

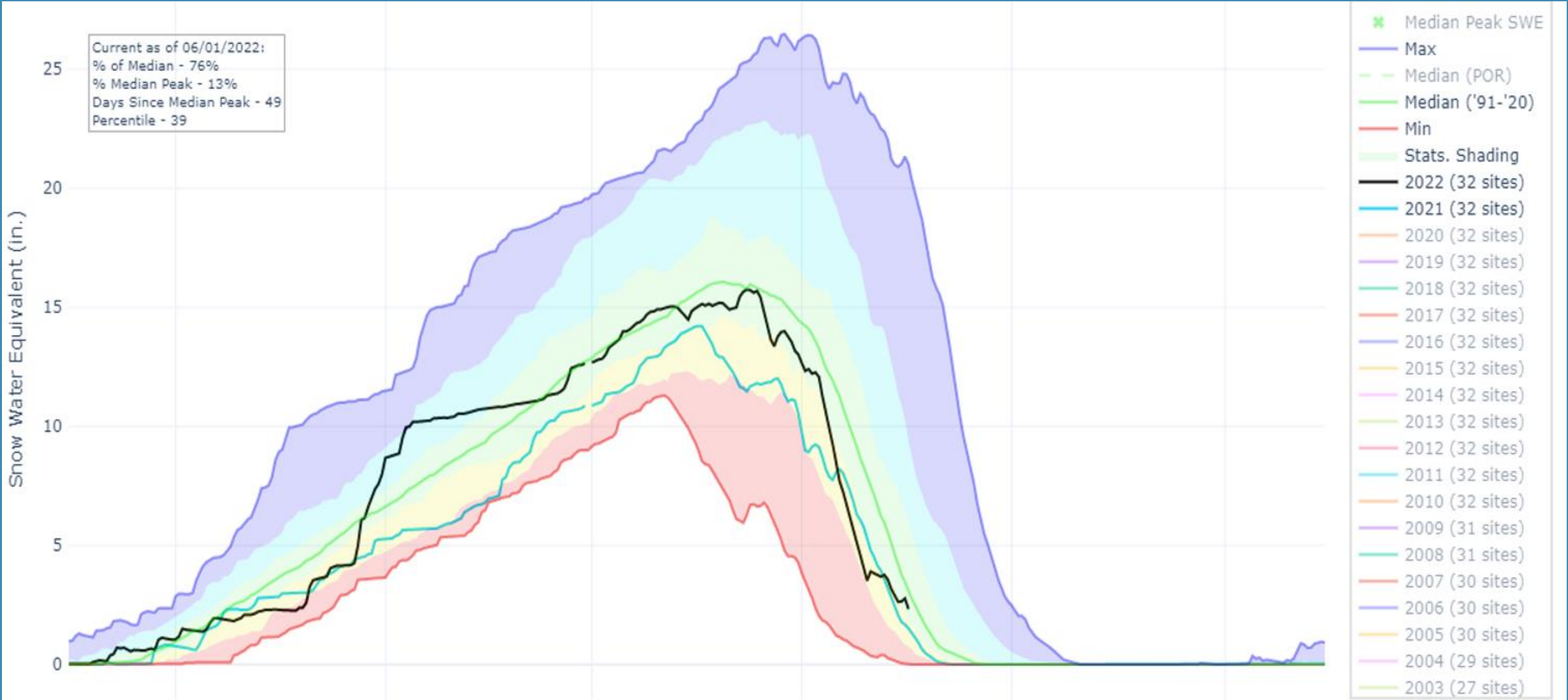


USGS PRESENTATION FOR THE EAST GRAND WATER QUALITY BOARD

JUNE 8, 2022

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USGS Colorado Water Science Center

COLORADO RIVER SNOWPACK SUMMARY



FRASER RIVER REAL-TIME DATA

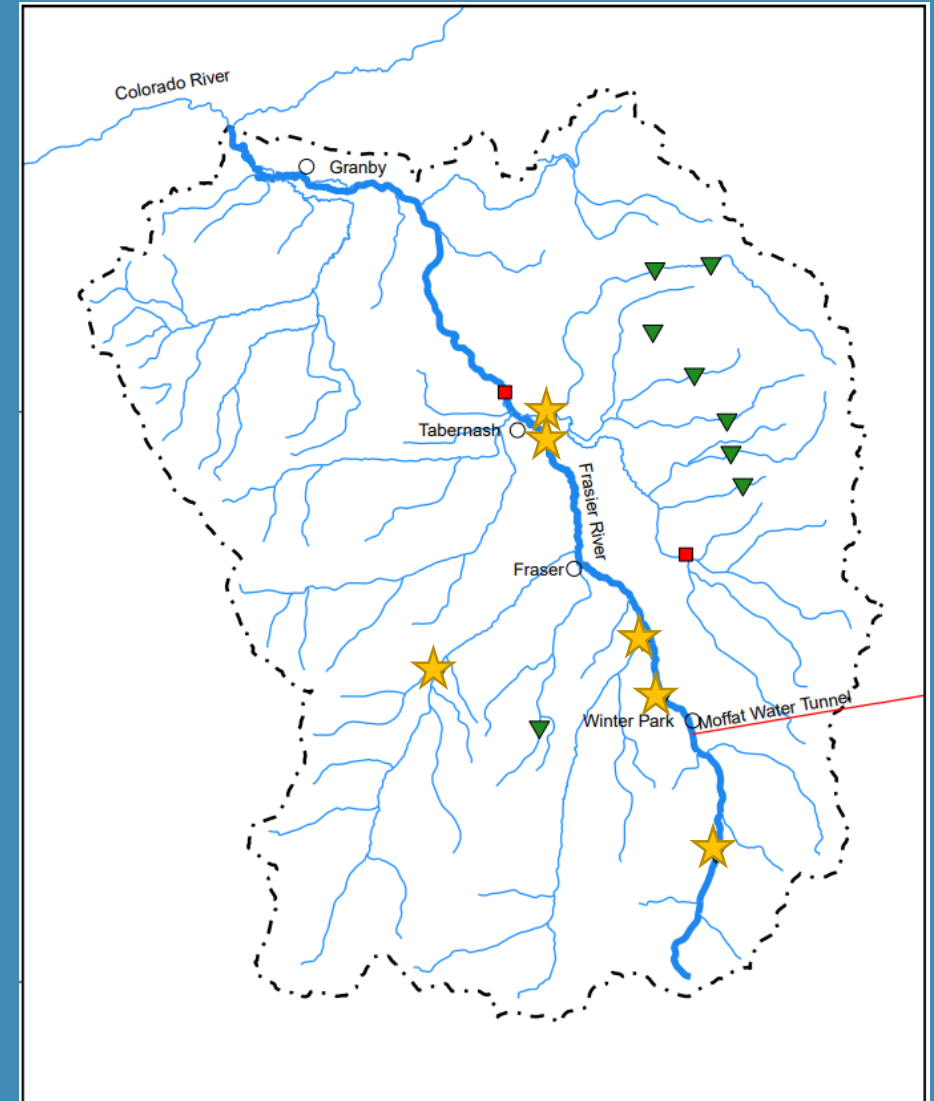
Fraser Basin Real-Time Data

2021 NGWOS Additions:

- Fraser River at Tabernash – Updated to a 5P Sonde

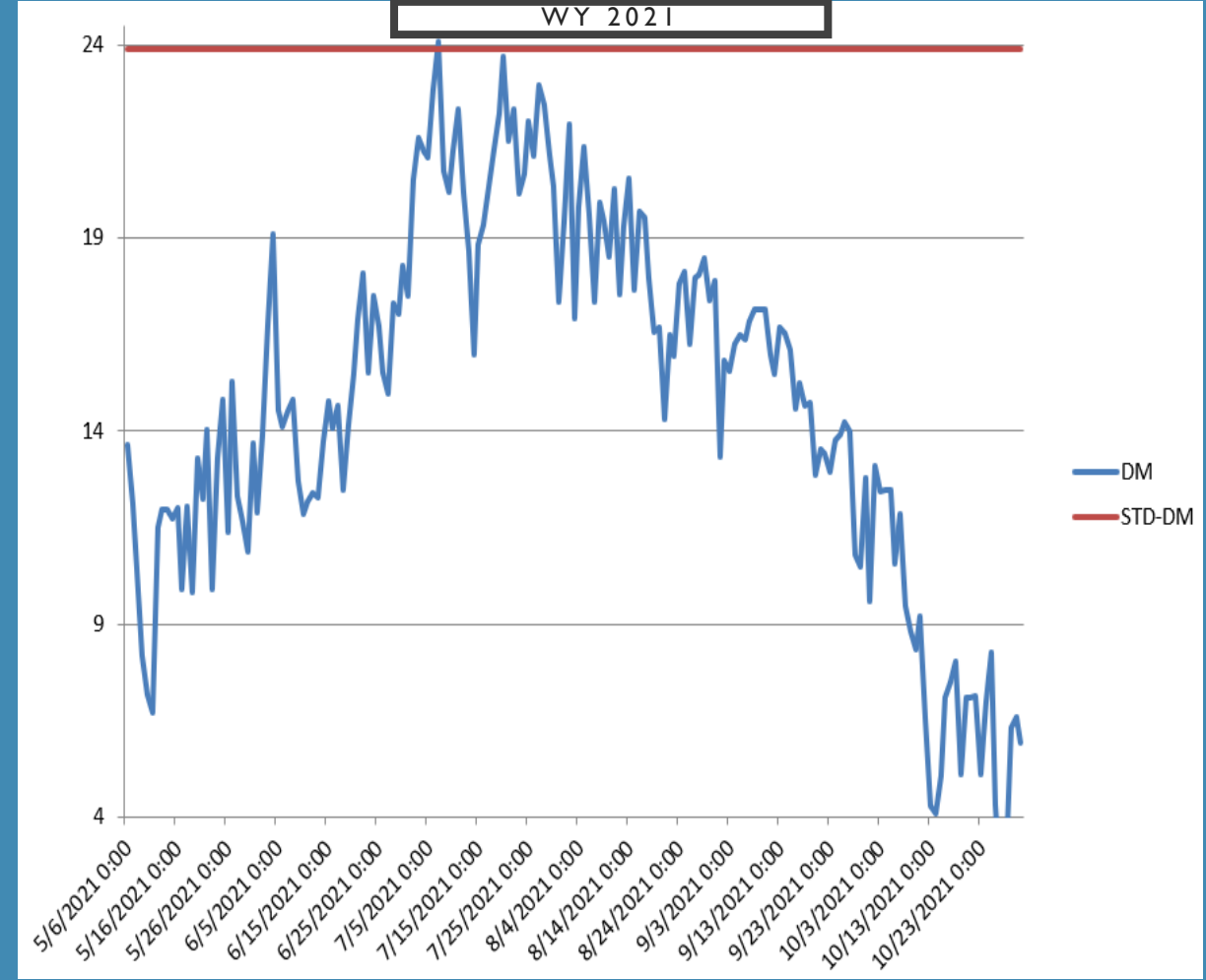
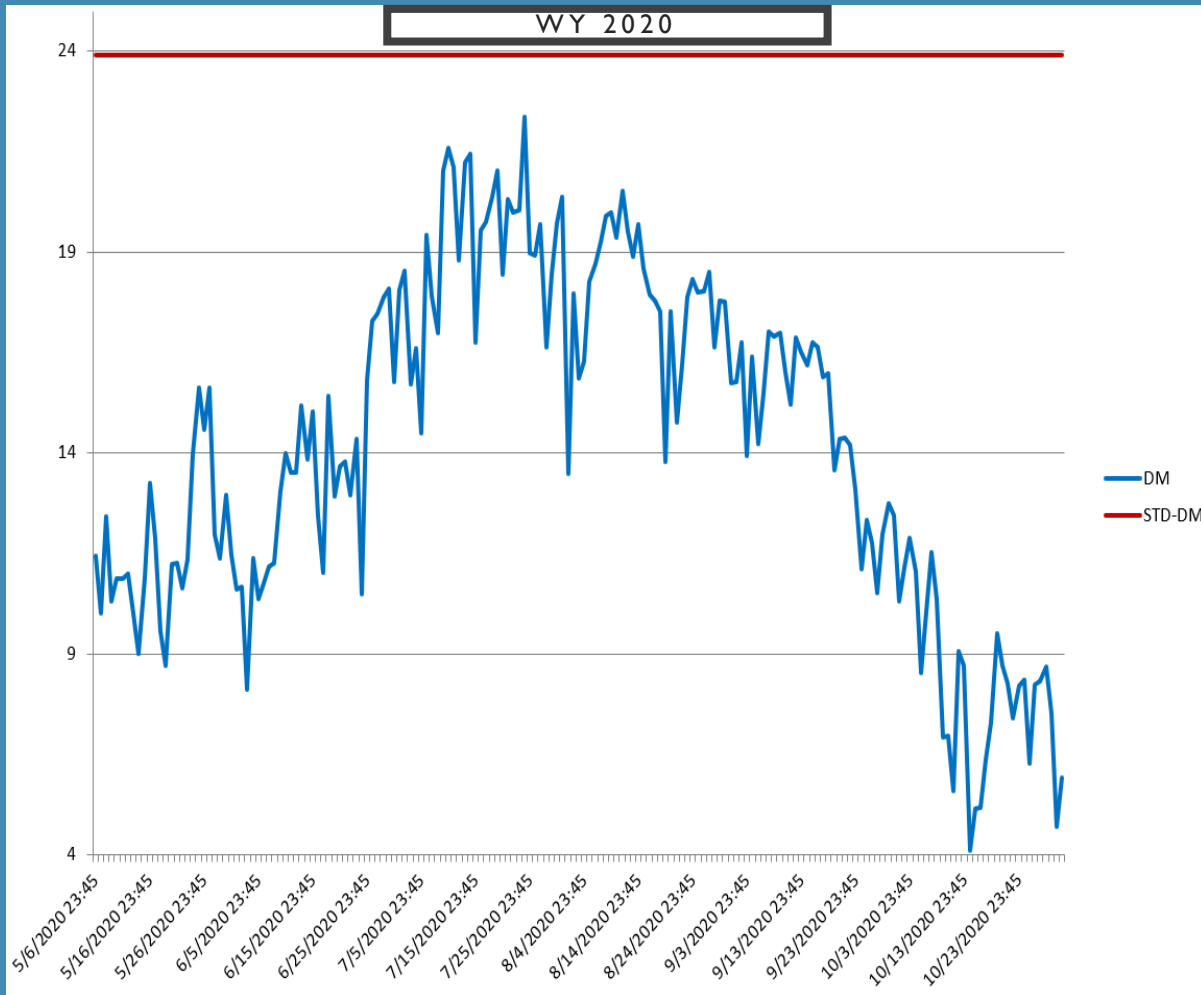
2022 NGWOS Additions:

- Fraser River at Upper Station - 2P Sonde
- Fraser River at Winter Park – 2P Sonde
- Vasquez Creek at Winter Park – 2P Sonde
- Saint Louis Creek nr. Fraser – 2P Sonde
- Ranch Creek blw. Meadow – Updated to a 2P Sonde



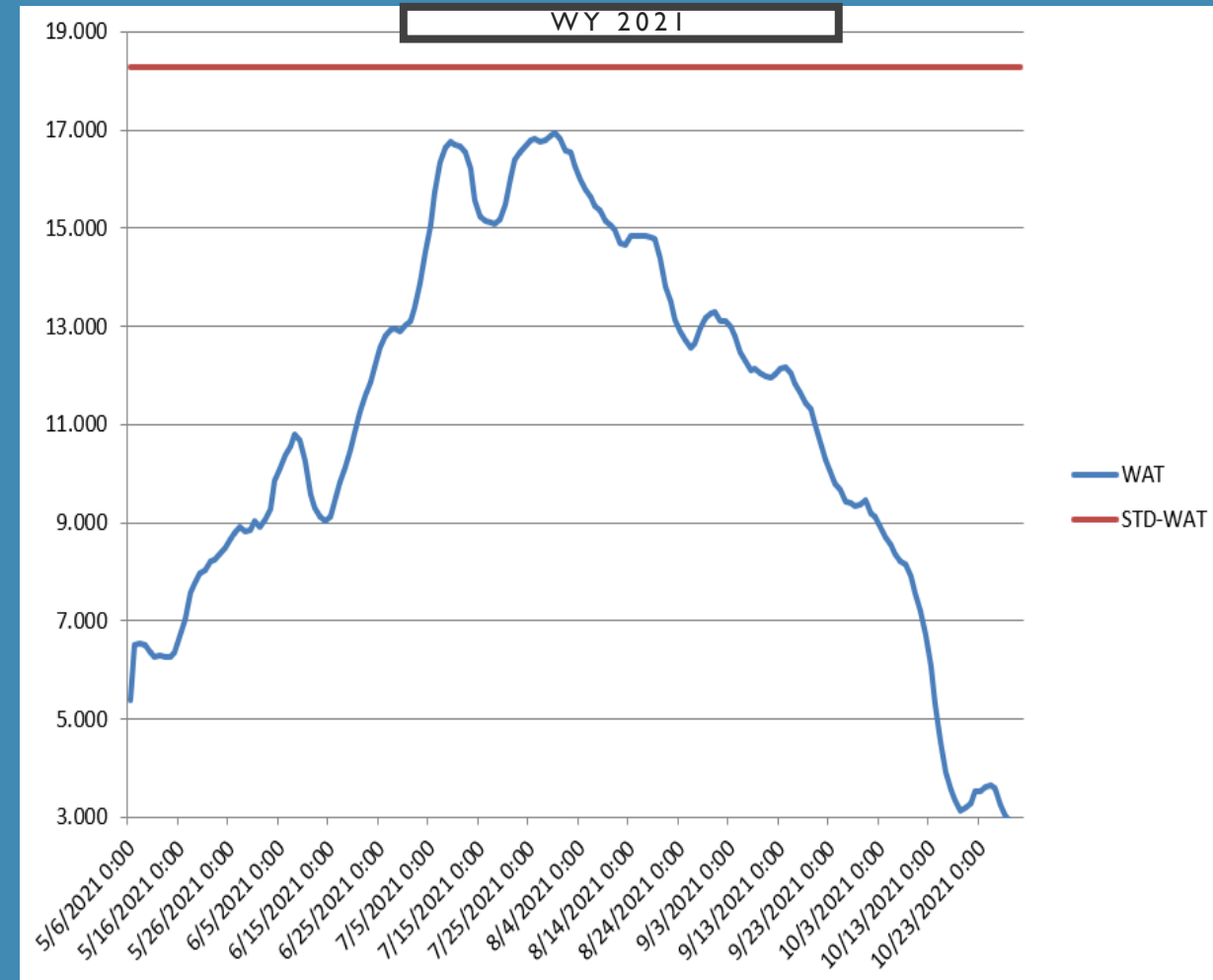
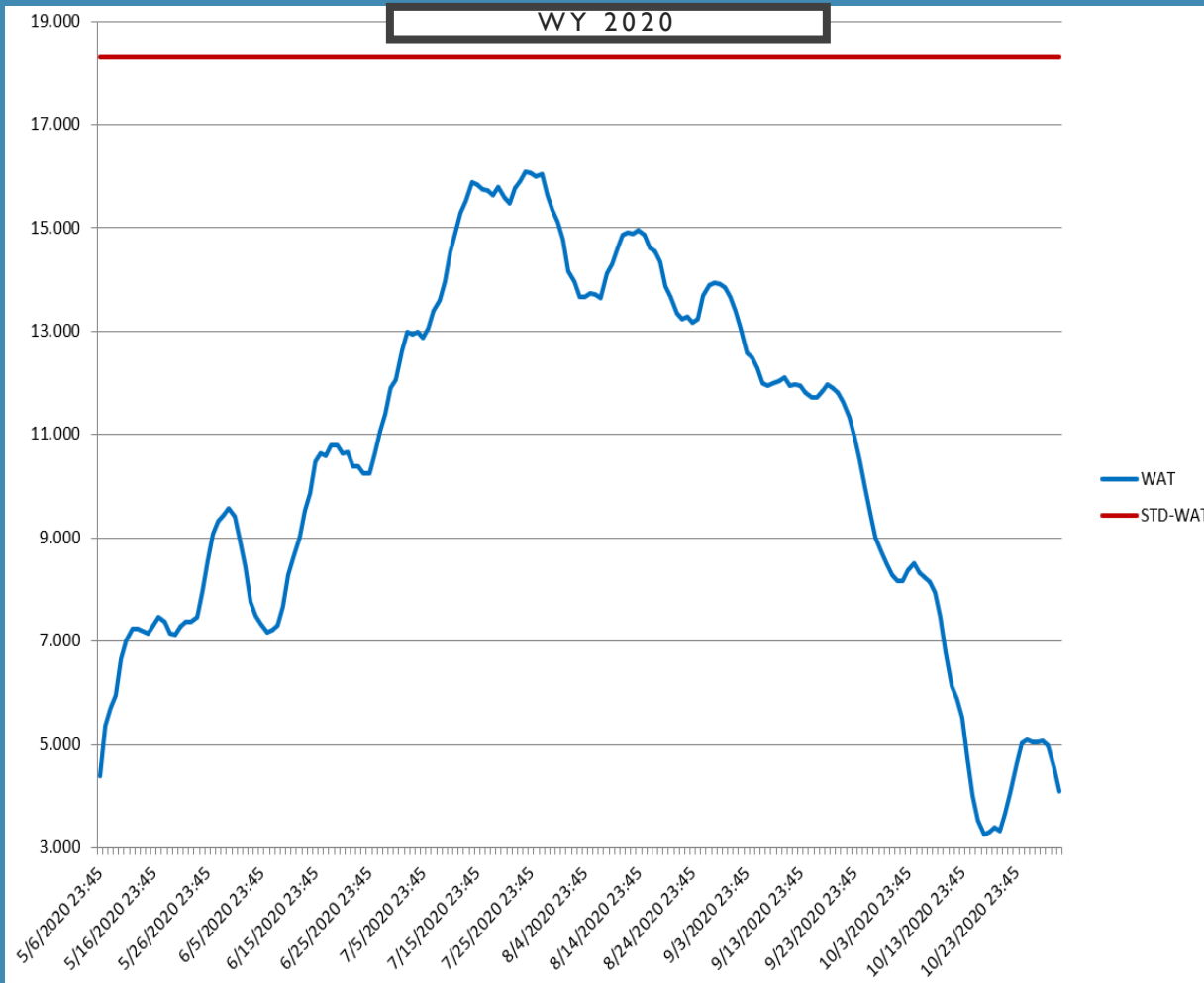
FRASER RIVER AT TABERNASH

DAILY MAXIMUM TEMPERATURE



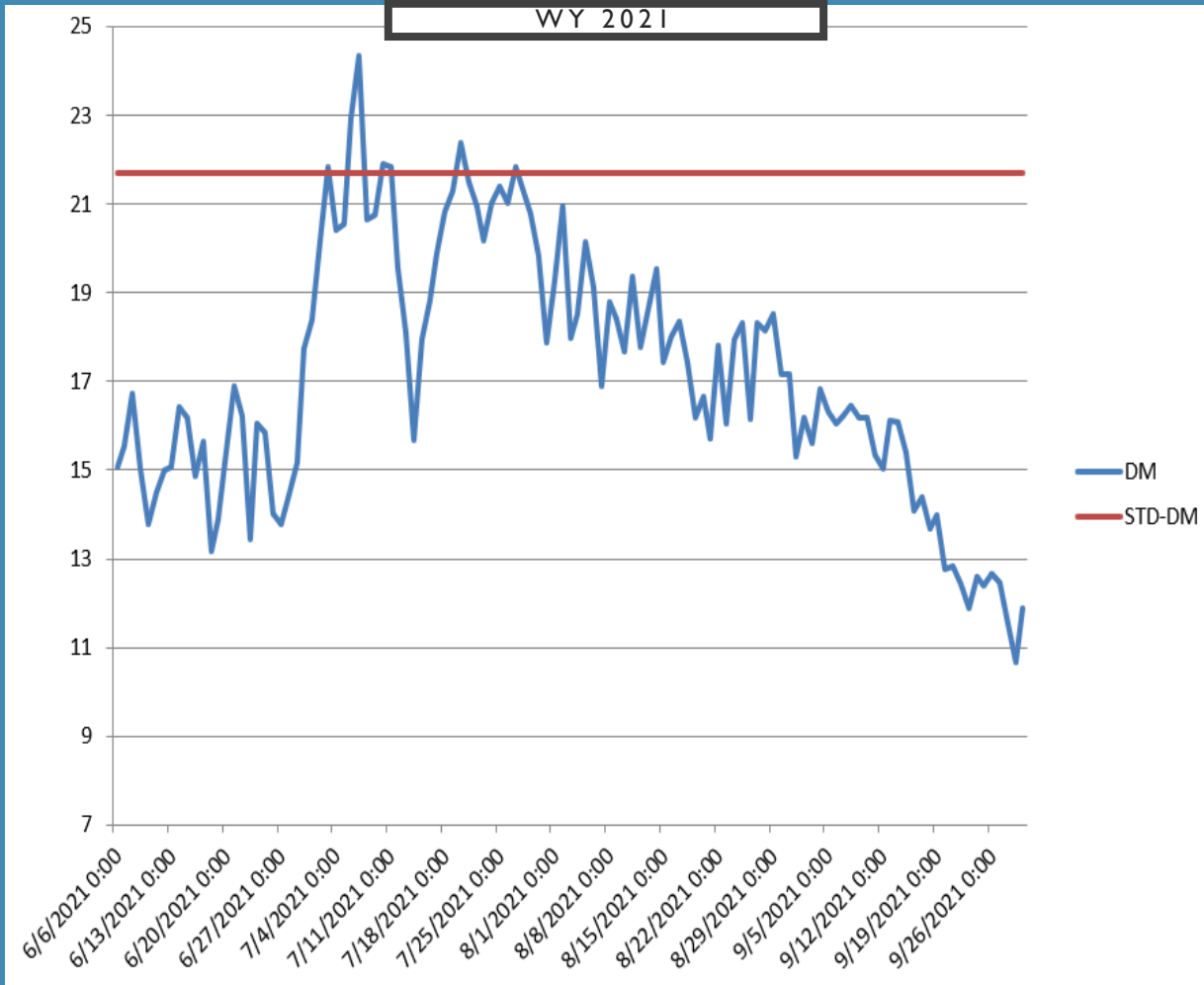
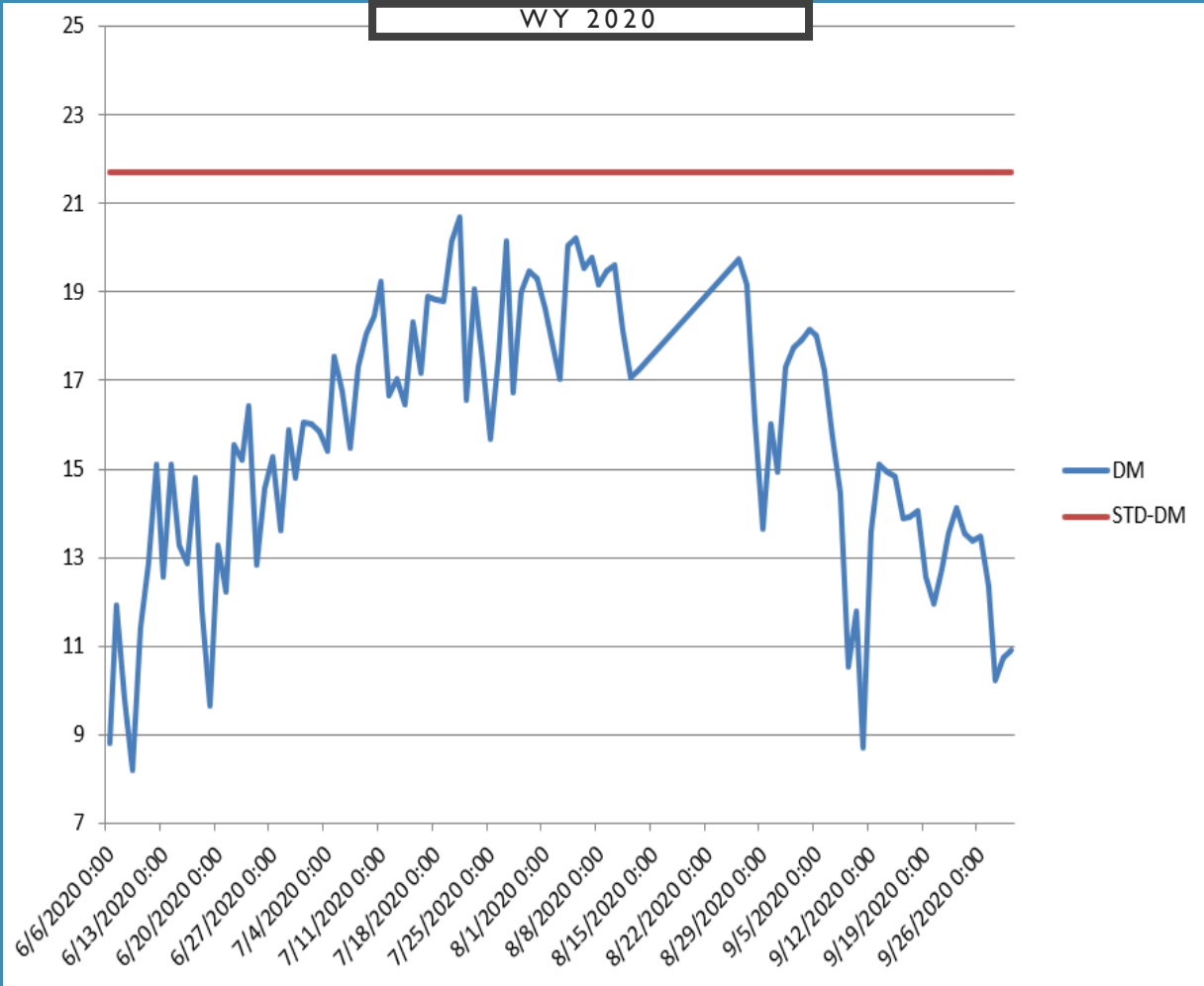
- Aquatic Life Warm Season DM Standard (April – October) – 23.9° C

FRASER RIVER AT TABERNASH WEEKLY AVERAGE TEMPERATURE



- Aquatic Life Warm Season WAT Standard – 18.3° C

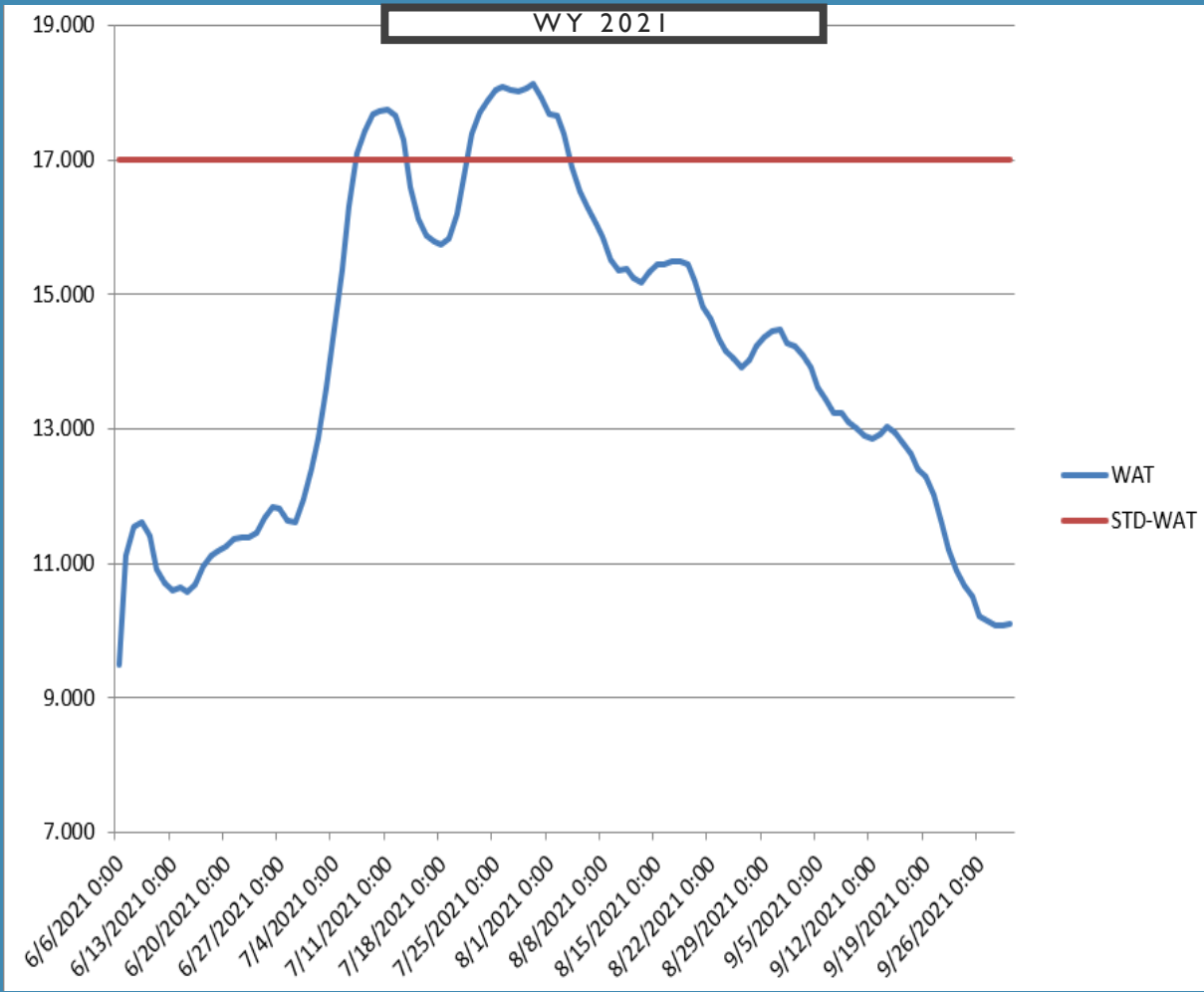
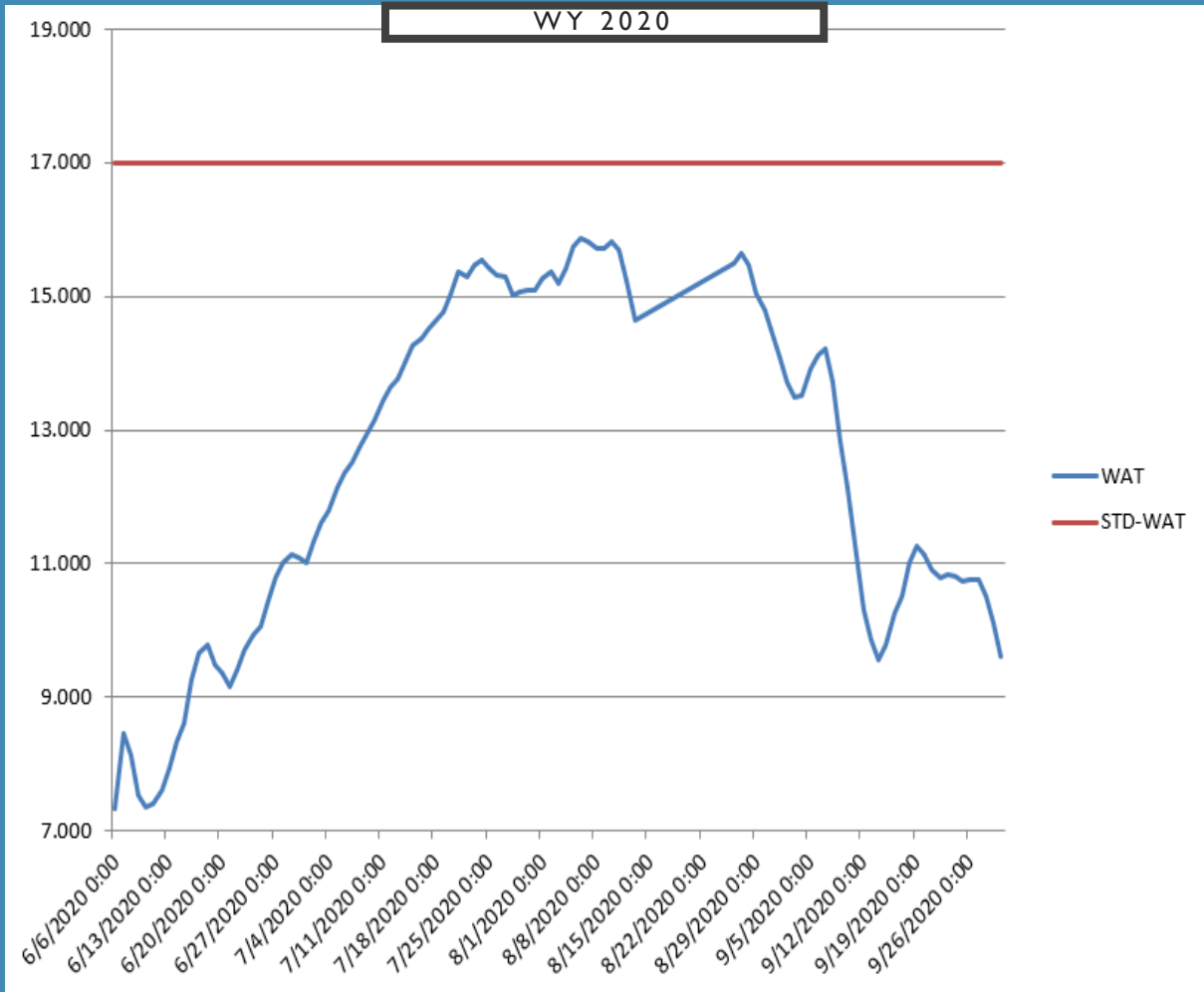
RANCH CREEK BLW. MEADOW CR. DAILY MAXIMUM TEMPERATURE



- Aquatic Life Warm Season DM Standard (June-September) – 21.7° C



RANCH CREEK BLW. MEADOW CR. WEEKLY AVERAGE TEMPERATURE



- Aquatic Life Warm Season WAT Standard (June-September) – 17.0° C



REAL-TIME WATER-QUALITY DATA

- Ranch Creek below Meadow Creek
 - WY 2020 data gap between August 13 – August 19, 2020
- Data Source:
 - U.S. Geological Survey, Current Conditions for Colorado: Water Quality: U.S. Geological Survey National Water Information System, accessed June 8, 2022, at <https://waterdata.usgs.gov/co/nwis/current/?type=quality>

EGWQB SAMPLING 2022-2024

EGWQB Sampling Matrix

Station Name	Parameter	Oct			Nov			Dec			Jan			Feb			Mar			Apr			May			Jun			Jul			Aug			Sep		
		2021	2022	2023	2021	2022	2023	2021	2022	2023	2022	2023	2024	2022	2023	2024	2022	2023	2024	2022	2023	2024	2022	2023	2024	2022	2023	2024	2022	2023	2024	2022	2023	2024			
Fraser R at Upper Station	N, M	x				x				x	x			x			x	x			x				x				x				x				
Fraser R above Moffat Tunnel	Mo, Hg	x				x				x	x			x			x	x			x				x				x				x				
Fraser R below Buck Creek	Mo, Hg, N	x				x				x	x			x			x	x			x				x				x				x				
Fraser R below Vasquez Cr	N, M	x				x				x	x			x			x	x			x				x				x				x				
Fraser R below St Louis Cr	N, M	x				x				x	x			x			x	x			x				x				x				x				
Fraser R at Tabernash	N, M	x				x				x	x			x			x	x			x				x				x				x				
Fraser R below Crooked Creek	N, M	x				x				x	x			x			x	x			x				x				x				x				
Fraser R at Hwy40	N, M	x				x				x	x			x			x	x			x				x				x				x				
Fraser R near mouth	N, M	x				x				x	x			x			x	x			x				x				x				x				
Ranch Cr below Meadow Cr	N, M	x				x				x	x			x			x	x			x				x				x				x				
Ranch Cr near Fraser	N, M	x									x							x																			
Ranch Cr below Cabin Cr	N, M	x									x							x																			
Vasquez Cr at Winter Park	N, M																																				
St Louis Cr above Fraser near mouth	N, M										x																										
Crooked Cr above Pole Cr	N, M																																				
Pole Cr at Mouth	N, M																																				

Annual Monitoring Sites	M - METALS (Cu, Pb, Zn, Fe, Ca, Mg)
Alternating Sites - 2022	Mo - MOFFAT TUNNEL SUITE
Alternating Sites - 2023	N - NUTRIENTS, CHLORIDE
Alternating Sites - 2024	Hg - MERCURY

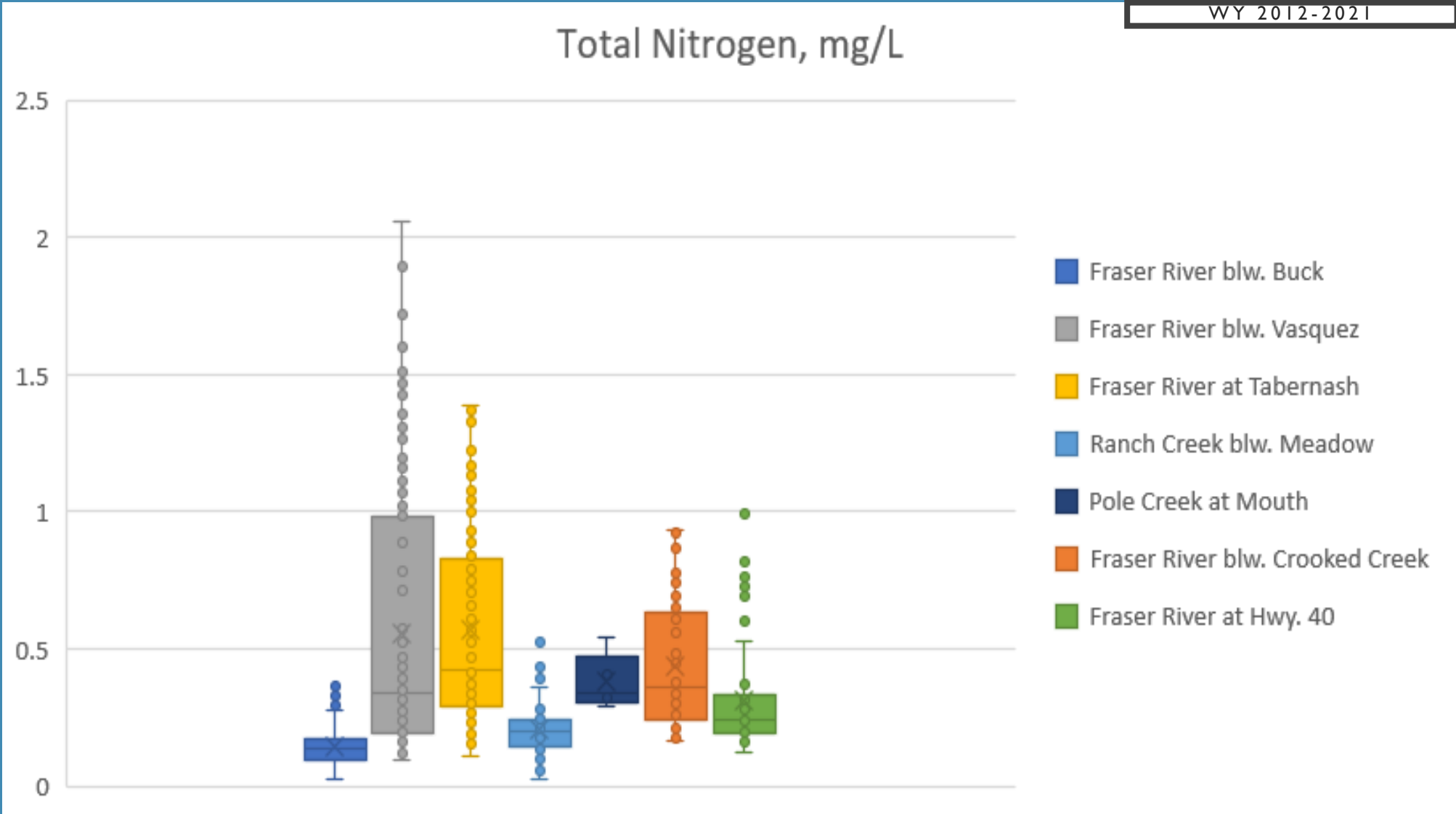


FRASER RIVER NUTRIENTS

- Total Nitrogen ($\text{NH}_3 + \text{NO}_2 + \text{NO}_3 + \text{Organic N}$)
- Nitrogen, ammonia as N
- Nitrogen, nitrite
- $\text{NO}_3 + \text{NO}_2$, as N
- Total Phosphorus
- Phosphorus, orthophosphate

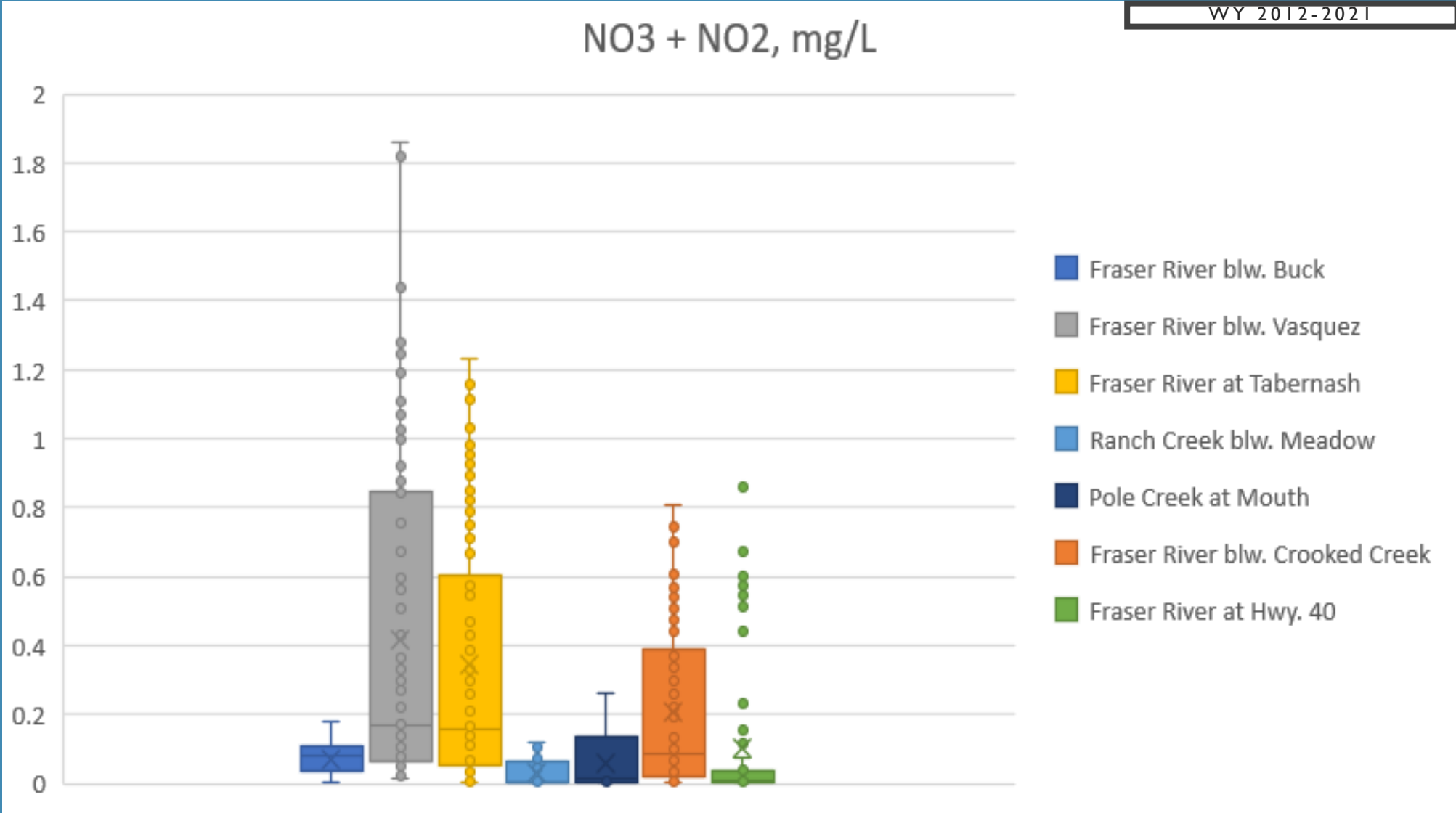
TOTAL NITROGEN

WY 2012-2021



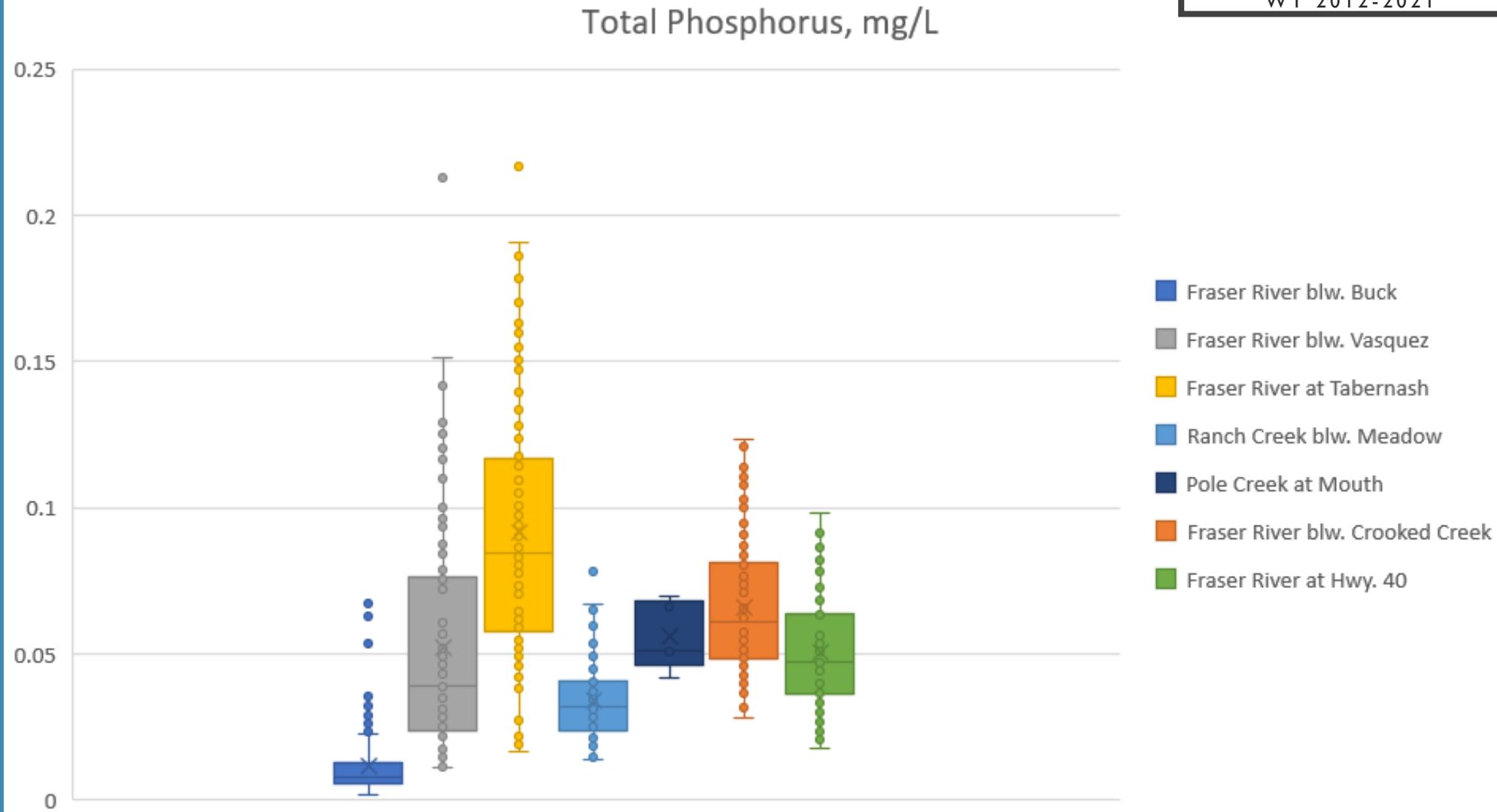
NO3 + NO2 (MG/L)

WY 2012-2021



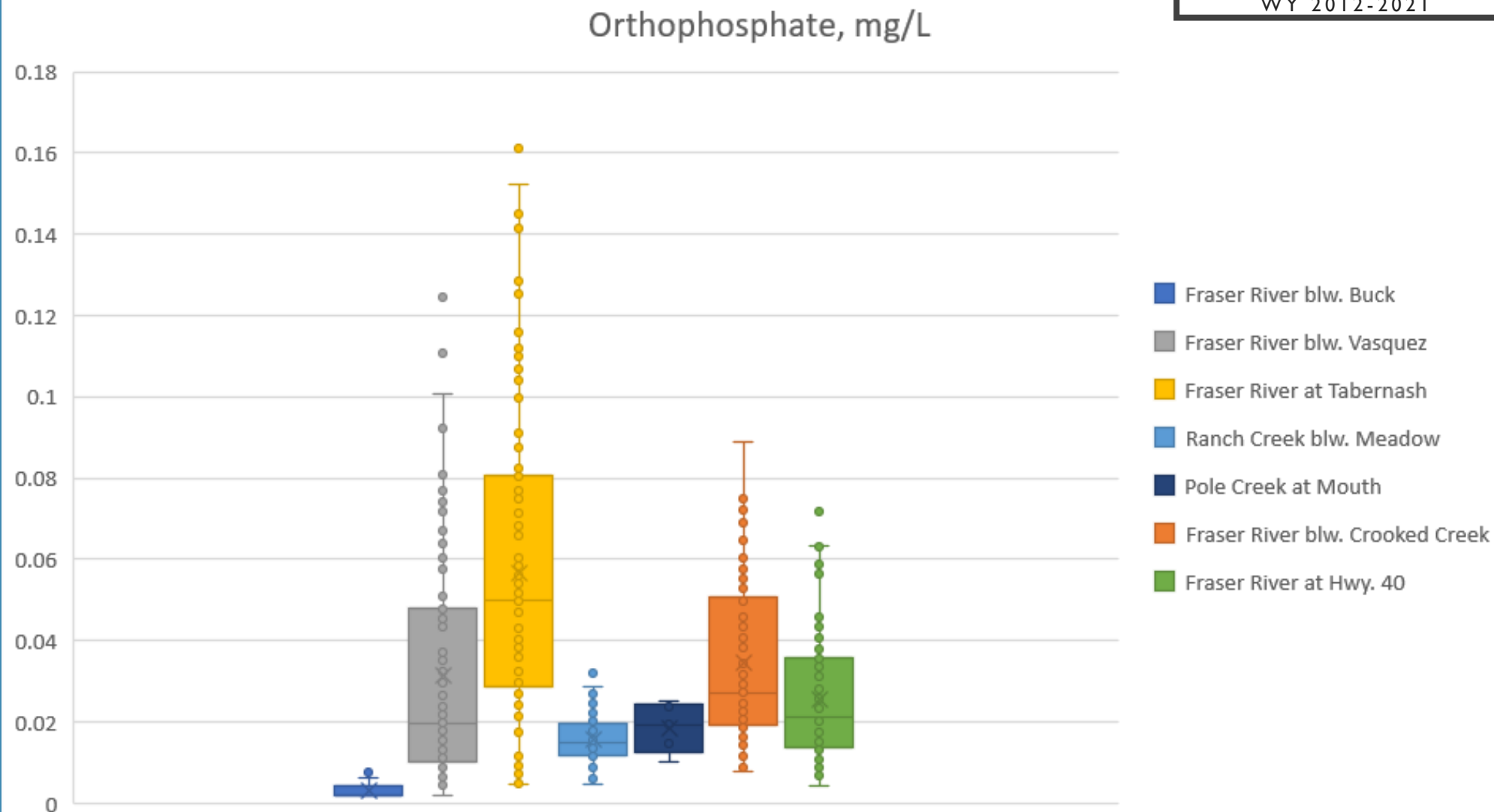
TOTAL PHOSPHORUS (MG/L)

WY 2012-2021



ORTHOPHOSPHATE (MG/L)

WY 2012-2021

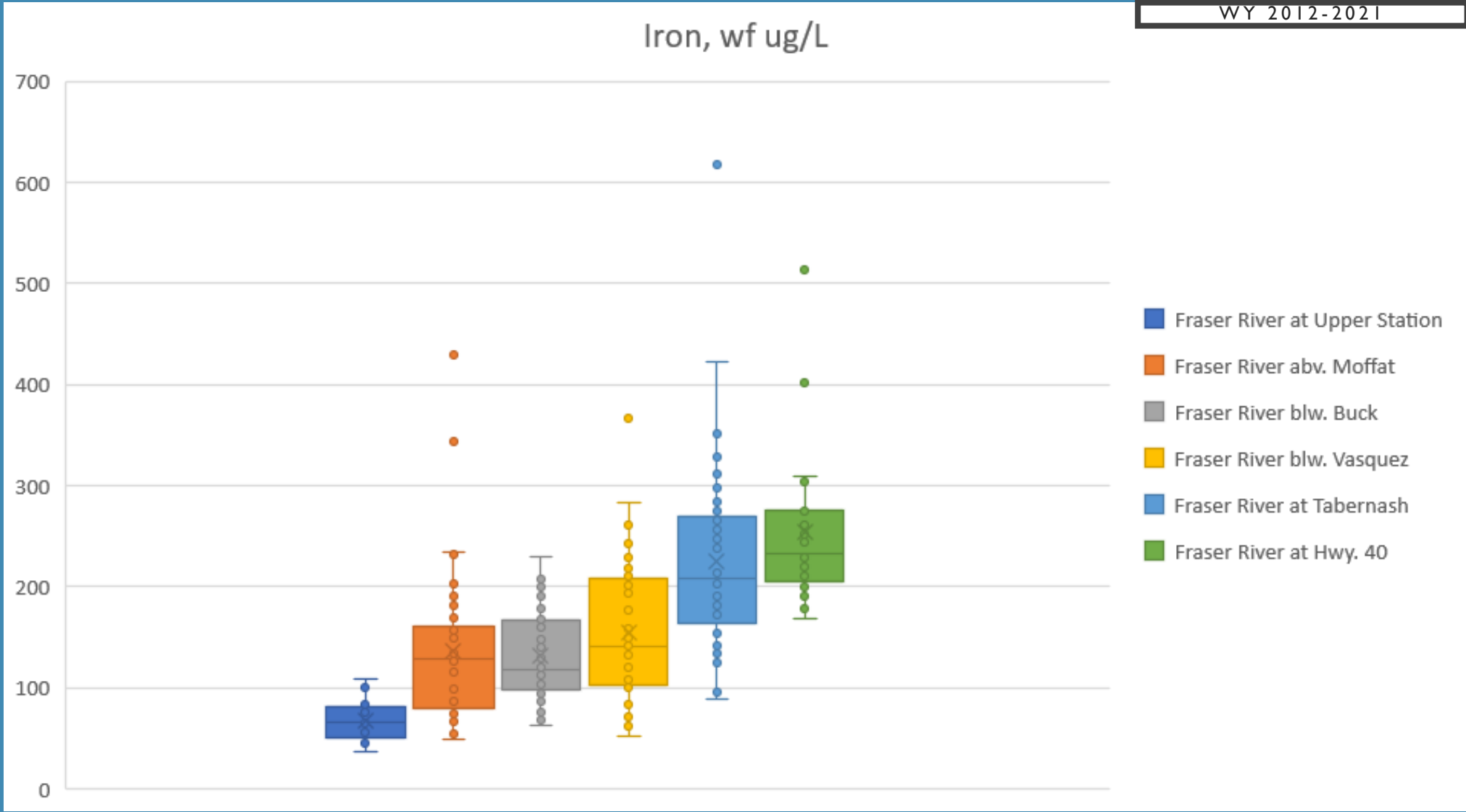


FRASER RIVER TRACE ELEMENTS

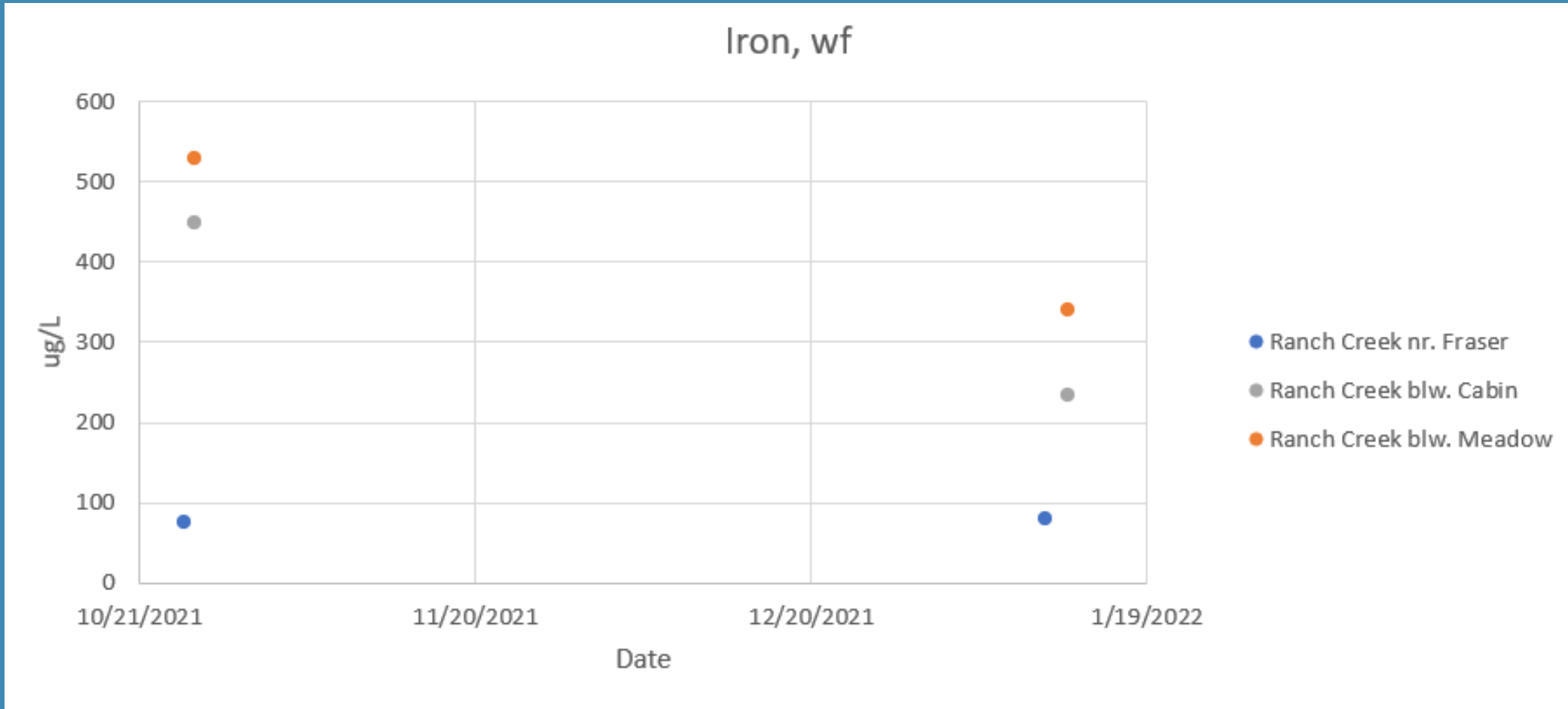
- Copper, wf (ug/L)
- Iron, wf (ug/L)
- Lead, wf (ug/L)
- Zinc, wf (ug/L)

IRON, WF (UG/L)

WY 2012-2021

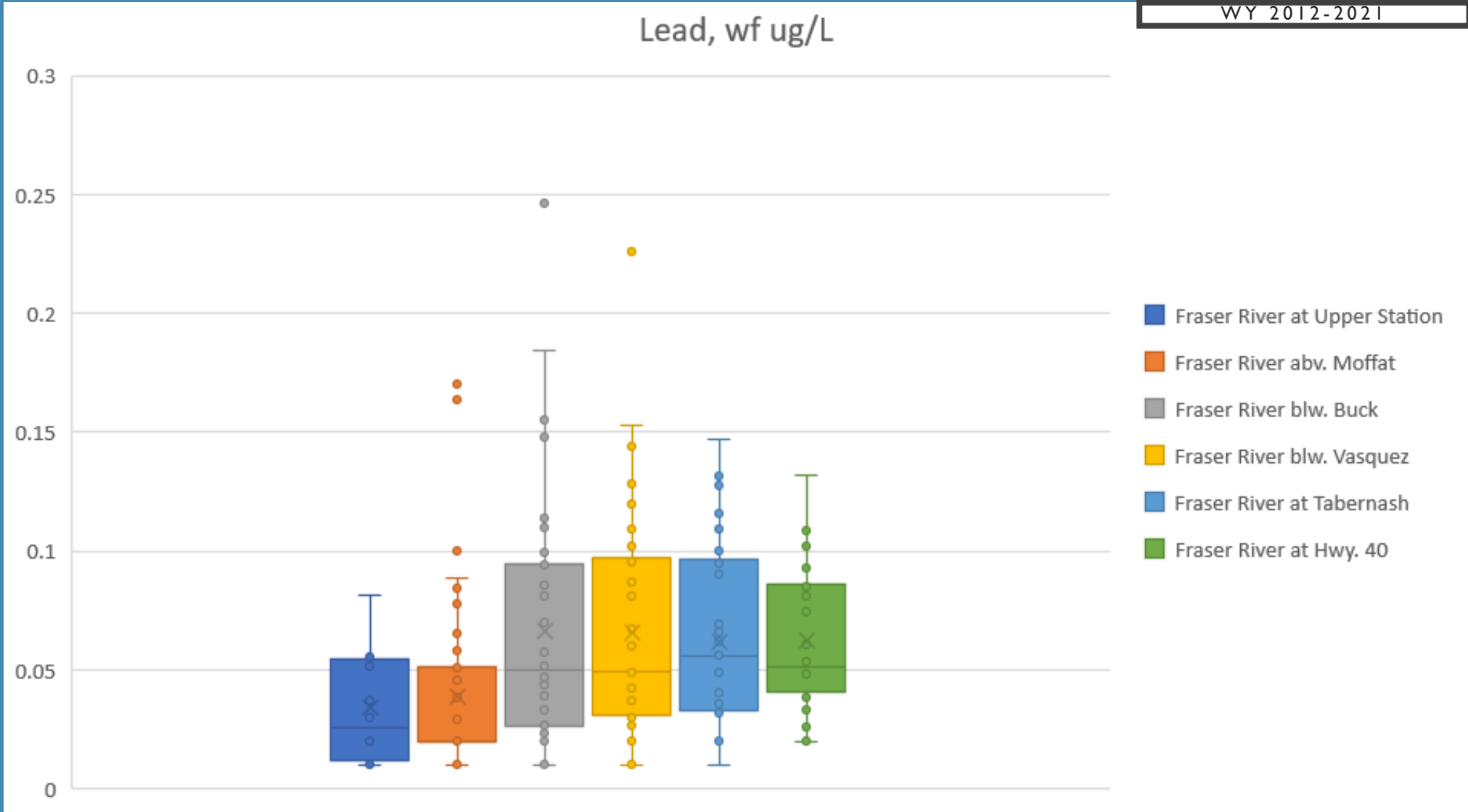


IRON, WF (UG/L)



LEAD, WF (UG/L)

WY 2012-2021



DISCRETE WATER-QUALITY DATA

- Box plots include all available approved data between WY 2012 – WY 2021
 - Pole Creek at Mouth includes WY 2021 data only
- Lab results that were non-detects were assumed to be half of the detection limit in the plots
 - For example: <0.04 ug/L is assumed to be 0.02 ug/L
- Data Source:
 - U.S. Geological Survey, Water Quality Samples for Colorado; U.S. Geological Survey National Water Information System, accessed June 8, 2022, at <https://nwis.waterdata.usgs.gov/co/nwis/qwdata>

UPPER COLORADO RIVER BASIN

- PFAS/Pharmaceutical Study
 - 12 River Sites
 - Winter Park WWTP
 - Tabernash WWTP
- GW/SW Interaction Project – Fraser Basin and Upper Colorado River Basin
 - 5 Sites located between Winter Park and Fraser
- Lake profiler on Willow Creek Reservoir
 - [Willow Creek Reservoir](#)
 - WT, SC, pH, DO, Turbidity, fCHL, fPC
- Satellite Imagery to predict chlorophyll (Algae Blooms)
 - Three Lakes System
 - Colorado River at Cameo
 - Blue Mesa Reservoir