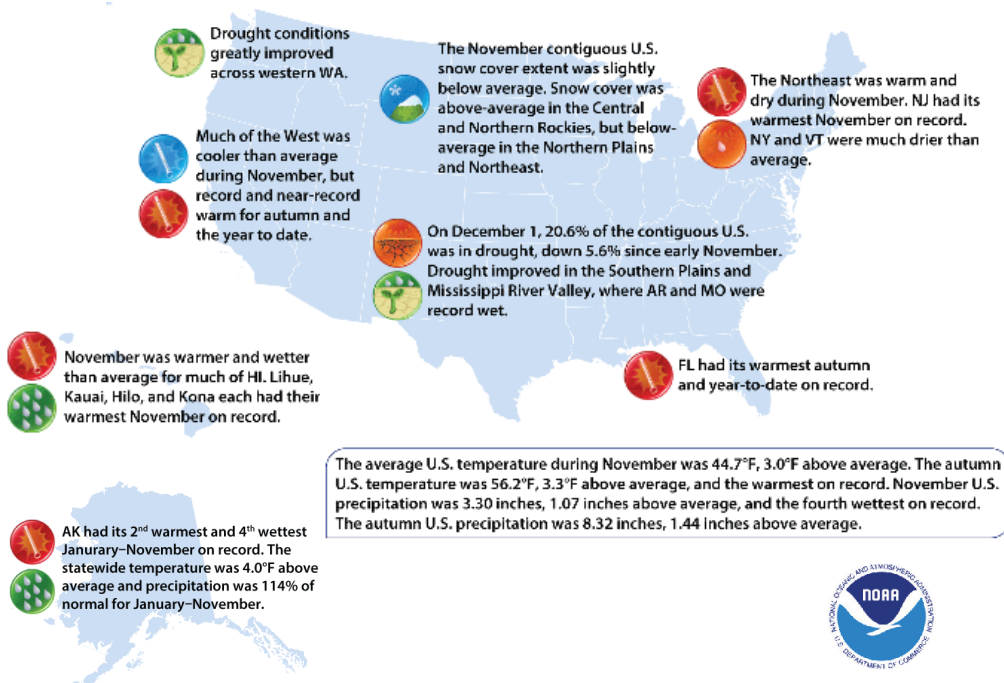


## Significant Events for September-November 2015

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



### Sep-Nov Highlights for the West

Great Basin much wetter than normal; Nevada statewide precipitation 11th highest on record

Very warm October; all western states observed one of their top-10 warmest Octobers on record (WA warmest)

Average autumn temperatures above normal West wide; greatest departures east of Rockies

Snowpack began to build in western mountains in November, earlier than usual for some locations

Anomalously warm sea surface temperatures referred to as “The Blob” persisted but weakened along coast

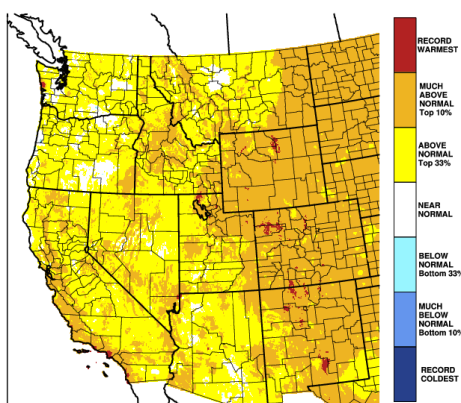
El Niño conditions in the equatorial Pacific strengthened through autumn and are forecast to persist through winter

## Regional Overview for September-November 2015

### Mean Temperature Percentile

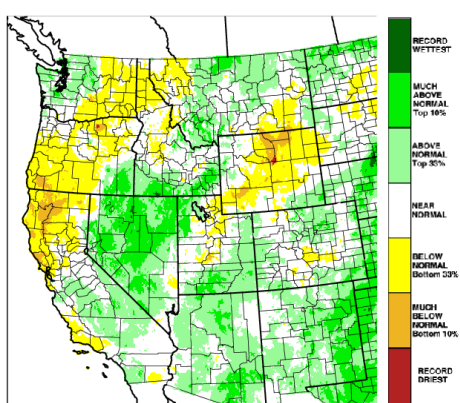
Sep-Nov 2015

WRCC // www.wrcc.dri.edu/wvu/



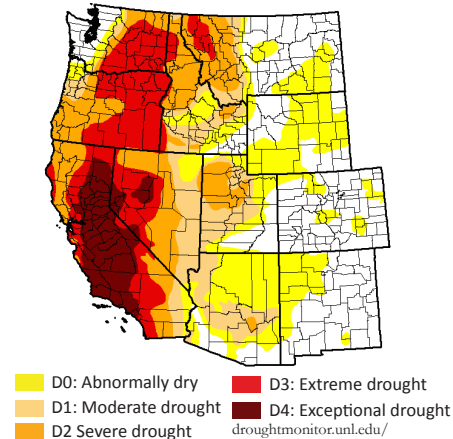
### Precipitation Percentile

Sep-Nov 2015



### U.S. Drought Monitor

Dec. 1, 2015



Autumn temperatures were above normal West-wide, owing to a very anomalously warm October and areas of above normal temperature in September. November was cooler than normal for much of the region. The greatest departures from normal were observed along the California coast, where Los Angeles tied 1983 for warmest autumn in a 139-year record; scattered areas of the Great Basin and Intermountain West, where Salt Lake City, Utah, observed its warmest autumn in a 88-year record; and areas within and east of the Rocky Mountains.

Many areas of the West saw above normal precipitation this autumn from a variety of storm systems. In September, remnants of tropical storms affected southern CA, the Southwest, and parts of UT, ID, and western MT. In October, a low pressure system that crossed the region twice brought abundant precipitation to central CA, the Great Basin, and Southwest. In November, several winter storms crossed the West beginning snow accumulation in mountainous areas, though snow levels remained relatively high in the Sierra and Cascades.

The West saw a 5% reduction in area categorized as “extreme to exceptional drought” in autumn. Most relief occurred in western WA and northwestern OR as well as eastern NV. Drought conditions expanded in southeastern MT and WY associated with the above normal temperatures and below normal precipitation observed in this area. Extreme to exceptional drought persists in CA, western NV, and eastern OR and WA. Drought conditions are likely to remain until the impacts of winter snowpack are known later in the season.

# Regional Impacts for September-November 2015

## Drought, Flooding and Water Resources

CA Department of Water Resources set initial allocation to customers of the State Water Project at 10%

Folsom Lake, one of CA's large reservoirs, reached a record low of 14% of capacity this fall

Heavy October rains and flooding damaged buildings, roads, and infrastructure in CA's Death Valley National Park

In October, debris laden flooding occurred on the Interstate-5 freeway in southern CA, stranding many vehicles and passengers

Late November King Tides broke records for highest sea level observed in San Diego, La Jolla, and Santa Barbara, CA

A powerful mid-November windstorm resulted in 3 deaths and large areas of extended power outages in eastern WA

## Agriculture and Fisheries

Bloom of toxic algae along West Coast that began earlier this year becomes largest on record, impacts fisheries

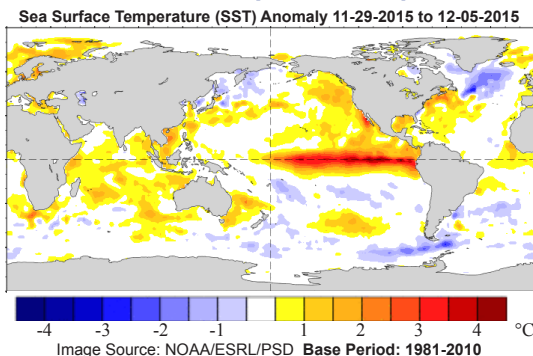
A sea snake was found in Ventura, CA, in October in association with warm coastal waters; this was the northernmost observation of this species

## Recreation

Early season Sierra Nevada snow allows ski resorts to open for Thanksgiving holiday

Low streamflow, warm temperatures negatively impacted fishing tourism in MT

## Early El Niño Impacts in West



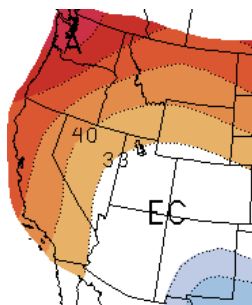
El Niño conditions (above normal SSTs in central/eastern equatorial Pacific) continued to strengthen during the autumn season. It is early in the cool season to see many El Niño impacts, though the known

relationship between El Niño and greater frequency of eastern Pacific hurricanes has been observed. There were 9 major hurricanes (category 3 or stronger) in the eastern Pacific, the most major hurricanes since reliable records began in 1971, and a total of 18 named storms. Remnants of one of the major hurricanes, Hurricane Linda, drifted northeast and provided moisture for heavy precipitation in the US Southwest. Thunderstorms associated with Linda's remnants produced flash flooding in southeastern Utah. In Zion National Park, 7 hikers were killed when trapped in a narrow canyon. In Hildale, Utah, 13 people were killed when their cars were swept away by flooding.



# Regional Outlook for Jan-Feb-Mar 2015

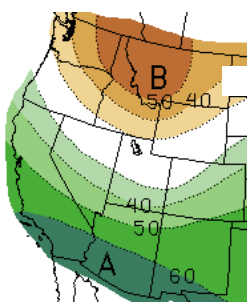
CPC // www.cpc.ncep.noaa.gov/



Jan-Feb-Mar temperature outlook produced by CPC Dec 17 2015

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



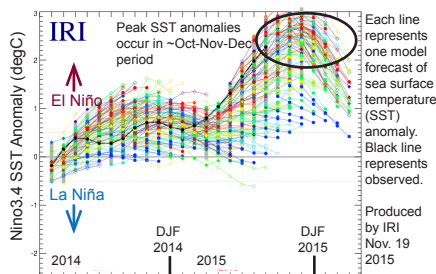
Jan-Feb-Mar precipitation outlook produced by CPC Dec 17 2015

## NOAA CPC Winter Seasonal Outlook

The greatest likelihood of well above normal temperatures is observed along the coast and the northern tier of the West this winter. The precipitation outlook displays an El Niño signal, with the greatest chances for above normal precipitation across the Southwest and the Inland Northwest leaning towards drier than normal conditions.

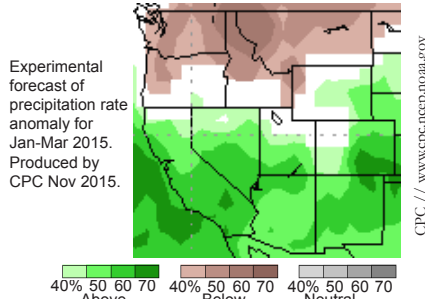
## Model ENSO Predictions Feb 2014-Nov 2015

IRI // iri.columbia.edu/our-expertise/



## IRI ENSO Outlook

Models continue to suggest a strong El Niño peaking in the late fall/early winter. Impacts of El Niño in the West are likely to be greater in late winter rather than early winter.



## NMME Precipitation Forecast

The National Multi-Model Ensemble combines 7 different climate research models. The NMME suggests above normal precipitation across the Southwest for Jan-Mar, related to El Niño

## Western Region Partners

- Western Regional Climate Center  
wrc.cdr.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.wr.noaa.gov/
- State Climatologists - stateclimate.org