



Roadmap Temperature TAC update



COLORADO
Department of Public
Health & Environment

November 14th, 2018
Glenwood Springs, CO

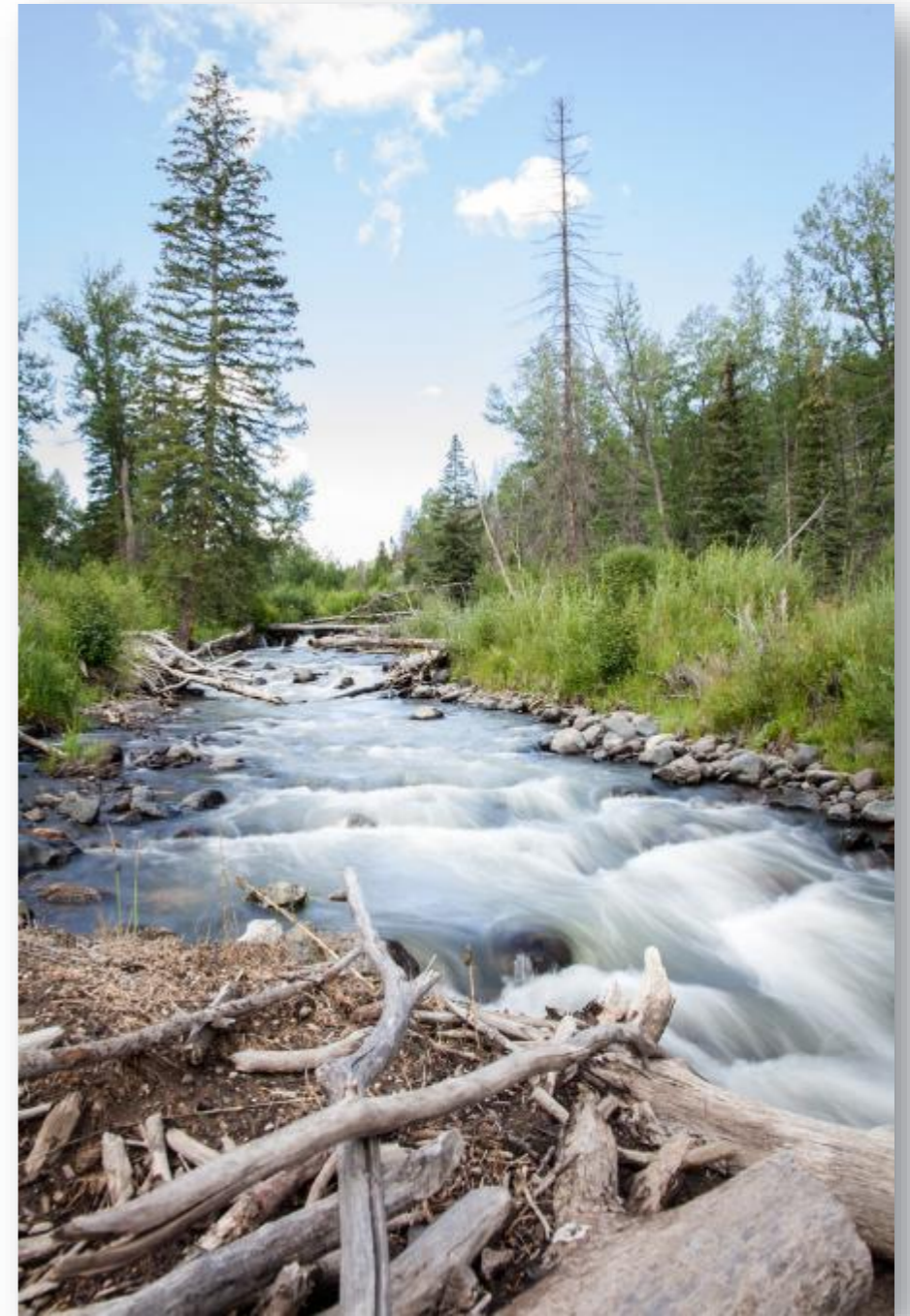
Temperature TAC Meetings

TAC meeting in June 2018

- Johnny Darter Study

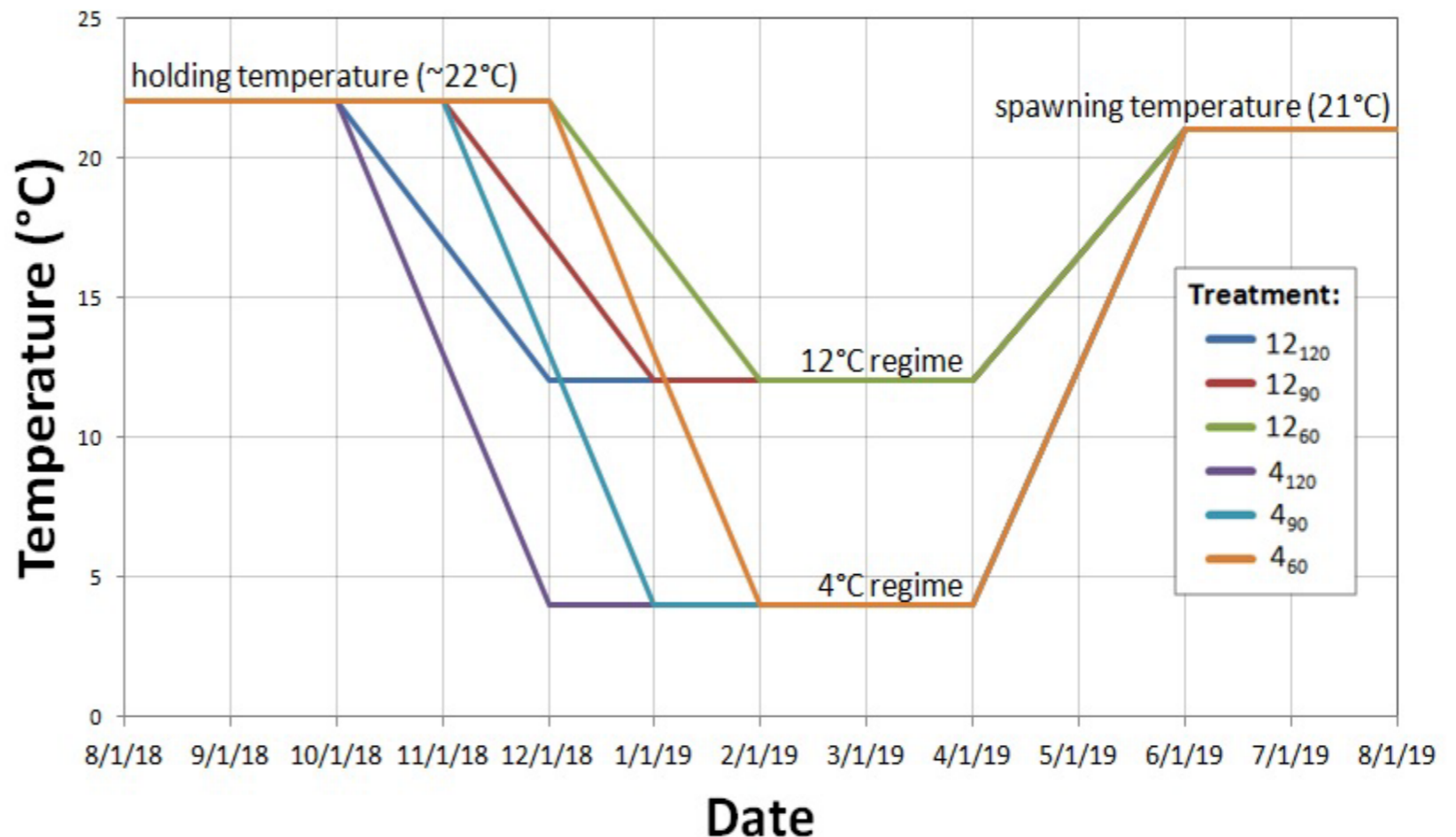
TAC meeting in October 2018

- Realized Thermal Niche
- Existing Quality
- TZ paper coming...



Johnny Darter Study

- Warm water winter study white paper recommendation
- CSU-larval fish lab CPW/CSU co-op
- Similar to Red Buttes Firkus et al 2017 study
- Wild caught JDs from CO front range streams (WS-I streams)



Johnny Darter Study

Table 2. Project schedule for Johnny Darter temperature study.				
Phase of Study	2018	2019	2020	2021
Proposal	X			
Experiment 1 (Laboratory Component)	X	X		
Experiment 2 (Field Component)		X	X	
Data Analysis & Writing		X	X	
Quarterly and Annual Reports	X	X	X	
M.S. Thesis Complete				X

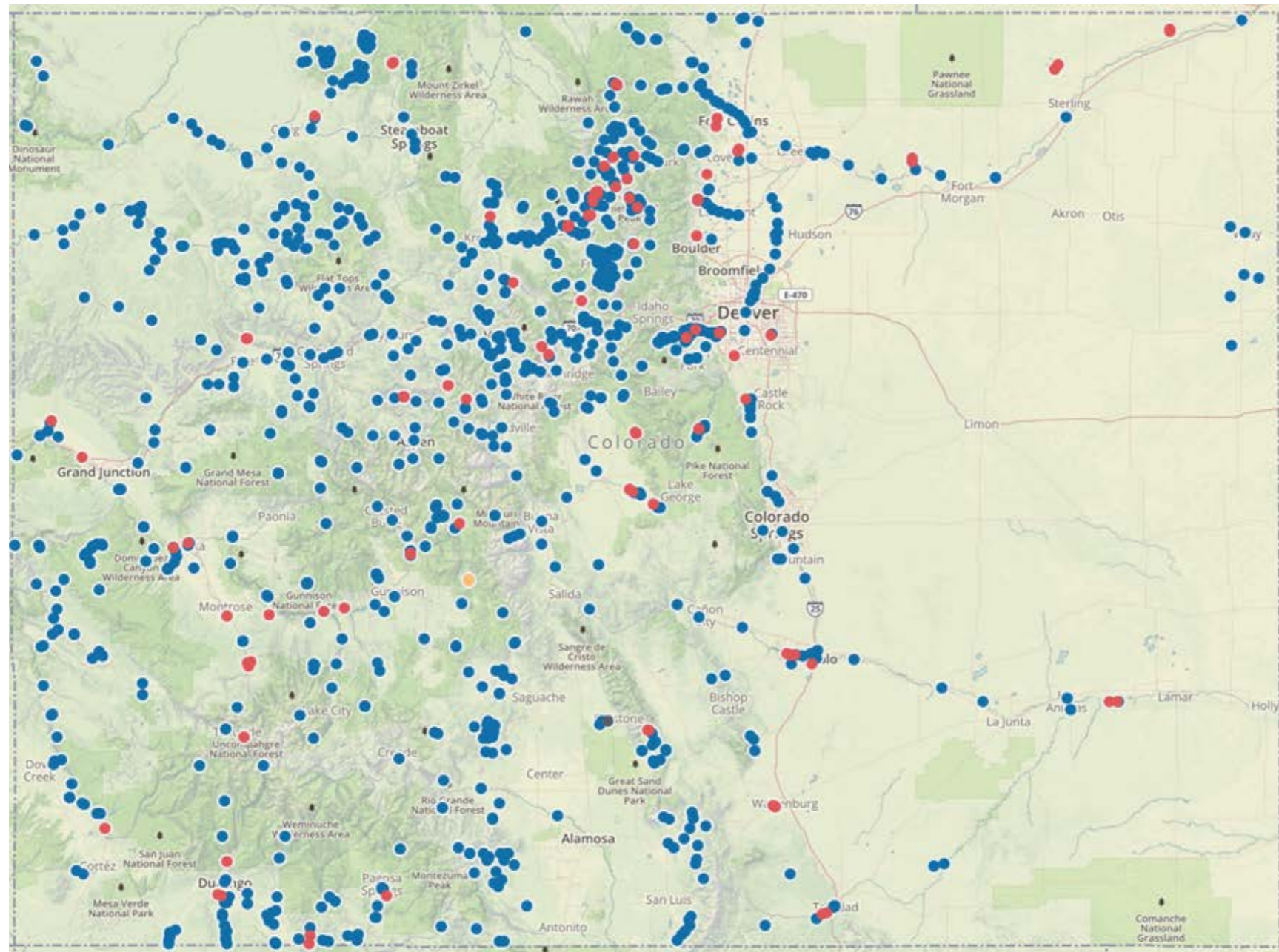
- Went under contract in August 2018
- Pending study results, WS-II species are also recommended for study



October TAC Meeting

- Thermal niche project with CPW - Andrew Treble
- Temperature paired with species location
- Logger + fish pairing criteria
 - Logger is on the same CPW watercode as fish sampling site
 - Logger is within 2.000m buffer of fish sampling site
 - Sampling date is within +/- 1 year of start/end of logger date

October TAC Meeting



Temperature
Logger Locations

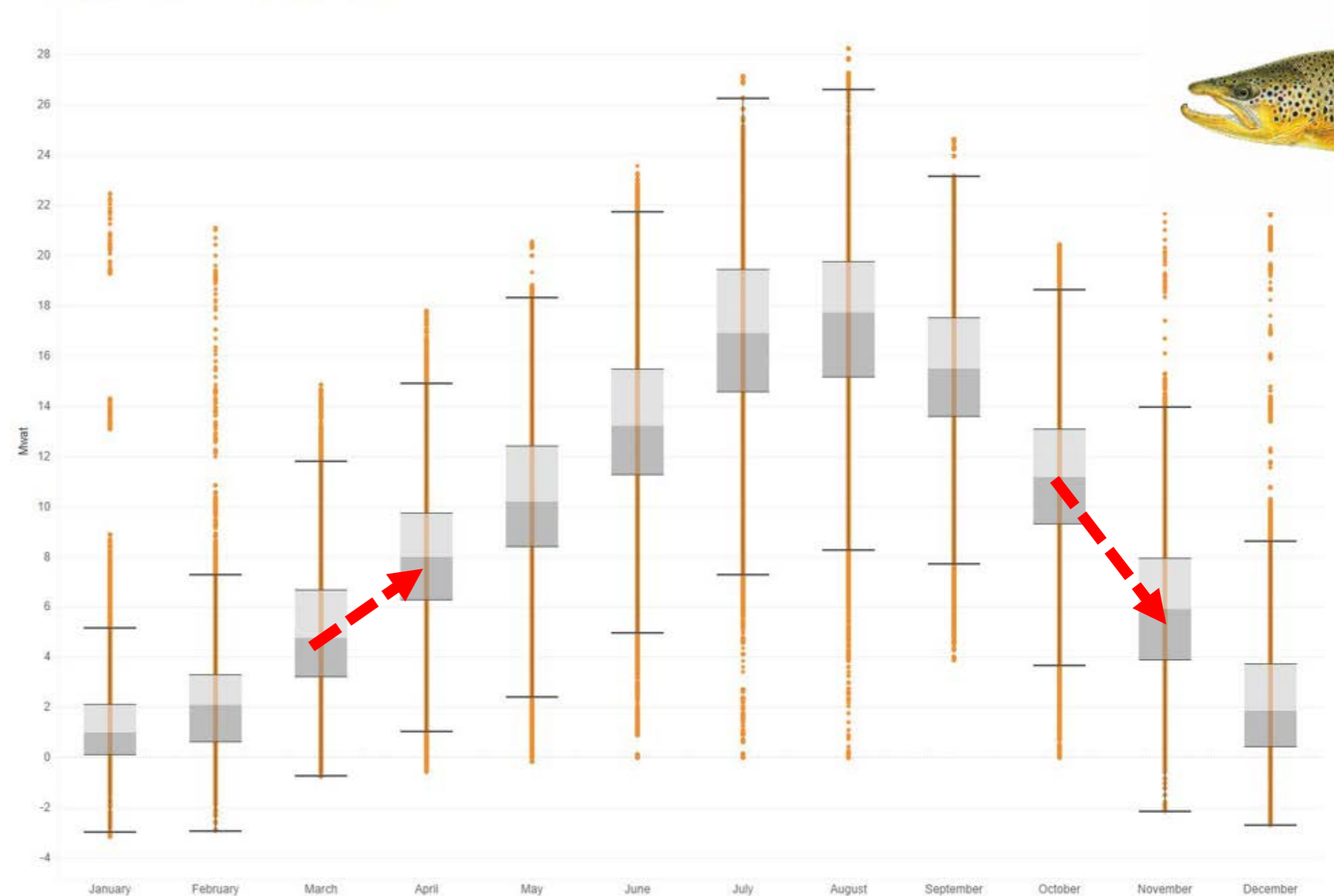


6,443 unique logger site-fish survey site pairings

October TAC Meeting

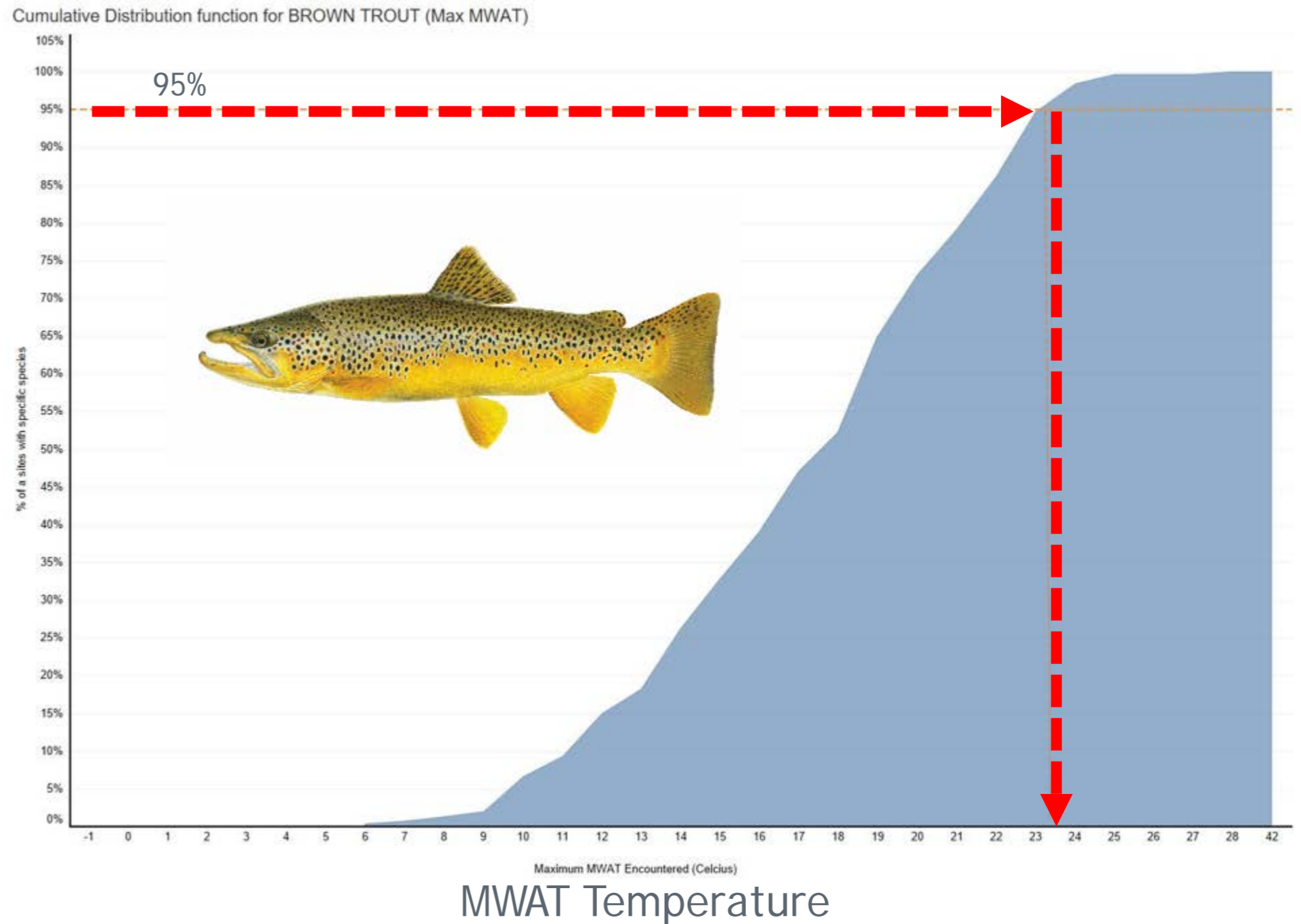
- Potential uses
 - Determining protective shoulder season standards

Thermograph Boxplots for BROWN TROUT



October TAC Meeting

- Potential uses continued
 - Criteria refinement for species without laboratory data
 - Validation of SSS/new lab papers
 - Other potential uses



October TAC Meeting

- Remove populations where condition factor or biologists suggest population is not doing well
- Remove populations that receive stocking
- Remove reaches that receive heavy inputs from upstream reservoir
- Comparison of thermal regimes of similar stations where species is present versus where species is absent
- Look at cumulative distribution frequency of MWAT < 9°C

Existing Quality for Temperature

2016 WQCD proposal to replace excursions with warming event—WQCC adopted event and kept excursions.

Warming event-degree day allowance specified in listing methodology

EPA letter to WQCC - not likely approvable

Existing Quality for Temperature

Assessment Details	2016 (STATEWIDE) Sites/Segments	2018 (SJ/GU Ark/Rio) Sites/Segments	Total Sites/Segments	% Removed from Impairment
Assessed	213	68/43	281	
Warming Event Applied	66	11/8	77	
Removed by Warming Event	9	1	10	13%
Air Excursions Applied	123	23/19	146	
Removed by Air Excursions	16	2/1	18	12%
Low Flow Applied	85	7/7	92	
Removed by Low Flow Excursions	0	0	0	0

Broad TAC agreement both excursions and warming event should not be kept, letter forthcoming.

Future TACs: Focused on Temperature Standards Progress/Refinement

- Transition zone (next white paper)
- Continue thermal niche support work
- JD Study results
- Literature/Data reviews

TEMPERATURE TIER	TIER CODE	SPECIES EXPECTED TO BE PRESENT	APPLICABLE MONTHS	TEMPERATURE STANDARD (°C)	
				(MWAT)	(DM)
Cold Stream Tier I	CS-I	brook trout, cutthroat trout	June – Sept.	17.0	21.7
			Oct. – May	9.0	13.0
Cold Stream Tier II	CS-II	brown trout, rainbow trout, mottled sculpin, mountain whitefish, longnose sucker, Arctic grayling	April – Oct.	18.3	24.3
			Nov. – March	9.0	13.0
Cold Lake	CL	brook trout, brown trout, cutthroat trout, lake trout, rainbow trout, Arctic grayling, sockeye salmon	April – Dec.	17.0	21.2
			Jan. – March	9.0	13.0
Cold Large Lake (>100 acres)	CLL	rainbow trout, brown trout, lake trout	April – Dec.	18.3	24.2
			Jan. – March	9.0	13.0
Warm Stream Tier I	WS-I	common shiner, Johnny darter, orangethroat darter	March – Nov.	24.2	29.0
			Dec. – Feb.	12.1	24.6
Warm Stream Tier II	WS-II	brook stickleback, central stoneroller, creek chub, longnose dace, Northern redbelly dace, fine scale dace, white sucker	March – Nov.	27.5	28.6
			Dec. – Feb.	13.8	25.2
Warm Stream Tier III	WS-III	Other warm-water species	March – Nov.	28.7	31.8
			Dec. – Feb.	14.3	24.9
Warm Lakes	WL	yellow perch, walleye, pumpkinseed, smallmouth bass, striped bass, white bass, largemouth bass, bluegill, spottail shiner, Northern pike, tiger muskellunge, black crappie, common carp, gizzard shad, sauger, white crappie, wiper	April – Dec.	26.2	29.3
			Jan. – March	13.1	24.1