

Recommendation

TRRP Flow Work Group



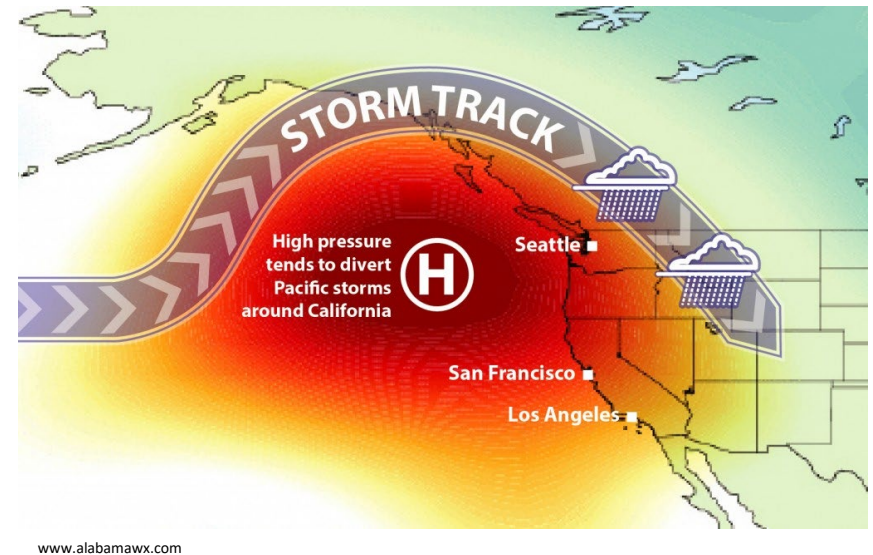
Trinity Management Council
March 30, 2022
Virtual Meeting

Seth Naman, TRRP Flow Work Group Coordinator



Presentation Outline

- Current Hydrology
- Flow Work Group Meeting Schedule
- Hydrographs Analyzed
- Models Used for Analysis
- Model Results
- Recommended Hydrographs



Snowpack

SNOW WATER EQUIVALENTS								
Station	ID	Coop. Agency	Elev (FT)	Apr 1 Avg (IN)	Today (IN)	Percent Apr 1	24 Hrs Ago (IN)	1 Week Ago (IN)
TRINITY RIVER								
Peterson Flat	PET	DWR	7,150	29.2	2.8 r	9%	3.7 r	7.6 r
Red Rock Mountain	RRM	DWR	6,700	39.6	8.6 r	22%	9.7 r	13.7 r
Bonanza King	BNK	DWR	6,450	40.5	11.3 r	28%	12.2 r	16.1 r
Shimmy Lake	SHM	DWR	6,400	40.3	2.1	5%	3.8	6.6
Middle Boulder 3	MB3	DWR	6,200	28.3	2.8 r	10%	3.8 r	6.3 r
Highland Lakes	HIG	DWR	6,030	29.9	0.7 r	2%	1.6 r	5.2 r
Scott Mountain	SCT	DWR	5,900	16.0	2.6 r	16%	2.6 r	2.6 r
Mumbo Basin	MUM	DWR	5,650	22.4	0.0 r	0%	0.0 r	0.4 r
Big Flat	BFL	DWR	5,100	15.8	8.3 r	52%	8.6 r	10.4 r
Crowder Flat	CWF	NRCS	5,100	---	0.0 r	---	0.0 r	0.0

<http://cdec.water.ca.gov>



Precipitation

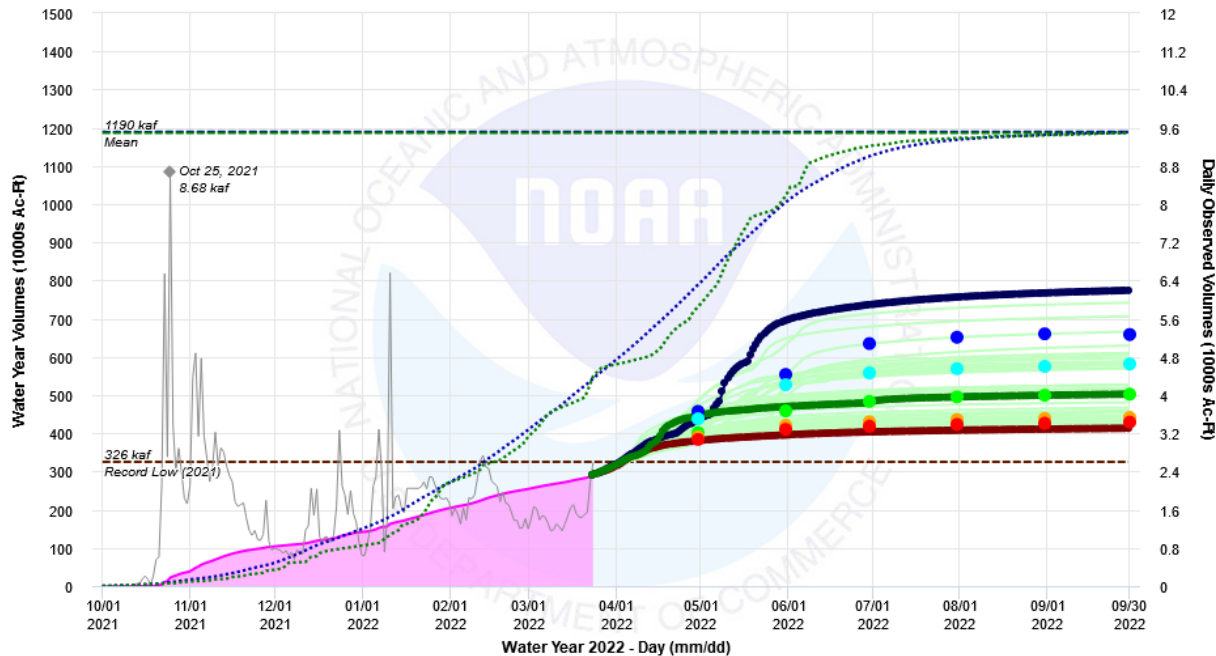
TRINITY RIVER			OCT	NOV	DEC	JAN	FEB	OCT-FEB	Water Year
COFFEE CREEK RANGER STATION	2503'	Precip	9.53	5.55	9.59	1.52	0.04	26.23	
	CFF	Average	2.48	6.68	9.78	10.37	9.52	38.83	54.23
		%-avg	384%	83%	98%	15%	0%	68%	48%
WEAVERVILLE RS	2050'	Precip	4.99	2.46	6.45	1.42	0.02	15.34	
	WVR	Average	2.24	4.33	7.44	6.86	5.39	26.26	37.40
		%-avg	223%	57%	87%	21%	0%	58%	41%
LEWISTON FISH HATCHERY	1870'	Precip	4.64	1.99	7.60	0.75	0.00	14.98	
	LFH	Average	1.90	3.46	6.48	5.64	4.70	22.18	31.87
		%-avg	244%	58%	117%	13%	0%	68%	47%
BIG BAR	1270'	Precip	6.50	2.37	6.67	1.51	0.11	17.16	
	BGB	Average	2.11	4.05	6.78	6.24	4.89	24.07	34.48
		%-avg	308%	59%	98%	24%	2%	71%	50%
HOOPA	333'	Precip	5.60	4.55	11.88	2.92	0.36	25.31	
	HOO	Average	2.87	6.51	10.72	9.52	7.28	36.90	50.72
		%-avg	195%	70%	111%	31%	5%	69%	50%

<http://cdec.water.ca.gov>

Water Year 2022 Inflow Forecast

Critically Dry

TRINITY R - TRINITY LAKE (CEGC1) 03/24/2022
Median Forecast: 503 kaf | 42% of Mean | 42% of Median
Created: 03/24/2022 at 08:33 AM PDT



Median Forecast

- February 3- 908 TAF
- February 11 - 752 TAF
- March 15 - 521 TAF
- March 24 - 503 TAF

Critically Dry Year Cutoff:

- 650 TAF

www.cnrfc.noaa.gov



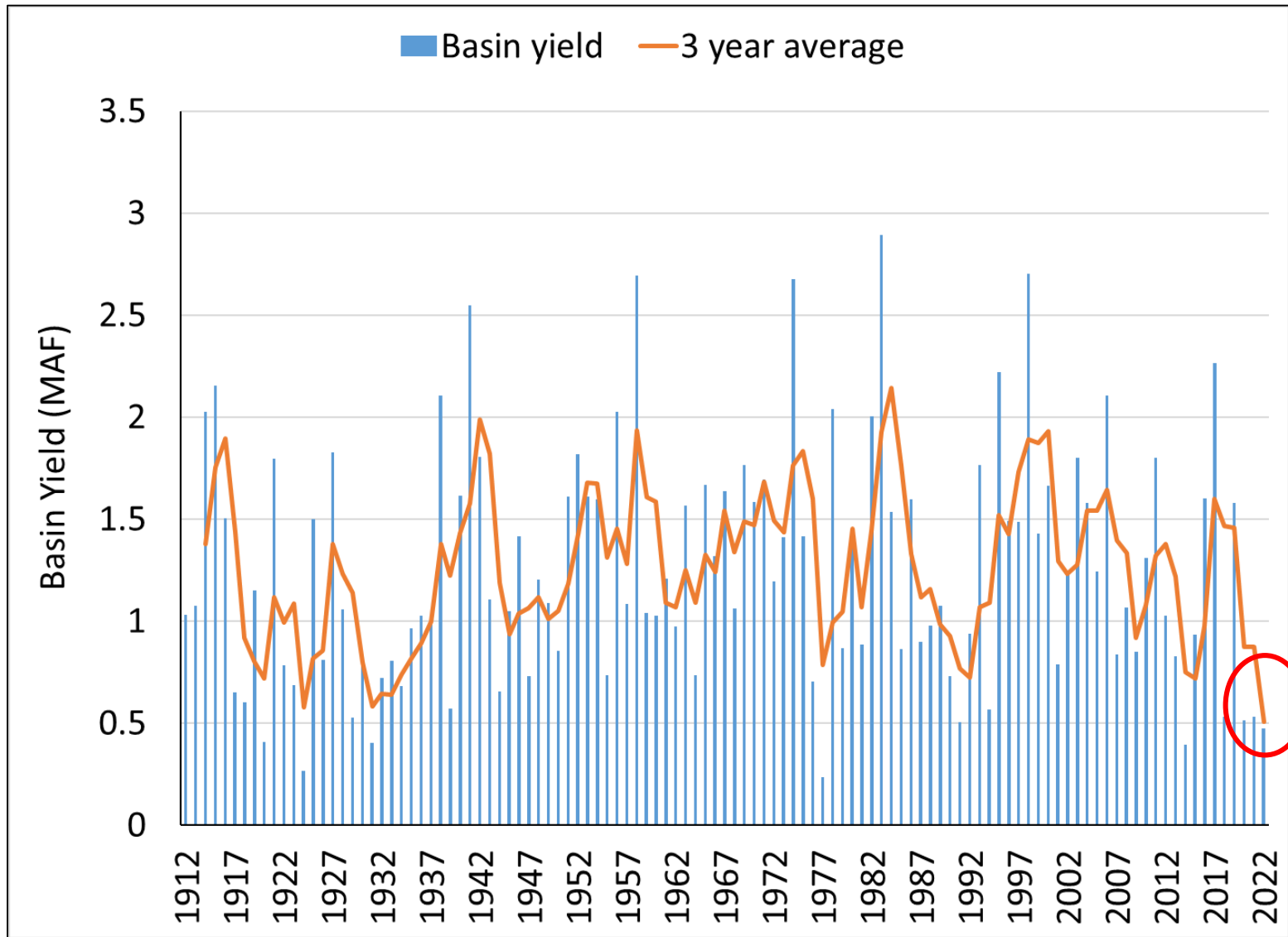
Forecasting Discrepancies

- Forecasts in Reclamation's CVP operations were greater than other forecasts
- Concern in work group regarding issues that could arise from discrepancies

50%			
Date	Reclamation	CADWR	CNRFC
23-Feb	893	685	644
15-Mar	NA	568	521

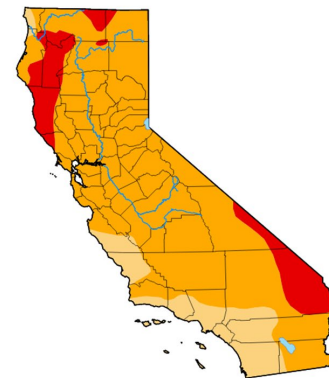
90%			
Date	Reclamation	CADWR	CNRFC
23-Feb	551	400	460
15-Mar	NA	380	457

Current Drought Is Historic



Flow Work Group Meeting Schedule

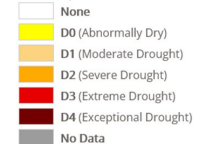
- February 3
 - Review hydrology
 - Review previous flow release hydrographs
 - Determine objectives for the year
 - Assign modelers
- February 11
 - Review hydrology
 - Discuss proposed hydrographs
 - Choose hydrographs for modeling
 - Coordinate modeling tasks
- March 15
 - Review hydrology
 - Review model outputs
 - Discuss merits of each hydrograph
 - Reach consensus on recommendation



Map released: Thurs. March 10, 2022

Data valid: March 8, 2022 at 7 a.m. EST

Intensity



Authors

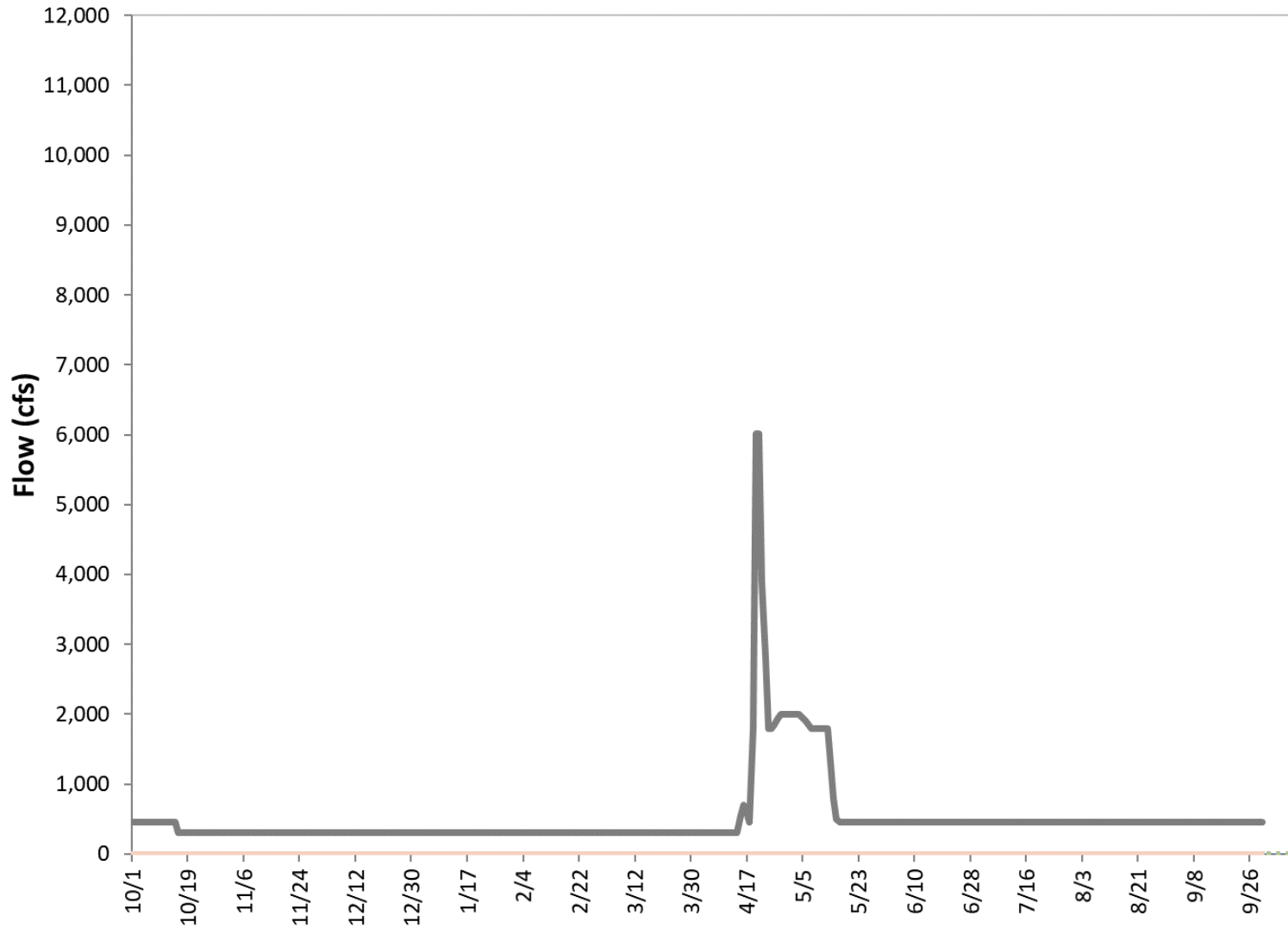
United States and Puerto Rico Author(s):

Brian Fuchs, National Drought Mitigation Center

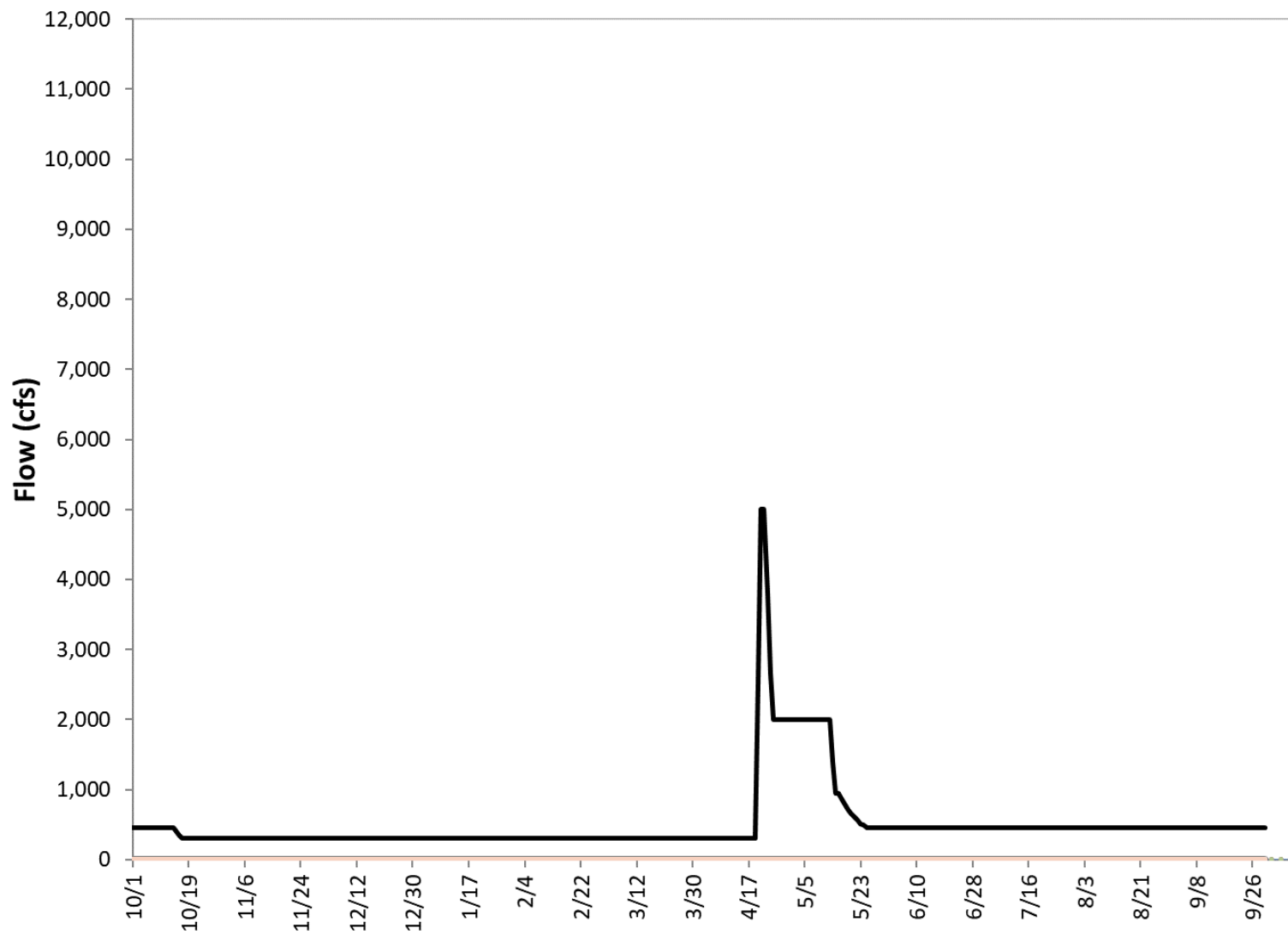
Pacific Islands and Virgin Islands Author(s):

Denise Gutzmer, National Drought Mitigation Center

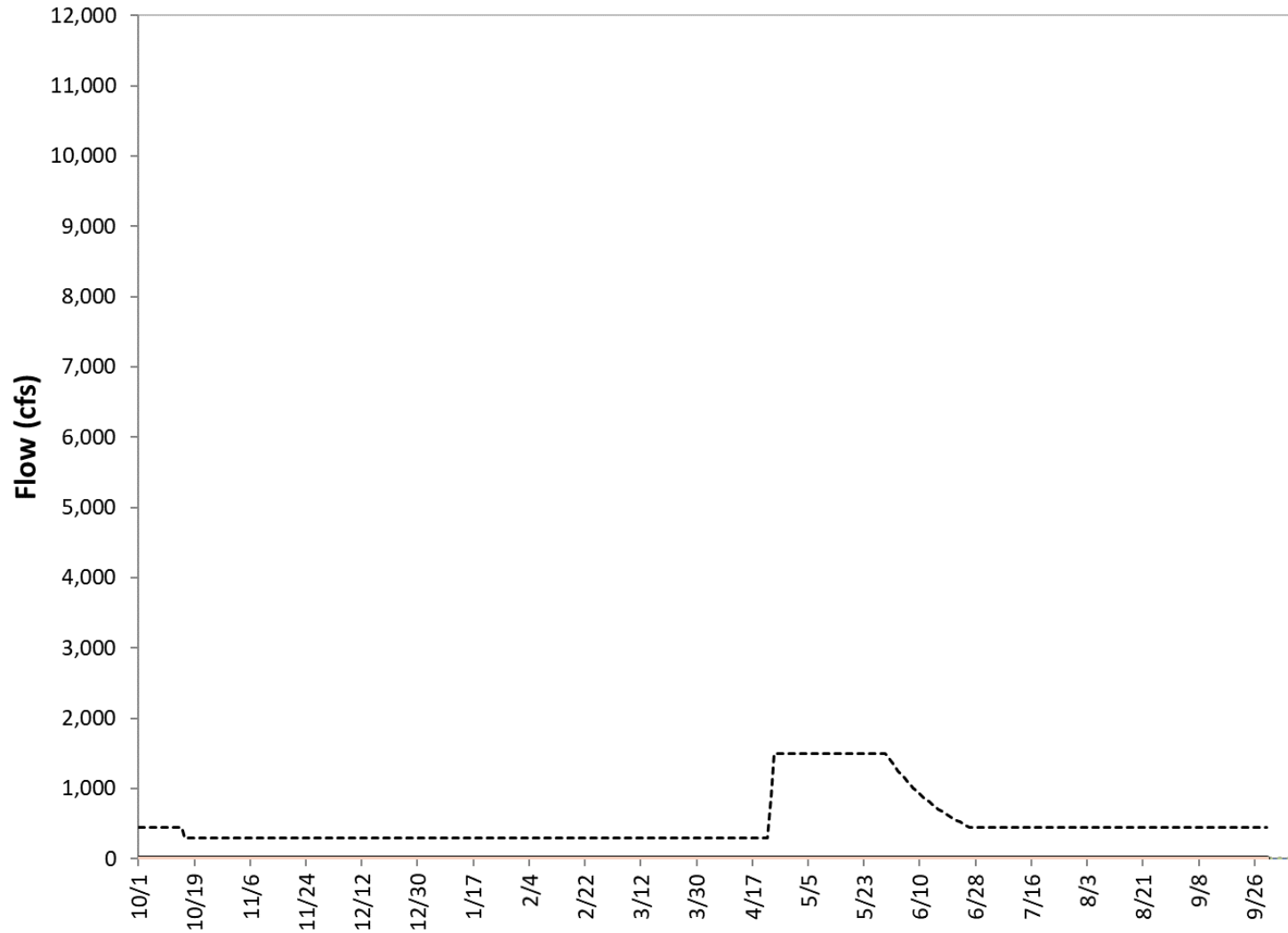
Crit Dry 1



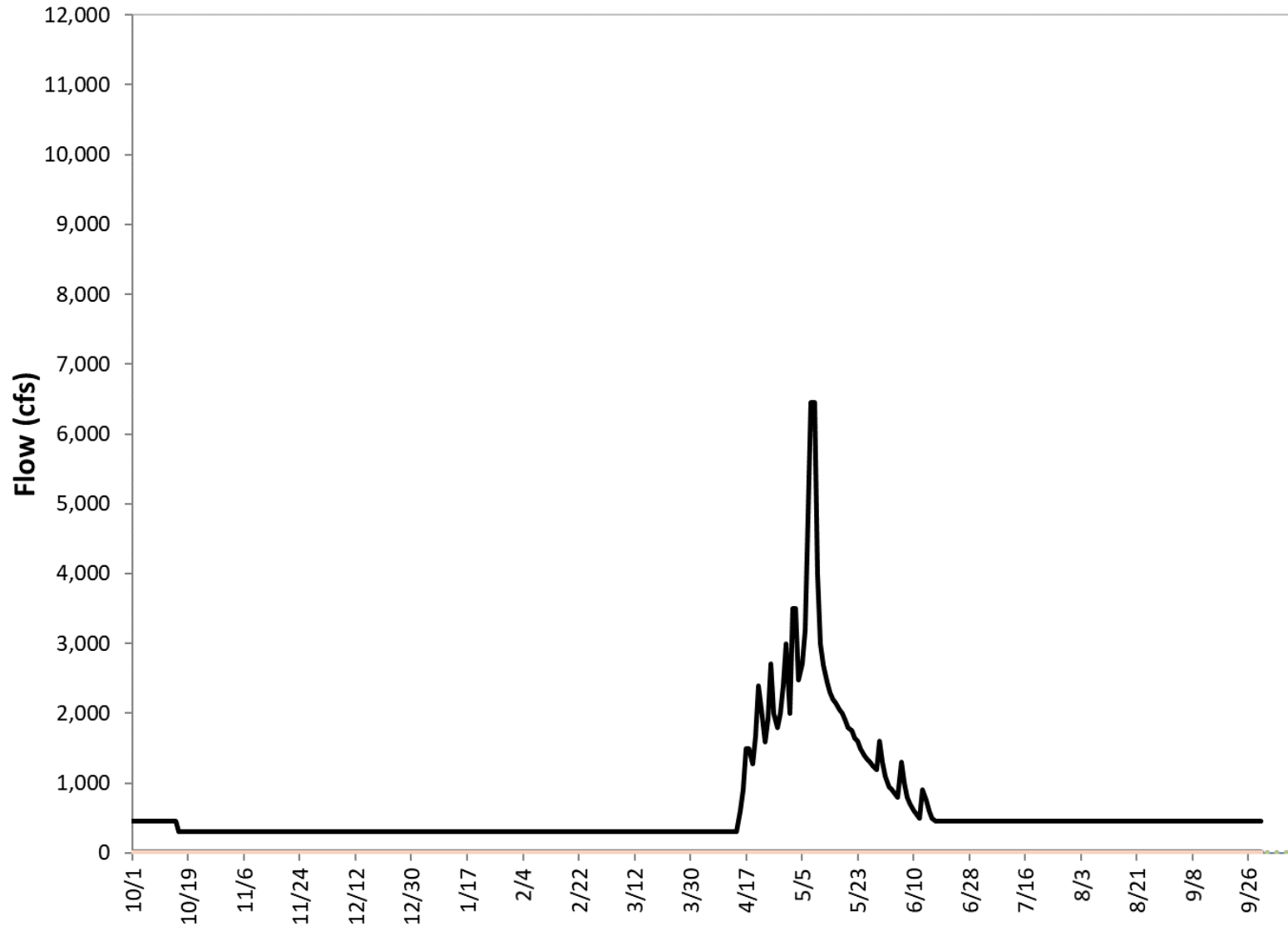
Crit Dry 2



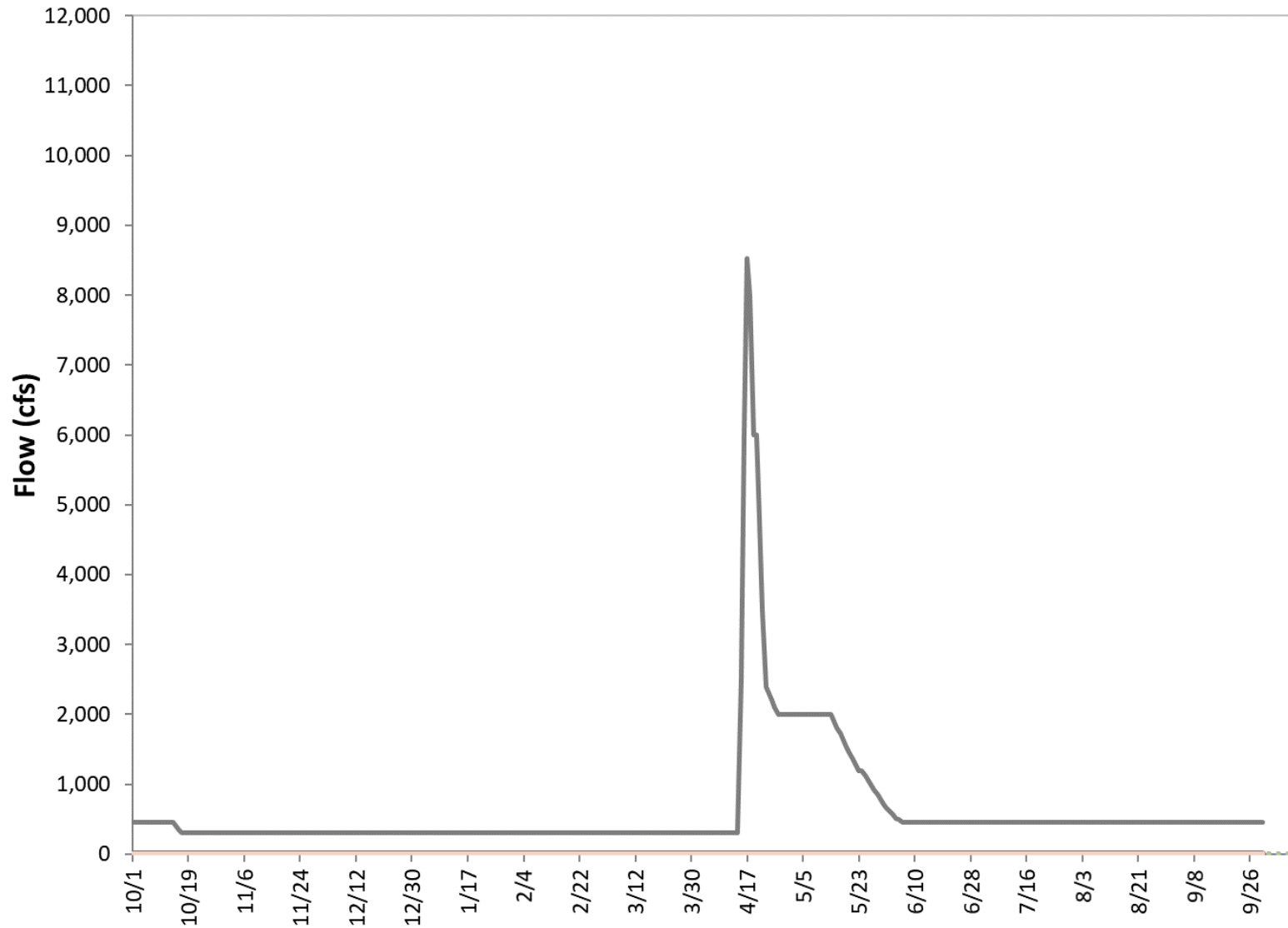
ROD Crit Dry



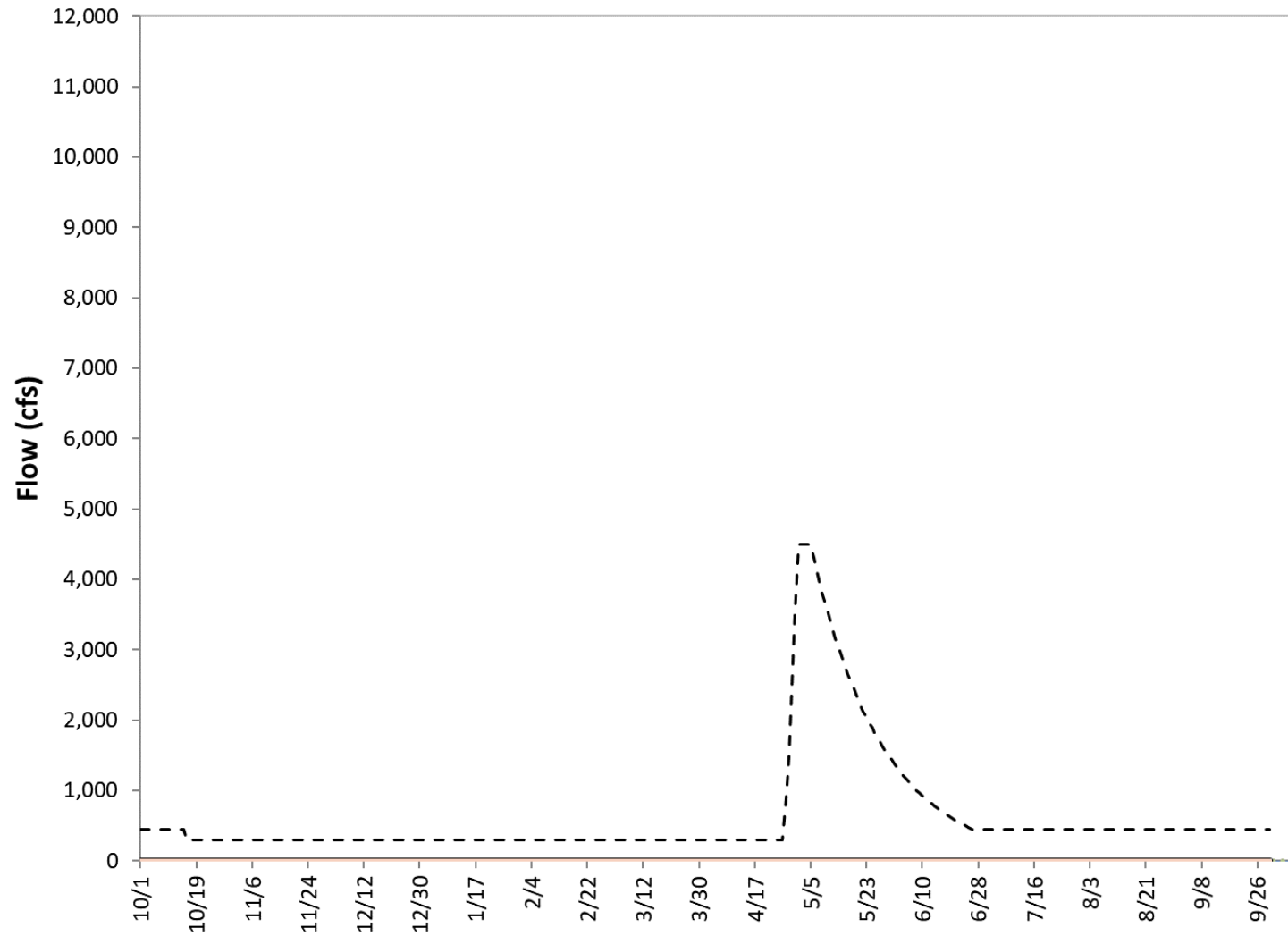
Dry 1



Dry 2



ROD Dry



Models Used

- River Basin 10 (RBM 10)
 - Simulates Flow and Water Temperature
 - Temperature compliance
 - Inputs for bedload transport
 - Inputs for frog production and salmonid production
- Foothill Yellow-legged Frog Assessment Model (FYFAM)
 - Number of froglets produced, survival
- Stream Salmonid Simulator (S3)
 - Chinook salmon fry, parr, and smolt abundance and biomass
- Bedload transport rating curve
 - Bedload transport (mass) at Douglas City

Modeling results for proposed hydrographs

Dry WY alternatives

	ROD Dry	Dry 1	Dry 2
Fisheries			
Total Natural Chinook Abundance at Weitchpec (spring and fall run) (SSS)	2,590,255	2,592,305	2,611,180
Fry abundance (<55 mm)	1,224,095	1,224,065	1,264,453
Parr abundance (55 - 90 mm)	1,366,148	1,368,218	1,346,681
Smolt abundance (>90 mm)	11	22	46
Total Natural Chinook Biomass at Weitchpec (metric tons) (SSS)	3.7905	3.8042	3.8837
Temperature			
EIS Temperature objectives for adult salmon holding/spawning at Douglas City July 1-Sept 14 (exceedance °C days)	10.2	10.2	10.2
EIS Temperature objectives for adult salmon holding/spawning at Douglas City Sept 15-Sept 30 (exceedance °C days)	1.1	1.1	1.1
EIS Temperature objectives for adult salmon holding/spawning above NF Trinity River Oct 1-Dec 31 (exceedance °C days)	0.3	0.3	0.3
Temperature Objectives for outmigrating juvenile salmon at Weitchpec (exceedance °C days)			
Steelhead	19.1	9.0	16.8
Coho Salmon	11.9	18.8	36.1
Chinook Salmon	142.6	157.9	177.9
Temperature objective for juvenile salmonid rearing Trinity above NF Trinity River April 1 - July 31 (degree days <13 °C <16.5 °C)	-35.6/132.6	-32.8/143.1	-24.9/159.8
Riparian			
Black Cottonwood Initiation Potential (nodes)	NA	NA	NA
Risk of encroachment narrowleaf willow (2 yr old, > 8,500 CFS)	Yes	Yes	No
Risk of encroachment narrowleaf willow (1 yr old, > 6,000 CFS)	Yes	No	No
Biology			
Number of froglets produced in the modeled reach, % survival	35,755	47,247	40,698
Median date for FYLF metamorphosis	9/9/2022	9/7/2022	8/31/2022
Physical			
Total bedload transport at Douglas City (tons)	1,994	1,323	2,440
Administrative			
Construction Impacts (Days ≥1000 cfs; July 15 to Sept 15)	0	0	0

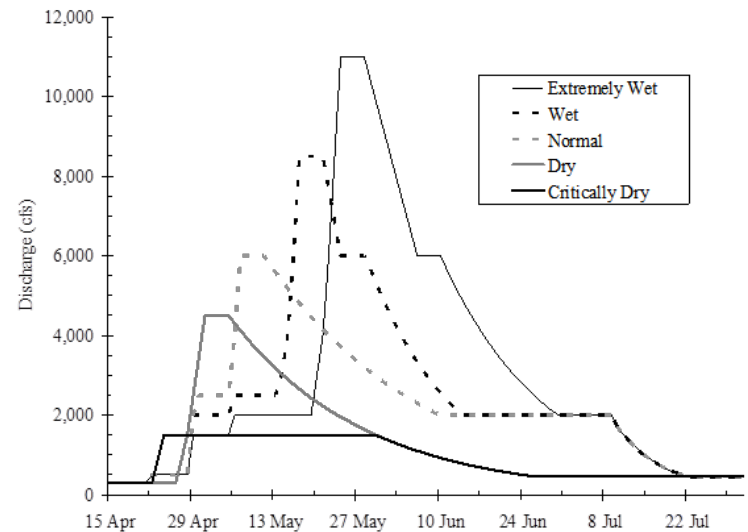
Modeling results for proposed hydrographs

Critically Dry WY alternatives

	ROD Crit Dry	Crit Dry 1	Crit Dry 2
Fisheries			
Total Natural Chinook Abundance at Weitchpec (spring and fall run) (SSS)	2,761,485	2,760,050	2,760,201
Fry abundance (<55 mm)	1,138,308	1,142,257	1,142,139
Parr abundance (55 - 90 mm)	1,623,017	1,617,694	1,617,961
Smolt abundance (>90 mm)	160	99	101
Total Natural Chinook Biomass at Weitchpec (metric tons) (SSS)	4.5198	4.4449	4.4451
Temperature			
EIS Temperature objectives for adult salmon holding/spawning at Douglas City July 1-Sept 14 (exceedance °C days)			
	0.04	0.04	0.04
EIS Temperature objectives for adult salmon holding/spawning at Douglas City Sept 15-Sept 30 (exceedance °C days)			
	9.7	9.7	9.7
EIS Temperature objectives for adult salmon holding/spawning above NF Trinity River Oct 1-Dec 31 (exceedance °C days)			
	5.0	5.0	5.0
Temperature Objectives for outmigrating juvenile salmon at Weitchpec (exceedance °C days)			
Steelhead	36.2	54.2	43.5
Coho Salmon	19.1	59.2	58.4
Chinook Salmon	95.1	132.0	132.0
Temperature objective for juvenile salmonid rearing Trinity above NF Trinity River April 1 - July 31 (degree days <13 °C <16.5 °C)			
	-30.8/127.7	-36.9/127.8	-36.7/126.7
Riparian			
Black Cottonwood Initiation Potential (nodes)	NA	NA	NA
Risk of encroachment narrowleaf willow (2 yr old, > 8,500 CFS)	Yes	Yes	Yes
Risk of encroachment narrowleaf willow (1 yr old, > 6,000 CFS)	Yes	No	Yes
Biology			
Number of froglets produced in the modeled reach, % survival	53,852	64,797	61,885
Median date for FYLF metamorphosis	9/3/2022	9/13/2022	9/13/2022
Physical			
Total bedload transport at Douglas City (tons)	267	783	757
Administrative			
Construction Impacts (Days ≥1000 cfs; July 15 to Sept 15)	0	0	0

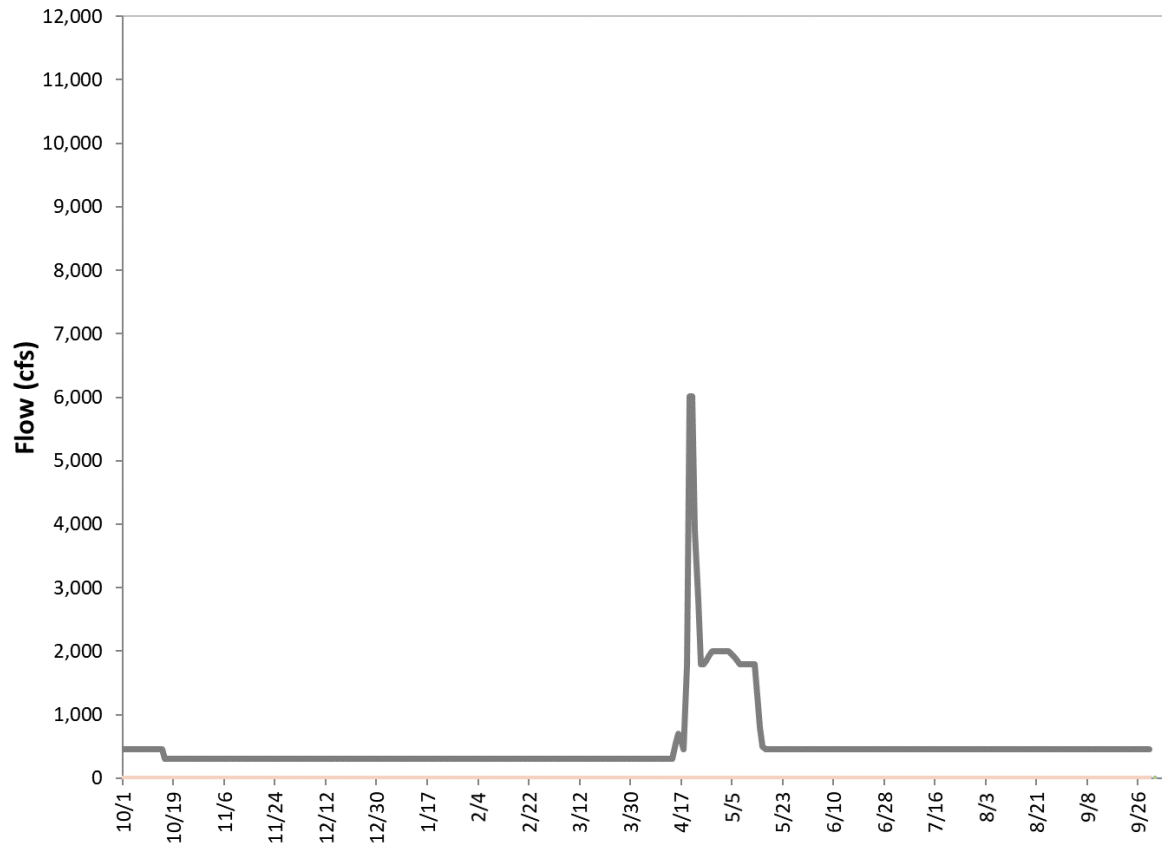
Model Results

- None of the alternatives clearly outperformed the others in all categories
- Little variation in fish production or temperature results because alternatives were so similar
- Crit dry 1 outperformed others in terms of frog production, riparian encroachment, sediment transport
- Crit dry 1 allows for data collection for hydrodynamic model



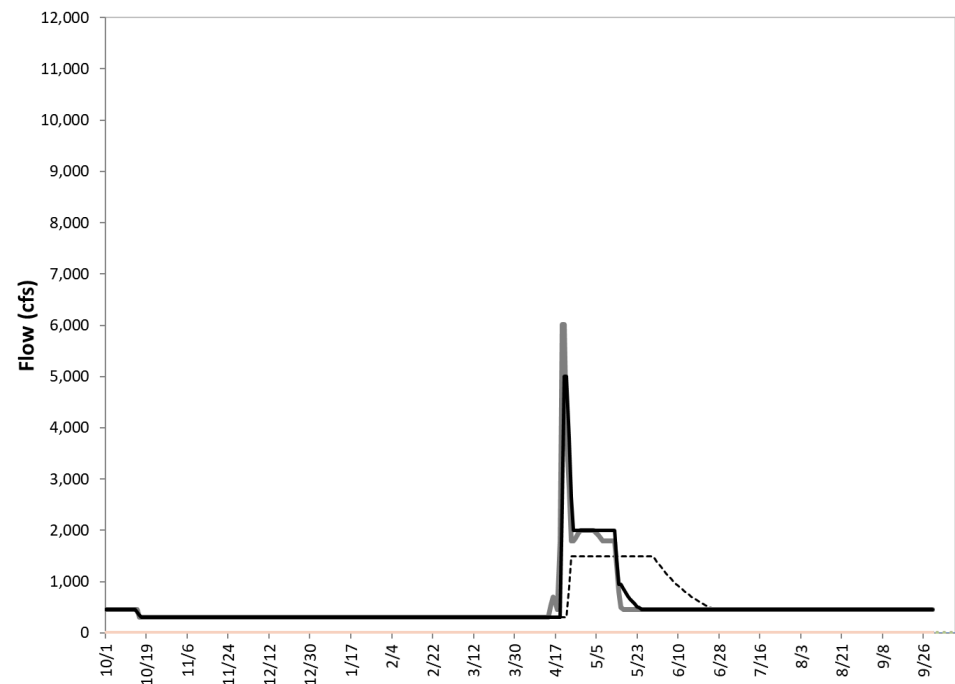
Recommendation

- The recommended hydrograph for water year 2021 is Critically Dry 1 (Dry 2 if Dry water year)



Concerns from the Flow Work Group

- TRRP is only able to manage water a few months of the year unless new management steps are taken
- Alternatives are so similar some believe the effort required for analysis is not a good use of staff time
- Most work group members wish TRRP had flexibility to manage flows year-round
- Group feels like they cannot implement their science based recommendations
- Hard on morale of the group



Thank You!

- Todd Buxton (Reclamation)
 - Bedload transport
- Ken Lindke (CDFW)
 - Temperature analysis
- Don Ashton (McBain Associates)
 - FYFAM modeling
- John Bair (McBain Associates)
 - Riparian advice
- Chris Laskodi (Yurok Tribe)
 - RBM10 modeling and S3 modeling
- Nick Som (USFWS), Russ Perry, John Plumb (USGS)
 - S3 support
- All Flow WG members!

