

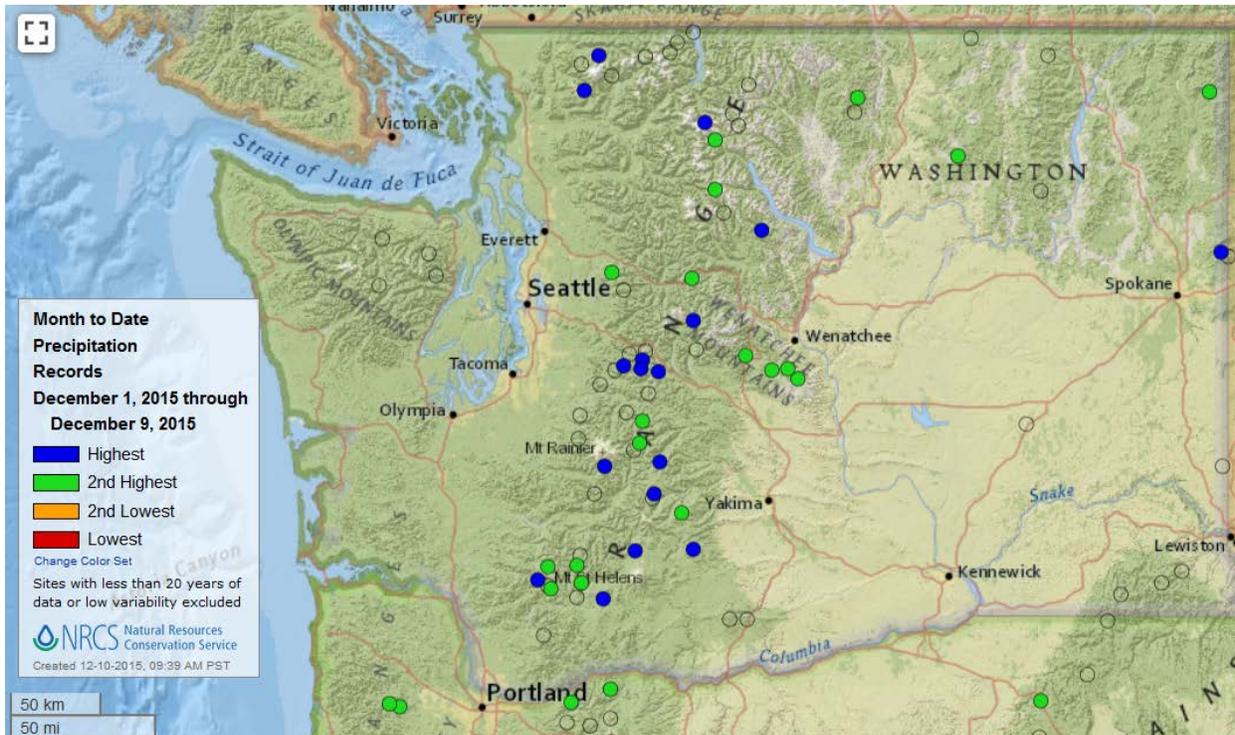
Water and Climate Update

December 10, 2015

The Natural Resources Conservation Service produces this weekly report using data and products from the National Water and Climate Center and other agencies. The report focuses on seasonal snowpack, precipitation, temperature, and drought conditions in the U.S.

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Weekly Highlight: Record precipitation in Washington leads to widespread flooding



The [month to date precipitation records](#) map shows that a series of very strong storms brought heavy precipitation to the Pacific Northwest this week, with many stations reporting a record or near record for the week.

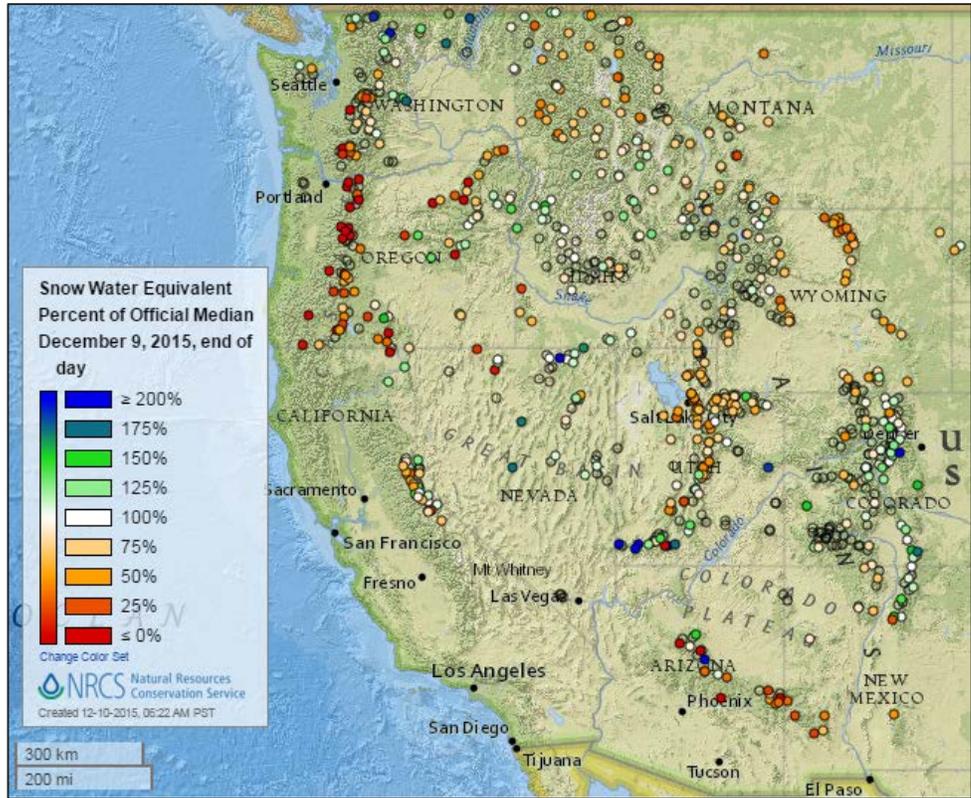
“SEATTLE — (Washington) Gov. Jay Inslee declared a [state of emergency](#) in Washington on Wednesday after days of heavy rain caused rivers to rise, flooding and landslides across the western part of the state.” USA Today

Snow

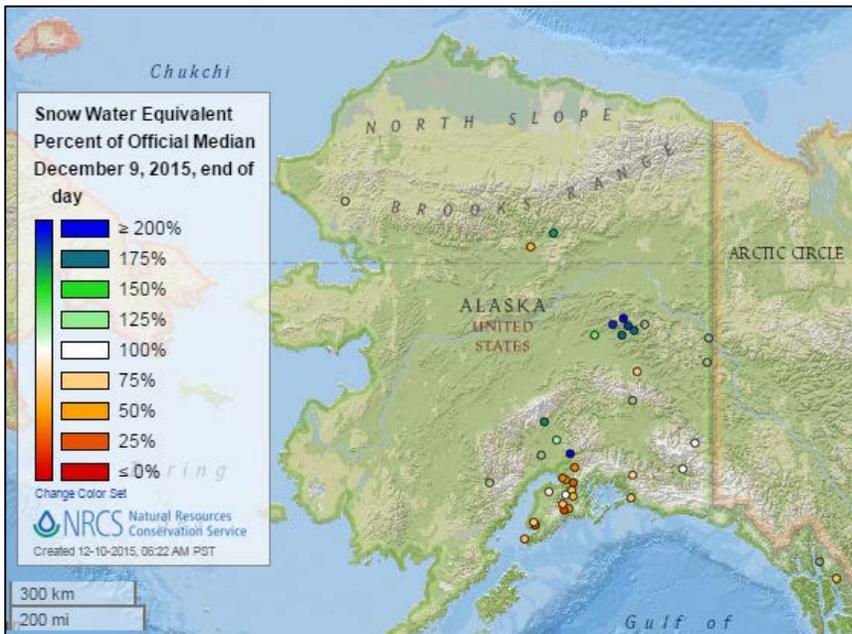
Current Snow Water Equivalent, Western Mountain Sites (NRCS SNOTEL Network)

The current [snow water equivalent percent of median](#) map shows that much of the West has median to below median snowpack at this time. The Southwest and Pacific Northwest have areas of very low snowpack at this time.

Warm and heavy precipitation have reduced the snowpack in the Pacific Northwest, highlighting the contrast to the maps on page 4 which show the precipitation that has occurred recently.

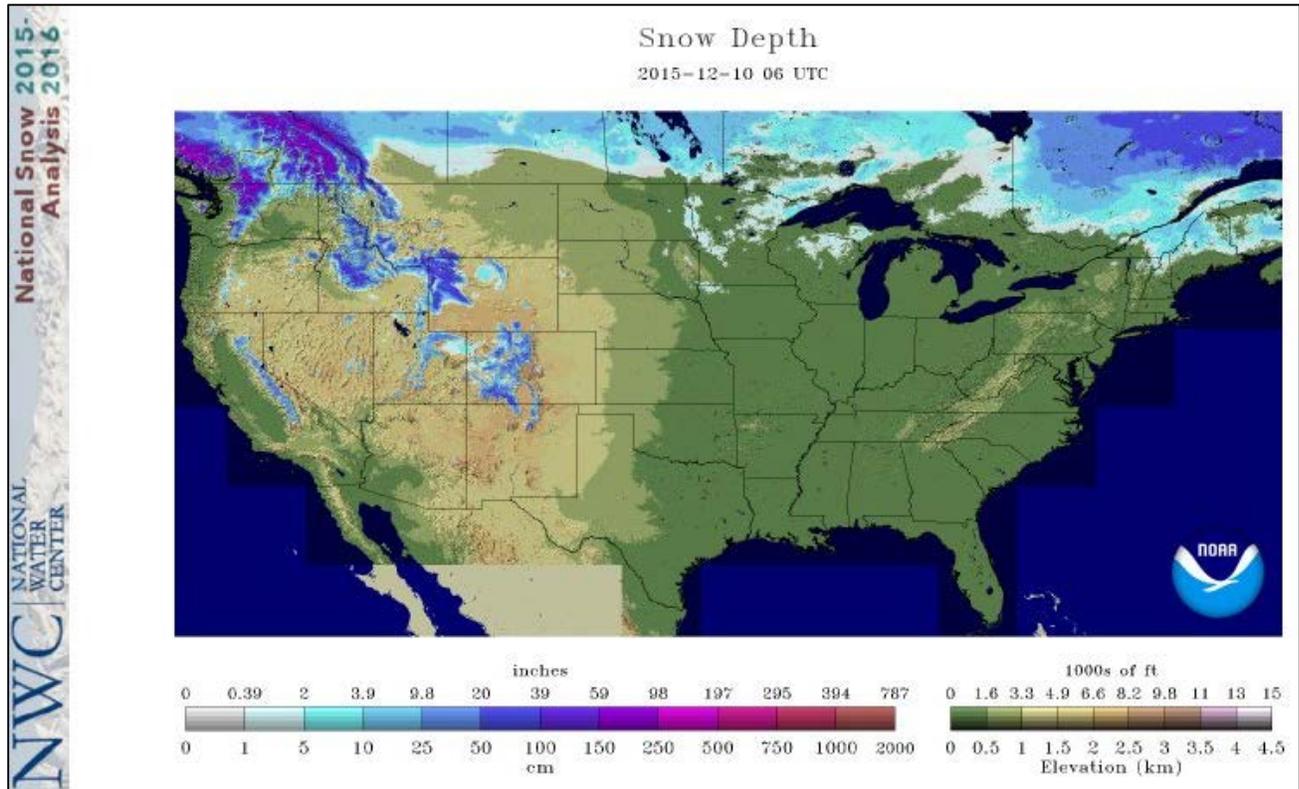


Current Snow Water Equivalent, NRCS SNOTEL Network



The current [snow water equivalent percent of median](#) map for Alaska shows median to above median snowpack in the Interior and median to below median in the southern part of the state.

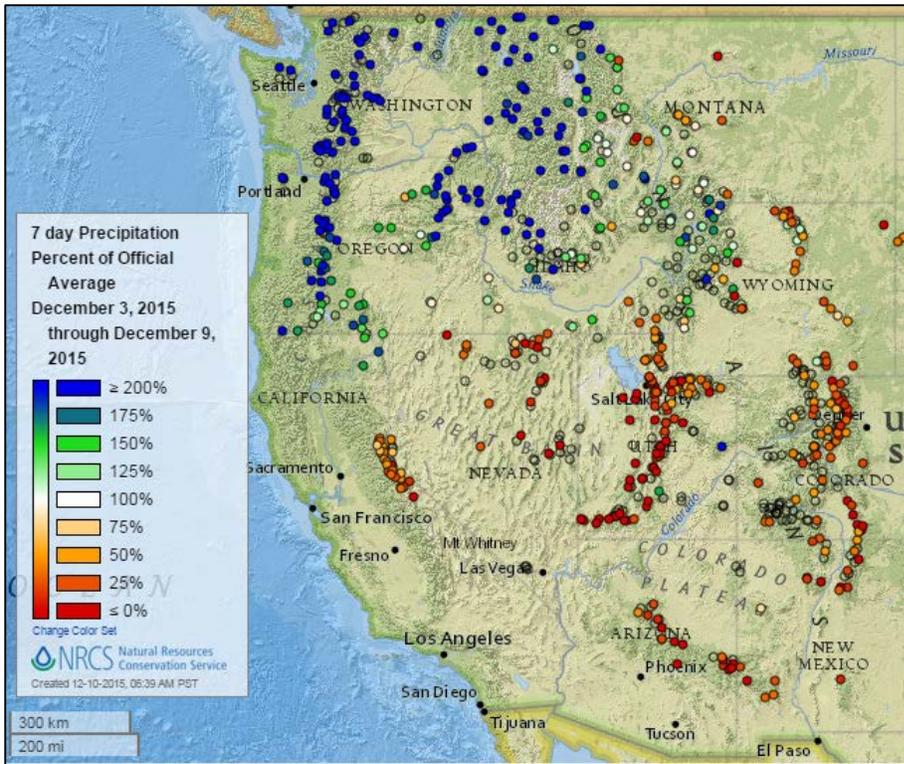
Current Snow Depth, National Weather Service (NWS) Networks



The National Water Center's current [snow depth](#) map for the continental U.S. shows several areas of significant snow accumulation in the mountains of the Pacific Northwest, Sierra Nevada, and the Rockies. Much of the northern Plains east to the Great Lakes, and northern New England lost snow over the week. Warm temperatures across the northern tier states have been detrimental to snow accumulation for much of the country that normally has snow at this time.

Precipitation

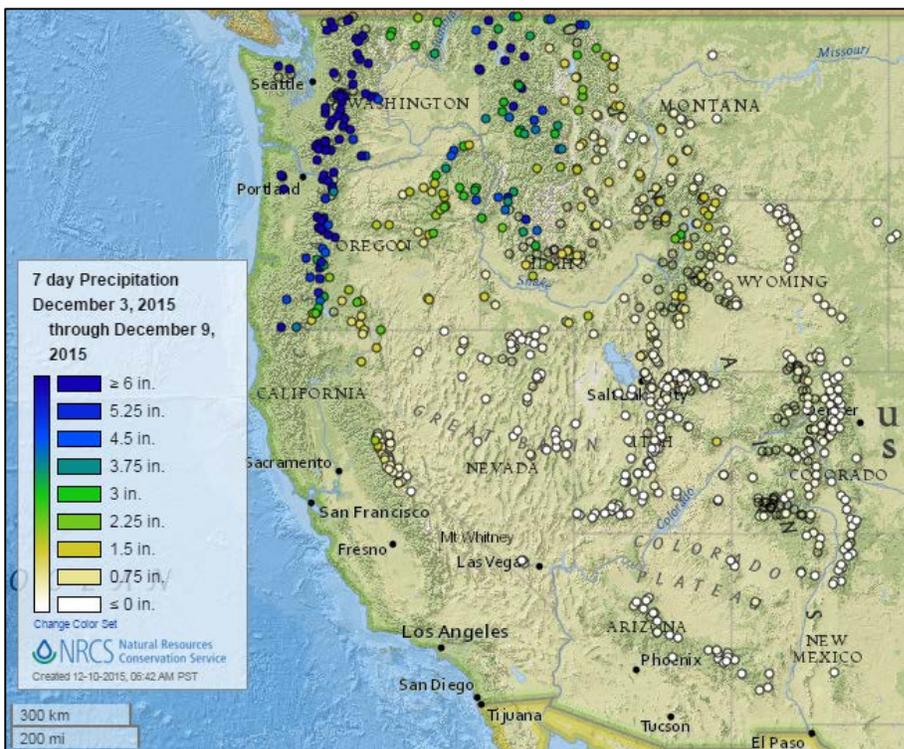
Last 7 Days, Western Mountain Sites (NRCS SNOTEL Network)



The 7-day [precipitation percent of average](#) map shows that a series of very strong storms brought heavy precipitation to the Pacific Northwest this week, with almost all the stations reporting more than 200 percent of average.

Contrastingly, most of the remainder of the West was very dry, with little to no precipitation for the week.

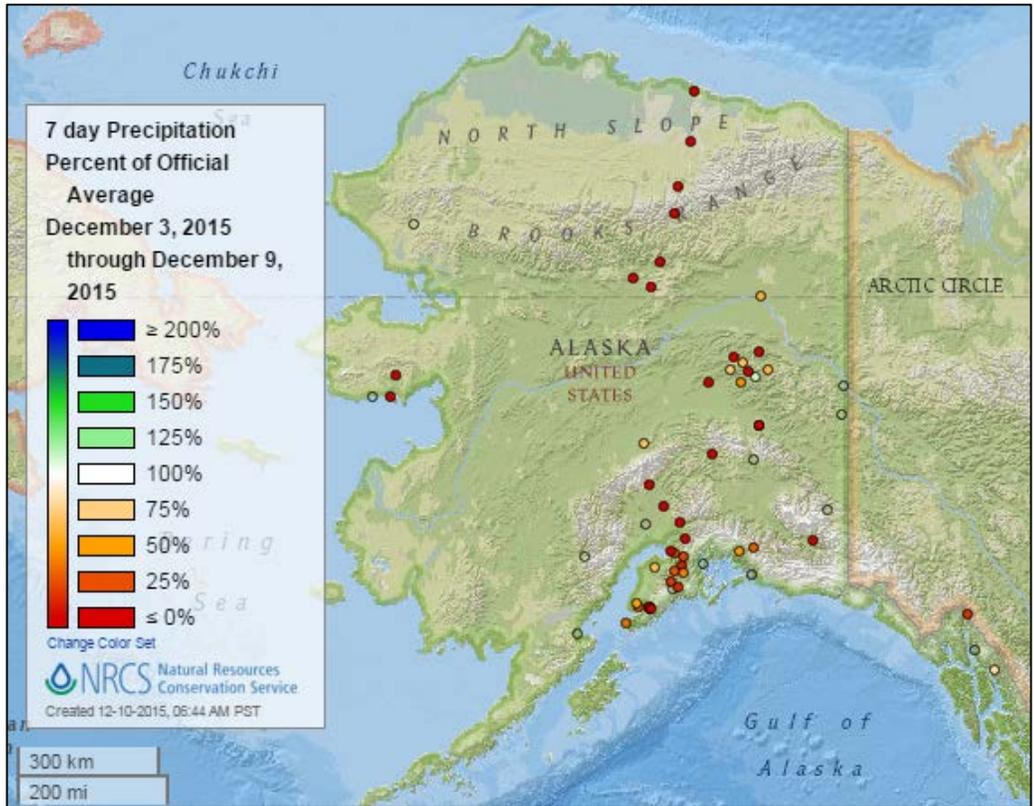
This pattern of precipitation is in contrast to what is expected during the forecasted El Niño conditions.



The [total precipitation](#) map shows over six inches of precipitation fell across the mountains of the Pacific Northwest, with lesser amounts farther east.

Much of the rest of the West received less than one inch of precipitation, and many stations were dry for the week.

The Alaska [precipitation percent of average](#) map for the last seven days shows primarily less than average precipitation across much of the state.



The Alaska seven day [total precipitation](#) map shows that very little total precipitation fell anywhere in the state this week.



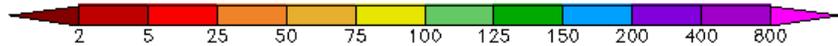
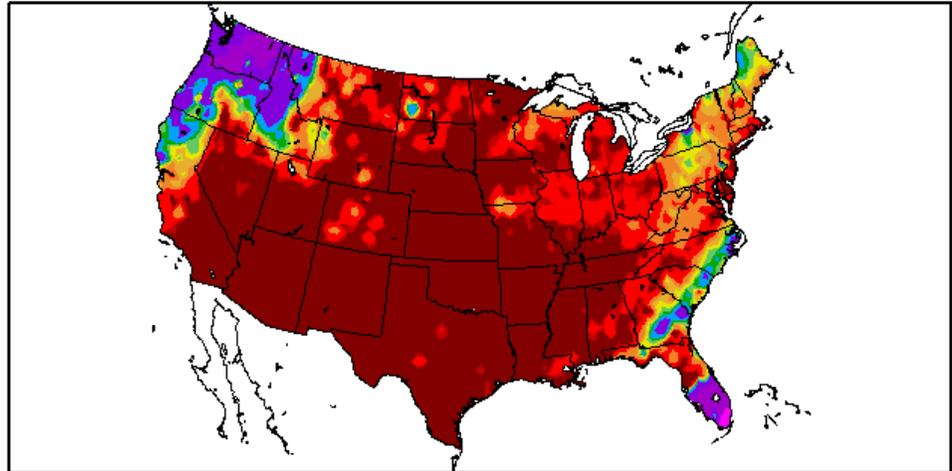
Last 7 Days, National Weather Service (NWS) Networks

Source: Regional Climate Centers

Percent of Normal Precipitation (%)
12/3/2015 - 12/9/2015

The [percent of normal precipitation](#) map shows well above normal precipitation throughout the Pacific Northwest, Florida, and other areas of the Southeast.

Very dry conditions dominated the majority of the country.

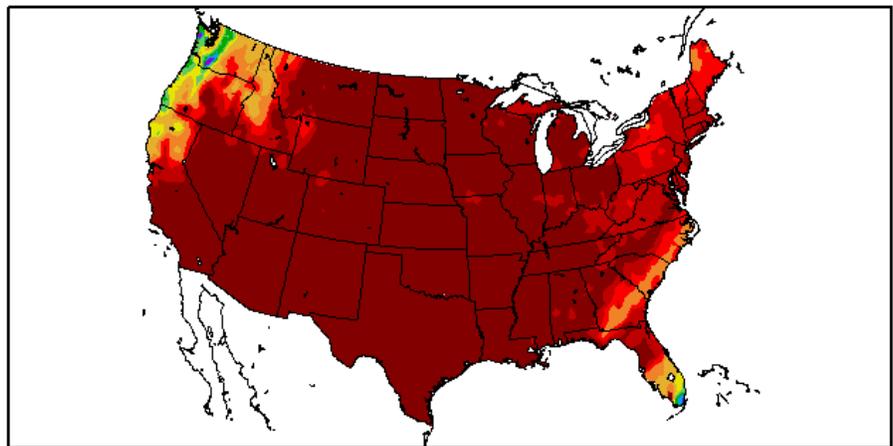


Generated 12/10/2015 at HPRCC using provisional data.

Regional Climate Centers

Precipitation (in)
12/3/2015 - 12/9/2015

The [7-day total precipitation](#) map prominently shows the highest amounts of precipitation in the Pacific Northwest and southern Florida, where some areas reported more than 10 inches of precipitation. Much of the remainder of the country was primarily dry.



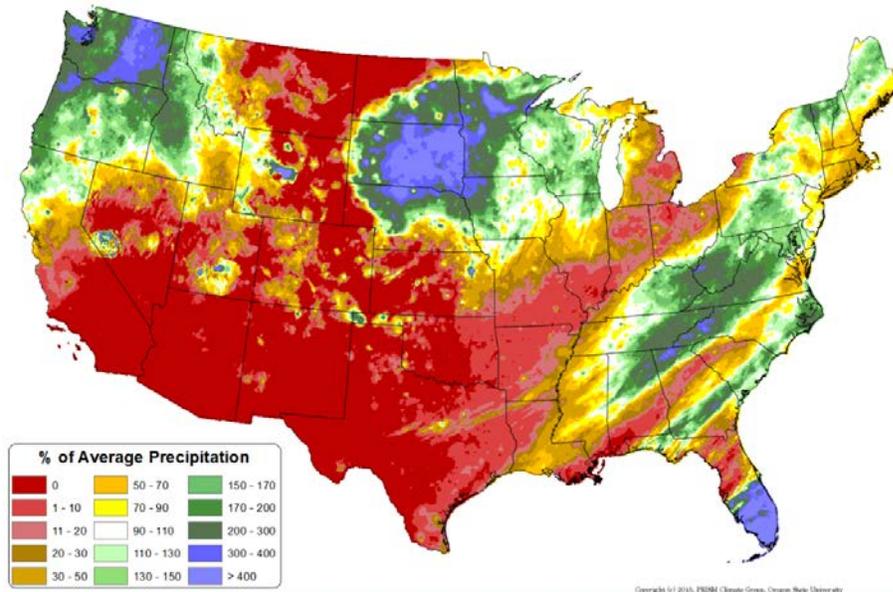
Generated 12/10/2015 at HPRCC using provisional data.

Regional Climate Centers

Month-to-Date, All Available Data Including SNOTEL and NWS Networks

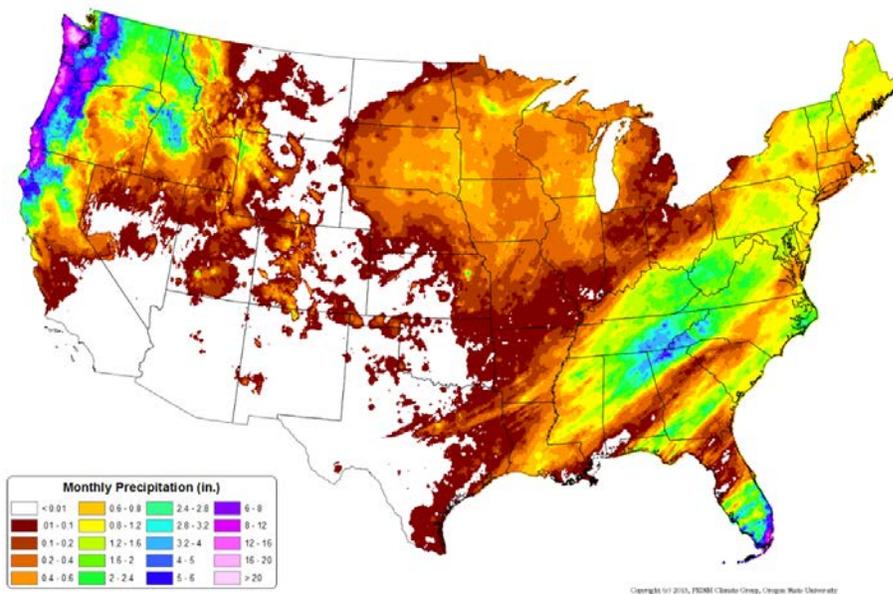
Source: PRISM

Total Precipitation Anomaly: 01 December 2015 - 08 December 2015
 Period ending 7 AM EST 08 Dec 2015
 Base period: 1981-2010
 (Map created 09 Dec 2015)



For the month of December to date, the national [precipitation percent of average](#) map shows patches of well above average precipitation scattered throughout the country, including the Southeast, northern Plains, and the Pacific Northwest. Drier than average areas included areas in the West, western Great Plains, Southwest, and southern Midwest.

Total Precipitation: 01 December 2015 - 08 December 2015
 Period ending 7 AM EST 08 Dec 2015
 (Map created 09 Dec 2015)

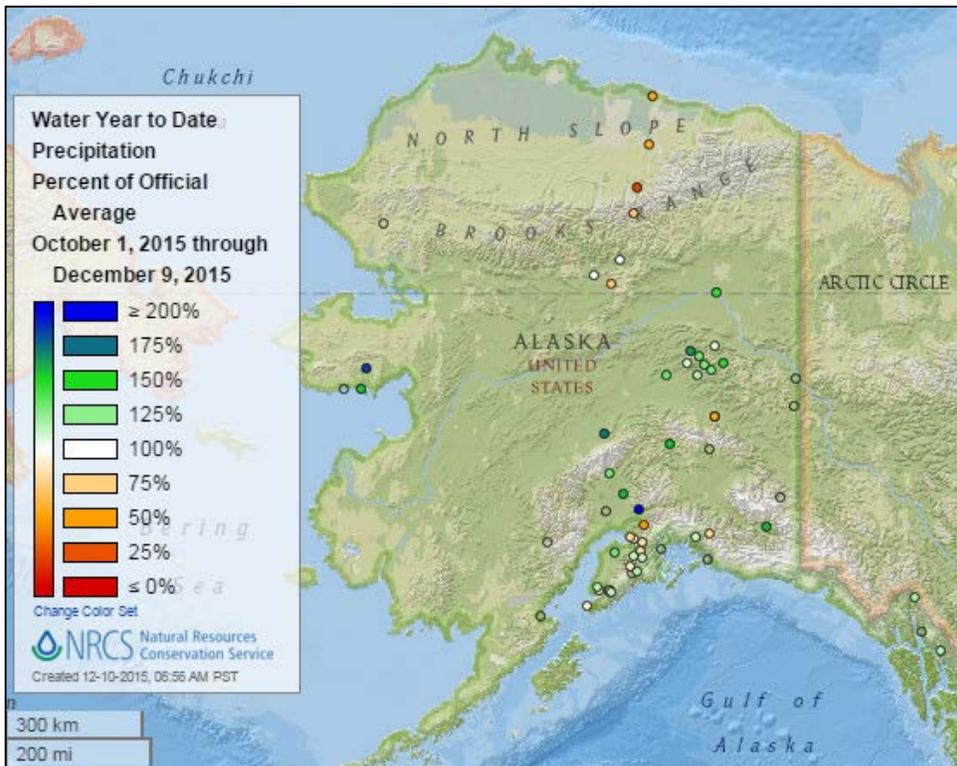
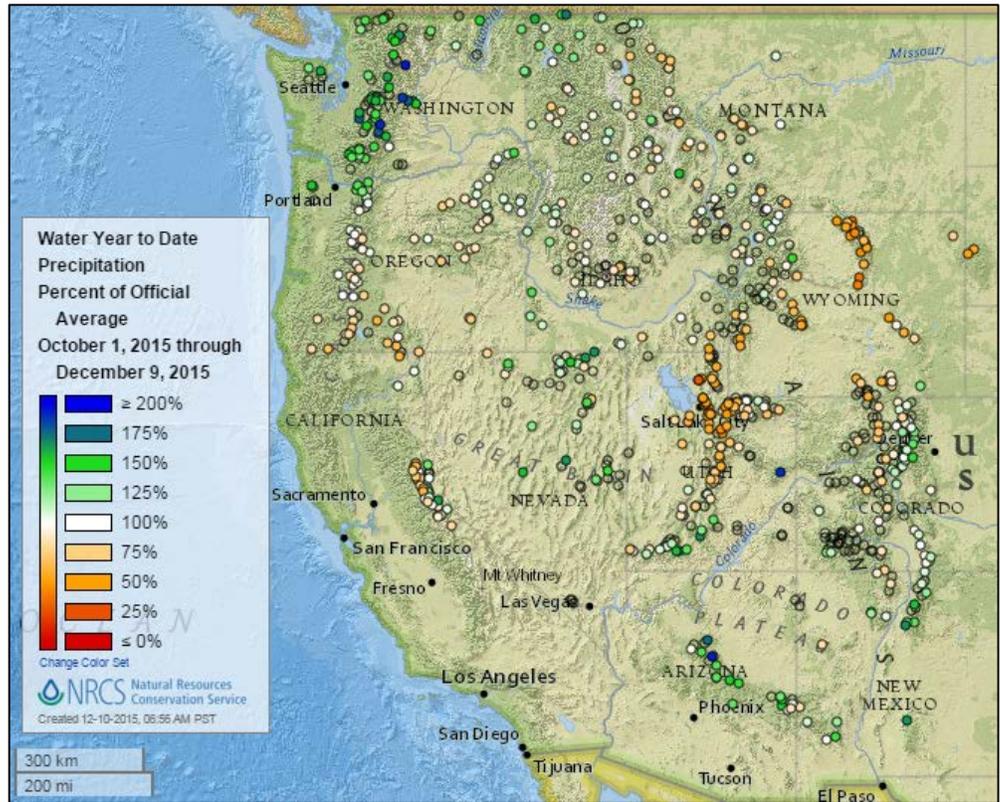


The December month-to-date [total precipitation](#) map highlights heavy precipitation in western Washington where amounts exceeded 16 inches, and in southern Florida with amounts exceeding 12 inches.

Noticeably dry areas included the Great Plains, the Southwest, and western Texas.

Water Year-to-Date, Western Mountain Sites (NRCS SNOTEL Network)

For the [2016 Water Year](#) that began on October 1, 2015, the northern and southern areas are average to above average. In between is a swath of below average areas, going through southern Oregon, southern Idaho, northern Colorado, northern Utah, and much of Wyoming.



The Alaska water year-to-date [precipitation percent of average](#) map shows a mix of above, near, and below average sites throughout the state.

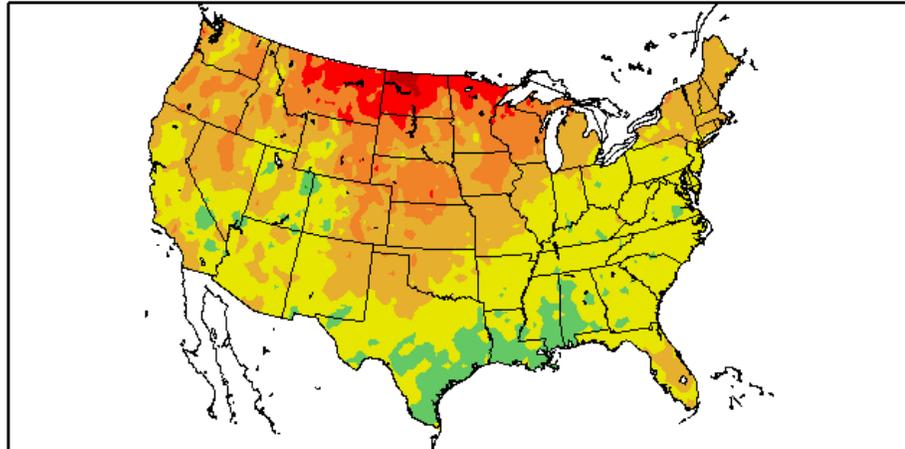
Temperature

Last 7 Days, National Weather Service (NWS) Networks

Source: Regional Climate Centers

Departure from Normal Temperature (F) 12/3/2015 – 12/9/2015

The map of the [average temperature anomalies](#) for the past week shows most of the country was warmer than normal for the week, with the northern Plains reporting temperatures of over 15 to 20 degrees above normal. The coolest areas of the country were actually near normal temperatures along the Gulf Coast.



Generated 12/10/2015 at HPRCC using provisional data.

Regional Climate Centers

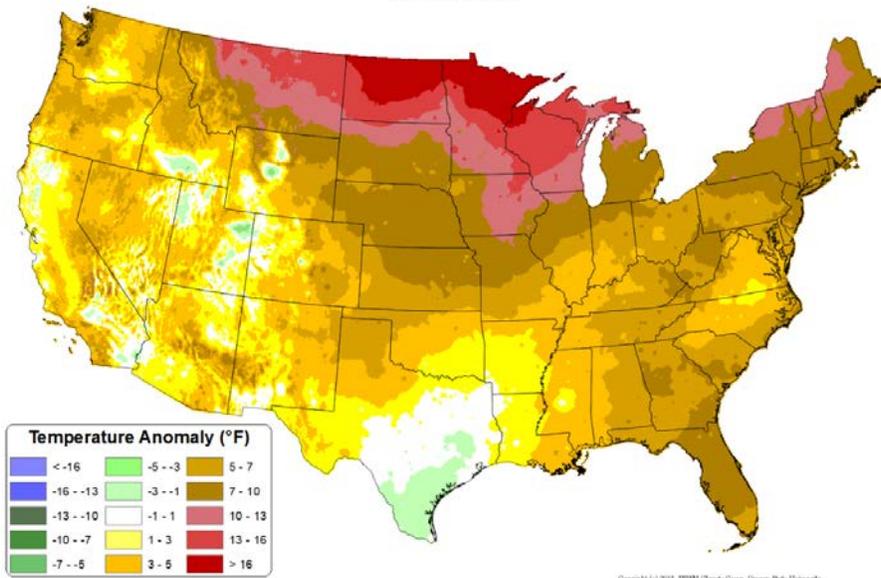
Month-to-Date, All Available Data Including SNOTEL and NWS Networks

Source: PRISM

For December 2015, the national [daily mean temperature anomaly](#) map shows well above normal temperatures in the upper Midwest and northern Great Plains. It was especially warm in North Dakota and Minnesota. Most of the remainder of the country was also above normal, to a lesser extent. This has drastically affected the snowpack across the northern tier states.

The exception to this was in southern Texas, which has been slightly cooler than normal.

Daily Mean Temperature Anomaly: 01 December 2015 - 08 December 2015
Period ending 7 AM EST 08 Dec 2015
Base period: 1981-2010
(Map created 09 Dec 2015)

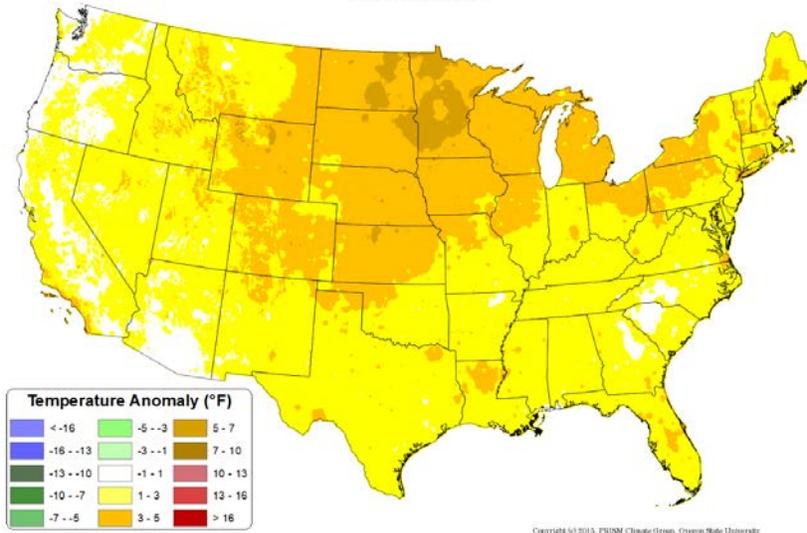


Copyright © 2015, PRISM Climate Group, Oregon State University

Last 3 Months, All Available Data Including SNOTEL and NWS Networks

Source: PRISM

Daily Mean Temperature Anomaly: September 2015 - November 2015
 Period ending 7 AM EST 30 Nov 2015
 Base period: 1981-2010
 (Map created 02 Dec 2015)



The September through November national [daily mean temperature anomaly](#) map shows most of the country reporting conditions slightly above average. The largest warm anomaly for the past three months was in the upper Midwest, centered in Minnesota.

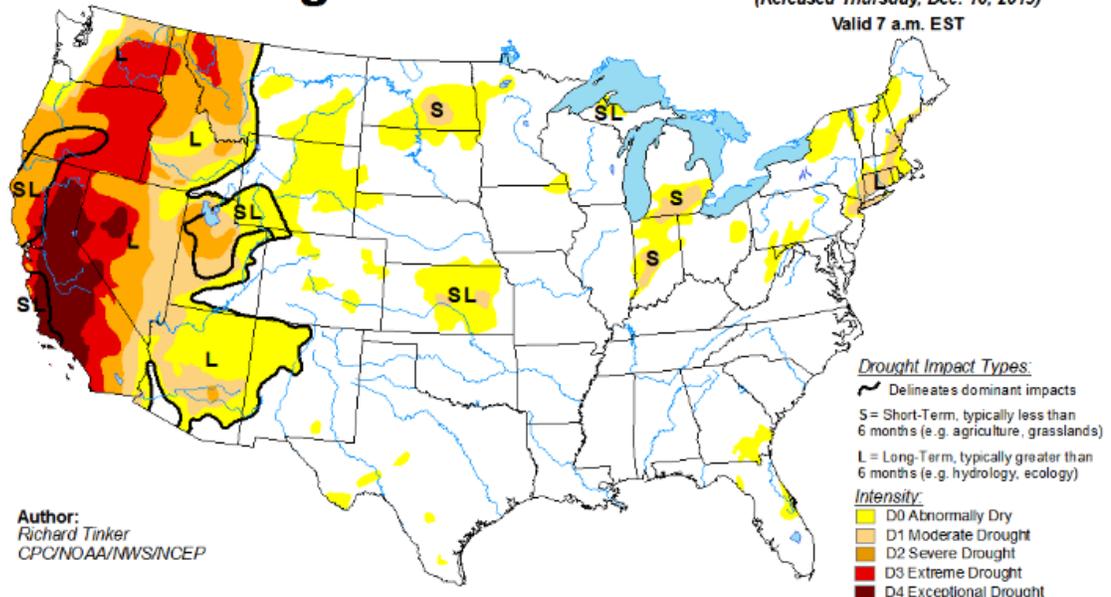
Drought

[U.S. Drought Portal](#) Comprehensive drought resource

[U.S. Drought Monitor](#) See map below. Drought conditions continue in the West Coast states, including the exceptional drought in California and Nevada.

U.S. Drought Monitor

December 8, 2015
 (Released Thursday, Dec. 10, 2015)
 Valid 7 a.m. EST



Author:
 Richard Tinker
 CPC/NOAA/NWS/NCEP

Drought Impact Types:
 ~ Delineates dominant impacts
 S = Short-Term, typically less than 6 months (e.g. agriculture, grasslands)
 L = Long-Term, typically greater than 6 months (e.g. hydrology, ecology)

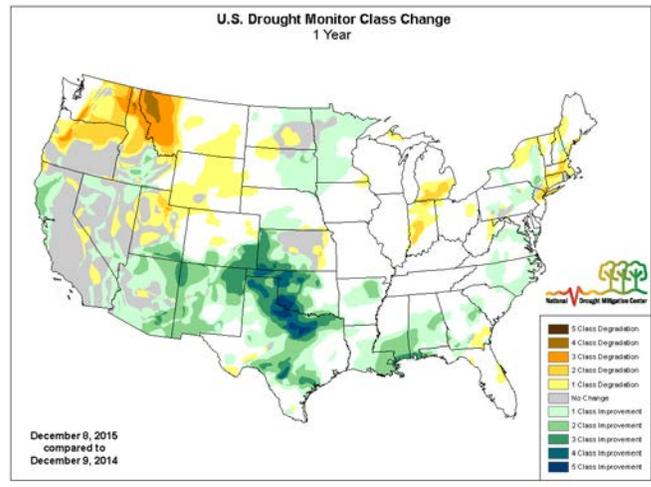
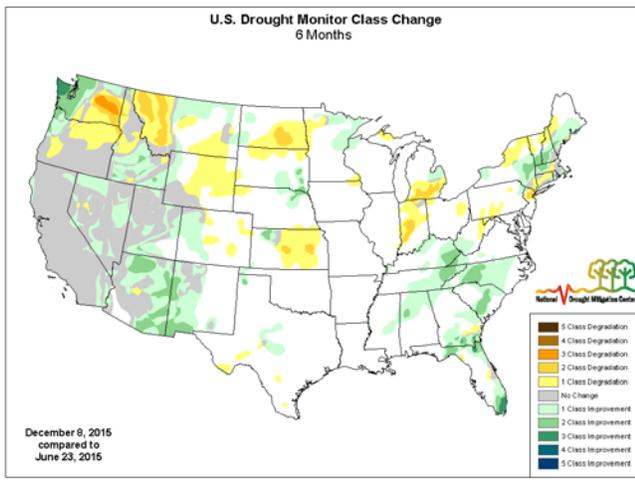
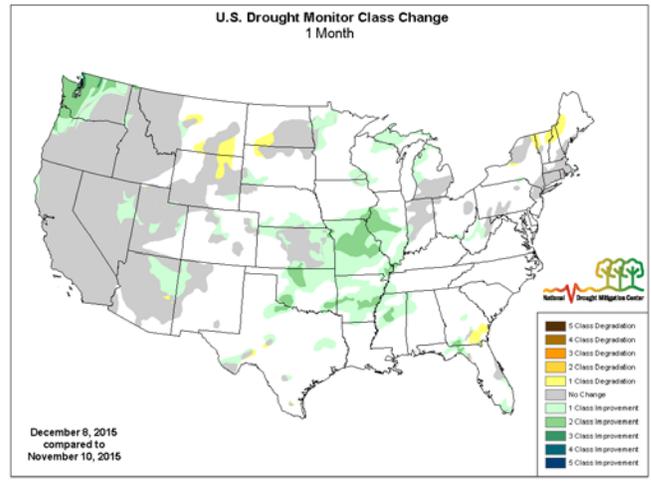
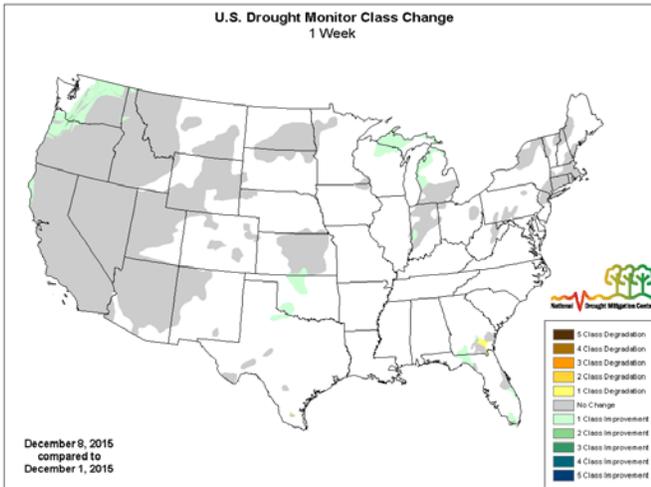
Intensity:
 D0 Abnormally Dry
 D1 Moderate Drought
 D2 Severe Drought
 D3 Extreme Drought
 D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.



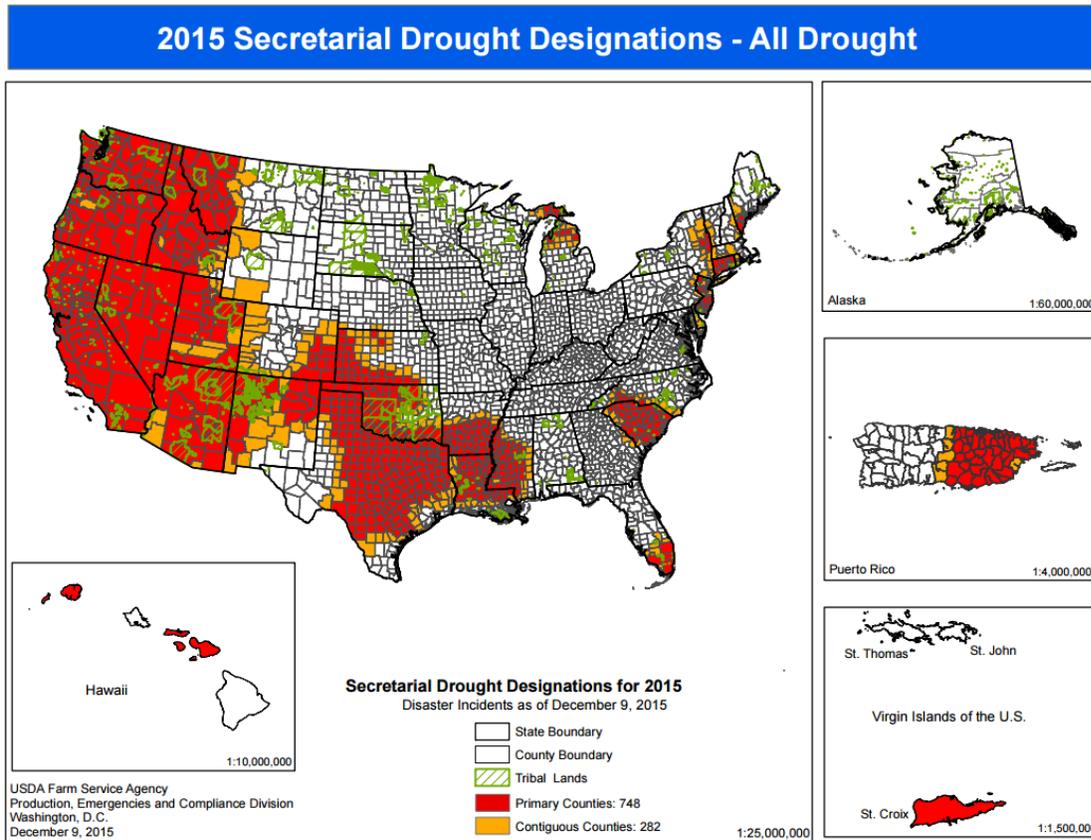
<http://droughtmonitor.unl.edu/>

Changes in Drought Monitor Categories over Time



Drought conditions have improved in much of the country, especially in the south-central U.S. The West has shown some recent improvement, but long-term drought persists.

2015 USDA Drought Designations



[Drought Designations as of December 9, 2015](#)

[USDA Disaster and Drought Information](#)

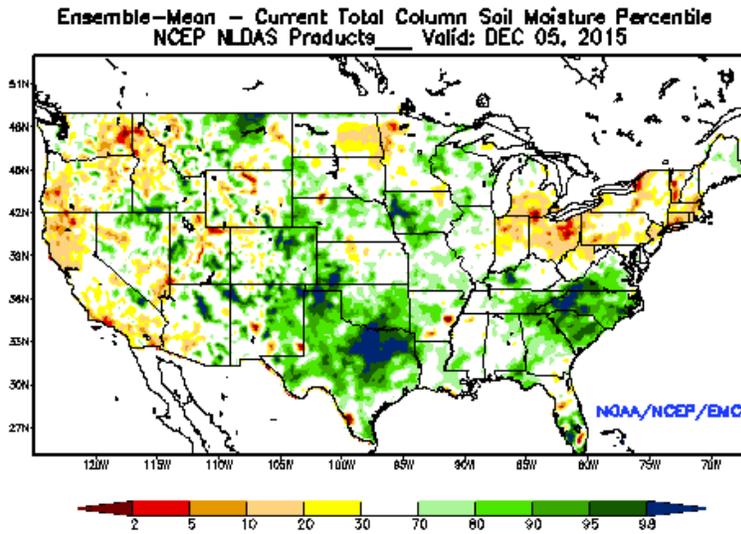
[U.S. Population in Drought, Weekly Comparison](#)

Highlighted Drought Resources

- [Drought Impact Reporter](#)
- [Quarterly Regional Climate Impacts and Outlook](#)
- [U.S. Drought Portal Indicators and Monitoring](#)

Other Climatic and Water Supply Indicators

Soil Moisture



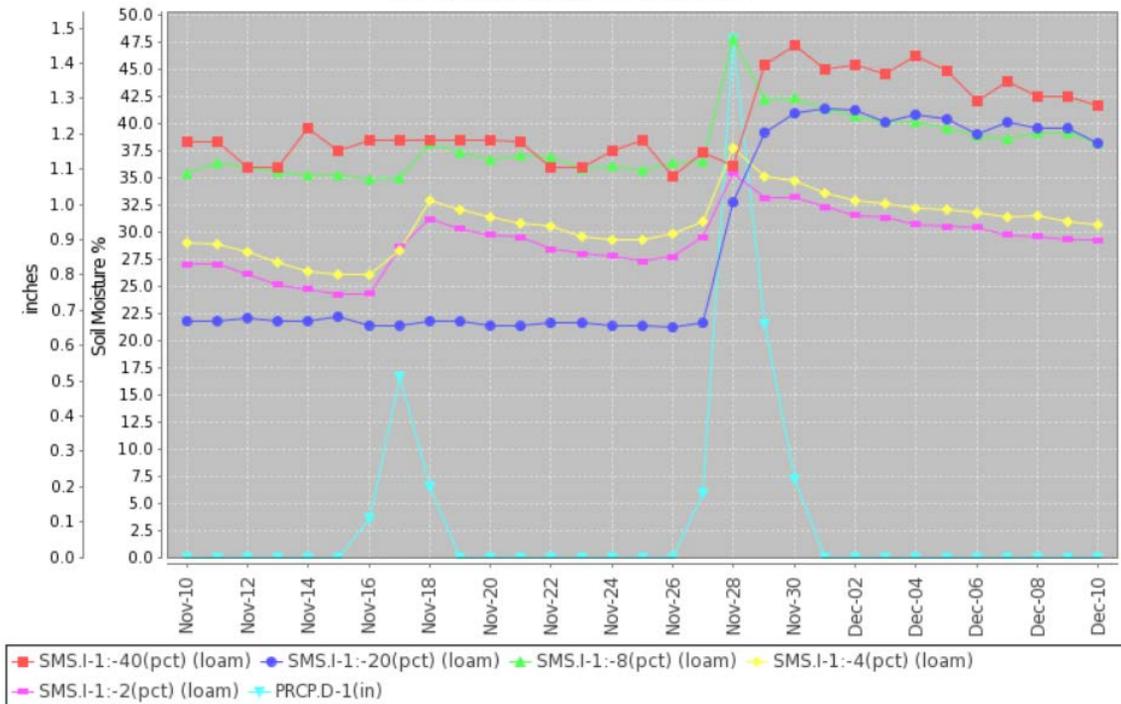
The modeled [soil moisture percentiles](#) as of December 5, 2015 show scattered areas of dryness in the far West, the Midwest, and Northeast.

Above average soil moisture was modeled in much of the interior West, Texas, and the Southeast. The areas with the wettest conditions were in the Carolinas and northeast Texas.

[University of Washington Experimental Modeled Soil Moisture](#)

Soil Moisture Data: NRCS [Soil Climate Analysis Network \(SCAN\)](#)

Station (2202) MONTH=2015-11-10 (Daily) NRCS National Water and Climate Center - Provisional Data - subject to revision
Thu Dec 10 09:18:10 GMT-08:00 2015



This graph shows soil moisture (at 2-, 4-, 8-, 20-, and 40-inch depths) and precipitation for the last 30 days at the [Vernon \(#2202\)](#) SCAN site in north-central Texas. Soil moisture response to precipitation events is noticeable at all depths for the larger storm events earlier in the month, whereas only a delayed response occurred at the 40-inch depth. The recent event on November 28 produced increased soil moisture at all depths.

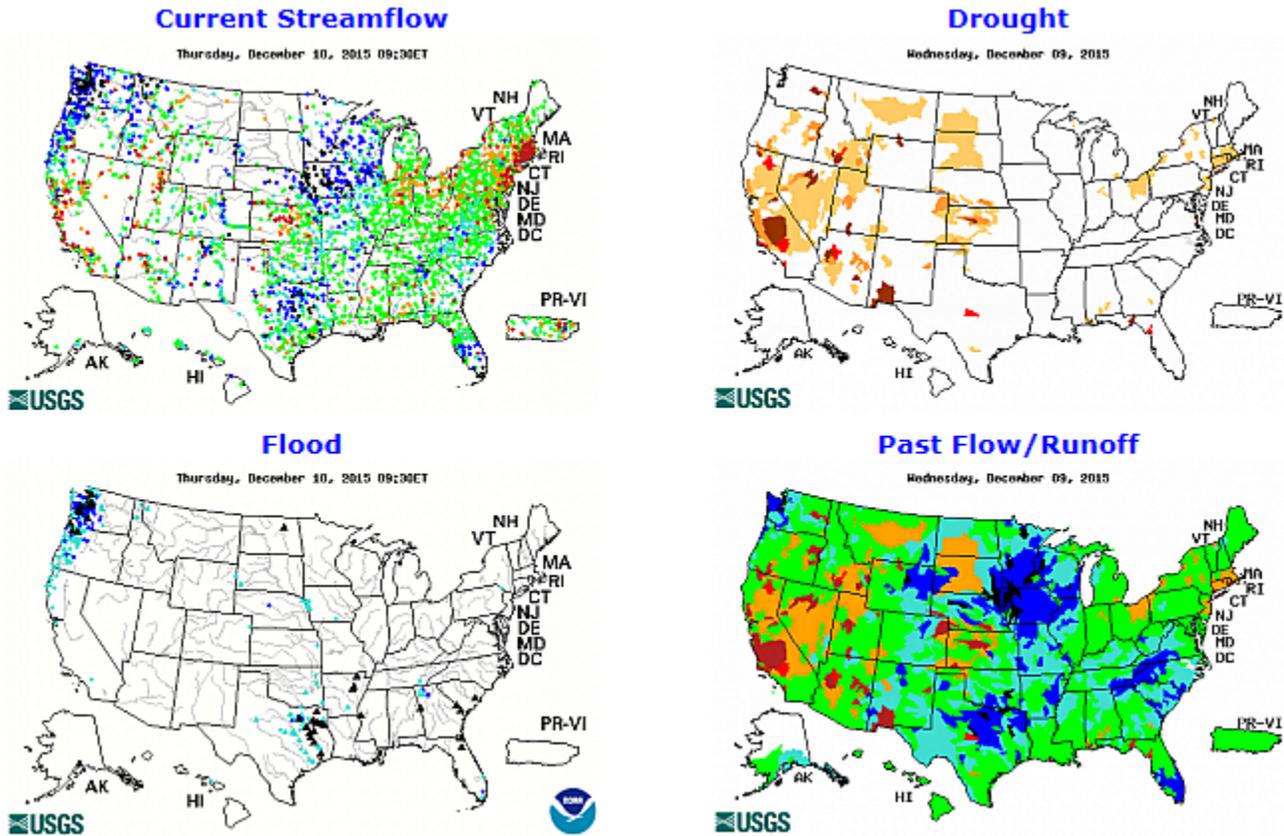
Soil Moisture Data Portals

[CRN Soil Moisture](#)

[Texas A&M University North American Soil Moisture Database](#)

Streamflow

Source: USGS



Streamflow is notably high in the upper Midwest, lower Mississippi River Valley, and the Southeast. Flooding is occurring in the Pacific Northwest, and continuing from Texas to the Carolinas.

Select any individual map to enlarge and display a legend.

Current Reservoir Storage

[National Water and Climate Center Reservoir Data](#)

U.S. Bureau of Reclamation Hydromet Tea Cup Reservoir Depictions:

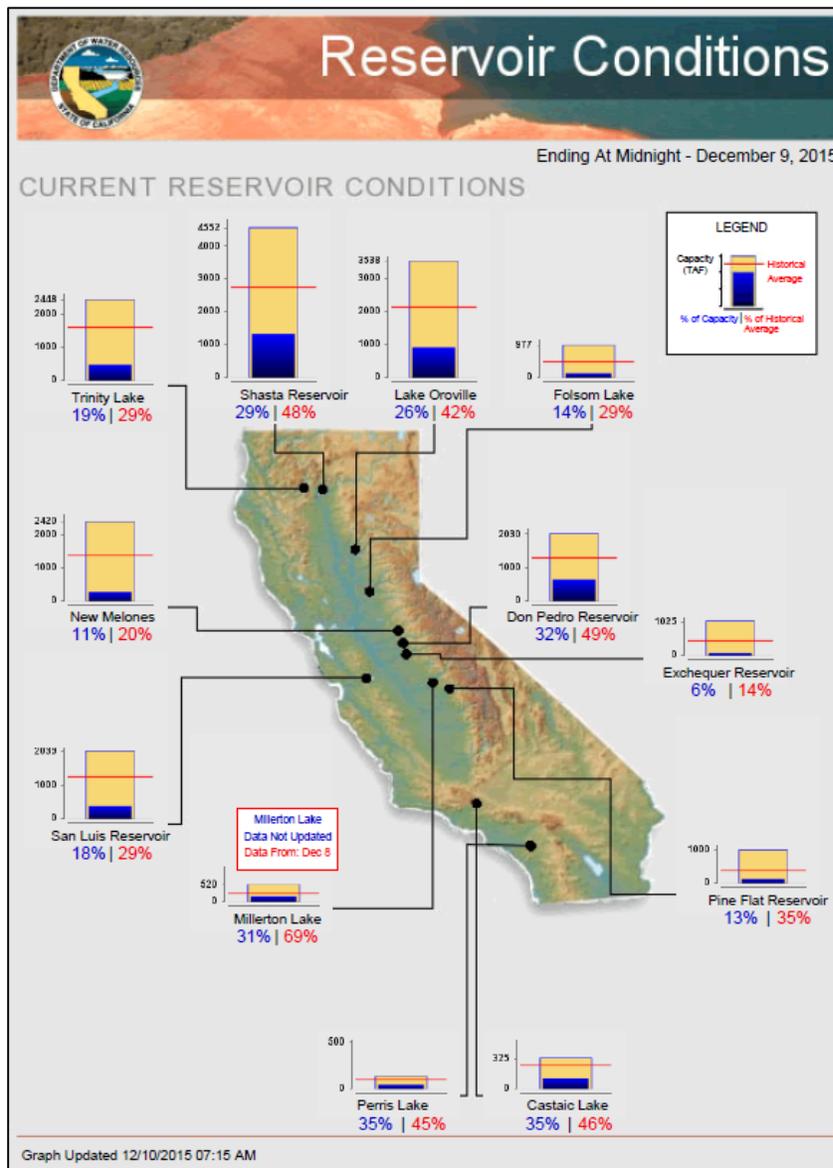
[Upper Colorado](#)

[Pacific Northwest/Snake/Columbia](#)

[Sevier River Water, Utah](#)

[Upper Missouri, Kansas, Oklahoma, Texas](#)

California Reservoir Conditions



Short- and Long-Range Outlooks

Agricultural Weather Highlights

Author: Brad Rippey, Agricultural Meteorologist, USDA/OCE/WAOB

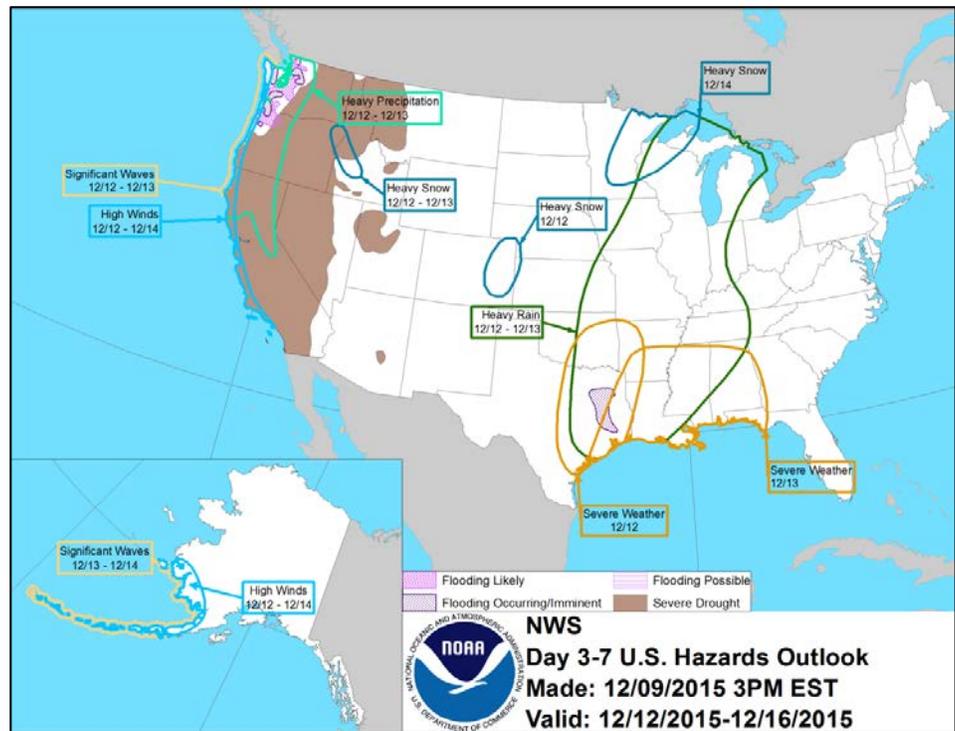
National Outlook, December 10, 2015: “During the next 5 days, several additional waves of Pacific moisture will overspread the western U.S., accompanied by a turn toward much colder weather. As a result, lowering snow levels will lead to significant accumulations from the Cascades and Sierra Nevada to the Rockies. Although stormy weather will continue in the Northwest, flooding should begin to subside as precipitation intensity diminishes and more precipitation falls as snow. During the weekend, heavy rain could lead to flooding from the western Gulf Coast region into the upper Great Lakes States, while snow should develop from the central High Plains into the upper Midwest. The NWS 6- to 10-day outlook for December 14 – 18 calls for the likelihood of above-normal temperatures from the Mississippi Valley to the East Coast, while colder-than-normal conditions will dominate areas from the Pacific Coast to the High Plains. Meanwhile, below-normal precipitation in the south-central U.S. will contrast with wetter-than-normal weather across Florida’s peninsula and in a broad area stretching from the Pacific Northwest to the middle and northern Atlantic States.”

National Weather Hazards

The outlook for [weather hazards](#) over the next week includes severe weather in the south-central part of the country and heavy rain over most of the Midwest.

Heavy snow is expected in the western Great Lakes, central Plains, and western Idaho. Significant waves, high winds, and heavy precipitation are expected along the West Coast.

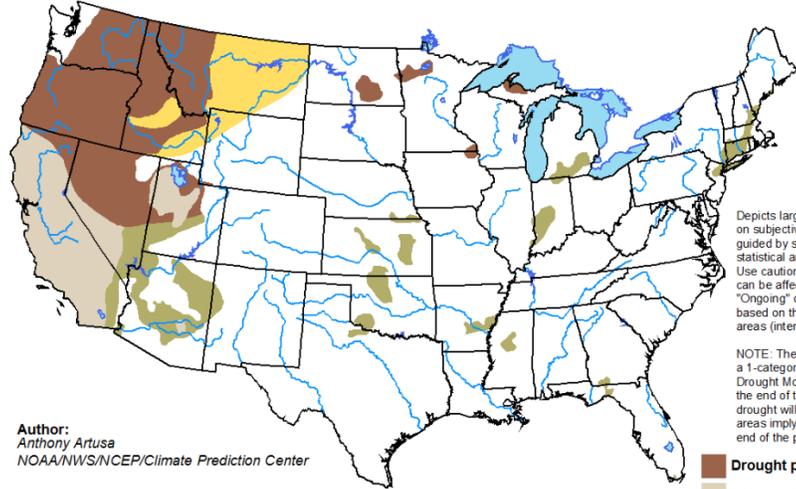
In Alaska, high winds and significant waves are expected along the Southwest coastal areas.



Seasonal Drought Outlook

During the next three months, **drought** will persist in the Northwest and may develop in eastern Montana and Hawaii. Elsewhere, most drought designations are expected to improve.

U.S. Seasonal Drought Outlook Valid for November 19 - February 29, 2016
Drought Tendency During the Valid Period
Released November 19, 2015



Author:
Anthony Artusa
NOAA/NWS/NCEP/Climate Prediction Center

Depicts large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Use caution for applications that can be affected by short-lived events. "Ongoing" drought areas are based on the U.S. Drought Monitor areas (intensities of D1 to D4).

NOTE: The tan areas imply at least a 1-category improvement in the Drought Monitor intensity levels by the end of the period, although drought will remain. The green areas imply drought removal by the end of the period (D0 or none).

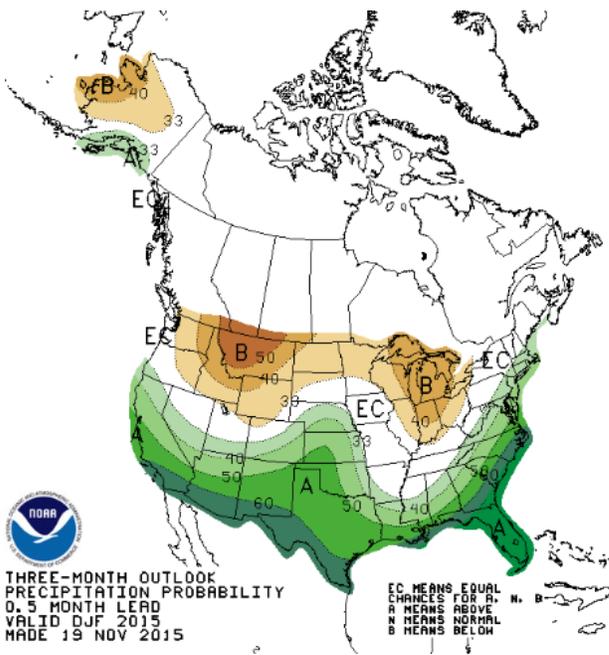
- Drought persists
- Drought remains but improves
- Drought removal likely
- Drought development likely



<http://go.usa.gov/3eZ73>

NWS Climate Prediction Center 3-Month Outlook

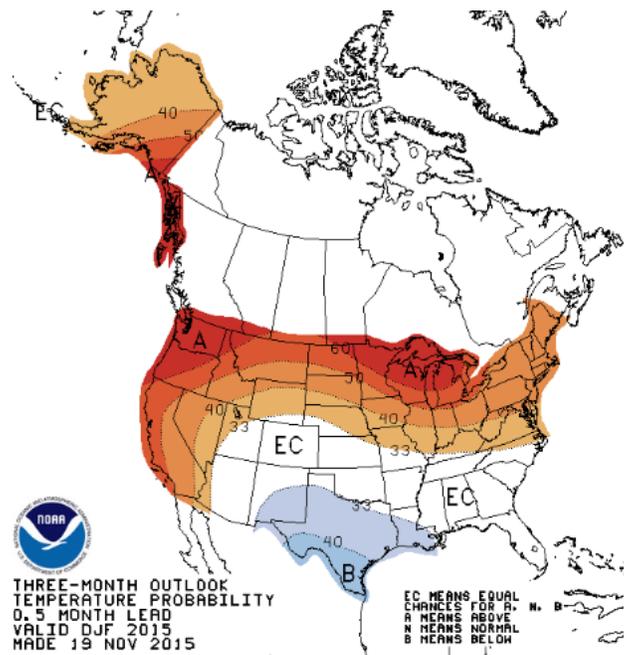
Precipitation



THREE-MONTH OUTLOOK
PRECIPITATION PROBABILITY
0.5 MONTH LEAD
VALID DJF 2015
MADE 19 NOV 2015

EC MEANS EQUAL CHANCES FOR A, N, B
A MEANS ABOVE
N MEANS NORMAL
B MEANS BELOW

Temperature



THREE-MONTH OUTLOOK
TEMPERATURE PROBABILITY
0.5 MONTH LEAD
VALID DJF 2015
MADE 19 NOV 2015

EC MEANS EQUAL CHANCES FOR A, N, B
A MEANS ABOVE
N MEANS NORMAL
B MEANS BELOW

Outlook Summary

NWS Climate Prediction Center:

“[The December-January-February \(DJF\) 2015-2016 precipitation outlook](#) through the early spring continues to favor a pattern that is typically associated with El Niño. Enhanced odds for above-median precipitation are forecast across California, the Southeast, central/southern Plains, Gulf Coast states, and parts of the east coast. Higher probabilities (above 50 percent) are shifted north across California from the previous outlook due to the strength of the ongoing El Niño. The highest probabilities (above 70 percent) for above-median precipitation are forecast across the Florida peninsula and DJF 2015-16 through JFM 2016 which typically has the strongest wet signal during El Niño. Below-median precipitation is favored through the early spring across the northern Rockies, parts of the northern Great Plains, Great Lakes, and the Ohio Valley. The dry signal across the Ohio Valley typically peaks during the JFM 2016 season during El Niño.”

“[The December-January-February \(DJF\) 2015-2016 temperature outlook](#). The largest change in the temperature outlook from the previous one released on October 15 is the expectation that below-normal temperatures are slightly less likely for the Southeast from DJF 2015-16 through MAM 2016. Although statistical models such as the CA, CCA, and SMLR continue to favor below-normal temperatures across the Southeast, especially during JFM 2016, the latest dynamical models have a notable warming trend since last month across the Southeast. The NMME temperature forecast is a good compromise and the official outlook for DJF 2015-16 and JFM 2016 is generally similar to its guidance across the southern tier of the continental U.S. Due to the strength of the current El Niño, above-normal temperatures are no longer favored for the Aleutians during DJF 2015-16 and JFM 2016. All temperature tools continue to strongly favor above-normal temperatures across the northern half of the continental U.S. through the early spring which is consistent with a strong El Niño. Also, above-normal SSTs along the west coast contribute to the enhanced odds for above-normal temperatures during DJF 2015-16. Below-normal temperatures favored for the southern high plains during the 2016 spring are partly related to the expectation of abnormally moist topsoil at that lead time.”

More Information

The NRCS [National Water and Climate Center](#) publishes this weekly report. We welcome your feedback. If you have questions or comments, please [contact us](#).