

# Implementation of LSWP Bay Inflow Criteria

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## Trinity and San Jacinto Basins and Galveston Bay

## Basin and Bay Area Stakeholder Committee

May 6, 2009

Bob Brandes





# *Today's Discussion Topics*

- ◆ **Key Elements of LSWP Inflow Criteria**
- ◆ **Implementation of LSWP Inflow Criteria in WAM Water Availability Analyses**
- ◆ **Sample WAM Results from Implementing LSWP Inflow Criteria**



# *Water Provided for B&E Freshwater Inflows Is Influenced by Highland Lakes Storage*

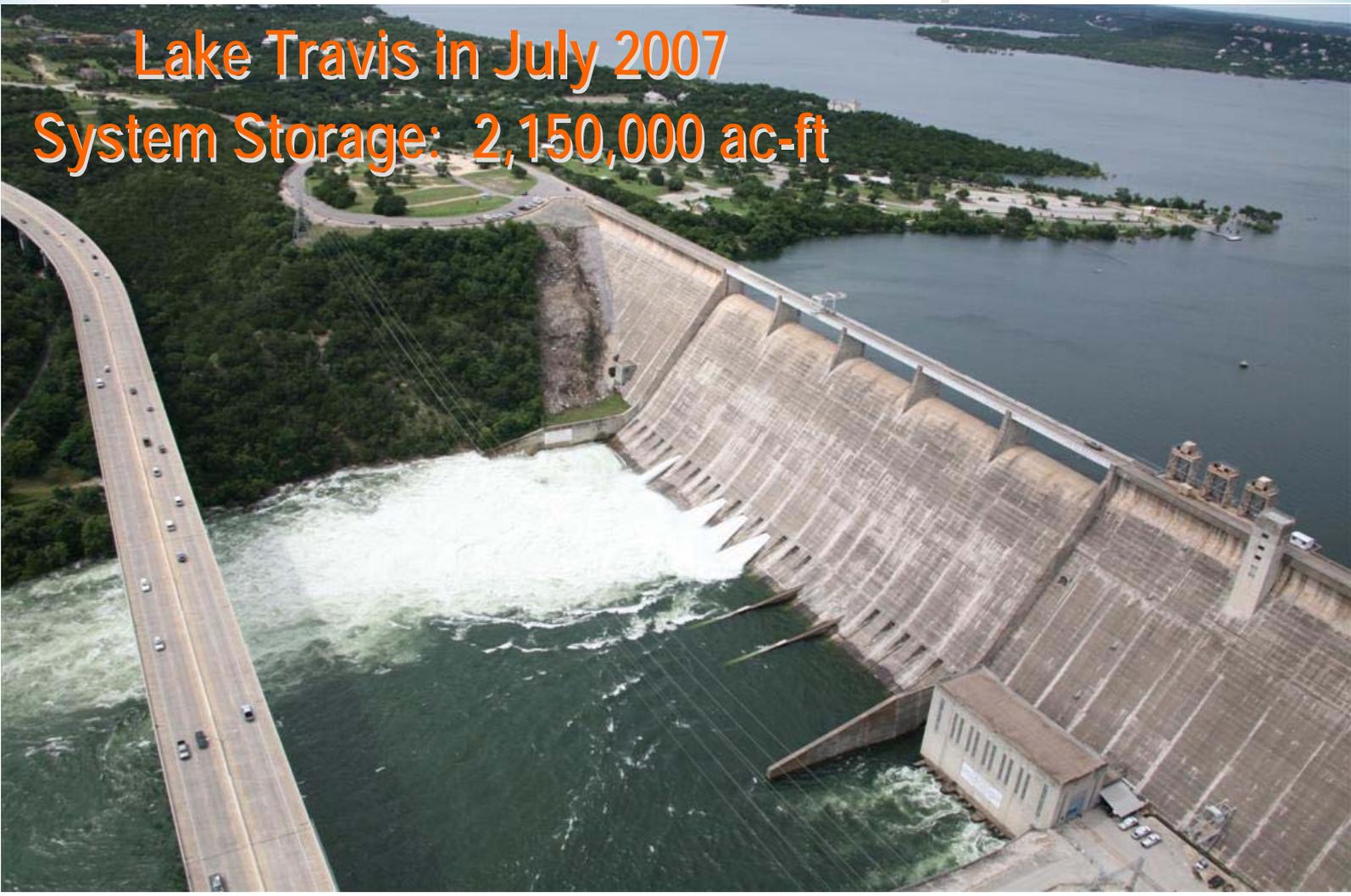
Lake Travis in January 2007  
System Storage: 1,050,000 ac-ft





# *Stored Water from Highland Lakes is Used Meet B&E Inflow Requirements*

Lake Travis in July 2007  
System Storage: 2,150,000 ac-ft



# *Key Elements of LSWP Bay Inflow Criteria*

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# LSWP Freshwater Inflow Categories

Inflow Category	Inflow Criteria	Description
LONG-TERM	Long-term Average Volume and Variability	provide <u>adequate bay food supply</u> to maintain the essential food supply and existing primary productivity of the bay system
MBHE INFLOW REGIME	MBHE 4	provide <u>inflow variability</u> and <u>support high levels of</u> primarily productivity, and <u>high quality oyster reef health</u> , benthic condition, low estuarine marsh, and shellfish and forage fish habitat.
	MBHE 3	provide <u>inflow variability</u> and <u>support quality oyster reef health</u> , benthic condition, low estuarine marsh, and shellfish and forage fish habitat.
	MBHE 2	provide <u>inflow variability</u> and <u>sustain oyster reef health</u> , benthic condition, low estuarine marsh, and shellfish and forage fish habitat
	MBHE 1	<u>maintain tolerable oyster reef health</u> , benthic character, and habitat conditions
MINIMUM	Threshold	<u>refuge</u> conditions for all species and habitats



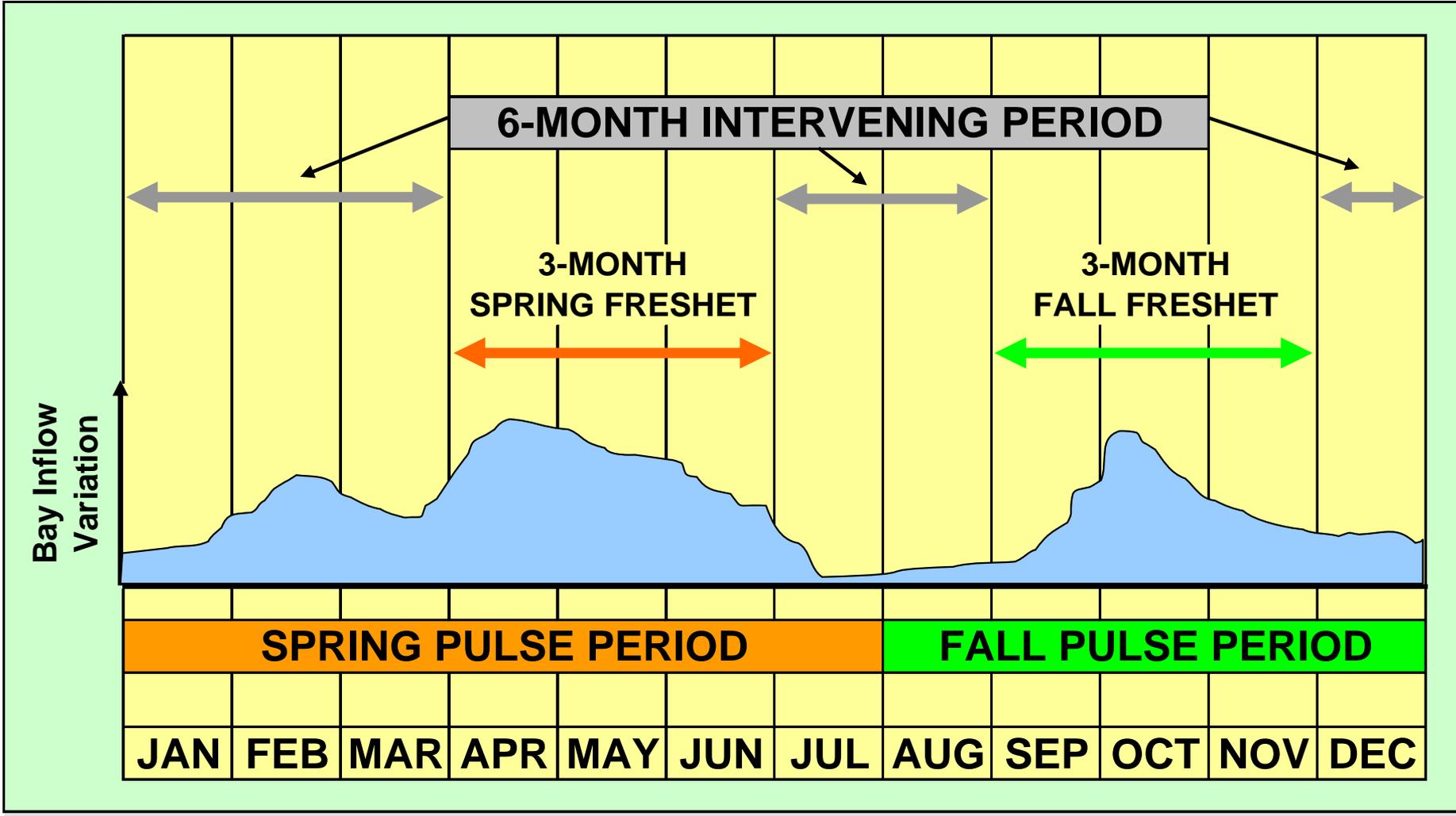
## *LSWP Bay Inflow Criteria Utilize Varying Time Intervals*

- ◆ Threshold (Minimum) – Monthly Inflows
- ◆ Base Inflow Regime – 3 Consecutive-Month Spring and Fall Pulses
- ◆ Long-Term Average Needs – Annual Inflows

Precise quantities of freshwater required for satisfying **Base Inflow Pulse** needs are not known until the end of the associated time intervals

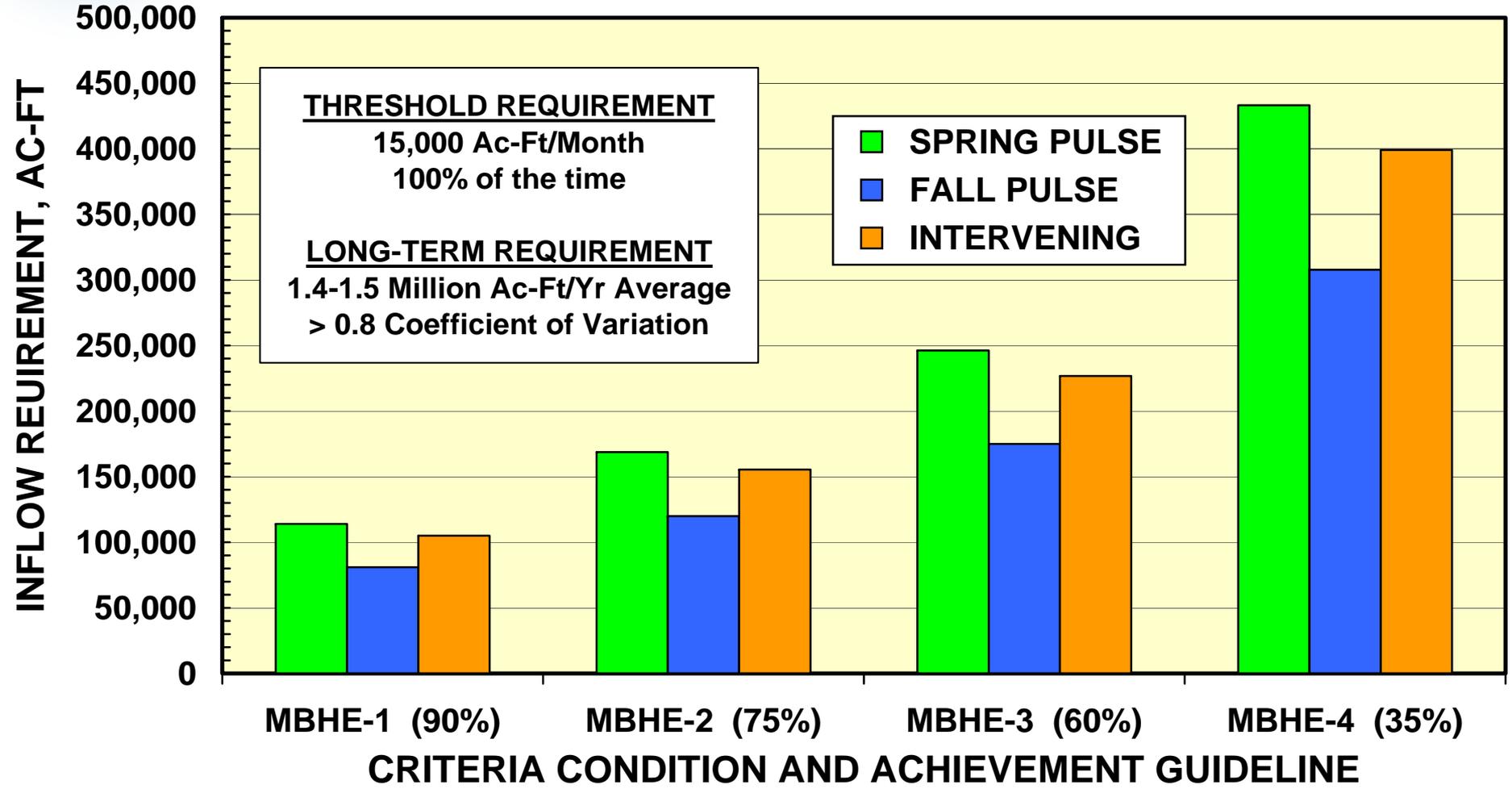


# Example of *LSWP Base Inflow Regime* Conditions





# Different Levels of MBHE Freshwater Inflow Requirements





# *LSWP Bay Inflow Criteria Include Achievement Guidelines*

- ◆ Threshold Needs – 100% of the time
- ◆ Combined MBHE-1 Needs – 90% of the time
- ◆ Combined MBHE-2 Needs – 75% of the time
- ◆ Combined MBHE-3 Needs – 60% of the time
- ◆ Combined MBHE-4 Needs – 35% of the time
- ◆ Long-Term Average Needs and Average Inflow Variation – 100% of the time

**Attaining achievement guidelines translates to definite commitments of water for B&E inflow needs**

# *Implementation of LSWP Bay Inflow Criteria in WAM Water Availability Analyses*

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## *Highland Lakes Water Released to Meet Identified Bay Inflow Needs*

- ◆ Stored Water Releases from Highland Lakes are made for Threshold, Spring and Fall Pulses, and Intervening needs for various LSWP criteria
- ◆ Achievement Guidelines for different LSWP inflow criteria can be satisfied more efficiently by capturing inflows and releasing stored water from the Highland Lakes rather than by only passing inflows to Highland Lakes

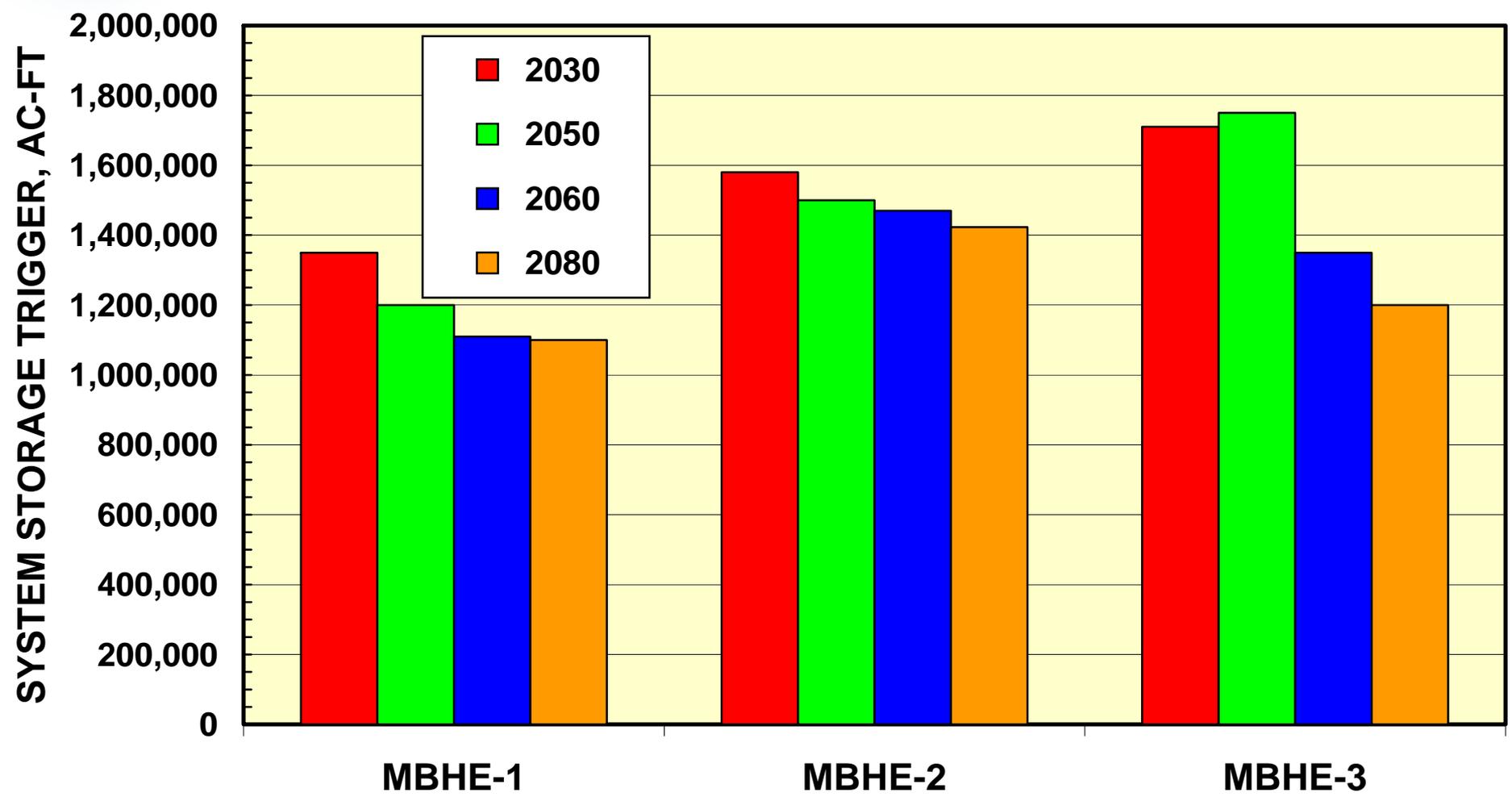


## *Highland Lakes **Storage Triggers** Used to Control Highland Lakes Releases for Satisfying Inflow Requirements*

- ◆ Threshold Needs – **Always** satisfied with Highland Lakes water – **no storage trigger**
- ◆ **MBHE-1, MBHE-2** or **MBHE-3** criteria condition for a given year is determined by **Storage Triggers** applied to Buchanan-Travis system storage on January 1
- ◆ Inflow needs for **Spring and Fall Pulses** and **Intervening** period **all** are satisfied for the engaged criteria condition during a given year



# Storage Triggers Used for LSWP Criteria





# *General Approach for Checking Needs for Different LSWP Bay Inflow Criteria*

- ◆ Threshold Needs – **Monthly** checks for minimum inflow requirements
- ◆ Spring Pulse Need – **End of March** pulse check
- ◆ Fall Pulse Need – **End of December** pulse check
- ◆ Intervening Needs – Selected period checks
  - **Interim – End of August** (satisfy 95% of requirement)
  - **Final – End of December** (if December not Fall Pulse)
- ◆ Long-Term and MBHE-4 Needs – Post processed



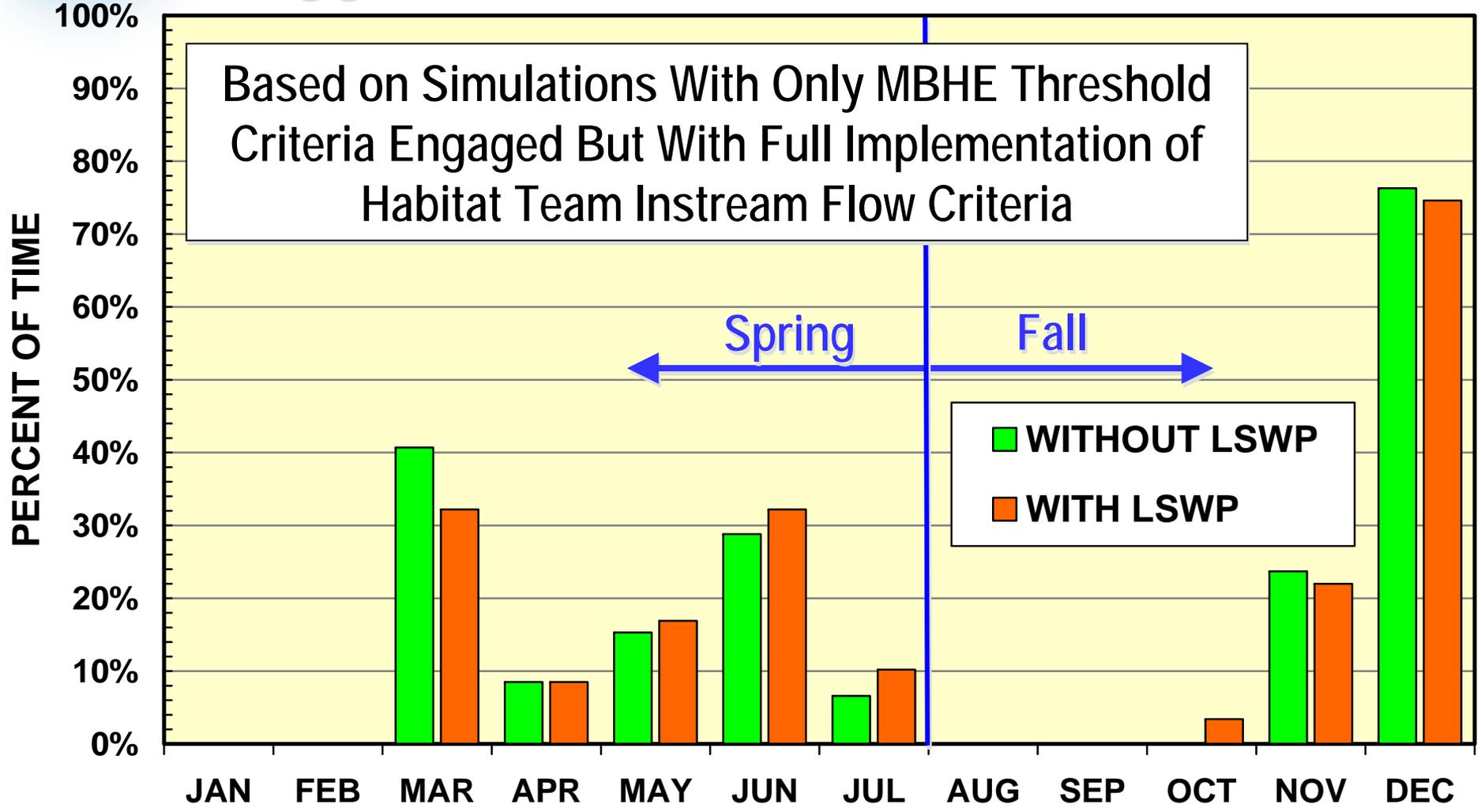
# Approach for Complying With *Pulse* and *Intervening* Inflow Regime Criteria

CRITERIA CHECKS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1) SPRING PULSE												
2) INTERVENING INTERIM (95% of Requirement)												
3) FALL PULSE												
4) INTERVENING FINAL* (100% of Requirement)												

\* Only if Fall Pulse does not end in December.



# Frequency of Maximum Pulse Inflows Suggests March and December Checks



# *Sample WAM Results from Implementing LSWP Bay Inflow Criteria*

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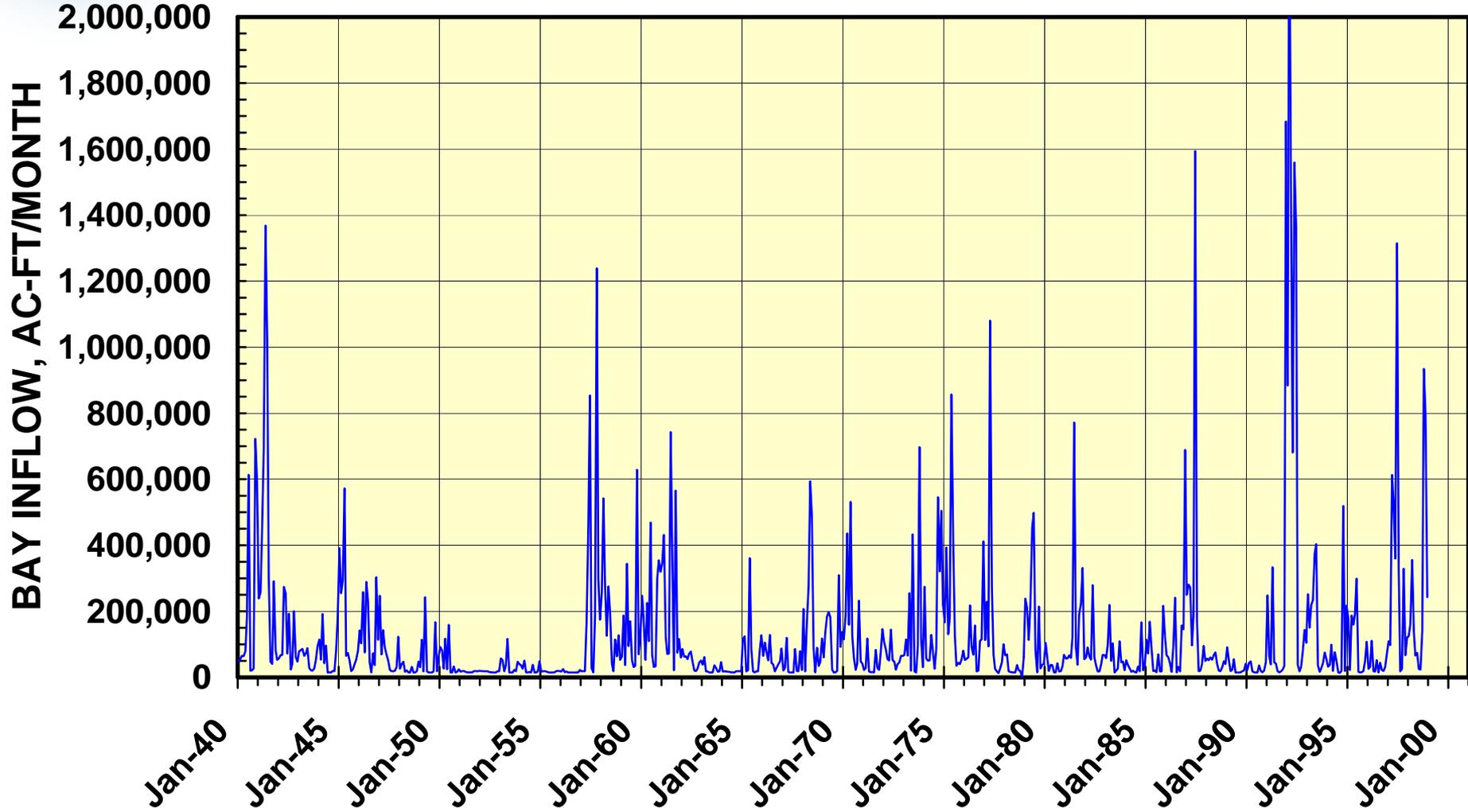
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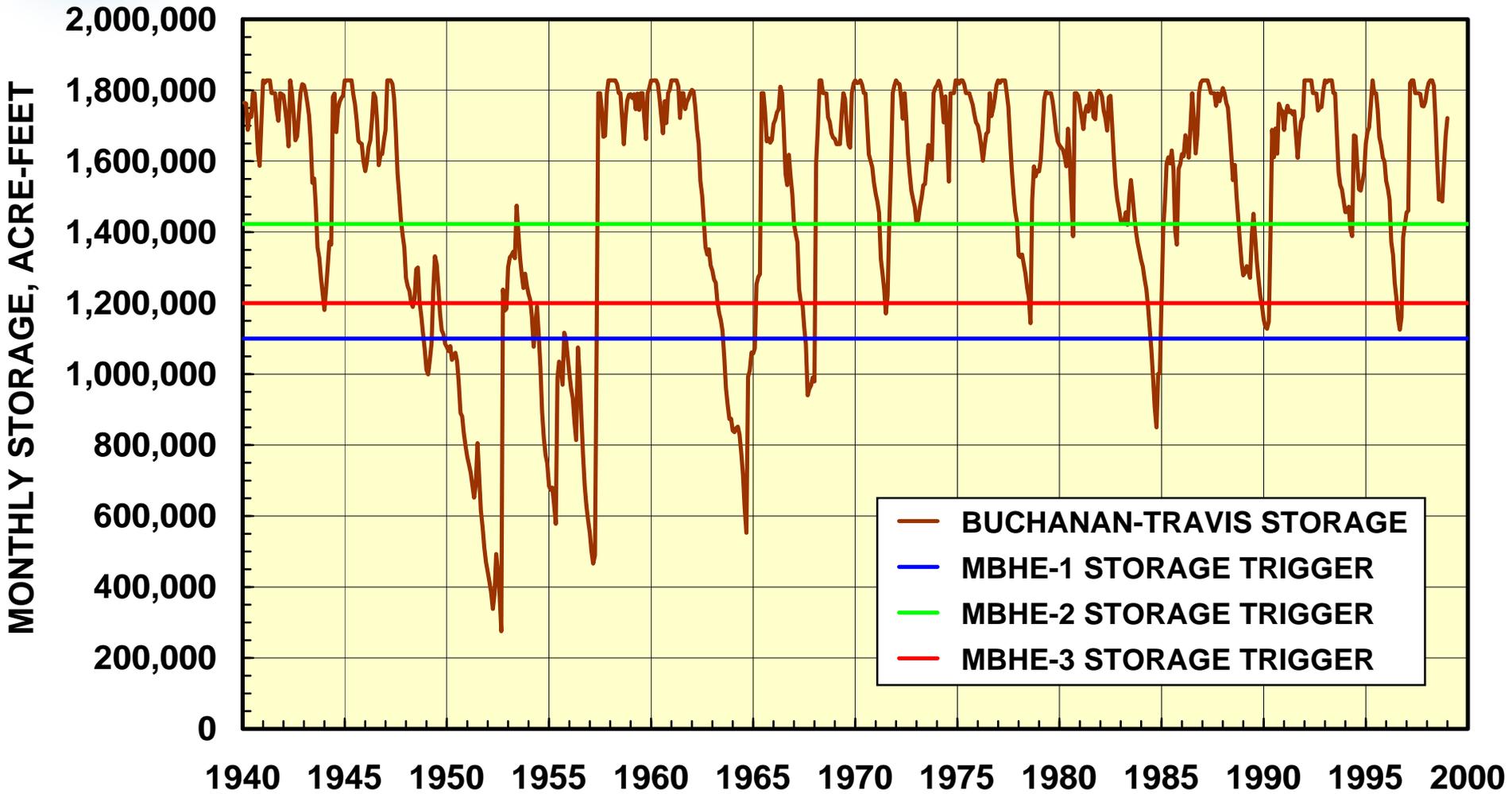


# 2080 Bay Inflows With LSWP Exhibit Wide Monthly Variations





# 2080 Buchanan-Travis Storage With Inflow Criteria Storage Triggers

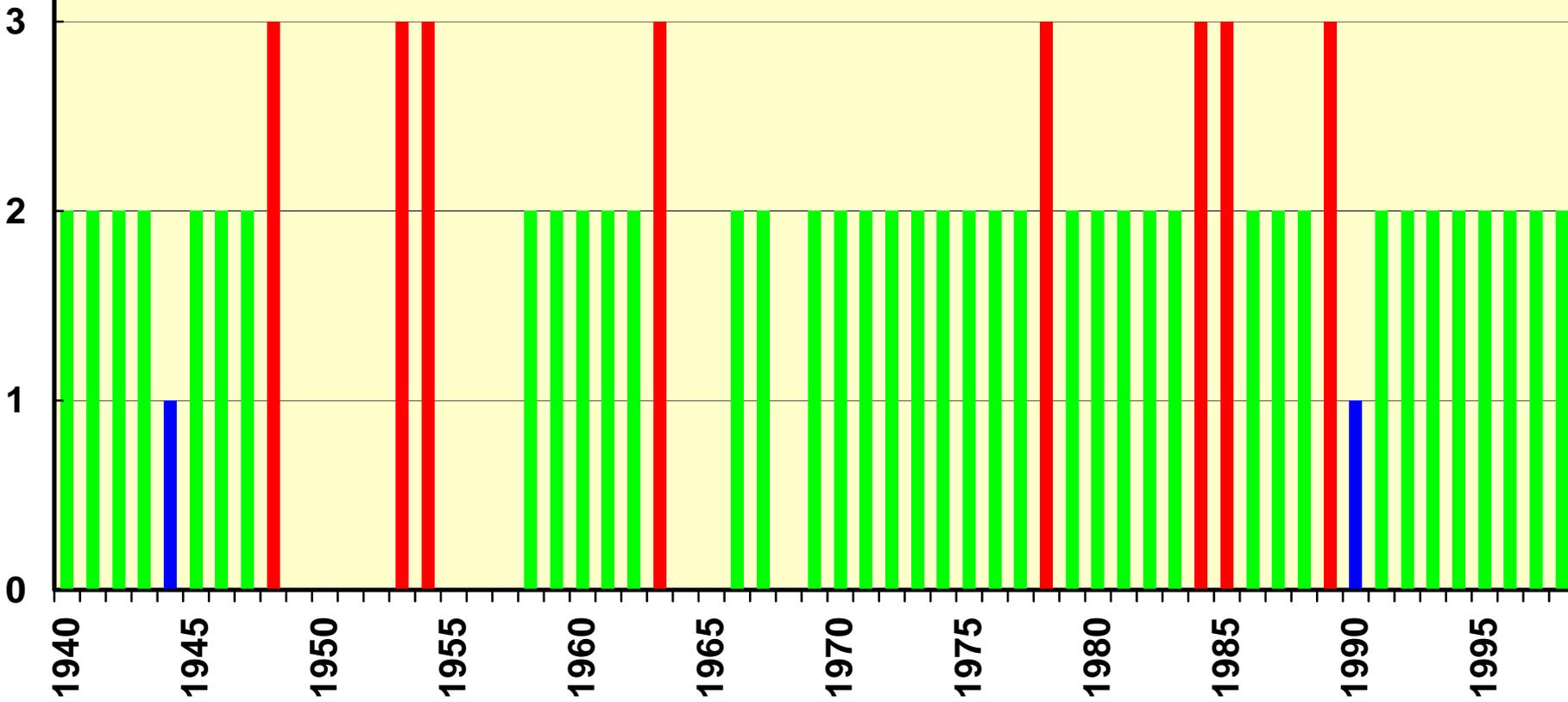




# 2080 Designated LSWP Inflow Criteria Based on Storage Triggers With LSWP

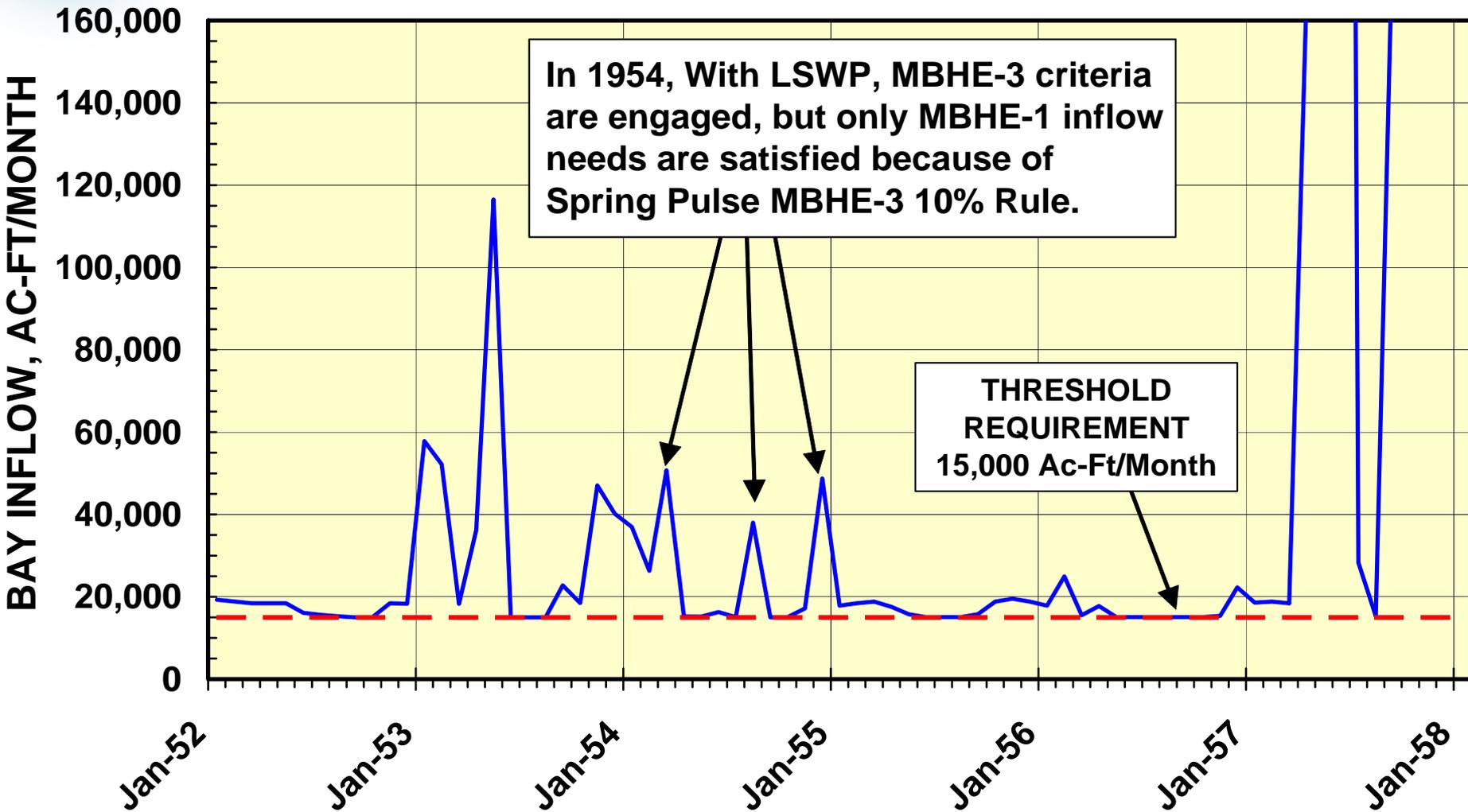
DESIGNATED BASE FLOW CONDITION

Note: If MBHE-2 Flow Condition is designated, then MBHE-3 Flow Condition also is engaged because of its lower Storage Trigger.



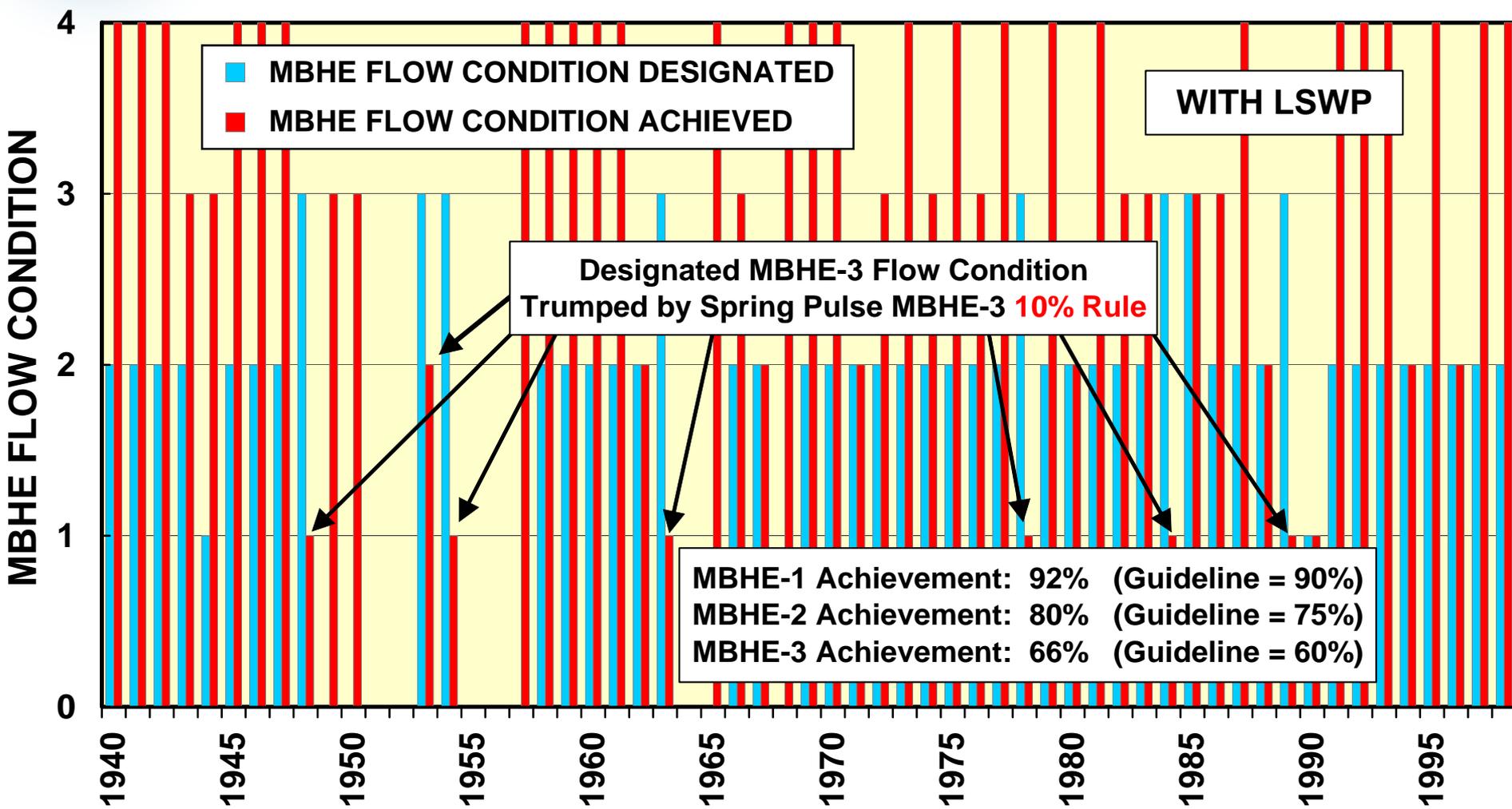


# Threshold Criteria Sustain Inflows During Severe Drought Periods



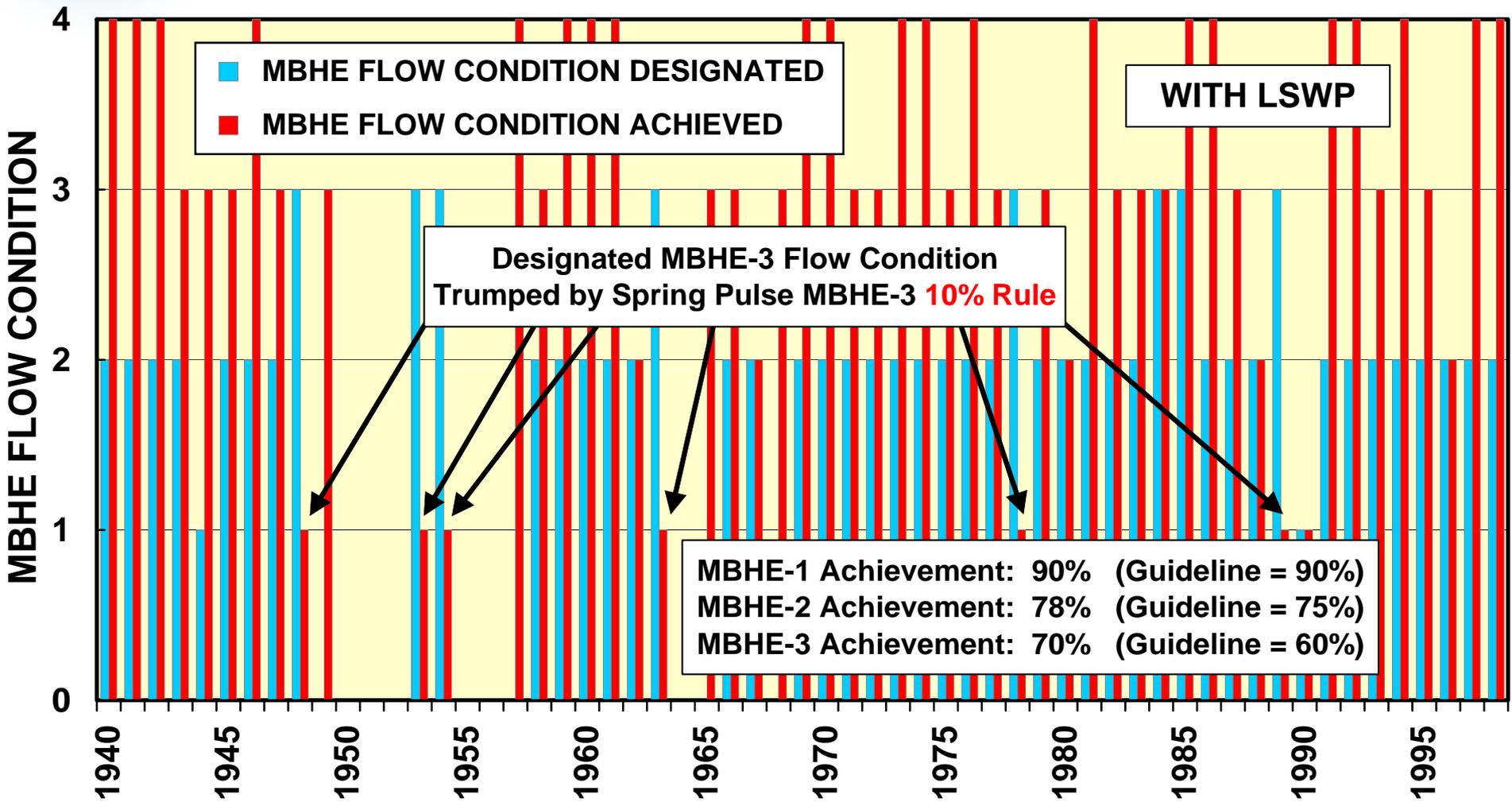


# Designated and Achieved LSWP Inflow Conditions for 2080 Spring Pulse Criteria



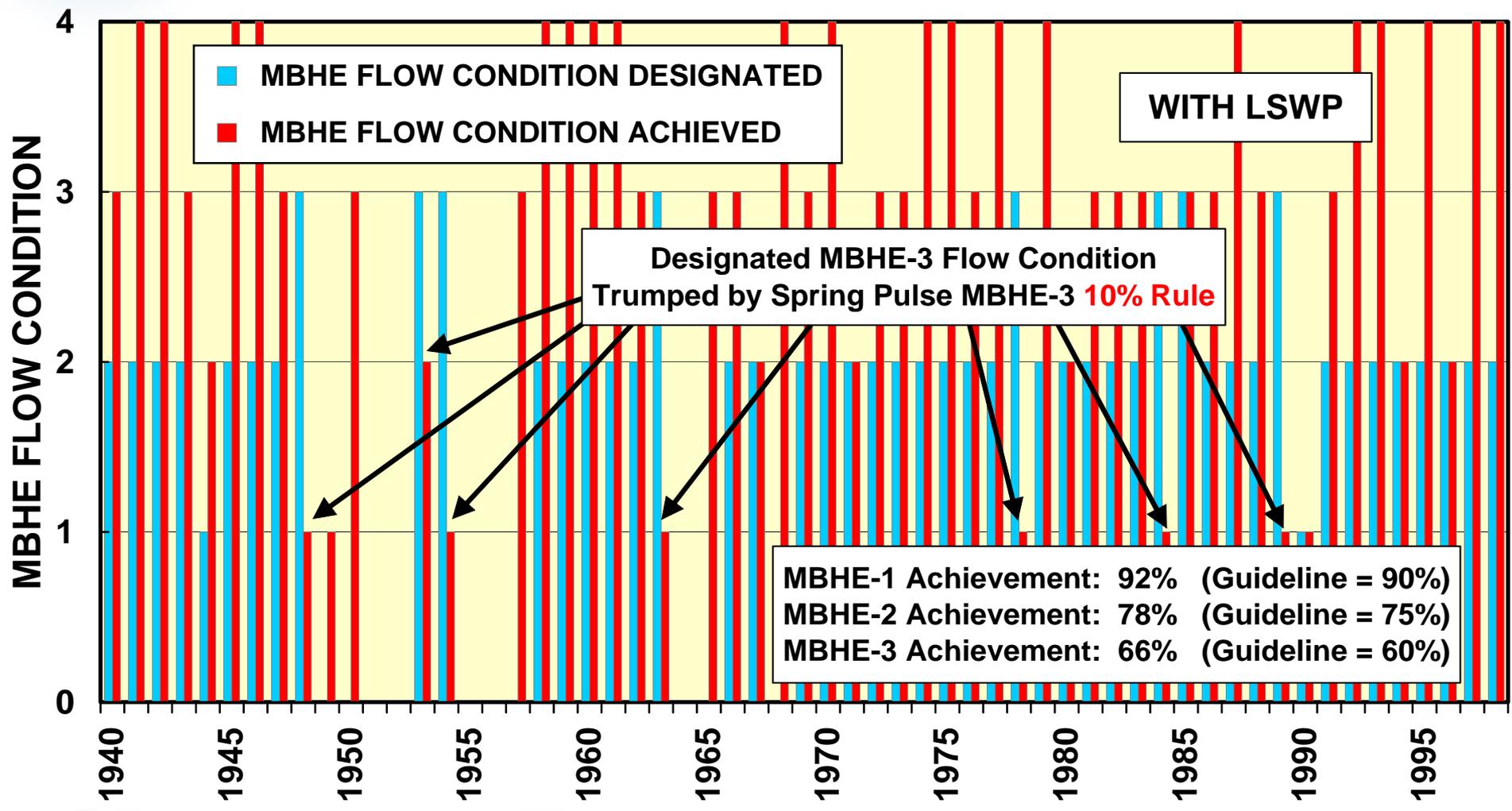


# Designated and Achieved LSWP Inflow Conditions for 2080 *Fall Pulse* Criteria



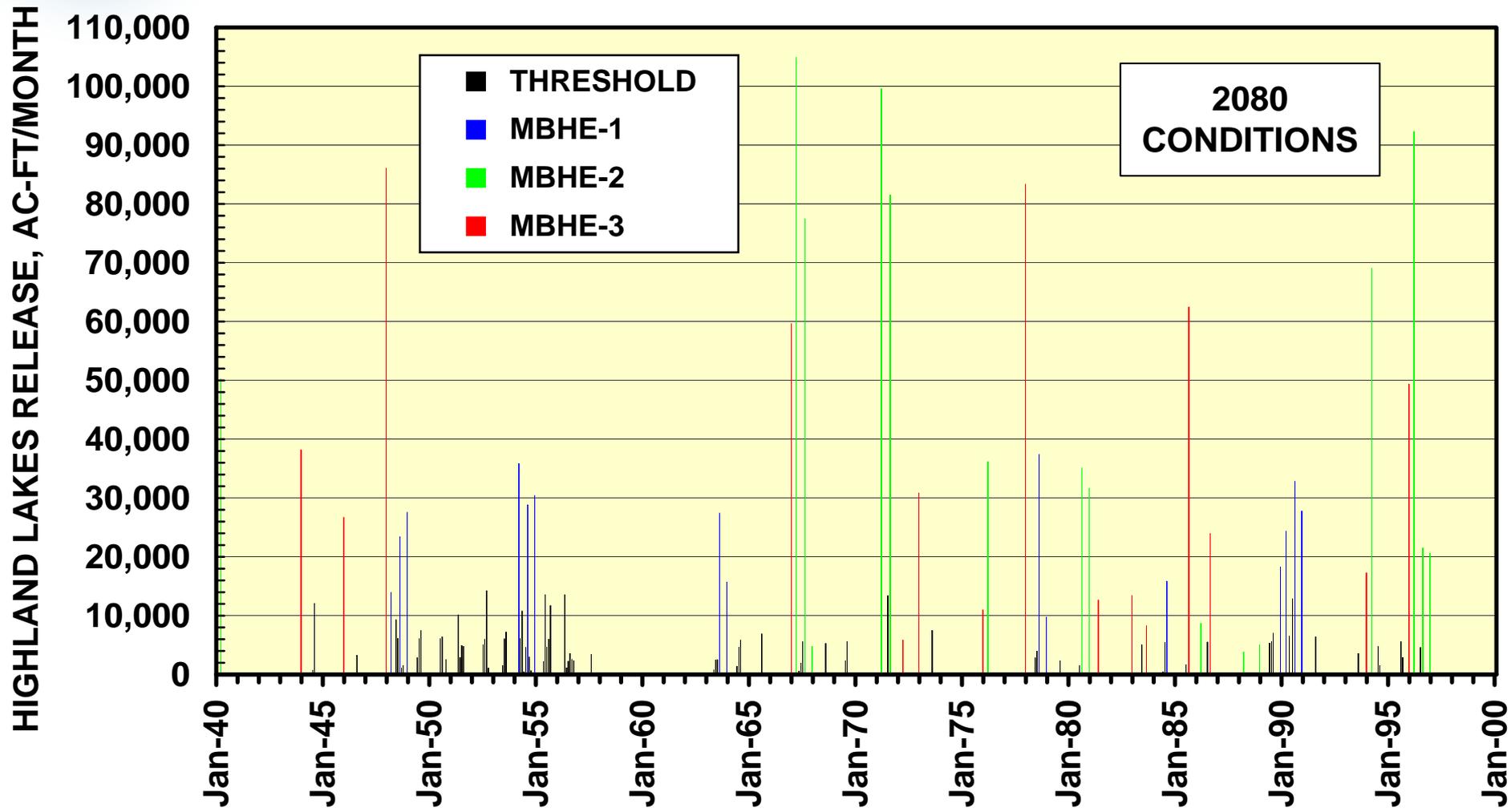


# Designated and Achieved LSWP Inflow Conditions for 2080 *Intervening* Criteria



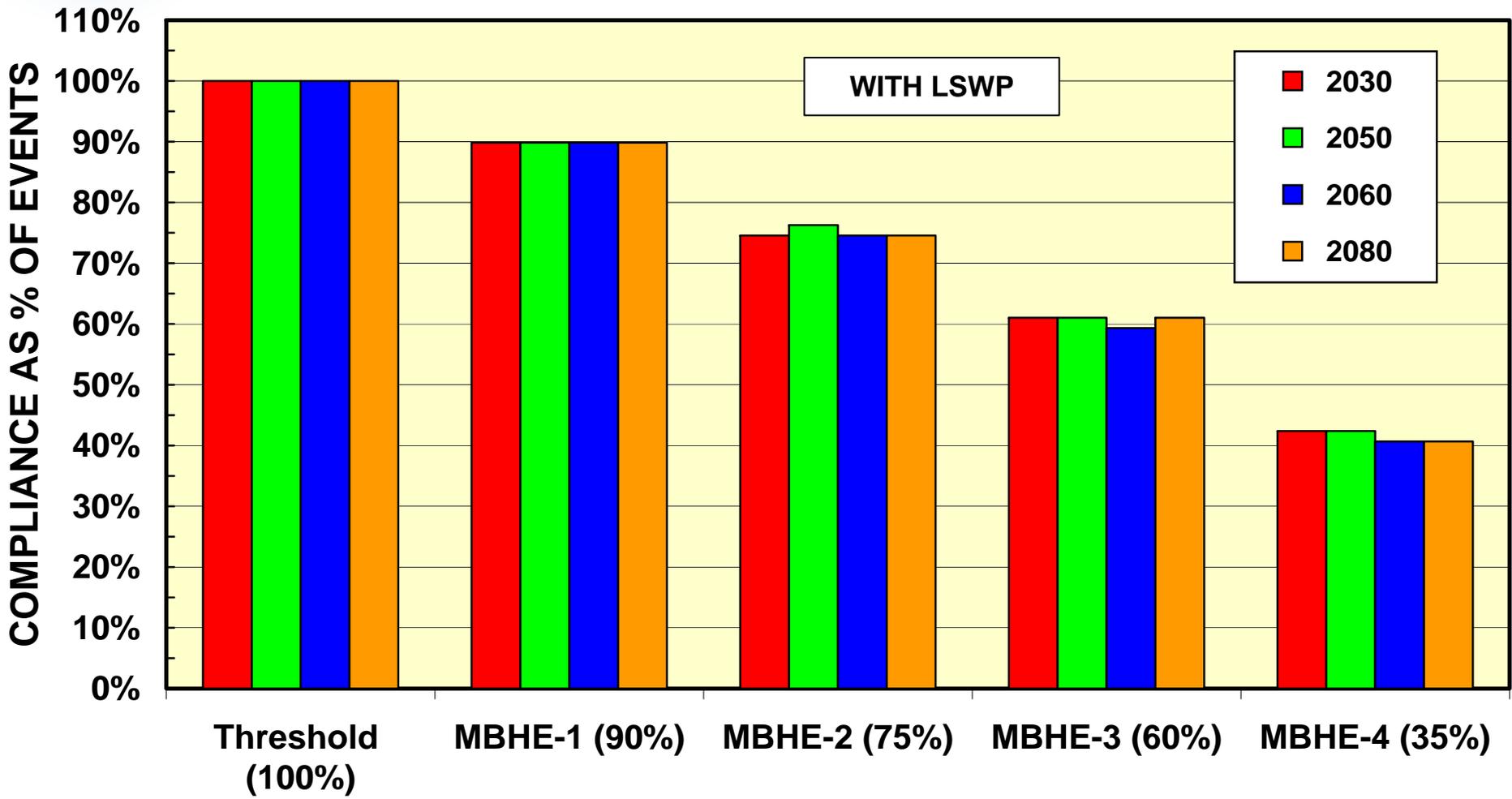


# 2080 Highland Lakes Releases to Satisfy LSWP Bay Inflow Criteria





# Compliance With LSWP Bay Inflow Criteria Guidelines



# *Questions*

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