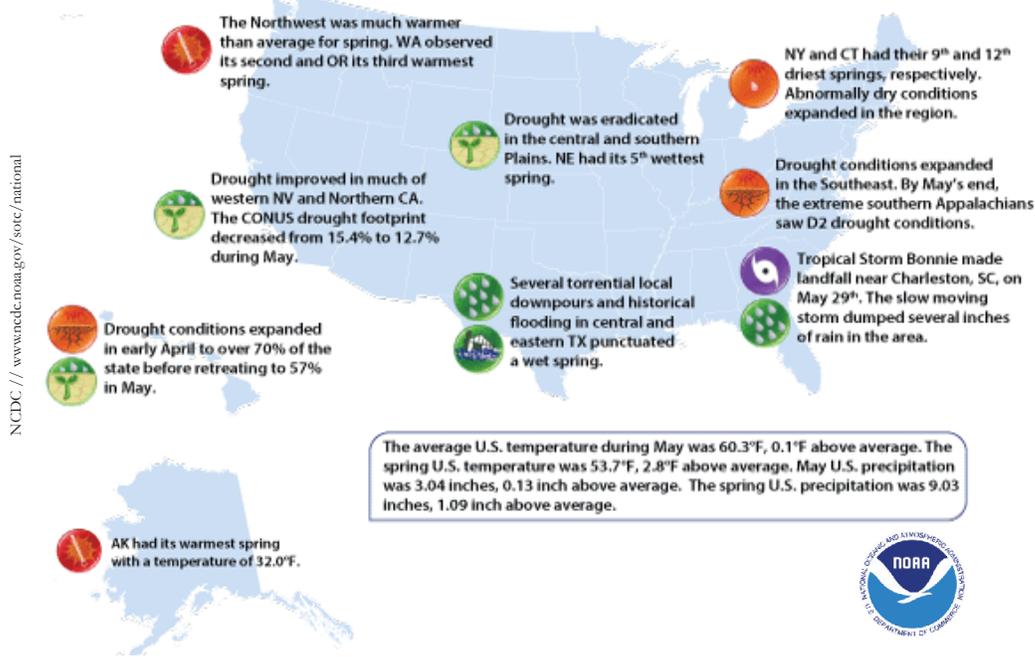


## Significant Events for March - May 2016



## March - Mid-May Highlights for the West

April 1 snowpack near normal for much of West; Sierra Nevada, southern Rockies slightly below normal

Spring snowmelt 2-3 weeks ahead of normal in Cascades, Sierra Nevada, N. Rockies

Well above normal spring temperatures in much of West

Spring precipitation above normal in portions of Great Basin, Upper Missouri Basin, central Rockies

Drought conditions improved across Pacific/Inland Northwest, northern CA, northern Rockies, northern Great Basin

Drought conditions developed in AZ, NM

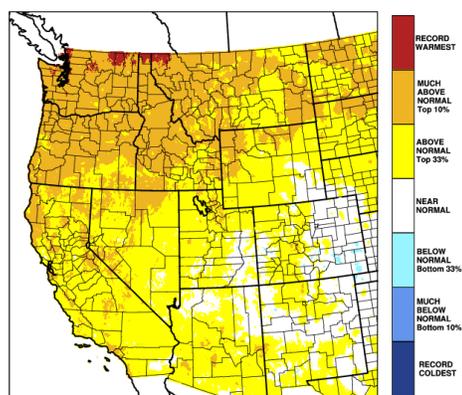
Warm coastal waters referred to as "blobs" continue to have negative impact on marine life

El Niño conditions weaken, autumn transition to La Niña anticipated

## Regional Overview for March - May 2016

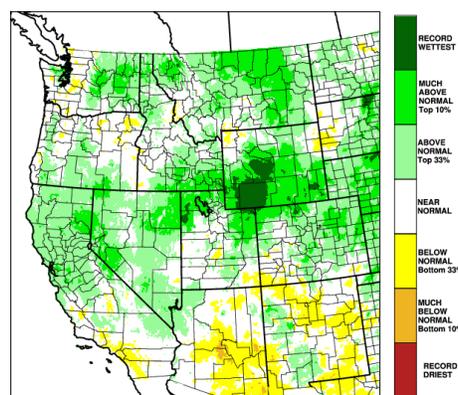
### Mean Temperature Percentile

Mar-May 2016



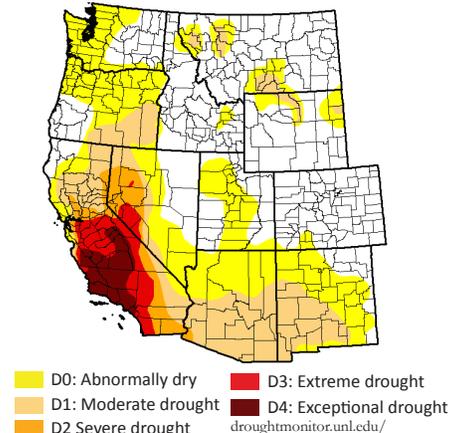
### Precipitation Percentile

Mar-May 2016



### U.S. Drought Monitor

May 31, 2016



March-May temperatures were well above normal for much of the West, especially along the northern tier. Miles City and Glasgow, MT, both had their 4<sup>th</sup> warmest March on record. Spokane, WA, Reno, NV, and Medford, OR, all had their second warmest April on record. Transient low pressure systems moving across the southern half of the region in April helped to moderate temperatures across the Four Corners states, southern NV and CA. May was much warmer than normal throughout the Pacific Northwest and N. CA.

March brought several strong storms and abundant precipitation to the northern tier of the West. Wenatchee, WA, and Riverton, WY both had their 2<sup>nd</sup> wettest March on record while several locations in the Southwest received no measurable March precipitation. April and May saw several slow moving storms that brought above normal precipitation to the Desert Southwest. Las Vegas received 54% of its annual precipitation in April alone. April and May were drier than normal for much of the Pacific Northwest.

The Mar-May period saw 1-3 category improvement in drought conditions across the Inland Northwest, northern CA, northern Great Basin, and much of Wyoming. May 3 marked the first time since April 2013 that <90% of CA was in drought. After a drier than normal winter and spring season, drought conditions returned to the Southwest with 60% of AZ and 37% on NM experiencing drought conditions. In contrast, at the start of March, only 16% of AZ and 0% of NM were categorized as experiencing moderate or worse drought conditions.

# Regional Impacts for March - May 2016

## Drought, Flooding and Water Resources

March storms brought several key northern CA reservoirs above historic average storage levels

In CA, State Water Project allocations set at 60%; Central Valley Project allocations 5% for agriculture south of Delta, 100% for agriculture north of Delta

Normal water levels in Owyhee Reservoir (serves eastern OR/southwest ID) for first time in 4 yrs; allotments to irrigators nearly double of past two years

Flash flooding occurred in April in Las Vegas, NV

June 3 forecast Apr-July runoff into L. Powell 91% of average

## Fisheries

West Coast commercial, recreational salmon fishing will be more restricted in 2016 than past few years

Salmon fisheries closed in WA's Puget Sound; Puget Sound experiencing ecosystem disruption due to warm waters

Elevated number of sea lion strandings continues along West Coast due to warmer than normal coastal waters

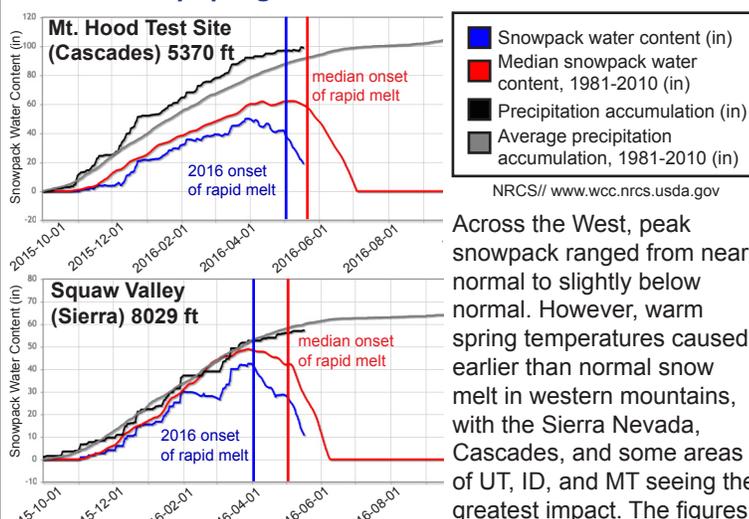
Most of CA coast opened to Dungeness crab fishing in May after 5 month delay due to elevated domoic acid levels in crab

## Agriculture/Rangeland

Early and significant green-up in northern Great Basin due to abundant spring precipitation

1.5 million acres fallowed in CA Central Valley in 2016, a decrease from 2015, still 775K acres greater than May 2011

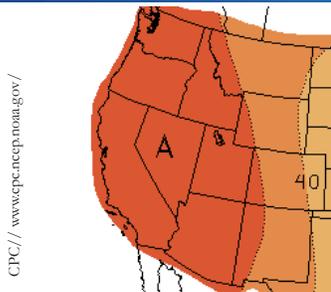
## Early Spring Snowmelt in Western Mountains



Across the West, peak snowpack ranged from near normal to slightly below normal. However, warm spring temperatures caused earlier than normal snow melt in western mountains, with the Sierra Nevada, Cascades, and some areas of UT, ID, and MT seeing the greatest impact. The figures

show that maximum snowpack and onset of rapid melting occurred roughly 2-3 weeks earlier than normal. In the Sierra and southern Cascades, late April snowfall and cloudy conditions helped stall melting. Early snow melt may have impacts later in summer. Basins without reservoir storage may not have sufficient flow for diversions, stream temperatures may increase above normal late in summer without continuous melt and affect fish populations, and the prolonged dry season may increase fire danger and have ecological impacts.

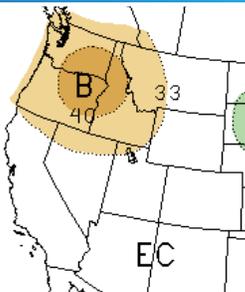
# Regional Outlook for Jul-Aug-Sep 2016



Jul-Aug-Sep temperature outlook produced by CPC June 16 2016

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

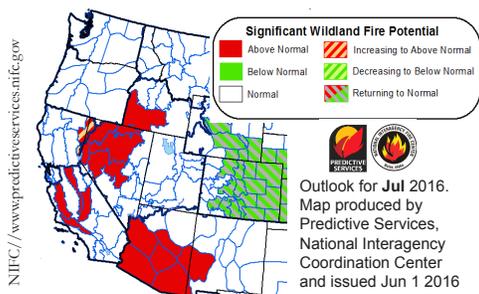
Numbers indicate percent chance of temperature in warmest one-third and of precipitation in wettest one-third



Jul-Aug-Sep precipitation outlook produced by CPC June 16 2016

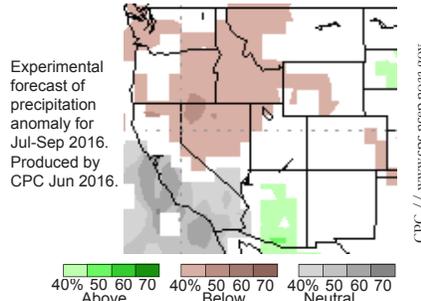
## NOAA CPC Jun-Aug Seasonal Outlook

There is a 40-50% chance of temperatures in the upper tercile (well above normal) across most of the West in Jun-Aug. Odds are tilted towards below normal precipitation in the Pacific Northwest, and equal chances of above/below normal precipitation elsewhere. However, late spring is typically a time of low forecast skill for the upcoming season.



## Wildland Fire Potential Outlook

In the northern Great Basin, spring rains established abundant fine fuels, raising summer fire risk. In CA, persistent drought conditions and tree deaths have contributed to elevated fire potential. Dry conditions in AZ have elevated fire risk.



## NMME Precipitation Forecast

The National Multi-Model Ensemble combines 7 climate research models. The NMME suggests a chance of precipitation being below normal in the Northwest, above normal in AZ, and equal chances of above/below normal or neutral elsewhere.

## Western Region Partners

- Western Regional Climate Center  
wrcc.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
- 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