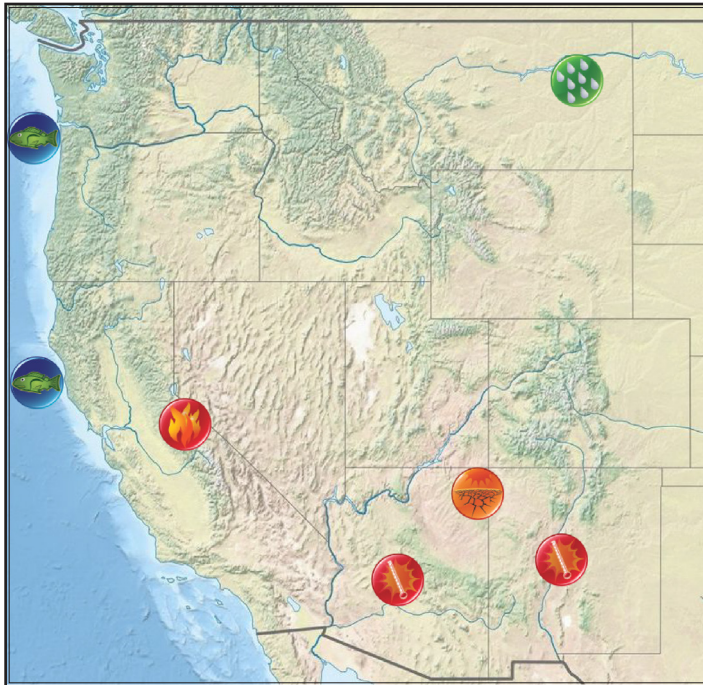











### Significant Events for June-July-August 2019

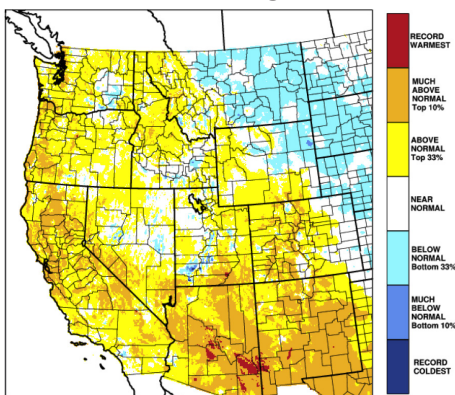
#### Jun-Jul-Aug Highlights



-  Inactive Southwestern Monsoon resulted in well below average precipitation in Four Corners region
-  Above normal temperatures across much of West: AZ recorded 6th warmest summer on record; both AZ and NM recorded 2nd warmest August on record
-  Warmer and drier than normal conditions led to expansion of drought conditions in the Four Corners region
-  Eastern MT experienced above normal summer precipitation; some areas recorded over 150% of normal
-  Marine heat wave emerged this summer in northeast Pacific, negative impacts observed in coastal marine ecosystems and fisheries
-  Well below normal wildfire summer wildfire activity in much of West
-  ENSO-neutral conditions currently present and likely to persist into autumn and winter

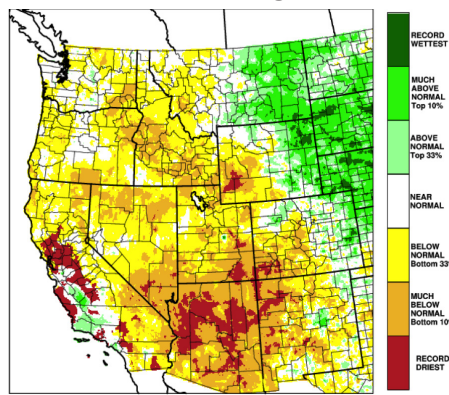
### Regional Overview for June-July-August 2019

**Mean Temperature Percentile Jun-Jul-Aug 2019**



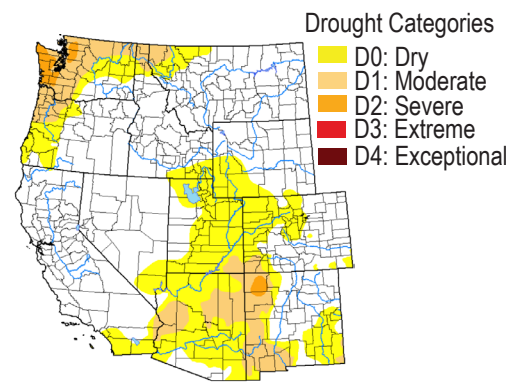
Summer temperatures were well above normal throughout the Southwest, CA, and western WA and OR. Great Basin and N. Rockies temperatures were generally near normal with widespread slightly below normal temperatures east of the Rockies. August was notably warmer than normal in AZ and NM; both observed 2nd warmest statewide average August temperatures dating back to 1895.

**Precipitation Percentile Jun-Jul-Aug 2019**



Most of the West observed a drier than normal summer with the exception of eastern MT, WY, and CO. The Southwestern Monsoon, which typically begins around June 15, started late and failed to produce ample precipitation. Statewide, AZ saw the driest summer on record dating back to 1895. Eastern NM fared better, with several locations recording near-normal summer precipitation.

**US Drought Monitor Aug 27 2019**



At the end of the summer season, 11% of the West was experiencing moderate or worse drought conditions. Small pockets (~1% of the region) of severe drought were present in northwestern NM and western WA; no extreme or exceptional drought was present. A large area of the Four Corners saw degradation of drought conditions in August as the peak Monsoon season produced little precipitation.

## Regional Impacts for Jun-Jul-Aug 2019

### Drought, Flooding and Water Resources

Flash flooding in UT in July prompted road closures due to mud and debris impacts.

L. Powell August inflow was 94% of normal.

### Agriculture and Wildlife

In AZ, water was transported by land and air to fill catchments and keep wildlife alive during dry summer.

Persistent hot, dry, and windy conditions in July caused damage to cotton, onion, and pepper crops in Doña Ana County, NM.

Central OR farmers followed 25-30% of crops due to prolonged drought impacts and low reservoir levels.

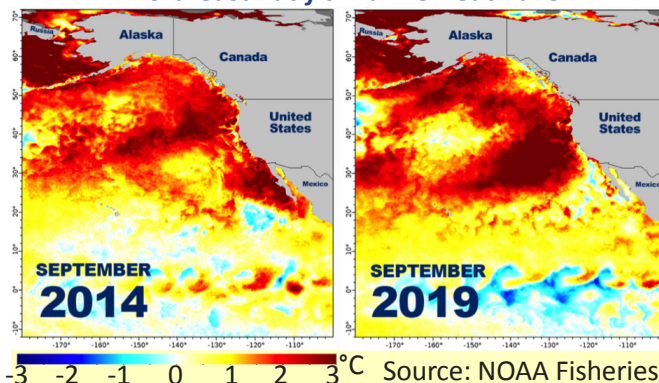
Low flows in July on the Chehalis River in WA led to a fishing ban to protect chinook salmon.

### Wildfire

Though fuels were plentiful following a wetter than normal winter, summer wildfire activity across most of the West was below average due to a lack of significant heatwaves and below normal evaporative demand.

The 243 Command Fire in WA in early June burned 20,380 acres and temporarily produced the worst air quality in the nation in Spokane.

### Northeast Pacific Marine Heatwave

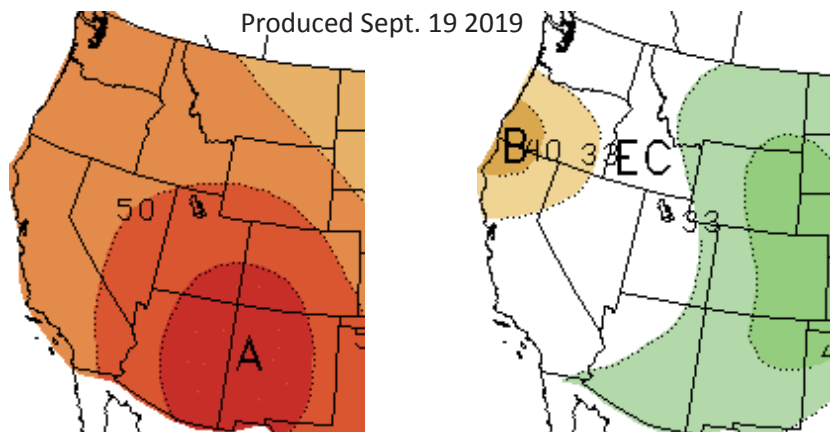


Well above normal sea surface temperatures (SSTs) in the northeast Pacific have persisted since June with maximum anomalies far exceeding 3 °C. The spatial extent and magnitude of SST anomalies with this marine heat wave are similar to the 2013-2016 event which led to numerous negative impacts on coastal marine ecosystems and fisheries. Impacts from the current marine heat wave are just starting to emerge. Nearly the entire coast of WA is currently closed to shellfish harvesting due to a large HAB. Biotoxin levels have been found to be more than ten times the limit for safe consumption. Current outlooks show the marine heat wave weakening but remaining for months.

## Regional Outlook for Oct-Nov-Dec 2019

### CPC Temperature Outlook

### CPC Precipitation Outlook



A = Above normal B = Below normal EC = Equal chances. Numbers indicate percent chance of temperatures in warmest/coolest one-third and precipitation in wettest/driest one-third.

Above normal temperatures are favored across the West for the autumn season, with the highest probabilities (50-60%) in the Southwest and 40% chance of above normal temperatures elsewhere. Below normal precipitation is slightly favored (33-40%) in northern CA, OR, and northwestern NV. Above normal precipitation is slightly favored (33-40%) for areas within and east of the Rocky Mountains as well as much of AZ and NM. With ENSO unlikely to significantly influence atmospheric conditions during autumn and no other notable driving factors present, decadal climate trends were given considerable weight in these outlooks.

## Western Region Partners

**Western Regional Climate Center**  
wrc.dri.edu

**National Integrated Drought Information System (NIDIS)** - drought.gov

**Western Governors' Association**  
westgov.org

**Western States Water Council**  
westgov.org/wswc

**NOAA/ESRL Physical Sciences Division**  
esrl.noaa.gov/psd

**NOAA Climate Prediction Center**  
www.cpc.ncep.noaa.gov

**National Centers for Envir. Info. (NCEI)**  
www.ncdc.noaa.gov

**USDA/NRCS National Water and Climate Center** - www.wcc.nrcs.usda.gov

**National Interagency Fire Center**  
www.nifc.gov

**Western Water Assessment**  
wwa.colorado.edu

**Climate Assessment for the Southwest**  
climas.arizona.edu

**California Nevada Applications Program**  
cnap.ucsd.edu

**Climate Impacts Research Consortium**  
pnwclimate.org/resources

**NWS Western Region Forecast Offices**  
www.wr.noaa.gov/