

# **Excluding Data Collected During High Flow Events**

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Guidance Advisory Workgroup Meeting

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# Review of Eliminating Low Flow Data

- Exceedances of standards due to natural phenomena or unrepresentative conditions (such as drought)
  - General criteria 307.4(a)
  - Toxics 307.6(a)
  - Site-specific criteria 307.7(a)
  - Representative sampling conditions 307.9(b)

# Review of Eliminating Low Flow Data

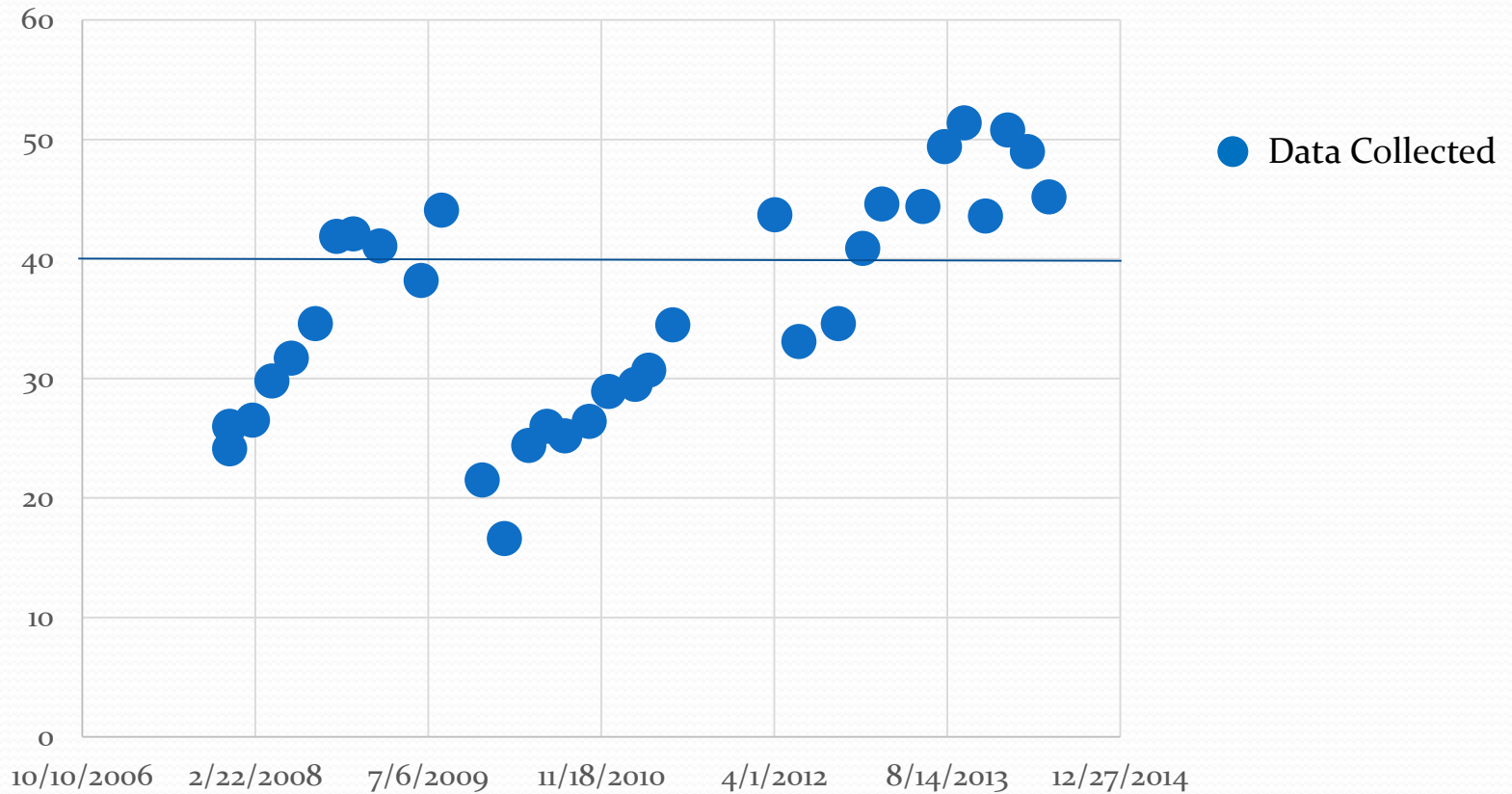
- Historically (2000 – 2016 IRs), data were removed using different methods for various reasons
  - Balance level of effort to perform assessments
    - Focus on waterbodies with identified new impairments or concerns
  - In response to stakeholder requests
  - Limited data in past assessments, retain data
    - Fewer sites specific critical low flow
    - Shorter assessment window
  - Expectations that samples meeting criteria under extreme conditions (below 7Q<sub>2</sub>) would meet otherwise

# Review of Eliminating Low Flow Data

- Critical\Severe Low Flow
  - Specific parameters and criteria, based on Sections 307.8(a) and 307.9(e) of the TSWQS
  - Critical Low Flow
    - DO, pH, Temperature, chronic toxic criteria, chronic ambient toxicity tests
  - Severe Low Flow (0.1 cfs)
    - TDS, Chloride, Sulfate, Bacteria, Human health criteria

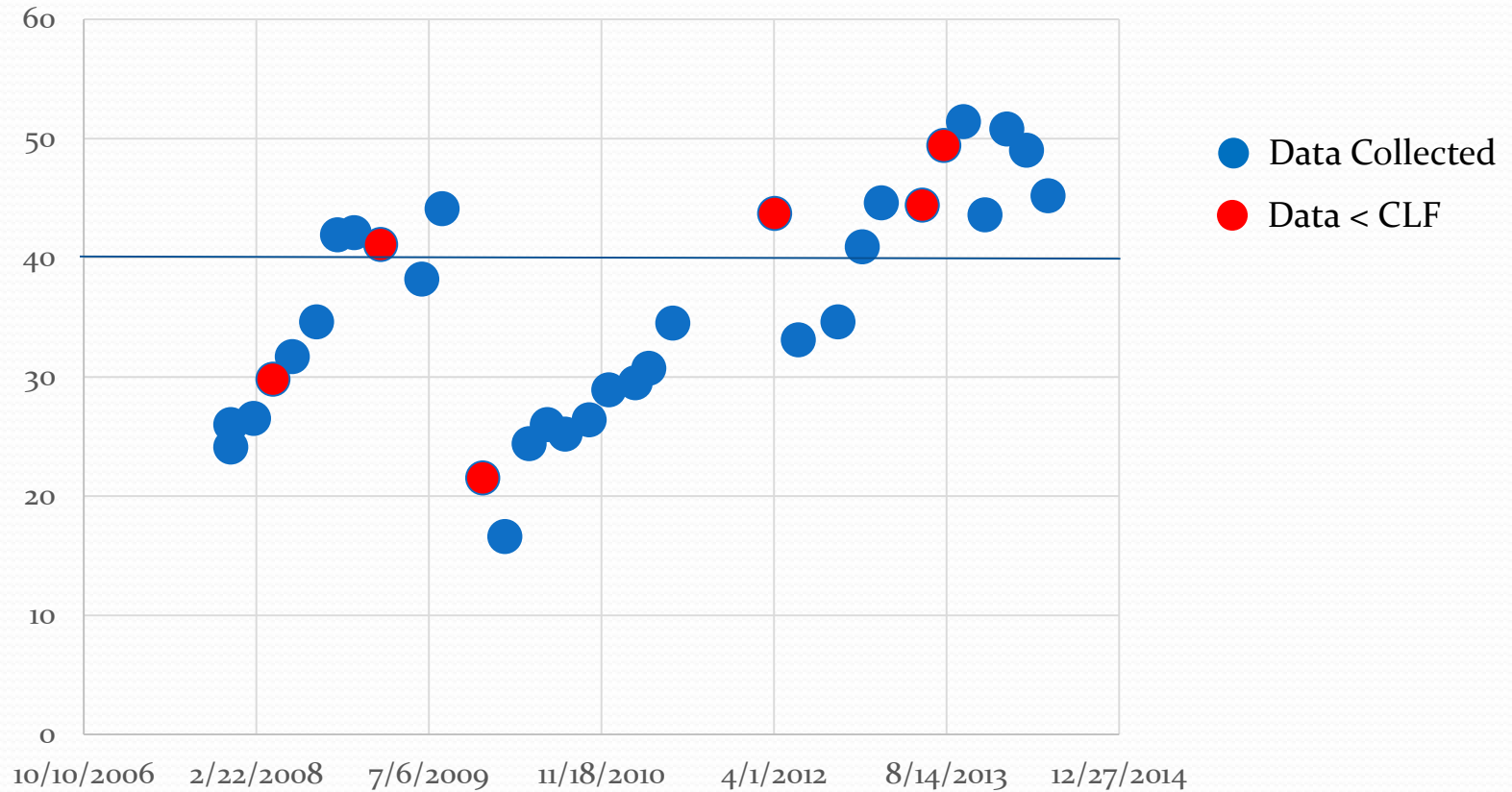
# Review of Eliminating Low Flow Data

N= 33



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N= 33

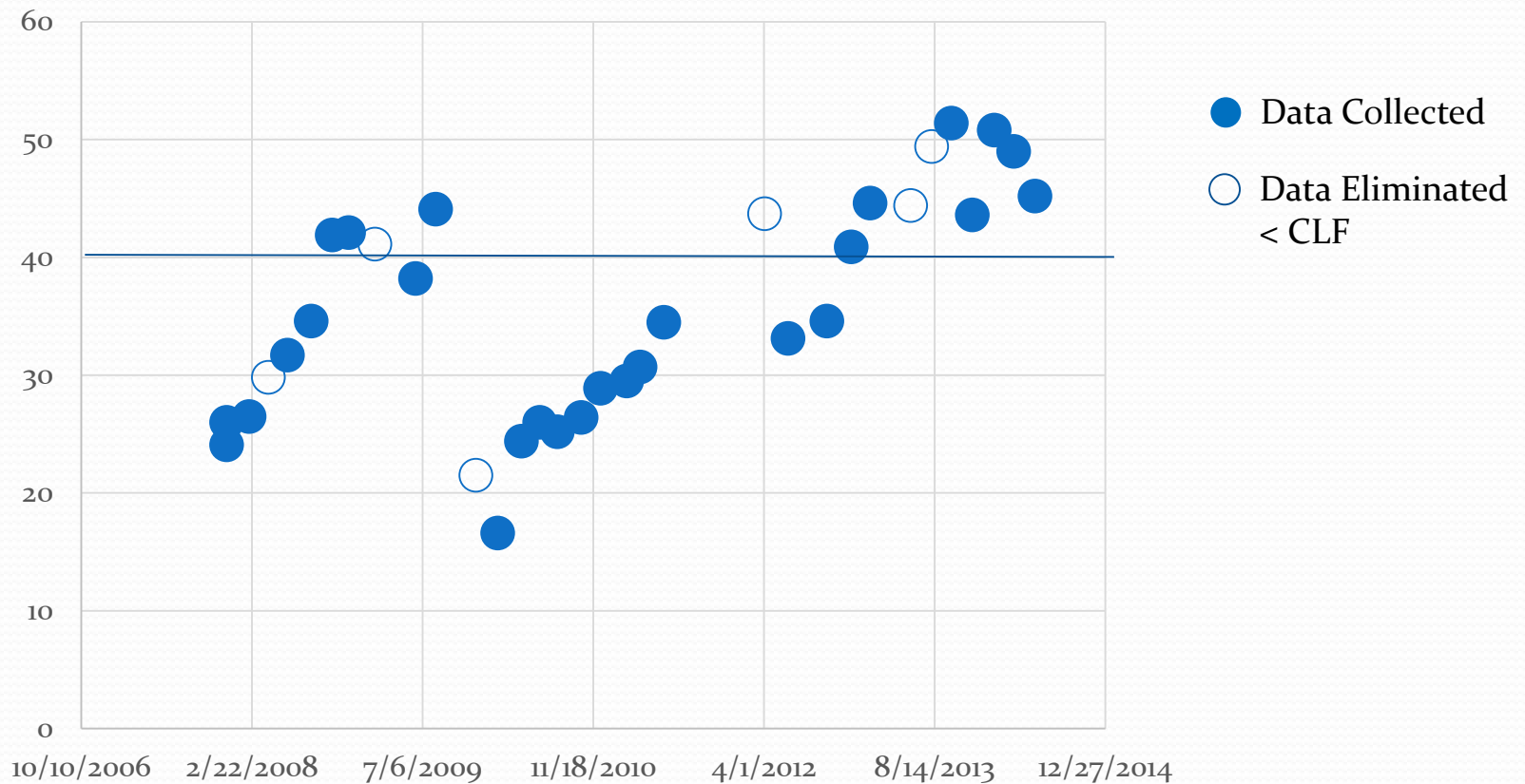




# Review of Eliminating Low Flow Data

Example: Remove All Low Flow Data

N= 27





# Review of Eliminating Low Flow Data

## Critical Low Flow

Options for consideration

**Remove exceedances only**

*(current practice for critical low flow)*

**VS**

**Remove all results, including data that meet criteria**

*(current practice for severe low flow)*

**Address new impairments\concerns only**

*(current practice for all low flow)*

**VS**

**Remove for all outcomes for specific parameters  
included in WQS**

# Review of Eliminating Low Flow Data

- Drought
  - Evaluated in 2014 IR
  - Implemented in 2016 IR
    - Reservoirs
      - Nutrients only
      - All sample results
  - 2018 IR

# Eliminating High Flow Data

## 2010 Surface Water Quality Standards

- *§307.9 (b) Samples to determine standards attainment are collected at locations approved by the commission. Samples collected at non-approved locations may be accepted at the discretion of the commission. Samples to determine standards attainment in ambient water must be representative in terms of location, seasonal variations, and hydrologic conditions. Locations must be typical of significant areas of a water body. Temporal sampling must be sufficient to appropriately address seasonal variations of concern. Sample results that are used to assess standards attainment must not include samples that are collected during extreme hydrologic conditions such as high-flows and flooding immediately after heavy rains. Further guidance on representative sampling, both spatially, temporally, and hydrologically, can be found in the TCEQ Surface Water Quality Monitoring Procedures and the TCEQ Guidance for Assessing and Reporting Surface Water Quality in Texas as amended.*

# 2018 Guidance Proposal

- High Flows Exclusion – 2018 (proposed)
  - All parameters removed – not explicit in WQS
  - All sample results vs Exceedances Only
  - New concerns\impairments vs all assessment outcomes

# 2018 Guidance Proposal - Application

- Sample results will be removed:
  - Flow severity reported as 4 (flood flow)
  - As requested, discretely measured flow that exceeds the 90<sup>th</sup> percentile (2010 WQS 307.9(e)(3)(A)):

# Flow Severity

Parameter Code 01351



**Flood flow** is reported as a flow severity of 4. Flood flows are those that leave the confines of the normal stream channel and move out onto the floodplain (either side of the stream)

# Flow Severity

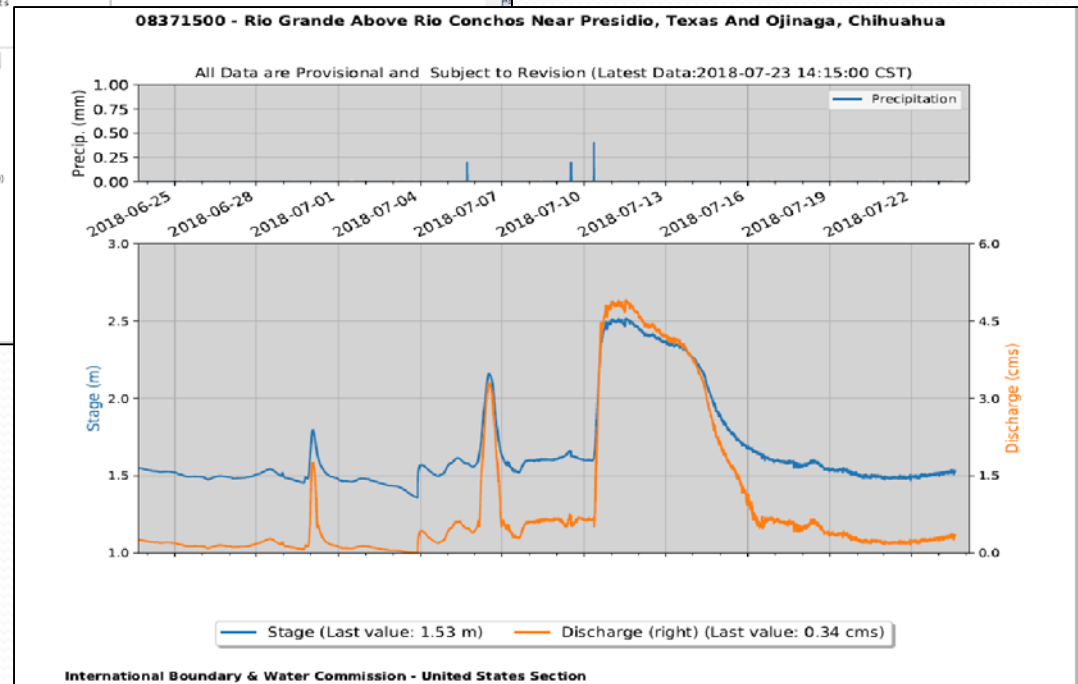
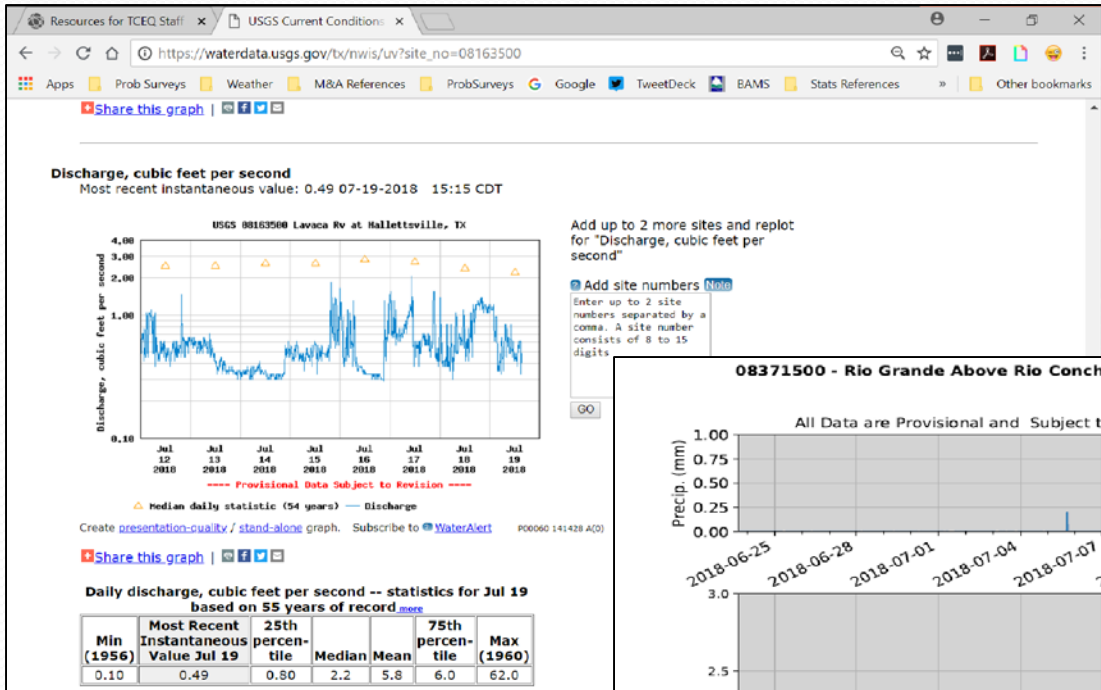
	Count	Percent
Monitoring Events -That included flow measurement September 2012 – September 2017	31,206	
Events with flow severity	26,614	85.28%
Breakdown of flow severity events		
No Flow (1)	1,167	4.38%
Low Flow (2)	4,396	16.52%
Normal (3)	15,528	58.35%
Flood (4)	675	2.54%
High (5)	4,264	16.02%
Dry (6)	584	2.19%
Not Reported	447	1.68%

# High Flow Estimation - 90<sup>th</sup> Percentile

- Calculations from historical records – USGS, IBWC or other applicable gauge.
- For small freshwater streams without gauges using statistical corrections to account for relative watershed size.
- Alternative percentiles may be used in special circumstances such as for spring-flow dominated streams.



# Gaged Flow Data



# Flow Estimation

$$Q_{ungaged} = \frac{A_{ungaged}}{A_{gaged}} \times Q_{gaged}$$

where

$Q_{ungaged}$ :	Flow at the ungaged location
$Q_{gaged}$ :	Flow at surrogate USGS gage station
$A_{ungaged}$ :	Drainage area of the ungaged location
$A_{gaged}$ :	Drainage area at surrogate USGS gage station

Requires a hydrograph representing a full range of flows experienced at the site

# Summary

## *Considering Data Collected During High Flow Events*

- Flow severity of 4 (flood flow) used to determine when data is to be removed.
- A 90th percentile flow can be used as a high-flow criteria calculated from an applicable gauge or using flow estimations.

# Discussion

## *Considering Data Collected During High Flow Events*

- Method to remove data on basis of flow severity of 4
- Method to remove data on the basis of percentile
- Other ideas?

# Discussion

## *Considering Data Collected During High Flow Events*

Data collected at a flow severity of 4 is removed only if it exceeds the criteria for new impairments and concerns

or

All data with a flow severity of 4 is removed prior to assessing the data

# Discussion

## *Considering Data Collected During All Extreme Flow Events*

- See handout
- Should we be consistent on whether all samples v. exceedances only are excluded?
- Other items?