

# Grand County Stream Management Plan Update Stakeholder Group Meeting September 19, 2023



# Icebreaker

**Stand up if the following statement applies to you and take note of who else is standing up when you are.**

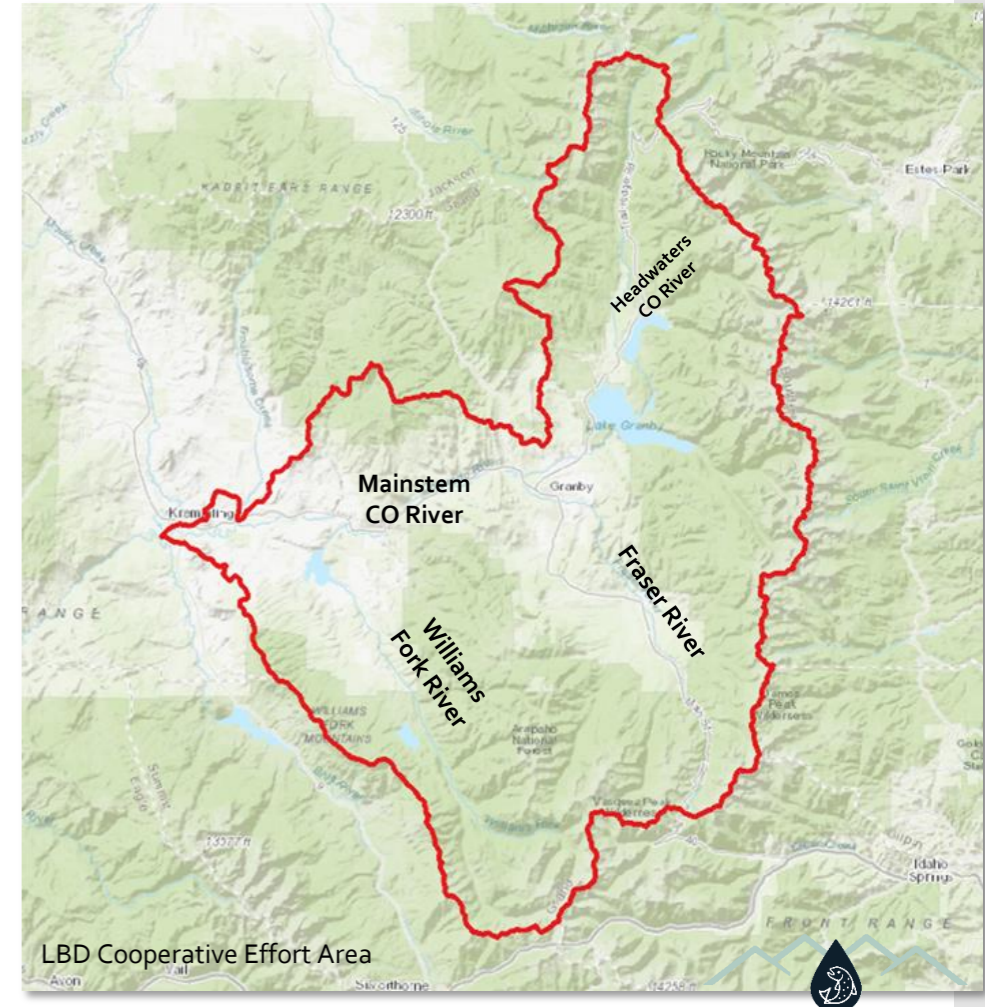
1. You have one or more pets.
2. You're a morning person.
3. You like to cook.
4. You tend to recharge your batteries alone rather than with others.
5. You are a person who talks with their hands.
6. You can play a musical instrument.
7. You are a member of LBD.

What Are  
We Doing  
Here?



# Purpose of the GC SMP Update

- The GC SMP is managed by Learning By Doing.
- The purpose of the GC SMP update is to improve river and stream health by synthesizing new **technical information** and **stakeholder input** to identify:
  - Objectives,
  - Priority areas,
  - Cooperative restoration projects.
- The GC SMP update will occur in the LBD Cooperative Effort Area (CEA).



## PHASE 1

Stakeholder Outreach  
and Engagement  
Program

Comprehensive  
Watershed  
Assessment

## PHASE 2

- Use stakeholder input and watershed assessment to identify:
  - Objectives
  - Priority areas
  - Cooperative restoration projects

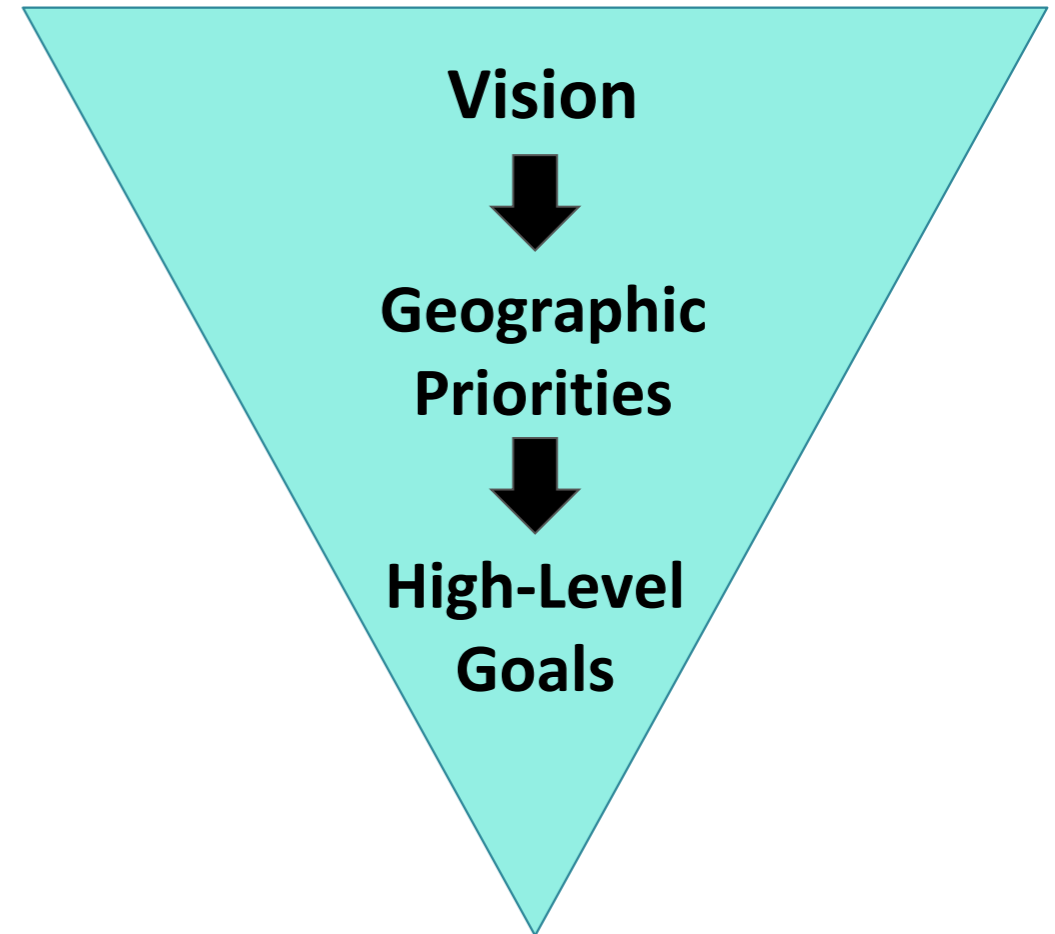
# Stakeholder Outreach Program Purpose

Gather community and stakeholder input on values, priorities, concerns, and opportunities.

Learn about ongoing challenges and opportunities in the Cooperative Effort Area.

Occur over five meetings from Spring 2023 to Winter 2024.

Summarize input in a stakeholder report at the end of Phase 1.



# GC SMP UPDATE SCOPE

## The GC SMP:

IS

IS NOT

**A Stream Management Plan - Data driven assessments on holistic river health to determine where and how our rivers are impaired.**

An Integrated Water Management Plan - Consumptive water use planning (ex. drinking water, irrigation, and industrial).

**The development of strategies for effective communication and use of environmental flows within the confines of the existing legal framework and water rights allocations.**

An attempt to reverse water development projects that are operating or have been approved.

**A way to identify and prioritize management actions that maintain or improve river conditions.**

A way to address consumptive water needs.

# GC SMP UPDATE SCOPE

## The GC SMP:

**IS**

**IS NOT**

**An update of an existing SMP.**

A watershed plan or other new and broader planning effort.

**A community effort focused on the needs of the river and aquatic habitat with opportunities for stakeholder feedback and input.**

Focused on specific individual stakeholder water needs.

**Focused on collaboration and solutions for changes in river conditions.**

Finding a culprit for changes in river conditions.



# GC SMP UPDATE SCOPE

## The GC SMP:

**IS**

**IS NOT**

**Focused on rivers and streams.**

Focused on lakes or reservoirs.

**Geographic scope: LBD's Cooperative Effort Area.**

Grand County watersheds in their entirety.

**Addressing environmental water needs (ex. target flushing flows).**

Addressing agricultural, municipal, industrial, and recreational water needs.



## GC SMP UPDATE STAKEHOLDER EXPECTATIONS

### Ground Rules:

- Listen to understand, not respond
- Allow every voice to be heard
- Participate in the discussion
- Treat everyone with respect
- Discuss ideas, not people
- Focus on the topic at hand
- Respect everyone's time
- Talk about what you think and know; let others do the same

# LAST MEETINGS

## May 3:

- Kick-off meeting with overview of process, LBD, and technical assessment
- Virtual input on stakeholder vision for river health

## July 18:

- Overview of historical and present water use and management
- Overview of recent landscape changes
- Stakeholder survey results
- Stakeholder headline exercise

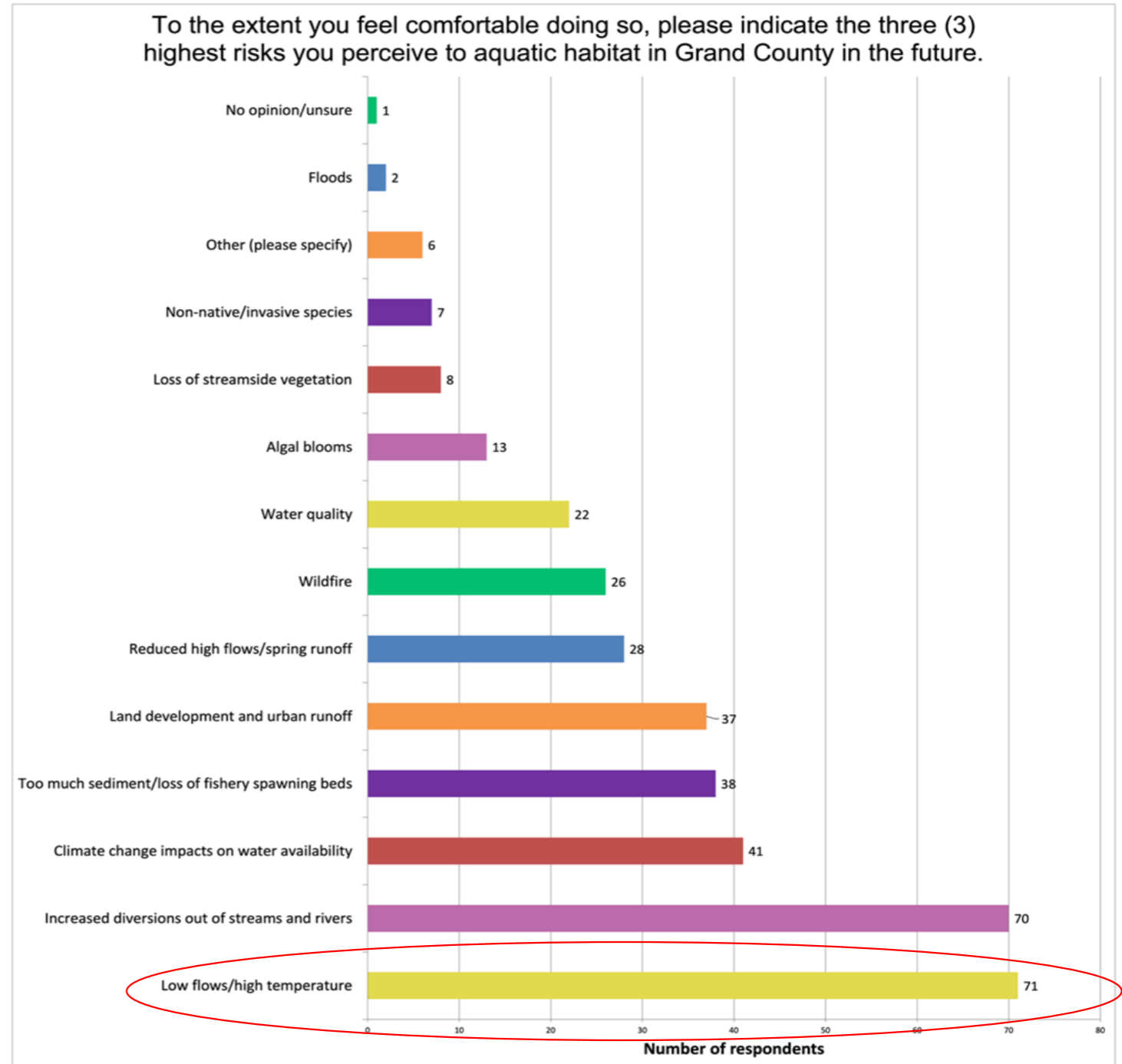
# TODAY'S AGENDA

- Presentation on flow operations and strategies used to meet established goals
- Open house to:
  - Identify priority areas
  - Provide feedback on the *Community Vision for Healthy Rivers and Streams*

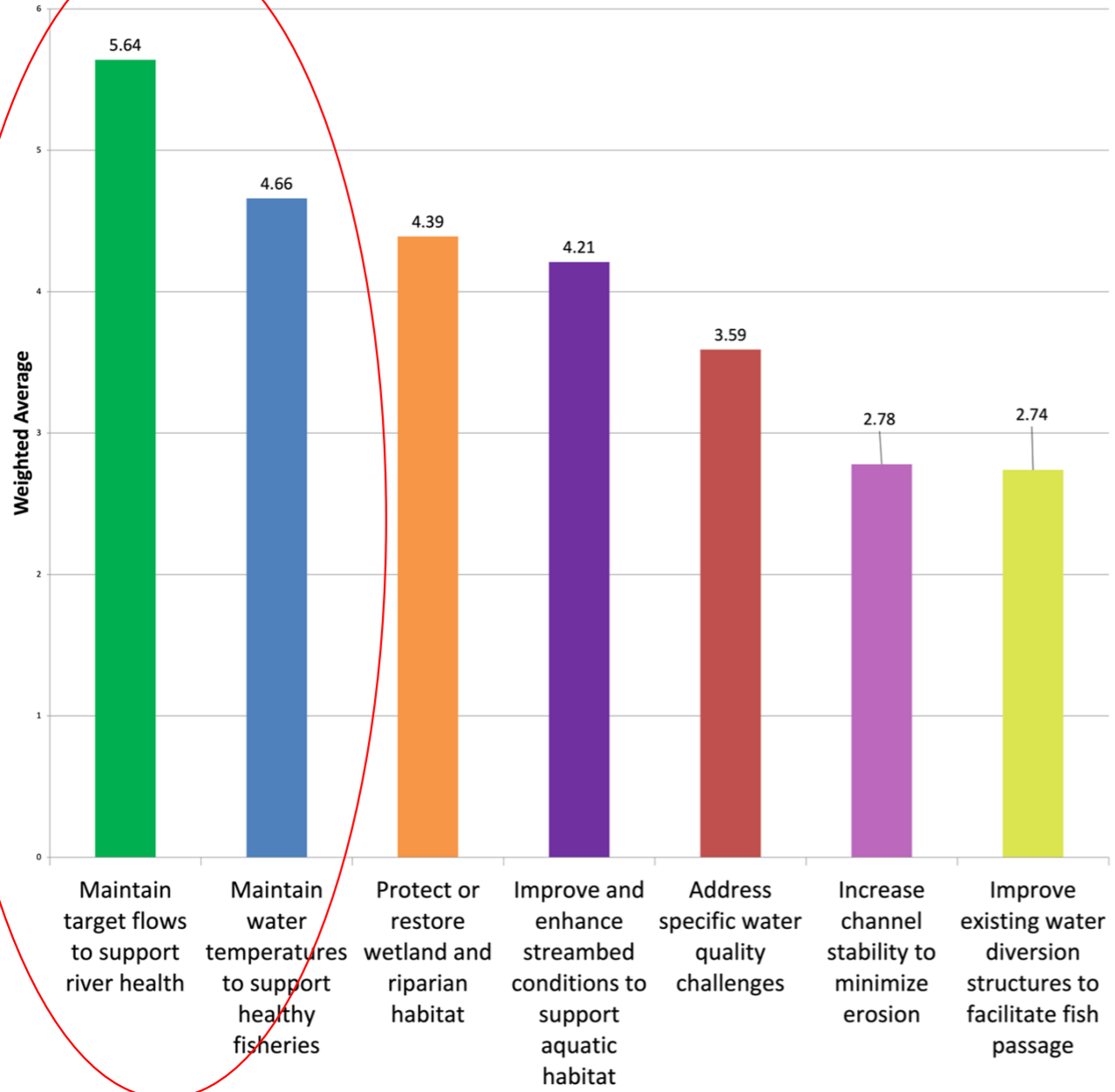


# WHY ARE WE TALKING ABOUT FLOWS?

- Stakeholder survey results indicated a strong interest in learning about flow operations.
- Low flows/high temperature were identified as the top concern.



Please indicate how you would prioritize the following management goals within the scope of the GC SMP update, with 1 being the highest priority and 7 being the lowest priority.




WHY ARE WE  
TALKING ABOUT  
FLOWS?

# TODAY'S AGENDA

- Presentation on Flows and Water Infrastructure in Grand County
  - Overview of Denver and Northern Water's operations and infrastructure within the County
  - Operational flexibility and the role of LBD in monitoring and influencing water releases
  - Opportunities for collaborative solutions to address low flows and high temperatures
- Participants are welcome to ask questions during the presentation, but the facilitator may postpone them if they apply to a topic discussed later in the presentation





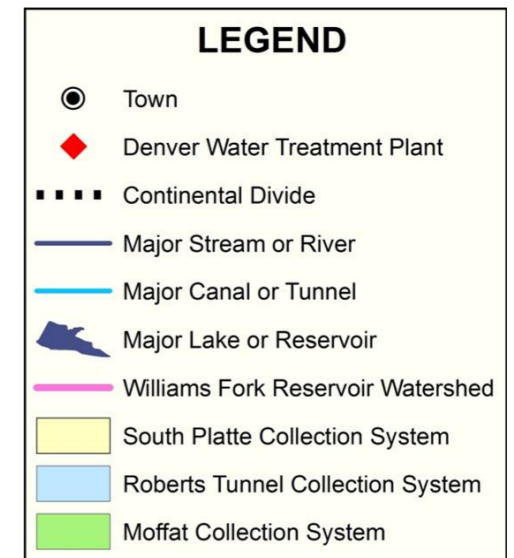
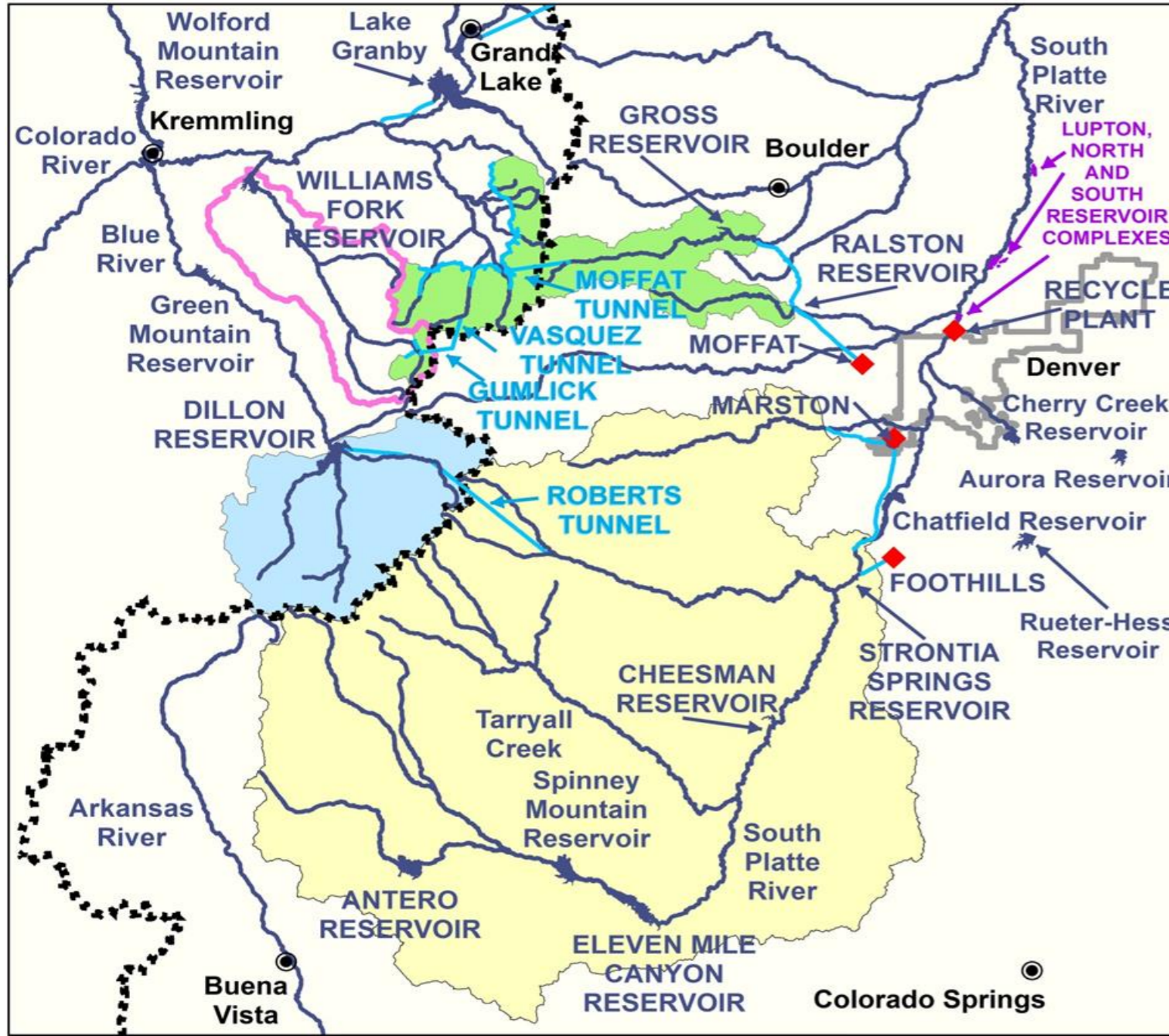
# Grand County SMP Stakeholder update: Denver Water Operations

September 19, 2023

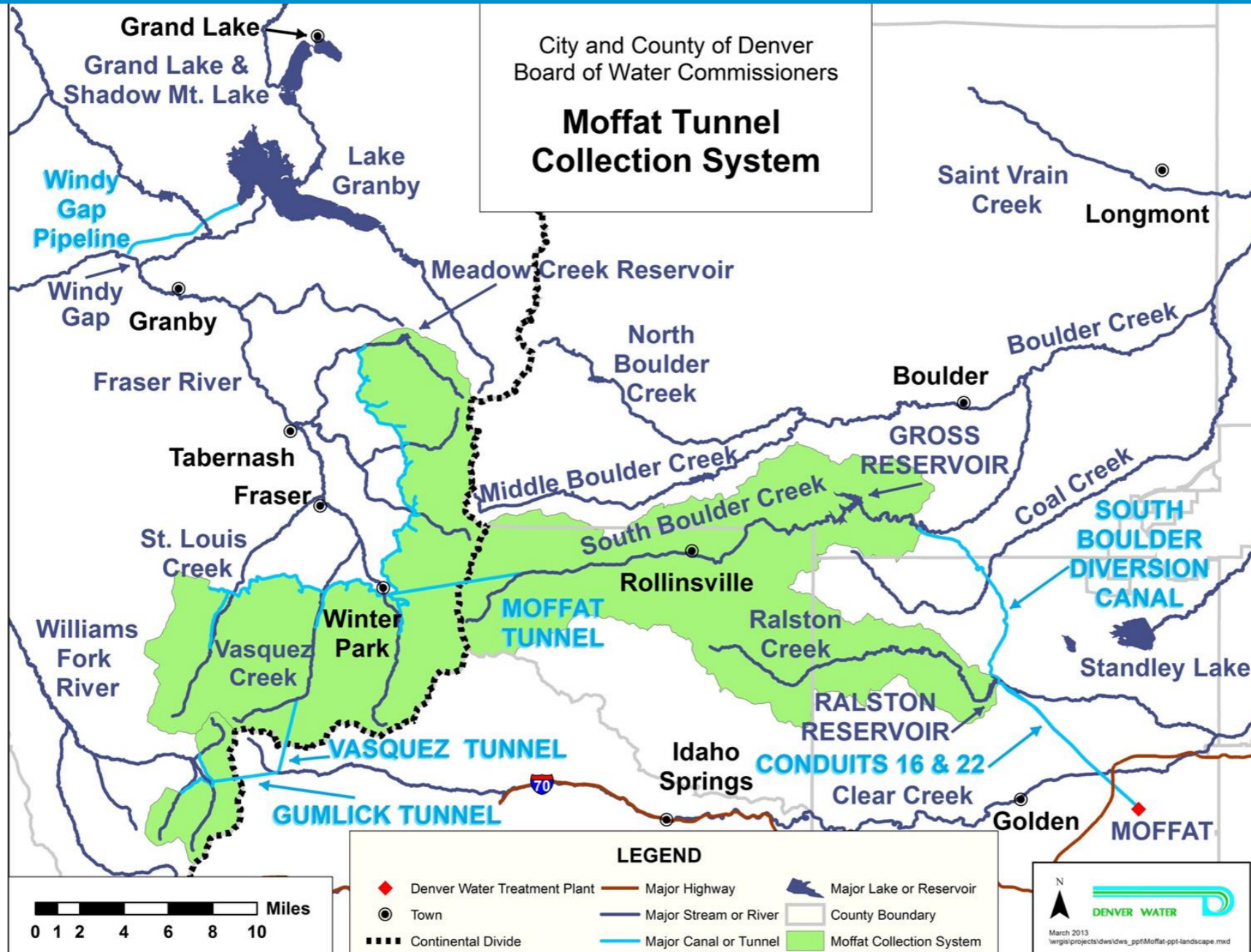
 DENVER WATER



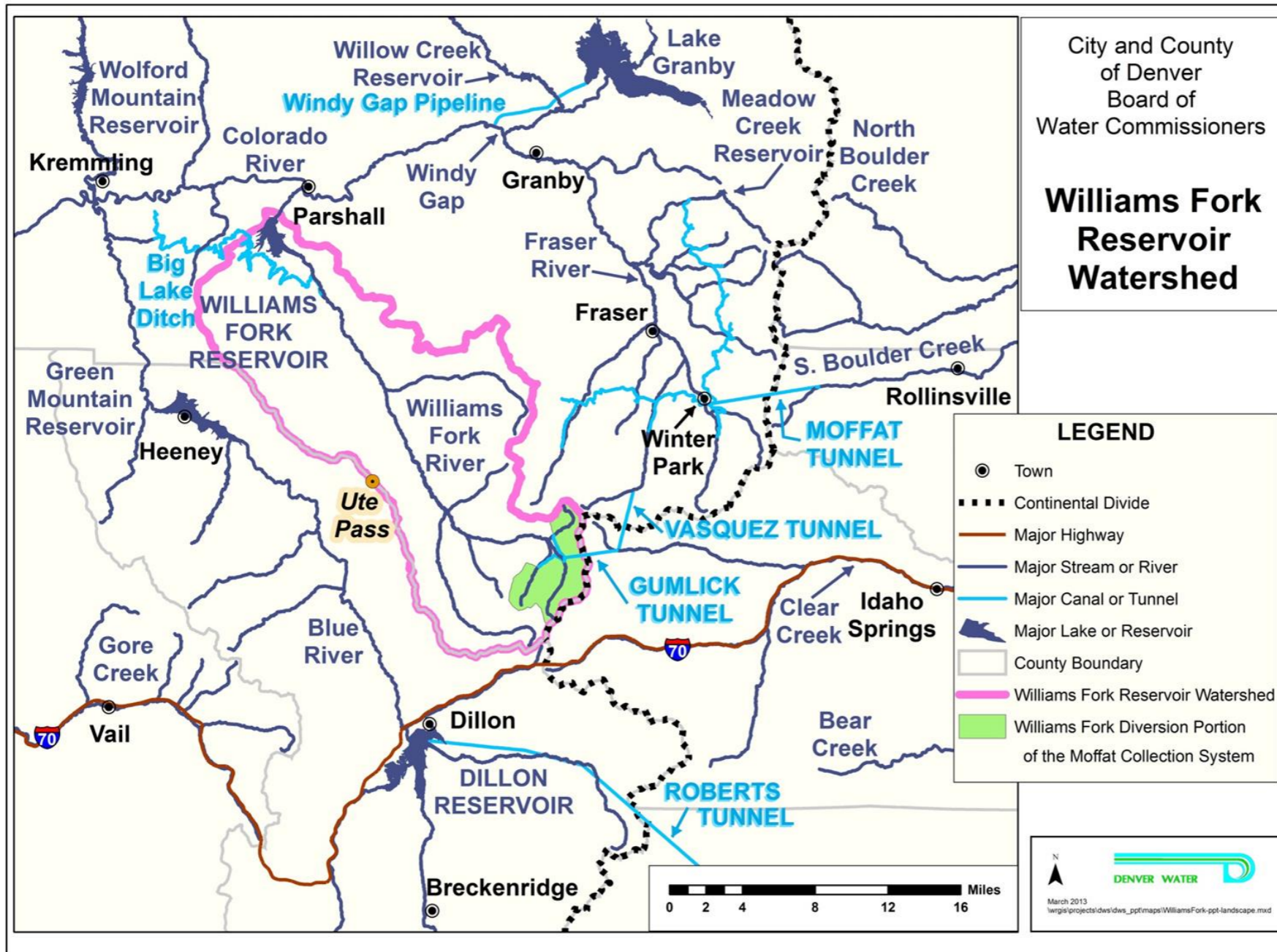
# Denver Water Collection System



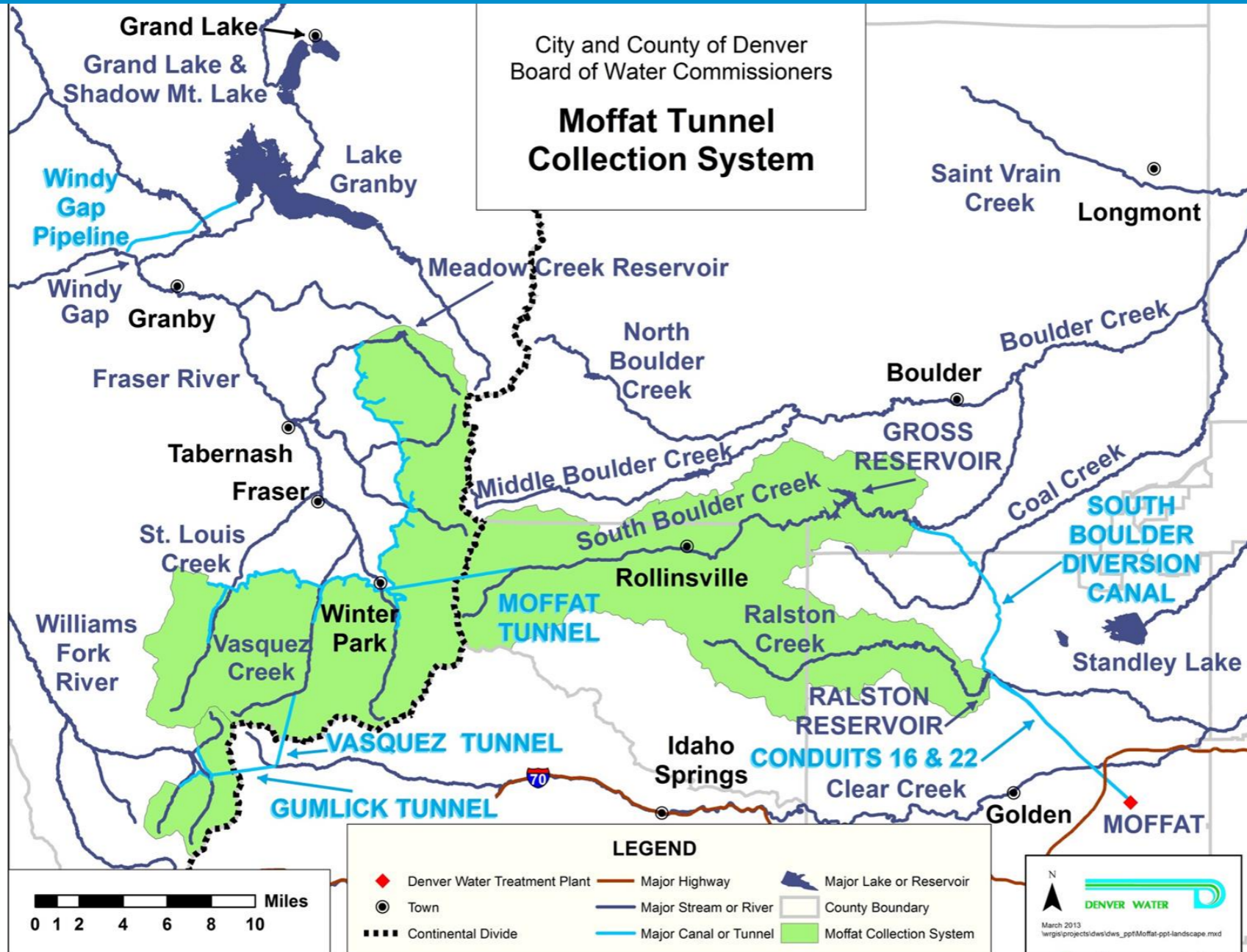
# Moffat Collection System



# Williams Fork Collection System



# Moffat Collection System Flexibility



# Denver Water – LBD Team

## Rachel Badger – LBD Management Committee & LBD Inc.

- [Rachel.Badger@denverwater.org](mailto:Rachel.Badger@denverwater.org)

## Jessica Alexander – Monitoring Subcommittee

- [Jessica.Alexander@denverwater.org](mailto:Jessica.Alexander@denverwater.org)

## Travis Bray – Operations Subcommittee

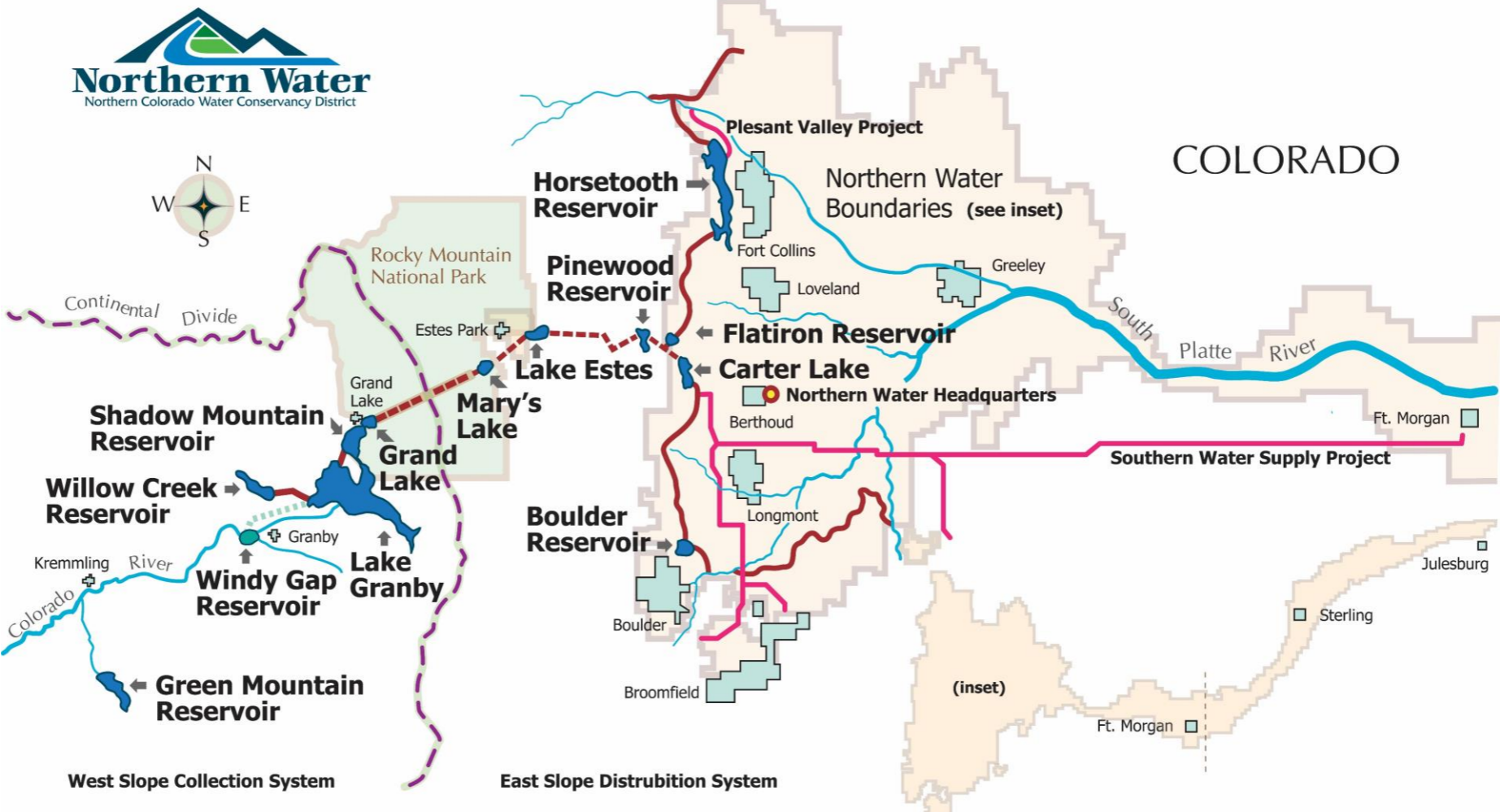
- [Travis.Bray@denverwater.org](mailto:Travis.Bray@denverwater.org)



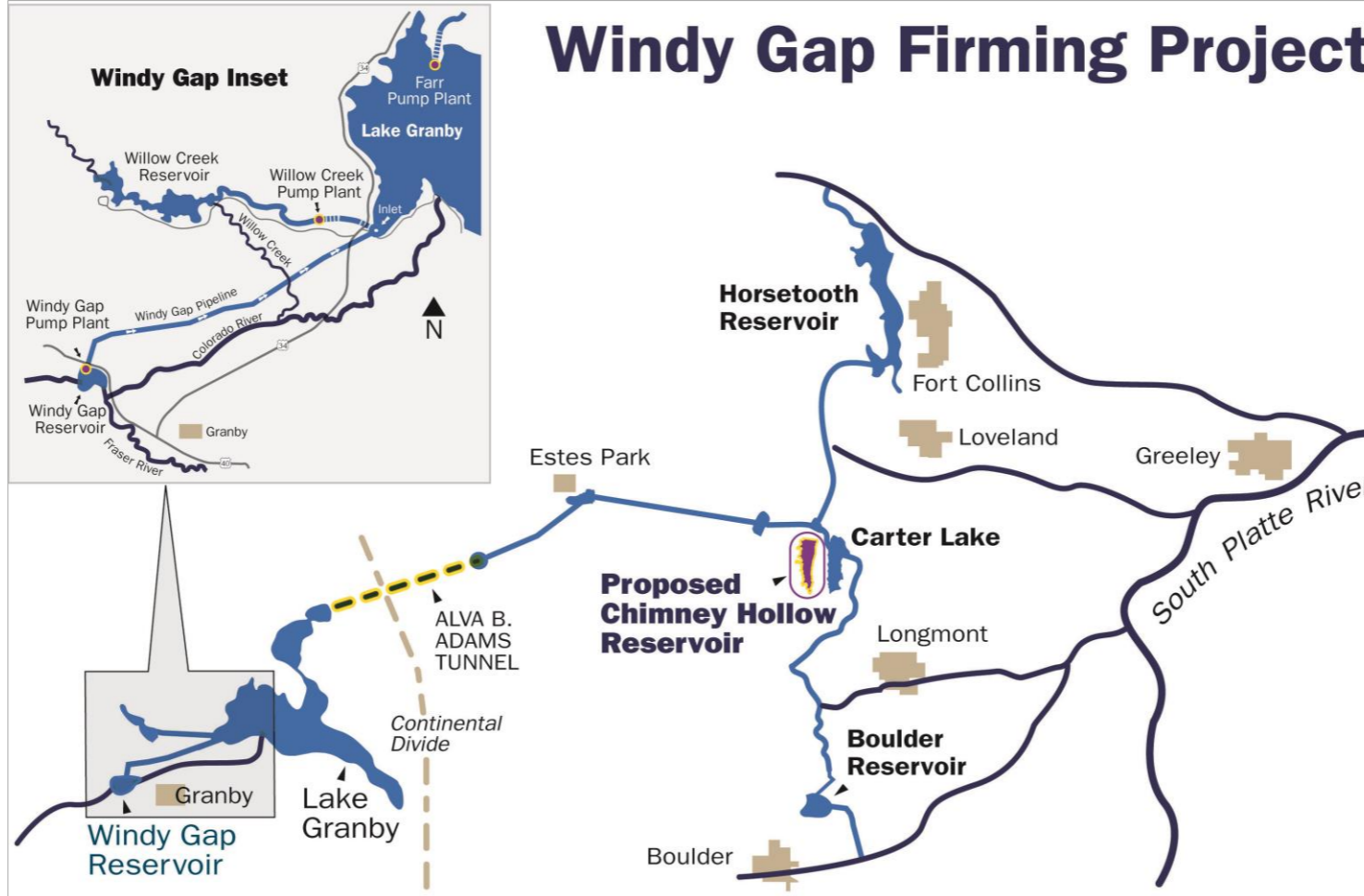
# Colorado-Big Thompson and Windy Gap Project Operation



# About Northern Water



# Windy Gap Firming Project





# C-BT Project Operations

- **1935 Water Rights**
- **Supplemental supply** to Northeast Colorado
- **Quota** set every year (50% to 100%)
- **Carryover Program**
  - Allows allottees to carry over up to 20% of water
  - Incentivizes conservation
- **Agricultural and Municipal water use** interchanges from year to year
- **Green Mountain Reservoir** – West slope benefit

# WG Project Operations

- **1967-1971 Water Rights**
- **Pumping** – typically May and June but may extend to April and July
- **Yield limited** by junior water right and often high storage levels in Granby Reservoir
- **Chimney Hollow Reservoir** - under construction (2021-2025) to increase reliability of project
- **Wolford Mountain Reservoir** – West Slope benefits



# Operational Flexibility and Role of Learning by Doing in Influencing Flow Releases Operations



Water flows in Grand County are highly managed.



Operational flexibility = Flows managed to minimize impacts

# Operational Flexibility Overview

# Tools of Operational Flexibility

## Tools available

- 1000 AF from Denver Water by foregoing Moffat Tunnel diversions
- Up to 2500 AF storage in Williams Fork
- Windy Gap water pumped by Grand County (up to 1500 AF)
- Unused Windy Gap water pumped by Middle Park Water Conservancy District
- Unused Storage capacity in Granby, if any (up to 7500AF)
- 5412.5 AF of water released from Granby for downstream endangered fish
- **Operations coordination**

# Role of LBD in Influencing Flow Releases

- LBD's Role: Operations Subcommittee
  - Planning: Annual Operations Plan
  - Doing: Weekly Calls from May to September
  - Reporting: Annual Operations Report





Annual Operations Plan is developed to maximize the stream environmental benefits using resources available to LBD within the CEA.



The plan prescribes operating procedures and timelines for LBD activities in support of operations.



The primary focus of the committee is to meet weekly from June – September to review flow and stream temperature data on streams and rivers located within the Fraser and Upper Colorado River watersheds that are impacted by the diversion projects.

# LBD Operations Subcommittee



**Colorado River  
Cooperative Agreement  
(CRCA)**



**2010 Grand County  
Stream Management  
Plan**



**Hydrologic and water  
supply forecasts**



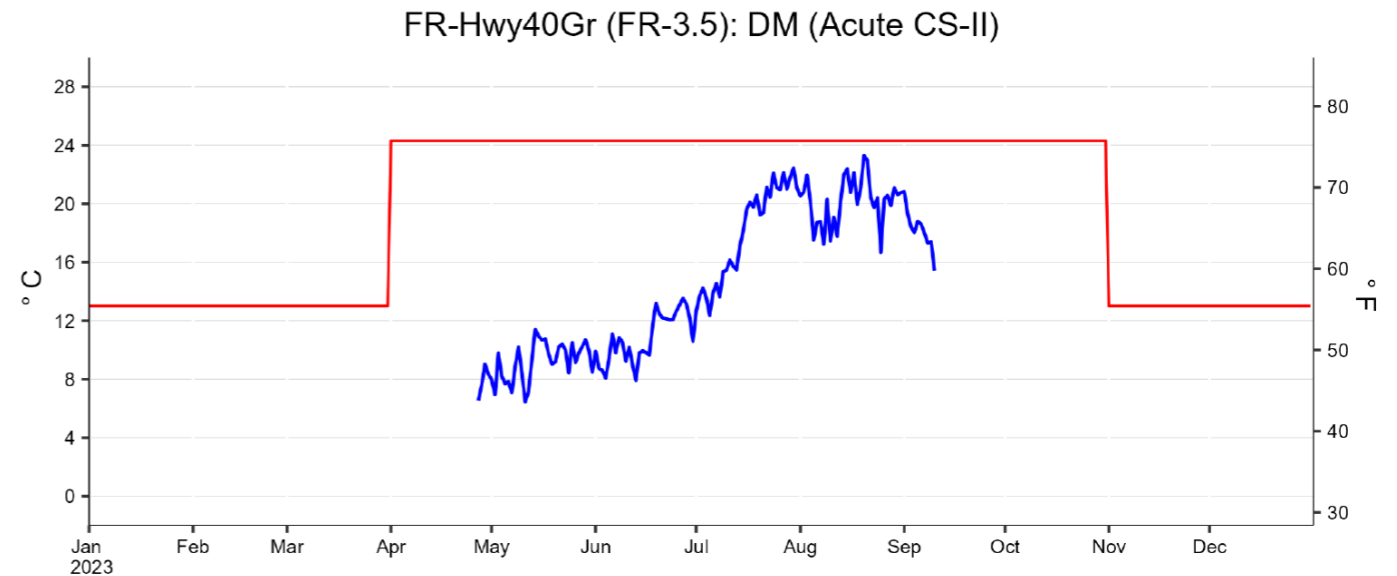
**Water supply system  
conditions**

# Annual Operations Plan Guidelines



# In-Season Operations

- Colorado Stream Temperature Standards
  - Chronic Standard: Maximum weekly average
  - Acute Standard: Daily maximum
- These standards facilitate our decision making during the runoff season.



# In-Season Operations

Flows below Granby Reservoir are dictated by minimum streamflow criteria per 1961 Principles.



1961 Principals		1961 Principals + 5412 Water	
May – July	75 cfs	May – July	75 cfs
August	40 cfs	<b>August</b>	<b>75 cfs</b>
September	20 cfs	<b>September</b>	<b>40 cfs</b>
October – April	20 cfs	October – April	20 cfs

# In Season Operations

- Shoshone Outage Protocol (ShOP)
  - Shoshone Hydroelectric Plant: most senior water right on the Colorado River, the calling of the water right (1,250 cfs) maintains flow in the river that otherwise could be diverted by upstream users with junior rights.
  - A 40-year agreement forged in 2016 called the Shoshone Outage Protocol Agreement.
  - This effectively keeps water in the river when the power plant is shut down for repair or maintenance. Without that agreement, the Colorado River would have very low flows.





# In-Season Operations

- Cameo Call
  - Provides water mostly for irrigation and power in the Grand Valley near Grand Junction.
- Operates only during irrigation season
- Like the Shoshone Call, the Cameo Call effectively keeps water instream until it reaches the Grand Junction area

# Why is the Shoshone and Cameo Call beneficial to instream flows in Grand County?

- Upstream reservoir releases from Granby, Green Mountain, Williams Fork, and Wolford keep water instream from the headwaters to the state line.
- The Calls protect segments of the river that would otherwise be drawn to critically low levels by upstream water users.

# Grand County SMP LBD Operations Summary

September 19, 2023



G R A N D C O U N T Y

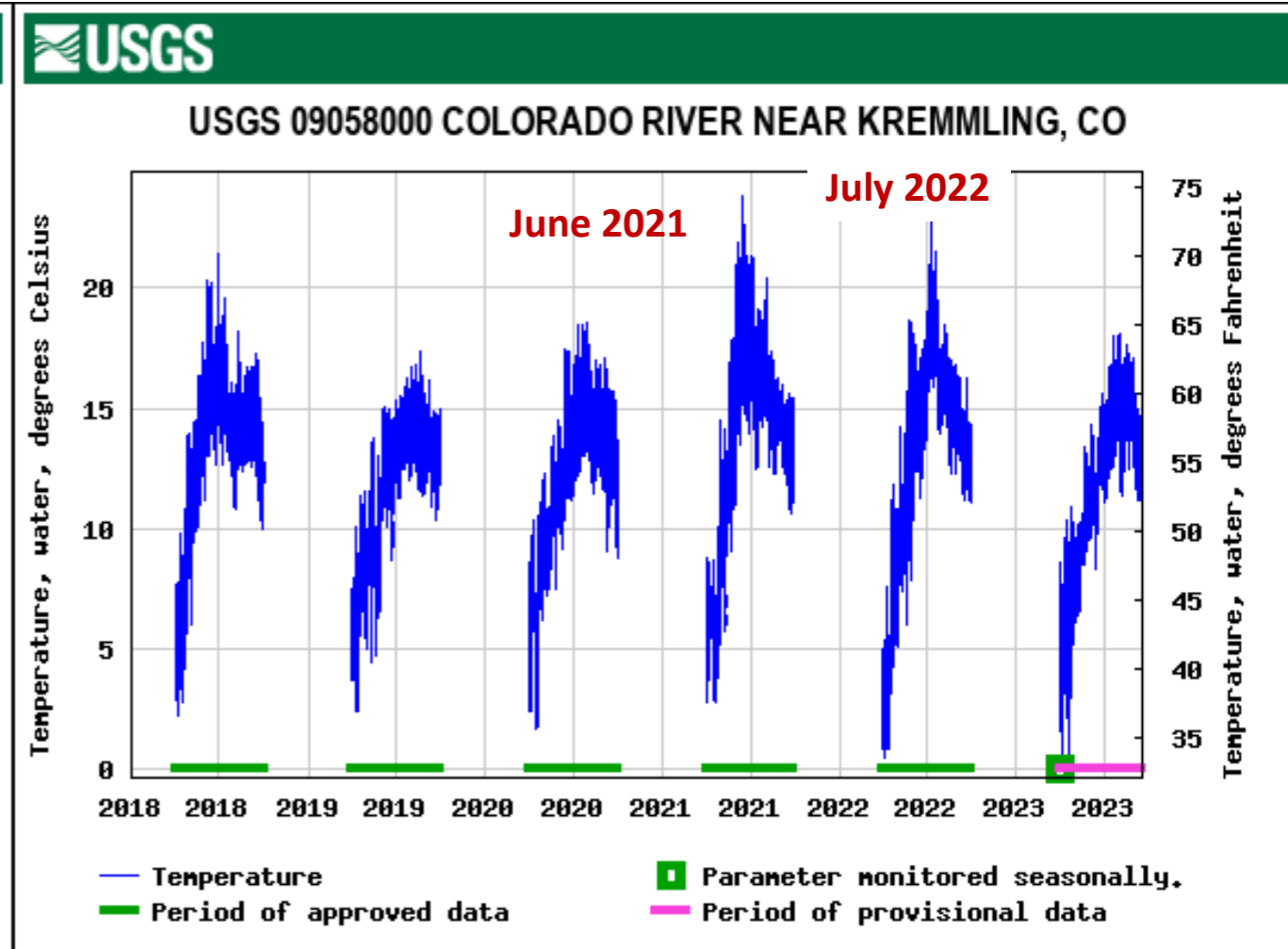
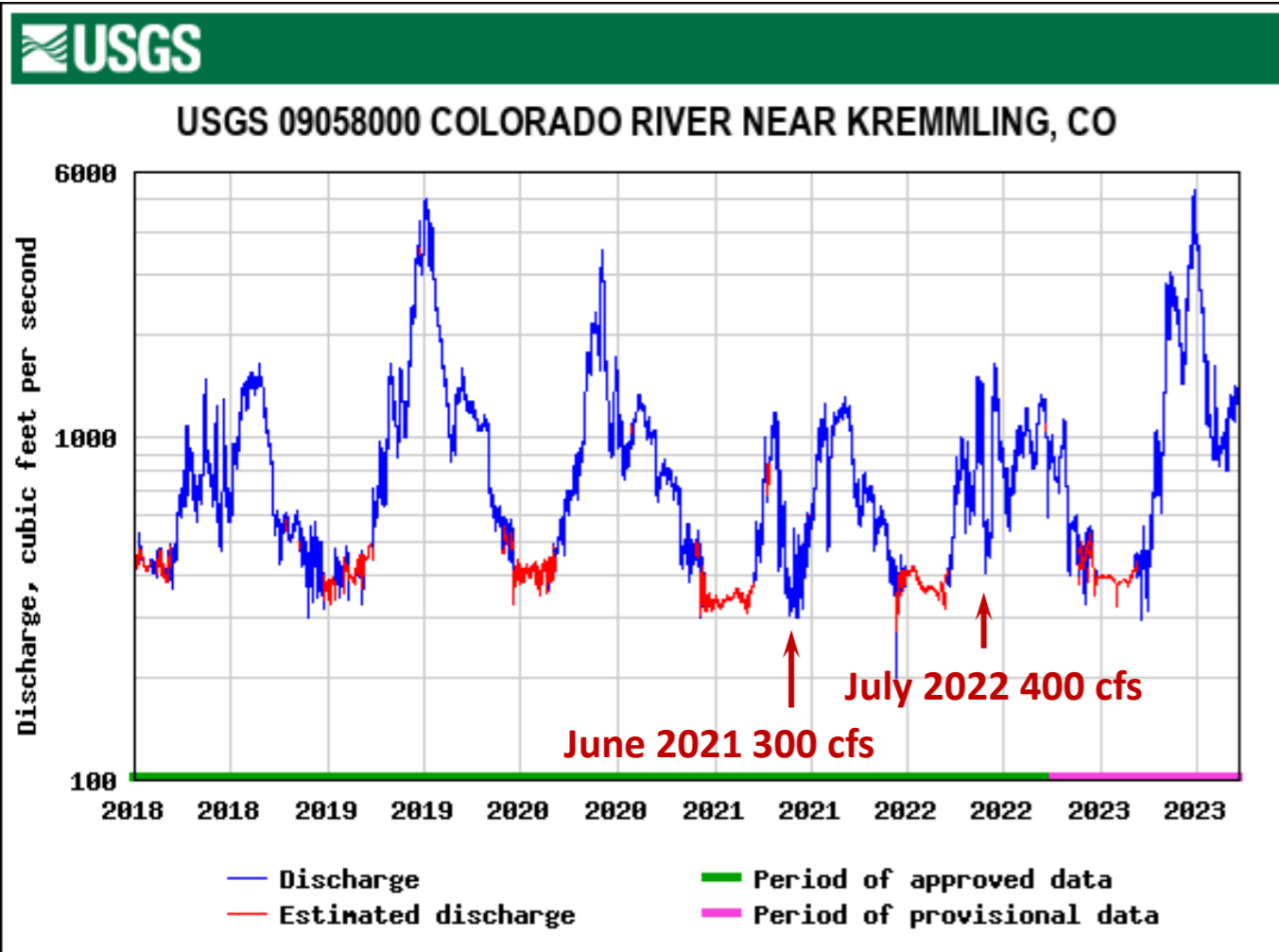
# LEARNING BY DOING

Don Meyer  
Senior Water Resources Engineer  
Colorado River District

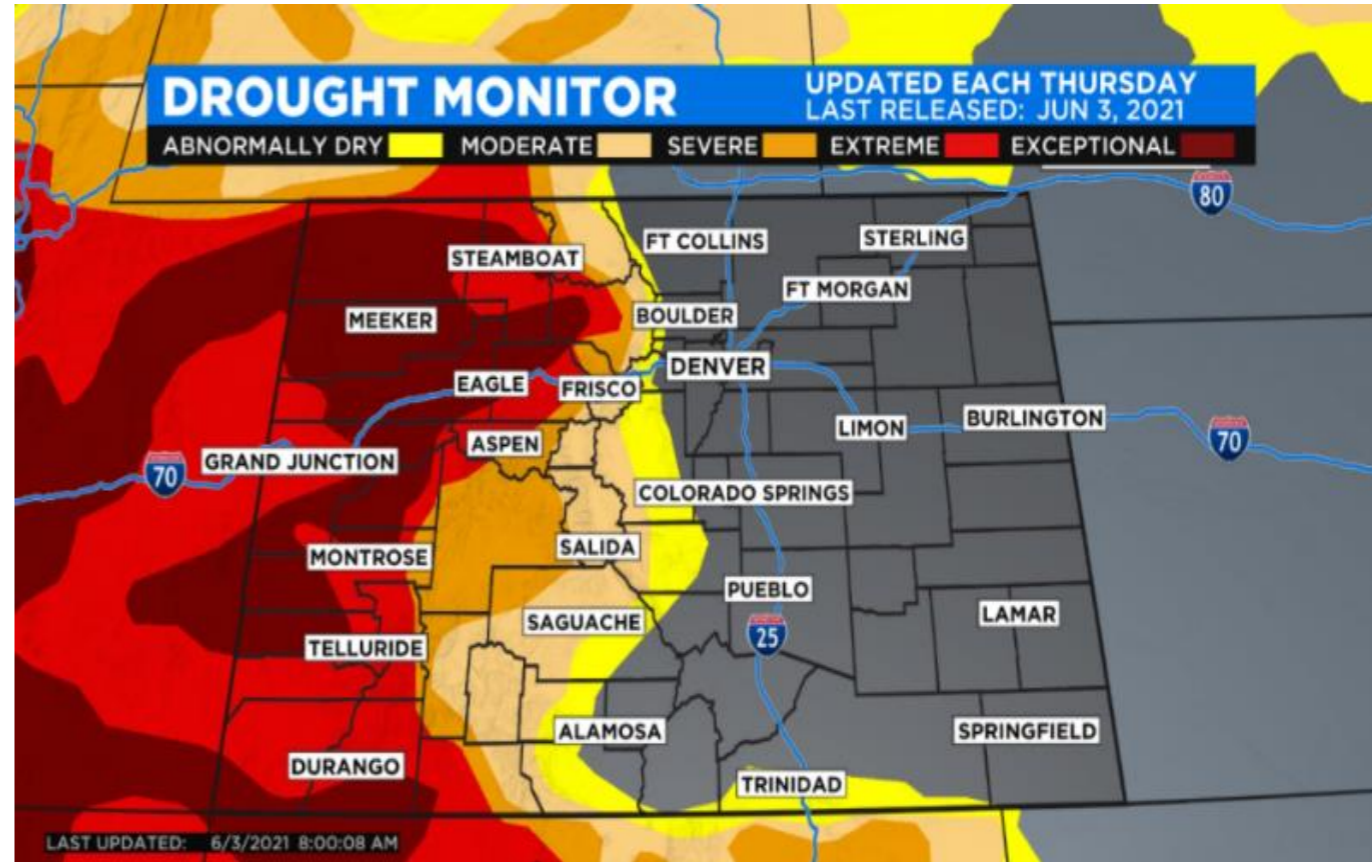
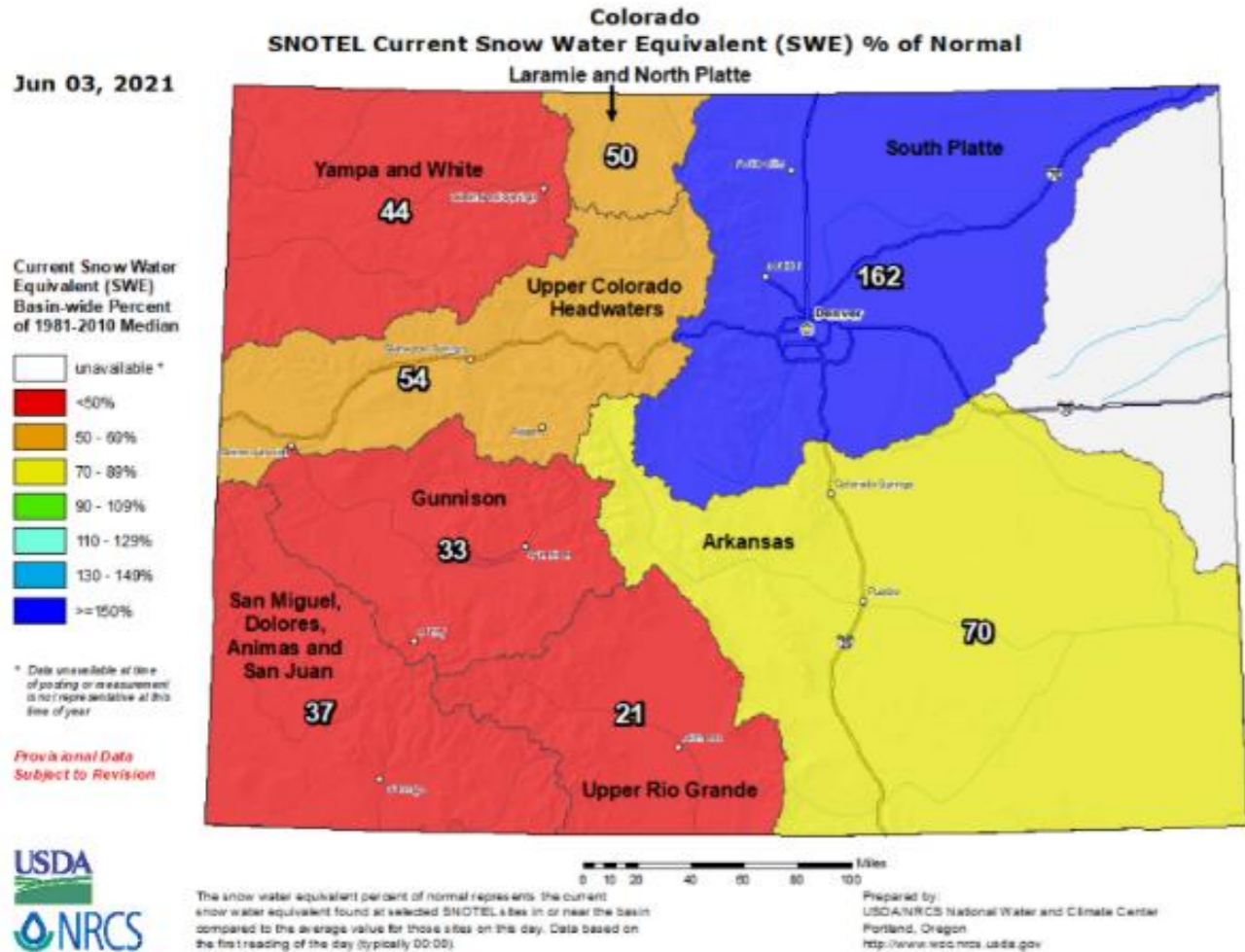


**COLORADO RIVER DISTRICT**  
PROTECTING WESTERN COLORADO WATER SINCE 1937

# 2018 thru 2023 Colorado River near Kremmling Streamflows and Water Temperatures



# June 3, 2021 Statewide Snowpack and Drought Monitor

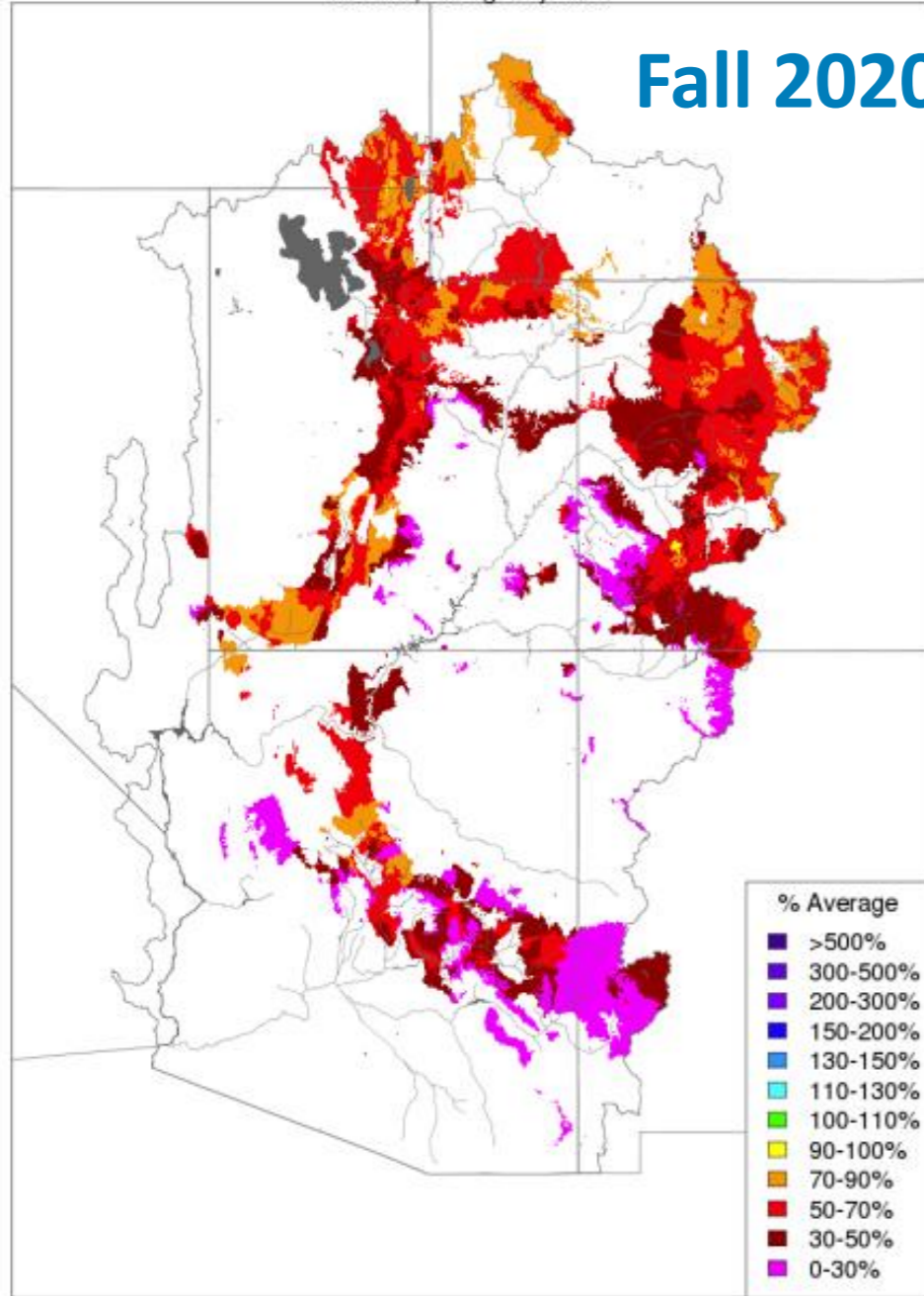




Soil Moisture - Fall - 2020 (November 15)

Modeled, Averaged by Basin

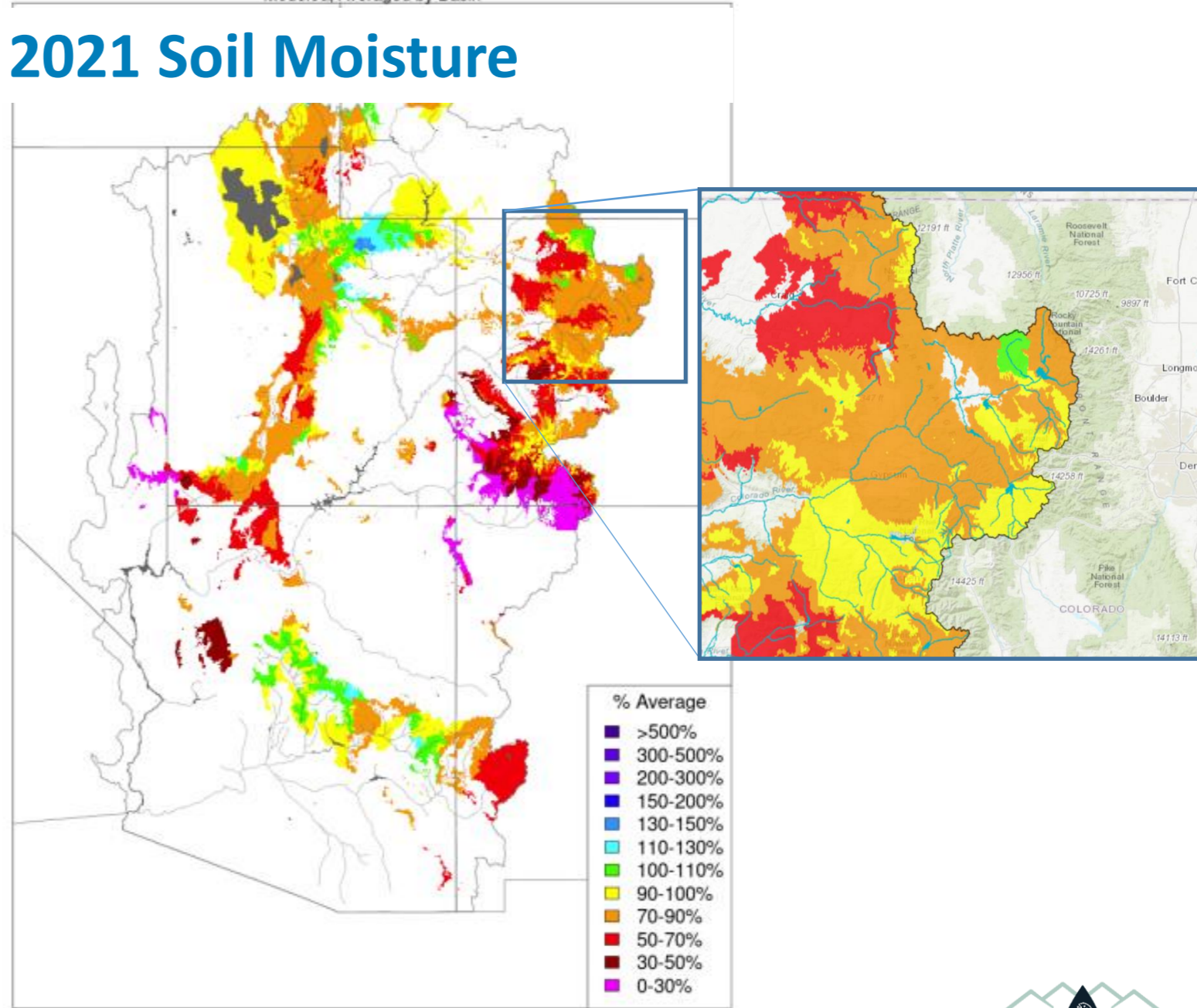
# Fall 2020 and 2021 Soil Moisture



Prepared by NOAA, Colorado Basin River Forecast Center  
Salt Lake City, Utah, [www.cbrfc.noaa.gov](http://www.cbrfc.noaa.gov)

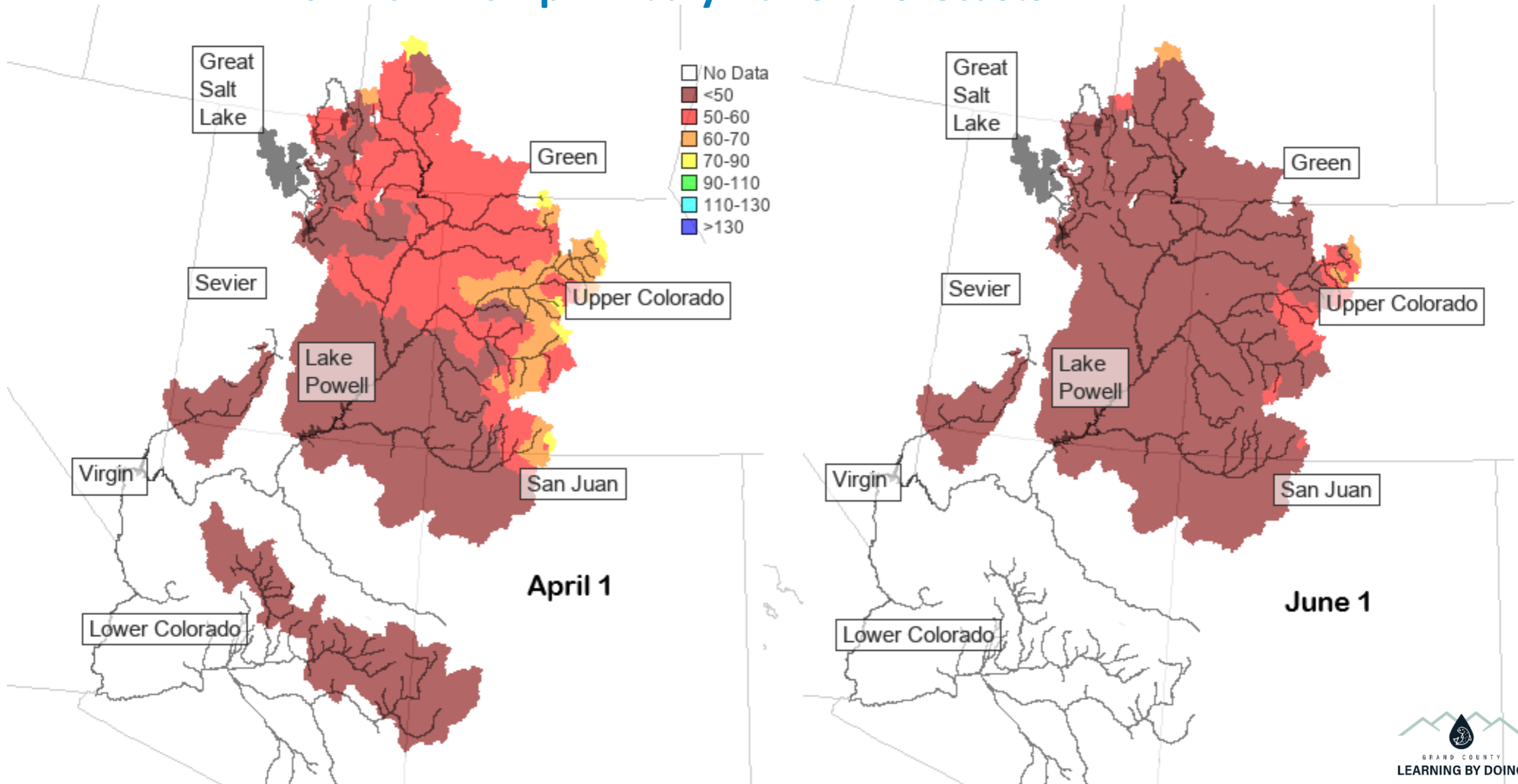
Soil Moisture - Fall - 2021 (November 15)

Modeled, Averaged by Basin



Prepared by NOAA, Colorado Basin River Forecast Center  
Salt Lake City, Utah, [www.cbrfc.noaa.gov](http://www.cbrfc.noaa.gov)

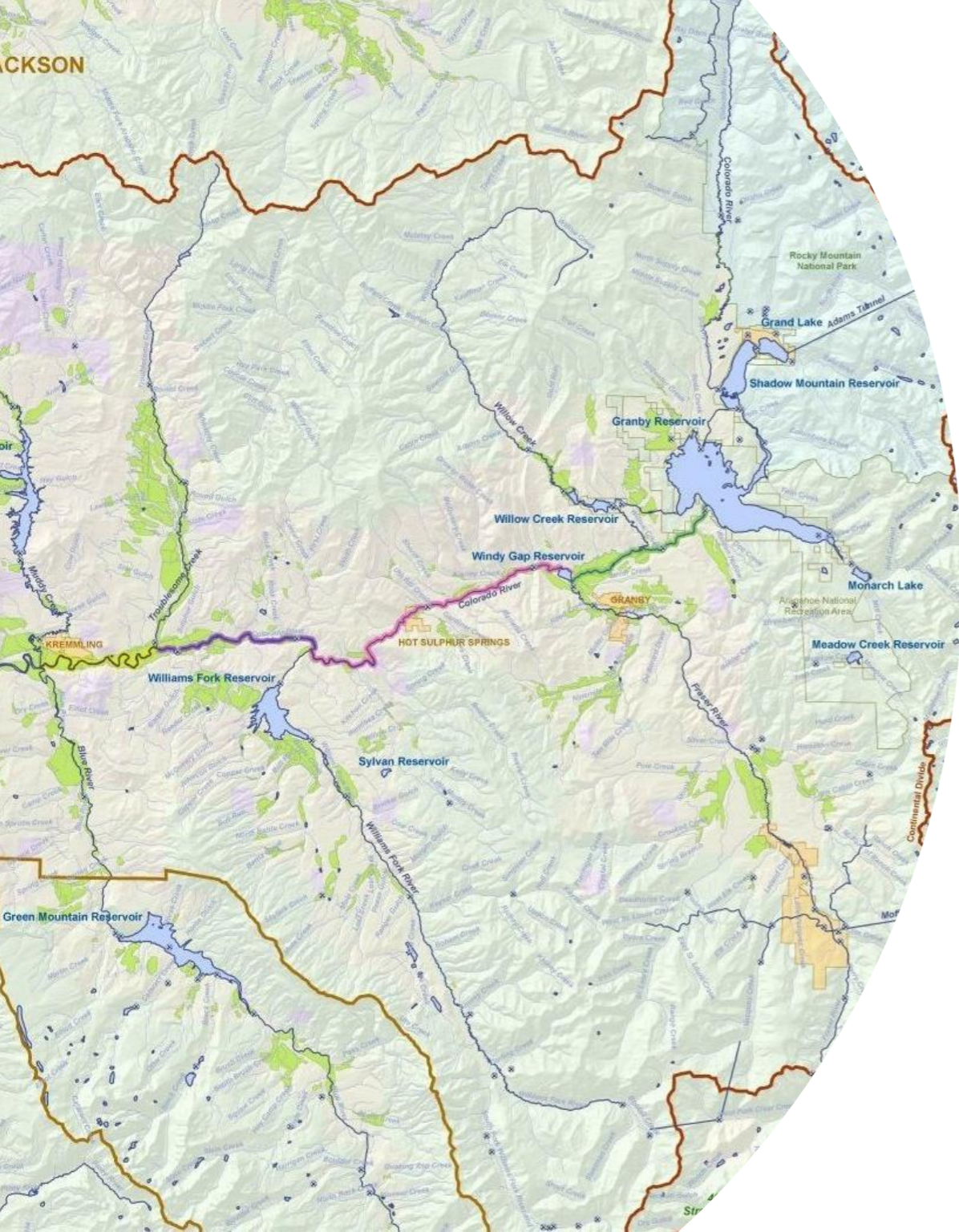
# 2021 CBRFC April – July Runoff Forecasts





## 2021 LBD Operations Highlights

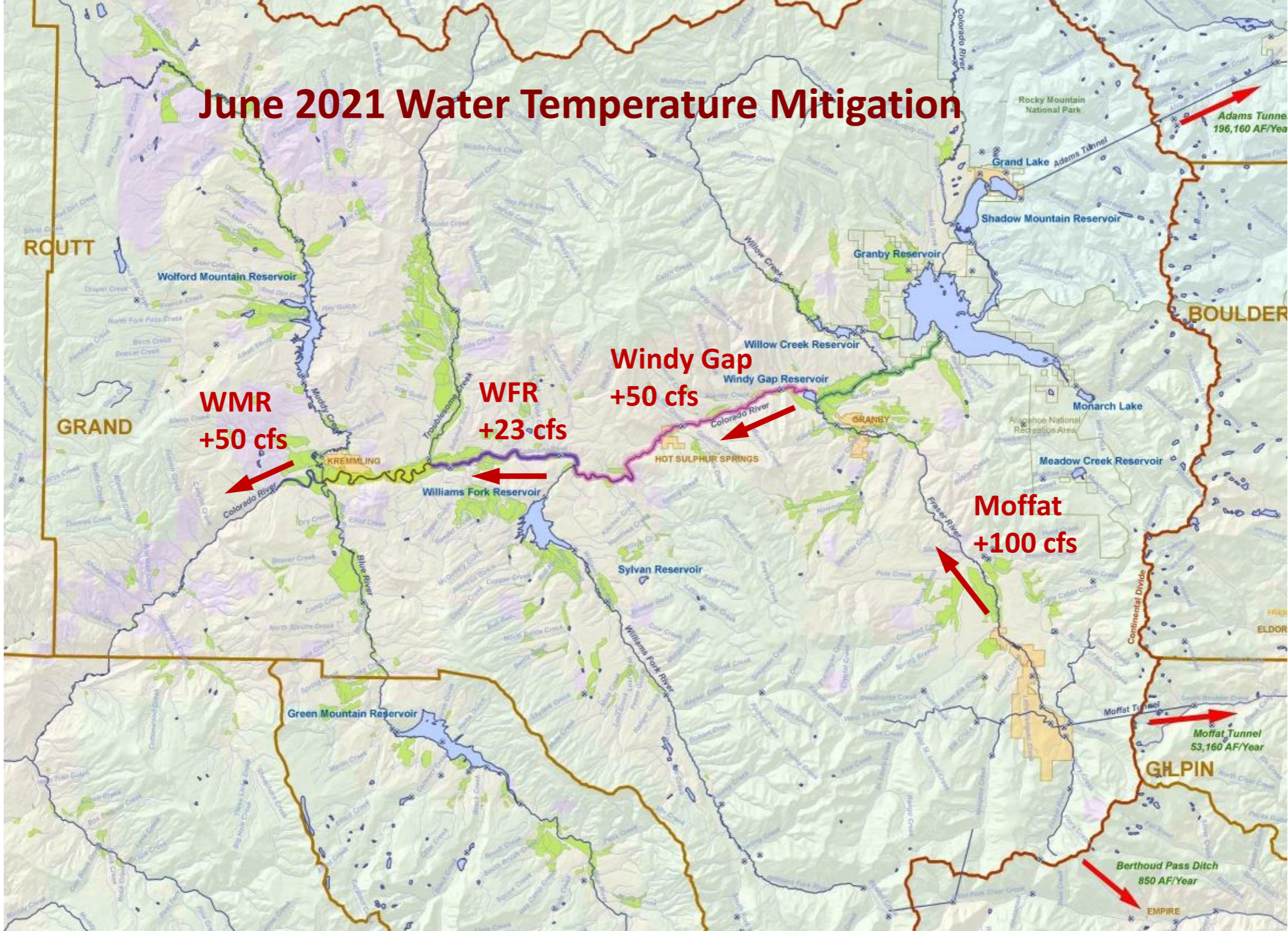
- **Multiple diversions to Upper Colorado River in critically dry year**
- **Hot dry April-June climate**
- **June water temperature mitigation by Denver, Northern, River District**
- **East Slope priority water**
- **Shoshone Outage (ShOP June 23<sup>rd</sup>)**
- **Cameo call July 11<sup>th</sup>**
- **July Granby 5412 dry year releases**
- **July and August monsoons**
- **Moffat Tunnel Maintenance Aug 20<sup>th</sup>**



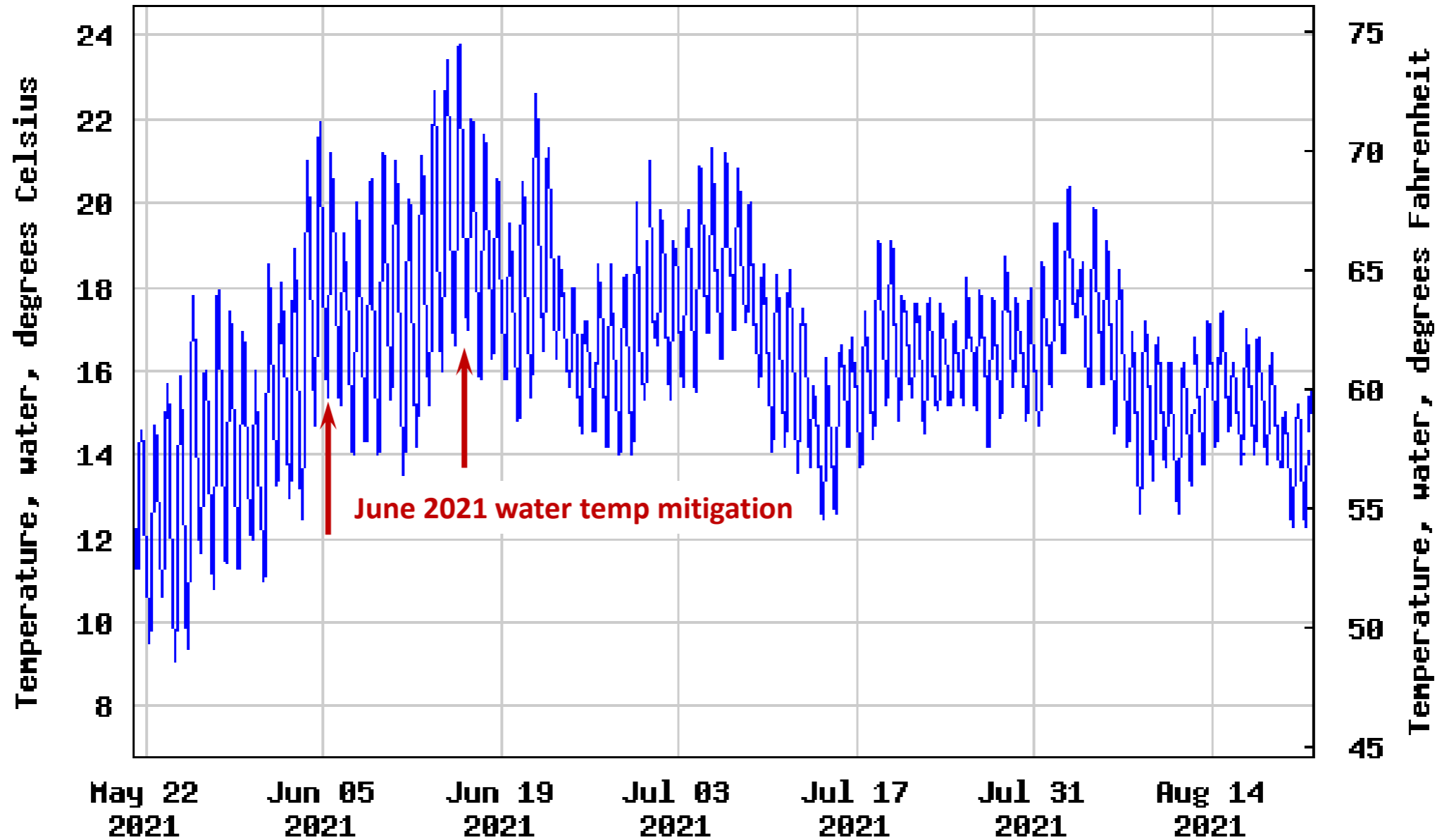
# 2022 LBD Operations Recap

- **Runoff 89% Average**
- **Early and Often Monsoons**
- **Early Willow Creek Bypasses**
- **Moffat Tunnel Limited to 150-200 cfs due to Gross Reservoir Expansion**
- **Granby 5412 Releases Mid-July**
- **July Water Temperature Mitigation**
  - **River District 500 af – Wolford**
  - **Subdistrict 400 af – Windy Gap**
  - **Denver Water 200 af – Ranch Creek**
- **Granby Release of Grand County 1,300 af**
- **GMR 20 Kaf Short of Fill (Substitution)**
- **Adams Tunnel Outage Mid-Sep to Dec**

# June 2021 Water Temperature Mitigation

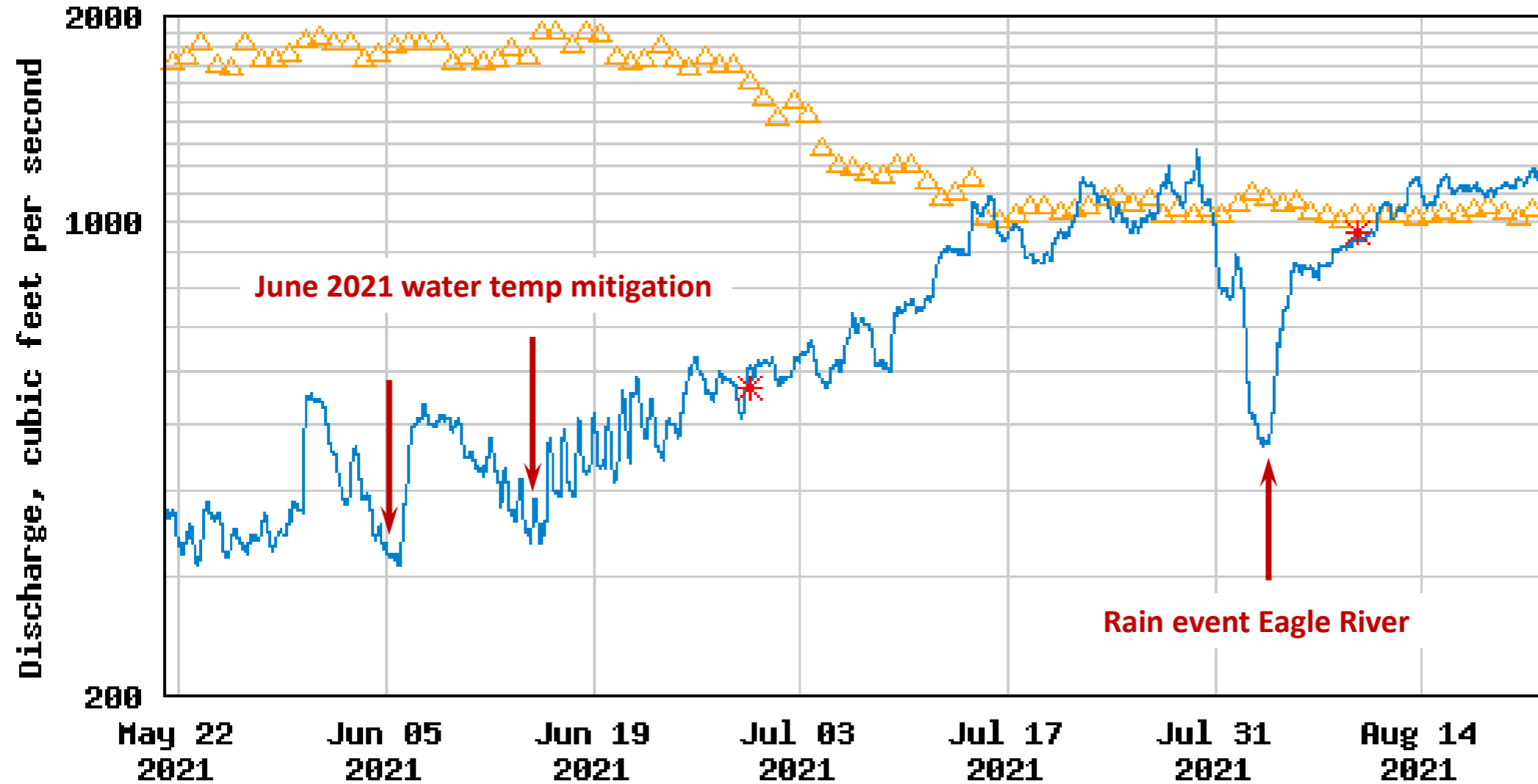


USGS 09058000 COLORADO RIVER NEAR KREHLING, CO



---- Provisional Data Subject to Revision ----

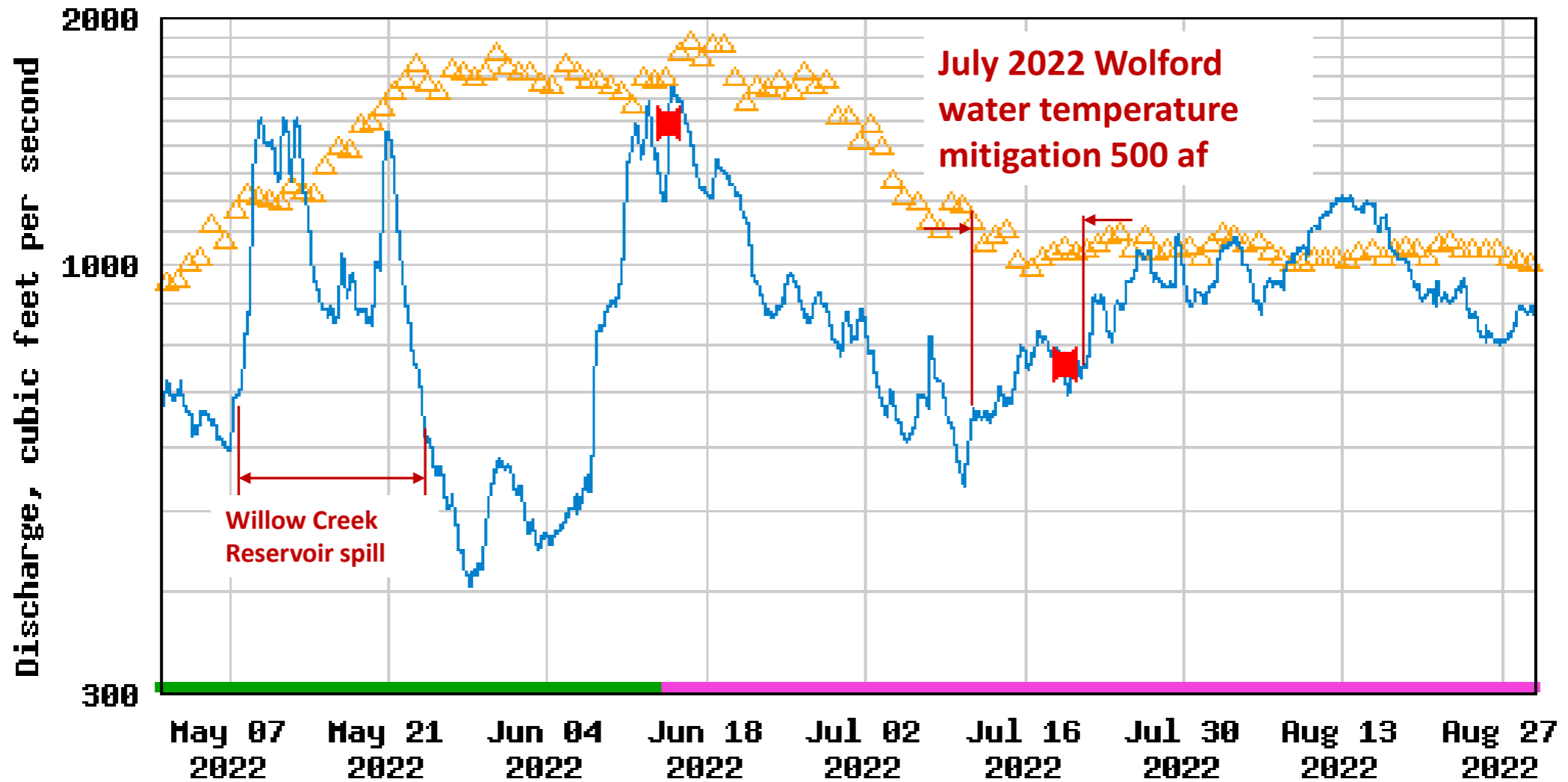
# USGS 09058000 COLORADO RIVER NEAR KREHLING, CO



----- Provisional Data Subject to Revision -----

- △ Median daily statistic (58 years)
- Discharge
- \* Measured discharge

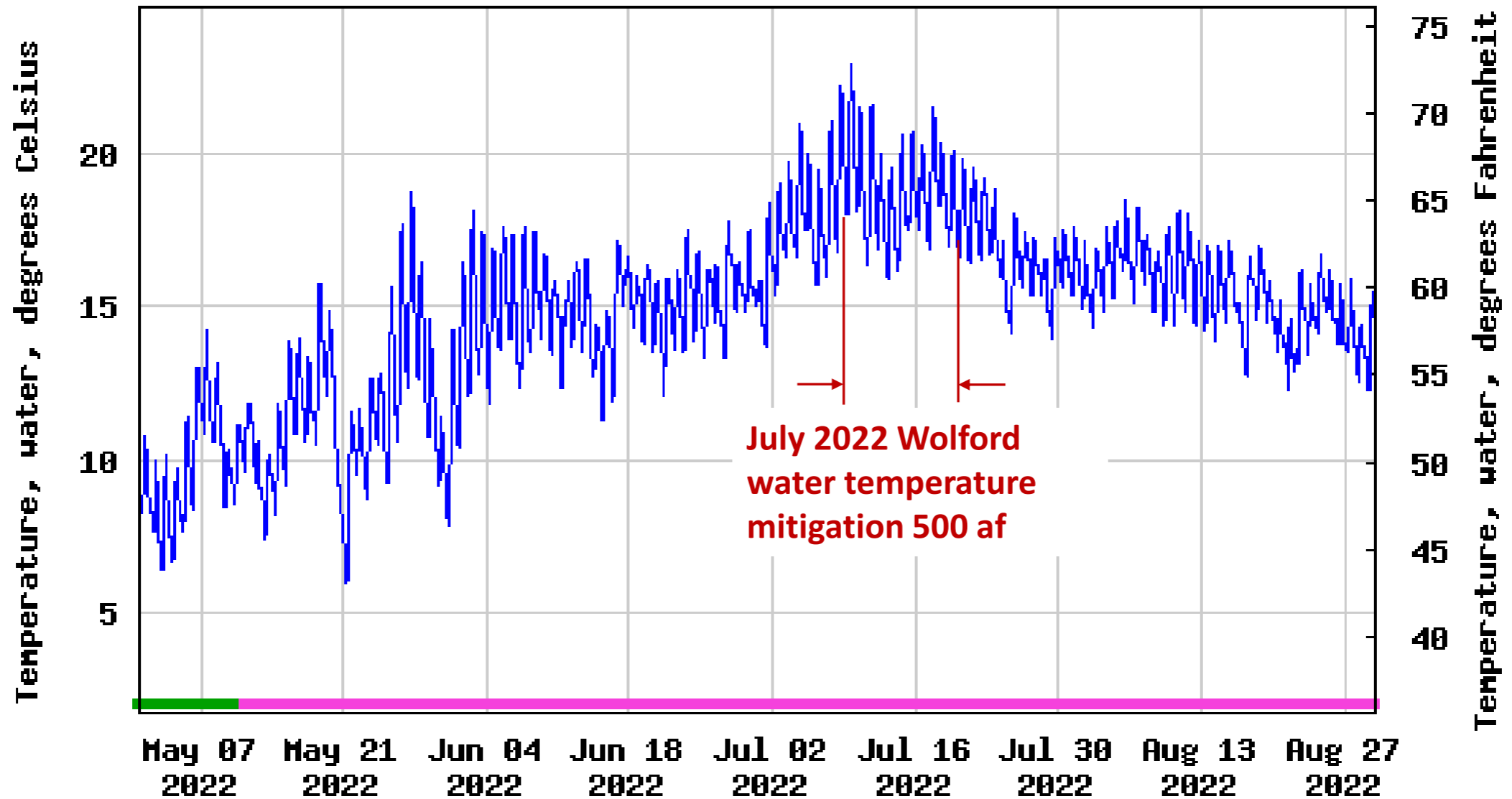
USGS 09058000 COLORADO RIVER NEAR KREHLING, CO



- △ Median daily statistic (59 years)
- Discharge
- Period of approved data
- Period of provisional data
- Measured discharge



# USGS 09058000 COLORADO RIVER NEAR KREMLING, CO



— Temperature  
— Period of approved data

— Period of provisional data

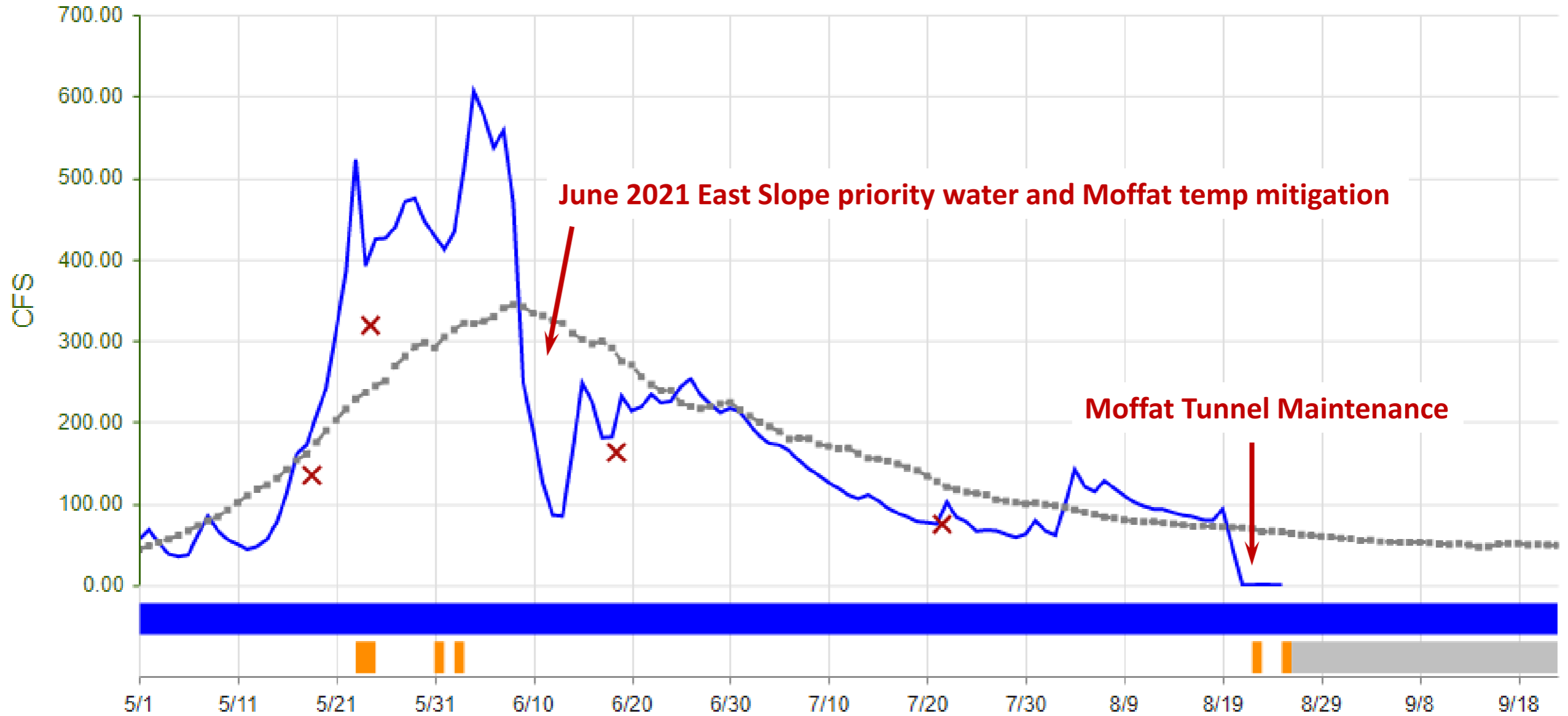
# 2021 LBD-related Operations

- **Denver Water - Moffat Collection System**
  - Spill bypasses to mitigate high water temperatures
  - Maintenance bypasses
- **Municipal Subdistrict - Windy Gap**
  - Bypass to mitigate high temperatures \*
- **River District - Wolford Mountain**
  - Bypass/release to mitigate high temperatures \*
- **USFWS - Granby Reservoir**
  - Release 5412 Endangered Fish water

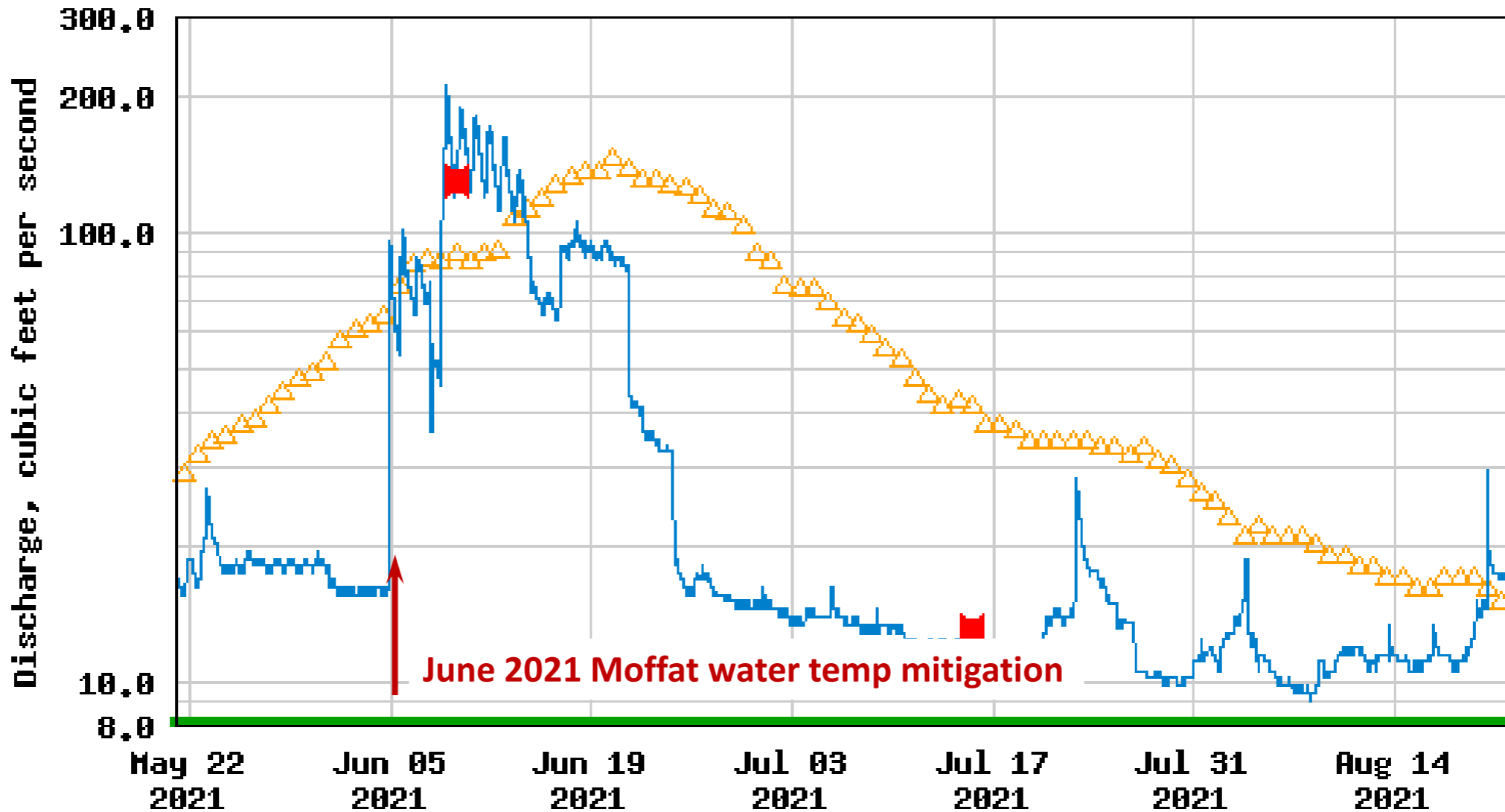


\* Loss of yield

# MOFTUNCO - MOFFAT WATER TUNNEL AT EAST PORTAL, CO.

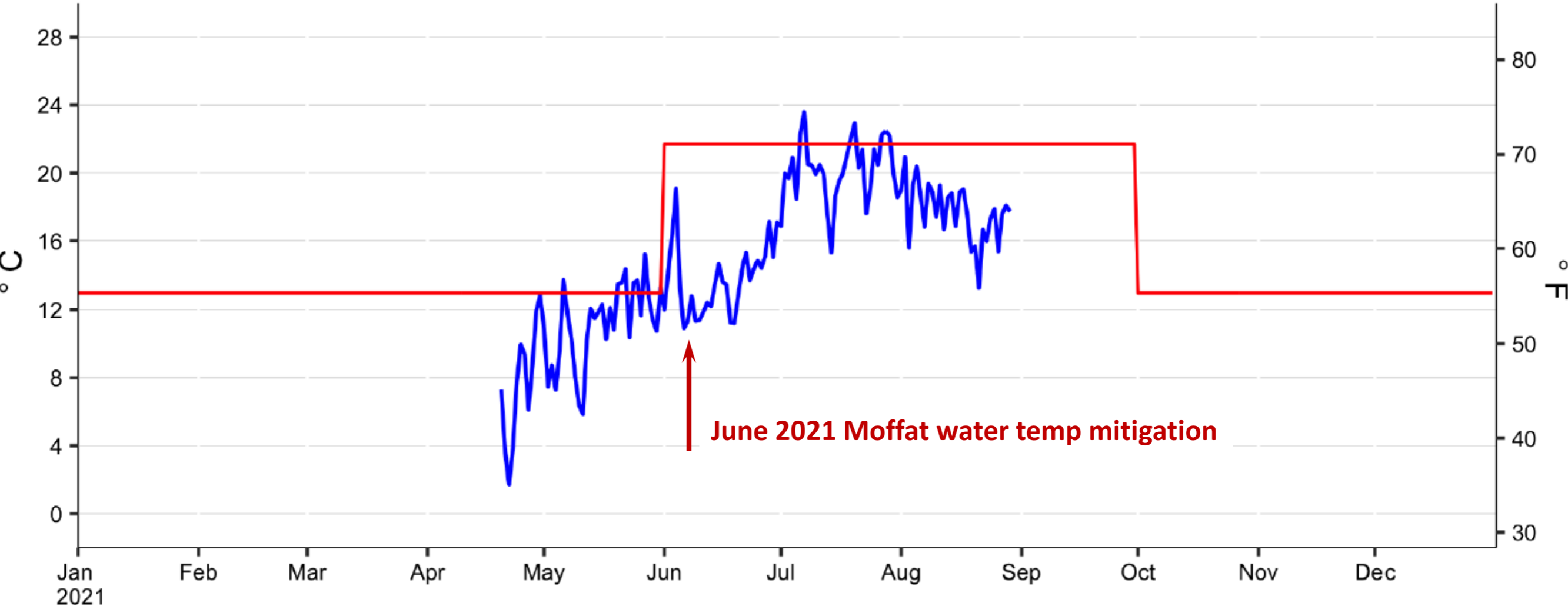


USGS 09026500 ST. LOUIS CREEK NEAR FRASER, CO.

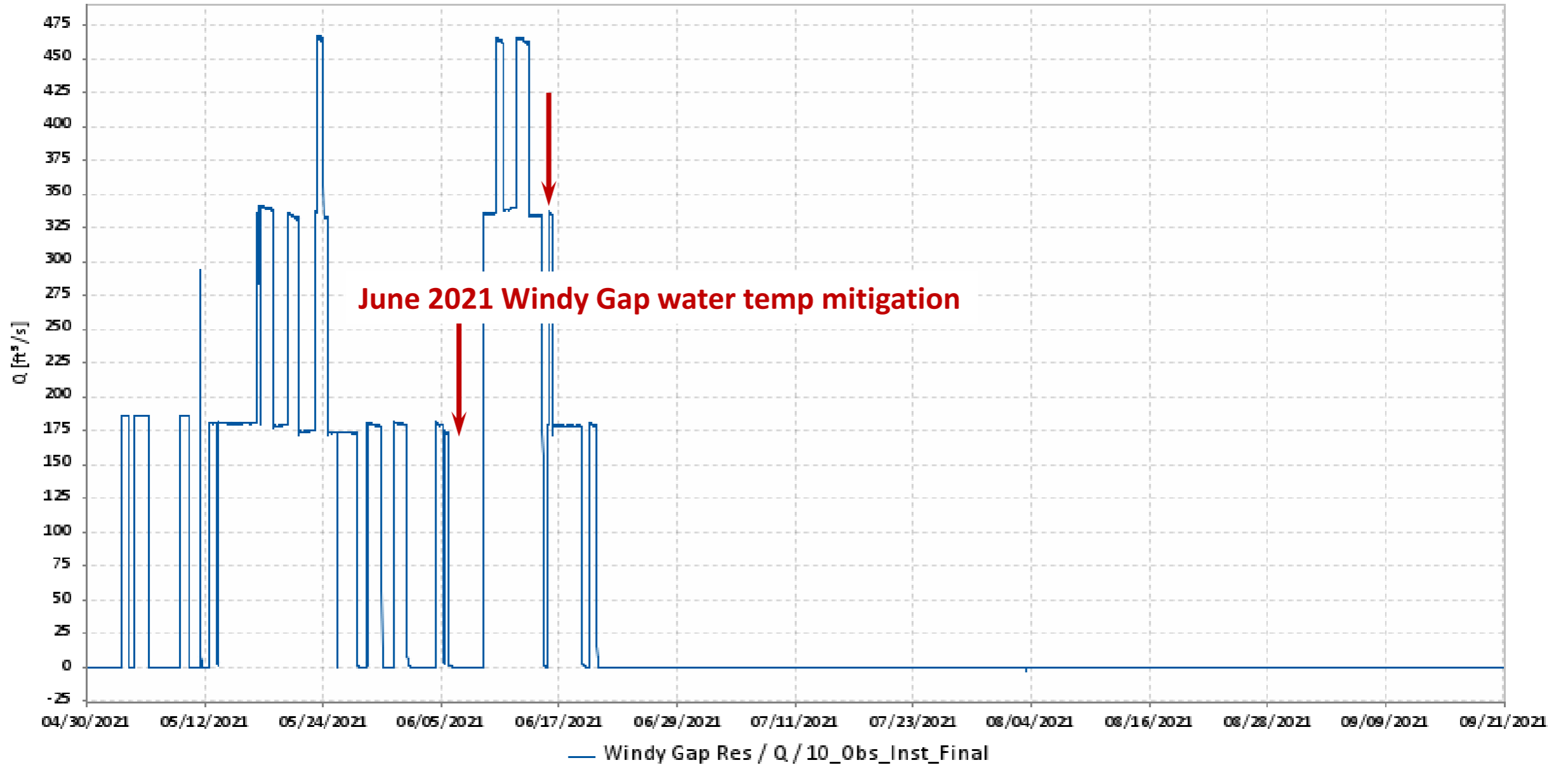


- △ Median daily statistic (87 years)
- Discharge
- Period of approved data
- Measured discharge

# ST-LC (STC-0): DM (Acute CS-I)

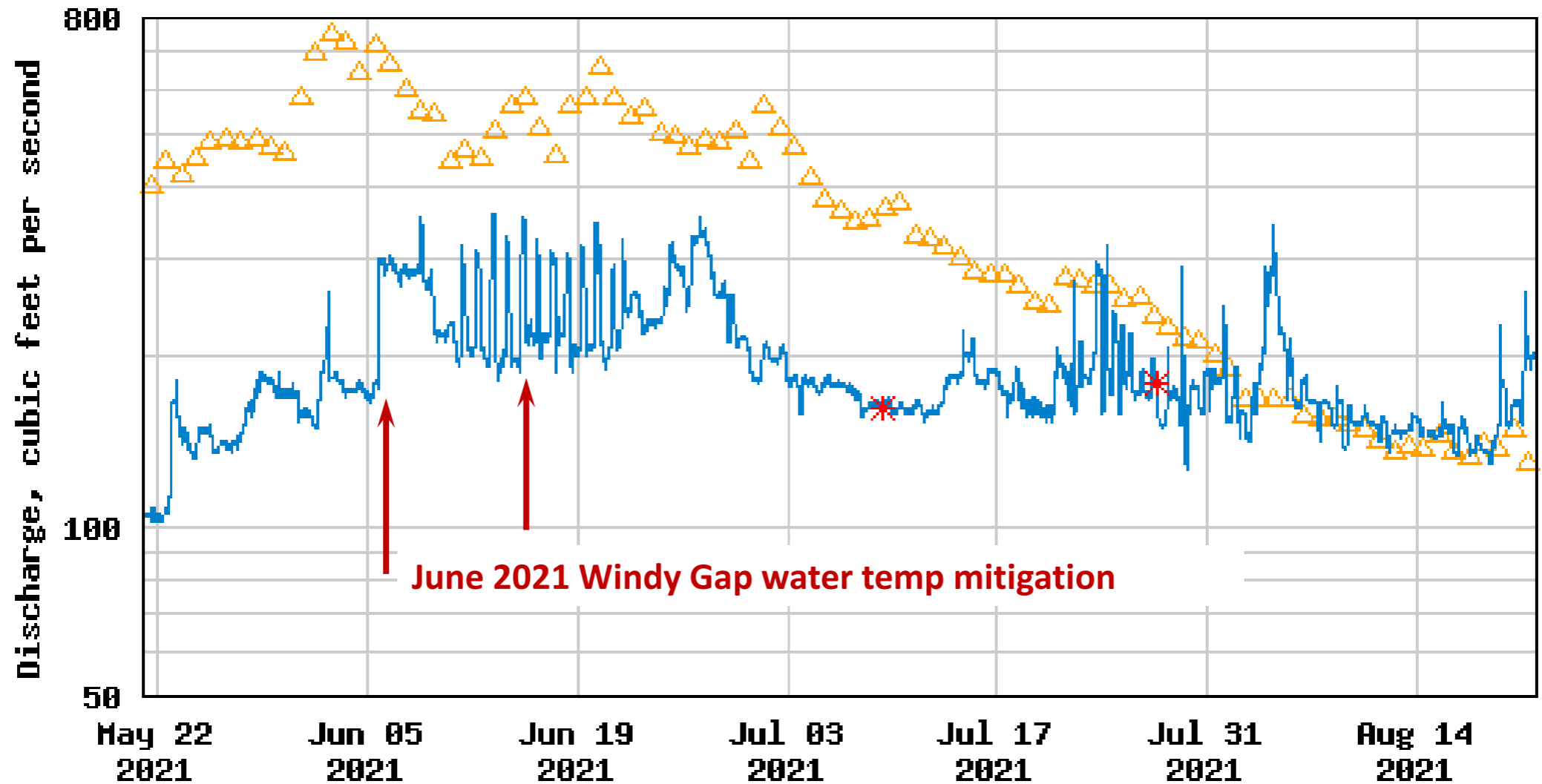


**June 2021 Moffat water temp mitigation**



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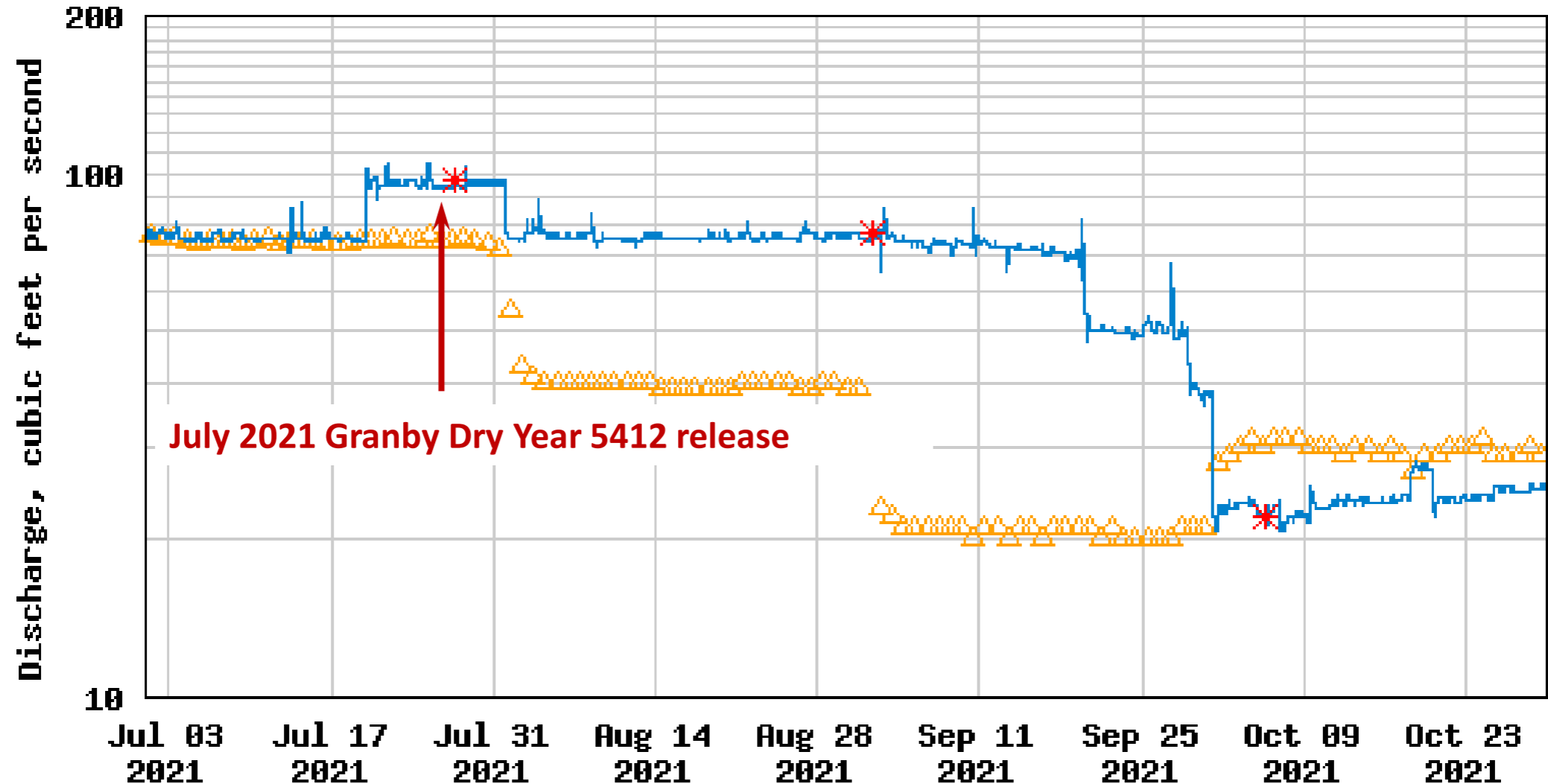
# USGS 09034250 COLORADO RIVER AT WINDY GAP, NEAR GRANBY, CO.



----- Provisional Data Subject to Revision -----

- △ Median daily statistic (39 years)
- \* Measured discharge
- Discharge

USGS 09019500 COLORADO RIVER NEAR GRANBY, CO

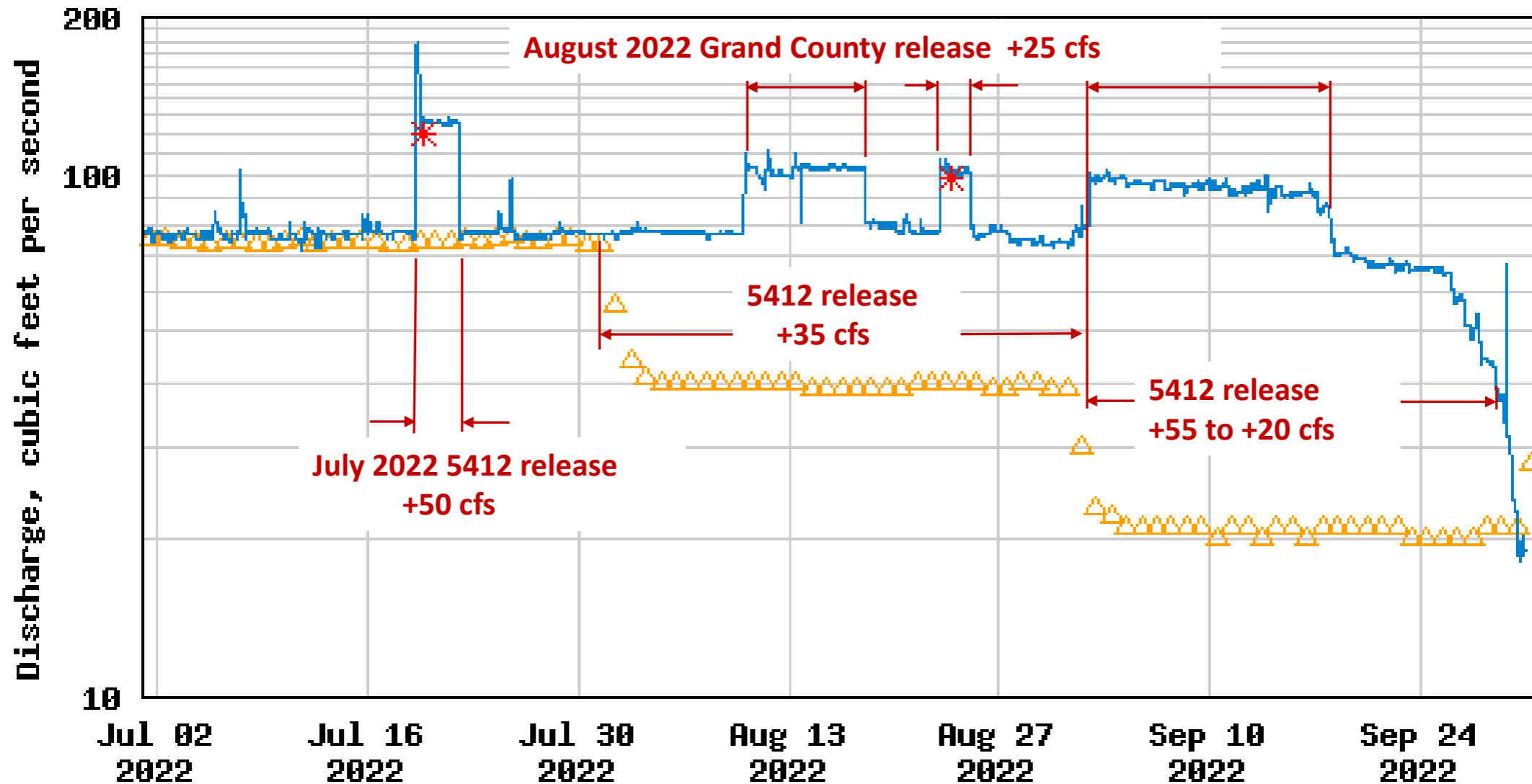


---- Provisional Data Subject to Revision ----

- △ Median daily statistic (9 years)
- \* Measured discharge
- Discharge



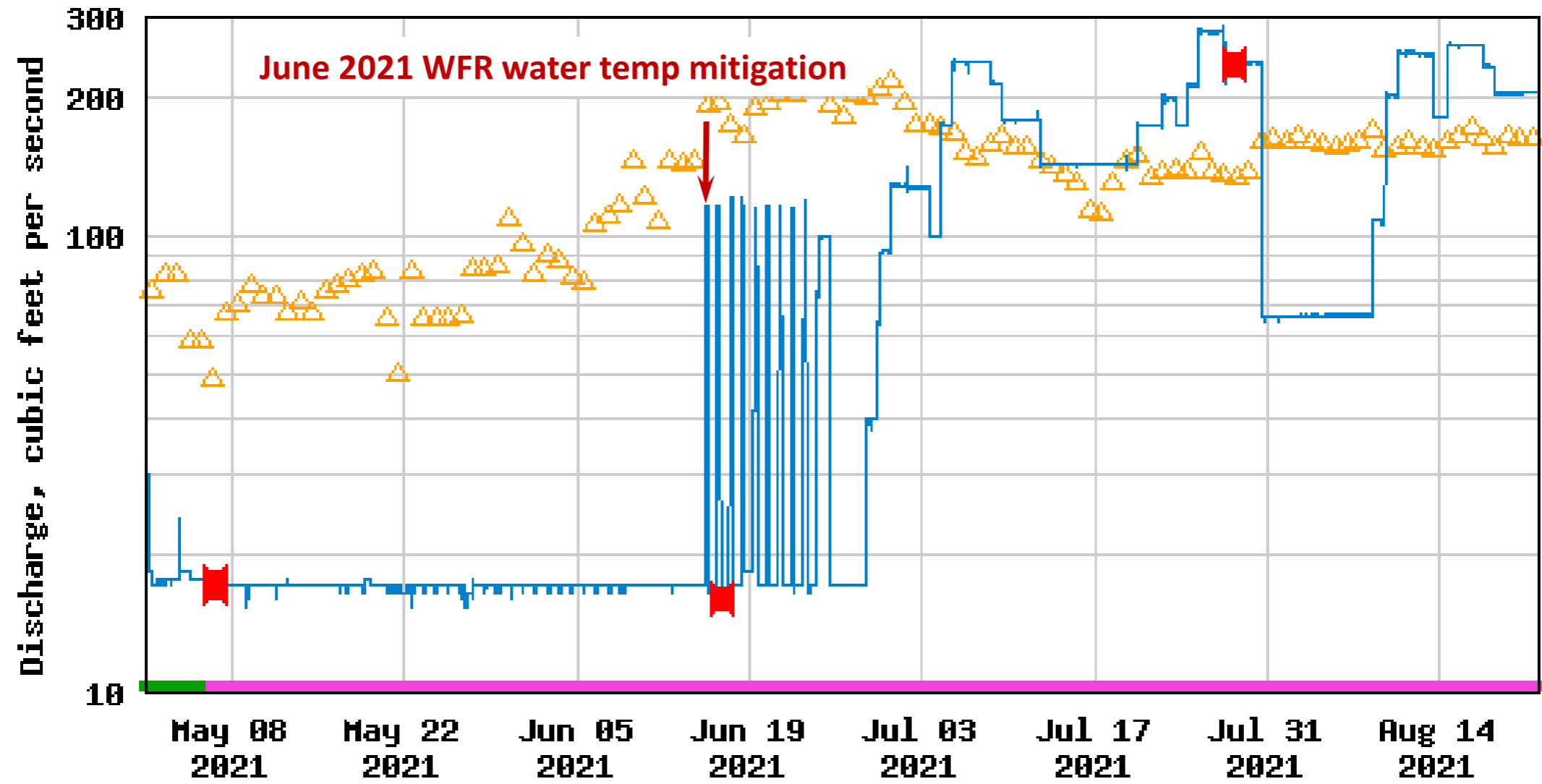
# USGS 09019500 COLORADO RIVER NEAR GRANBY, CO



----- Provisional Data Subject to Revision -----

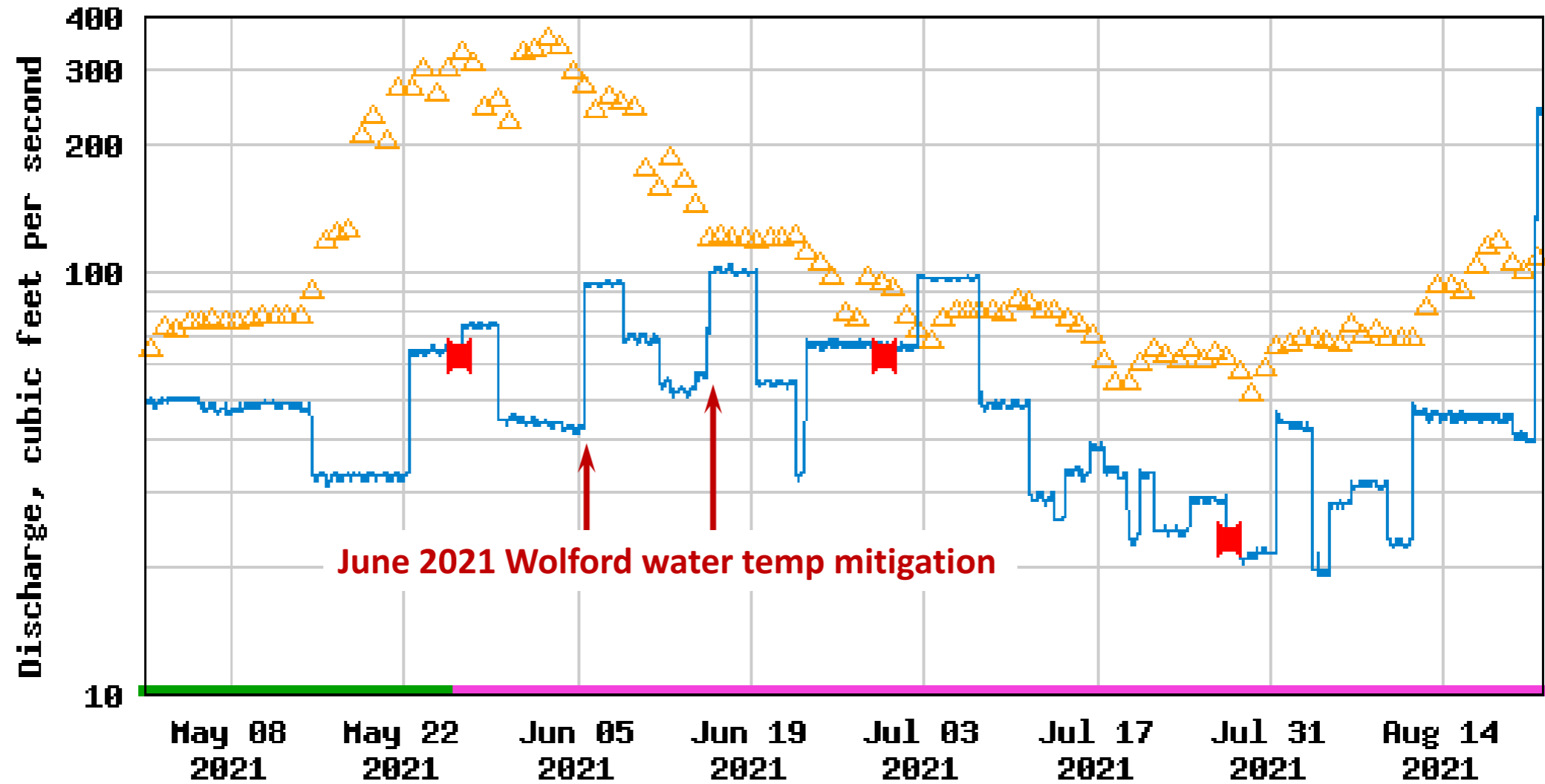
- △ Median daily statistic (20 years)
- \* Measured discharge
- Discharge

# USGS 09038500 WILLIAMS FORK BELOW WILLIAMS FORK RESERVOIR, CO



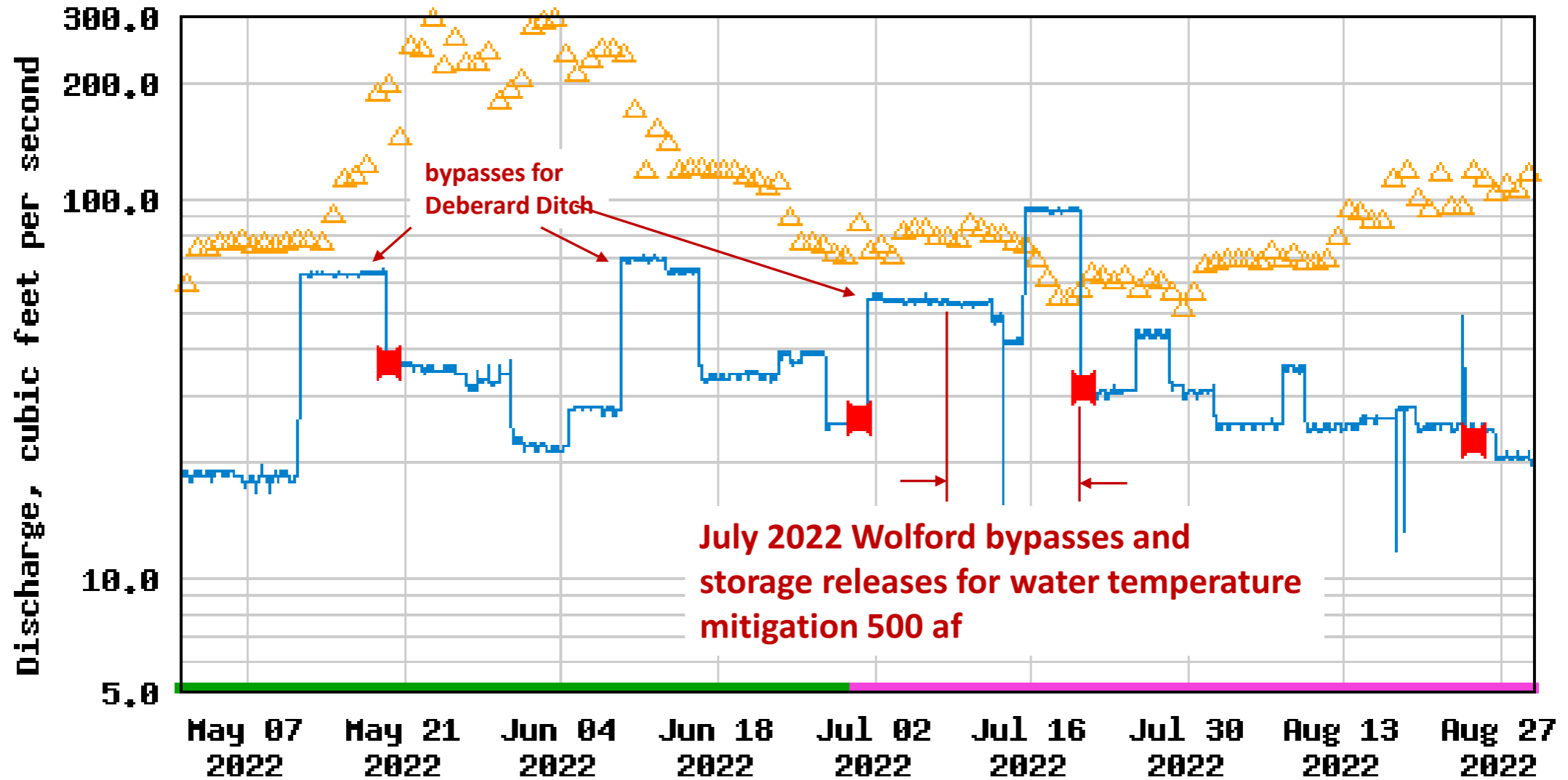
- △ Median daily statistic (67 years)
- Discharge
- Period of approved data
- Period of provisional data
- Measured discharge

USGS 09041400 MUDDY CRK BLW WOLFORD MTN RESER, NR KREMHLING, CO



- △ Median daily statistic (25 years)
- Discharge
- Measured discharge
- Period of approved data
- Period of provisional data

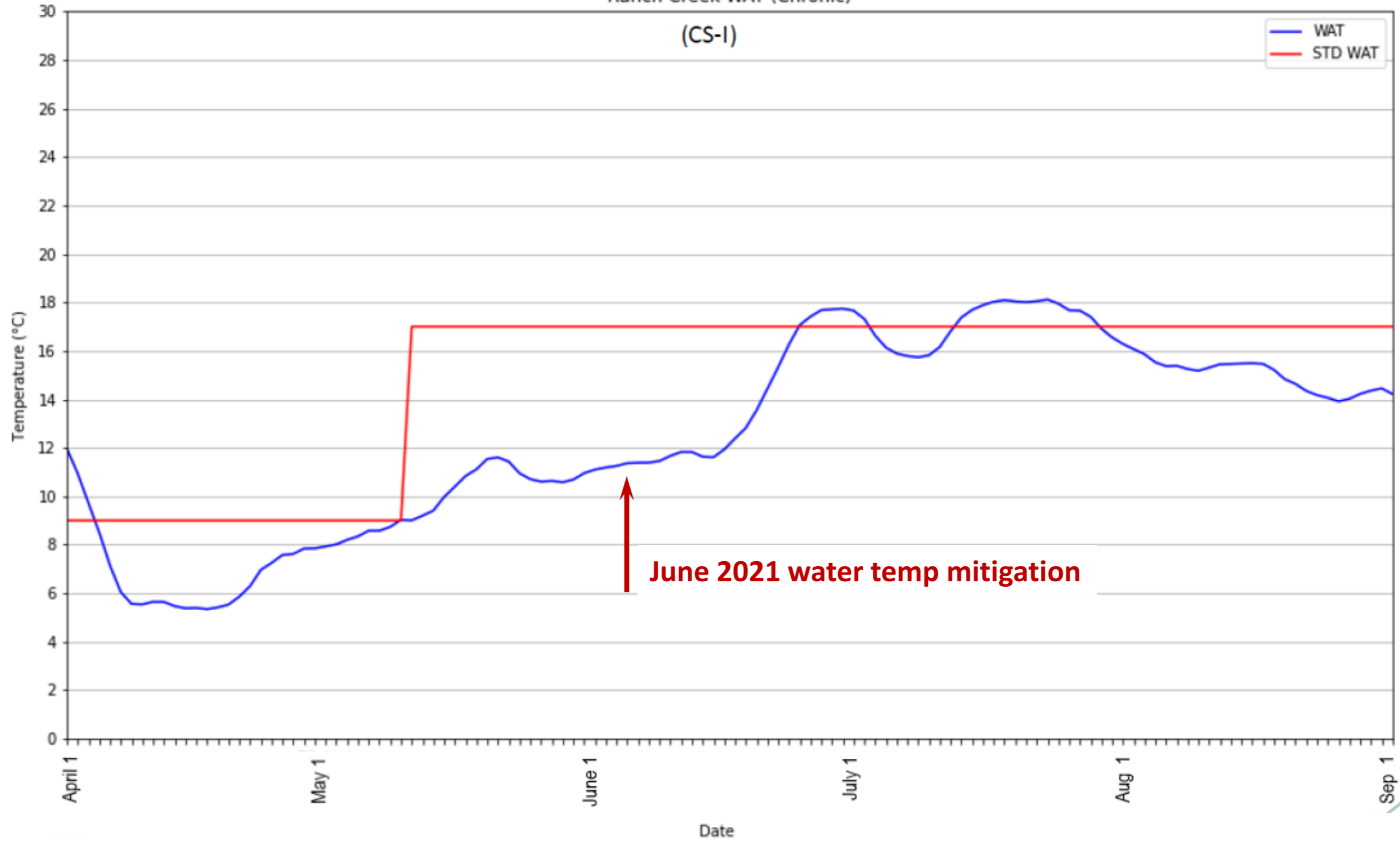
USGS 09041400 MUDDY CRK BLW WOLFORD MTN RESER., NR KREHLING, CO



- △ Median daily statistic (26 years)
- Discharge
- Measured discharge
- Period of approved data
- Period of provisional data

# Ranch Creek WAT (Chronic)

(CS-I)

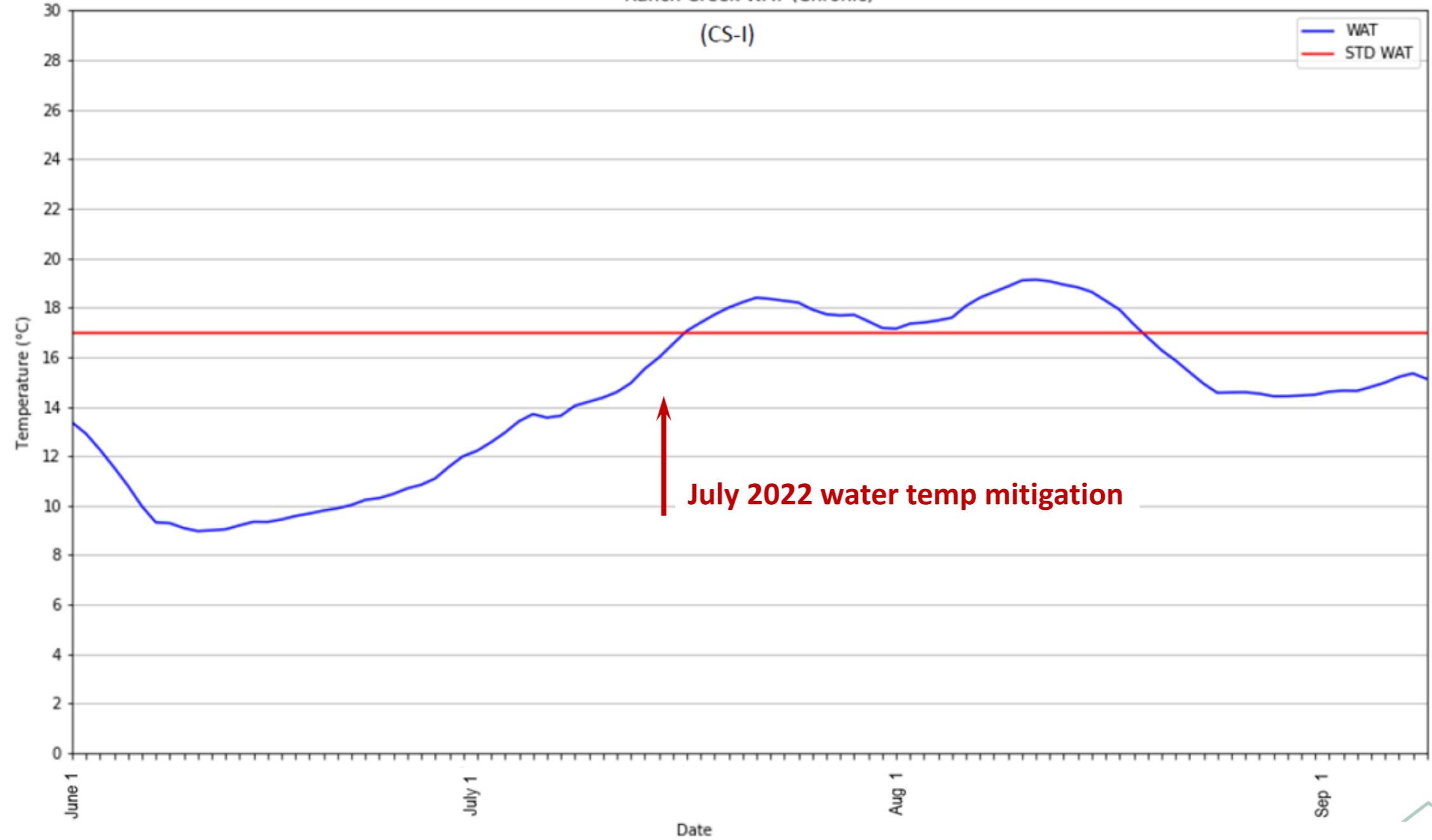


**June 2021 water temp mitigation**

Ranch Creek WAT (Chronic)

(CS-I)

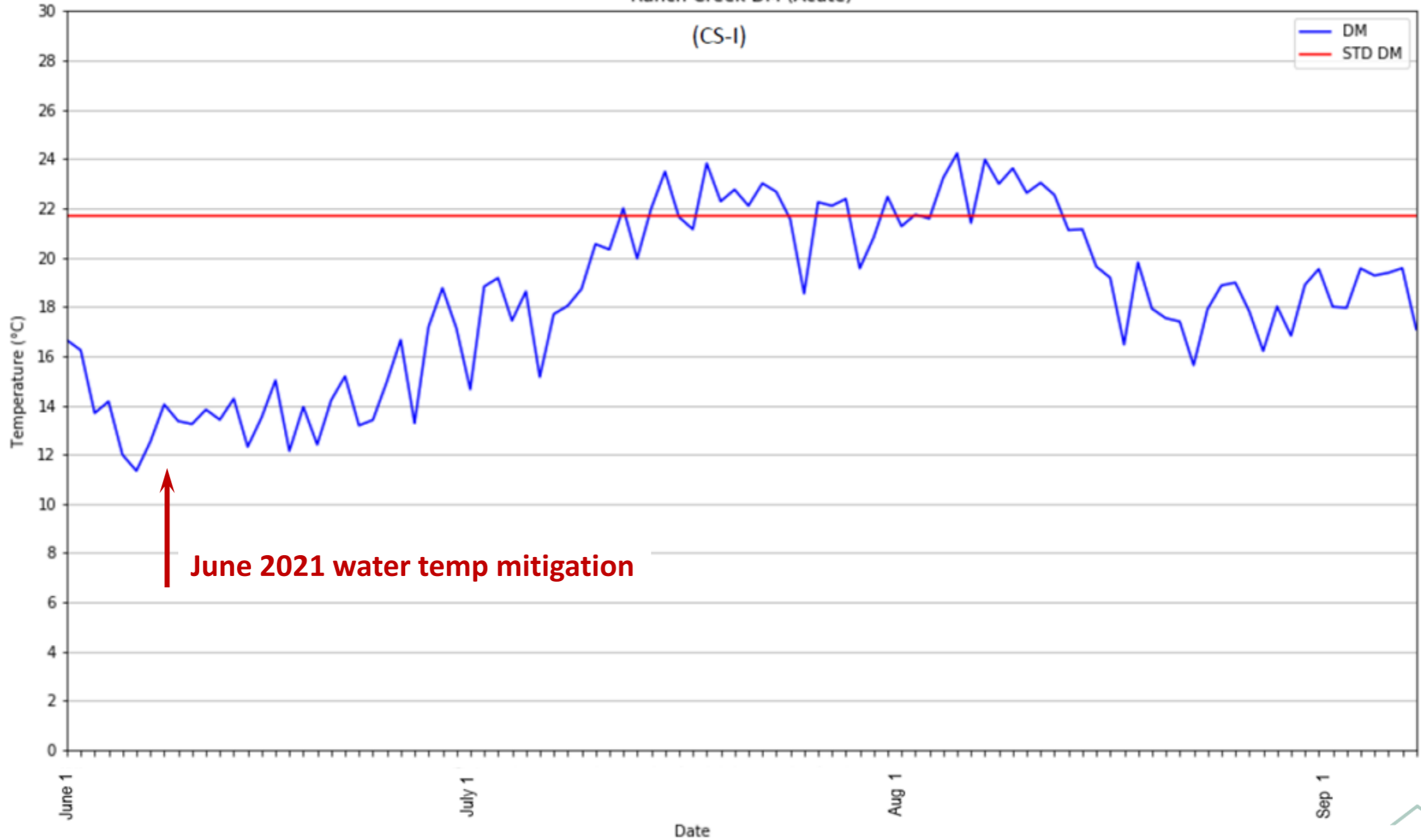
WAT  
STD WAT



July 2022 water temp mitigation

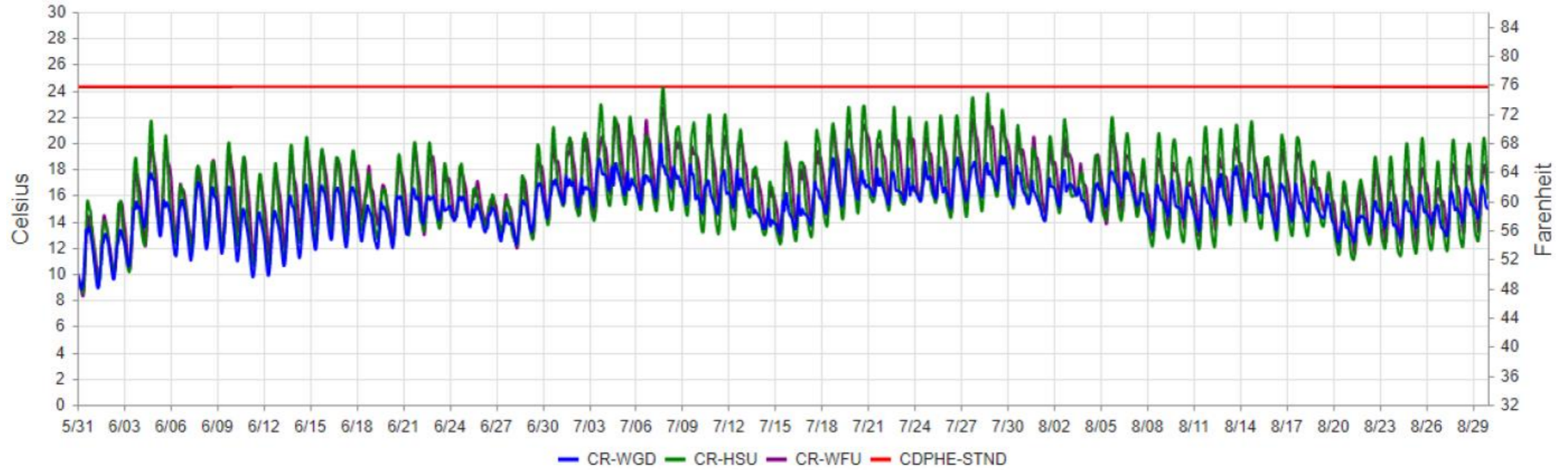
Ranch Creek DM (Acute)

(CS-I)

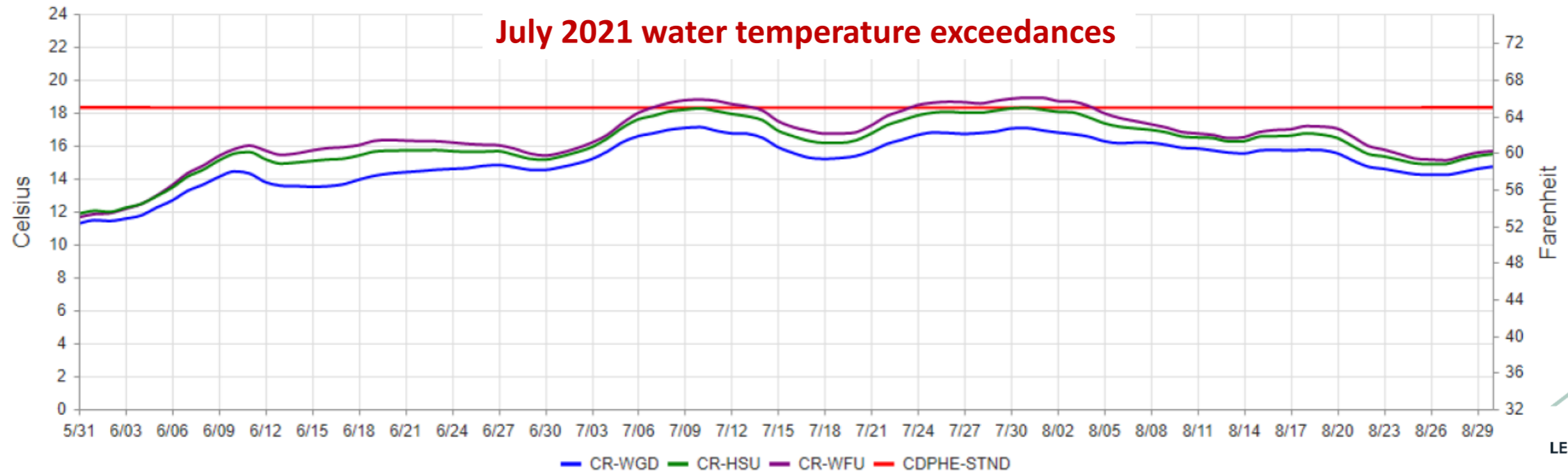


**June 2021 water temp mitigation**

2 Hour Running Average Temperature (Acute)

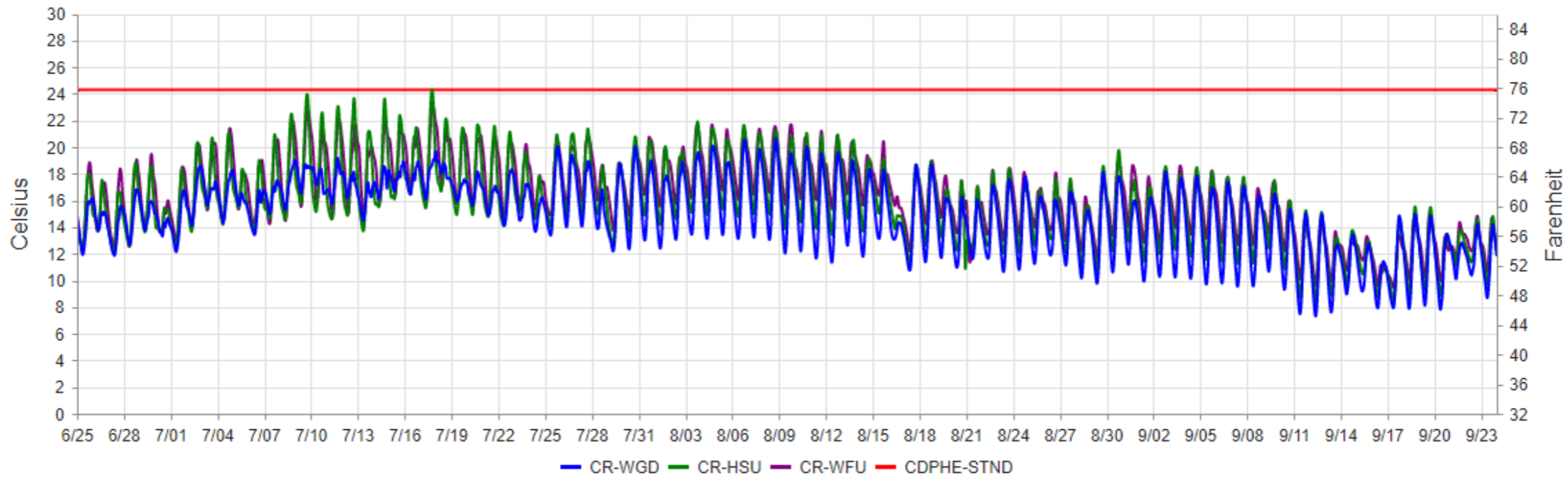


7 Day Running Average Temperature (Chronic)

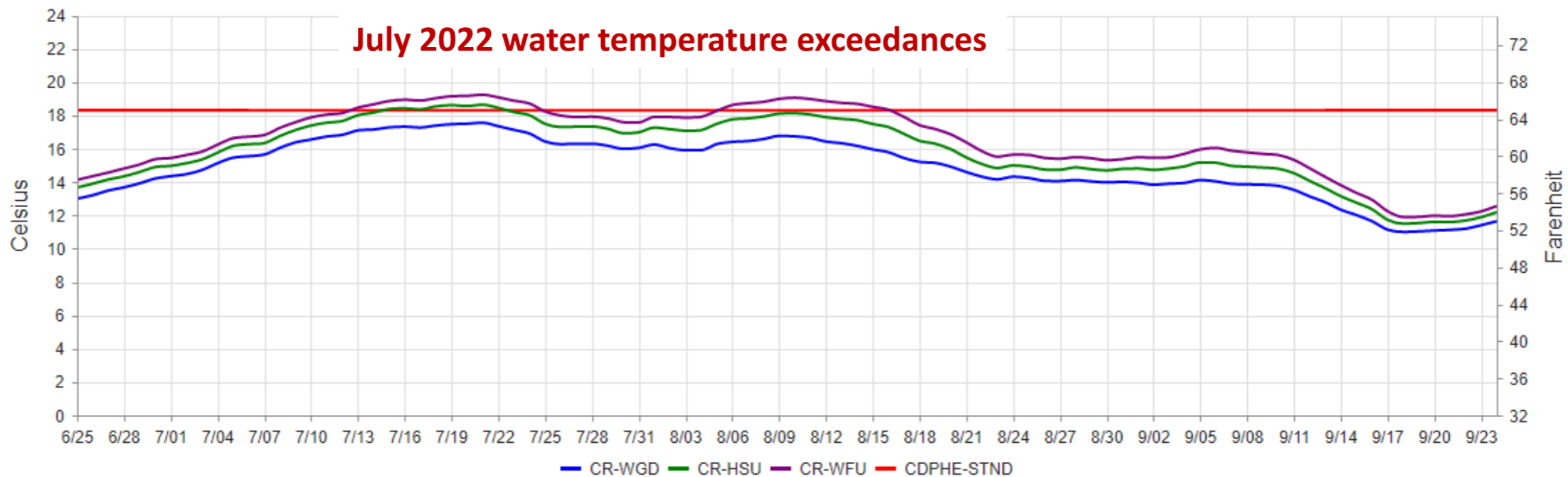




2 Hour Running Average Temperature (Acute)



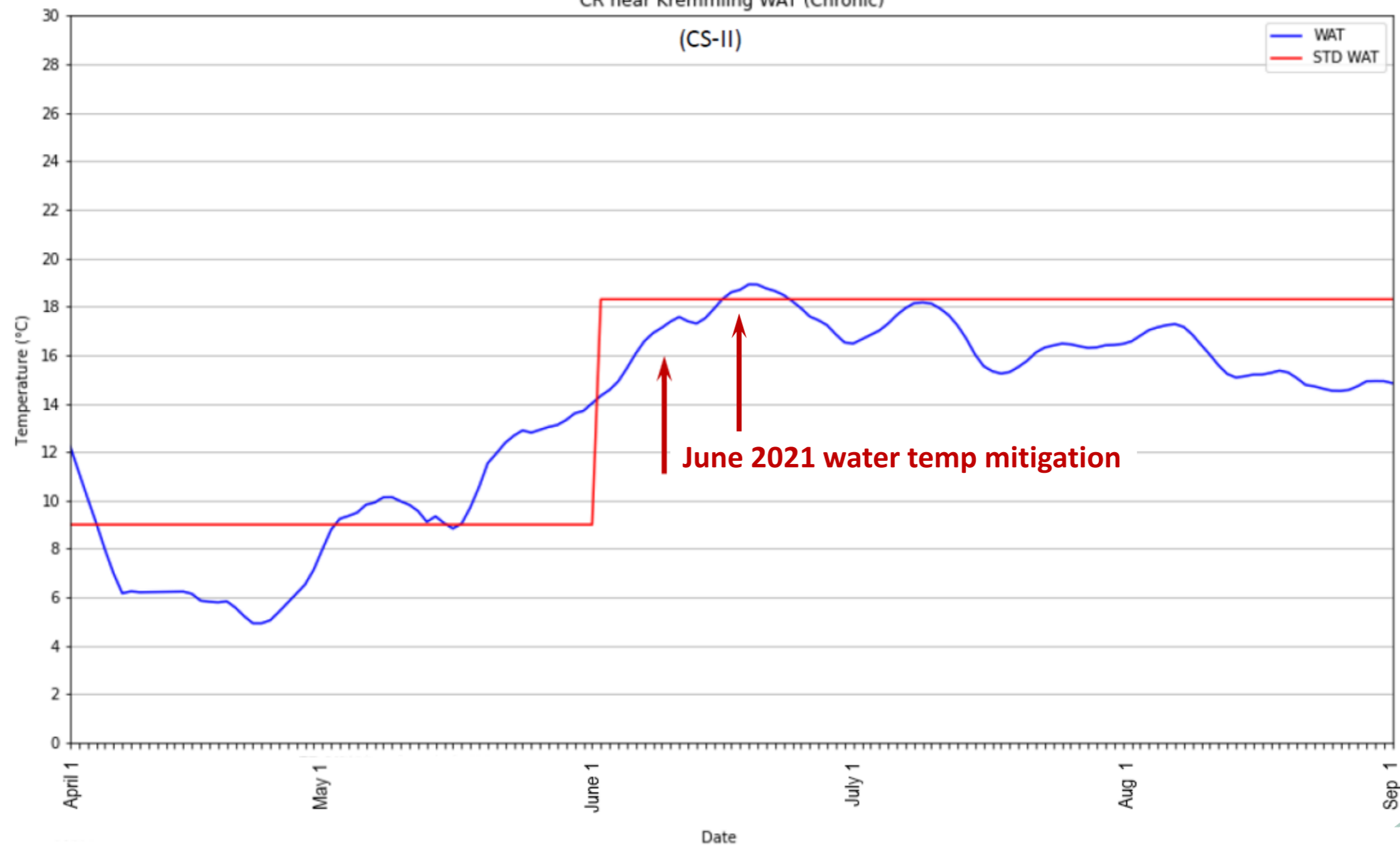
7 Day Running Average Temperature (Chronic)



CR near Kremmling WAT (Chronic)

(CS-II)

WAT  
STD WAT





# Opportunities for Collaborative Solutions to Address Low Flows and High Temperatures



Colorado River, Kemp-Breeze State Wildlife Area



# Untreated

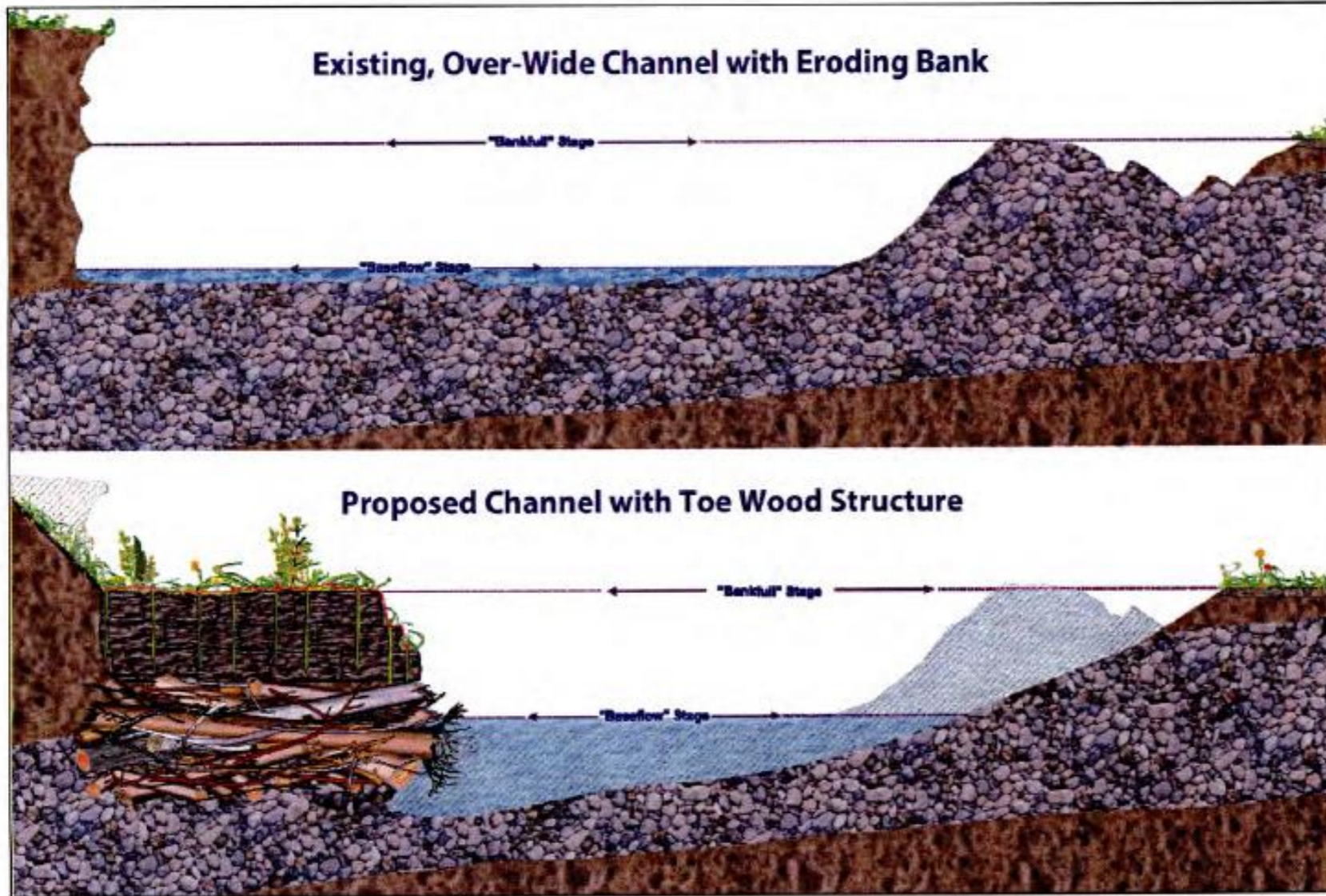




Treated



## General Concept



# Wood-toe / Sod mat treatment

***Installation Sequence for Option 1 –  
Use Cuttings & Sod Mats with Staking***

Used with permission from Dave  
Rosgen

BANKFULL BENCH: TOE WOOD SOD MAT

# Type 2 Toewood Treatment

Point of Curvature

UNDERLAYMENT CHARACTER

TERRACE

10-15 FEET

GRAVEL/COBBLE FILL

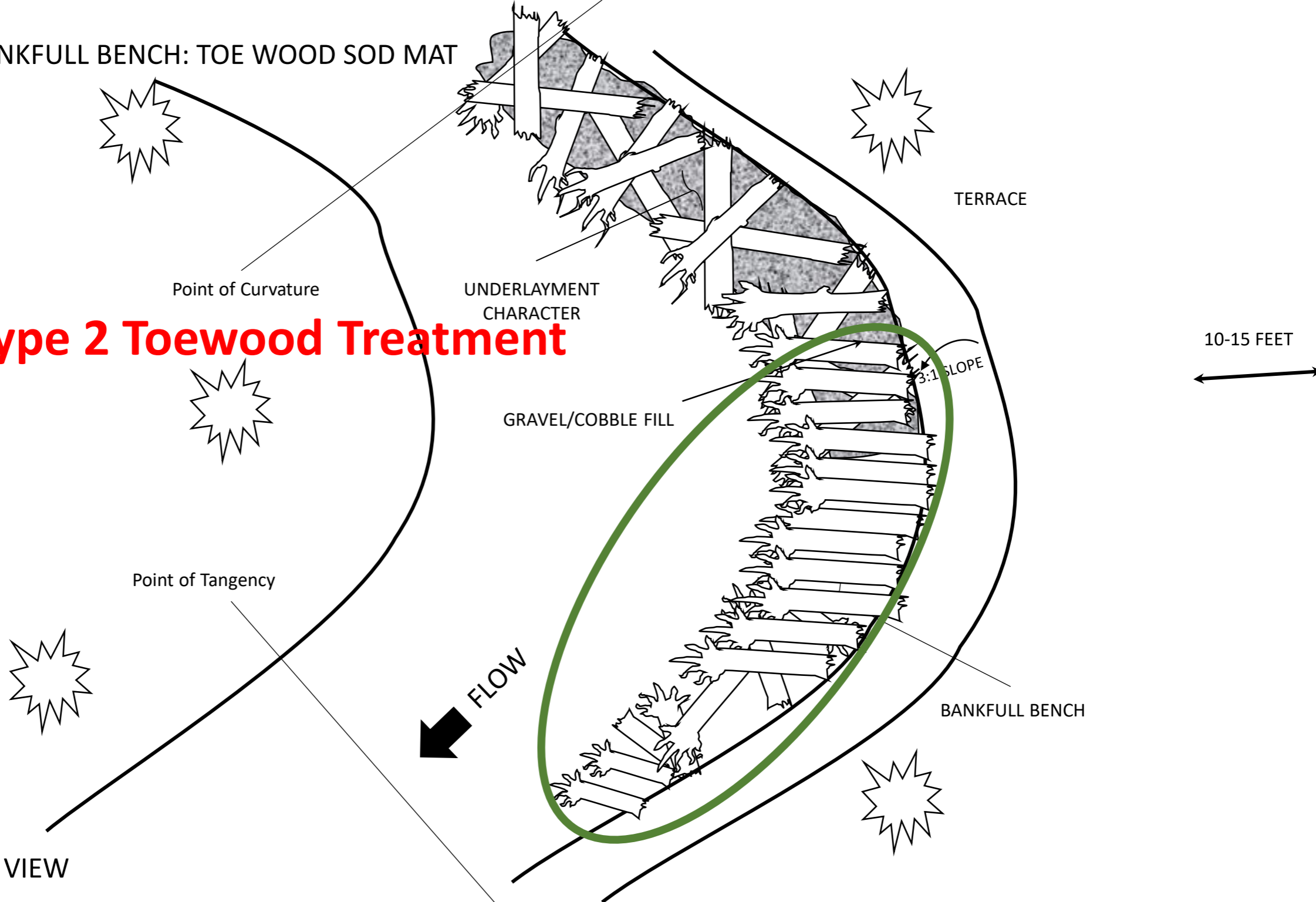
3:1 SLOPE

Point of Tangency

FLOW

BANKFULL BENCH

PLAN VIEW









Type 2 Treatment - Before





Type 2 Treatment –  
Construction

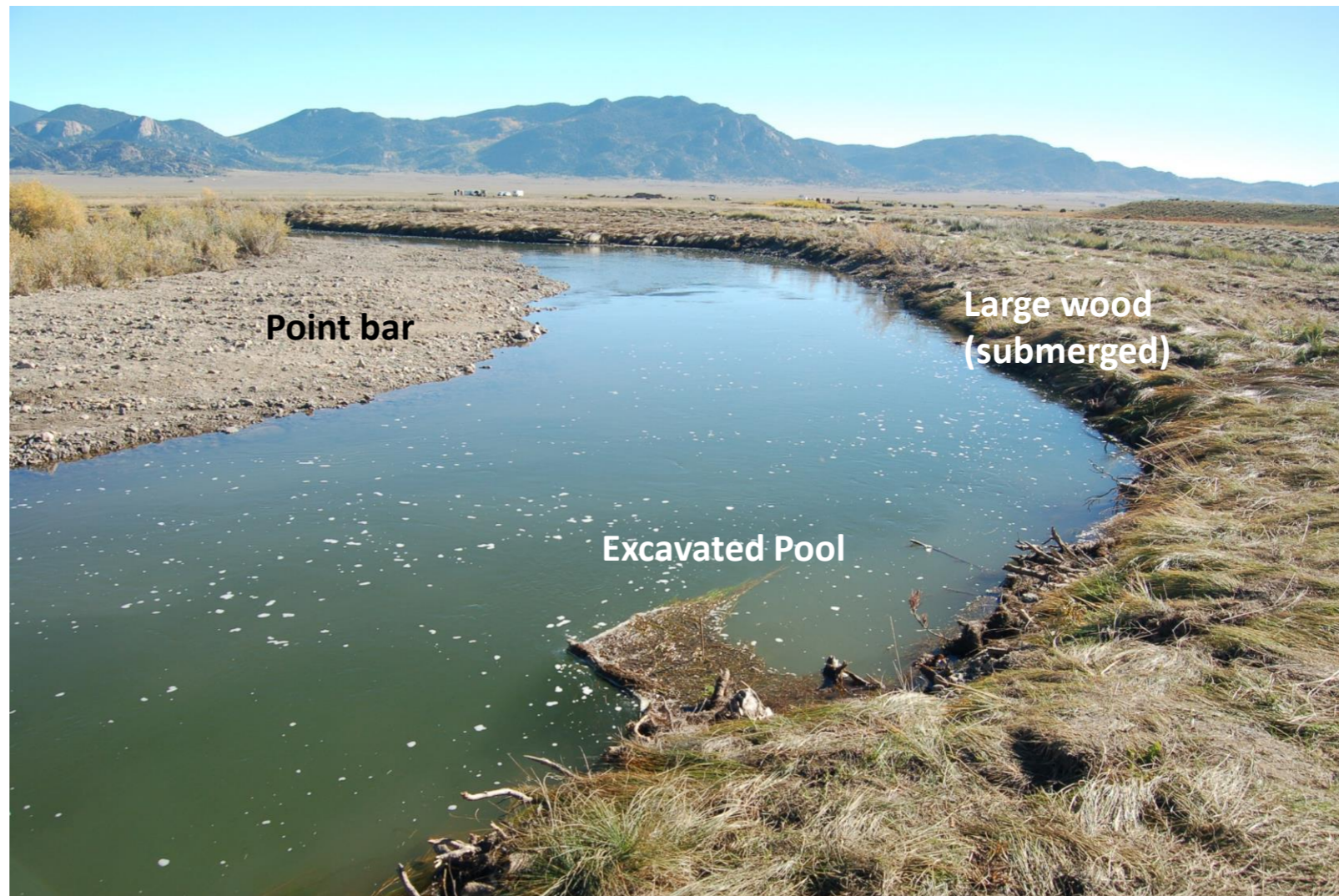


Type 2 Treatment –  
De-watered

## Type 2 Treatment – De-watered



Type 2 Pool -  
After





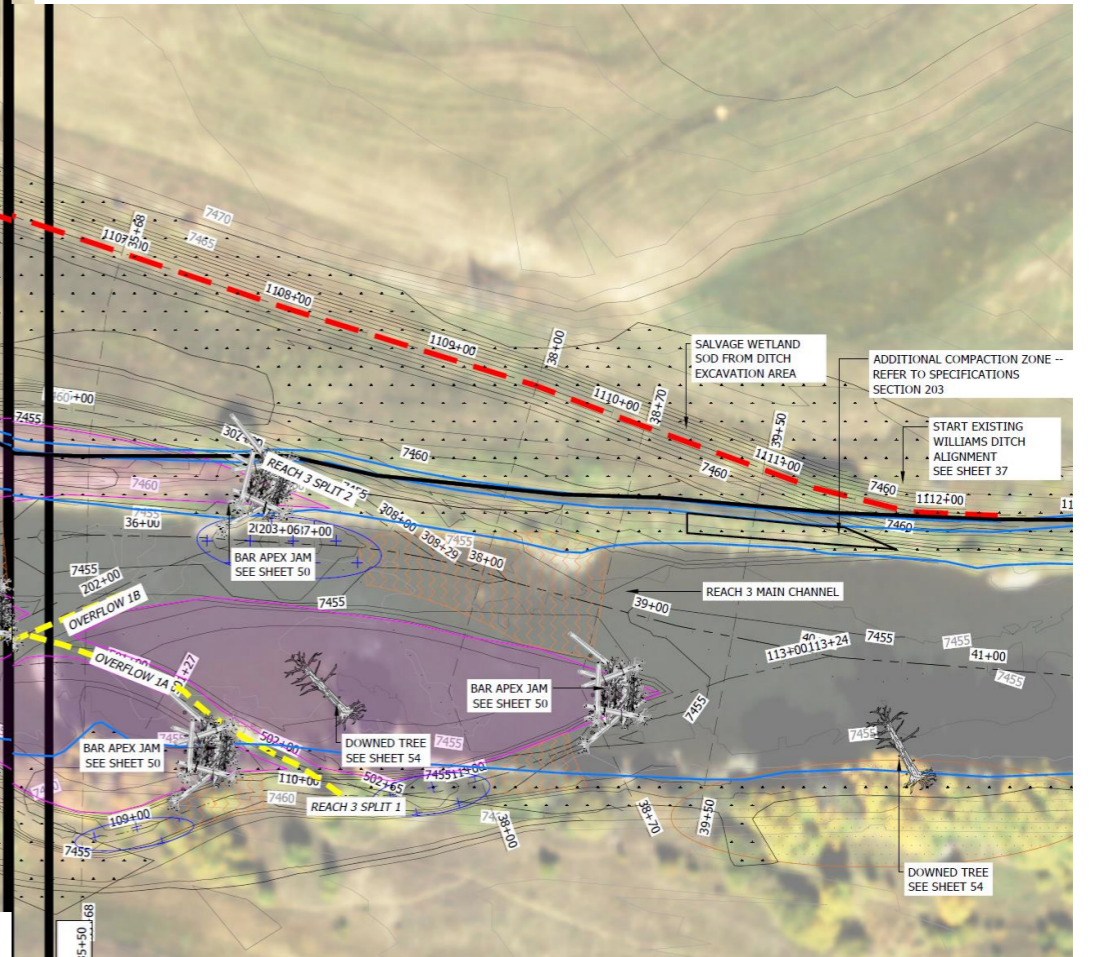
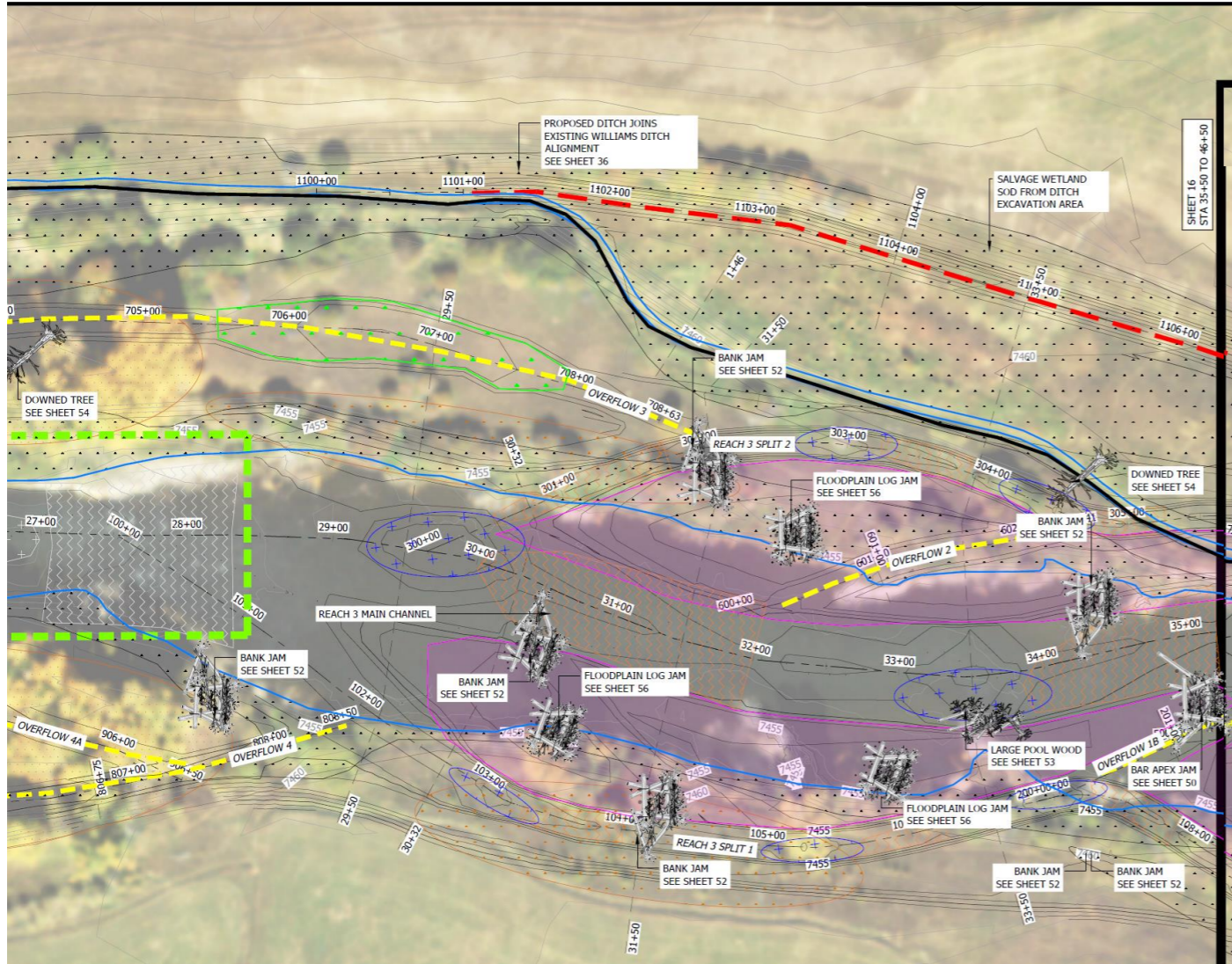
Type 2 Treatment-Before





Colorado River, Kemp-Breeze State Wildlife Area



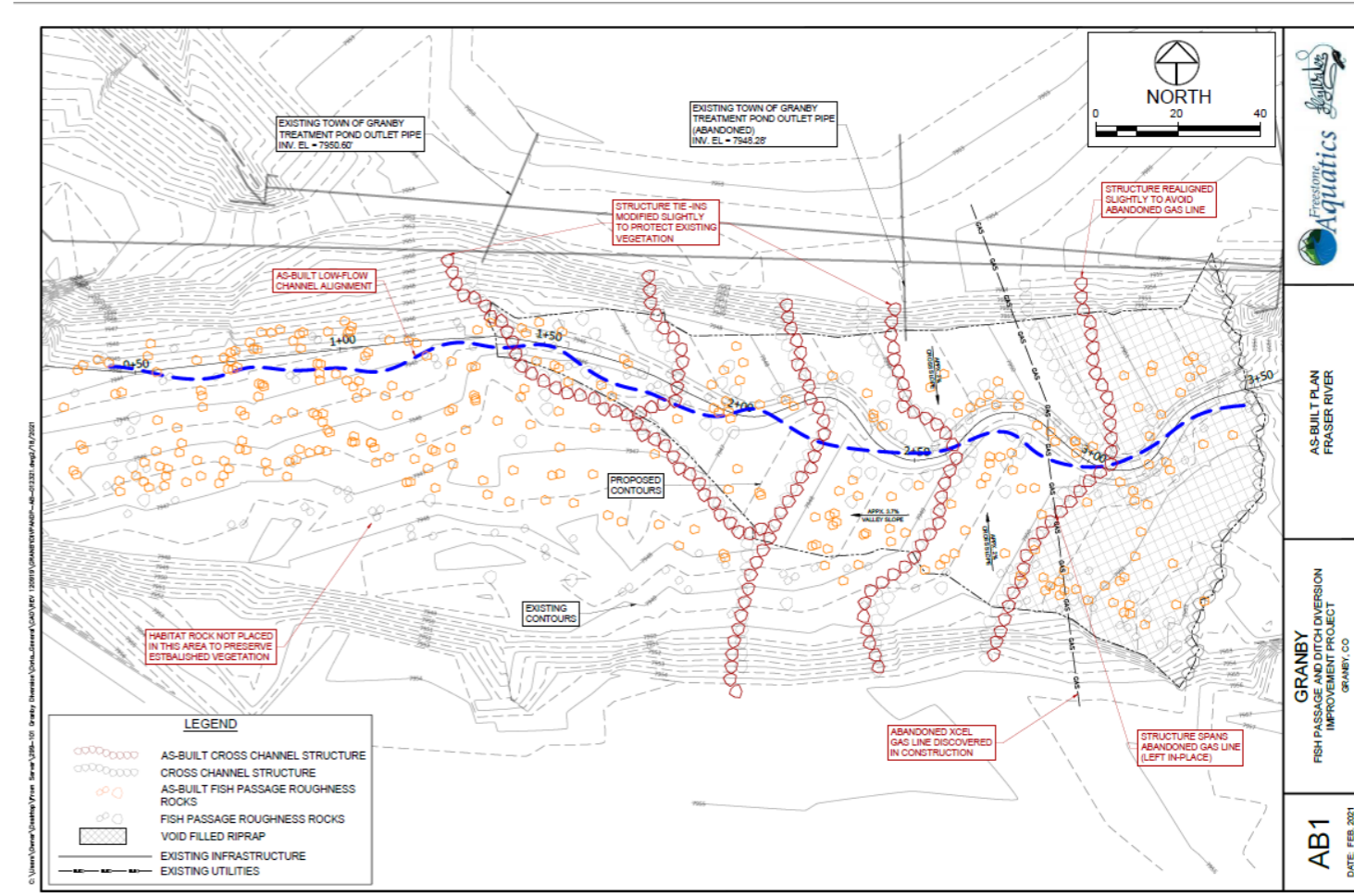
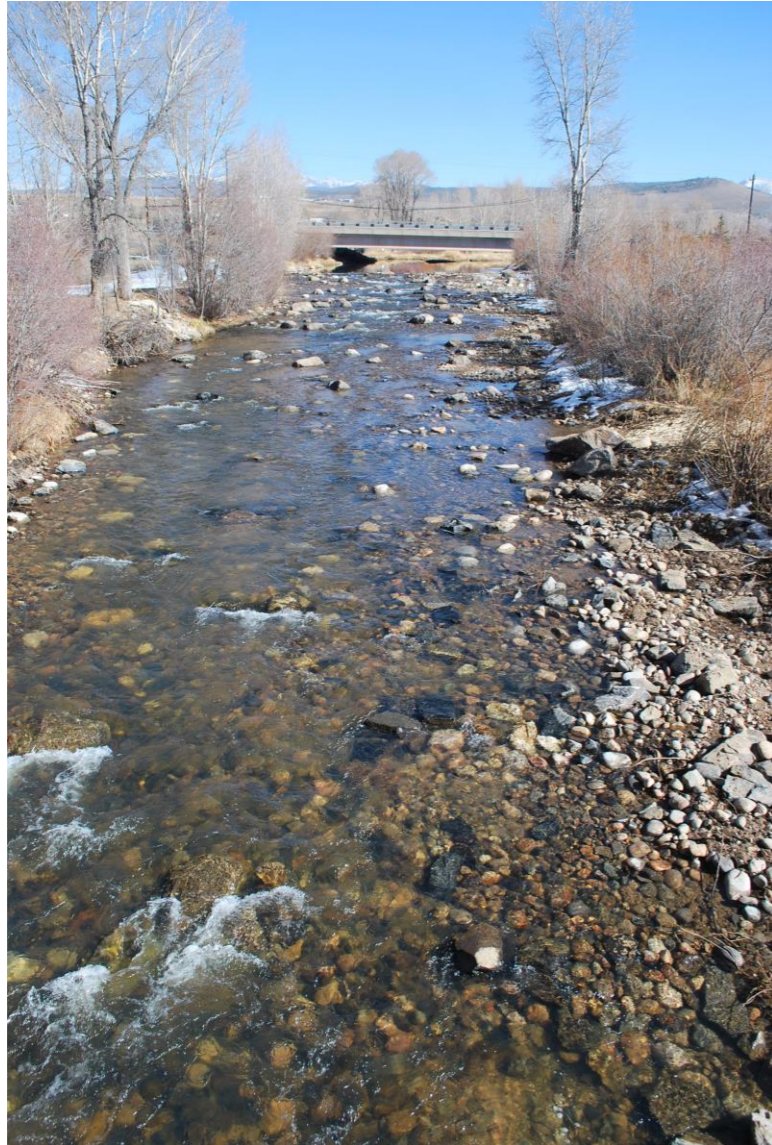




Fish Passage –  
Granby  
Diversion  
Structure



# Fish Passage – Granby diversion structure

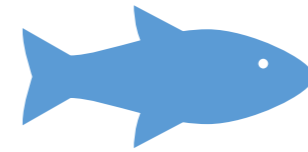


# Monitoring



## **Physical:**

Pool depths before and after  
Substrate composition  
Width:depth ratios  
Floodplain access  
Water temps



## **Biological:**

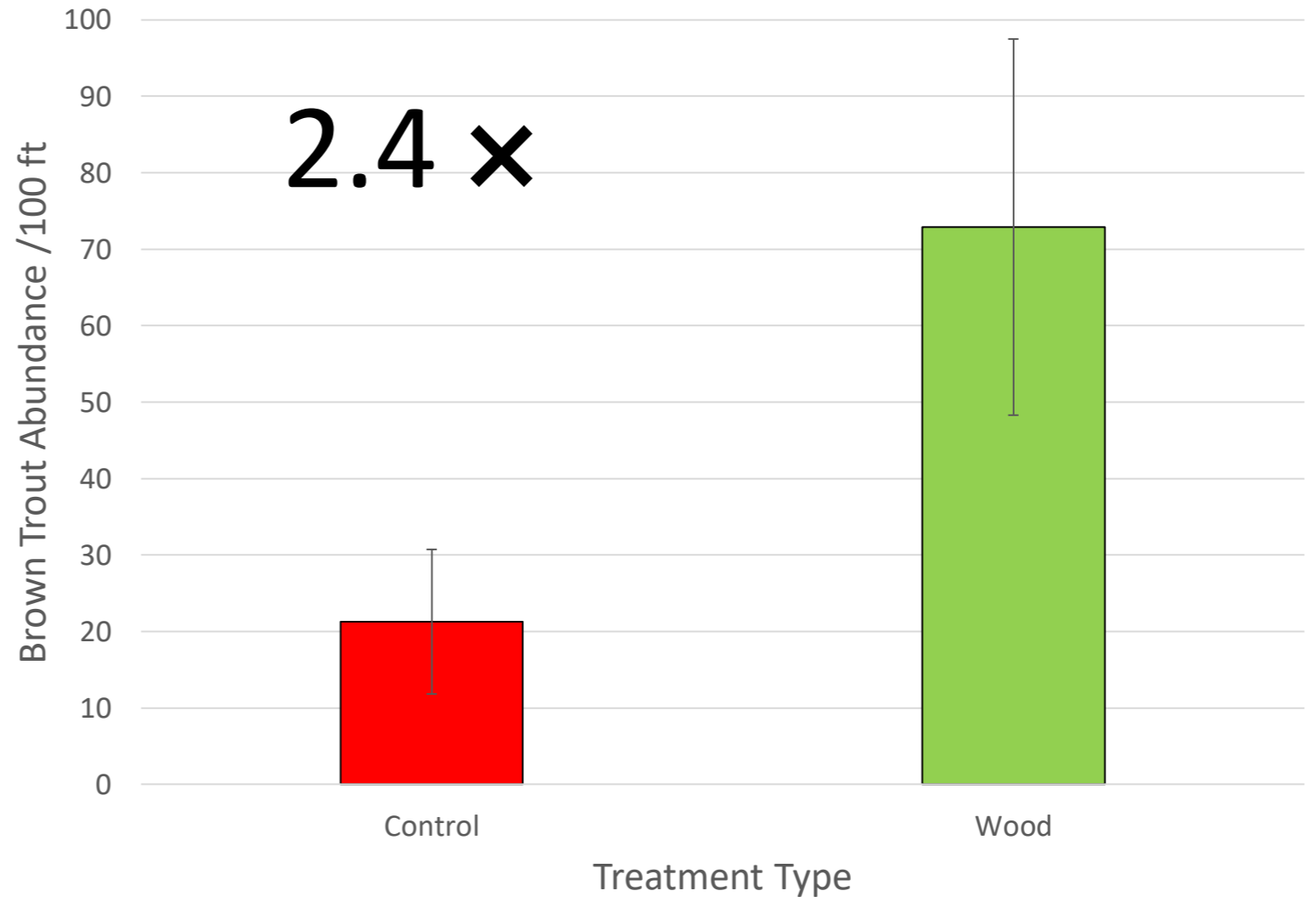
Invertebrates  
Fish







Results:  
Brown Trout  
Abundance



Results:  
Brown Trout  
Biomass





Results:  
Brown Trout  
>14" TL  
Abundance



# QUESTIONS?



# Open House Meeting Exercises

September 19, 2023



# Visioning Exercise Results

## Key Themes

- Partners and community members across the Continental Divide and within Grand County are working together to create healthy rivers.
- Rivers and streams support livelihoods, the local economy, and quality of life.
- Projects will support and create healthy rivers by:
  - Reducing water temperatures
  - Improving riparian and aquatic habitat for wildlife
  - Stabilizing streambanks and reducing sediment loads
  - Addressing water quality concerns

# Community Vision for Healthy Rivers

*To work collaboratively across boundaries to create healthy and resilient rivers, streams, and riparian corridors that sustain thriving aquatic habitat and support a vibrant community and local economy.*



# Exercise Instructions

- Geographic Priorities
  - Maps of the LBD Cooperative Effort Area are around the room.
  - Place up to two dots to identify priority areas.
  - Each dot is numbered. Please use comment cards to provide additional context.
- Community Vision for Healthy Rivers
  - Use sticky notes to provide feedback on the community vision for healthy rivers
- Virtual participants fill out survey.

