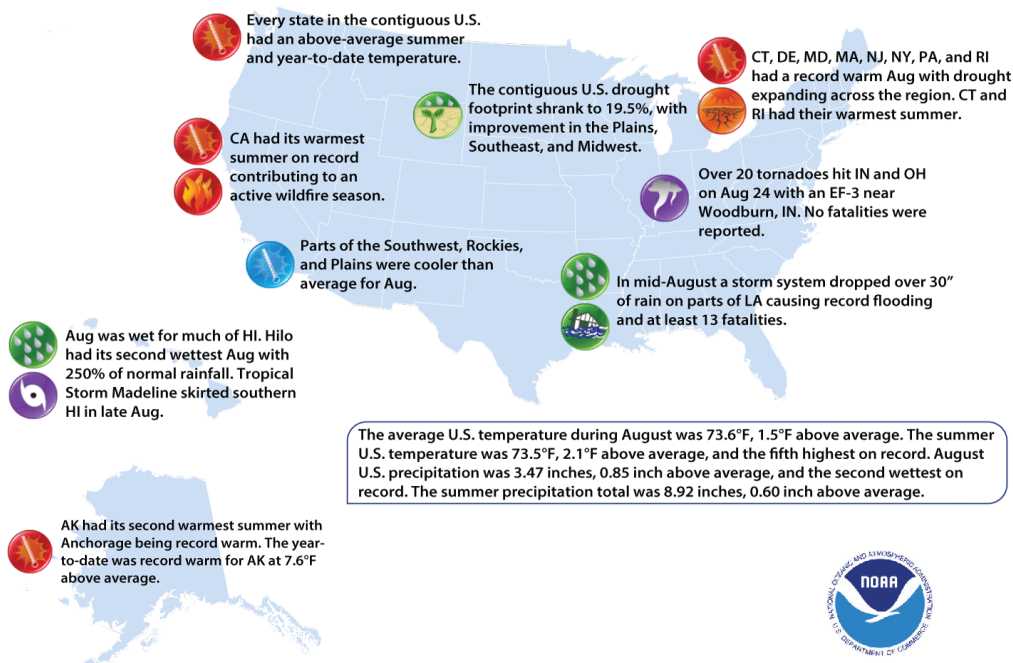


Significant Events for June - August 2016

NCEP // www.ncep.noaa.gov/sotc/national



The average U.S. temperature during August was 73.6°F, 1.5°F above average. The summer U.S. temperature was 73.5°F, 2.1°F above average, and the fifth highest on record. August U.S. precipitation was 3.47 inches, 0.85 inch above average, and the second wettest on record. The summer precipitation total was 8.92 inches, 0.60 inch above average.



Jun-Aug Highlights for the West

Record or near record warmth across southern portions of CA, NV, AZ

CA statewide warmest summer on record

Bottom-10 driest summer for much of WY, southwest MT, southern ID, northeast UT

Below normal summer streamflow in much of Inland Northwest, Pacific Northwest

Some drought improvement in AZ, NM this summer with active monsoon during June, August

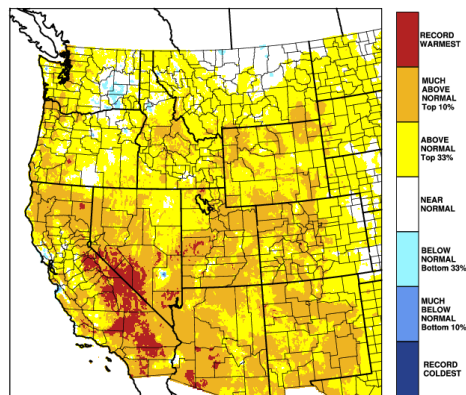
Warm water species found in S. CA coastal waters for 3rd consecutive year due to above normal ocean temperatures

ENSO-neutral conditions slightly favored to continue into autumn and winter

Regional Overview for June - August 2016

Mean Temperature Percentile

Jun-Aug 2016

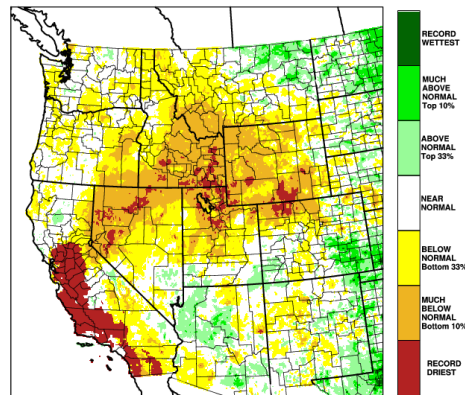


WRCC // www.wrcc.dri.edu/wwat/

Above normal summer temperatures were observed in most locations across the West, with the greatest departures from normal in the Southwest. Several locations in southeastern CA and western NV had their warmest summer on record, including Las Vegas, NV, where average temperature was 93.1 F, 3.2 F above normal. Heat waves in the desert Southwest in early and late June contributed to above normal temperatures. Passing disturbances kept the Northwest cooler than normal in July. In August, thunderstorms helped keep temperatures slightly cooler than normal in Southwest and Rocky Mountain states.

Precipitation Percentile

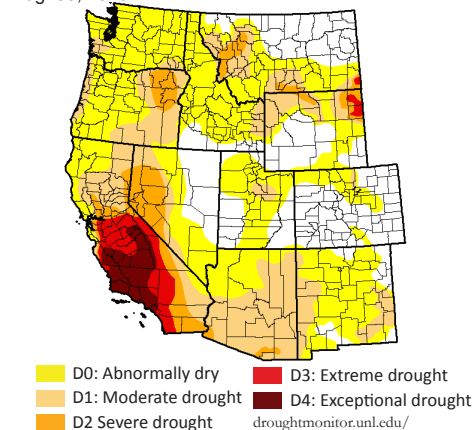
Jun-Aug 2016



Large areas of the West had a drier than normal summer; however, excepting the Southwest and areas east of the Rockies, summer is typically the driest part of the year. A large area centered on the ID-UT-WY border experienced one of its driest summers on record; Idaho Falls set a record for driest summer, receiving only 0.33 in, 15% of normal. Many areas of CA and northern Nevada received little to no precipitation this summer, not uncommon for the region. An active monsoon circulation in June and August brought near to slightly above normal precipitation to AZ, NM, and southern CO, UT, NV.

U.S. Drought Monitor

Aug. 30, 2016



At the end of summer, 35% of the West was experiencing drought conditions. Large areas of increasing drought severity or abnormally dry conditions were introduced in northeast OR, ID, western and southern MT, northern WY and northeast UT. Early snow melt contributed to the low summertime streamflows and drought impacts observed in the area. Given that summer is typically dry in CA, only minor changes were made to small areas and 84% of the state remains in drought. Areas of drought improvement were observed this summer in southern parts of AZ and NM and also in west-central NV.



Regional Impacts for June-August 2016

Drought, Flooding and Water Resources

85% of CA water districts say they have adequate supplies to handle 3 more years of drought

Lake Mead outlook adequate to meet 2017 needs; however, AZ, NV may see first cuts in 2018

Fisheries

West Coast ocean salmon fisheries featured less fishing opportunity and lower quota levels in 2016 than recent years due to relatively low abundance forecasts for several stocks

High water temperatures, low streamflow contributed to fish kill on Yellowstone R. in MT resulting in >100 mi river closure

Forests and Agriculture

66 million trees now dead in CA since 2010 due to drought and beetle kill (up from 29 million in 2015)

Drought cost CA farmers an estimated \$603M in 2016 to date, an improvement from \$2.7B in 2015

Dryland harvest down 30-50% in MT- with low wheat prices, rising hay prices, farmers opting to bale wheat for animal feed

Fire

Doghead Fire in central NM burned 18k acres, 24 homes

Roaring Lion fire in western MT burned >8k acres, 16 homes

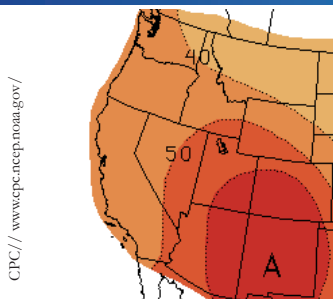
High winds, dry conditions on Aug 21 caused outbreak of several fires near Spokane, WA that burned >3k acres, destroyed multiple homes

Active Fire Season in California

Though the summer fire season was not particularly active across the US (number of fires 76% of normal; acres burned 83% of normal), CA experienced a large number of destructive fires, owing in part to the ongoing drought. Early this summer, fuels in CA were showing dryness usually observed in October. Periods of hot windy weather combined with dry fuels made for hazardous fire conditions. In 2016, CA had more fires and acres burned than in each of the previous 5 years. CAL FIRE alone spent roughly \$165M battling blazes this year. Some notable fires in CA this summer: **Erskine Fire**- most destructive of season, 48k acres, 285 homes destroyed. **Soberanes Fire**- 95k acres burned in Jul-Aug, 57 homes destroyed. **Blue Cut Fire**- 37k acres, 105 homes destroyed. **Sand Fire**- 41k acres, 18 homes destroyed. **Chimney Fire**- 45k acres, 49 homes destroyed.



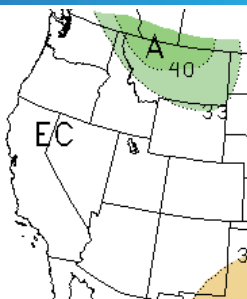
Regional Outlook for Oct-Nov-Dec 2016



Oct-Nov-Dec temperature outlook produced by CPC Sept 15 2016

A indicates above normal
B indicates below normal
N indicates normal
EC means equal chances for A, N or B

Numbers indicate percent chance of temperature in warmest one-third and of precipitation in wettest one-third

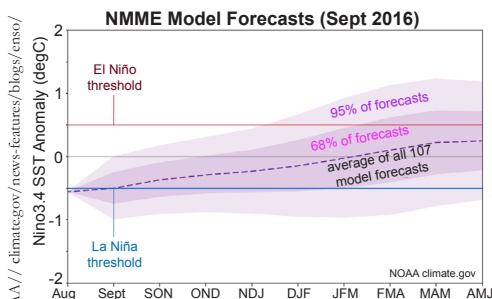


Oct-Nov-Dec precipitation outlook produced by CPC Sept 15 2016

NOAA CPC Oct-Dec Seasonal Outlook

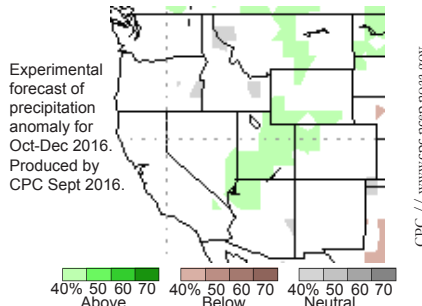
There is a 33-50% chance of temperatures in the upper tercile (well above normal) across the West for Oct-Dec, with greatest likelihood in NM and the 4-Corners region (60%).

There is a 33-40% chance of upper tercile precipitation across MT, northern ID and equal chances of normal, above normal, and below normal precipitation elsewhere in the West.



NMME ENSO Outlook

Models suggest ENSO-neutral conditions are slightly favored over La Niña conditions for the upcoming fall/winter season. However, this is an early outlook and conditions may change as cool season progresses.



NMME Precipitation Forecast

The National Multi-Model Ensemble combines 7 climate research models. The NMME suggests a chance of precipitation being above normal across UT and in central MT, with equal chances of above, below normal or neutral elsewhere.

Western Region Partners

- Western Regional Climate Center
wrc.cdm.noaa.gov
- 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 Environ. 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
- NOAA's Western Regional Collaboration Team
www.regions.noaa.gov/western/western_region_team.html
- Western Water Assessment
www.colorado.edu
- Climate Assessment for the Southwest
climas.arizona.edu
- California Nevada Applications Program
meteora.ucsd.edu/cnap
- Climate Impacts Research Consortium
pnwclimate.org/resources
- NWS River Forecast Centers
water.weather.gov/ahps/rfc/rfc.php
- NOAA Fisheries Service
www.nmfs.noaa.gov/
- NWS Western Region Forecast Offices
www.wrh.noaa.gov/
- State Climatologists - stateclimate.org