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May 2022 Southwest Climate Outlook

Monthly/Seasonal Precipitation and Temperature: Apr precipitation was between below average and record dry in Arizona and New Mexico (Fig. 1a). Apr temperatures were above average to much above average in Arizona and New Mexico (Fig. 1b). Water year precipitation is now almost entirely below average or drier in Arizona and New Mexico, with widespread pockets of much below normal, and small pockets of record dry (Fig. 2).

Drought: The May 10 U.S. Drought Monitor (USDM) shows increases in categorical severity of drought characterizations in Arizona and New Mexico (Fig. 3), but drought conditions are found across the entire southwestern United States. Long term accumulated precipitation deficits are a factor in these designations, but the relatively dry conditions over the water year to date are also playing their part in the drought.

Snowpack & Streamflow: May 1 is well past peak snowpack conditions, and snow water equivalent (SWE) is quickly waning but is well below median even in upper elevation regions (Fig. 4). May 1 streamflow forecasts are below median in both the Colorado River and Rio Grande basins (Fig. 5).

Water Supply: Most of the reservoirs in Arizona and New Mexico are at or below last year's values. Most are also below their long-term average (see Arizona and New Mexico reservoir storage). The tier one shortage declaration for the Colorado River in 2022 and low water levels in the Rio Grande highlight ongoing concerns about the intersection of long-term drought and water resource management.

Wildfire: Fire season is well underway in the Southwest with numerous fires in Arizona and New Mexico, including the devastating Calf Canyon/Hermits Peak Complex fire. Weather has been particularly challenging with very low humidity and unusually strong winds that led to numerous red flag days. The NIFC fire outlooks for June show above normal fire risk for much of Arizona and most of New Mexico (Fig. 6), with some relief predicted with the onset of monsoon in late June and into July, although the exact timing of that increased storm activity is unpredictable and brings increased risk of ignition from lightning.

ENSO Tracker: ENSO remains at La Niña status according to most outlooks. Previously, the forecast consensus was on a transition to ENSO-neutral conditions by summer, but there are now some indications of the potential for La Nina to persist into Fall (see ENSO-tracker for details).



Tweet May 2022 SW Climate Outlook

MAY2022 @CLIMAS_UA SW Climate Outlook, Forecasts, ENSO Tracker, Streamflow & Snowpack, Wildfire Outlook, AZ & NM Reservoirs, bit.ly/3sHVEeN #SWclimate #AZWx #NMWx



Online Resources

Figure 1
National Centers for Environmental Information
ncdc.noaa.gov/sotc

Figure 2
West Wide Drought Tracker
wwdt.dri.edu

Figure 3
U.S. Drought Monitor
droughtmonitor.unl.edu

Figures 4-5
National Resource Conservation Service (NRCS)
nrcs.usda.gov

Figure 6
National Interagency Fire Center
nifc.gov

May 2022 - Climate Summary

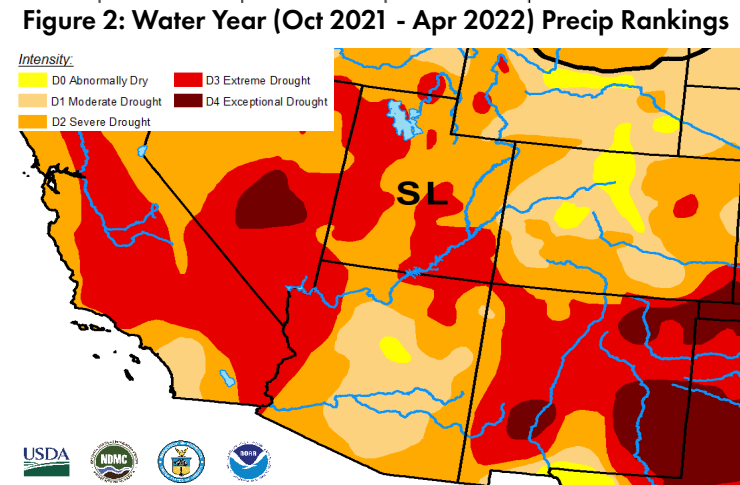
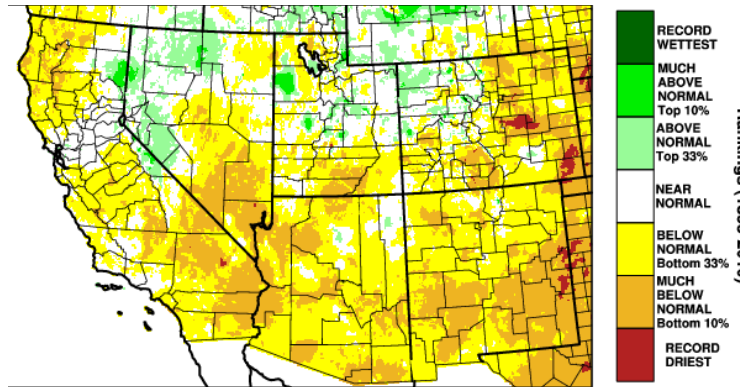
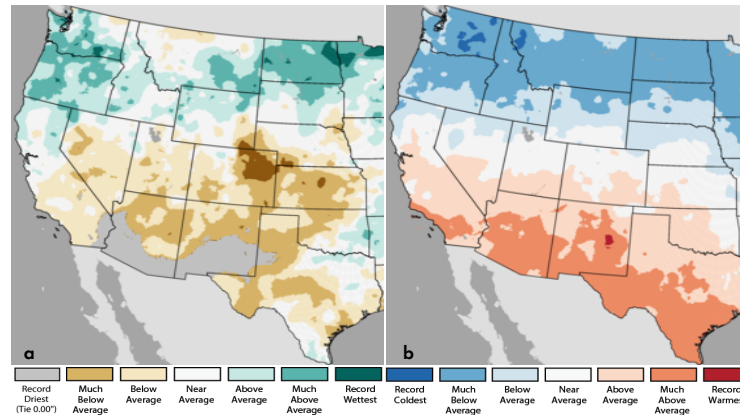


Figure 3: US Drought Monitor - May 10, 2022

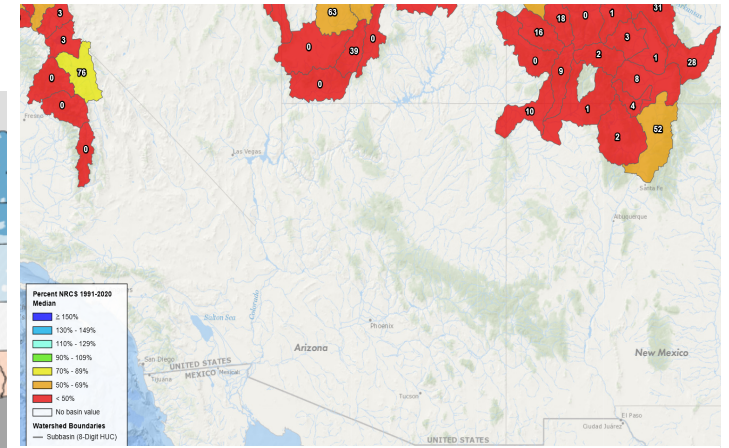


Figure 4: May 1 2022 Snow Water Equivalent (SWE) - Pct NRCS Median (1991-2020)

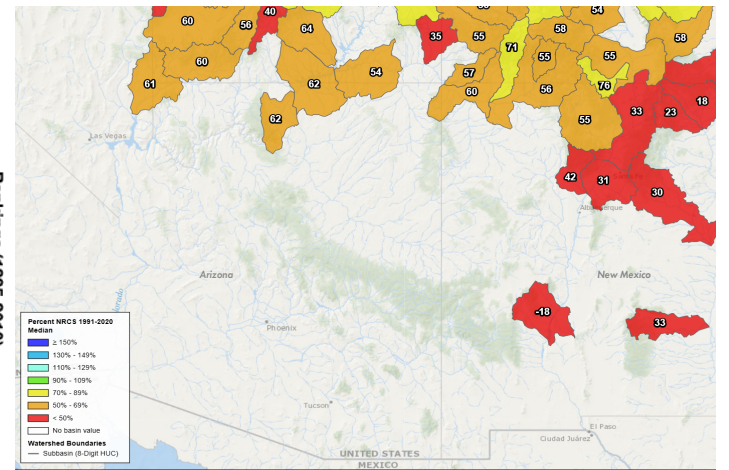


Figure 5: May 1 2022 Streamflow Forecast 50% Exceedence Prob., NRCS Median

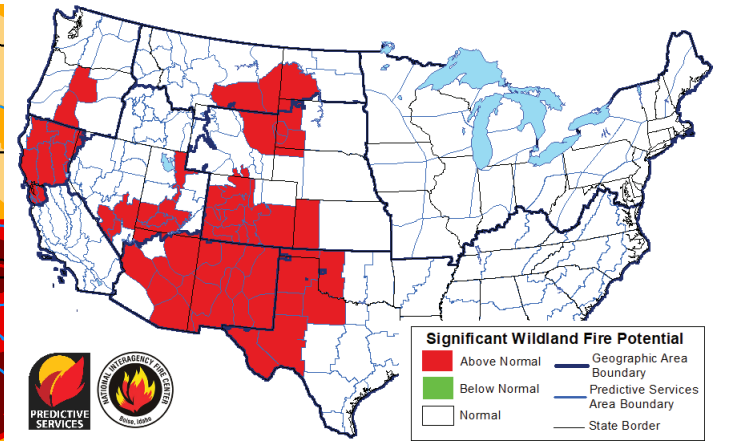


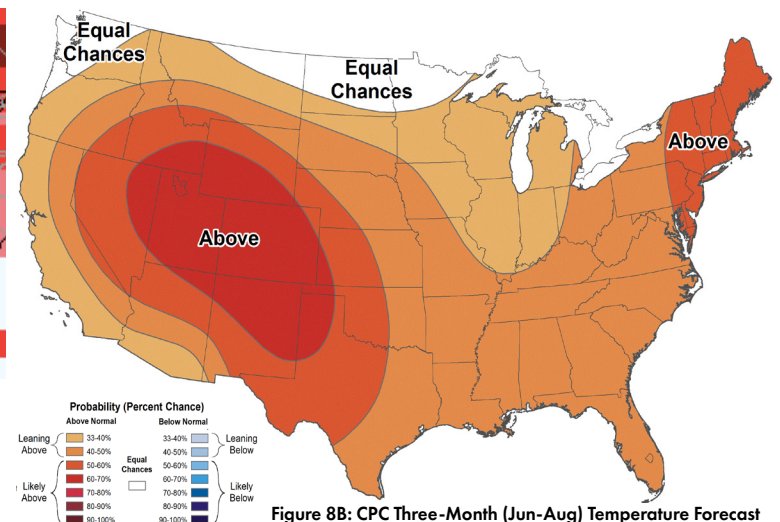
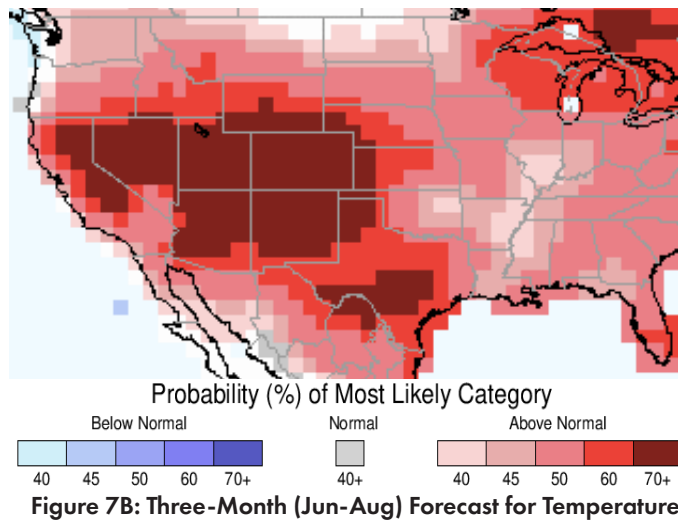
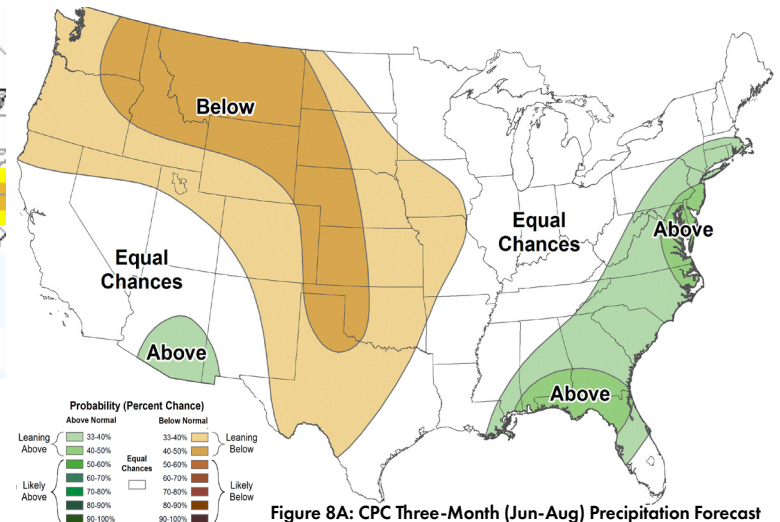
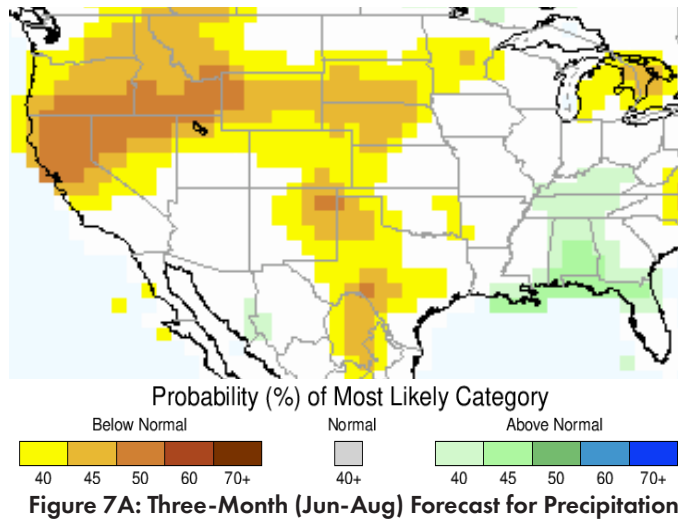
Figure 6: NIFC Significant Wildland Fire Potential Outlook - June 2022

Online Resources

Figure 7
 Intl. Research Institute for Climate
 and Society
 iri.columbia.edu

Figure 8
 NOAA Climate Prediction Center
 cpc.ncep.noaa.gov

May 2022 - Seasonal Forecasts



Precipitation Forecasts: The IRI outlook for Jun-Aug calls for equal chances of above or below average precipitation in Arizona and parts of New Mexico, and increased chances of below average precipitation in most of the western U.S. (Fig. 7a). The CPC outlook for Jun-Aug calls for increased chances of above average precipitation in much of southern Arizona with equal chances of above or below average precipitation in most of the rest of the Southwest (Fig. 8a).

Temperature Forecasts: The IRI outlook for Jun-Aug calls for increased chance of above average temperatures across the Southwest (Fig. 7b). The CPC outlook for Jun-Aug also calls for increased chances of above average temperatures across the Southwest (Fig. 8b). Both outlooks have a similar pattern across most of the contiguous U.S.

Online Resources

Figure 1

Australian Bureau of Meteorology
bom.gov.au/climate/enso

Figure 2

NOAA - Climate Prediction Center
cpc.ncep.noaa.gov

Figure 3

International Research Institute for Climate and Society
iri.columbia.edu

Figure 4

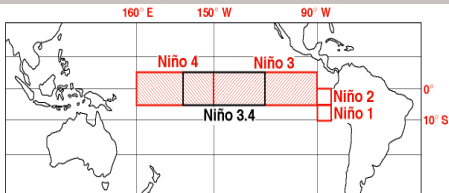
NOAA - Climate Prediction Center
cpc.ncep.noaa.gov

El Niño / La Niña

Information on this page is also found on the CLIMAS website:

climas.arizona.edu/sw-climate/el-niño-southern-oscillation

Equatorial Niño Regions



For more information: ncdc.noaa.gov/teleconnections/enso/indicators/sst/

Image source: aoml.noaa.gov/

ENSO Tracker

Sea surface temperature (SST) forecasts for Jun – Aug 2022 still indicate cool conditions across most of the equatorial Pacific (Fig. 1). Current 3.4/4 anomalies remain well below the La Niña threshold and show recent cooling (Fig. 2), although sub-surface warming may indicate a move towards neutral conditions. ENSO outlooks generally see La Niña lasting well into summer, with some indications of La Niña lasting into fall and winter 2022.

Forecast Roundup: On May 10 the Australian Bureau of Meteorology ENSO outlook saw La Niña indicators as having “maintained or slightly increased their strength” but highlighted warming sub-surface waters as an indicator a possible return to neutral conditions. On May 12 the Japanese Meteorological Agency (JMA) observed La Niña conditions had 70-percent chance of continuing through early summer, and equally likely of continued La Niña (50%) or ENSO-neutral (50%) by fall. On May 12 the NOAA Climate Prediction Center (CPC) maintained their “La Niña Advisory” noting “the coupled ocean-atmosphere system reflected the continuation of La Niña” and called for a 58-percent chance of La Niña in late summer (Aug-Oct), and a 61-percent chance of La Niña in fall and winter 2022. On May 12 the International Research Institute (IRI) issued an ENSO Quick Look (Fig. 3), noting “Sea Surface Temperatures remain below-average (strengthening slightly) in the central-eastern equatorial Pacific”, and their objective (model-based) forecast sees roughly equal chances between La Niña and ENSO-neutral, while the ‘subjective’ (forecaster consensus) outlook favors a continuation of La Niña through summer and fall. The North American Multi-Model Ensemble (solid and dashed black line, Fig. 4) remains in La Niña territory, and in a shift from previous months, now shows persistence of La Niña conditions into Fall 2022.

Summary: The outlooks this month continue the possibility of La Niña extending into fall and winter 2022, although there is considerable uncertainty in models and forecasts during the so-called spring predictability barrier. If La Niña does persist through summer, the potential influence on the monsoon is not well understood, partly due to the inherent variability and volatility of the monsoon, and limited sample size of ENSO events that persist over the summer period.

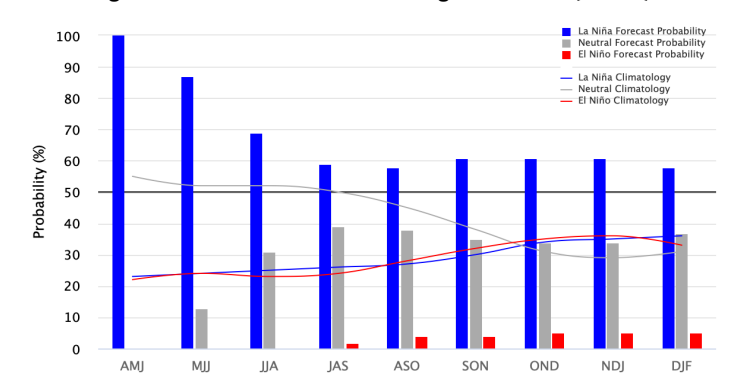
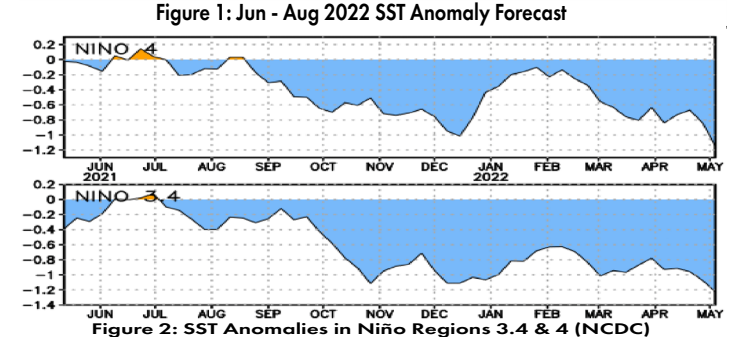
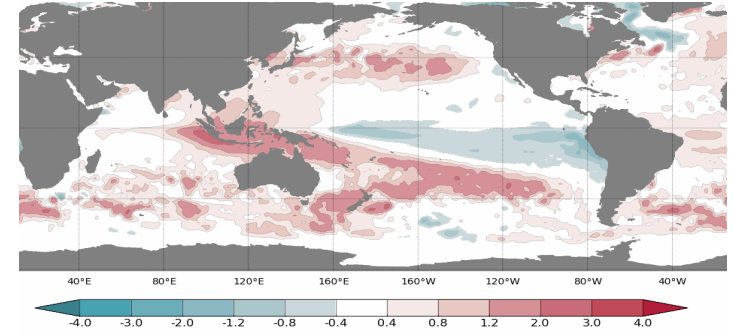


Figure 3: Early-May IRI/CPC Model-Based Probabilistic ENSO Forecast

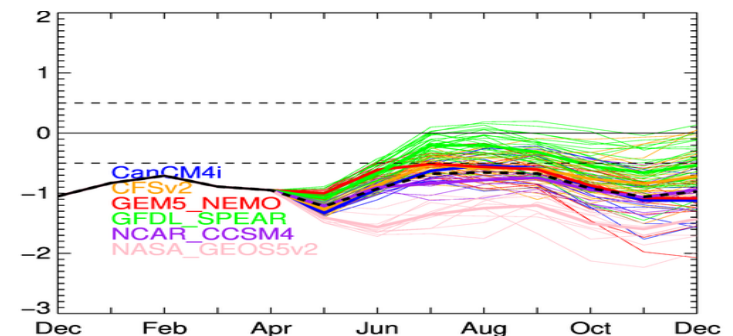


Figure 4: North American Multi-Model Ensemble Forecast for Niño 3.4

Online Resources

Portions of the information provided in this figure is available at the Natural Resources Conservation Service www.wcc.nrcs.usda.gov/BOR/basin.html

Contact Ben McMahan with questions/comments.

The map gives a representation of current storage for reservoirs in Arizona and New Mexico. Reservoir locations are numbered within the blue circles on the map, corresponding to the reservoirs listed in the table. The cup next to each reservoir shows the current storage (blue fill) as a percent of total capacity. Note that while the size of each cup varies with the size of the reservoir, these are representational and not to scale. Each cup also represents last year's storage (dotted line) and the 1981–2010 reservoir average (red line).

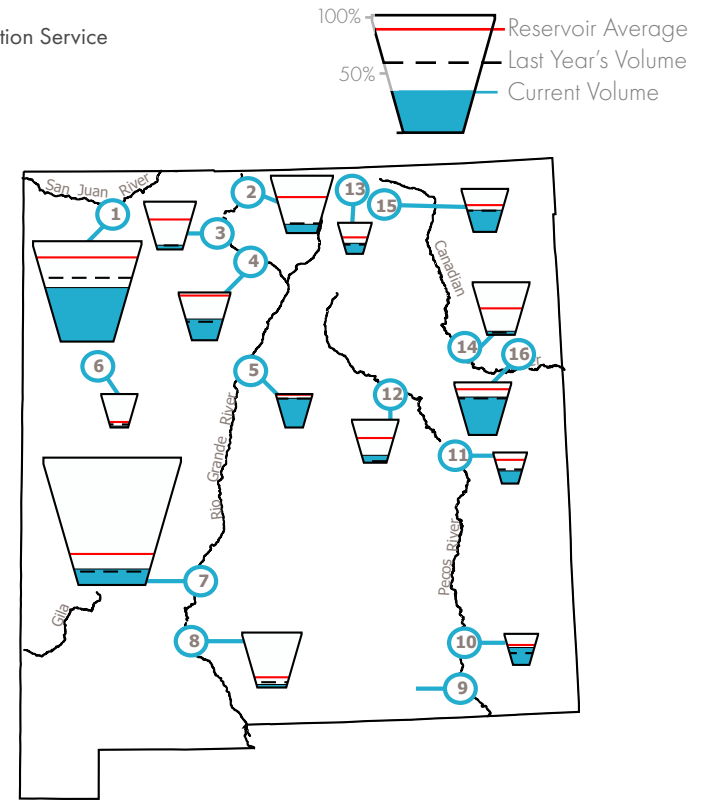
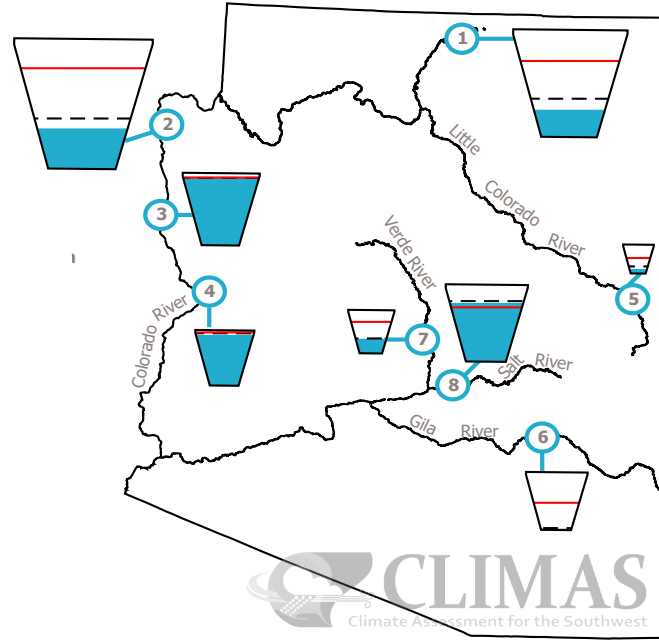
The table details more exactly the current capacity (listed as a percent of maximum storage). Current and maximum storage are given in thousands of acre-feet for each reservoir. One acre-foot is the volume of water sufficient to cover an acre of land to a depth of 1 foot (approximately 325,851 gallons). On average, 1 acre-foot of water is enough to meet the demands of four people for a year. The last column of the table lists an increase or decrease in storage since last month. A line indicates no change.

These data are based on reservoir reports updated monthly by the National Water and Climate Center of the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS).

Reservoir Volumes

DATA THROUGH MAY 1, 2022

Data Source: National Water and Climate Center, Natural Resources Conservation Service



* in KAF = thousands of acre-feet, ** = missing/incomplete data this month

Reservoir	Capacity	Current Storage*	Max Storage*	One-Month Change in Storage*
1. Lake Powell	24%	5,791	24,322.0	-22
2. Lake Mead	31%	8,026	26,159.0	-510
3. Lake Mohave	94%	1,706	1,810.0	+10
4. Lake Havasu	91%	566	619.0	-17
5. Lyman	15%	4.6	30.0	0.0
6. San Carlos	1%	7.8	875.0	-13.7
7. Verde River System	33%	95.5	287.4	+2.6
8. Salt River System	76%	1,538	2,025.8	-13

*KAF: thousands of acre-feet

Reservoir	Capacity	Current Storage*	Max Storage*	One-Month Change in Storage*
1. Navajo	53%	898.3	1,696.0	+44.8
2. Heron	15%	58.6	400.0	+15.1
3. El Vado	9%	17.5	190.3	+8.9
4. Abiquiu	43%	80.9	186.8	-1.6
5. Cochiti	85%	42.5	50.0	-0.5
6. Bluewater	4%	1.7	38.5	-0.1
7. Elephant Butte	12%	256.5	2,195.0	+16.9
8. Caballo	5%	15.2	332.0	-0.7
9. Lake Avalon	**	**	4.5	**
10. Brantley	55%	23.2	42.2	-8.5
11. Sumner	39%	13.9	35.9	-2.0
12. Santa Rosa	17%	17.6	105.9	-0.2
13. Costilla	33%	5.2	16.0	+0.6
14. Conchas	6%	15.0	254.2	-2.3
15. Eagle Nest	49%	38.4	79.0	+0.8
16. Ute Reservoir	70%	140	200	-2.0

Southwest Climate Podcast

climas.arizona.edu/media/podcasts

iTunes

<https://apple.co/3kHh8bf>

Spotify

<https://spoti.fi/3zZlVWu>

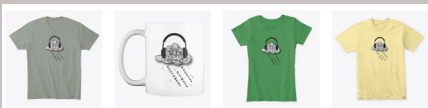
Android

<https://bit.ly/2ILYHos>

Stitcher

<https://bit.ly/3nEWhHd>

We also finally have podcast gear (shirts and mugs).



Order at: teespring.com/stores/the-southwest-climate-podcast.

If you are interested in showing your support - or enjoying the (lack of a) monsoon in style, this is one way to do so.

The Southwest Climate Podcast



Mar 2022 Southwest Climate Podcast Cold(ish), Windy, and Dry - Winter Recap

In the Mar 2022 edition of the CLIMAS Southwest Climate Podcast, Mike Crimmins and Zack Guido dive into a recap of winter (so far) in the Southwest. First, recap winter to date, and put it in the context of a double-dip La Niña, including precipitation totals, temperature, and snowpack. Then they take a closer look at the phases of the PNA (Pacific/North American pattern) and how this links to ENSO/La Niña and the weather conditions this winter. Finally, they revisit temperature to consider just how “cold” it has actually been, and preview a closer look at fire outlooks, snowpack, and water supply in upcoming podcasts.

<https://bit.ly/3lcHrBU>

Jan 2022 Southwest Climate Podcast - La Niña, Winter Storms, & the Jetstream

In the January 2022 edition of the CLIMAS Southwest Climate Podcast, Mike Crimmins and Zack Guido dive into the winter weather so far, tracking how this lines up with expectations in a La Niña year, and what to track this winter to look for La Nina effects - temperature, snow water equivalent, streamflow forecasts, etc. They also take a closer look at the jetstream and the role this plays in winter weather in the Southwest, and where these recent events (and the monsoon) leave us in terms of drought. They wrap with some discussion of the outlooks for the next month/season, as well as some obligatory pining for the monsoon.

<https://bit.ly/3LgUbKp>

2021 CLIMAS Environment & Society Graduate Fellows Interviews

In this special episode, Gigi Owen sits down for one on one conversations with Moriah Bailey Stephenson, Simone Williams, and Lea Schram von Haupt (the 2021 CLIMAS E&S Grad Fellows) to chat with each of them about their reflections and perspectives and their fellowship experience. You can also find more information about their projects in blog posts at climas.arizona.edu/blog.

<https://bit.ly/3Jk5IHw>

Online Resources

Figure 1 Climate Program Office

cpo.noaa.gov

RISA Program Homepage

cpo.noaa.gov/Meet-the-Divisions/Climate-and-Societal-Interactions/RISA

New Mexico Climate Center

weather.nmsu.edu

CLIMAS Research & Activities

CLIMAS Research

climas.arizona.edu/research

CLIMAS Outreach

climas.arizona.edu/outreach

Climate Services

climas.arizona.edu/climate-services



The Climate Assessment for the Southwest (CLIMAS) program was established in 1998 as part of the National Oceanic and Atmospheric Administration's Regional Integrated Sciences and Assessments program. CLIMAS—housed at the University of Arizona's Institute of the Environment—is a collaboration between the University of Arizona and New Mexico State University. The CLIMAS team is made up of experts from a variety of social, physical, and natural sciences who work with partners across the Southwest to develop sustainable answers to regional climate challenges.

What does CLIMAS do?

The CLIMAS team and its partners work to improve the ability of the region's social and ecological systems to respond to and thrive in a variable and changing climate. The program promotes collaborative research involving scientists, decision makers, resource managers and users, educators, and others who need more and better information about climate and its impacts. Current CLIMAS work falls into six closely related areas: 1) decision-relevant questions about the physical climate of the region; 2) planning for regional water sustainability in the face of persistent drought and warming; 3) the effects of climate on human health; 4) economic trade-offs and opportunities that arise from the impacts of climate on water security in a warming and drying Southwest; 5) building adaptive capacity in socially vulnerable populations; and 6) regional climate service options to support communities working to adapt to climate change.

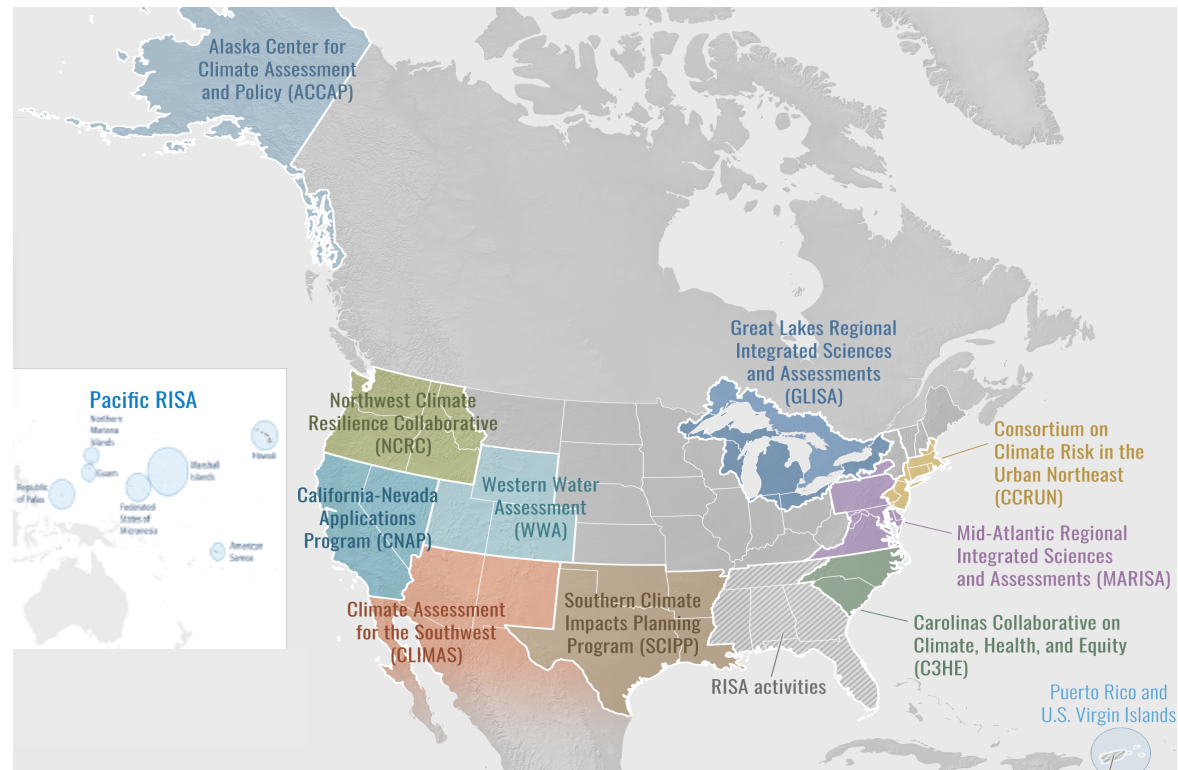


Figure 1: NOAA Regional Integrated Sciences and Assessments Regions