Colorado River Board of California

December 1, 2021

NOTICE OF REGULAR MEETING OF THE COLORADO RIVER BOARD

NOTICE IS HEREBY GIVEN pursuant to the call of the Chairperson, Peter Nelson, by the undersigned Executive Director of the Colorado River Board of California that a regular meeting of the Board Members is to be held as follows:

Date: Tuesday, December 14, 2021
Time: 10:00 a.m.
Place: Augustus III Room
Caesars Palace Las Vegas Hotel and Casino
3570 S Las Vegas Blvd
Las Vegas, NV 89109

The Colorado River Board of California welcomes any comments from members of the public pertaining to items included on this agenda and related topics. If members of the public wish to make a comment regarding items on the agenda, there are two options for consideration: (1) Public oral comments can be provided at the beginning of each Board meeting; (2) Public comments may be submitted by electronic mail, and **should be addressed to the Board's Chairman, Mr. Peter Nelson, at crb@crb.ca.gov and will be accepted up until 10:00 a.m. on the day of the meeting**. Please note, **written submissions will be read aloud at the public comment period** to the extent they fit within the five-minute time limit.

If accommodations from individuals with disabilities are required, such persons should provide a request at least 24 hours in advance of the meeting by electronic mail at crb@crb.ca.gov.

Requests for additional information may be directed to: Mr. Christopher S. Harris, Executive Director, Colorado River Board of California, 770 Fairmont Avenue, Suite 100, Glendale, CA 91203-1068, or 818-500-1625. A copy of this Notice and Agenda may be found on the Colorado River Board's web page at www.crb.ca.gov.

A copy of the meeting agenda, showing the matters to be considered and transacted, is attached.

Christopher S. Harris
Executive Director

Regular Meeting
COLORADO RIVER BOARD OF CALIFORNIA
Tuesday, December 14, 2021
10:00 a.m.

At the discretion of the Board, all items appearing on this agenda, whether or not expressly listed for action, may be deliberated upon and may be subject to action by the Board. Items may not necessarily be taken up in the order shown.

1. **Call to Order**

2. **Opportunity for the Public to Address the Board**[1] (Limited to 5 minutes)

3. **Administration**

   a. Consideration and approval of November 10, 2021, Board meeting Minutes (**Action**)
   b. Consideration and approval of the Proposed Calendar-Year 2022 Board meeting schedule **(Action)**

4. **Colorado River Basin and Local Water Supply and Operations Reports**

5. **Agency End-of-Year Reports**

6. **Colorado River Basin Programs Staff Reports**

7. **Executive Session**[2]

8. **Other Business**

9. **Future Agenda Items/Announcements**

Next Scheduled Board Meeting: January 12, 2022
10:00 a.m., Pacific
(TBD)

[1] In accordance with California Government Code, Section 54954.3(a).

[2] An Executive Session may be held by the Board pursuant to provisions of Article 9 (commencing with Section 11120) of Chapter 1 of Part 1 of Division 3 of Title 2 of the Government Code and Sections 12516 and 12519 of the Water Code to discuss matters concerning interstate claims to the use of Colorado River System waters in judicial proceedings, administrative proceedings, and/or negotiations with representatives from the other Basin states or federal government.

Minutes of Meeting
COLORADO RIVER BOARD OF CALIFORNIA
Wednesday, November 10, 2021

A meeting of the Colorado River Board of California (Board) was held virtually on Wednesday, November 10, 2021, using the Zoom Webinar meeting platform.

Board Members and Alternates Present:

David DeJesus (MWD Alternate)
Castulo Estrada (CVWD Alternate)
Dana B. Fisher, Jr. (PVID)
John B. Hamby (IID)
James Hanks (IID Alternate)
Jeanine Jones (DWR Designee)
Henry Kuiper (Public Member)
Jim Madaffer (SDCWA)
Peter Nelson, Chairman (CVWD)
Glen D. Peterson (MWD)
David R. Pettijohn (LADWP)
Jack Seiler (PVID Alternate)
David Vigil (DFW Alternate)

Board Members and Alternates Absent:

Christopher Hayes (DFW Designee)
Eric Katz (AG Office)
Mark Watton (SDWA Alternate)
Delon Kwan (LADWP Alternate)

Others Present:

Steven Abbott
Justina Arce
Jim Barrett
Robert Cheng
Dennis Davis
JR Echard
Melissa Haley
Christopher Harris
Joanna Hoff
Ned Hyduke
Lisa Johansen
Rich Juricich
Laura Lamdin
Tom Levy
Cary Meister
Dylan Mohamed
Jessica Neuwerth
Jessica Rangel
Shana Rapoport
Angela Rashid
Kelly Rodgers
Santi Rosset
Tom Ryan
Roberta Saligumba
Alexi Schnell
Keith Scoular
Gary Tavetian
Sara Tucker
Cherie Watte
Jerry Zimmerman

CALL TO ORDER

Chairman Nelson announced the presence of a quorum and called the meeting to order at 10:00 a.m.

OPPORTUNITY FOR THE PUBLIC TO ADDRESS THE BOARD

Chairman Nelson invited members of the audience to address the Board on items on the agenda or matters related to the Board. Hearing none, Chairman Nelson moved to the next item on the agenda.

ADMINISTRATION

Chairman Nelson asked for a motion to approve the September 15, 2021, meeting minutes. Mr. Pettijohn moved that the minutes be approved, seconded by Mr. Madaffer. By roll-call vote, the minutes were approved.

COLORADO RIVER BASIN WATER REPORTS

Colorado River Basin Report

Mr. Juricich reported that as of November 1st, the water level at Lake Powell was 3,543.85 feet with 7.15 million-acre feet (MAF) of storage, or 29% of capacity. Mr. Juricich added that Lake Powell is about nineteen feet above the critical elevation of 3,525 feet. The elevation of 3,525 feet provides some buffer to the minimum power pool elevation, which is at 3,490 feet. He noted that the water level at Lake Mead was 1,066.04 feet with 8.89 MAF of storage, or 34% of capacity. Mr. Juricich added that Lake Mead's elevation is about sixteen feet above the Level 2 Shortage Tier at elevation 1,050 feet. The total system storage was 22.49 MAF, or 38% of capacity, which is 5.64 MAF less than system storage at this time last year.

Mr. Juricich reported that as of November 1st, for Water Year-2022 (WY-2022), the observed October inflow to Lake Powell was 0.32 MAF, or 70% of normal. The November inflow forecast to Lake Powell is 0.33 MAF, or 79% of normal. The forecasted unregulated inflow into Lake Powell for WY-2022 is 7.80 MAF, or 81% of normal and the WY-2022 forecasted April to July inflow to Lake Powell is 5.27 MAF, or 82% of normal. Mr. Juricich reported that overall precipitation conditions in the Upper Colorado River Basin were 125% of normal.

Mr. Juricich reported that precipitation conditions in September were mixed, while precipitation conditions in October were above average due to storm activity, particularly benefiting Utah, Wyoming, and areas of the Basin over an 8,000-foot elevation. Mr. Juricich reported that the Pacific Ocean is in a La Nina condition which may mean a drier winter in the Southwest but may not correlate to drier conditions in the Upper Colorado Basin.

Mr. Juricich reported on the October 24-Month Study projections for reservoir elevations for Lakes Powell and Mead. He stated that the projections show that by February 2022, Lake Powell's elevation will hit the critical elevation of 3,525 feet and it is expected that spring runoff may improve Powell's elevation. Mr. Juricich also stated that Lake Mead is in a Level 1 shortage tier, with the possibility of a Level 2 shortage at elevation 1,050 feet looming at the end of 2022.

Mr. Juricich reported that through November 4th, the Brock and Senator Wash regulating reservoirs captured 112,093 AF and 61,874 AF, respectively. He also reported that the excess deliveries to Mexico were 28,592 AF, compared to 50,709 AF last year. Finally, the total amount of saline drainage water bypassed to the Cienega de Santa Clara in Mexico was 94,757 AF, through September 30, 2021.

State and Local Report

Ms. Jones, representing the California Department of Water Resources (DWR), reported that a large storm at the end of October brought above average precipitation to some parts of Northern California which was a great start to the water year. However, she noted that the precipitation conditions will be shifting to a drier pattern over the next seven to ten days for most of the state.

Ms. Jones noted that DWR has been fielding questions from the media about whether the latest storm made a dent on the drought. While much more precipitation will be needed to overcome drought conditions, she noted that Oroville reservoir, which has had record low elevations, and Folsom reservoir have both seen an improvement in elevations. She added that other reservoirs that were not directly in the storm's path did not see nearly as much improvement in reservoir elevation.

Ms. Jones reported that DWR should be receiving the experimental seasonal precipitation forecast from its research partners in December.

Mr. Peterson, representing The Metropolitan Water District of Southern California (MWD), reported that MWD's storage has declined slightly, but is holding steady. He also

reported that the Central Arizona Project and the Arizona Department of Water Resources, along with the Southern Nevada Water Authority finalized a deal to participate in MWD's regional recycling program.

Mr. Peterson reported that the Colorado aqueduct is on a 7-pump flow and water consumption has declined, adding that water conservation has particularly increased in service areas that receive State Water Project water only.

Mr. Peterson reported that MWD declared a drought emergency to bring water consumption down within its service areas. He added that the drought emergency gives the general manager the ability to make investments and purchase water.

Vice Chairman Pettijohn, representing the Los Angeles Department of Water and Power (LADWP), reported that LADWP is working with MWD on a program that will allow MWD to get some of its stored Colorado River water to LADWP. He added that MWD has the third highest level of storage in its history and can't get that water to its service areas that are exclusively serviced by State Water Project water, making those areas very unreliable. Mr. Pettijohn stated that in response to this situation, LADWP has limited outdoor watering to three days a week and city-owned property will only be watered twice a week. He noted that LADWP is also ramping up messaging on rebate and incentive programs. In addition, LADWP is actively enforcing prohibited uses and following up on reports of wasteful uses of water.

Mr. Pettijohn reported that the LADWP Board recently increased its spending on incentives, with a $2 million incentive for businesses that want to conserve water and LADWP is continuing to develop new programs. He noted that there is also a free turf replacement design service that is offering $3 a square foot for turf removal. LADWP will also plan to send home water use reports out to all single-family residential customers by next year. Mr. Pettijohn also reported on additional incentive programs that include replacement of cooling towers for businesses and real time monitoring of water use in the city that can be accessed from a smart phone.

Mr. Pettijohn added that this will be a difficult year ahead if the State Water Project doesn't receive adequate precipitation, noting that Lake Oroville will need an additional 600,000 AF of water before the State will start allocating water under the State Water Project contract. He stated that it is a critical time for areas within MWD's service area that depend on the State Water Project.

STATUS OF COLORADO RIVER BASIN PROGRAMS

Lower Basin 500+ Plan

Mr. Harris reported that Reclamation's August 24-Month Study projected that Lake Mead's elevation could decline to 1030' feet or lower under the minimum probable scenario, triggering additional consultation among the Lower Basin States under the Drought Contingency Plan (DCP). Mr. Harris reported that representatives from the Lower Basin States have been working since the release of these modeling results to evaluate potential opportunities and options to bolster the level of Lake Mead and to decrease the likelihood of reaching elevation 1020'. Through this process, the states have developed the "500+ Plan," under which the Lower Basin States and Bureau of Reclamation would make best efforts to conserve an additional 500,000 AF in both 2022 and 2023. Mr. Harris reported that these volumes of water would likely be generated through the creation of new conserved water or operational changes related to the storage and delivery of existing conserved water. The Lower Basin States propose providing $100 million to support this effort and have requested that the United States provide a matching $100 million. Mr. Harris also noted that outreach to Mexico has been underway to explore opportunities for Mexican participation in this plan. Mr. Harris reported that Reclamation hosted a public webinar on November 5th to provide information on the proposed 500+ plan. The current goal is to have the plan ready for approval by the CRWUA conference in mid-December. Final implementing agreements would likely need to be completed by the first or second quarter of 2022.

Mr. Fisher noted his concern that development of this short-term proposal might divert attention from the development of the next set of operating guidelines. Mr. Harris stated that although the States are interested in moving forward on the next set of guidelines, the group is also still working to reach consensus on aspects that will form the basis of the next set of guidelines, such as modeling frameworks and the timeline for completing the guidelines. Chairman Nelson agreed that the current crisis conditions at Lakes Powell and Mead have drawn attention away from the next set of guidelines.

Colorado River Basin Salinity Control Program Implementation

Mr. Juricich provided an update on the implementation of the Colorado River Basin Salinity Control Program including a summary of the Salinity Forum, Advisory Council and Work Group meetings held October 25, 27, and 28. Mr. Juricich described a graphic in the Board presentation showing historical and projected salinity concentrations at Lake Mead based on

analysis by the U.S. Bureau of Reclamation. The analysis shows an increasing value of salinity at Lake Mead, projected to increase to over 610 mg/l by the end of calendar year 2022.

Mr. Juricich provided an update from the Upper Region Regional Director Wayne Pullan regarding the Paradox Valley Salinity Control Project. Reclamation is continuing to conduct a risk assessment for Paradox to determine when and if the Paradox Valley brine injection well could be restarted. The risk assessment could take a couple of years. The Basin states are interested in restarting the injection well sooner even if at a much-reduced level.

Mr. Juricich provided an update from the USGS study on salinity trends in the Lower Basin. The study looked at tributaries to the mainstem of the Colorado River and not the mainstem itself. The analysis performed by the USGS didn't see a clear-cut trend in salinity in the Lower Basin, but more of a cyclical trend.

Mr. Juricich described a presentation from Reclamation on the impeller replacement project at Hoover Dam, which improved the efficiency of the power generation. And finally, Mr. Juricich described efforts to improve the Lower Colorado Basin Development Fund, which supports the Basin States cost share for salinity control projects.

Member Peterson expressed frustration at the lack of progress on the Paradox Valley Salinity Control Project and other projects like Pah Tempe Hot Springs. He expressed that there is too much studying of these activities without implementation. He would like to see the Basin States pressure action on Paradox. Chairman Nelson echoed comments by Member Peterson and highlighted that concern in his comments to Congress at the recent hearings. He received questions from California's representative about progress at Paradox Valley. Mr. Harris agreed that the Forum and Basin States need to pressure action. Chairman Nelson and Mr. Harris highlighted that California just added Mr. Joaquin Esquivel and Ms. Jessica Neuwerth as members to the Forum. Mr. Harris suggested that California could write a letter on behalf of California's water users regarding progress at Paradox Valley. Chairman Nelson supported this approach. Member Peterson stated that the linkage between injection and earthquakes is well known, and the risk analysis will not provide any new information. Mr. Juricich mentioned that there is the potential for a public-private partnership at Paradox that is being explored that would not require an injection well or land fill. Chairman Nelson asked for an update on the environmental analysis performed by Reclamation for a replacement project at Paradox Valley. Mr. Juricich explained that the Final Environmental Impact Statement was released in December 2020 and that it adopted a No Action Alternative, but a Record of Decision was not issued. Mr. Juricich noted that this leaves the door open for the Forum to continuing working with Reclamation to find an alternative.

Glen Canyon Dam Adaptive Management Program

Board Staff Ms. Neuwerth reported that the Technical Work Group (TWG) of the Glen Canyon Dam Adaptive Management Workgroup (AMWG) held a two-day meeting on October 13 and 14. Ms. Neuwerth reported that as the lake level at Lake Powell decreases, there is an increased risk of passing non-native fish through the dam from Lake Powell down into this river reach below the dam to the Grand Canyon. There is an ongoing study of this risk as Lake Powell continues to decline.

Ms. Neuwerth reported that the TWG was presented modeling data from 2021 that indicates a low population of juvenile humpback chub in the Little Colorado River. The TWG is continuing to monitor this population.

Ms. Neuwerth reported that there was sufficient sediment to trigger an extended high flow experiment (HFE) in the fall. The TWG found that an HFE could bring Lake Powell below 3,525' earlier and it could remain below 3,525' for longer than if an HFE were not conducted. As a result, the Department of the Interior decided not to move forward with an HFE this fall.

Ms. Neuwerth reported that the U.S. Fish and Wildlife Service downlisted the humpback chub from endangered to threatened. Ms. Neuwerth also reported that the GCDAMP will hold its annual science reporting meeting in January.

Board Member Peterson inquired about the funding status of the GCDAMP and if it is still funded through a blend of power revenues and congressional appropriations. Ms. Neuwerth responded that the funding has been alternating between these sources. Next year's funding is planned to come appropriations and she believed the previous year's funding was from power revenues. There will be a blend of appropriations and power funds supporting the program moving forward. The program costs approximately $11 million annually.

Lower Colorado River Multi-Species Conservation Program

Board Staff Ms. Neuwerth reported that the Steering Committee of the Lower Colorado River Multi-Species Conservation Program (LCR MSCP) met on October 27. The committee discussed impacts to habitats on LCR MSCP conservation areas as a result of the water shortage for 2022. Cibola Valley Conservation Area has junior water rights in Arizona. Lower water use habitat was selected for this area in anticipation of low water years.

Ms. Neuwerth reported that the committee discussed environmental impacts anticipated from changes in flow or reductions in diversions as a result of the 500+ plan. Program participants are on notice that changes may be needed to the LCR MSCP coverage to facilitate the 500+ plan.

Board Chair Nelson inquired regarding the risk in the LCR MSCP and what the Bureau could do if the risks are not mitigated.

Ms. Neuwerth relayed that there is less coverage for the area of the river between Hoover Dam and Parker Dam than there is downstream for reductions in flow; however, there are not many biological impacts anticipated. The current effort is to make sure that permits are in place and the program stays within the required numerical limits. Staff is uncertain what could happen if the program goes over the permit limits and would like to avoid finding out.

Mr. Harris added that the current covered flow reduction is 845,000 AF between Hoover and Davis and 860,000 AF between Davis Dam and Parker Dam. Below Parker Dam coverage is for up to 1.574 MAF. A small amount of mitigation habitat acres would be required to offset the 500+ plan activities.

Mr. Harris relayed that board staff has been and is continuing to meet with the California Natural Resources Agency and provide them briefings. There is also much discussion between Reclamation, the U.S. Fish and Wildlife Service and the LCR MSCP staff in Boulder City.

GENERAL ANNOUNCEMENTS

Lower Colorado Salinity Data

Mr. Juricich presented information on a study published by the U.S. Geological Survey in August 2021 that provides new real-time salinity concentration data at four locations in the Lower Colorado River including 1) Colorado River Above Imperial Dam (Station 09429490); 2) Colorado River Below Cooper Wasteway at the Northerly International Boundary (Station 09522005); 3) Yuma Main Drain Above Arizona-Sonora Boundary (Station 09534000); and 4) the 242 Lateral Above Main Drain at the Arizona-Sonora Boundary (Station 09534550). The study developed regression models to estimate salinity concentration from specific conductivity and temperature. A sample graph was presented to the Board.

Upper Colorado River Basin Baseflow Study

Mr. Juricich provided information on a new study by the U.S. Geological Survey published on October 28, 2021, of projected declines in the Upper Colorado River Basin baseflow by2050 in response to a warming and drying climate. Baseflow is the movement of groundwater into streams and, on average, accounts for more than 50% of annual streamflow in the Upper Colorado River Basin. The study predicts that baseflow deliveries to the Lower Colorado River

Basin may decline overall by the end of the 21st century despite potential increases in precipitation and baseflow in some areas.

Washington, D.C. Updates

Mr. Harris reported that Camille Touton has been confirmed as Commissioner of the Bureau of Reclamation and Michael Connor as Assistant Secretary of the Army for Civil Works. Mr. Harris reported on the passing of the $1.75 trillion-dollar Bipartisan Infrastructure Bill, Build Back Better by the U.S. House of Representatives.

Mr. Harris reported that in October, the House Natural Resources Subcommittee on Water, Oceans, and Wildlife held a two-day hearing on "Colorado River Drought Conditions and Response Measures." He stated that testimony was received from the seven basin states, Department of the Interior, tribes, and water users.

Next Scheduled Board Meeting

Finally, Mr. Harris noted that the next meeting of the Colorado River Board would be held on Tuesday, December 14, 2021, and would be an in-person meeting held at 10:00 a.m. in the Augustus III Room at Caesars Palace Las Vegas Hotel and Casino.

ADJOURNMENT

With no further items to be brought before the Board, Chairman Nelson adjourned the meeting at 11:01 a.m.

Draft Schedule 2022 Colorado River Board Meetings

Date	Location	Time
January 12	Remote/Ontario	10:00 am
February 9	Remote/Ontario	10:00 am
March 9	Remote/Ontario	10:00 am
April 13	Remote/Ontario	10:00 am
May 11	Remote/Ontario	10:00 am
June 15	Remote/Ontario	10:00 am
July 13	Remote/Ontario	10:00 am
August 10	Remote/Ontario	10:00 am
September 14	Remote/Ontario	10:00 am
October 12	Remote/Ontario	10:00 am
November 9	Remote/Ontario	10:00 am
December 14	Remote/Las Vegas, NV	10:00 am

12/6/2021

LOWER COLORADO WATER SUPPLY REPORT

River Operations

Bureau of Reclamation

Questions: BCOOWaterops@usbr.gov

(702)293-8373

http://www.usbr.gov/lc/region/g4000/weekly.pdf

	PERCENT FULL	Content 1000 ac-ft (kaf)	Elev. (Feet above mean sea level)	7-Day Release (CFS)
CURRENT STORAGE				
LAKE POWELL	29%	6,966	3,541.11	9,400
* LAKE MEAD	34%	8,813	1,065.08	9,700
LAKE MOHAVE	85%	1,541	637.11	8,600
LAKE HAVASU	90%	559	446.87	5,800
TOTAL SYSTEM CONTENTS **	37%	22,240		
As of 12/5/2021				
SYSTEM CONTENT LAST YEAR	47%	27,808		

*Percent based on capacity of 26,120 kaf or elevation 1,219.6 feet.

**Total System Contents includes Upper & Lower Colorado River Reservoirs, less Lake Mead exclusive flood control space.

Salt/Verde System	68%	1,547		
Painted Rock Dam	0%	0	530.00	0
Alamo Dam	10%	96	1,111.73	25

Forecasted Water Use for Calendar Year 2021 (as of 11/8/2021) (values in kaf)

NEVADA	242	
SOUTHERN NEVADA WATER SYSTEM		216
OTHERS		26
CALIFORNIA	4,359	
METROPOLITAN WATER DISTRICT OF CALIFORNIA		1,075
IRRIGATION DISTRICTS		3,268
OTHERS		17
ARIZONA	2,440	
CENTRAL ARIZONA PROJECT		1,369
OTHERS		1,070
TOTAL LOWER BASIN USE		7,041
DELIVERY TO MEXICO - 2021 (Mexico Scheduled Delivery + Preliminary Yearly Excess[1])		1,488

OTHER SIGNIFICANT INFORMATION

UNREGULATED INFLOW INTO LAKE POWELL - DECEMBER FINAL FORECAST DATED 12/1/2021

	MILLION ACRE-FEET	% of Normal
FORECASTED WATER YEAR 2022	6.273	65%
FORECASTED APRIL-JULY 2022	4.120	64%
NOVEMBER OBSERVED INFLOW	0.346	83%
DECEMBER INFLOW FORECAST	0.240	75%

	Upper Colorado Basin	Salt/Verde Basin
WATER YEAR 2022 PRECIP TO DATE[2]	82% (4.6")	56% (2.0")
CURRENT BASIN SNOWPACK[2]	49% (1.8")	NA% (NA)

[1]Delivery to Mexico forecasted yearly excess calculated using year-to-date observed and projected excess.

[2]Precipitation and snowpack values may vary significantly from week-to-week early in the water year.

Dec 06, 2021 08:23:11 AM

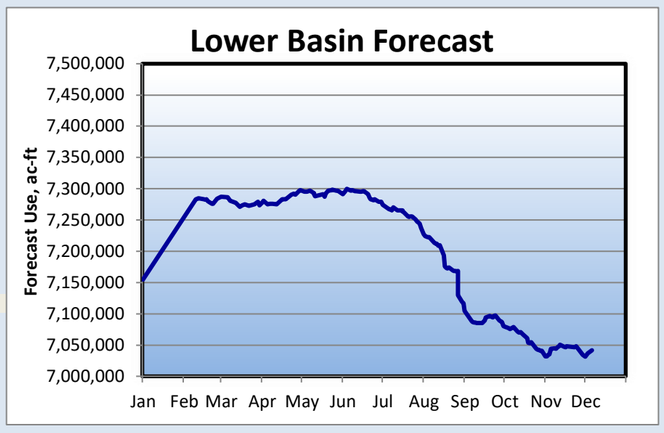
— BUREAU OF — RECLAMATION

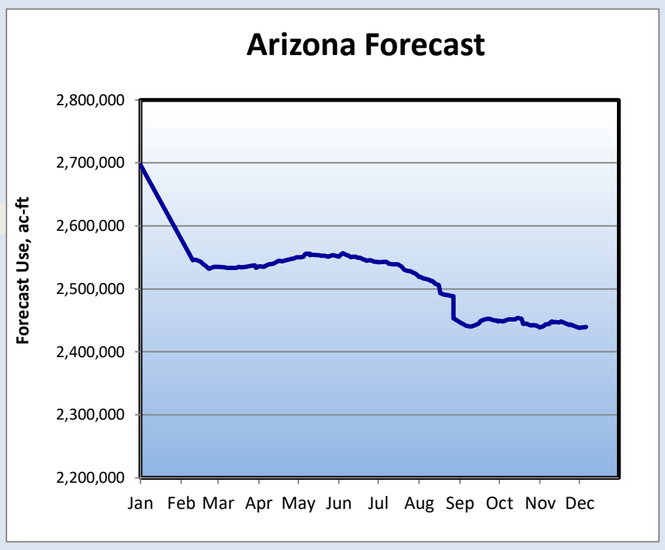
LOWER COLORADO BASIN REGION
CY 2021

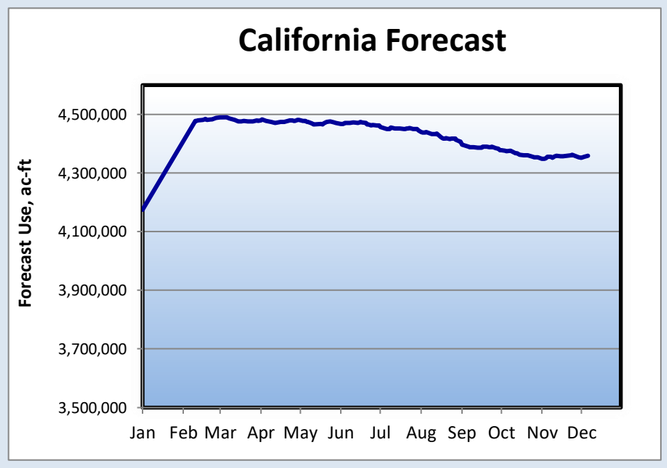
ARIZONA, CALIFORNIA, NEVADA, MEXICO
FORECAST OF END OF YEAR CONSUMPTIVE USE
FORECAST BASED ON USE TO DATE AND APPROVED ANNUAL WATER ORDERS [1]
(ACRE-FEET)

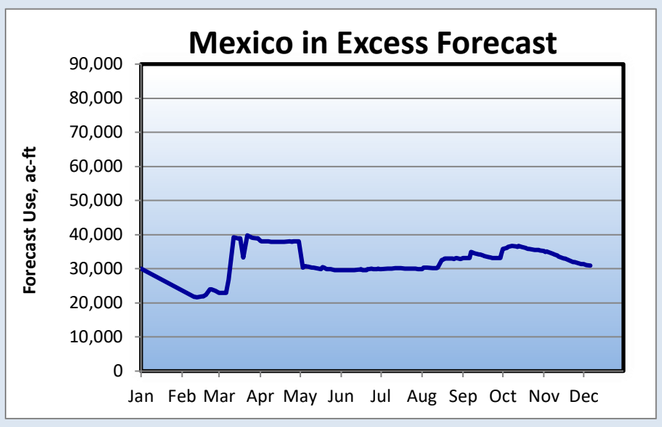
WATER USE SUMMARY	Use To Date CY 2021	Forecast Use CY 2021	Approved Use [2] CY 2021	Excess to Approval CY 2021
ARIZONA	2,323,718	2,439,667	2,437,205	**2,462**
CALIFORNIA	4,174,257	4,359,281	4,359,281	0
NEVADA	232,079	242,286	242,286	0
STATES TOTAL [3]	6,730,054	7,041,234	7,038,772	**2,462**
TOTAL DELIVERIES MEXICO IN SATISFACTION OF TREATY REQUIREMENTS [4]	1,416,121	1,456,683		
CREATION OF MEXICO'S RECOVERABLE WATER SAVINGS [5]	34,355	41,000		
CREATION OF MEXICO'S WATER RESERVE [6]	37,050	37,340		
DELIVERY OF MEXICO'S WATER RESERVE [7]	(35,023)	(35,023)		
TOTAL TO MEXICO IN SATISFACTION OF TREATY REQUIREMENTS [8]	1,452,503	1,500,000		
TO MEXICO IN EXCESS OF TREATY [9]	28,904	30,855		
WATER BYPASSED PURSUANT TO IBWC MINUTE NO. 242 [10]	115,219	123,375		
TOTAL LOWER BASIN & MEXICO [11]	8,290,298	8,652,147		

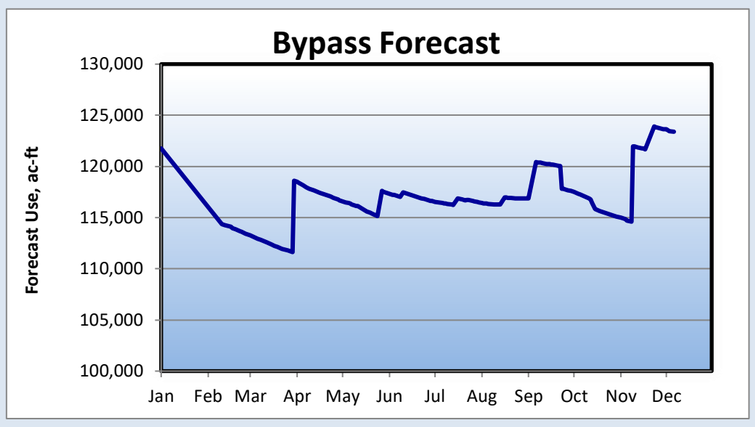
[1] Incorporates 80 daily reporting stations which may be revised after provisional data reports are distributed by the USGS. Use to date has been updated through September for users reporting monthly and estimated for users reporting annually.
[2] These values reflect adjusted apportionments. See Adjusted Apportionment calculation on each state page.
[3] Includes unmeasured returns based on estimated consumptive use/diversion ratios by user from studies provided by Arizona Department of Water Resources, Colorado River Board of California, and Reclamation.
[4] Includes deliveries to Mexico at the Northerly International Boundary (including delivery from Mexico's Water Reserve), Southerly International Boundary, Limitrophe, and Diversion Channel Discharge; and diversions at Parker Dam for Emergency Delivery to Tijuana; does not include Creation of Mexico's Water Reserve or Creation of Mexico's Recoverable Water Savings.
[5] Water deferred by Mexico pursuant to Section IV of IBWC Minute 323 and the Joint Report of the Principal Engineers with the Implementing Details of the Binational Water Scarcity Contingency Plan in the Colorado River Basin, dated July 11, 2019. (Mexico's required Binational Water Scarcity Contingency Plan Contribution).
[6] Water deferred by Mexico pursuant to Section V of IBWC Minute 323.
[7] Delivery from Mexico's Water Reserve pursuant to Section V.E.13 of IBWC Minute 323. Pursuant to Sections VIII.A and VIII.B of IBWC Minute 323, this water is being delivered for environmental purposes within Mexico.
[8] In accordance with the procedure documented in USIBWC's letter to the Mexican Section of the IBWC dated July 25, 2017 regarding the the calculation process applied when accounting for the quantity and quality of the volumes of Mexico's Water Reserve and Mexico's Recoverable Water Savings during creation and delivery, "Total Delivery to Mexico in Satisfaction of Treaty Requirements" adds in Mexico's Water Reserve and Mexico's Recoverable Water Savings creation and subtracts out Mexico's Water Reserve and Mexico's Recoverable Water Savings delivery.
[9] Mexico excess forecast is based on the 5-year average for the period 2015-2019.
[10] Bypass forecast is based on the average for the period 1990-2019.
[11] Includes States Total, Deliveries to Mexico in Satisfaction of Treaty, To Mexico in Excess of Treaty, and Water Bypassed Pursuant IBWC Minute 242.

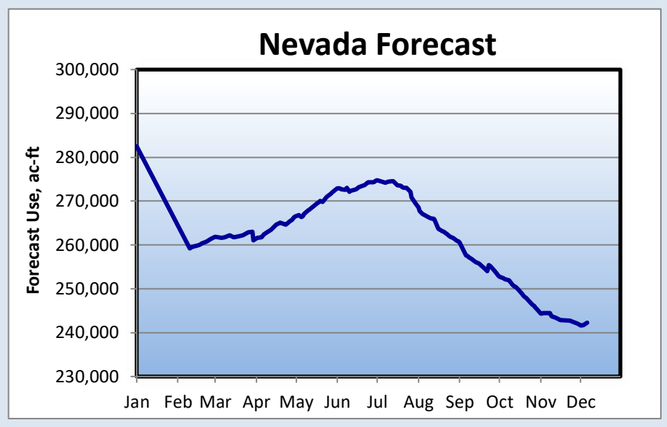


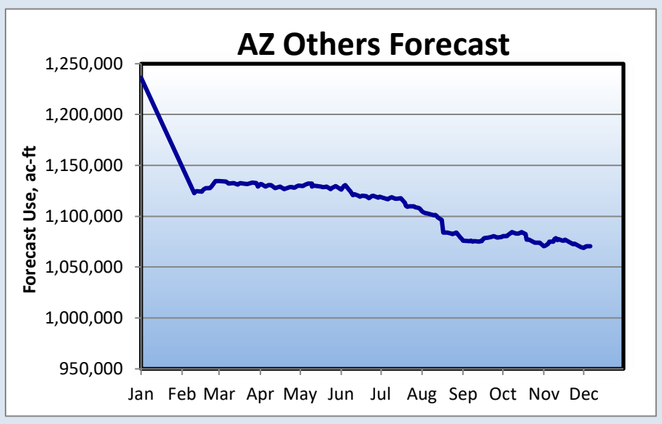


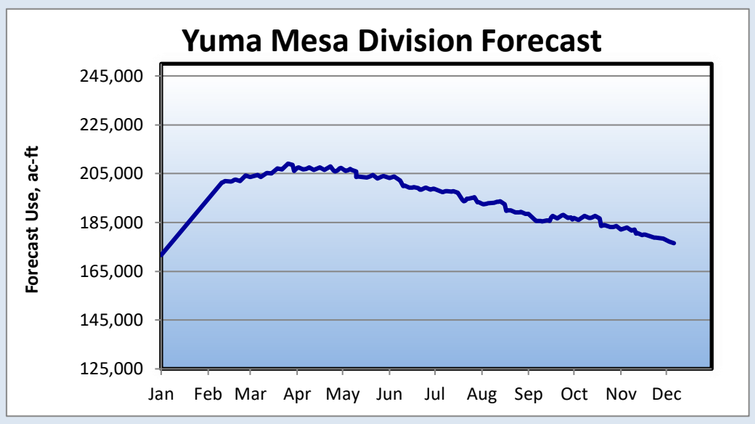


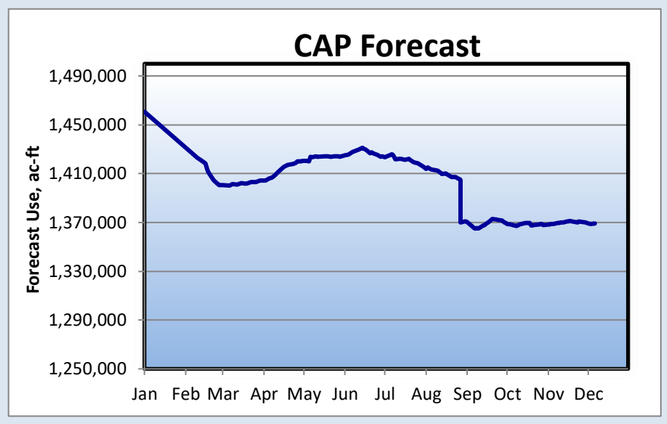


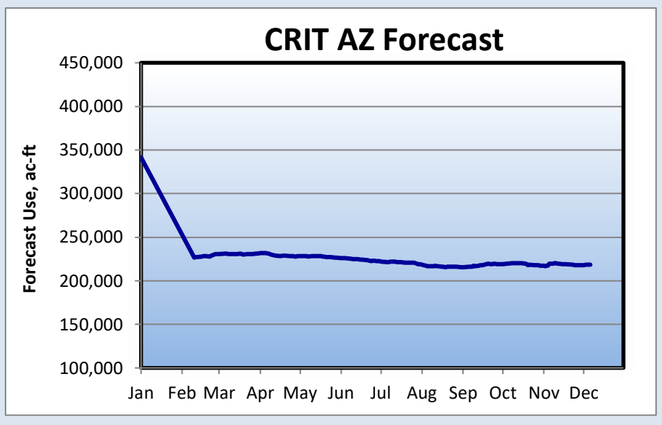


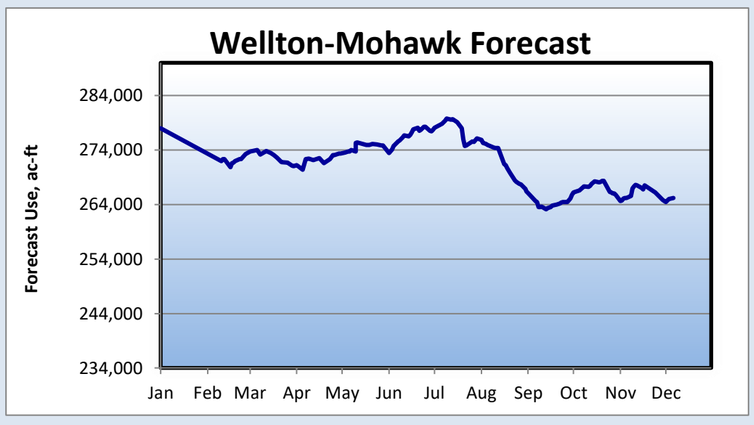


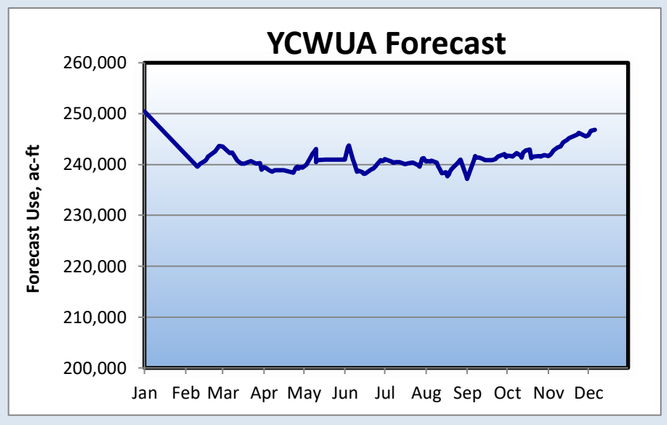












Graph notes: January 1 forecast use is scheduled use in accordance with the Annual Operating Plan's state entitlements, available unused entitlements, and over-run paybacks. A downward sloping line indicates use at a lower rate than scheduled, upward sloping is above schedule, and a flat line indicates a use rate equal to schedule. Lower priority users such as CAP, MWD, and Robt.B.Griffith may adjust use rates to meet state entitlements as higher priority use deviates from schedule. Abrupt changes in the forecast use line may be due to a diversion schedule change or monthly updating of provisional realtime diversions.

Dec 06, 2021 08:23:11 AM

BUREAU OF RECLAMATION

LOWER COLORADO BASIN REGION
CY 2021

NOTE:
- Diversions and uses that are pending approval are noted in *red italics*.
- Water users with a consumptive use entitlement - **Excess to Estimated Use** column indicates overrun/underrun of entitlement. Dash in this column indicates water user has a diversion entitlement.
- Water user with a diversion entitlement - **Excess to Approved Diversion** column indicates overrun/underrun of entitlement. Dash in this column indicates water user has a consumptive use entitlement.

ARIZONA WATER USERS
FORECAST OF END OF YEAR CONSUMPTIVE USE
FORECAST BASED ON USE TO DATE AND APPROVED ANNUAL WATER ORDERS
Arizona Schedules and Approvals
Historic Use Records (Water Accounting Reports)

WATER USER	Use To Date CY 2021	Forecast Use CY 2021	Estimated Use CY 2021	Excess to Estimated Use CY 2021	Diversion To Date CY 2021	Forecast Diversion CY 2021	Approved Diversion CY 2021	Excess to Approved Diversion CY 2021
ARIZONA PUMPERS	15,263	15,828	15,828	---	23,482	24,351	24,351	0
LAKE MEAD NRA, AZ - Diversions from Lake Mead	71	77	77	---	71	77	77	0
LAKE MEAD NRA, AZ - Diversions from Lake Mohave	209	224	224	---	209	224	224	0
DAVIS DAM PROJECT	2	2	2	---	16	17	17	0
BULLHEAD CITY	6,182	8,123	8,163	---	9,648	12,678	12,720	-42
MOHAVE WATER CONSERVATION DISTRICT	652	676	676	---	974	1,010	1,010	0
BROOKE WATER LLC	276	327	323	---	414	490	485	**5**
MOHAVE VALLEY I.D.D.	11,462	13,433	15,932	---	21,224	24,870	29,503	-4,633
FORT MOJAVE INDIAN RESERVATION, AZ	36,772	37,678	44,550	---	68,096	69,774	82,500	-12,726
GOLDEN SHORES WATER CONSERVATION DISTRICT	276	286	286	---	412	427	427	0
HAVASU NATIONAL WILDLIFE REFUGE	3,850	3,913	3,564	---	32,078	32,824	41,835	-9,011
LAKE HAVASU CITY	6,795	8,159	9,021	---	10,960	13,160	14,550	-1,390
CENTRAL ARIZONA WATER CONSERVATION DISTRICT (CAWCD)	1,287,193	1,369,236		---	1,287,193	1,369,236		**--**
TOWN OF PARKER	463	546	430	---	648	852	917	-65
COLORADO RIVER INDIAN RESERVATION, AZ	219,095	218,715	226,280	---	467,232	489,693	509,647	-19,954
EHRENBURG IMPROVEMENT ASSOCIATION	224	232	232	---	313	325	325	0
CIBOLA VALLEY [1]	12,482	14,008	15,618	---	17,457	19,593	21,843	-2,250
CIBOLA NATIONAL WILDLIFE REFUGE	13,581	14,264	14,264	0	21,905	23,005	23,005	0
IMPERIAL NATIONAL WILDLIFE REFUGE	1,981	2,605	3,799	-1,194	3,194	4,200	6,128	-1,928
BLM PERMITEES (PARKER DAM to IMPERIAL DAM)	814	844	844		1,253	1,299	1,299	0
CHA CHA, LLC	791	946	1,365	---	946	1,455	2,100	-645
BEATTIE FARMS	508	589	722	---	781	908	1,110	-202
YUMA PROVING GROUND	448	532	532	---	448	532	532	0
GILA MONSTER FARMS	4,229	4,446	5,273	---	7,748	8,157	9,156	-999
WELLTON-MOHAWK IDD	259,427	265,217	278,000	-12,783	384,658	402,887	423,333	-20,446
BLM PERMITEES (BELOW IMPERIAL DAM)	71	74	74	0	110	114	114	0
CITY OF YUMA	11,861	12,899	16,201	-3,302	22,914	24,851	27,500	-2,649
MARINE CORPS AIR STATION YUMA	1,175	1,240	1,320	---	1,175	1,240	1,320	-80
UNION PACIFIC RAILROAD	18	24	29	---	36	48	48	0
UNIVERSITY OF ARIZONA	817	1,028	1,050	---	817	1,028	1,050	-22
YUMA UNION HIGH SCHOOL DISTRICT	95	124	150	---	129	168	200	-32
DESERT LAWN MEMORIAL	22	23	23	---	32	33	33	0
NORTH GILA VALLEY IRRRIGATION DISTRICT	8,845	9,077	11,563	---	42,175	44,272	44,200	**72**
YUMA IRRIGATION DISTRICT	34,618	36,366	39,648	---	68,601	72,375	73,192	-817
YUMA MESA I.D.D.	125,488	131,005	150,455	---	217,040	228,774	242,080	-13,306
UNIT "B" IRRIGATION DISTRICT	17,143	17,492	20,816	---	25,933	26,772	29,400	-2,628
FORT YUMA INDIAN RESERVATION	1,441	1,494	1,494	---	2,217	2,299	2,299	0
YUMA COUNTY WATER USERS' ASSOCIATION	238,153	246,865	242,377	---	331,027	349,479	360,400	-10,921
COCOPAH INDIAN RESERVATION	706	823	1,686	---	897	1,077	2,585	-1,508
RECLAMATION-YUMA AREA OFFICE	219	227	227	---	219	227	227	0
RETURN FROM SOUTH GILA WELLS								
TOTAL ARIZONA	2,323,718	2,439,667	2,502,618		3,074,682	3,254,801	3,361,242	
CAWCD	1,287,193	1,369,236				1,369,236		
ALL OTHERS	1,036,525	1,070,431	1,133,118			1,885,565	1,991,742	
YUMA MESA DIVISION, GILA PROJECT	168,951	176,448	201,666	-25,218		345,421		

ARIZONA ADJUSTED APPORTIONMENT CALCULATION	
Arizona Basic Apportionment	2,800,000
System Conservation Water - Pilot System Conservation Program [2]	(360)
System Conservation Water - Colorado River Indian Tribes (CRIT) [3]	(50,000)
System Conservation Water - Fort McDowell Yavapai Nation (FMYN) [4]	(13,933)
System Conservation Water - Mohave Valley I.D.D. (MVIDD) [5]	(6,925)
System Conservation Water - Gila River Indian Community (GRIC) [6]	(40,000)
Creation of Extraordinary Conservation ICS - CRIT (Estimated) [7,10]	(4,685)
Creation of Extraordinary Conservation ICS - GRIC (Estimated) [8,10]	(40,000)
Creation of Extraordinary Conservation ICS - CAWCD (Estimated) [9,10]	(3,500)
Arizona DCP Contribution [9,10,11]	(203,392)
Total State Adjusted Apportionment	2,437,205
Excess to Total State Adjusted Apportionment	2,462
Estimated Allowable Use for CAP	1,364,287

[1] Includes the following water users within the Cibola Valley: Cibola Valley IDD, Arizona Game and Fish Commission, GSC Farms, Red River Land Co., Western Water, and the Hopi Tribe.

[2] The estimated amount of System Conservation Water that will be created by the City of Bullhead City pursuant to System Conservation Implementation Agreement (SCIA) No. 15-XX-30-W0587, as amended. This System Conservation Water will remain in Lake Mead to benefit system storage.

[3] System Conservation Water to be created by CRIT pursuant to the *Agreement Among the United States of America, Through the Department of the Interior, Bureau of Reclamation, the State of Arizona, Through the Arizona Department of Water Resources, the Central Arizona Water Conservation District, and the Colorado River Indian Tribes to Fund the Creation of Colorado River System Water Through Voluntary Water Conservation and Reductions in use During Calendar Years 2020-2022* . This System Conservation Water will remain in Lake Mead to benefit system storage.

[4] CAP water being conserved by FMYN pursuant to SCIA No. 20-XX-30-W0688, which will remain in Lake Mead to benefit system storage. In accordance with this SCIA and Section 3.b of the *Lower Basin Drought Contingency Plan Agreement* (LB DCP Agreement), the Bureau of Reclamation intends to apply this water towards the Secretary of the Interior's commitment to create or conserve 100,000 AF per annum or more of Colorado River System water to contribute to conservation of water supplies in Lake Mead and other Colorado River reservoirs in the Lower Basin.

[5] System Conservation Water to be created by MVIDD pursuant to SCIA No. 20-XX-30-W0686, which will remain in Lake Mead to benefit system storage. In accordance with this SCIA and Section 3.b of the LB DCP Agreement, Reclamation intends to apply this water towards the Secretary's commitment to create or conserve 100,000 AF per annum or more of Colorado River System water to contribute to conservation of water supplies in Lake Mead and other Colorado River reservoirs in the Lower Basin.

[6] CAP water being conserved by GRIC pursuant to SCIA No. 21-XX-30-W0713, which will remain in Lake Mead to benefit system storage. In accordance with this SCIA and Section 3.b of the LB DCP Agreement, Reclamation intends to apply this water towards the Secretary's commitment to create or conserve 100,000 AF per annum or more of Colorado River System water to contribute to conservation of water supplies in Lake Mead and other Colorado River reservoirs in the Lower Basin.

[7] CRIT has been approved to create up to 4,685 AF of Extraordinary Conservation (EC) ICS in 2021. The actual amount of EC ICS created by CRIT will be based on final accounting and verification.

[8] CAP water being conserved by GRIC in 2021 to create EC ICS. The actual amount of EC ICS created by GRIC will be based on final accounting and verification.

[9] CAWCD has been approved to create up to 60,500 AF of EC ICS in 2021. Of this amount, 57,000 AF will be converted to DCP ICS to meet a portion of Arizona's required 2021 DCP Contribution. The remaining 3,500 AF will remain in Lake Mead as EC ICS. The actual amount of EC ICS created by CAWCD will be based on final accounting and verification.

[10] When combined with the approved EC ICS creation amounts of other ICS Creators in the state of Arizona, the total amount of EC ICS approved for creation in the state of Arizona is 110,185 AF, which exceeds the state's annual creation limit set forth in Section XI.G.3.B.4 of the 2007 Interim Guidelines. In accordance with Section XI.G.3.B.4 and Section IV.B of the *Lower Basin Drought Contingency Operations* (LBOps), the total amount of EC ICS that may be created by the states of Arizona, California, and Nevada in 2021 will be limited to 625,000 AF. Additionally, the total amount accumulated in Arizona's ICS accounts will be limited in accordance with Section IV.C. of LBOps.

[11] In accordance with Sections III.B.1.a and III.E.4 of LBOps, the state of Arizona is required to make a DCP Contribution in the total amount of 203,392 AF in 2021. This includes the annual contribution amount required under Section III.B.1.a of LBOps (192,000 AF) and the state's 2020 DCP Contribution Deficiency amount of 11,392 AF, as shown in Table 23 in the 2020 *Colorado River Accounting and Water Use Report* . In accordance with the *Agreement Regarding Lower Basin Drought Contingency Plan Obligations* , it is currently anticipated that the required DCP Contribution will be made by CAWCD through the simultaneous creation and conversion of EC ICS to DCP ICS and the creation of Non-ICS Water (reductions in consumptive use).

NOTES: Click on Arizona Schedules and Approvals above for incoming diversion schedules and approvals.

Dec 06, 2021 08:23:11 AM

BUREAU OF RECLAMATION

LOWER COLORADO BASIN REGION
CY 2021

NOTE:
- Diversions and uses that are pending approval are noted in *red italics*.
- Water users with a consumptive use entitlement - **Excess to Estimated Use** column indicates overrun/underrun of entitlement. Dash in this column indicates water user has a diversion entitlement.
- Water user with a diversion entitlement - **Excess to Approved Diversion** column indicates overrun/underrun of entitlement. Dash in this column indicates water user has a consumptive use entitlement.

CALIFORNIA WATER USERS
FORECAST OF END OF YEAR CONSUMPTIVE USE
FORECAST BASED ON USE TO DATE AND APPROVED ANNUAL WATER ORDERS
California Schedules and Approvals
Historic Use Records (Water Accounting Reports)

WATER USER	Use To Date CY 2021	Forecast Use CY 2021	Estimated Use CY 2021	Excess to Estimated Use CY 2021	Diversion To Date CY 2021	Forecast Diversion CY 2021	Approved Diversion CY 2021	Excess to Approved Diversion CY 2021
CALIFORNIA PUMPERS	1,412	1,464	1,464	---	2,552	2,646	2,646	0
FORT MOJAVE INDIAN RESERVATION, CA	7,028	7,263	8,996	---	13,064	13,500	16,720	-3,220
CITY OF NEEDLES (includes LCWSP use)	1,030	1,234	1,605	-371	1,689	1,975	2,261	-286
METROPOLITAN WATER DISTRICT	991,847	1,074,691		---	994,508	1,077,540		---
COLORADO RIVER INDIAN RESERVATION, CA	4,835	5,014	5,014	---	8,011	8,307	8,307	0
PALO VERDE IRRIGATION DISTRICT	342,850	340,931	343,672	---	753,946	778,268	774,000	**4,268**
YUMA PROJECT RESERVATION DIVISION	35,706	37,168	46,687	---	73,764	77,892	90,394	-12,502
YUMA PROJECT RESERVATION DIVISION - INDIAN UNIT	---	---	---	---	39,503	41,534	45,384	-3,850
YUMA PROJECT RESERVATION DIVISION - BARD UNIT	---	---	---	---	34,261	36,358	45,010	-8,652
YUMA ISLAND PUMPERS	1,707	1,770	1,770	---	3,085	3,199	3,199	0
FORT YUMA INDIAN RESERVATION - RANCH 5	1,137	1,265	938	---	2,058	2,288	1,696	592
IMPERIAL IRRIGATION DISTRICT [1]	2,444,806	2,531,457	2,622,800	-91,343	2,525,605	2,620,401	2,694,973	---
SALTON SEA SALINITY MANAGEMENT	0	0	0	0	0	0	0	---
COACHELLA VALLEY WATER DISTRICT	341,128	356,225	379,000	-22,775	367,570	384,304	390,812	---
OTHER LCWSP CONTRACTORS	508	527	527	---	889	922	922	0
CITY OF WINTERHAVEN	61	63	63	---	88	91	91	0
CHEMEHUEVI INDIAN RESERVATION	202	209	209	---	10,935	11,340	11,340	0
TOTAL CALIFORNIA	4,174,257	4,359,281			4,757,764	4,982,673	5,075,574	

CALIFORNIA ADJUSTED APPORTIONMENT CALCULATION	
California Basic Apportionment	4,400,000
System Conservation Water - Pilot System Conservation Program [2]	(145)
System Conservation Water - PVID Fallowing Program [3]	(12,650)
IID Creation of Extraordinary Conservation ICS - Stored in Lake Mead (Estimated) [4]	(1,579)
MWD Creation of Extraordinary Conservation ICS (Estimated) [5]	(26,345)
Total State Adjusted Apportionment	4,359,281
Excess to Total State Adjusted Apportionment	0
Estimated Allowable Use for MWD	1,101,036

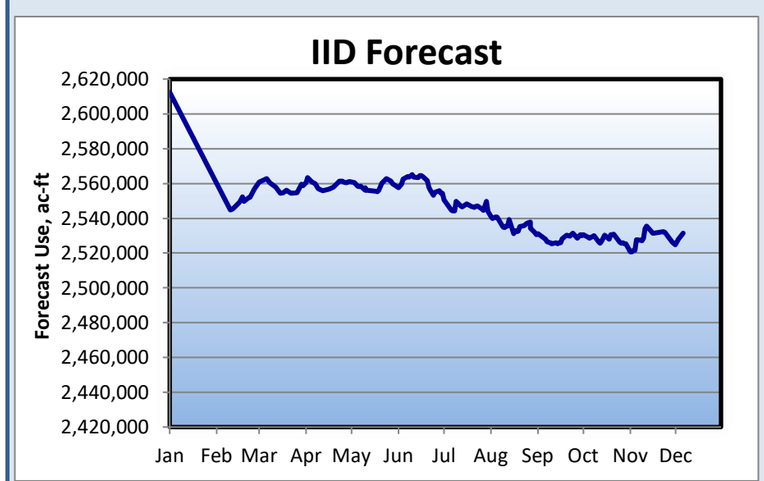
[1] As shown here, IID's Approved Diversion and Estimated Use values reflect the maximum amount of Colorado River water available to IID in 2021.

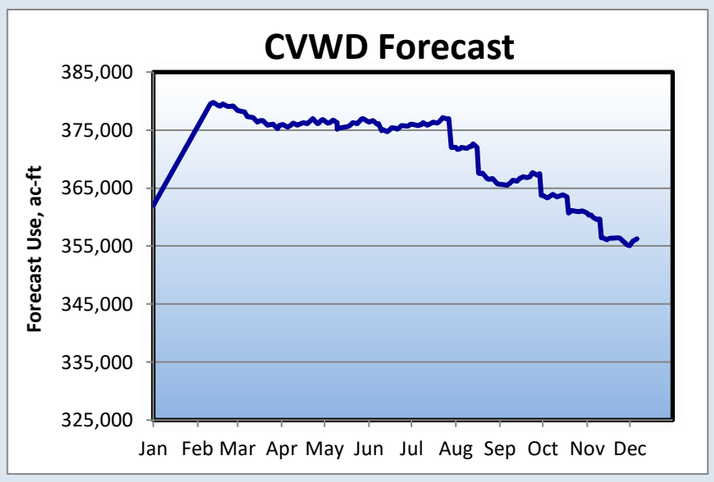
[2] System Consevation Water to be conserved by the City of Needles pursuant to System Conservation Implementation Agreement No. 15-XX-30-W0596, executed under the Pilot System Conservation Program. This water will remain in Lake Mead to benefit system storage.

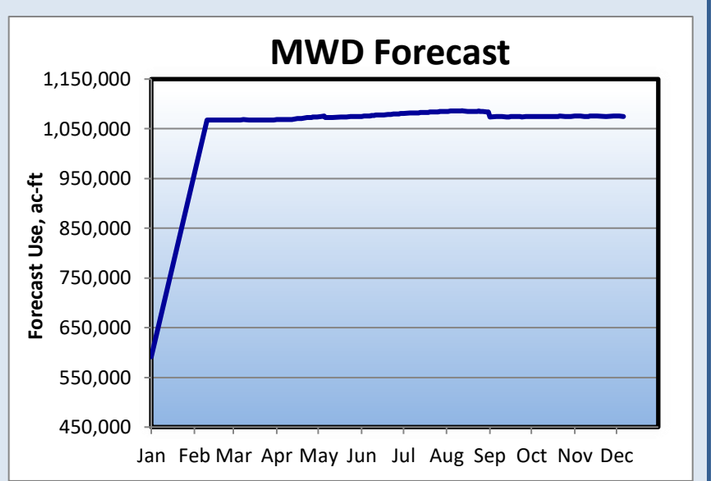
[3] The estimated amount of System Conservation Water that will be created pursuant to Funding Agreement No. 21-XX-30-W0714 (Funding Agreement). This System Conservation Water will remain in Lake Mead to benefit system storage. In accordance with the Funding Agreement, the Bureau of Reclamation intends to apply 50 percent this water towards the Secretary of the Interior's commitment to create or conserve 100,000 AF or more per annum of System Conservation Water pursuant to Section 3.b of the *Lower Basin Drought Contingency Plan Agreement* .

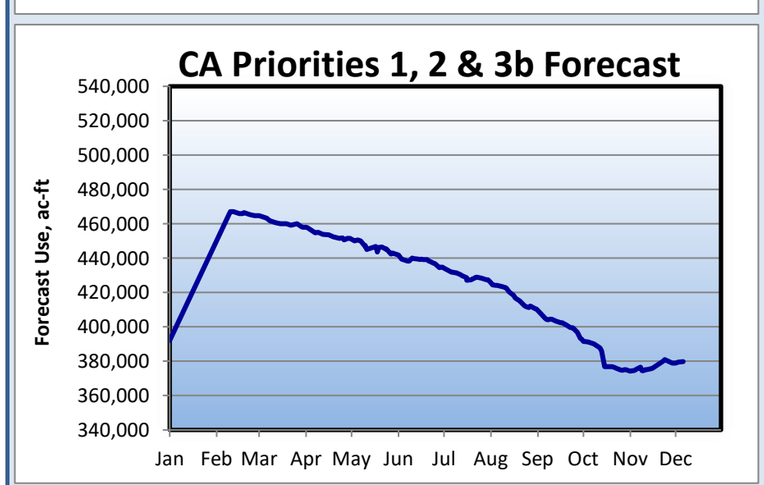
[4] IID has been approved to create up to 62,000 AF of "Additional Conserved Water" in 2021 for purposes including, but not limited to, the creation of ICS. Due to limitations set forth in the California ICS Agreement, IID may currently only store up to 1,579 AF in its Lake Mead ICS Account. Should IID elect to use "Additional Conserved Water" to create and credit EC ICS to the ICS account of another California contractor through application of Section XI.G.3.B.8 of the 2007 Interim Guidelines, IID must first obtain written agreement of the contractor. The actual amount of "Additional Conserved Water" created by IID in 2021 will be based on final accounting and verification.

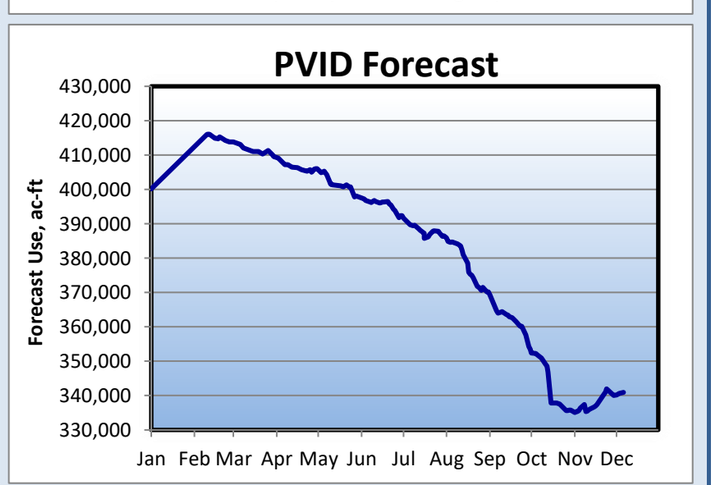
[5] MWD has been approved to create up to 450,000 AF of EC ICS in 2021, less the amount of EC ICS created by IID, and further limited to the amount that, when added to the EC ICS created by the states of Arizona and Nevada, does not exceed 625,000 AF. The actual amount of EC ICS created by MWD will be based on final accounting and verification.











NOTES: Click on California Schedules and Approvals above for incoming diversion schedules and approvals.

Dec 06, 2021 08:23:11 AM

BUREAU OF RECLAMATION

LOWER COLORADO BASIN REGION

CY 2021

NOTE:
- Diversions and uses that are pending approval are noted in *red italics*.
- Water users with a consumptive use entitlement - **Excess to Estimated Use** column indicates overrun/underrun of entitlement. Dash in this column indicates water user has a diversion entitlement.
- Water user with a diversion entitlement - **Excess to Approved Diversion** column indicates overrun/underrun of entitlement. Dash in this column indicates water user has a consumptive use entitlement.

NEVADA WATER USERS
FORECAST OF END OF YEAR CONSUMPTIVE USE
FORECAST BASED ON USE TO DATE AND APPROVED ANNUAL WATER ORDERS
Nevada Schedules and Approvals
Historic Use Records (Water Accounting Reports)

WATER USER	Use To Date CY 2021	Forecast Use CY 2021	Estimated Use CY 2021	Excess to Estimated Use CY 2021	Diversion To Date CY 2021	Forecast Diversion CY 2021	Approved Diversion CY 2021	Excess to Approved Diversion CY 2021
ROBERT B. GRIFFITH WATER PROJECT (SNWS)	429,735	450,397	452,709	-2,312	429,500	450,162	452,709	-2,547
LAKE MEAD NRA, NV - Diversions from Lake Mead	294	501	1,500	---	294	501	1,500	-999
LAKE MEAD NRA, NV - Diversions from Lake Mohave	162	231	500	---	162	231	500	-269
BASIC MANAGEMENT INC.	3,830	5,199	8,208	---	3,830	5,199	8,208	-3,009
CITY OF HENDERSON (BMI DELIVERY)	10,371	13,824	15,878	---	10,371	13,824	15,878	-2,054
NEVADA DEPARTMENT OF WILDLIFE	10	12	12	0	876	1,091	1,000	---
PACIFIC COAST BUILDING PRODUCTS INC.	795	941	928	---	795	941	928	**13**
BOULDER CANYON PROJECT	166	172	172	---	289	300	300	0
BIG BEND WATER DISTRICT	1,280	1,894	4,733	---	2,693	4,113	10,000	-5,887
FORT MOJAVE INDIAN TRIBE	2,926	3,038	4,020	---	4,369	4,537	6,000	-1,463
LAS VEGAS WASH RETURN FLOWS	-217,490	-233,923	-229,923	---				
TOTAL NEVADA	232,079	242,286	258,737	-2,312	453,179	480,899	497,023	-16,215
SOUTHERN NEVADA WATER SYSTEM (SNWS)	212,245	216,474				450,162		
ALL OTHERS	19,834	25,812				30,737		
NEVADA USES ABOVE HOOVER	227,873	237,354				472,249		
NEVADA USES BELOW HOOVER	4,206	4,932				8,650		

Tributary Conservation (TC) Intentionally Created Surplus (ICS)

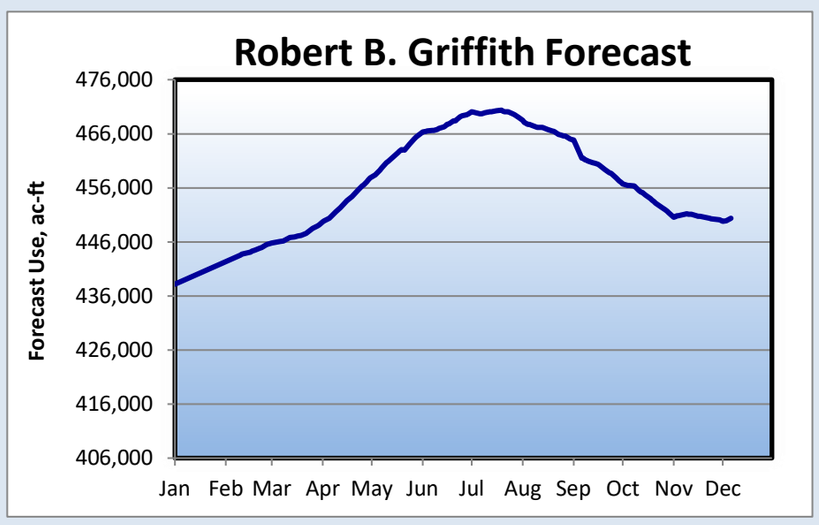
Southern Nevada Water Authority (SNWA) Creation of TC ICS (Approved) [1]	43,000

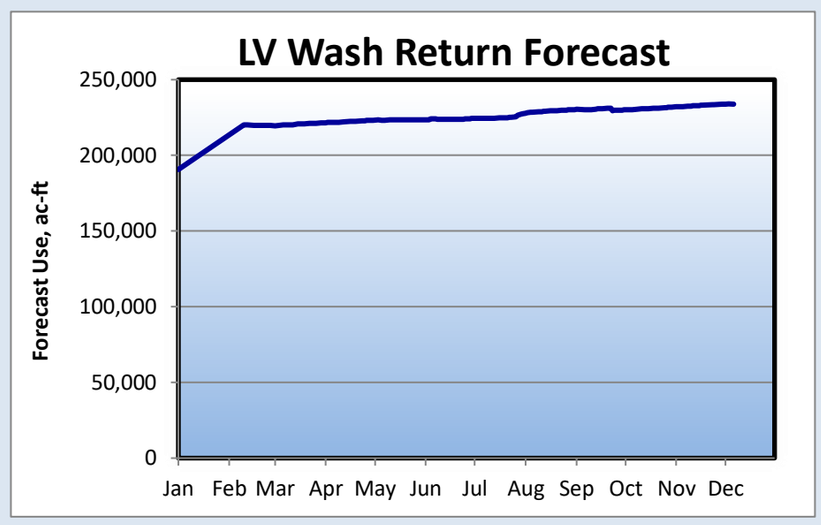
NEVADA ADJUSTED APPORTIONMENT CALCULATION

Nevada Basic Apportionment	300,000
SNWA Creation of Extraordinary Conservation (EC) ICS (Estimated) [2]	(57,714)
Total State Adjusted Apportionment	242,286
Excess to Total State Adjusted Apportionment	0

[1] SNWA has been approved to create up to 43,000 AF of TC ICS in 2021. The actual amount of TC ICS created by SNWA will be based on final accounting and verification.

[2] SNWA has been approved to create up to 100,000 AF of EC ICS in 2021. The actual amount of EC ICS created by SNWA will be based on final accounting and verification. The total amount accumulated in Nevada's ICS accounts will be limited in accordance with Section IV.C. of the *Lower Basin Drought Contingency Operations* .



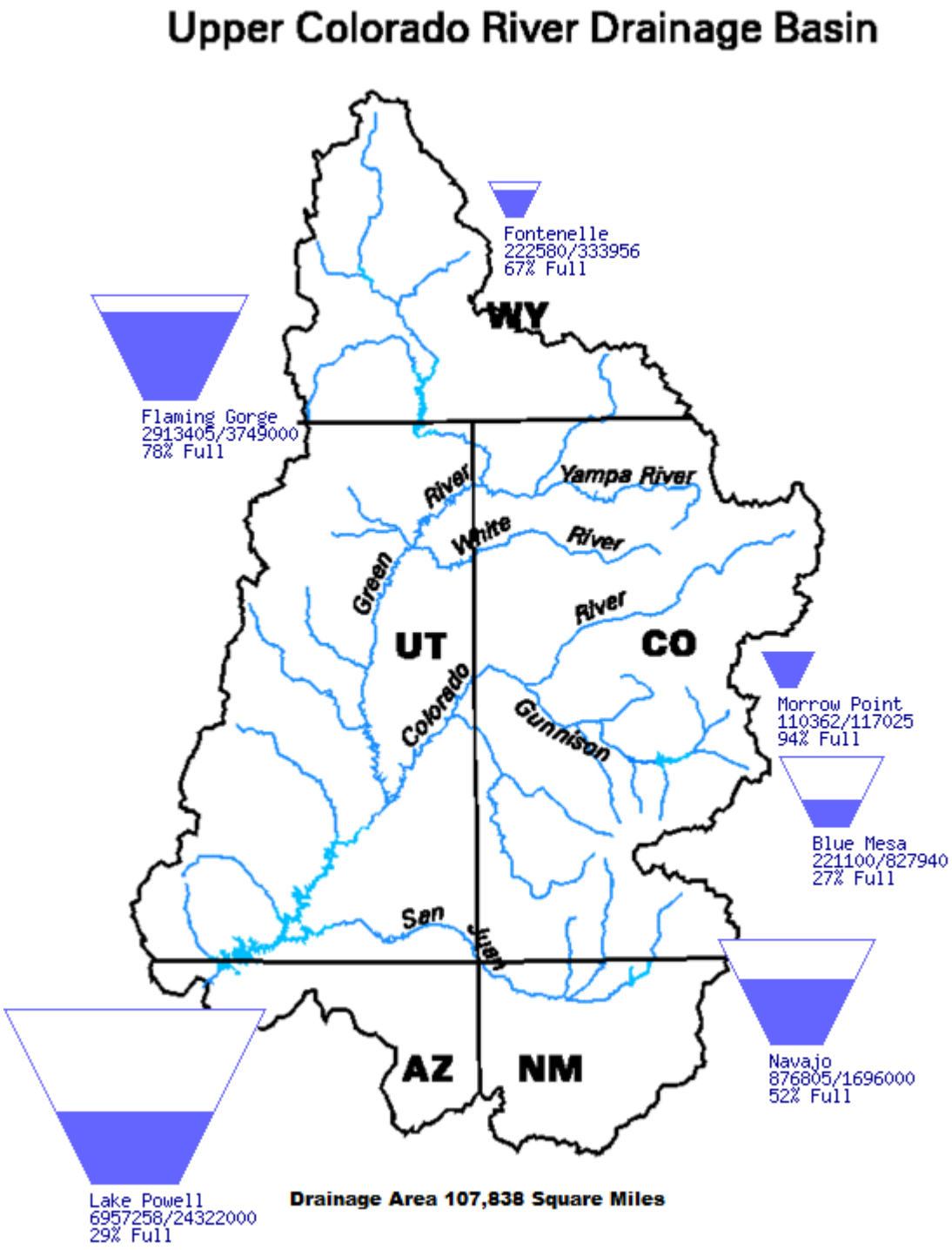


NOTES: Click on Nevada Schedules and Approvals above for incoming diversion schedules and approvals.

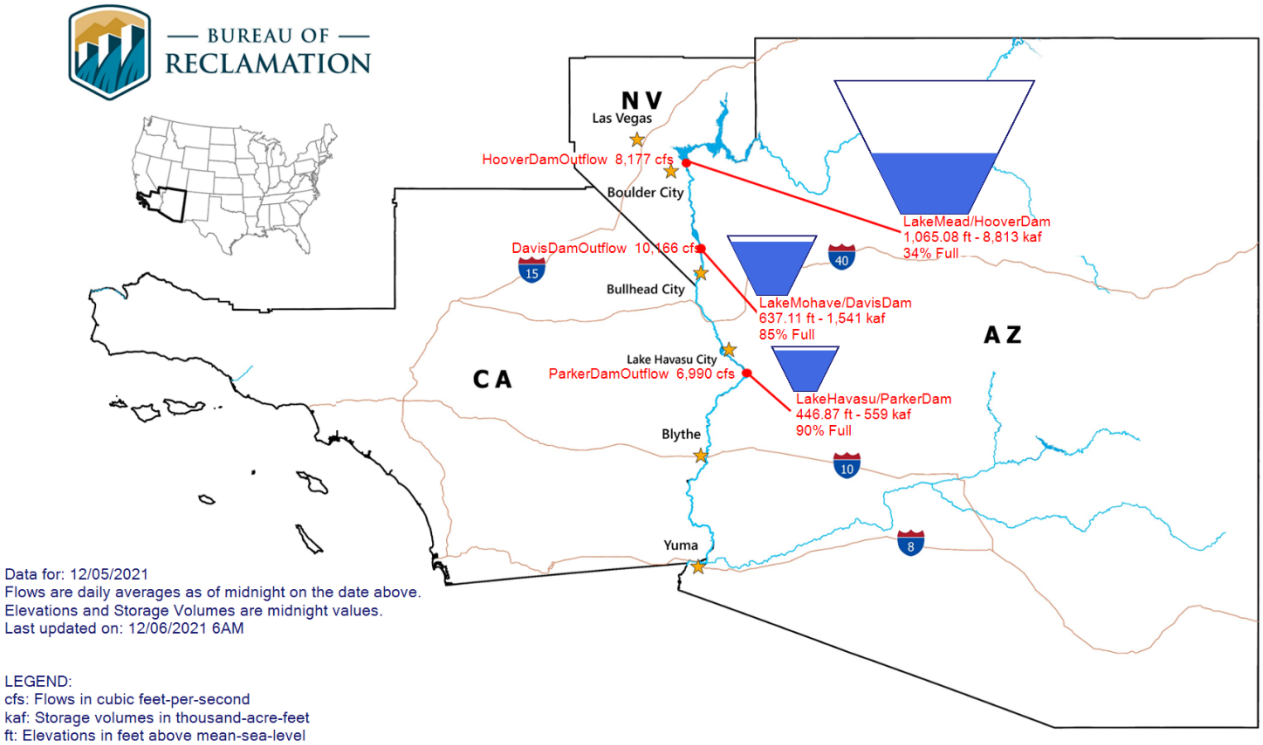
Upper Colorado Region Water Resources Group

River Basin Tea-Cup Diagrams

Data Current as of:
12/06/2021



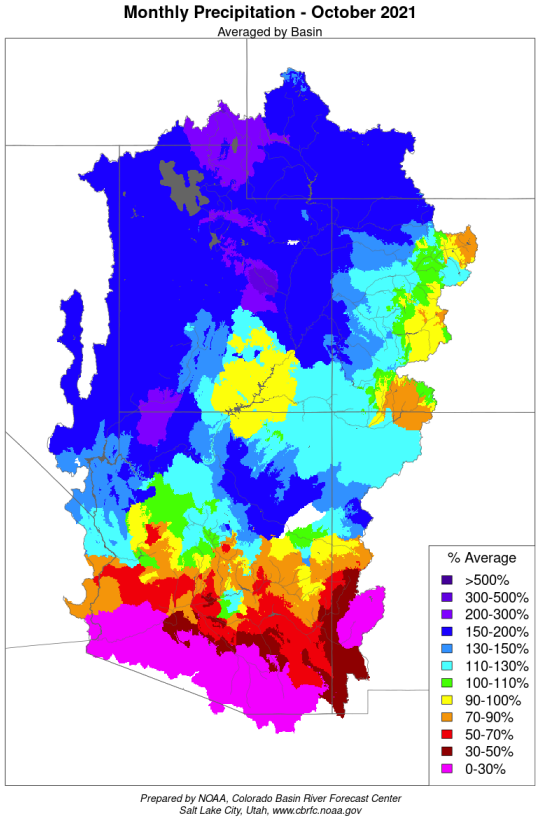
Lower Colorado River Teacup Diagram

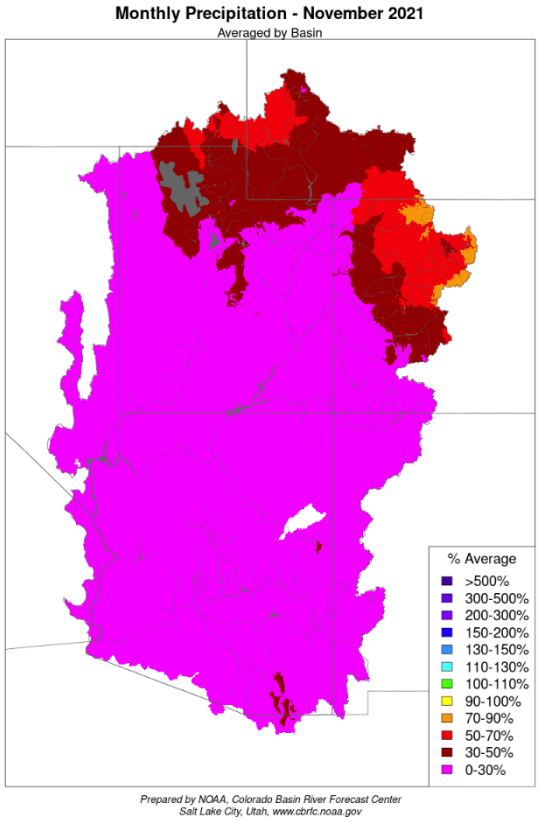


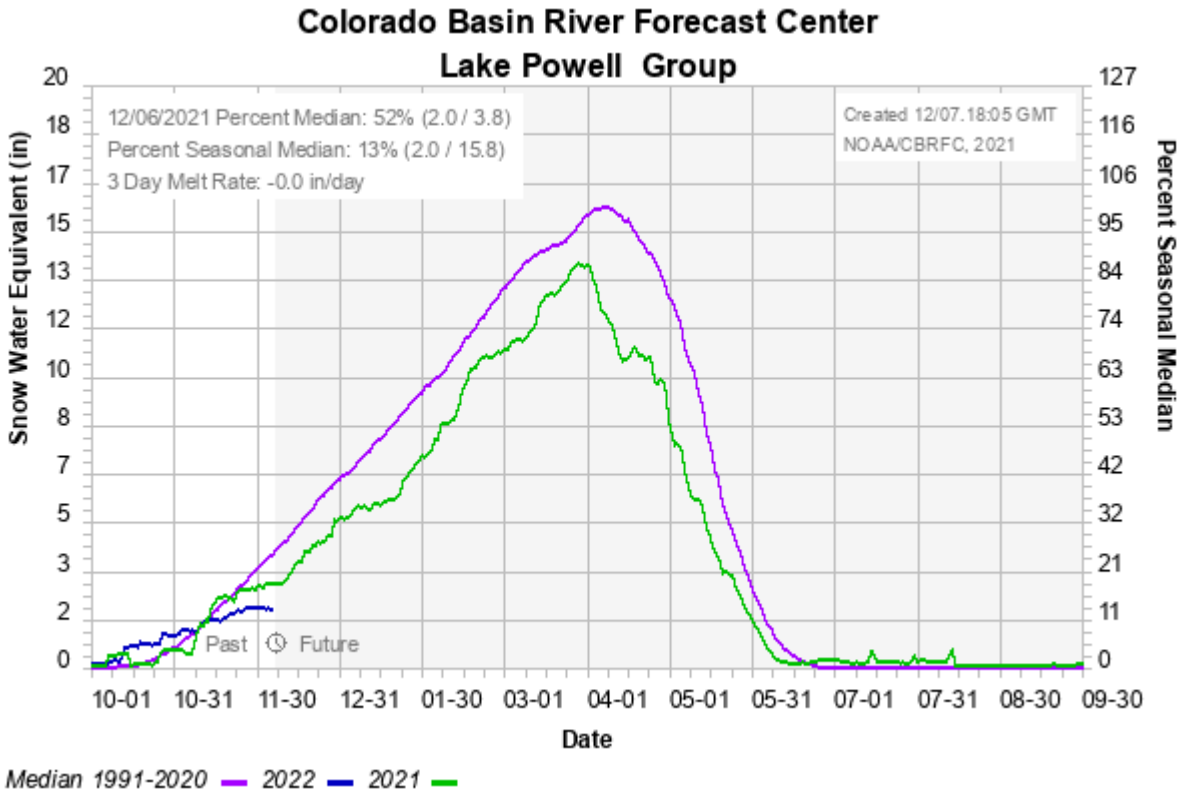
Data for: 12/05/2021
Flows are daily averages as of midnight on the date above.
Elevations and Storage Volumes are midnight values.
Last updated on: 12/06/2021 6AM

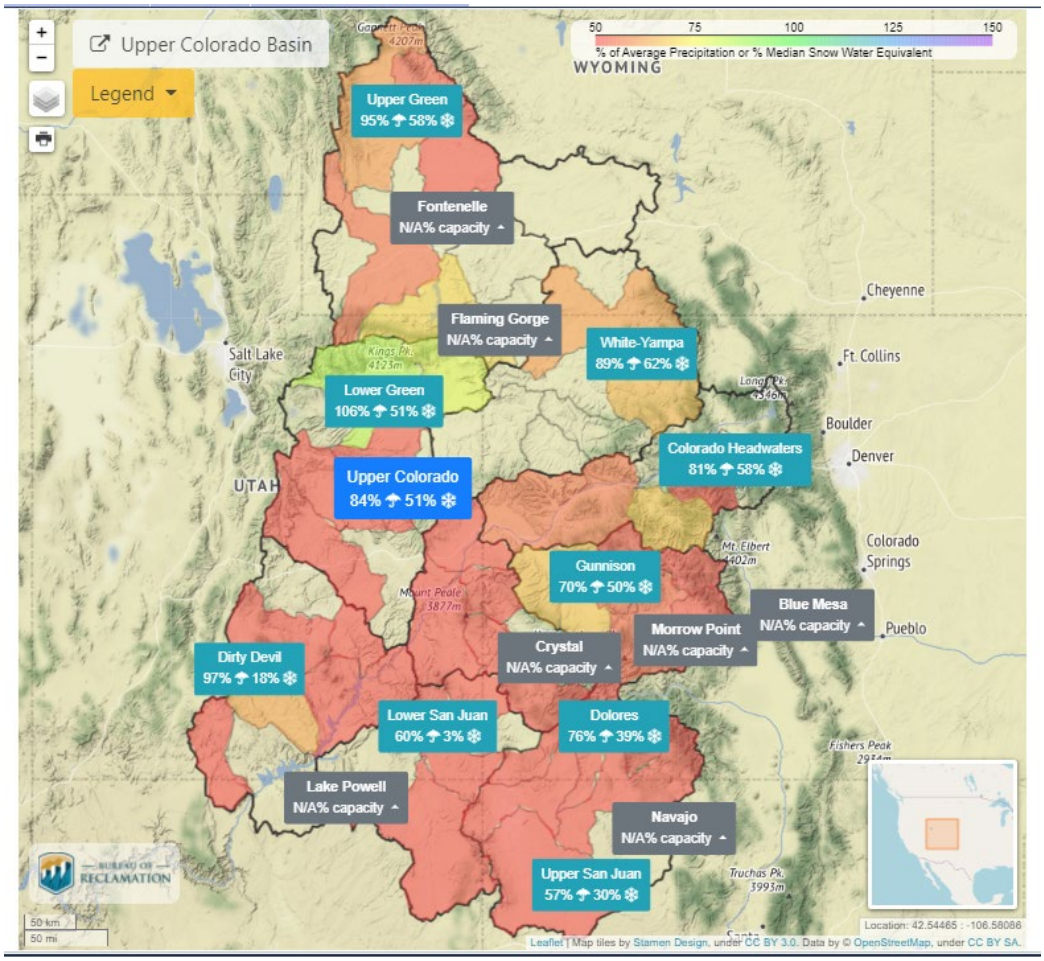
LEGEND:
cfs: Flows in cubic feet-per-second
kaf: Storage volumes in thousand-acre-feet
ft: Elevations in feet above mean-sea-level

NOAA National Weather Service Monthly Precipitation Map October and November 2021

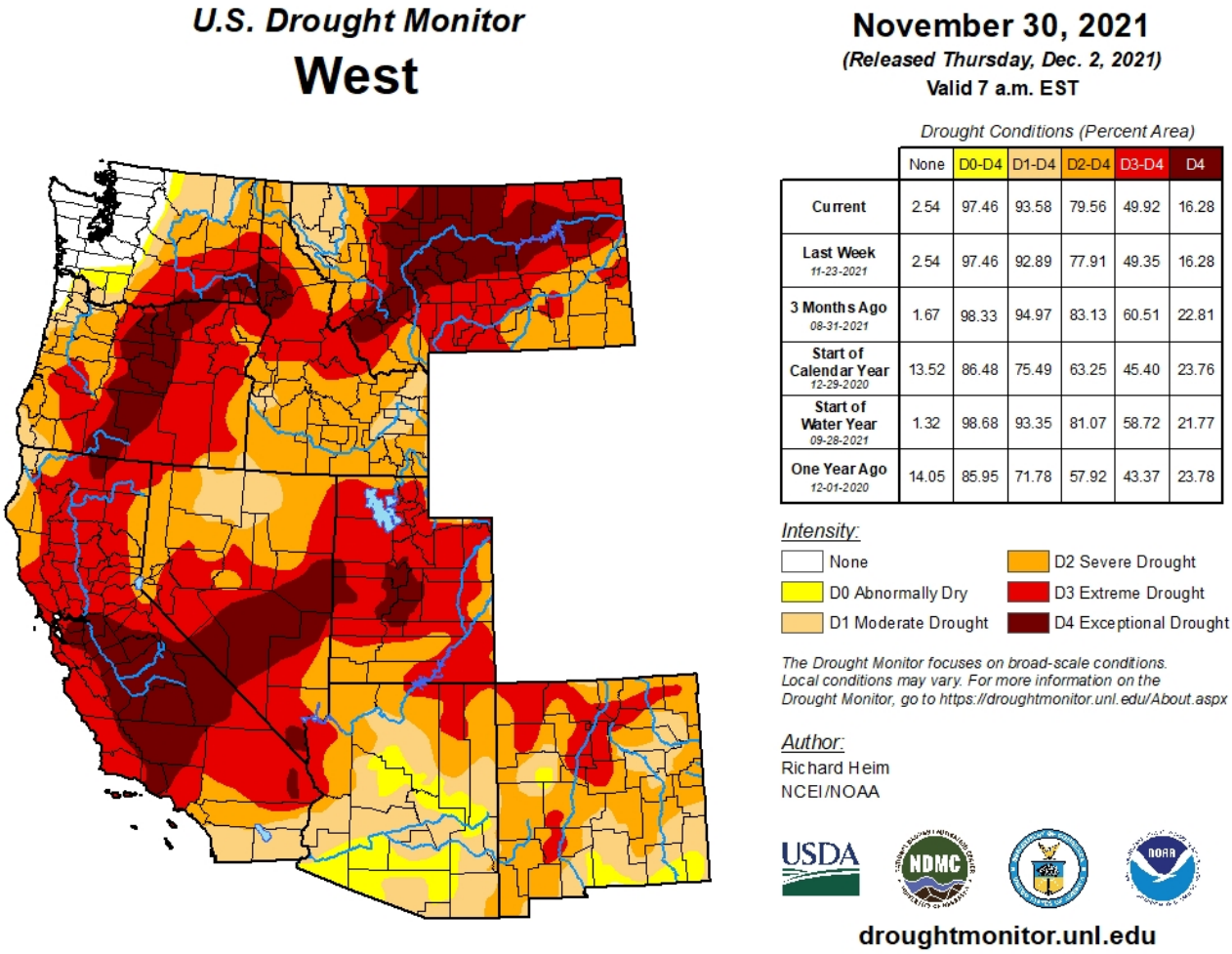


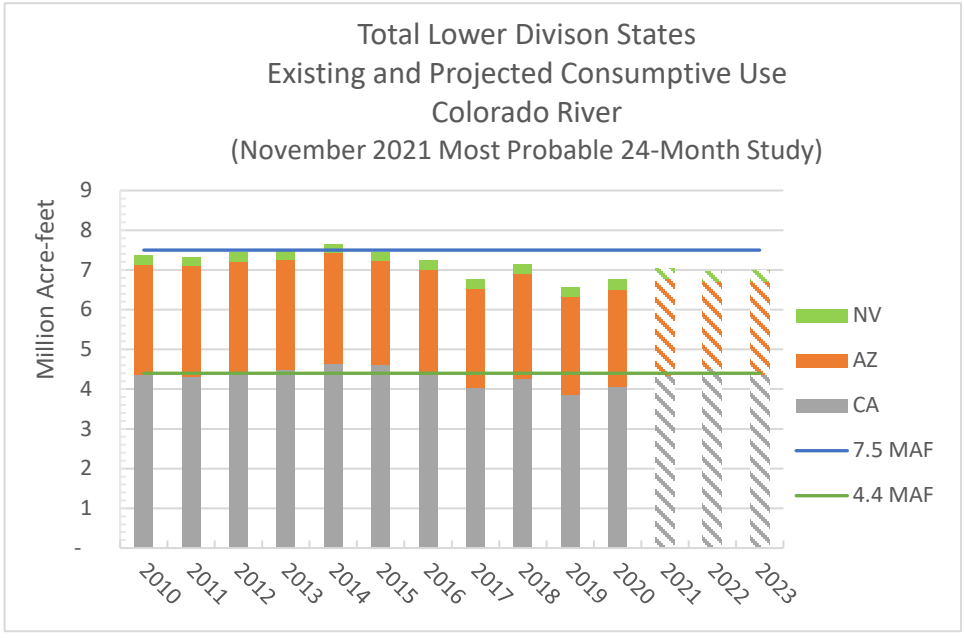



Colorado Basin River Forecast Center
Lake Powell Group
12/06/2021 Percent Median: 52% (2.0 / 3.8)
Percent Seasonal Median: 13% (2.0 / 15.8)
3 Day Melt Rate: -0.0 in/day
Created 12/07.18:05 GMT
NOAA/CBRFC, 2021
Snow Water Equivalent (in)
Percent Seasonal Median
Past
Future
Date
10-01
10-31
11-30
12-31
01-30
03-01
04-01
05-01
05-31
07-01
07-31
08-30
09-30
Median 1991-2020
2022
2021

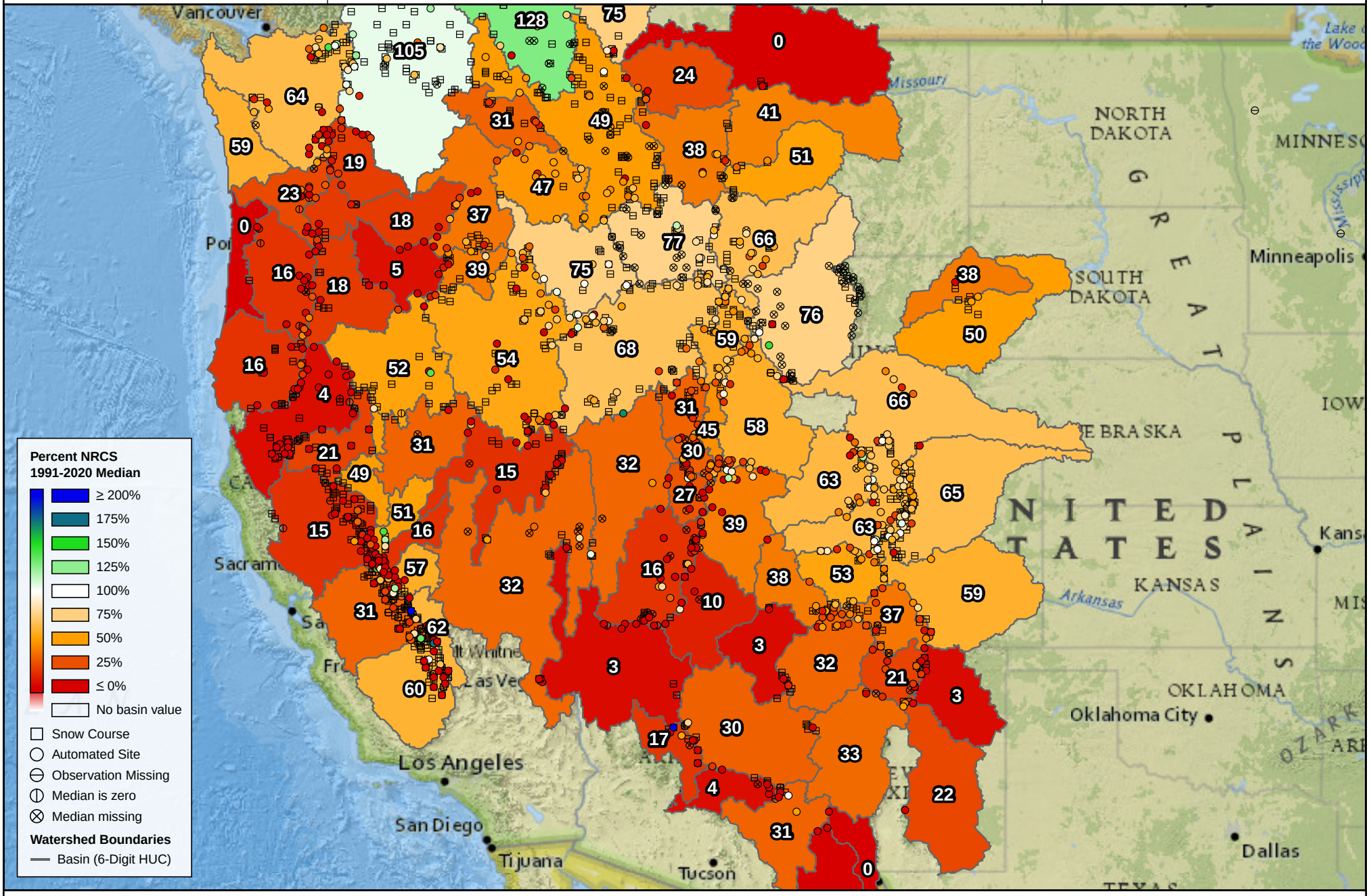

Upper Colorado Basin
Legend
% of Average Precipitation or % Median Snow Water Equivalent
WYOMING
Upper Green
95% 58%
Fontenelle
N/A% capacity
Flaming Gorge
N/A% capacity
White-Yampa
89% 62%
Lower Green
106% 51%
Colorado Headwaters
81% 58%
Upper Colorado
84% 51%
Gunnison
70% 50%
Blue Mesa
N/A% capacity
Morrow Point
N/A% capacity
Crystal
N/A% capacity
Dirty Devil
97% 18%
Lower San Juan
60% 3%
Dolores
76% 39%
Lake Powell
N/A% capacity
Navajo
N/A% capacity
Upper San Juan
57% 30%
Cheyenne
Ft. Collins
Boulder
Denver
Colorado Springs
Pueblo
Salt Lake City
UTAH
BUREAU OF RECLAMATION
Leaflet | Map tiles by Stamen Design, under CC BY 3.0. Data by © OpenStreetMap, under CC BY SA.

USDA United States Drought Monitor Map





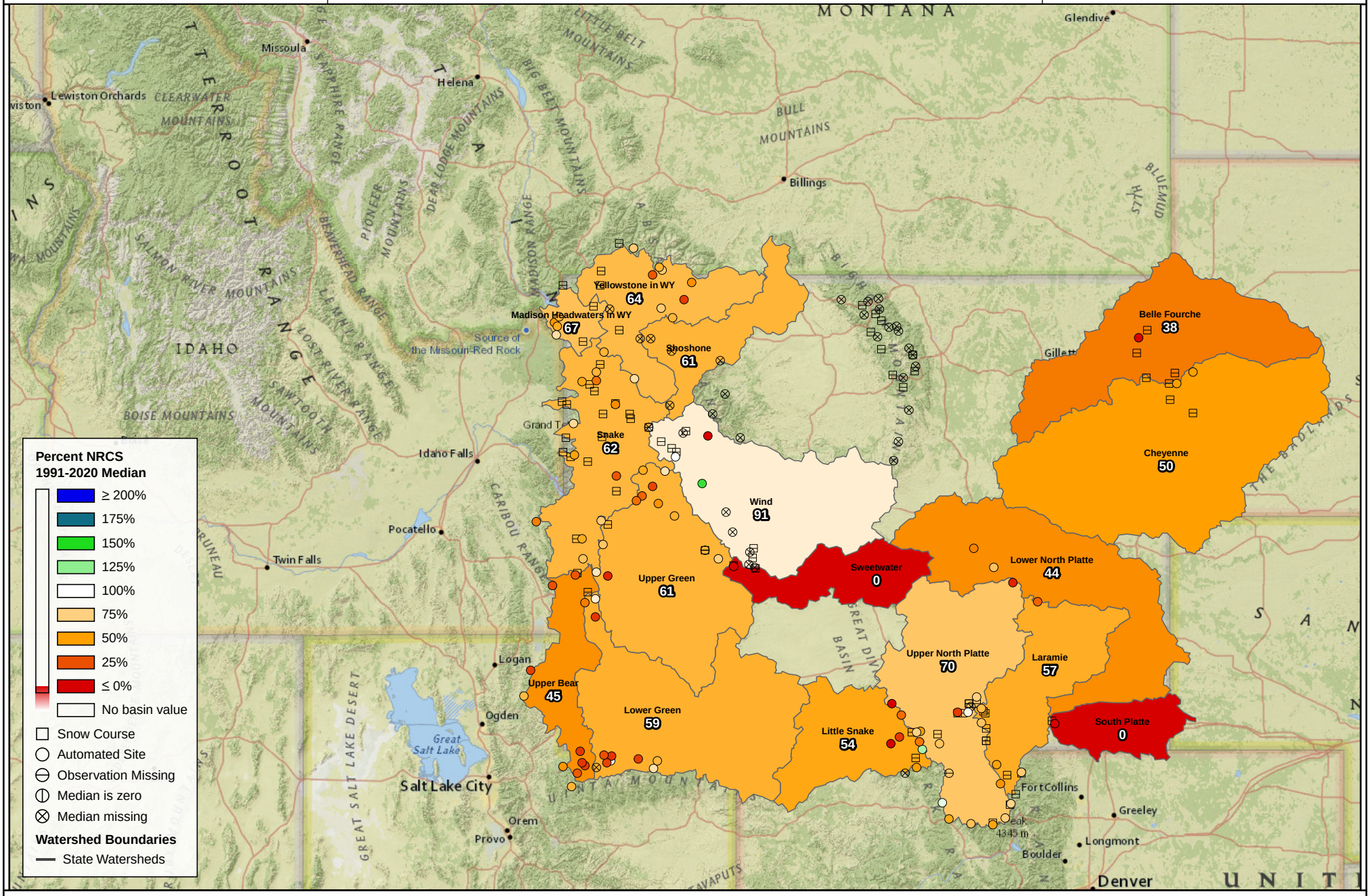
Snow Water Equivalent	Percent NRCS 1991-2020 Median	December 1st, 2021



USDA Natural Resources Conservation Service
United States Department of Agriculture

Created 12-07-2021

Snow Water Equivalent	Percent NRCS 1991-2020 Median	December 1st, 2021



USDA Natural Resources Conservation Service
United States Department of Agriculture

Created 12-07-2021

November 2021 24-Month Study Projections
Lake Powell and Lake Mead: End of Month Elevation Charts

Explanation of Hydrologic Scenarios

In addition to the November 2021 24-Month Study based on the Most Probable inflow scenario, and in accordance with the Upper Basin Drought Response Operations Agreement (DROA), Reclamation has conducted model runs in November to determine a possible range of reservoir elevations under Probable Minimum and Probable Maximum inflow scenarios. The Probable Minimum inflow scenario reflects a dry hydrologic condition which statistically would be exceeded 90% of the time. The Most Probable inflow scenario reflects a median hydrologic condition which statistically would be exceeded 50% of the time. The Probable Maximum inflow scenario reflects a wet hydrologic condition which statistically would be exceeded 10% of the time. There is approximately an 80% probability that a future elevation will fall inside the range of the minimum and maximum inflow scenarios. Additionally, there are possible inflow scenarios that would results in reservoir elevations falling outside the ranges indicated in these reports.

Consistent with the Upper Basin Drought Response Operations Agreement (DROA) provisions to protect a target elevation at Lake Powell of 3,525 feet, this November 2021 24-Month Study includes releases from the upstream initial units of the Colorado River Storage Project Act to deliver an additional 181 thousand acre-feet (kaf) to Lake Powell by the end of December 2021. The additional releases began in July and will continue to be implemented through December 2021. The table below contains the observed DROA releases and additional planned releases:

	Jul (kaf)	Aug (kaf)	Sep (kaf)	Oct (kaf)	Nov (kaf)	Dec (kaf)	Total (kaf)
Flaming Gorge Reservoir	12	45	44	24	0	0	125
Blue Mesa Reservoir	0	17	16	3	0	0	36
Navajo Reservoir	0	0	0	0	0	20	20
Total (kaf)	12	62	60	27	0	20	181

The releases detailed above are in addition to the already established releases determined by operational plans for each of the identified facilities. The additional delivery of 181 kaf is equivalent to Lake Powell's elevation of approximately three feet.

November 2021 Probable Minimum 24-Month Study

The water year 2022 unregulated inflow in the Probable Minimum inflow scenario is 5.00 million acre-feet (maf), or 52% of average. Consistent with the Interim Guidelines, the November Probable Minimum 24-Month Study includes a release volume from Glen Canyon Dam of 7.48 maf in water year 2022 and 7.00 maf in water year 2023. Under the probable minimum scenario, Lake Powell's elevation is projected to be 3,502.47 feet on December 31, 2022. With intervening flows between Lake Powell and Lake Mead of 0.764 maf in calendar year 2022, Lake Mead's elevation is projected to be 1,048.89 feet on December 31, 2022.

November 2021 Most Probable 24-Month Study

The water year 2022 unregulated inflow into Lake Powell in the August Most Probable inflow scenario is 7.80 maf, or 81% of average. Consistent with the Interim Guidelines, the November Probable Minimum 24-Month Study includes a release volume from Glen Canyon Dam of 7.48 maf in water years 2022 and 2023. Under the most probable scenario, Lake Powell's elevation is projected to be 3,536.40 feet on December 31, 2022. With intervening flows between Lake Powell and Lake Mead of 0.875 maf in calendar year 2022, Lake Mead's elevation is projected to be 1,051.76 feet on December 31, 2022.

November 2021 Probable Maximum 24-Month Study

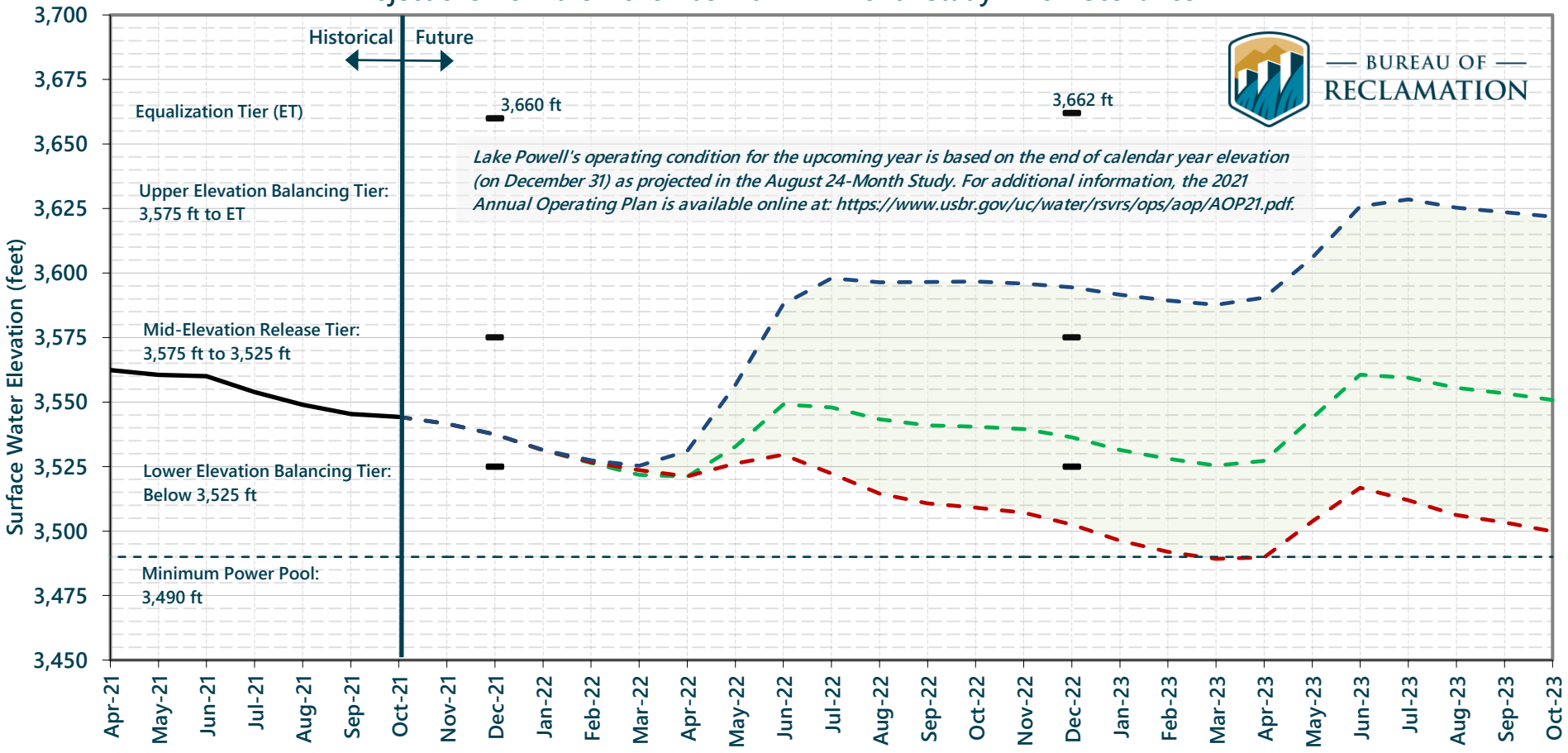
The water year 2022 unregulated inflow in the Probable Maximum inflow scenario is 14.02 maf, or 146% of average. Consistent with the Interim Guidelines, the November Probable Maximum 24-Month Study includes a release volume from Glen Canyon Dam of 7.48 maf in water year 2022 and 9.00 maf in water year 2023. Under the probable maximum scenario, Lake Powell's elevation is projected to be 3,594.44 feet on December 31, 2022. With intervening flows between Lake Powell and Lake Mead of 0.994 maf in calendar year 2022, Lake Mead's elevation is projected to be 1,061.95 feet on December 31, 2022.

The 2021 AOP is available online at:	https://www.usbr.gov/uc/water/rsvrs/ops/aop/AOP21.pdf.
The Draft 2022 AOP is available online at:	https://www.usbr.gov/lc/region/g4000/AOP2022/2022%20AOP_2021-08-26_Consultation-3.pdf.
The Interim Guidelines are available online at:	https://www.usbr.gov/lc/region/programs/strategies/RecordofDecision.pdf.
The Colorado River DCPs are available online at:	https://www.usbr.gov/dcp/finaldocs.html.
The Upper Basin Hydrology Summary is available online at:	https://www.usbr.gov/uc/water/crsp/studies/24Month_11_ucb.pdf.

.

Lake Powell End of Month Elevations

Projections from the November 2021 24-Month Study Inflow Scenarios

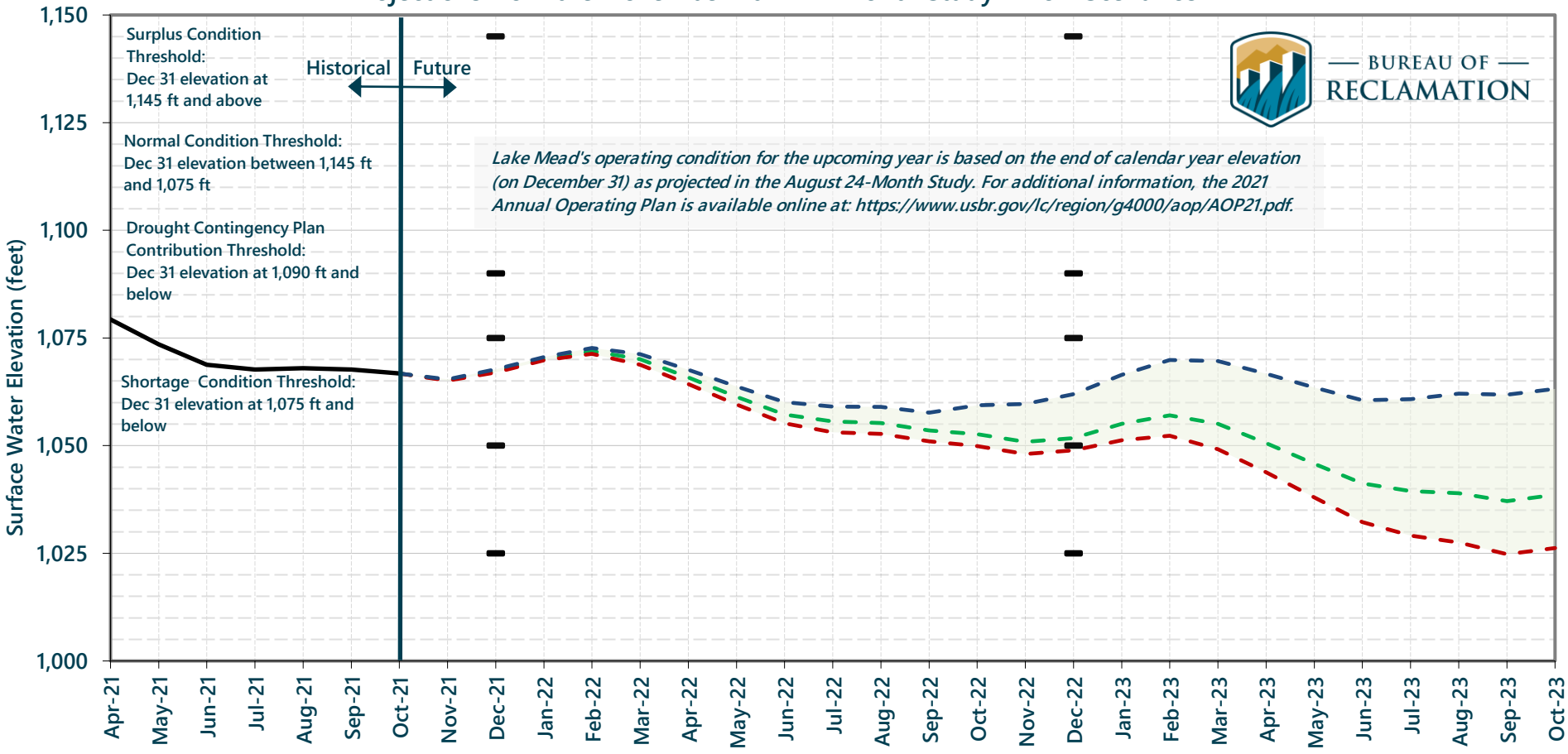


- November 2021 Most Probable Inflow with a Lake Powell release of 7.48 maf in WY 2022 and WY 2023
- November 2021 DROA Minimum Probable Inflow with a Lake Powell release of 7.48 maf in WY 2022 and 7.00 maf in WY 2023
- November 2021 DROA Maximum Probable Inflow with a Lake Powell release of 7.48 maf in WY 2022 and 9.00 maf in WY 2023
- Historical Elevations

The Drought Response Operations Agreement (DROA) is available online at: https://www.usbr.gov/dcp/finaldocs.html.

Lake Mead End of Month Elevations

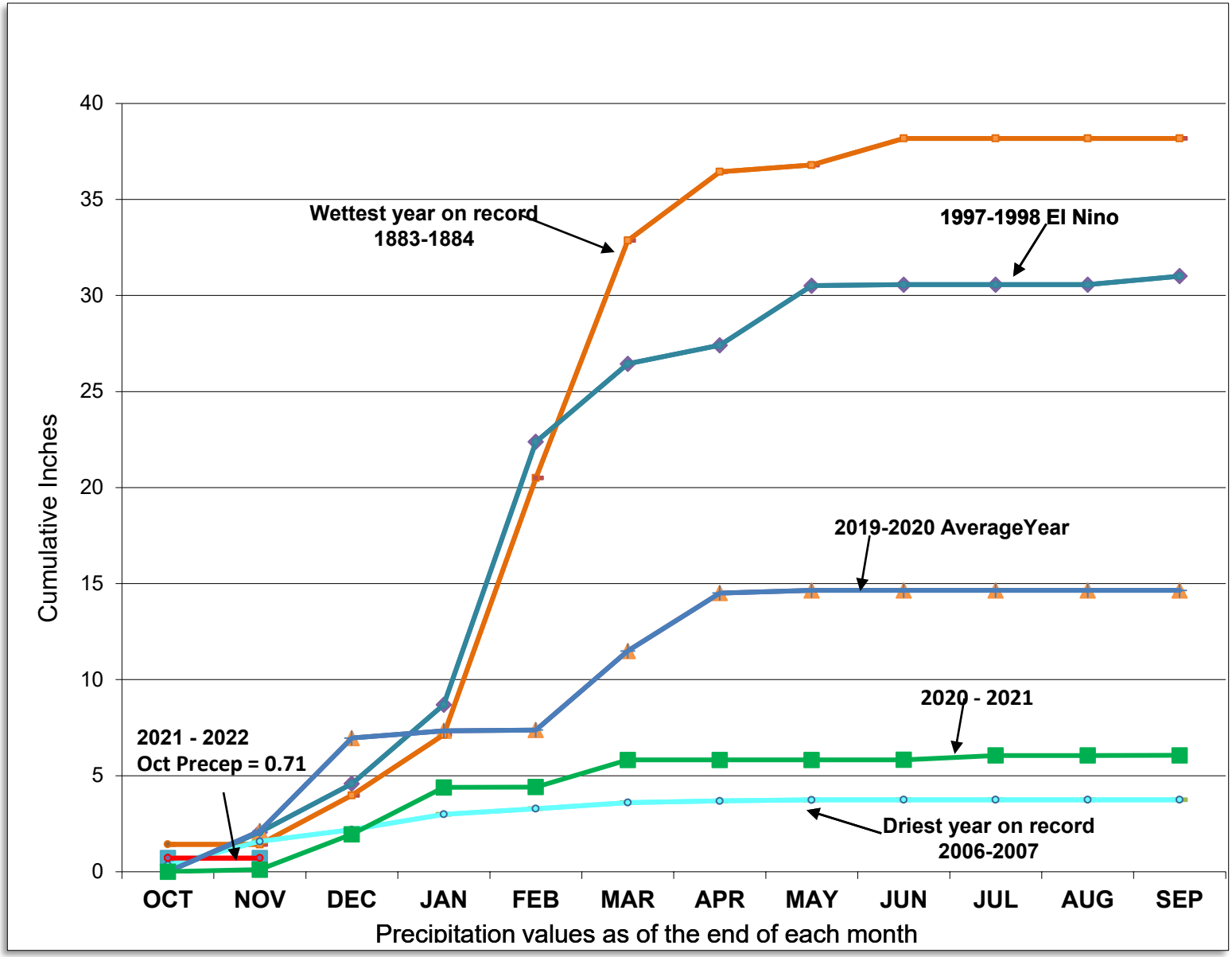
Projections from the November 2021 24-Month Study Inflow Scenarios



- November 2021 Most Probable Inflow with a Lake Powell release of 7.48 maf in WY 2022 and WY 2023
- November 2021 DROA Minimum Probable Inflow with a Lake Powell release of 7.48 maf in WY 2022 and 7.00 maf in WY 2023
- November 2021 DROA Maximum Probable Inflow with a Lake Powell release of 7.48 maf in WY 2022 and 9.00 maf in WY 2023
- Historical Elevations

The Drought Response Operations Agreement (DROA) is available online at: https://www.usbr.gov/dcp/finaldocs.html.

Los Angeles Civic Center Precipitation

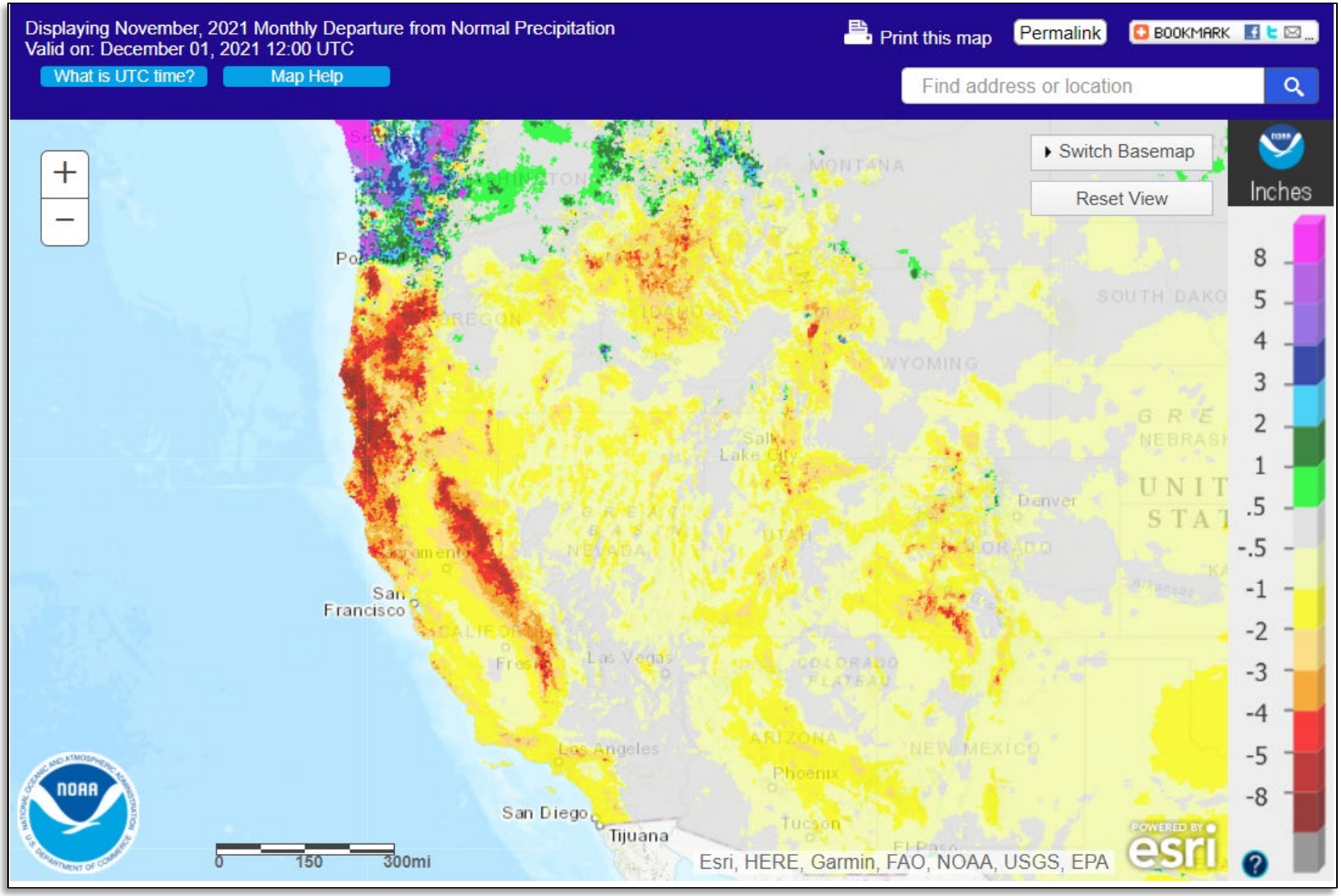


Precipitation at Six Major Stations in Southern California

From October 1, 2021 to November 30, 2021

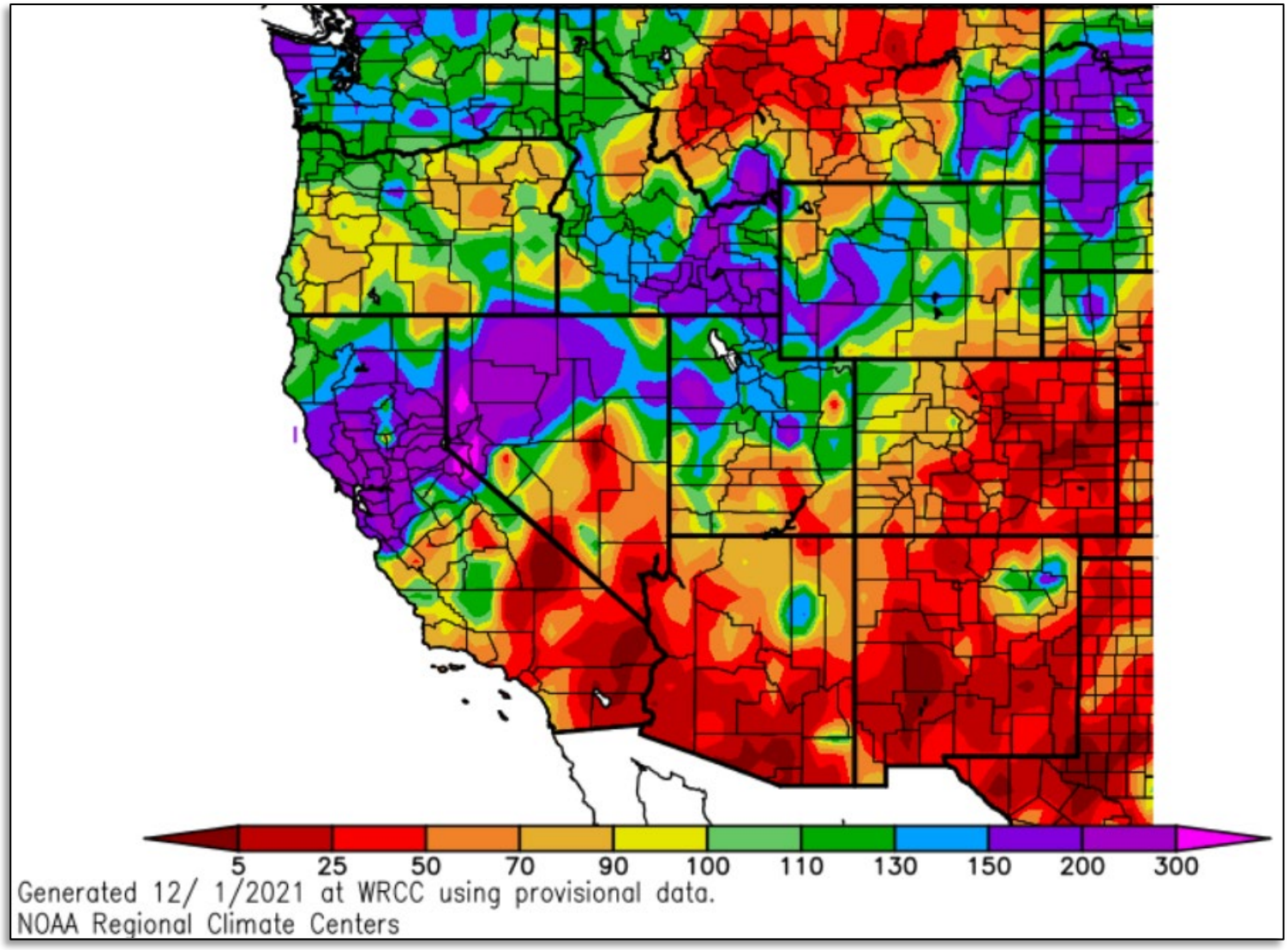
Station	Precipitation in inches		Average to Date	Percent of Average
	Nov	Oct 1 to Nov 30		
San Luis Obispo	0.00	1.70	3.05	56%
Santa Barbara	0.02	1.21	2.19	55%
Los Angeles	0.00	0.71	1.88	38%
San Diego	0.00	1.01	1.48	68%
Blythe	0.00	0.07	0.54	13%
Imperial	0.00	0.02	0.45	4%

Departure From Normal Precipitation (inches)
10/1/2021 - 11/30/2021



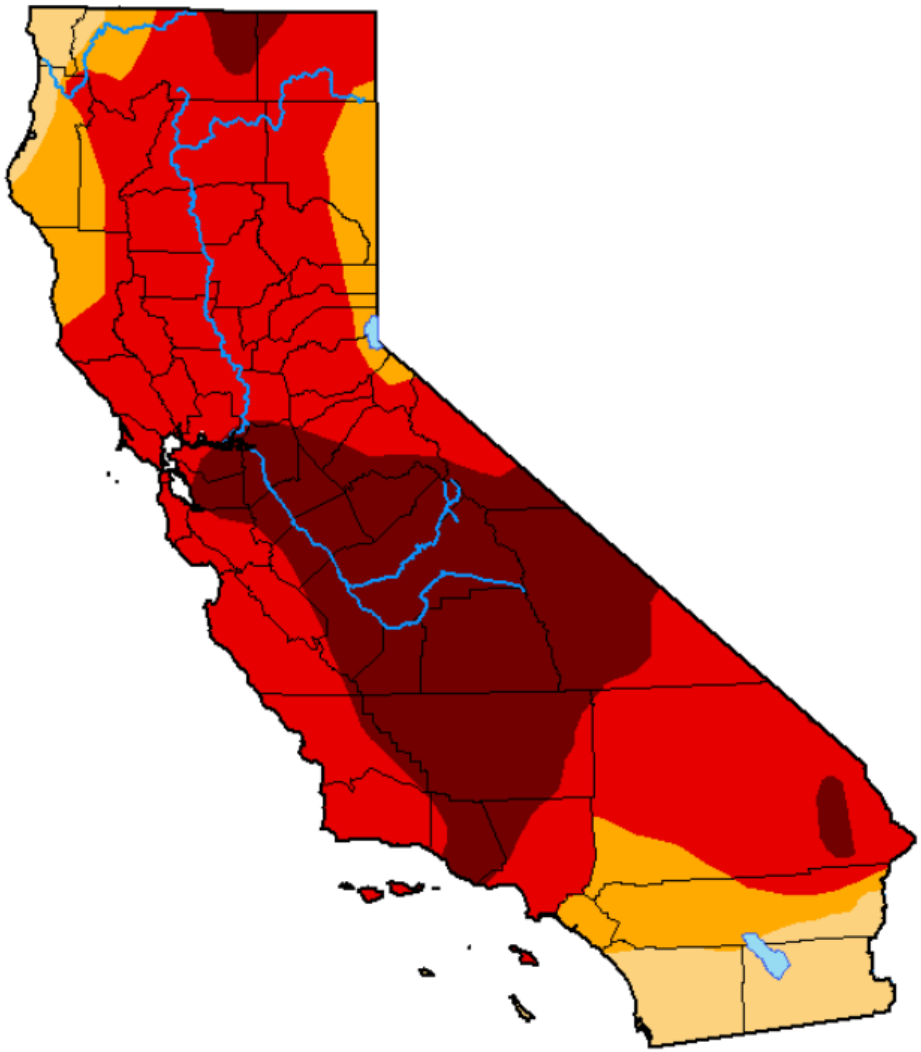
NOAA – National Weather Service
https://water.weather.gov/precip/

Percent of Average Precipitation (%)
10/1/2021 - 11/30/2021



Western Regional Climate Center
https://wrcc.dri.edu/cgi-bin/anomimage.pl?wrcOctPpct.png

U.S. Drought Monitor
California



November 23, 2021
(Released Wednesday, Nov. 24, 2021)
Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.00	100.00	100.00	92.43	80.28	28.27
Last Week *11-16-2021*	0.00	100.00	100.00	92.43	80.28	37.62
3 Months Ago *08-24-2021*	0.00	100.00	100.00	95.58	88.37	47.40
Start of Calendar Year *12-29-2020*	0.00	100.00	95.17	74.34	33.75	1.19
Start of Water Year *09-28-2021*	0.00	100.00	100.00	93.93	87.88	45.66
One Year Ago *11-24-2020*	3.50	96.50	75.03	48.19	19.36	0.00

Intensity:

- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

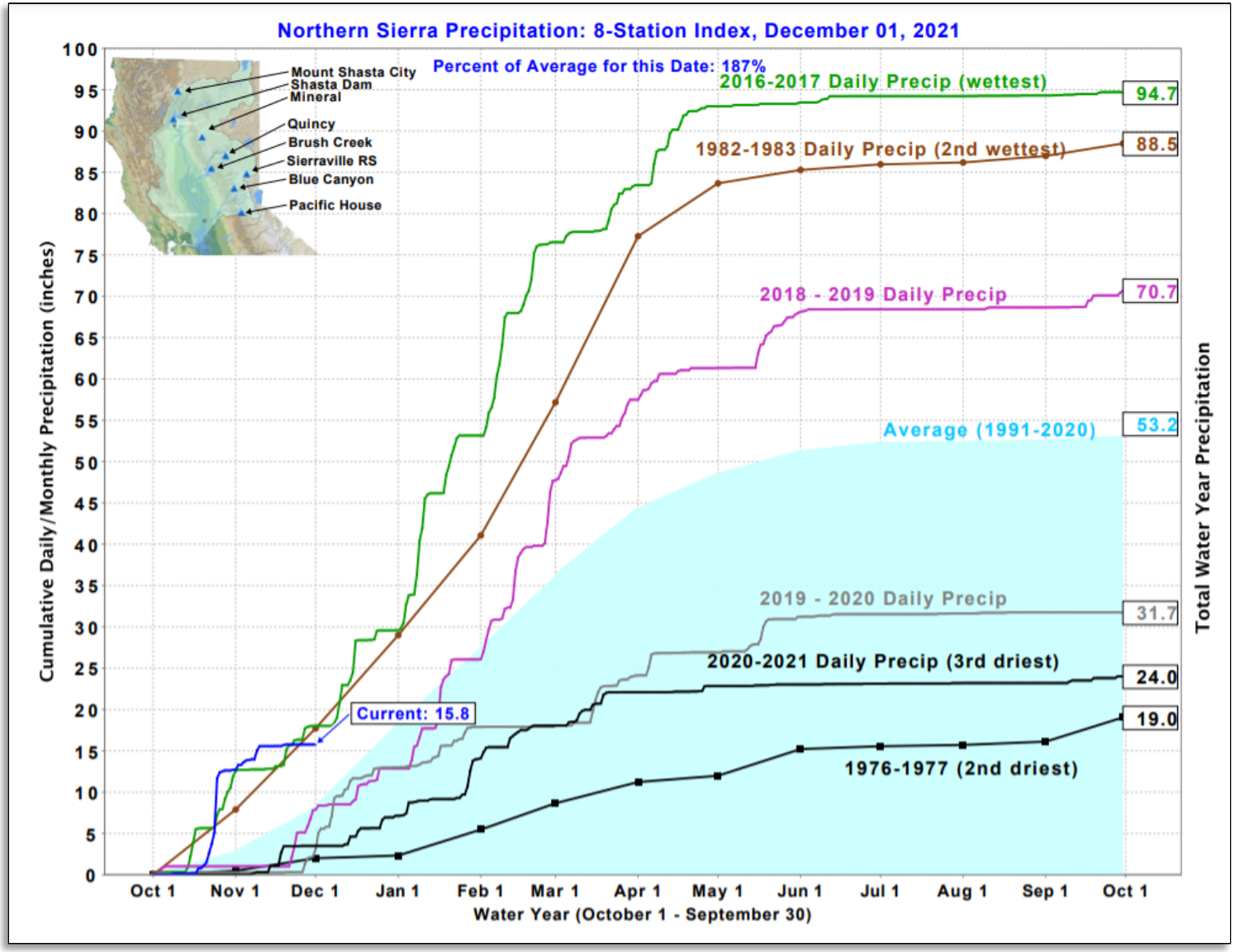
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to https://droughtmonitor.unl.edu/About.aspx

Author:
Richard Heim
NCEI/NOAA

droughtmonitor.unl.edu

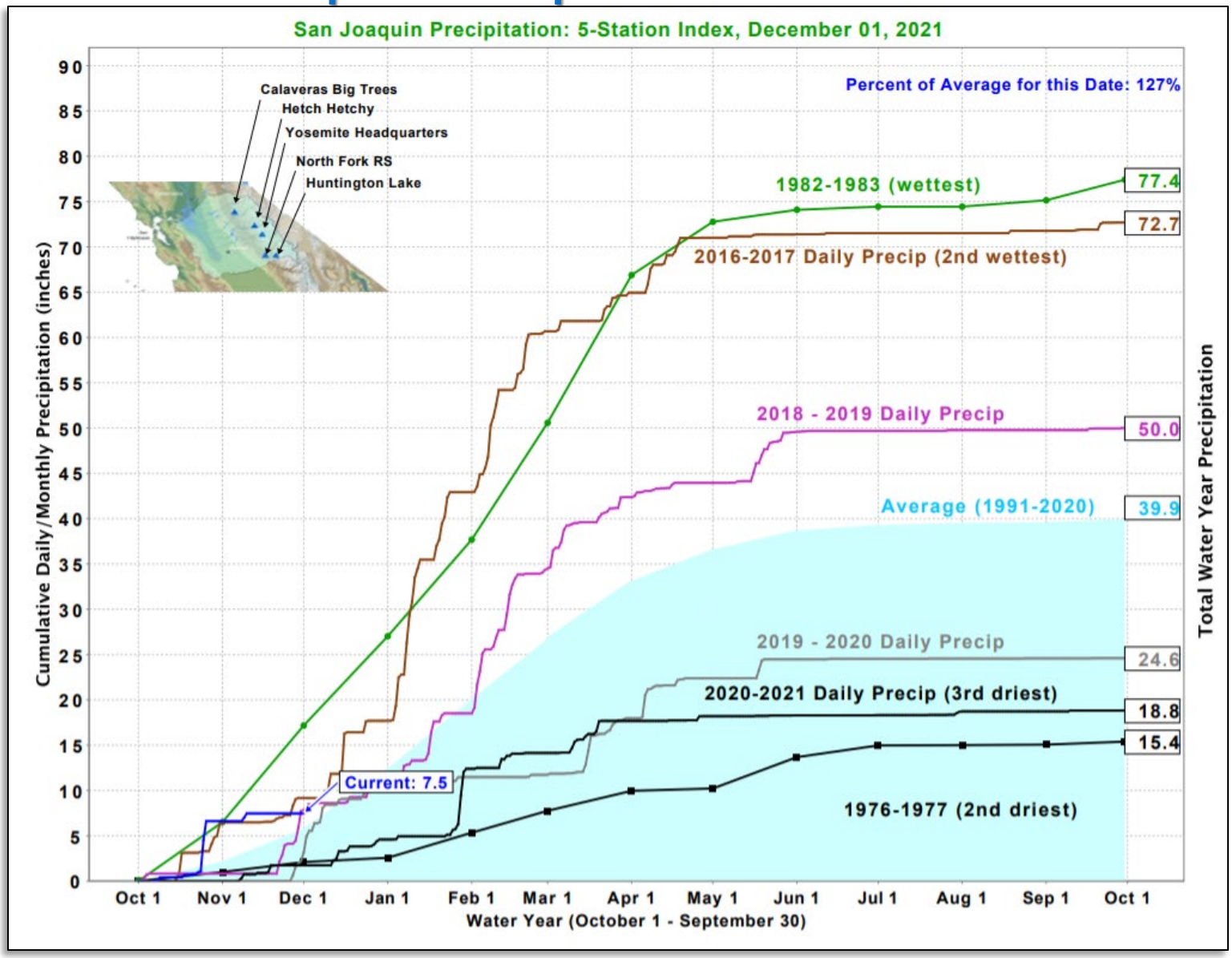
https://droughtmonitor.unl.edu/Maps/MapArchive.aspx

Northern Sierra Precipitation: 8 Station Index



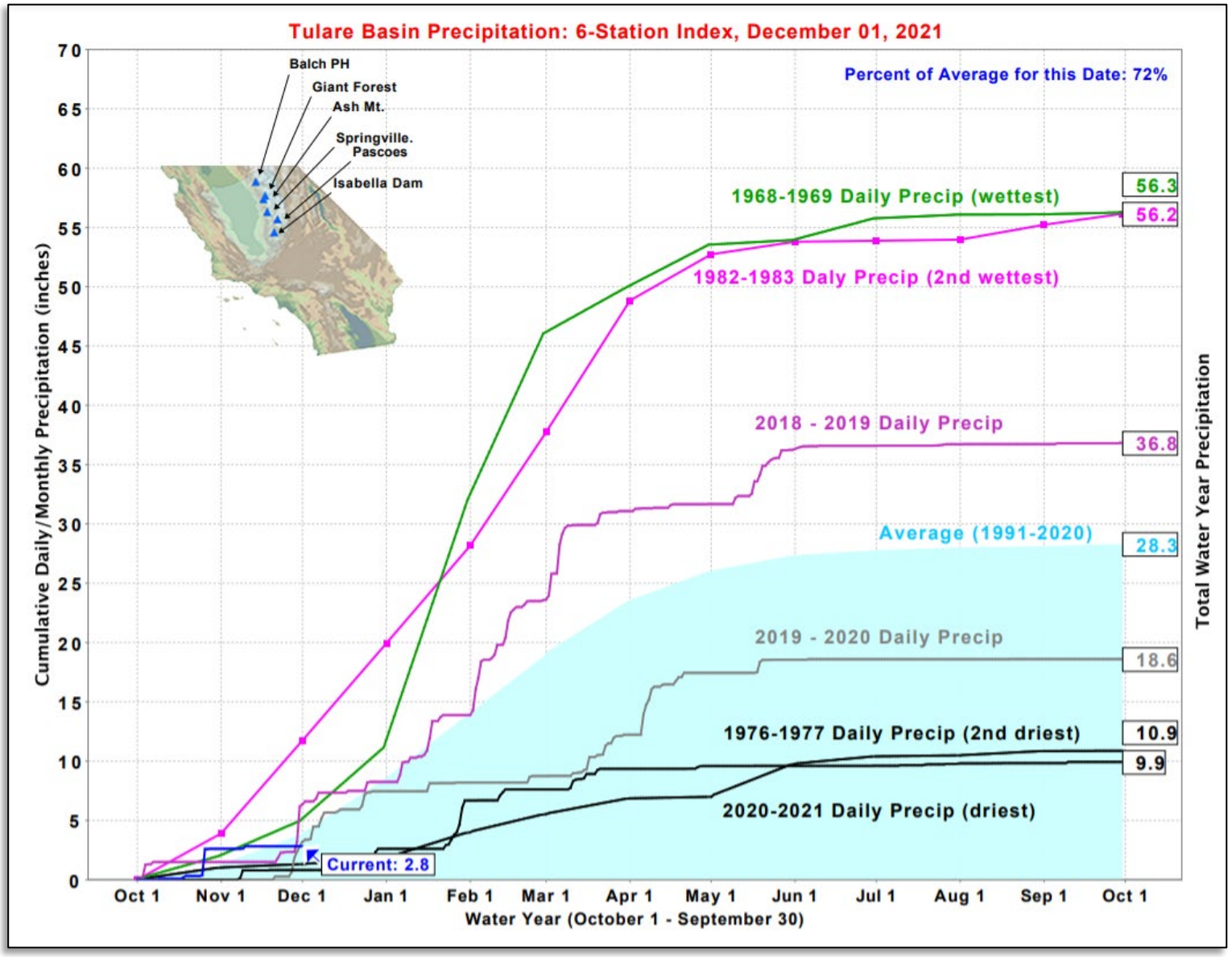
California Data Exchange Center
http://cdec.water.ca.gov/cgi-progs/products/PLOT_ESI.pdf

San Joaquin Precipitation: 5 Station Index



California Data Exchange Center
http://cdec.water.ca.gov/cgi-progs/products/PLOT_FSI.pdf

Tulare Basin Precipitation: 6 Station Index



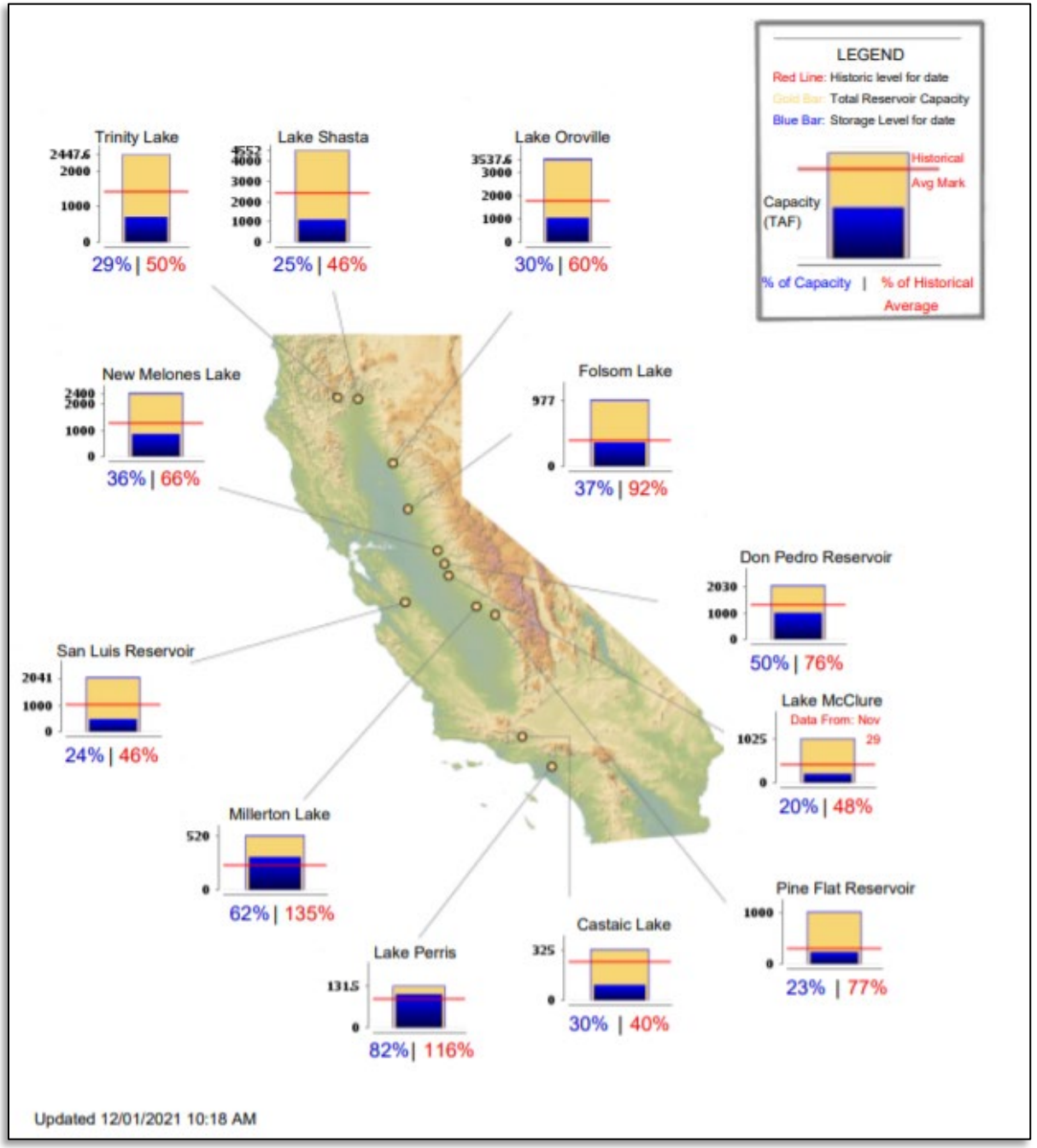
California Data Exchange Center
http://cdec.water.ca.gov/cgi-progs/products/PLOT_TSI.pdf

Comparison of SWP Water Storage

Reservoir	Capacity	2020 Storage (acre-feet) As of Dec 1	2020 Storage (acre-feet) % of Cap.	2021 Storage (acre-feet) As of Nov 30	2021 Storage (acre-feet) % of Cap.
Frenchman	55,475	35,453	64%	28,778	52%
Lake Davis	84,371	51,703	61%	41,826	50%
Antelope	22,564	13,921	62%	14,061	62%
Oroville	3,553,405	1,304,053	37%	1,055,064	30%
TOTAL North	3,715,815	1,405,130	38%	1,139,729	31%
Del Valle	39,914	29,781	75%	37,937	95%
San Luis	2,027,835	933,271	46%	480,402	24%
Pyramid	169,901	167,204	98%	164,725	97%
Castaic	319,247	243,758	76%	99,106	31%
Silverwood	74,970	58,713	78%	66,969	89%
Perris	132,614	121,520	92%	107,604	81%
TOTAL South	2,764,481	1,554,247	56%	956,743	35%
TOTAL SWP	6,480,296	2,959,377	46%	2,096,472	32%

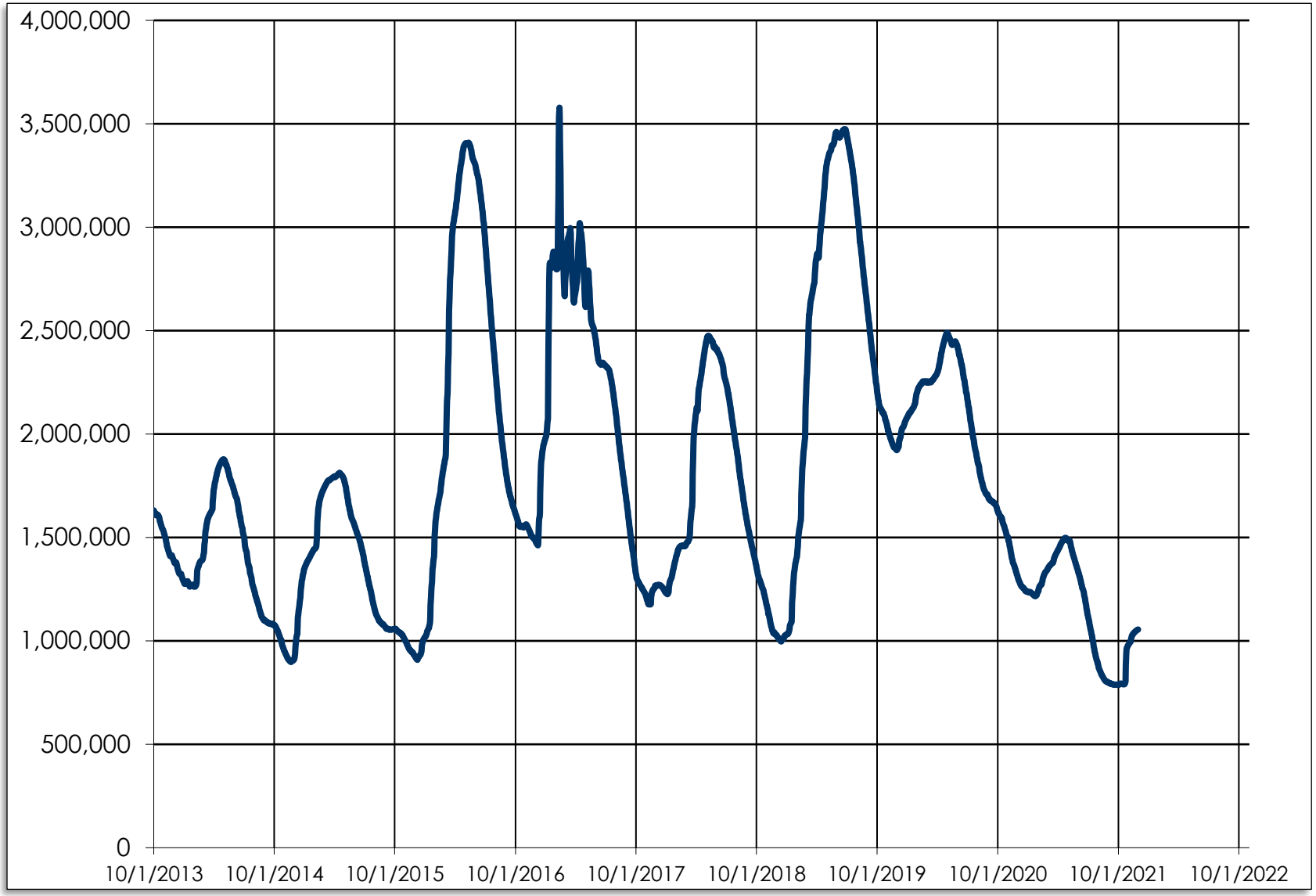
As of December 1, 2021, the Table A allocations for SWP contractors is 0%.

Reservoir Current Conditions



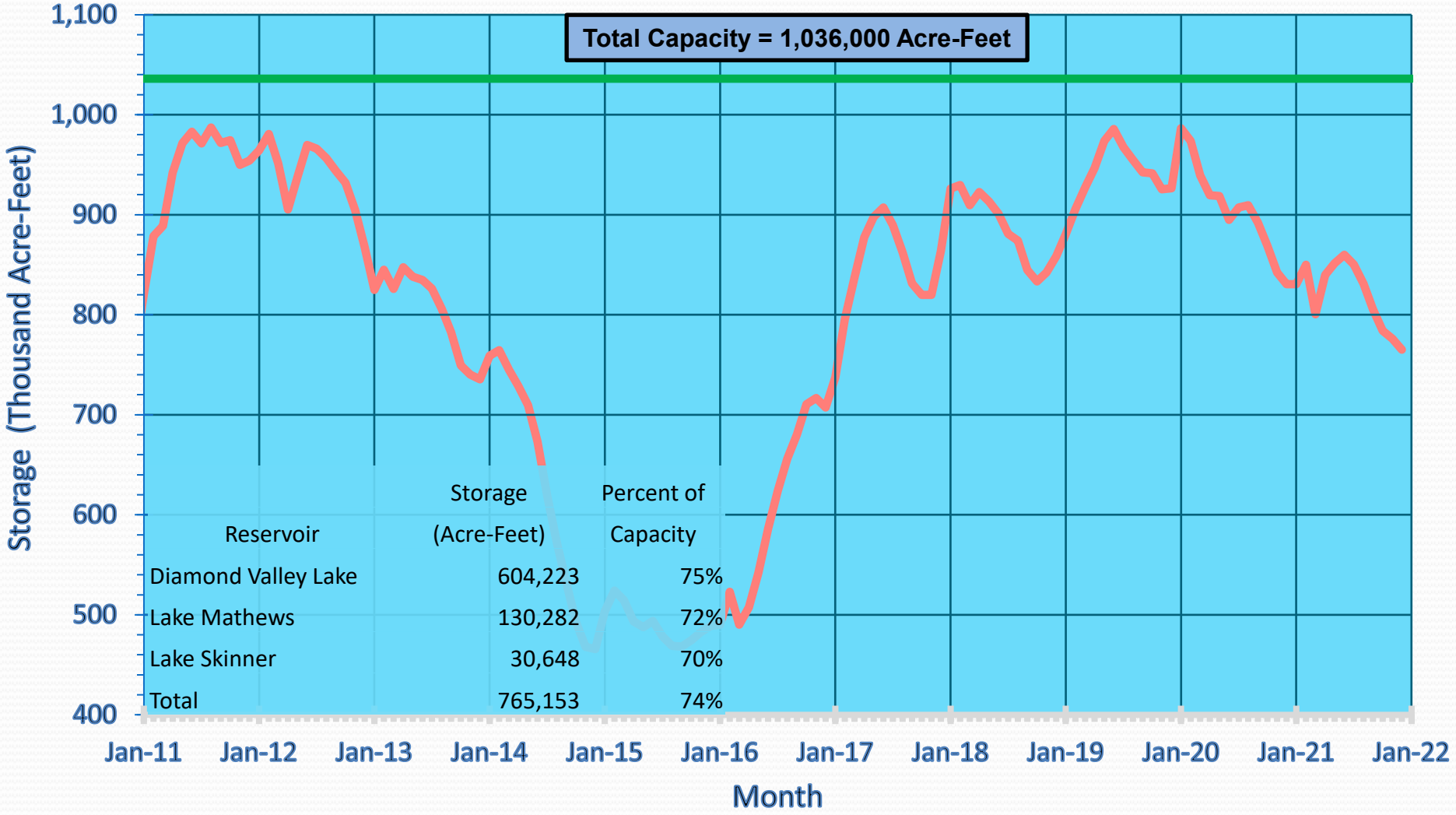
California Data Exchange Center
https://cdec.water.ca.gov/reportapp/javareports?name=rescond.pdf

Oroville Storage (acre-feet)
October 1, 2013 – December 1, 2021



MWD's Combined Reservoir Storage as of December 1, 2021

Lake Skinner, Lake Mathews, and Diamond Valley Lake



Reservoir	Storage (Acre-Feet)	Percent of Capacity
Diamond Valley Lake	604,223	75%
Lake Mathews	130,282	72%
Lake Skinner	30,648	70%
Total	765,153	74%

2021 Water Deliveries to Agencies (AF)