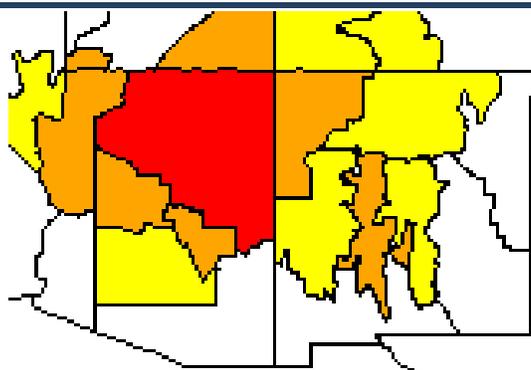




NAVAJO NATION DROUGHT STATUS REPORT

NN Dept. of Water Resources, Water Management Branch

P.O. Drawer 678 Fort Defiance, Arizona 86504 Ph. (928) 729-4004, Fax (928) 729-4126



- +3.00 and above (exceptionally wet)
- +2.00 to +2.99 (extremely wet)
- +1.25 to +1.99 (very wet)
- +0.75 to +1.24 (moderately wet)
- -0.74 to +0.74 (near normal)
- -1.24 to -0.75 (moderately dry)
- -1.99 to -1.25 (very dry)
- -2.99 to -2.00 (extremely dry)
- -3.00 and below (exceptionally dry)

Navajo Nation Drought Stage

| Location | 6 month SPI October | Stage as of October |
|----------|---------------------|---------------------|
| NE AZ | -2.09 | Emergency |
| NW NM | -1.42 | Warning |
| SE UT | -1.63 | Emergency |

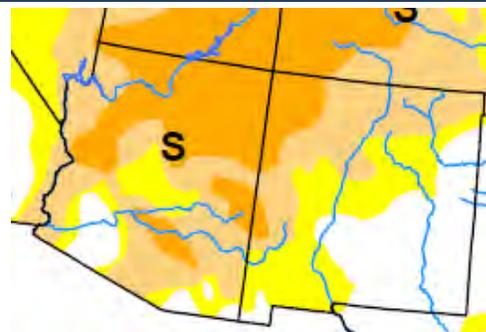
Drought Intensity Category

| NN Drought | US Drought | |
|------------|---------------------|---------|
| Normal | Normal | D0 |
| Alert | Moderate | D1 |
| Warning | Severe | D2 |
| Emergency | Extreme/Exceptional | D3 & D4 |

- Intensity:**
- D0 Abnormally Dry
 - D1 Moderate Drought
 - D2 Severe Drought
 - D3 Extreme Drought
 - D4 Exceptional Drought

Drought Impact Types:

- Delineates dominant impacts
- S** = Short-Term, typically less than 6 months (e.g. agriculture, grasslands)
- L** = Long-Term, typically greater than 6 months (e.g. hydrology, ecology)



National Drought Summary for October 29, 2019

Summary: This U.S. Drought Monitor week saw widespread improvements in drought-stricken areas across portions of the South, Southeast, and Mid-Atlantic, as moderate-to-heavy rainfall accumulations were observed associated with storm systems fueled by residual moisture from Tropical Storm Olga. Across these areas, precipitation accumulations ranged from 2-to-10 inches leading to improvements on the map in Louisiana, Mississippi, Tennessee, Alabama, Georgia, South Carolina, North Carolina, and Virginia. In California, numerous wildfires are burning across northern and southern portions of the state, including the Kincaide Fire (the state's largest active fire) in Sonoma County that has burned approximately 76,000 acres. In southern California, firefighting efforts have been hampered by strong Santa Ana winds that are causing extreme fire behavior.

West: Across most of the region, dry conditions prevailed with the exception of some snowfall activity in the central and northern Rockies, as well as in the Uinta and Wasatch ranges of Utah. According to the NRCS SNOTEL network, snow water equivalent (SWE) levels are above normal across all of the major drainage basins in the northern half of the region. In California, numerous wildfires are burning across the state including the Kincaide Fire near the northern California community of Geyserville where approximately 76,000 acres have burned, according to the October 30th National Interagency Coordination Center's Incident Management Situation Report. In southern California, low humidity and strong Santa Ana winds have led to extreme fire weather conditions that have exacerbated fire-fighting efforts in the greater Los Angeles area. During the past week, average temperatures were below normal across most of the region with the exception of California where temperatures were 3-to-9 degrees above normal. Further inland, well-below normal temperatures were observed across the eastern Great Basin and Intermountain West with average temperatures ranging from 6-to-15 degrees below normal.

Looking Ahead: The NWS WPC 7-Day Quantitative Precipitation Forecast (QPF) calls for moderate-to-heavy accumulations ranging from 2-to-5+ inches across portions of the South, Southeast, Mid-Atlantic, and Northeast. Lower accumulations (<2 inches) are expected across a swath extending from eastern Texas northward across most of the Plains states and Upper Midwest. Out West, liquid accumulations of generally less than 1 inch are expected across the Rockies and North Cascades of Washington state. The CPC 6-10-day Outlook calls for a high probability of above-normal temperatures across the Far West, Great Basin, and Southwest while areas east of the Rockies are expected to be below normal with the exception of Florida. In terms of precipitation, there is a high probability of below-normal precipitation across the Pacific Northwest, northern California, northern Great Basin, and the Intermountain West as well as in the central and southern Plains, lower Midwest, South, and Mid-Atlantic. Conversely, the northern Plains, Upper Midwest, southern Texas, and Florida are expected to have above-normal precipitation.

For further enquires contact Mr. Carlee McClellan, Senior Hydrologist, Ph. (928) 729-4125, Email: cmcclellan@navajo-nsn.gov

October 2019

Southwest Drought At Glance

Climate Summary by CLIMAS October 2019

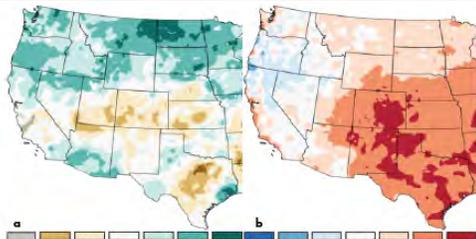


Figure 1: Sept 2019 Precipitation (a) & Temperature Ranks (b)

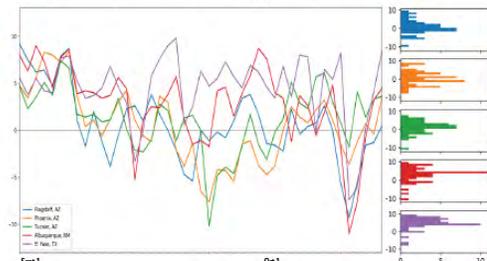


Figure 2: Daily Temperature Anomalies Sept 1 - Oct 15 (L) & Frequency of Anomalies (R)

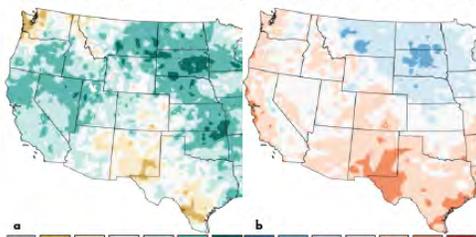


Figure 3: 2019 (Jan - Sept) Precipitation (a) & Temperature Ranks (b)

Monthly Precipitation and Temperature: September precipitation in Arizona ranged from much below average in the north, to much above average in the south, while most of New Mexico was average to below average (Fig. 1a). September temperatures were mostly average to much above average in Arizona and mostly much above average to record warmest in New Mexico (Fig. 1b). The daily average temperature anomalies for Sept 1 – Oct 15 (Fig. 2) highlight the fluctuations at select stations around the region.

Annual Precipitation and Temperature: Total precipitation for 2019 (Jan-Sept) in Arizona was mostly average to above average, with some below average in the four corners region, while New Mexico was drier with average to below average across most of the state, along with some pockets of much below average conditions (Fig. 3a). Mean temperatures in 2019 so far are mostly above average in Arizona and above average to much above average in New Mexico (Fig. 3b).

Drought: Water year precipitation (Oct 1 2018 – Sept 30 2019) was mostly normal to above normal across most of Arizona and much of northeastern New Mexico, while parts of eastern Arizona and south-central and northwestern New Mexico were normal to below normal (Fig. 4). These totals are buoyed by tropical storm activity in Oct 2018 and Sept 2019, and may be skewing some characterizations of longer term precipitation. Given recent conditions and the below average monsoon, drought has returned to much of Arizona and western New Mexico in the Oct 8 U.S. Drought Monitor (USDM) (Fig. 5). This designation is leaning more heavily on recent below average monsoon precipitation, despite water year precipitation totals.

Tropical Storm Activity: The eastern North Pacific hurricane season has been near normal, with 16 named storms as of Oct. 16 (Fig. 6), including four major hurricanes (category 4 or above), with the average through this date at approximately 15 named storms and 4 major hurricanes. The Accumulated Cyclonic Energy (ACE) to date is 95 (for comparison, last year this time ACE was 295), while the average to date is approximately 120. Recent notable events include heavy precipitation linked to TS Lorena and TS Mario, which funneled moisture into a cutoff low in mid-to-late September. This brought highly variable but at times intense storms to southern Arizona, including some supercell formation in central and eastern Arizona. Given the meager monsoon, their impacts are visible on the percent of normal maps.

ENSO Tracker: Oceanic and atmospheric conditions are generally consistent with an ENSO-neutral outlook for 2019 and into 2020.

Precipitation and Temperature Forecast: The three-month outlook for November through January calls for increased chances of above-normal precipitation in much of Arizona, New Mexico, and northwestern Mexico (Fig. 7, top). The three-month temperature outlook calls for increased chances of above-normal temperatures across the U.S. Southwest and northern Mexico (Fig. 7, bottom).

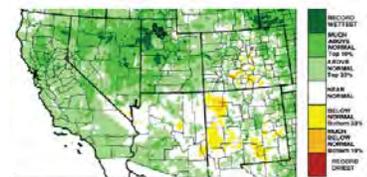


Figure 4: Oct 2018 - Sept 2019 - Water Year Precipitation Percentile Rank



Figure 5: US Drought Monitor - Oct 8, 2019



Figure 6: National Weather Service Eastern North Pacific Tracking Chart

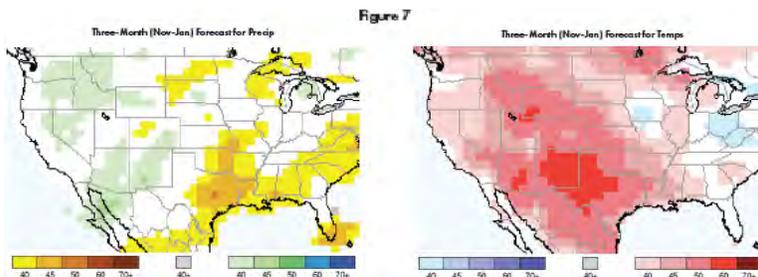


Figure 7

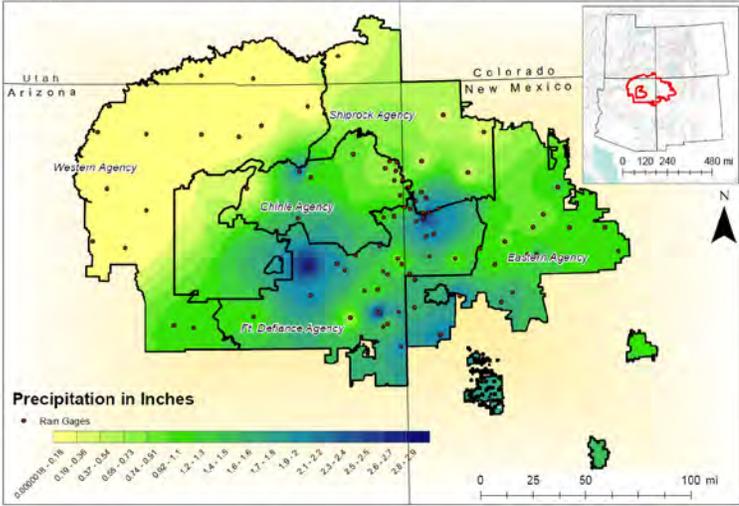
Published by the Climate Assessment for the Southwest (CLIMAS), with support from University of Arizona Cooperative Extension, the Arizona State Climate Office, and the New Mexico State Climate office.

Navajo Nation Precipitation Summary



Observed Precipitation on the Navajo Nation
(September 2019, WY 2019)

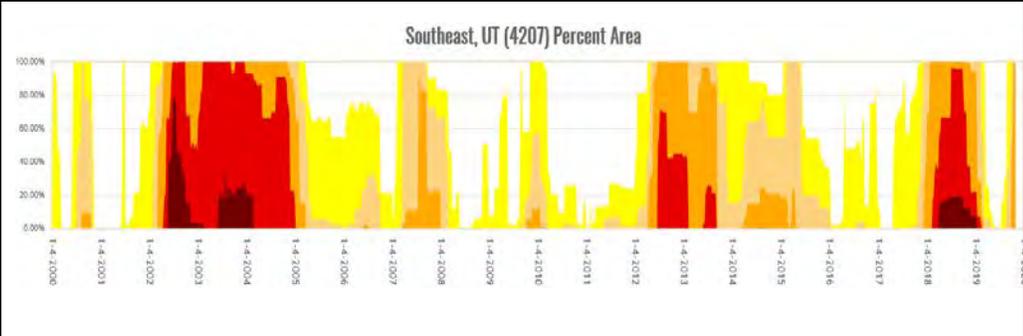
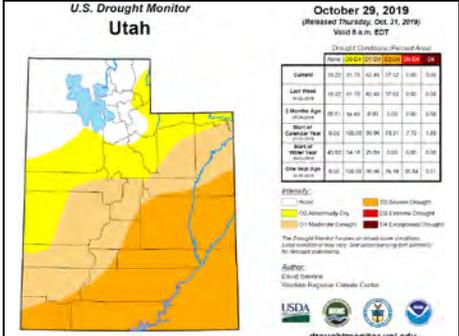
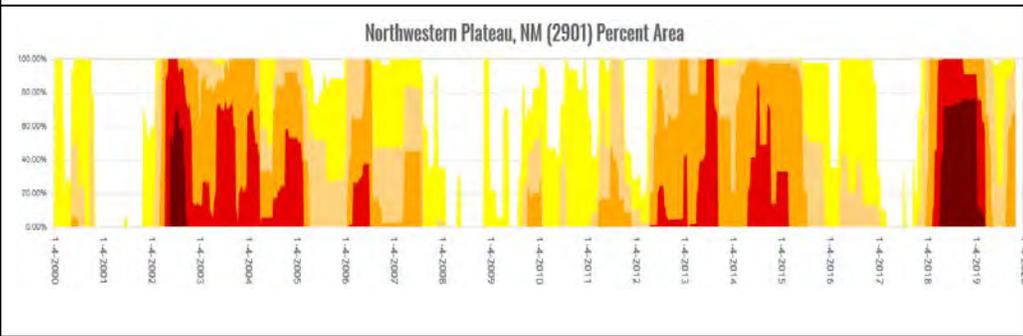
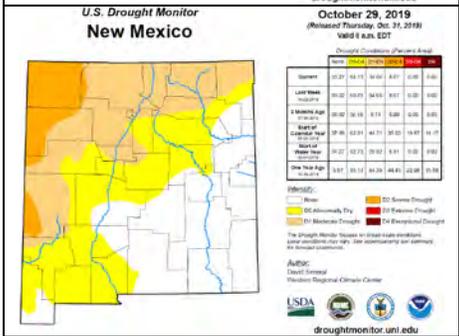
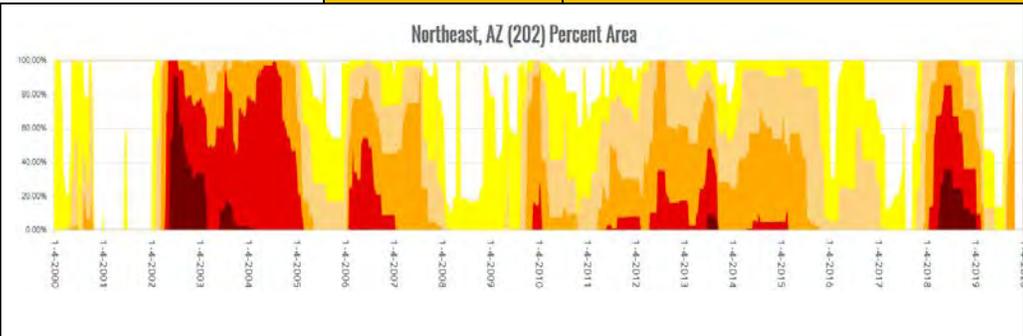
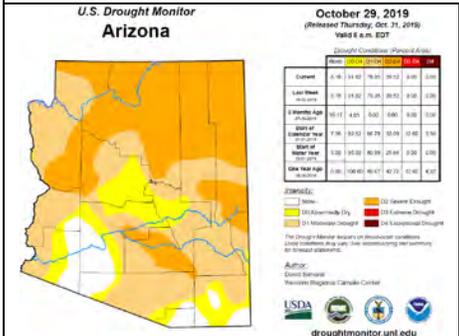
Division of Natural Resources
Department of Water Resources
Water Management Branch, WRE Section
PO Box 678
Fort Defiance, Arizona 86504
Phone: (928) 729-4804
Map by: Carter McClellan, 2019



| Agency | September | Avg | % of Avg |
|---------------|-----------|------|----------|
| Chinle | 0.86 | 1.38 | 62% |
| Eastern | 1.24 | 1.18 | 105% |
| Fort Defiance | 1.52 | 1.58 | 96% |
| Shiprock | 0.92 | 1.33 | 69% |
| Western | 0.14 | 0.84 | 17% |

Useful Drought Related Sites:

- NWS-CPC Seasonal Outlook
www.drought.unl.edu
- USGS Daily Stream Flow
www.usgs.gov/water/
- Western Regional Climate Center
www.wrcc.dri.edu
- CLIMAS Southwest Climate Outlook
www.climas.arizona.edu
- New Mexico Governor's Drought Task Force
http://www.ose.state.nm.us/DroughtTask_Force/index.html
- ADWR Drought Program
<http://www.azwater.gov/azdwr/StatewidePlanning/Drought>
- Utah Division of Water Resources
<http://www.water.utah.gov/DroughtConditions/>
- Navajo DWR-Water Management Branch
http://www.frontiernet.net/~nddwr_wmb/



October 2019