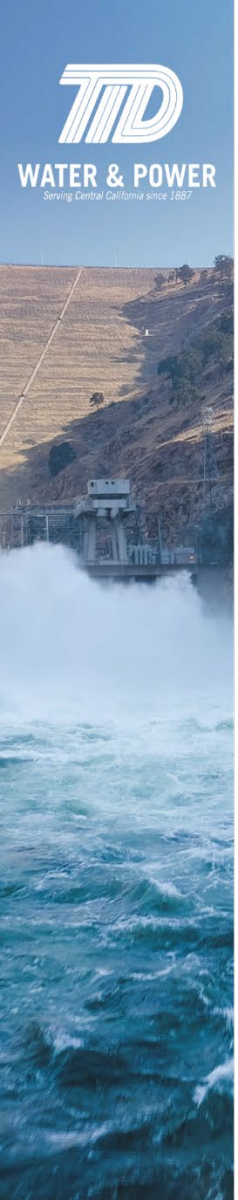
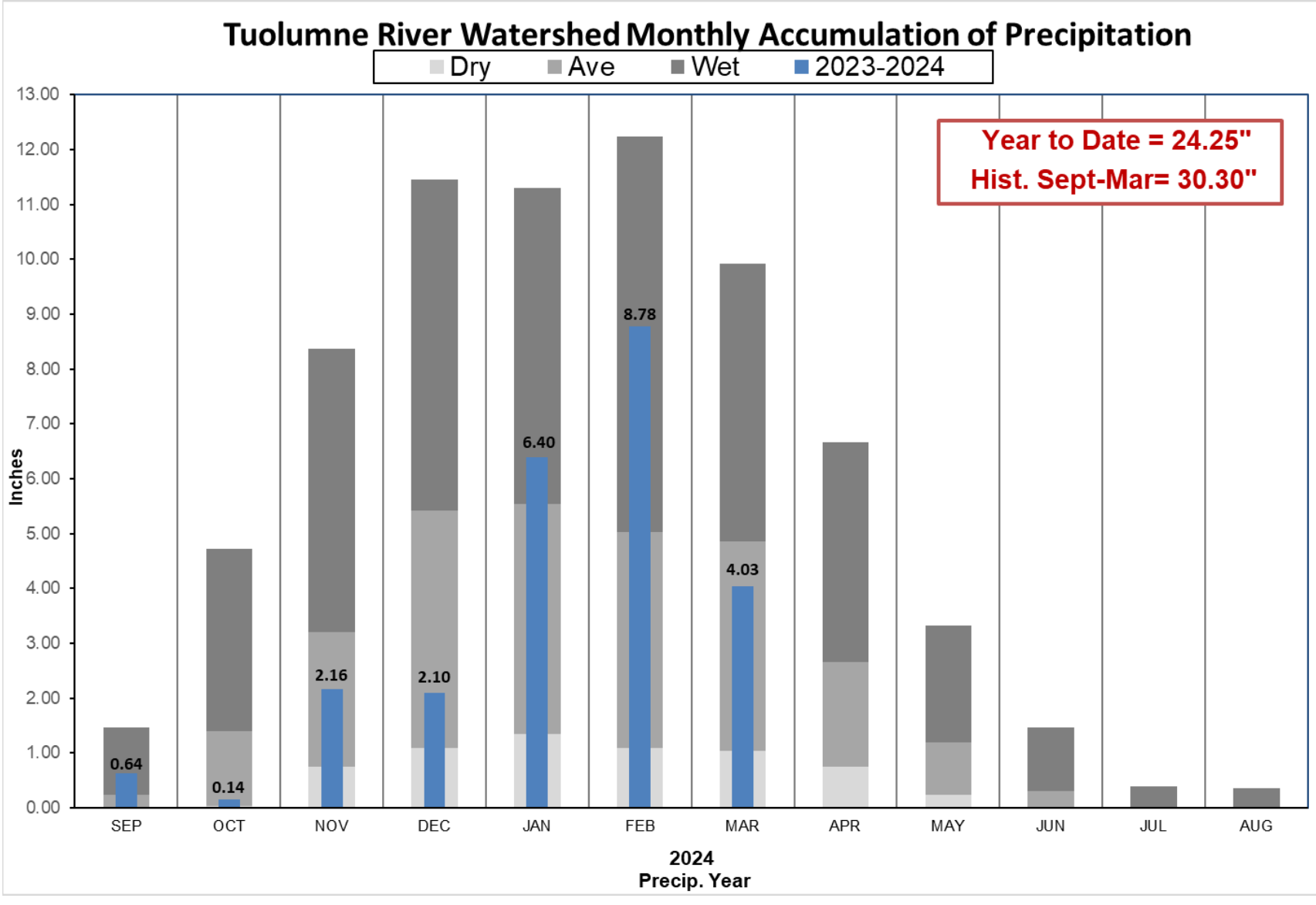
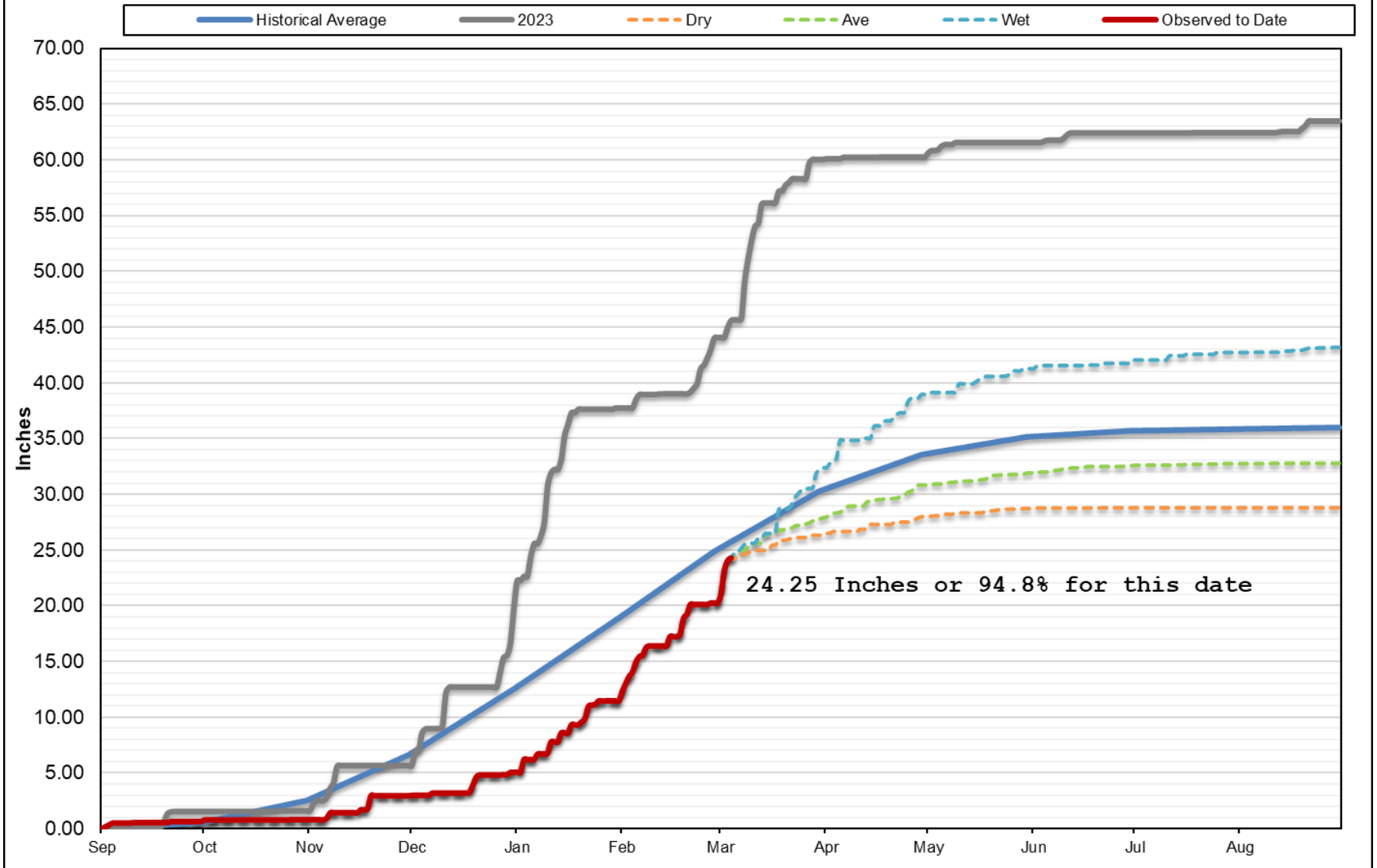


Hydrology Update

March 5, 2024


Tuolumne River Watershed Monthly Accumulation of Precipitation
Dry
Ave
Wet
2023-2024
Year to Date = 24.25"
Hist. Sept-Mar= 30.30"
Inches
13.00
12.00
11.00
10.00
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
0.64
0.14
2.16
2.10
6.40
8.78
4.03
SEP
OCT
NOV
DEC
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
2024
Precip. Year

Tuolumne River Watershed Accumulated Precipitation

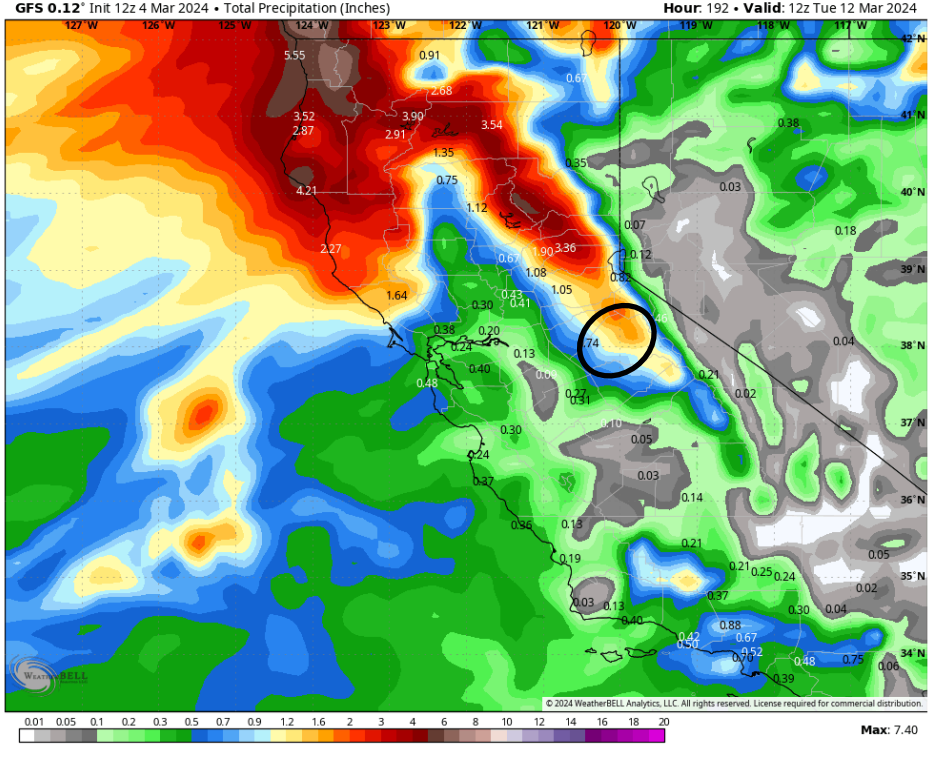


9-Day Local Forecast (Turlock)

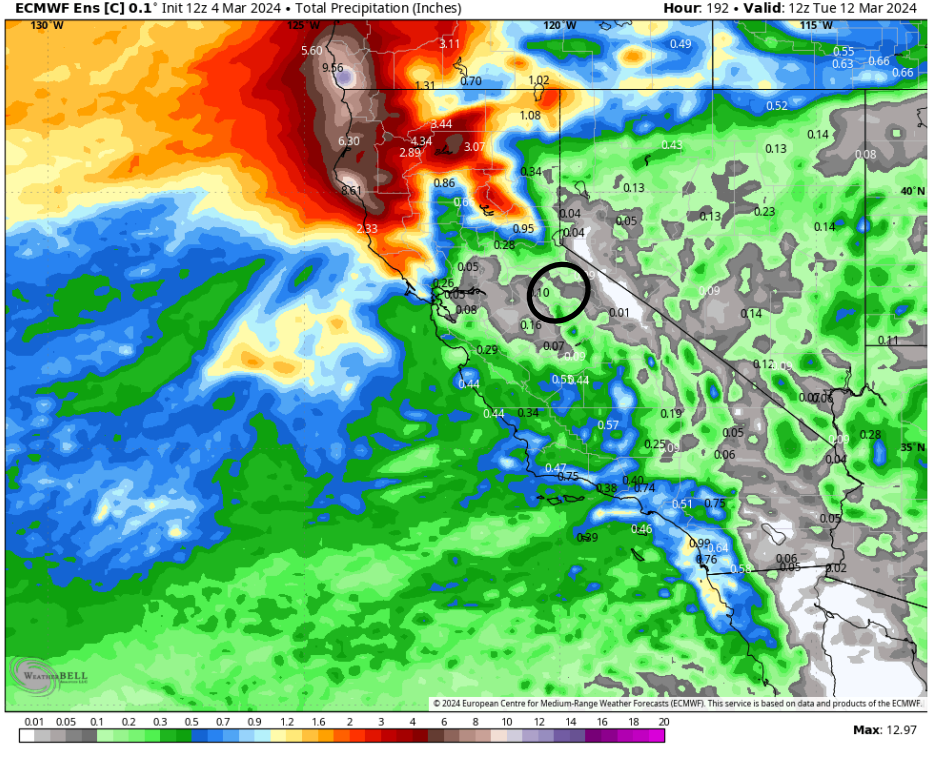
Date	03/05	03/06	03/07	03/08	03/09	03/10	03/11	03/12	03/13
Precip (in)	0	0	0	0	0	0.01	0.05	0.09	0
Temp (max)	64	63	63	66	66	65	64	64	66
Temp (min)	43	45	41	41	45	45	47	45	45

8 Day Precipitation Forecast

US MODEL

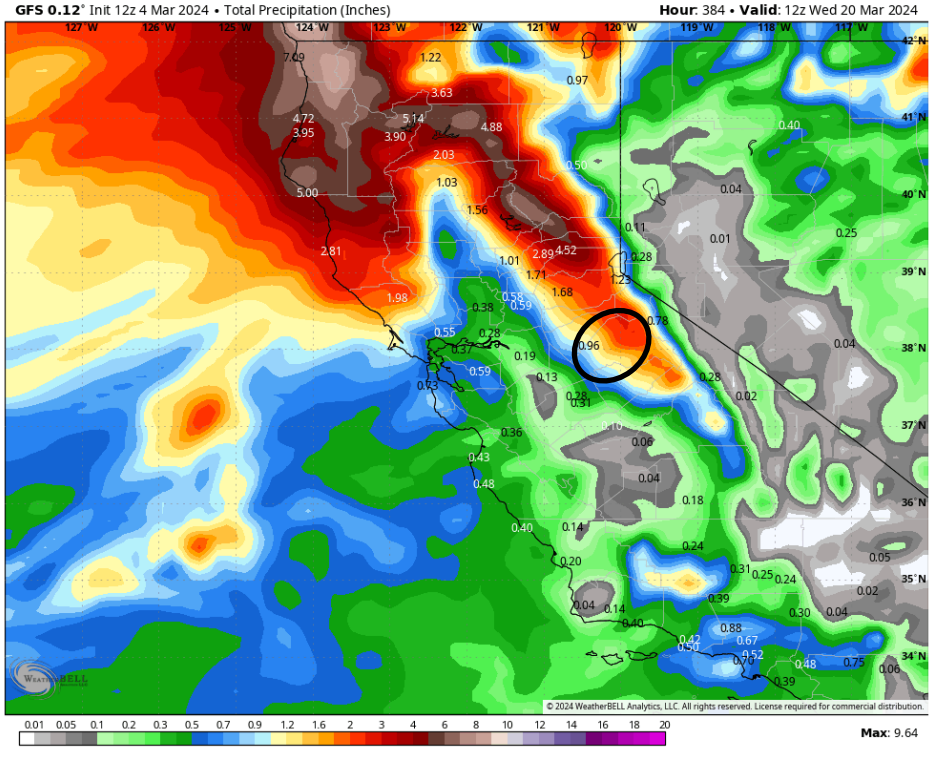


EURO MODEL

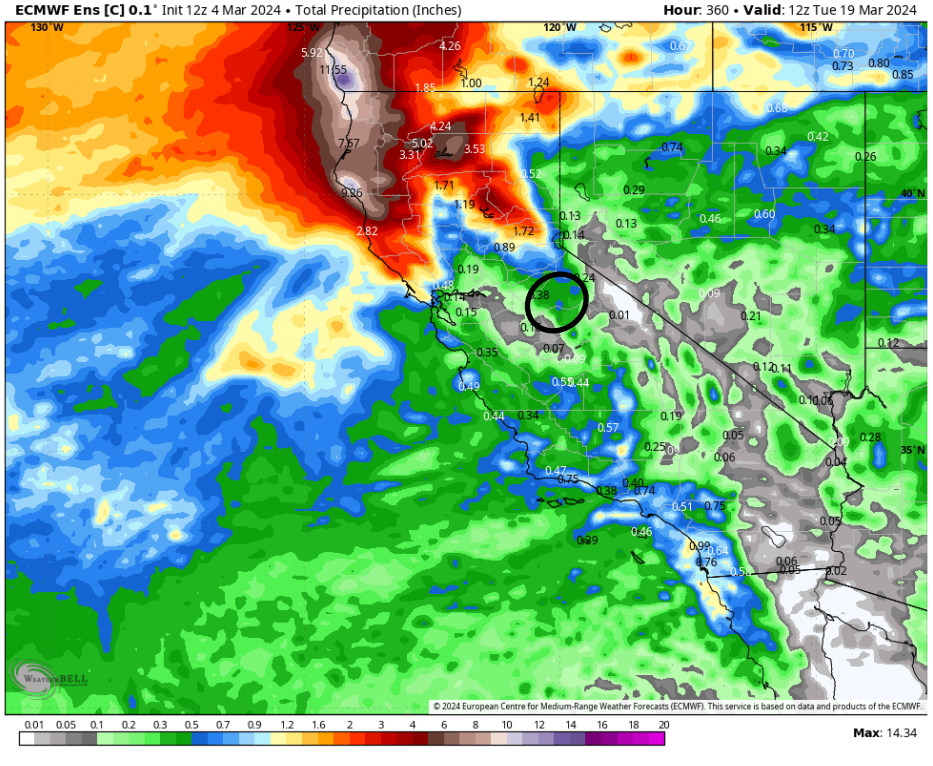


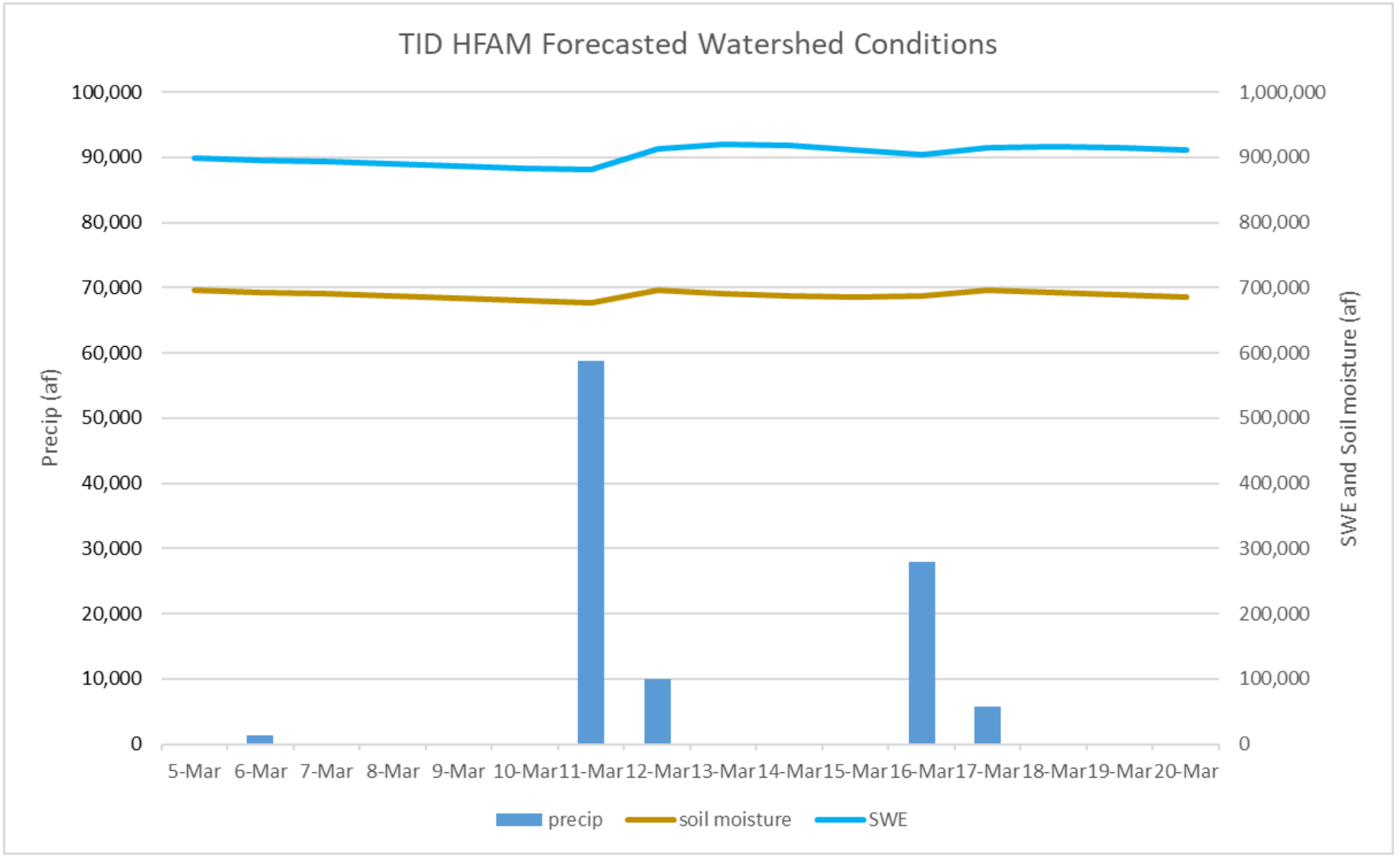
16 Day Precipitation Forecast

US MODEL

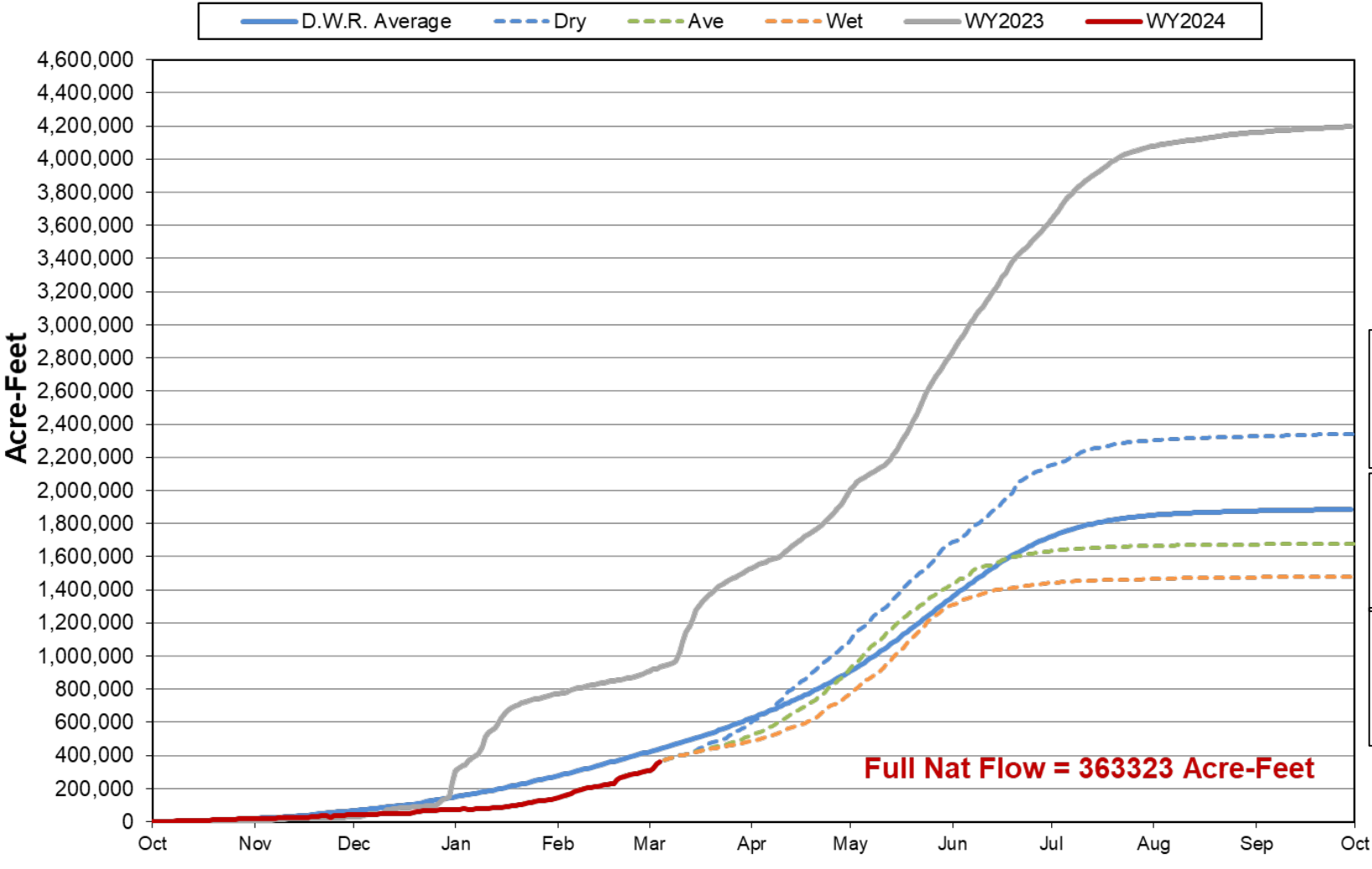


EURO MODEL




TID HFAM Forecasted Watershed Conditions
Precip (af)
SWE and Soil moisture (af)
100,000
90,000
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
1,000,000
900,000
800,000
700,000
600,000
500,000
400,000
300,000
200,000
100,000
0
5-Mar
6-Mar
7-Mar
8-Mar
9-Mar
10-Mar
11-Mar
12-Mar
13-Mar
14-Mar
15-Mar
16-Mar
17-Mar
18-Mar
19-Mar
20-Mar
precip
soil moisture
SWE

Accumulated Full Natural Flow w/ 7 day forecast

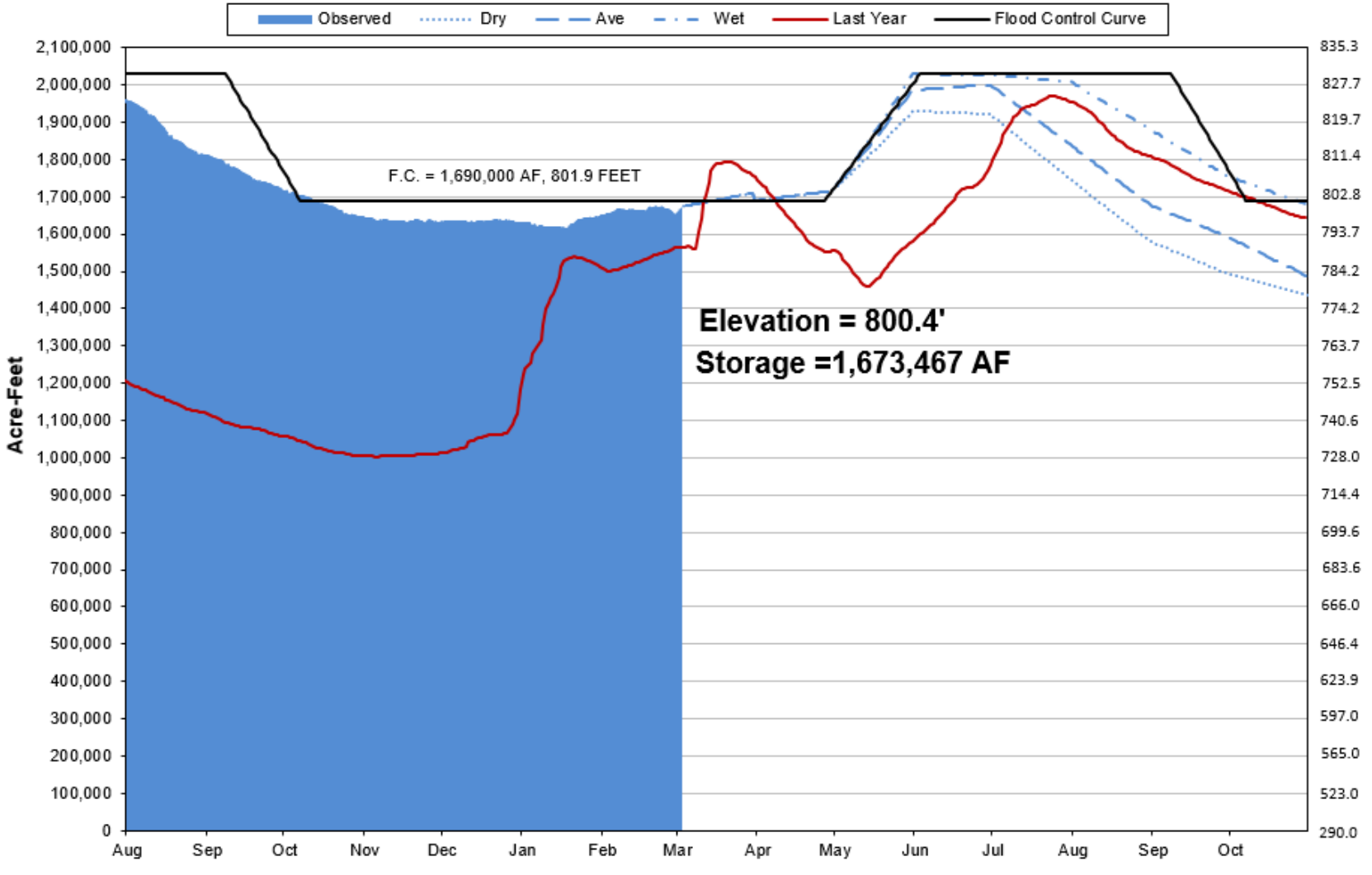


Wet
WY: 2,341,594 af
WY %: 123%
Rainfall: 18.4 in

Ave
WY: 1,678,168 af
WY %: 88%
Rainfall: 7.7 in

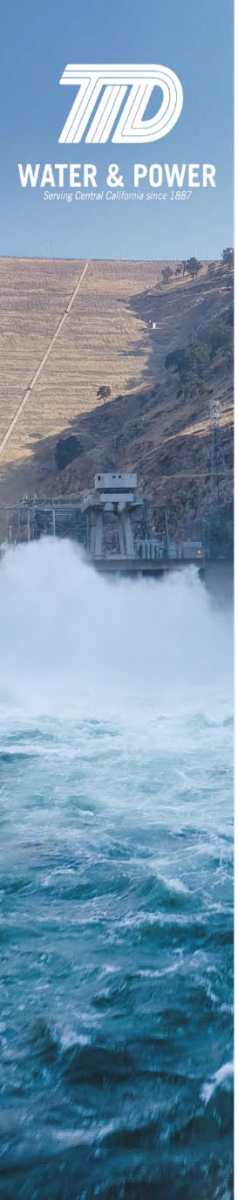
Dry
WY: 1,480,636 af
WY %: 78%
Rainfall: 4.2 in

DON PEDRO STORAGE



2024 Season (3/1-10/31)

Percent Exceedance Condition Type	90% Exceed. Dry	50% Exceed. Ave
1. Present Storage	900,937	900,937
2. Less Fish	(99,821)	(140,596)
3. Less WID Entitlement	(20,538)	(20,538)
4. Current Water Available	780,578	739,803
5. Additional Inflow	670,728	822,482
6. Evaporation	(14,932)	(15,416)
7. Subsequent Year's Obligations	(120,134)	(205,380)
8. Total Available Releases	1,316,240	1,341,489
9. Projected Irrigation Releases	(537,088)	(537,088)
10. Carry Over Storage	779,152	804,401



Modeling Discussion

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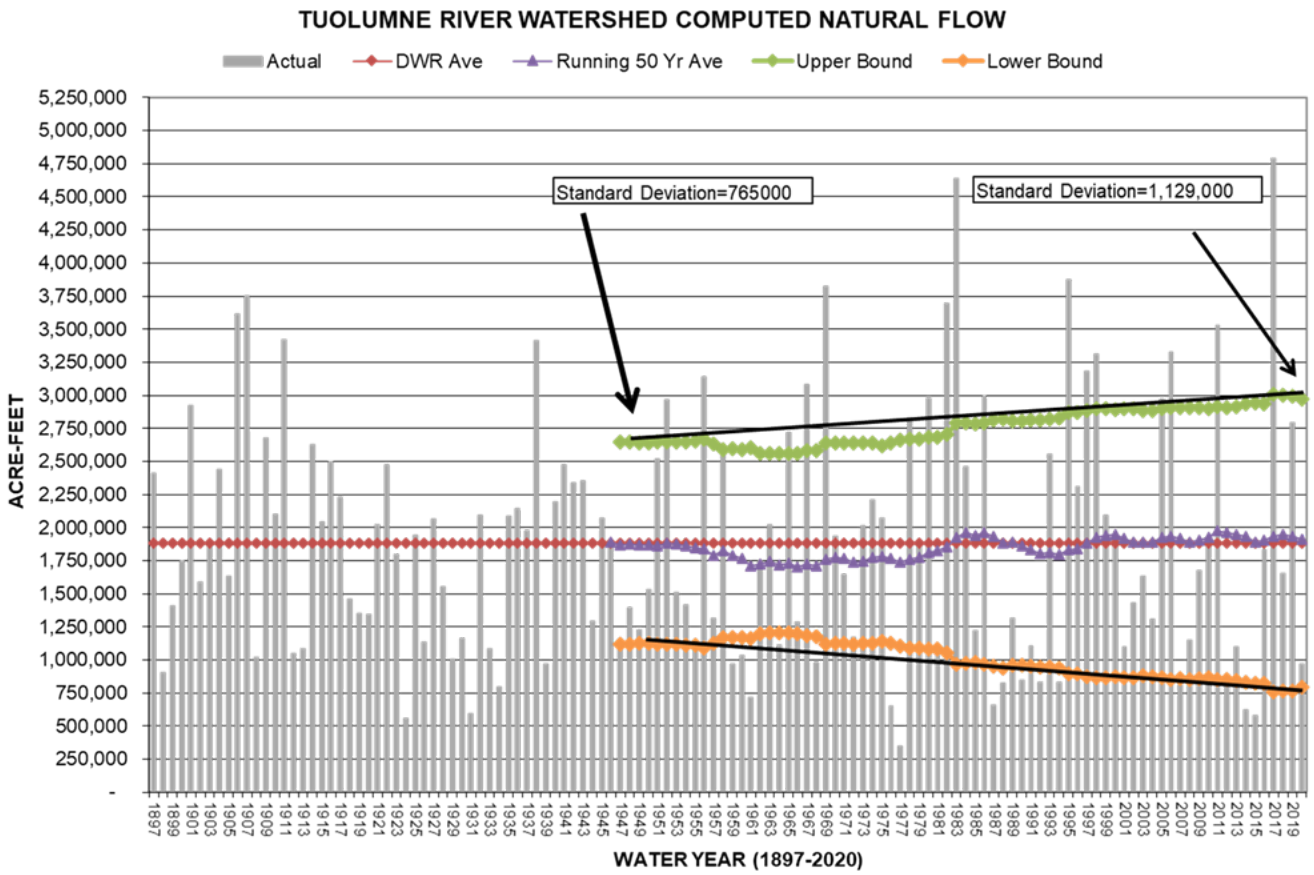
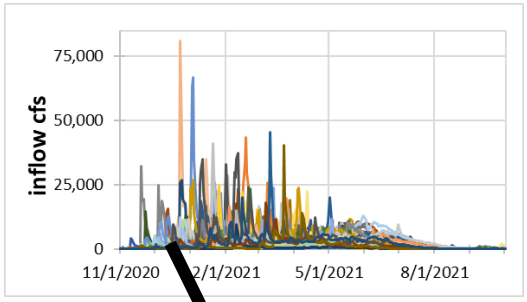
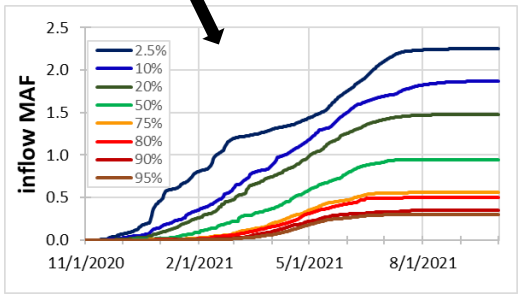
Increasing annual streamflow variability has increased flood risks on the system and reduced the firm yield of Don Pedro Reservoir.



The Districts brought HFAM in after the 1997 event, as it highlighted the need to shift from rule curves to real-time analysis to manage extreme hydrology.





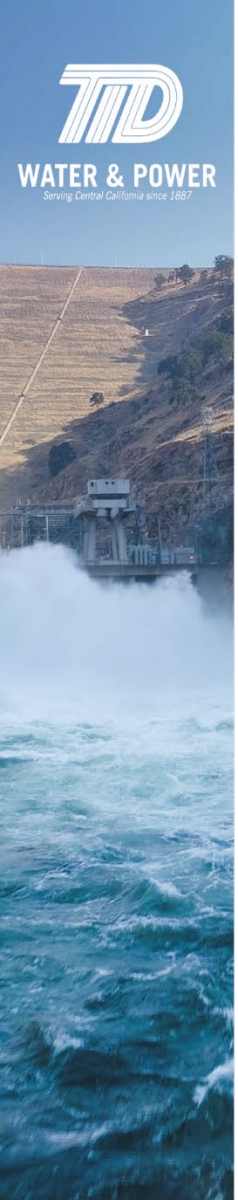
1962
Stanford Watershed Model

1970
HSP

1980
HSPF

1997
HFAM

2024
HFAM 2.5.11



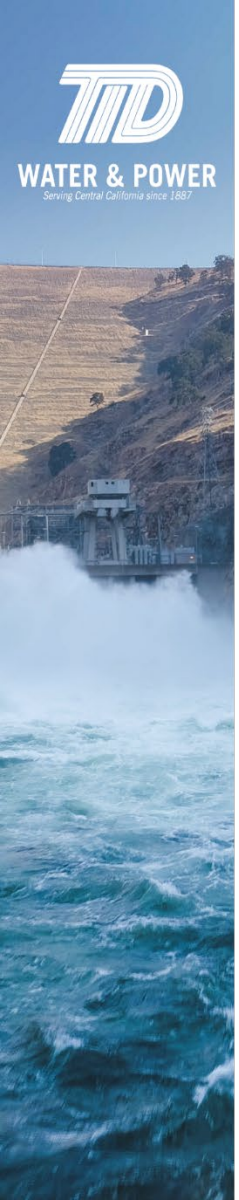
Hydrocomp represents more than just a software, but also includes a high level of expertise that has been translated across multiple projects.

HFAM

- Operations Support
- Model Improvements
- Data QA/QC

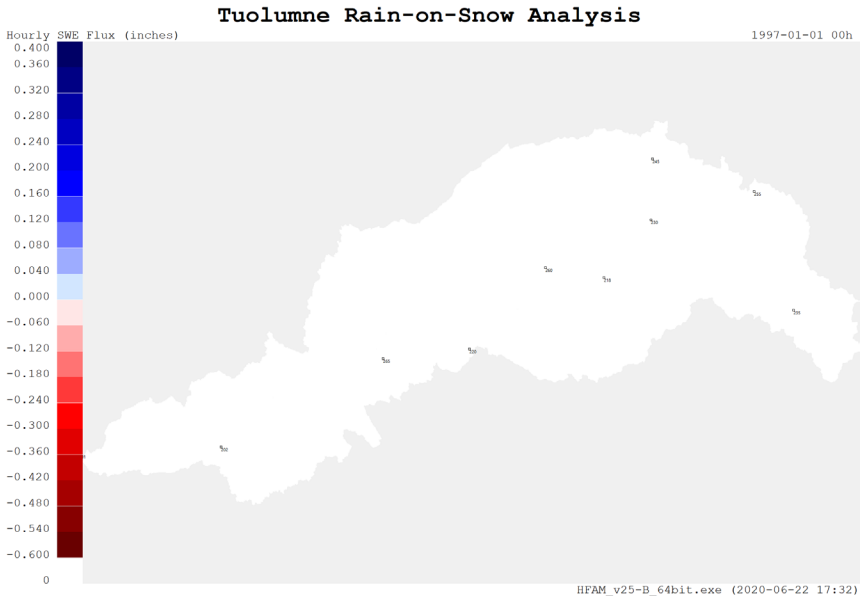
Consulting

- PMP/PMF Studies
- Water Augmentation Projects
- Weather Generator



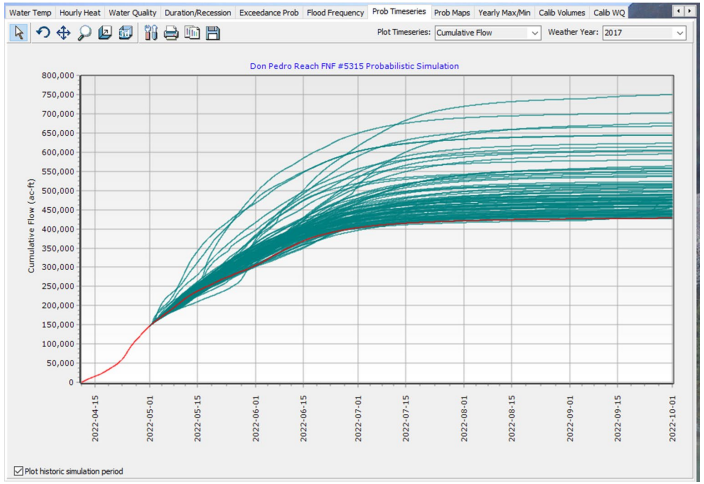
HFAM allows TID to model the impacts of both current and forecasted watershed conditions to make both short- and long-term operation decisions.

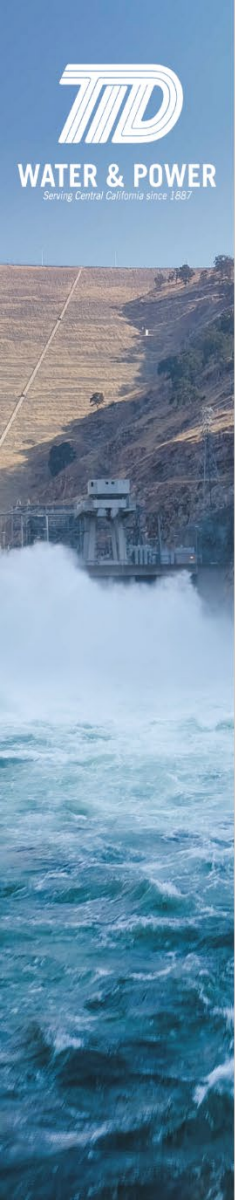
State Of The Watershed At Any Given Time



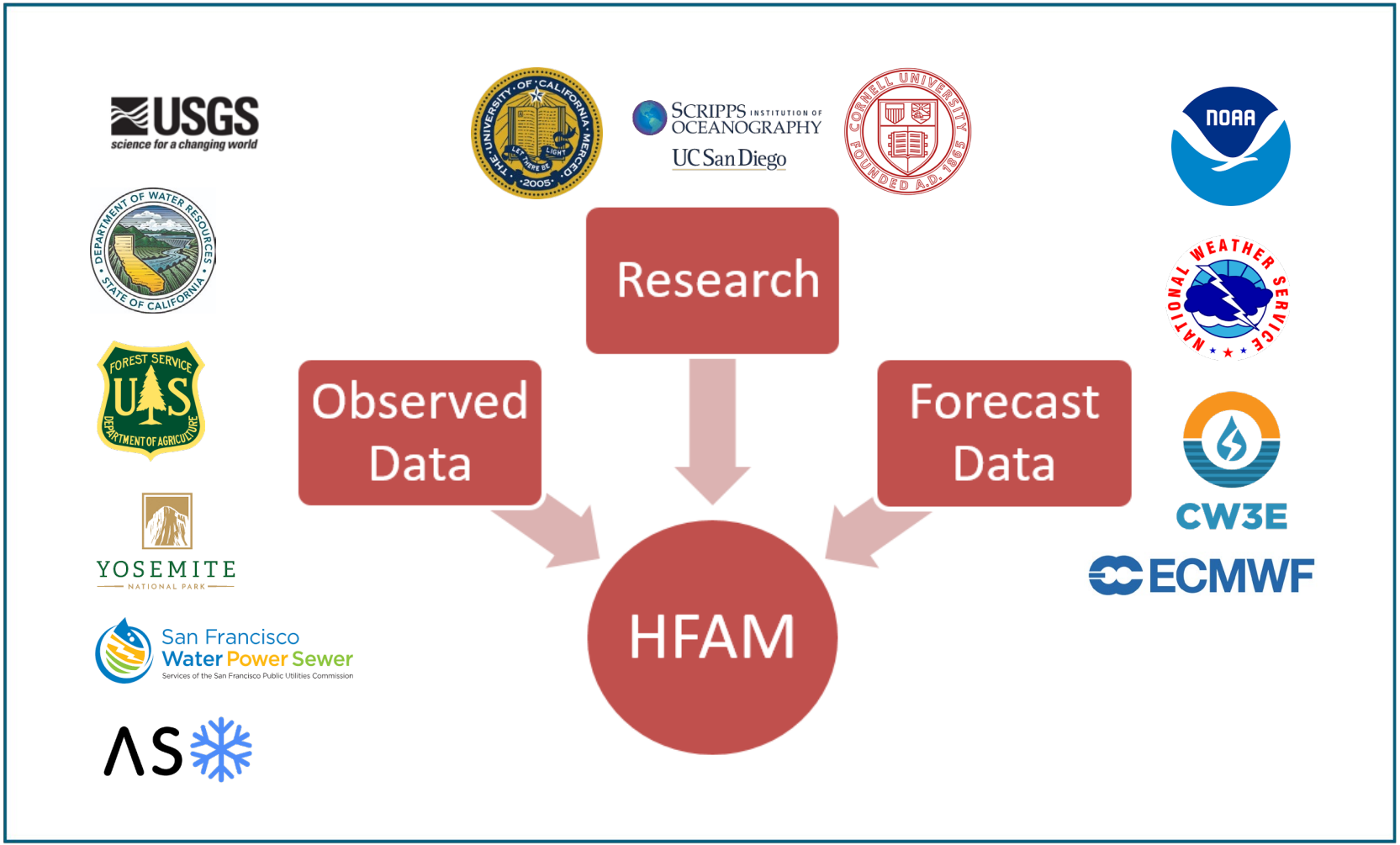
+

(30 Parameters X 771 land segments + 110 reaches x 11 parameters) Over 92 Years Of Hourly Meteorological Data =





TID partnerships bring technologies that allow us to adapt to greater variability and optimize the operations of Don Pedro.



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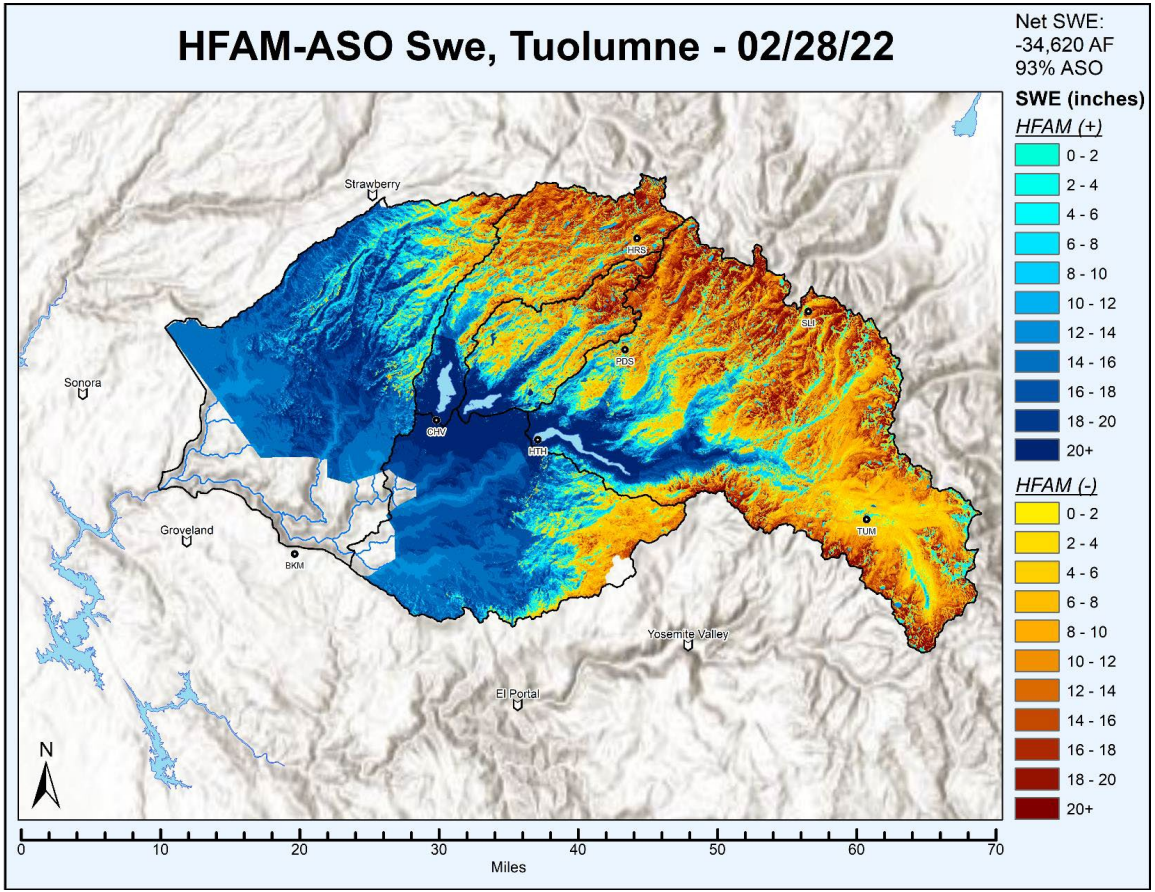
ASO provides an accurate snapshot of the snowpack conditions, but HFAM provides a continuous view of the full watershed conditions.



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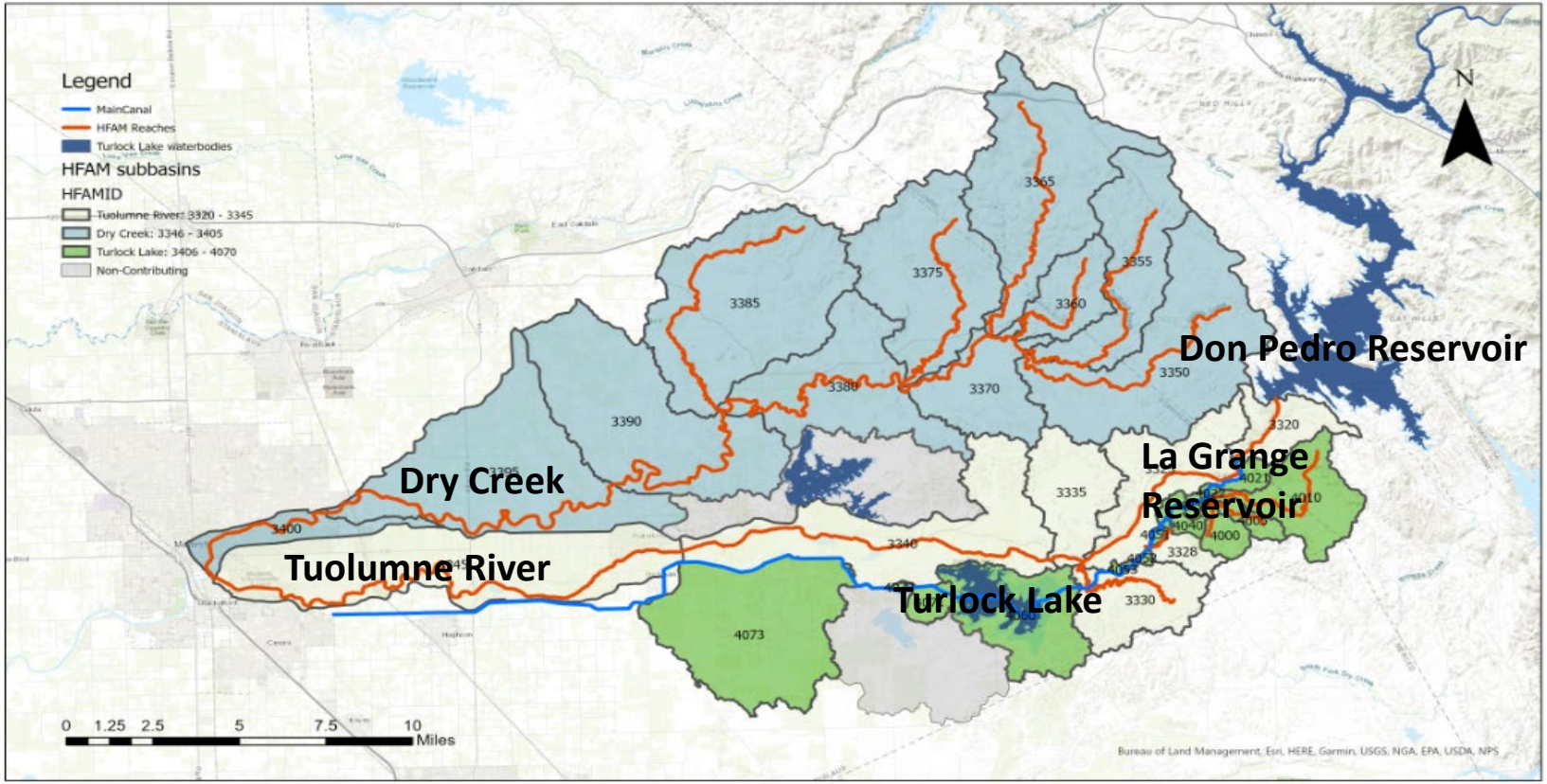
Over the years, HFAM's domain has been expanded for separate projects/studies and has become vital to operations.



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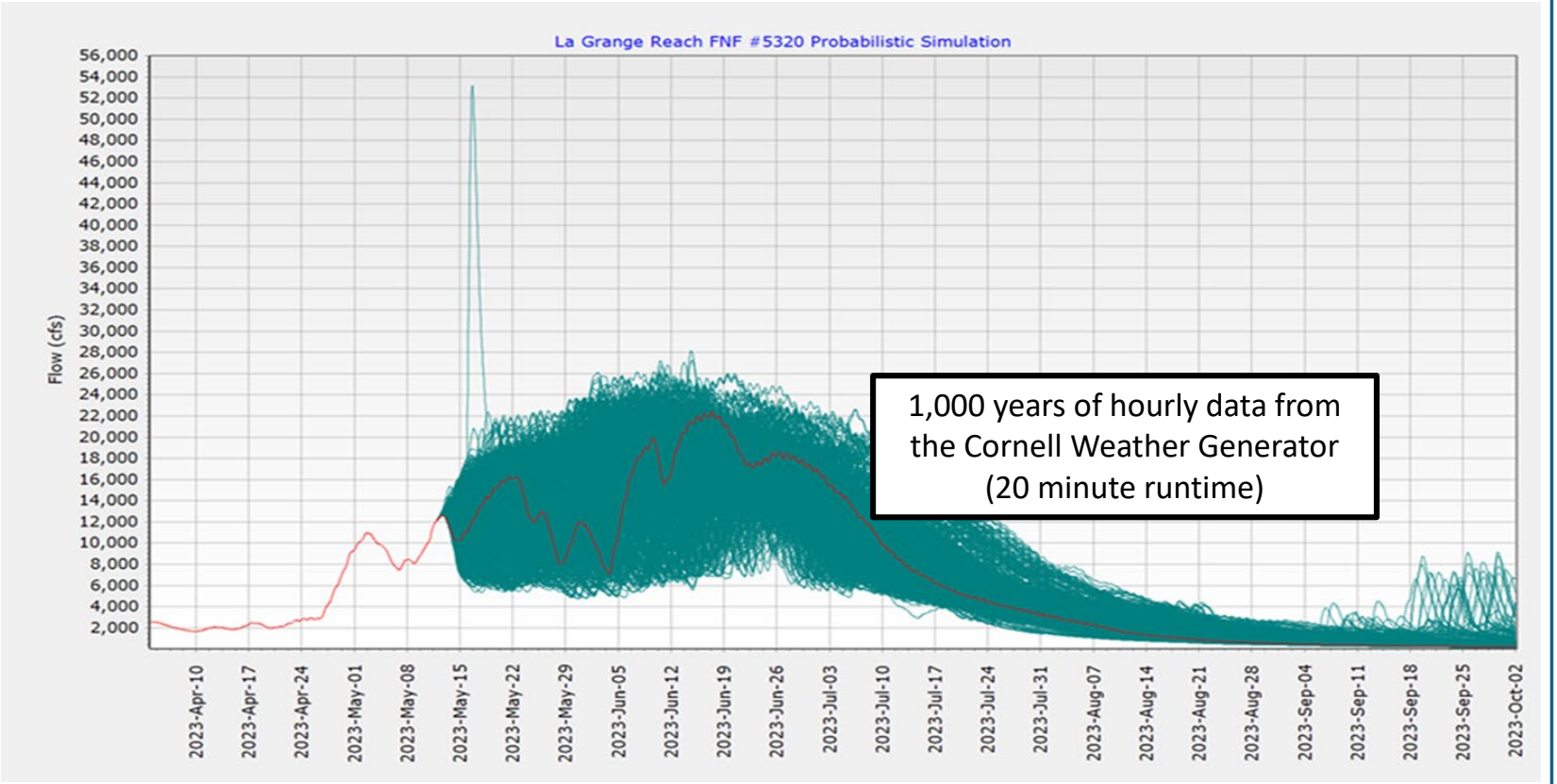
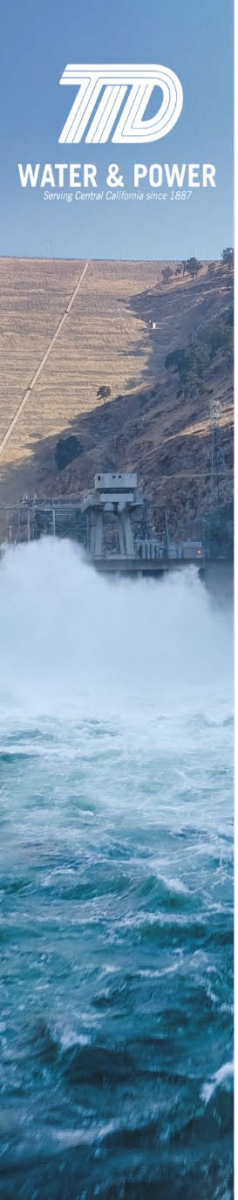
HFAM allows for the analysis of climate change on the watershed to identify the necessary adaption/mitigation plans and projects.





Success Stories

WATER & POWER
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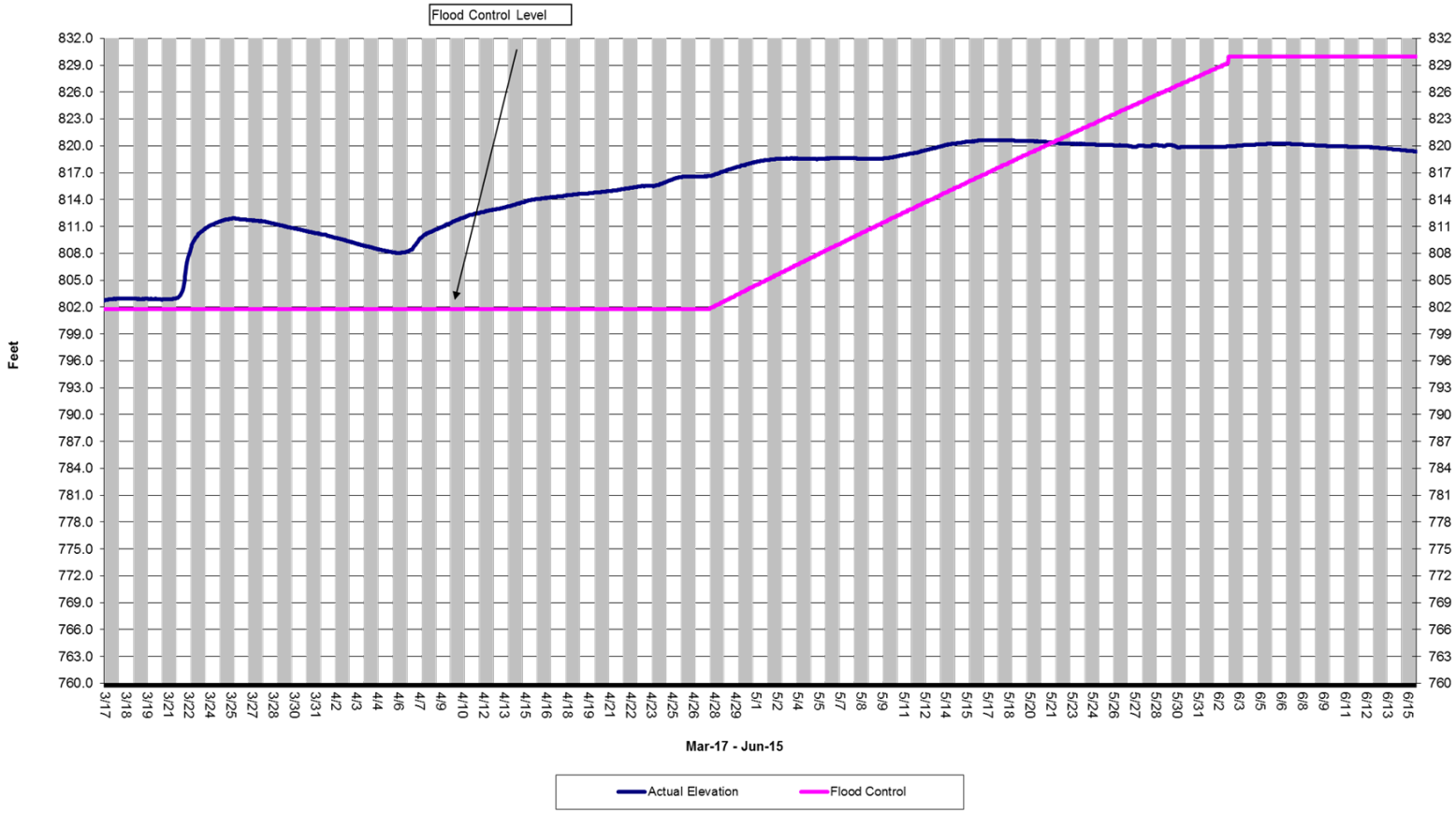
Utilizing HFAM, ASO, and Scripps, the Districts saved 150,000 af of water through a deviation from the USACE in 2018.



WATER & POWER
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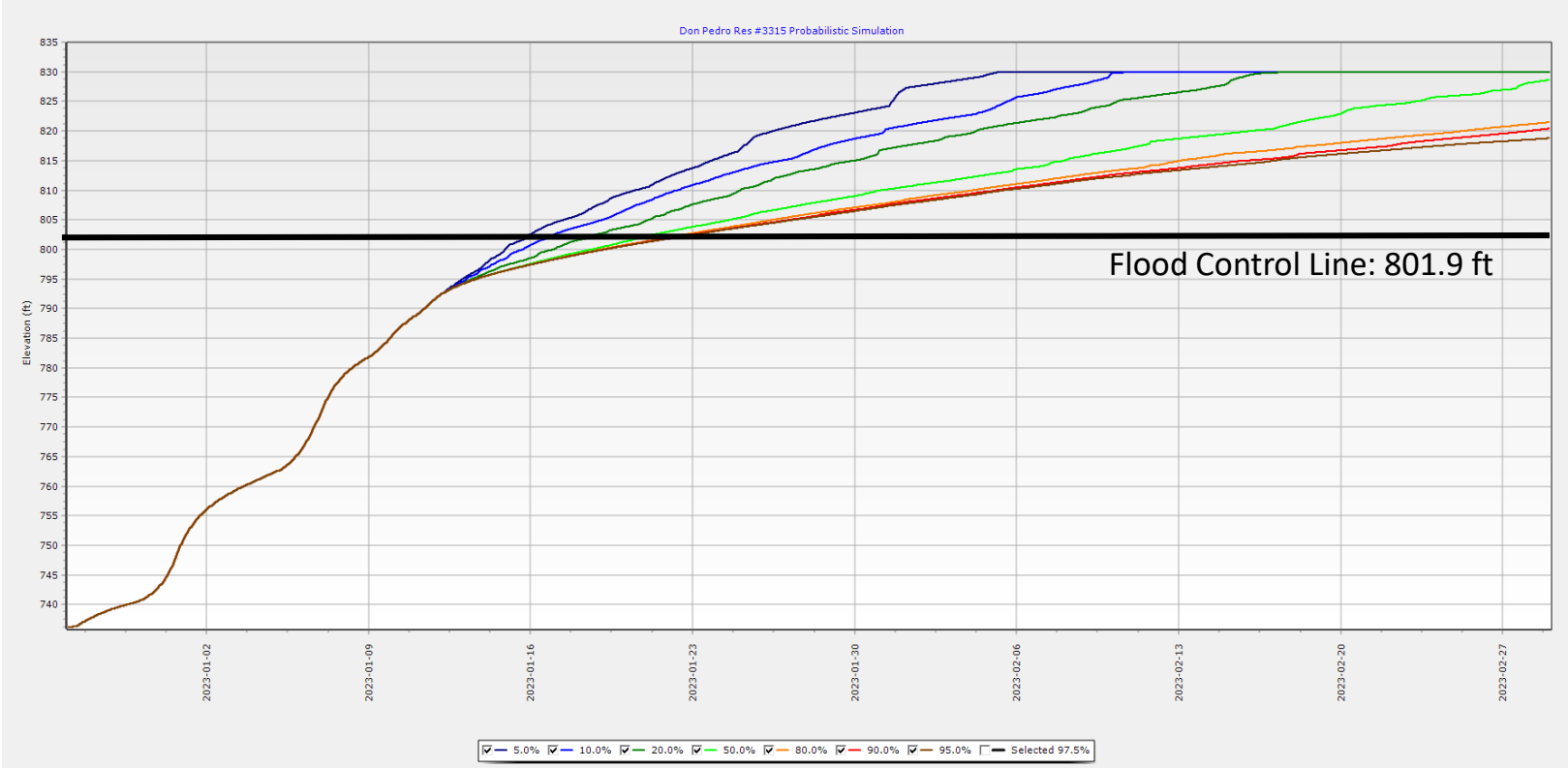
In 2023, HFAM allowed us to identify current and future risks and turn them into an opportunity to ensure public safety while also maximizing District resources.



TID
WATER & POWER
Serving Central California since 1887

TID continues to adapt to optimally operate Don Pedro Reservoir to safely and reliably provide water and power to our community.