



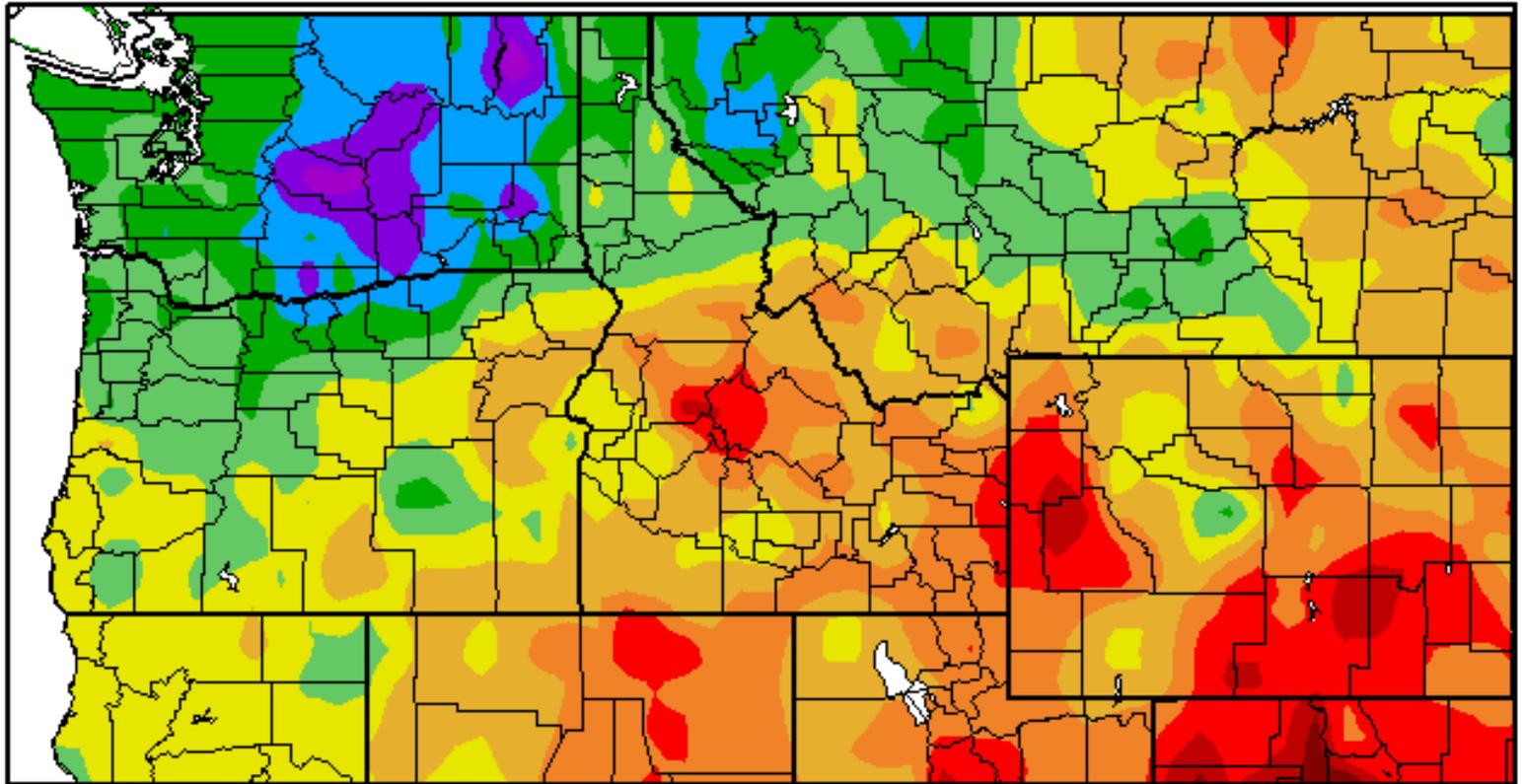
# The Month In Review

February 2017

National Weather Service  
Pendleton, Oregon

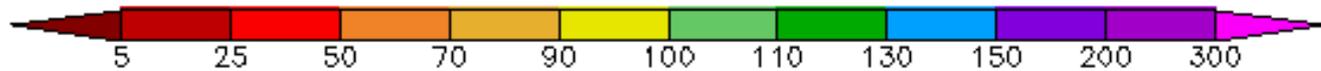
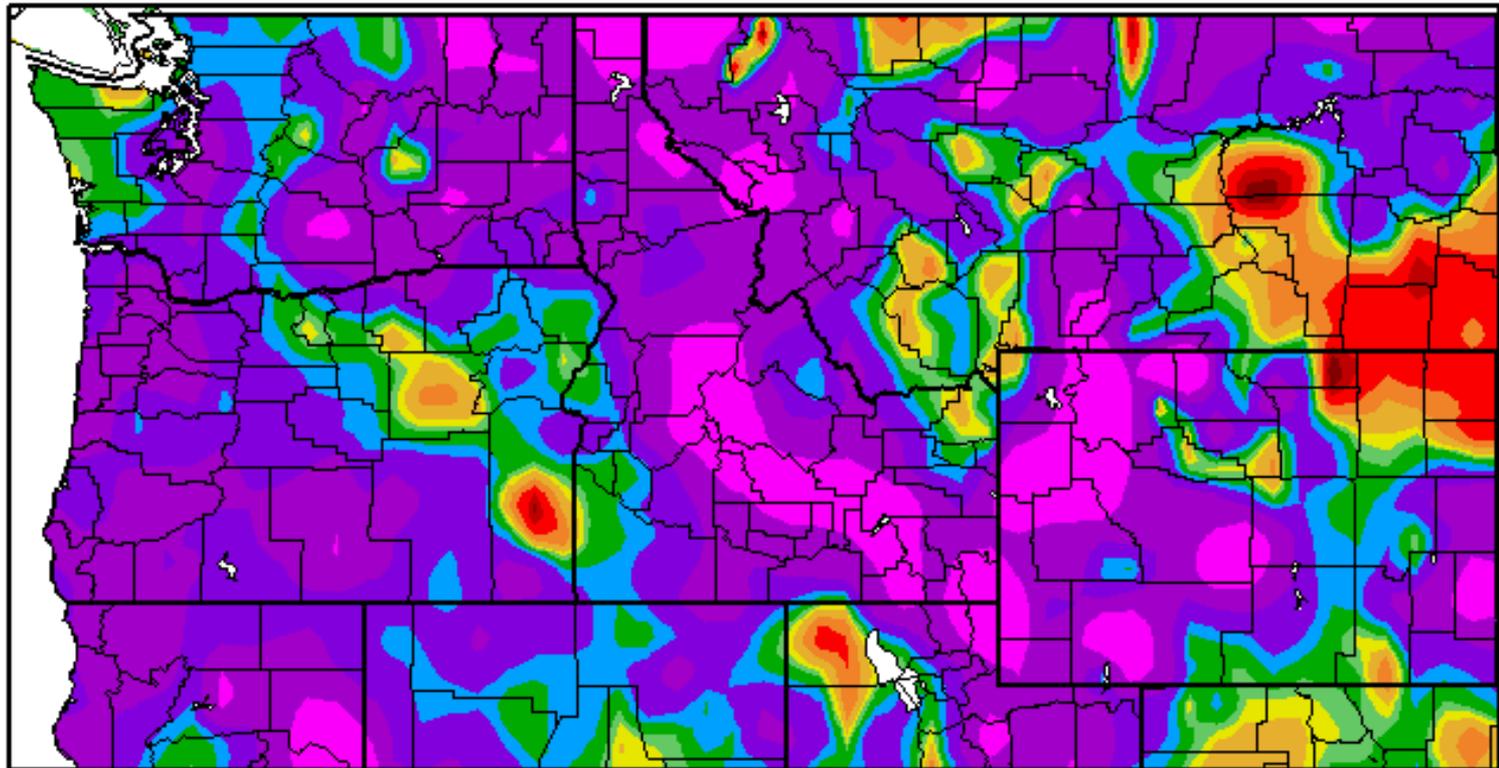
# Departure from Normal Temperature (F)

2/1/2017 - 2/28/2017



# Percent of Normal Precipitation (%)

2/1/2017 - 2/28/2017



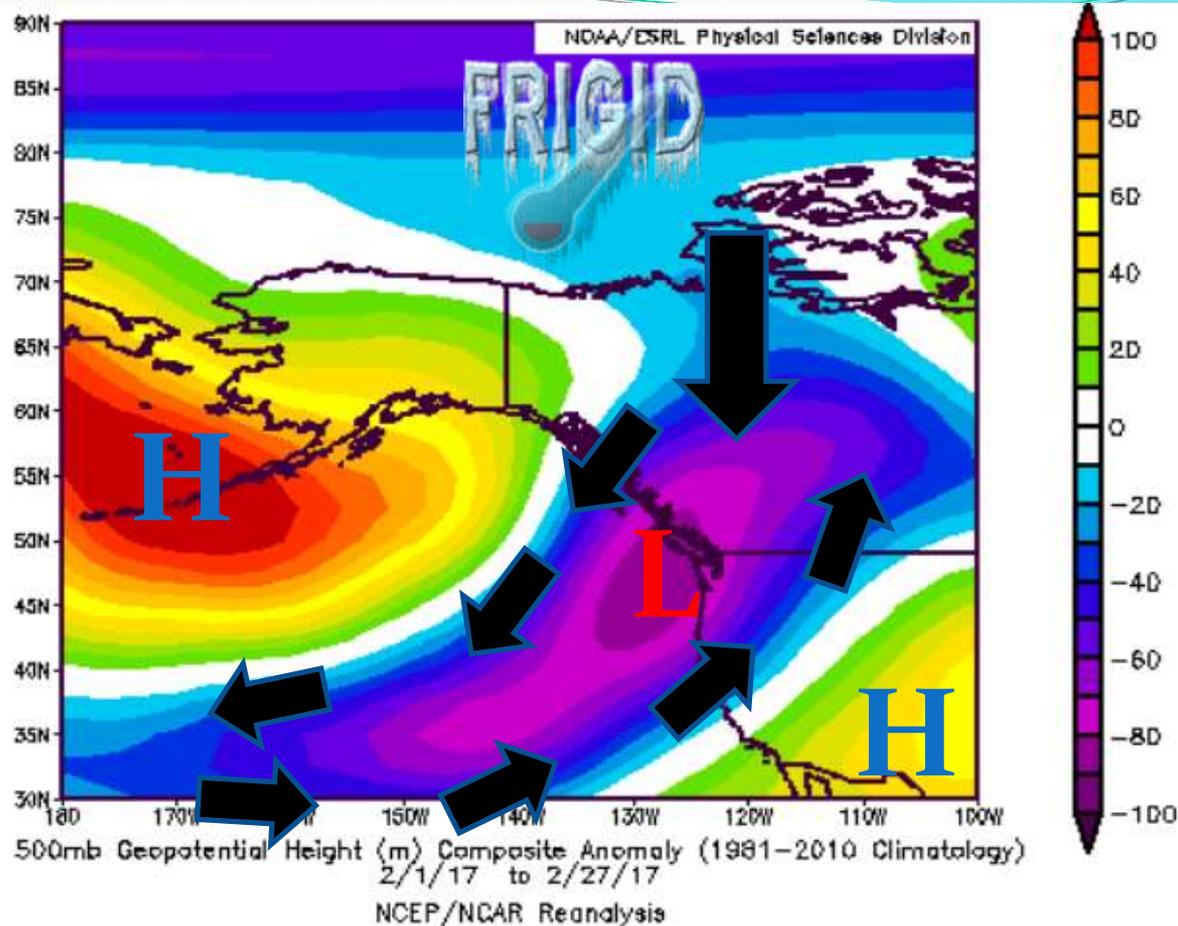
# Select February Averages and Departures

|                   | Max T | Max T D | Min T | Min T D | Ave T | Ave T D | PCPN | PCPN D | Snowfall | Snow D |
|-------------------|-------|---------|-------|---------|-------|---------|------|--------|----------|--------|
| Yakima            | 40.8  | -5.5    | 23.0  | -2.9    | 31.9  | -4.2    | 2.40 | 1.62   | 10.0     | 7.0    |
| Kennewick         | 41.5  | -6.5    | 26.4  | -4.3    | 34.0  | -5.3    | 1.84 | 1.06   | 4.0      | 1.0    |
| Walla Walla       | 43.4  | -2.6    | 29.4  | -2.8    | 36.4  | -2.7    | 2.68 | 0.92   | 4.5      | 1.5    |
| The Dalles        | 42.1  | -6.5    | 28.8  | -3.0    | 35.5  | -4.5    | 2.03 | 0.26   | M        | M      |
| Redmond           | 44.1  | -2.7    | 25.8  | 2.1     | 35.0  | -0.3    | 1.14 | 0.49   | 9.9      | 6.9    |
| Pendleton Airport | 42.8  | -4.0    | 27.5  | -2.8    | 35.2  | -3.4    | 2.27 | 1.16   | 7.1      | 4.1    |
| La Grande         | 43.6  | 0.7     | 26.8  | 0.9     | 35.2  | 0.8     | 1.47 | 0.33   | 7.0      | 4.0    |
| John Day          | 46.5  | -0.9    | 27.2  | 2.4     | 36.9  | 0.8     | 0.71 | -0.03  | 4.1      | 1.7    |



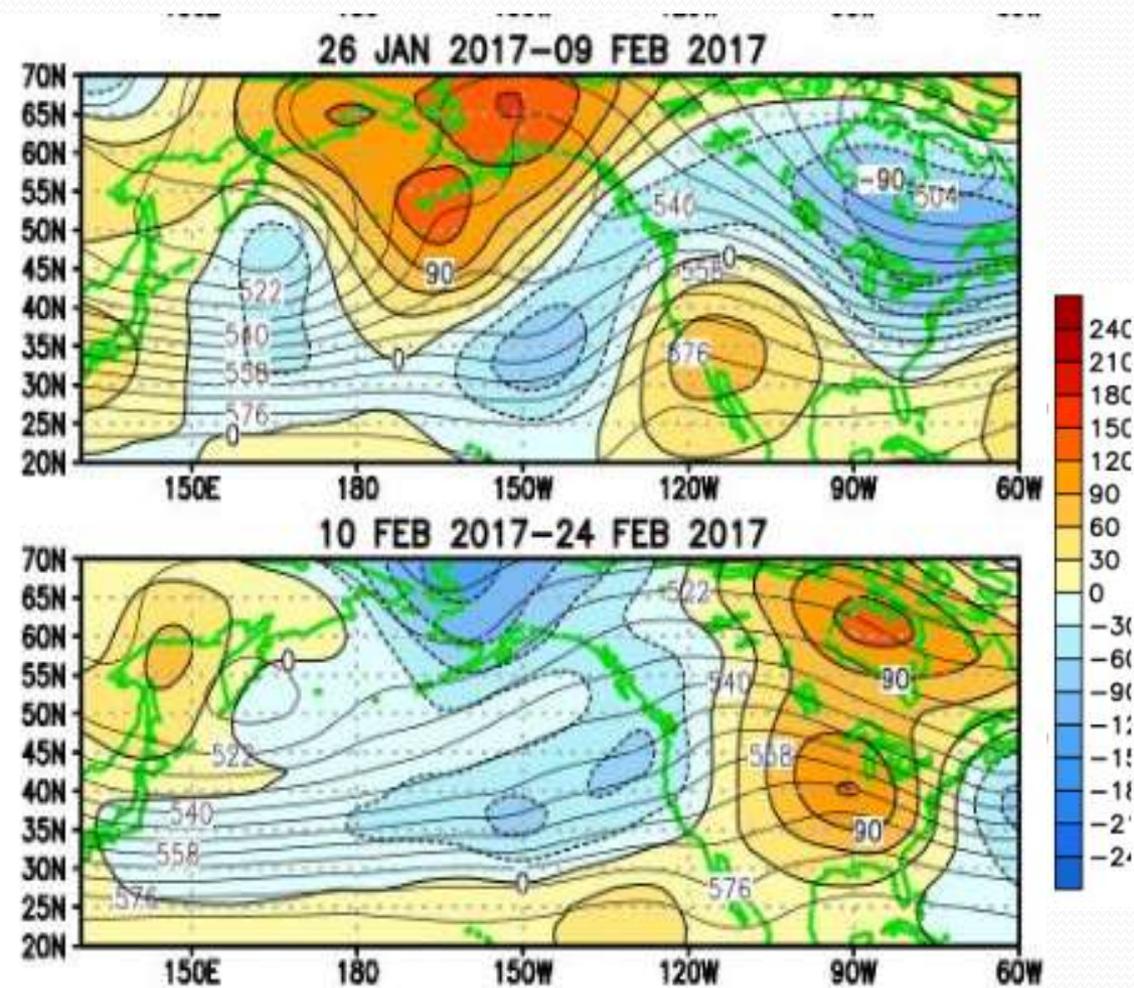


# February 2017 Weather Pattern



The mean synoptic pattern for the month of February 2017 was characterized by a deep trough of abnormally low pressure over the Pacific Northwest. A piece of this upper level trough also extended to the south along much of the West Coast. A large ridge of high pressure was also evident across the Aleutian Islands and western Alaska. This is the classic setup for cold weather in the Northwest, as a north or northeasterly flow of air develops. February ended rather cold, with below normal temperatures in much of eastern Washington and Oregon. Precipitation amounts were near to above normal for much of the area. Snowfall was also near to above average for much of the area. The snowpack continued to grow deeper in the mountains through the month. Most of the lowlands were also covered in snow for the first half of the month, especially in Washington.

# February 2017 Detailed Upper Level Pattern Analysis



- ❖ The 10 days of February featured high pressure over western Alaska and into northern Asia. With a trough of lower pressure in place across southern Canada and the Great Lakes and Northeast. The Northwest was between the mean trough and ridge during this time.
- ❖ For the last two weeks of the month, the offshore ridge broke down. This allowed some milder Pacific air into our region at times. A deeper trough of low pressure brought multiple waves of Pacific moisture into the area.



# Top 5 Coldest Average February Monthly Max T

| City            | Rank | Feb 2017<br>Avg Max T | Current or Previous Coldest<br>Feb Avg Max T |
|-----------------|------|-----------------------|--|
| Hermiston       | #1   | 40.2°                 | 41.8° in 2014                                |
| Pasco           | #1   | 40.6°                 | 42.5° in 2014                                |
| Easton          | #1   | 36.0°                 | 37.5° in 2011                                |
| Goldendale      | #3   | 35.8°                 | 31.3° in 1929                                |
| Richland        | #3   | 39.8°                 | 34.2° in 1989                                |
| Whitman Mission | #3   | 40.3°                 | 32.0° in 1989                                |
| Ellensburg      | #4   | 36.1°                 | 34.5° in 1949                                |
| Cle Elum        | #4   | 34.1°                 | 33.4° in 2014                                |
| The Dalles      | #5   | 42.1°                 | 38.9° in 1989                                |
| Pelton Dam      | #5   | 45.9°                 | 41.4° in 2014                                |



# Top 10 Coldest Average February Monthly Min T

| City            | Rank | Feb 2017<br>Avg Min T | Current or Previous<br>Coldest Feb Avg Min T |
|-----------------|------|-----------------------|--|
| Pasco           | #3   | 25.0°                 | 22.8° in 2005                                |
| Hermiston       | #4   | 25.8°                 | 20.0° in 2005                                |
| Ellensburg      | #5   | 18.9°                 | 12.2° in 1949                                |
| Easton          | #5   | 23.1°                 | 19.5° in 2006                                |
| Goldendale      | #5   | 20.8°                 | 12.4° in 1929                                |
| Whitman Mission | #5   | 24.1°                 | 17.2° in 1989                                |
| Walla Walla     | #7   | 29.4°                 | 18.4° in 1989                                |
| The Dalles      | #7   | 28.8°                 | 21.8° in 1989                                |
| Richland        | #7   | 26.0°                 | 18.4° in 1989                                |
| Cle Elum        | #8   | 15.2°                 | 11.3° in 1929                                |



# Top 10 Coldest Average February Monthly Temperature

| City            | Rank | Feb 2017<br>Avg T | Current or Previous<br>Coldest Feb Avg T |
|-----------------|------|-------------------|--|
| Hermiston       | #1   | 33.0°             | 35.1° in 2014                            |
| Ellensburg      | #3   | 27.5°             | 23.4° in 1949                            |
| The Dalles      | #4   | 35.4°             | 30.3° in 1989                            |
| Goldendale      | #4   | 28.3°             | 21.8° in 1929                            |
| Whitman Mission | #4   | 32.2°             | 25.6° in 1989                            |
| Cle Elum        | #5   | 24.7°             | 22.5° in 1929                            |
| Richland        | #5   | 32.9°             | 26.4° in 1989                            |
| Sisters         | #6   | 31.7°             | 22.6° in 1989                            |
| Yakima          | #7   | 31.9°             | 26.4° in 1989                            |
| Pelton Dam      | #7   | 36.8°             | 30.4° in 1989                            |
| Walla Walla     | #8   | 36.4°             | 25.2° in 1989                            |
| Arlington       | #9   | 34.1°             | 27.9° in 1893                            |
| Pendleton       | #10  | 35.2°             | 25.0° in 1989                            |



# Top 10 Monthly Snowfall Records for February

| City       | Rank  | Feb 2017 Snowfall | Current or Previous Highest Feb Snowfall |
|------------|-------|-------------------|--|
| Bickleton  | #4    | 12.8 Inches       | 13.8" in 1994                            |
| Goldendale | #4    | 13.4 Inches       | 16.0" in 1939                            |
| Meacham    | #5    | 34.8 Inches       | 62.0" in 1949                            |
| Redmond    | #5    | 9.9 Inches        | 16.7" in 1986                            |
| La Grande  | #5(T) | 7.0 Inches        | 19.7" in 1966                            |



# Top 10 Daily February Precipitation

| City       | Rank  | Feb 2017 Daily Precip | Current or Previous Feb Record Daily Precip |
|------------|-------|-----------------------|---|
| Hermiston  | #1    | 0.57" on 2/21         | 0.48" on 2/26/2000                          |
| Pasco      | #2    | 0.44" on 2/21         | 0.55" on 2/23/2002                          |
| Richland   | #5    | 0.65" on 2/15         | 1.11" on 2/21/1956                          |
| Bickleton  | #8    | 0.89" on 2/16         | 1.42" on 2/09/1961                          |
| Ellensburg | #9(T) | 0.39" on 2/15         | 0.65" on 2/25/2004                          |



# Top 10 February Monthly Precipitation Totals

| City              | Rank | Feb 2017<br>Precip | Current or Previous Feb<br>Record Monthly Precip |
|-------------------|------|--------------------|--|
| Hermiston         | #1   | 1.87 Inches        | 1.17 Inches in 2014                              |
| Pasco             | #1   | 1.62 Inches        | 0.91 Inches in 2002                              |
| Kennewick         | #1   | 1.84 Inches        | 1.83 Inches in 1961                              |
| Yakima            | #2   | 2.40 Inches        | 2.46 Inches in 1961                              |
| Pendleton Exp Sta | #2   | 3.11 Inches        | 3.27 Inches in 1961                              |
| Richland          | #2   | 1.82 Inches        | 2.30 Inches in 1961                              |
| Ellensburg        | #3   | 1.50 Inches        | 1.78 Inches in 1945                              |
| Pendleton         | #3   | 2.27 Inches        | 2.58 Inches in 1986                              |
| Mt Adams RS       | #4   | 11.87 Inches       | 17.18 inches in 1949                             |



# Top 10 February Monthly Precipitation Totals (Cont'd)

| City        | Rank  | Feb 2017<br>Precip | Current or Previous Feb<br>Record Monthly Precip |
|-------------|-------|--------------------|--|
| Easton      | #5    | 5.17 Inches        | 8.16 Inches in 1951                              |
| Goldendale  | #5    | 3.49 Inches        | 5.36 Inches in 1961                              |
| Walla Walla | #6    | 2.68 Inches        | 4.12 Inches in 1986                              |
| Meacham     | #6    | 4.60 Inches        | 6.71 Inches in 1949                              |
| Pelton Dam  | #6    | 1.81 Inches        | 3.24 Inches in 1983                              |
| Arlington   | #7    | 1.89 Inches        | 3.41 Inches in 1902                              |
| Bickleton   | #7    | 2.82 Inches        | 4.87 Inches in 1961                              |
| Dayton      | #7    | 3.35 Inches        | 5.24 Inches in 1899                              |
| Redmond     | #9(T) | 1.14 Inches        | 2.37 Inches in 1986                              |



# February

# Significant Weather

# February 1 – 5<sup>th</sup> Snow and Ice

| Location        | Total Snow | Freezing Rain? |
|-----------------|------------|----------------|
| Pendleton, OR   | Trace      | ~0.10"         |
| Meacham, OR     | 1.0"       | None           |
| Redmond, OR     | 4.9"       | Trace          |
| Pasco, WA       | 0.5"       | ~0.10"         |
| Walla Walla, WA | 0.2"       | ~0.10"         |
| Yakima, WA      | 5.0"       | None           |
| Hermiston, OR   | 1.1"       | ~0.10"         |
| Ellensburg, WA  | 2.6"       | None           |
| Bend, OR        | 1.6"       | None           |
| John Day, OR    | 0.1"       | <0.05"         |
| Heppner, OR     | 1.0"       | ~0.05"         |
| Seneca          | 4.0"       | Unknown        |



Image Courtesy of: ODOT



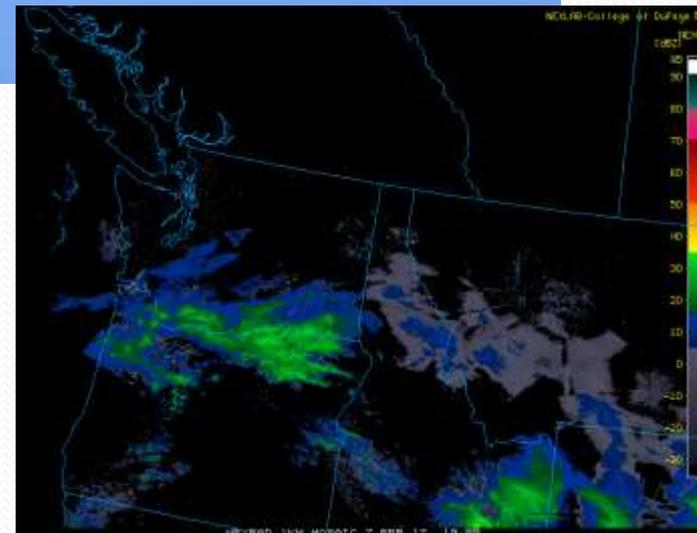
A large upper level low pressure system sent waves of wintry precipitation across our area. Some of the heavier snow totals occurred in Central Oregon, as well as the Yakima and Kittitas Valley. For the Lower Columbia Basin and Blue Mountain Foothills the bigger issue was light freezing rain, which mixed with the snow. This caused numerous accidents on local interstates and other highways.

# February 6 – 9<sup>th</sup> Snow Event

| Location        | Total Snow |
|-----------------|------------|
| Trout Lake (WA) | 20.7"      |
| Snowden         | 20.0"      |
| Easton          | 20.0"      |
| Mt Adams RS     | 17.5"      |
| Ellensburg      | 8.8"       |
| Meacham         | 6.0"       |
| Redmond         | 5.0"       |
| Yakima          | 4.9"       |
| Bend            | 4.3"       |
| Condon          | 3.2"       |
| Walla Walla     | 3.2"       |
| Pendleton       | 3.0"       |
| Pasco           | 2.8"       |
| Echo            | 2.2"       |
| Heppner         | 2.0"       |
| Madras          | 1.5"       |



A frontal system lifted north and east across the forecast area from February 6 – 9<sup>th</sup>. This spread periods of snow over the region, some heavy at times. Much of the forecast area received between 2 to 6 inches of snow from this storm. The heaviest snow occurred along the East Slopes of the Washington Cascades where 8 to 20 inches was observed.



# February 15 – 22<sup>nd</sup> Rain and Flooding

| Location        | Precip Total | Max Temp |
|-----------------|--------------|----------|
| Pendleton       | 1.54"        | 63       |
| Meacham         | 2.33"        | 53       |
| Redmond         | 0.53"        | 55       |
| Pasco           | 1.19"        | 55       |
| Walla Walla     | 1.63"        | 62       |
| Yakima          | 1.12"        | 49       |
| Hermiston       | 1.35"        | 54       |
| Ellensburg      | 0.96"        | 45       |
| Condon          | 0.77"        | 54       |
| Arlington       | 1.14"        | 52       |
| Whitman Mission | 1.12"        | 57       |
| Pelton Dam      | 0.68"        | 55       |
| Seneca          | 0.97"        | 48       |



*Photo: Yakima Valley Emergency Management*

A series of storm systems moved through the area during this time period. These systems brought warming temperatures and some significant periods of rain to much of the area. This rain and warmer temperatures combined with a deep, melting snowpack to produce widespread flooding and erosion issues, especially in south central Washington. There were reports of numerous roads being damaged, and some even washed out.

# February 26-28<sup>th</sup> Higher Elevation Snow

| Location     | Total Snow |
|--------------|------------|
| Ski Bluewood | 27"        |
| Meacham      | 19"        |
| Mt Bachelor  | 18"        |
| Easton       | 8.5"       |
| Cle Elum     | 6"         |
| Seneca       | 5"         |
| Pendleton    | 4.1"       |
| Bickleton    | 4.1        |
| Long Creek   | 3.7        |
| John Day     | 3.0"       |
| La Grande    | 2.5"       |
| Condon       | 1.8"       |
| Walla Walla  | 1.1"       |
| Echo         | 0.8"       |
| Goldendale   | 0.5"       |



*Deadman's Pass Rest Area, 3/1/2017*

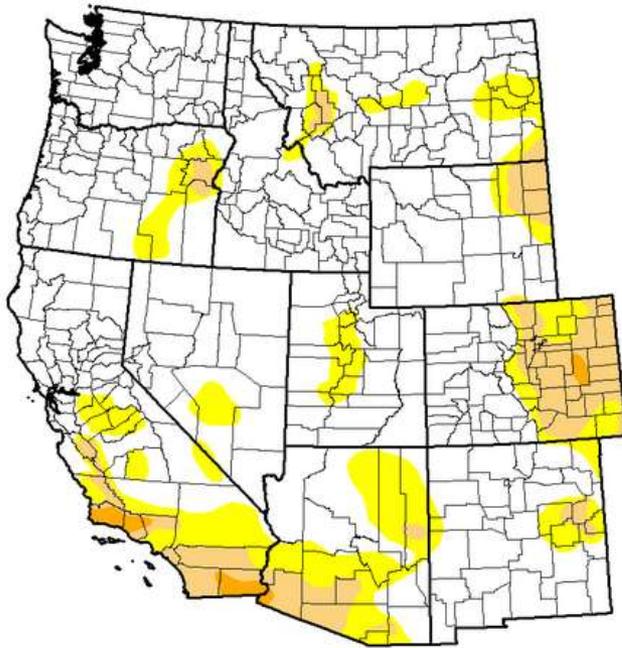
A storm system moved through the area bringing a mixture of snow, and lower elevation rain. Periods of snow showers persisted in the mountains and higher foothills for several days, leading to some impressive three day storm total amounts. Ski Bluewood, Meacham and Mount Bachelor all reported more than a foot and a half of snow from this system. Amounts quickly tapered back, to mostly 1 to 4 inches in the higher foothills, and mountain valleys. Locations along the east slopes of the Washington Cascades, such as Cle Elum and Easton also receive substantial snowfall from this system. Very little to no snow fell in the lowest elevations of the Columbia Basin and surrounding valleys.

# Drought Continues to Improve

## U.S. Drought Monitor West

February 21, 2017  
(Released Thursday February 23, 2017)  
Valid 7 a.m. EST

Statistics type: Traditional Percent Area Export table: [PNG](#) [CSV](#) [XLS](#)



| Week   | None  | D0-D4 | D1-D4 | D2-D4 | D3-D4 | D4   |
|--|-------|-------|-------|-------|-------|------|
| Current<br><a href="#">2017-02-21</a>                | 77.21 | 22.79 | 8.54  | 0.76  | 0.00  | 0.00 |
| Last Week<br><a href="#">2017-02-14</a>              | 73.57 | 26.43 | 9.68  | 1.11  | 0.10  | 0.00 |
| 3 Months Ago<br><a href="#">2016-11-22</a>           | 43.92 | 56.08 | 25.58 | 9.90  | 5.73  | 2.81 |
| Start of Calendar Year<br><a href="#">2016-12-27</a> | 52.19 | 47.81 | 22.47 | 9.10  | 5.43  | 2.44 |
| Start of Water Year<br><a href="#">2016-09-27</a>    | 27.78 | 72.22 | 30.95 | 13.45 | 5.77  | 2.81 |
| One Year Ago<br><a href="#">2016-02-23</a>           | 37.06 | 62.94 | 36.25 | 19.70 | 10.28 | 5.55 |

Estimated Population in Drought Areas: **20,586,415**

[View More Statistics](#)

### 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.

### Author(s):

Richard Heim, NOAA/NCEI

Download: [PNG](#) [PDF](#) [JPG](#)

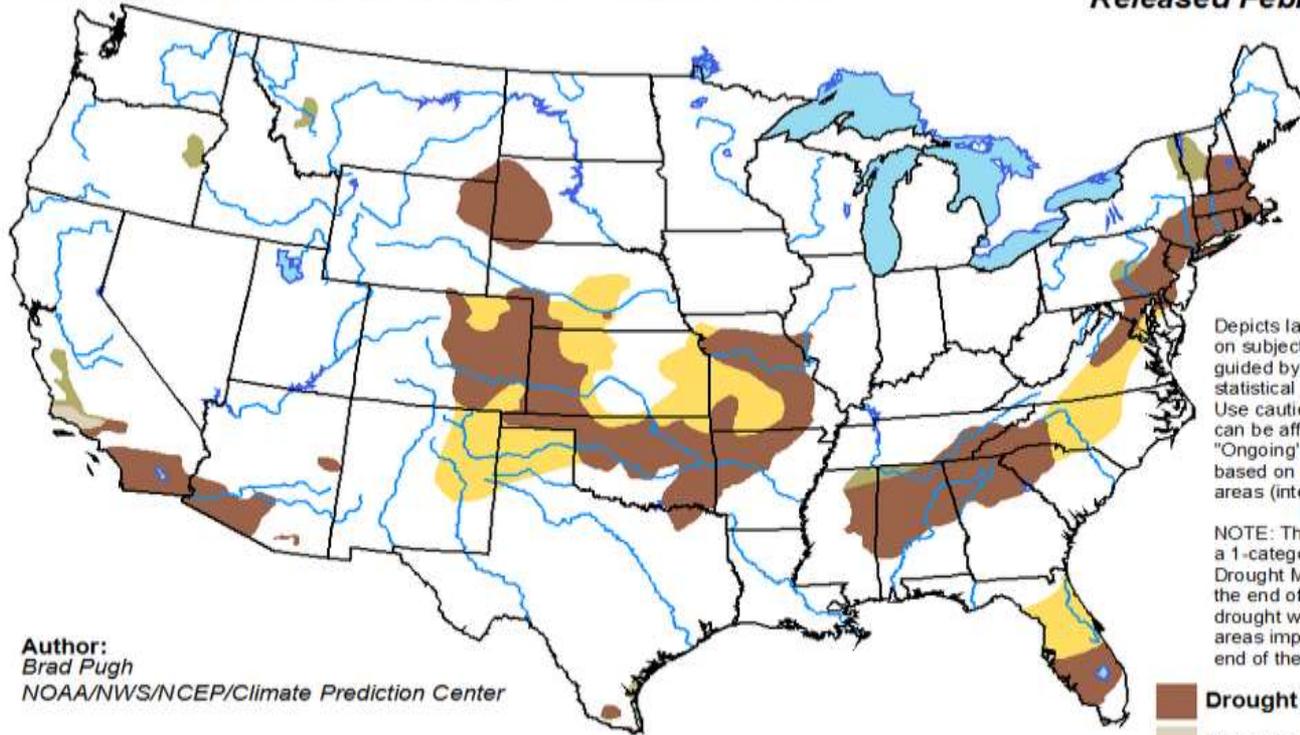


The latest drought monitor shows improvement over much of the region. Some D<sub>0</sub> and even a very small area of D<sub>1</sub> drought is lingering over eastern, and especially in Baker County. The substantial rain and snow since the beginning of the water year has allowed last year's drought to fade across much of the Western US. Even California has now seen significant improvement.

# March Drought Outlook

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

Valid for March 2017  
Released February 28, 2017



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).

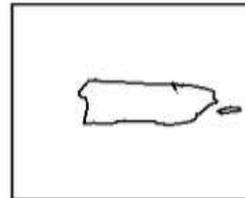
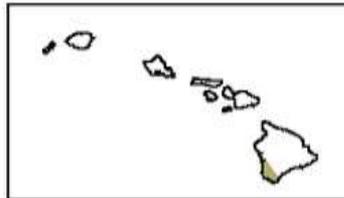
NOTE: The tan areas imply at least a 1-category improvement in the Drought Monitor intensity levels by the end of the period, although drought will remain. The green areas imply drought removal by the end of the period (D0 or none).

Author:  
Brad Pugh  
NOAA/NWS/NCEP/Climate Prediction Center

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



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



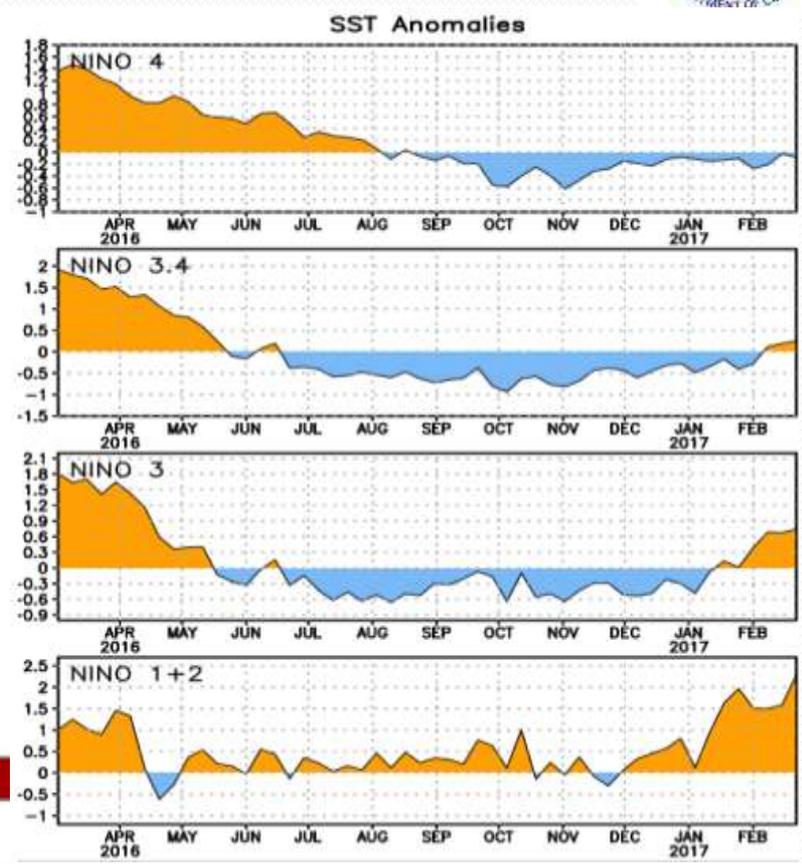
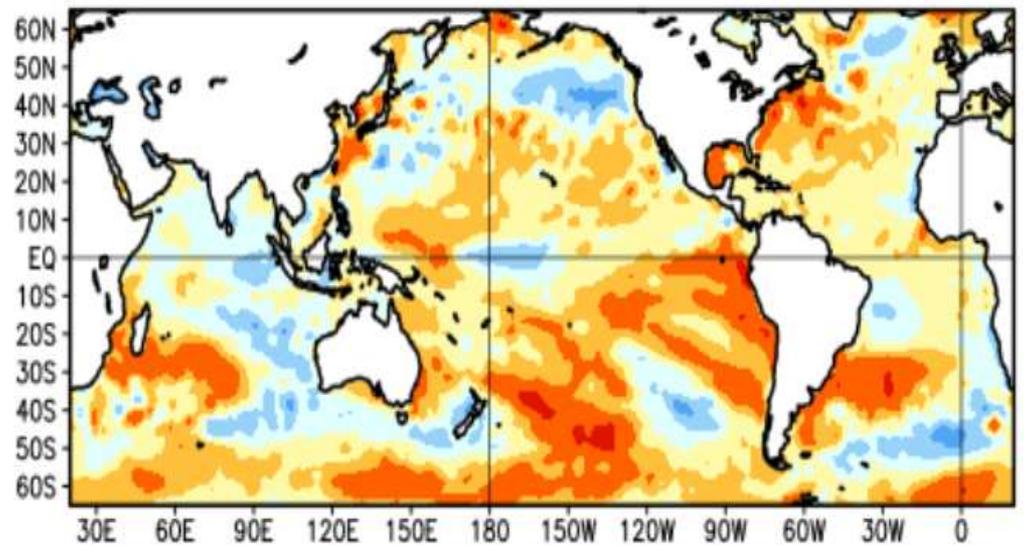
The monthly drought outlook for March from CPC indicates drought removal likely across most of eastern Oregon. A deep mountain snow pack has developed.



# La Niña Ends: ENSO Neutral Prevails



Average SST Anomalies  
30 DEC 2016 – 25 FEB 2017

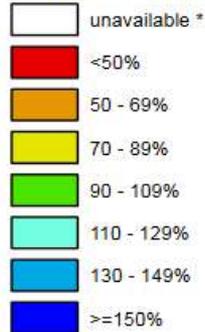


Currently, cooler than average sea surface temperatures were observed in Niño regions 3.4 and 4. Niño 1,2 and 3 are now running above average. The La Niña advisory has been allowed to end, as the colder sea surface temperatures fade. A transition to ENSO Neutral conditions is expected to continue through the month. The previous weak La Nina could still have a lingering impact on the atmospheric weather patterns through the end of winter.

## Oregon SNOTEL Current Snow Water Equivalent (SWE) % of Normal

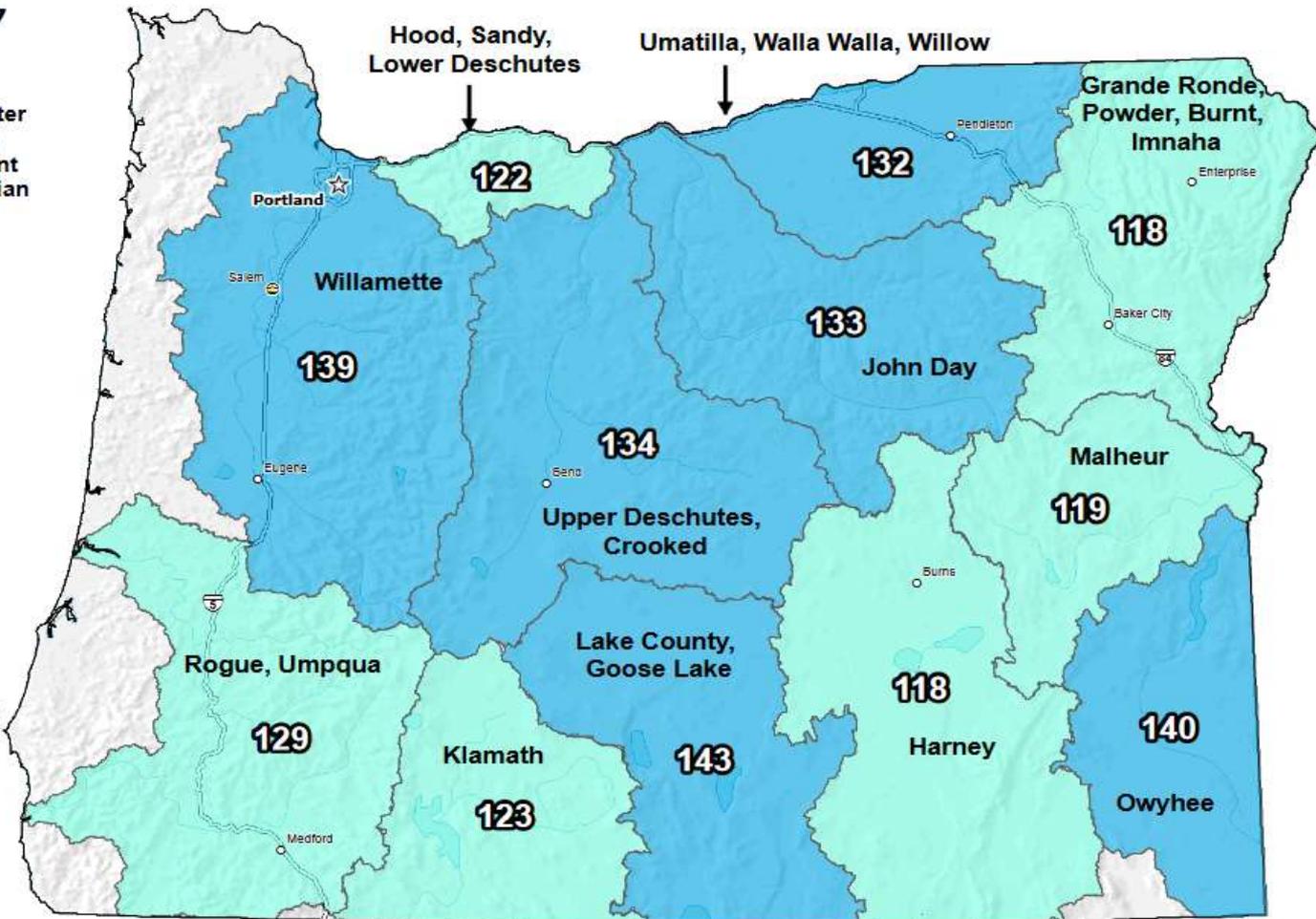
Mar 01, 2017

Current Snow Water Equivalent (SWE) Basin-wide Percent of 1981-2010 Median



\* Data unavailable at time of posting or measurement is not representative at this time of year

Provisional Data  
Subject to Revision



The snow water equivalent percent of normal represents the current snow water equivalent found at selected SNOTEL sites in or near the basin compared to the average value for those sites on this day. Data based on the first reading of the day (typically 00:00).

0 10 20 40 60 80 100 Miles

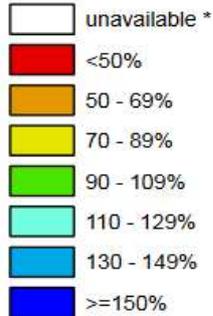
Prepared by:  
USDA/NRCS National Water and Climate Center  
Portland, Oregon  
<http://www.wcc.nrcs.usda.gov>

Snow pack is running between about 115 to 145 percent of normal across Oregon as of March 1<sup>st</sup> 2017. Additional snow has already fallen in the last few days of February, and more is expected through the month, mainly in the mountains.

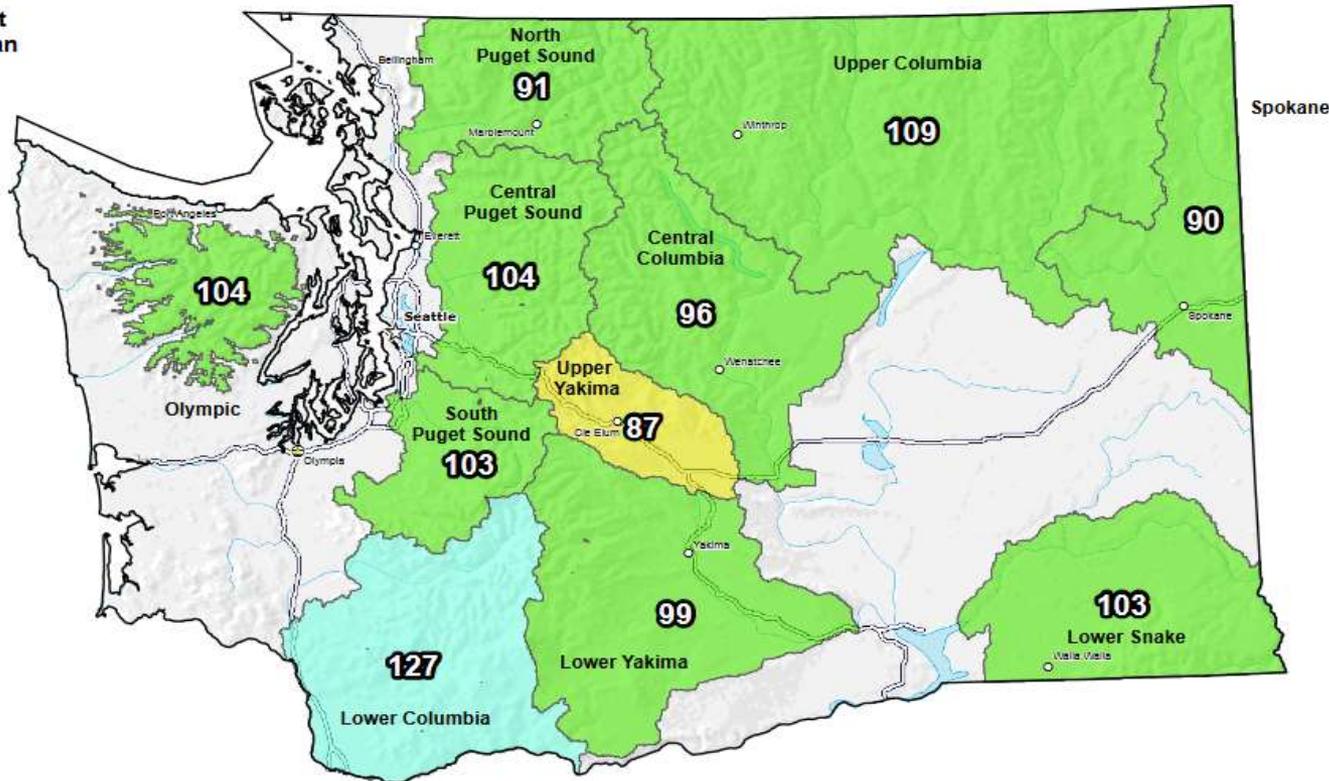
## Washington SNOTEL Current Snow Water Equivalent (SWE) % of Normal

Mar 01, 2017

Current Snow Water Equivalent (SWE) Basin-wide Percent of 1981-2010 Median



\* Data unavailable at time of posting or measurement is not representative at this time of year



Provisional Data  
Subject to Revision



The snow water equivalent percent of normal represents the current snow water equivalent found at selected SNOTEL sites in or near the basin compared to the average value for those sites on this day. Data based on the first reading of the day (typically 00:00).



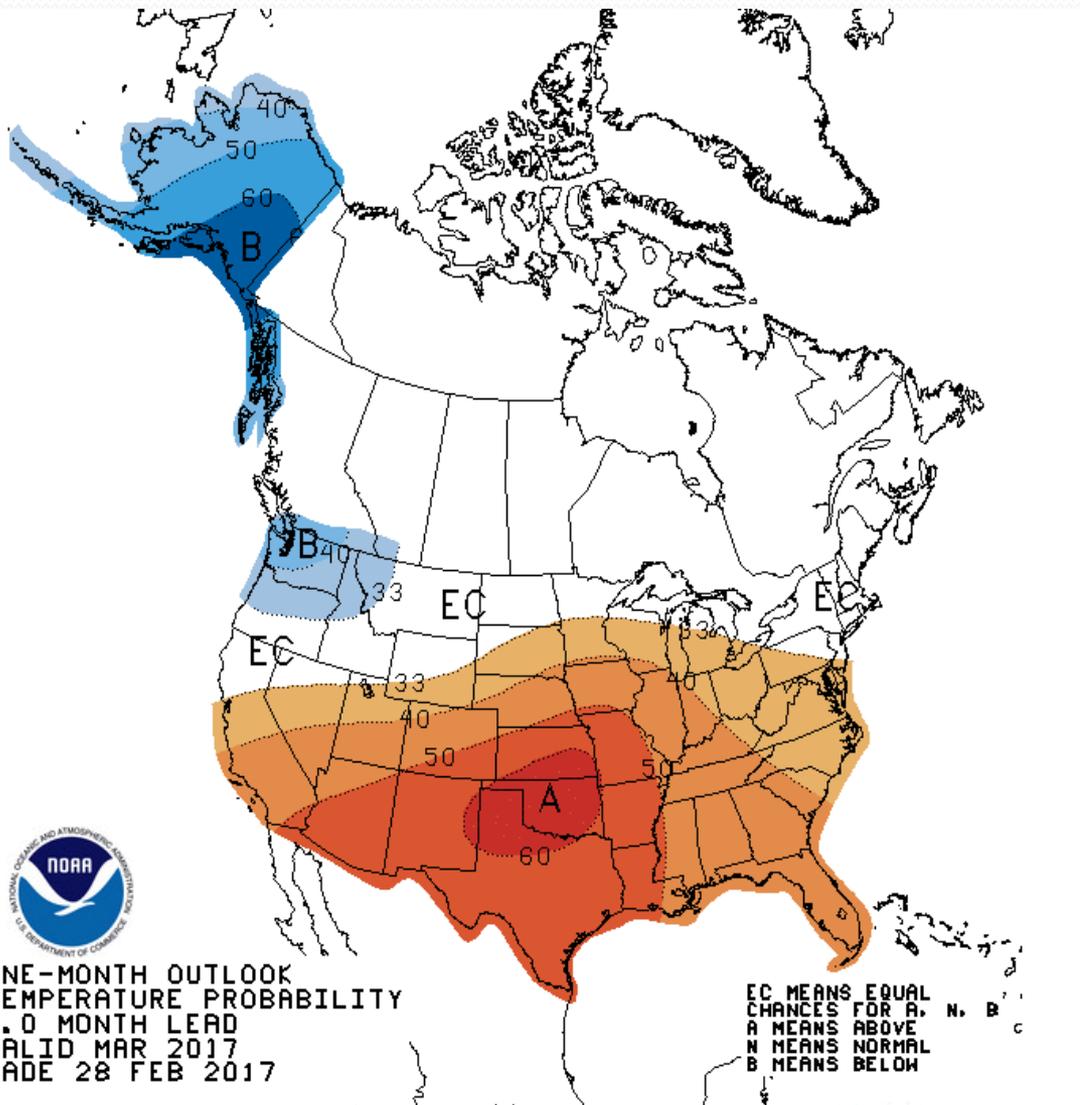
Prepared by:  
USDA/NRCS National Water and Climate Center  
Portland, Oregon  
<http://www.wcc.nrcs.usda.gov>

The snow pack has leveled off slightly in Washington, and is now running between 90 to 125 percent of normal across the state. Additional snowfall is likely through at least the first half of March, especially in the mountains.



# March Outlook

# March Temperature Outlook

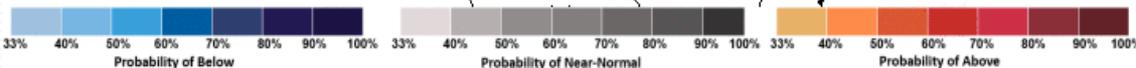


This graphic is issued by the Climate Prediction Center or CPC and is the Temperature Outlook for the month of March. The cool colors indicate a greater chance of below normal temperatures and the warm colors represent a greater chance of above normal temperatures. The time period for the normals runs from 1981-2010.

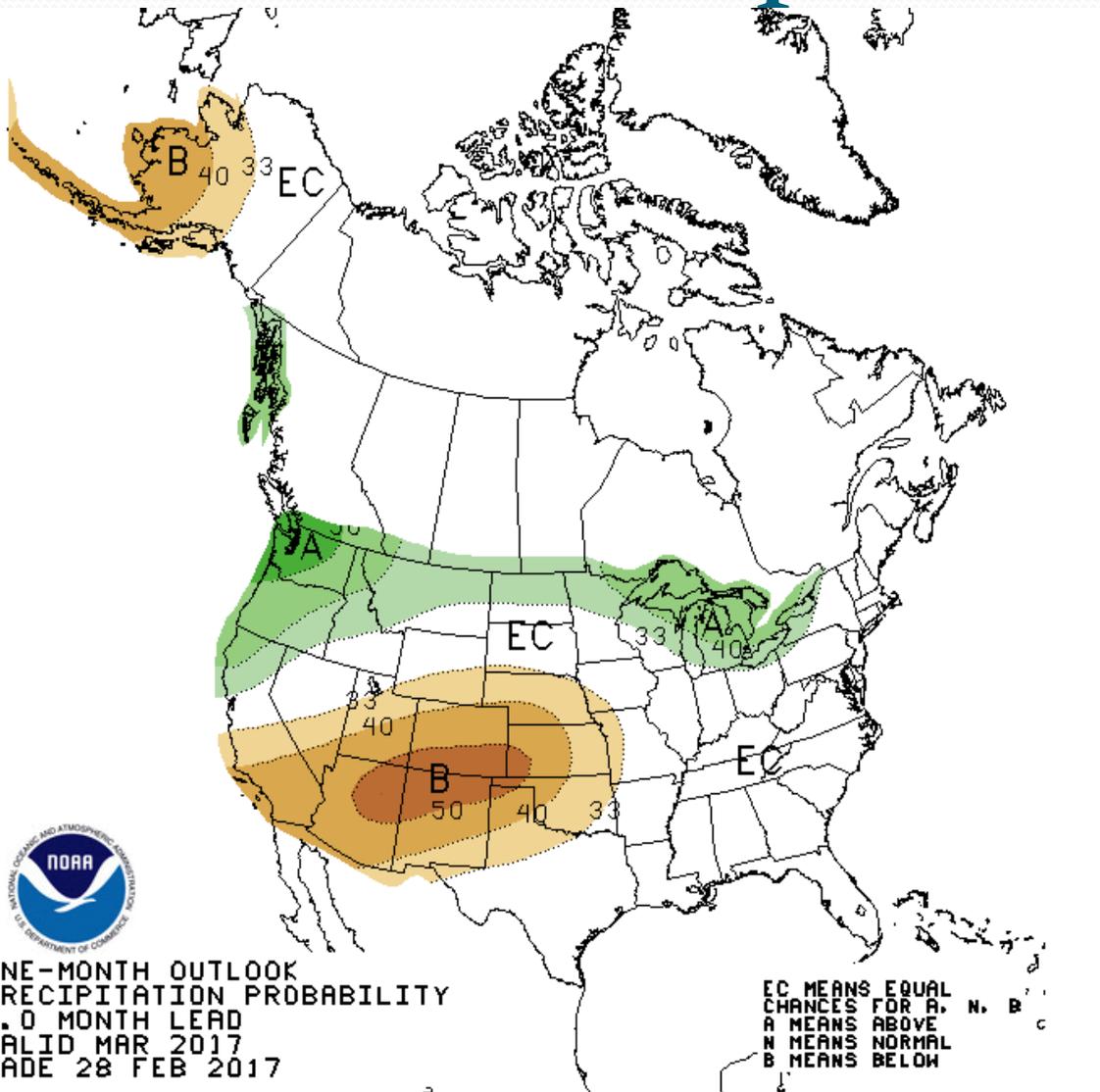
There are higher odds of below normal temperatures through March across most of the Pacific Northwest and Alaska. Much of the rest of the US has higher probabilities for above average temperatures in March.



ONE-MONTH OUTLOOK  
TEMPERATURE PROBABILITY  
0.0 MONTH LEAD  
VALID MAR 2017  
MADE 28 FEB 2017



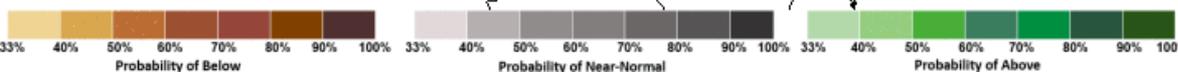
# March Precipitation Outlook



This graphic is CPC's Precipitation Outlook for the month of March. The green colors represent a greater chance of above normal precipitation, and the brown colors represent a greater chance of below normal precipitation. All of eastern Washington and eastern Oregon have higher probabilities for above average precipitation totals again heading into March. This area of favored above average precipitation extends across the northern portion of the US into the Great Lakes. Below average precipitation totals are favored across northern Texas and the Southwest.



ONE-MONTH OUTLOOK  
PRECIPITATION PROBABILITY  
0.0 MONTH LEAD  
VALID MAR 2017  
MADE 28 FEB 2017





Thank You!