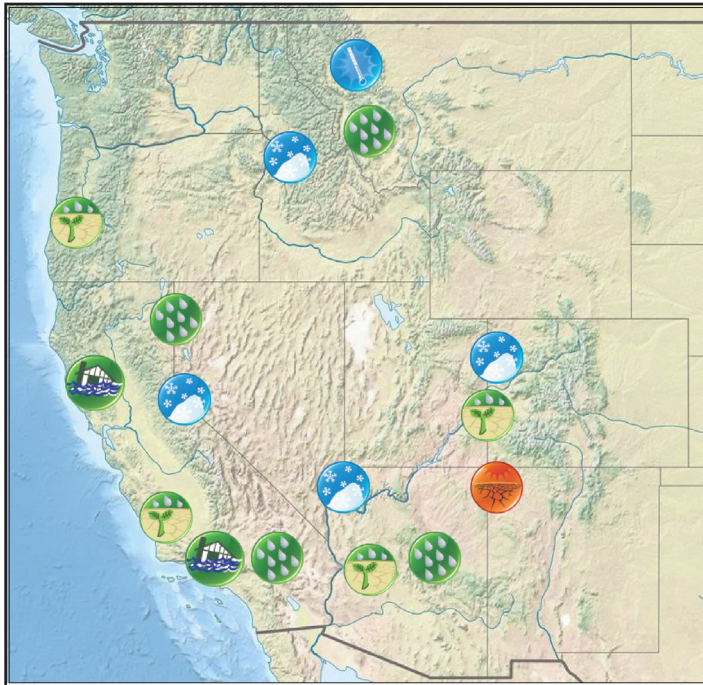




### Significant Events for December-February 2018-19

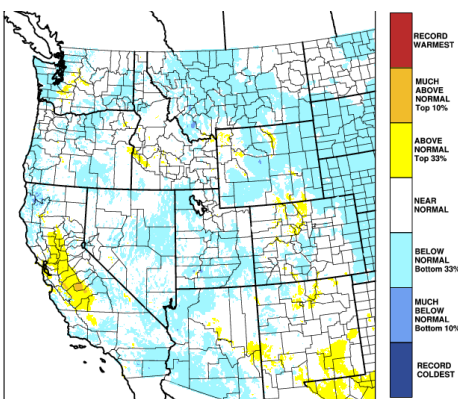
#### Dec-Jan-Feb Highlights



- Near-to-well above normal snowpack across the West; numerous snowfall records set in Feb.
- Above normal precipitation across large area of West (OR, CA, NV, UT, AZ, CO); below normal in parts of Pacific Northwest, NM, WY
- Improvements in drought conditions large areas of West; 55% of West in drought in Dec, 25% by Mar
- Some improvement, but persistence of extreme drought in Four Corners region
- This winter, 23 atmospheric rivers made landfall on the US West Coast
- Several strong winter storms caused vehicle accidents, road closures, travel delays throughout West, flooding in CA
- Near-to-below normal temperatures across West, much cooler than normal Feb. in MT
- Weak El Niño conditions present in mid-March, 80% chance of persisting through spring 2019

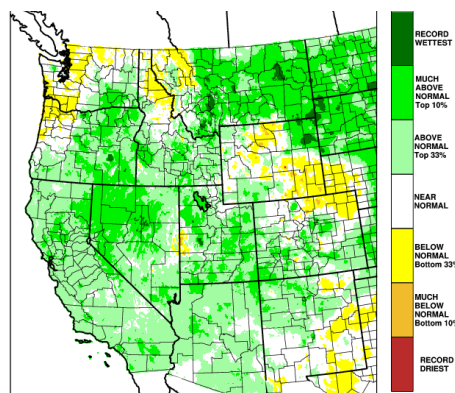
### Regional Overview for December-February 2018-19

**Mean Temperature Percentile**  
Dec-Jan-Feb 2018-19



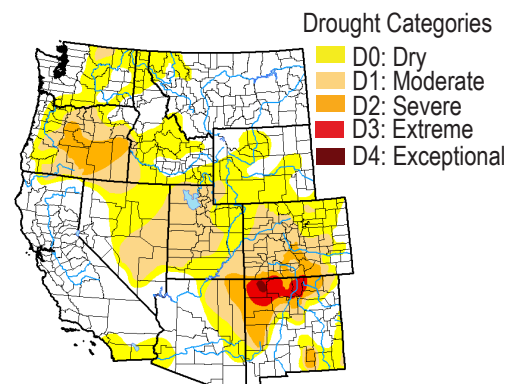
Persistent stormy conditions helped to maintain near-to-below normal temperatures across much of the West this winter. While Dec and Jan temperatures were near to somewhat above normal across the West, much cooler than normal temperatures impacted the northern tier of the region in Feb, with several records set. Great Falls, MT, recorded its coldest Feb in an 83-year record at -0.2 F.

**Precipitation Percentile**  
Dec-Jan-Feb 2018-19



This winter, an active storm track brought numerous disturbances across the West. Except for a few desert areas, Dec precipitation was below normal for most of the region. In Jan, scattered areas of the Southwest observed >150% of normal precipitation. During Feb, much of the West saw >200% of normal precipitation as back-to-back atmospheric rivers made landfall.

**US Drought Monitor**  
Mar 5 2019



Abundant precipitation and moderate temperatures helped alleviate drought conditions in large areas of the West. The areas of greatest improvement were in western OR, southern CA, AZ, and western CO. Further improvements are possible as drought impacts subside following recent precipitation. Severe or worse drought conditions persist in eastern OR and northern NM.

## Regional Impacts for December-February 2018-19

### Storm Impacts and Water Resources

Several storms this winter resulted in evacuations, flooding, mud and debris flows, and road closures in recently burned areas in southern CA

Jan 21-22: A strong winter storm caused road closures, avalanches, flight cancellations, 200 vehicle crashes in UT; also travel impacts, school closures in western MT

At end of Feb, all major CA reservoirs near or exceeding historical average storage

Record Feb snowfall at several Northwest locations, including Bozeman, MT and Seattle, WA

A persistent late Feb atmospheric river contributed to major flooding on the Russian R. in northern CA, initial damage and business loss estimates \$155M

Throughout winter, snowstorms caused prolonged closures of Interstate 80, a major transportation corridor over the Sierra Nevada

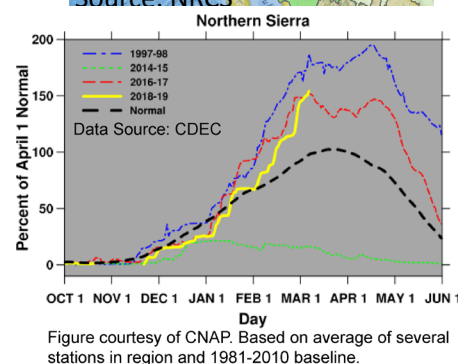
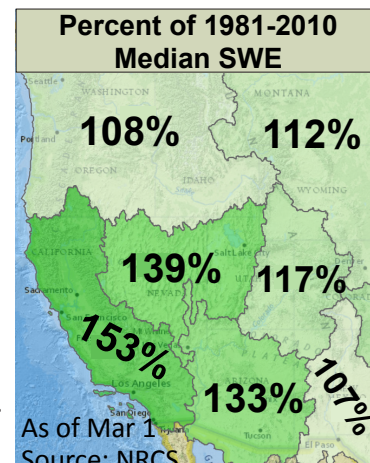
### Agriculture and Fisheries

Early Feb. blizzard in WA's Yakima Valley killed 1800 dairy cows; state estimates \$3.2M in damages

Dungeness crab fishing delayed in Pacific Northwest by ~1 month due to inclement weather, small crabs

### Near-to-above normal snowpack across West

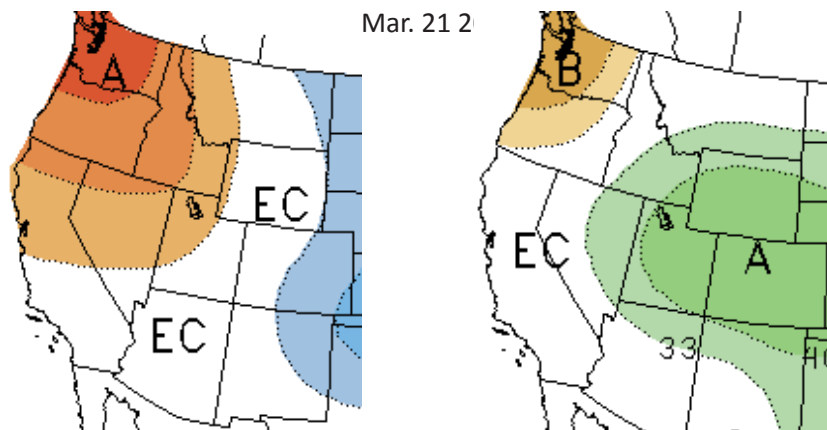
On March 1, snow water equivalent (SWE) was above median for all HUC-2 basins in the West (top right), though smaller basins within the Pacific Northwest, Missouri, and Lower Colorado regions were below median. The healthy snowpack in many areas of the West helped alleviate drought concerns. The Sierra Nevada snowpack grew fairly steadily through the year and roughly doubled in Feb. (bottom right), raising concerns for snow loading on structures as well as spring and summer snowmelt flooding.



## Regional Outlook for Apr-May-Jun 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.

The April-May-June outlook favors above normal temperatures in the Pacific Northwest and slightly favors below normal temperatures for the eastern extent of the region, with equal chances of above, near, or below normal temperatures for other areas. There are enhanced odds of below normal precipitation in the Pacific Northwest, while odds favor above normal precipitation across the eastern Great Basin, UT, CO, and WY. In addition to model guidance, the outlooks are influenced by the projected persistence of weak El Niño conditions in the equatorial Pacific, soil moisture, snowpack conditions, as well as near-coast sea surface temperature anomalies.

## Western Region Partners

- Western Regional Climate Center  
[wrcc.dri.edu](http://wrcc.dri.edu)
- National Integrated Drought Information System (NIDIS) - [drought.gov](http://drought.gov)
- Western Governors' Association  
[westgov.org](http://westgov.org)
- Western States Water Council  
[westgov.org/wswc](http://westgov.org/wswc)
- NOAA/ESRL Physical Sciences Division  
[esrl.noaa.gov/psd](http://esrl.noaa.gov/psd)
- NOAA Climate Prediction Center  
[www.cpc.ncep.noaa.gov](http://www.cpc.ncep.noaa.gov)
- National Centers for Envir. Info. (NCEI)  
[www.ncdc.noaa.gov](http://www.ncdc.noaa.gov)
- USDA/NRCS National Water and Climate Center - [www.wcc.nrcs.usda.gov](http://www.wcc.nrcs.usda.gov)
- National Interagency Fire Center  
[www.nifc.gov](http://www.nifc.gov)
- Western Water Assessment  
[wwa.colorado.edu](http://wwa.colorado.edu)
- Climate Assessment for the Southwest  
[climas.arizona.edu](http://climas.arizona.edu)
- California Nevada Applications Program  
[cnap.ucsd.edu](http://cnap.ucsd.edu)
- Climate Impacts Research Consortium  
[pnwclimate.org/resources](http://pnwclimate.org/resources)
- NWS Western Region Forecast Offices  
[www.wrh.noaa.gov/](http://www.wrh.noaa.gov/)