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May Southwest Climate Outlook

Monthly Precipitation and Temperature: April precipitation ranged between below average and above average in most of Arizona and between much below average and average in most of New Mexico (Fig. 1a). April temperatures were above average in most of Arizona and much of New Mexico (Fig. 1b). The daily average temperature anomalies for Apr 1 – May 20 (Fig. 2) highlight the fluctuations at select stations around the region.

Seasonal Precipitation and Temperature: Jan-Apr precipitation ranged between below average and much-above average in much of Arizona and New Mexico, with large areas of below-average conditions in northern California, central Nevada, and southern Colorado (Fig. 3a). Jan-Apr temperatures were above average to much above average across most of the western U.S. (Fig. 3b).

Streamflow, & Water Supply: As of May 1, streamflow forecasts were below median in New Mexico, northeastern Arizona, southern Colorado, and eastern Utah, and above median in northwestern Arizona and western Utah (Fig 4). Many of the reservoirs in the region are at or above the values recorded at this time last year, but most are below their long-term average (see reservoir storage on p. 5).

Drought: The May 5 U.S. Drought Monitor (USDM) maintains drought characterizations in the Four Corners region while expanding drought characterizations in Nevada, California, and southern Colorado (Fig. 5). "Moderate Drought" (D1) and "Severe Drought" (D2) characterizations are centered on the Four Corners region, with pockets of "Extreme Drought" now found in southern Colorado.

Wildfire: There are widespread areas of above normal wildfire risk in most of Arizona, western New Mexico, and southern parts of Colorado, Utah, and Nevada (Fig. 6).

ENSO Tracker: Conditions are back within the range of ENSO-neutral, and are expected to remain neutral through summer 2020, with increased chances for a La Niña event sometime this fall (see ENSO-tracker on p. 3 for details).

Precipitation and Temperature Forecast: The three-month outlook for June through Aug calls for slightly increased chances of below-normal precipitation in areas of eastern New Mexico, Texas, and northern Mexico, while parts of northwestern Arizona and southern Utah are showing slightly increased chances of above-normal precipitation (Fig. 7, top). The three-month temperature outlook calls for increased chances of above-normal temperatures across most of the western U.S. and northern Mexico (Fig. 7, bottom).

Tweet May 2020 SW Climate Outlook

CLICK TO TWEET

MAY2020 @CLIMAS_UA SW Climate Outlook, ENSO Tracker, AZ & NM Reservoirs, Webinar on Agriculture, Air Quality, & Climate, New CLIMAS food research - https://bit.ly/2zjyeu5 #SWclimate

May 2020 SW Climate Outlook

Online Resources

Figures 1,3
National Centers for Environmental Information
ncei.noaa.gov

Figure 2
Climate Assessment for the Southwest
climas.arizona.edu

Figure 4
Natural Resources Conservation Service
nrcs.usda.gov

Figure 5
U.S. Drought Monitor
droughtmonitor.unl.edu

Figure 6
National Interagency Fire Center
nifc.gov

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

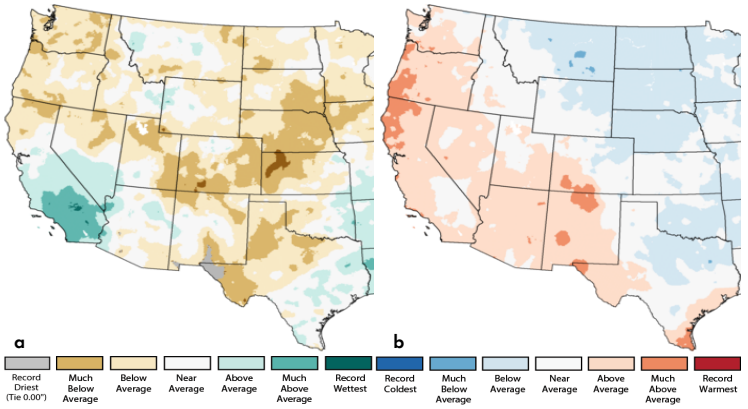


Figure 1: Apr 2020 Precipitation (a) & Temperature Ranks (b)

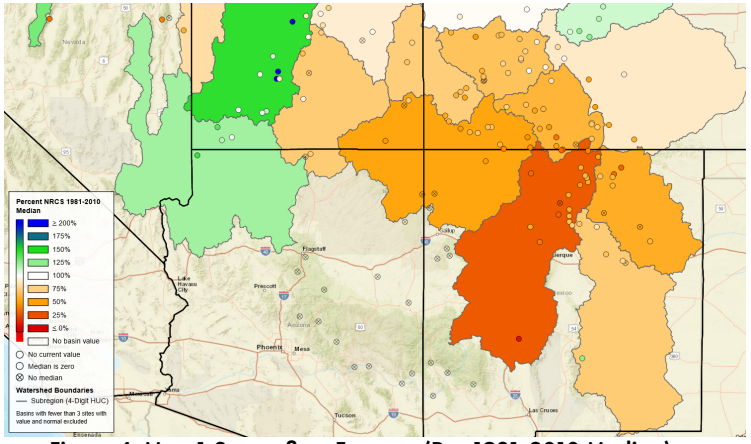


Figure 4: May 1 Streamflow Forecast (Pct. 1981-2010 Median)

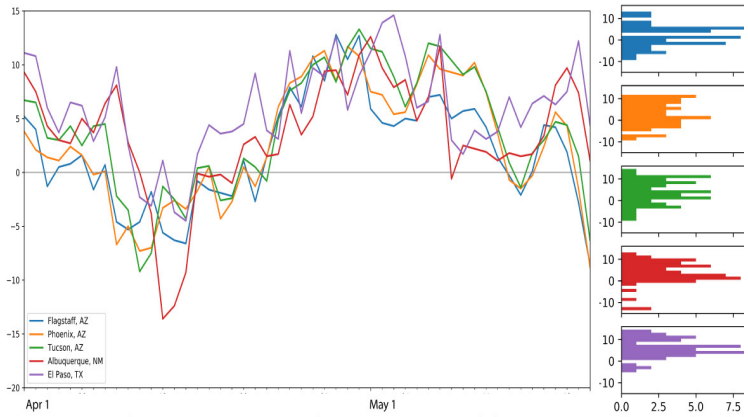


Figure 2: Daily Temperature Anomalies Apr 1 - May 20 (L) & Frequency of Anomalies (R)

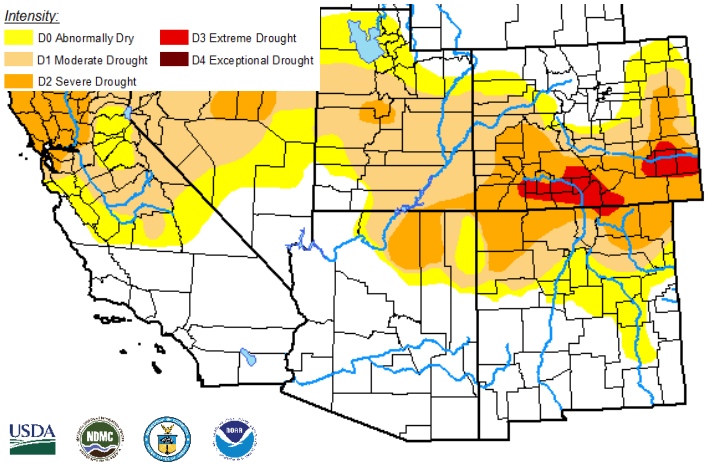
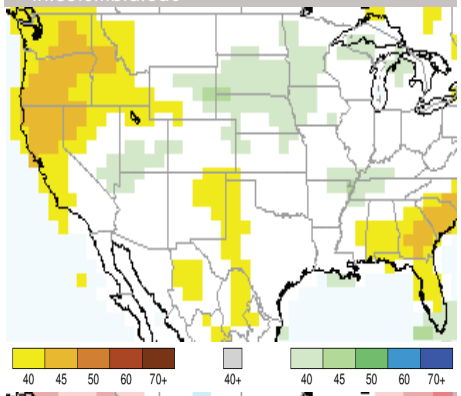


Figure 5: US Drought Monitor - May 5, 2020



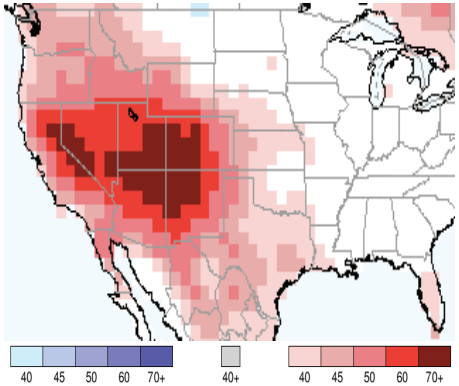


Figure 7: Three-Month (Jun-Aug) Forecast for Precip (top) and Temps (bottom)

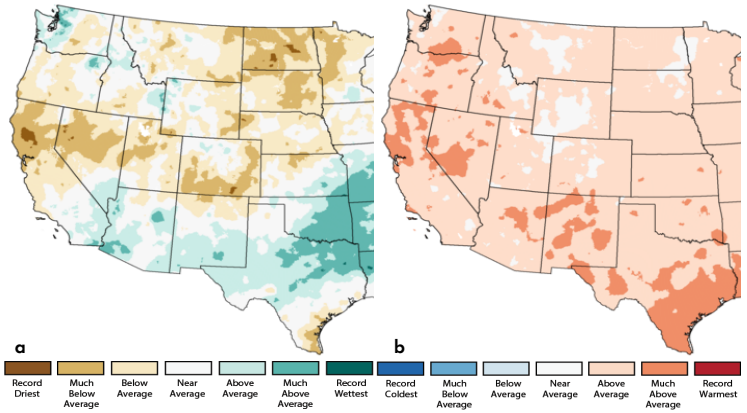


Figure 3: Jan - Apr 2020 Precipitation (a) & Temperature Ranks (b)

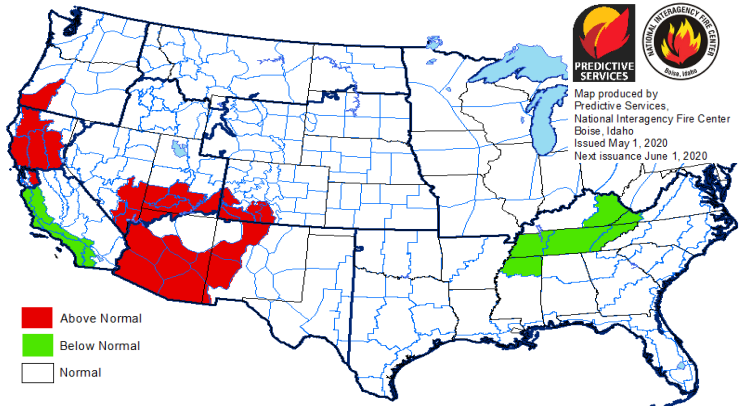


Figure 6: NIFC.gov Significant Wildland Fire Potential - June 2020

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

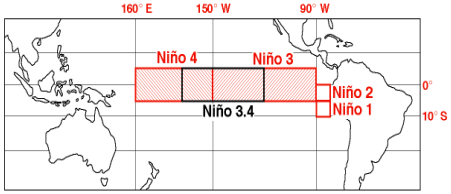
Figure 4
NOAA - Climate Prediction Center
cpc.ncep.noaa.gov

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 temperatures (SSTs) are returning to near normal across the equatorial Pacific (Figs. 1-2). Conditions are forecast to remain ENSO-neutral through summer 2020, while longer term outlooks point to the possibility of a La Niña event later in 2020.

Forecast Roundup: On May 9, the Australian Bureau of Meteorology maintained their ENSO outlook at an inactive status while highlighting a few models that suggest La Niña in 2020, but also noted: "model skill at this time of year is generally low for longer lead-times." On May 12, the Japanese Meteorological Agency (JMA) maintained its call for a 60-percent chance of ENSO-neutral conditions to last through summer 2020. On May 14, the NOAA Climate Prediction Center (CPC) issued its ENSO diagnostic discussion with an inactive alert status. The CPC called for a 65-percent chance of ENSO-neutral through summer 2020 and 45-50% for fall 2020. On May 14, the International Research Institute (IRI) issued an ENSO Quick Look (Fig. 3), noting "model forecasts favor neutral SST conditions continuing into summer, becoming below-average but not necessarily into La Niña territory by fall." They highlight near-average SSTs and ENSO-neutral atmospheric conditions "leaning slightly in the cool-ENSO direction." The North American Multi-Model Ensemble (NMME) remains borderline El Niño but shows steady movement into ENSO-neutral territory through the summer, with the mean forecast approaching La Niña conditions later in 2020 (dashed black line, Fig. 4).

Summary: Despite SST anomalies hovering at the El Niño border for much of the winter, oceanic and atmospheric conditions were ENSO-neutral over this period. These conditions are forecast to remain ENSO-neutral through summer, with hints of conditions turning towards La Niña by fall 2020. The caveat is the challenge associated with forecasts during the "spring predictability barrier" (i.e. the difficulty of accurate forecasts made this time of year). While the ENSO status tends to have limited bearing on the monsoon, La Niña brings decreased chances of tropical storm activity in the eastern Pacific Ocean.

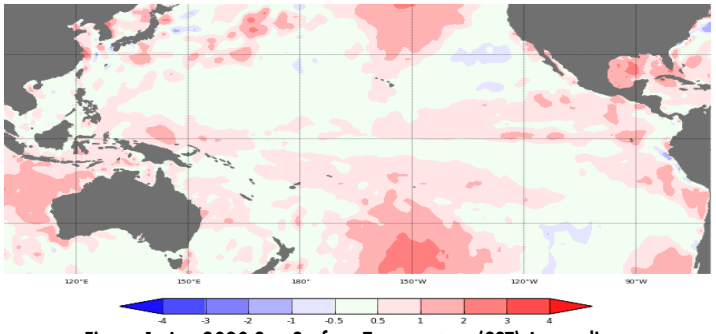


Figure 1: Apr 2020 Sea Surface Temperature (SST) Anomalies

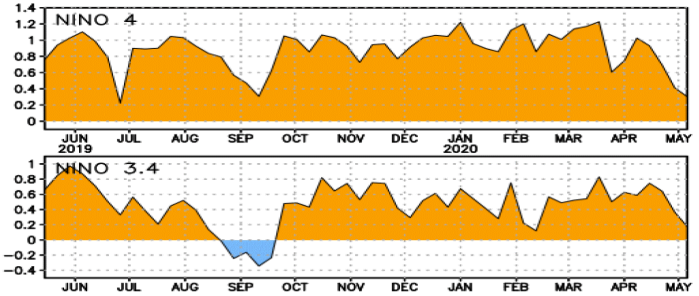


Figure 2: SST Anomalies in Niño Regions 3.4 & 4 (NCDC)

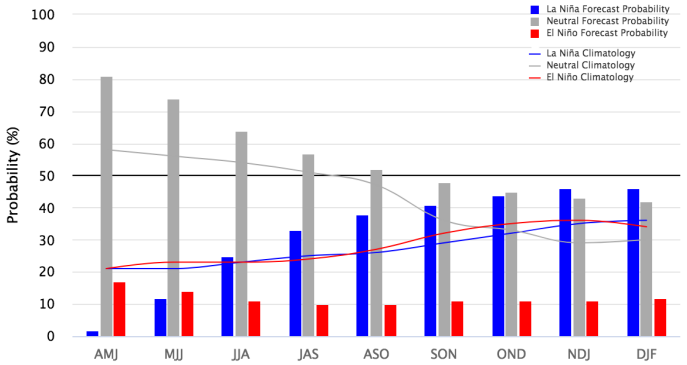


Figure 3: Early-May IRI/CPC Model-Based Probabilistic ENSO Forecast

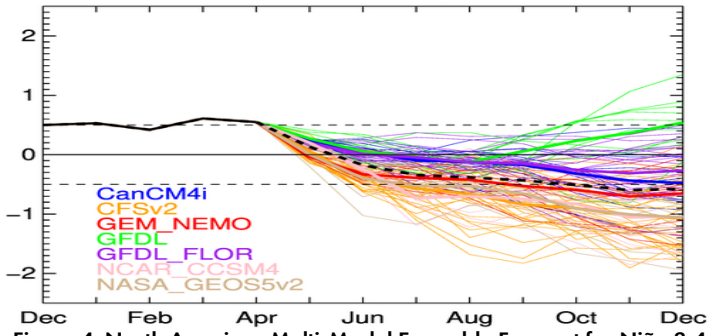


Figure 4: North American Multi-Model Ensemble Forecast for Niño 3.4

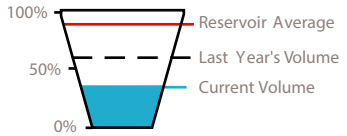
Online Resources

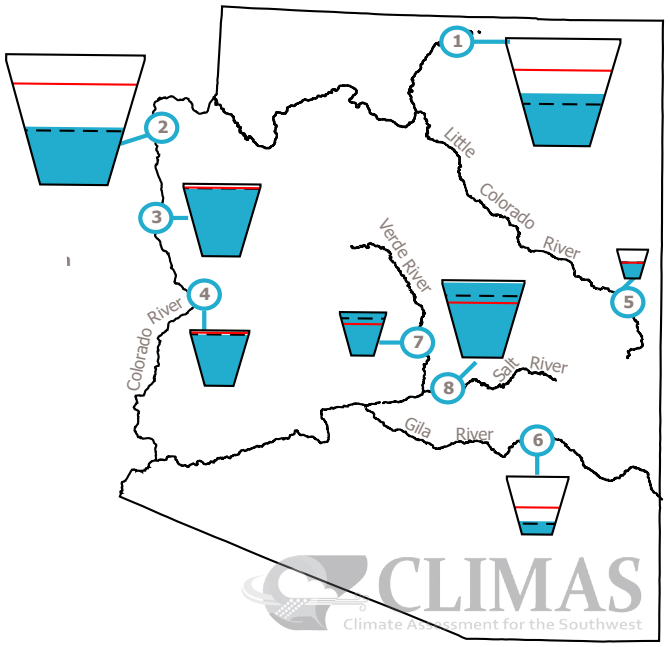
Portions of the information provided in this figure is available at the Natural Resources Conservation Service
www.wcc.nrcs.usda.gov/BOR/basin.html

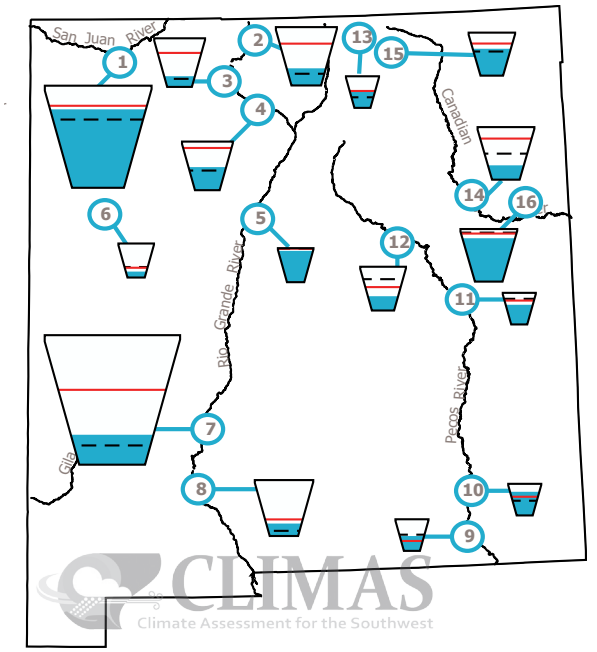
Contact Ben McMahan with questions/comments.

Reservoir Volumes

DATA THROUGH MAY 1, 2020
Data Source: National Water and Climate Center, Natural Resources Conservation Service







* in KAF = thousands of acre-feet

Reservoir	Capacity	Current Storage*	Max Storage*	One-Month Change in Storage*
1. Lake Powell	48%	11,685.3	24,322.0	-132.6
2. Lake Mead	44%	11,415.0	26,159.0	-187.0
3. Lake Mohave	94%	1,700.0	1,810.0	-8.0
4. Lake Havasu	92%	571.3	619.0	25.4
5. Lyman	58%	17.3	30.0	2.2
6. San Carlos	23%	204.8	875.0	5.1
7. Verde River System	99%	284.9	287.4	-1.7
8. Salt River System	97%	1,971.4	2,025.8	19.2

*KAF: thousands of acre-feet

Reservoir	Capacity	Current Storage*	Max Storage*	One-Month Change in Storage*
1. Navajo	76%	1296.8	1,696.0	4.3
2. Heron	29%	114.2	400.0	5.8
3. El Vado	22%	41.4	190.3	14.4
4. Abiquiu	47%	87.9	186.8	-2.0
5. Cochiti	92%	45.8	50.0	0.6
6. Bluewater	17%	6.7	38.5	-0.6
7. Elephant Butte	23%	500.5	2,195.0	-52.3
8. Caballo	22%	73.5	332.0	-5.3
9. Lake Avalon	47%	2.1	4.5	-1.3
10. Brantley	74%	31.2	42.2	-9.9
11. Sumner	62%	22.3	35.9	-3.4
12. Santa Rosa	32%	33.8	105.9	6.0
13. Costilla	52%	8.3	16.0	0.7
14. Conchas	27%	68.1	254.2	-4.0
15. Eagle Nest	61%	48.1	79.0	0.7
16. Ute Reservoir	81%	161	200	-3.0

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).

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

New CLIMAS Research: COVID-19 and its associated risks and policies have brought rapid change to our lives in all kinds of ways. One thing that hasn't changed is our need to eat. But the ways we access and prepare our food, and the ways people who work in the food industry provide, process, and distribute food, have shifted greatly.

Dr. Gigi Owen, a CLIMAS researcher at the University of Arizona, is conducting an open-ended survey about individual experiences with food during COVID-19. One portion of the survey is directed at people who work in the food system. Another portion is about food access and food preparation in the home. Your survey answers will be used to generate new research at the University of Arizona in collaboration with community partners. Understanding the types of changes and adaptations we are making - in the midst of a crisis - could help us all learn more about building more resilient food systems for the future.

Survey Link: *https://forms.gle/ggo18tPFS7WKyVvH8*

An Institutional Review Board responsible for human subjects research at The University of Arizona reviewed this research project and found it to be acceptable, according to applicable state and federal regulations and University policies designed to protect the rights and welfare of participants in research.

Webinar Recording: Understanding Regional Linkages Between Production Agriculture, Air Quality, and Climate.

As global demand for agricultural products continues to increase, agricultural systems will need to become more productive, while also adapting to a changing climate. Environmental impacts to food safety, security and production in the coming decades are critically important. While it is known that agricultural production systems are impacted by air quality and that air quality is impacted by production systems, these systematic relationships often remain ill-defined. Research and management topics requiring further exploration include agriculture and dust related hazards, herbicide and pesticide drift issues, and other air-quality related production impacts.

In this webinar, Dr. Dave DuBois, New Mexico State Climatologist, presents the results of a national air quality and production agriculture synthesis focused on expected impacts in a changing climate. Dr. DuBois synthesizes and presents the current state of knowledge regarding air quality impacts on production agriculture, and vice-versa, within the context of weather conditions and a changing climate. This national synthesis as part of a larger project of the USDA Climate Hub Network, the Agricultural Research Service and the Natural Resources Conservation Service to identify, elucidate, and respond to critical questions about agricultural production and air quality, which are strongly linked to United States food security, public safety, and health.

Webinar Recording: arizona.zoom.us/webinar/register/WN_yx6qfQgYT1Kylw6TN0HNmQ

Event details: climas.arizona.edu/event/regional-linkages-production-agriculture-air-quality-climate

NM STATE USDA Southwest Climate Hub
U.S. DEPARTMENT OF AGRICULTURE
CLIMAS Climate Assessment for the Southwest
A NOAA RISA TEAM
ARIZONA

Online Resources

Figure 1
Climate Program Office
cpo.noaa.gov

RISA Program Homepage

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New Mexico Climate Center

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CLIMAS Research & Activities

CLIMAS Research

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Climate Services

climas.arizona.edu/climate-services

CLIMAS
Climate Assessment for the Southwest
A NOAA RISA TEAM

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.

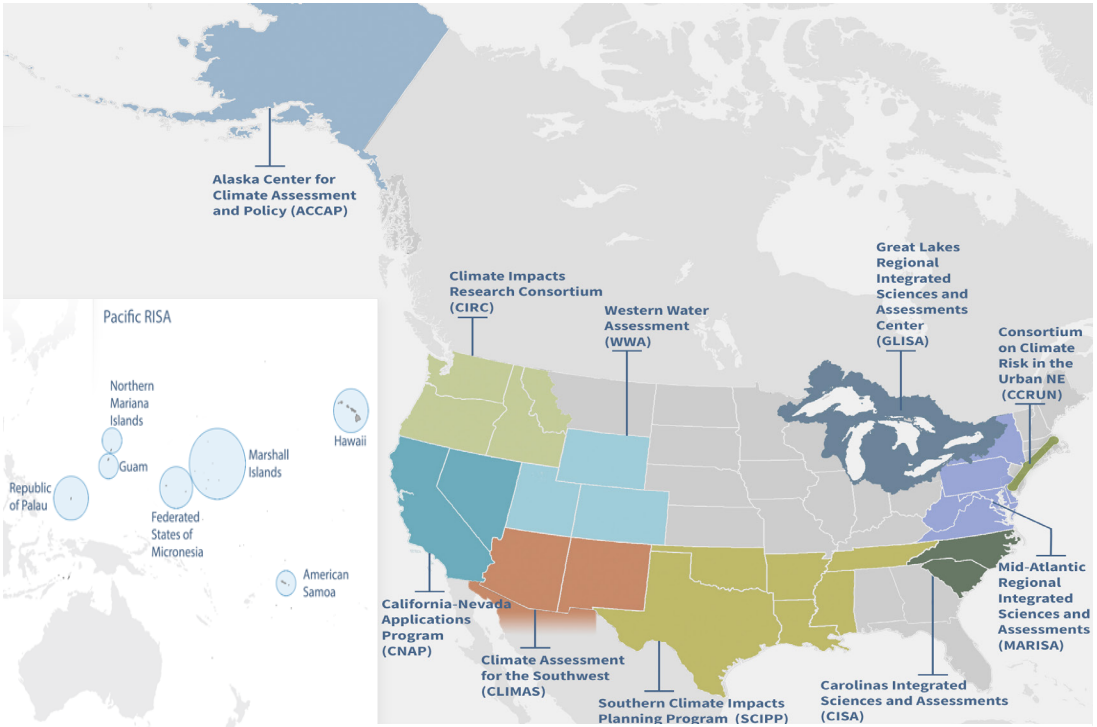

Figure 1: NOAA Regional Integrated Sciences and Assessments Regions