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FINAL REPORT WATER AVAILABILITY MODEL UPDATE - RED RIVER BASIN

Prepared for:

Texas Commission on Environmental Quality

Contract 582-20-13330

August 31, 2021

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Prepared for:

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Jon S. Albright

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EXECUTIVE SUMMARY

This report describes an update and extension of the hydrology (naturalized flow and net evaporation datasets) for the Texas Commission on Environmental Quality's (TCEQ) Red River Water Availability Model (Red River WAM). The work was authorized by TCEQ contract 582-20-13330. The revision includes the period from 1948 to 2018. Previous work began in 1948 and ended in 1998. The updated hydrology and the associated changes represent a substantial revision to the WAM. The primary changes to the Red River WAM hydrology are:

- Updated all fill relationships (**Chapter 3.4**).
- Recalculated net evaporation rates (**Chapter 2.4**).
- Updated all content change and evaporation data that were estimated with an operation study (**Appendix B**).
- Updated the methodology used for calculating naturalized flows for the six control points on the main stem of the Red River along the Texas/Oklahoma border (**Chapter 3.2.1**).
- Eliminated most manual adjustments for negative incremental flows (**Chapter 6.0**).

This report provides information regarding the update and extension. The calculations for the updated flows are in Excel workbooks that accompany this report. Text files with updated model code are provided as well.

1.0 INTRODUCTION

In 2019, the 86th Texas Legislature authorized the Texas Commission on Environmental Quality (TCEQ) to obtain or develop an updated water availability model for the Red River Basin by December 1, 2022. TCEQ retained the team of Freese and Nichols, Inc. (FNI) in association with Kennedy Resource Company, Rivulous LLC, Water P. Moore and Associates, and Robert J. Brandes Consulting, under Contract 582-20-13330 (Contract), to help develop the updated model. This report, and the associated files delivered with it, are submitted in fulfillment of that contract. The update focuses primarily on revision and extension of hydrologic data (naturalized flows and evaporation), although it also includes modifications to the existing Red River Water Availability Model (Red River WAM). Naturalized streamflows are historical stream gage data adjusted to remove the impact of upstream water right diversions, major reservoir depletions, and return flows greater than 1 MGD. This report presents new naturalized flows and evaporation data for the entire period of record (1948 to 2018). Consistent with the existing Red River WAM, the naturalized flows include only the Texas portion of the Red River Basin with consideration for the Red River Compact. We also updated historical Oklahoma flows, entered in the WAM as flow adjustments.

Espey Consultants, Inc. (in association with PBS&J, Crespo Consulting Services, Inc., Halff Associates, Inc. and CivilTech Engineering, Inc.) developed the original hydrology for the Red River WAM in 2001 for the Texas Natural Resources Conservation Commission, predecessor agency to TCEQ. The Red River WAM was developed pursuant to Senate Bill 1, passed by the 75th Legislature in 1997. The original contract for the Red River WAM included the Canadian River Basin, which is not included in the current project.

The Red River WAM hydrology has been through several updates since 2001. In this report, we refer to the hydrology and naturalized flow workbooks provided by TCEQ at the beginning of this project as the "previous" hydrology. TCEQ staff developed most of these data around 2007, although there have been some updates since that time. We refer to the hydrology developed as part of the original model development in 2001 as the "original" hydrology.

1.1 SCOPE OF WORK

The following Scope of Work is a summary of the detailed scope of work developed in the *Final Project Management Plan*, dated August 21, 2020. A more detailed version of the scope may be found in that report.

Task 1 Project Management Plan and Work Plan

Task 1.1. Project Management Plan

Task 1.2 Review of Previous Flow Naturalization

Task 1.3 Data Collection

Task 1.4 Final Project Management Plan and Work Plan

The Final Project Management Plan and Workplan was submitted to TCEQ on August 21, 2020.

Task 2 Development of Naturalized Flow Datasets

Task 2.1 Data Review

Task 2.2 Develop Reservoir Data

Task 2.3 Fill in Missing Data

Task 2.4 Develop Draft Naturalized Flows and Quality Control

Task 2.5 Peer Review and Report

Task 2.6 Report

1.2 DESCRIPTION OF BASIN

Of the fifteen major river basins in Texas, the Red River Basin is the fourth largest by area, covering 93,450 square miles overall and 24,297 square miles in Texas. Its headwaters are in New Mexico. The Red River and its tributaries flow across Texas, through Oklahoma into Arkansas, then into Louisiana, where it joins the Mississippi River. The surrounding basins include the Canadian River Basin to the north and the Brazos, Trinity, and Sulphur River Basins in the south. (Note that the Sulphur River and Cypress Creek both flow into the Red River in Louisiana, before it joins the Mississippi. Texas law treats these tributary basins as separate river basins, and they are not included in the Red River WAM.) Within Texas, there are six major tributaries: the North Fork of the Red River, the Salt Fork of the Red River, the Prairie Dog Town Fork of the Red River, the Pease River, the Wichita River, and the Little Wichita River. There are 271 water rights in this Red River Basin in Texas, with 24 existing major surface water reservoirs and one major reservoir under construction. Most are water-supply reservoirs. The principal water quality concern in this area of the basin is elevated levels of naturally occurring chloride in the surface water.

1.3 ORGANIZATION OF REPORT

In accordance with the Contract, the Final Report includes a summary of the work done and the updated naturalized streamflow, evaporation, and flow adjustment data for the Red River Basin. The report includes chapters on the following:

- **Chapter 2.0** - Data collection
- **Chapter 3.0** - Data analysis
- **Chapter 4.0** - Changes to the existing naturalized streamflow, evaporation, and flow adjustment datasets.
- **Chapter 5.0** - Corrections to the existing TCEQ water availability main input file (.dat), flow distribution file (.dis), and flow adjustment file (.fad) for the sole purpose of incorporating the extended naturalized streamflow, evaporation, and flow adjustment datasets.
- **Chapter 6.0** - A procedure for addressing any negative incremental flow issues.
- **Chapter 7.0** - Results of the independent peer review and any changes to the extended naturalized streamflow datasets resulting from the review.
- **Chapter 8.0** - Final naturalized streamflow, evaporation, and flow adjustment datasets.

2.0 DATA COLLECTION

Data collection was the first step in the naturalization process. This Chapter describes the data collected during the project and how that data was used.

2.1 STREAMFLOW DATA

With a few exceptions, the naturalized flows used in the WAMs are based on historical streamflow records, with missing data filled in using naturalized flows from nearby points. **Table 1** lists primary control points and the associated United States Geological Survey (USGS) streamflow gages in the Red River Basin. Primary control points are locations where naturalized flows are input into the WAM. **Figure 1** is a map of the study area showing the location of primary control points and major reservoirs.

We obtained most of the historical streamflow data from the USGS National Water Information System (https://waterdata.usgs.gov/nwis). In some cases, the USGS website did not have all the flow data in the previous workbooks. We verified these data using published USGS data or the Texas Department of Water Resources Report 244: *Streamflow and Reservoir Content Records in Texas Compilation Report January 1889 through December 1975*. We obtained unpublished USGS flows for the South Wichita River below low flow dam near Guthrie, TX (USGS 07311783) directly from the USGS.

We obtained outflows for Waurika Lake, Lake Hugo, Lake Texoma and Lake Pat Mayse from the U.S. Army Corps of Engineers (USACE) Tulsa District, either through the Tulsa District website (https://www.swt-wc.usace.army.mil/charts/) or directly from the Tulsa District. We used USACE Lake Texoma outflows for the historical flows at Red River at Denison Dam near Denison, TX gage (USGS 07331600) from September 1989 through November 1996, when the USGS did not report flows at this location. This gage location only measures outflows from Lake Texoma. We also used other USACE flows in the naturalization of gages on the main stem of the Red River on the Texas/Oklahoma border, discussed in **Chapter 3.2.1**.

Gages may not have continuous flow data for various reasons. The period of missing data could be as short as a single day or last for multiple years. Missing records for short periods of time (less than 10 days) usually occur when the gage is temporarily out of service. This can occur when flows are very low or very high, or there is a problem with the gage. These flows were filled in with a reasonable estimation of the daily flow so that the monthly total volume is as accurate as possible. Methods used for filling in short periods of flows included:

- Taking the average of the adjacent days,
- Taking the average of the remaining days in the month, or
- Looking at flow trends for nearby days.

The specific method applied was noted in the gage flow workbook. Methods used to estimate flows for longer periods of time are discussed in **Chapter 3.4**.

We converted daily average flow data from the USGS gages or other sources from cubic feet per second to acre-feet per day by multiplying by 86,400 seconds per day and dividing by 43,560 square feet per acre and then summed up to monthly data in acre-feet per month. These flows then serve as input for the naturalization process.

This project identified two new primary control points:

- Salt Fork of the Red River near Clarendon (SF_CL)
- North Fork of the Red River near Shamrock Texas (NF_SH)

The two new control points are marked by **black bold** text in **Table 1** and blue dots in **Figure 1**. **Chapter 5.1** includes more information on the new primary control points.

In the Work Plan, we also considered a potential primary control point at Lake Pat Mayse. This consideration was based on our experience with the Bois d'Arc Lake application, where we determined that the naturalized flows on the main stem of the Red River were not a good estimator of flows at that location. Bois d'Arc Lake is in the watershed adjacent to Lake Pat Mayse. However, the updated hydrology from the main stem of the Red River developed as part of this project is a good estimator of flows at Bois d'Arc Lake, and a preliminary review also indicated that this was true for inflows to Lake Pat Mayse as well. So consideration of a new primary control point at Lake Pat Mayse was dropped.

Several of the drainage areas reported by the USGS are inconsistent. These drainage areas are indicated by **red bold** text in **Table 1**. For example, the Little Wichita above Henrietta and the Little Wichita near Henrietta are at different locations but have the same drainage area. Also, gages along the main stem of the Red River have inconsistent non-contributing drainage areas. For example, the Red River near Gainesville, at Denison Dam and at Arthur City have approximately 7,900 square miles of non-contributing drainage area, while the Red River at Index has 5,900 square miles. Since the Index gage is downstream of the other gages, this is an inconsistency. It is not possible for downstream gage to have a smaller non-contributing drainage area than an upstream gage.

Table 1: Primary Control Point and Associated USGS Streamflow Gages in the Red River Basin

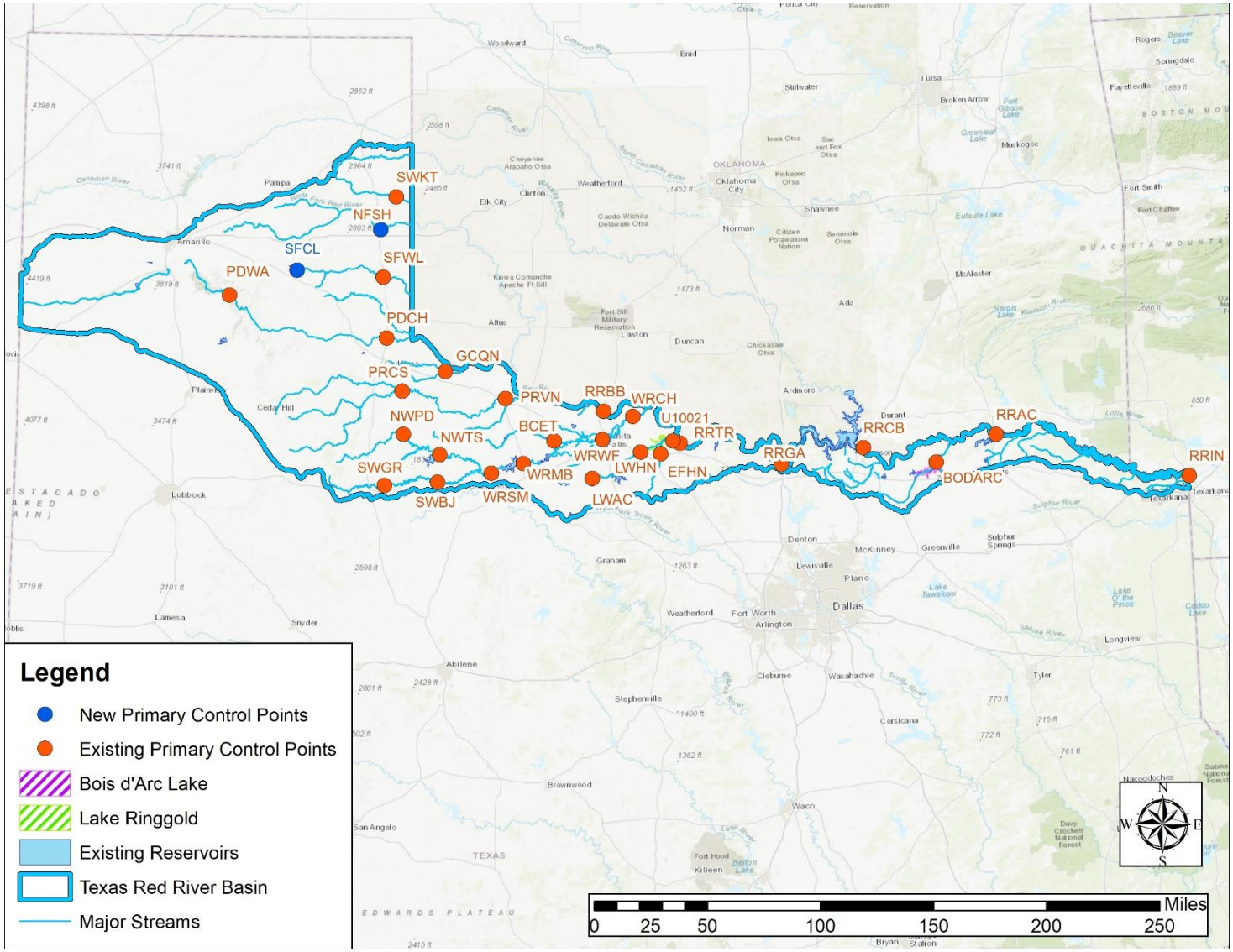
Gage Identifier	WAM Control Point (Texas)	USGS Gage Name	USGS Number	Total Drainage Area [a] (Square Miles)	Non-Contributing Drainage Area [a] (Square Miles)	Contributing Drainage Area [a] (Square Miles)	Period of Record
SW_KT	A10000	Sweetwater Creek near Kelton, TX	07301410	297	16	281	12/1961-Present
NF_SH	**10095**	**North Fork Red River near Shamrock, TX**	**07301300**	**1,368.6**	**551.9**	**816.7**	**3/1964-9/1991, 10/2000-Present**
SF_CL [b]	**B10060**	**Salt Fork Red River near Clarendon, TX**	**07299850**	**457**	**191**	**266**	**6-1960-9/1964**
SF_WL	B10000	Salt Fork Red River near Wellington, TX	07300000	1,222	209	1,013	6/1952-Present
PD_WA	C10000	Prairie Dog Town Fork Red River near Wayside, TX	07297910	3,754	2,824	930	10/1967-Present
PD_CH	D10000	Prairie Dog Town Fork Red River near Childress, TX	07299540	7,725	4,767	2,958	4/1965-Present
GC_QN	E10000	Groesbeck Creek at SH6 near Quanah, TX	07299670	303	0	303	11/1961-Present
PR_CS	F10000	Pease River near Childress, TX	07307800	2,754	559	2,195	12/1959-9/2011
PR_VN	G10000	Pease River near Vernon, TX	07308200	3,488	559	2,929	12/1959-Present
RR_BB	H10000	Red River near Burkburnett, TX	07308500	20,570	**5,936**	14,634	1/1960-Present
NW_PD	I10000	North Wichita River near Paducah, TX	07311600	540	0	540	2/1951-9/2011
NW_TS	J10000	North Wichita River near Truscott, TX	07311700	937	0	937	12/1959-Present
SW_GR	K10000	South Wichita River near Guthrie, TX	07311780	219	0	219	10/1970-9/1976
		South Wichita River below low flow dam near Guthrie, TX	07311783	223	0	223	10/1984-9/2011
SW_BJ	L10000	South Wichita River near Benjamin, TX	07311800	584	0	584	12/1959-Present
WR_SM	M10000	Wichita River near Seymour, TX	07311900	1,874	0	1,874	12/1959-9/1979, 10/1996-Present
WR_MB	N10000	Wichita River near Mabelle, TX	07312100	2,086	0	2,086	10/1959-Present
BC_ET	O10000	Beaver Creek near Electra, TX	07312200	652	0	652	2/1960-Present
WR_WF	P10000	Wichita River at Wichita Falls, TX [c]	07312500	3,140	**0**	3,140	3/1938-Present
WR_CH	Q10000	Wichita River near Charlie, TX	07312700	3,439	**0**	3,439	10/1967-9/2018
LW_AC	R10000	Little Wichita River near Archer City, TX	07314500	481	0	481	5/1932-12/1955; 9/1966-Present

Gage Identifier	WAM Control Point (Texas)	USGS Gage Name	USGS Number	Total Drainage Area [a] (Square Miles)	Non-Contributing Drainage Area [a] (Square Miles)	Contributing Drainage Area [a] (Square Miles)	Period of Record
LW_HN	S10000	Little Wichita River above Henrietta, TX	07314900	1,037	0	1,037	10/1974-Present
		Little Wichita River near Henrietta, TX	07315000	**1,037**	0	**1,037**	1/1953-9/1974
EF_HN	T10000	East Fork Little Wichita River near Henrietta, TX	07315200	178	0	178	11/1963-Present
--	U10021[d]	Lake Ringgold	N/A	1,480	0	1,480	N/A
RR_TR	U10000	Red River near Terral, OK	07315500	28,723	**5,936**	22,787	4/1938-Present
RR_GA	V10000	Red River near Gainesville, TX	07316000	30,728	**7,903**	22,825	5/1936-Present
RR_CB	W10000	Red River at Denison Dam near Dennison, TX	07331600	39,642	**7,928**	31,714	10/1961-9/1989, 12/1996-Present
		Red River near Colbert, OK	07332000	39,777	**5,936**	33,841	10/23-9/1961
--	BODARC	Bois d'Arc Lake	N/A	327	0	327	N/A
		Bois d'Arc Creek at Farm to Market Road 1396 near Honey Grove, TX	07332620	270	0	270	6/2006 – 10/2019
		Bois d'Arc Creek at Farm to Market Road 409 near Honey Grove, TX	07332622	370	0	370	7/2009 - Present
RR_AC	X10000	Red River at Arthur City, TX	07335500	44,445	**7,928**	36,517	10/1905-9/1911, 7/1936-Present
RR_IN	Y10000	Red River at Index, AR	07337000	48,000	**5,900**	42,100	10/1936-Present

Notes:
Text in **red bold** indicate possibly inconsistent drainage areas.
Text in **black bold** indicate new control points.

a Drainage areas are from the USGS except for where noted.
b SF_CL is also the location of USGS reservoir gage Greenbelt Lake near Clarendon, TX (07299840).
c The USGS reports the area above Lake Kemp as being "non-contributing". However, this is not consistent with the use of the non-contributing drainage areas used for this study, which only considers parts of the watershed that are not directly connected naturally, such as areas of the high plains that drain into playa lakes rather than streams. For the purposes of this study, the area above Lake Kemp will be considered part of this gage's contributing drainage area.
d The Lake Ringgold water right, which is pending at the time of this study, proposed a new primary control point at this location. It is not in the previous TCEQ WAM.

Figure 1: Primary Control Points in the Red River Basin



There are five primary control points that are associated with multiple USGS gage numbers:

- *SF_CL* represents both the stream gage Salt Fork Red River near Clarendon, TX (07299850) and the reservoir gage Greenbelt Lake near Clarendon, TX (07299840). The stream gage was in operation for several years before the reservoir was constructed. Both gages are at the same location.
- *SW_GR* represents both the South Wichita River near Guthrie, TX gage (07311780) and the South Wichita River below Low Flow Dam near Guthrie, TX (07311783). Gage 07311780 was located slightly upstream of the current gage. Another gage, South Wichita River at Low Flow Dam near Guthrie, TX (07311782) is at the same site as the current gage, but it measures flows pumped from the river to the Truscott Brine Reservoir.
- *LW_HN* is associated with both the Little Wichita River near Henrietta, TX gage (07315000) and the Little Wichita River above Henrietta, TX gage (07314900). 07315000 was located 2.6 miles downstream of the current site.
- *RR_CB* represents both the Red River near Colbert, OK gage (07332000) and the Red River at Denison Dam near Denison, TX (07332000). The Colbert gage was located slightly downstream of the Denison Dam gage. Both gages primarily report outflows from Lake Texoma. More information can be found in **Appendix E**.
- *BODARC* represents the location of Bois d'Arc Lake, which is currently under construction. For this update, we use naturalized flows for two stream gages, Bois d'Arc Creek at Farm to Market Road 1396 near Honey Grove, TX (07332620) and Bois d'Arc Creek at Farm to Market Road 409 near Honey Grove, TX (07332622) when available to estimate flows at the dam, which is located between the two gages. More information can be found in **Chapter 3.2.2.**

2.2 RESERVOIR STORAGE

Monthly changes in reservoir storage content and average monthly surface area are required to calculate naturalized flows. Reservoir data are used to estimate how much water is impounded in or released from a reservoir in each month as well as how much water evaporates from the reservoir surface that month. **Table 2** lists major reservoirs in the basin that are included in the flow naturalization. When available, we based changes in content on records from the USGS, USACE and/or records kept by others. If records are not available, we estimated content change using reservoir operational studies. We did not consider content

changes for smaller reservoirs, which are generally reservoirs with less than 5,000 acre-feet conservation storage, in naturalized flow development.

Table 2: Major Reservoirs in the Red River Basin

Reservoir	WAM Identifier	Primary Control Point ID	WAM Control Point	WAM Drainage Area (square miles)	Impoundment Date
McClellan (Cibola)	CIBOLA	NF_SH	10140	245.11	1938
Greenbelt	GREENB	SF_CL	B10060	263.56	Dec-66
Bivins (Amarillo City Lake)	BIVINS	PD_WA	C10210	71.82	1926
Tanglewood (Stockton)	TANGLE	PD_WA	C10040	676.11	1962
Buffalo Lake	BUFALO	PD_WA	C10080	474.85	Jun-38
Mackenzie	MAKNZE	PD_CH	D10130	319.35	Apr-74
Baylor Creek	BAYLOR	PD_CH	D10030	35.57	Dec-49
Lake Kemp	KEMP	WR_MB	N10020	2047.65	1922
Lake Diversion	DIVSON	WR_WF	P10110	2176.37	1924
Santa Rosa Lake	SROSA	BC_ET	O10090	322.51	1929
Lake Electra	ELCTRA	BC_ET	O10020	14.52	1950
North Fork Buffalo Creek	NFBUFF	WR_WF	P10060	33.18	Nov-64
Lake Wichita	WICHTA	WR_CH	Q10080	127.44	1901
Lake Kickapoo	KICKAP	LW_AC	R10010	262.31	Feb-46
Lake Arrowhead	AROWHD	LW_HN	S10030	826.59	1966
Lake Nocona	NOCONA	RR_GA	V10070	91.05	1961
Hubert H Moss Lake	MOSSLK	RR_GA	V10020	68.53	Apr-66
Lake Texoma	TEXOMA	RR_CB	W10060	17245.85	Jan-44
Randell Lake	RANDAL	RR_CB	W10020	10.24	1909
Valley Lake	VALLEY	RR_AC	X10490	8.5	Dec-60
Lake Bonham	BONHAM	RR_AC	X10270	25.66	Nov-69
Bois d'Arc Lake	BODARC	BODARC	BODARC	327	Under construction
Coffee Mill Lake	COFFEE	RR_AC	X10230	39.83	1938
Pat Mayse	MAYSE	RR_AC	X10010	177.9	Sep-67
Lake Crook	CROOK	RR_IN	Y10330	55.25	1923

We calculated average surface area for each reservoir based on area-capacity-elevation curves from either the content data or historical elevation data. More information may be found in **Chapter 2.3**.

Reservoir data may not be continuous for various reasons. If the end-of-month elevation or storage was not available, we used the following procedure to estimate reservoir storage:

- We estimated short periods of missing data by taking the average of neighboring days, or linear interpolation.
- For longer periods of missing data, or if no reservoir data are available at all, we used a reservoir operation study to estimate reservoir storage content. These operation studies used an Excel-based mass balance model using estimated reservoir inflows, net evaporation, historical diversions, and area-capacity information to calculate reservoir storage.
- If a reservoir is used for once-through cooling or uses makeup water from an alternative source to keep the reservoir at or near full, we assumed that the reservoir was full (zero content change) and estimated evaporation loss only.

More information regarding specific methods for individual reservoirs may be found in **Appendix B**.

Lake Tanglewood, also known as Lake Stockton, has an authorized storage capacity of 4,897 acre-feet (Certificate of Adjudication 02-5194). Since this is just under the 5,000 acre-feet minimum it was not included in the original naturalization. However, since the original flows were developed, return flows from the City of Amarillo have been discharged into the lake. In order to properly account for this discharge, the reservoir has been included in this update.

2.3 RESERVOIR AREA-CAPACITY DATA

Historical reservoir elevation data were converted to storage content and corresponding surface areas using available area-capacity-elevation data. Where multiple volumetric surveys are available, we changed surveys during points in time that coincide with periods of high flow so there will be less of an impact on water availability. Information on specific surveys used in the naturalization process may be found in **Appendix C**, as well as in notes in the reservoir content change workbooks included with the naturalized flow workbooks.

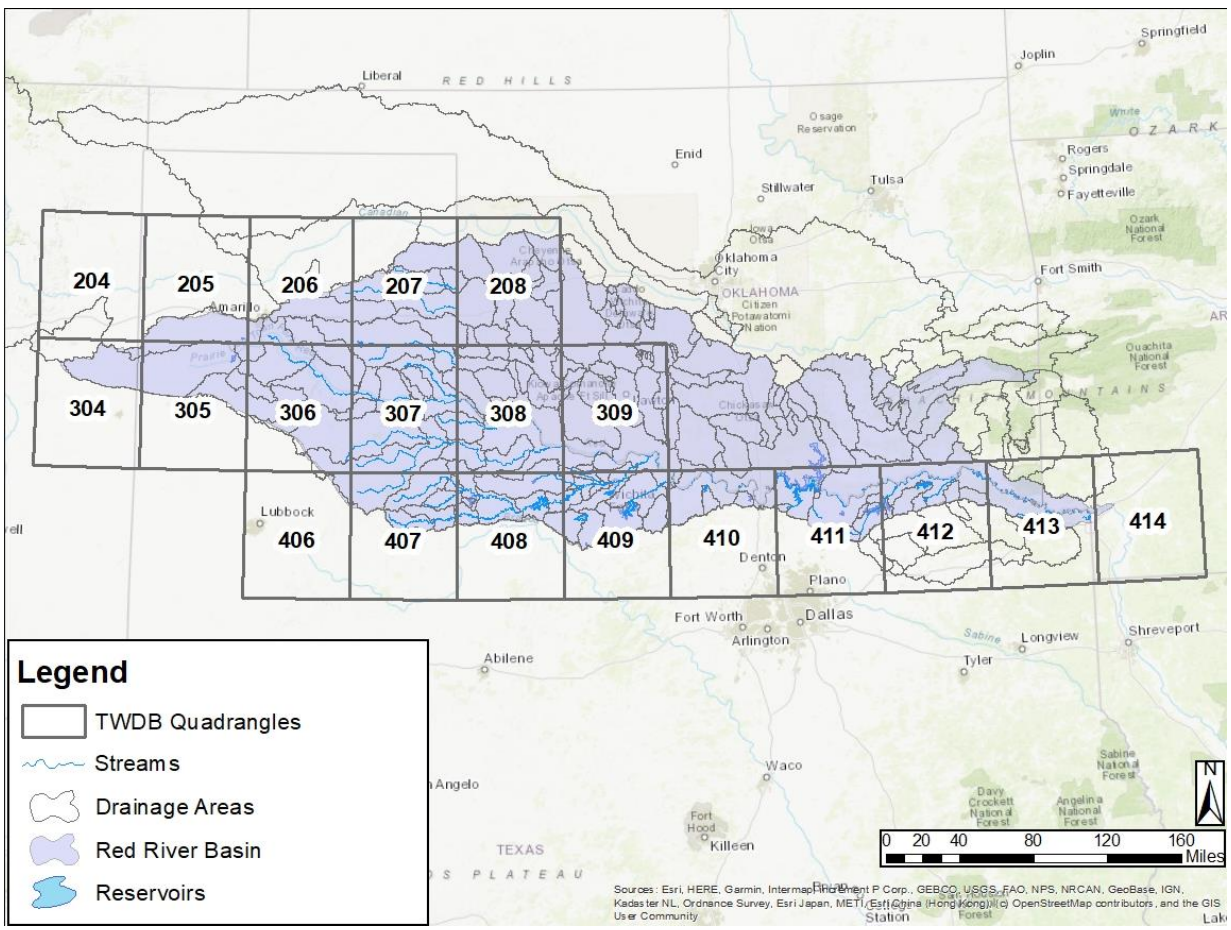
2.4 EVAPORATION AND PRECIPITATION DATA

The original naturalized flows used a proprietary method for calculating net evaporation rates. FNI was unable to replicate this method. For the update, we replaced the original evaporation rates from 1948 to

1998 with rates derived from evaporation and precipitation rates from the Texas Water Development Board (TWDB). This gives a consistent set of net evaporation rates for the entire period of simulation, is consistent with other WAMs, and can readily be updated the next time the hydrology is extended.

The TWDB has developed monthly precipitation and evaporation rates for each one-degree quadrangle in Texas. **Figure 2** shows the TWDB quadrangles that cover the Red River Basin. At the time of this study, precipitation data were available from 1940 to 2019, and gross reservoir evaporation rates from 1954 to 2019 (https://waterdatafortexas.org/lake-evaporation-rainfall). Evaporation data for the period from 1948 through 1953 are from older estimates of quadrangle evaporation by TWDB predecessor agencies and were retrieved from FNI files.

Figure 2: TWDB Evaporation Quadrangles Used in the Red River WAM



We obtained some historical evaporation and precipitation data from the National Oceanic and Atmospheric Administration (NOAA) website or from the USACE. We used these data for Lakes Kemp, Diversion and Kickapoo. when the data are available. Specific months where we used these data are noted in the evaporation workbooks.

The input evaporation rates for the WAMs are monthly Net Reservoir Evaporation rates, which are a combined factor that includes evaporation and precipitation on the reservoir surfaces, as well as an adjustment for effective runoff. Effective runoff is the portion of the precipitation that would have become runoff in the area occupied by the reservoir if the reservoir did not exist.

The formula for Net Reservoir Evaporation is:

Net Reservoir Evap = Gross Evaporation – (Precipitation – Effective Runoff)

Where

Net Reservoir Evap is the Net Reservoir Evaporation rate

Gross Evaporation is the observed evaporation rate, usually either measured by an evaporation pan multiplied by a pan coefficient, estimated from TWDB evaporation quadrangles, or calculated from other climatic data

Precipitation is the precipitation rate

Effective Runoff is the unit runoff in the reservoir area typically expressed in feet or inches

Effective runoff is typically estimated by taking nearby monthly gaged flow volumes from a small watershed and dividing by the drainage area of the gage, producing a unit runoff. Occasionally the calculated effective runoff is higher than the precipitation rate, and the effective runoff is limited to the precipitation rate when this happens.

Smaller reservoirs (i.e. those not included in **Table 2**) in the Red River WAM use net evaporation rates based on individual TWDB quadrangles. These rates are input on individual EV records in the WAM input for access at multiple locations. **Table 3** summarizes the methods used to calculate the effective runoff for each quadrangle.

For major reservoirs, we used weighted averages of the TWDB quadrangle data for the update. The weighting factors are based on the inverse of the distance of the reservoir to the center of each quadrangle. **Table 4** lists the quadrangle weighting factors for each reservoir**. Table 5** shows the gages used to calculate

Table 3: Quadrangle Effective Runoff Calculation

TWDB Quadrangle	Gage Name	USGS Number	Drainage Area (square miles)	Period
205	Canadian River near Amarillo	07227500	19,445	1/1948-12/2018
206	Palo Duro Creek nr Spearman	07233500	556	1/1948-2/1974, 7/1999-12/2018
	Dixon Creek nr Borger	07227920	134	3/1974-9/1989
	Canadian River near Canadian	07228000	22,866	10/1989-6/1999
207	Canadian River near Canadian	07228000	22,866	1/1948-11/1961
	Sweetwater Creek near Kelton (SW_KT)	07301410	287	12/1961-12/2018
305	Tierra Blanca Ck abv Buffalo Lk nr Umbarger	07295500	538	1/1948-9/1954, 4/1967-9/1973, 10/2002-12/2018
	N Tule Draw at Res nr Tulia	07298000	65	10/1954-3/1967
	Prairie Dog Town Fork, Red River near Wayside (PD_WA)	07297910	4,211	10/1973-9/2002
306	N Tule Draw at Res nr Tulia	07298000	65	1/1948-9/1973
	Prairie Dog Town Fork, Red River near Wayside (PD_WA)	07297910	4,211	10/1973-12/2018
307	N Tule Draw at Res nr Tulia	07298000	65	1/1948-6/1952
	Salt Fork, Red River near Wellington (SF_WL)	07300000	1,222	7/1952-11/1959, 9/1962-3/1965
	Pease River near Childress (PR_CS)	07307800	2,754	12/1959-8/1962, 10/1967-9/2011
	Prairie Dog Town Fork, Red River near Childress (PD_CH)	07299540	7,725	14/1965-9/1967, 10/2011-12/2018
308	Salt Fork Red River at Mangum, OK	07300500	3,488	1/1948-12/2018
309	Deep Red Run near Randlett	07311500	617	10/1949-12/2018
	East Cache Creek near Walters	07311000	675	1/1948-9/1949;
407	Salt Fork Brazos River near Aspermont	08082000	5,130	1/1948-12/2018
408	Brazos River at Seymour	08082500	15,538	1/1948-11/1959
	South Wichita River near Benjamin	07311800	584	12/1959-12/2018
409	Big Sandy Creek near Bridgeport	08044000	333	1/1948 - 2/1956
	West Fork Trinity River near Jacksboro	08042800	683	3/1956-12/2018
410	Big Sandy Creek near Bridgeport	08044000	333	1/1948 - 9/1949
	Denton Creek near Justin	08053500	400	10/1949-12/2018
411	East Fork Trinity River near Rockwall	08061500	840	1/1948 - 8/1949
	Sister Grove Creek near Princeton	08059500	113	9/1949-1/1975
	Little Elm Creek near Aubrey	08052700	75.5	2/1975 - 6/1975, 10/2001-4/2014
	Sister Grove Creek near Blue Ridge	08059400	83.1	7/1975-9/2001, 5/2014-12/2018
412	White Oak Creek below Talco	07343800	494	1/1948 - 9/1949
	North Sulphur River near Cooper	07343000	276	10/1949-12/2018
413	Naturalized Sulphur River at Stateline (F10)	N/A	3,546.52	1/1948-8/2010
	Anderson Cr nr Simms	07344100	89.9	9/2010-12/2018

Table 4: Quadrangle Weighting Factors for Deriving Reservoir Net Evaporation Rates

Reservoir	Quadrangle Weighting Factors
McClellan (Cibola)	0.5(206) + 0.5(207)
Greenbelt	0.25(206) + 0.25(207) + 0.25(306) + 0.25(307)
Bivins (Amarillo City Lake)	0.275(205) + 0.246(206) + 0.249(305) + 0.230(306)
Tanglewood (Stockton)	0.237(205) + 0.200(206) + 0.319(305) + 0.244(306)
Buffalo Lake	0.237(205) + 0.200(206) + 0.319(305) + 0.244(306)
Mackenzie	0.93(306) + 0.07(307)
Baylor Creek	0.87(307) + 0.13(308)
Lake Kemp	0.55(408) + 0.45(409)
Lake Diversion	0.19(308) + 0.2(309) + 0.29(408) + 0.32(409)
Santa Rosa Lake	0.283(308) + 0.151(407) + 0.350(408) + 0.216(409)
Lake Electra	0.25(308) + 0.24(309) + 0.26(408) + 0.25(409)
North Fork Buffalo Creek	0.2(308) + 0.3(309) + 0.2(408) + 0.3(409)
Lake Wichita	0.34(309) + 0.66(409)
Lake Kickapoo	0.32(408) + 0.68(409)
Lake Arrowhead	1.0(409)
Lake Ringgold	0.53125(409) + 0.46875(410)
Lake Nocona	1.0(410)
Hubert H Moss Lake	0.66(410) + 0.34(411)
Lake Texoma	0.38(410) + 0.62(411)
Randell Lake	0.73(411) + 0.27(410)
Valley Lake	0.96(411) + 0.04(412)
Lake Bonham	0.621(411) + 0.379(412)
Bois d'Arc Lake	0.566(411) + 0.434(412)
Coffee Mill Lake	0.161(410) + 0.422(411) + 0.417(412)
Pat Mayse	1.0(412)
Lake Crook	1.0(412)

Table 5: Stream Gages Used for Reservoir Effective Runoff Calculations

Reservoir	Gage Name	USGS Number	Drainage Area (mi^2)	Period
McClellan (Cibola)	Canadian River nr Amarillo	07227500	15,376	1/1948-6/1952
	Salt Fork Red River nr Wellington	07300000	1,222	7/1952-5/1960, 10/1964-7/1997
	Salt Fork Red River nr Clarendon	07299850	266	7/1960-9/1964
	Lelia Lake Creek nr Hedley	07299890	74	8/1997-12/2018
Greenbelt	Canadian River nr Amarillo	07227500	15,376	1/1948-6/1952
	Salt Fork Red River nr Wellington	07300000	1,222	7/1952-5/1960, 10/1964-7/1997
	Salt Fork Red River nr Clarendon	07299850	266	6/1960-9/1964
	Lelia Lake Creek nr Hedley	07299890	74	8/1997-12/2018

Reservoir	Gage Name	USGS Number	Drainage Area (mi^2)	Period
Bivins (Amarillo City Lake)	Tierra Blanca Creek above Buffalo Lake nr Umbarger	07295500	538	1/1948-9/1954, 4/1967-9/1973, 10/2002-12/2018
	Canadian River nr Amarillo	07227500	15,376	10/1954-3/1967, 10/1973-9/2002
Tanglewood (Stockton)	Uses Buffalo Lake (below)			
Buffalo Lake	Tierra Blanca Creek above Buffalo Lake nr Umbarger	07295500	538	1/1948-9/1954, 4/1967-9/1973, 10/2002-12/2018
	Canadian River nr Amarillo	07227500	15,376	10/1954-3/1967
	Prairie Dog Town Fork Red Rv nr Wayside	07297910	930	10/1973-9/2002
Mackenzie	N Tule Draw at Res nr Tulia	07298000	65	1/1948-7/1964
	Tule Ck nr Silverton	07298200	190	8/1964-9/1986
	Prairie Dog Town Fork Red Rv nr Wayside	07297910	930	10/1986-12/2018
Baylor Creek	N Tule Draw at Res nr Tulia	07298000	65	1/1948-11/1959, 9/1962-3/1965
	Pease River nr Childress	07307800	2,195	12/1959-8/1962
	Prairie Dog Town Fork, Red River nr Childress	07299540	2,958	4/1965-12/2018
Lake Kemp	Brazos River at Seymour	08082500	5,972	1/1948-2/1960
	Beaver Creek nr Electra	07312200	652	3/1960-12/2018
Lake Diversion	Brazos River at Seymour	08082500	5,972	1/1948-2/1960
	Beaver Creek nr Electra	07312200	652	3/1960-12/2018
Santa Rosa Lake	Brazos River at Seymour	08082500	5,972	1/1948-2/1960
	Beaver Creek nr Electra	07312200	652	3/1960-12/2018
Lake Electra	Wichita River at Wichita Falls	07312500	1,054	1/1948-3/1960
	Beaver Creek nr Electra	07312200	652	4/1960-12/2018
North Fork Buffalo Creek	Big Sandy Creek nr Bridgeport	08044000	333	1/1948-2/1960
	Beaver Creek nr Electra	07312200	652	3/1960-12/2018
Lake Wichita	Big Sandy Creek nr Bridgeport	08044000	333	1/1948-2/1960
	Beaver Creek nr Electra	07312200	652	3/1960-12/2018
Lake Kickapoo	Big Sandy Creek nr Bridgeport	08044000	333	1/1948-2/1956
	West Fork Trinity River nr Jacksboro	08042800	683	3/1956-11/1963
	East Fork Little Wichita River nr Henrietta	07315200	178	12/1963-12/2018
Lake Arrowhead	Big Sandy Creek nr Bridgeport	08044000	333	1/1948-2/1956
	West Fork Trinity River nr Jacksboro	08042800	683	3/1956-11/1963

Reservoir	Gage Name	USGS Number	Drainage Area (mi^2)	Period
	East Fork Little Wichita River nr Henrietta	07315200	178	12/1963-12/2018
Lake Ringgold	Naturalized flow at Ringgold damsite (U10021)	--	--	--
Lake Nocona	Big Sandy Creek nr Bridgeport	08044000	333	1/1948-9/1949
	Denton Creek nr Justin	08053500	400	10/1949-12/2018
Hubert H Moss Lake	Big Sandy Creek nr Bridgeport	08044000	333	1/1948-2/1949
	Clear Creek nr Sanger	08051500	295	3/1949-9/1956, 10/1973-9/1985
	Elm Fork Trinity River nr Muenster	08050300	46	10/1956-9/1973
	Elm Fork Trinity River at Gainesville	08050400	174	10/1985-12/2018
Lake Texoma	East Fork Trinity River nr Rockwall	08061500	840	1/1948-8/1949
	Sister Grove nr Princeton	08059500	113	9/1949-11/1967
	Mineral Creek nr Sadler	07316200	26	12/1967-12/1976
	Sister Grove Creek nr Blue Ridge	08059400	83.1	1/1977-9/1984
	Timber Creek nr Collinsville	08050800	38.8	10/1985-12/2018
Randell Lake	East Fork Trinity River nr Rockwall	08061500	840	1/1948-8/1949
	Sister Grove nr Princeton	08059500	113	9/1949-11/1967
	Mineral Creek nr Sadler	07316200	26	12/1967-12/1976
	Sister Grove Creek nr Blue Ridge	08059400	83.1	1/1977-9/1992
	Range Creek nr Collinsville	08050840	29.2	10/1992-12/2018
Valley Lake	East Fork Trinity River nr Rockwall	08061500	840	1/1948-8/1949
	Sister Grove Creek nr Princeton	08059500	113	9/1949-11/1962
	Bois d'Arc Creek nr Randolph	07332600	72	12/1962-9/1985
	Sister Grove Creek nr Blue Ridge	08059400	83.1	10/1985-9/1992
	Range Creek nr Collinsville	08050840	29.2	10/1992-12/2018
Lake Bonham	East Fork Trinity River nr Rockwall	08061500	840	1/1948-8/1949
	Sister Grove Creek nr Princeton	08059500	113	9/1949-12/1962
	Bois d'Arc Creek nr Randolph	07332600	72	1/1963-9/1985
	Sister Grove Creek nr Blue Ridge	08059400	83.1	10/1985-9/1991, 7/2006-12/2018
	Middle Sulphur River at Commerce	07342480	44.1	10/1991-6/2006
Bois d'Arc Lake	South Sulphur River nr Cooper	07342500	527	1/1948-9/1949
	North Sulphur River nr Cooper	07343000	276	10/1949-11/1962, 10/1985-6/2006
	Bois d'Arc Creek nr Randolph	07332600	72	12/1962-9/1985
	Bois d'Arc Creek at FM 1396 near Honey Grove	07332620	270	7/2006-12/2018
Coffee Mill Lake	East Fork Trinity River nr Rockwall	08061500	840	1/1948-8/1949

Reservoir	Gage Name	USGS Number	Drainage Area (mi^2)	Period
	Sister Grove Creek nr Princeton	08059500	113	9/1949-12/1962
	Bois d'Arc Creek nr Randolph	07332600	72	1/1963-9/1985
	Sister Grove Creek nr Blue Ridge	08059400	83.1	10/1985-9/1991
	Middle Sulphur River at Commerce	07342480	44.1	10/1991-6/2006
	Bois d'Arc Creek at FM 1396 near Honey Grove	07332620	270	7/2006-12/2018
Pat Mayse	South Sulphur River nr Cooper	07342500	527	1/1948-9/1949
	North Sulphur River nr Cooper	07343000	276	10/1949-12/2018
Lake Crook	South Sulphur River nr Cooper	07342500	527	1/1948-9/1949
	North Sulphur River nr Cooper	07343000	276	10/1949-12/2018

effective runoff for each reservoir. The resulting net evaporation rates are input at the control points associated with the reservoir.

Lakes Kemp, Diversion, Arrowhead and Kickapoo all had numerous months where the reservoir calculations result in large negative flows. This could be the result of underestimation of evaporation, overestimation of precipitation on the reservoir surface, incorrect storage change or diversion data, other unaccounted for losses (like leakage), or a combination of these factors. In order to mitigate somewhat for these negatives, in months where a mass balance calculation of reservoir inflows resulted in a negative flow (which would translate to the downstream gage location), the precipitation for that month was set to zero. TWDB quadrangle precipitation is spatially smoothed based on a number of rain gages. In the western portions of the state rainfall tends to be localized, so the quadrangle rainfall may not be representative of actual rainfall at the reservoir. Since these negative flows always occur when the reservoir storage has a large decrease over the month, we determined that it was likely that precipitation was over-stated during those months.

2.5 WATER RIGHTS/HISTORICAL WATER USE

TCEQ provided historical water use data from 2009 to 2018 at the beginning of this project. TCEQ previously supplied earlier water use data and FNI had these data. The City of Wichita Falls and the North Texas Municipal Water District provided additional water use data. FNI also had water use data from previous projects for the Red River Authority and the City of Nocona. We generally used historical water use data prior to 1998 from the previous workbooks for this update. These data are only available as the sum of all water use in the control point incremental watershed – individual water use data are not available. In some

cases, we replaced this previous data with historical water use data from FNI files. We noted these situations in the naturalized flow workbooks.

Table 6 is a summary of water rights and authorized diversions by primary control point. The number of water rights is based on the unique water right numbers. Water rights with multiple owners or types of use are considered as a unique water right. **Appendix D** contains a detailed list of water rights for each primary control point.

Table 6: Water Right Diversions by Control Point

Control Point ID	Name	Number of Water Rights	Total Authorized Diversions (ac-ft/yr)
SW_KT	Sweetwater Creek near Kelton	4	531
NF_SH	North Fork nr Shamrock	10	744
SF_CL	Salt Fork nr Clarendon (Greenbelt Lake)	2	12,200
SF_WL	Salt Fork, Red River near Wellington	5	4,477
--	Downstream of control points and upstream of TX/OK border	22	1,488
PD_WA	Prairie Dog Town Fork, Red River near Wayside	21	2,463
PD_CH	Prairie Dog Town Fork, Red River near Childress	25	6,757
GC_QN	Groesbeck Creek at SH6 near Quanah	5	319
PR_CS	Pease River near Childress	17	711
PR_VN	Pease River near Vernon	1	45
RR_BB	Red River near Burkburnett	6	3,436
NW_PD	North Wichita River near Paducah	1	35
NW_TS	North Wichita River near Truscott	3	10,290
SW_GR	South Wichita River at low flow dam near Guthrie	1	5,010
SW_BJ	South Wichita River near Benjamin	1	3,770
WR_SM	Wichita River near Seymour	2	105
WR_MB	Wichita River near Mabelle	2	2,153
BC_ET	Beaver Creek near Electra	6	5,745
WR_WF	Wichita River at Wichita Falls	10	189,596
WR_CH	Wichita River near Charlie	8	16,873
LW_AC	Little Wichita River near Archer City	5	42,201
LW_HN	Little Wichita River above Henrietta	6	67,552
EF_HN	East Fork Little Wichita River near Henrietta	0	0
RR_TR	Red River near Terral	14	6,405
RR_GA	Red River near Gainesville	16	10,581
RR_CB	Red River near Colbert	27	317,013

Control Point ID	Name	Number of Water Rights	Total Authorized Diversions (ac-ft/yr)
BODARC	Bois d'Arc Lake	8	181,351
RR_AC	Red River near Arthur City	46	98,520
RR_IN	Red River at Index	29	29,518
--	Downstream of Index	4	2,478
--	*Total*	*307*	*1,022,367*

Water use records are sometimes incomplete, or the values may be inconsistent with other water use data for a particular water right. Where appropriate, we estimated missing values, obtained data from previous FNI projects, used historical data from the Texas Water Development Board, or obtained data from the water user. For most unreported irrigation rights where the diversion amount is small, the historical use was assumed to be zero. Historical water use is added to historical streamflows to compute naturalized flows, so assuming zero water use leads to a conservatively low estimate of naturalized flow.

2.6 RETURN FLOWS

Table 7 lists wastewater treatment plant (WWTP) effluent discharges in the Red River Basin permitted for more than 1 million gallons per day (MGD) as of 2018. We obtained historical return flows from 1998 to 2018 from the Environmental Protection Agency (EPA) Envirofacts Permit Compliance System and Integrated Compliance Information System (PCS-ICIS) website and the Enforcement and Compliance History Online (ECHO) website. In almost all cases, we used the return flows from the original naturalized streamflow dataset from 1948 through 1997. Like the water use data, the original return flow data is only available as the sum of discharges at each control point. Individual return flows are not available. However, it appears that return flows less than 1 MGD may have been included in the original naturalization, since many of the return flow values are small. We did not identify any dischargers that were operating in the 1948 to 1998 period that were permitted for less than 1 MGD but are now permitted for more than 1 MGD that were not included in the original naturalization.

The only location where we adjusted the pre-1998 return flows in this study was in the Wichita River near Charlie watershed (WR_CH). It appears that historical return flows prior to 1996 were estimated, and the return flows from 1948 to 1958 appeared to be overstated based on historical population. We replaced the estimated return flows from 1948 to 1996 with estimates based on historical population and average per capita return flow from 1980 and 1990. After 1996 it appears that historical data were used.

Table 7: Current Wastewater Effluent Discharges to the Red River Basin Greater than 1 MGD

TPDES Number	NPDES Number	Facility	Average Permitted Flow (MGD)	Workbook ID	Classification
WQ0010392003	TX0025810	HOLLYWOOD ROAD WWTP	12	PD_WA	MUNICIPAL
WQ0001610000	TX0009334	GEORGIA-PACIFIC GYPSUM, LLC	1.5	GC_QN	NON-MUNICIPAL
WQ0002537000	TX0088781	RHODIA INC. GUAR PROCESSING [a]	1.3	RR_BB	NON-MUNICIPAL
WQ0010377001	TX0023001	CITY OF VERNON WWTP	2	RR_BB	MUNICIPAL
WQ0010691002	TX0052922	CITY OF IOWA PARK WWTP	1	WR_WF	MUNICIPAL
WQ0004419000	TX0124893	CYPRESS WTP	6	WR_WF	MUNICIPAL
WQ0010509001	TX0047686	RIVER ROAD WWTF	19.91	WR_CH [c]	MUNICIPAL
WQ0010509005	TX0084557	CITY OF WICHITA FALLS	1.5	WR_CH	MUNICIPAL
WQ0010002001	TX0026956	BURKBURNETT WWTP	2.2	RR_TR	MUNICIPAL
WQ0010070001	TX0021814	CITY OF BONHAM WWTP [b]	2.5	BODARC	MUNICIPAL
WQ0010079003	TX0047228	PAW PAW WWTP	6	RR_AC	MUNICIPAL
WQ0010329001	TX0024325	POST OAK WWTP	16	RR_AC	MUNICIPAL
WQ0001012000	TX0008982	CAMPBELL SOUP SUPPLY CO LLC	10	RR_IN	NON-MUNICIPAL
WQ0010479002	TX0027910	CITY OF PARIS WWTP	7.25	RR_IN	MUNICIPAL

Notes
a Located in PR_VN in original naturalization. Discharge is downstream of that gage.
b Located in RR_AC in original naturalization. BODARC is a new control point added since that time.
c Can also discharge into Lake Arrowhead, upstream of LW_HN.

We checked the raw data from the EPA websites for completeness and for duplicate entries. We examined duplicate entries to verify that they were duplicates and discarded them. We graphed the data to help identify erroneous entries. In most cases erroneous entries appeared to be decimal errors, and we corrected these. If they were not decimal errors, we used the average of adjacent months. We estimated occasional missing months from adjacent months.

In most cases, the discharges permitted for more than 1 MGD had almost complete records. One facility, Georgia-Pacific Gypsum LLC, which appeared to primarily discharge depressurization water in the Groesbeck Creek near Quanah (GC_QN) watershed, has several months of missing data. This facility is no longer operating and when contacted did not provide the missing information. Since it is not clear to what extent these discharges impacted streamflows or when the facility ceased discharging, we did not estimate the missing data. We estimated return flows for the City of Vernon from October 2000 to June 2002 from averages of surrounding years. The previous naturalization included Rhodia, Inc. discharges in the Pease River near Vernon (PR_VN) watershed. However, this facility discharges downstream of that gage. Since this was the only discharger in the PR_VN watershed, we moved the data prior to 1998 from PR_VN to RR_BB.

Since this facility, as well as the City of Vernon's wastewater discharges, are very close to the upstream (PR_VN) gage, we applied losses to the corrections at RR_BB (see **Table 8**).

We identified one new significant discharge in this update. The City of Amarillo has historically reused or had limited discharge to streams from its Hollywood Road WWTP. Beginning around 2006, the City began to discharge return flows to maintain storage in Lake Tanglewood, a recreation lake that had not previously been included in the flow naturalization because its authorized storage is slightly less than the 5,000 acre-feet storage cutoff. We incorporated this reservoir and the associated return flows into the naturalized flow update.

Beginning in 2018, the City of Wichita Falls began discharging some of their return flows from the River Road WWTF to Lake Arrowhead as part of an indirect reuse project, upstream of control point LW_HN. We obtained discharges for this project directly from the city.

A newly permitted facility, the North Texas Municipal Water District (NTMWD) Leonard water treatment plant, has not yet been put into operation and has no historical discharges. Discharges from this facility will be backwash from water treatment. NTMWD provided additional return flow data for the Bois d'Arc Lake watershed. FNI files provided supplemental historical return flow data for the City of Wichita Falls.

We did not include corrections for agricultural return flows in the naturalization because of lack of data. We did not include once-through cooling discharges into reservoirs, since these return flows are typically recycled, and consumptive use for these facilities is defined as the forced evaporation from the reservoirs produced by these facilities. We excluded return flows associated with water treatment plant backwash, since these discharges would be irregular and would not significantly affect streamflows.

3.0 DATA ANALYSIS

We used the data described in the previous section to calculate the naturalized flows and flow adjustments for input into the Red River WAM. The following sections describe the general procedure for obtaining naturalized flows, specific methods employed in the Red River WAM update, development of flow adjustment records, and methods used to fill in missing naturalized flow data.

3.1 GENERAL PROCEDURE FOR NATURALIZATION OF FLOWS

The Water Rights Analysis Package (WRAP) is the modeling program used to run the WAMs. According to the WRAP Reference Manual, naturalized streamflows are "sequences of monthly streamflow representing natural hydrology that are developed by adjusting historical gaged streamflow data to remove the impacts of reservoir construction, water use, and other human activities". A general equation for naturalized flow is as follows:

$$Naturalized\ Flow = Historical\ Flow + DF_0 * (Diversions_0 - Ret\ Flows_0 + Cont\ Change_0 + Evap\ Loss_0) + \sum_{i=1}^{n} DF_i * Upstream\ Adj_i)$$

Where:

Historical Flow is flow recorded at USGS streamflow gages or estimated from reservoir spills and releases recorded at the downstream end of the current reach ($n = 0$). Additional information on streamflows may be found in **Chapter 2.1**.

DF_0 is the deliver factor(1 - channel loss factor) applied to all upstream adjustments to determine the naturalized flow at downstream control points.

$Diversions_0$ are reach diversions from historical records or as estimated when records are missing, as described in **Chapter 2.5**.

$Ret\ Flows_0$ are the return flows in the reach from historical records or as estimated when records are missing, as described in **Chapter 2.6**.

$Cont\ Change_0$ is the change in content for major reservoirs in the reach based on USGS records, records kept by others, or estimates of content changes if records are not available. **Table 2** lists the reservoirs used in the naturalization, and **Appendix B** summarizes the methods used for estimating

content change for each major reservoir. We did not consider smaller reservoirs that are not in **Table 2** (generally reservoirs with less than 5,000 ac-ft of storage). More information on the data used in these calculations may be found in **Chapter 2.2**.

$Evap\ Loss_0$ is evaporation from reach reservoirs, estimated by multiplying the net reservoir evaporation rate by the reservoir surface area. **Table 4** and **Table 5** summarize the methods for determining net reservoir evaporation rates. Surface area is determined by taking the average of the surface area at the beginning and end of each month. Evaporation from smaller reservoirs not included in the previous naturalization were not included in the extension. More information on evaporation data may be found in **Chapter 2.4**.

n is the number of reaches immediately upstream of the current reach.

DF_i is the deliver factor(1 - channel loss factor) from each reach immediately upstream of the current reach.

$Upstream\ Adj_i$ is the sum of all the diversions, negative return flows, content change and reservoir evaporation from all upstream locations, from each upstream reach.

3.1.1 Loss and Delivery Factors

Channel losses in the WAMs are represented by channel loss factors, expressed as a number from 0.0 (no losses) to 1.0 (all flow is lost). Delivery factors are 1 – the channel loss factor. **Table 8** shows the loss and delivery factors used for the flow extension. The losses in **Table 8** are applied to all the upstream adjustments from the control points directly upstream of the location in the table. The upstream adjustments are the sum of the diversions, negative return flows, content change and evaporative losses from all upstream locations. Some of these adjustments may have had losses applied as they are routed through upstream reaches. The factors in **Table 8** are the same factors developed by TCEQ for the previous naturalization and are applied in the same way they were applied in the previous naturalization. In most cases, adjustments from the local reach between the current control point and upstream control points do not have loss factors applied (the delivery factor equals 1).

The current Red River WAM applies different loss factors than those listed in **Table 8**. The delivery factors in the model code have been conformed to these factors. It should be noted that the factors entered into the CP records in the WAMs apply to the reach downstream of that control point, while the factors in **Table 8** apply to corrections upstream of the listed location.

Table 8: Loss and Delivery Factors

Control Point ID	WAM Control Point ID	Loss Factor	Delivery Factor
SW_KT	A10000	0	1
SF_WL	B10000	0	1
PD_WA	C10000	0	1
PD_CH	D10000	0	1
GC_QN	E10000	0	1
PR_CS	F10000	0	1
PR_VN	G10000	0.5225	0.4775
RR_BB	H10000	0.3805	0.6195
NW_PD	I10000	0	1
NW_TS	J10000	0.2	0.8
SW_GR	K10000	0	1
SW_BJ	L10000	0.2	0.8
WR_SM	M10000	0.1	0.9
WR_MB	N10000	0.2	0.8
BC_ET	O10000	0	1
WR_WF	P10000	0.2	0.8
WR_CH	Q10000	0	1
LW_AC	R10000	0	1
LW_HN	S10000	0	1
EF_HN	T10000	0	1
RR_TR	U10000	0	1
RR_GA	V10000	0	1
RR_CB	W10000	0	1
RR_AC	X10000	0	1
RR_IN	Y10000	0	1

Note: these factors apply to the corrections from the watershed(s) immediately upstream of the listed control point.

3.1.2 Negative Naturalized Flows

The computation of naturalized flows described above sometimes results in negative flows for some months. Possible reasons for this include:

- Timing problems created by large flows which pass different gages during different months
- Errors in gage data
- Incorrect data on diversions, return flows, reservoir evaporation, or reservoir content
- Losses greater than those assumed in the naturalization process

Although negative *incremental* flows between primary control points are physically possible because they could represent losses of flow, negative total naturalized flows are physically impossible. Months with negative total naturalized flows were reviewed to identify problems with the underlying data. Corrections to data included revisions made to diversion and return flow records and adjustments to upstream reservoir content change and evaporation. Places where these corrections were made were noted in the naturalized flow workbooks. Remaining negative total naturalized flows were set to zero. Negative incremental flows between primary control points are discussed in **Chapter 6.0**.

3.2 SPECIFIC METHODS EMPLOYED IN THE RED RIVER WAM UPDATE

3.2.1 Naturalization of Main Stem Flows on Texas/Oklahoma Border

In accordance with the previous naturalization, the flows from the six control points along the main stem of the Red River on Texas/Oklahoma border were only partially naturalized (**Table 9**). Only the portion of the flows originating in Texas was naturalized and is input using IN Records in the WAM dataset. Oklahoma flows are represented by historical flows and are input on flow adjustment records (FA Records). The flow adjustment records differ between the full authorization run (Run 3) and the current conditions run (Run 8) and are described in **Chapter 3.3**. **Appendix E** describes the methods employed to develop the naturalized flows for these six control points. Although the methods are similar to those employed in the previous naturalization, there are some differences in the methods and the resulting naturalized flows.

Table 9: Partially Naturalized Main Stem Gages

Gage Identifier	WAM Control Point	USGS Gage Name	USGS Number
RR_BB	H10000	Red River near Burkburnett, TX	07308500
RR_TR	U10000	Red River near Terral, OK	07315500
RR_GA	V10000	Red River near Gainesville, TX	07316000
RR_CB	W10000	Red River at Denison Dam near Dennison, TX	07331600
		Red River near Colbert, OK	07332000
RR_AC	X10000	Red River at Arthur City, TX	07335500
RR_IN	Y10000	Red River at Index, AR	07337000

One of the most significant changes associated with these control points is that they have been disconnected from tributaries that originate in the Texas Panhandle and flow into Oklahoma. These tributaries are represented by primary control points SW_KT, NF_SH and SF_WL. More information on this change can be found in **Chapter 5.2**.

3.2.2 Naturalized Flow at BODARC

New stream gage records provided an opportunity to refine the hydrology for Bois d'Arc Lake, which has its own primary control point in the Red River WAM - BODARC. There are two stream gages that were used for this reevaluation:

- *USGS 07332620 Bois d'Arc Creek at FM 1396 near Honey Grove (FM 1396)*, in operation from July 2006 through October 2019, with a drainage area of 270 square miles. The gage location will be inundated by the lake.
- *USGS 07332622 Bois d'Arc Creek at FM 409 near Honey Grove (FM 409)*, in operation since July 2009, with a drainage area of 370 square miles. This gage will continue in operation because it is a measuring point for environmental flows associated with the lake. The gage is located downstream of the dam and below the confluence of the tributary that contains Coffee Mill Lake, a recreation reservoir that is large enough to be included in the flow naturalization.

BODARC is located between these gages. The method to determine the flows at BODARC using these two stream gages is as follows:

1. Naturalize gage flows from FM 1396 and FM 409.
2. Determine the incremental naturalized flow between the gages.
3. Calculate the unit incremental naturalized flow between the gages by dividing by the incremental drainage area (100 square miles).
4. Multiply the unit runoff by the drainage area between FM 1396 and BODARC (57 square miles) to get the flows from FM 1396 to BODARC.
5. Add the incremental runoff to the naturalized FM 1396 flows to determine the total BODARC naturalized flows.

During some periods of very low flow, the monthly flows at FM 1396 are greater than the flows at FM 409, resulting in a negative incremental flow. Based on inspection, it appears that the low flows at FM 1396 may

be overstated. For months where this happens, the flows at FM 409 are used, multiplied by the drainage area ratio (0.9).

From July 2006 through June 2009, the FM 1396 gage is the only operating gage. When FM 1396 is the only gage, the flows at BODARC are calculated by multiplying the naturalized FM 1396 flows by 1.13, which was determined by a linear fit of the naturalized FM 1396 flows to the flows determined by both gages.

Since there are limited gage flows in the Bois d'Arc watershed, the previous Red River WAM hydrology for BODARC was developed using drainage area ratios with nearby gages adjusted to account for differences in unit runoff, which generally increases from west to east. The gage used for the majority of this estimate was the North Sulphur River near Cooper gage. However, the updated incremental flows between RR_CB and RR_AC now show a good fit when compared to the new BODARC naturalized flows calculated using the measured flows at FM 409 and FM 1396. For the update, we used the incremental flows between RR_CB and RR_AC to develop the naturalized flows from 1948 through 2006, when the gage flows became available.

3.2.3 Naturalization of Other Streamflow Gages

Except for the six primary control points along the Texas/Oklahoma border, the remaining primary control points are all located in Texas. The workbooks that calculate naturalized flows for control points located in Texas use the following steps to calculate naturalized flows:

1) Enter total local adjustments for diversions, return flows, net evaporative loss, and content change for the local watershed (i.e. the portion between the current gage and any upstream gages) on their own worksheets. For the flow update, these data were imported from other spreadsheets that summarize the data for each control point.

2) Sum together the local adjustments (diversions, return flows, and reservoir content change and evaporation).

3) Import adjustments from upstream control points, applying delivery factors as needed.

4) Enter the historical gage flow for the period of record. For reservoir control points, this is the historical spills and releases from the reservoir.

5) Apply local adjustments plus upstream adjustments (after losses) to calculate naturalized flows for the historical period of the gage.

6) Apply adjustments for negative total flows (set to zero).

7) Apply adjustments for negative incremental flows, if applied (see **Chapter 6.0**).

8) Fill any periods that have missing observed flows with naturalized flows from other stream gages using a statistical relationship between the gages.

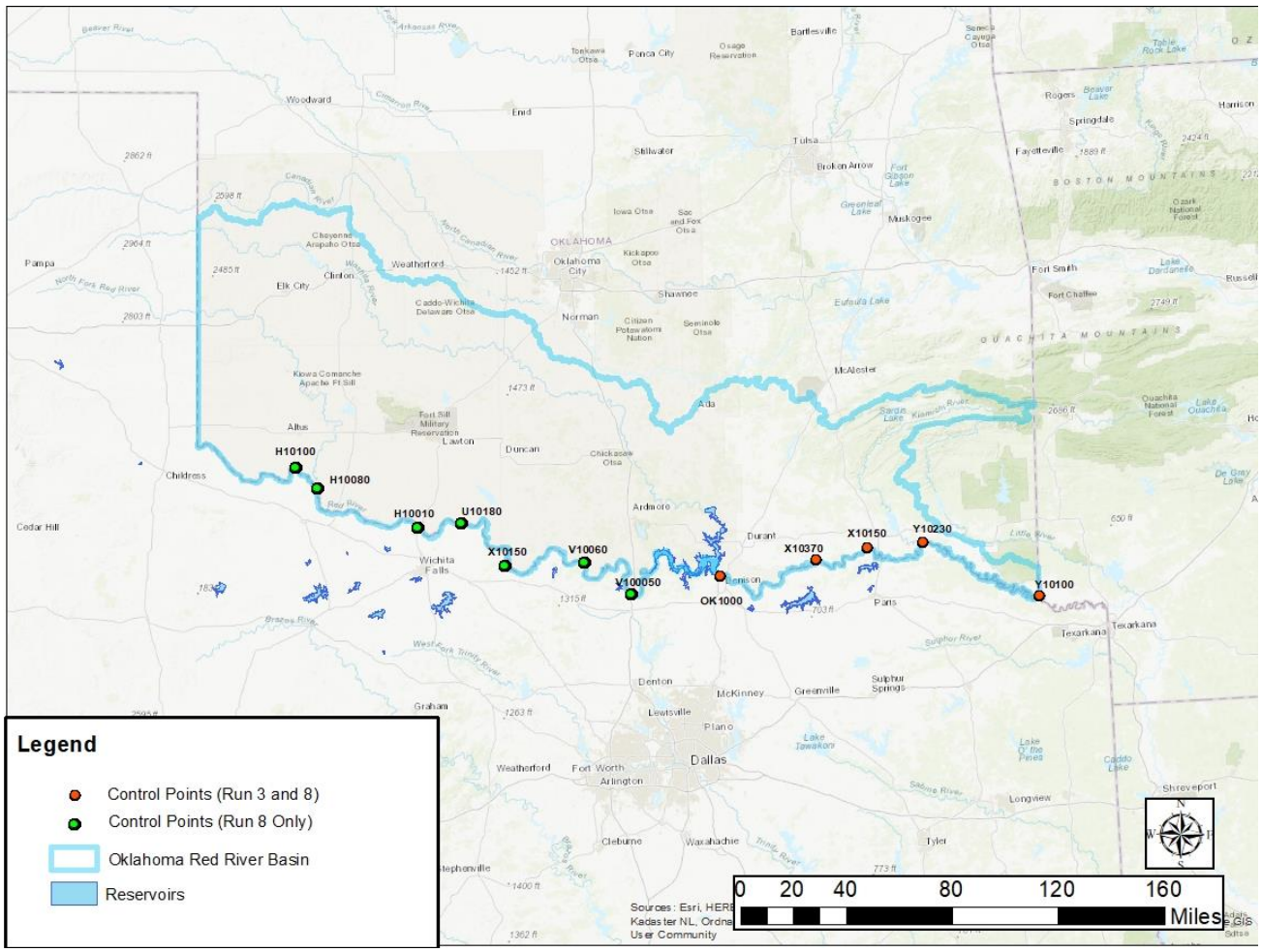
3.3 FLOW ADJUSTMENT RECORDS

In addition to the naturalized Texas flows, the Red River WAM uses Flow Adjustment (FA) records to represent flows originating in Oklahoma. **Table 10** shows the control point locations where flow adjustments are entered into the model and what that location represents. Notice that upstream of Lake Texoma, flow adjustments represent historical flows and are only in Run 8. This part of the basin is in Red River Compact Reach I Subbasin 2. In Run 3, pursuant to the Red River Compact, Oklahoma can use all of these flows, so they are assumed to be zero. At Lake Texoma and downstream the flow adjustments are the same in both runs. **Figure 3** shows the location of the flow adjustment control points. More information on the Flow Adjustment Calculations may be found in **Appendix F**.

Table 10: Flow Adjustment Locations and Flow Data Sources

WAM Control Point	Location	Run
H10100	Salt Fork Red River	Run 8 only
H10080	North Fork Red River	Run 8 only
H10010	Red River nr Burkburnett	Run 8 only
U10180	Cache Creek	Run 8 only
U10010	Red River nr Terral	Run 8 only
V10060	Mud Creek	Run 8 only
V10005	Red River nr Gainesville	Run 8 only
OK1000	Denison Dam	Run 3 and Run 8
X10370	Blue River	Run 3 and Run 8
X10150	Boggy River	Run 3 and Run 8
Y10230	Kiamichi River	Run 3 and Run 8
Y10100	OK/AR/TX border	Run 3 and Run 8

Figure 3: Flow Adjustment Control Points



3.4 ESTIMATING MISSING NATURALIZED FLOW DATA

Chapter 2.1 discusses estimating shorter periods of missing flow data. For longer periods of missing streamflow, we used naturalized flow at nearby or adjacent gages to fill the missing data. We reevaluated all the fill relationships in this update and changed most of them. We based the fill relationships on statistical relationships from scatter plots, double mass curves, or a drainage area ratio, whichever provided the better relationship for the missing period. **Table 11** lists streamflow gages with missing data and the stream gages used to fill in these data. **Appendix G** shows all of the fill relationships considered during the naturalization process.

Table 11: Fills Applied to Estimate Missing Gage Data

Workbook ID	Missing Data	Fill Method	Basis
SW_KT	1/1948 - 6/1952	0.08 * Naturalized North Fork nr Carter	Scatter plot
	7/1952-11/1961	0.23 * SF_WL	Double Mass
NF_SH	1/1948 - 6/1952	0.25 * Naturalized North Fork nr Carter	Scatter plot
	7/1952 - 11/1961	0.63 * SF_WL	Double Mass
	12/1961 - 2/1964, 10/1991 - 9/2000	2.8 * SW_KT	Scatter plot
SF_CL	1/1948 - 6/1952	0.15 * Naturalized Salt Fork nr Mangum	Double Mass
	7/1952 - 5/1960, 10/1964 - 8/1967	0.21 * SF_WL	Double Mass
SF_WL	1/1948 - 6/1952	0.64 * Naturalized Salt Fork nr Mangum	Scatter plot
PD_WA	1/1948 - 6/1952	0.39 * Naturalized Salt Fork nr Mangum	Double Mass
	7/1952 - 3/1965	0.58 * SF_WL	Double Mass
	4/1965 - 9/1967	0.26 * PD_CH	Double Mass
PD_CH	1/1948 - 6/1952	1.5 * Naturalized Salt Fork nr Mangum	Double Mass
	7/1962 - 3/1965	2.2 * SF_WL	Double Mass
GC_QN	1/1948 - 11/1961	0.02 * RR_TR	Double Mass
PR_CS	1/1948 - 11/1959	0.048 * RR_TR	Scatter plot
	9/1962 - 9/1967, 10/2011 - 12/2018	0.45 * PR_VN	Double Mass
PR_VN	1/1948 - 11/1959	0.106 * RR_TR	Scatter plot
	10/1982 - 3/1992	2.24 * PR_CS	Double Mass
RR_BB	1/1948 - 12/1959	0.446 * RR_TR	Scatter plot
NW_PD	1/1948 - 11/1959	0.06 * WR_WF	Scatter plot
	12/1959 - 7/1961, 1/1982 - 9/1994, 10/2011 - 12/2018	0.39 * NW_TS	Double Mass
NW_TS	1/1948 - 11/59	0.16 * WR_WF	Scatter plot
SW_GR	1/1948 - 11/1959	0.023 * WR_WF	Double Mass
	12/1959 - 9/1970, 10/1976 - 9/1985, 6/2013, 5/2014, 5/2015 - 7/2015, 10/2015 - 12/2018	0.2 * SW_BJ	Double Mass
SW_BJ	1/1948 - 11/1959	0.11 * WR_WF	Scatter plot
WR_SM	1/1948 - 11/1959	0.43 * WR_WF	Scatter plot
	10/1979 - 9/1996	0.82 * WR_MB	Scatter plot
WR_MB	1/1948 - 9/1959	0.56 * WR_WF	Scatter plot
BC_ET	1/1948 - 2/1960	0.28 * WR_WF	Scatter plot

Workbook ID	Missing Data	Fill Method	Basis
WR_CH	1/1948 - 9/1967, 10/2018 - 12/2018	1.18 * WR_WF	Scatter plot
LW_AC	1/1956 - 8/1966	1/1.94 * LW_HN	Double Mass
LW_HN	1/1948 - 12/1952	1.94 * LW_AC	Double Mass
EF_HN	1/1948 - 12/1952	0.21 * LW_HN	Scatter plot
	1/1953 - 11/1963	0.38 * LW_AC	Scatter plot
BODARC	1/1948 - 6/2006	0.35 * (RR_AC - RR_CB)	Scatter plot
	7/2006 - 6/2009	1.13 * Naturalized FM 1396	Scatter plot
	7/2009 – 12/2018	Nat FM 1396 + 0.57 * (Naturalized FM 409 – Naturalized FM 1396)	Drainage Area Ratio

One of the challenges in developing the naturalized flow dataset for the Red River WAM is the lack of Texas stream gages with long periods of record in the upper portion of the basin. Prior to the 1960s, there are numerous stream gages, but many only have a few years of record. The most upstream gage with a full 1948 to 2018 record is the Wichita River at Wichita Falls gage (WR_WF). The original naturalization relied heavily on this stream gage to fill in missing flows in the upper basin even though many of the control points are far to the west and north of this gage. There are, however, two gages located close to the state line between the Texas Panhandle and Oklahoma that have long periods of record and were in service in the early part of the record: the Salt Fork at Mangum, OK gage (07300500) and the North Fork of the Red River near Carter, OK gage (07301500). These gages have sufficient periods of record to establish a statistical relationship with other gages. These two gages are much closer to the six control points located in the Texas Panhandle (SW_KT, NF_SH, SF_CL, SF_WL, PD_WA and PD_CH), and provide a better estimate of missing flow data (**Figure 4**). We applied historical naturalized flow corrections for Texas diversions and reservoirs to these gages to develop semi-naturalized flows. These semi-naturalized flows were only used to estimate missing data until a neighboring naturalized flow location was available.

The RR_CB control point primarily measures outflows from Lake Texoma. USGS data for the RR_CB control point are missing from September 1989 to October 1996. We obtained the missing Texoma outflows during this period from the USACE, which owns and operates the lake. More discussion on the RR_CB control point may be found in **Appendix E**. Flow data from October 1958 to March 1959 are not on the USGS website, but they are available from published USGS records.

There is no stream gage at control point BODARC, which represents Bois d'Arc Lake. However, there are two gages that are located nearby. The first gage to be established was Bois d'Arc Creek at Farm to Market Road

1396 near Honey Grove, TX (USGS 07332620), which was established in June 2006. This gage is located upstream of the reservoir site. The FM 1396 gage was discontinued in October 2019, which is after the extension period for this project. Bois d'Arc Creek at Farm to Market Road 409 near Honey Grove, TX (USGS 07332622) was established just downstream of the reservoir site in July 2009. The method used to create naturalized flows at BODARC is described in **Chapter 3.2.2**. Prior to 2006, the updated hydrology bases BODARC flows on the incremental flows between RR_CB and RR_AC.

Control point U10021 represents the proposed Lake Ringgold. There is no stream gage located at this control point. For the update, we estimated flows at this primary control point using the same methodology employed in the Ringgold water right application. We based the naturalized flows at U10021 on the total naturalized flows from LW_HN (control point S10000, drainage area 1,040 square miles) and the EF_HN (control point T10000, drainage area 178 square miles). We used flows from these two control points to develop incremental flows between these two upstream gages and the dam site (1,480 square miles minus (1,040 square miles + 178 square miles) = 262 square miles). We added the incremental flows to the naturalized flows from the LW_HN and EF_HN gages to obtain the total flows at the dam site using drainage area ratios. Although these flows could be developed within the simulation with new capabilities in the WRAP model, it was necessary to add this primary control point to the FLO file to prevent flow discontinuities that could affect water availability in the vicinity of the reservoir.

4.0 CHANGES TO THE EXISTING NATURALIZED STREAMFLOW, EVAPORATION, AND FLOW ADJUSTMENT DATASETS

For the most part, the updated flows for the Red River WAM are different than previous hydrology for the entire period from 1948 to 1998, although there are a few periods for some control points where the flows are practically identical to the previous flows. Evaporation datasets have been entirely changed. Flow adjustment datasets are also different. **Appendix H** contains graphs that compare the previous naturalized flows to the updated naturalized flows.

The primary changes to the hydrology are:

- Updated all fill relationships (**Chapter 3.4**).
- Recalculated net evaporation rates (**Chapter 2.4**).
- Updated all content change and evaporation data that were estimated with an operation study (**Appendix B**).
- Updated the methodology used for the six control points on the main stem of the Red River along the Texas/Oklahoma border (**Chapter 3.2.1**), including:
    - Use of more available historical streamflow data to divide flows between Texas and Oklahoma, and
    - Removing flows from tributaries that originate in the Texas Panhandle and flow through Oklahoma before entering the main stem of the Red River along the Texas/Oklahoma border.
- Removing flows from tributaries that originate in the Texas Panhandle and flow through Oklahoma before entering the main stem of the Red River along the Texas/Oklahoma border
- Eliminated most manual adjustments for negative incremental flows (**Chapter 6.0**).

Other reasons for changes include updated diversion or return flow data, error corrections, or other data updates. Small changes occur even for months with no changes to the underlying data primarily due to rounding differences.

Table 12 is a summary of the changes for each control point.

Table 12: Summary of Changes by Control Point

Gage Identifier	WAM Control Point (Texas)	Period	Differences
SW_KT	A10000	1/1948-6/1961	New fill
		12/1961-12/1998	No change
NF_SH	10095	-	Not in previous naturalization
SF_CL	B10060	-	Not in previous naturalization
SF_WL	B10000	1/1948-6/1952	New fill
		7/1952-7/1967	Small rounding differences
		8/1967-12/1998	Updated evaporation
PD_WA	C10000	1/1948-9/1967	New fill
		10/1967-12/1998	Updated evaporation and storage estimates for Bivins and Buffalo. Added Lake Tanglewood and Amarillo return flow discharges
PD_CH	D10000	1/1948-3/1965	New fill
		4/1965-Present	Updated evaporation at Makenzie. New estimates for Baylor Cr Lake.
GC_QN	E10000	11/1961-Present	New fill
		12/1961-12/2018	Small rounding differences
PR_CS	F10000	1/1948-11/1959	New fill
		12/1959-12/1961	Small rounding differences
		1/1962-8/1962	Original used fill instead of naturalized gage flows
		9/1962-9/1967	Small difference in fill relationship with PR_VN
		10/1967-12/1998	Small rounding differences
PR_VN	G10000	1/1948-11/1959	New fill
		12/1959-9/1982	Small rounding differences
		10/1982-3/1992	New fill
		4/1992-12/1998	Moved Rhodia return flows to RR_BB (20-60 ac-ft per month)
RR_BB	H10000	1/1948-12/1959	New fill
		1/1960-12/1998	New flow splitting method
NW_PD	I10000	1/1948-7/1961	New fill
		8/1961-12/1981	Identical except for 7/1971, which has a different historical flow
		1/1982-9/1994	New fill
		10/1994-12/1998	Small rounding differences
NW_TS	J10000	1/1948-11/1959	New fill
		12/1959-9/1984	Small rounding differences except for 8/1966-9/1966 which were adjusted for timing in update
		9/1984-12/1998	Removed Truscott Brine Reservoir corrections in update
SW_GR	K10000	1/1948-9/1970	New fill

Gage Identifier	WAM Control Point (Texas)	Period	Differences
		10/1970-9/1976	Different historical flow. May be the result of different scale factors to adjust to current location. During this period gage was located upstream. USGS currently reports 219 mi^2 at this location and 223 mi^2 at current location.
		10/1976-9/1985	New fill
		10/1985-12/1998	Small rounding differences except for 6/1987-9/1987 where historical gage flows are different.
SW_BJ	L10000	1/1948-11/1959	New fill
		12/1959-12/1998	Small rounding differences except for some manual adjustments in the original that are not in the update.
WR_SM	M10000	1/1948-11/1959	New fill
		12/1959-9/1979	Small rounding differences except for some manual adjustments in the original that are not in the update.
		10/1979-9/1996	New fill
		10/1996-12/1998	Changes due to removal of Truscott Brine Reservoir in update
WR_MB	N10000	1/1948-9/1959	New fill
		10/1959-12/1998	Updated evaporation for Lake Kemp
BC_ET	O10000	1/1948-2/1960	New fill
		2/1960-12/1998	Estimated reservoir storage change and evaporative loss for Lakes Santa Rosa and Electra
WR_WF	P10000	1/1948-11/1964	Updated evaporation for Lakes Kemp and Diversion
		12/1964-12/1998	Updated evaporation for Lakes Kemp and Diversion, updated content & evaporation estimates for N. Fk. Buffalo Creek Reservoir
WR_CH	Q10000	1/1948-9/1967	New fill
		10/1967-12/1976	Updated estimate of City of Wichita Falls return flows prior to 1977, updated content and evaporation estimates for Lake Wichita and upstream reservoirs
		1/1977-12/1998	Updated content change and evaporation for upstream reservoirs.
LW_AC	R10000	1/1948-12/1955	Evaporative loss, some content change Kickapoo diversions
		1/1956-8/1956	New fill
		9/1956-12/1998	Evaporative loss, content change Kickapoo diversions
LW_HN	S10000	1/1948-12/1952	New fill
		1/1953-10/1966	Upstream changes
		11/1966-12/1998	Updated evaporation for Lake Arrowhead
EF_HN	T10000	1/1948-11/1063	New fill
		12/1963-12/1998	Small rounding differences
--	U10021	N/A	Control points used to estimate flows have changed flows
RR_TR	U10000	1/1948-12/1998	New flow splitting method

Gage Identifier	WAM Control Point (Texas)	Period	Differences
RR_GA	V10000	1/1948-12/1998	New flow splitting method
RR_CB	W10000	1/1948-8/1989	New flow splitting method
		9/1989-11/1996	USACE Texoma outflows, new flow splitting method
		12/1996-12/1998	New flow splitting method
--	BODARC	N/A	Updated method to estimate flows
RR_AC	X10000	1/1948-12/1998	New flow splitting method
RR_IN	Y10000	1/1948-12/1998	New flow splitting method

Although the flows at all control points have been changed to some extent, there are some periods where the updated naturalized flows are practically identical to the previous flows. These occur at gage locations located in the upper portions of watersheds that have no upstream reservoirs. These include:

- *SW_KT from December 1961 through December 1998.* Gage records start in December 1961. There are no major reservoirs and few water rights upstream.
- *SF_WL from June 1952 through July 1967.* Gage records begin in June 1952 and the flows remain the same until Greenbelt Lake begins impounding water in July 1967.
- *GC_QN from December 1961 through December 2018.* Gage records start in December 1961. There are no major reservoirs and few water rights upstream. There is one return flow.
- *PR_CS from December 1959 through December 1961 and October 1967 through December 1998.* Gage records begin in December 1969, and there is a gap between January 1961 and September 1967. There are only a few water rights and no reservoirs upstream.
- *PR_VN from December 1959 through September 1982.* Gage records begin in December 1959 and there is a gap beginning in October 1982. A return flow in the wrong location in the original naturalization prevents the flows from being identical after the gage is reinstated in April 1992.
- *NW_PD from August 1961 through December 1981 and from October 1994 through December 1998.* Gage records begin in August 1961 and there is a gap between January 1982 and September 1994. There are few water rights and no major reservoirs upstream.
- *NW_TS from December 1959 through September 1984.* Gage records begin in December 1959. There are few water rights and there are no major reservoirs upstream during this period. Beginning in

October 1984, the original naturalization included corrections for the Truscott Brine Reservoir. Since this is an off-channel evaporation reservoir, these corrections are not needed and have been removed from the update.

- *SW_GR from October 1985 through December 1998.* Gage records at the current location begin in October 1985. There are few diversions and no major reservoirs upstream. Another gage located a few miles upstream reported flows from October 1970 through September 1976. However, the previous naturalization appeared to have used a different factor to translate the flows from the upstream location to the current location so the flows for that period do not match.

- *SW_BJ from December 1959 through December 1998*. Gage records begin in December 1959. There are few diversions and no major reservoirs upstream. Except for some months that had some manual corrections in the original naturalization, the flows are identical. The manual adjustments in the original naturalization may have been to correct for negative incremental flows. These corrections have been left out of the update.

- *WR_SM from December 1959 through September 1979*. Gage records begin in December 1959, and there is a gap from October 1979 to September 1996. With the exception of a few months with manual corrections in the previous hydrology, flows are identical between the two datasets. After the gap, flows are different because the updated naturalization does not include corrections for Truscott Brine Reservoir.

- *EF_HN from December 1963 through December 1998*. Gage records begin in December 1963. There are no upstream water rights or return flows.

Naturalized flows at the six gages along the Texas/Oklahoma border (RR_BB, RR_TR, RR_GA, RR_CB, RR_AC and RR_IN) are about 10 to 15 percent lower than the previous hydrology. Most of this difference is because these gages no longer include flows from tributaries that originate in the Texas Panhandle and flow into Oklahoma before joining the Red River on the border. According to the Red River Compact, the State of Oklahoma can use all of the flows flowing into Oklahoma from Texas. There is no reserve for the State of Texas.

5.0 MODIFICATIONS TO WRAP INPUT FILES

In addition to adding the revised inflows, flow adjustment, and evaporation records, the following modifications to WRAP input files were required to implement the updated hydrology:

- *Addition of new primary control points.* Naturalized flows have been developed for two new primary control points, as discussed in **Chapter 5.1**.
- *Disconnecting control points in Red River Compact Reach 1 Subbasin 1 from the rest of the model.* The control points representing gages on streams in the Texas Panhandle that flow into Oklahoma area are assumed in the naturalization to be disconnected from the rest of the Texas portion of the basin, as discussed in **Chapter 5.2**.
- *Elimination of Primary Control Point OKRRCB.* This record has Oklahoma flows that enter Lake Texoma. These are now entirely included in flow adjustment records, so this control point can be eliminated.
- *Moving flow adjustment records from control point W10050 to OK1000.* In the previous version of the WAM flow adjustments at Lake Texoma were entered at W10050, which is just downstream of Lake Texoma. Since these flow adjustments represent the inflows into Lake Texoma, they were moved to OK1000 so that the lake can have access to them.

Although the following modifications are not required due to the updated hydrology, they were identified during the naturalization and were applied to the input files:

- *Modifications to loss rates.* Loss rates in the WRAP input file be consistent with the loss rates applied in the naturalization (**Table 8**).
- *60% limit from Reach I Subbasin 1*. One or more Instream flow records could be used to limit diversions in this subbasin to 60% of the flow entering Oklahoma to simulate compliance with the Red River Compact.

5.1 NEW PRIMARY CONTROL POINTS

This project includes two new primary control points:

- Greenbelt Lake (SF_CL)
- North Fork of the Red River near Shamrock Texas (NF_SH)

These two control points are marked by blue dots in **Figure 1**.

In studies conducted for the Panhandle Regional Water Planning Group (Region A) and the Greenbelt Municipal and Industrial Water Authority (GBMIWA), the Red River WAM was found to produce a higher

yield for Lake Greenbelt than other studies. This was primarily due to the use of the Wichita River at Wichita Falls (WR_WF) gage to fill flows during the period before the Salt Fork nr Wellington (SF_WL) became available. The WR_WF gage has higher flows than the Salt Fork at Mangum gage, which was used in the other studies. However, even with an updated SF_WL fill using semi-naturalized flows at the Mangum gage, the distributed flows to Greenbelt Lake were higher than other estimates. As a result, we added the new primary control point at Greenbelt Lake. We determined fill relationships with other gages using the naturalized historical flows for the Salt Fork near Clarendon Gage (07299850), which was in operation from June 1960 through September 1964 at the site of the reservoir. SF_CL is located at existing control point B10060 in the WAM.

The second new primary control point is the North Fork of the Red River near Shamrock (07301300). This gage has a fairly continuous period of record, with flows from May 1964 through September 1991 and from October 2000 to the present. Some of these records are not available on the USGS website and had to be obtained from published records. There are 10 water rights upstream of this gage, including Lake McClellan (also called Cibola), a small recreation lake. In the previous WAM, flows for these water rights were estimated using other gages. The Independent Peer Reviewers recommended naturalizing this gage because of the good period of record and the number of water rights affected. Implementing this change will require a new control point 10095 upstream of existing secondary control point 10070, which represents the Texas/Oklahoma state line on the North Fork. **Table 13** lists the upstream control points and their associated water rights. The USGS contributing drainage area for NF_SH is 816.7 square miles.

Table 13: Control Points Upstream of NF_SH

Control Point	Water Right
585531	Permit/Application 5855
10080	Certificate 02-5240
10090	Certificate 02-5239
10100	Certificate 02-5247
10110	none
10120	Certificate 02-5246
10130	Certificate 02-5245
10140	Certificate 02-5244

The original workplan for this project identified Lake Pat Mayse as a potential location for a new primary control point. This was based on experience with Bois d'Arc Lake, which is in the neighboring watershed. However, after review of the updated naturalized flows, a new primary control point at Lake Pat Mayse was dropped from consideration because the revised incremental flows on the Red River provide a good estimation of flows at the lake, making a new control point unnecessary.

5.2 RED RIVER COMPACT REACH I SUBBASIN 1 CONTROL POINTS

There are approximately 43 water rights located on streams originating in the Texas Panhandle that flow into the State of Oklahoma before eventually joining the main stem of the Red River along the Texas/Oklahoma border. The Red River Compact designates this portion of the basin as Reach I Subbasin 1. **Figure 4** shows the primary and secondary control points in this reach. The current Red River WAM setup connects these water rights to the main stem of the Red River at the confluences of the Salt Fork, North Fork and Washita River with the main stem along the Texas/Oklahoma border. The Salt Fork and North Fork join the main stem upstream of RR_BB, and the Washita River joins the main stem at Lake Texoma. This setup allows priority calls on these water rights by senior water rights located along the main stem of the Red River. It is unclear how this would work, since the water would first need to pass through Oklahoma before reaching the downstream rights. There is also a major reservoir, Lake Altus, located in Oklahoma on the North Fork. This issue was discussed at a meeting with TCEQ on December 10, 2020. It was agreed that the water rights in the Texas Panhandle on the Washita River, North Fork and Salt Fork would be disconnected from the rest of the model since these flows would need to pass through Oklahoma to become available to downstream Texas water rights. **Table 14** shows the affected control points. Control point W10070 is located at Lake Texoma, control point H10080 represents the confluence of the North Fork with the Red River, and control point H10100 represents the confluence of the Salt Fork with the Red River. The disconnected control points would have their downstream control point changed to a single control point, which would be connected to OUT. The flow distribution records (FD Records) for these control points would also need to be changed to use only the control points located within Reach I Subbasin 1. This should provide a much more accurate representation of available flows for water rights located downstream of the primary control points in Subbasin 1. The flow adjustment records (FA Records) have also been changed to show the full inflow at these locations in the current conditions run (**Chapter 3.3**).

Drainage areas for control points that were previously downstream of the control points in **Table 14** were adjusted to subtract the drainage areas in Subbasin 1.

The exception to this is the water right located on Buck Creek, Certificate of Adjudication 02-5223, located at control point H10160. Buck Creek joins the main stem of the Red River just downstream of where the main stem of the river becomes the border of the two states. Water passed due to a priority call on this right would only have a very short distance within Oklahoma before joining the Red River.

Figure 4: Reach I Subbasin 1 Control Points

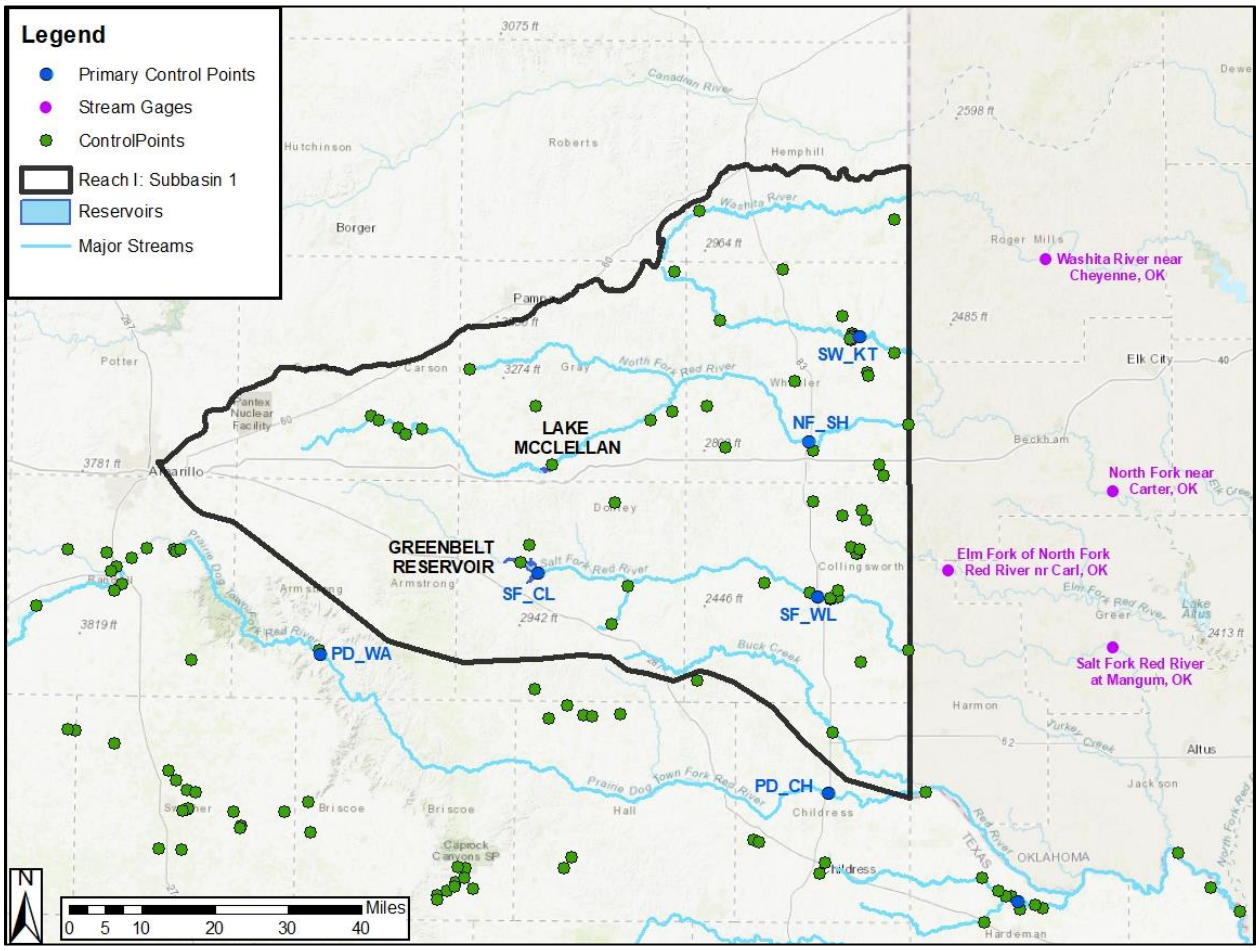


Table 14: Control Points in Reach I Subbasin 1 to be Disconnected from Main Stem

Control Point	Water Right	Current Downstream Control Point
10010	Certificate 02-5265	W10070
10020	Certificate 02-5264	W10070
10030	Certificate 02-5263	W10070
10040	Certificate 02-5254	H10080
10050	Permit 3885/Application 4194	H10080
10070	None	H10080
10200	Certificate 02-5262	H10080
10220	Certificate 02-5261	H10080
10260	Certificate 02-5258	H10080
10310	None	H10100

5.3 OTHER CHANGES

The channel losses on the CP Records in the current Red River WAM setup are not consistent with the loss rates in **Table 8**. These records have been updated so that the channel losses in the model match the channel losses assumed in the naturalization process.

According to Section 4.01 of the Red River Compact, Texas is apportioned 60 percent of the annual flows from streams in Reach I Subbasin 1, with the remaining 40 percent allocated to Oklahoma. This was added to the Red River WAM using the following process:

1. Set a monthly target equal to the sum of the naturalized flows at the new control point that represents the sum of the flows from the Washita River, Sweetwater Creek, North Fork, and Salt Fork, as recommended in **Chapter 5.2**.
2. Add estimated flows from Buck Creek to the target. This was implemented by adding a new control point H10155 that represents the flows from Buck Creek at the Oklahoma border.
3. Multiply the above target by 0.40.
4. Apply the target as an instream flow with a most senior priority date.

This assumption is conservative given that the 60 percent limitation is on an annual basis and has been applied in the updated WAM files.

6.0 PROCEDURE FOR NEGATIVE INCREMENTAL FLOWS

As discussed in **Chapter 3.1**, negative total naturalized flows are impossible and were set to zero. There are many times where the computation of naturalized flows results in negative *incremental* flows for some months (i.e. the flows at a downstream primary control point are less than the sum of the flows at the upstream primary control points). Although this is physically possible, it has implications for the distribution of available water by WRAP. Possible reasons for negative incremental naturalized flows include:

- Timing problems, in which the flow from upstream control point arrives at the downstream control point in a different month;
- Incorrect historical data (inaccurate gage data, streamflows too low, return flows too high, diversions too low, change in reservoir contents too low, evaporation too low); and
- Losses different from those assumed in the naturalization process, including losses to side or bank storage.

In consultation with the Independent Peer Reviewers, we decided to correct only timing problems and obviously inaccurate data in development of the updated hydrology. Rather than manually removing all negative incremental flows, we recommend that one of the options to correct for negative incremental flows built into the WRAP model should be applied. This allows exploration of various options for correcting for negative incremental flows. Option 5 is probably the most frequently applied in the TCEQ WAMs and has been applied in the updated WAM datasets. The various options are described in Chapter 3 of the WRAP Reference Manual.

Months where data were adjusted for incorrect values or timing issues are noted in the naturalized flow workbooks.

7.0 INDEPENDENT PEER REVIEW

Dr. Robert Brandes from Robert J. Brandes Consulting and Dr. Andres Salazar from Walter P. Moore and Associates were the Independent Peer Reviewers for the update of the Red River WAM hydrology. The Independent Peer Reviewers provided an overall review of the technical side of the project, including formal comments on the Work Plan, Draft Final Naturalized Flows and Draft Final Report. The Peer Reviewers were also available for consultation regarding technical issues throughout the project.

The comments provided by the reviewers and the changes to address those comments are found in **Appendix I**.

8.0 FINAL NATURALIZED FLOWS

Appendix J contains tables of the final naturalized flows at each control point, the flow adjustment datasets, and the net reservoir evaporation. In addition to this final written report, electronic files have been provided as part of the deliverables, including the naturalized flow and data workbooks used in this project. **Table 15** is a summary of the types of Excel workbooks included with the project. Two sets of workbooks were provided, one with links to other workbooks and one with the linked data converted to values. The linked workbooks contain a macro that can be used to update links as needed. Other support files have been provided in electronic format as well. These include gage flow workbooks, reservoir content change and evaporation calculations, and other supporting material. Text files with the updated WAM input files also have been included.

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Table 15: Naturalized Flow Workbooks

Type	Description	File Name
Naturalized Flow	Calculation of naturalized flows from gage flows, including corrections for diversions, return flows, reservoirs, negative flows, and other adjustments, as well as fills for missing data.	*20Nat_XXXX*
Water Use	Historical water use data by water right holder	*20WU_XXXX*
Return Flows	Historical return flows for more than 1 MGD of permitted discharge	*20RF_XXXX*
Content Change	Calculation of content change and evaporative loss for major reservoirs (more than 5,000 ac-ft of storage)	*RESNAME ContEvap*
Evaporation	Calculation of net evaporation rates for major reservoirs	*20RESNAME_netvap*

Notes: *XXXX* is a four-letter code associated with each naturalized flow location
RESNAME is the name of the reservoir

Appendix L contains information on updating these workbooks.

APPENDIX A
REFERENCES

References

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Freese and Nichols, Inc.: Update – Proposed Changes to Red River WAM Hydrology for Bois d'Arc Creek, prepared for the North Texas Municipal Water District, July 2011.

Appendix B
Reservoir Methodology

Appendix B: Reservoir Methodology

McClellan (Cibola)

Reservoir Information	Date Range	Data Source
Name: CIBOLA	1/1948-7/1963	Elevations and area-capacity-elevation curves from FNI Red River Authority Master Plan files
Water Right: CA 02-5244	8/1963-12/2018	Operation study using semi-naturalized North Fork near Carter flows
Control Point: 10140		
Date Completed: 1930s		

CA – Certificate of Adjudication

Lake McClellan (called CIBOLA in the Red River WAM) is located on McClellan Creek in Gray County, upstream of new control point NF_SH. The reservoir was not included in the original Red naturalized flow calculations. The reservoir was built in the late 1930's and has always been a recreation reservoir. The water right is owned by the U.S. Forest Service and the reservoir is part of the McClellan Creek National Grassland. Based on TCEQ reported water use information, there were a few sporadic, large, questionable historical diversions from the reservoir in the earlier period, with none in the later period. Review of the Red River Adjudication final determination documents for this right indicates that this reservoir has always been for recreation with no diversion of water. This, along with information concluded from mass balance attempts led to the dismissal of the reported water use quantities and the replacement with zeros. From FNI's files associated with the Red River Authority Master Plan (late 1960s), a drainage area less than what is specified in the Red River WAM (86 square miles verses WAM's 245 square miles), seemed to be more reasonable in light of the playa lakes in this reservoir's physical drainage area and review of GIS information. In addition, a few years of observed elevation data (1/1948-7/1963) were found and interpolated into storage using an area-capacity-elevation curve found in the same source. This information was used for the standard change in storage and evaporation loss information and was also used to deduce apparent inflows for the early period and this estimate was used to scale down the inflow estimate used for the remaining period of record.

Greenbelt

Reservoir Information	Date Range	Data Source
Name: GREENB	9/1967-8/1996	GBMIWA elevations
Water Right: CA 02-5233	9/1996-12/2016	USGS elevations
Control Point: B10060	1/2017-12/2018	USGS storage
Date Completed: 12/1966 (impoundment)		

Greenbelt Lake is located in Donley County on the Salt Fork of the Red River, upstream of new control point SF_CL, which is located at the dam. The reservoir is owned and operated by the Greenbelt Municipal and Industrial Water Authority (GBMIWA), primarily for municipal use. The original naturalization had this reservoir at SF_WL downstream. According to the Texas Water Development Board, deliberate impoundment began in December 1966 and the reservoir was completed in March 1968. There are historical elevation and diversion records for the entire period of the reservoir. A new

primary control point was added at this location because flows estimated with the SF_WL gage downstream appear to over-estimate the supply available from the reservoir when compared to calculated mass balance flows using historical records. The historical elevation data was translated to storage and area using the original curve from FNI files.

Bivins (Amarillo City Lake)

Reservoir Information	Date Range	Data Source
Name: BIVINS	1/1948-12/1954	USGS gaged inflows
Water Right: CA 02-5180	1/1955-12/1962	Operation study using semi-naturalized flows from the Salt Fork at Mangum
Control Point: C10210	1/1963-6/1987	Historical storage from original Red WAM
Date Completed: 1927	7/1987-9/2002	Operation study using semi-naturalized flows from the Salt Fork at Mangum
	10/2002-12/2018	Operation study using historical flows from the Tierra Blanca Ck abv Buffalo Lk nr Umbarger gage

Bivins Lake (also called Amarillo City Lake) is located on Palo Duro Creek in Randall County, upstream of PD_WA. This reservoir is owned by the city of Amarillo and serves as a recharge structure for the Ogallala aquifer (which representatives with the City of Amarillo confirmed). Because of the recharge the reservoir is dry much of the time. There were some observed inflows for the reservoir from 1948 to 1954 published as 07297000 Palo Duro Creek at Amarillo City Lake near Canyon. Historical storage data was available from the original Red WAM naturalization from January 1963 to June 1987. Although no source is cited, the data appear to be consistent with the operation of the reservoir and are assumed to be good. For the remainder of the period, the reservoir was simulated using the semi-naturalized flows from Salt Fork Red River near Mangum (OK) or historical flows from the Tierra Blanca Creek above Buffalo Lake near Umbarger (TX) gage with a drainage ratio based on the full drainage area for the reservoir's location from WAM (81.82 square miles) and the USGS contributing drainage area for the Mangum gage (1,319 square miles) or the Umbarger gage (538 square miles). The period that had observed inflows was compared to the estimated inflows based on the Mangum and Umbarger sites and it was concluded that the drainage area ratio was suitable. In the operation studies for the reservoir, a constant "diversion" of 150 acre-feet per month was assumed to approximate the leakage from the reservoir. This value results in a reservoir that is empty most of the time. The area-capacity-elevation table is from the original naturalized flow data.

Tanglewood (Stockton)

Reservoir Information	Date Range	Data Source
Name: TANGLE	1/1962-2/2006	Operation study using semi-naturalized flows from the Salt Fork at Mangum

Water Right: CA 02-5194	3/2006-12/2018	Operation study using semi-naturalized flows from the Salt Fork at Mangum plus Amarillo return flows
Control Point: C10040		
Date Completed: 1956?		

Lake Tanglewood, originally called Lake Stockton, is located on the Prairie Dog Town Fork of the Red River in Randall County, upstream of PD_WA. With an authorized storage of 4,897 acre-feet, the reservoir did not qualify as a major reservoir and was not included in the original naturalization. The construction date is unknown, but the original water right has a priority date of 1956. Since the early 1960s, this reservoir has served as an amenity lake for a large subdivision, although a small irrigation diversion is authorized from the reservoir. In 2006, the owners of the subdivision contracted for return flows from the City of Amarillo's Holly Street WWTP to supplement natural inflows. The reservoir was added to the naturalization for this update in order to properly account for the return flows. Detailed effluent discharge information was obtained from the City and used, along with semi-naturalized inflow from the Mangum gage, to simulate the reservoir. It should be noted that an effective drainage area was utilized in the drainage area ratio applied to the Mangum site to estimate inflows. This effective drainage area was calculated by using the WAM drainage area for the reservoir, then subtracting away the drainage area of the two large reservoirs upstream (Bivens and Buffalo). The area-capacity-elevation data is from FNI files from the Red River Authority Master Plan (1967).

Buffalo Lake

Reservoir Information	Date Range	Data Source
Name: BUFALO	1/1948-9/1954	USGS content records
Water Right: CA 02-5188	10/1954-2/1967	Operation study using Mangum flows
Control Point: C10080	3/1967-9/1973	USGS content records
Date Completed: 1938	10/1973-12-2018	Operation study using Mangum flows

Buffalo Lake is located on Tierra Blanca Creek in Randall County, upstream of PD_WA. The reservoir was constructed in the late 1930's for recreation purposes. The reservoir is part of the Buffalo Lake National Wildlife Refuge, owned and operated by TPWD and USFWS. Observed records for the reservoir are available as 07296000 Buffalo Lake near Umbarger from June 1938 to September 1954 and from March 1967 to September 1973. There are some records of inflow to the reservoir available as 07295500 Tierra Blanca Creek above Buffalo Lake near Umbarger from December 1940 to September 1954 and from April 1967 to September 1973. These observed inflows were used when available (slightly increased to reflect dam's drainage area). The semi-naturalized flows from the Mangum gage were used in other periods using a WAM based drainage area ratio with the Mangum gage, adjusted by a factor based on the observed flows. The area-capacity-elevation data are from the original Red WAM naturalization.

Mackenzie Lake

Reservoir Information	Date Range	Data Source

Name: MAKNZE	10/1974-8/1986	USGS storage
Water Right: CA02-5211	9/1986-12/1996	USGS elevations
Control Point: D10130	1/1997-3/1999	Operation study using Mangum gage flows
Date Completed: 6/1974	4/1999-12/2018	USGS storage

Mackenzie Lake is located on Tule Creek in Briscoe County, upstream of PD_CH. USGS data (some not available on the website) are available from October 1974 to December 1996 and from April 1999 through December 2018. The reservoir provides municipal supplies. The remaining unobserved period was simulated using an operation study. The inflows for the simulated period used flows derived from semi-naturalized flows at the Mangum gage and drainage area ratios. In addition, since the period missing observed data only involved 27 months, the estimated inflow was iterated down, by a single factor, until the simulated storage for the missing period "fit" the period after the missing period. The USGS's published storage records appear to use the 1973 elevation-area-capacity table used in the original naturalization.

Baylor Creek Reservoir

Reservoir Information	Date Range	Data Source
Name: BAYLOR	12/1949-12/2018	Operation study using Mangum flows
Water Right: CA 02-5221		
Control Point:D10030		
Date Completed: 12/1949		

Baylor Creek reservoir is located on Baylor Creek in Childress County, upstream of PD_CH. The reservoir is owned by the City of Childress. There are no observed records available thus the entire period was simulated using semi-naturalized flows from the Mangum site and drainage area ratios. Based on information from the manager of Baylor Lake (Roy Ripavi), Baylor Lake nearly went dry in 2001 and results from the simulation very near fit this narrative. Furthermore, it should be noted that although water use is fairly consistently reported from the reservoir, no diversions have been made from the reservoir since the mid 1960's, with all of the City's water being provided from Greenbelt Reservoir. Evidently the quantity reported under this water right are withdrawals from the pipeline.

Lake Kemp

Reservoir Information	Date Range	Data Source
Name: KEMP	1/1948-12/1998	USGS storage
Water Right: CA 02-5123	1/1999-12/2018	USGS elevation using 2003 survey
Control Point: N10020		
Date Completed: 10/1922, conservation pool increase 10/1972		

Lake Kemp is located on the Wichita River in Baylor County, upstream of WR_MB. The reservoir and the accompanying Lake Diversion were completed in 1922 by the Wichita County Water Improvement District #2 for irrigation and flood control purposes. The conservation pool was increased and additional improvements were made by the U.S. Army Corps of Engineers in the early 1970s. The reservoir and Lake Diversion are currently used for irrigation, power generation, and municipal purposes. Historical elevation or storage data are available for the entire period of record.

Lake Diversion

Reservoir Information	Date Range	Data Source
Name: DIVSON	1/1948-5/1995	Historical elevations from original WAM and 1973 survey
Water Right: CA 02-5123	6/1995-12/1998	Historical elevations from original WAM and 2013 survey.
Control Point: P10110	1/1999-7/2008	Operation study using Maybell and Kickapoo historical flows
Date Completed: 1924	9/2008-12/2018	USGS elevations and 2013 survey

Lake Diversion is located on the Wichita River on the Arche/Baylor County line, upstream of WR_WF. The reservoir is operated as a system with Lake Kemp. Water is released from Lake Kemp and diverted from Lake Diversion for irrigation, power generation and municipal use. The reservoir was built in 1924. Elevation data in the original naturalized flow workbooks appear to be based on historical data and, with some revisions and filling of missing data, were used for the period from 1/1948 to 12/1998. The USGS began reporting elevations in August 2008. A 1973 survey from FNI files for the Region B water plan and the 2013 TWDB survey were used to calculate areas and elevations. The missing data were simulated using an operation study using historical flows at WR_MB, which are Lake Kemp outflows, and incremental flows based on historical inflows to Lake Kickapoo from previous FNI studies.

Santa Rosa Lake

Reservoir Information	Date Range	Data Source
Name: SROSA	1/1948-11/1959	Operation study using FNI Lake Kemp inflows
Water Right: CA 02-5124	12/1959-8/1982	Operation study using historical PR_VN
Control Point: 010090	9/1982-3/1992	Operation study using historical NW_TS
Date Completed: 1929	4/1992-12/2018	Operation study using historical PR_VN

Santa Rosa Lake is on Beaver Creek in Wilbarger County, upstream of BC_ET. The reservoir is used for irrigation and livestock. No historical data are available. An operation study was used to estimate storage using inflows for Lake Kemp from a 1976 study by FNI, and historical flows from PR_VN and NW_TS. The area-capacity-elevation data are from the original Red WAM.

Lake Electra

Reservoir Information	Date Range	Data Source
Name: ELCTRA	5/1950-1/1960	Operation study using FNI Kemp Inflows
Water Right: CA 02-5128	2/1960-7/1998	Operation study using BC_ET
Control Point: C10020	8/1998-9/2012	USGS elevation and 1998 survey
Date Completed: 1950	10/2012-12/2018	Operation study using BC_ET

Lake Electra is located on Camp Creek in Wilbarger County, upstream of BC_ET. Reservoir was built for water supply and flood control by the City of Electra. According to TCEQ records there have been no diversions from the reservoir since 2005. Historical data are available from the USGS from 8/1998 to 9/2012. The remaining data were estimated using operation studies.

North Fork Buffalo Creek Reservoir

Reservoir Information	Date Range	Data Source
Name: NFBUFF	12/1964-3/1986	Operation study using BC_ET
Water Right: CA 02-5131	4/1986-7/1998	Elevations from original WAM
Control Point: P10060	8/1998-12/2018	USGS elevations
Date Completed: 11/1964		

North Fork Buffalo Creek Reservoir is located on North Fork Buffalo Creek in Wichita County, upstream of WR_WF. The reservoir was built by the City of Iowa Park for municipal use. Historical elevations from the previous WAM are available starting in October 1985. USGS elevations begin in August 1998. Area-capacity-elevation data is from the Texas Water Development Board, which gives a survey date of October 1974. Data prior to October 1984 were estimated using an operation study using historical flows from BC_ET multiplied by a drainage area ratio.

Lake Wichita

Reservoir Information	Date Range	Data Source
Name: WICHTA	1/1948-12/2018	Operation study using incremental Kickapoo to Arrowhead flows.
Water Right: CA 02-5122		
Control Point: Q10080		
Date Completed: 1901		

Lake Wichita is located on Holiday Creek in Wichita County, upstream of WR_CH. The reservoir was originally built in 1901 for irrigation purposes and was later used for municipal supply. According to TCEQ records the last diversions from the reservoir occurred in 1984. The reservoir is currently used for recreation. There are no historical records for the reservoir. All data was estimated using an operation study. Inflows are based on incremental flows between Lake Arrowhead and Lake Kickapoo from previous FNI studies. Area-capacity-elevation data are from the original Red WAM naturalization.

Lake Kickapoo

Reservoir Information	Date Range	Data Source
Name: KICKAP	1/1948-9/1962	USGS storage
Water Right: CA 02-5144	9/1962-5/1982	USGS storage converted to 1966 estimated storage
Control Point: R10010	6/1982-5/1995	USGS storage converted to 1986 estimated storage
Date Completed: 2/1946	6/1995-2/1999	USGS storage converted to 2001 storage
	3/1999-12/2012	USGS elevation with 2001 survey
	1/2013-12/2018	USGS elevation with 2013 survey

Lake Kickapoo is located on the Little Wichita River in Archer County, upstream of LW_AC. The reservoir is owned by the City of Wichita Falls and is used primarily for municipal purposes. Storage and/or elevation data are available from the USGS for the entire period of analysis. Area-capacity elevation data are available from the original application and TWDB surveys in 2001 and 2013. Intervening estimates of storage in 1966 and 1986 were also used in the naturalization. When USGS elevations were not available, the elevation was back calculated from the reported USGS storage and then converted to storage and area using the 1966, 1986, or 2001 curves.

Lake Arrowhead

Reservoir Information	Date Range	Data Source
Name: AROWHD	10/1966-5/1967	Even filling
Water Right: CA 02-5150	6/1967-11/1996	USGS storage
Control Point: S10030	12/1996-6/2007	USGS elevation and 2001 survey
Date Completed: 10/1966	7/2007-12/2018	USGS elevation and 2013 survey

Lake Arrowhead is located on the Little Wichita River in Clay County, upstream of LW_HN. The reservoir is owned by the City of Wichita Falls and is used primarily for municipal supplies. The reservoir began impounding water in October 1966. Storage and/or elevation data are available from the USGS for the entire historical period of the reservoir. Even filling was assumed from when the reservoir first began impounding water in October 1966 until the first storage was reported by the USGS in June 1967. Beginning in 2018 the City of Wichita Falls began supplementing inflows with return flows.

Lake Nocona

Reservoir Information	Date Range	Data Source
Name: NOCONA	4/1961-12/1978	Operation study using Big Sandy gage
Water Right: CA 02-4879	1/1979-12/1984	Historical FNI elevations and original survey
Control Point: V10070	1/1985-8/1995	Operation study using Big Sandy gage
Date Completed: 1961	9/1995-3/1995	Operation study using EF_HN
	4/1995-12/2018	USGS elevation and 2001 survey

Lake Nocona is located on Farmers Creek in Montague County, upstream of RR_GA. The reservoir is owned by the City of Nocona and provides municipal water supply. Historical elevations from FNI files are available from January 1979 to December 1984. USGS elevations and/or storage are available from March 1999 to December 2018. Missing data were estimated using operation studies. The original area-capacity-elevation data are available from FNI files and a TWDB volumetric survey was conducted in 2001. Estimated inflows were developed using historical flows for the Big Sandy near Bridgeport gage (Trinity Basin) and the EF_HN.

Hubert H. Moss Lake

Reservoir Information	Date Range	Data Source
Name: MOSSLK	12/1966-9/1967	Even filling
Water Right: CA 02-4881	10/1967-9/1999	USGS storage converted to 1999 survey
Control Point: V10020	10/1999-9/2010	USGS storage
Date Completed: 12/1966	10/2010-12/2018	USGS elevation

Hubert H. Moss Lake is located on Fish Creek in Cooke County, upstream of RR_GA. The reservoir is owned and operated by the City of Gainesville for municipal supply. USGS storage and/or elevation data for the reservoir are available beginning in October 1967, although some of the data are not available on the USGS website. The 1999 TWDB volumetric survey had more storage than the original 1966 survey. It was assumed that the TWDB survey was more accurate, so elevations were back-calculated from USGS storage data and the 1999 survey was applied throughout. The USGS switched to the 1999 survey in October 1999. Even filling was assumed between when the reservoir was completed in December 1966 until the USGS data were available.

Lake Texoma

Reservoir Information	Date Range	Data Source
Name: TEXOMA, OKTEX, COETEX, TEX1, TEX2, TEX3, TEX4, TEX5, TEX6, TEX7, TEX8, TEX9	1/1948-5/1952	USGS storage (1948 survey)
Water Rights: CA 02-4901, P 4301/A 2006, CA 02-4898, CA 02-4899, CA 02-4900, P/A 5003,	6/1952-9/1954	USGS storage updated to 1954 survey
Control Point: W10060, OK1000	10/1954-2/1961	USGS storage (1954 survey)
Date Completed: 2/1944	3/1961-9/1963	USGS storage updated to 1961 survey
	10/1963-4/1968	USGS storage (1961 survey)
	5/1968-9/1977	USGS storage updated to 1969 survey
	10/1977-12/1989	USGS storage
	1/1989-12/2018	USGS elevation and 2002 survey

P/A – Permit/Application

Lake Texoma is on the Red River in Bryan County, Oklahoma and Grayson County, Texas, upstream of RR_CB. The reservoir is owned and operated by the U.S. Army Corps of Engineers (USACE) for water supply, hydropower, and flood control. The reservoir is shared by Texas and Oklahoma. Multiple Texas water rights have been granted from the reservoir. Water from the reservoir is used to supplement inflows for Lake Randell and Valley Lake. Historical storage and/or elevation data are available from the USGS and the Tulsa District of the USACE. In some cases, elevations were back-calculated from the USGS data and used to calculate storage with a more recent survey. Unlike the corrections for other reservoirs, which are in applied along with other corrections to calculate naturalized flows, the corrections for Lake Texoma are applied first to the historical flows prior to spitting the flows between Texas and Oklahoma. Since the flows for Oklahoma are not naturalized, and the reservoir is shared equally by Texas and Oklahoma, the corrections for the reservoir are applied prior to the splitting of historical flows between the two states. More information can be found in **Appendix E**.

Randell Lake

Reservoir Information	Date Range	Data Source
Name: RANDAL	1/1948-2/1999	Constant storage
Water Right: CA 02-4901	3/1999-8/2011	USGS elevation data and 1974 survey
Control Point: W10020	9/2011-12/2018	Constant storage
Date Completed: 1909		

Lake Randell is located on Shawnee Creek in Grayson County, upstream of RR_CB. Shawnee Creek joins the Red River just downstream of Denison Dam (Lake Texoma). The reservoir is owned by the City of Denison. Water is pumped from Lake Texoma to provide additional supply and maintain storage. The USGS reported elevation and storage data from May 1999 to August 2011. Other records are not available, and records of diversions from Lake Texoma do not appear to be reliable. For the periods with no storage or elevation data, it was assumed that the reservoir was maintained at a constant elevation by supplemental inflows, which have been occurring since the early 1940s.

Valley Lake

Reservoir Information	Date Range	Data Source
Name: VALLEY	12/1960-9/1961	Even filling
Water Right: CA 02-4900	10/1961-12/2018	Constant level
Control Point: X10490		
Date Completed: 12/1960		

Valley Lake is on Brushy Creek in Fannin County, upstream of RR_AC. The reservoir is used for cooling water for power generation. It receives supplemental inflows pumped from Lake Texoma. Since records are not available, it was assumed that the reservoir is kept at a constant level.

Lake Bonham

Reservoir Information	Date Range	Data Source
Name: BONHAM	11/1969-9/1985	Operation study using Bois d'Arc Cr nr Randolph
Water Right: 02-4925	10/1985-12/1996	Operation study using North Sulphur River nr Cooper
Control Point: X10270	1/1997-2/1999	NTMWD elevations and 2004 survey
Date Completed: 12/1969	3/1999-12/2018	USGS elevations and 2004 survey

Lake Bonham is on Timber Creek in Fannin County. It is upstream of BODARC, the control point associated with Bois d'Arc Lake. The reservoir was built by the City of Bonham and is currently part of the North Texas Municipal Water District (NTMWD) system. Elevations are available from NTMWD from January 1977 to May 1999. The USGS has reported elevations and/or storage since March 1999. Data prior to 1977 was estimated using an operation study. Flows for the operation study were developed as part of the studies for Bois d'Arc Lake.

Bois d'Arc Lake

Reservoir Information	Date Range	Data Source
Name: BODARC	n/a	n/a
Water Right: P/A 12151		
Control Point: BODARC		
Date Completed: n/a		

Bois d'Arc Lake is a currently permitted reservoir that at the time of this report is under construction. It began impounding water in April 2021 and is expected to be completed in 2022. The reservoir was not in operation during the 1948-2018 study period.

Coffee Mill Lake

Reservoir Information	Date Range	Data Source
Name: COFFEE	1/1948-11/1962	Operation study using N. Sulphur nr Cooper
Water Right: CA 02-4915	12/1962-9/1985	Operation study using Bois d'Arc Cr nr Randolph
Control Point: X10230	10/1985-6/2006	Operation study using N. Sulphur nr Cooper
Date Completed: 1938	7/2006-12/2018	Operation study using Bois d'Arc Cr at FM 1396

Coffee Mill Lake is a recreation reservoir on Coffee Mill Creek in Fannin County. It is owned and operated by the U.S. Forest Service. Historical data for the reservoir are not available, so storage and evaporation were estimated using an operation study. Inflows were estimated using the North Sulphur

River near Cooper, Bois d'Arc Creek near Randolph, and Bois d'Arc Creek at FM 1396 gages. Flows were developed in the FNI studies for Bois d'Arc Lake and were extended for this project.

Pat Mayse Lake

Reservoir Information	Date Range	Data Source
Name: MAYSE	11/1966-9/1967	Data from original naturalization
Water Right: CA 02-4940	10/1967-9/1996	USGS storage
Control Point: X10010	10/1966-12/1998	USACE storage
Date Completed: 9/1967	1/1999-12/2018	USACE elevation and 2008 survey

Pat Mayse Lake is on Sanders Creek in Lamar County, upstream of RR_AC. The reservoir is owned and operated by the USACE. The City of Paris owns the Texas water right and uses the reservoir for municipal supply. Historical data are available for the full period of operation from either the USGS or the Tulsa District of the USACE.

Lake Crook

Reservoir Information	Date Range	Data Source
Name: CROOK	1/1948-12/1978	Operation study using original survey
Water Right: CA 02-4943	1/1979-2/1999	Operation study using 2003 survey
Control Point: Y10330	3/1999-12/2018	USGS elevations and 2003 survey
Date Completed: 1923		

Lake Crook is on Pine Creek in Lamar County, upstream of RR_IN. The reservoir is owned by the City of Paris and is used for municipal supply. USGS elevation data is available beginning in March 1999. For the rest of the period the storage and evaporation were simulated using an operation study with inflows estimated using the North Sulphur River near Cooper.

Appendix C
Reservoir Area-Capacity Data Used in Naturalization

Table C-1 Lake McClellan

Source: FNI yield study 1965

Elevation (feet)	Area (acres)	Capacity (acre-feet)
NA	0	0
NA	22	50
NA	45	150
NA	68	300
77.00	88	450
79.00	114	700
80.90	135	950
82.95	160	1300
83.88	175	1500
86.00	207	2000
88.10	237	2500
90.00	268	3000
91.58	296	3500
93.05	319	4000
94.40	340	4500
95.55	361	5000
96.60	380	5500

Table C-2 Greenbelt Dam

Source: FNI files Greenbelt Dam 1964

Elevation (feet)	Area (acres)	Capacity (acre-feet)
2,580	0	0
2,581	10	10
2,582	10	20
2,583	15	30
2,584	20	50
2,585	25	70
2,586	30	100
2,587	35	130
2,588	45	170
2,589	50	220
2,590	55	270
2,591	65	330
2,592	75	400
2,593	85	480
2,594	95	570
2,595	105	670
2,596	115	780
2,597	125	900
2,598	135	1,030
2,599	145	1,170
2,600	160	1,320
2,601	180	1,490
2,602	195	1,680
2,603	205	1,880
2,604	220	2,090
2,605	240	2,320
2,606	260	2,570
2,607	280	2,840
2,608	300	3,130
2,609	320	3,440
2,610	340	3,770
2,611	355	4,120
2,612	370	4,480
2,613	390	4,860
2,614	410	5,260
2,615	425	5,680
2,616	440	6,110
2,617	455	6,560
2,618	470	7,020
2,619	490	7,500

Elevation (feet)	Area (acres)	Capacity (acre-feet)
2,620	510	8,000
2,621	530	8,520
2,622	555	9,060
2,623	580	9,630
2,624	605	10,220
2,625	630	10,840
2,626	655	11,480
2,627	685	12,150
2,628	715	12,850
2,629	745	13,580
2,630	775	14,340
2,631	805	15,130
2,632	830	15,950
2,633	855	16,790
2,634	880	17,660
2,635	900	18,550
2,636	925	19,460
2,637	955	20,400
2,638	985	21,370
2,639	1,020	22,370
2,640	1,055	23,410
2,641	1,085	24,480
2,642	1,120	25,580
2,643	1,160	26,720
2,644	1,200	27,900
2,645	1,235	29,120
2,646	1,270	30,370
2,647	1,310	31,660
2,648	1,350	32,990
2,649	1,390	34,360
2,650	1,435	35,770
2,651	1,480	37,230
2,652	1,520	38,730
2,653	1,560	40,270
2,654	1,600	41,850
2,655	1,640	43,470
2,656	1,675	45,130
2,657	1,715	46,820
2,658	1,760	48,560
2,659	1,800	50,340
2,660	1,835	52,160
2,661	1,870	54,010
2,662	1,910	55,900
2,663	1,950	57,830

Elevation (feet)	Area (acres)	Capacity (acre-feet)	
2,664	1,990	59,800	TOC
2,665	2,030	61,810	
2,666	2,065	63,860	
2,667	2,100	65,940	
2,668	2,145	68,060	
2,669	2,190	70,230	
2,670	2,235	72,440	
2,671	2,280	74,700	
2,672	2,325	77,000	
2,673	2,380	79,350	
2,674	2,435	81,760	
2,675	2,485	84,220	
2,676	2,540	86,730	
2,677	2,600	89,300	
2,678	2,660	91,930	
2,679	2,715	94,620	
2,680	2,770	97,360	
2,681	2,830	100,160	
2,682	2,890	103,020	
2,683	2,950	105,940	
2,684	3,010	108,920	
2,685	3,070	111,960	
2,686	3,130	115,060	

Table C-3 Lake Bivens

Source: Original Red Nat Flow Data

Elevation (feet)	Area (acres)	Capacity (acre-feet)
3600	0	0
3605	16	35
3610	50	190
3615	100	560
3620	165	1190
3625	232.5	2190
3630	270	3520
3635	385	5260
3640	502	7360
3645	626	9700

Table C-4 Lake Tanglewood

Source: FNI Office Files

Elevation (feet)	Area (acres)	Capacity (acre-feet)
1	0	0
2	12	50
3	24	160
4	49	350
5	77	650
6	108	1100
7	140	1740
8	175	2520
9	210	3475
10	250	4625
11	292	6000
12	336	7550
13	383	9400
14	434	11450
15	486	13650

Table C-5 Lake Buffalo

Source: Original Red Nat Flow Information

Elevation (feet)	Area (acres)	Capacity (acre-feet)
3615.6	0	0
3620.6	792	60
3625.6	845	260
3630.6	1326	2080
3635.6	1604	7000
3640.6	2024	14420
3642.6	2236	18150
3645.6	2564	23940

Table C-6 Lake Mackenzie

Source: Original Red WAM Nat Flow Data

Elevation (feet)	Area (acres)	Capacity (acre-feet)
2950	0	0
2960	5.6	10
2970	27.1	170
2980	58.1	561
2990	96.1	1320
3000	141.3	2497
3010	195	4172
3020	255.7	6411
3030	312	9241
3040	375	12667
3050	445.7	16756
3060	485	21421
3070	534	26523
3080	585	32091
3090	674	38346
3100	883.5	46077
3110	1223.3	56566

Table C-7 Lake Baylor

Source: Original Red Nat Flow Information

Elevation (feet)	Area (acres)	Capacity (acre-feet)
1780	0	0
1782	16	20
1784	29	80
1786	42	160
1788	57	260
1790	76	400
1792	95	550
1794	118	750
1796	143	950
1798	170	1200
1800	200	1475
1802	230	1850
1804	265	2250
1806	302	2750
1808	340	3350
1810	380	4050
1812	424	4850
1814	468	5800
1816	515	6850
1818	560	7950
1820	610	9150

Table C-8 Kemp

Source: TWDB 2006 Survey

Elevation (feet)	Area (acres)	Capacity (acre-feet)
1080.8	0	0
1082	0	0
1083	0	0
1084	0	0
1085	0	0
1086	0	1
1087	0	1
1088	3	2
1089	63	33
1090	118	126
1091	192	277
1092	280	512
1093	383	848
1094	469	1271
1095	561	1786
1096	685	2403
1097	819	3160
1098	903	4022
1099	1001	4971
1100	1121	6030
1101	1246	7216
1102	1339	8507
1103	1480	9908
1104	1725	11528
1105	1897	13342
1106	2065	15322
1107	2241	17477
1108	2386	19792
1109	2520	22244
1110	2645	24828
1111	2766	27534
1112	2886	30360
1113	3014	33310
1114	3148	36390
1115	3265	39598
1116	3385	42921
1117	3516	46371
1118	3695	49975
1119	3895	53772
1120	4085	57765
1121	4256	61938
1122	4430	66278
1123	4619	70802
1124	4806	75514

Elevation (feet)	Area (acres)	Capacity (acre-feet)
1125	4984	80408
1126	5193	85493
1127	5432	90802
1128	5679	96357
1129	5918	102157
1130	6142	108187
1131	6356	114437
1132	6601	120906
1133	6876	127646
1134	7165	134667
1135	7455	141977
1136	7740	149574
1137	8042	157463
1138	8601	165690
1139	9527	175558
1140	10068	185335
1141	10786	195718
1142	11704	206978
1143	14819	230375
1144	15357	245434
1150	20700	353605

Table C-9 Lake Diversion

Source: TWDB 2013

Elevation (feet)	Area (acres)	Capacity (acre-feet)
1022	0	0
1023	12	4
1024	66	41
1025	96	123
1026	132	237
1027	182	393
1028	241	606
1029	294	873
1030	348	1195
1031	412	1577
1032	486	2027
1033	569	2551
1034	668	3169
1035	780	3891
1036	905	4731
1037	1053	5708
1038	1159	6820
1039	1246	8022
1040	1321	9305
1041	1392	10662
1042	1469	12092
1043	1552	13600
1044	1696	15216
1045	1939	17046
1046	2117	19076
1047	2276	21273
1048	2437	23630
1049	2691	26191
1050	2927	29000
1051	3162	32044
1052	3397	35324
1060	5550	71112

Table C-10 Lake Diversion

Source: 1973 from Region B

Elevation (feet)	Area (acres)	Capacity (acre-feet)
1021	0	0
1026	50	125
1031	350	1125
1036	850	4125
1041	1650	10375
1046	2750	21375
1050.5	3245	34988
1051	3300	36500
1052	3419	40000
1060	5550	75876

Table C-11 Santa Rosa

Source: PBSJ/Espey

Elevation (feet)	Area (acres)	Capacity (acre-feet)
1143	0	0
1145	0	0
1147	0	1
1149	2	3
1151	32	30
1153	77	135
1155	150	357
1157	251	752
1159	457	1446
1161	718	2605
1163	989	4296
1165	1342	6607
1167	1625	9556

Table C-12 Electra

Source: 1998 Survey data from Region B

Elevation (feet)	Area (acres)	Capacity (acre-feet)
1088	0	0
1090	17	18
1095	93	265
1098	144	658
1100	208	1035
1102	268	1508
1105	407	2495
1107	469	3371
1110	561	4916
1111	731	5626

Table C-13 North Fork Buffalo Creek Lake

Source: TWDB

Elevation (feet)	Area (acres)	Capacity (acre-feet)
1024	0	0
1025	41	30
1026	61	104
1027	85	199
1028	113	326
1029	144	496
1030	181	699
1031	223	946
1032	269	1240
1033	320	1580
1034	374	1972
1035	432	2418
1036	494	2917
1037	559	3486
1038	626	4116
1039	696	4826
1040	769	5624
1041	843	6497
1042	923	7449
1043	1009	8503
1044	1100	9605
1045	1196	10870
1046	1298	12258
1047	1405	13821
1048	1500	15400
1050	1730	19000
1052	1957	22728
1054	2183	26376

Table C-14 Lake Wichita

Source: PBSJ 1958 ACE

Elevation (feet)	Area (acres)	Capacity (acre-feet)
965	0	0
966	120	60
968	310	490
970	550	1350
972	810	2710
974	1040	4560
976	1310	6910
978	1650	9870
980	2000	13520
982	2400	17920
984	2900	23220
986	3490	29610
988	4150	37250
990	4840	46240
992	5670	56570
994	6590	69010
996	7750	83150
998	8600	99300
1000	9620	117500

Table C-15 Lake Kickapoo

Source: Original from Application

Elevation (feet)	Area (acres)	Capacity (acre-feet)
1000	0	0
1005	100	800
1010	480	2800
1015	890	7600
1020	1440	14000
1025	2080	22800
1030	2900	35600
1035	4000	52800
1040	5090	77200
1045	6180	106400
1050	7280	138000
1055	8360	179200
1060	9440	

Table C-16 Lake Kickapoo

Source: 1966 Calculated

Elevation (feet)	Area (acres)	Capacity (acre-feet)
1000	0	0
1005	77	192
1010	457	1526
1015	867	4835
1020	1417	10544
1025	2057	19228
1030	2877	31562
1035	3977	48696
1040	5067	71305
1045	6157	99364
1050	7280	132956

Table C-17 Lake Kickapoo

Source: 1986 Calculated

Elevation (feet)	Area (acres)	Capacity (acre-feet)
1000	0	0
1005	0	0
1010	279	698
1015	689	3120
1020	1239	7942
1025	1879	15739
1030	2699	27186
1035	3799	43433
1040	4889	65155
1045	5979	92327
1050	7280	125475

Table C-18 Lake Kickapoo

Source: TWDB 2001 (recalc)

Elevation (feet)	Area (acres)	Capacity (acre-feet)
1001.5	4	0
1004	2	2
1005	3	5
1006	4	8
1007	10	15
1008	23	30
1009	71	76
1010	126	175
1011	184	328
1012	279	559
1013	378	889
1014	474	1318
1015	557	1834
1016	660	2444
1017	750	3146
1018	862	3954
1019	970	4871
1020	1099	5904
1021	1208	7059
1022	1330	8324
1023	1476	9729
1024	1610	11271
1025	1751	12951
1026	1893	14772
1027	2039	16736
1028	2217	18863
1029	2368	21158
1030	2521	23598
1031	2706	26207
1032	2939	29037
1033	3131	32071
1034	3350	35313
1035	3600	38780
1036	3860	42513
1037	4117	46496
1038	4385	50755
1039	4618	55255
1040	4858	59993
1041	5102	64972
1042	5347	70202
1043	5525	75642
1044	5698	81251
1045	6028	87050

Table C-19 Lake Kickapoo

Source: TWDB 2013

Elevation (feet)	Area (acres)	Capacity (acre-feet)
1002.8	0	0
1004	1	0
1005	2	2
1006	5	5
1007	12	13
1008	23	30
1009	59	64
1010	124	157
1011	185	310
1012	270	534
1013	394	866
1014	501	1316
1015	591	1863
1016	681	2497
1017	777	3225
1018	890	4058
1019	1006	5006
1020	1135	6075
1021	1241	7263
1022	1352	8559
1023	1495	9978
1024	1623	11539
1025	1766	13231
1026	1911	15067
1027	2046	17043
1028	2235	19186
1029	2400	21505
1030	2576	23993
1031	2738	26652
1032	2884	29462
1033	3059	32428
1034	3319	35620
1035	3591	39069
1036	3819	42774
1037	4046	46707
1038	4273	50866
1039	4500	55253
1040	4728	59867
1041	4955	64708
1042	5182	69776
1043	5409	75072
1044	5636	80595
1045	5864	86345

Elevation (feet)	Area (acres)	Capacity (acre-feet)
1,050	7280	119205

Table C-20 Lake Arrowhead

Source: FNI Original

Elevation (feet)	Area (acres)	Capacity (acre-feet)
	0	0
889	700	2000
890	900	2800
900	3700	26000
905	5300	50000
910	7200	80000
914	9000	108000
915	9500	117250
916	10100	127050
917	10700	137450
918	11250	148475
923	14250	216575
924	14800	231100
925	15500	246250
926	16200	262100
931	19700	353000
936	23800	457500

Table C-21 Lake Arrowhead

Source: TWDB 2001 (2013 Recalc)

Elevation (feet)	Area (acres)	Capacity (acre-feet)
880.4	0	0
881	0	0
882	2	1
883	11	7
884	24	24
885	44	57
886	148	138
887	341	388
888	449	786
889	561	1287
890	754	1933
891	956	2795
892	1114	3826
893	1321	5042
894	1544	6472
895	1731	8117
896	1892	9928
897	2080	11898
898	2532	14209
899	2891	16929
900	3262	20013
901	3589	23440
902	3847	27162
903	4124	31148
904	4422	35408
905	4845	40044
906	5226	45083
907	5601	50489
908	5913	56252
909	6236	62322
910	6566	68722
911	6884	75449
912	7271	82518
913	7717	90008
914	8259	97975
915	9005	106622
916	9567	115906
917	10192	125788
918	10754	136267
919	11295	147292
920	11799	158844
921	12189	170846
922	12566	183220

Elevation (feet)	Area (acres)	Capacity (acre-feet)
923	13000	195996
924	13880	209456
925	14322	223557
926	14978	238114

Table C-22 Lake Arrowhead

Source: TWDB 2013

Elevation (feet)	Area (acres)	Capacity (acre-feet)
881.9	0	0
882	0	0
883	3	1
884	10	7
885	22	22
886	40	53
887	145	126
888	332	369
889	456	766
890	575	1279
891	746	1929
892	979	2791
893	1169	3871
894	1376	5145
895	1591	6623
896	1793	8319
897	1953	10194
898	2126	12227
899	2574	14568
900	2997	17368
901	3396	20568
902	3757	24152
903	4087	28074
904	4447	32334
905	4756	36943
906	5119	41868
907	5536	47198
908	5838	52894
909	6087	58857
910	6329	65067
911	6768	71587
912	7130	78545
913	7561	85875
914	8112	93689
915	8683	102090
916	9348	111089
917	9864	120695
918	10380	130817
919	10895	141455
920	11411	152608
921	11927	164277
922	12443	176462
923	12959	189162

Elevation (feet)	Area (acres)	Capacity (acre-feet)
924	13474	202379
925	13990	216111
926	14506	230359
931	19700	315874.262

Table C-23 Lake Nocona

Source: 06/2001 TWDB Survey

Elevation (feet)	Area (acres)	Capacity (acre-feet)
783.5	0	0
784	0	0
785	0	0
786	3	2
787	6	6
788	10	14
789	16	26
790	22	45
791	31	71
792	41	107
793	57	155
794	74	221
795	92	304
796	113	407
797	136	530
798	167	682
799	193	862
800	223	1069
801	255	1308
802	286	1579
803	314	1879
804	343	2208
805	382	2569
806	423	2972
807	460	3414
808	498	3893
809	533	4408
810	571	4960
811	607	5549
812	643	6175
813	685	6838
814	735	7548
815	788	8310
816	835	9122
817	877	9978
818	922	10877
819	970	11823
820	1019	12818
821	1066	13860
822	1116	14950
823	1165	16091
824	1210	17279
825	1250	18509

Elevation (feet)	Area (acres)	Capacity (acre-feet)
826	1287	19778
827	1323	21083
827.5	1362	21749
828	1359	22424
829	1395	23801
830	1431	25214
831	1467	26663
831.5	1485	27401

Table C-24 Lake Nocona

Source: FNI files (1960)

Elevation (feet)	Area (acres)	Capacity (acre-feet)
771	1	1
772	2	2
773	4	5
774	6	10
775	8	17
776	9	26
777	11	36
778	12	47
779	14	60
780	17	76
781	21	95
782	25	118
783	29	145
784	34	176
785	40	213
786	46	256
787	53	306
788	61	363
789	72	429
790	83	507
791	100	598
792	120	708
793	143	840
794	168	995
795	193	1176
796	218	1381
797	244	1612
798	272	1870
799	300	2156
800	330	2471
801	361	2817
802	393	3194
803	425	3603
804	458	4044
805	492	4519
806	528	5029
807	564	5575
808	600	6157
809	637	6776
810	674	7431
811	712	8124
812	751	8856
813	790	9626

Elevation (feet)	Area (acres)	Capacity (acre-feet)
814	831	10437
815	879	11292
816	927	12195
817	975	13146
818	1020	14143
819	1070	15188
820	1120	16283
821	1170	17428
822	1220	18623
823	1270	19868
824	1330	21168
825	1380	22523
826	1430	23928
827	1480	25383

Table C-25 Moss Lake

Source: TWDB 1999

Elevation (feet)	Area (acres)	Capacity (acre-feet)
649	0	0
657	1	1
660	3	6
661	5	10
662	9	17
663	13	28
664	19	44
665	26	67
666	34	97
667	44	135
668	54	184
669	64	243
670	75	313
671	84	393
672	93	482
673	104	580
674	118	691
675	130	815
676	141	950
677	159	1101
678	174	1267
679	193	1451
680	215	1655
681	236	1881
682	257	2127
683	280	2396
684	302	2687
685	324	3001
686	344	3335
687	368	3691
688	391	4070
689	416	4474
690	445	4904
691	476	5365
692	504	5855
693	540	6377
694	572	6933
695	599	7519
696	624	8131
697	649	8767
698	673	9427
699	696	10112
700	719	10820

Elevation (feet)	Area (acres)	Capacity (acre-feet)
701	739	11549
702	759	12298
703	779	13066
704	802	13856
705	824	14669
706	848	15505
707	871	16365
708	893	17247
709	917	18152
710	942	19082
711	971	20037
712	1006	21025
713	1031	22044
714	1055	23087
715	1140	24155
720	1340	30355
730	1680	45455

Table C-26 Lake Texoma

Source: From FNI Files

Elevation (feet)	Area (acres)	Capacity (acre-feet)
510	0	0
520	566	2407
530	1545	12480
540	4445	42300
550	10398	117200
560	18839	264300
570	26101	486900
580	36541	799500
590	46844	1216000
600	61309	1754000
610	73538	2427000
610.1	82167	2427000
617	94874	3046000
620	101025	3340000
630	120896	4449000
640	144088	5744000

Table C-27 Lake Texoma

Source: From FNI Files

Elevation (feet)	Area (acres)	Capacity (acre-feet)
510	0	0
520	0	0
530	1,545	4,440
540	4,445	27,040
550	10,398	92,110
560	18,839	232,100
570	26,101	446,800
580	36,541	754,200
590	46,844	1,163,000
600	61,309	1,691,000
610	73,538	2,348,000
610	82,167	2,348,000
617	94,874	2,945,000
620	101,025	3,233,000
630	120,896	4,333,000
640	144088	5659000

Table C-28 Lake Texoma

Source: From FNI Files

Elevation (feet)	Area (acres)	Capacity (acre-feet)
510	0	0
520	0	0
530	700	2320
540	3460	21150
550	9360	80630
560	17570	213800
570	24560	420400
580	34540	711200
590	43890	1106000
600	57170	1610000
610	70390	2250000
610.1	75950	2250000
617	91200	2886000
620	98630	3119000
630	120200	4210000
640	144144	5580000
650	0	6301000

Table C-29 Lake Texoma

Source: From FNI Files

Elevation (feet)	Area (acres)	Capacity (acre-feet)
510	0	0
520	0	0
530	500	1480
540	2500	15990
550	7200	60910
560	16890	184000
570	23000	383300
580	33300	661200
590	44100	1049200
600	54620	1542800
610	61200	2167900
610	72200	2167900
617	89000	2733300
620	96000	3010500
630	119000	4086200
640	143300	5392900

Table C-30 Lake Texoma

Source: From Tulsa District

Elevation (feet)	Area (acres)	Capacity (acre-feet)
520	0	0
522	60	60
524	120	240
526	180	540
528	240	960
530	300	1500
532	716	2516
534	1132	4364
536	1548	7044
538	1964	10556
540	2380	14900
542	3304	20584
544	4228	28116
546	5152	37496
548	6076	48724
550	7000	61800
552	8920	77720
554	10840	97450
556	12760	121080
558	14680	148520
560	16600	179800
562	17780	214180
564	18960	250920
566	20140	290020
568	21320	331450
570	22500	375300
572	24560	422360
574	26620	473540
576	28680	528840
578	30740	588260
580	32800	651800
582	34860	719460
584	36920	791240
586	38980	867140
588	41040	947250
590	43100	1031300
592	44740	1119140
594	46380	1210250
596	48020	1304060
598	49660	1402340

Elevation (feet)	Area (acres)	Capacity (acre-feet)
600	51300	1503300
602	54860	1609450
604	58420	1722740
606	61980	1883140
608	65540	1970650
610	69100	2105300
610.1	69600	2105300
612	73370	2248270
614	77180	2398770
616	80900	2556800
617.25	85000	2556800
618	91000	2733300
628	114560	3762540
630	119200	3996300
632	124160	4289660
634	129120	4492940
636	134080	4756140
638	139040	5029260
640	144000	5312300
642	149320	5605620
644	154640	5909580
646	159960	6224190
648	165280	6549420
650	170600	6885300
652	176100	7232040
654	181680	7589860
656	187220	7958750
658	192760	8338740
660	198300	8729800

Table C-31 Lake Texoma

Source: From TWDB

Elevation (feet)	Area (acres)	Capacity (acre-feet)
520.6	0	0
522	2	1
523	12	7
524	36	30
525	57	77
526	81	145
527	152	257
528	231	450
529	299	716
530	400	1062
531	503	1517
532	650	2081
533	1003	2879
534	1391	4089
535	1679	5629
536	1921	7432
537	2153	9469
538	2402	11744
539	2693	14287
540	3033	17149
541	3388	20357
542	3824	23958
543	4327	28043
544	4746	32583
545	5273	37585
546	5871	43146
547	6609	49377
548	7363	56369
549	8131	64111
550	8900	72616
551	9908	81974
552	11048	92457
553	11997	103983
554	12854	116416
555	13636	129669
556	14341	143662
557	15052	158357
558	15710	173735
559	16337	189766
560	16926	206401

Elevation (feet)	Area (acres)	Capacity (acre-feet)
561	17525	223625
562	18136	241447
563	18822	259941
564	19446	279074
565	20020	298808
566	20719	319179
567	21368	340231
568	21996	361913
569	22744	384271
570	23517	407404
571	24254	431288
572	25071	455939
573	25955	481461
574	26804	507832
575	27698	535073
576	28604	563231
577	29448	592255
578	30294	622131
579	31071	652811
580	31896	684293
581	32748	716607
582	33671	749806
583	34791	784049
584	35765	819327
585	36727	855578
586	37627	892759
587	38377	930772
588	39049	969486
589	39723	1008872
590	40434	1048949
591	41157	1089739
592	41968	1131294
593	42847	1173691
594	43797	1217013
595	44702	1261262
596	45588	1306408
597	46520	1352450
598	47492	1399463
599	48398	1447405
600	49380	1496276
601	50463	1546195
602	51572	1597216
603	52695	1649345
604	53835	1702608

Elevation (feet)	Area (acres)	Capacity (acre-feet)
605	54986	1757009
606	56151	1812573
607	57386	1869345
608	58583	1927331
609	59779	1986509
610	61022	2046901
611	62321	2108567
612	63809	2171603
613	65498	2236237
614	67524	2302729
615	69854	2371383
616	72516	2442556
617	74686	2516232
618	76197	2591700
618.9	77452	2660845
619	81966	2696769
620	84911	2779641
650	0	4053306

Table C-32 Lake Randell

Source: TWDB from Website (says 1974)

Elevation (feet)	Area (acres)	Capacity (acre-feet)
555	0	0
560	2	13
565	4	16
566	5	17
567	6	20
568	7	25
569	8	36
570	9	47
571	11	61
572	12	78
573	14	94
574	15	111
575	17	133
576	19	156
577	21	181
578	24	205
579	26	232
580	29	263
581	32	291
582	35	320
583	38	358
584	41	396
585	45	442
586	49	491
587	52	543
588	57	600
589	62	665
590	66	725
591	72	792
592	78	865
593	84	940
594	91	1019
595	98	1108
596	105	1202
597	111	1300
598	118	1404
599	125	1513
600	132	1633
601	139	1757
602	145	1887
603	152	2022
604	159	2166
605	165	2317

Elevation (feet)	Area (acres)	Capacity (acre-feet)
606	172	2478
607	179	2647
608	187	2826
609	194	3016
610	202	3224
611	210	3448
612	219	3685
613	228	3925
614	236	4162
615	246	4413
616	255	4657
617	264	4908
618	274	5162
619	284	5426
620	294	5708
621	304	6019
622	315	6356
623	328	6711
624	339	7067
625	351	7418
626	363	7768
627	375	8114
628	386	8459
629.2	398	8850

Table C-33 Lake Bonham

Source: Original from FNI Files

Elevation (feet)	Area (acres)	Capacity (acre-feet)
530	0	0
532	3	10
534	7	30
536	22	60
538	57	130
540	95	280
542	137	520
544	182	840
546	232	1240
548	282	1760
550	347	2380
552	411	3140
554	476	4050
556	551	5070
558	649	6250
560	728	7630
562	830	9200
564	952	10950
565	1026	11976

Table C-34 Lake Bonham

Source: 03/2004 TWDB Survey

Elevation (feet)	Area (acres)	Capacity (acre-feet)
535.1	0	0
537	4	2
538	18	12
539	34	38
540	51	80
541	68	140
542	87	217
543	109	315
544	132	436
545	160	582
546	191	757
547	223	964
548	256	1203
549	286	1474
550	315	1775
551	346	2105
552	374	2465
553	403	2854
554	430	3271
555	465	3718
556	501	4201
557	543	4722
558	592	5290
559	640	5906
560	691	6571
561	756	7292
562	900	8092
563	961	9026
564	1006	10010
565	1070	11038
566	1122	12134
568.5	1250	15099

Table C-35 Coffee Mill Lake

Source: FNI files

Elevation (feet)	Area (acres)	Capacity (acre-feet)
444	0	0
454	10	200
462	55	440
468	140	1000
470	165	1200
472	200	1500
474	225	1750
476	260	2010
478	290	2100
480	330	2800
482	365	3250
484	400	3750
486	440	4300
488	480	4900
490	520	5600
495	630	6600
500	780	10800
505	990	14500.01

Table C-36 Lake Pat Mayse

Source: TWDB 2008 Survey

Elevation (feet)	Area (acres)	Capacity (acre-feet)
398.6	0	0
400	4	1
401	17	10
402	38	37
403	64	88
404	94	167
405	127	277
406	160	420
407	190	596
408	220	800
409	256	1036
410	315	1319
411	416	1688
412	500	2145
413	612	2700
414	729	3371
415	852	4160
416	992	5076
417	1110	6126
418	1229	7299
419	1358	8589
420	1508	10024
421	1634	11594
422	1767	13296
423	1893	15127
424	2011	17080
425	2112	19142
426	2224	21306
427	2351	23591
428	2476	26005
429	2594	28539
430	2719	31195
431	2833	33971
432	2966	36869
433	3111	39908
434	3233	43082
435	3360	46380
436	3479	49801
437	3598	53337
438	3726	57001
439	3853	60789
440	3994	64712
441	4150	68782

Elevation (feet)	Area (acres)	Capacity (acre-feet)
442	4294	73006
443	4443	77375
444	4593	81894
445	4748	86566
446	4920	91399
447	5079	96402
448	5207	101548
449	5333	106815
450	5531	112260
451	5638	117844
452.02	5854	123705
454.43	6375	138441
460.01	7501	177156
461.27	7895	186856

Table C-37 Lake Pat Mayse

Source: 1967 PBSJ "Original"

Elevation (feet)	Area (acres)	Capacity (acre-feet)
394	0	0
400	34	57
410	283	1616
415	794	4616
420	1820	11724
430	2724	34401
440	4095	67460
450	5775	117467
451	5982	123345
460	7859	184280
460.5	7692	188126
470	9947	273789
477	12377	350734

Table C-38 Lake Crook

Source: PBSJ 1946

Elevation (feet)	Area (acres)	Capacity (acre-feet)
450	0	0
454	18	120
458	115	400
462	230	1000
466	410	2200
470	670	4300
474	1015	7700
478	1430	12400
482	1850	19400
486	2300	27600

Table C-39 Lake Crook

Source: 2003 TWDB Survey

Elevation (feet)	Area (acres)	Capacity (acre-feet)
452.5	0	0
455	3	2
456	7	6
457	17	18
458	30	41
459	60	83
460	117	172
461	189	324
462	234	537
463	270	788
464	311	1078
465	359	1415
466	410	1797
467	472	2240
468	534	2743
469	586	3302
470	644	3917
471	723	4599
472	809	5365
473	905	6222
474	983	7177
475	1017	8177
476	1060	9210
486	2300	26010

Appendix D
Water Rights

Table D-1
Water Rights Directly Upstream of Sweetwater Creek near Kelton
SW_KT
A10000

Water Right Number /Permit	Application	Owner	Diversion Amount (ac-ft/yr)	Use	Storage Amount (ac-ft)	Control Point	Water Right ID	Notes
3891	4130	TIFFANY J. SIMS TYE D. SIMS	132	AGRICULTURE - IRRIGATION		A10060	10204130001	
5251		GORDON, CAROL LYNN GORDON, FREDERICK W III	60	AGRICULTURE - IRRIGATION		A10070	60205251301	
5252		STANLEY, DUDLEY R	20	AGRICULTURE - IRRIGATION		A10050	60205252301	
5253		BURT, PENNY PURYEAR MALLOT, BILLIE JEANNE PURYEAR, THOMAS G PURYEAR, THOMAS G II ROYER, RAE MARIE	319	AGRICULTURE - IRRIGATION	132	A10010, A10020, A10030, A10040	60205253002	

Table D-2
Water Rights Directly Upstream of N Fk Red River nr Shamrock
NF_SH
10095

Water Right Number /Permit	Application	Owner	Diversion Amount (ac-ft/yr)	Use	Storage Amount (ac-ft)	Control Point	Water Right ID	Notes
5247		Minco Oil And Gas, LP	100	AGRICULTURE - IRRIGATION		10100	60205247301	
5246		TOC Ranch	70	AGRICULTURE - IRRIGATION		10120	60205246301, 60205246302	
5245		Taylor Properties	129			10130	60205245301	In WAM but not on current WR list. Cancelled in 2013.
5244		US Forest Service		RECREATION	5005	10140	60205244301	Lake McClellan/Cibola
5243		Biggs G Horn Estate HORN, TOM D	217	AGRICULTURE - IRRIGATION		10150	60205243301	u/s McClellan
5242		BRADDOCK, KAROL KOTARA KOTARA, EVANGELINE	9	AGRICULTURE - IRRIGATION		10160	60205242301	u/s McClellan
5241		HOERNER, MARGARET S	34	AGRICULTURE - IRRIGATION		10170	60205241301	u/s McClellan
5240		SANCHEZ, ELAYNE KOTARA	50	AGRICULTURE - IRRIGATION	200	10180	60205240301	u/s McClellan
5240		POUNDS, CECILIA KOTARA	50	AGRICULTURE - IRRIGATION		10180	60205240301	u/s McClellan
5239		RUSSELL, AUBREY L	85	AGRICULTURE - IRRIGATION		10190	60205239301	u/s McClellan
5855	5855	Amarillo AG Plex, LLC		DOMESTIC AND LIVESTOCK	356	585531	10205855301	

Table D-3
Water Rights Directly Upstream of Lake Greenbelt (Salt Fork nr Clarendon)
SF_CL
B10060

Water Right Number /Permit	Application	Owner	Diversion Amount (ac-ft/yr)	Use	Storage Amount (ac-ft)	Control Point	Water Right ID	Notes
5232		BRITTEN, CHRISTOPHER L BRITTEN, DEBORAH E	200	AGRICULTURE - IRRIGATION		B10070	60205232001	Upstream of Greenbelt,
5233		Greenbelt Municipal & Industrial Water Authority	10819	MUNICIPAL/DOMESTIC	59100	B10060	60205233301	From Lake Greenbelt
5233		Greenbelt Municipal & Industrial Water Authority	372	INDUSTRIAL		B10060	60205233302	From Lake Greenbelt
5233		Greenbelt Municipal & Industrial Water Authority	250	AGRICULTURE - IRRIGATION		B10060	60205233303	From Lake Greenbelt
5233		Greenbelt Municipal & Industrial Water Authority	559	MINING		B10060	60205233304	From Lake Greenbelt

Table D-4
Water Rights Directly Upstream of Salt Fork, Red River near Wellington
SF_WL
B10000

Water Right Number /Permit	Application	Owner	Diversion Amount (ac-ft/yr)	Use	Storage Amount (ac-ft)	Control Point	Water Right ID	Notes
5233		Greenbelt Municipal & Industrial Water Authority	3711	MUNICIPAL/DOMESTIC		B10050	60205233003	From Lelia Lake Cr
5233		Greenbelt Municipal & Industrial Water Authority	128	INDUSTRIAL		B10050	60205233004	From Lelia Lake Cr
5233		Greenbelt Municipal & Industrial Water Authority	191	MINING		B10050	60205233005	From Lelia Lake Cr
5235		HENARD, LARRY	108	AGRICULTURE - IRRIGATION		B10010	60205235001	
5234		Jack L. King Rebecca B. King	184	AGRICULTURE - IRRIGATION		B10040	60205234001	
3889	4207	DAVIS, KEITH Adolphus Andrew Hicks	75	AGRICULTURE - IRRIGATION		B10020	10204207001	
4265	4576	Rio Real Estate LTD	80	AGRICULTURE - IRRIGATION	1.25	B10030	10204576301	

Table D-5
Water Rights Downstream of SW_KT, NF_SH, and SF_WL but upstream of OK Border
n/a
H10080, 10070,H10100

Water Right Number /Permit	Application	Owner	Diversion Amount (ac-ft/yr)	Use	Storage Amount (ac-ft)	Control Point	Water Right ID	Notes
5254		ATHERTON, RUSSELL STEPHEN	125	AGRICULTURE - IRRIGATION		10040	60205254001	Sweetwater Cr
3885	4194	JANE ANN CASEY TRUST E JOHN WILLIAM YOUNG TRUST E MARK W YOUNG TRUST E	90	AGRICULTURE - IRRIGATION		10050	10204194201	N Fk
5250		Kimberly Wheeler	33	AGRICULTURE - IRRIGATION		10060	60205250002	N Fk
5249		C C Meek Estate	10	AGRICULTURE - IRRIGATION		10080	60205249301	N Fk
5248		BLAKEMORE, FORBUS E BLAKEMORE, JAMES A	30	AGRICULTURE - IRRIGATION		10090	60205248301	N Fk
5262		Kade Legett Matthews Royalty Trust	29	AGRICULTURE - IRRIGATION		10200	60205262101	Elm Fk
3877	4193	JANE ANN CASEY TRUST E JOHN WILLIAM YOUNG TRUST E MARK W YOUNG TRUST E	90	AGRICULTURE - IRRIGATION	30	10210	10204193301	Elm Fk
5261		BROWN, EDITH BROWN, JIMMY W	59	AGRICULTURE - IRRIGATION		10220	60205261102	Elm Fk
5260		Kyle Janes	100	AGRICULTURE - IRRIGATION		10230	60205260002	Elm Fk
5259		NUNNELLEY, DONALD L NUNNELLEY, ERNEST	34	AGRICULTURE - IRRIGATION	20	10240, 10250	60205259001, 60205259301	Elm Fk
5258		Virginia Hill Family Revocable Trust	140	AGRICULTURE - IRRIGATION		10260	60205258001	Elm Fk
5257		Nora Petty Estate	23	AGRICULTURE - IRRIGATION		10270	60205257101	Elm Fk
5257		Betty Tellman	47	AGRICULTURE - IRRIGATION		10270	60205257101	Elm Fk
5256		ELM CREEK RANCH, INC.	50	AGRICULTURE - IRRIGATION		10280	60205256001	Elm Fk
3901	4198	DAVIS, GEORGE W DAVIS, HAZEL T	25	AGRICULTURE - IRRIGATION	2	10290	10204198001	Elm Fk
5255		HRNCIAR, JOHN JR		RECREATION	100	10300	60205255301	Elm Fk
5237		ALLRED, LOUIS E SESSIONS, BOB L SESSIONS, JAMES E	300	AGRICULTURE - IRRIGATION	336	10320	60205237301	Salt Fk
5236		HENARD, LARRY	86.5	AGRICULTURE - IRRIGATION		10330, 10350	60205236002, 60205236003, 60205236004	Salt Fk
3859	4184	HALEY, JAN ELAINE HEWLETT HEWLETT, JAMES EDWIN MCKENZIE, JO ANN BUMPAS	60	AGRICULTURE - IRRIGATION		10340	10204184301	Salt Fk
5236		Henard Brothers HENARD, JOE J	86.5	AGRICULTURE - IRRIGATION	84	10350, 10360	60205236001, 60205236301	Salt Fk
5265		Estate of Huston Stickley		RECREATION	870	10010	60205265301	Washita River
5264		DOBBS, EUGENE H DOBBS, SOPHIA E FINSTERWALD, MILTON B. K. Holmes HOLMES, CLARA F K	70	AGRICULTURE - IRRIGATION	503	10020	60205264301, 60205264302	Washita River
5263		LOCKE, KEITH LOCKE, RICHARD		RECREATION	394	10030	60205263301	Washita River

Table D-6
Water Rights Directly Upstream of Praire Dog Town Fork, Red River near Wayside
PD_WA
C10000

Water Right Number /Permit	Application	Owner	Diversion Amount (ac-ft/yr)	Use	Storage Amount (ac-ft)	Control Point	Water Right ID	Notes
5179		GRIGSBY, RALPH R JR GRIGSBY, SAMUEL F SR	796	AGRICULTURE - IRRIGATION		C10220	60205179001	Diversions not authorized until
5180		City of Amarillo		RECHARGE	5122	C10210	60205180301	Lake Bivins, recharge
5182		2BR Land, LP	37	AGRICULTURE - IRRIGATION	15	C10170, C10180	60205182101, 60205182301	
5183		Barrett and Crofoot, Inc.	13	Irrigation	15	C10150, C10160	60205183101, 60205183301	Cancelled in 2003 according to TCEQ WR
5184		MARTIN, CLARENCE W Lawrence J Martin MARTIN, MARTHA WYNONA Patsy Arleen Martin	54	AGRICULTURE - IRRIGATION	40	C10130, C10140	60205184101, 60205184301	
5185		SIMPSON, JAMES E SIMPSON, MAYMIE SIMPSON, R L SIMPSON, VEATRICE	125	AGRICULTURE - IRRIGATION	7	C10120	60205185301	
5186		FRYE, GEORGE ARRON FRYE, H HOUSTON FRYE, HARLAND H FRYE, HERTHA FRYE, KENNETH FRYE, LINDA FRYE, VERNA	200	AGRICULTURE - IRRIGATION	492	C10110	60205186301	
5187		Floyd Cole Estate	40	AGRICULTURE - IRRIGATION	8	C10090	60205187401	
5188		U.S. Department of the Interior Fish and Wildlife Service		AGRICULTURE - WILDLIFE MANAGEMENT	18121	C10080	60205188301	Buffalo Lake/Umbarger Dam. Water right authorizes reconstruction of spillway to impound full amount, but that may
5188		U.S. Department of the Interior Fish and Wildlife Service		AGRICULTURE - WILDLIFE MANAGEMENT RECREATION	963			This is "Stewart Dike" which impounds the 964 ac-ft within pool of Buffalo Lake. Not in
5181		PEAR TREE POINTE, LLC	71.88	AGRICULTURE - IRRIGATION	25	C10190	60205181301	
5181		HASSAN DANA Jill Dana	8.12	AGRICULTURE - IRRIGATION	25	C10190	60205181301	
5189		Peckerwood Farm, Inc.	164	AGRICULTURE - IRRIGATION	120	C10070	60205189301	
5190		HALL, SALLY LOUISE	10	AGRICULTURE - IRRIGATION	120	C10070	60205190301	
5191		A2 Cattle Feeding, Inc. Chris Cabbiness	151.54	AGRICULTURE - IRRIGATION		C10070	60205191301	
5191		Blackburn Brothers, Inc. Wagner Enterprises, Inc.	12.46	AGRICULTURE - IRRIGATION				
5192		Taylor Foster Inc	164	AGRICULTURE - IRRIGATION		C10070	60205192301	
5193		Palo Duro Club		RECREATION	460	C10060	60205193301	
5194		Lake Tanglewood, Inc.	52.5	AGRICULTURE - IRRIGATION RECREATION	4897	C10040	60205194301, 60205194302, 60205194303	Lake Tanglewood, supplemented with Amarillo RF.
5194		CURRIE, JOHN J JR Lake Tanglewood, Inc.	37.5	AGRICULTURE - IRRIGATION				
5195		SCHAEFFER, STANLEY D	400	AGRICULTURE - IRRIGATION	900	C10020	60205195301	
5312	5312	City Of Canyon		AGRICULTURE - IRRIGATION		C10200	10205312301	
5312	5312	City Of Canyon		RECREATION	23			
5022	5022	GOLDEN SPREAD COUNCIL, INC. #562 OF THE BOY SCOUTS OF AMERICA	2	MUNICIPAL/DOMESTIC RECREATION		C10050	10205022301	
5845	5845	Spring Lake Owners Association, Inc.		RECREATION	136	584531	10205845301	
5196		HEARD, DAN J	124	AGRICULTURE - IRRIGATION	19	C10100	60205196301	Moved from PDCH

Table D-7
Water Rights Directly Upstream of Prairie Dog Town Fork, Red River near Childress
PD_CH
D10000

Water Right Number /Permit	Application	Owner	Diversion Amount (ac-ft/yr)	Use	Storage Amount (ac-ft)	Control Point	Water Right ID	Notes
5199		JOHNSON, CONE JOHNSON, EDITH JOHNSON, RANDY JOHNSON, ROXIE WYNN	66.3	AGRICULTURE - IRRIGATION	173	D10260	60205199301	
5199		JOHNSON, CONE	89.03	AGRICULTURE - IRRIGATION	90	D10250	60205199302	
5199		JOHNSON, ROXIE WYNN	107.67	AGRICULTURE - IRRIGATION		D10260	60205199301	
5222		Lakewood Farms		RECREATION	712	D10010	60205222301	
5221		City of Childress	397	MUNICIPAL/DOMESTIC	7820	D10030	60205221301	Baylor Cr Lake
5221		City of Childress		RECREATION	4725	D10020	60205221302	
5213		Briscoe Ranch, Inc.		RECREATION	661	D10110	60205213301	
5220		Texas Parks And Wildlife Department	20	MUNICIPAL/DOMESTIC RECREATION	1184	D10050	60205220301, 60205220302	
5210		SIMPSON, J E JR	60	AGRICULTURE - IRRIGATION		D10270	60205210301	
5215		Briscoe Ranch, Inc.		RECREATION	554	D10090	60205215301	
5217		Briscoe Ranch, Inc.		RECREATION	260	D10070	60205217301	
5214		Briscoe Ranch, Inc.		RECREATION	1057	D10100	60205214301	
5211		Mackenzie Municipal Water Authority	4000	MUNICIPAL/DOMESTIC RECREATION	46450	D10130	60205211301, 60205211304, 60205211303	Mackenzie Reservoir
5211		Mackenzie Municipal Water Authority	1200	INDUSTRIAL		D10130	60205211302, 60205211305	
5216		BYARS, J B CLARK, GAYLON		RECREATION	535	D10080	60205216301	
3958	4277	Linda Kay Roeder FOY YOUNG		RECREATION	1036	D10040	10204277301	
5212		Roy Mayfield Estate	107	AGRICULTURE - IRRIGATION		D10120	60205212301	
5219		HAWKINS, DORA HAWKINS, WILLIAM ELBERT		RECREATION		D10060	60205219301	
5200		BRIGGS, JIMMIE BRIGGS, PHILLIP BRIGGS, R L	12	AGRICULTURE - IRRIGATION		D10240	60205200301	
5206		CROUSE, GLADYS DAWSON DAWSON, EDWIN L DAWSON, R B JR	24	AGRICULTURE - IRRIGATION		D10160	60205206301	
5207		SIMPSON, J E JR	8	AGRICULTURE - IRRIGATION		D10150	60205207301	
5198		BB-ARMS L.P.	1.49	AGRICULTURE - IRRIGATION		D10170	60205198302	
5198		Adams Family Trust	55.51	AGRICULTURE - IRRIGATION		D10180	60205198301	
5202		ROUSSEAU, PAUL	61	AGRICULTURE - IRRIGATION	65	D10230	60205202301	
5203		Debra Ann Barnes Mikeal Barnes	26	AGRICULTURE - IRRIGATION	26	D10220	60205203301	
5204		Dera Beth Rousseau Leland Paul Rousseau	34	AGRICULTURE - IRRIGATION	197	D10210	60205204301	
5205		City Of Tulia		RECREATION	500	D10200	60205205301	
5208		Larry Nelson Farms, Inc.	55	AGRICULTURE - IRRIGATION		D10290	60205208301	
5209		DIAMOND B FEEDYARD, LLC	284	AGRICULTURE - IRRIGATION	294.5	D10280	60205209301	
5197		ESTATE OF WILLIAM MASON BIVENS	42.72	AGRICULTURE - IRRIGATION	120	D10190	60205197302, 60205197303, 60205197304, 60205197305	
5197		ROYAL PLASTICS, INC.	7.09	AGRICULTURE - IRRIGATION	5			
5197		Chamisa CAES at Tulia LLC	99.19	AGRICULTURE - IRRIGATION	5			

Table D-8
Water Rights Directly Upstream of Groesbeck Creek at SH6 near Quanah
GC_QN
E10000

Water Right Number /Permit	Application	Owner	Diversion Amount (ac-ft/yr)	Use	Storage Amount (ac-ft)	Control Point	Water Right ID	Notes
5224		City of Childress		RECREATION	47	E10050	60205224301	
5225		HUNTER BROTHERS	96	AGRICULTURE - IRRIGATION		E10040	60205225001	
5227		HOWARD, F W JR HOWARD, VIRGINIA K	100	AGRICULTURE - IRRIGATION		E10010	60205227001	
5228		HOWARD, B J HOWARD, JOAN	63	AGRICULTURE - IRRIGATION		E10020	60205228001	
5226		HOWARD, F W JR HOWARD, VIRGINIA K	60	AGRICULTURE - IRRIGATION		E10030	60205226001	

Table D-9
Water Rights Directly Upstream of Pease River near Childress
PR_CS
F10000

Water Right Number /Permit	Application	Owner	Diversion Amount (ac-ft/yr)	Use	Storage Amount (ac-ft)	Control Point	Water Right ID	Notes
5111		ISBELL, DOROTHY ISBELL, JOHN E JR	22.7	AGRICULTURE - IRRIGATION		F10020	60205111001	
5316	5316	City of Childress Fires and Caperton FIRES, CHESTER ANN GONZALES, RITA JONES, ROBERT E JONES, ROBERT E LARRY KEYS, J C		RECREATION	279	F10100	10205316301	
5110		LAURA K. BAKER	40	AGRICULTURE - IRRIGATION		F10050	60205110302	
5110		LAURA K. BAKER		RECREATION	104	F10050	60205110301	
5102		Dm Cogdell Jr Land Co Ltd	50	DOMESTIC AND LIVESTOCK RECREATION	1092	F10170	60205102302	
5102		Dm Cogdell Jr Land Co Ltd	33	AGRICULTURE - IRRIGATION		F10170	60205102301	
5101		CHAMALES, LINDA LORRAINE CHAMALES, MICHAEL HOOD	20.77	AGRICULTURE - IRRIGATION RECREATION		F10190	60205101301	
5101		MCWILLIAMS, BOB	16.23	AGRICULTURE - IRRIGATION RECREATION		F10190	60205101302	
5107		LANE, BILLY J LANE, OLGA J	101	AGRICULTURE - IRRIGATION		F10110	60205107301	
5108		TRIPP, P W		RECREATION		F10120	60205108301	
5099		Gary Raymond Powell Lorna Powell	116.8	AGRICULTURE - IRRIGATION	718	F10220	60205099301	
5100		RICHARDSON, FLOYD J	19	AGRICULTURE - IRRIGATION		F10200	60205100301	
5100		RICHARDSON, FLOYD J		RECREATION	179	F10200		
5103		MAYFIELD, J A	28	AGRICULTURE - IRRIGATION	235	F10150	60205103301	
5104		PIGG, BILLY M PIGG, KAROL LYNN	17	AGRICULTURE - IRRIGATION		F10160	60205104301	
5105		MERRELL, DEXTER L MERRELL, JOSEPHINE M	30	AGRICULTURE - IRRIGATION RECREATION		F10140	60205105301	
5106		Rodney D. Carpenter Ronald H. Carpenter R & R Cattle Company	80	AGRICULTURE - IRRIGATION		F10130	60205106301	
5266		FLETCHER, DARLEEN FLETCHER, J N JR		RECREATION		F10060	60205266301	
5267		Cottonwood Lake LLC	100	AGRICULTURE - IRRIGATION		F10210	60205267301	
5267		Cottonwood Lake LLC		RECREATION	132	F10210	60205267302	
4127	4391	Roaring Springs Ranch Club, Inc.	36	RECREATION	51	F10070,	10204391301	
12729	12729	BRISCOE, DOLPH III		AGRICULTURE - WILDLIFE MANAGEMENT DOMESTIC AND LIVESTOCK	1600			Not in WAM3

Table D-10
Water Rights Directly Upstream of Pease River near Vernon
PR_VN
G10000

Water Right Number /Permit	Application	Owner	Diversion Amount (ac-ft/yr)	Use	Storage Amount (ac-ft)	Control Point	Water Right ID	Notes
5112		Texas Parks And Wildlife Department	45	AGRICULTURE - IRRIGATION RECREATION	455	G10010, G10020	60205112301, 60205112302, 60205112303	

Table D-11
Water Rights Directly Upstream of Red River near Burkburnett
RR_BB
H10000

Water Right Number /Permit	Application	Owner	Diversion Amount (ac-ft/yr)	Use	Storage Amount (ac-ft)	Control Point	Water Right ID	Notes
5223		STARKEY, SHARON CAMPBELL	38.5	AGRICULTURE - IRRIGATION		H10160	60205223001	Buck Creek (Subbasin 1)
5113		BELEW, JAMES DAVID BELEW, JOELYN	150	AGRICULTURE - IRRIGATION		H10040, H10050	60205113302	
5230		FLEET EQUIPMENT LEASING, L.P.	3000	INDUSTRIAL		H10110, H10130	60205230302, 60205230304	
5230		FLEET EQUIPMENT LEASING, L.P.	16	AGRICULTURE - IRRIGATION		H10110, H10130	60205230301	
5230		FLEET EQUIPMENT LEASING, L.P.		RECREATION	4136.7	H10110,	60205230303	
5238		CHAPMAN, JOYCE VIRGINIA	160	AGRICULTURE - IRRIGATION	189	H10090	60205238301	
5229		BUTTS, MARVIN T	30	AGRICULTURE - IRRIGATION	4	H10140	60205229301	
5231		Garland Welborn	41	AGRICULTURE - IRRIGATION		H10120	60205231001	

Table D-12
Water Rights Directly Upstream of North Wichita River near Paducah
NW_PD
I10000

Water Right Number /Permit	Application	Owner	Diversion Amount (ac-ft/yr)	Use	Storage Amount (ac-ft)	Control Point	Water Right ID	Notes
5114		Max Bowen	35	AGRICULTURE - IRRIGATION		I10010	60205114301	
5114		JETER, ROSE MARIE The Maylock Trust		AGRICULTURE - IRRIGATION	140	I10010	60205114302	

Table D-13
Water Rights Directly Upstream of North Wichita River near Truscott
NW_TS
J10000

Water Right Number /Permit	Application	Owner	Diversion Amount (ac-ft/yr)	Use	Storage Amount (ac-ft)	Control Point	Water Right ID	Notes
5116		Red River Authority of Texas		OTHER	107000	J10010	60205116301	
5115		Red River Authority of Texas	3050	OTHER		J10020	60205115001	
12618	12618	Red River Authority of Texas	7240	WATER QUALITY	22	12618	10212618001	

Table D-14
Water Rights Directly Upstream of South Wichita River below Low Flow Dam near Guthrie
SW_GR
K10000

Water Right Number /Permit	Application	Owner	Diversion Amount (ac-ft/yr)	Use	Storage Amount (ac-ft)	Control Point	Water Right ID	Notes
5117		Red River Authority of Texas	5010	OTHER		K10010	60205117001, 60205117002	

Table D-15
Water Rights Directly Upstream of South Wichita River near Benjamin
SW_BJ
L10000

Water Right Number /Permit	Application	Owner	Diversion Amount (ac-ft/yr)	Use	Storage Amount (ac-ft)	Control Point	Water Right ID	Notes
5118		Red River Authority of Texas	3770	OTHER		L10010	60205118001	

Table D-16
Water Rights Directly Upstream of Wichita River near Seymour
WR_SM
M10000

Water Right Number /Permit	Application	Owner	Diversion Amount (ac-ft/yr)	Use	Storage Amount (ac-ft)	Control Point	Water Right ID	Notes
5120		LITTLEPAGE REAL ESTATE, L.P.	85	AGRICULTURE - IRRIGATION	172	M10010	60205120301	
5119		Lynda Beck Dentler	20	AGRICULTURE - IRRIGATION		M10020	60205119301	

Table D-17
Water Rights Directly Upstream of Wichita River near Mabelle
WR_MB
N10000

Water Right Number /Permit	Application	Owner	Diversion Amount (ac-ft/yr)	Use	Storage Amount (ac-ft)	Control Point	Water Right ID	Notes
5123		City of Wichita Falls Wichita County Water Improvement District 2			318000	N10020	60205123305	Lake Kemp. Diversions are from Lk Diversion downstream
5121		ALLSUP, LONNIE D	2153	AGRICULTURE - IRRIGATION	404	N10060, N10050	60205121301, 60205121101'	

Table D-18
Water Rights Directly Upstream of Beaver Creek near Electra
BC_ET
O10000

Water Right Number /Permit	Application	Owner	Diversion Amount (ac-ft/yr)	Use	Storage Amount (ac-ft)	Control Point	Water Right ID	Notes
5124		W.T. Waggoner Estate, Inc.	3075	AGRICULTURE - IRRIGATION	9616	O10040, O10090	60205124101, 60205124401, 60205124301, 60205124102, 60205124302	Santa Rosa Lake
5125		W.T. Waggoner Estate, Inc.	675	AGRICULTURE - IRRIGATION	60	O10070, O10080	60205125002, 60205125301, 60205125302	
5126		W.T. Waggoner Estate, Inc.	60	AGRICULTURE - STOCKRAISING MUNICIPAL/DOMESTIC	60	O10050	60205126301, 60205126302	
5127		W.T. Waggoner Estate, Inc.	55	MUNICIPAL/DOMESTIC	85	O10040	60205127301, 60205127003, 60205127303, 60205127305	
5127		W.T. Waggoner Estate, Inc.	30	MINING		O10060, O10050	60205127001, 60205127302, 60205127304	
5128		City of Electra	800	MUNICIPAL/DOMESTIC		O10030	60205128001	
5128		City of Electra	600	MUNICIPAL/DOMESTIC	8730	O10020	60205128301, 60205128302	Lake Electra
5393	5393	James Brockriede	450	AGRICULTURE - IRRIGATION	10	O10010	10205393301, 10205393302	

Table D-19
Water Rights Directly Upstream of Wichita River at Wichita Falls
WR_WF
P10000

Water Right Number /Permit	Application	Owner	Diversion Amount (ac-ft/yr)	Use	Storage Amount (ac-ft)	Control Point	Water Right ID	Notes
5123		City of Wichita Falls Wichita County Water Improvement District 2	25150	MUNICIPAL/DOMESTIC RECREATION	318000			
5123		City of Wichita Falls Wichita County Water Improvement District 2	40000	INDUSTRIAL	45000	P10110	60205123308	
5123		City of Wichita Falls Wichita County Water Improvement District 2	2000	MINING		P10110	60205123310	
5123		City of Wichita Falls Wichita County Water Improvement District 2	120000	AGRICULTURE - IRRIGATION INDUSTRIAL MUNICIPAL/DOMESTIC		P10110, P10080	60205123304, 60205123307, 60205123312	
5130		PAUL A. COOK	40	AGRICULTURE - IRRIGATION		P10070	60205130002	
5131		City of Iowa Park	840	MUNICIPAL/DOMESTIC RECREATION	15400	P10060	60205131301, 60205131302	N Fk Buffalo Cr
5132		City of Iowa Park	500	MUNICIPAL/DOMESTIC	2565	P10050	60205132301	
5133		City of Iowa Park	300	MUNICIPAL/DOMESTIC RECREATION	292	P10030	60205133301, 60205133302	
4290	4610	Tanglewood Lake Homeowners Association	30	RECREATION	48	P10020, P10010	10204610301	
5530	5530	BURTON, JOE L	32	AGRICULTURE - IRRIGATION		P10040	10205530001	
4099	4433	Laurie Murray	300	AGRICULTURE - IRRIGATION		P10100	10204433101	
5129		Michael L. Mitchell	148	AGRICULTURE - IRRIGATION		P10090	60205129002	
5129		Michael L. Mitchell	256	AGRICULTURE - IRRIGATION		P10090	60205129001	
12670	12670	Vitro Flat Glass LLC		RECREATION	4			Not in Run3

Table D-20
Water Rights Directly Upstream of Wichita River near Charlie
WR_CH
Q10000

Water Right Number /Permit	Application	Owner	Diversion Amount (ac-ft/yr)	Use	Storage Amount (ac-ft)	Control Point	Water Right ID	Notes
5122		City of Wichita Falls	7289	MUNICIPAL/DOMESTIC		Q10060, Q10080	60205122002, 60205122301	Lake Wichita. Diversions downstream
5122		City of Wichita Falls	672	AGRICULTURE - IRRIGATION		Q10060, Q10080	60205122003, 60205122302	
5122		City of Wichita Falls		RECREATION	13050	Q10080	60205122303	
5123		City of Wichita Falls Wichita County Water Improvement District 2	5850	RECREATION		Q10080	60205123306	Kemp/Diversion at Lake Wichita
5134		ESTATE OF DELBERT WADE YANDELL	125	AGRICULTURE - IRRIGATION		Q10100	60205134102	
5135		Charlotte Spragins	357	AGRICULTURE - IRRIGATION		Q10020	60205135003	
5136		Joe L. Hale Estate	200	AGRICULTURE - IRRIGATION		Q10010	60205136002	
4283	4602	Midwestern State University		RECREATION	180	Q10050	10204602301	
4283	4602	Midwestern State University	20	AGRICULTURE - IRRIGATION				
5152	5152	City of Wichita Falls	2352	RECREATION	181	Q10040	10205152001	
5078	5078	City of Holliday	8	AGRICULTURE - IRRIGATION		10450	10205078601	Effluent from City of Holliday, disconnected CP

Table D-21
Water Rights Directly Upstream of Little Wichita River near Archer City
LW_AC
R10000

Water Right Number /Permit	Application	Owner	Diversion Amount (ac-ft/yr)	Use	Storage Amount (ac-ft)	Control Point	Water Right ID	Notes
5144		City of Wichita Falls	40000	AGRICULTURE - IRRIGATION INDUSTRIAL MINING MUNICIPAL/DOMESTIC RECREATION	105000	R10010	60205144303, 60205144301, 60205144302	Lake Kickapoo
5145		City of Megargel	70	MUNICIPAL/DOMESTIC	223	R10060	60205145301	
5146		City of Olney	1260	MUNICIPAL/DOMESTIC	6650	R10080, R10070	60205146301, 60205146302, 60205146303	Olney/Cooper
5146		City of Olney	35	AGRICULTURE - IRRIGATION		R10080	60205146304	
5147		GRAHAM, JOY	30	AGRICULTURE - IRRIGATION		R10050	60205147301	
5148		City of Archer City	506	MUNICIPAL/DOMESTIC	1	R10040	60205148001	
5148		City of Archer City	300	MUNICIPAL/DOMESTIC	396	R10030	60205148301	

Table D-22
Water Rights Directly Upstream of Little Wichita River above Henrietta
LW_HN
S10000

Water Right Number /Permit	Application	Owner	Diversion Amount (ac-ft/yr)	Use	Storage Amount (ac-ft)	Control Point	Water Right ID	Notes
5150		City of Wichita Falls	45000	AGRICULTURE - IRRIGATION INDUSTRIAL MINING MUNICIPAL/DOMESTIC RECREATION	228000	S10030	60205150301, 60205150302	Lake Arrowhead
5150		City of Wichita Falls	22302	AGRICULTURE - IRRIGATION INDUSTRIAL MINING MUNICIPAL/DOMESTIC RECREATION		S10030	60205150301, 60205150302	
5151		A. R. E. Property Owners Association, Inc.		RECREATION	44	S10010	60205151301	
5149		Windthorst Water Supply Corporation	100	MUNICIPAL/DOMESTIC	690	S10050	60205149301, 60205149302	
5149		MFW Development		RECREATION	394	S10050	60205149301, 60205149302	
5904	5904	HANDLOS, DORIS Lawrence Handlos	150	AGRICULTURE - IRRIGATION AGRICULTURE - STOCKRAISING	151	590431, S10030	10205904301, 60205150307	

Table D-23
Water Rights Directly Upstream of Red River near Terral
RR_TR
U10000

Water Right Number /Permit	Application	Owner	Diversion Amount (ac-ft/yr)	Use	Storage Amount (ac-ft)	Control Point	Water Right ID	Notes
3965	4268	Elizabeth E. Horwood EstateTrust Elizabeth E. Horwood Stanley K. Horwood	3600	AGRICULTURE - IRRIGATION		U10020	10204268101	
5140		BROWN, MARY C BROWN, WILLIAM L	270	AGRICULTURE - IRRIGATION		U10130	60205140001	
5140		BROWN, MARY C BROWN, WILLIAM L		INDUSTRIAL	4	U10130	60205140001	
5138		Anthony F. Lucido	55	AGRICULTURE - IRRIGATION RECREATION	40	U10170	60205138401	
5109		HANNA, A D	200	AGRICULTURE - IRRIGATION	370	U10030	60205109301	
5137		City of Petrolia	225	MUNICIPAL/DOMESTIC	402	U10160, U10150	60205137301, 60205137302	
5139		BROWN, WILLIAM L	30	AGRICULTURE - IRRIGATION		U10140	60205139003	
5141		City of Byers		RECREATION	116	U10120	60205141301	
5142		Saranna Land, LLC	200	AGRICULTURE - IRRIGATION	261	U10100, U10090, U10080	60205142301, 60205142302, 60205142303	
5153		Clay County Country Club, Inc.	50	AGRICULTURE - IRRIGATION RECREATION		U10040	60205153301, 60205153302	
5154		SHAW, JOHNNIE H	15	AGRICULTURE - IRRIGATION	10	U10050	60205154301	
5143		Jim Parker Farms, LLC	200	AGRICULTURE - IRRIGATION		U10070	60205143001	
5152		CITY OF HENRIETTA	1559	MUNICIPAL/DOMESTIC	743	U10060	60205152401, 60205152301, 60205152302, 60205152303	
5152		CITY OF HENRIETTA	1	MINING		U10060	60205152304, 60205152305	

Table D-24
Water Rights Directly Upstream of Red River near Gainesville
RR_GA
V10000

Water Right Number /Permit	Application	Owner	Diversion Amount (ac-ft/yr)	Use	Storage Amount (ac-ft)	Control Point	Water Right ID	Notes
4875		CLARICE BENTON WHITESIDE ESTATE	133	AGRICULTURE - IRRIGATION	24	V10130, V10140	60204875301, 60204875302	
4875		CLARICE BENTON WHITESIDE ESTATE	9	MINING		V10130, V10140	60204875303, 60204875304	
4874		STUDDARD, HERSCHEL H	30	AGRICULTURE - IRRIGATION		V10150	60204874301	
4879		City of Nocona		AGRICULTURE - IRRIGATION MUNICIPAL/DOMESTIC RECREATION	25,389	V10070	60204879301	Lake Nocona
4879		City of Nocona	100	AGRICULTURE - IRRIGATION		V10070	60204879303	
4879		City of Nocona	80	RECREATION		V10070	60204879304	
4879		City of Nocona	435.04	MUNICIPAL/DOMESTIC		V10070	60204879302	
4879		City of Nocona	644.96	MUNICIPAL/DOMESTIC		V10070	60204879301	
5434	5434	Doyle Hess Land, L.L.C. DOYLE HESS	10	AGRICULTURE - IRRIGATION RECREATION	12	V10030	10205434301, 10205434302	
5434	5434	Doyle Hess Land, L.L.C. DOYLE HESS	13	AGRICULTURE - IRRIGATION		V10040	10205434303, 10205434304	
5605	5605	NUNNELEY, JERRY D	100	AGRICULTURE - IRRIGATION		V10090	10205605001	
5605	5605	NUNNELEY, JERRY D		AGRICULTURE - IRRIGATION	388	V10100	10205605301	
4876		City of Bowie	1,286	MUNICIPAL/DOMESTIC	800	V10120	60204876301	
4881		City of Gainesville	4,500	MUNICIPAL/DOMESTIC	23,210	V10020	60204881301	Moss Lake
4881		City of Gainesville	3,240	MUNICIPAL/DOMESTIC		V10020	60204881302	
4878		NOCONA HILLS OWNERS ASSOCIATION		RECREATION	246	V10080	60204878301	
4880		Katy Rod and Gun Club		RECREATION	400	V10050	60204880301	
4882		Gainesville Country Club		RECREATION		V10010	60204882301	
3834	4142	ADDISON, JERRY G ADDISON, LINDA J Jerry G Addison Et Ux		RECREATION	706	V10110	10204142301	

Table D-25
Water Rights Directly Upstream of Red River near Colbert
RR_CB
W10000

Water Right Number /Permit	Application	Owner	Diversion Amount (ac-ft/yr)	Use	Storage Amount (ac-ft)	Control Point	Water Right ID	Notes
4895		U.S. Department of the Interior Fish and Wildlife Service	208	AGRICULTURE - IRRIGATION AGRICULTURE - WILDLIFE MANAGEMENT RECREATION	94	W10170	60204895001, 60204895003	
4895		U.S. Department of the Interior Fish and Wildlife Service		AGRICULTURE - WILDLIFE MANAGEMENT RECREATION	22	W10190	60204895302	
4895		U.S. Department of the Interior Fish and Wildlife Service		AGRICULTURE - WILDLIFE MANAGEMENT RECREATION	10	W10100	60204895303	
4895		U.S. Department of the Interior Fish and Wildlife Service		AGRICULTURE - WILDLIFE MANAGEMENT	174	W10180, W10170, W10150, W10140, W10160	60204895306, 60204895307, 60204895308, 60204895309, 60204895310	
4895		U.S. Department of the Interior Fish and Wildlife Service		AGRICULTURE - WILDLIFE MANAGEMENT RECREATION	8	W10110, W10120	60204895304, 60204895305	
4895		U.S. Department of the Interior Fish and Wildlife Service		AGRICULTURE - WILDLIFE MANAGEMENT RECREATION	34	W10210	60204895301	
4896		ARNETT, BOBBY G ARNETT, MARY	21	AGRICULTURE - IRRIGATION	50	W10090	60204896301	
4884		Simmental Ranch Corporation	72	AGRICULTURE - IRRIGATION	32	W10320, W10340, W10350, W10360, W10330	60204884302, 60204884303, 60204884304, 60204884301, 60204884305, 60204884306, 60204884307	
4886		RICH, J B	33	AGRICULTURE - IRRIGATION	85	W10290	60204886301	
4883		DAVIS, ROBERT E JR	80	AGRICULTURE - AQUACULTURE AGRICULTURE - IRRIGATION	87	W10320	60204883401, 60204883301	
4889		JOHNSON, RAYMOND W	30	AGRICULTURE - IRRIGATION		W10270	60204889301	
4890		SKINNER FARM, L.L.C.	20	AGRICULTURE - IRRIGATION	20	W10260	60204890301	
4891		HUFF, J P	130	AGRICULTURE - IRRIGATION		W10250	60204891301	
4892		Niobe D Noland Independent Executrix	20	AGRICULTURE - IRRIGATION		W10240	60204892301	
4893		HEDGES, CARROLL	7.454	AGRICULTURE - IRRIGATION		W10230, W10220	60204893301, 60204893302	
4893		SMALLEY, CHARLES F Jewel D Smalley	16.546	AGRICULTURE - IRRIGATION		W10230, W10220	60204893301, 60204893302	
4898		Red River Authority of Texas	1650	MUNICIPAL/DOMESTIC	2722000	W10060	60204898302, 60204898312	Lake Texoma
4898		Red River Authority of Texas	250	AGRICULTURE - IRRIGATION	24	W10060	60204898301, 60204898311	
4898		Red River Authority of Texas	100	MINING		W10060	60204898303, 60204898313	
4902		Denison Country Club	120	AGRICULTURE - IRRIGATION RECREATION	234	W10030	60204902301, 60204902302	
5113	5113	Grayson County Junior College District	125	AGRICULTURE - IRRIGATION RECREATION	4	W10130	10205113301	
4901		City of Denison	5280	MUNICIPAL/DOMESTIC	5400	W10020	60204901301	Lake Randall
4901		City of Denison	24400	MUNICIPAL/DOMESTIC RECREATION		W10020, W10060	60204901303	
4899		Red River Authority of Texas	250	MUNICIPAL/DOMESTIC	450	W10060	60204899301, 60204899311	Lake Texoma
5003	5003	North Texas Municipal Water District	84000	MUNICIPAL/DOMESTIC	75000	W10060	10205003301, 10205003311	Lake Texoma
5003	5003	North Texas Municipal Water District	113000	INDUSTRIAL MUNICIPAL/DOMESTIC	100000	W10060	10205003002, 10205003012	
4903		J-M Manufacturing Company, Inc.	4000	INDUSTRIAL		W10010	60204903001	
4900		Luminant Generation Company LLC		INDUSTRIAL	16400	W10060	60204900302, 60204900303, 60204900305, 60204900306	Backup for Valley Lake from Texoma. Valley moved to RRAC

Water Right Number /Permit	Application	Owner	Diversion Amount (ac-ft/yr)	Use	Storage Amount (ac-ft)	Control Point	Water Right ID	Notes
4887		First Interstate Bank of Dallas Trustee		AGRICULTURE - AQUACULTURE INDUSTRIAL		W10280	60204887301	
4885		BUSH, DALE A		AGRICULTURE - AQUACULTURE RECREATION		W10310, W10300	60204885301, 60204885303, 60204885302, 60204885304	
4894		Sherman Country Club		RECREATION	270	W10200	60204894301	
4301	2006	Greater Texoma Utility Authority	1700	AGRICULTURE - IRRIGATION INDUSTRIAL MUNICIPAL/DOMESTIC	1515	W10060	10202006303, 10202006313	Lake Texoma
4301	2006	Greater Texoma Utility Authority	56500	AGRICULTURE - IRRIGATION INDUSTRIAL MUNICIPAL/DOMESTIC		W10060	10202006302, 10202006312	
4301	2006	Greater Texoma Utility Authority	25000	INDUSTRIAL MUNICIPAL/DOMESTIC		W10060	10202006301, 10202006311	

Table D-26
Water Rights Directly Upstream of Bois d'Arc Lake
BODARC
BODARC

Water Right Number /Permit	Application	Owner	Diversion Amount (ac-ft/yr)	Use	Storage Amount (ac-ft)	Control Point	Water Right ID	Notes
4921		KEAHEY, FLORENCE KEAHEY, PAUL	109	AGRICULTURE - IRRIGATION		X10340, X10330	60204921001, 60204921002	
4922		RILEY, RAY JOE TAYLOR, MARY	362	AGRICULTURE - IRRIGATION		X10320, X10310	60204922301, 60204922001	
4926		Joe Riley Ray, Trustee RILEY, JO EDDY RILEY, JODIE ED RILEY, KEVIN RAY	520	AGRICULTURE - IRRIGATION		X10260	60204926101	
4923		Canoe Lake Development Corp.	20	MUNICIPAL/DOMESTIC RECREATION	245.00	X10290	60204923301, 60204923302	
12151	12151	North Texas Municipal Water District	175,000	Multiple	367,609	BODARC	P12151_1	Bois d'Arc Lake
4925		North Texas Municipal Water District	5,340	MUNICIPAL/DOMESTIC		X10270	60204925301	Lake Bonham
4925		City of Bonham		MUNICIPAL/DOMESTIC RECREATION	13000	X10270	60204925302	
4924		Texas Parks And Wildlife Department		RECREATION	470	X10300	60204924301	
4927		City of Honey Grove		RECREATION	324	X10250	60204927301	

Table D-27
Water Rights Directly Upstream of Red River near Arthur City
RR_AC
X10000

Water Right Number /Permit	Application	Owner	Diversion Amount (ac-ft/yr)	Use	Storage Amount (ac-ft)	Control Point	Water Right ID	Notes
4907		George Robert Whitmire	200.00	AGRICULTURE - IRRIGATION		X10530	60204907001	
4904		The Munson Realty Company	482.00	AGRICULTURE - IRRIGATION		X10630	60204904003	
4917		OLD, ROBERT E JR	219.00	AGRICULTURE - IRRIGATION		X10430	60204917003	
4918		WHITE, J W	266.40	AGRICULTURE - IRRIGATION		X10410	60204918101	
4918		KELTON, RAYMOND R	93.60	AGRICULTURE - IRRIGATION		X10410	60204918101	
4930		Joey Cale Sanders	48.00	AGRICULTURE - IRRIGATION		X10160	60204930001	
4919		WHITE, D W	20.00	AGRICULTURE - IRRIGATION		X10400	60204919001	
4914		WALKER, HAROLD H	30.00	AGRICULTURE - IRRIGATION	1.00	X10470	60204914301	
4908		Dale Bordelon	135.00	AGRICULTURE - IRRIGATION		X10520	60204908001	
4916		RAMSEY, CHARLES R	65.17	AGRICULTURE - IRRIGATION		X10450	60204916001	
4916		WEST, CAROL A WEST, HARVEY A	94.83	AGRICULTURE - IRRIGATION		X10450	60204916001	
4913		ELLIOTT, WILLIAM DAVID	30.00	AGRICULTURE - IRRIGATION		X10480	60204913002	
4936		WADE, FINAS D	20.00	AGRICULTURE - IRRIGATION		X10060	60204936301	
4931		RANNALS, D	10.00	AGRICULTURE - IRRIGATION		X10175	60204931301	
4935		Jennifer Foster Kevin Clark Foster	100.00	AGRICULTURE - IRRIGATION	56.00	X10090	60204935401, 60204935301, 60204935302	
4937		HAYS, MARJORIE L HURD, DAVID L HURD, MARVIN L	30.00	AGRICULTURE - IRRIGATION		X10050	60204937301	
4912		John and Mark Family Limited Partnership	987.00	AGRICULTURE - IRRIGATION MINING		X10500	60204912301	
4912		Lattimore Materials Company, L.P.	140.00	MINING		X10510	60204912401	
4912		John and Mark Family Limited Partnership		MINING RECREATION	20.25	X10510	60204912402	
4912		John and Mark Family Limited Partnership		AGRICULTURE RECREATION	44.00	X10500	60204912302	
4911		The Woodlawn Country Club	30.00	AGRICULTURE - IRRIGATION RECREATION		X10570, X10580	60204911302, 60204911301	
4920		North Texas Municipal Water District	33.20	AGRICULTURE - IRRIGATION		X10200	60204920001	
4920		North Texas Municipal Water District	606.80	AGRICULTURE - IRRIGATION		X10200	60204920001	
4933		SIMMONS, J WELDON	110.00	AGRICULTURE - IRRIGATION	110.00	X10130	60204933401, 60204933301	
4934		ROBINSON, A G	50.00	AGRICULTURE - IRRIGATION		X10110, X10100	60204934301, 60204934302	
4938		2017 PG Investments, LLC	220.00	AGRICULTURE - IRRIGATION	9.00	X10070	60204938401, 60204938301	
4939		STEPHENS, LAURA STEPHENS, Q B	78.00	AGRICULTURE - IRRIGATION		X10040, X10030	60204939301, 60204939302	
5129	5129	KIRKPATRICK, VERMELLE	92.00	AGRICULTURE - IRRIGATION	140.00	X10080	60204929301	
5276	5276	VULGAMORE FAMILY FARMS, LLC	2535.00	AGRICULTURE - IRRIGATION		X10140	10205276001	
5630	5630	NTEX DEVELOPMENT, LLC	797.40	AGRICULTURE - IRRIGATION		X10610	10205630001	
4928		LMBH Partners, LLC		AGRICULTURE - IRRIGATION AGRICULTURE - WILDLIFE MANAGEMENT DOMESTIC AND LIVESTOCK RECREATION	455.00	X10240, 492801	60204928301, 60204928001, 60204928002	
4928		LMBH Partners, LLC	340.00	AGRICULTURE - WILDLIFE MANAGEMENT DOMESTIC AND LIVESTOCK RECREATION		X10240, 492801	60204928301, 60204928001, 60204928002	

Water Right Number /Permit	Application	Owner	Diversion Amount (ac-ft/yr)	Use	Storage Amount (ac-ft)	Control Point	Water Right ID	Notes
4928		LMBH Partners, LLC	200.00	AGRICULTURE - IRRIGATION		X10240, 492801	60204928301, 60204928001, 60204928002	
4940		City of Paris	25000.00	MUNICIPAL/DOMESTIC	124500.00	X10010	60204940301, 60204940302	Pat Mayse
4940		City of Paris	36610.00	AGRICULTURE - IRRIGATION INDUSTRIAL INDUSTRIAL - POWER GENERATION		X10010	60204940303, 60204940304	
4915		Us Forest Service		RECREATION	350.00	X10460	60204915301	
4915		Us Forest Service		RECREATION	8000.00	X10230	60204915302	Coffee Mill
4915		Us Forest Service		RECREATION	3900.00	X10220	60204915303	Crockett (probably)
4905		City of Sherman		RECREATION	251	X10550	60204905301	
4929		Fin and Feather Club of Fannin County		RECREATION		X10210	60204929301	
4910		City of Denison		RECREATION	684	X10590	60204910301	
4906		City of Sherman		RECREATION	350	X10540	60204906301	
4909		Grayson County		RECREATION	370	X10600	60204909301	
3888	4209	HICKS, RONALD B	200	AGRICULTURE - IRRIGATION		X10170, X10180	10204209001, 10204209002	
3924	4228	Crawford Family Farm, LP	179	AGRICULTURE - IRRIGATION		X10190	10204228002	
3924	4228	John Thomas Graves Linda Crawford Graves	141	AGRICULTURE - IRRIGATION		X10190	10204228002	
4044	4371	North Texas Municipal Water District	3728	AGRICULTURE - IRRIGATION INSTREAM		X10350	10204371101	
4044	4371	North Texas Municipal Water District	455	AGRICULTURE - IRRIGATION INSTREAM		X10360	10204371001	
4044	4371	North Texas Municipal Water District	45	AGRICULTURE - IRRIGATION INSTREAM		X10360	10204371001	
4059	4397	MCCRAW, MAYFIELD WOODARD, KATIE	360	AGRICULTURE - IRRIGATION		X10420	10204397002	
4294	4582	R & L Foster Construction Co., Inc.	103	AGRICULTURE - IRRIGATION	103	X10120	10204582301	
4033	4363	Lamar Ranch, Ltd.	677.565	AGRICULTURE - IRRIGATION		X10390	10204363003	
4033	4363	Lamar Ranch, Ltd.	701.865	AGRICULTURE - IRRIGATION		X10390	10204363003	
4033	4363	Lamar Ranch, Ltd.	341.142	AGRICULTURE - IRRIGATION		X10390	10204363002	
4033	4363	North Texas Municipal Water District	1816.428	AGRICULTURE - IRRIGATION INSTREAM		X10390	10204363002	
4033	4363	North Texas Municipal Water District	3698.704	AGRICULTURE - IRRIGATION INSTREAM		X10380	10204363004	
4900		Luminant Generation Company LLC	10000	AGRICULTURE INDUSTRIAL INDUSTRIAL - POWER GENERATION MUNICIPAL/DOMESTIC RECREATION WATER QUALITY	15000	X10490	60204900301	Valley Lake
4900		Luminant Generation Company LLC	6400	AGRICULTURE INDUSTRIAL MUNICIPAL/DOMESTIC RECREATION		X10490	60204900304	

Table D-28
Water Rights Directly Upstream of Red River at Index
RR_IN
Y10000

Water Right Number /Permit	Application	Owner	Diversion Amount (ac-ft/yr)	Use	Storage Amount (ac-ft)	Control Point	Water Right ID	Notes
4955		ASCKCC, LLP	380.74	AGRICULTURE - IRRIGATION	276.00	Y10070	60204955301	
4954		Three Sides Land Co., LTD WARD, JOHN WAYNE	1875.00	AGRICULTURE - IRRIGATION		Y10080	60204954002	
4945		DARNELL, JAMES C DARNELL, TERRI	110.00	AGRICULTURE - IRRIGATION		Y10280	60204945001	
4953		Anne R. Farris	85.28	AGRICULTURE - IRRIGATION		Y10110	60204953002	
4953		LINDA WIDNER MERRITT ROBERT P. MERRITT	664.72	AGRICULTURE - IRRIGATION		Y10110	60204953002	
4952		Carol A. Lenth Eldon K. Lenth	90.83	AGRICULTURE - IRRIGATION		Y10140	60204952002	
4952		Chris Sylte Jason Sylte	9.18	AGRICULTURE - IRRIGATION		Y10140	60204952002	
4952		Chris Sylte Jason Sylte		AGRICULTURE - IRRIGATION		Y10140	60204952002	
4952		Chris Sylte Jason Sylte	650.00	AGRICULTURE - IRRIGATION		Not in Run3	Not in Run3	
4949		NICHOLS, GLEN E NICHOLS, SUE	550.00	AGRICULTURE - IRRIGATION		Y10170	60204949002	
4957		HART, JOE CONNER	66.70	AGRICULTURE - IRRIGATION		Y10050	60204957003	
4956		Cranfill Dairy Farms, Inc.	81.00	AGRICULTURE - IRRIGATION		Y10060	60204956001	
4941		BUTTS, DOROTHY E BUTTS, NOLAN TAYLOR, CHARLES C Cynthia Taylor	2970.00	AGRICULTURE - IRRIGATION	750.00	Y10370, Y10360	60204941002, 60204941301, 60204941003, 60204941302	
4947		WAGGONER, JAMES E	225.00	AGRICULTURE - IRRIGATION		Y10210	60204947301	
4948		WAGGONER, JAMES E	150.00	AGRICULTURE - IRRIGATION		Y10200	60204948301	
4950		WAGGONER, JAMES E	102.00	AGRICULTURE - IRRIGATION		Y10160	60204950301	
4959		Texarkana Riverbend Plantation, Inc.	2556.00	AGRICULTURE - IRRIGATION		Y10020	60204959002	
4946		Atlee M Kohl Trustee Dianne M Siebens Trustee	1000.00	AGRICULTURE - IRRIGATION		Y10220	60204946002	
4946		Atlee M Kohl Trustee Dianne M Siebens Trustee	250.00	AGRICULTURE - IRRIGATION		Y10190	60204946004	
4946		Atlee M Kohl Trustee Dianne M Siebens Trustee	350.00	AGRICULTURE - IRRIGATION		Y10180	60204946003	
4951		Clarksville Country Club	40.00	AGRICULTURE - IRRIGATION RECREATION	300.00	Y10150	60204951301, 60204951302	
5119	5119	City of Paris	300	AGRICULTURE - IRRIGATION		Not in Run3	Not in Run3	
5233	5233	Leroy H. Kautz Viola E. Kautz	162.53	AGRICULTURE - IRRIGATION		Y10260	10205233002	
5233	5233	L. Harvey & Son-Kautz Farm, LLC	2537.47	AGRICULTURE - IRRIGATION		Y10260	10205233002	
5233	5233	Michael & Sons Ranch, LLC	650.00	AGRICULTURE - IRRIGATION		Y10240	10205233005	
5233	5233	Michael & Sons Ranch, LLC	250.00	AGRICULTURE - IRRIGATION		Y10250	10205233004	
5558	5558	Paris Golf and Country Club, Inc.	85.00	AGRICULTURE - IRRIGATION	9.42	Y10290	10205558401	
5632	5632	KNOSBY, JOHN Twilia Knosby Farms, Inc.	800.00	AGRICULTURE - IRRIGATION		Y10040, Y10130	10205632001	
4943		City of Paris	12000.00	MUNICIPAL/DOMESTIC	11011.00	Y10330	60204943301	Lake Crook
4958		Cranfill Dairy Farms, Inc.	7.00	INDUSTRIAL	20.00	Y10030	60204958301	
4942		City of Paris		RECREATION	3581.00	Y10340	60204942301	
4944		Texas Military Department		RECREATION	214.00	Y10320	60204944301	
4058	4392	J C DODSON	144.1667	AGRICULTURE - IRRIGATION		Y10120	10204392002	
4058	4392	B J SHIPPING COMPANY INC	10.338	AGRICULTURE - IRRIGATION		Y10120	10204392002	

Water Right Number /Permit	Application	Owner	Diversion Amount (ac-ft/yr)	Use	Storage Amount (ac-ft)	Control Point	Water Right ID	Notes
4058	4392	Theodorus J. DeBoer Wanda DeBoer	170.1779	AGRICULTURE - IRRIGATION		Y10120	10204392002	
4058	4392	Jeffery V. Brown	24.1255	AGRICULTURE - IRRIGATION		Y10120	10204392002	
4058	4392	William Travis Byrd Jr.	133.0533	AGRICULTURE - IRRIGATION		Y10120	10204392002	
4058	4392	Charlotte Mitchell Roger Mitchell	11.9598	AGRICULTURE - IRRIGATION		Y10120	10204392002	
4058	4392	Edwin A. Okerson Kimiko Okerson	19.884	AGRICULTURE - IRRIGATION		Y10120	10204392002	
4058	4392	Bobby L. Howell Lisa Howell	6.2948	AGRICULTURE - IRRIGATION		Y10120	10204392002	
5149	5149	MFW Development		RECREATION	393.7	Y10270	10205149301	

Table D-29
Water Rights Downstream of Red River at Index

Water Right Number /Permit	Application	Owner	Diversion Amount (ac-ft/yr)	Use	Storage Amount (ac-ft)	Control Point	Water Right ID	Notes
4961		City of Texarkana	1920	MUNICIPAL/DOMESTIC	2792	10380	60204961301	
4961		City of Texarkana	300	AGRICULTURE - IRRIGATION		10380	60204961302	
3976	4317	Ethel E. Musselman Joint Trustee John A Musselman Joint Trustee MUSSELMAN, ETHEL E	18	AGRICULTURE - IRRIGATION		10390	10204317001	
4962		LEDWELL, STEVE	80	AGRICULTURE - IRRIGATION		10400	60204962001	
4960		WOMMACK, W H JR	160	AGRICULTURE - IRRIGATION	180	10420	60204960301	

Appendix E
Flow Naturalization on Texas/Oklahoma Border

1 Introduction

This appendix describes the method used to split flows at six primary control points located on the main stem of the Red River on Texas-Oklahoma border. These control points are shown in **Figure 1**. In the Red River WAM, only the Texas portion of the flows at these gages are naturalized. This is because historical water use records from Oklahoma are not generally available. The split between Texas and Oklahoma flows is based on drainage area ratios applied to historical flow data, prior to naturalization. If flows were naturalized first, using only the Texas corrections, then those corrections would be reduced by the fraction of the flows in Oklahoma, potentially underestimating the difference between historical and naturalized flows.

1.1 Flow Data Sources

Table 1 is a summary of the drainage areas for the five gages. Total, noncontributing and contributing drainage areas are the values currently reported by the USGS[i]. Total Incremental drainage area was calculated as the difference in the USGS drainage areas for adjacent gages. Incremental Oklahoma drainage area was calculated by a) delineating the Oklahoma portion of the total incremental drainage area between the downstream gage and upstream gages on the main stem and tributaries and b) adding that drainage area to the USGS drainage areas of tributaries entering the reach on the Oklahoma side. Since many of these Oklahoma tributaries have headwaters in the Texas Panhandle, some of the Oklahoma drainage areas are actually in Texas. For the purposes of this approach, the Texas headwaters are considered part of the Oklahoma drainage areas. (This is probably different than the approach used for these drainage areas in the original Red naturalization, which may have excluded these drainage areas.) The Texas incremental drainage areas are simply the difference between the total incremental drainage area and the Oklahoma incremental drainage area.

Table 2 is a list of stream gages and other sources of flow used in determining the split between Texas and Oklahoma. The six main stem gages are indicated by bold text. Other naturalized flow gages are associated with the Gage ID used in the naturalization. USGS flow data were obtained from the USGS website and from published sources if not available on the website. U.S. Army Corps of Engineers (USACE) flow data were obtained from the Tulsa District website[ii] or directly from the Tulsa District through a Freedom of Information Act request.

Figure 1: Red River Main Stem Gages

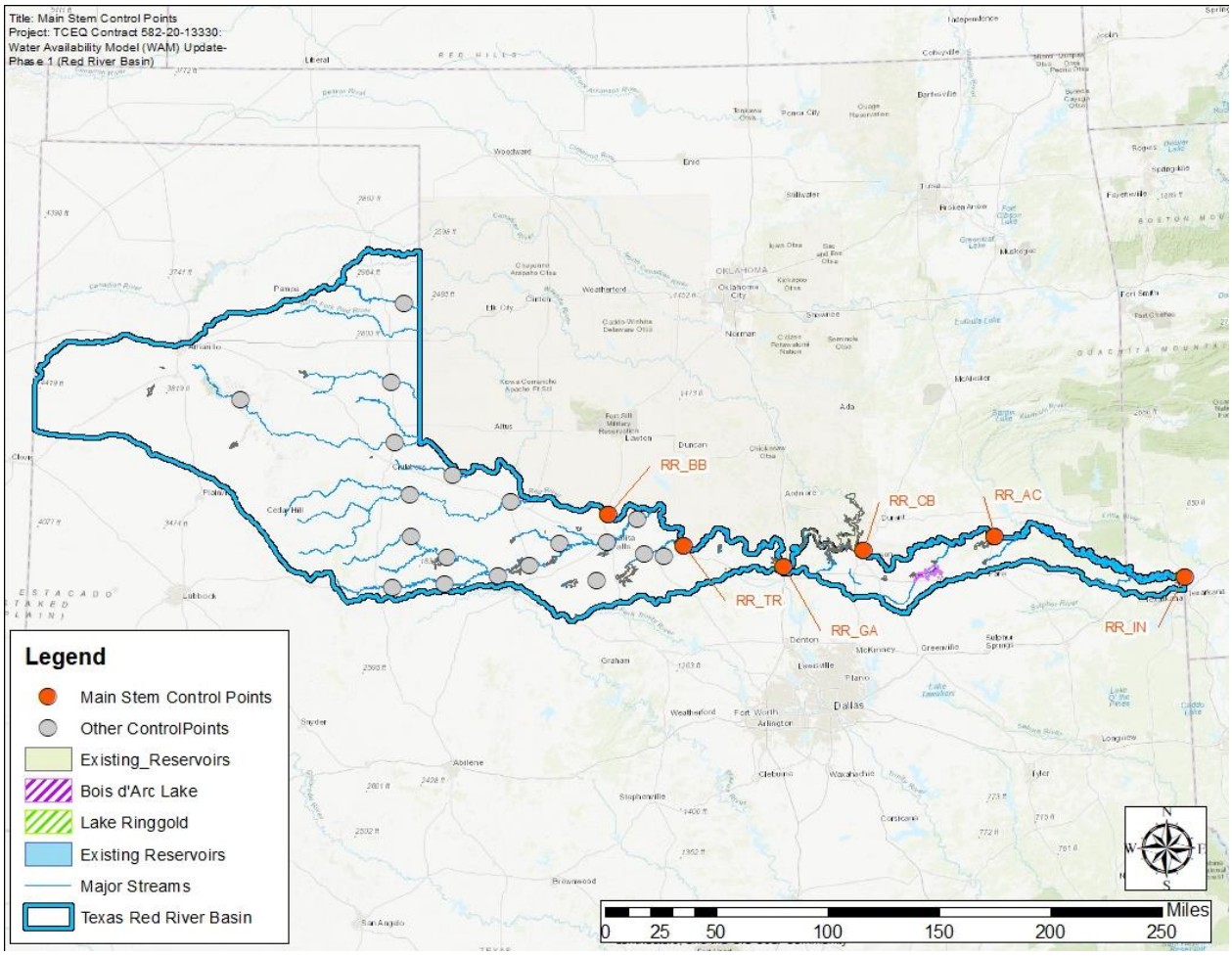


Table 1: Main Stem Gages and Drainage Areas
(Values in square miles)

Gage ID	USGS Total	USGS Non-Contributing	USGS Contributing	Total Incremental	Incremental Oklahoma [a]	Incremental Texas	Total Oklahoma	Total Texas
RR_BB	20,570	5,936	14,634	-	7,277	7,357	7,277	7,357
RR_TR	28,723	5,936	22,787	8,153	2,998	5,155	10,275	12,512
RR_GA [b]	30,728	7,903	22,825	2,005	1,310	695	11,585	13,207
RR_CB [b]	39,777	8,002	31,775	9,049	8,490	559	20,075	13,766
RR_AC	44,445	7,928	36,517	4,668	3,579	1,089	23,654	14,855
RR_IN [c]	48,000	5,900	42,100	3,555	2,528	1,027	26,182	15,882

a Incremental Oklahoma includes portions of the drainage area that are in the Texas Panhandle.
b TDWR Report 244 has 5,936 square miles noncontributing for RR_GA and RR_CB.
c TDWR Report 244 has a total drainage area of 48,030 square miles and a noncontributing drainage area of 5,936 square miles for RR_IN.

Table 2: Relevant Stream Gages and Other Sources of Flows

Gage ID	USGS Gage Name	USGS Number	Total Drainage Area (Sq. Mi.)	Non-Contributing Drainage Area (Sq. Mi.)	Contributing Drainage Area (Sq. Mi.)
PD_CH	Prairie Dog Town Fork, Red River near Childress, TX	07299540	7,725	4,767	2,958
-	Red River near Quanah, TX	07299570	8,321	4,769	3,552
GC_QN	Groesbeck Creek at SH6 near Quanah, TX	07299670	303	0	303
-	Salt Fork Red River at Mangum, OK	07300500	1,454	135	1,319
-	Salt Fork Red River near Elmer, OK	07301110	1,983	135	1,848
-	North Fork Red River near Headrick, OK	07305000	4,560	579	3,581
-	North Fork Red River near Tipton, OK	07307028	5,010	579	4,431
PR_CS	Pease River near Childress, TX	07307800	2,754	559	2,195
PR_VN	Pease River near Vernon, TX	07308200	3,488	559	2,929
RR_BB	**Red River near Burkburnett**	**07308500**	**20,570**	**5,936**	**14,634**
-	Deep Red Creek near Randlett, OK	07311500	604	0	604
-	West Cache Creek near Cookietown, OK	07311240	454	0	454
-	East Cache Creek near Walters, OK	07311000	694	0	694
WR_WF	Wichita River at Wichita Falls, TX	07312500	3,140	0	3,140
WR_CH	Wichita River near Charlie, TX	07312700	3,439	0	3,439
LW_AC	Little Wichita River near Archer City, TX	07314500	481	0	481
LW_HN	Little Wichita River above Henrietta, TX	07314900	1,037	0	1,037
EF_HN	East Fork Little Wichita River near Henrietta, TX	07315200	178	0	178
-	USACE Waurika Lake Outflows, OK	-	562	0	562
-	Cow Creek at Waurika, OK	07313600	193	0	193
RR_TR	**Red River near Terral**	**07315500**	**28,723**	**5,936**	**22,787**
-	Mud Creek near Courtney, OK	07315700	574	0	574
RR_GA	**Red River near Gainesville**	**07316000**	**30,728**	**7,903**	**22,825**
-	Mineral Creek near Sadler, TX	07316200	26	0	26
-	Washita River near Dickson, OK	07331000	7,172	12	7,160
-	Pennington Creek at Capital Ave at Tishomingo, OK	07331383	94.3	0	94.3
RR_CB	**Red River at Denison Dam (was RR nr Colbert)**	**07331600**	**39,642**	**7,928**	**31,714**
	Red River nr Colbert	**07332000**	**39,777**	**8,002**	**31,775**
	USACE Lake Texoma outflows	**-**	**39,642**	**7,928**	**31,714**
-	Blue River near Blue, OK	07332500	477	0	477
-	Bois d'Arc Creek near Randolph, TX	07332600	72	0	72
-	Bois d'Arc Creek at FM 1396, TX	07332620	270	0	270
-	Bois d'Arc Creek at FM 409, TX	07332622	370	0	370
-	Muddy Boggy Creek near Farris, OK	07334000	1,089	0	1,089
-	Muddy Boggy Creek near Unger, OK	07335300	2,262	0	2,262

Gage ID	USGS Gage Name	USGS Number	Total Drainage Area (Sq. Mi.)	Non-Contributing Drainage Area (Sq. Mi.)	Contributing Drainage Area (Sq. Mi.)
-	Sanders Creek near Chicota, TX	07335400	175	0	175
-	USACE Pat Mayse Outflows	-	175	0	175
RR_AC	**Red River at Arthur City, TX**	**07335500**	**44,445**	**7,928**	**36,517**
-	Little Pine Creek nr Kanawha, TX	07336750	75.4	0	75.4
-	Kiamichi River near Belzoni, OK	07336500	1,423	0	1,423
-	USACE Lake Hugo Outflows, OK	-	1,709	0	1,709
-	Pecan Bayou near Clarksville, TX	07336800	100	0	100
RR_IN	**Red River at Index, AR**	**07337000**	**48,000**	**5,900**	**42,100**

1.2 Contributing and Noncontributing Drainage Areas

In **Table 1**, notice that the noncontributing drainage area for the Red River at Index (RR_IN) is less than the noncontributing drainage area of the Red River at Arthur City (RR_AC), located upstream. This does not make sense – the noncontributing drainage areas should either be the same or the downstream gage should be larger. Looking at the *Report 244: Streamflow and Reservoir-Content Records in Texas Compilation Report January 1889 through December 1975*[iii], which was developed from USGS records in the late 1970s, all six of these stream gages have the same noncontributing drainage area – 5,936 square miles. The increase in noncontributing drainage areas for some of these gages appears to be a more recent development. Also, looking at the stream gages in **Table 2**, the only gages with noncontributing drainage areas are the six main stem gages, the tributaries upstream of the Red River near Burkburnett (RR_BB), and the Washita River near Dickson, which flows into Lake Texoma upstream of the Red River near Colbert (RR_CB). Most of the noncontributing drainage areas are probably in the High Plains area of the Texas Panhandle, so it makes sense to assume that almost all of the noncontributing portion of the drainage areas is upstream of RR_BB. Therefore the difference between both the total drainage areas and the contributing drainage areas should be the same, or at least very close. Since we do not know whether the 5,936 square miles associated with RR_BB, RR_TR and RR_IN is more accurate than the around 7,900 square miles associated with the other gages, the incremental drainage areas were determined by subtracting the upstream total drainage area from the downstream total drainage area, rather than using the contributing drainage areas. The total drainage areas were assumed to be correct. Since the noncontributing drainage area is assumed to be constant, this should give the correct incremental drainage area.

2 Methodology for Splitting Flows

There are insufficient historical data from Oklahoma to fully naturalize the flows for the six main stem gages along the Texas-Oklahoma border (**Table 1**), so only the Texas portion of the flow is naturalized. Rather than partially naturalizing the total flows and then dividing the flows between the two states, the division of

flows between Texas and Oklahoma is performed on historical incremental flows. This prevents the corrections made to the Texas portion of the flows being under-estimated.

2.1 General Method

The general method for splitting the flows is as follows:

1. Subtract flows at main stem upstream gage (*RR_up)* from flows at downstream main stem gage (*RR_down*) to calculate main stem incremental flows for the Red River (*RR_incr*).

   RR_incr = RR_down – RR_up

2. Subtract Texas tributary (*TX_trib*) and Oklahoma tributary (*OK_trib*) gage flows to determine reach incremental flows (*Reach_incr*).

   Reach_incr = RR_incr – TX_trib – OK_trib

3. Determine drainage area of reach (*DA_Reach*) by subtracting upstream gage drainage areas (*DA_RR_up, DA_TX_trib, DA_OK_trib*) from downstream drainage area (*DA RR down*).

   DA_Reach = DA_RR_down – DA_RR_up – DA_TX_trib – DA_OK_trib

4. Determine the portion of the reach incremental flow drainage area that is in Oklahoma (*DA_incr_OK*). This may vary over time depending as historical flow for Oklahoma tributary gages come and go.

5. Multiply the reach incremental flows (*Reach_incr*) by the ratio of the Oklahoma incremental drainage area (*DA_incr_OK*) and the reach incremental flow drainage area (*DA_Reach)* to determine the incremental Oklahoma flows (*OK_reach_incr*).

   *OK_reach_incr = Reach_incr * DA_incr_OK/DA_Reach*

6. Add the incremental Oklahoma flows (*OK_reach_incr*) to the gaged Oklahoma tributary flows (*OK_trib)* to determine the portion of the main stem incremental flows that originate in Oklahoma (*OK_RR_incr*). These flows will be input in the FAD files for Run 8.

   OK_RR_incr = OK_reach_incr + OK_trib

7. Subtract the incremental flows that originate in Oklahoma (*OK_RR_incr*) from the main stem incremental flows (*RR_incr*) to determine the main stem incremental flows that originate in Texas (*TX_RR_incr*).

   TX_RR_incr = RR_incr – OK_RR_incr

8. Add the Texas main stem incremental flows (*TX_RR_incr)* to the Texas flows from the upstream reach (*TX_RR_up*) to get total Texas flows at downstream gage (*TX_RR_tot*).

   TX_RR_tot = TX_RR_incr + TX_RR_up

This general method applies to three gages: Red River near Gainesville (RR_GA), Red River at Arthur City (RR_AC) and Red River at Index (RR_IN). The other three gages are similar but require some modifications, which are described in the sections on these gages.

All reaches include a check to make sure that the Texas main stem incremental flows (*TX_RR_incr*) are less than the total main stem incremental flows (*RR_incr*). This situation typically occurs when the *RR_incr* calculation is negative. A negative RR_incr occurs when the sum of the upstream gaged flows is greater than the downstream gage (see **Chapter 6** in the main report for a discussion of why this can occur). The individual reach descriptions include the methodology for dealing with this situation.

Reaches upstream of the Red River near Colbert (RR_CB) also include a check to verify that the total Texas flows (*TX_RR_tot*) are less than the gaged flows (*RR_down*). Downstream of Lake Texoma, the flows have been semi-naturalized since they include corrections for Lake Texoma. In some cases the Texoma corrections make the total Texas flows more than the gaged flows. This is expected to occur when Lake Texoma impounded a large volume of flows that was not immediately passed downstream historically or stored water evaporated, thus never making it downstream.

Whenever possible contributing drainage areas are used for calculations. However, for some gages the noncontributing portion of the drainage areas are not consistent. See discussion on drainage areas in **Section 1.2** of this appendix.

The following sections discuss the procedures, gaged flows, and drainage areas used to determine the division of historical flow between Oklahoma and Texas for the six gages in **Table 1**. The Texas component of these flows is then used as the historical gage flows for developing naturalized flows using the procedures described in **Chapter 3** of the main report. It should be noted that the order of the following sections are arranged from the simplest to the most complicated rather than from upstream to downstream.

2.2 Red River near Terral (RR_TR) to Red River near Gainesville (RR_GA)

Splitting of flows between Texas and Oklahoma for the reach between the Red River near Terral, Oklahoma (RR_TR) and the Red River near Gainesville, Texas (RR_GA) follows the general methodology outlined in **Section 2.1**. **Table 3** shows the drainage areas as tributary gages come and go through the 1948 to 2018 period of record. **Figure 2** shows the drainage area of the smallest incremental area between RR_GA and upstream gages over the study period (1948-2018).

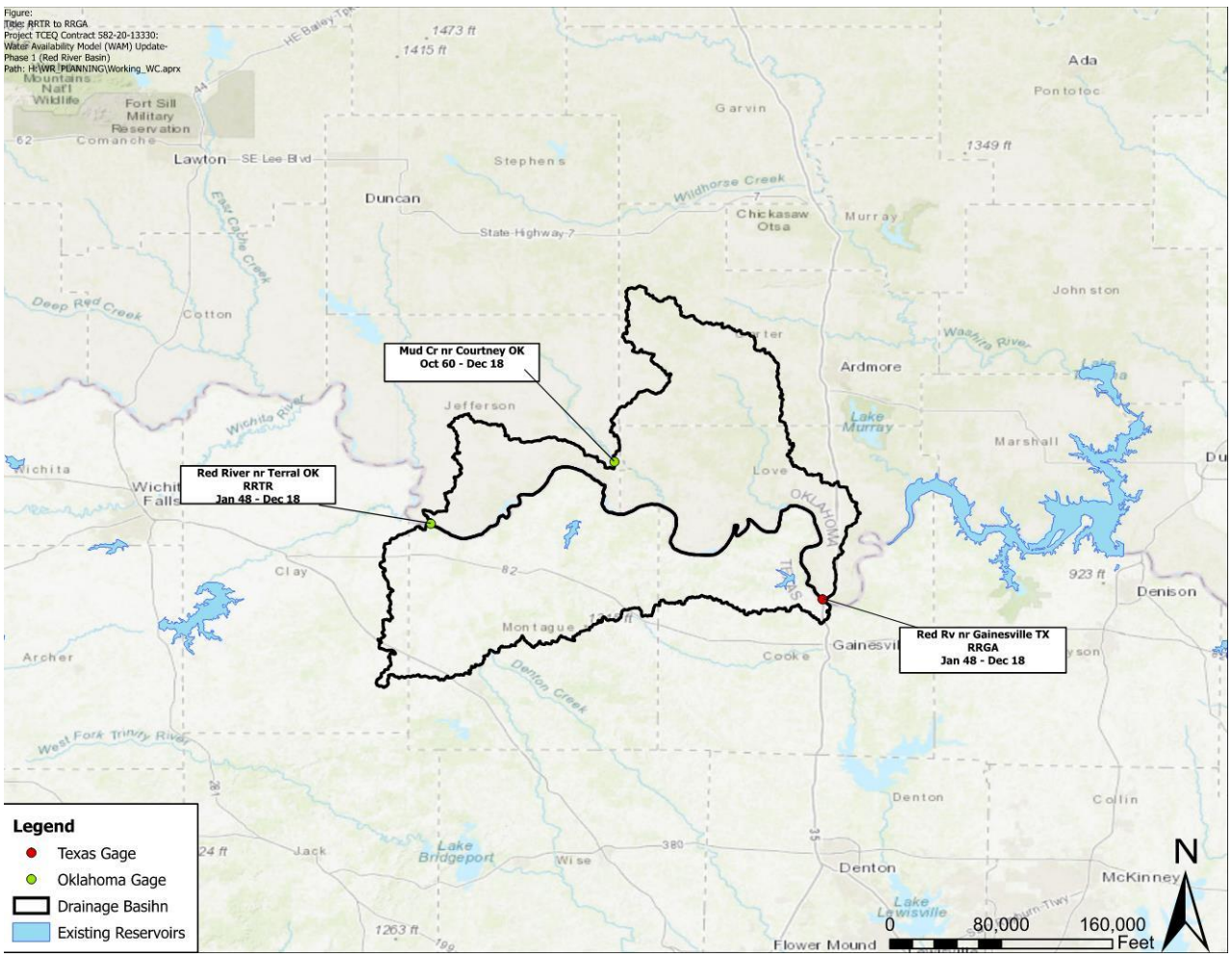
RRGA has a total drainage area of 30,728 square miles. The upstream gage is RR_TR with a total drainage area of 28,723 square miles. The RR_TR to RR_GA reach has only one tributary gage - Mud Creek near Courtney. Prior to the Courtney gage, the incremental drainage area was 2,005 square miles, of which 1,310 square miles of which are in Oklahoma. The Courtney gage came online in October 1960 and has a drainage area of 574 square miles, which results in a total incremental drainage area of 1,431 square miles, of which 736 square miles are in Oklahoma.

Table 3: Red River near Terral (RR_TR) to Red River near Gainesville (RR_GA)

Start Date	End Date	Red River nr Terral OK	Mud Cr nr Courtney OK	Red River nr Gainesville TX	OK Tributary Drainage Area (mi2)	TX Tributary Drainage Area (mi2)	Upstream Gaged Drainage Area (mi2)	Incremental Drainage Area (mi2)	Incremental OK Drainage Area (mi2)	OK Drainage Area Ratio
Jan-48	Sep-60	X		X	0	0	28,723	2,005	1,310	0.6534
Oct-60	Dec-18	X	X	X	574	0	29,297	1,431	736	0.5143

Using total drainage area

Figure 2: RR_TR to RR_GA



In the calculations, there are a few months where the total Texas flows (*TX_RR_tot*) are greater than the historical gage flows. This occurs when the flow at RR_GA is less than the flow at RR_TR, causing a negative incremental flow. There is also one month where the total Texas flow is less than zero. This occurs when

the historical negative incremental flow is greater than the upstream Texas flow (*TX_RR_up*). In these cases, the total Texas flow is set equal to the historical flow at RR_GA multiplied by the ratio of the upstream RR_TR Texas flows (*TX_RR_up*) to the historical RR_TR flows (*RR_up*). This retains the same proportion of Texas flows in relation to Oklahoma flows that occurred upstream.

2.3 Red River near Colbert (RR_CB) to Red River at Arthur City (RR_AC)

Splitting of flows between Texas and Oklahoma for the reach between the Red River near Colbert/Denison Dam (RR_CB) and the Red River at Arthur City (RR_AC) also follows the general methodology outlined in **Section 2.1**. **Table 4** shows the drainage areas as tributary gages come and go through the 1948 to 2018 period of record. **Figure 3** shows the drainage area of the smallest incremental area between RR_AC and upstream gages over the study period.

RR_AC has a total drainage area of 44,445 square miles. The upstream gage is RR_CB with a total drainage area of 39,777 square miles. A stream gage was located at the RR_CB location until October 1961, when it was moved upstream to its current location just below Denison Dam (Lake Texoma). The current location has a drainage area of 39,720 square miles. More information can be found in **Section 2.7** below. The calculation of incremental flow takes into account the change in the location of the upstream gage.

Major Oklahoma tributaries include the Blue River and Muddy Boggy Creek. The Blue River near Blue Oklahoma gage has flows for the entire 1948 to 2018 period of record and a drainage area of 477 square miles. The Muddy Boggy near Farris Oklahoma gage also has a full period of record and a drainage area of 1,089 square miles. Beginning in September 1982, the gage on Muddy Boggy Creek near Unger Oklahoma, located downstream of the Farris gage, began reporting flows closer to the Red River. The Unger gage has a drainage area of 2,262 square miles. The Unger flows are used to calculate incremental flows when available.

Major Texas tributaries include Bois d'Arc Creek and Sanders Creek. Bois d'Arc Reservoir, which is currently under construction, Lake Bonham, and Coffee Mill Lake are located on Bois d'Arc Creek. The Bois d'Arc Creek near Randolph gage reported flows from December 1962 to September 1985 from 72 square miles of drainage area. In July 2006, the FM 1396 gage began reporting for 270 square miles of drainage area, and in July 2009, the FM 409 gage began reporting for 370 square miles of drainage area. The FM 409 gage will continue in operation when Bois d'Arc Lake has been completed. The FM 1396 gage has been discontinued (after 2018) and its location will be inundated by Bois d'Arc Lake. Lake Pat Mayse is on Sanders Creek. The Sanders Creek near Chicota gage began reporting Lake Pat Mayse outflows in October 1967 around the time Lake Pat Mayse was completed. The Chicota gage was discontinued in September 1986. From October 1986 through 2018 reported outflows for Lake Pat Mayse from the USACE were used.

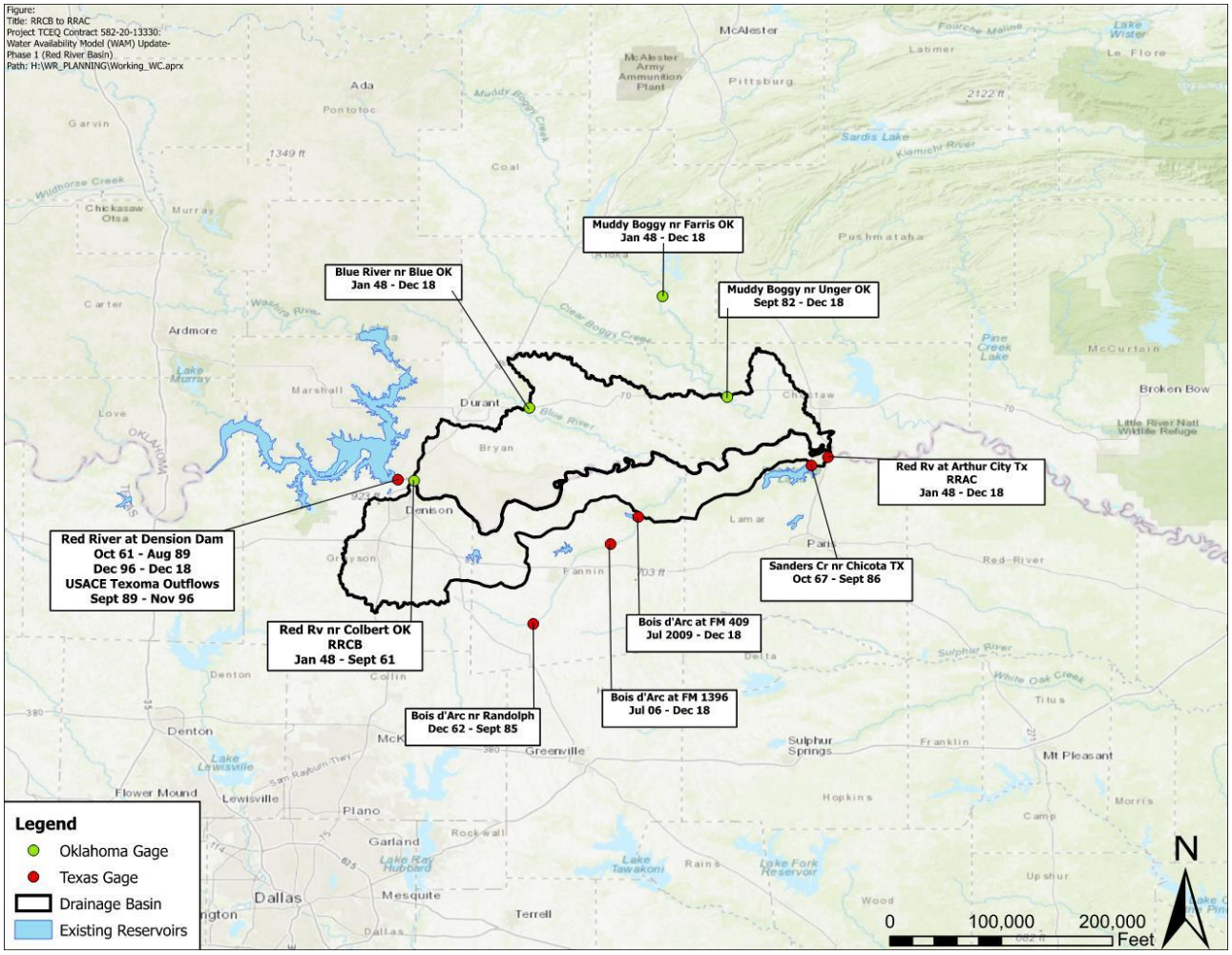
RR_AC includes a check to verify that the Texas incremental flows (*TX_RR_incr*) are less than the total incremental flows (*RR_incr*). For some months, it is possible that the total Texas flow (*TX_RR_tot*) is greater than the total measured RR_AC flow (*RR_down*), since the flow is partially naturalized and includes some flows that were historically impounded in Lake Texoma.

Table 4: Red River nr Colbert/Denison Dam (RR_CB) to Red River at Arthur City (RR_AC)

Start Date	End Date	Red River nr Colbert OK	Red River at Denison Dam TX	Blue R nr Blue OK	Bois d'Arc Cr nr Randolph TX	Bois d'Arc Cr at FM1396 TX	Bois d'Arc Cr at FM409 TX	Muddy Boggy nr Farris OK	Muddy Boggy nr Unger OK	Sanders Cr nr Chicota TX	Pat Mayse Outflows TX	Red River at Arthur City TX	OK Tributary Drainage Area (mi2)	TX Tributary Drainage Area (mi2)	Upstream Gaged Drainage Area	Incremental Drainage Area (mi2)	Incremental OK Drainage Area (mi2)	OK Drainage Area Ratio
Jan-48	Sep-61	X		X				X				X	1,566	0	41,343	3,102	1,984	0.6396
Oct-61	Nov-62		X	X				X				X	1,566	0	41,286	3,159	2,013	0.6372
Dec-62	Sep-67		X	X	X			X				X	1,566	72	41,358	3,087	2,013	0.6521
Oct-67	Aug-82		X	X	X			X		X		X	1,566	247	41,533	2,912	2,013	0.6913
Sep-82	Sep-85		X	X	X				X	X		X	2,739	247	42,706	1,739	840	0.4830
Oct-85	Sep-86		X	X					X	X		X	2,739	175	42,634	1,811	840	0.4638
Oct-86	Jun-06		X	X					X		X	X	2,739	175	42,634	1,811	840	0.4638
Jul-06	Jun-09		X	X		X			X		X	X	2,739	445	42,904	1,541	840	0.5451
Jul-09	Dec-18		X	X			X		X		X	X	2,739	545	43,004	1,441	840	0.5829

Using total drainage area

Figure 3: RR_CB to RR_AC



2.4 Red River at Arthur City (RR_AC) to Red River at Index (RR_IN)

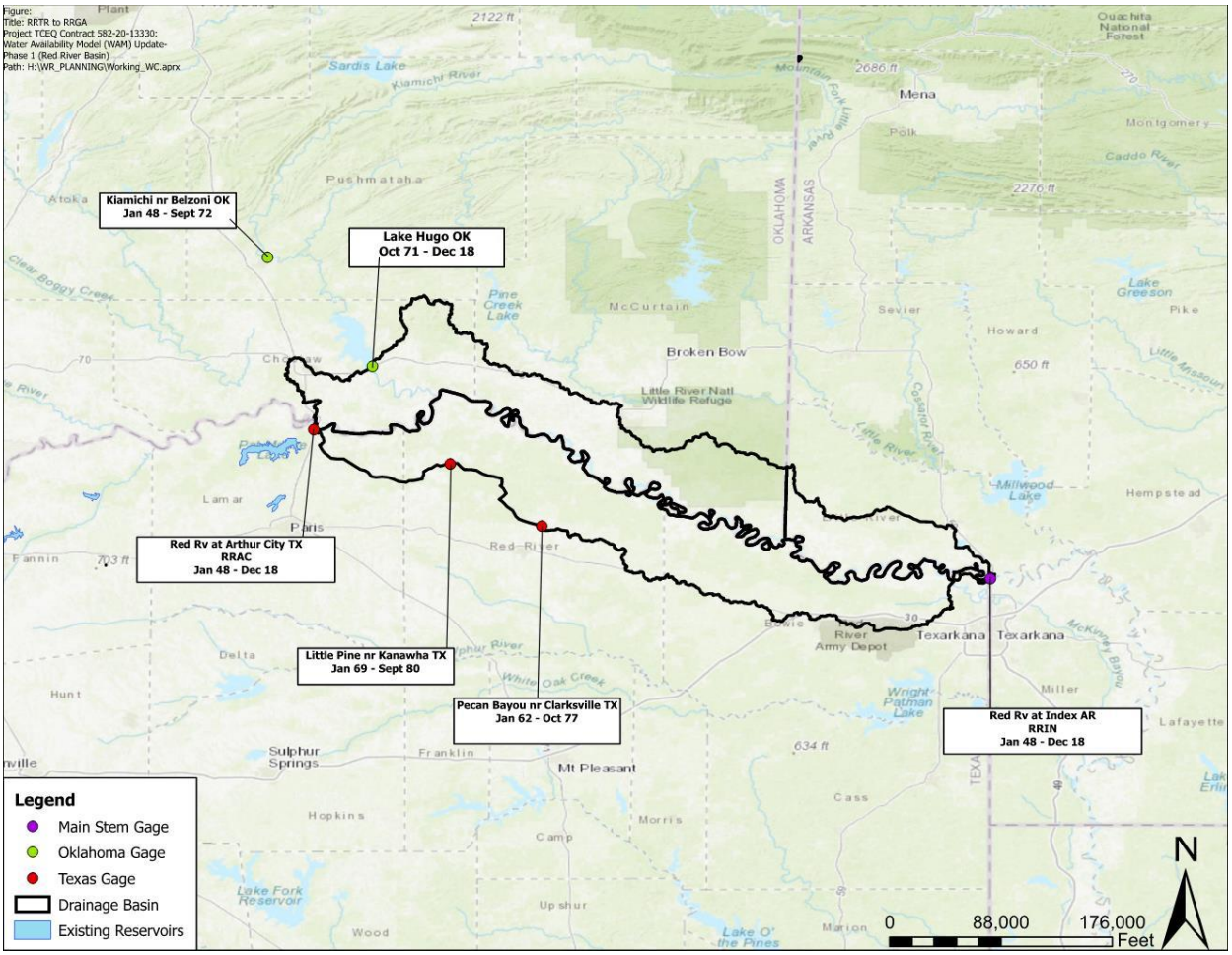
Splitting of flows between Texas and Oklahoma for the reach between the Red River at Arthur City (RR_AC) and the Red River at Index (RR_IN) follows the general methodology outlined in **Section 2.1**. **Table 5** shows the drainage areas as tributary gages come and go through the 1948 to 2018 period of record. **Figure 4** shows the drainage area of the smallest incremental area between RR_IN and upstream gages over the study period.

Table 5: Red River at Arthur City (RRAC) to Red River at Index (RRIN)

Start Date	End Date	Red River at Arthur City TX	Little Pine nr Kanawha TX	Kiamichi R nr Belzoni OK	Lake Hugo Outflows (OK)	Pecan Bayou nr Clarksville TX	Red Rv at Index AR	OK Tributary Drainage Area (mi2)	TX Tributary Drainage Area (mi2)	Total Upstream Gaged Drainage Area (mi2)	Incremental Drainage Area (mi2)	Incremental OK/AR Drainage Area (mi2)	OK/AR Drainage Area Ratio
Jan-48	Dec-61	X		X			X	1,423	0	45,868	2,132	1,105	0.5183
Jan-62	Dec-68	X		X		X	X	1,423	100	45,968	2,032	1,105	0.5438
Jan-69	Sep-71	X	X	X		X	X	1,423	175	46,043	1,957	1,105	0.5648
Oct-71	Oct-77	X	X		X	X	X	1,709	175	46,329	1,671	819	0.4902
Nov-77	Sep-80	X	X		X		X	1,709	75	46,229	1,771	819	0.4626
Oct-80	Dec-18	X			X		X	1,709	0	46,154	1,846	819	0.4437

Using total drainage area

Figure 4: RR_AC to RR_IN



The RR_IN gage has a total drainage area of 48,000 square miles. The RR_AC gage is located on the upstream end of the reach. The most significant Oklahoma tributary is the Kiamichi River. Lake Hugo (drainage area 1,709 square miles) is located on the Kiamichi just upstream of the confluence with the Red River. Lake Hugo outflows are available from the USACE beginning in October 1971. The Kiamichi near Belzoni gage (drainage area 1,423 square miles) has flows for the early part of the record. Major Texas tributaries include Little Pine Creek and Pecan Bayou. The Little Pine near Kanawha gage reported flows from 75.4 square miles of drainage area from January 1969 to September 1980. The Pecan Bayou near Clarksville gage reported flows from 100 square miles of drainage area from January 1962 to October 1977. There are no major tributaries or stream gages in the Arkansas portion of the reach.

Like the RR_AC gage, calculations for the RR_IN gage include a check to verify that the Texas incremental flows (*TX_RR_incr*) are less than the total incremental flows (*RR_incr*). It is possible that the total Texas flow (*TX_RR_tot*) is greater than the total measured RR_IN flow (*RR_down*), since the flow is partially naturalized and includes some flows that were historically impounded in Lake Texoma.

2.5 Red River near Burkburnett (RR_BB)

The Red River near Burkburnett Texas gage (RR_BB) is the most upstream of the six gages shared with Oklahoma. The gage has a total drainage area of 20,570 square miles and a contributing drainage area of 14,634 square miles. Unlike other gages shared with Oklahoma, RR_BB does not have a full period of record, with gage records starting in January 1960. Flows prior to January 1960 are filled with naturalized flows from the RR_TR gage. As a result, the methodology from **Section 2.1** only applies beginning in January 1960. **Table 6** shows the drainage areas as tributary gages come and go through the 1960 to 2018 period of record. **Figure 5** shows the incremental drainage area between RR_BB and upstream gages.

One of the issues with splitting flows at the RR_BB gage relates to the upstream gage, equivalent to *RR_up* in the calculations. The Prairie Dog Town Fork near Childress gage (PD_CH) is considered as the upstream gage when available. However, unlike other reaches, all of the inflows at this gage originate in Texas. When RR_BB records start, the PD_CH gage is not active, and the only active gages on the Prairie Dog Town Fork are relatively far upstream. However, there was a main stem gage, Red River near Quanah, that began reporting flows in December 1959, one month prior to the RR_BB gage. This gage is downstream of where the western Oklahoma border meets the Red River, starting the southern Oklahoma border, so it does include some Oklahoma flows. The Red River near Quanah gage has been used as the upstream end of the reach until the PD_CH gage becomes available in April 1965. This means that from January 1960 to March 1965, part of the incremental flows in the reach are not directly measured but, instead, are estimated from downstream incremental flows using a drainage area ratio.

Major Oklahoma tributaries in this reach include the Salt Fork of the Red River and North Fork of the Red River. Both of these streams have headwaters in the Texas Panhandle and flow into Oklahoma before joining the main stem of the Red River along the Texas/Oklahoma border. For this calculation, the flows at these gages that originate in Texas but pass into Oklahoma are considered part of the total Oklahoma flows. The Salt Fork near Mangum Oklahoma has a full period of record from 1,319 square miles of drainage area. The Salt Fork near Elmer gage begins in October 1979 and measures flows from 1,848 square miles of drainage area. The Mangum gage is used until the Elmer gage becomes available. On the North Fork, the North Fork near Headrick gage has reported flows for the full period of record from 3,981 square miles of drainage area. The North Fork near Tipton gage becomes available in July 1983, with a gap between September 1997 and September 1998. The Tipton gage has a drainage area of 4,431 square miles. The Headrick gage is used when flows from the Tipton gage are unavailable.

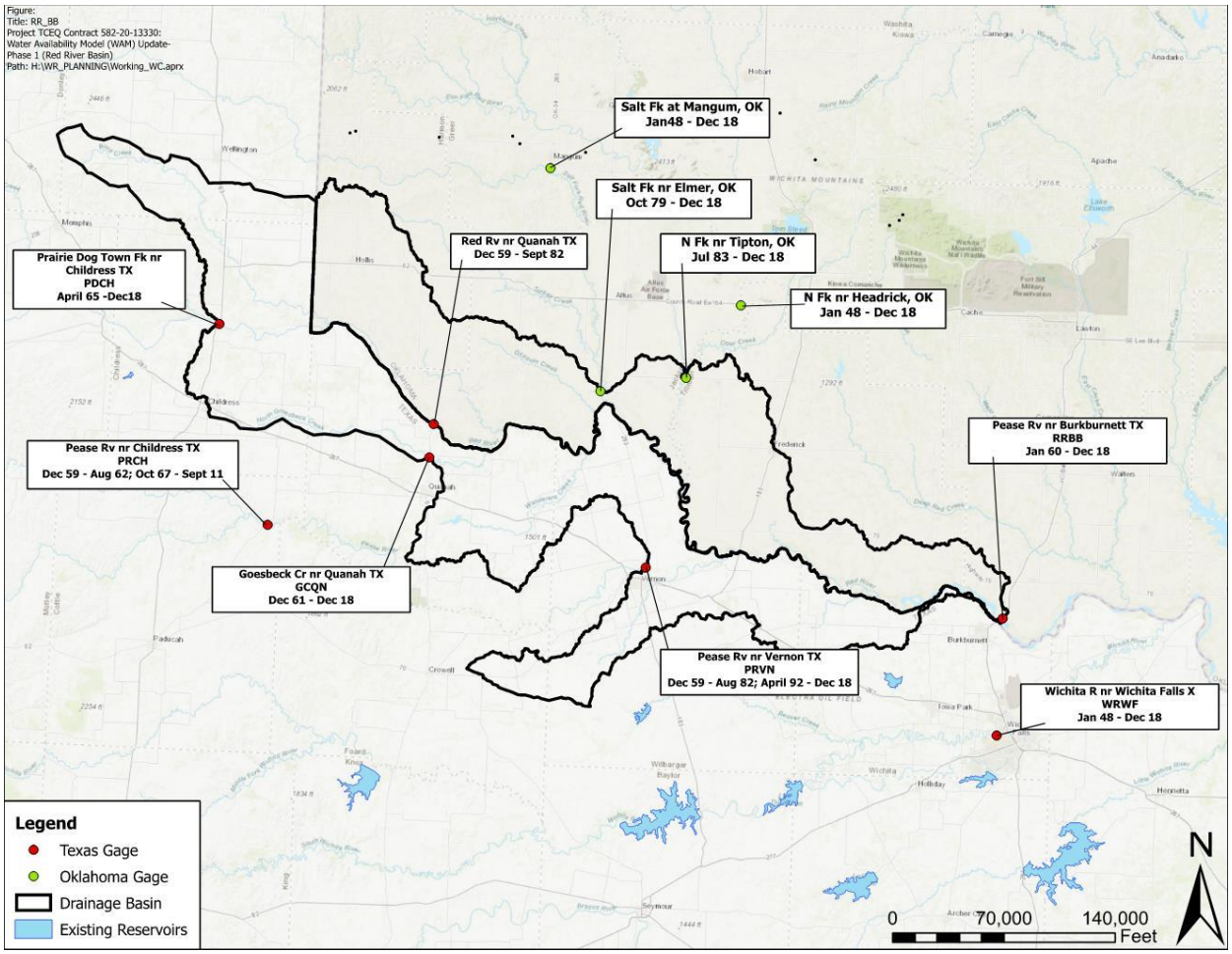
Major Texas tributaries include the Prairie Dog Town Fork of the Red River, Groesbeck Creek, and the Pease River. The Prairie Dog Town Fork near Childress gage (PD_CH), with 2,958 square miles of drainage area, becomes available in April 1965 and serves as the upper end of the RR_BB reach. The Groesbeck Creek near Quanah gage (GC_QN) with 330 square miles of drainage area becomes available in December 1961. The Pease River near Vernon (PR_VN) gage is the most downstream gage on the Pease River (2,929 square miles) and is available in January 1960 when flows begin at the RR_BB gage. There is a gap in the records for this gage between October 1982 and March 1992. During the gap, flows at the gage Pease River near Childress (PR_CS), with 2,195 square miles of drainage area, are used.

Table 6: Red River near Burkburnett (RR_BB)

Start Date	End Date	Pr Dog Twn Fk nr Childress TX	Red Rv nr Quanah TX	Groesbeck Cr nr Quanah TX	Salt Fk at Mangum OK	Salt Fk nr Elmer OK	N Fk nr Headrick OK	N Fk nr Tipton OK	Pease R nr Childress TX	Pease R nr Vernon TX	Red RV nr Burkburnett	OK Tributary Drainage Area (mi2)	TX Tributary Drainage Area (mi2)	Total Upstream Gaged Drainage Area (mi2)	Incremental Drainage Area (mi2)	Incremental OK Drainage Area (mi2)	OK Drainage Area Ratio
Jan-60	Nov-61		X		X		X			X	X	5,300	2,929	11,781	2,853	1,977	0.6930
Dec-61	Mar-65		X	X	X		X			X	X	5,300	3,232	12,084	2,550	1,977	0.7753
Apr-65	Sep-79	X		X	X		X			X	X	5,300	3,232	11,490	3,144	1,977	0.6288
Oct-79	Sep-82	X		X		X	X			X	X	5,829	3,232	12,019	2,615	1,448	0.5537
Oct-82	Jun-83	X		X		X	X		X		X	5,829	2,498	11,285	3,349	1,448	0.4324
Jul-83	Mar-92	X		X		X		X	X		X	6,279	2,498	11,735	2,899	998	0.3443
Apr-92	Aug-97	X		X		X		X		X	X	6,279	3,232	12,469	2,165	998	0.4610
Sep-97	Sep-98	X		X		X	X			X	X	5,829	3,232	12,019	2,615	1,448	0.5537
Oct-98	Dec-18	X		X		X		X		X	X	6,279	3,232	12,469	2,165	998	0.4610

Using contributing drainage area

Figure 5: RR_BB



Contributing drainage areas are used because the noncontributing portion of the drainage area is consistent, with the sum of the noncontributing portions of the tributaries reasonably close to the reported noncontributing drainage area for RR_BB.

If the calculated Texas flow is a) more than the gaged flow at RR_BB or b) is less than zero, then the calculated flows are replaced by multiplying the RR_BB flow by the ratio of the sum of the Texas gaged flows to the total gaged flows at RR_BB.

From January 1948 to December 1959 the RR_BB gage naturalized flows are filled in as follows:

- The maximum of:
  - The sum of the upstream naturalized flows (PD_CH, PR_VN and GC_QN), multiplied by the delivery factor, or
  - The minimum of:
    - RR_TR naturalized flows multiplied by 0.446

- RR_TR naturalized flows less the tributary naturalized flows between RR_BB and RR_TR (WR_CH, LW_HN, and EF_HN)

Note that the other gages are almost all filled flows. The limitations are to prevent negative incremental flows.

The factor 0.446 is based on a linear fit of the data. **Table 7** compares the linear fit to the drainage area ratio and the double mass curve. Fills are discussed in **Chapter 3** of the main report and in **Appendix F**.

Table 7: Fill Relationship RR_BB and RR_TR

	Total Contributing Drainage Area (mi^2)	Texas Contributing Drainage Area (mi^2)	Drainage Area Ratio	Linear Fit Slope	Linear Fit R^2	Double Mass
RR_BB	14,634	7,357	0.59	0.45	0.80	0.41
RR_TR	22,787	12,512	-	-	-	-

2.6 Red River near Burkburnett (RR_BB) to Red River near Terral (RR_TR)

The Red River near Terral, Oklahoma gage (RR_TR) is the next gage downstream of the RR_BB gage. This gage has a total drainage area of 28,723 square miles and a contributing drainage area of 22,787 square miles. RR_TR has flows for the full 1948 to 2018 period of record. However, flows for the upstream gage RR_BB only begin in 1960, so the general method described in **Section 2.1** for splitting Texas and Oklahoma flows cannot be used for the full period of record. **Table 8** shows the drainage areas as tributary gages come and go through the 1960 to 2018 period of record. **Figure 6** shows the incremental drainage area between RR_BB and RR_TR.

Prior to 1960, the RR_TR Texas flows (equivalent to *TX_RR_tot*) are set to the maximum of:

- The RR_TR monthly flow multiplied by the drainage area ratio of the Texas portion of the basin (excluding Oklahoma tributary headwaters in the Texas Panhandle) to the total contributing drainage area (12,512 square miles in Texas/22,787 square miles RR_TR = 0.549085)
- The sum of the gaged Texas flows, consisting of historical flows measured at the Wichita River at Wichita Falls gage (WR_WF, 3,439 square miles) plus:
    - From January 1948 to December 1952 and January 1956 to December 1959 the Little Wichita near Archer City gage flows (LW_AC, 481 square miles)
    - From January 1953 to December 1955 the Little Wichita above Henrietta gage flows (LW_HN, 1,037 square miles)

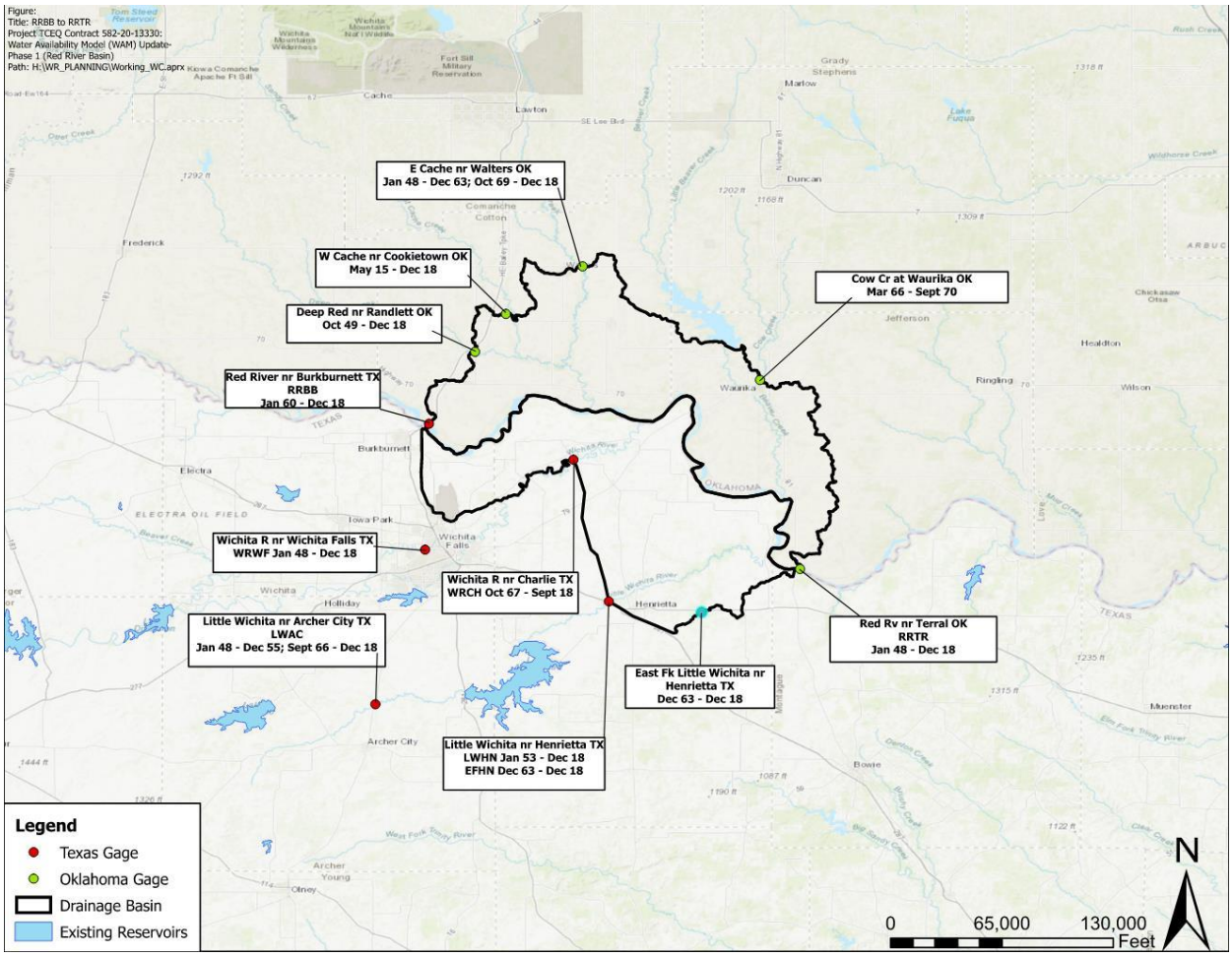
Lake Arrowhead, which is in between LW_AC and LW_HN, was built in 1966, after the period of record described in this methodology.

Table 8: RR_BB to RR_TR

Start Date	End Date	Red River nr Burkburnett, TX	Deep Red Cr nr Randlett OK	W Cache Cr nr Cookietown OK	E Cache Cr nr Walters OK	Wichita R at Wichita Falls TX	Wichita R nr Charlie TX	Little Wichita nr Archer City TX	Little Wichita abv Henrietta TX	East Fk Little Wichita nr Henrietta TX	Waurika Lake Outflows OK	Cow Cr at Waurika OK	Red River nr Terral OK	OK Tributary Drainage Area (mi2)	TX Tributary Drainage Area (mi2)	Upstream Gaged Drainage Area (mi2)	Incremental Drainage Area (mi2)	Incremental OK Drainage Area (mi2)	OK Drainage Area Ratio
Jan-60	Nov-63	X	X		X	X			X				X	1,298	4,177	20,109	2,678	1,700	0.6348
Dec-63	Dec-63	X	X		X	X			X	X			X	1,298	4,355	20,287	2,500	1,700	0.6800
Jan-64	Feb-66	X	X			X			X	X			X	604	4,355	19,593	3,194	2,394	0.7495
Mar-66	Sep-67	X	X			X			X	X		X	X	797	4,355	19,786	3,001	2,201	0.7334
Oct-67	Sep-69	X	X				X		X	X		X	X	797	4,654	20,085	2,702	2,201	0.8146
Oct-69	Sep-70	X	X		X		X		X	X		X	X	1,491	4,654	20,779	2,008	1,507	0.7505
Oct-70	Oct-94	X	X		X		X		X	X			X	1,298	4,654	20,586	2,201	1,700	0.7724
Nov-94	Apr-15	X	X		X		X		X	X	X		X	1,860	4,654	21,148	1,639	1,138	0.6943
May-15	Sep-18	X	X	X	X		X		X	X	X		X	2,314	4,654	21,602	1,185	684	0.5772
Oct-18	Dec-18	X	X	X	X	X			X	X	X		X	2,314	4,355	21,303	1,484	684	0.4609

Using contributing drainage areas

Figure 6: RR_BB to RR_TR



Starting with January 1960 the method used is identical to the general method described in **Section 2.1**, with the upstream end of the reach (*RR_up*) being the RR_BB gage.

Major Oklahoma tributaries include Cache Creek and Beaver Creek (including Cow Creek). There are gages on three tributaries of Cache Creek:

- Deep Red Creek near Randlett, drainage area 604 square miles, with flows from October 1949 to December 2018
- West Cache Creek near Cookietown, drainage area 454 square miles, with flows from May 2015 to December 2018
- East Cache Creek near Walters, drainage area 694 square miles, with flows from January 1948 to December 1963, and October 1969 to December 2018.

Oklahoma's Waurika Lake is on Beaver Creek with a drainage area of 562 square miles. USACE outflows for the lake are available beginning in October 1979. The Cow Creek at Waurika Oklahoma gage, on a

tributary that joins Beaver Creek downstream of Waurika Lake, has a drainage are of 193 square miles and recorded flows from March 1966 to September 1970.

Major Texas tributaries include the Wichita River and Little Wichita River. The Wichita River at Wichita Falls (WR_WF) gage has flows for the full period of record (1948 to 2018) and a drainage area of 3,439 square miles[a]. The Wichita River near Charlie gage (WR_CH) is located downstream of the WR_WF gage, with a 3,140 square mile drainage area and flow records from October 1967 to September 2018. WR_WF flows are used when WR_CH flows are not available. The Little Wichita above Henrietta gage (LW_HN) has a drainage area of 1,037 square miles and reported flows from January 1953 to December 2018. The East Fork of the Little Wichita near Henrietta gage (LW_HN) has a drainage area of 178 square miles and flow records from December 1963 to December 2018. The East Fork joins the Little Wichita downstream of the LW_HN gage, just upstream of the confluence with the Red River.

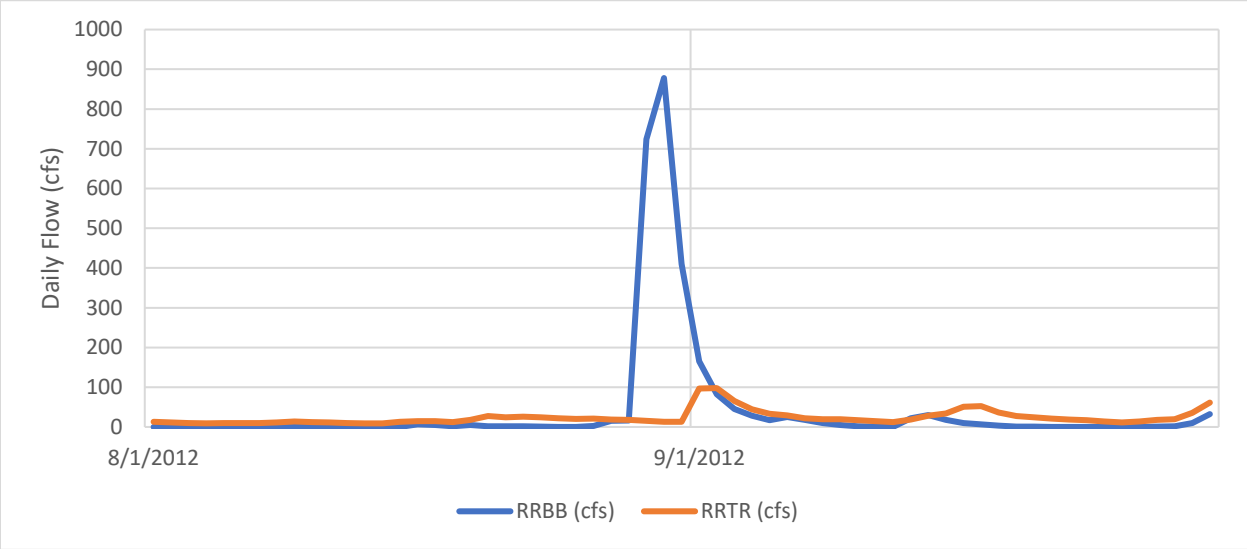
The calculations include checks so that the calculated Texas incremental flow (*TX_RR_incr*) is never greater than the total incremental flow (*RR_incr*). If the calculated incremental Texas flow is more than the incremental flow, the incremental Texas flow is set to the incremental flow multiplied by the ratio of the gaged Texas tributary flow (from the Wichita and Little Wichita Rivers) to the total tributary gage flow (Texas tributary flow plus Oklahoma tributary flow from Cache Creek and Beaver Creek).:

$$TX\_RR\_incr = RR\_incr * DA\_TX\_trib/(DA\_TX\_trib + DA\_OK\_trib)$$

There is an inconsistency between flows measured at the RR_BB gage and the RR_TR gage in August 2012, where significantly more flow is measured upstream at RR_BB and other tributary gages than is reported at the RR_TR gage (**Figure 7**). It is unclear if this is due to an error in gage flows or significant losses during this month. In this case, the final calculated Texas flows are 285 acre-feet more than the total flows measured at RR_TR. In all other months, the total Texas flows are less than the gage flows at RR_TR.

[a] The USGS states that the 2,086 square miles upstream of Lake Kemp is probably noncontributing. For the purposes of this study, the drainage area upstream of Lake Kemp is considered part of the WR_WF drainage area.

Figure 7: August – September 2012, RR_BB and RR_TR



2.7 Red River near Gainesville (RR_GA) to Red River near Colbert (RR_CB)

The Red River near Colbert, Oklahoma (RR_CB) control point is located downstream of Lake Texoma. The RR_GA gage is the upstream control point. A stream gage was located at the RR_CB location until October 1961, when it was moved upstream to its current location at Denison Dam and renamed Red River at Denison Dam near Denison, Texas. (The USGS website reports flows at the Colbert gage site as Red River at Denison Dam from October 1958 to September 1961. Published records use the near Colbert name until the gage is moved upstream.) The USGS currently reports the total drainage area for the RR_CB location as 39,777 square miles with 8,002 square miles noncontributing. The current Denison Dam gage location has a total drainage area of 39,720 square miles with 7,928 square miles noncontributing. It is not clear why the noncontributing drainage areas are different.

Table 9 shows the drainage areas as tributary gages come and go through the period of record. **Figure 8** shows the incremental drainage area between RR_GA and RR_CB.

The RR_CB control point has two complicating factors:

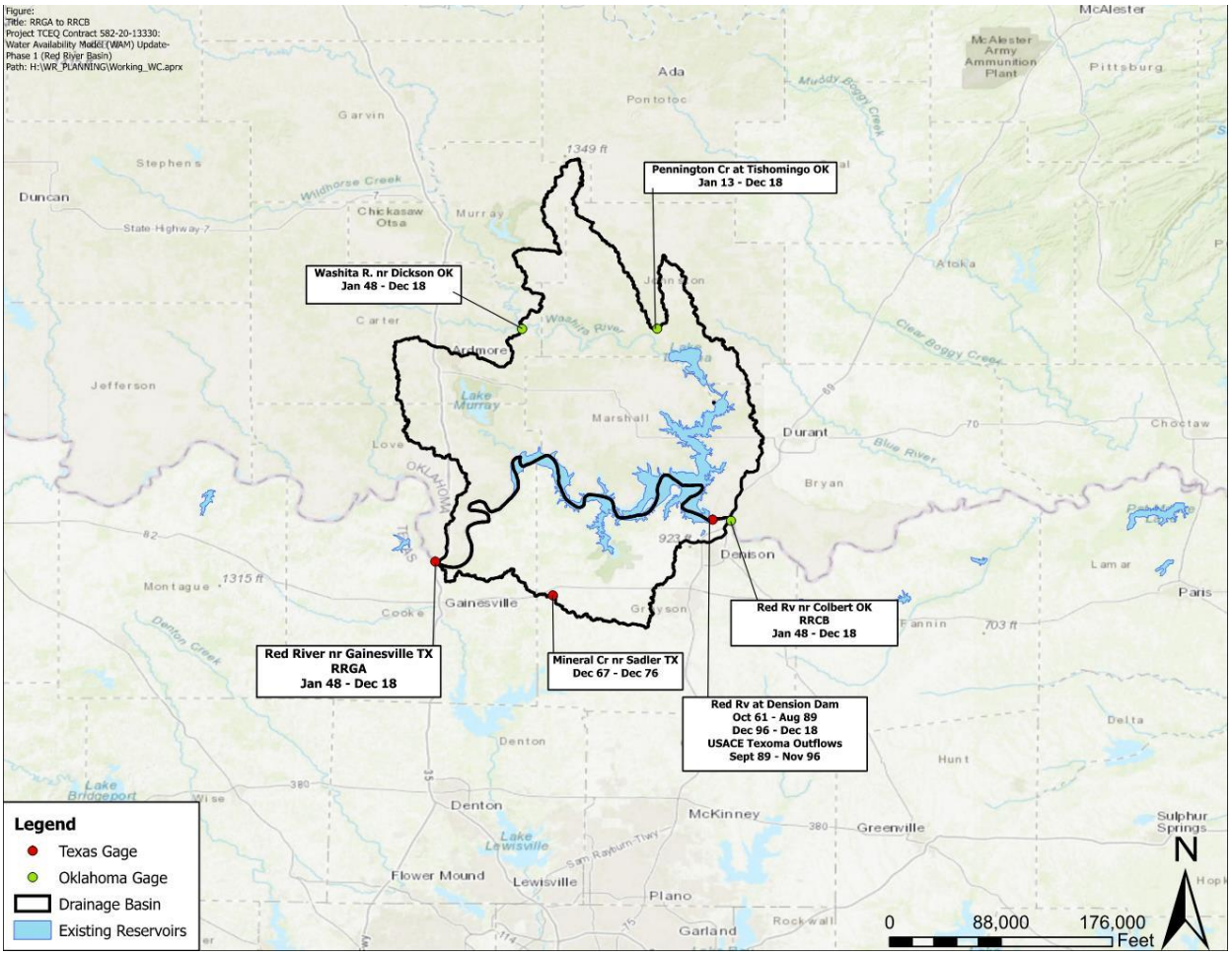
- Lake Texoma regulates the flow at RR_CB. Lake Texoma is also used to generate hydropower. As a result, the method used to split flows at other control points (**Section 2.1**) cannot be directly applied to this reach.
- There are two different gage locations associated with this control point:
    - From January 1948 to September 1961 the gage was located at the current RR_CB control point (W10000 in the WAM). This point is approximately 2.5 miles downstream of current Red River at Denison Dam gage. It is also downstream of the confluence of Shawnee Creek with the Red River. The spillway for Lake Texoma discharges into Shawnee Creek. Randell Lake is also located on Shawnee Creek.

Table 9: RRGA to RRCB

Start Date	End Date	Red River nr Gainesville, TX	Mineral Cr nr Sadler TX	Washita nr Dickson OK	Pennington Cr at Tishomingo OK	Red River at Denison Dam TX	Red River nr Colbert OK	OK Tributary Drainage Area (mi2)	TX Tributary Drainage Area (mi2)	Upstream Gaged Drainage Area (mi2)	Average Texoma Surface Area (mi2)	Incremental Drainage Area (mi2)	Incremental OK Drainage Area (mi2)	OK Drainage Area Ratio
Jan-48	Sep-61	X		X			X	7,172	0	37,900	128	1,692	1,318	0.7790
Oct-61	Nov-67	X		X		X		7,172	0	37,900	115	1,705	1,318	0.7730
Dec-67	Dec-76	X	X	X		X		7,172	26	37,926	126	1,668	1,318	0.7902
Jan-77	Dec-12	X		X		X		7,172	0	37,900	121	1,699	1,318	0.7758
Jan-13	Dec-18	X		X	X	X		7,266	0	37,994	117	1,609	1,224	0.7607

Using total drainage area

Figure 8: RR_GA to RR_CB



- Since October 1961, the gage has been located about 1,800 feet downstream of Denison Dam (Lake Texoma). This gage measures outflows from the turbines and low-flow releases but is upstream of Shawnee Creek and thus does not directly measure spillway discharges.

Flows at RR_CB are available from the USGS and the USACE. Flows for USGS gage 07332000 Red River near Colbert, Oklahoma, are available from the USGS website from January 1948 to August 1958. Flows for USGS gage 07331600 Red River at Denison Dam near Denison, Texas, are available from the USGS website from December 1958 to August 1989 and from December 1996 to December 2018. Data for the overlap period between Denison Dam and Colbert are identical. Flows from the USACE are available from January 1989 to December 2018. Data from November 1994 through December 2018 were obtained from the Tulsa District website[4]. USACE data prior to that were obtained using a Freedom of Information request. The USACE flows are the reported total releases, including hydropower and other releases.

Use of a method similar to the one described in **Section 2.1** for splitting Texas and Oklahoma flows would require the equivalent of the unregulated downstream flows (i.e. flows that would have occurred if Lake Texoma were not there). The unregulated flows can be estimated by determining the inflows into Lake Texoma for the downstream gage (*RR_down*). Specifically, this approach uses the standard mass balance formula applied in the naturalization process:

Mass_Balance_Inflow = Content_Change + Diversions + Net_Evap_Loss + Outflows

Where

Mass_Balance_Inflow is the calculated inflow into the reservoir

Content_Change is the current end-of-month storage less the previous end-of-month storage

Diversions are the total lakeside diversions from the reservoir

Net_Evap_Loss is the net evaporation rate (evaporation less precipitation plus effective runoff) multiplied by the average surface area over the month

Outflows are the total outflows (spills and releases, including hydropower releases) from the reservoir.

If the calculated *Mass_Balance_Inflow* is less than the sum of the upstream gaged inflows (RR_GA, Washita River, and any other available gages), then the sum of the gaged inflows is used rather than the mass balance inflow.

Content_Change and *Net_Evap_Loss* are calculated using the same methods used for other reservoirs in the naturalization process (see **Chapter 3** of the main report).

Diversions are the historical Texas diversions from the reservoir, including diversions made by the City of Dallas in the 1950s. Records are not available for Oklahoma diversions, but it can be assumed that these diversions are small. Given the magnitude of the inflows the Oklahoma diversions would make little difference in the calculations.

Outflows are based on historical gage records or USACE data, as shown in **Table 10**. From January 1948 to September 1961, when flows were measured at the downstream RR_CB location, the gage records include flows from the 57 square miles of drainage area below Denison Dam. These downstream flows are estimated by multiplying the historical flow records from the Blue River near Blue, OK gage, which is an adjacent watershed, by the drainage area ratio (57/477 = 0.1195). These flows are then subtracted from the gage flows to estimate the historical reservoir outflows. From October 1961 to December 2018 the USGS flow records are preferentially used over the USACE records when available. There is no need to adjust these flows because the gage is located very close to the dam. Exceptions are the periods from September 2013 through February 2014 and May to August of 2015, when there appears to be spillway releases that are not measured at the current USGS gage location (spillway releases go into Shawnee Creek, which joins the Red River downstream of the current gage location). From September 1989 to November 1996 USGS records are not available so only the USACE data are used.

Table 10: Source of Lake Texoma Outflows

Start Date	End Date	Outflow Source
Jan-1948	Sep-1961	USGS Red River near Colbert less flows between dam and gage
Oct-1961	Aug-1989	USGS Red River at Denison Dam flows
Sep-1989	Nov-1996	USACE Texoma outflows
Dec-1996	Aug-2013	USGS Red River at Denison Dam flows
Sep-2013	Feb-2014	USACE Texoma outflows
Mar-2014	Apr-2015	USGS Red River at Denison Dam flows
May-2015	Jun-2015	USACE Texoma outflows
Jul-2015	Dec-2018	USGS Red River at Denison Dam flows

Once the estimated Lake Texoma inflows have been calculated, the process of splitting the historical flows between Texas and Oklahoma follows the general procedure described in **Section 2.1**. The Washita River is the major Oklahoma tributary in this reach. The Washita River near Dickson gage is available for the entire period of analysis, with a drainage area of 7,172 square miles. The small part of the headwaters of the Washita River located in the Texas Panhandle are included in this drainage area. The Pennington Creek at Tishomingo Oklahoma gage is available from January 2013 to December 2018 and has a drainage area of 94.3 square miles. Pennington Creek joins the Washita River downstream of the Dickson gage. The only Texas tributary gage is Mineral Creek near Sadler, which has a drainage area of 26 square miles and flow records from December 1967 to December 1976.

Lake Texoma is a very large lake, so the surface area occupied by the reservoir is considered in the incremental drainage area calculations. The average drainage area over the different periods is shown in **Table 9**; however, the actual average monthly surface area for each month is used in the calculations. The area occupied by the lake is subtracted from the incremental drainage area when calculating the flow split.

Once the Texas portion of the historical incremental flows (*TX_RR_incr*) has been calculated it is added to the upstream RR_GA Texas flows (*TX_RR_up*) to get the total Texas flows (*TX_RR_tot*). For the flows after the RR_CB gage was moved upstream in September 1961, the portion of the Texas flows between the current gage and RR_CB are added as well. These flows are estimated using flows from the Blue River near Blue OK gage, multiplied by the drainage area ratio. The Texas portion of that drainage area is about half of the 57 square miles between the dam and RR_CB.

From this point downstream the Texas flows are “semi-naturalized” because they include corrections for Lake Texoma. Since the Lake Texoma corrections have already been applied, they do not need to be applied again or passed to downstream naturalized flow points. This also implies that the Texas flows can now be more than the historical downstream gage flows, since water that was historically used to fill Lake Texoma storage may now be present in the Texas flows.

Part of Lake Texoma is known as the Cumberland Pool, which is an area of the lake fed by the Washita River and Pennington Creek[5]. At lower lake levels, this pool is disconnected from the main pool of Lake Texoma[6]. Since the Cumberland Pool is a relatively small part of Lake Texoma's total storage it is ignored in the naturalization calculations.

References

[i] United States Geological Survey: National Water Information System - Mapper, available on-line at https://maps.waterdata.usgs.gov/mapper/index.html.

[ii] U.S. Army Corps of Engineers: Tulsa District website, https://www.swt.usace.army.mil/

[iii] Dougherty, John P: Texas Department of Water Resources Report 244: Streamflow and Reservoir-Content Records in Texas Compilation Report January 1889 through December 1975, Volume 1, February 1980.

[4] Tulsa District Water Control Data System, available on line at https://www.swt-wc.usace.army.mil/

[5] U.S. Fish and Wildlife Service: Tishomingo National Wildlife Refuge, Oklahoma, available on-line at https://www.fws.gov/refuge/Tishomingo/wildlife_and_habitat/index.html

[6] Texas Water Development Board: Volumetric Survey of Lake Texoma, prepared for the U.S. Army Corps of Engineers Tulsa District, April 14, 2003.

Appendix F
Flow Adjustment Records

Appendix F – Flow Adjustment Records

Flows from Oklahoma in the Red River WAM are based on historical flows. In the full authorization run (Run3), only the historical Oklahoma flows that enter the Red River at Lake Texoma and downstream of Lake Texoma are in the model. The current conditions run (Run 8) has historical Oklahoma flows both upstream and downstream of Lake Texoma. **Table F-1** lists the control point locations where the Oklahoma flows are input, the flows represented by that control point, the run (Run 3 or Run 8) which uses the flows, and the source of the flow data input at those control points. These flows are entered into the model using Flow Adjustment (FA) records and are added to the naturalized flows at the beginning of the run.

The flow adjustment records were directly calculated from Oklahoma flow data used in the process to split historical flows between Texas and Oklahoma for the six gages along the Texas/Oklahoma border, as described in **Chapter 3.2.1** and **Appendix E**. The flow adjustment calculation uses the following steps:

1. Extract the flows from the major Oklahoma tributaries from the flow splitting calculations, as described in **Appendix E**.
2. If for the current month the Oklahoma tributary gaged flows are not at the most downstream gage location in the historical record, or some of the historical gaged flow from that tributary are missing, estimate the incremental flows between the current gage location and the downstream location as follows:
    a. If the gage is upstream of the most downstream gaged location on the tributary, determine the incremental drainage area between the current gage and the most downstream gage in the historical record. For example, the most downstream gage on the Salt Fork is the Elmer gage (USGS 07301110), with a contributing drainage area of 1,848 square miles. This gage began reporting data in October 1979. Prior to that, the Mangum gage (USGS 07300500), with a contributing drainage area of 1,319 square miles, is the most downstream gage on the Salt Fork. The incremental drainage area between these two gages is 1,848 – 1,319 = 529 square miles.

Table F-1: Flow Adjustment Locations and Flow Data Sources

WAM Control Point	Location	Run	Source of Flow
H10100	Salt Fork Red River, Lebos Creek	Run 8 only	Salt Fork Red River at Mangum, OK (07300500)
			Salt Fork Red River near Elmer, OK (07301110)
H10080	North Fork Red River	Run 8 only	North Fork Red River near Headrick, OK(07305000)
			North Fork Red River near Tipton, OK (07307028)
H10010	Red River nr Burkburnett (RR_BB)	Run 8 only	Historical OK incremental flows from naturalization
U10180	Cache Creek	Run 8 only	Deep Red Creek near Randlett, OK (07311500)
			West Cache Creek near Cookietown, OK (07311240)
			East Cache Creek near Walters, OK (07311000)
U10010	Red River nr Terral (RR_TR)	Run 8 only	Cow Creek nr Addington, OK (07313585),
			Waurika Lake outflows (USACE)
			Historical OK incremental flows from naturalization
V10060	Mud Creek	Run 8 only	Mud Creek near Courtney, OK (07315700)
V10005	Red River nr Gainesville (RR_GA)	Run 8 only	Historical OK incremental flows from naturalization
OK1000	Denison Dam (RR_CB)	Run 3 and Run 8	Washita River near Dickson, OK (07331000)
			Pennington Cr at Tishomingo, OK (07331383)
			Historical OK incremental flows from naturalization
X10370	Blue River, Island Bayou	Run 3 and Run 8	Blue River near Blue, OK (07332500)
X10150	Boggy River, Red River at Arthur City (RRAC)	Run 3 and Run 8	Muddy Boggy Creek near Farris, OK (07334000)
			Muddy Boggy Creek near Unger, OK (07335300)
			Historical OK incremental flows from naturalization
Y10230	Kiamichi River	Run 3 and Run 8	Kiamichi R nr Belzoni, OK (07336500)
			Lk Hugo outflows from USACE
Y10100	Red River at Index (RR_AC)	Run 3 and Run 8	Historical OK incremental flows from naturalization

b. If there are multiple gages on the tributary and one or more has missing flow data, determine the drainage area of the gages that are missing. For example, the Cache Creek watershed has gages on three tributaries: Deep Red Creek (USGS 07311500, drainage area 604 square miles), West Cache Creek (USGS 07311240, drainage area 454 square miles), and East Cache Creek (USGS 07311000, drainage area 694 square miles). In January 1948, only the East Cache Creek gage is reporting data. So the drainage area of the missing gage data is the sum of the Deep Red Creek and West Cache Creek drainage areas, 604 + 454 = 1,058 square miles.

c. For some ungaged Oklahoma tributaries that are located at the upstream end of the reach, add that drainage area to the tributary gage drainage area. For example, Island Bayou (drainage area 148 square miles) is located between RR_CB and the Blue River.

d. Divide the sum of the drainage areas from the "missing" gage flows determined in steps 2.a, 2.b and 2.c above by the drainage area of the incremental Oklahoma drainage area *DA_incr OK* (see Appendix E for definition).

e. Multiply the drainage area ratio calculated in 2.d. by the incremental Oklahoma flows *OK_reach_incr* (see Appendix E).

f. Add the flow calculated in step 2.e to the gage flow at the tributary to determine the flow adjustment for that tributary.

g. The flow at the downstream control point in the reach is the incremental Oklahoma flows *OK_reach_incr* less the flows calculated in step 2.f.

Occasional negative flows occur when *OK_reach_incr* is less than zero. Any negative final flow calculations (tributary or at the downstream gage in the reach) are set to zero.

From 1948 to 1959 the RR_BB and RR_TR reaches have a slightly modified version of the above procedure resulting from the fact that gage records for RR_BB do not begin until January 1960. The process for this period is as follows:

1. Determine the total Oklahoma flows for RR_TR by subtracting the total Texas flows (*TX_RR_tot*) from the total historical flows at RR_TR.

2. Subtract the historical Oklahoma gage flows (with loss adjustments) from the total Oklahoma flows to determine *OK_reach_incr*. In this case, the incremental Oklahoma flows are for both RR_BB and RR_TR.

3. Follow the same steps as described above to calculate the flows for each tributary.

Appendix G
Methods Considered to Fill Missing Naturalized Flows

Appendix G - Methods Considered to Fill Missing Naturalized Flow

Workbook ID	Period of Record		Contributing Drainage Area (mi2)	Fill Gage(s)	Overlap		Contributing Drainage Area (mi2)	Drainage Area Ratio	Scatter			Double Mass
	Start	End			Start	End			Slope	Intercept	R2	
SW_KT	Dec-61	Dec-18	281	WR_WF	Dec-61	Dec-18	3,140	0.089	0.02	0	0.34	0.04
				Mangum	Dec-61	Dec-18	1,319	0.213	0.10	0	0.62	0.16
				Carter	Dec-61	Sep-62	2,073	0.136	**0.08**	**0**	**0.79**	0.11
				SF_WL	Dec-61	Dec-18	1,222	0.230	0.13	0	0.54	**0.23**
NF_SH	May-64	Sep-91	816.7	WR_WF	May-64	Sep-91	3,140	0.260	0.06	0	0.29	0.09
	Oct-00	Dec-18			Oct-00	Dec-18						
				Mangum	May-64	Sep-91	1,319	0.619	0.35	0	0.68	0.44
					Oct-00	Dec-18						
				Carter	Aug-64	Sep-91	2,073	0.394	**0.25**	**0**	**0.72**	0.31
					Oct-00	Dec-18						
				SF_WL	May-64	Sep-91	1,222	0.668	0.54	0	0.69	**0.63**
					Oct-00	Dec-18						
				SW_KT	May-64	Sep-91	281	2.906	**2.80**	**0**	**0.71**	2.60
					Oct-00	Dec-18						
SF_CL	Jun-60	Sep-64	266	WR_WF	Jun-60	Sep-64	3,140	0.085	0.02	0	0.27	0.04
	Sep-67	Dec-18			Sep-67	Dec-18						
				Mangum	Jun-60	Sep-64	1,319	0.202	0.10	0	0.54	**0.15**
					Sep-67	Dec-18						
				Carter	Jun-60	Sep-64	2,073	0.128	0.06	0	0.45	0.10
					Sep-67	Dec-18						
				SF_WL	Jun-60	Sep-64	1,222	0.218	0.14	0	0.59	**0.21**
					Sep-67	Dec-18						
				SW_KT	Jun-60	Sep-64	281	0.947	0.70	0	0.48	0.89
					Sep-67	Dec-18						
SF_WL	Jul-52	Dec-18	1,222	WR_WF	Jul-52	Dec-18	3,140	0.389	0.12	0	0.40	0.17
				Mangum	Jul-52	Dec-18	1,319	0.926	**0.64**	**0**	**0.80**	0.70
PD_WA	Oct-67	Dec-18	930	WR_WF	Oct-67	Dec-18	3,140	0.296	0.06	0	0.15	0.10
				Mangum	Oct-67	Dec-18	1,319	0.705	0.34	0	0.38	**0.39**
				PD_CH	Oct-67	Dec-18	2,958	0.314	0.25	0	0.50	**0.26**
				SF_WL	Oct-67	Dec-18	1,222	0.761	0.43	0	0.31	**0.58**

Appendix G - Methods Considered to Fill Missing Naturalized Flow

Workbook ID	Period of Record		Contributing Drainage Area (mi2)	Fill Gage(s)	Overlap		Contributing Drainage Area (mi2)	Drainage Area Ratio	Scatter			Double Mass
	Start	End			Start	End			Slope	Intercept	R2	
PD_CH	Oct-65	Dec-18	2,958	WRWF	Oct-65	Dec-18	3,140	0.942	0.25	0	0.35	0.35
				Mangum	Oct-65	Dec-18	1,319	2.243	1.27	0	0.62	**1.51**
				PR_CS	Oct-67	Sep-11	2,195	1.348	1.35	0	0.47	2.22
				SF_WL	Oct-65	Dec-18	1,222	2.421	1.57	0	0.49	**2.22**
				Carter	Oct-65	Dec-18	2,073	1.427	0.83	0	0.54	1.08
				RR_TR (Texas)	Oct-65	Dec-18	22,787	0.130	0.079	0	0.45	0.102
GC_QN	Dec-61	Dec-18	303	WR_WF	Dec-61	Dec-18	3,140	0.096	0.06	0	0.44	0.067
				Mangum	Dec-61	Dec-18	1,319	0.230	0.20	0	0.34	0.29
				RR_TR (Texas)	Dec-61	Dec-18	12,512	0.024	0.018	0	0.49	**0.020**
				RRTR-WRWF	Dec-61	Dec-18	9,372	0.032	0.023	0	0.48	0.028
PR_CS	Dec-59	Dec-61	2,195	WR_WF	Dec-59	Dec-61	3,140	0.699	0.17	0	0.56	0.17
	Oct-67	Sep-11			Oct-67	Sep-11						
				Mangum	Dec-59	Dec-61	1,319	1.664	0.54	0	0.48	0.66
					Oct-67	Sep-11						
				PR_VN	Dec-59	Dec-61	2,929	0.749	0.38	0	0.71	**0.45**
					Oct-67	Sep-82						
					Apr-92	Sep-11						
				RR_TR (Texas)	Dec-59	Dec-61	12,512	0.175	**0.048**	**0**	**0.61**	0.048
					Oct-67	Sep-11						
PR_VN	Dec-59	Sep-82	2,929	WR_WF	Dec-59	Sep-82	3,140	0.933	0.35	0	0.59	0.35
	Apr-92	Dec-18			Apr-92	Dec-18						
				WR_MB	Dec-59	Sep-82	2,086	1.404	0.59	0	0.57	0.64
					Apr-92	Dec-18						
				Mangum	Dec-59	Sep-82	1,319	2.221	1.06	0	0.46	1.41
					Apr-92	Dec-18						
				PRCS	Dec-59	Aug-62	2,195	1.334	1.86	0	0.71	**2.24**
					Oct-67	Sep-82						
					Apr-92	Sep-11						
				RR_TR (Texas)	Dec-59	Sep-82	12,512	0.234	**0.106**	**0**	**0.66**	0.107
					Apr-92	Dec-18						
				RRTR-WRWF	Dec-59	Sep-82	9,372	0.313	0.14	0	0.64	0.15
					Apr-92	Dec-18						

Appendix G - Methods Considered to Fill Missing Naturalized Flow

Workbook ID	Period of Record		Contributing Drainage Area (mi2)	Fill Gage(s)	Overlap		Contributing Drainage Area (mi2)	Drainage Area Ratio	Scatter			Double Mass
	Start	End			Start	End			Slope	Intercept	R2	
RR_BB (Texas	Jan-60	Dec-18	7,357	RR_TR (Texas)	Jan-60	Dec-18	12,512	0.588	**0.446**	**0**	**0.80**	0.41
				WR_WF	Jan-60	Dec-18	3,140	4.661	1.40	0	0.65	1.40
				RRTR-WRWF			9,372	0.785	0.610		0.82	0.59
				Mangum	Jan-60	Dec-18	1,319	11.09	5.09	0	0.58	6.11
NW_PD	Aug-62	Feb-82	540	NW_TS	Aug-62	Feb-82	937	0.576	0.30	0	0.73	**0.39**
	Oct-94	Oct-11			Oct-94	Oct-11						
				WR_WF	Aug-62	Feb-82	3,140	0.172	**0.06**	**0**	**0.56**	0.07
					Oct-94	Oct-11						
				WR_MB	Aug-62	Feb-82	2,086	0.259	0.10	0	0.59	0.12
					Oct-94	Oct-11						
				Mangum	Aug-62	Feb-82	1,319	0.409	0.16	0	0.41	0.26
					Oct-94	Oct-11						
				SFAS06 (Brazos)	Aug-62	Feb-82	2,496	0.216	0.17	0	0.31	0.35
					Oct-94	Dec-18						
NW_TS	Dec-59	Dec-18	937	WR_WF	Dec-59	Dec-18	3,140	0.298	**0.16**	**0**	**0.60**	0.17
				Mangum	Dec-59	Dec-18	1,319	0.710	0.44	0	0.33	0.69
				SFAS06 (Brazos)	Dec-59	Dec-18	2,496	0.375	0.55	0	0.53	0.85
				BRSE11 (Brazos)	Dec-59	Dec-18	5,972	0.157	0.15	0	0.49	0.21
SW_GR	Oct-70	Sep-76	223	SW_BJ	Oct-70	Sep-76	584	0.382	0.11	0	0.42	**0.20**
	Oct-85	Sep-15			Oct-85	Sep-11						
				NW_TS	Oct-70	Sep-76	937	0.238	0.07	0	0.31	0.14
					Oct-85	Sep-11						
				WR_WF	Oct-70	Sep-76	3,140	0.071	0.012	0	0.32	**0.023**
					Oct-85	Sep-11						
				Mangum	Oct-70	Sep-76	1,319	0.169	0.04	0	0.22	0.10
					Oct-85	Sep-11						
				SFAS06 (Brazos)	Oct-70	Sep-76	2,496	0.089	0.04	0	0.28	0.12
					Oct-85	Sep-11						
SW_BJ	Dec-59	Dec-18	584	WR_WF	Dec-59	Dec-18	3,140	0.186	**0.11**	**0**	**0.68**	0.11
				Mangum	Dec-59	Dec-18	1,319	0.443	0.29	0	0.33	0.46
				SFAS06 (Brazos)	Dec-59	Dec-18	2,496	0.234	0.38	0	0.58	0.57
				BRSE11 (Brazos)	Dec-59	Dec-18	5,972	0.098	0.11	0	0.65	0.14

Appendix G - Methods Considered to Fill Missing Naturalized Flow

Workbook ID	Period of Record		Contributing Drainage Area (mi2)	Fill Gage(s)	Overlap		Contributing Drainage Area (mi2)	Drainage Area Ratio	Scatter			Double Mass
	Start	End			Start	End			Slope	Intercept	R2	
WR_SM	Dec-59	Sep-79	1,874	WR_WF	Dec-59	Sep-79	3,140	0.597	**0.43**	**0**	**0.78**	0.46
	Oct-96	Dec-18			Oct-96	Dec-18						
				SWBJ + NWTS	Dec-59	Sep-79	1,521	1.232	1.48	0	0.85	1.74
					Oct-96	Dec-18						
				WR_MB	Dec-59	Sep-79	2,086	0.898	**0.82**	**0**	**0.94**	0.82
					Oct-96	Dec-18						
				WRMB-SWBJ-NWTS	Dec-59	Sep-79	565	3.32	1.11	0	0.64	1.54
					Oct-96	Dec-18						
				Mangum	Dec-59	Sep-79	1,319	1.421	0.88	0	0.31	1.82
					Oct-96	Dec-18						
				BRSE11 (Brazos)	Dec-59	Sep-79	5,972	0.314	0.39	0	0.62	0.58
					Oct-96	Dec-18						
WR_MB	Oct-59	Dec-18	2,086	WR_WF	Oct-59	Dec-18	3,140	0.664	**0.56**	**0**	**0.90**	0.57
BC_ET	Mar-60	Dec-18	652	WR_WF	Mar-60	Dec-18	3,140	0.21	**0.28**	**0**	**0.85**	0.23
				WR_MB	Mar-60	Dec-18	2,086	0.313	0.44	0	0.72	0.40
WR_CH	Oct-67	Sep-18	3,439	WR_WF	Oct-67	Sep-18	3,140	1.095	**1.18**	**0**	**0.98**	1.26
				RR_TR (Texas)	Oct-67	Sep-18	12,512	0.27	0.31		0.92	0.35
LW_AC	Jan-48	Dec-55	481	LW_HN	Jan-53	Dec-55	1,037	0.464	0.495	0	0.93	**0.52**
	Sep-66	Dec-18			Sep-66	Dec-18						
				WR_WF	Jan-48	Dec-55	3,140	0.153	0.26	0	0.57	0.25
					Sep-66	Dec-18						
LW_HN	Jan-53	Dec-18	1,037	LW_AC	Jan-53	Dec-55	481	2.156	1.874	0	0.928	**1.94**
					Sep-66	Dec-18						0.52
				WR_WF	Jan-53	Dec-18	3,140	0.330	0.493	0	0.58	0.48
EF_HN	Dec-63	Dec-18	178	LW_HN	Dec-63	Dec-18	1,037	0.172	**0.21**	**0**	**0.76**	0.18
				LW_AC	Sep-66	Dec-18	481	0.370	**0.38**	**0**	**0.62**	0.37
				WR_WF	Dec-63	Dec-18	3,140	0.057	0.10	0	0.34	0.09
BODARC	Jul-06	Dec-18	327	Nat N Sulphur	Jul-06	Dec-17	276	1.185	0.96	0	0.89	0.94
				Nat S Sulphur	Jul-06	Dec-17	527	0.620	0.62	0	0.86	0.61
				RRAC	Jul-06	Dec-18	14,855	0.022	0.10	0	0.70	0.11
				Naturalized FM 1396	Jul-06	Dec-18	270	1.21	**1.13**	**0**	**0.99**	1.14
				RRAC-RRCB	Jul-06	Dec-18	1,089	0.300	**0.35**	**0**	**0.90**	0.31

Text in **bold underline** were selected for fill

Appendix H
Comparison of Updated Naturalized Flows to Original Naturalized Flows

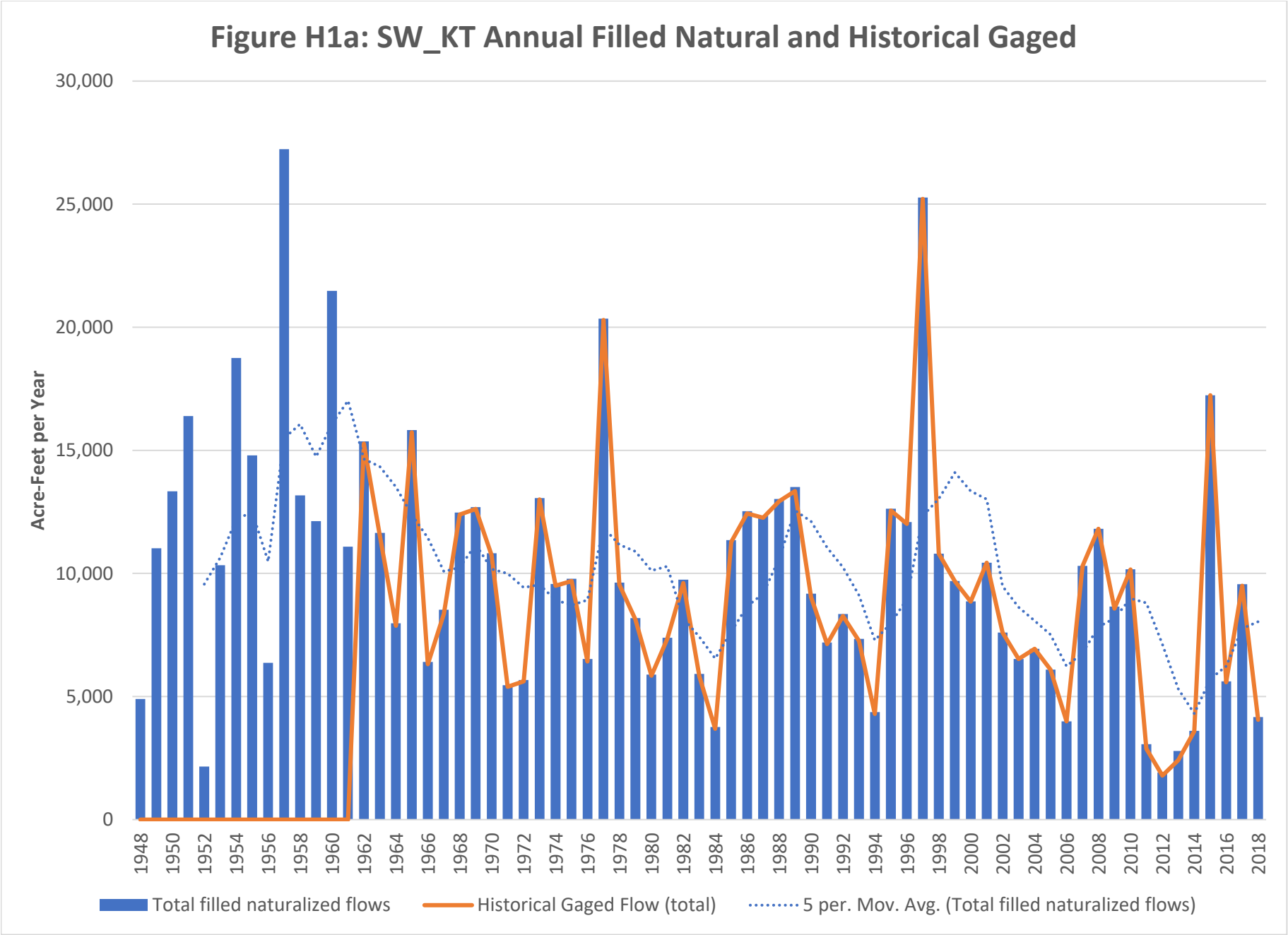


Figure H1a: SW_KT Annual Filled Natural and Historical Gaged
Acre-Feet per Year
30,000
25,000
20,000
15,000
10,000
5,000
0
1948
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
Total filled naturalized flows
Historical Gaged Flow (total)
5 per. Mov. Avg. (Total filled naturalized flows)

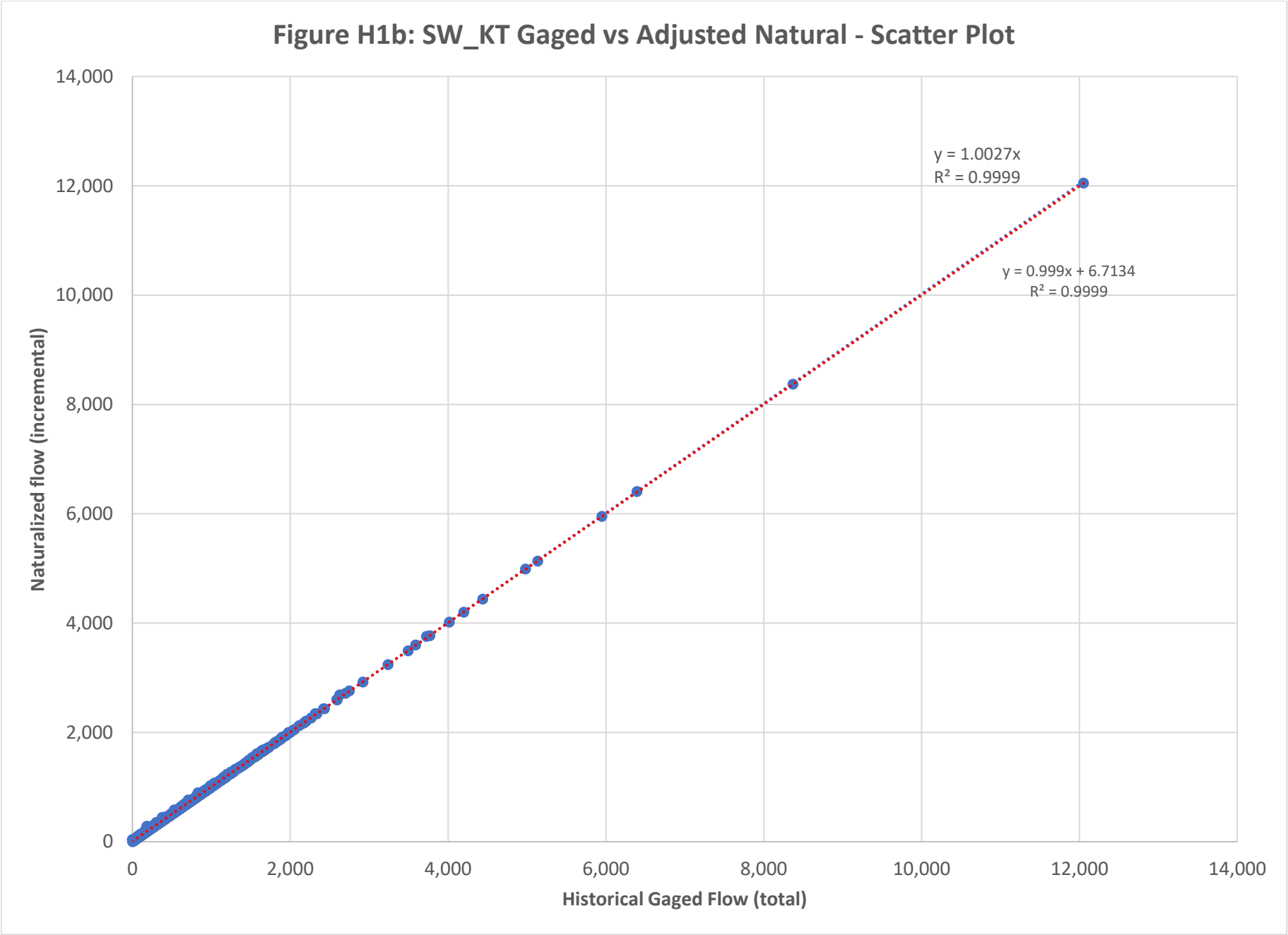


Figure H1b: SW_KT Gaged vs Adjusted Natural - Scatter Plot
y = 1.0027x
R² = 0.9999
y = 0.999x + 6.7134
R² = 0.9999
Naturalized flow (incremental)
Historical Gaged Flow (total)
0
2,000
4,000
6,000
8,000
10,000
12,000
14,000

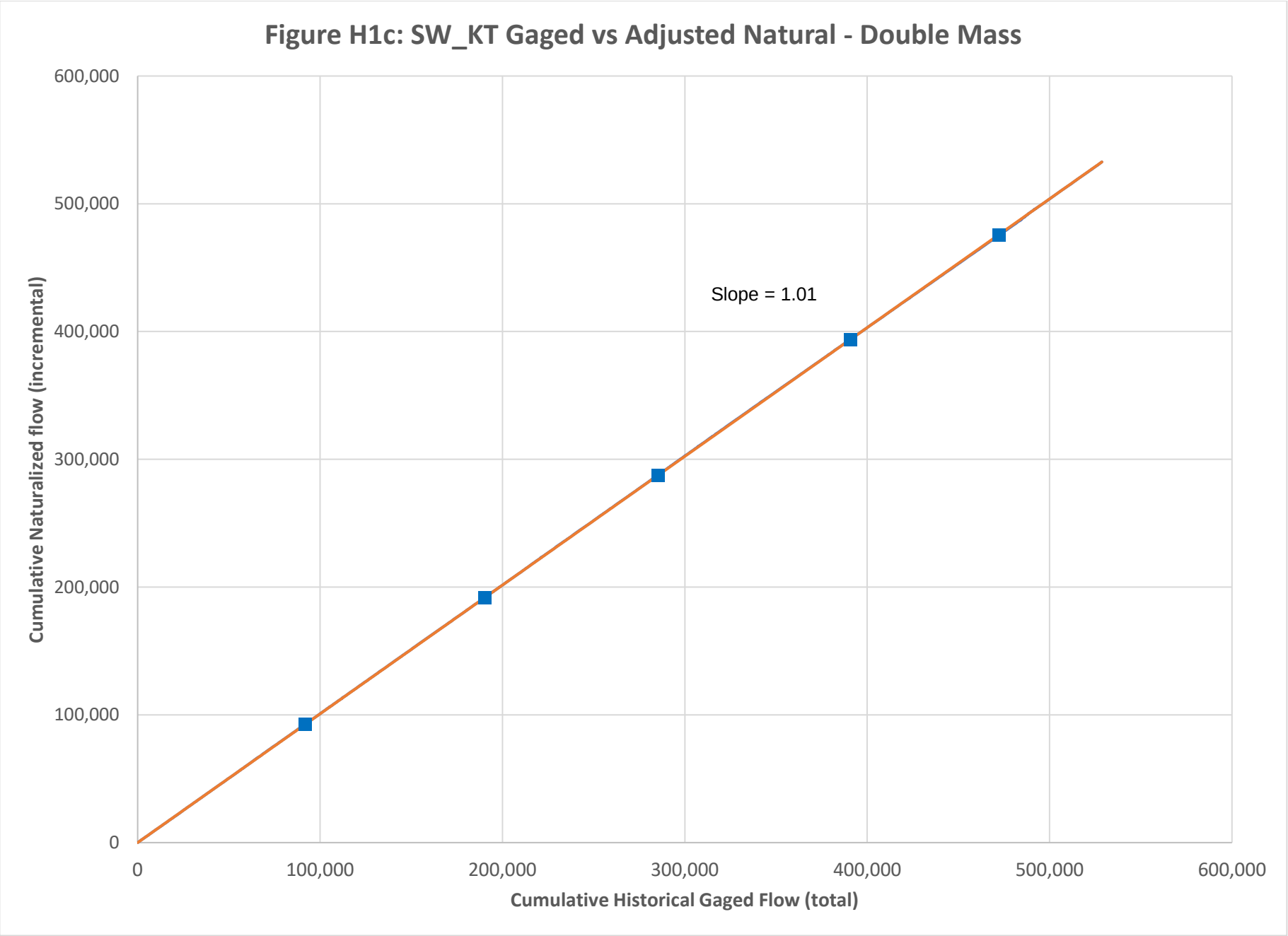


Figure H1c: SW_KT Gaged vs Adjusted Natural - Double Mass
Slope = 1.01
Cumulative Naturalized flow (incremental)
Cumulative Historical Gaged Flow (total)
0
100,000
200,000
300,000
400,000
500,000
600,000

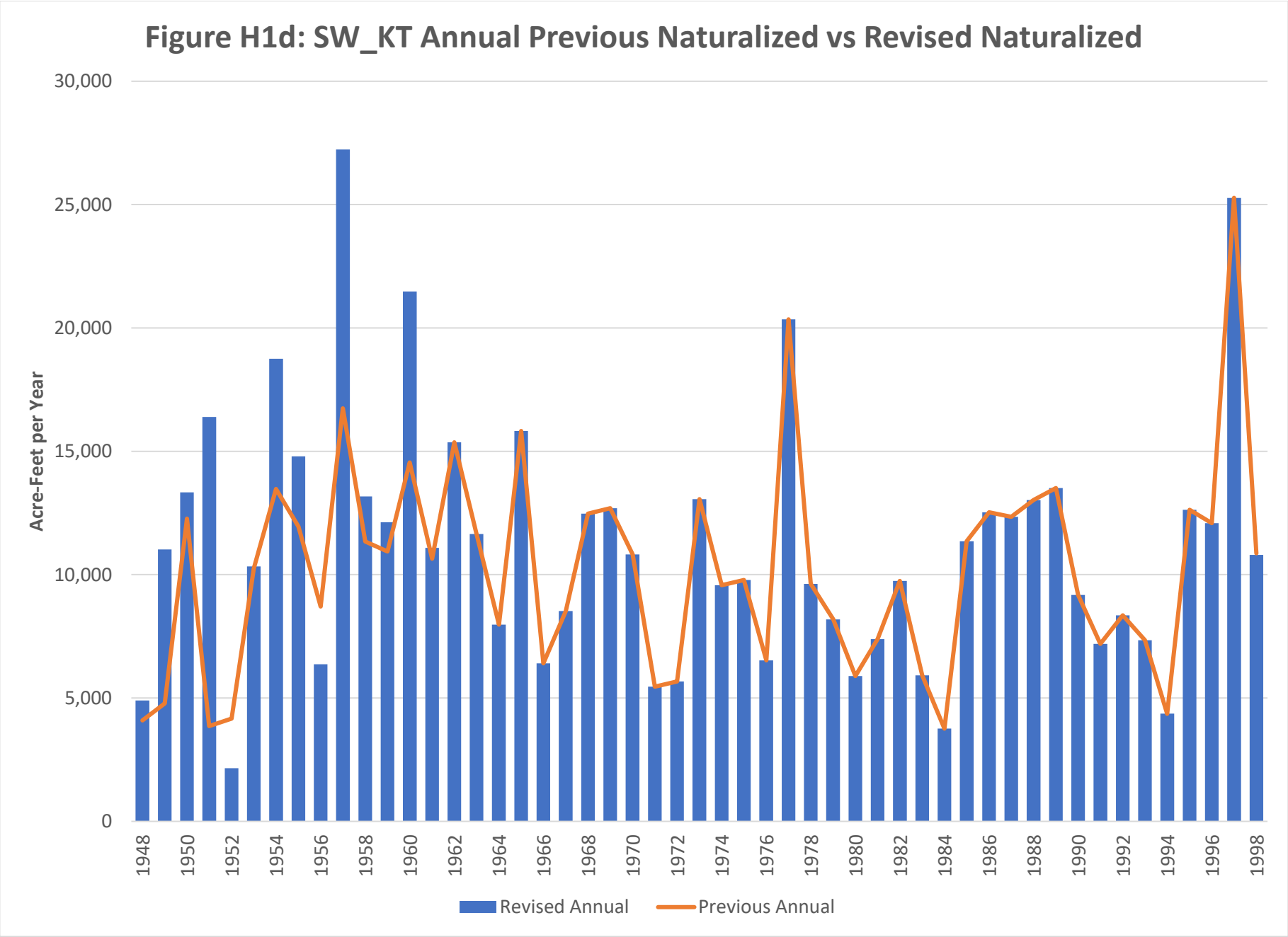


Figure H1d: SW_KT Annual Previous Naturalized vs Revised Naturalized
Acre-Feet per Year
30,000
25,000
20,000
15,000
10,000
5,000
0
1948
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
Revised Annual
Previous Annual

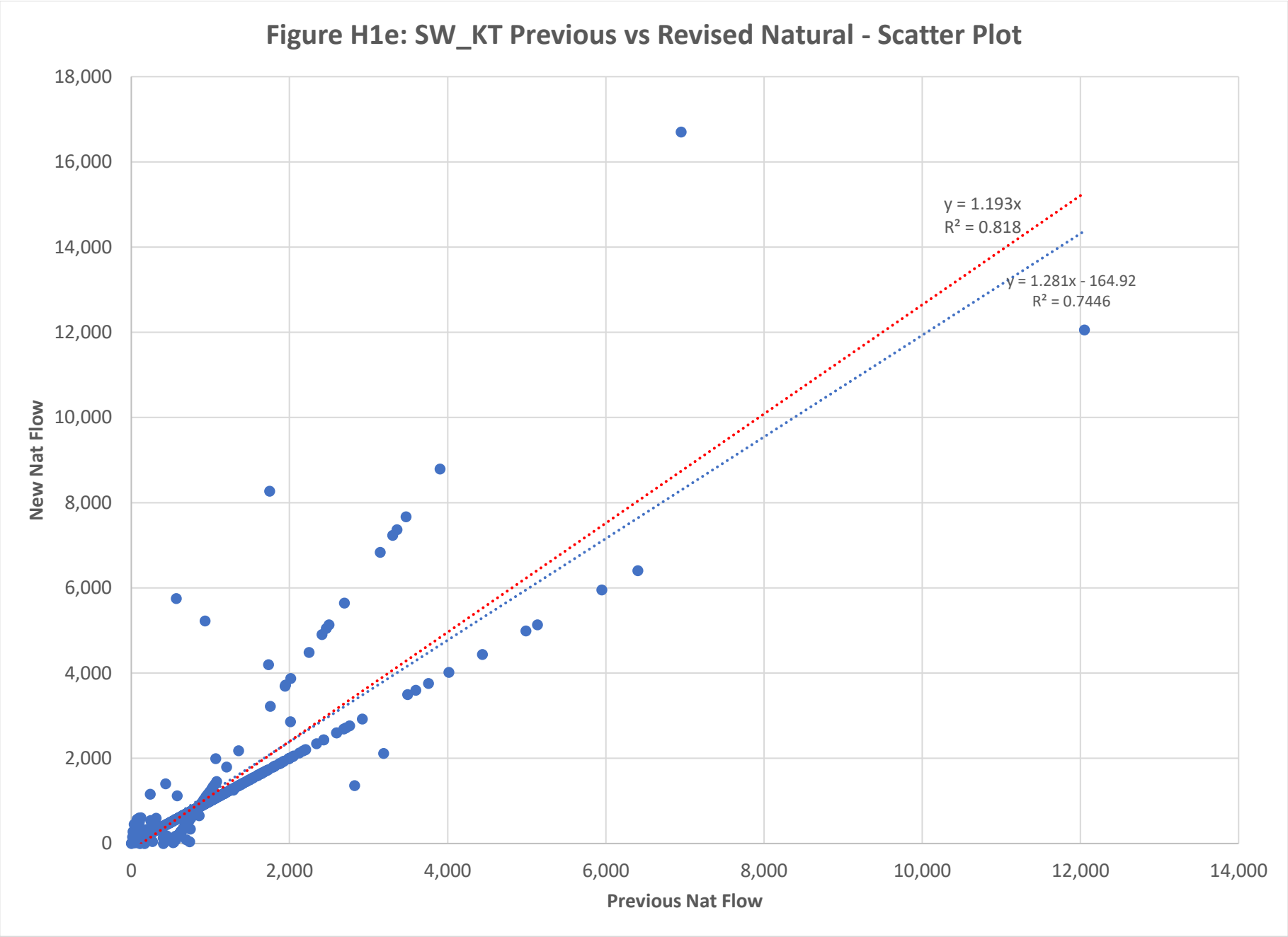


Figure H1e: SW_KT Previous vs Revised Natural - Scatter Plot
18,000
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
New Nat Flow
0
2,000
4,000
6,000
8,000
10,000
12,000
14,000
Previous Nat Flow
y = 1.193x
R² = 0.818
y = 1.281x - 164.92
R² = 0.7446

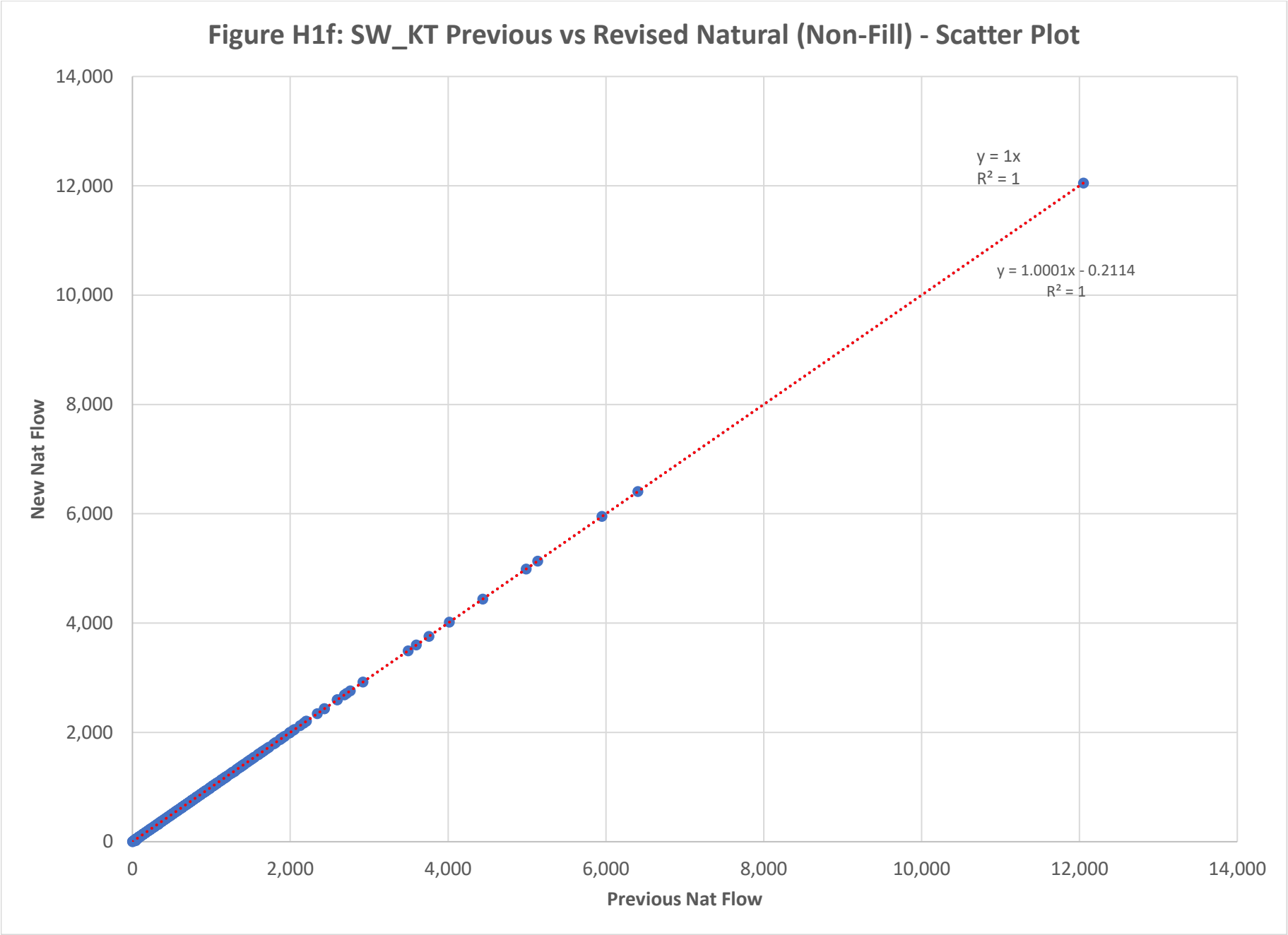


Figure H1f: SW_KT Previous vs Revised Natural (Non-Fill) - Scatter Plot
y = 1x
R² = 1
y = 1.0001x - 0.2114
R² = 1
New Nat Flow
Previous Nat Flow
0
2,000
4,000
6,000
8,000
10,000
12,000
14,000


Figure H1g: SW_KT Previous vs Revised Natural - Double Mass
600,000
500,000
400,000
300,000
200,000
100,000
0
Cumulative New Nat Flow
Slope = 1.09
0
100,000
200,000
300,000
400,000
500,000
600,000
Cumulative Previous Nat Flow

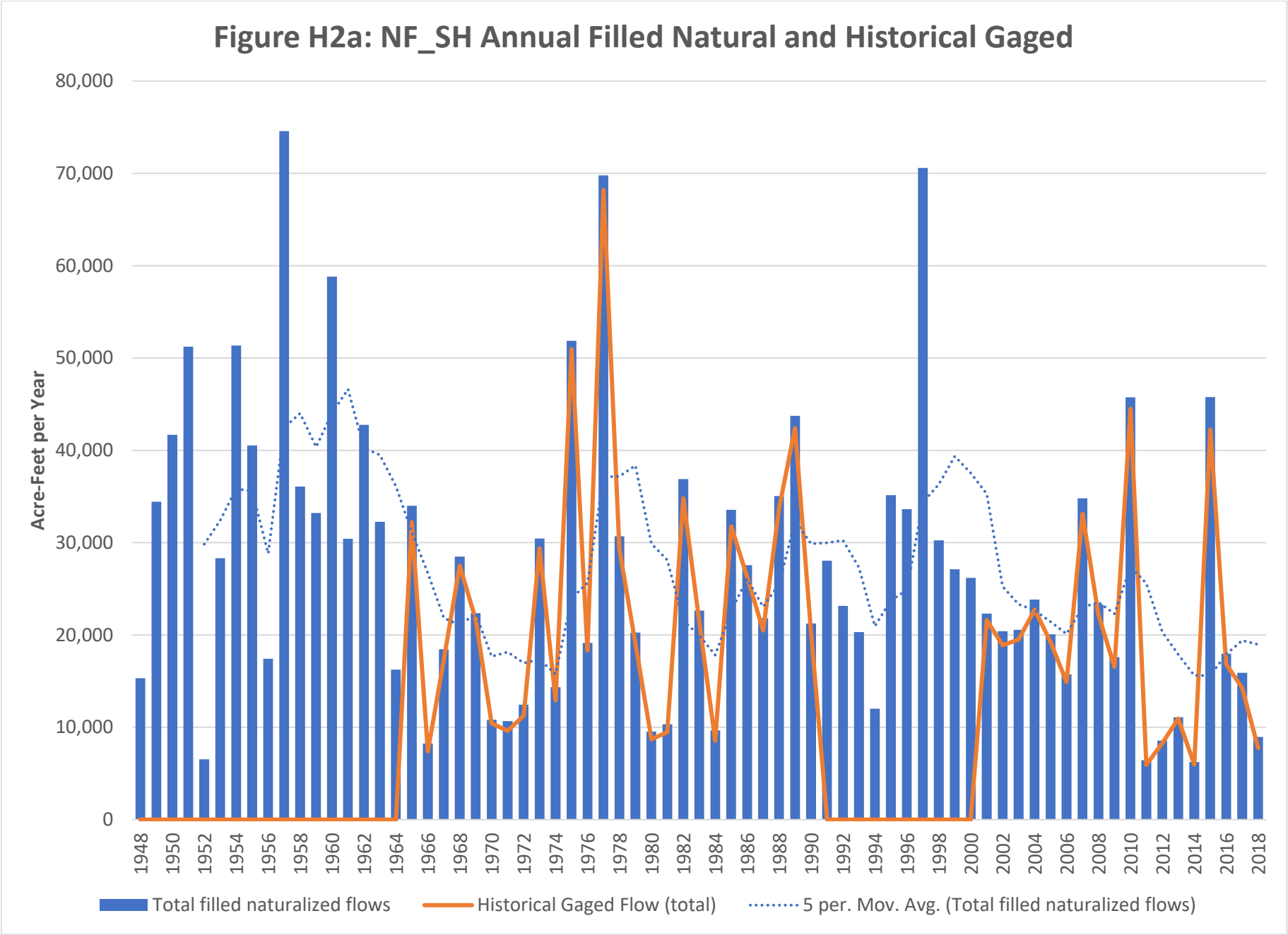


Figure H2a: NF_SH Annual Filled Natural and Historical Gaged
Acre-Feet per Year
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
1948
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
Total filled naturalized flows
Historical Gaged Flow (total)
5 per. Mov. Avg. (Total filled naturalized flows)

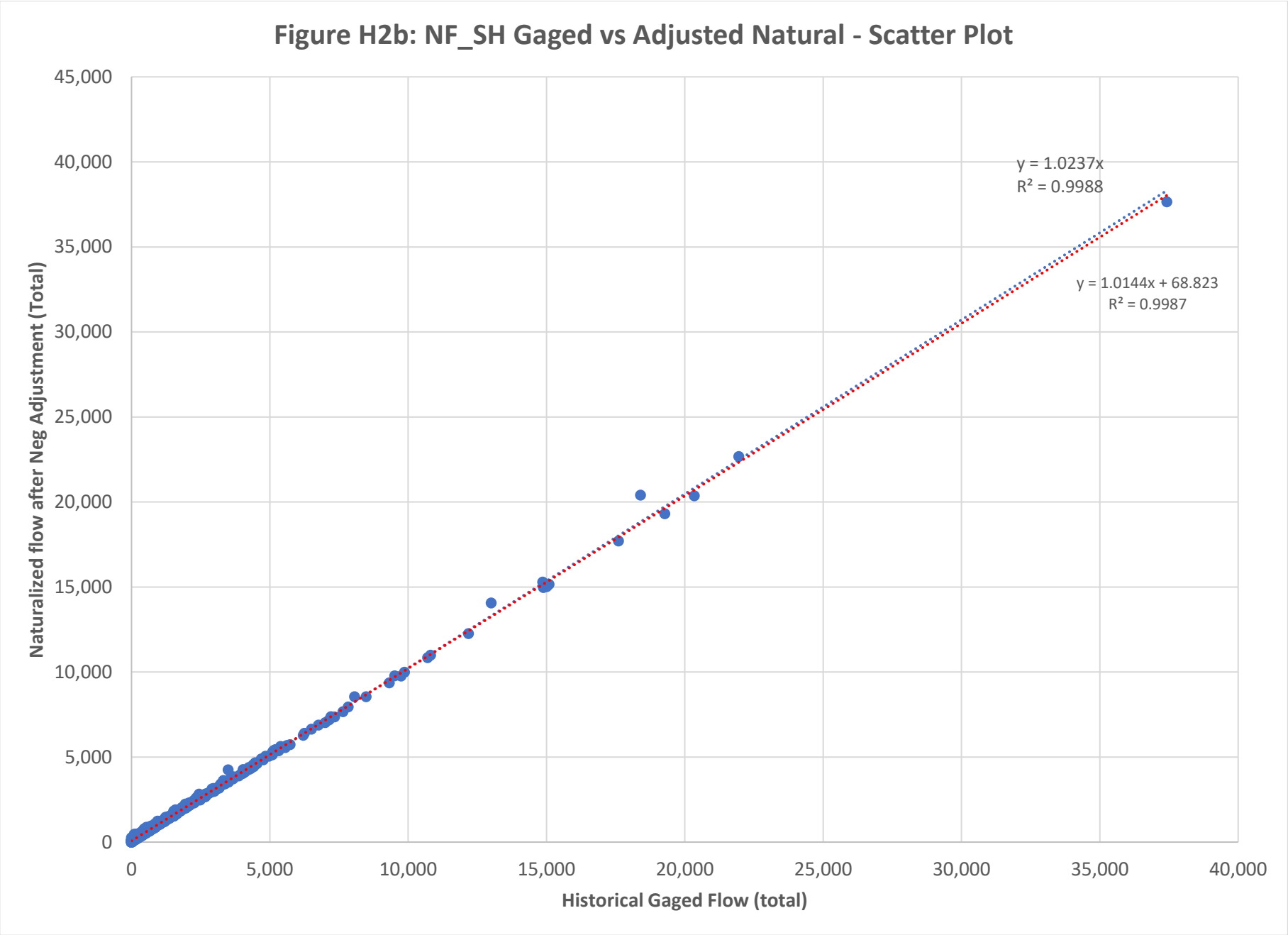


Figure H2b: NF_SH Gaged vs Adjusted Natural - Scatter Plot
y = 1.0237x
R² = 0.9988
y = 1.0144x + 68.823
R² = 0.9987
Naturalized flow after Neg Adjustment (Total)
Historical Gaged Flow (total)
0
5,000
10,000
15,000
20,000
25,000
30,000
35,000
40,000
45,000

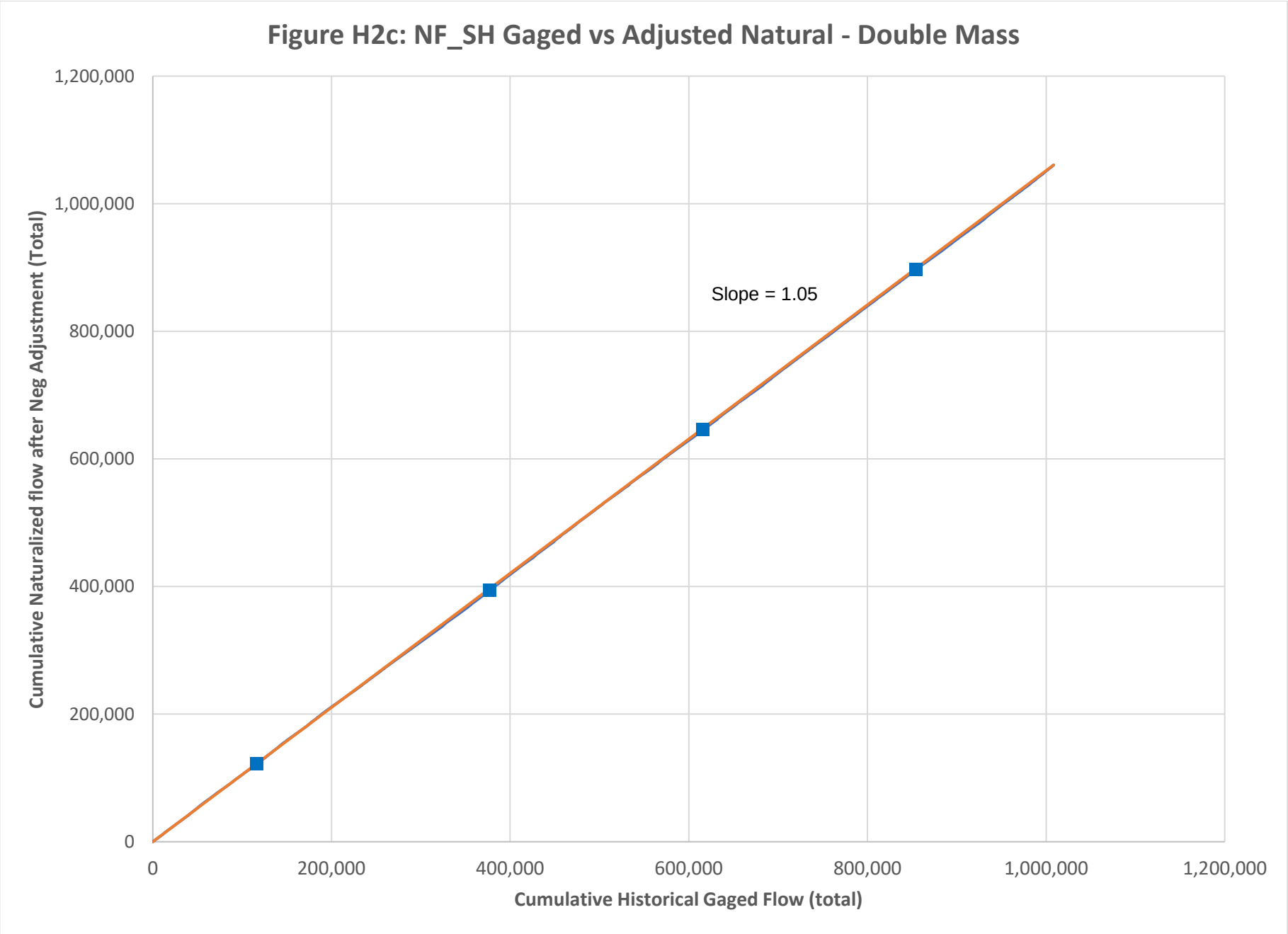


Figure H2c: NF_SH Gaged vs Adjusted Natural - Double Mass
Slope = 1.05
Cumulative Naturalized flow after Neg Adjustment (Total)
Cumulative Historical Gaged Flow (total)
0
200,000
400,000
600,000
800,000
1,000,000
1,200,000

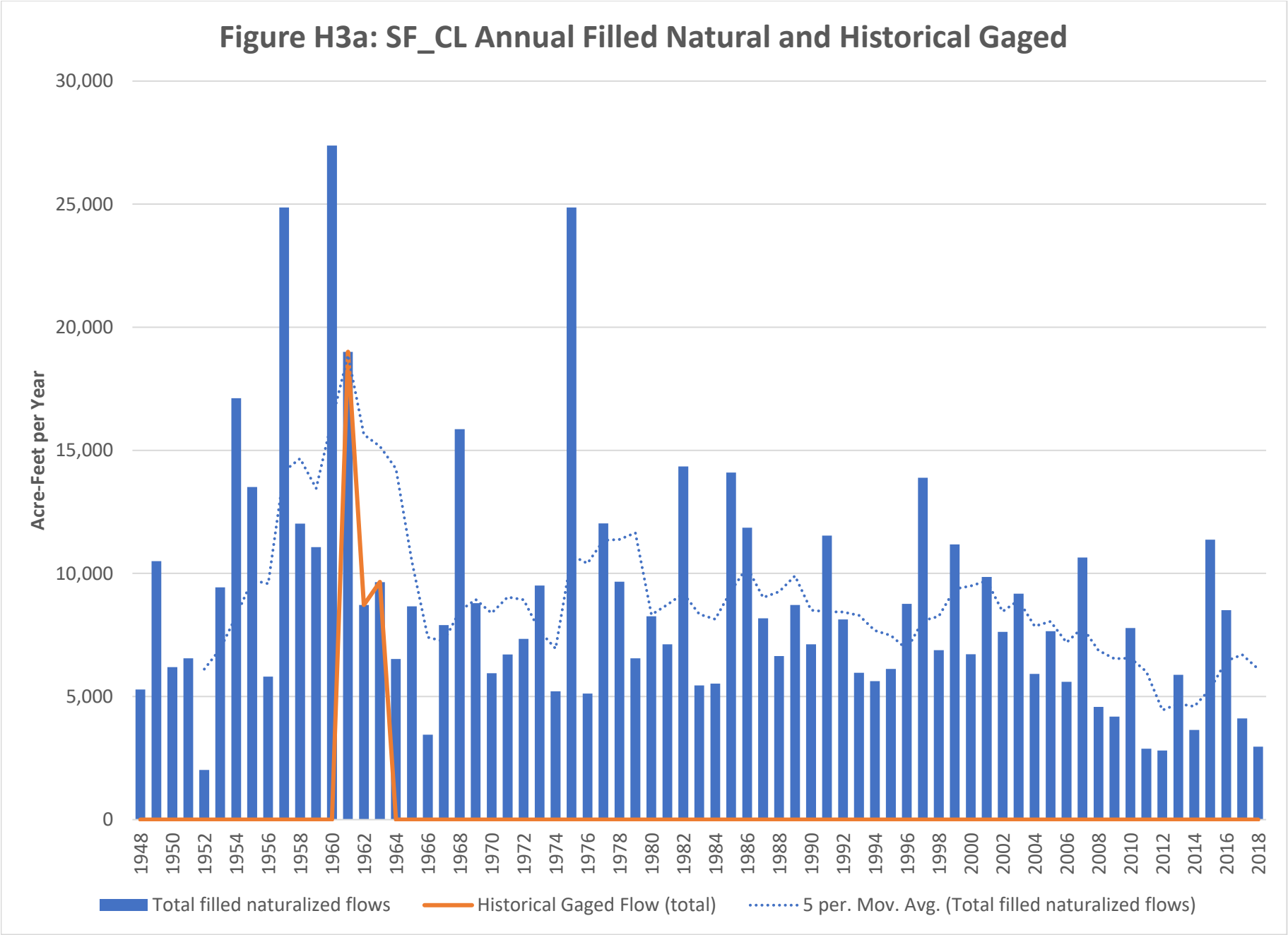


Figure H3a: SF_CL Annual Filled Natural and Historical Gaged
Acre-Feet per Year
30,000
25,000
20,000
15,000
10,000
5,000
0
1948
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
Total filled naturalized flows
Historical Gaged Flow (total)
5 per. Mov. Avg. (Total filled naturalized flows)

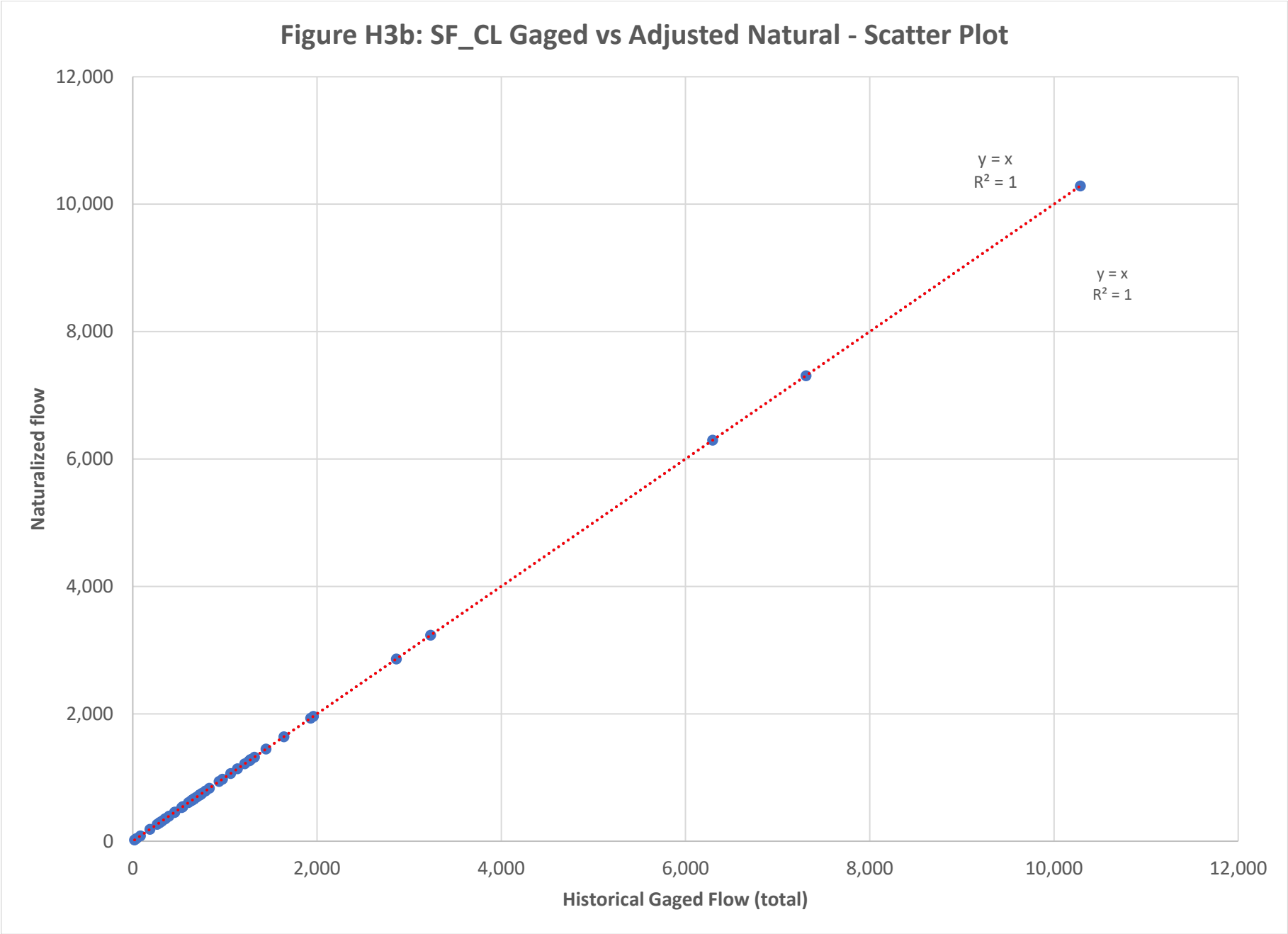


Figure H3b: SF_CL Gaged vs Adjusted Natural - Scatter Plot
12,000
10,000
8,000
6,000
4,000
2,000
0
Naturalized flow
0
2,000
4,000
6,000
8,000
10,000
12,000
Historical Gaged Flow (total)
y = x
R² = 1
y = x
R² = 1

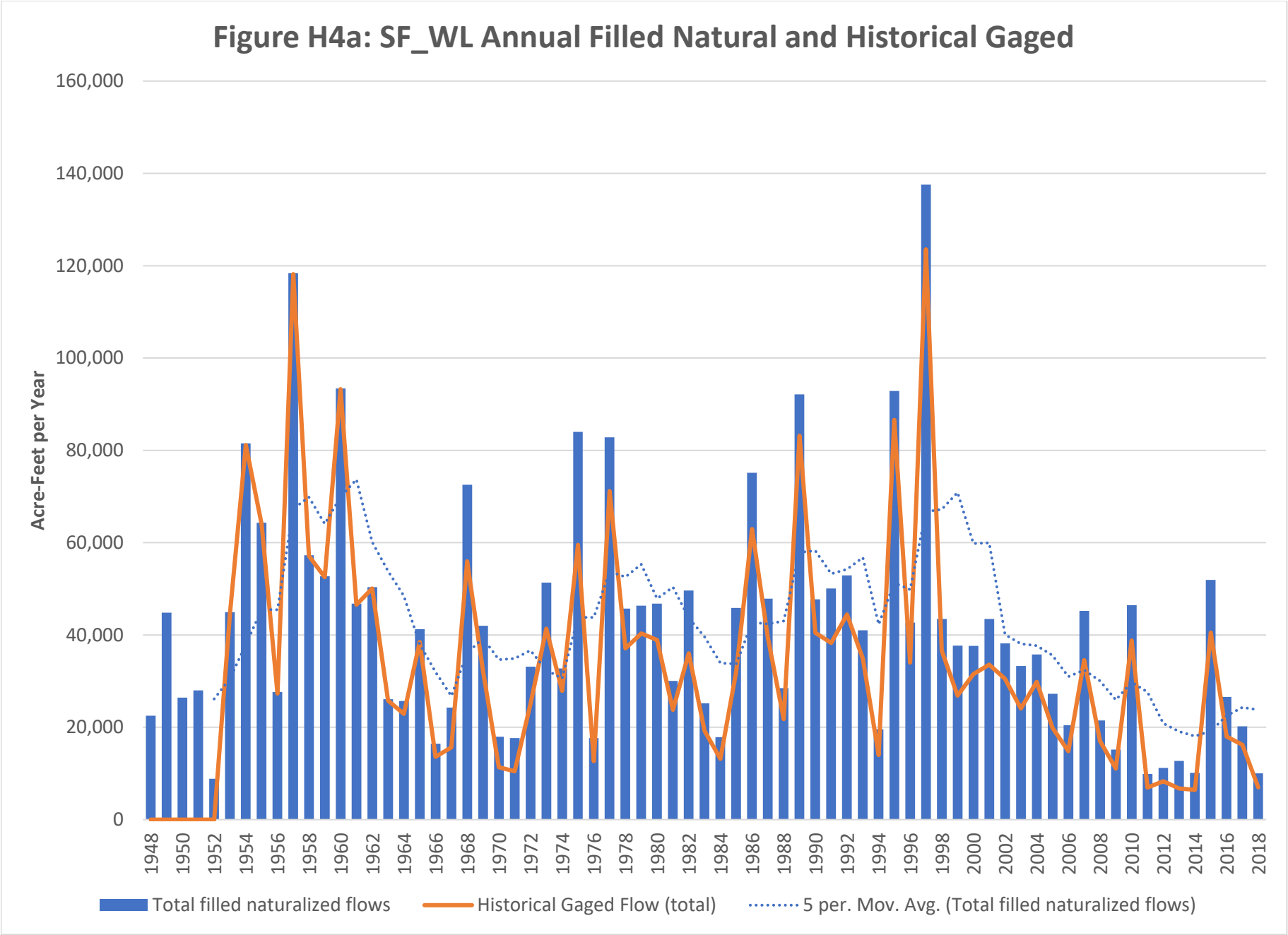


Figure H4a: SF_WL Annual Filled Natural and Historical Gaged
Acre-Feet per Year
160,000
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
1948
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
Total filled naturalized flows
Historical Gaged Flow (total)
5 per. Mov. Avg. (Total filled naturalized flows)

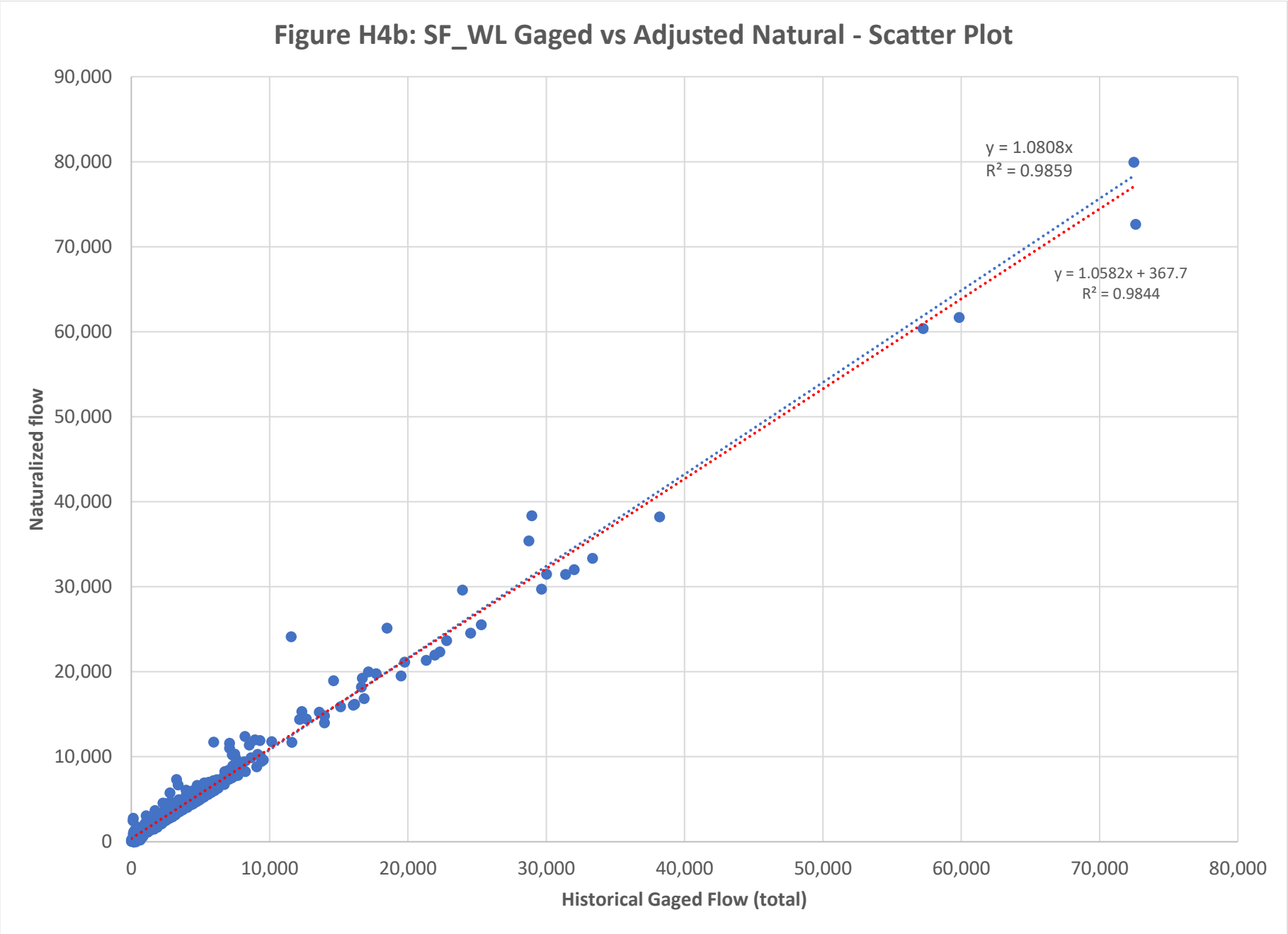


Figure H4b: SF_WL Gaged vs Adjusted Natural - Scatter Plot
y = 1.0808x
R² = 0.9859
y = 1.0582x + 367.7
R² = 0.9844
Naturalized flow
Historical Gaged Flow (total)
0
10,000
20,000
30,000
40,000
50,000
60,000
70,000
80,000
90,000

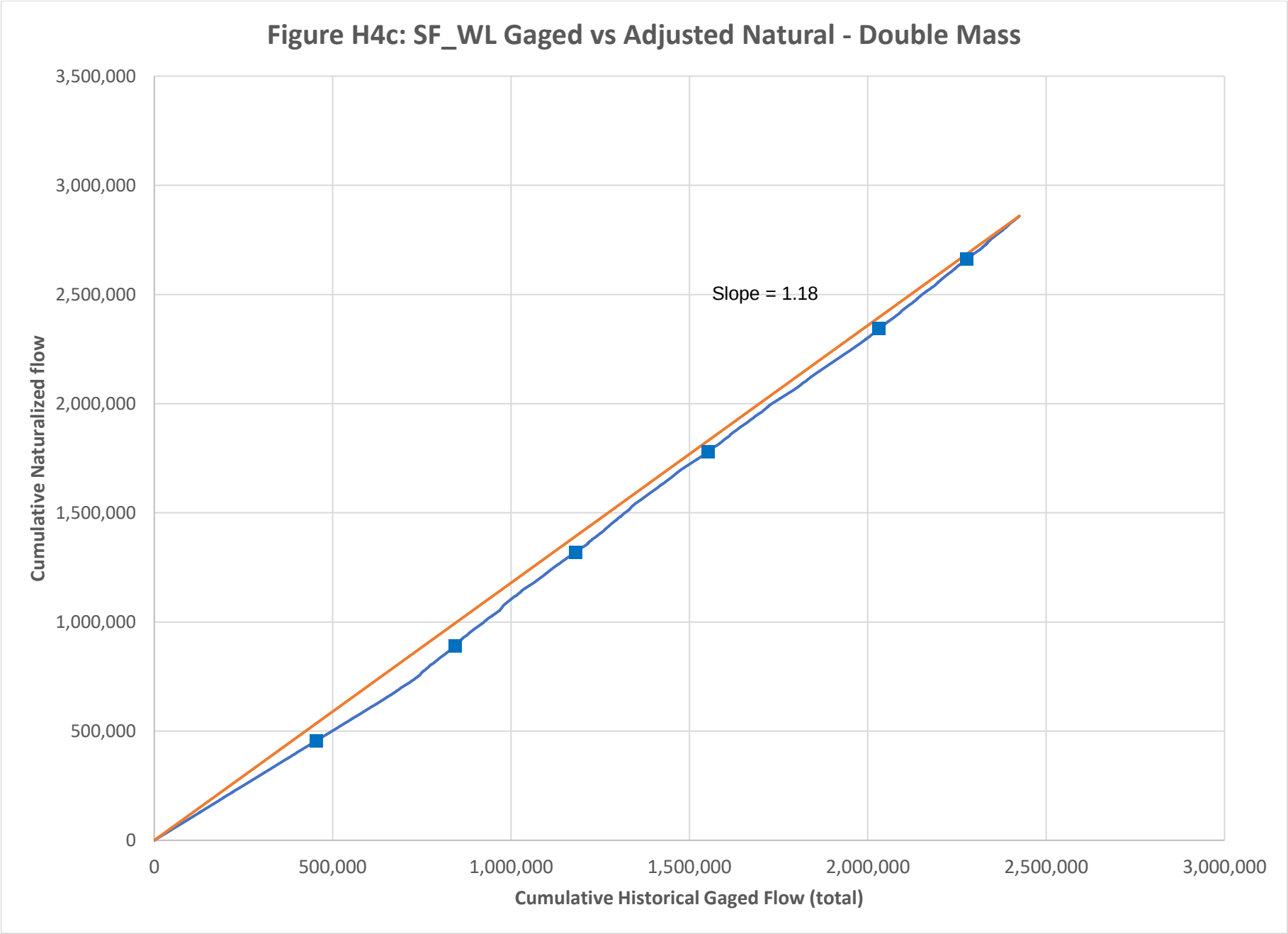


Figure H4c: SF_WL Gaged vs Adjusted Natural - Double Mass
Slope = 1.18
Cumulative Naturalized flow
Cumulative Historical Gaged Flow (total)
0
500,000
1,000,000
1,500,000
2,000,000
2,500,000
3,000,000
3,500,000

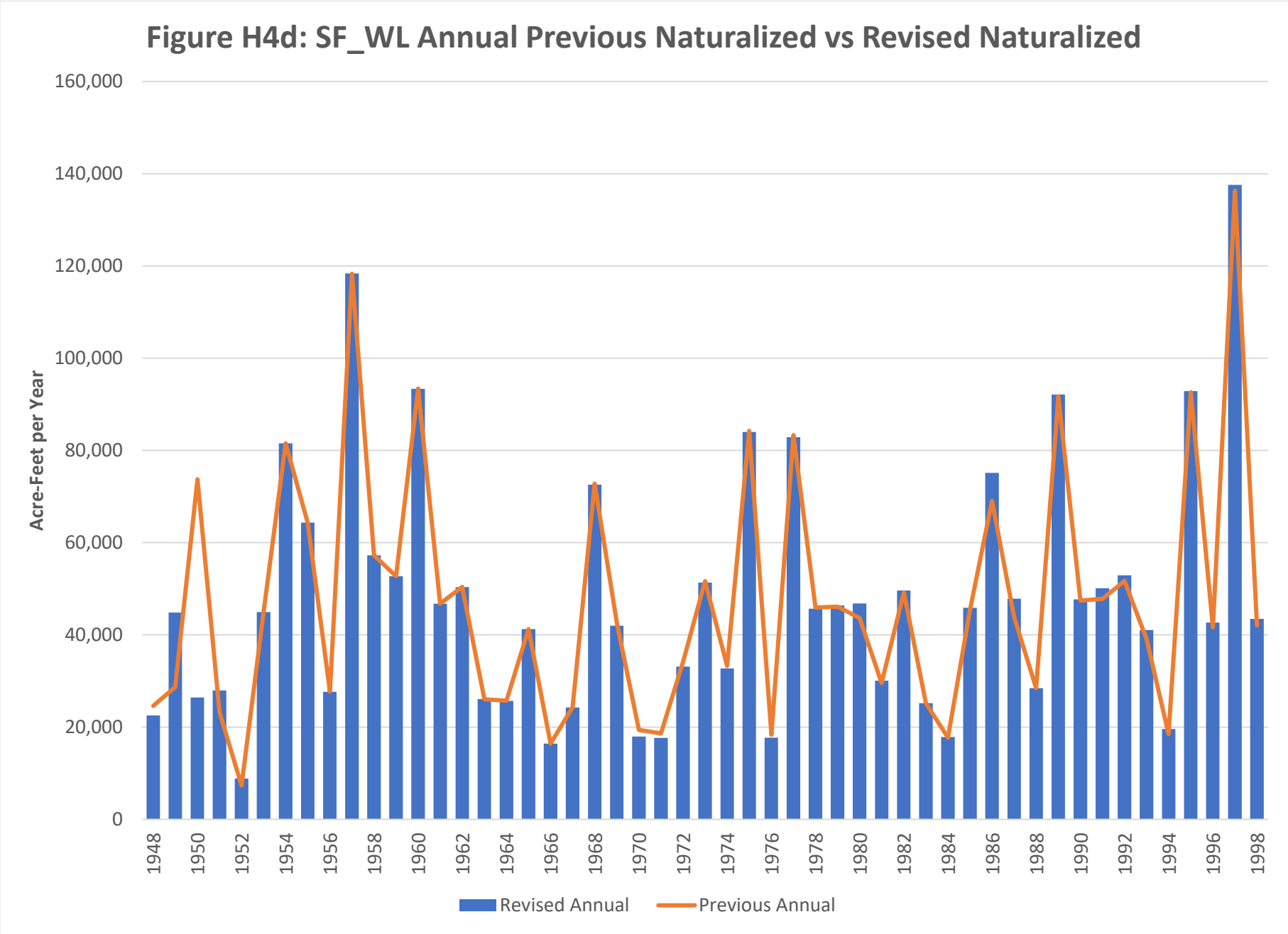


Figure H4d: SF_WL Annual Previous Naturalized vs Revised Naturalized
Acre-Feet per Year
160,000
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
1948
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
Revised Annual
Previous Annual

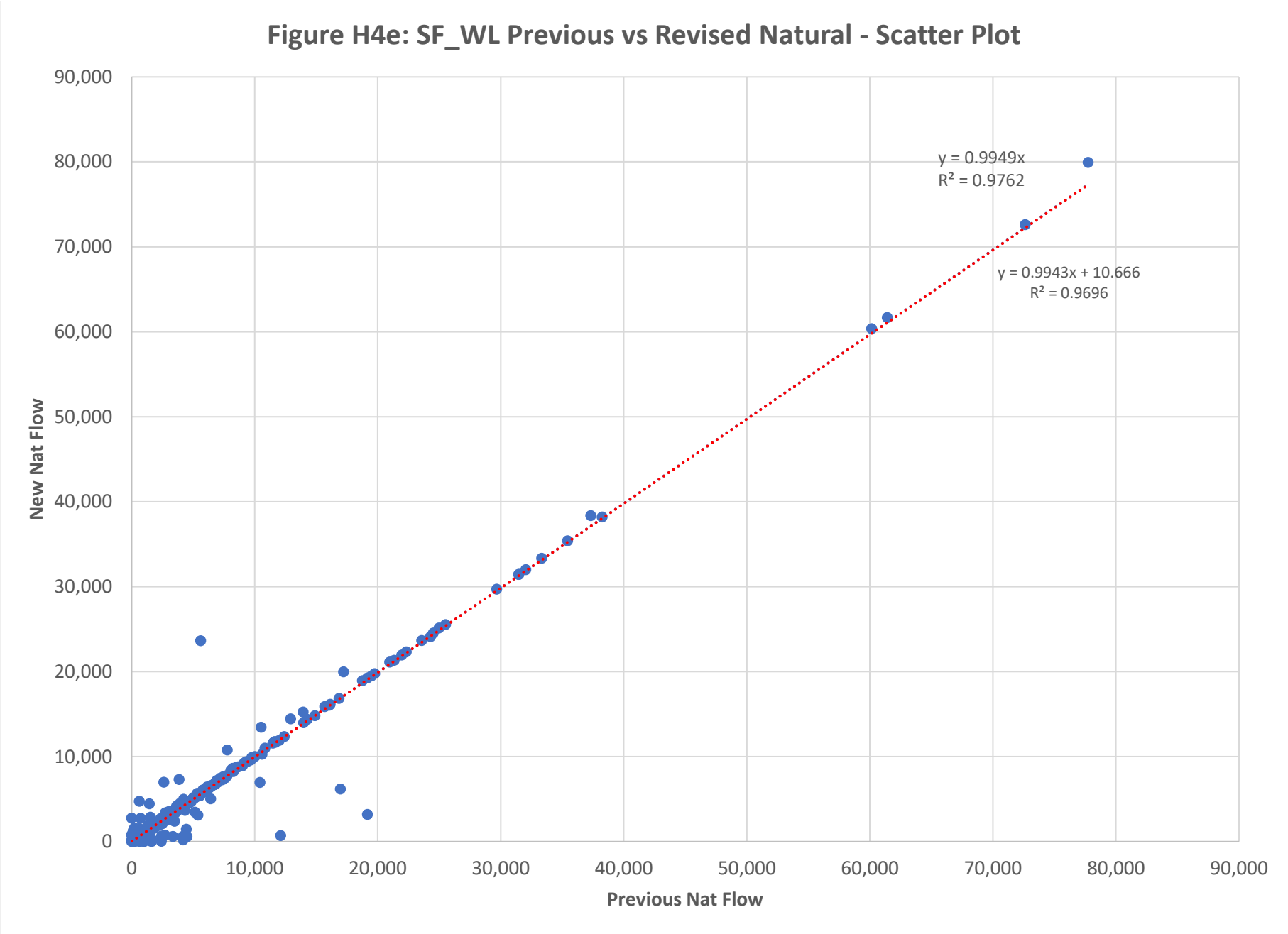


Figure H4e: SF_WL Previous vs Revised Natural - Scatter Plot
y = 0.9949x
R² = 0.9762
y = 0.9943x + 10.666
R² = 0.9696
New Nat Flow
Previous Nat Flow
0
10,000
20,000
30,000
40,000
50,000
60,000
70,000
80,000
90,000

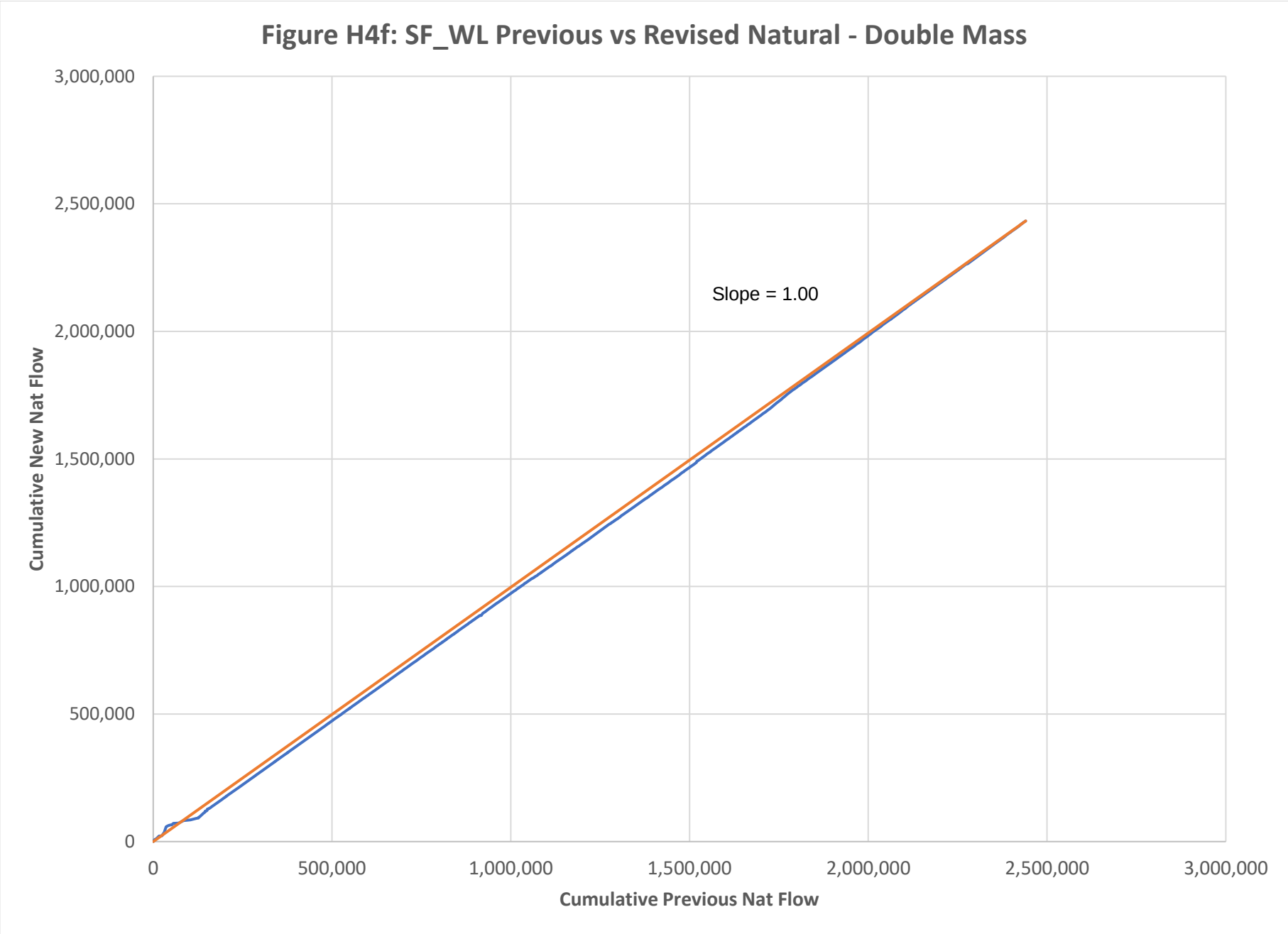


Figure H4f: SF_WL Previous vs Revised Natural - Double Mass
Slope = 1.00
Cumulative New Nat Flow
Cumulative Previous Nat Flow
0
500,000
1,000,000
1,500,000
2,000,000
2,500,000
3,000,000

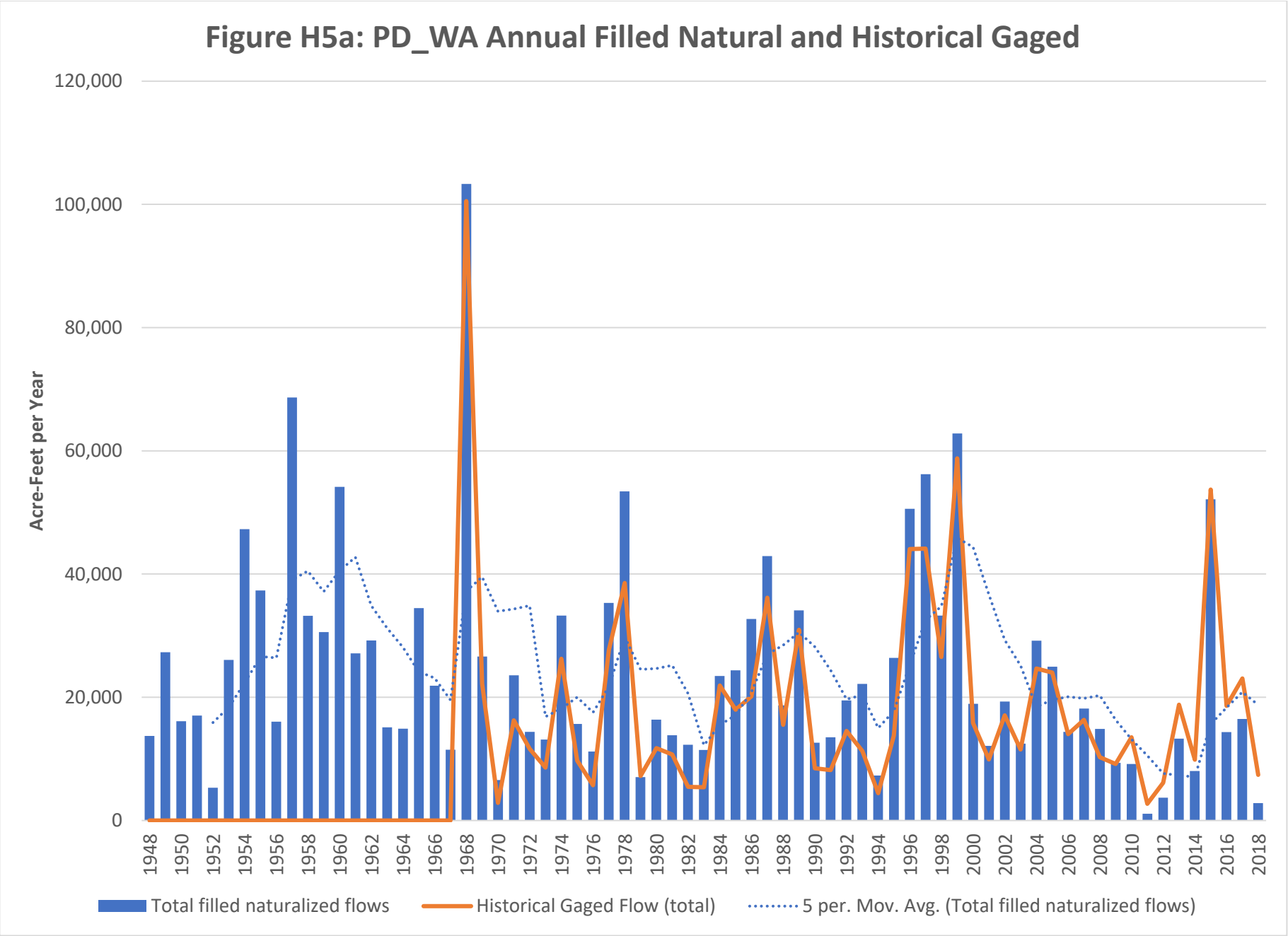


Figure H5a: PD_WA Annual Filled Natural and Historical Gaged
Acre-Feet per Year
120,000
100,000
80,000
60,000
40,000
20,000
0
1948
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
Total filled naturalized flows
Historical Gaged Flow (total)
5 per. Mov. Avg. (Total filled naturalized flows)

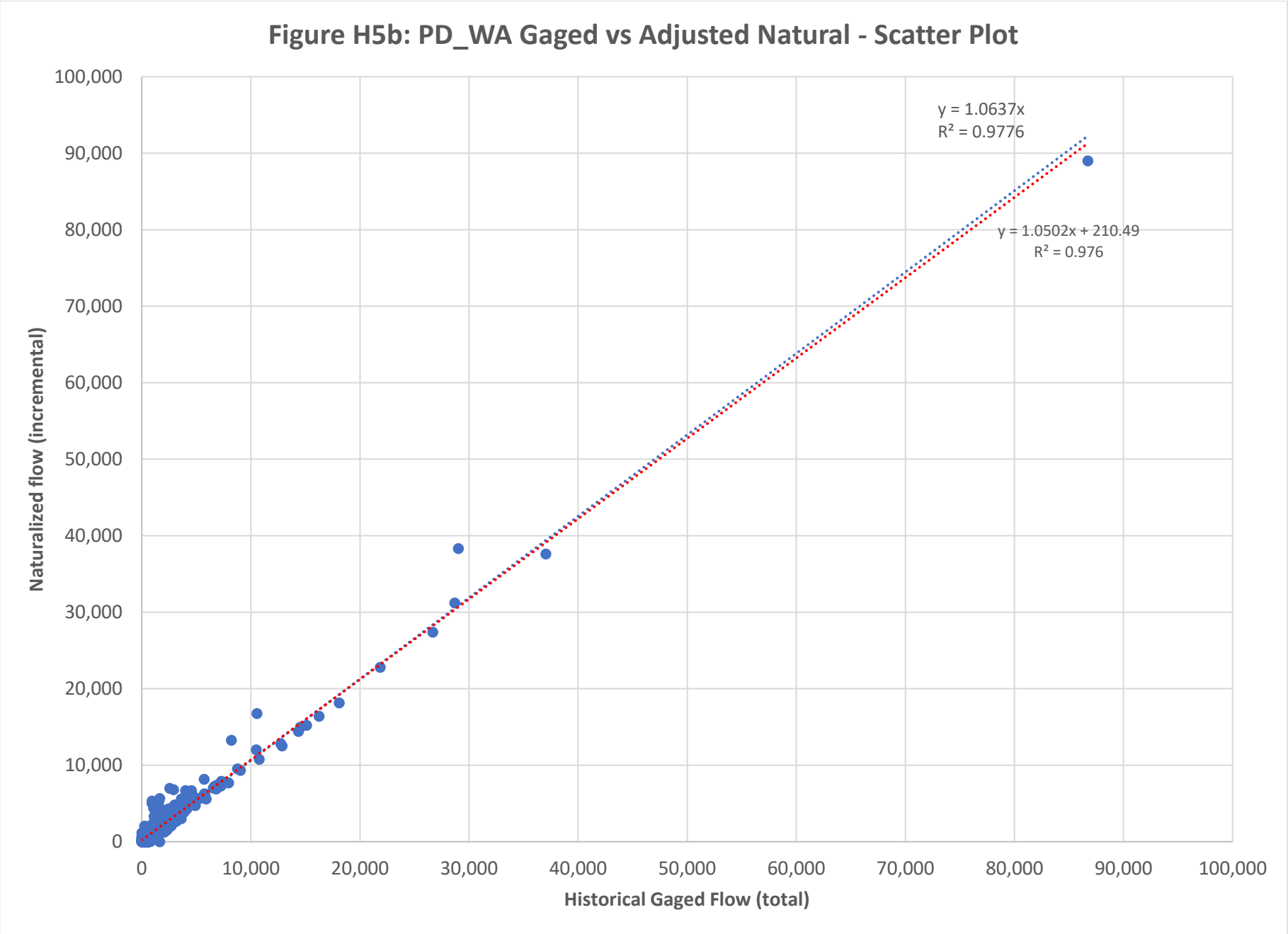


Figure H5b: PD_WA Gaged vs Adjusted Natural - Scatter Plot
y = 1.0637x
R² = 0.9776
y = 1.0502x + 210.49
R² = 0.976
Naturalized flow (incremental)
Historical Gaged Flow (total)
0
10,000
20,000
30,000
40,000
50,000
60,000
70,000
80,000
90,000
100,000

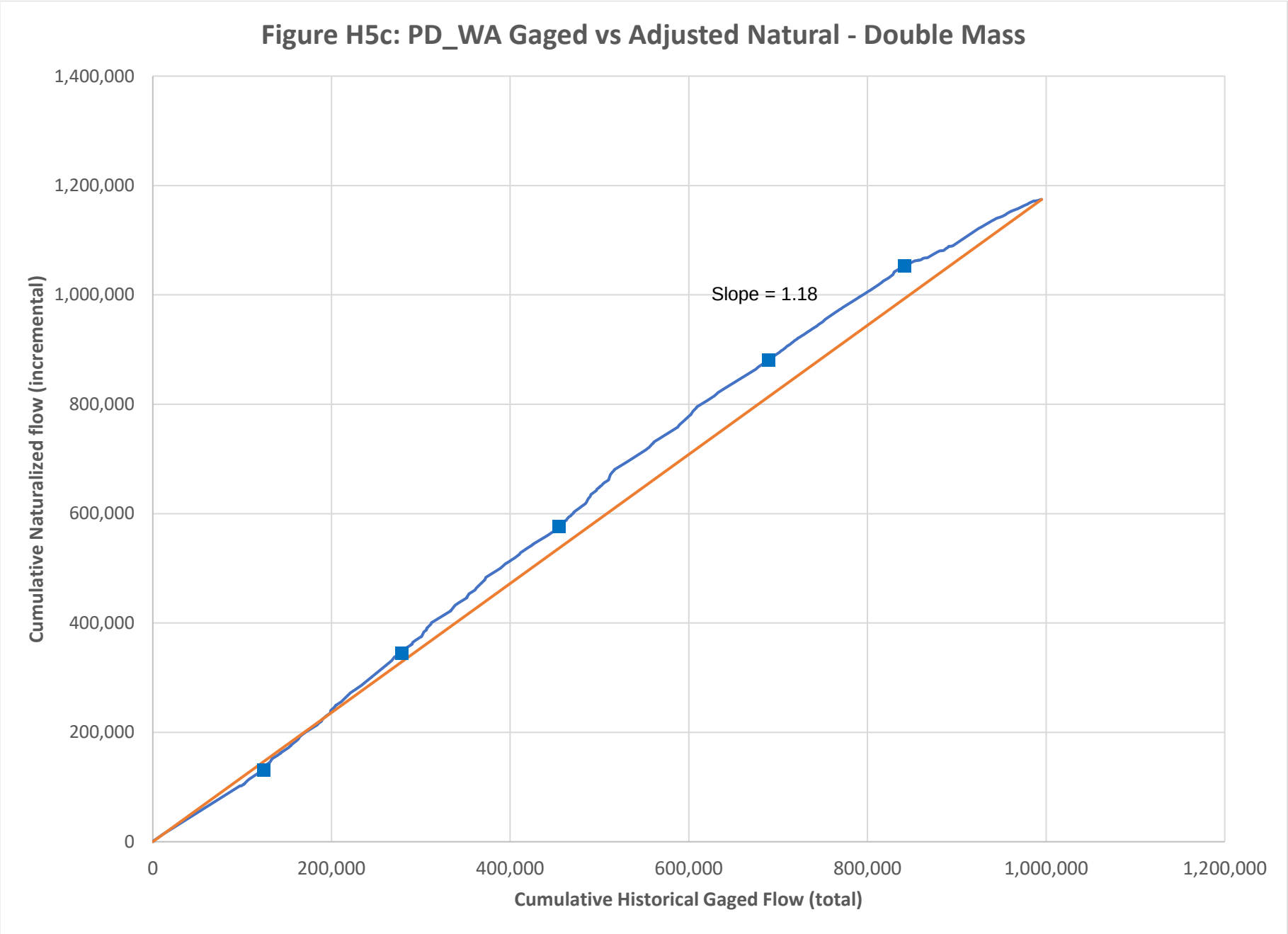


Figure H5c: PD_WA Gaged vs Adjusted Natural - Double Mass
Slope = 1.18
Cumulative Naturalized flow (incremental)
Cumulative Historical Gaged Flow (total)
0
200,000
400,000
600,000
800,000
1,000,000
1,200,000
1,400,000

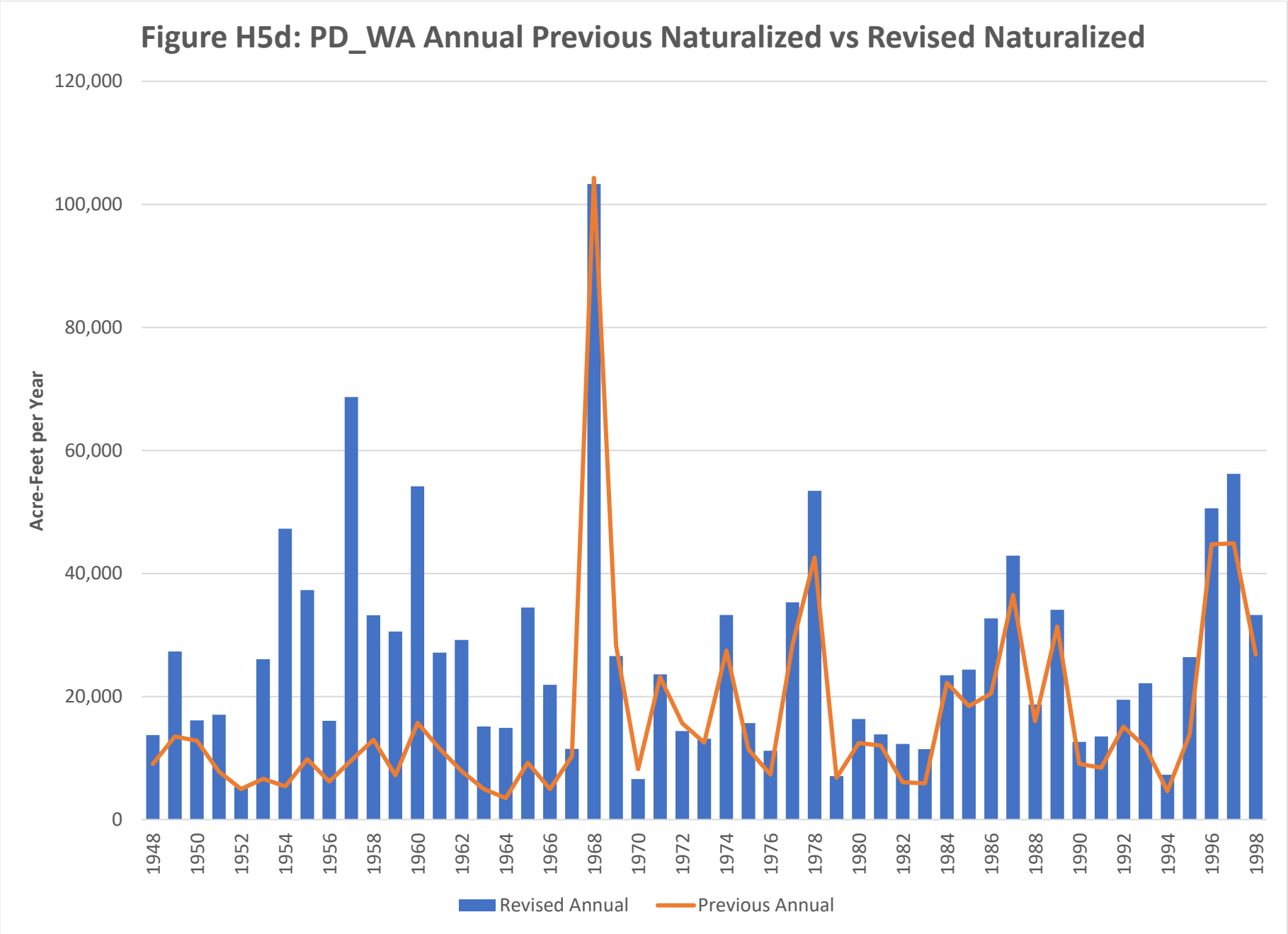


Figure H5d: PD_WA Annual Previous Naturalized vs Revised Naturalized
Acre-Feet per Year
120,000
100,000
80,000
60,000
40,000
20,000
0
1948
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
Revised Annual
Previous Annual

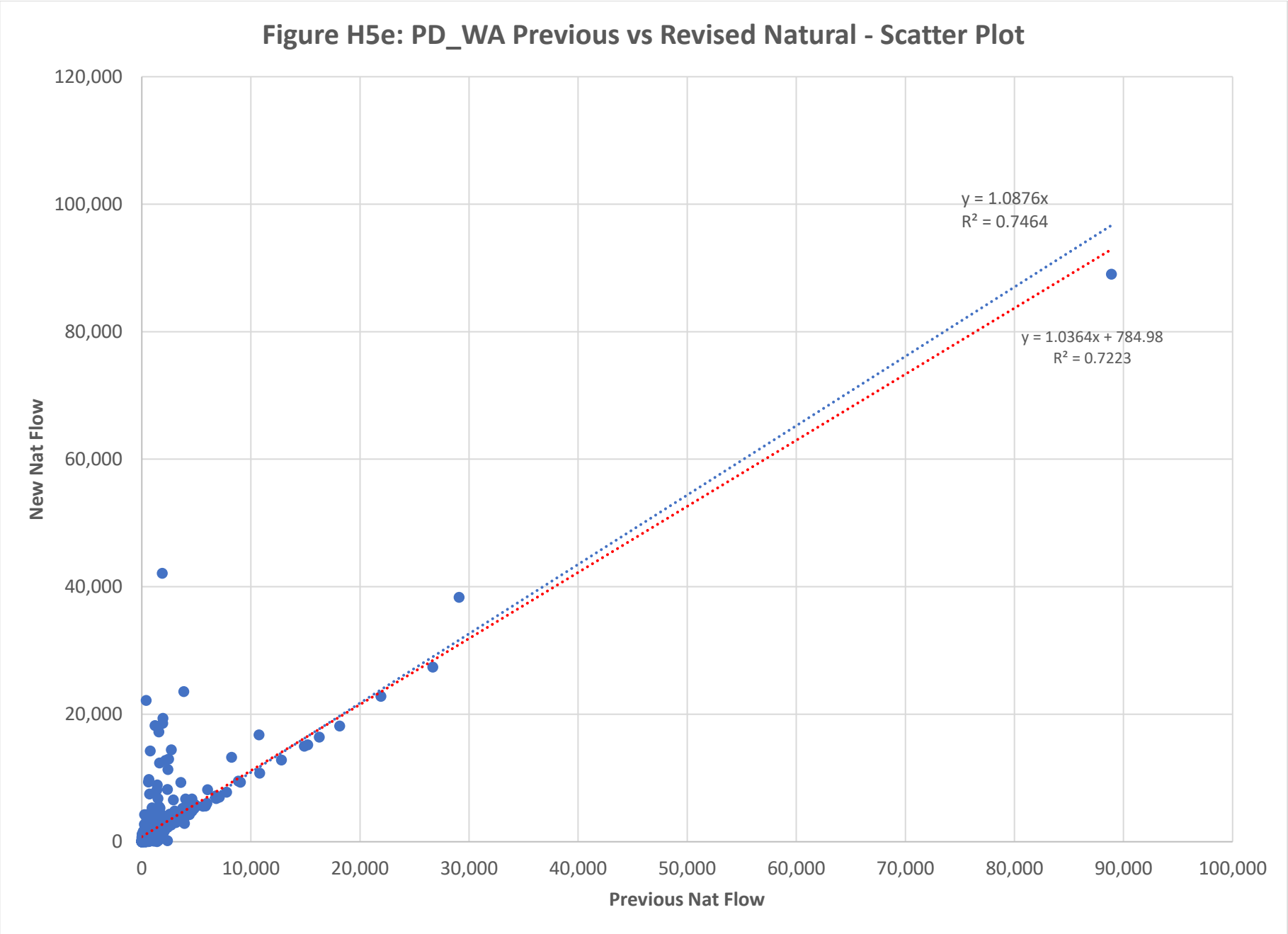


Figure H5e: PD_WA Previous vs Revised Natural - Scatter Plot
120,000
100,000
80,000
60,000
40,000
20,000
0
New Nat Flow
0
10,000
20,000
30,000
40,000
50,000
60,000
70,000
80,000
90,000
100,000
Previous Nat Flow
y = 1.0876x
R² = 0.7464
y = 1.0364x + 784.98
R² = 0.7223

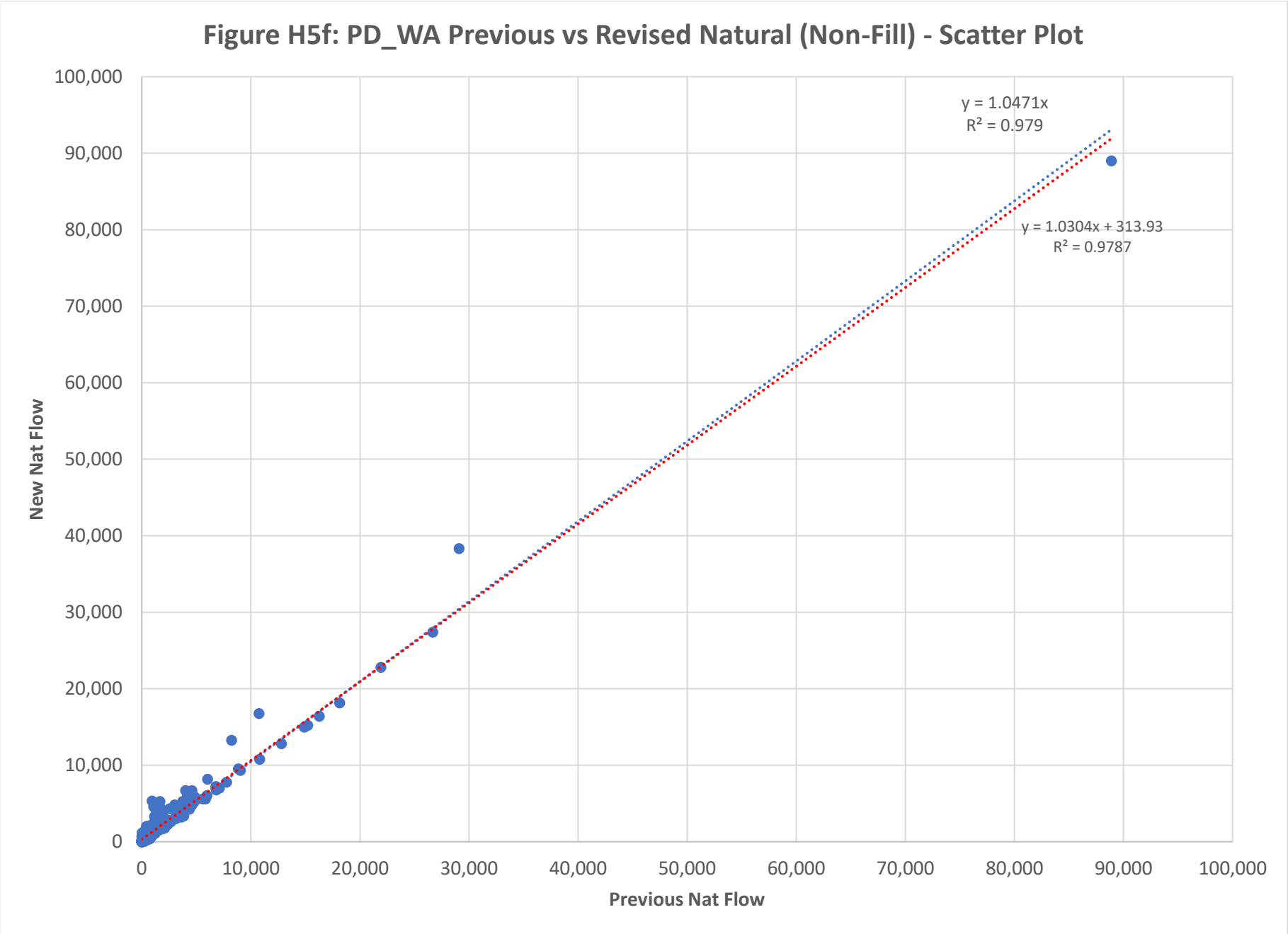


Figure H5f: PD_WA Previous vs Revised Natural (Non-Fill) - Scatter Plot
y = 1.0471x
R² = 0.979
y = 1.0304x + 313.93
R² = 0.9787
New Nat Flow
Previous Nat Flow
0
10,000
20,000
30,000
40,000
50,000
60,000
70,000
80,000
90,000
100,000

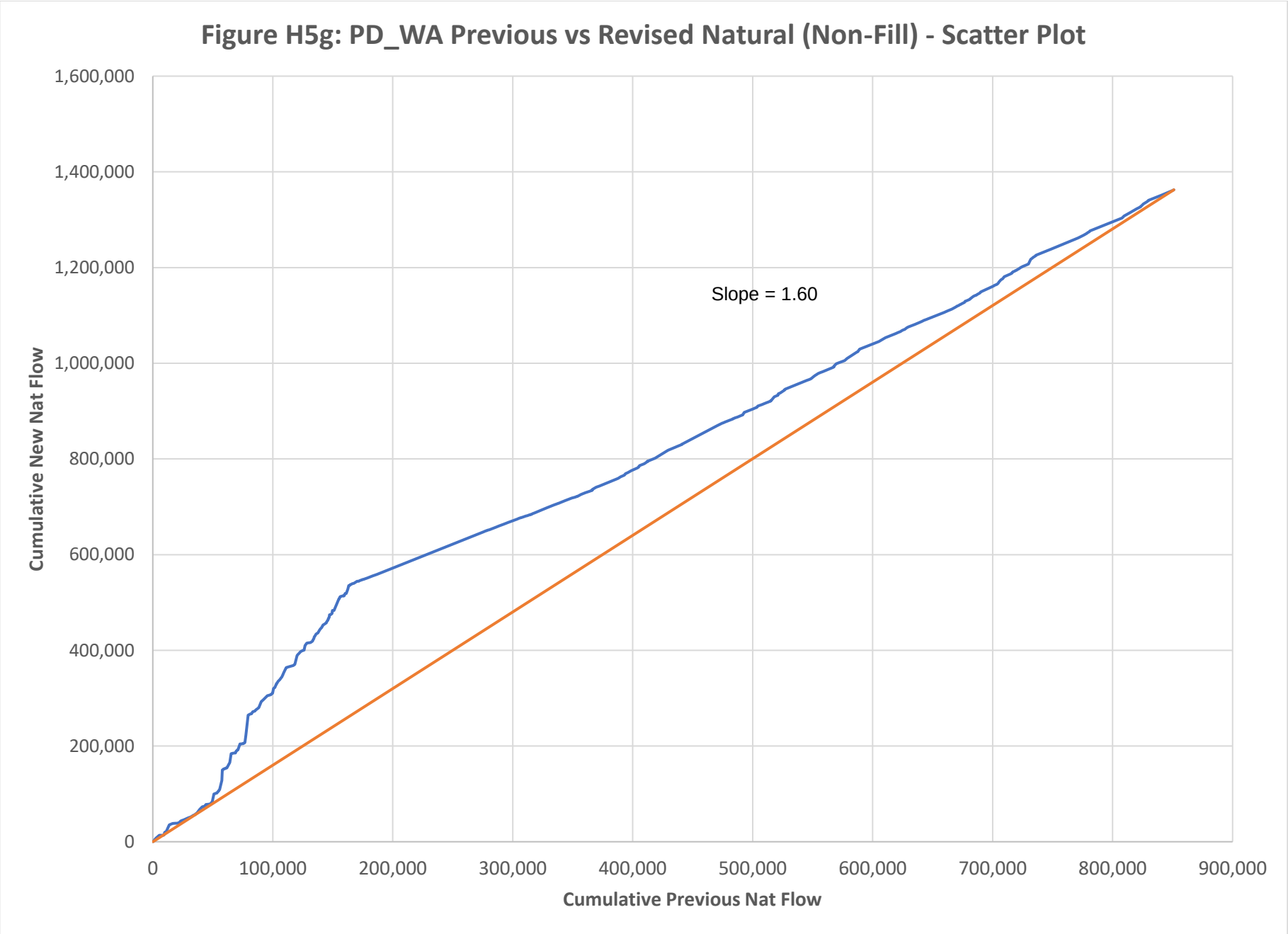


Figure H5g: PD_WA Previous vs Revised Natural (Non-Fill) - Scatter Plot
Slope = 1.60
Cumulative New Nat Flow
Cumulative Previous Nat Flow
0
200,000
400,000
600,000
800,000
1,000,000
1,200,000
1,400,000
1,600,000
0
100,000
200,000
300,000
400,000
500,000
600,000
700,000
800,000
900,000

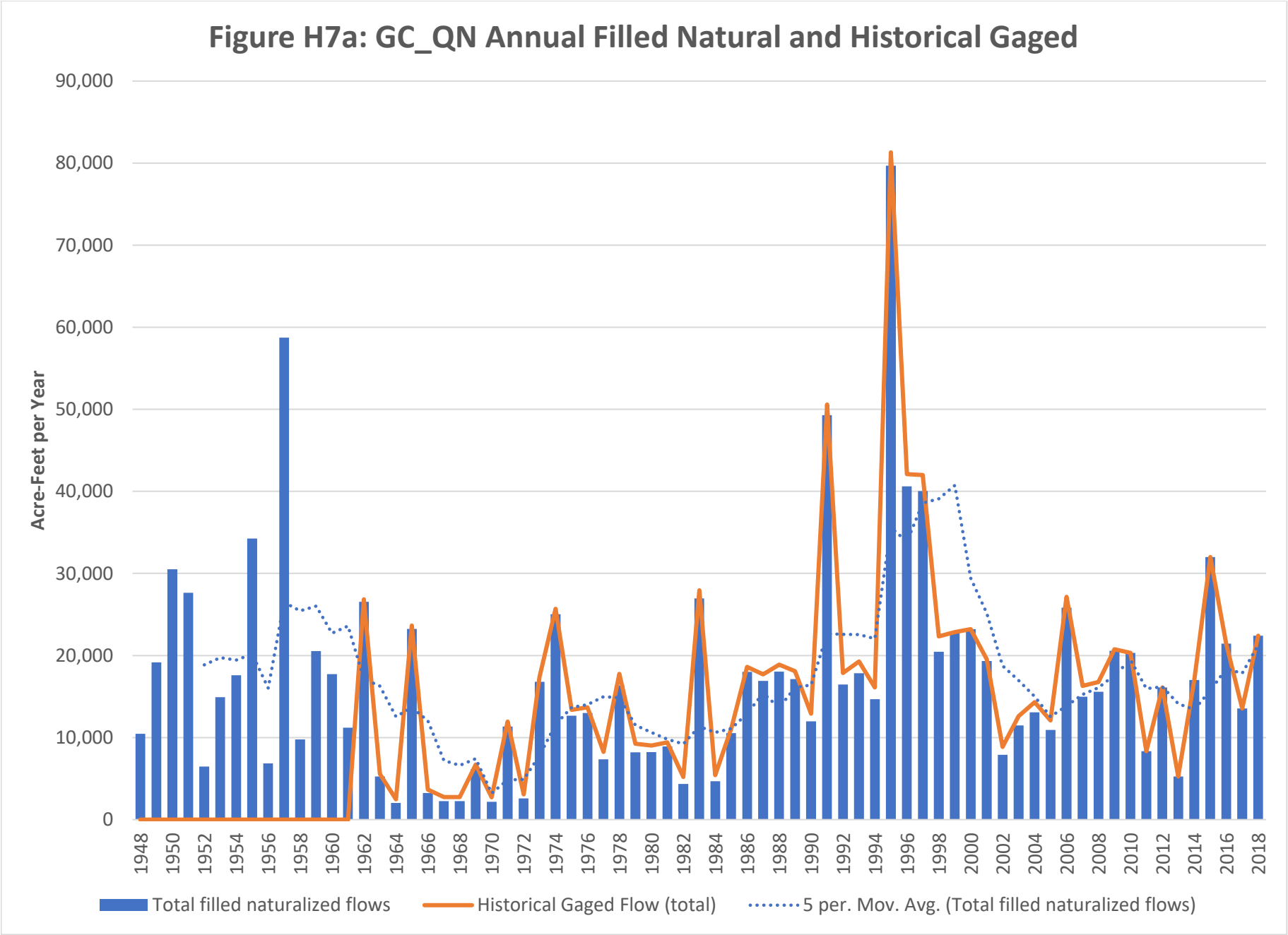


Figure H7a: GC_QN Annual Filled Natural and Historical Gaged
Acre-Feet per Year
90,000
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
1948
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
Total filled naturalized flows
Historical Gaged Flow (total)
5 per. Mov. Avg. (Total filled naturalized flows)

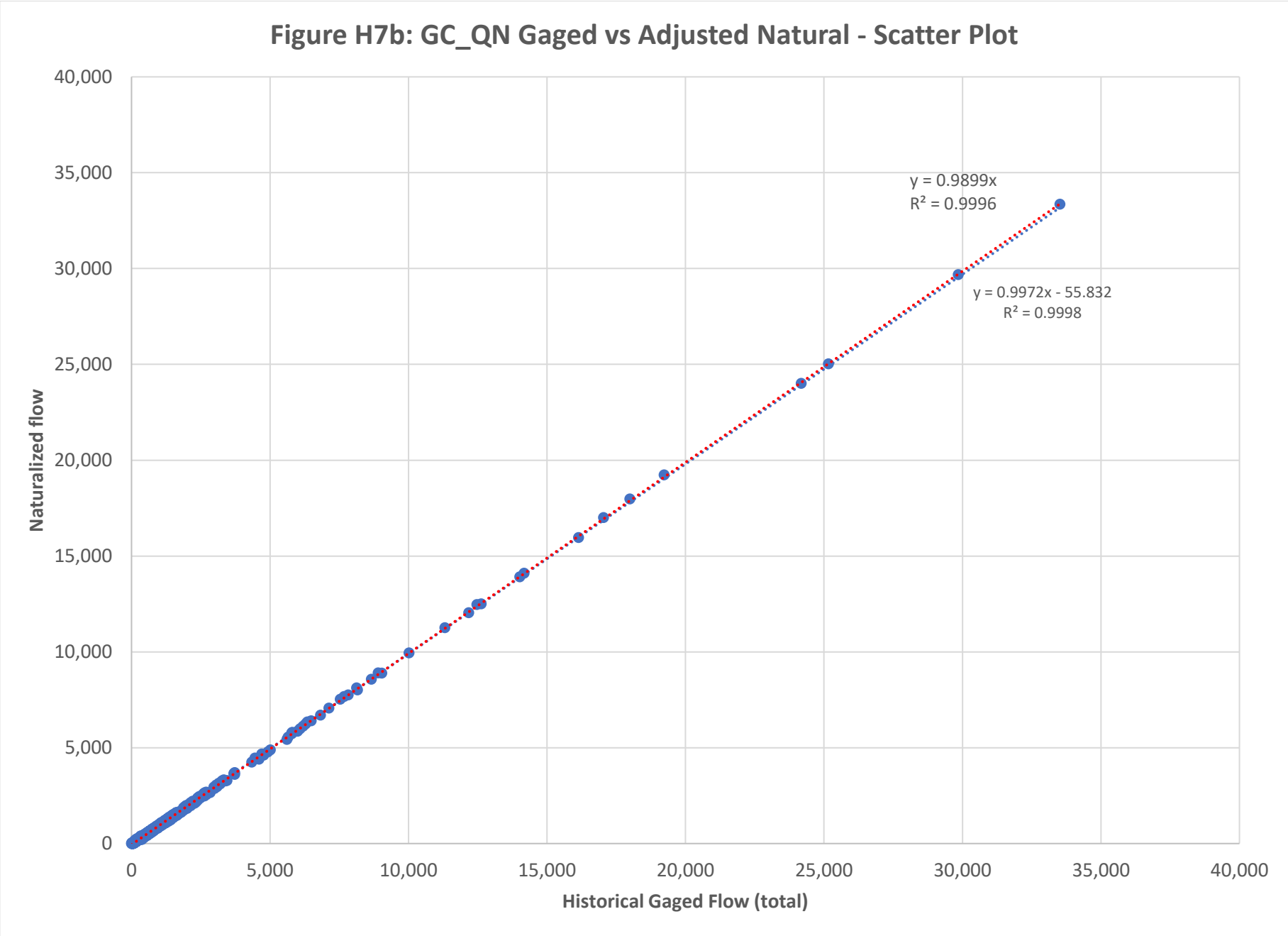


Figure H7b: GC_QN Gaged vs Adjusted Natural - Scatter Plot
y = 0.9899x
R² = 0.9996
y = 0.9972x - 55.832
R² = 0.9998
Naturalized flow
Historical Gaged Flow (total)
0
5,000
10,000
15,000
20,000
25,000
30,000
35,000
40,000

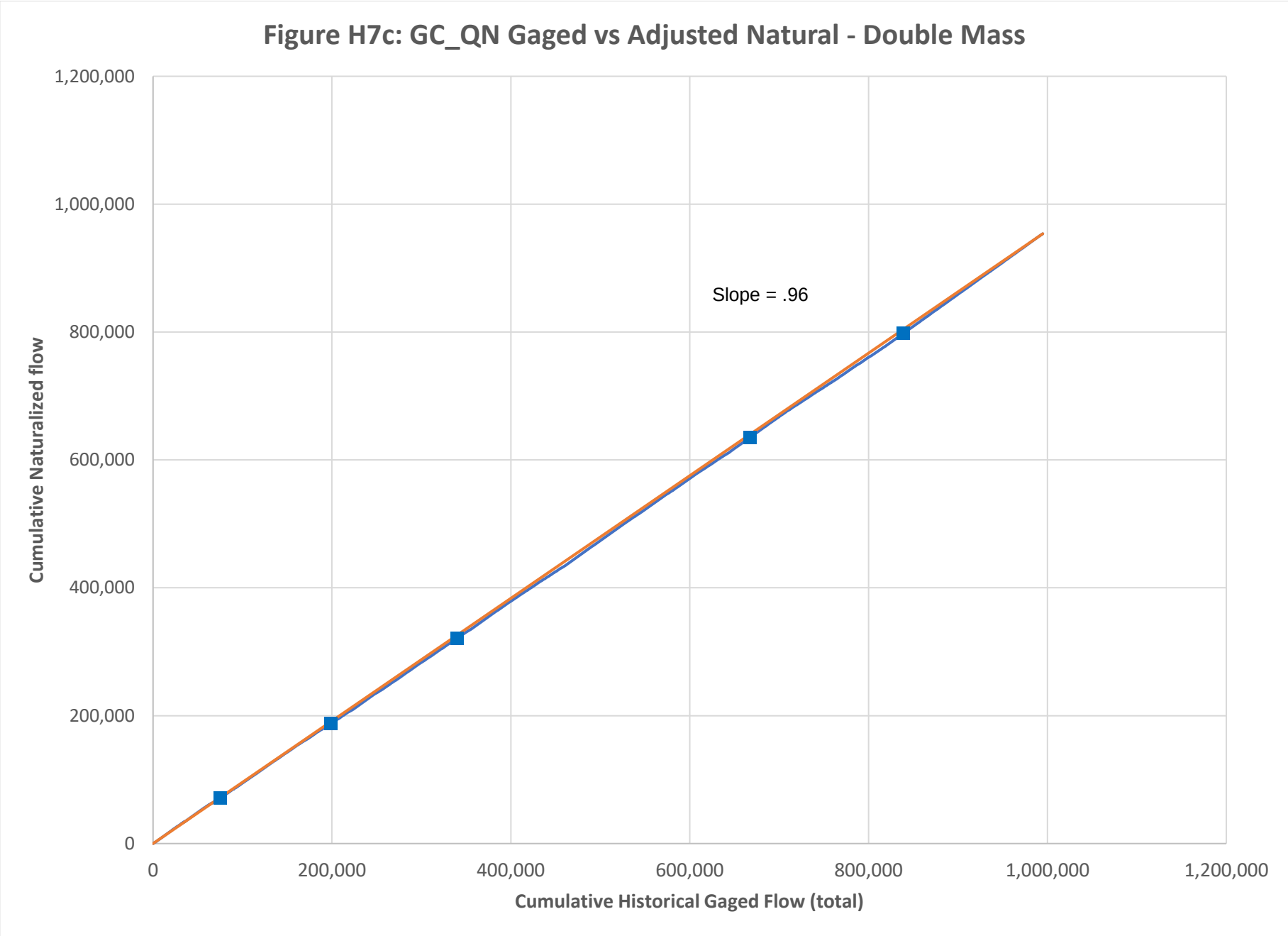


Figure H7c: GC_QN Gaged vs Adjusted Natural - Double Mass
Slope = .96
Cumulative Naturalized flow
Cumulative Historical Gaged Flow (total)
0
200,000
400,000
600,000
800,000
1,000,000
1,200,000

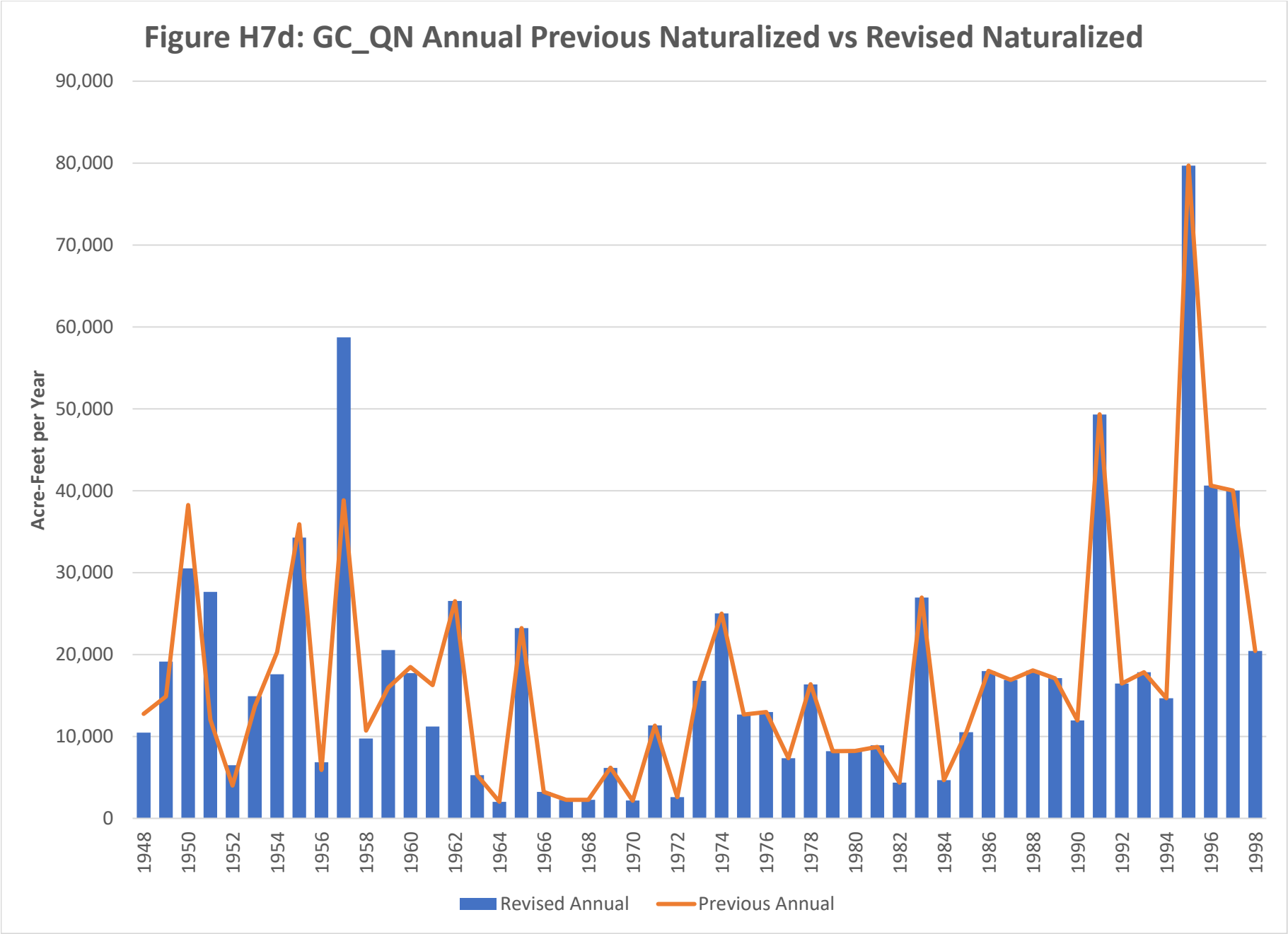


Figure H7d: GC_QN Annual Previous Naturalized vs Revised Naturalized
Acre-Feet per Year
90,000
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
1948
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
Revised Annual
Previous Annual

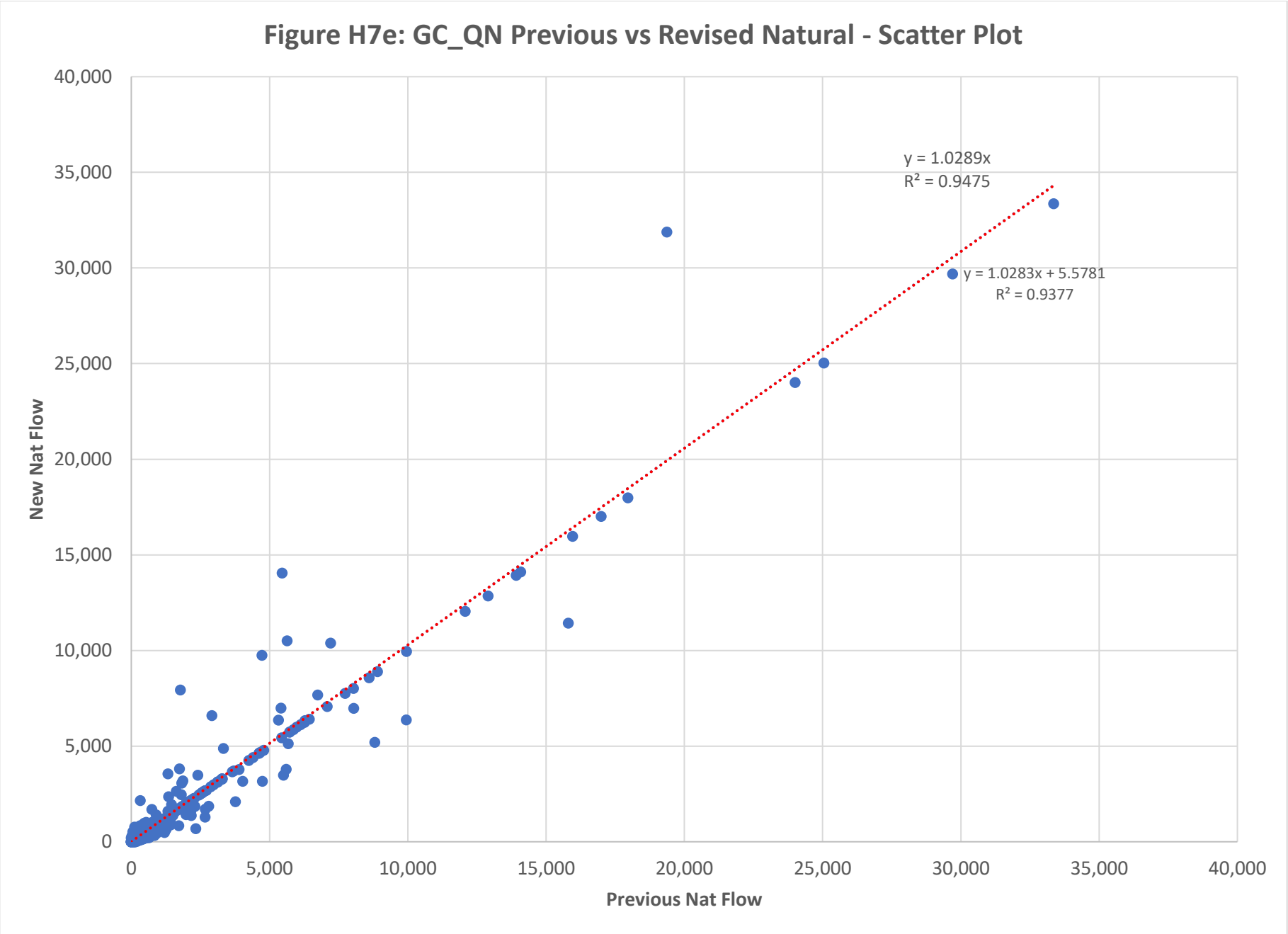


Figure H7e: GC_QN Previous vs Revised Natural - Scatter Plot
y = 1.0289x
R² = 0.9475
y = 1.0283x + 5.5781
R² = 0.9377
New Nat Flow
Previous Nat Flow
0
5,000
10,000
15,000
20,000
25,000
30,000
35,000
40,000

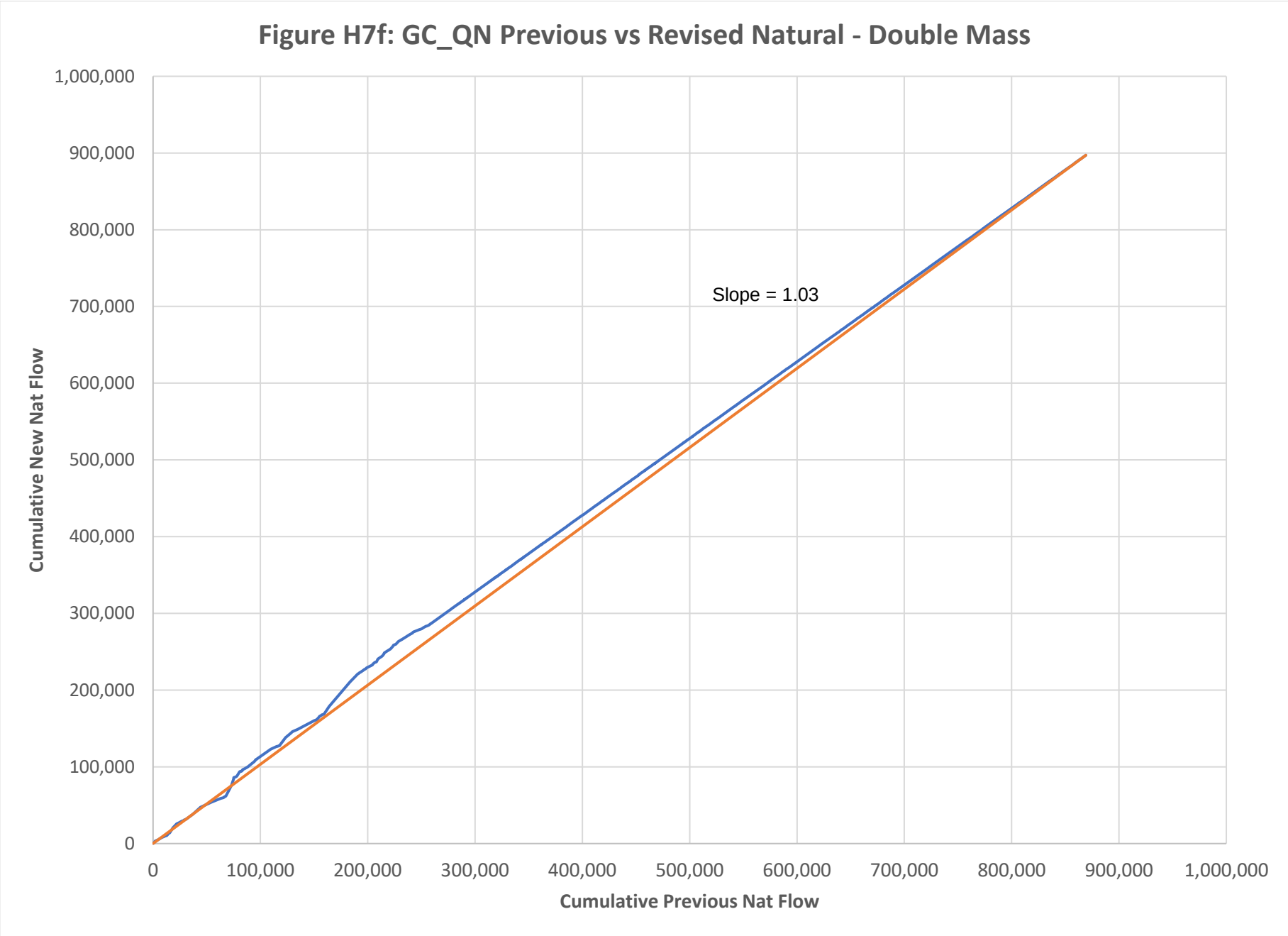


Figure H7f: GC_QN Previous vs Revised Natural - Double Mass
Slope = 1.03
Cumulative New Nat Flow
Cumulative Previous Nat Flow
0
100,000
200,000
300,000
400,000
500,000
600,000
700,000
800,000
900,000
1,000,000

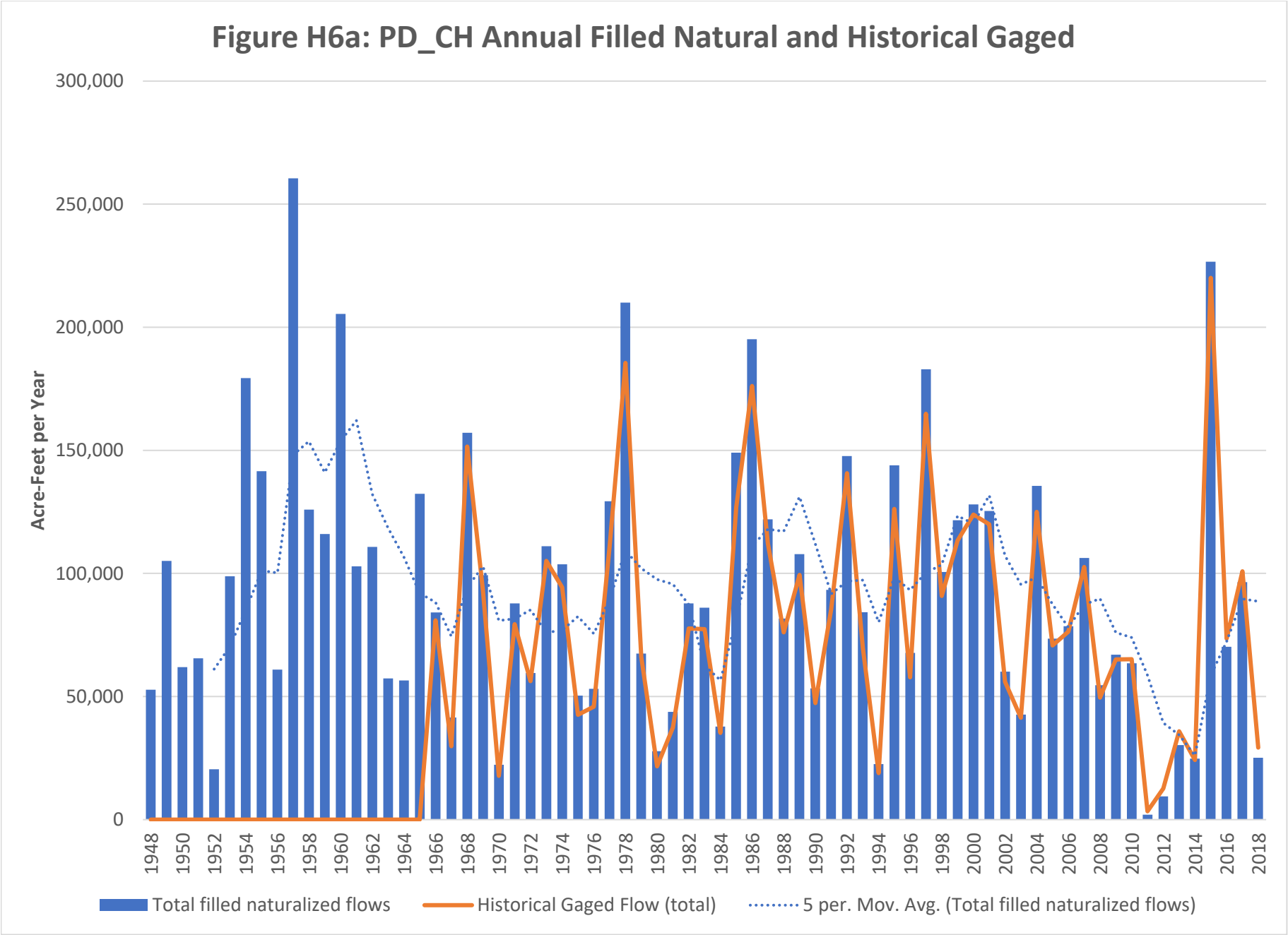


Figure H6a: PD_CH Annual Filled Natural and Historical Gaged
Acre-Feet per Year
300,000
250,000
200,000
150,000
100,000
50,000
0
1948
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
Total filled naturalized flows
Historical Gaged Flow (total)
5 per. Mov. Avg. (Total filled naturalized flows)

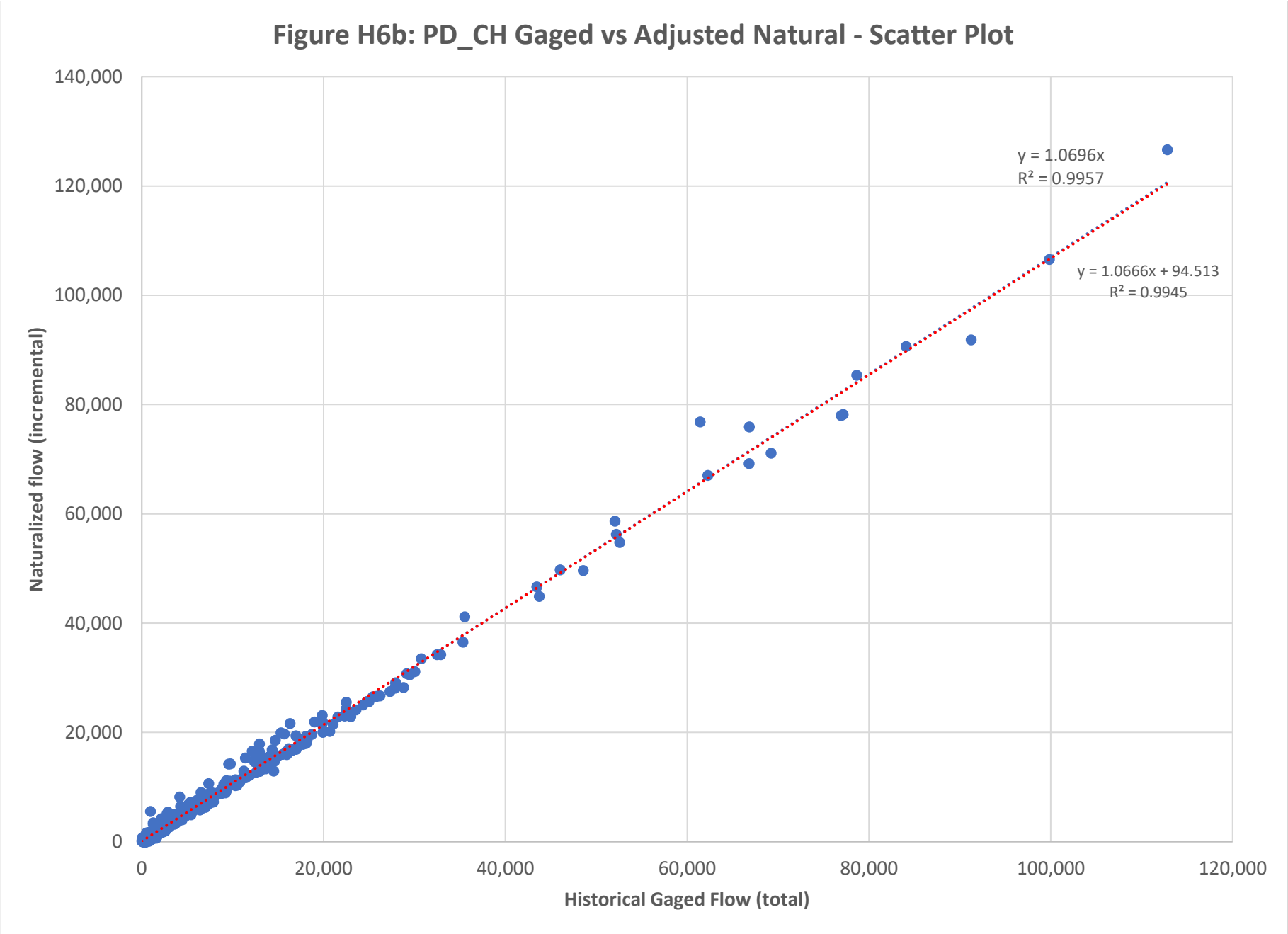


Figure H6b: PD_CH Gaged vs Adjusted Natural - Scatter Plot
y = 1.0696x
R² = 0.9957
y = 1.0666x + 94.513
R² = 0.9945
Naturalized flow (incremental)
Historical Gaged Flow (total)
0
20,000
40,000
60,000
80,000
100,000
120,000
140,000

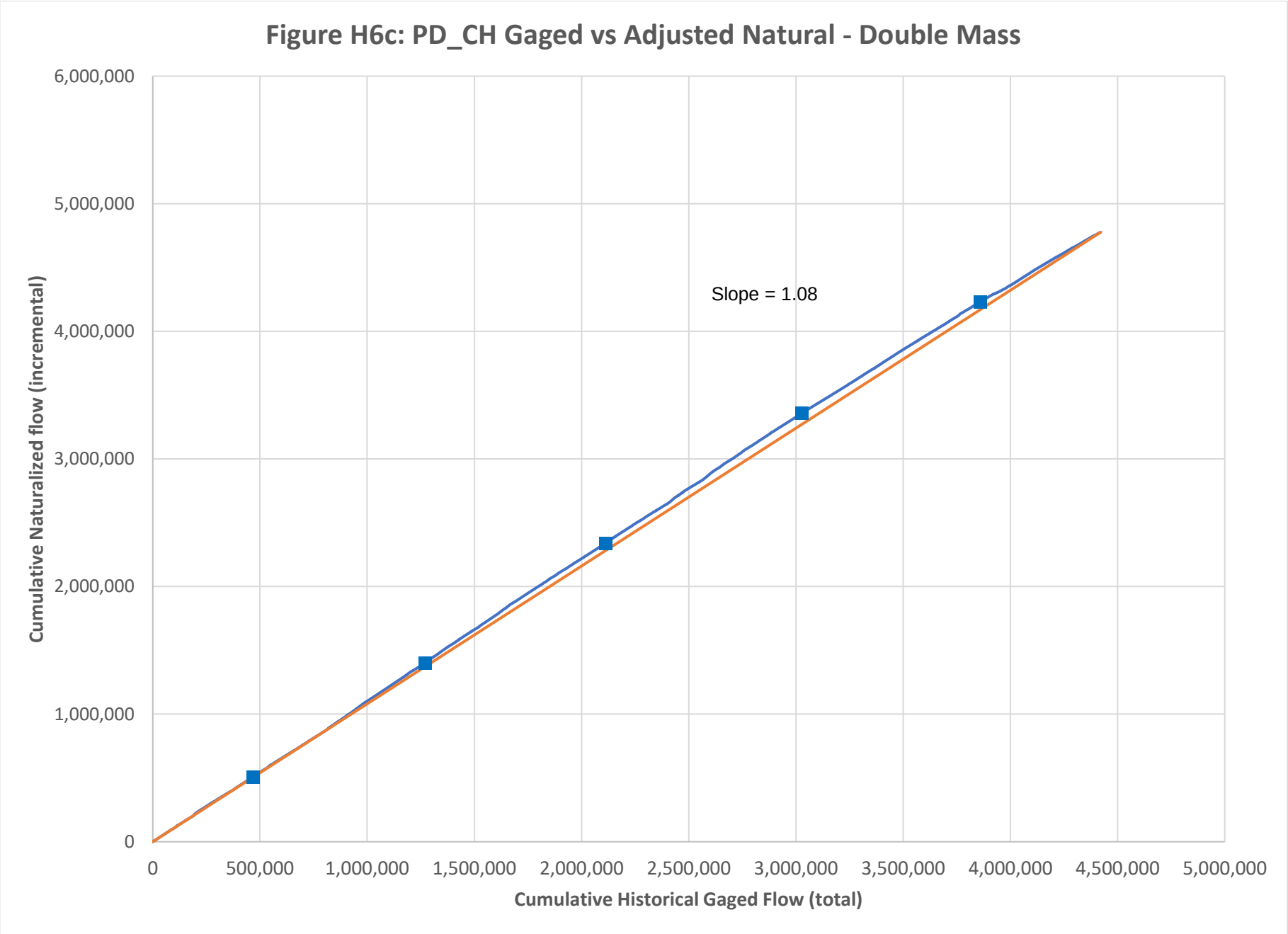


Figure H6c: PD_CH Gaged vs Adjusted Natural - Double Mass
Slope = 1.08
Cumulative Naturalized flow (incremental)
Cumulative Historical Gaged Flow (total)
0
1,000,000
2,000,000
3,000,000
4,000,000
5,000,000
6,000,000
0
500,000
1,000,000
1,500,000
2,000,000
2,500,000
3,000,000
3,500,000
4,000,000
4,500,000
5,000,000

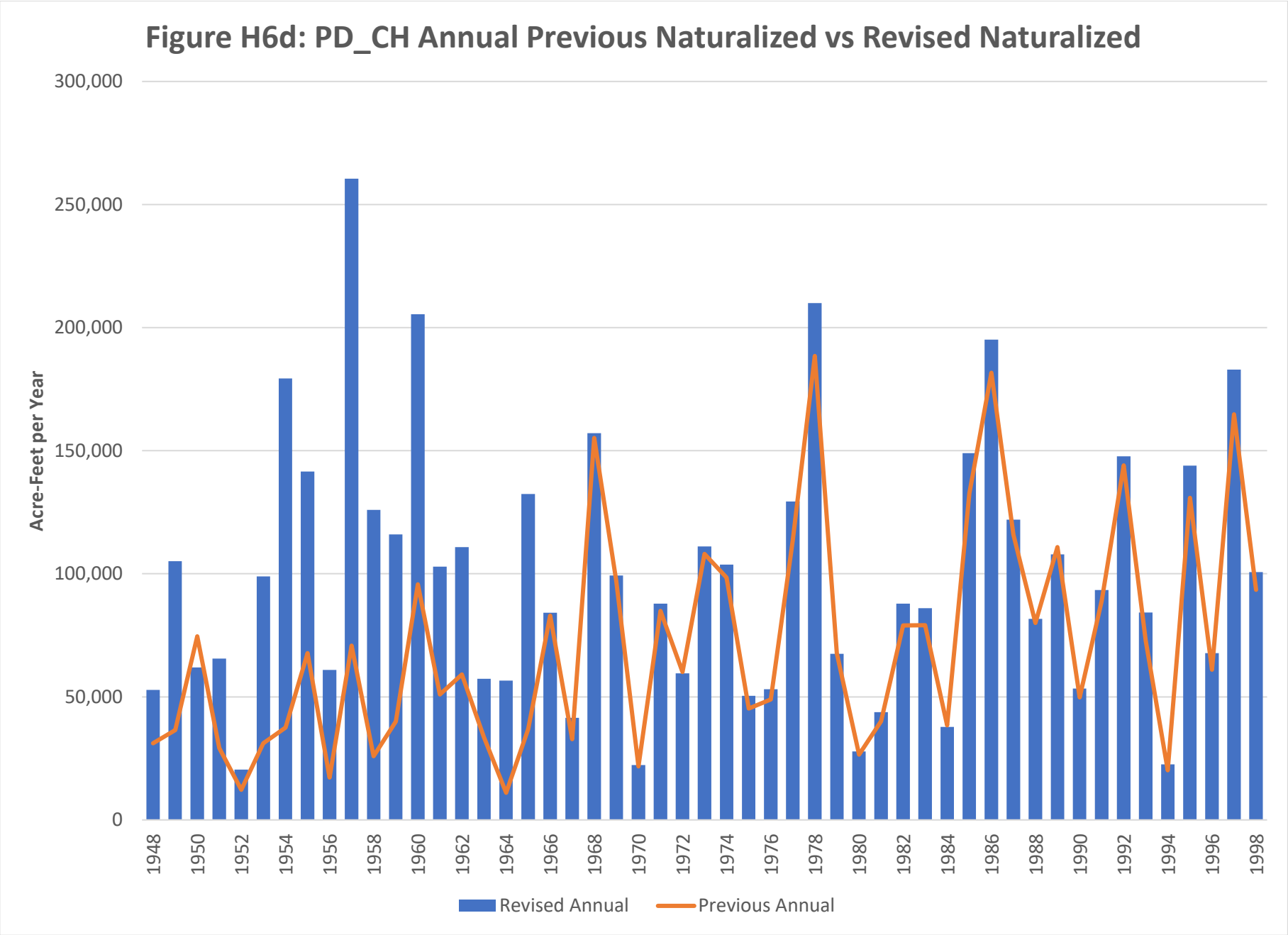


Figure H6d: PD_CH Annual Previous Naturalized vs Revised Naturalized
Acre-Feet per Year
300,000
250,000
200,000
150,000
100,000
50,000
0
1948
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
Revised Annual
Previous Annual

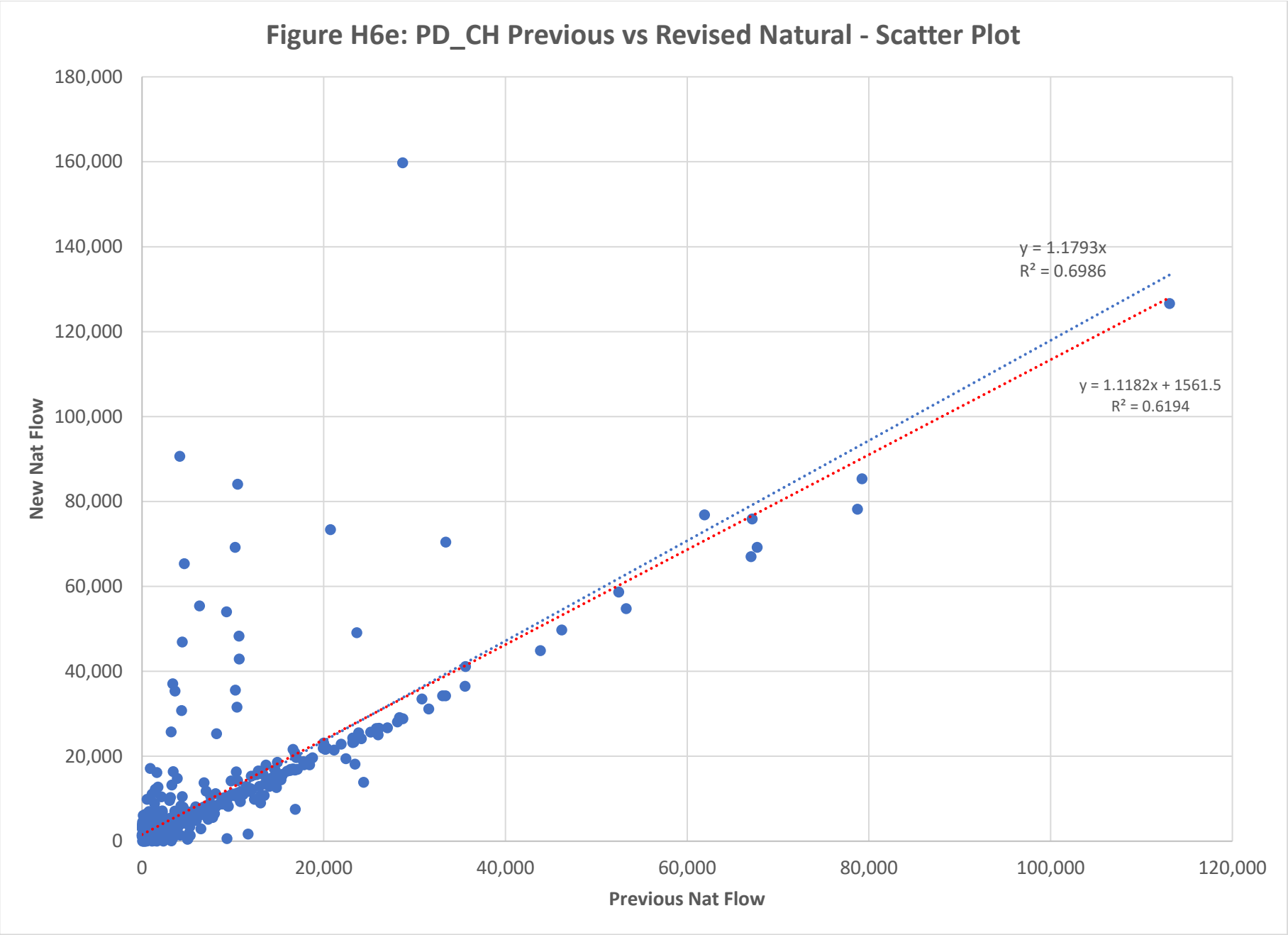


Figure H6e: PD_CH Previous vs Revised Natural - Scatter Plot
180,000
160,000
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
New Nat Flow
0
20,000
40,000
60,000
80,000
100,000
120,000
Previous Nat Flow
y = 1.1793x
R² = 0.6986
y = 1.1182x + 1561.5
R² = 0.6194

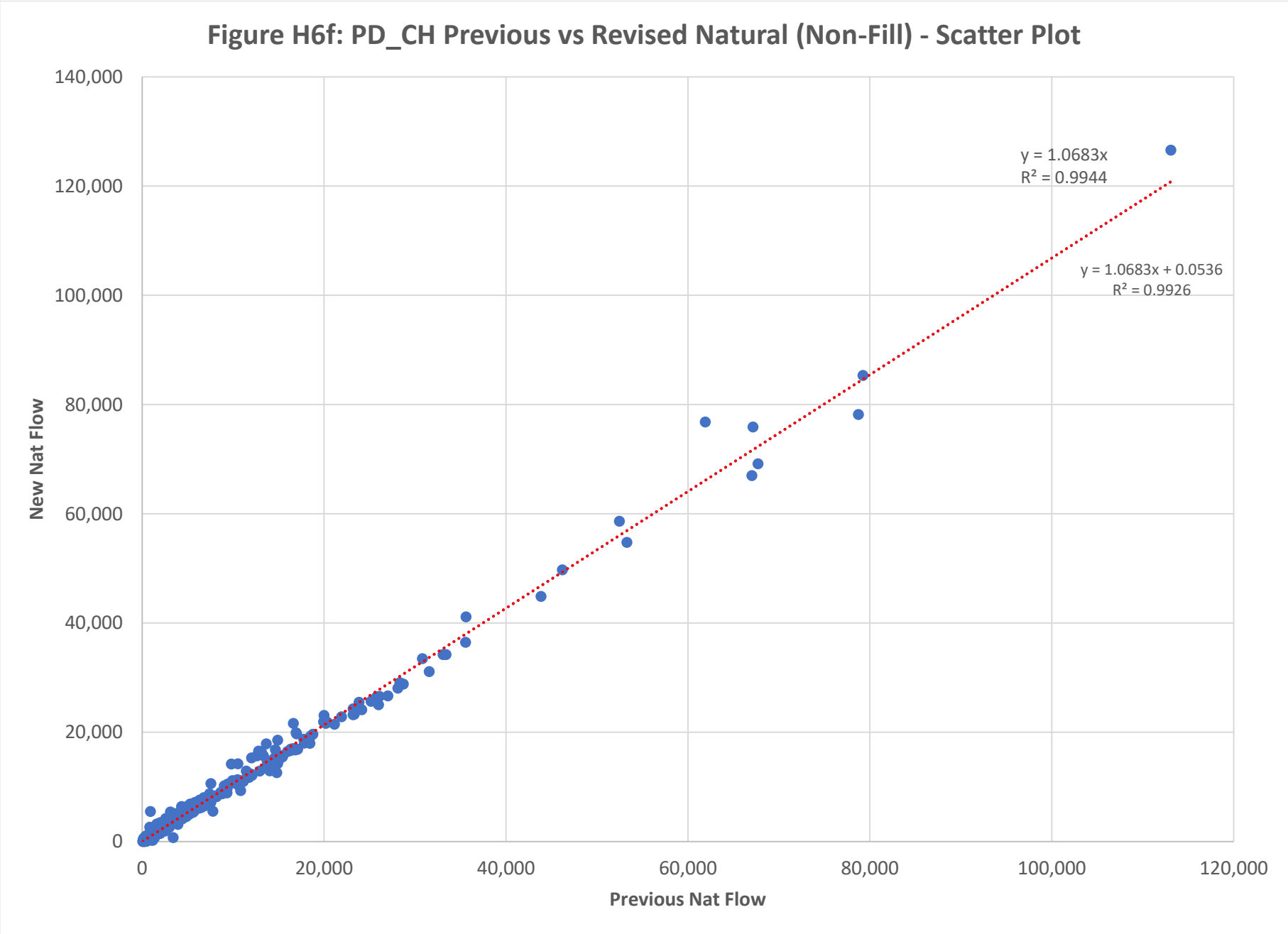


Figure H6f: PD_CH Previous vs Revised Natural (Non-Fill) - Scatter Plot
y = 1.0683x
R² = 0.9944
y = 1.0683x + 0.0536
R² = 0.9926
New Nat Flow
Previous Nat Flow
0
20,000
40,000
60,000
80,000
100,000
120,000
140,000

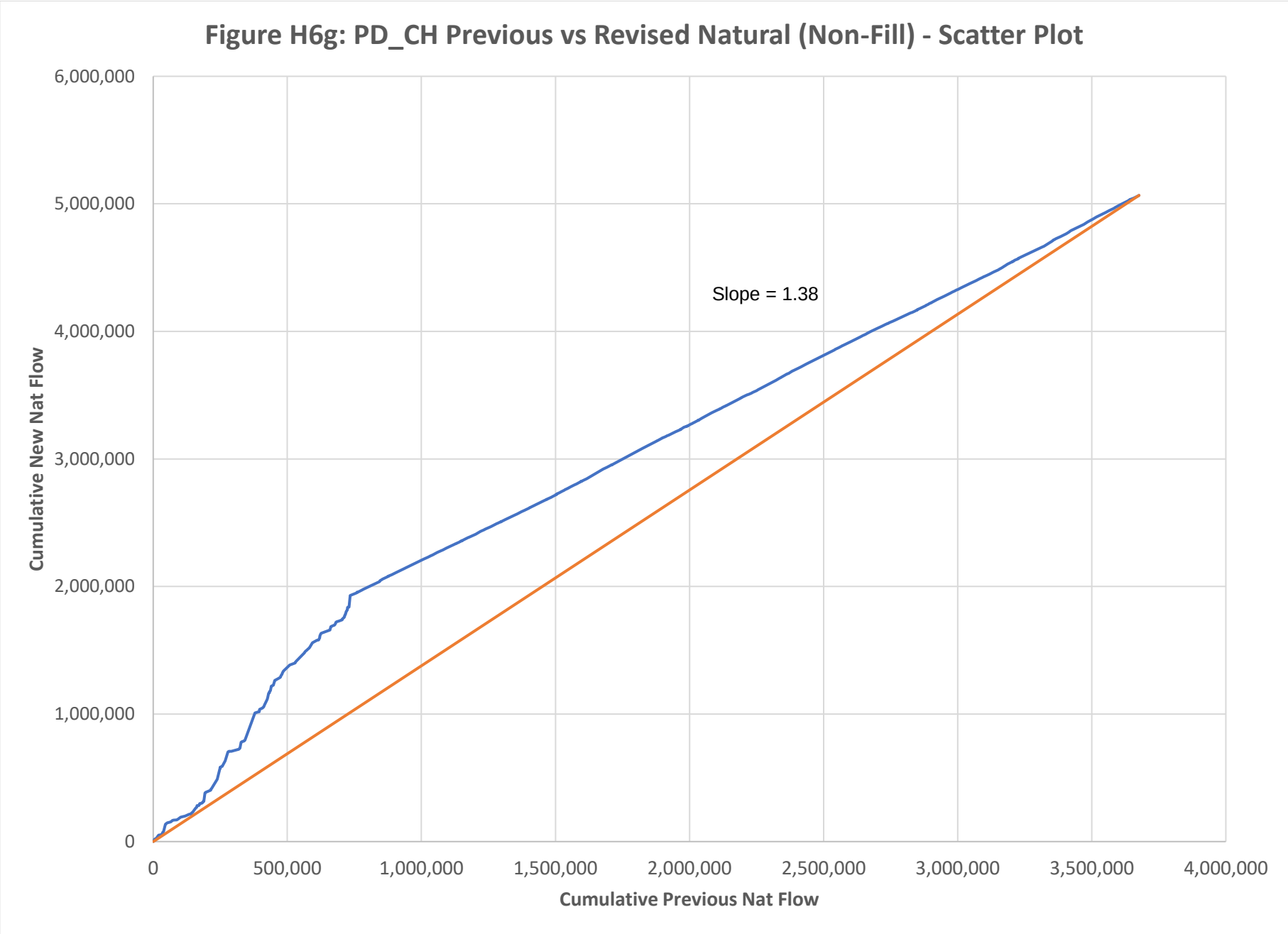


Figure H6g: PD_CH Previous vs Revised Natural (Non-Fill) - Scatter Plot
6,000,000
5,000,000
4,000,000
3,000,000
2,000,000
1,000,000
0
Cumulative New Nat Flow
Slope = 1.38
0
500,000
1,000,000
1,500,000
2,000,000
2,500,000
3,000,000
3,500,000
4,000,000
Cumulative Previous Nat Flow

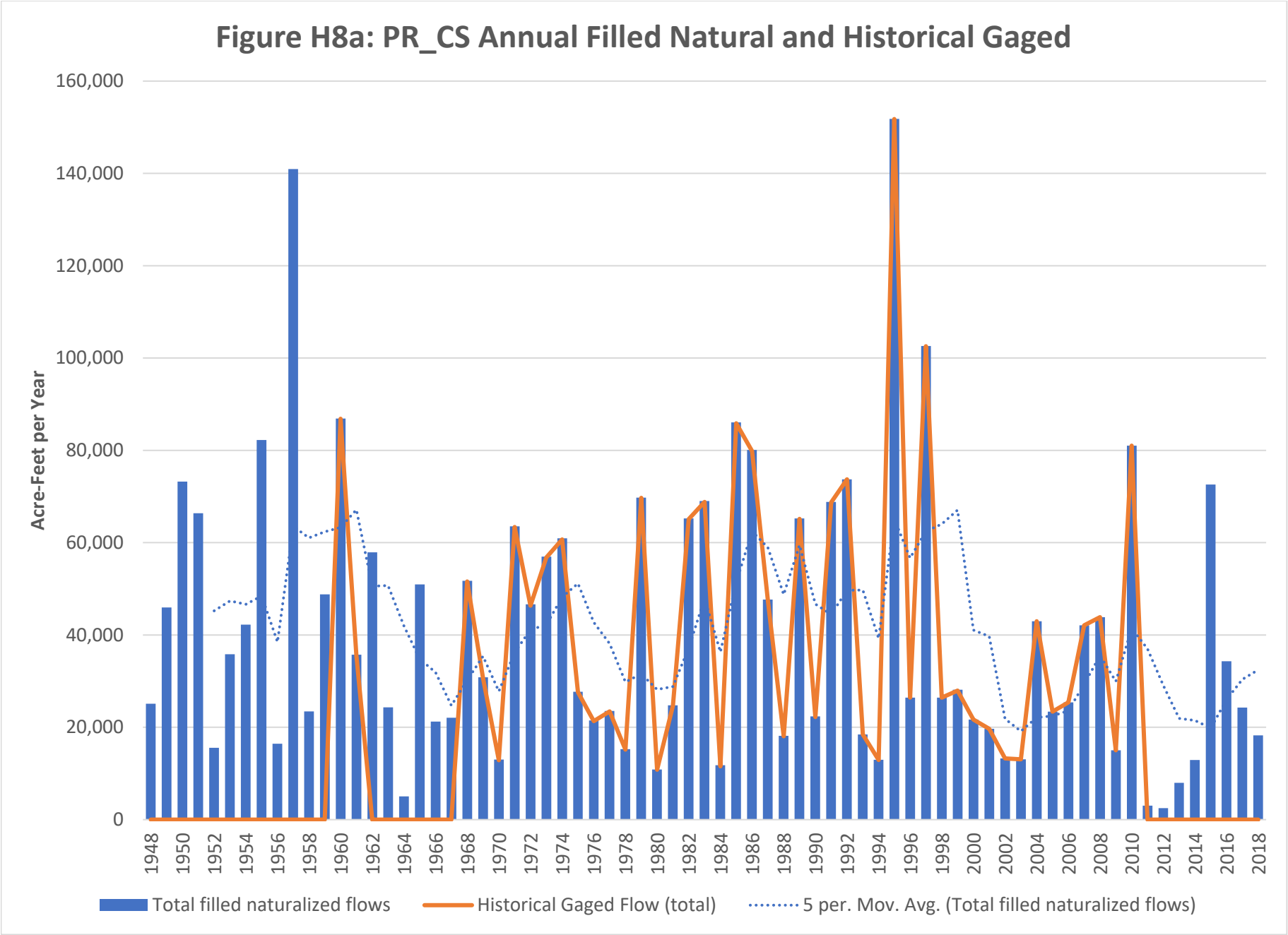


Figure H8a: PR_CS Annual Filled Natural and Historical Gaged
Acre-Feet per Year
160,000
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
1948
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
Total filled naturalized flows
Historical Gaged Flow (total)
5 per. Mov. Avg. (Total filled naturalized flows)

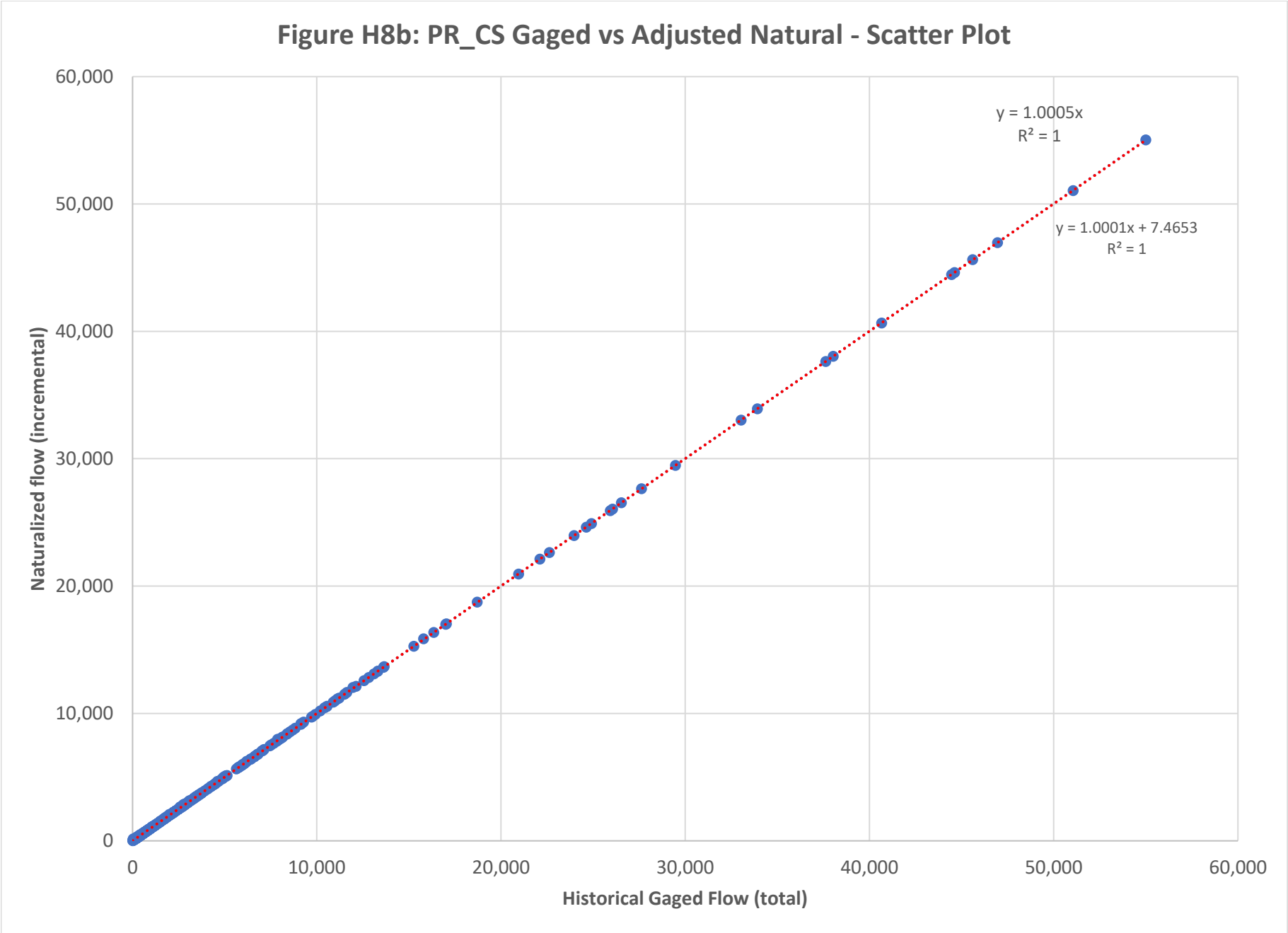


Figure H8b: PR_CS Gaged vs Adjusted Natural - Scatter Plot
y = 1.0005x
R² = 1
y = 1.0001x + 7.4653
R² = 1
Naturalized flow (incremental)
Historical Gaged Flow (total)
0
10,000
20,000
30,000
40,000
50,000
60,000

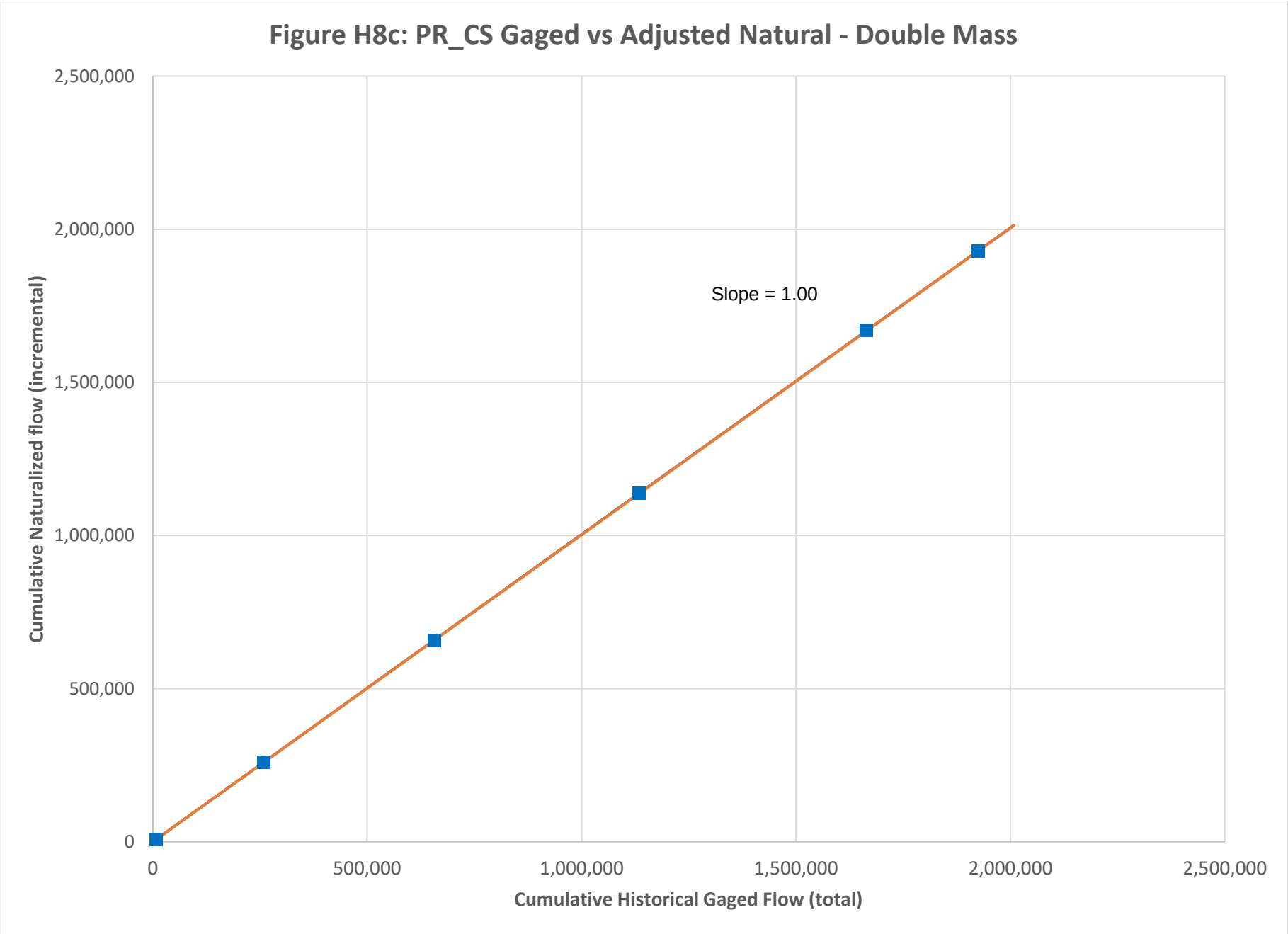


Figure H8c: PR_CS Gaged vs Adjusted Natural - Double Mass
Slope = 1.00
Cumulative Naturalized flow (incremental)
Cumulative Historical Gaged Flow (total)
0
500,000
1,000,000
1,500,000
2,000,000
2,500,000

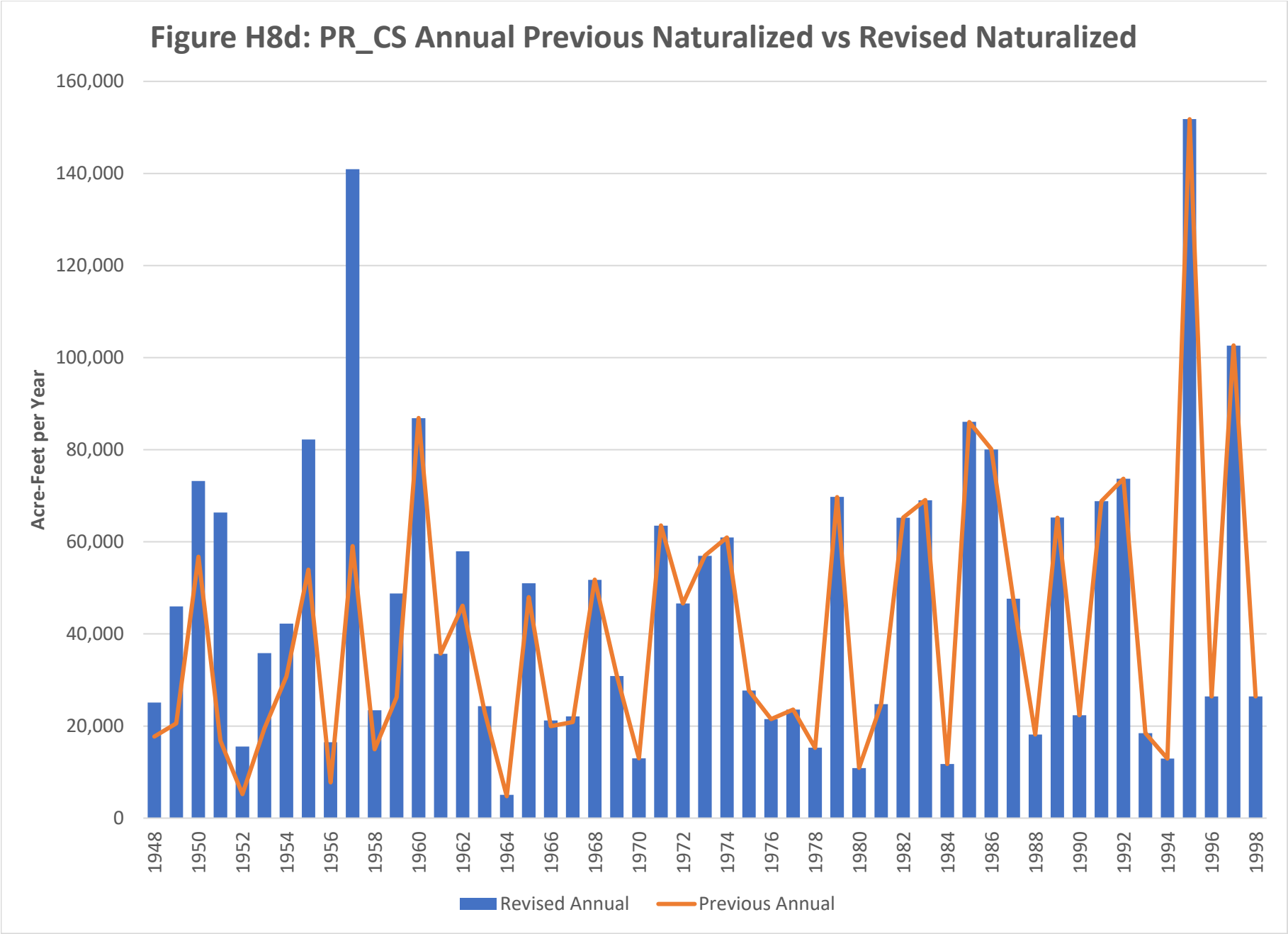


Figure H8d: PR_CS Annual Previous Naturalized vs Revised Naturalized
Acre-Feet per Year
160,000
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
1948
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
Revised Annual
Previous Annual

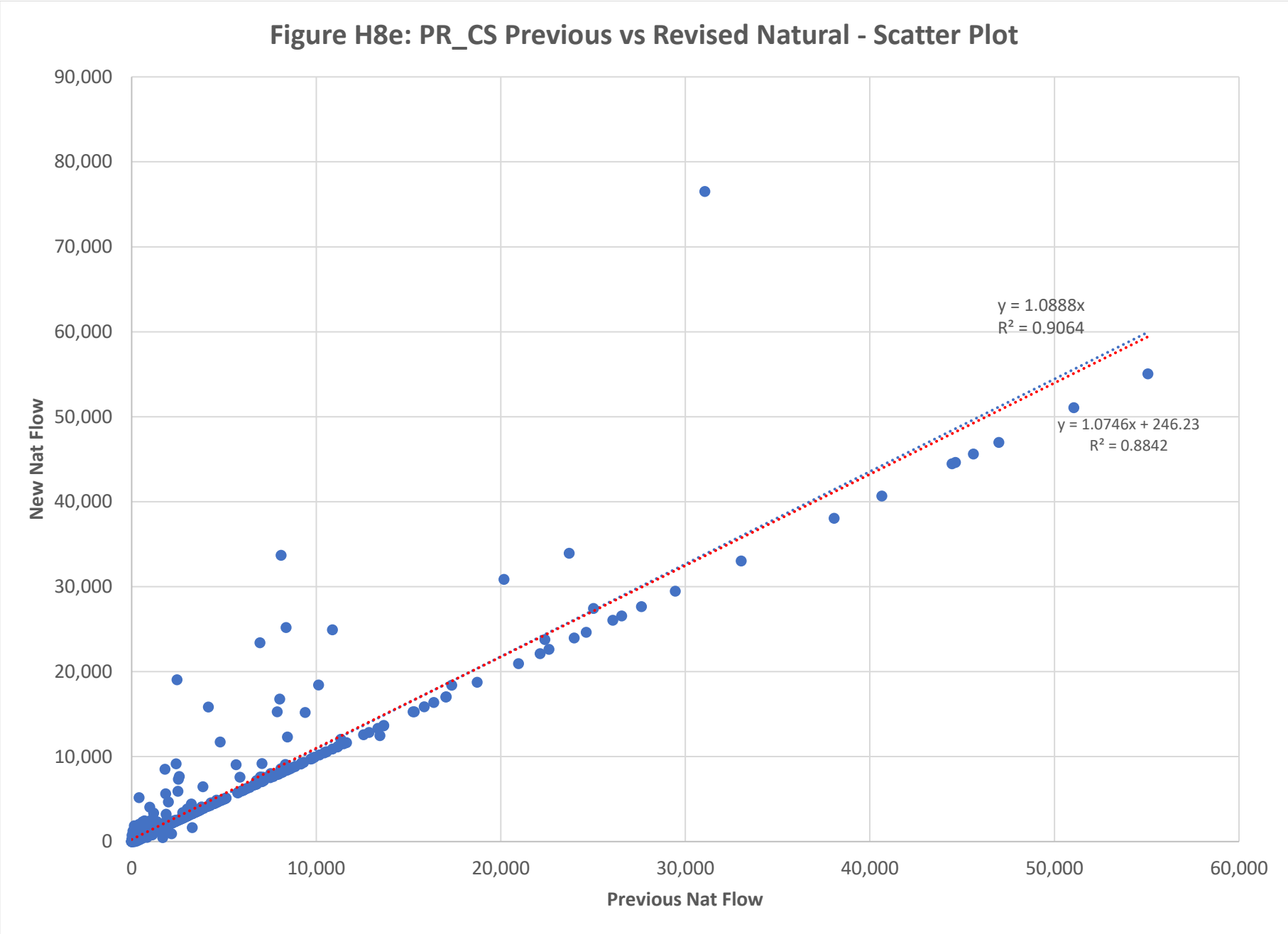


Figure H8e: PR_CS Previous vs Revised Natural - Scatter Plot
90,000
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
New Nat Flow
0
10,000
20,000
30,000
40,000
50,000
60,000
Previous Nat Flow
y = 1.0888x
R² = 0.9064
y = 1.0746x + 246.23
R² = 0.8842

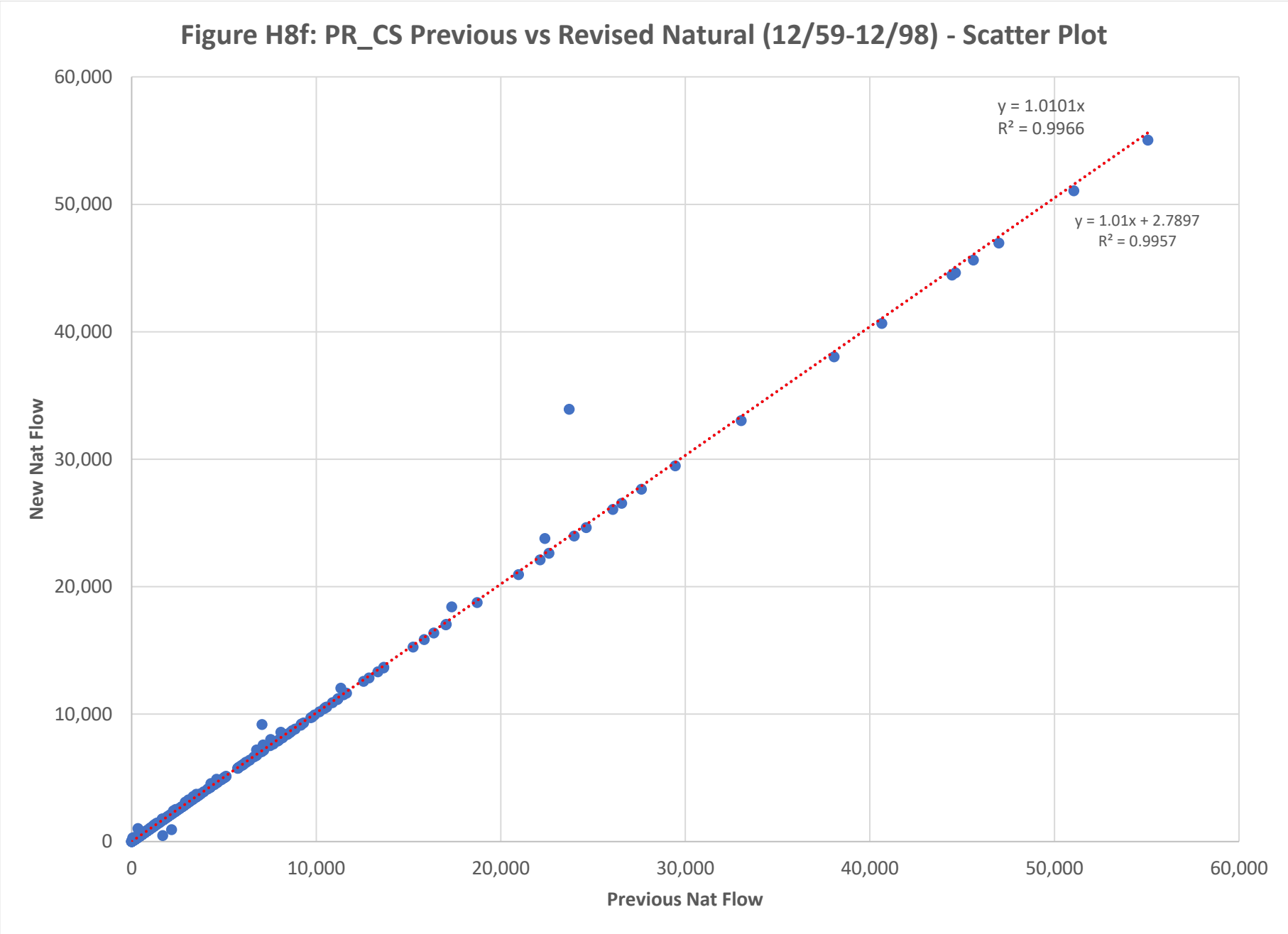


Figure H8f: PR_CS Previous vs Revised Natural (12/59-12/98) - Scatter Plot
y = 1.0101x
R² = 0.9966
y = 1.01x + 2.7897
R² = 0.9957
New Nat Flow
Previous Nat Flow
0
10,000
20,000
30,000
40,000
50,000
60,000

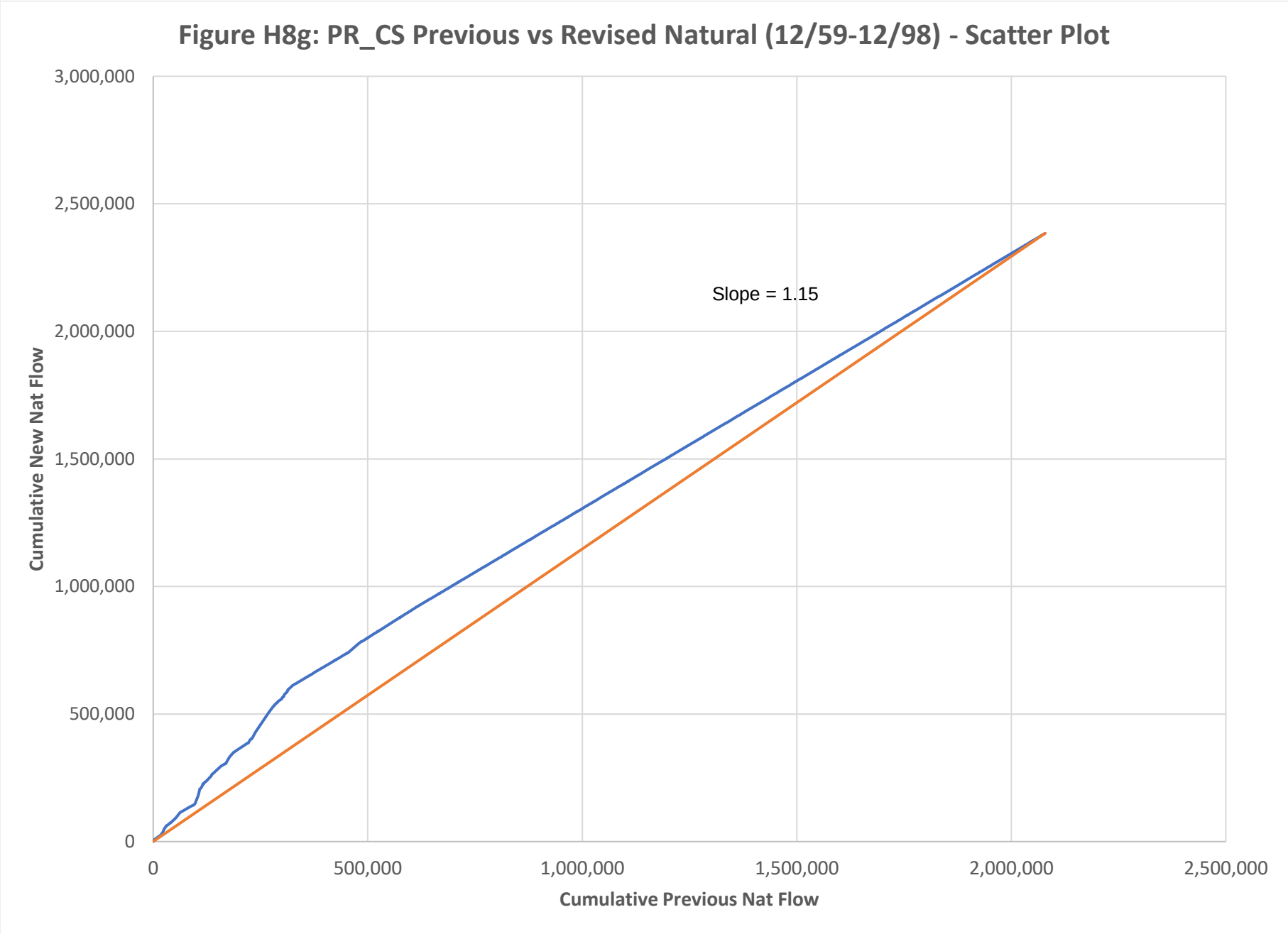


Figure H8g: PR_CS Previous vs Revised Natural (12/59-12/98) - Scatter Plot
3,000,000
2,500,000
2,000,000
1,500,000
1,000,000
500,000
0
Cumulative New Nat Flow
Slope = 1.15
0
500,000
1,000,000
1,500,000
2,000,000
2,500,000
Cumulative Previous Nat Flow

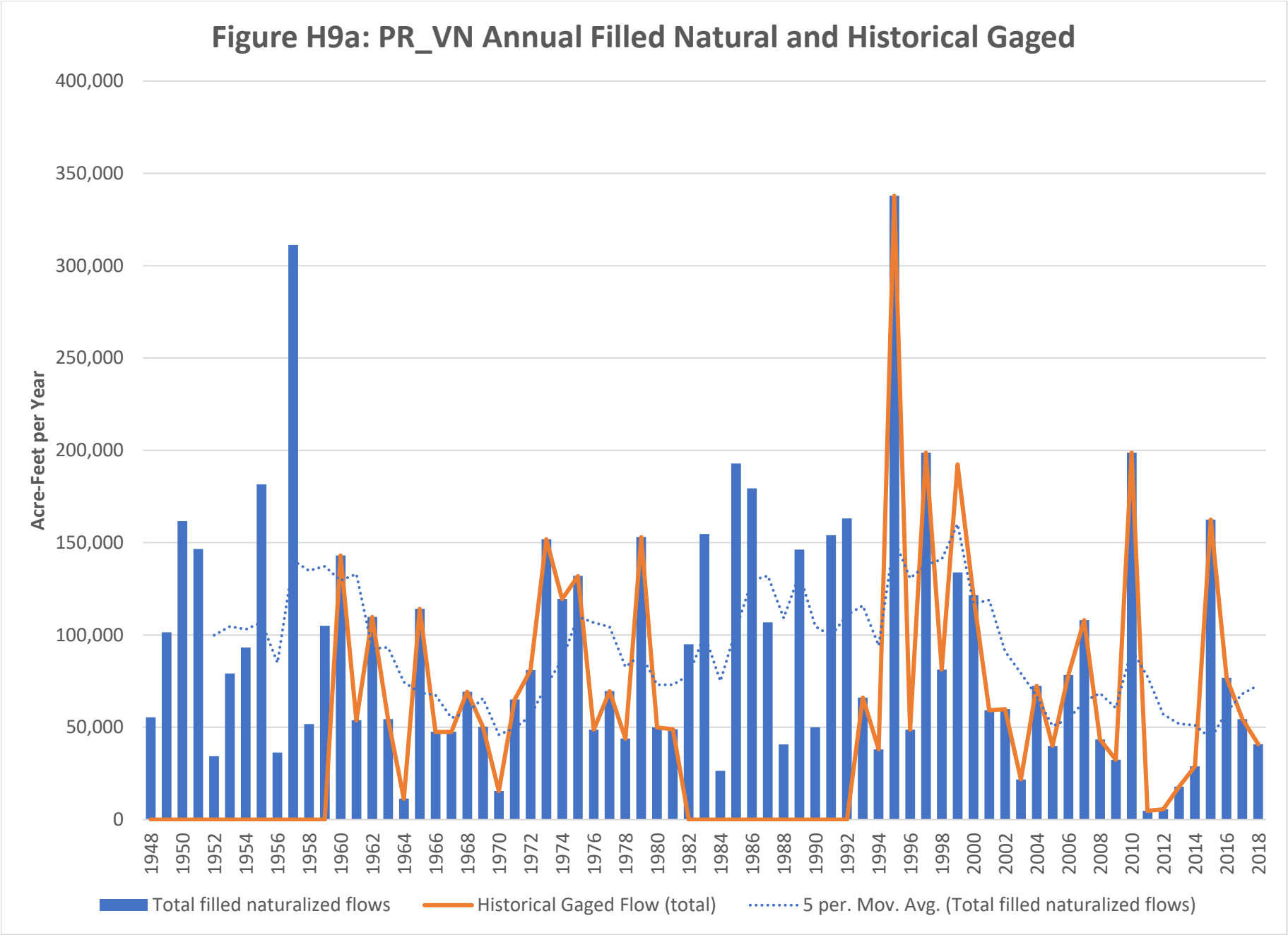


Figure H9a: PR_VN Annual Filled Natural and Historical Gaged
Acre-Feet per Year
400,000
350,000
300,000
250,000
200,000
150,000
100,000
50,000
0
1948
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
Total filled naturalized flows
Historical Gaged Flow (total)
5 per. Mov. Avg. (Total filled naturalized flows)

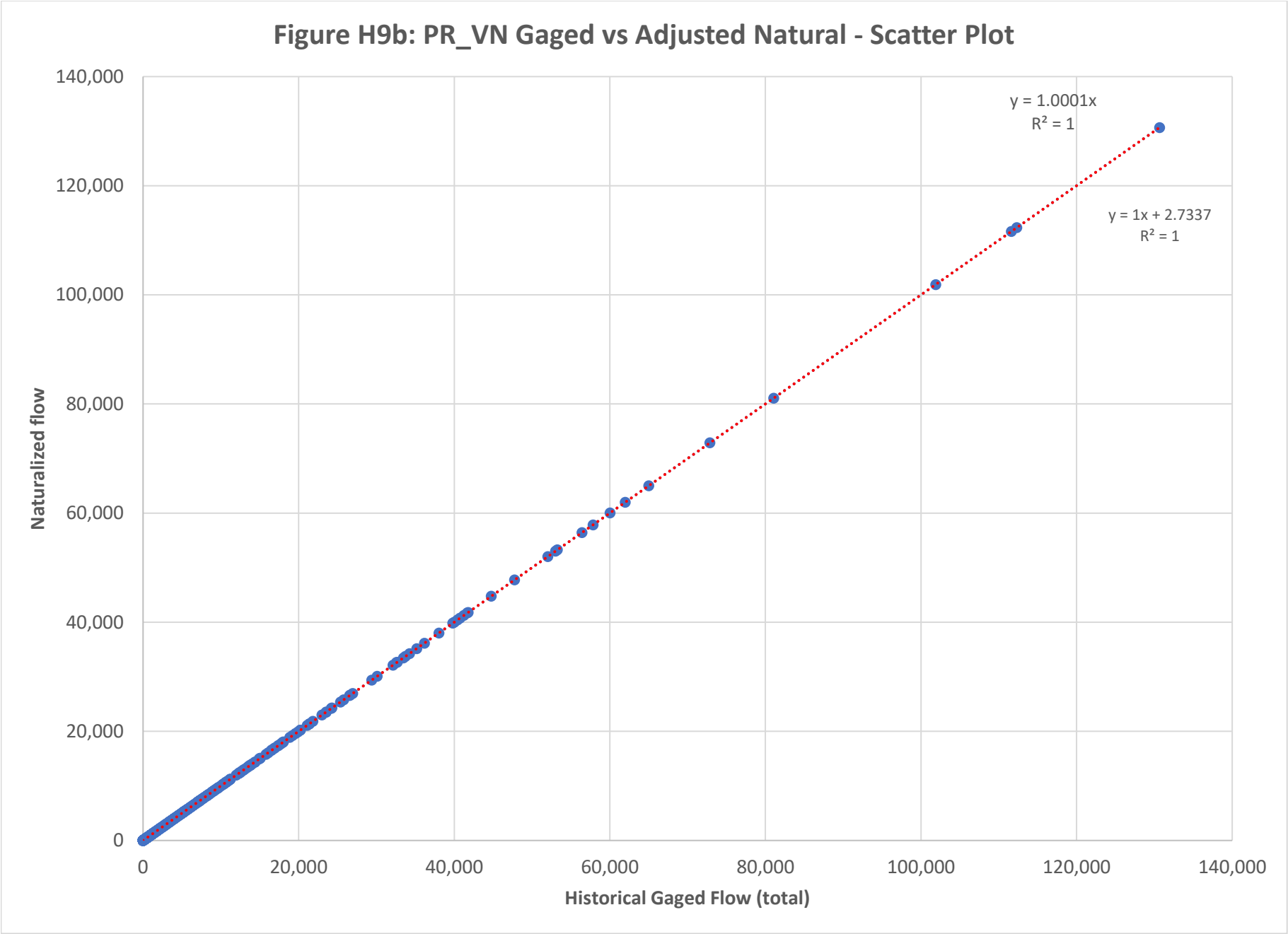


Figure H9b: PR_VN Gaged vs Adjusted Natural - Scatter Plot
y = 1.0001x
R² = 1
y = 1x + 2.7337
R² = 1
Naturalized flow
Historical Gaged Flow (total)
0
20,000
40,000
60,000
80,000
100,000
120,000
140,000

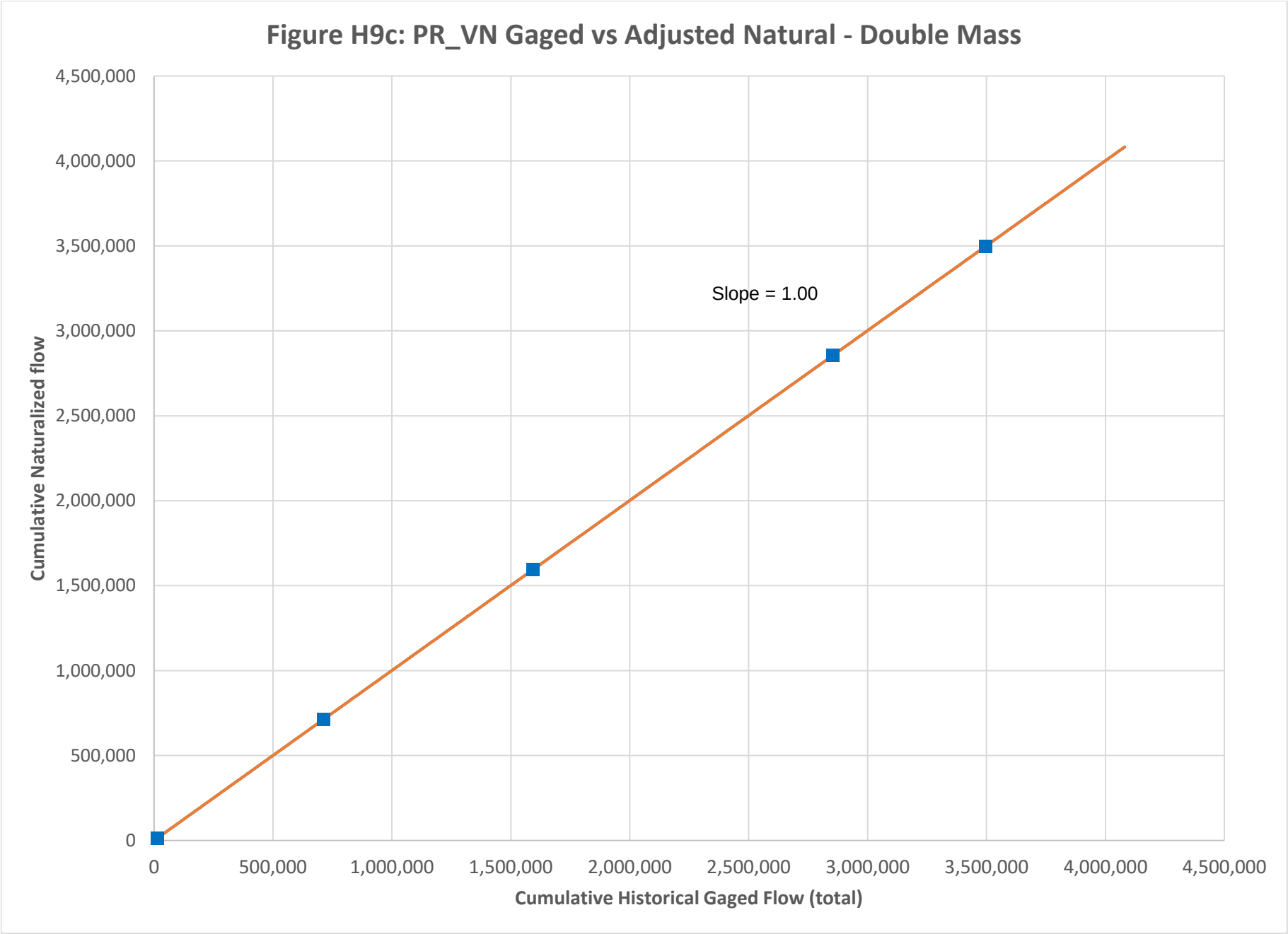


Figure H9c: PR_VN Gaged vs Adjusted Natural - Double Mass
Slope = 1.00
Cumulative Naturalized flow
Cumulative Historical Gaged Flow (total)
0
500,000
1,000,000
1,500,000
2,000,000
2,500,000
3,000,000
3,500,000
4,000,000
4,500,000

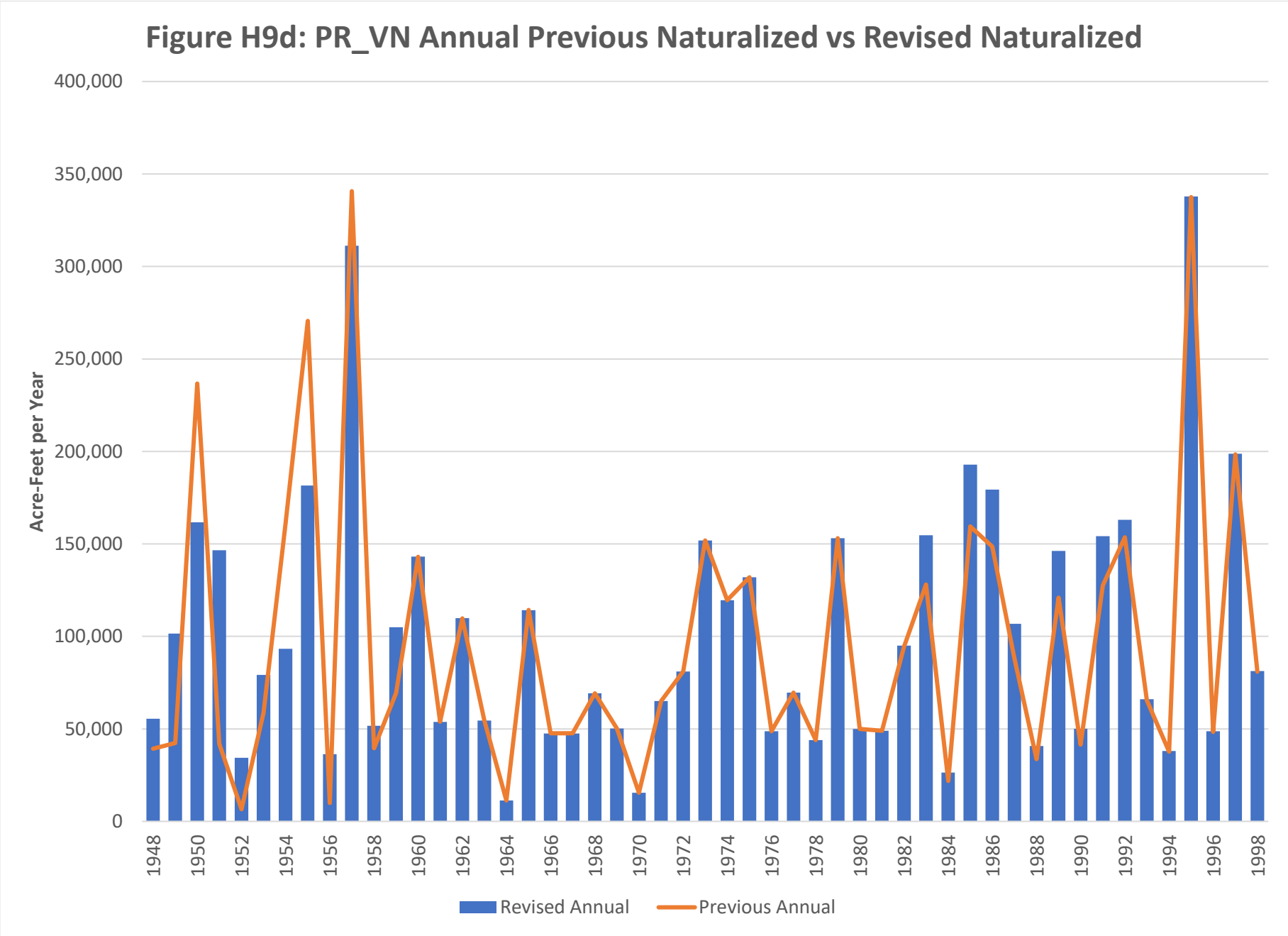


Figure H9d: PR_VN Annual Previous Naturalized vs Revised Naturalized
Acre-Feet per Year
400,000
350,000
300,000
250,000
200,000
150,000
100,000
50,000
0
1948
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
Revised Annual
Previous Annual

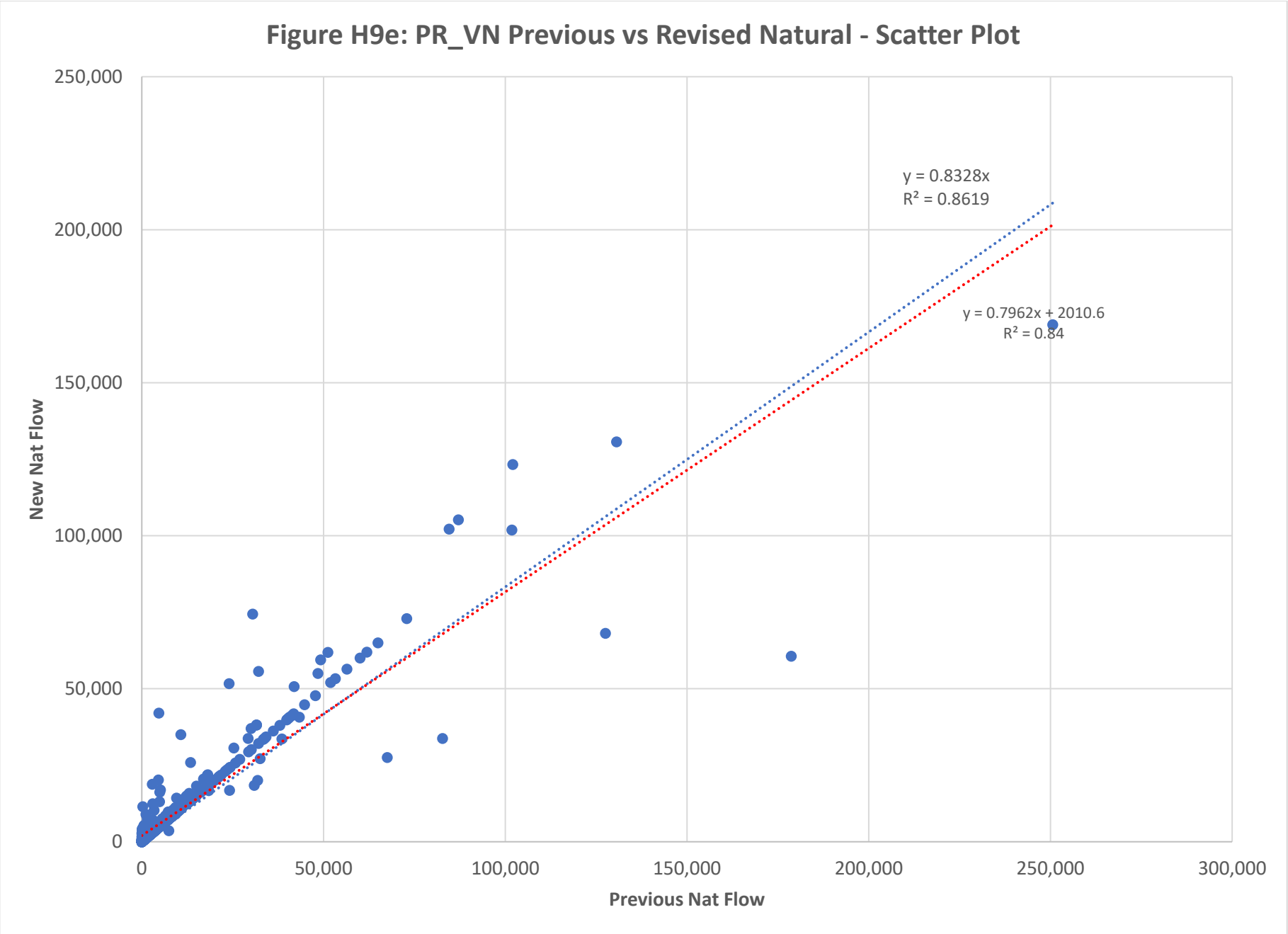


Figure H9e: PR_VN Previous vs Revised Natural - Scatter Plot
y = 0.8328x
R² = 0.8619
y = 0.7962x + 2010.6
R² = 0.84
New Nat Flow
Previous Nat Flow
0
50,000
100,000
150,000
200,000
250,000
300,000

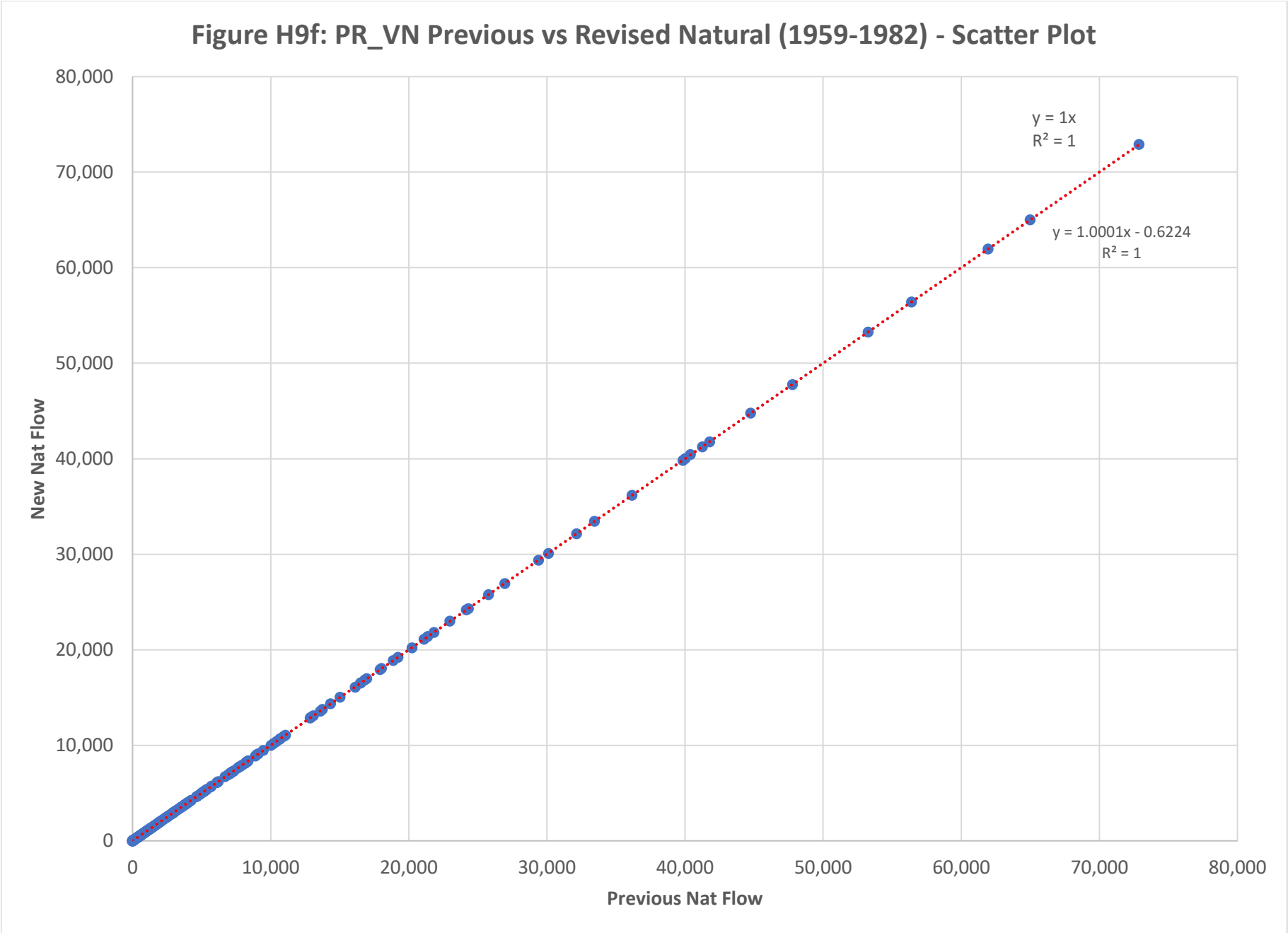


Figure H9f: PR_VN Previous vs Revised Natural (1959-1982) - Scatter Plot
y = 1x
R² = 1
y = 1.0001x - 0.6224
R² = 1
New Nat Flow
Previous Nat Flow
0
10,000
20,000
30,000
40,000
50,000
60,000
70,000
80,000

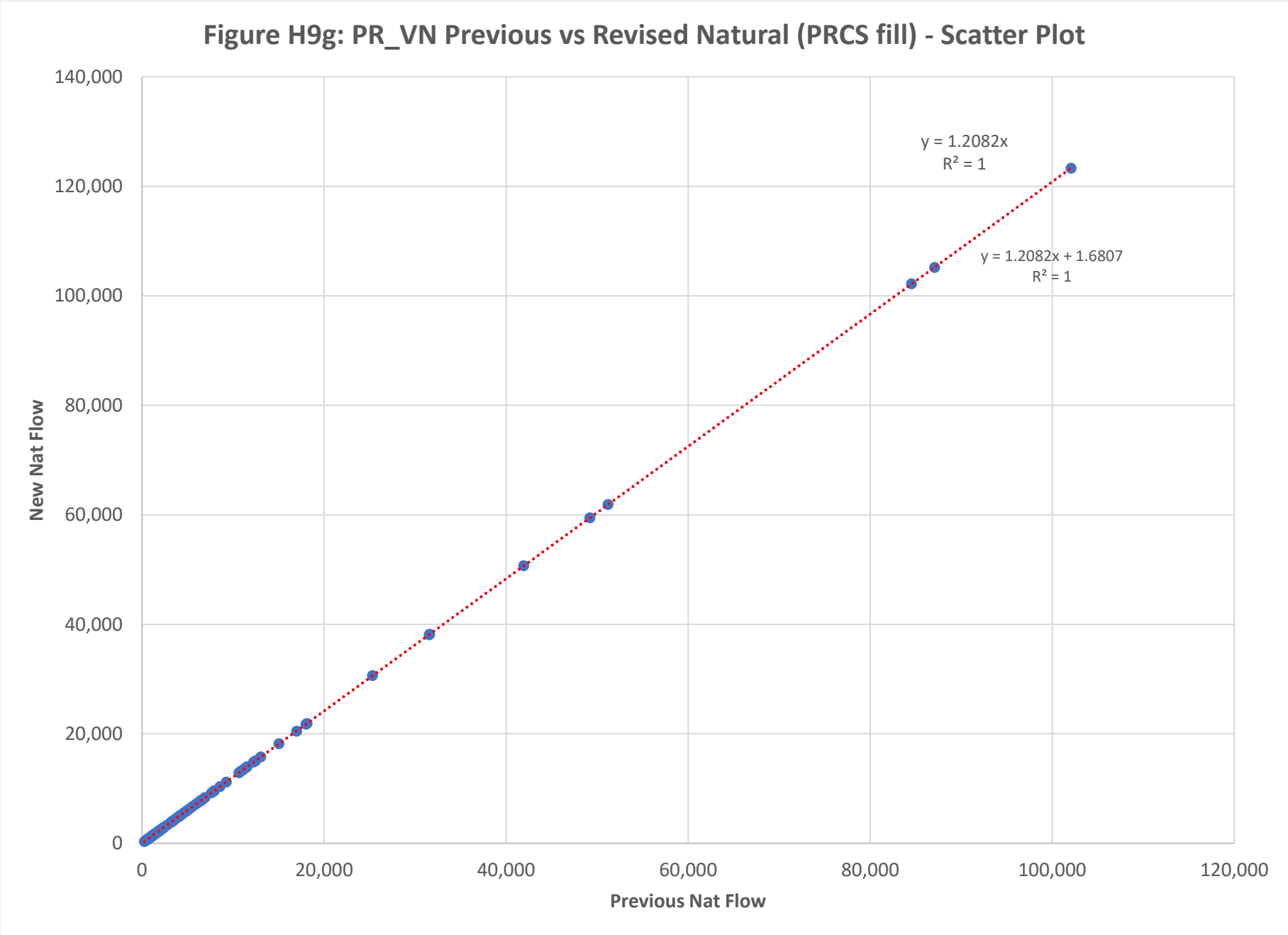


Figure H9g: PR_VN Previous vs Revised Natural (PRCS fill) - Scatter Plot
y = 1.2082x
R² = 1
y = 1.2082x + 1.6807
R² = 1
New Nat Flow
Previous Nat Flow
0
20,000
40,000
60,000
80,000
100,000
120,000
140,000

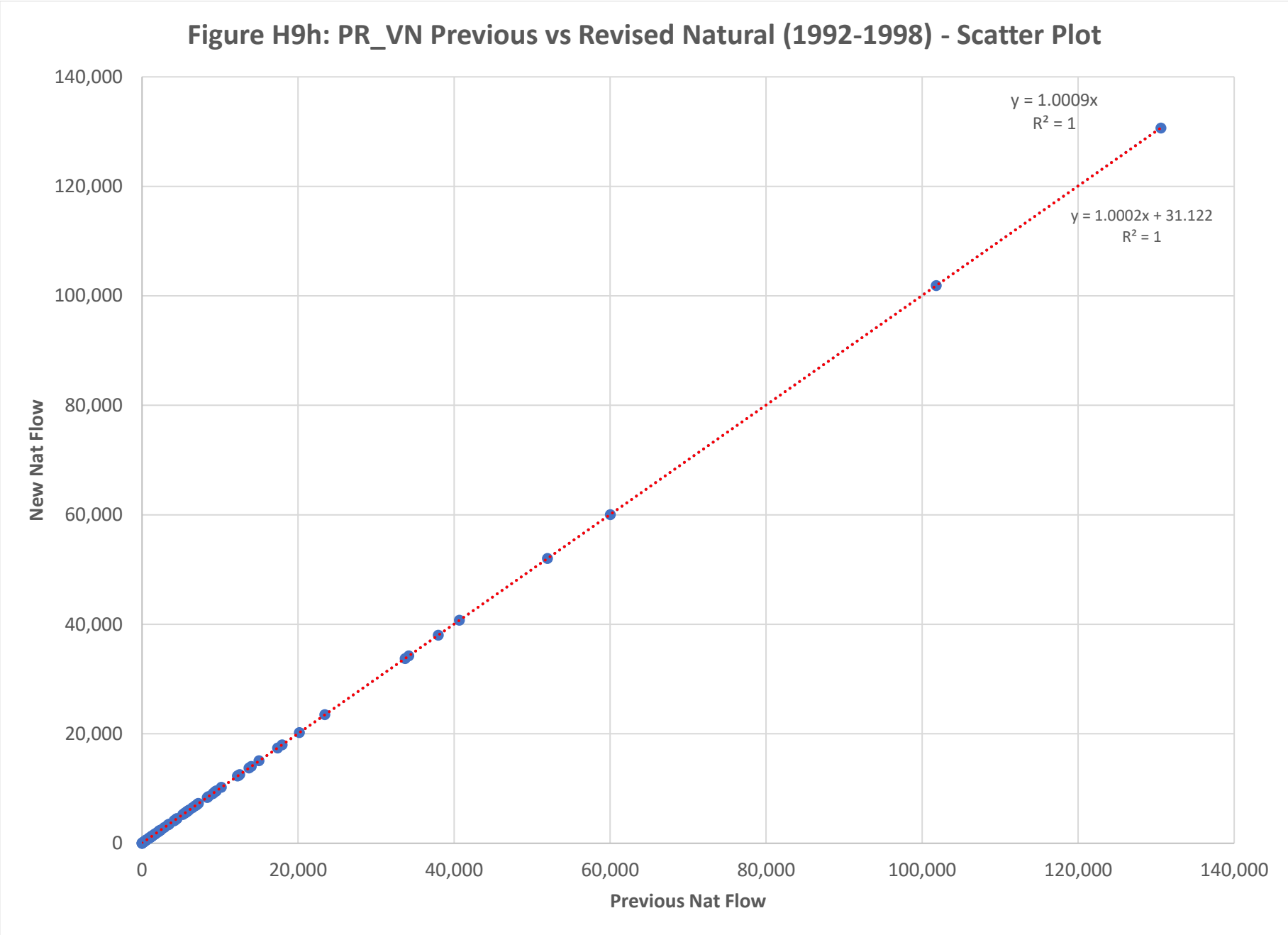


Figure H9h: PR_VN Previous vs Revised Natural (1992-1998) - Scatter Plot
y = 1.0009x
R² = 1
y = 1.0002x + 31.122
R² = 1
New Nat Flow
Previous Nat Flow
0
20,000
40,000
60,000
80,000
100,000
120,000
140,000

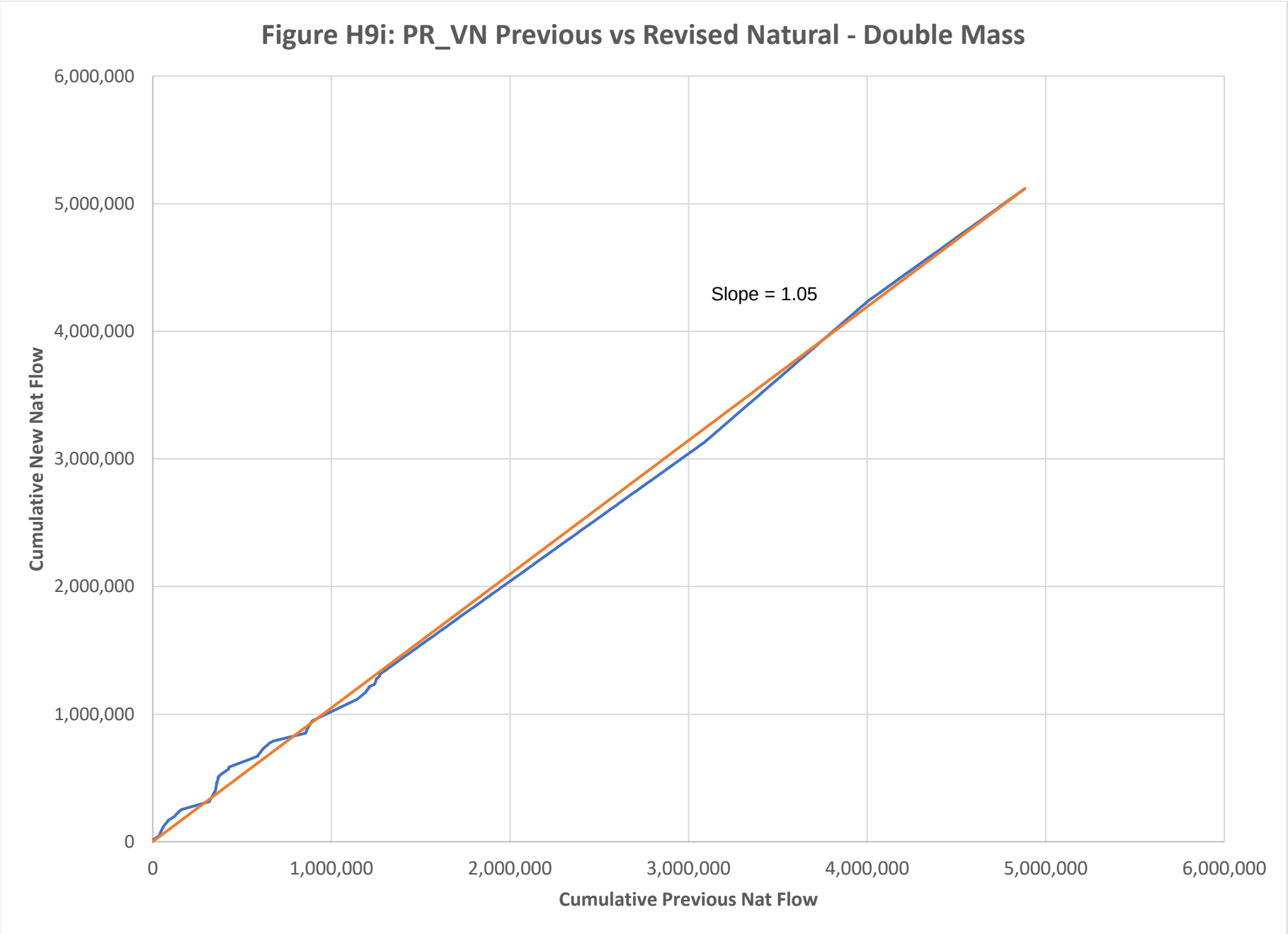


Figure H9i: PR_VN Previous vs Revised Natural - Double Mass
6,000,000
5,000,000
4,000,000
3,000,000
2,000,000
1,000,000
0
Cumulative New Nat Flow
Slope = 1.05
0
1,000,000
2,000,000
3,000,000
4,000,000
5,000,000
6,000,000
Cumulative Previous Nat Flow

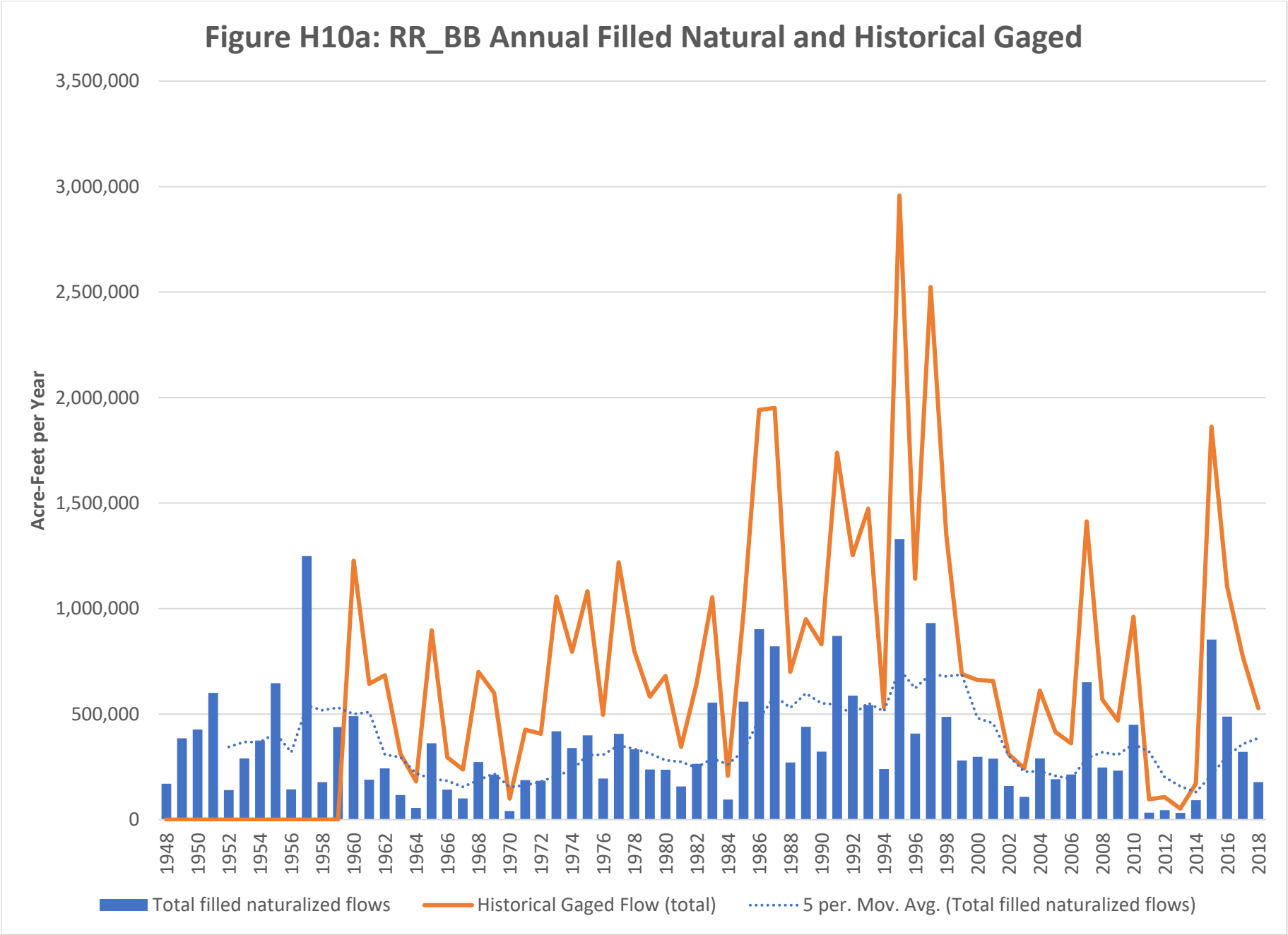


Figure H10a: RR_BB Annual Filled Natural and Historical Gaged
Acre-Feet per Year
3,500,000
3,000,000
2,500,000
2,000,000
1,500,000
1,000,000
500,000
0
1948
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
Total filled naturalized flows
Historical Gaged Flow (total)
5 per. Mov. Avg. (Total filled naturalized flows)

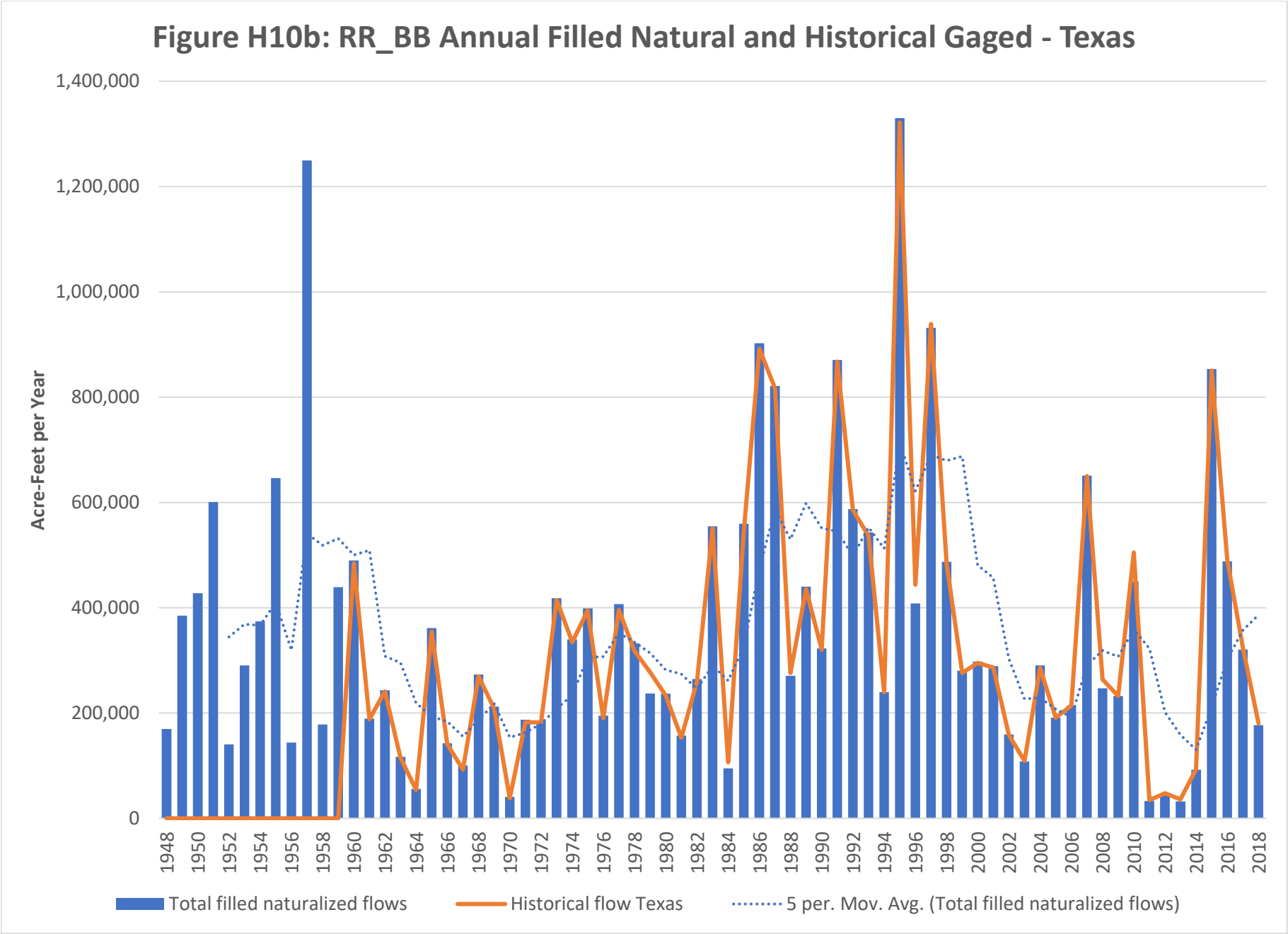


Figure H10b: RR_BB Annual Filled Natural and Historical Gaged - Texas
Acre-Feet per Year
1,400,000
1,200,000
1,000,000
800,000
600,000
400,000
200,000
0
1948
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
Total filled naturalized flows
Historical flow Texas
5 per. Mov. Avg. (Total filled naturalized flows)

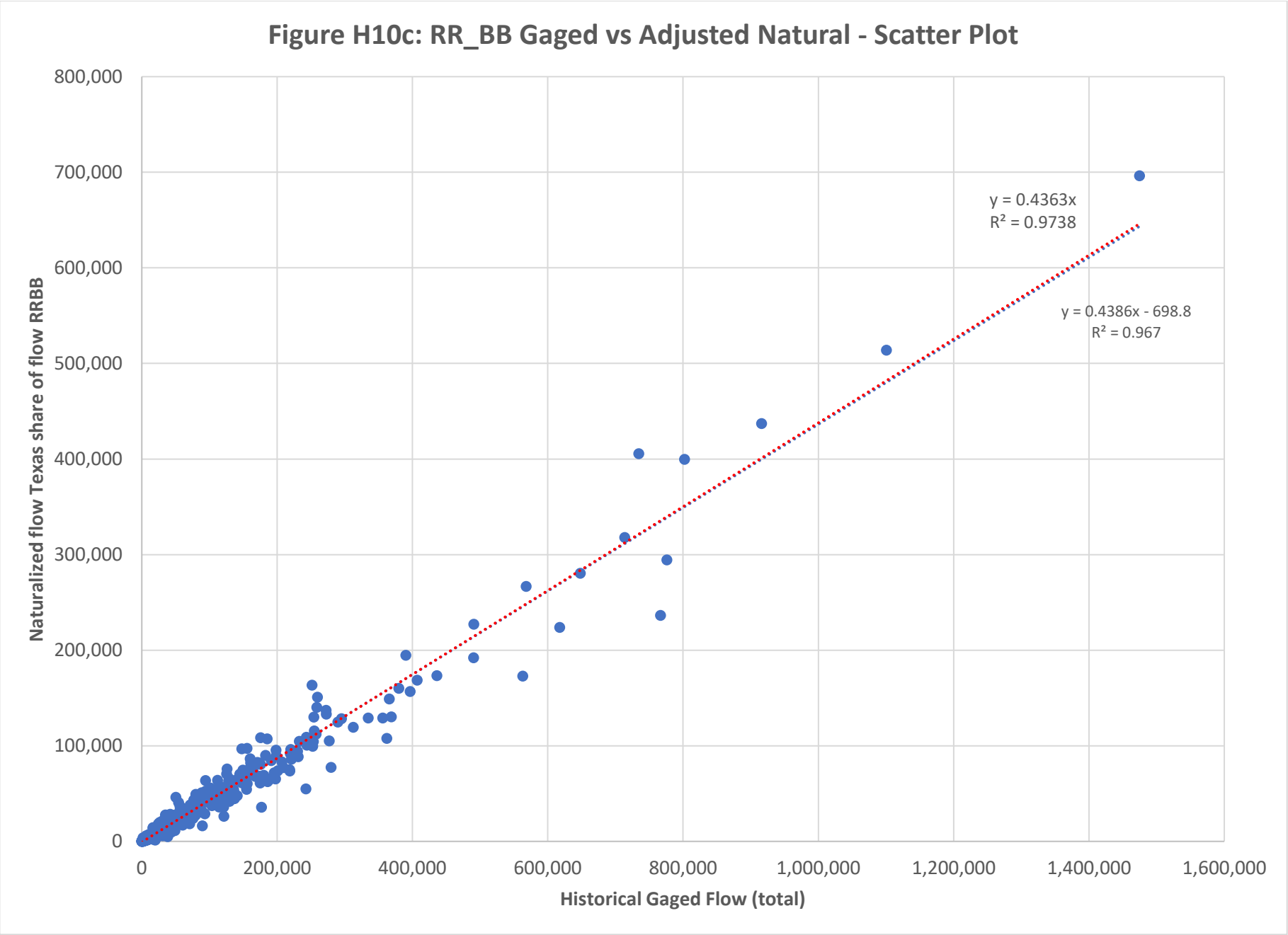


Figure H10c: RR_BB Gaged vs Adjusted Natural - Scatter Plot
Naturalized flow Texas share of flow RRBB
Historical Gaged Flow (total)
y = 0.4363x
R² = 0.9738
y = 0.4386x - 698.8
R² = 0.967
0
100,000
200,000
300,000
400,000
500,000
600,000
700,000
800,000
0
200,000
400,000
600,000
800,000
1,000,000
1,200,000
1,400,000
1,600,000

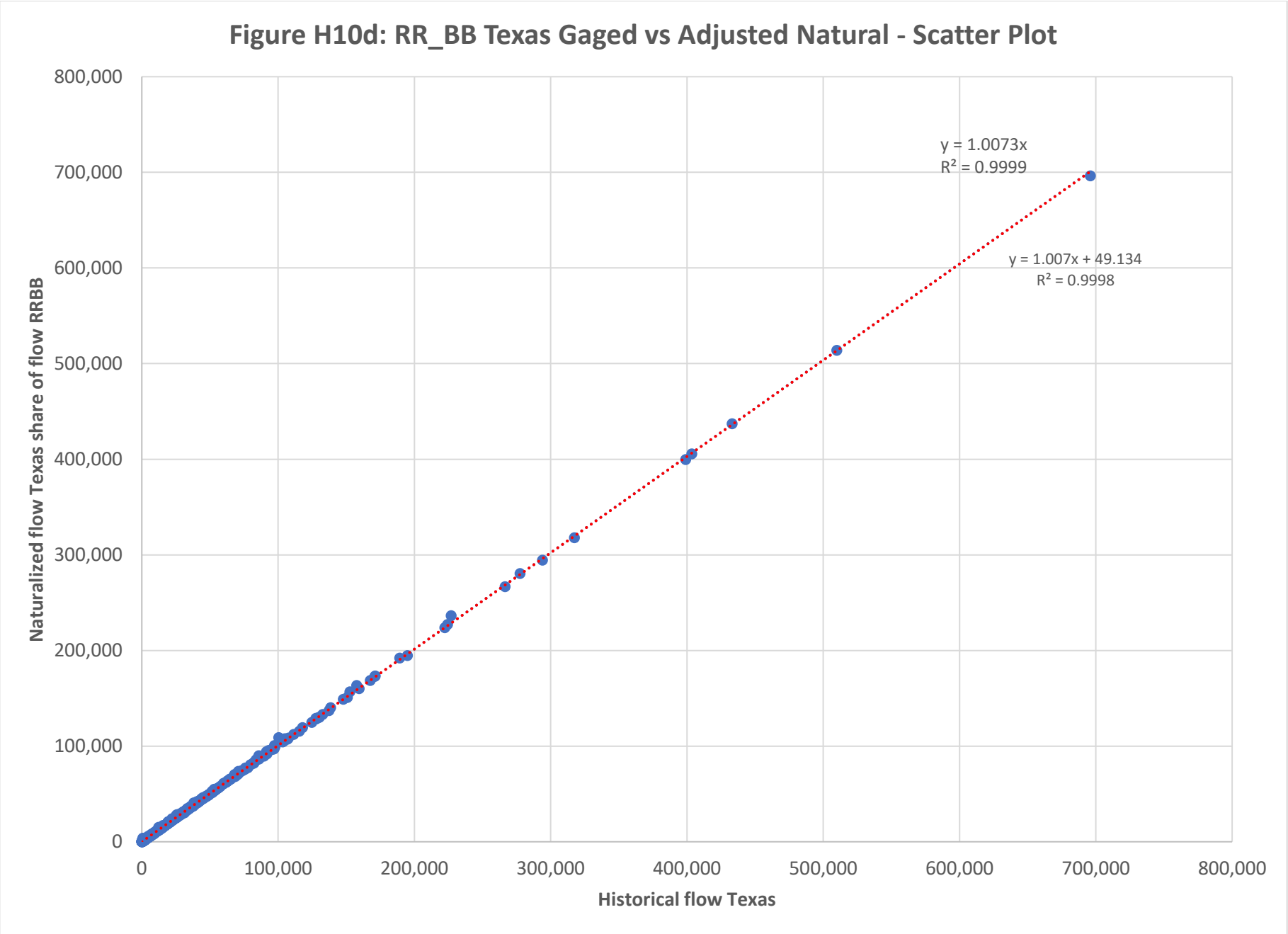


Figure H10d: RR_BB Texas Gaged vs Adjusted Natural - Scatter Plot
y = 1.0073x
R² = 0.9999
y = 1.007x + 49.134
R² = 0.9998
Naturalized flow Texas share of flow RRBB
Historical flow Texas
0
100,000
200,000
300,000
400,000
500,000
600,000
700,000
800,000

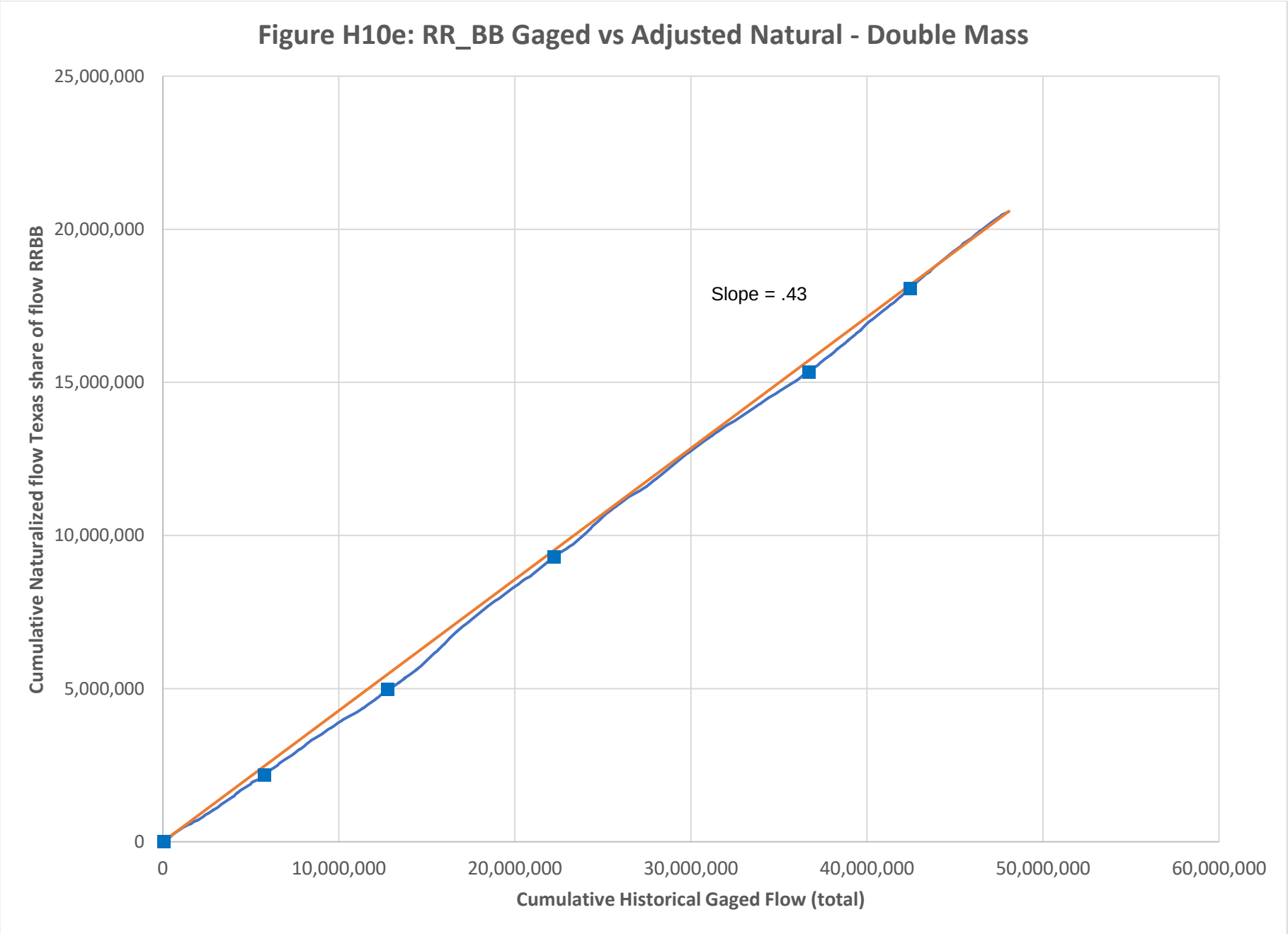


Figure H10e: RR_BB Gaged vs Adjusted Natural - Double Mass
Cumulative Naturalized flow Texas share of flow RRBB
25,000,000
20,000,000
15,000,000
10,000,000
5,000,000
0
Slope = .43
0
10,000,000
20,000,000
30,000,000
40,000,000
50,000,000
60,000,000
Cumulative Historical Gaged Flow (total)

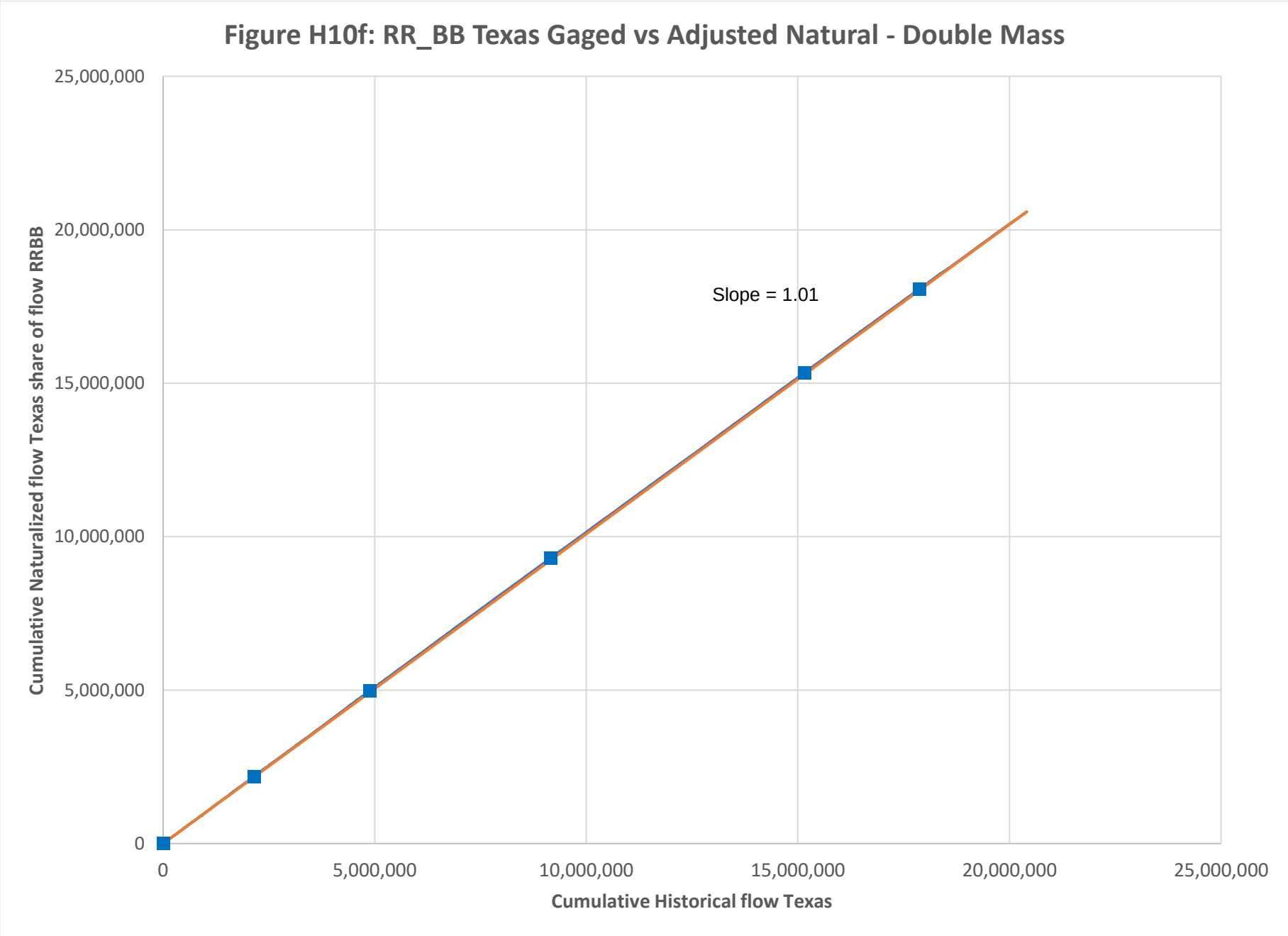


Figure H10f: RR_BB Texas Gaged vs Adjusted Natural - Double Mass
Slope = 1.01
Cumulative Naturalized flow Texas share of flow RRBB
Cumulative Historical flow Texas
0
5,000,000
10,000,000
15,000,000
20,000,000
25,000,000

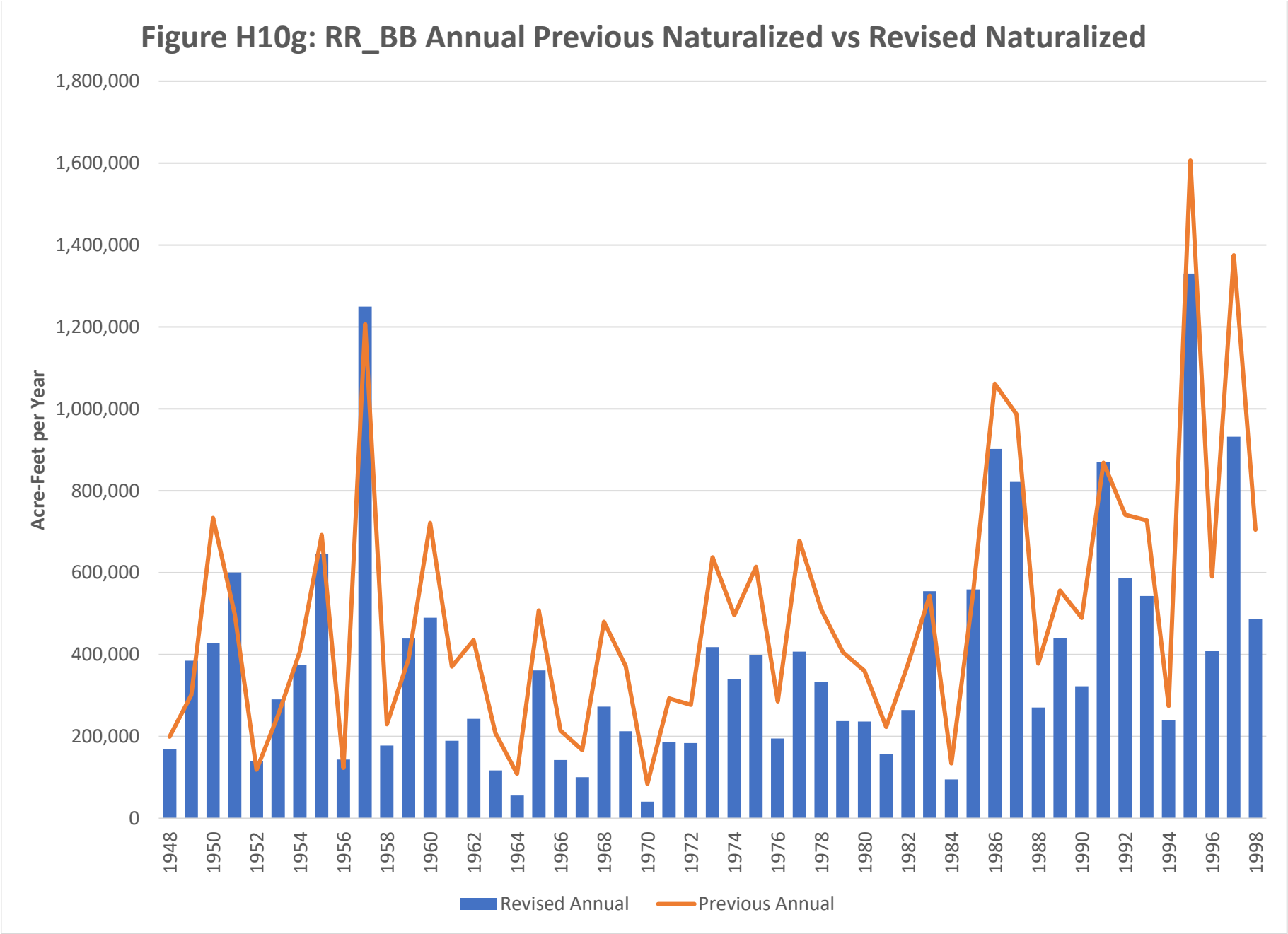


Figure H10g: RR_BB Annual Previous Naturalized vs Revised Naturalized
Acre-Feet per Year
1,800,000
1,600,000
1,400,000
1,200,000
1,000,000
800,000
600,000
400,000
200,000
0
1948
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
Revised Annual
Previous Annual

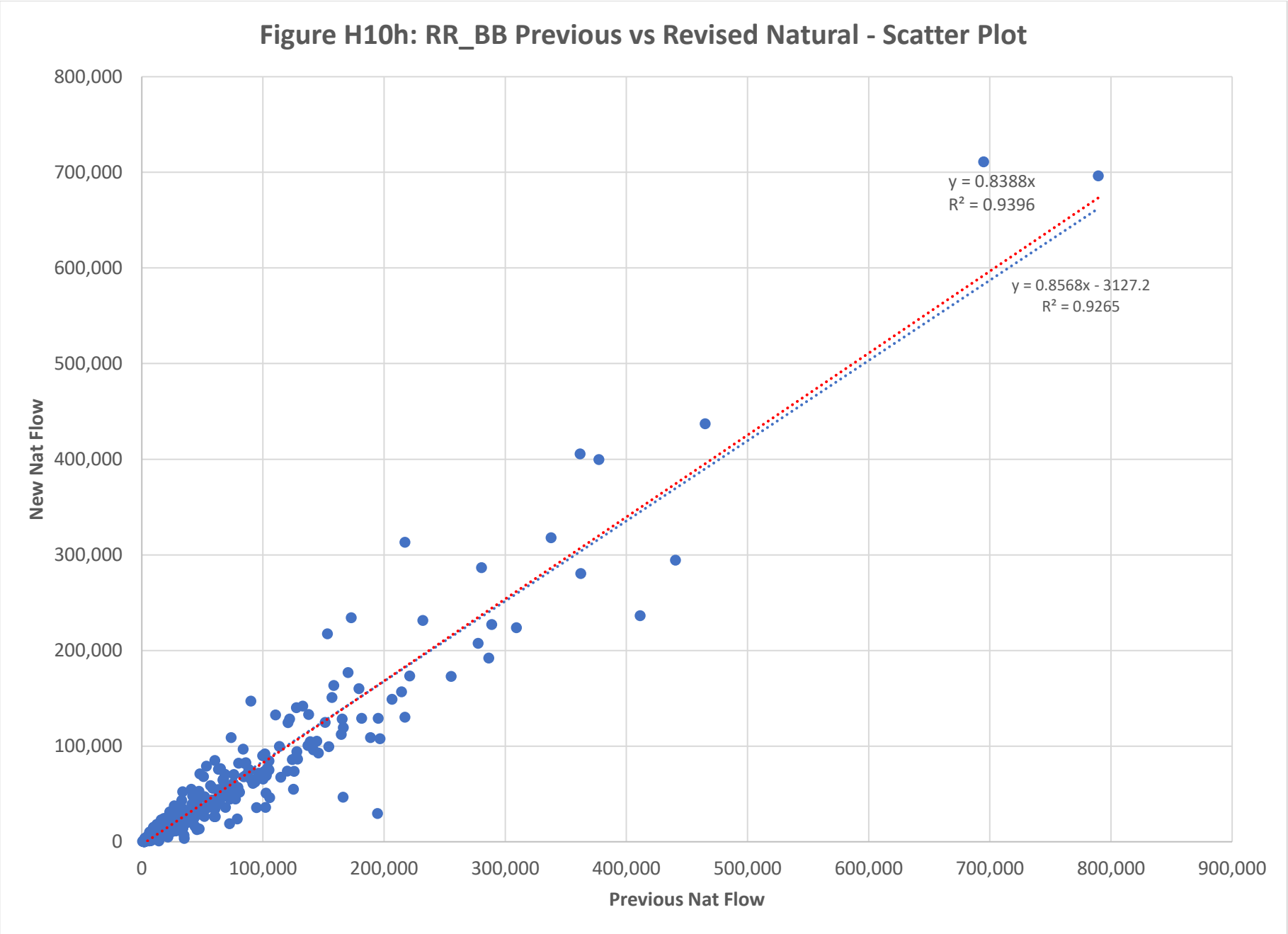


Figure H10h: RR_BB Previous vs Revised Natural - Scatter Plot
y = 0.8388x
R² = 0.9396
y = 0.8568x - 3127.2
R² = 0.9265
New Nat Flow
Previous Nat Flow
0
100,000
200,000
300,000
400,000
500,000
600,000
700,000
800,000
900,000

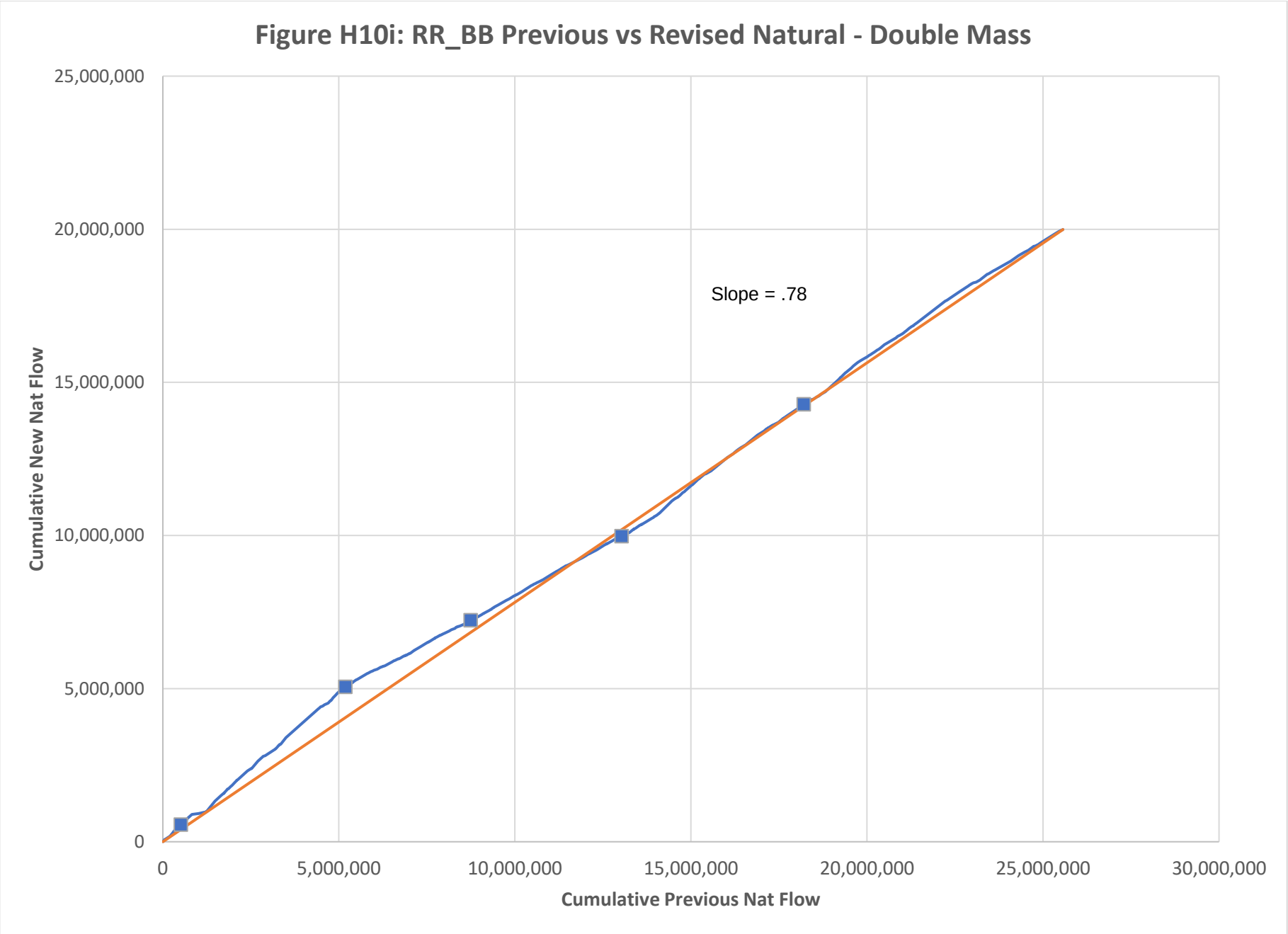


Figure H10i: RR_BB Previous vs Revised Natural - Double Mass
25,000,000
20,000,000
15,000,000
10,000,000
5,000,000
0
Cumulative New Nat Flow
Slope = .78
0
5,000,000
10,000,000
15,000,000
20,000,000
25,000,000
30,000,000
Cumulative Previous Nat Flow

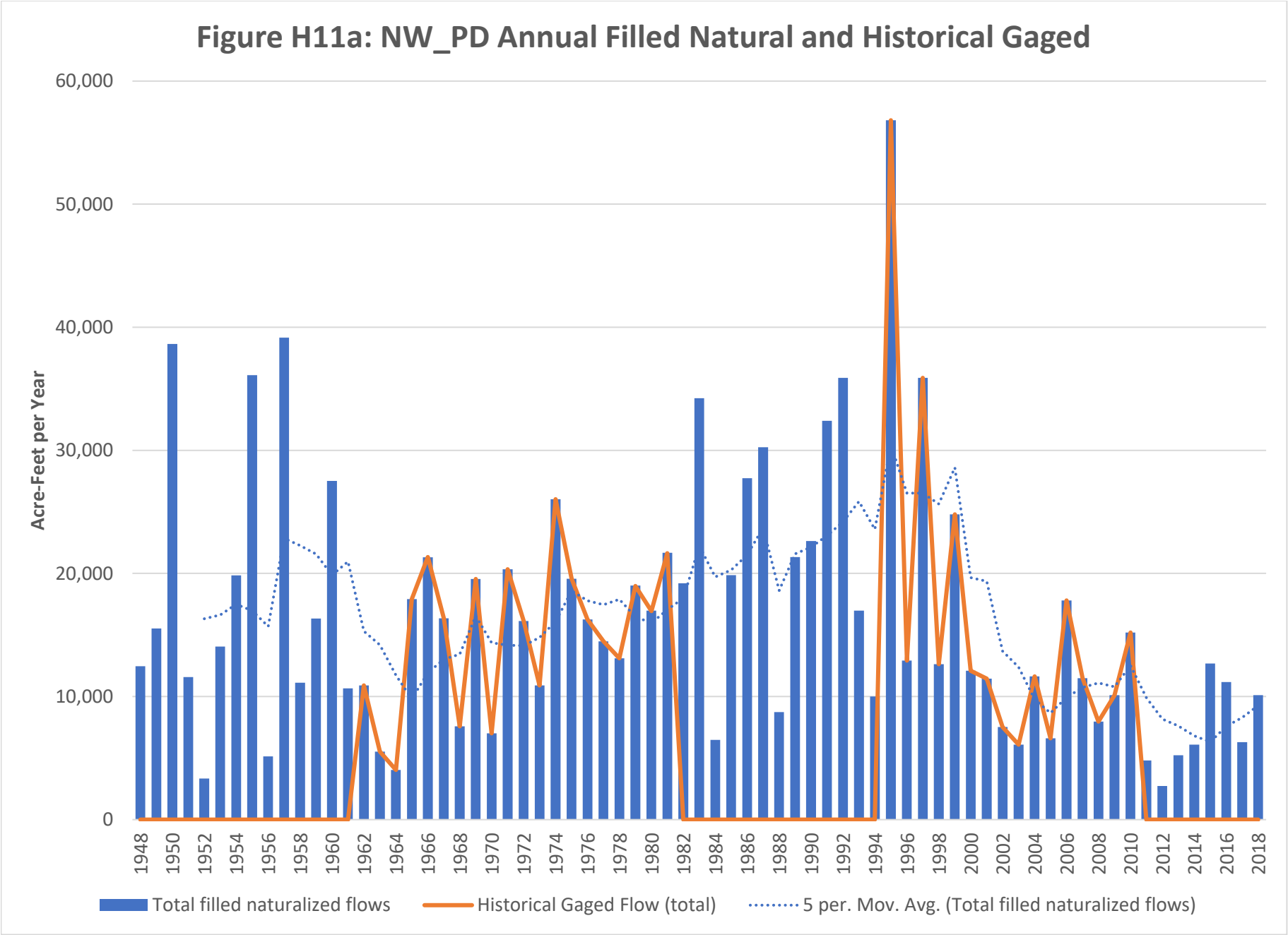


Figure H11a: NW_PD Annual Filled Natural and Historical Gaged
Acre-Feet per Year
60,000
50,000
40,000
30,000
20,000
10,000
0
1948
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
Total filled naturalized flows
Historical Gaged Flow (total)
5 per. Mov. Avg. (Total filled naturalized flows)

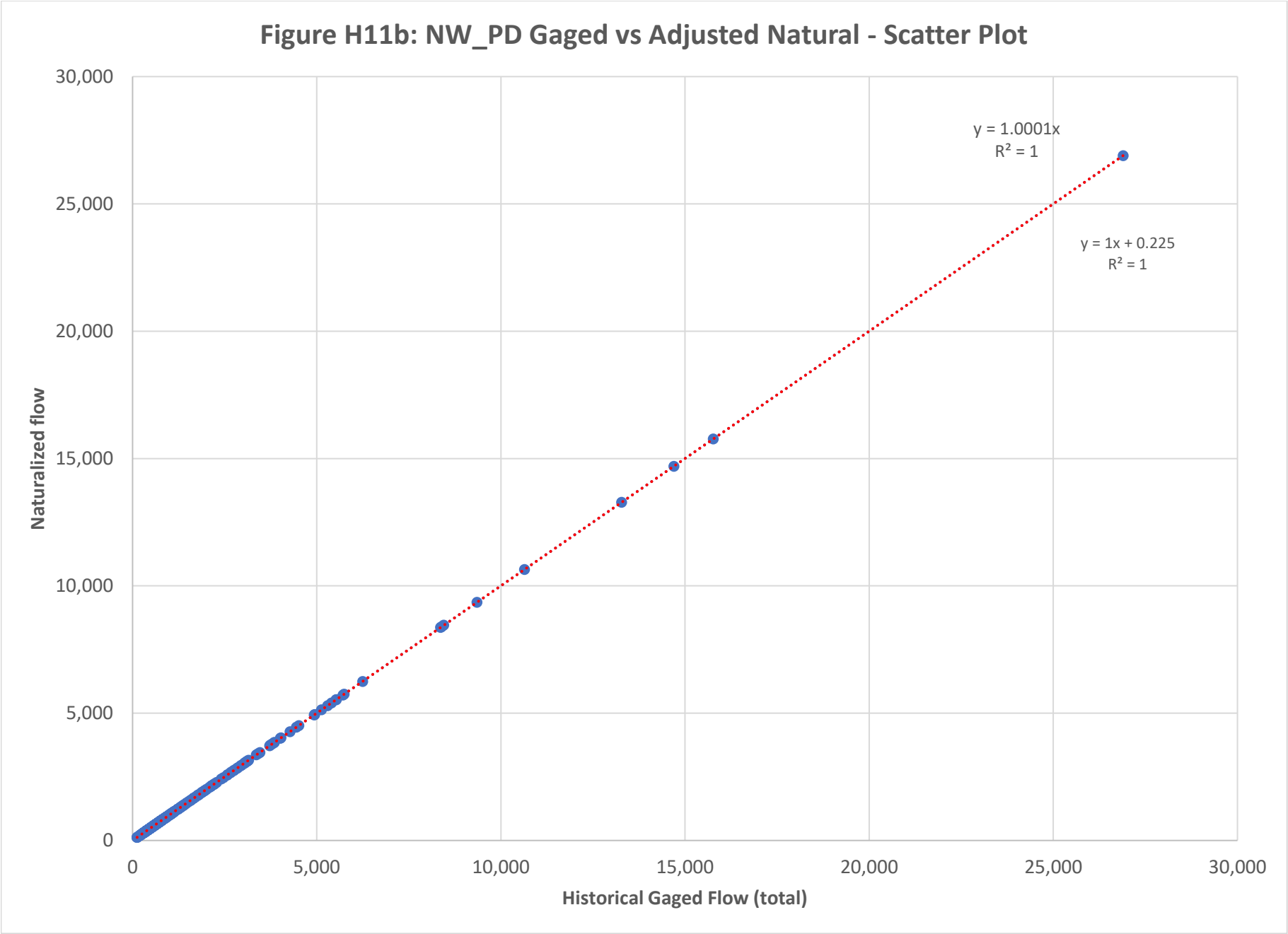


Figure H11b: NW_PD Gaged vs Adjusted Natural - Scatter Plot
y = 1.0001x
R² = 1
y = 1x + 0.225
R² = 1
Naturalized flow
Historical Gaged Flow (total)
0
5,000
10,000
15,000
20,000
25,000
30,000

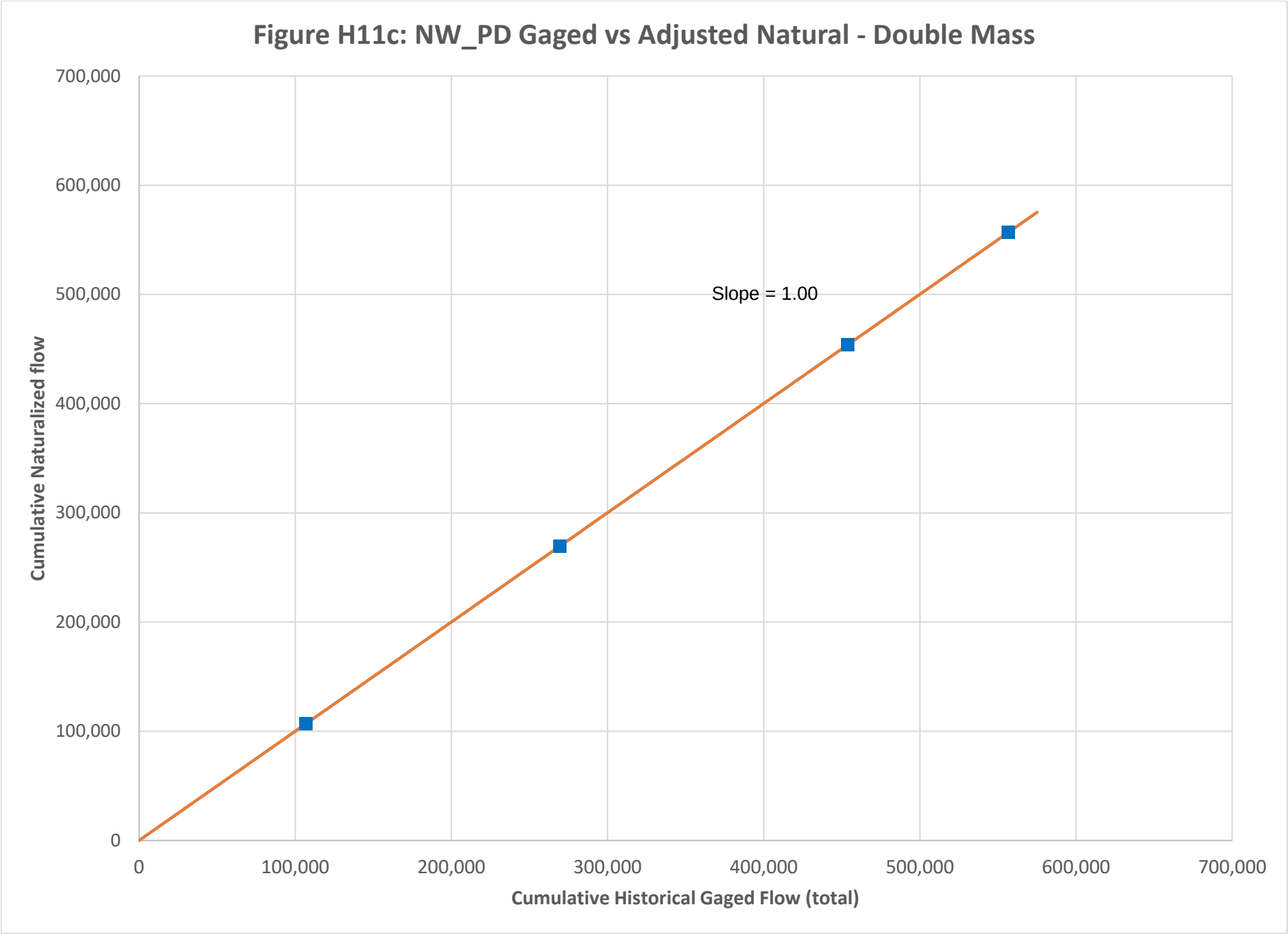


Figure H11c: NW_PD Gaged vs Adjusted Natural - Double Mass
Slope = 1.00
Cumulative Naturalized flow
Cumulative Historical Gaged Flow (total)
0
100,000
200,000
300,000
400,000
500,000
600,000
700,000

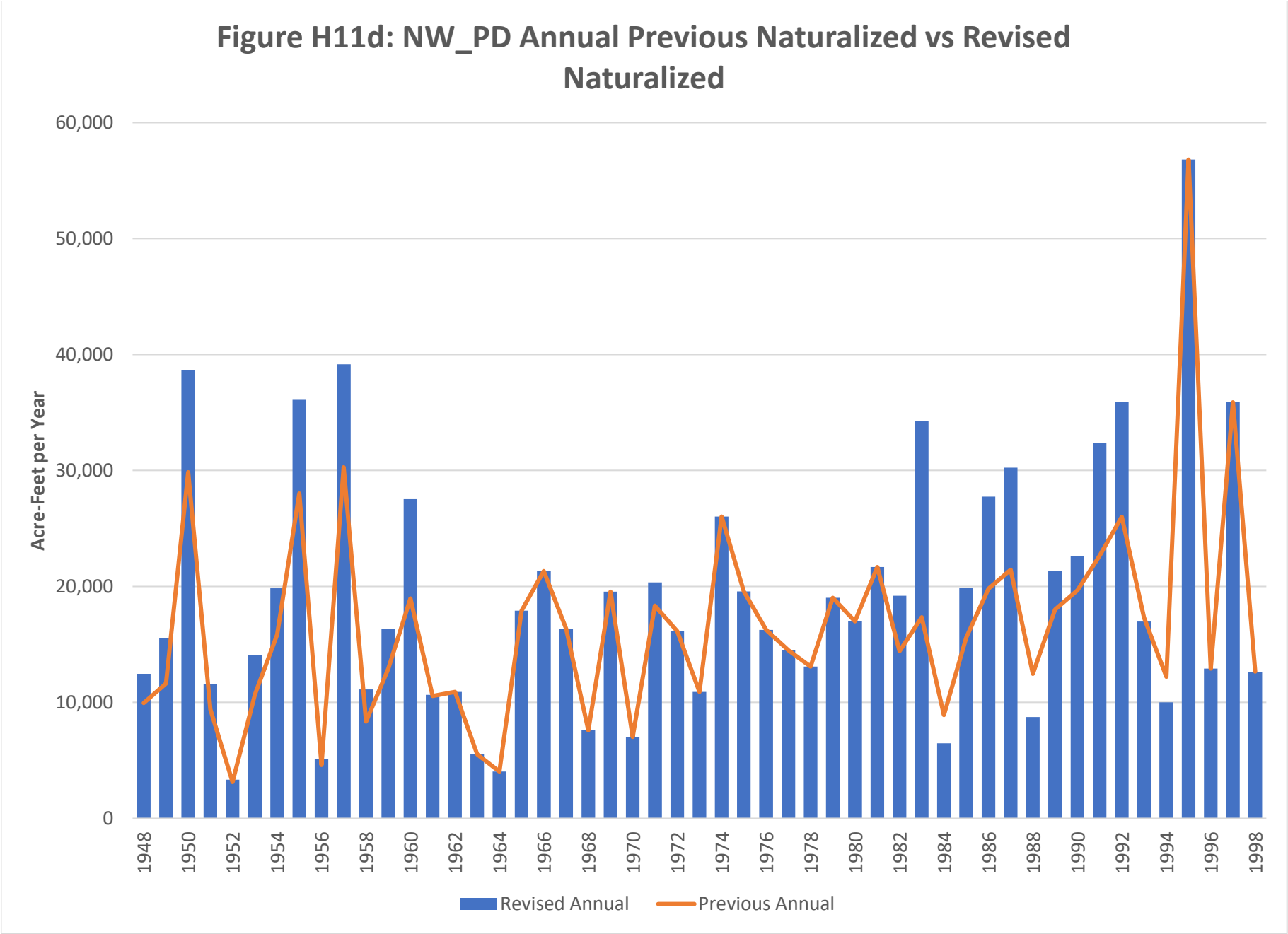


Figure H11d: NW_PD Annual Previous Naturalized vs Revised Naturalized
Acre-Feet per Year
60,000
50,000
40,000
30,000
20,000
10,000
0
1948
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
Revised Annual
Previous Annual

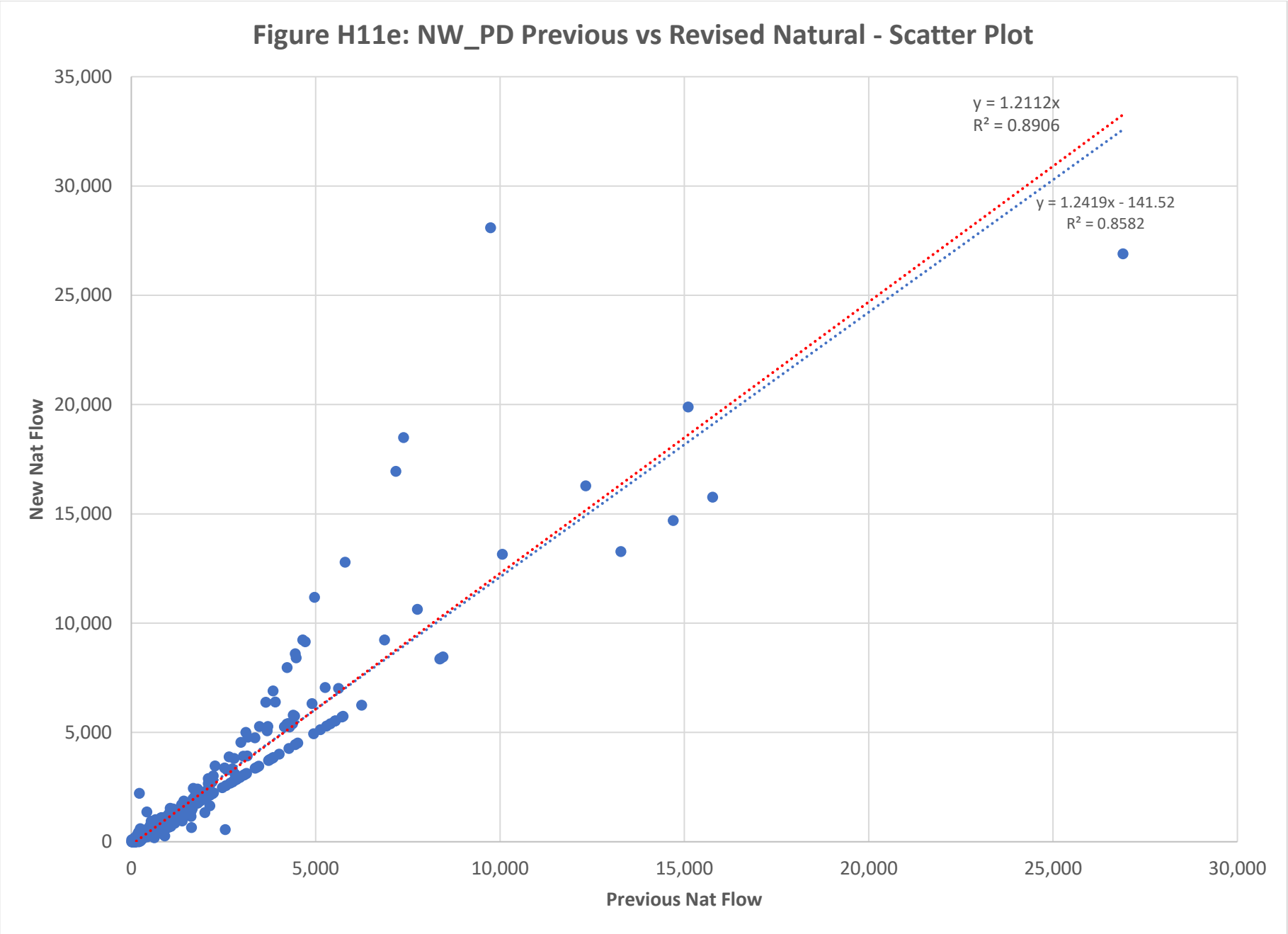


Figure H11e: NW_PD Previous vs Revised Natural - Scatter Plot
y = 1.2112x
R² = 0.8906
y = 1.2419x - 141.52
R² = 0.8582
New Nat Flow
Previous Nat Flow
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
0
5,000
10,000
15,000
20,000
25,000
30,000

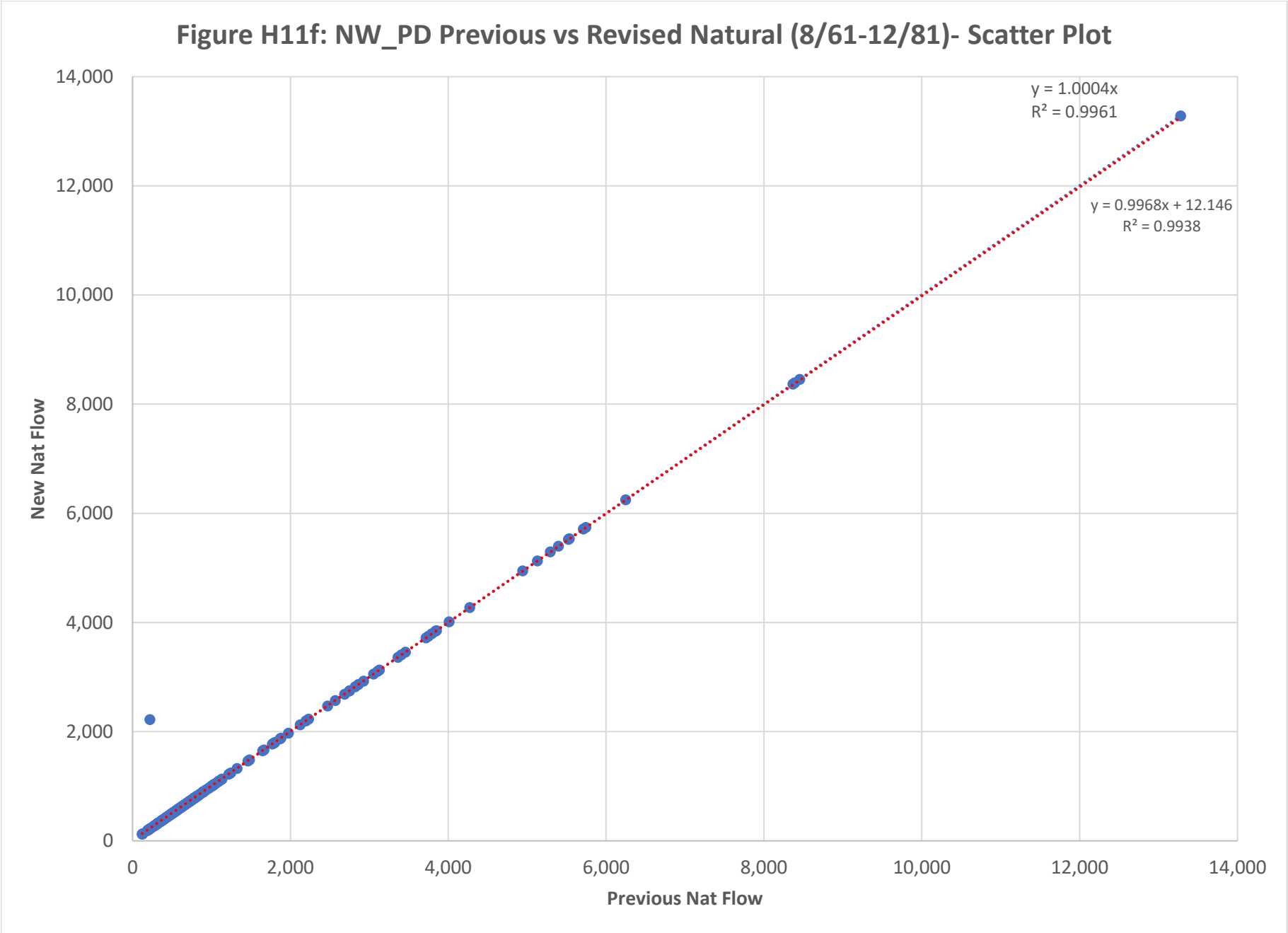


Figure H11f: NW_PD Previous vs Revised Natural (8/61-12/81)- Scatter Plot
y = 1.0004x
R² = 0.9961
y = 0.9968x + 12.146
R² = 0.9938
New Nat Flow
Previous Nat Flow
0
2,000
4,000
6,000
8,000
10,000
12,000
14,000

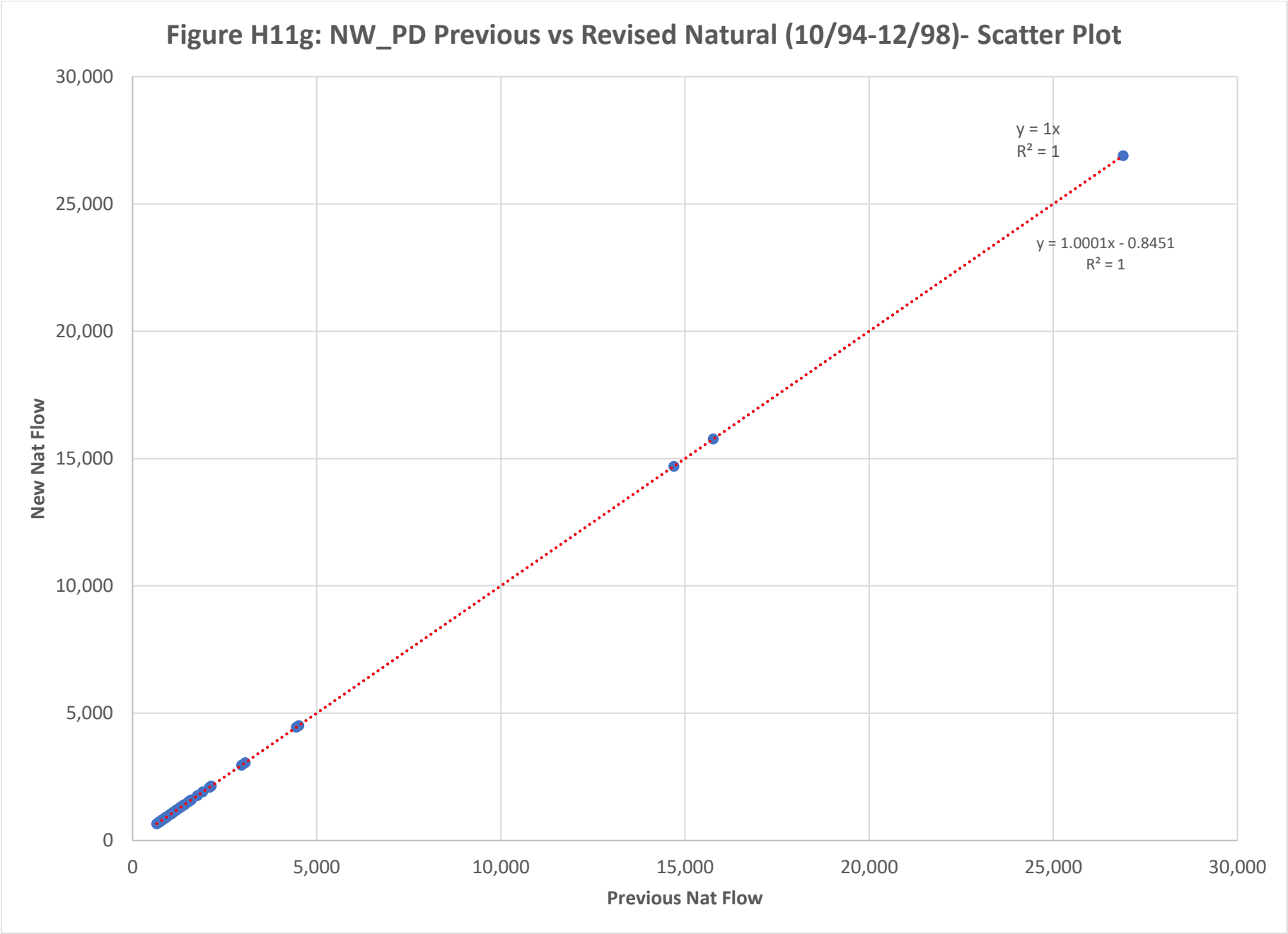


Figure H11g: NW_PD Previous vs Revised Natural (10/94-12/98)- Scatter Plot
y = 1x
R² = 1
y = 1.0001x - 0.8451
R² = 1
New Nat Flow
Previous Nat Flow
0
5,000
10,000
15,000
20,000
25,000
30,000

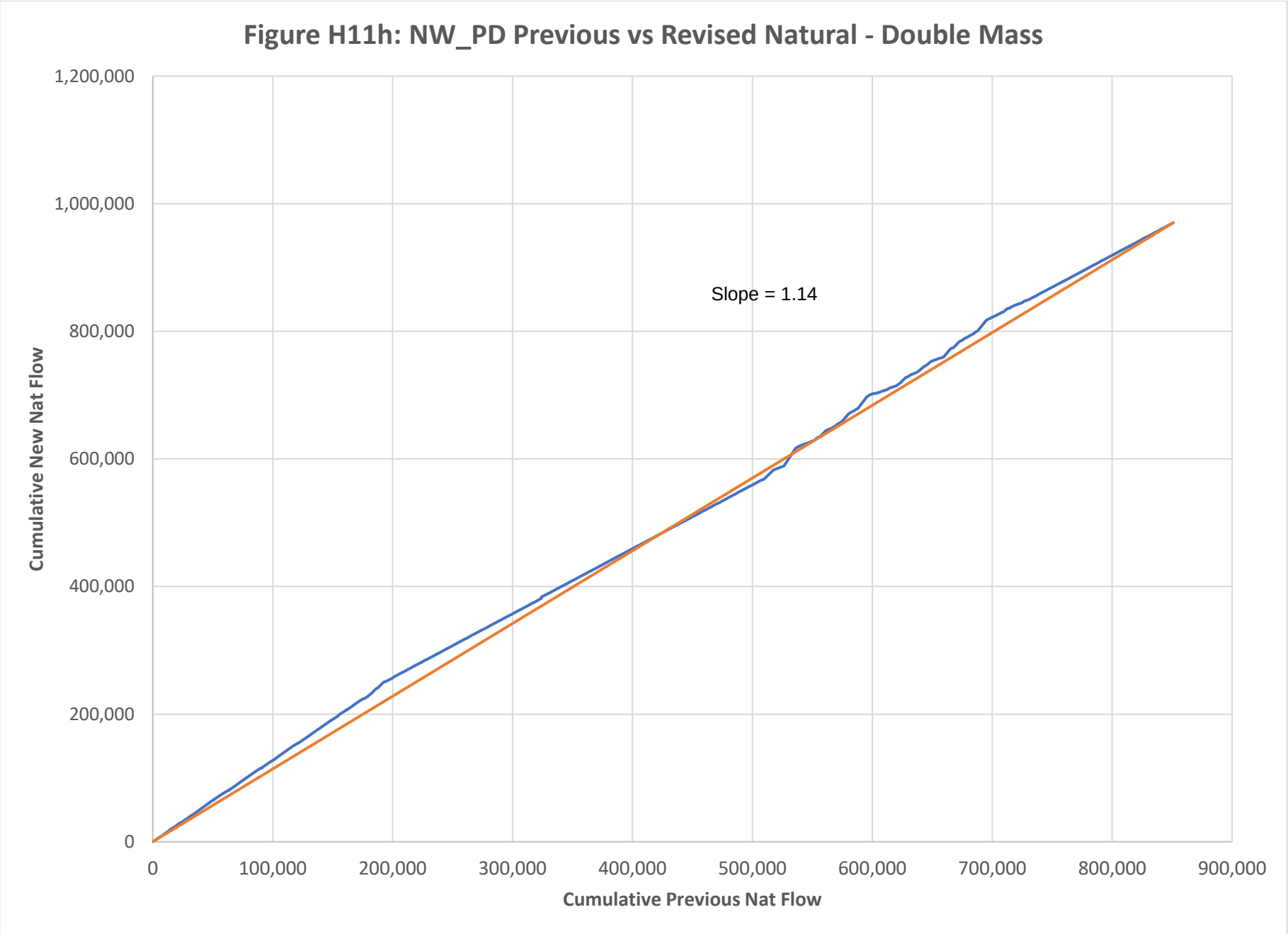


Figure H11h: NW_PD Previous vs Revised Natural - Double Mass
Slope = 1.14
Cumulative New Nat Flow
Cumulative Previous Nat Flow
0
200,000
400,000
600,000
800,000
1,000,000
1,200,000
0
100,000
200,000
300,000
400,000
500,000
600,000
700,000
800,000
900,000

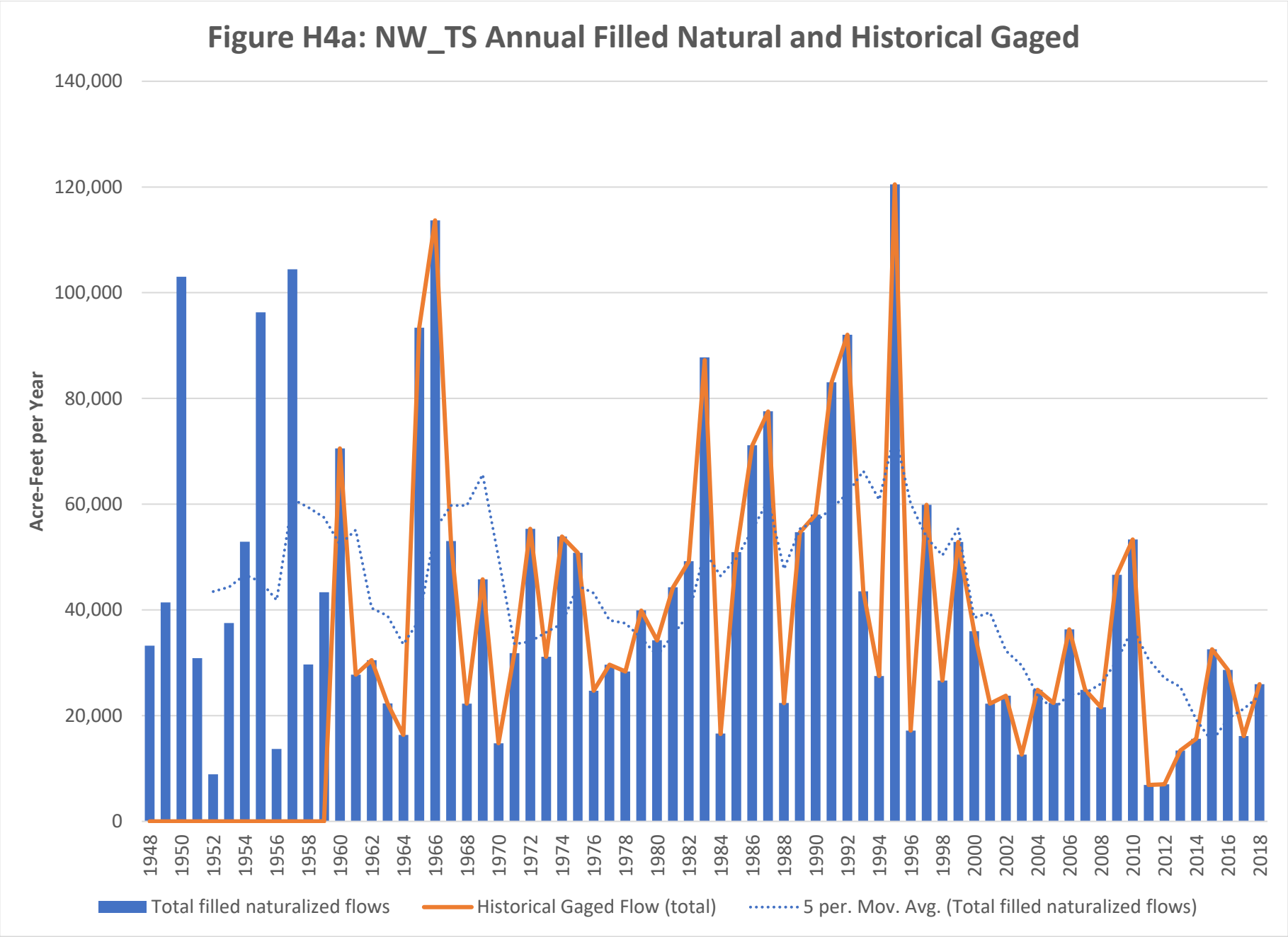


Figure H4a: NW_TS Annual Filled Natural and Historical Gaged
Acre-Feet per Year
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
1948
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
Total filled naturalized flows
Historical Gaged Flow (total)
5 per. Mov. Avg. (Total filled naturalized flows)

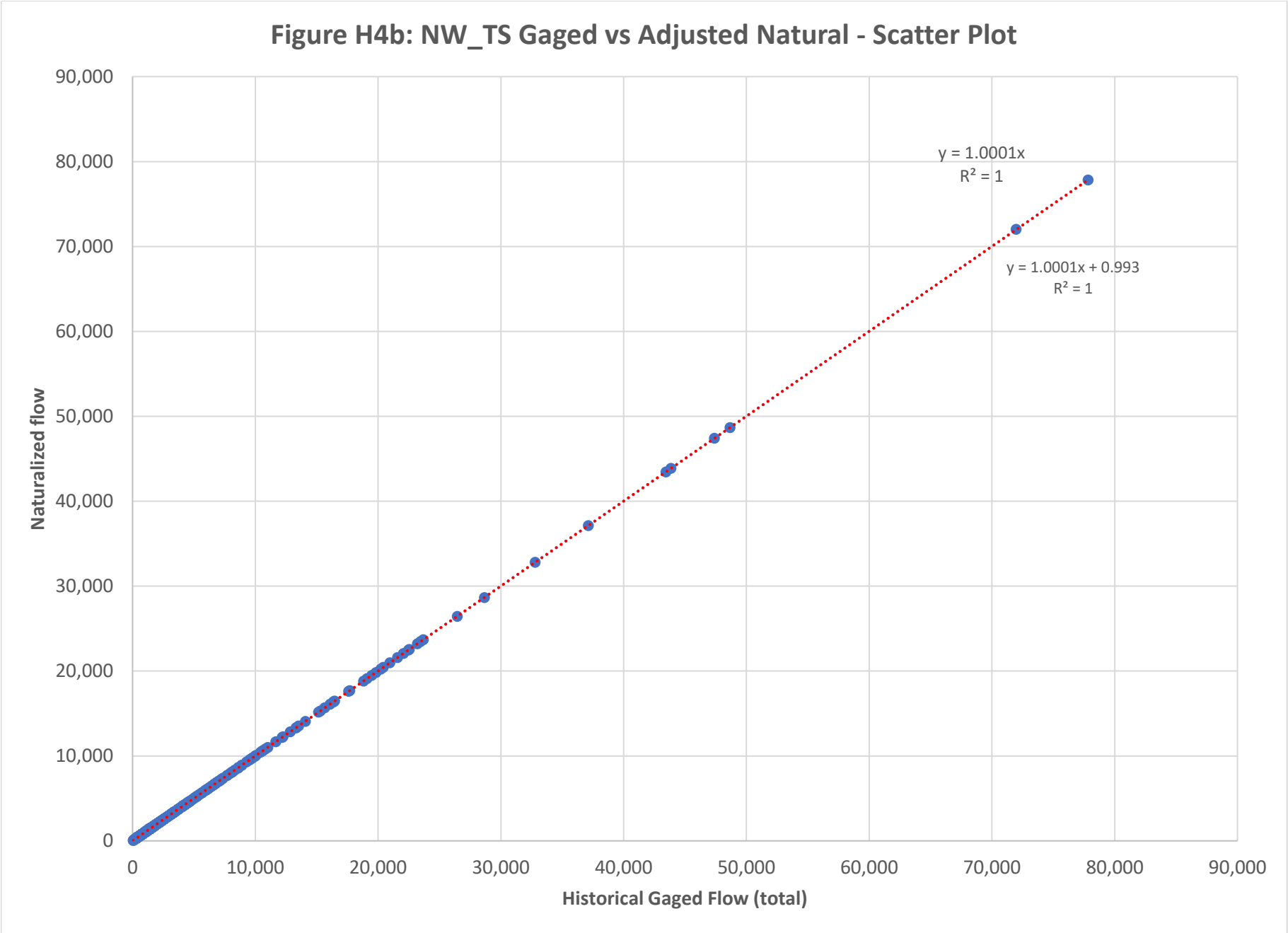


Figure H4b: NW_TS Gaged vs Adjusted Natural - Scatter Plot
y = 1.0001x
R² = 1
y = 1.0001x + 0.993
R² = 1
Naturalized flow
Historical Gaged Flow (total)
0
10,000
20,000
30,000
40,000
50,000
60,000
70,000
80,000
90,000

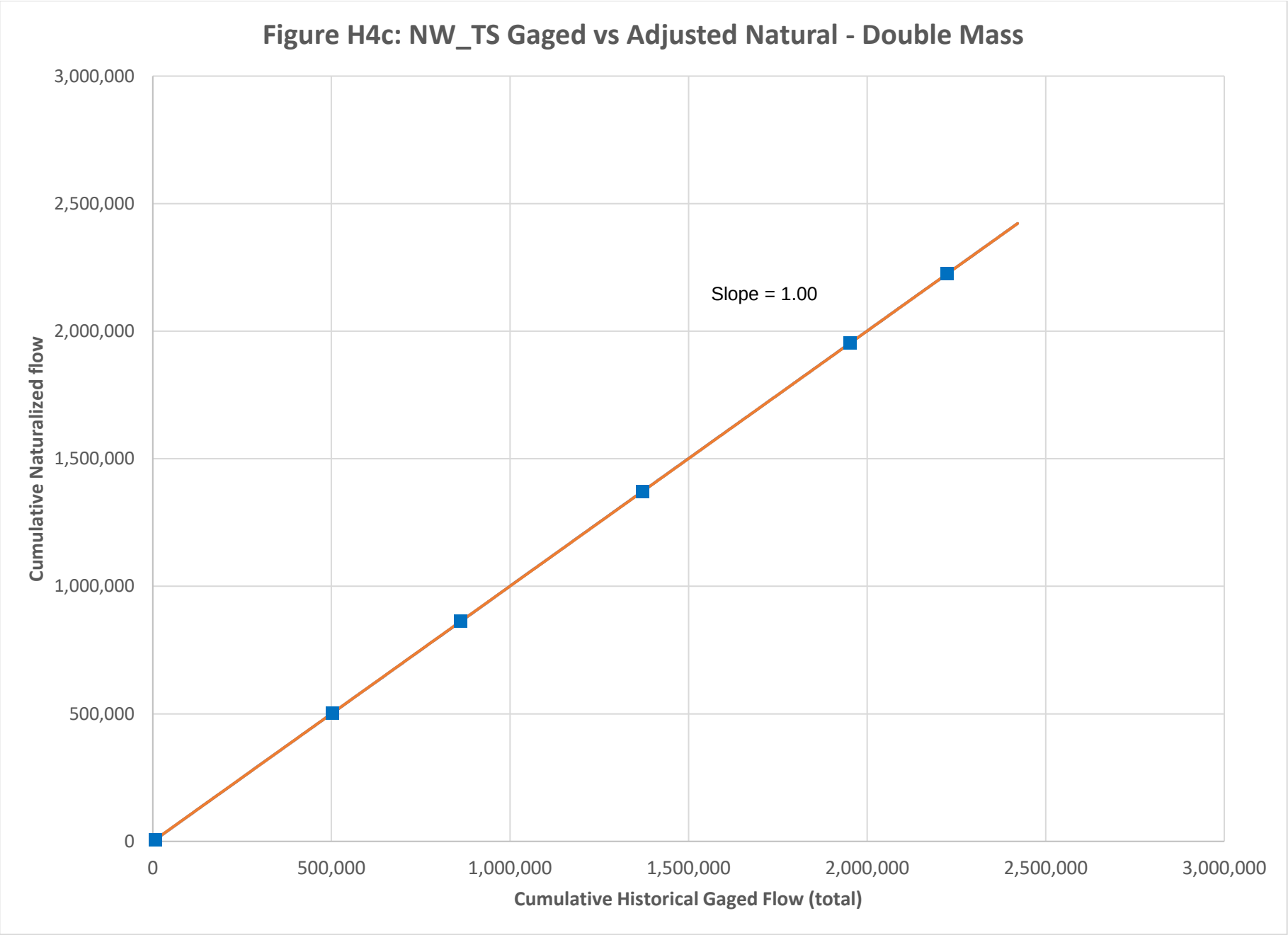


Figure H4c: NW_TS Gaged vs Adjusted Natural - Double Mass
Slope = 1.00
Cumulative Naturalized flow
Cumulative Historical Gaged Flow (total)
0
500,000
1,000,000
1,500,000
2,000,000
2,500,000
3,000,000

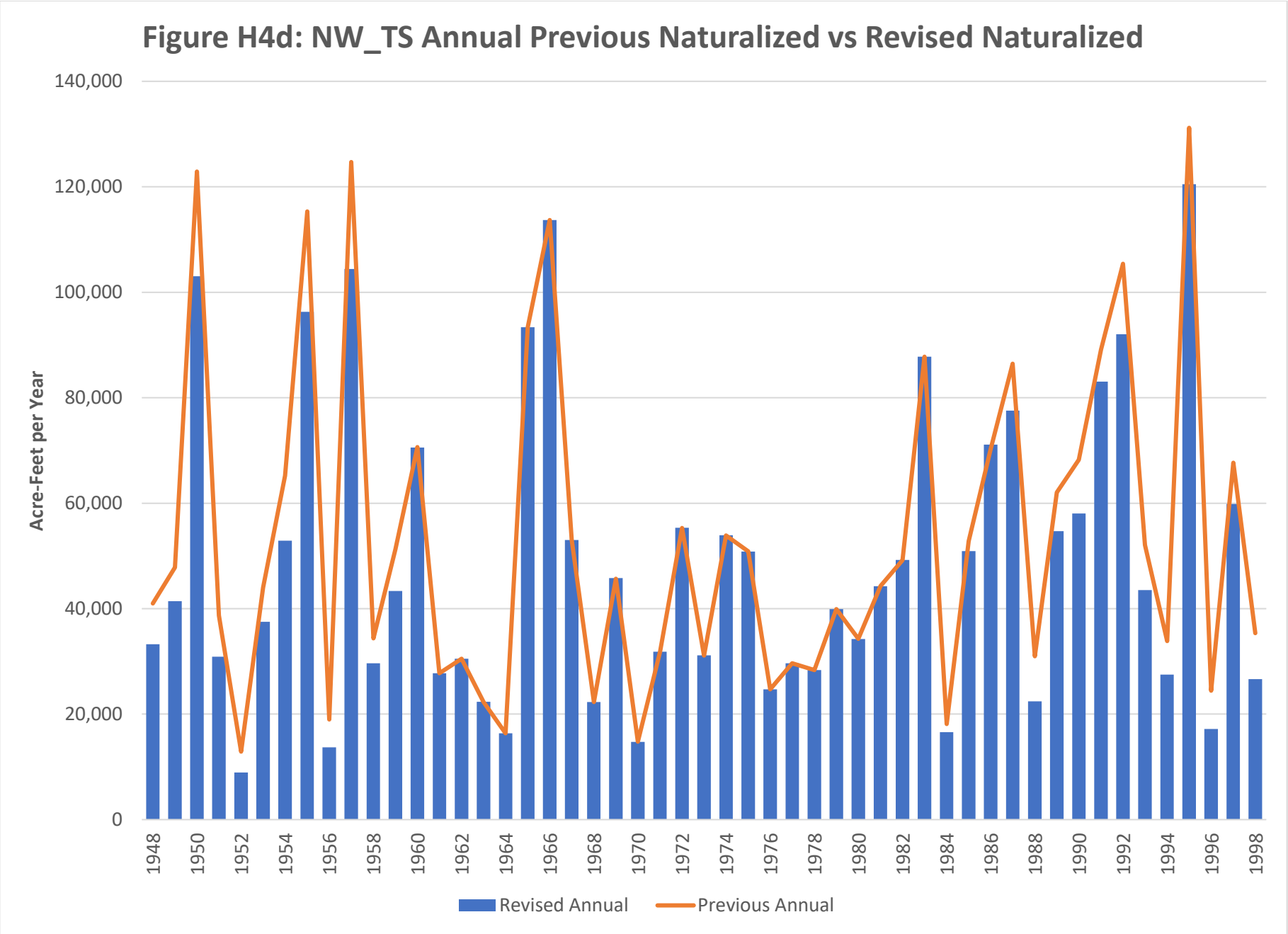


Figure H4d: NW_TS Annual Previous Naturalized vs Revised Naturalized
Acre-Feet per Year
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
1948
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
Revised Annual
Previous Annual

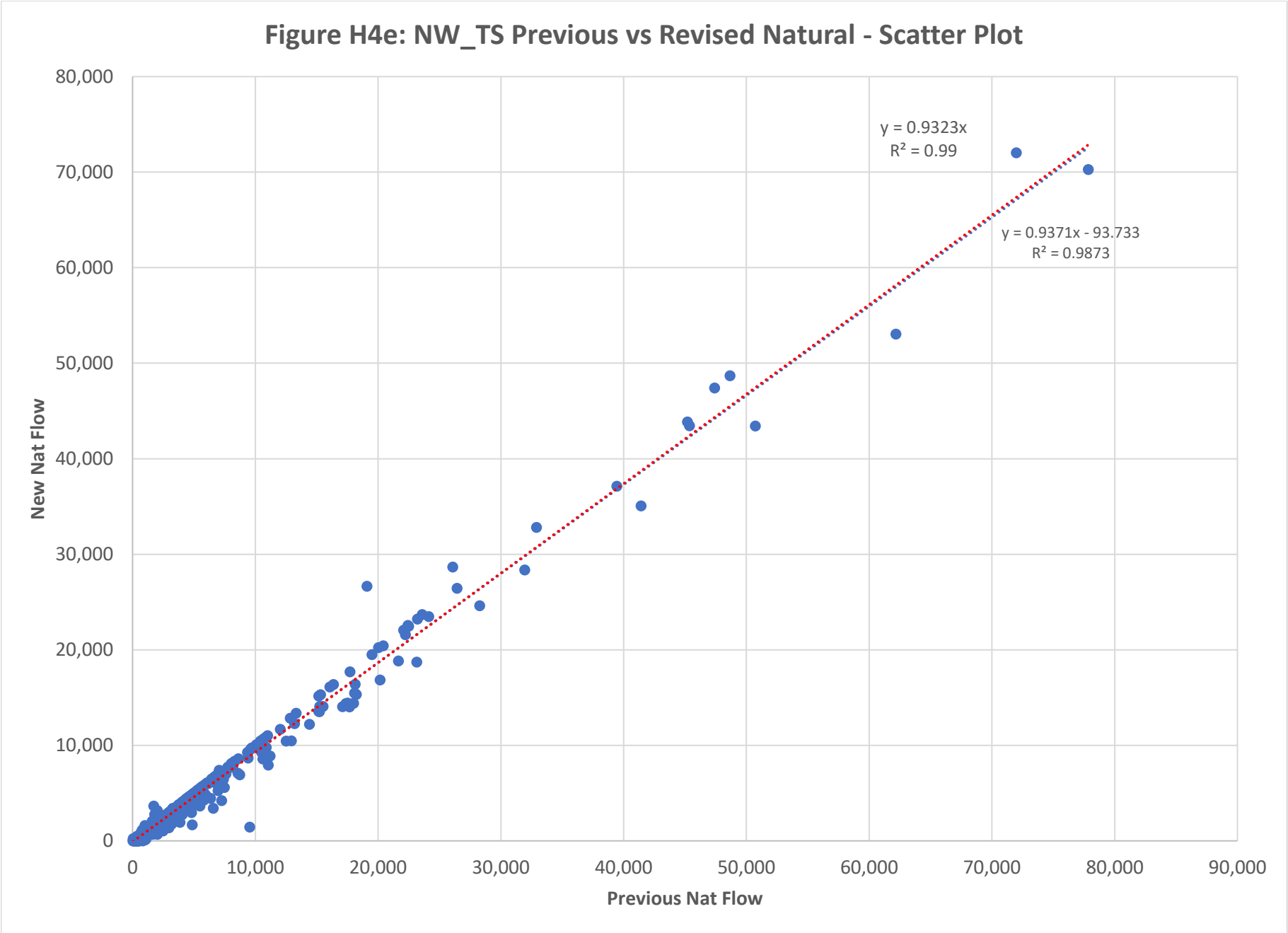


Figure H4e: NW_TS Previous vs Revised Natural - Scatter Plot
y = 0.9323x
R² = 0.99
y = 0.9371x - 93.733
R² = 0.9873
New Nat Flow
Previous Nat Flow
0
10,000
20,000
30,000
40,000
50,000
60,000
70,000
80,000
90,000

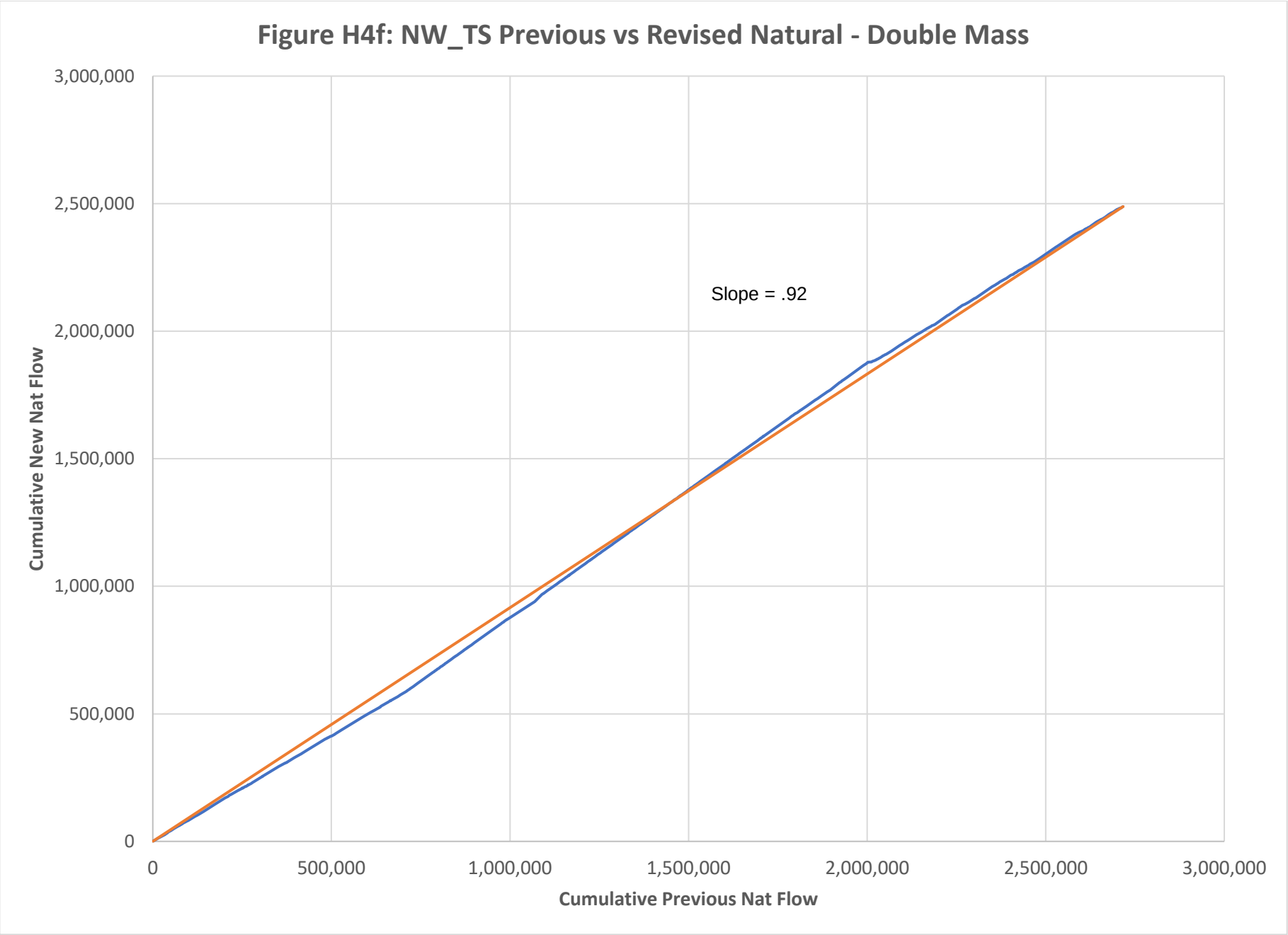


Figure H4f: NW_TS Previous vs Revised Natural - Double Mass
Slope = .92
Cumulative New Nat Flow
Cumulative Previous Nat Flow
0
500,000
1,000,000
1,500,000
2,000,000
2,500,000
3,000,000

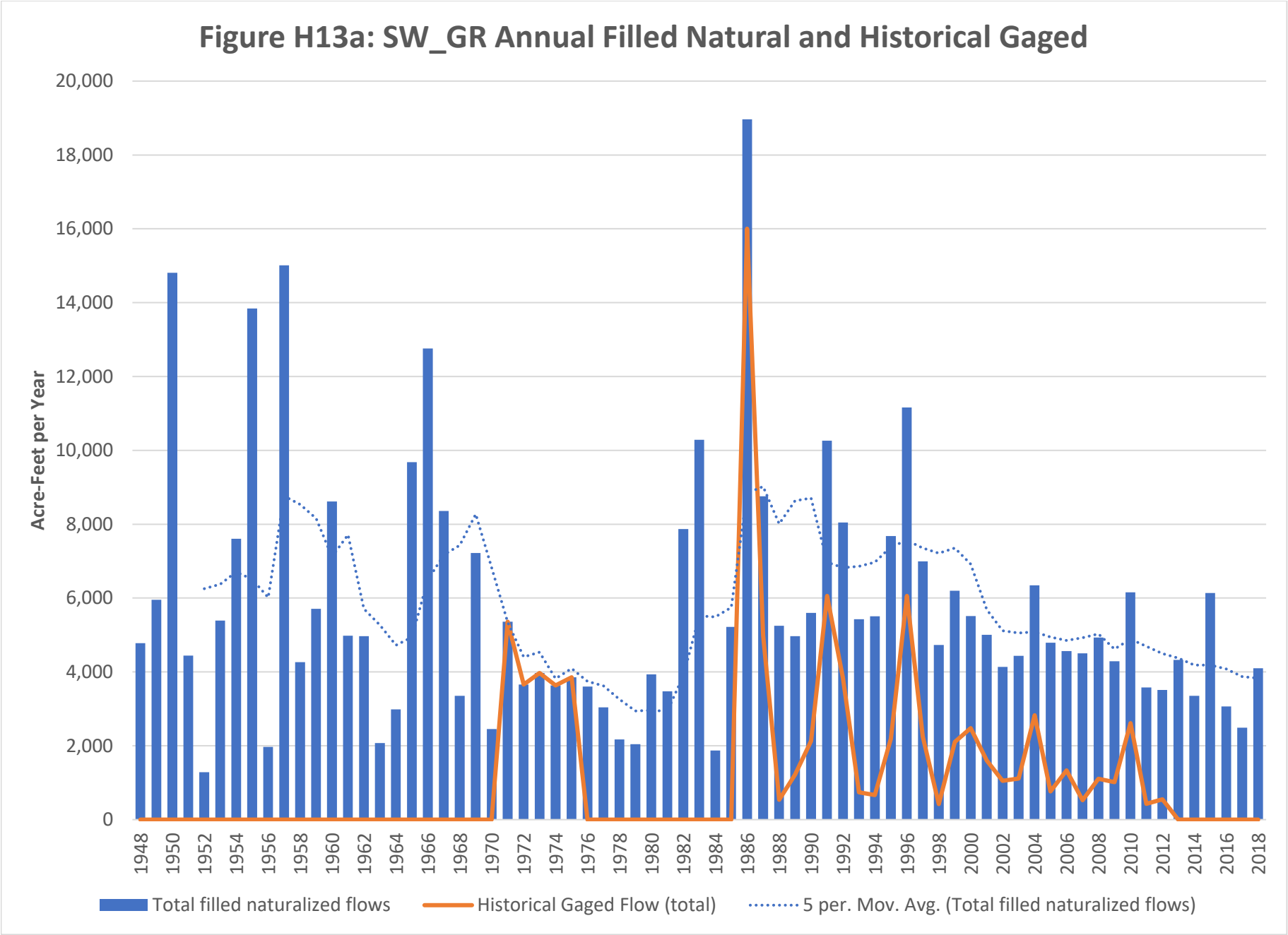


Figure H13a: SW_GR Annual Filled Natural and Historical Gaged
Acre-Feet per Year
20,000
18,000
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
1948
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
Total filled naturalized flows
Historical Gaged Flow (total)
5 per. Mov. Avg. (Total filled naturalized flows)

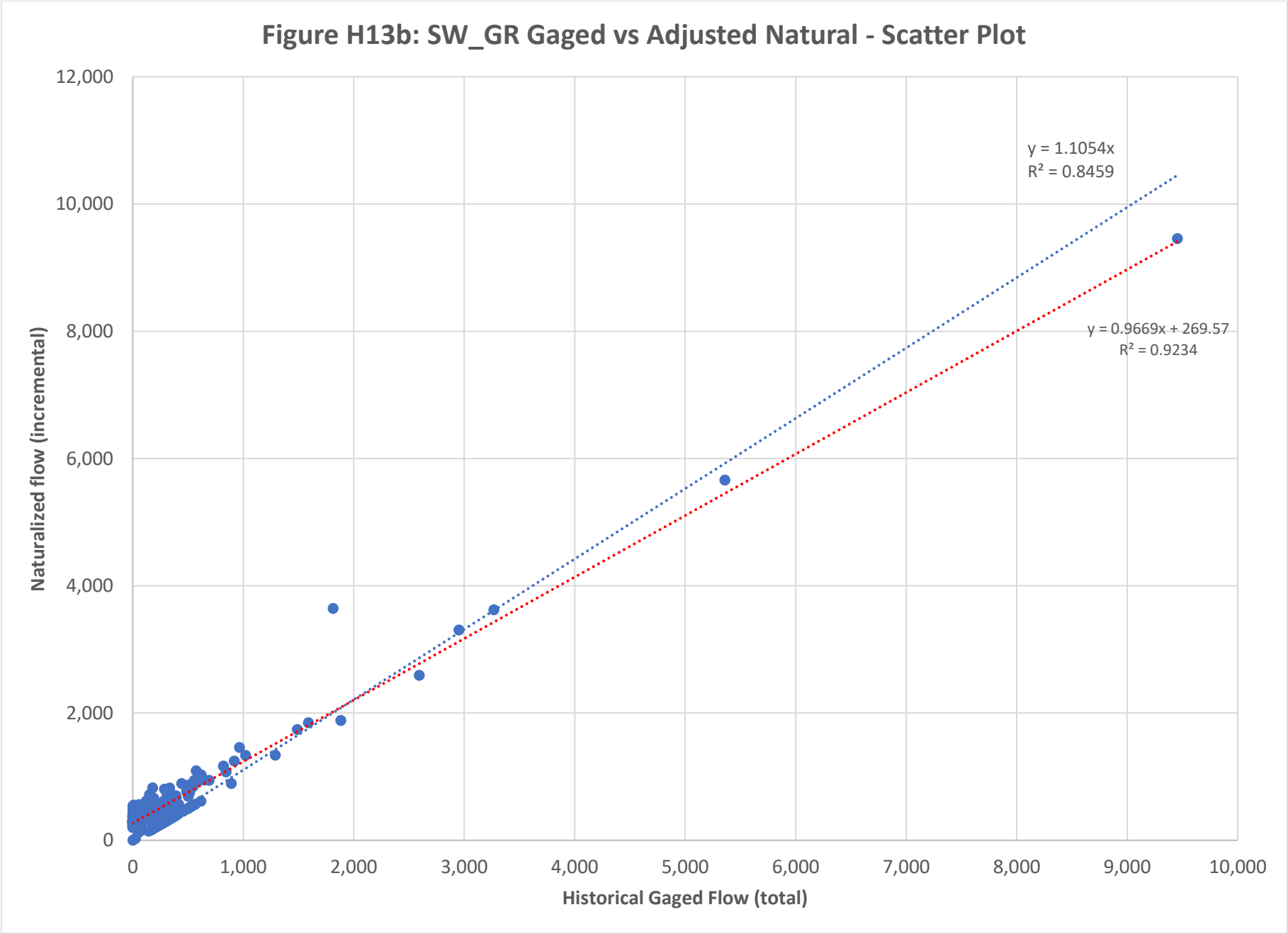


Figure H13b: SW_GR Gaged vs Adjusted Natural - Scatter Plot
y = 1.1054x
R² = 0.8459
y = 0.9669x + 269.57
R² = 0.9234
Naturalized flow (incremental)
Historical Gaged Flow (total)
0
2,000
4,000
6,000
8,000
10,000
12,000
0
1,000
2,000
3,000
4,000
5,000
6,000
7,000
8,000
9,000
10,000

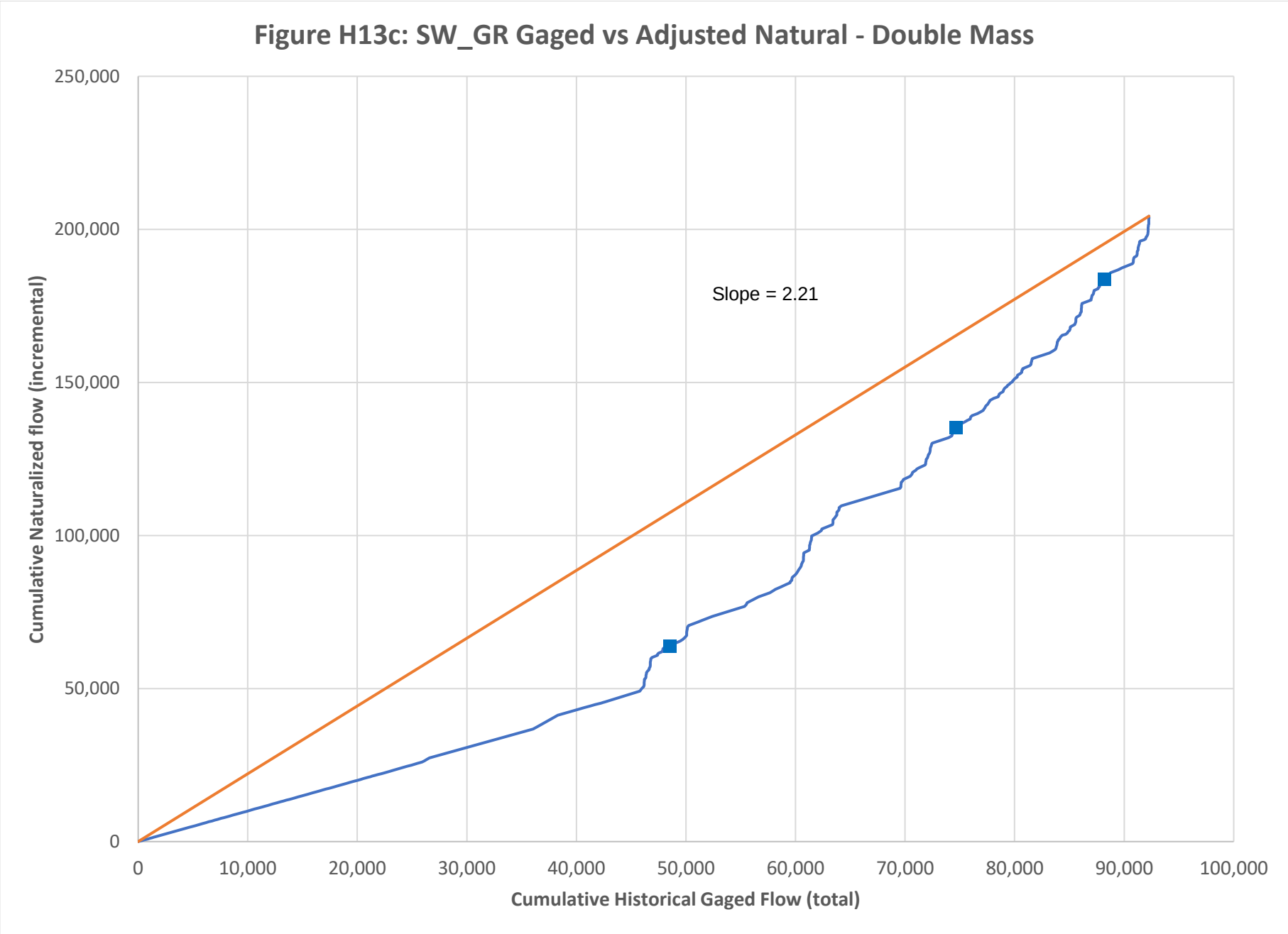


Figure H13c: SW_GR Gaged vs Adjusted Natural - Double Mass
Slope = 2.21
Cumulative Naturalized flow (incremental)
Cumulative Historical Gaged Flow (total)
250,000
200,000
150,000
100,000
50,000
0
0
10,000
20,000
30,000
40,000
50,000
60,000
70,000
80,000
90,000
100,000

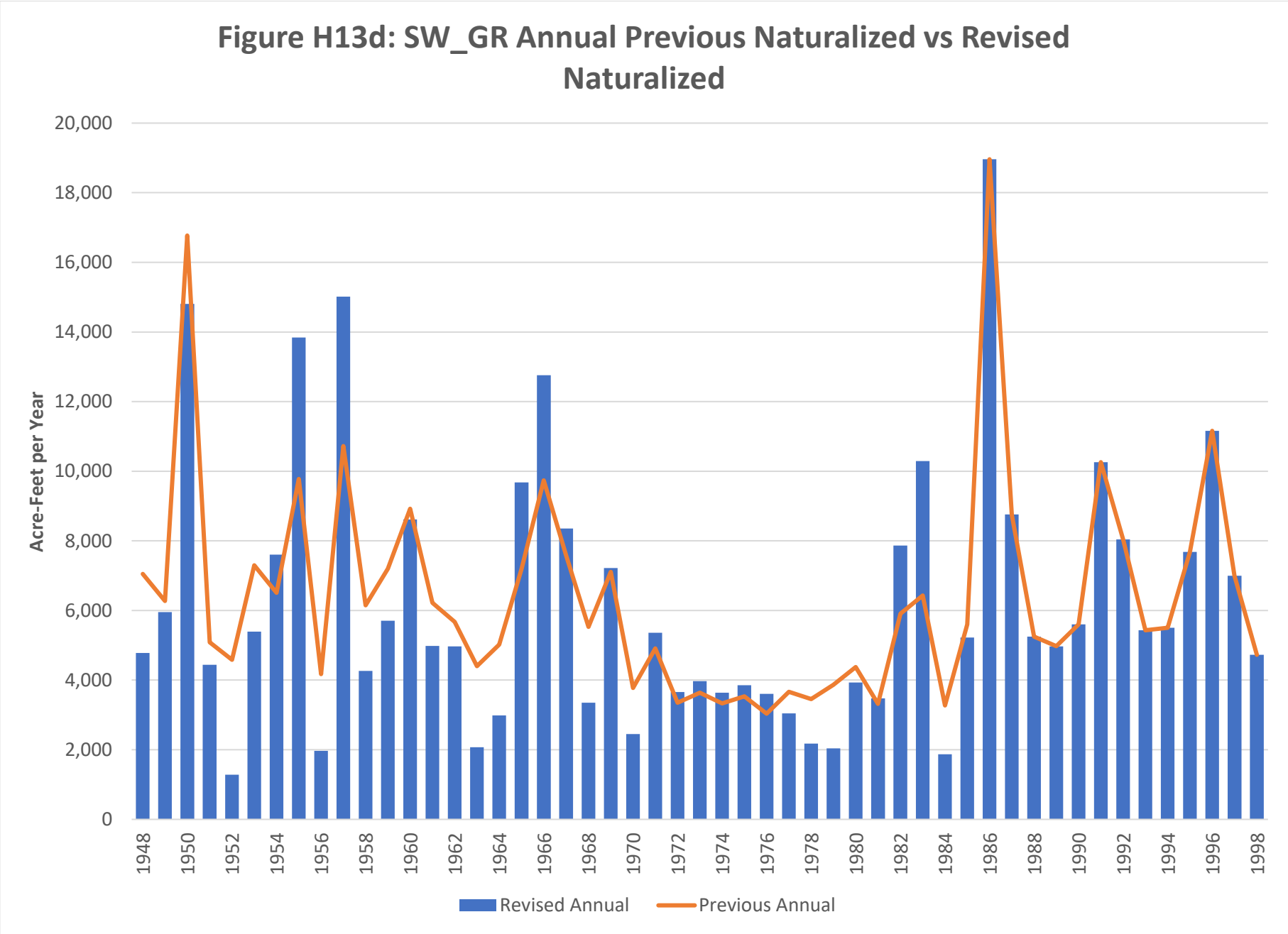


Figure H13d: SW_GR Annual Previous Naturalized vs Revised Naturalized
Acre-Feet per Year
20,000
18,000
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
1948
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
Revised Annual
Previous Annual

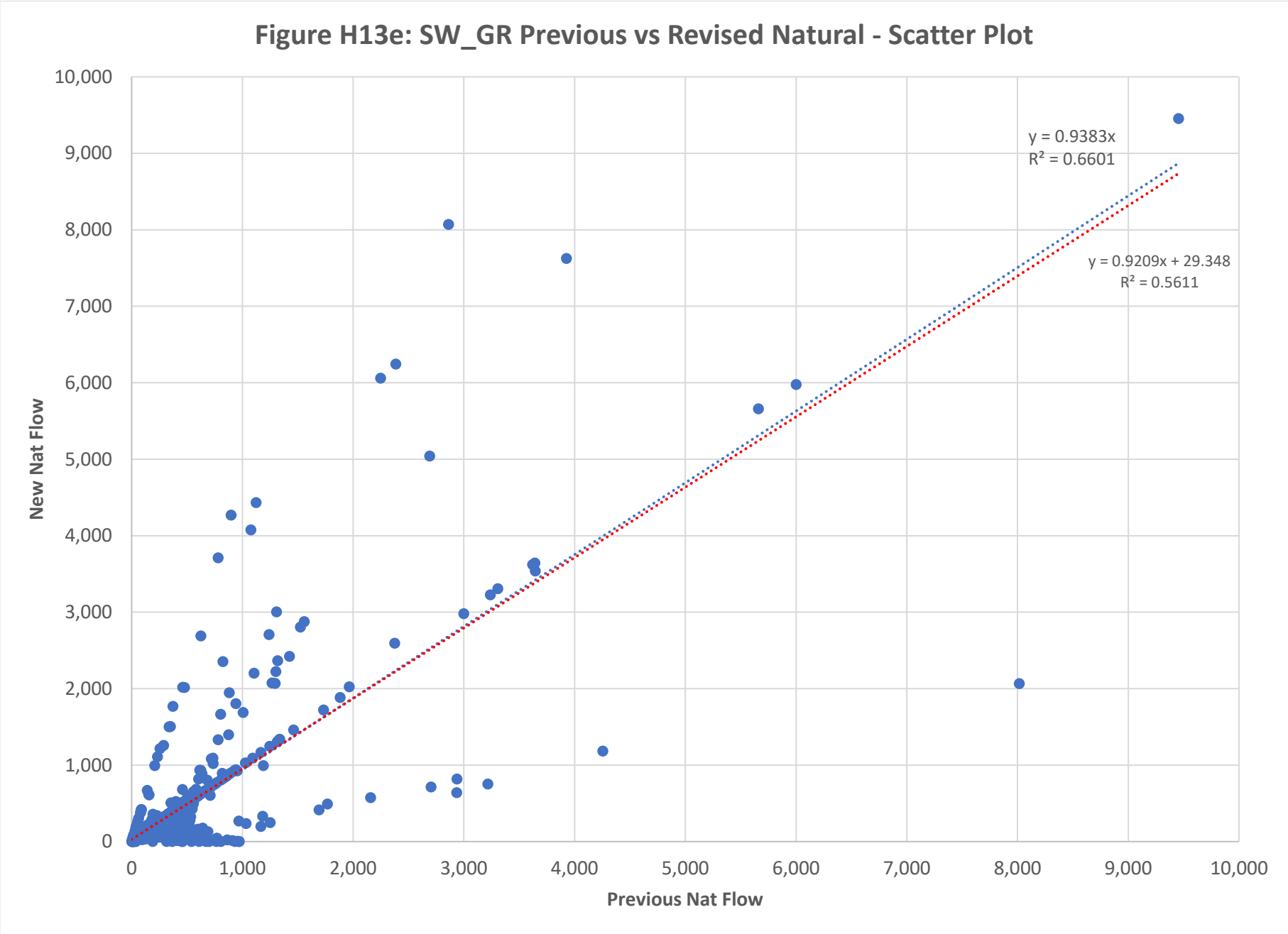


Figure H13e: SW_GR Previous vs Revised Natural - Scatter Plot
y = 0.9383x
R² = 0.6601
y = 0.9209x + 29.348
R² = 0.5611
New Nat Flow
Previous Nat Flow
0
1,000
2,000
3,000
4,000
5,000
6,000
7,000
8,000
9,000
10,000

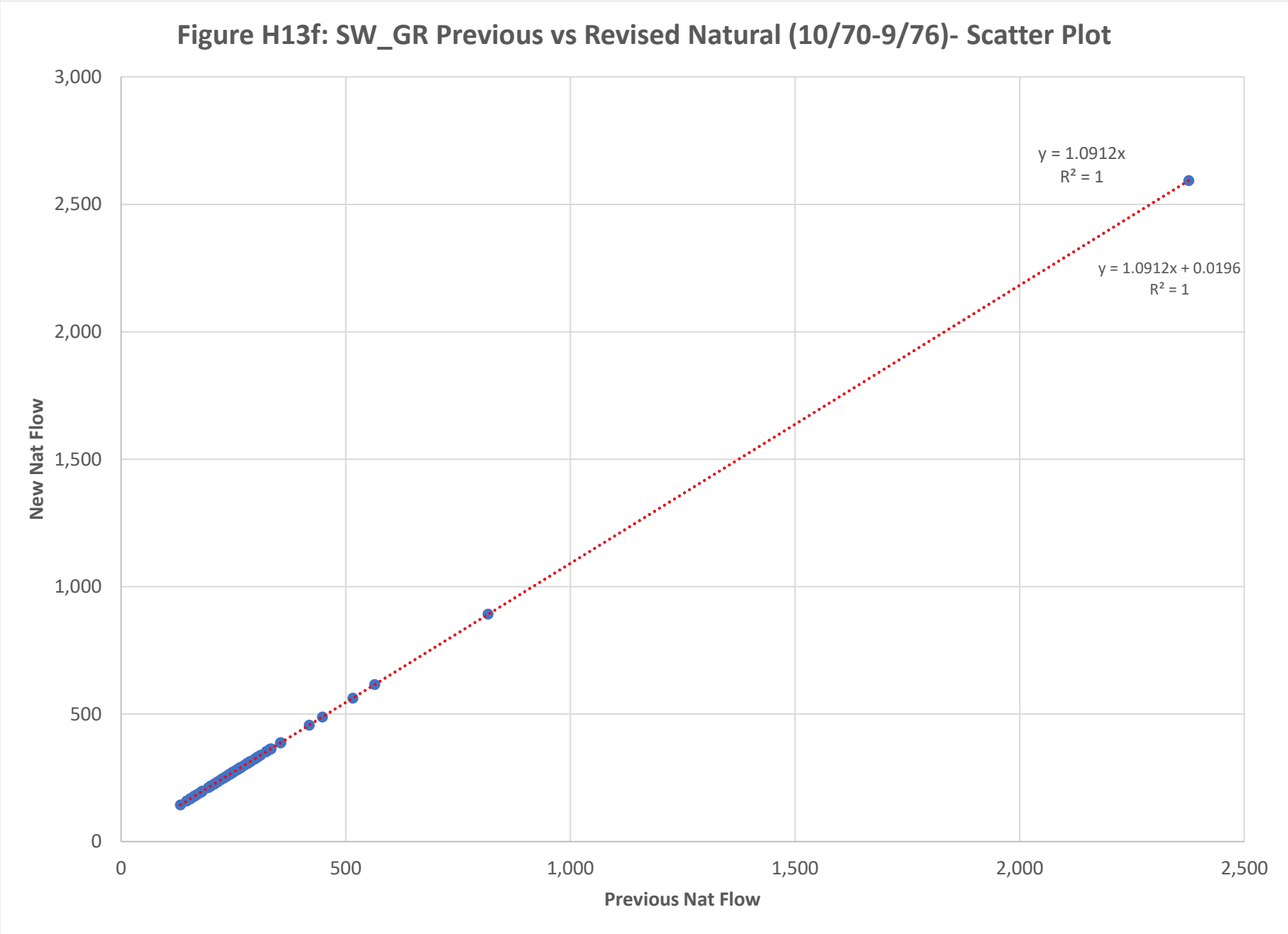


Figure H13f: SW_GR Previous vs Revised Natural (10/70-9/76)- Scatter Plot
y = 1.0912x
R² = 1
y = 1.0912x + 0.0196
R² = 1
New Nat Flow
Previous Nat Flow
0
500
1,000
1,500
2,000
2,500
3,000

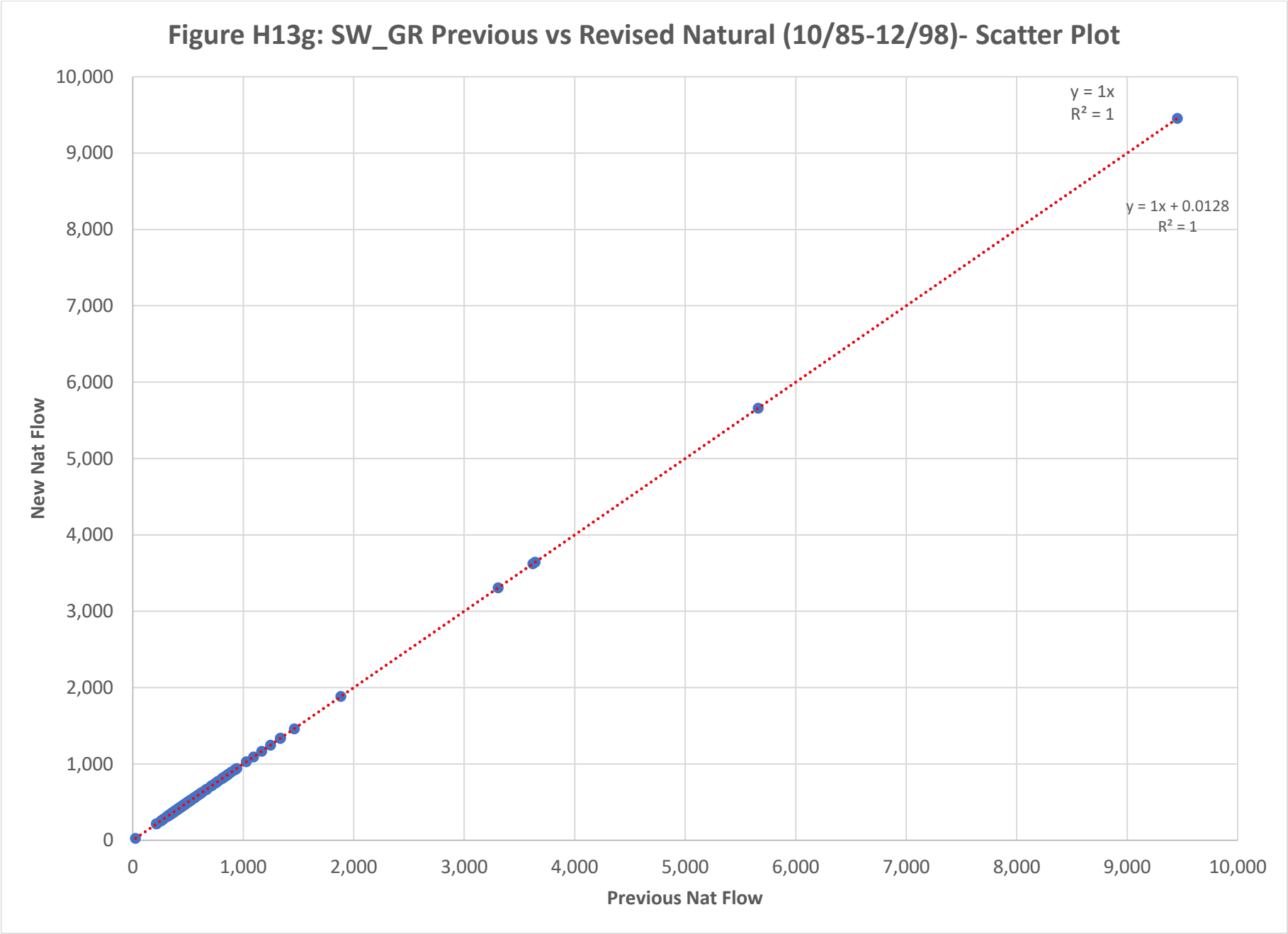


Figure H13g: SW_GR Previous vs Revised Natural (10/85-12/98)- Scatter Plot
y = 1x
R² = 1
y = 1x + 0.0128
R² = 1
New Nat Flow
Previous Nat Flow
0
1,000
2,000
3,000
4,000
5,000
6,000
7,000
8,000
9,000
10,000

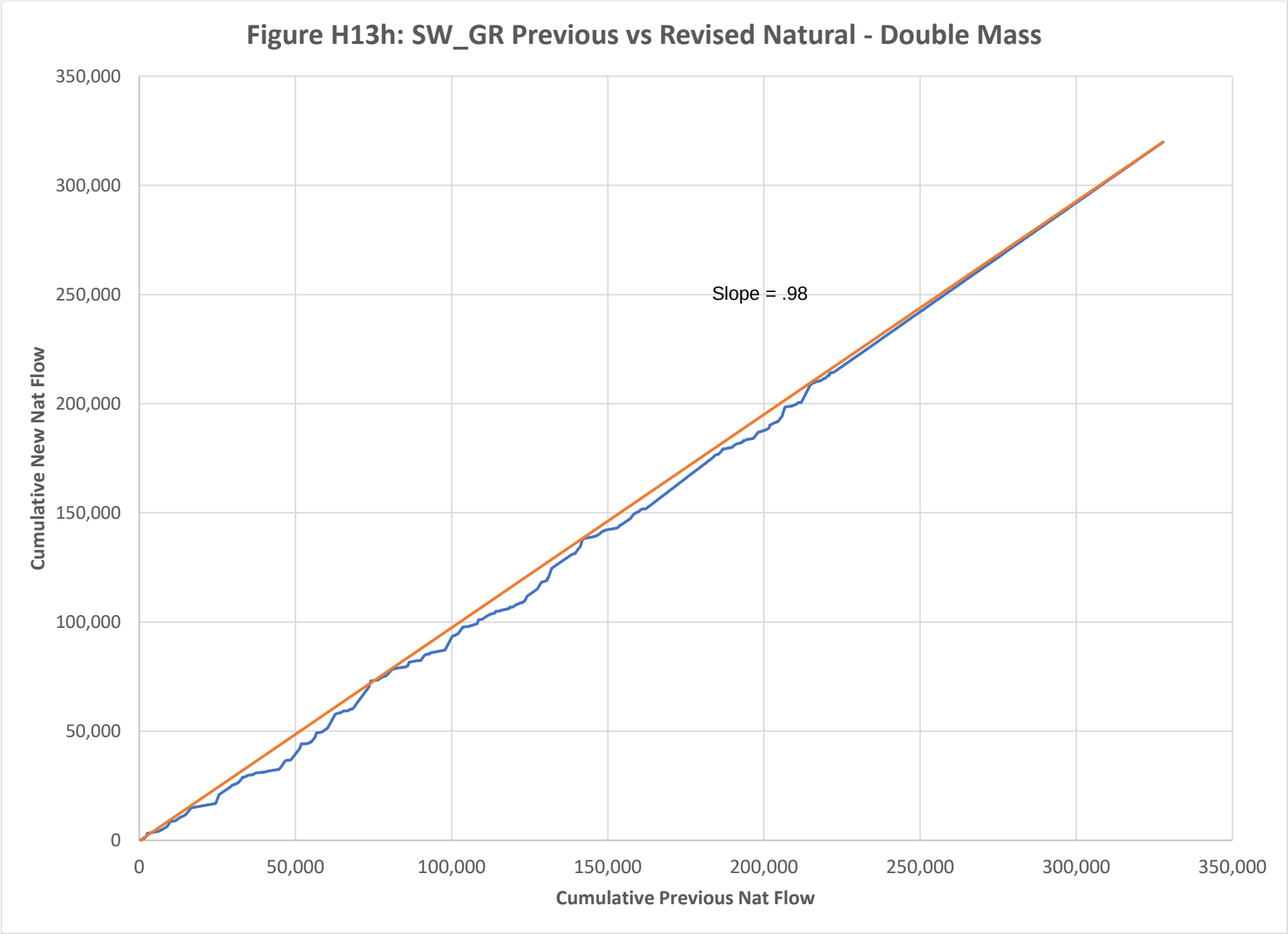


Figure H13h: SW_GR Previous vs Revised Natural - Double Mass
Slope = .98
Cumulative New Nat Flow
Cumulative Previous Nat Flow
0
50,000
100,000
150,000
200,000
250,000
300,000
350,000

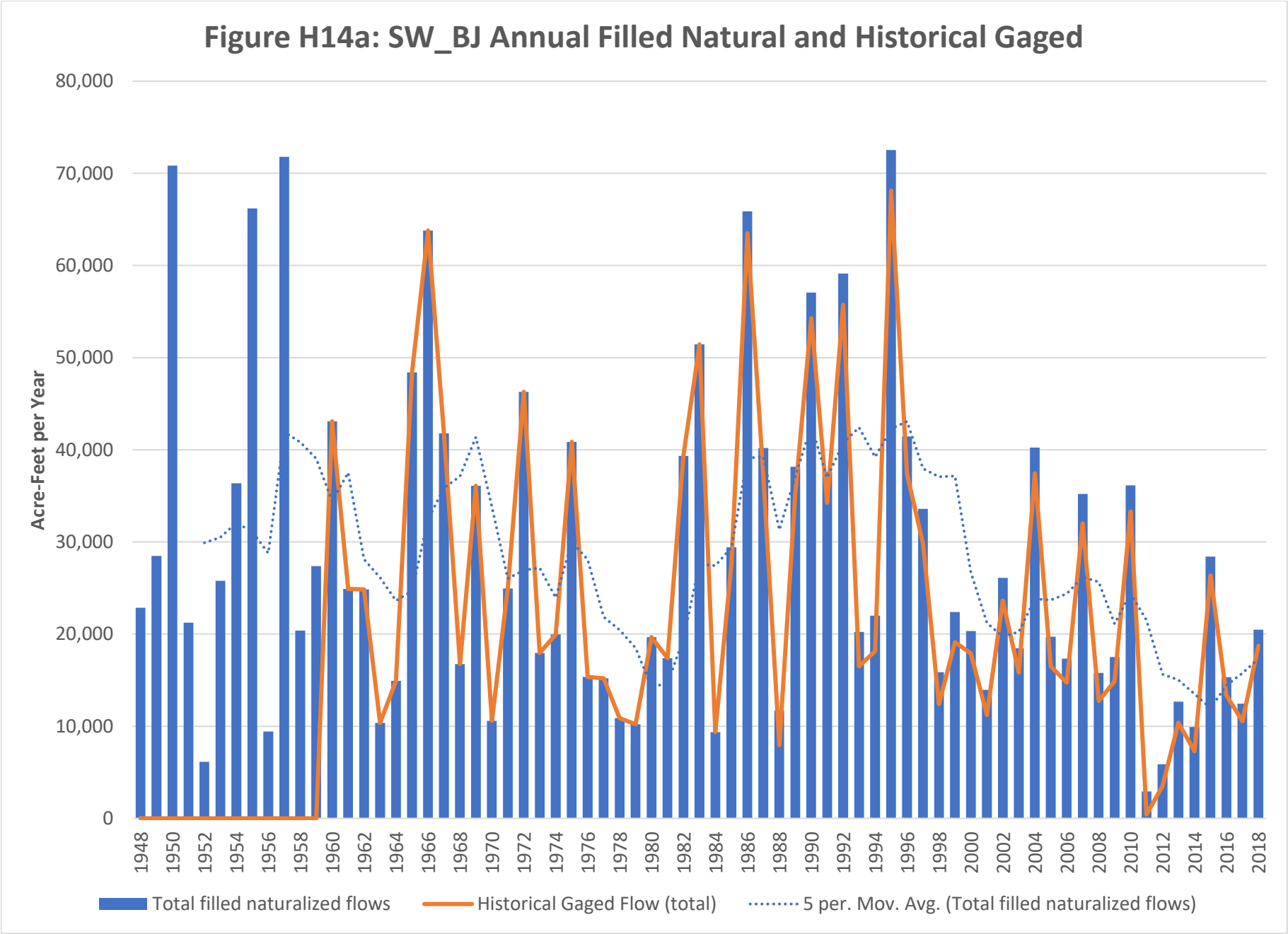


Figure H14a: SW_BJ Annual Filled Natural and Historical Gaged
Acre-Feet per Year
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
1948
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
Total filled naturalized flows
Historical Gaged Flow (total)
5 per. Mov. Avg. (Total filled naturalized flows)

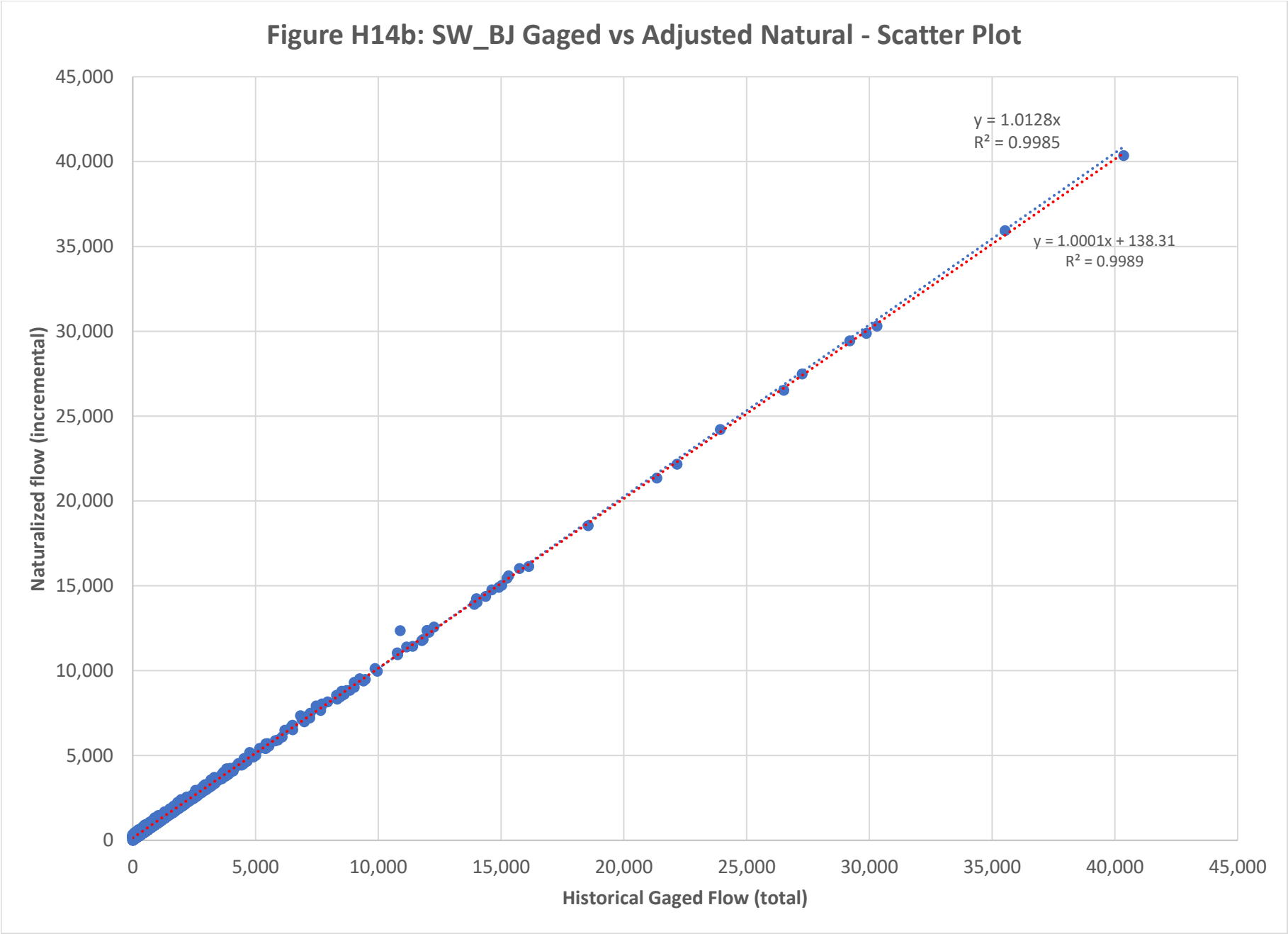


Figure H14b: SW_BJ Gaged vs Adjusted Natural - Scatter Plot
y = 1.0128x
R² = 0.9985
y = 1.0001x + 138.31
R² = 0.9989
Naturalized flow (incremental)
Historical Gaged Flow (total)
0
5,000
10,000
15,000
20,000
25,000
30,000
35,000
40,000
45,000

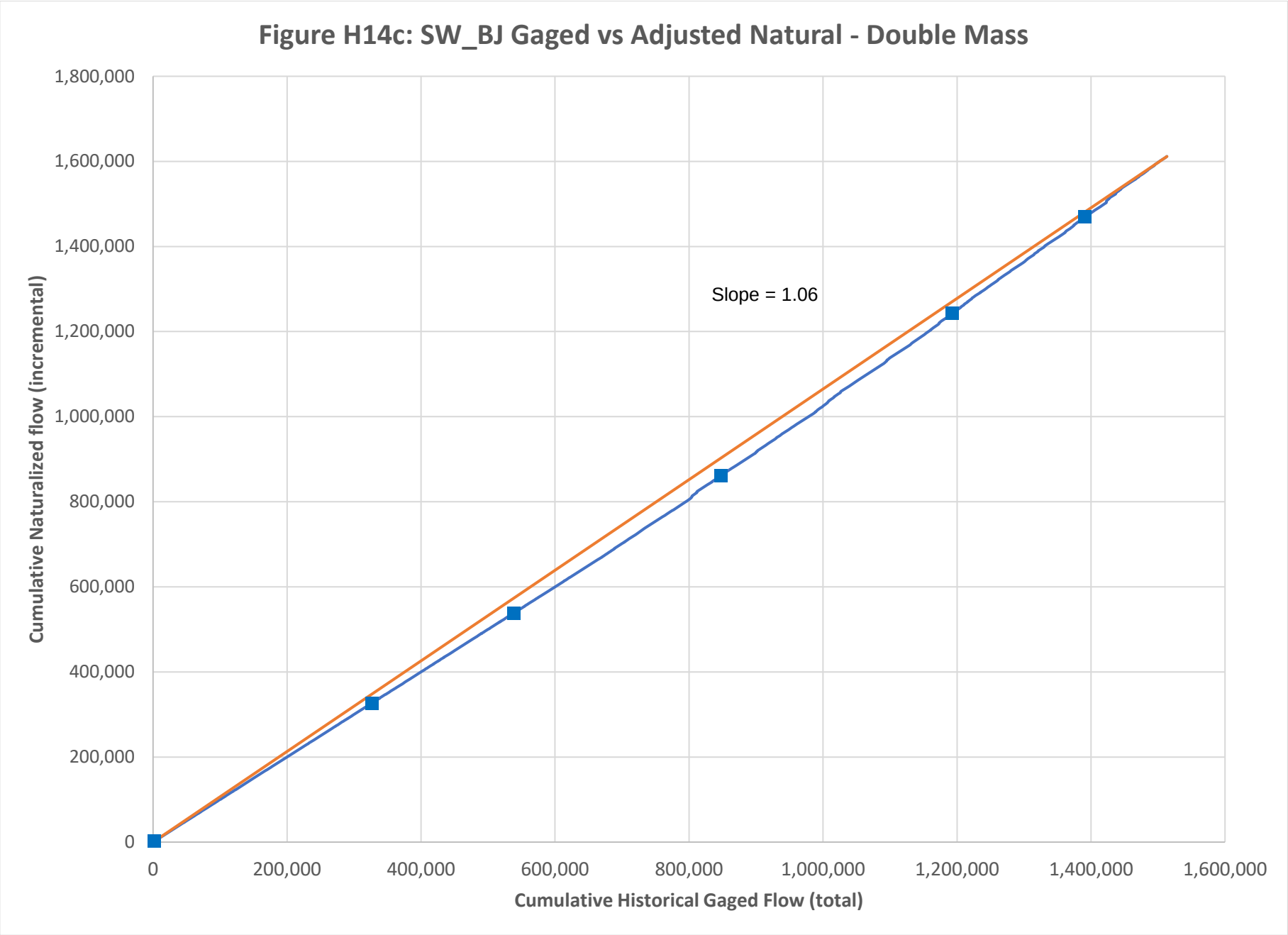


Figure H14c: SW_BJ Gaged vs Adjusted Natural - Double Mass
Slope = 1.06
Cumulative Naturalized flow (incremental)
Cumulative Historical Gaged Flow (total)
0
200,000
400,000
600,000
800,000
1,000,000
1,200,000
1,400,000
1,600,000
1,800,000

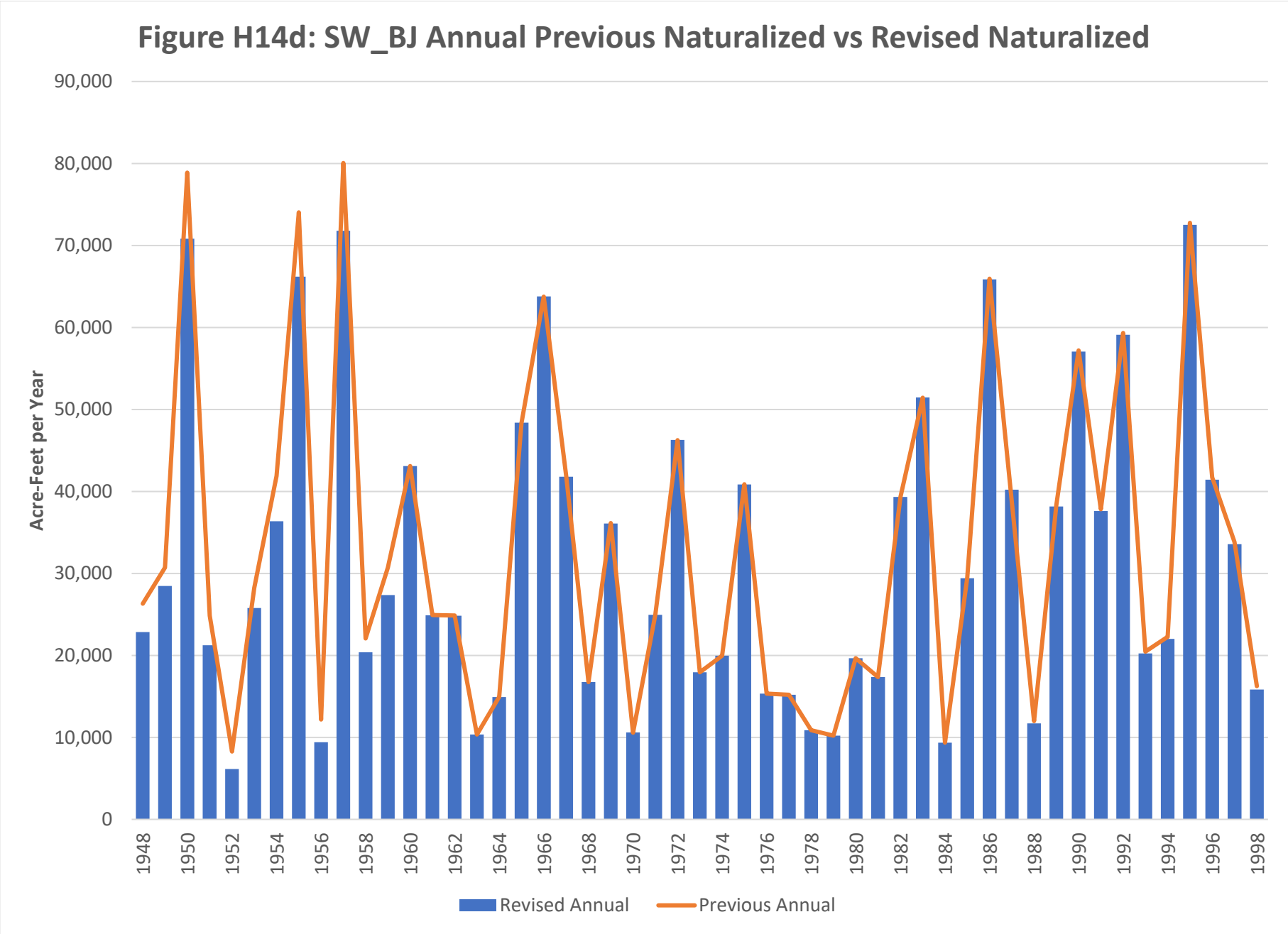


Figure H14d: SW_BJ Annual Previous Naturalized vs Revised Naturalized
Acre-Feet per Year
90,000
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
1948
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
Revised Annual
Previous Annual

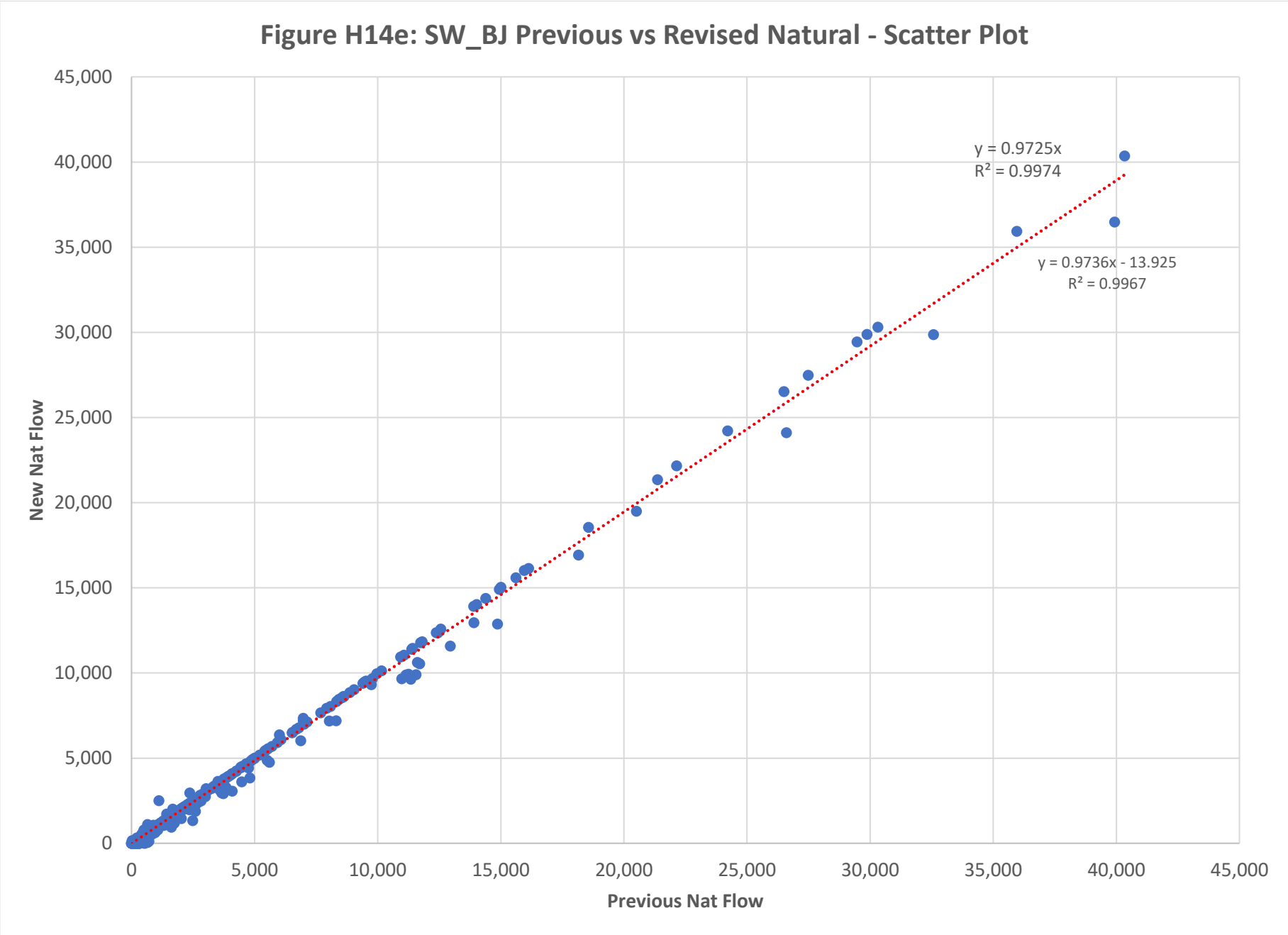


Figure H14e: SW_BJ Previous vs Revised Natural - Scatter Plot
y = 0.9725x
R² = 0.9974
y = 0.9736x - 13.925
R² = 0.9967
New Nat Flow
Previous Nat Flow
0
5,000
10,000
15,000
20,000
25,000
30,000
35,000
40,000
45,000

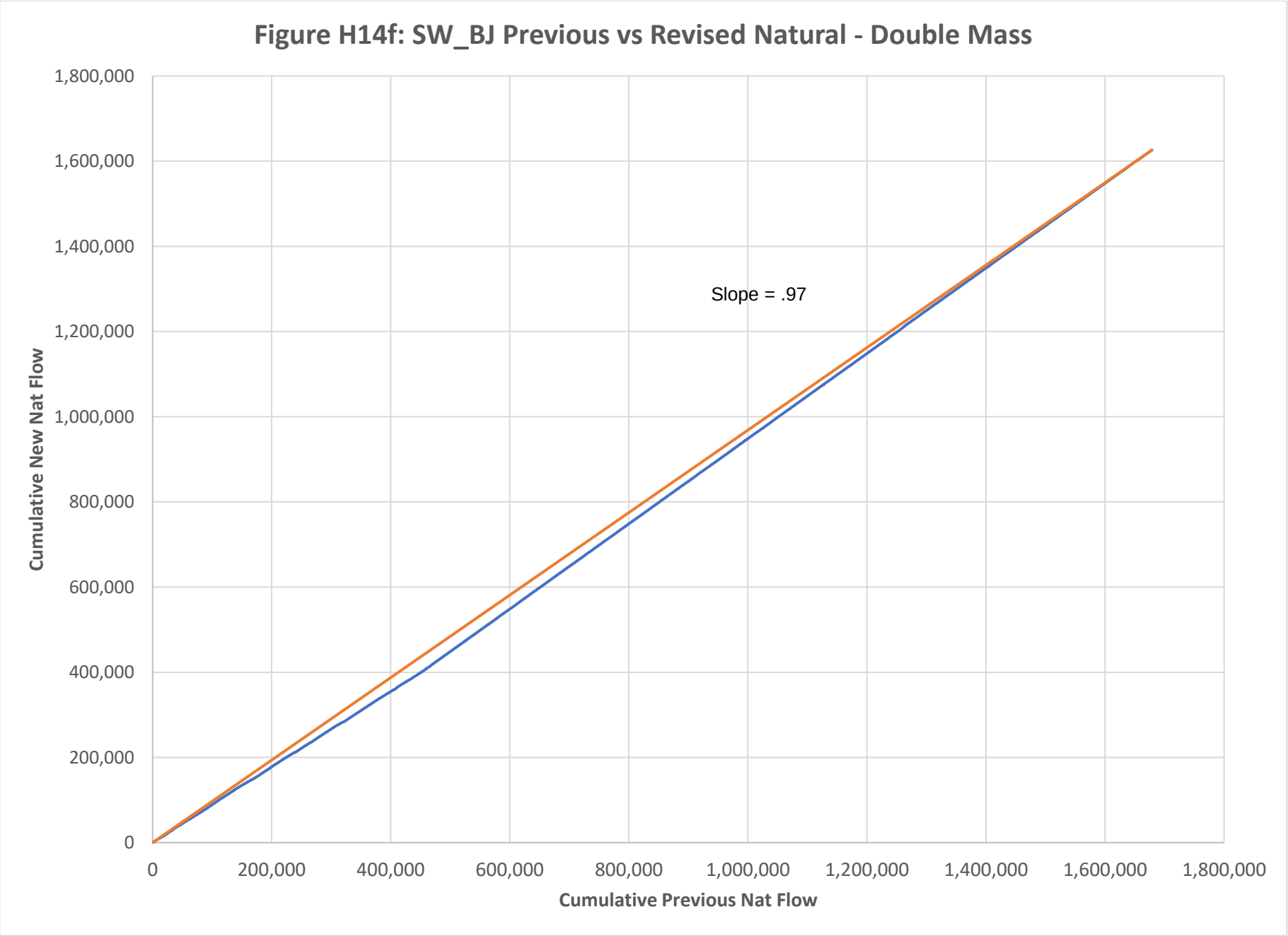


Figure H14f: SW_BJ Previous vs Revised Natural - Double Mass
Slope = .97
Cumulative New Nat Flow
Cumulative Previous Nat Flow
0
200,000
400,000
600,000
800,000
1,000,000
1,200,000
1,400,000
1,600,000
1,800,000

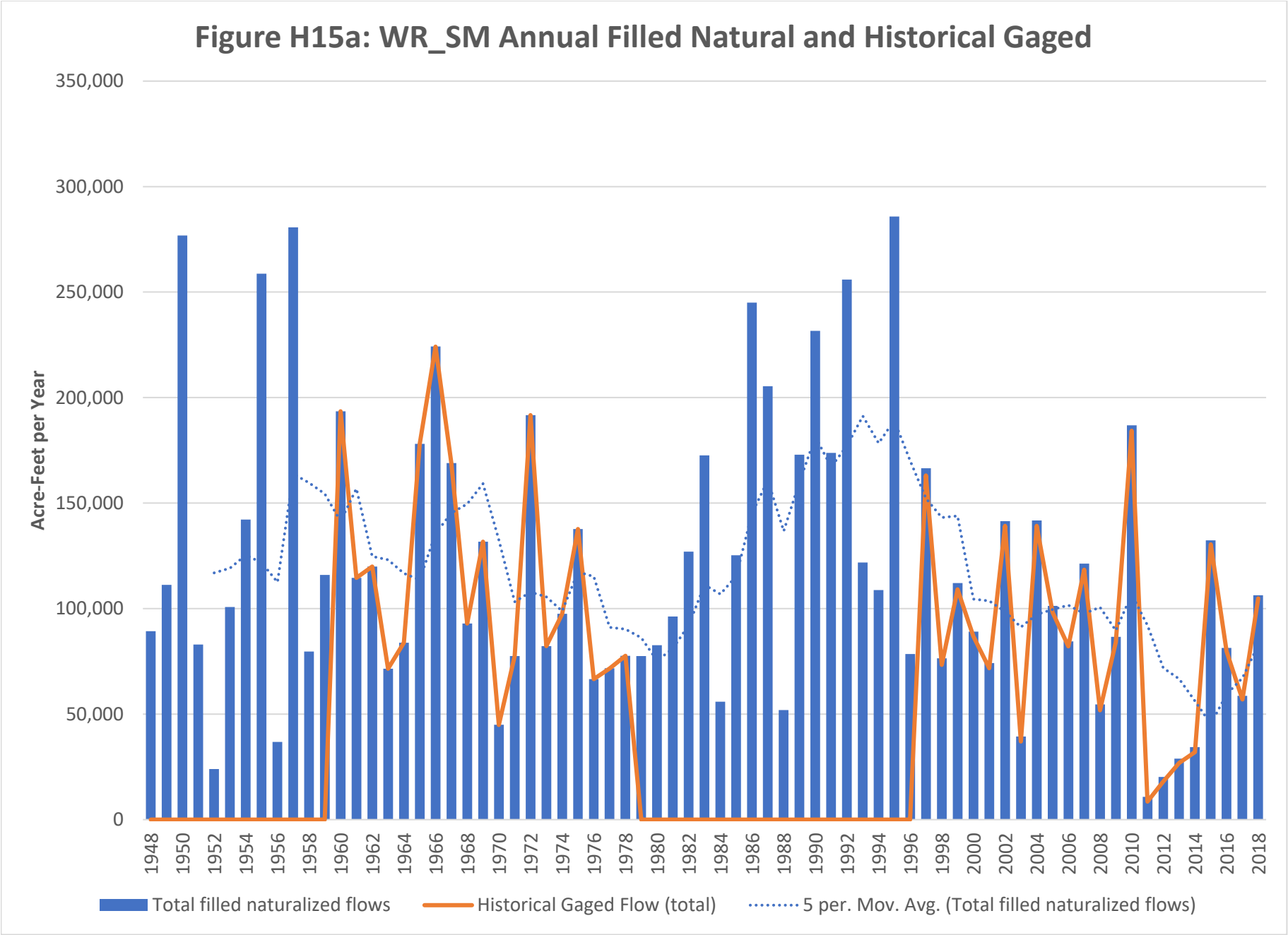


Figure H15a: WR_SM Annual Filled Natural and Historical Gaged
Acre-Feet per Year
350,000
300,000
250,000
200,000
150,000
100,000
50,000
0
1948
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
Total filled naturalized flows
Historical Gaged Flow (total)
5 per. Mov. Avg. (Total filled naturalized flows)

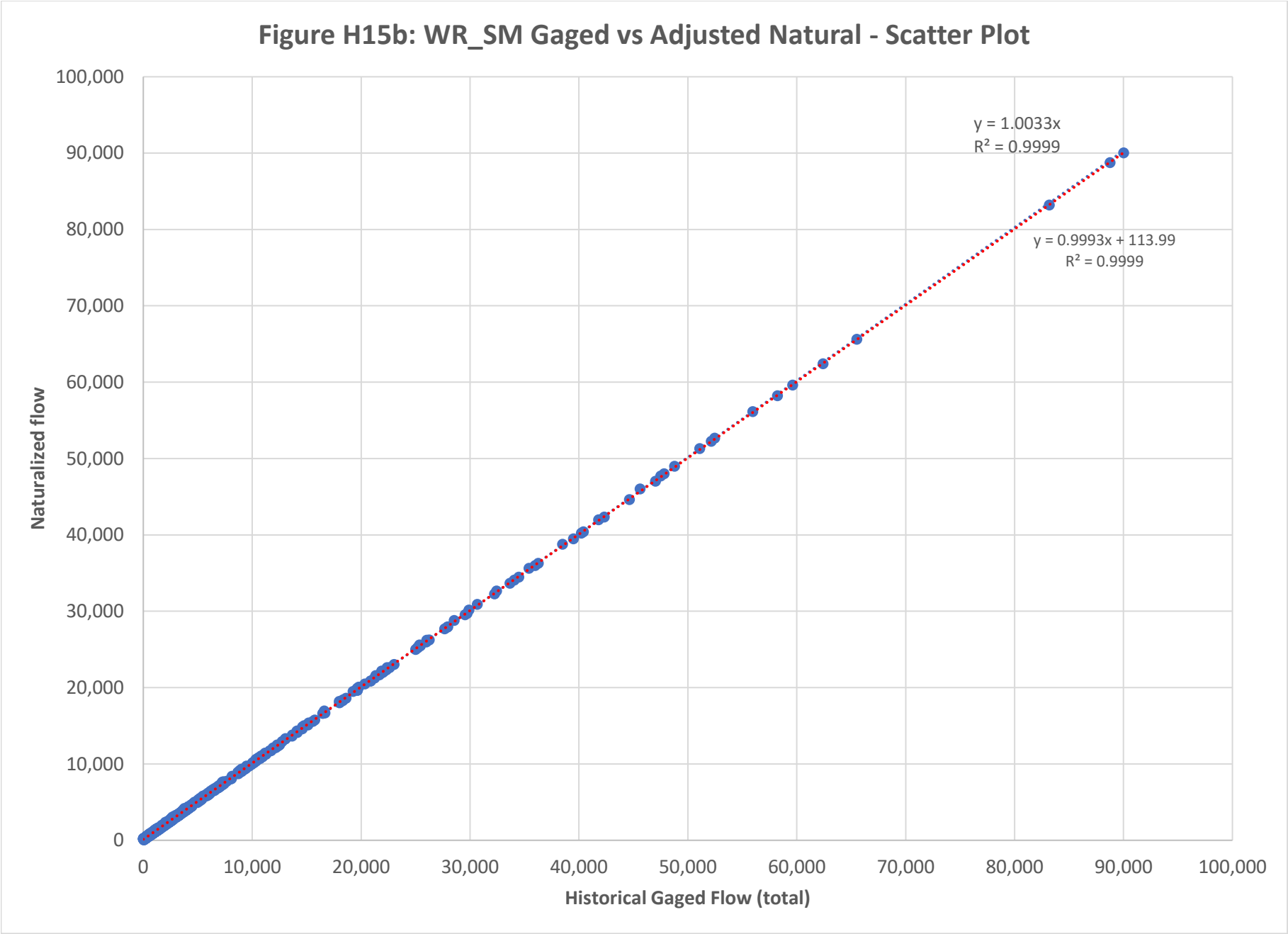


Figure H15b: WR_SM Gaged vs Adjusted Natural - Scatter Plot
y = 1.0033x
R² = 0.9999
y = 0.9993x + 113.99
R² = 0.9999
Naturalized flow
Historical Gaged Flow (total)
0
10,000
20,000
30,000
40,000
50,000
60,000
70,000
80,000
90,000
100,000

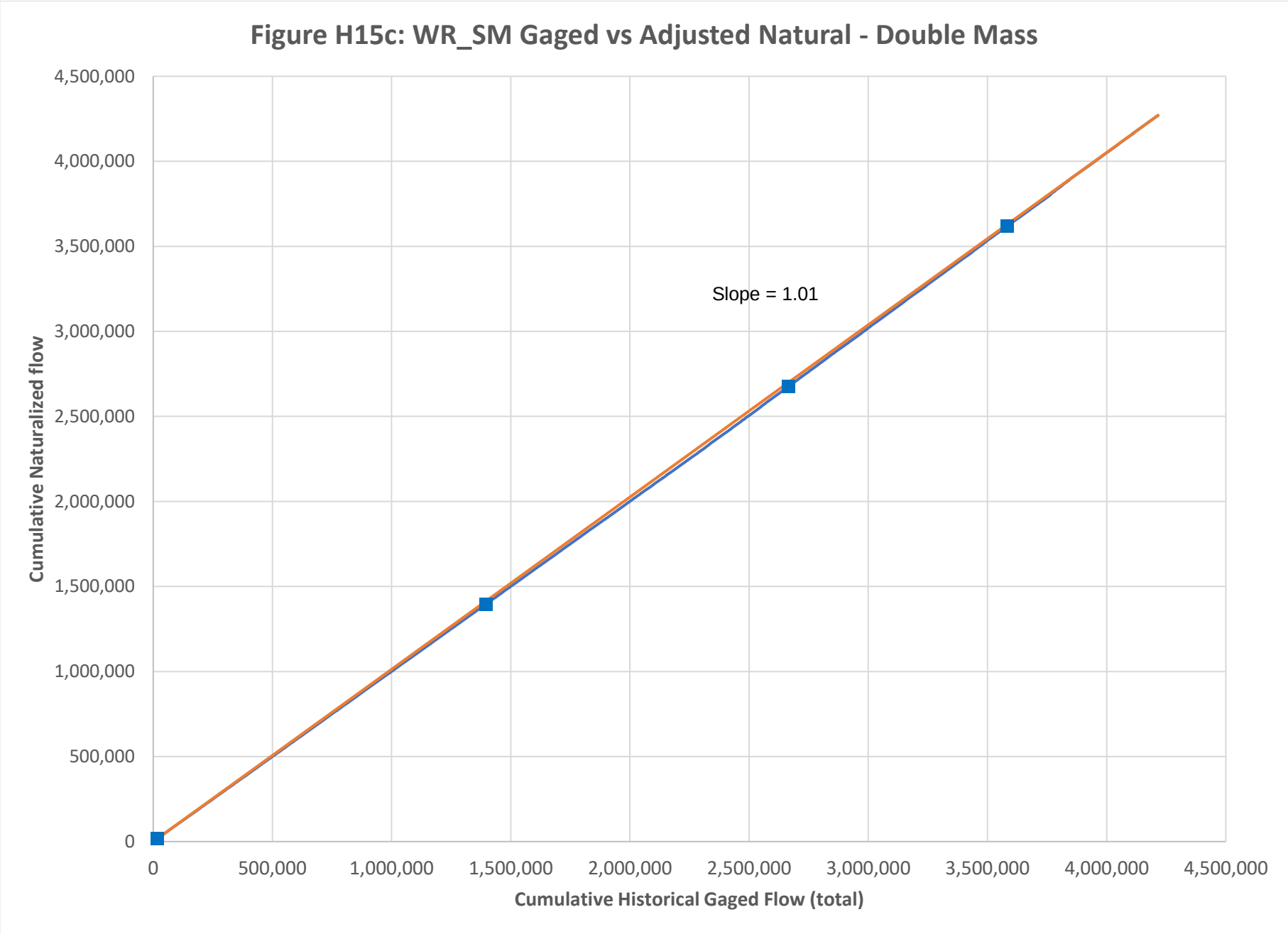


Figure H15c: WR_SM Gaged vs Adjusted Natural - Double Mass
Slope = 1.01
Cumulative Naturalized flow
Cumulative Historical Gaged Flow (total)
0
500,000
1,000,000
1,500,000
2,000,000
2,500,000
3,000,000
3,500,000
4,000,000
4,500,000

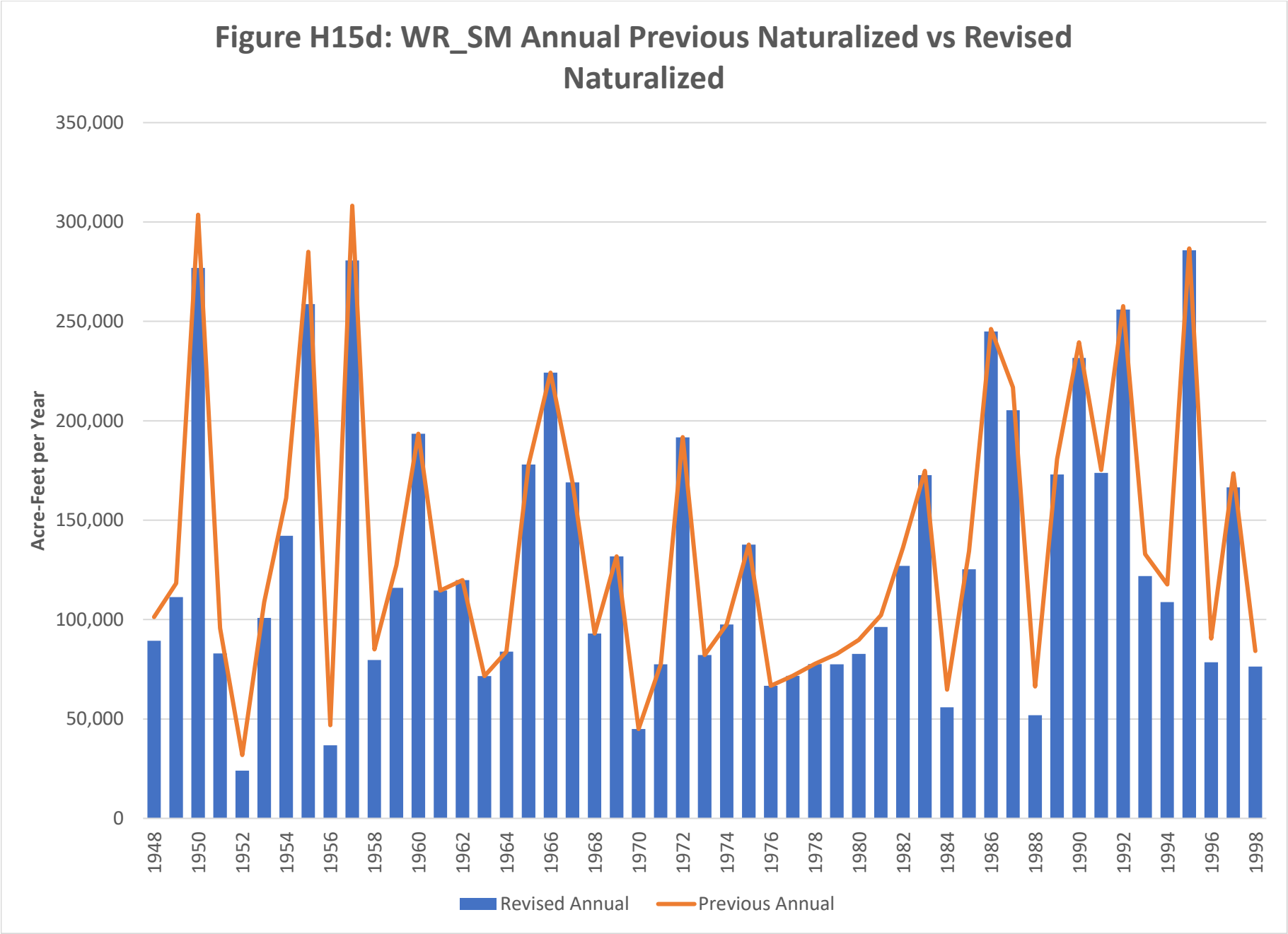


Figure H15d: WR_SM Annual Previous Naturalized vs Revised Naturalized
Acre-Feet per Year
350,000
300,000
250,000
200,000
150,000
100,000
50,000
0
1948
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
Revised Annual
Previous Annual

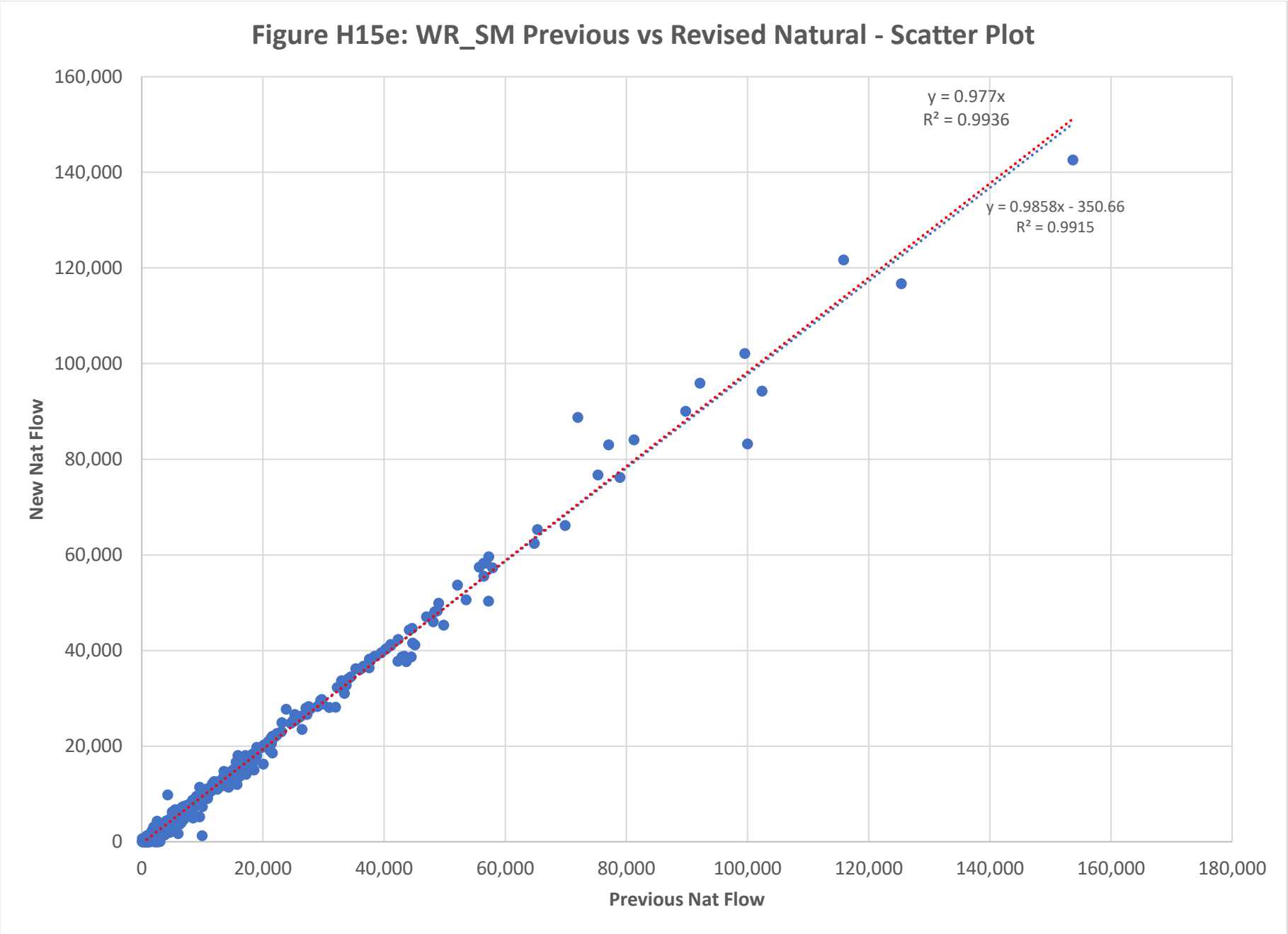


Figure H15e: WR_SM Previous vs Revised Natural - Scatter Plot
y = 0.977x
R² = 0.9936
y = 0.9858x - 350.66
R² = 0.9915
New Nat Flow
Previous Nat Flow
0
20,000
40,000
60,000
80,000
100,000
120,000
140,000
160,000
180,000

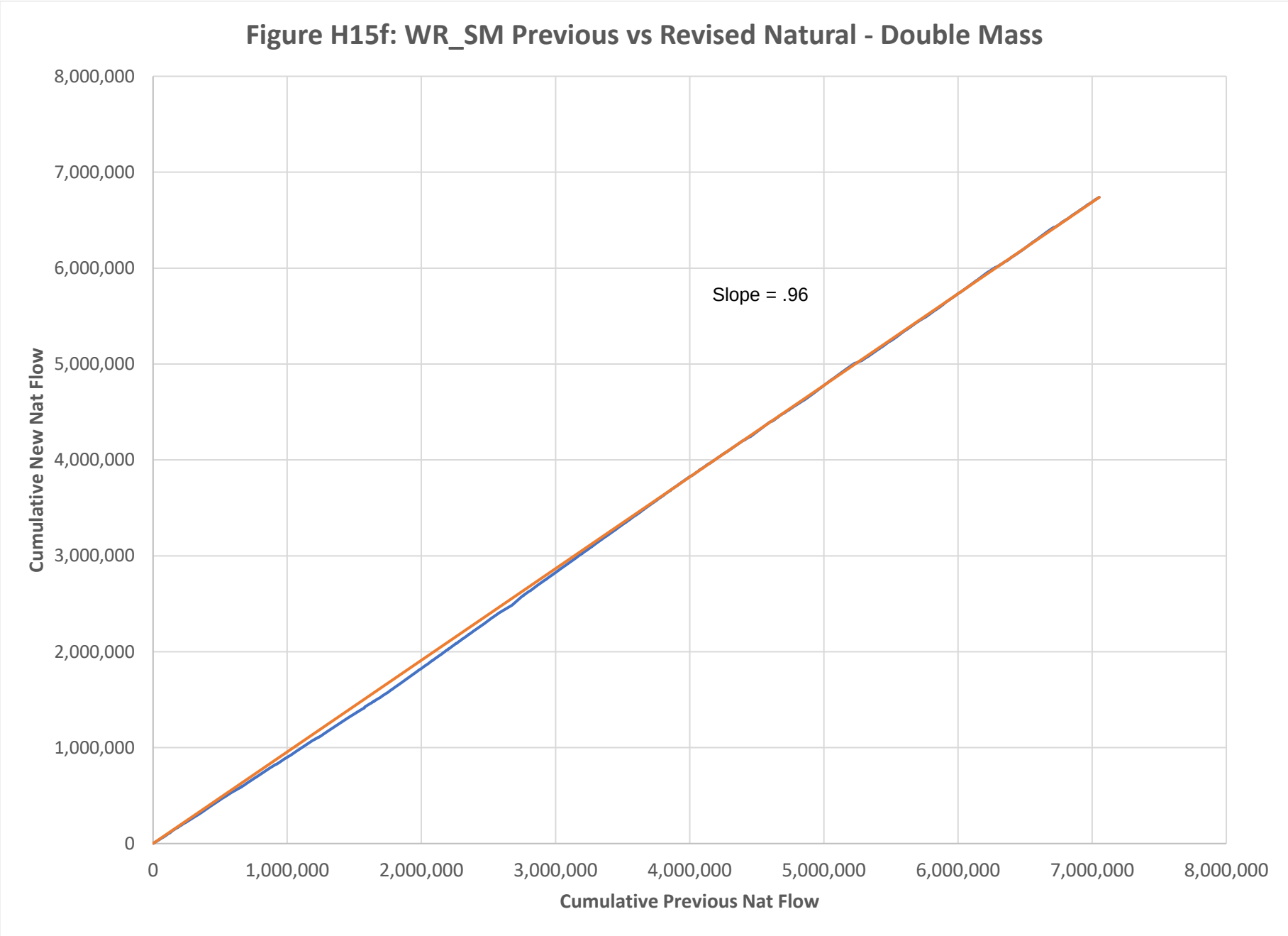


Figure H15f: WR_SM Previous vs Revised Natural - Double Mass
Slope = .96
Cumulative New Nat Flow
Cumulative Previous Nat Flow
0
1,000,000
2,000,000
3,000,000
4,000,000
5,000,000
6,000,000
7,000,000
8,000,000

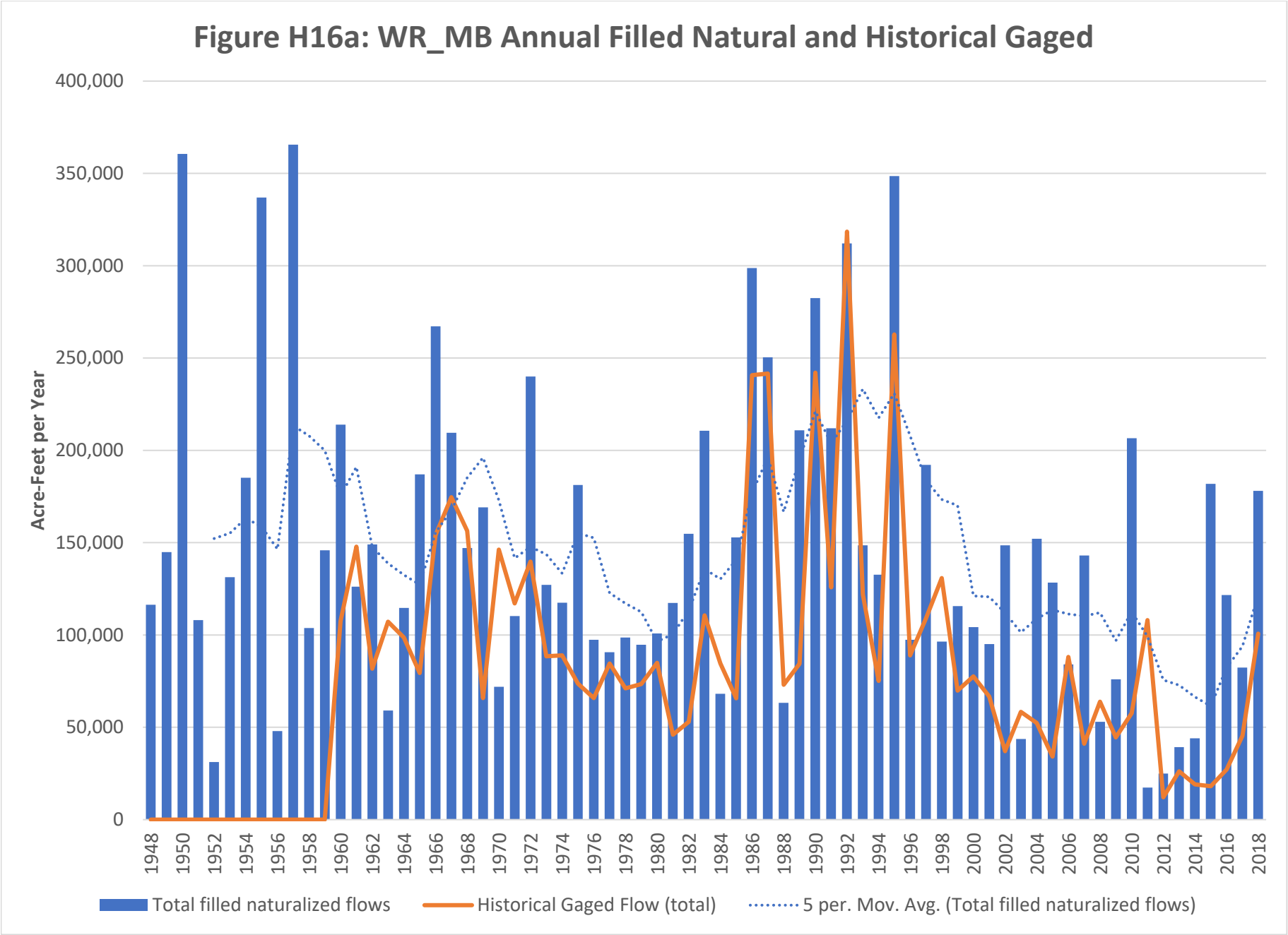


Figure H16a: WR_MB Annual Filled Natural and Historical Gaged
Acre-Feet per Year
400,000
350,000
300,000
250,000
200,000
150,000
100,000
50,000
0
1948
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
Total filled naturalized flows
Historical Gaged Flow (total)
5 per. Mov. Avg. (Total filled naturalized flows)

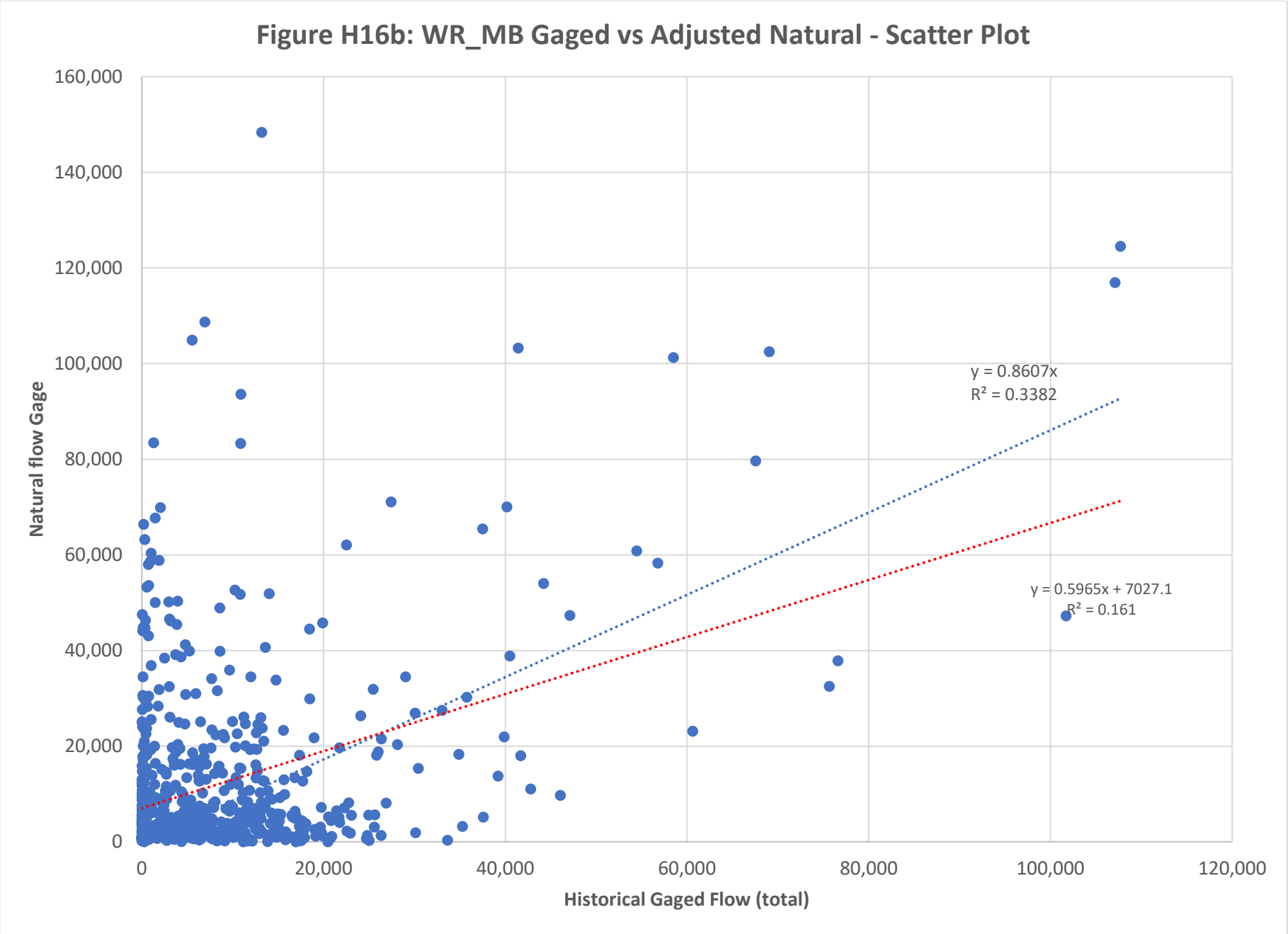


Figure H16b: WR_MB Gaged vs Adjusted Natural - Scatter Plot
160,000
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
Natural flow Gage
0
20,000
40,000
60,000
80,000
100,000
120,000
Historical Gaged Flow (total)
y = 0.8607x
R² = 0.3382
y = 0.5965x + 7027.1
R² = 0.161

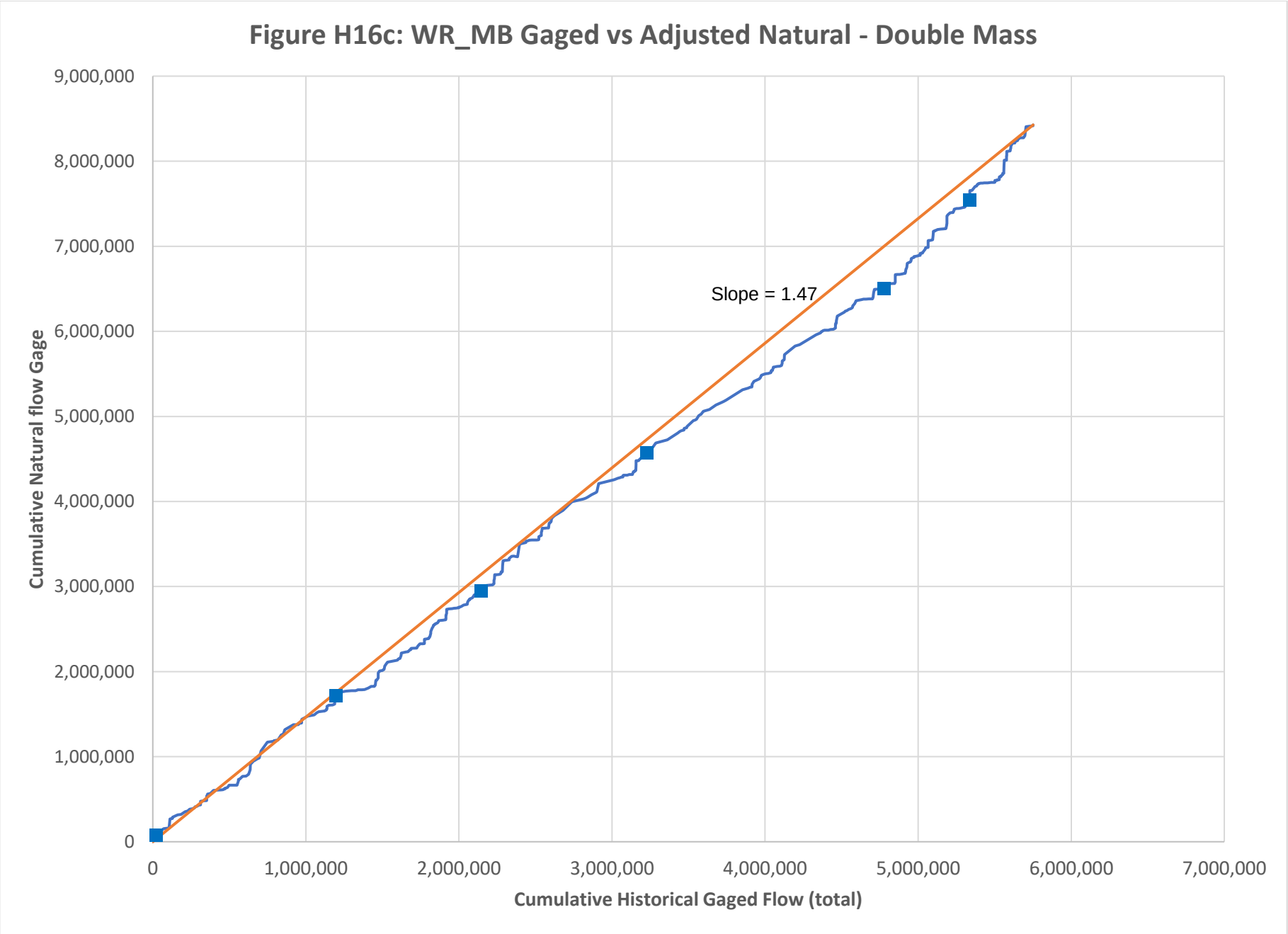


Figure H16c: WR_MB Gaged vs Adjusted Natural - Double Mass
Slope = 1.47
Cumulative Natural flow Gage
Cumulative Historical Gaged Flow (total)
0
1,000,000
2,000,000
3,000,000
4,000,000
5,000,000
6,000,000
7,000,000
8,000,000
9,000,000

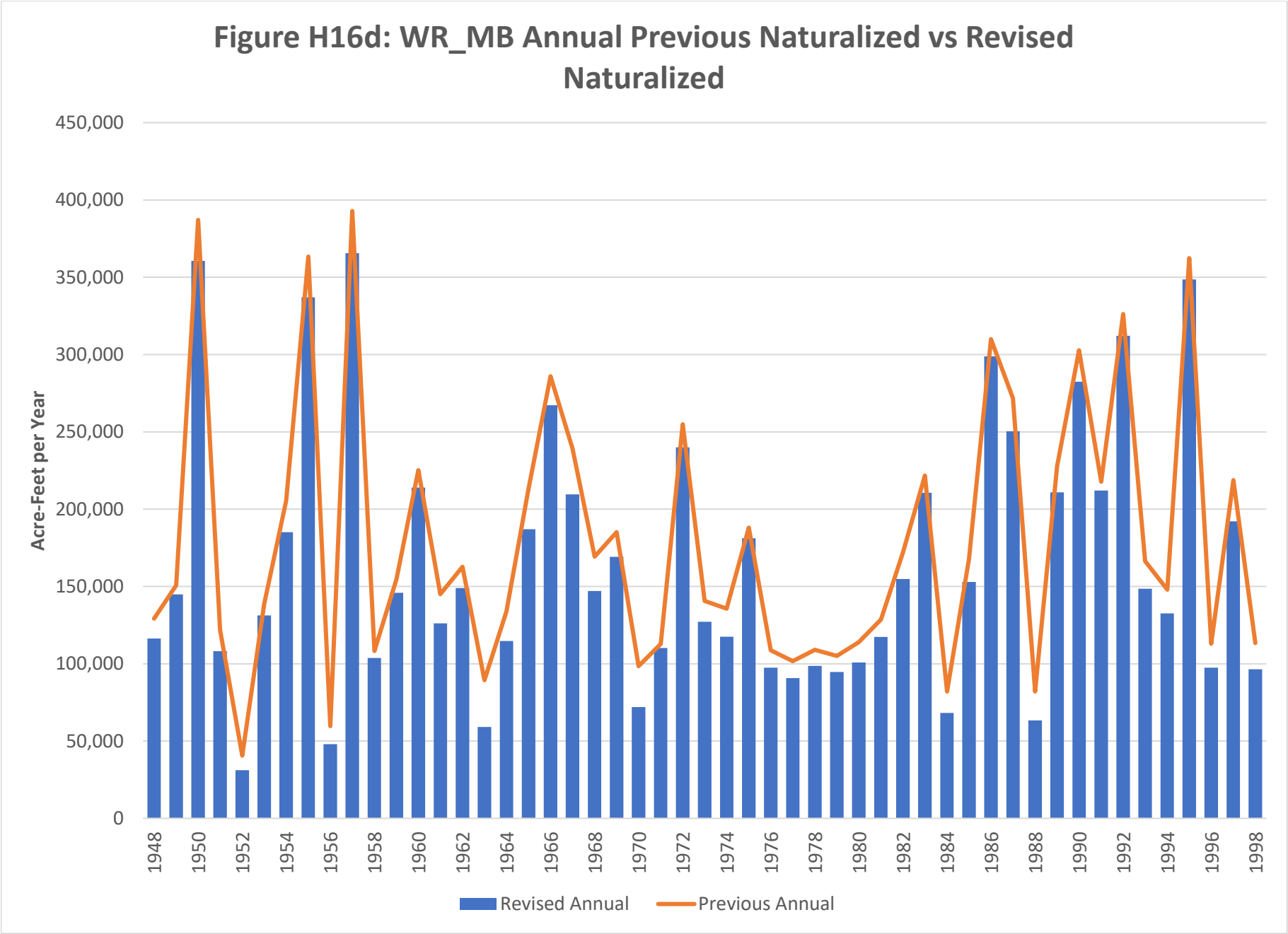


Figure H16d: WR_MB Annual Previous Naturalized vs Revised Naturalized
Acre-Feet per Year
450,000
400,000
350,000
300,000
250,000
200,000
150,000
100,000
50,000
0
1948
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
Revised Annual
Previous Annual

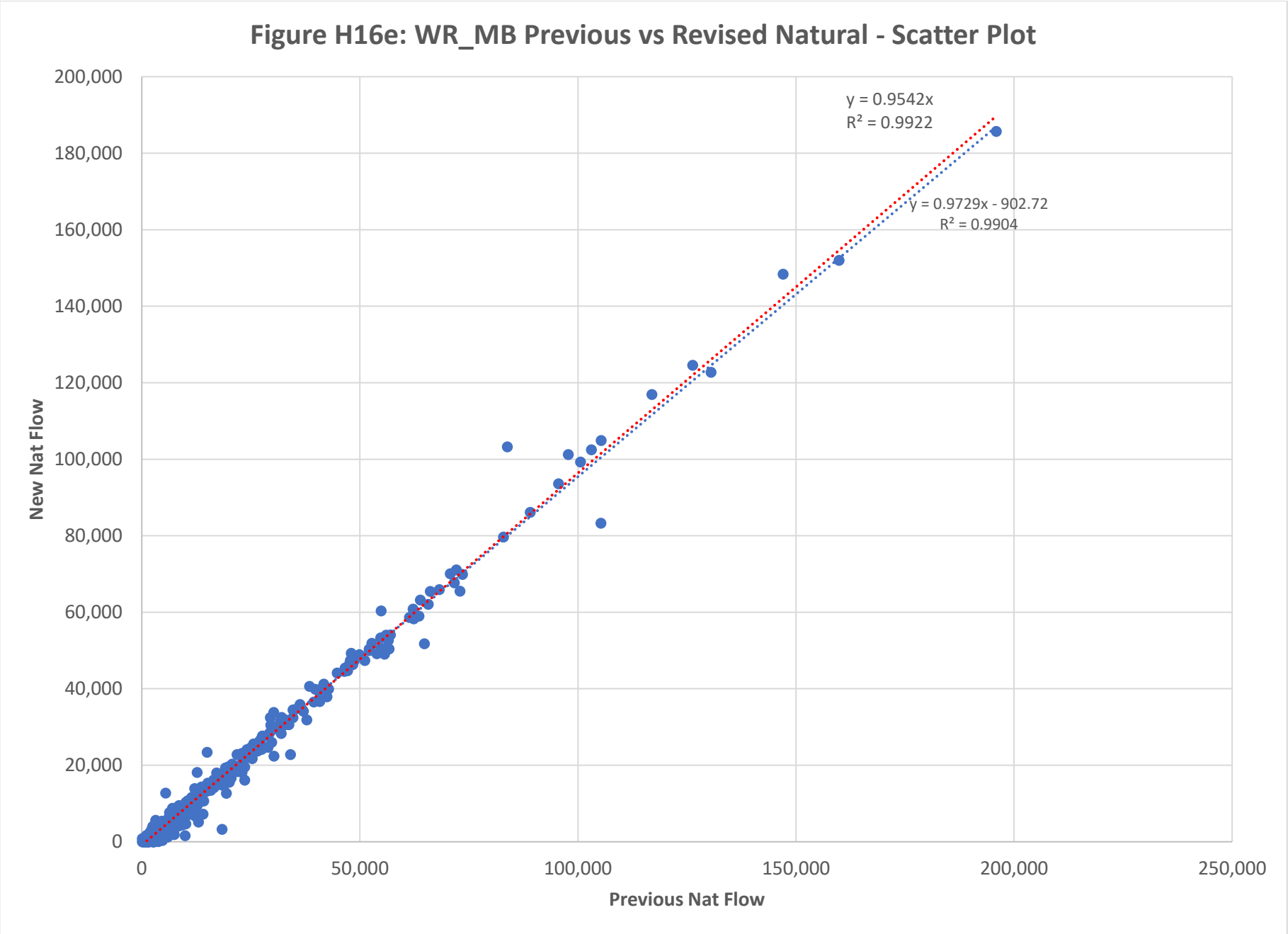


Figure H16e: WR_MB Previous vs Revised Natural - Scatter Plot
y = 0.9542x
R² = 0.9922
y = 0.9729x - 902.72
R² = 0.9904
New Nat Flow
Previous Nat Flow
0
20,000
40,000
60,000
80,000
100,000
120,000
140,000
160,000
180,000
200,000
0
50,000
100,000
150,000
200,000
250,000

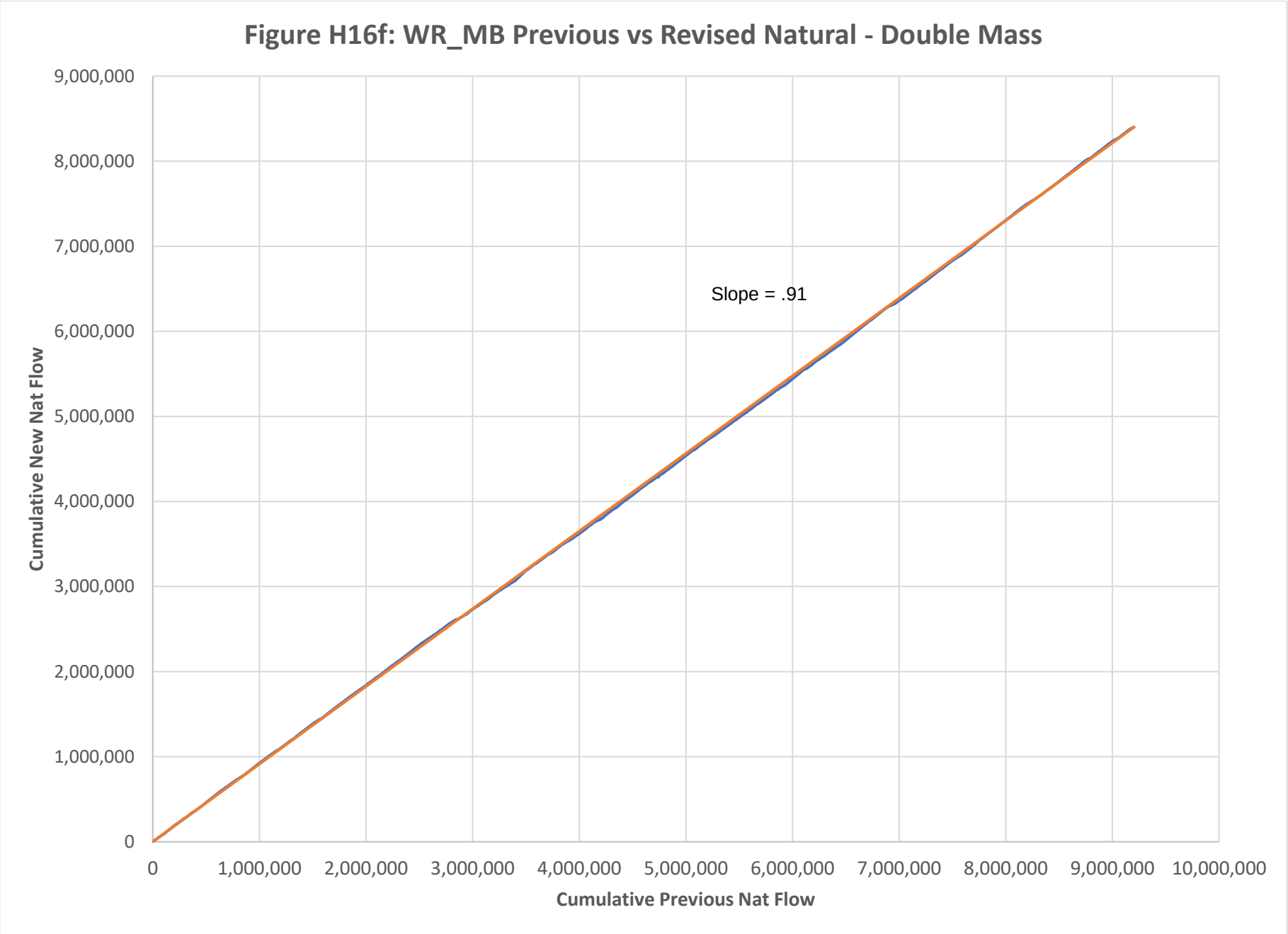


Figure H16f: WR_MB Previous vs Revised Natural - Double Mass
Slope = .91
Cumulative New Nat Flow
Cumulative Previous Nat Flow
0
1,000,000
2,000,000
3,000,000
4,000,000
5,000,000
6,000,000
7,000,000
8,000,000
9,000,000
10,000,000

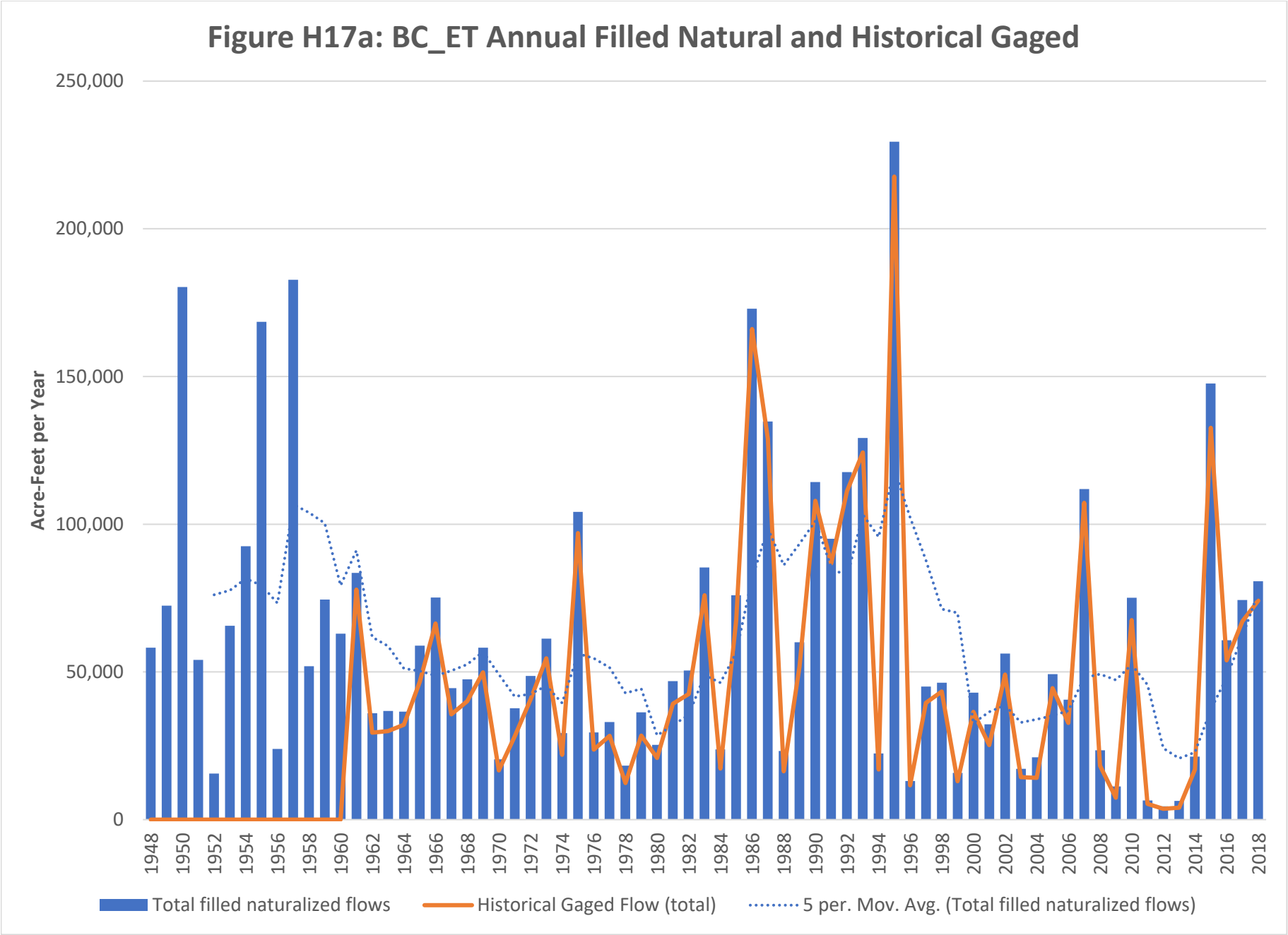


Figure H17a: BC_ET Annual Filled Natural and Historical Gaged
Acre-Feet per Year
250,000
200,000
150,000
100,000
50,000
0
1948
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
Total filled naturalized flows
Historical Gaged Flow (total)
5 per. Mov. Avg. (Total filled naturalized flows)

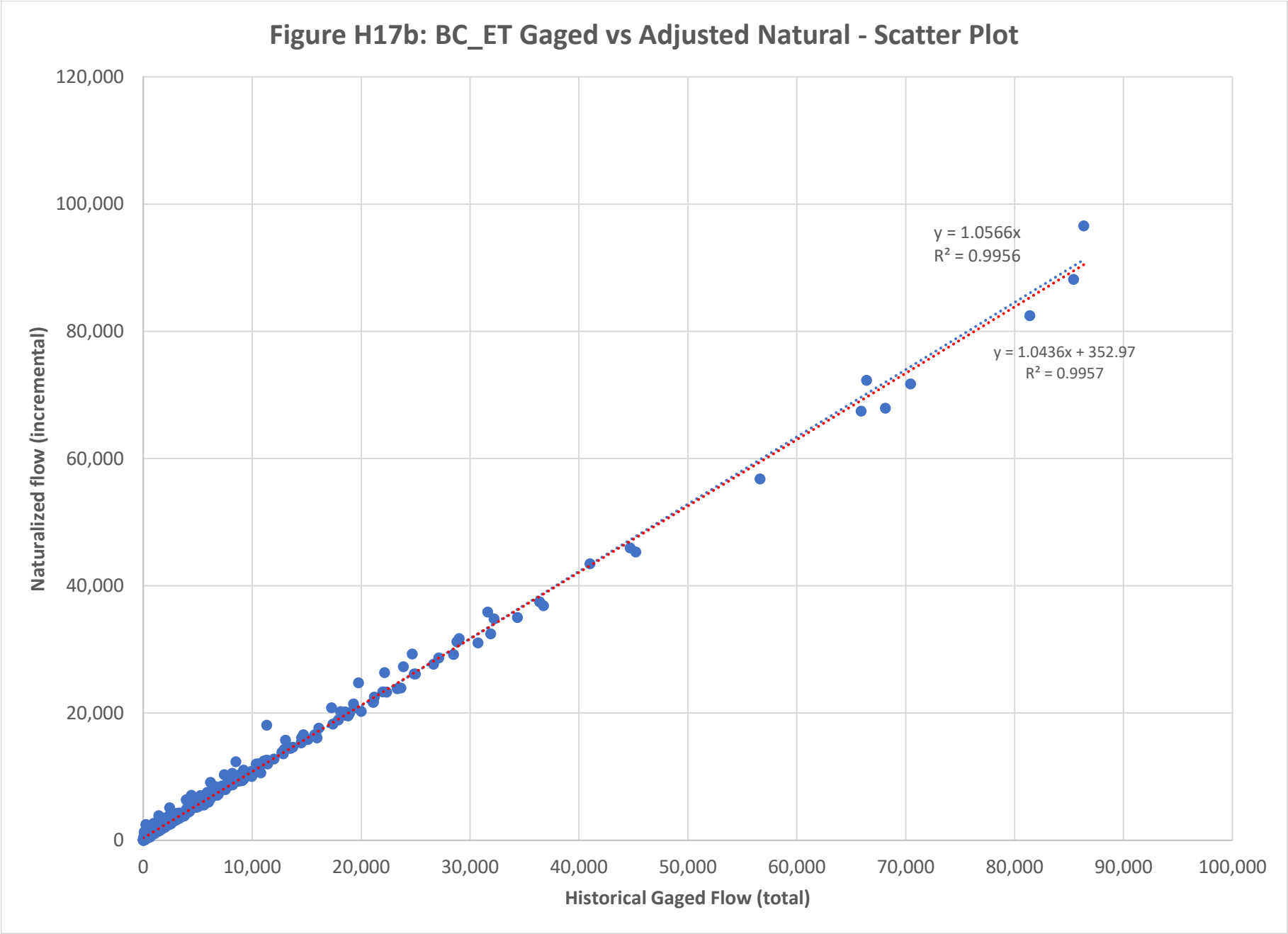


Figure H17b: BC_ET Gaged vs Adjusted Natural - Scatter Plot
Naturalized flow (incremental)
Historical Gaged Flow (total)
120,000
100,000
80,000
60,000
40,000
20,000
0
0
10,000
20,000
30,000
40,000
50,000
60,000
70,000
80,000
90,000
100,000
y = 1.0566x
R² = 0.9956
y = 1.0436x + 352.97
R² = 0.9957

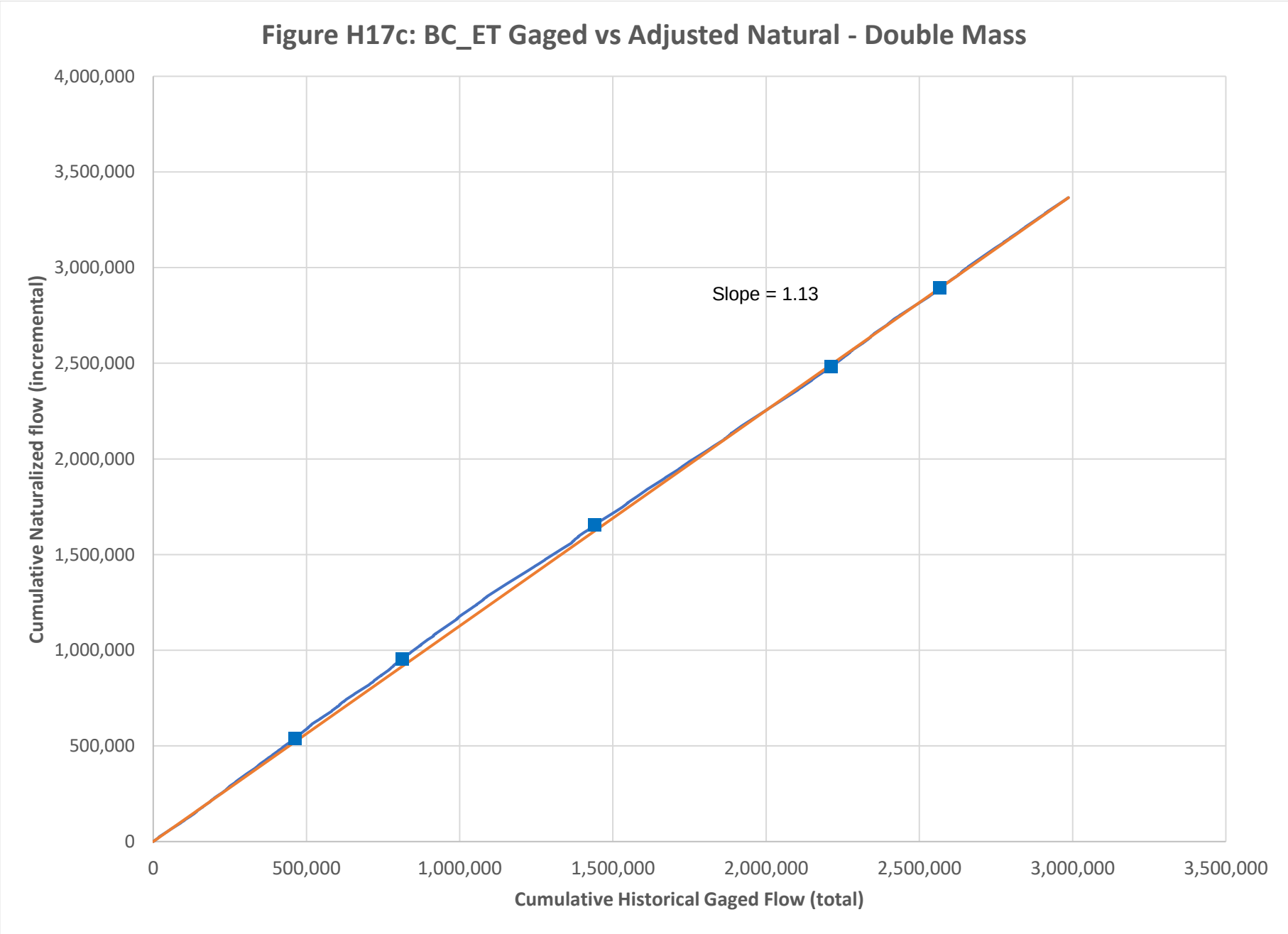


Figure H17c: BC_ET Gaged vs Adjusted Natural - Double Mass
Slope = 1.13
Cumulative Naturalized flow (incremental)
Cumulative Historical Gaged Flow (total)
0
500,000
1,000,000
1,500,000
2,000,000
2,500,000
3,000,000
3,500,000
4,000,000

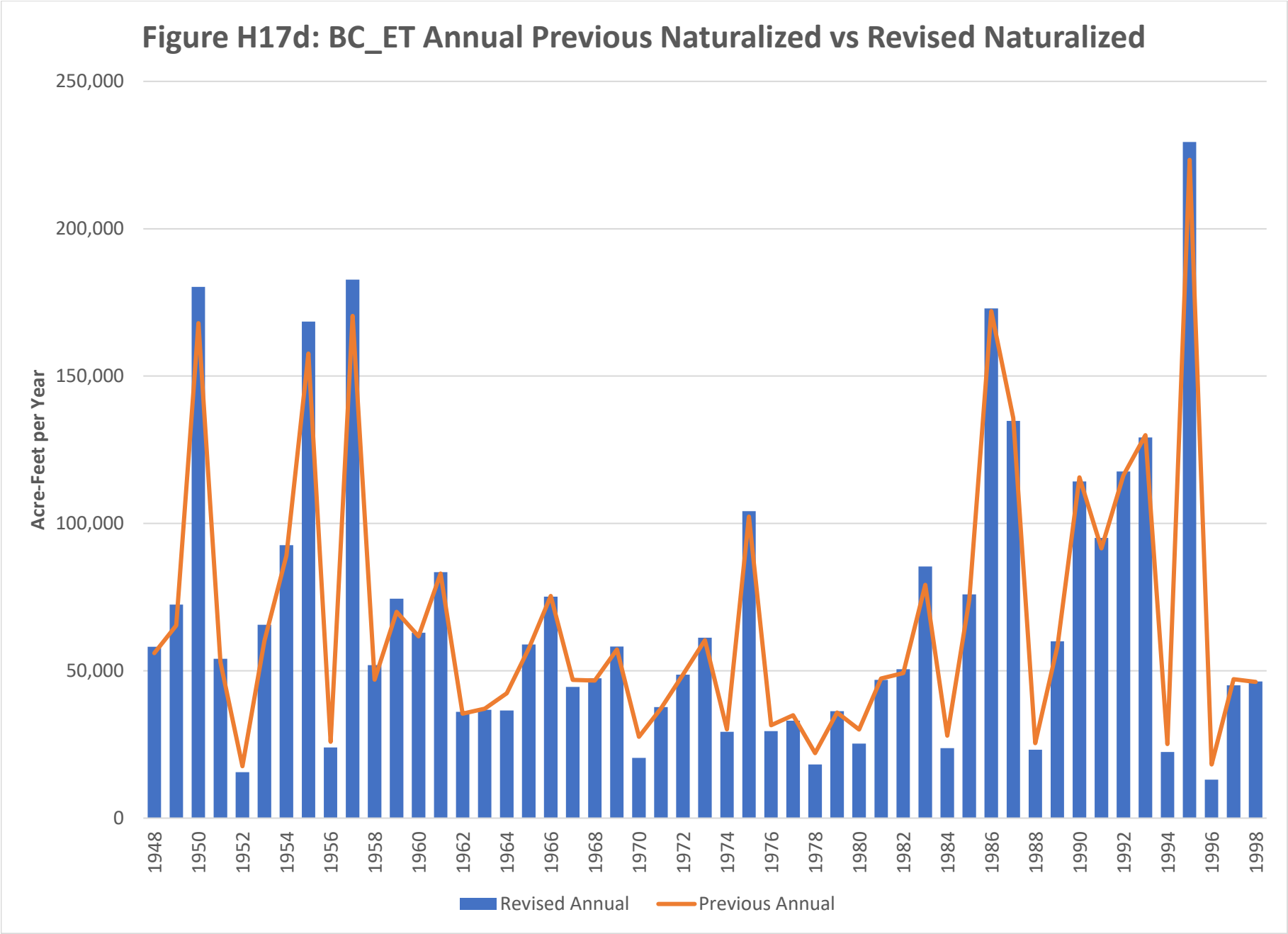


Figure H17d: BC_ET Annual Previous Naturalized vs Revised Naturalized
Acre-Feet per Year
250,000
200,000
150,000
100,000
50,000
0
1948
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
Revised Annual
Previous Annual

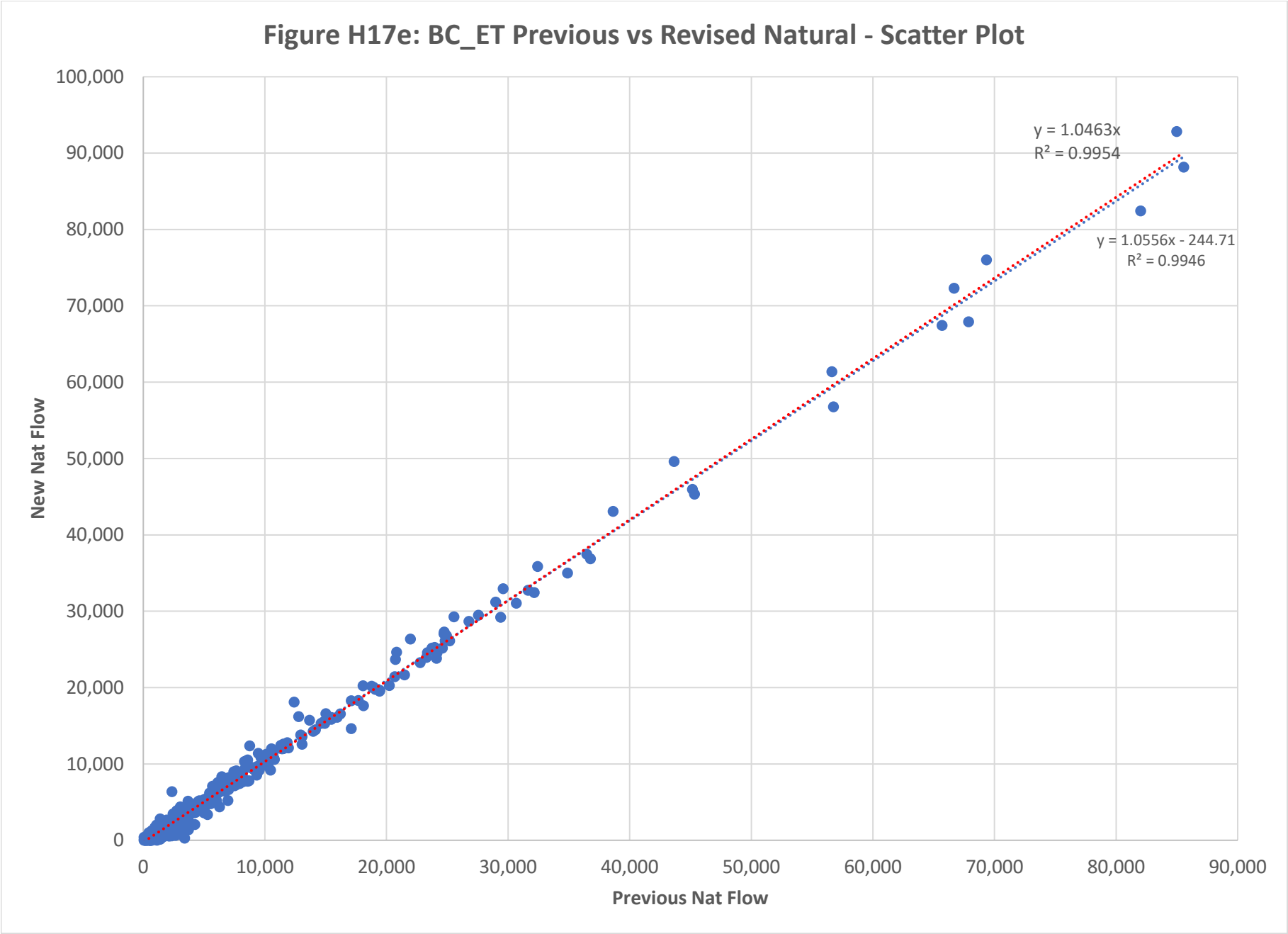


Figure H17e: BC_ET Previous vs Revised Natural - Scatter Plot
y = 1.0463x
R² = 0.9954
y = 1.0556x - 244.71
R² = 0.9946
New Nat Flow
Previous Nat Flow
0
10,000
20,000
30,000
40,000
50,000
60,000
70,000
80,000
90,000
100,000

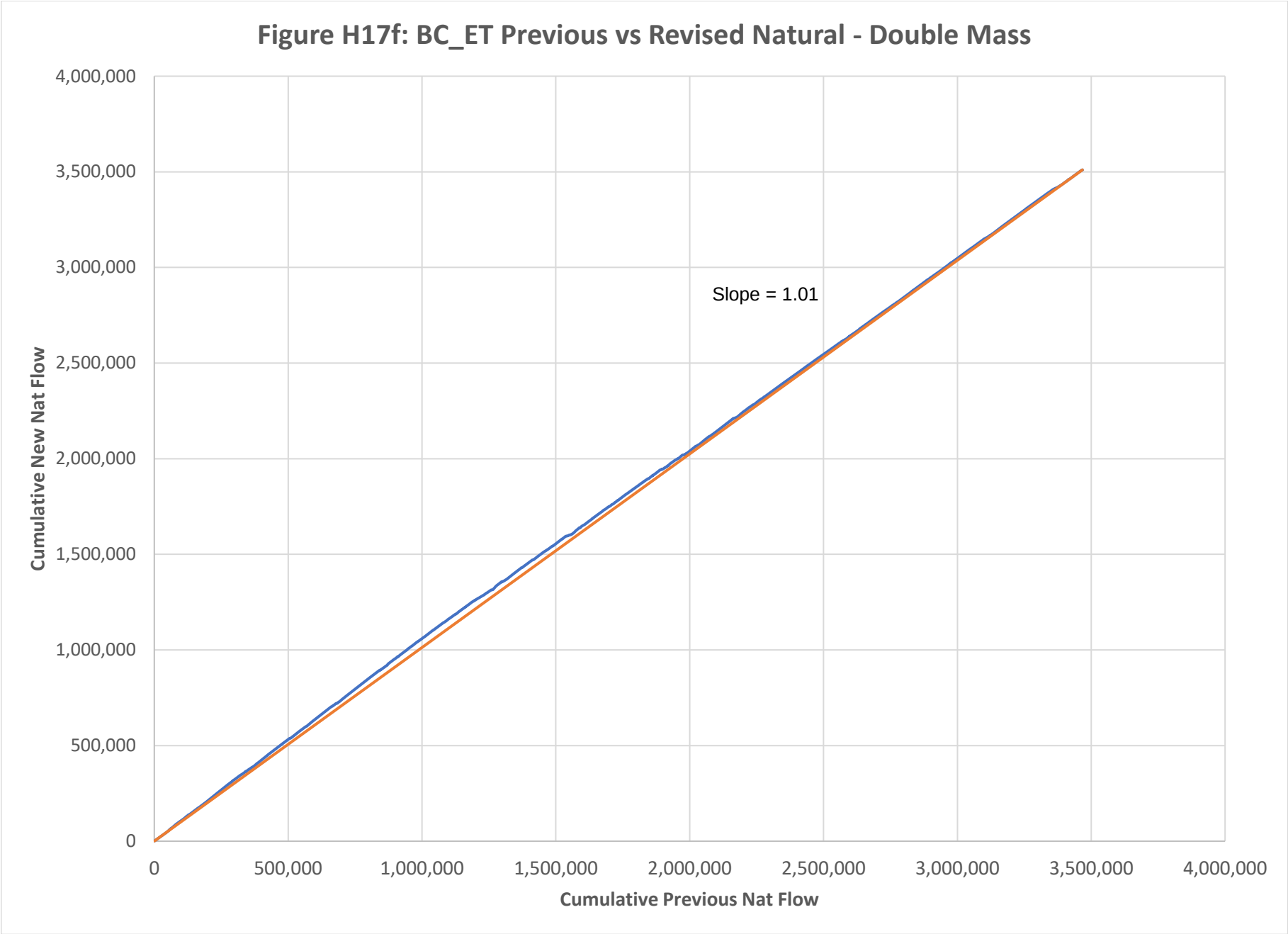


Figure H17f: BC_ET Previous vs Revised Natural - Double Mass
Slope = 1.01
Cumulative New Nat Flow
Cumulative Previous Nat Flow
0
500,000
1,000,000
1,500,000
2,000,000
2,500,000
3,000,000
3,500,000
4,000,000

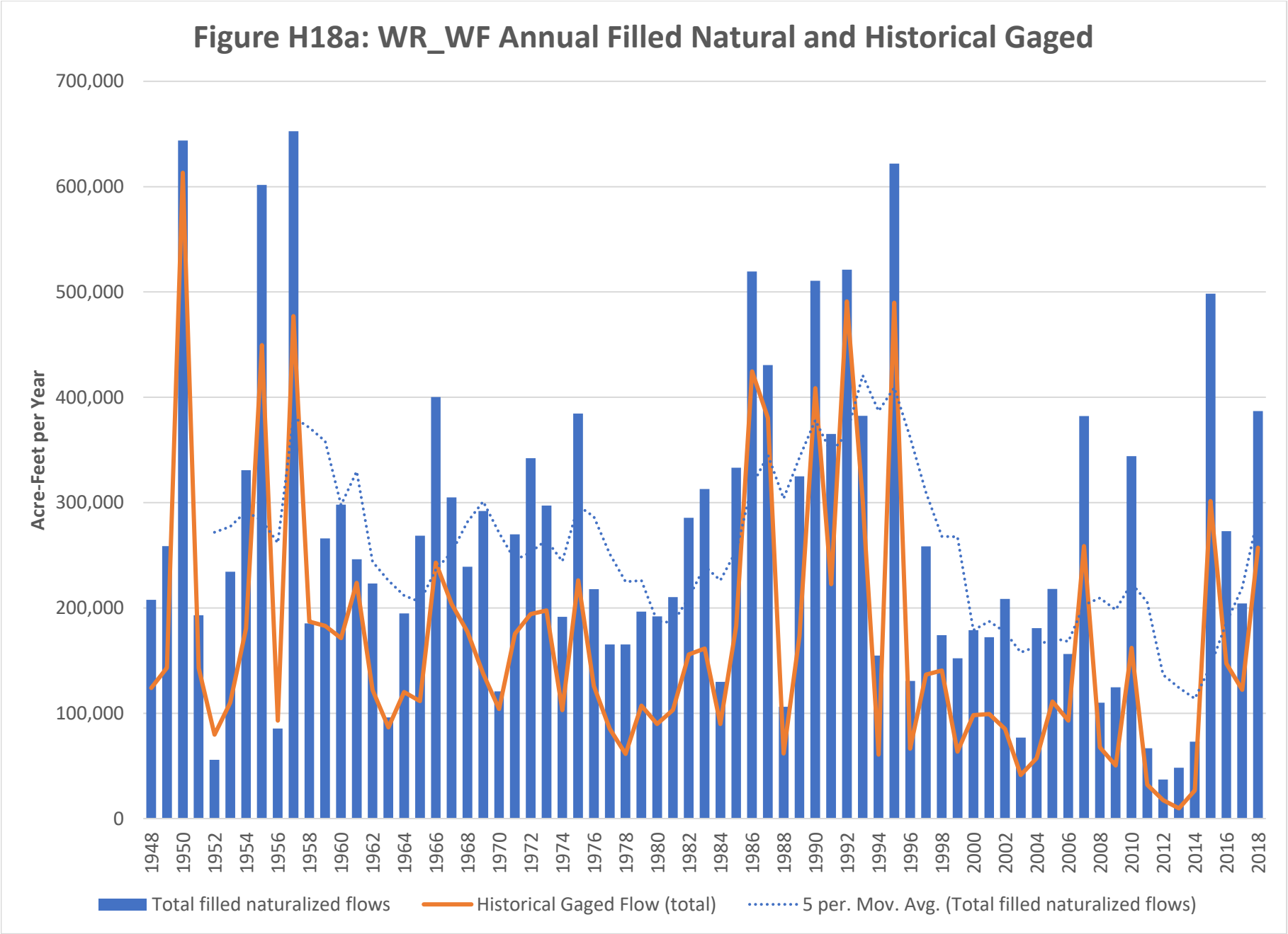


Figure H18a: WR_WF Annual Filled Natural and Historical Gaged
Acre-Feet per Year
700,000
600,000
500,000
400,000
300,000
200,000
100,000
0
1948
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
Total filled naturalized flows
Historical Gaged Flow (total)
5 per. Mov. Avg. (Total filled naturalized flows)

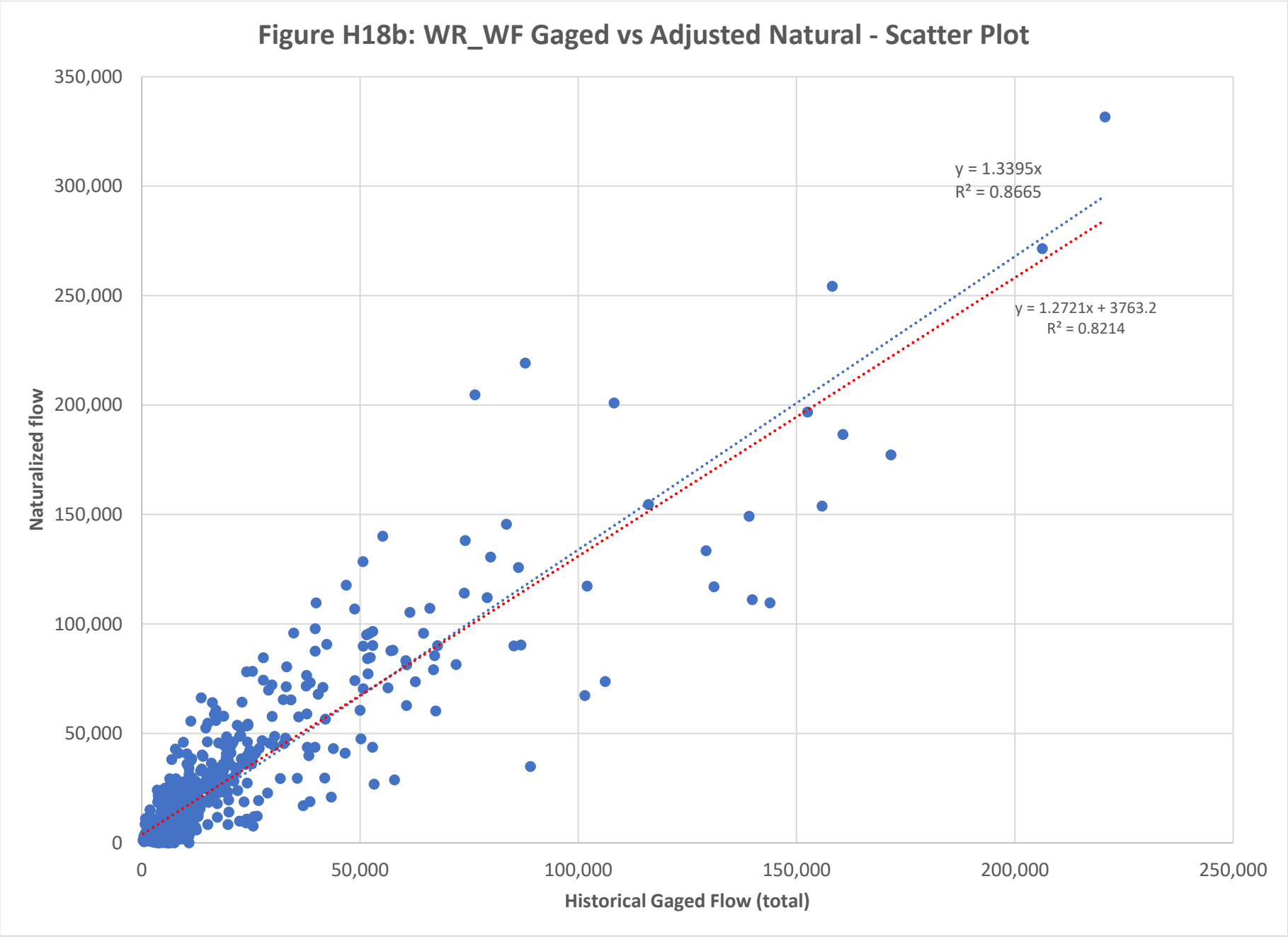


Figure H18b: WR_WF Gaged vs Adjusted Natural - Scatter Plot
350,000
300,000
250,000
200,000
150,000
100,000
50,000
0
Naturalized flow
0
50,000
100,000
150,000
200,000
250,000
Historical Gaged Flow (total)
y = 1.3395x
R² = 0.8665
y = 1.2721x + 3763.2
R² = 0.8214

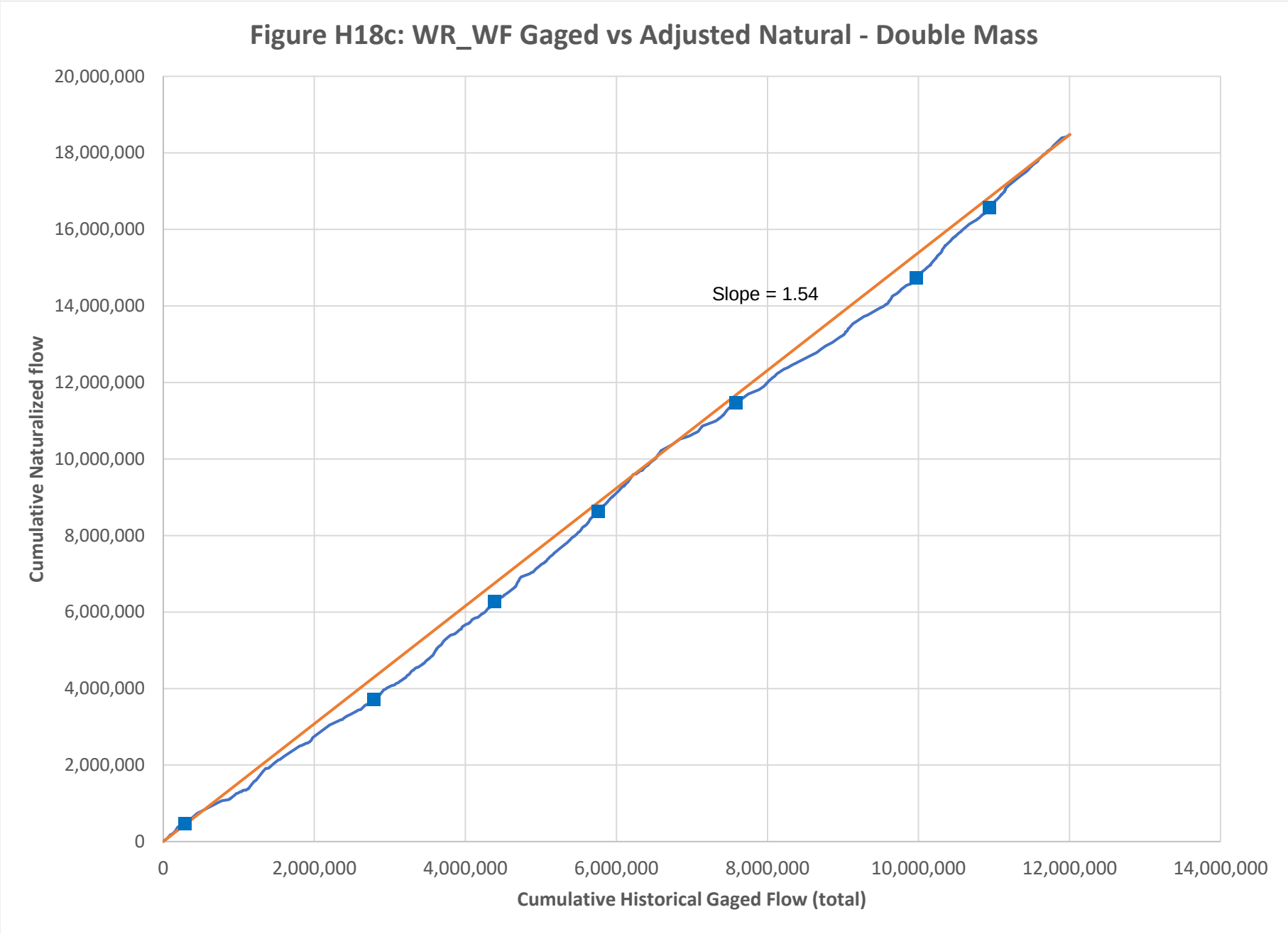


Figure H18c: WR_WF Gaged vs Adjusted Natural - Double Mass
Slope = 1.54
Cumulative Naturalized flow
Cumulative Historical Gaged Flow (total)
0
2,000,000
4,000,000
6,000,000
8,000,000
10,000,000
12,000,000
14,000,000
16,000,000
18,000,000
20,000,000

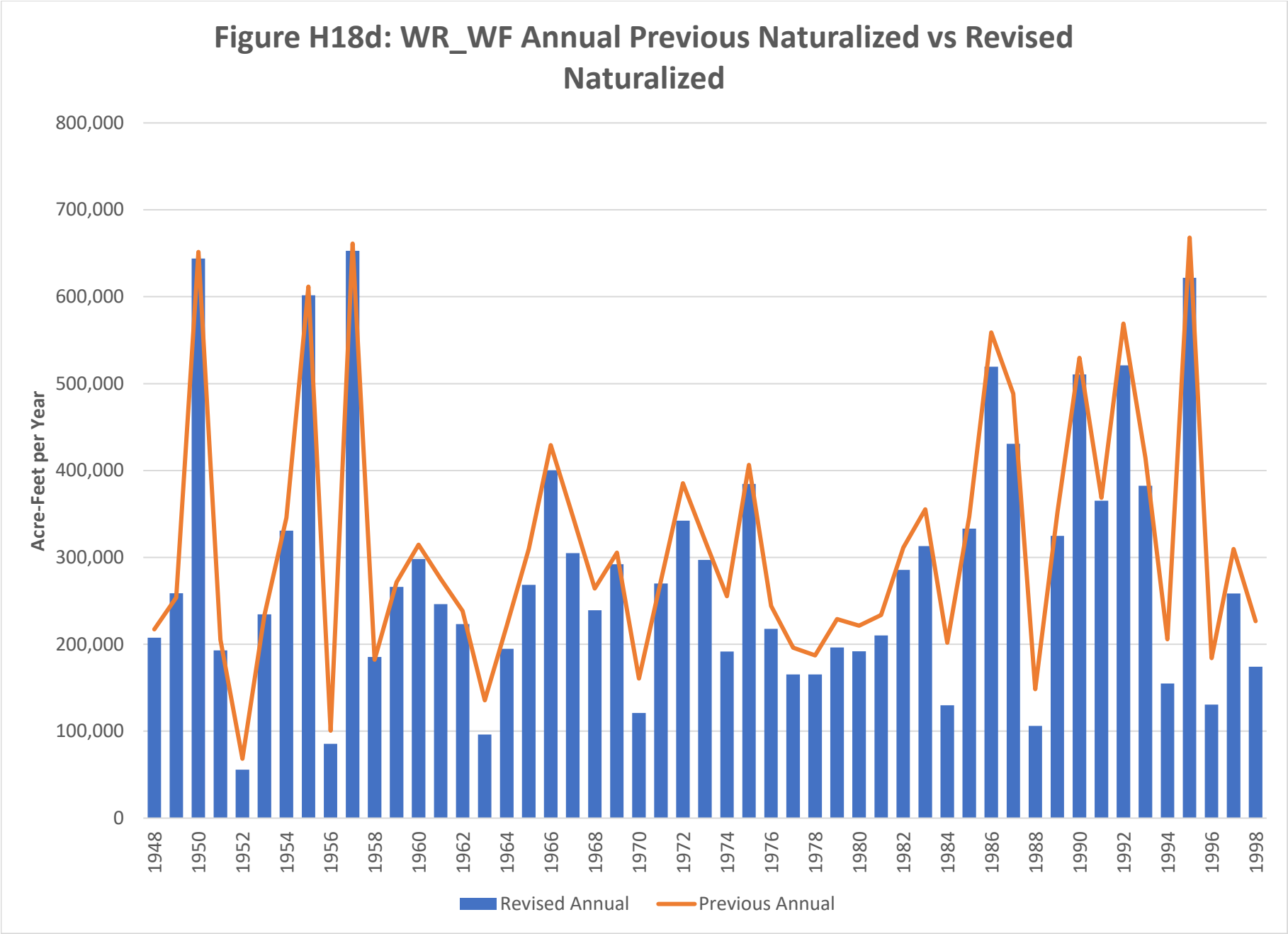


Figure H18d: WR_WF Annual Previous Naturalized vs Revised Naturalized
Acre-Feet per Year
800,000
700,000
600,000
500,000
400,000
300,000
200,000
100,000
0
1948
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
Revised Annual
Previous Annual

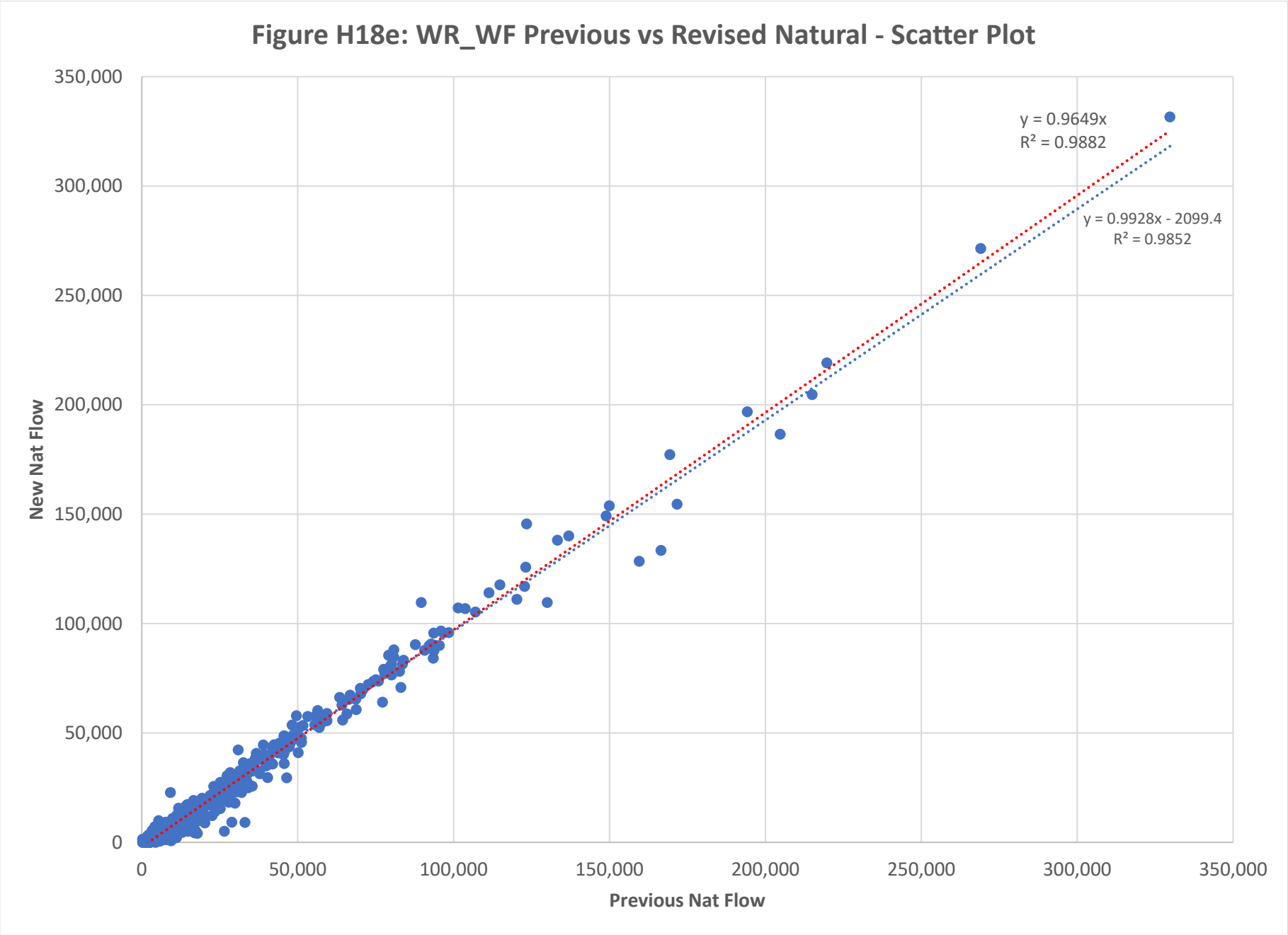


Figure H18e: WR_WF Previous vs Revised Natural - Scatter Plot
y = 0.9649x
R² = 0.9882
y = 0.9928x - 2099.4
R² = 0.9852
New Nat Flow
Previous Nat Flow
0
50,000
100,000
150,000
200,000
250,000
300,000
350,000

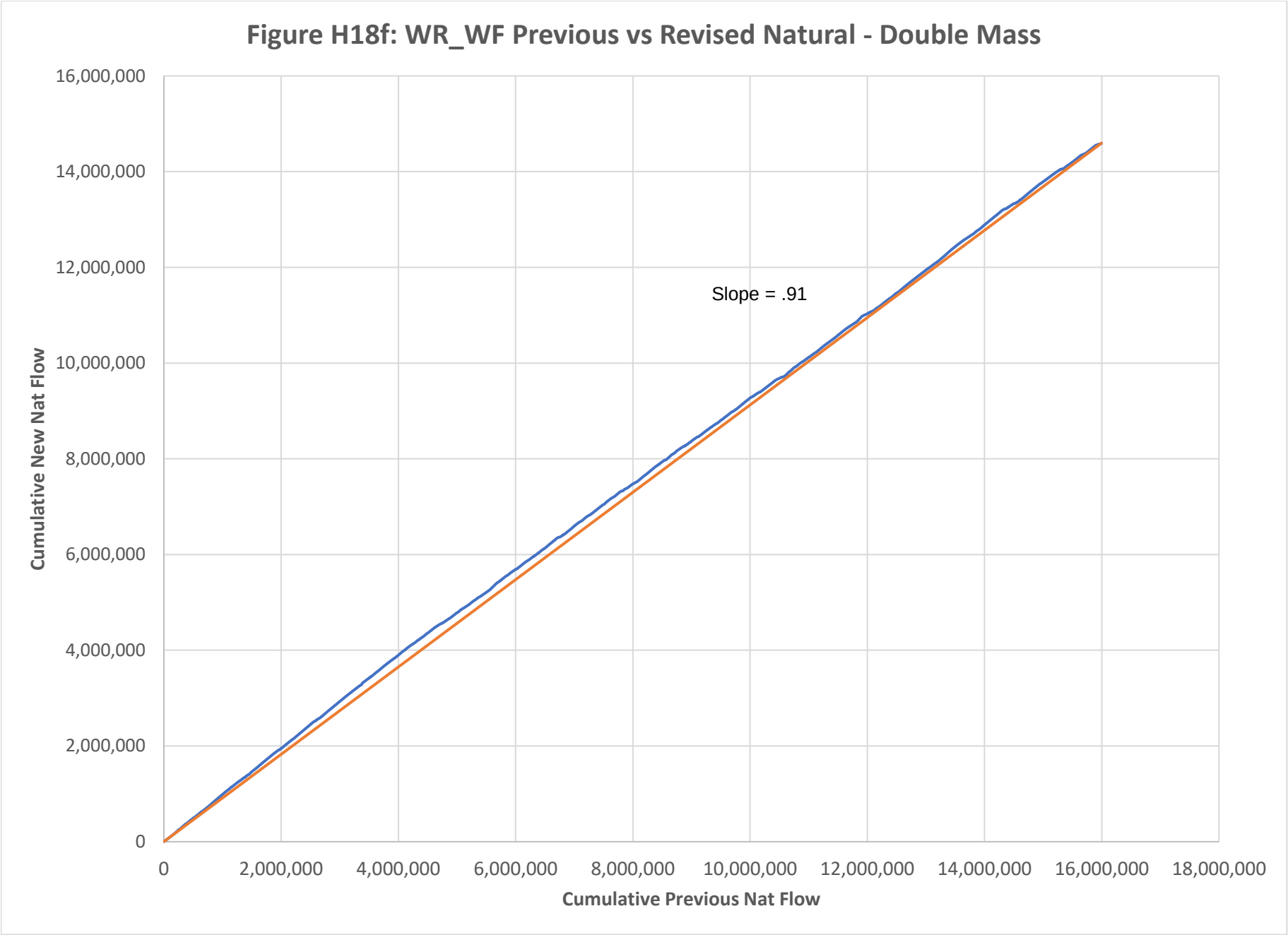


Figure H18f: WR_WF Previous vs Revised Natural - Double Mass
Slope = .91
Cumulative New Nat Flow
Cumulative Previous Nat Flow
0
2,000,000
4,000,000
6,000,000
8,000,000
10,000,000
12,000,000
14,000,000
16,000,000
18,000,000

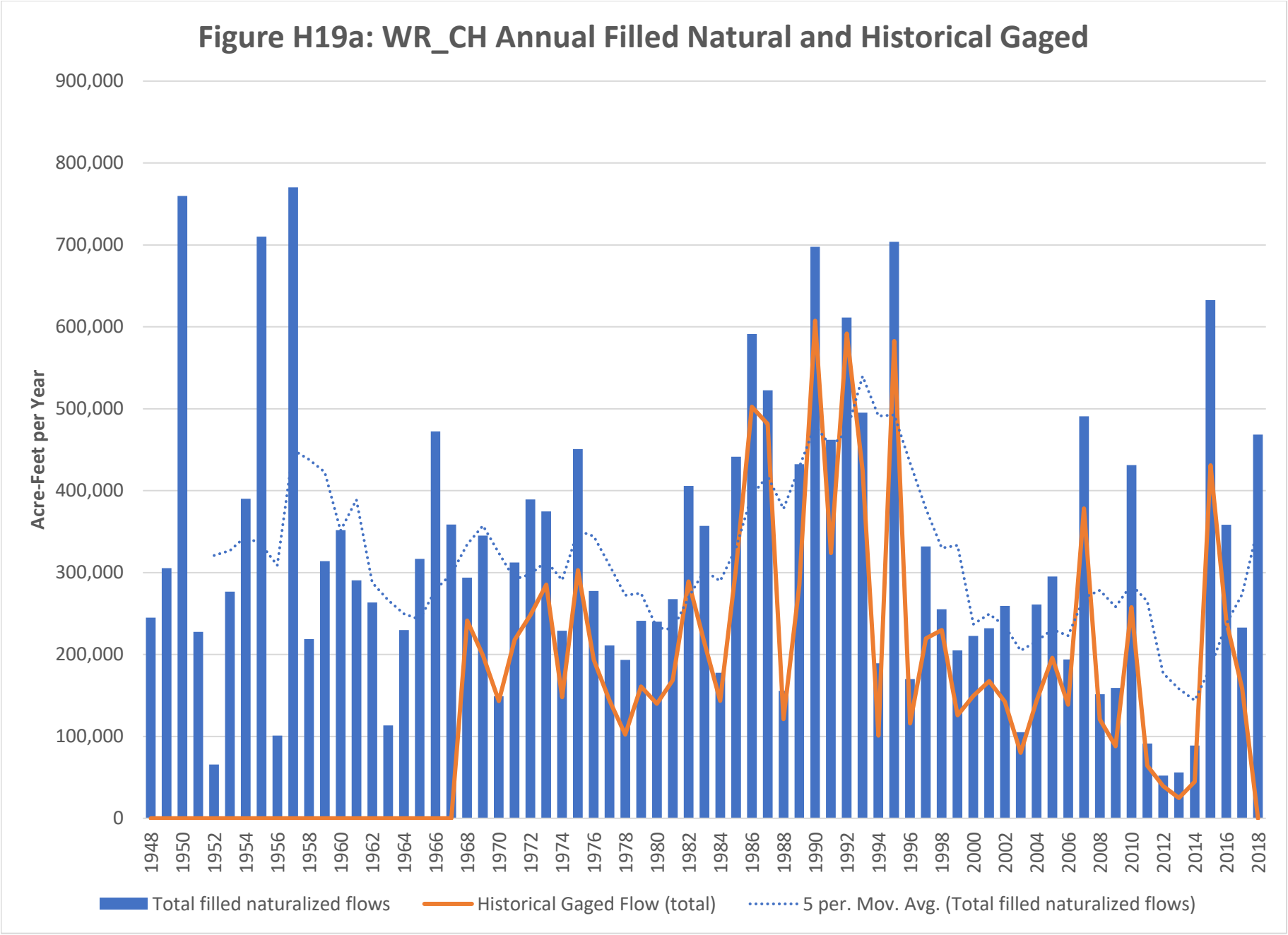


Figure H19a: WR_CH Annual Filled Natural and Historical Gaged
Acre-Feet per Year
900,000
800,000
700,000
600,000
500,000
400,000
300,000
200,000
100,000
0
1948
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
Total filled naturalized flows
Historical Gaged Flow (total)
5 per. Mov. Avg. (Total filled naturalized flows)

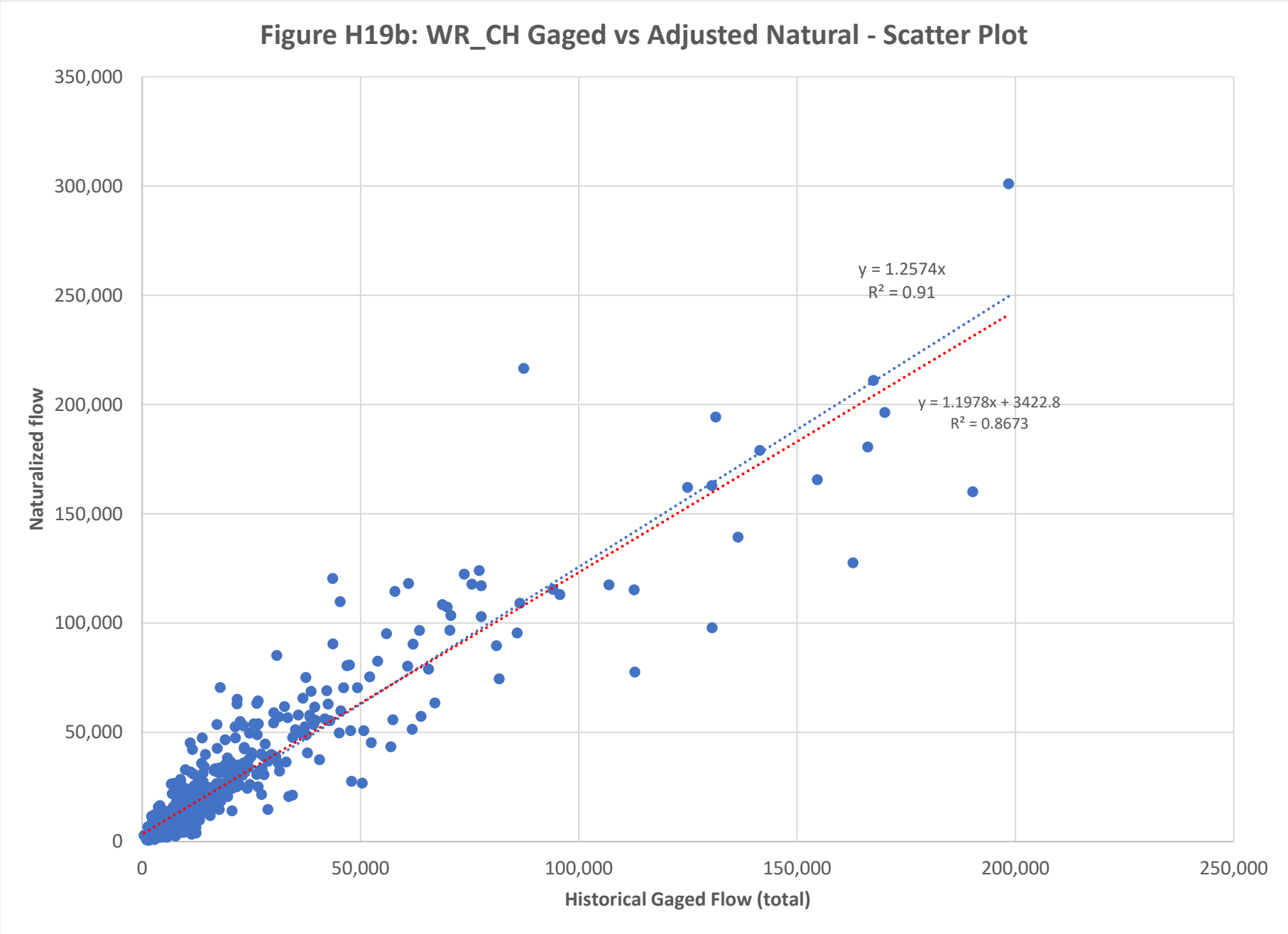


Figure H19b: WR_CH Gaged vs Adjusted Natural - Scatter Plot
350,000
300,000
250,000
200,000
150,000
100,000
50,000
0
Naturalized flow
0
50,000
100,000
150,000
200,000
250,000
Historical Gaged Flow (total)
y = 1.2574x
R² = 0.91
y = 1.1978x + 3422.8
R² = 0.8673

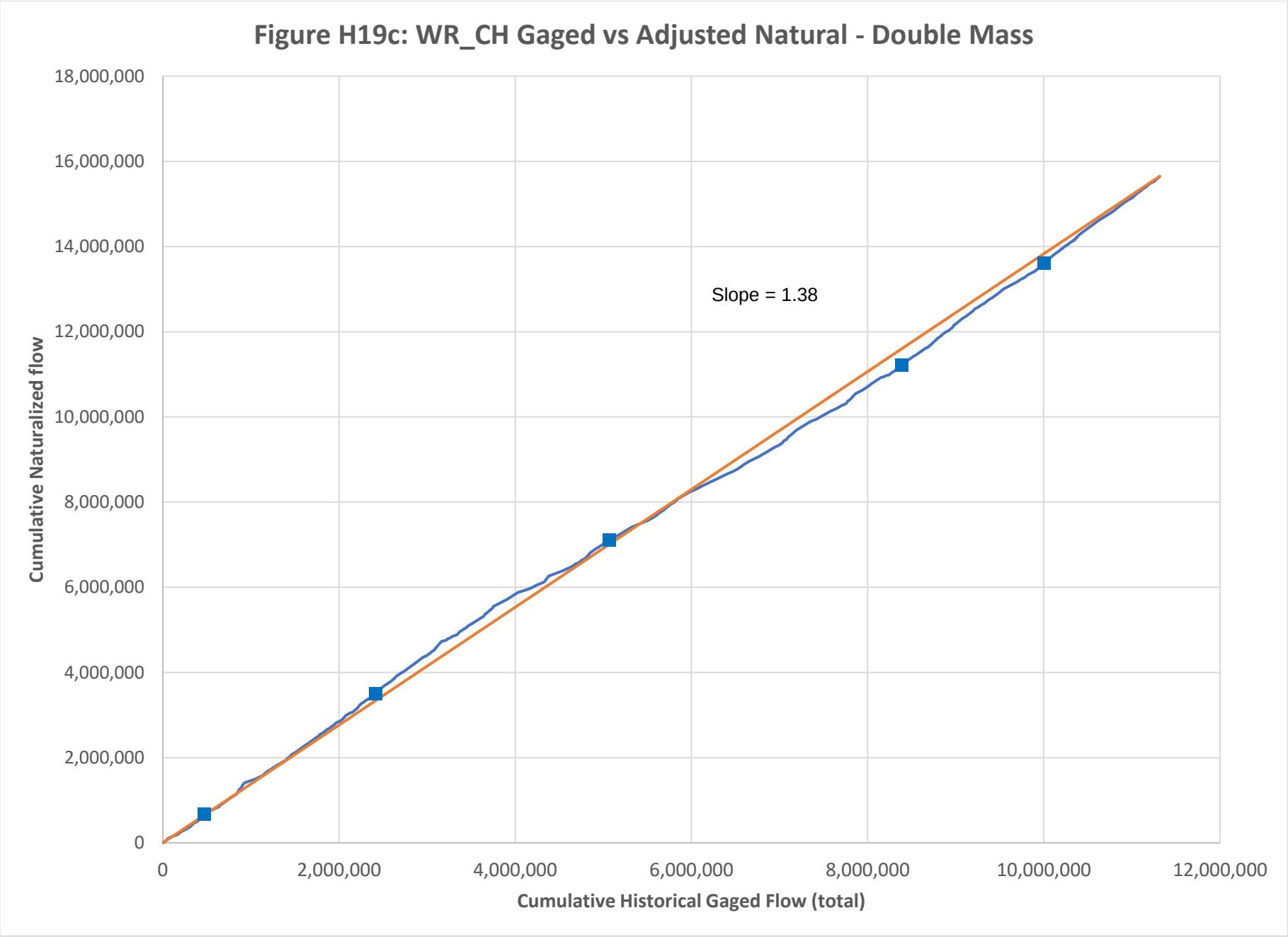


Figure H19c: WR_CH Gaged vs Adjusted Natural - Double Mass
Slope = 1.38
Cumulative Naturalized flow
Cumulative Historical Gaged Flow (total)
0
2,000,000
4,000,000
6,000,000
8,000,000
10,000,000
12,000,000
14,000,000
16,000,000
18,000,000

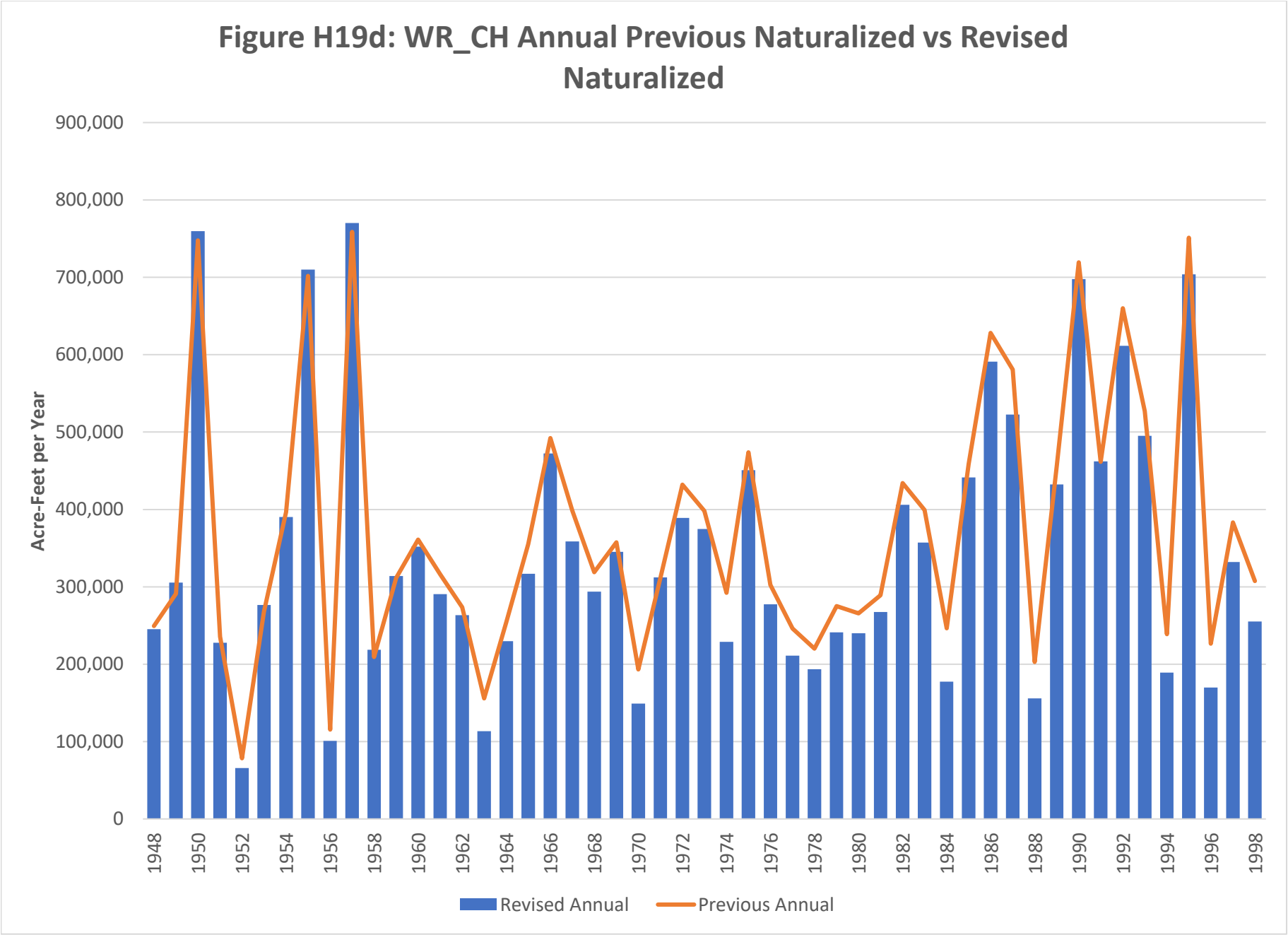


Figure H19d: WR_CH Annual Previous Naturalized vs Revised Naturalized
Acre-Feet per Year
900,000
800,000
700,000
600,000
500,000
400,000
300,000
200,000
100,000
0
1948
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
Revised Annual
Previous Annual

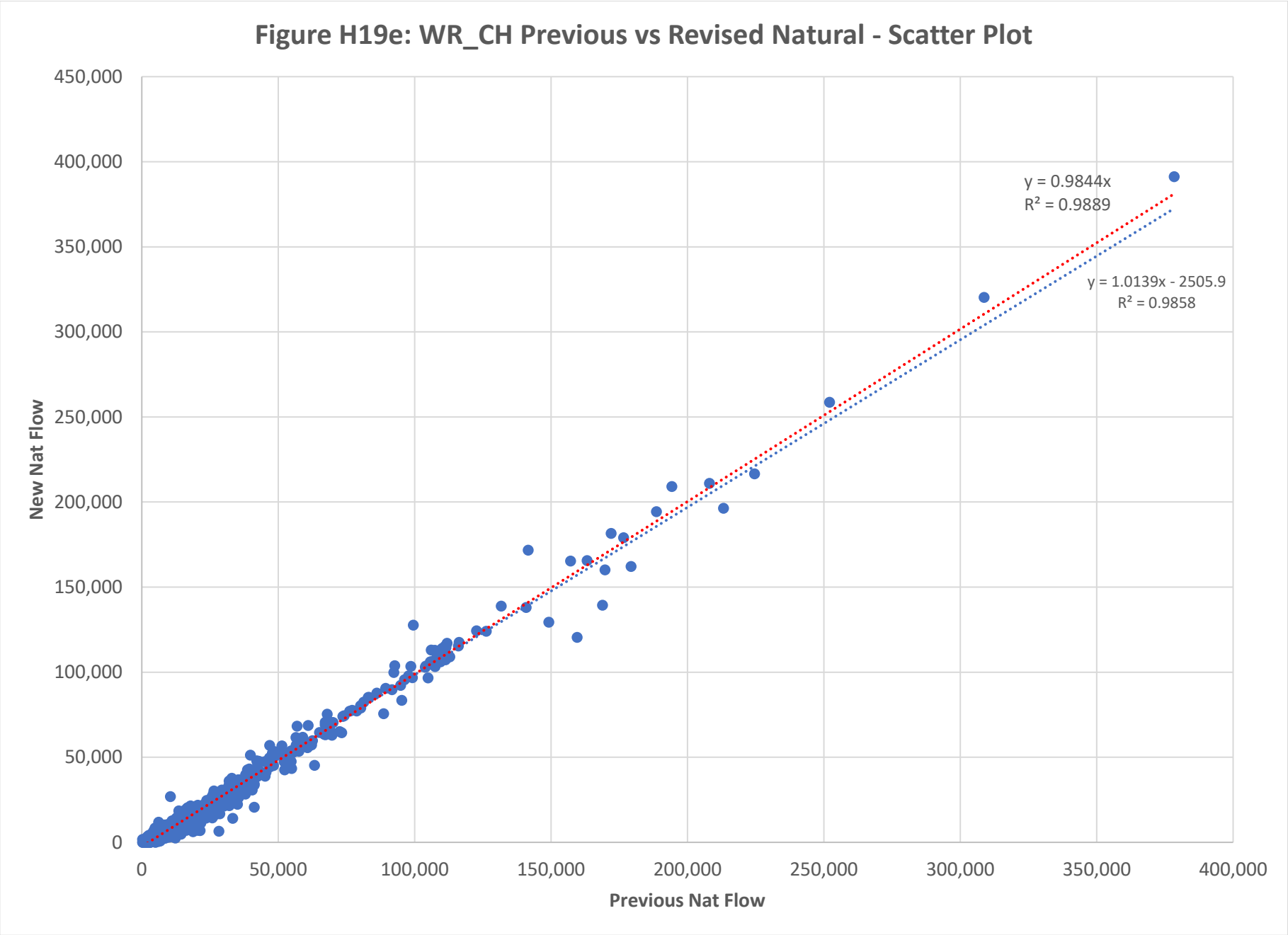


Figure H19e: WR_CH Previous vs Revised Natural - Scatter Plot
y = 0.9844x
R² = 0.9889
y = 1.0139x - 2505.9
R² = 0.9858
New Nat Flow
Previous Nat Flow
0
50,000
100,000
150,000
200,000
250,000
300,000
350,000
400,000
450,000

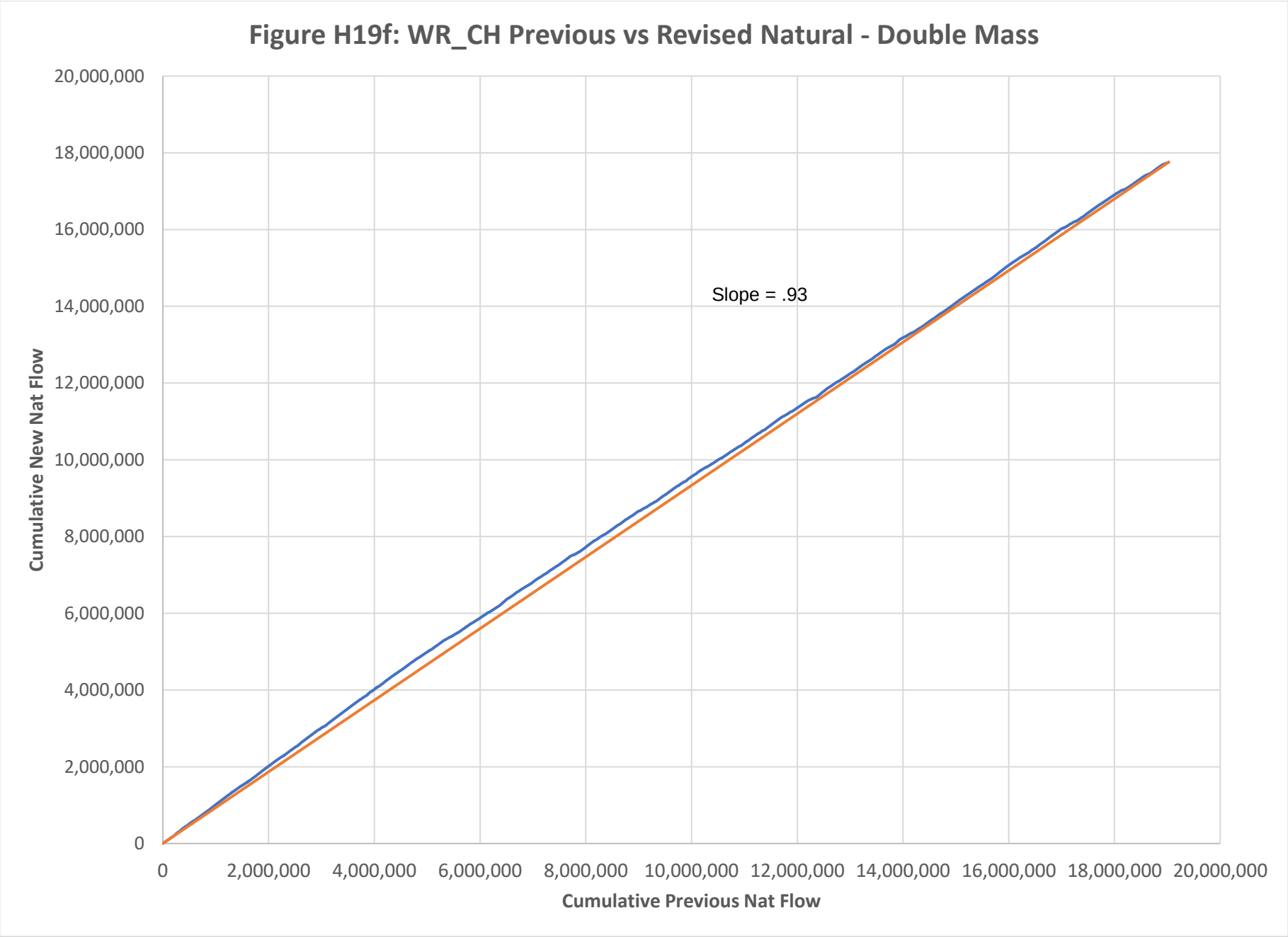


Figure H19f: WR_CH Previous vs Revised Natural - Double Mass
Slope = .93
Cumulative New Nat Flow
Cumulative Previous Nat Flow
0
2,000,000
4,000,000
6,000,000
8,000,000
10,000,000
12,000,000
14,000,000
16,000,000
18,000,000
20,000,000

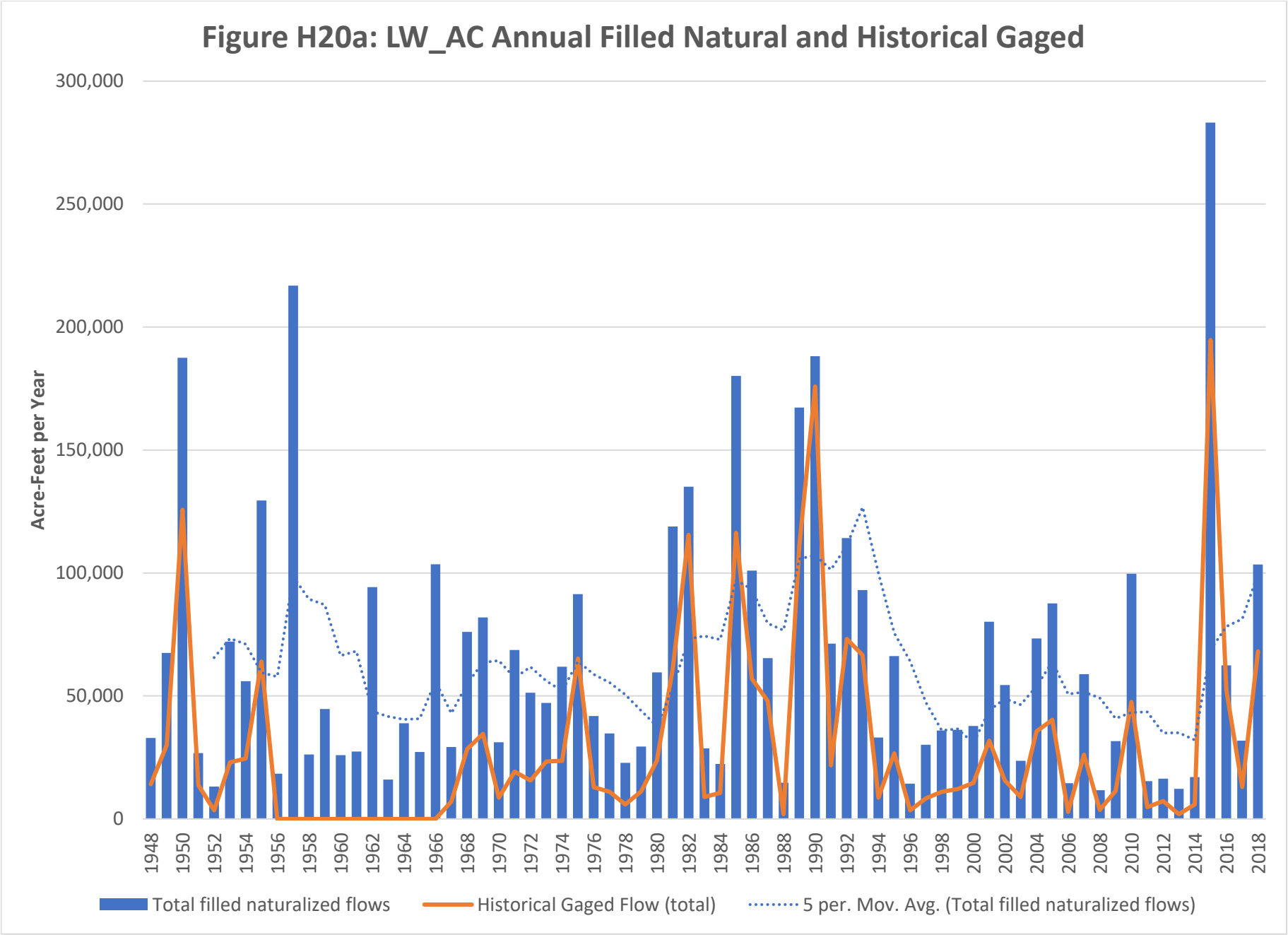


Figure H20a: LW_AC Annual Filled Natural and Historical Gaged
Acre-Feet per Year
300,000
250,000
200,000
150,000
100,000
50,000
0
1948
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
Total filled naturalized flows
Historical Gaged Flow (total)
5 per. Mov. Avg. (Total filled naturalized flows)

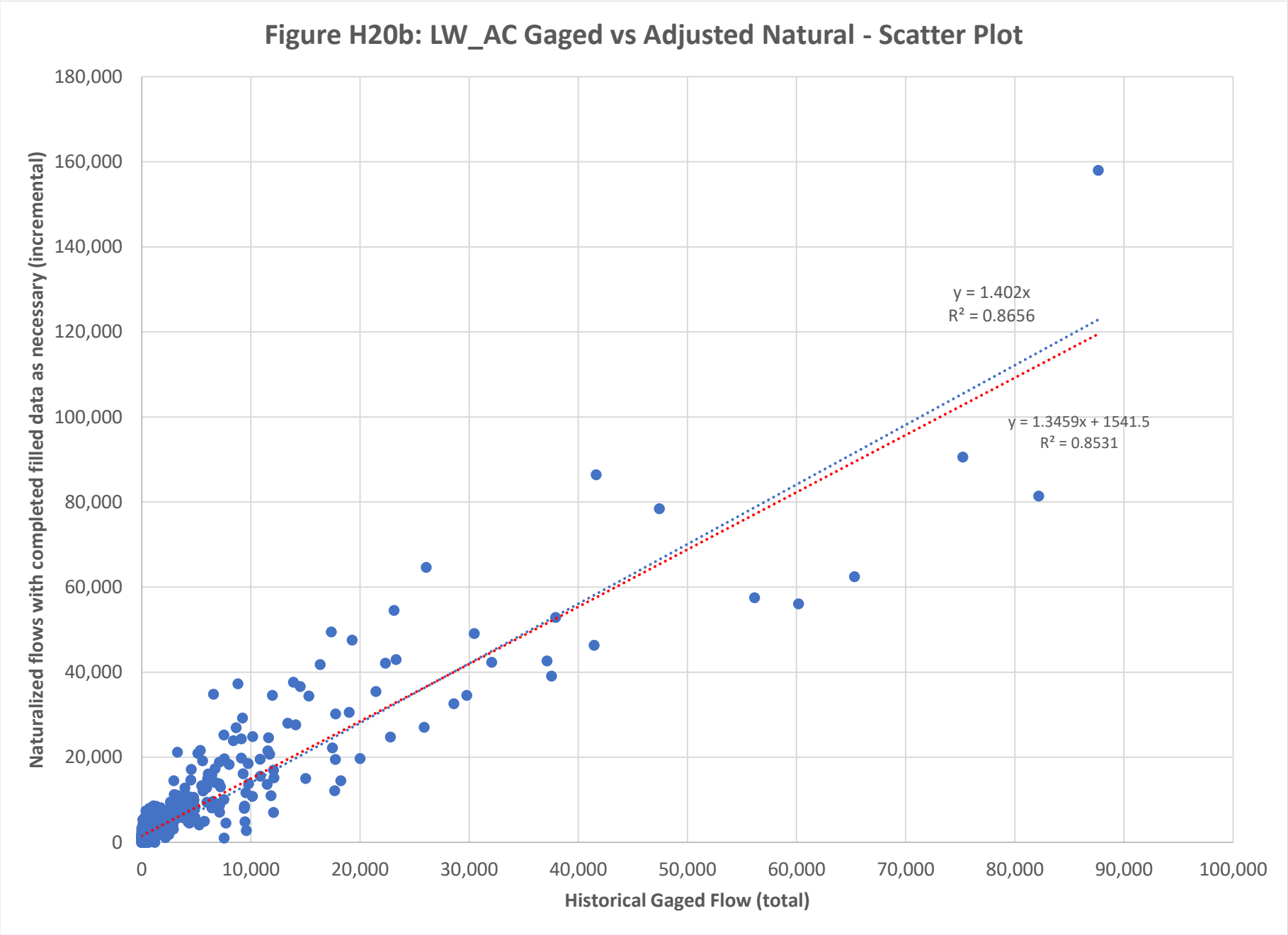


Figure H20b: LW_AC Gaged vs Adjusted Natural - Scatter Plot
Naturalized flows with completed filled data as necessary (incremental)
Historical Gaged Flow (total)
y = 1.402x
R² = 0.8656
y = 1.3459x + 1541.5
R² = 0.8531
0
20,000
40,000
60,000
80,000
100,000
120,000
140,000
160,000
180,000
0
10,000
20,000
30,000
40,000
50,000
60,000
70,000
80,000
90,000
100,000

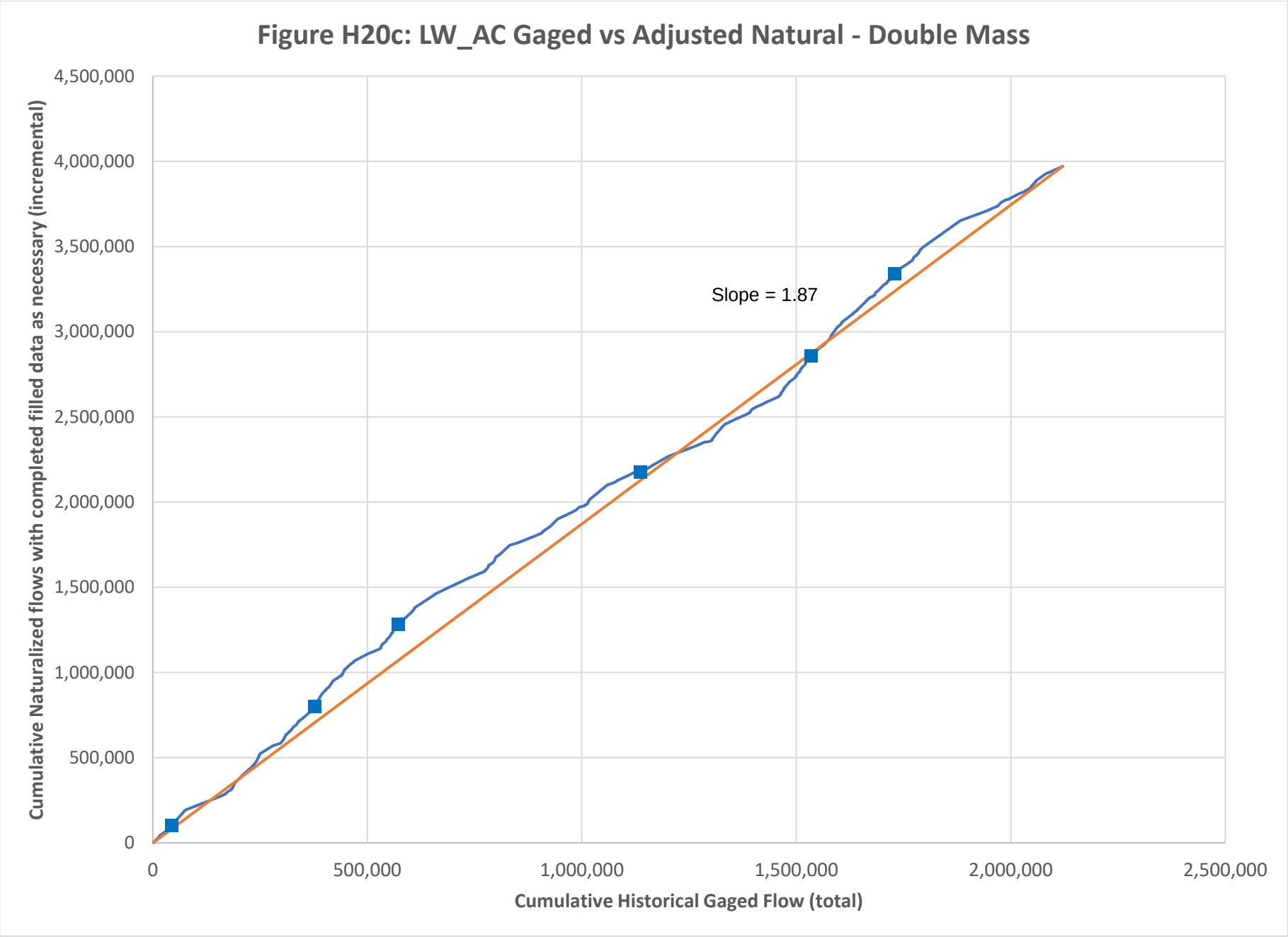


Figure H20c: LW_AC Gaged vs Adjusted Natural - Double Mass
Cumulative Naturalized flows with completed filled data as necessary (incremental)
4,500,000
4,000,000
3,500,000
3,000,000
2,500,000
2,000,000
1,500,000
1,000,000
500,000
0
Slope = 1.87
0
500,000
1,000,000
1,500,000
2,000,000
2,500,000
Cumulative Historical Gaged Flow (total)

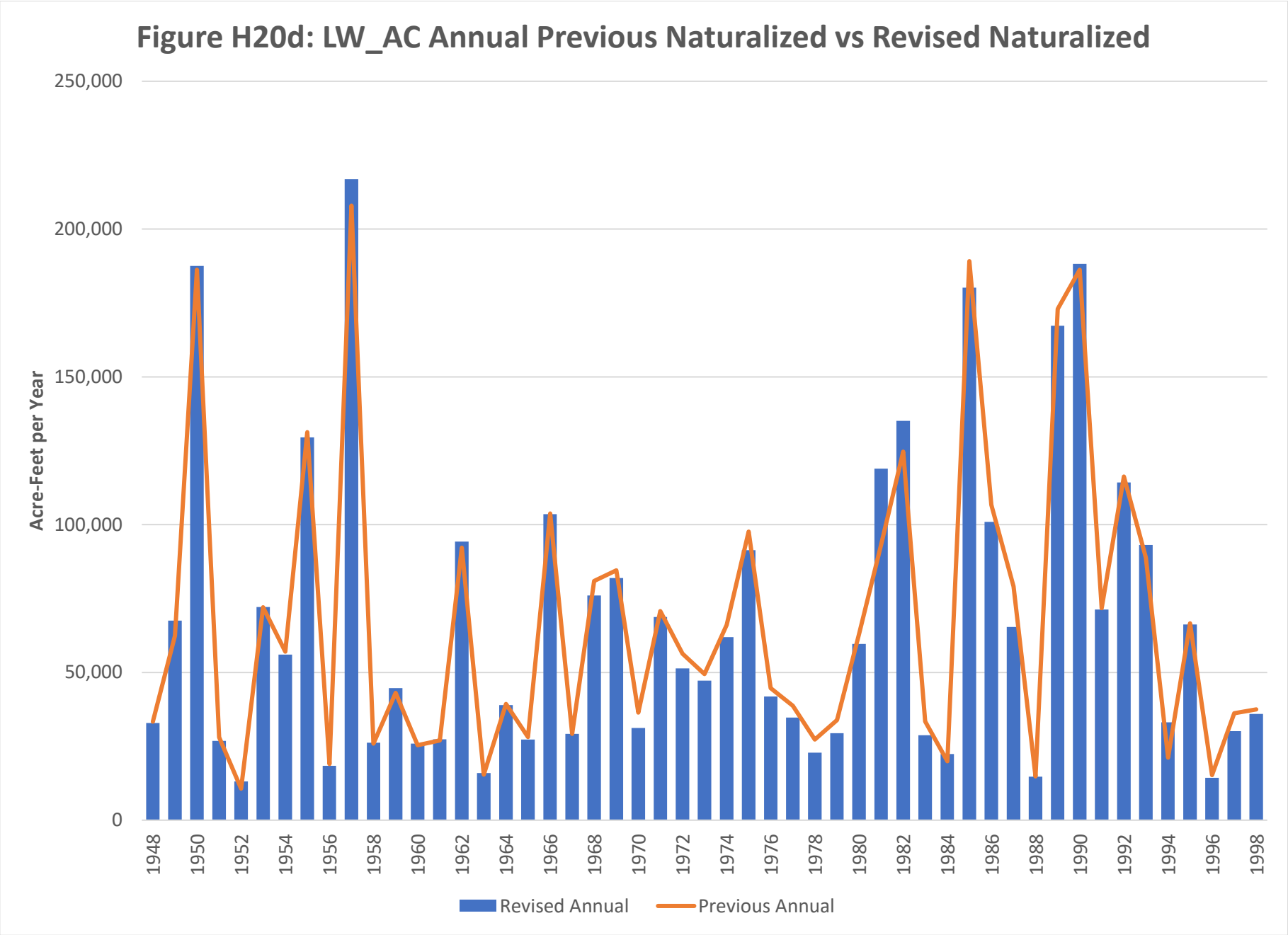


Figure H20d: LW_AC Annual Previous Naturalized vs Revised Naturalized
Acre-Feet per Year
250,000
200,000
150,000
100,000
50,000
0
1948
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
Revised Annual
Previous Annual

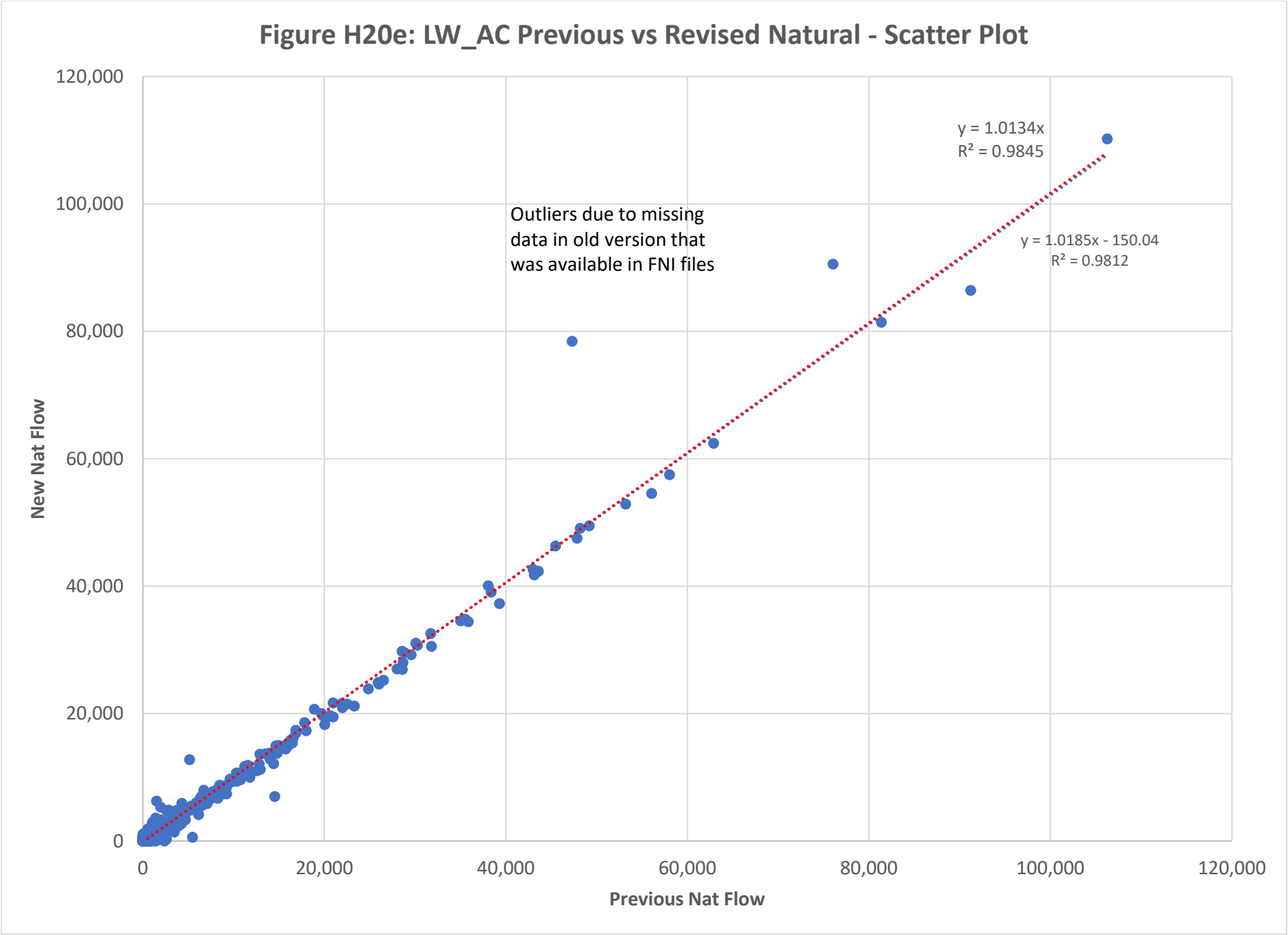


Figure H20e: LW_AC Previous vs Revised Natural - Scatter Plot
y = 1.0134x
R² = 0.9845
y = 1.0185x - 150.04
R² = 0.9812
Outliers due to missing data in old version that was available in FNI files
New Nat Flow
Previous Nat Flow
0
20,000
40,000
60,000
80,000
100,000
120,000

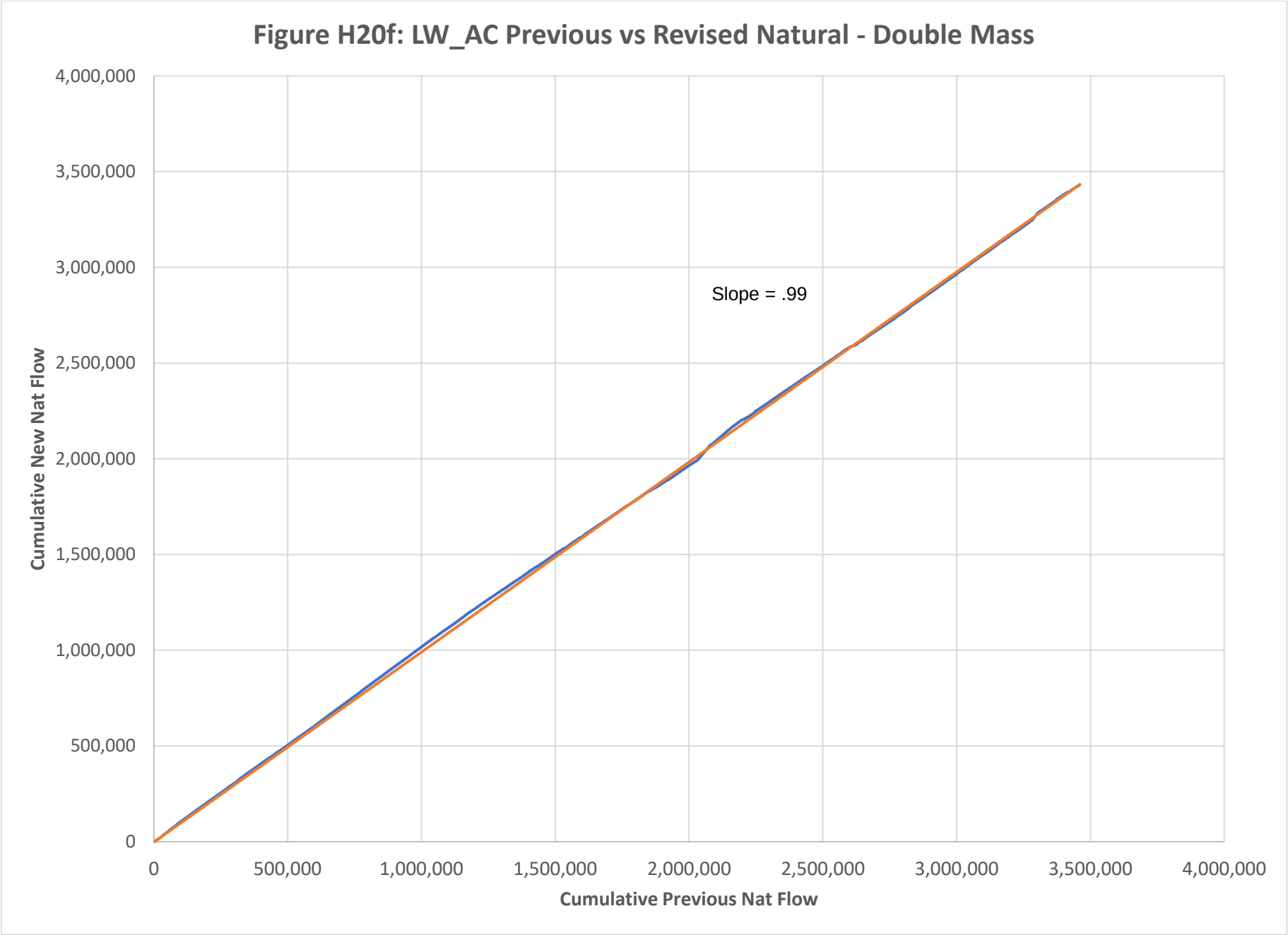


Figure H20f: LW_AC Previous vs Revised Natural - Double Mass
Slope = .99
Cumulative New Nat Flow
Cumulative Previous Nat Flow
0
500,000
1,000,000
1,500,000
2,000,000
2,500,000
3,000,000
3,500,000
4,000,000

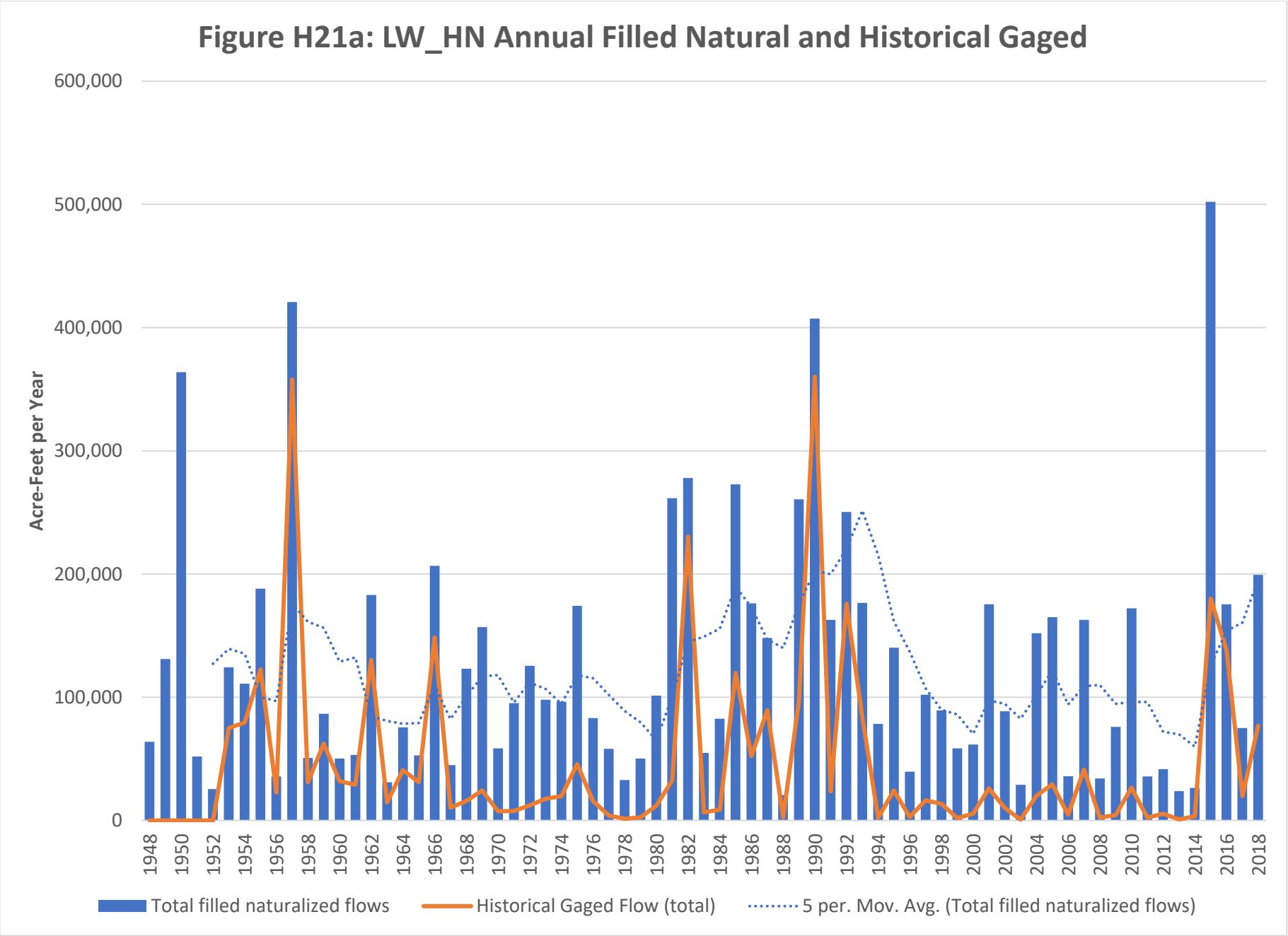


Figure H21a: LW_HN Annual Filled Natural and Historical Gaged
Acre-Feet per Year
600,000
500,000
400,000
300,000
200,000
100,000
0
1948
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
Total filled naturalized flows
Historical Gaged Flow (total)
5 per. Mov. Avg. (Total filled naturalized flows)

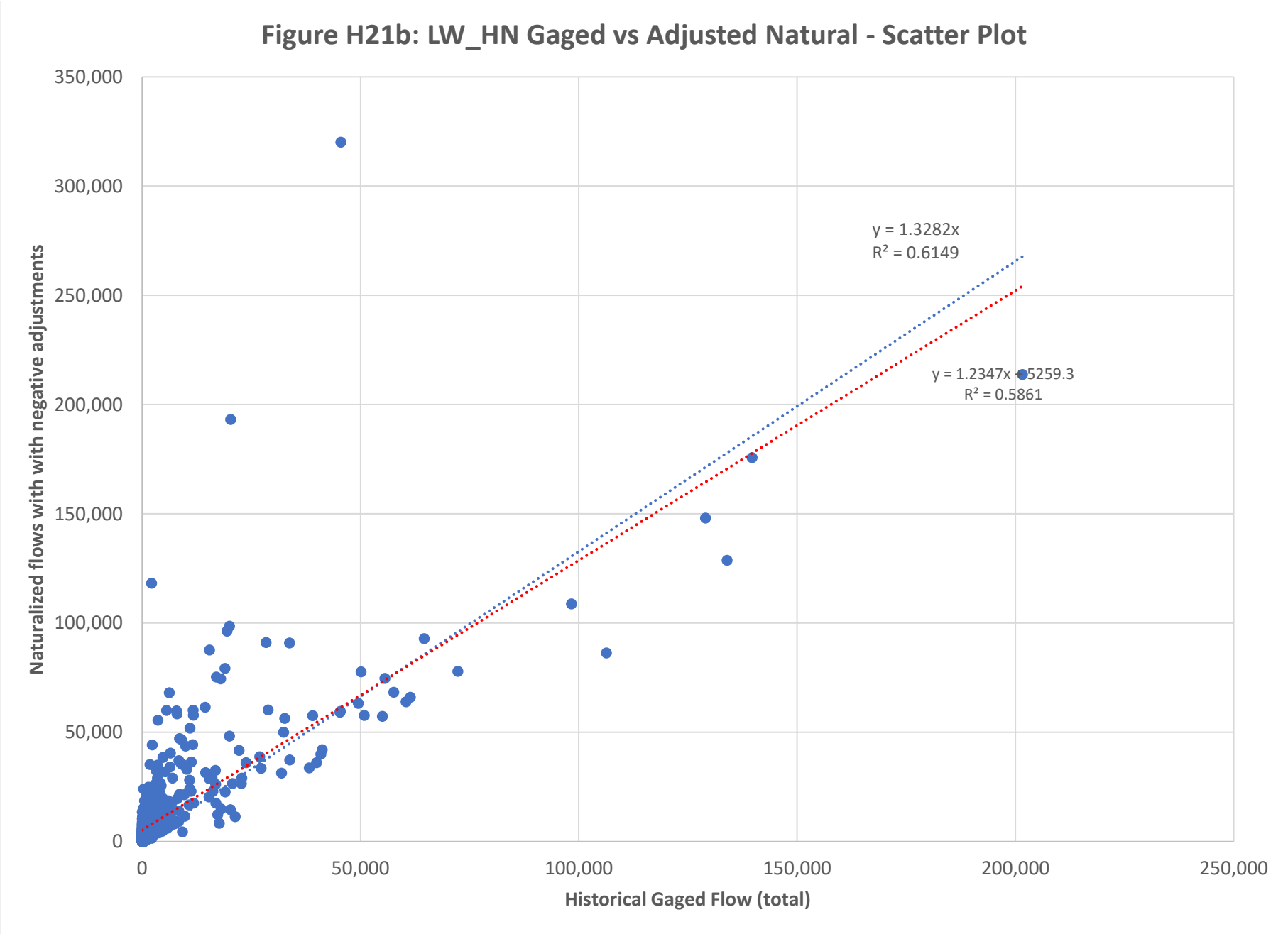


Figure H21b: LW_HN Gaged vs Adjusted Natural - Scatter Plot
Naturalized flows with with negative adjustments
Historical Gaged Flow (total)
350,000
300,000
250,000
200,000
150,000
100,000
50,000
0
0
50,000
100,000
150,000
200,000
250,000
y = 1.3282x
R² = 0.6149
y = 1.2347x - 5259.3
R² = 0.5861

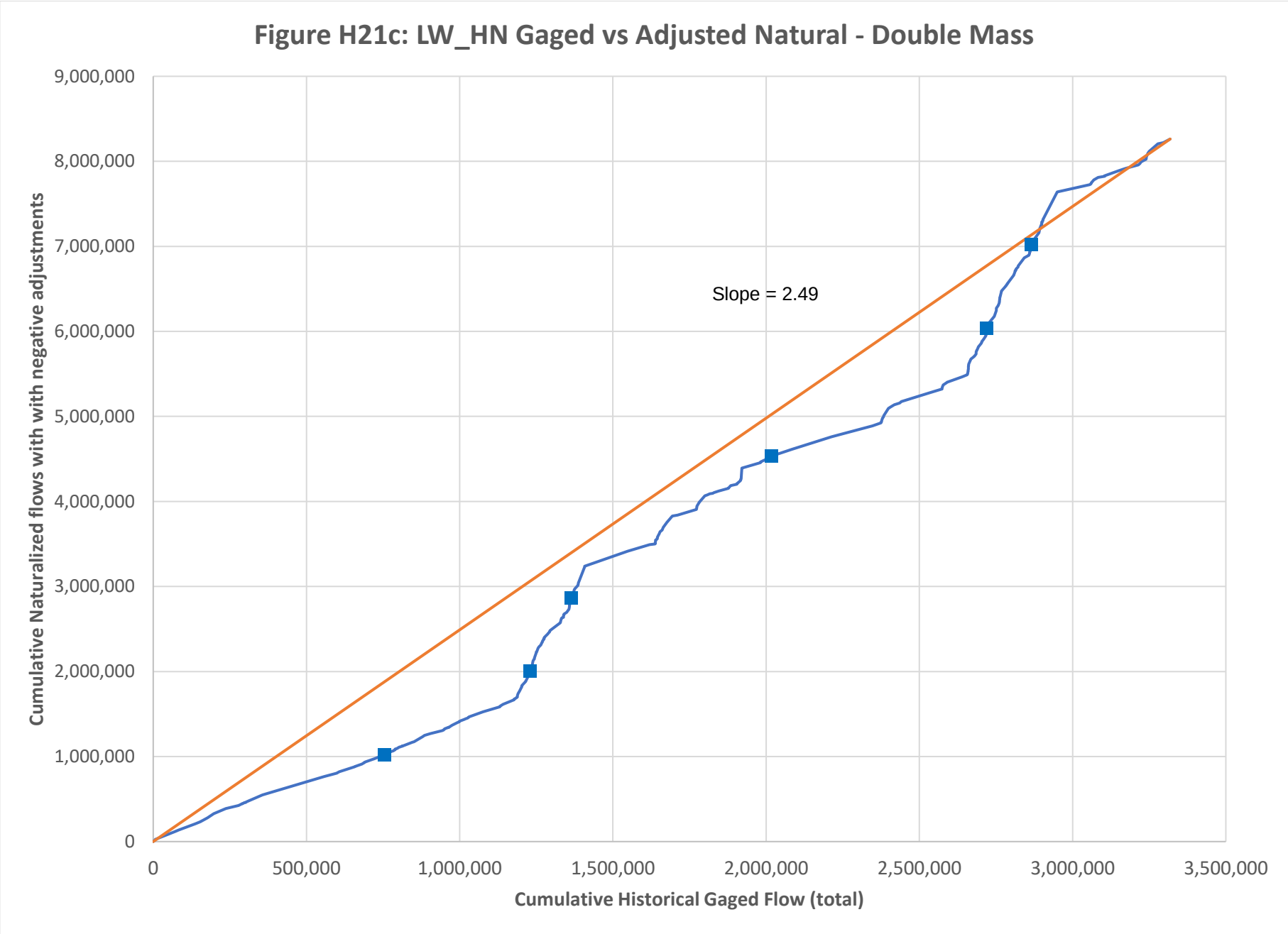


Figure H21c: LW_HN Gaged vs Adjusted Natural - Double Mass
Slope = 2.49
Cumulative Naturalized flows with with negative adjustments
Cumulative Historical Gaged Flow (total)
0
1,000,000
2,000,000
3,000,000
4,000,000
5,000,000
6,000,000
7,000,000
8,000,000
9,000,000
0
500,000
1,000,000
1,500,000
2,000,000
2,500,000
3,000,000
3,500,000

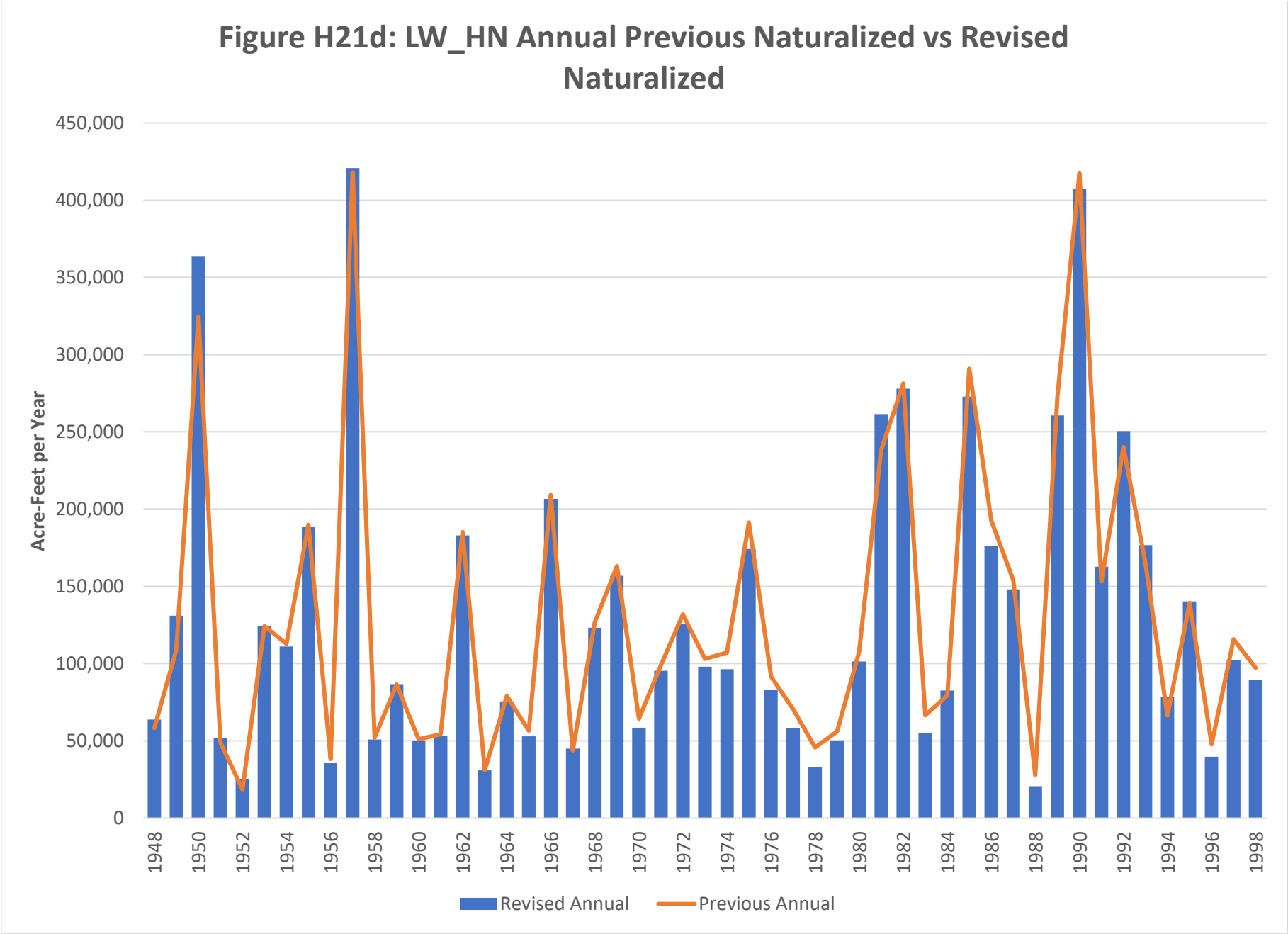


Figure H21d: LW_HN Annual Previous Naturalized vs Revised Naturalized
Acre-Feet per Year
450,000
400,000
350,000
300,000
250,000
200,000
150,000
100,000
50,000
0
1948
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
Revised Annual
Previous Annual

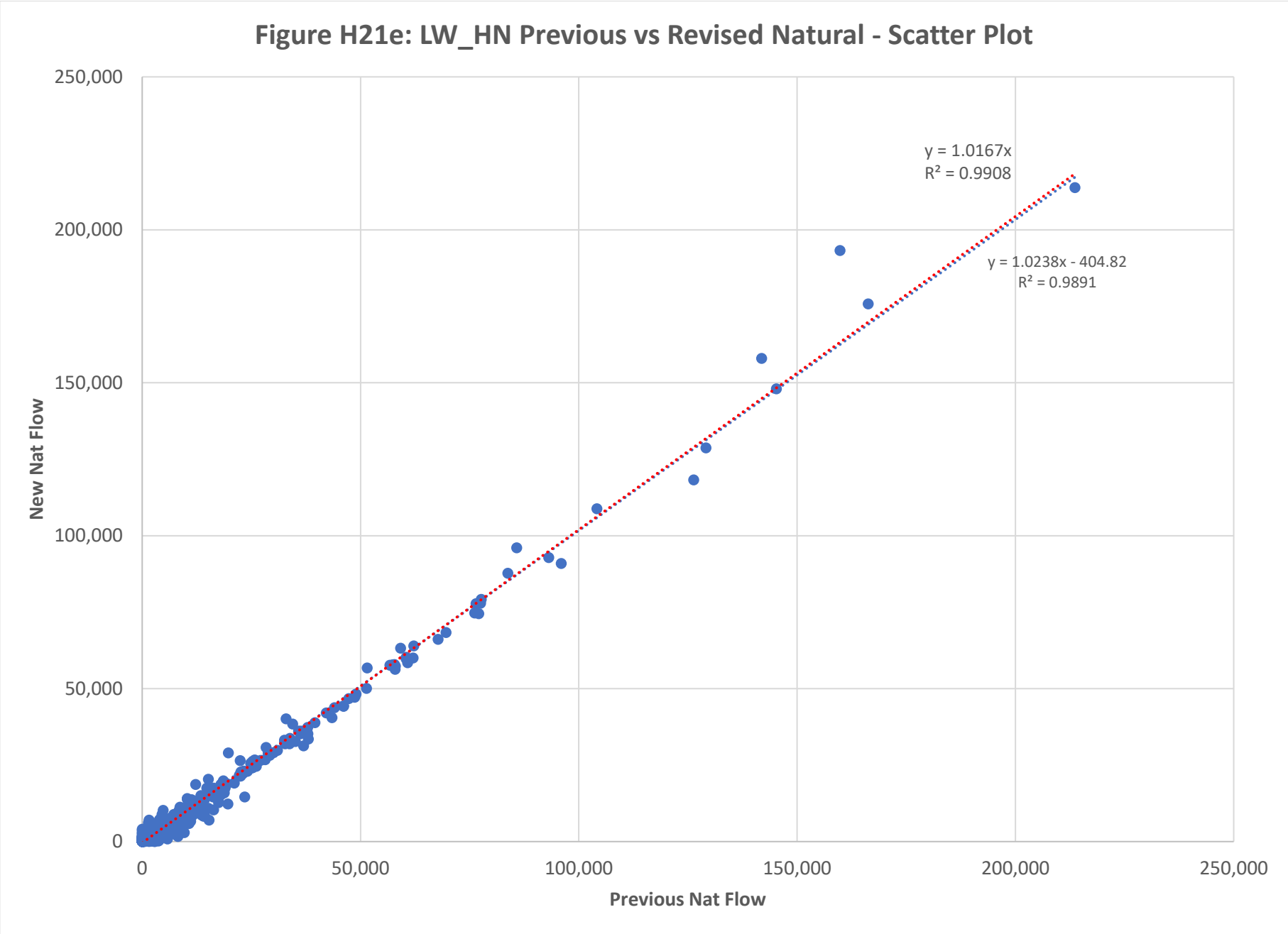


Figure H21e: LW_HN Previous vs Revised Natural - Scatter Plot
y = 1.0167x
R² = 0.9908
y = 1.0238x - 404.82
R² = 0.9891
New Nat Flow
Previous Nat Flow
0
50,000
100,000
150,000
200,000
250,000

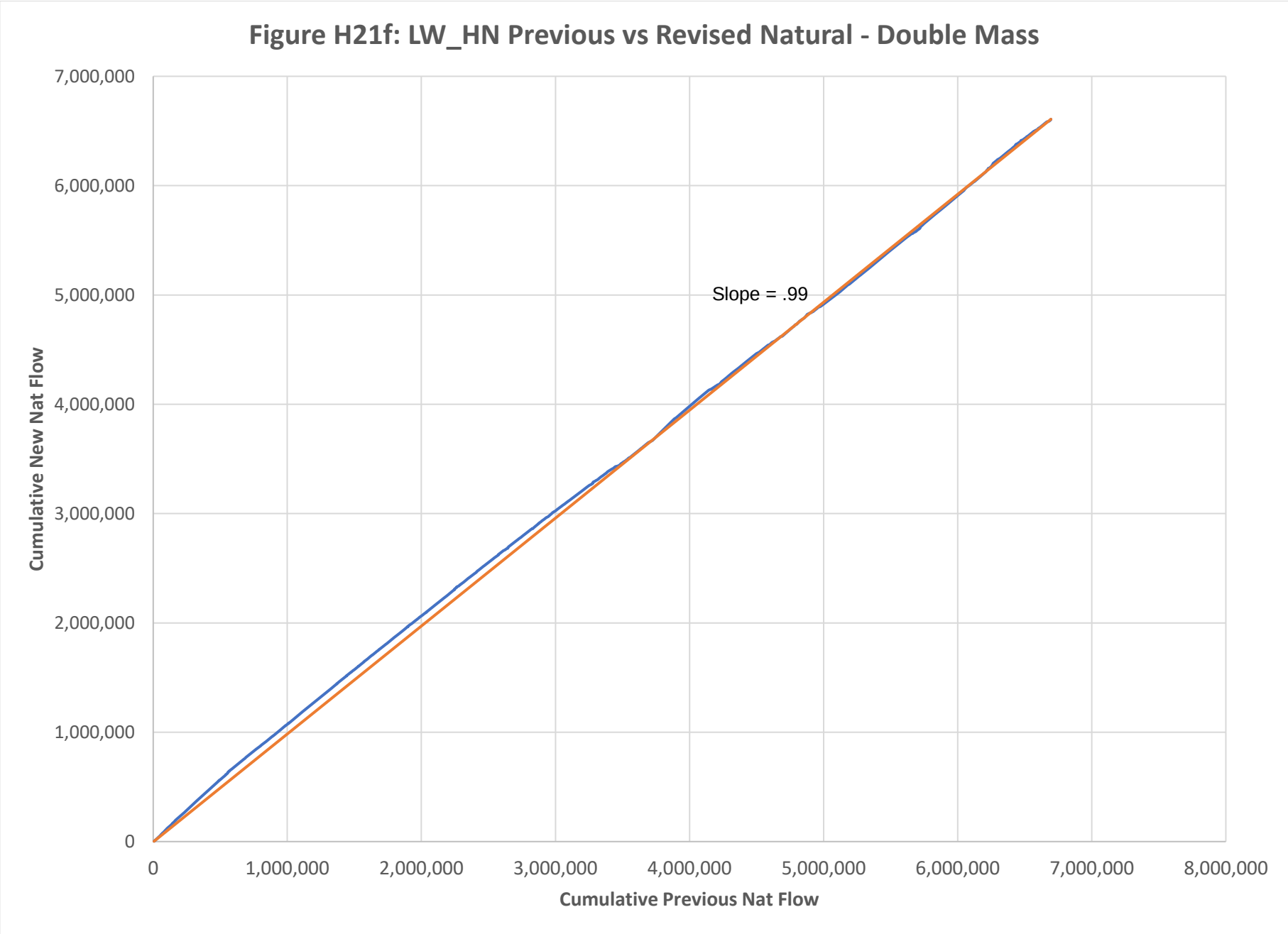


Figure H21f: LW_HN Previous vs Revised Natural - Double Mass
7,000,000
6,000,000
5,000,000
4,000,000
3,000,000
2,000,000
1,000,000
0
Cumulative New Nat Flow
Slope = .99
0
1,000,000
2,000,000
3,000,000
4,000,000
5,000,000
6,000,000
7,000,000
8,000,000
Cumulative Previous Nat Flow

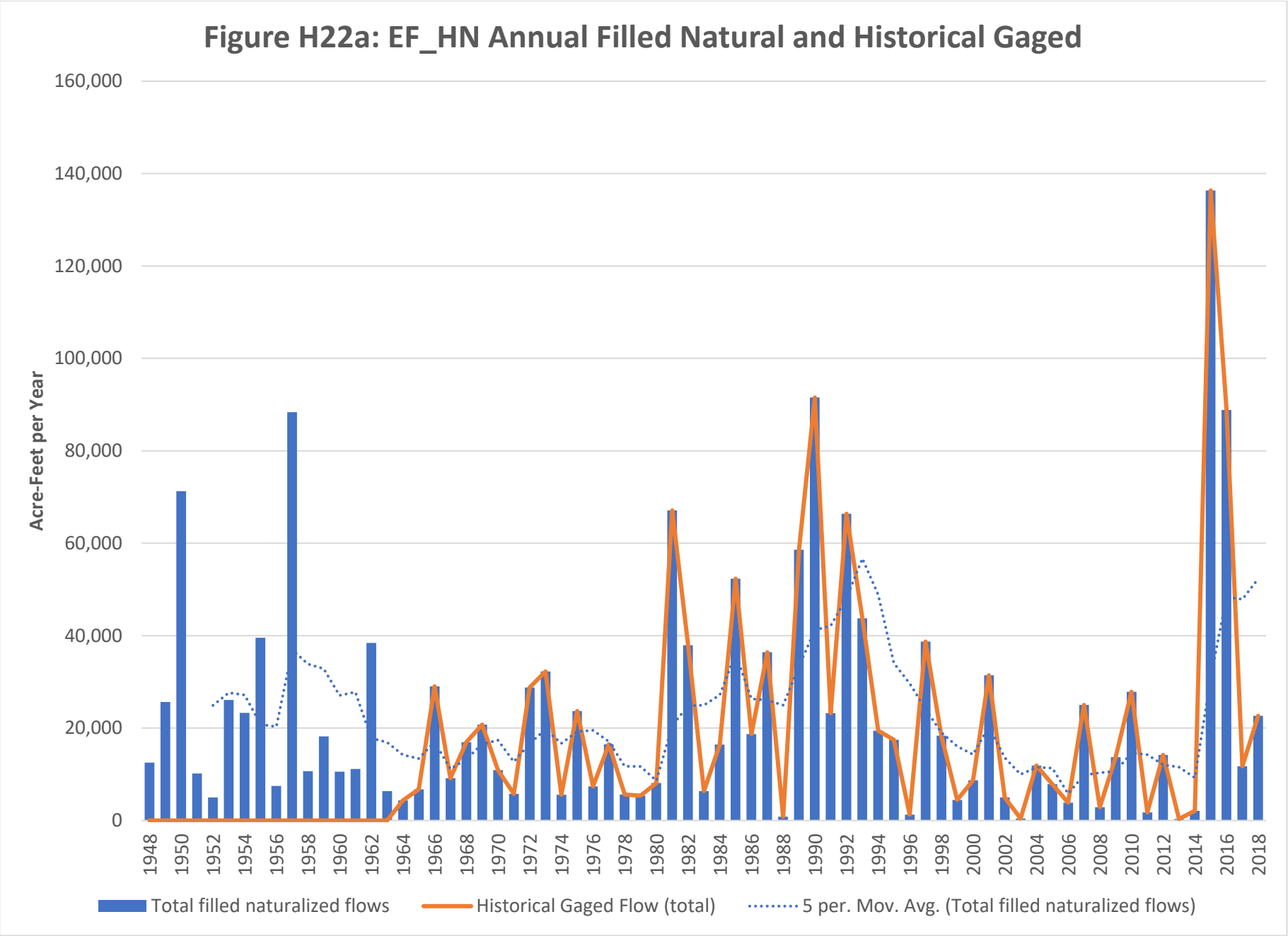


Figure H22a: EF_HN Annual Filled Natural and Historical Gaged
Acre-Feet per Year
160,000
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
1948
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
Total filled naturalized flows
Historical Gaged Flow (total)
5 per. Mov. Avg. (Total filled naturalized flows)

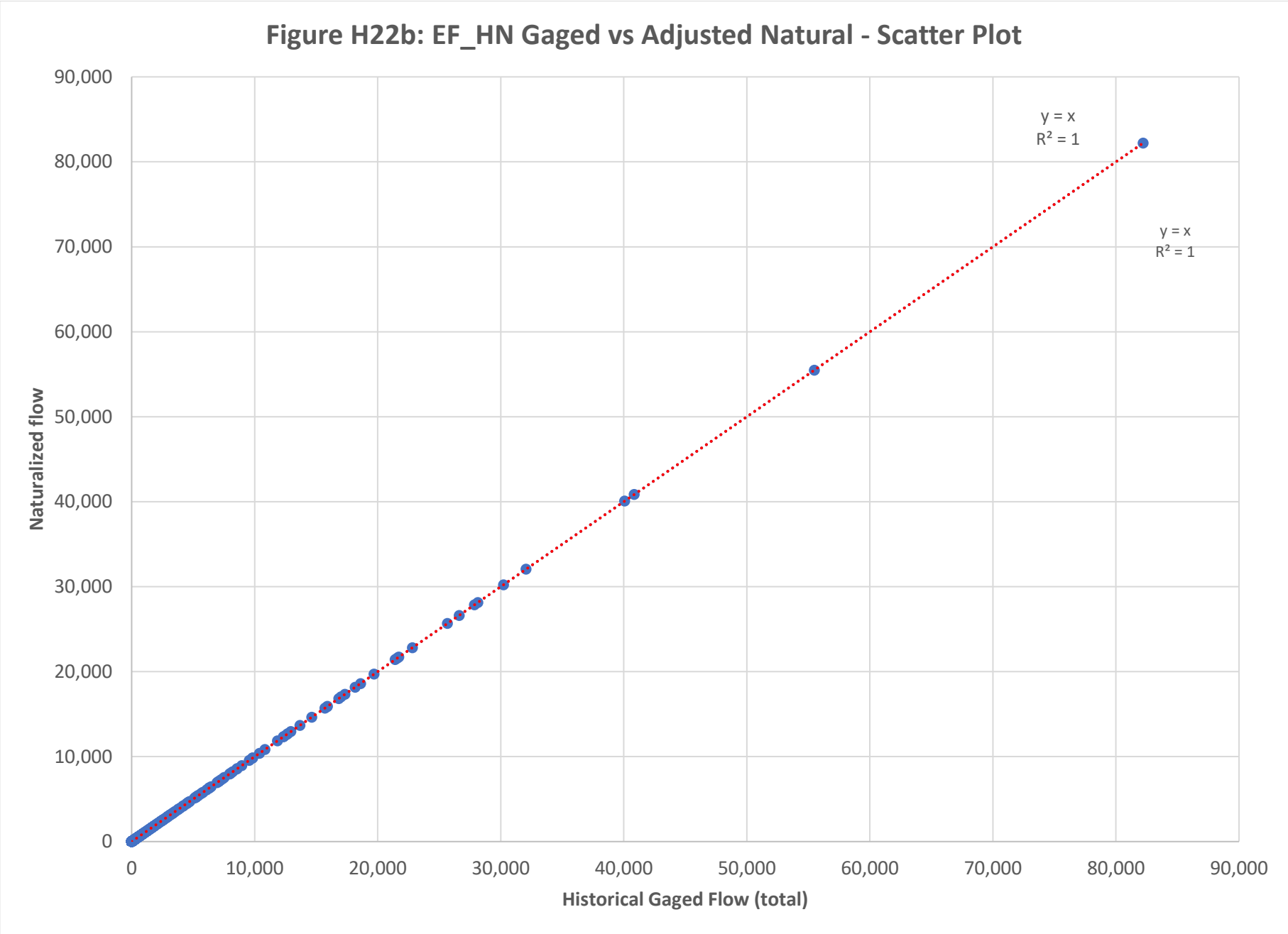


Figure H22b: EF_HN Gaged vs Adjusted Natural - Scatter Plot
y = x
R² = 1
y = x
R² = 1
Naturalized flow
Historical Gaged Flow (total)
0
10,000
20,000
30,000
40,000
50,000
60,000
70,000
80,000
90,000

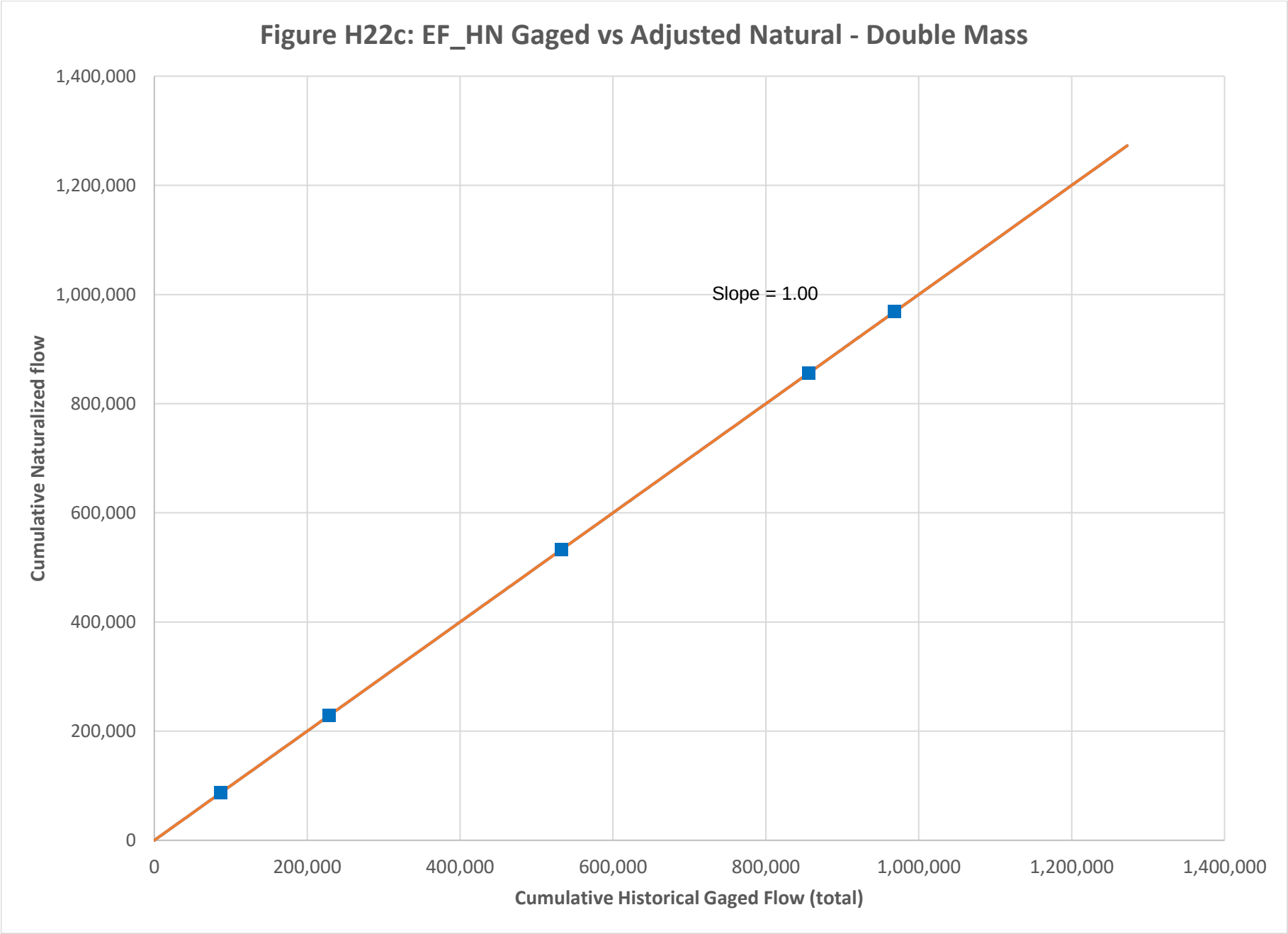


Figure H22c: EF_HN Gaged vs Adjusted Natural - Double Mass
Slope = 1.00
Cumulative Naturalized flow
Cumulative Historical Gaged Flow (total)
0
200,000
400,000
600,000
800,000
1,000,000
1,200,000
1,400,000

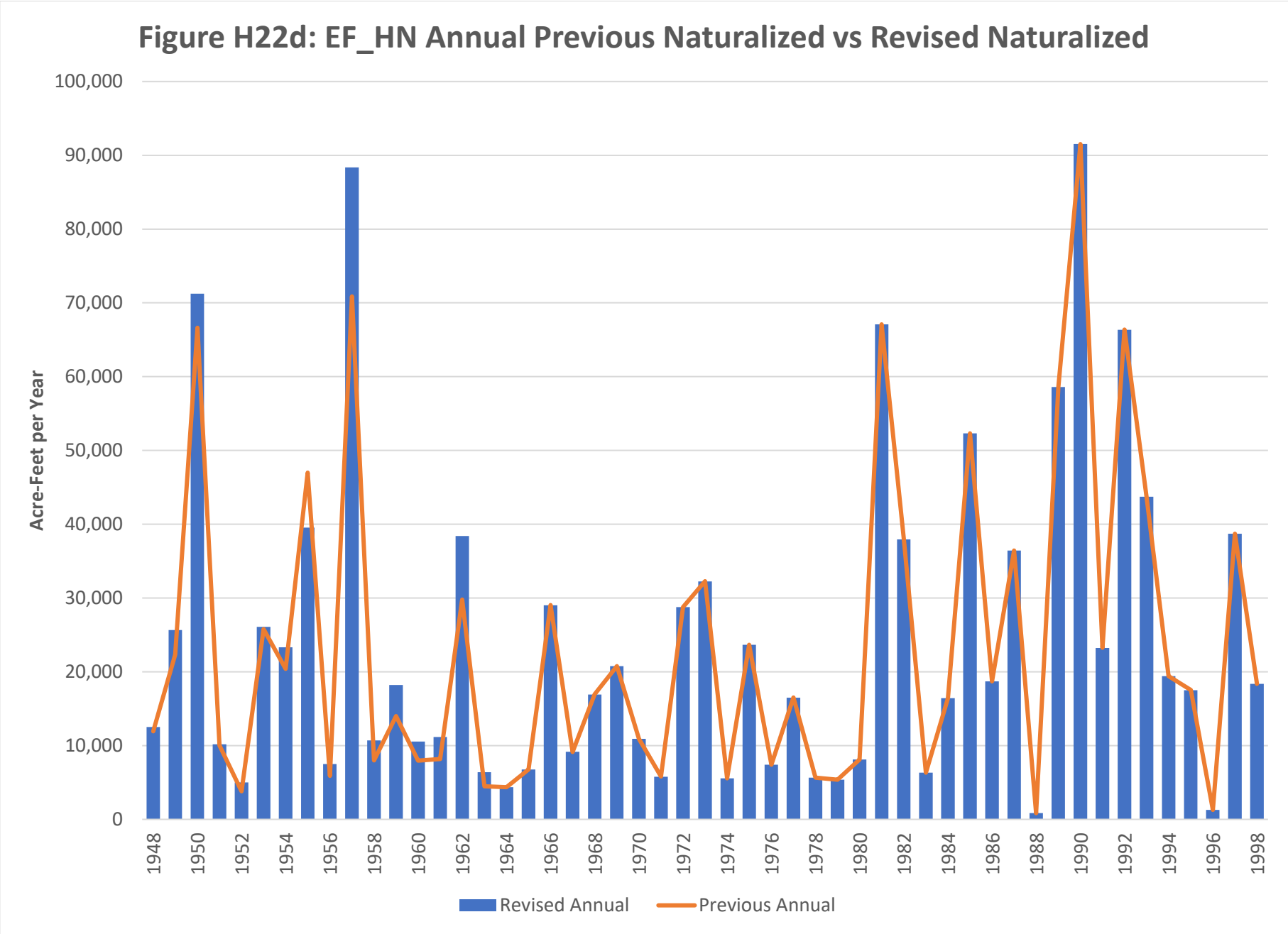


Figure H22d: EF_HN Annual Previous Naturalized vs Revised Naturalized
Acre-Feet per Year
100,000
90,000
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
1948
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
Revised Annual
Previous Annual

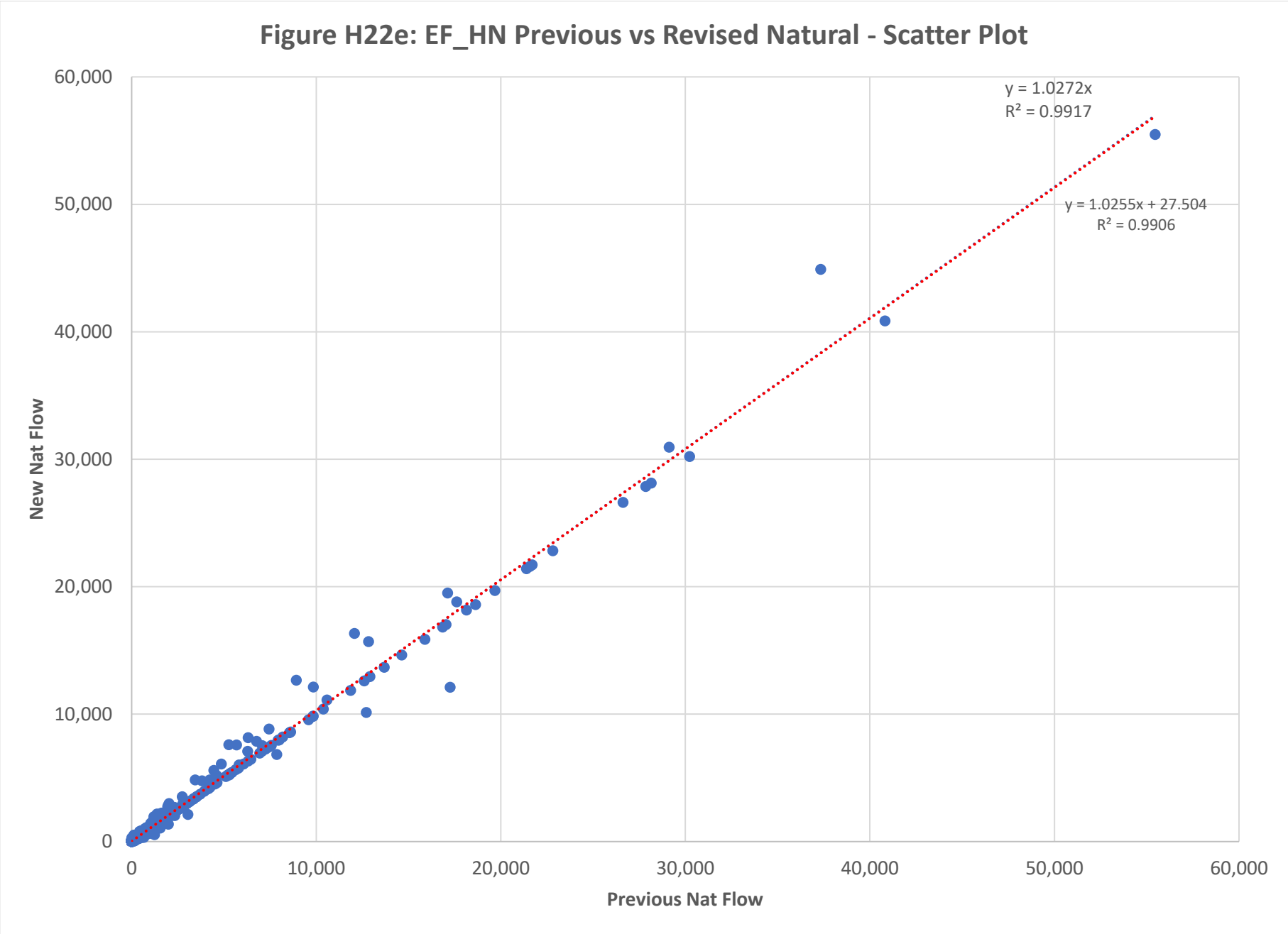


Figure H22e: EF_HN Previous vs Revised Natural - Scatter Plot
y = 1.0272x
R² = 0.9917
y = 1.0255x + 27.504
R² = 0.9906
New Nat Flow
Previous Nat Flow
0
10,000
20,000
30,000
40,000
50,000
60,000

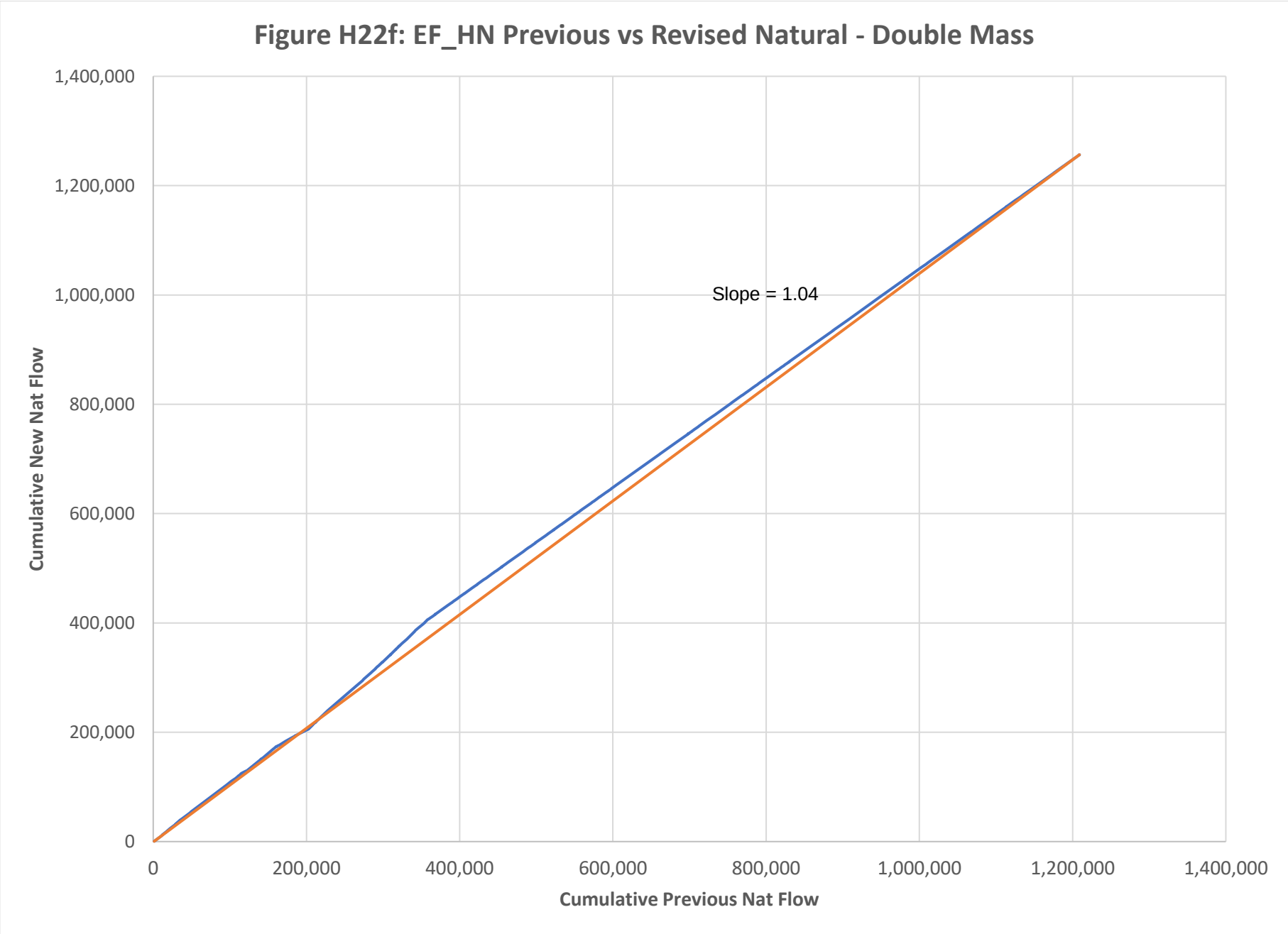


Figure H22f: EF_HN Previous vs Revised Natural - Double Mass
1,400,000
1,200,000
1,000,000
800,000
600,000
400,000
200,000
0
Cumulative New Nat Flow
Slope = 1.04
0
200,000
400,000
600,000
800,000
1,000,000
1,200,000
1,400,000
Cumulative Previous Nat Flow

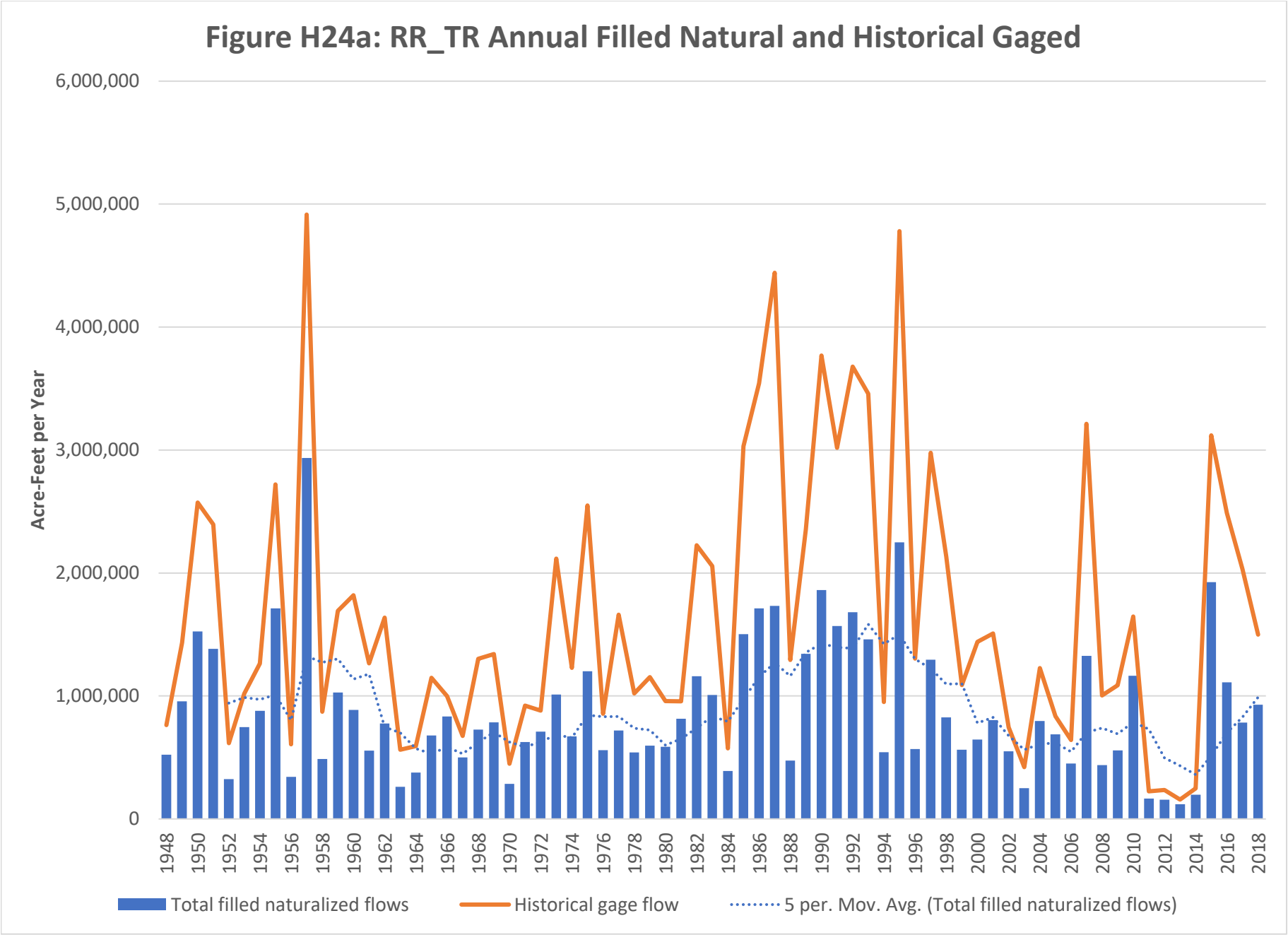


Figure H24a: RR_TR Annual Filled Natural and Historical Gaged
Acre-Feet per Year
6,000,000
5,000,000
4,000,000
3,000,000
2,000,000
1,000,000
0
1948
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
Total filled naturalized flows
Historical gage flow
5 per. Mov. Avg. (Total filled naturalized flows)

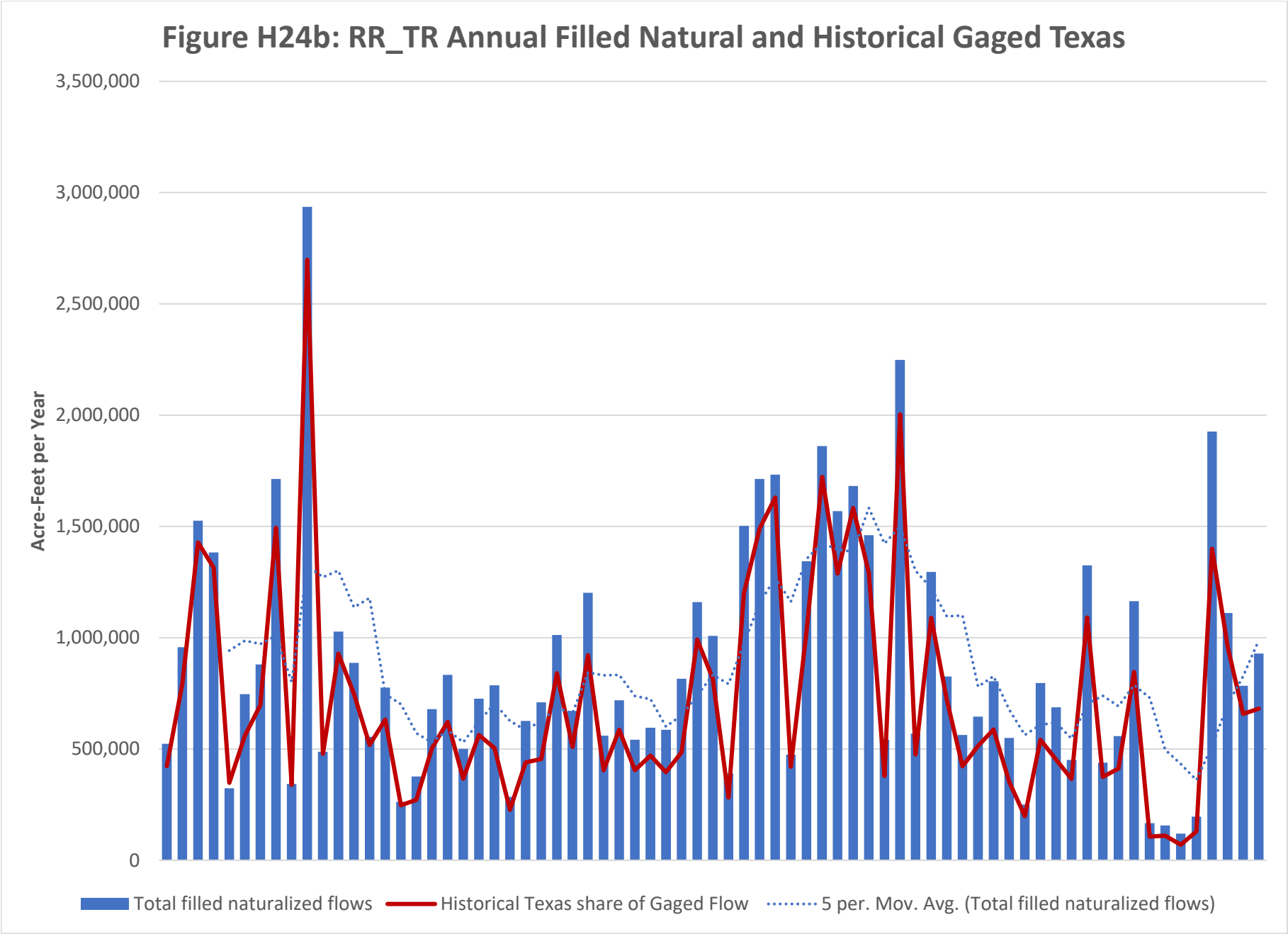


Figure H24b: RR_TR Annual Filled Natural and Historical Gaged Texas
3,500,000
3,000,000
2,500,000
2,000,000
1,500,000
1,000,000
500,000
0
Acre-Feet per Year
Total filled naturalized flows
Historical Texas share of Gaged Flow
5 per. Mov. Avg. (Total filled naturalized flows)

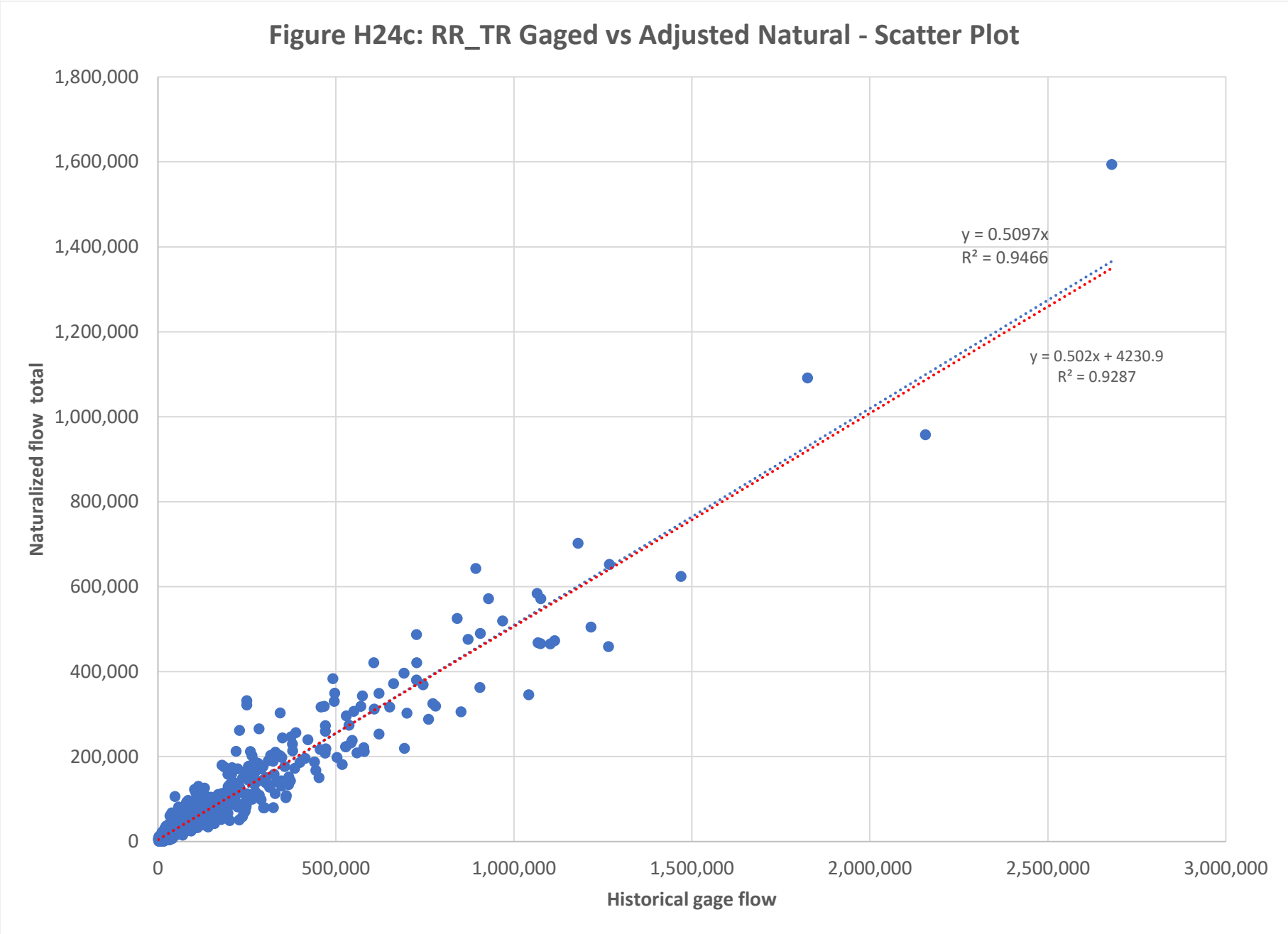


Figure H24c: RR_TR Gaged vs Adjusted Natural - Scatter Plot
1,800,000
1,600,000
1,400,000
1,200,000
1,000,000
800,000
600,000
400,000
200,000
0
Naturalized flow total
0
500,000
1,000,000
1,500,000
2,000,000
2,500,000
3,000,000
Historical gage flow
y = 0.5097x
R² = 0.9466
y = 0.502x + 4230.9
R² = 0.9287

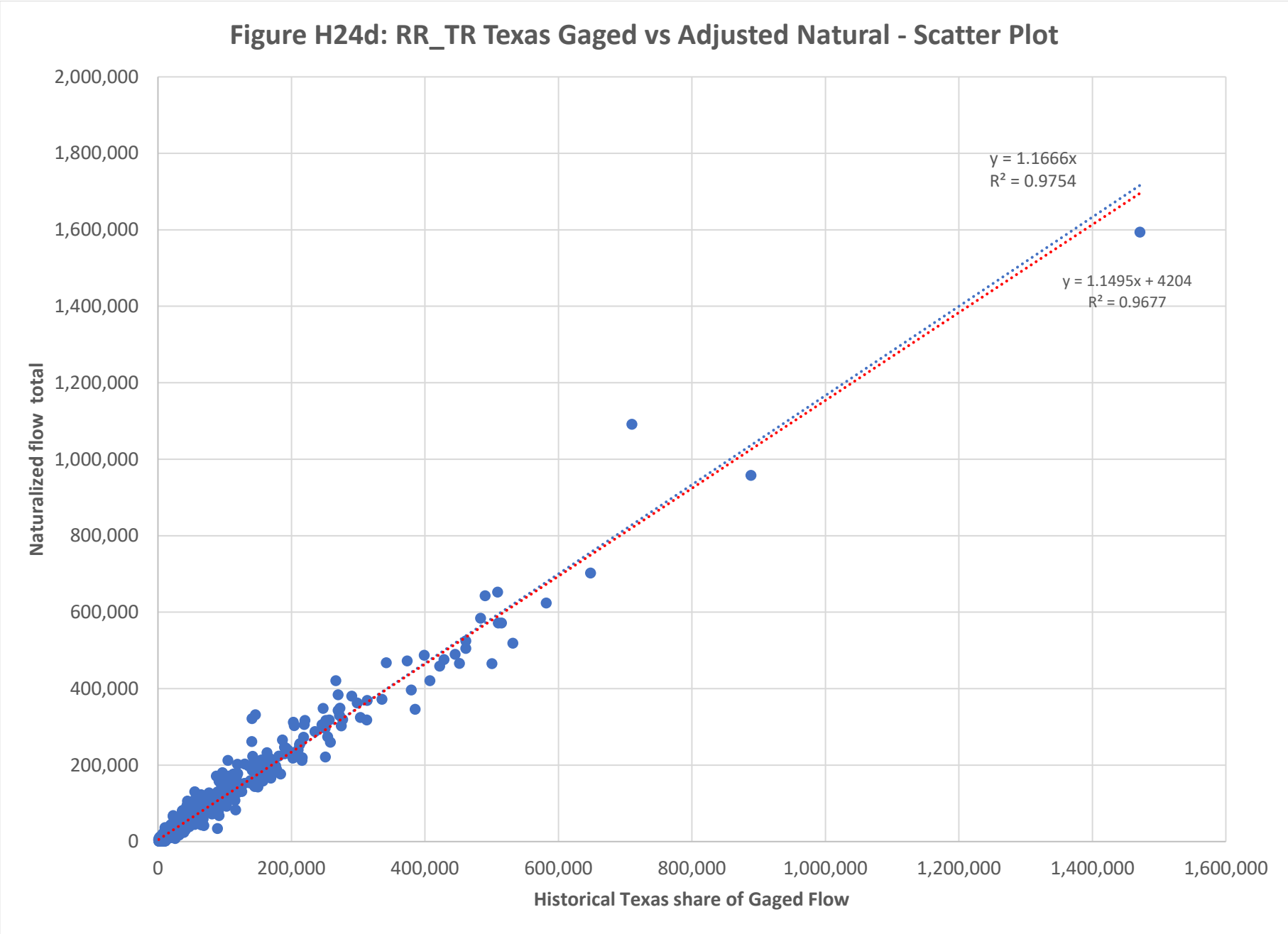


Figure H24d: RR_TR Texas Gaged vs Adjusted Natural - Scatter Plot
y = 1.1666x
R² = 0.9754
y = 1.1495x + 4204
R² = 0.9677
Naturalized flow total
Historical Texas share of Gaged Flow
0
200,000
400,000
600,000
800,000
1,000,000
1,200,000
1,400,000
1,600,000
1,800,000
2,000,000

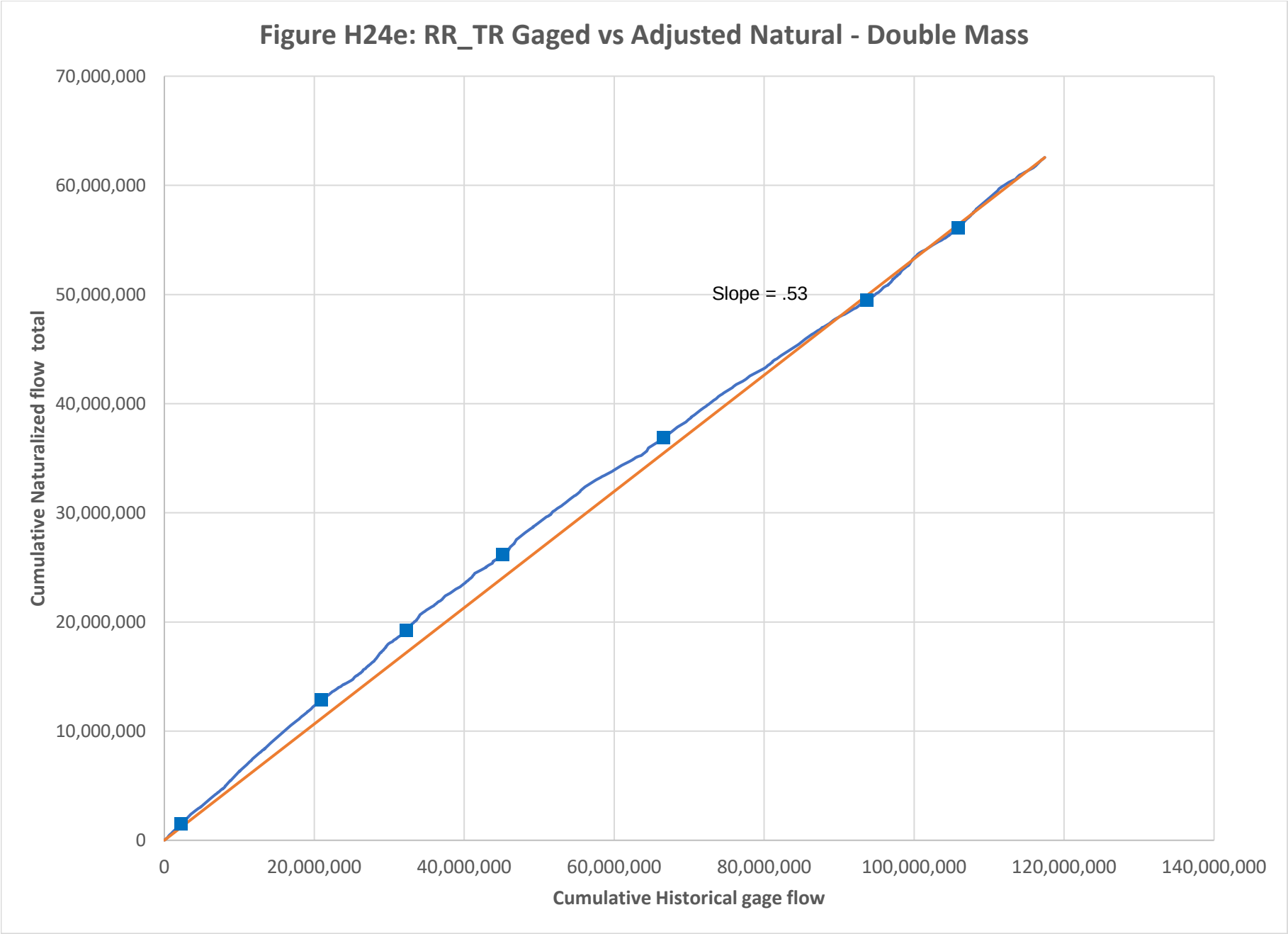


Figure H24e: RR_TR Gaged vs Adjusted Natural - Double Mass
Slope = .53
Cumulative Naturalized flow total
Cumulative Historical gage flow
70,000,000
60,000,000
50,000,000
40,000,000
30,000,000
20,000,000
10,000,000
0
0
20,000,000
40,000,000
60,000,000
80,000,000
100,000,000
120,000,000
140,000,000

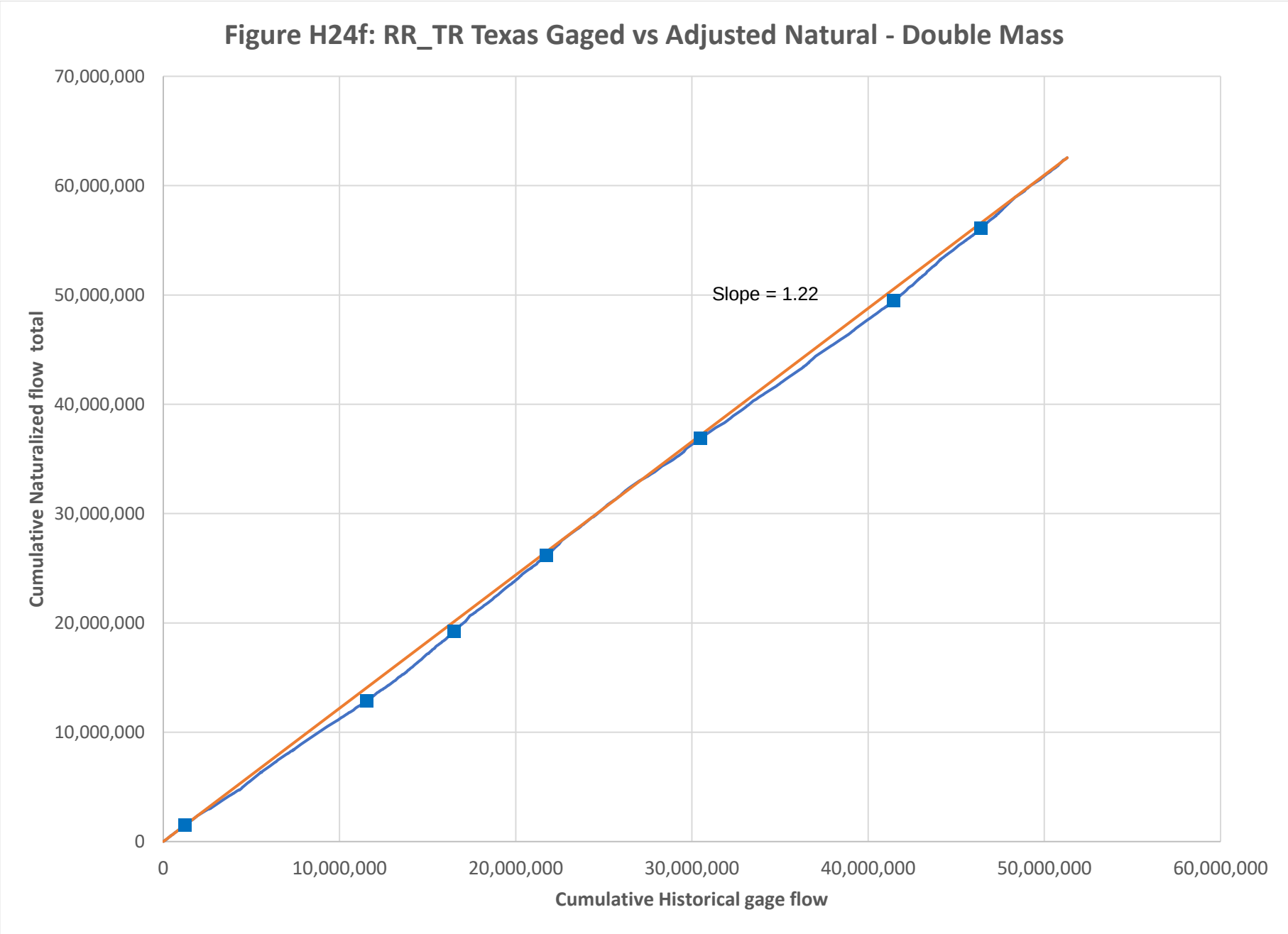


Figure H24f: RR_TR Texas Gaged vs Adjusted Natural - Double Mass
70,000,000
60,000,000
50,000,000
40,000,000
30,000,000
20,000,000
10,000,000
0
Cumulative Naturalized flow total
Slope = 1.22
0
10,000,000
20,000,000
30,000,000
40,000,000
50,000,000
60,000,000
Cumulative Historical gage flow

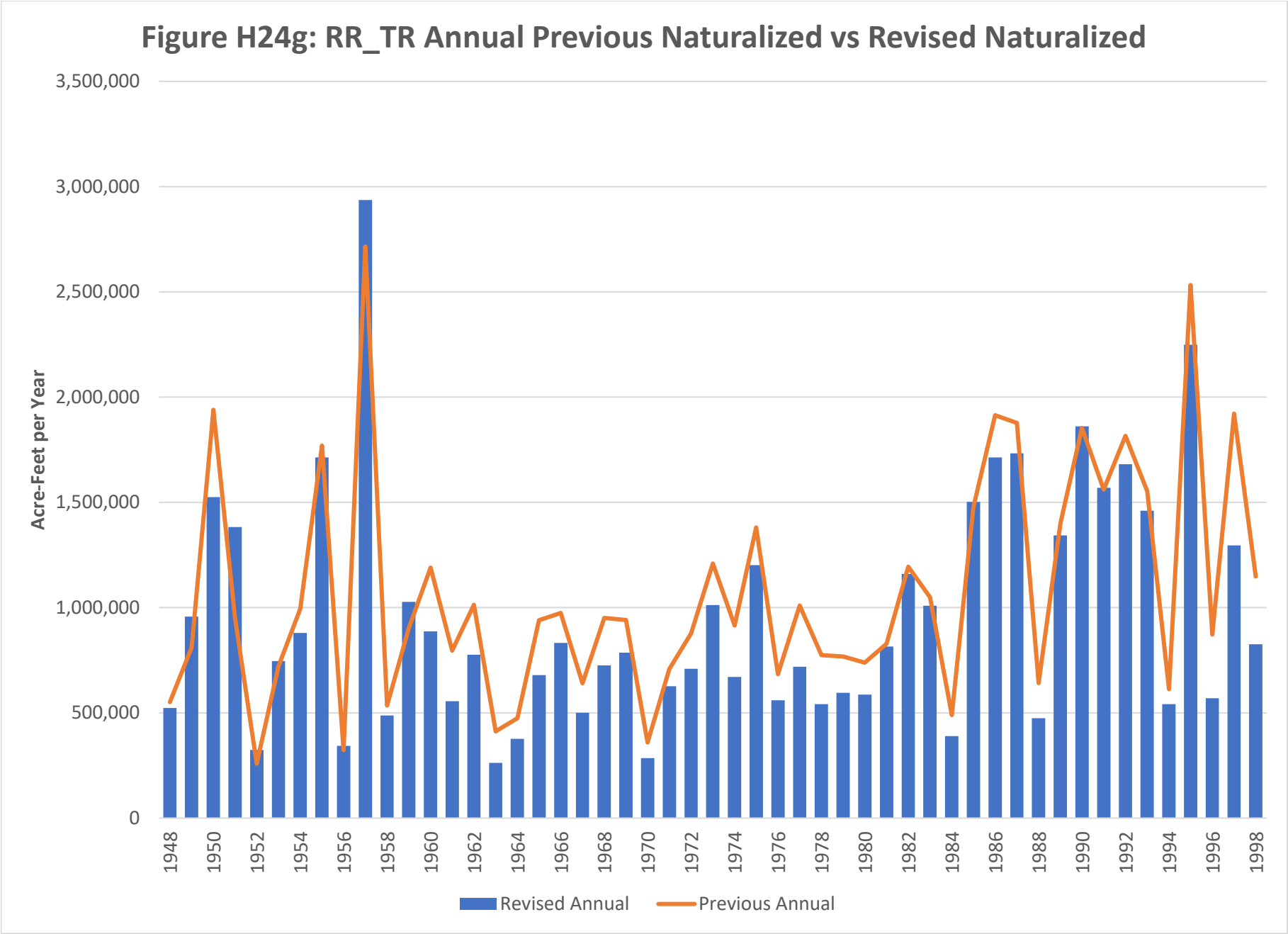


Figure H24g: RR_TR Annual Previous Naturalized vs Revised Naturalized
Acre-Feet per Year
3,500,000
3,000,000
2,500,000
2,000,000
1,500,000
1,000,000
500,000
0
1948
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
Revised Annual
Previous Annual

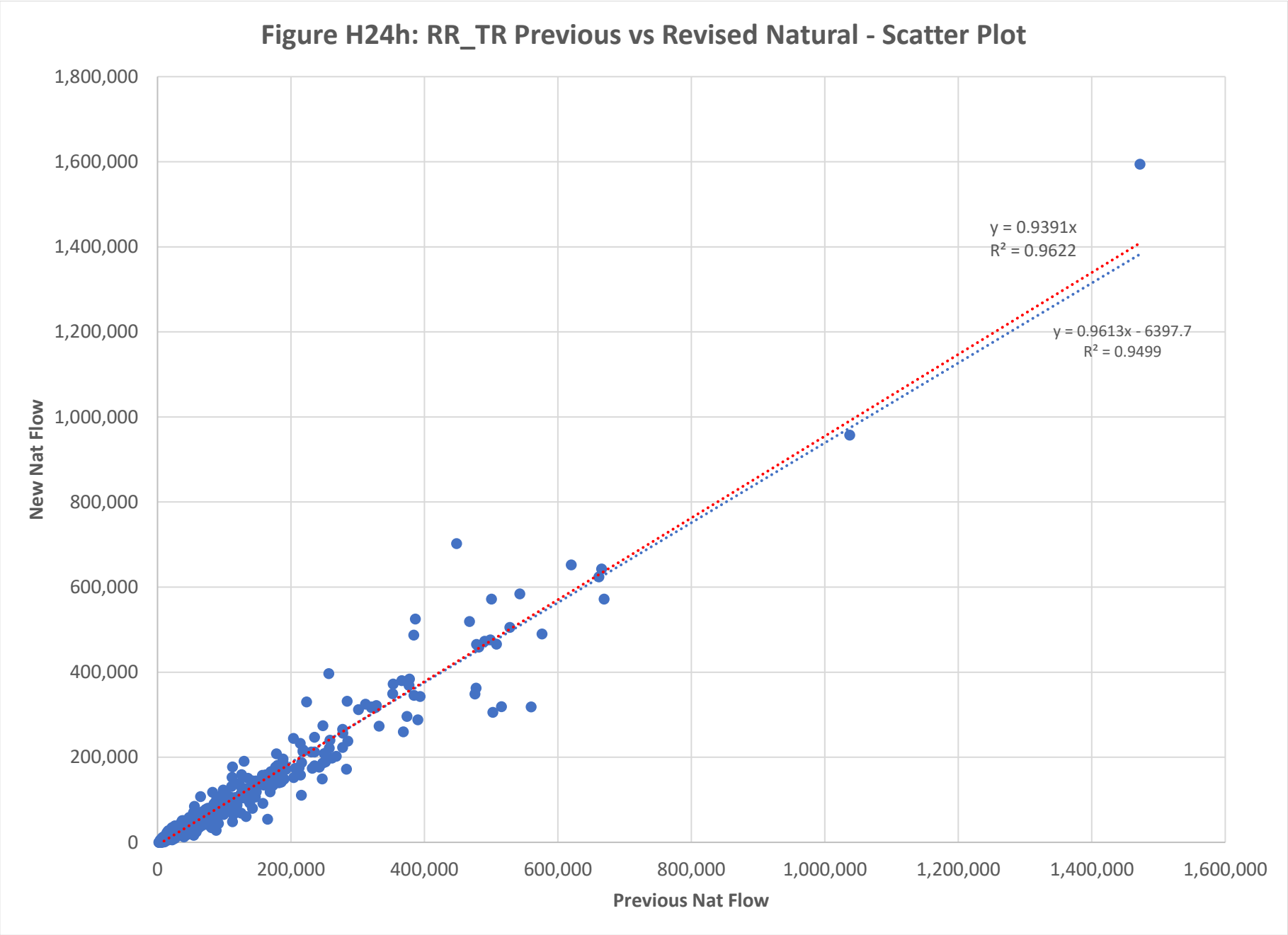


Figure H24h: RR_TR Previous vs Revised Natural - Scatter Plot
1,800,000
1,600,000
1,400,000
1,200,000
1,000,000
800,000
600,000
400,000
200,000
0
New Nat Flow
0
200,000
400,000
600,000
800,000
1,000,000
1,200,000
1,400,000
1,600,000
Previous Nat Flow
y = 0.9391x
R² = 0.9622
y = 0.9613x - 6397.7
R² = 0.9499

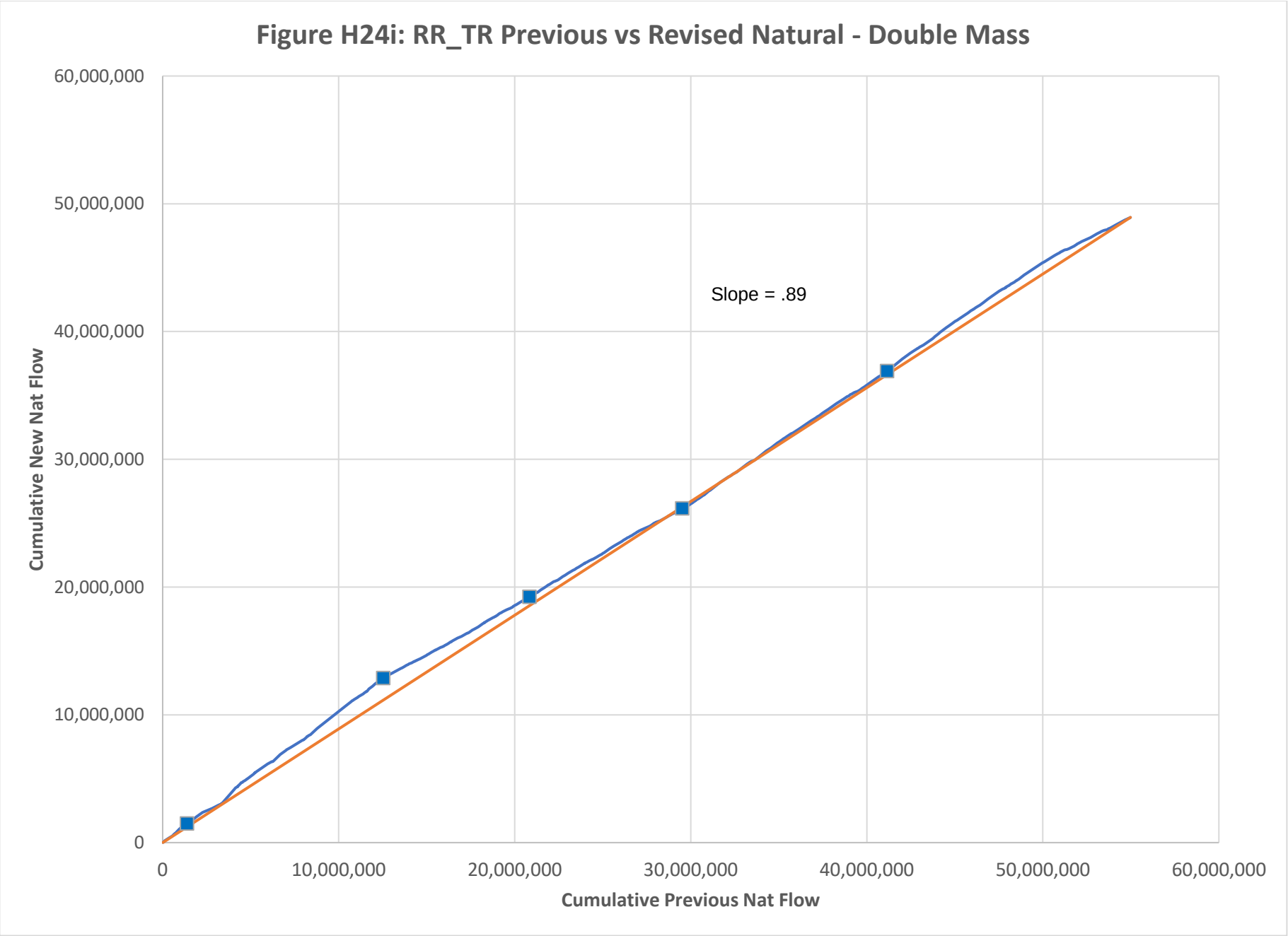


Figure H24i: RR_TR Previous vs Revised Natural - Double Mass
Slope = .89
Cumulative New Nat Flow
Cumulative Previous Nat Flow
0
10,000,000
20,000,000
30,000,000
40,000,000
50,000,000
60,000,000

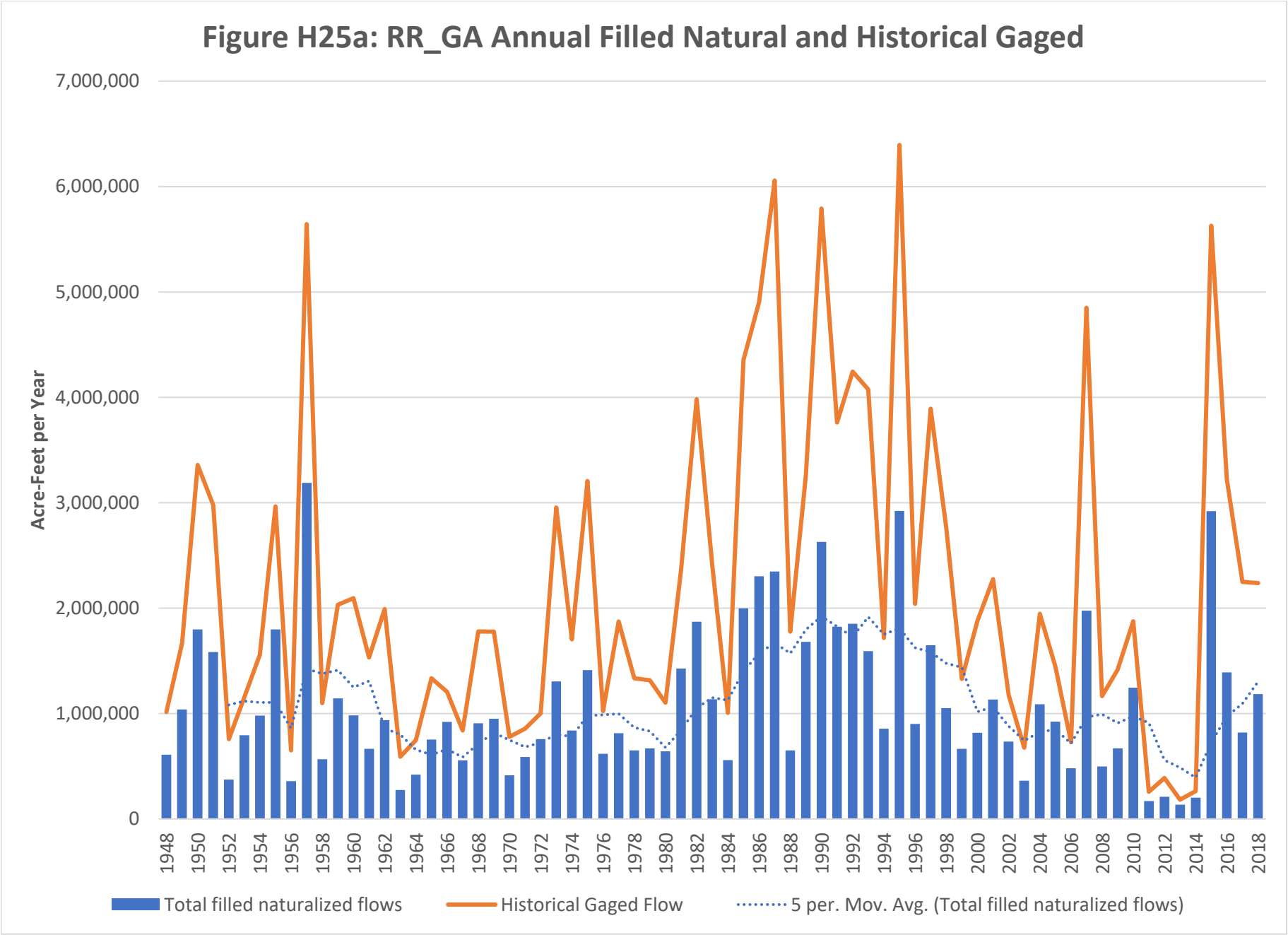


Figure H25a: RR_GA Annual Filled Natural and Historical Gaged
Acre-Feet per Year
7,000,000
6,000,000
5,000,000
4,000,000
3,000,000
2,000,000
1,000,000
0
1948
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
Total filled naturalized flows
Historical Gaged Flow
5 per. Mov. Avg. (Total filled naturalized flows)

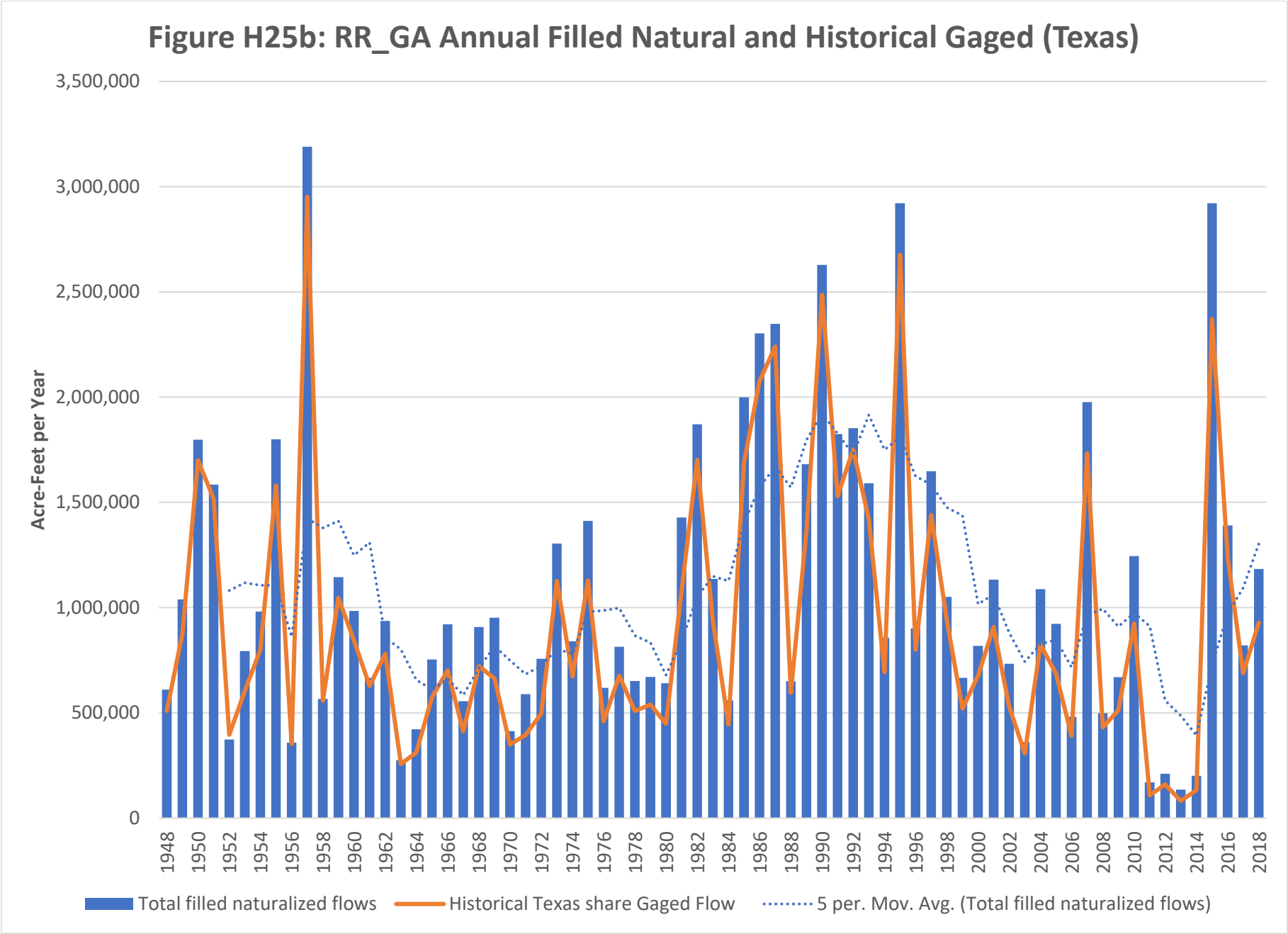


Figure H25b: RR_GA Annual Filled Natural and Historical Gaged (Texas)
Acre-Feet per Year
3,500,000
3,000,000
2,500,000
2,000,000
1,500,000
1,000,000
500,000
0
1948
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
Total filled naturalized flows
Historical Texas share Gaged Flow
5 per. Mov. Avg. (Total filled naturalized flows)

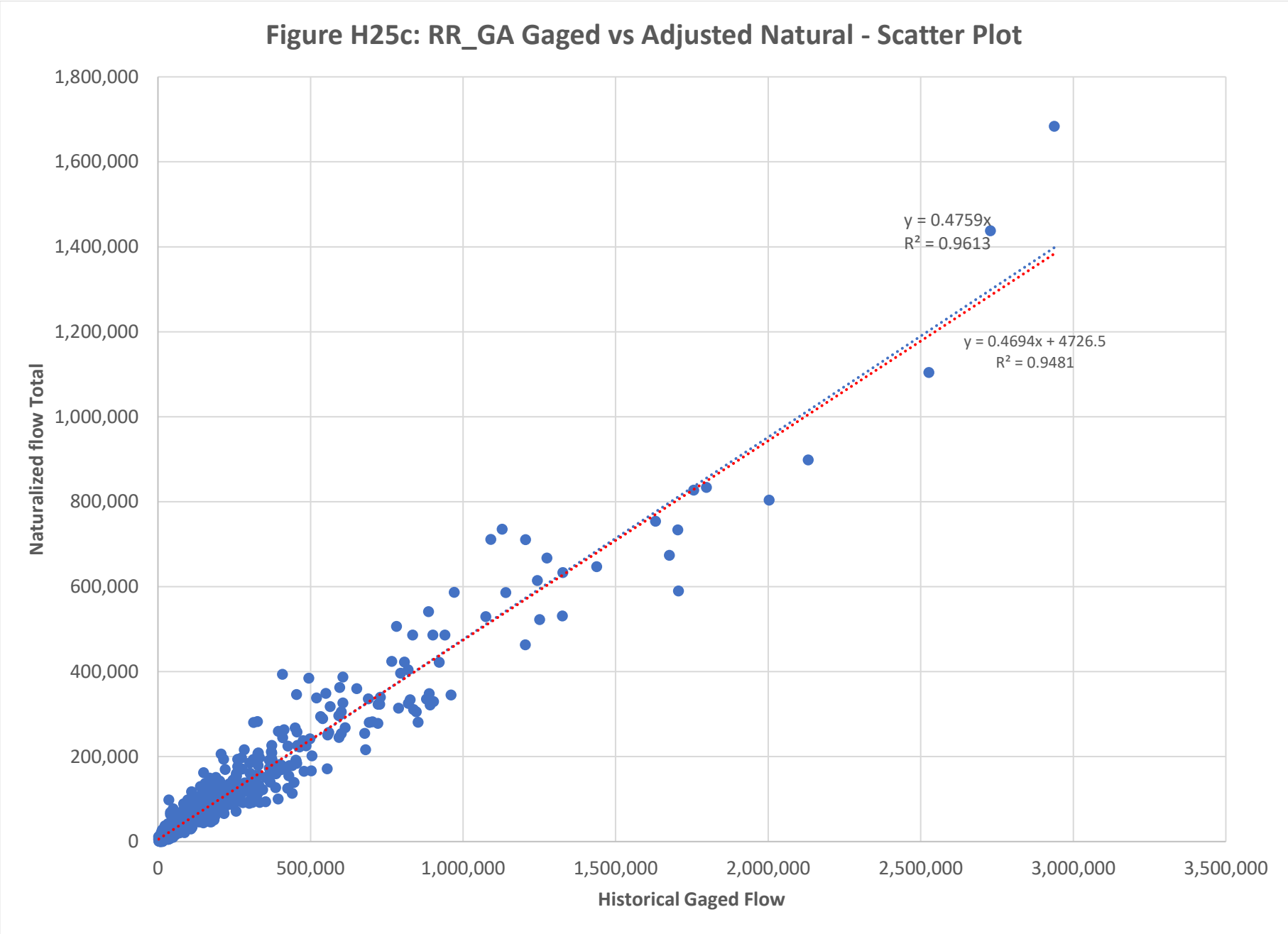


Figure H25c: RR_GA Gaged vs Adjusted Natural - Scatter Plot
1,800,000
1,600,000
1,400,000
1,200,000
1,000,000
800,000
600,000
400,000
200,000
0
Naturalized flow Total
0
500,000
1,000,000
1,500,000
2,000,000
2,500,000
3,000,000
3,500,000
Historical Gaged Flow
y = 0.4759x
R² = 0.9613
y = 0.4694x + 4726.5
R² = 0.9481

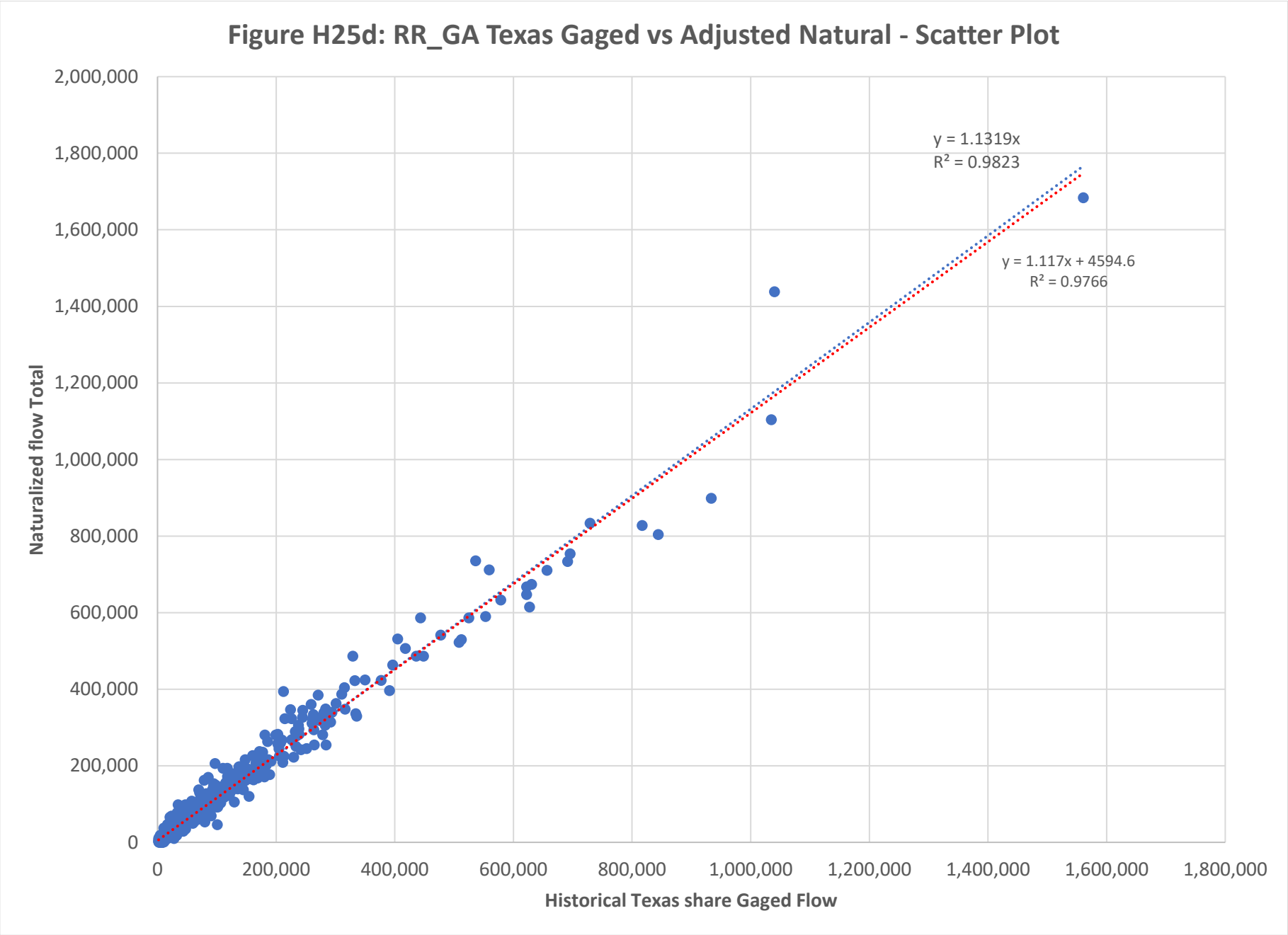


Figure H25d: RR_GA Texas Gaged vs Adjusted Natural - Scatter Plot
y = 1.1319x
R² = 0.9823
y = 1.117x + 4594.6
R² = 0.9766
Naturalized flow Total
Historical Texas share Gaged Flow
0
200,000
400,000
600,000
800,000
1,000,000
1,200,000
1,400,000
1,600,000
1,800,000
2,000,000

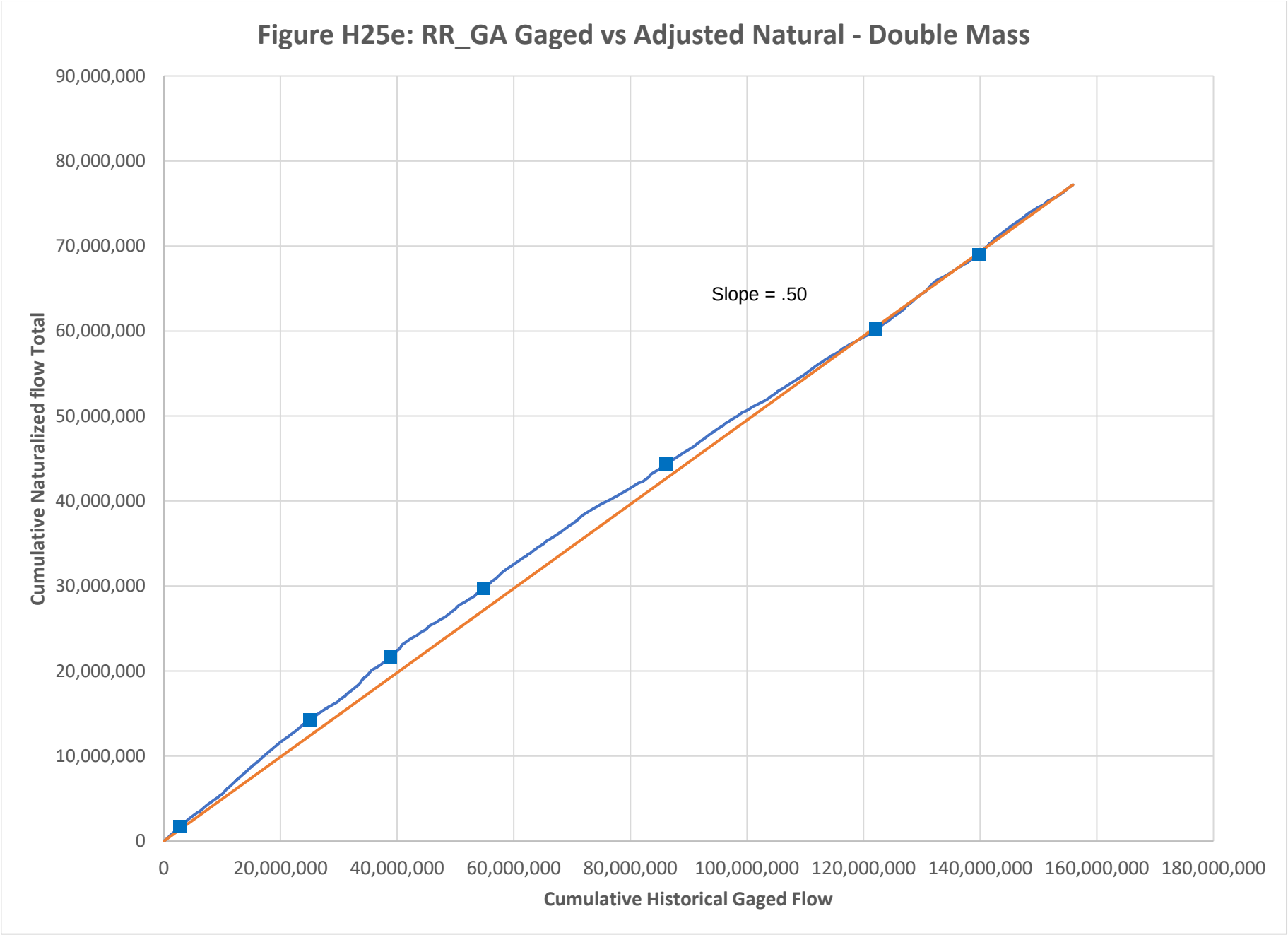


Figure H25e: RR_GA Gaged vs Adjusted Natural - Double Mass
Slope = .50
Cumulative Naturalized flow Total
Cumulative Historical Gaged Flow
0
10,000,000
20,000,000
30,000,000
40,000,000
50,000,000
60,000,000
70,000,000
80,000,000
90,000,000
0
20,000,000
40,000,000
60,000,000
80,000,000
100,000,000
120,000,000
140,000,000
160,000,000
180,000,000

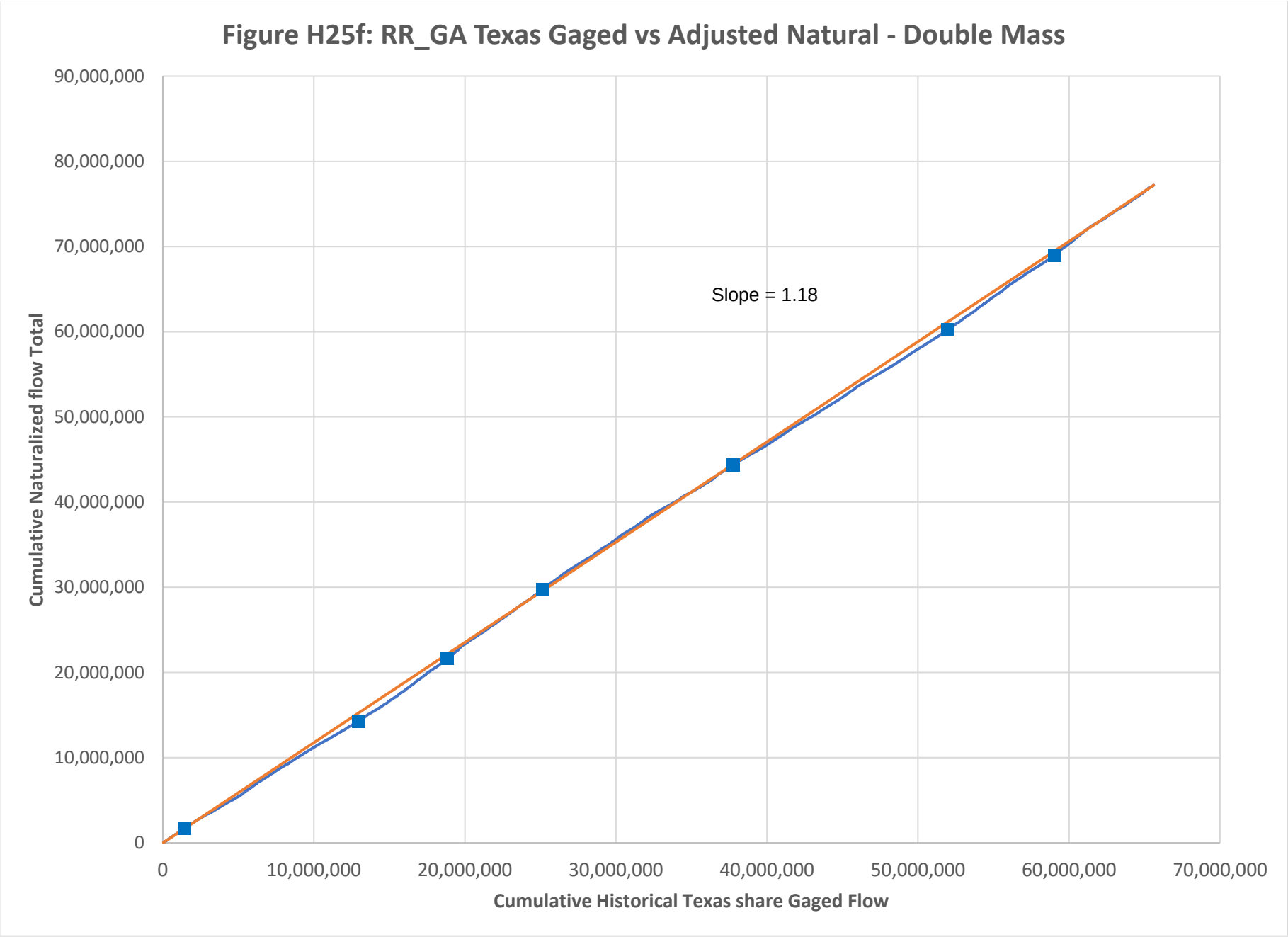


Figure H25f: RR_GA Texas Gaged vs Adjusted Natural - Double Mass
Slope = 1.18
Cumulative Naturalized flow Total
Cumulative Historical Texas share Gaged Flow
0
10,000,000
20,000,000
30,000,000
40,000,000
50,000,000
60,000,000
70,000,000
80,000,000
90,000,000

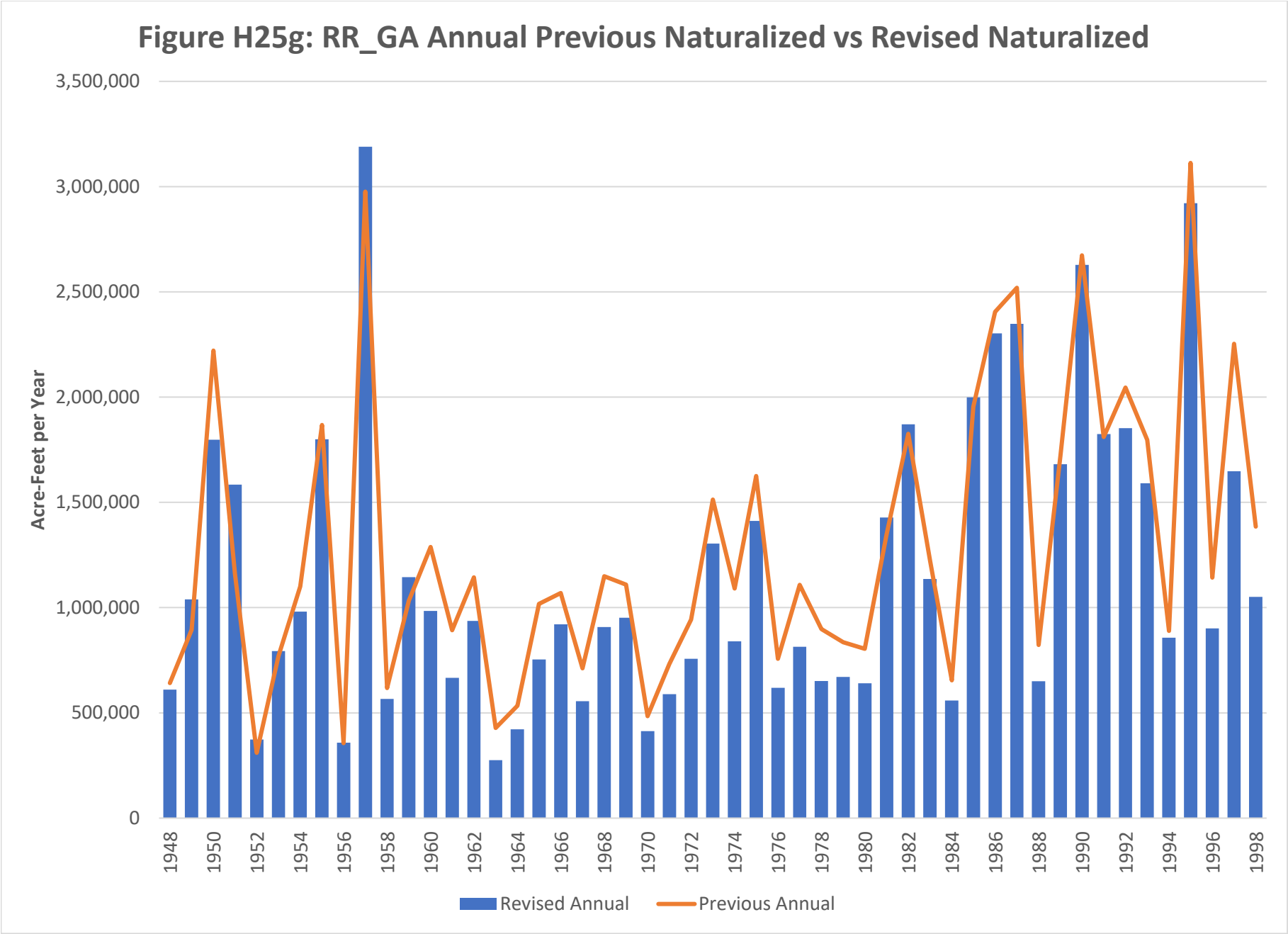


Figure H25g: RR_GA Annual Previous Naturalized vs Revised Naturalized
Acre-Feet per Year
3,500,000
3,000,000
2,500,000
2,000,000
1,500,000
1,000,000
500,000
0
1948
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
Revised Annual
Previous Annual

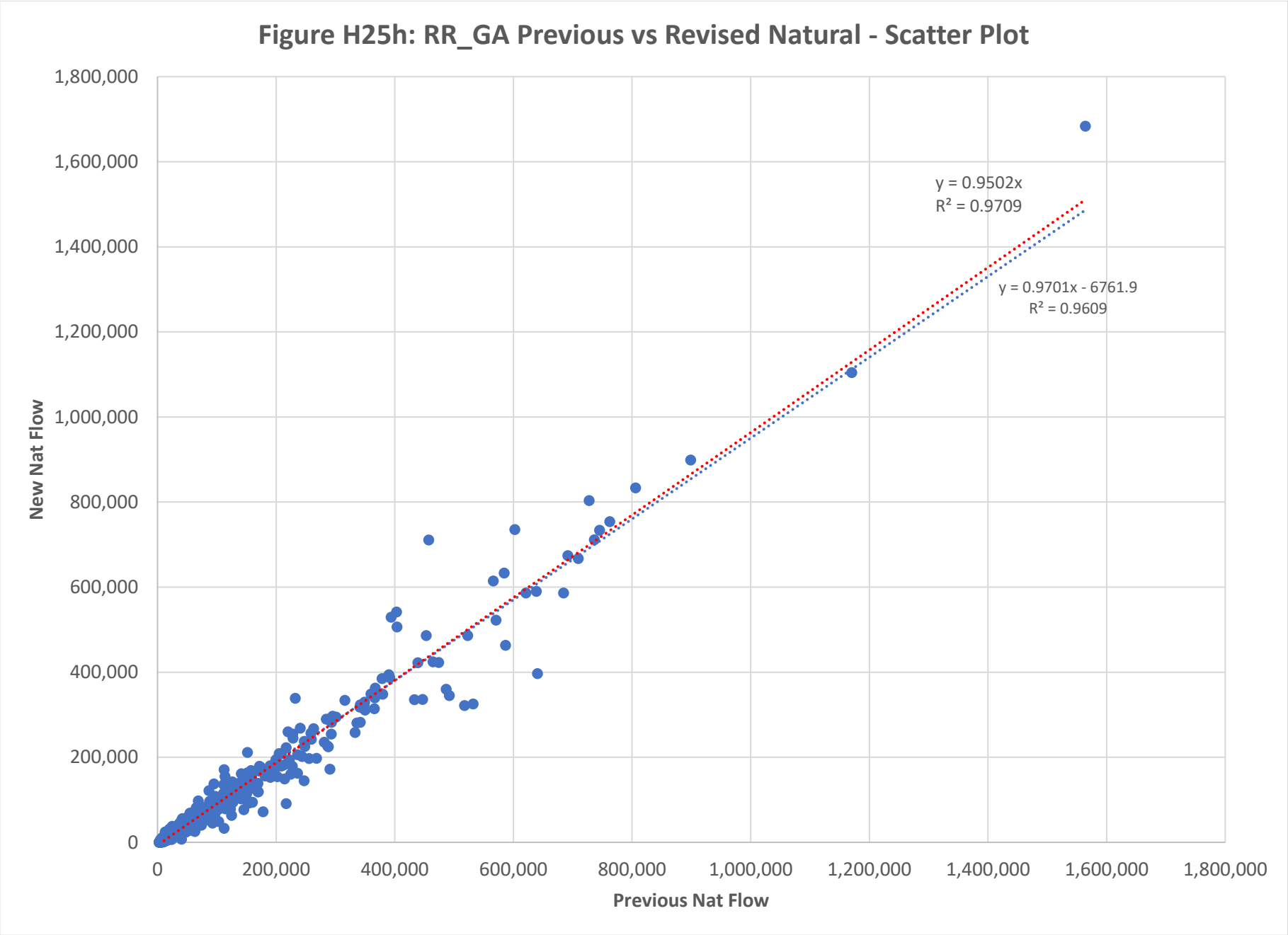


Figure H25h: RR_GA Previous vs Revised Natural - Scatter Plot
y = 0.9502x
R² = 0.9709
y = 0.9701x - 6761.9
R² = 0.9609
New Nat Flow
Previous Nat Flow
0
200,000
400,000
600,000
800,000
1,000,000
1,200,000
1,400,000
1,600,000
1,800,000

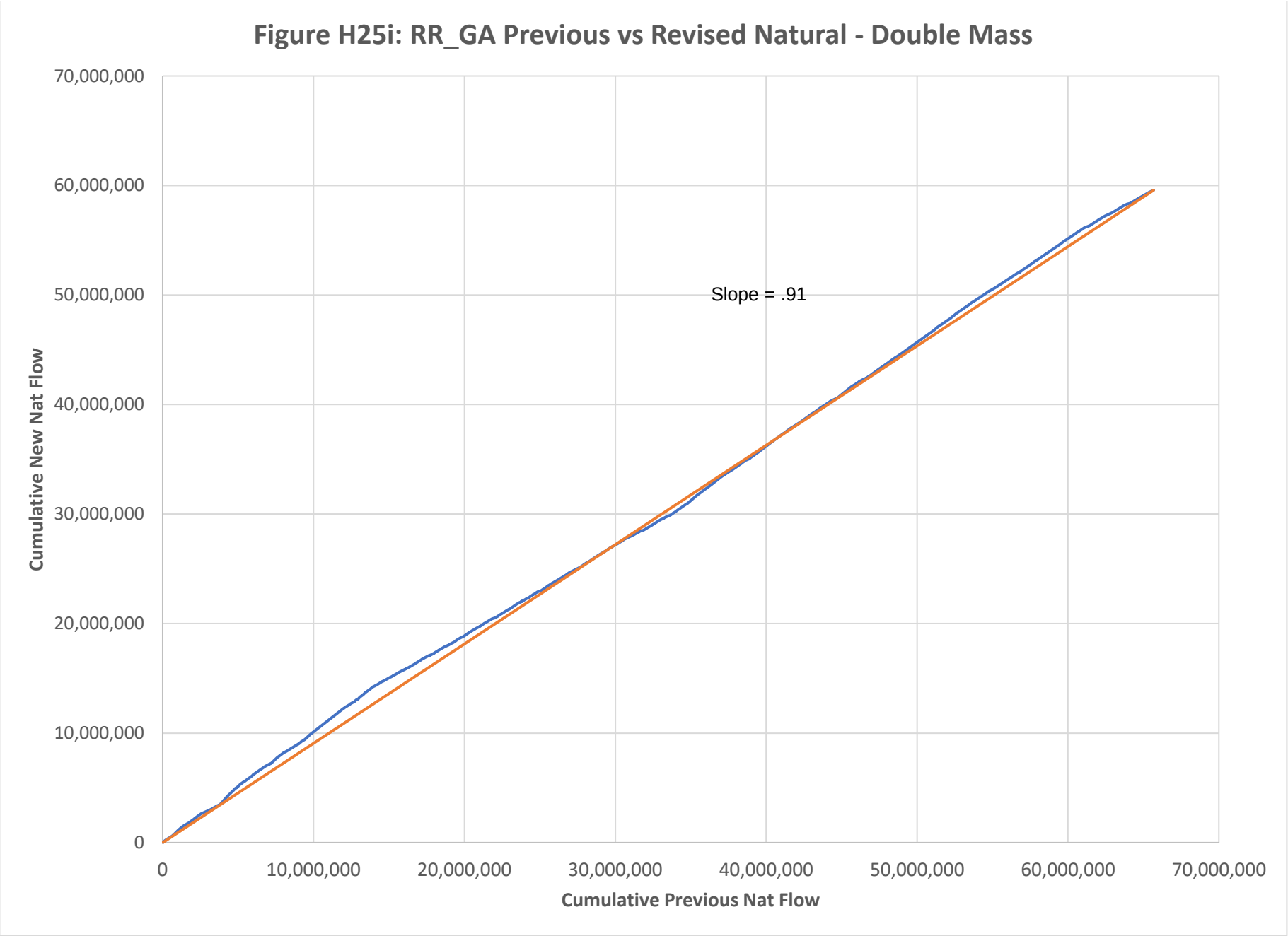


Figure H25i: RR_GA Previous vs Revised Natural - Double Mass
70,000,000
60,000,000
50,000,000
40,000,000
30,000,000
20,000,000
10,000,000
0
Cumulative New Nat Flow
Slope = .91
0
10,000,000
20,000,000
30,000,000
40,000,000
50,000,000
60,000,000
70,000,000
Cumulative Previous Nat Flow

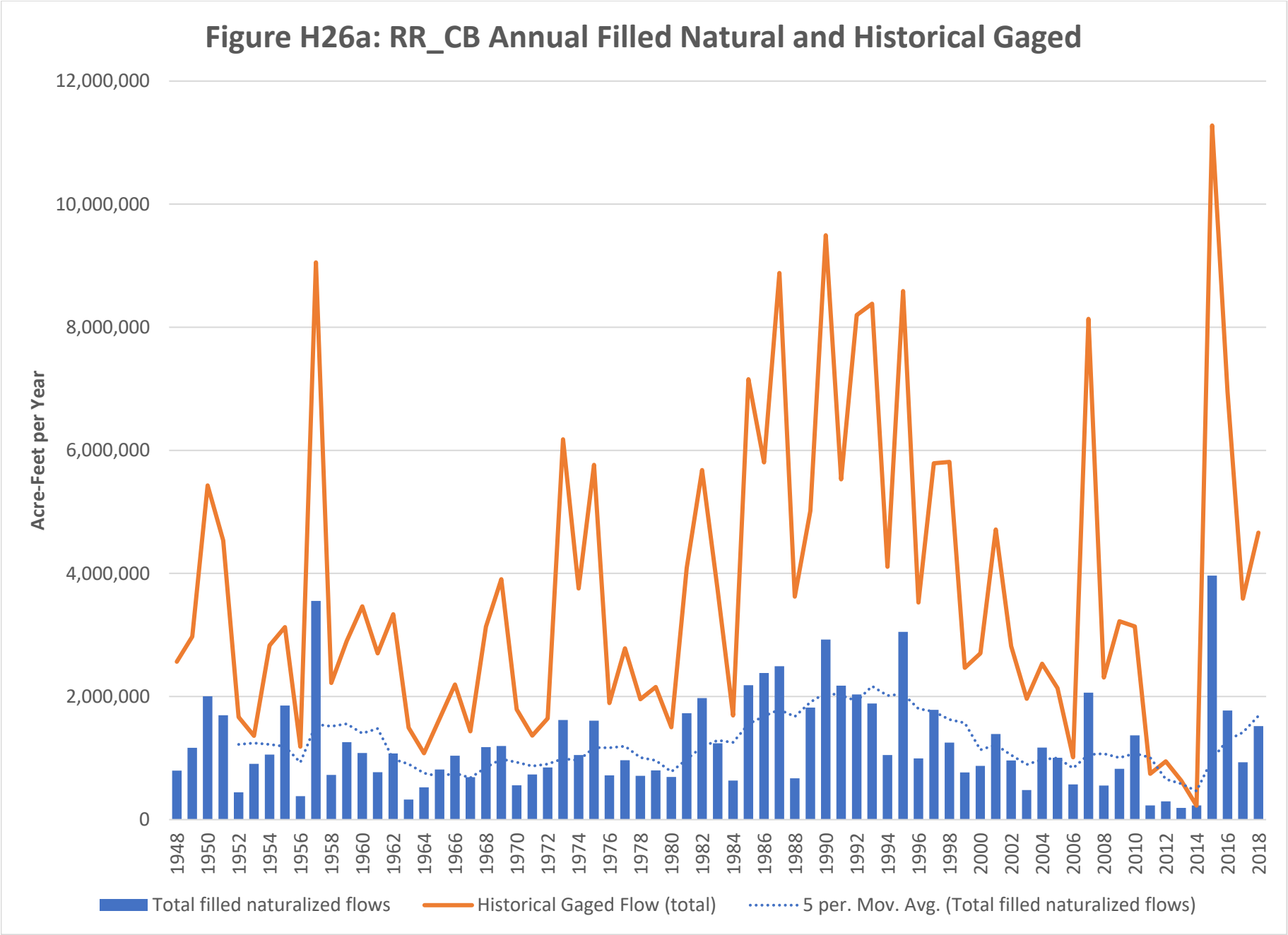


Figure H26a: RR_CB Annual Filled Natural and Historical Gaged
Acre-Feet per Year
12,000,000
10,000,000
8,000,000
6,000,000
4,000,000
2,000,000
0
1948
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
Total filled naturalized flows
Historical Gaged Flow (total)
5 per. Mov. Avg. (Total filled naturalized flows)

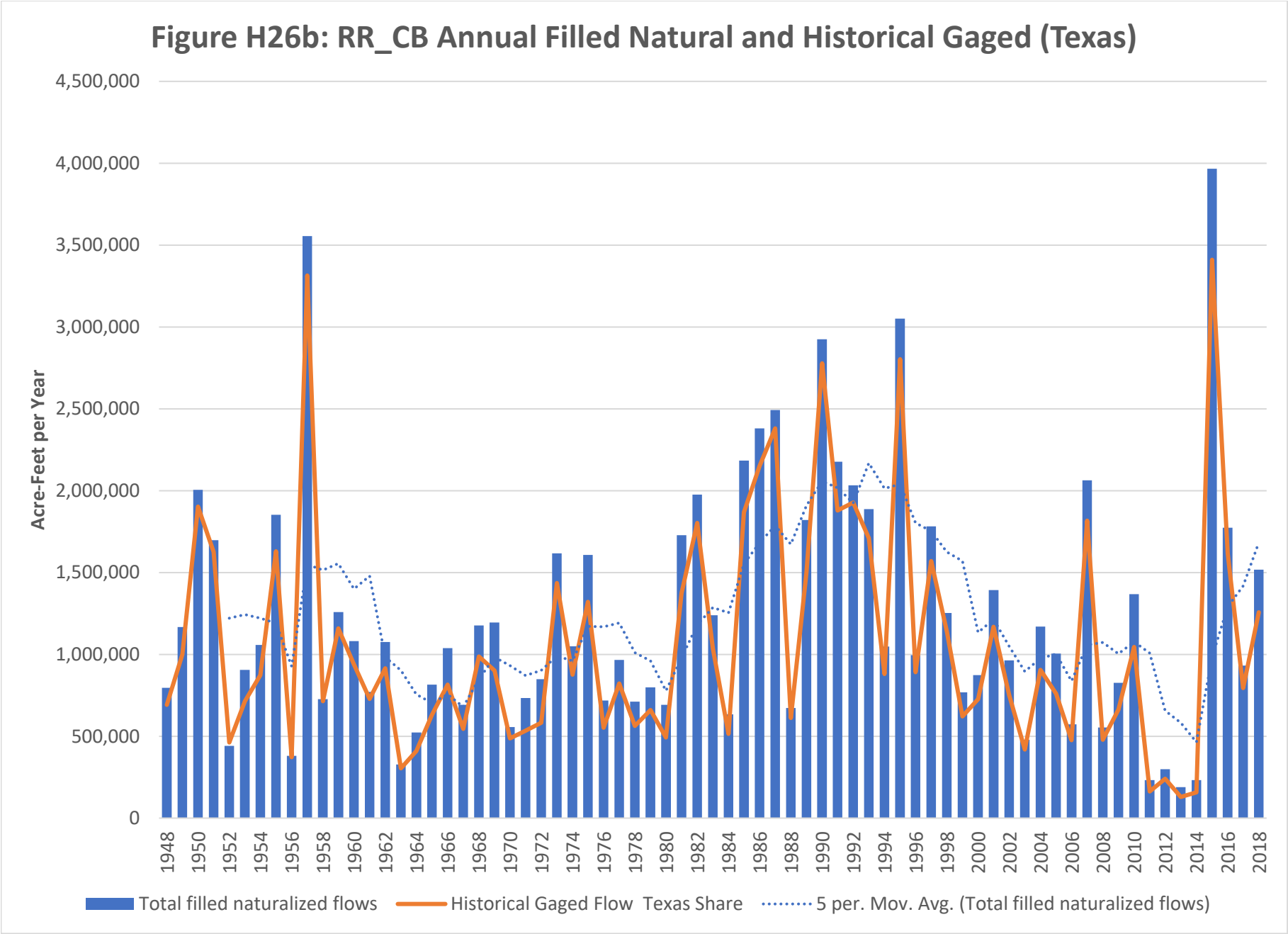


Figure H26b: RR_CB Annual Filled Natural and Historical Gaged (Texas)
Acre-Feet per Year
4,500,000
4,000,000
3,500,000
3,000,000
2,500,000
2,000,000
1,500,000
1,000,000
500,000
0
1948
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
Total filled naturalized flows
Historical Gaged Flow Texas Share
5 per. Mov. Avg. (Total filled naturalized flows)

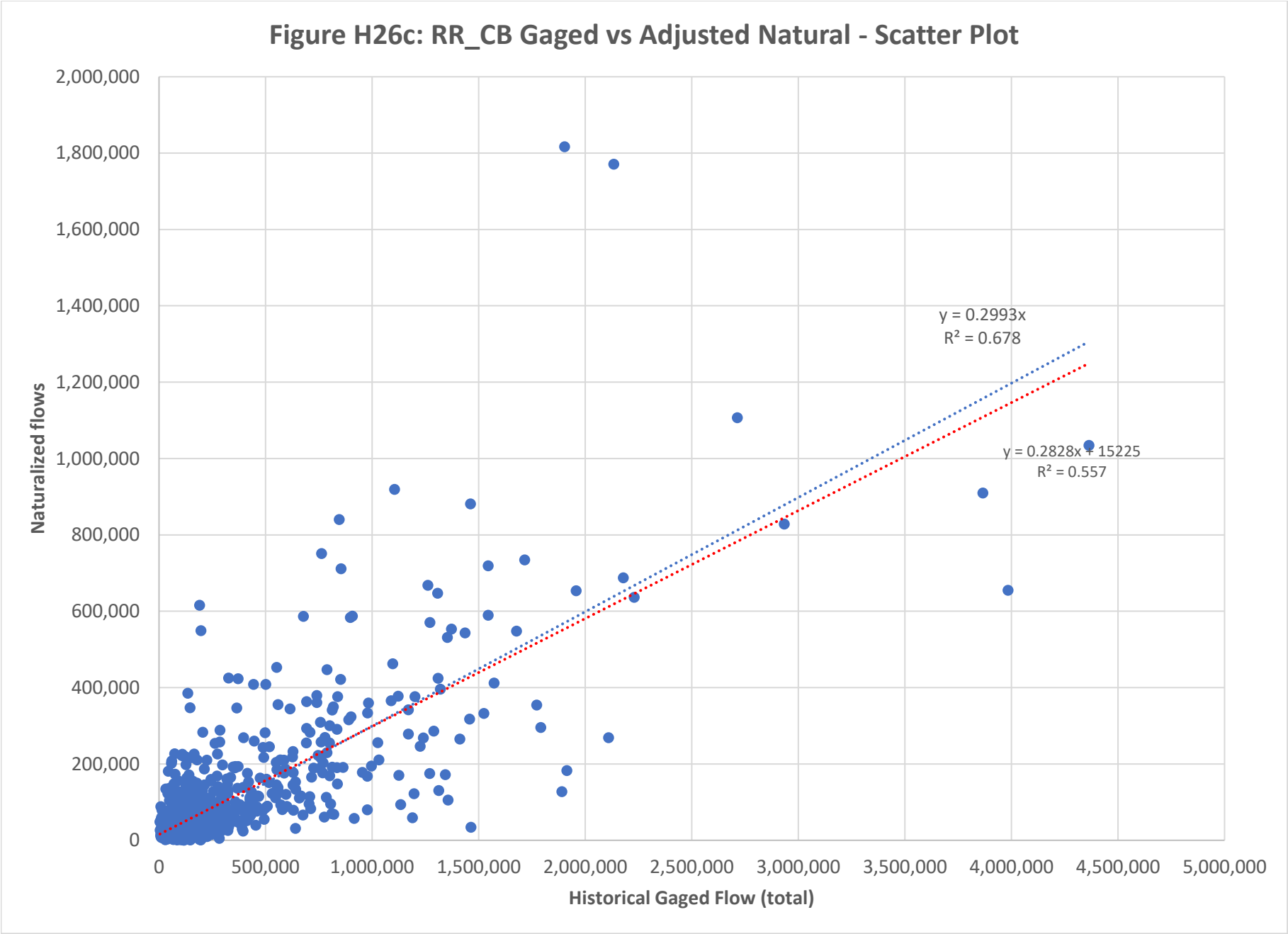


Figure H26c: RR_CB Gaged vs Adjusted Natural - Scatter Plot
Naturalized flows
Historical Gaged Flow (total)
y = 0.2993x
R² = 0.678
y = 0.2828x + 15225
R² = 0.557
0
200,000
400,000
600,000
800,000
1,000,000
1,200,000
1,400,000
1,600,000
1,800,000
2,000,000
0
500,000
1,000,000
1,500,000
2,000,000
2,500,000
3,000,000
3,500,000
4,000,000
4,500,000
5,000,000

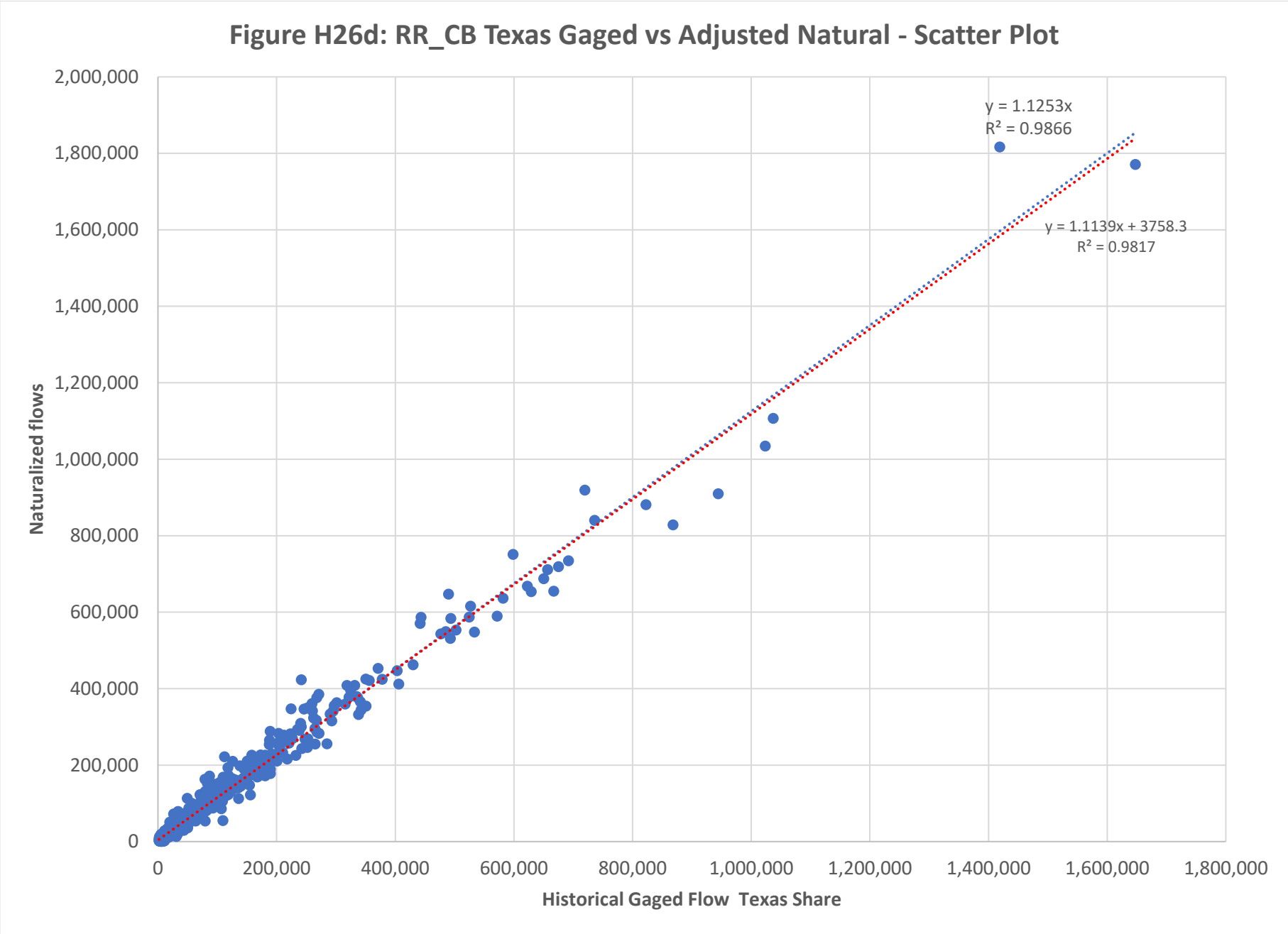


Figure H26d: RR_CB Texas Gaged vs Adjusted Natural - Scatter Plot
y = 1.1253x
R² = 0.9866
y = 1.1139x + 3758.3
R² = 0.9817
Naturalized flows
Historical Gaged Flow Texas Share
0
200,000
400,000
600,000
800,000
1,000,000
1,200,000
1,400,000
1,600,000
1,800,000
2,000,000

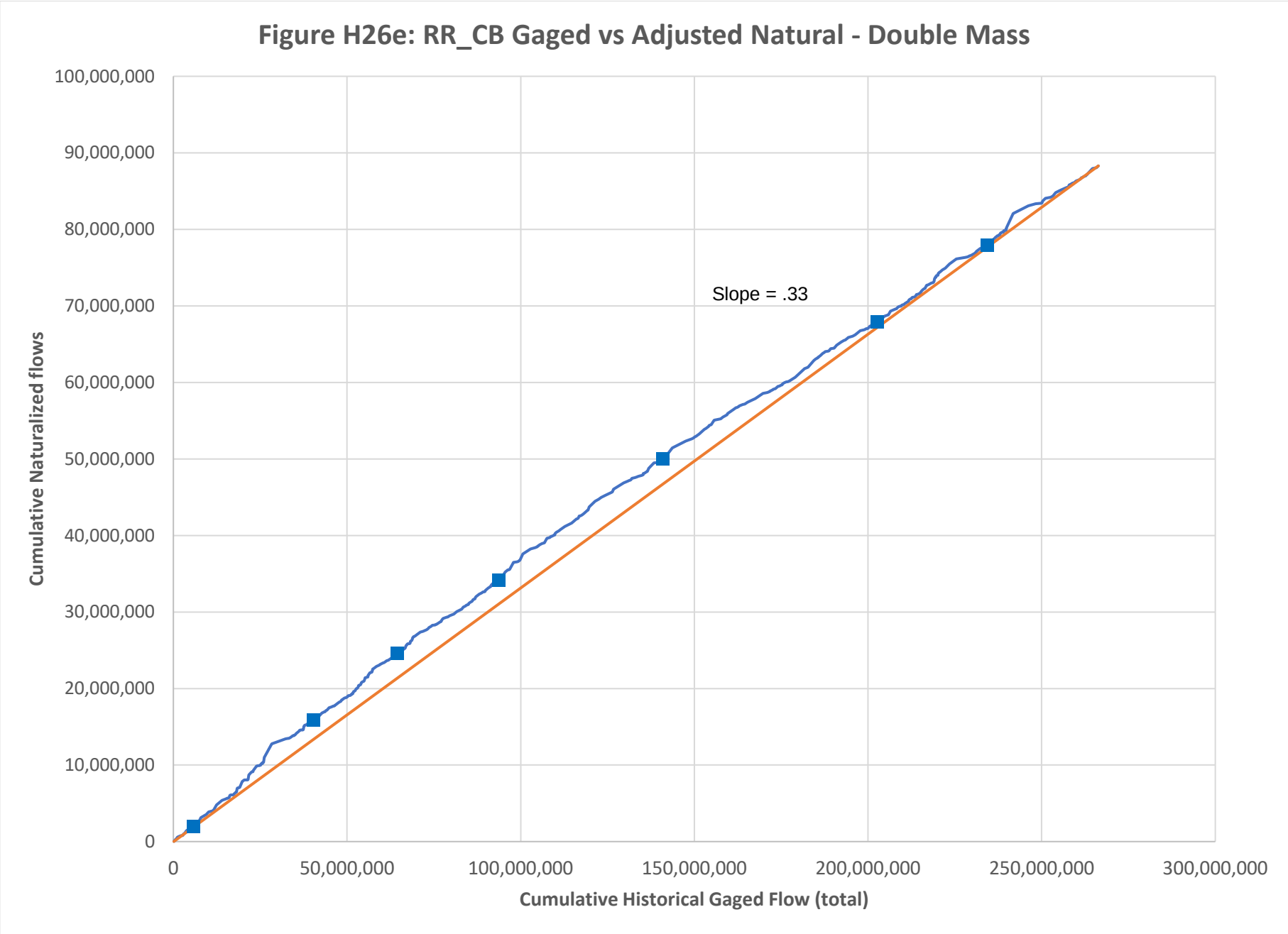


Figure H26e: RR_CB Gaged vs Adjusted Natural - Double Mass
Slope = .33
Cumulative Naturalized flows
Cumulative Historical Gaged Flow (total)
100,000,000
90,000,000
80,000,000
70,000,000
60,000,000
50,000,000
40,000,000
30,000,000
20,000,000
10,000,000
0
0
50,000,000
100,000,000
150,000,000
200,000,000
250,000,000
300,000,000

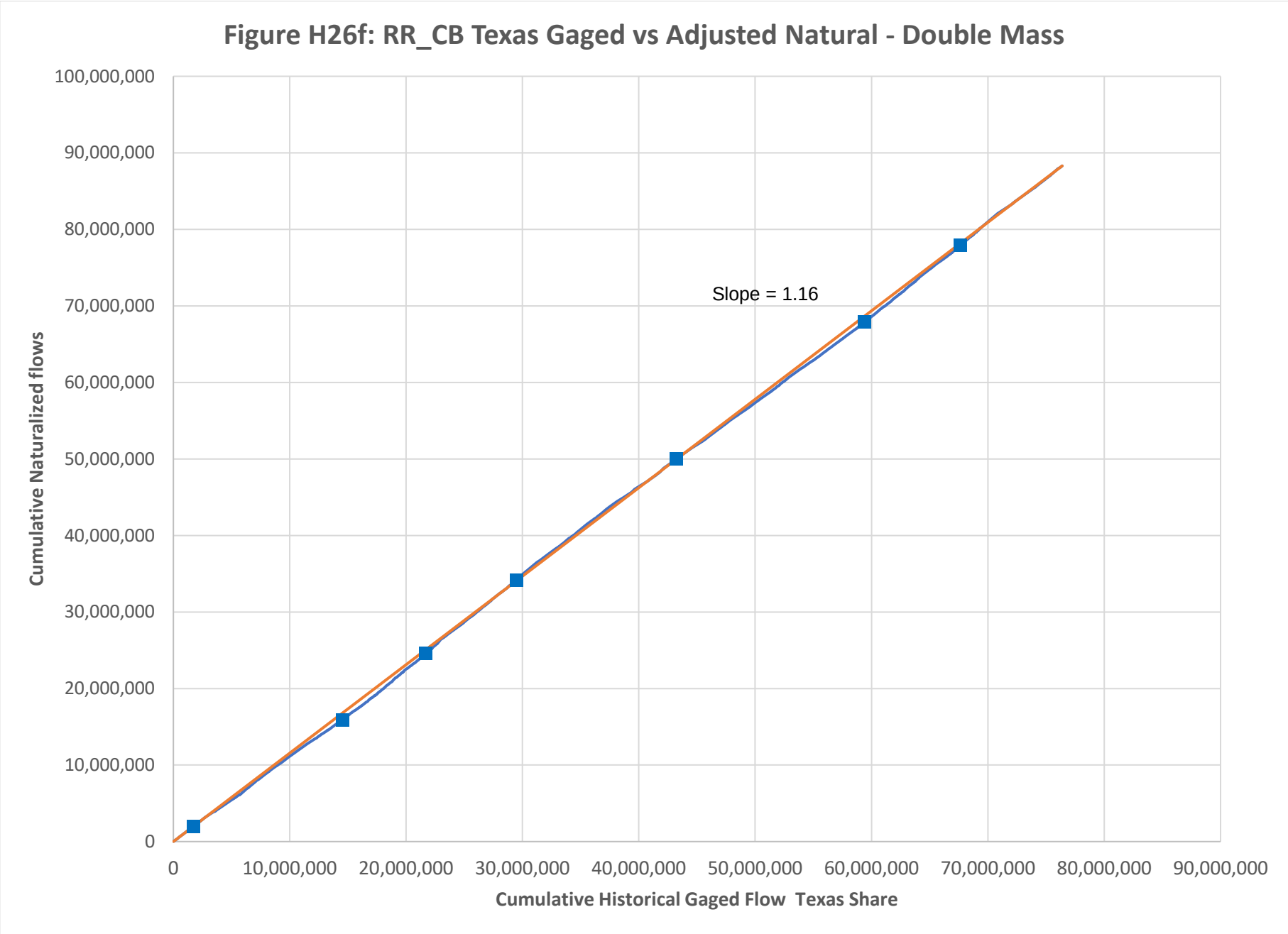


Figure H26f: RR_CB Texas Gaged vs Adjusted Natural - Double Mass
Slope = 1.16
Cumulative Naturalized flows
Cumulative Historical Gaged Flow Texas Share
100,000,000
90,000,000
80,000,000
70,000,000
60,000,000
50,000,000
40,000,000
30,000,000
20,000,000
10,000,000
0
0
10,000,000
20,000,000
30,000,000
40,000,000
50,000,000
60,000,000
70,000,000
80,000,000
90,000,000

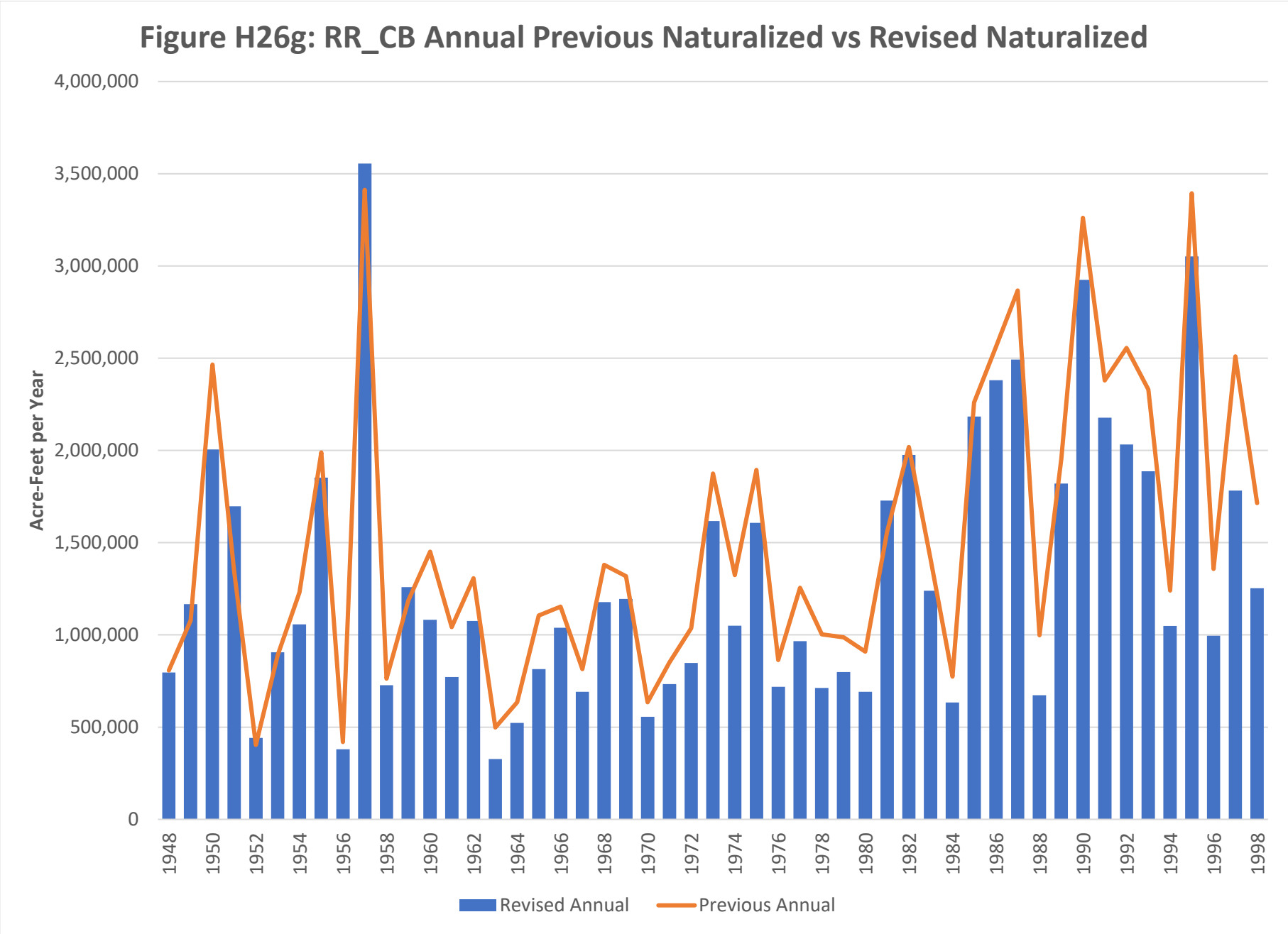


Figure H26g: RR_CB Annual Previous Naturalized vs Revised Naturalized
Acre-Feet per Year
4,000,000
3,500,000
3,000,000
2,500,000
2,000,000
1,500,000
1,000,000
500,000
0
1948
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
Revised Annual
Previous Annual

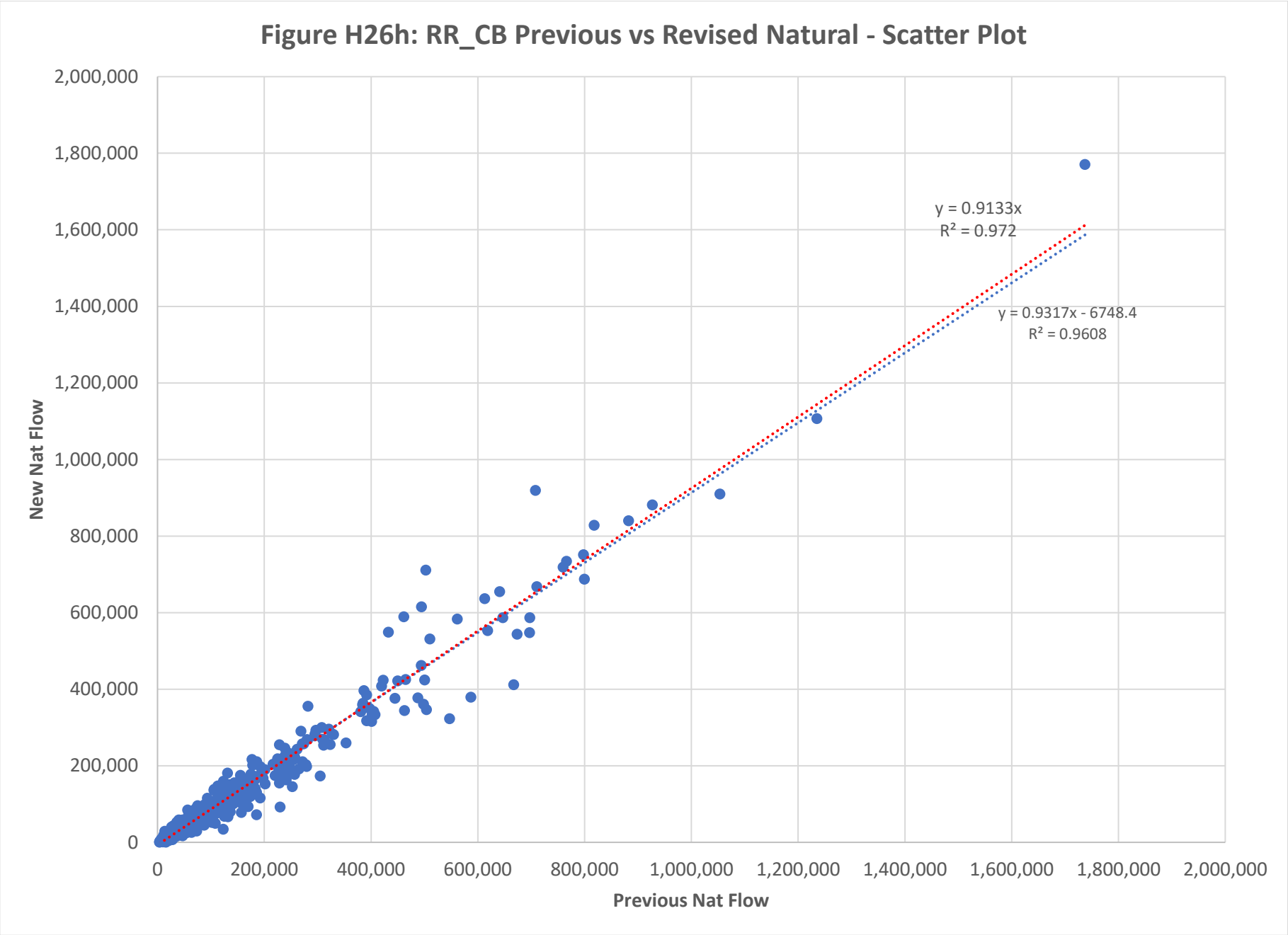


Figure H26h: RR_CB Previous vs Revised Natural - Scatter Plot
y = 0.9133x
R² = 0.972
y = 0.9317x - 6748.4
R² = 0.9608
New Nat Flow
Previous Nat Flow
0
200,000
400,000
600,000
800,000
1,000,000
1,200,000
1,400,000
1,600,000
1,800,000
2,000,000

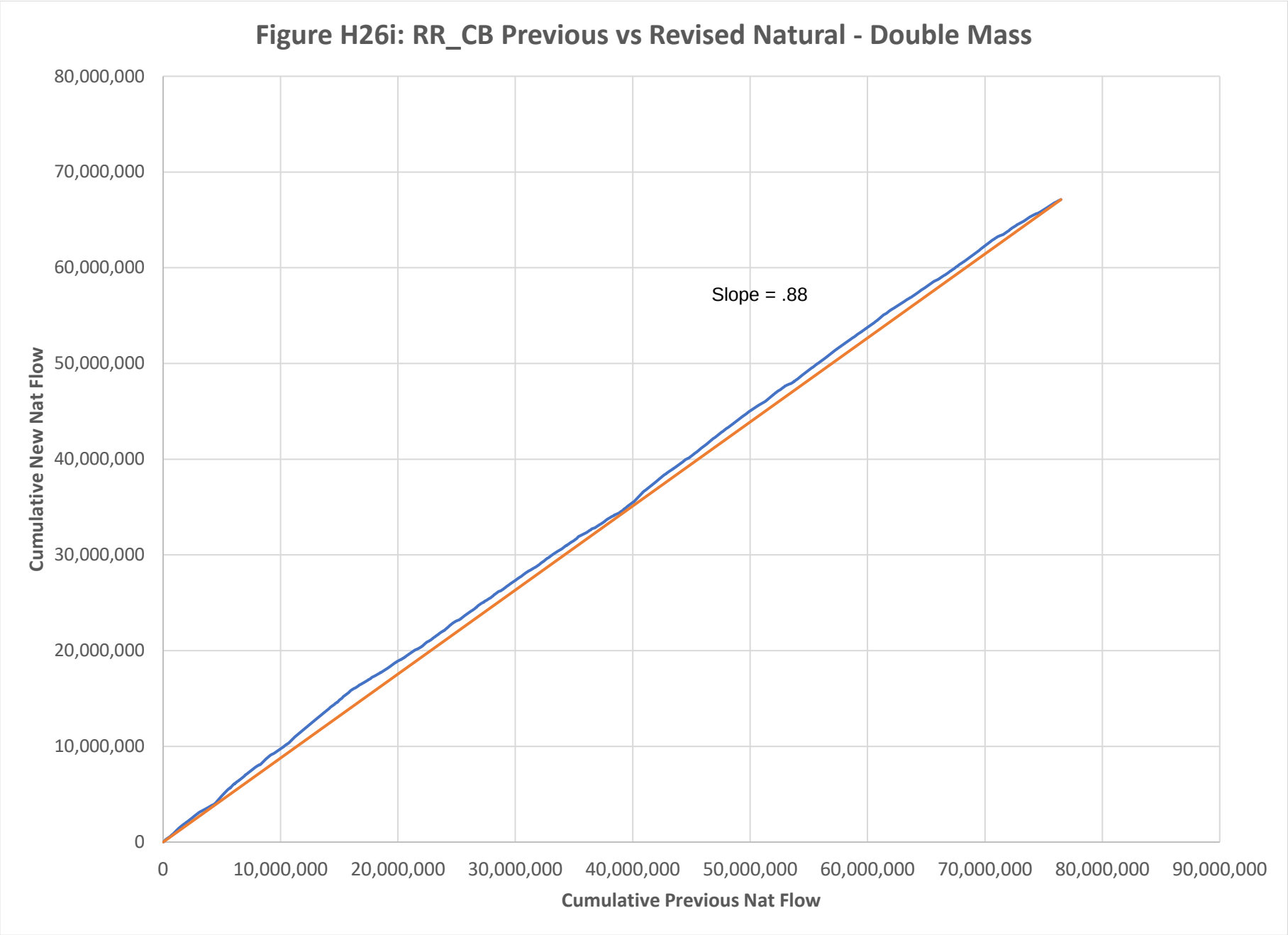


Figure H26i: RR_CB Previous vs Revised Natural - Double Mass
Slope = .88
Cumulative New Nat Flow
Cumulative Previous Nat Flow
0
10,000,000
20,000,000
30,000,000
40,000,000
50,000,000
60,000,000
70,000,000
80,000,000
90,000,000

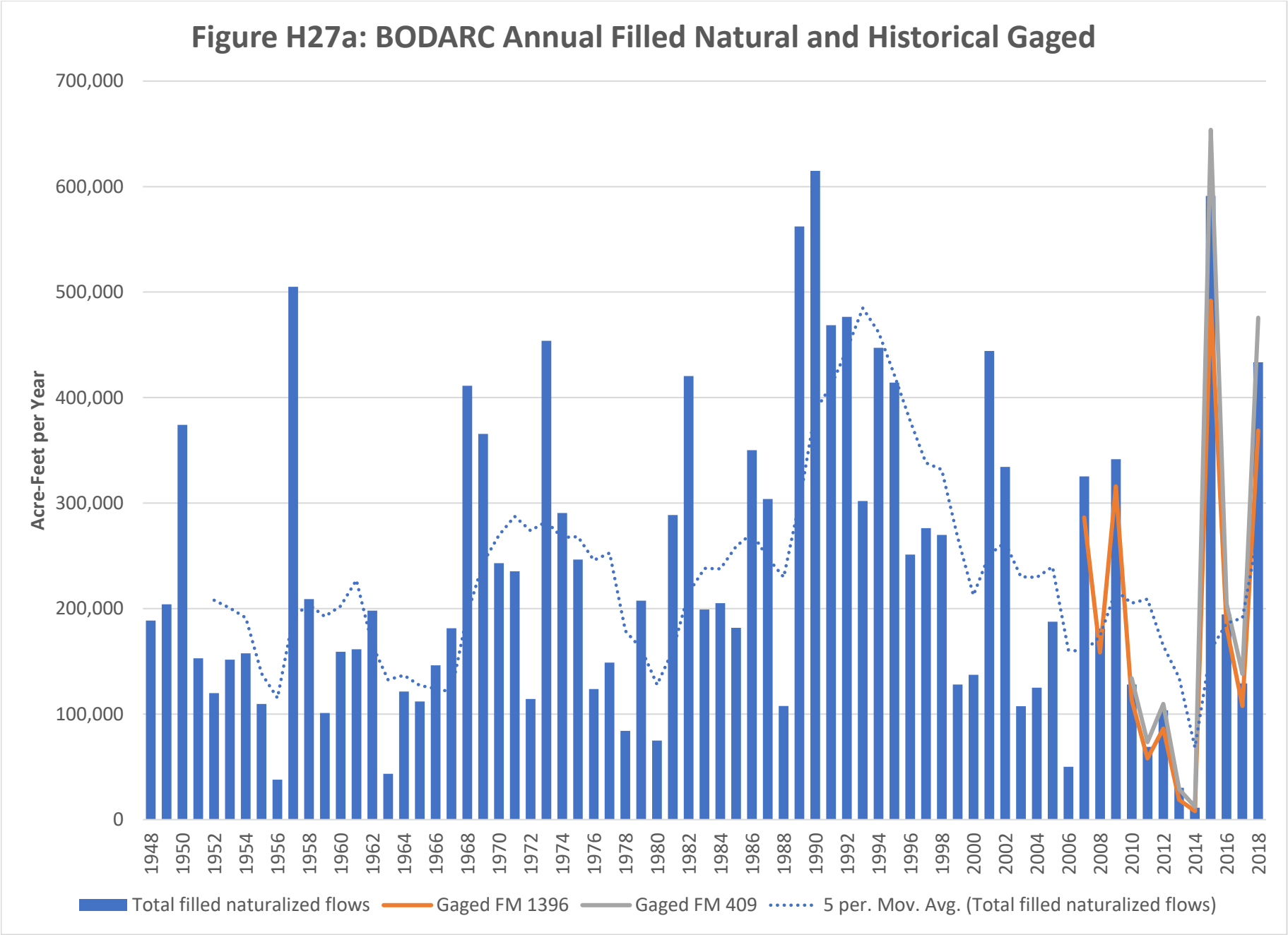


Figure H27a: BODARC Annual Filled Natural and Historical Gaged
Acre-Feet per Year
700,000
600,000
500,000
400,000
300,000
200,000
100,000
0
1948
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
Total filled naturalized flows
Gaged FM 1396
Gaged FM 409
5 per. Mov. Avg. (Total filled naturalized flows)

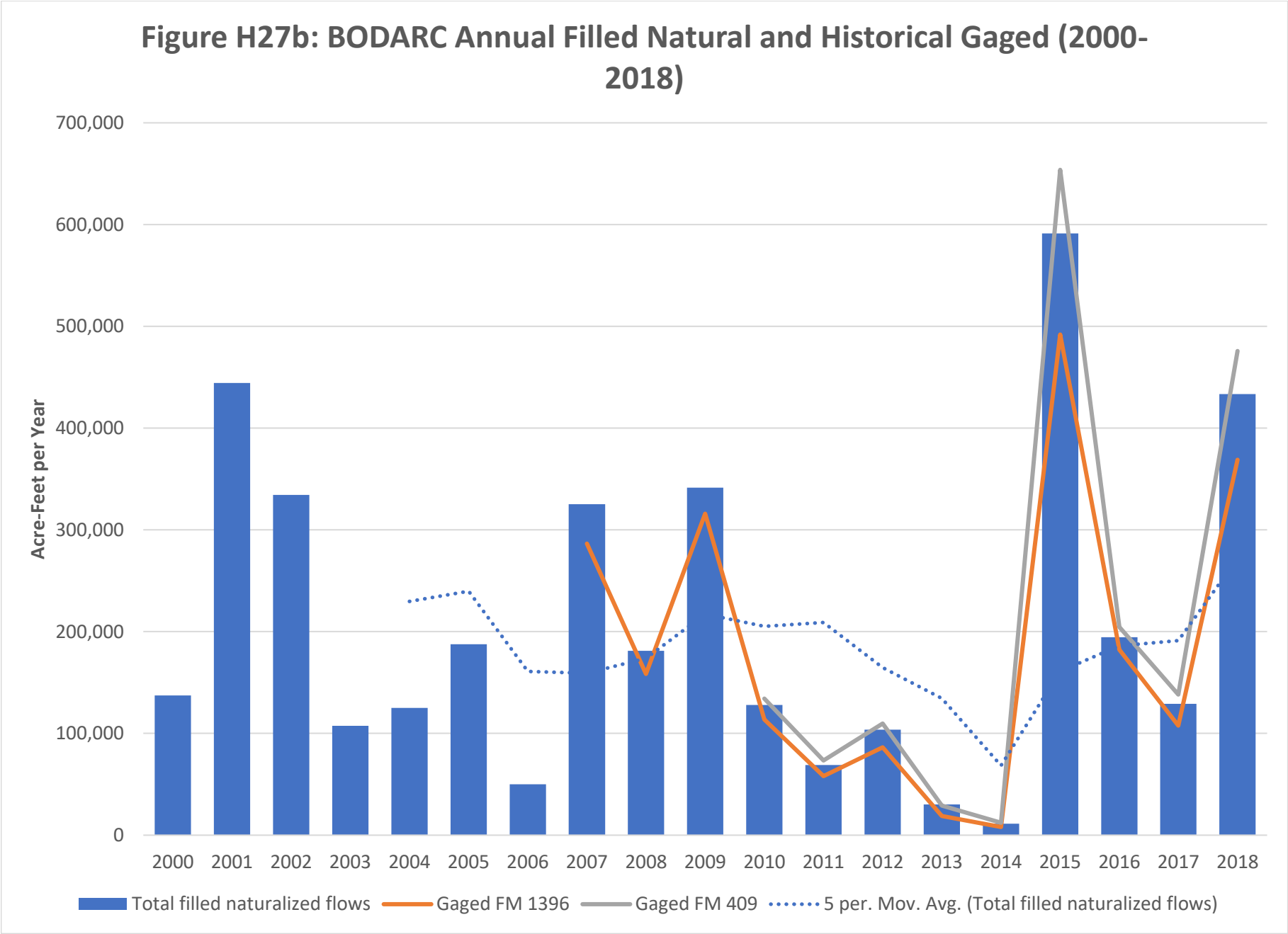


Figure H27b: BODARC Annual Filled Natural and Historical Gaged (2000-2018)
Acre-Feet per Year
700,000
600,000
500,000
400,000
300,000
200,000
100,000
0
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Total filled naturalized flows
Gaged FM 1396
Gaged FM 409
5 per. Mov. Avg. (Total filled naturalized flows)

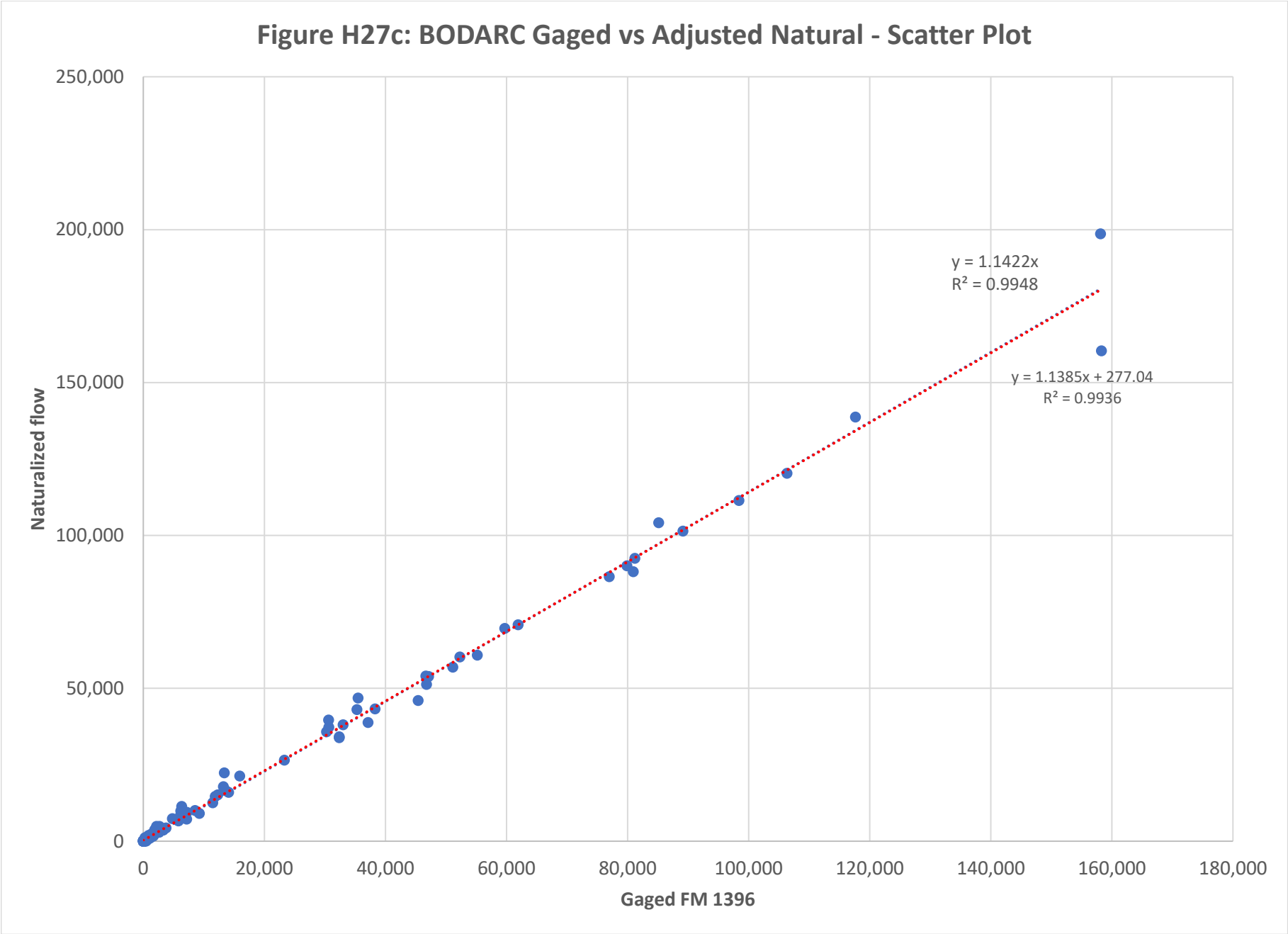


Figure H27c: BODARC Gaged vs Adjusted Natural - Scatter Plot
250,000
200,000
150,000
100,000
50,000
0
Naturalized flow
0
20,000
40,000
60,000
80,000
100,000
120,000
140,000
160,000
180,000
Gaged FM 1396
y = 1.1422x
R² = 0.9948
y = 1.1385x + 277.04
R² = 0.9936

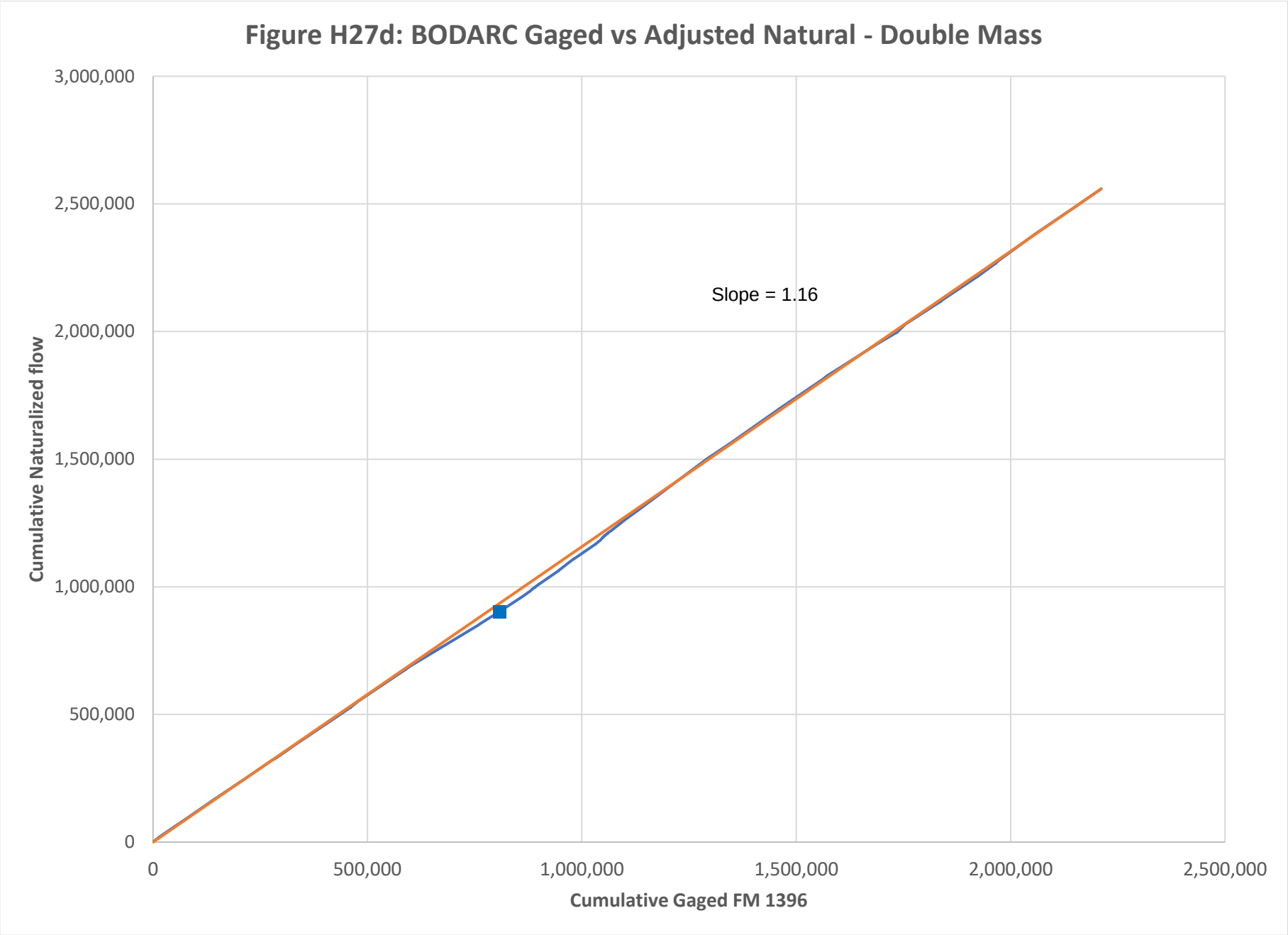


Figure H27d: BODARC Gaged vs Adjusted Natural - Double Mass
3,000,000
2,500,000
2,000,000
1,500,000
1,000,000
500,000
0
Cumulative Naturalized flow
Slope = 1.16
0
500,000
1,000,000
1,500,000
2,000,000
2,500,000
Cumulative Gaged FM 1396

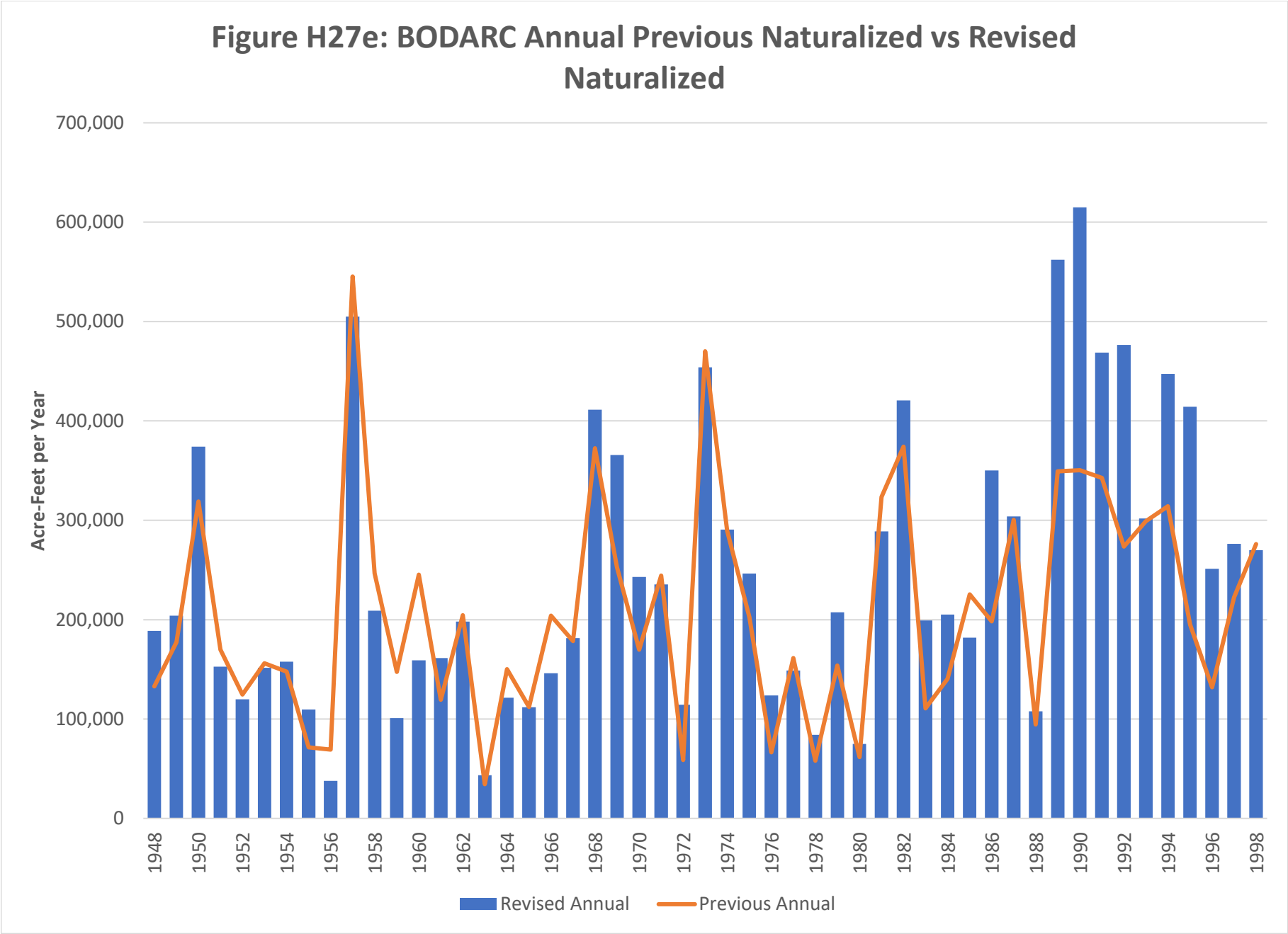


Figure H27e: BODARC Annual Previous Naturalized vs Revised Naturalized
Acre-Feet per Year
700,000
600,000
500,000
400,000
300,000
200,000
100,000
0
1948
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
Revised Annual
Previous Annual

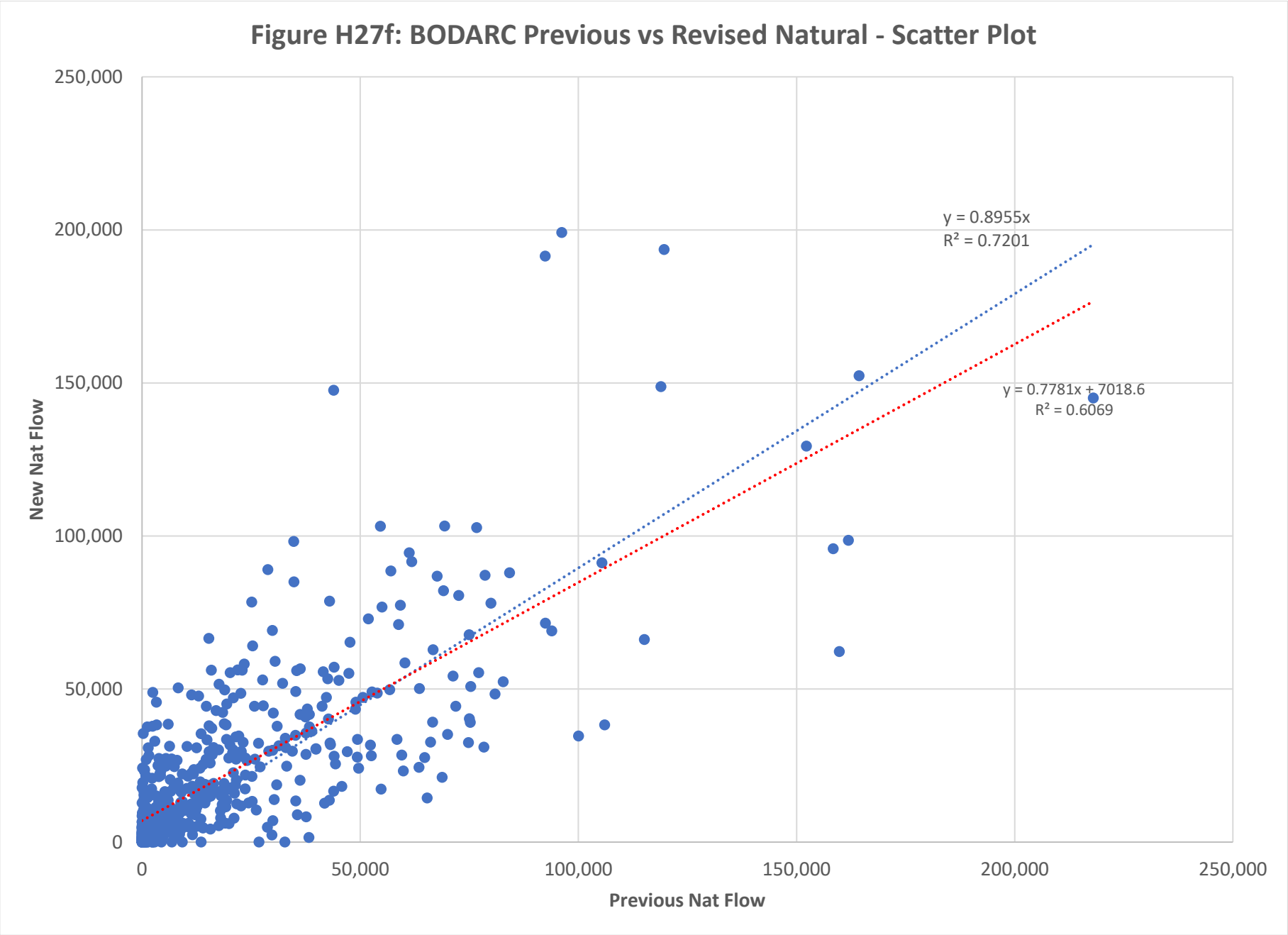


Figure H27f: BODARC Previous vs Revised Natural - Scatter Plot
250,000
200,000
150,000
100,000
50,000
0
New Nat Flow
0
50,000
100,000
150,000
200,000
250,000
Previous Nat Flow
y = 0.8955x
R² = 0.7201
y = 0.7781x + 7018.6
R² = 0.6069

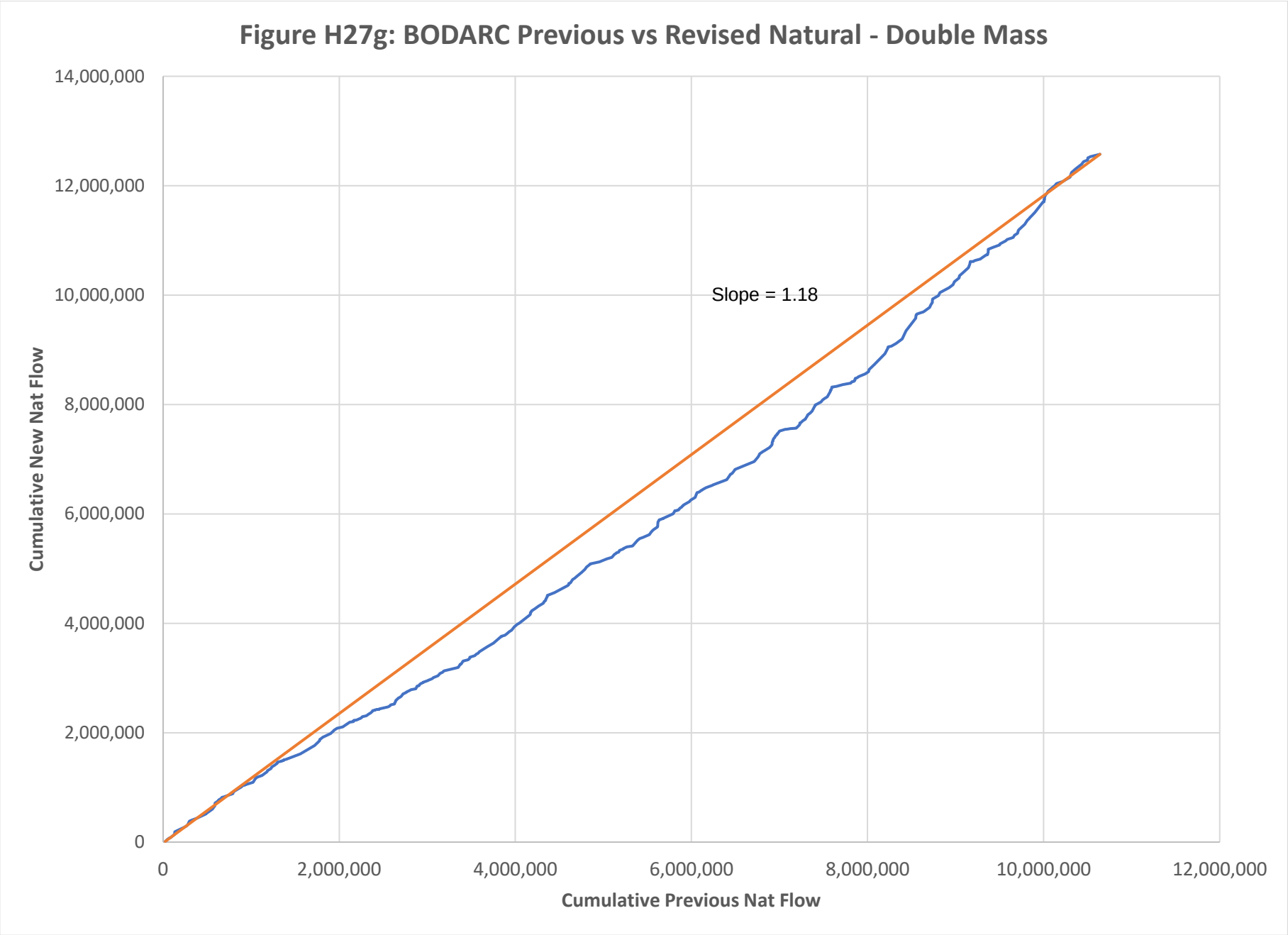


Figure H27g: BODARC Previous vs Revised Natural - Double Mass
14,000,000
12,000,000
10,000,000
8,000,000
6,000,000
4,000,000
2,000,000
0
Cumulative New Nat Flow
Slope = 1.18
0
2,000,000
4,000,000
6,000,000
8,000,000
10,000,000
12,000,000
Cumulative Previous Nat Flow

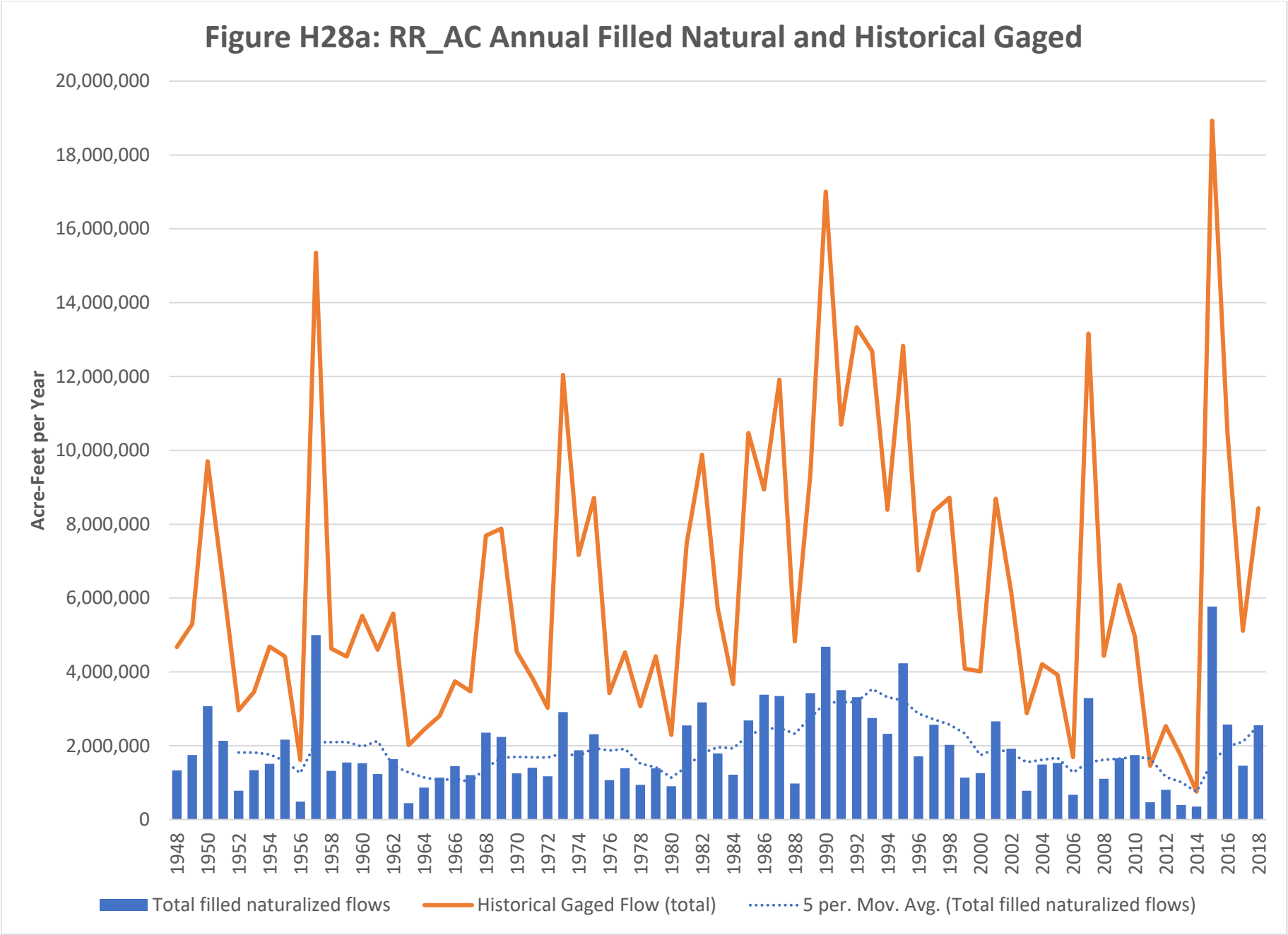


Figure H28a: RR_AC Annual Filled Natural and Historical Gaged
Acre-Feet per Year
20,000,000
18,000,000
16,000,000
14,000,000
12,000,000
10,000,000
8,000,000
6,000,000
4,000,000
2,000,000
0
1948
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
Total filled naturalized flows
Historical Gaged Flow (total)
5 per. Mov. Avg. (Total filled naturalized flows)

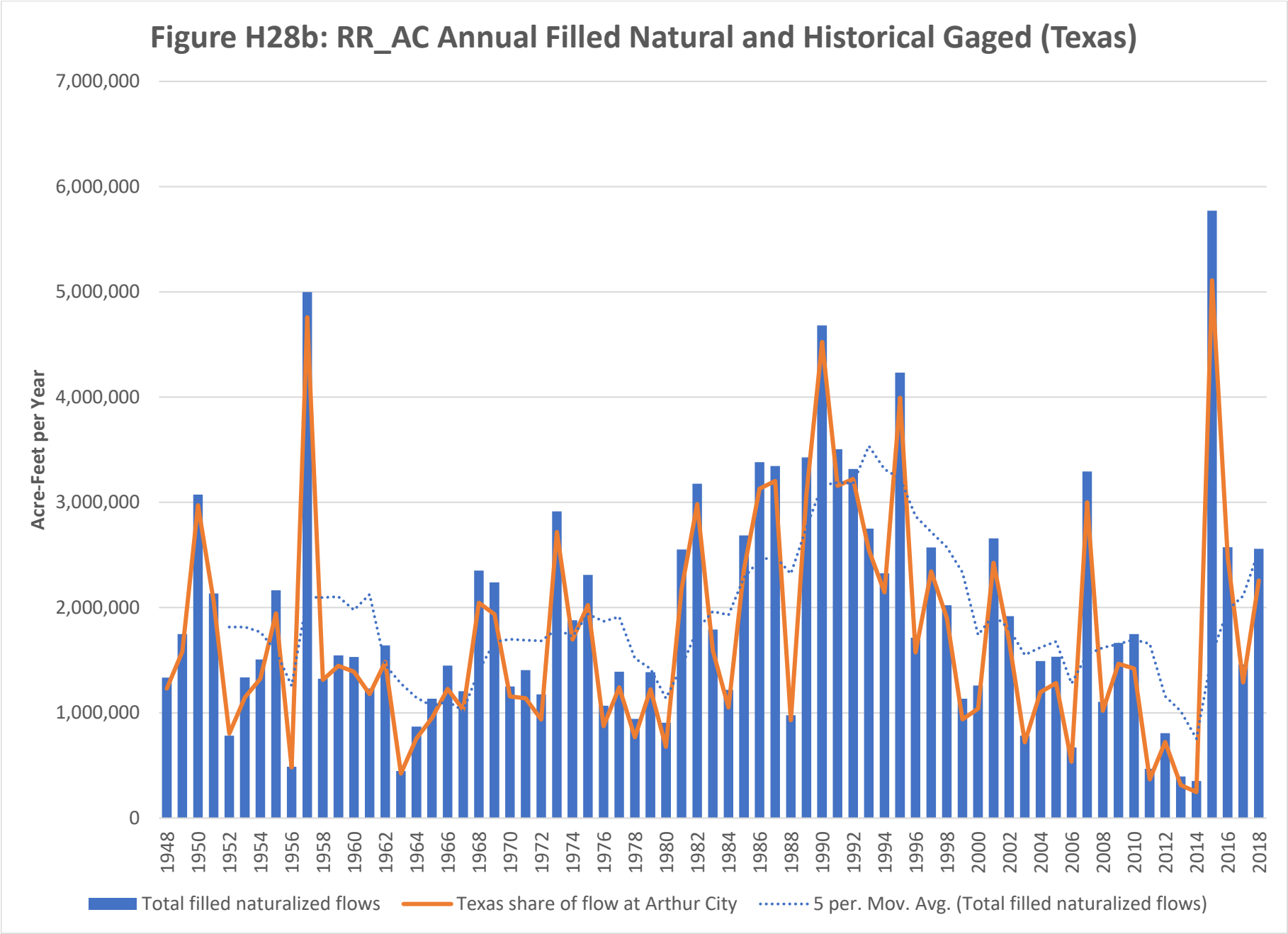


Figure H28b: RR_AC Annual Filled Natural and Historical Gaged (Texas)
Acre-Feet per Year
7,000,000
6,000,000
5,000,000
4,000,000
3,000,000
2,000,000
1,000,000
0
1948
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
Total filled naturalized flows
Texas share of flow at Arthur City
5 per. Mov. Avg. (Total filled naturalized flows)

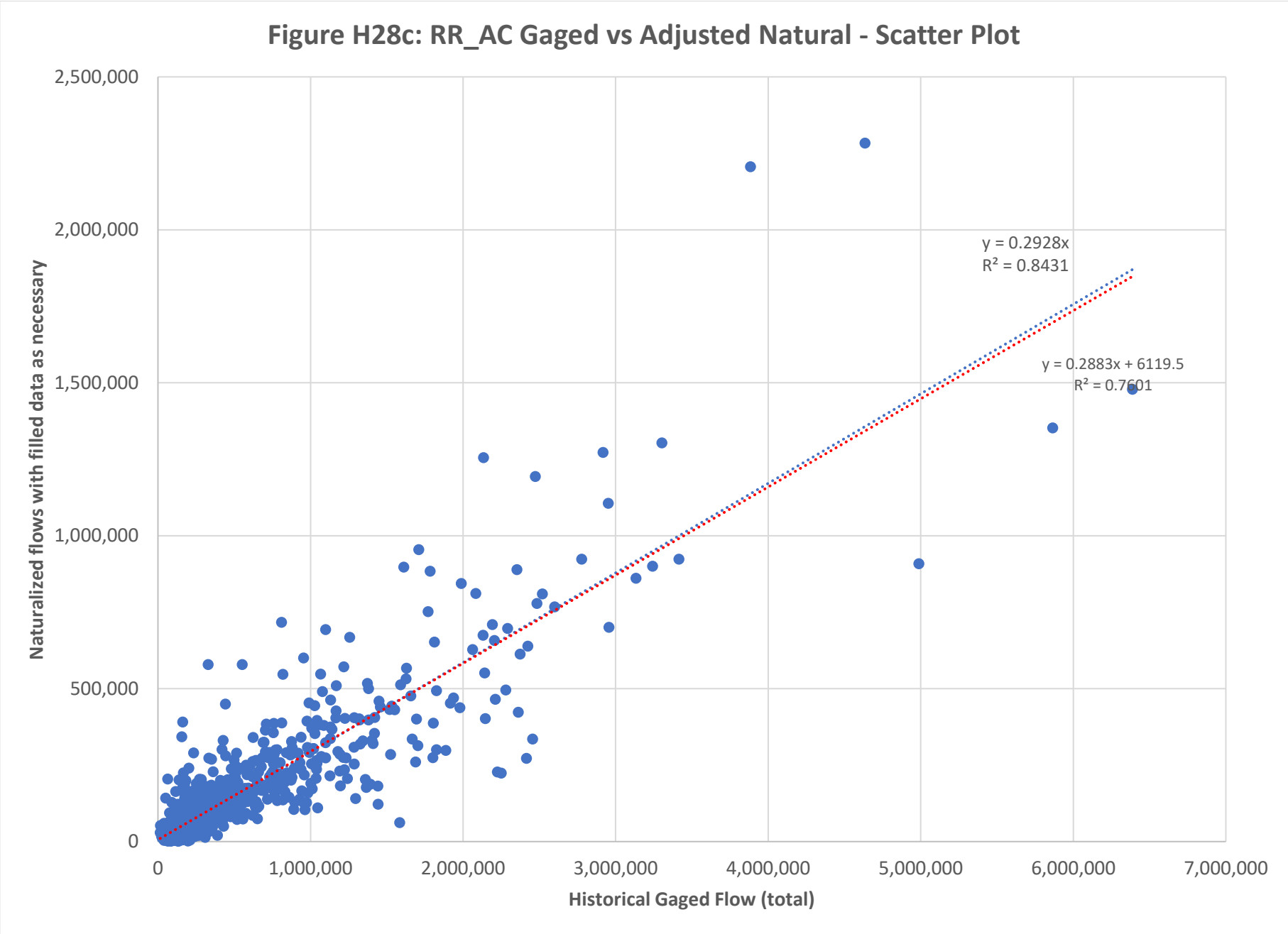


Figure H28c: RR_AC Gaged vs Adjusted Natural - Scatter Plot
Naturalized flows with filled data as necessary
Historical Gaged Flow (total)
2,500,000
2,000,000
1,500,000
1,000,000
500,000
0
0
1,000,000
2,000,000
3,000,000
4,000,000
5,000,000
6,000,000
7,000,000
y = 0.2928x
R² = 0.8431
y = 0.2883x + 6119.5
R² = 0.7601

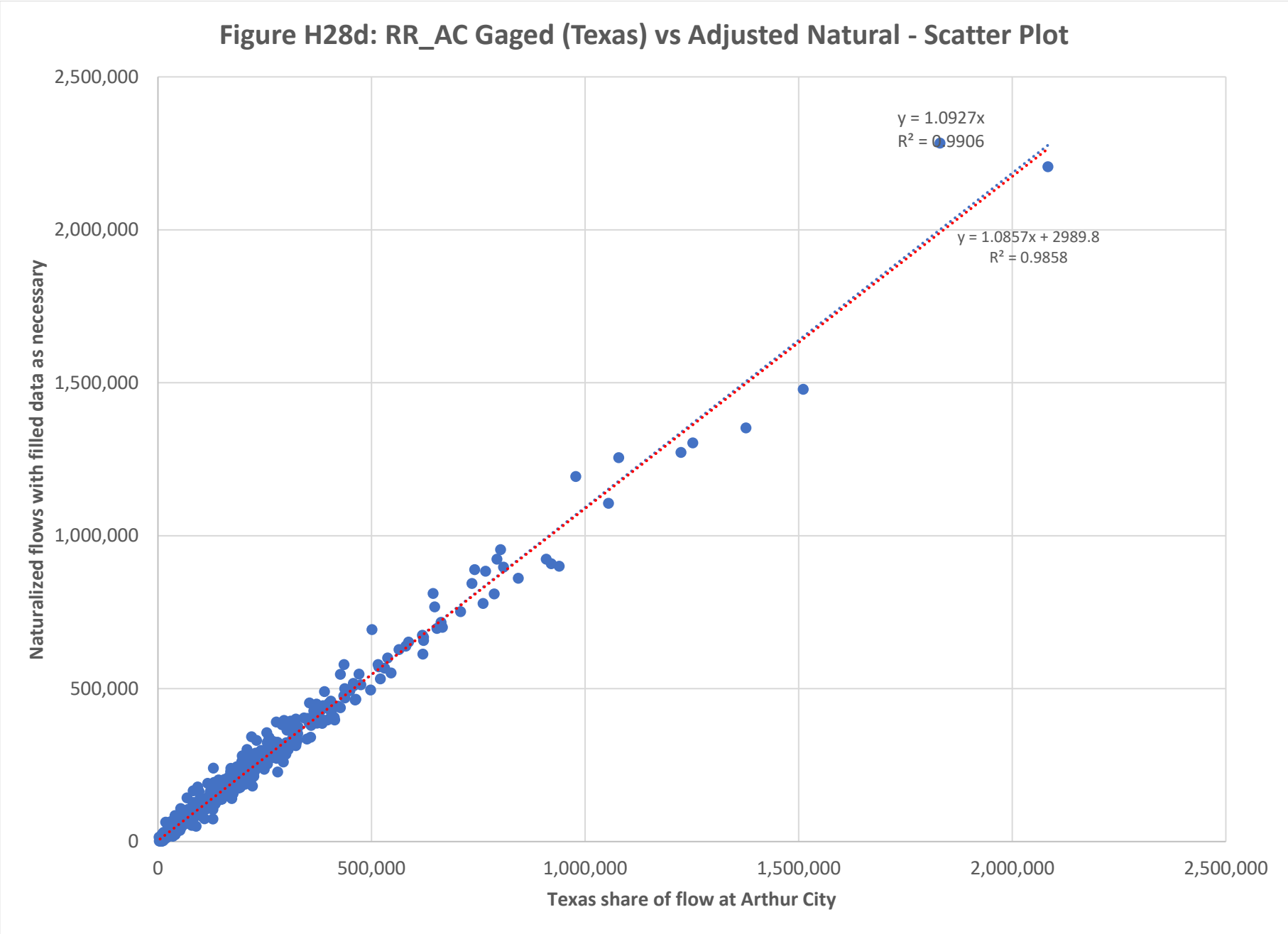


Figure H28d: RR_AC Gaged (Texas) vs Adjusted Natural - Scatter Plot
y = 1.0927x
R² = 0.9906
y = 1.0857x + 2989.8
R² = 0.9858
Naturalized flows with filled data as necessary
Texas share of flow at Arthur City
0
500,000
1,000,000
1,500,000
2,000,000
2,500,000

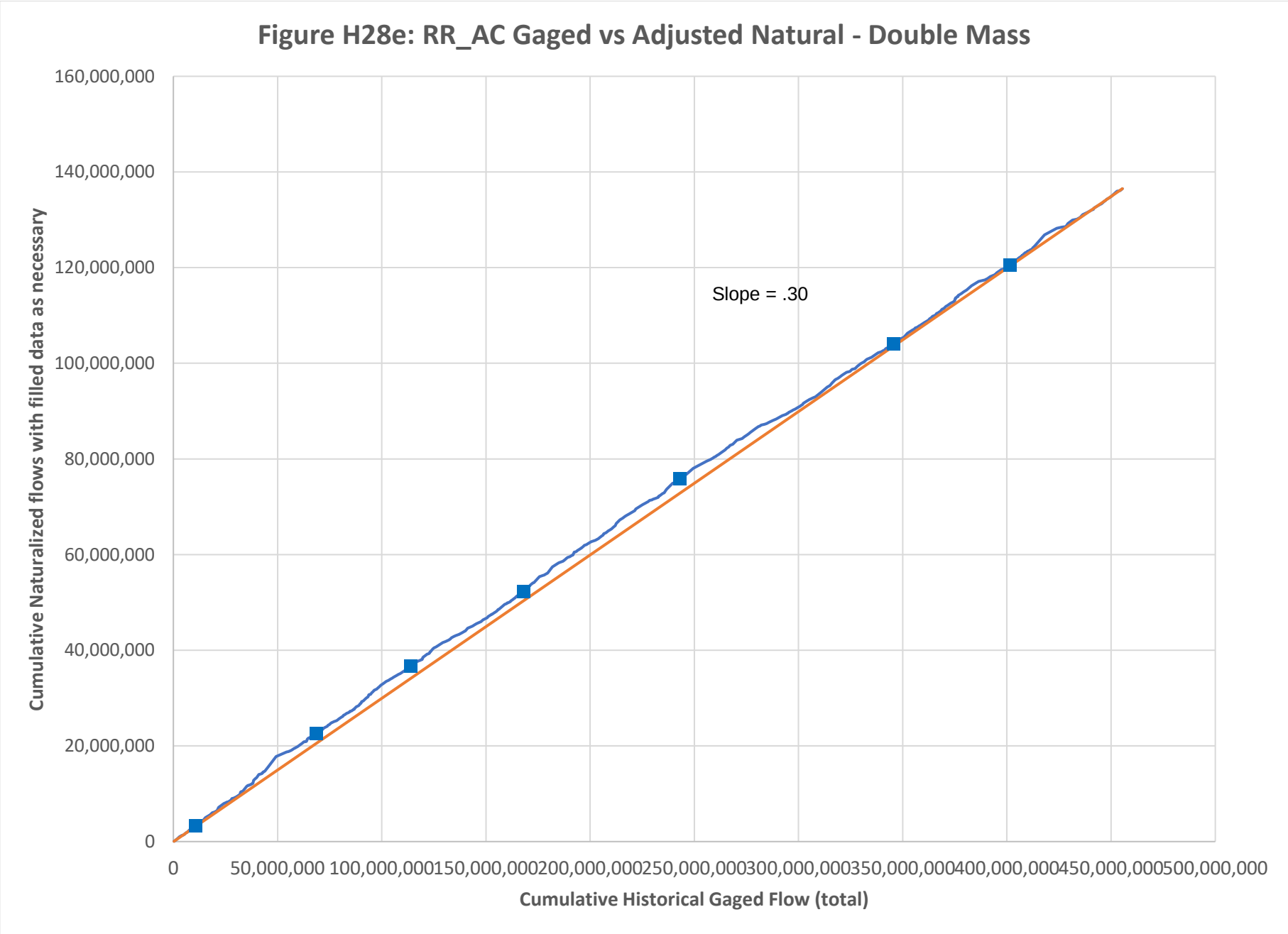


Figure H28e: RR_AC Gaged vs Adjusted Natural - Double Mass
Cumulative Naturalized flows with filled data as necessary
160,000,000
140,000,000
120,000,000
100,000,000
80,000,000
60,000,000
40,000,000
20,000,000
0
Slope = .30
0
50,000,000
100,000,000
150,000,000
200,000,000
250,000,000
300,000,000
350,000,000
400,000,000
450,000,000
500,000,000
Cumulative Historical Gaged Flow (total)

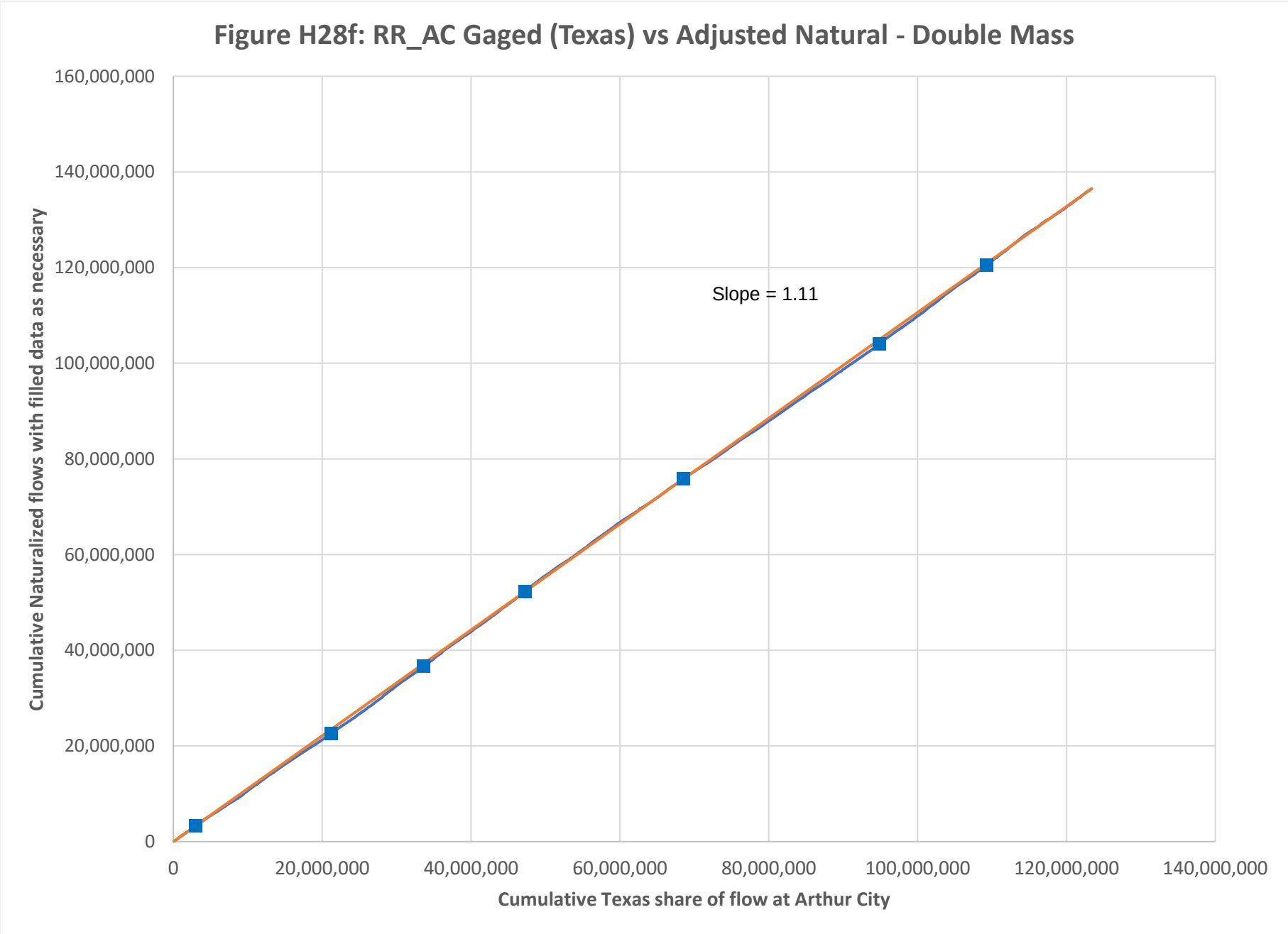


Figure H28f: RR_AC Gaged (Texas) vs Adjusted Natural - Double Mass
Slope = 1.11
Cumulative Naturalized flows with filled data as necessary
Cumulative Texas share of flow at Arthur City
0
20,000,000
40,000,000
60,000,000
80,000,000
100,000,000
120,000,000
140,000,000
160,000,000

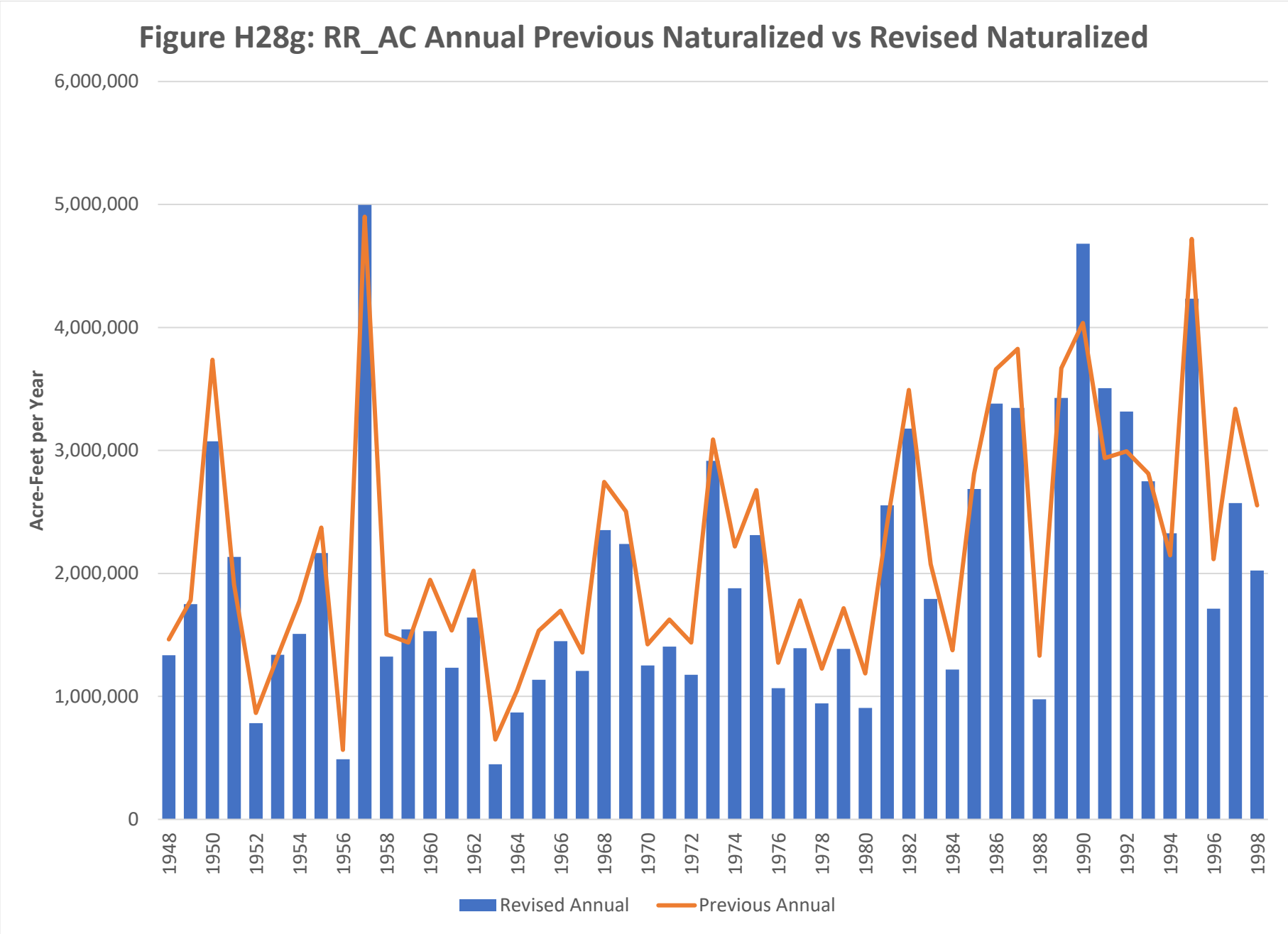


Figure H28g: RR_AC Annual Previous Naturalized vs Revised Naturalized
6,000,000
5,000,000
4,000,000
3,000,000
2,000,000
1,000,000
0
Acre-Feet per Year
1948
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
Revised Annual
Previous Annual

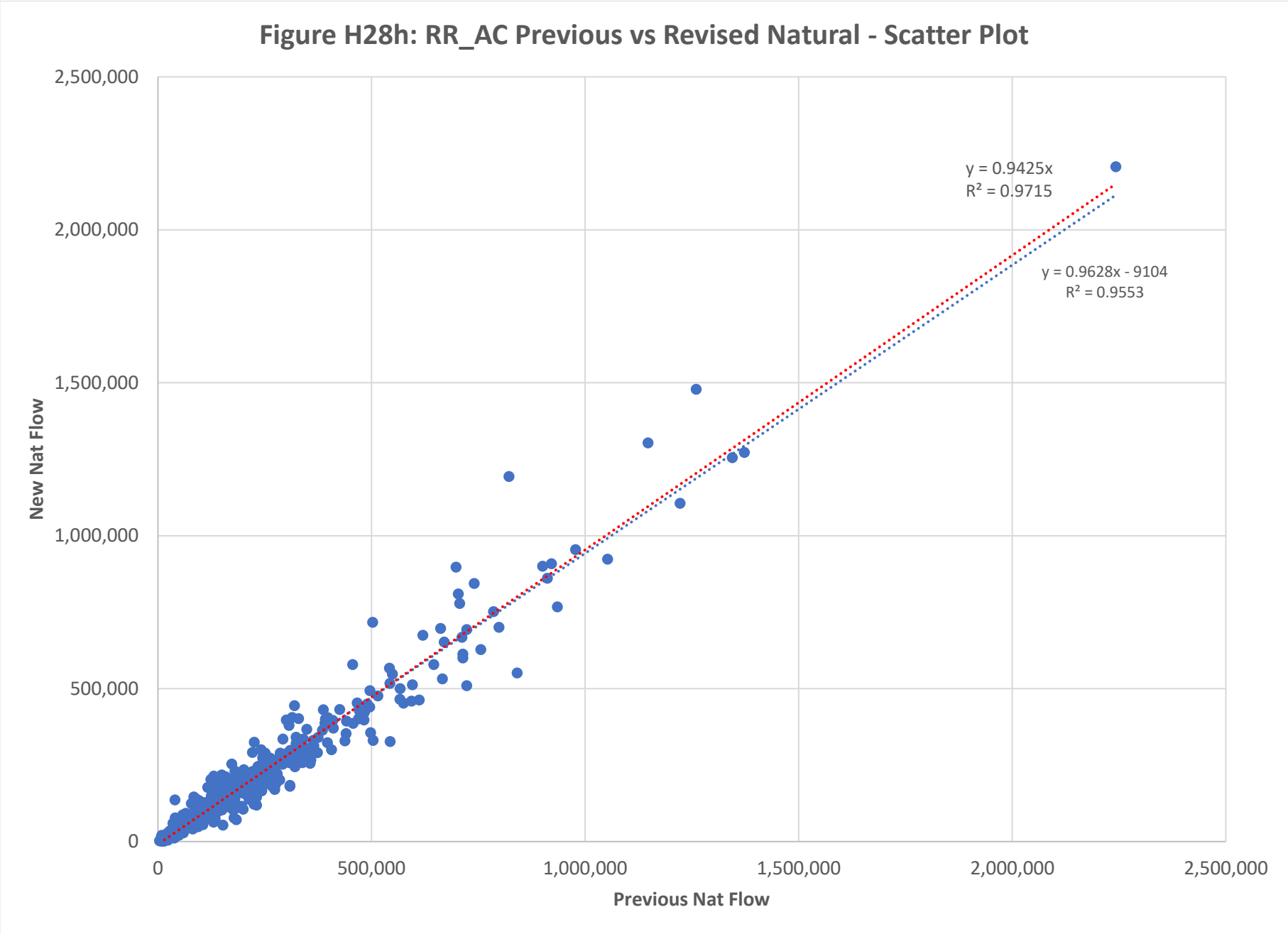


Figure H28h: RR_AC Previous vs Revised Natural - Scatter Plot
y = 0.9425x
R² = 0.9715
y = 0.9628x - 9104
R² = 0.9553
New Nat Flow
Previous Nat Flow
0
500,000
1,000,000
1,500,000
2,000,000
2,500,000

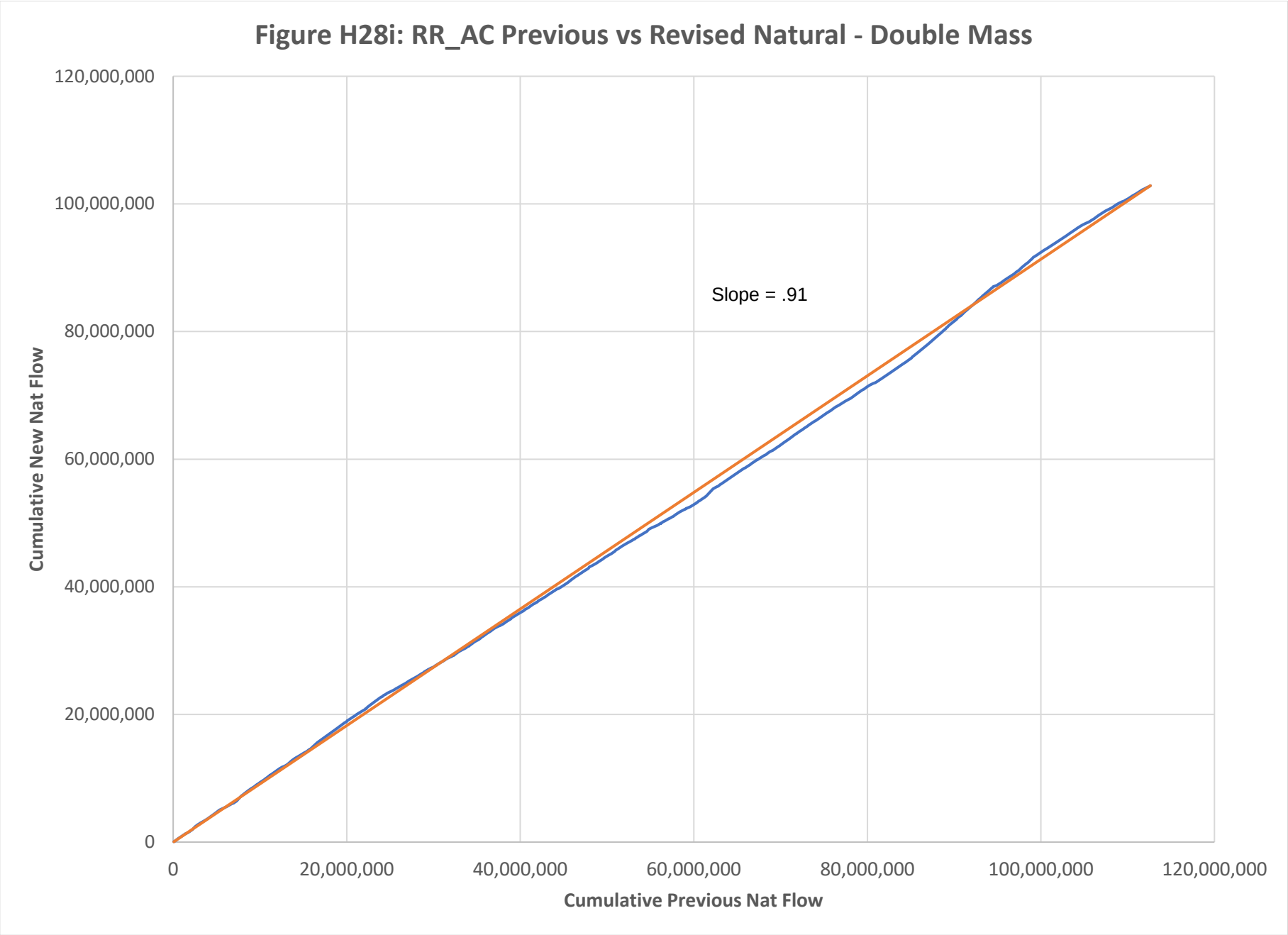


Figure H28i: RR_AC Previous vs Revised Natural - Double Mass
120,000,000
100,000,000
80,000,000
60,000,000
40,000,000
20,000,000
0
Cumulative New Nat Flow
Slope = .91
0
20,000,000
40,000,000
60,000,000
80,000,000
100,000,000
120,000,000
Cumulative Previous Nat Flow

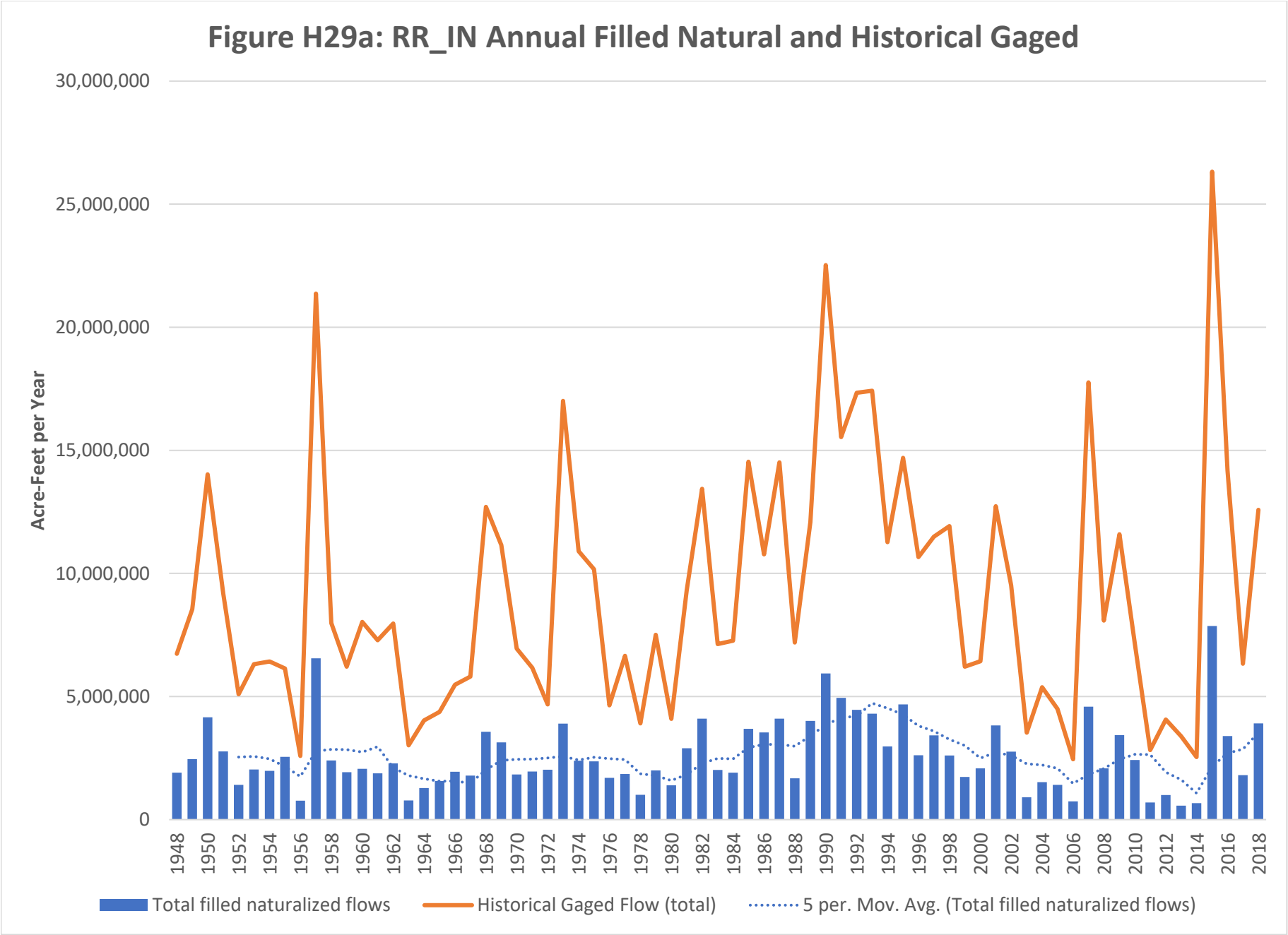


Figure H29a: RR_IN Annual Filled Natural and Historical Gaged
Acre-Feet per Year
30,000,000
25,000,000
20,000,000
15,000,000
10,000,000
5,000,000
0
1948
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
Total filled naturalized flows
Historical Gaged Flow (total)
5 per. Mov. Avg. (Total filled naturalized flows)

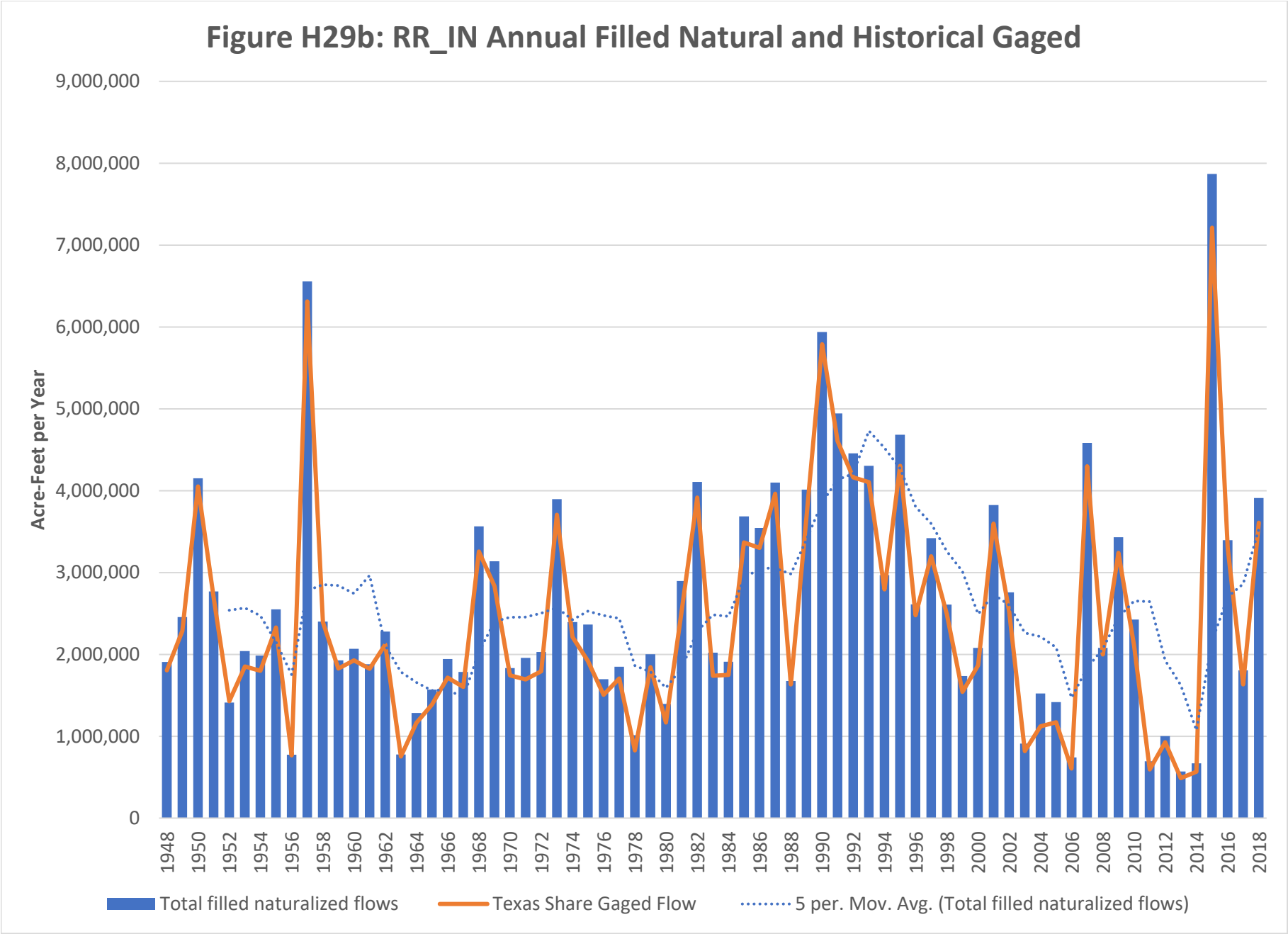


Figure H29b: RR_IN Annual Filled Natural and Historical Gaged
Acre-Feet per Year
9,000,000
8,000,000
7,000,000
6,000,000
5,000,000
4,000,000
3,000,000
2,000,000
1,000,000
0
1948
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
Total filled naturalized flows
Texas Share Gaged Flow
5 per. Mov. Avg. (Total filled naturalized flows)

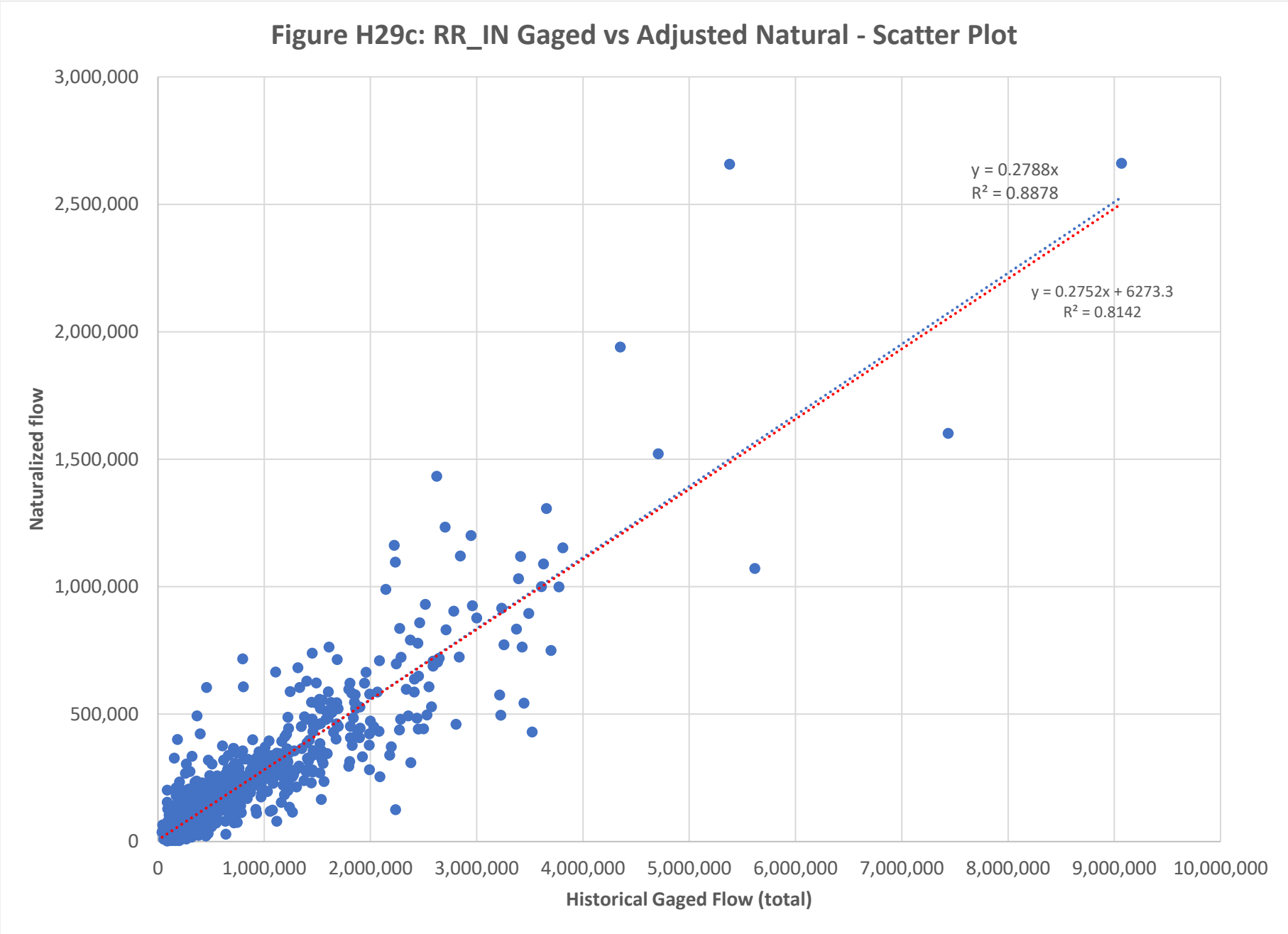


Figure H29c: RR_IN Gaged vs Adjusted Natural - Scatter Plot
y = 0.2788x
R² = 0.8878
y = 0.2752x + 6273.3
R² = 0.8142
Naturalized flow
Historical Gaged Flow (total)
0
500,000
1,000,000
1,500,000
2,000,000
2,500,000
3,000,000
0
1,000,000
2,000,000
3,000,000
4,000,000
5,000,000
6,000,000
7,000,000
8,000,000
9,000,000
10,000,000

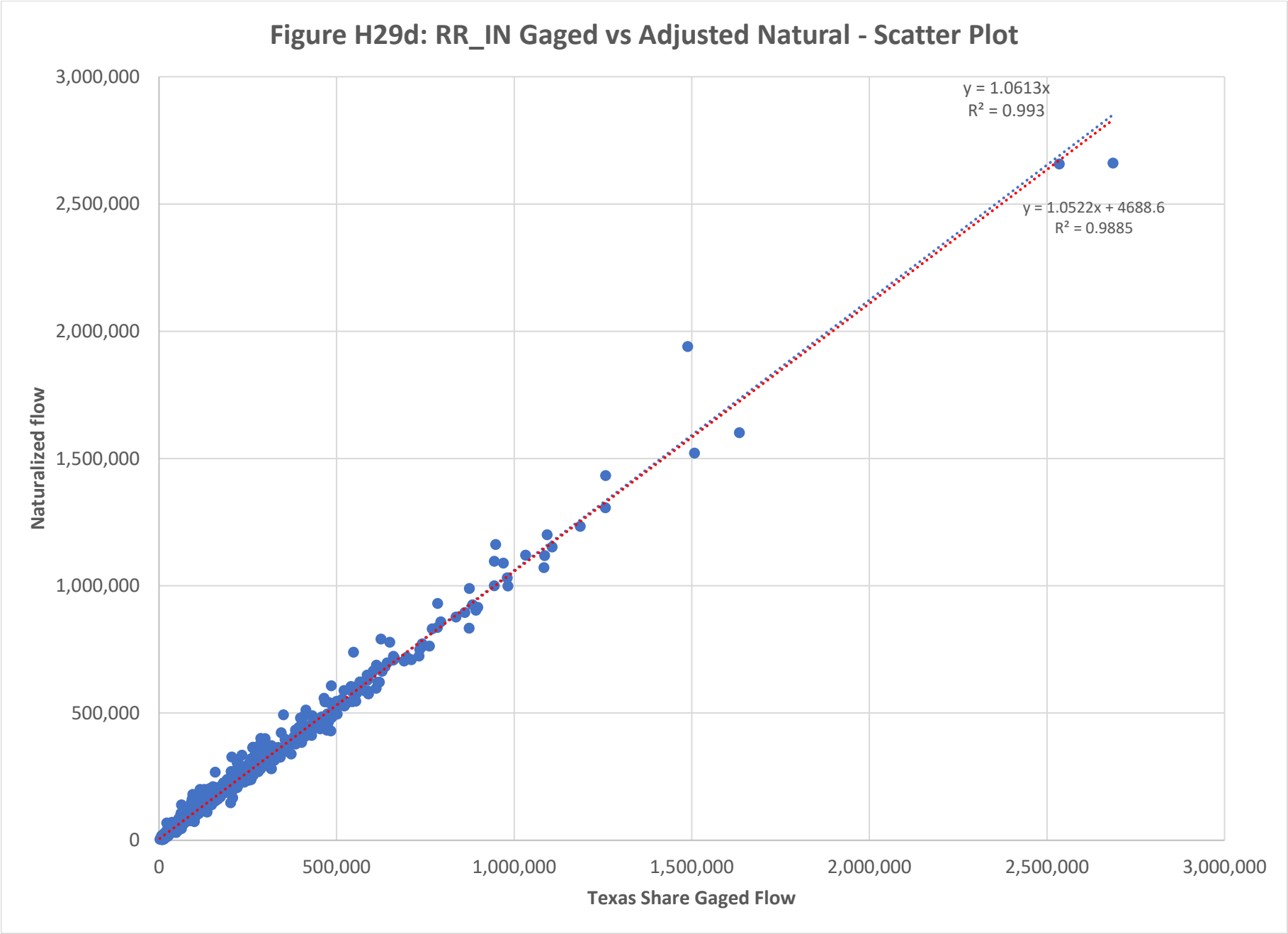


Figure H29d: RR_IN Gaged vs Adjusted Natural - Scatter Plot
y = 1.0613x
R² = 0.993
y = 1.0522x + 4688.6
R² = 0.9885
3,000,000
2,500,000
2,000,000
1,500,000
1,000,000
500,000
0
Naturalized flow
0
500,000
1,000,000
1,500,000
2,000,000
2,500,000
3,000,000
Texas Share Gaged Flow

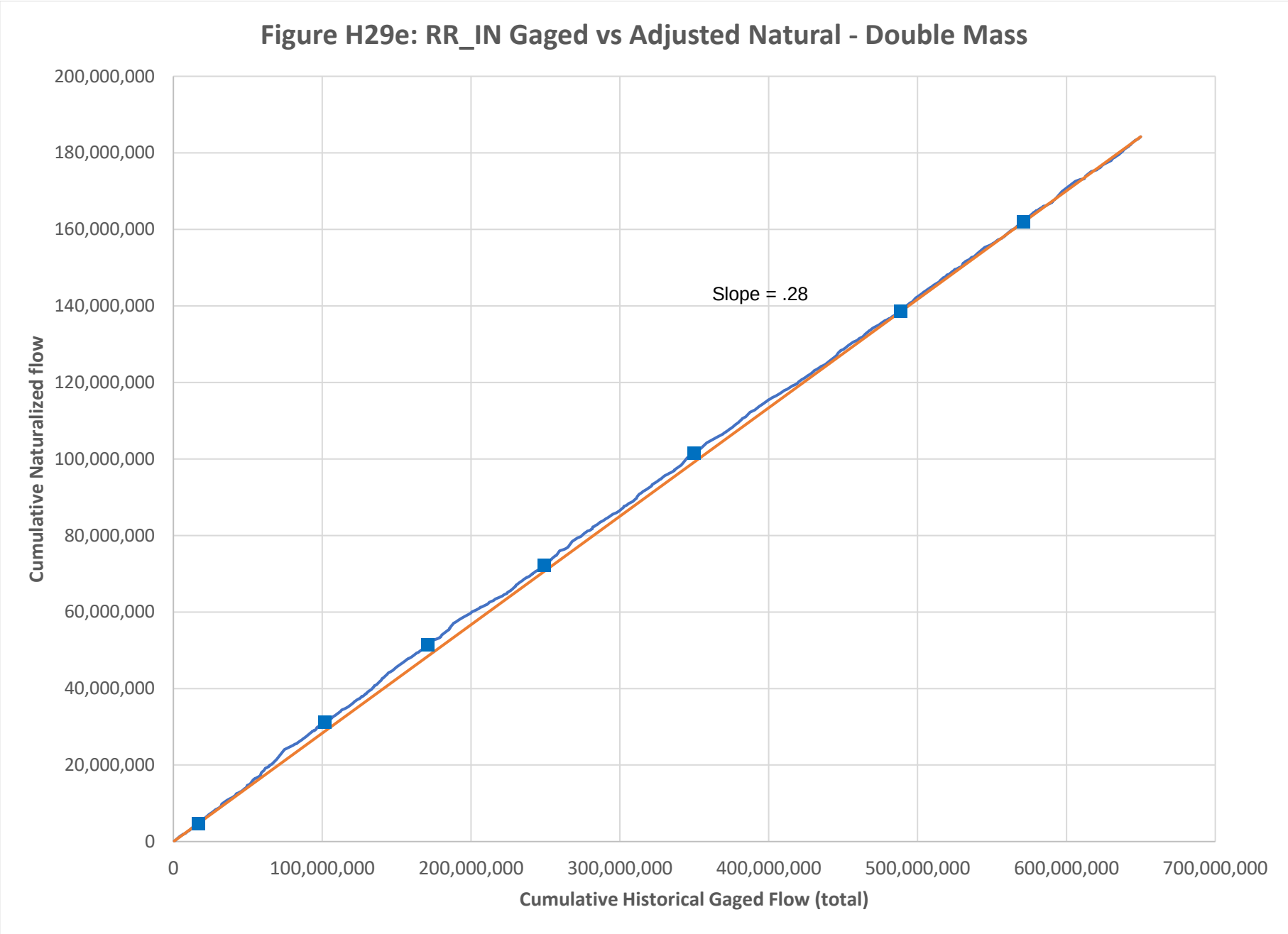


Figure H29e: RR_IN Gaged vs Adjusted Natural - Double Mass
Slope = .28
Cumulative Naturalized flow
Cumulative Historical Gaged Flow (total)
200,000,000
180,000,000
160,000,000
140,000,000
120,000,000
100,000,000
80,000,000
60,000,000
40,000,000
20,000,000
0
0
100,000,000
200,000,000
300,000,000
400,000,000
500,000,000
600,000,000
700,000,000

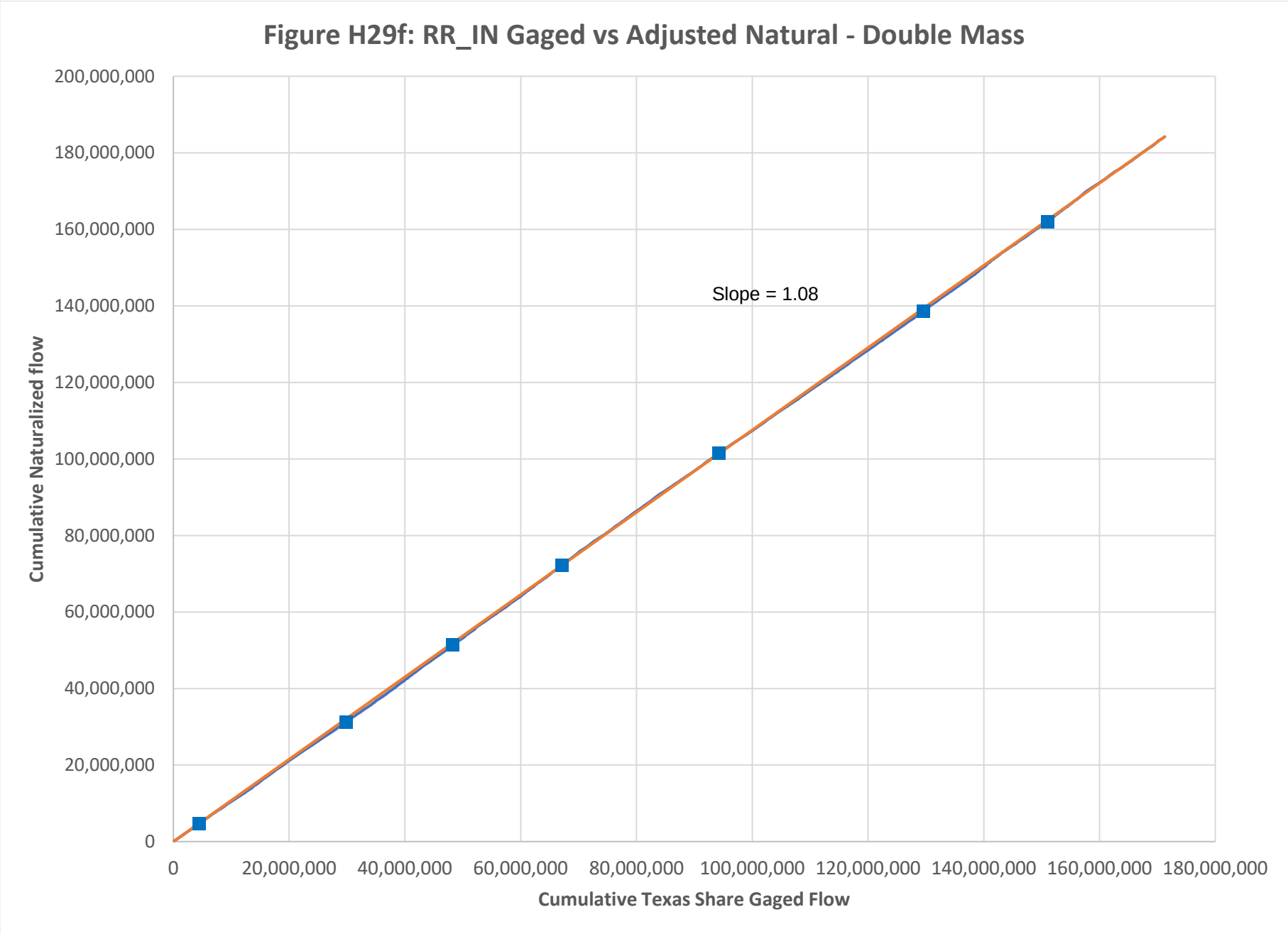


Figure H29f: RR_IN Gaged vs Adjusted Natural - Double Mass
Slope = 1.08
Cumulative Naturalized flow
Cumulative Texas Share Gaged Flow
0
20,000,000
40,000,000
60,000,000
80,000,000
100,000,000
120,000,000
140,000,000
160,000,000
180,000,000
200,000,000

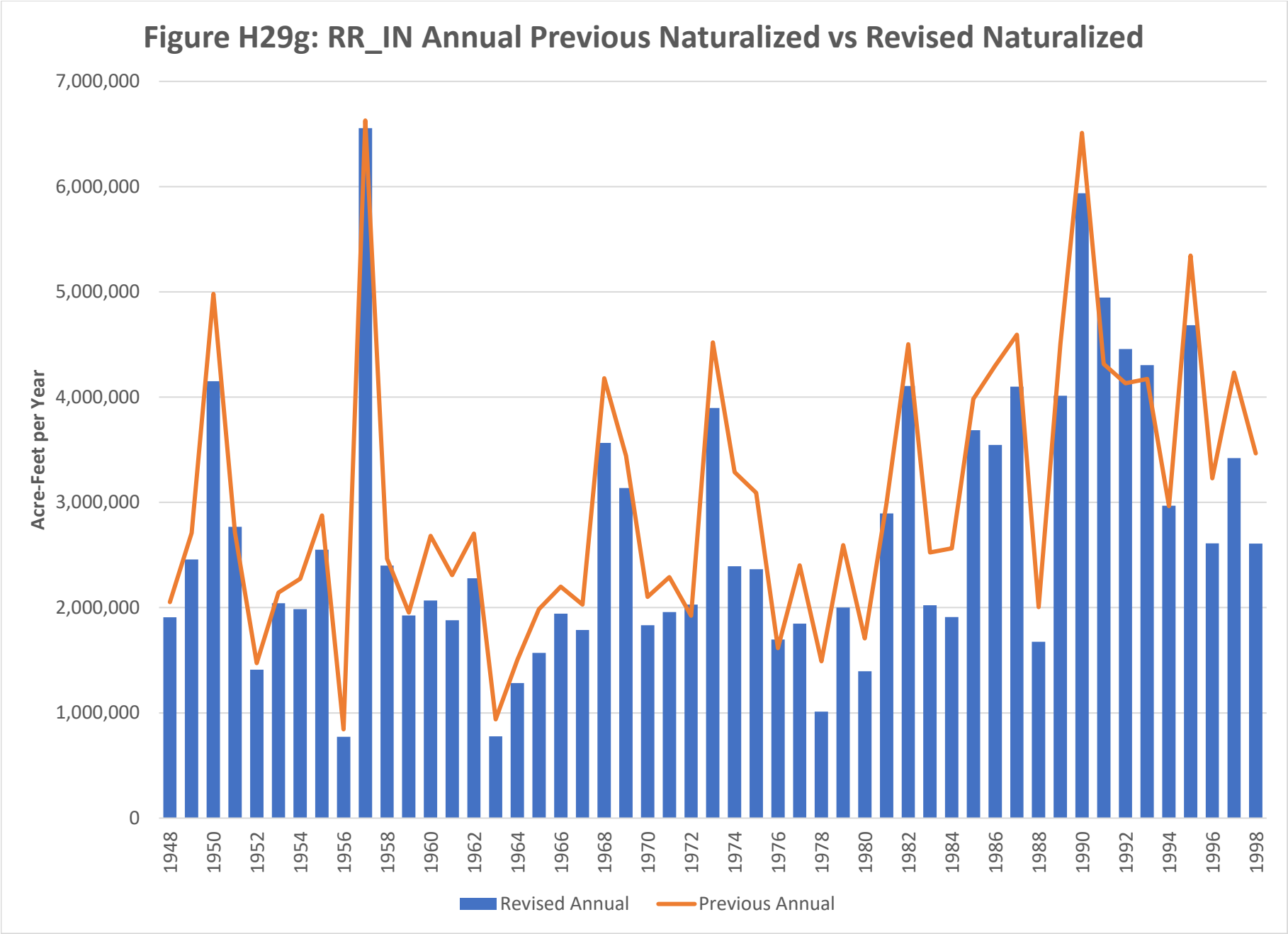


Figure H29g: RR_IN Annual Previous Naturalized vs Revised Naturalized
Acre-Feet per Year
7,000,000
6,000,000
5,000,000
4,000,000
3,000,000
2,000,000
1,000,000
0
1948
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
Revised Annual
Previous Annual

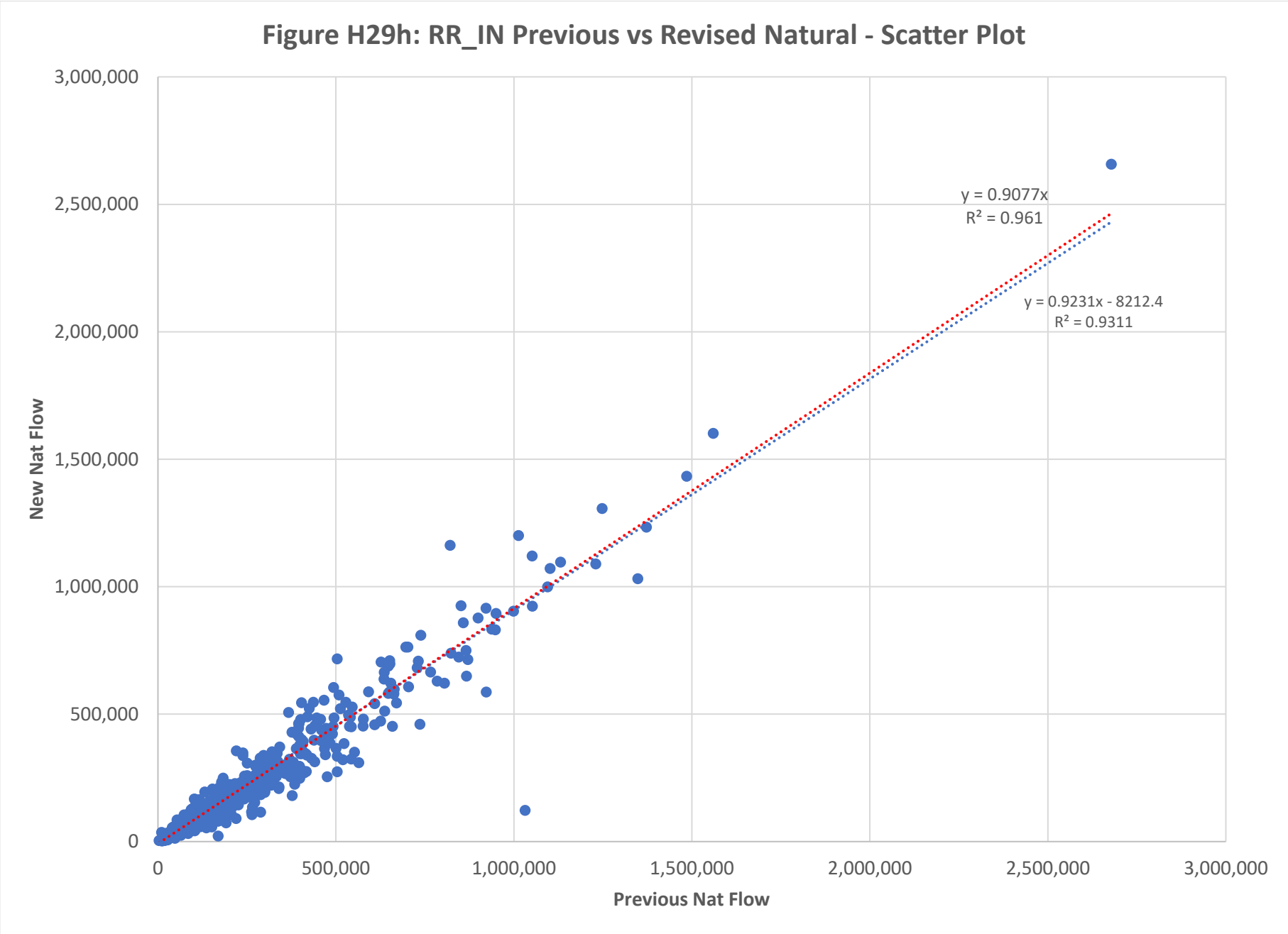


Figure H29h: RR_IN Previous vs Revised Natural - Scatter Plot
3,000,000
2,500,000
2,000,000
1,500,000
1,000,000
500,000
0
New Nat Flow
0
500,000
1,000,000
1,500,000
2,000,000
2,500,000
3,000,000
Previous Nat Flow
y = 0.9077x
R² = 0.961
y = 0.9231x - 8212.4
R² = 0.9311

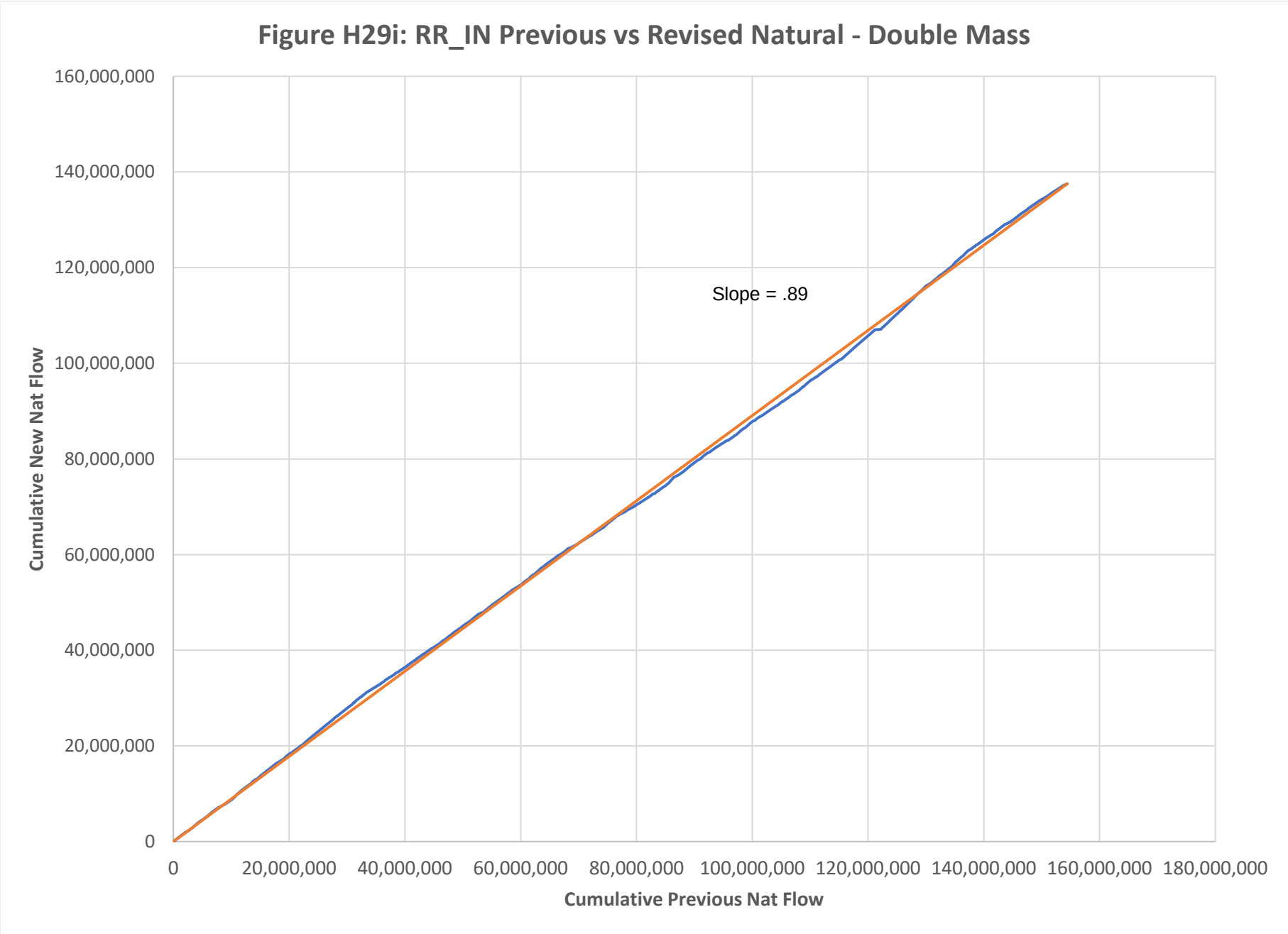


Figure H29i: RR_IN Previous vs Revised Natural - Double Mass
Slope = .89
Cumulative New Nat Flow
Cumulative Previous Nat Flow
0
20,000,000
40,000,000
60,000,000
80,000,000
100,000,000
120,000,000
140,000,000
160,000,000
180,000,000

Appendix I
Independent Peer Review

Appendix I – Independent Peer Review

Dr. Robert Brandes from Robert J. Brandes Consulting (RJBC) and Dr. Andres Salazar from Walter P. Moore and Associates were the Independent Peer Reviewers (IPRs) for the update of the Red River WAM hydrology. The IPRs provided an overall review of the technical side of the project, including formal comments on the Work Plan, Draft Final Naturalized Flows and Draft Final Report. The Peer Reviewers were also available for consultation regarding technical issues throughout the project.

The IPRs were formally engaged at four points in the project:

- During the development of the Work Plan, where the IPRs provided comments on the technical report and other aspects of the Work Plan.
- In September 2020, where the IPRs provided input on:
    - Red River Compact Reach 1 Subbasin 1 issues. As a result of this input:
        - A new primary control point, the North Fork of the Red River near Shamrock (NF_SH) was identified (**Chapter 5.1**).
        - A recommendation that the control points in this Subbasin be disconnected from the rest of the WAM model since these tributaries flow into Oklahoma before joining the Red River on the Texas/Oklahoma border. (**Chapter 5.2**)
    - Provided a general review of the approach to naturalizing flows along the Texas/Oklahoma border (**Chapter 3.2.1** and **Appendix E**).
    - Provided input on City of Amarillo return flows that are used to maintain storage in Lake Tangle wood (**Chapter 2.6**).
    - Reviewed proposed methods for defining fill relationships.
- In May 2021, where the IPRs provided input on:
    - The final methods used to naturalize flows on the Texas/Oklahoma border.
    - Reviewed and approved the proposal to use WRAP to adjust for negative incremental flows.

RJBC Comments on Initial Draft Final Report and Naturalized Flows

Bob Brandes reviewed the Initial Draft Final Report and, in addition to minor editorial comments, had the following comments (comments are in plain text, responses are in *italics*).

1. Executive Summary page ES-1 - Might make it clear that 1948 was the initial year of the original WAM datasets.

   The following sentence has been added: "Previous work began in 1948 and ended in 1998."

2. Section 2.1 page 4 – It is not clear why this (the Lake Pat Mayse control point)is proposed. Can you make a brief statement here as to why (the Pat Mayse control point was dropped from consideration)?

   A paragraph has been added describing why Lake Pat Mayse was considered for a primary control point and why it was dropped from the final.

3. If these two CPs (new control points SF_CL and NF_SH) are retained, why are they referred above as potential new primary control points?

   Text has been corrected to affirm that these are new primary control points and are no longer proposed.

4. Section 2.2 page 9 – (Discussion of mass balance model) Is this explained later? If not, may want a brief explanation here.

   A brief description of the mass balance model has been added, and it was clarified that the mass balance model was used for the reservoir operation studies.

5. Section 2.6 page 22 – (discussion of Leonard Water Treatment Plant) Water or wastewater?

   Text was added to clarify that this is a water treatment plant and return flows from the plant will be backwash from water treatment.

6. Section 3.1 page 23 - (discussion of delivery factors in Table 8) Proposed or used? As shown in Table 8, each individual reach associated with a downstream control point has a delivery factor. So the implication that a single delivery factor is applied to all upstream adjustments as shown in the basic naturalized flow equation above is somewhat misleading. I assume that individual delivery factors for specific reaches are applied to the adjustments for an upstream control point as these adjustments move downstream in the naturalized flow calculation process. Maybe some clarification as to how delivery factors are applied would be helpful.

   Section 3.1 has been revised to clarify that the loss and deliver factors in Table 8 were used in the naturalization, explain how they are applied, and have been applied in the updated WRAP code. The equation has been updated.

7. Section 3.4 page 31 (discussion of fills as they apply to Bois d'Arc flows) Is this paragraph needed since all it does is provide a description of gages and refer to Chapter 3.2.2.

   The paragraph, which is in the section on fills, has been retained because Bois d'Arc naturalized flows require the use of fills. Chapter 3.2.2 provides the details.

8. Section 3.4 page 31 (discussion of Ringgold flows) How was this done? By drainage area ratios?

Text was clarified to state that the Ringgold naturalized flows were determined using drainage area ratios

9. Appendix H – some graphs do not have horizontal axis.

   This has been corrected.

10. There is one issue that needs to be clarified in Section 5.0 – Modifications to WRAP Input Files and Section 6 – Procedure for Negative Incremental Flows. In several places there are "recommended" or "suggested" changes or approaches, but it is not clear if these have been done or if it is being left up to TCEQ to make these changes or approaches. If these have not been made, then there should be a statement up front that clarifies why these changes or approaches are being noted and discussed. If they have been made, then it needs to be so stated. I would think that TCEQ (Kathy) would want all of these changes or approaches implemented by FNI subject to TCEQ's after-the-fact acceptance.

    These sections have been clarified to indicate that the recommendations have been applied to the WRAP code submitted with the Draft Final Report.

Walter P. Moore Comments on Initial Draft Final Report and Naturalized Flows

Andres Salazar, PhD, of Walter P. Moore provided comments on draft Final Report and Naturalized Flows on August 5, 2021, and a final comment letter on August 19, 2021. The following table contains the responses to the comments. The letter is provided as an attachment to this Appendix.

As a result of these comments, plus comments from TCEQ, an additional Appendix has been provided describing the update process for the naturalized flows.

WPM Initial Comments

FNI responses in italic

Workbook	Variable	Comments
RR_CB.xls RRGAtoRRCB	Adjustment to Dam (-) or Colbert (-) Column V	If the Texoma outflows are measured at the Denison Dam gage, then, no adjustment is needed. I see that for the period 10/1958 to 9/1961, the Denison Dam is used but an adjustment is added to calculate the Texoma Outflows. *According to the description, the flows were measured at the downstream location until 9/1961. On the website, the flows from 10/58 to 9/61 are reported as Denison Dam (and sometimes the same flows are reported as both Colbert and Denison Dam), even though the published records are consistent in the name (Denison Dam as the upstream location and Colbert as the downstream location). In the workbooks, I listed them as reported on the website.*
RR_AC.xls RRCBtoRRAC	RRCB - Texoma Outflows (ac-ft) Column C	This column should the Texoma outflow, either as measured at the Denison Dam, USACE numbers, or the adjusted Colbert gage. This should be equal to <u>Column W</u> of RR_CB and the drainage area of the outflow should be 39,720 sq-mi. But the workbook calls for <u>Column S</u> of RR_CB and the drainage are changes in the middle of the analysis. *I am referring to Column S because I wanted to only use measured flows. Column W has some estimated flows, the incremental flows between the dam and the Colbert location, from 10/61 to 12/18. Makes it a little more complicated because the drainage areas change, but I think it is consistent with the approach used throughout (i.e. not using estimated historical flows unless I have to).*

713.630.7300 main

August 19, 2021

Mr. Jon Albright
Water Resources Planning
Freese and Nichols, Inc.
Via email to jsa@freese.com

Re: Naturalized Flows Extension for the Red River WAM
Independent Peer Review Comments
WPM Project: H20.20009.00

Dear Mr. Albright:

Walter P Moore and Associates (WPM) has completed the review of the Naturalized Flows Workbooks as part of our Independent Peer Review contract for the Red River Natural Flow Extension. The reviewed documents include:

- Draft Technical Memorandum entitled "Methodology for Main Stem Flow Naturalization", dated May 19, 2021.
- Draft Technical Report "Water Availability Model Update – Red River Basin", dated July 1, 2021
- Naturalized Flow Workbooks, which include:
    - Natural Flow Calculation Workbooks for the Red River WAM Primary Control Points
    - Content Change Calculations
    - Net Evaporation Calculations
    - Gaged Flows Compilation
    - Water Use
    - Return Flows

The Memorandum listed in the first bullet and associated spreadsheets were transmitted to our office on May 20. 2021. The other documents were transmitted to our office on July 6, 2021. Our understanding of the overall process for naturalized flow extension and comments are:

1. We reviewed the general methodology for calculating the portion of the gaged flows of the control points in the main stem of the Red River that originates in Texas. We found the process to be well documented in the technical memorandum. The proposed methodology by FNI provides reasonable estimates of Texas flows using the available data.

2. WPM developed an independent spreadsheet that follows the proposed approach to estimate the contribution from the Texas portion at each of the six gages in the main stem using gaged data and drainage areas. We were able to reproduce FNI results.

3. Specific comments on the estimates of gaged flows originating in Texas are included in Appendix 1.

4. The workbooks to estimate naturalized flows and those with reservoir operation simulations have links to external workbooks as data source for the calculations. This linkage creates a chain of workbooks that will need be updated sequentially from upstream to downstream. This set up is practical given the vast amount of data and the need to maintain calculations for each control point and reservoir in individual spreadsheets. But a change to one value requires updates of multiple workbooks. We suggest creating and documenting a process to update the workbooks in case of future revisions.

5. The structure of the workbooks that calculate naturalized flows ("20Nat_XXYY") is logical and accounts for all adjustments required (diversion, return flows, evaporation, and content change). Each spreadsheet calculates incremental adjustments. Adjustments made at the upstream control points are linked to the corresponding workbook.

6. The naturalized flow is then calculated as gaged flow plus incremental adjustments plus upstream adjustments. Upstream adjustments account for channel losses. Negative naturalizes flows are removed.

7. Months with missing gaged values are filled in correlation with nearby gages. The is a series of workbooks that document the relationships used to fill in missing values.

8. Our review found all workbooks for primary control point follow consistently the methods outlined in items 5 to 7. WPM is in general agreement with the process and structure of the workbooks.

9. Specific comments on specific Workbooks are listed in Appendix 2.

Should you have question or need clarification on any of these comments, please contact me at asalazar@walterpmoore.com or (713) 630-7436. We appreciate the opportunity to be part of your team on this project.

Sincerely,

Walter P. Moore and Associates, Inc.

Andres Salazar, PhD, PE, D.WRE.
Director of Water Resources

Enclosure

Appendix 1 – Comments on the Main Stem Flow Naturalization
Appendix 2 – Specific comments on Naturalized Flow Workbooks

Appendix 1
Comments on the Main Stem Flow Naturalization

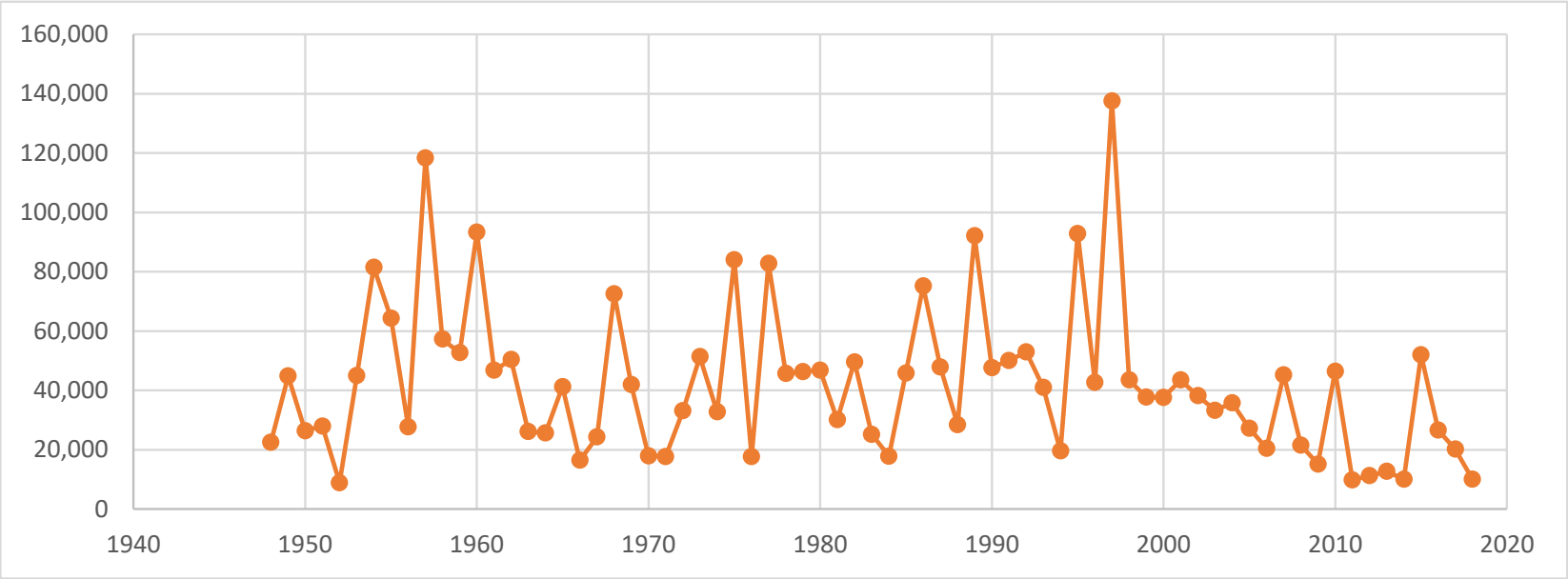
	Workbook	Variable	Comments
1	RR_CB.xls RRGAtoRRCB	Adjustment to Dam (-) or Colbert (-) Column V	If the Texoma outflows are measured at the Denison Dam gage, then, no adjustment is needed. I see that for the period 10/1958 to 9/1961, the Denison Dam is used but an adjustment is added to calculate the Texoma Outflows.
2	RR_AC.xls RRCBtoRRAC	RRCB - Texoma Outflows (ac-ft) Column C	This column should the Texoma outflow, either as measured at the Denison Dam, USACE numbers, or the adjusted Colbert gage. This should be equal to Column W of RR_CB and the drainage area of the outflow should be 39,720 sq-mi. But the workbook calls for Column S of RR_CB and the drainage are changes in the middle of the analysis.

Appendix 2
Comments on the Naturalized Flow Workbooks

	Control Point / Reservoir	Workbook	Comment
1	Buffalo Lake	Buffalo_SIM_Partial.xlsb (under KRC Reservoirs)	Calculated inflows after 2003 are substantially smaller than the rest of the historical period with most months being zero. Some explanation or an alternate source gage is required.
2	Salt Fork of Red River at Magnum	20Fill_SFMA.xlsb	Total flows are calculated with Drainage Area Ratio method using incremental flows. This is reasonable as long as the incremental flow is greater than zero. If incremental flows are negative, the calculations adjust the incremental flow to zero, also producing zero naturalized flow even when there is flow at both gages.
3	Bivens Lake	Bivens_SIM.xlsb	There is not a good correlation between the flows at SF_MA and the available flow at the lake to be able to use a correlation or drainage area method.
4	Various Reservoir Simulations	All reservoirs under Content Change/KRC Reservoirs	The simulations calculate evaporation based on the area at the beginning of the month and not based on the average area in the month. This may work if the reservoir content does not change a lot in the month, but it neglects some evap/precip on the surface if there is a substantial change. For example, if the reservoir is empty and fills in the month (because of high flows and high precipitation), the net evap amount is being calculated as zero and the precipitation over the surface is not accounted for.
5	Salt Fork Red River near Clarendon (SF_CL)	KRC-Historical Data Greenbelt Reservoir - extended to 2019.xlsb	The spreadsheet does not have input for releases and spills. We recommend adding a comment Greenbelt Lake has not had any releases or spills and therefore, they are not included in the calculations.
6	Salt Fork Red River near Wellington	20Nat_SFWL.xlsb	The naturalized flows after 1998 appear to have a different pattern from those before 1998. See Figure 1 at the end. I did not find anything wrong with the calculations, but I suggest confirming the calculations are not missing any watershed development after 1998.
7	McClellan Lake	McClellan_SIM.xlsb	The gage at McClellan Ck nr McLean (USGS 07301200) has a good period of record and we think is a better source than SF_MA to estimate the inflow to this reservoir.

	Control Point / Reservoir	Workbook	Comment
8	McClellan Lake	McClellan_SIM.xlsb	Suggest verifying the drainage area of 86 sq-miles (FNI estimate). The gage at McClellan Ck at McLean has a contributing drainage area of 460 sq-miles and seems to be consistent with the 245 sq-miles of the Red River WAM.
9	Groesbeck Creek at SH6 near Quanah	20RF_GCQN.xlsb	Return flows are missing (1999-2000 and 5/2009 to 12/2019).
10	North Wichita River near Truscott	20Nat_NWTS.xlsb	Truscott Brine Lake is located upstream of the gage but not included in the calculations. Suggest adding a comment to either the report or the spreadsheet that chloride control projects do not have discharge and therefore, excluded from the calculations.
11	Lake Kemp	KempContEvap.xlsb	Reservoir content in tab “Cont. Chg. 1” is hardwired before 1998 and could not be verified/reviewed.
12	Wichita River near Wichita Falls	20Nat_WRWF.xlsb	My recollection is Lake Kemp and Lake Diversion is a reservoir system where releases are made upstream and diverted downstream. I spent some time looking at how this was handled. Lake Kemp historical records have some months with large negative content change, which probably suggest a release, but these months have substantial smaller diversion or storage gain downstream. I suggest verifying the diversion from Diversion Lake are properly accounted for.
13	Red River near Arthur	20Nat_RRAC.xlsb	Lake Bonham Content Change has all zeroes.

Figure 1
Annual Naturalized Flow Salt Fork Red River near Wellington



Red River WAM Naturalized Workbooks Review
August 5, 2021
Comments by Andres Salazar, Walter P Moore and Associates, Inc.
FNI responses added August 12, 2021

	Control Point / Reservoir	Workbook	WPM Comment	FNI Response
1	Buffalo Lake	Buffalo_SIM_Partial.xlsb (under KRC Reservoirs)	Calculated inflows after 2003 are substantially smaller than the rest of the historical period with most months being zero. Some explanation or an alternate source gage is required.	The flows after 2003 are based on USGS 07295500 Tierra Blanca Ck above Buffalo Lake near Umbarger, TX, which measures a substantial portion of the inflows into the lake. It is not clear why the flows are lower than earlier years, but it matches a trend seen in other gages in West Texas.
2	Salt Fork of Red River at Magnum	20Fill_SFMA.xlsb	Total flows are calculated with Drainage Area Ratio method using incremental flows. This is reasonable as long as the incremental flow is greater than zero. If incremental flows are negative, the calculations adjust the incremental flow to zero, also producing zero naturalized flow even when there is flow at both gages.	The semi-naturalized incremental flows at Mangum are only used to fill data at other naturalized flow locations from 1/1948 to 6/1952, before flows at the Wellington gage (SFWL) become available. Since these are total flows and not incremental, this comment does not apply. The incremental flows are sometimes used to estimate reservoir inflows when other sources are not available. In this case, the incremental flows are scaled up so that they represent the total Mangum drainage area. The zero flows provide a conservatively low estimate of inflows for use in operation studies, most of which are located relatively far upstream.

	Control Point / Reservoir	Workbook	WPM Comment	FNI Response
3	Bivens Lake	Bivens_SIM.xlsb	There is not a good correlation between the flows at SF_MA and the available flow at the lake to be able to use a correlation or drainage area method.	The operation has been changed to use the USGS 07295500 Tierra Blanca Ck above Buffalo Lake near Umbarger, TX gage when available. This gage is located fairly close to the Bivens watershed. There are no other good alternatives when this gage is not available. The available historical storage from the original Red WAM was inadvertently left out of the original calculations and that has been corrected. Also, the assumed recharge rate has been increased based on the historical storage data.
4	Various Reservoir Simulations	All reservoirs under ContentChange/KRC Reservoirs	The simulations calculate evaporation based on the area at the beginning of the month and not based on the average area in the month. This may work if the reservoir content does not change a lot in the month, but it neglects some evap/precip on the surface if there is a substantial change. For example, if the reservoir is empty and fills in the month (because of high flows and high precipitation), the net evap amount is being calculated as zero and the precipitation over the surface is not accounted for.	All of these reservoirs are relatively small, and the error introduced by using the beginning of month area rather than the average area is small.
5	Salt Fork Red River near Clarendon (SF_CL)	KRC-Historical Data Greenbelt Reservoir - extended to 2019.xlsb	The spreadsheet does not have input for releases and spills. We recommend adding a comment Greenbelt Lake has not had any releases or spills and therefore, they are not included in the calculations.	A note has been added to the historical data file. There already is a note in the naturalized flow workbook for SF_CL.

	Control Point / Reservoir	Workbook	WPM Comment	FNI Response
6	Salt Fork Red River near Wellington	20Nat_SFWL.xlsb	The naturalized flows after 1998 appear to have a different pattern from those before 1998. See Figure 1 at the end. I did not find anything wrong with the calculations, but I suggest confirming the calculations are not missing any watershed development after 1998.	There appears to be a change in high flow events in recent years. Looking at the daily flows, the maximum flow on any day since 1998 is 3,230 cfs. Flows over 10,000 cfs occurred every few years prior to that. There are no new reservoirs or flood control projects that we are aware of that could cause this.
7	McClellan Lake	McClellan_SIM.xlsb	The gage at McClellan Ck nr McLean (USGS 07301200) has a good period of record and I think is a better source than SF_MA to estimate the inflow to this reservoir.	The McClean gage has records from 10/1967 to 9/1980 and from 10/2002 to 9/2005. There are quite a few days with missing flows in the 2002 to 2005 period. According to Report 244 records are poor and flows are largely regulated by Lake McClellan. Because it is so close to the lake and historical records from the lake are limited (1/1948 to 6/1963), this is probably not the best gage to use. We did examine several alternatives to SF_MA as part of this reevaluation and are submitting a revised simulation using the North Fork near Carter instead of the Mangum gage. Although this gage is downstream of the lake, it is far enough downstream that is it not greatly influenced by the lake. It also has an overlap with the period of available historical data (1948 to 1963), so a correlation can be made between mass balance flows and the gage records. This is beneficial because of uncertainty around the drainage areas (see next comment).

	Control Point / Reservoir	Workbook	WPM Comment	FNI Response
8	McClellan Lake	McClellan_SIM.xlsb	Suggest verifying the drainage area of 86 sq-miles (FNI estimate). The gage at McClellan Ck at McLean has a contributing drainage area of 460 sq-miles and seems to be consistent with the 245 sq-miles of the Red River WAM.	The drainage area is from FNI's 1965 Red River Master Plan and was provided by the U.S. Fish and Wildlife Service, the owners of the reservoir. The Red River Compact Commission does not report a drainage area for Lake McClellan, but it does report that the entire contributing drainage area for McClellan Creek is 258 sq miles. The gage is located well upstream of the confluence with the North Fork, and Lake McClellan is about 18 miles upstream of the gage. It should be noted that the drainage area was not directly used to calculate inflows. The drainage area ratio, using the 86 square mile drainage area for the lake, was reduced by more than half to correlate with the Mangum gage. A similar reduction in the drainage area ratio was also determined for the updated simulation using the Carter gage.
9	Groesbeck Creek at SH6 near Quanah	20RF_GCQN.xlsb	Return flows are missing (1999-2000 and 5/2009 to 12/2019).	These discharges are depressurization water from mining operations. It is not clear if the missing data represent periods of no discharge or were simply not reported. Georgia Pacific was contacted and declined to provide further information. Since these discharges are quite variable, we decided not to estimate the missing data.

	Control Point / Reservoir	Workbook	WPM Comment	FNI Response
10	North Wichita River near Truscott	20Nat_NWTS.xlsb	Truscott Brine Lake is located upstream of the gage but not included in the calculations. Suggest adding a comment to either the report or the spreadsheet that chloride control projects do not have discharge and therefore, excluded from the calculations.	Removal of the Truscott Brine Reservoir is discussed on page 38 of the Naturalized Flow Report and on the Notes tab and on the Content Change 1 tab in the 20Nat_NWTS workbook.
11	Lake Kemp	KempContEvap.xlsb	Reservoir content in tab "Cont. Chg. 1" is hardwired before 1998 and could not be verified/reviewed.	The hardwired data is from the original naturalization. Tab Cont Change Extended has a comparison of the hardwired data to the USGS data, which begins in 10/1949. The data before that matches Report 244. We have added a note to that effect.

	Control Point / Reservoir	Workbook	WPM Comment	FNI Response
12	Wichita River near Wichita Falls	20Nat_WRWF.xlsb	My recollection is Lake Kemp and Lake Diversion is a reservoir system where releases are made upstream and diverted downstream. I spent some time looking at how this was handled. Lake Kemp historical records have some months with large negative content change, which probably suggest a release, but these months have substantial smaller diversion or storage gain downstream. I suggest verifying the diversion from Diversion Lake are properly accounted for.	We looked at this in detail as well. For the period of record of the Mabelle gage (10/1959 to 12/2018) we can be confident about the Kemp releases, since that is all that gage records. However, the same cannot be said for the Lake Diversion storage or water use. Historical Lake Diversion storage is from the original WAM files and appears to be based on historical data, but the source is not known. We estimated Lake Diversion storage from 1/1999 to 7/2008 using an operation study. Beginning in 8/2008 the USGS began reporting Lake Diversion elevations. It is our understanding that most if not all irrigation diversions from Lake Diversion are estimated based on notes in the TCEQ historical diversion database. Also, because the irrigation district uses a canal system, more water is diverted than is used and unused water is returned to the river upstream of WRWF. No better data are available, so we used reported consumed irrigation use from the TCEQ database.
13	Red River near Arthur	20Nat_RRAC.xlsb	Lake Bonham Content Change has all zeroes.	Lake Bonham is upstream of control point BODARC, which was not in the original WAM files. This was recorded on the Notes tab. I have added a note to the content change and evaporation tabs for both RRAC and BODARC with this information as well.

Appendix J
Tables of Final Naturalized Flows, Flow Adjustments and Evaporation

Total filled naturalized flows

Control Point: A10000
Control Point I.D.: SW-KT
Description: Sweetwater Creek near Kelton

Period of record = 12/61-present

	Original	Date:	Extension	Date:
Calcs:				
Checked:			WEC	4/21/2021

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	19	520	1,158	83	654	1,253	89	332	41	47	598	107	4,901
1949	507	1,401	593	567	5,224	1,992	287	0	41	181	35	192	11,020
1950	261	309	107	0	2,858	1,121	4,196	2,114	1,360	336	235	444	13,341
1951	450	540	338	285	8,271	5,751	364	0	131	20	90	152	16,392
1952	280	244	235	604	175	58	34	20	29	62	265	153	2,159
1953	127	203	273	386	122	29	6,832	710	88	1,031	242	296	10,339
1954	347	174	123	544	7,670	8,791	105	660	72	80	87	96	18,749
1955	199	222	86	66	4,487	7,232	476	142	61	1,452	104	271	14,798
1956	278	266	89	68	4,906	69	171	35	28	366	38	52	6,366
1957	85	167	577	5,644	16,702	939	70	1,793	204	384	510	157	27,232
1958	514	335	722	493	5,049	1,279	3,694	73	457	80	143	331	13,170
1959	423	256	86	231	3,873	679	3,219	62	624	1,212	288	1,172	12,125
1960	1,385	1,000	1,335	103	1,075	5,135	1,133	539	930	7,363	742	738	21,478
1961	521	1,096	835	398	131	3,717	2,175	187	92	263	640	1,033	11,088
1962	1,119	977	990	1,672	664	4,017	627	894	1,470	781	994	1,162	15,367
1963	818	1,166	1,377	845	426	1,732	443	2,686	483	231	581	861	11,649
1964	898	1,404	1,051	809	762	1,642	51	40	3	45	499	769	7,973
1965	818	851	1,015	964	1,025	5,135	311	53	1,803	1,789	928	1,131	15,823
1966	904	1,206	1,027	922	544	217	121	69	269	232	412	479	6,402
1967	683	651	719	1,278	582	891	1,986	264	175	243	565	488	8,525
1968	707	857	1,094	1,020	1,490	1,646	316	694	348	2,433	934	935	12,474
1969	1,045	1,072	1,390	1,119	1,878	682	142	2,341	775	621	702	928	12,695
1970	744	811	1,015	4,439	1,350	629	196	85	53	216	624	658	10,820
1971	614	561	570	519	212	863	69	62	97	403	762	726	5,458
1972	750	736	620	578	1,315	378	376	85	81	55	252	449	5,675
1973	612	728	2,000	3,493	2,200	615	204	137	975	544	631	922	13,061
1974	910	811	1,990	938	976	309	37	75	355	353	2,053	762	9,569
1975	824	989	1,070	1,064	1,917	1,613	811	255	76	160	430	571	9,780
1976	683	627	689	2,206	946	352	85	21	167	133	235	383	6,527
1977	481	566	559	1,254	12,052	2,761	478	352	223	245	558	818	20,347
1978	898	1,077	1,051	803	2,714	1,714	189	35	291	90	330	432	9,624
1979	501	761	1,549	869	1,168	1,416	228	134	77	374	523	591	8,191
1980	707	771	1,033	934	1,420	414	41	29	15	38	126	364	5,892
1981	448	403	818	780	438	296	98	59	2,124	379	815	732	7,390
1982	695	650	781	738	2,921	1,868	678	282	81	160	374	516	9,744
1983	664	922	1,162	1,067	877	662	92	22	30	87	139	191	5,915
1984	361	543	639	875	418	289	51	33	2	18	62	467	3,758
1985	464	1,372	1,162	1,999	1,126	1,181	207	102	152	1,931	791	867	11,354
1986	818	866	731	620	1,629	1,173	320	48	695	2,599	1,892	1,138	12,529
1987	1,494	1,644	2,035	1,184	1,590	1,512	462	121	294	404	637	972	12,349
1988	1,260	1,047	2,171	1,595	917	636	390	106	2,434	729	839	898	13,022
1989	1,015	972	1,156	910	1,233	3,758	1,019	1,074	553	513	590	719	13,512
1990	1,199	1,261	1,402	1,595	1,539	592	143	165	96	231	409	547	9,179
1991	824	705	750	665	711	754	276	132	288	276	631	1,187	7,199
1992	1,131	995	1,015	1,047	1,104	1,176	444	169	93	87	340	750	8,351
1993	898	1,022	1,347	1,125	1,381	532	264	105	64	48	173	380	7,339
1994	507	600	947	845	742	221	75	27	39	34	90	237	4,364
1995	355	379	568	748	1,449	4,990	677	1,363	325	478	493	805	12,630
1996	812	800	805	634	1,324	903	1,529	612	1,819	750	928	1,174	12,090
1997	978	1,272	1,260	5,950	6,405	3,598	975	515	511	972	1,172	1,666	25,274
1998	1,697	1,461	2,595	1,601	1,285	317	55	38	21	277	744	713	10,804
1999	683	936	1,430	1,460	1,952	1,274	312	121	102	308	533	584	9,695
2000	514	447	1,164	867	363	1,886	702	71	31	1,187	629	1,008	8,869
2001	1,559	1,692	1,853	1,240	2,337	739	108	25	31	71	283	498	10,436
2002	634	709	766	785	523	365	220	40	28	1,164	1,167	1,196	7,597
2003	1,138	1,068	1,079	913	749	741	193	13	42	71	246	276	6,529
2004	475	539	864	1,019	550	316	161	581	401	564	777	692	6,939
2005	830	854	1,042	810	747	978	182	19	10	145	125	355	6,097
2006	413	424	695	515	618	334	32	119	55	58	111	619	3,993
2007	874	620	1,239	1,834	1,675	495	109	214	795	456	1,039	957	10,307
2008	595	766	938	868	990	3,769	604	375	457	931	748	771	11,812
2009	850	817	930	1,245	1,262	1,057	300	422	145	353	579	698	8,658
2010	806	1,094	979	1,812	2,265	687	1,016	159	126	232	430	559	10,165
2011	660	612	643	555	257	38	24	23	25	49	77	97	3,060
2012	99	305	303	458	333	203	52	21	17	13	75	38	1,917
2013	129	197	451	428	692	97	34	107	254	94	62	240	2,785
2014	355	332	463	494	342	772	91	53	25	210	268	201	3,606
2015	159	163	244	4,198	8,370	1,427	686	249	78	217	519	931	17,241
2016	1,075	757	739	647	607	626	157	111	349	183	116	249	5,616
2017	896	694	3,238	1,272	1,693	123	81	430	95	287	348	411	9,568
2018	470	491	532	573	570	319	111	42	35	132	486	408	4,169
Total	48,946	53,786	68,302	81,169	148,822	105,775	42,486	23,146	24,616	38,561	35,893	43,370	714,872
Mean	689	758	962	1,143	2,096	1,490	598	326	347	543	506	611	10,069
Max	1,697	1,692	3,238	5,950	16,702	8,791	6,832	2,686	2,434	7,363	2,053	1,666	27,232
Min	19	163	86	0	122	29	24	0	2	13	35	38	1,917

Total filled naturalized flows

Control Point: 10095

Control Point I.D.: NF_SH

Description: North Fork, Red River near Shamrock Period of record = 3/64-9/91 & 10/00-12/18

Original	Date:	Extension	Date
		WEC	4/22/2

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	60	1,626	3,617	260	2,045	3,916	278	1,037	130	147	1,869	335	15,320
1949	1,585	4,377	1,853	1,771	16,325	6,226	896	0	127	566	109	600	34,435
1950	816	967	334	0	8,932	3,503	13,114	6,606	4,249	1,049	736	1,389	41,695
1951	1,406	1,688	1,058	892	25,846	17,972	1,137	0	410	64	282	475	51,230
1952	874	763	736	1,886	547	182	94	55	79	170	727	419	6,532
1953	349	556	747	1,056	334	79	18,713	1,944	242	2,825	664	810	28,319
1954	951	477	337	1,490	21,009	24,078	288	1,808	197	220	239	264	51,358
1955	546	609	234	182	12,291	19,809	1,304	389	168	3,978	285	742	40,537
1956	762	727	243	187	13,438	190	468	95	78	1,004	103	142	17,437
1957	232	456	1,579	15,461	45,749	2,571	191	4,911	560	1,052	1,396	430	74,588
1958	1,407	918	1,977	1,350	13,829	3,503	10,119	199	1,251	220	392	906	36,071
1959	1,160	701	236	633	10,609	1,859	8,816	170	1,708	3,319	790	3,211	33,212
1960	3,792	2,740	3,658	282	2,944	14,065	3,105	1,475	2,547	20,168	2,032	2,020	58,828
1961	1,427	3,002	2,288	1,090	360	10,181	5,956	511	253	722	1,752	2,892	30,434
1962	3,133	2,737	2,772	4,598	1,859	11,246	1,756	2,324	4,115	2,186	2,782	3,254	42,762
1963	2,290	3,266	3,857	2,366	1,193	4,848	1,055	7,351	1,353	647	1,626	2,410	32,262
1964	2,514	3,930	124	0	363	7,381	0	0	16	129	741	1,047	16,245
1965	882	1,310	1,228	1,212	253	22,674	175	1	2,237	2,861	298	855	33,986
1966	309	509	141	546	140	1	25	2,628	3,857	25	27	41	8,249
1967	905	417	286	1,908	1,532	4,426	4,616	711	224	1,995	57	1,364	18,441
1968	1,071	1,534	1,977	1,817	5,730	9,994	2,397	502	176	1,777	988	524	28,487
1969	1,199	2,660	3,525	479	7,367	582	29	3,594	848	738	392	952	22,365
1970	846	692	2,006	6,284	299	642	12	41	5	0	0	0	10,827
1971	10	1,415	766	16	397	454	33	73	48	3,834	2,298	1,332	10,676
1972	1,089	730	40	255	3,629	878	2,327	332	950	57	1,063	1,111	12,461
1973	1,906	1,333	5,444	15,017	2,968	429	3	6	1,100	622	359	1,263	30,450
1974	494	734	4,244	418	3,125	254	32	39	451	902	2,827	823	14,343
1975	810	1,658	1,052	1,533	19,309	17,704	3,134	933	18	54	4,669	991	51,865
1976	1,271	516	883	10,850	2,041	117	66	275	2,718	166	34	204	19,141
1977	356	1,748	573	15,285	37,650	10,989	122	683	83	46	154	2,108	69,797
1978	352	944	1,161	229	15,151	7,952	95	72	3,813	469	90	375	30,703
1979	1,152	1,332	2,564	2,536	1,847	4,189	2,018	187	38	1,584	2,158	654	20,259
1980	2,304	1,686	339	2,098	2,585	126	55	33	24	5	1	296	9,552
1981	1	37	3,429	679	223	1,027	75	49	1,527	1,490	872	926	10,335
1982	1,179	3,111	2,787	162	14,066	12,259	2,353	663	52	22	29	213	36,896
1983	941	2,006	2,949	2,124	6,877	6,641	200	144	48	635	49	34	22,648
1984	574	946	1,851	2,476	130	2,040	48	61	55	62	31	1,394	9,668
1985	3,427	4,897	5,632	2,509	624	1,072	93	60	161	9,783	2,161	3,145	33,564
1986	1,979	2,568	660	330	4,258	4,210	736	171	1,233	3,991	4,432	2,997	27,565
1987	2,494	2,692	7,190	1,578	2,301	1,522	472	263	335	145	335	2,477	21,804
1988	9,767	5,652	7,030	5,057	607	754	937	133	2,214	255	1,084	1,567	35,057
1989	2,512	1,558	2,454	716	9,360	20,365	622	1,460	1,812	434	573	1,872	43,738
1990	3,190	3,892	4,328	3,463	3,511	941	47	173	129	107	1,065	408	21,254
1991	2,213	1,036	716	277	5,381	6,394	2,452	311	3,417	773	1,766	3,323	28,059
1992	3,168	2,786	2,841	2,932	3,065	3,266	1,176	444	183	244	953	2,100	23,158
1993	2,514	2,861	3,770	3,149	3,839	1,463	625	265	152	134	485	1,064	20,321
1994	1,420	1,679	2,651	2,366	2,049	528	181	46	82	96	253	663	12,014
1995	995	1,061	1,589	2,066	4,029	13,945	1,825	3,788	881	1,338	1,380	2,255	35,152
1996	2,273	2,239	2,255	1,733	3,650	2,499	4,252	1,685	5,065	2,100	2,599	3,288	33,638
1997	2,737	3,561	3,529	16,661	17,905	10,047	2,703	1,413	1,371	2,720	3,282	4,666	70,595
1998	4,752	4,090	7,265	4,482	3,598	888	153	105	60	775	2,083	1,997	30,248
1999	1,911	2,621	4,004	4,088	5,465	3,568	875	339	286	864	1,465	1,636	27,122
2000	1,438	1,251	3,261	2,428	991	5,279	1,966	198	86	470	1,141	7,672	26,181
2001	5,559	4,043	3,546	2,105	5,375	440	51	5	7	4	704	489	22,328
2002	1,350	2,560	2,071	2,223	409	264	1,190	10	13	5,053	2,523	2,750	20,416
2003	2,393	2,531	1,720	1,314	4,539	4,130	441	6	1,818	363	520	792	20,567
2004	2,028	1,596	4,387	3,082	275	3,279	1,269	189	54	946	2,658	4,074	23,837
2005	4,280	3,205	3,375	1,718	2,714	3,502	38	458	38	27	112	604	20,071
2006	906	836	1,092	310	3,563	370	32	3,039	1,136	538	579	3,326	15,727
2007	3,156	2,843	8,548	4,835	5,130	1,429	580	1,475	2,702	722	934	2,462	34,816
2008	2,547	2,847	2,241	1,784	2,318	2,460	68	1,412	1,222	3,164	1,645	1,596	23,304
2009	1,466	1,697	1,895	2,240	3,028	1,114	313	412	219	1,438	1,594	2,177	17,593
2010	2,604	3,719	2,937	8,544	14,968	2,706	5,301	835	487	723	1,324	1,596	45,744
2011	1,792	2,145	1,342	620	119	2	0	0	0	1	4	408	6,433
2012	687	1,608	2,679	1,476	466	1,617	5	3	1	3	5	4	8,554
2013	267	645	1,810	886	1,344	169	53	819	2,989	666	574	863	11,085
2014	1,027	1,261	846	549	321	1,061	654	191	34	13	31	245	6,233
2015	749	832	965	4,253	20,406	2,950	5,684	2,806	582	1,430	1,934	3,188	45,779
2016	3,200	2,180	1,986	2,541	2,057	1,726	162	345	1,482	389	579	1,325	17,972
2017	2,200	1,884	2,143	1,771	2,202	292	324	782	207	2,101	882	1,122	15,910
2018	1,520	1,025	1,015	816	1,590	1,122	194	7	7	543	541	569	8,949
Total	125,476	136,759	166,668	194,330	444,449	340,361	120,579	63,550	66,220	98,163	75,121	105,526	1,937,202
Mean	1,767	1,926	2,347	2,737	6,260	4,794	1,698	895	933	1,383	1,058	1,486	27,285
Max	9,767	5,652	8,548	16,661	45,749	24,078	18,713	7,351	5,065	20,168	4,669	7,672	74,588
Min	1	37	40	0	119	1	0	0	0	0	0	0	6,233

Total filled naturalized flows

	Original	Date:	Extension	Date:
			WEC	4/22/202

Control Point: B10060
Control Point I.D.: SF-CL
Description: Salt Fork, Red River near Clarendon, Greenbelt Reservoir Period of record = 6/60-9/64 (Clarendon), 9/67-current (Greenbelt)

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	64	670	1,044	31	810	2,530	44	13	0	0	27	49	5,282
1949	359	1,636	436	307	5,540	1,180	65	81	339	179	105	277	10,504
1950	389	397	131	150	168	560	1,631	750	1,448	135	103	334	6,196
1951	371	250	220	208	3,155	832	1,110	3	10	167	101	130	6,557
1952	297	208	216	639	143	0	31	18	26	57	242	140	2,017
1953	116	185	249	352	111	26	6,238	648	81	942	221	270	9,439
1954	317	159	112	497	7,003	8,026	96	603	66	73	80	88	17,120
1955	182	203	78	61	4,097	6,603	435	130	56	1,326	95	247	13,513
1956	254	242	81	62	4,479	63	156	32	26	335	34	47	5,811
1957	77	152	526	5,154	15,250	857	64	1,637	187	351	465	143	24,863
1958	469	306	659	450	4,610	1,168	3,373	66	417	73	131	302	12,024
1959	387	234	79	211	3,536	620	2,939	57	569	1,106	263	1,070	11,071
1960	1,264	913	1,219	94	981	10,287	1,214	1,445	735	7,308	657	1,266	27,383
1961	726	1,137	1,279	830	544	6,294	2,861	668	393	1,961	1,640	670	19,003
1962	540	744	693	789	754	1,931	452	937	289	346	642	606	8,723
1963	316	1,263	726	265	187	530	39	3,234	1,281	457	634	718	9,650
1964	974	1,063	667	295	359	1,320	82	19	646	196	472	430	6,523
1965	361	316	276	240	164	5,362	219	147	274	577	268	460	8,664
1966	421	518	201	289	155	196	186	582	355	133	187	229	3,452
1967	191	163	178	555	232	171	299	133	3,778	1,431	364	407	7,902
1968	706	388	860	716	1,161	4,173	172	6,596	363	232	236	262	15,865
1969	636	525	699	530	2,486	1,309	115	786	559	509	110	533	8,797
1970	537	395	406	3,172	338	192	92	178	57	26	228	328	5,949
1971	515	485	533	350	206	240	0	885	644	1,069	1,308	474	6,709
1972	322	521	496	319	1,490	1,579	1,360	159	17	39	460	583	7,345
1973	574	579	1,285	2,424	500	1,144	333	0	1,847	316	230	280	9,512
1974	812	663	577	485	277	377	101	594	120	487	287	433	5,213
1975	365	490	417	502	12,525	9,409	0	0	0	81	600	473	24,862
1976	298	651	373	711	597	0	94	325	1,306	40	252	471	5,118
1977	459	821	350	1,374	6,557	458	452	480	174	151	264	496	12,036
1978	421	803	533	499	4,351	1,289	150	0	512	257	434	420	9,669
1979	644	356	988	570	616	929	363	276	606	463	297	446	6,554
1980	408	646	684	1,056	760	613	227	2,700	0	0	201	963	8,258
1981	417	667	641	600	506	1,355	91	746	541	569	542	444	7,119
1982	356	468	686	560	2,262	4,579	4,027	332	61	165	408	439	14,343
1983	716	798	799	589	288	1,195	130	0	269	256	184	223	5,447
1984	752	641	682	666	185	1,183	104	0	0	286	334	694	5,527
1985	368	1,236	1,143	1,259	513	1,293	452	599	807	5,692	336	400	14,098
1986	659	773	891	443	885	730	189	726	1,180	2,831	1,775	772	11,854
1987	817	860	978	858	1,651	418	229	488	523	312	318	730	8,182
1988	774	617	879	782	694	872	218	73	515	313	365	545	6,647
1989	582	515	929	552	648	3,103	0	734	474	324	470	385	8,716
1990	609	662	599	2,059	1,362	339	0	438	321	225	272	238	7,124
1991	633	572	588	694	1,369	1,221	2,162	949	1,177	461	823	892	11,541
1992	651	760	1,074	796	543	2,061	506	74	144	348	445	732	8,134
1993	795	667	808	778	766	345	36	380	141	227	548	478	5,969
1994	626	592	885	957	794	164	139	555	0	0	533	379	5,624
1995	302	322	644	568	541	1,823	268	230	31	277	577	541	6,124
1996	559	663	470	1,080	0	757	1,023	1,528	881	483	626	698	8,768
1997	695	833	814	7,411	1,233	740	213	185	168	421	530	647	13,890
1998	811	778	1,608	757	686	219	154	28	45	644	717	434	6,881
1999	0	1,367	1,181	1,321	2,818	1,334	1,077	681	0	248	523	626	11,176
2000	903	585	0	1,632	142	2,205	43	0	0	347	361	502	6,720
2001	746	845	811	614	2,966	188	32	687	391	0	2,026	548	9,854
2002	555	622	575	1,031	382	512	364	272	464	1,480	492	875	7,624
2003	688	468	650	557	258	1,858	487	281	2,924	160	409	439	9,179
2004	556	749	1,155	984	237	358	244	0	53	455	552	573	5,916
2005	768	636	930	921	547	2,950	0	0	0	103	302	497	7,654
2006	630	447	636	311	387	454	193	812	342	124	388	875	5,599
2007	853	541	3,048	1,074	2,851	673	229	66	0	294	324	692	10,645
2008	460	553	667	571	0	284	0	779	0	483	331	447	4,575
2009	411	511	728	574	386	301	0	87	103	350	391	342	4,184
2010	466	763	717	1,587	1,052	339	1,551	0	171	322	419	399	7,786
2011	414	491	460	357	71	194	62	185	110	161	81	293	2,879
2012	308	378	562	173	351	874	8	24	10	38	47	33	2,806
2013	274	400	382	195	302	2,329	173	220	795	233	273	311	5,887
2014	335	341	374	259	222	305	310	758	89	97	264	286	3,640
2015	482	405	514	448	5,668	510	541	133	134	1,066	638	831	11,370
2016	674	526	478	804	1,830	336	204	1,978	570	335	312	463	8,510
2017	387	450	631	414	487	294	10	330	0	481	376	251	4,111
2018	394	499	456	281	249	81	224	116	86	46	213	320	2,965
Total	36,198	42,083	47,344	59,704	120,274	109,044	40,686	39,656	30,701	41,480	30,163	33,319	630,652
Mean	510	593	667	841	1,694	1,536	573	559	432	584	425	469	8,882
Max	1,264	1,636	3,048	7,411	15,250	10,287	6,238	6,596	3,778	7,308	2,026	1,266	27,383
Min	0	152	0	31	0	0	0	0	0	0	27	33	2,017

Total filled naturalized flows

	Original	Date:	Extension	Date:
			WEC	4/22/202

Control Point: B10000
Control Point I.D.: SF-WL
Description: Salt Fork, Red River near Wellington Period of record = 7/52-present

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	271	2,861	4,455	133	3,454	10,793	189	53	0	0	114	210	22,533
1949	1,534	6,981	1,861	1,311	23,639	5,033	279	347	1,445	765	448	1,182	44,825
1950	1,659	1,695	559	641	716	2,389	6,960	3,202	6,179	574	441	1,424	26,439
1951	1,583	1,066	938	888	13,461	3,548	4,738	13	44	711	429	553	27,972
1952	1,266	886	920	2,726	611	0	150	87	126	270	1,154	666	8,862
1953	553	883	1,186	1,676	530	126	29,703	3,086	384	4,485	1,053	1,286	44,951
1954	1,509	757	534	2,365	33,347	38,220	457	2,870	313	349	379	419	81,519
1955	867	966	372	289	19,509	31,442	2,069	617	267	6,314	453	1,178	64,343
1956	1,209	1,155	385	297	21,330	301	743	151	124	1,593	163	226	27,677
1957	368	724	2,507	24,541	72,617	4,081	303	7,795	888	1,669	2,216	682	118,391
1958	2,233	1,458	3,138	2,144	21,951	5,560	16,062	316	1,986	348	622	1,438	57,256
1959	1,841	1,113	375	1,005	16,839	2,951	13,994	270	2,711	5,268	1,254	5,098	52,719
1960	6,020	4,350	5,806	448	4,672	22,325	4,928	2,342	4,044	32,013	3,225	3,207	93,380
1961	2,265	4,764	3,632	1,730	572	16,161	9,454	812	402	1,145	2,781	3,055	46,773
1962	4,479	1,747	1,734	6,724	1,501	8,251	3,787	11,691	3,735	1,424	2,102	3,196	50,371
1963	1,954	3,166	1,447	825	1,333	4,895	416	2,767	6,257	519	1,057	1,445	26,081
1964	1,842	3,240	1,819	702	1,448	7,338	613	562	2,923	933	2,248	2,046	25,714
1965	1,719	1,507	1,316	1,141	780	25,532	1,043	699	1,306	2,748	1,275	2,188	41,254
1966	2,007	2,465	957	1,378	740	936	886	2,774	1,691	632	890	1,090	16,446
1967	909	777	846	2,643	1,106	814	1,425	635	7,309	4,943	1,132	1,747	24,286
1968	3,318	3,055	2,573	2,080	6,044	12,373	7,533	25,137	3,160	1,927	3,099	2,264	72,563
1969	2,724	3,329	5,891	2,316	11,908	2,808	517	5,155	2,362	1,901	1,320	1,755	41,986
1970	1,823	1,470	2,502	6,680	1,437	686	278	273	247	358	874	1,316	17,944
1971	1,162	1,190	1,196	783	409	2,051	196	1,155	1,826	2,796	2,469	2,451	17,684
1972	1,445	1,401	1,101	2,229	8,924	5,968	4,521	894	1,341	738	2,315	2,269	33,146
1973	2,072	2,677	6,994	19,249	2,609	7,299	1,033	649	3,670	2,528	1,140	1,450	51,370
1974	2,225	1,602	3,934	3,294	7,517	1,890	201	956	3,544	3,618	2,616	1,348	32,745
1975	2,288	3,989	2,511	3,305	24,118	38,356	2,096	1,683	322	800	2,167	2,353	83,988
1976	1,975	1,990	1,446	3,151	2,789	669	651	724	1,724	635	772	1,163	17,689
1977	1,234	2,380	1,454	31,459	35,399	3,022	785	1,164	1,899	1,218	1,374	1,459	82,847
1978	1,252	2,249	1,890	1,332	18,934	10,268	404	273	4,546	1,219	1,690	1,651	45,708
1979	2,506	2,482	8,814	5,044	2,400	14,822	2,927	2,273	1,154	1,236	1,156	1,557	46,371
1980	2,114	2,165	2,841	3,802	23,655	6,087	416	2,768	0	206	699	2,048	46,801
1981	1,242	1,449	1,928	2,813	1,669	3,639	245	1,422	7,186	4,115	1,693	2,670	30,071
1982	1,748	1,988	2,085	1,130	14,382	11,594	10,987	1,642	245	681	1,467	1,669	49,618
1983	2,241	3,654	3,797	1,985	1,110	6,703	433	203	497	3,228	901	468	25,220
1984	1,609	1,850	1,870	1,945	499	5,484	336	194	9	586	934	2,539	17,855
1985	1,698	3,618	4,165	5,011	2,251	9,399	938	900	2,418	11,708	1,725	2,044	45,875
1986	2,432	2,978	2,050	1,264	7,481	6,883	524	6,416	7,179	19,988	14,439	3,521	75,155
1987	4,495	3,374	4,973	2,322	15,245	3,532	2,604	1,153	3,730	1,415	2,083	2,928	47,854
1988	4,161	4,353	4,718	3,167	1,258	2,034	936	280	3,249	973	1,431	1,902	28,462
1989	2,139	2,294	4,752	2,154	10,001	60,357	570	2,563	2,747	1,201	1,806	1,525	92,109
1990	2,655	3,415	3,431	6,070	21,135	2,554	1,487	1,516	859	894	1,839	1,851	47,706
1991	2,916	2,104	1,920	1,429	8,416	9,892	4,536	2,708	4,029	1,565	3,986	6,596	50,097
1992	4,428	3,769	4,675	3,605	6,339	19,778	2,193	687	704	1,003	2,030	3,715	52,926
1993	6,080	3,356	3,714	2,735	8,632	1,413	9,615	867	549	877	1,528	1,674	41,040
1994	2,099	2,412	3,313	3,064	3,625	969	855	720	0	246	1,168	1,106	19,577
1995	1,099	1,239	1,948	1,940	3,517	61,680	4,180	7,656	3,521	1,812	1,666	2,602	92,860
1996	2,475	2,770	2,350	2,064	573	5,204	8,725	2,913	6,487	1,925	2,983	4,190	42,659
1997	4,025	6,747	3,101	79,922	9,232	15,876	1,863	1,877	1,976	3,864	3,725	5,379	137,587
1998	4,028	7,292	11,767	5,686	3,576	781	418	228	233	3,051	3,684	2,736	43,480
1999	2,917	3,064	5,609	6,500	10,318	2,962	1,365	1,562	0	653	1,109	1,651	37,710
2000	2,295	2,253	8,802	6,912	2,043	9,778	832	54	0	1,353	1,559	1,742	37,623
2001	5,625	6,284	5,690	2,056	15,307	800	247	873	642	227	4,497	1,241	43,489
2002	1,884	2,219	1,670	4,102	978	1,125	6,493	468	2,010	8,248	4,508	4,463	38,168
2003	3,096	2,387	2,692	1,903	1,110	6,634	1,588	411	10,227	976	1,039	1,244	33,307
2004	2,438	3,055	5,557	6,136	1,311	1,420	1,118	475	1,693	3,565	5,375	3,630	35,773
2005	5,740	4,889	3,605	2,667	1,341	5,752	190	615	256	442	650	1,138	27,285
2006	1,438	1,432	2,574	1,005	3,276	796	384	2,736	1,758	1,112	875	3,082	20,468
2007	3,495	3,727	11,991	7,089	11,383	2,041	1,097	483	642	914	825	1,548	45,235
2008	889	2,069	2,388	2,315	1,834	703	257	1,711	1,159	4,521	1,773	1,867	21,486
2009	2,010	2,009	2,267	2,725	1,754	802	85	203	311	717	953	1,341	15,177
2010	1,956	5,050	3,381	5,587	6,501	1,668	18,201	465	394	1,165	1,015	1,078	46,461
2011	2,546	2,598	1,776	1,034	290	228	86	206	123	215	213	557	9,872
2012	609	1,013	3,009	1,437	1,778	1,806	52	53	547	271	313	330	11,218
2013	728	1,440	1,519	665	627	2,462	312	2,248	930	479	625	667	12,702
2014	725	791	807	586	1,307	2,118	1,054	1,049	197	235	570	686	10,125
2015	1,083	1,123	1,418	3,261	29,615	3,815	2,496	816	438	2,158	2,375	3,341	51,939
2016	3,401	2,132	1,831	2,742	4,688	1,936	676	3,068	2,015	1,154	1,177	1,754	26,574
2017	2,759	2,553	2,676	2,320	1,613	689	322	963	724	3,180	1,249	1,165	20,213
2018	1,493	1,586	1,461	1,042	935	537	580	231	180	363	683	921	10,012
Total	160,923	182,876	215,214	328,721	603,249	572,839	208,637	136,828	137,793	176,963	125,598	137,981	2,987,622
Mean	2,267	2,576	3,031	4,630	8,496	8,068	2,939	1,927	1,941	2,492	1,769	1,943	42,079
Max	6,080	7,292	11,991	79,922	72,617	61,680	29,703	25,137	10,227	32,013	14,439	6,596	137,587
Min	271	724	372	133	290	0	52	13	0	0	114	210	8,862

Total filled naturalized flows

Control Point: C10000
Control Point I.D.: PD-WA
Description: Prairie Dog Town Fork, Red River near Wayside Period of record = 10/67-present

	Original	Date:	Extension	Date:
Calcs:	ab	6/5/2001		
Checked:	DH	17-Oct		

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	165	1,743	2,715	81	2,105	6,577	115	33	0	0	69	128	13,731
1949	935	4,254	1,134	799	14,405	3,067	170	212	881	466	273	720	27,316
1950	1,011	1,033	340	391	436	1,456	4,241	1,951	3,765	350	269	868	16,111
1951	965	650	572	541	8,203	2,162	2,887	8	27	433	262	337	17,047
1952	771	540	561	1,661	372	0	87	50	73	156	669	386	5,326
1953	321	512	688	972	307	73	17,228	1,790	223	2,601	611	746	26,072
1954	875	439	310	1,372	19,341	22,167	265	1,664	181	202	220	243	47,279
1955	503	560	216	167	11,315	18,237	1,200	358	155	3,662	263	683	37,319
1956	701	670	223	173	12,371	175	431	88	72	924	95	131	16,054
1957	213	420	1,454	14,234	42,118	2,367	176	4,521	515	968	1,285	396	68,667
1958	1,295	846	1,820	1,243	12,732	3,225	9,316	184	1,152	202	361	834	33,210
1959	1,068	646	217	583	9,767	1,712	8,117	157	1,573	3,056	727	2,957	30,580
1960	3,492	2,523	3,367	260	2,710	12,949	2,858	1,358	2,345	18,568	1,871	1,860	54,161
1961	1,314	2,763	2,107	1,004	332	9,373	5,484	471	233	664	1,613	1,772	27,130
1962	2,598	1,014	1,006	3,900	870	4,786	2,196	6,781	2,166	826	1,219	1,854	29,216
1963	1,133	1,836	839	478	773	2,839	241	1,605	3,629	301	613	838	15,125
1964	1,068	1,879	1,055	407	840	4,256	356	326	1,695	541	1,304	1,187	14,914
1965	997	874	763	1,285	150	23,559	173	0	5,046	1,409	111	88	34,455
1966	8	152	92	303	4	4,394	331	8,903	7,501	86	41	78	21,893
1967	89	80	1,437	902	904	1,332	3,968	304	1,011	1,221	153	100	11,501
1968	664	174	244	480	3,020	3,582	3,363	89,005	0	1,686	794	295	103,307
1969	88	204	679	631	5,586	2,247	3,208	4,268	7,005	1,696	937	55	26,604
1970	277	237	282	1,088	1,703	671	533	861	466	248	117	87	6,570
1971	170	212	285	167	290	1,263	1,044	3,708	6,985	5,579	3,627	255	23,585
1972	96	115	380	406	4,209	5,636	1,808	384	271	432	375	273	14,385
1973	247	238	1,454	2,101	3,757	1,554	1,687	830	606	506	75	74	13,129
1974	20	28	192	1,148	4,643	3,213	425	14,976	3,418	3,190	1,526	475	33,254
1975	334	574	494	686	1,309	4,008	5,601	1,880	37	0	665	96	15,684
1976	179	224	210	893	621	609	2,562	1,222	4,322	89	141	125	11,197
1977	220	152	160	6,037	16,745	7,211	353	4,242	77	17	35	54	35,303
1978	146	313	87	42	38,320	5,922	618	1,187	6,786	2	0	0	53,423
1979	123	164	1,170	178	0	2,629	1,796	961	0	0	35	0	7,056
1980	4	61	252	1,139	5,035	7,767	292	406	1,344	20	13	23	16,356
1981	95	147	141	113	828	2,020	3,106	4,305	1,340	1,413	218	115	13,841
1982	106	92	99	84	3,307	5,272	2,732	356	0	5	13	239	12,305
1983	342	587	470	256	1,149	320	265	304	603	6,690	275	196	11,457
1984	361	202	364	610	64	18,140	556	1,073	538	932	147	478	23,465
1985	108	679	2,309	1,921	1,238	2,642	1,829	2,241	1,124	9,318	592	376	24,377
1986	131	460	200	233	1,104	3,889	458	6,891	4,055	13,246	978	1,057	32,702
1987	779	1,248	1,140	879	16,406	5,996	1,830	4,777	3,868	2,196	1,974	1,827	42,920
1988	2,006	599	1,489	1,888	1,574	2,461	3,562	1,353	2,341	350	341	734	18,698
1989	921	899	913	325	1,242	15,212	3,506	3,558	5,246	537	495	1,252	34,106
1990	1,079	1,118	1,374	1,603	1,090	2,012	384	906	2,037	261	327	427	12,618
1991	522	225	344	817	2,583	2,120	1,771	351	1,157	431	1,577	1,626	13,524
1992	826	620	1,998	2,831	2,449	5,854	1,084	1,401	279	187	1,052	905	19,486
1993	468	761	783	1,603	4,076	2,192	4,369	5,162	1,015	700	599	452	22,180
1994	323	312	480	695	627	1,183	630	551	690	596	483	731	7,301
1995	1,079	727	863	619	3,083	3,229	1,785	5,307	4,585	2,605	1,224	1,306	26,412
1996	1,046	932	697	464	341	448	12,809	22,792	5,515	2,129	1,985	1,447	50,605
1997	1,062	1,110	1,155	27,388	4,240	6,694	8,177	2,079	1,833	540	596	1,342	56,216
1998	1,401	2,233	4,830	1,388	1,060	216	27	452	55	10,759	9,514	1,315	33,250
1999	1,395	1,745	1,124	5,710	37,611	4,058	6,282	1,135	1,827	516	393	1,035	62,831
2000	743	806	1,749	1,363	3,044	7,885	964	7	0	243	792	1,355	18,951
2001	1,184	816	1,949	974	1,105	1,557	10	1,298	1,967	61	774	408	12,103
2002	545	836	730	1,309	2,536	2,623	1,151	2,716	1,075	3,864	1,000	928	19,313
2003	699	479	456	358	483	7,398	237	375	955	235	320	487	12,482
2004	613	609	2,401	1,233	361	1,504	833	746	4,012	12,028	3,452	1,411	29,203
2005	1,401	958	1,361	1,328	1,465	14,402	688	1,363	520	601	353	516	24,956
2006	596	543	651	113	374	534	382	7,278	1,457	804	636	1,016	14,384
2007	1,003	820	2,433	3,463	4,725	1,275	356	564	2,700	305	39	489	18,172
2008	542	676	576	482	441	3,249	1,466	5,657	101	498	316	851	14,855
2009	800	420	320	3,886	764	535	1,399	713	83	103	114	209	9,346
2010	36	26	298	2,916	1,047	1,964	1,918	337	340	90	106	103	9,181
2011	187	373	0	0	0	76	29	38	163	219	0	0	1,085
2012	0	0	0	0	75	1,526	32	905	1,163	0	0	0	3,701
2013	59	0	166	0	0	501	2,387	7,690	2,487	0	0	0	13,290
2014	49	79	34	0	620	3,696	1,255	871	1,366	54	0	13	8,037
2015	273	77	11	1,057	31,206	2,129	12,509	824	0	3,035	508	488	52,117
2016	465	230	175	1,491	781	2,820	1,608	4,717	30	0	2,050	0	14,367
2017	1,508	922	3,022	1,791	2,067	475	1,031	2,685	1,398	1,471	64	47	16,481
2018	398	177	285	0	0	558	0	72	63	1,274	0	0	2,827
Total	47,241	49,673	64,195	116,943	360,459	309,683	166,547	258,544	121,548	128,397	53,676	43,199	1,720,105
Mean	665	700	904	1,647	5,077	4,362	2,346	3,641	1,712	1,808	756	608	24,227
Max	3,492	4,254	4,830	27,388	42,118	23,559	17,228	89,005	7,501	18,568	9,514	2,957	103,307
Min	0	0	0	0	0	0	0	0	0	0	0	0	1,085

Total filled naturalized flows

Control Point: D10000
Control Point I.D.: PD-CH
Description: Prairie Dog Town Fork, Red River near Childress Period of record = 10/65-present

	Original	Date:	Extension	Date:
Calcs:				
Checked:				

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	635	6,705	10,442	312	8,096	25,295	442	125	0	0	267	492	52,811
1949	3,595	16,361	4,362	3,072	55,404	11,797	653	814	3,388	1,794	1,050	2,770	105,060
1950	3,889	3,972	1,309	1,502	1,679	5,599	16,313	7,505	14,481	1,346	1,034	3,338	61,967
1951	3,710	2,499	2,198	2,080	31,550	8,316	11,104	30	103	1,667	1,006	1,297	65,560
1952	2,966	2,077	2,156	6,389	1,432	0	330	191	276	593	2,539	1,464	20,413
1953	1,217	1,943	2,610	3,688	1,166	276	65,347	6,789	846	9,866	2,317	2,830	98,895
1954	3,321	1,666	1,176	5,203	73,364	84,083	1,005	6,313	688	768	835	923	179,345
1955	1,907	2,125	818	635	42,920	69,173	4,552	1,357	587	13,891	997	2,592	141,554
1956	2,660	2,540	847	654	46,926	663	1,635	332	273	3,504	360	497	60,891
1957	809	1,593	5,516	53,991	159,757	8,979	668	17,149	1,955	3,673	4,874	1,501	260,465
1958	4,913	3,207	6,903	4,716	48,293	12,232	35,337	696	4,369	767	1,369	3,164	125,966
1959	4,049	2,449	824	2,211	37,046	6,492	30,788	595	5,965	11,591	2,758	11,215	115,983
1960	13,244	9,569	12,773	986	10,279	49,115	10,841	5,152	8,896	70,429	7,096	7,055	205,435
1961	4,983	10,481	7,991	3,807	1,258	35,554	20,800	1,786	884	2,520	6,118	6,721	102,903
1962	9,853	3,844	3,815	14,792	3,302	18,153	8,331	25,720	8,217	3,133	4,625	7,031	110,816
1963	4,298	6,964	3,184	1,814	2,932	10,769	915	6,087	13,766	1,142	2,326	3,180	57,377
1964	4,053	7,129	4,001	1,544	3,185	16,144	1,350	1,235	6,431	2,053	4,946	4,501	56,572
1965	3,782	3,315	2,895	4,941	578	90,611	665	0	19,407	5,419	426	340	132,379
1966	32	584	353	1,165	16	16,899	1,272	34,241	28,849	332	157	298	84,198
1967	343	308	5,526	3,468	3,477	5,122	15,261	1,171	3,890	1,906	524	502	41,498
1968	5,017	591	1,654	4,016	19,291	29,083	6,551	69,179	12,929	3,267	3,375	2,167	157,120
1969	289	1,091	4,985	1,317	21,899	15,756	3,657	15,052	26,676	5,362	2,497	685	99,266
1970	485	322	1,563	9,606	4,090	1,288	701	1,033	2,013	640	289	248	22,278
1971	282	470	389	989	6,268	17,021	1,619	25,034	19,923	8,932	4,463	2,435	87,825
1972	403	246	473	939	7,481	13,472	23,227	2,057	5,552	1,795	3,156	726	59,527
1973	810	662	15,601	36,496	9,588	14,748	3,310	8,222	18,007	2,969	315	362	111,090
1974	466	111	1,824	2,613	54,758	6,259	513	14,267	11,159	6,971	3,881	919	103,741
1975	1,525	2,910	684	1,829	5,460	10,556	11,096	5,005	4,481	1,029	4,288	1,516	50,379
1976	709	561	615	10,587	12,182	8,239	7,842	4,814	6,441	405	340	362	53,097
1977	541	2,360	670	16,771	76,820	12,373	2,059	16,637	412	394	133	157	129,327
1978	365	748	459	316	126,604	58,651	444	2,601	19,711	46	21	21	209,987
1979	1,148	1,168	10,337	4,176	6,591	25,666	11,732	5,385	77	532	362	289	67,463
1980	483	686	265	1,110	14,203	5,557	471	447	1,915	355	652	1,698	27,842
1981	415	318	553	880	2,770	8,766	3,173	6,883	7,188	11,320	960	507	43,733
1982	508	650	831	415	15,689	41,140	21,479	4,374	1,914	235	241	362	87,838
1983	1,838	3,883	2,551	720	7,604	7,154	2,988	863	5,173	49,758	2,708	812	86,052
1984	1,780	1,318	1,181	1,793	1,887	17,991	330	4,579	135	249	1,928	4,604	37,775
1985	972	1,489	3,557	14,924	6,240	75,893	16,565	5,323	2,644	15,720	3,289	2,408	149,024
1986	989	3,972	741	2,115	3,393	15,328	1,031	28,103	25,511	85,359	23,321	5,241	195,104
1987	14,851	10,224	3,457	1,633	31,123	16,816	10,694	8,846	12,894	2,520	1,567	7,355	121,980
1988	6,402	1,336	9,861	18,714	710	24,114	12,124	685	5,705	279	44	1,715	81,689
1989	993	1,704	1,526	541	12,614	67,019	746	7,569	12,918	584	671	988	107,873
1990	2,539	1,718	3,621	8,763	14,599	3,206	6,183	1,782	5,969	2,345	1,756	845	53,326
1991	1,282	687	553	996	21,630	26,515	6,617	1,385	16,472	1,377	4,865	10,989	93,368
1992	6,456	6,535	9,802	26,586	7,531	24,290	16,888	7,300	6,126	527	18,708	16,942	147,691
1993	18,572	6,133	3,962	7,190	10,625	1,677	14,257	6,876	9,336	3,986	793	835	84,242
1994	757	1,373	2,915	2,825	8,370	330	770	198	650	2,816	755	828	22,587
1995	997	553	1,069	1,178	9,014	78,207	5,457	21,627	17,907	4,202	1,563	2,115	143,889
1996	1,579	1,743	1,250	1,448	3,459	2,956	15,475	22,849	8,042	3,346	3,288	2,300	67,735
1997	2,649	4,937	4,105	44,881	18,564	23,103	16,492	34,232	11,160	3,982	4,202	14,609	182,916
1998	5,046	21,911	33,488	2,178	5,348	729	771	354	325	9,314	19,651	1,524	100,639
1999	5,232	2,827	5,315	19,995	56,238	14,175	6,387	7,850	1,842	460	456	843	121,620
2000	1,260	2,342	13,716	12,098	4,815	77,981	2,495	336	425	6,004	3,588	2,995	128,055
2001	5,752	4,218	11,335	3,170	71,085	2,452	83	13,269	8,755	416	3,510	1,313	125,358
2002	2,738	6,120	3,125	2,797	2,787	4,456	6,114	4,497	3,584	15,836	3,384	4,707	60,145
2003	1,142	999	1,053	951	6,465	22,996	422	2,220	5,132	344	507	478	42,709
2004	1,993	4,821	7,315	6,814	375	14,637	5,307	4,256	6,178	46,636	30,740	6,514	135,586
2005	6,411	3,140	2,617	1,395	5,113	49,614	396	858	502	1,718	467	1,281	73,512
2006	592	645	4,439	2,809	3,955	1,032	900	16,648	13,628	15,970	147	17,826	78,591
2007	8,884	8,723	25,621	14,505	30,559	3,378	160	1,787	7,919	480	665	3,619	106,300
2008	1,045	1,562	1,611	4,635	6,896	3,666	291	8,203	14,733	4,727	222	7,024	54,615
2009	13,834	5,351	1,746	4,880	10,967	10,603	5,188	8,190	3,995	1,250	186	841	67,031
2010	2,704	7,299	1,461	10,611	3,207	4,060	22,885	298	0	5,836	5,117	0	63,478
2011	0	0	0	57	235	515	174	118	116	291	328	155	1,989
2012	0	229	508	0	1,047	5,127	126	741	1,254	118	181	104	9,435
2013	901	1,079	0	1,556	476	6,828	2,931	10,282	4,026	1,796	0	444	30,319
2014	0	59	0	183	3,205	9,037	7,049	1,811	2,874	0	596	0	24,814
2015	280	0	0	3,429	106,539	16,093	91,830	2,138	618	3,250	846	1,620	226,643
2016	3,706	1,157	1,025	2,654	20,164	9,014	5,251	15,931	3,442	93	5,815	1,980	70,232
2017	6,295	7,193	2,158	4,147	715	2,766	2,436	27,471	13,338	28,234	1,077	663	96,493
2018	809	1,016	397	233	6,053	2,811	666	3,500	3,274	4,937	961	521	25,178
Total	218,985	230,521	287,683	442,434	1,419,961	1,390,416	613,962	581,253	498,271	505,406	218,499	201,203	6,608,594
Mean	3,084	3,247	4,052	6,231	19,999	19,583	8,647	8,187	7,018	7,118	3,077	2,834	93,079
Max	18,572	21,911	33,488	53,991	159,757	90,611	91,830	69,179	28,849	85,359	30,740	17,826	260,465
Min	0	0	0	0	16	0	83	0	0	0	0	0	1,989

Total filled naturalized flows

	Original	Date:	Extension	Date:
Calcs:				
Checked:			WEC	4/23/2021

Control Point: E10000
Control Point I.D.: GC-QN
Description: Groesbeck Creek at SH6 near Quanah Period of record = 12/61-present

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	245	817	1,689	450	1,700	3,154	1,371	406	110	331	140	48	10,461
1949	405	2,349	708	241	6,598	4,882	472	197	1,840	1,099	204	155	19,150
1950	206	1,024	108	657	6,333	2,464	6,983	6,366	5,193	686	223	266	30,509
1951	240	682	559	243	14,042	7,929	2,155	367	637	327	408	67	27,656
1952	132	106	191	763	3,809	772	446	30	27	0	47	154	6,477
1953	43	142	529	519	264	551	1,420	1,599	90	7,674	1,402	694	14,927
1954	136	108	37	837	12,854	3,480	50	14	0	0	0	86	17,602
1955	115	183	402	126	10,501	6,363	964	273	3,165	11,432	485	258	34,267
1956	287	348	109	12	3,188	837	391	0	0	973	464	250	6,859
1957	55	347	582	9,748	31,881	10,382	876	287	280	1,343	2,685	258	58,724
1958	347	451	680	1,017	3,782	962	1,938	292	140	81	22	49	9,761
1959	36	52	0	577	3,549	3,770	3,060	302	722	5,129	721	2,634	20,552
1960	653	853	301	139	841	3,477	2,016	362	228	6,971	528	1,372	17,741
1961	453	512	2,089	871	1,287	1,593	1,857	201	913	210	856	359	11,201
1962	401	342	408	345	289	17,982	1,369	401	3,706	523	397	382	26,545
1963	351	322	391	244	859	734	236	167	1,515	152	130	160	5,261
1964	153	178	263	163	116	117	14	6	266	62	596	92	2,026
1965	73	106	118	536	134	136	38	188	6,241	14,109	198	1,357	23,234
1966	198	233	192	229	96	33	364	263	1,286	94	119	131	3,238
1967	110	58	84	645	49	36	1,080	97	7	33	27	36	2,262
1968	96	82	90	159	98	1,485	194	14	0	0	19	28	2,265
1969	50	54	66	26	78	204	0	3,280	2,121	106	96	89	6,170
1970	115	91	83	1,167	534	67	23	1	0	4	37	44	2,166
1971	28	32	9	12	1,188	178	0	295	7,757	1,581	158	112	11,350
1972	78	87	106	79	550	134	214	684	60	327	181	86	2,586
1973	108	120	662	1,513	600	4,674	633	61	6,126	1,942	176	170	16,785
1974	145	185	265	100	3,132	1,961	159	169	17,014	595	956	356	25,037
1975	394	342	709	758	430	602	7,071	529	444	487	460	445	12,671
1976	408	541	450	5,725	2,135	638	418	356	965	441	442	465	12,984
1977	391	339	368	1,133	2,601	783	296	338	237	210	317	329	7,342
1978	332	277	360	315	8,014	2,555	503	424	2,613	244	384	333	16,354
1979	390	422	419	858	560	2,978	394	548	291	361	583	409	8,213
1980	616	322	338	603	4,628	809	186	53	97	156	203	214	8,225
1981	225	192	266	335	913	3,131	493	172	232	2,439	221	298	8,917
1982	255	251	313	248	375	283	435	1,081	514	200	211	193	4,359
1983	222	226	264	259	250	202	176	123	84	24,014	722	418	26,960
1984	397	323	392	386	258	138	167	1,823	140	176	192	275	4,667
1985	340	258	338	380	256	3,284	202	154	485	3,652	802	382	10,533
1986	348	316	381	352	359	391	2,081	226	5,738	6,404	799	597	17,992
1987	505	854	738	585	9,952	1,015	627	658	469	511	491	503	16,908
1988	530	503	875	1,213	667	2,545	810	451	8,577	617	607	631	18,026
1989	648	541	621	494	2,062	4,245	490	399	5,993	489	553	589	17,124
1990	560	530	2,201	843	923	3,117	899	804	472	547	569	497	11,962
1991	561	479	485	509	1,403	25,032	3,267	808	12,049	1,129	1,048	2,522	49,292
1992	1,375	1,402	1,140	2,251	1,130	2,872	1,166	964	926	950	1,153	1,123	16,452
1993	1,140	1,210	1,494	1,281	5,866	1,179	817	1,009	939	966	946	1,005	17,852
1994	985	906	1,671	1,120	2,019	838	1,062	611	477	2,666	1,730	583	14,668
1995	568	522	538	527	1,763	29,682	2,567	33,363	4,623	2,273	1,689	1,571	79,686
1996	1,319	1,127	1,458	1,623	1,189	1,179	13,923	4,785	8,891	2,099	1,381	1,654	40,628
1997	1,214	3,289	1,970	15,970	4,409	2,666	2,110	1,831	2,485	1,374	1,229	1,486	40,033
1998	1,286	2,165	5,435	1,843	1,627	1,371	1,162	1,089	1,102	1,189	1,122	1,057	20,448
1999	1,254	1,303	1,595	1,281	7,672	2,690	1,498	1,541	686	990	1,289	1,057	22,856
2000	1,115	1,049	3,152	1,575	1,974	6,349	1,960	1,123	780	1,488	1,448	1,206	23,219
2001	1,624	1,870	1,470	1,129	2,500	1,101	863	2,949	1,546	1,620	2,455	207	19,334
2002	212	169	188	144	272	790	2,960	612	548	671	633	696	7,895
2003	692	641	741	783	1,402	1,026	853	2,421	1,211	497	645	555	11,467
2004	605	551	4,895	762	656	1,484	504	763	407	440	1,423	586	13,076
2005	809	571	567	520	1,570	1,179	2,122	490	1,027	869	585	618	10,927
2006	609	550	636	2,373	890	515	360	5,548	814	12,511	433	600	25,839
2007	697	500	637	378	1,594	763	792	6,704	1,261	512	503	643	14,984
2008	634	655	807	1,193	1,886	1,048	541	3,605	1,662	2,622	447	479	15,579
2009	521	551	667	11,263	2,212	957	1,233	546	922	666	489	539	20,566
2010	671	623	754	8,123	1,483	2,128	2,415	858	756	1,067	666	783	20,327
2011	798	672	730	614	807	485	435	442	373	510	1,915	566	8,347
2012	600	444	761	1,036	511	5,791	231	4,458	916	456	427	475	16,106
2013	536	425	410	419	568	380	529	313	413	460	389	407	5,249
2014	414	414	466	2,583	3,330	7,533	828	313	280	254	289	307	17,011
2015	325	284	334	2,383	19,231	5,807	1,426	538	445	278	313	621	31,985
2016	550	586	725	1,199	1,996	8,903	799	1,455	1,192	3,057	408	571	21,441
2017	828	1,019	1,103	1,188	1,004	773	1,082	1,284	3,271	903	567	521	13,543
2018	619	656	653	633	2,647	730	505	757	1,021	12,469	876	854	22,420
Total	34,381	40,734	55,236	100,608	216,346	220,324	91,581	105,641	137,818	151,718	45,329	39,563	1,239,279
Mean	484	574	778	1,417	3,047	3,103	1,290	1,488	1,941	2,137	638	557	17,455
Max	1,624	3,289	5,435	15,970	31,881	29,682	13,923	33,363	17,014	24,014	2,685	2,634	79,686
Min	28	32	0	12	49	33	0	0	0	0	0	28	2,026

Total filled naturalized flows

Control Point: F10000
Control Point I.D.: PR-CS
Description: Pease River near Childress

Period of record = 12/59-present

	Original	Date:	Extension	Date:
Calcs:				
Checked:			PIT	4/19/2021

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	587	1,961	4,054	1,081	4,079	7,570	3,291	973	265	795	336	116	25,108
1949	972	5,637	1,698	578	15,836	11,718	1,132	472	4,416	2,637	490	373	45,959
1950	493	2,458	259	1,578	15,200	5,914	16,759	15,279	12,462	1,647	536	639	73,224
1951	577	1,637	1,341	584	33,701	19,030	5,171	880	1,529	784	980	162	66,376
1952	316	255	458	1,831	9,142	1,854	1,071	73	64	0	114	369	15,547
1953	104	342	1,270	1,245	633	1,323	3,409	3,837	216	18,419	3,365	1,666	35,829
1954	326	260	90	2,009	30,851	8,353	120	35	0	0	0	206	42,250
1955	276	439	965	302	25,202	15,270	2,314	655	7,596	27,436	1,164	620	82,239
1956	688	835	262	30	7,651	2,009	938	0	0	2,336	1,114	600	16,463
1957	131	834	1,398	23,395	76,515	24,916	2,102	689	673	3,224	6,445	619	140,941
1958	832	1,082	1,631	2,440	9,076	2,309	4,651	700	336	195	53	119	23,424
1959	86	124	0	1,384	8,518	9,049	7,343	725	1,734	12,309	1,731	5,780	48,783
1960	1,725	1,553	748	171	1,628	23,967	10,894	5,003	548	38,039	637	1,960	86,873
1961	1,554	2,590	2,664	406	226	7,886	15,269	3,159	685	190	701	379	35,709
1962	333	195	286	932	1,024	33,919	9,192	473	7,576	1,764	1,451	780	57,925
1963	254	254	1,029	816	4,549	12,029	38	26	4,883	0	439	6	24,323
1964	8	1,102	17	2	835	721	2	446	509	21	1,377	6	5,046
1965	3	5	2	368	3,262	2,527	24	26	23,774	18,408	1,257	1,323	50,979
1966	559	436	406	676	282	3,082	174	7,181	8,006	336	51	42	21,231
1967	21	4	5	8,575	2,405	3,717	3,543	513	1,764	970	270	288	22,075
1968	2,324	983	3,542	799	8,837	13,326	2,872	15,854	859	498	1,420	436	51,750
1969	321	377	1,554	279	7,079	7,659	274	4,670	2,489	3,655	2,029	463	30,849
1970	484	261	1,098	6,780	1,308	243	43	1,897	138	264	207	270	12,993
1971	172	157	177	423	9,930	10,186	89	9,316	22,111	8,155	1,044	1,771	63,531
1972	497	360	184	295	13,626	9,219	7,975	2,858	7,525	2,119	1,418	553	46,629
1973	1,807	1,549	11,137	12,830	1,721	8,703	1,730	2,915	10,435	3,304	455	369	56,955
1974	282	279	1,093	236	11,649	18,746	148	441	16,364	6,077	4,465	1,188	60,968
1975	1,141	3,031	1,507	2,679	402	5,050	7,171	3,109	927	725	1,497	482	27,721
1976	337	348	413	8,566	4,510	1,881	532	2,833	829	461	356	437	21,503
1977	375	332	284	2,720	4,477	6,058	237	8,424	99	110	181	264	23,561
1978	300	227	316	198	2,644	6,811	508	496	2,860	274	423	230	15,287
1979	300	285	8,082	2,366	11,210	29,474	10,562	5,052	767	442	926	310	69,776
1980	766	469	321	277	6,383	1,870	34	8	73	133	260	287	10,881
1981	218	175	628	2,368	2,755	11,512	341	269	607	5,115	359	404	24,751
1982	340	390	693	236	20,952	33,029	4,252	1,794	2,093	321	422	719	65,241
1983	775	848	786	583	2,827	3,593	228	455	378	55,038	2,216	1,307	69,034
1984	1,273	811	695	571	993	1,979	308	2,243	137	416	626	1,721	11,773
1985	980	821	1,069	1,886	921	45,623	6,201	563	6,248	17,041	3,005	1,723	86,081
1986	1,119	2,120	1,107	403	1,801	3,336	3,463	175	6,725	46,965	9,138	3,731	80,083
1987	3,495	5,857	4,994	1,480	13,670	5,762	7,051	1,151	953	1,785	728	751	47,677
1988	980	801	1,067	2,382	1,240	917	2,230	342	6,630	569	426	584	18,168
1989	603	670	701	437	4,286	27,640	315	6,004	22,625	687	590	717	65,275
1990	833	1,140	2,507	5,744	4,116	3,474	1,122	954	348	612	1,003	500	22,353
1991	855	457	370	448	3,192	26,542	4,614	2,624	17,000	1,887	2,690	8,127	68,806
1992	9,717	9,775	4,252	12,567	4,836	24,629	2,716	982	900	379	1,499	1,470	73,722
1993	3,771	2,582	2,772	2,800	2,714	372	1,508	462	213	318	409	514	18,435
1994	482	593	844	1,107	2,958	1,036	2,457	568	212	953	1,189	548	12,947
1995	523	425	457	507	4,897	51,053	1,757	44,457	40,658	4,680	933	1,445	151,792
1996	1,347	1,148	1,022	447	1,975	2,334	3,651	3,302	5,105	2,594	2,236	1,284	26,445
1997	1,120	3,913	2,182	44,623	26,052	7,953	1,957	8,389	1,785	858	760	3,014	102,606
1998	3,037	5,956	10,530	2,807	1,208	563	93	114	36	713	846	509	26,412
1999	1,100	624	1,233	2,072	12,035	7,819	963	924	128	445	372	404	28,119
2000	414	425	5,131	5,052	909	6,452	878	114	35	904	771	601	21,686
2001	899	1,131	1,791	363	6,802	147	43	1,620	1,517	438	3,569	1,343	19,663
2002	812	712	453	493	1,242	2,657	3,746	209	181	900	738	1,116	13,259
2003	615	543	558	1,204	1,820	5,636	781	907	129	225	346	283	13,047
2004	688	722	5,937	2,526	689	10,997	3,347	2,647	380	160	13,103	1,787	42,983
2005	2,879	2,507	1,635	648	7,449	5,788	135	391	846	523	277	310	23,388
2006	279	342	689	862	1,004	166	57	3,771	1,997	13,306	1,032	1,880	25,385
2007	1,388	553	6,422	3,456	6,612	12,131	3,342	4,405	2,200	389	324	891	42,113
2008	612	676	581	909	1,797	2,032	457	566	25,926	8,033	1,358	898	43,845
2009	864	833	691	2,677	4,061	1,246	698	332	1,211	817	659	929	15,018
2010	933	1,391	1,228	37,634	4,907	2,324	24,915	3,161	2,240	1,364	399	528	81,024
2011	645	678	549	340	310	118	121	87	179	10	4	0	3,041
2012	0	0	125	483	13	1,298	44	489	36	13	0	0	2,501
2013	0	108	75	110	0	4,819	1,003	1,797	21	0	0	33	7,966
2014	24	89	44	53	4,334	5,556	2,365	299	117	9	3	12	12,905
2015	280	162	221	3,354	49,825	11,853	3,465	505	45	234	659	1,976	72,579
2016	2,013	954	1,025	3,379	8,888	9,534	1,657	506	1,494	2,204	1,521	1,141	34,316
2017	1,222	1,544	5,007	4,114	1,802	448	474	2,335	3,925	2,283	670	473	24,297
2018	498	439	388	227	3,628	1,068	48	17	1,463	7,750	1,559	1,169	18,254
Total	66,584	83,576	118,750	238,203	553,911	659,825	212,415	198,948	299,235	336,665	93,631	67,955	2,929,698
Mean	938	1,177	1,673	3,355	7,802	9,293	2,992	2,802	4,215	4,742	1,319	957	41,263
Max	9,717	9,775	11,137	44,623	76,515	51,053	24,915	44,457	40,658	55,038	13,103	8,127	151,792
Min	0	0	0	2	0	118	2	0	0	0	0	0	2,501

Total filled naturalized flows

Control Point: G10000
Control Point I.D.: PR-VN
Description: Pease River near Vernon

Period of record = 12/59-present

	Original	Date:	Extension	Date:
Calcs:	ab	9/15/2001		
Checked:	DH	10/17/2001	PIT	4/19/20

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	1,296	4,330	8,952	2,387	9,009	16,717	7,268	2,150	585	1,755	742	255	55,446
1949	2,146	12,449	3,750	1,277	34,970	25,877	2,499	1,042	9,751	5,824	1,082	823	101,490
1950	1,090	5,427	571	3,484	33,567	13,060	37,009	33,741	27,520	3,637	1,184	1,411	161,701
1951	1,274	3,614	2,961	1,290	74,422	42,025	11,419	1,944	3,376	1,731	2,164	357	146,577
1952	699	563	1,011	4,044	20,187	4,094	2,365	161	141	0	251	816	34,332
1953	229	755	2,806	2,750	1,398	2,921	7,529	8,474	477	40,674	7,431	3,679	79,123
1954	720	575	198	4,436	68,129	18,446	265	77	0	0	0	455	93,301
1955	609	969	2,131	667	55,655	33,722	5,109	1,447	16,775	60,587	2,571	1,368	181,610
1956	1,519	1,844	579	65	16,897	4,436	2,072	0	0	5,158	2,459	1,324	36,353
1957	289	1,841	3,086	51,664	168,971	55,024	4,643	1,521	1,486	7,120	14,232	1,368	311,245
1958	1,838	2,389	3,601	5,388	20,043	5,100	10,270	1,546	741	431	116	262	51,725
1959	189	275	0	3,056	18,810	19,983	16,215	1,600	3,829	27,183	3,822	9,997	104,959
1960	2,711	2,918	1,307	332	2,097	33,455	24,193	4,243	824	65,006	2,342	3,677	143,105
1961	2,868	4,998	8,877	2,196	376	7,019	21,825	1,443	1,629	8	2,093	464	53,796
1962	383	158	123	5,152	818	56,410	16,830	4,015	16,970	3,951	3,251	1,747	109,808
1963	568	570	2,306	1,828	10,189	26,944	84	59	10,939	0	984	13	54,484
1964	18	2,468	38	4	1,870	1,615	5	999	1,140	48	3,085	14	11,304
1965	7	11	5	824	7,307	5,660	53	58	53,254	41,234	2,815	2,963	114,191
1966	1,252	976	910	1,515	631	6,903	389	16,086	17,934	752	114	95	47,557
1967	46	8	11	19,209	5,388	8,326	7,937	1,149	3,952	1,291	144	86	47,547
1968	4,613	1,602	4,695	1,976	10,624	18,876	7,213	15,028	2,863	393	729	658	69,270
1969	285	547	1,311	398	7,763	13,095	124	3,772	9,126	9,463	3,517	842	50,243
1970	983	359	5,058	3,021	2,551	1,231	9	1,395	848	9	0	3	15,467
1971	3	0	3	20	6,193	12,939	20	5,238	30,089	7,188	1,398	1,952	65,043
1972	702	455	510	1,218	25,780	8,227	5,289	3,451	22,995	6,724	4,213	1,490	81,054
1973	7,158	2,922	16,557	21,391	7,078	20,208	16,497	3,765	44,776	8,290	2,116	1,152	151,910
1974	781	570	1,652	506	21,109	32,135	105	71	41,777	11,066	7,795	2,049	119,616
1975	1,866	6,095	3,146	3,842	9,020	10,396	72,889	13,755	2,971	1,819	4,856	1,367	132,022
1976	1,214	1,033	1,264	12,864	13,579	3,547	272	2,947	7,063	2,622	1,559	782	48,746
1977	1,061	895	610	8,129	47,752	7,611	656	2,489	182	139	25	16	69,565
1978	30	609	288	72	7,234	18,050	526	963	14,350	850	634	296	43,902
1979	306	547	6,137	3,953	39,816	61,964	10,695	24,305	1,654	629	1,980	1,083	153,069
1980	2,567	1,511	994	671	40,428	3,550	169	0	12	14	0	66	49,982
1981	1	3	177	2,424	8,379	29,382	126	60	162	7,311	448	453	48,926
1982	357	436	1,255	374	36,165	40,011	3,337	4,075	5,715	719	945	1,611	95,000
1983	1,736	1,900	1,761	1,306	6,332	8,048	511	1,019	847	123,285	4,964	2,928	154,637
1984	2,852	1,817	1,557	1,279	2,224	4,433	690	5,024	307	932	1,402	3,855	26,372
1985	2,195	1,839	2,395	4,225	2,063	102,196	13,890	1,261	13,996	38,172	6,731	3,860	192,823
1986	2,507	4,749	2,480	903	4,034	7,473	7,757	392	15,064	105,202	20,469	8,357	179,387
1987	7,829	13,120	11,187	3,315	30,621	12,907	15,794	2,578	2,135	3,998	1,631	1,682	106,797
1988	2,195	1,794	2,390	5,336	2,778	2,054	4,995	766	14,851	1,275	954	1,308	40,696
1989	1,351	1,501	1,570	979	9,601	61,914	706	13,449	50,680	1,539	1,322	1,606	146,218
1990	1,866	2,554	5,616	12,867	9,220	7,782	2,513	2,137	780	1,371	2,247	1,120	50,073
1991	1,915	1,024	829	1,004	7,150	59,454	10,335	5,878	38,080	4,227	6,026	18,204	154,126
1992	21,766	21,896	9,524	17,975	6,992	52,034	9,080	2,884	2,211	362	12,282	6,071	163,077
1993	5,514	9,579	12,330	7,212	15,087	6,813	5,842	598	185	873	616	1,393	66,042
1994	916	1,640	4,456	1,399	8,548	1,071	9,309	1,061	314	1,132	7,269	956	38,071
1995	1,226	1,238	2,053	5,892	23,508	130,660	9,517	101,881	33,739	17,402	6,486	4,267	337,869
1996	3,377	2,364	1,906	1,245	1,630	3,393	4,502	5,762	13,746	4,127	2,488	4,151	48,691
1997	2,164	12,551	5,448	60,041	34,250	14,044	2,294	12,421	38,024	10,221	1,691	5,621	198,770
1998	5,260	20,220	40,730	8,360	3,520	297	13	9	8	6	2,250	556	81,229
1999	3,130	2,230	5,180	2,926	32,606	32,670	53,772	676	21	146	67	447	133,871
2000	465	640	14,910	10,600	10,400	35,170	6,470	49	26	10,368	25,384	7,021	121,503
2001	8,481	5,879	14,396	2,575	15,806	1,201	490	1,142	274	43	7,122	1,827	59,236
2002	1,027	1,511	1,878	3,271	4,992	13,396	23,540	980	26	2,656	1,795	4,764	59,836
2003	2,096	1,387	1,254	1,855	2,645	9,654	1,640	60	1,138	0	0	0	21,729
2004	442	742	12,709	3,923	1,687	12,255	5,664	2,781	461	530	26,630	4,583	72,407
2005	5,214	4,918	3,086	1,282	7,322	5,446	137	4,869	6,324	1,068	70	204	39,940
2006	223	233	688	733	1,339	850	0	7,445	6,225	53,006	5,553	2,014	78,309
2007	4,979	3,221	6,486	7,152	11,173	41,683	10,486	13,812	6,618	705	535	1,254	108,104
2008	701	966	1,198	4,322	4,641	1,783	318	665	19,600	6,884	1,409	911	43,398
2009	831	647	566	11,205	10,747	2,563	241	11	2,827	1,280	663	800	32,381
2010	4,464	3,985	2,439	57,850	11,958	2,891	81,055	9,721	17,709	3,911	1,589	1,184	198,756
2011	1,291	1,608	890	433	516	12	0	0	0	22	10	1	4,783
2012	0	0	280	1,081	29	2,908	99	1,095	80	28	0	0	5,600
2013	1	243	169	246	0	10,795	2,246	4,025	46	1	0	73	17,845
2014	53	199	99	118	9,709	12,446	5,298	669	261	20	6	27	28,905
2015	627	362	494	7,514	111,607	26,551	7,762	1,132	101	525	1,477	4,427	162,579
2016	4,509	2,136	2,297	7,569	19,908	21,357	3,712	1,133	3,347	4,936	3,406	2,556	76,866
2017	2,738	3,458	11,215	9,215	4,036	1,003	1,061	5,230	8,793	5,113	1,501	1,059	54,422
2018	1,115	984	870	509	8,127	2,392	108	39	3,278	17,359	3,492	2,618	40,891
Total	148,734	199,857	274,216	440,144	1,271,011	1,380,558	597,753	375,723	658,028	746,351	240,634	146,699	6,479,708
Mean	2,095	2,815	3,862	6,199	17,902	19,444	8,419	5,292	9,268	10,512	3,389	2,066	91,263
Max	21,766	21,896	40,730	60,041	168,971	130,660	81,055	101,881	53,254	123,285	26,630	18,204	337,869
Min	0	0	0	4	0	12	0	0	0	0	0	0	4,783

Total filled naturalized flows

Control Point: H10000
Control Point I.D.: RR-BB
Description: Red River near Burkburnett

Period of record = 1/60-present

	Original	Date:	Extension	Date:
Calcs:	ab	6/5/2001		
Checked:	SD	12/30/2005	WEC	4/26/20

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	3,411	18,219	37,667	10,045	26,346	43,771	20,066	5,807	431	1,292	2,094	493	169,642
1949	3,807	52,381	14,766	5,375	147,139	108,879	9,391	1,272	28,923	9,299	1,447	2,322	385,001
1950	3,212	22,835	2,404	3,496	124,548	54,953	128,315	29,496	46,501	3,512	2,092	5,937	427,301
1951	5,362	15,208	8,079	5,426	313,134	176,823	48,047	8,179	2,550	7,161	9,106	1,503	600,578
1952	2,940	2,369	4,254	17,016	84,940	17,225	7,447	237	275	367	1,758	1,508	140,336
1953	922	1,759	6,429	11,572	5,081	12,290	46,026	25,915	1,305	132,514	31,268	15,478	290,559
1954	3,031	2,418	874	8,303	286,654	65,673	1,114	3,967	426	476	517	907	374,360
1955	1,630	2,030	2,076	885	234,170	141,888	21,497	6,090	12,716	207,539	9,941	5,757	646,219
1956	5,577	7,760	2,436	453	71,093	18,666	8,719	206	169	17,047	10,346	1,283	143,755
1957	714	2,342	5,689	217,377	710,955	231,515	19,534	11,744	6,252	24,248	13,500	5,756	1,249,626
1958	7,731	5,073	15,153	20,993	50,810	21,457	43,212	6,504	3,252	792	934	2,153	178,064
1959	2,648	1,720	510	12,858	79,142	76,391	68,227	6,732	16,109	99,767	16,080	58,743	438,927
1960	11,379	16,243	4,856	2,202	7,498	150,818	49,383	10,576	6,157	192,190	17,074	21,447	489,823
1961	11,417	13,418	20,724	9,890	8,837	35,737	56,717	2,567	5,181	2,356	18,517	4,194	189,555
1962	3,558	2,340	1,663	10,693	5,803	130,315	27,762	13,480	26,365	8,195	6,401	6,395	242,970
1963	3,169	3,260	3,944	4,061	14,156	69,096	1,190	1,509	14,562	91	1,420	575	117,033
1964	620	7,877	1,133	626	3,480	17,221	400	130	9,119	966	12,141	2,300	56,013
1965	1,317	953	868	7,369	11,048	89,972	8,536	499	99,369	119,457	11,042	10,952	361,382
1966	5,695	6,434	4,600	6,005	2,934	18,290	1,252	36,947	53,968	4,637	888	1,049	142,699
1967	1,054	688	3,609	28,859	8,504	17,046	30,771	2,277	4,671	1,198	1,142	584	100,403
1968	9,761	3,201	10,261	5,058	35,986	73,849	42,595	46,139	30,166	9,754	3,204	3,080	273,054
1969	2,092	4,491	7,526	4,228	54,935	32,785	4,397	21,191	55,597	14,873	7,364	2,943	212,422
1970	2,532	1,728	10,917	11,011	7,845	3,396	382	632	1,484	666	50	96	40,739
1971	162	250	213	75	765	34,884	781	26,543	73,606	20,969	16,578	12,497	187,323
1972	3,117	2,205	1,992	3,035	53,151	24,661	21,803	4,849	19,894	16,449	30,226	2,792	184,174
1973	25,510	7,793	51,895	129,165	19,523	44,766	18,351	14,478	70,366	27,231	5,485	3,601	418,164
1974	2,621	2,278	9,429	3,414	96,222	43,176	1,466	12,037	104,718	26,984	28,827	8,487	339,659
1975	8,053	18,440	12,908	12,605	34,062	73,547	148,924	44,370	14,551	7,016	14,573	9,793	398,842
1976	7,559	5,088	5,667	35,530	31,012	27,057	8,161	9,048	41,983	10,757	8,366	4,678	194,906
1977	6,528	6,877	3,898	26,158	236,424	71,700	9,192	30,846	7,722	2,296	2,785	2,466	406,892
1978	2,760	5,145	4,366	2,864	108,924	156,771	5,421	8,486	28,339	4,698	2,514	2,319	332,607
1979	2,946	3,331	16,712	14,041	48,985	86,338	22,431	18,798	8,466	2,128	8,182	4,981	237,339
1980	6,763	6,020	3,733	5,984	107,768	91,978	5,353	2,076	2,069	639	1,212	3,066	236,661
1981	1,607	1,675	3,269	6,477	19,678	84,551	3,570	5,524	7,312	18,838	2,112	2,481	157,094
1982	1,956	3,337	5,508	1,600	88,553	100,655	22,993	25,162	11,700	987	1,061	1,085	264,597
1983	2,303	9,278	10,321	8,819	29,608	22,347	11,615	442	826	405,573	41,127	12,230	554,489
1984	10,701	8,849	9,618	8,696	3,706	14,015	1,944	9,196	1,081	4,100	6,243	16,693	94,842
1985	32,714	34,410	52,660	34,306	31,392	163,320	15,060	5,769	11,972	140,267	24,464	12,903	559,237
1986	6,615	9,379	7,231	6,222	44,844	70,362	27,578	6,708	92,917	437,155	128,330	64,845	902,186
1987	54,766	67,836	75,059	26,985	317,912	129,093	65,533	16,776	26,236	9,909	11,769	19,322	821,196
1988	23,736	14,029	26,191	31,627	12,879	27,432	19,293	6,460	82,648	12,235	6,658	7,619	270,807
1989	5,923	10,673	11,252	11,009	49,613	227,146	15,743	16,805	53,935	17,346	11,923	8,486	439,854
1990	11,947	10,850	47,856	74,610	35,959	77,076	7,583	22,902	8,135	7,707	10,110	7,797	322,532
1991	14,689	7,397	5,959	9,673	60,995	399,642	75,855	14,597	96,885	23,963	27,730	133,012	870,397
1992	70,624	63,886	55,836	52,404	20,564	112,320	42,351	14,515	25,320	5,670	69,622	54,158	587,270
1993	42,580	53,195	81,845	54,429	172,800	47,049	40,730	18,712	9,599	7,396	5,374	9,346	543,055
1994	7,229	17,034	39,315	14,912	82,196	6,966	23,550	4,927	2,291	14,366	19,542	7,281	239,609
1995	6,051	4,172	7,497	26,715	75,596	696,326	32,207	280,573	94,289	61,165	22,709	22,745	1,330,045
1996	20,143	14,678	11,953	9,849	5,299	25,332	23,887	65,529	160,118	28,971	11,990	30,377	408,126
1997	12,499	62,539	22,659	294,434	173,470	85,844	24,049	67,558	124,706	12,255	6,924	44,795	931,732
1998	47,875	105,076	223,773	42,852	23,464	6,217	2,988	1,669	1,223	4,681	20,956	6,287	487,061
1999	7,988	17,493	20,983	15,819	95,360	65,261	38,254	10,088	3,052	1,473	3,267	1,332	280,370
2000	1,662	3,001	45,185	16,037	24,852	63,627	23,771	2,321	1,296	46,940	50,887	18,005	297,584
2001	24,376	35,362	38,018	14,557	104,377	31,991	2,813	8,518	8,632	1,651	13,749	4,922	288,966
2002	3,603	10,866	5,849	22,155	5,406	19,148	49,305	2,361	888	14,032	9,885	16,014	159,512
2003	8,753	4,539	3,268	4,734	11,246	54,651	11,381	632	6,886	561	952	572	108,175
2004	2,642	4,264	62,119	5,516	9,438	34,672	40,642	7,094	3,725	21,094	80,516	18,500	290,222
2005	24,852	20,587	11,850	7,322	14,608	40,574	5,696	27,623	21,792	11,184	2,241	3,016	191,345
2006	2,202	1,659	5,453	6,417	16,762	3,470	221	14,380	19,614	97,218	21,421	24,976	213,793
2007	31,143	11,125	32,897	32,125	60,333	266,728	115,545	49,245	29,308	8,098	3,065	11,148	650,760
2008	6,100	10,919	19,408	52,456	32,942	12,648	1,552	27,634	29,603	40,902	7,495	5,577	247,236
2009	6,823	5,401	4,382	29,157	130,095	19,531	5,184	10,498	4,635	2,785	7,075	6,885	232,451
2010	33,485	28,617	11,105	108,480	48,073	18,470	142,110	16,751	17,214	13,489	7,614	4,586	449,994
2011	5,353	5,975	3,332	1,835	6,128	270	51	0	265	880	6,027	2,830	32,946
2012	1,232	1,376	6,967	12,304	2,217	12,345	152	3,845	934	3,859	31	0	45,262
2013	649	1,125	1,875	1,672	137	13,646	2,569	5,813	2,075	1,786	0	699	32,046
2014	104	334	152	2,751	11,920	41,889	20,369	5,599	2,479	443	5,459	914	92,413
2015	1,261	939	2,023	11,940	513,958	168,584	107,316	9,695	2,039	7,527	9,805	18,328	853,415
2016	20,415	11,318	11,801	68,212	137,034	89,486	41,018	21,869	25,468	34,444	15,146	11,688	487,899
2017	13,979	15,412	36,593	53,619	51,360	27,631	14,251	18,252	31,204	37,447	12,549	8,302	320,599
2018	8,004	7,714	7,974	6,183	18,403	5,678	995	3,216	13,946	77,397	14,864	12,804	177,178
Total	738,182	948,493	1,310,287	1,825,582	5,575,051	5,548,927	1,966,587	1,242,885	1,833,510	2,613,358	997,766	842,695	25,443,323
Mean	10,397	13,359	18,455	25,712	78,522	78,154	27,698	17,505	25,824	36,808	14,053	11,869	358,357
Max	70,624	105,076	223,773	294,434	710,955	696,326	148,924	280,573	160,118	437,155	128,330	133,012	1,330,045
Min	104	250	152	75	137	270	51	0	169	91	0	0	32,046

Total filled naturalized flows

Control Point: I10000
Control Point I.D.: NW-PD
Description: North Wichita River near Paducah Period of record = 2/51-present

	Original	Date:	Extension	Date:
Calcs:	pm	8/29/2001	JSA	11/9/2020
Checked:	kll	8/31/2001	PIT	4/19/2021

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	279	768	693	35	2,657	3,925	1,966	476	317	1,011	228	109	12,464
1949	599	1,536	789	122	3,473	3,280	643	284	2,412	1,487	446	456	15,527
1950	572	932	66	1,026	6,319	1,593	5,391	10,633	9,229	2,093	462	319	38,635
1951	158	881	747	0	5,412	1,612	134	500	1,185	433	519	0	11,581
1952	0	69	76	262	1,697	0	618	0	105	13	175	328	3,343
1953	101	336	620	71	247	115	1,668	2,439	158	7,061	908	342	14,066
1954	12	87	0	1,110	13,149	5,253	0	0	0	0	5	224	19,840
1955	281	411	937	93	5,795	5,268	512	212	5,277	16,286	723	309	36,104
1956	427	415	127	0	1,786	30	336	0	0	1,084	266	663	5,134
1957	125	689	817	5,078	19,894	7,019	1,076	107	180	1,356	2,590	233	39,164
1958	136	848	429	1,365	5,396	424	1,499	267	303	210	107	139	11,123
1959	0	0	0	579	1,319	3,917	1,866	0	340	5,745	510	2,055	16,331
1960	511	471	420	307	3,011	5,006	6,902	746	308	8,605	596	640	27,523
1961	598	696	1,468	576	565	1,006	2,843	494	431	483	714	787	10,661
1962	738	578	621	519	430	2,749	627	775	1,880	935	550	504	10,906
1963	519	527	1,008	546	448	631	193	214	295	189	590	364	5,524
1964	366	500	398	315	652	601	206	122	123	229	234	282	4,028
1965	298	265	303	2,231	885	2,124	200	830	5,742	3,837	298	898	17,911
1966	371	286	321	329	223	1,791	130	13,281	3,457	389	353	390	21,321
1967	386	324	329	4,272	357	5,397	1,648	307	1,803	646	424	453	16,346
1968	603	501	750	562	627	1,868	477	405	329	471	462	528	7,583
1969	543	566	582	481	3,406	5,129	361	805	3,053	2,822	1,065	744	19,557
1970	695	678	1,021	857	707	613	464	317	271	386	495	509	7,013
1971	499	463	418	394	3,720	4,011	2,220	2,748	3,850	812	543	670	20,348
1972	615	517	554	1,131	1,974	1,000	805	1,107	6,248	744	702	738	16,135
1973	922	722	1,131	970	775	607	1,008	775	1,244	1,033	899	812	10,898
1974	701	666	824	780	3,105	5,712	437	552	8,390	2,927	1,041	892	26,027
1975	898	889	818	797	1,666	785	4,944	5,294	994	812	893	781	19,571
1976	614	525	744	2,862	824	696	568	5,534	1,220	1,088	791	793	16,259
1977	769	711	824	845	5,522	1,089	775	965	660	738	791	799	14,488
1978	756	700	781	726	1,482	2,196	508	561	3,362	707	672	646	13,097
1979	639	578	1,324	1,032	2,471	3,748	2,686	3,129	862	749	1,029	769	19,016
1980	732	657	709	1,021	8,367	1,772	614	590	600	572	631	719	16,984
1981	676	590	728	902	2,569	8,455	570	1,462	636	3,792	650	646	21,676
1982	507	406	720	294	6,384	7,967	665	369	506	383	459	535	19,195
1983	548	463	566	546	587	440	157	160	171	28,085	1,595	919	34,237
1984	742	596	599	484	403	481	353	593	269	407	551	997	6,475
1985	775	506	646	584	427	4,551	472	221	753	9,152	1,089	684	19,860
1986	602	603	508	482	2,733	602	3,886	957	3,381	11,177	1,650	1,159	27,740
1987	1,052	1,587	1,723	684	18,488	1,961	1,369	891	595	557	619	724	30,250
1988	650	527	654	802	526	434	888	467	2,342	486	451	511	8,738
1989	462	436	408	398	4,753	8,418	566	1,575	2,588	645	473	607	21,329
1990	856	672	2,445	6,393	3,094	5,276	1,206	665	401	551	610	468	22,637
1991	688	435	417	425	1,155	12,792	901	947	9,235	1,554	964	2,884	32,397
1992	1,642	3,339	1,521	3,810	1,252	16,946	1,773	1,334	948	709	1,694	927	35,895
1993	879	1,769	1,410	1,309	4,781	1,330	1,074	1,678	640	587	702	817	16,976
1994	720	846	704	725	2,729	422	585	182	495	898	904	799	10,009
1995	793	739	849	934	2,958	26,896	2,140	14,696	2,089	1,906	1,422	1,396	56,818
1996	1,224	1,133	1,058	922	928	887	713	1,562	1,202	1,297	1,148	842	12,916
1997	738	889	658	15,769	4,513	1,303	1,371	1,765	4,445	1,311	1,595	1,525	35,882
1998	1,061	1,083	3,055	1,000	928	1,033	752	839	742	749	677	710	12,629
1999	770	791	908	1,367	10,643	4,933	1,101	829	740	1,333	710	672	24,797
2000	657	618	1,932	942	952	3,098	758	582	512	604	780	660	12,095
2001	591	855	2,579	658	647	431	471	856	704	611	2,410	635	11,448
2002	627	609	528	605	595	709	822	710	546	589	536	644	7,520
2003	516	398	489	1,018	472	785	522	357	363	385	432	363	6,100
2004	370	384	2,011	1,078	399	2,284	427	644	336	424	2,650	636	11,643
2005	559	457	545	591	882	510	354	479	419	405	317	1,090	6,608
2006	769	415	462	387	750	694	457	1,355	1,972	9,350	642	561	17,814
2007	507	387	467	409	815	3,020	1,710	1,660	697	516	783	523	11,494
2008	544	509	618	586	855	1,050	421	470	752	1,242	481	441	7,969
2009	440	390	367	1,401	1,070	2,153	647	743	788	733	809	567	10,108
2010	474	492	506	4,028	1,263	1,581	3,148	1,069	809	594	642	588	15,194
2011	601	629	636	398	425	271	329	365	337	152	372	284	4,799
2012	314	282	328	171	141	279	188	236	209	200	219	170	2,737
2013	257	255	245	330	252	2,482	272	110	473	88	180	285	5,229
2014	299	237	246	286	1,005	1,044	1,307	695	330	144	258	244	6,095
2015	269	176	244	547	7,337	1,440	694	287	89	395	592	616	12,686
2016	677	422	526	1,342	2,033	1,776	327	805	1,450	343	889	587	11,177
2017	373	337	1,233	647	722	239	171	1,331	535	199	250	259	6,296
2018	225	206	221	200	1,009	924	103	286	1,565	4,120	688	572	10,119
Total	39,917	44,260	54,409	84,748	199,836	210,864	77,995	98,701	109,692	152,626	52,605	46,442	1,172,095
Mean	562	623	766	1,194	2,815	2,970	1,099	1,390	1,545	2,150	741	654	16,508
Max	1,642	3,339	3,055	15,769	19,894	26,896	6,902	14,696	9,235	28,085	2,650	2,884	56,818
Min	0	0	0	0	141	0	0	0	0	0	5	0	2,737

Total filled naturalized flows

	Original	Date:	Extension	Date:
Calcs:	ab	9/17/2001		
Checked:			PIT	4/22/2021

Control Point: J10000
Control Point I.D.: NW-TS
Description: North Wichita River near Truscott Period of record = 12/59-present

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	744	2,049	1,849	94	7,086	10,466	5,242	1,269	845	2,695	607	290	33,236
1949	1,597	4,095	2,104	325	9,262	8,748	1,716	757	6,431	3,966	1,189	1,216	41,406
1950	1,525	2,486	175	2,736	16,850	4,249	14,376	28,355	24,610	5,581	1,231	851	103,025
1951	421	2,350	1,992	0	14,431	4,298	359	1,333	3,160	1,153	1,385	0	30,882
1952	0	185	203	699	4,526	0	1,649	0	280	35	467	874	8,918
1953	269	896	1,653	188	660	307	4,447	6,503	421	18,830	2,422	911	37,507
1954	32	233	0	2,959	35,063	14,008	0	0	0	0	14	596	52,905
1955	750	1,095	2,500	248	15,455	14,047	1,366	566	14,071	43,431	1,927	823	96,279
1956	1,137	1,108	339	0	4,762	80	896	0	0	2,891	711	1,769	13,693
1957	333	1,836	2,178	13,540	53,050	18,716	2,870	286	480	3,615	6,906	622	104,432
1958	363	2,261	1,144	3,639	14,390	1,129	3,996	713	809	560	285	370	29,659
1959	0	0	0	1,543	3,516	10,445	4,976	0	907	15,321	1,359	5,268	43,335
1960	1,309	1,208	1,077	787	7,720	12,837	17,697	1,912	789	22,063	1,527	1,642	70,568
1961	1,533	1,785	3,763	1,478	1,448	2,580	7,289	1,596	1,800	1,284	2,009	1,176	27,741
1962	1,123	895	861	1,689	1,202	6,829	1,076	1,041	7,203	5,671	1,815	1,087	30,492
1963	786	758	1,287	2,694	5,192	6,634	404	222	1,524	240	1,861	728	22,330
1964	638	1,523	593	453	3,727	4,707	44	72	1,782	657	1,403	764	16,363
1965	506	342	338	4,047	1,011	5,668	80	3,399	48,675	26,444	1,139	1,734	93,383
1966	960	946	966	1,387	1,140	8,102	237	70,271	26,647	1,250	879	910	113,695
1967	821	706	729	11,012	3,851	22,464	6,088	656	4,365	970	619	757	53,038
1968	3,255	2,053	4,280	1,190	1,156	4,025	3,170	344	209	812	1,027	754	22,275
1969	753	825	956	685	8,323	8,061	259	1,098	13,355	8,134	1,851	1,484	45,784
1970	1,271	1,029	5,276	1,511	1,414	706	285	416	654	704	660	829	14,755
1971	732	714	670	680	6,632	4,693	385	3,312	8,600	2,862	1,250	1,287	31,817
1972	1,256	1,537	1,593	7,039	9,576	6,450	1,654	4,484	15,157	3,110	2,293	1,172	55,321
1973	2,337	1,712	4,441	2,608	1,601	1,215	5,529	2,523	4,765	1,492	1,781	1,127	31,131
1974	958	835	978	1,313	4,891	10,433	284	1,998	23,211	5,419	2,188	1,394	53,902
1975	1,535	2,188	1,404	1,456	6,861	2,198	19,482	6,674	2,791	1,539	3,205	1,478	50,811
1976	1,214	998	1,045	4,604	1,902	1,110	640	5,071	2,555	3,348	1,139	1,073	24,699
1977	922	904	1,031	2,089	15,302	1,537	799	2,490	1,055	1,204	1,103	1,194	29,630
1978	1,137	946	1,053	875	3,022	5,883	447	798	10,655	1,093	1,365	1,067	28,341
1979	1,361	1,012	2,166	1,490	4,586	10,814	4,546	9,727	769	786	1,557	1,107	39,921
1980	1,388	1,219	952	880	22,553	2,289	571	612	711	655	1,089	1,325	34,244
1981	984	782	1,398	2,059	10,061	16,096	652	1,828	1,206	6,765	1,124	1,313	44,268
1982	1,301	1,040	1,845	753	16,370	20,428	1,705	947	1,297	983	1,177	1,371	49,217
1983	1,406	1,186	1,450	1,401	1,504	1,127	402	410	439	72,014	4,089	2,357	87,785
1984	1,903	1,528	1,537	1,240	1,033	1,233	905	1,520	689	1,044	1,413	2,557	16,602
1985	1,987	1,298	1,656	1,498	1,094	11,669	1,211	566	1,932	23,467	2,792	1,753	50,923
1986	1,543	1,545	1,303	1,236	7,008	1,543	9,965	2,454	8,668	28,659	4,230	2,973	71,127
1987	2,698	4,070	4,418	1,754	47,404	5,028	3,511	2,285	1,525	1,428	1,586	1,857	77,564
1988	1,666	1,350	1,678	2,057	1,349	1,113	2,276	1,197	6,005	1,246	1,157	1,310	22,404
1989	1,184	1,119	1,046	1,021	12,186	21,585	1,450	4,038	6,637	1,654	1,213	1,557	54,690
1990	2,196	1,724	6,268	16,393	7,934	13,529	3,093	1,706	1,029	1,414	1,565	1,200	58,051
1991	1,765	1,115	1,069	1,091	2,961	32,801	2,309	2,428	23,679	3,985	2,473	7,396	83,072
1992	4,211	8,561	3,900	9,769	3,209	43,450	4,546	3,420	2,432	1,819	4,344	2,376	92,037
1993	2,253	4,536	3,616	3,356	12,260	3,410	2,755	4,302	1,642	1,505	1,801	2,095	43,531
1994	1,845	2,168	1,805	1,860	6,998	1,082	1,500	466	1,270	2,502	4,534	1,460	27,490
1995	1,448	1,307	1,553	3,064	14,071	43,860	4,207	37,129	5,990	3,737	2,071	2,063	120,500
1996	1,597	1,210	1,333	1,323	1,269	1,027	1,036	2,341	2,065	1,427	1,158	1,396	17,182
1997	1,394	2,993	1,377	20,223	8,886	2,156	1,765	6,040	7,696	3,178	1,833	2,327	59,868
1998	1,942	3,648	9,291	2,124	1,813	1,252	673	918	867	1,398	1,511	1,206	26,643
1999	2,116	863	2,559	3,251	19,833	15,654	2,888	660	469	1,454	1,279	1,833	52,859
2000	1,561	1,313	9,967	1,545	1,985	6,776	883	332	312	3,323	6,514	1,470	35,981
2001	1,484	1,295	3,467	960	1,680	556	143	3,358	1,757	518	5,993	1,051	22,262
2002	938	741	1,093	1,920	819	2,075	5,681	1,016	528	4,208	1,431	3,302	23,752
2003	1,232	1,088	1,087	2,181	638	2,612	249	467	1,194	810	514	551	12,623
2004	710	703	4,221	750	371	6,162	1,098	1,320	330	1,169	7,122	942	24,898
2005	1,342	1,099	1,070	710	1,933	822	719	2,344	8,621	1,865	871	995	22,391
2006	706	485	432	493	1,728	1,311	737	2,682	3,491	20,961	2,170	1,136	36,332
2007	1,398	958	1,336	1,226	3,148	8,905	1,542	3,153	699	494	679	1,352	24,890
2008	1,031	707	492	1,516	4,164	4,640	740	984	2,247	3,382	810	874	21,587
2009	844	699	1,128	5,549	15,061	9,511	3,387	2,632	2,620	3,087	1,036	1,102	46,656
2010	1,772	2,044	1,221	16,457	4,180	1,951	17,602	1,744	2,433	1,546	1,192	1,201	53,343
2011	1,057	863	799	611	666	284	139	112	268	391	953	729	6,872
2012	804	723	842	438	362	715	482	605	537	512	561	436	7,017
2013	660	655	628	845	647	6,363	697	282	1,213	226	462	732	13,410
2014	766	608	632	733	2,576	2,678	3,352	1,783	847	369	662	626	15,632
2015	689	452	625	1,402	18,814	3,693	1,780	735	228	1,014	1,518	1,580	32,530
2016	1,736	1,083	1,349	3,441	5,212	4,553	838	2,065	3,719	879	2,280	1,504	28,659
2017	957	865	3,162	1,660	1,851	613	438	3,413	1,373	510	642	663	16,147
2018	576	527	567	513	2,587	2,369	265	733	4,014	10,564	1,763	1,467	25,945
Total	88,668	101,680	132,816	194,361	537,826	520,360	200,480	262,913	341,254	403,322	128,786	99,792	3,012,258
Mean	1,249	1,432	1,871	2,737	7,575	7,329	2,824	3,703	4,806	5,681	1,814	1,406	42,426
Max	4,211	8,561	9,967	20,223	53,050	43,860	19,482	70,271	48,675	72,014	7,122	7,396	120,500
Min	0	0	0	0	362	0	0	0	0	0	14	0	6,872

Total filled naturalized flows

Control Point: K10000
Control Point I.D.: SW-GR
Description: S. Wichita Rv nr Guthrie, South Wichita River below Lake Period of record = 0

	Original		Extension	
			PIT	4/22/2021

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	107	295	266	13	1,019	1,504	754	182	121	387	87	42	4,777
1949	230	589	302	47	1,331	1,258	247	109	925	570	171	175	5,954
1950	219	357	25	393	2,422	611	2,066	4,076	3,538	802	177	122	14,808
1951	60	338	286	0	2,074	618	52	192	454	166	199	0	4,439
1952	0	27	29	101	651	0	237	0	40	5	67	126	1,283
1953	39	129	238	27	95	44	639	935	60	2,707	348	131	5,392
1954	5	33	0	425	5,040	2,014	0	0	0	0	2	86	7,605
1955	108	157	359	36	2,222	2,019	196	81	2,023	6,243	277	118	13,839
1956	164	159	49	0	684	11	129	0	0	416	102	254	1,968
1957	48	264	313	1,946	7,626	2,690	413	41	69	520	993	89	15,012
1958	52	325	164	523	2,069	162	574	103	116	80	41	53	4,262
1959	0	0	0	222	505	1,501	715	0	130	2,202	195	238	5,708
1960	88	89	57	52	62	399	1,184	227	19	6,061	209	171	8,618
1961	133	116	339	111	2,875	303	330	23	362	59	240	88	4,979
1962	91	56	62	331	61	1,769	123	43	1,722	251	330	129	4,968
1963	84	76	73	90	519	414	100	0	469	17	163	67	2,072
1964	60	180	60	38	98	670	8	13	1,304	67	400	88	2,986
1965	82	54	58	410	130	23	0	2,354	3,226	3,005	199	137	9,678
1966	106	91	111	264	58	1,110	55	4,433	5,976	286	148	120	12,758
1967	108	77	64	1,664	1,398	3,710	817	116	204	47	70	81	8,356
1968	605	261	931	221	167	263	492	154	10	46	123	77	3,350
1969	66	70	89	62	887	185	8	326	2,981	1,803	525	217	7,219
1970	173	115	1,091	232	152	46	1	4	108	185	169	177	2,453
1971	196	159	181	167	193	177	144	2,593	278	563	354	352	5,357
1972	311	253	288	242	264	326	257	457	339	309	306	307	3,659
1973	315	271	489	332	300	288	324	388	387	364	247	263	3,968
1974	269	234	282	272	307	616	212	198	315	362	283	287	3,637
1975	263	227	291	217	892	270	363	331	290	257	219	234	3,854
1976	195	168	249	281	274	225	290	292	265	1,081	178	108	3,606
1977	92	94	91	494	1,689	213	38	70	26	94	77	65	3,043
1978	64	92	66	37	152	86	8	818	596	93	124	38	2,174
1979	75	62	214	100	414	375	178	429	12	2	119	62	2,042
1980	87	76	56	71	2,804	139	3	43	284	98	104	166	3,931
1981	85	96	192	222	508	1,216	4	493	119	349	96	93	3,473
1982	103	123	200	125	2,366	4,270	269	74	93	45	85	115	7,868
1983	191	152	134	214	286	419	30	1	0	8,071	528	263	10,289
1984	215	184	163	124	91	64	33	148	38	84	221	507	1,872
1985	237	152	680	602	101	993	163	94	171	1,337	410	281	5,221
1986	261	219	214	428	344	588	9,455	891	3,643	1,883	506	530	18,962
1987	507	502	255	25	3,622	825	670	480	477	443	450	500	8,756
1988	469	441	474	382	419	412	627	386	510	385	368	374	5,247
1989	393	347	366	348	427	749	309	374	574	386	344	353	4,970
1990	564	327	551	842	525	413	409	519	338	391	321	401	5,601
1991	394	323	349	323	370	1,167	564	1,246	3,307	604	523	1,092	10,262
1992	856	1,334	668	460	770	922	439	331	511	448	501	804	8,044
1993	481	619	548	529	421	500	363	346	320	358	451	493	5,429
1994	473	455	473	422	866	383	358	418	365	355	502	436	5,506
1995	485	404	438	475	940	820	485	1,461	497	554	509	612	7,680
1996	499	424	486	462	660	411	450	593	5,660	451	539	524	11,159
1997	467	499	444	1,029	719	562	708	405	376	928	417	441	6,995
1998	459	457	435	435	386	351	339	379	310	385	396	397	4,729
1999	456	303	437	364	1,739	612	429	409	333	381	367	368	6,198
2000	397	344	689	364	526	484	380	371	326	426	691	516	5,514
2001	553	374	496	368	382	338	292	327	328	364	659	524	5,005
2002	403	368	419	512	383	376	356	334	1	164	382	435	4,133
2003	394	306	332	322	322	582	307	295	565	430	305	274	4,434
2004	328	292	946	396	298	308	333	359	301	314	1,846	622	6,343
2005	564	456	442	373	372	336	363	402	316	411	350	408	4,793
2006	352	352	434	321	469	371	264	289	300	701	348	366	4,567
2007	388	326	368	330	366	581	382	373	340	348	345	358	4,505
2008	355	302	367	323	371	1,076	337	408	347	401	309	338	4,934
2009	356	318	318	619	303	366	270	299	336	421	331	350	4,287
2010	364	357	380	506	467	401	942	670	797	543	334	394	6,155
2011	381	381	366	308	309	274	283	219	275	334	328	124	3,582
2012	274	334	324	226	260	261	269	274	323	330	285	352	3,512
2013	317	267	295	235	272	1,174	317	328	265	265	265	325	4,325
2014	307	279	310	256	277	264	243	283	246	292	289	305	3,351
2015	296	276	288	219	2,951	702	276	200	230	115	176	410	6,139
2016	336	121	91	683	100	588	184	176	318	93	226	149	3,065
2017	138	117	432	150	290	50	707	420	42	55	43	45	2,489
2018	58	46	46	39	874	324	7	20	528	1,632	293	230	4,097
Total	18,651	18,471	22,023	23,782	64,586	48,572	33,573	34,126	50,475	54,625	22,585	19,777	411,246
Mean	263	260	310	335	910	684	473	481	711	769	318	279	5,792
Max	856	1,334	1,091	1,946	7,626	4,270	9,455	4,433	5,976	8,071	1,846	1,092	18,962
Min	0	0	0	0	58	0	0	0	0	0	2	0	1,283

Total filled naturalized flows

	Original	Date:	Extension	Date:
Calcs:	ab	6/5/2001	JSA	11/10/20
Checked:	kll	9/4/2001	PIT	4/22/20

Control Point: L10000
Control Point I.D.: SW-BJ
Description: South Wichita River near Benjamin Period of record = 12/59-present

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	512	1,409	1,271	64	4,872	7,195	3,604	872	581	1,853	417	199	22,849
1949	1,098	2,815	1,446	224	6,368	6,014	1,180	521	4,422	2,726	818	836	28,468
1950	1,048	1,709	120	1,881	11,584	2,921	9,883	19,494	16,919	3,837	847	585	70,828
1951	289	1,616	1,370	0	9,921	2,955	247	916	2,173	793	952	0	21,232
1952	0	127	140	481	3,112	0	1,134	0	192	24	321	601	6,132
1953	185	616	1,136	129	454	211	3,058	4,471	289	12,945	1,665	626	25,785
1954	22	160	0	2,034	24,106	9,631	0	0	0	0	9	410	36,372
1955	516	753	1,718	170	10,625	9,657	939	389	9,674	29,859	1,325	566	66,191
1956	782	762	233	0	3,274	55	616	0	0	1,987	489	1,216	9,414
1957	229	1,263	1,497	9,309	36,472	12,867	1,973	196	330	2,485	4,748	428	71,797
1958	249	1,554	786	2,502	9,893	776	2,747	490	556	385	196	254	20,388
1959	0	0	0	1,061	2,417	7,181	3,421	0	624	10,533	934	1,192	27,363
1960	442	445	283	262	312	1,997	5,918	1,135	93	30,307	1,043	855	43,092
1961	667	580	1,695	554	14,375	1,513	1,648	115	1,809	296	1,202	441	24,895
1962	455	282	310	1,655	305	8,844	614	214	8,610	1,257	1,651	645	24,842
1963	418	381	364	451	2,597	2,070	499	0	2,346	84	816	337	10,363
1964	298	899	302	188	491	3,350	40	67	6,518	336	2,000	441	14,930
1965	409	271	292	2,049	648	113	1	11,772	16,131	15,025	994	684	48,389
1966	529	456	554	1,318	289	5,548	273	22,165	29,879	1,432	740	601	63,784
1967	542	387	322	8,321	6,988	18,549	4,086	581	1,020	237	352	406	41,791
1968	3,027	1,303	4,655	1,107	836	1,317	2,458	769	51	230	613	387	16,753
1969	330	349	446	311	4,433	927	41	1,628	14,906	9,015	2,624	1,085	36,095
1970	865	575	5,457	1,160	759	231	4	18	540	408	264	307	10,588
1971	322	256	214	230	8,542	1,562	281	4,505	1,650	4,915	1,152	1,313	24,942
1972	505	446	389	9,394	3,799	2,928	3,124	8,620	9,475	5,010	1,845	740	46,275
1973	1,160	1,343	3,911	3,199	870	396	932	332	3,778	455	1,203	366	17,945
1974	289	258	298	910	1,879	4,664	23	131	7,207	2,662	1,075	571	19,967
1975	596	1,511	620	1,009	13,909	4,516	7,655	2,572	4,466	631	2,802	565	40,852
1976	487	486	533	1,638	458	89	1,016	2,262	1,530	5,406	891	542	15,338
1977	460	469	457	2,468	8,446	1,065	190	348	128	469	383	324	15,207
1978	318	458	331	185	759	430	38	4,090	2,979	467	621	192	10,868
1979	377	309	1,068	501	2,070	1,873	892	2,147	60	11	595	312	10,215
1980	436	379	280	354	14,022	694	15	214	1,418	492	520	831	19,655
1981	426	482	962	1,110	2,539	6,082	21	2,463	594	1,747	478	467	17,371
1982	516	615	1,001	625	11,829	21,348	1,345	368	464	224	425	575	39,335
1983	954	759	671	1,068	1,431	2,095	151	4	2	40,357	2,640	1,317	51,449
1984	1,075	922	817	618	454	322	164	740	192	419	1,104	2,533	9,360
1985	1,184	759	3,398	3,012	504	4,963	815	469	857	11,438	1,275	728	29,402
1986	488	451	421	424	3,737	2,516	9,957	2,550	12,352	26,519	3,869	2,585	65,869
1987	1,922	3,234	3,632	999	15,589	7,342	2,951	2,005	1,060	435	426	606	40,202
1988	614	517	615	502	390	399	3,696	638	3,285	361	359	343	11,719
1989	353	351	331	279	16,016	6,686	447	1,378	10,935	611	417	349	38,155
1990	923	1,338	3,291	11,387	7,120	27,480	1,544	1,228	436	586	1,113	617	57,063
1991	1,179	498	434	587	1,874	11,047	592	3,637	9,525	2,123	946	5,177	37,621
1992	4,006	10,122	4,247	3,940	4,525	24,211	2,135	1,121	1,142	534	1,670	1,457	59,112
1993	905	4,216	3,558	2,268	2,162	1,844	1,820	858	689	557	545	818	20,241
1994	540	1,369	804	407	6,485	604	870	410	4,819	1,503	3,704	495	22,009
1995	514	503	552	842	12,574	12,367	3,542	35,928	909	2,397	1,267	1,126	72,521
1996	1,088	702	645	457	447	3,203	355	709	29,439	2,158	1,325	913	41,442
1997	792	2,363	1,161	8,034	7,920	2,234	1,036	1,622	478	6,777	410	752	33,578
1998	782	3,545	5,686	1,095	2,176	392	434	305	230	479	417	307	15,848
1999	1,357	363	2,517	1,201	12,261	2,749	512	367	199	303	292	275	22,397
2000	130	209	9,309	919	559	1,421	1,250	289	240	1,470	4,100	440	20,335
2001	474	1,012	4,007	618	913	180	207	995	1,003	401	3,684	437	13,932
2002	631	459	896	1,954	507	2,890	7,288	696	224	5,861	1,659	3,037	26,102
2003	947	660	585	2,990	785	7,496	544	761	2,989	246	242	214	18,461
2004	891	586	3,317	1,343	275	4,850	7,938	1,297	380	1,819	15,446	2,108	40,250
2005	1,748	1,695	1,102	579	939	1,900	1,017	5,424	3,879	873	292	274	19,723
2006	230	385	551	530	4,797	738	279	230	214	8,545	386	437	17,322
2007	591	351	1,311	429	3,646	14,238	3,058	8,784	1,179	418	469	735	35,207
2008	565	539	676	6,749	1,280	2,160	685	354	915	1,377	184	312	15,794
2009	297	226	288	2,464	2,105	5,700	843	1,123	1,180	2,657	228	395	17,505
2010	1,618	2,059	1,564	8,821	2,538	482	9,465	1,607	6,677	508	345	464	36,147
2011	401	405	328	216	151	173	223	164	218	281	310	58	2,927
2012	202	266	292	200	198	2,081	441	320	1,240	337	161	133	5,870
2013	385	604	328	1,327	506	5,872	1,994	422	566	194	211	259	12,668
2014	244	580	247	195	1,383	2,445	646	1,690	1,464	291	374	362	9,922
2015	841	406	914	2,462	14,755	3,509	1,378	448	184	577	878	2,051	28,402
2016	1,680	603	453	3,415	498	2,939	919	881	1,588	464	1,129	744	15,313
2017	689	587	2,160	748	1,449	249	3,534	2,099	211	277	216	226	12,445
2018	289	232	232	197	4,368	1,619	33	98	2,639	8,160	1,464	1,152	20,483
Total	50,332	69,597	95,801	130,131	361,571	320,966	132,680	175,517	254,950	280,857	90,567	54,137	2,017,107
Mean	709	980	1,349	1,833	5,093	4,521	1,869	2,472	3,591	3,956	1,276	762	28,410
Max	4,006	10,122	9,309	11,387	36,472	27,480	9,957	35,928	29,879	40,357	15,446	5,177	72,521
Min	0	0	0	0	151	0	0	0	0	0	9	0	2,927

Total filled naturalized flows

	Original	Date:	Extension	Date:
Calcs:	pm	8/29/2001		
Checked:	ab	19-Oct	PIT	4/23/2021

Control Point: M10000
Control Point I.D.: WR-SM
Description: Wichita River near Seymour Period of record = 12/59-present

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	2,001	5,507	4,970	252	19,044	28,127	14,088	3,409	2,271	7,242	1,631	779	89,321
1949	4,291	11,005	5,653	874	24,891	23,510	4,611	2,035	17,284	10,658	3,197	3,269	111,278
1950	4,098	6,680	470	7,352	45,285	11,419	38,634	76,204	66,140	14,999	3,309	2,287	276,877
1951	1,130	6,315	5,354	0	38,783	11,550	964	3,582	8,494	3,100	3,723	0	82,995
1952	0	497	546	1,879	12,163	0	4,432	0	751	93	1,256	2,349	23,966
1953	722	2,409	4,442	506	1,773	824	11,952	17,476	1,131	50,605	6,508	2,448	100,796
1954	87	625	0	7,952	94,231	37,647	0	0	0	0	37	1,603	142,182
1955	2,015	2,944	6,717	666	41,534	37,751	3,670	1,521	37,816	116,720	5,178	2,213	258,745
1956	3,057	2,977	912	0	12,797	214	2,407	0	0	7,768	1,910	4,755	36,797
1957	896	4,936	5,853	36,390	142,572	50,300	7,712	768	1,291	9,715	18,561	1,672	280,666
1958	975	6,076	3,073	9,781	38,673	3,035	10,740	1,917	2,174	1,504	767	994	79,709
1959	0	0	0	4,146	9,449	28,071	13,373	0	2,438	41,174	3,653	13,660	115,964
1960	2,577	2,545	1,490	1,051	20,872	26,249	29,725	6,013	661	90,020	4,259	8,041	193,503
1961	3,066	3,180	15,110	3,660	25,452	6,849	25,233	7,031	10,209	3,011	9,939	1,829	114,569
1962	1,622	1,142	968	9,459	1,989	40,407	4,467	2,710	35,984	9,360	9,310	2,477	119,895
1963	1,307	1,281	2,454	3,782	10,974	32,253	5,857	1,466	3,919	186	7,137	950	71,566
1964	707	6,002	835	469	7,432	19,653	68	285	34,064	2,084	10,920	1,337	83,856
1965	1,171	886	516	14,144	4,447	3,260	1,524	21,674	62,401	59,621	5,096	3,316	178,056
1966	1,940	1,896	1,727	11,751	3,505	18,360	2,705	83,192	88,764	5,800	2,547	2,015	224,202
1967	1,637	1,265	1,231	39,491	9,029	58,229	44,628	2,274	6,574	2,094	1,109	1,410	168,971
1968	23,034	9,725	20,876	3,370	3,660	12,298	8,724	2,724	252	1,640	5,257	1,386	92,946
1969	1,077	1,906	3,003	1,662	22,067	12,437	424	4,074	47,032	27,888	6,899	3,289	131,758
1970	2,442	2,104	21,973	3,273	2,729	1,128	144	90	7,254	2,437	553	831	44,958
1971	905	724	557	595	22,614	12,494	1,408	7,332	12,134	12,301	2,281	4,179	77,524
1972	1,509	1,283	1,119	27,959	40,229	21,237	5,992	12,169	36,276	25,976	15,572	2,390	191,711
1973	5,889	3,396	18,292	12,522	3,277	1,551	8,963	3,245	18,018	2,402	3,293	1,355	82,203
1974	1,279	938	2,584	4,019	10,398	27,698	161	1,446	33,662	9,100	3,995	2,245	97,525
1975	2,799	5,185	2,313	5,377	29,537	10,715	34,467	14,606	19,658	2,277	8,106	2,707	137,747
1976	1,819	1,578	1,941	11,264	6,127	1,515	3,871	6,488	4,341	22,324	3,537	1,841	66,646
1977	1,964	1,363	1,509	10,068	42,321	3,891	1,686	3,968	1,348	1,635	952	990	71,695
1978	1,275	2,130	1,394	724	5,320	15,741	322	24,996	18,611	2,398	3,015	1,686	77,612
1979	2,515	1,303	4,956	1,816	14,135	16,687	6,960	18,059	2,612	1,033	4,861	2,552	77,488
1980	2,377	3,052	1,724	3,146	41,262	5,418	2,515	2,114	12,835	1,434	2,232	4,596	82,705
1981	1,506	8,617	5,078	8,324	14,230	41,004	0	2,943	3,152	9,514	1,114	771	96,253
1982	1,736	2,034	5,420	2,303	55,523	48,256	4,356	2,049	1,688	288	1,556	1,770	126,979
1983	5,418	3,216	4,185	5,305	6,177	8,350	789	0	0	121,674	14,739	2,815	172,668
1984	6,229	5,010	4,909	3,102	1,958	46	678	3,100	3,055	6,200	7,431	14,190	55,908
1985	10,622	12,572	14,594	8,585	6,239	26,616	1,260	780	1,326	38,201	3,542	998	125,335
1986	3,847	2,074	2,998	5,176	11,582	19,463	16,238	16,476	49,886	83,021	26,630	7,580	244,971
1987	10,465	21,590	22,067	8,134	76,727	38,738	15,420	4,237	3,573	1,283	25	3,104	205,363
1988	3,947	2,695	4,699	3,043	0	1,380	6,731	0	25,405	727	1,592	1,671	51,890
1989	512	4,081	3,288	1,240	57,302	36,730	658	10,436	53,671	3,299	877	860	172,954
1990	5,574	7,479	28,287	58,295	31,048	65,305	15,860	6,055	5,669	1,436	6,236	372	231,616
1991	7,945	3,127	1,175	2,163	13,623	57,439	4,959	7,185	33,320	11,016	4,134	27,727	173,813
1992	17,989	44,301	17,637	16,100	10,987	102,117	14,996	5,729	4,166	1,788	11,422	8,727	255,959
1993	4,375	28,279	24,789	13,420	20,569	12,016	4,436	1,679	3,821	2,142	1,424	4,893	121,843
1994	1,476	9,017	5,646	923	32,721	1,629	3,981	1,504	8,406	20,211	19,738	3,499	108,751
1995	2,383	1,382	4,053	4,452	48,068	84,038	12,593	95,889	16,644	10,698	3,512	2,132	285,844
1996	3,055	4,136	2,962	1,425	0	5,688	2,504	10,964	36,169	4,397	4,164	3,044	78,508
1997	2,357	13,307	3,132	38,782	46,018	7,614	3,954	19,881	10,164	10,837	2,809	7,661	166,517
1998	5,763	16,927	28,784	5,001	5,831	4,651	1,140	897	509	1,614	3,979	1,305	76,403
1999	9,151	1,906	9,320	6,746	48,000	25,580	5,473	1,442	510	1,155	845	1,963	112,090
2000	1,121	1,341	30,168	5,205	3,382	12,497	2,046	294	216	11,026	20,470	1,299	89,066
2001	3,287	8,385	20,054	2,750	5,233	683	200	4,984	4,894	1,549	19,913	2,299	74,232
2002	1,301	1,494	7,089	15,362	5,810	11,390	52,670	7,285	3,843	18,406	5,762	11,034	141,445
2003	2,973	1,771	1,613	5,360	2,682	13,266	1,441	2,056	6,185	684	851	501	39,384
2004	2,439	2,915	11,416	2,462	671	21,562	32,646	15,014	1,168	5,993	41,986	3,471	141,743
2005	4,815	4,137	3,179	1,438	2,863	2,495	5,307	30,888	35,634	7,142	1,932	1,412	101,241
2006	919	690	2,236	2,706	8,914	5,545	712	1,802	6,090	48,992	2,256	3,611	84,473
2007	3,875	1,317	5,713	2,516	14,313	51,307	14,856	19,510	3,719	748	644	2,807	121,325
2008	898	2,108	3,305	22,613	6,602	6,672	1,078	562	2,932	6,434	597	803	54,604
2009	846	656	622	7,212	19,844	26,219	3,445	4,383	7,361	10,704	2,675	2,609	86,575
2010	9,735	10,574	9,307	52,266	22,181	4,798	47,696	4,139	18,197	4,594	1,925	1,445	186,858
2011	1,312	1,459	1,002	667	984	177	201	148	196	2,547	1,304	830	10,827
2012	646	664	890	788	4,755	6,312	459	708	3,782	696	256	245	20,201
2013	713	1,873	984	2,531	676	11,694	4,852	463	3,096	1,067	347	589	28,885
2014	459	571	408	687	7,547	12,108	4,981	1,993	1,066	815	3,143	587	34,364
2015	819	724	1,003	4,542	65,634	25,279	10,234	996	218	3,797	6,144	12,923	132,312
2016	3,435	1,912	1,519	13,804	14,336	11,724	3,520	3,042	16,706	3,723	4,936	2,718	81,376
2017	2,226	1,843	10,837	5,644	8,952	5,281	2,832	11,002	7,374	1,350	704	649	58,695
2018	599	630	754	492	11,168	7,724	48	817	16,607	56,149	6,892	4,478	106,359
Total	228,952	339,667	449,686	580,964	1,501,720	1,403,909	607,678	634,199	996,818	1,064,516	399,108	236,842	8,444,061
Mean	3,225	4,784	6,334	8,183	21,151	19,773	8,559	8,932	14,040	14,993	5,621	3,336	118,930
Max	23,034	44,301	30,168	58,295	142,572	102,117	52,670	95,889	88,764	121,674	41,986	27,727	285,844
Min	0	0	0	0	0	0	0	0	0	0	25	0	10,827

Total filled naturalized flows

Control Point: N10000
Control Point I.D.: WR-MB
Description: Wichita River near Mabelle

Period of record = 10/59-present

	Original	Date	Extension	Date
Calcs:				
Checked:			PIT	4/23/202

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	2,606	7,172	6,472	328	24,802	36,630	18,347	4,440	2,958	9,432	2,125	1,015	116,327
1949	5,588	14,332	7,362	1,138	32,417	30,617	6,005	2,650	22,510	13,880	4,163	4,258	144,920
1950	5,337	8,700	612	9,574	58,975	14,871	50,314	99,242	86,135	19,533	4,310	2,978	360,581
1951	1,472	8,225	6,972	0	50,509	15,042	1,255	4,665	11,062	4,037	4,848	0	108,087
1952	0	647	711	2,447	15,841	0	5,771	0	978	122	1,636	3,059	31,212
1953	940	3,138	5,785	659	2,309	1,073	15,566	22,760	1,473	65,904	8,476	3,189	131,272
1954	114	814	0	10,356	122,720	49,029	1	1	1	1	48	2,087	185,172
1955	2,625	3,834	8,748	867	54,091	49,164	4,780	1,981	49,249	152,007	6,744	2,882	336,972
1956	3,981	3,877	1,188	0	16,666	278	3,134	0	0	10,117	2,487	6,192	47,920
1957	1,167	6,428	7,622	47,391	185,675	65,507	10,044	1,000	1,681	12,652	24,172	2,178	365,517
1958	1,270	7,913	4,002	12,738	50,365	3,953	13,987	2,496	2,831	1,958	998	1,294	103,805
1959	0	0	0	5,400	12,306	36,558	17,416	0	3,175	51,855	3,981	15,173	145,864
1960	2,321	1,921	2,884	959	19,445	25,131	29,904	6,497	2,104	104,892	5,198	12,678	213,934
1961	1,558	3,197	27,492	5,513	31,872	5,523	23,758	5,630	8,171	2,412	9,588	1,469	126,183
1962	2,126	1,188	8,077	7,908	1,989	44,704	5,316	2,229	53,265	8,579	10,629	2,987	148,997
1963	0	1,056	1,363	3,676	15,829	22,775	1,216	1,785	649	2,545	7,475	762	59,131
1964	708	8,581	2,512	1,693	6,952	24,691	333	229	48,901	4,520	14,523	1,071	114,714
1965	2,204	489	790	14,358	8,394	8,920	1,300	23,306	51,746	63,181	6,830	5,541	187,059
1966	2,398	2,954	4,619	17,806	4,149	21,722	10,651	83,280	103,238	11,019	3,390	1,946	267,172
1967	2,551	1,012	3,184	62,072	7,223	52,629	58,279	1,872	13,393	5,224	887	1,238	209,564
1968	29,247	12,414	38,848	13,747	4,663	19,398	12,680	5,109	961	2,328	6,287	1,427	147,109
1969	1,966	5,389	7,026	3,338	28,291	15,423	1,296	10,286	53,581	30,459	8,673	3,437	169,165
1970	2,487	2,893	31,616	6,194	4,345	8,125	5,128	247	6,391	2,977	762	793	71,958
1971	724	579	446	1,417	18,091	18,092	1,126	13,915	19,288	25,598	3,396	7,551	110,223
1972	1,927	2,762	1,257	22,367	60,358	22,463	4,909	14,886	39,142	44,499	23,093	2,349	240,012
1973	14,265	4,155	34,116	28,375	3,954	1,816	7,170	2,596	22,588	3,886	3,110	1,112	127,143
1974	2,251	2,357	6,547	3,215	23,399	25,961	800	1,561	30,603	14,703	3,828	2,232	117,457
1975	8,095	6,710	5,098	8,743	41,200	20,040	39,819	15,756	18,773	3,988	8,067	4,935	181,224
1976	2,780	4,519	3,889	16,149	9,205	2,526	3,097	5,190	10,968	34,462	3,124	1,473	97,382
1977	2,406	4,721	2,864	15,981	46,312	5,835	1,863	5,710	1,213	1,784	762	1,247	90,698
1978	1,020	4,057	3,496	2,124	7,604	15,333	5,593	31,807	19,584	3,068	3,546	1,349	98,581
1979	3,405	2,473	9,913	3,318	15,738	18,597	8,907	19,287	2,762	1,260	5,928	3,112	94,700
1980	2,899	3,722	2,103	3,837	50,319	6,607	3,067	2,578	15,652	1,749	2,722	5,605	100,860
1981	1,837	10,508	6,193	10,151	17,354	50,005	0	3,589	3,844	11,603	1,359	940	117,383
1982	2,117	2,480	6,610	2,808	67,711	58,849	5,312	2,499	2,058	351	1,898	2,158	154,851
1983	6,607	3,922	5,104	6,470	7,533	10,183	962	0	0	148,383	17,974	3,433	210,571
1984	7,596	6,110	5,986	3,783	2,388	56	827	3,781	3,725	7,561	9,062	17,305	68,180
1985	12,954	15,332	17,797	10,469	7,608	32,459	1,536	951	1,617	46,587	4,320	1,217	152,847
1986	4,691	2,529	3,656	6,312	14,124	23,735	19,803	20,093	60,836	101,245	32,476	9,244	298,744
1987	12,762	26,329	26,911	9,920	93,569	47,242	18,805	5,167	4,357	1,565	31	3,785	250,443
1988	4,813	3,287	5,731	3,711	0	1,683	8,208	0	30,982	886	1,942	2,038	63,281
1989	624	4,977	4,010	1,512	69,881	44,793	803	12,727	65,453	4,023	1,069	1,049	210,921
1990	6,798	9,121	34,496	71,091	37,864	79,640	19,342	7,384	6,914	1,751	7,605	454	282,460
1991	9,689	3,813	1,433	2,638	16,613	70,047	6,047	8,762	40,634	13,434	5,041	33,814	211,965
1992	21,938	54,026	21,508	19,634	13,399	124,533	18,288	6,987	5,080	2,180	13,929	10,643	312,145
1993	5,335	34,487	30,230	16,366	25,084	14,654	5,410	2,047	4,660	2,612	1,736	5,967	148,588
1994	1,800	10,996	6,885	1,126	39,904	1,986	4,855	1,834	10,251	24,647	24,071	4,267	132,622
1995	2,906	1,685	4,943	5,429	58,620	102,485	15,357	116,938	20,297	13,046	4,283	2,600	348,589
1996	3,725	5,044	3,612	1,738	0	6,936	3,054	13,371	44,109	4,339	6,108	5,399	97,435
1997	3,070	27,658	5,751	45,440	47,347	10,472	4,066	16,099	8,945	10,684	3,367	9,210	192,109
1998	9,627	24,555	35,902	7,096	5,519	5,341	912	718	407	2,162	3,182	1,044	96,465
1999	10,714	4,594	11,975	9,104	38,400	30,805	4,379	1,153	408	1,249	1,090	1,784	115,655
2000	4,010	1,347	26,066	5,983	3,546	11,998	3,778	3,193	173	16,295	25,124	2,739	104,252
2001	5,850	12,397	24,815	4,388	13,006	547	1,027	5,300	4,754	2,742	16,370	3,870	95,066
2002	1,665	1,289	5,988	19,975	8,681	14,519	46,171	10,749	3,828	16,184	6,628	12,935	148,612
2003	2,811	1,417	2,817	8,337	3,515	10,752	2,955	3,644	5,386	702	681	702	43,719
2004	2,538	3,583	15,380	3,385	1,028	17,250	26,116	20,370	2,015	6,132	47,507	6,825	152,129
2005	5,444	8,829	5,517	1,150	2,290	2,586	4,246	50,157	36,857	7,046	2,192	2,024	128,338
2006	3,351	552	6,153	4,751	7,131	4,436	3,779	1,441	4,996	38,657	5,192	3,685	84,124
2007	5,920	3,862	8,053	3,371	18,145	57,993	16,257	21,043	2,975	599	515	4,345	143,078
2008	1,278	1,686	6,136	19,708	6,120	6,360	863	1,473	3,114	5,147	479	642	53,006
2009	677	1,753	1,415	5,770	15,875	22,594	2,756	3,857	6,834	8,563	2,301	3,550	75,945
2010	10,220	12,478	10,720	66,376	23,380	3,838	45,745	3,312	19,533	4,825	2,657	3,509	206,593
2011	1,050	2,554	802	534	2,108	655	4,030	118	157	3,182	1,169	993	17,352
2012	722	762	2,134	1,111	3,804	9,834	532	752	3,646	1,208	205	196	24,906
2013	790	2,036	787	3,340	939	11,848	11,996	569	3,985	1,881	278	790	39,239
2014	367	805	987	977	6,914	11,966	10,390	3,028	1,828	1,197	5,067	469	43,995
2015	1,174	722	2,812	4,317	83,440	43,080	12,194	797	174	3,415	8,780	20,963	181,868
2016	10,841	6,760	1,649	30,160	12,796	9,379	2,816	2,433	24,945	9,348	8,187	2,300	121,614
2017	4,633	3,863	11,839	8,884	10,308	4,856	2,266	18,193	12,709	3,735	563	519	82,368
2018	704	2,326	776	394	12,706	8,392	1,555	654	21,729	108,673	9,691	10,423	178,023
Total	306,086	462,703	621,193	761,397	1,834,658	1,657,820	710,270	768,174	1,179,241	1,352,470	479,935	306,449	10,440,396
Mean	4,311	6,517	8,749	10,724	25,840	23,350	10,004	10,819	16,609	19,049	6,760	4,316	147,048
Max	29,247	54,026	38,848	71,091	185,675	124,533	58,279	116,938	103,238	152,007	47,507	33,814	365,517
Min	0	0	0	0	0	0	0	0	0	1	31	0	17,352

Total filled naturalized flows

Control Point: O10000
Control Point I.D.: BC-ET
Description: Beaver Creek near Electra

Period of record = 3/60-present

	Original		Extension	
			PIT	4/26/2021

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	1,303	3,586	3,236	164	12,401	18,315	9,174	2,220	1,479	4,716	1,062	507	58,163
1949	2,794	7,166	3,681	569	16,208	15,309	3,003	1,325	11,255	6,940	2,082	2,129	72,461
1950	2,668	4,350	306	4,787	29,488	7,435	25,157	49,621	43,068	9,767	2,155	1,489	180,291
1951	736	4,112	3,486	0	25,254	7,521	627	2,333	5,531	2,019	2,424	0	54,043
1952	0	323	356	1,224	7,920	0	2,886	0	489	61	818	1,530	15,607
1953	470	1,569	2,892	329	1,154	536	7,783	11,380	736	32,952	4,238	1,594	65,633
1954	57	407	0	5,178	61,360	24,514	0	0	0	0	24	1,044	92,584
1955	1,312	1,917	4,374	434	27,045	24,582	2,390	991	24,624	76,003	3,372	1,441	168,485
1956	1,991	1,938	594	0	8,333	139	1,567	0	0	5,058	1,243	3,096	23,959
1957	584	3,214	3,811	23,696	92,838	32,754	5,022	500	841	6,326	12,086	1,089	182,761
1958	635	3,956	2,001	6,369	25,183	1,977	6,994	1,248	1,415	979	499	647	51,903
1959	0	0	0	2,700	6,153	18,279	8,708	0	1,588	26,811	2,379	7,866	74,484
1960	1,664	1,673	391	182	6,029	9,541	4,679	1,582	1,506	28,660	455	6,570	62,932
1961	432	678	37,456	2,897	7,260	6,763	19,648	1,474	3,820	730	1,936	395	83,489
1962	194	94	150	3,023	552	10,525	2,671	1,994	9,438	2,788	3,483	1,135	36,047
1963	115	118	1,485	563	12,439	12,018	4,209	740	3,471	31	1,458	117	36,764
1964	152	1,558	75	1,441	5,499	1,151	821	2,197	14,638	284	8,581	139	36,536
1965	920	203	56	3,986	7,680	4,729	638	1,539	18,097	20,176	388	483	58,895
1966	175	541	1,430	2,370	316	1,125	9,198	27,263	31,200	911	320	313	75,162
1967	229	259	488	9,092	5,843	2,781	21,419	831	1,302	1,592	485	179	44,500
1968	8,211	1,483	6,748	1,043	6,137	14,261	3,385	2,318	1,140	606	1,926	216	47,474
1969	442	3,567	2,544	170	6,720	7,048	683	6,623	16,585	7,511	5,392	921	58,206
1970	671	389	11,432	1,018	741	659	668	1,049	3,224	387	130	61	20,429
1971	116	596	124	163	1,155	2,197	546	7,121	12,354	9,497	336	3,510	37,715
1972	163	162	133	704	7,068	4,279	1,033	1,198	4,225	9,400	20,026	285	48,676
1973	5,341	3,075	13,587	15,472	1,529	2,576	7,731	1,807	4,715	3,582	1,433	398	61,246
1974	287	360	2,755	3,128	3,869	2,624	764	1,172	8,342	4,141	1,276	555	29,273
1975	1,188	3,172	875	2,686	26,133	4,879	45,952	9,857	4,375	1,593	1,894	1,589	104,193
1976	389	271	654	3,254	4,004	4,184	418	1,181	8,147	6,196	598	226	29,522
1977	673	637	248	11,968	13,797	2,474	579	1,687	415	303	165	80	33,028
1978	16	302	124	152	2,068	6,357	419	5,167	2,665	312	543	121	18,244
1979	496	184	1,644	1,221	10,311	2,705	1,250	12,563	856	2,117	2,115	859	36,321
1980	712	772	214	528	15,733	2,633	290	292	1,507	233	606	1,804	25,324
1981	83	1,415	1,819	2,014	6,425	29,275	583	597	533	3,355	411	396	46,904
1982	377	178	1,138	60	26,364	15,843	2,387	967	1,017	535	957	682	50,505
1983	992	1,285	837	1,779	1,580	2,603	903	233	218	72,303	2,277	356	85,367
1984	727	920	1,396	671	875	1,157	626	1,371	1,078	2,970	2,963	8,988	23,741
1985	12,606	12,790	9,680	3,955	2,141	9,440	693	782	2,050	20,240	1,009	563	75,951
1986	779	816	862	1,870	3,075	7,150	1,711	1,384	67,441	67,901	16,102	3,846	172,936
1987	3,427	10,590	21,668	2,941	56,774	29,215	2,665	2,246	1,716	2,026	992	512	134,774
1988	816	749	2,202	895	740	1,054	1,865	656	11,976	718	757	778	23,205
1989	639	2,087	673	630	17,618	15,298	1,087	3,953	14,466	1,669	855	1,039	60,014
1990	1,275	3,606	19,749	45,328	23,831	10,334	1,855	3,195	1,171	1,343	1,606	982	114,276
1991	1,576	713	638	631	8,542	23,277	16,094	4,011	10,815	3,622	1,222	23,938	95,080
1992	6,006	20,256	9,293	5,304	1,694	36,873	7,963	1,837	10,797	687	7,548	9,354	117,613
1993	1,799	31,035	32,458	19,537	35,009	2,258	1,544	1,223	1,064	1,376	672	1,180	129,153
1994	253	3,612	1,325	746	6,258	635	2,687	485	386	1,282	4,141	596	22,406
1995	593	494	845	2,038	35,869	88,148	2,292	82,434	10,027	3,956	1,689	1,067	229,451
1996	817	621	622	220	246	1,736	374	1,952	4,383	288	1,653	179	13,091
1997	147	5,221	235	7,946	16,548	4,534	334	843	5,119	1,035	701	2,379	45,040
1998	3,875	11,998	26,128	975	576	1,359	579	102	101	101	512	72	46,379
1999	1,767	410	2,456	1,923	2,463	2,623	2,204	251	145	358	444	741	15,783
2000	569	379	3,793	561	513	1,865	853	630	133	9,312	20,836	3,508	42,952
2001	5,224	5,655	11,017	1,224	5,556	379	254	407	351	378	1,274	569	32,287
2002	300	359	1,378	5,850	787	4,011	34,793	2,046	342	2,349	1,065	2,935	56,215
2003	1,903	422	338	523	5,219	7,142	494	438	232	117	215	155	17,198
2004	179	589	3,515	1,032	1,354	2,144	853	865	76	390	8,429	1,674	21,099
2005	483	1,031	665	389	1,112	2,636	443	23,309	16,675	1,859	280	342	49,224
2006	325	249	582	451	877	798	140	1,095	1,081	24,751	8,713	1,515	40,576
2007	5,779	1,185	1,089	719	5,546	71,732	18,896	1,915	3,261	604	520	642	111,887
2008	374	714	1,139	11,234	4,096	659	235	277	2,471	1,563	374	335	23,471
2009	289	251	174	3,074	2,387	772	272	155	1,017	1,461	245	1,125	11,223
2010	5,306	2,385	1,754	31,697	3,548	2,117	21,720	1,967	2,163	1,404	576	478	75,116
2011	434	475	330	382	681	442	322	236	138	1,519	888	680	6,527
2012	115	2	344	2,893	17	365	123	339	251	80	2	2	4,533
2013	2	91	322	561	275	1,333	1,935	1,099	393	84	73	142	6,310
2014	32	113	174	162	1,223	2,615	7,037	3,191	311	156	6,197	130	21,341
2015	296	182	380	2,575	96,561	27,657	3,044	641	285	647	2,984	12,378	147,629
2016	6,329	1,288	647	22,515	8,032	4,648	1,456	754	1,832	9,089	3,151	961	60,702
2017	828	841	7,830	7,355	18,258	7,063	948	4,105	20,802	5,108	651	555	74,343
2018	535	580	579	480	7,087	687	612	573	14,472	43,466	6,242	5,386	80,699
Total	102,988	178,219	277,424	303,653	867,974	678,745	343,190	311,836	453,838	562,782	195,154	133,547	4,409,350
Mean	1,451	2,510	3,907	4,277	12,225	9,560	4,834	4,392	6,392	7,927	2,749	1,881	62,104
Max	12,606	31,035	37,456	45,328	96,561	88,148	45,952	82,434	67,441	76,003	20,836	23,938	229,451
Min	0	0	0	0	17	0	0	0	0	0	2	0	4,533

Total filled naturalized flows

	Original	Date:	Extension	Date:
Calcs:	ab	6/5/2001	JSA	11/20/20
Checked:	DH	10/17/2001	PIT	4/28/20

Control Point: P10000
Control Point I.D.: WR-WF
Description: Wichita River at Wichita Falls Period of record = 4/38-present

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	4,653	12,807	11,558	586	44,289	65,411	32,763	7,929	5,282	16,843	3,794	1,812	207,727
1949	9,979	25,592	13,147	2,032	57,887	54,674	10,724	4,733	40,196	24,785	7,434	7,603	258,786
1950	9,530	15,535	1,092	17,097	105,313	26,555	89,847	177,218	153,813	34,881	7,696	5,318	643,895
1951	2,629	14,687	12,450	0	90,194	26,860	2,241	8,331	19,753	7,209	8,658	0	193,012
1952	0	1,155	1,270	4,370	28,287	0	10,306	0	1,747	217	2,921	5,463	55,736
1953	1,679	5,603	10,330	1,176	4,123	1,916	27,796	40,642	2,630	117,686	15,135	5,694	234,410
1954	203	1,454	0	18,492	219,142	87,551	1	1	1	1	86	3,727	330,659
1955	4,687	6,846	15,622	1,549	96,591	87,792	8,535	3,538	87,944	271,441	12,042	5,146	601,733
1956	7,109	6,923	2,121	0	29,760	497	5,597	0	0	18,066	4,441	11,057	85,571
1957	2,084	11,478	13,611	84,627	331,563	116,977	17,936	1,785	3,002	22,593	43,164	3,889	652,709
1958	2,268	14,130	7,147	22,746	89,938	7,059	24,977	4,457	5,055	3,497	1,783	2,311	185,368
1959	0	0	0	9,643	21,975	65,282	31,100	0	5,670	95,754	8,495	28,094	266,013
1960	5,944	5,974	3,325	995	27,670	37,569	32,617	6,498	3,066	140,064	8,342	26,103	298,167
1961	4,624	6,060	62,682	16,966	40,190	19,345	45,527	5,897	21,958	6,365	12,991	3,579	246,184
1962	2,438	1,032	5,933	17,380	2,076	69,823	11,966	3,384	74,320	11,272	17,279	6,389	223,292
1963	1,103	948	3,021	6,845	19,504	36,069	7,116	2,023	8,906	2,064	7,794	715	96,108
1964	1,612	10,761	2,356	18,568	23,651	24,552	619	1,944	72,192	9,282	25,821	3,466	194,824
1965	4,598	3,028	500	24,446	31,242	26,436	1,152	22,453	64,095	78,147	6,935	5,451	268,483
1966	2,116	6,816	13,328	34,186	7,946	18,278	22,862	109,666	145,539	26,823	7,754	5,009	400,323
1967	4,323	1,678	5,396	95,629	14,055	55,568	70,779	12,175	20,522	9,755	9,146	5,973	304,999
1968	44,661	17,377	43,731	18,866	19,354	33,209	26,688	7,364	4,232	6,492	14,522	2,603	239,099
1969	3,059	14,292	21,440	7,684	54,280	27,183	1,626	25,366	78,416	37,710	17,241	3,815	292,112
1970	6,123	6,958	48,614	11,676	4,582	7,027	4,995	2,852	18,919	7,715	714	683	120,858
1971	5,365	7,523	4,301	1,265	15,397	19,161	12,990	70,437	48,693	58,858	7,113	18,770	269,873
1972	4,759	5,212	3,906	24,896	66,265	31,377	8,047	18,202	42,877	53,744	73,732	9,163	342,180
1973	26,163	10,876	52,620	57,740	9,881	12,803	23,269	10,134	34,021	43,668	11,903	4,024	297,102
1974	3,384	4,406	8,458	5,074	27,480	25,643	9,973	12,225	45,667	35,796	10,462	3,007	191,575
1975	7,426	12,300	4,778	10,807	107,132	35,334	114,107	40,930	26,521	11,024	8,250	5,984	384,593
1976	4,058	3,832	6,772	25,601	21,662	17,406	7,864	5,476	57,608	53,428	12,021	2,048	217,776
1977	3,973	9,349	4,142	36,387	55,904	12,755	9,442	17,300	8,651	1,672	4,128	1,606	165,309
1978	3,870	5,532	7,964	4,086	15,069	26,697	10,282	46,120	22,638	10,421	5,794	6,782	165,255
1979	11,403	10,692	9,245	8,553	24,490	47,801	15,360	38,708	5,281	7,079	10,766	7,138	196,516
1980	6,833	4,781	7,726	4,361	60,681	10,297	5,860	11,680	46,734	13,189	7,404	12,542	192,088
1981	3,746	9,538	30,457	12,376	22,055	80,443	5,345	5,450	10,346	25,847	2,049	2,669	210,321
1982	3,763	2,823	8,427	5,171	138,090	90,653	10,386	4,395	12,034	1,425	3,445	5,020	285,632
1983	8,821	8,059	6,573	9,082	13,089	16,987	6,504	4,953	6,954	204,650	20,912	6,406	312,990
1984	8,867	7,730	7,780	7,248	6,654	8,204	7,755	13,987	4,154	9,097	14,115	34,153	129,744
1985	42,249	45,356	44,501	28,965	12,342	67,925	8,073	8,491	7,887	58,716	5,963	2,570	333,038
1986	6,106	4,216	6,285	10,342	20,910	40,727	21,508	19,447	149,149	154,587	67,294	18,773	519,344
1987	19,603	39,897	47,504	19,850	128,503	109,592	29,458	11,931	7,551	5,466	1,553	9,776	430,684
1988	8,461	4,463	13,400	4,374	1,206	3,162	9,347	3,068	49,071	2,687	3,138	3,807	106,184
1989	2,056	13,017	7,438	2,607	95,888	76,534	6,054	17,719	84,717	11,859	3,928	3,038	324,855
1990	10,226	14,673	79,120	125,787	111,062	90,056	27,786	17,023	13,543	6,747	11,333	3,244	510,600
1991	13,532	5,313	4,290	7,129	29,802	84,173	24,765	20,164	53,633	27,821	9,162	85,491	365,275
1992	43,693	81,453	43,026	23,336	29,440	133,399	60,203	9,871	28,106	4,036	31,846	32,677	521,086
1993	10,869	81,401	90,370	56,477	83,201	19,261	7,056	4,545	9,328	5,277	4,078	10,632	382,495
1994	2,060	18,548	10,727	2,673	40,964	2,149	8,010	1,864	9,175	24,923	28,374	5,326	154,793
1995	4,577	1,855	6,947	8,260	106,847	196,822	29,582	186,544	41,010	22,729	9,763	6,916	621,852
1996	7,277	7,235	5,521	1,855	757	8,758	2,744	20,580	46,006	7,974	12,964	9,001	130,672
1997	4,698	35,994	6,234	52,505	73,646	23,052	4,345	17,931	12,436	9,776	5,044	12,827	258,488
1998	14,263	38,390	77,266	9,901	5,046	8,922	2,583	1,843	1,255	4,532	6,744	3,469	174,214
1999	13,577	5,639	30,654	14,847	38,041	29,278	6,276	2,068	1,887	2,477	3,650	3,836	152,230
2000	5,881	2,119	29,242	7,191	3,247	11,090	3,705	3,058	1,234	29,025	74,144	8,933	178,869
2001	15,179	34,215	46,034	9,281	29,910	2,134	1,877	6,092	4,566	3,070	15,100	4,670	172,128
2002	2,865	1,931	7,242	33,747	9,751	22,935	71,377	11,911	3,497	17,447	9,502	16,273	208,478
2003	6,006	2,503	3,461	9,237	11,656	22,391	5,932	4,709	6,050	1,280	2,277	1,352	76,854
2004	2,823	5,570	20,046	5,441	3,637	18,081	22,608	18,632	1,673	8,925	64,319	9,150	180,905
2005	7,100	10,271	5,970	2,368	3,753	15,478	9,844	95,020	48,435	12,134	4,278	3,356	218,007
2006	4,544	2,484	7,995	5,004	19,200	5,787	3,135	2,729	6,735	73,212	18,668	6,817	156,310
2007	17,707	6,161	11,827	9,099	35,906	130,501	117,270	27,301	13,054	3,747	3,767	5,786	382,126
2008	2,740	3,442	9,068	31,980	10,759	6,696	1,603	23,914	6,198	10,161	2,127	1,261	109,949
2009	873	2,939	3,493	13,384	24,316	24,121	7,305	4,625	16,819	14,362	4,059	8,404	124,700
2010	30,293	25,786	17,940	97,871	41,050	8,754	71,586	6,904	25,480	8,530	4,964	4,942	344,100
2011	4,880	5,079	1,739	3,461	5,211	5,988	9,092	8,536	4,906	10,715	3,750	3,475	66,832
2012	2,438	1,750	5,259	6,324	3,518	8,613	962	2,256	3,552	1,386	611	479	37,148
2013	3,047	2,058	3,259	3,930	1,403	11,038	11,920	2,631	4,248	2,439	1,209	1,095	48,277
2014	1,132	1,153	1,110	1,396	7,241	14,826	21,061	5,979	2,574	2,764	12,222	1,652	73,110
2015	1,913	1,108	4,619	9,045	254,322	112,055	22,778	5,334	7,066	6,365	27,789	46,044	498,438
2016	21,219	10,232	3,793	71,060	39,011	21,530	10,339	10,222	38,356	26,541	15,490	5,111	272,904
2017	7,746	8,327	16,039	19,272	35,999	21,851	6,106	20,316	35,652	27,371	3,294	2,245	204,218
2018	2,732	4,789	3,511	786	27,375	7,558	7,359	3,195	39,495	200,905	28,780	60,528	387,013
Total	572,218	823,154	1,136,753	1,336,991	3,292,381	2,696,431	1,388,603	1,354,706	1,993,781	2,288,546	937,466	666,168	18,487,198
Mean	8,059	11,594	16,011	18,831	46,372	37,978	19,558	19,080	28,081	32,233	13,204	9,383	260,383
Max	44,661	81,453	90,370	125,787	331,563	196,822	117,270	186,544	153,813	271,441	74,144	85,491	652,709
Min	0	0	0	0	757	0	1	0	0	1	86	0	37,148

Total filled naturalized flows

	Original		Extension	
			PIT	4/28/20

Control Point: Q10000
Control Point I.D.: WR-CH
Description: Wichita River near Charlie Period of record = 10/67-present

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	5,491	15,112	13,638	691	52,261	77,185	38,660	9,356	6,233	19,875	4,477	2,138	245,117
1949	11,775	30,199	15,513	2,398	68,307	64,515	12,654	5,585	47,431	29,246	8,772	8,972	305,367
1950	11,245	18,331	1,289	20,174	124,269	31,335	106,019	209,117	181,499	41,160	9,081	6,275	759,794
1951	3,102	17,331	14,691	0	106,429	31,695	2,644	9,831	23,309	8,507	10,216	0	227,755
1952	0	1,363	1,499	5,157	33,379	0	12,161	0	2,061	256	3,447	6,446	65,769
1953	1,981	6,612	12,189	1,388	4,865	2,261	32,799	47,958	3,103	138,869	17,859	6,719	276,603
1954	240	1,716	0	21,821	258,588	103,310	1	1	1	1	101	4,398	390,178
1955	5,531	8,078	18,434	1,828	113,977	103,595	10,071	4,175	103,774	320,300	14,210	6,072	710,045
1956	8,389	8,169	2,503	0	35,117	586	6,604	0	0	21,318	5,240	13,047	100,973
1957	2,459	13,544	16,061	99,860	391,244	138,033	21,164	2,106	3,542	26,660	50,934	4,589	770,196
1958	2,676	16,673	8,433	26,840	106,127	8,330	29,473	5,259	5,965	4,126	2,104	2,727	218,733
1959	0	0	0	11,379	25,931	77,033	36,698	0	6,691	112,990	10,024	33,151	313,897
1960	7,014	7,049	3,924	1,174	32,651	44,331	38,488	7,668	3,618	165,276	9,844	30,802	351,839
1961	5,456	7,151	73,965	20,020	47,424	22,827	53,722	6,958	25,910	7,511	15,329	4,223	290,496
1962	2,877	1,218	7,001	20,508	2,450	82,391	14,120	3,993	87,698	13,301	20,389	7,539	263,485
1963	1,302	1,119	3,565	8,077	23,015	42,561	8,397	2,387	10,509	2,436	9,197	844	113,409
1964	1,902	12,698	2,780	21,910	27,908	28,971	730	2,294	85,187	10,953	30,469	4,090	229,892
1965	5,426	3,573	590	28,846	36,866	31,194	1,359	26,495	75,632	92,213	8,183	6,432	316,809
1966	2,497	8,043	15,727	40,339	9,376	21,568	26,977	129,406	171,736	31,651	9,150	5,911	472,381
1967	5,101	1,980	6,367	112,842	16,585	65,570	83,519	14,367	24,216	10,379	10,746	6,913	358,585
1968	53,359	19,130	49,743	27,583	25,682	38,942	30,731	8,769	6,020	8,918	20,080	4,943	293,900
1969	4,201	21,273	29,973	11,565	65,653	32,485	3,407	26,540	85,151	39,836	19,125	5,916	345,125
1970	8,025	8,100	49,592	14,027	11,940	10,921	6,297	3,868	23,449	8,154	2,047	2,717	149,137
1971	7,657	9,167	5,330	4,208	16,184	20,284	12,976	70,374	56,969	70,379	10,694	28,111	312,333
1972	8,131	5,969	4,421	26,676	70,495	34,277	8,256	20,141	45,142	54,953	97,867	12,849	389,177
1973	30,250	14,652	58,999	69,104	13,227	24,285	30,424	17,044	40,647	50,781	17,388	7,995	374,796
1974	3,644	5,390	10,777	6,538	36,155	28,386	10,842	16,541	52,997	38,835	14,561	4,247	228,913
1975	10,268	15,801	7,115	13,675	117,053	55,596	108,425	53,562	33,249	14,024	12,195	9,843	450,806
1976	6,496	4,483	8,690	27,777	23,395	20,012	9,977	7,298	75,392	61,767	26,094	6,101	277,482
1977	6,970	13,222	8,827	43,115	64,400	17,448	13,092	23,799	10,500	3,093	4,530	2,085	211,081
1978	4,099	6,082	11,657	5,645	18,207	32,707	11,717	52,506	24,342	11,899	7,318	7,260	193,439
1979	13,344	12,561	14,145	10,563	31,439	59,821	18,387	42,482	7,418	9,516	13,189	8,225	241,090
1980	8,637	5,280	9,741	5,630	65,119	14,882	6,819	12,686	56,699	24,848	9,952	19,753	240,046
1981	5,105	11,091	47,622	16,346	26,168	90,501	7,078	8,146	13,588	36,009	2,537	3,346	267,537
1982	5,484	4,837	9,661	6,870	194,342	124,005	18,437	8,619	14,899	6,321	5,854	6,631	405,960
1983	9,701	11,926	10,847	12,731	16,205	20,148	8,543	6,931	8,335	216,610	26,750	8,406	357,133
1984	10,648	9,900	9,836	9,860	9,015	11,084	10,449	15,500	6,932	20,629	21,096	42,642	177,591
1985	51,216	48,759	61,575	38,816	32,469	96,763	13,270	11,422	12,310	62,999	8,214	3,577	441,390
1986	6,931	6,094	7,661	13,297	25,655	57,900	24,766	21,902	165,646	162,110	77,575	21,602	591,139
1987	25,132	50,770	63,441	26,559	120,398	127,610	45,266	16,513	11,709	9,910	3,846	21,420	522,574
1988	12,808	6,741	23,441	11,195	3,372	7,508	11,936	4,479	57,124	7,312	4,911	4,935	155,762
1989	4,839	21,173	9,860	3,273	109,807	107,278	14,673	26,491	103,459	20,595	6,123	4,652	432,223
1990	13,728	16,583	117,488	179,047	160,138	109,049	33,302	21,833	17,125	10,332	14,931	4,262	697,818
1991	19,776	7,502	5,857	11,357	38,279	96,600	26,961	24,681	68,727	36,703	12,687	113,025	462,155
1992	51,402	89,654	55,780	30,605	37,448	139,342	74,446	16,886	33,353	5,010	37,632	39,856	611,414
1993	13,634	80,248	115,180	78,981	115,418	25,851	11,657	7,038	14,887	7,494	6,624	18,095	495,107
1994	3,902	21,300	13,386	4,198	47,475	5,276	12,772	4,608	11,096	27,792	30,966	6,488	189,259
1995	5,068	2,424	10,338	10,359	114,472	211,039	43,435	196,380	57,273	30,723	12,580	9,826	703,917
1996	10,238	8,454	11,627	4,820	2,498	11,043	3,698	26,570	53,561	7,881	17,577	11,930	169,897
1997	5,239	46,643	8,618	63,232	95,516	33,624	7,057	22,405	14,416	12,556	5,573	17,134	332,013
1998	18,252	52,488	102,906	21,288	11,291	16,700	4,877	4,222	2,816	6,109	9,053	5,094	255,096
1999	15,881	8,028	49,621	22,576	42,097	35,834	8,691	4,334	4,808	4,458	4,494	4,196	205,018
2000	7,436	3,292	31,846	8,999	5,763	14,131	4,714	3,139	1,905	35,122	90,427	15,888	222,662
2001	20,675	56,151	62,962	12,177	32,033	3,819	2,904	8,308	6,725	4,436	15,874	5,874	231,938
2002	3,508	2,976	9,701	48,951	11,750	32,482	75,131	14,502	7,086	22,939	12,395	17,991	259,412
2003	7,272	3,166	4,355	11,889	17,182	30,042	8,342	6,449	8,727	2,740	3,545	1,495	105,204
2004	3,306	8,675	26,128	7,724	6,952	23,213	32,910	24,333	2,734	16,511	95,200	13,414	261,100
2005	10,827	14,071	8,035	3,615	5,825	20,868	14,291	117,842	53,840	36,430	5,665	3,959	295,268
2006	6,004	4,427	11,168	8,770	25,079	8,025	4,787	3,709	9,601	80,496	22,931	8,868	193,865
2007	22,607	7,853	15,630	17,431	44,633	122,429	180,571	34,801	24,363	7,529	5,459	7,504	490,810
2008	3,691	5,112	13,780	36,721	15,880	11,415	4,487	32,262	8,250	14,767	2,951	2,168	151,484
2009	991	3,982	4,043	19,641	36,545	26,349	9,564	5,140	20,480	18,356	4,480	9,575	159,146
2010	33,625	40,092	24,536	118,149	57,797	13,384	80,809	8,988	31,328	11,385	5,686	5,453	431,232
2011	6,520	5,900	3,259	5,939	7,962	7,331	10,789	9,991	6,849	17,093	4,775	5,051	91,459
2012	6,412	2,400	8,976	9,656	3,421	9,603	878	2,544	4,519	2,503	655	584	52,151
2013	3,316	3,118	3,516	5,842	2,175	11,575	12,353	3,484	5,644	2,383	1,181	1,441	56,028
2014	977	882	3,243	2,434	6,804	16,450	27,380	5,600	4,017	2,841	16,190	2,098	88,916
2015	2,937	1,548	5,688	11,721	301,056	162,976	32,114	9,095	8,825	8,873	33,424	54,255	632,512
2016	31,073	12,185	5,042	82,612	55,353	35,730	14,581	11,677	53,942	34,138	17,950	4,078	358,361
2017	9,603	12,499	14,745	21,910	33,907	27,087	8,544	23,407	32,478	40,596	4,836	3,296	232,908
2018	3,192	8,186	7,311	2,100	32,072	9,311	9,726	6,645	47,412	237,068	33,960	71,423	468,406
Total	722,501	1,022,199	1,485,888	1,713,049	3,979,970	3,280,712	1,723,799	1,623,442	2,396,879	2,741,790	1,191,419	862,865	22,744,513
Mean	10,176	14,397	20,928	24,127	56,056	46,207	24,279	22,865	33,759	38,617	16,781	12,153	320,345
Max	53,359	89,654	117,488	179,047	391,244	211,039	180,571	209,117	181,499	320,300	97,867	113,025	770,196
Min	0	0	0	0	2,175	0	1	0	0	1	101	0	52,151

Total filled naturalized flows

Control Point: R10000
Control Point I.D.: LW-AC
Description: Little Wichita River near Archer City Period of record = 10/45-present

	Original	Date:	Extension	Date
Calcs:	ab	8/28/2001		
Checked:	kll	9/4/2001	PIT	4/28/2

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	1,433	2,705	1,433	697	2,750	15,843	4,242	2,206	355	353	185	699	32,901
1949	2,769	3,989	2,199	651	20,700	19,791	660	2,078	6,740	7,068	188	695	67,528
1950	1,165	152	0	7,761	29,246	4,561	49,487	81,426	13,632	0	0	79	187,509
1951	235	0	2,226	658	13,766	5,628	941	0	2,989	284	0	71	26,798
1952	830	233	283	1,593	5,338	424	1,164	1,323	0	264	344	1,352	13,148
1953	0	39	5,142	1,210	2,093	0	8,587	4,725	157	47,544	2,213	394	72,104
1954	314	371	190	7,075	34,418	10,698	0	196	293	370	516	1,604	56,045
1955	1,588	2,338	1,817	3,722	20,927	34,812	621	144	49,092	14,461	0	0	129,522
1956	156	138	192	0	8,644	1,707	530	66	257	4,385	1,210	1,111	18,396
1957	57	2,470	4,204	40,074	110,199	21,678	774	0	719	6,928	29,776	0	216,879
1958	303	338	886	1,276	13,694	152	7,318	875	1,208	87	98	0	26,235
1959	0	39	0	153	2,371	14,951	2,418	166	1,460	18,610	180	4,322	44,670
1960	1,638	4,692	493	127	1,392	1,159	521	0	623	11,873	0	3,395	25,913
1961	430	1,365	4,226	322	4,802	4,190	1,690	0	5,504	431	3,699	736	27,395
1962	0	54	403	1,961	2,394	20,014	2,598	0	31,057	6,691	11,716	17,402	94,290
1963	0	0	1,589	3,499	1,708	5,332	0	536	403	784	1,812	309	15,972
1964	669	3,158	1,347	1,673	3,583	6,475	117	1,592	14,998	479	4,319	522	38,932
1965	793	901	323	2,318	9,065	4,922	383	2,586	1,636	3,387	559	396	27,269
1966	0	687	1,222	30,738	29,559	484	3,646	11,058	25,242	481	454	0	103,571
1967	1,980	257	786	6,679	2,538	5,034	5,215	821	4,071	254	826	783	29,244
1968	14,929	1,546	14,618	9,465	13,030	3,837	11,045	2,061	0	435	2,412	2,661	76,039
1969	258	4,321	14,055	1,505	24,621	5,028	1,442	702	23,899	2,944	833	2,308	81,916
1970	2,513	1,446	13,304	1,266	6,724	1,751	160	0	1,781	592	1,689	0	31,226
1971	2,111	161	2,344	1,128	734	2,377	771	37,279	10,680	6,556	299	4,284	68,724
1972	408	1,152	1,798	1,571	12,849	2,970	725	0	1,719	5,934	21,620	578	51,324
1973	6,499	1,136	9,413	6,025	1,609	2,337	4,111	6,253	4,798	1,503	2,008	1,493	47,185
1974	0	2,898	607	1,135	5,562	8,456	154	1,984	24,880	7,428	8,265	575	61,944
1975	896	2,437	952	2,789	42,350	27,027	6,767	2,060	1,519	2,913	1,668	0	91,378
1976	0	1,162	1,617	2,061	3,239	3,332	1,102	2,771	7,075	12,108	7,408	0	41,875
1977	1,136	1,324	3,220	10,268	10,018	4,159	227	1,882	2,197	0	302	0	34,733
1978	0	0	3,218	1,068	405	1,402	1,410	14,461	602	0	0	263	22,829
1979	573	1,005	3,195	2,124	9,406	3,055	3,766	3,207	2,754	0	0	387	29,472
1980	633	1,470	934	301	7,429	4,279	0	2,872	28,018	7,300	1,487	4,901	59,624
1981	680	1,186	15,396	3,687	1,118	11,249	636	0	6,422	78,452	0	130	118,956
1982	216	664	1,467	0	90,562	39,063	0	1,808	164	531	122	486	135,083
1983	538	5,205	1,716	2,331	2,697	8,341	0	857	990	6,037	0	0	28,712
1984	324	0	2,587	143	0	2,270	0	1,655	696	5,922	2,955	5,827	22,379
1985	11,013	21,193	16,127	54,543	12,146	57,497	462	560	0	5,759	152	721	180,173
1986	0	1,260	1,054	3,191	7,616	19,537	2,260	0	41,776	10,814	11,655	1,802	100,965
1987	5,567	4,934	16,972	0	18,286	7,000	229	1,024	1,362	1,219	0	8,755	65,348
1988	5,315	543	412	2,199	113	1,158	852	0	3,050	264	333	500	14,739
1989	434	5,432	1,595	154	86,420	19,692	805	5,944	42,649	3,158	0	1,024	167,307
1990	4,816	7,969	30,543	52,874	62,430	19,502	2,778	4,775	1,099	418	982	0	188,186
1991	3,524	152	157	735	6,136	10,003	248	3,813	4,605	6,798	518	34,564	71,253
1992	8,225	17,325	7,098	0	4,644	46,327	9,624	0	6,004	881	9,736	4,399	114,263
1993	447	13,806	15,004	5,300	32,591	10,063	741	1,640	4,410	1,533	1,270	6,289	93,094
1994	0	852	2,096	906	12,788	1,823	4,490	3,341	409	3,614	1,628	1,144	33,091
1995	842	488	898	2,287	26,923	21,494	116	10,600	1,930	205	0	445	66,228
1996	140	845	489	1,296	0	1,331	763	1,523	2,152	649	4,872	276	14,336
1997	706	10,665	387	2,475	5,890	5,687	279	599	390	393	492	2,199	30,162
1998	1,694	4,858	19,646	142	1,477	1,719	1,213	1,026	938	1,264	1,748	215	35,940
1999	3,491	423	18,828	1,762	7,251	1,880	0	898	147	657	215	714	36,266
2000	832	179	2,669	261	1,650	190	3,397	0	34	3,589	24,313	655	37,769
2001	4,241	27,648	37,645	1,779	4,943	560	999	394	742	261	495	501	80,208
2002	458	401	2,522	19,163	917	17,116	4,922	35	538	4,431	1,559	2,373	54,435
2003	583	58	751	480	9,899	7,122	946	1,377	1,351	212	534	321	23,634
2004	34	3,020	3,262	264	154	715	42,100	0	3,408	910	18,537	1,004	73,408
2005	540	2,974	1,120	0	743	426	625	64,619	768	15,147	390	261	87,613
2006	1,140	723	1,533	194	1,555	203	144	548	145	7,483	533	359	14,560
2007	1,694	881	1,236	1,200	7,980	36,605	5,669	620	2,722	0	0	299	58,906
2008	0	118	2,539	691	2,560	770	670	699	1,655	1,889	0	89	11,680
2009	51	318	848	2,038	8,074	8,040	2,530	306	4,927	2,490	156	1,893	31,671
2010	9,177	8,154	5,986	35,439	30,200	1,433	5,866	269	2,411	677	0	76	99,688
2011	0	888	1,826	544	290	0	1,005	850	228	5,680	3,005	1,082	15,398
2012	3,244	121	1,820	989	287	1,547	351	873	4,737	2,115	264	0	16,348
2013	569	132	406	2,268	453	1,881	2,103	1,258	2,654	386	0	108	12,218
2014	0	187	104	1,157	311	310	8,536	649	417	1,548	3,706	114	17,039
2015	889	132	2,589	982	157,987	56,061	24,741	4,511	60	3,602	16,086	15,529	283,169
2016	4,538	2,985	702	22,219	4,548	10,967	589	6,103	3,101	3,328	2,953	400	62,433
2017	1,978	7,022	721	666	1,173	3,632	1,352	2,766	10,142	1,742	657	0	31,851
2018	693	847	3,565	529	3,880	627	127	763	6,404	42,973	8,535	34,536	103,479
Total	122,949	198,572	322,552	377,781	1,073,855	681,706	254,760	312,033	435,995	399,478	224,487	180,410	4,584,578
Mean	1,732	2,797	4,543	5,321	15,125	9,601	3,588	4,395	6,141	5,626	3,162	2,541	64,572
Max	14,929	27,648	37,645	54,543	157,987	57,497	49,487	81,426	49,092	78,452	29,776	34,564	283,169
Min	0	0	0	0	0	0	0	0	0	0	0	0	11,680

Total filled naturalized flows

	Original	Date:	Extension	Date:
Calcs:	ab	9/4/2001		
Checked:	kll	9/4/2001	PIT	4/29/20

Control Point: S10000
Control Point I.D.: LW-HN
Description: Little Wichita River above Henrietta Period of record = 10/66-present

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	2,780	5,248	2,780	1,352	5,335	30,735	8,229	4,280	689	685	359	1,356	63,828
1949	5,372	7,739	4,266	1,263	40,158	38,395	1,280	4,031	13,076	13,712	365	1,348	131,005
1950	2,260	295	0	15,056	56,737	8,848	96,005	157,966	26,446	0	0	153	363,766
1951	456	0	4,318	1,277	26,706	10,918	1,826	0	5,799	551	0	138	51,989
1952	1,610	452	549	3,090	10,356	823	2,258	2,567	0	512	667	2,623	25,507
1953	0	39	6,487	1,027	2,677	0	10,144	5,016	76	92,840	5,242	705	124,253
1954	314	371	184	9,687	74,710	23,010	284	126	293	0	432	1,601	111,012
1955	1,552	2,984	2,166	5,219	32,550	48,232	1,512	133	57,653	36,149	82	0	188,232
1956	303	267	373	0	16,769	3,311	1,029	128	498	8,507	2,347	2,156	35,688
1957	110	4,792	8,156	77,744	213,787	42,055	1,501	0	1,395	13,441	57,765	0	420,746
1958	587	656	1,718	2,476	26,567	294	14,196	1,698	2,343	168	190	0	50,893
1959	0	76	0	297	4,599	29,004	4,690	323	2,832	36,104	350	8,385	86,660
1960	3,177	9,103	957	247	2,700	2,248	1,011	0	1,209	23,034	0	6,586	50,272
1961	835	2,648	8,199	624	9,316	8,129	3,278	0	10,678	837	7,176	1,428	53,148
1962	0	104	782	3,805	4,645	38,828	5,041	0	60,250	12,981	22,730	33,760	182,926
1963	0	0	3,082	6,788	3,314	10,344	0	1,039	782	1,520	3,516	599	30,984
1964	1,297	6,126	2,613	3,246	6,951	12,561	227	3,089	29,096	930	8,379	1,012	75,527
1965	1,538	1,747	626	4,496	17,586	9,548	743	5,017	3,173	6,571	1,084	768	52,897
1966	0	1,333	2,370	59,631	57,344	938	7,074	21,453	50,091	4,046	1,383	973	206,636
1967	3,068	1,300	2,110	13,404	3,090	8,270	5,060	350	6,866	96	808	576	44,998
1968	24,612	646	31,985	11,251	26,795	6,352	10,486	2,712	536	508	4,786	2,556	123,225
1969	698	9,091	35,235	4,184	58,449	5,212	1,673	1,968	32,725	1,967	866	4,843	156,911
1970	5,580	2,381	22,209	5,796	10,294	5,822	130	0	2,282	1,667	1,603	743	58,507
1971	3,660	0	3,641	2,797	852	2,832	1,275	44,235	12,919	9,539	0	13,571	95,321
1972	0	2,702	2,094	6,444	60,060	4,588	1,661	1,887	1,801	13,838	28,913	1,588	125,576
1973	15,892	4,793	15,659	16,522	1,821	5,904	11,583	7,272	5,447	2,865	10,192	0	97,950
1974	471	4,399	2,823	1,050	6,345	10,241	241	1,025	44,336	8,451	15,938	1,069	96,389
1975	2,629	4,361	2,278	4,112	90,924	35,243	15,901	4,691	8,685	3,152	1,144	1,031	174,151
1976	38	2,758	2,483	6,151	5,873	6,649	3,482	4,128	21,671	19,105	10,786	0	83,124
1977	3,064	5,290	11,585	15,309	12,748	3,998	1,032	2,811	2,130	0	143	0	58,110
1978	0	1,566	8,338	1,199	425	2,843	1,515	13,590	1,307	819	1,171	0	32,773
1979	2,738	1,564	7,576	2,349	10,840	5,883	6,274	7,347	3,103	928	1,190	556	50,348
1980	694	3,209	1,592	868	8,610	4,761	0	4,022	47,179	18,906	3,202	8,301	101,344
1981	1,208	6,430	35,719	4,672	1,479	10,870	0	274	7,455	193,207	223	0	261,537
1982	918	2,099	4,292	721	175,758	77,914	8,313	1,584	196	2,474	3,166	531	277,966
1983	1,025	8,416	2,109	7,917	5,270	9,553	0	2,777	0	17,450	0	425	54,942
1984	3,641	2,236	5,059	2,340	708	2,861	85	2,659	487	25,583	4,539	32,395	82,593
1985	17,505	31,987	57,859	74,478	12,308	66,093	862	1,768	1,434	6,794	0	1,732	272,820
1986	2,306	2,926	4,899	3,492	10,337	40,504	2,592	2,499	79,214	9,040	13,937	4,412	176,158
1987	8,179	20,396	31,316	3,624	29,002	14,570	0	1,112	5,037	1,633	105	33,117	148,091
1988	2,707	856	3,554	3,697	1,478	1,148	1,728	719	3,542	0	629	626	20,684
1989	1,990	5,174	2,552	908	118,242	63,927	1,188	6,193	56,335	4,188	0	0	260,697
1990	9,347	11,633	68,316	148,038	128,730	33,495	2,939	3,636	223	0	1,017	0	407,374
1991	6,927	1,847	2,526	1,367	12,036	14,613	4,423	4,670	14,101	11,116	1,445	87,725	162,796
1992	19,556	24,189	17,640	851	18,682	108,792	37,324	0	7,338	865	10,043	5,175	250,455
1993	3,076	21,386	28,159	4,108	63,212	26,253	7,450	2,122	11,253	0	771	8,846	176,636
1994	467	1,263	5,314	1,800	18,633	4,706	6,993	7,019	220	24,072	3,574	4,240	78,301
1995	1,379	1,758	6,146	4,271	59,816	36,436	1,269	19,822	4,021	3,087	0	2,299	140,304
1996	1,350	1,535	3,762	2,001	1,504	3,897	759	1,325	8,469	1,922	10,234	2,923	39,681
1997	1,984	29,809	647	5,781	43,737	7,007	1,651	1,703	0	2,470	1,731	5,590	102,110
1998	6,115	8,689	46,760	4,350	2,573	3,586	2,693	4,437	2,460	3,773	3,534	386	89,356
1999	9,040	1,582	21,554	3,848	7,651	5,765	0	2,339	2,344	2,137	569	1,728	58,557
2000	4,091	850	2,761	921	1,274	2,668	1,831	0	0	6,508	38,525	2,156	61,585
2001	10,455	75,338	68,136	3,864	8,038	1,562	1,811	592	735	2,001	1,853	1,060	175,445
2002	496	1,687	3,755	34,159	2,393	26,262	7,020	194	1,637	5,367	3,038	2,688	88,696
2003	1,616	49	2,348	2,217	8,766	6,627	1,601	1,419	2,270	529	936	645	29,023
2004	950	5,328	5,581	2,115	269	1,034	55,550	10,275	3,743	3,724	61,505	1,913	151,987
2005	8,438	6,228	2,659	223	2,044	6,618	2,565	98,637	475	35,021	1,225	965	165,098
2006	3,170	1,233	4,662	736	4,424	1,153	980	1,941	2,531	7,883	5,257	1,897	35,867
2007	5,471	2,278	7,454	6,426	9,700	96,337	28,706	478	3,891	373	137	1,650	162,901
2008	313	617	8,313	3,099	5,463	3,953	1,984	1,979	4,037	3,859	0	474	34,091
2009	1,242	1,027	2,156	17,672	24,851	10,670	6,330	1,003	5,523	2,067	502	2,958	76,001
2010	11,801	16,000	11,987	51,918	60,161	4,796	6,412	60	5,763	2,002	0	1,232	172,132
2011	0	3,312	2,993	1,822	2,017	0	3,235	3,630	1,047	11,067	4,653	2,046	35,822
2012	11,049	1,101	5,595	4,604	185	3,247	1,229	3,413	5,702	4,050	1,152	357	41,684
2013	1,662	2,175	1,764	5,334	2,706	758	3,939	1,900	2,378	662	0	475	23,753
2014	0	275	896	1,893	968	1,413	12,431	1,248	698	1,614	4,722	185	26,343
2015	1,268	151	5,370	2,954	320,150	86,336	7,955	4,170	181	5,007	37,091	31,514	502,147
2016	11,331	5,447	2,465	59,182	26,602	39,942	907	3,563	11,486	8,491	5,074	1,060	175,550
2017	5,631	29,536	2,050	2,420	1,520	5,444	2,859	6,191	15,013	3,067	0	1,412	75,143
2018	2,638	6,978	15,501	2,414	7,877	2,012	1,470	1,589	11,120	91,156	14,945	41,707	199,407
Total	265,677	431,861	703,863	770,998	2,110,497	1,259,641	449,725	511,844	739,725	838,688	428,941	386,969	8,898,429
Mean	3,742	6,083	9,914	10,859	29,725	17,741	6,334	7,209	10,419	11,813	6,041	5,450	125,330
Max	24,612	75,338	68,316	148,038	320,150	108,792	96,005	157,966	79,214	193,207	61,505	87,725	502,147
Min	0	0	0	0	185	0	0	0	0	0	0	0	20,684

Total filled naturalized flows

	Original		Extension	
			PIT	4/19/20

Control Point: T10000
Control Point I.D.: EF-HN
Description: East Fork Little Wichita River near Henrietta Period of record = 12/63-present

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	545	1,028	545	265	1,045	6,020	1,612	838	135	134	70	266	12,503
1949	1,052	1,516	836	247	7,866	7,521	251	790	2,561	2,686	71	264	25,661
1950	443	58	0	2,949	11,113	1,733	18,805	30,942	5,180	0	0	30	71,253
1951	89	0	846	250	5,231	2,139	358	0	1,136	108	0	27	10,184
1952	315	89	108	605	2,028	161	442	503	0	100	131	514	4,996
1953	0	8	1,362	216	562	0	2,130	1,053	16	19,496	1,101	148	26,092
1954	66	78	39	2,034	15,689	4,832	60	26	62	0	91	336	23,313
1955	326	627	455	1,096	6,836	10,129	318	28	12,107	7,591	17	0	39,530
1956	64	56	78	0	3,521	695	216	27	105	1,786	493	453	7,494
1957	23	1,006	1,713	16,326	44,895	8,832	315	0	293	2,823	12,131	0	88,357
1958	123	138	361	520	5,579	62	2,981	357	492	35	40	0	10,688
1959	0	16	0	62	966	6,091	985	68	595	7,582	74	1,761	18,200
1960	667	1,912	201	52	567	472	212	0	254	4,837	0	1,383	10,557
1961	175	556	1,722	131	1,956	1,707	688	0	2,242	176	1,507	300	11,160
1962	0	22	164	799	975	8,154	1,059	0	12,653	2,726	4,773	7,090	38,415
1963	0	0	647	1,425	696	2,172	0	218	164	319	738	1	6,380
1964	11	64	3	1,057	1,083	26	0	354	458	14	1,262	18	4,350
1965	0	10	2	1	3,372	2,484	2	650	146	87	1	0	6,755
1966	0	0	454	15,872	4,628	595	0	1,939	5,430	96	2	1	29,017
1967	1	0	0	15	1,791	7,107	132	0	105	0	0	0	9,151
1968	1,532	90	8,589	89	5,390	791	16	58	50	2	300	15	16,922
1969	1	737	7,415	2,776	8,205	48	0	0	234	3	1	1,336	20,756
1970	129	653	1,796	1,281	6,466	237	0	0	284	77	1	0	10,924
1971	0	0	0	0	0	0	0	1,131	1,516	529	0	2,615	5,791
1972	0	0	0	682	21,709	269	2	0	144	2,636	3,331	5	28,778
1973	2,311	775	73	6,314	70	5,633	7,537	2,540	544	540	5,788	129	32,254
1974	24	383	45	124	511	3	0	1	1,635	670	2,162	7	5,565
1975	77	4,148	707	762	12,939	3,505	1,268	70	167	1	11	18	23,673
1976	0	1	3	985	1,363	1,183	27	0	1,363	2,164	290	18	7,397
1977	1,709	1,678	9,820	1,801	456	13	51	954	5	0	0	0	16,487
1978	0	0	473	1,438	155	3,364	0	206	2	0	0	0	5,638
1979	34	5	2,418	269	2,357	284	0	0	0	0	0	0	5,367
1980	0	2	0	0	559	0	0	0	6,082	322	33	1,127	8,125
1981	1	465	2,559	896	4,245	2,383	1	0	892	55,477	147	33	67,099
1982	18	46	105	26	21,586	14,632	528	8	23	325	106	524	37,927
1983	114	476	679	1,797	499	707	9	1	0	2,058	3	1	6,344
1984	1	1	142	2	1	1	0	0	0	5,753	695	9,839	16,435
1985	8,544	2,478	18,159	2,918	762	13,676	64	5	0	5,319	29	362	52,316
1986	18	13	9	531	4,183	4,515	4	1	3,722	591	3,153	1,959	18,699
1987	3,004	7,963	11,859	307	3,943	3,102	942	50	25	3	3	5,230	36,431
1988	30	50	55	402	24	200	5	0	54	9	5	3	837
1989	7	682	274	10	27,864	28,131	47	35	1,471	35	21	5	58,582
1990	652	1,662	16,830	40,848	26,619	3,535	529	250	293	8	292	6	91,524
1991	1,605	13	74	18	1,228	283	19	22	105	699	560	18,602	23,228
1992	5,194	3,171	1,770	250	21,410	30,216	1,942	35	78	6	541	1,752	66,365
1993	351	6,944	7,968	553	19,704	7,254	19	34	889	9	3	13	43,741
1994	7	142	196	556	10,389	246	19	620	535	363	5,109	1,225	19,407
1995	195	70	964	1,540	9,561	2,106	43	2,993	12	2	1	3	17,490
1996	4	6	202	31	5	0	0	1	62	16	842	100	1,269
1997	4	22,825	319	1,099	12,614	937	23	6	0	0	0	877	38,704
1998	838	234	17,028	213	47	13	0	0	0	0	0	0	18,373
1999	0	8	1,432	1,634	1,352	25	0	0	0	0	0	0	4,451
2000	0	0	0	1	883	22	12	0	0	274	5,222	2,282	8,696
2001	2,531	17,339	10,840	283	99	7	0	0	0	335	0	0	31,434
2002	0	0	1	1,858	0	2,866	28	0	0	76	1	174	5,004
2003	27	0	0	0	58	111	0	1	228	0	0	0	425
2004	0	225	522	3,797	57	176	449	75	0	90	6,269	235	11,895
2005	7,097	359	57	0	0	350	0	27	0	0	0	0	7,890
2006	0	0	130	4	2,700	0	0	0	33	1	138	844	3,850
2007	529	0	5,276	3,798	1,093	12,366	1,770	146	10	0	0	0	24,988
2008	0	0	2,491	220	30	0	0	1	126	0	0	0	2,868
2009	0	0	0	4,727	8,057	0	4	1	7	677	42	172	13,687
2010	1,572	2,885	2,840	4,449	15,919	21	1	0	171	1	0	0	27,859
2011	0	10	0	0	0	0	0	0	168	945	640	1	1,764
2012	2,448	34	4,576	7,020	0	0	0	0	86	9	0	0	14,173
2013	0	0	0	246	0	64	5	0	0	0	0	0	315
2014	0	0	0	0	0	83	1,636	0	270	0	88	1	2,078
2015	6	34	1,048	1,588	82,209	25,665	231	31	0	896	15,706	8,942	136,356
2016	624	889	403	32,058	12,332	40,067	1,333	2	145	553	372	83	88,861
2017	904	6,313	167	786	375	1,594	1	5	1,427	158	0	0	11,730
2018	0	1,977	3,280	103	213	0	0	0	129	12,708	2,175	2,082	22,667
Total	46,042	92,970	153,130	175,012	470,640	281,616	49,131	47,103	67,121	144,936	76,582	73,212	1,677,495
Mean	648	1,309	2,157	2,465	6,629	3,966	692	663	945	2,041	1,079	1,031	23,627
Max	8,544	22,825	18,159	40,848	82,209	40,067	18,805	30,942	12,653	55,477	15,706	18,602	136,356
Min	0	0	0	0	0	0	0	0	0	0	0	0	315

Total filled naturalized flows

	Original		Extension	

Control Point: U10021
Control Point I.D.: n/a
Description: Lake Ringgold Period of record = 0

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	4,050	7,645	4,050	1,970	7,772	44,772	11,987	6,234	1,004	998	523	1,976	92,981
1949	7,825	11,274	6,215	1,839	58,498	55,931	1,865	5,872	19,048	19,975	531	1,964	190,837
1950	3,293	430	0	21,932	82,649	12,889	139,851	230,110	38,524	0	0	223	529,901
1951	664	0	6,290	1,860	38,903	15,905	2,660	0	8,448	803	0	201	75,734
1952	2,345	659	800	4,501	15,085	1,199	3,289	3,740	0	745	972	3,821	37,156
1953	0	57	9,561	1,514	3,945	0	14,951	7,393	112	136,837	7,726	1,039	183,135
1954	463	547	272	14,277	110,116	33,915	419	185	432	0	637	2,359	163,622
1955	2,288	4,399	3,193	7,692	47,976	71,090	2,229	196	84,975	53,280	121	0	277,439
1956	447	393	549	0	24,715	4,880	1,517	189	735	12,538	3,459	3,178	52,600
1957	162	7,063	12,021	114,587	315,102	61,986	2,212	0	2,056	19,811	85,141	0	620,141
1958	865	967	2,532	3,649	39,157	434	20,923	2,503	3,453	247	280	0	75,010
1959	0	112	0	437	6,779	42,749	6,913	476	4,174	53,214	516	12,359	127,729
1960	4,682	13,417	1,411	364	3,980	3,313	1,490	0	1,782	33,950	0	9,707	74,096
1961	1,230	3,903	12,085	920	13,731	11,981	4,831	0	15,738	1,234	10,577	2,105	78,335
1962	0	153	1,152	5,608	6,846	57,229	7,430	0	88,804	19,133	33,502	49,760	269,617
1963	0	0	4,542	10,004	4,885	15,246	0	1,531	1,152	2,240	5,182	731	45,513
1964	1,593	7,540	3,187	5,242	9,786	15,332	277	4,194	36,000	1,150	11,744	1,255	97,300
1965	1,873	2,140	765	5,478	25,529	14,656	907	6,903	4,043	8,110	1,322	936	72,662
1966	0	1,624	3,440	91,971	75,489	1,867	8,617	28,494	67,631	5,045	1,687	1,186	287,051
1967	3,738	1,584	2,570	16,346	5,946	18,731	6,324	426	8,491	117	984	702	65,959
1968	31,846	897	49,423	13,813	39,205	8,701	12,793	3,374	714	621	6,195	3,132	170,714
1969	851	11,972	51,952	8,478	81,192	6,407	2,038	2,397	40,148	2,400	1,056	7,527	216,418
1970	6,954	3,696	29,241	8,621	20,415	7,381	158	0	3,126	2,124	1,954	905	84,575
1971	4,458	0	4,435	3,407	1,038	3,450	1,553	55,261	17,583	12,264	0	19,716	123,165
1972	0	3,291	2,551	8,680	99,603	5,916	2,026	2,299	2,369	20,067	39,277	1,940	188,019
1973	22,173	6,782	19,163	27,817	2,303	14,053	23,290	11,952	7,298	4,148	19,465	157	158,601
1974	603	5,825	3,494	1,430	8,351	12,478	294	1,250	55,998	11,110	22,048	1,311	124,192
1975	3,296	10,365	3,636	5,937	126,516	47,199	20,914	5,799	10,783	3,841	1,407	1,278	240,971
1976	46	3,361	3,028	8,692	8,814	9,540	4,274	5,028	28,058	25,908	13,492	22	110,263
1977	5,814	8,488	26,074	20,842	16,084	4,886	1,319	4,586	2,601	0	174	0	90,868
1978	0	1,908	10,733	3,212	707	7,561	1,845	16,805	1,595	998	1,426	0	46,790
1979	3,377	1,911	12,174	3,189	16,075	7,512	7,642	8,949	3,780	1,130	1,450	677	67,866
1980	845	3,911	1,939	1,057	11,169	5,799	0	4,899	64,878	23,422	3,941	11,484	133,344
1981	1,473	8,399	46,627	6,782	6,972	16,144	1	334	10,168	302,924	451	40	400,315
1982	1,140	2,613	5,356	910	240,386	112,731	10,769	1,939	267	3,409	3,986	1,285	384,791
1983	1,387	10,831	3,396	11,833	7,027	12,498	11	3,384	0	23,763	4	519	74,653
1984	4,436	2,725	6,335	2,853	864	3,486	104	3,239	593	38,171	6,376	51,446	120,628
1985	31,730	41,982	92,598	94,277	15,921	97,167	1,128	2,160	1,747	14,755	35	2,551	396,051
1986	2,831	3,580	5,978	4,900	17,687	54,838	3,162	3,045	101,025	11,732	20,817	7,761	237,356
1987	13,622	34,544	52,592	4,788	40,131	21,526	1,147	1,415	6,166	1,993	132	46,711	224,767
1988	3,334	1,104	4,396	4,993	1,830	1,642	2,111	876	4,380	11	772	766	26,215
1989	2,433	7,133	3,442	1,118	177,973	112,136	1,504	7,586	70,414	5,144	26	6	388,915
1990	12,180	16,195	103,717	230,083	189,232	45,107	4,224	4,734	629	10	1,595	7	607,713
1991	10,393	2,266	3,167	1,687	16,157	18,145	5,411	5,715	17,304	14,392	2,442	129,518	226,597
1992	30,148	33,327	23,643	1,341	48,836	169,327	47,830	43	9,033	1,061	12,892	8,438	385,919
1993	4,174	34,509	44,007	5,678	101,001	40,815	9,098	2,626	14,790	11	943	10,791	268,443
1994	577	1,711	6,712	2,870	35,352	6,032	8,541	9,305	920	29,764	10,577	6,657	119,018
1995	1,917	2,227	8,661	7,078	84,509	46,948	1,598	27,791	4,913	3,763	1	2,804	192,210
1996	1,649	1,877	4,829	2,475	1,838	4,747	925	1,615	10,392	2,361	13,492	3,682	49,882
1997	2,422	64,114	1,177	8,381	68,642	9,677	2,039	2,082	0	3,009	2,109	7,877	171,529
1998	8,469	10,869	77,701	5,558	3,191	4,384	3,280	5,405	2,997	4,596	4,305	470	131,225
1999	11,012	1,937	27,999	6,678	10,967	7,053	0	2,849	2,855	2,603	693	2,105	76,751
2000	4,983	1,035	3,363	1,123	2,627	3,277	2,245	0	0	8,261	53,289	5,406	85,609
2001	15,818	112,891	96,201	5,051	9,912	1,911	2,206	721	895	2,845	2,257	1,291	251,999
2002	604	2,055	4,575	43,873	2,915	35,481	8,585	236	1,994	6,630	3,702	3,486	114,136
2003	2,001	60	2,860	2,701	10,749	8,208	1,950	1,730	3,043	644	1,140	786	35,872
2004	1,157	6,764	7,434	7,201	397	1,474	68,213	12,607	4,559	4,646	82,556	2,616	199,624
2005	18,923	8,024	3,308	272	2,490	8,488	3,124	120,183	579	42,659	1,492	1,175	210,717
2006	3,861	1,502	5,837	901	8,678	1,404	1,194	2,364	3,123	9,604	6,572	3,339	48,379
2007	7,309	2,775	15,507	12,454	13,147	132,412	37,123	760	4,752	454	167	2,010	228,870
2008	381	752	13,160	4,043	6,691	4,815	2,417	2,412	5,071	4,701	0	577	45,020
2009	1,513	1,251	2,626	27,284	40,085	12,997	7,715	1,223	6,736	3,342	663	3,813	109,248
2010	16,290	23,004	18,061	68,661	92,674	5,868	7,812	73	7,228	2,440	0	1,501	243,612
2011	0	4,047	3,646	2,219	2,457	0	3,941	4,422	1,480	14,632	6,447	2,493	45,784
2012	16,441	1,383	12,389	14,159	225	3,955	1,497	4,157	7,050	4,944	1,403	435	68,038
2013	2,024	2,649	2,149	6,797	3,296	1,001	4,804	2,314	2,897	806	0	579	29,316
2014	0	335	1,091	2,306	1,179	1,822	17,135	1,520	1,179	1,966	5,859	227	34,619
2015	1,552	225	7,818	5,533	490,116	136,429	9,971	5,117	220	7,190	64,312	49,280	777,763
2016	14,562	7,718	3,494	111,140	47,426	97,460	2,729	4,343	14,168	11,017	6,634	1,392	322,083
2017	7,960	43,668	2,701	3,905	2,308	8,573	3,484	7,547	20,026	3,928	0	1,720	105,820
2018	3,213	10,908	22,877	3,066	9,854	2,451	1,791	1,936	13,702	126,517	20,854	53,340	270,509
Total	379,700	639,303	1,043,908	1,152,338	3,144,103	1,877,417	607,657	680,853	982,828	1,198,158	615,784	560,551	12,882,600
Mean	5,348	9,004	14,703	16,230	44,283	26,442	8,559	9,589	13,843	16,875	8,673	7,895	181,445
Max	31,846	112,891	103,717	230,083	490,116	169,327	139,851	230,110	101,025	302,924	85,141	129,518	777,763
Min	0	0	0	0	225	0	0	0	0	0	0	0	26,215

Total filled naturalized flows

	Original	Date:	Extension	Date:
Calcs:	ab	6/5/2001		
Checked:	SD	12/30/2005	WEC	4/28/2

Control Point: U10000
Control Point I.D.: RR-TR
Description: Red River near Terral

Period of record = N/A

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	12,227	40,849	84,456	22,523	84,987	157,711	68,567	20,281	5,523	16,557	7,000	2,407	523,088
1949	20,248	117,447	35,381	12,051	329,909	244,123	23,576	9,828	91,991	54,943	10,206	7,767	957,470
1950	10,279	51,200	5,390	32,870	316,667	123,212	349,144	318,314	259,626	34,313	11,173	13,312	1,525,500
1951	12,023	34,098	27,934	12,167	702,095	396,464	107,729	18,339	31,853	16,327	20,417	3,369	1,382,815
1952	6,593	5,312	9,537	38,152	190,448	38,621	22,308	1,515	1,327	0	2,366	7,697	323,876
1953	2,157	7,123	26,467	25,946	13,185	27,557	71,024	79,942	4,500	383,719	70,108	34,705	746,433
1954	6,797	5,422	1,865	41,845	642,723	174,017	2,498	723	0	0	0	4,297	880,187
1955	5,746	9,144	20,101	6,297	525,045	318,134	48,200	13,654	158,259	571,579	24,250	12,907	1,713,316
1956	14,333	17,399	5,463	616	159,402	41,853	19,549	0	0	48,658	23,198	12,493	342,964
1957	2,730	17,367	29,116	487,393	1,594,069	519,093	43,799	14,348	14,019	67,172	134,262	12,906	2,936,274
1958	17,335	22,540	33,976	50,829	189,083	48,110	96,889	14,583	6,990	4,069	1,099	2,471	487,974
1959	1,786	2,591	0	28,829	177,449	188,519	152,975	15,094	36,118	256,443	36,054	131,711	1,027,569
1960	32,651	42,659	15,027	6,934	42,071	173,845	100,802	18,083	11,393	348,534	26,391	68,623	887,013
1961	22,662	25,611	104,443	43,540	64,326	79,652	92,844	10,032	45,628	10,506	42,795	13,174	555,213
1962	5,856	3,894	9,665	35,084	24,645	288,013	59,693	22,900	175,343	35,962	54,586	60,767	776,408
1963	6,605	5,502	7,625	35,079	34,195	118,503	10,382	4,070	22,825	2,717	12,616	1,867	261,986
1964	3,264	26,777	6,598	23,282	39,452	60,279	591	6,080	122,516	14,920	64,300	8,440	376,499
1965	8,837	7,138	2,366	41,611	69,373	116,204	12,481	30,322	149,141	202,273	20,217	19,155	679,118
1966	8,182	14,525	21,529	126,063	89,428	36,871	30,838	180,000	265,647	41,958	10,559	6,926	832,526
1967	8,015	3,447	10,571	163,912	28,977	96,040	106,633	16,735	32,881	11,843	13,097	8,277	500,428
1968	92,724	25,025	105,016	45,033	100,972	133,465	65,710	48,492	38,486	21,797	35,599	13,660	725,979
1969	7,901	43,495	90,912	25,066	222,950	75,541	8,182	39,937	171,403	56,771	28,797	15,380	786,335
1970	17,361	13,276	88,646	34,562	45,912	25,103	5,568	831	34,782	11,595	3,950	3,546	285,132
1971	11,539	9,650	9,042	5,168	15,336	42,238	15,319	157,803	151,023	105,281	31,106	72,564	626,069
1972	13,888	11,750	8,795	36,332	212,224	44,014	24,248	22,304	60,643	80,348	176,601	18,753	709,900
1973	78,190	30,458	134,414	237,880	41,363	113,212	54,102	51,411	118,559	89,490	49,953	13,382	1,012,414
1974	8,112	14,259	32,775	12,582	141,672	72,797	12,336	23,081	176,552	80,394	81,609	15,086	671,255
1975	24,805	60,496	32,193	38,214	316,969	208,692	272,910	113,959	61,929	25,099	28,602	17,535	1,201,403
1976	15,524	12,873	17,979	73,680	66,854	57,280	22,823	14,598	137,341	81,744	47,923	10,844	559,463
1977	17,757	27,726	35,769	87,282	305,543	109,382	26,974	66,950	25,185	5,821	7,919	2,931	719,239
1978	6,431	13,984	27,806	11,823	110,733	198,114	19,418	67,856	47,776	17,738	10,792	9,284	541,755
1979	19,622	18,034	49,327	33,620	104,365	187,225	48,141	68,528	19,929	10,202	22,470	14,289	595,752
1980	18,389	15,476	14,964	9,904	172,132	127,908	10,249	15,478	106,001	49,894	12,820	33,535	586,750
1981	8,167	19,497	97,253	27,375	53,809	213,293	10,709	14,530	25,914	331,883	6,350	6,508	815,288
1982	8,264	10,770	24,516	10,116	584,094	369,185	59,032	36,028	27,485	10,001	9,903	10,986	1,160,380
1983	15,096	36,535	28,786	37,908	56,977	54,139	20,924	9,571	6,858	652,181	67,850	21,693	1,008,518
1984	28,585	21,427	26,804	25,403	15,007	24,591	12,203	18,817	8,083	63,928	34,056	110,452	389,356
1985	138,270	150,692	232,457	171,504	91,763	372,007	35,063	23,630	16,210	216,987	34,094	19,598	1,502,275
1986	17,868	20,854	21,520	24,857	89,863	177,960	48,841	30,841	342,930	624,010	221,265	92,589	1,713,398
1987	99,507	181,257	212,170	63,575	472,683	345,742	142,715	39,022	38,670	25,871	21,420	90,418	1,733,050
1988	47,581	17,346	79,991	50,989	17,764	16,470	35,426	8,155	144,361	23,793	15,560	17,386	474,822
1989	14,298	44,412	24,693	17,780	321,643	505,089	39,575	52,984	246,858	41,637	23,802	10,460	1,343,231
1990	37,829	42,249	324,727	571,936	465,077	239,901	46,490	50,369	27,025	18,488	25,918	11,467	1,861,476
1991	44,072	18,161	15,631	21,879	110,455	475,799	109,786	58,611	208,170	77,364	49,043	380,150	1,569,121
1992	158,502	184,360	144,249	87,332	112,610	465,754	166,203	35,297	72,254	13,411	133,636	108,067	1,681,675
1993	67,231	195,773	274,026	167,731	458,892	116,162	57,568	20,195	38,735	13,960	12,354	38,172	1,460,799
1994	12,366	42,145	61,019	19,310	155,751	21,518	39,454	8,767	14,375	65,427	79,766	22,025	541,923
1995	14,306	9,774	29,967	52,136	311,996	957,559	78,017	489,762	148,648	89,791	38,171	28,569	2,248,696
1996	31,710	24,838	29,079	18,582	9,488	35,329	28,348	60,680	186,076	38,384	57,086	49,729	569,329
1997	23,314	149,093	49,652	319,059	295,993	140,036	39,196	91,671	54,200	45,156	22,940	65,381	1,295,691
1998	79,582	152,145	362,804	71,857	38,588	31,235	13,269	7,740	6,356	14,724	34,972	12,258	825,530
1999	31,877	32,209	110,656	49,095	129,867	101,730	47,382	22,465	11,761	7,603	8,569	9,272	562,486
2000	14,521	7,586	68,982	31,756	35,821	81,838	36,635	4,586	582	103,527	197,909	62,078	645,821
2001	71,031	202,852	202,151	35,396	143,025	56,229	8,916	17,367	17,607	7,985	28,913	12,560	804,032
2002	7,946	15,872	20,435	127,172	25,050	90,740	116,485	18,172	9,606	42,805	33,598	42,171	550,052
2003	19,455	7,828	11,918	19,229	43,697	91,169	22,216	5,858	16,996	3,940	5,419	2,744	250,469
2004	7,136	19,237	96,448	22,981	17,108	54,223	130,226	42,597	11,530	46,186	306,396	42,124	796,192
2005	62,365	45,976	22,627	10,510	23,968	65,838	20,251	261,655	75,625	80,304	9,678	8,532	687,329
2006	11,770	7,760	22,274	15,806	39,163	11,437	5,903	11,898	31,289	210,193	49,236	34,511	451,240
2007	68,118	26,113	65,245	100,503	150,487	468,012	302,473	58,706	38,505	15,898	10,169	21,178	1,325,407
2008	10,923	15,940	46,522	98,757	53,019	22,370	8,540	89,570	39,085	33,241	10,940	9,450	438,357
2009	10,344	10,788	10,451	66,948	253,024	59,110	21,964	17,219	38,034	37,082	13,732	19,658	558,354
2010	84,550	106,561	55,811	303,048	212,072	36,444	229,492	27,520	56,077	25,833	14,688	11,749	1,163,845
2011	11,698	15,851	10,284	11,882	18,415	8,193	12,779	12,262	6,381	30,849	16,616	11,294	166,504
2012	24,941	5,467	30,295	43,805	5,164	20,062	2,146	5,250	9,455	7,527	1,896	579	156,587
2013	5,574	6,171	7,486	17,126	7,681	25,384	20,207	12,427	9,674	3,971	1,045	2,662	119,408
2014	1,342	1,805	4,877	6,955	15,674	52,654	58,016	9,253	5,858	4,819	30,578	4,356	196,187
2015	5,892	2,992	13,752	19,369	1,091,331	420,880	112,895	23,714	13,613	21,626	95,620	104,485	1,926,169
2016	58,390	31,750	19,172	223,427	218,137	219,335	54,484	41,318	98,605	85,917	41,748	18,474	1,110,757
2017	35,664	86,320	37,562	80,785	104,480	67,105	47,279	72,102	87,149	130,926	20,946	13,926	784,244
2018	14,889	28,812	39,320	12,751	75,963	19,228	13,355	11,113	82,428	421,022	83,121	126,436	928,438
Total	1,945,543	2,755,765	4,040,760	4,942,799	13,500,153	11,175,542	4,260,965	3,307,793	4,858,257	6,446,917	2,991,838	2,328,207	62,554,539
Mean	27,402	38,814	56,912	69,617	190,143	157,402	60,014	46,589	68,426	90,802	42,139	32,792	881,050
Max	158,502	202,852	362,804	571,936	1,594,069	957,559	349,144	489,762	342,930	652,181	306,396	380,150	2,936,274
Min	1,342	1,805	0	616	5,164	8,193	591	0	0	0	0	579	119,408

Total filled naturalized flows

	Original	Date:	Extension	I
Calcs:	ab	6/5/2001	JSA	2/
Checked:	SD	12/30/2005	WEC	5

Control Point: V10000
Control Point I.D.: RR-GA
Description: Red River near Gainesville
Period of record = 10/36-present

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	16,626	45,477	97,314	22,717	90,138	176,568	107,712	21,552	6,454	16,530	6,854	2,735	610,677
1949	20,001	121,566	42,205	15,636	338,339	259,672	29,573	11,080	108,297	67,522	15,821	9,824	1,039,536
1950	16,915	55,922	8,116	35,674	348,658	135,916	387,118	396,623	335,724	46,044	15,190	15,836	1,797,736
1951	14,869	36,346	35,243	13,700	710,715	529,464	137,298	22,100	35,402	16,443	28,309	4,928	1,584,817
1952	7,838	6,699	11,772	47,242	211,569	52,761	22,247	1,432	801	273	2,601	8,043	373,278
1953	2,547	7,426	32,095	30,666	20,623	30,966	77,808	81,759	5,583	384,680	81,342	37,689	793,184
1954	8,206	6,190	2,229	45,492	711,465	196,956	4,426	91	391	0	77	5,339	980,862
1955	6,753	9,723	22,590	7,705	541,207	362,618	53,218	15,544	149,173	586,449	28,728	15,642	1,799,350
1956	15,613	18,987	6,696	1,025	142,315	56,305	21,690	0	0	48,022	26,227	21,142	358,022
1957	4,186	20,779	34,755	506,497	1,683,655	614,585	50,921	19,116	15,360	70,034	152,881	16,169	3,188,938
1958	27,503	25,545	38,389	65,074	224,587	54,130	96,451	17,056	6,449	5,902	2,182	3,467	566,735
1959	2,375	2,986	0	29,788	170,722	208,602	154,907	14,203	36,772	317,829	45,218	161,278	1,144,680
1960	58,703	51,253	21,117	9,695	45,498	185,014	107,831	18,439	11,841	360,044	34,736	79,705	983,876
1961	29,874	23,430	103,841	69,441	78,683	92,419	102,684	13,911	48,226	17,095	57,691	28,820	666,115
1962	7,143	5,892	11,809	30,068	33,503	335,462	78,345	36,992	193,663	36,609	83,157	84,516	937,159
1963	7,222	8,157	10,131	28,937	48,624	118,941	11,032	3,291	21,784	2,310	12,256	2,648	275,333
1964	3,271	28,349	7,591	24,611	36,649	62,845	836	4,841	129,541	24,573	86,487	11,826	421,420
1965	12,895	9,653	4,912	41,300	95,303	136,806	29,402	34,919	144,827	197,597	28,445	17,245	753,304
1966	11,934	27,025	25,408	150,759	114,910	40,536	31,074	162,208	282,318	53,002	12,547	8,724	920,445
1967	9,378	4,426	11,734	179,344	32,846	127,191	101,241	18,360	32,752	14,129	14,391	9,306	555,098
1968	98,072	28,513	143,248	59,062	181,289	154,483	78,033	33,048	51,819	22,791	28,603	29,205	908,166
1969	9,777	55,481	134,904	44,333	280,573	87,575	11,652	33,975	169,482	67,843	34,517	21,454	951,566
1970	23,992	20,823	121,717	49,139	66,784	38,267	7,221	933	51,650	21,921	6,342	4,729	413,518
1971	12,767	10,061	10,749	5,726	17,827	40,432	13,914	137,090	118,800	107,033	33,738	80,332	588,469
1972	14,970	14,823	10,864	37,130	206,019	45,216	27,951	21,870	63,783	65,412	222,590	26,666	757,294
1973	99,971	49,540	155,804	281,958	59,241	166,367	57,112	79,689	115,401	117,472	97,419	24,308	1,304,282
1974	13,126	16,897	29,878	7,296	160,311	97,825	14,153	22,757	226,483	108,493	122,265	20,734	840,218
1975	28,759	66,144	69,172	61,150	322,907	310,906	258,110	151,907	68,784	27,885	28,088	18,230	1,412,042
1976	17,617	14,687	21,783	93,942	79,395	71,498	28,169	15,082	130,670	77,435	55,659	13,100	619,037
1977	22,635	39,089	76,731	97,152	321,652	132,360	25,760	46,255	38,596	3,993	7,072	2,689	813,984
1978	7,614	13,097	31,197	17,599	91,040	314,195	21,937	68,583	42,107	21,307	11,339	11,027	651,042
1979	21,075	22,076	87,269	37,741	114,904	189,936	53,636	63,534	33,021	11,025	22,799	13,730	670,746
1980	14,502	16,118	15,234	8,945	171,966	168,710	10,507	14,549	98,061	67,052	15,426	40,031	641,101
1981	9,393	17,387	135,483	34,482	100,964	296,277	14,031	13,655	28,876	735,440	27,687	14,428	1,428,103
1982	13,855	36,715	41,340	18,999	833,462	632,945	170,956	55,912	27,067	13,534	12,465	13,684	1,870,934
1983	19,329	41,777	31,773	52,899	105,748	77,145	49,680	12,619	7,224	586,129	105,280	46,114	1,135,717
1984	44,582	28,623	32,998	38,812	23,768	40,675	16,725	19,164	6,682	84,753	69,198	153,108	559,088
1985	178,979	154,310	333,800	237,346	163,496	486,339	40,617	38,053	46,574	256,600	41,465	21,100	1,998,679
1986	23,007	24,374	23,375	46,315	132,821	289,445	63,763	32,712	424,359	733,619	254,551	254,339	2,302,680
1987	109,153	171,043	329,638	56,420	344,913	803,671	244,859	44,112	49,695	27,556	28,833	138,154	2,348,047
1988	86,791	49,830	113,556	93,975	34,100	25,479	44,409	8,857	134,207	30,979	13,806	14,508	650,497
1989	15,916	61,208	40,211	28,268	393,886	674,012	57,925	52,945	267,465	50,961	23,627	14,590	1,681,014
1990	43,503	48,970	348,104	753,833	898,501	294,147	58,172	54,042	36,511	24,550	44,308	23,718	2,628,359
1991	69,035	27,129	31,213	33,648	150,623	486,354	84,492	68,400	268,120	108,002	75,378	422,274	1,824,668
1992	179,984	193,482	167,729	106,224	125,372	522,323	208,873	34,358	74,731	12,117	101,964	125,187	1,852,344
1993	71,818	170,060	225,234	165,547	589,685	128,154	66,928	24,637	48,771	27,512	18,161	54,783	1,591,290
1994	19,073	59,794	103,390	35,396	195,074	40,439	85,936	21,732	35,565	86,245	118,935	55,181	856,760
1995	26,838	20,708	61,833	91,562	322,907	1,104,013	176,893	667,187	242,062	121,427	45,991	40,286	2,921,707
1996	50,320	37,505	46,075	46,738	16,444	44,262	48,900	76,676	339,602	61,560	66,748	66,124	900,954
1997	26,785	235,411	71,364	325,092	422,808	201,531	46,014	94,314	71,664	49,291	25,228	78,741	1,648,243
1998	139,114	179,031	463,280	92,441	52,338	32,570	13,760	11,981	8,609	15,705	29,156	13,363	1,051,348
1999	29,967	30,410	102,160	59,394	160,203	159,318	65,699	13,885	15,306	8,755	9,255	11,709	666,061
2000	16,886	8,637	77,190	51,588	49,507	84,491	49,474	4,794	166	100,358	305,731	69,333	818,155
2001	74,965	326,459	263,079	54,326	191,617	87,237	14,758	15,631	28,127	21,392	30,973	24,041	1,132,605
2002	11,201	19,445	41,952	226,475	38,735	114,220	117,395	22,355	9,860	36,205	49,351	46,452	733,646
2003	27,289	13,236	18,537	20,442	72,996	112,491	45,800	7,779	27,455	6,024	5,899	3,870	361,818
2004	4,966	21,129	102,808	34,457	41,711	104,585	193,598	51,880	14,915	48,743	404,121	65,296	1,088,209
2005	133,871	61,407	31,449	15,564	27,791	80,854	23,784	346,349	90,576	88,884	12,252	10,195	922,976
2006	12,892	7,613	26,876	38,564	51,369	11,615	7,109	5,796	29,570	206,859	50,058	32,529	480,850
2007	74,608	26,207	49,600	184,203	215,974	531,187	646,898	127,008	69,445	20,421	11,924	19,493	1,976,968
2008	12,145	16,845	62,384	110,975	71,557	30,725	10,868	89,216	42,005	31,363	11,529	9,218	498,830
2009	11,180	12,777	13,231	107,644	305,742	65,009	24,680	16,315	30,280	39,472	21,424	22,308	670,062
2010	77,733	155,719	85,794	280,263	216,095	37,046	244,432	34,824	60,278	24,742	14,657	13,778	1,245,361
2011	13,710	17,850	11,307	10,810	13,567	10,077	12,669	11,475	4,590	27,482	20,654	15,374	169,565
2012	31,721	11,607	47,145	56,521	7,397	26,914	3,828	5,840	9,972	7,003	2,171	828	210,947
2013	6,138	6,035	7,757	14,780	16,070	28,521	18,060	17,383	9,379	5,108	1,627	4,768	135,626
2014	2,315	2,422	4,557	6,307	12,246	52,243	56,525	13,572	6,668	6,766	30,783	7,133	201,537
2015	7,800	5,374	21,677	33,036	1,437,929	827,355	191,613	32,766	17,568	27,325	127,033	191,508	2,920,984
2016	102,949	45,230	52,402	278,182	250,757	281,134	80,600	35,617	105,944	109,344	41,278	6,508	1,389,945
2017	39,463	90,119	44,212	90,275	114,939	86,848	50,114	63,472	46,858	139,797	33,146	20,770	820,013
2018	22,849	62,781	59,165	24,714	93,618	24,624	15,561	14,099	87,149	485,997	120,196	173,134	1,183,887
Total	2,510,852	3,381,839	5,160,175	6,113,061	16,050,647	14,531,802	5,580,367	3,844,201	5,597,910	7,452,769	3,827,840	3,149,044	77,200,507
Mean	35,364	47,632	72,679	86,099	226,065	204,673	78,597	54,144	78,844	104,969	53,913	44,353	1,087,331
Max	179,984	326,459	463,280	753,833	1,683,655	1,104,013	646,898	667,187	424,359	735,440	404,121	422,274	3,188,938
Min	2,315	2,422	0	1,025	7,397	10,077	836	0	0	0	77	828	135,626

Total filled naturalized flows

	Original	Date:	Extension
Calcs:	ab	10/17/2001	
Checked:	DH	10/17/2001	

Control Point: W10000
Control Point I.D.: RR-CB
Description: Red River near Colbert

Period of record = 24-59

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	21,116	70,689	115,575	30,901	136,595	189,462	165,474	27,111	8,103	18,959	7,317	4,565	795,867
1949	27,155	138,191	60,898	27,205	355,332	290,531	33,332	13,419	113,378	76,759	17,246	13,146	1,166,592
1950	36,156	84,323	13,726	42,742	421,571	151,102	408,418	411,756	344,036	55,064	15,917	19,832	2,004,643
1951	18,714	44,092	46,543	17,799	711,316	589,212	147,366	25,631	37,312	23,089	29,670	6,287	1,697,031
1952	9,587	10,630	17,953	81,043	216,635	62,781	25,679	2,026	1,614	1,086	3,470	9,418	441,922
1953	7,277	10,131	41,280	52,557	38,355	35,311	94,588	87,665	14,621	384,967	95,883	42,601	905,236
1954	11,504	6,643	5,106	50,889	751,057	210,666	5,168	744	2,715	2,318	433	10,224	1,057,467
1955	10,591	15,851	30,750	21,158	549,153	363,136	57,496	17,516	154,981	586,875	29,097	15,980	1,852,584
1956	15,934	23,278	12,604	3,687	143,204	60,011	22,328	1,454	1,260	48,363	26,503	21,483	380,109
1957	5,385	23,877	43,666	615,468	1,770,654	654,946	60,759	21,282	58,520	70,737	203,900	25,699	3,554,893
1958	58,314	35,637	57,912	87,663	283,162	62,334	103,405	18,738	6,888	6,291	2,528	3,816	726,688
1959	2,742	4,111	7,862	46,563	180,968	218,234	159,676	20,443	38,051	359,441	45,703	175,219	1,259,013
1960	77,271	75,539	44,393	21,469	56,311	186,570	110,165	19,050	12,378	360,875	35,182	82,289	1,081,492
1961	30,763	34,117	118,280	86,069	91,035	95,094	103,370	17,565	54,074	32,214	66,805	41,609	770,995
1962	10,747	10,448	19,513	45,100	34,261	377,302	79,059	41,683	209,660	47,113	107,056	93,944	1,075,886
1963	15,487	13,504	22,902	38,849	55,625	119,645	16,852	4,013	22,308	2,815	12,597	3,038	327,635
1964	3,660	28,725	17,126	38,053	43,312	77,840	5,214	9,016	148,098	27,039	104,047	20,855	522,985
1965	16,016	27,661	10,952	44,932	118,655	140,065	30,858	35,619	145,393	197,990	28,942	17,653	814,736
1966	12,389	56,789	33,741	210,426	129,900	41,243	31,939	163,108	283,040	53,547	13,027	9,136	1,038,285
1967	12,885	4,734	17,722	226,310	59,763	149,941	108,060	20,171	48,326	14,660	16,093	12,824	691,489
1968	130,804	36,962	201,643	97,999	257,164	191,116	79,833	34,127	52,884	34,006	30,215	30,711	1,177,464
1969	40,008	83,891	163,306	76,105	342,053	102,500	28,444	38,087	171,573	82,524	35,220	31,150	1,194,861
1970	30,342	45,185	142,727	81,098	78,542	48,777	8,243	2,770	57,027	26,141	28,720	6,837	556,409
1971	21,013	15,108	19,290	13,945	31,764	50,615	18,052	151,678	121,094	125,745	34,693	130,108	733,105
1972	26,269	18,730	16,346	48,102	221,805	51,741	31,330	22,802	64,471	78,305	225,661	42,601	848,163
1973	110,712	53,718	210,023	333,570	83,115	210,564	58,548	90,684	155,042	144,754	136,246	30,973	1,617,949
1974	15,367	23,881	38,062	25,527	177,484	100,821	27,322	33,824	253,791	160,739	170,169	22,296	1,049,283
1975	54,966	106,540	120,295	80,603	349,308	317,671	259,562	152,985	86,271	29,797	28,672	20,989	1,607,659
1976	22,178	19,454	28,542	99,002	111,264	81,538	47,775	19,066	131,784	78,759	59,355	19,496	718,213
1977	34,036	57,120	136,267	113,396	323,254	133,258	54,428	52,517	44,528	6,723	7,658	3,236	966,421
1978	8,105	19,544	47,904	33,567	92,512	315,842	28,459	72,105	48,297	22,012	11,886	11,621	711,854
1979	21,947	28,626	130,428	59,173	147,835	191,768	68,386	66,523	34,570	11,694	23,383	14,265	798,598
1980	15,055	20,233	15,758	12,073	173,290	176,126	12,963	15,282	113,141	73,742	15,992	48,196	691,851
1981	9,945	23,682	155,754	49,466	120,973	300,137	23,169	14,824	29,972	919,215	57,405	23,762	1,728,304
1982	36,179	64,961	58,524	27,966	840,269	636,259	171,951	58,779	27,792	13,880	18,212	21,332	1,976,104
1983	28,483	51,221	44,471	65,236	116,039	110,952	52,776	16,097	8,050	586,792	112,410	46,602	1,239,129
1984	45,597	33,898	51,201	48,302	36,020	45,596	17,649	19,950	7,333	88,271	71,546	168,399	633,762
1985	190,082	164,853	396,114	278,071	169,233	531,102	46,138	38,940	47,224	257,436	42,566	22,143	2,183,902
1986	28,816	36,385	29,176	86,571	138,637	292,846	64,784	33,555	425,195	734,292	255,413	255,133	2,380,803
1987	122,356	176,518	332,359	79,991	346,672	828,331	246,035	45,029	53,827	28,132	35,876	197,595	2,492,721
1988	95,072	51,102	116,061	95,031	34,931	29,635	45,161	9,796	134,655	31,415	14,193	15,402	672,454
1989	32,548	72,904	63,302	29,261	423,406	718,976	58,931	61,822	268,465	51,508	24,075	15,132	1,820,330
1990	59,502	63,905	462,093	881,301	909,619	295,528	59,073	55,091	41,545	25,418	46,818	24,640	2,924,533
1991	80,475	31,414	50,910	56,641	152,833	553,253	92,284	69,151	269,142	145,038	92,908	583,290	2,177,339
1992	182,493	232,591	188,895	111,761	141,003	547,631	215,791	35,486	87,138	12,657	109,525	167,519	2,032,490
1993	78,482	229,655	267,970	194,609	687,211	130,606	67,823	28,967	49,762	47,550	23,830	80,907	1,887,372
1994	24,315	76,150	110,775	54,885	218,357	48,865	126,839	24,258	38,579	100,028	144,941	80,641	1,048,633
1995	34,009	22,725	87,404	125,282	376,188	1,106,953	177,962	668,097	243,108	122,119	46,570	40,925	3,051,342
1996	51,001	38,058	46,835	57,443	17,221	45,167	49,784	78,055	341,289	65,313	137,827	67,944	995,937
1997	37,778	281,750	79,865	379,295	424,228	202,743	46,957	95,103	72,319	49,722	25,667	86,850	1,782,277
1998	174,687	188,335	543,395	93,487	76,410	49,145	22,527	20,569	15,356	16,061	32,366	20,015	1,252,353
1999	38,597	40,349	109,801	72,497	192,021	160,252	65,987	18,176	24,578	12,696	12,886	20,391	768,231
2000	25,325	18,468	81,199	52,719	50,249	85,119	50,160	9,890	746	100,808	309,331	89,207	873,221
2001	88,982	452,983	265,311	77,304	193,094	87,155	24,236	20,375	56,022	43,168	37,156	46,806	1,392,592
2002	28,000	36,426	94,162	255,139	57,326	128,002	124,723	49,458	23,697	45,468	58,758	62,039	963,198
2003	39,682	26,066	38,934	31,962	88,571	126,158	50,835	14,392	31,811	10,309	10,059	10,067	478,846
2004	12,279	30,222	103,295	58,082	47,023	105,112	193,452	69,050	21,821	53,234	408,354	67,666	1,169,590
2005	138,249	77,131	49,548	32,786	36,520	81,839	33,204	347,233	94,740	89,496	12,918	10,804	1,004,468
2006	16,935	9,314	40,711	61,647	66,898	12,106	12,182	10,332	30,329	207,758	66,528	38,312	573,052
2007	87,510	38,377	50,014	184,940	222,414	570,459	653,844	127,639	69,616	21,748	17,019	19,562	2,063,142
2008	19,020	18,537	89,523	114,469	73,327	31,033	20,055	90,126	42,478	32,055	12,367	10,008	552,998
2009	11,175	17,021	14,663	122,719	365,561	65,917	24,700	19,050	30,591	97,304	30,128	27,650	826,479
2010	88,868	186,798	115,090	288,554	226,170	37,542	244,916	36,652	82,802	25,689	14,787	20,490	1,368,358
2011	19,910	24,148	16,196	18,224	37,993	12,389	14,271	12,744	5,488	28,287	21,687	20,277	231,614
2012	56,932	20,208	77,187	62,819	12,366	34,864	4,732	6,718	10,655	7,614	2,701	1,291	298,087
2013	6,609	7,075	11,494	15,393	21,354	51,552	18,901	28,336	10,209	5,679	2,088	10,146	188,836
2014	2,888	5,778	7,219	11,303	17,580	53,256	59,866	15,601	7,514	7,424	31,362	11,961	231,752
2015	11,554	8,360	38,167	78,984	1,816,858	1,034,387	268,518	34,298	27,658	45,570	226,150	376,135	3,966,639
2016	105,445	71,597	110,463	447,175	285,918	354,106	81,947	36,487	106,666	110,062	45,470	18,369	1,773,705
2017	57,791	93,921	44,838	111,459	127,817	88,747	67,078	93,734	50,578	140,541	33,764	21,312	931,580
2018	23,367	88,089	84,532	35,689	106,701	25,663	17,598	19,190	131,052	646,880	122,306	216,789	1,517,856
Total	3,125,433	4,358,937	6,536,546	7,711,506	17,811,265	15,667,146	6,109,390	4,143,510	6,059,031	8,271,780	4,437,253	4,059,610	88,291,407
Mean	44,020	61,393	92,064	108,613	250,863	220,664	86,048	58,359	85,338	116,504	62,497	57,178	1,243,541
Max	190,082	452,983	543,395	881,301	1,816,858	1,106,953	653,844	668,097	425,195	919,215	408,354	583,290	3,966,639
Min	2,742	4,111	5,106	3,687	12,366	12,106	4,732	744	746	1,086	433	1,291	188,836

Total filled naturalized flows

	Original		Extension	

Control Point: BODARC
Control Point I.D.: BODARC
Description: Bois d'Arc Lake Period of record = n/a

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	12,769	34,671	27,096	6,185	57,141	6,791	37,870	2,353	964	806	1,073	1,002	188,721
1949	50,185	31,821	24,613	17,537	31,246	26,704	4,967	50	2,516	10,553	492	3,315	203,999
1950	48,422	71,511	8,274	1,373	80,604	13,022	48,626	48,879	41,699	6,634	2,369	2,665	374,078
1951	2,011	34,866	7,930	7,537	2,008	66,173	20,847	875	3,185	1,006	4,687	1,672	152,797
1952	0	1,824	10,857	78,083	19,700	3,930	179	0	688	404	2,408	1,826	119,899
1953	1,234	1,973	12,302	40,283	64,137	2,891	11,630	5,925	1,020	1,998	3,552	4,604	151,549
1954	15,960	4,708	275	2,638	71,074	11,940	3,038	1,524	4,672	36,242	1,808	3,800	157,679
1955	9,125	17,882	26,668	16,670	10,404	328	9,863	200	8,704	4,583	2,778	2,333	109,538
1956	2,876	16,644	5,021	707	7,878	1,476	0	140	193	1,342	869	658	37,804
1957	359	6,177	11,841	98,581	152,372	88,582	23,225	1,589	27,066	9,909	68,969	16,254	504,924
1958	32,558	10,712	37,659	24,448	87,176	8,248	1,232	2,121	1,707	84	2,088	919	208,952
1959	0	1,219	4,358	4,673	6,545	2,340	30,521	5,104	0	15,869	12,174	18,186	100,989
1960	29,982	19,166	18,606	6,232	18,924	6,046	5,891	3,203	5,144	0	11,316	34,641	159,151
1961	17,715	22,261	13,713	24,781	14,176	5,385	6,014	1,131	6,568	8,553	9,389	31,786	161,472
1962	15,008	8,742	9,335	33,411	11,359	28,693	3,120	4,955	24,820	16,665	17,290	24,630	198,028
1963	6,250	5,363	10,084	6,198	13,648	0	1,509	401	0	58	0	0	43,511
1964	4	405	7,936	17,750	7,513	14,482	154	950	28,186	6,585	28,035	9,472	121,472
1965	10,822	33,545	7,953	8,846	24,138	6,390	2,018	1,518	12,462	1,170	1,815	1,206	111,883
1966	0	18,906	4,311	62,217	56,237	664	357	1,078	2,405	0	0	0	146,175
1967	0	0	3,295	55,364	23,276	28,605	15,329	0	27,802	2,037	10,011	15,759	181,478
1968	21,885	23,695	87,987	67,756	76,785	29,248	11,665	6,848	20,222	3,332	27,490	34,364	411,277
1969	29,706	59,047	49,183	20,265	148,800	16,570	2,039	3,242	2,432	14,524	6,625	13,218	365,651
1970	17,367	35,595	52,865	49,036	27,195	5,259	855	3,051	15,314	23,065	8,681	4,682	242,965
1971	9,719	8,945	7,111	8,886	8,899	3,913	6,271	4,056	2,533	39,214	6,480	129,353	235,380
1972	8,282	6,032	4,456	8,525	6,358	1,109	3,394	797	142	10,261	56,177	8,882	114,415
1973	19,152	29,611	77,387	55,989	42,943	43,498	8,554	4,607	38,331	52,425	28,445	52,949	453,891
1974	12,818	9,773	8,462	13,283	26,759	32,348	1,364	5,595	30,362	14,443	103,217	32,266	290,690
1975	18,698	55,373	38,638	38,304	16,289	47,251	2,661	16,557	4,875	2,191	1,418	4,247	246,502
1976	3,037	3,471	7,569	45,707	22,283	13,411	25,536	265	277	2,161	0	0	123,717
1977	12,757	17,408	54,246	49,747	1,386	4,139	245	4,880	0	607	2,700	676	148,791
1978	2,643	8,843	22,499	10,682	9,201	13,064	1,465	0	565	0	10,309	4,764	84,035
1979	10,393	21,482	40,205	29,555	47,286	48,080	4,123	0	0	0	1,608	4,779	207,511
1980	2,258	5,159	2,960	2,444	3,759	12,636	654	1,699	10,512	16,621	3,230	12,980	74,912
1981	2,640	2,970	16,591	3,639	18,653	44,388	3,959	190	2,279	95,876	85,008	12,560	288,753
1982	12,928	45,129	21,573	10,252	145,102	78,732	30,814	9,168	2,994	2,947	16,504	44,381	420,524
1983	10,602	58,580	33,584	10,542	15,092	28,315	27,308	1,673	1,988	0	0	11,551	199,235
1984	7,087	21,357	30,864	21,767	28,118	0	4,284	3,696	4,849	12,490	38,012	32,676	205,200
1985	0	12,743	1,497	7,020	56,604	12,487	10,635	5,373	6,651	4,080	42,154	22,637	181,881
1986	5,176	58,208	16,371	37,838	30,115	78,395	16,743	12,761	8,533	6,160	49,814	30,156	350,270
1987	27,446	30,872	98,223	23,676	0	25,039	26,078	5,622	8,943	4,236	32,530	21,188	303,853
1988	5,363	27,050	7,800	17,540	15,381	6,531	9,044	4,704	2,586	0	5,601	6,138	107,738
1989	17,712	50,869	40,889	38,502	94,508	193,561	89,037	10,705	7,203	9,202	4,858	5,139	562,185
1990	13,471	48,715	82,104	147,617	199,179	37,160	21,680	16,926	14,186	18,314	5,106	10,353	614,811
1991	24,101	15,525	11,290	55,115	47,709	42,380	35,448	26,944	0	62,812	56,138	91,240	468,702
1992	53,381	51,588	72,942	38,297	55,630	91,622	66,533	27,314	13,438	5,769	0	0	476,514
1993	17,688	27,639	41,692	31,487	4,727	50,405	24,176	17,763	9,518	31,691	11,565	33,582	301,933
1994	16,499	15,183	43,410	25,833	35,217	44,414	29,711	22,156	11,075	31,311	103,264	69,134	447,207
1995	44,412	8,453	44,552	51,847	191,410	0	37,669	0	2,251	19,483	7,303	6,872	414,252
1996	10,133	5,760	8,320	8,443	3,933	20,452	7,478	12,957	10,250	35,401	102,777	25,351	251,255
1997	9,844	39,143	33,937	45,705	30,818	19,343	4,797	5,591	0	6,796	15,106	65,262	276,342
1998	86,865	47,117	29,515	32,934	6,227	1,741	54	1,455	5,336	13,652	13,908	31,026	269,830
1999	15,851	13,400	8,100	15,026	28,293	5,760	9,196	1,503	7,890	3,447	4,046	15,622	128,134
2000	2,498	5,843	9,909	13,479	6,638	15,310	3,138	730	2,904	0	25,548	51,326	137,323
2001	26,920	150,701	130,670	47,701	6,575	13,525	0	4,333	9,133	13,447	5,386	35,914	444,305
2002	21,112	48,193	74,853	75,177	24,950	12,173	1,170	3,807	8,676	28,054	11,269	24,815	334,249
2003	16,086	11,996	33,285	3,663	7,460	15,163	3,791	2,094	11,124	1,090	1,770	0	107,522
2004	6,555	17,534	6,215	4,411	5,108	13,200	0	0	0	0	28,692	43,258	124,973
2005	106,733	22,710	19,273	13,795	6,992	4,454	3,707	0	0	3,632	4,336	1,900	187,532
2006	175	551	14,408	4,735	7,624	1,726	0	38	276	2,051	626	17,844	50,054
2007	43,297	3,642	4,102	38,063	54,013	86,533	70,772	9,115	1,368	3,651	731	10,011	325,298
2008	1,731	35,769	111,398	26,491	3,998	1,088	0	746	0	0	0	0	181,221
2009	0	66	2,776	21,342	120,294	1,653	3	71	15,153	160,360	7,248	12,591	341,557
2010	34,144	60,861	16,517	3,812	3,831	0	1,857	0	3,723	0	968	2,328	128,041
2011	976	789	449	3,741	60,254	174	0	0	0	0	158	2,434	68,975
2012	39,629	6,754	53,840	1,665	36	1,635	39	0	0	0	0	0	103,598
2013	1,450	714	7,345	2,672	11,387	1,116	216	0	0	0	371	4,841	30,112
2014	294	228	1,220	810	3,361	1,770	38	842	1,140	1,166	0	338	11,207
2015	3,904	4,335	46,797	37,233	198,666	56,946	2,921	0	0	314	138,688	101,415	591,219
2016	14,633	9,425	38,819	51,277	33,885	46,000	0	7	149	0	241	22	194,458
2017	1,053	1,101	369	4,820	479	1,888	22,374	88,141	345	132	0	8,345	129,047
2018	1,233	90,030	43,029	6,600	9,915	255	12	38	104,181	92,528	15,943	69,632	433,396
Total	1,127,617	1,678,373	1,964,223	1,898,260	2,769,681	1,648,550	859,898	430,056	603,508	973,434	1,273,172	1,399,770	16,626,542
Mean	15,882	23,639	27,665	26,736	39,010	23,219	12,111	6,057	8,500	13,710	17,932	19,715	234,177
Max	106,733	150,701	130,670	147,617	199,179	193,561	89,037	88,141	104,181	160,360	138,688	129,353	614,811
Min	0	0	275	707	0	0	0	0	0	0	0	0	11,207

Total filled naturalized flows

	Original	Date:	Extension
Calcs:	ab	6/5/2001	JSA
Checked:	SD	12/30/2005	WEC

Control Point: X10000
Control Point I.D.: RR-AC
Description: Red River near Arthur City

Period of record = 10/05-9/11; 10/36-present

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	57,599	169,749	192,992	48,573	299,854	208,866	273,675	33,835	10,856	21,261	10,384	7,427	1,335,071
1949	170,541	229,108	131,222	77,312	444,607	366,829	47,524	13,562	120,567	106,909	18,651	22,617	1,749,449
1950	174,505	288,641	37,367	46,666	651,869	188,307	547,349	551,410	463,176	74,018	22,686	27,445	3,073,439
1951	24,460	143,708	69,201	39,332	717,052	778,277	206,930	28,132	46,413	25,962	43,060	11,063	2,133,590
1952	8,684	15,842	48,973	304,137	272,920	74,010	26,189	1,553	3,580	2,241	10,349	14,635	783,113
1953	10,802	15,768	76,429	167,650	221,603	43,571	127,817	104,593	17,535	390,675	106,031	55,756	1,338,230
1954	57,105	20,095	5,893	58,427	954,126	244,780	13,847	5,098	16,063	105,867	5,600	21,080	1,507,981
1955	36,661	66,943	106,945	68,786	578,878	364,074	85,677	18,087	179,849	599,969	37,034	22,646	2,165,549
1956	24,150	70,833	26,950	5,706	165,712	64,227	22,140	1,853	1,812	52,198	28,987	23,363	487,931
1957	6,411	41,525	77,496	897,127	2,206,002	908,036	127,117	25,822	135,850	99,048	400,953	72,140	4,997,527
1958	151,337	66,242	165,508	157,514	532,237	85,901	106,926	24,797	11,764	6,531	8,494	6,442	1,323,693
1959	1,364	7,593	20,314	59,913	199,668	224,919	246,880	35,026	37,670	404,781	80,487	227,180	1,545,795
1960	162,934	130,298	97,554	39,274	110,380	203,843	126,996	28,201	27,075	355,625	67,512	181,262	1,530,954
1961	81,377	97,721	157,461	156,871	131,539	110,481	120,554	20,795	72,841	56,651	93,631	132,425	1,232,347
1962	53,627	35,426	46,184	140,560	66,714	459,282	87,972	55,841	280,575	94,726	156,456	164,316	1,641,679
1963	33,344	28,826	51,713	56,558	94,618	119,640	21,162	5,158	21,720	2,982	10,256	2,014	447,991
1964	3,671	29,882	39,799	88,768	64,778	119,218	5,655	11,729	228,630	45,853	184,148	47,919	870,050
1965	46,936	123,505	33,676	70,205	187,620	158,322	36,625	39,956	181,000	201,332	34,128	21,099	1,134,404
1966	10,644	110,805	46,059	388,190	290,576	43,140	32,958	166,187	289,911	52,762	9,242	8,325	1,448,799
1967	12,205	4,301	27,136	384,492	126,267	231,669	151,857	17,540	127,760	20,481	44,696	57,851	1,206,255
1968	193,332	104,661	453,034	291,587	476,550	274,683	113,162	53,693	110,660	43,526	108,759	128,894	2,352,541
1969	124,881	252,597	303,828	134,004	767,197	149,843	34,271	47,350	178,522	124,020	54,149	68,917	2,239,579
1970	79,962	146,884	293,769	221,202	156,243	63,804	10,686	11,487	100,782	92,041	53,523	20,215	1,250,598
1971	48,782	40,664	39,608	39,333	57,191	61,796	35,970	163,266	128,331	237,784	53,208	499,689	1,405,622
1972	49,933	35,965	29,077	72,460	239,970	54,910	41,027	25,078	64,878	107,623	386,167	67,979	1,175,067
1973	165,433	138,321	431,130	493,539	205,808	334,843	82,987	103,847	264,560	294,540	217,517	182,255	2,914,780
1974	51,989	51,804	62,239	63,479	253,937	193,244	31,218	49,811	340,540	202,004	465,074	114,484	1,879,823
1975	108,389	264,749	230,689	190,043	395,848	452,675	267,166	200,292	100,199	36,057	32,723	33,122	2,311,952
1976	30,854	29,370	50,169	229,593	174,929	119,854	120,736	19,824	132,574	84,933	58,169	16,520	1,067,525
1977	70,485	106,857	291,256	255,531	327,215	145,083	55,129	66,461	44,493	8,458	15,373	5,166	1,391,507
1978	15,656	44,811	112,188	64,086	118,800	353,169	32,644	63,635	49,910	21,289	41,340	25,233	942,761
1979	51,640	90,003	245,298	143,616	282,938	329,140	80,166	63,603	33,387	10,630	27,976	27,919	1,386,316
1980	21,505	34,974	24,214	19,057	184,030	212,228	14,832	20,137	143,174	121,230	25,221	85,281	905,883
1981	17,488	32,168	203,157	59,863	174,267	426,959	34,479	15,367	36,484	1,193,147	300,285	59,647	2,553,311
1982	73,116	193,900	120,160	57,256	1,254,845	861,207	259,990	84,972	36,347	22,299	65,366	148,136	3,177,594
1983	58,775	218,593	140,424	95,356	159,158	191,851	130,799	20,876	13,730	578,734	104,919	79,605	1,792,820
1984	65,846	94,919	139,385	110,492	116,358	43,830	29,889	30,510	21,186	123,958	180,151	261,758	1,218,282
1985	172,307	201,262	400,392	298,129	330,958	566,778	76,524	54,291	66,228	269,093	163,005	86,821	2,685,788
1986	43,605	202,694	75,950	194,679	224,680	516,832	112,621	70,014	449,575	751,892	397,739	341,293	3,381,574
1987	200,773	264,724	612,997	147,636	330,751	899,872	320,543	61,092	79,378	40,234	128,820	258,131	3,344,951
1988	110,396	128,389	138,346	145,144	78,876	48,294	71,000	23,236	142,043	27,864	30,196	32,939	976,723
1989	83,153	218,245	180,129	139,266	693,428	1,272,008	313,322	92,407	289,045	77,798	37,954	29,815	3,426,570
1990	97,990	203,091	696,675	1,303,064	1,478,702	401,698	121,017	103,450	82,077	77,743	61,406	54,221	4,681,134
1991	149,336	75,771	83,166	214,112	289,143	674,340	193,564	146,135	258,252	324,502	253,301	843,976	3,505,598
1992	335,009	379,984	397,300	221,181	299,945	809,409	405,885	113,527	125,532	29,141	77,873	121,999	3,316,785
1993	129,018	308,623	387,089	284,572	700,718	274,621	136,897	79,718	76,955	138,096	56,872	176,855	2,750,034
1994	71,456	119,531	234,803	128,694	318,976	175,762	211,728	87,561	70,221	189,489	439,982	278,167	2,326,370
1995	160,899	46,877	214,694	273,416	923,075	1,105,820	285,587	668,067	249,539	177,785	67,436	60,560	4,233,755
1996	79,952	54,516	70,607	81,565	28,459	103,601	71,150	115,076	370,576	166,460	431,475	140,374	1,713,811
1997	65,905	393,587	176,827	509,881	512,280	258,008	60,663	111,077	71,487	69,138	68,828	273,312	2,570,993
1998	422,873	322,955	627,723	187,583	94,201	54,120	22,680	24,725	30,601	55,067	72,104	108,662	2,023,294
1999	83,886	78,634	132,943	115,427	272,858	176,709	92,262	22,469	47,120	22,545	24,445	65,025	1,134,323
2000	32,462	35,163	109,511	91,230	69,214	128,863	59,126	11,976	9,044	94,138	382,325	235,852	1,258,904
2001	165,897	883,556	638,653	213,592	211,881	125,797	20,545	32,755	82,115	81,589	52,545	149,416	2,658,341
2002	88,319	174,120	308,027	469,930	128,612	162,782	128,067	60,335	48,485	125,621	90,955	132,939	1,918,192
2003	85,642	60,341	134,035	42,427	109,884	169,482	61,667	20,374	63,593	13,423	15,115	7,514	783,497
2004	31,007	80,320	121,051	70,686	61,618	142,826	190,277	59,639	13,747	40,376	490,332	191,259	1,493,138
2005	443,200	142,017	104,613	72,200	56,496	94,566	43,796	342,899	91,651	99,874	25,307	16,233	1,532,852
2006	17,434	10,889	81,877	75,175	88,681	17,038	0	0	17,743	204,836	51,975	105,999	671,647
2007	239,213	41,900	53,290	306,769	353,965	888,753	923,453	223,838	126,900	60,503	26,267	49,393	3,294,244
2008	18,386	103,062	404,316	203,202	112,909	51,827	20,520	97,682	32,640	33,653	15,603	11,174	1,104,974
2009	1,660	17,297	44,754	163,848	657,680	104,185	28,067	26,838	74,978	403,122	74,355	67,710	1,664,494
2010	162,151	336,981	170,867	300,872	239,337	46,274	265,747	55,574	95,395	33,188	21,143	20,908	1,748,437
2011	14,989	28,840	16,766	46,147	199,176	10,811	17,746	14,345	7,576	30,322	33,424	48,021	468,163
2012	196,580	62,688	283,805	123,071	27,077	49,839	12,962	14,694	13,768	13,083	4,006	4,835	806,408
2013	13,673	8,960	39,319	31,259	86,053	85,600	24,857	32,240	16,694	14,744	8,901	33,501	395,801
2014	14,961	11,171	21,609	16,113	42,017	60,442	59,751	28,435	27,041	20,151	32,471	17,483	351,645
2015	33,488	26,902	174,940	199,789	2,283,361	1,352,650	271,897	62,258	51,297	58,727	547,075	709,706	5,772,090
2016	227,529	106,155	255,440	571,261	437,749	495,587	123,899	57,972	107,430	122,216	51,421	16,861	2,573,520
2017	58,045	103,252	75,183	184,130	136,886	122,510	209,847	275,138	64,209	144,262	44,035	42,069	1,459,566
2018	41,578	324,183	236,197	82,476	150,738	40,148	16,117	16,938	281,876	811,231	181,852	374,535	2,557,869
Total	6,449,195	9,134,731	12,332,391	13,305,084	25,692,688	20,754,363	8,764,785	5,436,159	7,709,215	10,844,051	8,023,248	8,059,383	136,505,293
Mean	90,834	128,658	173,696	187,396	361,869	292,315	123,448	76,566	108,580	152,733	113,003	113,512	1,922,610
Max	443,200	883,556	696,675	1,303,064	2,283,361	1,352,650	923,453	668,067	463,176	1,193,147	547,075	843,976	5,772,090
Min	1,364	4,301	5,893	5,706	27,077	10,811	0	0	1,812	2,241	4,006	2,014	351,645

Total filled naturalized flows

	Original	Date:	Extension
Calcs:	ab	12/10/2001	JSA
Checked:	DH	12/12/2001	WEC

Control Point: Y10000
Control Point I.D.: RR-IN
Description: Red River at Index
Period of record = 7/36-present

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	143,200	197,960	370,707	87,870	450,994	225,722	300,221	44,582	22,421	25,176	19,060	21,041	1,908,954
1949	274,121	393,487	245,884	137,006	489,653	454,872	85,159	24,855	122,403	143,086	40,419	45,633	2,456,578
1950	326,881	621,386	101,406	50,504	858,663	223,814	543,995	586,571	621,836	147,091	42,301	27,728	4,152,176
1951	60,301	269,732	127,943	98,692	716,969	915,347	330,645	45,472	66,339	26,101	57,680	53,139	2,768,360
1952	64,879	46,516	115,086	587,023	319,490	104,327	31,702	3,546	17,667	4,014	26,425	90,067	1,410,742
1953	48,657	47,569	175,431	153,319	709,601	62,577	92,755	140,316	22,532	400,305	121,542	66,208	2,040,812
1954	83,991	85,558	22,745	82,742	1,095,972	323,211	16,928	14,090	35,671	160,978	50,382	13,343	1,985,611
1955	95,086	94,849	180,280	136,996	604,559	364,417	115,786	30,583	193,079	665,300	39,182	29,826	2,549,943
1956	26,706	204,231	58,119	9,951	227,402	88,415	25,721	8,496	2,295	65,406	37,226	19,665	773,633
1957	6,844	88,779	163,423	1,120,433	2,657,646	1,071,648	295,831	41,494	118,657	218,393	578,910	193,177	6,555,235
1958	320,290	99,681	287,409	295,465	904,210	112,916	189,547	39,168	44,261	25,544	49,985	31,843	2,400,319
1959	10,347	85,618	56,676	126,734	233,273	233,778	239,179	76,680	56,282	398,066	105,048	304,817	1,926,498
1960	278,116	168,535	146,616	78,312	134,516	237,811	137,238	73,750	47,350	365,841	88,300	311,403	2,067,788
1961	161,479	148,301	221,192	346,896	175,478	136,638	193,939	45,830	65,626	55,590	113,506	215,798	1,880,273
1962	170,918	137,739	103,320	202,540	151,849	458,166	139,370	57,052	304,636	140,281	182,002	231,720	2,279,593
1963	55,561	50,043	135,049	41,568	199,429	143,233	55,106	18,769	34,593	13,102	17,537	12,856	776,846
1964	5,384	38,871	93,755	257,298	115,684	141,491	9,084	12,781	203,356	139,911	186,941	78,905	1,283,461
1965	78,948	252,194	65,710	148,664	209,477	230,311	42,493	44,026	207,753	210,579	48,970	30,277	1,569,402
1966	4,081	144,517	62,936	394,895	587,566	56,207	55,898	200,221	303,816	73,060	27,701	32,421	1,943,319
1967	42,872	12,728	50,877	487,713	299,999	299,524	211,780	30,638	139,745	24,422	82,238	104,574	1,787,110
1968	163,391	352,714	512,070	452,225	877,336	521,788	175,682	82,747	115,116	66,926	22,192	222,697	3,564,884
1969	189,468	528,212	484,751	126,448	1,088,860	206,663	48,279	54,298	180,374	128,572	54,889	46,113	3,136,927
1970	166,007	189,105	546,391	287,507	253,938	73,584	18,765	10,054	88,543	74,831	111,932	12,256	1,832,913
1971	61,528	50,770	98,529	24,226	88,051	79,008	36,031	161,785	127,659	337,897	60,671	831,070	1,957,225
1972	167,438	100,485	70,577	128,124	267,778	60,047	47,287	42,816	70,554	147,578	762,921	164,094	2,029,699
1973	160,942	228,617	637,211	607,083	422,951	492,762	114,346	87,045	217,018	282,076	239,095	407,254	3,896,400
1974	190,702	85,792	42,029	54,127	225,336	269,188	60,789	31,970	350,751	308,173	459,841	315,316	2,394,014
1975	122,421	273,205	230,390	214,238	395,848	452,675	267,166	200,322	102,409	38,233	41,676	27,387	2,365,970
1976	57,153	42,909	164,896	259,915	327,423	207,976	181,954	41,498	151,664	106,843	69,920	85,253	1,697,404
1977	79,442	186,302	331,687	452,564	323,633	198,192	86,865	71,185	44,474	20,644	43,093	10,701	1,848,782
1978	28,964	44,811	79,517	108,062	105,730	313,214	39,841	67,928	59,861	28,184	94,531	41,796	1,012,439
1979	125,057	88,755	305,590	255,458	364,946	472,848	117,583	81,215	27,353	34,390	53,185	74,088	2,000,468
1980	97,821	134,350	58,184	56,173	180,137	330,385	30,561	29,452	139,717	140,572	75,477	122,569	1,395,398
1981	25,722	63,137	238,954	71,579	210,286	541,128	105,016	19,514	61,231	1,161,836	309,943	87,228	2,895,574
1982	45,739	284,448	199,864	78,672	1,433,442	999,398	281,691	114,380	56,979	38,486	151,974	421,078	4,106,151
1983	127,687	226,935	201,330	126,714	115,559	180,823	221,578	45,434	17,393	581,209	110,692	66,279	2,021,633
1984	77,598	101,299	254,541	247,791	227,987	77,997	46,554	31,856	43,392	115,835	340,881	344,306	1,910,037
1985	274,469	274,552	688,535	372,370	450,357	664,206	159,507	67,573	89,803	274,488	123,373	247,438	3,686,671
1986	60,201	280,241	86,628	221,652	254,468	597,782	131,619	63,510	422,340	629,716	384,336	412,144	3,544,637
1987	196,293	275,697	723,625	214,771	334,111	833,582	484,984	94,470	88,000	39,987	258,924	554,318	4,098,762
1988	378,505	221,980	183,761	262,737	129,705	52,472	76,407	27,968	154,804	24,722	105,113	57,837	1,676,011
1989	81,798	431,205	294,945	238,008	738,878	1,233,673	254,616	166,021	319,515	142,275	58,458	54,350	4,013,742
1990	172,318	429,300	925,125	1,306,495	1,601,769	762,891	177,138	122,020	66,727	155,512	88,925	129,797	5,938,017
1991	320,564	194,806	92,322	461,929	522,403	696,903	209,692	162,691	255,319	347,640	479,957	1,200,858	4,945,084
1992	574,683	478,486	544,803	221,181	299,945	809,409	546,590	188,277	160,253	46,478	90,282	496,724	4,457,111
1993	346,030	355,130	704,285	295,601	894,917	441,333	128,887	66,712	83,451	356,312	125,045	506,150	4,303,853
1994	121,509	175,511	445,429	137,999	433,484	337,486	249,056	93,423	90,463	205,933	320,768	357,174	2,968,235
1995	298,816	139,275	199,727	345,046	923,075	1,031,413	462,755	682,092	257,528	198,392	83,970	60,555	4,682,644
1996	81,662	86,771	44,184	73,079	135,310	140,025	111,317	167,189	444,082	281,082	707,468	338,622	2,610,791
1997	97,379	481,040	437,915	714,086	581,858	343,869	58,637	135,423	106,752	99,975	88,933	274,419	3,420,286
1998	750,155	387,037	649,104	235,783	135,170	85,738	15,751	31,358	56,864	57,565	61,095	143,551	2,609,171
1999	124,645	119,582	195,080	174,601	604,696	189,302	150,353	22,125	51,078	23,828	25,259	55,488	1,736,037
2000	27,890	34,059	148,990	126,967	220,676	237,497	75,212	10,504	15,582	104,042	557,901	521,243	2,080,563
2001	306,811	989,390	1,000,072	269,109	215,741	234,957	47,591	62,893	141,603	125,660	73,673	356,201	3,823,701
2002	145,647	245,740	478,988	772,066	288,261	181,307	122,154	67,095	67,444	150,024	103,651	137,088	2,759,465
2003	111,558	86,703	188,099	76,887	104,659	169,482	62,896	0	56,172	17,332	16,699	19,310	909,797
2004	15,869	102,716	151,983	69,790	88,976	188,508	200,364	56,613	19,738	36,968	399,689	191,259	1,522,473
2005	377,253	130,298	95,554	58,787	55,552	94,223	31,616	327,768	85,472	94,769	34,312	30,499	1,416,103
2006	31,121	24,492	157,701	79,992	56,796	27,796	4,945	32,895	34,749	202,059	15,550	72,395	740,491
2007	407,834	124,041	102,395	257,228	164,936	930,967	1,521,525	542,891	316,329	102,227	35,948	78,051	4,584,372
2008	35,832	140,255	722,682	442,000	280,179	96,137	28,780	125,952	64,361	80,903	34,395	28,083	2,079,559
2009	4,293	3,907	86,225	182,086	1,118,614	314,206	103,679	74,411	192,841	836,088	280,625	234,276	3,431,251
2010	208,808	575,786	312,454	375,253	270,594	100,461	266,463	91,887	100,531	61,894	38,170	23,812	2,426,113
2011	31,657	58,844	31,156	67,432	299,451	24,720	19,713	11,323	20,325	39,210	28,664	62,037	694,532
2012	122,886	164,108	272,587	242,939	49,258	55,386	22,640	17,645	16,268	16,476	9,679	12,204	1,002,076
2013	35,967	25,088	36,331	31,622	28,919	147,101	43,608	25,884	21,918	45,132	50,446	78,293	570,309
2014	66,256	67,515	25,089	65,069	74,507	94,977	78,780	33,553	57,155	37,554	48,413	21,596	670,464
2015	88,961	66,432	333,634	245,756	1,940,320	2,660,569	496,187	124,851	64,527	88,538	607,596	1,152,053	7,869,424
2016	429,979	290,805	401,803	622,433	528,972	483,875	136,683	100,883	149,588	135,549	68,111	45,698	3,394,379
2017	59,683	115,874	97,855	237,888	132,709	163,838	277,582	327,290	112,179	156,930	65,955	56,629	1,804,412
2018	72,830	588,752	597,642	238,408	185,679	71,431	73,349	29,465	283,485	791,104	432,306	545,903	3,910,354
Total	10,605,904	14,335,558	18,697,783	18,132,577	32,196,616	25,859,623	11,823,441	6,867,074	8,952,052	12,920,895	10,821,957	13,749,981	184,963,461
Mean	149,379	201,909	263,349	255,388	453,473	364,220	166,527	96,719	126,085	181,984	152,422	193,662	2,605,119
Max	750,155	989,390	1,000,072	1,306,495	2,657,646	2,660,569	1,521,525	682,092	621,836	1,161,836	762,921	1,200,858	7,869,424
Min	4,081	3,907	22,745	9,951	28,919	24,720	4,945	0	2,295	4,014	9,679	10,701	570,309

Flow Adjustments - Run 8

Control Point: H10100
Control Point I.D.: RR-BB
Description: Salt Fork Red River

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	1,910	7,836	9,546	484	19,563	32,067	9,885	2,450	544	355	81	1,196	85,917
1949	4,510	24,089	6,821	3,619	69,304	31,433	2,433	2,277	14,865	10,534	3,554	3,342	176,781
1950	6,440	10,131	2,600	5,820	29,492	14,598	53,639	77,587	65,137	16,061	4,232	5,097	290,834
1951	5,038	5,466	4,898	3,978	47,555	34,259	24,957	5,477	4,615	2,752	3,710	2,271	144,976
1952	3,663	2,821	3,560	9,841	10,865	7,535	4,291	599	341	387	835	1,328	46,066
1953	844	701	0	6,247	2,949	0	30,729	9,697	1,450	53,028	10,826	4,229	120,700
1954	2,973	1,909	1,586	7,317	107,380	57,084	2,618	2,903	894	739	505	1,006	186,914
1955	1,292	1,653	2,267	1,054	90,279	93,323	13,508	5,503	14,481	91,568	10,455	4,280	329,663
1956	3,838	4,331	1,732	1,724	71,372	11,631	7,226	1,273	34	7,532	4,921	1,393	117,007
1957	707	2,572	4,802	84,799	320,501	122,661	8,613	9,979	3,063	11,318	26,183	3,614	598,812
1958	3,728	5,230	6,975	12,996	62,981	7,782	20,850	4,531	2,624	1,455	742	1,609	131,503
1959	2,409	2,176	990	2,283	41,163	29,992	26,273	5,933	2,658	16,385	2,865	19,277	152,404
1960	20,181	28,481	10,331	3,864	14,230	75,550	16,760	8,018	8,377	178,627	26,064	24,058	414,541
1961	14,912	19,641	22,916	14,085	7,431	55,195	41,594	2,158	6,116	2,980	23,988	7,219	218,235
1962	9,728	5,380	3,390	15,586	12,773	111,686	2,619	13,446	26,653	10,905	7,374	11,715	231,255
1963	5,754	7,131	6,093	6,371	12,341	66,623	2,389	137	6,009	0	2,036	2,132	117,016
1964	2,255	14,313	2,725	1,076	5,503	18,456	341	0	4,177	2,098	21,784	6,499	79,227
1965	3,834	2,878	2,271	7,912	7,369	67,494	9,708	614	70,577	108,487	12,172	12,380	305,696
1966	7,487	11,519	6,458	7,411	3,337	4,004	664	15,908	34,072	4,797	1,138	1,792	98,587
1967	2,006	1,334	722	24,337	6,090	10,254	24,577	938	5,456	7,183	1,057	1,038	84,992
1968	11,729	7,882	11,188	5,131	47,766	79,849	53,972	6,581	28,697	13,772	3,849	3,705	274,121
1969	4,451	9,970	15,342	7,569	77,679	21,641	2,550	19,990	39,125	8,215	5,397	4,025	215,954
1970	5,695	2,612	11,388	15,460	4,685	2,569	0	0	4	371	0	0	42,784
1971	0	33	7	0	0	23,605	238	10,383	46,267	14,072	16,176	13,475	124,256
1972	3,756	2,588	1,599	2,940	48,192	15,582	7,484	1,227	2,539	13,237	30,564	2,126	131,834
1973	25,769	7,873	45,383	136,281	14,249	40,958	6,696	8,545	33,928	24,773	5,558	4,096	354,109
1974	3,486	3,047	10,421	8,491	68,367	21,804	1,123	4,311	82,100	20,590	33,550	10,322	267,612
1975	10,235	20,416	15,291	14,030	31,982	103,787	112,675	43,469	12,271	6,708	15,198	11,302	397,364
1976	9,501	6,439	6,139	25,760	19,724	24,008	3,456	4,500	47,568	10,634	8,895	5,249	171,873
1977	7,568	7,041	4,137	31,397	247,912	72,820	8,882	22,842	8,784	2,431	3,611	3,412	420,837
1978	3,823	7,090	5,653	3,670	92,548	141,485	5,282	6,889	9,314	5,013	3,259	3,526	287,552
1979	4,569	5,431	14,729	12,743	24,900	44,706	11,035	48,215	8,728	2,402	5,464	3,560	186,482
1980	7,847	4,855	3,547	7,306	188,232	52,285	7,197	5,608	2,162	640	818	2,088	282,585
1981	1,308	1,314	2,519	6,996	11,745	58,872	1,094	772	1,637	7,852	1,117	2,012	97,238
1982	1,681	2,670	3,004	1,221	52,317	67,622	12,304	15,293	5,957	640	683	1,182	164,574
1983	2,910	6,413	9,305	5,059	21,511	13,349	4,101	3,209	1,406	183,031	16,516	7,252	274,062
1984	8,668	5,581	5,785	6,197	1,042	16,518	1,215	4,459	893	1,224	1,539	6,363	59,484
1985	13,338	13,588	26,229	33,429	18,444	54,704	7,955	2,894	6,784	64,507	13,829	7,955	263,656
1986	5,235	7,421	3,834	3,225	34,574	43,208	10,764	4,386	75,391	209,130	69,648	34,394	501,210
1987	31,022	44,519	43,132	17,013	174,742	77,417	27,372	11,244	11,660	11,197	13,526	12,793	475,637
1988	22,821	11,639	31,105	31,552	12,992	9,784	12,019	7,268	31,483	5,580	4,287	5,623	186,153
1989	6,463	9,367	11,508	6,888	33,754	123,348	8,725	11,493	33,177	6,909	5,490	5,231	262,353
1990	9,205	8,605	36,388	38,983	39,476	50,230	19,053	30,989	5,024	3,469	8,367	5,314	255,103
1991	8,354	4,874	5,043	10,272	70,811	237,154	27,248	12,881	24,903	10,266	15,147	75,327	502,280
1992	30,367	28,268	23,264	30,313	24,564	92,463	23,717	18,988	15,078	3,834	47,267	38,386	376,509
1993	33,885	36,185	42,659	46,439	157,904	26,460	51,355	24,893	9,503	5,049	5,247	6,798	446,377
1994	6,033	10,690	25,048	16,261	43,416	6,074	14,690	15,303	2,077	6,626	13,845	5,233	165,296
1995	4,173	3,283	6,671	14,612	39,656	404,045	27,495	182,074	60,579	41,152	15,301	16,257	815,298
1996	16,247	12,243	10,011	7,145	6,418	24,112	48,027	73,789	117,372	20,318	14,682	20,790	371,154
1997	12,151	63,281	20,353	235,458	128,528	78,102	38,706	80,475	63,895	15,251	10,700	34,186	781,086
1998	33,482	66,726	153,179	32,834	21,073	6,885	4,677	6,082	2,331	1,058	10,657	8,464	347,448
1999	9,018	12,428	15,659	10,049	53,074	60,018	17,744	8,144	2,717	5,304	2,128	4,687	200,970
2000	2,312	2,892	38,644	16,094	21,785	14,410	20,331	4,202	2,818	23,284	17,748	7,721	172,241
2001	12,193	25,393	19,143	11,312	47,945	19,277	5,717	4,633	3,989	754	5,825	3,419	159,600
2002	4,180	7,485	4,273	20,013	3,695	5,398	17,216	604	594	5,170	6,605	9,131	84,364
2003	6,768	4,518	3,920	4,024	2,970	24,366	7,252	1,644	9,383	634	630	702	66,811
2004	3,952	2,839	43,822	5,310	5,226	14,473	19,744	4,709	1,535	909	51,095	12,926	166,540
2005	15,599	12,933	9,152	6,242	9,656	6,511	4,805	14,017	25,447	10,195	1,923	1,935	118,415
2006	1,818	1,392	2,856	2,802	8,108	1,948	386	1,303	5,763	32,409	8,919	8,253	75,957
2007	14,843	5,038	13,006	22,492	47,696	116,163	54,360	22,348	11,577	5,056	2,217	6,999	321,795
2008	4,826	7,044	12,442	24,766	13,783	7,341	2,745	14,568	17,935	23,282	5,756	3,007	137,495
2009	1,324	2,855	3,286	19,006	60,524	6,784	5,061	5,315	3,113	2,704	4,650	4,166	118,788
2010	17,916	17,259	8,162	38,523	23,279	10,897	110,103	9,729	5,640	7,048	4,299	3,878	256,733
2011	4,345	4,051	2,768	1,450	4,601	1,074	391	27	59	339	12,197	2,334	33,636
2012	1,111	1,019	6,228	11,486	3,499	2,914	482	11	7	1,536	0	0	28,293
2013	131	404	1,013	463	258	1,112	11	0	15	459	17	179	4,062
2014	250	274	102	615	2,108	20,867	11,776	2,159	327	263	2,321	512	41,574
2015	526	557	937	7,898	278,033	127,942	38,253	14,762	4,686	4,356	11,807	17,422	507,179
2016	17,064	10,256	10,434	43,102	68,358	62,304	31,630	17,033	24,238	20,086	9,218	9,218	322,941
2017	10,905	12,382	19,535	30,611	31,957	15,330	20,872	12,721	14,748	17,056	8,407	6,777	201,301
2018	6,417	5,816	6,162	4,940	6,754	3,229	1,951	5,766	10,871	112,147	13,455	11,580	189,088
Total	584,779	718,371	926,088	1,316,677	3,394,990	3,409,431	1,235,611	1,002,175	1,208,242	1,520,133	733,926	590,767	16,641,190
Mean	8,236	10,118	13,043	18,545	47,817	48,020	17,403	14,115	17,017	21,410	10,337	8,321	234,383
Max	33,885	66,726	153,179	235,458	320,501	404,045	112,675	182,074	117,372	209,130	69,648	75,327	815,298
Min	0	33	0	0	0	0	0	0	4	0	0	0	4,062

Flow Adjustments - Run 8

Control Point: H10080
Control Point I.D.: RR-BB
Description: North Fork Red River

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	2,227	6,700	10,793	1,412	10,335	41,108	8,388	15,455	833	342	7,891	660	106,144
1949	2,137	28,874	5,892	4,026	110,816	84,915	13,727	4,313	14,375	9,603	3,343	3,031	285,052
1950	4,201	6,556	2,498	3,947	41,704	23,260	146,895	82,350	62,439	15,380	3,796	3,833	396,859
1951	3,759	5,054	7,697	3,487	274,457	200,947	27,155	4,762	5,251	9,708	3,315	2,045	547,637
1952	2,707	2,216	2,692	20,517	19,399	4,866	2,818	321	182	208	447	738	57,111
1953	506	602	749	11,114	1,601	30,325	24,176	17,915	892	53,216	6,354	3,704	151,154
1954	1,584	966	962	4,816	101,637	15,437	1,488	1,271	502	397	272	551	129,883
1955	815	1,057	1,433	934	114,068	53,474	12,787	4,546	7,875	146,900	6,678	3,750	354,317
1956	3,424	3,096	1,734	1,398	78,962	13,163	12,500	798	18	6,433	3,510	1,128	126,164
1957	646	1,718	3,961	114,869	394,663	108,096	11,201	5,429	1,999	13,832	15,467	2,854	674,735
1958	2,871	3,886	4,922	9,010	21,458	26,354	19,801	4,467	1,677	879	600	1,181	97,106
1959	1,455	1,421	1,000	6,985	90,486	44,788	76,808	7,086	23,621	56,532	4,122	34,364	348,668
1960	34,929	76,319	40,248	17,838	12,826	53,692	38,342	7,036	5,627	207,687	27,434	34,270	556,248
1961	26,357	26,103	28,435	20,261	14,676	140,585	30,624	8,388	17,984	17,509	43,204	9,665	383,791
1962	7,869	5,663	4,335	19,852	19,304	188,295	9,000	16,931	39,996	14,897	7,462	9,218	342,822
1963	4,837	11,942	11,692	6,558	14,537	70,158	2,367	19	3,084	4,059	1,762	1,251	132,266
1964	1,229	13,503	2,625	1,372	10,787	22,860	489	0	4,783	1,561	20,928	3,929	84,066
1965	3,104	2,077	2,134	6,701	10,421	60,578	6,999	605	131,089	127,928	14,006	13,942	379,584
1966	8,443	11,850	9,762	6,011	3,932	2,728	323	12,018	30,932	5,957	1,846	1,591	95,393
1967	1,857	1,636	1,028	32,180	10,466	11,831	31,239	1,379	9,784	1,784	1,599	1,794	106,577
1968	4,336	2,839	6,911	10,249	63,656	85,655	45,894	2,471	18,000	33,878	9,962	5,901	289,752
1969	4,526	5,751	11,313	8,228	193,403	21,237	5,292	18,992	25,283	5,797	4,346	3,543	307,711
1970	2,944	2,651	6,737	4,647	10,917	5,087	0	0	6,106	534	0	136	39,759
1971	397	455	630	0	0	30,187	2,048	14,028	68,921	33,474	17,109	13,206	180,455
1972	3,937	3,185	2,049	6,676	46,044	35,239	5,442	1,068	6,179	8,936	18,824	1,988	139,567
1973	21,791	6,107	61,040	143,645	24,325	62,751	9,126	6,862	59,848	41,214	6,754	5,982	449,445
1974	5,527	4,468	15,715	7,668	88,922	15,263	1,538	5,094	67,943	22,781	51,699	11,801	298,419
1975	10,524	27,582	21,721	17,261	28,875	75,064	151,262	60,673	12,984	10,333	20,574	10,946	447,799
1976	8,709	6,254	6,450	35,401	28,668	25,632	4,792	3,196	64,849	8,890	7,754	4,961	205,556
1977	6,667	6,029	4,459	16,369	473,447	71,945	11,540	26,692	10,404	5,368	5,896	5,439	644,255
1978	5,312	6,721	6,866	5,482	118,005	149,812	7,670	6,847	11,301	6,023	4,604	4,688	333,331
1979	5,587	6,135	15,365	12,377	26,461	46,129	12,569	30,172	6,269	2,125	8,758	4,871	176,818
1980	5,836	5,494	4,262	5,641	159,054	71,716	4,693	1,671	1,033	791	1,269	3,805	265,265
1981	2,302	2,302	4,591	7,557	14,947	59,430	1,787	2,052	2,039	17,188	5,023	3,043	122,261
1982	3,690	8,327	6,530	2,658	127,324	121,231	18,907	16,176	6,503	2,082	2,208	2,953	318,589
1983	3,069	5,841	12,807	7,590	20,680	20,885	5,439	2,185	670	150,119	26,624	9,548	265,457
1984	8,398	6,827	9,443	7,997	3,852	7,018	3,031	2,596	801	927	1,835	5,371	58,096
1985	6,371	5,601	14,396	16,473	8,809	37,662	4,554	2,431	8,862	57,053	10,975	5,201	178,388
1986	4,193	3,995	3,372	2,936	21,174	51,185	12,789	2,591	103,509	355,648	135,431	54,073	750,896
1987	45,606	83,304	147,610	41,347	296,281	188,678	42,964	21,818	25,486	18,581	10,223	12,476	934,374
1988	31,402	17,623	111,784	50,878	40,727	14,160	9,854	2,767	69,497	10,592	7,486	6,906	373,676
1989	6,536	5,710	8,017	8,908	26,194	204,369	21,679	15,308	45,521	10,086	7,061	6,450	365,839
1990	12,089	7,107	61,531	44,043	83,298	122,801	15,344	22,187	9,792	6,563	14,166	7,573	406,494
1991	7,995	4,850	5,857	9,965	87,667	202,973	14,093	9,507	14,013	8,674	13,509	79,127	458,230
1992	21,529	16,691	21,903	17,998	17,439	83,453	29,568	20,432	27,959	5,347	51,727	56,368	370,414
1993	30,149	37,375	38,949	74,378	328,800	36,557	45,384	23,599	11,875	7,029	6,434	7,178	647,707
1994	6,506	6,034	11,730	12,202	16,629	6,823	5,958	6,607	2,331	4,604	34,683	6,873	120,980
1995	5,288	3,892	5,732	10,540	43,301	330,849	41,629	241,757	106,873	47,066	20,771	20,688	878,386
1996	19,930	16,598	14,783	10,598	9,840	26,777	14,904	84,067	96,012	26,805	28,748	46,427	395,489
1997	27,568	81,991	43,129	298,691	147,848	76,883	36,452	62,775	105,127	32,621	29,927	82,086	1,025,098
1998	76,020	126,695	295,394	65,652	36,898	11,249	4,648	3,183	2,819	4,232	23,728	9,043	659,561
1999	9,326	7,819	14,156	22,251	63,981	103,190	27,041	10,138	3,217	4,102	3,822	24,978	294,021
2000	5,548	6,115	52,147	30,419	34,223	25,349	25,202	5,266	1,950	46,971	12,587	6,885	252,662
2001	13,065	21,360	15,360	8,339	147,796	41,389	7,745	6,036	9,519	2,269	4,040	4,128	281,046
2002	4,054	6,623	3,380	20,606	5,104	5,585	5,127	2,802	592	13,956	6,376	6,852	81,057
2003	4,982	3,697	3,945	3,990	4,821	43,691	4,216	1,374	13,366	2,214	1,639	1,682	89,617
2004	3,804	2,448	49,259	12,899	6,035	11,136	18,846	4,661	3,769	16,331	61,647	12,063	202,898
2005	18,417	11,445	8,291	5,410	8,612	10,773	6,527	27,265	19,849	11,597	2,939	3,210	134,335
2006	3,070	2,462	3,571	3,491	8,658	6,195	1,130	2,093	5,693	17,105	2,240	6,610	62,318
2007	5,516	4,287	21,861	35,181	75,392	143,897	67,190	37,446	14,247	9,190	4,359	7,562	426,128
2008	4,971	9,449	27,784	37,004	9,427	5,951	3,279	10,532	19,860	27,640	7,785	6,130	169,812
2009	2,675	4,093	4,401	21,152	29,921	5,266	4,733	4,535	17,241	8,054	4,164	3,170	109,405
2010	8,657	15,134	6,251	13,003	6,008	3,149	82,961	7,396	7,046	9,119	6,001	3,369	168,094
2011	3,231	2,312	1,906	1,617	7,756	1,324	467	30	235	615	20,172	3,555	43,220
2012	1,623	1,523	7,523	13,422	6,660	7,085	1,259	266	93	726	0	0	40,180
2013	641	1,375	1,416	3,421	1,387	403	394	0	105	4,007	957	1,028	15,134
2014	656	521	329	943	7,747	14,280	7,391	1,016	289	249	1,767	454	35,642
2015	611	551	531	4,999	326,537	126,740	45,739	11,726	5,305	4,147	13,093	22,219	562,198
2016	28,104	9,558	10,522	68,571	43,827	51,599	27,060	12,698	30,147	11,762	6,031	5,374	305,253
2017	9,846	24,179	25,093	30,383	36,897	13,631	10,869	46,720	27,437	73,692	9,673	7,146	315,566
2018	5,997	4,684	5,185	3,584	7,625	3,730	3,275	8,374	12,816	160,739	19,490	19,291	254,790
Total	654,485	875,308	1,388,579	1,598,028	4,788,434	4,120,523	1,418,428	1,115,267	1,554,528	2,064,658	950,926	777,856	21,307,020
Mean	9,218	12,328	19,557	22,507	67,443	58,036	19,978	15,708	21,895	29,080	13,393	10,956	300,099
Max	76,020	126,695	295,394	298,691	473,447	330,849	151,262	241,757	131,089	355,648	135,431	82,086	1,025,098
Min	397	455	329	0	0	403	0	0	18	208	0	0	15,134

Flow Adjustments - Run 8

Control Point: H10010
Control Point I.D.: RR-BB
Description: Red River near Burkburnet

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	1,096	2,481	1,904	204	10,440	11,203	7,067	1,744	401	262	0	640	37,442
1949	1,558	9,713	2,883	1,157	23,852	17,368	1,473	1,279	9,290	6,882	2,103	1,102	78,660
1950	2,836	5,515	1,273	3,551	20,908	8,006	31,513	53,487	40,886	11,174	2,610	2,116	183,875
1951	1,891	2,801	2,531	1,909	19,544	21,160	12,951	4,036	3,350	1,224	2,247	1,036	74,680
1952	1,242	1,059	1,568	4,120	7,304	5,552	3,102	442	251	286	615	979	26,520
1953	623	516	0	1,535	2,173	0	0	5,985	1,039	33,556	7,007	2,523	54,957
1954	1,446	929	934	4,727	54,203	15,440	1,807	1,716	658	545	372	741	83,518
1955	856	996	1,608	777	42,743	36,683	8,961	3,982	9,938	57,505	7,637	2,650	174,336
1956	2,026	2,097	1,216	1,271	4,618	7,360	1,305	937	25	5,036	3,620	1,027	30,538
1957	521	1,672	2,325	42,554	173,259	79,994	6,179	3,378	1,925	7,226	18,142	1,836	339,011
1958	1,445	3,037	2,375	6,758	23,906	3,142	7,968	3,211	1,557	1,062	496	574	55,531
1959	686	758	623	44	2,246	19,281	9,457	4,362	1,307	10,194	1,759	8,659	59,376
1960	4,032	8,969	1,962	1,489	3,140	28,761	7,093	2,099	2,809	62,023	10,345	8,357	141,079
1961	5,169	4,975	7,616	5,687	3,300	19,864	16,488	863	3,039	1,513	10,916	2,561	81,991
1962	1,810	1,818	1,296	3,090	5,426	52,660	0	1,463	8,249	4,652	2,903	4,256	87,623
1963	2,021	2,088	2,089	3,059	3,010	28,066	1,213	0	0	0	525	359	42,430
1964	394	3,824	867	543	2,180	4,368	173	0	1,134	997	8,931	1,503	24,914
1965	1,100	554	543	2,020	3,599	17,797	4,731	312	29,757	48,251	5,289	4,791	118,744
1966	2,854	3,172	2,218	2,472	1,443	2,000	0	3,300	14,204	2,264	343	369	34,639
1967	378	218	42	8,443	1,720	5,084	9,248	475	0	0	412	106	26,126
1968	2,178	1,038	3,685	696	10,214	25,485	20,034	0	12,058	4,460	406	778	81,032
1969	1,005	2,017	2,091	1,823	21,488	8,705	1,234	4,441	18,902	3,281	2,099	1,161	68,247
1970	870	689	3,955	1,421	1,969	1,036	0	0	0	188	0	0	10,128
1971	0	0	0	0	0	9,561	0	4,517	22,312	5,890	7,531	5,675	55,486
1972	1,356	967	772	959	19,009	6,592	2,374	623	1,289	6,492	15,058	782	56,273
1973	12,056	3,205	18,582	54,416	5,188	11,909	3,366	4,150	16,304	11,280	2,328	1,555	144,339
1974	1,085	1,070	4,241	873	27,841	10,722	570	1,798	36,192	9,152	12,429	3,838	109,811
1975	3,415	7,503	6,002	5,126	14,680	35,461	54,380	19,163	5,743	2,968	5,132	4,608	164,181
1976	3,655	2,185	2,412	10,242	8,143	11,461	1,700	2,286	19,423	5,003	4,028	2,128	72,666
1977	3,081	2,702	1,687	5,870	92,937	34,744	4,355	11,107	4,205	1,023	1,407	1,218	164,336
1978	1,304	2,373	2,117	1,371	12,375	63,446	2,602	3,485	3,279	2,366	1,157	1,185	97,060
1979	1,121	1,234	3,738	5,046	11,781	17,863	4,934	23,240	4,312	759	3,803	2,323	80,154
1980	2,706	2,560	1,563	2,590	41,899	50,673	2,854	1,092	514	174	383	1,046	108,054
1981	675	759	1,556	2,386	7,191	34,758	721	707	1,605	3,470	660	970	55,458
1982	714	1,447	2,345	545	33,170	29,659	4,374	11,408	3,988	277	280	231	88,438
1983	328	2,384	3,066	2,949	8,699	6,073	3,468	0	0	124,766	13,929	4,064	169,726
1984	3,299	2,787	3,096	2,641	797	5,243	589	1,689	327	1,363	1,730	4,759	28,320
1985	11,417	11,952	18,027	8,785	9,806	36,771	1,052	785	3,004	44,692	7,603	3,841	157,735
1986	1,959	2,229	2,243	1,655	15,231	21,642	8,963	0	25,972	132,978	40,165	21,830	274,867
1987	16,069	21,518	25,744	9,160	104,523	42,190	20,519	3,872	6,412	2,722	3,723	5,133	261,585
1988	6,972	4,620	6,985	6,776	6,916	3,896	3,897	2,084	26,081	4,203	2,253	2,205	76,888
1989	1,723	3,251	3,479	3,691	14,234	63,470	5,432	3,699	13,036	6,002	4,016	2,675	124,708
1990	3,578	3,338	15,796	24,307	9,158	26,162	1,080	7,654	1,500	2,116	3,069	2,520	100,278
1991	4,851	2,401	1,919	3,152	16,626	130,450	24,801	4,555	26,996	7,954	8,472	44,335	276,512
1992	22,869	20,400	17,367	13,862	6,468	37,366	15,120	4,558	11,611	2,734	29,372	23,185	204,912
1993	15,958	25,246	41,829	26,439	90,424	24,284	16,453	8,005	1,910	2,308	2,365	4,392	259,613
1994	3,350	8,663	19,944	6,903	41,607	3,349	9,876	2,280	880	6,112	8,019	3,483	114,466
1995	2,601	1,663	3,135	13,032	32,109	323,472	12,645	108,193	35,096	33,574	10,486	11,269	587,275
1996	10,536	7,502	5,951	4,580	1,322	13,328	26,609	28,443	88,098	14,986	5,261	16,306	222,922
1997	5,694	33,768	11,034	151,230	93,766	41,095	7,287	35,774	60,286	4,248	1,948	20,462	466,592
1998	25,829	53,068	117,601	23,701	11,185	2,800	955	317	113	0	4,673	2,656	242,898
1999	2,189	8,419	9,645	1,439	32,733	32,190	14,846	2,402	793	241	1,194	0	106,091
2000	6	399	20,328	4,303	11,957	6,567	12,264	680	136	21,131	18,881	6,503	103,155
2001	8,604	16,517	12,485	6,071	28,932	17,065	1,184	0	1,278	272	3,383	1,739	97,530
2002	723	3,539	1,610	10,850	299	4,535	17,130	0	0	1,322	3,752	5,770	49,530
2003	3,765	1,608	859	1,524	2,829	19,964	5,688	0	1,374	63	183	6	37,863
2004	492	330	27,574	0	4,617	10,132	19,826	1,389	0	0	26,043	6,686	97,089
2005	10,161	9,026	4,737	3,193	3,543	3,429	2,438	14,067	10,026	5,305	953	1,055	67,933
2006	820	492	1,162	1,672	7,668	1,216	0	0	4,065	27,610	10,434	7,308	62,447
2007	13,090	2,058	7,483	10,934	19,785	140,557	63,987	20,935	11,553	4,197	1,224	4,596	300,399
2008	2,771	5,322	10,164	27,259	14,566	5,131	538	11,788	14,928	18,960	3,701	256	115,384
2009	0	827	1,541	7,242	68,010	6,400	669	3,047	0	519	3,721	3,307	95,283
2010	16,927	12,565	4,891	36,030	22,310	7,619	75,974	5,949	3,477	4,047	1,842	2,108	193,739
2011	2,504	2,766	1,417	720	3,087	0	0	0	20	261	2,771	1,449	14,995
2012	549	598	3,583	6,544	771	2,272	0	14	0	2,101	0	0	16,432
2013	0	65	961	209	0	1,506	0	0	0	269	0	116	3,126
2014	22	0	0	608	1,134	14,140	7,246	2,311	259	265	2,936	516	29,437
2015	337	424	932	2,211	216,355	81,736	26,409	4,358	811	2,993	4,858	8,409	349,833
2016	8,873	5,292	5,507	36,077	65,460	38,451	20,645	6,151	12,137	17,393	5,450	5,065	226,501
2017	4,675	4,855	16,315	26,331	28,216	14,671	6,771	0	9,156	9,615	6,286	4,113	131,004
2018	3,838	3,618	4,045	3,188	4,739	1,215	152	366	5,500	32,981	6,858	6,131	72,631
Total	286,584	370,451	523,074	678,042	1,716,781	1,926,251	668,740	466,453	656,780	851,738	394,527	311,931	8,851,352
Mean	4,036	5,218	7,367	9,550	24,180	27,130	9,419	6,570	9,250	11,996	5,557	4,393	124,667
Max	25,829	53,068	117,601	151,230	216,355	323,472	75,974	108,193	88,098	132,978	40,165	44,335	587,275
Min	0	0	0	0	0	0	0	0	0	0	0	0	3,126

Flow Adjustments - Run 8

Control Point: U10180
Control Point I.D.: RR-TR
Description: Cache Creek

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	3,693	11,566	46,342	19,896	15,928	22,774	11,328	2,871	870	765	596	1,255	137,884
1949	3,433	31,905	7,199	3,385	58,114	46,566	3,190	2,545	10,794	5,093	1,787	1,522	175,533
1950	2,583	15,543	2,163	4,197	115,516	47,574	28,855	37,581	41,171	7,001	2,451	2,245	306,880
1951	2,227	7,396	3,194	6,023	288,720	118,330	33,217	5,886	3,258	6,555	6,281	1,753	482,840
1952	1,861	1,573	3,273	4,112	104,793	18,488	6,999	904	576	530	948	1,076	145,133
1953	774	1,437	14,858	7,775	3,571	16,899	9,919	6,179	1,372	80,359	25,067	16,188	184,398
1954	2,238	1,739	1,521	6,104	151,298	14,176	1,458	1,011	439	462	434	827	181,707
1955	1,043	1,493	2,985	888	156,198	37,283	6,032	2,741	52,338	141,619	4,176	2,753	409,549
1956	2,416	2,745	1,784	1,579	10,165	6,934	2,468	725	167	13,598	5,095	1,749	49,425
1957	924	1,565	6,875	108,186	375,598	113,849	9,092	2,746	10,061	7,762	24,721	3,621	665,000
1958	8,563	5,389	14,350	17,292	39,890	13,862	18,068	2,791	2,131	1,350	1,221	1,217	126,124
1959	1,459	1,322	1,019	15,667	46,572	32,546	28,661	4,977	12,760	106,601	22,665	44,797	319,046
1960	24,864	28,470	11,471	7,207	20,965	0	22,991	2,801	2,007	72,435	4,251	22,580	220,042
1961	11,007	10,039	18,756	17,666	10,088	48,444	0	3,343	29,988	3,914	13,910	9,490	176,645
1962	6,957	15,384	5,123	13,890	22,709	223,855	17,885	15,637	20,571	15,634	10,069	17,834	385,548
1963	4,678	3,475	7,903	30,934	3,374	14,107	3,853	1,351	873	1,026	2,473	2,046	76,093
1964	1,329	5,902	2,204	1,028	10,959	9,401	628	2,216	16,918	9,153	49,042	4,096	112,876
1965	3,802	3,614	2,552	12,019	10,054	0	5,033	3,356	0	4,726	3,297	4,473	52,926
1966	2,416	1,455	2,720	14,239	24,336	0	0	44,482	23,402	10,252	2,254	1,699	127,255
1967	1,234	1,352	1,088	48,211	7,483	11,980	1,121	4,422	6,061	1,952	1,716	674	87,294
1968	16,394	5,561	12,542	2,924	32,048	69,366	0	0	4,881	6,247	18,966	7,315	176,244
1969	2,719	25,398	28,413	6,039	97,248	17,814	0	0	76,448	1,925	2,878	1,802	260,684
1970	2,601	1,917	23,215	7,542	13,574	5,481	0	0	19,826	2,241	1,321	1,171	78,889
1971	1,444	1,882	1,027	0	0	0	2,218	49,237	32,456	11,242	5,056	23,462	128,024
1972	4,219	2,361	1,746	5,381	20,352	0	0	0	0	5,686	86,290	3,473	129,508
1973	49,883	5,999	72,542	80,116	11,822	68,780	0	22,191	19,271	16,828	16,543	4,918	368,893
1974	3,581	4,602	36,059	5,851	27,259	0	42	0	0	17,076	37,908	5,024	137,402
1975	13,116	48,242	15,639	12,038	223,970	152,651	34,122	19,738	15,047	2,995	3,802	0	541,360
1976	3,659	2,667	5,522	19,382	11,191	8,992	4,110	0	32,069	0	5,821	2,313	95,726
1977	1,220	5,254	3,622	8,147	65,965	19,442	9,123	29,983	8,708	2,712	1,738	0	155,914
1978	587	4,610	8,178	2,918	8,525	76,368	2,845	0	0	1,373	1,082	399	106,885
1979	4,243	2,830	14,058	22,525	51,171	111,298	4,353	0	2,199	0	2,784	3,337	218,798
1980	5,696	3,418	1,943	0	8,942	44,269	0	0	0	6,080	0	3,545	73,893
1981	1,545	1,296	10,097	1,138	25,300	81,089	4,765	7,052	0	45,758	3,891	3,112	185,043
1982	2,067	3,290	11,609	3,220	270,897	133,239	26,126	12,277	6,284	1,833	2,064	4,871	477,777
1983	4,920	17,027	10,130	13,628	57,972	20,084	4,548	44	0	383,591	15,360	5,098	532,402
1984	6,931	8,330	28,655	19,632	5,419	0	1,205	0	546	12,433	8,928	34,549	126,628
1985	82,355	109,367	177,497	75,364	42,311	146,765	11,201	8,968	0	151,375	24,268	10,432	839,903
1986	6,119	7,358	17,822	7,335	63,137	39,993	0	1,419	154,250	324,967	110,039	42,697	775,136
1987	68,060	163,154	122,618	15,022	336,715	204,367	74,945	14,529	8,550	16,091	8,986	32,114	1,065,151
1988	33,267	5,438	98,384	64,274	0	0	4,093	0	49,044	6,398	6,381	6,514	273,793
1989	3,903	12,976	7,408	4,500	34,606	311,479	14,351	8,470	69,642	3,438	7,420	0	478,193
1990	7,769	8,070	231,631	274,498	224,816	31,627	10,164	16,410	3,815	1,902	1,678	1,101	813,481
1991	3,944	2,872	2,645	3,255	59,499	32,429	54,998	22,104	153,828	30,302	16,033	227,503	609,412
1992	50,270	25,579	74,533	65,712	81,765	293,506	37,476	15,838	16,400	2,714	110,163	133,560	907,516
1993	50,563	93,098	101,637	107,167	275,689	62,670	2,035	0	7,358	303	1,268	4,769	706,557
1994	2,460	8,760	33,609	776	54,695	10,161	2,594	0	1,503	2,735	28,212	5,544	151,049
1995	3,893	5,588	25,400	58,866	173,455	402,635	9,653	65,736	14,401	4,114	6,367	0	770,108
1996	3,254	2,860	5,123	9,596	2,047	0	0	0	29,747	14,576	25,684	11,508	104,395
1997	6,842	15,331	40,965	17,621	11,076	42,226	15,893	0	0	33,081	11,529	21,737	216,301
1998	97,205	50,327	173,460	37,319	9,722	7,897	3,879	0	339	1,496	5,562	3,942	391,148
1999	5,665	13,439	40,991	23,890	2,478	39,060	18,169	8,290	3,121	472	1,928	7,402	164,905
2000	4,356	3,338	0	14,538	18,604	11,857	13,891	0	0	190,761	138,318	37,976	433,639
2001	71,141	90,339	55,377	17,765	62,137	30,773	2,235	2,240	3,919	2,491	0	3,706	342,123
2002	2,991	3,290	5,570	58,734	8,657	26,678	0	3,027	2,335	15,899	12,302	20,178	159,661
2003	5,101	7,775	4,557	3,679	12,921	28,601	4,097	0	279	1,730	1,967	1,826	72,533
2004	2,757	3,410	19,793	10,052	3,839	0	13,558	5,497	2,665	12,637	148,769	16,571	239,548
2005	25,075	20,890	6,629	2,313	5,968	3,818	0	24,895	2,077	0	2,301	2,231	96,197
2006	2,062	2,222	3,561	2,273	0	352	335	0	6,472	69,011	1,238	2,056	89,582
2007	30,665	7,890	56,047	61,265	160,348	375,386	176,234	77,529	2,718	5,697	4,799	14,517	973,095
2008	5,210	12,593	21,775	105,760	22,761	0	3,405	64,426	0	0	2,676	3,535	242,141
2009	3,879	3,193	2,225	25,217	160,314	11,697	2,781	1,544	12,632	28,286	3,461	6,705	261,934
2010	35,799	47,980	23,578	33,617	34,253	6,059	0	4,342	7,489	3,148	3,088	2,172	201,525
2011	775	2,001	1,848	4,343	21,043	984	0	0	0	4,458	4,614	3,857	43,923
2012	5,336	1,894	13,209	18,799	472	0	387	0	0	0	882	710	41,689
2013	1,188	1,234	1,685	12,071	5,157	2,856	28,034	3,278	353	0	1,285	1,781	58,922
2014	1,568	1,483	1,891	1,349	0	0	15,792	0	0	554	12,697	2,389	37,723
2015	1,856	1,710	1,142	0	523,950	48,825	3,248	4,492	1,759	2,199	27,528	47,063	663,772
2016	17,878	4,233	12,192	216,271	113,569	261,030	14,090	3,431	18,485	3,712	2,797	2,452	670,140
2017	4,606	22,867	61,091	90,613	48,507	60,684	46,718	68,155	146,779	88,366	9,424	8,325	656,135
2018	4,075	6,064	10,845	4,217	32,651	1,767	1,201	3,423	48,110	90,170	15,640	96,443	314,606
Total	864,213	1,066,671	1,899,115	1,998,850	5,015,148	4,102,123	889,712	717,130	1,221,562	2,121,890	1,156,190	1,029,600	22,082,204
Mean	12,172	15,024	26,748	28,153	70,636	57,776	12,531	10,100	17,205	29,886	16,284	14,501	311,017
Max	97,205	163,154	231,631	274,498	523,950	402,635	176,234	77,529	154,250	383,591	148,769	227,503	1,065,151
Min	587	1,234	0	0	0	0	0	0	0	0	0	0	37,723

Flow Adjustments - Run 8

Control Point: U10010
Control Point I.D.: RR-TR
Description: Red River near Terral

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	1,368	3,097	2,377	255	13,034	13,987	8,824	2,177	500	326	0	799	46,744
1949	1,945	12,127	3,600	1,445	29,779	21,684	1,839	1,597	11,599	8,592	2,626	1,375	98,208
1950	3,540	6,885	1,589	4,433	26,104	9,996	39,344	66,779	51,046	13,950	3,258	2,642	229,566
1951	2,360	3,496	3,160	2,384	24,400	26,418	16,169	5,039	4,183	1,529	2,806	1,293	93,237
1952	1,551	1,322	1,958	5,144	9,119	6,932	3,873	552	314	357	768	1,222	33,112
1953	777	645	0	1,916	2,713	0	0	7,472	1,297	41,894	8,748	3,150	68,612
1954	1,805	1,160	1,166	5,902	67,672	19,277	2,256	2,143	821	680	465	925	104,272
1955	1,068	1,243	2,007	970	53,365	45,799	11,188	4,972	12,407	71,795	9,535	3,309	217,658
1956	2,529	2,619	1,518	1,586	5,766	9,189	1,629	1,170	32	6,288	4,519	1,282	38,127
1957	650	2,087	2,903	53,128	216,314	99,873	7,715	4,217	2,403	9,021	22,650	2,292	423,253
1958	1,804	3,791	2,966	8,438	29,847	3,923	9,948	4,009	1,944	1,326	619	716	69,331
1959	857	947	778	55	2,805	24,072	11,807	5,446	1,632	12,728	2,196	10,810	74,133
1960	17,139	15,894	9,166	5,946	6,571	0	23,952	2,933	2,819	0	2,685	19,463	106,568
1961	8,956	5,810	17,634	22,018	7,813	22,095	0	3,585	10,137	2,711	6,310	6,476	113,545
1962	1,474	2,053	3,335	4,960	16,265	62,444	19,878	9,240	19,325	5,670	11,933	19,591	176,168
1963	4,615	3,191	0	22,715	0	4,420	4,150	926	0	298	1,296	1,877	43,488
1964	1,420	3,762	2,317	1,053	7,533	8,667	681	2,328	14,420	7,573	27,233	4,296	81,283
1965	3,904	3,771	2,630	9,228	10,441	0	4,843	3,516	0	0	3,444	4,777	46,554
1966	2,535	1,422	2,670	12,140	22,668	9	0	18,451	19,586	11,084	2,540	1,851	94,956
1967	1,355	1,420	1,233	42,432	6,340	12,118	2,316	3,864	2,630	708	1,247	992	76,655
1968	8,878	5,091	11,863	3,001	20,291	36,383	0	0	5,922	8,684	23,846	7,675	131,634
1969	3,369	21,666	27,781	9,436	99,129	12,087	0	0	1,096	606	3,448	1,233	179,851
1970	2,822	1,309	10,398	7,124	21,600	10,074	0	0	24,566	2,765	508	180	81,346
1971	379	776	0	0	0	0	736	38,786	15,089	9,837	9,499	39,445	114,547
1972	6,739	2,390	939	0	17,062	0	0	0	0	0	40,370	4,003	71,503
1973	10,750	6,300	19,495	41,762	16,950	81,194	0	25,248	4,084	20,045	27,836	4,357	258,021
1974	3,539	4,672	24,315	3,795	6,232	0	0	0	0	13,651	50,139	3,324	109,667
1975	9,588	44,292	23,028	17,731	154,330	101,606	0	28,134	13,261	2,416	1,854	0	396,240
1976	3,731	1,522	2,998	8,227	13,131	6,060	3,045	0	0	0	6,108	292	45,114
1977	0	1,790	4,239	2,381	0	40,382	9,023	21,338	12,076	1,250	1,321	0	93,800
1978	0	3,149	7,587	1,886	0	6,242	1,971	0	0	1,030	0	0	21,865
1979	1,572	1,635	21,362	16,232	27,127	87,013	2,784	0	2,554	0	49	891	161,219
1980	3,314	1,510	68	0	0	22,386	0	0	0	7,334	0	1,902	36,514
1981	530	0	11,249	0	3,245	34,253	301	952	0	38,885	1,983	997	92,395
1982	0	719	6,864	1,349	166,647	151,528	35,859	1,045	1,040	0	0	3,125	368,176
1983	2,765	8,890	6,564	10,358	29,244	6,886	1,027	0	0	45,040	94,329	966	206,069
1984	5,022	4,918	10,585	7,226	2,226	0	0	0	0	11,189	2,173	22,147	65,486
1985	85,692	59,009	158,523	69,580	60,303	85,383	9,071	6,552	0	16,297	2,937	5,414	558,761
1986	2,985	3,464	9,530	8,279	17,750	16,073	0	167	13,415	79,904	49,988	23,362	224,917
1987	36,346	78,166	96,854	12,351	8,109	244,996	83,416	6,453	112	6,296	7,911	30,747	611,757
1988	36,498	1,124	60,020	60,270	0	0	3,445	0	1,570	5,831	4,659	5,825	179,242
1989	2,191	11,071	9,056	5,035	22,241	177,454	43,208	4,815	53,091	99	7,915	0	336,176
1990	3,044	2,182	160,937	210,660	291,901	46,405	3,041	2,457	1,787	641	0	0	723,055
1991	1,562	1,990	1,801	0	8,703	7,205	3,357	21,691	97,946	14,332	22,358	68,177	249,122
1992	63,651	45,459	27,829	20,146	33,531	183,641	20,568	8,137	7,274	2,634	55,496	52,343	520,709
1993	30,052	92,088	88,325	84,329	175,689	45,534	135	0	3,235	0	0	2,708	522,095
1994	1,206	3,434	11,188	8	24,548	27,322	4,013	0	614	2,091	49,052	6,363	129,839
1995	3,443	4,872	14,901	45,745	147,508	86,033	36,289	23,738	1,171	292	4,014	0	368,006
1996	92	327	2,110	2,676	258	0	0	0	7,496	213	33,833	11,227	58,232
1997	4,936	3,025	64,326	3,109	2,512	30,826	9,969	0	0	24,450	11,937	1,072	156,162
1998	39,952	14,553	37,101	42,323	6,802	6,657	3,896	0	131	415	1,969	776	154,575
1999	0	6,981	23,332	7,136	355	13,747	5,738	26,436	2,288	10	337	2,776	89,136
2000	1,848	630	0	7,976	4,100	1,920	8,547	0	0	20,067	36,326	43,178	124,592
2001	29,276	50,663	55,676	17,974	11,547	38,053	1,886	206	2,070	0	0	980	208,331
2002	491	514	1,595	32,482	7,488	13,609	0	1,461	1	497	11,342	7,264	76,744
2003	2,502	120	2,654	576	8,730	0	1,177	0	0	117	9	52	15,937
2004	372	1,049	2,872	5,278	505	0	897	1,142	1,808	6,577	85,965	11,039	117,504
2005	15,291	13,079	3,574	0	1,978	4	0	23,935	0	0	753	819	59,433
2006	534	584	1,182	0	0	10	98	0	20	33,572	0	0	36,000
2007	11,427	6,613	5,440	55,618	71,529	48,754	108,835	59,604	13,414	516	2,403	1,389	385,542
2008	1,116	0	9,320	38,212	873	0	931	37,793	0	0	664	1,682	90,591
2009	1,765	533	0	0	124,451	19,592	155	166	8,851	18,048	2,243	118	175,922
2010	5,563	43,632	9,353	37,466	40,994	4,125	0	2,496	2,304	0	1,883	644	148,460
2011	0	888	931	3,074	3,073	368	0	0	0	1,116	703	1,861	12,014
2012	5,185	728	5,709	13,958	0	0	0	0	0	0	56	0	25,636
2013	0	0	454	5,506	3,624	0	1,792	1,638	0	0	24	53	13,091
2014	359	427	798	0	0	0	0	0	0	0	5,653	1,589	8,826
2015	573	439	0	0	0	31,474	457	1,178	3,687	1	0	5,578	43,387
2016	9,741	4,315	2,797	24,272	20,692	106,523	41,649	5,664	10,311	11,328	4,393	2,150	243,835
2017	7,593	30,861	2,626	21,972	37,770	18,358	31,839	33,091	9,590	67,811	4,869	1,261	267,641
2018	1,456	5,435	7,205	2,688	33,327	2,961	1,519	0	13,416	47,845	29,349	10,055	155,256
Total	531,392	675,626	1,130,361	1,175,355	2,306,654	2,244,024	651,086	534,739	492,385	720,262	817,382	480,177	11,759,443
Mean	7,484	9,516	15,921	16,554	32,488	31,606	9,170	7,532	6,935	10,145	11,512	6,763	165,626
Max	85,692	92,088	160,937	210,660	291,901	244,996	108,835	66,779	97,946	79,904	94,329	68,177	723,055
Min	0	0	0	0	0	0	0	0	0	0	0	0	8,826

Flow Adjustments - Run 8

Control Point: V10060
Control Point I.D.: RR-GA
Description: Mud Creek

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	3,617	3,805	10,602	140	4,234	15,540	32,286	1,005	727	0	0	255	72,211
1949	0	3,386	5,619	2,940	6,942	12,805	4,905	986	13,426	10,357	4,617	1,678	67,661
1950	5,460	3,883	2,235	2,295	26,400	10,463	31,328	64,625	62,808	9,655	3,297	2,063	224,512
1951	2,317	1,823	6,003	1,233	7,083	109,791	24,363	3,065	2,898	63	6,484	1,254	166,377
1952	992	1,109	1,808	7,471	17,394	11,629	0	0	0	190	157	249	40,999
1953	301	234	4,632	3,878	6,123	2,787	5,568	1,452	854	761	9,258	2,444	38,292
1954	1,143	618	284	2,991	56,754	18,917	1,556	0	840	749	416	840	85,108
1955	811	462	2,039	1,143	13,328	36,711	4,109	1,511	0	12,248	3,678	2,239	78,279
1956	1,034	1,296	999	316	0	11,914	1,736	8	0	0	2,483	7,125	26,911
1957	1,202	2,818	4,657	15,778	73,989	78,867	5,882	3,937	1,108	2,363	15,378	2,695	208,674
1958	8,398	2,481	3,644	11,765	29,323	4,971	0	2,042	0	1,514	894	823	65,855
1959	487	326	661	792	0	16,586	1,596	0	540	50,699	7,568	24,419	103,674
1960	21,516	7,098	5,029	2,281	2,830	9,224	5,806	294	370	6,876	93	11,736	73,153
1961	1,204	0	0	8,353	2,375	8,843	742	255	1,146	657	5,828	2,629	32,032
1962	100	60	350	0	279	26,934	1,556	257	840	57	8,357	8,788	47,578
1963	236	72	1,020	0	327	262	1	0	0	0	0	35	1,953
1964	0	560	708	1,058	0	366	0	0	6,814	593	20,394	548	31,041
1965	1,784	1,894	334	0	13,020	16,224	191	2,066	0	0	11	0	35,524
1966	10	11	875	12,372	4,544	900	0	0	8,448	8,438	13	17	35,628
1967	10	9	5	15,530	2,274	11,325	0	4	0	125	26	16	29,324
1968	4,067	1,258	12,871	839	44,822	22,004	1,015	0	2,364	1,118	0	5,968	96,326
1969	1,170	11,373	20,200	13,833	46,217	5,028	122	0	0	527	16	1,896	100,382
1970	743	233	5,995	11,781	12,084	2,766	191	0	16,025	7,824	355	167	58,164
1971	782	272	146	79	211	0	0	0	0	0	10	6,374	7,874
1972	132	103	616	119	0	1	97	0	268	0	13,826	85	15,247
1973	8,692	4,902	18,777	45,595	2,091	56,525	763	1,277	0	16,594	49,826	2,727	207,769
1974	1,200	1,976	0	0	19,734	1,121	424	0	21,275	5,924	15,719	1,034	68,407
1975	3,997	5,847	25,277	18,809	5,962	68,826	0	3,412	2,962	246	0	333	135,671
1976	404	368	2,961	18,343	8,846	15,844	706	183	0	0	479	439	48,573
1977	795	1,915	13,340	2,330	8,708	165	0	0	282	0	0	0	27,535
1978	3	0	2,209	3,314	0	48,012	153	348	0	0	3	1	54,043
1979	83	26	7,901	733	2,275	3,165	87	0	0	0	266	0	14,536
1980	0	52	0	0	0	3,358	2	0	0	547	5	6,114	10,078
1981	23	0	22,816	1,238	31,093	43,235	730	38	587	74,781	3,670	959	179,170
1982	979	9,427	5,349	756	225,633	35,810	12,899	4,767	254	53	36	1,320	297,283
1983	410	4,062	2,507	6,785	50,150	7,646	1,451	209	21	0	406	179	73,826
1984	210	368	2,712	1,260	1,048	8,173	105	1	0	19,670	10,580	41,143	85,270
1985	41,943	3,512	78,998	49,246	5,738	45,824	655	179	112	31,324	1,382	1,258	260,171
1986	847	944	1,517	3,743	5,881	51,981	436	14	27,629	8,313	30,470	22,544	154,319
1987	9,063	0	77,502	0	0	17,173	12,887	1,053	2,490	853	1,242	41,513	163,776
1988	18,198	3,915	35,262	36,980	2,513	5,001	393	15	0	85	0	0	102,362
1989	471	15,397	12,167	822	12,246	110,643	1,289	0	21,539	123	931	320	175,948
1990	7,385	4,947	13,575	182,949	136,980	1,793	533	2,491	12,590	604	5,711	1,191	370,749
1991	14,095	4,409	10,054	11,191	15,233	7,924	0	1,682	21,957	6,212	20,870	44,818	158,445
1992	22,758	9,414	25,051	17,942	13,265	58,641	10,762	0	2,098	0	0	17,113	177,044
1993	5,088	0	0	0	138,713	5,921	723	108	10,155	1,389	753	17,372	180,222
1994	1,095	9,368	12,645	3,624	26,761	2,673	11,330	327	2,378	5,075	33,128	9,860	118,264
1995	8,537	2,456	23,165	23,447	12,221	69,828	2,196	4,972	2,924	285	268	1,319	151,618
1996	2,530	598	4,681	2,329	309	2,366	151	2,693	15,747	974	10,259	11,010	53,647
1997	1,702	69,497	6,617	4,595	18,145	46,733	1,485	266	21	686	32	14,126	163,905
1998	35,877	8,678	98,013	21,586	3,338	905	92	1	0	58	0	69	168,617
1999	0	0	0	9,935	2,409	8,932	485	0	381	0	135	10	22,287
2000	3	3	149	121	6	666	123	0	0	0	42,875	6,164	50,110
2001	1,955	54,286	12,046	4,550	6,252	811	77	0	3,291	3,205	37	1,611	88,121
2002	178	398	2,126	52,778	2,112	3,704	1,446	230	2	0	284	2,843	66,101
2003	2,738	385	403	301	16,149	5,069	176	787	3,119	1	82	6	29,216
2004	2	1,135	4,237	898	3,161	17,703	19,929	1,375	164	2,492	72,552	8,219	131,867
2005	52,021	12,567	3,657	1,448	2,168	1,749	445	53,276	544	307	21	48	128,251
2006	85	0	4,009	1,314	6,990	381	0	0	0	0	824	0	13,603
2007	5,910	0	0	26,923	65,855	66,412	23,772	7,569	601	342	196	0	197,580
2008	134	367	7,819	10,477	6,900	1,004	85	0	473	0	21	0	27,280
2009	15	78	23	14,202	74,500	6,297	458	0	0	460	749	1,919	98,701
2010	0	14,053	7,838	0	3,636	407	553	6	390	0	1	2	26,886
2011	5	10	5	0	0	0	0	0	0	0	3,931	227	4,178
2012	4,948	261	16,391	12,720	1,329	3,118	6	0	0	0	0	0	38,773
2013	0	0	0	0	2,711	2,542	0	0	0	259	27	106	5,645
2014	0	4	0	0	0	0	0	171	100	44	179	32	530
2015	322	475	825	2,562	223,715	184,897	22,657	379	1	2,474	27,963	42,099	508,369
2016	4,919	2,293	4,848	56,653	20,592	31,847	1,073	0	3,757	1,033	0	0	127,015
2017	1,347	2,802	1,430	9,771	10,899	4,828	2,869	0	0	1,063	455	521	35,985
2018	724	2,423	13,486	3,936	18,154	606	78	218	3,784	66,630	11,258	40,001	161,298
Total	319,207	298,802	673,720	783,193	1,584,974	1,495,117	257,534	169,554	281,104	366,920	450,785	424,913	7,105,823
Mean	4,496	4,208	9,489	11,031	22,324	21,058	3,627	2,388	3,959	5,168	6,349	5,985	100,082
Max	52,021	69,497	98,013	182,949	225,633	184,897	32,286	64,625	62,808	74,781	72,552	44,818	508,369
Min	0	0	0	0	0	0	0	0	0	0	0	0	530

Flow Adjustments - Run 8

Control Point: V10005
Control Point I.D.: RR-GA
Description: Red River near Gainesville

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	4,637	4,880	13,595	179	5,428	19,925	41,399	1,288	933	0	0	326	92,590
1949	0	4,341	7,205	3,770	8,901	16,418	6,289	1,264	17,215	13,279	5,920	2,151	86,753
1950	7,000	4,980	2,866	2,943	33,852	13,417	40,169	82,865	80,535	12,381	4,227	2,646	287,881
1951	2,971	2,338	7,697	1,582	9,081	140,778	31,239	3,931	3,716	81	8,315	1,609	213,338
1952	1,271	1,421	2,319	9,579	22,303	14,910	0	0	0	244	201	319	52,567
1953	386	300	5,939	4,972	7,851	3,574	7,139	1,861	1,094	976	11,871	3,134	49,097
1954	1,466	792	364	3,836	72,771	24,255	1,996	0	1,078	960	533	1,078	109,129
1955	1,039	592	2,614	1,465	17,089	47,071	5,268	1,937	0	15,705	4,716	2,870	100,366
1956	1,326	1,661	1,282	406	0	15,276	2,226	11	0	0	3,183	9,135	34,506
1957	1,541	3,613	5,972	20,231	94,871	101,125	7,543	5,049	1,421	3,031	19,718	3,455	267,570
1958	10,768	3,182	4,673	15,085	37,599	6,375	0	2,618	0	1,941	1,147	1,055	84,443
1959	624	419	848	1,015	0	21,268	2,046	0	692	65,008	9,704	31,311	132,935
1960	27,588	9,102	6,449	2,924	3,629	11,827	7,444	377	475	5,312	8,745	0	83,872
1961	6,434	0	0	18,716	12,565	4,212	9,626	3,853	1,606	6,299	9,820	13,718	86,849
1962	1,200	2,025	1,868	0	8,889	20,739	17,931	14,560	13,453	352	19,495	15,504	116,016
1963	173	2,550	1,485	0	13,831	0	677	0	0	0	0	740	19,456
1964	0	935	237	0	0	2,288	259	0	0	9,566	0	2,857	16,142
1965	2,026	419	2,192	0	12,660	4,894	17,718	2,770	0	0	8,639	0	51,318
1966	3,910	12,315	3,073	11,685	18,843	2,389	240	0	8,783	3,077	2,007	1,834	68,156
1967	795	376	496	0	0	19,861	0	886	0	1,557	1,310	1,020	26,301
1968	0	1,791	14,938	11,014	33,259	0	11,729	0	11,989	0	0	10,363	95,083
1969	0	0	25,262	5,958	14,739	7,116	3,501	0	0	11,430	6,007	2,779	76,792
1970	5,790	6,339	28,715	2,123	10,574	11,319	1,271	247	0	3,315	2,030	823	72,546
1971	241	0	1,251	219	1,903	0	0	0	0	0	2,475	0	6,089
1972	822	2,785	1,181	120	0	1,030	3,837	0	3,100	0	34,536	8,196	55,607
1973	13,266	14,390	3,488	0	16,372	0	1,814	27,939	0	12,937	0	8,755	98,961
1974	3,771	497	0	0	0	25,041	1,387	0	29,179	12,434	37,714	4,520	114,543
1975	0	0	13,309	5,617	0	39,290	0	36,272	4,265	2,521	0	0	101,274
1976	1,592	936	601	0	2,817	584	4,747	384	0	0	7,774	1,736	21,171
1977	3,611	8,659	27,699	7,986	7,665	23,785	0	0	14,512	0	0	0	93,917
1978	1,278	0	0	1,029	0	74,247	2,299	475	0	3,842	556	2,000	85,726
1979	974	4,123	26,531	3,893	7,194	0	6,448	0	14,393	1,057	359	0	64,972
1980	0	267	199	0	0	39,957	650	0	0	14,895	2,598	0	58,566
1981	1,161	0	14,000	5,898	15,518	44,784	2,706	119	1,796	338,481	22,113	7,135	453,711
1982	3,928	18,167	12,482	9,010	34,840	245,043	106,049	15,719	104	4,072	2,714	1,819	453,947
1983	3,416	797	0	8,436	0	16,309	29,198	2,655	529	0	39,538	26,106	126,984
1984	16,386	7,145	2,735	12,219	7,236	8,148	4,764	821	650	0	26,756	0	86,860
1985	0	0	26,293	20,681	69,521	73,959	5,025	15,033	32,339	6,188	6,458	0	255,497
1986	4,262	2,465	57	17,037	38,630	67,420	15,397	2,009	56,871	107,830	5,050	148,631	465,659
1987	0	0	49,268	0	0	468,594	94,344	4,235	8,430	757	6,738	8,156	640,522
1988	22,740	30,421	0	8,280	14,552	4,317	9,163	898	0	7,672	0	0	98,043
1989	187	0	3,287	10,338	63,057	68,595	17,710	0	0	9,823	1,470	9,580	184,047
1990	1,066	1,045	0	8,394	321,964	54,823	11,296	1,494	0	11,207	14,829	11,611	437,729
1991	11,528	4,426	5,827	882	24,068	0	0	8,737	40,782	19,304	8,406	0	123,960
1992	0	0	0	1,547	0	1,614	33,925	0	0	0	0	0	37,086
1993	0	0	0	0	0	6,223	8,774	4,419	0	11,058	5,076	0	35,550
1994	5,745	6,131	34,371	11,295	16,542	17,392	37,941	13,423	19,288	16,795	8,826	26,904	214,653
1995	9,208	9,640	5,404	16,223	0	84,852	102,081	182,383	95,833	33,172	11,525	10,961	561,282
1996	16,885	12,451	12,270	24,447	6,798	7,023	21,760	13,420	145,896	23,353	0	6,537	290,840
1997	1,857	17,502	18,024	0	115,731	18,005	6,352	2,512	18,637	3,858	4,669	0	207,147
1998	22,712	19,851	5,854	0	10,997	0	532	4,304	2,328	1,197	0	1,020	68,795
1999	0	0	0	0	27,015	51,754	19,389	0	3,377	901	594	2,382	105,412
2000	2,336	756	8,535	20,936	14,583	1,486	13,396	333	374	0	65,142	0	127,877
2001	0	66,766	58,341	15,007	44,766	31,399	6,047	0	7,767	10,642	2,328	10,069	253,132
2002	3,293	2,985	17,662	50,282	12,675	20,368	5	4,556	580	0	16,236	896	129,538
2003	5,884	4,827	6,473	432	12,832	17,463	25,046	1,322	8,186	2,327	839	1,356	86,987
2004	2,294	562	998	9,903	20,119	29,411	45,926	9,274	3,820	0	28,976	16,749	168,032
2005	23,683	3,404	5,475	3,518	1,549	13,329	3,635	35,082	15,324	8,937	2,878	1,767	118,581
2006	974	0	0	18,148	7,072	0	1,363	0	0	0	0	0	27,557
2007	0	0	0	61,867	0	0	344,033	64,945	32,222	4,794	1,748	0	509,609
2008	1,019	375	6,267	1,976	11,920	7,945	2,214	0	2,724	0	771	0	35,211
2009	955	1,779	2,563	1,803	0	0	2,685	0	0	0	7,840	0	17,625
2010	0	37,164	23,053	0	0	0	15,069	7,887	3,575	0	171	1,680	88,599
2011	1,894	1,507	638	0	0	2,467	168	0	0	0	0	4,191	10,865
2012	0	5,417	0	0	910	3,604	1,840	825	570	0	216	290	13,672
2013	474	0	0	0	4,923	229	0	5,023	0	713	886	1,201	13,449
2014	1,179	458	0	0	0	0	0	4,075	680	2,041	0	2,918	11,351
2015	1,326	1,117	4,081	9,870	125,913	248,953	61,220	9,176	4,211	0	2,512	51,708	520,087
2016	43,773	13,022	30,969	0	12,296	34,191	26,603	0	3,977	23,664	0	0	188,495
2017	0	0	4,988	0	0	15,880	0	0	0	8,877	12,599	6,924	49,268
2018	7,719	28,824	7,142	8,801	0	5,297	2,263	3,310	0	0	28,695	8,582	100,633
Total	324,384	395,032	581,405	493,577	1,510,713	2,383,848	1,314,811	606,576	719,309	859,863	550,199	503,107	10,242,824
Mean	4,569	5,564	8,189	6,952	21,278	33,575	18,518	8,543	10,131	12,111	7,749	7,086	144,265
Max	43,773	66,766	58,341	61,867	321,964	468,594	344,033	182,383	145,896	338,481	65,142	148,631	640,522
Min	0	0	0	0	0	0	0	0	0	0	0	0	6,089

Flow Adjustments - Run 3 and Run 8

Control Point: OK1000
Control Point I.D.: RR-CB
Description: Lake Texoma Oklahoma inflows

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	38,169	164,333	199,145	68,297	275,400	208,746	296,462	45,846	14,126	13,540	17,754	17,094	1,358,912
1949	42,526	197,214	143,735	87,491	501,963	436,721	70,233	32,374	68,792	70,769	22,333	27,590	1,701,741
1950	101,955	148,420	39,379	54,033	788,131	157,688	283,990	249,205	140,998	90,341	23,687	37,378	2,115,205
1951	42,188	76,898	98,376	45,347	450,960	639,534	124,478	32,382	28,725	40,413	22,747	17,896	1,619,944
1952	21,523	29,413	54,224	171,441	195,624	81,677	41,419	5,141	2,812	2,011	6,164	11,157	622,606
1953	21,911	15,830	63,196	133,933	118,095	51,244	150,843	38,609	33,895	189,205	104,593	67,099	988,453
1954	25,573	14,922	21,500	65,362	531,789	142,995	9,191	2,499	8,971	26,142	2,807	21,332	873,083
1955	24,812	34,885	52,438	59,843	253,431	127,271	36,517	34,917	129,249	152,858	17,790	15,693	939,704
1956	14,267	32,373	30,659	18,622	30,926	48,134	5,998	6,235	3,467	6,676	15,790	24,540	237,687
1957	9,956	31,203	53,681	803,652	1,621,093	623,420	98,746	23,953	259,766	31,985	247,970	57,748	3,863,173
1958	175,500	65,332	138,029	143,560	305,200	113,247	62,859	41,288	10,506	7,343	8,049	11,000	1,081,913
1959	11,179	12,741	35,545	80,518	149,492	110,421	67,262	71,862	79,817	391,940	62,247	126,156	1,199,180
1960	180,672	194,875	163,729	94,027	274,465	54,615	46,180	33,542	21,007	110,469	39,872	111,068	1,324,521
1961	41,706	67,264	130,872	120,043	94,659	99,264	70,590	35,542	116,790	133,851	154,813	111,310	1,176,704
1962	49,644	42,317	60,447	94,430	52,193	501,889	41,054	35,887	114,236	102,551	137,368	101,267	1,333,283
1963	50,835	43,935	86,591	107,833	48,393	24,002	31,896	2,207	6,718	1,866	4,376	6,452	415,104
1964	6,756	13,438	39,973	59,472	121,180	70,310	12,901	28,823	86,033	16,191	253,336	56,500	764,913
1965	40,426	84,970	40,941	57,147	138,528	67,915	13,826	14,955	71,837	96,916	27,281	23,825	678,567
1966	21,326	117,476	55,973	237,664	74,480	9,427	4,059	41,903	23,002	16,078	4,764	6,309	612,461
1967	16,538	5,272	22,657	295,470	131,642	118,140	37,382	4,730	57,732	12,869	11,708	16,227	730,367
1968	139,236	47,217	282,565	162,544	490,065	373,807	89,069	22,177	43,045	75,763	81,779	60,486	1,867,753
1969	158,593	205,595	199,584	257,413	548,079	123,525	73,380	20,113	35,686	73,943	11,250	48,058	1,755,219
1970	38,792	89,739	110,796	162,096	104,645	69,991	3,207	5,191	137,972	316,072	104,244	18,987	1,161,732
1971	51,758	33,538	43,531	39,152	60,335	89,567	20,695	61,224	18,474	114,196	20,515	242,660	795,645
1972	61,306	27,420	29,350	53,955	132,284	37,758	16,973	1,251	2,503	70,628	152,422	72,818	658,668
1973	121,444	77,793	458,523	597,682	172,623	413,106	51,574	64,200	307,556	294,893	447,131	128,031	3,134,556
1974	48,011	74,527	107,712	149,211	300,497	90,763	58,582	76,623	240,227	322,812	474,331	58,385	2,001,681
1975	166,810	315,695	373,878	201,773	489,120	330,233	193,954	160,534	108,380	36,561	37,567	40,997	2,455,502
1976	43,184	40,860	69,271	113,777	204,493	80,860	90,286	19,544	18,129	13,134	24,536	35,766	753,840
1977	56,378	82,586	258,102	112,406	382,665	142,175	124,007	43,745	35,194	20,968	17,224	12,456	1,287,906
1978	13,394	41,510	86,369	92,114	178,237	285,590	43,312	17,540	27,022	5,272	10,381	10,019	810,760
1979	16,094	31,873	197,205	126,758	200,895	378,258	96,340	41,056	24,559	9,164	34,399	15,959	1,172,560
1980	20,997	31,249	15,707	27,893	240,216	248,068	34,465	4,647	57,916	29,434	8,854	48,150	767,596
1981	10,955	32,586	109,030	67,211	148,913	119,274	33,650	14,504	13,439	909,639	171,991	55,297	1,686,489
1982	95,254	176,759	104,836	50,061	798,589	457,349	147,725	49,844	20,251	16,044	36,073	52,491	2,005,276
1983	57,342	106,445	133,514	123,403	337,941	226,623	81,565	35,163	12,364	361,061	146,364	51,808	1,673,593
1984	54,955	55,430	148,459	114,850	77,705	87,535	11,573	6,462	4,649	62,818	66,176	205,942	896,554
1985	284,402	265,972	642,615	433,418	241,935	485,548	65,042	24,046	27,648	214,542	78,284	69,931	2,833,383
1986	61,974	83,324	81,630	221,823	212,128	133,745	34,322	16,865	65,954	508,740	349,825	184,324	1,954,654
1987	265,238	327,219	510,288	217,332	686,241	843,544	248,529	78,942	109,420	75,257	97,419	507,196	3,966,625
1988	248,825	132,139	393,183	341,494	104,311	64,593	32,475	16,078	76,318	54,026	43,686	47,198	1,554,326
1989	95,981	172,284	194,559	63,160	232,754	761,669	134,916	88,794	162,867	71,792	53,625	56,755	2,089,156
1990	149,585	115,463	1,047,733	1,417,752	968,727	160,264	102,585	50,206	88,630	26,007	60,420	48,268	4,235,640
1991	135,323	58,191	110,083	136,472	174,044	487,346	82,953	31,359	311,548	233,517	258,097	1,153,226	3,172,159
1992	198,962	245,382	264,147	160,760	179,476	480,144	212,254	93,033	129,542	34,469	224,470	525,237	2,747,876
1993	223,675	526,333	510,933	482,276	1,475,177	246,664	99,142	54,555	160,542	102,083	60,871	200,237	4,142,488
1994	59,307	144,636	301,308	138,234	500,186	184,979	246,285	21,034	57,199	90,657	377,301	187,028	2,308,154
1995	94,159	62,466	314,564	323,937	886,558	838,552	151,755	187,438	164,152	120,555	63,312	75,644	3,283,092
1996	88,929	64,508	69,576	130,901	48,331	157,200	75,590	165,640	283,379	195,392	537,337	155,187	1,971,970
1997	121,112	467,686	198,526	537,241	411,213	318,962	112,768	94,586	76,822	87,828	64,078	162,871	2,653,693
1998	480,755	193,477	810,110	330,149	232,837	109,108	46,685	39,328	30,793	50,047	81,935	76,631	2,481,855
1999	71,689	104,481	169,810	233,856	279,386	166,700	81,103	32,038	63,823	23,322	27,900	79,833	1,333,941
2000	55,334	56,615	112,927	139,992	167,203	142,221	113,919	26,033	5,298	194,043	250,647	187,804	1,452,036
2001	264,050	825,522	165,441	195,957	191,076	178,969	69,287	31,585	231,837	154,775	34,845	156,798	2,500,142
2002	87,565	86,211	214,849	437,173	111,992	130,926	41,663	144,508	63,175	64,390	72,334	137,254	1,592,040
2003	130,910	76,872	117,103	73,421	132,885	160,223	45,269	32,456	75,805	26,909	27,040	34,261	933,154
2004	41,258	56,092	170,460	122,201	61,529	151,291	174,379	81,464	30,540	90,336	314,636	125,088	1,419,274
2005	335,389	150,908	110,640	81,271	53,823	62,055	56,124	166,054	71,063	36,438	12,549	14,033	1,150,347
2006	25,025	16,562	83,283	100,853	121,616	16,452	19,344	14,644	24,125	36,024	62,101	58,342	578,371
2007	121,734	73,901	98,106	399,987	762,347	1,135,269	1,057,031	712,800	228,972	104,821	61,551	86,979	4,843,498
2008	75,855	89,611	359,798	451,379	168,054	230,955	62,627	44,957	37,228	36,565	31,365	25,384	1,613,778
2009	30,726	45,267	33,383	130,062	868,431	111,919	26,537	54,838	55,942	369,907	115,522	76,997	1,919,531
2010	143,911	238,751	195,320	122,512	160,216	88,149	125,258	29,222	121,873	20,323	20,434	40,688	1,306,657
2011	40,322	43,512	33,625	45,988	136,114	19,272	3,896	6,948	1,000	11,003	93,087	30,969	465,736
2012	108,410	44,160	224,466	164,066	47,210	52,145	4,591	957	1,099	9,061	4,948	6,378	667,491
2013	9,443	12,012	23,908	75,523	125,296	164,434	28,273	54,047	3,373	9,204	10,437	30,981	546,931
2014	12,445	18,779	22,136	23,844	21,687	78,886	20,852	10,254	3,120	6,226	22,467	24,003	264,699
2015	21,307	21,907	71,378	170,506	2,306,508	1,746,300	637,977	68,821	64,342	84,931	426,863	852,297	6,473,137
2016	198,375	148,765	312,236	876,056	300,080	652,035	83,292	25,432	52,450	43,683	46,950	65,371	2,804,725
2017	108,020	106,714	58,353	201,203	394,288	106,021	112,663	185,126	68,432	87,903	38,834	35,059	1,502,616
2018	33,859	197,429	207,420	119,984	225,088	48,146	29,819	43,902	348,592	992,123	111,440	335,374	2,693,176
Total	6,515,819	8,137,084	12,493,419	14,351,267	24,013,693	17,955,828	7,115,448	4,153,708	5,682,748	8,513,315	7,167,296	7,879,577	123,979,202
Mean	91,772	114,607	175,964	202,131	338,221	252,899	100,218	58,503	80,039	119,906	100,948	110,980	1,746,186
Max	480,755	825,522	1,047,733	1,417,752	2,306,508	1,746,300	1,057,031	712,800	348,592	992,123	537,337	1,153,226	6,473,137
Min	6,756	5,272	15,707	18,622	21,687	9,427	3,207	957	1,000	1,866	2,807	6,309	237,687

Flow Adjustments - Run 3 and Run 8

Control Point: X10370
Control Point I.D.: RR-AC
Description: Blue River

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	24,085	60,004	38,664	11,096	97,507	25,316	66,007	6,509	3,328	2,949	3,141	3,250	341,856
1949	53,921	47,244	38,675	25,128	67,139	45,949	8,893	2,848	10,458	22,272	3,867	7,134	333,528
1950	69,877	101,996	14,087	12,717	157,087	28,668	91,147	89,766	55,704	13,418	8,894	8,905	652,266
1951	8,025	47,825	18,756	13,458	7,462	119,157	25,771	3,389	5,475	5,143	10,890	5,153	270,504
1952	2,424	5,062	19,776	122,745	26,428	6,297	2,114	745	1,812	1,587	4,393	3,753	197,136
1953	2,870	3,658	22,020	66,800	78,001	8,295	56,821	13,339	8,928	5,796	8,014	11,146	285,688
1954	22,015	7,549	2,964	11,325	136,236	20,071	5,002	2,911	5,780	46,033	3,658	13,592	277,136
1955	16,384	27,978	38,044	23,562	27,205	3,015	17,757	1,510	16,104	5,857	4,039	3,765	185,220
1956	4,224	18,816	6,484	3,687	11,001	3,714	326	246	257	1,544	1,698	2,944	54,941
1957	2,040	11,765	25,078	228,810	270,483	164,794	29,269	5,676	113,455	16,957	131,879	30,582	1,030,788
1958	60,789	21,473	69,670	44,329	156,364	14,578	5,507	4,642	3,855	2,026	4,051	3,088	390,372
1959	781	3,105	9,958	17,389	13,133	7,410	38,006	6,848	5,178	43,659	15,353	35,659	196,479
1960	52,629	38,460	39,768	13,051	43,428	11,777	13,448	7,230	8,268	7,033	13,603	53,697	302,392
1961	26,218	35,546	32,629	34,583	24,349	9,951	9,254	2,221	9,029	18,576	38,716	47,180	288,252
1962	22,016	14,539	18,073	45,255	14,535	82,619	7,784	7,264	32,196	45,616	55,089	40,206	385,192
1963	13,534	9,962	22,128	17,603	17,255	2,038	3,162	1,453	0	0	781	860	88,776
1964	1,816	2,453	17,354	28,944	15,050	30,962	1,317	4,109	41,574	9,057	51,307	16,360	220,303
1965	17,337	46,873	14,499	14,579	37,809	9,706	3,668	2,873	12,992	2,629	5,252	3,041	171,258
1966	1,397	53,622	9,025	93,718	70,601	3,057	1,895	7,204	7,601	1,098	0	901	250,119
1967	643	896	2,907	101,064	33,870	64,253	22,500	3,358	50,530	7,124	18,548	21,255	326,948
1968	70,259	38,485	141,021	114,636	174,217	65,933	23,893	12,790	25,816	9,660	39,955	50,103	766,768
1969	43,622	91,176	88,081	64,346	222,354	30,765	7,297	7,019	5,316	42,003	12,078	23,945	638,002
1970	29,145	39,539	69,754	70,210	48,558	25,086	3,911	5,547	27,705	84,548	18,117	11,622	433,742
1971	18,242	16,209	13,075	14,777	18,208	8,678	7,799	9,742	14,075	57,449	15,413	180,925	374,592
1972	17,856	12,145	9,219	18,594	22,156	4,453	5,665	2,466	3,755	36,538	94,116	13,741	240,704
1973	38,560	58,951	145,947	155,545	84,049	107,511	18,197	10,321	80,684	86,615	91,051	85,222	962,653
1974	25,674	24,272	20,126	21,591	47,539	41,074	5,093	10,881	57,736	37,640	171,307	45,154	508,087
1975	38,007	87,889	102,601	69,812	43,889	70,499	13,484	24,765	11,299	5,910	6,431	12,011	486,597
1976	7,566	7,274	19,894	109,139	45,339	22,653	20,842	2,648	2,566	4,833	1,761	1,406	245,921
1977	15,491	22,072	124,438	67,645	19,625	9,328	3,478	5,955	10,311	3,045	7,562	3,147	292,097
1978	5,436	19,990	39,743	24,366	27,005	30,889	4,801	0	2,548	671	11,137	6,557	173,143
1979	14,612	31,245	79,444	46,639	88,988	67,411	10,156	1,404	2,252	871	4,027	5,216	352,265
1980	4,545	8,369	5,271	5,626	14,311	23,256	993	1,767	18,403	26,380	7,017	24,102	140,040
1981	5,710	8,269	36,865	5,414	30,807	57,129	37,915	3,660	5,997	307,652	132,371	28,570	660,359
1982	45,432	92,014	35,294	20,642	210,645	127,873	41,596	18,578	6,985	6,453	22,509	45,270	673,291
1983	14,730	73,840	37,303	19,095	57,859	58,528	33,018	4,776	3,988	723	2,242	16,775	322,877
1984	11,716	13,390	36,233	28,174	29,493	2,076	6,454	5,054	6,559	28,531	61,354	48,210	277,244
1985	22,514	40,857	61,064	83,108	76,638	45,336	18,745	8,280	8,830	12,909	50,061	32,680	461,022
1986	10,589	66,874	21,837	75,879	62,877	122,111	21,125	16,318	16,486	12,970	55,622	38,570	521,258
1987	39,342	49,651	132,584	33,520	21,973	42,629	37,373	8,648	13,006	8,148	42,894	79,450	509,218
1988	26,054	40,433	41,738	26,852	21,226	10,343	11,814	6,140	4,368	934	8,291	9,299	207,492
1989	31,394	66,176	74,794	49,289	131,085	266,350	97,571	15,812	16,111	12,656	8,122	7,810	777,170
1990	36,492	70,598	201,395	367,270	364,804	46,972	29,428	21,261	36,862	28,039	16,206	21,934	1,241,261
1991	50,214	23,086	33,649	83,520	78,736	157,038	53,820	33,714	10,431	93,081	85,410	147,209	849,908
1992	87,501	85,762	88,375	51,655	96,990	136,532	95,856	38,811	31,549	10,149	10,729	59,608	793,517
1993	40,478	78,646	93,189	66,685	130,271	86,794	28,820	20,445	19,856	32,385	21,324	64,842	683,735
1994	26,948	32,200	75,555	46,317	105,496	54,928	38,174	27,931	17,523	40,509	152,973	103,222	721,776
1995	58,666	20,515	94,264	108,763	290,202	41,584	48,950	5,036	13,961	26,756	11,527	13,033	733,257
1996	16,571	8,648	15,904	33,873	9,208	19,220	12,452	28,322	30,760	86,263	184,371	49,060	494,652
1997	23,750	76,471	50,473	69,394	48,834	32,681	10,055	8,792	1,626	9,733	18,197	79,425	429,431
1998	151,390	59,916	92,288	50,797	14,533	7,149	2,291	2,439	6,567	17,275	16,915	35,713	457,273
1999	18,182	16,815	16,865	40,544	42,014	15,639	14,356	3,229	11,944	5,626	5,752	15,494	206,460
2000	5,469	8,791	15,110	18,852	9,913	14,892	4,152	267	3,286	4,250	46,867	84,248	216,097
2001	57,298	237,378	161,393	72,481	21,673	18,169	3,265	5,682	36,317	43,896	10,478	62,743	730,773
2002	28,610	61,352	130,704	183,413	39,188	24,433	7,304	29,211	16,539	34,180	19,539	46,901	621,374
2003	28,018	20,308	44,742	8,167	12,222	35,993	5,499	2,900	16,812	3,288	4,577	1,595	184,121
2004	13,304	22,676	16,003	23,531	12,027	19,247	6,275	119	0	3,618	79,882	58,757	255,439
2005	147,326	40,919	28,874	23,205	11,782	9,557	10,688	2,064	1,754	5,860	6,846	3,525	292,400
2006	2,036	2,544	22,396	22,383	21,770	4,122	0	0	960	1,451	9,092	36,379	123,133
2007	76,494	5,695	5,544	50,558	141,991	267,725	208,905	56,958	34,344	20,535	7,802	11,606	888,157
2008	1,913	25,595	131,796	75,409	27,034	15,147	1,942	5,591	0	2,098	3,117	1,764	291,406
2009	0	1,309	10,689	15,386	183,197	38,618	5,889	5,679	12,369	151,348	35,644	25,441	485,569
2010	31,521	71,032	47,018	23,702	21,640	15,727	20,244	13,912	16,558	7,565	5,784	2,956	277,659
2011	1,470	6,344	1,923	11,706	67,171	624	1,556	186	1,440	1,687	15,258	16,715	126,080
2012	89,869	31,539	109,853	44,379	12,647	10,589	4,859	4,847	1,808	5,309	2,395	4,120	322,214
2013	5,185	3,226	11,790	9,941	45,364	33,135	5,657	3,238	4,730	7,075	5,409	10,292	145,042
2014	9,915	5,491	14,054	5,650	8,677	9,277	10,644	9,520	7,770	5,672	3,994	5,835	96,499
2015	13,566	11,851	53,729	78,002	460,078	251,163	60,877	26,833	19,295	18,001	128,523	222,545	1,344,463
2016	98,475	30,724	104,263	88,741	95,833	107,099	33,311	15,974	4,292	9,938	6,287	1,854	596,791
2017	4,015	8,001	20,383	36,374	30,917	25,229	85,137	58,159	12,185	6,817	9,125	5,910	302,252
2018	9,025	76,826	78,885	34,836	39,608	14,241	2,299	4,874	86,391	110,650	49,724	93,900	601,259
Total	2,073,222	2,612,204	3,567,991	3,800,276	5,247,604	3,415,062	1,653,573	792,706	1,195,249	1,838,567	2,220,358	2,368,882	30,785,694
Mean	29,200	36,792	50,253	53,525	73,910	48,099	23,290	11,165	16,834	25,895	31,273	33,365	433,601
Max	151,390	237,378	201,395	367,270	460,078	267,725	208,905	89,766	113,455	307,652	184,371	222,545	1,344,463
Min	0	896	1,923	3,687	7,462	624	0	0	0	0	0	860	54,941

Flow Adjustments - Run 3 and Run 8

Control Point: X10150
Control Point I.D.: RR-AC
Description: Boggy River

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	92,481	242,275	185,987	28,080	335,641	106,660	208,907	10,572	4,862	3,622	4,833	4,655	1,228,575
1949	246,848	243,330	187,539	96,646	311,902	183,651	23,691	2,963	23,302	63,396	3,226	23,380	1,409,874
1950	311,259	406,238	38,878	23,383	572,542	71,418	393,237	340,425	341,887	30,894	11,902	12,847	2,554,910
1951	10,654	215,087	71,163	67,161	17,407	555,932	113,630	4,062	16,122	16,318	48,182	11,448	1,147,166
1952	1,111	17,762	90,735	492,493	99,608	25,680	984	48	3,115	1,927	10,784	11,453	755,700
1953	5,819	12,959	138,537	393,135	434,409	15,071	255,663	30,334	15,333	15,814	20,639	36,616	1,374,329
1954	108,245	27,871	3,113	57,532	607,936	54,343	13,096	6,632	19,950	174,443	8,741	47,669	1,129,571
1955	55,528	129,406	216,586	91,854	75,134	7,429	41,118	4,775	118,876	28,759	12,009	10,228	791,702
1956	12,508	94,294	22,724	9,447	70,844	29,121	27	888	1,096	6,480	5,539	8,330	261,298
1957	7,987	89,863	132,975	910,620	1,044,719	585,479	102,156	10,324	337,588	45,779	440,667	117,394	3,825,551
1958	196,534	59,257	284,613	164,462	512,684	63,376	24,395	72,881	19,904	2,343	15,840	5,540	1,421,829
1959	341	6,521	99,854	77,883	107,260	25,957	233,923	25,033	13,163	213,752	70,829	156,640	1,031,156
1960	208,485	121,254	123,336	35,808	387,376	31,186	74,221	21,374	23,925	14,084	50,657	209,228	1,300,934
1961	95,477	128,001	114,295	148,024	95,446	32,123	51,774	9,933	42,574	81,462	155,922	207,180	1,162,211
1962	86,329	58,766	93,330	231,961	57,013	163,363	15,258	20,688	116,496	147,909	147,611	156,386	1,295,110
1963	34,216	25,382	62,391	106,867	77,150	1,240	8,972	2,267	0	0	0	242	318,727
1964	684	4,632	70,116	125,880	64,708	100,348	191	7,281	168,931	30,016	169,999	46,852	789,638
1965	58,019	185,980	54,687	63,852	194,768	34,966	8,206	6,603	50,640	5,588	11,357	6,018	680,684
1966	1,879	183,138	33,826	361,701	286,153	2,513	2,311	14,987	13,621	510	0	290	900,929
1967	242	379	8,074	400,233	156,439	164,533	75,553	3,606	239,428	24,574	72,160	80,602	1,225,823
1968	249,662	150,504	595,096	406,625	510,680	204,604	80,740	36,022	73,064	21,829	171,908	237,143	2,737,877
1969	155,135	379,067	308,199	194,050	822,269	85,946	9,822	17,697	12,605	213,305	36,258	75,869	2,310,222
1970	115,828	137,278	287,775	264,722	172,997	132,950	2,181	15,281	85,906	363,511	52,755	27,031	1,658,215
1971	62,077	61,267	43,725	143,323	108,117	50,796	32,604	34,604	19,067	194,525	47,294	699,044	1,496,443
1972	51,788	34,702	25,654	69,539	55,624	6,904	18,335	4,589	5,837	73,084	403,448	44,458	793,962
1973	177,075	209,224	607,131	533,855	315,371	403,856	50,087	33,695	233,508	321,967	421,997	316,775	3,624,541
1974	68,035	73,876	111,532	103,394	252,446	342,168	8,863	33,681	230,645	63,567	622,309	173,812	2,084,328
1975	125,339	370,961	382,622	244,326	138,616	257,813	27,919	96,851	40,297	13,580	17,468	52,625	1,768,417
1976	20,094	22,215	99,667	439,221	197,856	70,914	82,515	3,435	3,089	20,689	2,798	6,171	968,664
1977	75,977	93,419	422,807	317,316	24,781	29,247	4,918	17,090	12,475	5,291	25,710	5,394	1,034,425
1978	18,123	69,607	224,080	120,280	166,076	74,975	8,749	0	3,220	0	44,898	23,212	753,220
1979	57,922	121,394	282,826	190,833	328,821	322,781	23,464	1,155	1,835	154	10,397	15,974	1,357,556
1980	12,614	18,154	16,623	15,871	77,820	86,475	2,791	8,040	42,157	82,504	20,162	83,140	466,351
1981	13,752	20,949	114,362	17,878	103,997	186,722	25,922	9,368	12,851	803,820	534,703	88,948	1,933,272
1982	111,980	377,762	117,942	55,593	737,120	516,693	192,840	51,866	7,421	7,780	35,436	146,860	2,359,293
1983	33,220	308,363	107,842	59,290	424,755	80,388	64,164	5,412	6,798	1,769	8,558	29,395	1,129,954
1984	22,309	39,657	188,205	100,825	80,961	5,497	10,449	5,966	14,272	242,649	244,139	213,729	1,168,658
1985	164,002	243,736	317,705	606,326	367,488	195,817	31,612	10,439	11,839	45,169	226,636	151,373	2,372,142
1986	20,863	193,247	64,083	274,024	306,594	337,162	29,819	20,893	78,085	28,267	171,036	116,607	1,640,680
1987	225,520	147,994	436,763	62,890	56,643	198,477	77,306	12,904	18,691	12,967	101,747	365,911	1,717,813
1988	188,206	107,220	201,074	77,407	27,478	11,965	19,029	8,411	5,953	1,265	13,141	20,092	681,241
1989	91,069	277,872	242,461	156,655	337,380	560,235	155,937	39,621	85,228	19,252	12,481	12,267	1,990,458
1990	151,636	308,511	772,206	1,046,016	1,595,790	193,266	66,561	41,521	131,133	83,993	54,172	92,481	4,537,286
1991	245,864	50,706	139,277	281,380	277,278	488,084	91,647	53,588	23,503	228,533	465,418	703,764	3,049,042
1992	288,840	225,390	300,529	150,423	366,379	455,310	371,586	193,809	133,217	18,667	94,733	460,088	3,058,971
1993	176,270	354,274	348,257	372,440	636,269	258,301	45,077	30,618	120,054	78,050	94,860	278,954	2,793,424
1994	64,008	169,455	364,823	79,907	492,042	123,456	66,354	75,827	35,912	62,665	466,035	299,915	2,300,399
1995	208,170	77,583	450,319	413,572	761,119	183,516	81,879	7,165	54,810	47,614	17,355	26,624	2,329,726
1996	53,760	19,393	65,090	253,903	49,962	44,171	63,992	121,169	141,945	237,583	680,271	314,689	2,045,928
1997	46,811	316,141	223,272	236,923	137,167	71,262	20,214	15,416	4,174	17,707	30,331	242,106	1,361,524
1998	692,060	150,096	448,807	108,755	26,002	17,392	3,846	4,151	10,701	50,702	48,502	133,457	1,694,471
1999	33,528	66,537	178,264	232,247	270,866	123,900	99,111	3,585	18,458	7,098	9,795	55,896	1,099,285
2000	18,625	40,008	56,372	62,117	70,346	76,500	14,766	1,467	5,411	7,669	206,171	221,465	780,917
2001	191,095	600,348	461,055	192,502	104,593	82,748	8,762	8,615	31,101	84,254	15,008	210,891	1,990,972
2002	61,100	171,817	440,606	720,453	86,093	85,023	22,021	23,195	19,040	44,787	29,762	97,264	1,801,161
2003	86,116	55,079	120,664	17,027	23,912	61,596	12,809	13,152	31,720	7,283	9,080	3,842	442,280
2004	38,468	64,744	67,468	80,802	52,331	68,247	48,600	359	0	69,687	426,415	209,013	1,126,134
2005	534,108	131,712	89,465	110,121	24,282	18,903	20,856	13,646	6,730	11,874	8,452	4,749	974,898
2006	4,005	4,447	54,435	27,871	243,870	9,232	0	0	1,720	7,885	18,187	171,342	542,994
2007	516,661	46,760	15,607	165,448	406,529	516,893	970,542	203,390	56,729	33,930	10,706	25,288	2,968,483
2008	5,777	91,622	546,972	455,095	82,643	80,633	4,526	24,072	0	3,380	4,962	3,548	1,303,230
2009	0	6,401	19,151	33,627	654,255	196,305	10,239	11,009	41,891	667,945	146,445	70,449	1,857,717
2010	111,498	311,586	228,512	91,375	240,335	58,404	86,166	20,215	18,413	9,749	7,689	3,997	1,187,939
2011	5,075	16,827	6,211	61,187	190,098	2,691	2,885	958	2,292	2,216	39,698	43,754	373,892
2012	199,062	103,750	295,636	104,328	19,826	24,584	7,349	7,378	3,200	7,530	2,782	5,508	780,933
2013	8,188	13,110	43,529	79,816	306,534	203,235	9,673	6,985	6,864	10,938	9,553	52,760	751,185
2014	19,010	10,081	82,780	40,289	28,379	85,478	18,480	19,106	8,282	9,771	6,050	17,567	345,273
2015	31,164	27,243	173,372	199,810	1,861,570	903,848	222,643	67,335	26,991	22,735	279,399	806,973	4,623,083
2016	599,548	65,162	357,629	229,167	437,172	257,135	46,471	21,523	6,544	14,413	8,709	3,094	2,046,567
2017	8,263	20,648	32,881	56,640	141,363	62,235	257,829	103,358	17,369	10,407	11,677	9,766	732,436
2018	15,161	231,086	282,092	123,967	128,137	22,144	2,888	16,003	305,427	513,357	131,053	404,768	2,176,083
Total	8,009,107	9,461,380	13,896,214	14,368,473	20,838,171	11,191,266	5,285,151	2,171,311	3,839,287	5,817,036	7,819,446	9,032,840	111,729,682
Mean	112,804	133,259	195,721	202,373	293,495	157,623	74,439	30,582	54,074	81,930	110,133	127,223	1,573,657
Max	692,060	600,348	772,206	1,046,016	1,861,570	903,848	970,542	340,425	341,887	803,820	680,271	806,973	4,623,083
Min	0	379	3,113	9,447	17,407	1,240	0	0	0	0	0	242	261,298

Flow Adjustments - Run 3 and Run 8

Control Point: Y10230
Control Point I.D.: RR-IN
Description: Kiamichi River

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	146,055	217,184	220,612	52,356	307,619	18,489	24,652	7,128	3,653	1,584	5,656	19,150	1,024,138
1949	625,313	354,579	226,826	140,533	270,902	166,044	18,699	8,505	26,731	70,369	16,747	58,458	1,983,706
1950	456,375	460,387	52,844	31,089	278,669	31,955	423,803	207,200	389,096	32,000	10,368	3,951	2,377,737
1951	46,746	407,827	125,113	142,190	58,045	435,470	174,436	10,853	14,350	30,880	154,761	63,513	1,664,184
1952	50,221	53,573	187,212	538,355	57,144	24,161	2,694	812	5,400	911	27,177	55,450	1,003,110
1953	32,289	80,063	257,517	495,693	419,487	9,598	201,308	19,880	3,554	3,388	6,109	23,121	1,552,007
1954	220,605	57,188	15,573	83,481	270,324	29,065	1,131	2,562	5,658	117,597	28,171	84,941	916,296
1955	91,616	188,251	283,296	92,579	82,386	8,247	8,533	12,382	183,610	35,336	1,874	3,564	991,674
1956	2,769	191,240	42,252	37,548	127,969	21,970	1,896	1,933	208	3,739	9,262	22,674	463,460
1957	81,433	205,181	221,917	831,282	684,180	335,794	51,371	6,035	254,748	42,238	351,642	137,353	3,203,174
1958	156,289	75,233	298,347	179,215	488,482	38,105	63,229	31,985	17,147	7,562	37,763	19,439	1,412,796
1959	19,668	47,645	129,968	123,757	104,573	23,232	174,196	30,750	30,176	143,543	38,990	239,566	1,106,064
1960	211,316	127,044	118,086	36,500	543,651	29,094	127,945	40,762	15,650	23,838	13,426	258,535	1,545,847
1961	88,437	144,672	160,046	163,298	256,075	41,187	95,746	21,187	37,103	50,508	258,095	203,614	1,519,968
1962	161,966	140,091	162,917	254,608	54,022	53,371	17,712	1,151	18,233	175,393	99,238	92,583	1,231,285
1963	53,648	15,111	120,597	84,875	61,991	9,665	20,063	6,295	4,247	3,208	2,368	3,971	386,039
1964	1,108	14,414	146,707	208,347	65,175	9,840	1,504	35,961	106,283	47,010	133,104	49,767	819,220
1965	63,847	199,615	137,594	94,951	123,451	55,783	6,080	3,104	54,239	13,370	18,285	8,102	778,421
1966	17,006	246,548	33,213	232,501	210,410	6,791	8,358	23,159	9,085	7,303	6,577	10,822	811,773
1967	13,687	7,002	24,639	334,713	267,295	102,466	41,301	6,212	178,831	43,795	88,786	195,606	1,304,333
1968	190,392	167,345	505,588	422,433	609,198	192,478	48,576	17,265	63,406	40,435	167,757	294,728	2,719,601
1969	162,153	376,801	247,163	147,613	460,778	94,914	9,465	4,374	3,830	56,902	22,131	50,401	1,636,525
1970	96,390	73,249	284,483	275,423	135,890	128,516	5,228	6,863	28,090	187,935	76,514	8,761	1,307,342
1971	102,360	106,999	79,782	121,056	83,832	26,878	5,833	15,191	1,250	109	32,443	786,468	1,362,201
1972	80	58	46	91	69	17	14	3	1	33	542	89	1,043
1973	172,836	206,428	517,478	556,535	327,411	398,747	27,439	25,948	87,048	169,621	393,747	290,390	3,173,628
1974	66,385	4,556	140,025	170,047	251,350	561,781	6,336	60,599	608,561	64,225	598,501	209,160	2,741,526
1975	172,768	411,599	251,015	262,575	202,622	126,959	25,512	11,307	11,911	9,361	4,306	28,343	1,518,278
1976	61	29	158	363	213	51	21	18	13	10	4	61	1,002
1977	127,616	148,054	213,803	699,066	65,317	17,171	16,299	13,302	12,926	8,391	4,081	1,026	1,327,052
1978	0	75,422	292,244	76,480	130,102	0	18,078	17,624	12,494	7,684	5,327	31,046	666,501
1979	163,098	175,873	370,593	396,141	344,304	402,044	20,002	18,446	10,236	8,299	19,952	48,982	1,977,970
1980	62,614	97,593	17,098	99,421	240,660	73,521	18,139	17,653	8,248	108,651	32,928	126,236	902,762
1981	14,438	66,732	165,481	62,626	152,880	274,675	33,773	19,168	13,067	77,916	238,227	73,218	1,192,201
1982	56,542	397,805	156,137	41,042	167,901	391,745	263,135	19,061	12,867	8,969	11,542	325,210	1,851,956
1983	104,852	229,478	175,845	100,372	325,967	45,988	45,172	18,341	13,085	0	3,905	15,630	1,078,635
1984	41,492	94,988	363,784	136,608	155,978	20,418	18,672	18,839	13,630	409,256	689,036	368,458	2,331,159
1985	196,376	214,881	374,805	173,689	413,572	152,965	43,551	18,325	13,444	8,352	285,812	334,088	2,229,860
1986	13,851	230,075	88,610	374,065	365,488	276,169	18,143	14,220	16,189	0	14,797	76,897	1,488,504
1987	161,120	68,850	260,600	39,291	60,272	140,178	19,803	41,808	14,025	8,694	141,330	220,526	1,176,497
1988	457,803	119,923	180,143	204,688	12,107	16,114	19,464	19,815	13,089	6,650	11,123	44,670	1,105,589
1989	118,924	431,968	201,888	184,264	268,764	114,875	152,274	50,473	47,909	8,454	3,673	1,503	1,584,969
1990	191,306	475,170	254,253	346,334	827,484	632,479	93,148	115,892	57,114	135,275	12,139	97,607	3,238,201
1991	290,678	58,308	143,605	481,870	189,199	70,727	30,476	50,055	12,116	8,924	586,506	313,769	2,236,233
1992	326,975	154,322	94,988	75,770	173,498	216,378	174,603	205,004	184,495	10,536	124,288	413,613	2,154,470
1993	237,189	172,713	255,134	249,219	182,727	348,454	12,533	30,626	13,914	65,984	68,920	285,187	1,922,600
1994	158,551	143,488	300,341	47,361	346,937	74,218	19,027	57,148	13,976	8,890	203,543	245,185	1,618,665
1995	330,916	47,280	109,419	228,954	200,463	129,665	18,430	19,420	13,801	8,834	5,143	4,645	1,116,970
1996	125,538	14,604	38,160	311,171	213,608	38,868	131,776	67,799	87,326	138,902	572,921	527,220	2,267,893
1997	63,967	317,595	436,917	149,070	107,871	62,658	88,527	19,575	14,717	8,400	68,660	274,040	1,611,997
1998	748,024	187,807	350,822	82,280	10,758	16,546	13,788	18,756	58,145	259,610	89,371	292,457	2,128,364
1999	66,635	159,538	220,963	201,352	335	107,113	111,342	75,219	16,215	8,898	4,536	61,297	1,033,443
2000	22,280	48,829	53,829	133,011	3,237	198,220	20,340	42,321	15,064	9,273	147,532	244,663	938,599
2001	355,930	168,730	531,268	106,256	116,963	141,707	18,920	44,725	22,750	100,705	4,558	323,861	1,936,373
2002	157,329	353,161	294,049	771,780	64,852	51,291	14,914	60,613	14,454	8,612	4,943	29,651	1,825,649
2003	88,379	3,640	229,835	14,420	19,375	0	18,900	23,536	8,510	10,094	4,814	1,942	423,445
2004	67,200	164,255	89,458	33,757	111,394	185,328	109,638	60,673	13,656	11,617	130,601	161,581	1,139,158
2005	361,112	110,915	27,911	99,860	10,349	16,382	9,471	12,912	8,838	4,995	4,679	2,239	669,663
2006	1,809	3,509	4,725	7,981	156,920	13,880	18,837	18,748	13,708	24,711	53,881	232,911	551,620
2007	612,749	113,147	4,675	32,835	194,407	86,067	218,785	618,829	118,016	8,095	4,427	62,219	2,074,251
2008	64,167	233,111	550,839	707,561	123,868	57,515	34,060	18,845	34,366	39,751	4,846	18,690	1,887,619
2009	56,592	56,307	24,950	138,978	373,511	463,434	34,280	68,787	57,229	270,040	429,628	60,912	2,034,648
2010	266,229	293,078	166,566	52,673	97,369	15,324	18,696	18,282	13,646	8,727	4,723	1,874	957,187
2011	1,912	3,654	4,518	70,391	403,468	19,142	19,628	16,672	13,714	9,459	86,796	293,452	942,806
2012	176,709	298,457	324,077	199,656	22,332	17,623	18,992	19,016	14,505	8,953	4,457	2,277	1,107,054
2013	2,202	2,255	96,288	350,545	276,592	277,345	19,252	14,060	14,640	11,046	61,333	178,151	1,303,709
2014	99,554	36,534	124,084	154,082	354,402	209,532	18,962	86,483	14,122	27,792	5,633	78,793	1,209,973
2015	110,057	14,130	328,365	305,851	523,301	386,019	409,051	539,613	13,319	9,340	95,480	603,100	3,337,626
2016	930,027	90,343	369,842	185,056	427,345	168,677	19,172	18,900	15,856	8,636	4,578	1,765	2,240,197
2017	1,815	22,431	35,754	76,729	79,210	65,883	175,293	111,675	15,255	9,150	4,623	1,954	599,772
2018	23,700	78,998	647,133	225,384	48,587	15,592	17,990	36,173	45,578	186,039	186,676	189,669	1,701,519
Total	10,962,076	10,757,863	13,964,813	14,541,947	15,166,887	8,992,598	4,188,417	3,396,856	3,302,366	3,464,807	7,046,312	9,894,795	105,679,737
Mean	154,395	151,519	196,688	204,816	213,618	126,656	58,992	47,843	46,512	48,800	99,244	139,363	1,488,447
Max	930,027	475,170	647,133	831,282	827,484	632,479	423,803	618,829	608,561	409,256	689,036	786,468	3,337,626
Min	0	29	46	91	69	0	14	3	1	0	4	61	1,002

Flow Adjustments - Run 3 and Run 8

Control Point: Y10100
Control Point I.D.: RR-IN
Description: Red River at Index

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	68,379	22,627	141,964	31,155	120,417	13,357	21,094	8,779	9,449	3,352	7,126	10,916	458,615
1949	80,447	131,183	91,652	47,755	35,860	70,114	29,834	9,128	1,631	28,584	17,562	18,125	561,875
1950	121,554	265,333	51,099	3,217	164,870	28,203	0	27,928	126,526	58,455	15,842	421	863,448
1951	28,769	99,639	46,950	47,188	0	108,899	98,564	14,052	16,073	0	11,787	33,764	505,685
1952	45,003	24,622	51,756	225,726	37,214	23,811	4,595	1,813	11,464	1,646	11,482	59,731	498,863
1953	30,114	25,480	79,073	0	389,474	15,348	0	28,474	4,143	7,825	11,915	8,116	599,962
1954	21,673	52,005	13,638	18,860	113,124	62,106	2,605	7,329	15,794	41,799	35,663	0	384,596
1955	46,650	22,378	58,336	54,353	20,482	363	23,107	9,889	10,648	52,065	1,932	5,952	306,155
1956	2,212	105,074	24,984	3,207	48,595	19,424	3,077	5,518	597	10,706	6,460	0	229,854
1957	412	37,502	65,831	178,097	360,057	130,242	134,692	12,142	0	95,299	142,069	96,589	1,252,932
1958	134,827	26,655	97,277	110,101	296,376	21,330	65,808	11,672	26,066	15,377	33,256	20,429	859,174
1959	7,352	62,162	28,847	53,474	26,970	5,740	0	32,909	14,566	0	19,560	62,038	313,618
1960	91,996	30,543	39,041	31,018	19,042	26,885	7,959	36,148	16,160	8,084	16,703	103,676	427,255
1961	63,916	40,481	50,819	151,324	34,958	20,983	58,571	20,159	0	0	15,142	66,663	523,016
1962	92,542	82,995	45,328	43,743	71,054	0	44,518	1,211	18,520	38,561	19,428	58,630	516,530
1963	17,624	18,746	65,644	0	91,627	20,440	28,275	11,865	11,449	9,185	6,672	9,824	291,351
1964	1,971	8,343	43,843	128,871	44,026	18,728	2,865	958	0	83,535	2,158	27,355	362,653
1965	23,827	93,976	26,171	68,846	14,849	61,750	5,155	3,701	23,053	8,581	13,529	8,565	352,003
1966	0	26,542	15,184	0	254,574	11,476	20,288	29,360	11,834	18,123	16,747	21,618	425,746
1967	27,512	7,725	20,506	77,689	137,571	49,843	52,366	11,688	9,360	2,344	32,621	36,074	465,299
1968	0	210,061	29,371	123,917	331,911	204,834	54,807	25,414	3,455	20,061	0	76,874	1,080,705
1969	25,059	231,802	152,560	0	246,420	54,529	13,748	6,773	2,070	3,760	1,144	0	737,865
1970	80,291	26,211	204,121	40,766	90,002	8,768	8,097	0	0	0	54,412	0	512,668
1971	11,872	7,312	52,633	0	12,016	16,876	0	0	0	82,020	6,917	212,362	402,008
1972	110,110	61,002	39,958	53,985	27,252	5,418	6,561	17,549	5,983	33,950	344,523	84,035	790,326
1973	0	69,228	139,189	53,326	202,643	131,958	30,226	0	0	0	0	183,378	809,948
1974	101,515	30,610	0	0	0	56,288	28,997	0	0	99,278	0	168,608	485,296
1975	8,665	0	0	15,052	0	0	0	0	2,688	2,668	9,162	0	38,235
1976	25,867	13,565	109,799	19,033	138,393	81,721	57,321	21,319	18,798	21,356	11,623	61,762	580,557
1977	51	54,665	0	159,273	0	48,623	30,616	4,725	508	12,194	23,970	5,117	339,742
1978	11,753	0	0	36,808	0	0	5,970	3,230	8,842	6,430	40,885	13,611	127,529
1979	55,559	0	39,524	93,326	57,527	110,179	31,774	14,517	0	20,951	21,644	36,927	481,928
1980	63,152	81,849	29,355	30,111	0	97,182	12,854	6,909	0	15,981	40,626	30,293	408,312
1981	7,168	25,142	28,969	9,673	28,497	90,945	55,319	2,197	19,405	0	8,284	22,507	298,106
1982	0	72,863	63,967	17,457	142,831	110,610	17,403	23,654	16,330	13,273	69,606	218,722	766,716
1983	55,586	7,308	49,222	25,367	0	0	72,420	19,963	3,425	0	5,105	0	238,396
1984	10,005	5,394	92,603	109,891	89,443	27,488	13,524	1,311	18,132	0	128,805	66,735	563,331
1985	82,282	59,307	230,589	59,779	95,480	77,553	66,178	10,614	18,939	3,653	0	128,852	833,226
1986	13,751	62,430	8,875	22,227	24,123	64,965	14,795	0	0	0	0	57,438	268,604
1987	0	9,405	88,980	54,050	2,484	0	131,089	26,894	6,951	366	104,548	237,112	661,879
1988	214,446	75,177	36,887	94,294	40,731	3,604	3,852	3,977	10,491	0	59,630	20,645	563,734
1989	0	170,609	92,315	79,147	37,011	0	0	58,883	24,179	52,023	16,876	20,118	551,161
1990	57,947	181,063	183,192	3,511	98,831	288,131	44,983	15,119	0	62,135	22,783	61,274	1,018,969
1991	137,533	95,693	7,884	198,603	186,718	18,165	13,398	13,617	0	17,891	181,457	285,476	1,156,435
1992	191,970	79,284	118,279	0	0	0	112,437	59,059	28,374	14,465	10,356	299,557	913,781
1993	173,637	37,333	253,587	9,550	155,472	132,985	0	0	5,513	172,596	55,125	263,247	1,259,045
1994	40,623	45,239	168,411	7,860	91,832	129,220	30,058	4,812	16,600	13,317	0	63,787	611,759
1995	110,723	74,415	0	57,788	0	0	141,527	11,563	6,399	16,928	13,614	702	433,659
1996	1,749	26,239	0	0	85,356	29,211	32,659	42,290	59,332	92,021	221,003	159,008	748,868
1997	25,476	70,293	208,691	163,268	55,805	68,683	0	19,673	28,380	24,539	16,222	1,283	682,313
1998	261,684	51,756	17,404	38,647	32,944	25,474	0	5,380	20,042	1,824	0	28,321	483,476
1999	32,775	32,952	49,999	47,533	264,931	10,223	46,556	0	3,516	1,297	1,032	0	490,814
2000	0	0	31,540	28,715	121,102	86,551	13,662	0	5,705	8,379	139,355	228,092	663,101
2001	113,327	85,211	289,915	44,096	1,840	88,708	22,124	24,641	47,194	35,541	17,252	165,095	934,944
2002	45,610	58,086	135,924	242,256	127,734	14,820	0	5,712	15,402	18,796	10,180	4,805	679,325
2003	20,233	21,977	42,904	27,625	0	0	635	0	0	3,482	1,509	9,800	128,165
2004	0	17,633	25,009	0	21,826	36,791	8,584	0	5,106	0	0	0	114,949
2005	0	0	0	0	0	0	0	0	0	0	7,468	11,659	19,127
2006	11,300	11,131	58,862	4,194	0	8,809	4,613	27,052	13,680	0	0	0	139,641
2007	135,600	65,951	39,415	0	0	34,063	477,391	255,292	151,623	33,614	8,086	23,074	1,224,109
2008	14,458	29,896	253,442	191,945	133,732	35,677	6,942	22,932	25,341	38,200	15,374	13,796	781,735
2009	2,572	0	33,353	13,272	370,017	167,904	60,805	37,857	94,699	345,603	165,611	133,415	1,425,108
2010	37,564	191,609	113,468	59,957	25,353	43,545	910	29,281	4,357	23,347	14,088	2,591	546,070
2011	13,733	23,949	11,770	16,952	80,514	11,054	1,517	0	10,175	7,286	0	9,990	186,940
2012	0	81,573	0	96,280	18,041	4,754	7,962	2,670	2,269	3,108	4,781	6,371	227,809
2013	17,926	13,091	0	79	0	49,077	15,047	0	4,505	24,420	33,464	35,676	193,285
2014	41,532	45,324	3,156	39,322	26,035	27,245	14,532	3,837	23,896	14,080	13,082	3,669	255,710
2015	44,913	31,785	127,624	37,110	0	1,044,182	178,700	49,530	10,458	24,342	46,509	354,256	1,949,409
2016	162,544	147,444	117,477	38,518	74,832	0	9,481	34,303	33,854	10,766	13,728	23,417	666,364
2017	1,315	9,971	18,377	43,521	0	32,088	52,970	41,630	38,516	10,241	17,714	11,673	278,016
2018	25,336	211,305	288,828	124,843	27,530	23,609	44,458	9,709	767	0	200,606	136,729	1,093,720
Total	3,505,992	4,198,154	5,145,371	3,907,551	5,848,349	4,311,552	2,600,875	1,248,611	1,143,232	1,889,703	2,615,813	4,630,345	41,045,548
Mean	49,380	59,129	72,470	55,036	82,371	60,726	36,632	17,586	16,102	26,616	36,842	65,216	578,106
Max	261,684	265,333	289,915	242,256	389,474	1,044,182	477,391	255,292	151,623	345,603	344,523	354,256	1,949,409
Min	0	0	0	0	0	0	0	0	0	0	0	0	19,127

Table of Final Results - Calculated Monthly Net Reservoir Evaporation Values

Quadrangle: 205
Units: Feet
Control Point 205

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	0.06	-0.03	0.22	0.54	0.31	0.41	0.62	0.39	0.66	0.37	0.16	0.34	4.05
1949	0.13	0.14	0.33	0.20	0.23	0.26	0.37	0.50	0.37	0.43	0.35	0.14	3.45
1950	0.21	0.19	0.38	0.41	0.55	0.41	0.18	0.50	0.18	0.44	0.32	0.26	4.03
1951	0.11	0.19	0.36	0.49	0.14	0.50	0.75	0.91	0.88	0.65	0.31	0.19	5.48
1952	0.24	0.30	0.35	0.28	0.50	0.87	0.82	0.82	0.88	0.83	0.38	0.23	6.50
1953	0.31	0.26	0.54	0.67	0.76	0.95	0.85	0.61	1.00	0.46	0.28	0.07	6.76
1954	0.10	0.34	0.40	0.43	0.17	0.55	0.59	0.52	0.63	0.29	0.34	0.25	4.61
1955	0.15	0.22	0.42	0.46	0.22	0.56	0.54	0.46	0.35	0.43	0.35	0.24	4.40
1956	0.17	0.06	0.51	0.57	0.59	0.63	0.52	0.56	0.72	0.46	0.29	0.23	5.31
1957	0.16	0.18	0.06	0.18	0.12	0.52	0.74	0.31	0.46	0.01	0.07	0.25	3.06
1958	0.02	0.08	-0.12	0.18	0.20	0.55	0.28	0.46	0.31	0.32	0.19	0.13	2.60
1959	0.14	0.19	0.38	0.41	0.23	0.39	0.43	0.23	0.53	0.17	0.22	-0.11	3.21
1960	0.02	0.08	0.18	0.47	0.48	0.14	0.00	0.38	0.13	-0.03	0.25	0.09	2.19
1961	0.07	0.08	0.12	0.37	0.45	0.37	0.33	0.23	0.31	0.38	0.00	0.13	2.84
1962	0.03	0.20	0.33	0.38	0.58	0.17	0.22	0.62	0.27	0.39	0.22	0.10	3.51
1963	0.05	0.13	0.46	0.66	0.29	0.38	0.64	0.24	0.35	0.45	0.29	0.07	4.01
1964	0.07	0.05	0.29	0.51	0.53	0.65	0.73	0.55	0.19	0.44	0.14	0.11	4.26
1965	0.09	0.11	0.07	0.43	0.26	-0.14	0.42	0.34	0.28	0.32	0.27	0.08	2.53
1966	0.06	-0.04	0.44	0.36	0.46	0.47	0.50	0.16	0.35	0.44	0.41	0.10	3.71
1967	0.09	0.13	0.46	0.42	0.35	0.24	0.32	0.38	0.37	0.58	0.23	0.06	3.63
1968	-0.04	0.03	0.19	0.36	0.17	0.50	0.30	0.40	0.48	0.39	0.14	0.04	2.96
1969	0.03	0.03	0.07	0.40	0.11	0.32	0.35	0.36	0.09	0.09	0.14	-0.02	1.97
1970	0.08	0.09	0.10	0.22	0.55	0.52	0.50	0.49	0.39	0.18	0.15	0.11	3.38
1971	0.23	0.21	0.30	0.42	0.40	0.48	0.27	0.28	0.22	0.20	0.08	0.08	3.17
1972	0.19	0.25	0.48	0.52	0.25	0.38	0.13	0.24	0.17	0.12	0.00	0.21	2.94
1973	0.10	0.11	-0.04	0.15	0.33	0.52	0.41	0.59	0.35	0.38	0.31	0.26	3.47
1974	0.19	0.37	0.32	0.67	0.49	0.67	0.73	0.21	0.21	0.08	0.21	0.08	4.23
1975	0.02	0.03	0.25	0.30	0.34	0.44	0.33	0.61	0.18	0.61	0.26	0.17	3.54
1976	0.25	0.35	0.47	0.41	0.32	0.73	0.52	0.60	0.16	0.34	0.21	0.25	4.61
1977	0.11	0.28	0.44	0.26	0.37	0.63	0.68	0.33	0.46	0.46	0.33	0.24	4.59
1978	0.09	0.09	0.37	0.67	0.23	0.40	0.78	0.57	0.44	0.41	-0.09	0.21	4.17
1979	0.08	0.14	0.29	0.36	0.21	0.34	0.52	0.33	0.48	0.60	0.21	0.22	3.78
1980	0.14	0.22	0.43	0.33	0.11	0.72	1.01	0.63	0.52	0.49	0.19	0.20	4.99
1981	0.19	0.28	0.24	0.51	0.45	0.68	0.50	0.05	0.18	0.22	0.21	0.20	3.71
1982	0.18	0.21	0.42	0.52	0.31	0.38	0.19	0.34	0.46	0.40	0.31	0.09	3.81
1983	0.05	0.07	0.20	0.39	0.33	0.49	0.86	0.70	0.69	0.31	0.27	0.06	4.42
1984	0.14	0.39	0.18	0.43	0.58	0.48	0.61	0.24	0.56	0.09	0.27	0.04	4.01
1985	0.07	0.17	0.23	0.39	0.32	0.47	0.62	0.54	0.23	0.04	0.17	0.04	3.29
1986	0.24	0.19	0.43	0.43	0.37	0.26	0.68	0.38	0.19	0.13	0.01	0.09	3.40
1987	0.10	0.03	0.22	0.46	0.09	0.37	0.79	0.27	0.24	0.38	0.22	0.13	3.30
1988	0.09	0.22	0.29	0.27	0.24	0.17	0.37	0.42	0.16	0.39	0.34	0.26	3.22
1989	0.18	0.07	0.48	0.49	0.28	0.23	0.49	0.25	0.31	0.48	0.43	0.16	3.85
1990	0.12	0.07	0.20	0.29	0.40	0.83	0.46	0.48	0.28	0.27	0.17	0.14	3.71
1991	0.10	0.31	0.40	0.60	0.41	0.59	0.62	0.39	0.41	0.64	0.17	0.11	4.75
1992	0.09	0.22	0.37	0.36	0.20	0.17	0.50	0.30	0.54	0.48	0.28	0.14	3.65
1993	0.09	0.15	0.32	0.49	0.43	0.44	0.76	0.61	0.67	0.48	0.27	0.16	4.87
1994	0.13	0.20	0.34	0.49	0.15	0.69	0.52	0.47	0.52	0.34	0.31	0.20	4.36
1995	0.00	0.00	0.44	0.43	0.21	0.39	0.44	0.52	0.32	0.51	0.39	0.31	3.96
1996	0.24	0.25	0.44	0.68	0.24	0.44	0.25	0.19	0.09	0.39	0.29	0.38	3.88
1997	0.19	0.20	0.61	0.07	0.35	0.41	0.57	0.19	0.46	0.41	0.19	-0.03	3.62
1998	0.25	0.23	0.32	0.49	0.64	1.01	0.68	0.44	0.65	0.08	0.26	0.19	5.24
1999	0.33	0.31	0.31	0.31	0.26	0.41	0.56	0.55	0.35	0.45	0.37	0.30	4.51
2000	0.36	0.45	0.08	0.49	0.63	0.18	0.66	0.72	0.70	-0.05	0.23	0.06	4.51
2001	0.00	0.08	0.10	0.60	0.23	0.71	0.92	0.53	0.60	0.61	0.20	0.21	4.79
2002	0.14	0.22	0.43	0.55	0.72	0.84	0.59	0.55	0.35	0.13	0.22	0.27	5.01
2003	0.34	0.20	0.30	0.54	0.63	0.19	0.94	0.70	0.41	0.37	0.28	0.24	5.14
2004	0.15	0.34	0.29	0.16	0.65	0.45	0.48	0.46	0.40	0.26	-0.04	0.20	3.80
2005	0.08	0.11	0.28	0.32	0.20	0.57	0.68	0.23	0.50	0.33	0.36	0.33	3.99
2006	0.48	0.35	0.39	0.56	0.64	0.77	0.65	0.19	0.34	0.34	0.40	0.11	5.22
2007	0.15	0.31	0.16	0.45	0.28	0.41	0.56	0.56	0.41	0.66	0.28	0.20	4.43
2008	0.13	0.44	0.54	0.59	0.32	0.69	0.44	0.33	0.43	-0.06	0.38	0.27	4.50
2009	0.26	0.32	0.44	0.42	0.44	0.54	0.43	0.61	0.49	0.26	0.36	0.11	4.68
2010	0.06	0.14	0.24	0.30	0.31	0.53	0.31	0.43	0.58	0.53	0.54	0.19	4.16
2011	0.13	0.13	0.18	0.75	0.83	1.15	1.02	0.77	0.65	0.52	0.46	-0.04	6.55
2012	0.26	0.19	0.53	0.57	0.53	0.60	0.91	0.81	0.51	0.51	0.26	0.19	5.87
2013	0.14	0.20	0.44	0.46	0.63	0.70	0.37	0.49	0.23	0.57	0.27	0.17	4.67
2014	0.18	0.18	0.47	0.68	0.43	0.28	0.41	0.50	0.18	0.30	0.30	0.15	4.06
2015	0.08	0.18	0.33	0.34	-0.14	0.34	-0.07	0.23	0.45	-0.17	0.29	0.18	2.04
2016	0.16	0.31	0.46	0.28	0.34	0.40	0.78	0.16	0.37	0.62	0.26	0.23	4.37
2017	0.01	0.28	0.37	0.26	0.46	0.62	0.62	-0.17	0.34	0.18	0.42	0.32	3.71
2018	0.32	0.37	0.51	0.43	0.67	0.74	0.66	0.46	0.42	-0.13	0.24	0.17	4.86
Total	9.96	13.43	22.83	30.34	26.36	35.15	38.21	30.70	29.04	24.45	17.85	11.54	198.99
Mean	0.14	0.19	0.32	0.43	0.37	0.49	0.54	0.43	0.41	0.35	0.25	0.16	4.07
Max	0.48	0.45	0.61	0.75	0.83	1.15	1.02	0.91	1.00	0.83	0.54	0.38	6.76
Min	-0.04	-0.04	-0.12	0.07	-0.14	-0.14	-0.07	-0.17	0.09	-0.17	-0.09	-0.11	1.97

Table of Final Results - Calculated Monthly Net Reservoir Evaporation Values

Quadrangle: 206
Units: Feet
Control Point 206

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	0.11	-0.01	0.25	0.50	0.37	0.46	0.51	0.26	0.63	0.37	0.13	0.36	3.94
1949	0.05	0.14	0.32	0.24	0.09	0.31	0.32	0.43	0.36	0.30	0.33	0.15	3.04
1950	0.28	0.20	0.41	0.38	0.48	0.31	-0.13	0.28	0.12	0.45	0.31	0.26	3.35
1951	0.11	0.14	0.32	0.43	-0.17	0.30	0.82	0.88	0.80	0.59	0.32	0.23	4.77
1952	0.24	0.30	0.36	0.30	0.47	0.76	0.78	0.90	0.89	0.82	0.37	0.21	6.40
1953	0.25	0.25	0.50	0.58	0.74	0.90	0.76	0.59	0.94	0.28	0.30	0.06	6.15
1954	0.13	0.35	0.40	0.35	-0.02	0.58	0.66	0.51	0.68	0.36	0.35	0.26	4.61
1955	0.13	0.23	0.43	0.59	0.08	0.42	0.59	0.54	0.33	0.45	0.35	0.24	4.38
1956	0.17	0.05	0.51	0.58	0.50	0.60	0.48	0.65	0.69	0.48	0.32	0.25	5.28
1957	0.16	0.13	0.00	0.06	-0.06	0.50	0.79	0.25	0.42	0.09	0.07	0.26	2.67
1958	0.02	0.07	-0.08	0.17	0.08	0.45	0.07	0.54	0.32	0.36	0.18	0.12	2.30
1959	0.15	0.20	0.37	0.35	0.07	0.42	0.29	0.38	0.50	0.14	0.21	-0.24	2.84
1960	-0.02	0.03	0.17	0.40	0.39	0.05	0.01	0.27	0.08	-0.08	0.25	0.12	1.67
1961	0.07	0.05	0.02	0.42	0.40	0.16	0.20	0.33	0.38	0.36	-0.04	0.16	2.51
1962	0.02	0.21	0.34	0.31	0.53	0.07	0.15	0.43	0.21	0.35	0.22	0.11	2.95
1963	0.06	0.15	0.47	0.65	0.36	0.35	0.64	0.28	0.33	0.42	0.30	0.05	4.06
1964	0.06	-0.04	0.31	0.60	0.49	0.51	0.78	0.59	0.26	0.43	0.10	0.09	4.18
1965	0.09	0.13	0.08	0.45	0.32	-0.17	0.57	0.38	0.34	0.29	0.28	0.12	2.88
1966	0.05	-0.02	0.45	0.38	0.50	0.39	0.67	0.24	0.27	0.45	0.44	0.14	3.96
1967	0.10	0.13	0.47	0.38	0.41	0.24	0.31	0.41	0.39	0.55	0.24	0.11	3.74
1968	-0.07	-0.01	0.24	0.37	0.13	0.49	0.39	0.32	0.54	0.41	0.16	0.06	3.03
1969	0.07	0.03	0.06	0.46	0.11	0.33	0.42	0.42	0.11	0.11	0.16	0.01	2.29
1970	0.09	0.14	0.07	0.27	0.60	0.57	0.58	0.51	0.47	0.22	0.14	0.12	3.78
1971	0.24	0.10	0.34	0.43	0.51	0.43	0.47	0.39	0.13	0.19	0.04	0.08	3.35
1972	0.18	0.26	0.49	0.54	0.16	0.30	0.45	0.48	0.36	0.21	0.00	0.22	3.65
1973	0.10	0.12	-0.13	0.09	0.32	0.63	0.36	0.61	0.27	0.38	0.26	0.24	3.25
1974	0.20	0.36	0.26	0.70	0.42	0.60	0.86	0.09	0.21	0.05	0.22	0.10	4.07
1975	0.03	0.01	0.22	0.36	0.15	0.39	0.18	0.50	0.22	0.62	0.10	0.17	2.95
1976	0.26	0.39	0.42	0.33	0.34	0.63	0.57	0.63	0.20	0.32	0.21	0.25	4.55
1977	0.10	0.24	0.46	0.16	0.04	0.61	0.70	0.23	0.54	0.43	0.33	0.25	4.09
1978	0.07	0.06	0.39	0.63	0.02	0.28	0.79	0.65	0.34	0.37	0.10	0.22	3.92
1979	0.05	0.12	0.20	0.30	0.15	0.30	0.52	0.34	0.50	0.48	0.20	0.22	3.38
1980	0.09	0.19	0.32	0.40	0.10	0.65	1.04	0.66	0.54	0.50	0.19	0.17	4.85
1981	0.18	0.27	0.20	0.46	0.34	0.61	0.49	0.24	0.24	0.09	0.20	0.20	3.52
1982	0.19	0.17	0.42	0.50	0.13	0.17	0.19	0.53	0.50	0.45	0.27	0.09	3.61
1983	0.07	-0.01	0.20	0.33	0.29	0.36	0.92	0.73	0.65	0.23	0.26	0.09	4.12
1984	0.13	0.37	0.14	0.47	0.58	0.39	0.68	0.36	0.55	0.17	0.24	0.04	4.12
1985	0.07	0.19	0.23	0.33	0.41	0.39	0.73	0.55	0.18	0.07	0.16	-0.02	3.29
1986	0.26	0.26	0.49	0.52	0.30	0.33	0.77	0.25	0.22	0.07	0.05	0.10	3.62
1987	0.10	0.09	0.18	0.49	0.02	0.23	0.72	0.33	0.13	0.34	0.24	0.06	2.93
1988	0.09	0.22	0.21	0.27	0.23	0.46	0.42	0.44	0.27	0.37	0.37	0.28	3.63
1989	0.24	0.11	0.43	0.45	0.18	0.02	0.53	0.28	0.36	0.49	0.46	0.17	3.72
1990	0.11	0.09	0.13	0.22	0.39	0.87	0.66	0.60	0.35	0.37	0.17	0.16	4.12
1991	0.11	0.29	0.44	0.60	0.38	0.52	0.61	0.60	0.43	0.59	0.16	0.06	4.79
1992	0.09	0.25	0.34	0.27	0.19	0.03	0.54	0.25	0.58	0.49	0.20	0.14	3.37
1993	0.09	0.15	0.30	0.49	0.42	0.48	0.66	0.56	0.62	0.52	0.28	0.19	4.76
1994	0.16	0.20	0.36	0.45	0.30	0.70	0.49	0.46	0.44	0.36	0.28	0.17	4.37
1995	0.00	0.00	0.39	0.40	0.09	0.35	0.40	0.52	0.23	0.51	0.39	0.30	3.58
1996	0.26	0.31	0.46	0.69	0.34	0.42	0.19	0.18	0.04	0.38	0.28	0.37	3.92
1997	0.18	0.17	0.61	-0.13	0.25	0.38	0.57	0.28	0.42	0.37	0.19	-0.03	3.26
1998	0.23	0.13	0.29	0.46	0.53	0.97	0.70	0.52	0.62	0.12	0.19	0.16	4.92
1999	0.29	0.33	0.13	0.31	0.29	0.41	0.58	0.51	0.37	0.48	0.44	0.31	4.45
2000	0.57	0.42	-0.01	0.29	0.28	0.01	0.46	0.55	0.57	-0.06	0.25	0.11	3.44
2001	0.01	0.08	0.16	0.61	0.33	0.69	0.89	0.56	0.50	0.54	0.14	0.25	4.76
2002	0.12	0.22	0.43	0.50	0.56	0.69	0.63	0.53	0.39	-0.11	0.24	0.20	4.40
2003	0.26	0.17	0.31	0.53	0.62	0.11	0.95	0.68	0.40	0.12	0.29	0.24	4.68
2004	0.12	0.25	0.28	0.13	0.70	0.32	0.48	0.51	0.30	0.16	-0.14	0.19	3.30
2005	0.10	0.11	0.28	0.36	0.20	0.51	0.60	0.25	0.62	0.32	0.36	0.33	4.04
2006	0.48	0.35	0.36	0.55	0.55	0.82	0.67	0.12	0.30	0.28	0.38	-0.08	4.78
2007	0.14	0.25	-0.03	0.24	0.25	0.29	0.60	0.54	0.33	0.65	0.30	0.16	3.72
2008	0.13	0.26	0.47	0.50	0.18	0.68	0.38	0.34	0.41	-0.03	0.31	0.28	3.91
2009	0.24	0.35	0.43	0.29	0.39	0.52	0.56	0.35	0.38	0.20	0.36	0.12	4.19
2010	0.07	0.16	0.31	0.26	0.34	0.64	0.32	0.41	0.51	0.43	0.26	0.19	3.90
2011	0.12	0.17	0.42	0.70	0.77	1.06	0.89	0.74	0.65	0.44	0.36	0.01	6.33
2012	0.25	0.16	0.41	0.33	0.56	0.61	0.84	0.67	0.39	0.46	0.38	0.19	5.25
2013	0.11	0.16	0.43	0.50	0.58	0.67	0.56	0.37	0.30	0.51	0.29	0.20	4.68
2014	0.28	0.15	0.48	0.61	0.42	0.43	0.50	0.58	0.26	0.36	0.29	0.15	4.51
2015	0.08	0.18	0.33	0.21	-0.34	0.37	0.13	0.25	0.60	-0.07	0.23	0.19	2.16
2016	0.17	0.30	0.47	0.38	0.26	0.54	0.81	0.26	0.38	0.59	0.33	0.24	4.73
2017	-0.05	0.26	0.36	0.33	0.45	0.63	0.72	-0.01	0.29	0.25	0.38	0.32	3.93
2018	0.34	0.39	0.54	0.50	0.63	0.57	0.67	0.56	0.47	-0.02	0.26	0.19	5.10
Total	10.03	12.68	21.82	28.56	22.47	32.07	39.11	31.42	28.62	23.24	17.24	11.49	192.49
Mean	0.14	0.18	0.30	0.40	0.31	0.45	0.55	0.44	0.40	0.33	0.24	0.16	3.91
Max	0.57	0.42	0.61	0.70	0.77	1.06	1.04	0.90	0.94	0.82	0.46	0.37	6.40
Min	-0.07	-0.04	-0.13	-0.13	-0.34	-0.17	-0.13	-0.01	0.04	-0.11	-0.14	-0.24	1.67

Table of Final Results - Calculated Monthly Net Reservoir Evaporation Values

Quadrangle: 207
Units: Feet
Control Point 207

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	0.12	0.00	0.21	0.48	0.36	0.40	0.53	0.32	0.60	0.37	0.20	0.36	3.95
1949	-0.01	0.14	0.26	0.22	-0.01	0.24	0.49	0.45	0.38	0.28	0.33	0.14	2.91
1950	0.27	0.17	0.40	0.39	0.34	0.33	-0.05	0.24	0.14	0.46	0.31	0.26	3.26
1951	0.11	0.14	0.31	0.37	-0.08	0.19	0.85	0.93	0.73	0.51	0.26	0.24	4.56
1952	0.21	0.26	0.32	0.18	0.43	0.78	0.76	0.89	0.83	0.77	0.34	0.19	5.96
1953	0.25	0.21	0.46	0.48	0.66	0.76	0.67	0.55	0.91	0.24	0.29	0.07	5.55
1954	0.16	0.36	0.38	0.29	-0.22	0.64	0.79	0.58	0.68	0.36	0.36	0.26	4.64
1955	0.10	0.16	0.40	0.57	-0.13	0.21	0.63	0.55	0.41	0.35	0.34	0.21	3.80
1956	0.16	0.10	0.43	0.55	0.20	0.62	0.58	0.73	0.73	0.46	0.31	0.19	5.06
1957	0.11	0.10	-0.06	-0.02	-0.21	0.34	0.76	0.48	0.40	0.02	0.05	0.23	2.20
1958	0.03	0.09	-0.07	0.14	0.11	0.38	0.12	0.46	0.21	0.39	0.23	0.12	2.21
1959	0.15	0.16	0.37	0.29	-0.08	0.29	0.25	0.48	0.39	0.11	0.23	-0.25	2.39
1960	-0.02	-0.04	0.17	0.43	0.25	0.20	0.10	0.36	0.14	-0.17	0.26	0.01	1.69
1961	0.09	0.06	0.06	0.40	0.28	0.03	0.32	0.32	0.37	0.35	-0.02	0.14	2.40
1962	0.01	0.24	0.35	0.20	0.55	0.04	0.36	0.52	0.07	0.31	0.20	0.09	2.94
1963	0.06	0.16	0.44	0.53	0.34	0.36	0.67	0.38	0.27	0.49	0.27	0.09	4.06
1964	0.05	-0.05	0.34	0.58	0.32	0.41	0.82	0.60	0.26	0.35	-0.04	0.05	3.69
1965	0.10	0.10	0.13	0.38	0.29	-0.09	0.73	0.44	0.14	0.20	0.28	0.14	2.84
1966	0.00	-0.03	0.45	0.24	0.45	0.52	0.61	0.10	0.17	0.43	0.38	0.08	3.40
1967	0.08	0.16	0.41	0.28	0.26	0.22	0.29	0.39	0.21	0.42	0.17	0.06	2.95
1968	-0.07	-0.02	0.19	0.34	-0.13	0.35	0.45	0.30	0.43	0.31	0.10	0.02	2.27
1969	0.00	-0.02	0.03	0.38	0.06	0.37	0.58	0.37	0.18	0.15	0.19	-0.02	2.27
1970	0.07	0.16	0.06	0.14	0.54	0.56	0.55	0.50	0.34	0.25	0.16	0.11	3.44
1971	0.22	0.09	0.37	0.45	0.43	0.48	0.44	0.32	0.12	0.14	0.00	-0.01	3.05
1972	0.12	0.27	0.48	0.44	0.01	0.38	0.46	0.41	0.28	0.17	-0.09	0.14	3.07
1973	0.02	0.08	-0.30	-0.18	0.22	0.43	0.33	0.61	0.02	0.26	0.12	0.17	1.78
1974	0.16	0.34	0.23	0.39	0.30	0.54	0.88	0.19	0.05	0.07	0.05	0.09	3.29
1975	0.02	-0.04	0.13	0.35	-0.08	0.21	0.17	0.40	0.30	0.50	-0.09	0.17	2.04
1976	0.23	0.34	0.31	0.15	0.24	0.48	0.51	0.65	0.16	0.28	0.20	0.22	3.77
1977	0.09	0.17	0.44	0.05	-0.27	0.45	0.76	0.18	0.49	0.39	0.20	0.26	3.21
1978	0.04	0.04	0.37	0.54	-0.23	0.42	0.74	0.59	0.25	0.42	0.04	0.17	3.39
1979	-0.01	0.02	-0.03	0.18	0.04	0.27	0.32	0.40	0.43	0.41	0.14	0.17	2.34
1980	0.07	0.16	0.23	0.31	0.08	0.72	0.93	0.77	0.33	0.45	0.14	0.14	4.33
1981	0.19	0.23	0.13	0.44	0.19	0.46	0.33	0.44	0.37	0.01	0.12	0.22	3.13
1982	0.16	0.12	0.39	0.42	-0.08	0.02	0.39	0.61	0.50	0.42	0.08	-0.02	3.01
1983	0.09	-0.02	0.19	0.30	0.13	0.27	0.88	0.76	0.54	0.18	0.22	0.04	3.58
1984	0.14	0.30	0.08	0.41	0.46	0.40	0.60	0.47	0.58	0.20	0.13	-0.05	3.72
1985	0.07	-0.09	0.07	0.25	0.41	0.21	0.66	0.40	0.26	-0.08	0.05	0.00	2.21
1986	0.34	0.20	0.51	0.37	0.19	0.30	0.80	0.31	0.12	-0.05	0.02	0.07	3.18
1987	0.06	-0.01	0.16	0.51	-0.04	0.32	0.66	0.48	0.15	0.36	0.11	-0.08	2.68
1988	0.08	0.19	-0.01	0.27	0.45	0.38	0.41	0.46	0.04	0.30	0.14	0.25	2.96
1989	0.18	0.01	0.26	0.39	0.07	-0.12	0.43	0.21	0.36	0.43	0.50	0.16	2.88
1990	0.08	0.00	-0.01	0.13	0.14	0.62	0.56	0.50	0.28	0.23	0.12	0.08	2.73
1991	0.13	0.26	0.46	0.59	0.31	0.39	0.57	0.61	0.26	0.54	0.14	0.08	4.34
1992	0.09	0.30	0.31	0.29	0.14	0.16	0.57	0.40	0.62	0.48	0.08	0.14	3.58
1993	0.08	0.14	0.23	0.46	0.34	0.39	0.67	0.65	0.64	0.46	0.34	0.29	4.69
1994	0.28	0.22	0.41	0.33	0.34	0.70	0.53	0.58	0.41	0.28	0.23	0.13	4.44
1995	0.00	0.00	0.33	0.29	-0.06	0.10	0.44	0.38	0.04	0.49	0.40	0.28	2.69
1996	0.28	0.43	0.49	0.64	0.41	0.35	0.15	0.24	0.00	0.40	0.26	0.37	4.02
1997	0.31	0.11	0.58	-0.38	0.07	0.29	0.56	0.36	0.27	0.21	0.27	-0.03	2.62
1998	0.19	0.04	0.14	0.43	0.36	0.85	0.68	0.43	0.59	0.08	-0.03	0.10	3.86
1999	0.30	0.34	0.02	0.30	0.29	0.39	0.72	0.59	0.27	0.51	0.45	0.26	4.44
2000	0.58	0.14	-0.06	0.17	0.20	-0.34	0.46	0.59	0.58	-0.17	0.25	0.09	2.49
2001	0.02	0.03	0.19	0.53	-0.03	0.64	0.82	0.47	0.43	0.49	0.09	0.25	3.93
2002	0.15	0.24	0.44	0.38	0.27	0.55	0.26	0.61	0.39	-0.40	0.24	0.13	3.26
2003	0.20	0.16	0.33	0.40	0.33	0.02	0.79	0.50	0.19	0.08	0.30	0.23	3.53
2004	0.08	0.18	0.23	0.16	0.51	0.11	0.49	0.32	0.45	0.01	-0.08	0.22	2.68
2005	0.07	0.13	0.30	0.37	0.14	0.31	0.56	0.19	0.54	0.29	0.37	0.32	3.59
2006	0.47	0.35	0.33	0.54	0.30	0.66	0.68	0.27	0.37	0.31	0.37	-0.15	4.50
2007	0.13	0.29	-0.05	0.21	0.00	0.28	0.46	0.36	0.15	0.52	0.34	0.16	2.85
2008	0.18	0.22	0.45	0.34	0.23	0.50	0.56	0.14	0.31	0.04	0.30	0.28	3.55
2009	0.23	0.36	0.43	0.31	0.27	0.49	0.53	0.32	0.30	0.10	0.36	0.12	3.82
2010	0.09	0.15	0.39	0.18	0.22	0.67	0.29	0.57	0.42	0.31	0.27	0.21	3.77
2011	0.13	0.17	0.52	0.63	0.67	1.01	0.86	0.71	0.61	0.31	0.31	-0.02	5.91
2012	0.23	0.10	0.35	0.29	0.51	0.55	0.79	0.59	0.36	0.45	0.42	0.20	4.84
2013	0.09	0.11	0.39	0.43	0.54	0.61	0.50	0.37	0.15	0.46	0.31	0.22	4.18
2014	0.35	0.16	0.48	0.52	0.43	0.31	0.31	0.61	0.36	0.35	0.27	0.15	4.30
2015	0.13	0.20	0.33	-0.05	-0.37	0.33	0.30	0.33	0.61	0.12	0.21	0.13	2.27
2016	0.20	0.32	0.47	0.42	0.20	0.34	0.69	0.24	0.30	0.54	0.36	0.21	4.29
2017	-0.08	0.24	0.39	0.34	0.30	0.54	0.62	0.15	0.29	0.20	0.38	0.32	3.69
2018	0.34	0.38	0.52	0.40	0.47	0.45	0.66	0.47	0.30	-0.08	0.28	0.19	4.38
Total	9.63	10.78	19.44	23.53	14.63	27.04	38.64	32.15	24.83	19.88	14.89	9.86	169.03
Mean	0.13	0.15	0.27	0.33	0.20	0.38	0.54	0.45	0.35	0.29	0.21	0.14	3.44
Max	0.58	0.43	0.58	0.64	0.67	1.01	0.93	0.93	0.91	0.77	0.50	0.37	5.96
Min	-0.08	-0.09	-0.30	-0.38	-0.37	-0.34	-0.05	0.10	0.00	-0.40	-0.09	-0.25	1.69

Table of Final Results - Calculated Monthly Net Reservoir Evaporation Values

Quadrangle: 305
Units: Feet
Control Point 305

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	0.14	0.03	0.30	0.55	0.40	0.47	0.63	0.59	0.68	0.45	0.34	0.38	4.96
1949	0.00	0.12	0.34	0.21	0.05	0.36	0.57	0.62	0.36	0.30	0.39	0.17	3.49
1950	0.23	0.20	0.43	0.46	0.35	0.52	-0.07	0.46	0.13	0.52	0.41	0.25	3.89
1951	0.25	0.15	0.40	0.46	0.28	0.62	0.73	0.75	0.74	0.41	0.26	0.31	5.36
1952	0.28	0.31	0.39	0.34	0.68	0.95	0.87	0.98	0.79	0.71	0.29	0.17	6.76
1953	0.34	0.30	0.38	0.50	0.64	0.96	0.82	0.77	0.96	0.30	0.30	0.22	6.49
1954	0.19	0.31	0.40	0.43	0.23	0.69	0.73	0.41	0.56	0.24	0.32	0.24	4.75
1955	0.11	0.22	0.43	0.58	0.20	0.58	0.42	0.48	0.33	0.32	0.35	0.27	4.29
1956	0.19	0.09	0.51	0.55	0.47	0.57	0.67	0.63	0.71	0.46	0.32	0.26	5.43
1957	0.17	0.20	0.17	0.19	0.12	0.46	0.74	0.24	0.38	0.05	0.07	0.26	3.05
1958	0.00	0.10	-0.07	0.23	0.21	0.50	0.48	0.36	0.19	0.26	0.22	0.17	2.65
1959	0.17	0.20	0.42	0.39	0.33	0.36	0.40	0.38	0.54	0.19	0.27	0.01	3.66
1960	-0.01	0.08	0.23	0.48	0.51	0.43	0.01	0.42	0.32	0.07	0.29	0.08	2.91
1961	0.03	0.13	0.28	0.48	0.43	0.35	0.32	0.39	0.34	0.40	-0.04	0.10	3.21
1962	0.02	0.25	0.34	0.34	0.55	0.33	0.12	0.59	0.08	0.24	0.20	0.12	3.18
1963	0.06	0.12	0.40	0.52	0.28	0.19	0.81	0.34	0.31	0.44	0.26	0.07	3.80
1964	0.18	0.08	0.33	0.53	0.46	0.43	0.69	0.47	0.18	0.38	0.07	0.10	3.90
1965	0.14	0.10	0.08	0.40	0.31	0.34	0.45	0.34	0.27	0.32	0.33	0.08	3.16
1966	0.08	0.08	0.43	0.27	0.35	0.28	0.46	0.00	0.23	0.39	0.27	0.11	2.95
1967	0.09	0.21	0.39	0.37	0.35	0.11	0.22	0.35	0.35	0.43	0.23	0.04	3.14
1968	-0.08	0.08	0.11	0.36	0.16	0.48	0.37	0.31	0.38	0.33	0.10	0.13	2.73
1969	0.14	0.10	0.17	0.33	0.08	0.33	0.47	0.42	0.11	-0.05	0.16	0.00	2.26
1970	0.08	0.15	0.08	0.39	0.48	0.45	0.46	0.43	0.32	0.22	0.24	0.19	3.49
1971	0.24	0.18	0.30	0.36	0.36	0.44	0.37	0.01	0.08	0.18	0.14	0.01	2.67
1972	0.20	0.25	0.48	0.53	0.16	0.33	0.24	0.21	0.14	0.11	0.04	0.22	2.91
1973	0.08	0.09	0.04	0.16	0.40	0.46	0.22	0.51	0.31	0.32	0.33	0.34	3.26
1974	0.20	0.36	0.34	0.59	0.55	0.60	0.61	0.00	0.07	-0.10	0.20	0.08	3.50
1975	0.02	0.03	0.30	0.30	0.37	0.47	0.13	0.50	0.29	0.45	0.25	0.16	3.27
1976	0.26	0.33	0.45	0.39	0.42	0.56	0.44	0.42	0.16	0.24	0.20	0.24	4.11
1977	0.12	0.25	0.41	0.25	0.26	0.52	0.60	0.24	0.49	0.33	0.31	0.29	4.07
1978	0.13	0.07	0.41	0.66	0.37	0.51	0.77	0.42	0.16	0.26	-0.03	0.20	3.93
1979	0.07	0.19	0.29	0.30	0.25	0.13	0.43	0.23	0.35	0.40	0.18	0.20	3.02
1980	0.15	0.21	0.49	0.40	0.15	0.66	0.81	0.49	0.22	0.36	0.17	0.20	4.31
1981	0.13	0.22	0.27	0.44	0.41	0.67	0.42	0.08	0.10	0.02	0.20	0.21	3.17
1982	0.19	0.22	0.42	0.51	0.33	0.31	0.36	0.49	0.55	0.44	0.27	0.03	4.12
1983	0.06	0.06	0.28	0.42	0.42	0.46	0.84	0.67	0.62	0.20	0.27	0.10	4.40
1984	0.15	0.40	0.35	0.56	0.58	0.48	0.53	0.10	0.54	0.12	0.24	0.03	4.08
1985	0.08	0.24	0.26	0.55	0.30	0.40	0.58	0.59	0.14	0.08	0.20	-0.02	3.40
1986	0.25	0.18	0.43	0.49	0.29	0.12	0.66	0.15	0.12	0.06	0.04	0.00	2.79
1987	0.12	0.10	0.32	0.40	0.13	0.35	0.62	0.24	0.09	0.33	0.27	0.06	3.03
1988	0.12	0.18	0.33	0.30	0.20	0.32	0.42	0.49	0.22	0.43	0.36	0.25	3.62
1989	0.18	0.11	0.57	0.63	0.38	0.31	0.62	0.21	0.32	0.52	0.46	0.17	4.48
1990	0.14	0.14	0.25	0.28	0.46	0.81	0.48	0.38	0.25	0.32	0.14	0.17	3.82
1991	0.09	0.31	0.49	0.64	0.69	0.53	0.60	0.37	0.24	0.62	0.19	0.06	4.83
1992	0.06	0.24	0.36	0.36	0.14	0.03	0.60	0.34	0.27	0.30	0.25	0.15	3.10
1993	0.10	0.20	0.38	0.52	0.54	0.73	0.63	0.60	0.39	0.50	0.29	0.22	5.10
1994	0.20	0.23	0.38	0.50	0.12	0.71	0.58	0.52	0.36	0.45	0.31	0.22	4.58
1995	0.00	0.00	0.48	0.53	0.22	0.55	0.47	0.58	0.19	0.49	0.41	0.31	4.23
1996	0.29	0.36	0.52	0.45	0.52	0.45	0.39	0.34	0.17	0.39	0.29	0.38	4.55
1997	0.17	0.18	0.57	0.07	0.20	0.38	0.47	0.19	0.34	0.41	0.23	0.01	3.22
1998	0.27	0.18	0.35	0.55	0.73	1.08	0.90	0.28	0.52	0.05	0.24	0.19	5.34
1999	0.26	0.30	0.26	0.42	0.33	0.24	0.56	0.38	0.21	0.43	0.39	0.24	4.02
2000	0.29	0.45	0.22	0.46	0.70	-0.19	0.71	0.71	0.69	0.14	0.20	0.11	4.49
2001	-0.01	0.09	0.06	0.60	0.14	0.81	0.94	0.60	0.59	0.58	0.14	0.14	4.68
2002	0.15	0.22	0.40	0.54	0.72	0.82	0.70	0.61	0.45	0.08	0.23	0.26	5.18
2003	0.34	0.19	0.32	0.56	0.51	0.10	0.95	0.72	0.38	0.35	0.31	0.25	4.98
2004	0.10	0.25	0.26	0.14	0.53	0.31	0.39	0.33	0.03	0.03	-0.10	0.23	2.50
2005	0.08	0.13	0.29	0.41	0.28	0.63	0.57	0.06	0.55	0.29	0.39	0.33	4.01
2006	0.49	0.34	0.38	0.56	0.58	0.61	0.62	0.18	0.13	0.27	0.37	0.08	4.61
2007	0.08	0.30	0.01	0.42	0.18	0.20	0.48	0.57	0.33	0.60	0.28	0.18	3.63
2008	0.13	0.45	0.50	0.58	0.38	0.47	0.49	0.16	0.32	0.11	0.40	0.33	4.32
2009	0.25	0.33	0.48	0.42	0.43	0.40	0.42	0.50	0.39	0.24	0.37	0.09	4.32
2010	0.08	0.11	0.32	0.36	0.38	0.56	0.23	0.38	0.49	0.48	0.59	0.29	4.27
2011	0.21	0.22	0.12	0.79	0.82	0.94	0.92	0.80	0.52	0.41	0.48	-0.02	6.21
2012	0.25	0.19	0.53	0.54	0.39	0.48	0.65	0.60	0.40	0.48	0.25	0.20	4.96
2013	0.15	0.20	0.44	0.22	0.63	0.49	0.23	0.44	0.41	0.50	0.27	0.18	4.16
2014	0.25	0.18	0.51	0.65	0.34	0.40	0.31	0.45	-0.04	0.35	0.27	0.15	3.82
2015	0.05	0.16	0.32	0.35	-0.32	0.27	0.16	0.36	0.43	-0.26	0.22	0.15	1.89
2016	0.18	0.31	0.47	0.37	0.29	0.39	0.72	0.20	0.15	0.57	0.26	0.22	4.13
2017	0.02	0.26	0.40	0.23	0.36	0.39	0.36	-0.36	0.18	0.22	0.43	0.30	2.79
2018	0.30	0.33	0.44	0.25	0.67	0.66	0.32	0.28	0.13	-0.10	0.26	0.18	3.72
Total	10.52	14.13	24.19	30.37	26.21	33.11	36.89	28.35	23.70	21.43	18.11	12.10	196.42
Mean	0.15	0.20	0.34	0.43	0.36	0.46	0.52	0.40	0.34	0.31	0.26	0.17	3.93
Max	0.49	0.45	0.57	0.79	0.82	1.08	0.95	0.98	0.96	0.71	0.59	0.38	6.76
Min	-0.08	0.00	-0.07	0.07	-0.32	-0.19	-0.07	-0.36	-0.04	-0.26	-0.10	-0.02	2.26

Table of Final Results - Calculated Monthly Net Reservoir Evaporation Values

Quadrangle: 306
Units: Feet
Control Point 306

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	0.11	-0.02	0.19	0.50	0.40	0.45	0.62	0.45	0.65	0.42	0.39	0.37	4.53
1949	-0.15	0.12	0.27	0.21	0.12	0.36	0.56	0.48	0.35	0.28	0.37	0.20	3.17
1950	0.22	0.21	0.43	0.41	0.38	0.41	0.00	0.42	-0.04	0.52	0.40	0.23	3.59
1951	0.25	0.14	0.38	0.40	0.43	0.60	0.78	0.78	0.58	0.45	0.24	0.30	5.33
1952	0.24	0.31	0.39	0.27	0.65	0.95	0.82	1.03	0.79	0.70	0.28	0.16	6.59
1953	0.29	0.31	0.37	0.48	0.61	0.97	0.75	0.70	0.93	0.17	0.28	0.20	6.06
1954	0.14	0.31	0.38	0.25	0.01	0.58	0.59	0.42	0.57	0.34	0.30	0.22	4.11
1955	0.11	0.18	0.38	0.56	-0.07	0.23	0.49	0.48	0.33	0.25	0.33	0.24	3.51
1956	0.16	-0.02	0.52	0.56	0.29	0.62	0.56	0.69	0.70	0.45	0.29	0.22	5.04
1957	0.15	0.10	0.17	0.02	-0.06	0.19	0.81	0.39	0.47	-0.04	0.03	0.26	2.49
1958	0.00	0.10	-0.09	0.09	0.08	0.43	0.43	0.49	0.18	0.28	0.19	0.15	2.33
1959	0.17	0.21	0.40	0.33	0.13	0.21	0.29	0.52	0.53	0.06	0.24	-0.19	2.90
1960	0.00	0.05	0.19	0.32	0.37	0.15	-0.07	0.37	0.13	-0.10	0.27	0.08	1.76
1961	0.04	0.02	0.10	0.41	0.37	0.13	0.06	0.43	0.32	0.32	0.01	0.14	2.35
1962	0.05	0.26	0.41	0.34	0.47	0.04	0.25	0.55	0.10	0.23	0.15	0.14	2.99
1963	0.06	0.17	0.50	0.56	0.30	0.22	0.61	0.30	0.35	0.43	0.21	0.05	3.76
1964	0.13	0.06	0.37	0.61	0.54	0.49	0.83	0.57	0.20	0.41	0.14	0.07	4.42
1965	0.11	0.13	0.11	0.41	0.39	0.13	0.62	0.44	0.23	0.28	0.29	0.13	3.27
1966	0.05	0.02	0.44	0.29	0.47	0.35	0.76	0.11	0.21	0.47	0.43	0.14	3.74
1967	0.10	0.13	0.45	0.47	0.40	0.24	0.32	0.52	0.36	0.60	0.24	0.11	3.94
1968	-0.07	-0.01	0.17	0.39	0.15	0.34	0.36	0.23	0.49	0.41	0.14	0.06	2.66
1969	0.07	0.07	0.06	0.44	0.08	0.39	0.59	0.41	0.05	-0.02	0.18	0.00	2.32
1970	0.09	0.14	0.04	0.41	0.54	0.56	0.67	0.60	0.44	0.20	0.17	0.13	3.99
1971	0.25	0.18	0.32	0.43	0.36	0.41	0.50	0.19	-0.01	0.21	0.20	0.06	3.10
1972	0.20	0.26	0.50	0.51	0.06	0.30	0.23	0.38	0.23	0.15	0.04	0.21	3.07
1973	0.08	0.09	-0.10	0.07	0.33	0.47	0.37	0.48	0.15	0.36	0.34	0.35	2.99
1974	0.21	0.38	0.29	0.62	0.49	0.56	0.80	0.07	-0.05	-0.03	0.21	0.09	3.64
1975	0.03	0.00	0.24	0.41	0.23	0.45	0.17	0.47	0.30	0.51	0.17	0.15	3.13
1976	0.26	0.40	0.45	0.29	0.39	0.56	0.30	0.57	0.14	0.23	0.21	0.25	4.05
1977	0.12	0.23	0.46	0.20	0.03	0.54	0.72	0.25	0.60	0.35	0.37	0.32	4.19
1978	0.08	0.06	0.42	0.62	0.13	0.35	0.77	0.57	0.24	0.38	0.05	0.23	3.90
1979	0.07	0.10	0.16	0.35	0.24	0.11	0.39	0.28	0.45	0.45	0.21	0.20	3.01
1980	0.13	0.18	0.41	0.47	0.15	0.60	0.94	0.68	0.32	0.41	0.18	0.15	4.62
1981	0.13	0.22	0.29	0.40	0.39	0.66	0.58	0.21	0.32	0.09	0.26	0.21	3.76
1982	0.19	0.20	0.41	0.52	0.06	0.11	0.42	0.58	0.55	0.46	0.26	0.07	3.83
1983	0.01	0.03	0.30	0.37	0.35	0.42	0.82	0.68	0.56	-0.02	0.26	0.09	3.87
1984	0.16	0.36	0.34	0.53	0.59	0.38	0.59	0.29	0.53	0.28	0.22	0.02	4.29
1985	0.08	0.19	0.22	0.50	0.36	0.08	0.48	0.57	0.14	0.00	0.21	-0.03	2.80
1986	0.28	0.23	0.52	0.46	0.34	0.12	0.85	0.07	0.13	-0.10	0.06	0.08	3.04
1987	0.13	0.06	0.31	0.54	0.04	0.37	0.52	0.32	0.19	0.39	0.27	0.01	3.15
1988	0.12	0.21	0.28	0.28	0.36	0.44	0.38	0.49	0.15	0.42	0.36	0.27	3.76
1989	0.18	0.10	0.47	0.56	0.18	0.03	0.68	0.26	0.18	0.53	0.49	0.18	3.84
1990	0.15	0.07	0.20	0.15	0.29	0.69	0.53	0.51	0.37	0.37	0.14	0.19	3.66
1991	0.08	0.29	0.51	0.66	0.47	0.53	0.57	0.61	0.18	0.59	0.19	0.06	4.74
1992	0.08	0.24	0.38	0.28	0.08	0.00	0.54	0.46	0.55	0.50	0.18	0.16	3.45
1993	0.08	0.20	0.33	0.51	0.54	0.72	0.63	0.62	0.70	0.50	0.32	0.27	5.42
1994	0.22	0.23	0.39	0.41	0.20	0.76	0.53	0.59	0.43	0.43	0.29	0.19	4.67
1995	0.00	0.00	0.44	0.45	0.12	0.46	0.60	0.40	0.04	0.49	0.41	0.32	3.73
1996	0.30	0.42	0.51	0.74	0.54	0.41	0.34	0.29	0.23	0.40	0.28	0.37	4.83
1997	0.16	0.05	0.52	-0.09	0.16	0.32	0.65	0.27	0.34	0.34	0.25	0.01	2.98
1998	0.27	0.03	0.30	0.55	0.59	0.97	0.83	0.38	0.62	0.08	0.17	0.16	4.95
1999	0.25	0.31	0.20	0.50	0.21	0.37	0.69	0.58	0.33	0.46	0.44	0.28	4.62
2000	0.54	0.45	0.13	0.34	0.60	-0.08	0.71	0.57	0.57	0.08	0.21	0.13	4.25
2001	-0.02	0.08	0.03	0.57	0.11	0.81	0.98	0.54	0.55	0.62	0.13	0.19	4.59
2002	0.27	0.20	0.36	0.47	0.67	0.78	0.64	0.53	0.47	0.02	0.22	0.24	4.87
2003	0.34	0.20	0.32	0.52	0.58	0.12	0.97	0.77	0.49	0.42	0.32	0.25	5.30
2004	0.00	0.24	0.24	0.18	0.68	0.17	0.48	0.39	0.38	0.06	-0.23	0.22	2.81
2005	0.10	0.12	0.27	0.36	0.21	0.48	0.60	0.21	0.56	0.29	0.40	0.33	3.93
2006	0.49	0.32	0.29	0.49	0.49	0.73	0.74	0.30	0.09	0.22	0.37	0.01	4.54
2007	0.10	0.25	-0.09	0.31	0.04	0.15	0.50	0.58	0.29	0.68	0.33	0.15	3.29
2008	0.13	0.35	0.47	0.52	0.18	0.58	0.59	0.36	0.26	0.13	0.40	0.33	4.30
2009	0.25	0.31	0.45	0.31	0.51	0.38	0.45	0.55	0.41	0.31	0.39	0.10	4.42
2010	0.06	0.13	0.26	0.12	0.39	0.59	0.03	0.32	0.52	0.51	0.56	0.32	3.81
2011	0.21	0.25	0.17	0.87	0.87	1.16	1.03	0.96	0.69	0.48	0.46	0.04	7.19
2012	0.26	0.20	0.47	0.54	0.44	0.40	0.66	0.55	0.25	0.51	0.29	0.22	4.79
2013	0.16	0.14	0.47	0.52	0.60	0.41	0.34	0.50	0.34	0.52	0.31	0.20	4.51
2014	0.34	0.18	0.49	0.60	0.32	0.24	0.39	0.50	0.07	0.32	0.19	0.15	3.79
2015	0.08	0.18	0.31	0.27	-0.53	0.30	0.32	0.41	0.52	0.02	0.21	0.18	2.27
2016	0.20	0.32	0.49	0.26	0.25	0.37	0.60	0.18	0.25	0.58	0.25	0.21	3.96
2017	-0.03	0.26	0.37	0.27	0.50	0.37	0.40	-0.03	0.17	0.33	0.42	0.29	3.32
2018	0.35	0.35	0.53	0.55	0.67	0.48	0.61	0.44	0.10	-0.05	0.26	0.18	4.47
Total	10.45	12.84	22.73	29.09	22.91	29.67	39.16	32.13	24.81	22.39	18.10	12.07	191.32
Mean	0.14	0.18	0.32	0.41	0.32	0.42	0.55	0.45	0.35	0.32	0.25	0.17	3.88
Max	0.54	0.45	0.53	0.87	0.87	1.16	1.03	1.03	0.93	0.70	0.56	0.37	6.59
Min	-0.15	-0.02	-0.10	-0.09	-0.53	-0.08	-0.07	-0.03	-0.05	-0.10	-0.23	-0.19	1.76

Table of Final Results - Calculated Monthly Net Reservoir Evaporation Values

Quadrangle: 307
Units: Feet
Control Point 307

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	0.16	-0.05	0.18	0.51	0.38	0.50	0.59	0.67	0.72	0.43	0.44	0.36	4.89
1949	-0.23	0.08	0.20	0.18	0.02	0.41	0.72	0.62	0.38	0.28	0.40	0.18	3.24
1950	0.20	0.21	0.43	0.36	0.21	0.34	0.04	0.46	0.02	0.59	0.49	0.23	3.58
1951	0.25	0.10	0.35	0.36	0.33	0.45	0.73	0.85	0.52	0.45	0.21	0.36	4.96
1952	0.23	0.27	0.33	0.06	0.40	0.98	0.81	1.15	0.82	0.82	0.32	0.13	6.32
1953	0.35	0.36	0.31	0.38	0.55	1.00	0.72	0.71	0.99	-0.07	0.15	0.24	5.69
1954	0.15	0.33	0.36	0.26	-0.23	0.59	0.72	0.41	0.66	0.54	0.34	0.26	4.39
1955	0.10	0.21	0.44	0.62	-0.01	0.09	0.59	0.65	0.33	0.12	0.38	0.21	3.73
1956	0.18	0.20	0.56	0.60	0.25	0.72	0.79	0.85	0.74	0.39	0.34	0.23	5.85
1957	0.18	0.11	0.19	-0.10	-0.19	0.20	0.82	0.54	0.44	-0.02	0.05	0.26	2.48
1958	0.05	0.09	-0.05	0.11	0.08	0.48	0.34	0.58	0.19	0.31	0.21	0.16	2.55
1959	0.17	0.21	0.44	0.37	0.01	0.17	0.35	0.53	0.49	0.01	0.25	-0.21	2.79
1960	-0.01	0.02	0.18	0.30	0.17	0.04	0.22	0.31	0.24	-0.33	0.28	-0.01	1.41
1961	0.07	0.02	0.09	0.43	0.26	0.04	0.15	0.47	0.29	0.29	0.02	0.09	2.22
1962	0.10	0.31	0.42	0.25	0.54	0.06	0.29	0.62	-0.02	0.23	0.14	0.14	3.08
1963	0.07	0.23	0.45	0.47	0.29	0.32	0.75	0.47	0.35	0.49	0.20	0.08	4.17
1964	0.21	0.05	0.43	0.62	0.41	0.53	0.87	0.64	0.15	0.34	0.03	0.07	4.35
1965	0.12	0.14	0.21	0.32	0.32	0.29	0.85	0.57	0.23	0.16	0.36	0.28	3.85
1966	0.03	0.01	0.47	0.26	0.50	0.47	0.79	0.16	0.21	0.48	0.44	0.15	3.97
1967	0.10	0.13	0.42	0.37	0.32	0.50	0.49	0.70	0.30	0.48	0.22	0.10	4.13
1968	-0.18	-0.03	0.19	0.30	0.06	0.39	0.32	0.32	0.51	0.42	0.08	0.04	2.42
1969	0.10	0.10	0.07	0.43	0.16	0.53	0.89	0.49	0.18	0.12	0.25	0.09	3.41
1970	0.12	0.21	0.05	0.32	0.42	0.74	0.59	0.58	0.46	0.35	0.26	0.30	4.40
1971	0.26	0.18	0.36	0.51	0.42	0.60	0.83	0.34	0.03	0.16	0.23	0.03	3.95
1972	0.16	0.27	0.52	0.51	0.12	0.46	0.49	0.40	0.35	0.08	0.02	0.21	3.59
1973	0.05	0.09	-0.12	-0.07	0.35	0.37	0.46	0.60	0.02	0.29	0.32	0.29	2.65
1974	0.20	0.38	0.29	0.48	0.17	0.64	0.93	0.43	-0.05	0.06	0.21	0.13	3.87
1975	0.12	-0.01	0.17	0.26	0.14	0.37	0.18	0.47	0.28	0.42	0.06	0.16	2.62
1976	0.26	0.34	0.36	0.07	0.22	0.39	0.44	0.61	0.22	0.20	0.24	0.25	3.60
1977	0.10	0.16	0.47	0.16	0.05	0.52	0.88	0.35	0.64	0.39	0.29	0.34	4.35
1978	0.06	0.03	0.34	0.58	-0.07	0.41	0.79	0.64	0.10	0.45	0.13	0.22	3.68
1979	0.05	0.10	0.09	0.31	0.21	0.16	0.36	0.37	0.52	0.52	0.22	0.20	3.11
1980	0.09	0.17	0.39	0.45	-0.05	0.67	1.05	0.81	0.35	0.51	0.24	0.15	4.83
1981	0.25	0.26	0.26	0.34	0.24	0.52	0.69	0.41	0.49	0.08	0.28	0.24	4.06
1982	0.21	0.16	0.38	0.49	0.08	0.11	0.47	0.67	0.57	0.49	0.26	0.07	3.96
1983	0.03	0.05	0.16	0.37	0.38	0.40	0.89	0.81	0.67	-0.15	0.24	0.09	3.94
1984	0.20	0.32	0.31	0.52	0.59	0.46	0.69	0.44	0.64	0.37	0.18	-0.07	4.65
1985	0.09	0.09	0.11	0.36	0.42	0.05	0.55	0.56	0.31	0.05	0.19	0.06	2.84
1986	0.34	0.18	0.52	0.42	0.22	0.24	0.88	0.25	0.21	-0.24	0.07	0.09	3.18
1987	0.10	0.01	0.25	0.51	0.04	0.36	0.63	0.42	0.29	0.38	0.29	0.03	3.31
1988	0.09	0.21	0.28	0.26	0.48	0.46	0.43	0.68	0.08	0.40	0.36	0.25	3.98
1989	0.21	0.09	0.34	0.47	-0.05	0.03	0.67	0.34	0.21	0.49	0.49	0.19	3.48
1990	0.13	0.04	0.15	0.13	0.16	0.66	0.44	0.44	0.34	0.35	0.05	0.11	3.00
1991	0.06	0.28	0.47	0.55	0.23	0.38	0.68	0.59	0.13	0.56	0.19	0.04	4.16
1992	0.07	0.19	0.35	0.26	0.16	-0.03	0.66	0.50	0.54	0.52	0.04	0.12	3.38
1993	0.04	0.15	0.29	0.42	0.32	0.66	0.80	0.77	0.66	0.44	0.35	0.27	5.17
1994	0.26	0.20	0.33	0.36	0.29	0.77	0.57	0.70	0.46	0.28	0.23	0.17	4.62
1995	0.00	0.00	0.33	0.31	-0.04	0.14	0.55	0.11	-0.08	0.51	0.41	0.29	2.53
1996	0.27	0.46	0.46	0.66	0.49	0.43	0.33	0.35	0.11	0.39	0.24	0.37	4.56
1997	0.26	0.04	0.55	-0.30	0.19	0.27	0.65	0.27	0.29	0.24	0.26	-0.06	2.66
1998	0.21	-0.05	0.18	0.48	0.43	0.87	0.87	0.59	0.60	0.19	0.10	0.16	4.63
1999	0.30	0.33	0.12	0.31	0.11	0.43	0.73	0.58	0.35	0.45	0.45	0.33	4.49
2000	0.58	0.27	-0.08	0.09	0.30	-0.20	0.49	0.62	0.59	0.00	0.18	0.12	2.96
2001	-0.02	0.02	0.11	0.45	-0.09	0.66	0.88	0.38	0.31	0.51	0.09	0.22	3.52
2002	0.19	0.21	0.35	0.28	0.42	0.41	0.35	0.62	0.40	-0.08	0.24	0.13	3.52
2003	0.23	0.17	0.31	0.36	0.36	-0.01	0.84	0.61	0.36	0.38	0.31	0.25	4.17
2004	0.02	0.14	0.14	0.15	0.57	0.03	0.52	0.36	0.48	0.12	-0.30	0.22	2.45
2005	0.07	0.12	0.33	0.40	0.21	0.55	0.60	0.37	0.48	0.28	0.42	0.33	4.16
2006	0.49	0.33	0.25	0.45	0.34	0.70	0.75	0.39	0.25	0.10	0.36	-0.07	4.34
2007	0.10	0.29	-0.09	0.25	-0.09	0.12	0.41	0.47	0.31	0.56	0.35	0.20	2.88
2008	0.15	0.23	0.43	0.37	0.25	0.52	0.65	0.31	-0.03	0.09	0.37	0.29	3.63
2009	0.23	0.35	0.46	0.27	0.37	0.37	0.45	0.53	0.16	0.18	0.39	0.13	3.89
2010	0.04	0.12	0.36	0.05	0.32	0.42	0.13	0.57	0.35	0.29	0.43	0.33	3.41
2011	0.20	0.24	0.44	0.66	0.63	0.97	0.88	0.94	0.59	0.27	0.25	0.03	6.10
2012	0.26	0.21	0.31	0.40	0.40	0.36	0.71	0.52	0.30	0.46	0.43	0.25	4.61
2013	0.12	0.11	0.51	0.43	0.50	0.42	0.50	0.49	0.37	0.36	0.32	0.14	4.27
2014	0.35	0.17	0.44	0.50	0.28	0.27	0.41	0.54	0.30	0.45	0.19	0.14	4.04
2015	0.09	0.18	0.30	0.09	-0.54	0.26	0.40	0.50	0.60	0.26	0.17	0.14	2.45
2016	0.19	0.31	0.44	0.27	-0.09	0.28	0.53	0.23	0.21	0.46	0.26	0.17	3.26
2017	0.01	0.18	0.30	0.24	0.46	0.44	0.51	0.10	0.12	0.31	0.41	0.28	3.36
2018	0.36	0.34	0.35	0.44	0.33	0.47	0.64	0.48	0.03	-0.19	0.25	0.17	3.67
Total	10.65	12.02	21.09	24.11	16.48	28.68	42.67	36.88	24.71	20.57	17.62	11.94	192.24
Mean	0.15	0.17	0.30	0.34	0.23	0.40	0.60	0.52	0.35	0.30	0.25	0.17	3.77
Max	0.58	0.46	0.56	0.66	0.63	1.00	1.05	1.15	0.99	0.82	0.49	0.37	6.32
Min	-0.23	-0.05	-0.12	-0.30	-0.54	-0.20	0.04	0.10	-0.08	-0.33	-0.30	-0.21	1.41

Table of Final Results - Calculated Monthly Net Reservoir Evaporation Values

Quadrangle: 308
Units: Feet
Control Point 308

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	0.11	-0.08	0.14	0.43	0.23	0.43	0.47	0.63	0.74	0.37	0.39	0.29	4.15
1949	-0.29	0.05	0.14	0.13	-0.09	0.26	0.74	0.58	0.28	0.16	0.38	0.13	2.47
1950	0.12	0.11	0.41	0.34	0.08	0.30	0.02	0.34	0.15	0.56	0.47	0.21	3.11
1951	0.20	0.05	0.31	0.33	0.06	0.32	0.62	0.70	0.50	0.37	0.18	0.34	3.98
1952	0.23	0.24	0.26	0.10	0.26	0.95	0.75	1.17	0.82	0.80	0.28	0.11	5.97
1953	0.36	0.33	0.20	0.32	0.57	0.84	0.71	0.65	0.96	-0.24	0.12	0.22	5.04
1954	0.13	0.39	0.40	0.29	-0.29	0.74	0.91	0.70	0.71	0.38	0.35	0.20	4.91
1955	0.03	0.12	0.25	0.54	-0.13	0.30	0.67	0.58	0.15	-0.17	0.36	0.19	2.89
1956	0.14	0.14	0.51	0.59	0.25	0.72	0.83	0.86	0.72	0.24	0.27	0.08	5.35
1957	0.12	0.05	0.02	-0.31	-0.44	0.20	0.74	0.57	0.31	0.03	-0.05	0.20	1.44
1958	-0.02	0.07	-0.08	0.17	0.23	0.50	0.21	0.55	0.40	0.39	0.23	0.13	2.78
1959	0.14	0.21	0.46	0.41	-0.02	0.21	0.25	0.61	0.31	-0.02	0.22	-0.14	2.64
1960	0.01	0.01	0.14	0.35	0.20	0.35	0.30	0.29	0.33	-0.32	0.27	-0.07	1.86
1961	0.09	-0.01	0.06	0.45	0.29	0.11	0.30	0.49	0.26	0.28	-0.05	0.04	2.31
1962	0.13	0.30	0.37	0.23	0.48	-0.08	0.44	0.74	-0.13	0.18	0.15	0.09	2.90
1963	0.09	0.19	0.33	0.45	0.25	0.39	0.79	0.60	0.39	0.58	0.14	0.09	4.29
1964	0.22	-0.04	0.37	0.62	0.27	0.66	0.95	0.57	0.17	0.32	-0.06	0.14	4.19
1965	0.13	0.12	0.23	0.29	0.26	0.42	0.89	0.62	0.07	0.02	0.39	0.30	3.74
1966	0.02	0.04	0.44	0.29	0.49	0.63	0.84	0.15	0.07	0.47	0.43	0.16	4.03
1967	0.19	0.21	0.41	0.20	0.32	0.52	0.48	0.72	0.30	0.43	0.21	0.07	4.06
1968	-0.16	-0.01	0.16	0.28	0.02	0.41	0.22	0.51	0.50	0.30	0.06	0.07	2.36
1969	0.11	0.08	0.08	0.40	-0.01	0.53	0.75	0.46	0.11	0.10	0.26	0.12	2.99
1970	0.12	0.21	-0.02	0.28	0.34	0.69	0.68	0.61	0.37	0.34	0.27	0.33	4.22
1971	0.23	0.20	0.35	0.51	0.39	0.55	0.76	0.39	-0.05	0.04	0.17	0.00	3.54
1972	0.16	0.27	0.48	0.45	0.19	0.48	0.61	0.49	0.33	-0.01	0.05	0.22	3.72
1973	-0.12	0.08	-0.04	0.00	0.34	0.37	0.39	0.61	-0.17	0.17	0.23	0.25	2.11
1974	0.19	0.38	0.35	0.30	0.21	0.54	0.77	0.35	-0.14	0.05	0.19	0.12	3.31
1975	0.11	-0.02	0.20	0.31	-0.06	0.11	-0.02	0.42	0.23	0.38	0.05	0.13	1.84
1976	0.25	0.35	0.37	-0.02	0.13	0.39	0.58	0.60	-0.03	0.04	0.24	0.23	3.13
1977	0.05	0.13	0.45	0.15	-0.29	0.48	0.78	0.20	0.63	0.35	0.23	0.39	3.55
1978	0.08	-0.01	0.36	0.49	-0.01	0.46	0.83	0.45	0.11	0.47	0.10	0.21	3.54
1979	0.02	0.10	0.11	0.20	0.08	0.32	0.38	0.26	0.56	0.50	0.19	0.12	2.84
1980	0.03	0.14	0.30	0.39	-0.33	0.70	1.07	0.86	0.41	0.49	0.27	0.11	4.44
1981	0.28	0.28	0.19	0.19	0.07	0.28	0.72	0.49	0.55	0.06	0.23	0.22	3.56
1982	0.13	0.14	0.18	0.40	-0.23	0.05	0.57	0.67	0.49	0.49	0.19	0.07	3.15
1983	0.02	0.01	0.05	0.29	0.19	0.35	0.78	0.78	0.69	-0.48	0.16	0.07	2.91
1984	0.22	0.29	0.18	0.42	0.53	0.52	0.82	0.59	0.62	0.26	0.13	-0.17	4.41
1985	0.05	-0.03	-0.04	0.20	0.39	0.07	0.67	0.58	0.28	-0.10	0.17	0.15	2.39
1986	0.34	0.14	0.39	0.29	0.04	0.25	0.80	0.29	-0.06	-0.21	0.06	0.09	2.42
1987	0.05	-0.07	0.18	0.43	-0.35	0.23	0.70	0.53	0.26	0.31	0.27	-0.02	2.52
1988	0.07	0.22	0.10	0.20	0.44	0.42	0.47	0.69	-0.09	0.38	0.31	0.24	3.45
1989	0.18	0.05	0.29	0.53	0.08	-0.02	0.62	0.41	0.17	0.42	0.46	0.21	3.40
1990	0.10	-0.01	-0.06	0.03	0.17	0.59	0.30	0.30	0.32	0.36	0.01	0.08	2.19
1991	0.02	0.31	0.34	0.37	0.08	0.04	0.72	0.52	0.00	0.42	0.18	-0.08	2.92
1992	0.04	0.15	0.26	0.16	0.12	-0.04	0.64	0.32	0.40	0.52	-0.11	0.05	2.51
1993	0.03	0.08	0.16	0.17	0.09	0.53	0.88	0.69	0.50	0.36	0.30	0.23	4.02
1994	0.31	0.17	0.19	0.29	0.19	0.62	0.55	0.69	0.41	0.18	0.00	0.20	3.80
1995	0.00	0.00	0.16	0.19	-0.15	-0.12	0.50	-0.10	-0.19	0.49	0.39	0.24	1.41
1996	0.25	0.49	0.39	0.59	0.51	0.39	0.39	0.05	-0.01	0.38	0.21	0.41	4.05
1997	0.33	-0.05	0.40	-0.19	0.13	0.25	0.67	0.32	0.22	0.23	0.24	-0.04	2.51
1998	0.02	-0.08	-0.10	0.39	0.40	0.85	0.95	0.67	0.63	0.21	-0.01	0.07	4.00
1999	0.27	0.33	0.05	0.18	-0.02	0.29	0.67	0.73	0.40	0.30	0.40	0.24	3.84
2000	0.58	0.09	0.03	0.16	0.35	-0.07	0.65	0.92	0.64	-0.14	-0.01	0.09	3.29
2001	-0.02	0.00	0.12	0.40	-0.08	0.66	0.90	0.39	0.35	0.49	0.06	0.25	3.52
2002	0.13	0.21	0.27	0.12	0.30	0.34	0.24	0.68	0.43	-0.09	0.25	0.06	2.94
2003	0.20	0.14	0.29	0.32	0.31	0.00	0.80	0.49	0.35	0.41	0.22	0.26	3.79
2004	-0.01	0.11	0.11	0.16	0.48	-0.03	0.47	0.31	0.49	0.10	-0.33	0.18	2.04
2005	0.03	0.11	0.30	0.41	0.11	0.41	0.47	0.20	0.33	0.16	0.42	0.26	3.21
2006	0.42	0.34	0.24	0.42	0.32	0.61	0.71	0.47	0.28	0.00	0.27	0.01	4.09
2007	0.09	0.27	0.03	0.24	-0.05	-0.14	0.41	0.35	0.35	0.46	0.32	0.10	2.43
2008	0.25	0.20	0.34	0.31	0.34	0.57	0.68	0.29	0.28	0.12	0.32	0.29	3.99
2009	0.21	0.37	0.43	0.11	0.19	0.40	0.46	0.66	0.08	0.07	0.29	0.07	3.34
2010	0.01	0.14	0.34	0.19	0.27	0.44	-0.06	0.64	0.27	0.26	0.33	0.30	3.13
2011	0.24	0.28	0.44	0.58	0.38	0.93	0.96	0.99	0.60	0.30	0.25	0.05	6.00
2012	0.20	0.20	0.18	0.22	0.37	0.37	0.75	0.54	0.33	0.44	0.39	0.24	4.23
2013	0.19	0.05	0.51	0.26	0.41	0.56	0.39	0.58	0.43	0.33	0.33	0.10	4.14
2014	0.34	0.17	0.34	0.42	0.18	0.20	0.23	0.65	0.41	0.43	0.14	0.13	3.64
2015	0.09	0.19	0.29	-0.09	-0.58	0.20	0.59	0.51	0.62	0.27	0.07	0.10	2.26
2016	0.16	0.27	0.34	-0.02	-0.05	0.09	0.48	0.39	0.02	0.26	0.19	0.14	2.27
2017	0.09	0.15	0.21	0.16	0.35	0.37	0.47	0.12	0.14	0.26	0.34	0.22	2.88
2018	0.28	0.22	0.08	0.32	0.24	0.65	0.65	0.43	-0.10	-0.41	0.23	0.10	2.69
Total	9.41	10.33	16.72	19.78	10.79	26.91	42.38	37.16	22.26	16.35	14.66	10.29	169.32
Mean	0.13	0.14	0.24	0.28	0.15	0.38	0.60	0.52	0.32	0.24	0.21	0.15	3.35
Max	0.58	0.49	0.51	0.62	0.57	0.95	1.07	1.17	0.96	0.80	0.47	0.41	5.97
Min	-0.29	-0.08	-0.10	-0.31	-0.58	-0.14	-0.06	-0.10	-0.19	-0.48	-0.33	-0.17	1.41

Table of Final Results - Calculated Monthly Net Reservoir Evaporation Values

Quadrangle: 309
Units: Feet
Control Point 309

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	0.14	-0.12	0.19	0.44	0.14	0.36	0.68	0.87	0.91	0.49	0.41	0.25	4.76
1949	-0.24	0.03	0.17	0.20	-0.06	0.39	0.85	0.69	0.31	0.22	0.35	0.12	3.03
1950	0.12	0.09	0.45	0.33	0.04	0.42	0.13	0.28	0.34	0.58	0.45	0.22	3.45
1951	0.17	0.04	0.25	0.36	0.08	0.25	0.68	0.77	0.66	0.35	0.18	0.26	4.05
1952	0.15	0.19	0.19	0.19	0.18	0.70	0.68	1.35	1.02	0.82	0.23	0.12	5.82
1953	0.17	0.15	0.07	0.31	0.47	0.73	0.59	0.60	0.79	0.11	0.20	0.24	4.43
1954	0.07	0.29	0.28	0.14	-0.18	0.50	0.76	0.67	0.61	0.26	0.28	0.07	3.75
1955	-0.03	0.04	0.15	0.46	-0.13	0.31	0.56	0.42	0.09	0.17	0.31	0.16	2.51
1956	0.10	0.08	0.44	0.47	0.22	0.60	0.54	0.69	0.68	0.09	0.18	0.01	4.10
1957	0.01	-0.01	-0.02	-0.20	-0.21	0.23	0.57	0.52	0.18	-0.03	-0.12	0.14	1.06
1958	-0.06	0.07	-0.08	0.15	0.15	0.33	0.31	0.44	0.27	0.32	0.19	0.09	2.18
1959	0.06	0.17	0.40	0.29	-0.05	0.23	0.09	0.42	0.21	-0.13	0.16	-0.09	1.76
1960	-0.01	0.02	0.10	0.41	0.07	0.44	0.21	0.35	0.31	-0.10	0.26	-0.12	1.94
1961	0.08	0.01	0.05	0.37	0.16	-0.03	0.31	0.36	-0.06	0.23	-0.07	0.02	1.43
1962	0.13	0.25	0.23	0.07	0.30	-0.28	0.29	0.53	-0.14	0.07	0.08	0.01	1.54
1963	0.08	0.10	0.14	0.27	0.21	0.35	0.43	0.49	0.24	0.40	0.04	0.06	2.81
1964	0.10	-0.02	0.33	0.52	0.03	0.62	0.86	0.36	0.00	0.27	-0.21	0.15	3.01
1965	0.05	0.06	0.21	0.27	0.17	0.29	0.81	0.43	0.26	0.14	0.31	0.30	3.30
1966	0.03	0.01	0.45	0.11	0.45	0.57	0.74	0.09	0.12	0.43	0.41	0.11	3.52
1967	0.20	0.23	0.38	0.06	0.11	0.50	0.41	0.65	0.14	0.30	0.19	0.02	3.19
1968	-0.18	0.00	0.11	0.18	-0.15	0.43	0.25	0.60	0.20	0.14	-0.09	0.04	1.53
1969	0.03	0.01	0.04	0.28	-0.03	0.44	0.65	0.29	0.22	0.09	0.21	0.00	2.23
1970	0.11	0.15	-0.06	0.18	0.33	0.61	0.71	0.59	0.07	0.17	0.28	0.22	3.36
1971	0.12	0.16	0.35	0.48	0.33	0.49	0.54	0.03	0.06	0.05	0.15	-0.11	2.65
1972	0.14	0.19	0.40	0.24	0.17	0.51	0.59	0.40	0.27	-0.12	0.01	0.13	2.93
1973	-0.15	0.06	-0.09	-0.01	0.30	0.21	0.26	0.47	-0.21	0.11	0.04	0.16	1.15
1974	0.12	0.22	0.24	0.18	0.24	0.54	0.63	0.17	-0.07	-0.02	0.11	0.06	2.42
1975	0.05	0.01	0.16	0.28	-0.28	0.28	0.06	0.35	0.11	0.35	0.08	0.08	1.53
1976	0.22	0.32	0.25	-0.04	0.12	0.35	0.39	0.44	0.02	0.00	0.20	0.13	2.40
1977	-0.01	0.12	0.35	0.21	-0.08	0.46	0.55	0.14	0.44	0.27	0.15	0.27	2.87
1978	0.06	-0.05	0.24	0.43	-0.28	0.37	0.74	0.38	0.32	0.41	-0.01	0.19	2.80
1979	-0.03	0.08	0.09	0.05	0.05	0.14	0.32	0.41	0.43	0.47	0.09	0.00	2.10
1980	0.02	0.12	0.23	0.34	-0.17	0.63	0.91	0.78	0.33	0.35	0.11	0.03	3.68
1981	0.24	0.12	0.11	0.11	-0.01	0.22	0.44	0.29	0.36	-0.14	0.12	0.15	2.01
1982	0.03	0.08	0.12	0.29	-0.30	0.09	0.34	0.60	0.32	0.35	0.05	0.02	1.99
1983	-0.05	0.03	0.08	0.23	0.03	0.19	0.61	0.55	0.61	-0.02	0.17	0.06	2.49
1984	0.21	0.23	0.07	0.42	0.37	0.46	0.80	0.57	0.61	-0.01	0.01	-0.30	3.44
1985	0.10	-0.12	-0.06	0.12	0.36	0.21	0.66	0.56	0.15	0.07	0.11	0.15	2.31
1986	0.34	0.11	0.27	0.18	-0.12	0.25	0.75	0.39	-0.10	0.08	0.08	0.03	2.26
1987	0.05	-0.02	0.21	0.42	-0.06	0.23	0.51	0.46	0.17	0.30	0.16	-0.11	2.32
1988	0.05	0.21	0.02	0.19	0.48	0.44	0.48	0.63	-0.04	0.25	0.18	0.18	3.07
1989	0.08	0.00	0.11	0.46	0.06	-0.02	0.46	0.35	0.10	0.34	0.30	0.22	2.46
1990	0.08	-0.15	-0.02	0.04	0.22	0.58	0.24	0.36	0.24	0.29	0.04	0.03	1.95
1991	0.00	0.27	0.27	0.24	0.06	0.41	0.62	0.38	-0.04	0.29	0.22	0.17	2.89
1992	0.06	0.16	0.24	0.12	0.03	0.21	0.43	0.31	0.34	0.40	-0.08	0.09	2.31
1993	0.08	0.00	0.12	0.15	0.11	0.34	0.82	0.67	0.29	0.29	0.32	0.07	3.26
1994	0.08	-0.10	0.14	0.14	0.11	0.50	0.42	0.62	0.30	0.01	0.03	0.19	2.44
1995	0.00	0.00	0.00	0.13	-0.08	0.52	0.45	0.38	-0.08	0.43	0.29	0.20	2.24
1996	0.25	0.35	0.29	0.40	0.53	0.23	0.41	-0.08	-0.01	0.23	-0.35	0.27	2.52
1997	0.32	0.00	0.40	-0.07	0.09	0.28	0.54	0.25	0.33	0.09	0.24	-0.08	2.39
1998	0.01	-0.01	0.16	0.28	0.47	0.61	0.81	0.66	0.61	0.16	-0.13	0.01	3.64
1999	0.24	0.29	-0.16	0.18	0.10	0.13	0.64	0.73	0.47	0.29	0.36	0.20	3.47
2000	0.54	0.07	0.11	0.17	0.29	-0.08	0.53	0.71	0.61	-0.32	-0.04	0.09	2.68
2001	0.02	0.01	0.15	0.35	-0.03	0.64	0.85	0.46	0.28	0.40	0.25	0.19	3.57
2002	0.11	0.19	0.16	0.05	0.27	0.27	0.30	0.57	0.37	-0.10	0.24	0.04	2.47
2003	0.19	0.10	0.28	0.32	0.16	-0.06	0.74	0.41	0.31	0.38	0.13	0.25	3.21
2004	0.07	0.06	0.14	0.14	0.38	0.10	0.20	0.24	0.46	-0.03	-0.23	0.13	1.66
2005	0.03	0.09	0.33	0.40	0.13	0.49	0.43	0.12	0.34	0.19	0.37	0.24	3.16
2006	0.36	0.24	0.26	0.37	0.25	0.56	0.75	0.55	0.18	0.09	0.20	-0.01	3.80
2007	-0.01	0.22	-0.07	0.23	-0.26	-0.21	0.51	0.19	0.31	0.34	0.28	0.01	1.54
2008	0.26	0.14	0.27	0.29	0.29	0.49	0.57	0.11	0.35	0.21	0.30	0.22	3.50
2009	0.18	0.31	0.38	0.07	0.19	0.41	0.45	0.62	0.12	-0.02	0.25	0.02	2.98
2010	0.05	0.13	0.28	0.21	0.19	0.29	0.25	0.69	0.21	0.27	0.33	0.29	3.19
2011	0.15	0.16	0.43	0.56	0.37	0.70	0.94	0.89	0.50	0.27	0.18	0.06	5.21
2012	0.10	0.16	0.12	0.23	0.37	0.46	0.79	0.61	0.31	0.41	0.36	0.21	4.13
2013	0.16	0.05	0.37	-0.01	0.19	0.40	0.20	0.50	0.39	0.29	0.18	0.04	2.76
2014	0.15	0.17	0.27	0.42	0.32	0.14	0.39	0.61	0.43	0.40	0.01	0.13	3.44
2015	0.12	0.19	0.26	0.02	-0.54	0.32	0.41	0.48	0.53	0.20	0.06	0.13	2.18
2016	0.18	0.22	0.33	-0.03	0.15	0.08	0.50	0.47	0.05	0.30	0.18	0.13	2.56
2017	0.10	0.08	0.28	0.21	0.28	0.42	0.43	-0.02	0.14	0.26	0.28	0.14	2.60
2018	0.22	0.01	0.03	0.17	0.19	0.55	0.50	0.42	-0.20	-0.24	0.23	0.01	1.89
Total	6.97	7.12	13.44	16.22	8.34	24.82	37.27	33.34	19.45	14.26	10.84	7.21	139.28
Mean	0.10	0.10	0.19	0.23	0.12	0.35	0.53	0.47	0.28	0.21	0.15	0.10	2.82
Max	0.54	0.35	0.45	0.56	0.53	0.73	0.94	1.35	1.02	0.82	0.45	0.30	5.82
Min	-0.24	-0.15	-0.16	-0.20	-0.54	-0.28	0.06	-0.08	-0.21	-0.32	-0.35	-0.30	1.06

Table of Final Results - Calculated Monthly Net Reservoir Evaporation Values

Quadrangle: 407
Units: Feet
Control Point 407

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	0.12	-0.01	0.31	0.56	0.49	0.46	0.62	0.79	0.78	0.41	0.42	0.39	5.34
1949	-0.13	0.19	0.26	0.22	0.11	0.42	0.64	0.51	0.34	0.27	0.46	0.19	3.48
1950	0.21	0.20	0.45	0.39	0.06	0.42	0.18	0.61	-0.07	0.49	0.46	0.25	3.65
1951	0.20	0.20	0.30	0.40	0.30	0.44	0.68	0.48	0.51	0.44	0.40	0.33	4.68
1952	0.23	0.36	0.41	0.30	0.55	1.11	0.64	0.97	0.70	0.72	0.33	0.21	6.53
1953	0.39	0.28	0.39	0.52	0.71	0.93	0.57	0.48	0.74	0.34	0.27	0.28	5.90
1954	0.13	0.27	0.30	0.14	-0.29	0.43	0.56	0.34	0.59	0.66	0.27	0.25	3.65
1955	0.10	0.19	0.42	0.66	0.22	0.35	0.50	0.54	0.30	0.16	0.40	0.22	4.06
1956	0.19	0.20	0.60	0.59	0.47	0.83	0.83	0.81	0.82	0.48	0.36	0.28	6.46
1957	0.17	0.06	0.33	0.09	0.01	0.25	0.77	0.56	0.48	0.07	-0.02	0.30	3.07
1958	0.08	0.09	-0.02	0.06	0.08	0.44	0.42	0.55	0.06	0.19	0.16	0.17	2.28
1959	0.17	0.22	0.41	0.36	0.15	0.17	0.21	0.49	0.54	-0.15	0.23	-0.10	2.70
1960	-0.01	0.06	0.24	0.22	0.29	0.22	0.21	0.51	0.20	-0.10	0.29	0.02	2.15
1961	0.05	0.07	0.16	0.50	0.29	-0.04	0.05	0.51	0.17	0.21	-0.02	0.08	2.03
1962	0.12	0.32	0.45	0.30	0.57	0.06	0.26	0.50	-0.24	0.20	0.11	0.16	2.81
1963	0.13	0.24	0.48	0.41	0.20	0.19	0.71	0.55	0.17	0.42	0.11	0.06	3.67
1964	0.21	0.10	0.46	0.54	0.36	0.53	0.75	0.61	0.21	0.36	0.14	0.15	4.42
1965	0.17	0.16	0.27	0.34	0.24	0.51	0.86	0.48	0.39	0.20	0.36	0.25	4.23
1966	0.05	0.07	0.46	0.30	0.47	0.54	0.83	0.03	0.12	0.47	0.41	0.22	3.97
1967	0.26	0.28	0.38	0.33	0.35	0.38	0.46	0.70	0.27	0.50	0.19	0.10	4.20
1968	-0.13	0.00	0.09	0.33	0.20	0.41	0.33	0.49	0.49	0.39	0.10	0.16	2.86
1969	0.14	0.11	0.07	0.44	0.00	0.57	0.92	0.54	0.06	-0.06	0.25	0.08	3.12
1970	0.12	0.17	-0.04	0.37	0.38	0.65	0.57	0.63	0.50	0.30	0.31	0.29	4.25
1971	0.29	0.26	0.52	0.55	0.37	0.75	0.83	0.06	0.03	0.11	0.23	0.02	4.02
1972	0.19	0.25	0.49	0.43	0.20	0.45	0.48	0.22	0.25	-0.07	0.02	0.22	3.13
1973	-0.09	0.04	-0.02	0.19	0.39	0.41	0.46	0.63	-0.02	0.23	0.26	0.32	2.80
1974	0.20	0.37	0.50	0.54	0.35	0.45	0.90	0.32	-0.16	0.06	0.23	0.10	3.86
1975	0.06	0.00	0.24	0.42	0.01	0.50	0.21	0.47	0.10	0.47	0.12	0.14	2.74
1976	0.25	0.45	0.51	0.14	0.39	0.65	0.23	0.49	0.11	-0.07	0.23	0.22	3.60
1977	0.05	0.21	0.39	0.16	0.09	0.54	0.74	0.39	0.58	0.44	0.33	0.38	4.30
1978	0.00	-0.02	0.44	0.67	0.15	0.48	0.78	0.56	0.16	0.40	0.03	0.21	3.86
1979	0.06	0.11	0.17	0.37	0.26	0.27	0.49	0.41	0.55	0.59	0.19	0.05	3.52
1980	0.07	0.18	0.42	0.52	0.01	0.59	1.06	0.87	-0.03	0.42	0.24	0.11	4.46
1981	0.20	0.11	0.29	0.27	0.23	0.46	0.71	0.26	0.43	0.07	0.33	0.18	3.54
1982	0.08	0.06	0.38	0.46	-0.07	0.12	0.56	0.65	0.41	0.46	0.24	-0.01	3.34
1983	-0.03	0.06	0.23	0.34	0.26	0.44	0.87	0.69	0.71	-0.16	0.16	-0.02	3.55
1984	0.18	0.23	0.32	0.54	0.50	0.59	0.72	0.44	0.57	0.06	0.16	-0.13	4.18
1985	0.08	-0.04	0.04	0.21	0.33	0.30	0.61	0.70	0.31	-0.10	0.11	0.02	2.57
1986	0.33	0.25	0.46	0.34	0.24	0.26	0.70	0.39	0.02	-0.04	0.06	0.02	3.03
1987	0.09	-0.03	0.22	0.45	-0.25	0.20	0.37	0.60	0.20	0.38	0.20	0.01	2.44
1988	0.07	0.14	0.27	0.31	0.50	0.57	0.42	0.56	0.18	0.40	0.33	0.19	3.94
1989	0.11	0.07	0.38	0.61	0.23	0.16	0.67	0.44	0.29	0.54	0.44	0.25	4.19
1990	0.03	0.04	0.05	-0.03	0.19	0.66	0.44	0.37	0.28	0.34	0.10	0.08	2.55
1991	0.03	0.31	0.49	0.61	0.43	0.26	0.74	0.32	0.16	0.50	0.34	-0.01	4.18
1992	0.03	0.04	0.35	0.29	0.15	-0.04	0.62	0.45	0.50	0.49	0.16	0.16	3.20
1993	0.10	0.09	0.30	0.40	0.43	0.62	0.88	0.77	0.56	0.58	0.34	0.21	5.28
1994	0.15	0.15	0.40	0.45	0.10	0.79	0.76	0.71	0.34	0.31	0.23	0.19	4.58
1995	0.00	0.00	0.38	0.42	0.02	0.47	0.67	0.10	0.19	0.49	0.38	0.30	3.42
1996	0.27	0.44	0.46	0.69	0.70	0.55	0.64	0.22	0.22	0.48	0.31	0.44	5.42
1997	0.17	-0.04	0.47	-0.10	0.15	0.28	0.67	0.53	0.47	0.31	0.29	-0.09	3.11
1998	0.16	0.18	0.47	0.65	0.61	1.07	1.05	0.64	0.76	0.42	0.29	0.20	6.50
1999	0.30	0.31	0.14	0.28	0.31	0.30	0.76	0.69	0.58	0.51	0.51	0.35	5.04
2000	0.48	0.38	0.03	0.31	0.49	0.14	0.78	0.87	0.72	0.03	0.01	0.18	4.42
2001	-0.01	0.04	-0.02	0.41	0.28	0.67	0.88	0.46	0.43	0.49	0.00	0.13	3.76
2002	0.30	0.16	0.26	0.15	0.55	0.56	0.32	0.74	0.54	-0.10	0.26	0.14	3.88
2003	0.31	0.17	0.36	0.44	0.40	0.06	0.85	0.63	0.42	0.45	0.31	0.26	4.66
2004	0.05	0.17	0.16	0.24	0.64	0.06	0.34	0.40	0.45	0.10	-0.30	0.22	2.53
2005	0.09	0.08	0.31	0.55	0.30	0.54	0.52	0.13	0.54	0.23	0.47	0.33	4.09
2006	0.48	0.33	0.26	0.37	0.35	0.74	0.83	0.51	0.18	-0.07	0.36	0.08	4.42
2007	0.08	0.30	-0.08	0.21	0.00	-0.04	0.32	0.28	0.40	0.55	0.33	0.21	2.56
2008	0.14	0.33	0.42	0.41	0.39	0.66	0.58	0.37	0.19	0.20	0.34	0.36	4.39
2009	0.25	0.32	0.48	0.35	0.36	0.46	0.44	0.68	0.25	0.24	0.49	0.17	4.49
2010	0.04	0.07	0.30	0.03	0.29	0.47	-0.19	0.61	0.24	0.44	0.51	0.51	3.32
2011	0.35	0.39	0.53	0.91	0.72	1.12	1.27	1.25	0.80	0.43	0.35	0.04	8.16
2012	0.26	0.24	0.38	0.62	0.48	0.43	0.74	0.66	0.34	0.45	0.43	0.30	5.33
2013	0.19	0.17	0.58	0.58	0.55	0.68	0.64	0.73	0.63	0.58	0.40	0.05	5.78
2014	0.35	0.15	0.50	0.66	0.43	0.50	0.74	0.66	0.03	0.45	0.13	0.13	4.73
2015	0.00	0.15	0.21	0.18	-0.37	0.35	0.63	0.83	0.70	0.21	0.15	0.09	3.13
2016	0.20	0.31	0.43	0.22	0.14	0.46	0.71	0.52	0.27	0.53	0.14	0.14	4.07
2017	0.15	0.26	0.34	0.33	0.50	0.59	0.56	0.41	0.29	0.52	0.42	0.24	4.61
2018	0.37	0.33	0.47	0.64	0.53	0.88	0.82	0.75	-0.01	-0.31	0.24	0.12	4.83
Total	10.48	12.40	22.86	27.16	20.52	32.75	43.39	38.12	24.29	21.01	17.89	12.15	194.82
Mean	0.14	0.17	0.32	0.38	0.29	0.46	0.61	0.53	0.35	0.30	0.25	0.17	3.97
Max	0.48	0.45	0.60	0.91	0.72	1.12	1.27	1.25	0.82	0.72	0.51	0.51	6.53
Min	-0.13	-0.04	-0.08	-0.10	-0.37	-0.04	-0.19	0.03	-0.24	-0.31	-0.30	-0.13	2.03

Table of Final Results - Calculated Monthly Net Reservoir Evaporation Values

Quadrangle: 408
Units: Feet
Control Point 408

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	0.17	-0.02	0.29	0.55	0.38	0.37	0.66	0.92	0.85	0.44	0.45	0.34	5.40
1949	-0.15	0.07	0.25	0.19	0.10	0.43	0.78	0.56	0.31	0.25	0.42	0.16	3.37
1950	0.13	0.18	0.45	0.26	-0.03	0.38	0.18	0.40	0.20	0.56	0.45	0.24	3.40
1951	0.21	0.14	0.30	0.40	0.12	0.37	0.75	0.75	0.55	0.47	0.29	0.30	4.65
1952	0.22	0.28	0.35	0.25	0.35	0.95	0.71	1.20	0.85	0.78	0.27	0.17	6.38
1953	0.27	0.22	0.23	0.39	0.58	0.81	0.51	0.44	0.80	0.16	0.25	0.27	4.93
1954	0.10	0.34	0.39	0.16	-0.25	0.56	0.78	0.67	0.69	0.41	0.21	0.07	4.13
1955	0.03	0.14	0.29	0.51	0.16	0.21	0.63	0.63	0.08	0.27	0.29	0.20	3.44
1956	0.15	0.16	0.42	0.49	0.33	0.72	0.84	0.85	0.78	0.34	0.27	0.14	5.49
1957	0.12	0.00	0.18	-0.10	-0.27	0.40	0.75	0.63	0.42	0.03	-0.18	0.23	2.21
1958	0.00	0.07	0.00	0.15	0.11	0.54	0.34	0.59	0.12	0.24	0.18	0.11	2.45
1959	0.14	0.20	0.34	0.25	0.05	-0.01	0.23	0.56	0.44	-0.12	0.21	-0.05	2.24
1960	-0.02	0.03	0.24	0.25	0.24	0.37	0.19	0.45	0.24	-0.11	0.28	-0.07	2.09
1961	0.06	0.00	0.07	0.43	0.21	-0.02	0.01	0.51	0.11	0.25	-0.04	0.06	1.65
1962	0.14	0.25	0.32	0.17	0.48	0.00	0.23	0.40	-0.48	0.14	0.02	0.09	1.76
1963	0.11	0.14	0.17	0.24	-0.07	0.13	0.44	0.39	0.26	0.37	0.07	0.06	2.31
1964	0.22	-0.02	0.39	0.54	0.27	0.47	0.91	0.60	0.00	0.36	0.05	0.20	3.99
1965	0.14	0.14	0.26	0.25	0.12	0.50	0.90	0.60	0.42	0.09	0.37	0.29	4.08
1966	0.01	0.09	0.44	0.02	0.43	0.61	0.80	0.12	0.01	0.45	0.41	0.25	3.64
1967	0.31	0.32	0.42	0.11	0.35	0.52	0.35	0.69	0.24	0.42	0.18	0.08	3.99
1968	-0.29	0.03	0.07	0.29	0.07	0.44	0.22	0.54	0.48	0.37	0.07	0.19	2.48
1969	0.11	0.04	0.06	0.33	-0.04	0.51	0.90	0.53	-0.05	0.06	0.23	0.04	2.72
1970	0.13	0.11	0.01	0.24	0.37	0.71	0.61	0.60	0.23	0.26	0.31	0.25	3.83
1971	0.31	0.22	0.56	0.54	0.37	0.69	0.76	0.05	0.11	0.02	0.20	-0.02	3.81
1972	0.16	0.23	0.47	0.41	0.12	0.48	0.57	0.52	0.18	-0.16	0.04	0.23	3.25
1973	-0.09	0.03	0.06	0.16	0.42	0.34	0.46	0.68	-0.05	0.19	0.22	0.26	2.68
1974	0.17	0.33	0.39	0.40	0.35	0.53	0.88	0.44	-0.15	0.08	0.23	0.09	3.74
1975	0.15	0.01	0.25	0.38	-0.12	0.46	0.17	0.44	0.09	0.47	0.11	0.10	2.51
1976	0.23	0.41	0.36	0.13	0.26	0.55	0.42	0.62	0.01	-0.24	0.22	0.20	3.17
1977	-0.01	0.18	0.35	0.11	-0.02	0.53	0.59	0.36	0.56	0.36	0.30	0.35	3.66
1978	0.07	-0.04	0.30	0.56	0.29	0.56	0.87	-0.01	0.10	0.34	0.07	0.19	3.30
1979	0.04	0.10	0.13	0.28	0.15	0.18	0.51	0.36	0.48	0.61	0.18	0.05	3.07
1980	0.10	0.15	0.39	0.51	-0.13	0.68	1.08	0.79	-0.01	0.40	0.17	0.08	4.21
1981	0.22	0.08	0.22	0.16	0.10	0.33	0.73	0.38	0.50	-0.10	0.26	0.20	3.08
1982	0.11	0.12	0.28	0.31	-0.43	-0.11	0.64	0.51	0.45	0.39	0.21	0.06	2.54
1983	-0.01	0.05	0.10	0.28	0.11	0.23	0.66	0.67	0.58	-0.07	0.17	0.03	2.80
1984	0.21	0.25	0.24	0.48	0.53	0.48	0.64	0.49	0.46	0.08	0.06	-0.17	3.75
1985	0.12	-0.03	-0.01	0.13	0.30	0.24	0.61	0.66	0.42	0.01	0.22	0.16	2.83
1986	0.33	0.14	0.40	0.28	0.09	0.16	0.72	0.45	0.01	-0.28	0.06	0.03	2.39
1987	0.04	-0.08	0.18	0.41	-0.11	0.22	0.63	0.52	0.32	0.47	0.26	-0.08	2.78
1988	0.09	0.19	0.29	0.30	0.54	0.28	0.43	0.69	0.03	0.40	0.34	0.18	3.76
1989	0.17	-0.05	0.33	0.53	0.10	0.09	0.61	0.43	0.15	0.47	0.32	0.21	3.36
1990	0.10	-0.01	-0.01	-0.14	0.16	0.61	0.45	0.36	0.20	0.37	0.07	0.08	2.24
1991	-0.05	0.28	0.41	0.44	0.21	0.25	0.75	0.44	0.10	0.40	0.29	-0.03	3.49
1992	-0.02	-0.01	0.23	0.25	0.07	-0.07	0.58	0.48	0.39	0.49	0.04	0.06	2.49
1993	0.12	-0.05	0.15	0.32	0.26	0.49	1.03	0.79	0.45	0.52	0.26	0.16	4.50
1994	0.22	0.10	0.32	0.43	0.05	0.70	0.58	0.70	0.29	0.13	0.14	0.08	3.74
1995	0.00	0.00	0.28	0.35	-0.16	0.23	0.57	0.22	0.00	0.51	0.27	0.25	2.52
1996	0.20	0.42	0.27	0.56	0.67	0.47	0.68	0.08	0.05	0.45	0.23	0.40	4.48
1997	0.29	-0.08	0.38	0.00	0.16	0.15	0.68	0.38	0.38	0.20	0.22	-0.08	2.68
1998	0.06	0.06	0.14	0.45	0.49	0.55	0.69	0.65	0.65	0.25	0.15	0.18	4.32
1999	0.22	0.33	-0.02	0.24	0.10	0.17	0.82	0.76	0.55	0.39	0.40	0.36	4.32
2000	0.49	0.15	0.10	0.24	0.51	0.18	0.78	1.03	0.79	0.15	-0.15	0.18	4.45
2001	-0.03	-0.05	-0.04	0.40	0.18	0.70	0.97	0.59	0.27	0.46	0.08	0.16	3.69
2002	0.17	0.16	0.20	0.11	0.35	0.38	0.15	0.64	0.42	-0.12	0.23	0.02	2.71
2003	0.19	0.12	0.29	0.42	0.27	0.00	0.81	0.58	0.37	0.49	0.22	0.27	4.03
2004	0.08	-0.05	0.23	0.16	0.47	0.00	0.33	0.36	0.49	0.01	-0.34	0.19	1.93
2005	0.09	0.05	0.25	0.49	0.23	0.48	0.39	-0.07	0.40	0.18	0.44	0.30	3.23
2006	0.40	0.25	0.26	0.39	0.33	0.66	0.78	0.69	0.32	0.04	0.29	0.07	4.48
2007	0.05	0.27	0.01	0.16	-0.15	-0.26	0.36	0.49	0.33	0.54	0.28	0.20	2.28
2008	0.21	0.20	0.27	0.38	0.23	0.61	0.76	0.48	0.26	0.27	0.32	0.25	4.24
2009	0.25	0.32	0.45	0.31	0.16	0.38	0.45	0.80	0.04	0.00	0.37	0.07	3.60
2010	-0.06	0.05	0.24	0.12	0.18	0.52	-0.03	0.67	0.12	0.40	0.43	0.34	2.98
2011	0.31	0.35	0.43	0.67	0.58	1.05	1.10	1.08	0.66	0.24	0.32	-0.01	6.78
2012	0.12	0.19	0.27	0.50	0.42	0.51	0.81	0.63	0.31	0.38	0.40	0.27	4.81
2013	0.21	0.12	0.50	0.38	0.54	0.50	0.37	0.67	0.50	0.38	0.34	0.11	4.62
2014	0.28	0.16	0.35	0.46	0.36	0.31	0.46	0.52	0.36	0.45	0.09	0.12	3.92
2015	0.01	0.12	0.24	0.09	-0.53	0.22	0.45	0.65	0.62	0.07	0.01	0.01	1.96
2016	0.17	0.23	0.34	0.05	0.02	0.19	0.68	0.37	0.00	0.28	0.10	0.12	2.55
2017	0.13	0.19	0.32	0.36	0.36	0.30	0.60	0.23	0.20	0.45	0.31	0.18	3.63
2018	0.26	0.16	0.00	0.48	0.33	0.76	0.72	0.51	-0.29	-0.55	0.17	0.00	2.55
Total	9.19	9.23	18.09	21.80	13.83	27.93	42.47	38.46	21.02	17.76	14.68	10.08	171.78
Mean	0.13	0.13	0.26	0.30	0.19	0.39	0.60	0.54	0.30	0.26	0.21	0.14	3.46
Max	0.49	0.42	0.56	0.67	0.67	1.05	1.10	1.20	0.85	0.78	0.45	0.40	6.38
Min	-0.29	-0.08	-0.04	-0.14	-0.53	-0.26	-0.03	-0.07	-0.48	-0.55	-0.34	-0.17	1.65

Table of Final Results - Calculated Monthly Net Reservoir Evaporation Values

Quadrangle: 409
Units: Feet
Control Point 409

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	0.15	-0.06	0.20	0.43	0.13	0.37	0.76	0.90	0.90	0.47	0.43	0.24	4.92
1949	-0.15	-0.04	0.16	0.23	-0.13	0.46	0.83	0.66	0.30	0.19	0.35	0.11	2.97
1950	0.07	0.17	0.45	0.18	0.02	0.50	0.05	0.30	0.28	0.59	0.45	0.22	3.28
1951	0.19	0.07	0.28	0.28	0.03	0.20	0.75	0.87	0.61	0.42	0.18	0.26	4.14
1952	0.18	0.22	0.24	0.17	0.22	0.77	0.80	1.36	1.00	0.82	0.15	0.15	6.08
1953	0.17	0.20	0.17	0.29	0.42	0.95	0.68	0.63	0.80	0.05	0.21	0.25	4.82
1954	0.05	0.28	0.34	-0.08	-0.18	0.42	0.64	0.70	0.59	0.30	0.17	0.06	3.29
1955	0.00	0.07	0.15	0.35	0.05	0.14	0.60	0.59	-0.14	0.30	0.26	0.15	2.52
1956	0.06	0.07	0.39	0.40	0.21	0.67	0.76	0.80	0.74	0.18	0.19	0.05	4.52
1957	0.04	-0.11	0.05	-0.18	-0.25	0.24	0.53	0.59	0.24	-0.02	-0.25	0.11	0.99
1958	-0.01	0.08	-0.04	0.03	0.14	0.40	0.34	0.47	0.18	0.23	0.16	0.06	2.04
1959	0.09	0.12	0.31	0.29	0.07	-0.15	0.23	0.45	0.35	-0.20	0.18	-0.07	1.67
1960	-0.03	0.03	0.12	0.24	0.16	0.41	0.24	0.43	0.11	-0.07	0.28	-0.10	1.82
1961	0.00	0.00	0.04	0.35	0.25	0.07	0.25	0.42	-0.01	0.20	-0.08	0.03	1.52
1962	0.12	0.15	0.16	0.03	0.35	-0.12	0.11	0.37	-0.39	0.12	-0.04	0.03	0.89
1963	0.09	0.07	0.15	0.08	0.03	0.22	0.34	0.32	0.14	0.16	-0.02	0.04	1.62
1964	0.03	0.03	0.28	0.31	-0.01	0.59	0.84	0.42	0.06	0.35	-0.09	0.15	2.96
1965	0.03	0.08	0.21	0.22	-0.03	0.41	0.89	0.45	0.30	0.15	0.31	0.24	3.26
1966	0.01	0.04	0.34	-0.14	0.46	0.58	0.70	0.06	-0.17	0.41	0.36	0.14	2.79
1967	0.24	0.24	0.40	0.15	0.13	0.51	0.51	0.73	-0.01	0.37	0.17	0.05	3.49
1968	-0.28	0.02	0.01	0.24	0.01	0.38	0.22	0.57	0.35	0.28	-0.06	0.14	1.88
1969	0.12	-0.03	-0.03	0.19	0.12	0.41	0.72	0.36	-0.07	0.08	0.18	-0.08	1.97
1970	0.16	0.01	0.02	0.07	0.37	0.58	0.74	0.60	0.20	0.22	0.33	0.24	3.54
1971	0.22	0.17	0.46	0.51	0.40	0.58	0.60	-0.02	0.04	0.06	0.18	-0.12	3.08
1972	0.14	0.18	0.43	0.28	0.19	0.42	0.61	0.43	0.24	-0.13	0.11	0.16	3.06
1973	-0.12	0.04	0.14	0.03	0.33	0.25	0.25	0.59	-0.06	0.09	0.13	0.23	1.90
1974	0.14	0.19	0.32	0.24	0.37	0.57	0.63	0.28	-0.25	-0.02	0.17	0.05	2.69
1975	0.10	-0.02	0.18	0.23	-0.38	0.37	0.21	0.38	0.18	0.46	0.17	0.11	1.99
1976	0.23	0.38	0.36	0.10	0.10	0.42	0.36	0.54	-0.12	-0.15	0.18	0.11	2.51
1977	-0.06	0.17	0.24	0.18	0.13	0.44	0.64	0.35	0.51	0.36	0.22	0.29	3.47
1978	0.07	-0.05	0.18	0.41	0.19	0.44	0.83	0.21	0.33	0.28	-0.03	0.19	3.05
1979	-0.03	0.08	0.10	0.17	0.09	0.29	0.38	0.31	0.48	0.43	0.18	-0.01	2.47
1980	0.07	0.10	0.31	0.42	-0.19	0.68	0.93	0.78	-0.11	0.32	0.11	0.04	3.46
1981	0.18	0.03	0.13	0.15	0.08	0.19	0.62	0.48	0.33	-0.33	0.18	0.16	2.20
1982	0.13	0.09	0.18	0.25	-0.32	-0.04	0.49	0.58	0.37	0.28	0.04	-0.01	2.04
1983	0.04	0.02	0.07	0.25	0.04	0.18	0.62	0.64	0.63	0.08	0.14	0.06	2.77
1984	0.19	0.20	0.19	0.50	0.37	0.57	0.71	0.50	0.41	-0.24	0.06	-0.20	3.26
1985	0.09	-0.07	-0.08	0.18	0.26	0.14	0.58	0.66	0.38	-0.05	0.11	0.15	2.35
1986	0.28	0.10	0.32	0.17	-0.05	0.12	0.67	0.50	0.13	-0.14	-0.03	-0.02	2.05
1987	0.04	-0.17	0.26	0.40	-0.10	0.25	0.54	0.43	0.23	0.45	0.16	-0.23	2.26
1988	0.09	0.18	0.21	0.23	0.47	0.25	0.45	0.58	0.04	0.33	0.25	0.14	3.22
1989	0.07	-0.09	0.17	0.44	0.03	0.13	0.55	0.31	0.11	0.39	0.32	0.22	2.65
1990	0.04	-0.15	-0.07	0.02	0.31	0.65	0.40	0.43	0.12	0.36	-0.01	0.07	2.17
1991	-0.09	0.23	0.33	0.41	0.27	0.30	0.73	0.41	0.22	0.24	0.26	0.00	3.31
1992	-0.01	0.08	0.19	0.30	-0.08	0.15	0.51	0.46	0.34	0.44	-0.05	0.03	2.36
1993	0.05	-0.04	0.15	0.23	0.20	0.40	1.02	0.72	0.33	0.19	0.28	0.02	3.55
1994	0.08	-0.05	0.29	0.18	-0.02	0.65	0.46	0.64	0.24	-0.29	0.04	0.05	2.27
1995	0.00	0.00	0.07	0.25	-0.08	0.24	0.46	0.28	0.17	0.49	0.30	0.17	2.35
1996	0.18	0.32	0.22	0.43	0.59	0.34	0.55	0.12	-0.04	0.21	-0.31	0.19	2.80
1997	0.21	-0.06	0.34	0.01	0.07	0.25	0.58	0.38	0.49	0.23	0.19	-0.28	2.41
1998	-0.05	0.02	0.18	0.38	0.46	0.64	0.78	0.66	0.62	0.21	0.12	0.04	4.06
1999	0.15	0.28	-0.15	0.28	0.13	0.29	0.73	0.84	0.66	0.29	0.35	0.32	4.17
2000	0.35	0.12	0.18	0.07	0.28	0.11	0.53	0.69	0.64	-0.05	-0.28	0.08	2.72
2001	-0.06	-0.09	0.07	0.36	0.23	0.71	0.90	0.61	0.34	0.32	0.19	0.13	3.71
2002	0.15	0.16	0.09	0.05	0.25	0.19	0.20	0.68	0.39	-0.14	0.21	-0.01	2.22
2003	0.19	0.08	0.29	0.43	0.18	0.01	0.77	0.50	0.19	0.44	0.15	0.26	3.49
2004	0.09	-0.12	0.21	0.11	0.32	-0.05	0.25	0.33	0.48	0.06	-0.36	0.13	1.45
2005	0.01	0.04	0.28	0.46	0.24	0.48	0.44	-0.02	0.48	0.07	0.38	0.24	3.10
2006	0.31	0.14	0.22	0.34	0.27	0.63	0.82	0.69	0.32	0.13	0.19	0.05	4.11
2007	0.00	0.21	-0.05	0.19	-0.21	-0.28	0.33	0.59	0.13	0.48	0.25	0.09	1.73
2008	0.25	0.19	0.07	0.28	0.28	0.47	0.72	0.25	0.23	0.22	0.30	0.23	3.49
2009	0.22	0.31	0.38	0.08	0.22	0.42	0.34	0.73	0.05	-0.09	0.26	0.01	2.93
2010	-0.04	0.02	0.21	0.12	0.18	0.38	0.29	0.69	0.07	0.35	0.35	0.14	2.76
2011	0.13	0.11	0.43	0.61	0.48	0.66	1.07	1.07	0.63	0.22	0.18	0.03	5.62
2012	-0.02	0.13	0.09	0.39	0.42	0.49	0.79	0.52	0.34	0.32	0.38	0.22	4.07
2013	0.20	0.09	0.36	0.27	0.44	0.57	0.50	0.59	0.40	0.29	0.17	0.02	3.90
2014	0.21	0.10	0.28	0.37	0.43	0.31	0.35	0.57	0.44	0.41	-0.03	0.05	3.49
2015	0.04	0.05	0.19	0.06	-0.65	0.18	0.51	0.63	0.56	0.00	-0.13	0.03	1.47
2016	0.17	0.20	0.27	0.04	-0.05	0.38	0.63	0.33	0.04	0.24	0.06	0.13	2.44
2017	0.06	0.06	0.39	0.31	0.33	0.16	0.53	0.16	0.06	0.41	0.24	0.08	2.79
2018	0.23	-0.04	0.06	0.39	0.33	0.74	0.65	0.46	-0.27	-0.40	0.17	-0.09	2.23
Total	6.25	5.63	14.14	16.69	10.40	25.73	40.04	36.59	18.90	13.72	10.32	6.22	142.74
Mean	0.09	0.08	0.20	0.23	0.14	0.36	0.56	0.52	0.27	0.20	0.15	0.09	2.89
Max	0.35	0.38	0.46	0.61	0.59	0.95	1.07	1.36	1.00	0.82	0.45	0.32	6.08
Min	-0.28	-0.17	-0.15	-0.18	-0.65	-0.28	0.05	-0.02	-0.39	-0.40	-0.36	-0.28	0.89

Table of Final Results - Calculated Monthly Net Reservoir Evaporation Values

Quadrangle: 410
Units: Feet
Control Point 410

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	0.11	-0.15	0.12	0.37	-0.13	0.29	0.43	0.83	0.73	0.49	0.50	0.26	3.85
1949	-0.19	-0.01	0.13	0.23	-0.18	0.24	0.59	0.57	0.20	0.00	0.35	0.10	2.03
1950	-0.05	0.17	0.41	0.08	-0.04	0.20	0.09	0.27	0.06	0.57	0.49	0.30	2.55
1951	0.22	-0.03	0.30	0.29	0.19	-0.03	0.50	0.79	0.49	0.29	0.25	0.24	3.50
1952	0.20	0.16	0.09	0.05	0.16	0.57	0.80	0.83	0.69	0.66	0.36	0.07	4.64
1953	0.19	0.12	0.02	0.07	0.24	0.58	0.55	0.76	0.72	0.15	0.19	0.29	3.88
1954	-0.04	0.23	0.35	0.14	-0.18	0.26	0.44	0.72	0.44	0.11	0.17	0.02	2.66
1955	0.02	0.00	0.10	0.12	-0.03	0.19	0.44	0.53	0.19	0.41	0.32	0.15	2.44
1956	0.02	-0.03	0.31	0.28	0.08	0.62	0.45	0.64	0.63	0.15	0.11	-0.10	3.16
1957	0.00	-0.09	-0.05	-0.33	-0.24	0.26	0.42	0.42	0.13	0.01	-0.26	0.07	0.34
1958	-0.05	0.08	-0.14	-0.09	0.22	0.19	0.37	0.25	0.16	0.19	0.09	0.07	1.34
1959	0.09	0.08	0.19	0.20	0.14	-0.12	0.01	0.35	0.18	-0.23	0.13	-0.09	0.93
1960	-0.05	0.03	0.12	0.11	0.05	0.23	0.03	0.40	0.15	-0.02	0.21	-0.17	1.09
1961	-0.03	-0.03	-0.07	0.28	0.16	0.08	0.14	0.33	-0.01	0.10	-0.04	-0.02	0.89
1962	0.09	0.10	0.15	-0.05	0.29	-0.17	0.04	0.36	-0.29	0.06	-0.07	0.09	0.60
1963	0.08	0.10	0.19	0.00	0.07	0.42	0.21	0.41	0.26	0.34	0.11	0.01	2.20
1964	-0.03	0.07	0.12	0.13	0.06	0.49	0.77	0.29	-0.20	0.35	-0.11	0.13	2.07
1965	0.01	0.01	0.17	0.20	-0.11	0.22	0.66	0.36	0.26	0.22	0.12	0.04	2.16
1966	-0.01	-0.08	0.29	-0.16	0.37	0.31	0.47	0.03	0.05	0.33	0.24	0.06	1.90
1967	0.21	0.19	0.35	0.04	-0.05	0.40	0.38	0.60	-0.08	0.18	0.15	0.01	2.38
1968	-0.27	0.00	-0.04	0.15	-0.01	0.22	0.26	0.40	0.11	0.18	-0.06	0.09	1.03
1969	0.00	-0.01	-0.01	0.15	0.11	0.37	0.62	0.45	0.19	-0.10	0.19	-0.11	1.85
1970	0.09	-0.05	0.03	-0.05	0.20	0.40	0.56	0.53	-0.24	0.00	0.24	0.19	1.90
1971	0.13	0.13	0.42	0.35	0.27	0.42	0.46	0.18	0.10	-0.16	0.08	-0.16	2.22
1972	0.14	0.19	0.33	0.13	0.26	0.47	0.63	0.24	0.21	-0.14	-0.06	0.07	2.47
1973	-0.13	0.00	0.04	-0.04	0.13	-0.11	0.10	0.51	-0.13	-0.05	0.02	0.18	0.52
1974	0.11	0.16	0.30	0.17	0.38	0.39	0.63	0.16	-0.28	-0.16	0.16	0.01	2.03
1975	0.05	-0.02	0.06	0.18	-0.17	0.30	0.28	0.25	0.19	0.37	0.17	0.05	1.71
1976	0.25	0.35	0.21	-0.04	0.00	0.36	0.31	0.55	0.05	-0.08	0.17	0.08	2.21
1977	-0.10	0.12	0.07	0.26	0.23	0.59	0.62	0.34	0.44	0.32	0.20	0.25	3.34
1978	0.00	-0.11	0.15	0.28	0.03	0.40	0.81	0.48	0.38	0.40	-0.10	0.13	2.85
1979	-0.06	-0.02	-0.06	0.11	0.01	0.35	0.50	0.30	0.34	0.34	0.16	-0.01	1.96
1980	0.03	0.10	0.28	0.36	0.05	0.66	0.87	0.85	0.01	0.24	0.14	0.05	3.64
1981	0.15	0.05	0.03	0.11	-0.20	0.31	0.52	0.45	0.19	-0.42	0.17	0.19	1.55
1982	0.05	0.08	0.15	0.18	-0.09	0.15	0.45	0.54	0.49	0.20	-0.08	-0.07	2.05
1983	0.06	-0.01	0.06	0.31	0.02	0.21	0.53	0.53	0.58	-0.02	0.06	0.00	2.33
1984	0.16	0.11	0.07	0.34	0.26	0.55	0.61	0.37	0.45	-0.34	0.02	-0.24	2.36
1985	0.07	-0.06	-0.04	0.05	0.19	0.08	0.49	0.61	0.33	-0.16	0.01	0.12	1.69
1986	0.27	-0.03	0.25	0.00	-0.14	0.23	0.61	0.36	0.01	-0.03	-0.08	-0.03	1.42
1987	0.06	-0.21	0.22	0.40	-0.13	0.17	0.44	0.48	0.22	0.36	-0.05	-0.28	1.68
1988	0.11	0.12	0.11	0.28	0.35	0.24	0.42	0.61	-0.06	0.21	0.05	-0.02	2.42
1989	-0.03	-0.08	0.09	0.38	-0.16	0.10	0.31	0.40	0.09	0.36	0.28	0.24	1.98
1990	-0.01	-0.11	-0.16	0.07	0.33	0.44	0.35	0.43	0.20	0.22	-0.08	0.00	1.68
1991	-0.06	0.12	0.23	0.19	0.02	0.21	0.50	0.16	0.06	-0.03	0.15	-0.09	1.46
1992	-0.05	0.09	0.15	0.23	-0.07	0.03	0.38	0.36	0.07	0.34	-0.06	-0.15	1.32
1993	-0.02	-0.10	0.09	0.08	0.11	0.32	0.92	0.62	0.07	-0.10	0.14	-0.02	2.11
1994	0.02	-0.04	0.17	0.14	-0.06	0.44	0.13	0.43	-0.04	-0.16	-0.09	0.01	0.95
1995	0.03	0.01	-0.06	0.01	-0.15	0.21	0.34	0.29	0.12	0.44	0.26	0.04	1.54
1996	0.15	0.35	0.15	0.30	0.48	0.39	0.40	-0.02	-0.10	0.14	-0.49	0.08	1.83
1997	0.20	-0.13	0.18	0.05	0.06	0.20	0.49	0.37	0.43	-0.03	0.14	-0.19	1.77
1998	-0.13	0.06	0.15	0.30	0.46	0.56	0.88	0.66	0.50	0.11	0.04	-0.04	3.55
1999	0.14	0.26	-0.01	0.21	0.04	0.29	0.64	0.83	0.46	0.34	0.32	0.19	3.71
2000	0.19	0.19	0.16	0.00	0.36	0.07	0.68	0.80	0.49	-0.10	-0.27	0.02	2.59
2001	0.01	-0.01	0.12	0.30	0.14	0.50	0.79	0.51	0.22	0.28	0.20	0.01	3.07
2002	0.12	0.11	-0.07	0.14	0.07	0.25	0.21	0.56	0.36	-0.23	0.24	-0.02	1.74
2003	0.19	-0.03	0.25	0.39	0.03	0.18	0.66	0.39	0.11	0.36	0.07	0.19	2.79
2004	0.05	-0.10	0.18	0.09	0.25	-0.28	0.14	0.30	0.36	-0.09	-0.28	0.15	0.77
2005	0.02	0.08	0.26	0.42	0.21	0.44	0.35	0.22	0.50	0.32	0.32	0.23	3.37
2006	0.23	0.08	0.14	0.15	0.30	0.55	0.76	0.62	0.27	0.15	0.06	-0.04	3.27
2007	-0.09	0.22	-0.12	0.19	-0.27	-0.26	0.29	0.45	0.18	0.25	0.23	0.05	1.12
2008	0.22	0.13	-0.09	0.23	0.27	0.51	0.61	0.16	0.26	0.28	0.28	0.24	3.10
2009	0.16	0.23	0.22	-0.18	0.03	0.41	0.39	0.58	-0.02	-0.39	0.26	-0.03	1.66
2010	0.00	-0.02	0.15	0.17	0.21	0.37	0.32	0.61	-0.15	0.31	0.23	0.09	2.29
2011	0.09	0.10	0.41	0.29	0.08	0.56	0.79	0.77	0.51	0.08	0.07	-0.05	3.70
2012	-0.11	0.09	-0.06	0.29	0.32	0.26	0.62	0.40	0.37	0.25	0.35	0.12	2.90
2013	0.05	0.10	0.22	0.26	0.05	0.30	0.32	0.77	0.36	0.05	0.09	-0.09	2.48
2014	0.11	0.14	0.19	0.43	0.35	0.26	0.05	0.47	0.35	0.27	0.07	0.10	2.79
2015	-0.01	-0.03	0.04	-0.13	-0.25	0.41	0.49	0.65	0.48	-0.19	-0.18	0.10	1.38
2016	0.21	0.21	0.20	0.01	-0.03	0.38	0.45	0.06	0.16	0.15	0.03	0.20	2.03
2017	0.07	0.23	0.30	0.12	0.29	0.10	0.41	0.00	0.26	0.33	0.21	0.03	2.35
2018	0.16	-0.29	0.16	0.29	0.22	0.53	0.51	0.28	-0.44	-0.42	0.16	-0.09	1.07
Total	3.87	3.67	9.42	11.06	6.51	20.72	32.69	32.06	14.83	8.61	7.47	3.30	106.03
Mean	0.05	0.06	0.13	0.15	0.09	0.29	0.46	0.45	0.22	0.13	0.10	0.05	2.19
Max	0.27	0.35	0.42	0.43	0.48	0.66	0.92	0.85	0.73	0.66	0.50	0.30	4.64
Min	-0.27	-0.29	-0.16	-0.33	-0.27	-0.28	0.01	-0.02	-0.44	-0.42	-0.49	-0.28	0.34

Table of Final Results - Calculated Monthly Net Reservoir Evaporation Values

Quadrangle: 411
Units: Feet
Control Point 411

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	0.05	0.06	0.22	0.45	0.21	0.44	0.20	0.66	0.61	0.32	0.31	0.19	3.72
1949	-0.33	0.01	0.05	0.09	0.11	0.32	0.59	0.49	0.17	-0.19	0.30	-0.08	1.53
1950	-0.12	0.21	0.31	0.24	0.14	0.39	-0.17	0.13	0.20	0.47	0.37	0.21	2.38
1951	0.10	-0.12	0.29	0.25	0.18	0.18	0.53	0.78	0.34	0.22	0.08	0.18	3.01
1952	0.14	0.07	0.04	-0.17	0.27	0.75	0.61	0.81	0.49	0.53	-0.14	-0.10	3.30
1953	0.13	0.06	-0.01	0.07	0.37	0.84	0.34	0.50	0.44	0.09	-0.05	0.10	2.88
1954	-0.14	0.29	0.35	0.13	-0.09	0.36	0.73	0.69	0.37	-0.22	0.17	-0.01	2.63
1955	0.01	-0.05	0.11	0.09	0.00	0.39	0.45	0.44	0.18	0.39	0.34	0.14	2.49
1956	0.03	-0.17	0.35	0.26	0.27	0.59	0.72	0.86	0.72	0.26	0.00	0.02	3.91
1957	-0.03	-0.07	-0.15	-0.29	0.04	0.42	0.58	0.50	-0.07	0.05	-0.34	0.10	0.74
1958	-0.03	0.11	-0.08	-0.07	0.27	0.27	0.45	0.41	0.09	0.19	0.05	0.05	1.71
1959	0.06	0.03	0.21	0.20	0.18	-0.01	-0.05	0.35	0.28	-0.23	0.07	-0.05	1.04
1960	0.01	0.03	0.12	0.19	0.16	0.30	0.13	0.23	0.12	0.05	0.13	-0.36	1.11
1961	0.07	-0.03	0.02	0.38	0.10	0.11	0.24	0.44	0.09	0.13	-0.14	-0.06	1.35
1962	0.00	0.08	0.09	0.06	0.40	-0.27	0.22	0.39	-0.10	0.08	-0.08	0.09	0.96
1963	0.12	0.15	0.25	0.08	0.27	0.49	0.29	0.59	0.39	0.49	0.15	-0.01	3.26
1964	0.02	0.03	-0.11	0.03	0.02	0.32	0.73	0.24	-0.25	0.37	-0.03	0.13	1.50
1965	0.03	-0.04	0.19	0.32	-0.17	0.23	0.59	0.50	0.03	0.23	0.01	0.07	1.99
1966	-0.02	-0.11	0.28	-0.19	0.36	0.30	0.43	0.03	0.08	0.29	0.22	-0.02	1.65
1967	0.20	0.15	0.25	-0.21	-0.21	0.51	0.30	0.56	-0.20	0.14	0.13	-0.05	1.57
1968	-0.13	0.10	0.10	0.27	0.17	0.12	0.24	0.48	-0.11	0.22	-0.05	0.09	1.50
1969	0.01	0.07	0.07	0.18	0.13	0.36	0.66	0.37	0.16	-0.08	0.18	-0.18	1.93
1970	0.05	-0.12	0.18	0.10	0.18	0.32	0.55	0.41	-0.32	0.03	0.21	0.13	1.72
1971	0.10	0.07	0.36	0.29	0.08	0.54	0.39	0.06	0.11	-0.15	0.13	0.02	2.00
1972	0.12	0.21	0.27	0.14	0.23	0.44	0.56	0.29	0.11	-0.27	-0.13	0.04	2.01
1973	-0.09	0.01	0.13	-0.05	0.16	-0.02	0.20	0.49	-0.24	0.20	0.25	0.15	1.19
1974	0.04	0.22	0.29	0.23	0.27	0.29	0.57	0.06	-0.02	-0.09	0.23	0.04	2.13
1975	0.07	0.04	0.02	0.27	-0.12	0.33	0.32	0.36	0.25	0.39	0.12	0.03	2.08
1976	0.23	0.23	0.02	-0.11	-0.15	0.17	0.13	0.40	0.21	-0.05	0.15	0.09	1.32
1977	-0.07	0.15	0.06	0.41	0.28	0.35	0.60	0.17	0.29	0.34	0.11	0.23	2.92
1978	-0.07	-0.16	0.04	0.28	0.00	0.40	0.72	0.47	0.31	0.37	-0.32	0.08	2.12
1979	-0.12	-0.13	-0.06	0.20	-0.08	0.49	0.30	0.24	0.29	0.24	0.19	-0.05	1.51
1980	0.01	0.10	0.19	0.26	0.06	0.52	0.84	0.81	-0.12	0.16	0.10	0.06	2.99
1981	0.12	0.05	0.07	0.20	-0.12	0.19	0.45	0.45	0.24	-0.46	0.20	0.23	1.62
1982	-0.02	0.08	0.22	0.12	-0.20	0.09	0.38	0.42	0.40	0.16	-0.24	-0.23	1.18
1983	0.11	0.01	0.10	0.26	-0.13	0.06	0.37	0.40	0.44	0.02	-0.02	-0.02	1.60
1984	0.03	0.00	-0.02	0.27	0.15	0.33	0.52	0.46	0.41	-0.43	0.00	-0.11	1.61
1985	0.08	-0.03	0.10	0.02	0.15	0.26	0.41	0.66	0.32	-0.22	-0.09	0.08	1.74
1986	0.23	0.15	0.31	-0.13	-0.10	0.29	0.67	0.44	0.03	-0.04	-0.21	-0.04	1.60
1987	0.07	-0.09	0.18	0.43	-0.22	0.19	0.38	0.53	0.00	0.20	-0.24	-0.20	1.23
1988	0.18	0.10	0.11	0.26	0.39	0.34	0.28	0.52	-0.05	0.13	0.00	-0.07	2.19
1989	-0.05	0.02	0.17	0.44	-0.03	-0.06	0.05	0.39	0.09	0.31	0.25	0.23	1.81
1990	-0.18	-0.06	0.00	0.12	0.13	0.44	0.40	0.39	0.21	0.14	-0.08	-0.12	1.39
1991	-0.09	0.07	0.21	-0.09	0.03	0.08	0.48	0.29	0.10	-0.14	0.26	0.12	1.32
1992	0.15	0.11	0.28	0.25	-0.12	-0.06	0.21	0.38	0.01	0.31	-0.05	-0.08	1.39
1993	0.06	-0.03	0.21	0.11	0.06	0.18	0.87	0.59	0.15	-0.09	0.07	0.03	2.21
1994	0.06	0.00	0.25	0.10	-0.10	0.32	-0.15	0.22	0.11	-0.23	-0.07	0.03	0.54
1995	0.11	0.06	0.13	0.14	-0.01	0.31	0.32	0.49	-0.03	0.39	0.22	-0.03	2.10
1996	0.15	0.44	0.21	0.31	0.47	0.33	0.28	-0.13	0.06	0.24	-0.28	0.11	2.19
1997	0.19	-0.14	0.25	-0.01	0.15	0.20	0.45	0.30	0.45	-0.16	0.03	-0.17	1.54
1998	-0.23	0.00	0.02	0.32	0.34	0.47	0.67	0.55	0.33	-0.03	0.00	-0.12	2.32
1999	0.18	0.26	0.05	0.20	-0.06	0.26	0.57	0.63	0.35	0.34	0.30	0.07	3.15
2000	0.21	0.29	0.17	0.22	0.18	0.04	0.52	0.64	0.41	0.05	-0.23	0.14	2.64
2001	0.13	-0.01	0.23	0.22	0.04	0.25	0.61	0.20	-0.09	0.16	0.09	-0.16	1.67
2002	-0.09	0.19	0.10	0.09	0.04	0.24	0.16	0.26	0.25	-0.30	0.14	-0.03	1.05
2003	0.17	-0.03	0.21	0.33	0.05	0.06	0.52	0.35	-0.07	0.27	0.02	0.14	2.02
2004	-0.04	-0.13	0.20	0.05	0.20	-0.27	0.24	0.30	0.35	-0.07	-0.21	0.17	0.79
2005	-0.09	0.05	0.18	0.26	0.12	0.42	0.19	0.36	0.45	0.33	0.28	0.23	2.78
2006	0.16	0.02	-0.04	0.20	0.32	0.48	0.65	0.53	0.21	0.01	-0.04	-0.08	2.42
2007	0.01	0.17	0.03	0.29	-0.27	0.42	0.32	0.37	0.19	0.04	0.22	-0.07	1.72
2008	0.17	0.07	-0.10	0.11	0.11	0.30	0.60	0.19	0.22	0.28	0.15	0.16	2.26
2009	0.12	0.18	0.03	-0.22	-0.05	0.29	0.19	0.31	-0.25	-0.11	0.16	-0.03	0.62
2010	0.02	0.13	0.16	0.19	0.22	0.39	0.22	0.54	-0.06	0.13	0.03	0.07	2.04
2011	0.11	0.13	0.33	0.22	0.05	0.51	0.65	0.69	0.49	0.14	0.07	-0.02	3.37
2012	-0.10	0.08	0.03	0.14	0.22	0.24	0.52	0.40	0.36	0.18	0.31	-0.01	2.37
2013	-0.06	0.06	0.09	0.16	-0.08	0.36	0.31	0.57	0.33	-0.14	-0.02	-0.03	1.55
2014	0.11	0.15	0.01	0.19	0.20	0.25	0.04	0.50	0.33	0.12	0.13	0.01	2.04
2015	-0.13	0.01	0.13	0.18	0.10	0.46	0.53	0.65	0.43	-0.22	-0.30	0.31	2.15
2016	0.18	0.22	0.14	0.09	0.13	0.41	0.57	0.14	0.09	0.30	-0.01	0.10	2.36
2017	0.02	0.13	0.23	0.01	0.23	0.02	0.18	-0.21	0.44	0.12	0.19	-0.06	1.30
2018	0.13	-0.28	0.24	0.24	0.26	0.47	0.52	0.22	-0.61	-0.07	0.18	0.02	1.32
Total	2.63	3.91	9.67	10.67	6.94	20.80	29.14	29.20	11.99	6.63	3.93	1.84	97.73
Mean	0.04	0.06	0.13	0.15	0.10	0.29	0.41	0.41	0.18	0.10	0.05	0.03	1.94
Max	0.23	0.44	0.36	0.45	0.47	0.84	0.87	0.86	0.72	0.53	0.37	0.31	3.91
Min	-0.33	-0.28	-0.15	-0.29	-0.27	-0.27	-0.17	-0.21	-0.61	-0.46	-0.34	-0.36	0.54

Table of Final Results - Calculated Monthly Net Reservoir Evaporation Values

Quadrangle: 412.00
Units: Feet
Control Point 412

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	-0.02	0.09	-0.01	0.26	0.38	0.38	0.43	0.63	0.56	0.20	0.14	0.04	3.08
1949	-0.27	0.13	-0.10	-0.06	0.23	0.08	0.14	0.28	0.23	-0.41	0.24	-0.04	0.45
1950	0.04	0.09	0.06	-0.09	0.10	0.12	0.05	0.19	-0.01	0.23	0.27	0.20	1.25
1951	-0.08	-0.09	0.09	0.15	0.20	0.43	0.24	0.63	-0.21	0.19	0.07	0.01	1.63
1952	0.01	-0.05	-0.02	-0.06	-0.02	0.39	0.19	0.66	0.64	0.58	-0.22	-0.24	1.86
1953	0.00	-0.06	-0.04	0.00	-0.25	0.49	-0.18	0.23	0.34	0.33	-0.06	-0.16	0.64
1954	-0.16	0.26	0.30	0.18	0.00	0.52	0.65	0.75	0.33	-0.18	0.12	-0.02	2.75
1955	-0.04	-0.07	0.23	0.10	0.05	0.45	0.37	0.11	0.25	0.36	0.27	0.12	2.20
1956	0.00	-0.06	0.27	0.23	0.29	0.39	0.64	0.68	0.61	0.26	-0.19	0.05	3.17
1957	-0.11	-0.05	-0.17	0.04	0.16	0.26	0.51	0.36	-0.16	-0.08	-0.10	-0.01	0.65
1958	-0.04	0.06	-0.01	-0.04	0.30	0.20	0.15	0.19	-0.10	0.14	-0.08	-0.03	0.74
1959	0.03	-0.13	0.21	0.15	0.12	0.08	0.07	0.30	0.30	-0.07	0.08	-0.06	1.08
1960	-0.07	0.02	0.16	0.25	0.21	0.24	0.26	0.19	0.03	0.12	0.12	0.03	1.56
1961	0.05	-0.07	0.09	0.30	0.14	-0.09	0.13	0.30	0.16	0.20	-0.24	-0.11	0.86
1962	-0.12	0.04	0.08	0.06	0.36	0.04	0.33	0.42	-0.03	-0.04	0.15	0.04	1.33
1963	0.02	0.14	0.19	0.09	0.15	0.31	0.10	0.56	0.41	0.46	0.10	-0.01	2.52
1964	0.03	-0.04	-0.07	-0.04	0.16	0.42	0.60	0.14	-0.07	0.24	0.00	0.08	1.45
1965	0.00	-0.04	0.06	0.29	-0.10	0.25	0.53	0.50	0.06	0.24	0.02	0.01	1.82
1966	-0.16	-0.27	0.27	0.29	0.08	0.46	0.33	-0.04	0.02	0.15	0.22	-0.10	1.25
1967	0.11	0.07	0.21	0.05	0.02	0.49	0.18	0.46	-0.02	0.03	0.12	-0.01	1.71
1968	-0.12	0.07	0.17	0.14	0.11	0.20	0.34	0.44	0.04	0.22	-0.08	0.01	1.54
1969	0.10	-0.07	-0.02	0.10	0.02	0.42	0.59	0.55	0.22	0.00	0.13	-0.09	1.95
1970	0.03	0.06	0.16	0.11	0.30	0.29	0.51	0.45	0.01	-0.05	0.14	0.07	2.08
1971	0.10	0.02	0.32	0.31	0.13	0.54	0.10	0.17	0.18	0.22	0.12	-0.51	1.70
1972	0.01	0.18	0.24	0.27	0.26	0.25	0.46	0.46	0.04	-0.26	-0.11	-0.03	1.77
1973	-0.07	0.03	-0.05	-0.11	0.20	-0.02	0.34	0.45	-0.27	0.09	0.13	-0.02	0.70
1974	-0.13	0.17	0.23	0.09	0.22	0.24	0.52	0.04	-0.41	0.03	-0.11	-0.05	0.84
1975	0.06	0.17	0.01	0.18	-0.05	0.10	0.35	0.37	0.30	0.38	0.09	-0.03	1.93
1976	0.22	0.18	-0.13	-0.05	-0.05	0.26	0.22	0.49	-0.02	-0.09	0.11	0.04	1.18
1977	-0.12	0.06	0.04	0.05	0.27	0.27	0.47	0.24	0.31	0.30	-0.16	0.17	1.90
1978	-0.11	-0.08	0.03	0.26	0.08	0.42	0.64	0.57	0.35	0.44	-0.36	-0.05	2.19
1979	0.00	-0.06	0.10	0.12	-0.13	0.30	0.13	0.20	0.14	0.10	0.08	-0.10	0.88
1980	-0.14	0.12	0.17	0.12	0.00	0.22	0.72	0.69	0.02	0.15	0.08	0.07	2.22
1981	0.16	0.11	0.17	0.23	-0.17	0.32	0.37	0.46	0.38	-0.12	0.24	0.21	2.36
1982	-0.01	0.00	0.17	0.17	0.28	0.08	0.32	0.29	0.41	0.03	-0.33	-0.36	1.05
1983	0.08	0.11	0.10	0.24	-0.05	0.16	0.42	0.36	0.41	0.09	0.04	-0.12	1.84
1984	-0.04	0.13	0.04	0.27	0.12	0.43	0.32	0.43	0.23	-0.41	0.14	-0.05	1.61
1985	0.05	-0.11	0.05	0.06	0.11	0.30	0.37	0.60	0.32	-0.11	-0.10	-0.04	1.50
1986	0.18	-0.02	0.26	-0.05	0.09	0.09	0.46	0.53	0.29	-0.08	-0.07	-0.02	1.66
1987	0.03	0.03	0.09	0.38	-0.04	-0.01	0.31	0.49	0.11	0.12	-0.12	-0.15	1.24
1988	0.13	0.03	-0.01	0.22	0.40	0.48	0.07	0.27	0.23	-0.09	-0.33	-0.03	1.37
1989	-0.06	0.12	0.11	0.29	-0.15	0.34	0.03	0.34	0.23	0.24	0.25	0.16	1.90
1990	-0.18	0.10	-0.19	0.07	-0.08	0.34	0.16	0.36	0.00	0.00	-0.16	-0.12	0.30
1991	0.10	-0.02	0.20	-0.09	-0.01	0.40	0.35	0.31	0.23	0.01	0.07	0.26	1.81
1992	0.21	0.05	0.19	0.16	0.15	0.03	-0.06	0.40	0.05	0.31	-0.13	-0.05	1.31
1993	0.09	0.21	0.12	0.11	0.14	0.32	0.85	0.55	0.25	-0.12	0.05	0.19	2.76
1994	0.03	0.08	0.32	0.08	0.14	0.39	0.11	0.30	0.28	-0.09	0.14	0.00	1.78
1995	0.13	0.01	0.23	0.09	0.13	0.29	0.34	0.50	0.00	0.36	0.21	-0.02	2.27
1996	0.04	0.39	0.14	0.21	0.19	0.15	-0.13	0.03	0.00	0.14	-0.05	-0.03	1.08
1997	0.08	-0.06	0.24	0.10	0.07	0.17	0.47	0.21	0.44	-0.08	-0.03	-0.04	1.57
1998	-0.05	-0.04	0.15	0.26	0.31	0.54	0.67	0.47	0.04	-0.05	0.10	0.04	2.44
1999	0.22	0.27	0.10	0.24	0.12	0.23	0.53	0.72	0.33	0.32	0.20	0.32	3.60
2000	-0.01	0.07	-0.01	0.05	0.03	0.14	0.36	0.58	0.35	0.03	-0.32	0.07	1.34
2001	0.14	0.15	0.14	0.22	0.09	0.24	0.53	0.30	-0.04	0.10	0.04	0.16	2.07
2002	0.19	0.19	0.25	0.22	0.14	0.32	0.28	0.38	0.24	0.16	0.19	0.06	2.62
2003	0.18	0.08	0.20	0.29	0.20	0.03	0.48	0.38	0.09	0.25	0.06	0.12	2.36
2004	0.03	-0.10	0.22	0.06	0.10	-0.14	0.34	0.32	0.41	-0.04	-0.17	0.17	1.20
2005	0.13	0.05	0.21	0.20	0.23	0.50	0.20	0.42	0.39	0.39	0.26	0.23	3.21
2006	0.06	-0.02	0.03	0.26	0.26	0.48	0.68	0.56	0.34	0.02	-0.02	-0.17	2.48
2007	-0.01	0.16	0.06	0.20	-0.06	0.31	0.34	0.37	0.09	0.04	0.14	0.00	1.64
2008	0.12	0.11	0.25	-0.07	-0.08	0.12	0.57	0.06	-0.01	0.10	0.14	0.16	1.47
2009	0.05	0.12	-0.05	-0.02	-0.07	0.34	0.00	0.11	-0.22	0.02	0.13	-0.05	0.36
2010	0.13	0.08	0.14	0.21	0.10	0.24	0.21	0.50	-0.05	0.10	-0.08	0.01	1.59
2011	0.06	0.00	0.25	-0.03	0.08	0.53	0.64	0.68	0.48	0.24	-0.06	-0.35	2.52
2012	-0.06	0.00	0.14	0.10	0.16	0.37	0.42	0.30	0.32	0.16	0.30	-0.03	2.18
2013	-0.09	-0.04	0.16	0.12	-0.01	0.21	0.25	0.57	0.12	-0.18	-0.08	0.01	1.04
2014	0.07	0.11	0.09	0.09	0.08	0.15	0.09	0.38	0.20	0.13	0.10	-0.09	1.40
2015	-0.02	0.03	0.19	-0.09	-0.08	0.37	0.54	0.47	0.29	-0.17	0.16	0.15	1.84
2016	0.10	0.13	0.05	0.05	0.18	0.34	0.58	0.16	0.24	0.29	-0.05	0.04	2.11
2017	-0.05	0.05	0.12	-0.27	0.16	0.04	0.09	-0.02	0.41	-0.01	0.14	-0.14	0.52
2018	0.04	-0.14	0.28	0.13	0.18	0.38	0.43	0.32	-0.20	0.09	0.00	-0.03	1.48
Total	1.30	3.24	8.27	8.50	7.38	19.42	24.10	27.12	11.93	6.67	2.09	-0.26	82.73
Mean	0.02	0.05	0.11	0.12	0.10	0.27	0.34	0.38	0.17	0.09	0.03	0.00	1.69
Max	0.22	0.39	0.32	0.38	0.40	0.54	0.85	0.75	0.64	0.58	0.30	0.32	3.17
Min	-0.27	-0.27	-0.19	-0.27	-0.25	-0.14	-0.18	-0.04	-0.41	-0.41	-0.36	-0.51	0.30

Table of Final Results - Calculated Monthly Net Reservoir Evaporation Values

Quadrangle: 413
Units: Feet
Control Point 413

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	-0.04	-0.13	0.00	0.12	-0.16	0.35	0.35	0.44	0.48	0.06	-0.06	-0.03	1.38
1949	-0.53	0.04	0.04	0.05	0.25	-0.04	0.07	0.30	0.25	-0.34	0.26	-0.13	0.22
1950	-0.16	0.10	0.07	-0.06	-0.21	0.24	-0.11	0.26	-0.23	0.17	0.22	0.17	0.46
1951	-0.17	-0.04	0.18	-0.06	0.19	-0.04	0.21	0.54	-0.25	0.09	-0.03	0.02	0.64
1952	-0.02	0.01	-0.10	0.01	0.04	0.36	0.30	0.50	0.57	0.47	-0.46	-0.12	1.56
1953	-0.08	0.12	-0.05	-0.23	0.07	0.50	-0.09	0.34	0.29	0.29	-0.01	-0.10	1.05
1954	-0.16	0.16	0.19	0.00	-0.21	0.46	0.46	0.70	0.37	-0.36	0.05	-0.16	1.50
1955	-0.06	-0.07	0.05	0.07	0.06	0.29	0.21	0.03	0.01	0.03	0.24	0.06	0.92
1956	-0.02	-0.18	0.06	0.02	0.14	0.15	0.31	0.35	0.29	0.10	-0.11	0.00	1.11
1957	-0.20	-0.17	-0.19	-0.22	0.28	0.20	0.17	0.22	-0.15	-0.24	-0.16	-0.09	-0.55
1958	-0.07	0.04	-0.10	-0.45	0.21	-0.06	0.03	-0.19	-0.14	-0.04	-0.21	0.04	-0.94
1959	0.01	-0.17	0.09	0.01	0.00	0.10	0.01	0.31	0.17	0.04	0.04	-0.05	0.56
1960	-0.12	-0.08	0.12	0.29	0.16	0.11	0.36	0.18	0.01	0.12	0.05	-0.11	1.09
1961	0.12	-0.09	-0.17	0.36	0.16	-0.12	-0.05	0.22	0.11	0.00	-0.27	-0.17	0.10
1962	-0.16	-0.09	0.06	0.11	0.38	0.02	0.40	0.43	-0.07	-0.28	-0.05	0.07	0.82
1963	0.04	0.14	0.03	-0.08	0.23	0.24	0.05	0.34	0.32	0.39	-0.03	-0.09	1.58
1964	0.07	-0.05	-0.06	-0.19	0.23	0.37	0.39	0.00	-0.19	0.30	-0.05	-0.01	0.81
1965	-0.08	-0.13	0.00	0.27	-0.01	0.18	0.40	0.38	0.05	0.25	0.07	0.01	1.39
1966	-0.15	-0.05	0.26	-0.31	0.35	0.51	0.23	-0.09	0.05	0.08	0.06	-0.29	0.65
1967	0.08	0.02	0.19	0.03	-0.28	0.41	0.26	0.39	0.03	0.11	0.20	-0.18	1.26
1968	-0.18	0.10	0.03	0.02	-0.33	-0.06	0.26	0.32	-0.14	0.06	-0.21	-0.03	-0.16
1969	-0.11	0.10	0.00	0.17	0.20	0.34	0.49	0.53	0.23	0.00	-0.09	-0.30	1.56
1970	0.08	-0.10	0.10	0.00	0.23	0.20	0.33	0.12	0.27	-0.09	0.04	0.01	1.19
1971	0.07	-0.04	0.18	0.20	0.10	0.50	-0.23	0.15	0.27	0.23	-0.01	0.05	1.47
1972	-0.08	0.17	0.19	0.26	0.23	0.21	0.24	0.42	0.00	-0.23	-0.20	-0.12	1.09
1973	-0.10	0.05	-0.09	-0.16	0.28	-0.07	0.19	0.38	-0.23	-0.29	0.01	0.00	-0.03
1974	-0.16	0.13	0.23	0.06	0.12	-0.05	0.33	-0.02	-0.48	0.02	-0.21	0.02	-0.01
1975	0.03	0.00	-0.01	0.10	-0.15	0.16	0.26	0.29	0.24	0.26	-0.03	-0.11	1.04
1976	0.04	0.01	-0.29	0.15	-0.06	0.01	0.33	0.45	-0.10	-0.09	0.04	-0.10	0.39
1977	-0.09	0.04	0.00	0.25	0.32	0.25	0.34	0.26	0.13	0.26	-0.25	0.04	1.55
1978	-0.23	0.00	0.07	0.22	0.13	0.42	0.56	0.50	0.24	0.29	-0.61	-0.15	1.44
1979	-0.02	-0.11	-0.10	-0.02	0.24	0.32	-0.18	0.17	-0.05	0.04	-0.01	0.03	0.31
1980	-0.13	0.17	0.05	0.05	0.01	0.21	0.64	0.61	-0.09	0.08	0.00	0.08	1.68
1981	0.12	-0.06	0.06	0.25	-0.37	0.15	0.08	0.21	0.27	-0.33	0.15	0.18	0.71
1982	-0.13	-0.08	0.15	-0.02	0.15	-0.09	0.30	0.29	0.31	-0.09	-0.44	-0.34	0.01
1983	0.03	-0.05	0.09	0.13	-0.03	-0.01	0.17	0.34	0.34	0.12	-0.13	-0.23	0.77
1984	-0.03	-0.16	-0.04	0.23	-0.04	0.36	0.06	0.17	0.00	-0.70	-0.08	0.01	-0.22
1985	-0.02	-0.14	0.04	0.04	0.08	0.15	0.24	0.51	0.19	-0.20	-0.31	-0.06	0.52
1986	0.21	-0.01	0.17	-0.13	0.00	-0.02	0.43	0.41	-0.17	-0.08	-0.33	-0.15	0.33
1987	0.02	-0.28	0.16	0.36	0.11	0.14	0.15	0.43	0.13	0.00	-0.44	-0.39	0.39
1988	0.13	-0.03	-0.04	0.20	0.38	0.42	0.12	0.08	0.27	-0.10	-0.47	-0.12	0.84
1989	-0.05	-0.07	-0.15	0.17	-0.22	0.00	0.01	0.12	0.24	0.16	0.18	0.11	0.50
1990	-0.36	0.02	-0.16	0.10	-0.03	0.30	0.14	0.39	0.04	-0.28	-0.19	-0.25	-0.28
1991	-0.13	-0.10	0.13	-0.39	-0.03	0.24	0.21	0.10	0.04	-0.26	-0.11	0.04	-0.26
1992	-0.02	-0.01	0.06	0.05	0.14	-0.25	-0.03	0.37	-0.27	0.11	-0.29	-0.17	-0.31
1993	-0.07	-0.06	0.07	-0.01	-0.03	0.17	0.55	0.22	0.14	-0.52	-0.10	-0.04	0.32
1994	-0.14	-0.05	0.09	0.15	-0.17	0.16	-0.07	0.25	0.31	-0.43	-0.19	-0.17	-0.26
1995	0.18	0.07	0.12	-0.13	0.07	0.21	0.26	0.37	0.00	0.19	0.06	-0.06	1.34
1996	0.04	0.14	0.05	0.10	0.04	-0.14	-0.18	-0.05	-0.11	-0.06	0.08	0.04	-0.05
1997	-0.01	-0.07	0.16	-0.27	0.17	0.04	0.28	0.10	0.18	-0.28	-0.21	-0.16	-0.07
1998	-0.03	-0.14	0.09	0.17	0.09	0.39	0.37	0.11	-0.36	-0.20	-0.12	-0.03	0.34
1999	-0.09	0.18	-0.12	0.01	0.08	0.08	0.38	0.48	0.14	0.08	0.10	-0.10	1.22
2000	-0.02	0.01	-0.04	0.04	-0.12	-0.15	0.39	0.48	0.23	0.09	-0.62	-0.03	0.26
2001	0.16	-0.06	0.19	0.20	-0.26	0.01	0.27	0.02	-0.22	-0.20	-0.14	-0.04	-0.07
2002	0.03	0.16	-0.19	0.33	0.03	0.22	0.23	0.33	0.22	-0.13	0.05	-0.19	1.09
2003	0.17	-0.28	0.16	0.18	-0.03	-0.07	0.31	0.25	-0.02	0.15	-0.05	-0.04	0.73
2004	0.00	-0.23	0.07	0.03	-0.04	-0.38	0.23	0.24	0.30	-0.15	-0.22	0.00	-0.15
2005	-0.12	-0.08	0.08	0.14	0.26	0.34	0.21	0.31	0.11	0.22	0.04	0.15	1.66
2006	-0.06	-0.08	-0.14	0.10	0.14	0.14	0.33	0.24	0.19	-0.08	0.01	-0.21	0.58
2007	-0.28	0.10	0.08	0.12	-0.17	-0.03	0.13	0.39	-0.03	0.03	0.06	-0.19	0.21
2008	0.05	-0.06	0.05	-0.03	-0.02	0.08	0.43	-0.29	-0.15	-0.14	-0.04	0.03	-0.09
2009	0.00	0.09	-0.09	-0.02	-0.18	0.36	-0.26	0.11	-0.39	-0.34	0.13	-0.11	-0.70
2010	-0.04	0.04	0.10	0.25	0.18	0.11	0.06	0.41	0.10	0.08	-0.11	0.00	1.18
2011	-0.08	-0.12	0.23	0.01	-0.01	0.47	0.59	0.62	0.37	0.24	-0.12	-0.38	1.82
2012	-0.14	-0.08	-0.17	0.08	0.33	0.09	-0.06	0.14	0.03	0.03	0.00	-0.14	0.11
2013	-0.20	-0.08	0.18	0.07	-0.09	0.27	0.16	0.38	-0.28	-0.05	-0.03	0.02	0.35
2014	0.04	-0.01	0.01	0.14	-0.11	0.02	0.11	0.25	0.03	-0.06	-0.01	-0.19	0.22
2015	-0.15	-0.05	-0.07	-0.09	-0.12	0.33	0.39	0.54	0.36	-0.20	-0.46	0.14	0.62
2016	0.09	0.24	0.04	0.07	0.28	0.28	0.46	0.01	0.30	0.29	-0.11	-0.12	1.83
2017	-0.08	0.05	0.08	-0.18	0.11	0.19	-0.10	-0.35	0.30	0.18	0.07	-0.31	-0.04
2018	-0.03	-0.24	0.09	0.13	0.18	0.16	0.23	0.11	-0.22	-0.28	-0.14	-0.12	-0.13
Total	-3.59	-1.68	2.62	3.62	3.95	11.41	15.10	18.92	5.18	-1.41	-6.31	-5.36	31.75
Mean	-0.05	-0.02	0.04	0.05	0.05	0.16	0.21	0.27	0.08	-0.02	-0.09	-0.07	0.61
Max	0.21	0.24	0.26	0.36	0.38	0.51	0.64	0.70	0.57	0.47	0.26	0.18	1.68
Min	-0.53	-0.28	-0.29	-0.45	-0.37	-0.38	-0.26	-0.35	-0.48	-0.70	-0.62	-0.39	-0.94

Table of Final Results - Calculated Monthly Net Reservoir Evaporation Values

Quadrangle: Cibola (McLellan)
Units: Feet
Control Point 10140

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	0.12	-0.01	0.23	0.49	0.36	0.44	0.52	0.29	0.62	0.37	0.17	0.36	3.96
1949	0.02	0.14	0.29	0.23	0.03	0.28	0.41	0.44	0.38	0.29	0.33	0.15	2.99
1950	0.27	0.18	0.41	0.38	0.41	0.32	-0.09	0.26	0.13	0.46	0.31	0.26	3.30
1951	0.11	0.14	0.32	0.40	-0.15	0.24	0.84	0.91	0.76	0.55	0.29	0.24	4.65
1952	0.22	0.28	0.34	0.23	0.45	0.77	0.77	0.89	0.86	0.80	0.36	0.20	6.17
1953	0.25	0.23	0.48	0.53	0.70	0.83	0.74	0.57	0.92	0.26	0.29	0.07	5.87
1954	0.15	0.36	0.39	0.32	-0.08	0.65	0.72	0.54	0.68	0.35	0.35	0.26	4.69
1955	0.12	0.20	0.42	0.57	-0.03	0.35	0.61	0.54	0.37	0.41	0.35	0.23	4.14
1956	0.17	0.07	0.47	0.57	0.37	0.61	0.53	0.69	0.71	0.47	0.31	0.22	5.19
1957	0.13	0.12	-0.03	0.05	-0.05	0.42	0.77	0.37	0.41	0.06	0.07	0.25	2.57
1958	0.03	0.08	-0.07	0.16	0.12	0.42	0.09	0.50	0.26	0.38	0.21	0.12	2.30
1959	0.15	0.18	0.37	0.32	0.01	0.36	0.28	0.43	0.45	0.13	0.22	-0.24	2.66
1960	-0.01	0.00	0.18	0.42	0.32	0.18	0.05	0.32	0.10	-0.10	0.26	0.08	1.80
1961	0.08	0.06	0.05	0.41	0.34	0.13	0.27	0.33	0.38	0.36	-0.02	0.15	2.54
1962	0.01	0.22	0.35	0.25	0.54	0.06	0.25	0.47	0.14	0.33	0.21	0.10	2.93
1963	0.06	0.16	0.46	0.59	0.35	0.35	0.65	0.35	0.30	0.46	0.29	0.07	4.09
1964	0.06	-0.04	0.32	0.59	0.41	0.46	0.80	0.59	0.27	0.39	0.03	0.07	3.95
1965	0.09	0.12	0.11	0.41	0.29	-0.19	0.65	0.41	0.24	0.24	0.28	0.13	2.78
1966	0.03	-0.02	0.45	0.31	0.47	0.45	0.64	0.18	0.22	0.44	0.41	0.11	3.69
1967	0.09	0.14	0.44	0.33	0.34	0.21	0.29	0.39	0.30	0.49	0.20	0.08	3.30
1968	-0.07	-0.02	0.21	0.35	0.00	0.42	0.43	0.33	0.49	0.34	0.13	0.04	2.65
1969	0.03	0.00	0.05	0.42	0.09	0.35	0.50	0.39	0.14	0.13	0.17	0.00	2.27
1970	0.08	0.15	0.07	0.20	0.57	0.56	0.56	0.50	0.40	0.23	0.15	0.12	3.59
1971	0.23	0.10	0.35	0.44	0.47	0.44	0.45	0.35	0.13	0.17	0.00	0.04	3.17
1972	0.15	0.26	0.48	0.49	0.09	0.34	0.45	0.44	0.32	0.19	-0.05	0.18	3.34
1973	0.06	0.10	-0.22	-0.03	0.26	0.53	0.35	0.61	0.15	0.32	0.19	0.20	2.52
1974	0.18	0.35	0.24	0.54	0.37	0.57	0.87	0.14	0.13	0.06	0.14	0.10	3.69
1975	0.03	-0.01	0.17	0.36	0.04	0.33	0.17	0.45	0.26	0.56	0.01	0.17	2.54
1976	0.24	0.37	0.36	0.24	0.29	0.55	0.54	0.64	0.17	0.30	0.21	0.24	4.15
1977	0.09	0.21	0.45	0.14	-0.13	0.52	0.73	0.20	0.52	0.41	0.27	0.25	3.66
1978	0.05	0.05	0.38	0.58	-0.10	0.36	0.77	0.62	0.29	0.40	0.07	0.19	3.66
1979	0.02	0.07	0.09	0.25	0.09	0.30	0.42	0.37	0.46	0.44	0.16	0.20	2.87
1980	0.08	0.18	0.27	0.36	0.11	0.69	0.99	0.71	0.44	0.47	0.17	0.15	4.62
1981	0.19	0.25	0.17	0.45	0.26	0.54	0.41	0.34	0.31	0.05	0.16	0.21	3.34
1982	0.17	0.15	0.40	0.46	0.03	0.10	0.29	0.57	0.50	0.43	0.17	0.04	3.31
1983	0.08	-0.02	0.20	0.31	0.20	0.32	0.90	0.75	0.60	0.21	0.24	0.06	3.85
1984	0.14	0.33	0.11	0.44	0.52	0.40	0.64	0.41	0.57	0.18	0.19	0.00	3.93
1985	0.07	0.05	0.15	0.29	0.41	0.31	0.70	0.47	0.22	0.00	0.11	-0.01	2.77
1986	0.30	0.23	0.50	0.44	0.25	0.32	0.78	0.28	0.18	0.03	0.04	0.09	3.44
1987	0.08	0.04	0.17	0.50	-0.01	0.26	0.69	0.41	0.14	0.35	0.18	-0.01	2.80
1988	0.09	0.21	0.10	0.27	0.33	0.42	0.41	0.45	0.15	0.34	0.25	0.26	3.28
1989	0.21	0.06	0.35	0.42	0.12	0.00	0.48	0.25	0.36	0.46	0.48	0.16	3.35
1990	0.10	0.04	0.06	0.18	0.29	0.75	0.61	0.55	0.31	0.30	0.15	0.12	3.46
1991	0.12	0.27	0.45	0.60	0.35	0.47	0.59	0.61	0.35	0.57	0.15	0.08	4.61
1992	0.10	0.28	0.33	0.28	0.17	0.11	0.56	0.33	0.60	0.48	0.14	0.14	3.52
1993	0.09	0.14	0.27	0.47	0.38	0.43	0.68	0.60	0.63	0.49	0.31	0.24	4.73
1994	0.22	0.21	0.39	0.39	0.32	0.70	0.51	0.52	0.42	0.32	0.25	0.15	4.40
1995	0.00	0.00	0.36	0.35	0.02	0.29	0.42	0.46	0.14	0.50	0.40	0.29	3.23
1996	0.27	0.37	0.47	0.66	0.37	0.39	0.17	0.21	0.02	0.39	0.27	0.37	3.96
1997	0.25	0.14	0.59	-0.18	0.16	0.34	0.56	0.32	0.35	0.29	0.23	-0.03	3.02
1998	0.22	0.09	0.22	0.45	0.45	0.91	0.69	0.48	0.61	0.10	0.08	0.13	4.43
1999	0.29	0.34	0.08	0.30	0.28	0.40	0.65	0.55	0.32	0.49	0.44	0.29	4.43
2000	0.58	0.28	-0.03	0.23	0.24	-0.16	0.46	0.57	0.58	-0.12	0.25	0.10	2.98
2001	0.01	0.05	0.18	0.57	0.15	0.66	0.85	0.52	0.46	0.52	0.12	0.25	4.34
2002	0.14	0.23	0.44	0.44	0.42	0.62	0.46	0.57	0.39	-0.25	0.24	0.16	3.86
2003	0.23	0.17	0.32	0.47	0.48	0.08	0.87	0.59	0.30	0.10	0.30	0.24	4.15
2004	0.10	0.22	0.26	0.15	0.61	0.21	0.49	0.41	0.37	0.08	-0.11	0.21	3.00
2005	0.08	0.12	0.29	0.37	0.17	0.41	0.58	0.22	0.58	0.31	0.37	0.33	3.83
2006	0.48	0.35	0.34	0.55	0.43	0.74	0.67	0.20	0.33	0.29	0.38	-0.11	4.65
2007	0.14	0.27	-0.03	0.23	0.13	0.29	0.53	0.45	0.24	0.60	0.32	0.16	3.33
2008	0.16	0.24	0.47	0.42	0.20	0.58	0.47	0.24	0.36	0.00	0.31	0.28	3.73
2009	0.24	0.35	0.43	0.30	0.33	0.50	0.54	0.33	0.34	0.15	0.36	0.12	3.99
2010	0.08	0.15	0.35	0.22	0.27	0.64	0.31	0.49	0.46	0.37	0.26	0.20	3.80
2011	0.13	0.17	0.47	0.67	0.72	1.03	0.87	0.72	0.63	0.37	0.33	0.00	6.11
2012	0.24	0.13	0.38	0.31	0.53	0.58	0.81	0.63	0.37	0.46	0.40	0.20	5.04
2013	0.10	0.14	0.41	0.47	0.56	0.64	0.53	0.37	0.23	0.48	0.30	0.21	4.44
2014	0.31	0.16	0.48	0.56	0.42	0.37	0.41	0.59	0.31	0.36	0.28	0.15	4.40
2015	0.11	0.19	0.33	0.07	-0.29	0.35	0.22	0.29	0.61	0.02	0.22	0.16	2.28
2016	0.18	0.31	0.47	0.40	0.23	0.44	0.75	0.25	0.34	0.57	0.35	0.22	4.51
2017	-0.07	0.25	0.37	0.33	0.37	0.58	0.67	0.07	0.29	0.23	0.38	0.32	3.79
2018	0.34	0.39	0.53	0.45	0.55	0.51	0.66	0.52	0.39	-0.05	0.27	0.19	4.75
Total	9.89	11.77	20.71	26.19	18.77	29.83	38.91	31.81	26.76	21.63	16.11	10.76	181.73
Mean	0.14	0.16	0.29	0.37	0.26	0.42	0.55	0.45	0.38	0.31	0.23	0.15	3.69
Max	0.58	0.39	0.59	0.67	0.72	1.03	0.99	0.91	0.92	0.80	0.48	0.37	6.17
Min	-0.07	-0.04	-0.22	-0.18	-0.29	-0.19	-0.09	0.07	0.02	-0.25	-0.11	-0.24	1.80

Table of Final Results - Calculated Monthly Net Reservoir Evaporation Values

Quadrangle: Greenbelt
Units: Feet
Control Point B10060

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	0.12	-0.02	0.21	0.50	0.38	0.46	0.56	0.43	0.65	0.40	0.29	0.36	4.34
1949	-0.09	0.12	0.26	0.20	0.04	0.33	0.53	0.50	0.37	0.28	0.36	0.17	3.07
1950	0.24	0.20	0.42	0.38	0.35	0.35	-0.03	0.35	0.06	0.51	0.38	0.24	3.45
1951	0.18	0.13	0.34	0.39	0.01	0.38	0.80	0.86	0.66	0.50	0.26	0.28	4.79
1952	0.23	0.28	0.35	0.20	0.49	0.87	0.79	0.99	0.83	0.78	0.33	0.17	6.31
1953	0.28	0.28	0.41	0.48	0.64	0.91	0.75	0.64	0.94	0.16	0.26	0.14	5.89
1954	0.15	0.34	0.38	0.29	-0.09	0.61	0.69	0.48	0.65	0.40	0.34	0.25	4.49
1955	0.11	0.20	0.41	0.58	-0.03	0.26	0.58	0.55	0.35	0.30	0.35	0.23	3.89
1956	0.17	0.08	0.50	0.57	0.33	0.64	0.60	0.73	0.71	0.45	0.31	0.22	5.31
1957	0.15	0.11	0.08	0.01	-0.07	0.30	0.79	0.42	0.43	0.01	0.05	0.25	2.53
1958	0.03	0.09	-0.07	0.13	0.11	0.44	0.24	0.51	0.22	0.34	0.20	0.14	2.38
1959	0.16	0.20	0.40	0.34	0.05	0.27	0.30	0.48	0.48	0.08	0.23	-0.22	2.77
1960	-0.01	0.02	0.18	0.36	0.30	0.15	0.04	0.33	0.14	-0.17	0.27	0.06	1.67
1961	0.07	0.04	0.07	0.42	0.33	0.12	0.19	0.39	0.34	0.34	0.00	0.14	2.45
1962	0.04	0.26	0.39	0.28	0.53	0.05	0.26	0.53	0.09	0.28	0.18	0.12	3.01
1963	0.07	0.18	0.47	0.55	0.32	0.29	0.66	0.37	0.33	0.46	0.25	0.07	4.02
1964	0.12	0.01	0.36	0.60	0.44	0.48	0.83	0.60	0.22	0.38	0.06	0.07	4.17
1965	0.10	0.13	0.13	0.39	0.33	-0.06	0.69	0.46	0.23	0.23	0.30	0.17	3.10
1966	0.04	0.00	0.45	0.29	0.48	0.43	0.71	0.14	0.21	0.46	0.42	0.13	3.76
1967	0.10	0.14	0.44	0.38	0.35	0.29	0.34	0.50	0.32	0.52	0.22	0.09	3.69
1968	-0.10	-0.02	0.20	0.35	0.06	0.39	0.39	0.31	0.49	0.38	0.12	0.04	2.61
1969	0.06	0.05	0.06	0.43	0.11	0.40	0.62	0.42	0.12	0.09	0.19	0.02	2.57
1970	0.09	0.16	0.06	0.28	0.52	0.60	0.60	0.54	0.43	0.25	0.18	0.17	3.88
1971	0.24	0.14	0.34	0.45	0.43	0.46	0.55	0.30	0.06	0.17	0.11	0.04	3.29
1972	0.17	0.27	0.50	0.50	0.09	0.36	0.41	0.41	0.31	0.15	-0.01	0.20	3.36
1973	0.06	0.09	-0.16	-0.01	0.30	0.48	0.38	0.57	0.12	0.32	0.26	0.26	2.67
1974	0.19	0.37	0.27	0.55	0.35	0.58	0.87	0.19	0.04	0.04	0.17	0.10	3.72
1975	0.05	-0.01	0.19	0.35	0.12	0.39	0.17	0.46	0.28	0.51	0.06	0.17	2.74
1976	0.25	0.37	0.38	0.21	0.30	0.52	0.46	0.61	0.17	0.26	0.22	0.24	3.99
1977	0.10	0.20	0.46	0.17	-0.03	0.53	0.76	0.25	0.57	0.39	0.30	0.29	3.99
1978	0.06	0.05	0.38	0.59	-0.03	0.37	0.77	0.61	0.23	0.41	0.08	0.21	3.73
1979	0.04	0.09	0.11	0.29	0.16	0.22	0.39	0.35	0.47	0.46	0.19	0.20	2.97
1980	0.10	0.18	0.34	0.41	0.09	0.66	0.99	0.73	0.38	0.47	0.19	0.15	4.69
1981	0.19	0.25	0.22	0.41	0.29	0.56	0.52	0.32	0.36	0.07	0.22	0.22	3.63
1982	0.19	0.16	0.40	0.48	0.05	0.10	0.37	0.60	0.53	0.45	0.22	0.05	3.60
1983	0.05	0.01	0.22	0.34	0.28	0.37	0.88	0.75	0.60	0.05	0.24	0.07	3.86
1984	0.16	0.34	0.22	0.48	0.56	0.41	0.64	0.39	0.58	0.25	0.19	-0.01	4.21
1985	0.08	0.09	0.16	0.36	0.40	0.18	0.61	0.52	0.22	0.01	0.15	0.01	2.79
1986	0.31	0.22	0.51	0.44	0.27	0.25	0.82	0.22	0.18	-0.07	0.06	0.09	3.30
1987	0.10	0.04	0.23	0.51	0.02	0.32	0.63	0.39	0.19	0.37	0.23	0.01	3.04
1988	0.10	0.21	0.19	0.27	0.37	0.43	0.41	0.52	0.13	0.37	0.31	0.26	3.57
1989	0.20	0.08	0.38	0.47	0.10	0.04	0.58	0.27	0.27	0.49	0.48	0.17	3.53
1990	0.12	0.05	0.12	0.16	0.27	0.71	0.55	0.52	0.33	0.33	0.12	0.13	3.41
1991	0.10	0.28	0.47	0.60	0.35	0.46	0.61	0.60	0.25	0.57	0.17	0.06	4.52
1992	0.09	0.24	0.35	0.27	0.15	0.05	0.58	0.40	0.57	0.50	0.13	0.14	3.47
1993	0.08	0.16	0.29	0.47	0.41	0.56	0.70	0.65	0.65	0.48	0.32	0.26	5.03
1994	0.23	0.21	0.37	0.39	0.28	0.73	0.53	0.58	0.43	0.34	0.26	0.17	4.52
1995	0.00	0.00	0.38	0.36	0.03	0.32	0.50	0.35	0.05	0.50	0.40	0.30	3.19
1996	0.28	0.40	0.48	0.68	0.44	0.40	0.25	0.26	0.10	0.39	0.27	0.37	4.32
1997	0.23	0.10	0.57	-0.16	0.16	0.33	0.60	0.30	0.33	0.29	0.25	-0.02	2.98
1998	0.23	0.04	0.24	0.49	0.48	0.92	0.77	0.48	0.61	0.12	0.11	0.15	4.64
1999	0.29	0.33	0.12	0.36	0.21	0.40	0.68	0.56	0.33	0.47	0.44	0.30	4.49
2000	0.57	0.32	0.00	0.23	0.35	-0.15	0.53	0.58	0.58	-0.04	0.23	0.11	3.31
2001	0.00	0.06	0.12	0.54	0.08	0.70	0.89	0.49	0.45	0.54	0.12	0.23	4.22
2002	0.18	0.22	0.40	0.41	0.48	0.61	0.48	0.57	0.41	-0.14	0.24	0.18	4.04
2003	0.26	0.18	0.32	0.46	0.47	0.07	0.89	0.64	0.36	0.25	0.31	0.24	4.45
2004	0.06	0.20	0.23	0.16	0.62	0.15	0.49	0.39	0.40	0.08	-0.19	0.21	2.80
2005	0.09	0.12	0.30	0.38	0.19	0.46	0.59	0.25	0.55	0.30	0.39	0.33	3.95
2006	0.48	0.34	0.31	0.51	0.42	0.73	0.71	0.27	0.25	0.22	0.37	-0.07	4.54
2007	0.12	0.27	-0.06	0.25	0.05	0.21	0.49	0.48	0.27	0.62	0.33	0.17	3.20
2008	0.15	0.27	0.46	0.43	0.21	0.57	0.54	0.29	0.23	0.05	0.35	0.30	3.85
2009	0.24	0.34	0.45	0.30	0.39	0.44	0.50	0.44	0.31	0.20	0.38	0.12	4.11
2010	0.07	0.14	0.33	0.15	0.31	0.57	0.20	0.47	0.45	0.38	0.38	0.26	3.71
2011	0.17	0.21	0.39	0.71	0.73	1.05	0.91	0.84	0.64	0.38	0.34	0.02	6.39
2012	0.25	0.17	0.39	0.39	0.48	0.48	0.75	0.58	0.32	0.47	0.38	0.21	4.87
2013	0.12	0.13	0.45	0.47	0.55	0.53	0.47	0.43	0.29	0.46	0.31	0.19	4.40
2014	0.33	0.17	0.47	0.56	0.36	0.31	0.41	0.56	0.25	0.37	0.23	0.15	4.17
2015	0.10	0.19	0.32	0.12	-0.40	0.32	0.27	0.37	0.59	0.08	0.21	0.16	2.33
2016	0.19	0.31	0.47	0.33	0.15	0.38	0.66	0.23	0.28	0.54	0.30	0.21	4.05
2017	-0.04	0.23	0.35	0.29	0.43	0.49	0.56	0.05	0.22	0.27	0.40	0.30	3.55
2018	0.35	0.37	0.48	0.47	0.53	0.49	0.64	0.49	0.23	-0.09	0.26	0.18	4.40
Total	10.29	12.18	21.41	26.45	19.28	29.48	39.89	33.11	25.69	21.53	17.03	11.40	186.91
Mean	0.14	0.17	0.30	0.37	0.27	0.41	0.56	0.47	0.36	0.31	0.24	0.16	3.76
Max	0.57	0.40	0.57	0.71	0.73	1.05	0.99	0.99	0.94	0.78	0.48	0.37	6.31
Min	-0.10	-0.02	-0.16	-0.16	-0.40	-0.15	-0.03	0.05	0.04	-0.17	-0.19	-0.22	1.67

Table of Final Results - Calculated Monthly Net Reservoir Evaporation Values

Quadrangle: Bois d'Arc
Units: Feet
Control Point BODARC

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	0.03	-0.02	0.07	0.38	0.22	0.41	0.29	0.65	0.59	0.27	0.23	0.13	3.25
1949	-0.28	0.02	-0.02	0.01	0.08	0.21	0.41	0.40	0.20	-0.28	0.27	-0.05	0.97
1950	0.10	0.23	0.18	0.05	0.15	0.24	-0.04	0.13	0.14	0.36	0.33	0.20	2.07
1951	0.02	-0.03	0.19	0.21	0.20	0.41	0.40	0.71	0.10	0.21	0.08	0.10	2.60
1952	0.08	0.02	0.04	0.05	0.16	0.60	0.43	0.74	0.55	0.55	-0.15	-0.15	2.92
1953	0.08	0.01	0.02	0.14	0.07	0.68	0.15	0.38	0.40	0.19	-0.05	0.02	2.09
1954	-0.11	0.30	0.32	0.15	0.05	0.43	0.70	0.71	0.35	-0.10	0.16	-0.01	2.95
1955	-0.01	-0.05	0.21	0.13	0.03	0.41	0.43	0.30	0.21	0.38	0.31	0.13	2.48
1956	0.02	-0.01	0.31	0.25	0.30	0.50	0.68	0.78	0.67	0.26	-0.08	0.03	3.71
1957	-0.06	-0.05	-0.11	0.03	0.11	0.40	0.55	0.45	-0.05	0.01	-0.10	0.03	1.21
1958	-0.04	0.06	-0.01	0.04	0.28	0.33	0.32	0.31	0.00	0.16	-0.01	0.02	1.46
1959	0.05	-0.03	0.22	0.18	0.15	0.10	0.11	0.34	0.30	-0.14	0.07	0.00	1.35
1960	-0.02	0.02	0.15	0.21	0.20	0.33	0.20	0.23	0.11	0.15	0.12	0.06	1.76
1961	0.06	-0.05	0.13	0.34	0.10	0.02	0.19	0.38	0.12	0.15	-0.17	-0.05	1.22
1962	-0.02	0.07	0.10	0.05	0.37	-0.05	0.27	0.40	-0.14	0.06	0.15	0.06	1.32
1963	0.06	0.14	0.22	0.12	0.13	0.39	0.20	0.58	0.40	0.48	0.13	-0.01	2.84
1964	0.02	0.00	-0.11	-0.01	0.07	0.38	0.67	0.20	-0.13	0.29	0.00	0.11	1.49
1965	0.00	-0.06	0.13	0.31	-0.22	0.22	0.56	0.50	0.13	0.24	0.02	0.04	1.87
1966	-0.08	-0.15	0.29	0.06	0.17	0.37	0.39	-0.01	0.05	0.23	0.22	-0.05	1.49
1967	0.16	0.11	0.25	-0.17	-0.06	0.46	0.25	0.51	0.00	0.07	0.12	-0.08	1.62
1968	-0.12	0.06	0.12	0.30	0.05	0.08	0.25	0.45	0.02	0.22	-0.02	0.05	1.46
1969	0.00	0.00	0.01	0.17	0.11	0.38	0.63	0.45	0.19	-0.06	0.16	-0.17	1.87
1970	0.03	-0.10	0.10	0.11	0.20	0.30	0.53	0.43	-0.14	-0.05	0.17	0.10	1.68
1971	0.10	0.05	0.34	0.30	0.11	0.54	0.26	0.09	0.14	-0.03	0.13	-0.02	2.01
1972	0.06	0.20	0.25	0.20	0.24	0.36	0.51	0.36	0.08	-0.23	-0.08	0.01	1.96
1973	-0.06	0.02	0.09	-0.13	0.18	0.06	0.26	0.47	0.00	0.09	0.19	0.12	1.29
1974	-0.05	0.21	0.27	0.15	0.23	0.23	0.55	0.05	-0.25	0.10	0.02	0.01	1.52
1975	0.11	0.19	0.03	0.23	-0.17	0.20	0.32	0.37	0.27	0.39	0.10	0.01	2.05
1976	0.22	0.20	-0.05	-0.10	-0.10	0.14	0.23	0.44	0.10	-0.09	0.13	0.05	1.17
1977	-0.08	0.10	0.10	0.12	0.27	0.31	0.54	0.33	0.30	0.32	-0.01	0.21	2.51
1978	-0.09	-0.10	0.05	0.30	0.06	0.41	0.69	0.51	0.33	0.40	-0.33	-0.01	2.22
1979	-0.11	-0.05	0.02	0.15	-0.06	0.38	0.22	0.21	0.23	0.18	0.14	-0.10	1.21
1980	-0.07	0.09	0.18	0.20	0.02	0.39	0.78	0.76	0.01	0.20	0.09	0.07	2.72
1981	0.14	0.08	0.13	0.20	-0.16	0.28	0.42	0.45	0.29	-0.11	0.11	0.23	2.06
1982	0.01	0.03	0.19	0.12	0.15	0.09	0.35	0.36	0.40	0.10	-0.28	-0.19	1.33
1983	0.11	0.10	0.07	0.25	-0.12	0.09	0.38	0.38	0.43	0.05	0.02	-0.06	1.70
1984	0.00	-0.01	-0.06	0.24	0.14	0.37	0.43	0.44	0.33	-0.39	0.09	0.01	1.59
1985	0.04	0.03	0.00	0.03	0.14	0.27	0.39	0.64	0.32	-0.15	-0.04	0.06	1.73
1986	0.21	0.00	0.27	-0.05	-0.01	0.05	0.60	0.48	0.15	-0.04	-0.01	0.00	1.65
1987	0.07	-0.01	0.15	0.40	-0.19	0.05	0.36	0.51	0.15	0.21	0.02	-0.06	1.66
1988	0.15	0.08	0.08	0.26	0.39	0.40	0.20	0.41	0.07	0.05	-0.11	-0.04	1.94
1989	-0.06	0.12	0.10	0.34	-0.07	0.24	0.10	0.37	0.16	0.28	0.25	0.20	2.03
1990	-0.10	0.07	-0.10	-0.08	0.02	0.40	0.29	0.38	0.12	0.09	-0.08	-0.09	0.92
1991	0.11	0.06	0.22	0.03	0.01	0.25	0.42	0.29	0.16	0.00	0.10	0.16	1.81
1992	0.18	0.05	0.27	0.17	0.09	0.09	0.11	0.38	0.02	0.31	-0.08	-0.04	1.55
1993	0.07	0.11	0.15	0.14	0.10	0.24	0.86	0.57	0.19	-0.04	0.10	0.18	2.67
1994	0.04	0.06	0.34	0.12	0.12	0.38	0.04	0.26	0.17	-0.23	0.02	0.02	1.34
1995	0.13	0.01	0.01	0.07	0.06	0.28	0.33	0.49	-0.01	0.37	0.22	-0.05	1.91
1996	0.06	0.40	0.12	0.21	0.30	0.25	0.09	-0.06	0.00	0.17	-0.10	0.02	1.46
1997	0.13	-0.05	0.24	0.09	0.09	0.18	0.45	0.26	0.45	-0.12	0.00	-0.09	1.63
1998	-0.09	-0.02	0.11	0.28	0.32	0.50	0.67	0.49	0.20	-0.05	0.06	0.05	2.52
1999	0.28	0.26	0.08	0.23	-0.02	0.25	0.56	0.67	0.32	0.27	0.22	0.15	3.27
2000	0.05	0.12	0.05	0.08	0.12	0.12	0.45	0.61	0.38	-0.01	-0.14	0.14	1.97
2001	0.13	0.16	0.18	0.21	0.05	0.24	0.57	0.28	-0.05	0.15	0.09	0.17	2.18
2002	0.15	0.22	0.24	0.18	0.11	0.27	0.22	0.33	0.25	0.13	0.18	0.07	2.35
2003	0.18	0.09	0.22	0.31	0.13	0.09	0.50	0.36	0.00	0.26	0.04	0.13	2.31
2004	0.01	-0.06	0.24	0.06	0.17	-0.24	0.27	0.28	0.37	-0.07	-0.20	0.19	1.02
2005	0.11	0.09	0.21	0.25	0.17	0.45	0.19	0.38	0.42	0.35	0.27	0.23	3.12
2006	0.12	0.01	0.08	0.22	0.29	0.48	0.66	0.54	0.27	0.02	-0.03	-0.08	2.58
2007	0.01	0.19	0.05	0.25	-0.08	0.06	0.21	0.41	0.14	0.02	0.19	-0.03	1.42
2008	0.16	0.15	0.06	0.07	0.02	0.21	0.58	0.13	0.12	0.20	0.14	0.16	2.00
2009	0.09	0.15	-0.02	-0.17	0.14	0.32	0.10	0.21	-0.24	0.14	0.14	-0.05	0.81
2010	0.10	0.17	0.10	0.21	0.18	0.32	0.22	0.52	-0.16	0.12	-0.02	0.05	1.81
2011	0.09	0.07	0.29	0.09	0.20	0.52	0.65	0.69	0.48	0.18	0.01	-0.19	3.08
2012	-0.12	0.05	0.10	0.12	0.19	0.30	0.48	0.36	0.34	0.17	0.30	-0.02	2.27
2013	-0.08	0.01	0.13	0.15	-0.05	0.28	0.29	0.57	0.23	-0.16	-0.05	-0.04	1.28
2014	0.10	0.13	0.04	0.14	0.09	0.21	0.05	0.43	0.25	0.10	0.11	-0.05	1.60
2015	-0.11	-0.02	0.02	0.01	0.00	0.46	0.53	0.57	0.37	-0.21	-0.08	0.18	1.72
2016	0.13	0.13	0.10	-0.05	0.19	0.48	0.57	0.15	0.16	0.30	-0.03	0.07	2.20
2017	-0.02	0.09	0.17	-0.15	0.20	0.01	0.09	0.06	0.43	0.06	0.16	-0.11	0.99
2018	0.09	-0.18	0.19	0.18	0.23	0.42	0.48	0.26	-0.17	-0.07	0.07	-0.02	1.48
Total	2.67	4.34	8.91	9.74	7.41	20.28	27.09	28.52	12.79	7.43	4.00	2.12	95.84
Mean	0.04	0.06	0.12	0.14	0.10	0.28	0.38	0.40	0.19	0.11	0.06	0.03	1.91
Max	0.28	0.40	0.34	0.40	0.39	0.68	0.86	0.78	0.67	0.55	0.33	0.23	3.71
Min	-0.28	-0.18	-0.11	-0.17	-0.22	-0.24	-0.04	-0.06	-0.25	-0.39	-0.33	-0.19	0.92

Table of Final Results - Calculated Monthly Net Reservoir Evaporation Values

Quadrangle: Buffalo Lake
Units: Feet
Control Point C10080

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	0.11	0.00	0.24	0.53	0.37	0.45	0.60	0.44	0.66	0.41	0.27	0.36	4.44
1949	0.00	0.13	0.32	0.21	0.12	0.32	0.47	0.52	0.36	0.33	0.36	0.17	3.31
1950	0.23	0.20	0.41	0.42	0.43	0.43	-0.01	0.42	0.10	0.49	0.37	0.25	3.74
1951	0.19	0.16	0.37	0.45	0.15	0.52	0.76	0.82	0.75	0.51	0.28	0.26	5.22
1952	0.25	0.31	0.37	0.30	0.59	0.89	0.83	0.94	0.83	0.76	0.32	0.19	6.58
1953	0.30	0.28	0.44	0.55	0.68	0.95	0.79	0.68	0.96	0.31	0.29	0.15	6.38
1954	0.14	0.33	0.40	0.37	0.11	0.59	0.65	0.46	0.60	0.30	0.32	0.24	4.51
1955	0.12	0.21	0.41	0.55	0.11	0.44	0.50	0.49	0.34	0.36	0.35	0.25	4.13
1956	0.17	0.05	0.51	0.56	0.46	0.60	0.57	0.63	0.71	0.46	0.31	0.24	5.27
1957	0.16	0.16	0.11	0.12	0.04	0.40	0.76	0.29	0.43	0.03	0.06	0.26	2.82
1958	0.01	0.09	-0.09	0.17	0.16	0.49	0.35	0.46	0.25	0.30	0.20	0.15	2.54
1959	0.16	0.20	0.40	0.38	0.21	0.34	0.35	0.38	0.53	0.14	0.24	-0.12	3.21
1960	0.00	0.06	0.20	0.42	0.45	0.20	-0.05	0.37	0.17	-0.09	0.27	0.09	2.09
1961	0.05	0.07	0.15	0.43	0.41	0.26	0.23	0.35	0.34	0.37	-0.02	0.13	2.77
1962	0.03	0.23	0.35	0.34	0.53	0.17	0.18	0.55	0.16	0.29	0.19	0.12	3.14
1963	0.06	0.14	0.45	0.59	0.30	0.22	0.68	0.30	0.33	0.44	0.26	0.06	3.83
1964	0.12	0.04	0.33	0.56	0.50	0.50	0.75	0.53	0.20	0.41	0.11	0.09	4.14
1965	0.11	0.12	0.09	0.42	0.32	-0.12	0.51	0.37	0.28	0.31	0.30	0.10	2.81
1966	0.06	0.02	0.44	0.32	0.44	0.35	0.58	0.09	0.26	0.43	0.38	0.12	3.49
1967	0.09	0.15	0.44	0.41	0.37	0.19	0.28	0.41	0.36	0.53	0.23	0.07	3.53
1968	-0.07	0.03	0.17	0.37	0.15	0.45	0.35	0.31	0.46	0.37	0.13	0.07	2.79
1969	0.08	0.06	0.10	0.40	0.09	0.34	0.46	0.40	0.08	0.02	0.16	0.00	2.19
1970	0.09	0.13	0.07	0.33	0.53	0.51	0.54	0.50	0.40	0.20	0.18	0.14	3.62
1971	0.24	0.17	0.31	0.40	0.40	0.43	0.39	0.19	0.11	0.19	0.11	0.05	2.99
1972	0.20	0.26	0.48	0.53	0.16	0.33	0.25	0.31	0.21	0.14	0.02	0.21	3.10
1973	0.09	0.10	-0.05	0.12	0.35	0.51	0.33	0.54	0.27	0.35	0.31	0.30	3.22
1974	0.20	0.37	0.31	0.64	0.50	0.61	0.73	0.10	0.10	-0.01	0.21	0.09	3.85
1975	0.02	0.02	0.25	0.34	0.28	0.44	0.20	0.52	0.25	0.54	0.20	0.16	3.22
1976	0.26	0.36	0.44	0.36	0.37	0.61	0.45	0.54	0.16	0.28	0.21	0.25	4.29
1977	0.12	0.25	0.44	0.22	0.18	0.57	0.67	0.26	0.52	0.39	0.33	0.28	4.23
1978	0.09	0.07	0.40	0.65	0.23	0.40	0.78	0.54	0.28	0.34	0.00	0.21	3.99
1979	0.07	0.14	0.24	0.33	0.22	0.21	0.46	0.29	0.43	0.48	0.19	0.21	3.27
1980	0.13	0.20	0.42	0.40	0.13	0.66	0.94	0.60	0.38	0.43	0.18	0.18	4.65
1981	0.16	0.24	0.25	0.45	0.40	0.66	0.49	0.13	0.20	0.10	0.22	0.21	3.51
1982	0.19	0.20	0.42	0.51	0.22	0.25	0.30	0.48	0.52	0.44	0.28	0.06	3.87
1983	0.05	0.04	0.25	0.38	0.35	0.44	0.86	0.69	0.63	0.18	0.27	0.08	4.22
1984	0.14	0.38	0.26	0.50	0.58	0.45	0.59	0.23	0.54	0.16	0.24	0.03	4.10
1985	0.07	0.20	0.24	0.46	0.34	0.34	0.60	0.57	0.17	0.06	0.19	-0.01	3.23
1986	0.26	0.21	0.46	0.47	0.32	0.20	0.74	0.21	0.16	0.05	0.04	0.06	3.18
1987	0.12	0.07	0.27	0.47	0.08	0.33	0.65	0.29	0.16	0.36	0.25	0.07	3.12
1988	0.11	0.21	0.29	0.29	0.25	0.34	0.40	0.47	0.20	0.41	0.36	0.26	3.59
1989	0.19	0.10	0.50	0.54	0.27	0.17	0.59	0.25	0.29	0.51	0.46	0.17	4.04
1990	0.13	0.10	0.20	0.24	0.39	0.80	0.52	0.48	0.31	0.33	0.15	0.17	3.82
1991	0.09	0.30	0.47	0.63	0.51	0.54	0.60	0.48	0.31	0.61	0.18	0.07	4.79
1992	0.08	0.24	0.36	0.32	0.15	0.06	0.55	0.34	0.46	0.43	0.23	0.15	3.37
1993	0.09	0.18	0.34	0.50	0.49	0.61	0.67	0.60	0.58	0.50	0.29	0.21	5.06
1994	0.18	0.22	0.37	0.47	0.18	0.72	0.53	0.51	0.43	0.40	0.30	0.20	4.51
1995	0.00	0.00	0.44	0.46	0.17	0.46	0.48	0.51	0.19	0.50	0.40	0.31	3.92
1996	0.28	0.34	0.49	0.62	0.42	0.43	0.31	0.27	0.14	0.39	0.29	0.37	4.35
1997	0.18	0.15	0.58	0.01	0.24	0.38	0.56	0.23	0.38	0.38	0.22	-0.01	3.30
1998	0.26	0.15	0.32	0.52	0.63	1.01	0.79	0.39	0.59	0.09	0.22	0.18	5.15
1999	0.28	0.31	0.23	0.39	0.30	0.34	0.60	0.49	0.30	0.45	0.41	0.28	4.38
2000	0.43	0.44	0.12	0.40	0.58	-0.03	0.65	0.65	0.64	0.04	0.22	0.10	4.24
2001	0.00	0.08	0.08	0.59	0.19	0.76	0.94	0.56	0.57	0.59	0.15	0.19	4.70
2002	0.17	0.21	0.41	0.52	0.68	0.79	0.65	0.56	0.42	0.04	0.23	0.24	4.92
2003	0.32	0.19	0.31	0.54	0.58	0.13	0.95	0.72	0.42	0.33	0.30	0.24	5.03
2004	0.09	0.27	0.27	0.15	0.63	0.31	0.45	0.41	0.26	0.12	-0.13	0.21	3.04
2005	0.09	0.12	0.28	0.37	0.23	0.55	0.61	0.17	0.56	0.30	0.38	0.33	3.99
2006	0.48	0.34	0.35	0.54	0.57	0.72	0.66	0.20	0.20	0.28	0.38	0.04	4.76
2007	0.12	0.28	0.01	0.36	0.18	0.26	0.53	0.56	0.34	0.64	0.30	0.17	3.75
2008	0.13	0.39	0.50	0.55	0.28	0.59	0.48	0.29	0.35	0.05	0.38	0.30	4.29
2009	0.25	0.32	0.45	0.37	0.44	0.45	0.45	0.51	0.42	0.25	0.37	0.10	4.38
2010	0.07	0.13	0.28	0.27	0.36	0.57	0.22	0.38	0.52	0.49	0.50	0.25	4.04
2011	0.17	0.19	0.21	0.78	0.83	1.07	0.96	0.82	0.62	0.46	0.44	0.00	6.55
2012	0.25	0.19	0.49	0.50	0.47	0.51	0.75	0.65	0.39	0.49	0.29	0.20	5.18
2013	0.14	0.18	0.44	0.41	0.61	0.56	0.35	0.45	0.33	0.52	0.28	0.19	4.46
2014	0.26	0.17	0.49	0.64	0.37	0.34	0.39	0.50	0.10	0.33	0.26	0.15	4.00
2015	0.07	0.17	0.32	0.30	-0.34	0.32	0.13	0.32	0.49	-0.14	0.24	0.17	2.05
2016	0.18	0.31	0.47	0.32	0.29	0.42	0.72	0.20	0.27	0.59	0.27	0.22	4.26
2017	-0.01	0.26	0.38	0.26	0.44	0.49	0.50	-0.17	0.23	0.24	0.41	0.30	3.33
2018	0.32	0.36	0.50	0.42	0.66	0.62	0.54	0.42	0.26	-0.08	0.25	0.18	4.45
Total	10.27	13.35	23.02	29.71	24.68	32.22	38.09	30.42	26.22	22.70	17.84	11.77	194.49
Mean	0.14	0.19	0.32	0.42	0.34	0.45	0.54	0.43	0.37	0.33	0.25	0.17	3.94
Max	0.48	0.44	0.58	0.78	0.83	1.07	0.96	0.94	0.96	0.76	0.50	0.37	6.58
Min	-0.07	0.00	-0.09	0.01	-0.34	-0.12	-0.05	-0.17	0.08	-0.14	-0.13	-0.12	2.09

Table of Final Results - Calculated Monthly Net Reservoir Evaporation Values

Quadrangle: Bivins
Units: Feet
Control Point C10210

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	0.10	-0.01	0.24	0.52	0.36	0.45	0.60	0.42	0.66	0.40	0.25	0.36	4.35
1949	0.01	0.13	0.32	0.21	0.13	0.32	0.45	0.51	0.36	0.33	0.36	0.16	3.29
1950	0.23	0.20	0.41	0.41	0.44	0.41	0.00	0.41	0.10	0.48	0.36	0.25	3.70
1951	0.18	0.16	0.37	0.45	0.13	0.50	0.77	0.83	0.76	0.53	0.28	0.26	5.22
1952	0.25	0.31	0.37	0.29	0.57	0.88	0.83	0.93	0.84	0.77	0.33	0.19	6.56
1953	0.30	0.28	0.45	0.56	0.69	0.95	0.79	0.66	0.96	0.32	0.29	0.14	6.39
1954	0.14	0.33	0.40	0.37	0.10	0.59	0.64	0.46	0.61	0.31	0.33	0.24	4.52
1955	0.13	0.21	0.41	0.54	0.11	0.44	0.51	0.49	0.34	0.37	0.35	0.25	4.15
1956	0.17	0.05	0.51	0.57	0.47	0.60	0.56	0.63	0.70	0.46	0.31	0.24	5.27
1957	0.16	0.15	0.10	0.11	0.03	0.41	0.77	0.30	0.43	0.03	0.06	0.26	2.81
1958	0.01	0.09	-0.09	0.17	0.15	0.49	0.32	0.47	0.26	0.31	0.20	0.14	2.52
1959	0.15	0.20	0.39	0.37	0.19	0.35	0.35	0.38	0.53	0.14	0.23	-0.13	3.15
1960	0.00	0.06	0.19	0.42	0.44	0.18	-0.04	0.36	0.16	-0.09	0.27	0.09	2.04
1961	0.05	0.07	0.13	0.42	0.41	0.25	0.23	0.34	0.34	0.37	-0.02	0.13	2.72
1962	0.03	0.23	0.35	0.34	0.53	0.15	0.19	0.55	0.17	0.30	0.20	0.12	3.16
1963	0.06	0.14	0.46	0.60	0.31	0.24	0.67	0.29	0.33	0.44	0.27	0.06	3.87
1964	0.11	0.04	0.32	0.56	0.50	0.51	0.75	0.54	0.21	0.42	0.11	0.09	4.16
1965	0.11	0.12	0.09	0.42	0.31	-0.14	0.51	0.37	0.28	0.31	0.29	0.10	2.77
1966	0.06	0.01	0.44	0.32	0.45	0.37	0.59	0.11	0.27	0.44	0.39	0.12	3.57
1967	0.09	0.15	0.44	0.41	0.37	0.20	0.29	0.41	0.37	0.54	0.23	0.08	3.58
1968	-0.06	0.02	0.18	0.37	0.15	0.45	0.35	0.31	0.47	0.37	0.13	0.07	2.81
1969	0.08	0.05	0.09	0.40	0.10	0.34	0.45	0.40	0.08	0.04	0.16	0.00	2.19
1970	0.09	0.13	0.07	0.32	0.54	0.52	0.55	0.50	0.40	0.20	0.17	0.14	3.63
1971	0.24	0.17	0.31	0.41	0.41	0.43	0.39	0.22	0.12	0.19	0.10	0.06	3.05
1972	0.19	0.26	0.48	0.53	0.16	0.33	0.25	0.32	0.22	0.15	0.02	0.21	3.12
1973	0.09	0.10	-0.06	0.12	0.34	0.52	0.34	0.55	0.27	0.36	0.31	0.29	3.23
1974	0.20	0.37	0.30	0.64	0.48	0.61	0.75	0.09	0.11	0.00	0.21	0.09	3.85
1975	0.03	0.02	0.25	0.34	0.27	0.44	0.20	0.53	0.24	0.55	0.20	0.17	3.24
1976	0.26	0.37	0.44	0.36	0.37	0.62	0.46	0.56	0.16	0.28	0.21	0.25	4.34
1977	0.11	0.25	0.44	0.21	0.16	0.57	0.67	0.26	0.52	0.40	0.33	0.27	4.19
1978	0.09	0.07	0.40	0.64	0.17	0.39	0.78	0.55	0.29	0.35	0.00	0.21	3.94
1979	0.07	0.14	0.24	0.33	0.21	0.23	0.46	0.30	0.44	0.49	0.20	0.21	3.32
1980	0.13	0.20	0.41	0.40	0.13	0.65	0.95	0.62	0.40	0.44	0.18	0.18	4.69
1981	0.16	0.25	0.25	0.45	0.40	0.66	0.49	0.15	0.21	0.11	0.22	0.21	3.56
1982	0.19	0.20	0.42	0.51	0.21	0.25	0.29	0.48	0.51	0.44	0.28	0.07	3.85
1983	0.05	0.04	0.24	0.38	0.35	0.43	0.86	0.69	0.63	0.18	0.27	0.08	4.20
1984	0.14	0.38	0.25	0.50	0.58	0.42	0.60	0.25	0.55	0.16	0.24	0.03	4.10
1985	0.07	0.20	0.23	0.44	0.35	0.34	0.61	0.56	0.18	0.04	0.19	0.00	3.21
1986	0.26	0.21	0.47	0.47	0.32	0.21	0.74	0.21	0.17	0.04	0.04	0.07	3.21
1987	0.11	0.07	0.26	0.47	0.06	0.32	0.66	0.29	0.16	0.36	0.25	0.07	3.08
1988	0.11	0.21	0.28	0.28	0.25	0.34	0.39	0.46	0.20	0.40	0.36	0.27	3.55
1989	0.20	0.10	0.49	0.53	0.25	0.14	0.57	0.25	0.29	0.51	0.46	0.17	3.96
1990	0.13	0.09	0.19	0.24	0.39	0.80	0.53	0.49	0.31	0.33	0.16	0.16	3.82
1991	0.10	0.30	0.46	0.62	0.48	0.55	0.60	0.49	0.32	0.61	0.17	0.07	4.77
1992	0.08	0.24	0.36	0.32	0.16	0.06	0.54	0.34	0.48	0.44	0.23	0.14	3.39
1993	0.09	0.17	0.33	0.50	0.48	0.59	0.67	0.59	0.59	0.50	0.29	0.21	5.01
1994	0.17	0.22	0.37	0.46	0.19	0.71	0.53	0.51	0.44	0.39	0.30	0.20	4.49
1995	0.00	0.00	0.44	0.45	0.16	0.44	0.47	0.51	0.20	0.50	0.40	0.31	3.88
1996	0.27	0.33	0.48	0.64	0.40	0.43	0.28	0.23	0.13	0.39	0.28	0.37	4.23
1997	0.18	0.15	0.58	-0.04	0.24	0.37	0.56	0.23	0.39	0.38	0.21	-0.01	3.24
1998	0.26	0.15	0.31	0.51	0.62	1.01	0.77	0.41	0.60	0.07	0.21	0.17	5.09
1999	0.28	0.31	0.23	0.38	0.25	0.36	0.59	0.51	0.31	0.45	0.41	0.28	4.36
2000	0.44	0.44	0.11	0.40	0.55	-0.02	0.64	0.64	0.64	0.03	0.22	0.10	4.19
2001	0.00	0.08	0.09	0.59	0.20	0.75	0.93	0.55	0.56	0.59	0.15	0.20	4.69
2002	0.17	0.21	0.41	0.52	0.67	0.78	0.64	0.55	0.41	0.03	0.23	0.24	4.86
2003	0.32	0.19	0.31	0.54	0.59	0.13	0.95	0.72	0.42	0.32	0.30	0.24	5.03
2004	0.10	0.27	0.27	0.15	0.64	0.32	0.46	0.42	0.28	0.13	-0.13	0.21	3.12
2005	0.09	0.12	0.28	0.36	0.22	0.54	0.61	0.19	0.56	0.31	0.38	0.33	3.99
2006	0.48	0.34	0.35	0.54	0.57	0.73	0.67	0.19	0.22	0.28	0.38	0.03	4.78
2007	0.12	0.28	0.01	0.35	0.19	0.27	0.54	0.56	0.34	0.65	0.30	0.17	3.78
2008	0.13	0.38	0.50	0.55	0.27	0.61	0.47	0.30	0.36	0.03	0.37	0.30	4.27
2009	0.25	0.33	0.45	0.36	0.44	0.47	0.46	0.51	0.42	0.25	0.37	0.10	4.41
2010	0.07	0.13	0.28	0.26	0.35	0.57	0.23	0.39	0.52	0.49	0.49	0.24	4.02
2011	0.16	0.19	0.22	0.77	0.82	1.08	0.96	0.81	0.63	0.46	0.44	0.00	6.54
2012	0.25	0.19	0.48	0.49	0.48	0.53	0.77	0.66	0.39	0.49	0.30	0.20	5.23
2013	0.14	0.18	0.44	0.42	0.61	0.57	0.37	0.45	0.31	0.53	0.28	0.19	4.49
2014	0.26	0.17	0.49	0.64	0.38	0.34	0.40	0.51	0.12	0.33	0.27	0.15	4.06
2015	0.07	0.17	0.32	0.29	-0.33	0.32	0.12	0.30	0.50	-0.13	0.24	0.17	2.04
2016	0.18	0.31	0.47	0.32	0.29	0.42	0.73	0.20	0.29	0.59	0.27	0.22	4.29
2017	-0.01	0.26	0.37	0.27	0.44	0.51	0.53	-0.15	0.25	0.24	0.41	0.31	3.43
2018	0.33	0.36	0.50	0.43	0.66	0.62	0.56	0.44	0.29	-0.08	0.25	0.18	4.54
Total	10.26	13.29	22.84	29.49	24.36	32.22	38.17	30.56	26.58	22.84	17.80	11.75	194.04
Mean	0.14	0.18	0.32	0.42	0.34	0.45	0.54	0.43	0.38	0.33	0.25	0.17	3.94
Max	0.48	0.44	0.58	0.77	0.82	1.08	0.96	0.93	0.96	0.77	0.49	0.37	6.56
Min	-0.06	-0.01	-0.09	-0.04	-0.33	-0.14	-0.04	-0.15	0.08	-0.13	-0.13	-0.13	2.04

Table of Final Results - Calculated Monthly Net Reservoir Evaporation Values

Quadrangle: Baylor
Units: Feet
Control Point D10030

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	0.15	-0.06	0.17	0.50	0.36	0.49	0.57	0.67	0.72	0.43	0.43	0.35	4.78
1949	-0.24	0.08	0.19	0.17	0.00	0.39	0.73	0.61	0.36	0.26	0.40	0.17	3.12
1950	0.19	0.20	0.43	0.35	0.19	0.34	0.04	0.44	0.04	0.58	0.49	0.23	3.52
1951	0.24	0.09	0.34	0.36	0.32	0.43	0.71	0.83	0.52	0.43	0.20	0.36	4.83
1952	0.23	0.27	0.32	0.06	0.38	0.97	0.80	1.16	0.82	0.81	0.31	0.13	6.26
1953	0.35	0.35	0.29	0.37	0.55	0.98	0.68	0.70	0.99	-0.10	0.15	0.23	5.54
1954	0.15	0.33	0.36	0.26	-0.26	0.64	0.75	0.45	0.67	0.52	0.34	0.25	4.46
1955	0.09	0.20	0.41	0.61	-0.04	0.10	0.60	0.64	0.31	0.07	0.38	0.21	3.58
1956	0.18	0.19	0.55	0.60	0.22	0.72	0.79	0.85	0.74	0.37	0.33	0.21	5.75
1957	0.17	0.10	0.16	-0.16	-0.31	0.23	0.82	0.55	0.42	-0.02	0.03	0.25	2.24
1958	0.04	0.09	-0.06	0.11	0.07	0.48	0.30	0.58	0.22	0.32	0.21	0.15	2.51
1959	0.16	0.21	0.44	0.37	-0.02	0.18	0.33	0.54	0.47	0.00	0.25	-0.20	2.73
1960	-0.01	0.02	0.17	0.30	0.17	0.08	0.23	0.31	0.25	-0.34	0.28	-0.02	1.44
1961	0.07	0.02	0.08	0.44	0.26	0.05	0.17	0.47	0.29	0.28	0.01	0.08	2.22
1962	0.10	0.31	0.42	0.24	0.53	0.05	0.31	0.63	-0.04	0.22	0.14	0.13	3.04
1963	0.07	0.22	0.43	0.47	0.28	0.41	0.77	0.49	0.35	0.50	0.19	0.08	4.26
1964	0.21	0.03	0.42	0.62	0.39	0.56	0.88	0.64	0.15	0.34	0.02	0.08	4.34
1965	0.12	0.14	0.21	0.32	0.32	0.31	0.85	0.58	0.21	0.14	0.37	0.28	3.85
1966	0.03	0.01	0.46	0.26	0.50	0.49	0.80	0.16	0.19	0.48	0.44	0.15	3.97
1967	0.11	0.14	0.42	0.35	0.32	0.50	0.49	0.70	0.30	0.47	0.22	0.09	4.11
1968	-0.18	-0.02	0.18	0.30	0.06	0.40	0.30	0.36	0.52	0.41	0.08	0.05	2.46
1969	0.10	0.10	0.07	0.43	0.14	0.53	0.87	0.49	0.18	0.12	0.25	0.10	3.38
1970	0.12	0.21	0.04	0.31	0.41	0.73	0.60	0.58	0.45	0.34	0.26	0.31	4.36
1971	0.25	0.18	0.35	0.51	0.41	0.59	0.82	0.35	0.01	0.15	0.23	0.03	3.88
1972	0.16	0.27	0.52	0.50	0.12	0.46	0.51	0.41	0.35	0.06	0.03	0.21	3.60
1973	0.03	0.08	-0.11	-0.06	0.35	0.37	0.45	0.60	0.00	0.28	0.31	0.28	2.58
1974	0.20	0.38	0.30	0.46	0.19	0.62	0.91	0.43	-0.07	0.06	0.20	0.13	3.81
1975	0.12	-0.02	0.17	0.26	0.12	0.33	0.15	0.46	0.28	0.41	0.06	0.16	2.50
1976	0.25	0.34	0.36	0.05	0.21	0.40	0.46	0.61	0.18	0.18	0.24	0.25	3.53
1977	0.09	0.16	0.47	0.16	0.03	0.52	0.87	0.34	0.63	0.39	0.28	0.35	4.29
1978	0.06	0.03	0.34	0.57	-0.01	0.44	0.79	0.61	0.11	0.45	0.13	0.22	3.74
1979	0.05	0.10	0.09	0.29	0.19	0.18	0.36	0.35	0.53	0.52	0.21	0.19	3.06
1980	0.08	0.17	0.38	0.44	-0.09	0.67	1.05	0.82	0.36	0.51	0.24	0.14	4.77
1981	0.25	0.26	0.25	0.32	0.22	0.49	0.70	0.42	0.50	0.08	0.27	0.24	4.00
1982	0.20	0.16	0.36	0.47	0.04	0.09	0.49	0.67	0.56	0.49	0.25	0.07	3.85
1983	0.03	0.05	0.15	0.36	0.36	0.40	0.88	0.81	0.68	-0.20	0.23	0.08	3.83
1984	0.20	0.31	0.30	0.51	0.59	0.48	0.71	0.46	0.64	0.35	0.17	-0.08	4.64
1985	0.08	0.08	0.09	0.35	0.42	0.06	0.57	0.56	0.30	0.02	0.19	0.08	2.80
1986	0.34	0.18	0.50	0.40	0.19	0.24	0.86	0.27	0.18	-0.23	0.08	0.09	3.10
1987	0.10	0.00	0.24	0.50	0.00	0.35	0.64	0.44	0.29	0.37	0.29	0.02	3.24
1988	0.09	0.22	0.26	0.26	0.47	0.47	0.44	0.68	0.05	0.40	0.36	0.25	3.95
1989	0.21	0.09	0.34	0.47	-0.03	0.03	0.67	0.35	0.20	0.48	0.49	0.19	3.49
1990	0.13	0.03	0.12	0.11	0.16	0.65	0.42	0.43	0.34	0.35	0.05	0.10	2.89
1991	0.06	0.28	0.45	0.53	0.21	0.33	0.69	0.58	0.11	0.54	0.19	0.02	3.99
1992	0.06	0.18	0.34	0.25	0.15	-0.04	0.66	0.48	0.53	0.52	0.03	0.11	3.27
1993	0.05	0.14	0.27	0.39	0.29	0.65	0.81	0.76	0.65	0.43	0.34	0.26	5.04
1994	0.26	0.19	0.31	0.35	0.28	0.75	0.57	0.70	0.46	0.27	0.20	0.17	4.51
1995	0.00	0.00	0.31	0.29	-0.05	0.11	0.54	0.06	-0.12	0.50	0.40	0.28	2.32
1996	0.27	0.46	0.45	0.65	0.49	0.42	0.34	0.32	0.09	0.39	0.24	0.38	4.50
1997	0.27	0.03	0.53	-0.30	0.17	0.27	0.65	0.29	0.29	0.24	0.26	-0.06	2.64
1998	0.18	-0.05	0.15	0.47	0.43	0.87	0.88	0.60	0.60	0.20	0.10	0.14	4.57
1999	0.30	0.33	0.11	0.30	0.11	0.41	0.72	0.60	0.36	0.43	0.44	0.31	4.42
2000	0.58	0.25	-0.06	0.10	0.31	-0.15	0.51	0.66	0.60	-0.02	0.16	0.12	3.06
2001	-0.02	0.02	0.12	0.44	-0.06	0.66	0.88	0.39	0.32	0.51	0.08	0.23	3.57
2002	0.18	0.21	0.34	0.26	0.40	0.40	0.33	0.63	0.41	-0.08	0.24	0.12	3.44
2003	0.23	0.17	0.30	0.36	0.36	0.00	0.84	0.60	0.36	0.39	0.30	0.25	4.16
2004	0.01	0.14	0.13	0.15	0.56	0.02	0.51	0.35	0.49	0.14	-0.30	0.21	2.41
2005	0.07	0.12	0.32	0.40	0.19	0.55	0.58	0.35	0.46	0.26	0.42	0.32	4.04
2006	0.48	0.33	0.25	0.45	0.34	0.69	0.74	0.40	0.26	0.09	0.35	-0.06	4.32
2007	0.10	0.29	-0.07	0.26	-0.07	0.08	0.41	0.45	0.31	0.55	0.35	0.19	2.85
2008	0.16	0.23	0.42	0.36	0.27	0.53	0.65	0.31	0.00	0.09	0.36	0.29	3.67
2009	0.24	0.36	0.45	0.25	0.35	0.38	0.45	0.55	0.15	0.17	0.38	0.12	3.85
2010	0.04	0.13	0.36	0.05	0.31	0.42	0.09	0.57	0.33	0.29	0.42	0.32	3.33
2011	0.21	0.25	0.44	0.65	0.59	0.97	0.89	0.95	0.59	0.28	0.25	0.03	6.10
2012	0.25	0.21	0.30	0.37	0.40	0.36	0.72	0.52	0.30	0.46	0.42	0.25	4.56
2013	0.13	0.10	0.51	0.41	0.49	0.44	0.48	0.50	0.38	0.36	0.32	0.13	4.25
2014	0.35	0.17	0.43	0.49	0.27	0.26	0.38	0.55	0.31	0.44	0.19	0.13	3.97
2015	0.09	0.18	0.30	0.06	-0.55	0.25	0.43	0.50	0.61	0.26	0.16	0.13	2.42
2016	0.18	0.30	0.43	0.23	-0.08	0.25	0.53	0.26	0.19	0.43	0.26	0.17	3.15
2017	0.02	0.17	0.29	0.23	0.45	0.44	0.51	0.10	0.13	0.31	0.40	0.27	3.32
2018	0.35	0.32	0.31	0.43	0.32	0.49	0.64	0.47	0.01	-0.22	0.25	0.16	3.53
Total	10.47	11.81	20.47	23.45	15.71	28.71	42.57	37.00	24.43	19.98	17.30	11.66	189.14
Mean	0.14	0.16	0.29	0.33	0.22	0.40	0.60	0.52	0.35	0.29	0.24	0.16	3.71
Max	0.58	0.46	0.55	0.65	0.59	0.98	1.05	1.16	0.99	0.81	0.49	0.38	6.26
Min	-0.24	-0.06	-0.11	-0.30	-0.55	-0.15	0.04	0.06	-0.12	-0.34	-0.30	-0.20	1.44

Table of Final Results - Calculated Monthly Net Reservoir Evaporation Values

Quadrangle: Mackenzie
Units: Feet
Control Point D10130

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	0.11	-0.02	0.19	0.50	0.39	0.46	0.61	0.47	0.66	0.42	0.40	0.37	4.56
1949	-0.16	0.11	0.27	0.21	0.12	0.37	0.57	0.49	0.35	0.28	0.38	0.19	3.18
1950	0.22	0.21	0.43	0.41	0.37	0.41	0.00	0.43	-0.03	0.52	0.41	0.23	3.61
1951	0.25	0.13	0.38	0.40	0.43	0.59	0.77	0.78	0.57	0.45	0.24	0.31	5.30
1952	0.24	0.31	0.39	0.25	0.63	0.96	0.82	1.04	0.80	0.71	0.28	0.16	6.59
1953	0.29	0.31	0.37	0.47	0.61	0.97	0.75	0.70	0.94	0.16	0.27	0.20	6.04
1954	0.14	0.31	0.38	0.25	0.00	0.58	0.60	0.42	0.58	0.36	0.31	0.22	4.15
1955	0.11	0.18	0.38	0.56	-0.07	0.22	0.50	0.49	0.33	0.24	0.33	0.24	3.51
1956	0.16	-0.01	0.52	0.56	0.28	0.63	0.58	0.70	0.70	0.45	0.30	0.22	5.09
1957	0.16	0.10	0.17	0.01	-0.08	0.19	0.81	0.40	0.47	-0.04	0.03	0.26	2.48
1958	0.01	0.10	-0.09	0.09	0.08	0.43	0.43	0.49	0.18	0.28	0.19	0.15	2.34
1959	0.17	0.21	0.40	0.34	0.12	0.20	0.29	0.52	0.53	0.05	0.24	-0.19	2.88
1960	-0.01	0.05	0.18	0.32	0.36	0.15	-0.04	0.36	0.14	-0.11	0.27	0.07	1.74
1961	0.04	0.02	0.10	0.41	0.36	0.12	0.07	0.43	0.32	0.32	0.01	0.14	2.34
1962	0.06	0.27	0.41	0.33	0.47	0.04	0.25	0.55	0.09	0.23	0.15	0.13	2.98
1963	0.06	0.18	0.49	0.55	0.30	0.23	0.62	0.31	0.35	0.43	0.21	0.05	3.78
1964	0.14	0.06	0.37	0.61	0.53	0.49	0.83	0.58	0.20	0.40	0.13	0.07	4.41
1965	0.11	0.13	0.12	0.40	0.39	0.05	0.64	0.45	0.23	0.28	0.29	0.14	3.23
1966	0.05	0.02	0.44	0.29	0.47	0.37	0.76	0.12	0.23	0.47	0.43	0.14	3.79
1967	0.10	0.13	0.45	0.46	0.39	0.25	0.34	0.53	0.36	0.59	0.24	0.11	3.95
1968	-0.08	-0.01	0.17	0.38	0.15	0.37	0.36	0.22	0.49	0.41	0.14	0.06	2.66
1969	0.07	0.07	0.06	0.44	0.08	0.39	0.61	0.41	0.07	-0.01	0.19	0.01	2.39
1970	0.09	0.14	0.04	0.40	0.53	0.57	0.66	0.60	0.44	0.21	0.17	0.14	3.99
1971	0.25	0.18	0.32	0.44	0.37	0.43	0.51	0.20	-0.01	0.20	0.20	0.06	3.15
1972	0.20	0.26	0.50	0.51	0.07	0.31	0.25	0.38	0.24	0.14	0.04	0.21	3.11
1973	0.08	0.09	-0.10	0.06	0.34	0.46	0.38	0.49	0.15	0.35	0.34	0.34	2.98
1974	0.21	0.38	0.29	0.61	0.46	0.57	0.81	0.07	-0.06	-0.03	0.21	0.09	3.61
1975	0.03	0.00	0.23	0.39	0.22	0.44	0.16	0.47	0.30	0.50	0.16	0.15	3.05
1976	0.26	0.39	0.44	0.27	0.38	0.55	0.31	0.57	0.14	0.23	0.21	0.25	4.00
1977	0.12	0.22	0.46	0.19	0.06	0.53	0.73	0.26	0.60	0.35	0.37	0.32	4.21
1978	0.08	0.06	0.41	0.62	0.08	0.35	0.77	0.57	0.23	0.38	0.05	0.23	3.83
1979	0.07	0.10	0.16	0.35	0.23	0.11	0.38	0.28	0.45	0.45	0.21	0.20	2.99
1980	0.12	0.18	0.41	0.46	0.13	0.60	0.95	0.69	0.32	0.42	0.18	0.15	4.61
1981	0.14	0.22	0.29	0.40	0.38	0.65	0.58	0.22	0.33	0.09	0.26	0.21	3.77
1982	0.19	0.19	0.41	0.51	0.06	0.11	0.42	0.59	0.55	0.47	0.26	0.07	3.83
1983	0.01	0.03	0.29	0.37	0.36	0.42	0.83	0.69	0.57	-0.02	0.26	0.09	3.90
1984	0.16	0.36	0.34	0.53	0.59	0.36	0.60	0.30	0.53	0.28	0.22	0.02	4.29
1985	0.08	0.18	0.21	0.49	0.36	0.08	0.50	0.57	0.15	0.00	0.21	-0.02	2.81
1986	0.29	0.24	0.52	0.46	0.33	0.13	0.85	0.07	0.14	-0.11	0.06	0.08	3.06
1987	0.13	0.06	0.31	0.54	0.04	0.37	0.53	0.33	0.20	0.39	0.27	0.01	3.18
1988	0.12	0.21	0.28	0.28	0.36	0.44	0.38	0.50	0.15	0.41	0.36	0.27	3.76
1989	0.18	0.10	0.46	0.55	0.17	0.03	0.68	0.27	0.18	0.53	0.49	0.18	3.82
1990	0.14	0.06	0.19	0.15	0.28	0.69	0.53	0.51	0.37	0.37	0.14	0.18	3.61
1991	0.08	0.29	0.51	0.65	0.45	0.52	0.58	0.61	0.18	0.59	0.19	0.05	4.70
1992	0.08	0.23	0.38	0.27	0.09	0.00	0.55	0.47	0.55	0.50	0.17	0.15	3.44
1993	0.08	0.19	0.33	0.51	0.52	0.71	0.64	0.63	0.69	0.50	0.32	0.27	5.39
1994	0.22	0.23	0.39	0.41	0.20	0.76	0.53	0.60	0.43	0.42	0.28	0.19	4.66
1995	0.00	0.00	0.43	0.44	0.11	0.44	0.59	0.37	0.03	0.49	0.41	0.31	3.62
1996	0.29	0.42	0.51	0.74	0.53	0.41	0.34	0.30	0.22	0.40	0.28	0.37	4.81
1997	0.17	0.04	0.52	-0.10	0.16	0.32	0.65	0.27	0.33	0.33	0.25	0.01	2.95
1998	0.27	0.03	0.29	0.54	0.58	0.96	0.83	0.39	0.62	0.09	0.17	0.16	4.93
1999	0.25	0.31	0.19	0.49	0.20	0.37	0.69	0.58	0.33	0.46	0.44	0.28	4.59
2000	0.54	0.44	0.11	0.32	0.58	-0.09	0.70	0.57	0.57	0.08	0.21	0.13	4.16
2001	-0.02	0.08	0.03	0.56	0.10	0.80	0.97	0.53	0.53	0.61	0.13	0.19	4.51
2002	0.26	0.20	0.36	0.46	0.66	0.76	0.62	0.53	0.46	0.01	0.23	0.23	4.78
2003	0.33	0.20	0.32	0.51	0.57	0.11	0.96	0.76	0.48	0.42	0.32	0.25	5.23
2004	0.00	0.23	0.23	0.18	0.67	0.16	0.48	0.38	0.38	0.07	-0.23	0.22	2.77
2005	0.09	0.12	0.27	0.36	0.21	0.49	0.60	0.22	0.56	0.29	0.40	0.33	3.94
2006	0.49	0.32	0.29	0.49	0.48	0.73	0.74	0.31	0.11	0.21	0.37	0.00	4.54
2007	0.10	0.25	-0.09	0.30	0.03	0.15	0.49	0.57	0.30	0.67	0.33	0.15	3.25
2008	0.13	0.34	0.47	0.51	0.19	0.58	0.59	0.36	0.24	0.12	0.40	0.33	4.26
2009	0.25	0.31	0.45	0.31	0.50	0.38	0.45	0.55	0.40	0.30	0.39	0.10	4.39
2010	0.06	0.13	0.27	0.12	0.39	0.57	0.03	0.33	0.51	0.49	0.55	0.32	3.77
2011	0.21	0.25	0.19	0.85	0.85	1.14	1.02	0.95	0.69	0.47	0.44	0.04	7.10
2012	0.26	0.20	0.46	0.53	0.44	0.39	0.66	0.54	0.26	0.51	0.30	0.22	4.77
2013	0.16	0.14	0.47	0.52	0.59	0.41	0.35	0.50	0.34	0.51	0.31	0.19	4.49
2014	0.34	0.18	0.49	0.60	0.32	0.25	0.39	0.51	0.09	0.33	0.19	0.15	3.84
2015	0.08	0.18	0.31	0.25	-0.53	0.30	0.32	0.41	0.53	0.03	0.21	0.18	2.27
2016	0.20	0.32	0.49	0.26	0.22	0.36	0.60	0.19	0.25	0.57	0.26	0.21	3.93
2017	-0.03	0.25	0.36	0.27	0.50	0.37	0.41	-0.02	0.17	0.33	0.42	0.29	3.32
2018	0.35	0.35	0.52	0.54	0.64	0.48	0.61	0.44	0.10	-0.06	0.26	0.18	4.41
Total	10.43	12.74	22.59	28.71	22.43	29.50	39.37	32.37	24.88	22.24	18.11	12.01	191.06
Mean	0.14	0.18	0.32	0.40	0.31	0.41	0.55	0.46	0.35	0.32	0.26	0.17	3.87
Max	0.54	0.44	0.52	0.85	0.85	1.14	1.02	1.04	0.94	0.71	0.55	0.37	6.59
Min	-0.16	-0.02	-0.10	-0.10	-0.53	-0.09	-0.04	-0.02	-0.06	-0.11	-0.23	-0.19	1.74

Table of Final Results - Calculated Monthly Net Reservoir Evaporation Values

Quadrangle: Truscott Same as 408
Units: Feet
Control Point J10010

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	0.17	-0.02	0.29	0.55	0.38	0.37	0.66	0.92	0.85	0.44	0.45	0.34	5.40
1949	-0.15	0.07	0.25	0.19	0.10	0.43	0.78	0.56	0.31	0.25	0.42	0.16	3.37
1950	0.13	0.18	0.45	0.26	-0.03	0.38	0.18	0.40	0.20	0.56	0.45	0.24	3.40
1951	0.21	0.14	0.30	0.40	0.12	0.37	0.75	0.75	0.55	0.47	0.29	0.30	4.65
1952	0.22	0.28	0.35	0.25	0.35	0.95	0.71	1.20	0.85	0.78	0.27	0.17	6.38
1953	0.27	0.22	0.23	0.39	0.58	0.81	0.51	0.44	0.80	0.16	0.25	0.27	4.93
1954	0.10	0.34	0.39	0.16	-0.25	0.56	0.78	0.67	0.69	0.41	0.21	0.07	4.13
1955	0.03	0.14	0.29	0.51	0.16	0.21	0.63	0.63	0.08	0.27	0.29	0.20	3.44
1956	0.15	0.16	0.42	0.49	0.33	0.72	0.84	0.85	0.78	0.34	0.27	0.14	5.49
1957	0.12	0.00	0.18	-0.10	-0.27	0.40	0.75	0.63	0.42	0.03	-0.18	0.23	2.21
1958	0.00	0.07	0.00	0.15	0.11	0.54	0.34	0.59	0.12	0.24	0.18	0.11	2.45
1959	0.14	0.20	0.34	0.25	0.05	-0.01	0.23	0.56	0.44	-0.12	0.21	-0.05	2.24
1960	-0.02	0.03	0.24	0.25	0.24	0.37	0.19	0.45	0.24	-0.11	0.28	-0.07	2.09
1961	0.06	0.00	0.07	0.43	0.21	-0.02	0.01	0.51	0.11	0.25	-0.04	0.06	1.65
1962	0.14	0.25	0.32	0.17	0.48	0.00	0.23	0.40	-0.48	0.14	0.02	0.09	1.76
1963	0.11	0.14	0.17	0.24	-0.07	0.13	0.44	0.39	0.26	0.37	0.07	0.06	2.31
1964	0.22	-0.02	0.39	0.54	0.27	0.47	0.91	0.60	0.00	0.36	0.05	0.20	3.99
1965	0.14	0.14	0.26	0.25	0.12	0.50	0.90	0.60	0.42	0.09	0.37	0.29	4.08
1966	0.01	0.09	0.44	0.02	0.43	0.61	0.80	0.12	0.01	0.45	0.41	0.25	3.64
1967	0.31	0.32	0.42	0.11	0.35	0.52	0.35	0.69	0.24	0.42	0.18	0.08	3.99
1968	-0.29	0.03	0.07	0.29	0.07	0.44	0.22	0.54	0.48	0.37	0.07	0.19	2.48
1969	0.11	0.04	0.06	0.33	-0.04	0.51	0.90	0.53	-0.05	0.06	0.23	0.04	2.72
1970	0.13	0.11	0.01	0.24	0.37	0.71	0.61	0.60	0.23	0.26	0.31	0.25	3.83
1971	0.31	0.22	0.56	0.54	0.37	0.69	0.76	0.05	0.11	0.02	0.20	-0.02	3.81
1972	0.16	0.23	0.47	0.41	0.12	0.48	0.57	0.52	0.18	-0.16	0.04	0.23	3.25
1973	-0.09	0.03	0.06	0.16	0.42	0.34	0.46	0.68	-0.05	0.19	0.22	0.26	2.68
1974	0.17	0.33	0.39	0.40	0.35	0.53	0.88	0.44	-0.15	0.08	0.23	0.09	3.74
1975	0.15	0.01	0.25	0.38	-0.12	0.46	0.17	0.44	0.09	0.47	0.11	0.10	2.51
1976	0.23	0.41	0.36	0.13	0.26	0.55	0.42	0.62	0.01	-0.24	0.22	0.20	3.17
1977	-0.01	0.18	0.35	0.11	-0.02	0.53	0.59	0.36	0.56	0.36	0.30	0.35	3.66
1978	0.07	-0.04	0.30	0.56	0.29	0.56	0.87	-0.01	0.10	0.34	0.07	0.19	3.30
1979	0.04	0.10	0.13	0.28	0.15	0.18	0.51	0.36	0.48	0.61	0.18	0.05	3.07
1980	0.10	0.15	0.39	0.51	-0.13	0.68	1.08	0.79	-0.01	0.40	0.17	0.08	4.21
1981	0.22	0.08	0.22	0.16	0.10	0.33	0.73	0.38	0.50	-0.10	0.26	0.20	3.08
1982	0.11	0.12	0.28	0.31	-0.43	-0.11	0.64	0.51	0.45	0.39	0.21	0.06	2.54
1983	-0.01	0.05	0.10	0.28	0.11	0.23	0.66	0.67	0.58	-0.07	0.17	0.03	2.80
1984	0.21	0.25	0.24	0.48	0.53	0.48	0.64	0.49	0.46	0.08	0.06	-0.17	3.75
1985	0.12	-0.03	-0.01	0.13	0.30	0.24	0.61	0.66	0.42	0.01	0.22	0.16	2.83
1986	0.33	0.14	0.40	0.28	0.09	0.16	0.72	0.45	0.01	-0.28	0.06	0.03	2.39
1987	0.04	-0.08	0.18	0.41	-0.11	0.22	0.63	0.52	0.32	0.47	0.26	-0.08	2.78
1988	0.09	0.19	0.29	0.30	0.54	0.28	0.43	0.69	0.03	0.40	0.34	0.18	3.76
1989	0.17	-0.05	0.33	0.53	0.10	0.09	0.61	0.43	0.15	0.47	0.32	0.21	3.36
1990	0.10	-0.01	-0.01	-0.14	0.16	0.61	0.45	0.36	0.20	0.37	0.07	0.08	2.24
1991	-0.05	0.28	0.41	0.44	0.21	0.25	0.75	0.44	0.10	0.40	0.29	-0.03	3.49
1992	-0.02	-0.01	0.23	0.25	0.07	-0.07	0.58	0.48	0.39	0.49	0.04	0.06	2.49
1993	0.12	-0.05	0.15	0.32	0.26	0.49	1.03	0.79	0.45	0.52	0.26	0.16	4.50
1994	0.22	0.10	0.32	0.43	0.05	0.70	0.58	0.70	0.29	0.13	0.14	0.08	3.74
1995	0.00	0.00	0.28	0.35	-0.16	0.23	0.57	0.22	0.00	0.51	0.27	0.25	2.52
1996	0.20	0.42	0.27	0.56	0.67	0.47	0.68	0.08	0.05	0.45	0.23	0.40	4.48
1997	0.29	-0.08	0.38	0.00	0.16	0.15	0.68	0.38	0.38	0.20	0.22	-0.08	2.68
1998	0.06	0.06	0.14	0.45	0.49	0.55	0.69	0.65	0.65	0.25	0.15	0.18	4.32
1999	0.22	0.33	-0.02	0.24	0.10	0.17	0.82	0.76	0.55	0.39	0.40	0.36	4.32
2000	0.49	0.15	0.10	0.24	0.51	0.18	0.78	1.03	0.79	0.15	-0.15	0.18	4.45
2001	-0.03	-0.05	-0.04	0.40	0.18	0.70	0.97	0.59	0.27	0.46	0.08	0.16	3.69
2002	0.17	0.16	0.20	0.11	0.35	0.38	0.15	0.64	0.42	-0.12	0.23	0.02	2.71
2003	0.19	0.12	0.29	0.42	0.27	0.00	0.81	0.58	0.37	0.49	0.22	0.27	4.03
2004	0.08	-0.05	0.23	0.16	0.47	0.00	0.33	0.36	0.49	0.01	-0.34	0.19	1.93
2005	0.09	0.05	0.25	0.49	0.23	0.48	0.39	-0.07	0.40	0.18	0.44	0.30	3.23
2006	0.40	0.25	0.26	0.39	0.33	0.66	0.78	0.69	0.32	0.04	0.29	0.07	4.48
2007	0.05	0.27	0.01	0.16	-0.15	-0.26	0.36	0.49	0.33	0.54	0.28	0.20	2.28
2008	0.21	0.20	0.27	0.38	0.23	0.61	0.76	0.48	0.26	0.27	0.32	0.25	4.24
2009	0.25	0.32	0.45	0.31	0.16	0.38	0.45	0.80	0.04	0.00	0.37	0.07	3.60
2010	-0.06	0.05	0.24	0.12	0.18	0.52	-0.03	0.67	0.12	0.40	0.43	0.34	2.98
2011	0.31	0.35	0.43	0.67	0.58	1.05	1.10	1.08	0.66	0.24	0.32	-0.01	6.78
2012	0.12	0.19	0.27	0.50	0.42	0.51	0.81	0.63	0.31	0.38	0.40	0.27	4.81
2013	0.21	0.12	0.50	0.38	0.54	0.50	0.37	0.67	0.50	0.38	0.34	0.11	4.62
2014	0.28	0.16	0.35	0.46	0.36	0.31	0.46	0.52	0.36	0.45	0.09	0.12	3.92
2015	0.01	0.12	0.24	0.09	-0.53	0.22	0.45	0.65	0.62	0.07	0.01	0.01	1.96
2016	0.17	0.23	0.34	0.05	0.02	0.19	0.68	0.37	0.00	0.28	0.10	0.12	2.55
2017	0.13	0.19	0.32	0.36	0.36	0.30	0.60	0.23	0.20	0.45	0.31	0.18	3.63
2018	0.26	0.16	0.00	0.48	0.33	0.76	0.72	0.51	-0.29	-0.55	0.17	0.00	2.55
Total	9.19	9.23	18.09	21.80	13.83	27.93	42.47	38.46	21.02	17.76	14.68	10.08	171.78
Mean	0.13	0.13	0.26	0.30	0.19	0.39	0.60	0.54	0.30	0.26	0.21	0.14	3.46
Max	0.49	0.42	0.56	0.67	0.67	1.05	1.10	1.20	0.85	0.78	0.45	0.40	6.38
Min	-0.29	-0.08	-0.04	-0.14	-0.53	-0.26	-0.03	-0.07	-0.48	-0.55	-0.34	-0.17	1.65

Table of Final Results - Calculated Monthly Net Reservoir Evaporation Values

Quadrangle: Lake Kemp
Units: Feet
Control Point N10020

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	0.14	-0.04	0.27	0.46	0.34	0.35	0.69	0.96	0.86	0.49	0.42	0.33	5.27
1949	0.16	-0.03	0.26	0.25	0.09	0.31	0.78	0.58	0.25	0.20	0.39	0.14	3.38
1950	0.18	0.14	0.45	0.28	0.02	0.27	-0.06	0.32	0.17	0.54	0.45	0.23	2.99
1951	0.23	0.16	0.29	0.33	0.15	0.38	0.70	0.65	0.40	0.54	0.26	0.29	4.38
1952	0.22	0.24	0.32	0.25	0.32	0.87	0.65	1.30	0.93	0.80	0.26	0.15	6.31
1953	0.20	0.18	0.18	0.33	0.57	0.79	0.40	0.51	0.81	-0.02	0.25	0.26	4.46
1954	0.08	0.32	0.38	0.12	-0.31	0.42	0.75	0.66	0.66	0.45	0.23	-0.06	3.70
1955	-0.05	0.13	0.24	0.45	0.14	0.06	0.54	0.63	-0.01	0.26	0.28	0.18	2.85
1956	0.11	0.12	0.39	0.49	0.24	0.75	0.84	0.84	0.75	0.25	0.29	0.14	5.21
1957	0.15	-0.01	0.10	-0.07	-0.30	0.30	0.70	0.64	0.48	0.01	-0.30	0.20	1.90
1958	0.02	0.07	0.00	0.15	0.05	0.56	0.21	0.55	0.00	0.20	0.20	0.13	2.14
1959	0.11	0.17	0.38	0.25	0.05	-0.08	0.25	0.55	0.47	-0.08	0.18	-0.07	2.18
1960	-0.02	0.04	0.21	0.31	0.27	0.39	0.29	0.35	0.22	-0.16	0.28	-0.12	2.06
1961	0.08	-0.01	0.05	0.40	0.00	0.00	0.09	0.51	0.03	0.25	-0.03	0.06	1.43
1962	0.13	0.23	0.28	0.04	0.46	-0.14	0.33	0.43	-0.37	0.13	-0.02	0.03	1.53
1963	0.11	0.12	0.28	0.28	0.08	0.27	0.43	0.45	-0.07	0.40	0.05	0.09	2.49
1964	0.17	0.04	0.36	0.52	0.31	0.51	0.89	0.75	-0.02	0.34	-0.03	0.19	4.03
1965	0.04	0.13	0.25	0.35	0.11	0.58	0.95	0.61	0.55	0.08	0.36	0.28	4.29
1966	0.03	0.06	0.46	0.10	0.39	0.64	0.65	0.18	0.09	0.41	0.33	0.22	3.56
1967	0.27	0.29	0.44	-0.08	0.35	0.42	0.33	0.52	0.27	0.37	0.17	0.07	3.42
1968	-0.25	0.02	0.05	0.27	-0.07	0.52	0.01	0.59	0.45	0.33	-0.01	0.17	2.08
1969	0.10	-0.02	0.10	0.34	-0.03	0.39	0.86	0.58	-0.14	0.12	0.24	0.03	2.57
1970	0.14	0.08	0.08	0.14	0.34	0.66	0.70	0.69	0.21	0.17	0.32	0.24	3.77
1971	0.28	0.28	0.54	0.56	0.27	0.53	0.70	0.06	0.12	0.07	0.19	-0.04	3.56
1972	0.16	0.22	0.44	0.41	0.13	0.44	0.57	0.60	0.18	-0.27	0.07	0.21	3.16
1973	-0.10	0.06	0.02	0.15	0.43	0.55	0.34	0.69	-0.04	0.17	0.24	0.24	2.75
1974	0.15	0.29	0.35	0.38	0.32	0.54	0.78	0.63	-0.10	0.15	0.22	0.08	3.79
1975	0.11	0.01	0.29	0.30	-0.04	0.44	0.27	0.56	0.13	0.50	0.19	0.07	2.83
1976	0.23	0.39	0.33	0.18	0.22	0.61	0.51	0.69	0.09	-0.17	0.21	0.19	3.48
1977	-0.02	0.19	0.37	0.08	0.11	0.59	0.67	0.22	0.62	0.33	0.27	0.33	3.76
1978	0.09	-0.05	0.33	0.56	0.32	0.68	0.96	0.07	0.32	0.38	0.12	0.19	3.97
1979	0.04	0.08	0.12	0.30	0.27	0.43	0.60	0.35	0.50	0.65	0.08	0.02	3.44
1980	0.11	0.17	0.38	0.43	0.15	0.74	1.09	0.85	0.03	0.44	0.17	0.07	4.63
1981	0.21	-0.06	0.21	0.26	0.15	0.31	0.87	0.54	0.55	0.00	0.24	0.18	3.46
1982	0.10	0.14	0.29	0.40	-0.47	-0.12	0.60	0.61	0.52	0.45	0.12	0.07	2.71
1983	0.05	0.06	0.10	0.27	0.15	0.15	0.79	0.77	0.72	0.05	0.20	0.04	3.35
1984	0.23	0.24	0.17	0.50	0.50	0.47	0.77	0.44	0.71	0.04	0.11	-0.22	3.96
1985	0.13	-0.04	0.07	0.29	0.34	0.32	0.68	0.74	0.54	0.00	0.24	0.13	3.44
1986	0.30	0.13	0.33	0.38	0.12	-0.04	0.78	0.59	-0.33	-0.04	-0.01	0.07	2.28
1987	0.07	-0.01	0.24	0.45	0.10	0.43	0.66	0.46	0.36	0.49	0.28	-0.02	3.51
1988	0.07	0.22	0.21	0.43	0.61	0.29	0.56	0.78	0.08	0.39	0.30	0.18	4.12
1989	0.12	-0.08	0.32	0.55	0.13	0.17	0.64	0.40	0.13	0.50	0.32	0.22	3.42
1990	0.08	-0.09	0.04	0.07	0.31	0.64	0.52	0.45	0.29	0.38	0.09	0.14	2.92
1991	-0.05	0.27	0.43	0.50	0.09	0.30	0.56	0.38	0.13	0.28	0.29	0.03	3.21
1992	0.01	0.09	0.16	0.28	0.17	-0.09	0.63	0.46	0.43	0.48	0.01	0.07	2.70
1993	0.12	-0.05	0.24	0.41	0.25	0.47	0.96	0.65	0.36	0.44	0.27	0.07	4.19
1994	0.18	0.03	0.27	0.43	-0.14	0.62	0.61	0.73	0.35	0.01	0.11	0.06	3.26
1995	0.16	0.22	0.22	0.34	-0.13	0.38	0.63	0.41	0.15	0.54	0.23	0.24	3.39
1996	0.21	0.38	0.30	0.61	0.73	0.47	0.84	0.03	-0.14	0.34	0.03	0.38	4.18
1997	0.26	-0.02	0.38	0.06	0.17	0.06	0.76	0.32	0.50	0.24	0.21	-0.07	2.87
1998	0.04	0.07	0.21	0.41	0.52	0.66	1.00	0.71	0.64	0.24	0.00	0.15	4.65
1999	0.18	0.31	-0.03	0.25	0.10	0.22	0.88	0.79	0.61	0.37	0.38	0.33	4.39
2000	0.42	0.13	0.13	0.28	0.65	0.30	0.62	1.04	0.80	0.18	-0.16	0.18	4.57
2001	-0.02	-0.06	0.02	0.40	0.17	0.77	0.99	0.58	0.39	0.49	-0.03	0.16	3.86
2002	0.17	0.17	0.14	0.00	0.24	0.35	0.20	0.69	0.31	-0.07	0.23	0.03	2.46
2003	0.19	0.13	0.33	0.41	0.27	0.07	0.83	0.60	0.40	0.51	0.19	0.27	4.20
2004	0.05	-0.03	0.24	0.27	0.49	0.01	0.46	0.44	0.46	0.00	-0.23	0.18	2.34
2005	0.09	0.02	0.26	0.51	0.43	0.56	0.37	-0.04	0.41	0.12	0.42	0.27	3.42
2006	0.38	0.21	0.27	0.46	0.44	0.72	0.82	0.83	0.40	-0.07	0.24	0.08	4.78
2007	0.02	0.26	0.14	0.19	-0.18	-0.26	0.41	0.54	0.34	0.56	0.31	0.15	2.48
2008	0.23	0.14	0.28	0.38	0.13	0.61	0.84	0.50	0.32	0.27	0.32	0.26	4.28
2009	0.25	0.32	0.47	0.24	0.23	0.24	0.76	0.78	-0.07	0.03	0.32	0.05	3.62
2010	-0.06	0.04	0.25	0.25	0.15	0.55	0.17	0.76	0.18	0.33	0.40	0.32	3.34
2011	0.24	0.28	0.43	0.68	0.62	0.91	1.14	1.15	0.73	0.18	0.30	-0.01	6.65
2012	0.15	0.18	0.25	0.44	0.43	0.66	0.90	0.64	0.39	0.39	0.39	0.28	5.10
2013	0.22	0.11	0.48	0.40	0.49	0.65	0.39	0.67	0.49	0.33	0.33	0.08	4.64
2014	0.25	0.14	0.29	0.37	0.46	0.37	0.25	0.55	0.47	0.50	0.12	0.12	3.89
2015	0.05	0.10	0.22	0.15	-0.82	0.15	0.53	0.71	0.68	0.25	-0.03	0.03	2.02
2016	0.18	0.22	0.35	0.05	0.14	0.21	0.59	0.68	0.17	0.32	0.14	0.12	3.17
2017	0.13	0.15	0.35	0.42	0.30	0.44	0.70	0.22	0.15	0.41	0.31	0.20	3.78
2018	0.24	0.13	0.34	0.52	0.37	0.90	0.77	0.46	-0.26	-0.53	0.18	0.02	3.14
Total	9.05	8.52	18.39	22.62	14.46	28.69	43.95	40.63	22.20	17.73	13.50	9.38	172.99
Mean	0.13	0.12	0.26	0.32	0.20	0.40	0.62	0.57	0.32	0.26	0.19	0.13	3.51
Max	0.42	0.39	0.54	0.68	0.73	0.91	1.14	1.30	0.93	0.80	0.45	0.38	6.31
Min	-0.25	-0.09	-0.03	-0.08	-0.82	-0.26	-0.06	-0.04	-0.37	-0.53	-0.30	-0.22	1.43

Table of Final Results - Calculated Monthly Net Reservoir Evaporation Values

Quadrangle: Lake Electra
Units: Feet
Control Point O10020

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	0.14	-0.07	0.18	0.46	0.26	0.41	0.66	0.85	0.86	0.45	0.42	0.29	4.91
1949	-0.20	0.04	0.18	0.19	-0.06	0.37	0.81	0.63	0.31	0.21	0.38	0.17	3.03
1950	0.14	0.14	0.45	0.29	0.05	0.38	0.14	0.57	0.44	0.58	0.45	0.23	3.86
1951	0.20	0.08	0.29	0.35	0.06	0.26	0.70	0.79	0.60	0.42	0.22	0.30	4.27
1952	0.20	0.24	0.27	0.19	0.24	0.85	0.75	1.28	0.93	0.80	0.24	0.14	6.13
1953	0.25	0.23	0.18	0.33	0.52	0.84	0.62	0.59	0.84	0.05	0.20	0.25	4.90
1954	0.09	0.33	0.36	0.13	-0.16	0.60	0.78	0.69	0.66	0.35	0.26	0.11	4.20
1955	0.01	0.10	0.22	0.47	0.01	0.30	0.63	0.57	0.10	0.39	0.31	0.19	3.30
1956	0.12	0.12	0.45	0.50	0.26	0.68	0.76	0.81	0.74	0.23	0.23	0.08	4.98
1957	0.08	-0.02	0.07	-0.31	-0.18	0.41	0.67	0.59	0.30	0.01	-0.14	0.17	1.65
1958	-0.02	0.09	-0.05	0.16	0.25	0.45	0.31	0.53	0.25	0.30	0.20	0.10	2.57
1959	0.11	0.18	0.38	0.31	0.01	0.09	0.21	0.52	0.34	-0.07	0.20	-0.07	2.21
1960	-0.02	0.02	0.15	0.31	0.17	0.40	0.24	0.38	0.24	-0.16	0.27	-0.09	1.91
1961	0.05	0.00	0.13	0.40	0.24	0.04	0.25	0.45	0.07	0.24	-0.06	0.04	1.85
1962	0.13	0.24	0.27	0.12	0.40	-0.15	0.26	0.51	-0.30	0.13	0.05	0.05	1.71
1963	0.09	0.12	0.20	0.25	0.12	0.28	0.51	0.45	0.26	0.38	0.06	0.06	2.78
1964	0.14	-0.02	0.34	0.50	0.15	0.57	0.89	0.49	0.08	0.32	-0.08	0.16	3.54
1965	0.09	0.10	0.23	0.26	0.13	0.40	0.87	0.52	0.27	0.12	0.35	0.28	3.62
1966	0.02	0.04	0.42	0.04	0.43	0.59	0.79	0.12	0.04	0.44	0.40	0.17	3.50
1967	0.23	0.25	0.40	0.13	0.23	0.50	0.48	0.70	0.16	0.38	0.19	0.05	3.70
1968	-0.22	0.01	0.08	0.24	-0.02	0.41	0.22	0.55	0.38	0.27	0.00	0.11	2.03
1969	0.09	0.02	0.03	0.29	-0.03	0.48	0.76	0.42	0.02	0.09	0.23	0.02	2.42
1970	0.13	0.12	0.00	0.19	0.34	0.65	0.69	0.60	0.22	0.25	0.30	0.26	3.75
1971	0.22	0.19	0.43	0.51	0.37	0.58	0.66	0.11	0.04	0.05	0.17	-0.06	3.27
1972	0.15	0.22	0.45	0.34	0.13	0.48	0.59	0.45	0.25	-0.10	0.07	0.19	3.22
1973	-0.13	0.05	0.02	0.04	0.35	0.28	0.35	0.58	-0.12	0.14	0.16	0.23	1.95
1974	0.16	0.28	0.33	0.28	0.28	0.54	0.73	0.31	-0.17	0.02	0.16	0.08	3.00
1975	0.10	-0.02	0.20	0.30	-0.21	0.24	0.19	0.41	0.16	0.42	0.11	0.11	2.01
1976	0.23	0.36	0.33	0.03	0.16	0.43	0.44	0.55	-0.05	-0.09	0.21	0.17	2.77
1977	-0.01	0.15	0.34	0.17	-0.11	0.48	0.64	0.26	0.53	0.34	0.23	0.33	3.35
1978	0.07	-0.04	0.27	0.47	0.02	0.45	0.82	0.26	0.21	0.38	0.03	0.20	3.14
1979	0.00	0.09	0.10	0.17	0.09	0.21	0.40	0.36	0.49	0.51	0.16	0.04	2.62
1980	0.06	0.13	0.31	0.42	-0.22	0.66	1.00	0.80	0.15	0.39	0.16	0.07	3.93
1981	0.23	0.13	0.16	0.15	0.06	0.27	0.63	0.41	0.44	-0.21	0.20	0.18	2.65
1982	0.10	0.11	0.19	0.31	-0.41	-0.02	0.51	0.59	0.41	0.38	0.12	0.04	2.33
1983	0.00	0.02	0.07	0.26	0.07	0.22	0.67	0.66	0.63	-0.12	0.16	0.06	2.70
1984	0.21	0.24	0.17	0.46	0.45	0.51	0.74	0.54	0.53	0.02	0.07	-0.21	3.73
1985	0.08	-0.06	-0.08	0.15	0.32	0.12	0.62	0.61	0.31	-0.05	0.15	0.15	2.32
1986	0.32	0.12	0.35	0.23	-0.04	0.17	0.73	0.41	0.10	-0.14	0.04	0.03	2.32
1987	0.03	-0.11	0.22	0.42	-0.15	0.24	0.58	0.49	0.24	0.38	0.21	-0.12	2.43
1988	0.07	0.20	0.15	0.22	0.48	0.34	0.45	0.65	-0.02	0.34	0.27	0.19	3.34
1989	0.13	-0.02	0.22	0.49	-0.02	-0.07	0.56	0.38	0.14	0.41	0.35	0.21	2.78
1990	0.08	-0.08	-0.07	-0.05	0.16	0.58	0.35	0.36	0.22	0.35	0.03	0.06	1.99
1991	-0.03	0.27	0.34	0.37	0.14	0.24	0.71	0.44	0.05	0.32	0.23	-0.03	3.05
1992	0.01	0.12	0.22	0.21	0.01	0.00	0.55	0.40	0.39	0.46	-0.07	0.05	2.35
1993	0.07	0.05	0.20	0.24	0.19	0.42	0.93	0.72	0.40	0.34	0.29	0.12	3.97
1994	0.17	0.03	0.23	0.26	0.07	0.62	0.50	0.66	0.31	0.01	0.05	0.13	3.04
1995	0.00	0.00	0.13	0.22	-0.10	0.28	0.49	0.31	-0.02	0.48	0.31	0.21	2.31
1996	0.22	0.39	0.29	0.50	0.58	0.36	0.51	0.04	-0.05	0.31	-0.06	0.31	3.40
1997	0.28	-0.08	0.38	-0.10	0.12	0.22	0.61	0.33	0.36	0.18	0.22	-0.12	2.40
1998	-0.01	0.00	0.07	0.37	0.45	0.66	0.81	0.66	0.62	0.21	0.04	0.07	3.95
1999	0.22	0.31	-0.08	0.22	0.06	0.21	0.71	0.76	0.52	0.32	0.38	0.28	3.91
2000	0.49	0.11	0.10	0.16	0.36	0.04	0.62	0.84	0.67	-0.11	-0.13	0.11	3.26
2001	-0.03	-0.06	0.07	0.38	0.07	0.68	0.91	0.51	0.31	0.42	0.14	0.18	3.58
2002	0.14	0.18	0.18	0.07	0.29	0.29	0.29	0.65	0.40	-0.12	0.23	0.02	2.62
2003	0.19	0.11	0.29	0.37	0.24	-0.03	0.78	0.50	0.30	0.43	0.18	0.26	3.62
2004	0.05	0.00	0.16	0.14	0.42	-0.02	0.30	0.31	0.48	0.03	-0.35	0.16	1.68
2005	0.03	0.07	0.29	0.44	0.18	0.46	0.43	0.10	0.42	0.15	0.40	0.26	3.23
2006	0.37	0.24	0.25	0.38	0.28	0.61	0.77	0.60	0.28	0.08	0.26	0.03	4.15
2007	0.04	0.24	-0.04	0.19	-0.19	-0.18	0.38	0.40	0.28	0.46	0.28	0.10	1.96
2008	0.24	0.18	0.23	0.32	0.28	0.53	0.68	0.27	0.28	0.20	0.31	0.25	3.77
2009	0.22	0.33	0.41	0.13	0.14	0.40	0.42	0.70	0.07	-0.02	0.29	0.04	3.13
2010	-0.02	0.07	0.26	0.19	0.18	0.41	0.12	0.67	0.16	0.32	0.36	0.27	2.99
2011	0.21	0.23	0.43	0.60	0.45	0.84	1.02	1.01	0.60	0.25	0.24	0.03	5.91
2012	0.09	0.17	0.16	0.33	0.39	0.46	0.78	0.58	0.32	0.39	0.38	0.23	4.28
2013	0.19	0.08	0.44	0.23	0.40	0.50	0.37	0.59	0.43	0.33	0.25	0.07	3.88
2014	0.25	0.15	0.31	0.42	0.32	0.24	0.35	0.59	0.41	0.42	0.06	0.11	3.63
2015	0.07	0.13	0.24	0.02	-0.65	0.22	0.48	0.57	0.58	0.13	-0.02	0.06	1.83
2016	0.18	0.23	0.32	-0.06	-0.02	0.12	0.57	0.37	0.02	0.28	0.14	0.13	2.28
2017	0.09	0.11	0.29	0.26	0.36	0.31	0.49	0.11	0.13	0.34	0.29	0.16	2.94
2018	0.25	0.08	0.04	0.34	0.28	0.68	0.63	0.46	-0.20	-0.35	0.20	-0.01	2.40
Total	7.93	8.06	15.60	18.37	10.50	26.09	40.87	36.95	20.82	15.86	12.64	8.50	157.14
Mean	0.11	0.11	0.22	0.26	0.15	0.36	0.57	0.52	0.30	0.23	0.18	0.12	3.14
Max	0.49	0.39	0.45	0.60	0.58	0.85	1.02	1.28	0.93	0.80	0.45	0.33	6.13
Min	-0.22	-0.11	-0.08	-0.31	-0.65	-0.18	0.12	0.04	-0.30	-0.35	-0.35	-0.21	1.65

Table of Final Results - Calculated Monthly Net Reservoir Evaporation Values

Quadrangle: Santa Rosa Lake
Units: Feet
Control Point O10090

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	0.14	-0.05	0.23	0.49	0.30	0.40	0.63	0.81	0.82	0.42	0.42	0.31	4.92
1949	-0.19	0.06	0.20	0.19	-0.01	0.39	0.76	0.58	0.31	0.20	0.40	0.15	3.04
1950	0.13	0.16	0.44	0.28	0.02	0.37	0.09	0.39	0.16	0.55	0.46	0.23	3.28
1951	0.20	0.11	0.30	0.35	0.10	0.31	0.69	0.72	0.54	0.42	0.25	0.31	4.30
1952	0.22	0.27	0.31	0.20	0.33	0.94	0.73	1.19	0.85	0.79	0.26	0.16	6.25
1953	0.29	0.26	0.23	0.37	0.56	0.86	0.61	0.55	0.84	0.06	0.21	0.25	5.09
1954	0.10	0.33	0.37	0.15	-0.25	0.55	0.76	0.63	0.66	0.42	0.25	0.13	4.10
1955	0.03	0.13	0.27	0.51	0.07	0.23	0.62	0.60	0.12	0.17	0.32	0.19	3.26
1956	0.13	0.14	0.47	0.51	0.28	0.72	0.82	0.83	0.76	0.29	0.26	0.13	5.34
1957	0.11	-0.01	0.13	-0.24	-0.34	0.29	0.70	0.59	0.36	0.03	-0.14	0.20	1.68
1958	0.01	0.07	-0.04	0.11	0.13	0.48	0.31	0.55	0.20	0.27	0.19	0.11	2.39
1959	0.13	0.19	0.38	0.32	0.04	0.06	0.24	0.54	0.40	-0.12	0.21	-0.09	2.30
1960	-0.02	0.02	0.18	0.27	0.23	0.36	0.23	0.41	0.23	-0.15	0.28	-0.05	1.99
1961	0.05	0.01	0.16	0.43	0.26	0.04	0.18	0.49	0.14	0.24	-0.05	0.05	2.00
1962	0.13	0.25	0.32	0.18	0.47	-0.05	0.26	0.50	-0.33	0.16	0.06	0.08	2.03
1963	0.10	0.15	0.26	0.29	0.10	0.25	0.57	0.46	0.26	0.39	0.08	0.06	2.97
1964	0.17	0.00	0.37	0.51	0.23	0.55	0.88	0.56	0.12	0.35	0.01	0.16	3.91
1965	0.12	0.12	0.24	0.27	0.15	0.46	0.89	0.55	0.30	0.13	0.36	0.28	3.87
1966	0.02	0.06	0.42	0.07	0.44	0.60	0.81	0.13	0.03	0.45	0.40	0.20	3.63
1967	0.25	0.27	0.41	0.18	0.30	0.48	0.48	0.71	0.20	0.42	0.19	0.07	3.96
1968	-0.22	0.01	0.08	0.28	0.06	0.43	0.24	0.53	0.46	0.33	0.04	0.14	2.38
1969	0.12	0.05	0.04	0.33	-0.02	0.51	0.82	0.48	0.02	0.06	0.24	0.04	2.69
1970	0.13	0.12	0.01	0.23	0.35	0.67	0.65	0.61	0.31	0.28	0.30	0.27	3.93
1971	0.26	0.21	0.47	0.53	0.37	0.64	0.73	0.13	0.05	0.06	0.19	-0.03	3.61
1972	0.16	0.23	0.47	0.39	0.13	0.47	0.57	0.43	0.24	-0.08	0.09	0.21	3.31
1973	-0.10	0.05	0.06	0.11	0.37	0.34	0.41	0.63	-0.08	0.17	0.21	0.26	2.43
1974	0.17	0.32	0.39	0.36	0.31	0.53	0.80	0.36	-0.17	0.04	0.20	0.09	3.40
1975	0.11	-0.01	0.22	0.33	-0.11	0.33	0.22	0.44	0.16	0.44	0.11	0.12	2.36
1976	0.24	0.39	0.38	0.08	0.21	0.50	0.42	0.58	-0.01	-0.11	0.22	0.19	3.09
1977	0.00	0.17	0.35	0.15	-0.06	0.50	0.68	0.32	0.57	0.37	0.27	0.35	3.67
1978	0.06	-0.03	0.31	0.52	0.14	0.49	0.84	0.26	0.16	0.37	0.05	0.20	3.37
1979	0.02	0.10	0.12	0.25	0.15	0.25	0.44	0.35	0.51	0.54	0.19	0.06	2.98
1980	0.07	0.14	0.35	0.46	-0.18	0.67	1.04	0.82	0.08	0.41	0.20	0.08	4.14
1981	0.22	0.13	0.20	0.18	0.11	0.35	0.70	0.41	0.47	-0.15	0.24	0.19	3.05
1982	0.11	0.11	0.24	0.34	-0.32	-0.02	0.57	0.59	0.44	0.41	0.17	0.04	2.68
1983	0.00	0.04	0.09	0.29	0.14	0.28	0.72	0.70	0.64	-0.05	0.16	0.04	3.05
1984	0.20	0.25	0.23	0.48	0.49	0.53	0.72	0.51	0.51	0.06	0.10	-0.16	3.92
1985	0.10	-0.01	-0.02	0.17	0.32	0.18	0.62	0.64	0.36	-0.03	0.16	0.13	2.62
1986	0.32	0.14	0.39	0.27	0.06	0.18	0.72	0.40	0.15	-0.08	0.07	0.03	2.65
1987	0.05	-0.08	0.23	0.42	-0.09	0.27	0.59	0.52	0.27	0.41	0.23	-0.09	2.73
1988	0.08	0.19	0.22	0.25	0.49	0.36	0.44	0.65	0.04	0.38	0.31	0.19	3.60
1989	0.14	-0.01	0.29	0.52	0.03	0.05	0.61	0.40	0.18	0.45	0.38	0.22	3.26
1990	0.08	-0.03	-0.01	-0.02	0.19	0.59	0.39	0.36	0.23	0.36	0.04	0.08	2.26
1991	-0.03	0.29	0.38	0.44	0.23	0.24	0.77	0.44	0.12	0.38	0.26	-0.02	3.50
1992	0.01	0.09	0.26	0.25	0.06	0.01	0.60	0.43	0.42	0.49	0.01	0.08	2.71
1993	0.08	0.07	0.24	0.31	0.29	0.50	0.95	0.75	0.46	0.41	0.29	0.16	4.51
1994	0.21	0.10	0.29	0.34	0.08	0.68	0.57	0.69	0.32	0.08	0.09	0.12	3.57
1995	0.00	0.00	0.21	0.29	-0.06	0.35	0.54	0.27	0.03	0.50	0.33	0.24	2.70
1996	0.22	0.42	0.32	0.56	0.61	0.43	0.56	0.10	0.01	0.38	0.12	0.36	4.09
1997	0.26	-0.08	0.39	-0.09	0.15	0.21	0.65	0.38	0.38	0.23	0.23	-0.11	2.60
1998	0.05	0.05	0.16	0.45	0.47	0.73	0.84	0.66	0.65	0.26	0.12	0.12	4.56
1999	0.23	0.31	-0.01	0.24	0.09	0.25	0.75	0.76	0.54	0.36	0.40	0.32	4.24
2000	0.48	0.16	0.08	0.19	0.41	0.09	0.69	0.90	0.71	0.02	-0.08	0.14	3.79
2001	-0.03	-0.04	0.03	0.39	0.14	0.69	0.92	0.52	0.33	0.44	0.08	0.17	3.64
2002	0.18	0.17	0.21	0.11	0.34	0.36	0.28	0.68	0.44	-0.12	0.23	0.04	2.92
2003	0.21	0.13	0.30	0.39	0.29	0.00	0.80	0.55	0.33	0.45	0.22	0.26	3.93
2004	0.05	0.01	0.18	0.16	0.47	-0.03	0.34	0.34	0.48	0.06	-0.34	0.18	1.90
2005	0.05	0.07	0.28	0.47	0.21	0.47	0.44	0.09	0.45	0.16	0.42	0.28	3.39
2006	0.40	0.26	0.25	0.39	0.31	0.65	0.78	0.60	0.29	0.07	0.29	0.05	4.34
2007	0.07	0.26	-0.02	0.19	-0.11	-0.05	0.39	0.43	0.30	0.51	0.30	0.15	2.42
2008	0.22	0.22	0.26	0.36	0.30	0.58	0.70	0.36	0.24	0.20	0.32	0.27	4.03
2009	0.23	0.33	0.43	0.21	0.20	0.40	0.42	0.72	0.08	0.03	0.34	0.07	3.46
2010	-0.02	0.07	0.27	0.16	0.20	0.46	0.03	0.66	0.16	0.36	0.40	0.31	3.06
2011	0.26	0.28	0.45	0.67	0.52	0.94	1.08	1.08	0.66	0.28	0.28	0.02	6.52
2012	0.13	0.18	0.22	0.42	0.41	0.45	0.78	0.59	0.33	0.40	0.40	0.25	4.56
2013	0.20	0.10	0.48	0.35	0.48	0.55	0.45	0.64	0.48	0.38	0.31	0.08	4.50
2014	0.29	0.15	0.35	0.46	0.33	0.31	0.42	0.59	0.34	0.43	0.10	0.11	3.88
2015	0.04	0.13	0.24	0.05	-0.47	0.24	0.53	0.63	0.62	0.13	0.01	0.06	2.21
2016	0.18	0.24	0.33	0.05	0.01	0.21	0.62	0.37	0.06	0.32	0.13	0.13	2.65
2017	0.10	0.16	0.32	0.30	0.41	0.35	0.54	0.21	0.21	0.40	0.32	0.18	3.50
2018	0.28	0.15	0.11	0.44	0.35	0.74	0.70	0.52	-0.16	-0.37	0.21	0.04	3.01
Total	8.79	9.30	17.77	20.91	13.27	28.20	42.34	37.87	21.84	17.37	14.38	9.64	169.73
Mean	0.12	0.13	0.25	0.29	0.18	0.39	0.59	0.53	0.31	0.25	0.20	0.14	3.41
Max	0.48	0.42	0.48	0.67	0.61	0.94	1.08	1.19	0.85	0.79	0.46	0.36	6.25
Min	-0.22	-0.08	-0.04	-0.24	-0.47	-0.05	0.03	0.09	-0.33	-0.37	-0.34	-0.16	1.68

Table of Final Results - Calculated Monthly Net Reservoir Evaporation Values

Quadrangle: North Fork Buffalo Creek
Units: Feet
Control Point P10060

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	0.14	-0.07	0.17	0.45	0.20	0.38	0.65	0.84	0.86	0.45	0.42	0.27	4.76
1949	-0.21	0.01	0.18	0.19	-0.06	0.40	0.81	0.63	0.31	0.24	0.37	0.13	3.00
1950	0.11	0.15	0.44	0.28	0.03	0.44	0.18	0.34	0.28	0.57	0.45	0.22	3.49
1951	0.19	0.07	0.28	0.34	-0.02	0.33	0.71	0.78	0.59	0.40	0.20	0.29	4.16
1952	0.19	0.23	0.25	0.18	0.22	0.82	0.73	1.29	0.94	0.81	0.23	0.14	6.03
1953	0.23	0.21	0.16	0.32	0.50	0.83	0.61	0.59	0.83	0.01	0.19	0.24	4.72
1954	0.08	0.32	0.34	0.10	-0.27	0.53	0.76	0.68	0.64	0.33	0.25	0.09	3.85
1955	0.00	0.09	0.20	0.45	-0.08	0.23	0.60	0.54	0.00	0.10	0.30	0.17	2.60
1956	0.11	0.10	0.44	0.48	0.23	0.66	0.72	0.79	0.72	0.19	0.21	0.06	4.71
1957	0.06	-0.02	0.05	-0.04	-0.22	0.31	0.62	0.57	0.27	-0.01	-0.13	0.16	1.62
1958	-0.02	0.07	-0.04	0.12	0.28	0.42	0.29	0.50	0.24	0.29	0.19	0.09	2.43
1959	0.10	0.17	0.37	0.29	-0.01	0.15	0.20	0.50	0.32	0.11	0.18	-0.09	2.29
1960	0.02	0.03	0.14	0.31	0.16	0.40	0.23	0.38	0.24	-0.15	0.27	-0.09	1.94
1961	0.05	0.00	0.13	0.39	0.23	0.03	0.27	0.44	0.04	0.23	-0.07	0.03	1.77
1962	0.13	0.23	0.26	0.10	0.38	-0.18	0.25	0.50	-0.29	0.12	0.04	0.04	1.58
1963	0.09	0.11	0.19	0.23	0.13	0.29	0.48	0.44	0.24	0.36	0.05	0.06	2.67
1964	0.12	-0.01	0.33	0.48	0.12	0.58	0.88	0.47	0.08	0.32	-0.10	0.16	3.43
1965	0.08	0.09	0.22	0.26	0.12	0.39	0.87	0.51	0.27	0.14	0.34	0.28	3.57
1966	0.02	0.04	0.41	0.01	0.43	0.59	0.78	0.12	0.04	0.44	0.40	0.16	3.44
1967	0.23	0.25	0.40	0.12	0.21	0.50	0.48	0.70	0.14	0.37	0.19	0.05	3.64
1968	-0.22	0.01	0.07	0.24	-0.04	0.40	0.22	0.56	0.36	0.26	-0.02	0.11	1.95
1969	0.09	0.02	0.02	0.28	-0.02	0.47	0.74	0.40	0.01	0.09	0.23	0.00	2.33
1970	0.13	0.11	-0.01	0.17	0.33	0.64	0.70	0.60	0.20	0.24	0.30	0.25	3.66
1971	0.21	0.19	0.43	0.50	0.36	0.57	0.64	0.08	0.04	0.05	0.17	-0.07	3.17
1972	0.15	0.21	0.44	0.32	0.12	0.48	0.59	0.45	0.25	-0.11	0.06	0.18	3.14
1973	-0.14	0.05	0.02	0.03	0.34	0.26	0.32	0.57	-0.13	0.13	0.14	0.22	1.81
1974	0.15	0.26	0.31	0.27	0.28	0.54	0.71	0.29	-0.18	0.01	0.15	0.08	2.87
1975	0.10	-0.02	0.19	0.29	-0.24	0.23	0.20	0.41	0.16	0.42	0.11	0.11	1.96
1976	0.23	0.36	0.33	0.03	0.15	0.42	0.43	0.54	-0.07	-0.08	0.20	0.16	2.70
1977	-0.01	0.15	0.32	0.18	-0.10	0.47	0.63	0.25	0.52	0.33	0.22	0.32	3.28
1978	0.07	-0.04	0.26	0.46	-0.01	0.43	0.81	0.27	0.24	0.37	0.02	0.19	3.07
1979	0.00	0.09	0.10	0.16	0.08	0.21	0.39	0.36	0.48	0.50	0.16	0.03	2.56
1980	0.05	0.12	0.30	0.41	-0.21	0.66	0.98	0.80	0.14	0.37	0.15	0.06	3.83
1981	0.23	0.12	0.15	0.15	0.05	0.26	0.61	0.40	0.42	-0.24	0.19	0.18	2.52
1982	0.10	0.10	0.18	0.30	-0.43	-0.02	0.49	0.59	0.39	0.37	0.11	0.03	2.21
1983	0.00	0.02	0.07	0.26	0.05	0.21	0.66	0.65	0.63	-0.12	0.16	0.06	2.65
1984	0.21	0.24	0.16	0.46	0.43	0.51	0.74	0.54	0.52	-0.01	0.06	-0.22	3.64
1985	0.08	-0.08	-0.09	0.14	0.32	0.11	0.62	0.61	0.30	-0.05	0.14	0.15	2.25
1986	0.32	0.12	0.33	0.22	-0.06	0.16	0.72	0.41	0.10	-0.14	0.02	0.02	2.22
1987	0.03	-0.12	0.21	0.42	-0.16	0.23	0.56	0.48	0.23	0.38	0.20	-0.14	2.32
1988	0.06	0.20	0.13	0.21	0.48	0.34	0.46	0.64	-0.02	0.33	0.26	0.18	3.27
1989	0.12	-0.03	0.20	0.48	-0.05	-0.10	0.55	0.37	0.13	0.40	0.34	0.22	2.63
1990	0.07	-0.09	-0.08	-0.06	0.15	0.59	0.34	0.37	0.21	0.34	0.02	0.06	1.92
1991	-0.03	0.27	0.33	0.36	0.13	0.25	0.70	0.43	0.04	0.31	0.23	-0.03	2.99
1992	0.01	0.12	0.22	0.20	-0.01	0.01	0.53	0.39	0.38	0.45	-0.08	0.05	2.27
1993	0.06	0.05	0.20	0.23	0.18	0.40	0.93	0.72	0.38	0.32	0.29	0.11	3.87
1994	0.15	0.01	0.22	0.24	0.06	0.61	0.49	0.65	0.30	-0.02	0.05	0.12	2.88
1995	0.00	0.00	0.10	0.21	-0.09	0.29	0.48	0.33	-0.01	0.48	0.31	0.21	2.31
1996	0.22	0.38	0.28	0.48	0.57	0.34	0.50	0.03	-0.06	0.29	-0.12	0.29	3.20
1997	0.28	-0.09	0.37	-0.09	0.10	0.22	0.60	0.33	0.37	0.18	0.22	-0.14	2.35
1998	-0.02	0.00	0.07	0.36	0.45	0.65	0.81	0.66	0.62	0.20	0.03	0.06	3.89
1999	0.21	0.30	-0.10	0.22	0.06	0.21	0.71	0.77	0.53	0.31	0.37	0.28	3.87
2000	0.48	0.11	0.11	0.15	0.34	0.03	0.60	0.81	0.66	-0.15	-0.14	0.11	3.11
2001	-0.03	-0.07	0.07	0.37	0.07	0.68	0.90	0.52	0.31	0.41	0.16	0.18	3.57
2002	0.14	0.18	0.17	0.06	0.28	0.28	0.30	0.64	0.40	-0.13	0.23	0.02	2.57
2003	0.19	0.11	0.29	0.37	0.23	-0.03	0.77	0.49	0.29	0.43	0.17	0.26	3.57
2004	0.06	-0.01	0.16	0.13	0.40	-0.02	0.28	0.30	0.48	0.03	-0.35	0.15	1.61
2005	0.03	0.07	0.29	0.44	0.18	0.47	0.43	0.10	0.43	0.15	0.40	0.25	3.24
2006	0.36	0.23	0.24	0.38	0.28	0.61	0.77	0.60	0.27	0.09	0.25	0.03	4.11
2007	0.03	0.24	-0.05	0.19	-0.21	-0.20	0.37	0.39	0.27	0.45	0.28	0.09	1.85
2008	0.24	0.18	0.21	0.31	0.28	0.52	0.67	0.24	0.28	0.20	0.31	0.24	3.68
2009	0.21	0.32	0.40	0.11	0.14	0.40	0.42	0.69	0.07	-0.03	0.29	0.04	3.06
2010	-0.02	0.07	0.26	0.18	0.17	0.40	0.15	0.67	0.16	0.32	0.35	0.26	2.97
2011	0.19	0.21	0.43	0.60	0.44	0.81	1.01	1.00	0.59	0.25	0.22	0.03	5.78
2012	0.08	0.16	0.14	0.33	0.39	0.46	0.78	0.57	0.32	0.38	0.38	0.23	4.22
2013	0.19	0.08	0.42	0.21	0.38	0.50	0.36	0.58	0.42	0.32	0.24	0.06	3.76
2014	0.23	0.15	0.30	0.41	0.33	0.23	0.35	0.59	0.42	0.42	0.05	0.10	3.58
2015	0.07	0.13	0.24	0.02	-0.70	0.22	0.47	0.56	0.58	0.12	-0.03	0.05	1.73
2016	0.18	0.22	0.31	-0.09	-0.03	0.11	0.57	0.37	0.03	0.28	0.13	0.13	2.21
2017	0.09	0.10	0.29	0.25	0.35	0.30	0.48	0.09	0.11	0.33	0.28	0.15	2.82
2018	0.24	0.06	0.04	0.33	0.27	0.67	0.62	0.45	-0.21	-0.34	0.20	-0.02	2.31
Total	7.59	7.64	14.97	17.94	9.44	25.59	40.28	36.22	20.12	15.21	12.09	7.95	151.42
Mean	0.11	0.11	0.21	0.25	0.13	0.36	0.57	0.51	0.29	0.22	0.17	0.11	3.04
Max	0.48	0.38	0.44	0.60	0.57	0.83	1.01	1.29	0.94	0.81	0.45	0.32	6.03
Min	-0.22	-0.12	-0.10	-0.09	-0.70	-0.20	0.15	0.03	-0.29	-0.34	-0.35	-0.22	1.58

Table of Final Results - Calculated Monthly Net Reservoir Evaporation Values

Quadrangle: Lake Diversion
Units: Feet
Control Point P10110

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	0.13	-0.05	0.21	0.52	0.03	0.36	0.77	0.92	0.89	0.44	0.44	0.32	4.98
1949	-0.27	-0.03	0.26	0.27	0.05	0.68	0.90	0.68	0.22	0.21	0.36	0.10	3.43
1950	0.14	0.13	0.45	0.24	-0.08	0.32	0.07	0.32	-0.01	0.55	0.45	0.22	2.80
1951	0.20	0.01	0.26	0.38	-0.07	0.32	0.82	0.86	0.55	0.52	0.21	0.29	4.35
1952	0.22	0.25	0.26	0.24	0.23	0.89	0.83	1.31	0.96	0.80	0.22	0.13	6.34
1953	0.23	0.21	0.21	0.33	0.52	0.76	0.78	0.59	0.82	0.06	0.24	0.23	4.98
1954	0.08	0.32	0.36	0.17	-0.37	0.41	0.74	0.74	0.66	0.41	0.27	0.07	3.86
1955	-0.04	0.13	0.22	0.49	0.01	0.19	0.61	0.58	-0.07	0.09	0.30	0.17	2.68
1956	0.10	0.12	0.45	0.52	0.09	0.70	0.73	0.86	0.70	0.14	0.21	0.06	4.68
1957	0.05	-0.02	0.05	-0.27	-0.38	0.29	0.65	0.64	0.40	-0.05	-0.30	0.16	1.22
1958	0.00	0.05	0.02	0.16	0.06	0.49	0.30	0.45	0.25	0.23	0.20	0.10	2.31
1959	0.11	0.17	0.38	0.33	0.11	0.14	0.27	0.50	0.39	-0.17	0.06	-0.08	2.21
1960	0.00	0.13	0.13	0.31	0.10	0.40	0.34	0.49	0.15	-0.14	0.28	-0.16	2.03
1961	0.08	-0.03	0.08	0.41	0.27	-0.02	0.26	0.56	0.04	0.26	-0.03	0.02	1.90
1962	0.13	0.24	0.28	-0.01	0.44	0.05	0.28	0.53	-0.37	0.18	0.01	0.02	1.78
1963	0.08	0.10	0.29	0.27	0.19	0.38	0.35	0.45	0.17	0.44	0.01	0.06	2.79
1964	0.17	-0.03	0.33	0.21	0.30	0.58	0.91	0.49	-0.03	0.30	-0.02	0.17	3.38
1965	0.08	0.11	0.23	0.34	0.11	0.49	0.93	0.62	0.49	0.10	0.35	0.30	4.15
1966	0.03	0.01	0.44	-0.04	0.47	0.63	0.57	0.07	-0.07	0.41	0.39	0.19	3.10
1967	0.22	0.26	0.43	-0.16	0.24	0.46	0.44	0.75	0.26	0.39	0.21	0.09	3.59
1968	-0.29	-0.04	0.08	0.27	0.23	0.45	0.29	0.59	0.44	0.28	0.01	0.12	2.43
1969	0.09	-0.04	0.08	0.36	0.08	0.49	0.79	0.16	0.00	0.00	0.24	0.01	2.26
1970	0.13	0.11	-0.06	0.17	0.41	0.69	0.72	0.64	0.19	0.24	0.31	0.26	3.81
1971	0.24	0.19	0.46	0.55	0.37	0.69	0.76	0.22	-0.21	-0.04	0.20	-0.09	3.34
1972	0.16	0.22	0.48	0.42	0.28	0.42	0.60	0.52	0.18	-0.11	0.01	0.17	3.35
1973	-0.08	0.04	0.21	0.01	0.35	0.26	0.43	0.59	0.00	0.13	0.17	0.21	2.32
1974	0.17	0.27	0.33	0.15	0.36	0.63	0.75	0.31	-0.10	0.02	0.16	0.08	3.13
1975	0.10	0.01	0.22	0.29	-0.39	0.30	0.22	0.44	0.11	0.46	0.11	0.02	1.89
1976	0.23	0.38	0.27	0.01	0.02	0.55	0.52	0.61	-0.65	-0.11	0.23	0.16	2.22
1977	0.05	0.13	0.34	0.11	0.02	0.57	0.70	0.25	0.60	0.34	0.24	0.32	3.67
1978	0.09	0.01	0.30	0.51	0.16	0.49	0.74	0.04	0.39	0.36	-0.01	0.23	3.31
1979	0.03	0.10	0.21	0.18	0.20	0.22	0.63	0.44	0.51	0.51	0.03	0.03	3.09
1980	0.06	0.14	0.32	0.46	0.08	0.59	1.01	0.85	-0.24	0.39	0.17	0.10	3.93
1981	0.23	-0.04	0.22	0.16	0.24	0.33	0.71	0.47	0.54	-0.25	0.24	0.18	3.03
1982	0.12	0.11	0.22	0.36	-0.67	0.03	0.62	0.59	0.39	0.42	0.17	0.05	2.41
1983	0.07	0.02	0.09	0.26	0.21	0.17	0.66	0.72	0.67	-0.07	0.19	0.05	3.04
1984	0.23	0.23	0.21	0.52	0.47	0.53	0.78	0.49	0.57	0.14	0.09	-0.16	4.10
1985	0.14	-0.16	0.07	0.20	0.37	0.10	0.66	0.66	0.49	0.06	0.18	0.17	2.94
1986	0.32	0.09	0.35	0.29	0.04	0.22	0.88	0.31	0.16	0.07	-0.01	0.07	2.79
1987	-0.01	-0.07	0.28	0.42	0.01	0.42	0.69	0.35	0.22	0.46	0.21	-0.23	2.75
1988	0.14	0.23	0.23	0.31	0.55	0.40	0.58	0.67	0.08	0.37	0.32	0.26	4.14
1989	0.02	-0.15	0.27	0.51	0.15	0.15	0.64	0.47	-0.04	0.38	0.35	0.22	2.97
1990	0.16	-0.15	-0.05	-0.06	0.23	0.76	0.44	0.50	0.35	0.30	0.03	0.08	2.59
1991	-0.04	0.28	0.39	0.46	0.36	0.40	0.61	0.40	-0.17	0.36	0.26	-0.01	3.30
1992	0.01	0.08	0.15	0.27	-0.01	0.04	0.57	0.42	0.27	0.48	0.01	0.04	2.33
1993	0.10	-0.02	0.18	0.20	0.32	0.56	0.95	0.75	0.37	0.24	0.22	0.08	3.95
1994	0.19	0.04	0.23	0.34	0.18	0.63	0.62	0.73	0.41	-0.03	0.18	0.12	3.64
1995	0.14	0.22	0.15	0.24	-0.30	0.43	0.63	0.26	0.15	0.49	0.24	0.21	2.86
1996	0.17	0.39	0.25	0.56	0.61	0.47	0.52	0.04	-0.02	0.35	-0.05	0.39	3.68
1997	0.26	-0.08	0.36	-0.03	0.13	0.13	0.72	0.42	0.54	0.19	0.24	-0.11	2.77
1998	-0.03	-0.02	0.13	0.37	0.55	0.51	0.65	0.69	0.56	0.25	0.18	0.10	3.94
1999	0.17	0.32	-0.12	0.27	0.21	0.28	0.73	0.81	0.62	0.25	0.36	0.40	4.30
2000	0.46	0.11	0.07	0.21	0.46	0.19	0.65	0.84	0.70	-0.02	-0.31	0.19	3.55
2001	-0.03	-0.07	0.05	0.37	0.10	0.72	0.92	0.64	0.40	0.46	0.20	0.17	3.93
2002	0.17	0.18	0.15	-0.02	0.30	0.13	0.27	0.65	0.37	-0.08	0.22	0.13	2.47
2003	0.18	0.11	0.31	0.43	0.10	-0.10	0.79	0.50	0.38	0.46	0.18	0.27	3.61
2004	0.09	-0.04	0.19	0.22	0.35	0.08	0.37	0.38	0.40	0.12	-0.29	0.16	2.03
2005	0.09	0.02	0.29	0.46	0.34	0.23	0.38	-0.05	0.46	0.09	0.36	0.26	2.93
2006	0.37	0.20	0.24	0.44	0.36	0.67	0.83	0.77	0.20	-0.07	0.16	0.08	4.25
2007	-0.03	0.25	-0.04	0.15	-0.02	-0.71	0.41	0.42	0.27	0.52	0.31	0.12	1.65
2008	0.24	0.19	0.27	0.31	0.21	0.53	0.69	0.34	0.28	0.27	0.32	0.24	3.89
2009	0.24	0.26	0.45	0.17	0.14	0.31	0.46	0.68	-0.09	-0.02	0.30	0.02	2.92
2010	-0.04	0.05	0.26	0.18	0.19	0.48	0.16	0.67	0.30	0.26	0.38	0.28	3.17
2011	0.21	0.22	0.43	0.63	0.47	0.87	1.03	1.07	0.60	0.10	0.13	0.00	5.76
2012	0.11	0.18	0.04	0.36	0.41	0.45	0.85	0.47	0.46	0.40	0.39	0.24	4.36
2013	0.25	0.09	0.44	0.33	0.41	0.62	0.38	0.59	0.43	0.33	0.25	0.06	4.18
2014	0.24	0.14	0.31	0.42	0.34	0.25	0.37	0.58	0.41	0.42	0.06	0.10	3.64
2015	0.06	0.12	0.24	0.03	-0.66	0.21	0.47	0.58	0.58	0.11	-0.04	0.05	1.75
2016	0.18	0.22	0.31	-0.06	-0.03	0.13	0.59	0.36	0.02	0.28	0.12	0.13	2.25
2017	0.09	0.11	0.31	0.27	0.36	0.29	0.51	0.13	0.13	0.36	0.29	0.15	3.00
2018	0.25	0.07	0.04	0.36	0.29	0.69	0.64	0.46	-0.22	-0.37	0.20	-0.02	2.39
Total	8.24	7.33	16.55	19.11	12.26	27.47	43.14	37.90	19.86	15.72	12.37	8.62	162.54
Mean	0.11	0.10	0.24	0.27	0.17	0.38	0.61	0.53	0.29	0.23	0.17	0.12	3.23
Max	0.46	0.39	0.48	0.63	0.61	0.89	1.03	1.31	0.96	0.80	0.45	0.40	6.34
Min	-0.29	-0.16	-0.12	-0.27	-0.67	-0.71	0.07	-0.05	-0.65	-0.37	-0.31	-0.23	1.22

Table of Final Results - Calculated Monthly Net Reservoir Evaporation Values

Quadrangle: Lake Wichita
Units: Feet
Control Point Q10080

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	0.14	-0.08	0.16	0.42	0.13	0.37	0.73	0.89	0.90	0.48	0.42	0.25	4.81
1949	-0.18	-0.03	0.16	0.22	-0.12	0.43	0.84	0.67	0.31	0.22	0.35	0.12	2.99
1950	0.09	0.14	0.45	0.24	-0.01	0.48	0.12	0.30	0.31	0.58	0.45	0.22	3.37
1951	0.18	0.06	0.27	0.30	-0.05	0.23	0.73	0.84	0.63	0.39	0.18	0.26	4.02
1952	0.17	0.21	0.22	0.18	0.17	0.74	0.76	1.35	1.01	0.82	0.18	0.14	5.95
1953	0.17	0.18	0.13	0.30	0.44	0.87	0.65	0.62	0.80	0.05	0.20	0.25	4.66
1954	0.06	0.28	0.32	-0.01	-0.23	0.45	0.68	0.69	0.59	0.29	0.21	0.06	3.39
1955	-0.01	0.06	0.15	0.39	-0.06	0.20	0.58	0.53	-0.08	0.21	0.28	0.15	2.40
1956	0.07	0.08	0.41	0.42	0.21	0.63	0.69	0.76	0.72	0.13	0.18	0.03	4.33
1957	0.03	-0.08	0.02	-0.18	-0.28	0.27	0.54	0.57	0.22	-0.03	-0.20	0.12	1.00
1958	-0.03	0.08	-0.04	0.06	0.26	0.37	0.32	0.46	0.21	0.26	0.17	0.07	2.19
1959	0.08	0.14	0.34	0.28	0.01	0.06	0.20	0.44	0.30	0.03	0.17	-0.08	1.97
1960	0.00	0.03	0.11	0.30	0.14	0.43	0.23	0.41	0.18	-0.07	0.27	-0.10	1.93
1961	0.01	0.00	0.12	0.36	0.24	0.04	0.30	0.40	-0.04	0.20	-0.08	0.03	1.58
1962	0.12	0.19	0.19	0.04	0.33	-0.24	0.15	0.43	-0.33	0.10	-0.02	0.01	0.97
1963	0.09	0.08	0.15	0.13	0.11	0.28	0.38	0.38	0.18	0.24	0.00	0.05	2.07
1964	0.05	0.01	0.29	0.38	0.00	0.59	0.84	0.40	0.07	0.32	-0.15	0.15	2.95
1965	0.04	0.07	0.21	0.24	0.03	0.37	0.86	0.45	0.30	0.18	0.31	0.26	3.32
1966	0.02	0.03	0.38	-0.14	0.39	0.58	0.73	0.09	-0.03	0.42	0.38	0.13	2.98
1967	0.22	0.24	0.39	0.12	0.13	0.49	0.52	0.70	0.03	0.35	0.18	0.04	3.41
1968	-0.25	0.01	0.01	0.21	-0.05	0.39	0.22	0.58	0.30	0.24	-0.07	0.11	1.70
1969	0.09	-0.02	-0.04	0.21	0.00	0.42	0.70	0.34	-0.02	0.09	0.20	-0.06	1.91
1970	0.14	0.05	0.00	0.10	0.32	0.59	0.73	0.59	0.16	0.20	0.32	0.23	3.43
1971	0.18	0.17	0.43	0.50	0.38	0.55	0.58	-0.01	0.03	0.06	0.17	-0.12	2.92
1972	0.14	0.19	0.42	0.26	0.08	0.46	0.60	0.42	0.25	-0.13	0.07	0.15	2.91
1973	-0.15	0.05	0.06	0.01	0.32	0.22	0.25	0.53	-0.12	0.08	0.09	0.21	1.55
1974	0.13	0.20	0.29	0.22	0.32	0.56	0.63	0.24	-0.21	-0.03	0.12	0.06	2.53
1975	0.08	-0.03	0.17	0.25	-0.38	0.24	0.24	0.38	0.16	0.43	0.14	0.10	1.78
1976	0.23	0.36	0.32	0.04	0.11	0.40	0.37	0.51	-0.12	-0.10	0.18	0.11	2.41
1977	-0.05	0.15	0.25	0.20	-0.01	0.44	0.61	0.27	0.48	0.33	0.20	0.28	3.15
1978	0.06	-0.05	0.20	0.41	0.01	0.40	0.80	0.28	0.33	0.33	-0.03	0.19	2.93
1979	-0.03	0.08	0.09	0.12	0.07	0.21	0.36	0.37	0.47	0.45	0.15	0.00	2.34
1980	0.05	0.10	0.28	0.39	-0.19	0.65	0.92	0.78	0.03	0.32	0.11	0.03	3.47
1981	0.20	0.06	0.12	0.13	0.04	0.20	0.56	0.42	0.35	-0.48	0.16	0.16	1.92
1982	0.10	0.09	0.16	0.26	-0.53	-0.02	0.44	0.58	0.35	0.31	0.04	0.00	1.78
1983	0.01	0.02	0.07	0.24	0.00	0.15	0.62	0.61	0.62	0.02	0.15	0.06	2.57
1984	0.19	0.21	0.15	0.48	0.37	0.54	0.74	0.53	0.48	-0.17	0.04	-0.25	3.31
1985	0.06	-0.10	-0.14	0.13	0.29	0.09	0.60	0.62	0.30	-0.06	0.11	0.15	2.05
1986	0.30	0.10	0.30	0.17	-0.12	0.12	0.70	0.46	0.16	-0.09	-0.01	-0.01	2.08
1987	0.03	-0.17	0.22	0.41	-0.12	0.23	0.51	0.44	0.20	0.40	0.16	-0.21	2.10
1988	0.07	0.19	0.13	0.20	0.47	0.31	0.46	0.60	0.01	0.30	0.23	0.16	3.13
1989	0.08	-0.07	0.15	0.44	-0.22	-0.15	0.51	0.32	0.10	0.38	0.31	0.22	2.07
1990	0.05	-0.15	-0.13	-0.15	0.11	0.60	0.35	0.40	0.16	0.33	0.01	0.06	1.64
1991	-0.06	0.25	0.31	0.35	0.17	0.31	0.69	0.40	0.10	0.22	0.24	-0.06	2.92
1992	0.00	0.12	0.19	0.24	-0.08	0.03	0.48	0.41	0.36	0.43	-0.09	0.03	2.12
1993	0.06	0.03	0.18	0.22	0.18	0.34	0.95	0.71	0.32	0.22	0.30	0.04	3.55
1994	0.08	-0.07	0.23	0.17	0.00	0.60	0.44	0.63	0.26	-0.19	0.03	0.09	2.27
1995	0.00	0.00	0.04	0.19	-0.07	0.38	0.45	0.44	0.09	0.48	0.30	0.18	2.48
1996	0.21	0.33	0.24	0.42	0.57	0.30	0.50	0.04	-0.08	0.21	-0.34	0.21	2.61
1997	0.25	-0.13	0.36	-0.04	0.07	0.25	0.57	0.34	0.44	0.18	0.21	-0.22	2.28
1998	-0.05	0.01	0.12	0.34	0.46	0.63	0.79	0.66	0.61	0.19	0.04	0.03	3.83
1999	0.18	0.28	-0.17	0.24	0.10	0.23	0.70	0.80	0.60	0.29	0.35	0.28	3.88
2000	0.41	0.10	0.16	0.11	0.28	0.05	0.53	0.70	0.63	-0.19	-0.23	0.09	2.64
2001	-0.05	-0.13	0.06	0.35	0.13	0.68	0.88	0.56	0.32	0.35	0.21	0.15	3.51
2002	0.14	0.17	0.12	0.03	0.26	0.22	0.31	0.65	0.38	-0.14	0.22	0.01	2.37
2003	0.19	0.09	0.29	0.39	0.18	-0.05	0.76	0.47	0.23	0.42	0.14	0.26	3.37
2004	0.08	-0.06	0.18	0.11	0.34	-0.06	0.22	0.29	0.47	0.03	-0.35	0.13	1.38
2005	0.01	0.06	0.30	0.44	0.20	0.48	0.44	0.07	0.47	0.11	0.38	0.24	3.20
2006	0.32	0.17	0.23	0.35	0.25	0.60	0.80	0.64	0.27	0.13	0.21	0.03	4.00
2007	0.00	0.21	-0.09	0.17	-0.27	-0.26	0.34	0.45	0.20	0.43	0.26	0.06	1.50
2008	0.25	0.17	0.12	0.28	0.28	0.47	0.67	0.18	0.27	0.21	0.30	0.23	3.43
2009	0.21	0.31	0.38	0.06	0.14	0.42	0.37	0.68	0.07	-0.09	0.26	0.01	2.82
2010	-0.02	0.03	0.23	0.13	0.11	0.35	0.28	0.69	0.11	0.32	0.34	0.19	2.76
2011	0.14	0.13	0.43	0.59	0.43	0.68	1.02	1.01	0.58	0.22	0.18	0.04	5.45
2012	0.00	0.14	0.08	0.33	0.40	0.48	0.79	0.55	0.33	0.35	0.37	0.21	4.03
2013	0.19	0.08	0.36	0.18	0.36	0.51	0.40	0.56	0.40	0.29	0.17	0.02	3.52
2014	0.19	0.13	0.27	0.39	0.40	0.25	0.35	0.59	0.44	0.40	-0.01	0.08	3.48
2015	0.07	0.09	0.21	0.04	-0.90	0.16	0.45	0.58	0.55	0.06	-0.12	0.02	1.21
2016	0.17	0.20	0.28	-0.17	-0.06	0.12	0.58	0.33	0.04	0.26	0.10	0.13	1.98
2017	0.07	0.04	0.34	0.26	0.33	0.23	0.47	0.08	0.05	0.35	0.25	0.10	2.57
2018	0.22	-0.04	0.04	0.32	0.28	0.67	0.60	0.45	-0.24	-0.33	0.19	-0.08	2.08
Total	6.29	5.84	13.43	15.77	7.65	24.31	39.18	35.60	19.02	13.59	10.24	6.29	138.03
Mean	0.09	0.08	0.19	0.22	0.11	0.34	0.55	0.50	0.28	0.20	0.14	0.09	2.79
Max	0.41	0.36	0.45	0.59	0.57	0.87	1.02	1.35	1.01	0.82	0.45	0.28	5.95
Min	-0.25	-0.17	-0.17	-0.18	-0.90	-0.26	0.12	-0.01	-0.33	-0.48	-0.35	-0.25	0.97

Table of Final Results - Calculated Monthly Net Reservoir Evaporation Values

Quadrangle: Kickapoo
Units: Feet
Control Point R10010

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	0.20	0.08	0.24	0.65	0.37	0.23	0.68	0.81	0.71	0.51	0.39	0.34	5.21
1949	-0.11	-0.01	0.25	0.41	0.04	0.22	0.74	0.64	0.06	0.31	0.36	0.14	3.05
1950	0.16	0.22	0.46	0.38	0.06	0.46	-0.25	-0.32	0.32	0.47	0.41	0.23	2.60
1951	0.23	0.19	0.36	0.53	0.28	0.39	0.80	0.84	0.43	0.36	0.28	0.27	4.96
1952	0.19	0.29	0.42	0.40	0.35	0.87	0.64	0.86	0.69	0.59	0.23	0.16	5.69
1953	0.22	0.21	0.06	0.42	0.52	1.05	0.45	0.51	0.64	-0.15	0.13	0.21	4.27
1954	0.10	0.33	0.45	-0.01	-0.24	0.41	0.80	0.83	0.62	0.46	0.32	0.12	4.19
1955	-0.01	0.06	0.19	0.40	0.09	0.15	0.64	0.67	-0.09	0.16	0.27	0.19	2.72
1956	0.15	0.11	0.40	0.50	0.31	0.78	0.84	0.92	0.73	0.30	0.30	0.16	5.50
1957	0.14	-0.03	0.08	-0.03	-0.09	0.26	0.55	0.64	0.47	-0.09	-0.33	0.16	1.73
1958	0.13	0.07	0.01	0.10	0.16	0.46	0.18	0.48	0.14	0.32	0.27	0.13	2.45
1959	0.12	0.17	0.36	0.37	0.03	-0.12	0.48	0.62	0.42	-0.02	0.29	-0.03	2.69
1960	-0.02	0.07	0.22	0.36	0.06	0.47	0.33	0.60	0.23	-0.13	0.30	-0.08	2.41
1961	0.13	0.03	0.04	0.35	0.30	0.16	0.21	0.54	-0.03	0.38	0.05	0.05	2.21
1962	0.15	0.21	0.25	0.13	0.15	-0.17	0.30	0.41	-0.70	-0.14	-0.14	0.09	0.54
1963	0.11	0.12	0.12	0.31	0.14	0.35	0.57	0.44	0.22	0.35	0.05	0.15	2.93
1964	0.09	0.02	0.31	0.53	0.08	0.54	0.90	0.48	0.04	0.35	-0.05	0.16	3.45
1965	0.06	0.10	0.27	0.23	0.02	0.46	0.89	0.49	0.31	0.12	0.33	0.25	3.53
1966	0.13	0.05	0.37	-0.05	0.42	0.70	0.73	0.07	-0.12	0.42	0.37	0.21	3.30
1967	0.26	0.26	0.41	0.13	0.49	0.54	0.45	0.71	0.06	0.38	0.17	0.05	3.91
1968	-0.28	0.02	0.05	0.25	0.07	0.40	0.22	0.56	0.54	0.31	-0.02	0.16	2.28
1969	0.12	-0.01	0.03	0.25	0.07	0.44	0.78	0.64	-0.08	0.37	0.20	-0.04	2.77
1970	0.15	0.04	0.02	0.13	0.39	0.62	0.73	0.68	0.54	0.23	0.33	0.27	4.13
1971	0.25	0.28	0.49	0.52	0.60	0.62	0.65	0.00	0.06	0.04	0.24	-0.07	3.68
1972	0.14	0.20	0.44	0.32	0.24	0.44	0.60	0.68	0.21	-0.13	0.10	0.18	3.42
1973	-0.10	0.04	0.11	0.12	0.36	0.33	0.64	0.63	0.40	0.11	0.20	0.24	3.08
1974	0.17	0.24	0.34	0.29	0.36	0.55	0.84	0.33	-0.22	0.00	0.19	0.16	3.25
1975	0.11	0.01	0.33	0.28	-0.24	0.38	0.18	0.39	0.15	0.46	0.15	0.23	2.43
1976	0.23	0.39	0.36	0.42	0.16	0.46	0.60	0.56	-0.10	-0.17	0.19	0.18	3.28
1977	0.10	0.18	0.33	0.15	0.04	0.46	0.62	0.58	0.52	0.44	0.24	0.32	3.98
1978	0.11	0.13	0.22	0.46	0.22	0.50	0.84	0.13	0.44	0.45	0.21	0.19	3.90
1979	-0.01	0.09	0.12	0.21	0.12	0.25	0.42	0.33	0.48	0.59	0.27	0.01	2.88
1980	0.08	0.11	0.33	0.45	-0.20	0.67	0.99	0.79	-0.04	0.34	0.13	0.06	3.71
1981	0.19	0.05	0.17	0.15	0.42	0.23	0.65	0.60	0.39	0.01	0.26	0.20	3.32
1982	0.12	0.19	0.21	0.41	-0.37	0.01	0.54	0.56	0.54	0.42	0.32	0.19	3.14
1983	0.02	0.04	0.08	0.27	0.06	0.17	0.68	0.65	0.62	0.02	0.30	0.11	3.02
1984	0.19	0.34	0.21	0.50	0.52	0.54	0.76	0.50	0.61	0.35	0.06	-0.13	4.45
1985	0.14	-0.04	0.06	0.16	0.28	0.26	0.59	0.66	0.59	-0.01	0.24	0.15	3.08
1986	0.29	0.11	0.35	0.21	0.00	0.12	0.67	0.65	0.11	-0.22	0.02	0.00	2.31
1987	0.06	-0.10	0.29	0.41	-0.10	0.23	0.58	0.46	0.49	0.46	0.27	-0.15	2.90
1988	0.09	0.18	0.23	0.25	0.57	0.26	0.43	0.70	0.03	0.41	0.35	0.16	3.66
1989	0.20	-0.08	0.22	0.51	-0.01	0.20	0.69	0.34	0.11	0.42	0.33	0.24	3.17
1990	0.24	0.21	0.03	0.10	0.31	0.60	0.69	0.56	0.47	0.45	0.01	0.14	3.81
1991	-0.07	0.25	0.36	0.42	0.25	0.27	0.95	0.41	0.18	0.27	0.27	0.05	3.61
1992	0.01	0.04	0.20	0.28	0.14	0.20	0.54	0.47	0.36	0.45	-0.01	0.05	2.73
1993	0.07	0.00	0.19	0.26	0.37	0.47	1.02	0.74	0.38	0.29	0.27	0.06	4.12
1994	0.17	-0.01	0.30	0.45	0.08	0.67	0.50	0.66	0.49	-0.16	0.10	0.19	3.44
1995	0.22	0.24	0.14	0.29	-0.06	0.24	0.75	0.25	0.44	0.57	0.36	0.28	3.72
1996	0.19	0.35	0.23	0.47	0.69	0.38	0.80	0.10	-0.07	0.46	-0.14	0.25	3.71
1997	0.23	0.04	0.35	0.00	0.17	0.22	0.74	0.61	0.58	0.43	0.20	-0.21	3.36
1998	0.19	0.03	0.28	0.40	0.47	0.61	0.75	0.66	0.63	0.22	0.13	0.19	4.56
1999	0.17	0.29	-0.11	0.28	0.11	0.25	0.80	0.81	0.63	0.32	0.36	0.33	4.24
2000	0.39	0.13	0.15	0.13	0.50	0.13	0.61	0.80	0.70	0.01	-0.21	0.13	3.47
2001	-0.04	0.01	0.07	0.37	0.21	0.71	0.92	0.60	0.49	0.50	0.33	0.14	4.31
2002	0.16	0.25	0.12	0.08	0.28	0.27	0.17	0.73	0.53	0.33	0.21	0.00	3.13
2003	0.19	0.17	0.29	0.42	0.21	-0.04	0.78	0.73	0.46	0.46	0.30	0.26	4.23
2004	0.08	-0.10	0.21	0.15	0.37	-0.09	0.26	0.56	0.48	0.04	-0.33	0.15	1.78
2005	0.09	0.05	0.27	0.49	0.42	0.48	0.42	-0.04	0.45	0.10	0.40	0.26	3.39
2006	0.34	0.17	0.23	0.36	0.29	0.64	0.81	0.69	0.32	0.09	0.33	0.06	4.33
2007	0.02	0.23	0.00	0.19	-0.20	-0.21	0.32	0.71	0.19	0.54	0.30	0.22	2.31
2008	0.24	0.19	0.13	0.31	0.26	0.51	0.73	0.64	0.49	0.23	0.32	0.26	4.31
2009	0.23	0.31	0.40	0.19	0.25	0.40	0.37	0.74	0.04	-0.07	0.29	0.03	3.18
2010	-0.04	0.03	0.23	0.07	0.24	0.66	0.17	0.79	0.07	0.36	0.40	0.20	3.18
2011	0.20	0.19	0.43	0.63	0.51	0.85	1.08	1.07	0.69	0.21	0.23	0.01	6.10
2012	0.02	0.14	0.17	0.48	0.42	0.50	0.79	0.55	0.33	0.34	0.39	0.28	4.41
2013	0.20	0.10	0.40	0.31	0.62	0.54	0.46	0.62	0.43	0.32	0.30	0.05	4.35
2014	0.24	0.12	0.30	0.40	0.41	0.31	0.39	0.55	0.42	0.42	0.01	0.17	3.74
2015	0.03	0.20	0.21	0.39	-0.20	0.30	0.48	0.64	0.58	0.51	0.00	0.05	3.19
2016	0.17	0.21	0.29	0.16	0.04	0.46	0.65	0.29	0.03	0.45	0.07	0.20	3.02
2017	0.08	0.14	0.36	0.44	0.34	0.21	0.76	0.18	0.10	0.42	0.26	0.19	3.48
2018	0.24	0.02	0.06	0.42	0.33	0.86	0.67	0.48	-0.29	-0.41	0.18	-0.05	2.51
Total	9.06	8.96	16.55	21.77	14.93	27.75	43.01	39.26	22.14	18.00	13.91	9.56	172.24
Mean	0.13	0.13	0.24	0.31	0.21	0.38	0.60	0.55	0.32	0.26	0.20	0.14	3.46
Max	0.39	0.39	0.49	0.65	0.69	1.05	1.08	1.07	0.73	0.59	0.41	0.34	5.69
Min	-0.28	-0.10	-0.11	-0.05	-0.37	-0.21	-0.25	-0.32	-0.70	-0.41	-0.33	-0.21	0.54

Table of Final Results - Calculated Monthly Net Reservoir Evaporation Values

Quadrangle: Arrowhead
Units: Feet
Control Point S10030

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	0.15	-0.06	0.20	0.43	0.13	0.37	0.76	0.90	0.90	0.47	0.43	0.24	4.92
1949	-0.15	-0.04	0.16	0.23	-0.13	0.46	0.83	0.66	0.30	0.19	0.35	0.11	2.97
1950	0.07	0.17	0.45	0.18	0.02	0.50	0.05	0.30	0.28	0.59	0.45	0.22	3.28
1951	0.19	0.07	0.28	0.28	0.03	0.20	0.75	0.87	0.61	0.42	0.18	0.26	4.14
1952	0.18	0.22	0.24	0.17	0.22	0.77	0.80	1.36	1.00	0.82	0.15	0.15	6.08
1953	0.17	0.20	0.17	0.29	0.42	0.95	0.68	0.63	0.80	0.05	0.21	0.25	4.82
1954	0.05	0.28	0.34	-0.08	-0.18	0.42	0.64	0.70	0.59	0.30	0.17	0.06	3.29
1955	0.00	0.07	0.15	0.35	0.05	0.14	0.60	0.59	-0.14	0.30	0.26	0.15	2.52
1956	0.06	0.07	0.39	0.40	0.21	0.67	0.76	0.80	0.74	0.18	0.19	0.05	4.52
1957	0.04	-0.11	0.05	-0.18	-0.25	0.24	0.53	0.59	0.24	-0.02	-0.25	0.11	0.99
1958	-0.01	0.08	-0.04	0.03	0.14	0.40	0.34	0.47	0.18	0.23	0.16	0.06	2.04
1959	0.09	0.12	0.31	0.29	0.07	-0.15	0.23	0.45	0.35	-0.20	0.18	-0.07	1.67
1960	-0.03	0.03	0.12	0.24	0.16	0.41	0.24	0.43	0.11	-0.07	0.28	-0.10	1.82
1961	0.00	0.00	0.04	0.35	0.25	0.07	0.25	0.42	-0.01	0.20	-0.08	0.03	1.52
1962	0.12	0.15	0.16	0.03	0.35	-0.12	0.11	0.37	-0.39	0.12	-0.04	0.03	0.89
1963	0.09	0.07	0.15	0.08	0.03	0.22	0.34	0.32	0.14	0.16	-0.02	0.04	1.62
1964	0.03	0.02	0.28	0.32	-0.02	0.57	0.84	0.42	0.06	0.35	-0.10	0.15	2.92
1965	0.03	0.08	0.21	0.22	-0.04	0.43	0.89	0.46	0.28	0.14	0.31	0.24	3.25
1966	0.01	0.04	0.34	-0.14	0.40	0.58	0.70	0.07	-0.16	0.41	0.36	0.14	2.75
1967	0.24	0.24	0.40	0.15	0.14	0.55	0.70	0.77	-0.03	0.53	0.17	0.05	3.91
1968	-0.29	0.02	0.02	0.23	0.05	0.38	0.22	0.71	0.35	0.28	-0.06	0.21	2.12
1969	0.12	-0.03	-0.01	0.20	0.09	0.41	0.78	0.36	-0.08	0.07	0.18	-0.08	2.01
1970	0.16	0.01	0.03	0.07	0.38	0.58	0.74	0.67	0.20	0.39	0.37	0.24	3.84
1971	0.22	0.27	0.46	0.51	0.40	0.58	0.59	-0.03	0.03	0.05	0.25	-0.11	3.22
1972	0.16	0.18	0.47	0.28	0.21	0.42	0.61	0.64	0.24	-0.12	0.12	0.16	3.37
1973	-0.11	0.04	0.14	0.08	0.48	0.30	0.30	0.60	-0.07	0.07	0.17	0.23	2.23
1974	0.14	0.20	0.32	0.24	0.36	0.57	0.63	0.28	-0.25	-0.03	0.16	0.05	2.67
1975	0.10	-0.01	0.18	0.24	-0.33	0.34	0.19	0.37	0.18	0.49	0.28	0.11	2.14
1976	0.23	0.38	0.45	0.41	0.11	0.42	0.57	0.68	-0.15	-0.14	0.17	0.16	3.29
1977	-0.05	0.18	0.28	0.17	0.08	0.43	0.71	0.35	0.58	0.44	0.30	0.30	3.77
1978	0.11	-0.05	0.18	0.41	0.19	0.45	0.83	0.21	0.44	0.45	0.21	0.22	3.65
1979	-0.03	0.08	0.12	0.17	0.09	0.28	0.67	0.31	0.51	0.56	0.18	0.19	3.13
1980	0.07	0.10	0.38	0.49	-0.22	0.77	0.94	0.78	-0.07	0.30	0.11	0.04	3.69
1981	0.18	0.03	0.14	0.14	0.10	0.18	0.66	0.61	0.34	-0.17	0.24	0.18	2.63
1982	0.13	0.19	0.18	0.24	-0.41	0.04	0.49	0.63	0.37	0.29	0.29	-0.01	2.43
1983	0.04	0.03	0.07	0.26	0.45	0.15	0.65	0.64	0.66	0.10	0.29	0.06	3.40
1984	0.19	0.20	0.19	0.50	0.49	0.57	0.78	0.50	0.41	-0.22	0.06	-0.15	3.52
1985	0.12	-0.05	0.03	0.17	0.26	0.22	0.57	0.66	0.57	-0.03	0.23	0.15	2.90
1986	0.28	0.21	0.32	0.17	-0.05	0.09	0.67	0.50	0.16	-0.16	-0.01	-0.01	2.17
1987	0.05	-0.13	0.30	0.41	-0.09	0.24	0.55	0.43	0.49	0.45	0.16	-0.20	2.66
1988	0.14	0.18	0.21	0.23	0.56	0.25	0.67	0.58	0.04	0.40	0.34	0.14	3.74
1989	0.07	-0.10	0.17	0.44	-0.16	0.15	0.54	0.29	0.10	0.39	0.33	0.22	2.44
1990	0.04	-0.15	-0.02	0.05	0.28	0.62	0.40	0.43	0.12	0.44	-0.01	0.14	2.34
1991	-0.09	0.23	0.33	0.41	0.26	0.29	0.73	0.41	0.22	0.20	0.26	0.02	3.27
1992	0.01	0.07	0.19	0.30	0.08	0.23	0.51	0.58	0.56	0.47	-0.04	0.04	3.00
1993	0.05	0.00	0.19	0.23	0.35	0.43	1.02	0.72	0.34	0.50	0.34	0.02	4.19
1994	0.12	-0.06	0.28	0.19	0.06	0.65	0.74	0.64	0.48	-0.30	0.07	0.05	2.92
1995	0.00	0.24	0.07	0.26	-0.03	0.25	0.73	0.29	0.44	0.49	0.35	0.17	3.26
1996	0.18	0.32	0.21	0.57	0.59	0.53	0.55	0.12	-0.09	0.45	-0.32	0.18	3.29
1997	0.21	0.01	0.34	0.01	0.14	0.25	0.72	0.60	0.55	0.42	0.19	-0.27	3.17
1998	-0.05	0.02	0.28	0.38	0.46	0.64	0.78	0.66	0.62	0.50	0.12	0.04	4.45
1999	0.15	0.28	-0.15	0.29	0.13	0.29	0.77	0.84	0.66	0.29	0.35	0.32	4.22
2000	0.35	0.19	0.18	0.07	0.43	0.45	0.59	0.69	0.66	-0.05	-0.26	0.10	3.40
2001	-0.05	-0.03	0.08	0.35	0.22	0.71	0.90	0.61	0.50	0.32	0.32	0.13	4.06
2002	0.15	0.16	0.09	0.06	0.45	0.21	0.20	0.73	0.54	-0.15	0.21	-0.01	2.64
2003	0.19	0.08	0.29	0.43	0.18	-0.05	0.77	0.50	0.45	0.44	0.15	0.28	3.71
2004	0.19	-0.12	0.21	0.41	0.47	-0.14	0.24	0.32	0.48	0.06	-0.32	0.13	1.93
2005	0.06	0.04	0.28	0.46	0.24	0.49	0.70	-0.02	0.48	0.06	0.38	0.24	3.41
2006	0.31	0.14	0.22	0.34	0.27	0.74	0.82	0.69	0.32	0.13	0.19	0.06	4.23
2007	0.01	0.21	-0.02	0.19	-0.23	-0.22	0.30	0.59	0.47	0.53	0.25	0.19	2.27
2008	0.25	0.19	0.06	0.28	0.55	0.76	0.72	0.25	0.48	0.47	0.32	0.23	4.56
2009	0.22	0.31	0.38	0.12	0.26	0.69	0.33	0.71	0.04	-0.10	0.26	0.01	3.23
2010	-0.04	0.01	0.22	0.03	0.21	0.65	0.27	0.78	0.06	0.35	0.37	0.14	3.05
2011	0.15	0.11	0.43	0.61	0.48	0.75	1.07	1.07	0.63	0.19	0.19	0.03	5.71
2012	-0.03	0.23	0.10	0.43	0.60	0.49	0.79	0.52	0.34	0.32	0.38	0.22	4.39
2013	0.20	0.09	0.36	0.28	0.44	0.86	0.50	0.59	0.40	0.29	0.26	0.02	4.29
2014	0.21	0.10	0.28	0.37	0.43	0.66	0.36	0.71	0.45	0.41	-0.03	0.05	4.00
2015	0.04	0.05	0.20	0.07	-0.36	0.24	0.50	0.63	0.56	0.50	-0.07	0.04	2.40
2016	0.16	0.20	0.41	0.09	-0.01	0.48	0.64	0.25	0.04	0.22	0.06	0.19	2.73
2017	0.06	0.08	0.39	0.43	0.33	0.17	0.74	0.51	0.05	0.40	0.28	0.19	3.63
2018	0.23	-0.05	0.08	0.39	0.33	0.74	0.78	0.64	-0.28	-0.39	0.17	-0.08	2.56
Total	6.64	6.58	14.99	17.80	12.65	28.36	42.57	38.41	21.47	16.49	12.15	7.14	154.83
Mean	0.09	0.09	0.21	0.25	0.18	0.39	0.60	0.54	0.31	0.24	0.17	0.10	3.18
Max	0.35	0.38	0.47	0.61	0.60	0.95	1.07	1.36	1.00	0.82	0.45	0.32	6.08
Min	-0.29	-0.15	-0.15	-0.18	-0.41	-0.22	0.05	-0.03	-0.39	-0.39	-0.32	-0.27	0.89

Table of Final Results - Calculated Monthly Net Reservoir Evaporation Values

Quadrangle: Hubert H Moss
Units: Feet
Control Point V10020

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	0.06	-0.13	0.12	0.39	-0.07	0.34	0.34	0.77	0.69	0.43	0.44	0.24	3.62
1949	-0.30	-0.06	0.08	0.17	-0.09	0.27	0.59	0.54	0.19	-0.05	0.33	0.04	1.71
1950	-0.12	0.12	0.36	0.10	-0.06	0.25	-0.06	0.21	0.20	0.54	0.45	0.27	2.26
1951	0.18	-0.07	0.29	0.28	0.18	-0.09	0.50	0.78	0.44	0.27	0.20	0.22	3.18
1952	0.18	0.13	0.07	-0.05	0.19	0.63	0.73	0.82	0.62	0.62	0.18	0.01	4.13
1953	0.17	0.10	0.01	0.01	0.23	0.66	0.48	0.67	0.63	0.14	0.10	0.22	3.42
1954	-0.09	0.25	0.35	0.12	-0.19	0.29	0.53	0.71	0.41	-0.01	0.17	0.01	2.55
1955	0.02	-0.03	0.09	0.10	0.05	0.31	0.44	0.50	0.19	0.40	0.33	0.15	2.55
1956	0.02	-0.08	0.32	0.27	0.12	0.61	0.54	0.72	0.66	0.19	0.07	-0.06	3.38
1957	-0.01	-0.08	-0.10	-0.46	-0.21	0.39	0.48	0.45	0.06	0.03	-0.17	0.07	0.45
1958	-0.02	0.10	-0.10	-0.13	0.20	0.21	0.40	0.31	0.13	0.19	0.07	0.06	1.42
1959	0.08	0.07	0.20	0.20	0.15	-0.15	-0.02	0.35	0.21	-0.09	0.10	-0.09	1.01
1960	0.02	0.01	0.12	0.14	0.09	0.27	0.06	0.34	0.14	0.01	0.19	-0.25	1.14
1961	0.00	-0.03	0.02	0.33	0.13	0.08	0.17	0.37	0.02	0.11	-0.06	-0.03	1.11
1962	0.06	0.09	0.13	0.04	0.34	-0.14	0.10	0.37	-0.29	0.07	-0.04	0.14	0.87
1963	0.10	0.12	0.21	0.04	0.08	0.44	0.23	0.47	0.30	0.39	0.13	0.00	2.51
1964	-0.01	0.06	0.04	0.07	0.02	0.42	0.75	0.27	-0.22	0.36	0.06	0.19	2.01
1965	0.02	-0.04	0.18	0.24	-0.07	0.21	0.64	0.41	0.21	0.24	0.09	0.05	2.18
1966	0.00	0.05	0.32	-0.19	0.38	0.31	0.46	0.03	0.07	0.32	0.24	0.04	2.03
1967	0.21	0.18	0.31	-0.06	-0.11	0.37	0.35	0.59	-0.15	0.16	0.13	-0.02	1.96
1968	-0.19	0.03	0.04	0.10	0.01	0.18	0.24	0.42	0.02	0.18	-0.07	0.07	1.03
1969	-0.03	0.00	0.10	0.17	0.15	0.36	0.63	0.43	0.18	-0.09	0.19	-0.13	1.96
1970	0.09	-0.08	0.05	0.02	0.22	0.38	0.56	0.49	-0.27	0.01	0.23	0.17	1.87
1971	0.12	0.11	0.40	0.33	0.20	0.46	0.44	0.22	0.10	-0.02	0.11	-0.14	2.33
1972	0.13	0.19	0.31	0.14	0.26	0.46	0.61	0.26	0.18	-0.18	-0.09	0.06	2.33
1973	-0.11	0.02	0.04	0.01	0.16	-0.12	0.14	0.52	-0.24	-0.08	0.03	0.16	0.53
1974	0.08	0.18	0.29	0.15	0.34	0.30	0.61	0.13	-0.28	-0.10	0.21	-0.01	1.90
1975	0.05	0.01	0.09	0.21	-0.17	0.27	0.29	0.29	0.22	0.38	0.16	0.04	1.84
1976	0.25	0.31	0.15	-0.07	-0.06	0.29	0.25	0.50	0.10	-0.07	0.16	0.08	1.89
1977	-0.10	0.12	0.03	0.25	0.24	0.50	0.61	0.28	0.39	0.33	0.17	0.25	3.07
1978	-0.02	-0.13	0.11	0.28	0.01	0.40	0.78	0.48	0.35	0.39	-0.18	0.12	2.59
1979	-0.08	-0.06	-0.05	0.14	-0.03	0.38	0.43	0.28	0.32	0.31	0.17	-0.02	1.79
1980	0.02	0.10	0.25	0.33	0.05	0.61	0.86	0.83	-0.03	0.21	0.12	0.05	3.40
1981	0.14	0.05	0.09	0.13	-0.14	0.21	0.50	0.45	0.21	-0.17	0.09	0.20	1.76
1982	0.00	0.05	0.18	0.15	-0.31	0.16	0.42	0.50	0.46	0.19	-0.14	-0.15	1.51
1983	0.06	-0.05	0.05	0.29	-0.04	0.16	0.47	0.48	0.54	0.01	0.03	-0.01	1.99
1984	0.11	0.08	0.03	0.32	0.21	0.48	0.58	0.40	0.44	-0.37	0.01	-0.25	2.04
1985	0.06	-0.06	-0.01	0.01	0.17	0.16	0.46	0.63	0.32	-0.22	-0.05	0.08	1.55
1986	0.25	-0.07	0.25	-0.08	-0.21	0.04	0.62	0.39	-0.02	-0.06	-0.14	-0.06	0.91
1987	0.01	-0.18	0.07	0.39	-0.25	0.07	0.39	0.50	0.14	0.31	-0.12	-0.32	1.01
1988	0.09	0.09	0.08	0.25	0.36	0.27	0.37	0.58	-0.05	0.18	0.04	-0.04	2.22
1989	-0.07	-0.18	-0.01	0.36	-0.35	-0.36	0.20	0.40	0.09	0.34	0.27	0.23	0.92
1990	-0.09	-0.15	-0.31	-0.40	-0.20	0.38	0.36	0.41	0.20	0.18	-0.09	-0.05	0.24
1991	-0.09	0.08	0.21	0.06	-0.02	0.13	0.49	0.20	0.07	-0.15	0.09	-0.42	0.65
1992	-0.12	0.00	0.08	0.19	-0.12	-0.07	0.30	0.35	0.04	0.32	-0.07	-0.20	0.70
1993	-0.03	-0.23	0.01	0.03	0.01	0.18	0.90	0.61	0.10	-0.20	0.10	-0.08	1.40
1994	0.01	-0.05	0.14	0.13	-0.19	0.39	-0.01	0.36	-0.01	-0.26	-0.31	-0.06	0.14
1995	0.00	0.00	-0.18	-0.07	-0.35	0.21	0.33	0.34	0.06	0.42	0.24	0.00	1.00
1996	0.12	0.37	0.13	0.26	0.44	0.35	0.35	-0.07	-0.08	0.12	-0.54	0.03	1.48
1997	0.18	-0.36	0.10	-0.10	0.01	0.16	0.47	0.35	0.43	-0.08	0.10	-0.27	0.99
1998	-0.27	-0.01	-0.05	0.28	0.40	0.53	0.81	0.60	0.43	0.02	-0.02	-0.14	2.58
1999	0.13	0.24	-0.01	0.19	-0.04	0.27	0.62	0.76	0.41	0.30	0.29	0.10	3.26
2000	0.16	0.18	0.10	0.01	0.23	0.00	0.62	0.74	0.46	-0.08	-0.33	-0.07	2.02
2001	-0.07	-0.32	-0.06	0.23	0.07	0.41	0.72	0.41	0.10	0.21	0.16	-0.06	1.80
2002	0.02	0.11	-0.22	0.00	0.02	0.23	0.19	0.46	0.32	-0.28	0.20	-0.08	0.97
2003	0.18	-0.06	0.21	0.37	0.02	0.12	0.61	0.38	0.05	0.33	0.05	0.17	2.43
2004	0.01	-0.12	0.17	0.06	0.23	-0.45	0.14	0.28	0.35	-0.10	-0.38	0.13	0.32
2005	-0.11	0.05	0.21	0.35	0.17	0.43	0.29	0.26	0.49	0.32	0.31	0.23	3.00
2006	0.21	0.06	0.05	0.17	0.29	0.53	0.72	0.59	0.25	0.10	0.02	-0.06	2.93
2007	-0.11	0.20	-0.05	0.08	-0.36	-0.37	0.08	0.42	0.18	0.18	0.22	0.01	0.48
2008	0.21	0.08	-0.25	0.12	0.18	0.43	0.60	0.17	0.25	0.28	0.24	0.21	2.52
2009	0.14	0.21	0.15	-0.10	-0.13	0.37	0.32	0.49	-0.10	-0.55	0.21	-0.04	0.97
2010	-0.04	-0.10	0.05	0.15	0.19	0.37	0.28	0.58	-0.24	0.25	0.16	0.08	1.73
2011	0.09	0.10	0.38	0.26	0.01	0.54	0.74	0.74	0.50	0.10	0.07	-0.06	3.47
2012	-0.22	0.07	-0.16	0.23	0.29	0.25	0.59	0.40	0.37	0.23	0.33	0.07	2.45
2013	0.01	0.08	0.17	0.22	0.00	0.32	0.32	0.70	0.35	-0.02	0.05	-0.08	2.12
2014	0.11	0.15	0.13	0.34	0.30	0.26	0.06	0.47	0.35	0.22	0.09	0.07	2.55
2015	-0.05	-0.03	-0.02	-0.16	-0.94	0.02	0.48	0.65	0.47	-0.18	-0.49	-0.12	-0.37
2016	0.13	0.16	-0.02	-0.15	-0.12	0.17	0.47	0.05	0.13	0.19	0.00	0.15	1.16
2017	0.01	0.15	0.26	0.06	0.27	0.04	0.32	-0.14	0.32	0.26	0.20	-0.02	1.73
2018	0.15	-0.41	0.07	0.25	0.21	0.50	0.51	0.26	-0.57	-0.55	0.12	-0.18	0.36
Total	2.10	1.74	6.85	8.55	3.05	18.04	30.85	30.96	13.36	7.38	5.23	0.90	93.11
Mean	0.03	0.03	0.10	0.12	0.04	0.25	0.43	0.44	0.20	0.11	0.07	0.02	1.84
Max	0.25	0.37	0.40	0.39	0.44	0.66	0.90	0.83	0.69	0.62	0.45	0.27	4.13
Min	-0.30	-0.41	-0.31	-0.46	-0.94	-0.45	-0.06	-0.14	-0.57	-0.55	-0.54	-0.42	0.14

Table of Final Results - Calculated Monthly Net Reservoir Evaporation Values

Quadrangle: Nocona
Units: Feet
Control Point V10070

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	0.11	-0.15	0.12	0.37	-0.13	0.29	0.43	0.83	0.73	0.49	0.50	0.26	3.85
1949	-0.19	-0.01	0.13	0.23	-0.18	0.24	0.59	0.57	0.20	0.00	0.35	0.10	2.03
1950	-0.05	0.17	0.41	0.08	-0.04	0.20	0.09	0.27	0.06	0.57	0.49	0.30	2.55
1951	0.23	-0.03	0.30	0.29	0.19	-0.03	0.50	0.79	0.49	0.29	0.25	0.24	3.51
1952	0.20	0.16	0.09	0.05	0.16	0.57	0.80	0.83	0.69	0.66	0.36	0.07	4.64
1953	0.19	0.12	0.02	0.07	0.24	0.58	0.55	0.76	0.72	0.15	0.19	0.29	3.88
1954	-0.04	0.23	0.35	0.14	-0.18	0.26	0.44	0.72	0.44	0.11	0.17	0.02	2.66
1955	0.02	0.00	0.10	0.12	-0.03	0.19	0.44	0.53	0.19	0.41	0.32	0.15	2.44
1956	0.02	-0.03	0.31	0.28	0.08	0.62	0.45	0.64	0.63	0.15	0.11	-0.10	3.16
1957	0.00	-0.09	-0.05	-0.33	-0.24	0.26	0.42	0.42	0.13	0.01	-0.26	0.07	0.34
1958	-0.05	0.08	-0.14	-0.09	0.22	0.19	0.37	0.25	0.16	0.19	0.09	0.07	1.34
1959	0.09	0.08	0.19	0.20	0.14	-0.12	0.01	0.35	0.18	-0.23	0.13	-0.09	0.93
1960	-0.05	0.03	0.12	0.11	0.05	0.23	0.03	0.40	0.15	-0.02	0.21	-0.17	1.09
1961	-0.03	-0.03	-0.07	0.28	0.16	0.08	0.14	0.33	-0.01	0.10	-0.04	-0.02	0.89
1962	0.09	0.10	0.15	-0.05	0.29	-0.17	0.04	0.36	-0.29	0.06	-0.07	0.09	0.60
1963	0.08	0.10	0.19	0.00	0.07	0.42	0.21	0.41	0.26	0.34	0.11	0.01	2.20
1964	-0.03	0.07	0.12	0.13	0.06	0.49	0.77	0.29	-0.20	0.35	-0.11	0.13	2.07
1965	0.01	0.01	0.17	0.20	-0.11	0.22	0.66	0.36	0.26	0.22	0.12	0.04	2.16
1966	-0.01	-0.08	0.29	-0.16	0.37	0.31	0.47	0.03	0.05	0.33	0.24	0.06	1.90
1967	0.21	0.19	0.35	0.04	-0.05	0.40	0.38	0.60	-0.08	0.18	0.15	0.01	2.38
1968	-0.27	0.00	-0.04	0.15	-0.01	0.22	0.26	0.40	0.11	0.18	-0.06	0.09	1.03
1969	0.00	-0.01	-0.01	0.15	0.11	0.37	0.62	0.45	0.19	-0.10	0.19	-0.11	1.85
1970	0.09	-0.05	0.03	-0.05	0.20	0.40	0.56	0.53	-0.24	0.00	0.24	0.19	1.90
1971	0.13	0.13	0.42	0.35	0.27	0.42	0.46	0.18	0.10	-0.16	0.08	-0.16	2.22
1972	0.14	0.19	0.33	0.13	0.26	0.47	0.63	0.24	0.21	-0.14	-0.06	0.07	2.47
1973	-0.13	0.00	0.04	-0.04	0.13	-0.11	0.10	0.51	-0.13	-0.05	0.02	0.18	0.52
1974	0.11	0.16	0.30	0.17	0.38	0.39	0.63	0.16	-0.28	-0.16	0.16	0.01	2.03
1975	0.05	-0.02	0.06	0.18	-0.17	0.30	0.28	0.25	0.19	0.37	0.17	0.05	1.71
1976	0.25	0.35	0.21	-0.04	0.00	0.36	0.31	0.55	0.05	-0.08	0.17	0.08	2.21
1977	-0.10	0.12	0.07	0.26	0.23	0.59	0.62	0.34	0.44	0.32	0.20	0.25	3.34
1978	0.00	-0.11	0.15	0.28	0.03	0.40	0.81	0.48	0.38	0.40	-0.10	0.13	2.85
1979	-0.06	-0.02	-0.06	0.11	0.01	0.35	0.50	0.30	0.34	0.34	0.16	-0.01	1.96
1980	0.03	0.10	0.28	0.36	0.05	0.66	0.87	0.85	0.01	0.24	0.14	0.05	3.64
1981	0.15	0.05	0.03	0.11	-0.20	0.31	0.52	0.45	0.19	-0.42	0.17	0.19	1.55
1982	0.05	0.08	0.15	0.18	-0.09	0.15	0.45	0.54	0.49	0.20	-0.08	-0.07	2.05
1983	0.06	-0.01	0.06	0.31	0.02	0.21	0.53	0.53	0.58	-0.02	0.06	0.00	2.33
1984	0.16	0.11	0.07	0.34	0.26	0.55	0.61	0.37	0.45	-0.34	0.02	-0.24	2.36
1985	0.07	-0.06	-0.04	0.05	0.19	0.08	0.49	0.61	0.33	-0.16	0.01	0.12	1.69
1986	0.27	-0.03	0.25	0.00	-0.14	0.23	0.61	0.36	0.01	-0.03	-0.08	-0.03	1.42
1987	0.06	-0.21	0.22	0.40	-0.13	0.17	0.44	0.48	0.22	0.36	-0.05	-0.28	1.68
1988	0.11	0.12	0.11	0.28	0.35	0.24	0.42	0.61	-0.06	0.21	0.05	-0.02	2.42
1989	-0.03	-0.08	0.09	0.38	-0.16	0.10	0.31	0.40	0.09	0.36	0.28	0.24	1.98
1990	-0.01	-0.11	-0.16	0.07	0.33	0.44	0.35	0.43	0.20	0.22	-0.08	0.00	1.68
1991	-0.06	0.12	0.23	0.19	0.02	0.21	0.50	0.16	0.06	-0.03	0.15	-0.09	1.46
1992	-0.05	0.09	0.15	0.23	-0.07	0.03	0.38	0.36	0.07	0.34	-0.06	-0.15	1.32
1993	-0.02	-0.10	0.09	0.08	0.11	0.32	0.92	0.62	0.07	-0.10	0.14	-0.02	2.11
1994	0.02	-0.04	0.17	0.14	-0.06	0.44	0.13	0.43	-0.04	-0.16	-0.09	0.01	0.95
1995	0.03	0.01	-0.06	0.01	-0.15	0.21	0.34	0.29	0.12	0.44	0.26	0.04	1.54
1996	0.15	0.35	0.15	0.30	0.48	0.39	0.40	-0.02	-0.10	0.14	-0.49	0.08	1.83
1997	0.20	-0.13	0.18	0.05	0.06	0.20	0.49	0.37	0.43	-0.03	0.14	-0.19	1.77
1998	-0.13	0.06	0.15	0.30	0.46	0.56	0.88	0.66	0.50	0.11	0.04	-0.04	3.55
1999	0.14	0.26	-0.01	0.21	0.04	0.29	0.64	0.83	0.46	0.34	0.32	0.19	3.71
2000	0.19	0.19	0.16	0.00	0.36	0.07	0.68	0.80	0.49	-0.10	-0.27	0.02	2.59
2001	0.01	-0.01	0.12	0.30	0.14	0.50	0.79	0.51	0.22	0.28	0.20	0.01	3.07
2002	0.12	0.11	-0.07	0.14	0.07	0.25	0.21	0.56	0.36	-0.23	0.24	-0.02	1.74
2003	0.19	-0.03	0.25	0.39	0.03	0.18	0.66	0.39	0.11	0.36	0.07	0.19	2.79
2004	0.05	-0.10	0.18	0.09	0.25	-0.28	0.14	0.30	0.36	-0.09	-0.28	0.15	0.77
2005	0.02	0.08	0.26	0.42	0.21	0.44	0.35	0.22	0.50	0.32	0.32	0.23	3.37
2006	0.23	0.08	0.14	0.15	0.30	0.55	0.76	0.62	0.27	0.15	0.06	-0.04	3.27
2007	-0.09	0.22	-0.12	0.19	-0.27	-0.26	0.29	0.45	0.18	0.25	0.23	0.05	1.12
2008	0.23	0.13	-0.09	0.23	0.27	0.51	0.61	0.16	0.26	0.28	0.28	0.24	3.11
2009	0.16	0.23	0.22	-0.18	0.03	0.41	0.39	0.58	-0.02	-0.39	0.26	-0.03	1.66
2010	0.00	-0.02	0.15	0.17	0.21	0.37	0.32	0.61	-0.15	0.31	0.23	0.09	2.29
2011	0.09	0.10	0.41	0.29	0.08	0.56	0.79	0.77	0.51	0.08	0.07	-0.05	3.70
2012	-0.11	0.09	-0.06	0.29	0.32	0.26	0.62	0.40	0.37	0.25	0.35	0.12	2.90
2013	0.05	0.10	0.22	0.26	0.05	0.30	0.32	0.77	0.36	0.05	0.09	-0.09	2.48
2014	0.11	0.14	0.19	0.43	0.35	0.26	0.05	0.47	0.35	0.27	0.07	0.10	2.79
2015	-0.01	-0.03	0.04	-0.13	-0.25	0.41	0.49	0.65	0.48	-0.19	-0.18	0.10	1.38
2016	0.21	0.21	0.20	0.01	-0.03	0.38	0.45	0.06	0.16	0.15	0.03	0.20	2.03
2017	0.07	0.23	0.30	0.12	0.29	0.10	0.41	0.00	0.26	0.33	0.21	0.03	2.35
2018	0.16	-0.29	0.16	0.29	0.22	0.53	0.51	0.28	-0.44	-0.42	0.16	-0.09	1.07
Total	3.89	3.67	9.42	11.06	6.51	20.72	32.69	32.06	14.83	8.61	7.47	3.30	106.04
Mean	0.05	0.06	0.13	0.15	0.09	0.29	0.46	0.45	0.22	0.13	0.10	0.05	2.19
Max	0.27	0.35	0.42	0.43	0.48	0.66	0.92	0.85	0.73	0.66	0.50	0.30	4.64
Min	-0.27	-0.29	-0.16	-0.33	-0.27	-0.28	0.01	-0.02	-0.44	-0.42	-0.49	-0.28	0.34

Table of Final Results - Calculated Monthly Net Reservoir Evaporation Values

Quadrangle: Randell
Units: Feet
Control Point W10020

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	0.08	0.04	0.22	0.43	0.16	0.40	0.26	0.71	0.64	0.37	0.36	0.21	3.88
1949	-0.24	0.05	0.10	0.14	0.05	0.30	0.59	0.51	0.17	-0.14	0.32	-0.03	1.82
1950	-0.07	0.26	0.35	0.21	0.14	0.35	-0.12	0.18	0.17	0.50	0.41	0.24	2.62
1951	0.13	-0.09	0.29	0.26	0.19	0.21	0.53	0.78	0.38	0.24	0.13	0.19	3.24
1952	0.16	0.09	0.05	-0.09	0.25	0.70	0.66	0.81	0.54	0.57	-0.01	-0.05	3.68
1953	0.15	0.08	0.01	0.12	0.38	0.78	0.40	0.57	0.52	0.10	0.02	0.16	3.29
1954	-0.11	0.28	0.35	0.14	-0.09	0.34	0.65	0.69	0.39	-0.13	0.17	0.00	2.68
1955	0.01	-0.03	0.11	0.11	0.00	0.33	0.45	0.46	0.18	0.39	0.33	0.14	2.48
1956	0.03	-0.12	0.34	0.27	0.23	0.60	0.64	0.80	0.70	0.23	0.03	-0.02	3.73
1957	-0.03	-0.07	-0.12	-0.26	0.07	0.39	0.54	0.48	-0.01	0.04	-0.27	0.11	0.87
1958	-0.01	0.11	-0.08	-0.05	0.29	0.26	0.43	0.37	0.12	0.19	0.06	0.05	1.74
1959	0.07	0.05	0.21	0.20	0.16	-0.06	-0.04	0.35	0.25	-0.26	0.09	-0.03	0.99
1960	0.01	0.05	0.12	0.17	0.13	0.28	0.11	0.28	0.13	0.03	0.15	-0.29	1.17
1961	0.06	-0.02	0.01	0.36	0.12	0.10	0.22	0.41	0.06	0.13	-0.11	-0.03	1.31
1962	0.03	0.09	0.11	0.05	0.37	-0.24	0.18	0.38	-0.12	0.08	-0.08	0.10	0.95
1963	0.11	0.14	0.23	0.06	0.26	0.48	0.27	0.54	0.35	0.45	0.14	-0.01	3.02
1964	0.01	0.04	-0.05	0.06	0.05	0.37	0.74	0.26	-0.18	0.37	-0.04	0.14	1.77
1965	0.03	0.01	0.20	0.29	-0.14	0.24	0.61	0.46	0.09	0.23	0.04	0.06	2.12
1966	-0.02	-0.11	0.28	-0.09	0.37	0.30	0.44	0.03	0.07	0.30	0.23	0.00	1.80
1967	0.20	0.16	0.28	-0.13	-0.15	0.51	0.32	0.57	-0.14	0.16	0.14	-0.06	1.86
1968	-0.17	0.02	-0.03	0.14	-0.01	0.19	0.21	0.44	-0.08	0.19	-0.08	0.03	0.85
1969	-0.05	0.02	0.01	0.13	0.05	0.34	0.64	0.40	0.18	-0.03	0.19	-0.13	1.75
1970	0.04	-0.06	0.01	0.02	0.15	0.32	0.55	0.44	-0.20	0.02	0.22	0.14	1.65
1971	0.11	0.08	0.37	0.31	0.15	0.50	0.41	0.10	0.12	-0.17	0.09	-0.25	1.82
1972	0.09	0.19	0.28	0.14	0.24	0.45	0.58	0.28	0.14	-0.14	-0.10	0.04	2.19
1973	-0.09	0.03	0.05	-0.07	0.15	-0.08	0.17	0.49	-0.25	-0.11	0.04	0.12	0.45
1974	0.03	0.19	0.28	0.16	0.27	0.20	0.58	0.16	-0.22	-0.04	0.00	-0.05	1.56
1975	0.04	-0.03	0.14	0.24	-0.19	0.18	0.30	0.33	0.24	0.39	0.13	0.04	1.81
1976	0.24	0.26	0.07	-0.07	0.03	0.24	0.18	0.44	0.18	-0.04	0.15	0.08	1.76
1977	-0.06	0.17	0.11	0.42	0.27	0.41	0.61	0.22	0.33	0.33	0.14	0.24	3.19
1978	-0.05	-0.15	0.07	0.28	0.01	0.40	0.75	0.47	0.33	0.38	-0.26	0.10	2.33
1979	-0.10	-0.10	-0.03	0.19	-0.03	0.47	0.35	0.26	0.30	0.27	0.18	-0.03	1.73
1980	0.01	0.10	0.21	0.29	0.06	0.56	0.85	0.82	-0.09	0.19	0.11	0.07	3.18
1981	0.14	0.05	0.07	0.18	-0.13	0.26	0.47	0.45	0.22	-0.49	0.25	0.22	1.69
1982	0.02	0.10	0.21	0.14	-0.08	0.12	0.40	0.45	0.42	0.17	-0.20	-0.17	1.58
1983	0.11	0.05	0.11	0.28	-0.09	0.11	0.41	0.43	0.48	0.00	0.00	-0.02	1.87
1984	0.06	0.03	0.03	0.30	0.20	0.39	0.54	0.43	0.42	-0.40	0.01	-0.10	1.91
1985	0.10	-0.01	0.09	0.06	0.18	0.21	0.43	0.65	0.32	-0.21	-0.05	0.11	1.88
1986	0.25	0.17	0.30	-0.08	-0.10	0.34	0.65	0.42	0.01	-0.04	-0.16	-0.03	1.73
1987	0.07	-0.11	0.20	0.43	-0.20	0.18	0.39	0.52	0.06	0.24	-0.18	-0.19	1.41
1988	0.18	0.12	0.13	0.27	0.38	0.32	0.32	0.55	-0.05	0.15	0.02	-0.06	2.33
1989	-0.03	0.05	0.20	0.43	-0.04	-0.02	0.13	0.40	0.09	0.32	0.25	0.23	2.01
1990	-0.13	-0.03	0.03	0.12	0.21	0.45	0.38	0.40	0.21	0.14	-0.08	-0.09	1.61
1991	-0.08	0.09	0.22	-0.01	0.04	0.11	0.48	0.25	0.09	-0.12	0.26	0.13	1.46
1992	0.12	0.12	0.28	0.27	-0.11	-0.01	0.26	0.37	0.03	0.31	-0.06	-0.01	1.57
1993	0.00	-0.17	0.06	0.17	0.14	0.24	0.88	0.60	0.13	0.12	0.07	-0.02	2.22
1994	0.03	0.00	0.15	0.10	-0.13	0.35	0.00	0.29	0.07	-0.22	0.00	-0.02	0.62
1995	0.03	0.00	-0.03	-0.02	-0.14	0.23	0.32	0.43	0.01	0.40	0.23	-0.03	1.43
1996	0.10	0.39	0.13	0.23	0.40	0.32	0.28	-0.13	-0.02	0.17	0.11	0.02	2.00
1997	0.16	-0.05	0.22	0.05	0.11	0.19	0.45	0.32	0.44	-0.12	0.05	-0.12	1.70
1998	-0.02	0.01	0.16	0.28	0.35	0.49	0.72	0.54	0.34	-0.08	-0.08	-0.25	2.46
1999	0.16	0.23	0.01	0.28	-0.08	0.25	0.59	0.68	0.36	0.26	0.26	0.00	3.00
2000	0.12	0.16	0.07	0.06	0.10	-0.07	0.56	0.68	0.43	-0.06	-0.17	-0.01	1.87
2001	-0.02	-0.13	0.14	0.20	0.05	0.31	0.65	0.28	-0.02	0.18	0.12	-0.09	1.67
2002	-0.02	0.15	0.06	0.14	0.04	0.23	0.20	0.34	0.28	-0.30	0.17	-0.10	1.19
2003	0.17	-0.05	0.23	0.34	0.03	0.08	0.56	0.36	-0.02	0.29	0.03	0.15	2.17
2004	-0.02	-0.11	0.20	0.05	0.21	-0.15	0.21	0.26	0.34	-0.10	-0.18	0.16	0.87
2005	0.10	0.06	0.18	0.30	0.14	0.42	0.23	0.32	0.47	0.32	0.29	0.23	3.06
2006	0.18	0.04	0.05	0.17	0.30	0.50	0.68	0.55	0.23	0.05	0.01	-0.04	2.72
2007	0.00	0.19	0.00	0.21	-0.28	0.19	0.13	0.39	0.19	0.09	0.22	-0.04	1.29
2008	0.19	0.05	-0.08	0.13	0.12	0.35	0.60	0.18	0.23	0.28	0.19	0.18	2.42
2009	0.13	0.19	0.07	0.00	0.05	0.38	0.24	0.39	-0.17	-0.06	0.17	-0.02	1.37
2010	0.03	0.11	0.13	0.19	0.22	0.38	0.24	0.56	-0.10	0.18	0.08	0.08	2.10
2011	0.10	0.12	0.35	0.23	0.03	0.53	0.69	0.71	0.49	0.12	0.07	-0.02	3.42
2012	-0.04	0.08	0.02	0.17	0.24	0.27	0.55	0.40	0.37	0.20	0.32	0.02	2.60
2013	-0.04	0.07	0.14	0.21	-0.03	0.35	0.31	0.62	0.33	-0.09	0.01	-0.05	1.83
2014	0.11	0.15	0.06	0.25	0.24	0.25	0.10	0.47	0.34	0.16	0.11	0.03	2.27
2015	-0.06	0.01	0.07	0.29	0.09	0.31	0.49	0.65	0.45	-0.17	-0.14	0.17	2.16
2016	0.11	0.18	0.16	-0.03	0.14	0.40	0.52	0.11	0.11	0.26	0.00	0.12	2.08
2017	0.04	0.15	0.24	0.04	0.24	0.03	0.24	0.12	0.39	0.18	0.19	-0.05	1.81
2018	0.13	-0.11	0.10	0.21	0.22	0.48	0.52	0.24	-0.36	-0.16	0.15	-0.05	1.37
Total	3.12	4.08	9.31	11.07	7.05	20.59	29.88	30.17	12.90	7.06	5.26	1.55	100.77
Mean	0.04	0.06	0.13	0.16	0.10	0.29	0.42	0.43	0.19	0.10	0.07	0.02	2.01
Max	0.25	0.39	0.37	0.43	0.40	0.78	0.88	0.82	0.70	0.57	0.41	0.24	3.88
Min	-0.24	-0.17	-0.12	-0.26	-0.28	-0.24	-0.12	-0.13	-0.36	-0.49	-0.27	-0.29	0.45

Table of Final Results - Calculated Monthly Net Reservoir Evaporation Values

Quadrangle: Texoma
Units: Feet
Control Point W10060

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	0.10	0.03	0.22	0.42	0.14	0.38	0.29	0.73	0.66	0.39	0.38	0.21	3.95
1949	-0.20	0.06	0.12	0.16	0.02	0.29	0.59	0.52	0.17	-0.12	0.32	-0.01	1.92
1950	-0.05	0.28	0.36	0.21	0.15	0.33	-0.09	0.20	0.16	0.52	0.42	0.25	2.74
1951	0.15	-0.08	0.29	0.27	0.19	0.22	0.53	0.78	0.40	0.25	0.15	0.20	3.35
1952	0.16	0.10	0.06	-0.06	0.24	0.68	0.68	0.82	0.57	0.58	0.05	-0.03	3.85
1953	0.16	0.09	0.01	0.14	0.38	0.75	0.42	0.60	0.55	0.11	0.04	0.18	3.43
1954	-0.10	0.28	0.36	0.15	-0.09	0.33	0.62	0.70	0.40	-0.09	0.17	0.00	2.73
1955	0.02	-0.02	0.12	0.11	-0.01	0.31	0.45	0.47	0.18	0.40	0.33	0.15	2.51
1956	0.03	-0.10	0.34	0.27	0.21	0.60	0.61	0.78	0.69	0.22	0.04	-0.03	3.66
1957	-0.02	-0.08	-0.10	-0.25	0.08	0.38	0.52	0.47	0.01	0.04	-0.24	0.12	0.93
1958	0.00	0.12	-0.08	-0.04	0.29	0.25	0.42	0.35	0.13	0.19	0.06	0.06	1.75
1959	0.07	0.05	0.21	0.20	0.16	-0.08	-0.03	0.35	0.24	-0.27	0.10	-0.02	0.98
1960	0.01	0.05	0.12	0.16	0.12	0.27	0.10	0.30	0.13	0.02	0.16	-0.26	1.18
1961	0.06	-0.01	0.01	0.35	0.13	0.10	0.21	0.40	0.05	0.13	-0.09	-0.03	1.31
1962	0.05	0.10	0.12	0.05	0.37	-0.23	0.16	0.38	-0.13	0.08	-0.08	0.10	0.97
1963	0.11	0.13	0.23	0.05	0.25	0.48	0.27	0.52	0.34	0.43	0.14	0.00	2.95
1964	0.00	0.04	-0.02	0.08	0.06	0.40	0.74	0.26	-0.14	0.37	-0.04	0.14	1.89
1965	0.03	0.04	0.20	0.28	-0.13	0.24	0.62	0.44	0.11	0.23	0.06	0.06	2.18
1966	-0.02	-0.11	0.28	-0.05	0.37	0.30	0.45	0.03	0.07	0.30	0.23	0.01	1.86
1967	0.21	0.16	0.30	-0.10	-0.13	0.50	0.33	0.57	-0.12	0.16	0.14	-0.05	1.97
1968	-0.17	0.01	-0.02	0.15	0.00	0.21	0.21	0.44	-0.05	0.18	-0.07	0.04	0.93
1969	-0.04	0.03	0.00	0.14	0.09	0.34	0.64	0.40	0.18	-0.03	0.19	-0.12	1.82
1970	0.05	-0.04	0.01	0.03	0.16	0.33	0.55	0.45	-0.20	0.02	0.22	0.15	1.73
1971	0.11	0.09	0.38	0.31	0.17	0.49	0.42	0.12	0.12	-0.17	0.09	-0.22	1.91
1972	0.10	0.19	0.28	0.14	0.24	0.45	0.59	0.27	0.15	-0.13	-0.09	0.05	2.24
1973	-0.09	0.03	0.06	-0.06	0.15	-0.08	0.15	0.49	-0.21	-0.09	0.04	0.13	0.52
1974	0.04	0.19	0.28	0.17	0.28	0.24	0.59	0.17	-0.22	-0.04	0.01	-0.04	1.67
1975	0.05	-0.03	0.15	0.23	-0.19	0.20	0.30	0.32	0.23	0.39	0.14	0.04	1.83
1976	0.24	0.27	0.09	-0.06	0.05	0.26	0.20	0.46	0.16	-0.05	0.15	0.08	1.85
1977	-0.06	0.18	0.13	0.42	0.26	0.44	0.61	0.24	0.35	0.33	0.15	0.24	3.29
1978	-0.04	-0.14	0.09	0.28	0.02	0.40	0.76	0.48	0.33	0.38	-0.24	0.10	2.42
1979	-0.09	-0.08	-0.02	0.19	-0.01	0.47	0.38	0.26	0.31	0.28	0.18	-0.03	1.84
1980	0.02	0.10	0.23	0.30	0.06	0.57	0.85	0.82	-0.07	0.20	0.12	0.07	3.27
1981	0.14	0.06	0.07	0.18	-0.13	0.29	0.48	0.45	0.22	-0.50	0.26	0.21	1.73
1982	0.03	0.11	0.20	0.14	-0.03	0.14	0.41	0.46	0.43	0.18	-0.18	-0.14	1.75
1983	0.11	0.07	0.12	0.29	-0.07	0.12	0.43	0.45	0.50	-0.01	0.01	-0.02	2.00
1984	0.08	0.05	0.05	0.31	0.22	0.41	0.55	0.42	0.43	-0.39	0.01	-0.09	2.05
1985	0.11	-0.01	0.09	0.07	0.20	0.19	0.44	0.65	0.32	-0.14	-0.02	0.06	1.96
1986	0.24	-0.01	0.26	0.02	0.10	0.18	0.64	0.41	0.04	-0.01	-0.18	-0.06	1.63
1987	0.06	-0.12	0.17	0.40	-0.17	0.10	0.38	0.51	0.09	0.26	-0.16	-0.12	1.40
1988	0.11	0.10	0.08	0.25	0.37	0.30	0.33	0.56	-0.03	0.16	0.03	-0.05	2.21
1989	0.02	-0.07	0.13	0.37	0.08	0.06	0.21	0.39	0.10	0.33	0.26	0.23	2.11
1990	-0.11	-0.14	-0.13	0.21	-0.01	0.41	0.40	0.41	0.20	0.14	-0.08	-0.08	1.22
1991	-0.09	0.07	0.21	0.07	0.07	0.13	0.48	0.23	0.10	0.07	0.17	0.28	1.79
1992	0.09	0.11	0.12	0.33	0.05	0.00	0.25	0.35	0.10	0.32	-0.06	0.03	1.69
1993	0.02	-0.05	0.18	0.14	0.24	0.21	0.88	0.60	0.12	-0.07	0.12	0.02	2.41
1994	0.04	0.04	0.20	0.13	-0.04	0.38	0.56	0.30	0.06	-0.09	-0.23	-0.03	1.32
1995	0.04	0.04	-0.11	0.03	-0.19	0.28	0.35	0.40	0.02	0.41	0.23	-0.03	1.47
1996	0.10	0.38	0.13	0.26	0.41	0.33	0.30	-0.10	-0.03	0.14	-0.39	0.03	1.56
1997	0.17	-0.31	0.15	0.01	0.14	0.18	0.46	0.32	0.44	-0.12	0.06	-0.29	1.21
1998	-0.20	-0.01	0.17	0.29	0.37	0.50	0.75	0.56	0.36	-0.05	-0.07	-0.23	2.44
1999	0.12	0.23	0.00	0.18	-0.06	0.26	0.60	0.70	0.37	0.27	0.27	0.04	2.98
2000	0.13	0.16	0.07	0.04	0.14	-0.06	0.58	0.70	0.44	-0.05	-0.27	-0.04	1.84
2001	0.00	-0.18	0.04	0.21	0.06	0.35	0.68	0.32	0.02	0.16	0.13	-0.09	1.70
2002	-0.04	0.12	-0.14	0.14	0.04	0.27	0.18	0.38	0.29	-0.30	0.18	-0.11	1.01
2003	0.18	-0.06	0.22	0.35	0.03	0.09	0.57	0.37	0.00	0.30	0.04	0.15	2.24
2004	-0.01	-0.13	0.19	0.06	0.24	-0.37	0.19	0.27	0.34	-0.10	-0.38	0.15	0.45
2005	-0.17	0.06	0.19	0.32	0.15	0.42	0.25	0.30	0.47	0.32	0.29	0.23	2.83
2006	0.19	0.04	-0.01	0.17	0.32	0.51	0.69	0.56	0.23	0.06	0.00	-0.06	2.70
2007	-0.11	0.19	-0.03	0.06	-0.21	0.19	0.13	0.40	0.19	0.12	0.22	-0.03	1.12
2008	0.19	0.04	-0.18	0.20	0.15	0.37	0.60	0.18	0.24	0.28	0.20	0.19	2.46
2009	0.13	0.20	0.09	0.05	-0.05	0.33	0.26	0.41	-0.17	-0.23	0.18	-0.05	1.15
2010	0.04	0.04	0.15	0.18	0.20	0.38	0.25	0.56	-0.07	0.20	0.11	0.09	2.13
2011	0.10	0.11	0.36	0.24	0.06	0.53	0.70	0.72	0.49	0.12	0.08	-0.06	3.45
2012	-0.12	0.08	0.00	0.19	0.26	0.31	0.56	0.40	0.37	0.21	0.32	0.04	2.62
2013	-0.02	0.07	0.13	0.20	-0.03	0.34	0.32	0.64	0.34	-0.07	0.02	-0.06	1.88
2014	0.11	0.15	0.08	0.28	0.26	0.25	0.05	0.47	0.34	0.19	0.11	0.04	2.33
2015	-0.08	-0.02	-0.03	0.01	-0.41	0.23	0.49	0.65	0.45	-0.16	-0.20	0.23	1.16
2016	0.14	0.16	0.16	-0.05	0.03	0.55	0.52	0.09	0.12	0.24	0.03	0.13	2.12
2017	0.05	0.15	0.24	0.04	0.25	0.04	0.26	-0.10	0.37	0.20	0.19	-0.05	1.64
2018	0.14	-0.40	0.08	0.23	0.22	0.49	0.51	0.25	-0.38	-0.33	0.14	-0.11	0.84
Total	2.82	3.25	8.51	11.24	7.34	20.51	30.83	30.23	13.47	7.27	4.67	1.89	103.38
Mean	0.04	0.05	0.12	0.16	0.10	0.29	0.43	0.43	0.20	0.11	0.06	0.03	2.02
Max	0.24	0.38	0.38	0.42	0.41	0.75	0.88	0.82	0.69	0.58	0.42	0.28	3.95
Min	-0.20	-0.40	-0.18	-0.25	-0.41	-0.37	-0.09	-0.10	-0.38	-0.50	-0.39	-0.29	0.52

Table of Final Results - Calculated Monthly Net Reservoir Evaporation Values

Quadrangle: Pat Mayse
Units: Feet
Control Point X10010

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	-0.03	-0.06	-0.16	0.26	0.17	0.38	0.43	0.63	0.56	0.20	0.13	0.05	2.56
1949	-0.36	-0.03	-0.13	-0.09	0.12	0.10	0.15	0.28	0.23	-0.41	0.24	-0.04	0.06
1950	0.05	0.09	0.06	-0.09	0.10	0.12	0.05	0.19	-0.01	0.23	0.27	0.20	1.26
1951	-0.08	-0.09	0.09	0.15	0.20	0.43	0.24	0.63	-0.21	0.19	0.07	0.01	1.63
1952	0.01	-0.05	-0.02	-0.06	-0.02	0.39	0.19	0.66	0.64	0.58	-0.22	-0.24	1.86
1953	0.00	-0.06	-0.04	0.00	-0.25	0.49	-0.18	0.23	0.34	0.33	-0.06	-0.16	0.64
1954	-0.16	0.26	0.30	0.18	0.00	0.52	0.65	0.75	0.33	-0.18	0.12	-0.02	2.75
1955	-0.04	-0.07	0.23	0.10	0.05	0.45	0.37	0.11	0.25	0.36	0.27	0.12	2.20
1956	0.00	-0.06	0.27	0.23	0.29	0.39	0.64	0.68	0.61	0.26	-0.19	0.05	3.17
1957	-0.11	-0.05	-0.17	0.04	0.16	0.26	0.51	0.36	-0.16	-0.08	-0.10	-0.01	0.65
1958	-0.04	0.06	-0.01	-0.04	0.30	0.20	0.15	0.19	-0.10	0.14	-0.08	-0.03	0.74
1959	0.04	-0.13	0.21	0.15	0.12	0.08	0.07	0.30	0.30	-0.07	0.08	-0.06	1.09
1960	-0.08	0.02	0.16	0.25	0.21	0.24	0.26	0.19	0.03	0.12	0.12	0.03	1.55
1961	0.05	-0.07	0.09	0.30	0.14	-0.09	0.13	0.30	0.16	0.20	-0.24	-0.11	0.86
1962	-0.12	0.04	0.08	0.06	0.36	0.04	0.33	0.42	-0.03	-0.04	0.15	0.04	1.33
1963	0.02	0.14	0.19	0.09	0.15	0.31	0.10	0.56	0.41	0.46	0.10	-0.01	2.52
1964	0.03	-0.04	-0.07	-0.04	0.16	0.42	0.60	0.14	-0.07	0.24	0.00	0.08	1.45
1965	0.00	-0.04	0.06	0.29	-0.10	0.25	0.53	0.50	0.06	0.24	0.02	0.01	1.82
1966	-0.16	-0.27	0.27	0.29	0.08	0.46	0.33	-0.04	0.02	0.15	0.22	-0.10	1.25
1967	0.11	0.07	0.21	0.05	0.02	0.49	0.18	0.46	-0.02	0.03	0.12	-0.01	1.71
1968	-0.12	0.07	0.17	0.14	0.11	0.20	0.34	0.44	0.04	0.22	-0.08	0.01	1.54
1969	0.10	-0.07	-0.02	0.10	0.02	0.42	0.59	0.55	0.22	0.00	0.13	-0.09	1.95
1970	0.04	0.06	0.16	0.11	0.30	0.29	0.51	0.45	0.01	-0.05	0.14	0.07	2.09
1971	0.10	0.02	0.32	0.31	0.13	0.54	0.10	0.17	0.18	0.22	0.12	-0.51	1.70
1972	0.01	0.18	0.24	0.27	0.26	0.25	0.46	0.46	0.04	-0.26	-0.11	-0.03	1.77
1973	-0.07	0.03	-0.05	-0.11	0.20	-0.02	0.34	0.45	-0.27	0.09	0.13	-0.02	0.70
1974	-0.13	0.17	0.23	0.09	0.22	0.24	0.52	0.04	-0.41	0.03	-0.11	-0.05	0.84
1975	0.06	0.17	0.01	0.18	-0.05	0.10	0.35	0.37	0.30	0.38	0.09	-0.03	1.93
1976	0.22	0.18	-0.13	-0.05	-0.05	0.26	0.22	0.49	-0.02	-0.09	0.11	0.04	1.18
1977	-0.12	0.06	0.04	0.05	0.27	0.27	0.47	0.24	0.31	0.30	-0.16	0.17	1.90
1978	-0.11	-0.08	0.03	0.26	0.08	0.42	0.64	0.57	0.35	0.44	-0.36	-0.05	2.19
1979	0.00	-0.06	0.10	0.12	-0.13	0.30	0.13	0.20	0.14	0.10	0.08	-0.10	0.88
1980	-0.14	0.12	0.17	0.12	0.00	0.22	0.72	0.69	0.02	0.15	0.08	0.07	2.22
1981	0.16	0.11	0.17	0.23	-0.17	0.32	0.37	0.46	0.38	-0.12	0.24	0.21	2.36
1982	-0.01	0.00	0.17	0.17	0.28	0.08	0.32	0.29	0.41	0.03	-0.33	-0.36	1.05
1983	0.08	0.11	0.10	0.24	-0.05	0.16	0.42	0.36	0.41	0.09	0.04	-0.12	1.84
1984	-0.04	0.13	0.04	0.27	0.12	0.43	0.32	0.43	0.23	-0.41	0.15	-0.05	1.62
1985	0.05	-0.11	0.05	0.06	0.11	0.30	0.37	0.60	0.32	-0.11	-0.10	-0.04	1.50
1986	0.18	-0.02	0.26	-0.05	0.09	0.09	0.46	0.53	0.29	-0.08	-0.07	-0.02	1.66
1987	0.03	0.03	0.09	0.38	-0.04	-0.01	0.31	0.49	0.11	0.12	-0.12	-0.15	1.24
1988	0.13	0.03	-0.01	0.22	0.40	0.48	0.07	0.27	0.23	-0.09	-0.33	-0.03	1.37
1989	-0.06	0.12	0.11	0.29	-0.15	0.34	0.03	0.34	0.23	0.24	0.25	0.16	1.90
1990	-0.19	0.10	-0.19	0.07	-0.08	0.34	0.16	0.36	0.00	0.00	-0.16	-0.12	0.29
1991	0.10	-0.02	0.20	-0.09	-0.01	0.40	0.35	0.31	0.23	0.01	0.07	0.26	1.81
1992	0.21	0.05	0.19	0.16	0.15	0.03	-0.06	0.40	0.05	0.31	-0.13	-0.05	1.31
1993	0.09	0.21	0.12	0.11	0.14	0.32	0.85	0.55	0.25	-0.12	0.05	0.19	2.76
1994	0.03	0.08	0.32	0.08	0.14	0.39	0.11	0.30	0.28	-0.09	0.14	0.00	1.78
1995	0.13	0.01	0.23	0.09	0.13	0.29	0.34	0.50	0.00	0.36	0.21	-0.02	2.27
1996	0.04	0.39	0.14	0.21	0.19	0.15	-0.13	0.03	0.00	0.14	-0.05	-0.03	1.08
1997	0.08	-0.06	0.24	0.10	0.07	0.17	0.47	0.21	0.44	-0.08	-0.03	-0.04	1.57
1998	-0.05	-0.04	0.15	0.26	0.31	0.54	0.67	0.47	0.04	-0.05	0.10	0.04	2.44
1999	0.22	0.27	0.10	0.24	0.12	0.23	0.53	0.72	0.33	0.32	0.20	0.32	3.60
2000	-0.01	0.07	-0.01	0.05	0.03	0.14	0.36	0.58	0.35	0.03	-0.32	0.07	1.34
2001	0.14	0.15	0.14	0.22	0.09	0.24	0.53	0.30	-0.04	0.10	0.04	0.16	2.07
2002	0.19	0.19	0.25	0.22	0.14	0.32	0.28	0.38	0.24	0.16	0.19	0.06	2.62
2003	0.18	0.08	0.20	0.29	0.20	0.03	0.48	0.38	0.09	0.25	0.06	0.12	2.36
2004	0.03	-0.10	0.22	0.06	0.10	-0.14	0.34	0.32	0.41	-0.04	-0.17	0.17	1.20
2005	0.13	0.05	0.21	0.20	0.23	0.50	0.20	0.42	0.39	0.39	0.26	0.23	3.21
2006	0.06	-0.02	0.03	0.26	0.26	0.48	0.68	0.56	0.34	0.02	-0.02	-0.17	2.48
2007	-0.01	0.16	0.06	0.20	-0.06	0.31	0.34	0.37	0.09	0.04	0.14	0.00	1.64
2008	0.12	0.11	0.25	-0.07	-0.08	0.12	0.57	0.06	-0.01	0.10	0.14	0.16	1.47
2009	0.05	0.12	-0.05	-0.02	-0.07	0.34	0.00	0.11	-0.22	0.02	0.13	-0.05	0.36
2010	0.13	0.08	0.14	0.21	0.10	0.24	0.21	0.50	-0.05	0.10	-0.08	0.01	1.59
2011	0.06	0.00	0.25	-0.03	0.08	0.53	0.64	0.68	0.48	0.24	-0.06	-0.35	2.52
2012	-0.06	0.00	0.14	0.10	0.16	0.37	0.42	0.30	0.32	0.16	0.30	-0.03	2.18
2013	-0.09	-0.04	0.16	0.12	-0.01	0.21	0.25	0.57	0.12	-0.18	-0.08	0.01	1.04
2014	0.07	0.11	0.09	0.09	0.08	0.15	0.09	0.38	0.20	0.13	0.10	-0.09	1.40
2015	-0.02	0.03	0.19	-0.09	-0.08	0.37	0.54	0.47	0.29	-0.17	0.16	0.15	1.84
2016	0.10	0.13	0.05	0.05	0.18	0.34	0.58	0.16	0.24	0.29	-0.05	0.04	2.11
2017	-0.05	0.05	0.12	-0.27	0.16	0.04	0.09	-0.02	0.41	-0.01	0.14	-0.14	0.52
2018	0.04	-0.14	0.28	0.13	0.18	0.38	0.43	0.32	-0.20	0.09	0.00	-0.03	1.48
Total	1.21	2.93	8.09	8.47	7.06	19.44	24.11	27.12	11.93	6.67	2.09	-0.25	81.84
Mean	0.02	0.04	0.11	0.12	0.10	0.27	0.34	0.38	0.17	0.09	0.03	0.00	1.68
Max	0.22	0.39	0.32	0.38	0.40	0.54	0.85	0.75	0.64	0.58	0.30	0.32	3.17
Min	-0.36	-0.27	-0.19	-0.27	-0.25	-0.14	-0.18	-0.04	-0.41	-0.41	-0.36	-0.51	0.06

Table of Final Results - Calculated Monthly Net Reservoir Evaporation Values

Quadrangle: Coffee Mill Lake (Lake Fannin)
Units: Feet
Control Point X10230

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	-0.01	0.03	0.01	0.33	0.16	0.41	0.32	0.64	0.58	0.26	0.22	0.11	3.06
1949	-0.40	-0.04	-0.05	0.00	0.14	0.22	0.35	0.38	0.20	-0.31	0.27	-0.07	0.69
1950	-0.17	0.05	0.20	0.11	0.10	0.28	-0.09	0.19	0.07	0.36	0.33	0.21	1.64
1951	0.01	-0.18	0.19	0.20	0.19	0.21	0.39	0.70	0.06	0.19	0.07	0.09	2.12
1952	0.07	0.01	-0.02	-0.28	0.11	0.56	0.39	0.73	0.57	0.56	-0.21	-0.19	2.30
1953	0.06	0.00	-0.06	-0.06	0.07	0.67	0.05	0.35	0.39	0.21	-0.06	-0.06	1.56
1954	-0.19	0.26	0.33	0.15	-0.14	0.44	0.69	0.72	0.35	-0.29	0.14	-0.01	2.45
1955	-0.02	-0.07	0.13	0.06	0.02	0.42	0.39	0.26	0.21	0.37	0.30	0.13	2.20
1956	0.02	-0.21	0.31	0.24	0.26	0.48	0.67	0.77	0.66	0.26	-0.11	0.03	3.38
1957	-0.08	-0.07	-0.20	-0.28	0.09	0.29	0.55	0.42	-0.17	-0.03	-0.33	0.06	0.25
1958	-0.04	0.11	-0.09	-0.14	0.29	0.15	0.29	0.30	0.01	0.16	-0.02	0.01	1.03
1959	0.05	-0.05	0.21	0.17	0.15	-0.03	-0.09	0.31	0.28	-0.17	0.08	-0.11	0.80
1960	-0.04	0.02	0.12	0.23	0.17	0.22	0.19	0.19	0.04	0.02	0.12	-0.39	0.89
1961	0.06	-0.05	-0.01	0.35	0.13	0.01	0.18	0.37	0.12	0.18	-0.20	-0.11	1.03
1962	-0.09	0.05	0.07	0.07	0.38	-0.19	0.28	0.41	-0.01	-0.01	-0.08	0.09	0.97
1963	0.05	0.14	0.22	0.12	0.13	0.38	0.18	0.57	0.40	0.48	0.13	-0.01	2.79
1964	0.02	-0.01	-0.11	-0.02	0.08	0.38	0.66	0.19	-0.10	0.28	0.01	0.10	1.48
1965	0.00	-0.08	0.12	0.31	-0.22	0.23	0.56	0.50	0.13	0.24	0.02	0.04	1.85
1966	-0.09	-0.16	0.29	0.05	0.16	0.38	0.38	-0.02	0.04	0.21	0.22	-0.06	1.40
1967	0.16	0.11	0.25	-0.17	-0.06	0.46	0.24	0.51	0.01	0.06	0.12	-0.09	1.60
1968	-0.12	0.06	0.12	0.29	0.05	0.07	0.25	0.45	0.02	0.22	-0.03	0.04	1.42
1969	0.00	-0.01	0.00	0.17	0.11	0.39	0.62	0.47	0.19	-0.06	0.16	-0.17	1.87
1970	0.03	-0.10	0.10	0.11	0.22	0.30	0.53	0.43	-0.12	-0.07	0.16	0.10	1.69
1971	0.10	0.04	0.34	0.30	0.12	0.54	0.24	0.09	0.15	-0.04	0.13	-0.05	1.96
1972	0.05	0.19	0.25	0.21	0.24	0.34	0.50	0.38	0.08	-0.23	-0.08	0.00	1.93
1973	-0.06	0.02	0.06	-0.14	0.18	0.06	0.28	0.47	0.01	0.08	0.18	0.10	1.24
1974	-0.07	0.21	0.26	0.14	0.22	0.22	0.54	0.05	-0.27	0.11	0.00	0.01	1.42
1975	0.11	0.19	0.02	0.22	-0.17	0.19	0.32	0.37	0.28	0.39	0.10	0.00	2.02
1976	0.22	0.20	-0.06	-0.10	-0.09	0.14	0.22	0.45	0.09	-0.09	0.12	0.04	1.14
1977	-0.08	0.09	0.10	0.11	0.27	0.30	0.53	0.33	0.31	0.32	-0.03	0.20	2.45
1978	-0.09	-0.10	0.05	0.30	0.07	0.41	0.68	0.52	0.33	0.41	-0.34	-0.03	2.21
1979	-0.11	-0.06	0.02	0.15	-0.07	0.36	0.20	0.21	0.21	0.17	0.13	-0.11	1.10
1980	-0.09	0.09	0.17	0.19	0.02	0.36	0.77	0.75	0.01	0.20	0.09	0.07	2.63
1981	0.14	0.08	0.14	0.21	-0.16	0.27	0.41	0.45	0.30	-0.08	0.12	0.23	2.11
1982	0.01	0.02	0.19	0.12	0.19	0.10	0.35	0.35	0.40	0.09	-0.29	-0.20	1.33
1983	0.11	0.09	0.06	0.25	-0.11	0.10	0.37	0.38	0.42	0.06	0.02	-0.07	1.68
1984	-0.01	-0.02	-0.06	0.24	0.13	0.38	0.42	0.44	0.32	-0.40	0.10	0.01	1.55
1985	0.04	0.02	-0.01	0.03	0.13	0.27	0.38	0.63	0.32	-0.18	-0.14	-0.01	1.48
1986	0.21	0.13	0.30	-0.13	0.00	0.32	0.54	0.48	0.16	-0.08	-0.26	-0.05	1.62
1987	0.04	-0.05	0.12	0.42	-0.09	0.13	0.33	0.51	-0.03	0.12	-0.36	-0.28	0.86
1988	0.17	0.06	0.03	0.22	0.40	0.42	0.17	0.39	0.09	0.01	-0.20	-0.07	1.69
1989	-0.05	0.02	0.18	0.41	-0.10	0.04	-0.02	0.37	0.15	0.27	0.25	0.19	1.71
1990	-0.26	-0.04	-0.07	0.25	0.05	0.39	0.27	0.37	0.10	0.02	-0.14	-0.15	0.79
1991	-0.10	0.00	0.19	-0.19	0.01	0.21	0.41	0.30	0.17	-0.11	0.15	0.21	1.25
1992	0.15	0.09	0.29	0.15	0.34	0.04	0.20	0.43	0.02	0.31	-0.10	-0.06	1.86
1993	0.07	0.12	0.17	0.33	0.04	0.22	0.86	0.57	0.20	0.07	0.06	0.19	2.90
1994	0.05	0.07	0.27	0.08	0.06	0.31	0.13	0.25	0.20	-0.18	0.00	0.02	1.26
1995	0.17	0.01	0.03	0.12	0.05	0.31	0.33	0.49	0.00	0.37	0.21	-0.05	2.04
1996	0.06	0.39	0.13	0.22	0.28	0.20	0.04	-0.09	0.00	0.12	-0.03	0.00	1.32
1997	0.12	0.14	0.24	0.18	0.09	0.40	0.45	0.25	0.45	-0.11	-0.01	0.05	2.25
1998	-0.11	0.00	0.02	0.28	0.32	0.51	0.67	0.48	0.13	-0.01	0.04	0.12	2.45
1999	0.28	0.24	0.06	0.22	-0.02	0.24	0.55	0.67	0.33	0.27	0.21	0.11	3.16
2000	0.04	0.11	0.04	0.04	-0.06	0.06	0.43	0.61	0.38	-0.01	-0.25	0.07	1.46
2001	0.04	-0.01	0.12	0.29	0.02	0.24	0.57	0.23	-0.09	0.05	0.05	0.16	1.67
2002	-0.05	0.16	-0.08	0.12	0.06	0.28	0.21	0.31	0.24	-0.05	0.14	-0.09	1.25
2003	0.18	-0.04	0.19	0.30	0.10	0.03	0.50	0.36	0.01	0.26	0.03	0.12	2.04
2004	-0.03	-0.15	0.18	0.05	0.14	-0.26	0.28	0.28	0.37	-0.07	-0.29	0.15	0.65
2005	-0.06	0.03	0.17	0.22	0.18	0.46	0.19	0.39	0.42	0.36	0.27	0.23	2.86
2006	0.11	0.00	0.17	0.22	0.29	0.48	0.67	0.54	0.28	0.02	-0.03	-0.09	2.66
2007	0.00	0.19	0.05	0.26	-0.07	0.09	0.21	0.41	0.13	0.01	0.18	-0.03	1.43
2008	0.15	0.14	0.05	0.05	0.01	0.20	0.58	0.12	0.11	0.19	0.14	0.16	1.90
2009	0.08	0.15	-0.03	-0.16	0.12	0.32	0.08	0.20	-0.25	0.14	0.13	-0.06	0.72
2010	0.09	0.16	0.09	0.21	0.17	0.31	0.22	0.52	-0.14	0.12	-0.03	0.04	1.76
2011	0.08	0.06	0.29	0.07	0.20	0.52	0.65	0.69	0.48	0.19	0.00	-0.22	3.01
2012	-0.12	0.04	0.10	0.12	0.18	0.31	0.47	0.35	0.34	0.17	0.30	-0.02	2.24
2013	-0.08	0.01	0.14	0.15	-0.05	0.26	0.28	0.57	0.22	-0.16	-0.05	-0.04	1.25
2014	0.09	0.13	0.05	0.13	0.06	0.20	0.05	0.42	0.24	0.10	0.11	-0.06	1.52
2015	-0.11	-0.02	0.01	0.00	0.02	0.45	0.54	0.56	0.36	-0.21	-0.08	0.16	1.68
2016	0.13	0.13	0.09	-0.08	0.20	0.49	0.57	0.15	0.17	0.30	-0.03	0.07	2.19
2017	-0.03	0.08	0.16	-0.18	0.19	0.01	0.06	0.06	0.43	0.05	0.16	-0.12	0.87
2018	0.08	-0.20	0.19	0.17	0.22	0.42	0.47	0.27	-0.14	-0.05	0.05	-0.03	1.45
Total	0.94	3.02	7.60	8.78	6.97	19.38	26.15	28.22	12.42	6.41	2.04	0.56	86.72
Mean	0.01	0.05	0.11	0.12	0.10	0.27	0.37	0.40	0.18	0.09	0.03	0.01	1.73
Max	0.28	0.39	0.34	0.42	0.40	0.67	0.86	0.77	0.66	0.56	0.33	0.23	3.38
Min	-0.40	-0.21	-0.20	-0.28	-0.22	-0.26	-0.09	-0.09	-0.27	-0.40	-0.36	-0.39	0.25

Table of Final Results - Calculated Monthly Net Reservoir Evaporation Values

Quadrangle: Lake Bonham
Units: Feet
Control Point X10270

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	0.00	0.04	0.06	0.36	0.17	0.42	0.29	0.65	0.59	0.28	0.24	0.13	3.23
1949	-0.38	-0.02	-0.03	0.02	0.13	0.24	0.42	0.41	0.19	-0.28	0.28	-0.07	0.91
1950	-0.16	0.09	0.23	0.15	0.11	0.31	-0.11	0.18	0.10	0.39	0.34	0.21	1.84
1951	0.03	-0.16	0.22	0.21	0.19	0.20	0.43	0.72	0.13	0.20	0.07	0.11	2.35
1952	0.09	0.02	0.00	-0.25	0.15	0.61	0.45	0.75	0.55	0.55	-0.19	-0.16	2.57
1953	0.08	0.02	-0.05	-0.03	0.15	0.71	0.12	0.39	0.40	0.18	-0.06	-0.02	1.89
1954	-0.18	0.27	0.34	0.15	-0.13	0.42	0.70	0.71	0.36	-0.27	0.14	-0.01	2.50
1955	-0.01	-0.06	0.12	0.07	0.01	0.41	0.41	0.31	0.20	0.37	0.31	0.14	2.28
1956	0.02	-0.20	0.32	0.25	0.26	0.51	0.69	0.79	0.68	0.26	-0.08	0.03	3.53
1957	-0.07	-0.07	-0.19	-0.28	0.08	0.32	0.56	0.44	-0.14	-0.01	-0.33	0.07	0.38
1958	-0.04	0.11	-0.09	-0.12	0.28	0.19	0.33	0.33	0.03	0.17	0.00	0.02	1.21
1959	0.05	-0.03	0.21	0.18	0.15	-0.03	-0.08	0.32	0.28	-0.19	0.07	-0.09	0.84
1960	-0.03	0.02	0.12	0.22	0.17	0.24	0.17	0.20	0.06	0.03	0.12	-0.38	0.94
1961	0.06	-0.05	0.00	0.36	0.12	0.04	0.20	0.39	0.11	0.17	-0.18	-0.09	1.13
1962	-0.07	0.06	0.07	0.07	0.39	-0.21	0.26	0.40	-0.04	0.01	-0.08	0.09	0.95
1963	0.07	0.14	0.23	0.13	0.13	0.40	0.21	0.58	0.40	0.48	0.13	-0.01	2.89
1964	0.02	0.00	-0.11	0.00	0.06	0.38	0.68	0.20	-0.15	0.29	-0.01	0.11	1.47
1965	0.01	-0.06	0.13	0.31	-0.22	0.22	0.57	0.50	0.13	0.24	0.02	0.04	1.89
1966	-0.08	-0.14	0.29	0.06	0.19	0.36	0.39	-0.01	0.05	0.23	0.22	-0.05	1.51
1967	0.17	0.12	0.26	-0.17	-0.05	0.45	0.25	0.52	-0.01	0.08	0.12	-0.08	1.66
1968	-0.12	0.06	0.12	0.30	0.05	0.09	0.25	0.45	0.02	0.22	-0.02	0.06	1.48
1969	0.01	0.00	0.01	0.17	0.11	0.38	0.63	0.44	0.18	-0.06	0.16	-0.17	1.86
1970	0.03	-0.10	0.11	0.11	0.19	0.30	0.54	0.42	-0.15	-0.03	0.18	0.11	1.71
1971	0.11	0.05	0.34	0.30	0.11	0.54	0.28	0.09	0.14	-0.02	0.13	0.00	2.07
1972	0.07	0.20	0.25	0.19	0.24	0.37	0.52	0.35	0.09	-0.22	-0.08	0.01	1.99
1973	-0.06	0.02	0.10	-0.12	0.17	0.06	0.25	0.47	0.00	0.10	0.20	0.13	1.32
1974	-0.04	0.21	0.27	0.15	0.23	0.24	0.55	0.05	-0.24	0.10	0.04	0.01	1.57
1975	0.11	0.18	0.03	0.23	-0.17	0.21	0.32	0.37	0.27	0.39	0.11	0.01	2.06
1976	0.23	0.21	-0.04	-0.10	-0.10	0.15	0.24	0.43	0.12	-0.08	0.13	0.05	1.24
1977	-0.08	0.10	0.10	0.13	0.27	0.31	0.55	0.32	0.30	0.32	0.01	0.21	2.54
1978	-0.09	-0.10	0.05	0.30	0.06	0.41	0.69	0.51	0.32	0.40	-0.32	0.00	2.23
1979	-0.11	-0.05	0.01	0.15	-0.06	0.39	0.23	0.22	0.23	0.19	0.15	-0.09	1.26
1980	-0.06	0.09	0.18	0.20	0.03	0.40	0.79	0.76	0.01	0.20	0.09	0.07	2.76
1981	0.13	0.07	0.12	0.20	-0.15	0.28	0.43	0.45	0.28	-0.13	0.10	0.23	2.01
1982	0.00	0.03	0.19	0.11	0.13	0.09	0.35	0.37	0.40	0.11	-0.27	-0.18	1.33
1983	0.11	0.10	0.07	0.25	-0.12	0.09	0.38	0.38	0.43	0.05	0.01	-0.06	1.69
1984	0.00	-0.01	-0.06	0.24	0.15	0.37	0.44	0.44	0.34	-0.39	0.08	0.01	1.61
1985	0.04	0.03	0.01	0.03	0.14	0.27	0.39	0.64	0.32	-0.19	-0.13	0.02	1.57
1986	0.22	0.14	0.30	-0.13	-0.02	0.31	0.57	0.47	0.12	-0.07	-0.25	-0.05	1.61
1987	0.04	-0.06	0.14	0.42	-0.12	0.15	0.35	0.51	-0.02	0.14	-0.33	-0.26	0.96
1988	0.17	0.07	0.05	0.23	0.40	0.40	0.20	0.43	0.05	0.04	-0.14	-0.07	1.83
1989	-0.05	0.02	0.18	0.41	-0.08	0.01	0.00	0.37	0.13	0.28	0.25	0.20	1.72
1990	-0.24	-0.04	-0.05	0.22	0.07	0.40	0.31	0.38	0.13	0.04	-0.12	-0.14	0.96
1991	-0.10	0.02	0.20	-0.16	0.02	0.18	0.42	0.29	0.15	-0.12	0.16	0.18	1.24
1992	0.14	0.09	0.30	0.16	0.34	0.05	0.24	0.43	0.02	0.31	-0.09	-0.06	1.93
1993	0.06	0.09	0.17	0.34	0.04	0.20	0.86	0.57	0.19	0.09	0.07	0.19	2.87
1994	0.06	0.06	0.28	0.09	0.06	0.31	0.11	0.24	0.18	-0.21	-0.03	0.03	1.18
1995	0.17	0.01	-0.03	0.11	0.04	0.30	0.33	0.49	0.00	0.38	0.22	-0.05	1.97
1996	0.06	0.40	0.13	0.22	0.30	0.23	0.09	-0.11	0.00	0.13	-0.04	0.01	1.42
1997	0.13	0.15	0.24	0.18	0.10	0.41	0.45	0.26	0.45	-0.12	0.00	0.03	2.28
1998	-0.12	0.01	0.01	0.28	0.32	0.50	0.67	0.49	0.17	-0.01	0.03	0.12	2.47
1999	0.30	0.23	0.05	0.22	-0.05	0.24	0.55	0.66	0.32	0.26	0.22	0.07	3.07
2000	0.05	0.12	0.06	0.04	-0.03	0.05	0.45	0.62	0.39	-0.02	-0.20	0.09	1.62
2001	0.04	-0.03	0.13	0.30	0.01	0.24	0.58	0.22	-0.09	0.06	0.06	0.17	1.69
2002	-0.06	0.17	-0.09	0.11	0.06	0.27	0.20	0.30	0.24	-0.06	0.14	-0.09	1.19
2003	0.17	-0.03	0.20	0.31	0.08	0.05	0.50	0.36	-0.01	0.26	0.03	0.13	2.05
2004	-0.04	-0.14	0.19	0.04	0.16	-0.29	0.26	0.28	0.36	-0.08	-0.29	0.15	0.60
2005	-0.07	0.04	0.17	0.23	0.16	0.45	0.19	0.38	0.43	0.35	0.27	0.23	2.83
2006	0.12	0.01	0.19	0.21	0.29	0.48	0.66	0.54	0.26	0.02	-0.03	-0.08	2.67
2007	0.02	0.19	0.05	0.24	-0.09	0.03	0.22	0.41	0.15	0.02	0.19	-0.03	1.40
2008	0.16	0.15	0.07	0.08	0.03	0.22	0.59	0.14	0.14	0.21	0.15	0.16	2.10
2009	0.09	0.15	-0.01	-0.17	0.15	0.32	0.11	0.23	-0.24	0.14	0.15	-0.04	0.88
2010	0.10	0.18	0.10	0.21	0.19	0.33	0.22	0.52	-0.17	0.12	-0.01	0.05	1.84
2011	0.09	0.07	0.30	0.11	0.20	0.52	0.65	0.69	0.48	0.18	0.02	-0.18	3.13
2012	-0.12	0.06	0.10	0.12	0.19	0.29	0.48	0.37	0.35	0.17	0.30	-0.02	2.29
2013	-0.07	0.02	0.13	0.15	-0.05	0.29	0.29	0.57	0.25	-0.16	-0.04	-0.04	1.34
2014	0.10	0.14	0.04	0.14	0.10	0.22	0.05	0.43	0.26	0.10	0.12	-0.04	1.66
2015	-0.11	-0.02	0.03	0.01	-0.01	0.46	0.53	0.58	0.38	-0.21	-0.08	0.20	1.76
2016	0.13	0.14	0.11	-0.04	0.19	0.47	0.57	0.15	0.15	0.30	-0.02	0.08	2.23
2017	-0.02	0.09	0.18	-0.13	0.20	0.01	0.11	0.06	0.43	0.07	0.16	-0.10	1.06
2018	0.09	-0.17	0.19	0.18	0.23	0.43	0.48	0.26	-0.19	-0.08	0.08	-0.01	1.49
Total	1.37	3.52	8.10	9.26	7.10	19.67	27.06	28.53	12.44	6.67	2.65	1.24	90.71
Mean	0.02	0.05	0.11	0.13	0.10	0.27	0.38	0.40	0.18	0.10	0.04	0.02	1.80
Max	0.30	0.40	0.34	0.42	0.40	0.71	0.86	0.79	0.68	0.55	0.34	0.23	3.53
Min	-0.38	-0.20	-0.19	-0.28	-0.22	-0.29	-0.11	-0.11	-0.24	-0.39	-0.33	-0.38	0.38

Table of Final Results - Calculated Monthly Net Reservoir Evaporation Values

Quadrangle: Valley
Units: Feet
Control Point X10490

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	0.04	0.06	0.20	0.44	0.20	0.43	0.20	0.66	0.61	0.32	0.31	0.18	3.65
1949	-0.34	0.00	0.05	0.08	0.11	0.31	0.57	0.48	0.17	-0.20	0.30	-0.08	1.45
1950	-0.12	0.20	0.30	0.23	0.13	0.39	-0.17	0.14	0.19	0.46	0.37	0.21	2.33
1951	0.09	-0.12	0.28	0.25	0.18	0.18	0.52	0.78	0.32	0.21	0.08	0.17	2.94
1952	0.13	0.06	0.03	-0.18	0.26	0.74	0.59	0.80	0.49	0.53	-0.15	-0.11	3.19
1953	0.13	0.06	-0.01	0.06	0.34	0.83	0.32	0.49	0.44	0.10	-0.05	0.09	2.80
1954	-0.15	0.29	0.35	0.13	-0.09	0.36	0.73	0.69	0.37	-0.23	0.17	-0.01	2.61
1955	0.01	-0.05	0.11	0.09	0.00	0.39	0.45	0.43	0.18	0.39	0.33	0.14	2.47
1956	0.03	-0.17	0.35	0.26	0.27	0.58	0.71	0.86	0.72	0.26	-0.01	0.02	3.88
1957	-0.04	-0.07	-0.15	-0.29	0.04	0.41	0.58	0.50	-0.08	0.05	-0.34	0.10	0.71
1958	-0.03	0.11	-0.08	-0.07	0.27	0.26	0.44	0.41	0.09	0.18	0.04	0.04	1.66
1959	0.06	0.02	0.21	0.20	0.17	-0.01	-0.05	0.35	0.28	-0.23	0.07	-0.06	1.01
1960	0.00	0.03	0.12	0.19	0.16	0.30	0.14	0.23	0.11	0.05	0.13	-0.36	1.10
1961	0.07	-0.03	0.02	0.38	0.10	0.10	0.24	0.43	0.09	0.14	-0.14	-0.06	1.34
1962	-0.01	0.08	0.09	0.06	0.40	-0.26	0.23	0.39	-0.10	0.07	-0.08	0.07	0.94
1963	0.11	0.14	0.25	0.13	0.10	0.44	0.27	0.59	0.39	0.49	0.15	-0.01	3.05
1964	0.02	0.02	-0.11	0.05	0.02	0.36	0.72	0.24	-0.27	0.31	-0.06	0.11	1.41
1965	0.02	-0.01	0.17	0.32	-0.21	0.19	0.58	0.50	0.12	0.23	0.01	0.06	1.98
1966	-0.03	-0.08	0.29	0.10	0.26	0.30	0.42	0.02	0.08	0.28	0.22	-0.02	1.84
1967	0.20	0.15	0.27	-0.17	-0.03	0.43	0.30	0.55	-0.07	0.15	0.13	-0.05	1.86
1968	-0.13	0.07	0.11	0.31	0.04	0.13	0.24	0.46	0.01	0.22	0.02	0.10	1.58
1969	0.02	0.04	0.05	0.18	0.12	0.35	0.65	0.38	0.16	-0.08	0.18	-0.17	1.88
1970	0.02	-0.09	0.14	0.11	0.14	0.30	0.55	0.41	-0.24	0.04	0.21	0.13	1.72
1971	0.11	0.08	0.36	0.29	0.10	0.54	0.38	0.07	0.12	0.02	0.13	0.11	2.31
1972	0.09	0.20	0.26	0.14	0.23	0.44	0.55	0.30	0.11	-0.19	-0.05	0.05	2.13
1973	-0.05	0.02	0.20	-0.07	0.15	0.06	0.20	0.49	0.00	0.13	0.25	0.20	1.58
1974	0.04	0.22	0.28	0.18	0.25	0.29	0.57	0.05	-0.17	0.07	0.13	0.03	1.94
1975	0.11	0.17	0.05	0.25	-0.16	0.26	0.31	0.36	0.25	0.39	0.12	0.03	2.14
1976	0.23	0.22	0.02	-0.10	-0.13	0.17	0.31	0.40	0.19	-0.06	0.14	0.08	1.47
1977	-0.07	0.12	0.09	0.16	0.26	0.34	0.60	0.30	0.30	0.34	0.10	0.23	2.77
1978	-0.07	-0.11	0.07	0.30	0.03	0.41	0.72	0.48	0.31	0.38	-0.29	0.08	2.31
1979	-0.09	-0.04	0.00	0.16	-0.01	0.46	0.29	0.24	0.29	0.24	0.19	-0.05	1.68
1980	-0.01	0.10	0.18	0.25	0.06	0.51	0.83	0.80	-0.01	0.20	0.10	0.07	3.08
1981	0.12	0.05	0.09	0.18	-0.13	0.32	0.46	0.45	0.24	-0.25	0.04	0.23	1.80
1982	-0.02	0.05	0.20	0.11	-0.03	0.07	0.37	0.41	0.40	0.16	-0.23	-0.13	1.36
1983	0.10	0.11	0.08	0.25	-0.14	0.06	0.39	0.39	0.44	0.02	-0.01	-0.03	1.66
1984	0.02	0.00	-0.05	0.25	0.18	0.33	0.51	0.45	0.41	-0.38	0.05	-0.01	1.76
1985	0.03	0.05	0.06	0.03	0.18	0.26	0.40	0.66	0.32	-0.21	-0.09	0.08	1.77
1986	0.23	0.15	0.31	-0.13	-0.09	0.29	0.66	0.44	0.04	-0.04	-0.21	-0.04	1.61
1987	0.07	-0.08	0.17	0.43	-0.21	0.18	0.38	0.53	0.00	0.19	-0.25	-0.21	1.20
1988	0.18	0.10	0.10	0.26	0.39	0.35	0.27	0.51	-0.04	0.12	-0.01	-0.07	2.16
1989	-0.05	0.02	0.17	0.43	-0.03	-0.05	0.04	0.39	0.09	0.31	0.25	0.22	1.79
1990	-0.19	-0.06	0.00	0.13	0.13	0.44	0.39	0.39	0.20	0.10	-0.08	-0.13	1.32
1991	-0.09	0.06	0.21	-0.09	0.03	0.09	0.47	0.28	0.10	-0.18	0.27	0.13	1.28
1992	0.15	0.11	0.27	0.25	-0.12	-0.06	0.19	0.37	0.02	0.31	-0.06	-0.01	1.42
1993	0.01	-0.19	0.05	0.16	0.14	0.23	0.86	0.59	0.16	0.10	0.05	-0.04	2.12
1994	0.04	0.01	0.15	0.08	-0.16	0.31	-0.07	0.23	0.12	-0.26	-0.03	-0.04	0.38
1995	0.03	0.00	-0.07	-0.04	-0.18	0.23	0.32	0.48	-0.03	0.39	0.22	-0.05	1.30
1996	0.07	0.40	0.12	0.21	0.36	0.28	0.22	-0.17	0.01	0.17	0.13	0.00	1.80
1997	0.15	-0.07	0.21	0.02	0.15	0.19	0.44	0.29	0.45	-0.16	0.02	-0.16	1.53
1998	-0.09	-0.03	0.12	0.28	0.32	0.47	0.67	0.49	0.27	-0.15	-0.13	-0.33	1.89
1999	0.15	0.22	0.02	0.27	-0.12	0.24	0.57	0.63	0.32	0.23	0.23	-0.05	2.71
2000	0.08	0.15	0.02	0.07	0.00	-0.13	0.51	0.64	0.41	-0.04	-0.21	-0.05	1.45
2001	-0.02	-0.19	0.10	0.16	0.01	0.24	0.60	0.20	-0.11	0.12	0.09	-0.14	1.06
2002	-0.09	0.15	0.00	0.10	0.03	0.24	0.19	0.27	0.25	-0.34	0.14	-0.13	0.81
2003	0.16	-0.06	0.22	0.32	0.04	0.04	0.52	0.35	-0.06	0.27	0.02	0.13	1.95
2004	-0.05	-0.13	0.20	0.04	0.19	-0.11	0.24	0.26	0.34	-0.10	-0.21	0.16	0.83
2005	0.02	0.05	0.16	0.25	0.12	0.42	0.19	0.36	0.45	0.33	0.28	0.23	2.86
2006	0.15	0.02	-0.02	0.18	0.31	0.48	0.65	0.53	0.22	0.01	-0.01	-0.06	2.46
2007	-0.02	0.17	0.04	0.18	-0.28	0.18	0.05	0.36	0.19	0.03	0.22	-0.07	1.05
2008	0.17	0.01	-0.17	0.08	0.07	0.28	0.59	0.18	0.21	0.27	0.15	0.16	2.00
2009	0.11	0.18	0.02	-0.02	-0.07	0.35	0.18	0.30	-0.24	-0.15	0.14	-0.04	0.76
2010	0.02	0.11	0.12	0.21	0.23	0.38	0.21	0.54	-0.10	0.13	0.02	0.07	1.94
2011	0.10	0.12	0.32	0.20	-0.01	0.51	0.65	0.69	0.48	0.14	0.06	-0.03	3.23
2012	-0.07	0.07	0.02	0.14	0.21	0.26	0.52	0.40	0.36	0.18	0.30	-0.01	2.38
2013	-0.07	0.05	0.10	0.18	-0.07	0.35	0.31	0.57	0.32	-0.15	-0.02	-0.04	1.53
2014	0.11	0.15	0.01	0.17	0.19	0.25	0.11	0.47	0.33	0.12	0.13	0.00	2.04
2015	-0.10	0.01	0.02	0.30	0.07	0.39	0.50	0.64	0.43	-0.17	-0.24	0.13	1.98
2016	0.08	0.16	0.13	-0.06	0.18	0.40	0.56	0.14	0.09	0.30	0.00	0.10	2.08
2017	0.03	0.13	0.21	-0.01	0.22	0.02	0.16	0.01	0.43	0.11	0.18	-0.09	1.40
2018	0.12	-0.17	0.06	0.18	0.21	0.46	0.51	0.23	-0.44	-0.18	0.13	-0.10	1.01
Total	2.03	3.57	8.32	10.17	6.08	20.23	28.78	29.23	12.53	6.61	4.04	0.90	96.96
Mean	0.03	0.05	0.12	0.14	0.08	0.28	0.40	0.41	0.19	0.10	0.06	0.01	1.88
Max	0.23	0.40	0.36	0.44	0.40	0.83	0.86	0.86	0.72	0.53	0.37	0.23	3.88
Min	-0.34	-0.19	-0.17	-0.29	-0.28	-0.26	-0.17	-0.17	-0.44	-0.38	-0.34	-0.36	0.38

Table of Final Results - Calculated Monthly Net Reservoir Evaporation Values

Quadrangle: Lake Crook
Units: Feet
Control Point Y10330

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1948	-0.03	-0.06	-0.16	0.26	0.17	0.38	0.43	0.63	0.56	0.20	0.13	0.05	2.56
1949	-0.36	-0.03	-0.13	-0.09	0.12	0.10	0.15	0.28	0.23	-0.41	0.24	-0.04	0.06
1950	0.05	0.09	0.06	-0.09	0.10	0.12	0.05	0.19	-0.01	0.23	0.27	0.20	1.26
1951	-0.08	-0.09	0.09	0.15	0.20	0.43	0.24	0.63	-0.21	0.19	0.07	0.01	1.63
1952	0.01	-0.05	-0.02	-0.06	-0.02	0.39	0.19	0.66	0.64	0.58	-0.22	-0.24	1.86
1953	0.00	-0.06	-0.04	0.00	-0.25	0.49	-0.18	0.23	0.34	0.33	-0.06	-0.16	0.64
1954	-0.16	0.26	0.30	0.18	0.00	0.52	0.65	0.75	0.33	-0.18	0.12	-0.02	2.75
1955	-0.04	-0.07	0.23	0.10	0.05	0.45	0.37	0.11	0.25	0.36	0.27	0.12	2.20
1956	0.00	-0.06	0.27	0.23	0.29	0.39	0.64	0.68	0.61	0.26	-0.19	0.05	3.17
1957	-0.11	-0.05	-0.17	0.04	0.16	0.26	0.51	0.36	-0.16	-0.08	-0.10	-0.01	0.65
1958	-0.04	0.06	-0.01	-0.04	0.30	0.20	0.15	0.19	-0.10	0.14	-0.08	-0.03	0.74
1959	0.04	-0.13	0.21	0.15	0.12	0.08	0.07	0.30	0.30	-0.07	0.08	-0.06	1.09
1960	-0.08	0.02	0.16	0.25	0.21	0.24	0.26	0.19	0.03	0.12	0.12	0.03	1.55
1961	0.05	-0.07	0.09	0.30	0.14	-0.09	0.13	0.30	0.16	0.20	-0.24	-0.11	0.86
1962	-0.12	0.04	0.08	0.06	0.36	0.04	0.33	0.42	-0.03	-0.04	0.15	0.04	1.33
1963	0.02	0.14	0.19	0.09	0.15	0.31	0.10	0.56	0.41	0.46	0.10	-0.01	2.52
1964	0.03	-0.04	-0.07	-0.04	0.16	0.42	0.60	0.14	-0.07	0.24	0.00	0.08	1.45
1965	0.00	-0.04	0.06	0.29	-0.10	0.25	0.53	0.50	0.06	0.24	0.02	0.01	1.82
1966	-0.16	-0.27	0.27	0.29	0.08	0.46	0.33	-0.04	0.02	0.15	0.22	-0.10	1.25
1967	0.11	0.07	0.21	0.05	0.02	0.49	0.18	0.46	-0.02	0.03	0.12	-0.01	1.71
1968	-0.12	0.07	0.17	0.14	0.11	0.20	0.34	0.44	0.04	0.22	-0.08	0.01	1.54
1969	0.10	-0.07	-0.02	0.10	0.02	0.42	0.59	0.55	0.22	0.00	0.13	-0.09	1.95
1970	0.04	0.06	0.16	0.11	0.30	0.29	0.51	0.45	0.01	-0.05	0.14	0.07	2.09
1971	0.10	0.02	0.32	0.31	0.13	0.54	0.10	0.17	0.18	0.22	0.12	-0.51	1.70
1972	0.01	0.18	0.24	0.27	0.26	0.25	0.46	0.46	0.04	-0.26	-0.11	-0.03	1.77
1973	-0.07	0.03	-0.05	-0.11	0.20	-0.02	0.34	0.45	-0.27	0.09	0.13	-0.02	0.70
1974	-0.13	0.17	0.23	0.09	0.22	0.24	0.52	0.04	-0.41	0.03	-0.11	-0.05	0.84
1975	0.06	0.17	0.01	0.18	-0.05	0.10	0.35	0.37	0.30	0.38	0.09	-0.03	1.93
1976	0.22	0.18	-0.13	-0.05	-0.05	0.26	0.22	0.49	-0.02	-0.09	0.11	0.04	1.18
1977	-0.12	0.06	0.04	0.05	0.27	0.27	0.47	0.24	0.31	0.30	-0.16	0.17	1.90
1978	-0.11	-0.08	0.03	0.26	0.08	0.42	0.64	0.57	0.35	0.44	-0.36	-0.05	2.19
1979	0.00	-0.06	0.10	0.12	-0.13	0.30	0.13	0.20	0.14	0.10	0.08	-0.10	0.88
1980	-0.14	0.12	0.17	0.12	0.00	0.22	0.72	0.69	0.02	0.15	0.08	0.07	2.22
1981	0.16	0.11	0.17	0.23	-0.17	0.32	0.37	0.46	0.38	-0.12	0.24	0.21	2.36
1982	-0.01	0.00	0.17	0.17	0.28	0.08	0.32	0.29	0.41	0.03	-0.33	-0.36	1.05
1983	0.08	0.11	0.10	0.24	-0.05	0.16	0.42	0.36	0.41	0.09	0.04	-0.12	1.84
1984	-0.04	0.13	0.04	0.27	0.12	0.43	0.32	0.43	0.23	-0.41	0.15	-0.05	1.62
1985	0.05	-0.11	0.05	0.06	0.11	0.30	0.37	0.60	0.32	-0.11	-0.10	-0.04	1.50
1986	0.18	-0.02	0.26	-0.05	0.09	0.09	0.46	0.53	0.29	-0.08	-0.07	-0.02	1.66
1987	0.03	0.03	0.09	0.38	-0.04	-0.01	0.31	0.49	0.11	0.12	-0.12	-0.15	1.24
1988	0.13	0.03	-0.01	0.22	0.40	0.48	0.07	0.27	0.23	-0.09	-0.33	-0.03	1.37
1989	-0.06	0.12	0.11	0.29	-0.15	0.34	0.03	0.34	0.23	0.24	0.25	0.16	1.90
1990	-0.19	0.10	-0.19	0.07	-0.08	0.34	0.16	0.36	0.00	0.00	-0.16	-0.12	0.29
1991	0.10	-0.02	0.20	-0.09	-0.01	0.40	0.35	0.31	0.23	0.01	0.07	0.26	1.81
1992	0.21	0.05	0.19	0.16	0.15	0.03	-0.06	0.40	0.05	0.31	-0.13	-0.05	1.31
1993	0.09	0.21	0.12	0.11	0.14	0.32	0.85	0.55	0.25	-0.12	0.05	0.19	2.76
1994	0.03	0.08	0.32	0.08	0.14	0.39	0.11	0.30	0.28	-0.09	0.14	0.00	1.78
1995	0.13	0.01	0.23	0.09	0.13	0.29	0.34	0.50	0.00	0.36	0.21	-0.02	2.27
1996	0.04	0.39	0.14	0.21	0.19	0.15	-0.13	0.03	0.00	0.14	-0.05	-0.03	1.08
1997	0.08	-0.06	0.24	0.10	0.07	0.17	0.47	0.21	0.44	-0.08	-0.03	-0.04	1.57
1998	-0.05	-0.04	0.15	0.26	0.31	0.54	0.67	0.47	0.04	-0.05	0.10	0.04	2.44
1999	0.22	0.27	0.10	0.24	0.12	0.23	0.53	0.72	0.33	0.32	0.20	0.32	3.60
2000	-0.01	0.07	-0.01	0.05	0.03	0.14	0.36	0.58	0.35	0.03	-0.32	0.07	1.34
2001	0.14	0.15	0.14	0.22	0.09	0.24	0.53	0.30	-0.04	0.10	0.04	0.16	2.07
2002	0.19	0.19	0.25	0.22	0.14	0.32	0.28	0.38	0.24	0.16	0.19	0.06	2.62
2003	0.18	0.08	0.20	0.29	0.20	0.03	0.48	0.38	0.09	0.25	0.06	0.12	2.36
2004	0.03	-0.10	0.22	0.06	0.10	-0.14	0.34	0.32	0.41	-0.04	-0.17	0.17	1.20
2005	0.13	0.05	0.21	0.20	0.23	0.50	0.20	0.42	0.39	0.39	0.26	0.23	3.21
2006	0.06	-0.02	0.03	0.26	0.26	0.48	0.68	0.56	0.34	0.02	-0.02	-0.17	2.48
2007	-0.01	0.16	0.06	0.20	-0.06	0.31	0.34	0.37	0.09	0.04	0.14	0.00	1.64
2008	0.12	0.11	0.25	-0.07	-0.08	0.12	0.57	0.06	-0.01	0.10	0.14	0.16	1.47
2009	0.05	0.12	-0.05	-0.02	-0.07	0.34	0.00	0.11	-0.22	0.02	0.13	-0.05	0.36
2010	0.13	0.08	0.14	0.21	0.10	0.24	0.21	0.50	-0.05	0.10	-0.08	0.01	1.59
2011	0.06	0.00	0.25	-0.03	0.08	0.53	0.64	0.68	0.48	0.24	-0.06	-0.35	2.52
2012	-0.06	0.00	0.14	0.10	0.16	0.37	0.42	0.30	0.32	0.16	0.30	-0.03	2.18
2013	-0.09	-0.04	0.16	0.12	-0.01	0.21	0.25	0.57	0.12	-0.18	-0.08	0.01	1.04
2014	0.07	0.11	0.09	0.09	0.08	0.15	0.09	0.38	0.20	0.13	0.10	-0.09	1.40
2015	-0.02	0.03	0.19	-0.09	-0.08	0.37	0.54	0.47	0.29	-0.17	0.16	0.15	1.84
2016	0.10	0.13	0.05	0.05	0.18	0.34	0.58	0.16	0.24	0.29	-0.05	0.04	2.11
2017	-0.05	0.05	0.12	-0.27	0.16	0.04	0.09	-0.02	0.41	-0.01	0.14	-0.14	0.52
2018	0.04	-0.14	0.28	0.13	0.18	0.38	0.43	0.32	-0.20	0.09	0.00	-0.03	1.48
Total	1.21	2.93	8.09	8.47	7.06	19.44	24.11	27.12	11.93	6.67	2.09	-0.25	81.84
Mean	0.02	0.04	0.11	0.12	0.10	0.27	0.34	0.38	0.17	0.09	0.03	0.00	1.68
Max	0.22	0.39	0.32	0.38	0.40	0.54	0.85	0.75	0.64	0.58	0.30	0.32	3.17
Min	-0.36	-0.27	-0.19	-0.27	-0.25	-0.14	-0.18	-0.04	-0.41	-0.41	-0.36	-0.51	0.06

Appendix K
Response to TCEQ Comments

Appendix K – Response to TCEQ Comments

TCEQ provided review comments on August 24, 2021. The comments are provided below with the response in italics.

REPORT:

- There are typographical errors in the report that should be reviewed and corrected. (see for example the sentence at the top of Page 22).

  We apologize for any typographical errors. These have been corrected. A tracked changes version of the final report has been provided with the electronic submittal so that these changes can be identified.

- Table 12: Summary of Changes by Control Point page 35 –Row NF-SH, the WAM Control Point (Texas) should be CP 10095.

  This entry has been changed from n/a to 10095.

- If "recommended" changes to the WAM input files were indicated in the report but these changes were incorporated into the WAM input files delivered to TCEQ, the report text should be revised to indicate that the change was made:
  - Revise the discussion of U10021 on Page 33. The report indicates that it may be necessary to add this control point; however, U10021 is included in the new .flo files.
  - Discussion in Section 5.3 related to incorporation of changes to implement Section 4.01 of the Red River Compact.

  This section has been updated to reflect all changes made to the model. In addition, the instream flow requirements for the water right on Buck Creek (COA 02-5223) were not made in the last submission. The final submission includes these changes.

WORKBOOKS:

The worksheet "links" in all workbooks does not appear to be functioning correctly.

We apologize for not providing sufficient information to run these macros. Appendix L contains a memo that describes how to use the macros, as well as a recommended procedure for updating the naturalized flows as recommended by IPR Andres Salazar. Please note that these macros are designed to facilitate updating links and may not work in all situations.

WAM UPDATES:

- Review the new channel loss factors in the WAM to ensure they are consistent with the new losses shown in Table 8.

  The updated loss factors in the WAM match the loss factors in Table 8, although there are some small rounding errors because of the need to distribute the losses to multiple control points. Attached to this Appendix is a Tables output that shows the cumulative delivery factors for each primary control point, which match the delivery factors in Table 8 (except for the rounding errors). Please note that the factors in Table 8 apply to the watershed <u>upstream</u> of the associated control

point, while in the WAM input the losses on the CP record apply downstream of the control point. The report text has been clarified to address this issue.

- Review the revised naturalized flows from the workbooks to ensure they are consistent with the most recent versions of the WAM input files

  The naturalized flows should match the associated workbooks. We apologize for the confusion associated with earlier submittals.

- There are multiple January 1948 values in the WAM .eva file that do not match the values for January 1948 within the workbooks (305, 309, 413.xlsb)

  These have been corrected in the final submittal.

- The workbook (FA Flows) shows a flow adjustment at W10050; however, the WAM input .fad records indicate that these flows are added at CP OK1000. A note in the workbook would be helpful to avoid confusion.

  The FA Flows workbook has been updated to reflect having the FA flows at OK1000. Some explanatory text has been added to the report, and sections discussing FA flows have also been updated.

Attachment K-1: Tables Output with Loss and Delivery Factors

```
1CPT Record KK Option 7
CP, Channel Loss Factor, Delivery Factor,
and Cumulative Delivery Factor from CP A10000

A10000   0.00000   1.00000   1.00000

1CPT Record KK Option 7
CP, Channel Loss Factor, Delivery Factor,
and Cumulative Delivery Factor from CP 10095

10095    0.00000   1.00000   1.00000

1CPT Record KK Option 7
CP, Channel Loss Factor, Delivery Factor,
and Cumulative Delivery Factor from CP B10060

B10060   0.00000   1.00000   1.00000
B10000   0.00000   1.00000   1.00000

1CPT Record KK Option 7
CP, Channel Loss Factor, Delivery Factor,
and Cumulative Delivery Factor from CP B10000

B10000   0.00000   1.00000   1.00000

1CPT Record KK Option 7
CP, Channel Loss Factor, Delivery Factor,
and Cumulative Delivery Factor from CP C10000

C10000   0.00000   1.00000   1.00000
D10000   0.00000   1.00000   1.00000
H10000   0.00000   1.00000   0.61943
U10000   0.00000   1.00000   0.61943
V10000   0.00000   1.00000   0.61943
W10000   0.00000   1.00000   0.61943
X10000   0.00000   1.00000   0.61943
Y10000   0.00000   1.00000   0.61943

1CPT Record KK Option 7
CP, Channel Loss Factor, Delivery Factor,
and Cumulative Delivery Factor from CP D10000

D10000   0.00000   1.00000   1.00000
H10000   0.00000   1.00000   0.61943
U10000   0.00000   1.00000   0.61943
V10000   0.00000   1.00000   0.61943
W10000   0.00000   1.00000   0.61943
X10000   0.00000   1.00000   0.61943
Y10000   0.00000   1.00000   0.61943

1CPT Record KK Option 7
CP, Channel Loss Factor, Delivery Factor,
and Cumulative Delivery Factor from CP E10000

E10000   0.01900   0.98100   1.00000
H10000   0.00000   1.00000   0.61954
U10000   0.00000   1.00000   0.61954
V10000   0.00000   1.00000   0.61954
W10000   0.00000   1.00000   0.61954
X10000   0.00000   1.00000   0.61954
Y10000   0.00000   1.00000   0.61954
```

```
1CPT Record KK Option 7
CP, Channel Loss Factor, Delivery Factor,
and Cumulative Delivery Factor from CP F10000

F10000   0.52250   0.47750   1.00000
G10000   0.02090   0.97910   0.47750
H10000   0.00000   1.00000   0.29584
U10000   0.00000   1.00000   0.29584
V10000   0.00000   1.00000   0.29584
W10000   0.00000   1.00000   0.29584
X10000   0.00000   1.00000   0.29584
Y10000   0.00000   1.00000   0.29584

1CPT Record KK Option 7
CP, Channel Loss Factor, Delivery Factor,
and Cumulative Delivery Factor from CP G10000

G10000   0.02090   0.97910   1.00000
H10000   0.00000   1.00000   0.61955
U10000   0.00000   1.00000   0.61955
V10000   0.00000   1.00000   0.61955
W10000   0.00000   1.00000   0.61955
X10000   0.00000   1.00000   0.61955
Y10000   0.00000   1.00000   0.61955

1CPT Record KK Option 7
CP, Channel Loss Factor, Delivery Factor,
and Cumulative Delivery Factor from CP H10000

H10000   0.00000   1.00000   1.00000
U10000   0.00000   1.00000   1.00000
V10000   0.00000   1.00000   1.00000
W10000   0.00000   1.00000   1.00000
X10000   0.00000   1.00000   1.00000
Y10000   0.00000   1.00000   1.00000

1CPT Record KK Option 7
CP, Channel Loss Factor, Delivery Factor,
and Cumulative Delivery Factor from CP I10000

I10000   0.00000   1.00000   1.00000
J10000   0.07310   0.92690   0.80000
M10000   0.07430   0.92570   0.72002
N10000   0.03930   0.96070   0.57602
P10000   0.00000   1.00000   0.46081
Q10000   0.00000   1.00000   0.46081
U10000   0.00000   1.00000   0.46081
V10000   0.00000   1.00000   0.46081
W10000   0.00000   1.00000   0.46081
X10000   0.00000   1.00000   0.46081
Y10000   0.00000   1.00000   0.46081

1CPT Record KK Option 7
CP, Channel Loss Factor, Delivery Factor,
and Cumulative Delivery Factor from CP J10000

J10000   0.07310   0.92690   1.00000
M10000   0.07430   0.92570   0.90002
N10000   0.03930   0.96070   0.72002
P10000   0.00000   1.00000   0.57601
Q10000   0.00000   1.00000   0.57601
U10000   0.00000   1.00000   0.57601
```

```
V10000   0.00000   1.00000   0.57601
W10000   0.00000   1.00000   0.57601
X10000   0.00000   1.00000   0.57601
Y10000   0.00000   1.00000   0.57601

1CPT Record KK Option 7
CP, Channel Loss Factor, Delivery Factor,
and Cumulative Delivery Factor from CP K10000

K10000   0.10558   0.89442   1.00000
L10000   0.07310   0.92690   0.80000
M10000   0.07430   0.92570   0.72001
N10000   0.03930   0.96070   0.57601
P10000   0.00000   1.00000   0.46081
Q10000   0.00000   1.00000   0.46081
U10000   0.00000   1.00000   0.46081
V10000   0.00000   1.00000   0.46081
W10000   0.00000   1.00000   0.46081
X10000   0.00000   1.00000   0.46081
Y10000   0.00000   1.00000   0.46081

1CPT Record KK Option 7
CP, Channel Loss Factor, Delivery Factor,
and Cumulative Delivery Factor from CP L10000

L10000   0.07310   0.92690   1.00000
M10000   0.07430   0.92570   0.90002
N10000   0.03930   0.96070   0.72002
P10000   0.00000   1.00000   0.57601
Q10000   0.00000   1.00000   0.57601
U10000   0.00000   1.00000   0.57601
V10000   0.00000   1.00000   0.57601
W10000   0.00000   1.00000   0.57601
X10000   0.00000   1.00000   0.57601
Y10000   0.00000   1.00000   0.57601

1CPT Record KK Option 7
CP, Channel Loss Factor, Delivery Factor,
and Cumulative Delivery Factor from CP M10000

M10000   0.07430   0.92570   1.00000
N10000   0.03930   0.96070   0.80001
P10000   0.00000   1.00000   0.64000
Q10000   0.00000   1.00000   0.64000
U10000   0.00000   1.00000   0.64000
V10000   0.00000   1.00000   0.64000
W10000   0.00000   1.00000   0.64000
X10000   0.00000   1.00000   0.64000
Y10000   0.00000   1.00000   0.64000

1CPT Record KK Option 7
CP, Channel Loss Factor, Delivery Factor,
and Cumulative Delivery Factor from CP N10000

N10000   0.03930   0.96070   1.00000
P10000   0.00000   1.00000   0.79999
Q10000   0.00000   1.00000   0.79999
U10000   0.00000   1.00000   0.79999
V10000   0.00000   1.00000   0.79999
W10000   0.00000   1.00000   0.79999
X10000   0.00000   1.00000   0.79999
Y10000   0.00000   1.00000   0.79999
```

```
1CPT Record KK Option 7
CP, Channel Loss Factor, Delivery Factor,
and Cumulative Delivery Factor from CP O10000

O10000   0.09550   0.90450   1.00000
P10000   0.00000   1.00000   0.79998
Q10000   0.00000   1.00000   0.79998
U10000   0.00000   1.00000   0.79998
V10000   0.00000   1.00000   0.79998
W10000   0.00000   1.00000   0.79998
X10000   0.00000   1.00000   0.79998
Y10000   0.00000   1.00000   0.79998

1CPT Record KK Option 7
CP, Channel Loss Factor, Delivery Factor,
and Cumulative Delivery Factor from CP P10000

P10000   0.00000   1.00000   1.00000
Q10000   0.00000   1.00000   1.00000
U10000   0.00000   1.00000   1.00000
V10000   0.00000   1.00000   1.00000
W10000   0.00000   1.00000   1.00000
X10000   0.00000   1.00000   1.00000
Y10000   0.00000   1.00000   1.00000

1CPT Record KK Option 7
CP, Channel Loss Factor, Delivery Factor,
and Cumulative Delivery Factor from CP Q10000

Q10000   0.00000   1.00000   1.00000
U10000   0.00000   1.00000   1.00000
V10000   0.00000   1.00000   1.00000
W10000   0.00000   1.00000   1.00000
X10000   0.00000   1.00000   1.00000
Y10000   0.00000   1.00000   1.00000

1CPT Record KK Option 7
CP, Channel Loss Factor, Delivery Factor,
and Cumulative Delivery Factor from CP R10000

R10000   0.00000   1.00000   1.00000
S10000   0.00000   1.00000   1.00000
U10021   0.00000   1.00000   1.00000
U10000   0.00000   1.00000   1.00000
V10000   0.00000   1.00000   1.00000
W10000   0.00000   1.00000   1.00000
X10000   0.00000   1.00000   1.00000
Y10000   0.00000   1.00000   1.00000

1CPT Record KK Option 7
CP, Channel Loss Factor, Delivery Factor,
and Cumulative Delivery Factor from CP S10000

S10000   0.00000   1.00000   1.00000
U10021   0.00000   1.00000   1.00000
U10000   0.00000   1.00000   1.00000
V10000   0.00000   1.00000   1.00000
W10000   0.00000   1.00000   1.00000
X10000   0.00000   1.00000   1.00000
Y10000   0.00000   1.00000   1.00000

1CPT Record KK Option 7
CP, Channel Loss Factor, Delivery Factor,
```

```
and Cumulative Delivery Factor from CP T10000

T10000   0.00000   1.00000   1.00000
U10021   0.00000   1.00000   1.00000
U10000   0.00000   1.00000   1.00000
V10000   0.00000   1.00000   1.00000
W10000   0.00000   1.00000   1.00000
X10000   0.00000   1.00000   1.00000
Y10000   0.00000   1.00000   1.00000

1CPT Record KK Option 7
CP, Channel Loss Factor, Delivery Factor,
and Cumulative Delivery Factor from CP U10000

U10000   0.00000   1.00000   1.00000
V10000   0.00000   1.00000   1.00000
W10000   0.00000   1.00000   1.00000
X10000   0.00000   1.00000   1.00000
Y10000   0.00000   1.00000   1.00000

1CPT Record KK Option 7
CP, Channel Loss Factor, Delivery Factor,
and Cumulative Delivery Factor from CP V10000

V10000   0.00000   1.00000   1.00000
W10000   0.00000   1.00000   1.00000
X10000   0.00000   1.00000   1.00000
Y10000   0.00000   1.00000   1.00000

1CPT Record KK Option 7
CP, Channel Loss Factor, Delivery Factor,
and Cumulative Delivery Factor from CP W10000

W10000   0.00000   1.00000   1.00000
X10000   0.00000   1.00000   1.00000
Y10000   0.00000   1.00000   1.00000

1CPT Record KK Option 7
CP, Channel Loss Factor, Delivery Factor,
and Cumulative Delivery Factor from CP BODARC

BODARC   0.00000   1.00000   1.00000
X10000   0.00000   1.00000   1.00000
Y10000   0.00000   1.00000   1.00000

1CPT Record KK Option 7
CP, Channel Loss Factor, Delivery Factor,
and Cumulative Delivery Factor from CP X10000

X10000   0.00000   1.00000   1.00000
Y10000   0.00000   1.00000   1.00000
```

Appendix L
Updating Naturalized Flow Workbooks

MEMORANDUM

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TO: Kathy Alexander, TCEQ

FROM: Jon Albright

SUBJECT: Update Procedure for Red River WAM Workbooks

DATE: 8/31/2021

PROJECT: TCEQ Contract 582-20-13330 FNI Project TCQ20325

This memorandum contains a brief description of the processes for:

- Updating links for the naturalized flow workbooks and
- Making changes to the naturalized flows.

Two sets of naturalized flow workbooks have been provided. One set consists of mostly Excel binary workbooks with macros and links to other workbooks. A second set contains standard Excel format workbooks with no macros and without links. When updating workbooks, it is recommended that you start with the binary format workbooks with the links. The following table lists the naming conventions used for the workbooks.

Type	Description	File Name
Naturalized Flow	Calculation of naturalized flows from gage flows, including corrections for diversions, return flows, reservoirs, negative flows, and other adjustments, as well as fills for missing data.	*20Nat_XXXX*
Water Use	Historical water use data by water right holder	*20WU_XXXX*
Return Flows	Historical return flows for more than 1 MGD of permitted discharge	*20RF_XXXX*
Content Change	Calculation of content change and evaporative loss for major reservoirs (more than 5,000 ac-ft of storage)	*RESNAME ContEvap*
Evaporation	Calculation of net evaporation rates for major reservoirs	*20RESNAME_netvap*

It is also highly recommended that the directory structure of the original workbooks be maintained. The following illustrates the first level of the directory structure. Each folder may have subfolders.

Name	Date modified	Type	Size
ContentChange	8/26/2021 11:46 A...	File folder	
Evap	8/26/2021 11:46 A...	File folder	
GageFlows	8/26/2021 11:46 A...	File folder	
NatFlow	8/27/2021 4:37 PM	File folder	
ReturnFlows	8/26/2021 11:47 A...	File folder	
WaterUse	8/26/2021 11:47 A...	File folder	

Updating Links

There are two macros included in the naturalized flow workbooks to assist with updating links which can be executed by clicking on the associated button on the Links tab.

- *List Links* writes all of the current links in the workbook, including path names, beginning in cell B5.
- *Update Links* updates the links in column B with the links in column C, skipping any blank lines.

Formulas are provided in columns E through H to assist in making the updated links. Please note that these macros require proper setup to execute and are provided to facilitate the link updating process. They will not automatically update links and may not work in all situations. Some links may need to be updated manually.

The following steps are recommended when updating links:

1) Run *List Links* to show the latest links in the workbook. Excel may have automatically updated some of the links, most likely those in the NatFlow directory.
2) Update the original root directory in cell E1. The original FNI root directory was T:\WRP\NaturalizedFlow\. This may have been altered at some point.
3) Enter the new root directory for all of the workbooks in cell E2. The formulas in columns E through H will replace the string in E1 with the string in E2.
4) The updated link should be in column H. Make the cell in column C equal to the value in column H for the links you want to update. It is not necessary to update links that are already correct, so leave those blank.
5) Click on the *Update Links* button and the macro will step through the links.
6) Click on the *List Links* button to verify the links. Do this even if the macro fails to see if any links were updated.
7) If the macro fails to update the links they can be updated manually.

This process only changes the links. To change the values, open the linked workbooks.

Updating Naturalized Flows

First update the links for the naturalized flow workbooks as described in the previous section. Once the corrections have been made, it may be necessary to update the naturalized flows at downstream naturalized flow locations as well as any locations that use fills from the updated location. The recommended method is to open all naturalized flow workbooks at once. These are the files in the

NatFlow directory that begin with 20Nat. The workbook OpenFiles.xlsb contains two macros to facilitate this process:

- *OpenNatFiles* will open all naturalized flow workbooks and gives the user the option to open linked workbooks as well. This is probably not necessary for most update situations. Entering a TRUE value in cell G1 will update links on opening each file. A FALSE value will open without updating.
- *OpenNatOnly* will just open the naturalized flow workbooks, without updating any links to those workbooks in the process. This should work in most situations.

Once all the workbooks have been opened it will be necessary to manually close the files.

It should be noted that just updating the links when opening the workbooks will not guarantee that values will be updated. The files must be opened in order to fully update linked values.