

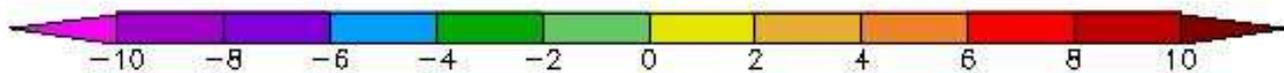
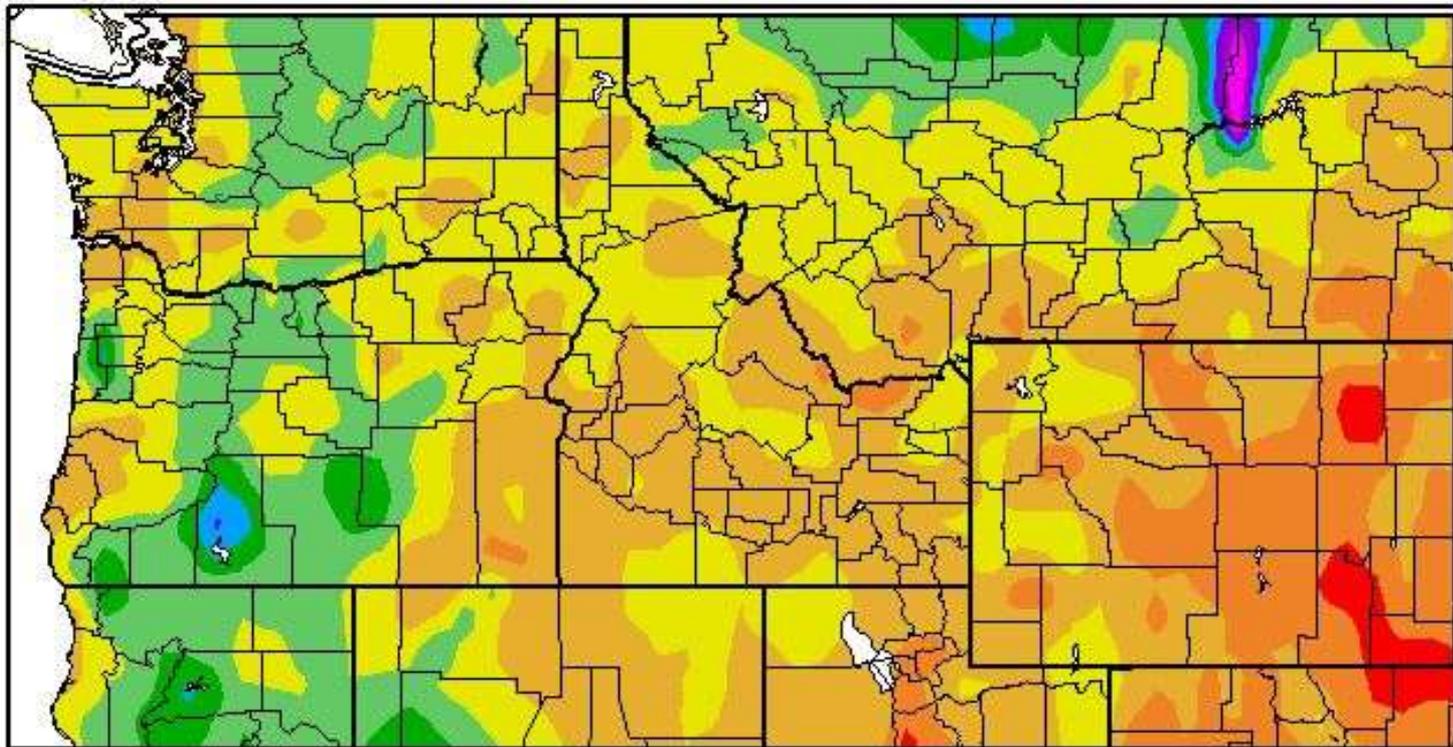


The Month In Review

October 2016

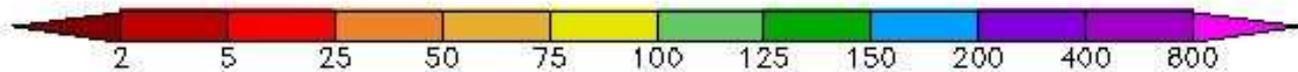
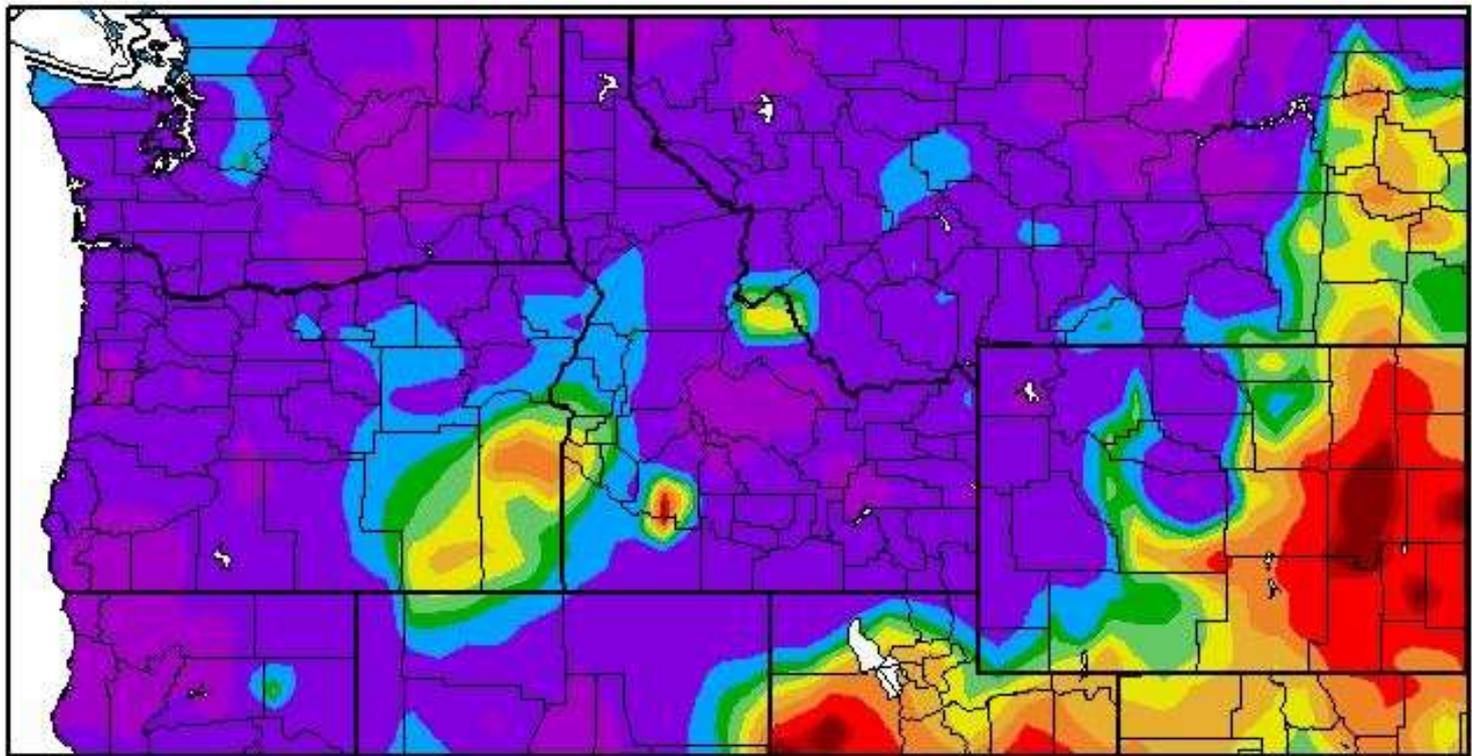
National Weather Service
Pendleton, Oregon

Departure from Normal Temperature (F) 10/1/2016 – 10/31/2016



Percent of Normal Precipitation (%)

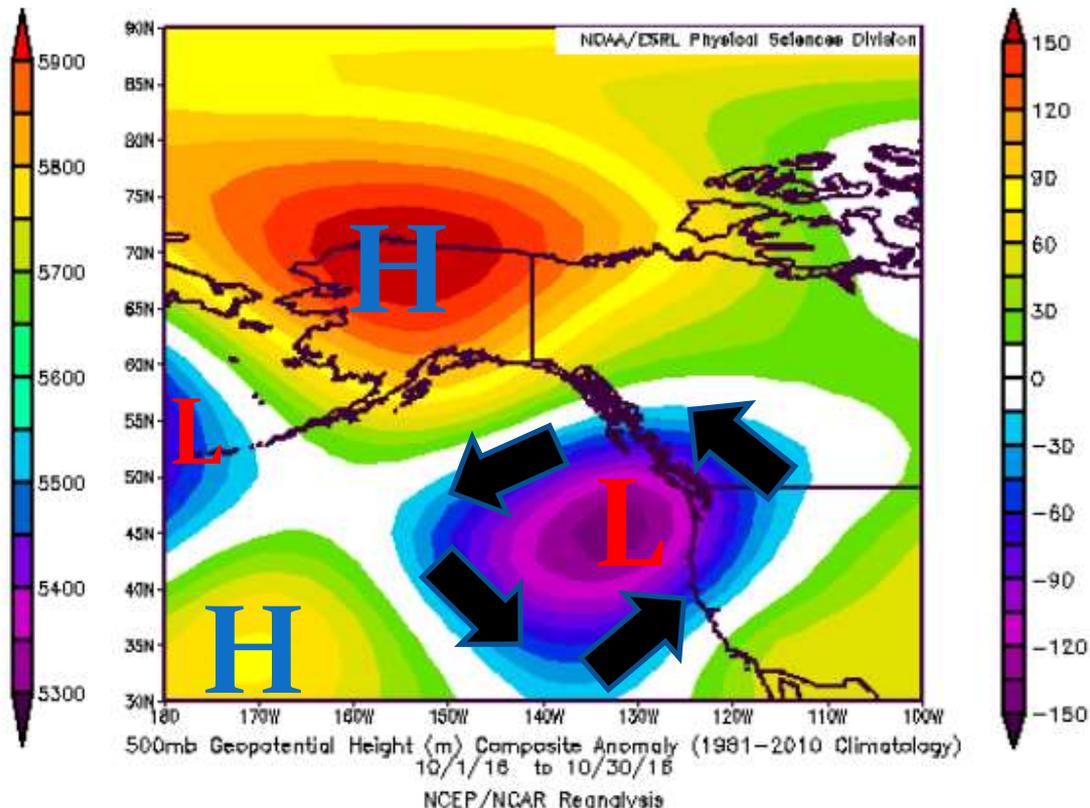
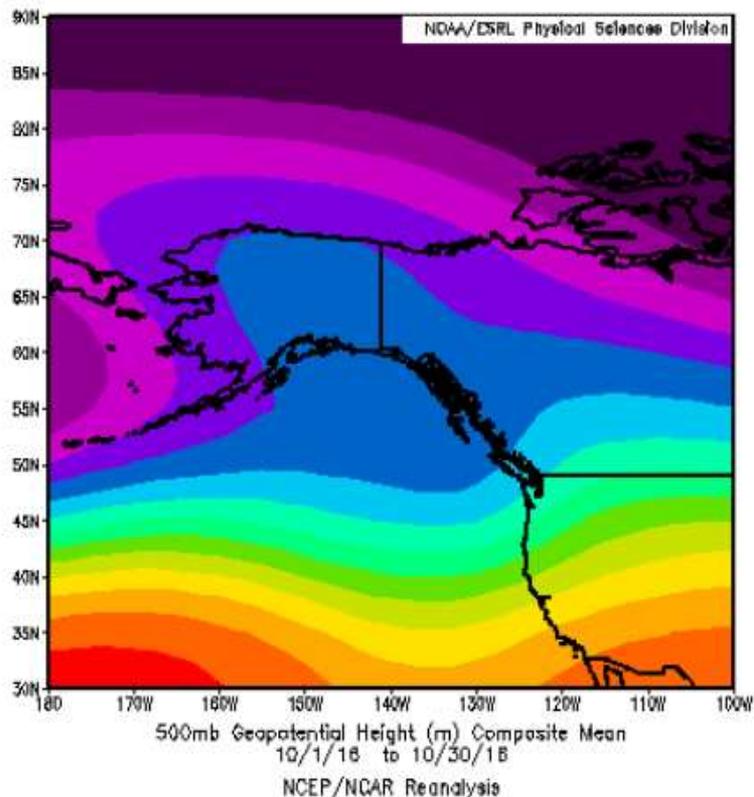
10/1/2016 – 10/31/2016





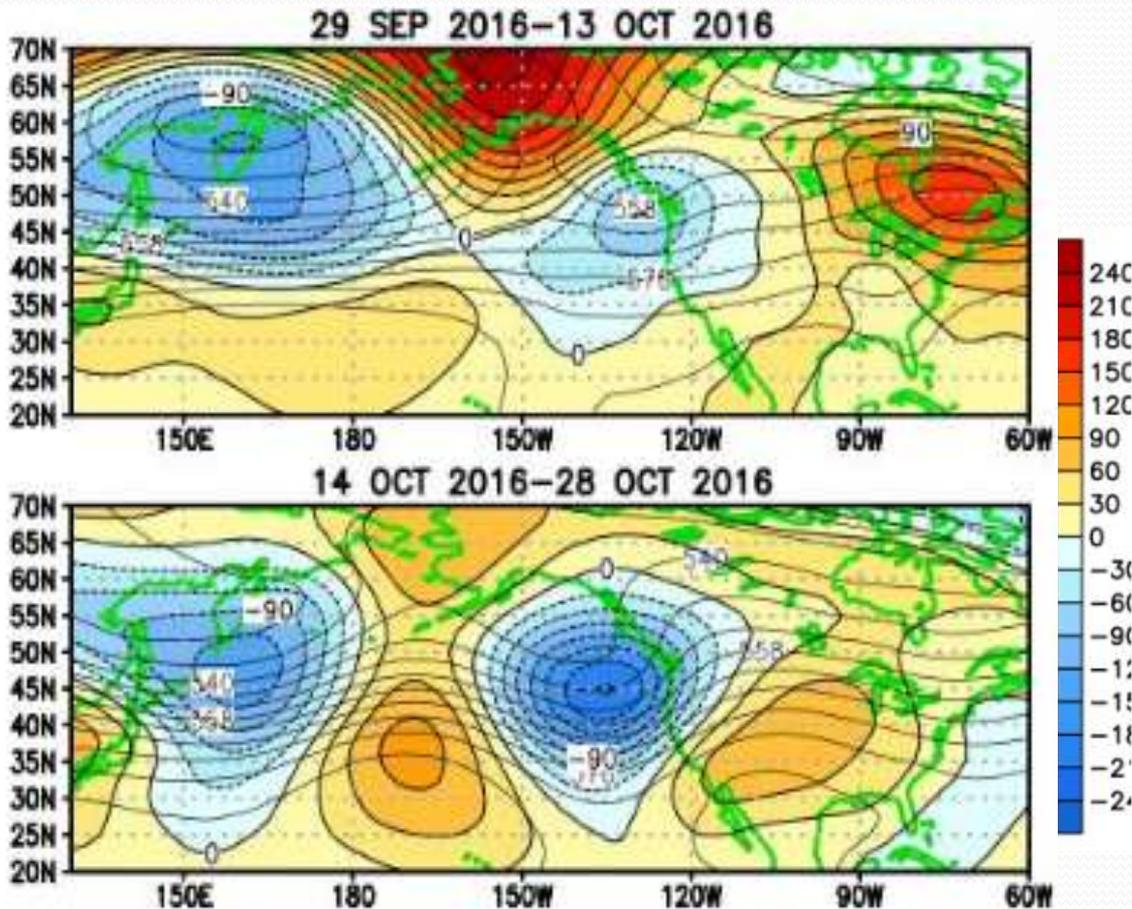
October 2016

Synoptic Weather Pattern



The mean synoptic pattern for the month of October 2016 was characterized by a strong Pacific jet stream and a deep trough of low pressure centered just off the Northwest coast. With the mean overall trough centered in this location, it allowed multiple weather systems to drag fronts across the interior Pacific Northwest. The general southwesterly flow kept conditions rather mild, and snow levels high. Therefore, much of the heavy precipitation which fell through the month came in the form of rain, even in the mountains. This same flow tapped subtropical moisture from time to time, and even brought remnants of western Pacific typhoons over the region. This allowed for a top 5, or even the wettest October on record for multiple locations in eastern Washington and Oregon.

October 2016 Detailed Upper Level Pattern Analysis



- ❖ The first two weeks of the month featured a developing trough of low pressure over the Pacific Northwest, and a very strong ridge of high pressure over Alaska.
- ❖ The next two weeks had an even deeper trough of low pressure developing along the Pacific Northwest coast, and extending inland. The ridge of high pressure had weakened and shifted into mostly west-central Alaska. A stronger ridge of high pressure also developed over the Plains States, and even the Southwest US.



Wettest Octobers On Record

City	Rank	Oct 2016 Precip Total	Current or previous Oct Max Precip
Walla Walla, WA	#1	4.55"	4.42" in 1950
Ellensburg, WA	#1	2.57"	2.11" in 2012
Hermiston, OR	#1	1.90"	1.62" in 2012
Pasco, WA	#1	2.58"	1.13" in 2000
Yakima, WA	#1	2.43"	2.22" in 1950
Madras, OR	#1	2.63"	2.21" in 1979
Moxee City, WA	#1	3.10"	2.81" in 1950
Satus Pass, WA	#1	6.27"	3.56" in 1973
Mcnary Dam, OR	#1	2.14"	1.53" in 2012
Mitchell, OR	#1	3.04"	2.42" in 1998
Wickiup Dam, OR	#1	5.74"	2.67" in 1982



Top 5 Wettest Octobers on Record

City	Rank	Oct 2016 Precip Total	Current or previous Oct Max Precip
Bickleton, WA	#1	4.54"	3.82" in 1947
Mill Creek Dam	#1	5.89"	4.61" in 1950
Prosser, WA	#1	2.74"	2.73" in 1950
Selah, WA	#1	1.90"	1.21" in 2011
Whitman Mission	#1	3.22"	2.78" in 2012
Mt. Adams RS	#1	14.58"	10.96" in 1947
Meacham, OR	#2	5.86"	6.49" in 1951
Easton, WA	#2	7.96"	8.23" in 2012
Kennewick, WA	#2	2.53"	3.07" in 1947
The Dalles, OR	#3	3.07"	4.04" in 1994
Redmond, OR	#3	1.74"	2.75" in 1950



Top 5 Wettest Octobers (Cont'd)

City	Rank	Oct 2016 Precip Total	Current or previous Oct Max Precip
Arlington, OR	#3	2.70"	2.89" in 1940
John Day, OR	#3	2.23"	3.32" in 1957
Milton Freewater	#3	2.94"	4.38" in 1950
Pendleton Exp Sta.	#3	3.66"	3.84" in 2000
Pendleton (City)	#3	2.32"	3.92" in 1900
Pelton Dam, OR	#3	1.72"	2.17" in 2007
Goldendale, WA	#4	4.28"	5.66" in 1950
Pendleton (Arpt)	#5	2.32"	2.79" in 1947
Dayton, WA	#5	3.85"	4.96" in 1893



Daily Record Maximum Precipitation in October

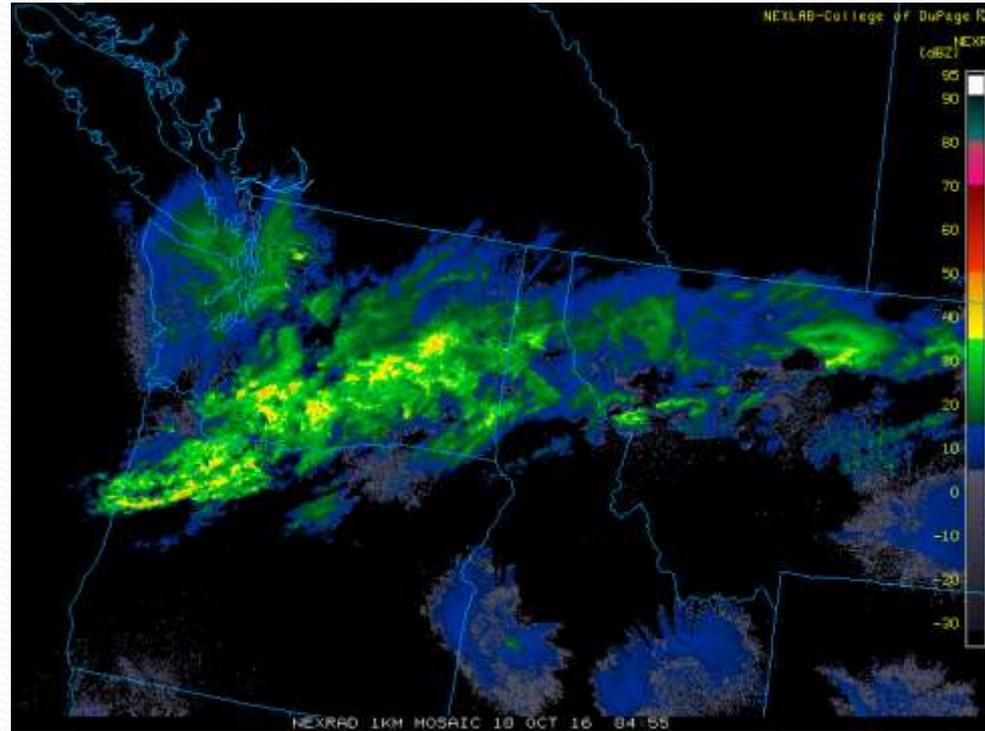
City	Rank	Daily Precip Record: Oct 2016	Current or Previous Oct Daily Precip Record
Pasco, WA	#1	0.88" 10/30	0.43" 10/01/2000
Moxee City, WA	#2	0.91" 10/10	1.17" 10/27/1994
Mt Adams RS. WA	#4	2.88" 10/15	3.35" 10/27/1994
Ellensburg, WA	#5(T)	0.49" 10/26	0.72" 10/19/1947
Redmond, OR	#5	0.69" 10/29	1.59" 10/28/1950
Satus Pass, WA	#7	1.00" 10/14	1.73" 10/31/1973
Milton Freewater	#8	0.91" 10/17	1.43" 10/14/1980
Yakima, WA	#9(T)	0.57" 10/09	1.01" 10/28/1982
Pendleton Exp. Station	#10	0.73" 10/14	1.61" 10/14/1980



October Significant Weather

October 9-10th Heavy Rain (Washington)

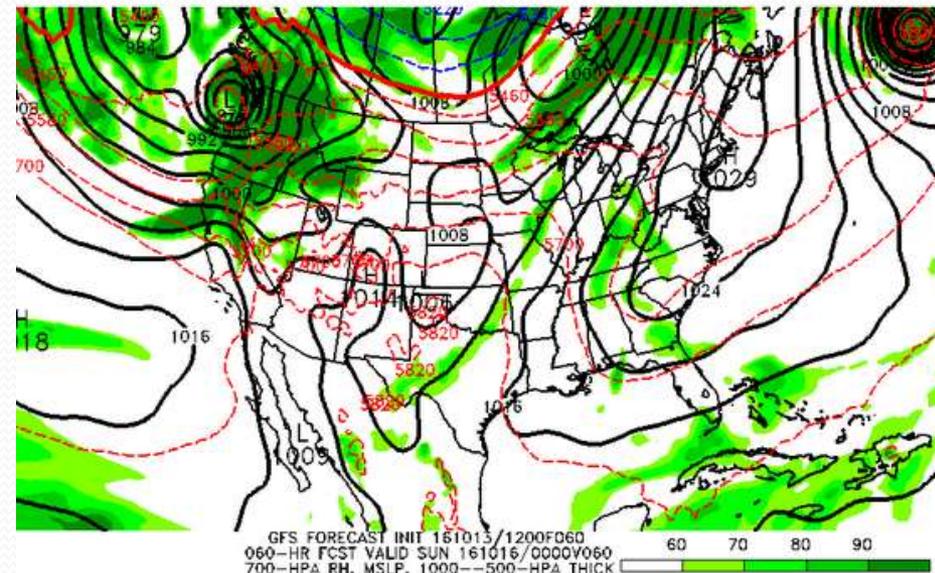
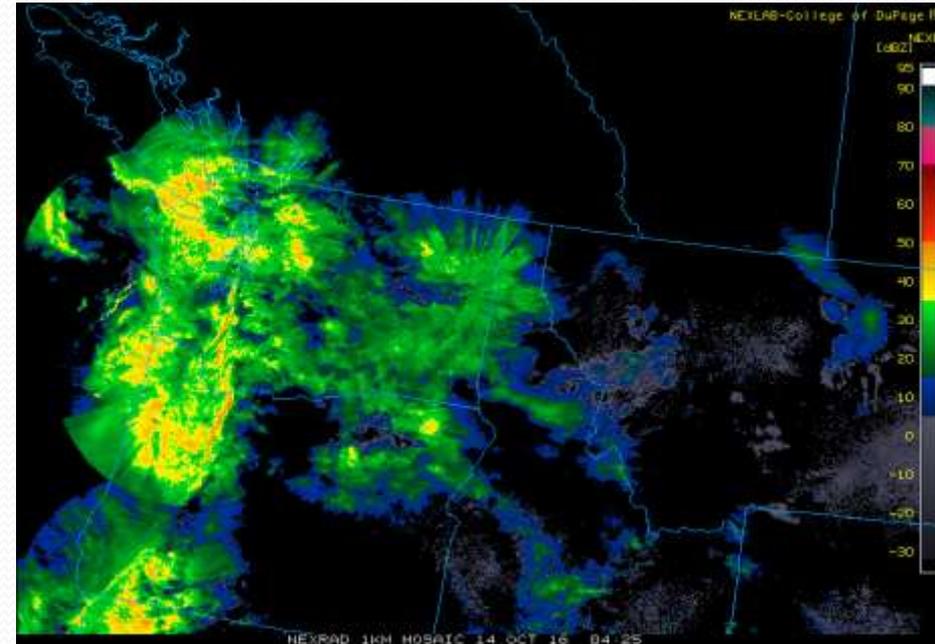
Location	Peak Wind	2 Day Precip
Pendleton, OR	27 MPH	0.16"
Meacham, OR	21 MPH	0.25"
Redmond, OR	22 MPH	Trace
Pasco, WA	33 MPH	0.70"
Walla Walla, WA	26 MPH	0.42"
Yakima, WA	25 MPH	0.57"
Hermiston, OR	22 MPH	0.15"
Ellensburg, WA	30 MPH	0.41"
The Dalles, OR	26 MPH	0.23"
Easton, WA	N/A	0.53"



A stalled frontal boundary moved into southern Washington and remained nearly stationary during the afternoon and evening hours on October 9th. This front then pushed through the remainder of northeast Oregon as a cold front overnight on the 9th into the 10th. This weather system produced moderate to heavy rainfall over southern Washington from near Yakima south to the Tri-cities.

October 13 – 16th Heavy Rain & Wind

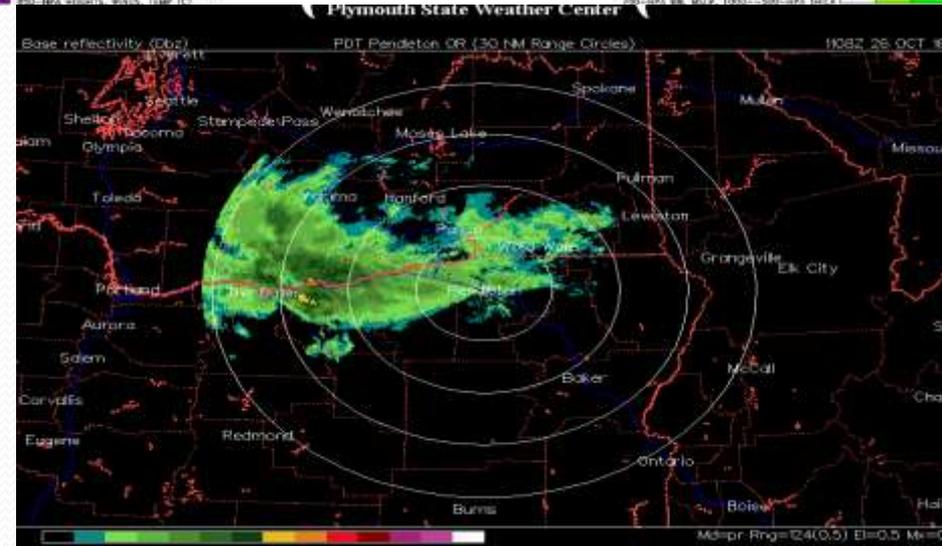
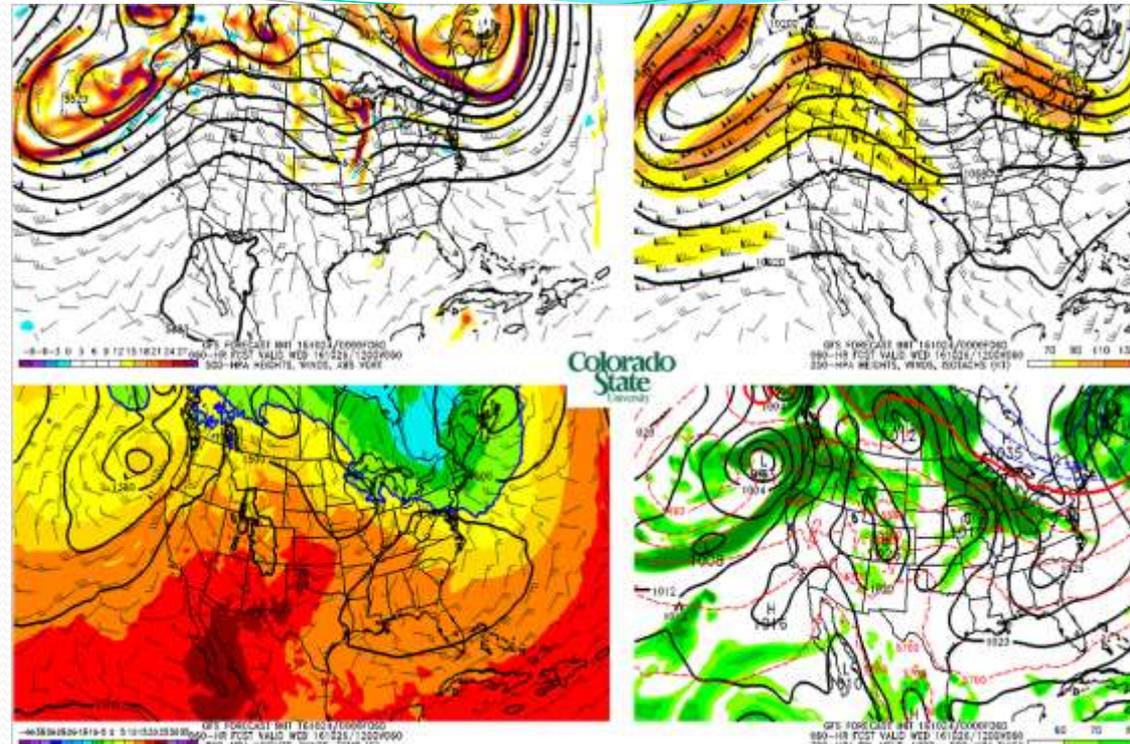
Location	Peak Wind	Total Precip
Pendleton, OR	59 MPH	0.78"
Meacham, OR	23 MPH	1.69"
Redmond, OR	54 MPH	0.17"
Pasco, WA	45 MPH	0.54"
Walla Walla, WA	54 MPH	0.99"
Yakima, WA	39 MPH	0.74"
Hermiston, OR	53 MPH	0.63"
Ellensburg, WA	24 MPH	0.89"
The Dalles, OR	38 MPH	0.64"
Easton, WA	N/A	2.12"



A power pacific jet stream developed during this period, and combined with the remnants of Typhoon Songda to produce heavy rain and strong winds over our area. There were actually two separate storm systems during this time which both affected the area. Four day rain totals were mainly between 0.5 to 1 inch in the lower elevations with 1-3 inches of rain in the mountains. Wind gusts briefly reached 50-60 MPH in some locations. Damage was mainly limited to downed tree branches and some localized power interruptions.

October 24 - 27th Rain & Wind

Location	Peak Wind	Total Precip
Pendleton, OR	32 MPH	0.33"
Meacham, OR	19 MPH	0.68"
Redmond, OR	42 MPH	0.62"
Pasco, WA	20 MPH	0.16"
Walla Walla	46 MPH	0.37"
Yakima, WA	18 MPH	0.68"
Hermiston, OR	24 MPH	0.20"
Ellensburg, WA	None	0.51"
The Dalles, OR	24 MPH	0.71"
Easton, WA	N/A	0.99"
Madras, OR	40 MPH	0.74"
Bend, OR	37 MPH	0.87"
Dayville, OR	N/A	0.25"
Joseph, OR	40 MPH	0.25"



A series of fronts brought periods of rain and some wind to the region during this time. The heaviest rain fell over Central Oregon, and along the East Slopes of the Cascades, including near The Dalles and Yakima.

October 29 – 30th Heavy Rain

Location	2 Day Precip Amounts
Pendleton, OR	0.53"
Meacham, OR	1.09"
Redmond, OR	0.70"
Pasco, WA	0.93"
Walla Walla	0.74"
Yakima, WA	0.30"
Hermiston, OR	0.49"
Ellensburg, WA	0.30"
The Dalles, OR	0.43"
Easton, WA	0.26"
Kennewick, WA	1.00"
Heppner, OR	0.49"
John Day, OR	0.53"
Madras, OR	0.20"



A warm front lifted through the area bringing periods of rain. Some of the steadiest and heaviest rain fell across far northern Oregon and into the Tri-Cities of Washington during the evening of the 30th. A thunderstorm even developed near Hermiston!

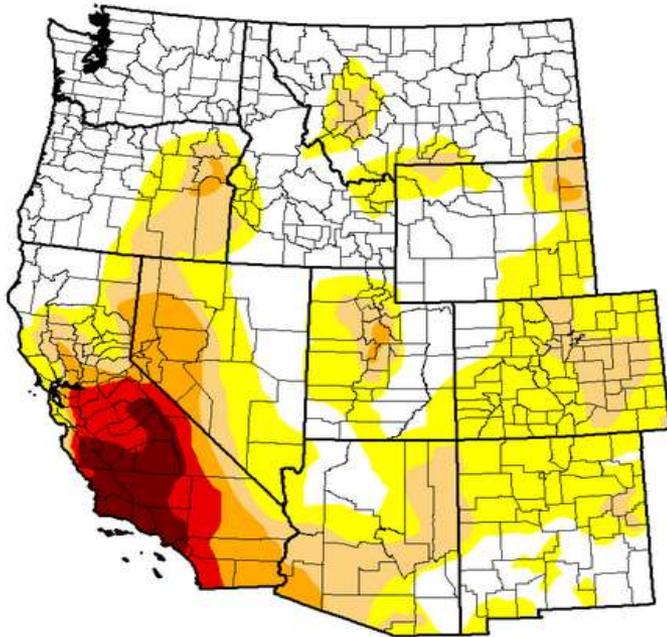
Drought Improves

U.S. Drought Monitor West

November 1, 2016
(Released Thursday November 3, 2016)
Valid 8 a.m. EDT

Statistics type: Traditional Percent Area

Export table:   



Week	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current 2016-11-01	44.71	55.29	25.26	11.18	5.73	2.81
Last Week 2016-10-25	48.25	51.75	24.46	11.24	5.73	2.81
3 Months Ago 2016-08-02	27.57	72.43	32.16	11.10	6.09	2.81
Start of Calendar Year 2015-12-29	33.17	66.83	45.07	29.30	15.92	6.85
Start of Water Year 2016-09-27	27.78	72.22	30.95	13.45	5.77	2.81
One Year Ago 2015-11-03	27.09	72.91	54.45	39.19	22.42	6.90

Estimated Population in Drought Areas: **44,728,323**

[View More Statistics](#)

Intensity:

-  D0 (Abnormally Dry)
-  D2 (Severe Drought)
-  D4 (Exceptional Drought)
-  D1 (Moderate Drought)
-  D3 (Extreme Drought)

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

Author(s):

Deborah Bathke, National Drought Mitigation Center

Download:   

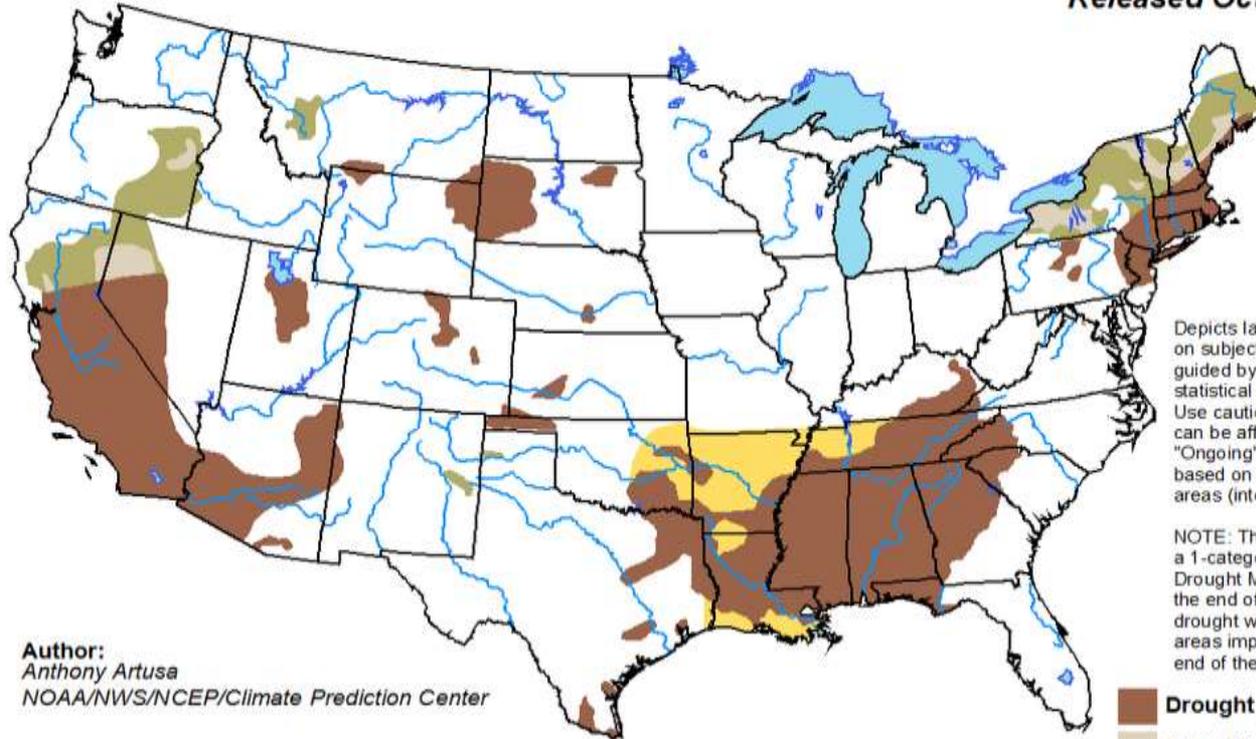
The latest drought monitor shows some improvement over much of the region. Some D1 and even a very small area of D2 drought is lingering over eastern, and especially southeastern Oregon. The substantial October rainfall allowed much of the area to be removed from any drought categories.



November Drought Outlook

U.S. Monthly Drought Outlook Drought Tendency During the Valid Period

Valid for November 2016
Released October 31, 2016



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).

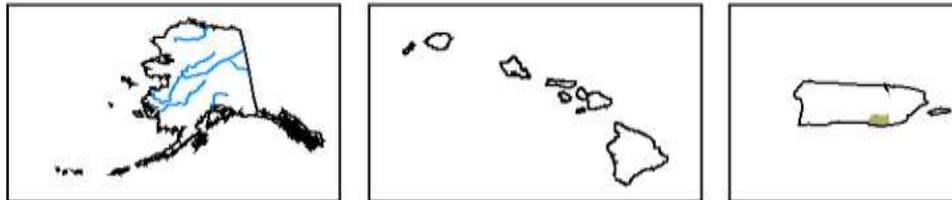
NOTE: The tan areas imply at least a 1-category improvement in the Drought Monitor intensity levels by the end of the period, although drought will remain. The green areas imply drought removal by the end of the period (D0 or none).

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

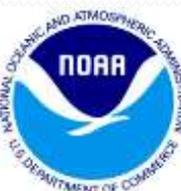
-  Drought persists
-  Drought remains but improves
-  Drought removal likely
-  Drought development likely



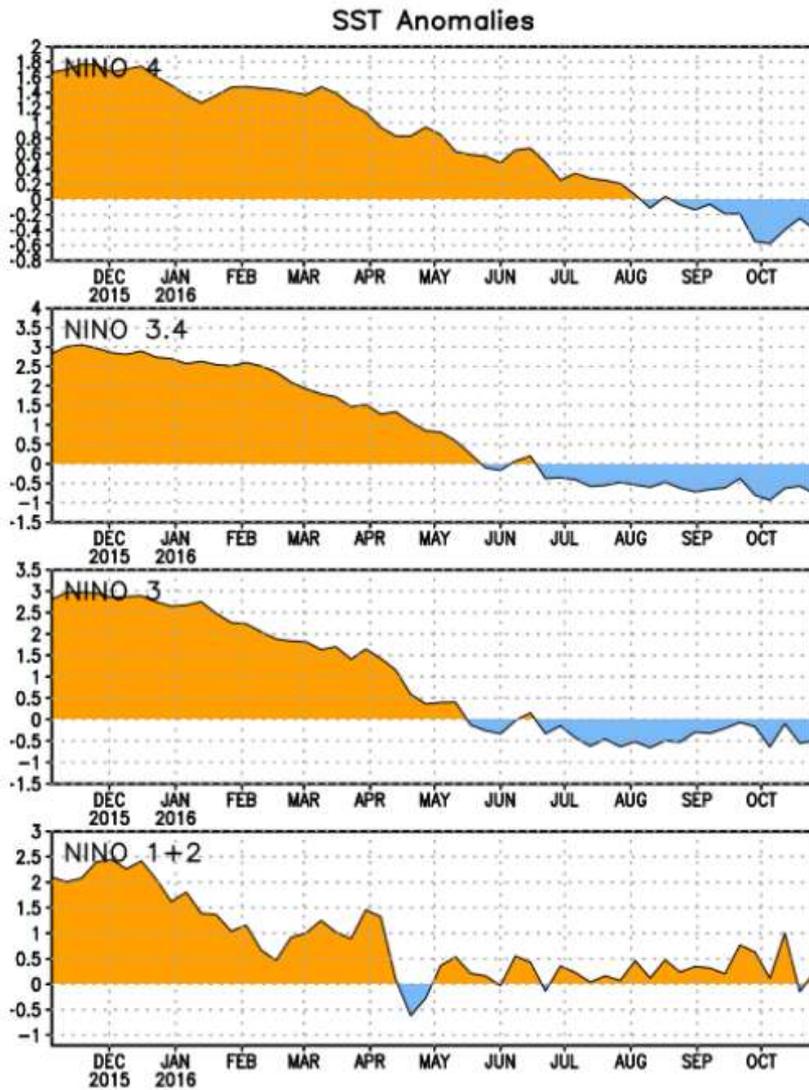
<http://go.usa.gov/3eZGd>



The monthly drought outlook for November from CPC indicates drought removal likely across most of eastern Oregon. A small area, mainly in Baker County may see drought improving, but still persisting.



La Nina Watch Reissued

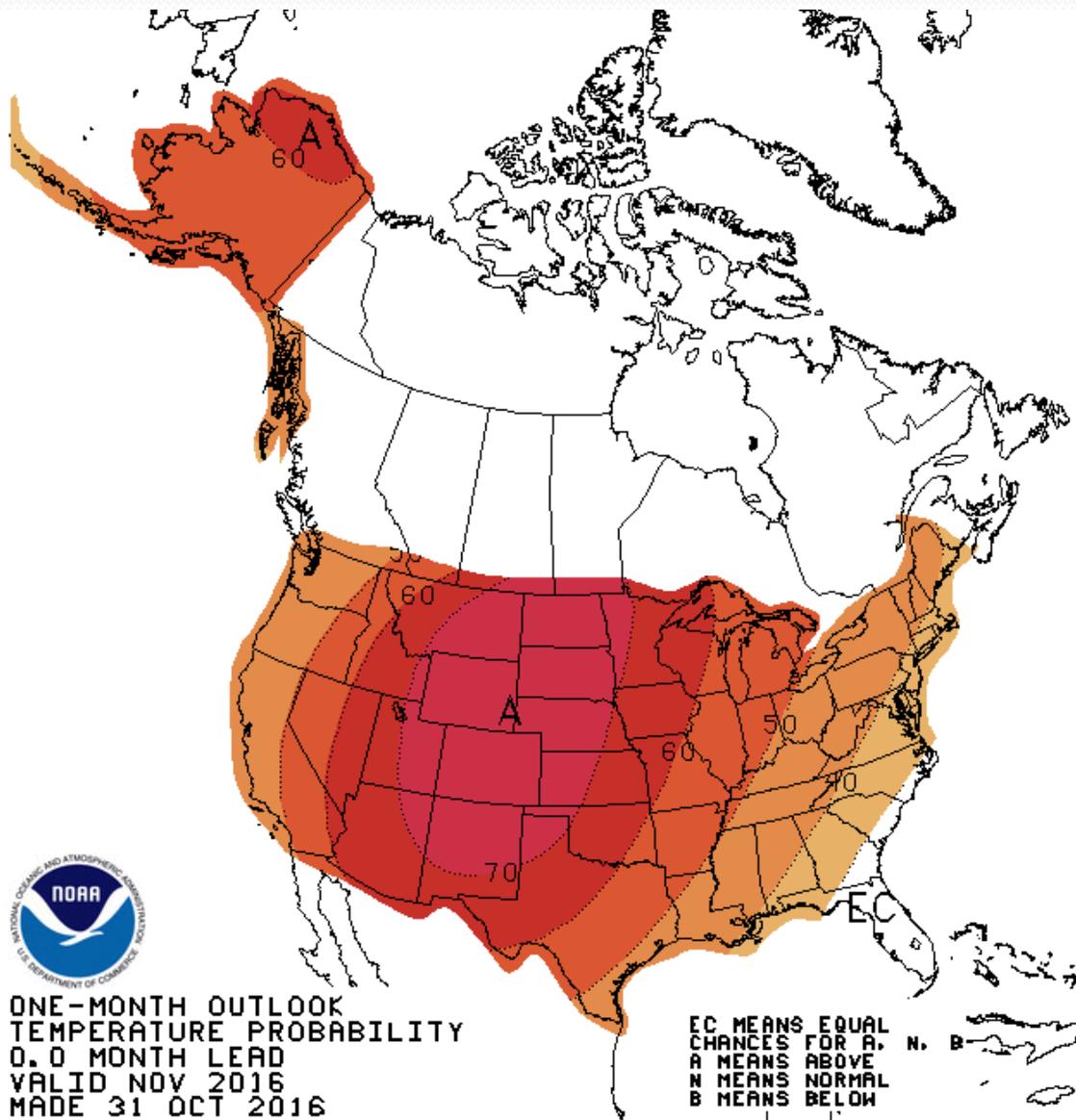


- ❖ Currently, cooler than average sea surface temperatures were observed in the Niño 3 and 3.4 regions. Niño 1+2 continues to have warmer than average sea surface temperatures.
- ❖ The La Niña watch has now been reissued. A developing La Niña is now favored through the first half of winter, before weakening during the late winter and early spring. Probabilities of La Niña are now near 70 percent.
- ❖ The La Niña is expected to remain weak, but will still likely have an impact on the atmospheric weather patterns into the winter months.



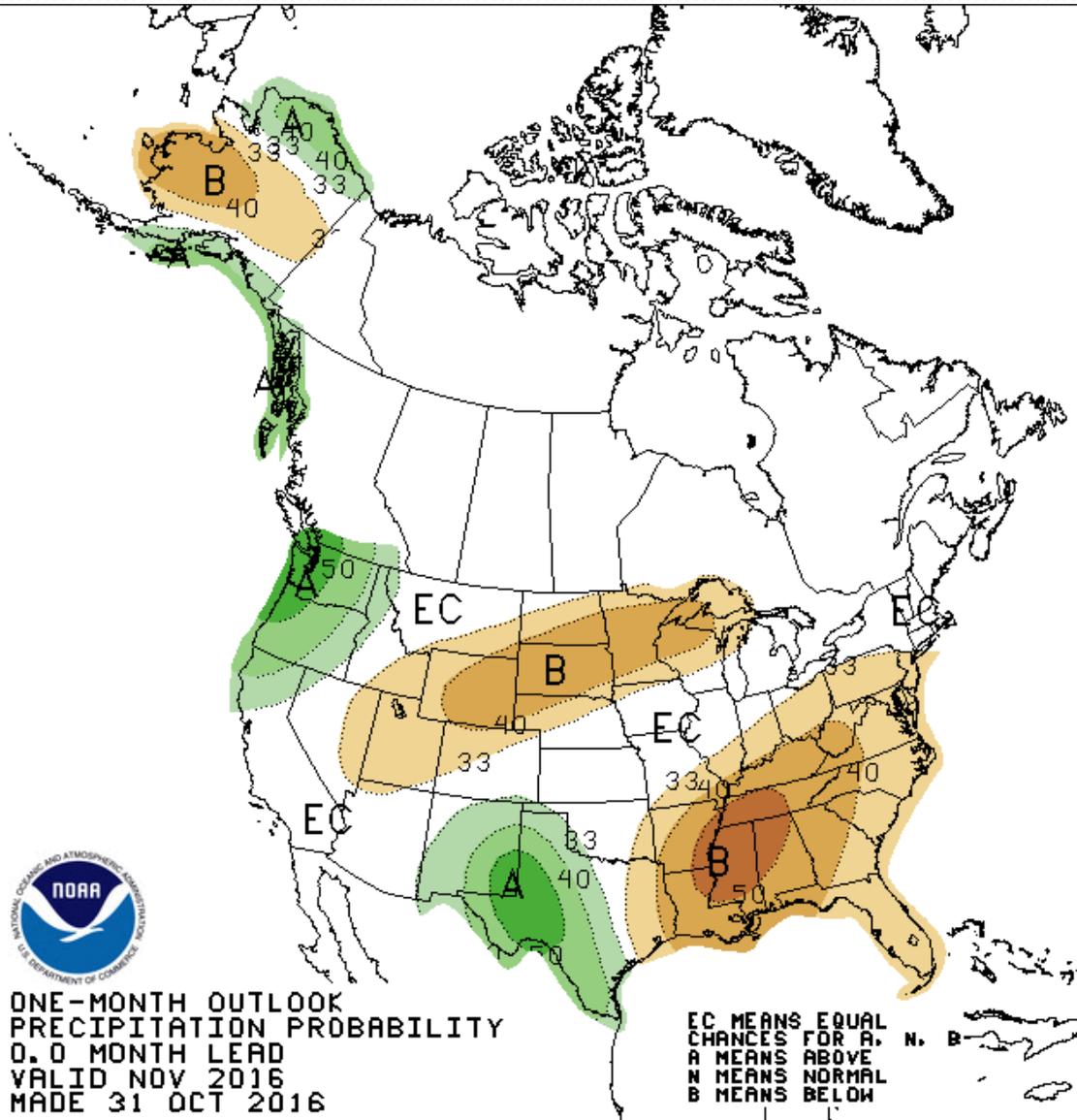
November Outlook

November Temperature Outlook



This graphic is issued by the Climate Prediction Center or CPC and is the Temperature Outlook for the month of November. The cool colors indicate a greater chance of below normal temperatures and the warm colors represent a greater chance of above normal temperatures. The time period for the normals runs from 1981-2010. Most of the Inland Pacific Northwest has the odds tilted (40-55 percent) toward above average temperatures in November. The center of the warmth is expected to be over the northern Great Plains and Central Rocky Mountains through the month.

November Precipitation Outlook



This graphic is CPC's Precipitation Outlook for the month of November. The green colors represent a greater chance of above normal precipitation, and the brown colors represent a greater chance of below normal precipitation. Much of eastern Washington and eastern Oregon have higher probabilities for above average precipitation totals in November. However, the highest probabilities for above average precipitation will be found along the northern Oregon, and Washington Coasts.



Thank You!