Precipitation and Temperature: June precipitation was between below average and much above average in Arizona and New Mexico (Fig. 1a). June temperatures were above average to record warmest in Arizona and between above average and much above average in most of New Mexico (Fig. 1b). 2021 precipitation ranks (Jan-Jun) were between average and much below average across most of the Southwest, with a few pockets of above-average and much above average (Fig. 2a). Temperature ranks for 2021 (Jan-Jun) were above average to much above average across most of the Southwest (Fig. 2b).

Drought: Water year precipitation (as of Jun 30, 2021) is between below normal and record driest across most of the Southwest (Fig. 3). The U.S. Drought Monitor (USDM) has scaled back some of the drought categorizations in eastern New Mexico and small areas in central Arizona (Fig. 4). Nearly all of the region was already characterized as experiencing drought, and these changes reflect a few areas with less intense, but still persistent, drought characterization. The rest of the region remains mostly unchanged.

Water Supply: Most of the reservoirs in the region are at or below the values recorded at this time last year. Most are also below their long-term average (see Arizona & New Mexico reservoir storage on p. 7).

Wildfire: Wildfire season saw a large and rapid surge in activity in May and June, particularly in Arizona. This led to numerous waves of closures and evacuations. New Mexico saw a much quieter early season. As of July 11, Arizona is much above both mean and median acres burned, while New Mexico is below mean and median for acres burned (Fig. 5). The National Interagency Fire Center (NIFC) significant wildland fire potential outlooks call for normal wildfire risk across all of Arizona and New Mexico in July and August. This forecast leaned on monsoon precipitation tamping down fire risk.

Monsoon Tracker: So far, early monsoon activity has been a welcome change from 2020 with numerous areas seeing normal to above-normal monsoon precipitation to date (Fig. 6, see details on pp. 4-6).

ENSO Tracker: ENSO conditions have reverted to ENSO-neutral. The long-term forecasts see a possible return to La Niña conditions this fall and winter. The forecasts have considerable uncertainty, so this picture will likely become clearer by the end of summer (see ENSO-tracker on p.3 for details).

Precipitation and Temperature Forecast: The three-month outlook for August through October calls for increased chances for normal to below-normal precipitation across much of Arizona and New Mexico (Fig. 7, top). The three-month temperature outlook mostly calls for equal chances of above- or below-normal temperatures across much of the southwestern U.S. and portions of northern Mexico (Fig. 7, bottom).
July 2021 SW Climate Outlook

Figure 1: June 2021 Precipitation (a) & Temperature Ranks (b)

Figure 2: Jan-Jun 2021 Precipitation (a) & Temperature Ranks (b)

Figure 3: Water Year (Oct 2020 - June 2021) Precip Rankings

Figure 4: US Drought Monitor - Jul 6, 2021

Figure 5: Wildfire Fire Acres burned - AZ and NM (as of Jul 11, 2021)

Figure 6: Percent of Average Precipitation, Jun 15 - Jul 14, 2021 (PRISM Data)
ENSO Tracker

Sea surface temperature (SST) forecasts for Aug – Oct 2021 call for cooling conditions across the equatorial Pacific (Fig. 1). The current Nino 3.4/4 anomalies have returned to the range of neutral (Fig. 2). The ENSO outlooks note the persistence of neutral conditions in the short term, along with the potential return of La Niña conditions in winter 2021-2022.

Forecast Roundup: On July 6, the Australian Bureau of Meteorology ENSO tracker was neutral/inactive, stating ENSO “remains neutral with all oceanic and atmospheric indicators within the neutral range”, but noted likely cooling in the Pacific SSTs into Fall 2021. On July 8, the NOAA Climate Prediction Center (CPC) ENSO status moved to “La Niña Watch” with a 51-percent chance of ENSO-neutral during Aug-Oct, and a 66-percent chance of La Niña emerging in Nov-Jan. On July 8, the International Research Institute (IRI) issued an ENSO Quick Look (Fig. 3), noting “most key atmospheric variables are consistent with ENSO-neutral conditions”, and with ENSO-neutral likely through fall, but “with greater uncertainty later in the year”. On July 9, the Japanese Meteorological Agency (JMA) observed ENSO-neutral conditions were persistent, and called for a 70-percent chance of neutral conditions continuing to autumn. The North American Multi-Model Ensemble (solid and dashed black line, Fig. 4) are back to ENSO-neutral, and are expected to remain neutral through summer, but then indicate a more towards La Niña conditions in late 2021.

Summary: ENSO neutral conditions persist, and the seasonal forecasts are relatively certain that neutral conditions will remain through the summer. Longer-term forecasts are starting to lean towards a return of La Niña later in 2021, despite considerable uncertainty in these forecasts. La Niña winters are typically drier than average in the Southwest, so this forecast is something to watch, along with the ongoing North American Monsoon, given the accumulated drought conditions in the region.
Online Resources

Figures 1-2
UA Climate Science Applications Program
cals.arizona.edu/climate

Figure 1: Total Rain - June 15 - Jul 14, 2021

Figure 2: Percent of Days with Rain - June 15 - July 14, 2021

READ ONLINE: CLIMAS.ARIZONA.EDU/SWCO/
Online Resources

Figure 3
CLIMAS: Climate Assessment for the Southwest
climas.arizona.edu

Figure 4
UA Climate Science Applications Program
cals.arizona.edu/climate

SW Monsoon Tracker: 2020 in Historical Context

Figure 3: Monsoon Monthly Percent of Normal Precipitation, Jul-Aug-Sept; 1990-2020

Figure 4: Total Rain - June 15 - Sept 30, 2020
Figure 5: SW Monsoon Tracker: 2021 Temperature, Dewpoint & Precipitation

Flagstaff

Phoenix

Tucson

Albuquerque

El Paso

Legend:
- Daily Ave
- Dewpoint
- 2021 Precip
- Normal Precip

Figure 5: Daily Average Temperature and Dewpoint, Daily and Cumulative Precipitation - Jun 15 - Jul 14, 2021
Reservoir Volumes
DATA THROUGH JULY 1, 2021
Data Source: National Water and Climate Center, Natural Resources Conservation Service

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 storage (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).
The Southwest Climate Podcast

July 2021 Southwest Climate Podcast - Tracking Heat Waves and the Onset of the Monsoon

In the June/early-July edition of the CLIMAS Southwest Climate Podcast, Mike Crimmins and Zack Guido sit down to discuss weather and climate in the Southwest. They start with June heatwaves, and where these sit in comparison to climatology/normal for the Southwest, and how they differ from the record heat waves seen in the Pacific Northwest. They transition to a discussion of the early(ish) onset of the monsoon this year, and whether this bodes well for a better monsoon than last year (frankly, this is a low bar to clear). Finally, they recap their own (forecast) guesses for July and run through the Southwest Monsoon Fantasy Forecast game we are trying out this year.

https://bit.ly/3xNGmvS

Southwest Monsoon Fantasy Forecast Game

Every year the most anticipated weather words (in the Southwest) are spoken: “What will the monsoon be like?”

Here’s your chance to use your experience and be a forecaster. Researchers at the Arizona Institutes for Resilience created a game where players make monsoon forecasts, score points based on them, and compete with others.

July guesses are locked in and July precipitation is well underway, but there is still time to play in August and September!

For details on how to play, information on scoring and prizes, and to sign up, visit the game page:

https://monsoonfantasy.arizona.edu/home
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.