

ATMOSPHERIC RIVERS AND RESERVOIR RESPONSE WY2023

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California Marine Affairs and
Navigation Conference

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CORPS AUTHORITY FOR MANAGEMENT OF FLOOD CONTROL SPACE

2

Section 7 of the Flood Control Act of 1944
(58 Stat. 890, 33 U.S.C. 709)

- Prescribe rules and regulations in the interest of flood control
- The project owner is responsible for real-time implementation of the water control plan, but the Corps has authority to determine flood releases in the flood control space with input from the owner.

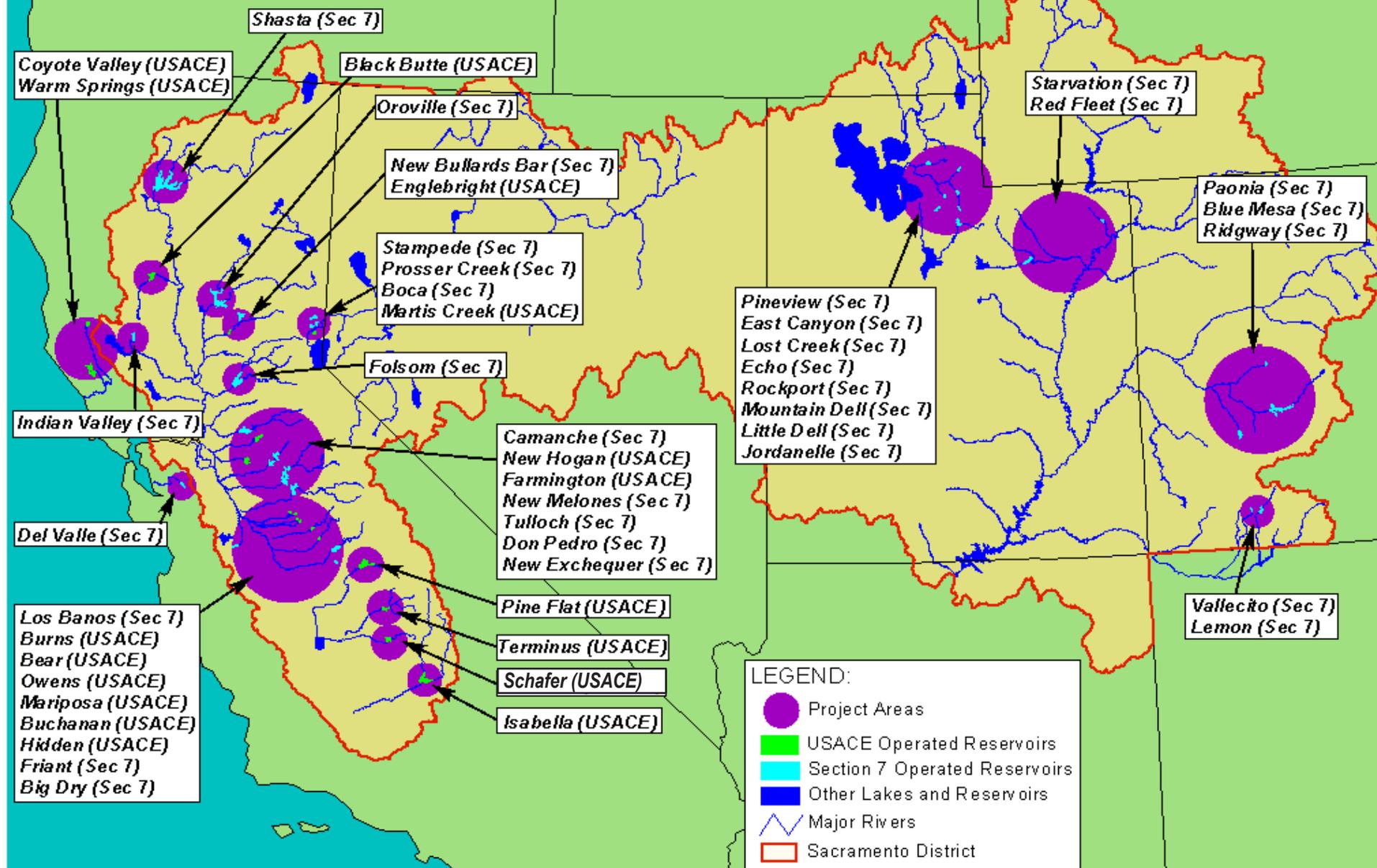


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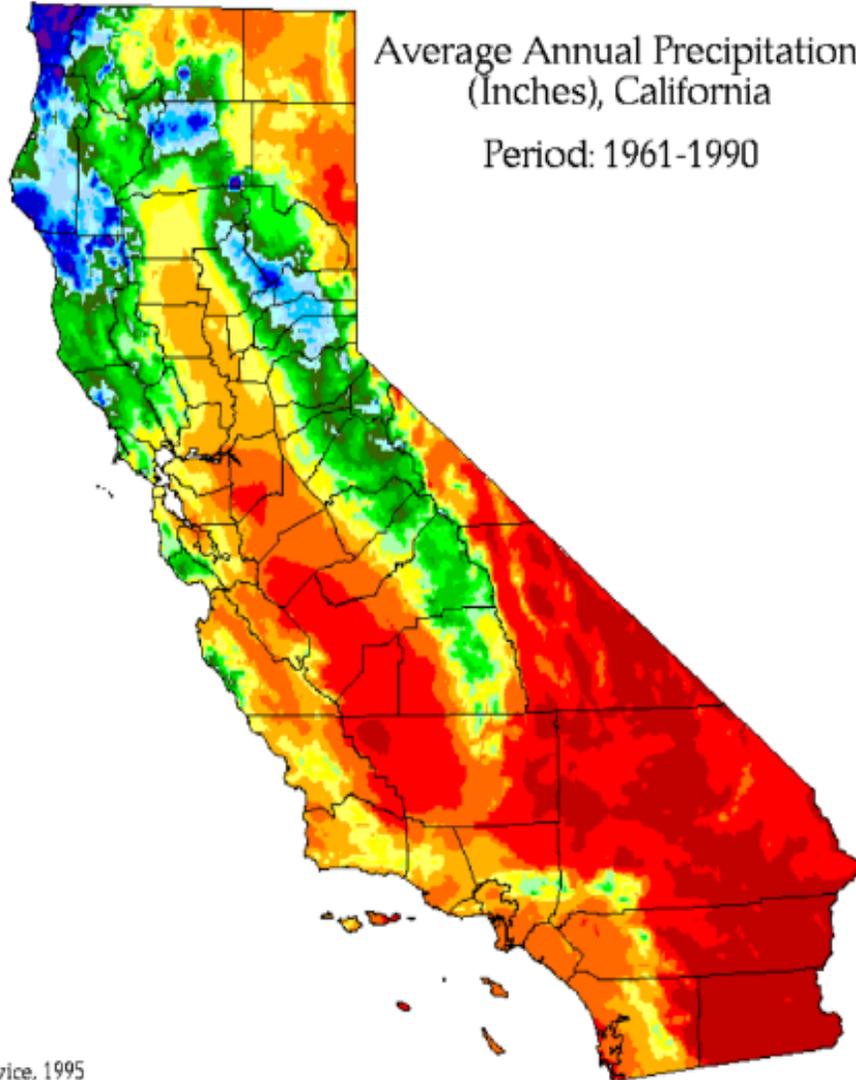
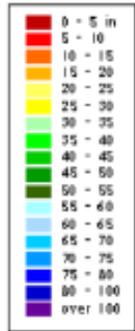
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SACRAMENTO DISTRICT PROJECTS



CENTRAL VALLEY HYDROLOGY

Average Annual Precipitation
(Inches), California
Period: 1961-1990



- Extreme spatial variation in precipitation from valley to Sierra Nevada Mountains
 - Orographic effect
 - Northern precipitation bias
 - Southern elevation bias
 - Rapid runoff
- Dominated by Atmospheric Rivers
- Heavily regulated by multi-purpose reservoirs

- Distinct extreme temporal variability in precipitation
 - Year to year: floods or drought
 - Annually -
 - Wet: Oct-Apr
 - Dry: May-Sept
 - Snowmelt: spring-summer
 - Climate change predictions: warmer temps
 - More precipitation will fall as rain (less as snow)
 - Increased precipitation intensity and frequency
 - Higher flood frequency

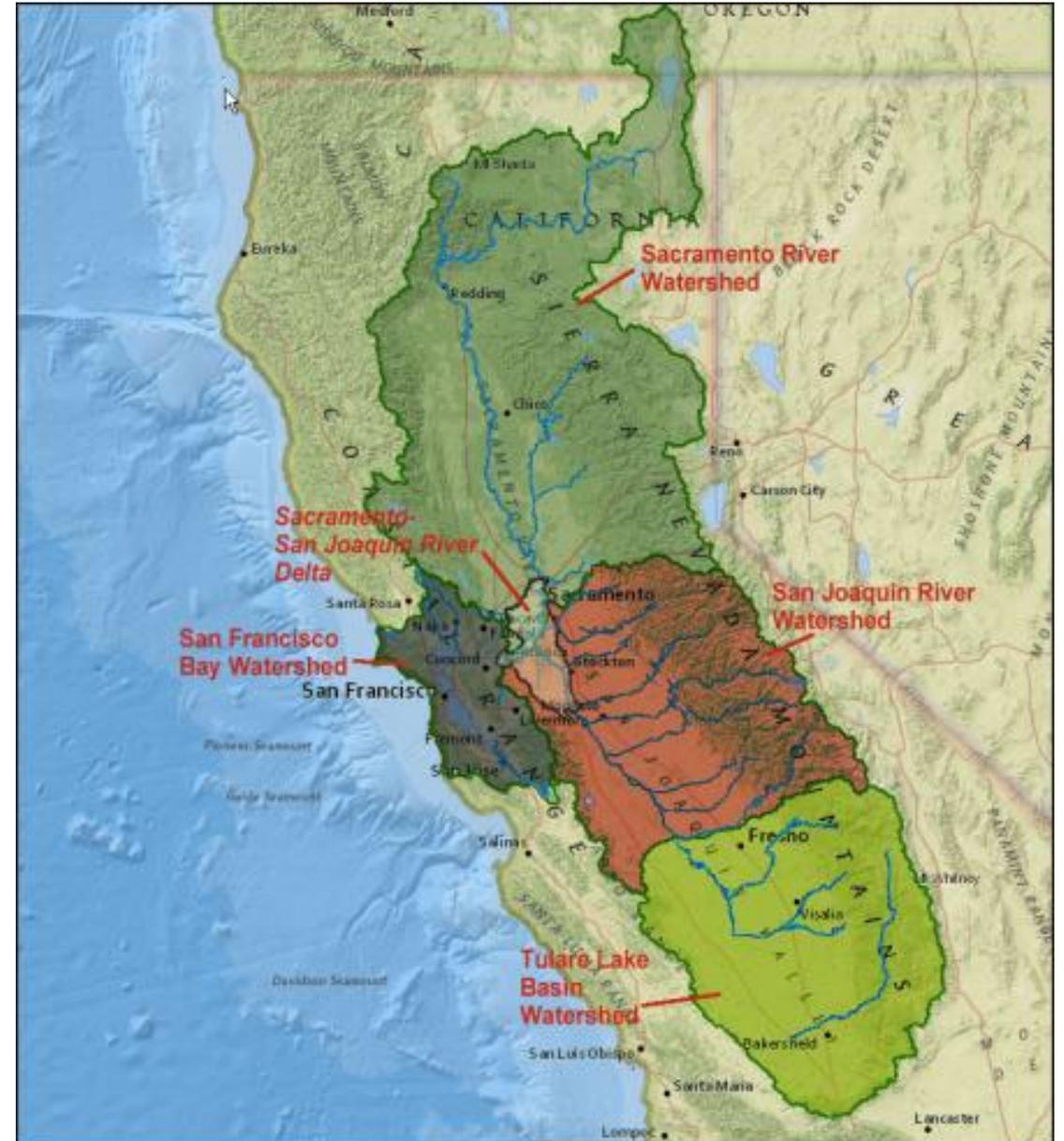


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CENTRAL VALLEY WATERSHEDS

5

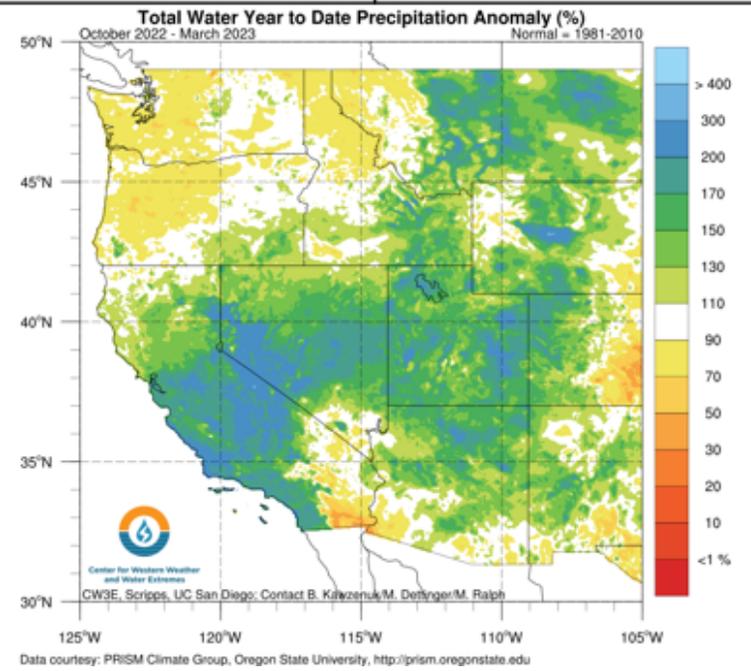
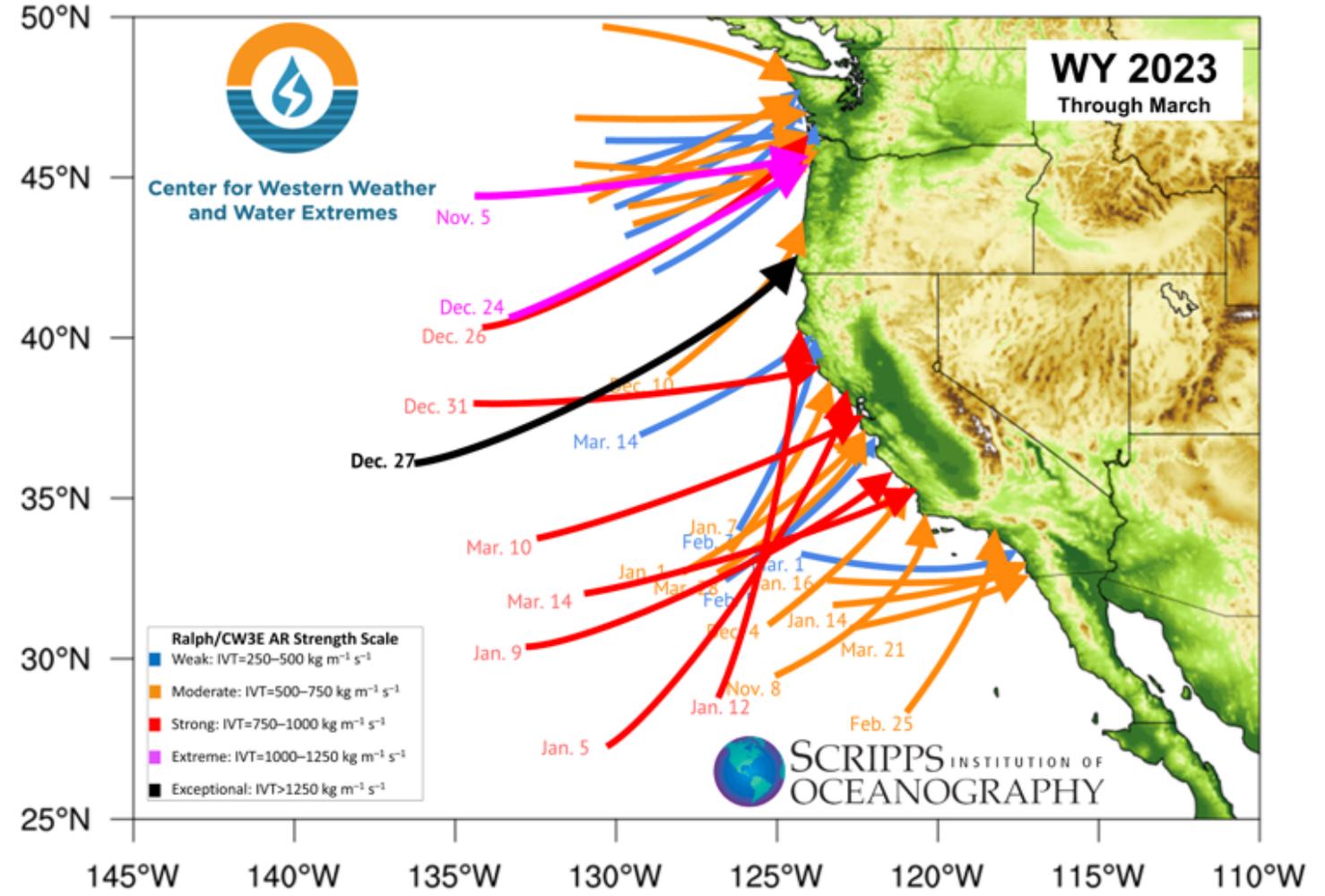
- Sacramento River
- San Joaquin River
- Tulare Lake Basin



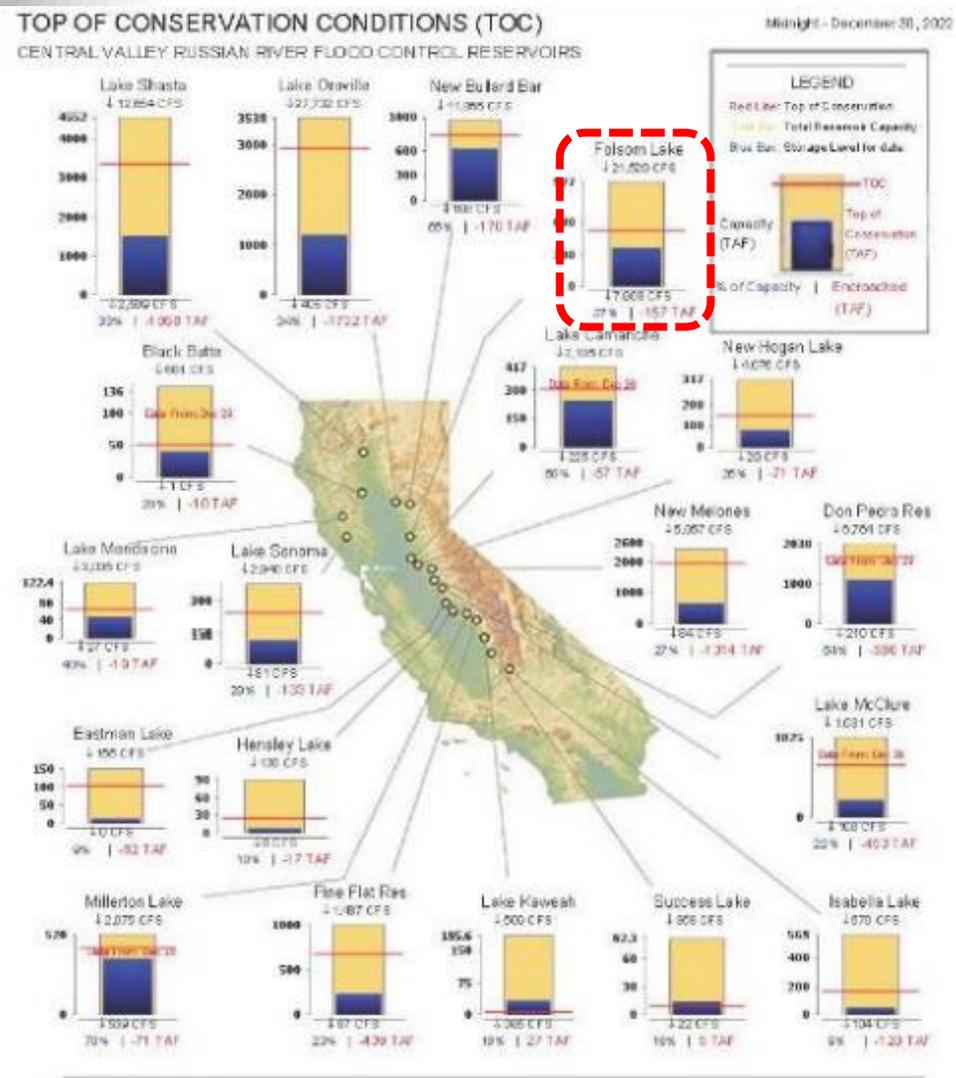
WY2023 ATMOSPHERIC RIVERS

Breakdown by Strength	
Strength	Number of ARs
Weak	11
Moderate	13
Strong	6
Extreme	1
Exceptional	0
Total	31

31 atmospheric rivers impacted California between October 1st 2022 and March 31st 2023

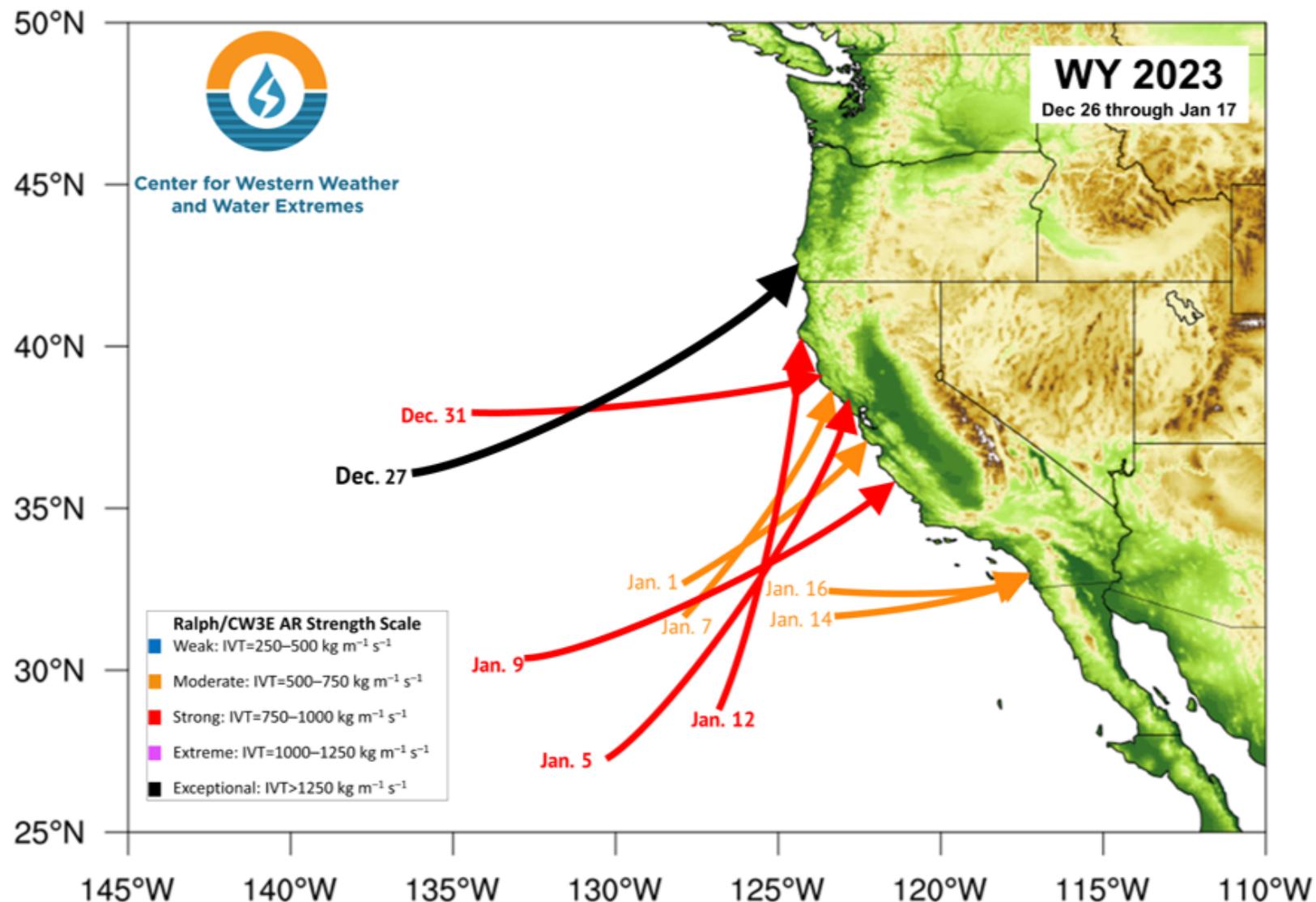


30 DECEMBER 2022 RESERVOIR STATUS



ATMOSPHERIC RIVERS FROM 27 DEC – 17

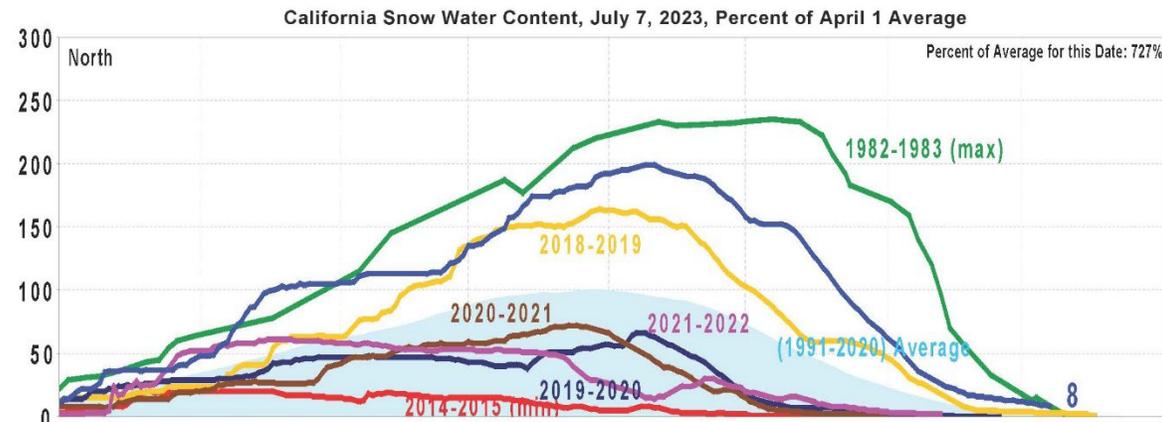
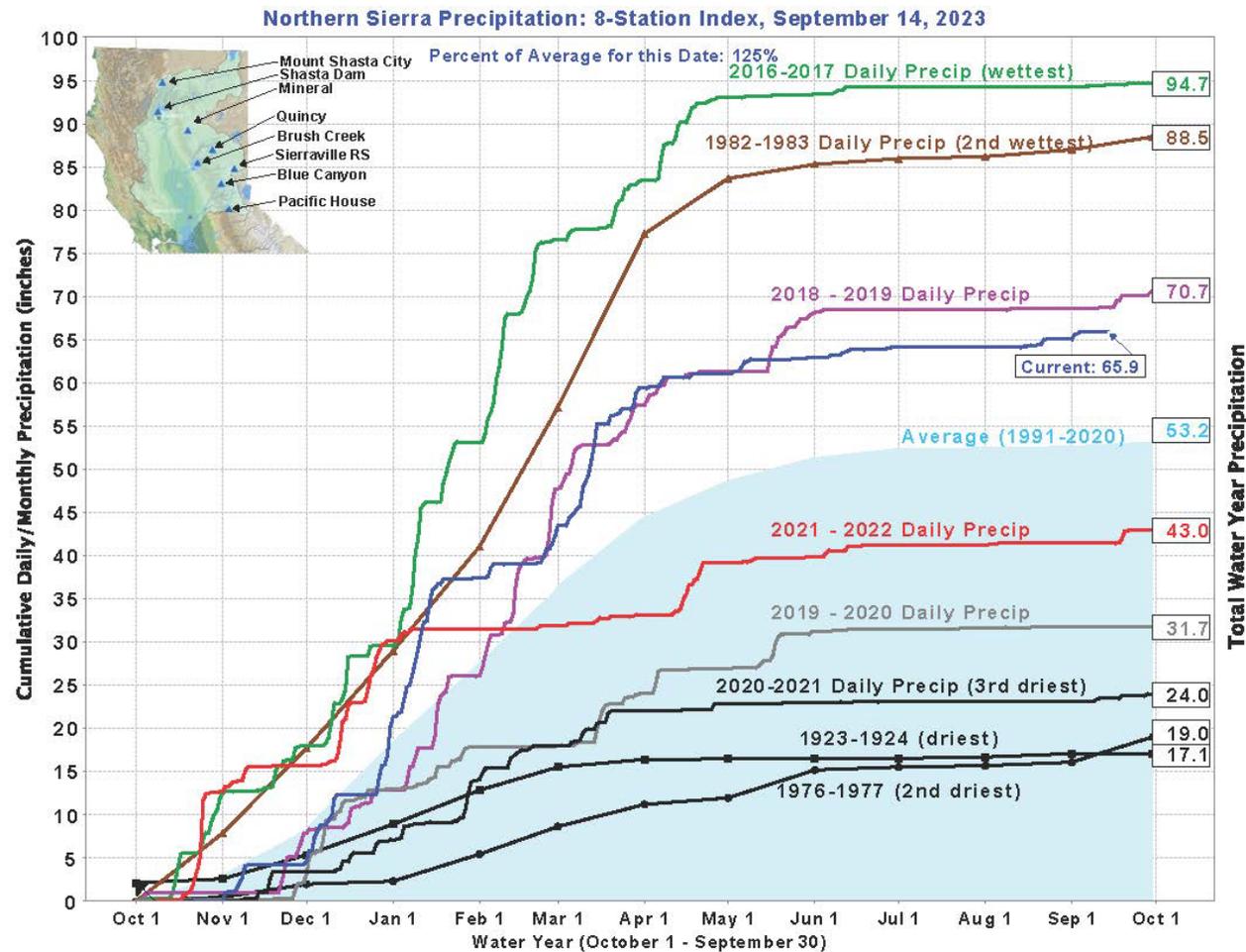
- 9 Atmospheric Rivers made landfall between December 26 and January 17
- Of the 9 ARs, 5 were of strong or greater magnitude
- California has averaged ~6 strong or greater magnitude ARs per water year since 2012
- For reference, California experienced 13 strong+ ARs during Water Year 2017





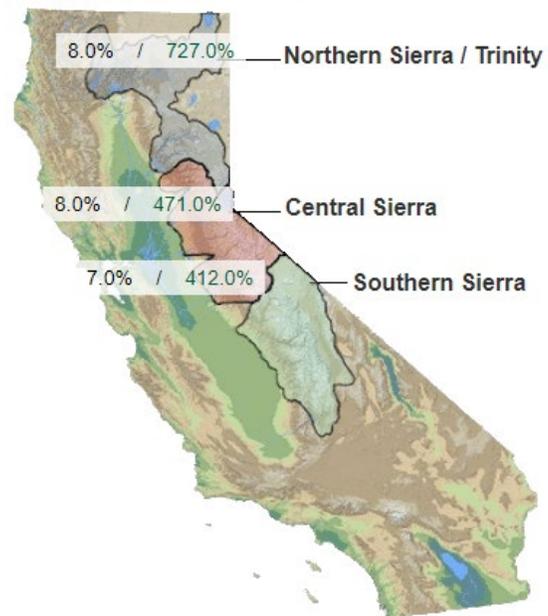
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NORTHERN SIERRA PRECIPITATION & SNOWPACK



Data For: 07-Jul-2023

% Apr 1 Avg. / % Normal for this Date



NORTH

Data For: 07-Jul-2023

Number of Stations Reporting 24

Average snow water equivalent 2.5"

Percent of April 1 Average 8%

Percent of normal for this date 727%

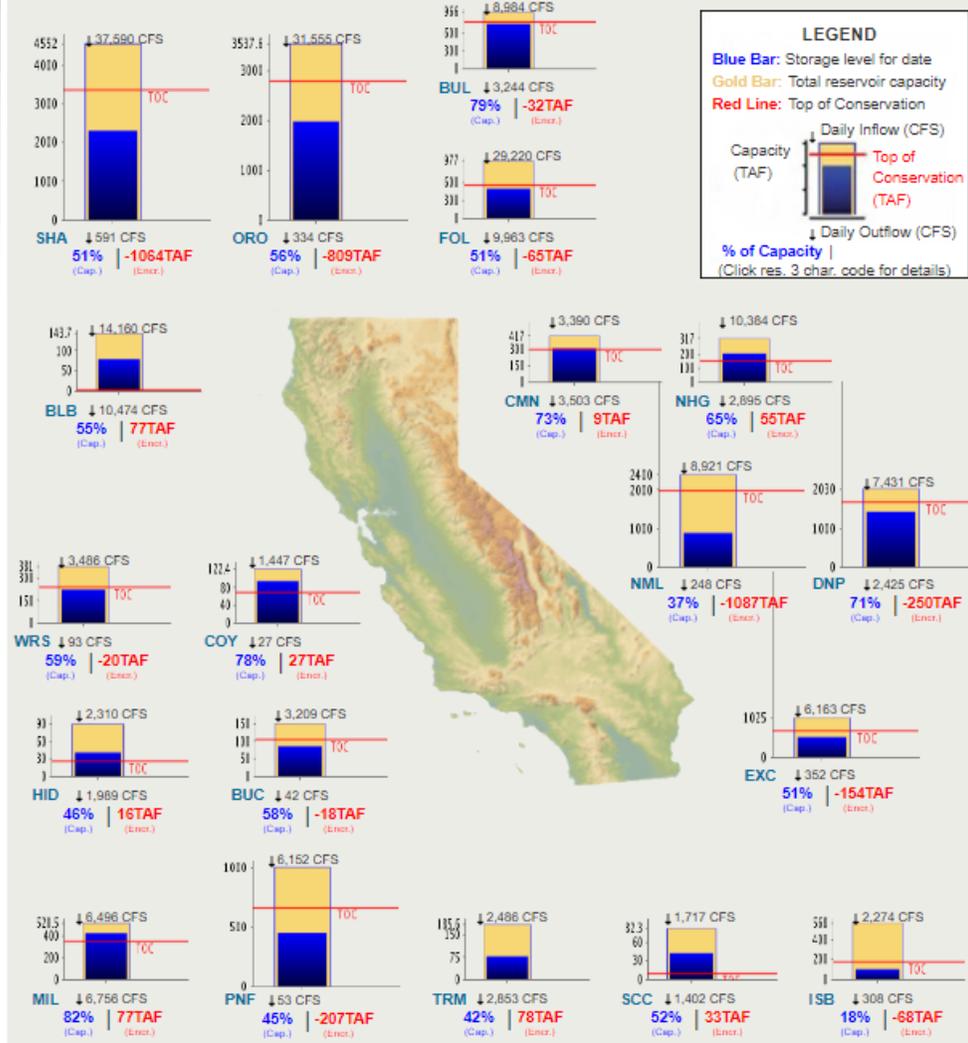


16 JANUARY 2023 RESERVOIR STATUS

CENTRAL VALLEY AND RUSSIAN RIVER FLOOD CONTROL RESERVOIRS: 15-JAN-2023

Midnight: 15-Jan-2023

Change Date: 15-Jan-2023



[Click for printable version of current data.](#)

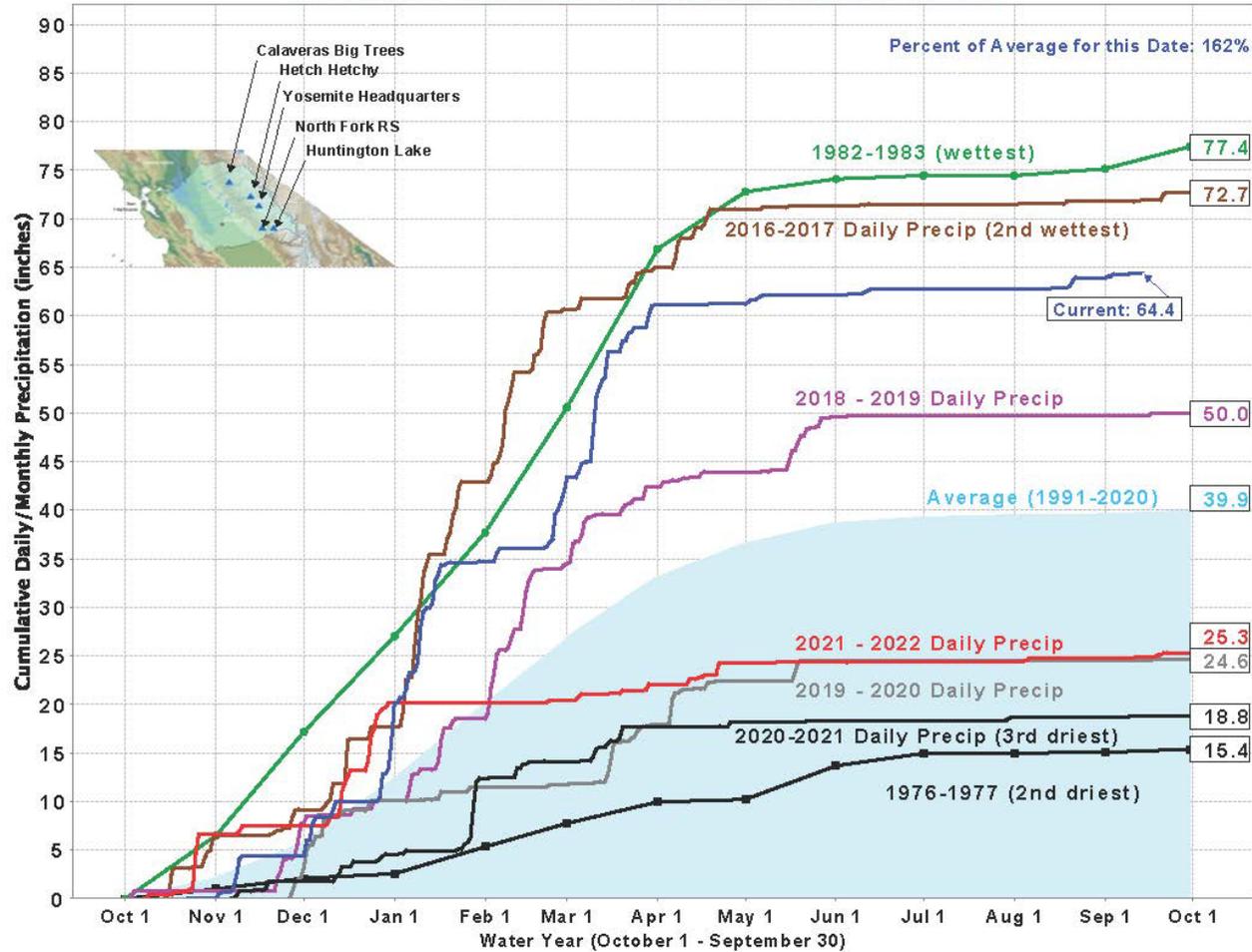
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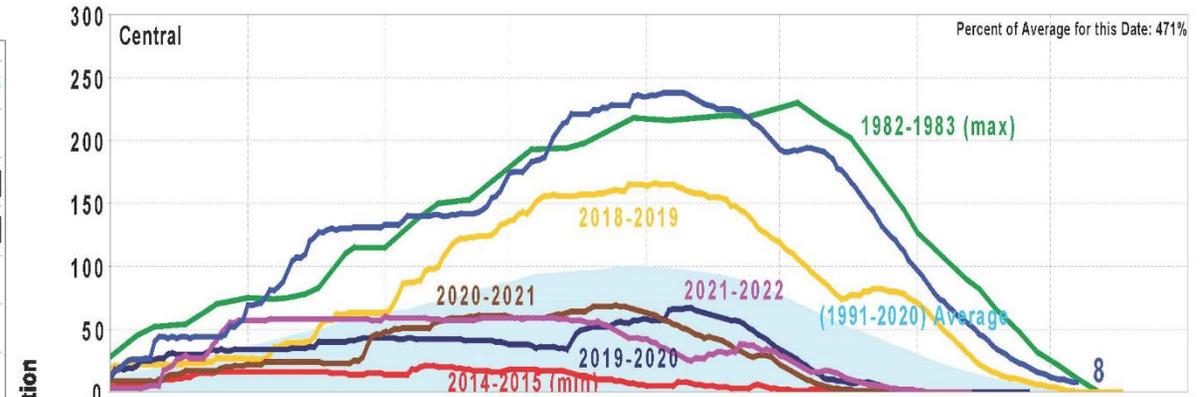
Farmington Dam-Lake (Corps – CA) January 2023

CENTRAL SIERRA PRECIPITATION & SNOWPACK

San Joaquin Precipitation: 5-Station Index, September 14, 2023

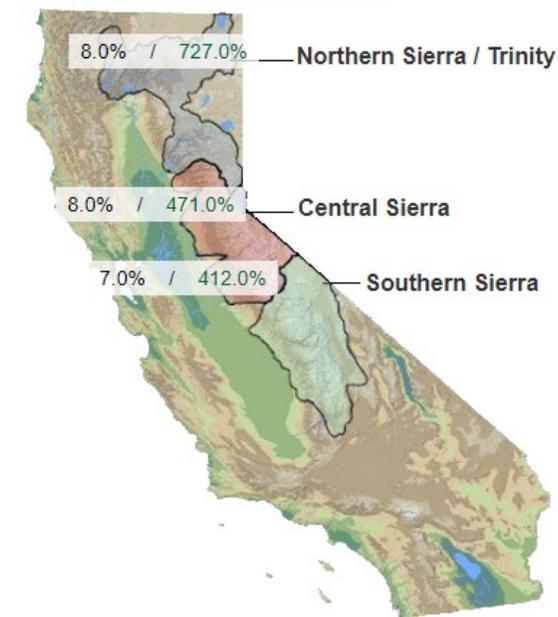


California Snow Water Content, July 7, 2023, Percent of April 1 Average



Data For: 07-Jul-2023

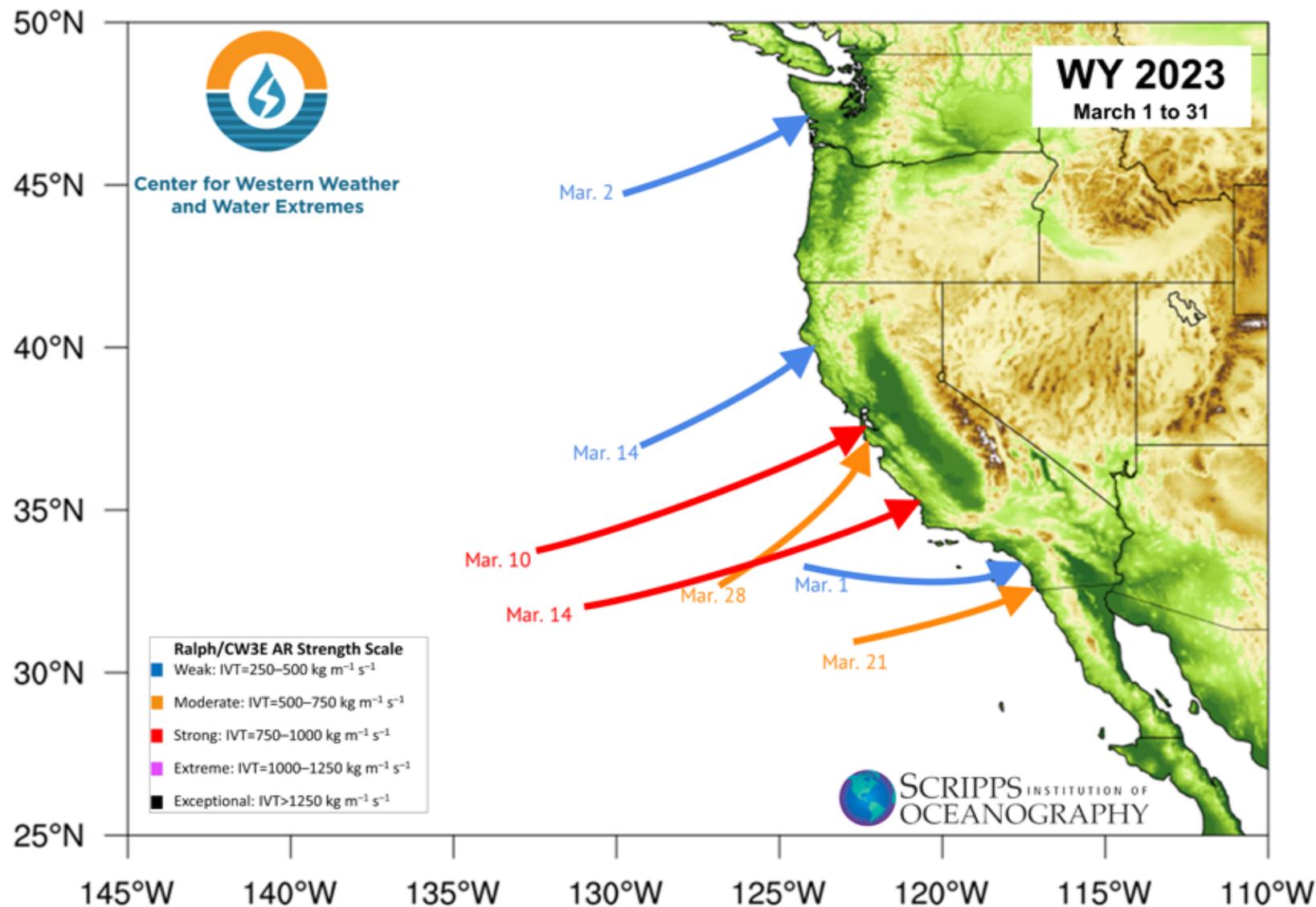
% Apr 1 Avg. / % Normal for this Date



CENTRAL	
Data For: 07-Jul-2023	
Number of Stations Reporting	41
Average snow water equivalent	1.9"
Percent of April 1 Average	8%
Percent of normal for this date	471%

ATMOSPHERIC RIVERS MARCH 2023

- 7 Atmospheric Rivers impacted California during March 2023
- Two of the Atmospheric Rivers were strong
- Central to Southern California averages <2 strong atmospheric rivers per Water Year





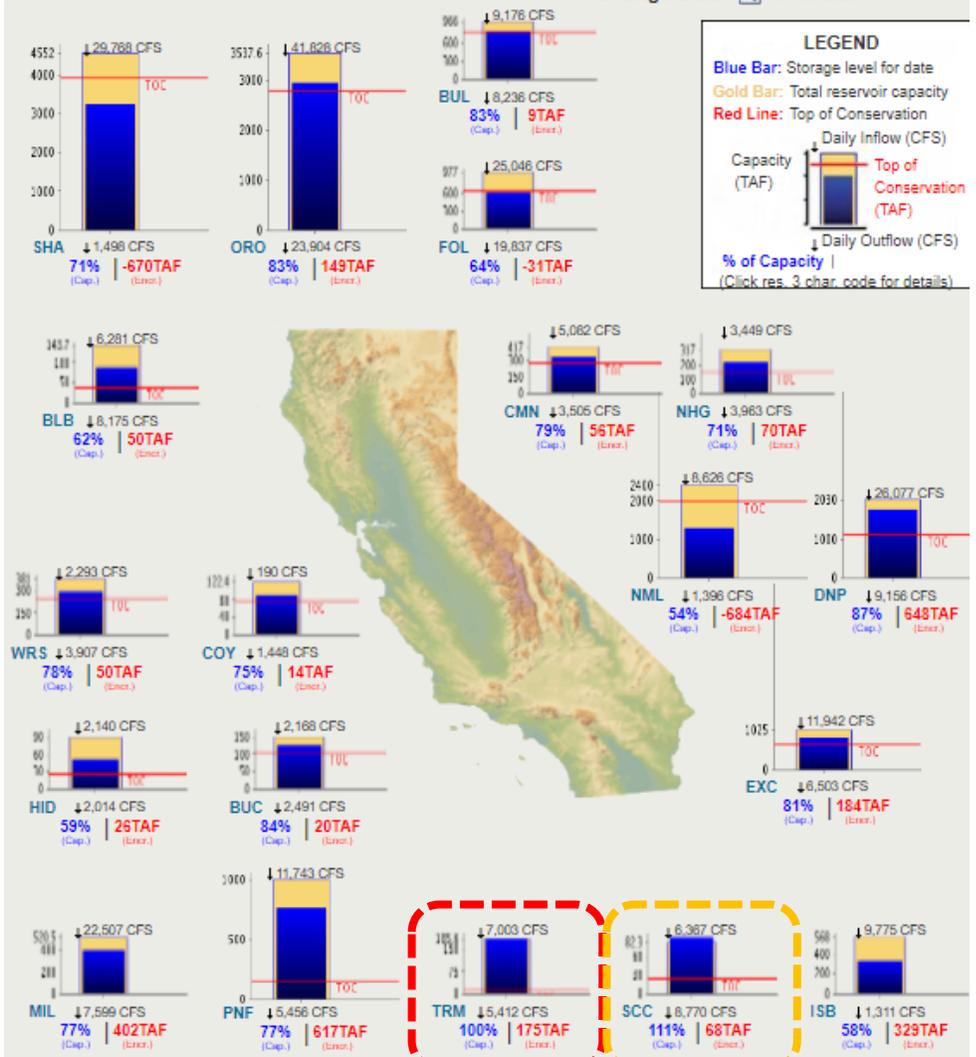
16 MARCH 2023 RESERVOIR STATUS

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TOP OF CONSERVATION CONDITIONS:
CENTRAL VALLEY AND RUSSIAN RIVER FLOOD CONTROL RESERVOIRS: 16-MAR-2023

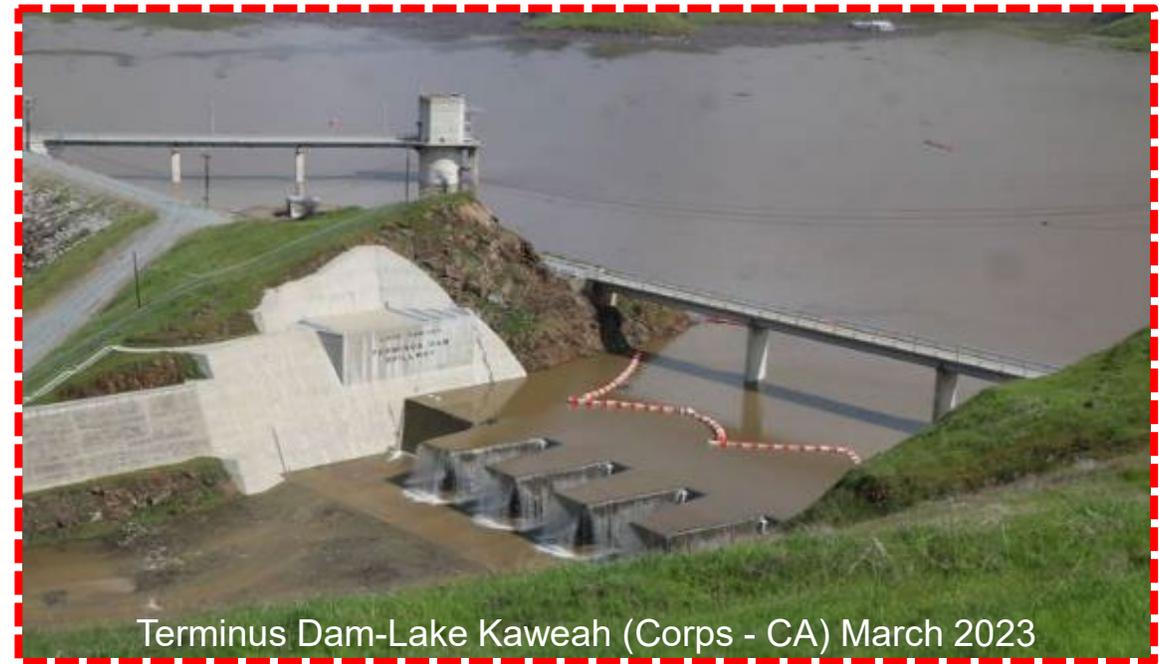
Midnight: 16-Mar-2023

Change Date: 16-Mar-2023



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Terminus Dam-Lake Kaweah (Corps - CA) March 2023



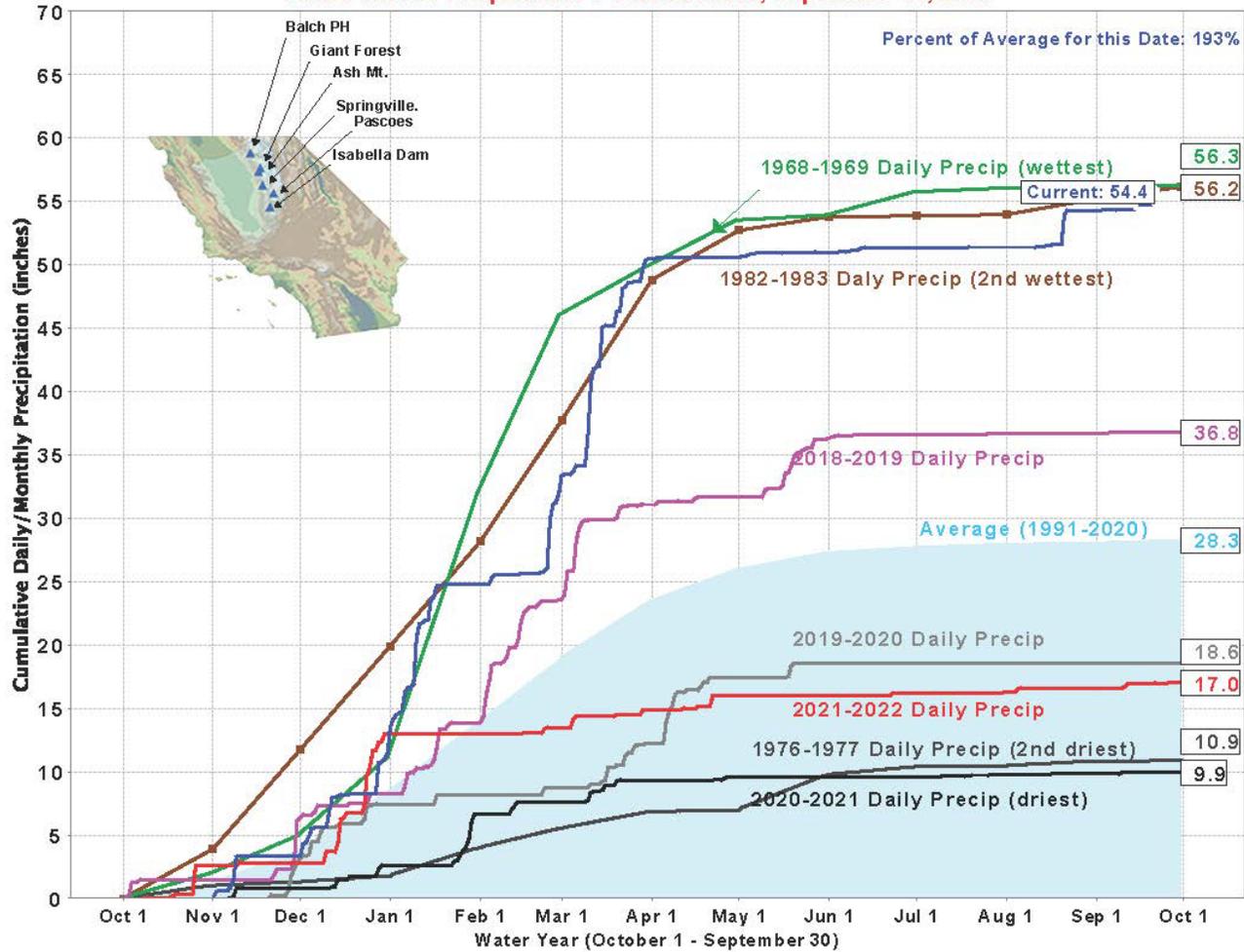
Schafer Dam-Success Lake(Corps - CA) March 2023



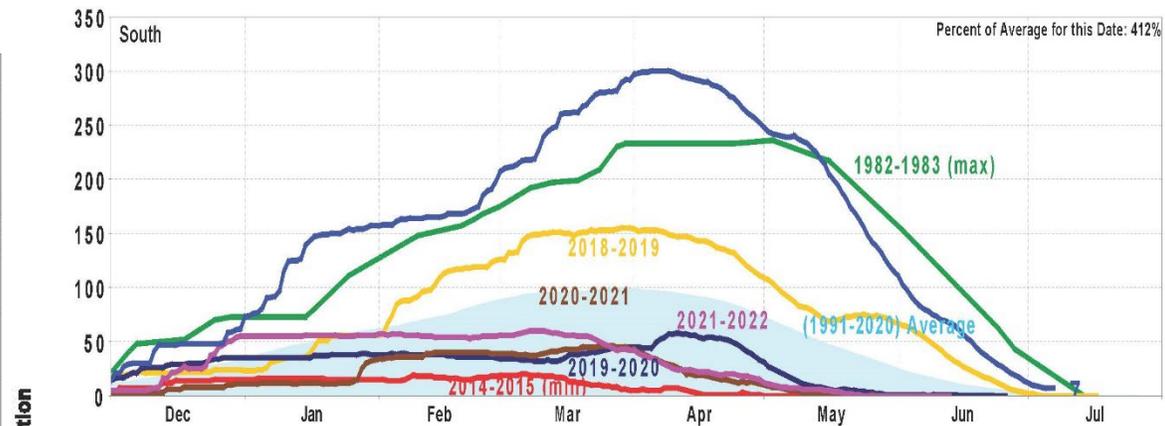
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SOUTHERN SIERRA PRECIPITATION & SNOWPACK

Tulare Basin Precipitation: 6-Station Index, September 14, 2023

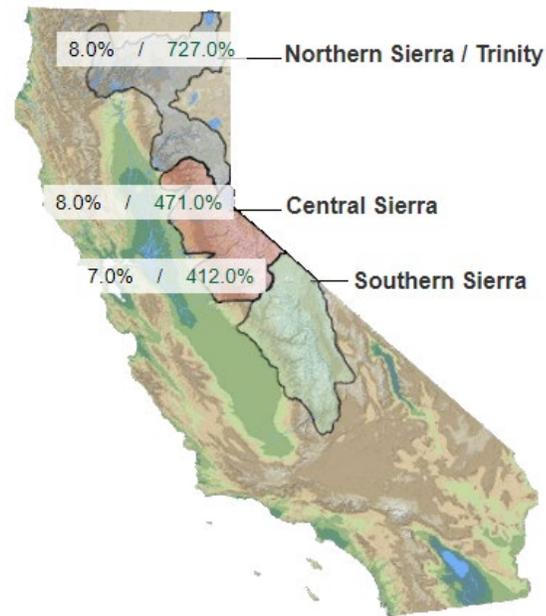


California Snow Water Content, July 7, 2023, Percent of April 1 Average



Data For: 07-Jul-2023

% Apr 1 Avg. / % Normal for this Date



SOUTH

Data For: 07-Jul-2023

Number of Stations Reporting 23

Average snow water equivalent 1.3"

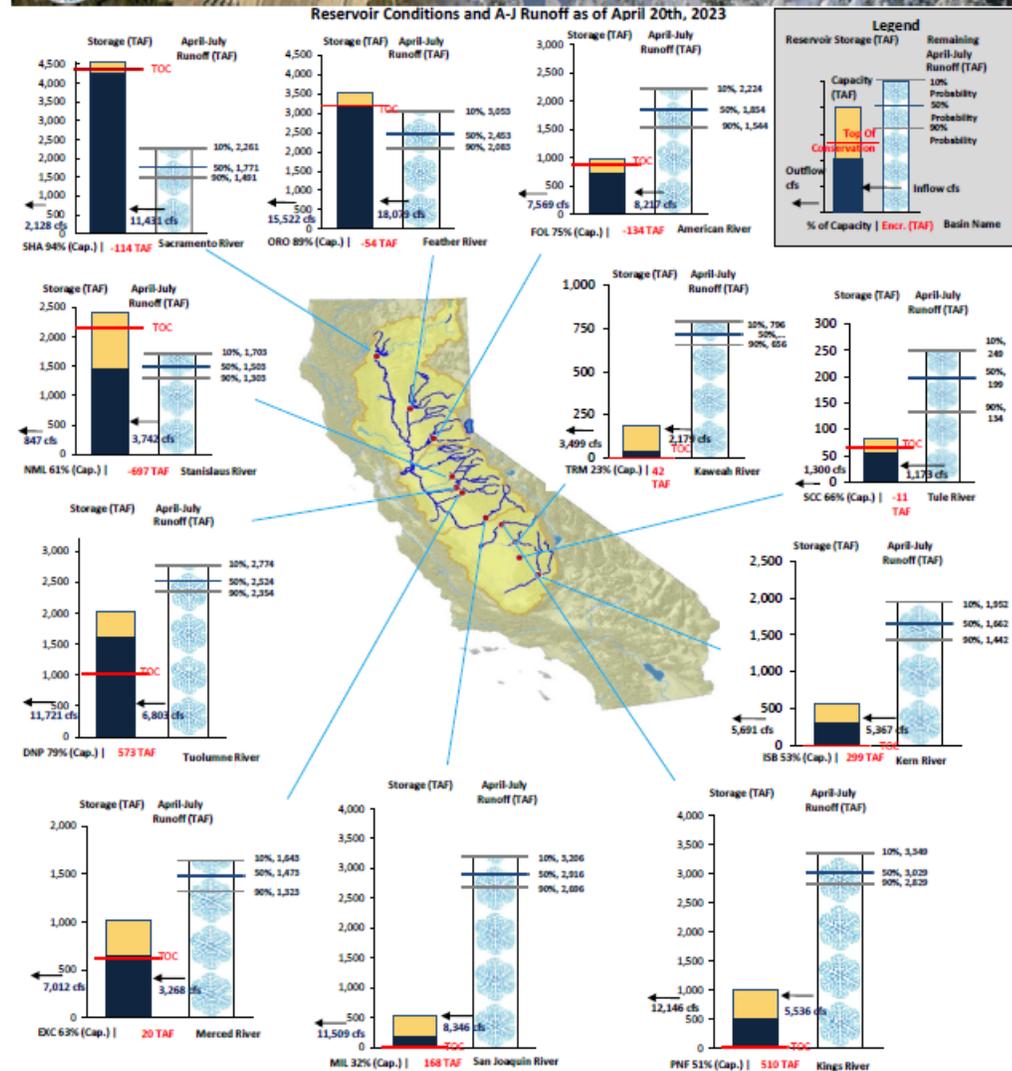
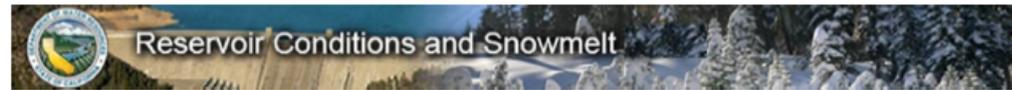
Percent of April 1 Average 7%

Percent of normal for this date 412%



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26 APRIL 2023 RESERVOIR STATUS



Goal of each reservoir – to route the snowmelt while following the Water Control Manual (WCM) and have a full reservoir at the end of the season (July)

Daily reservoir data as of 4/19/2023 (CDEC)
Snowmelt runoff forecast as of 4/18/2023 (8-120)

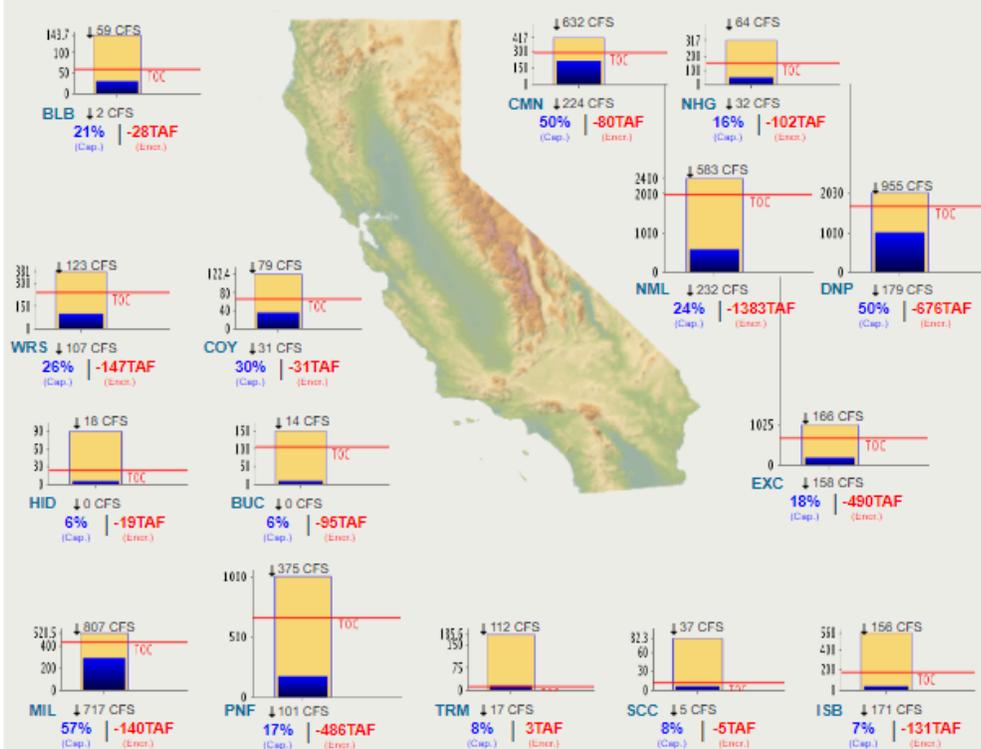
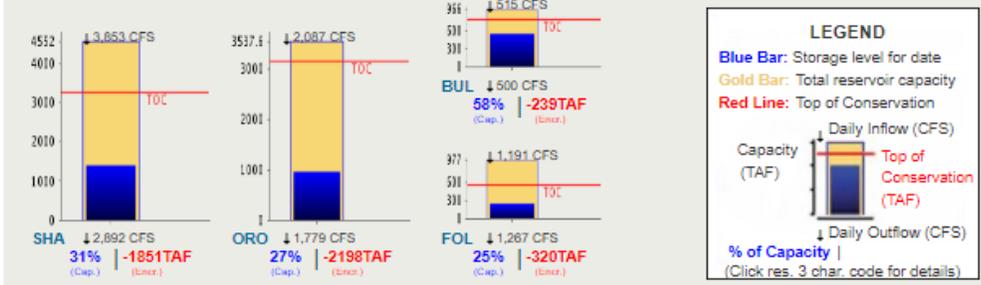


WY2023

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TOP OF CONSERVATION CONDITIONS: CENTRAL VALLEY AND RUSSIAN RIVER FLOOD CONTROL RESERVOIRS: 01-DEC-2022

Midnight: 01-Dec-2022 Change Date: 01-Dec-2022



Click for printable version of current data.

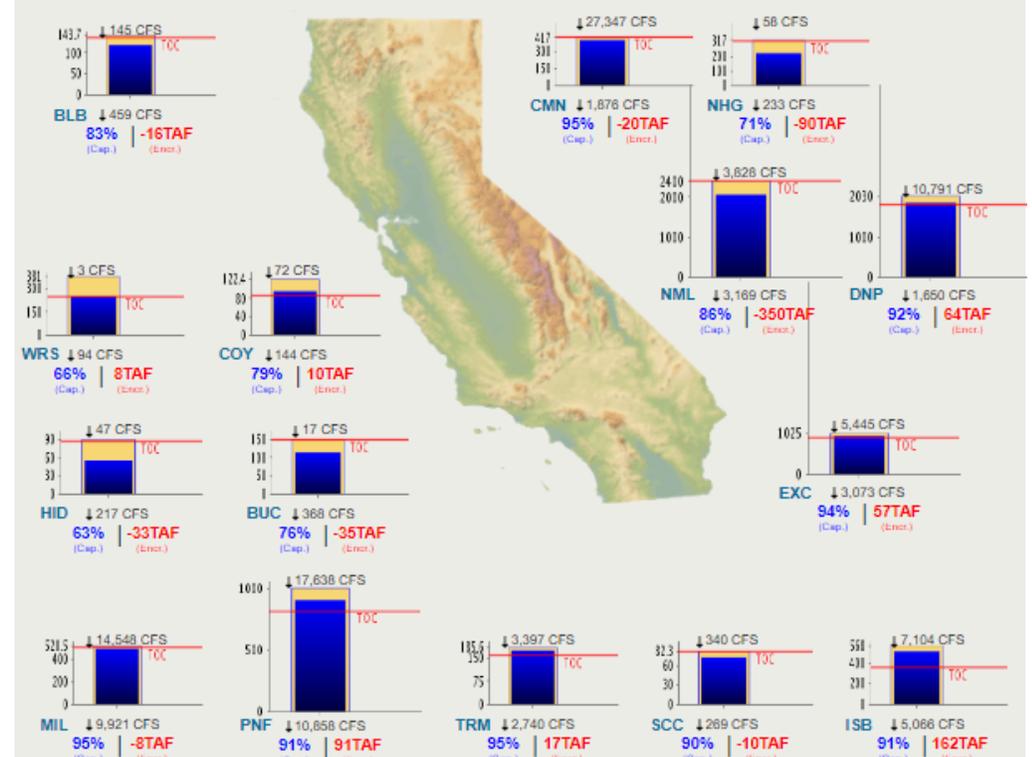
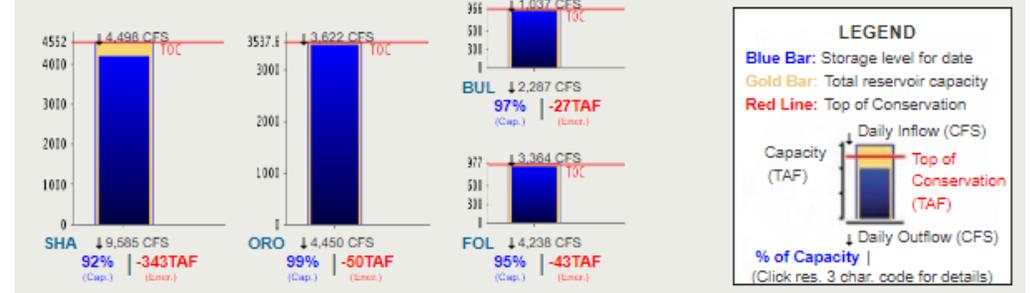
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06 JUL 2023

TOP OF CONSERVATION CONDITIONS: CENTRAL VALLEY AND RUSSIAN RIVER FLOOD CONTROL RESERVOIRS: 06-JUL-2023

Midnight: 06-Jul-2023 Change Date: 06-Jul-2023



Click for printable version of current data.

Report Generated: 07-Jul-2023 12:24 PM

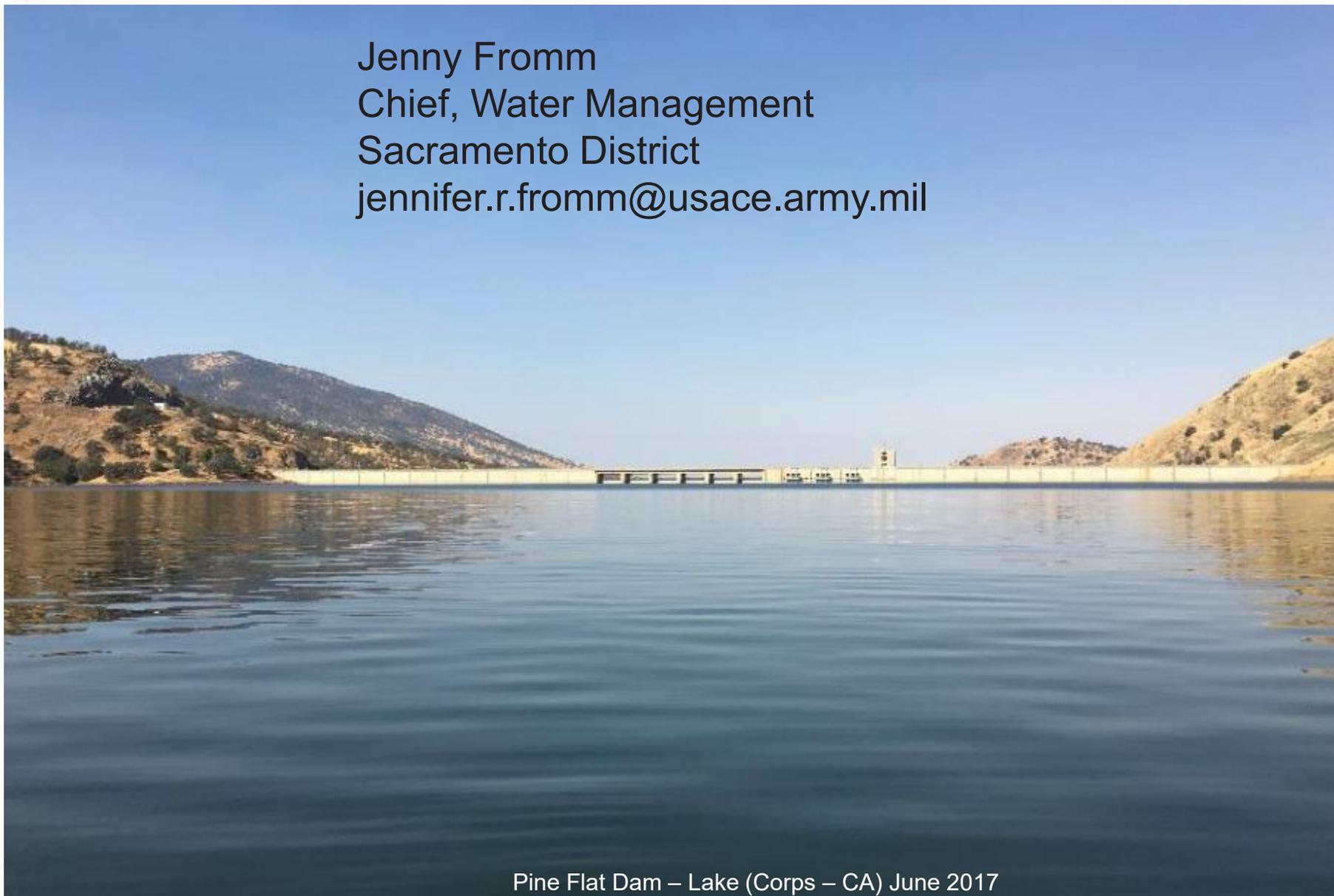
01 DEC 2022



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QUESTIONS

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Pine Flat Dam – Lake (Corps – CA) June 2017