

# Temperature in the LBD Cooperative Effort Area

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2017 – 2021 WEEKLY AVERAGE AND DAILY MAXIMUM DATA COMPILATION

# Stream Temperature Program Objectives

- Complement existing stream temperature monitoring efforts;
- Provide the LBD operations subcommittee with timely data to make informed decisions about releases of environmental water;
- Provide stream temperature data to evaluate effectiveness of environmental water releases;
- Identify critical stream reaches for water temperature;
- Assess compliance with Colorado's stream temperature standards;
- Monitor and assess impacts of restoration efforts performed by LBD

# Overview - Temperature Monitoring in CEA



67 sites in the CEA



Sites maintained by GCWIN, Northern Water, USGS, BLM



Financial support from many stakeholders



LBD program supplemental to existing monitoring

# Colorado Temperature Standards

There is a little more we can say about the temperature standards, too. The acute standard is designed to protect fish from conditions that might directly kill them. The chronic standard is designed to protect fish from conditions that might reduce their growth and reproduction.

*All temperature standards in °C*

## Chronic Standard

- Maximum Weekly Average
- 7-day moving average
- CS-I
  - 17.0 (Jun – Sep)
  - 9.0 (Oct – May)
- CS-II
  - 18.3 (Apr – Oct)
  - 9.0 (Nov – Mar)

## Acute Standard

- Daily Maximum
- Highest 2-hr average in 24-hrs
- CS-I
  - 21.7 (Jun – Sep)
  - 13.0 (Oct – May)
- CS-II
  - 24.3 (Apr – Oct)
  - 13 (Nov – Mar)

Assessment Period: Previous 5 years



## New sites

- No New Sites for 2021

## Frequency

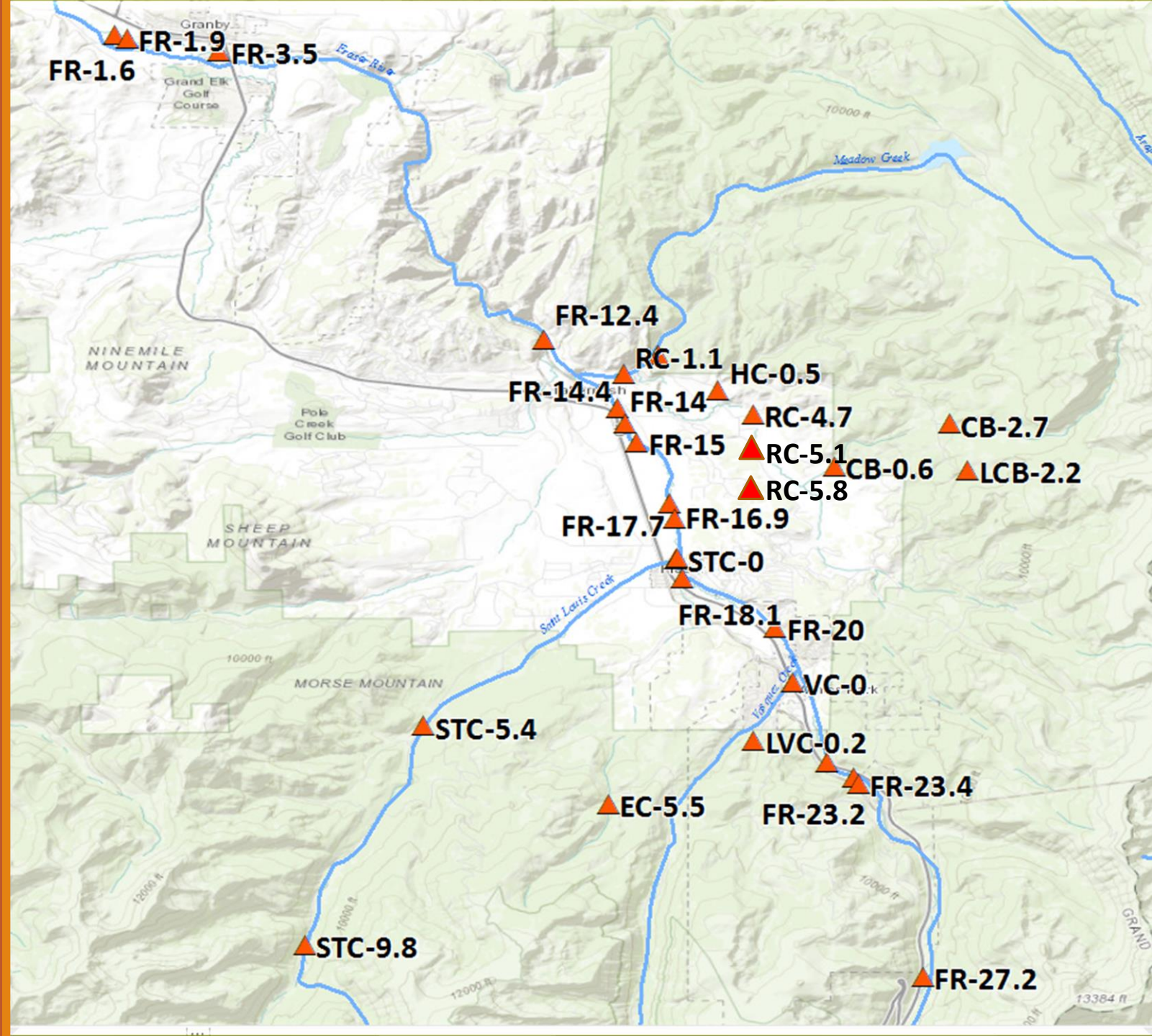
In 2021, data at six sites were downloaded and/or reviewed on a weekly basis to inform the Operations Subcommittee

1. STC-0 (Saint Louis Creek at confluence of Fraser River)
2. FR-3.5 (Fraser River at Hwy 40 in Granby)
3. CR- 28.7 (Colorado River downstream of Windy Gap)\*
4. CR-22.1 (Colorado River upstream of Hot Sulphur Water Treatment Plant)\*
5. CR-16.7 (Colorado River upstream of confluence with Williams Fork)\*
6. CR-2.3 (Colorado River, HWY 9 Bridge upstream of confluence with Blue River)
7. RC-5.8 (Ranch Creek above revegetation area on Quad Ranch)
8. RC-5.1 (Ranch Creek below revegetation area on Quad Ranch)

*\*Northern Water's real-time temperature monitoring sites.*

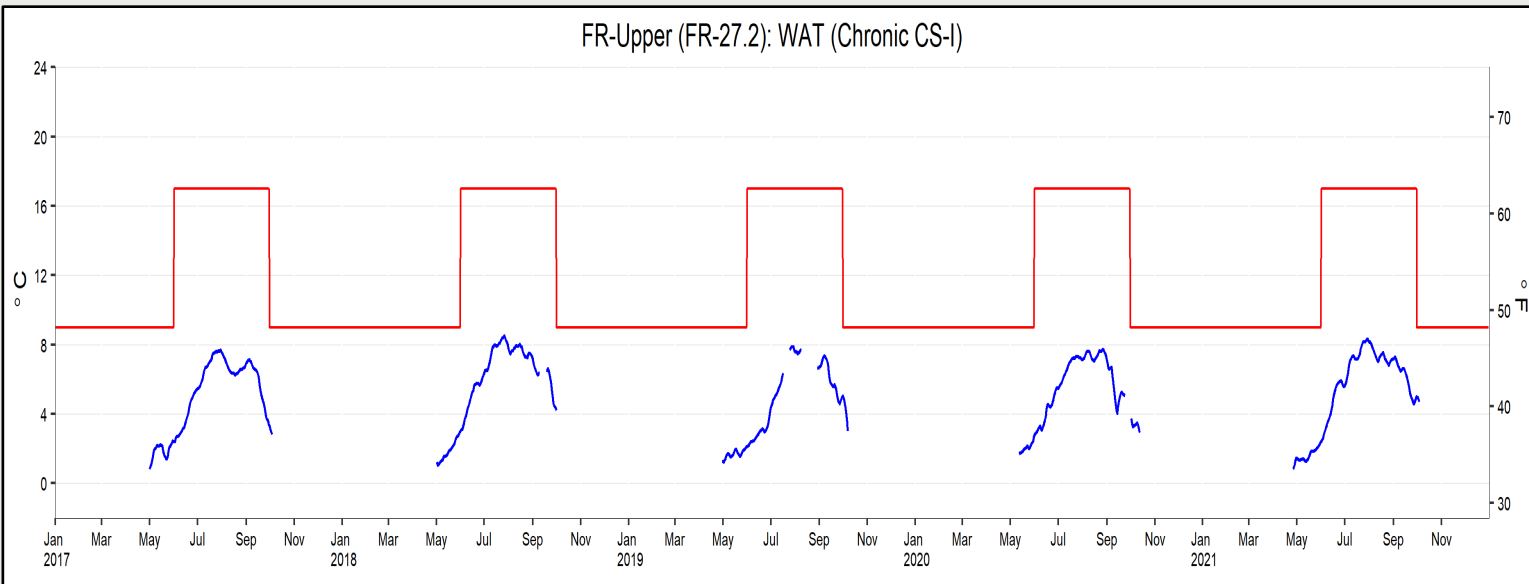
# 2021 LBD Program

# Fraser River and Tributaries

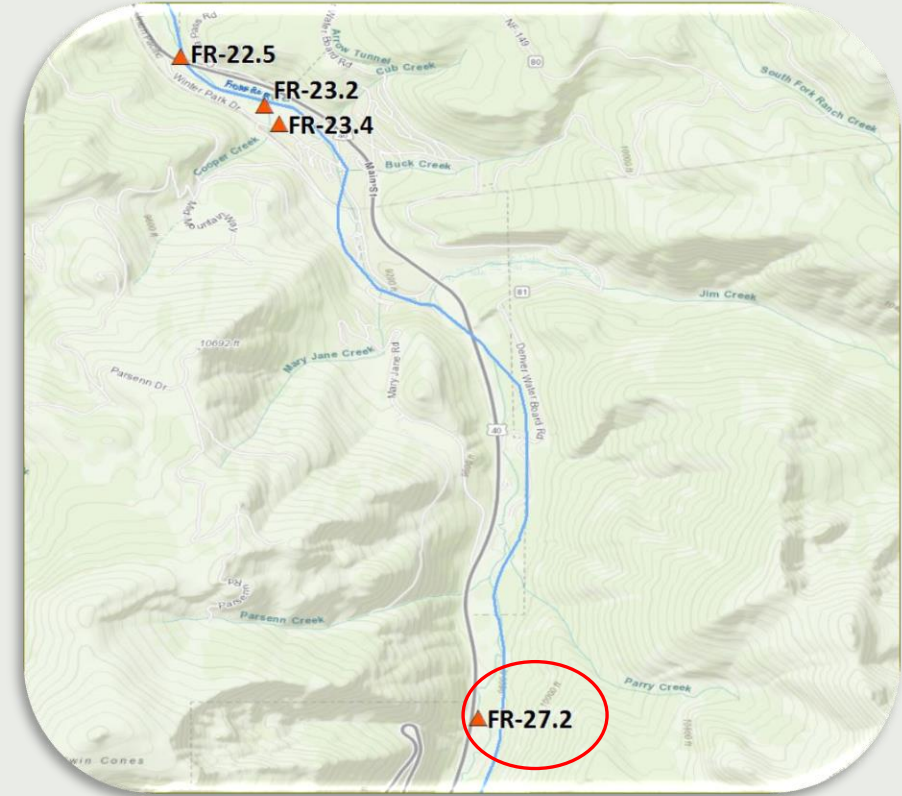
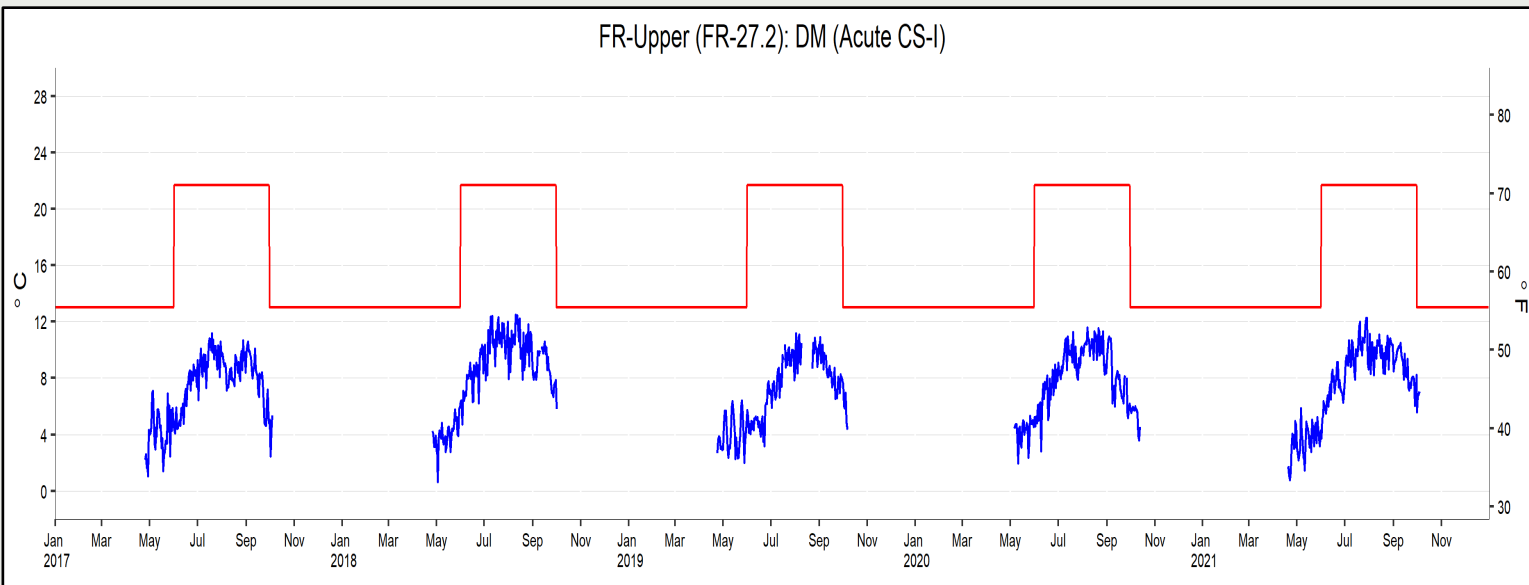


# CSI FR-Upper FR-27.2

FR-Upper (FR-27.2): WAT (Chronic CS-I)

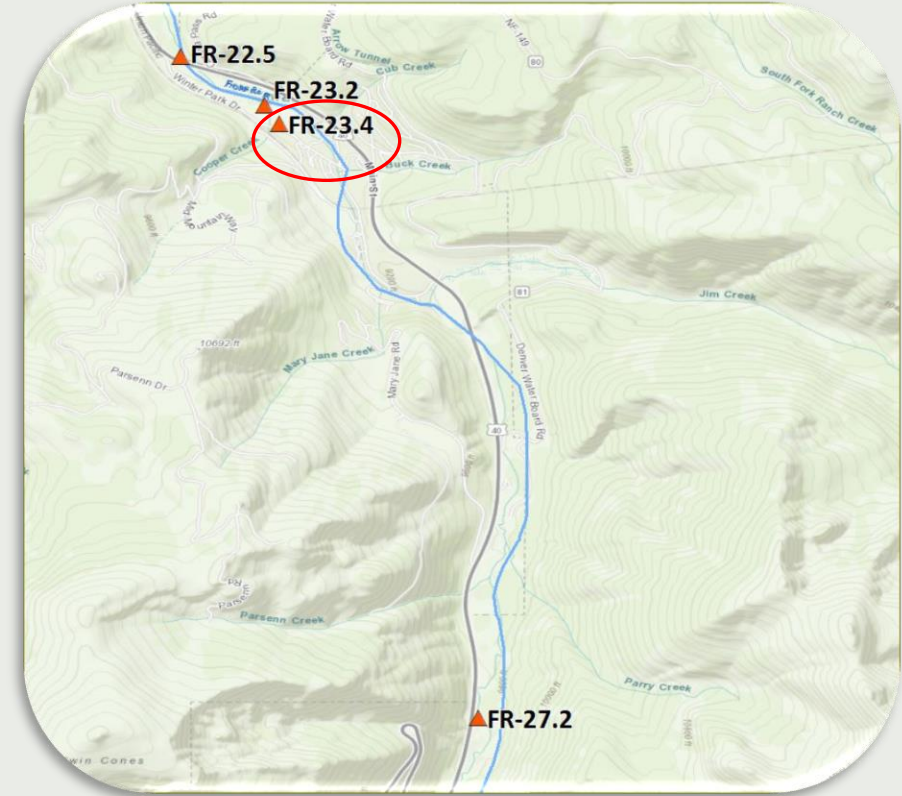


FR-Upper (FR-27.2): DM (Acute CS-I)

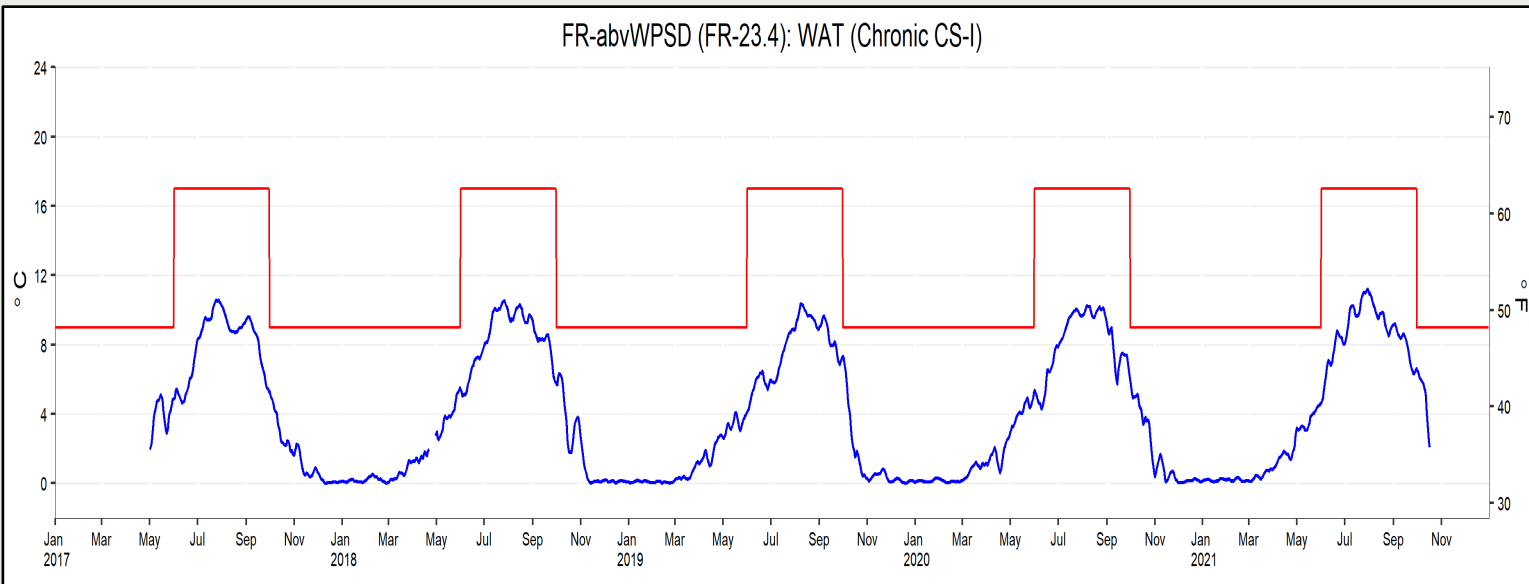




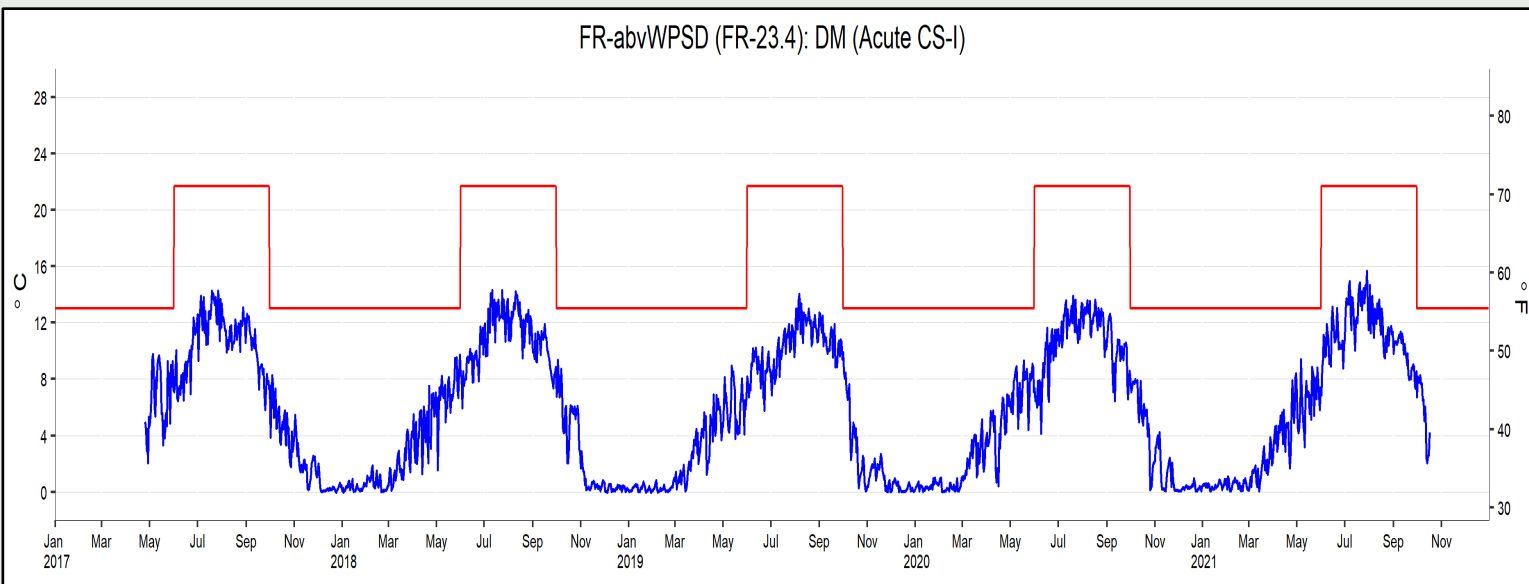
# CSI FR-abvWPSD FR-23.4



FR-abvWPSD (FR-23.4): WAT (Chronic CS-I)



FR-abvWPSD (FR-23.4): DM (Acute CS-I)

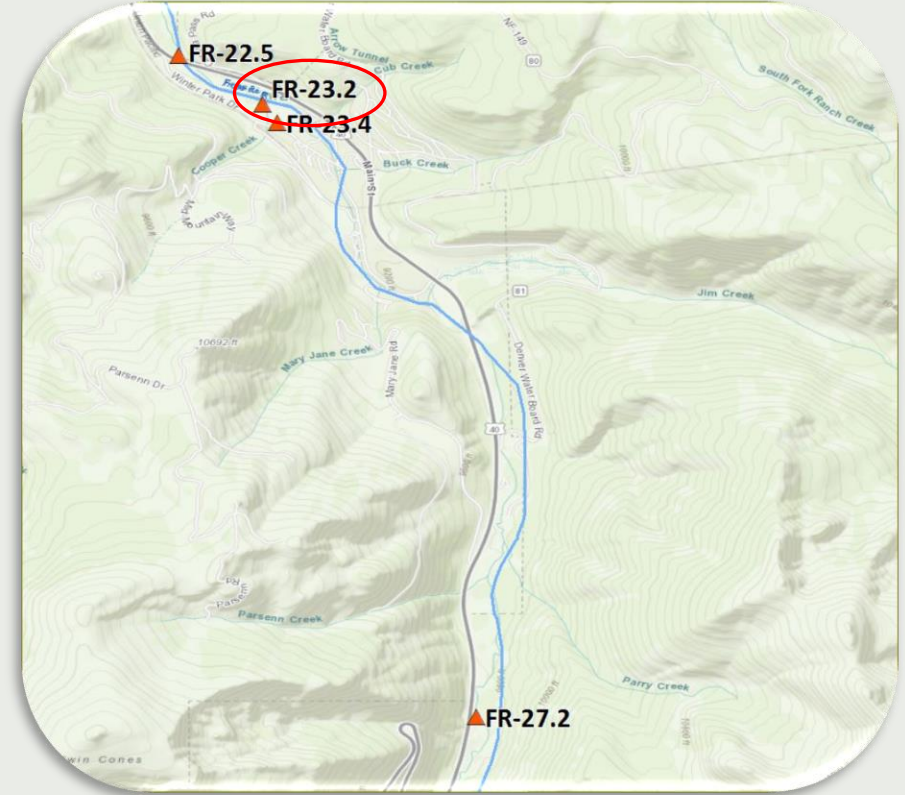
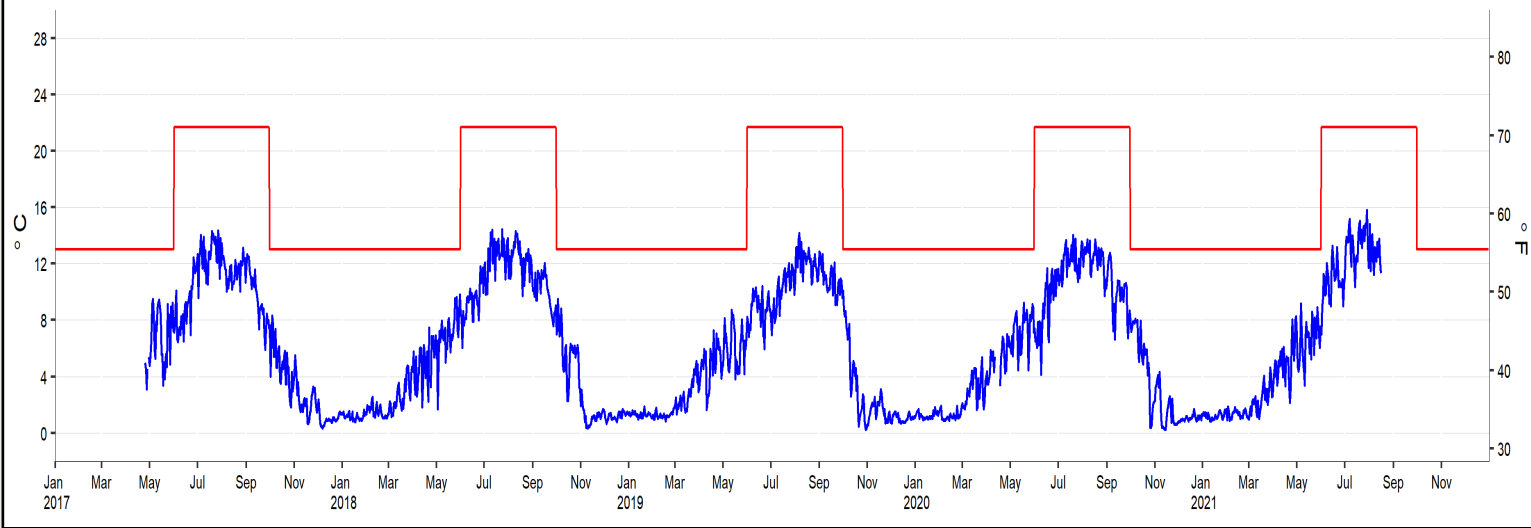


# CSI FR-blwWPSD FR-23.2

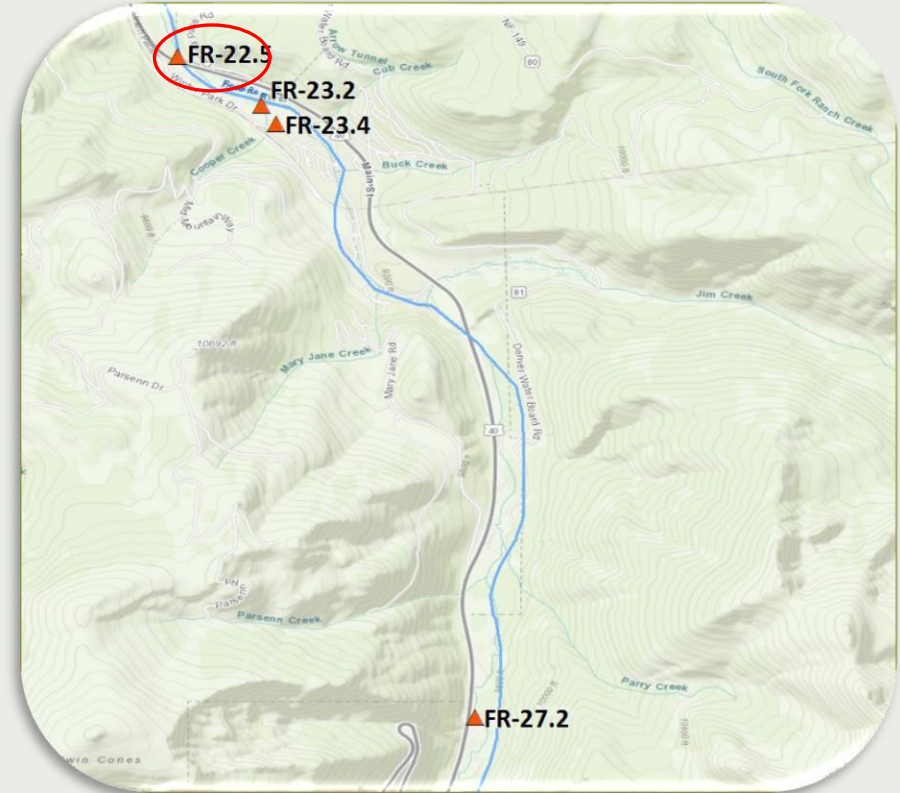
FR-blwWPSD (FR-23.2): WAT (Chronic CS-I)



FR-blwWPSD (FR-23.2): DM (Acute CS-I)

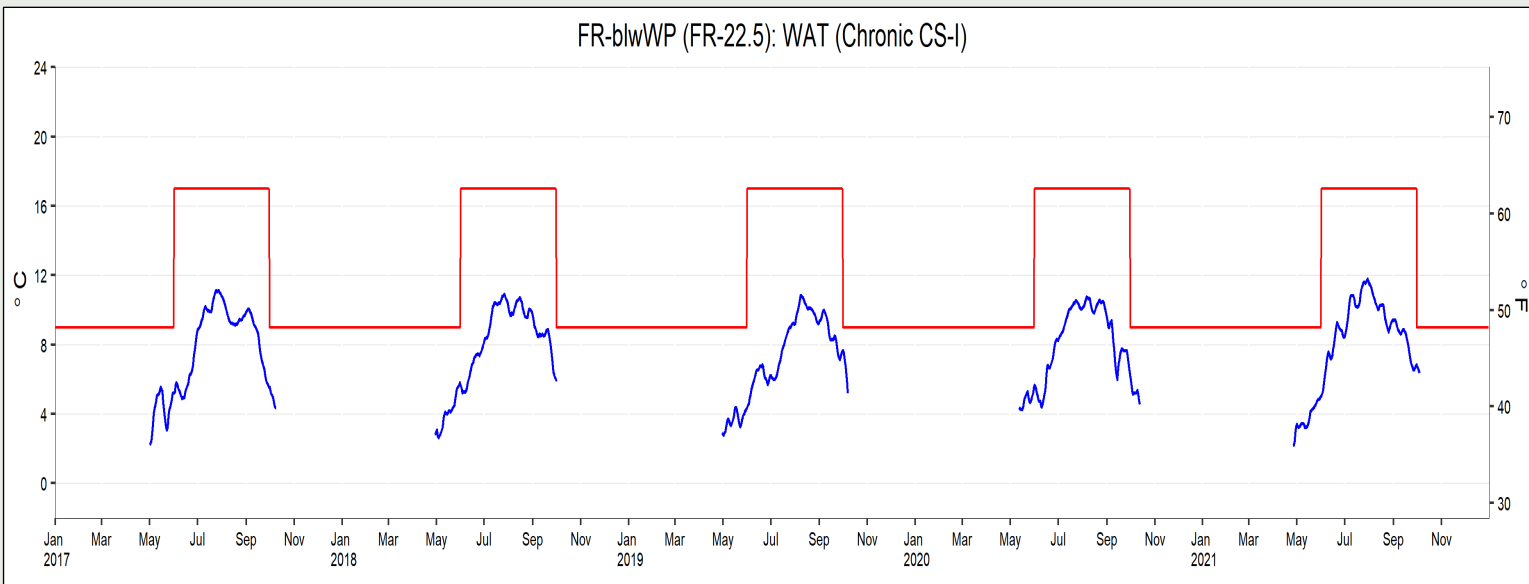


# CSI - FR-blwWP - FR-22.5

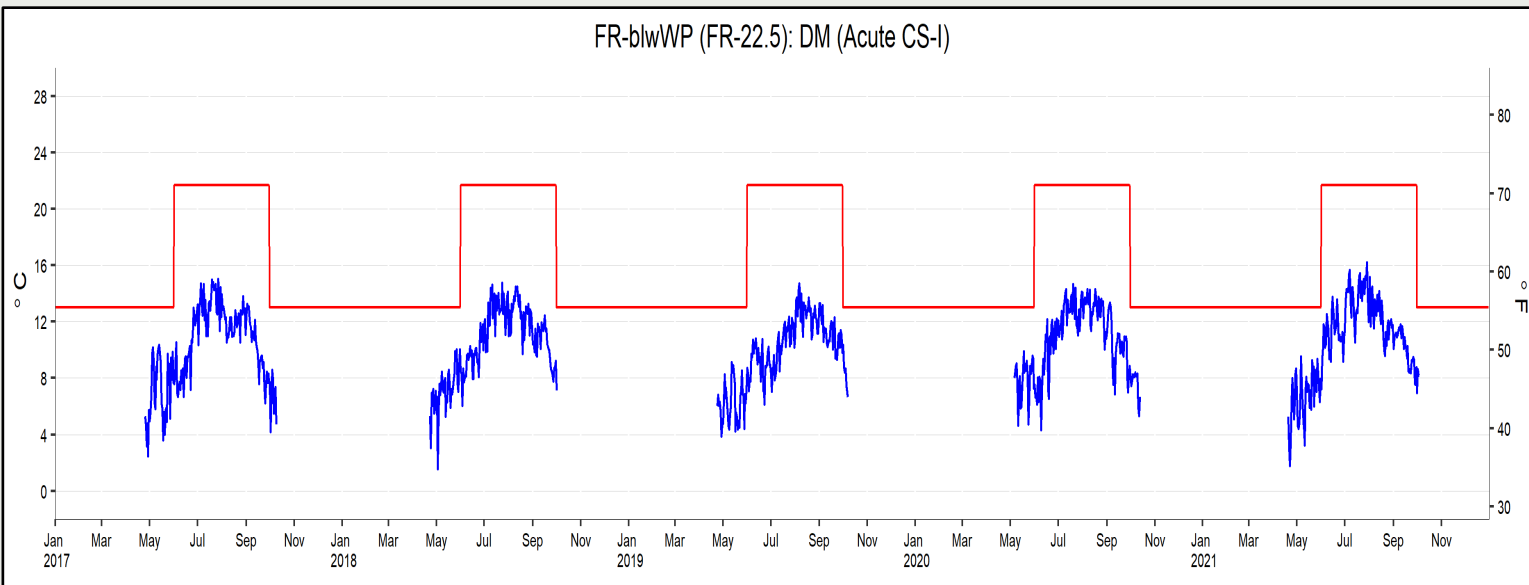


<b>2021 Above WAT standard</b>	
<b>5-25-2021 - 5-31-2021</b>	<b>Max Exceedance: 9.39°C</b>
<b>2021 Above DM standard</b>	
<b>5-06-2021 - 5-31-2021</b>	<b>Max Exceedance: 15.19°C</b>
<b>7-06-2021 - 7-29-2021</b>	<b>Max Exceedance: 23.60°C</b>

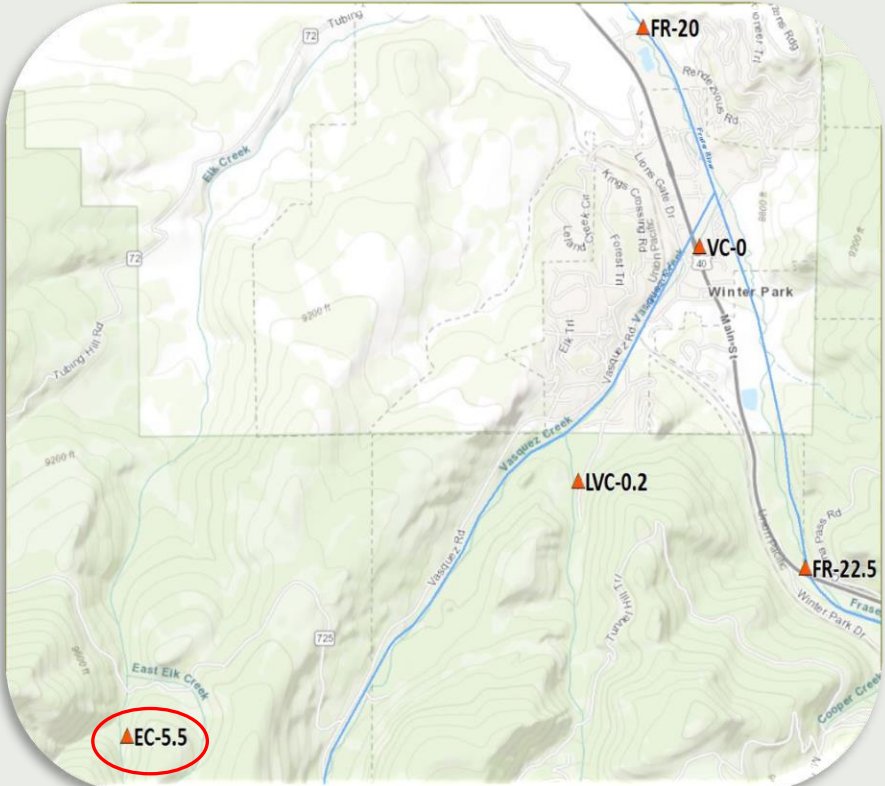
FR-blwWP (FR-22.5): WAT (Chronic CS-I)



FR-blwWP (FR-22.5): DM (Acute CS-I)



# CSI - Elk-blwDWB - EC-5.5



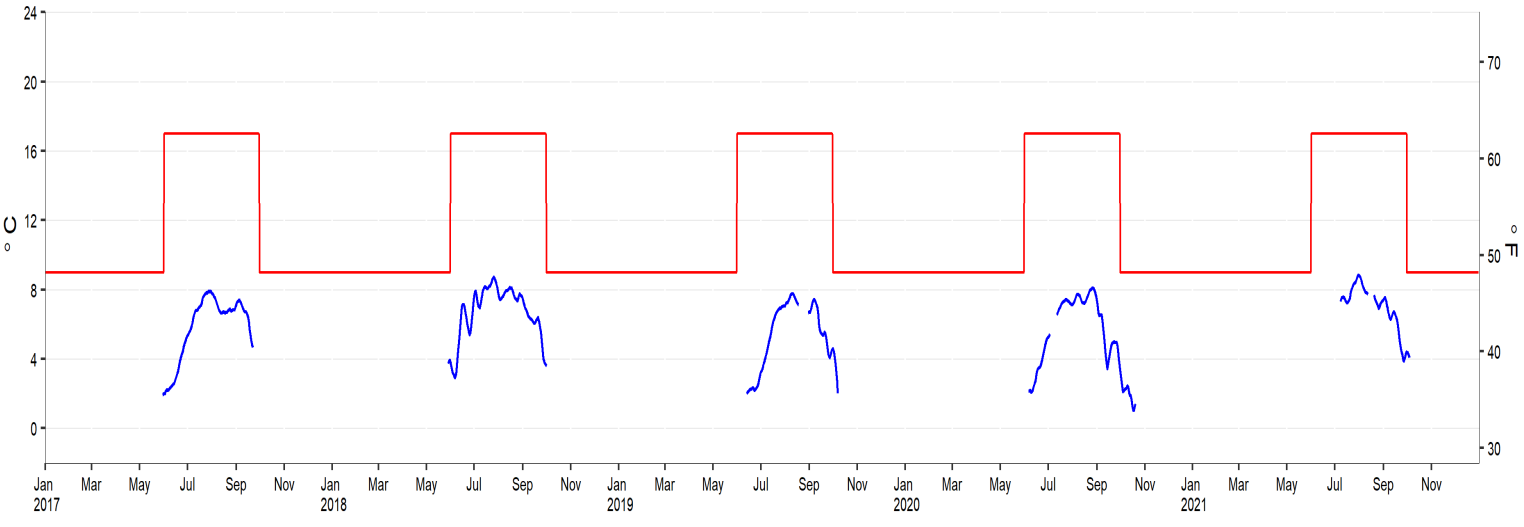
**2021 Above WAT standard**

5-25-2021 - 5-31-2021      Max Exceedance: 9.39°C

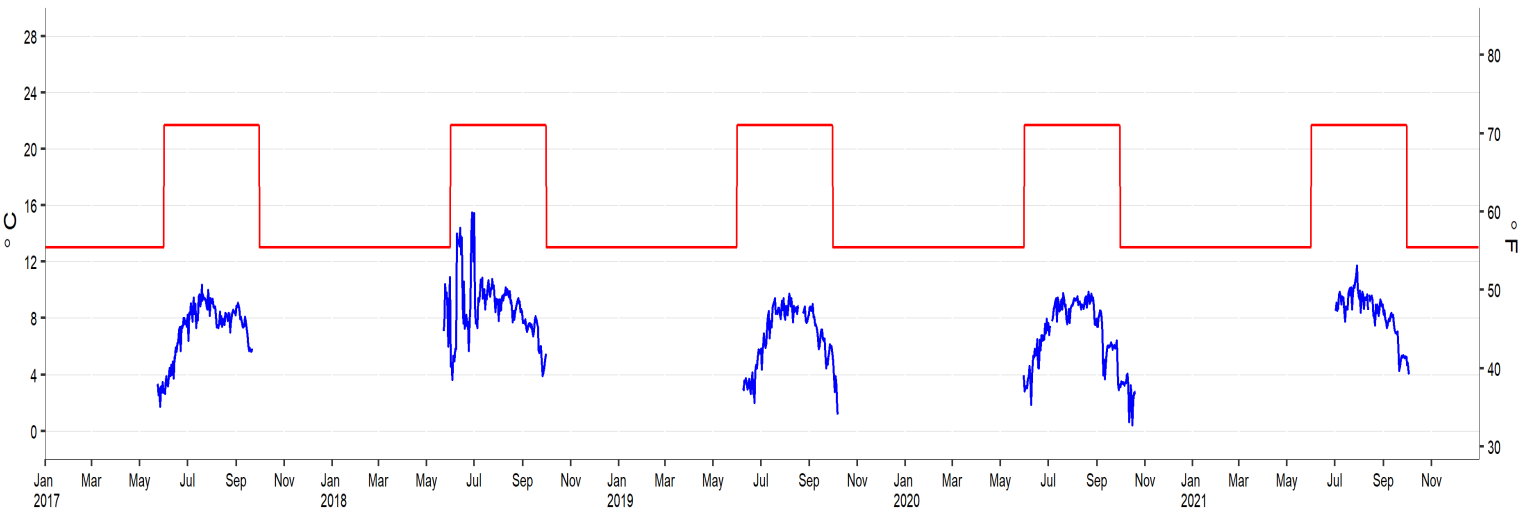
**2021 Above DM standard**

5-06-2021 - 5-31-2021      Max Exceedance: 13.75°C  
 7-06-2021 - 7-29-2021      Max Exceedance: 23.60°C

Elk-blwDWB (EC-5.5): WAT (Chronic CS-I)

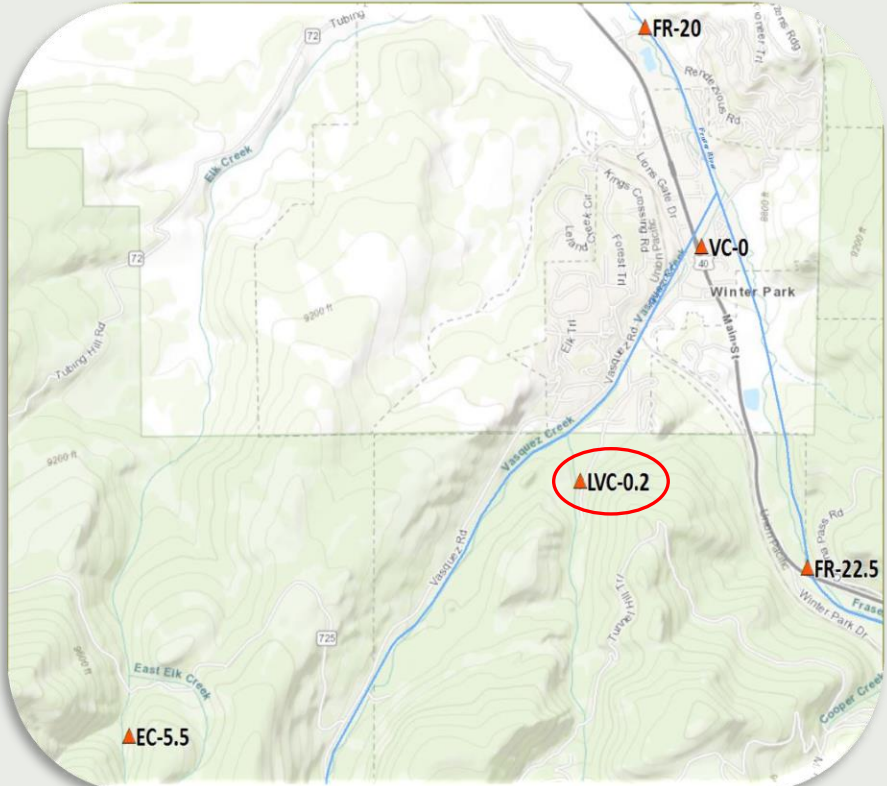


Elk-blwDWB (EC-5.5): DM (Acute CS-I)



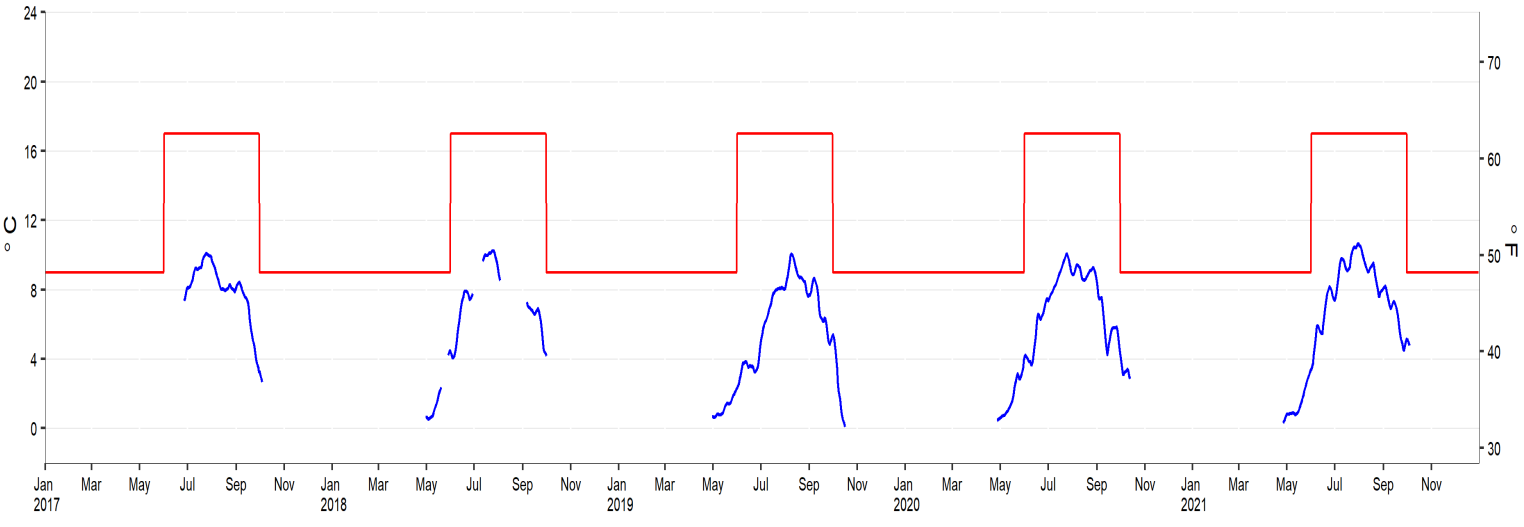


# CSI – LVC-abvWP - LVC-0.2

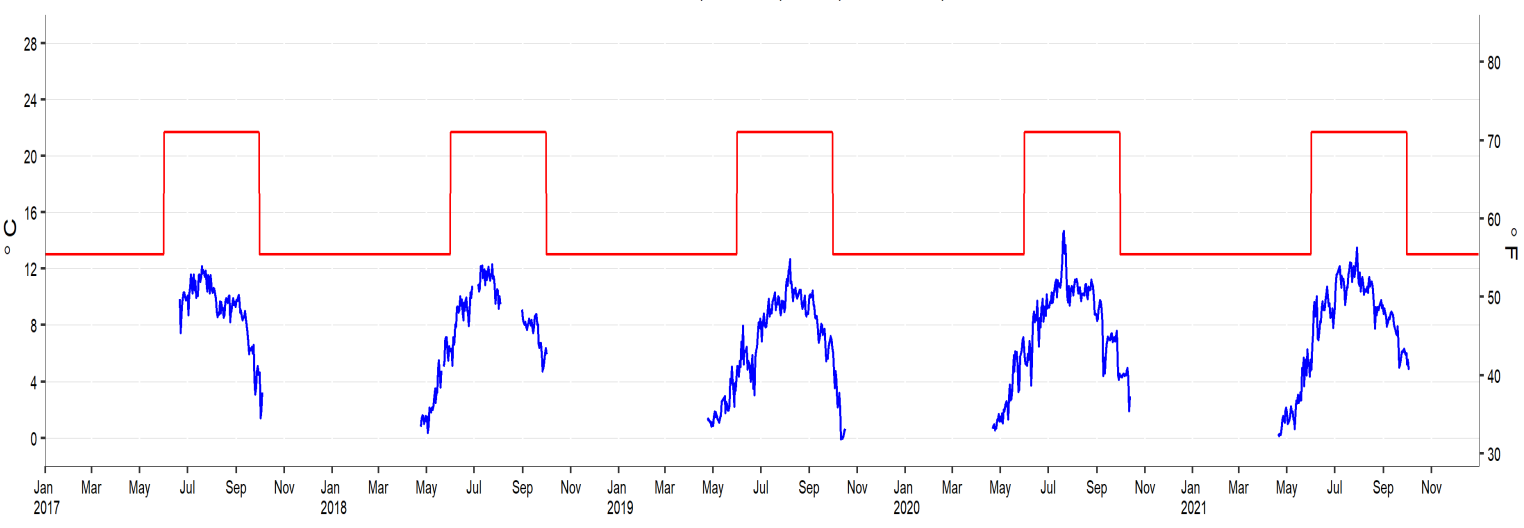


<b>2021 Above WAT standard</b>	
5-25-2021 - 5-31-2021	Max Exceedance: 9.39°C
<b>2021 Above DM standard</b>	
5-06-2021 - 5-31-2021	Max Exceedance: 15.19°C
7-06-2021 - 7-29-2021	Max Exceedance: 23.60°C

LVC-abvWP (LVC-0.2): WAT (Chronic CS-I)

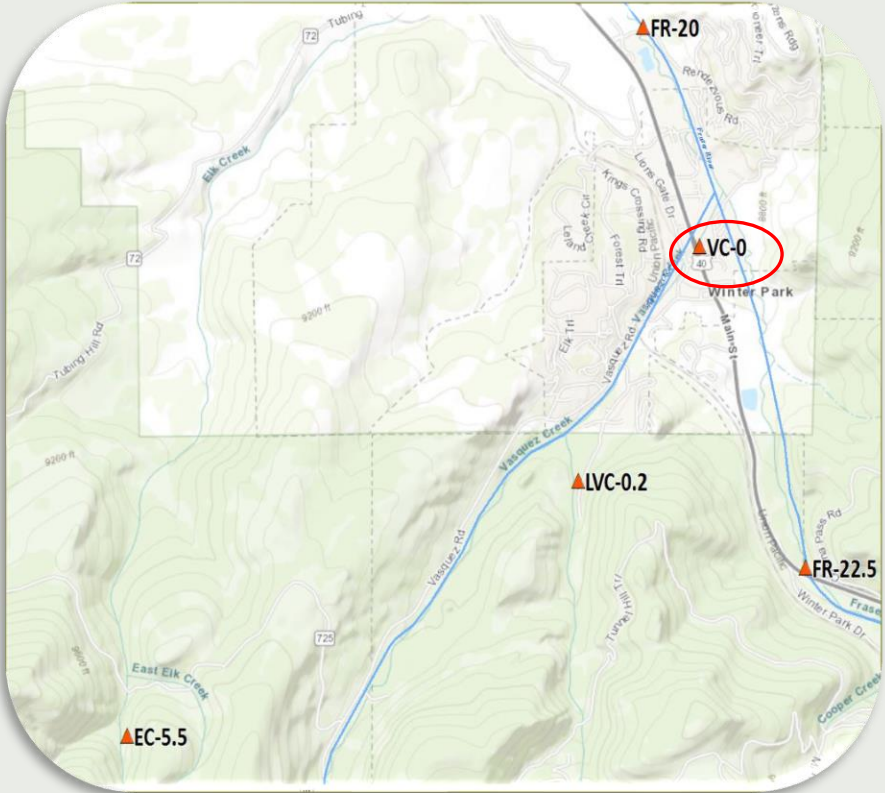


LVC-abvWP (LVC-0.2): DM (Acute CS-I)



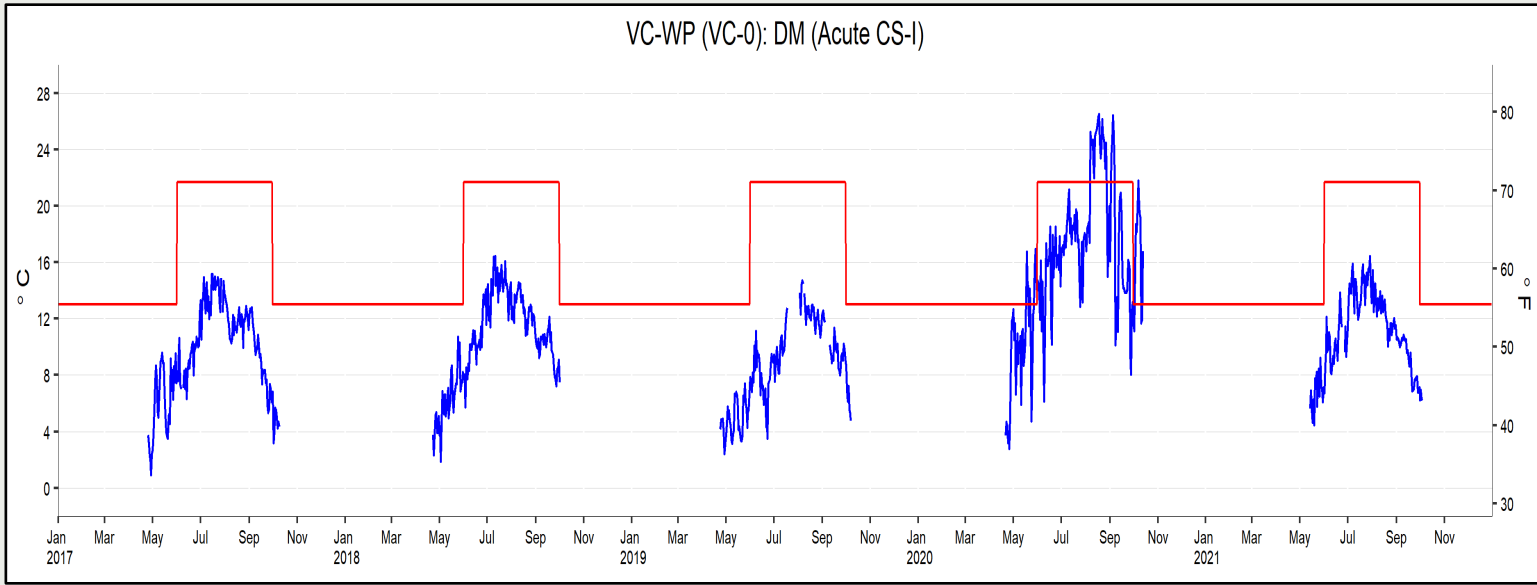
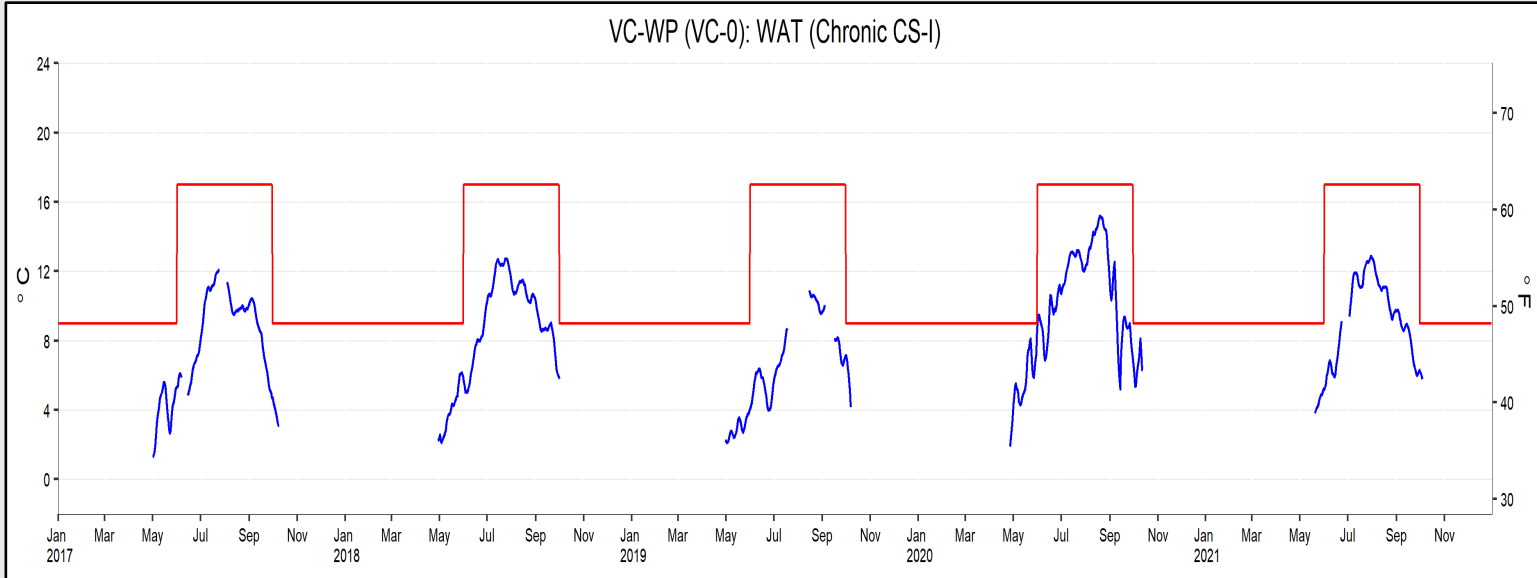


# CSI - VC-WP - VC-0



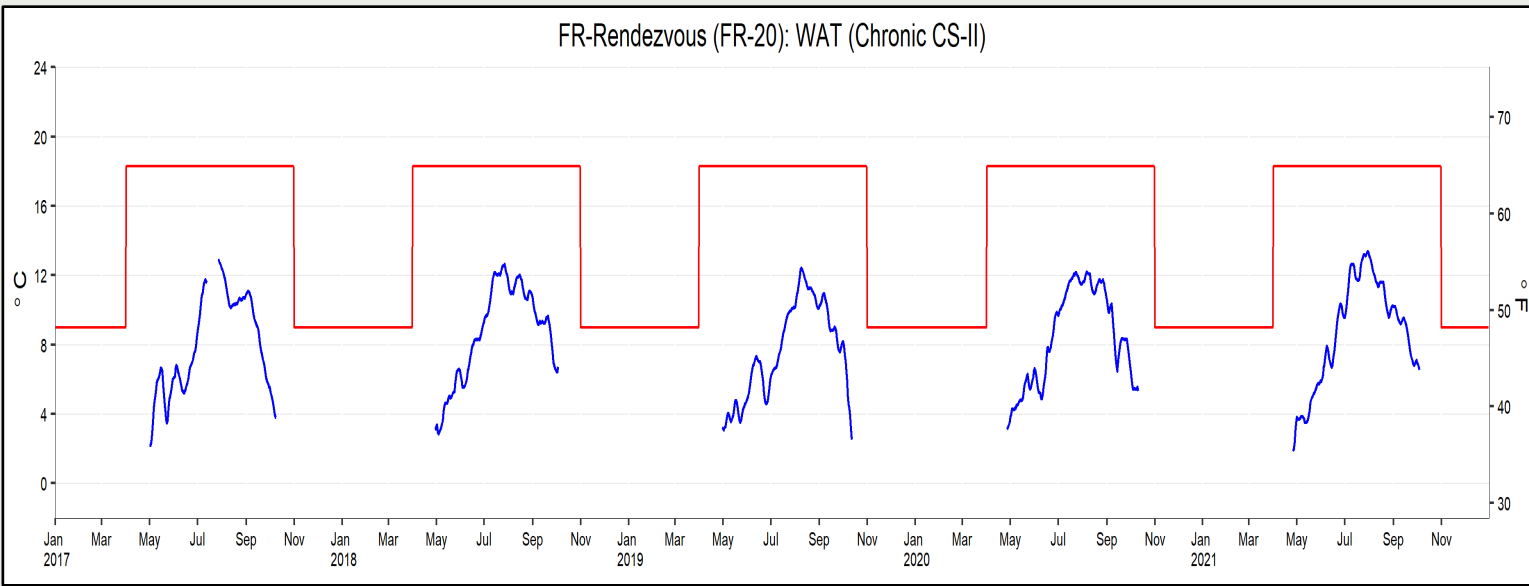
Data Gap:  
-2020: Rig found out of water.

**2021 Above WAT standard**  
5-25-2021 - 5-31-2021      Max Exceedance: 9.39°C

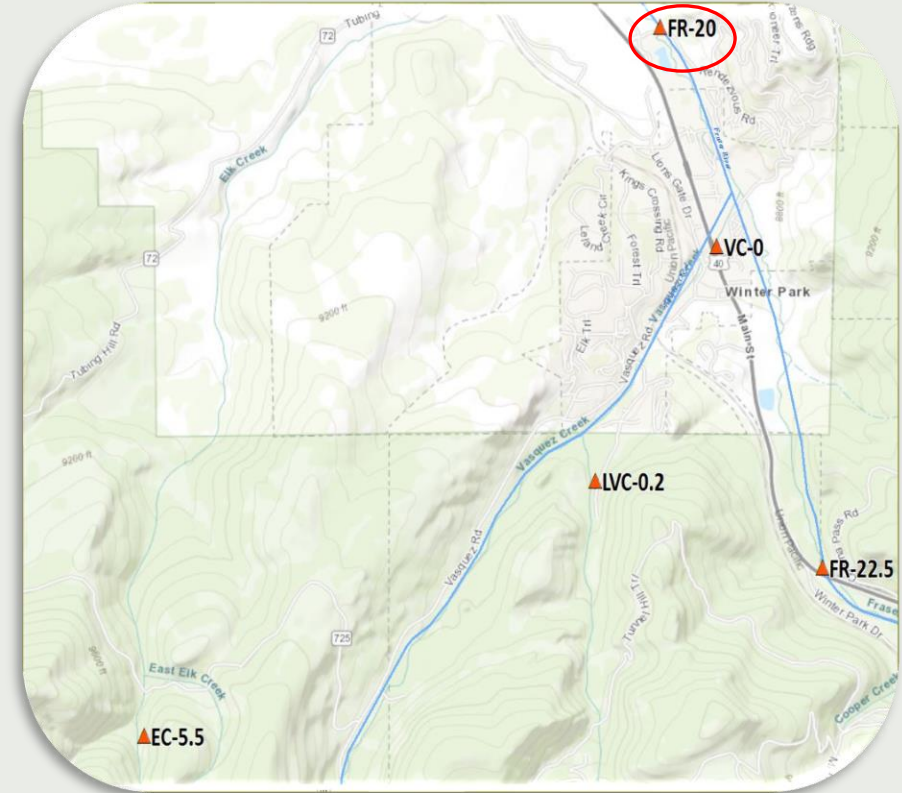
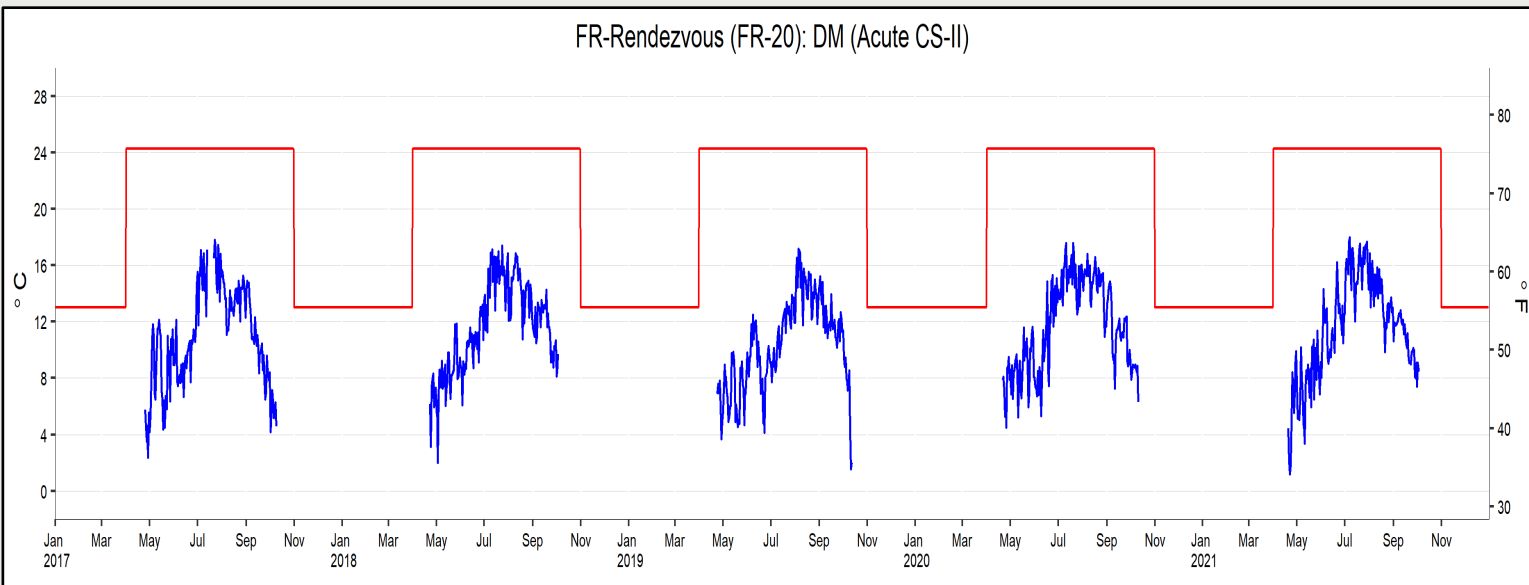


# CSII - FR20-Rendezvous - FR-20

FR-Rendezvous (FR-20): WAT (Chronic CS-II)

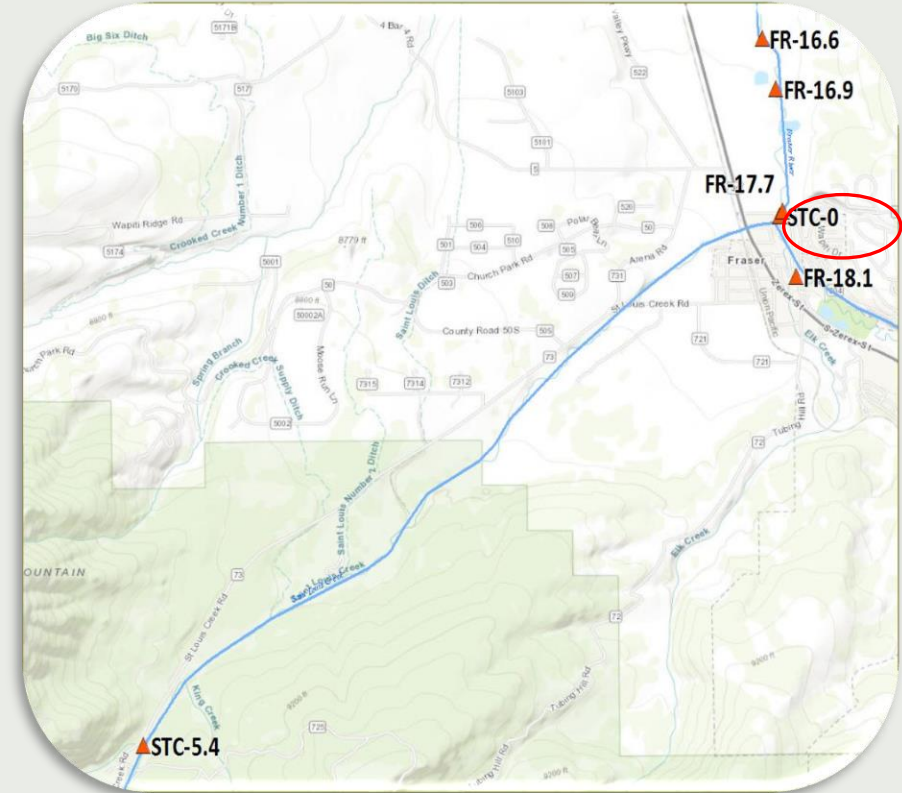


FR-Rendezvous (FR-20): DM (Acute CS-II)



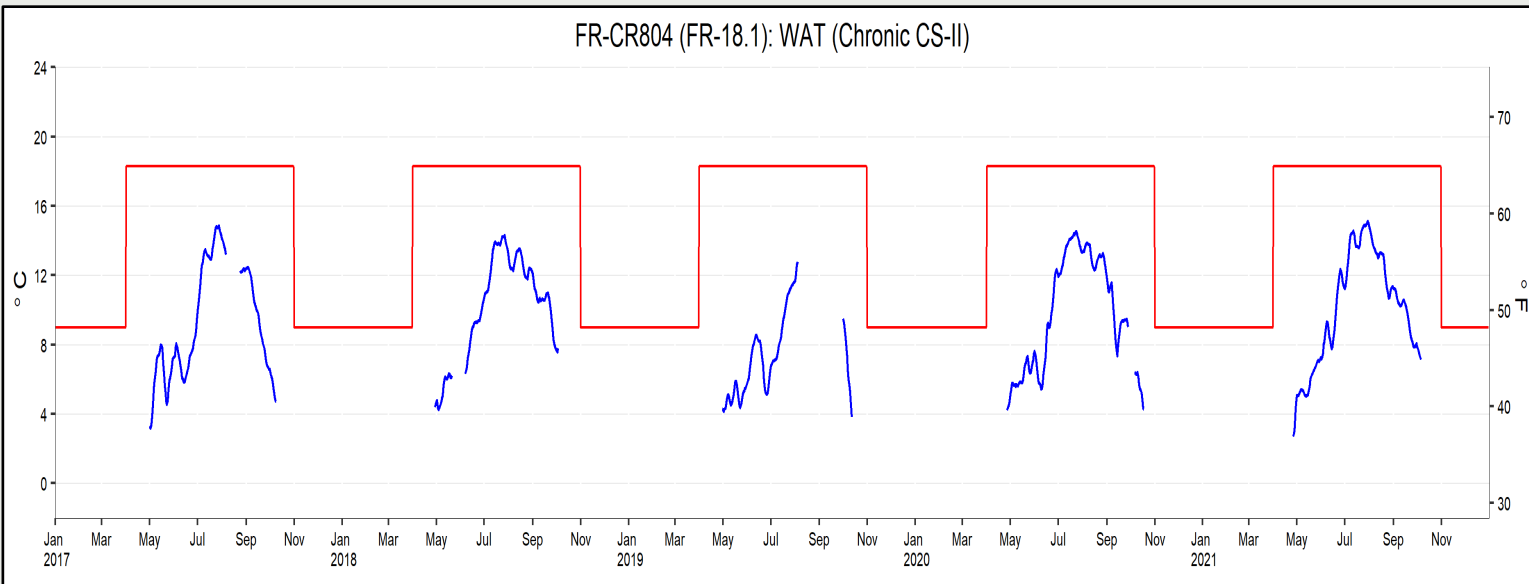
**2021 Above WAT standard**  
**5-25-2021 - 5-31-2021**      **Max Exceedance: 9.39°C**

# CSII - FR-CR804 - FR-18.1

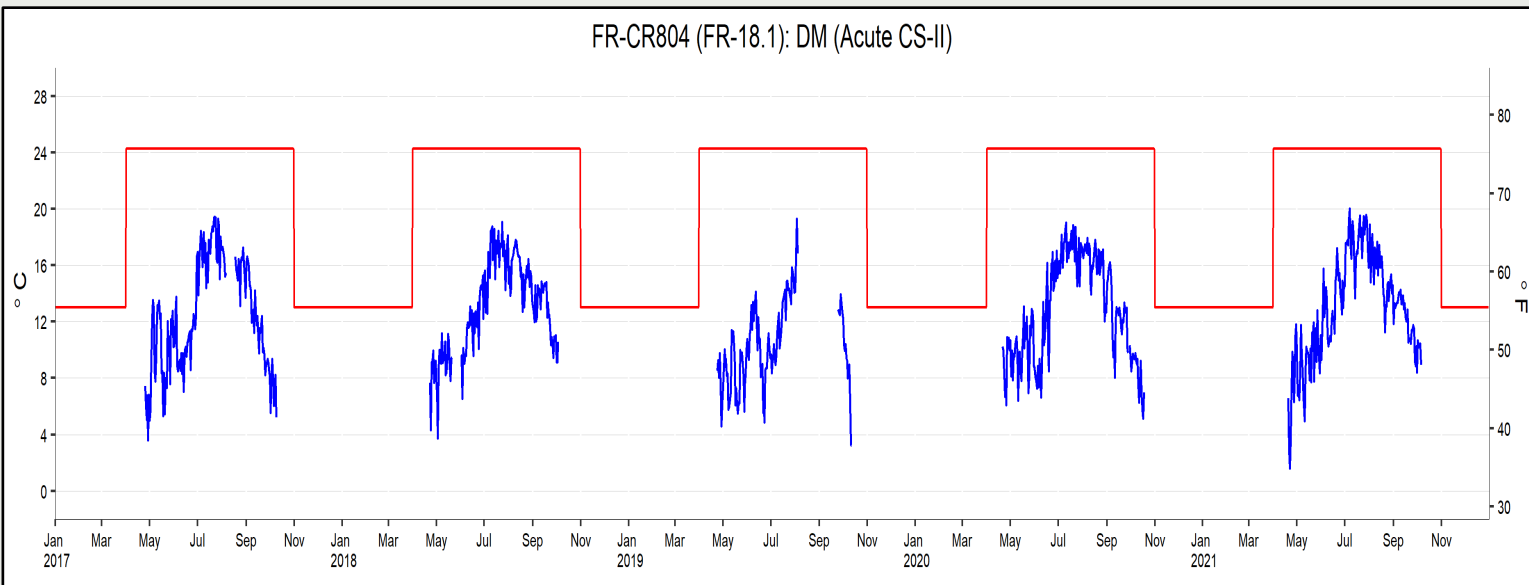


**2021 Above WAT standard**  
**5-25-2021 - 5-31-2021**      **Max Exceedance: 9.39°C**

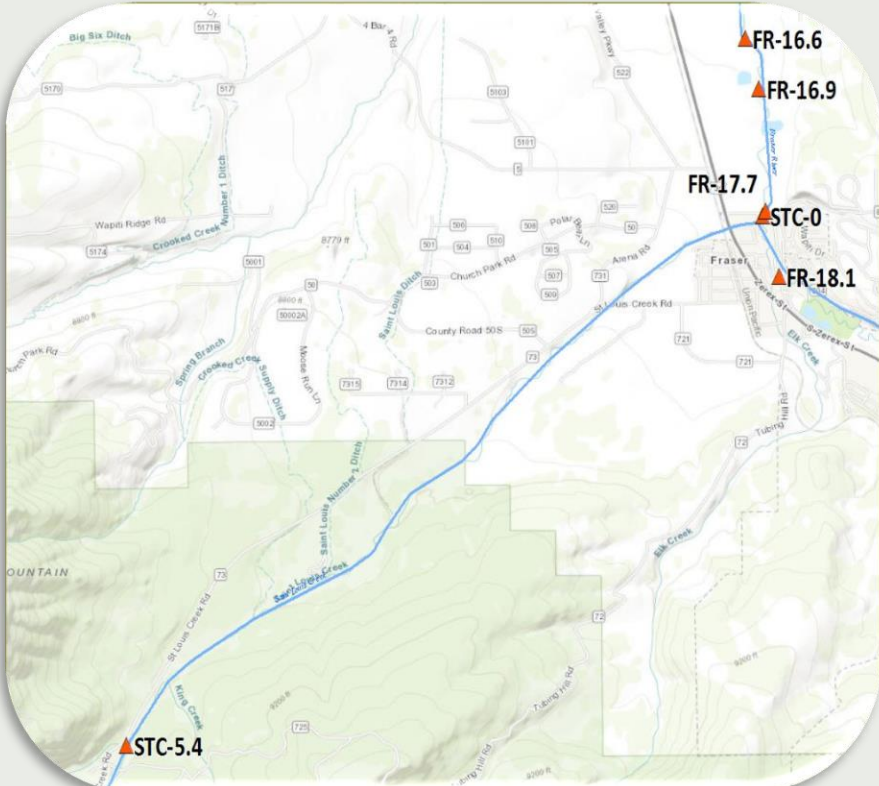
FR-CR804 (FR-18.1): WAT (Chronic CS-II)



FR-CR804 (FR-18.1): DM (Acute CS-II)

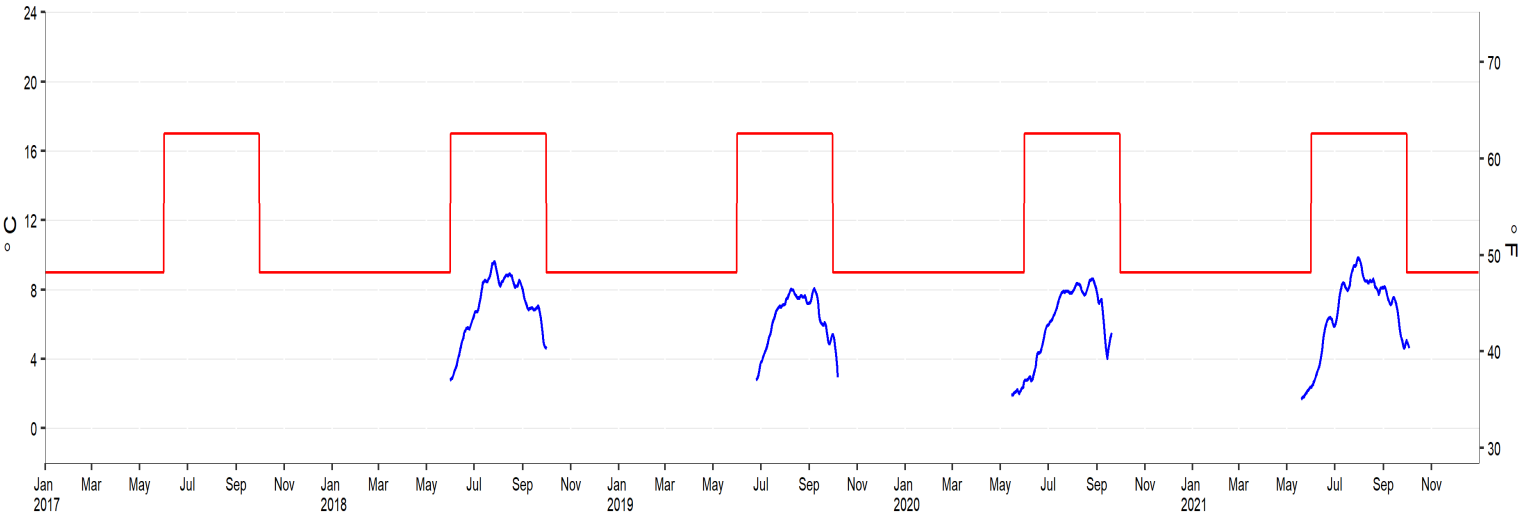


# CSI - STC-blwDWB - STC-9.8

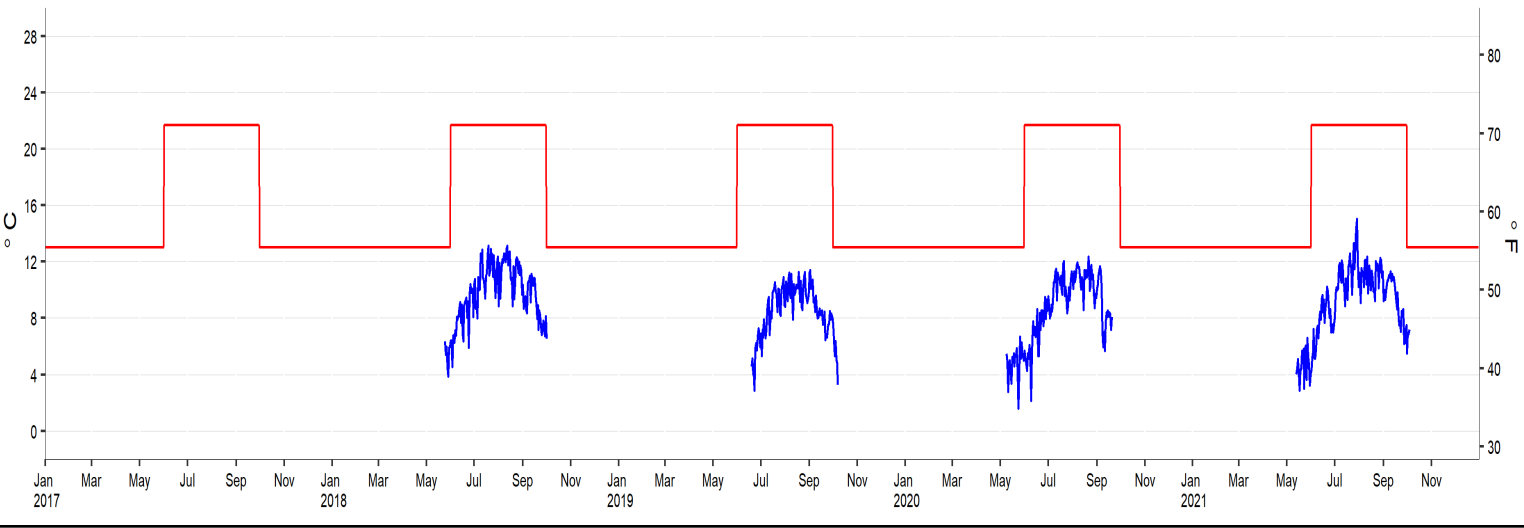


**2021 Above WAT standard**  
**5-25-2021 - 5-31-2021**      **Max Exceedance: 9.39°C**

STC-blwDWB (STC-9.8): WAT (Chronic CS-I)

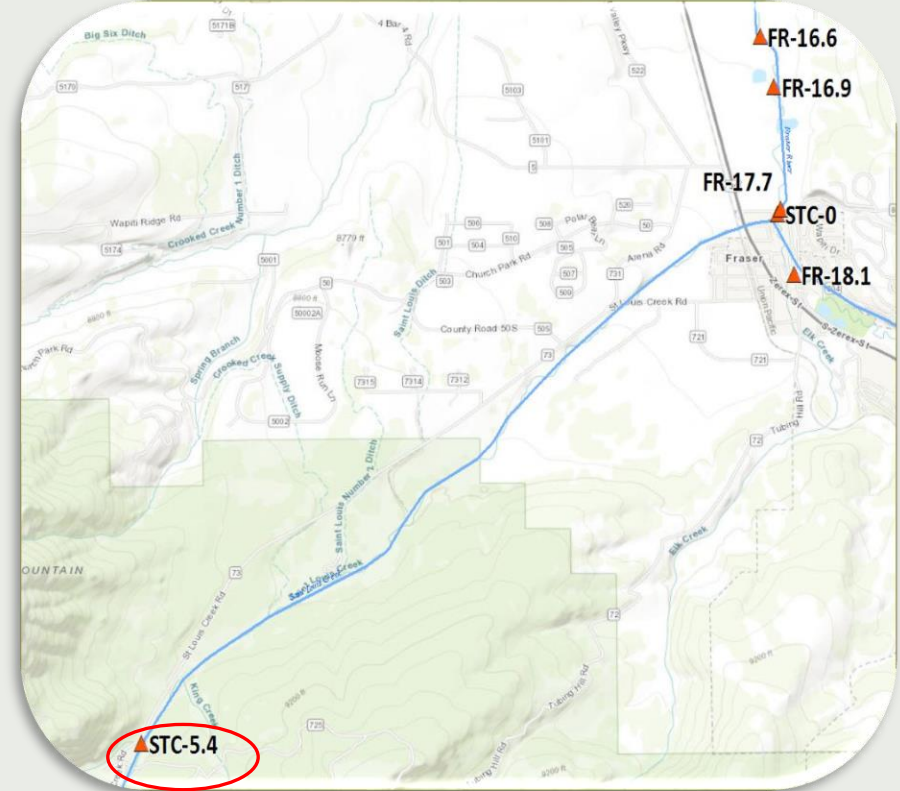


STC-blwDWB (STC-9.8): DM (Acute CS-I)



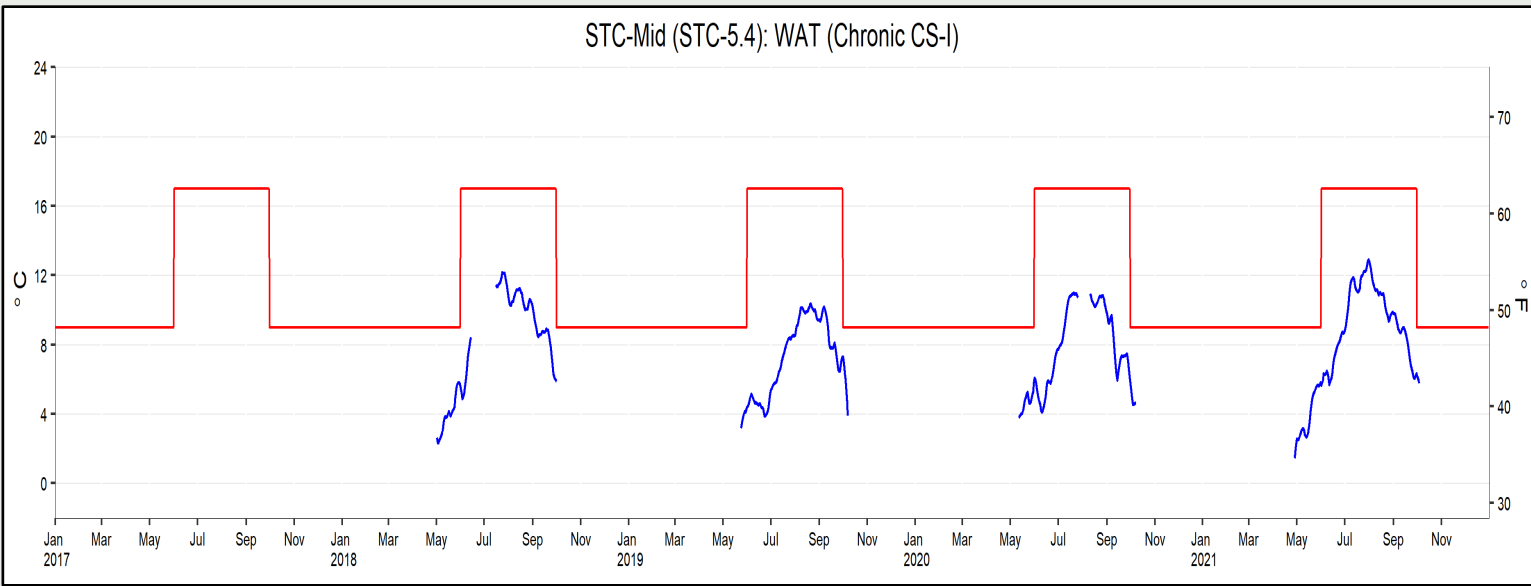


# CSI - STC-Mid - STC-5.4

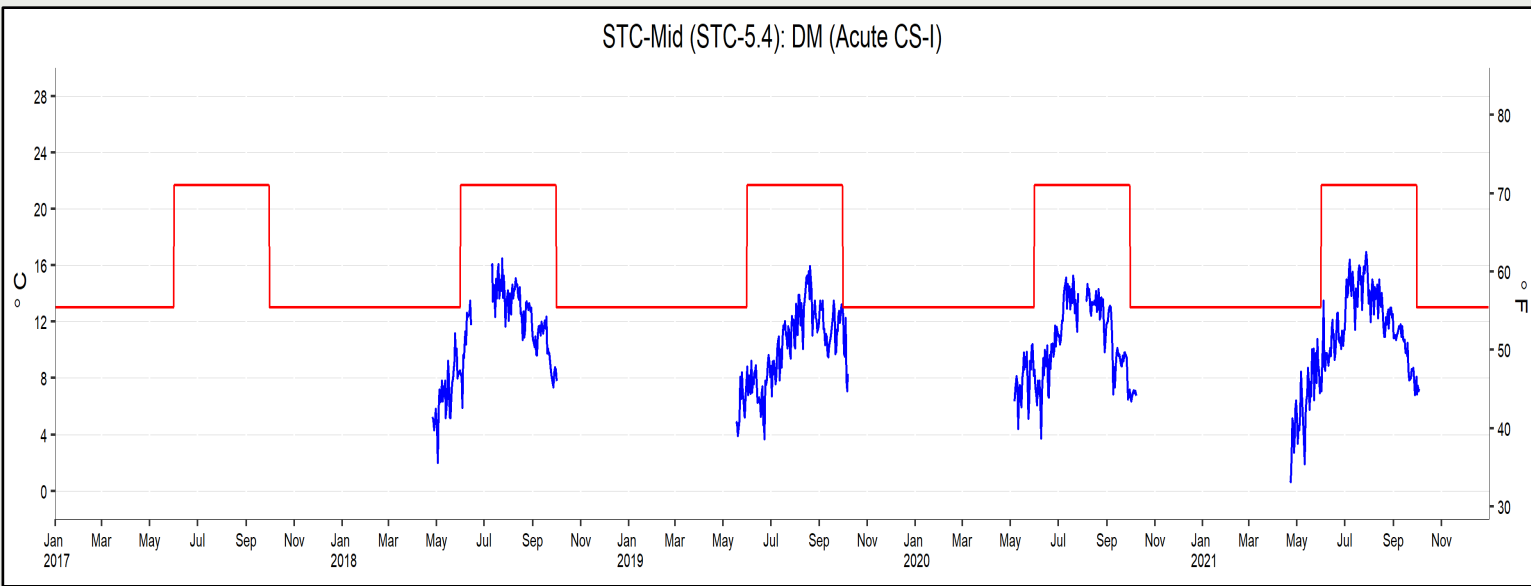


**2021 Above WAT standard**  
**5-25-2021 - 5-31-2021**      **Max Exceedance: 9.39°C**

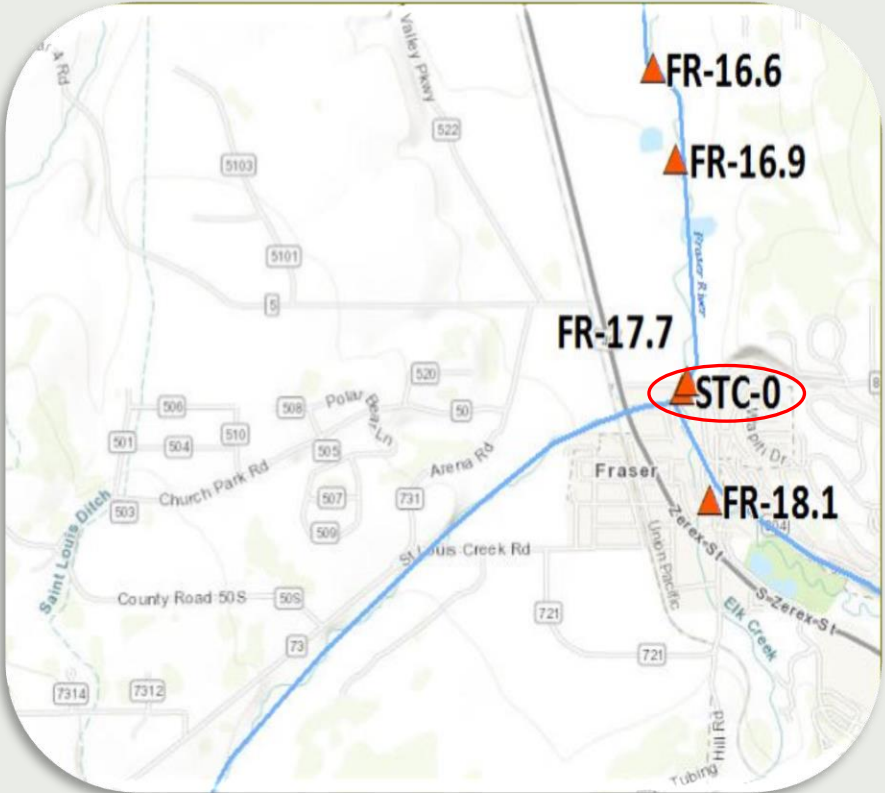
STC-Mid (STC-5.4): WAT (Chronic CS-I)



STC-Mid (STC-5.4): DM (Acute CS-I)



# CSI - ST-LC - STC-0

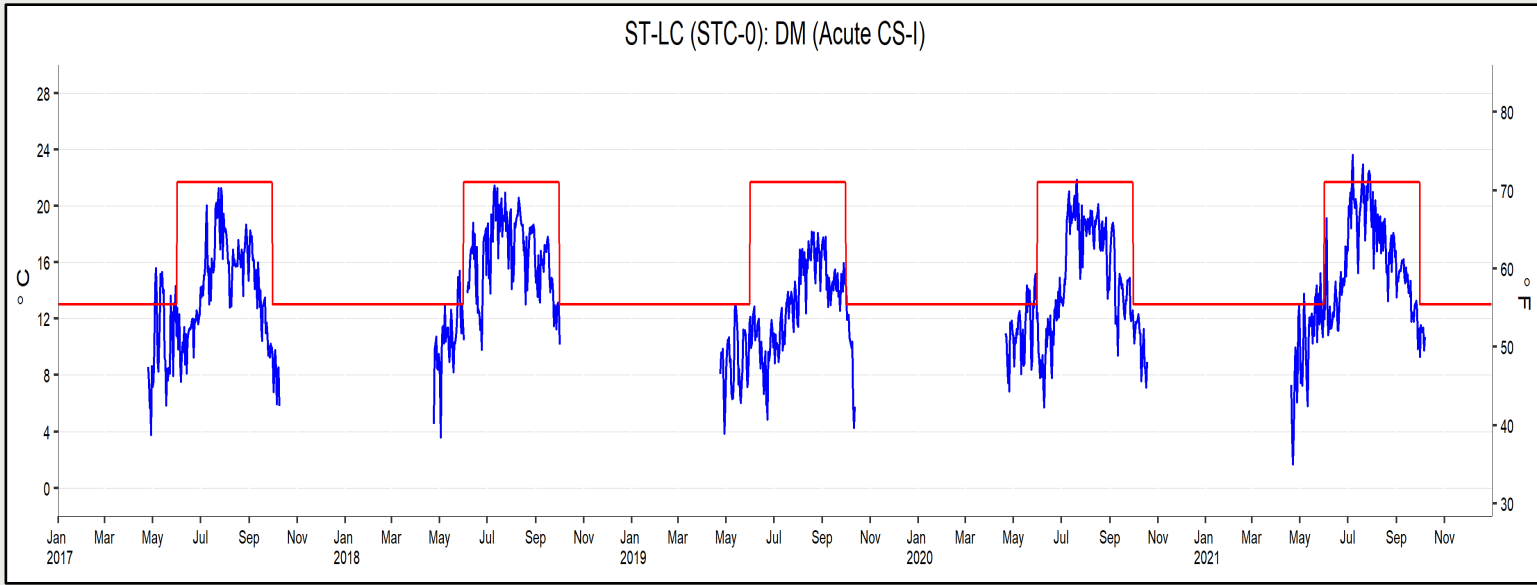
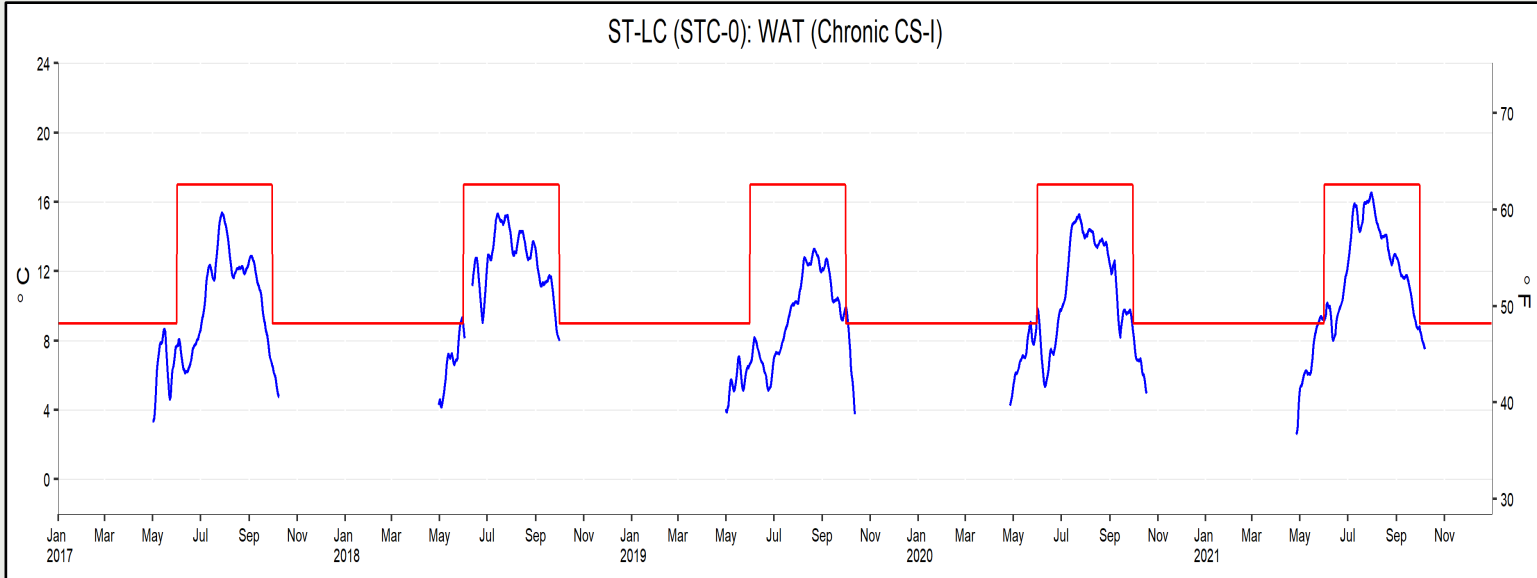


**2021 Above WAT standard**

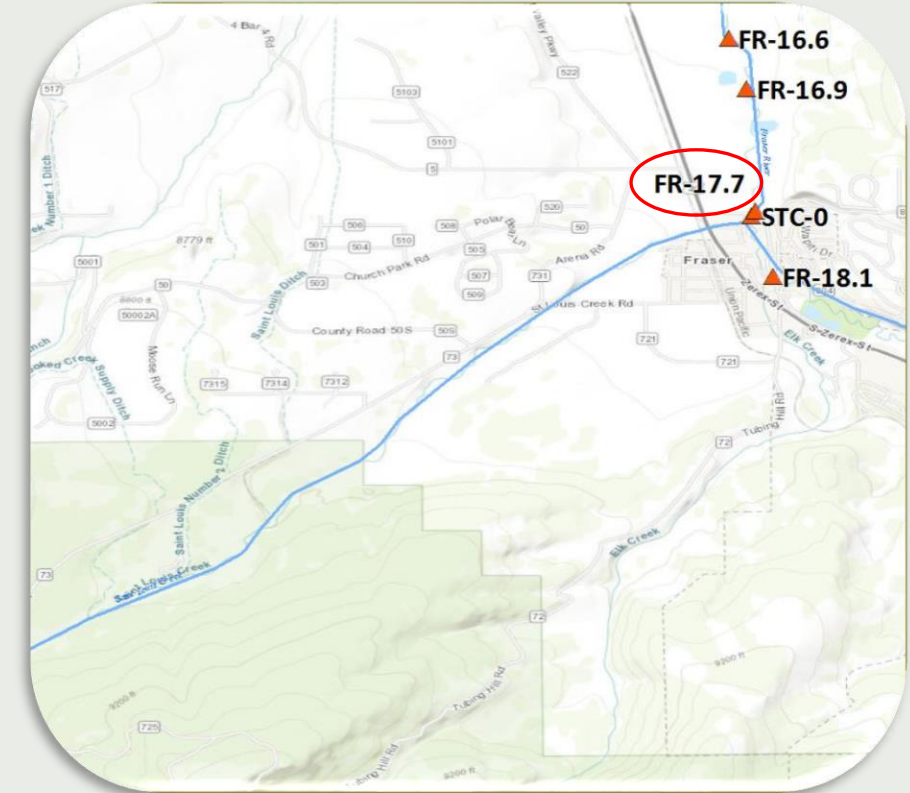
**5-25-2021 - 5-31-2021      Max Exceedance: 9.39°C**

**2021 Above DM standard**

**5-6-2021 - 5-31-2021      Max Exceedance: 15.19°C**  
**7-6-2021 - 7-29-2021      Max Exceedance: 23.60°C**

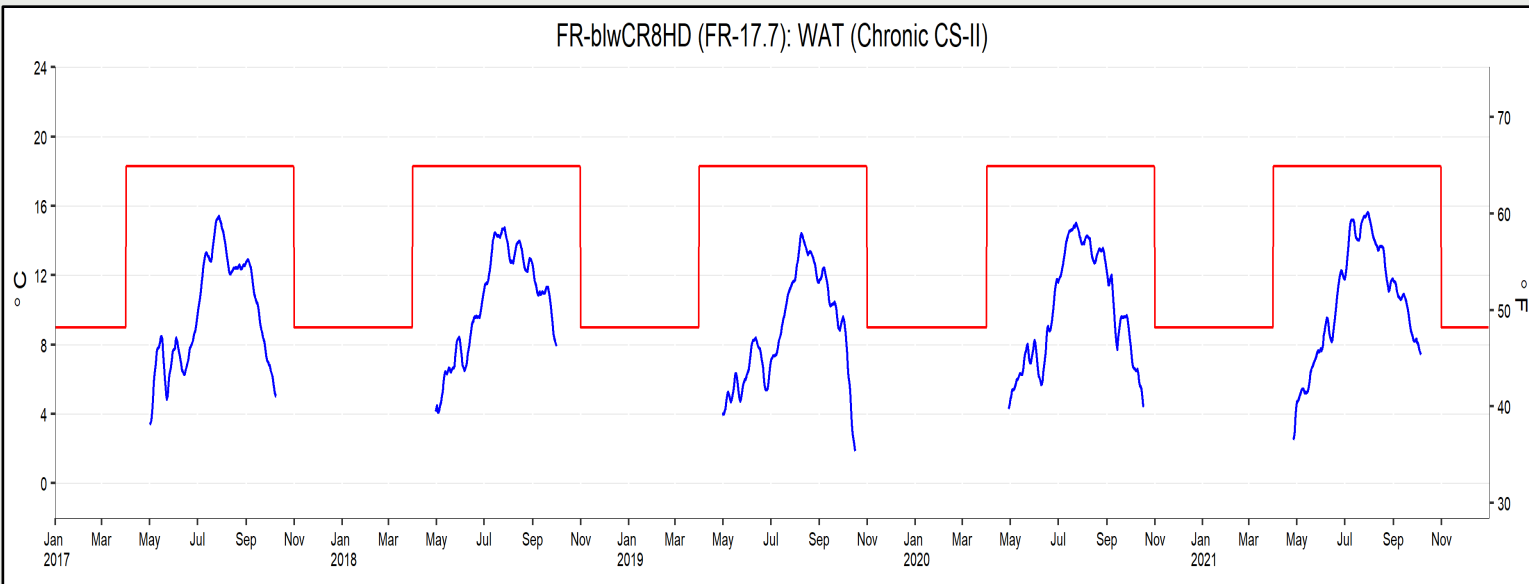


# CSII - FR-blwCR8HD - FR-17.7

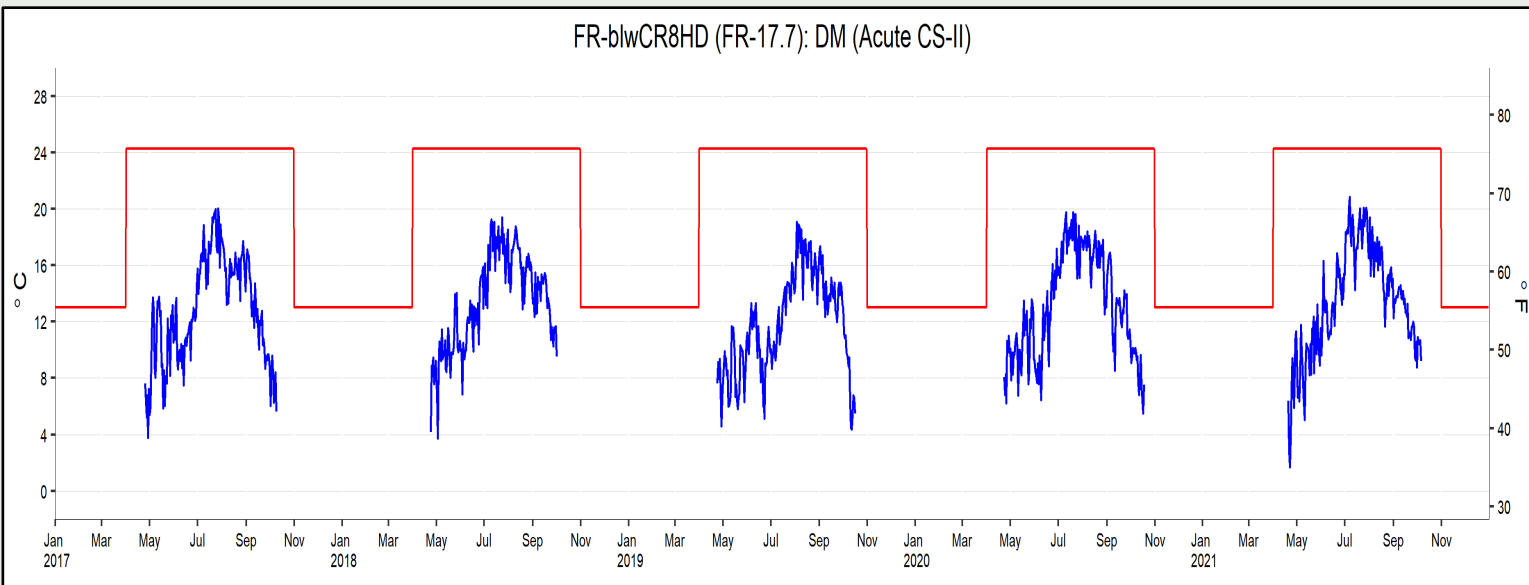


<b>2021 Above WAT standard</b>	
5-25-2021 - 5-31-2021	Max Exceedance: 9.39°C
<b>2021 Above DM standard</b>	
5-06-2021 - 5-31-2021	Max Exceedance: 15.19°C
7-06-2021 - 7-29-2021	Max Exceedance: 23.60°C

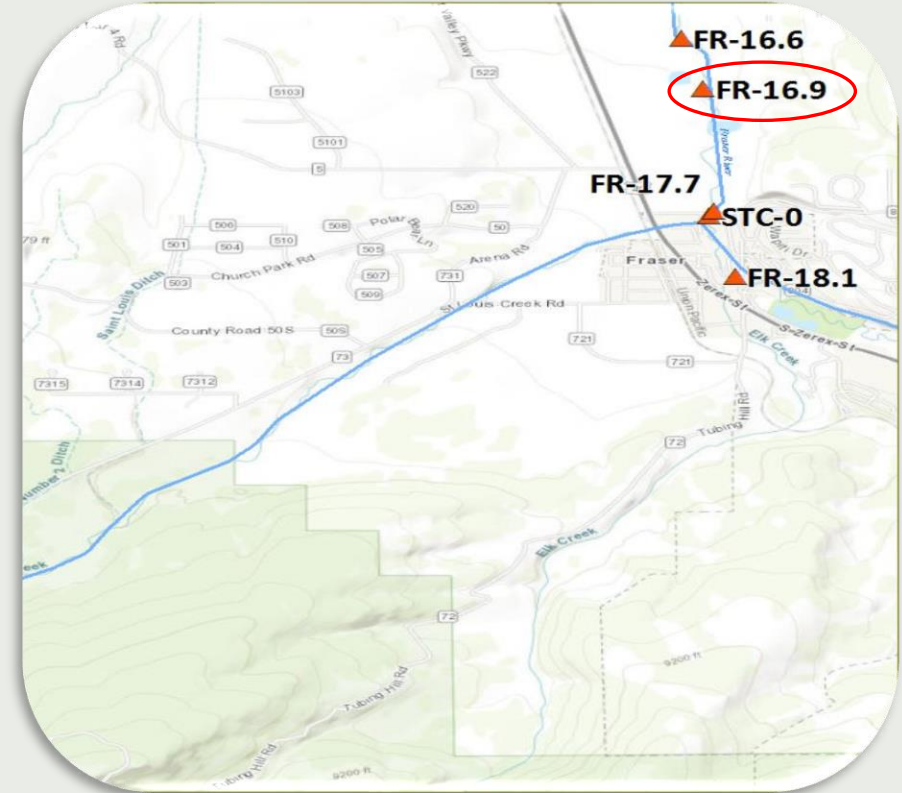
FR-blwCR8HD (FR-17.7): WAT (Chronic CS-II)



FR-blwCR8HD (FR-17.7): DM (Acute CS-II)



# CSII - FR-abvFSD - FR-16.9



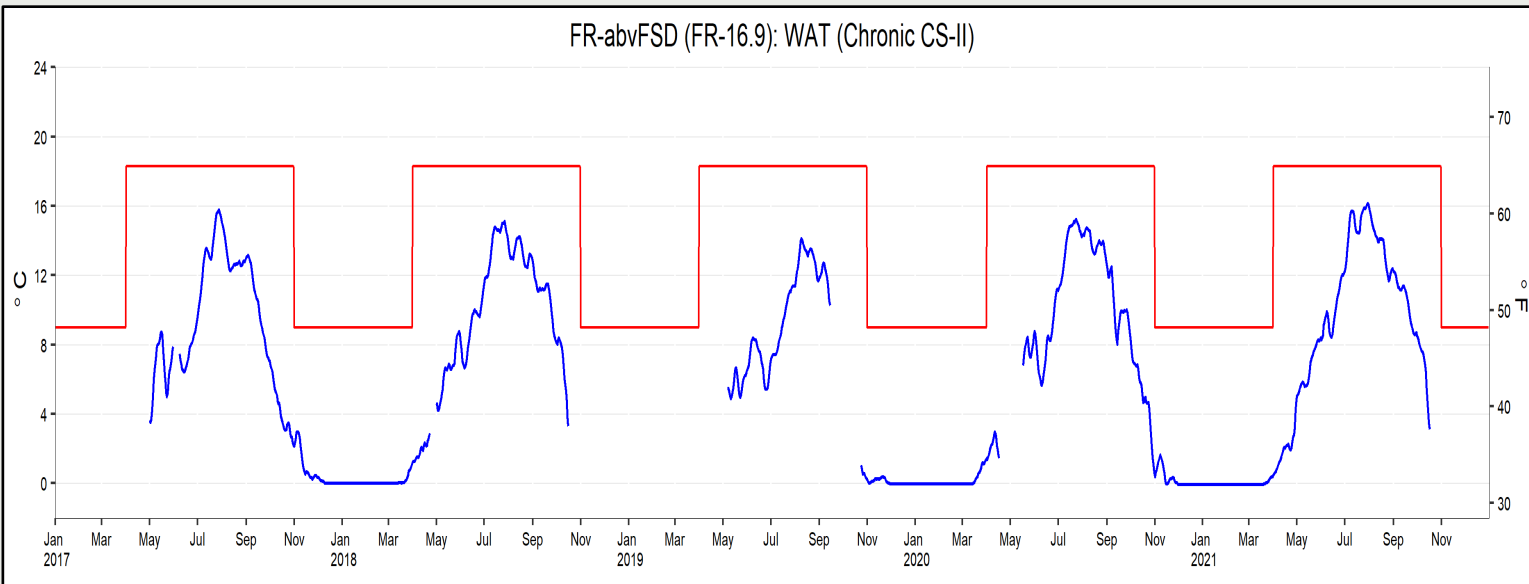
**2021 Above WAT standard**

5-25-2021 - 5-31-2021      Max Exceedance: 9.39°C

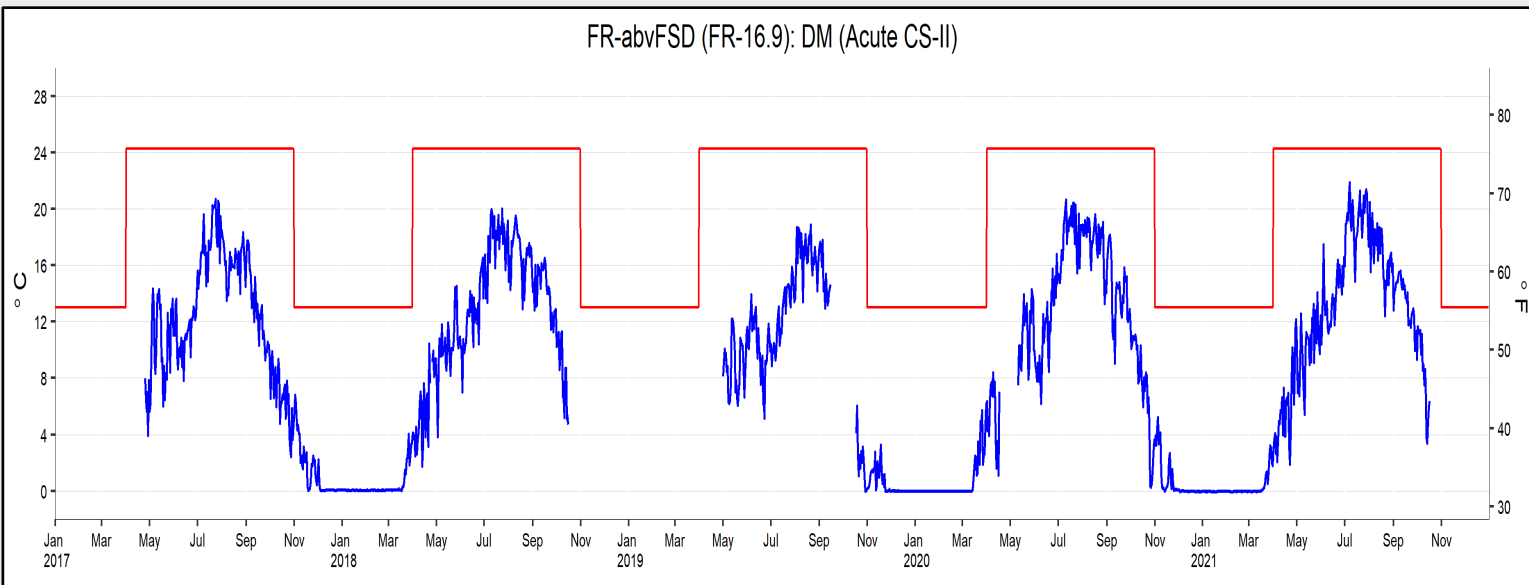
**2021 Above DM standard**

5-06-2021 - 5-31-2021      Max Exceedance: 15.19°C  
 7-06-2021 - 7-29-2021      Max Exceedance: 23.60°C

FR-abvFSD (FR-16.9): WAT (Chronic CS-II)

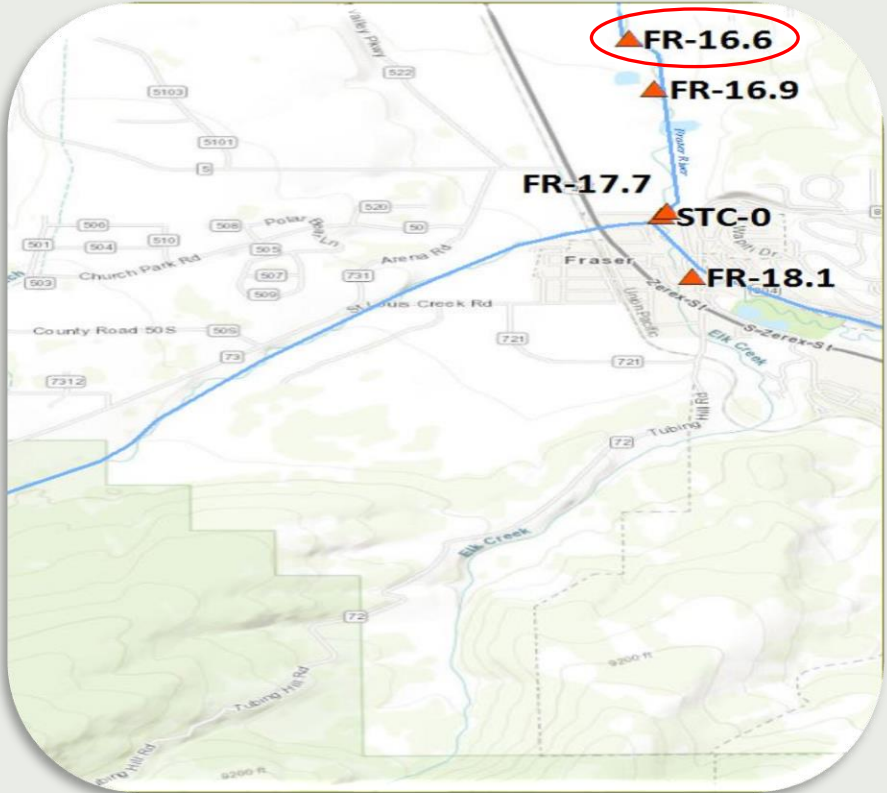


FR-abvFSD (FR-16.9): DM (Acute CS-II)





# CSII - FR-blwFSD - FR-16.6



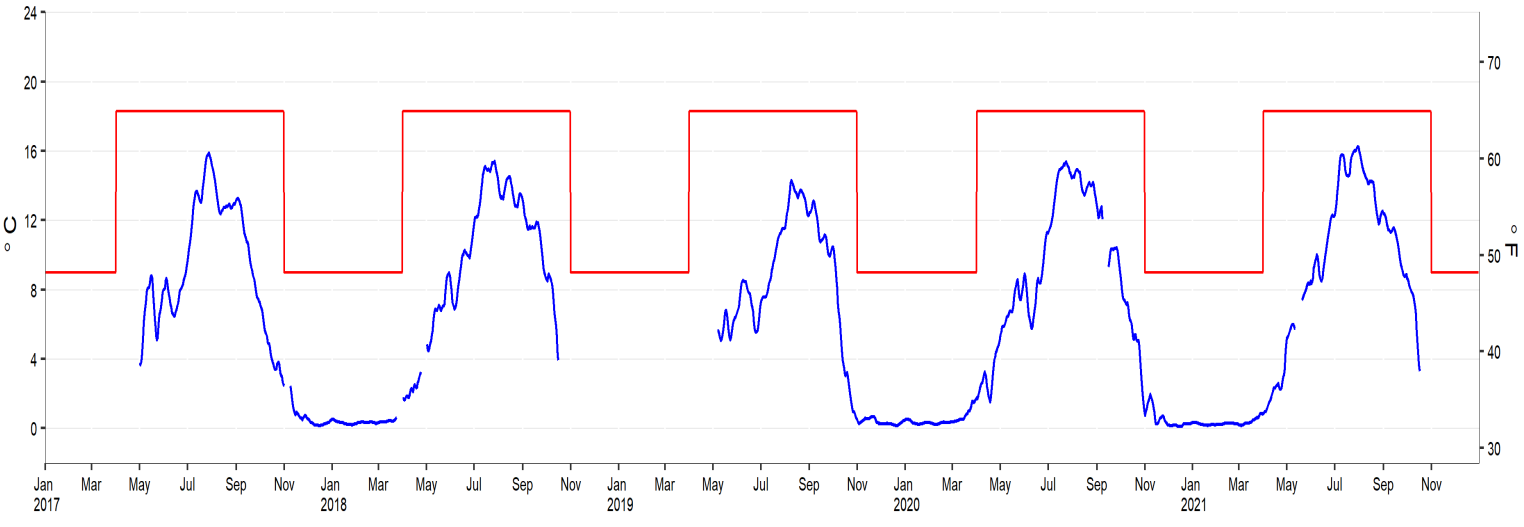
**2021 Above WAT standard**

5-25-2021 - 5-31-2021      Max Exceedance: 9.39°C

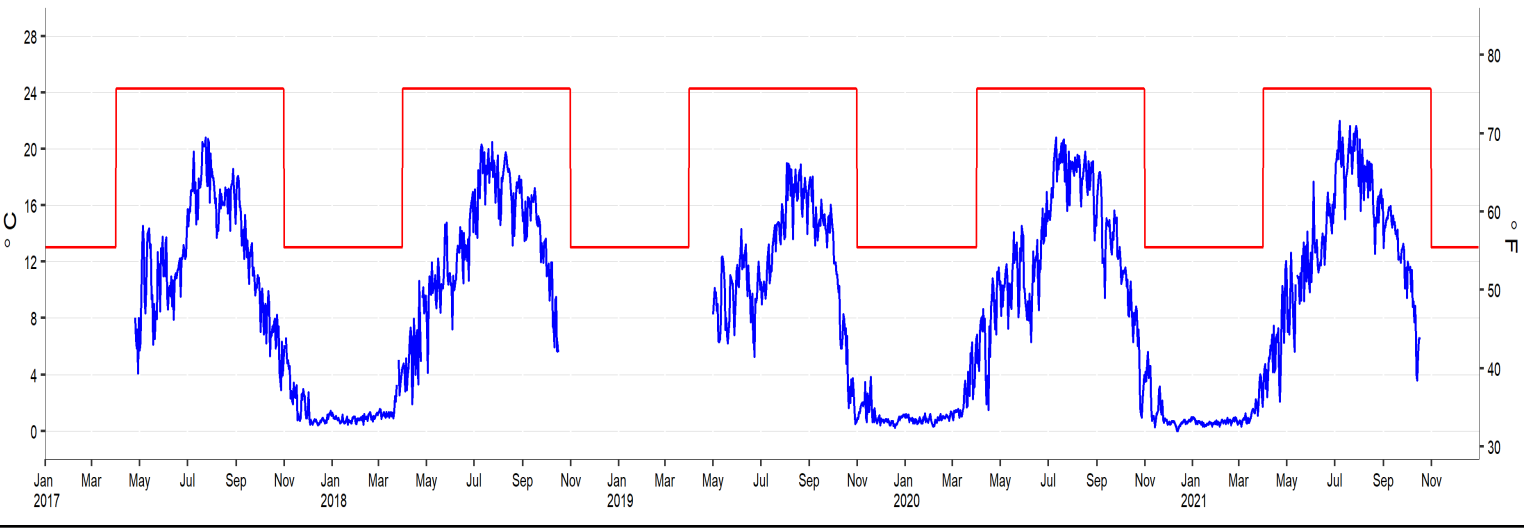
**2021 Above DM standard**

5-06-2021 - 5-31-2021      Max Exceedance: 15.19°C  
 7-06-2021 - 7-29-2021      Max Exceedance: 23.60°C

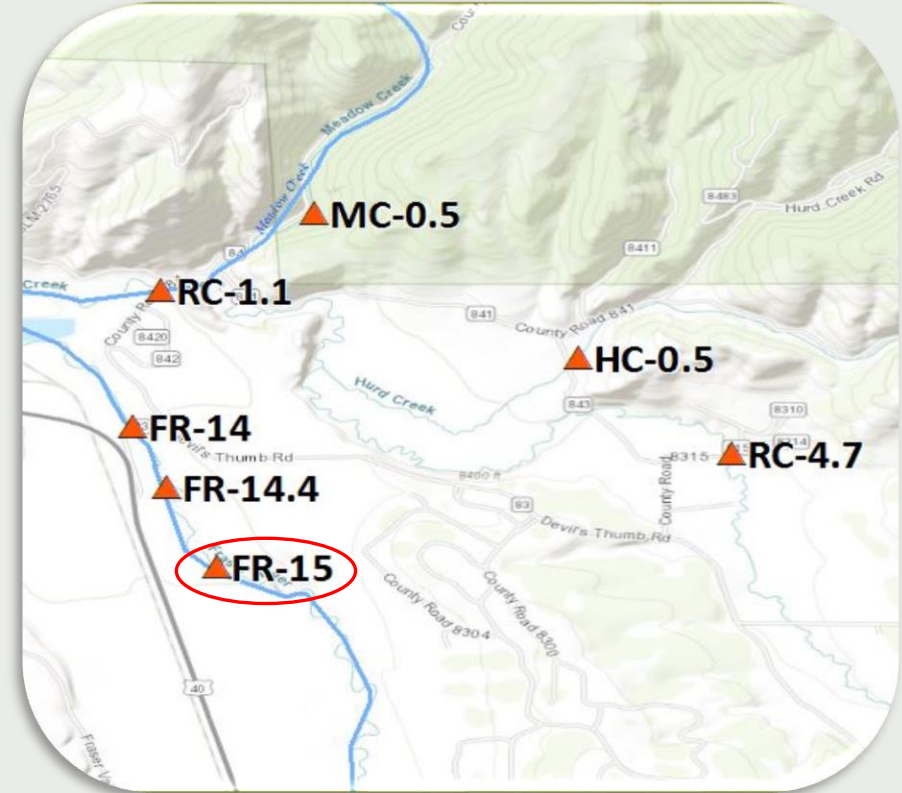
FR-blwFSD (FR-16.6): WAT (Chronic CS-II)



FR-blwFSD (FR-16.6): DM (Acute CS-II)

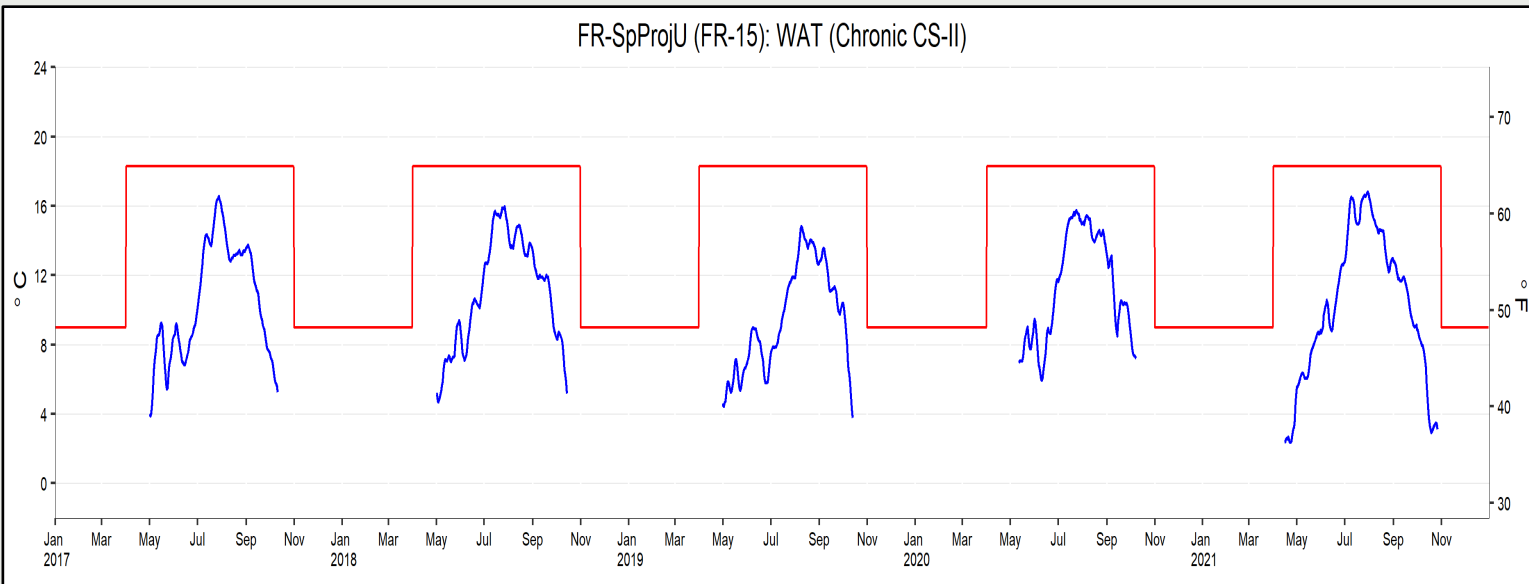


# CSII - FR-SpProjU - FR-15

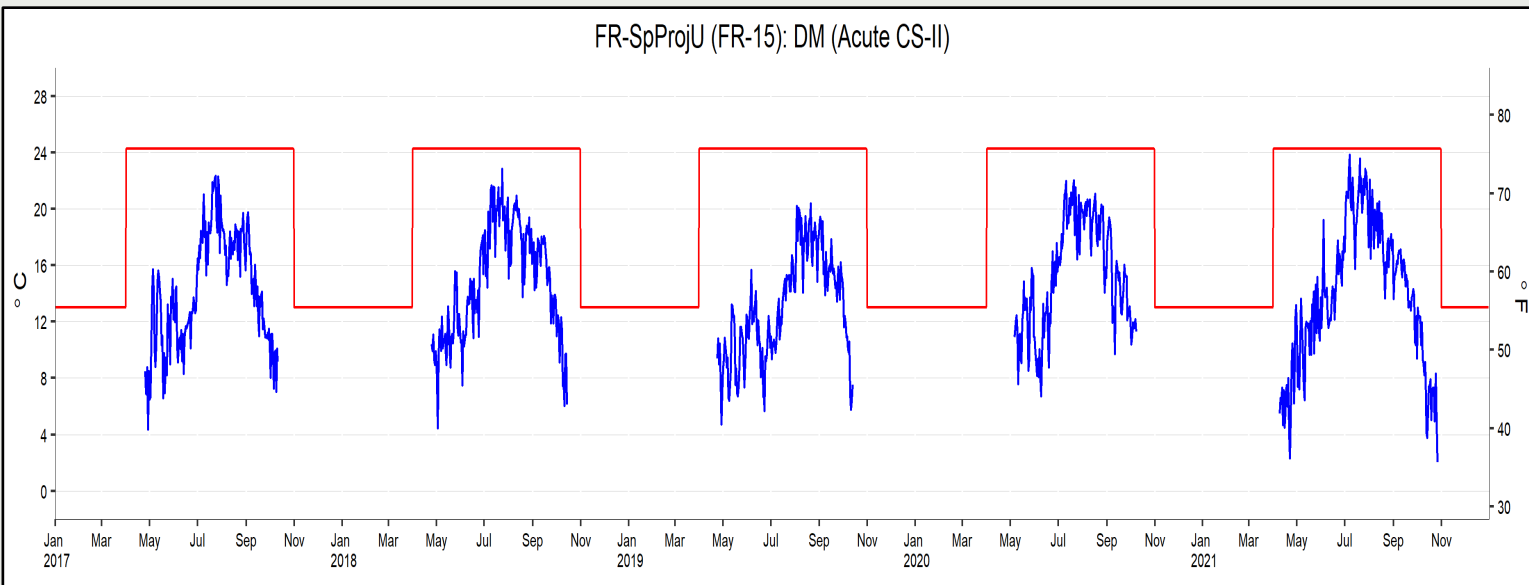


<b>2021 Above WAT standard</b>	
<b>5-25-2021 - 5-31-2021</b>	<b>Max Exceedance: 9.39°C</b>
<b>2021 Above DM standard</b>	
<b>5-06-2021 - 5-31-2021</b>	<b>Max Exceedance: 15.19°C</b>
<b>7-06-2021 - 7-29-2021</b>	<b>Max Exceedance: 23.60°C</b>

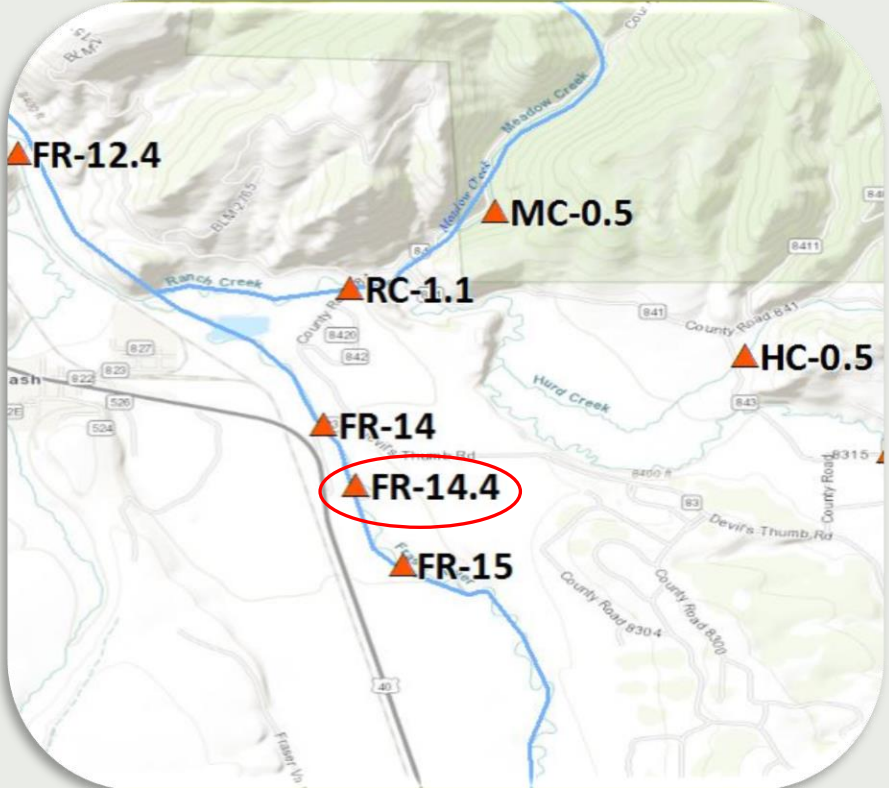
FR-SpProjU (FR-15): WAT (Chronic CS-II)



FR-SpProjU (FR-15): DM (Acute CS-II)

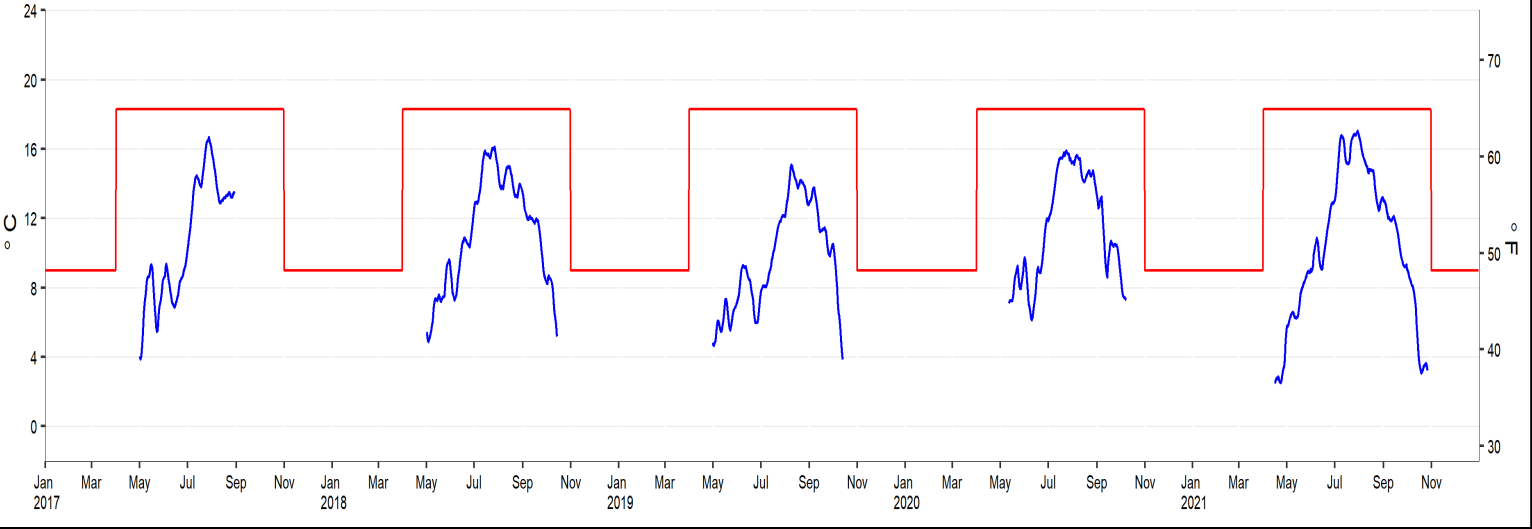


# CSII - FR-SpProjD - FR-14.4

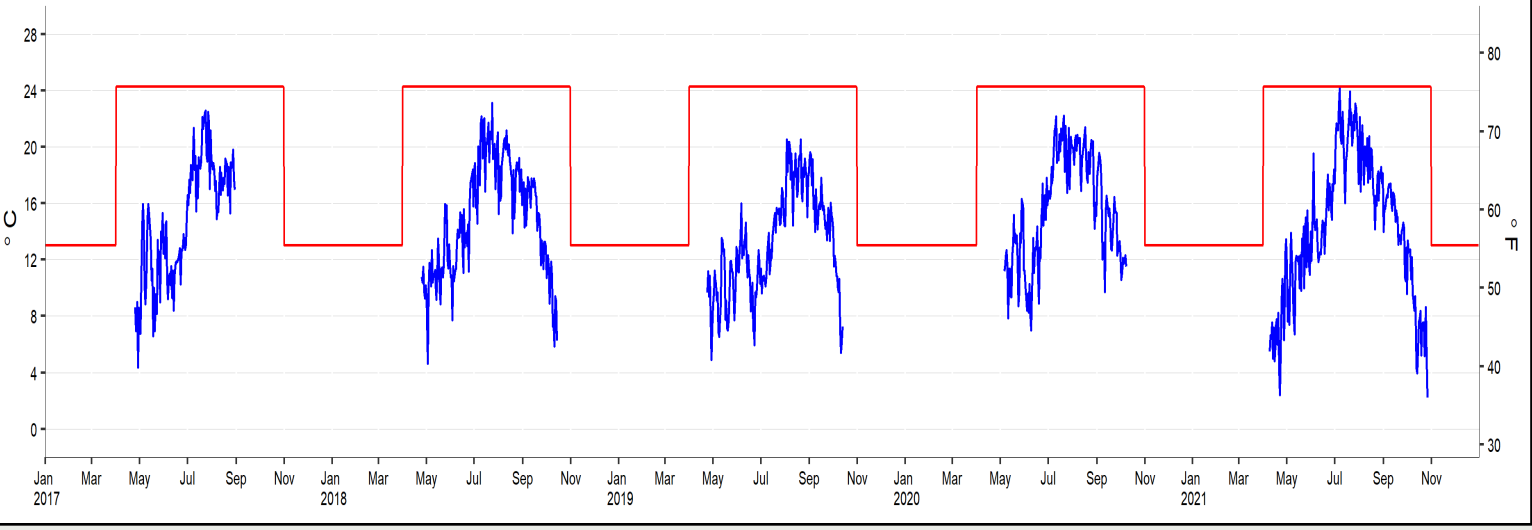


<b>2021 Above WAT standard</b>	
5-25-2021 - 5-31-2021	Max Exceedance: 9.39°C
<b>2021 Above DM standard</b>	
5-06-2021 - 5-31-2021	Max Exceedance: 15.19°C
7-06-2021 - 7-29-2021	Max Exceedance: 23.60°C

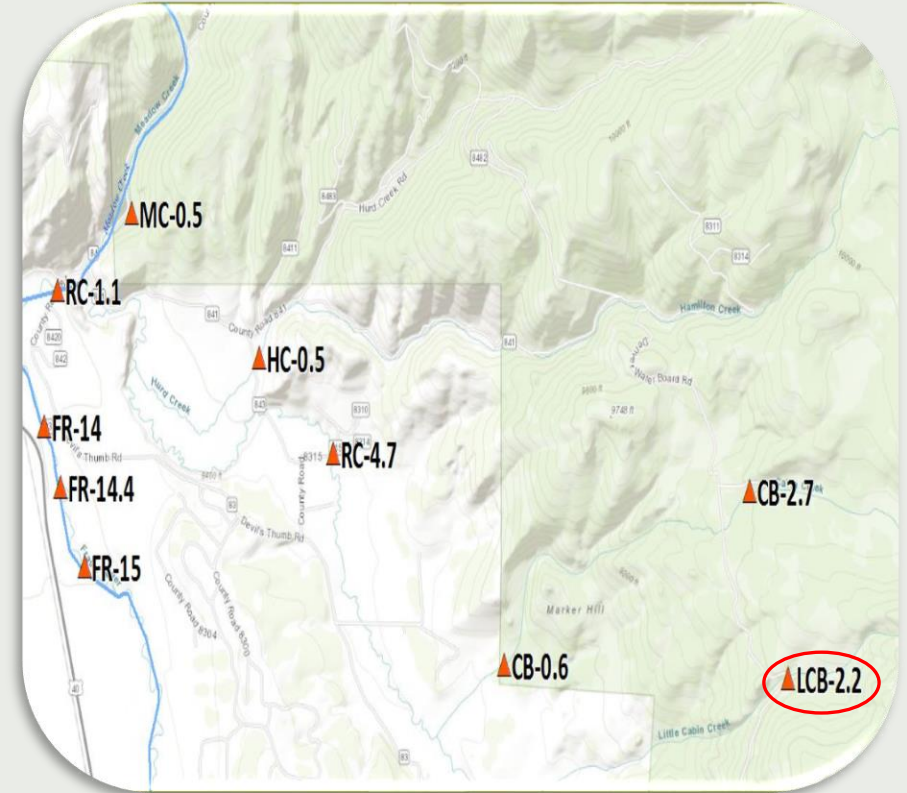
FR-SpProjD (FR-14.4): WAT (Chronic CS-II)



FR-SpProjD (FR-14.4): DM (Acute CS-II)



# CSI - LCAB-blwDWB - LCB-2.2



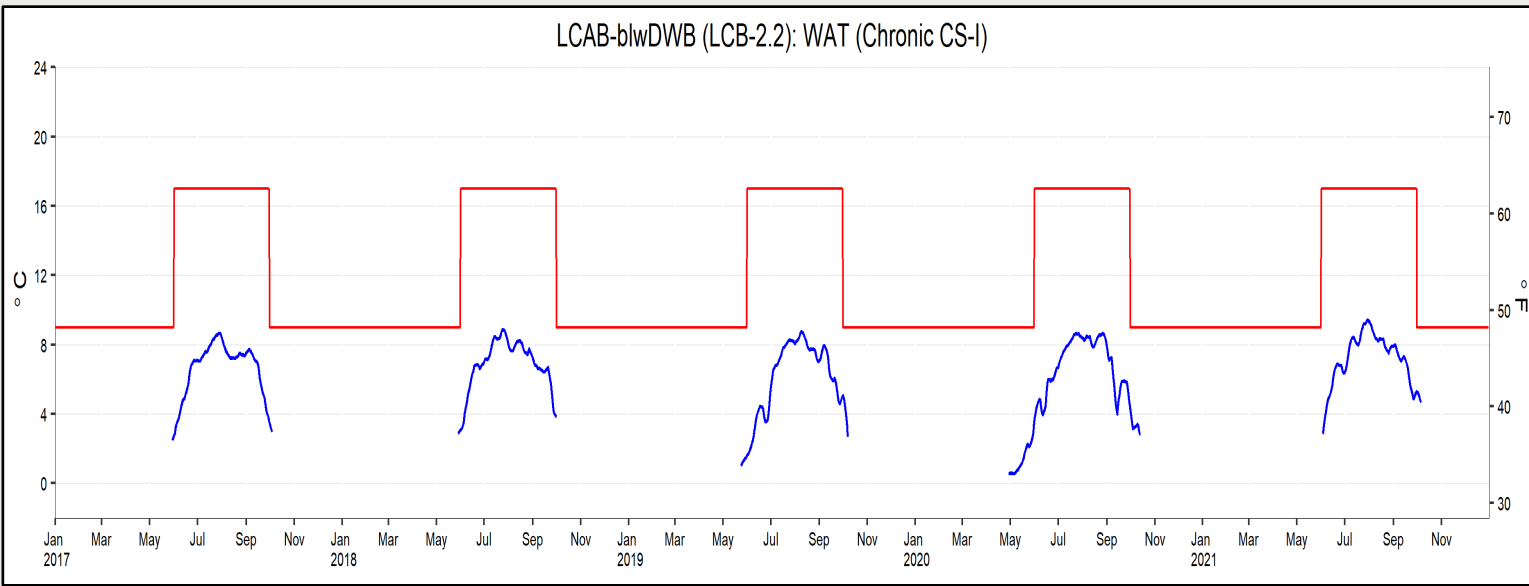
**2021 Above WAT standard**

5-25-2021 - 5-31-2021      Max Exceedance: 9.39°C

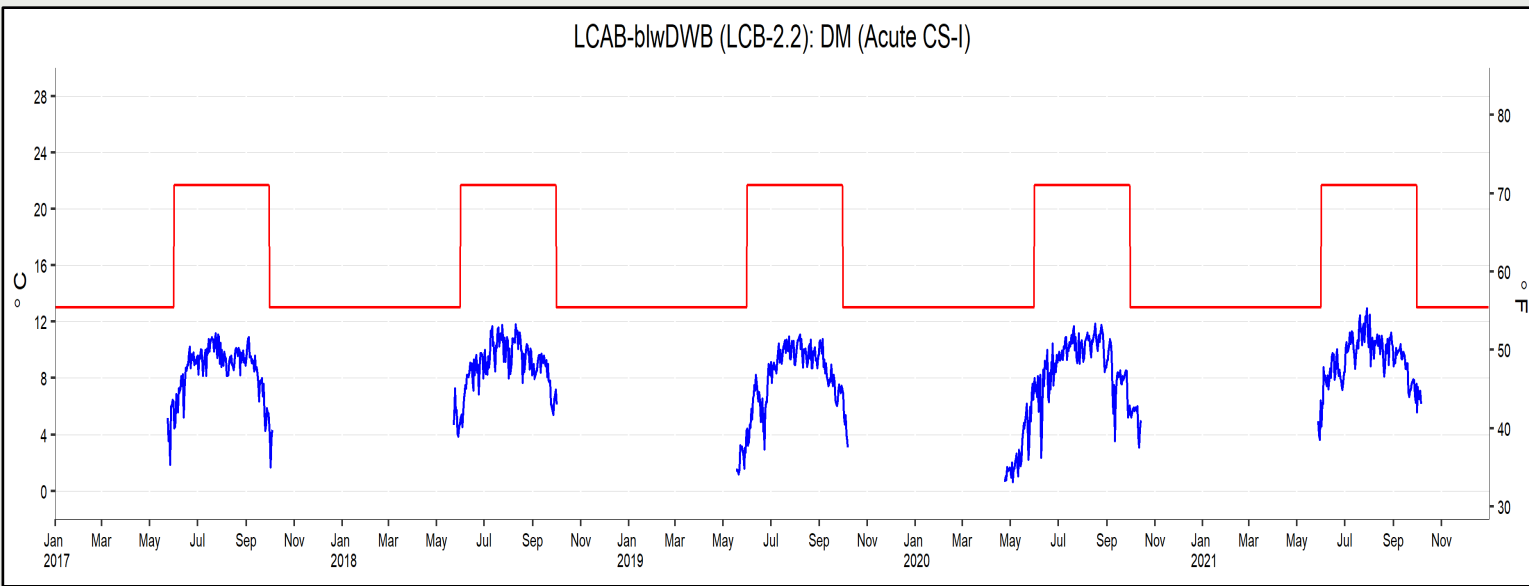
**2021 Above DM standard**

5-06-2021 - 5-31-2021      Max Exceedance: 15.19°C  
 7-06-2021 - 7-29-2021      Max Exceedance: 23.60°C

LCAB-blwDWB (LCB-2.2): WAT (Chronic CS-I)

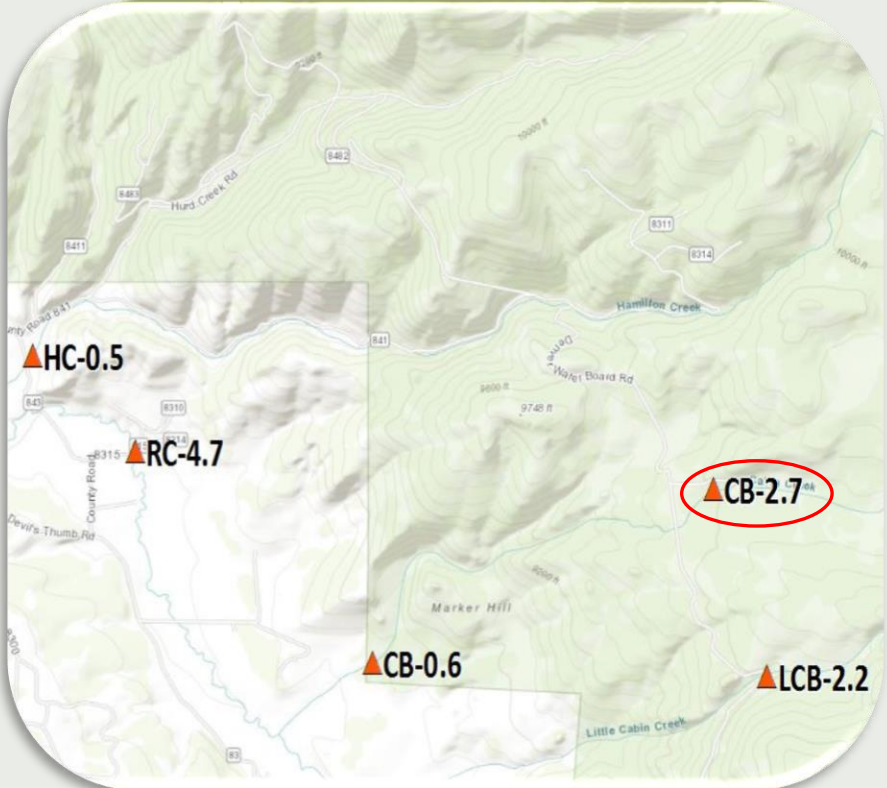


LCAB-blwDWB (LCB-2.2): DM (Acute CS-I)





# CSI - CAB-blwDWB - CB-2.7



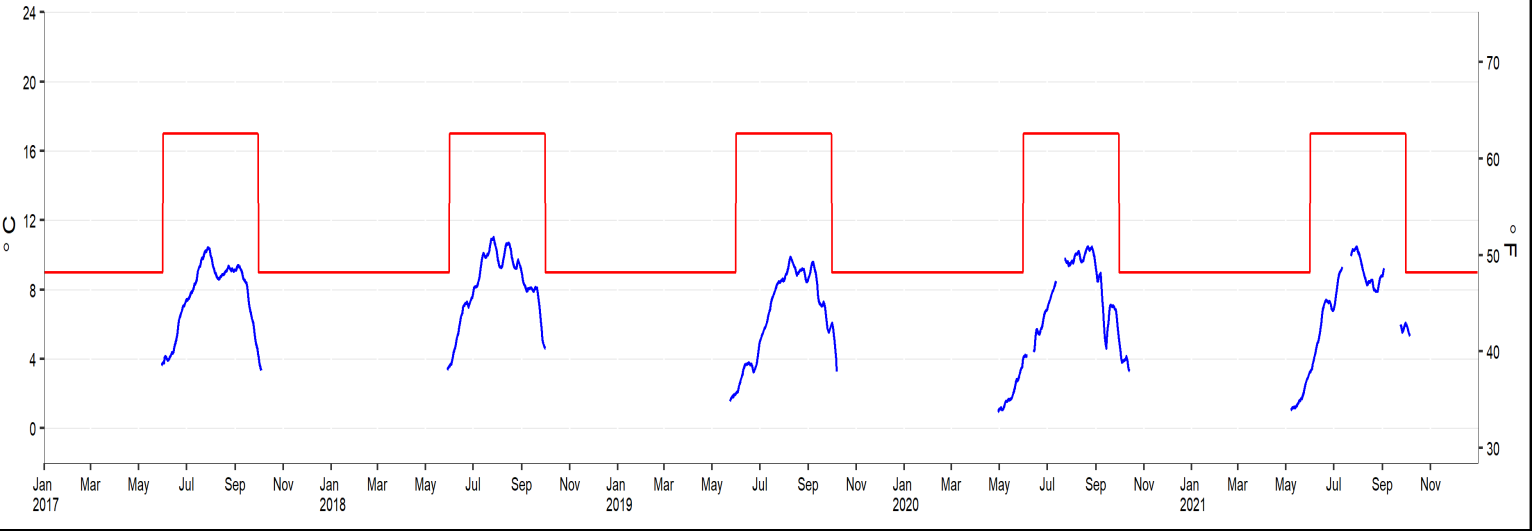
**2021 Above WAT standard**

**5-25-2021 - 5-31-2021      Max Exceedance: 9.39°C**

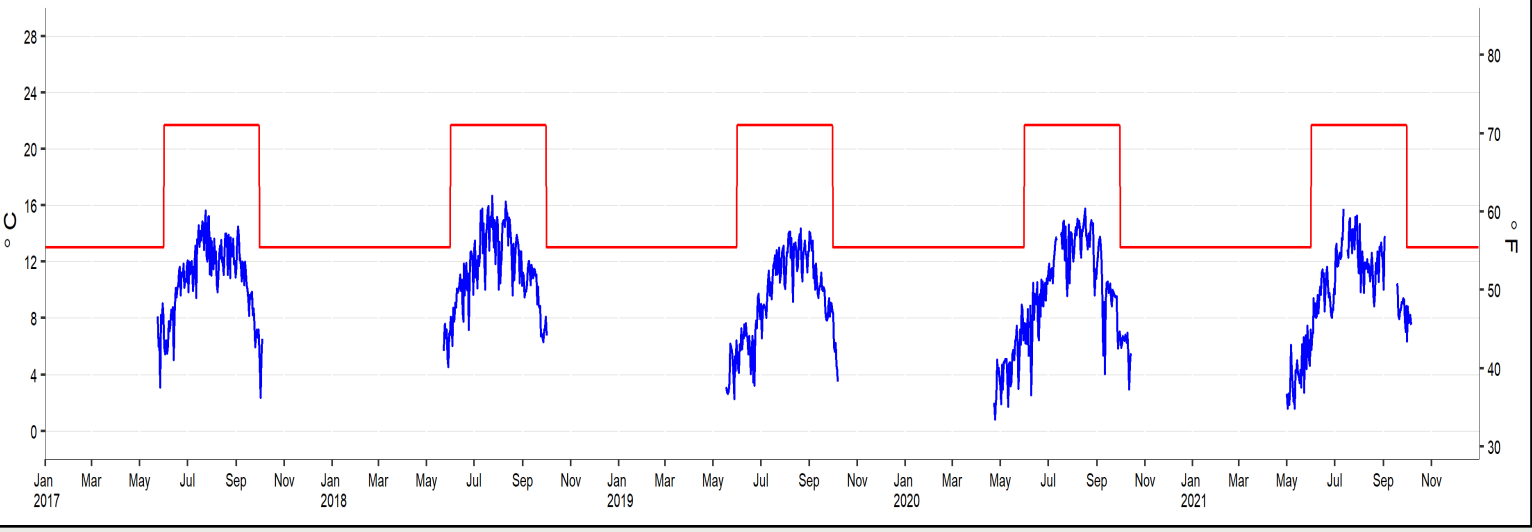
**2021 Above DM standard**

**5-06-2021 - 5-31-2021      Max Exceedance: 15.19°C**  
**7-06-2021 - 7-29-2021      Max Exceedance: 23.60°C**

CAB-blwDWB (CB-2.7): WAT (Chronic CS-I)

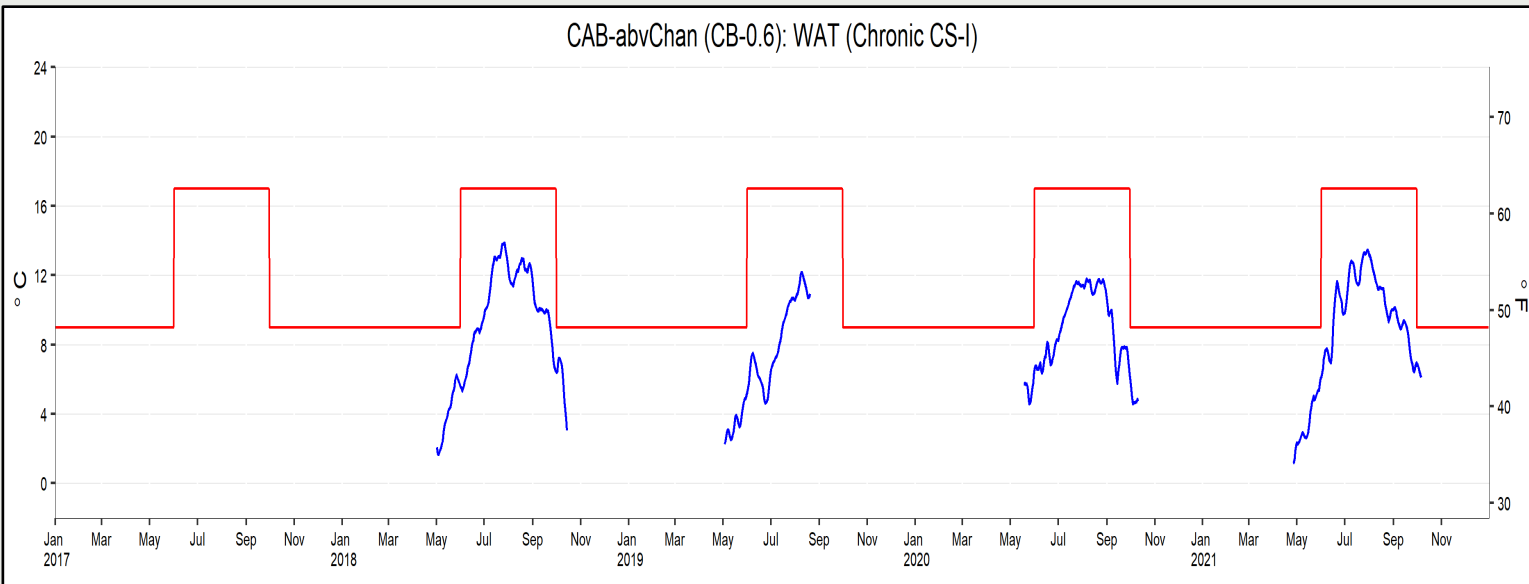


CAB-blwDWB (CB-2.7): DM (Acute CS-I)

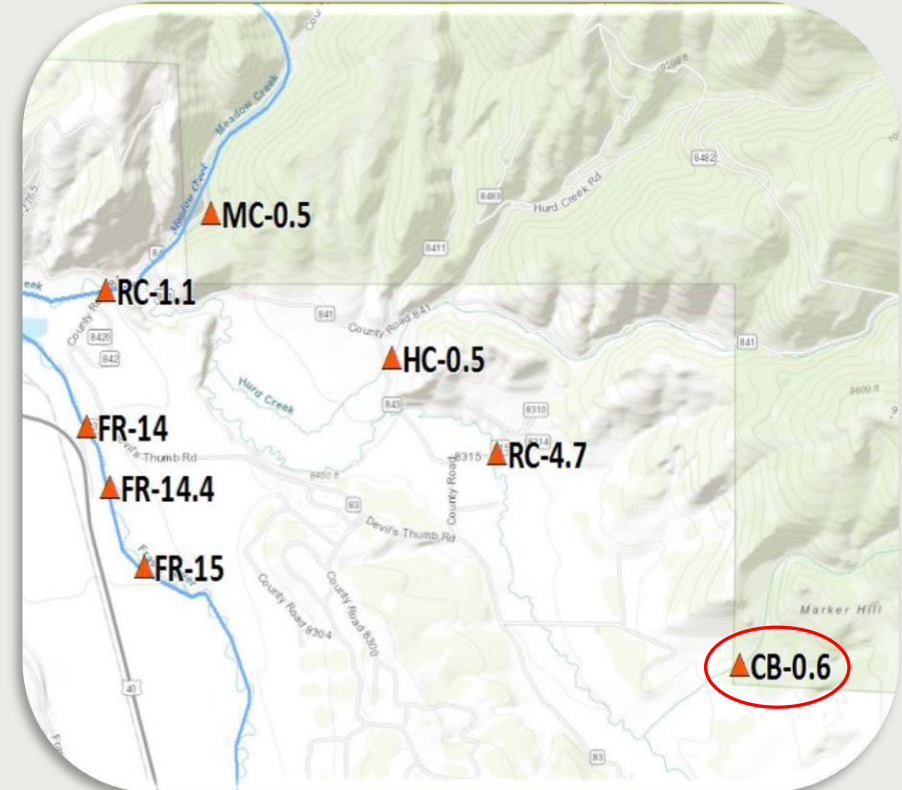
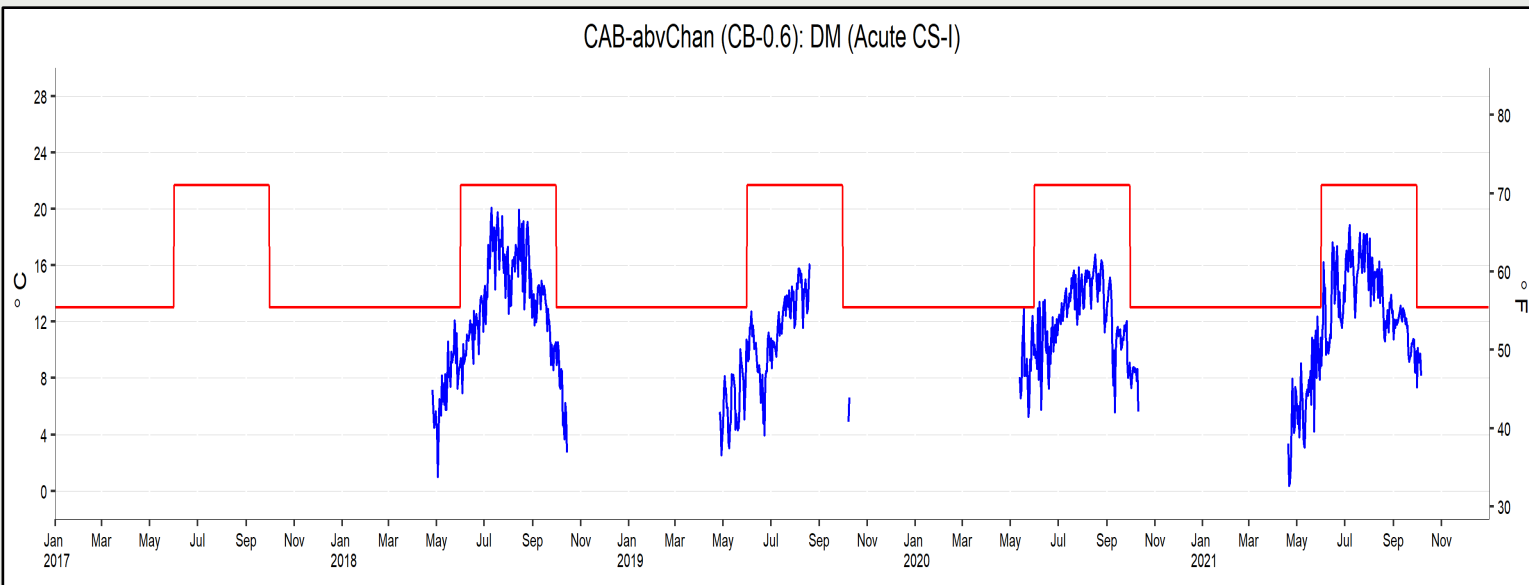


# CSI - CAB-abvChan - CB-0.6

CAB-abvChan (CB-0.6): WAT (Chronic CS-I)

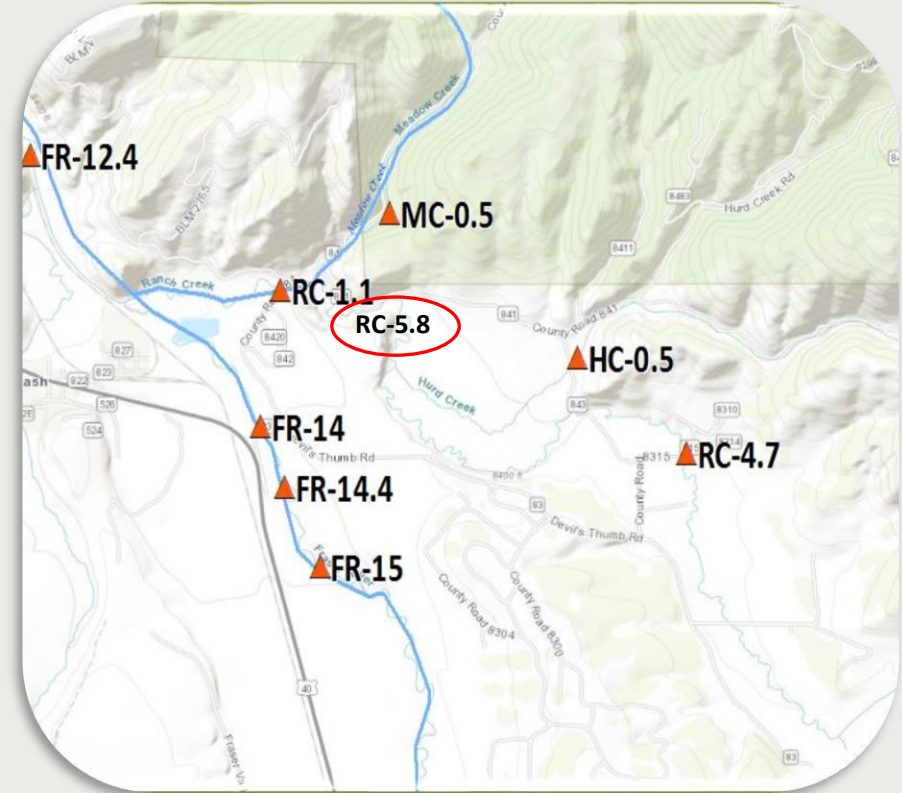


CAB-abvChan (CB-0.6): DM (Acute CS-I)



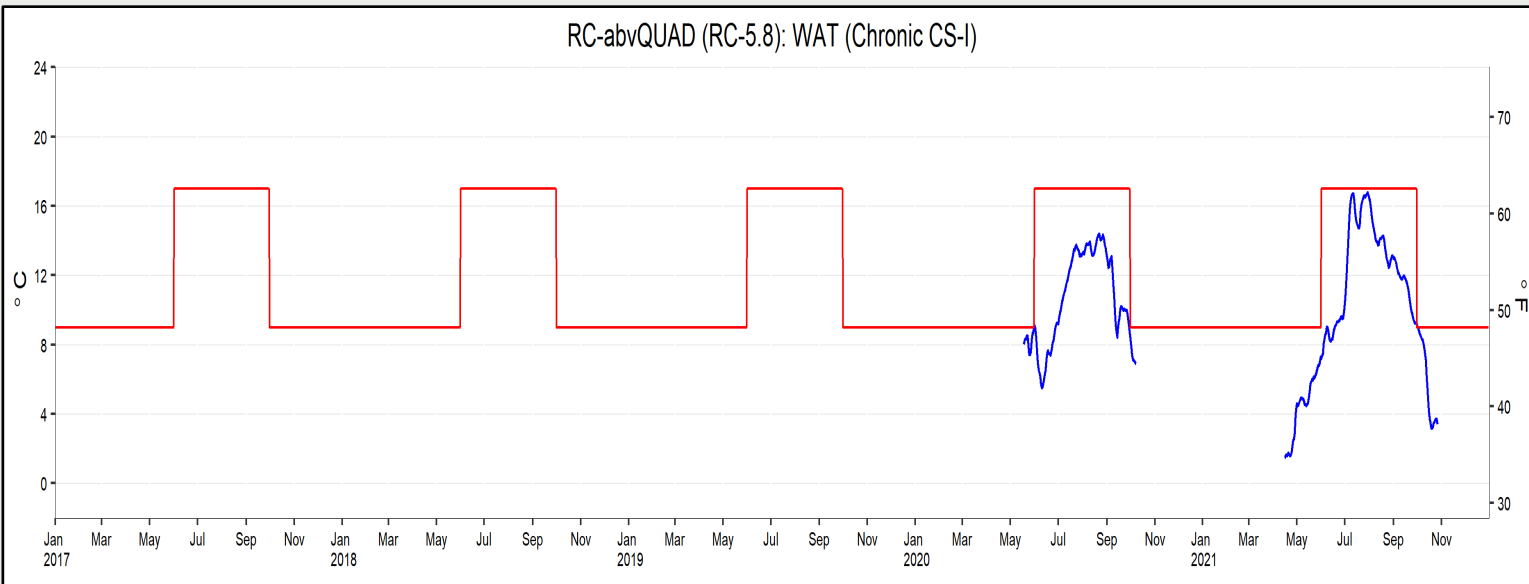
2021 Above WAT standard	
5-25-2021 - 5-31-2021	Max Exceedance: 9.39°C
2021 Above DM standard	
5-06-2021 - 5-31-2021	Max Exceedance: 15.19°C
7-06-2021 - 7-29-2021	Max Exceedance: 23.60°C

# CSI - RC-abvQuad - RC-5.8

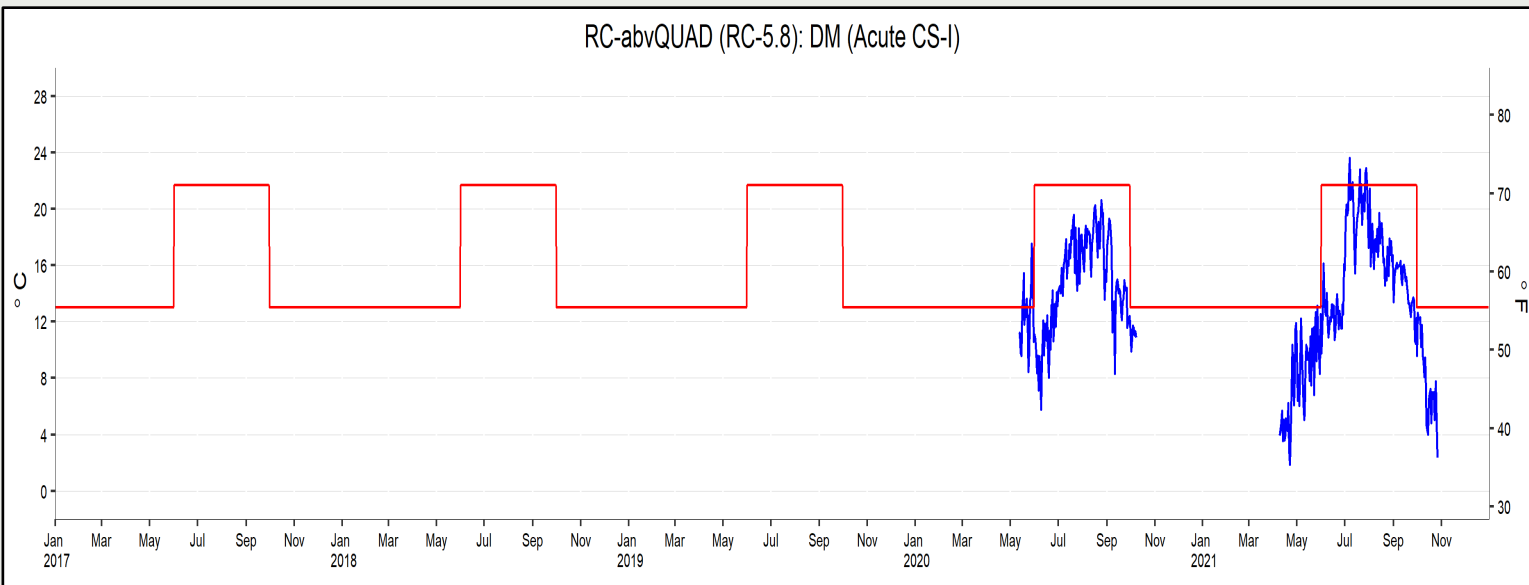


<b>2021 Above WAT standard</b>	
10-01-2021 - 10-02-2021	Max Exceedance: 9.11°C
<b>2021 Above DM standard</b>	
5-27-2021	Max Exceedance: 13.11°C
7-06-2021 - 7-29-2021	Max Exceedance: 23.58°C

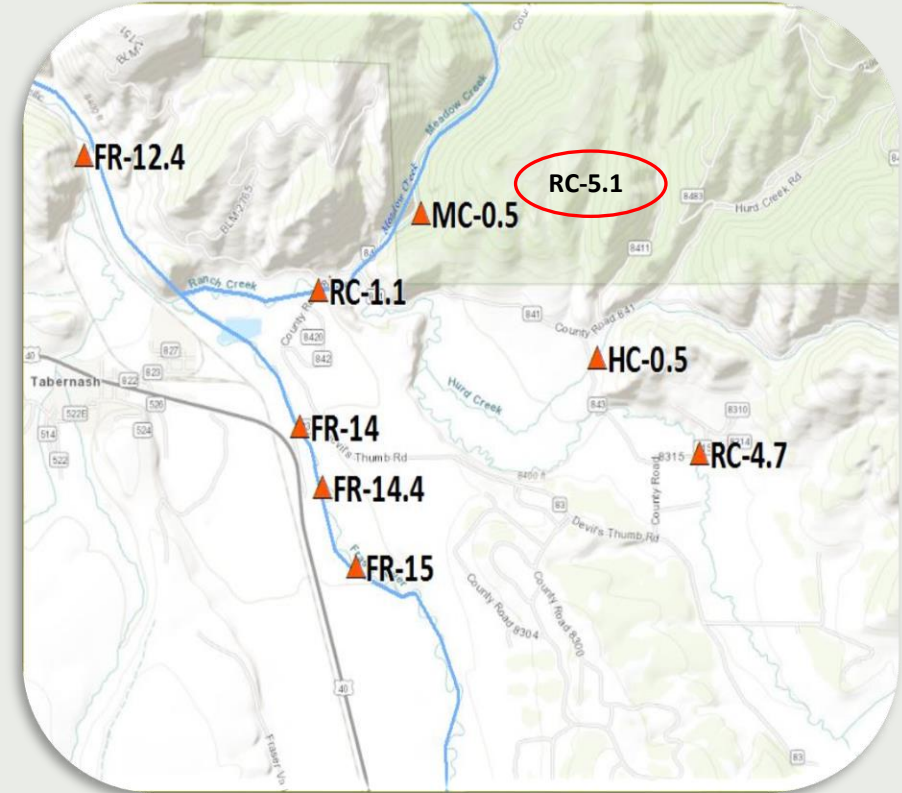
RC-abvQUAD (RC-5.8): WAT (Chronic CS-I)



RC-abvQUAD (RC-5.8): DM (Acute CS-I)



# CSI - RC-blwQuad - RC-5.1



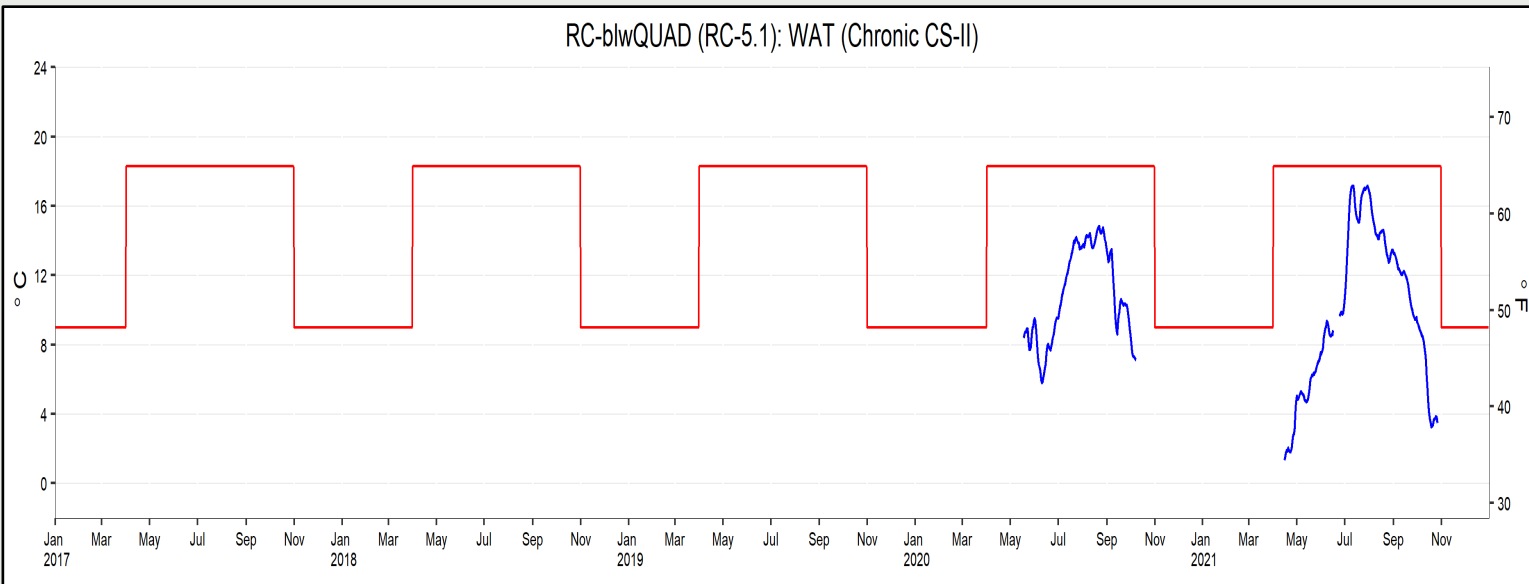
**2021 Above WAT standard**

**10-01-2021** **Max Exceedance: 9.12°C**

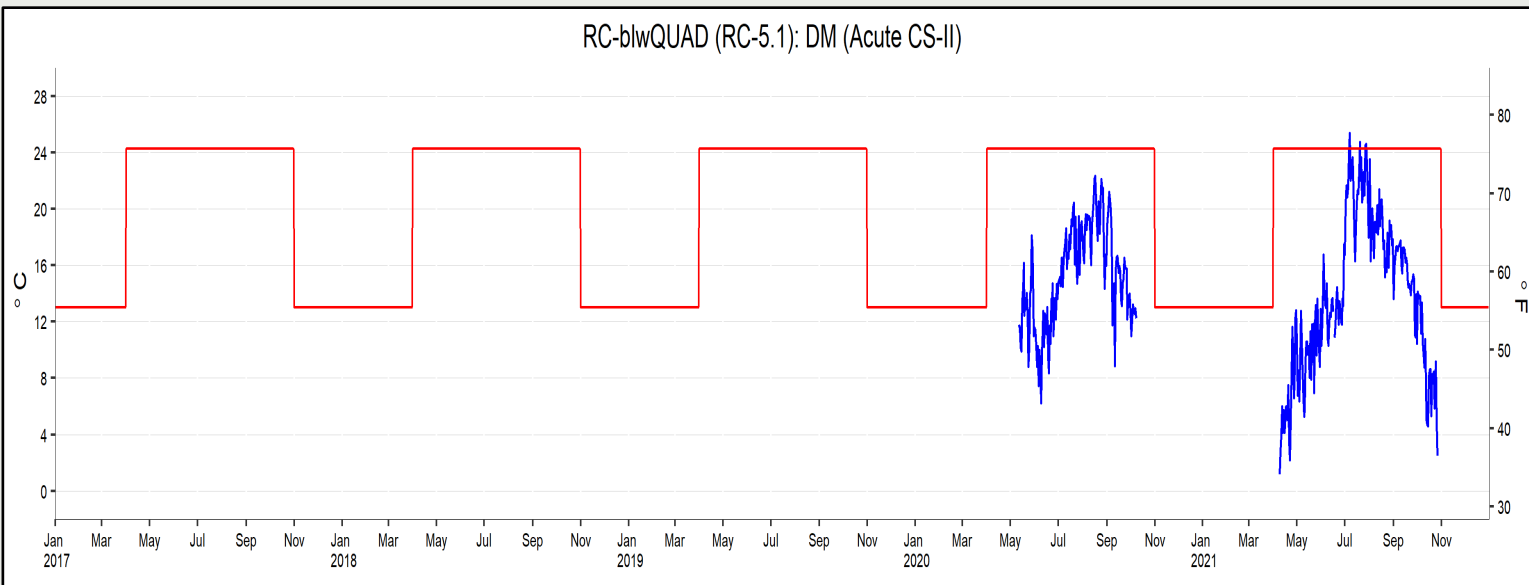
**2021 Above DM standard**

**7-07-2021 - 7-28-2021** **Max Exceedance: 25.36°C**

RC-blwQUAD (RC-5.1): WAT (Chronic CS-II)

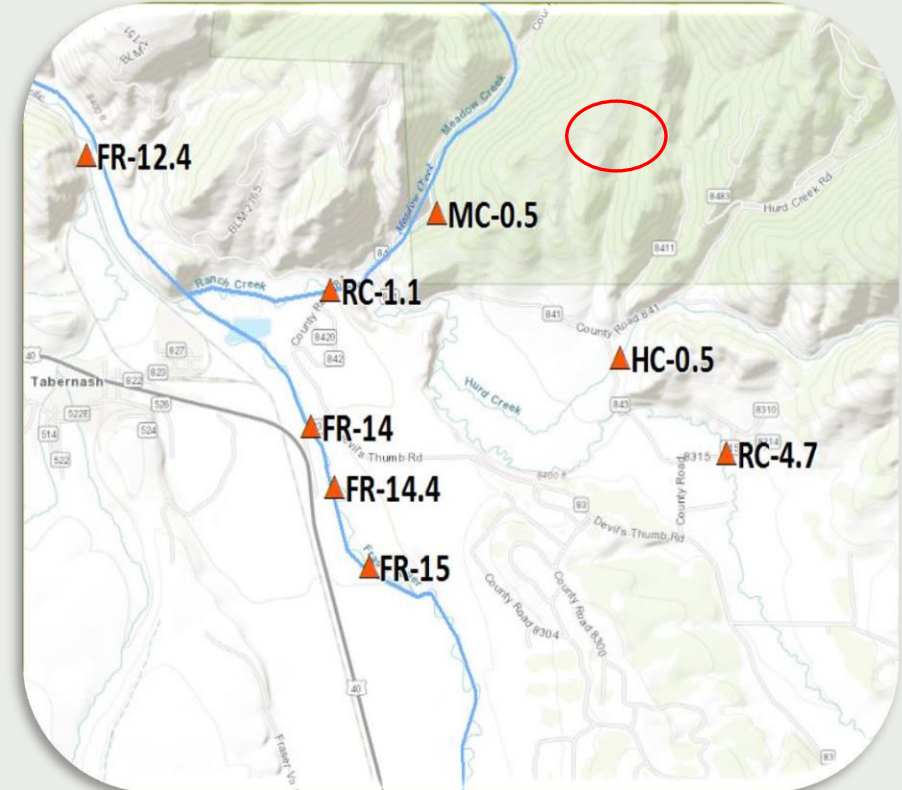


RC-blwQUAD (RC-5.1): DM (Acute CS-II)



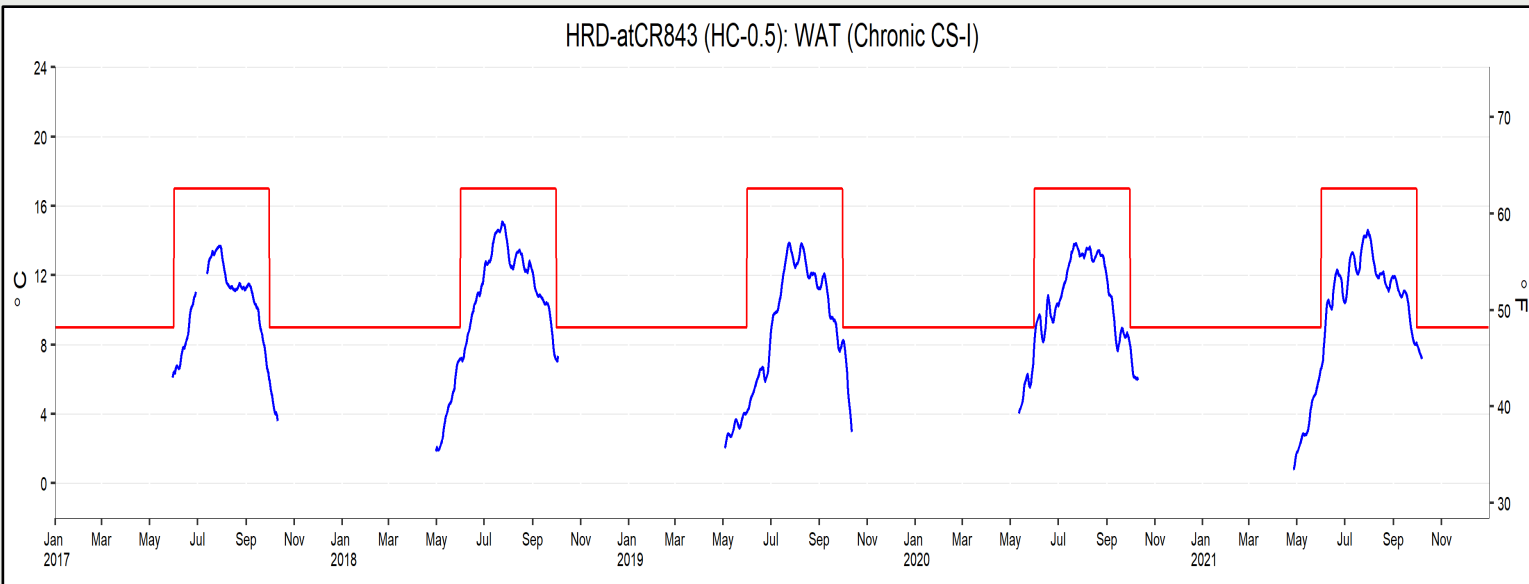


# CSI - HRD-atCR843 - HC-0.5

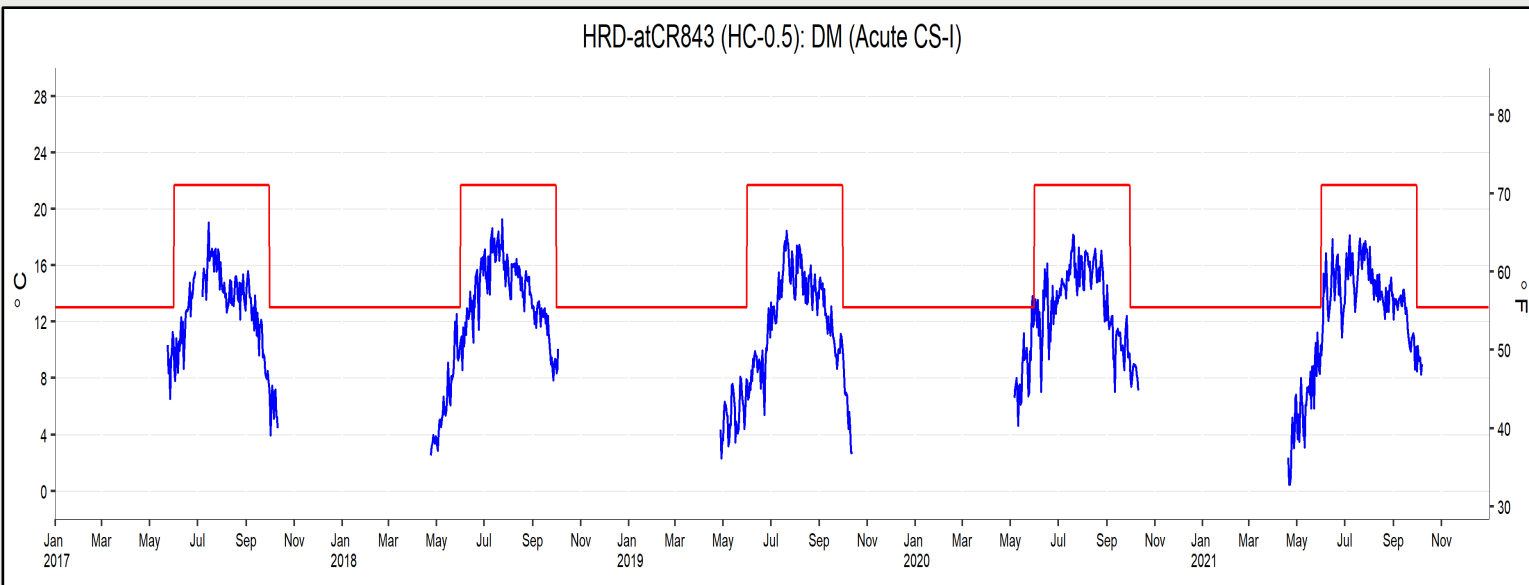


<b>2021 Above WAT standard</b>	
<b>10-01-2021 - 10-02-2021</b>	<b>Max Exceedance: 9.11°C</b>
<b>2021 Above DM standard</b>	
<b>5-29-2021</b>	<b>Max Exceedance: 13.80°C</b>

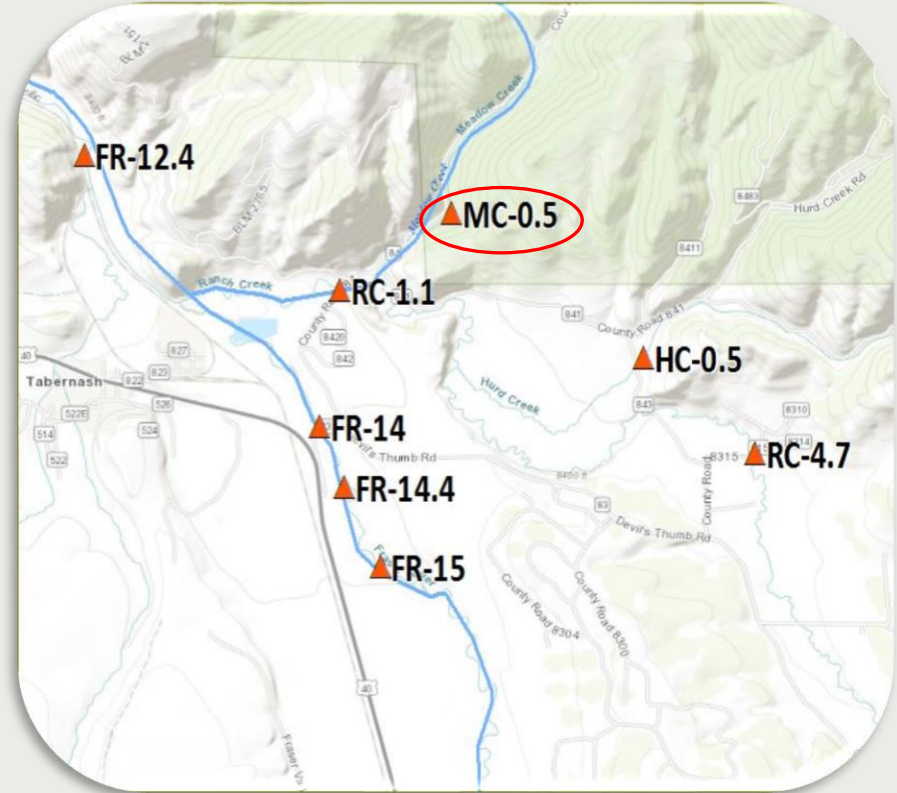
HRD-atCR843 (HC-0.5): WAT (Chronic CS-I)



HRD-atCR843 (HC-0.5): DM (Acute CS-I)



# CSI - MEA-atCR84 - MC-0.5



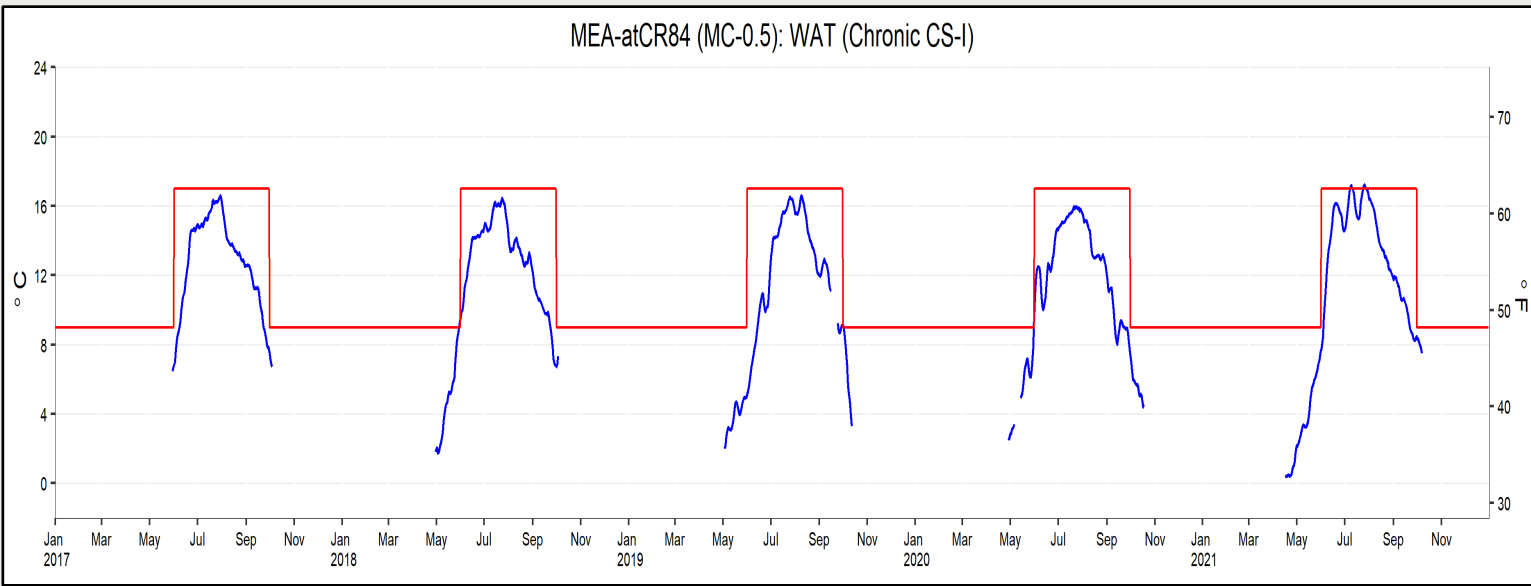
**2021 Above WAT standard**

**7-08-2021 - 7-28-2021      Max Exceedance: 17.20°C**

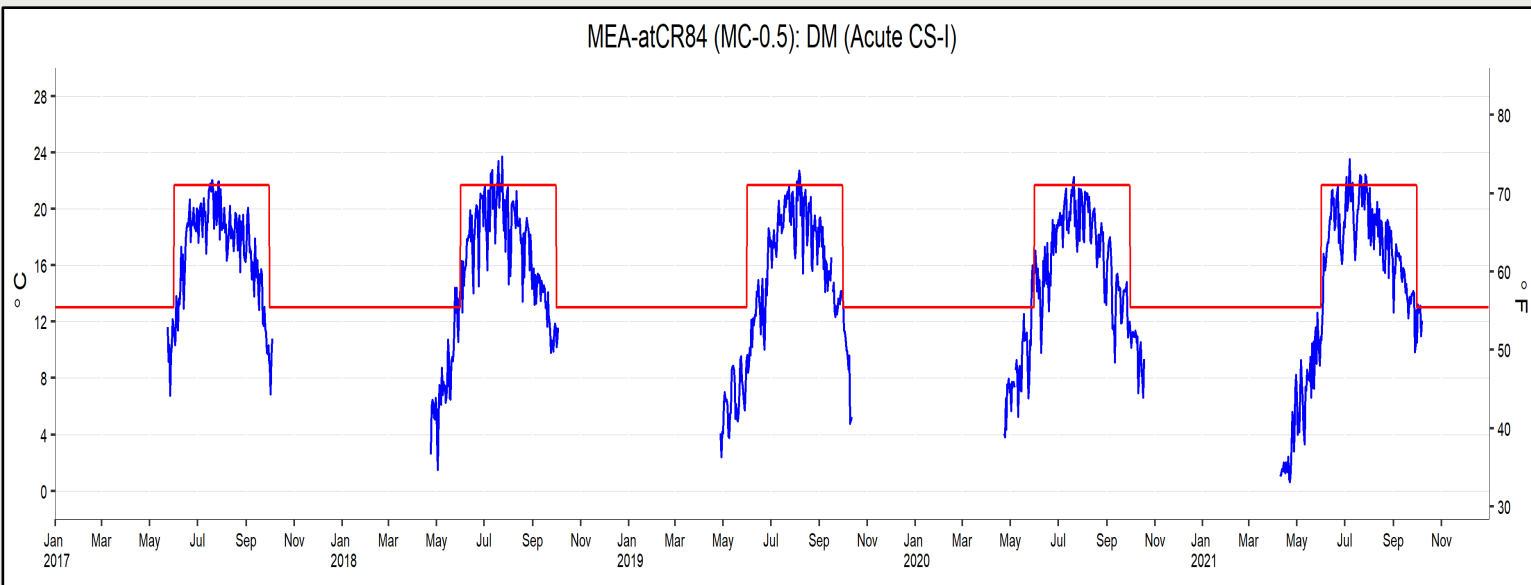
**2021 Above DM standard**

**7-03-2021 - 7-28-2021      Max Exceedance: 23.49°C**  
**10-02-2021 - 10-05-2021      Max Exceedance: 13.19°C**

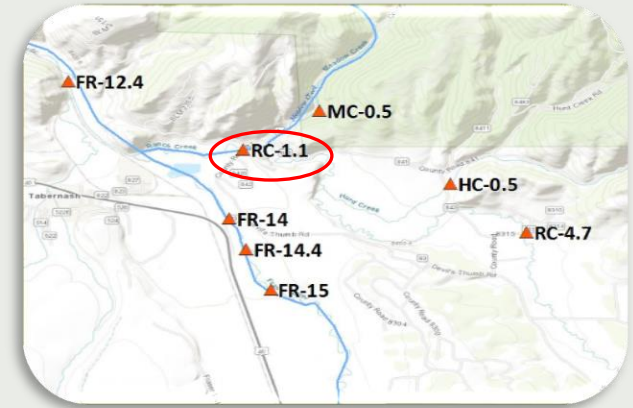
MEA-atCR84 (MC-0.5): WAT (Chronic CS-I)



MEA-atCR84 (MC-0.5): DM (Acute CS-I)



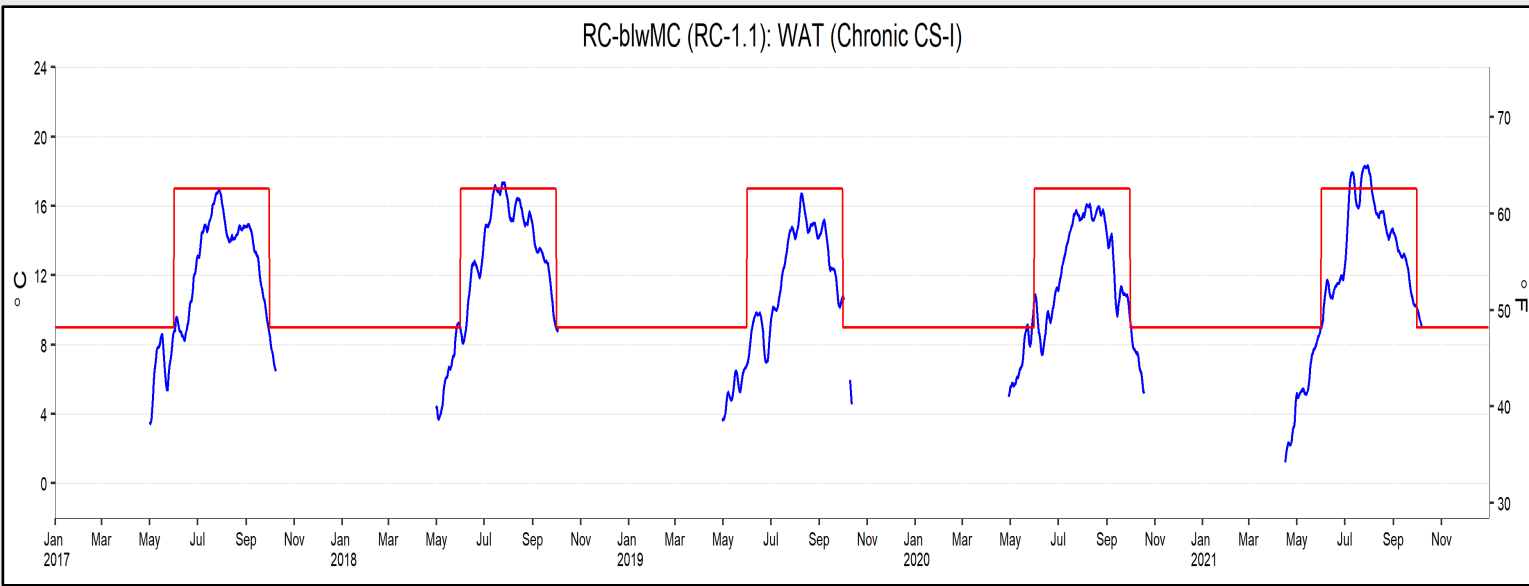
# CSI - RC-blwMC - RC-1.1



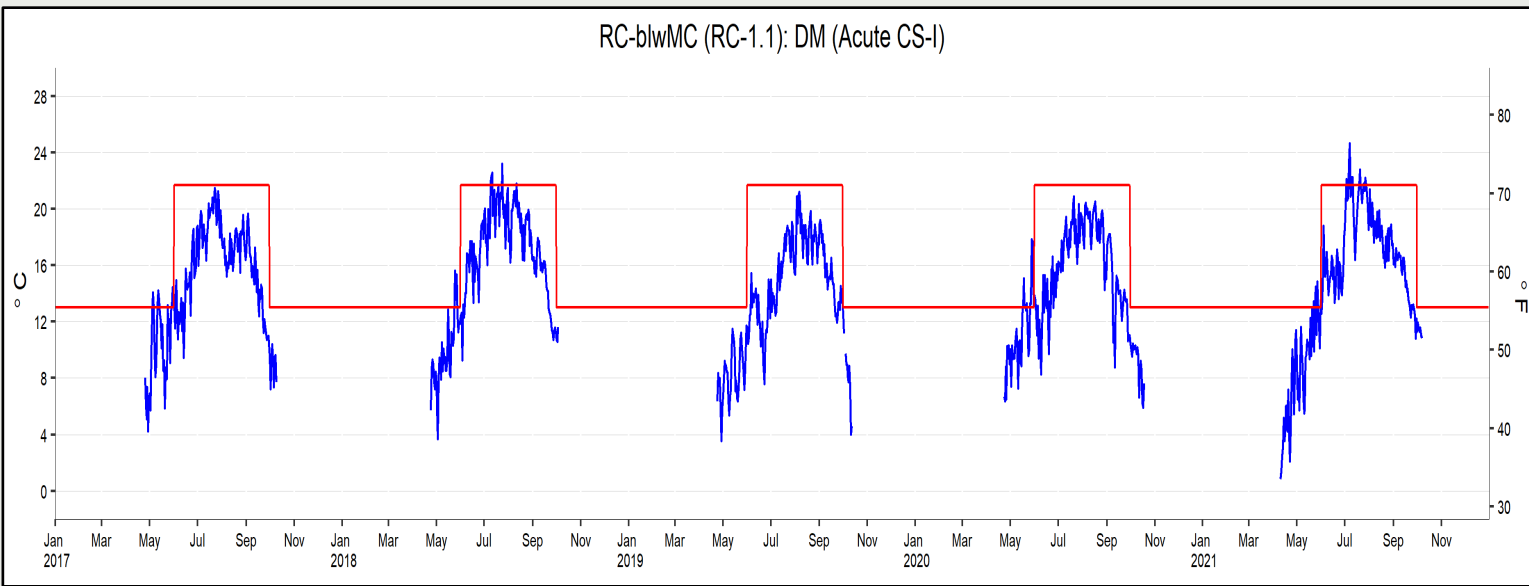
**2021 Above WAT standard**

<b>7-07-2021 - 7-31-2021</b>	<b>18.31°C</b>
<b>8-01-2021 - 8-04-2021</b>	<b>17.87°C</b>
<b>10-01-2021 - 10-07-2021</b>	<b>10.09°C</b>

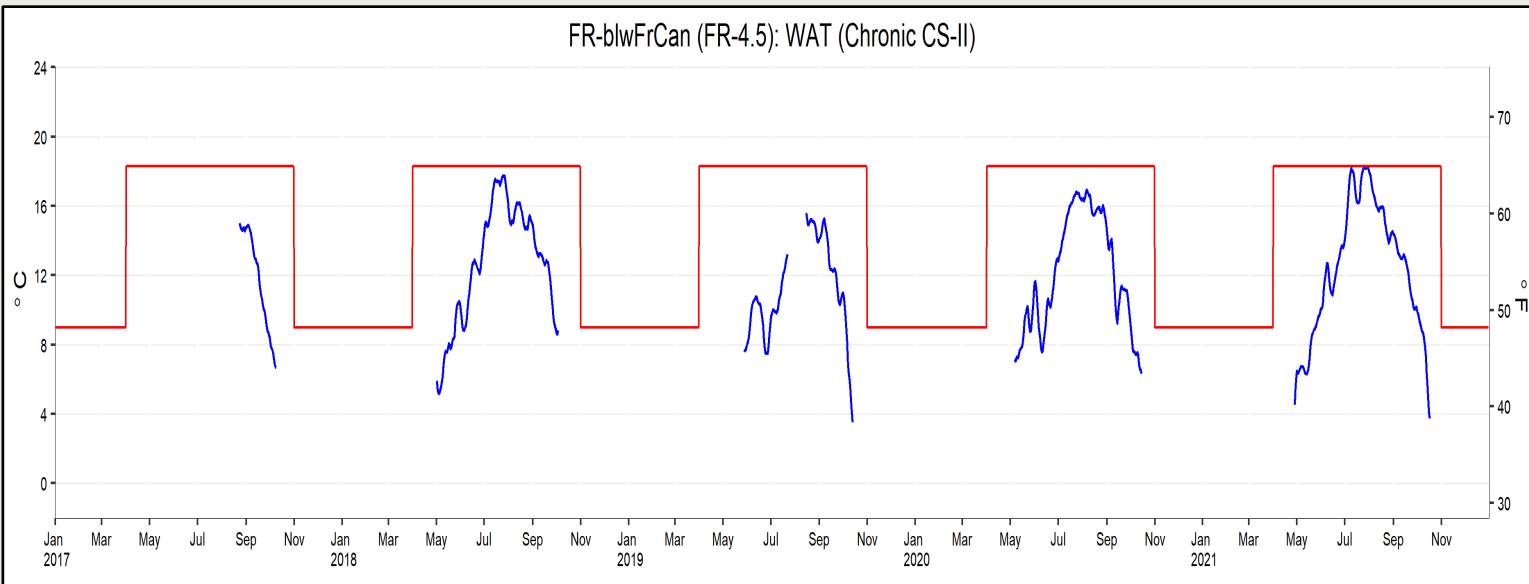
RC-blwMC (RC-1.1): WAT (Chronic CS-I)



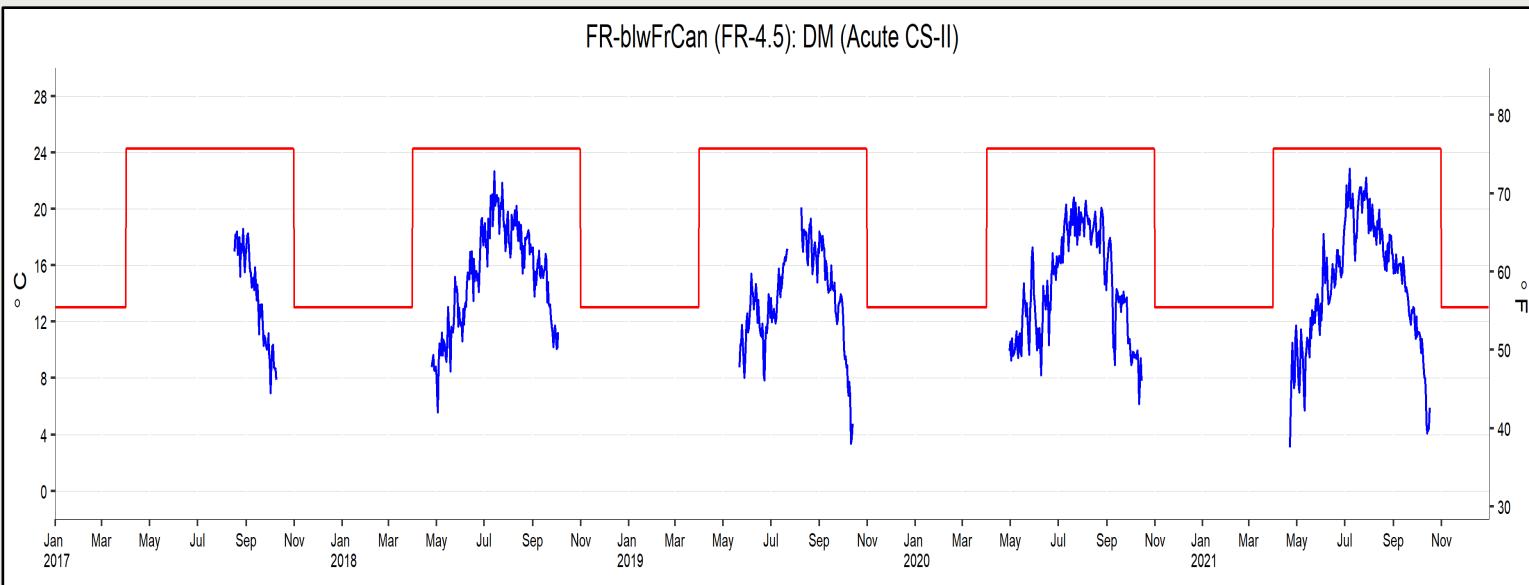
RC-blwMC (RC-1.1): DM (Acute CS-I)



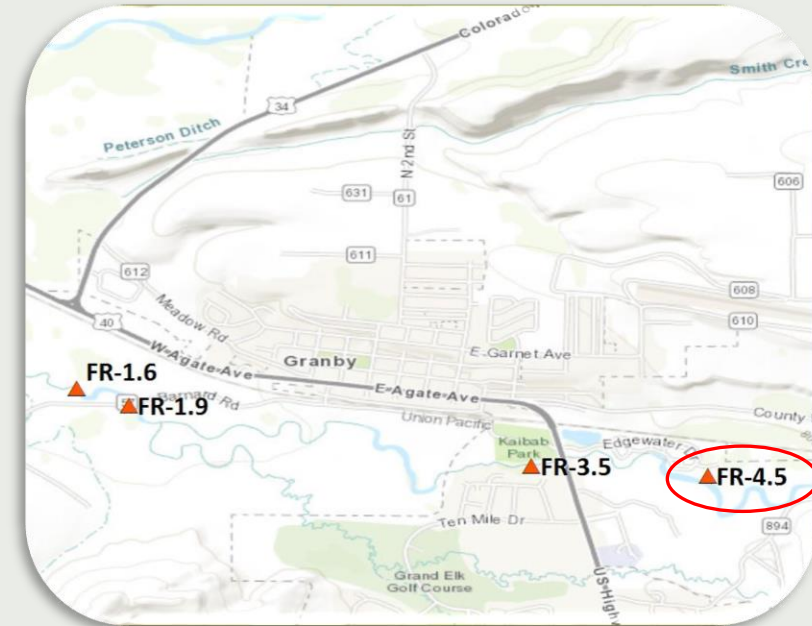
FR-blwFrCan (FR-4.5): WAT (Chronic CS-II)



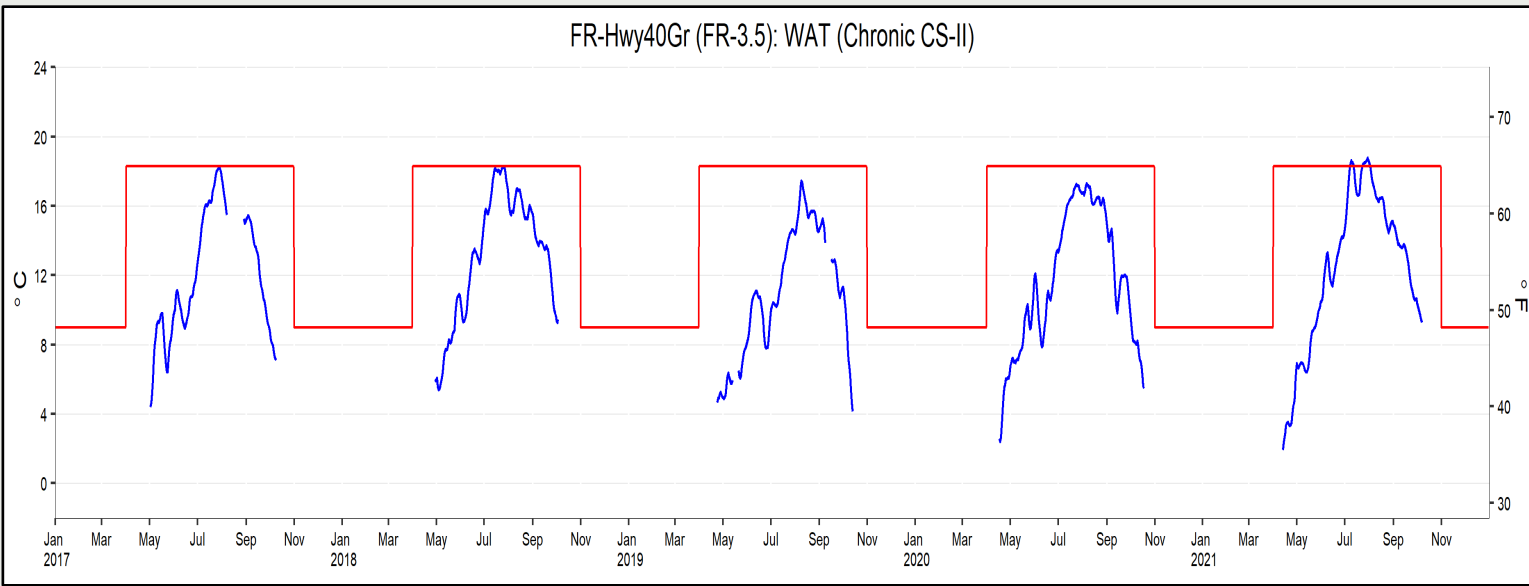
FR-blwFrCan (FR-4.5): DM (Acute CS-II)



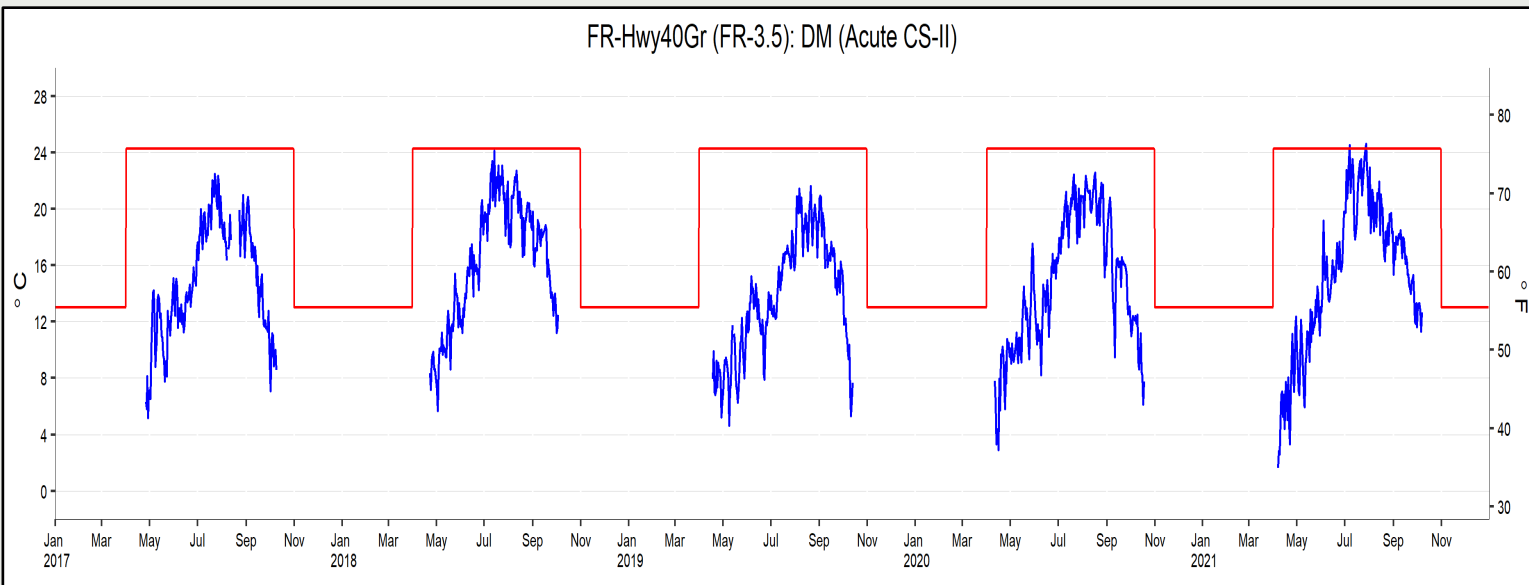
**CSII**  
**FR-blwFrCan**  
**FR-4.5**



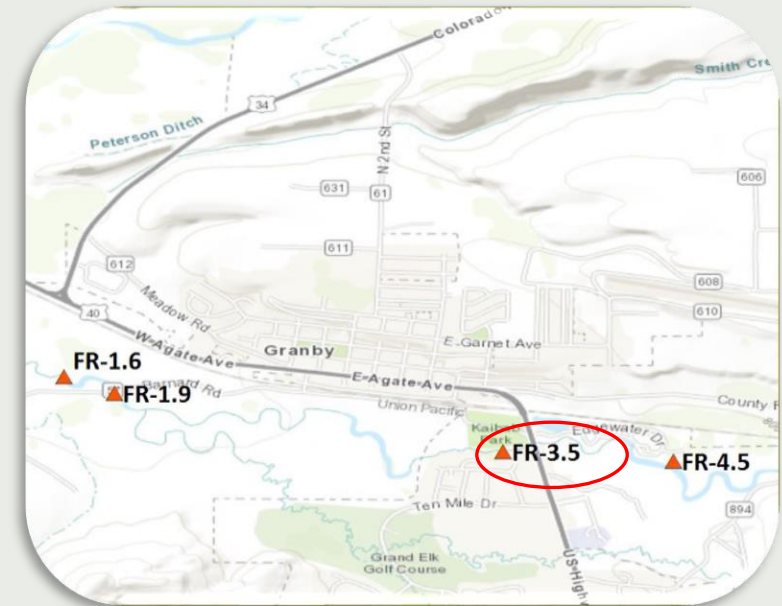
FR-Hwy40Gr (FR-3.5): WAT (Chronic CS-II)



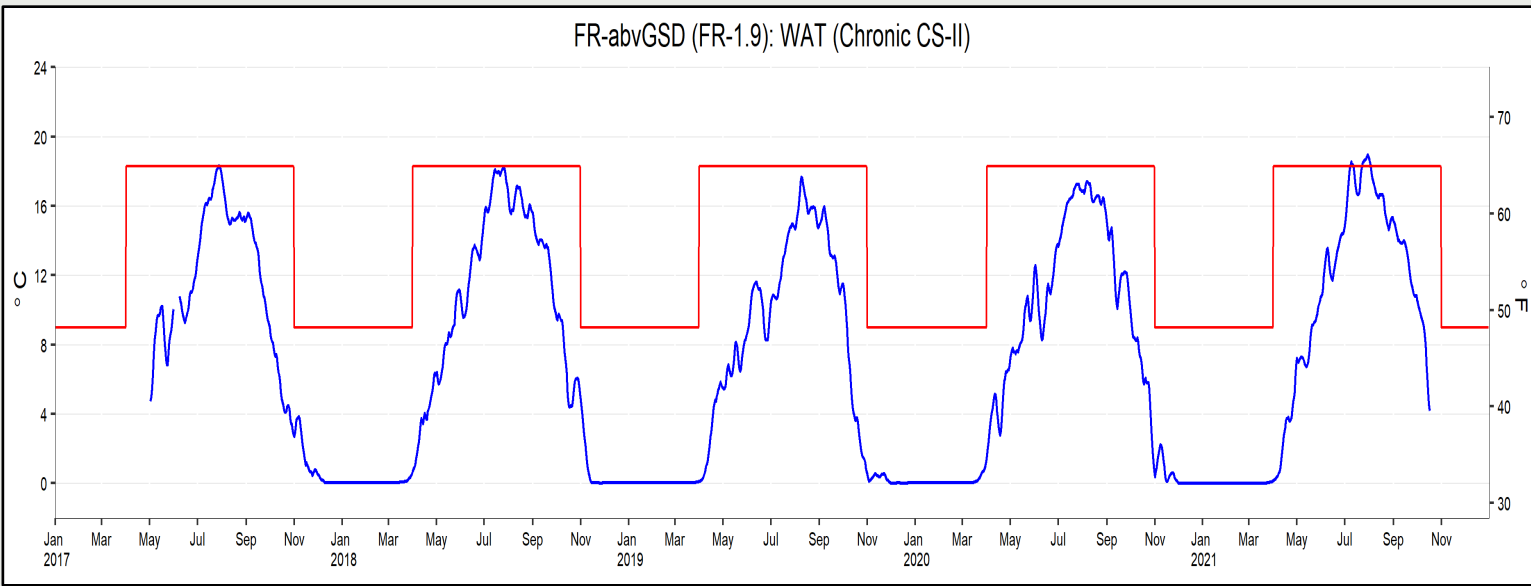
FR-Hwy40Gr (FR-3.5): DM (Acute CS-II)



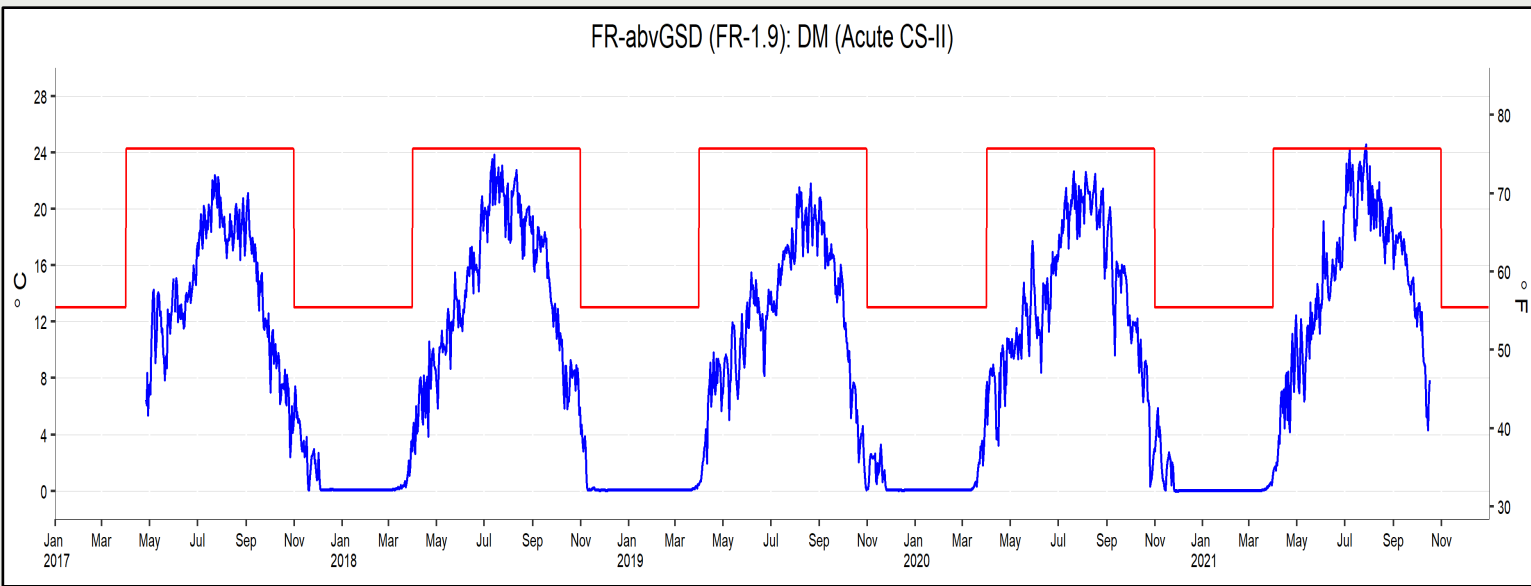
**CSII**  
**FR-HWY40GR**  
**FR-3.5**



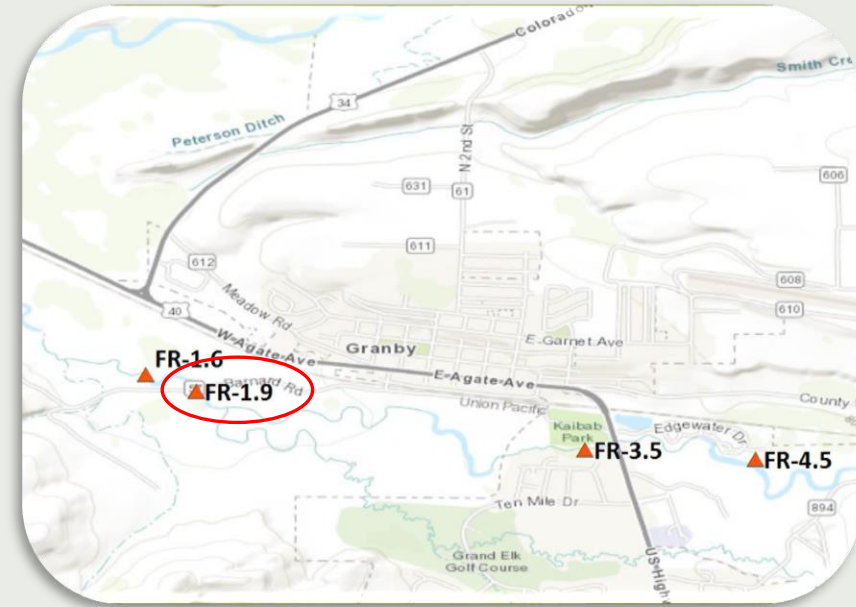
FR-abvGSD (FR-1.9): WAT (Chronic CS-II)



FR-abvGSD (FR-1.9): DM (Acute CS-II)

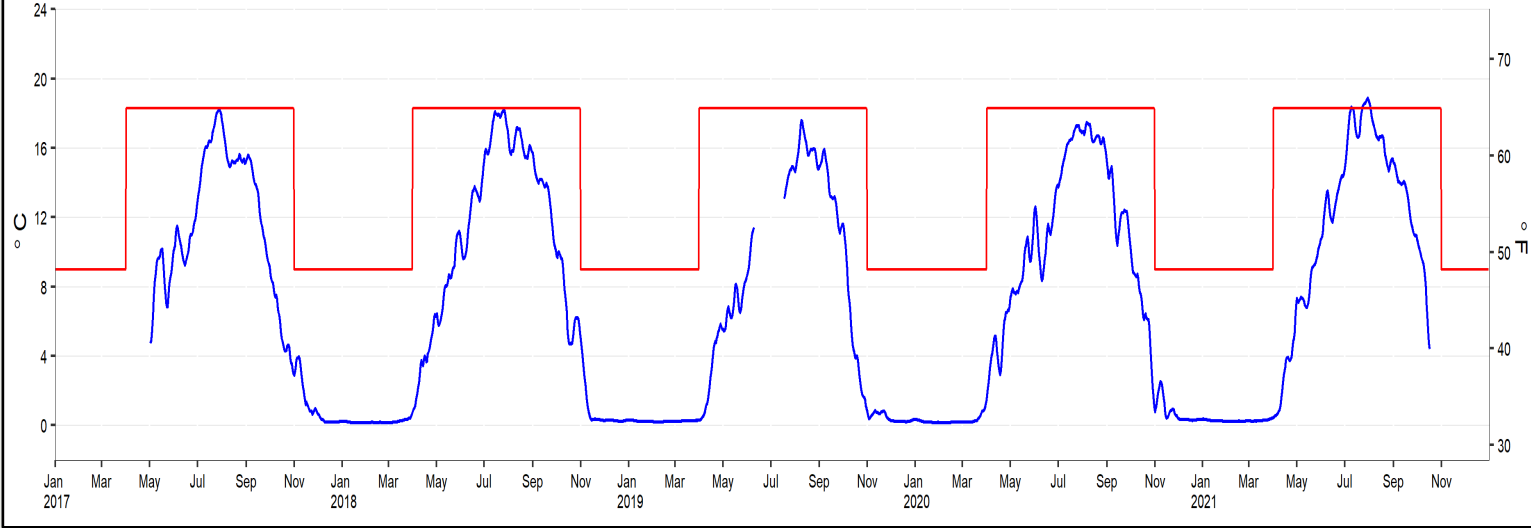


**CSII**  
**FR-abvGSD**  
**FR-1.9**

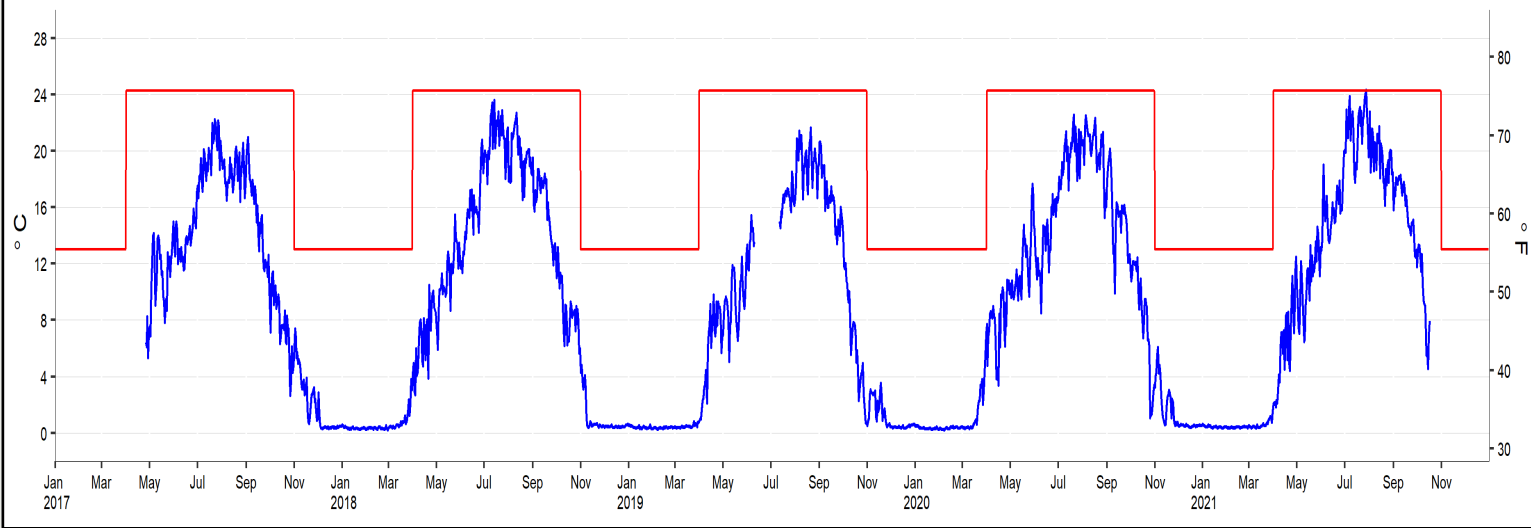




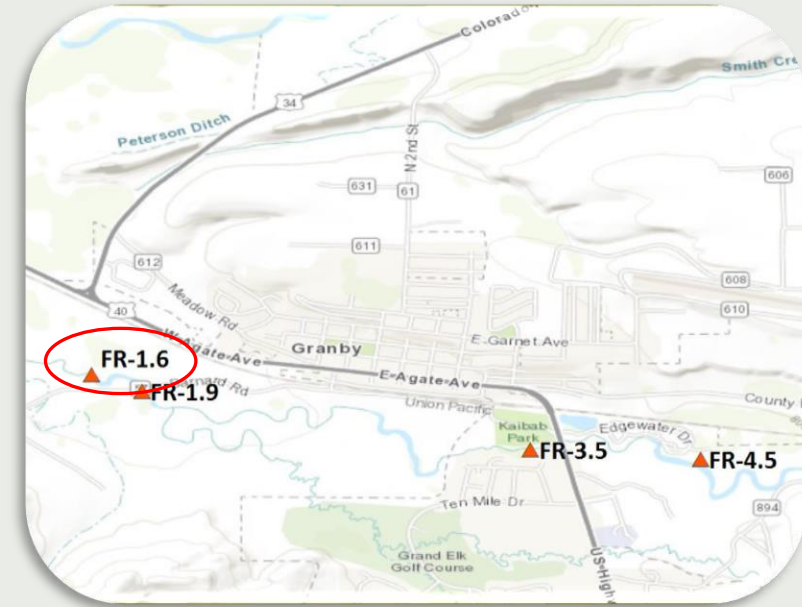
FR-blwGSD (FR-1.6): WAT (Chronic CS-II)



FR-blwGSD (FR-1.6): DM (Acute CS-II)



**CSII**  
**FR-blwGSD**  
**FR-1.6**



# Colorado River – Headwaters to Windy Gap



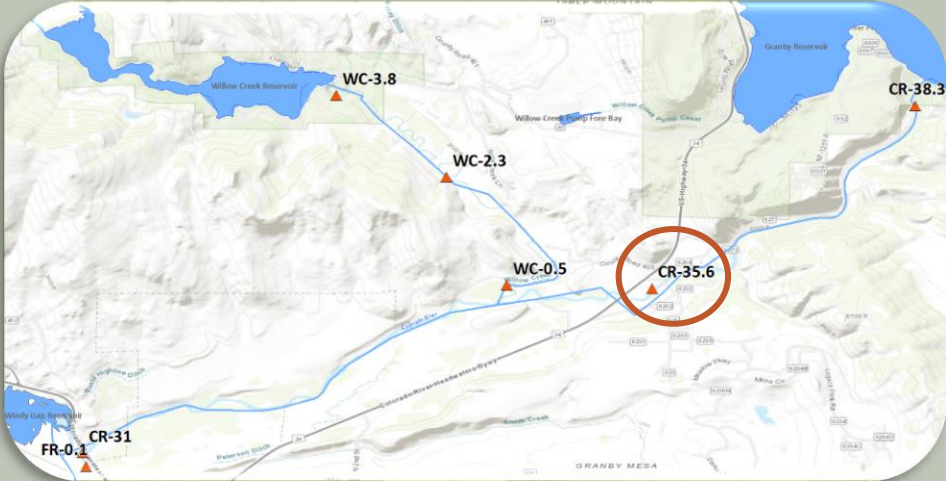


# Colorado River downstream of Granby Reservoir- CSII



Missing data due to gage replacement

# Colorado River at Y-Gage - CSII



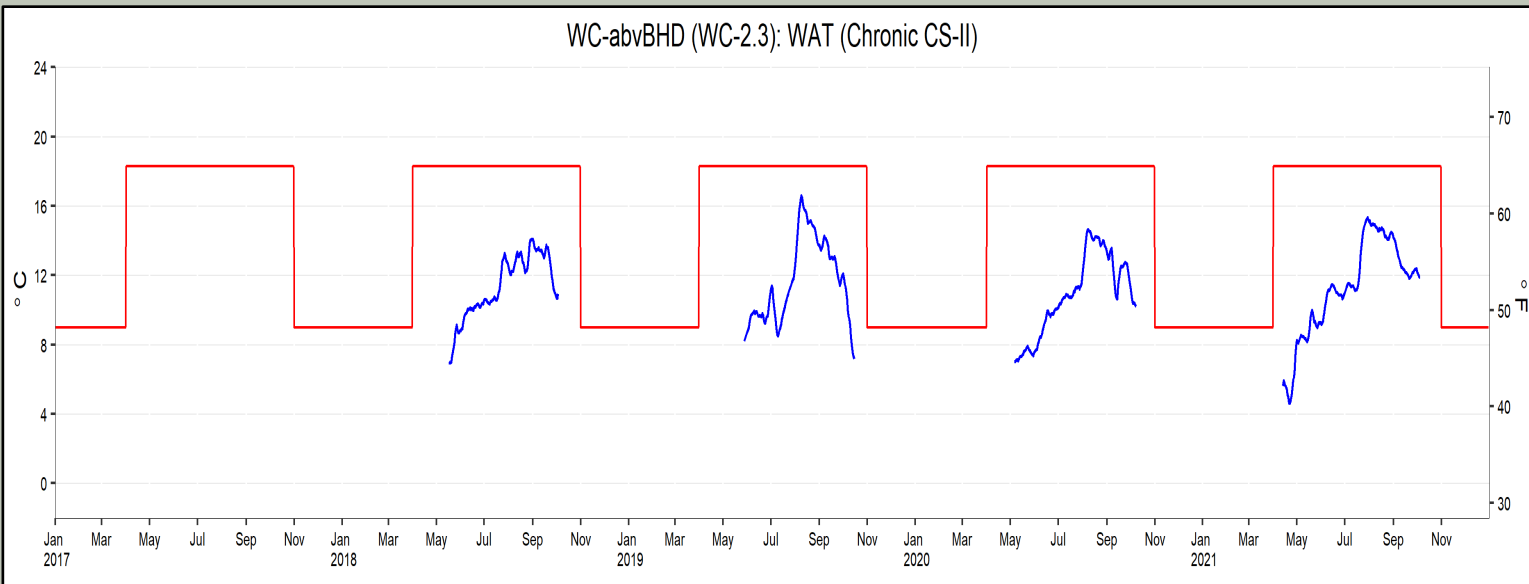
# Willow Creek downstream of Reservoir – CS-II



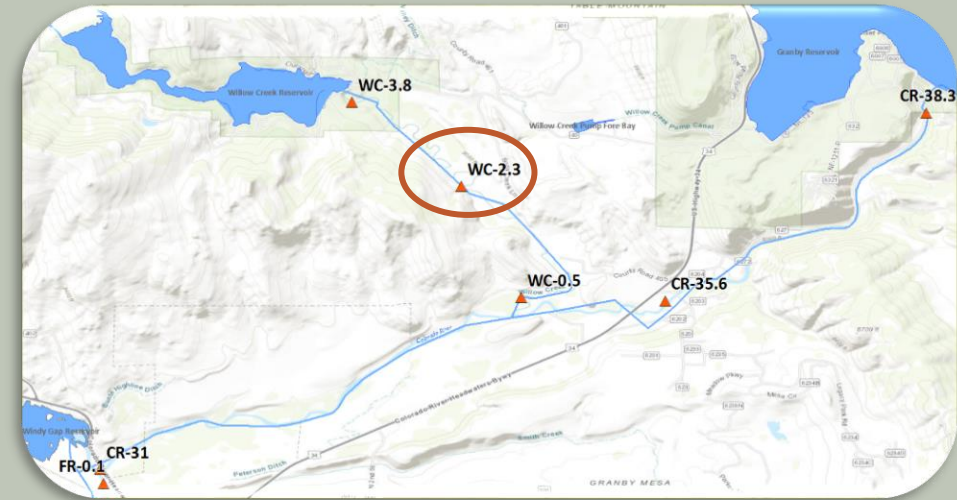
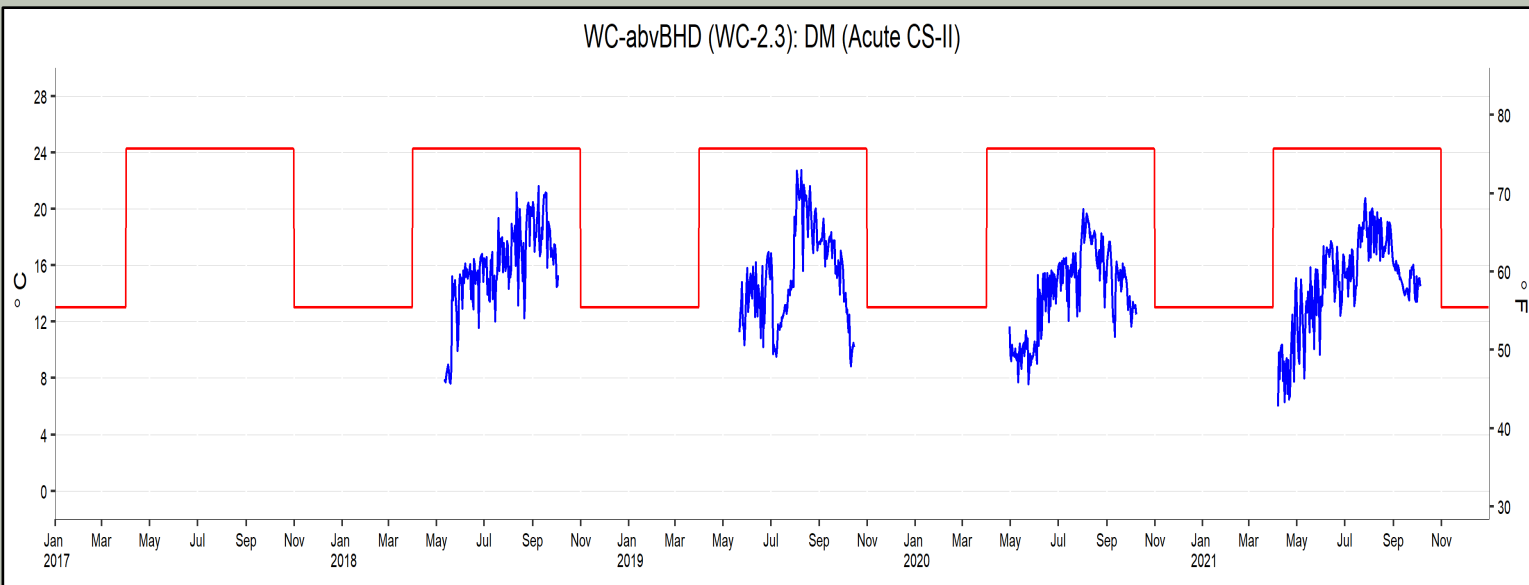
Changed from CS-I to CS-II

# Willow Creek upstream Bunte Highline – CS-II

WC-abvBHD (WC-2.3): WAT (Chronic CS-II)



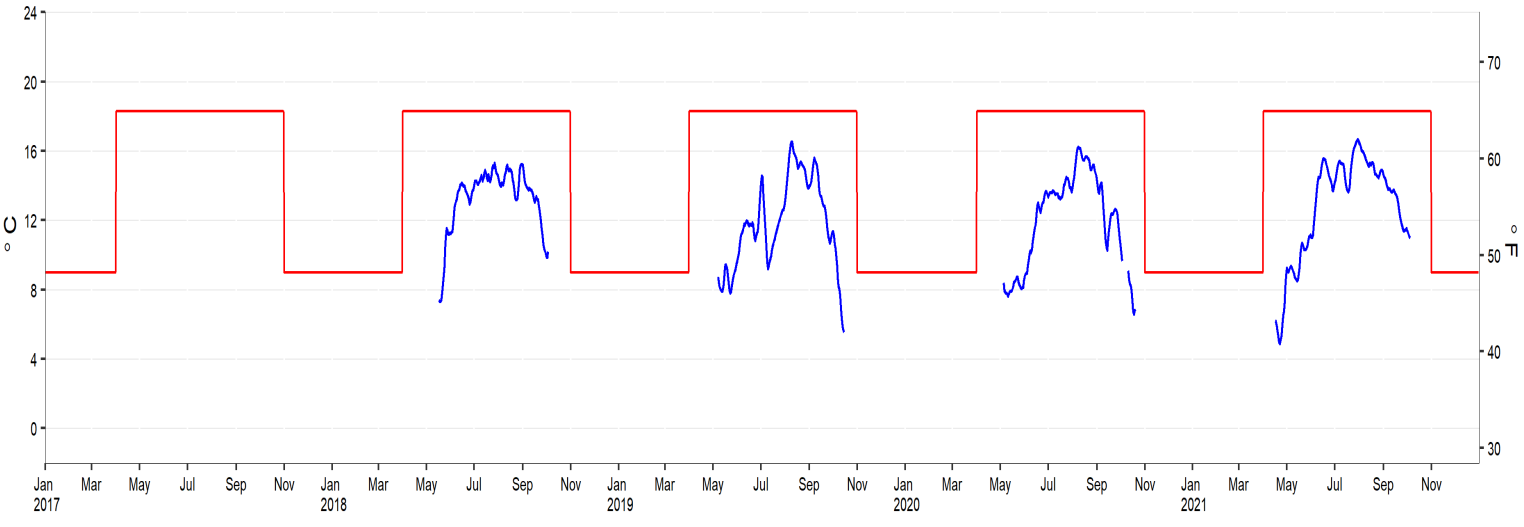
WC-abvBHD (WC-2.3): DM (Acute CS-II)



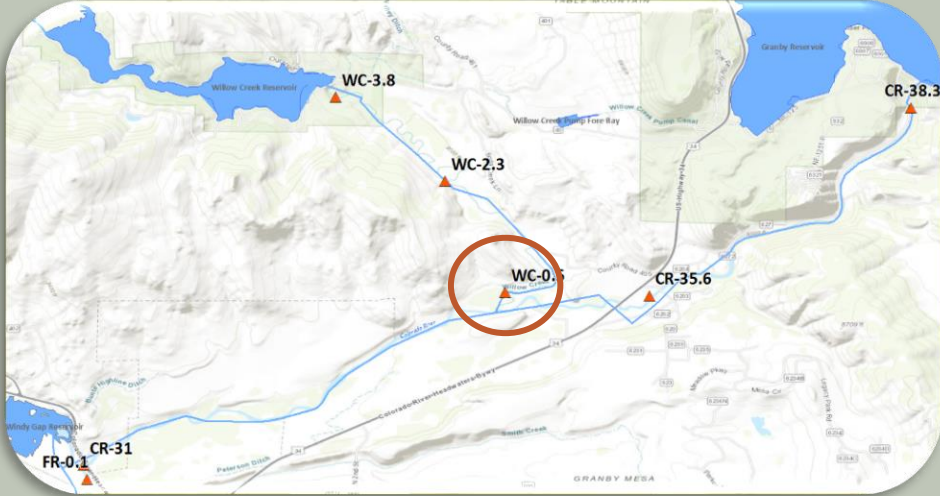
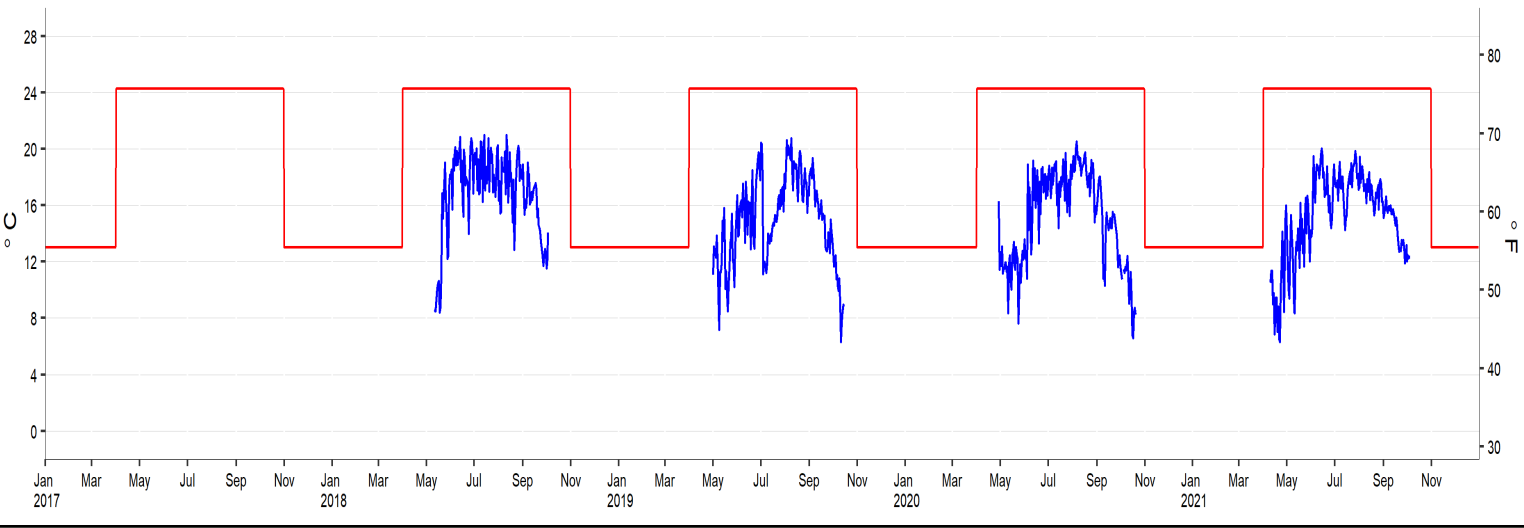


# Willow Creek upstream Colorado River – CS-II

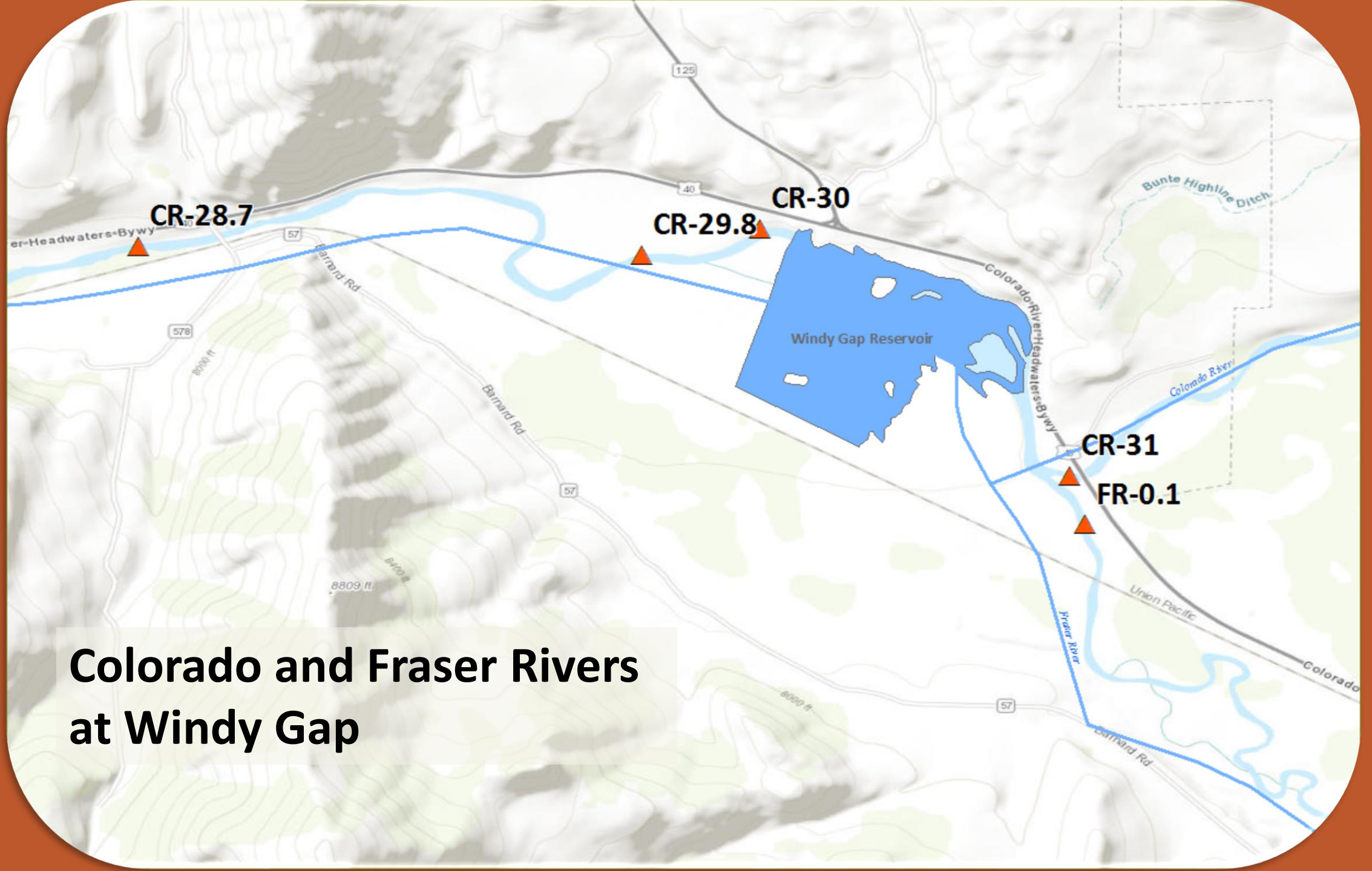
WC-abvCOR (WC-0.5): WAT (Chronic CS-II)



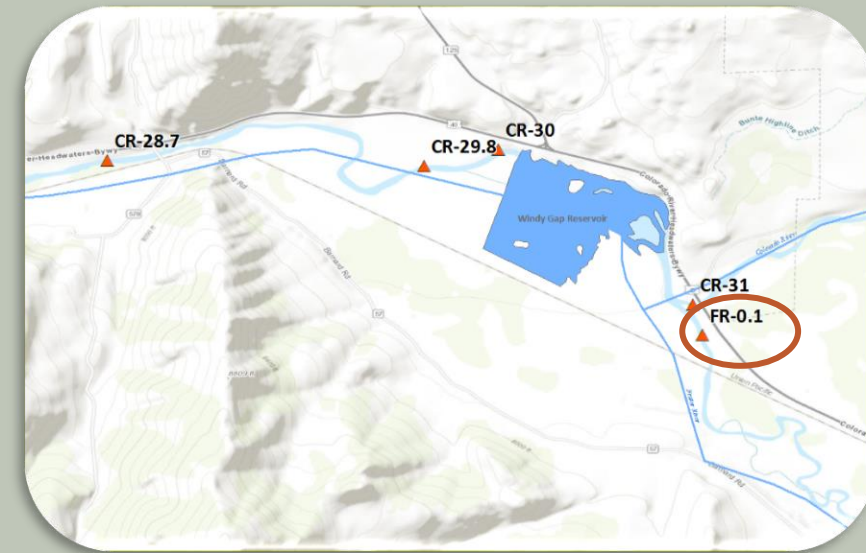
WC-abvCOR (WC-0.5): DM (Acute CS-II)



# Colorado and Fraser Rivers at Windy Gap



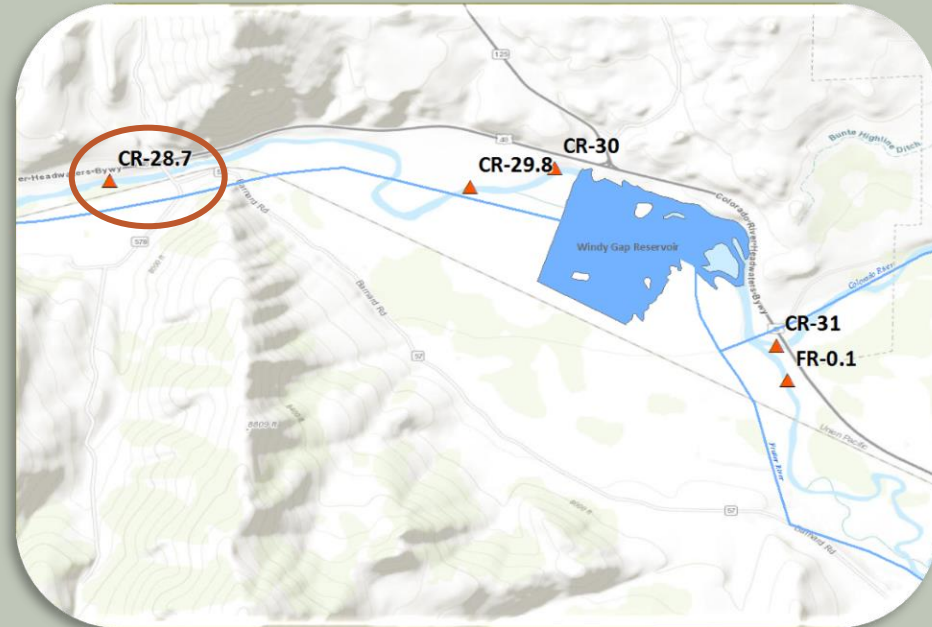
# Fraser River upstream of Windy Gap – CSII



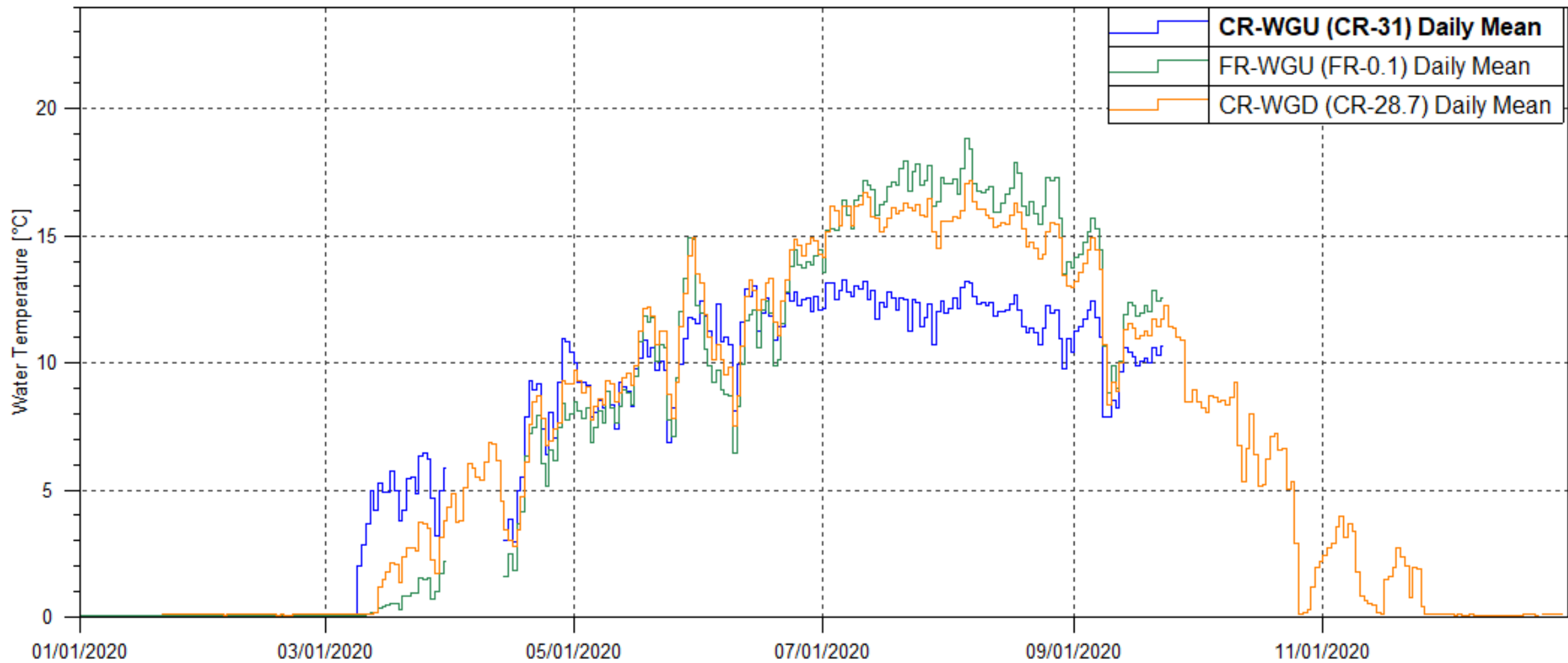


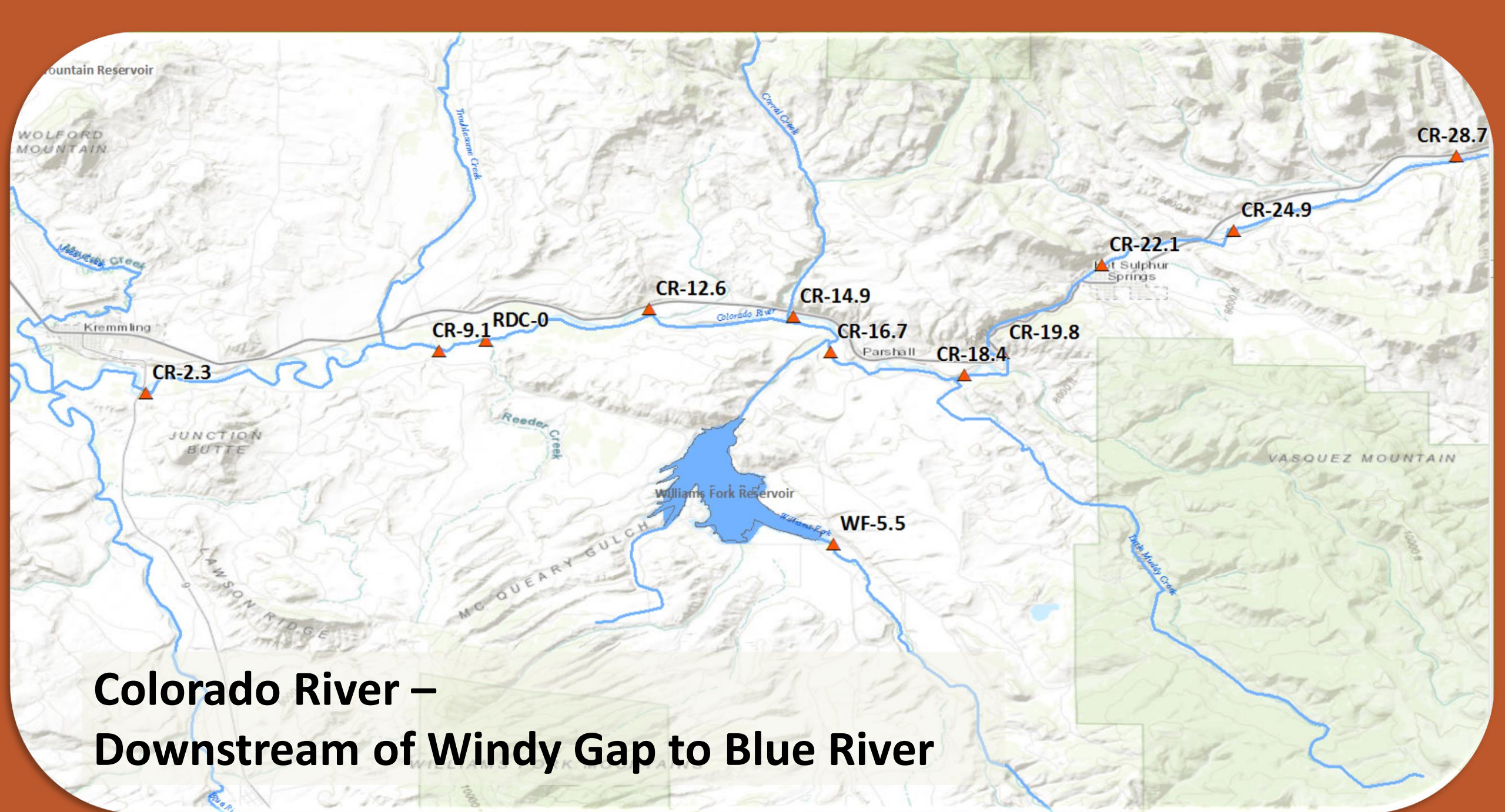


# Colorado River downstream of Windy Gap – CSII



*Northern Waters real-time site*



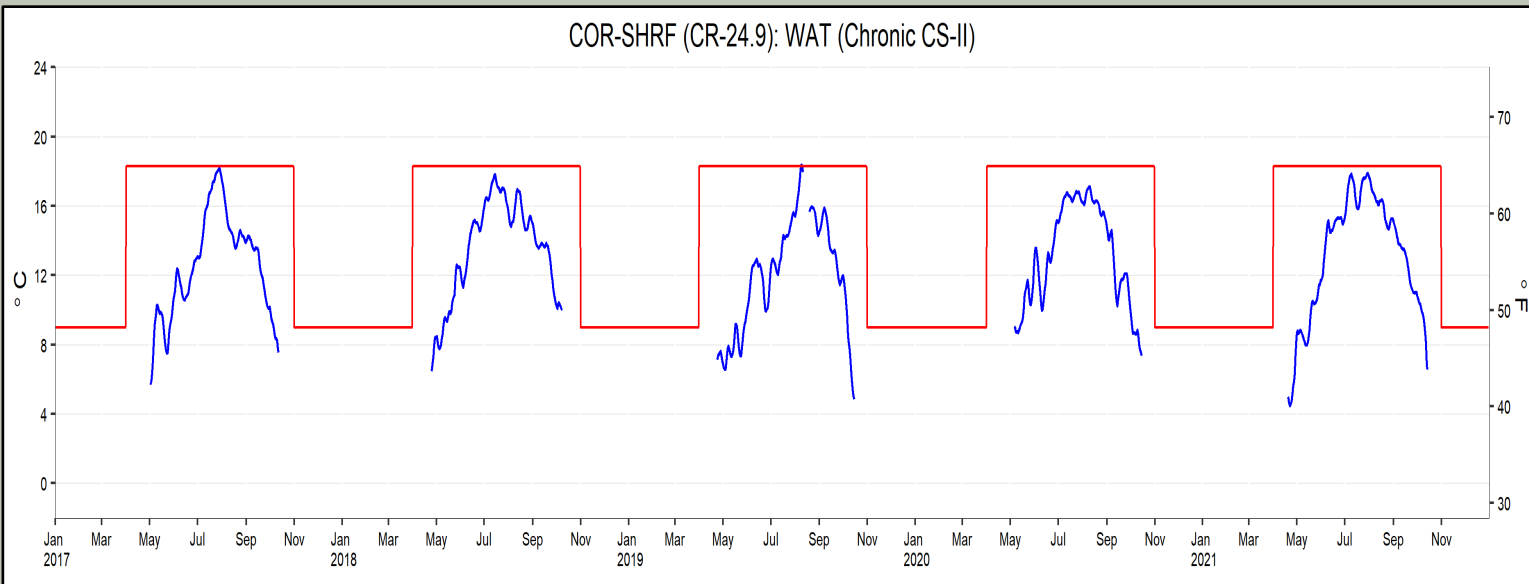


**Colorado River –  
Downstream of Windy Gap to Blue River**

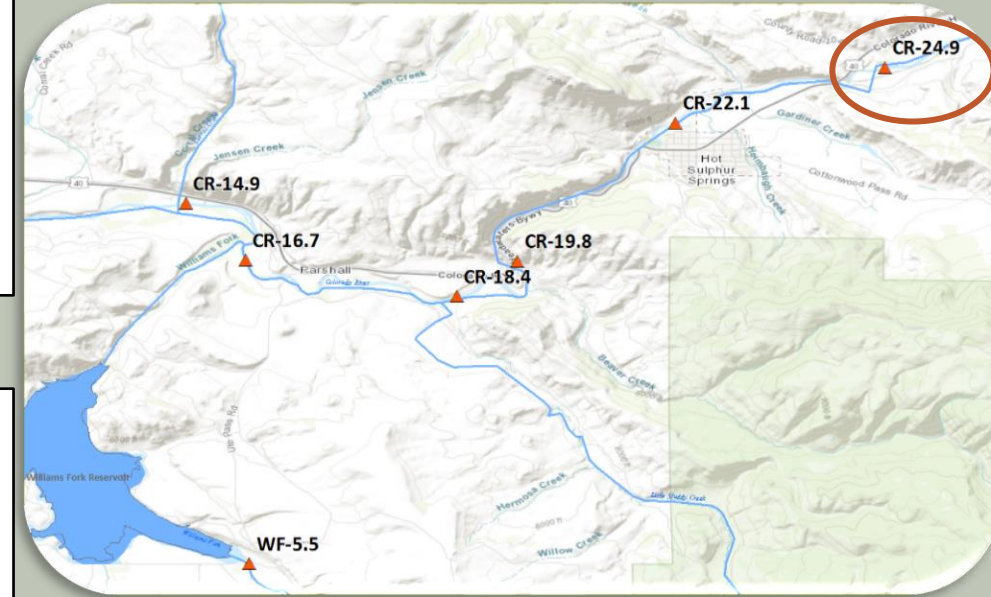
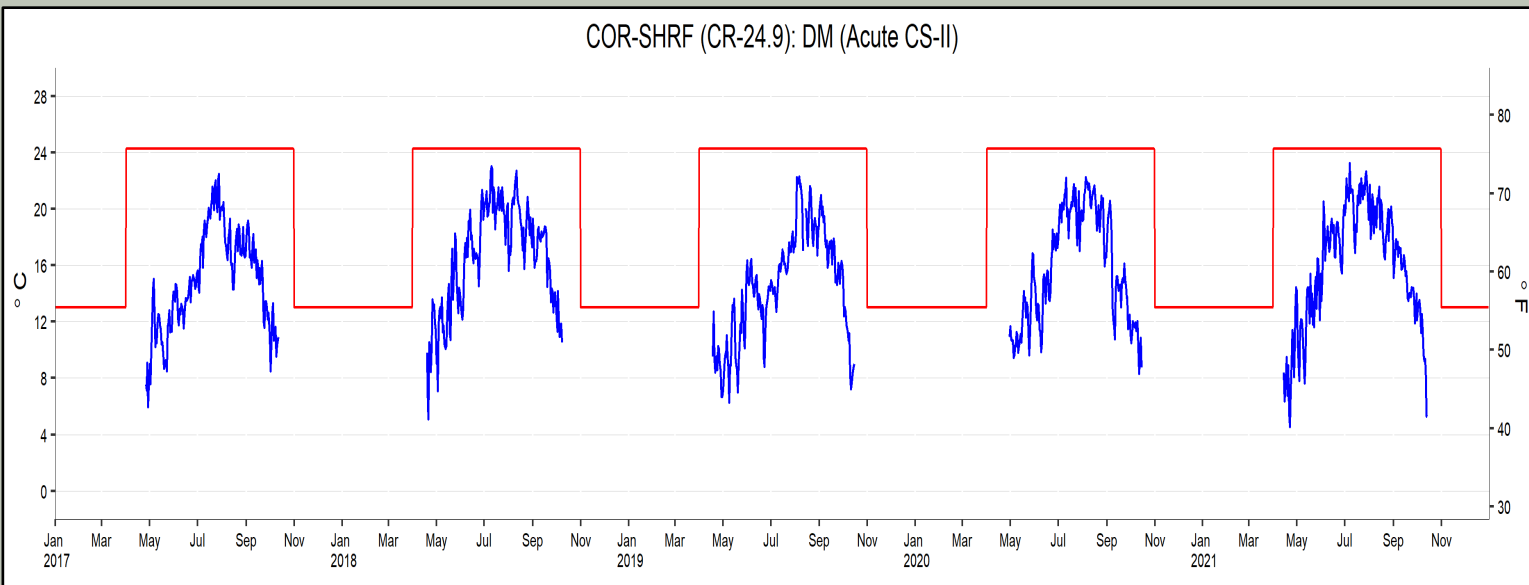


# Colorado River at Sheriff Ranch – CSII

COR-SHRF (CR-24.9): WAT (Chronic CS-II)

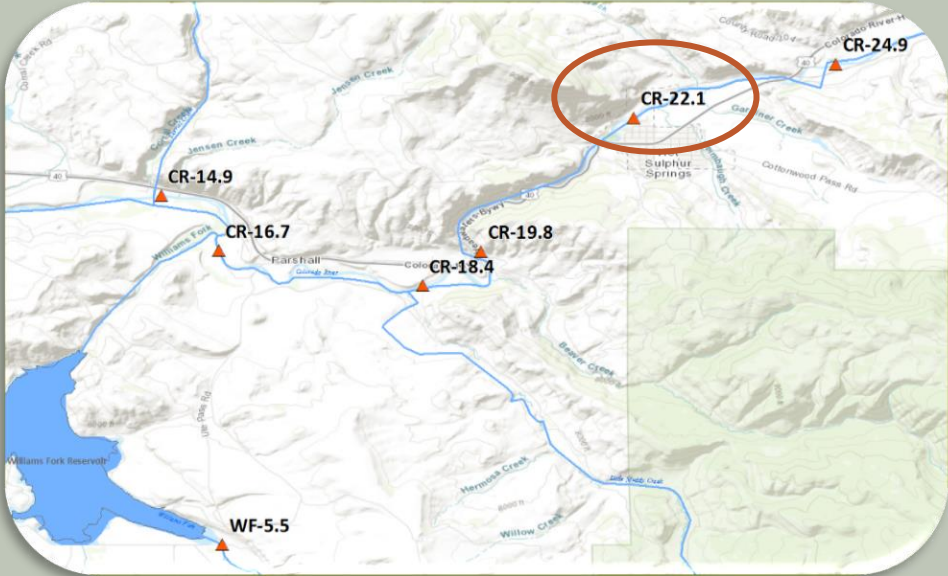


COR-SHRF (CR-24.9): DM (Acute CS-II)





# Colorado River upstream Hot Sulphur Springs – CSII

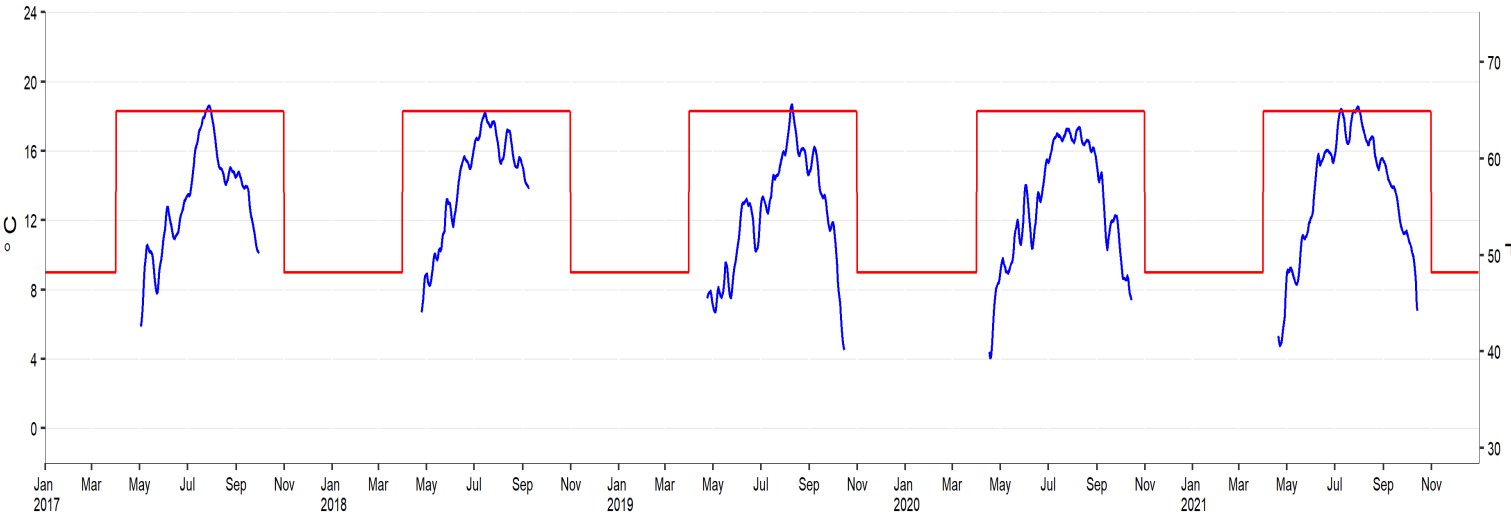


*Northern Waters real-time site*

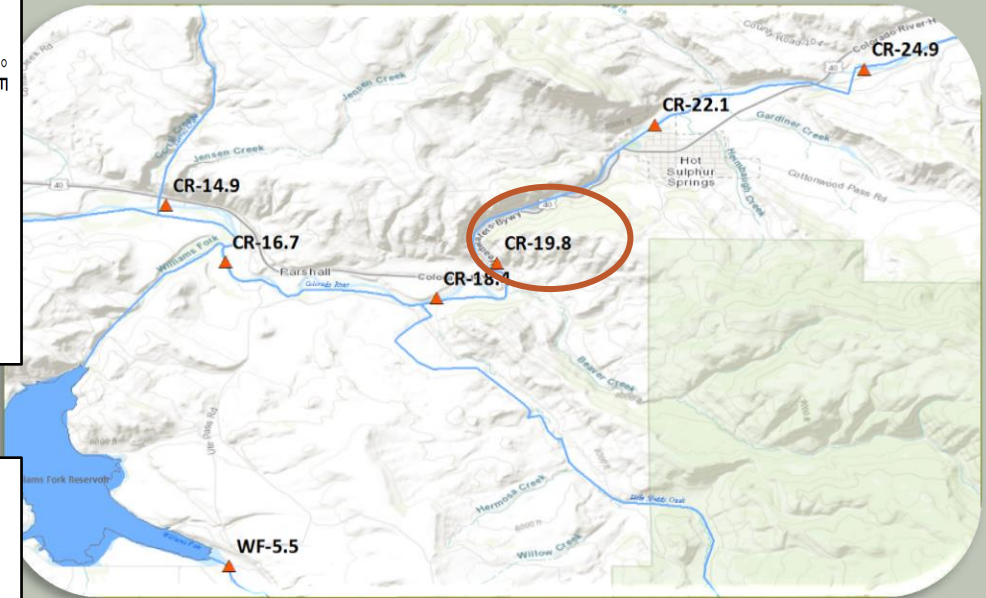
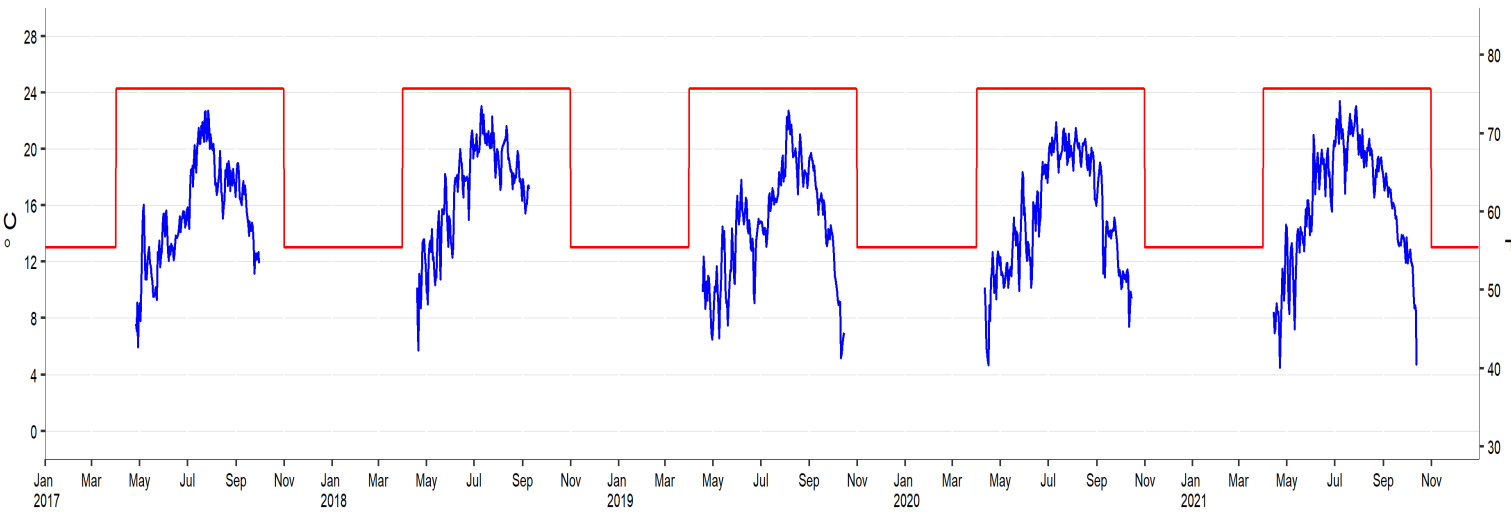
*\*2016 and 2017 GCWIN Data*

# Colorado River downstream Byers Canyon– CSII

COR-blwByers (CR-19.8): WAT (Chronic CS-II)

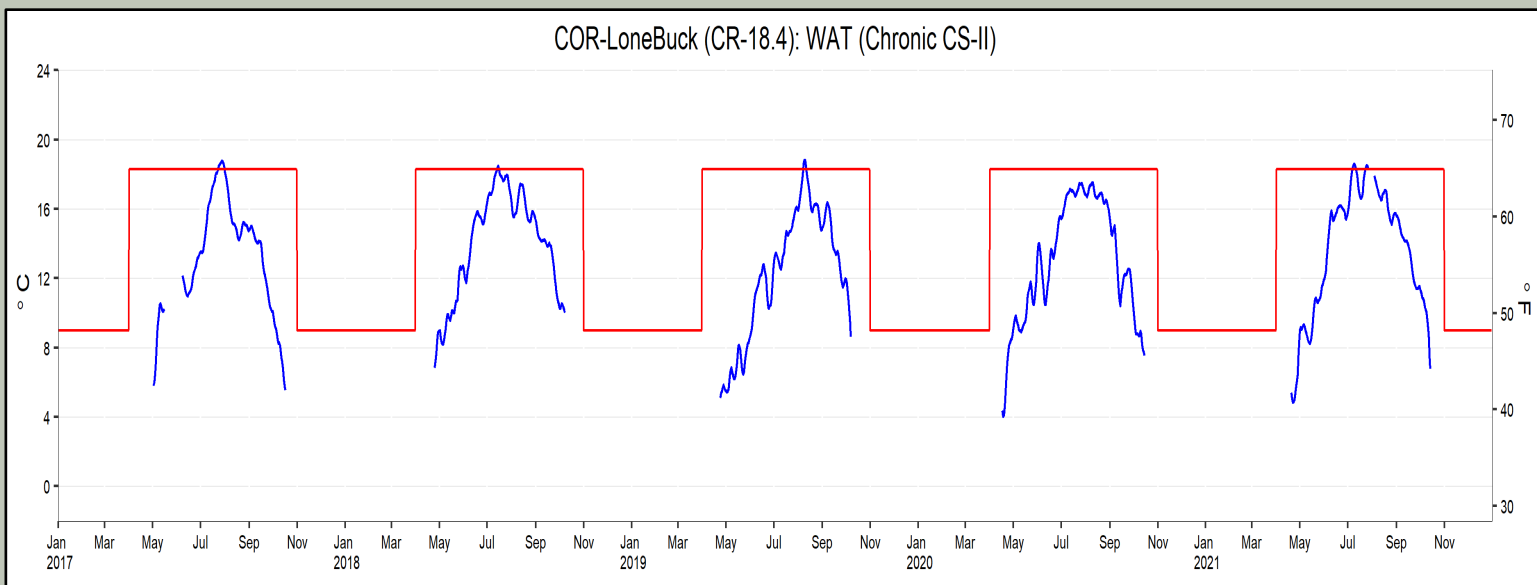


COR-blwByers (CR-19.8): DM (Acute CS-II)

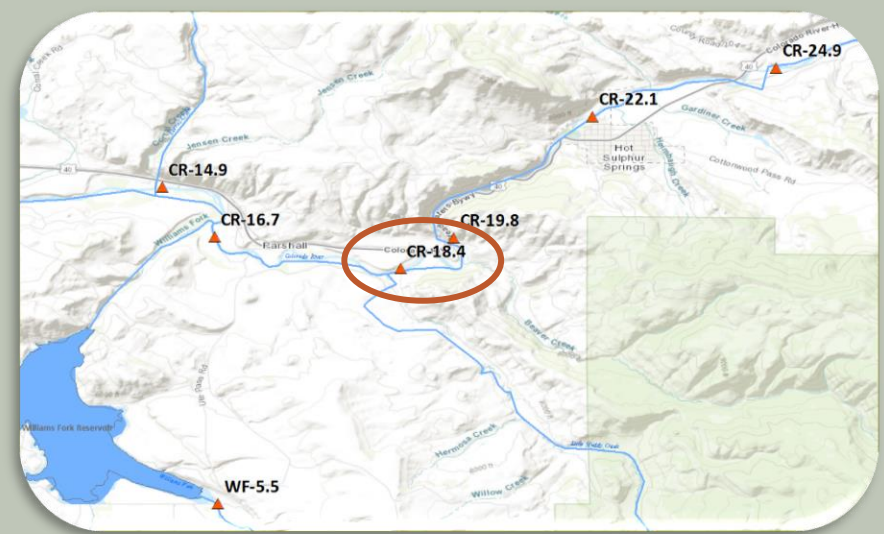
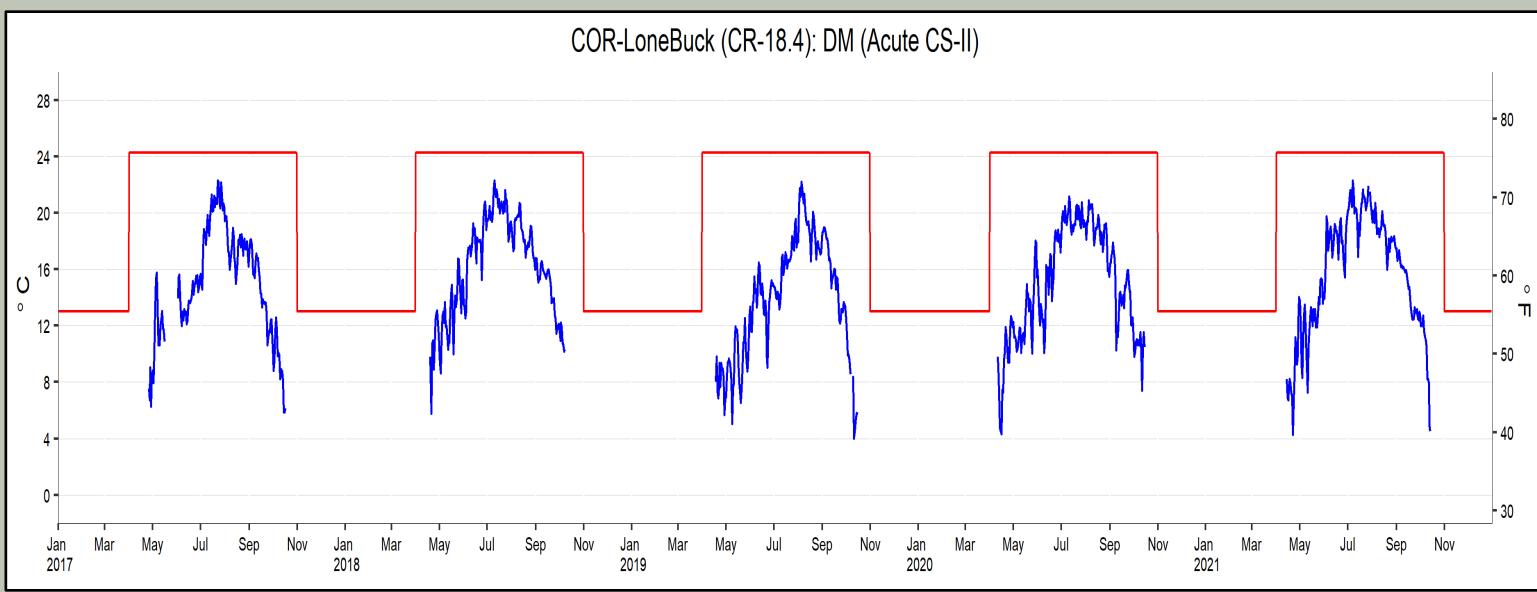


# Colorado River at Lone Buck – CSII

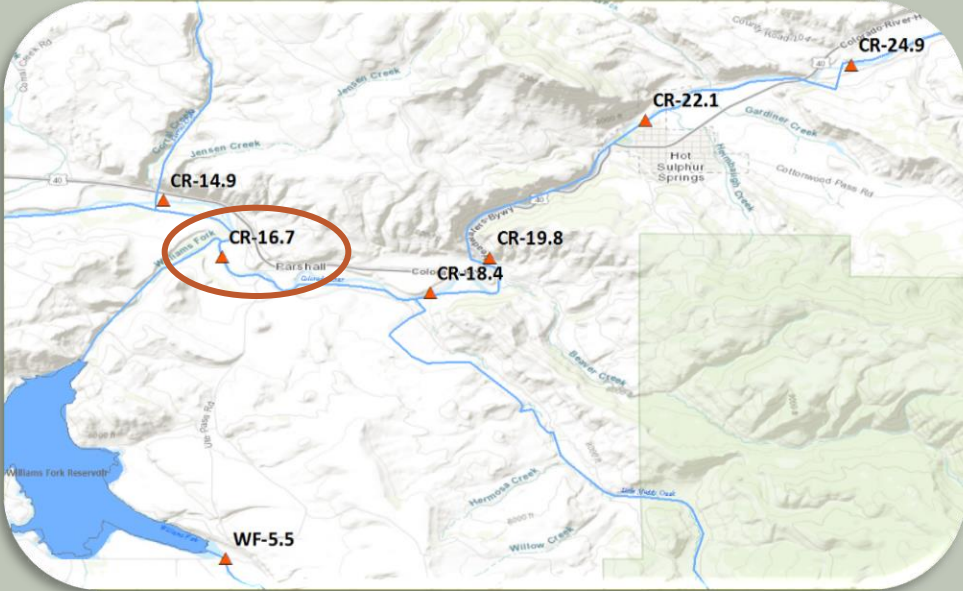
COR-LoneBuck (CR-18.4): WAT (Chronic CS-II)



COR-LoneBuck (CR-18.4): DM (Acute CS-II)



# Colorado River upstream Williams Fork – CSII

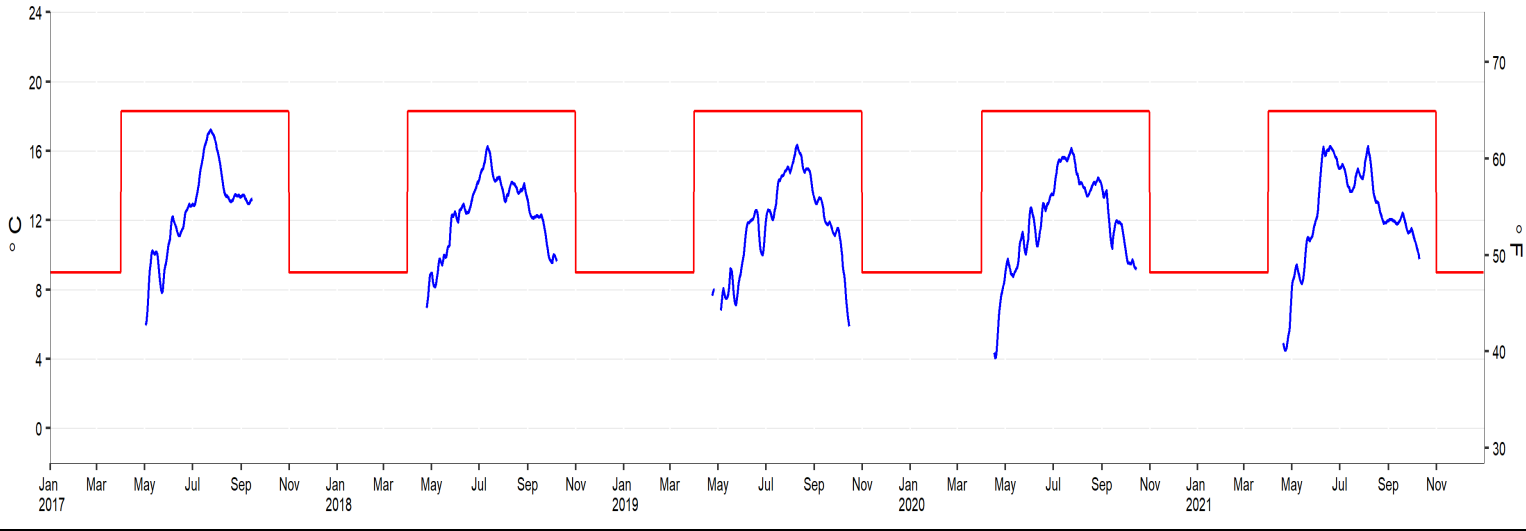


*Northern Waters real-time site*

*\*2016 and 2017 GCWIN Data*



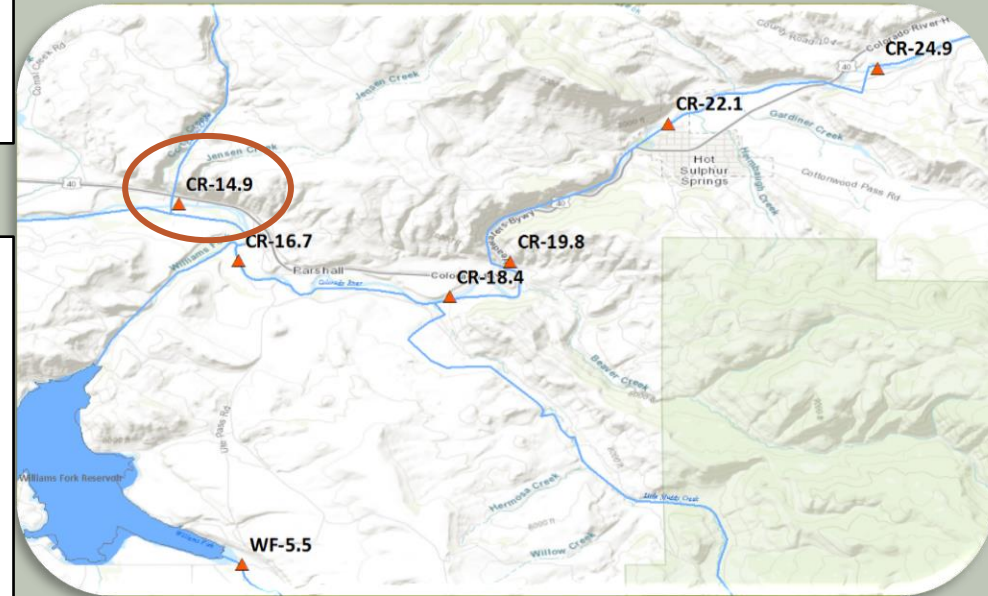
COR-abvKidPond (CR-14.9): WAT (Chronic CS-II)

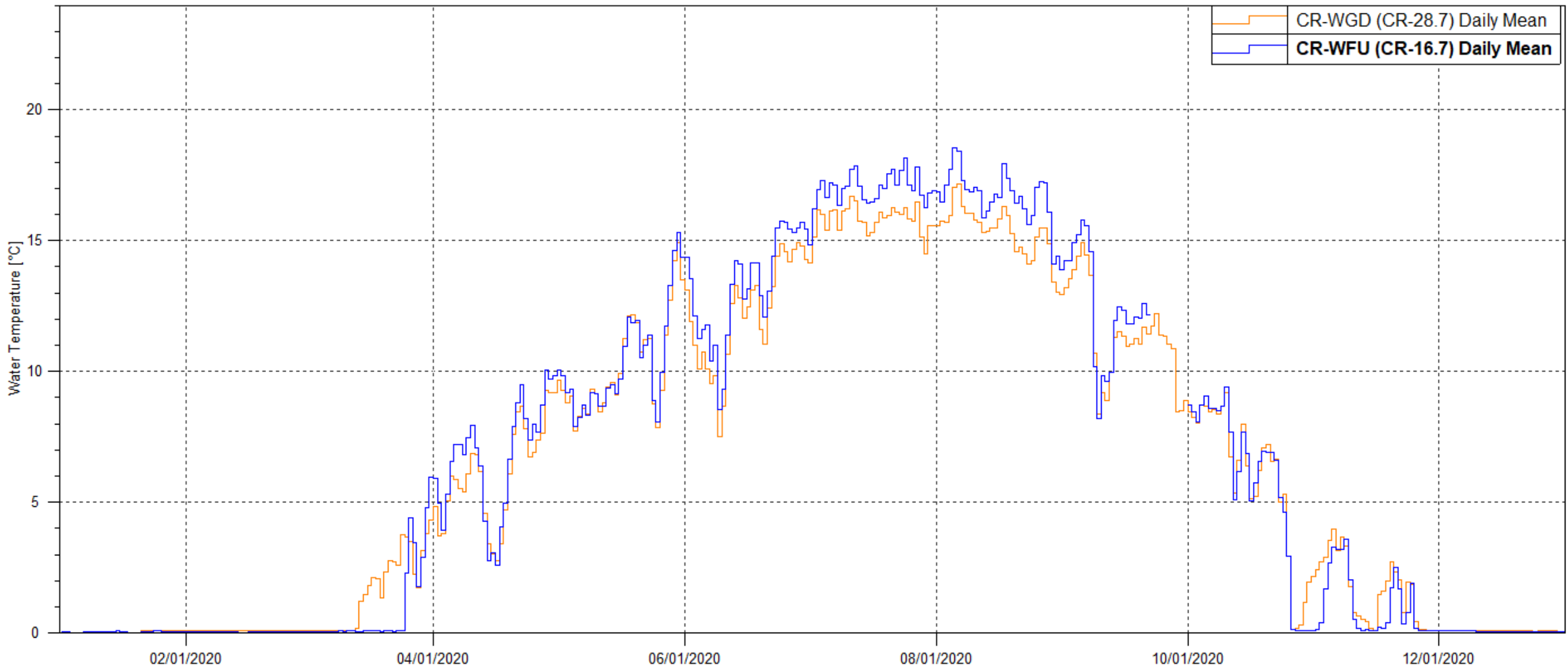


COR-abvKidPond (CR-14.9): DM (Acute CS-II)

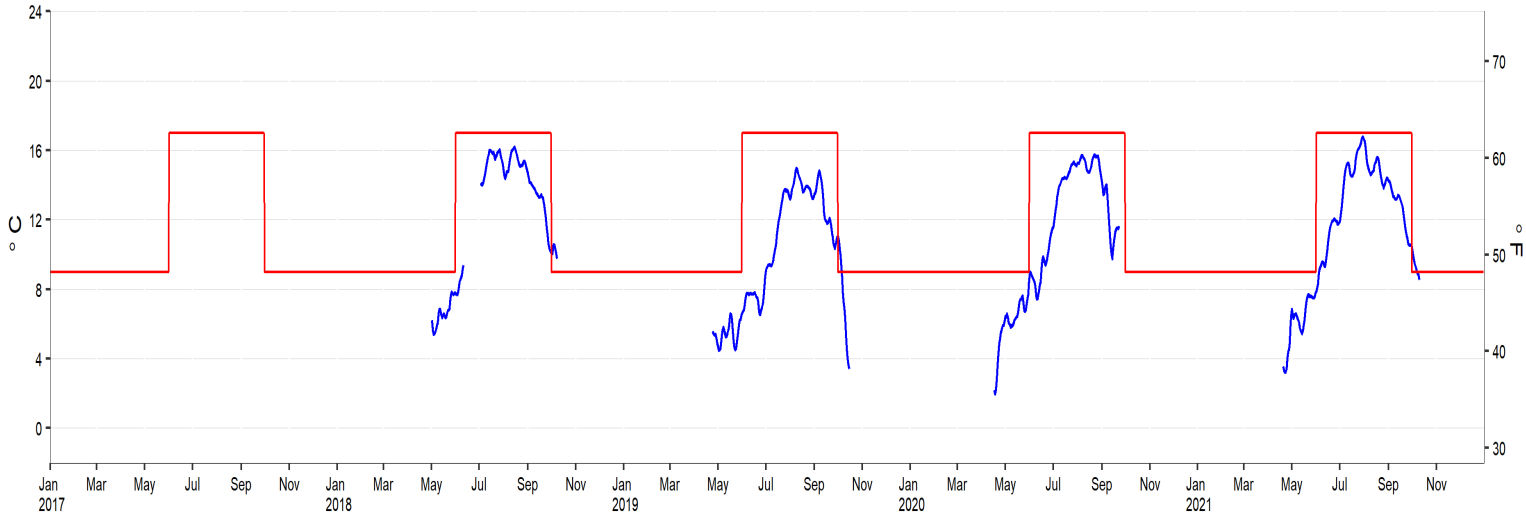


# Colorado River downstream Williams Fork (Kid-Pond) – CSII

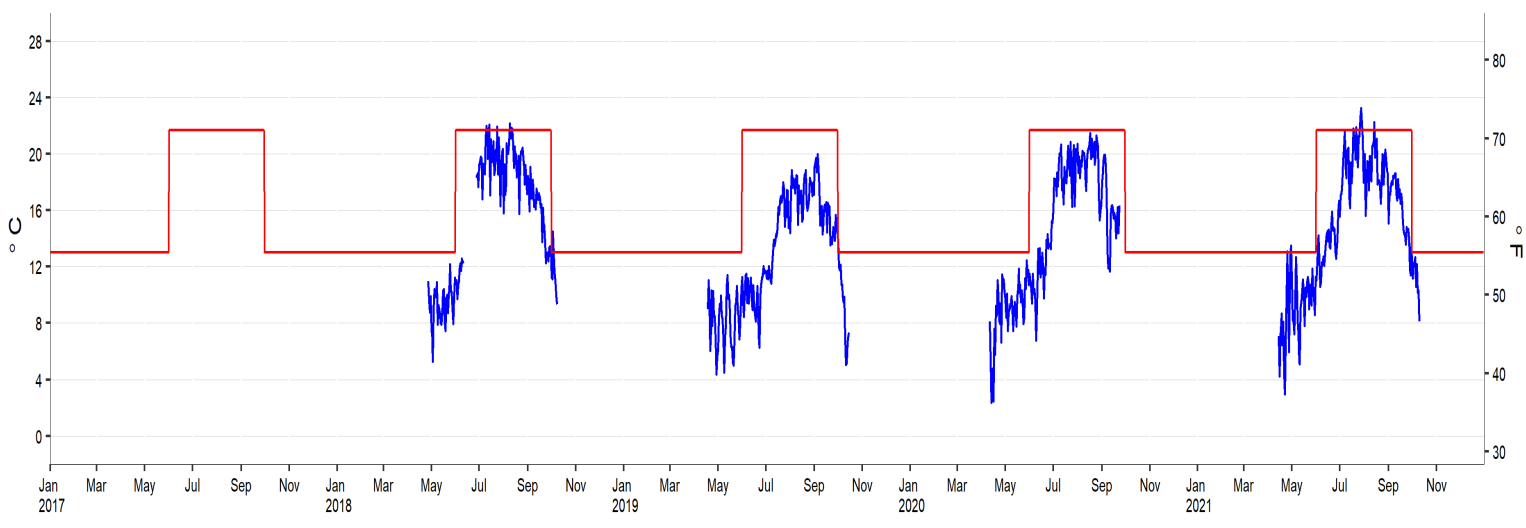




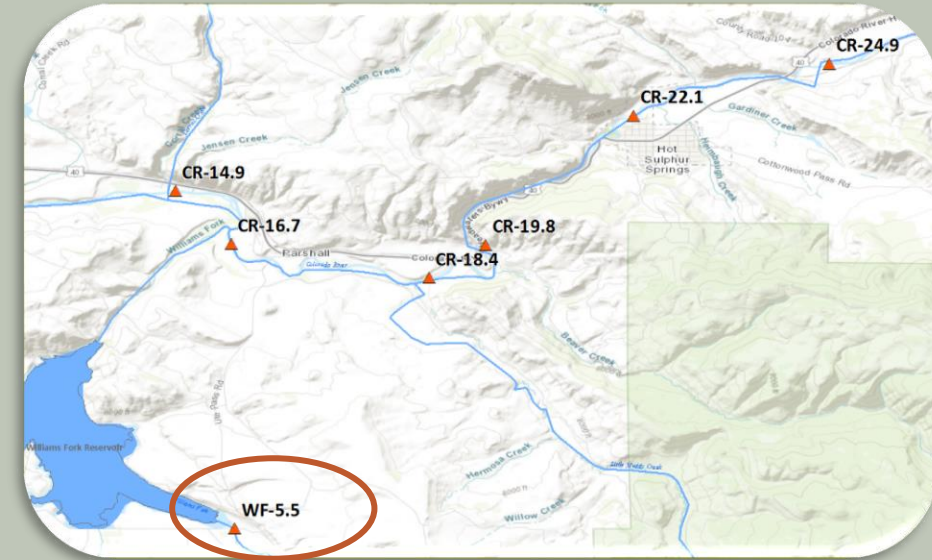
WF-abvWFR (WF-5.5): WAT (Chronic CS-I)



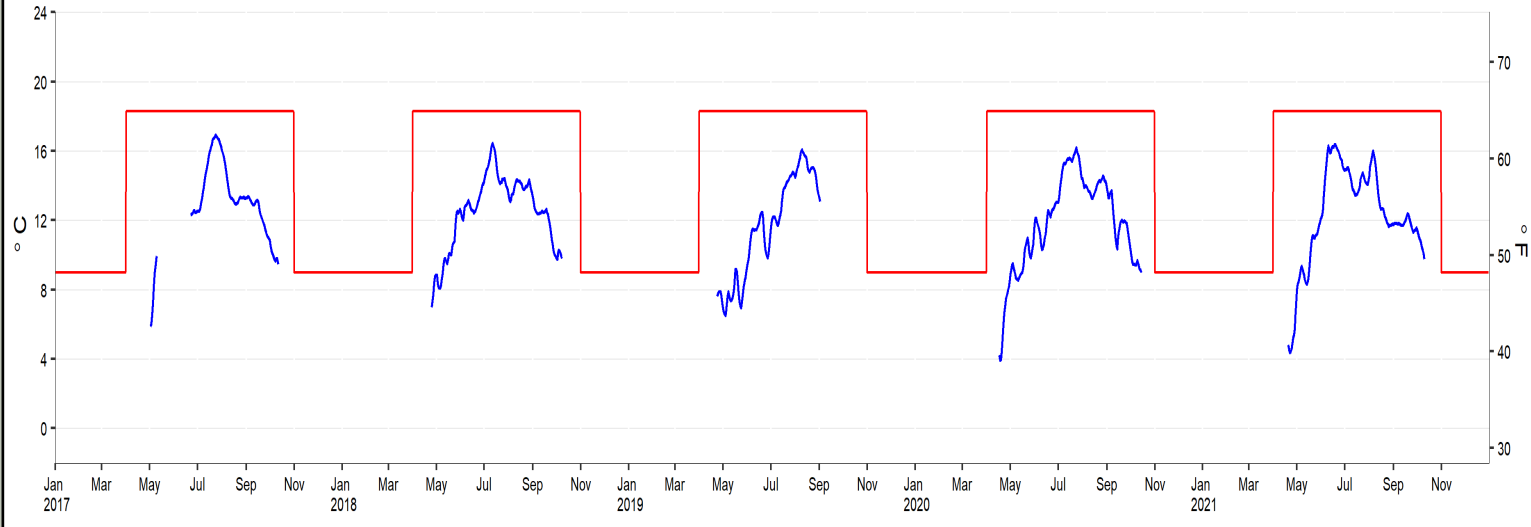
WF-abvWFR (WF-5.5): DM (Acute CS-I)



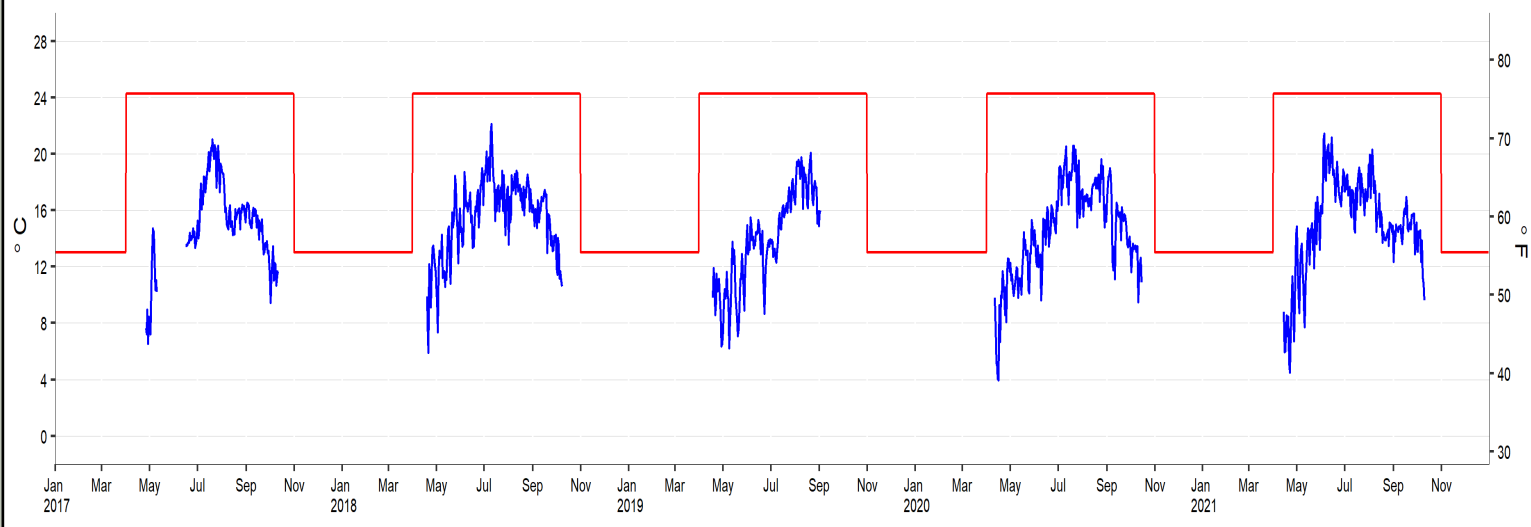
# Williams Fork upstream of Williams Fork Reservoir – CSI



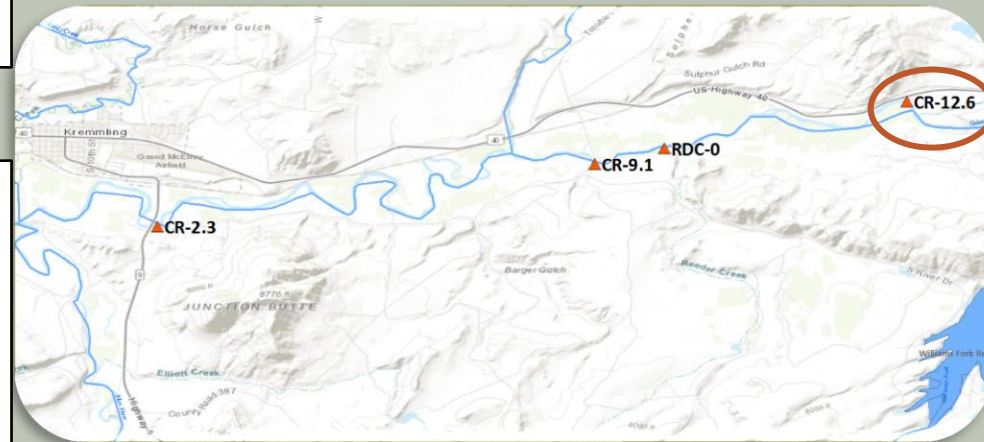
COR-ConRitschard (CR-12.6): WAT (Chronic CS-II)



COR-ConRitschard (CR-12.6): DM (Acute CS-II)



# Colorado River at Con Ritschard – CSII

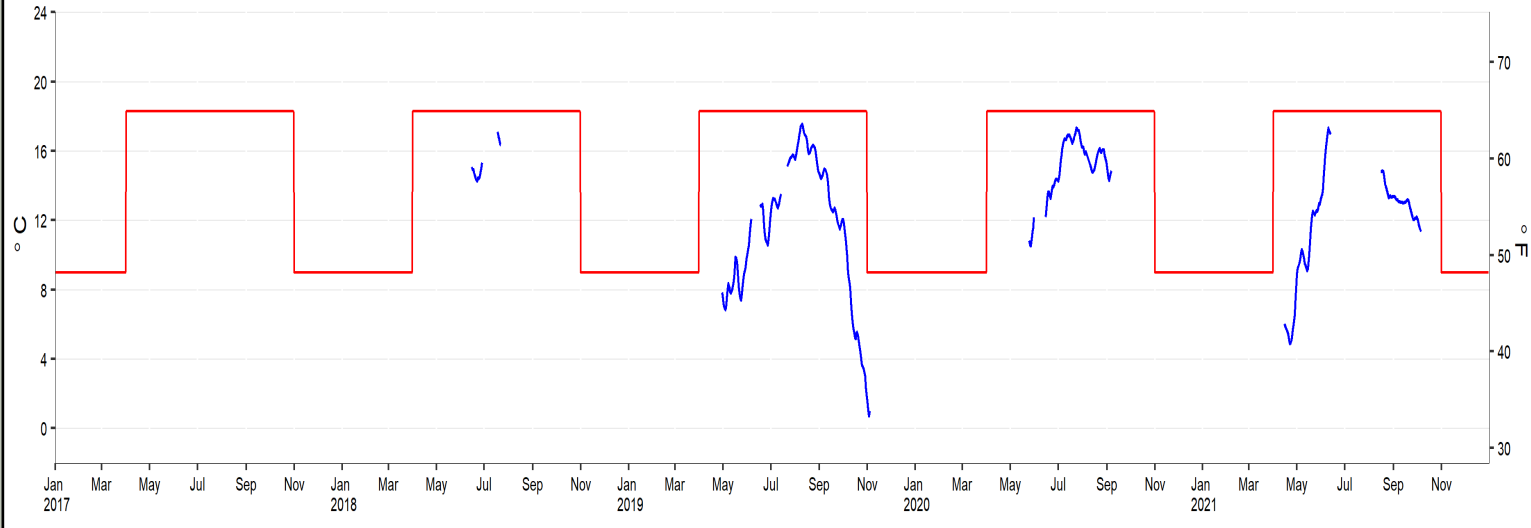




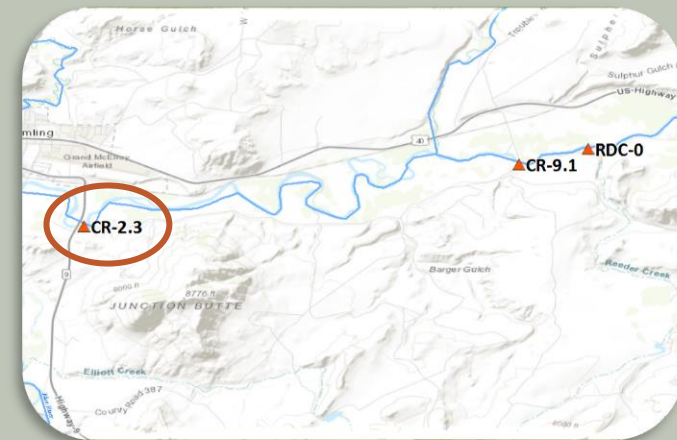
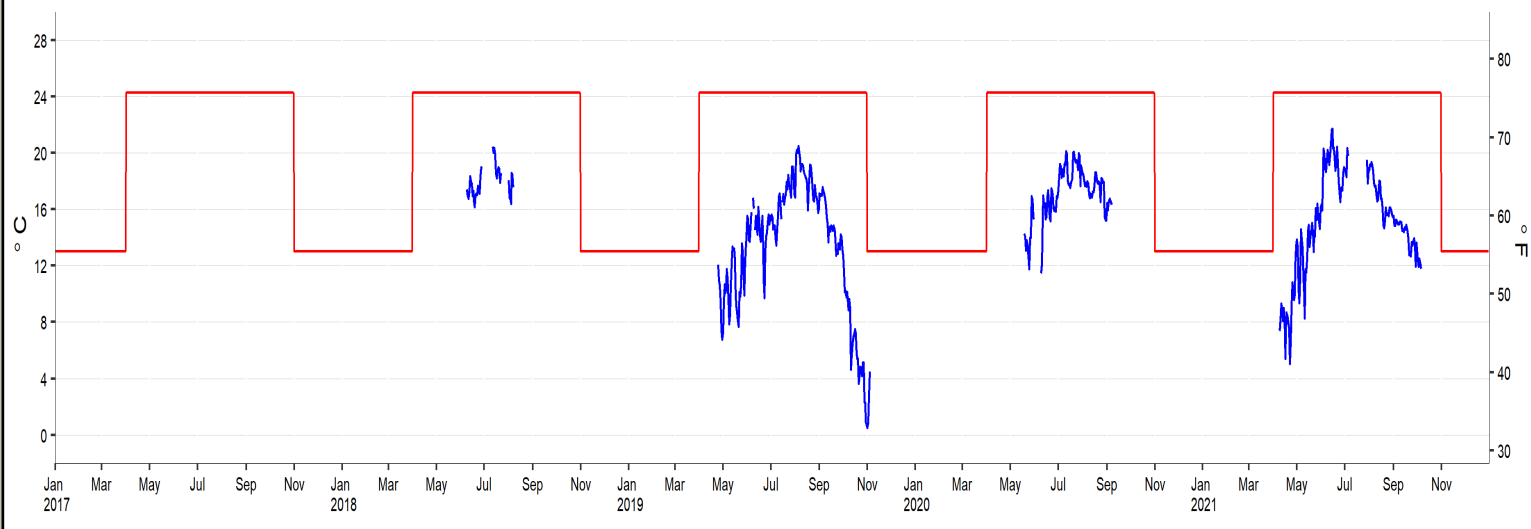


# CR 2.3 - Colorado River upstream Hwy 9 Bridge at Kremmling- CSII

COR-Hwy9 (CR-2.3): WAT (Chronic CS-II)



COR-Hwy9 (CR-2.3): DM (Acute CS-II)



# Fraser River Basin, including tributaries 2021 Summary

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# Fraser River Basin, including tributaries

➤ **32 sites assessed**

➤ **28 sites in attainment with state temperature standards**

6 sites above the state temperature threshold for acute (2-hr) exposure:

- Ranch Creek below CR 8315
- Ranch Creek below Meadow Creek
- Ranch Creek above Quad Ranch
- Meadow Creek at CR 84
- St. Louis Creek
- Herd Creek on County Road 843

3 sites above the state temperature threshold for chronic (7-day) exposure:

- Ranch Creek below CR 8315
- Ranch above Quad Ranch
- St. Louis Creek

# Colorado River Basin, including Williams Fork 2021 Summary

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## Colorado River/ Williams Fork

- **17 sites assessed**
- **16 sites in attainment with state temperature standards**

No sites above the state temperature threshold for acute (2-hr) exposure

No sites exceeded the state temperature threshold for chronic (7-day) exposure



# Questions & Comments

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# Fraser River and Tributaries

River Mile ID	Description	River	Sampling Entity	Entity Station ID	Tier
FR-27.2	Fraser River above Mary Jane entrance to Winter Park	Fraser River	GCWIN	FR-Upper	CS-I
FR-23.4	Fraser River above Winter Park Sanitation District	Fraser River	GCWIN	FR-abvWPSD	CS-I
FR-23.2	Fraser River below Winter Park Sanitation	Fraser River	GCWIN	FR-blwWPSD	CS-I
FR-22.5	Fraser River below Winter Park Resort at Idlewild Campground	Fraser River	GCWIN	FR-blwWP	CS-I
EC-5.5	Elk Creek below Denver Water diversion	Elk Creek	GCWIN	Elk-blwDWB	CS-I
LVC-0.2	Little Vasquez above Winter Park on Arapaho Road	Little Vasquez	GCWIN	LVC-abvWP	CS-I
VC-0	Vasquez Creek at the town of Winter Park	Vasquez Creek	GCWIN	VC-WP	CS-I
FR-20	Fraser River at Rendezvous Bridge	Fraser River	GCWIN	FR-Rendezvous	CS-II
FR-18.1	Fraser River below County Rd 804	Fraser River	GCWIN	FR-CR804	CS-II
STC-9.8	Saint Louis Creek upstream of Denver Water Board diversion	St. Louis Creek	GCWIN	STC-blwDWB	CS-I
STC-5.4	Saint Louis Creek at Fraser Experimental Forest	St. Louis Creek	GCWIN	STC-Mid	CS-I
STC-0	Saint Louis Creek above confluence with Fraser River	St. Louis Creek	GCWIN	ST-LC	CS-I
FR-17.7	Fraser River below County Rd 8 at Hammond Ditch	Fraser River	GCWIN	FR-blwCR8HD	CS-II
FR-16.9	Fraser River above Fraser Sanitation	Fraser River	GCWIN	FR-abvFSD	CS-II
FR-16.6	Fraser River below Fraser Sanitation	Fraser River	GCWIN	FR-blwFSD	CS-II
FR-15	Fraser River LBD Restoration Project, Upstream end	Fraser River	GCWIN	FR-SpProjU	CS-II
FR-14.4	Fraser River LBD Restoration Project, Downstream end	Fraser River	GCWIN	FR-SpProjD	CS-II

# Fraser River and Tributaries

River Mile ID	Description	River	Sampling Entity	Entity Station ID	Tier
FR-14	Fraser River At Tabernash Co.	Fraser River	USGS	09027100	CS-II
LCB-2.2	Little Cabin Creek below Denver Water diversion	Little Cabin	GCWIN	LCAB-blwDWB	CS-I
CB-2.7	Cabin Creek below Denver Water diversion	Cabin Creek	GCWIN	CAB-blwDWB	CS-I
CB-0.6	Cabin Creek upstream of North and South Channels	Cabin Creek	GCWIN	CAB-abvChan	CS-I
RC-4.7	Ranch Creek below County Rd 8315	Ranch Creek	GCWIN	RC-blwCR8315	CS-I
HC-0.5	Herd Creek on County Road 843	Herd Creek	GCWIN	HRD-atCR843	CS-I
MC-0.5	Meadow Creek on County Road 84/USFS 129	Meadow Creek	GCWIN	MEA-atCR84	CS-I
RC-1.1	Ranch Creek below Meadow Creek	Ranch Creek	GCWIN	RC-blwMC	CS-I
FR-12.4	Fraser River above Fraser Canyon below Tabernash	Fraser River	GCWIN	FR-abvFrCan	CS-II
FR-4.5	Fraser River below Fraser Canyon at Granby Ranch	Fraser River	GCWIN	FR-blwFrCan	CS-II
FR-3.5	Fraser River below Highway 40 in Granby	Fraser River	GCWIN	FR-Hwy40Gr	CS-II
FR-1.9	Fraser River above Granby Sanitation District	Fraser River	GCWIN	FR-abvGSD	CS-II
FR-1.6	Fraser River below Granby Sanitation District	Fraser River	GCWIN	FR-blwGSD	CS-II

# Colorado River- Headwaters to Windy Gap

River Mile ID	Description	River	Sampling Entity	Entity Station ID	Tier
EI-0.1	East Inlet upstream of Grand Lake	East Inlet	Northern	EI-GLU	CS-I
NI-0.1	North Inlet upstream Grand Lake	North Inlet	Northern	NI-GLU	CS-I
NF-0.1	North Fork of Colorado River upstream Shadow Mountain Reservoir	North Fork	Northern	CR-SMU	CS-I
CR-44.6	Colorado River downstream of Shadow Mountain Reservoir	Colorado River	Northern	CR-SMD	CS-I
CR-43.5	Colorado River upstream of Lake Granby	Colorado River	Northern	CR-GRU	CS-I
ST-0	Stillwater Creek upstream Lake Granby	Stillwater Creek	Northern	ST-GRU	CS-I
RF-0	Roaring Fork upstream Lake Granby	Roaring Fork	Northern	RF-GRU	CS-I
AC-0.6	Arapaho Creek upstream Lake Granby	Arapaho Creek	Northern	AC-GRU	CS-I
CR-38.3	Colorado River downstream of Lake Granby	Colorado River	Northern	CR-GRD	CS-II
CR-35.6	Colorado River downstream of Lake Granby at flow gage	Colorado River	Northern	CR-YGAGE	CS-II
WC-3.8	Willow Creek downstream of Willow Creek Reservoir	Willow Creek	Northern	WC-WCRD	CS-I
WC-2.3	Willow Creek upstream of Bunte Highline Ditch	Willow Creek	GCWIN	WC-abvBHD	CS-I
WC-0.5	Willow Creek upstream of confluence with Colorado River	Willow Creek	GCWIN	WC-abvCOR	CS-I

# Colorado and Fraser River at Windy Gap

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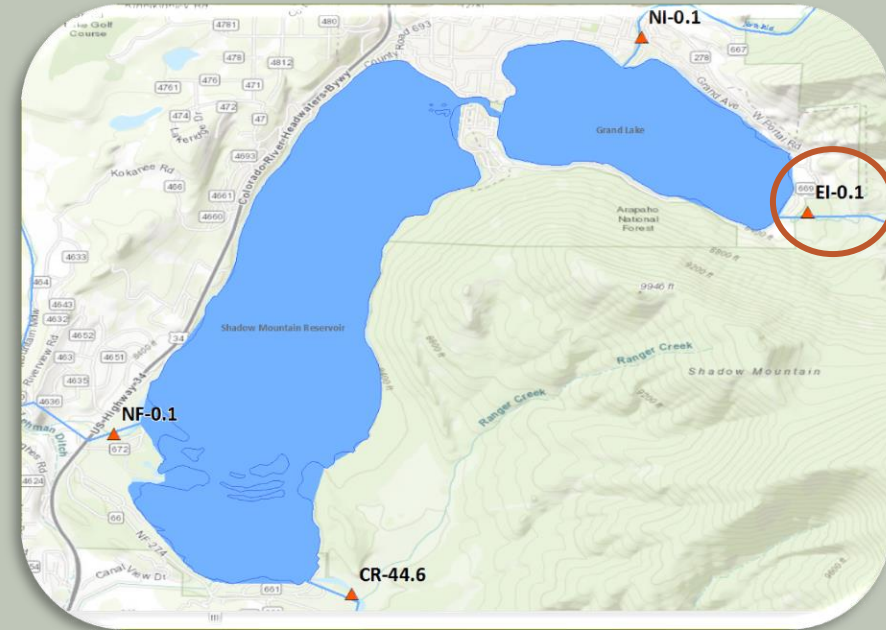
River Mile ID	Description	River	Sampling Entity	Entity Station ID	Tier
CR-31	Colorado River upstream of Windy Gap and Fraser River confluence	Colorado River	Northern	CR-WGU	CS-II
FR-0.1	Fraser River upstream of confluence with Colorado River	Fraser River	Northern	FR-WGU	CS-II
CR-30	Colorado River at Windy Gap Bypass	Colorado River	Northern	CR-WGB	CS-II
CR-29.8	Colorado River at confluence of Windy Gap spillway and bypass	Colorado River	Northern	CR-WGC	CS-II
CR-28.7	Colorado River downstream of Windy Gap Reservoir	Colorado River	Northern	CR-WGD	CS-II



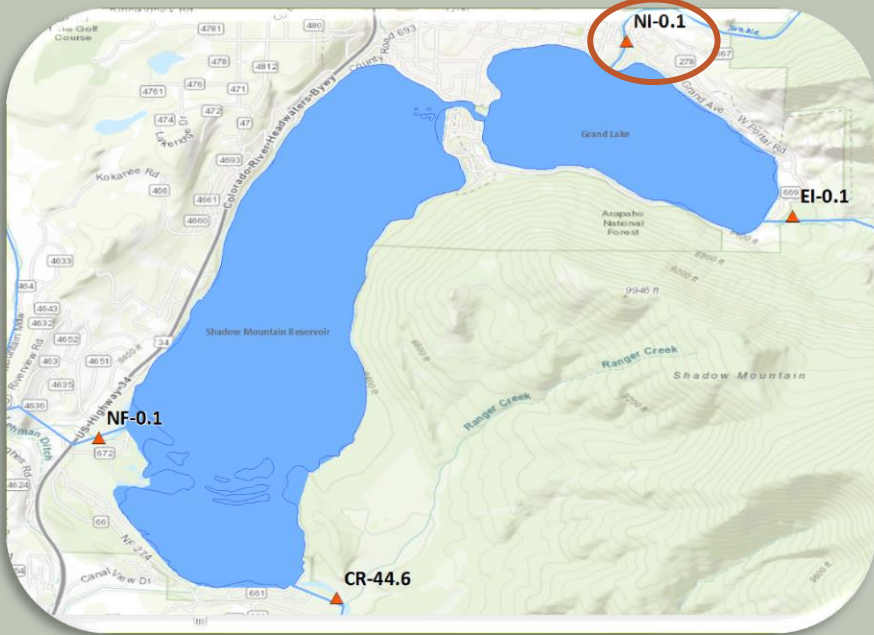
# Colorado River- Downstream Windy Gap to Blue River

River Mile ID	Description	River	Sampling Entity	Entity Station ID	Tier
CR-24.9	Colorado River at Sheriff Ranch	Colorado River	GCWIN	COR-SHRF	CS-II
CR-22.1	Colorado River upstream Hot Sulphur Springs	Colorado River	Northern	CR-HSU	CS-II
CR-19.8	Colorado River downstream of Byers Canyon	Colorado River	GCWIN	COR-blwByers	CS-II
CR-18.4	Colorado River at Lone Buck	Colorado River	GCWIN	COR-LoneBuck	CS-II
CR-16.7	Colorado River upstream of Williams Fork	Colorado River	Northern	CR-WFU	CS-II
WF-5.5	Williams Fork upstream of Williams Fork Reservoir	Williams Fork	GCWIN	WF-abvWFR	CS-I
CR-14.9	Colorado River above Kid Fishing Pond	Colorado River	GCWIN	COR-abvKidPond	CS-II
CR-12.6	Colorado River at ConRitschard	Colorado River	GCWIN	COR-ConRitschard	CS-II
RDC-0	Reeder Creek upstream of Colorado River confluence	Reeder Creek	BLM	REE-Upper	CS-II
CR-9.1	Colorado River downstream of KB Ditch	Colorado River	GCWIN	COR-KBDitch	CS-II
CR-2.3	Colorado River upstream Hwy 9 Bridge at Kremmling	Colorado River	BLM	COR-Hwy9	CS-II
MC-2.1	Muddy Creek below Hwy 40 in Kremmling	Muddy Creek	BLM	MC-blwHwy40	CS-II

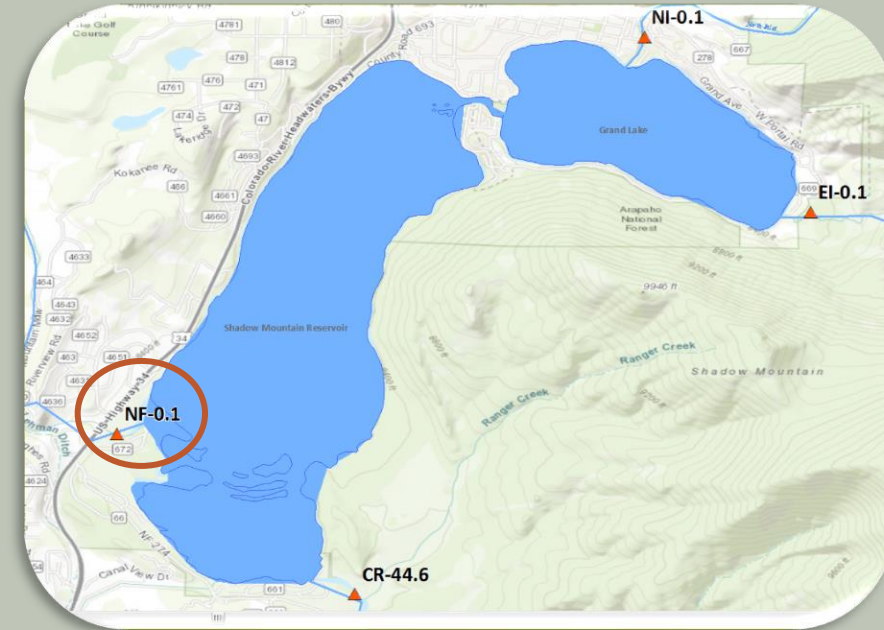
# East Inlet - CSI



# North Inlet - CSI

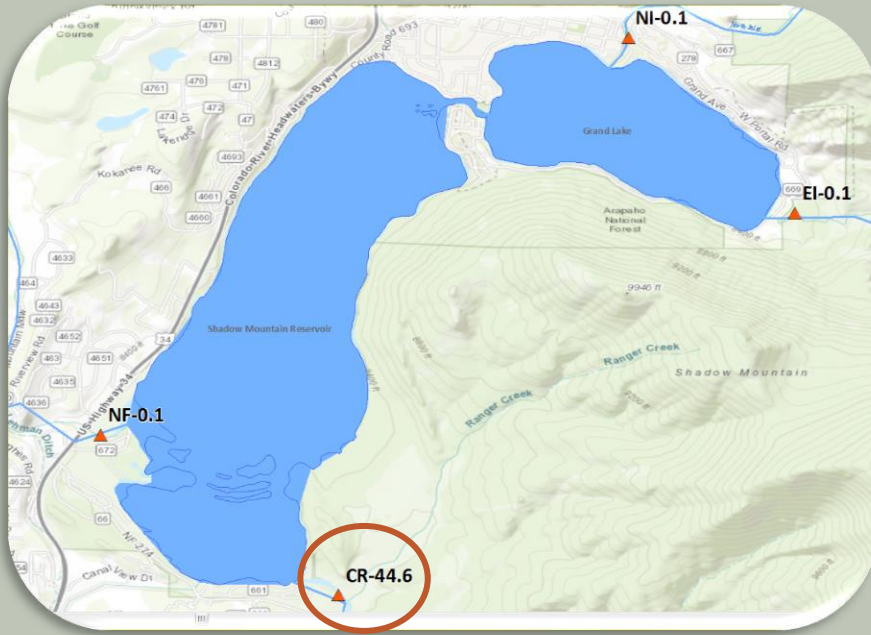


# North Fork Colorado - CSI

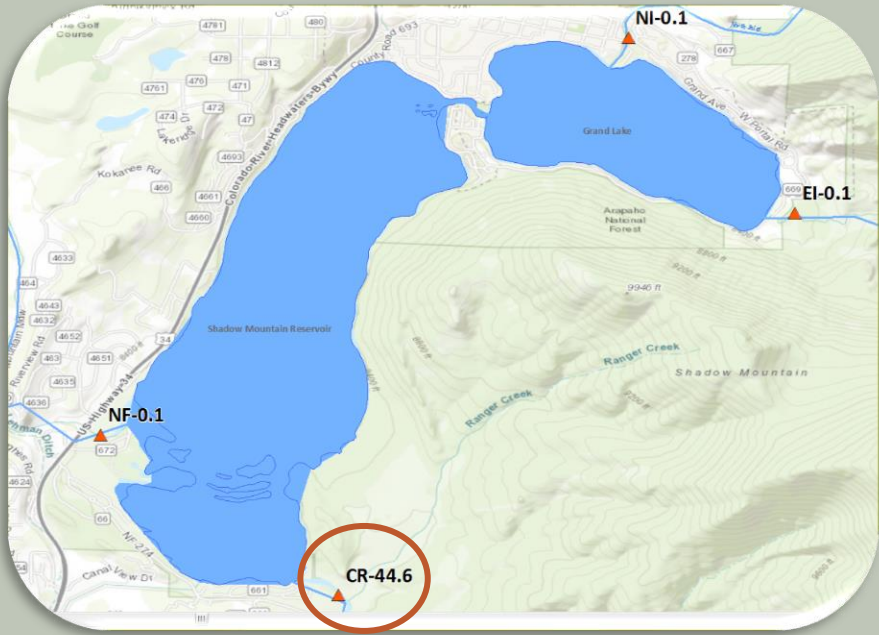




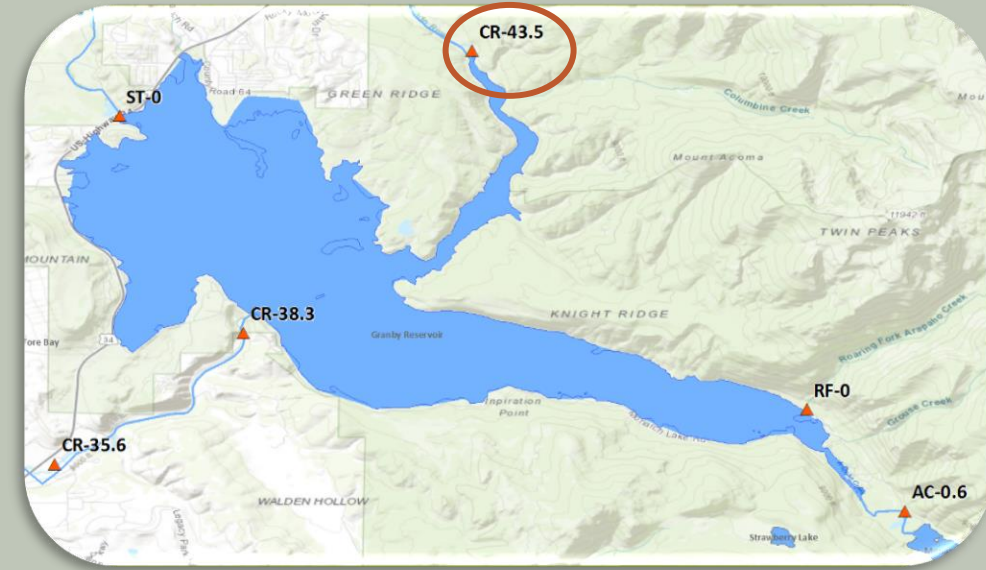
# GCWIN/NW Site Colorado downstream Shadow Mountain - CSI



# Northern Water Site Colorado downstream Shadow Mountain - CSI



# Colorado upstream Granby Reservoir - CSI



# Roaring Fork - CSI

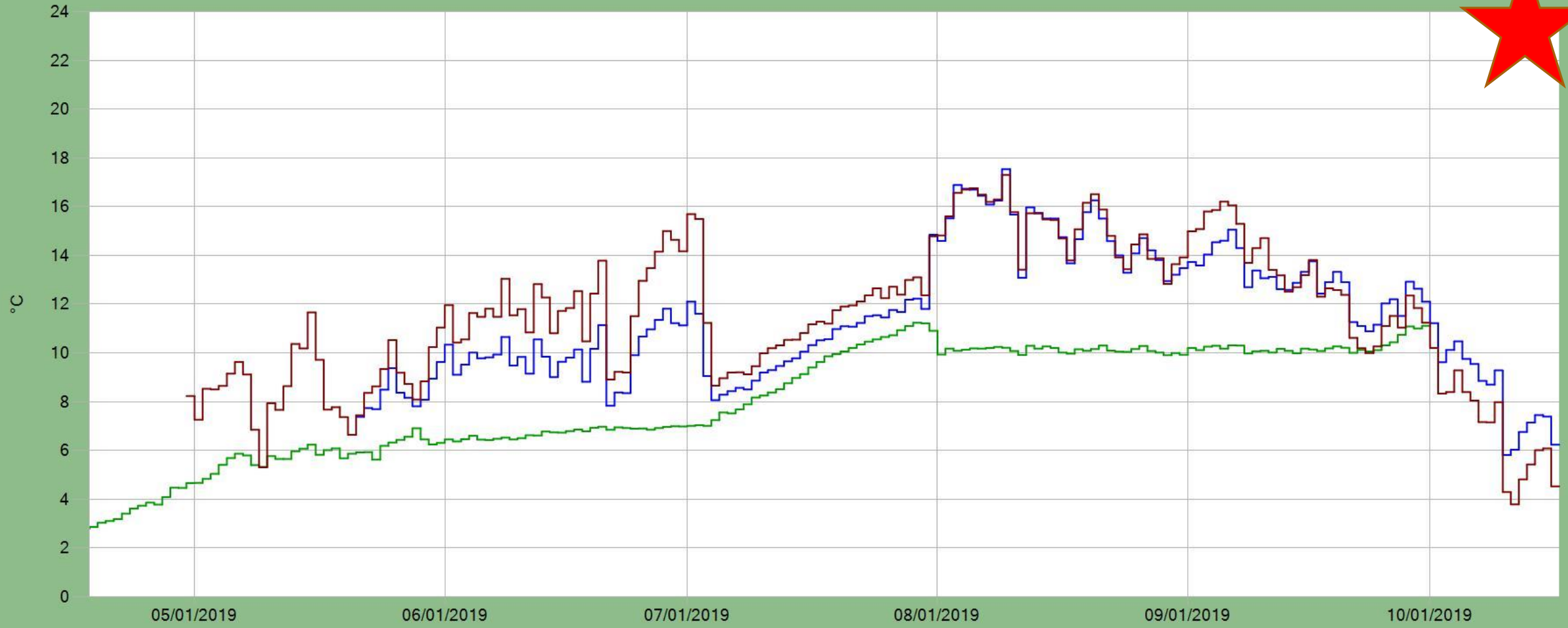


# Arapaho Creek - CSI



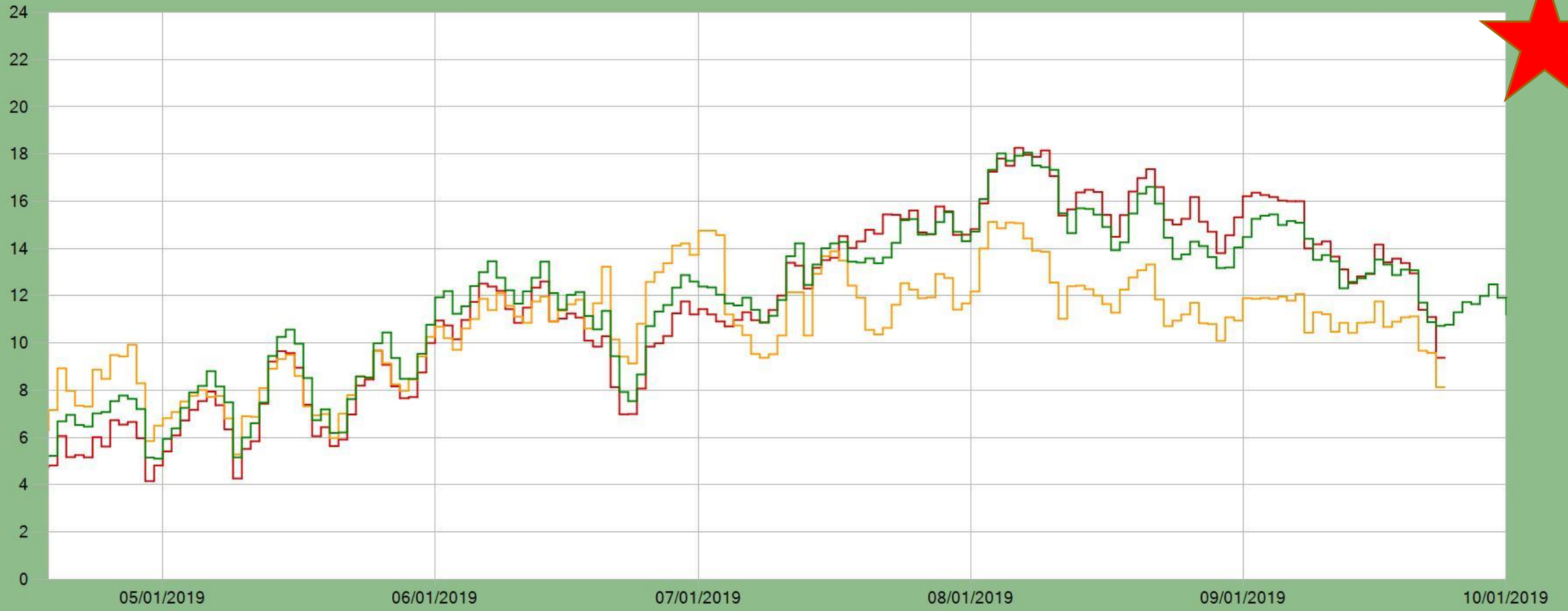


# Willow Creek Daily Average Temperature Downstream of Willow Creek Reservoir 2019



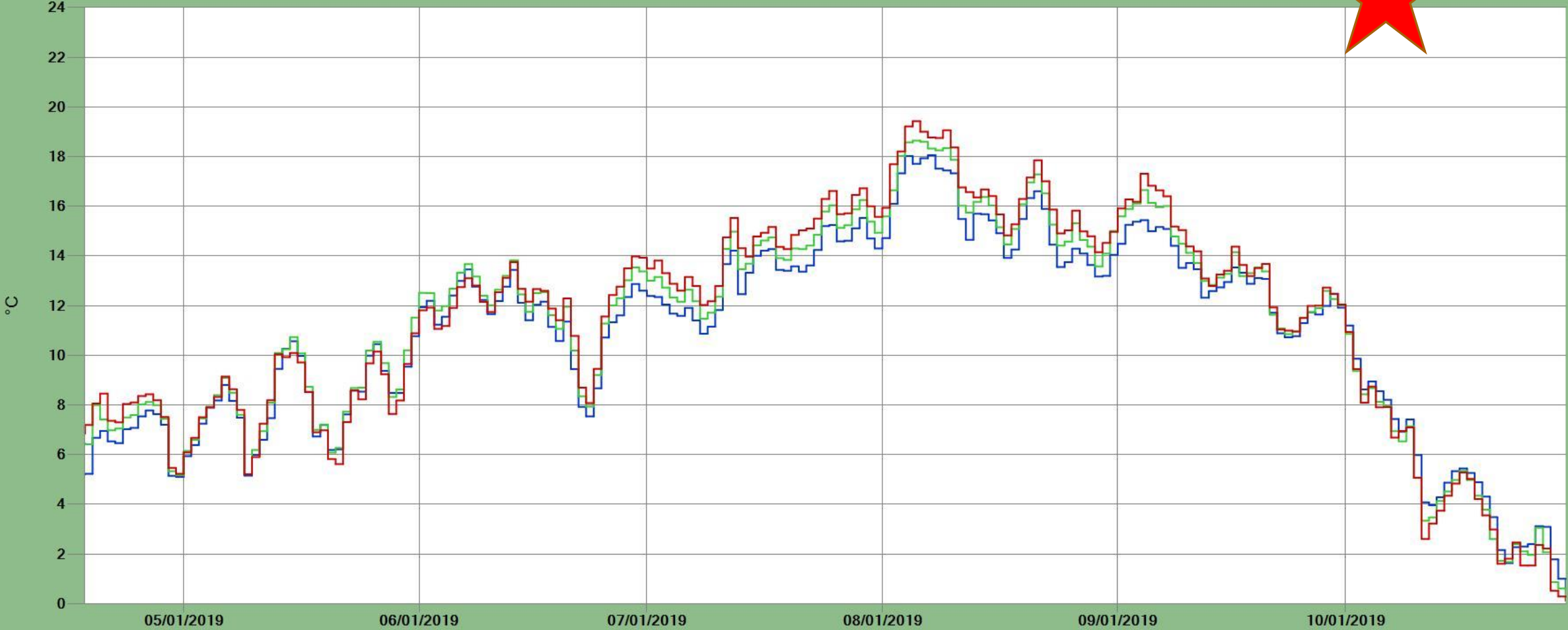
— WC-WCRD (WC-3.8)    — WC-abvBHD (WC-2.3)    — WC-abvCOR (WC-0.5)

# Colorado River Daily Average Temperature Upstream and Downstream of Windy Gap Reservoir



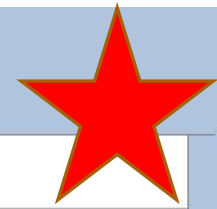
— Fraser Upstream FR-0.1 (FR-WGU) — Colorado Upstream CR-31 (CR-WGU) — Colorado Downstream CR-28.7 (CR-WGD)

Daily Average Temperature Windy Gap to Williams Fork



— CR-28.7 (CR-WGD) — CR-22.1 (CR-HSU) — CR-16.7 (CR-WFU)

# Water Temperature - Flow Comparison Downstream of Windy Gap Reservoir



— CR-WGD (28.7) Water Temp    — Discharge Downstream of Windy Gap Reservoir (CR-28.7)    — CR-WFU (CR-16.7) Water Temp