

National Weather Service Medford

November 2019 Climate Summary



*These data are preliminary and have not undergone final QC by NCEI. Therefore, these data are subject to revision. Final and certified climate data can be accessed at the [National Centers for Environmental Information \(NCEI\)](#).

November 2019 Weather Review

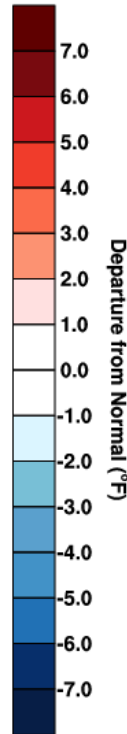
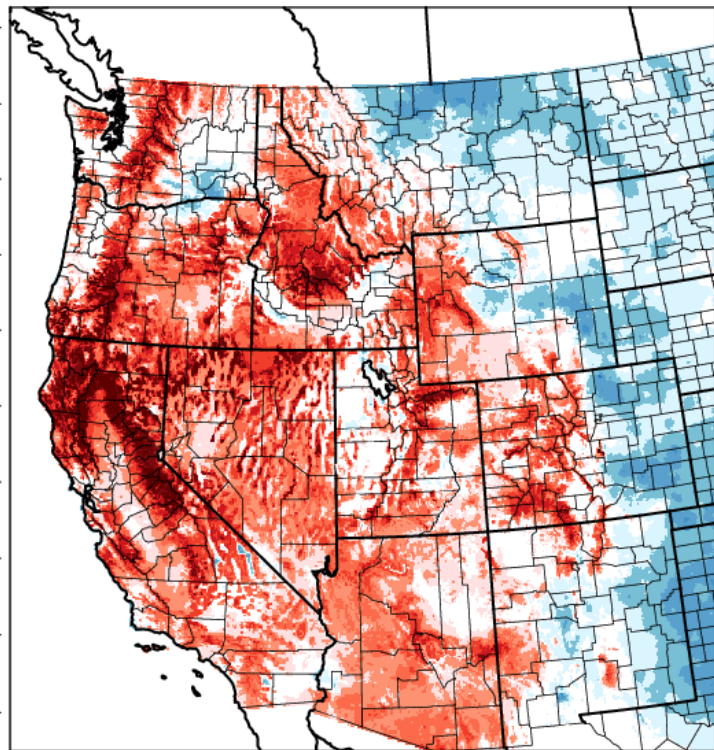
Overall, the month of November was drier and warmer than normal. The stretch of dry weather, which started during the middle of October, continued well into November with the area under the influence of a broad ridge. This pattern brought warm days and cold nights with large daily temperature swings. The dry conditions during the beginning of the month made our precipitation deficit grow and heightened fire weather concerns for a brief time. The Medford Airport experienced the second longest stretch of days (26) with no precipitation (starting in October), with the last day of measured precipitation occurring on October 20th. That stretch finally came to an end on November 15th when a series of weak fronts moved through the area, which only brought light amounts of precipitation through the 19th. After this series of weak fronts, a weak ridge of high pressure returned with a change back to cold nights.

An active weather pattern emerged in late November as the storm track took aim towards the area. This marked a change from fall like weather towards winter weather. Beginning on the 25th and lasting through the end of the month the pattern shifted towards cooler conditions, windy weather and light precipitation. First a strong upper level jet moved over the area, bringing a relatively weak system that resulted in light rainfall. This was just an appetizer to the more potent system that affected the area shortly after. A rapidly deepening low pressure system ("bomb cyclone") moved into the area on the 26th and 27th, bringing significant impacts during one of the busiest travel periods of the year. This low strengthened to near 970 mb as it moved into the coast of southern Oregon. This low was unprecedented in its strength and track with no similar events observed in the last 40 years-possibly longer. Strong winds associated with this low occurred across most of the area. 60-80 mph winds were common along the coast, in the Shasta Valley and in the higher terrain, and even the Medford Airport recorded a wind gust to 58 mph with this storm. The strongest gust reported was 106 mph measured at the Cape Blanco Coast Guard Station. These strong winds brought down trees and power lines causing numerous power outages. In addition to the strong winds, heavy snow fell down to 2000-2500 ft. One to two feet of snow fell on the higher passes of I-5, halting traffic and resulting in the closure of the Interstate overnight. The lowest pressure recorded with this system in our forecast area was at Buoy 46027, located 8 nautical miles northwest of Crescent City, of 971.7 mb. This storm also set a new monthly record for lowest sea level pressure of 981.4 mb for the Medford Airport.

There was a brief break in the active weather after this system with the coldest temperatures of the month occurring on the 28th – 30th. Another strong system moved into the area on the last day of the month. This storm brought another round of travel impacts during another busy holiday travel period, especially along I-5 south of Weed. Even with the active weather at the end of the month, the area's water year total was only 15%-25% of normal.

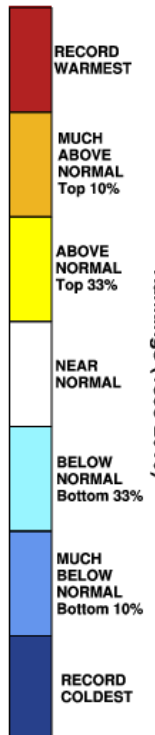
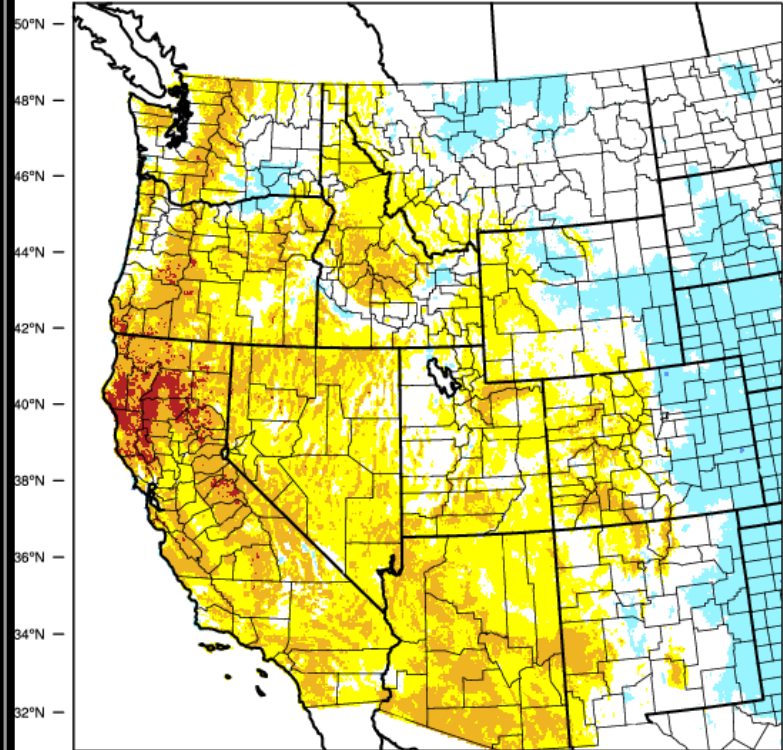
November 2019 *Observed* Temperatures

Western United States - Mean Temperature
November 2019 Departure from 1981-2010 Normal



WestWide Drought Tracker, U Idaho/WRCC Data Source: PRISM (Prelim), created 2 DEC 2019

Western United States - Mean Temperature
November 2019 Percentile

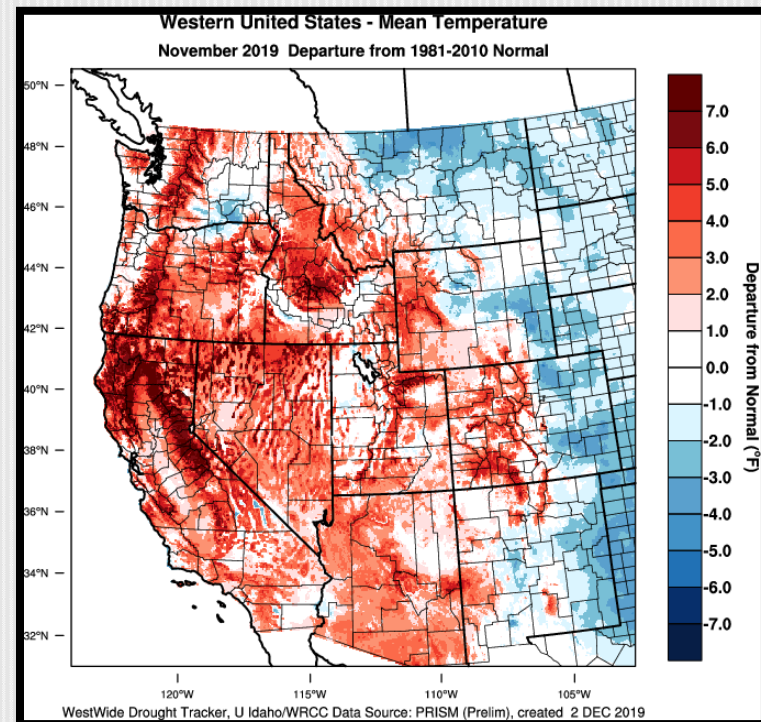
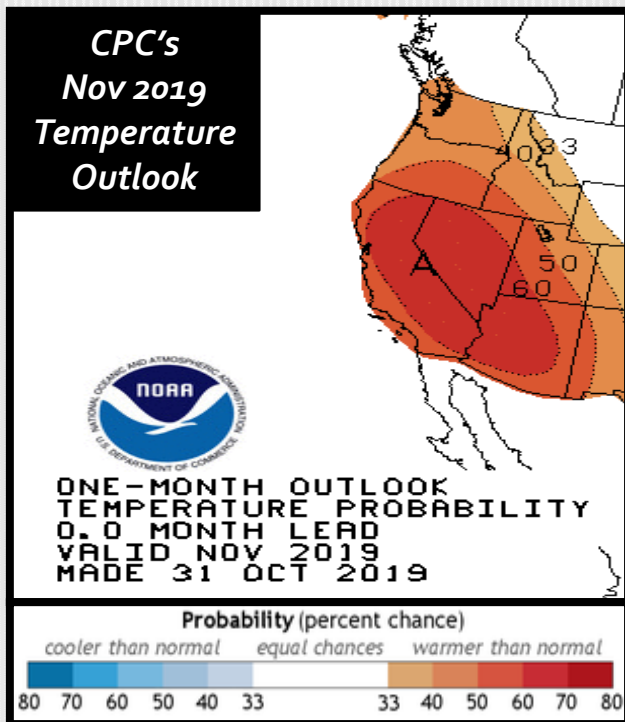


Rankings (1895-2010)

WestWide Drought Tracker, U Idaho/WRCC Data Source: PRISM (Prelim), created 2 DEC 2019

A Look Back at the November 2019 Temperature Outlook

- **Was the forecast anomaly correct?** Yes – Observed temperatures were mostly above normal across the Medford NWS forecast area.
- **Did our “Localized Forecast” improve upon the CPC forecast?** Yes. Our localized forecast from November 7th, called for temperature anomalies of 3 to 7 degrees above normal. This anomaly was generally correct for the forecast area. We also accurately depicted that temperatures would be the most anomalous across the ridges, which is what occurred. It should be noted that North Bend and Roseburg were slightly below normal by about 1 degree Fahrenheit. Additionally, due to the unusual dryness, diurnal ranges were higher than normal, so mornings were mostly cooler than normal while highs were much warmer than normal.
- **Was the expected impact correct?** Yes. There was heightened concern for wildfires for a period of time during November which limited prescribed burning. Weather was favorable for preparations for the upcoming winter.



Average Temperatures

	<i>Average (°F)</i>	<i>Departure from Normal</i>	<i>Average Max (°F)</i>	<i>Departure from Normal</i>	<i>Average Min (°F)</i>	<i>Departure from Normal</i>
<i>North Bend</i>	47.5	<i>-1.3°</i>	55.8	<i>0.9°</i>	39.2	<i>-3.5°</i>
<i>Roseburg</i>	46.4	<i>-0.5°</i>	55.1	<i>1.6°</i>	37.7	<i>-2.6°</i>
<i>Medford</i>	46.5	<i>1.8°</i>	59.6	<i>6.6°</i>	33.5	<i>-2.9°</i>
<i>Klamath Falls</i>	37.4	<i>1.9°</i>	54.0	<i>8.1°</i>	20.7	<i>-4.3°</i>
<i>Montague, CA</i>	42.6	<i>2.7°</i>	59.0	<i>8.6°</i>	26.2	<i>-3.2°</i>
<i>Mt. Shasta City, CA</i>	44.6	<i>4.0°</i>	58.0	<i>6.7°</i>	31.1	<i>1.3°</i>
<i>Alturas, CA</i>	38.5	<i>2.4°</i>	57.0	<i>7.7°</i>	20.0	<i>-2.9°</i>

Monthly Max & Min Temperatures

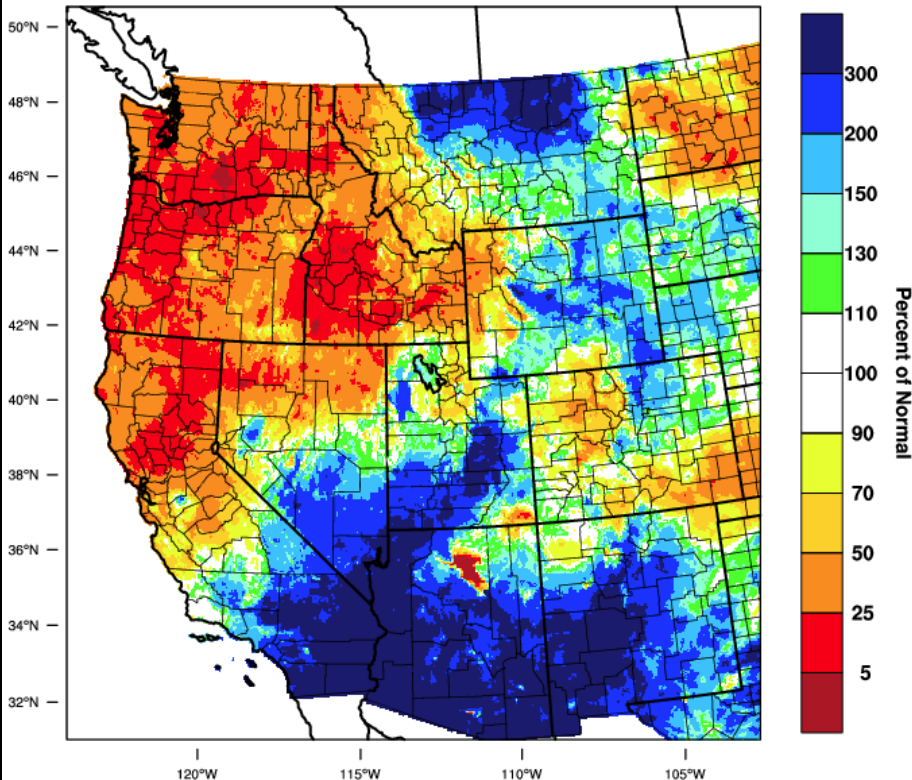
	<i>Max (°F)</i>	<i>Date(s)</i>	<i>Min (°F)</i>	<i>Date(s)</i>
<i>North Bend</i>	<i>65°</i>	<i>11th</i>	<i>27°</i>	<i>29th</i>
<i>Roseburg</i>	<i>65°</i>	<i>4th & 8th</i>	<i>26°</i>	<i>30th</i>
<i>Medford</i>	<i>72°</i>	<i>2nd</i>	<i>26°</i>	<i>24th & 29th</i>
<i>Klamath Falls</i>	<i>68°</i>	<i>10th</i>	<i>0°</i>	<i>30th</i>
<i>Montague, CA</i>	<i>72°</i>	<i>10th</i>	<i>11°</i>	<i>29th</i>
<i>Mt. Shasta City, CA</i>	<i>72°</i>	<i>8th</i>	<i>14°</i>	<i>29th</i>
<i>Alturas, CA</i>	<i>71°</i>	<i>8th</i>	<i>2°</i>	<i>28th</i>

<i>Record High Temperatures</i>	<i>Date</i>	<i>Record High</i>	<i>Old Record/Year</i>
<i>Montague</i>	<i>15th</i>	<i>66°</i>	<i>Ties with 1995</i>
<i>Mt Shasta City</i>	<i>8th</i>	<i>72°</i>	<i>Ties with 1956</i>

<i>Record Low Temperatures</i>	<i>Date</i>	<i>Record Low</i>	<i>Old Record/Year</i>
<i>North Bend</i>	<i>29th</i>	<i>27°</i>	<i>28° / 2004</i>

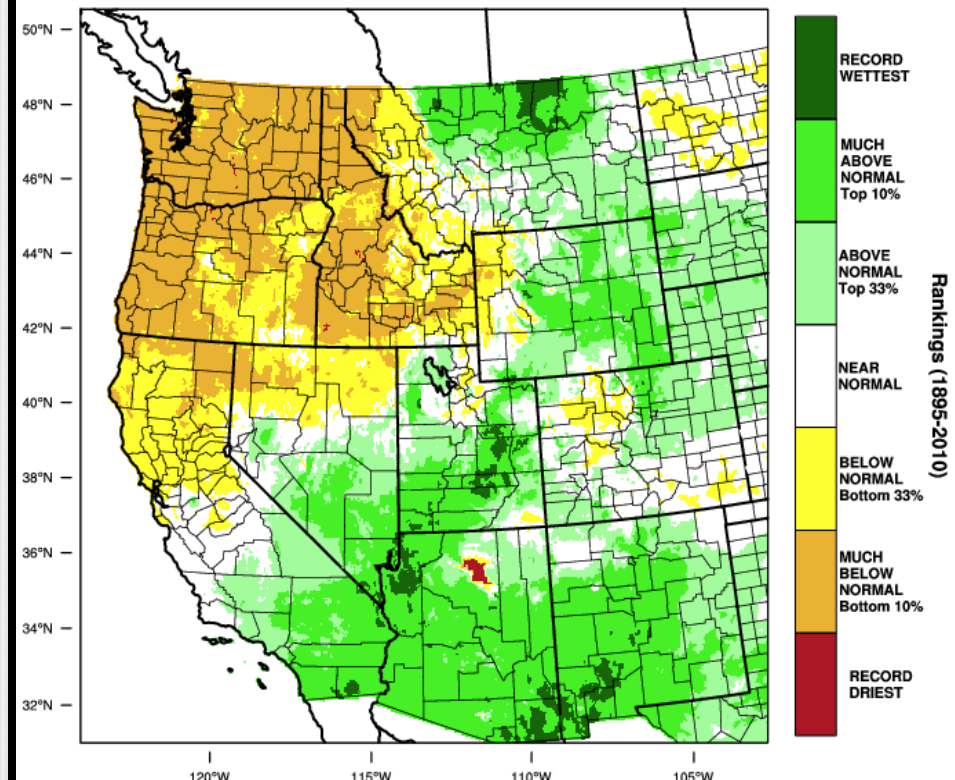
November 2019 *Observed Precipitation*

Western United States - Precipitation
November 2019 Percent of 1981-2010 Normal



WestWide Drought Tracker, U Idaho/WRCC Data Source: PRISM (Prelim), created 5 DEC 2019

Western United States - Precipitation
November 2019 Percentile



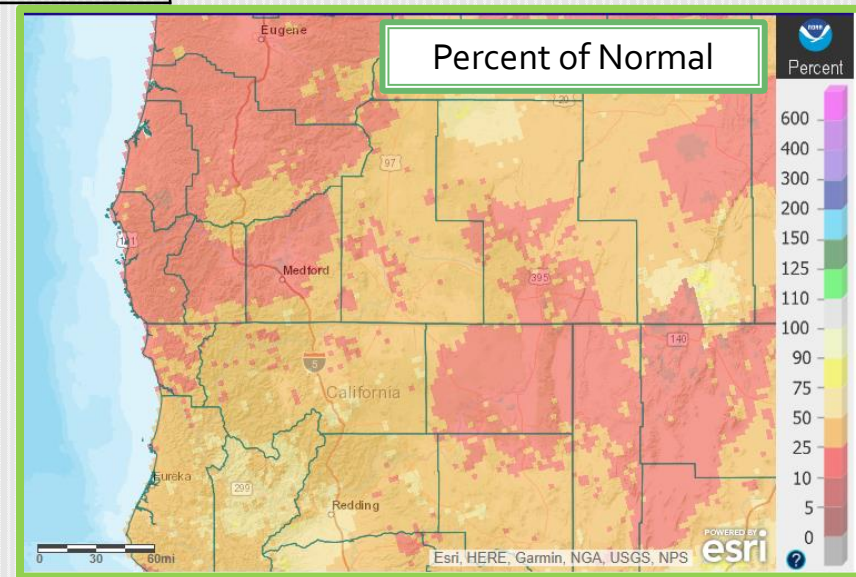
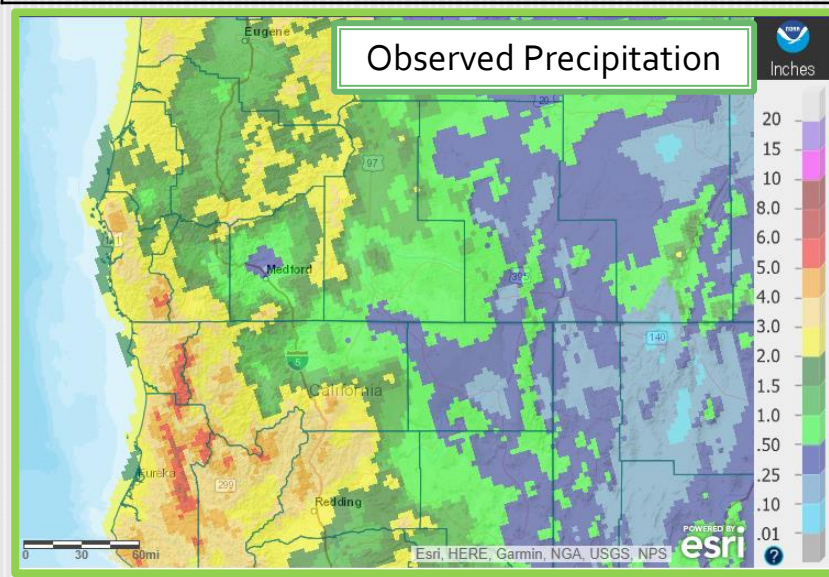
WestWide Drought Tracker, U Idaho/WRCC Data Source: PRISM (Prelim), created 5 DEC 2019

November Precipitation

	Total	Departure from Normal	Greatest 24-hr Total	Date(s)
North Bend	2.10"	-8.13"	1.04"	26th
Roseburg	1.45"	-5.01"	0.45"	26th
Medford	0.24"	-2.78"	0.09"	27th
Klamath Falls	0.11"	-2.08"	0.06"	19th
Montague, CA	0.05"	-2.92"	0.04"	26th
Mt. Shasta City, CA	2.47"	-2.61"	1.63"	26th
Alturas, CA	0.10"	-1.69"	0.08"	26th

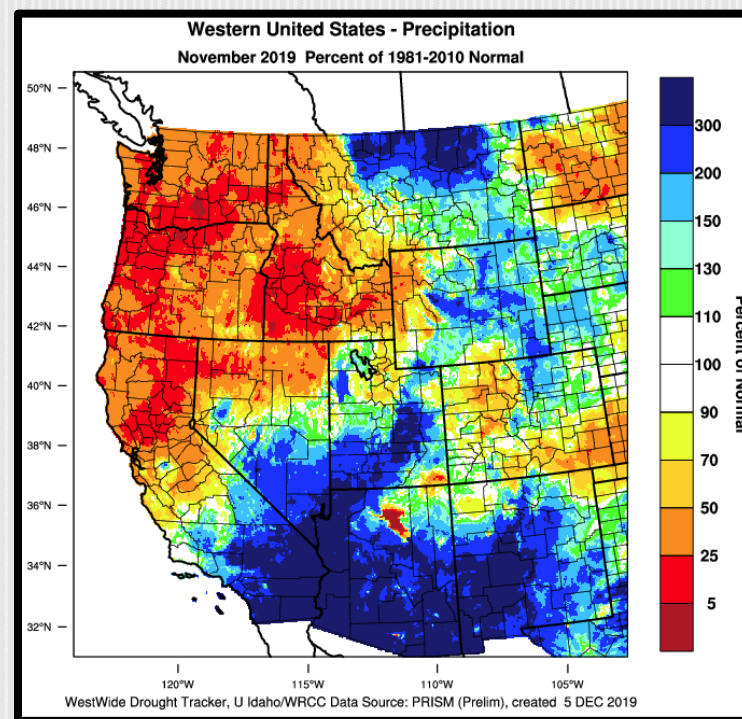
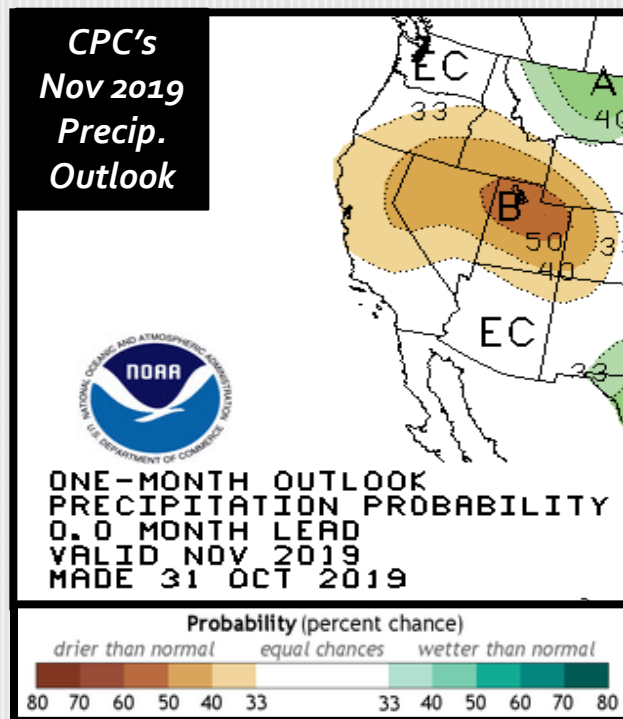
Record Daily Precipitation

	New Record	Date	Old Record	Year
Mt. Shasta City	1.63"	26th	1.57"	1962

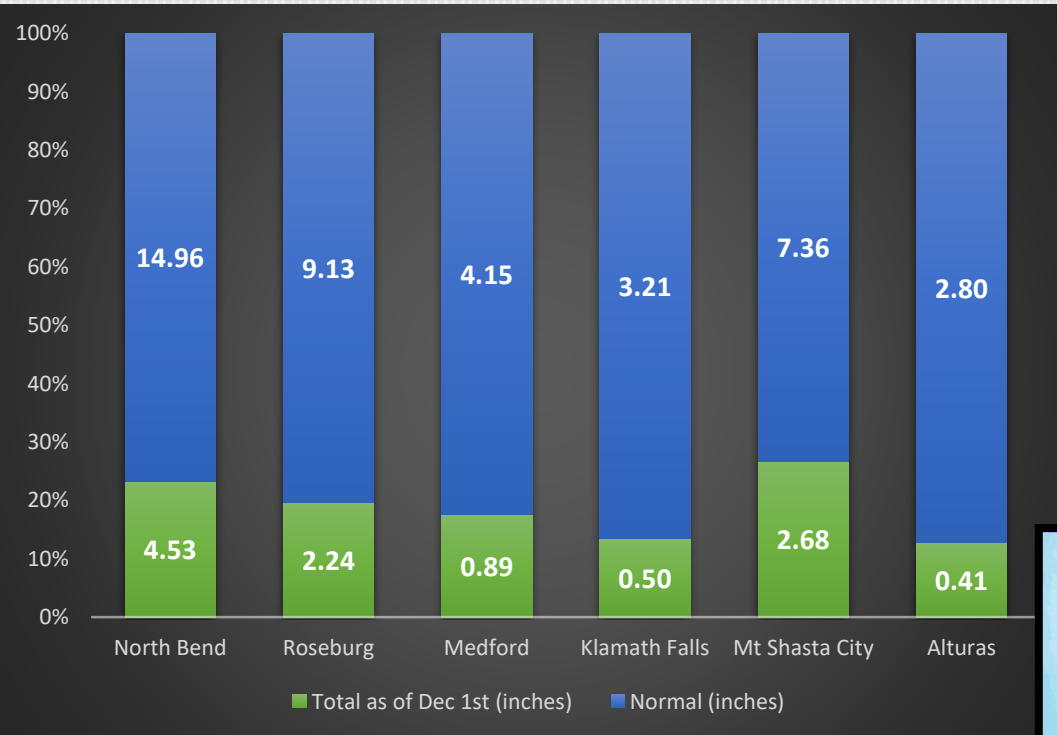


A Look Back at the October 2019 Precipitation Outlook

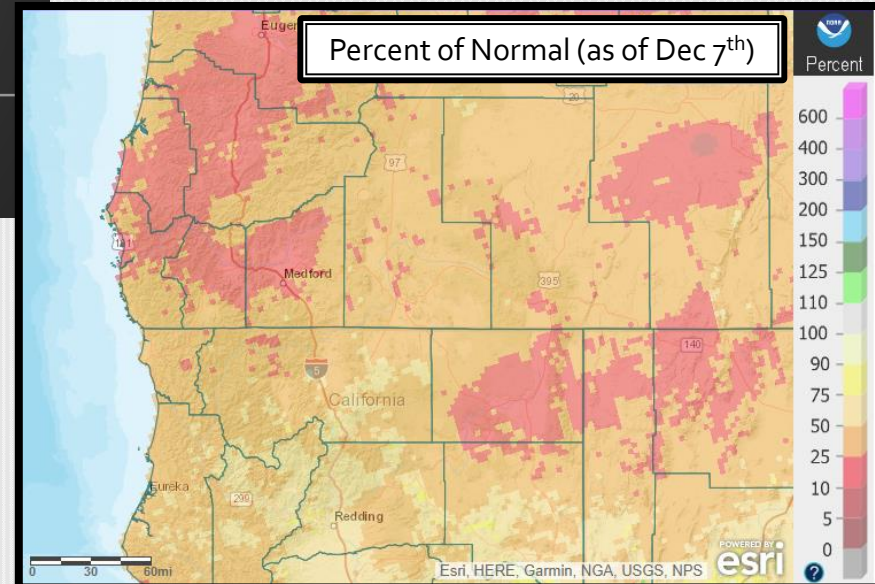
- **Was the forecast anomaly correct?** A forecast of equal chances for precipitation is never incorrect. However, based on what occurred, a forecast for highly increased probabilities of below normal precipitation would have been more accurate.
- **Did our forecast improve upon the CPC forecast?** Yes. Our localized outlook from 11/07/19 indicated that there was high confidence in the month ending with below normal precipitation across the entire area. We also added value by indicating the break down of the high pressure ridge occurring between the 15th and the 20th.
- **Was the expected impact correct?** Our localized forecast indicated low confidence in the precipitation forecast, with 25% to 75% of normal precipitation expected. In reality, precipitation amounts were mostly in the 5% to 50% range. Thus, it was even drier than we forecast in our localized outlook. The impacts of increased fire risk, and concerns for drought if December is not wetter than normal, were well grounded.



Water Year Status (As of Dec 1st)

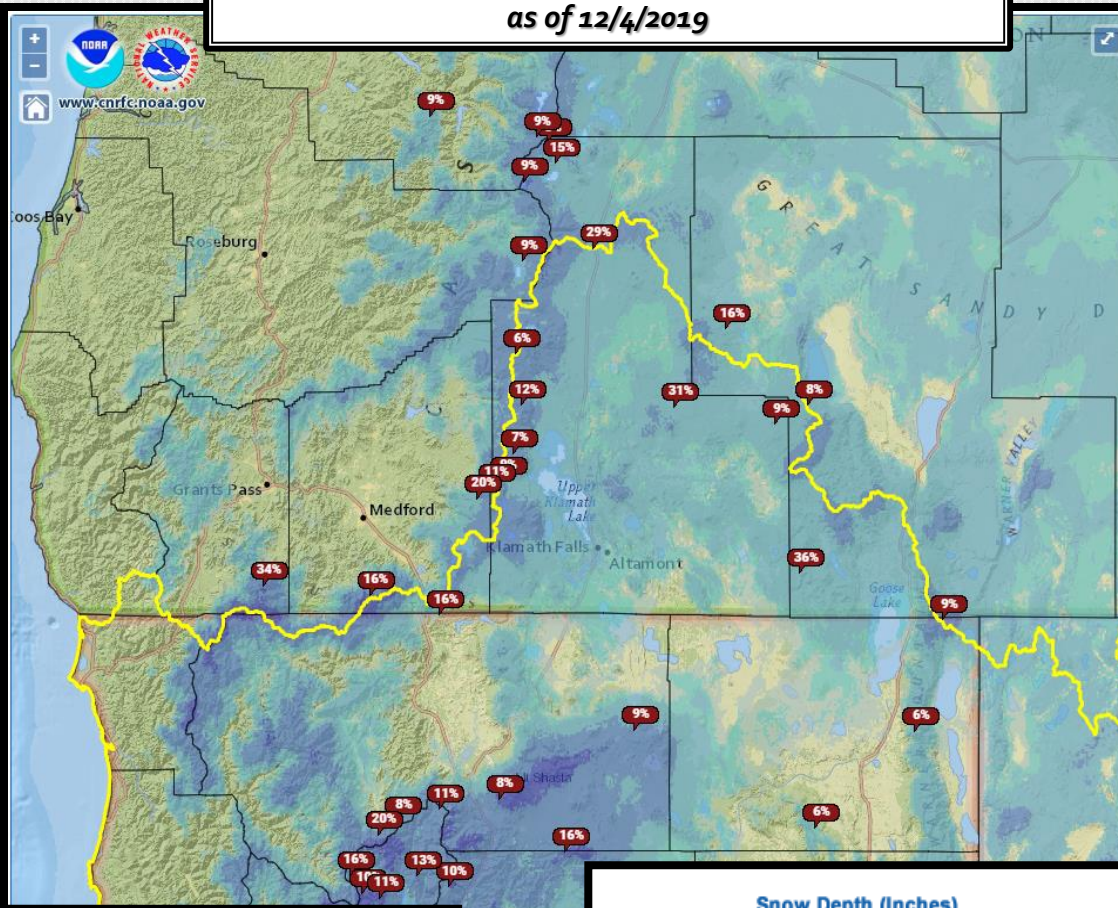


Given the dry start to the water year, it's no surprise to see all areas only 15-40% of normal for the water year to date.



Snowpack Status

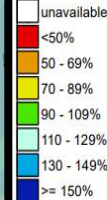
NOHRSC Snow Depth (Shaded) & Snow Water Equivalent (SWE) % of Normal (Bubble) as of 12/4/2019



Westwide SNOTEL Current Snow Water Equivalent (SWE) % of Normal

Dec 04, 2019

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



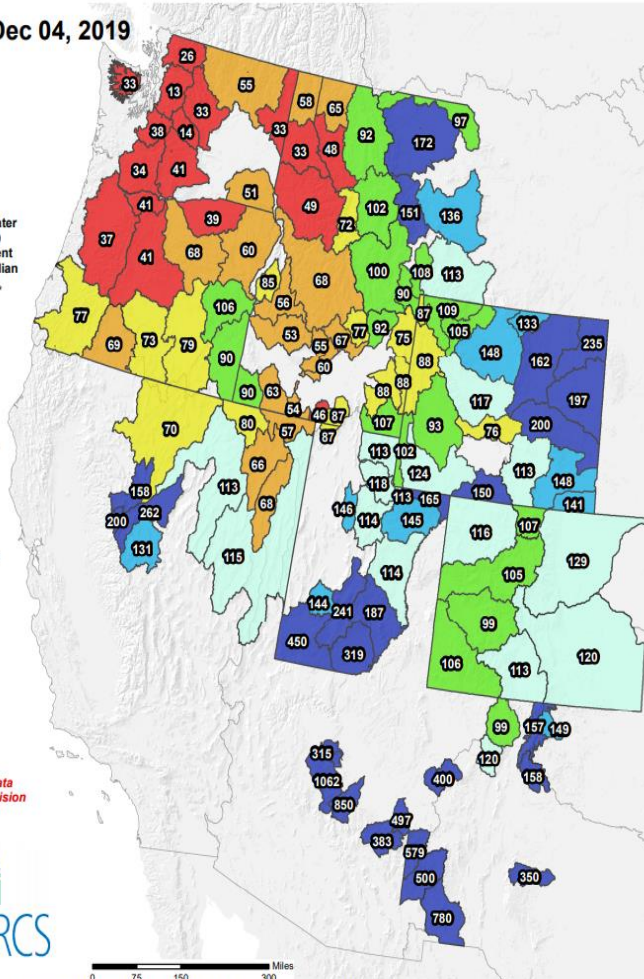
* Data unavailable at time of posting or measurement is not representative at this time of year

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).

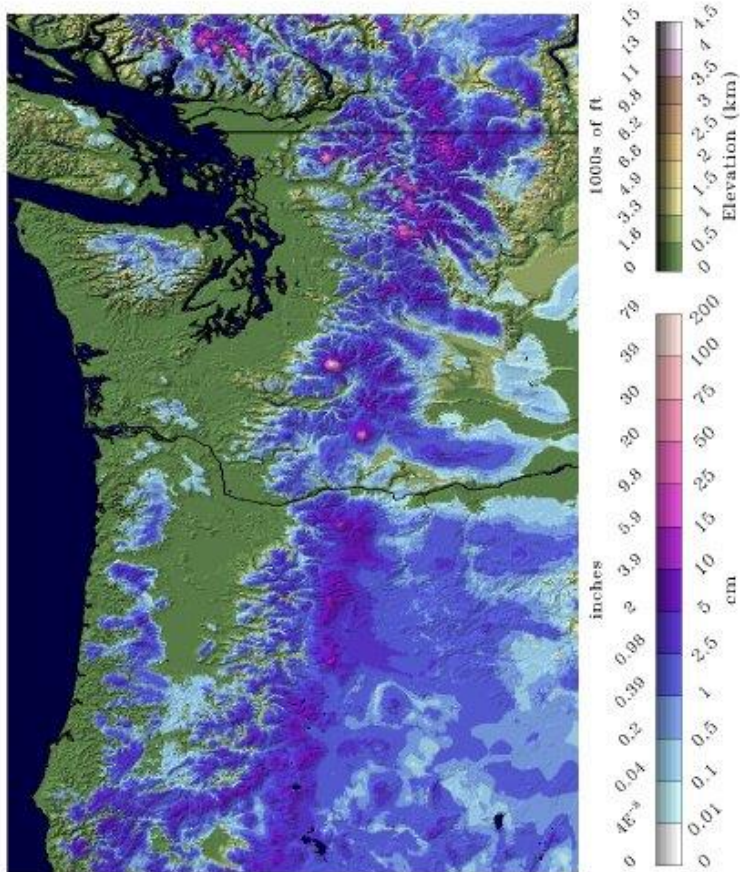
Prepared by:
USDA/NRCS National Water and Climate Center
Portland, Oregon
<http://www.wcc.nrcs.usda.gov>



PacNW SWE & SD as of 12/1/18

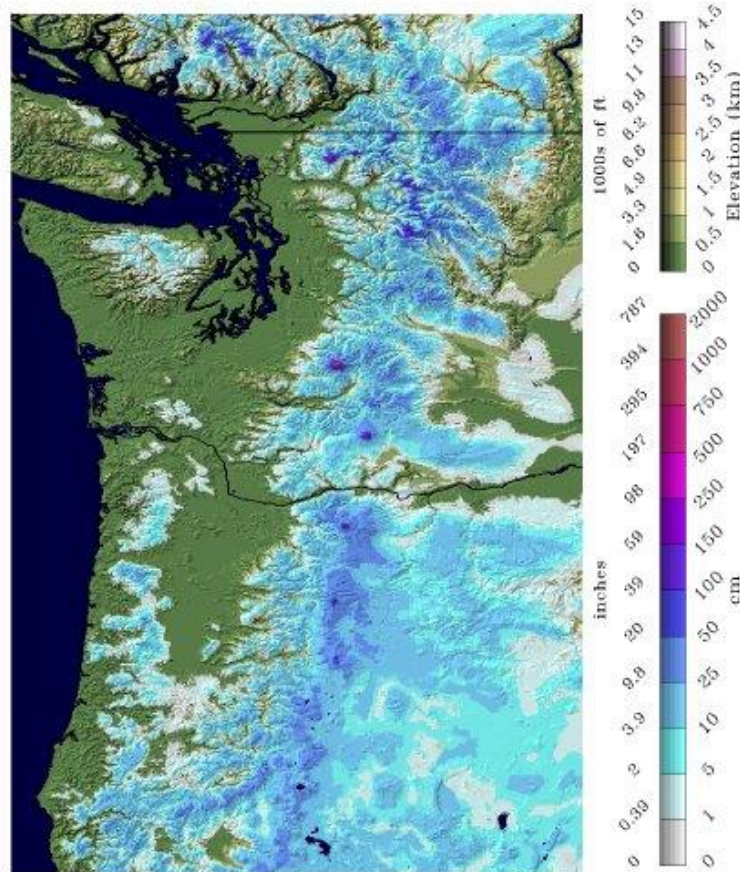
Snow Water Equivalent

2019-12-01 06 UTC



Snow Depth

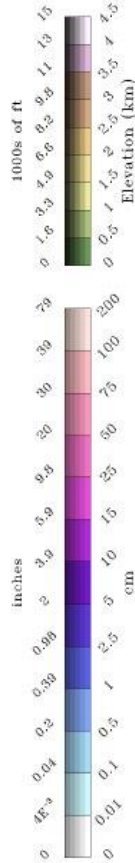
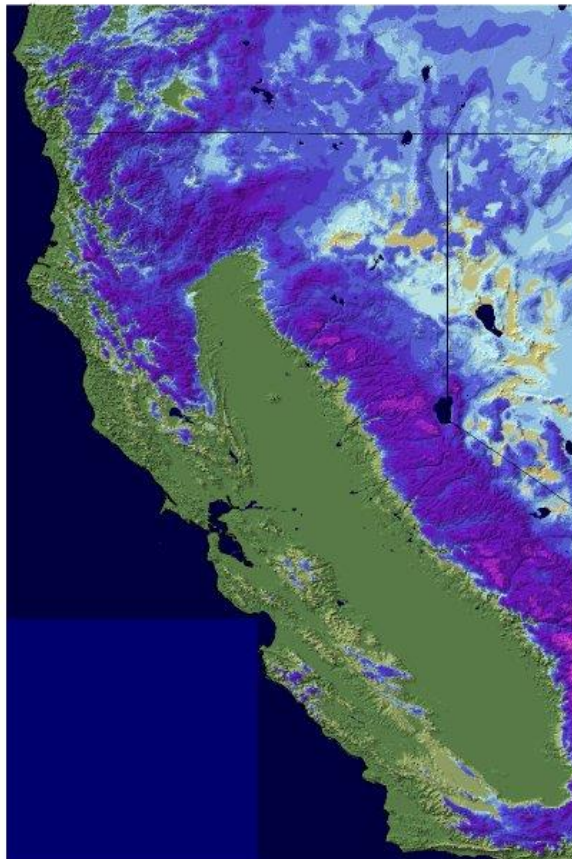
2019-12-01 06 UTC



California SWE & SD as of 12/1/18

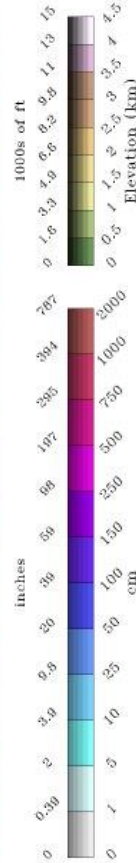
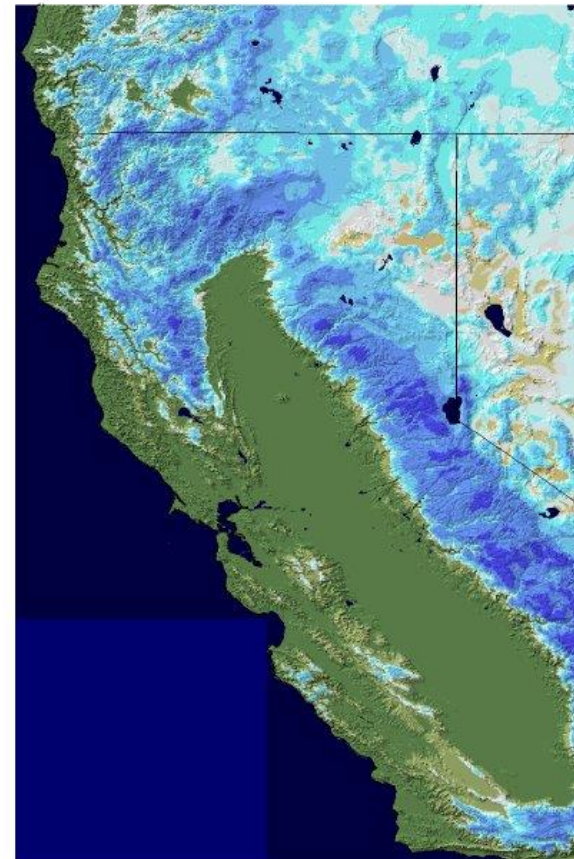
Snow Water Equivalent

2019-12-01 06 UTC



Snow Depth

2019-12-01 06 UTC



Crater Lake

Image Courtesy: NPS



	Average Max Temp (°F)	Average Min Temp (°F)	Total Precipitation	Total Snowfall	Snow Depth as of: 11/30/19	Highest Max/ Lowest Min
<i>November</i>	47.1°	27.2°	2.34"	22.3"	18"	62° on 5 th & 6 th / 5° on 30 th
<i>Normal (1981-2010)</i>	38.0°	22.0°	10.25"	71.1"	28"	N/A

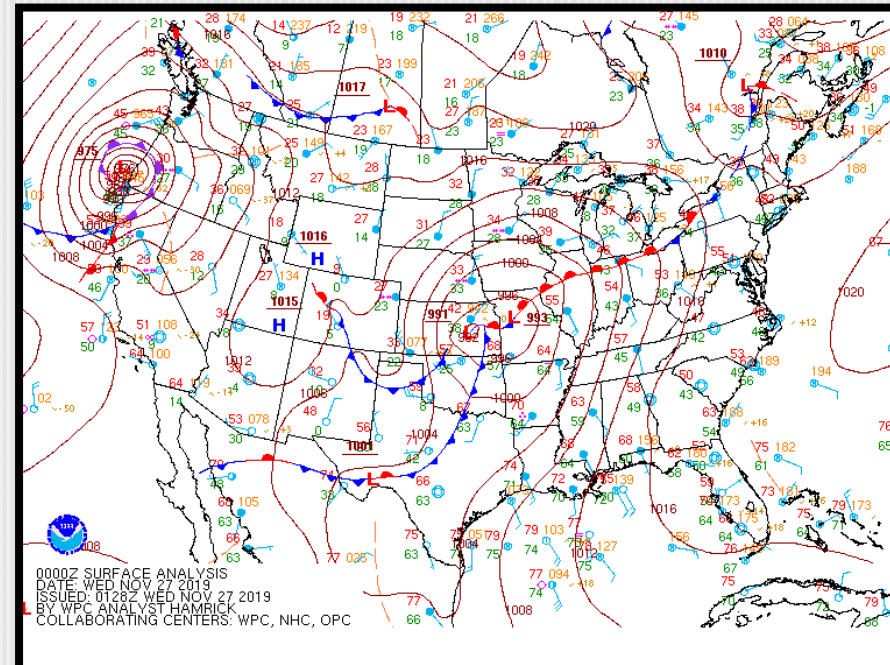
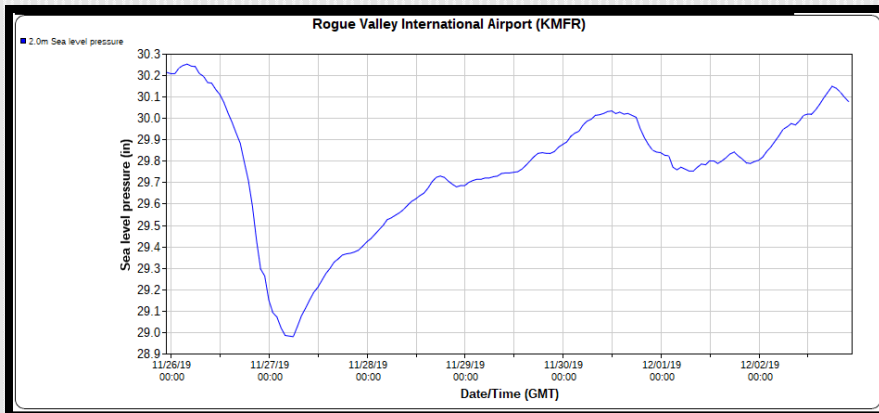
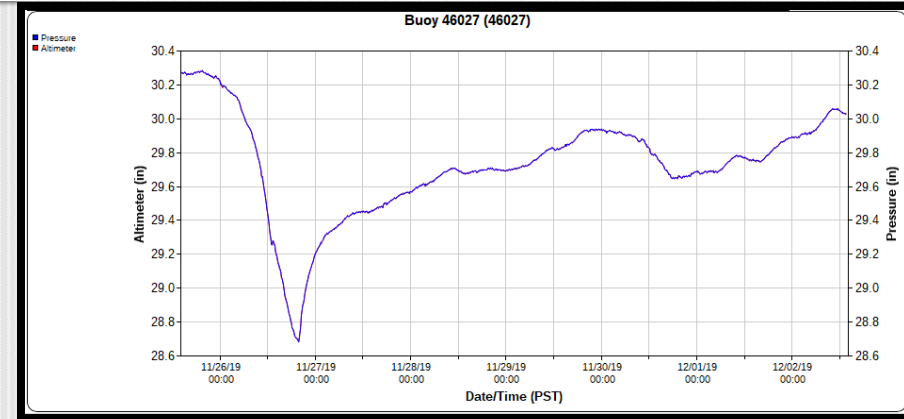
November Significant Weather Events

Bombogenesis (aka Bomb Cyclone) – A storm that strengthens rapidly, with barometric pressure falling at least 24 millibars in 24 hours.

On November 25th and 26th, a “bomb cyclone” moved into the area, bringing wide ranging impacts from high winds to heavy snow. This low was unique because of it’s track and it’s depth. Our typical strong systems move from the southwest to the northeast, whereas this system tracked from the northwest to southeast.

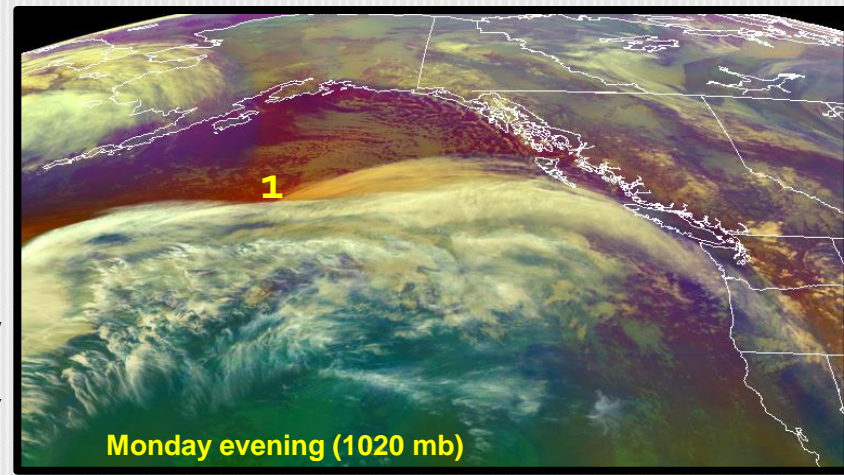
It was also one of the deepest lows to ever impact the southern Oregon coastline. The lowest sea-level pressure measured was 971.2 mb (28.68 inches) at Buoy 46027 just off Point Saint George, CA. The storm set an all-time record for the lowest sea-level pressure observed in California at Crescent City with 973.6 mb (28.75 inches) (**top right**). Also, a new record for lowest sea level pressure for the month of November was set for the Medford Airport, 981.4 mb (**bottom left**).

Wind gusts of 60 to 80 mph were common along the coast and at elevation just inland in SW Oregon and NW California, where widespread reports of downed trees and power lines caused power outages. A top instantaneous wind gust of 106 mph was measured at Cape Blanco Coast Guard station. It also brought 1-2 feet of snow to the higher passes along Interstate 5, which closed the road in both directions Monday night.

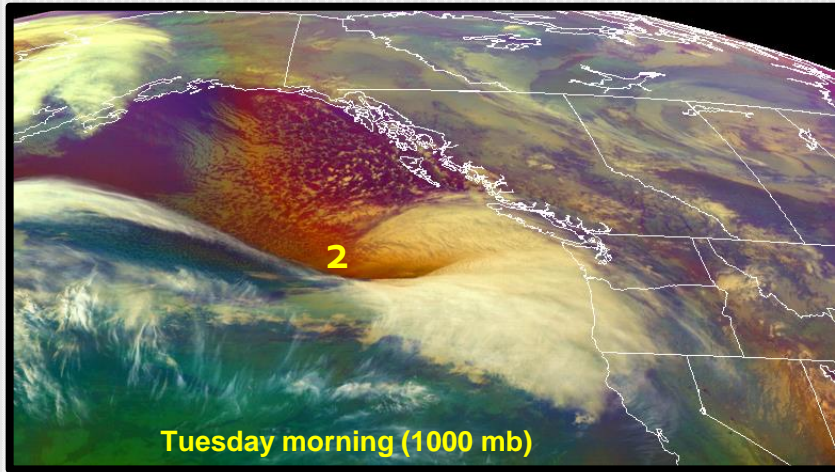


EVOLUTION OF A “BOMB CYCLONE” — MARC SPILDE

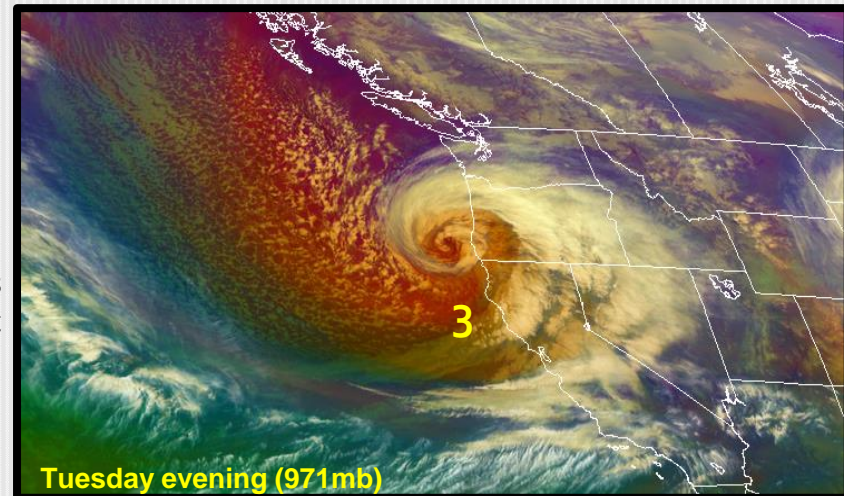
1. On Monday evening, November 25th, 2019, (right) at its infancy, the low was only 1020 mb (30.12 inches). This GOES-West Air Mass RGB image shows a jet streak (denoted by the reddish colors) advancing quickly eastward through the north Pacific Ocean. The blue/purple colors to the north and west of the jet streak (near the Aleutians) indicate a cold air mass. The olive/green colors to the south indicate a warm air mass.



2. By early Tuesday morning (left), increasing temperature gradients in the troposphere (reds very close to greens) and high-speed air associated with the jet streak aid in the formation of a baroclinic leaf (clouds aimed at Oregon), and, in this case, induce rapid cyclogenesis. At this point, the pressure has fallen to around 1000 mb (29.53 inches).



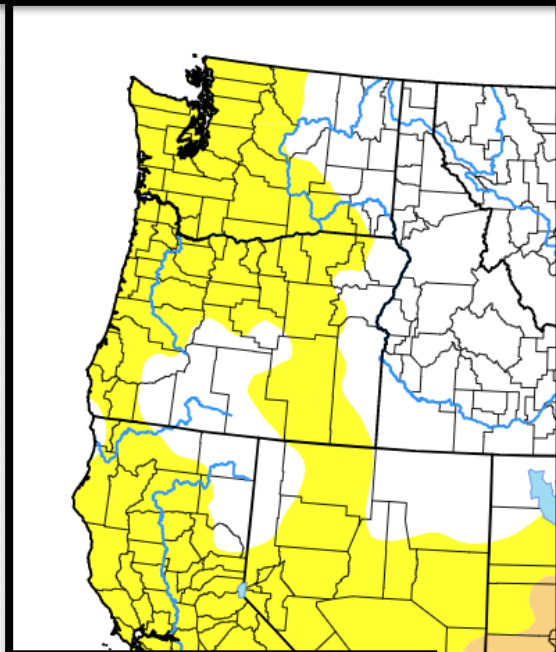
3. At maturity, by Tuesday evening (right), the low has deepened into its classic “comma-head” shape and developed an eye-like feature as it underwent warm occlusion.



**TOTAL PRESSURE DROP:
~49MB IN 24 HOURS**

Drought Monitor (Current) & Outlook (October)

United States Drought Monitor



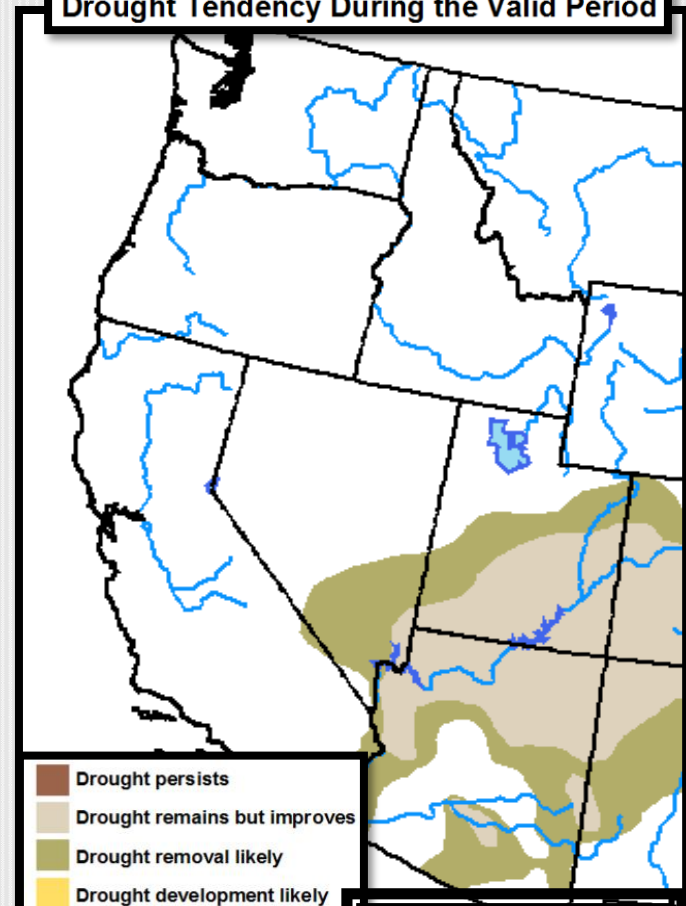
Map released: Thurs. December 5, 2019

Data valid: December 3, 2019 at 7 a.m. EST

Intensity:

- None
- D0 (Abnormally Dry)
- D1 (Moderate Drought)
- D2 (Severe Drought)
- D3 (Extreme Drought)
- D4 (Exceptional Drought)
- No Data

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



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



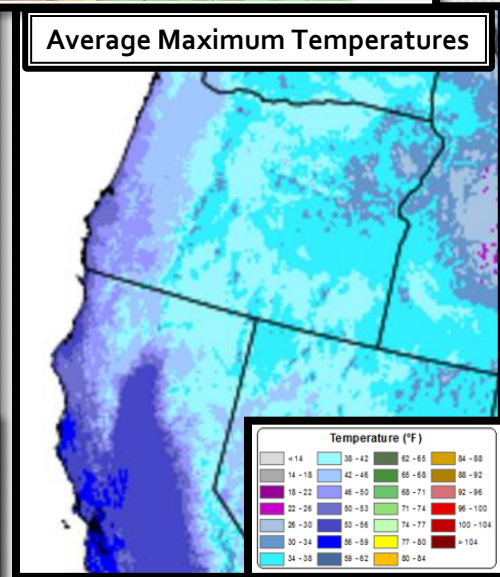
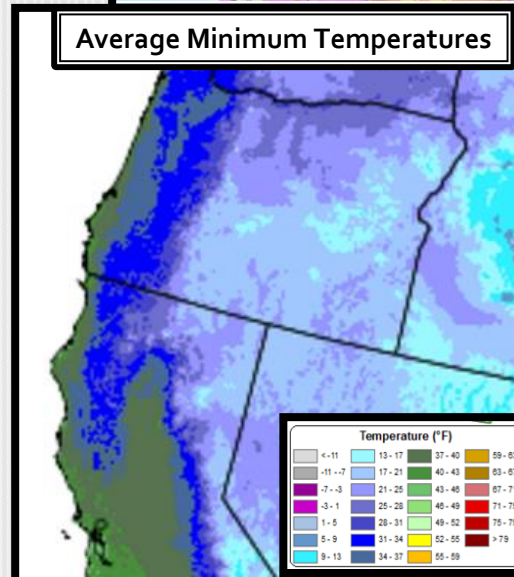
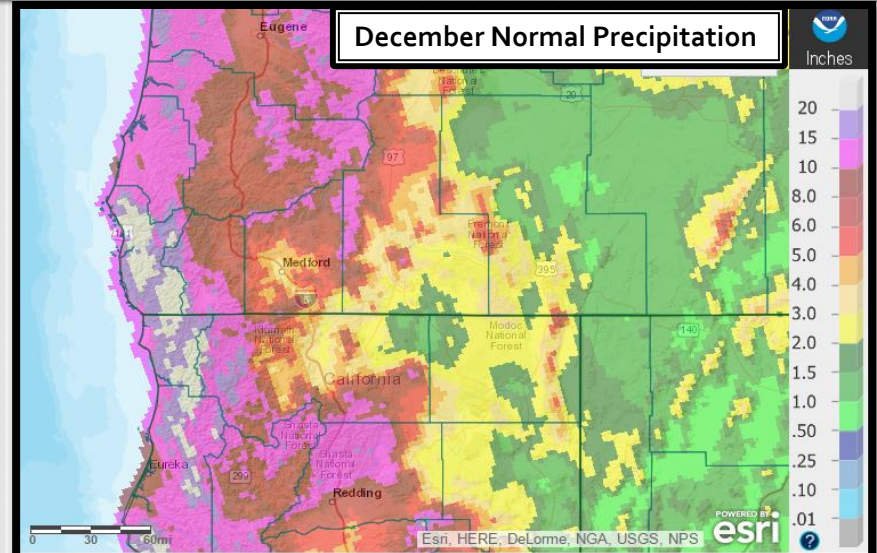
Valid for December 2019
Released November 30, 2019

Looking Ahead: Normals for December (1981-2010)

December is typically the wettest month of the year, collectively, for southwest Oregon and far northern California. The driest locations of Lake County average only a half inch to an inch of water. Most valleys east of the Cascades typically receive 1-4 inches of water, while the mountains east of the Cascades typically see 3-9 inches of water. For the Cascades and Mount Shasta area, typical December totals are 8-15 inches. The drier West Side Valleys, like the Bear Creek drainage of the Rogue Valley and the Shasta and Scott Valleys in California, usually receive 2-5 inches. The remainder of the West Side receives 5-15 inches, although the wettest portions of the Umpqua Basin, the Coast and the Coast Range get 15-20+ inches during an average December.

Much of this water often falls as snow above 4,500 feet MSL. For instance, the 1981-2010 average December snowfall for Crater Lake National Park Headquarters is 92.6". Snow depth there usually is 35.4" on December 1st and 67.5" on December 31st based on the same average period.

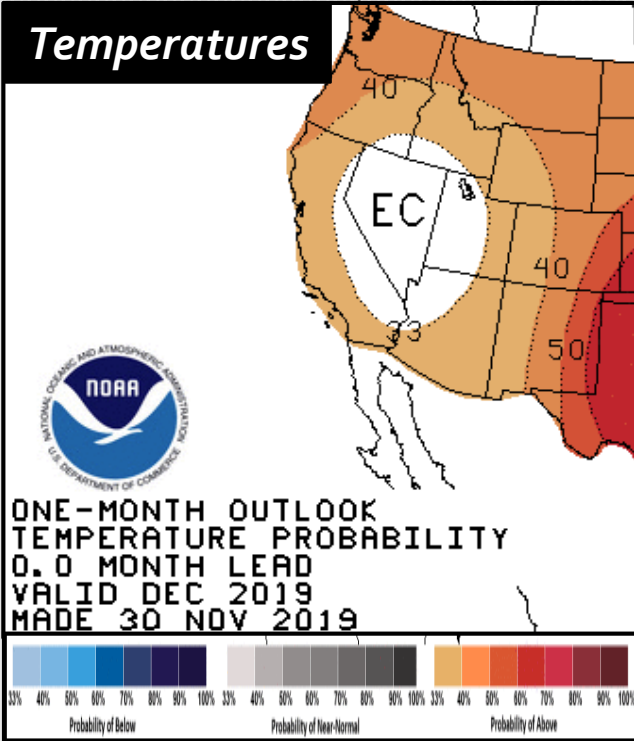
Typical daily high temperatures are 30°F to near 40°F in the mountains above 5000 feet and across the East Side and in the mid 40s to mid 50s west of the Cascades. Normal low temperatures are in the mid teens in the coldest locations on the East Side and on Mount Shasta to the upper 20s in and near the Cascades. West of the Cascades to the coast lower 30s to mid 40s are most typical from east to west.



December 2019 Outlook

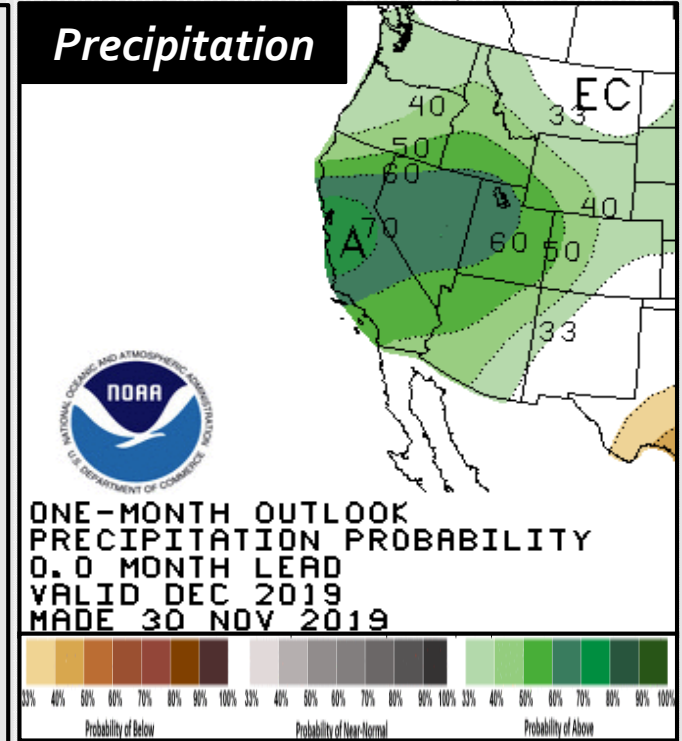
(Updated December 6th)

The official CPC forecast for Dec 2019 predicts increased chances for above normal temperatures (34-45%) and increased chances for above normal precipitation (35-55%). The greatest probability of wetter than normal conditions in our Medford Forecast Area is across NE California. However, as the first week of December has progressed, what appeared to be a near normal temperature and above average precipitation, **December 2019 has become more uncertain.** The general consensus of the ECMWF Ensemble and the GFS Ensemble is for warmer than normal temperatures for the first half of the month followed by cooler than normal temperatures for the 2nd half of the month. A significant precipitation event is expected, especially across Curry and Siskiyou counties 12/6– 12/8. High pressure is then expected from the 9th to the 13th with the next frontal system likely to arrive between the 13th and the 15th. Models suggest that low pressure troughing will become established along the west coast during the second half of the month, but how fast is uncertain, with the ECMWF Ensembles suggesting on the 17th and the GEFS more toward the 27th. Altogether, **the localized update is for near normal temperatures (-2F to +3F) and near normal precipitation (75-125% of normal).** It's likely to be coolest and wettest in Curry County and Northern California and driest and warmer NW as compared to climo.



Expected Impact, Dec 2019:

December typically brings wind, rain, and snow impacts, and, sometimes, flooding. Currently, we're not anticipating anything out of the ordinary for the first half of the month—minor wind, rain, and high elevation snow impacts. **If we're going to see a major storm with major rain, snow, and wind impacts, it's likely to be in the 2nd half of the month, probably after the 20th.** With temperatures turning colder for the 2nd half of the month, expect snow impacts to increase to mid and, possibly, lower elevations. Given the current below normal precip and low snowpack across the area, more precip would be mostly welcome, though this would present challenges for those traveling.



*A note about Period of Record (POR)

When looking at record setting events, it's important to consider the length and completeness of the site's period of record (POR). For example, a site September have records back to the early 1900's, but if there is a significant portion of the record missing, it's possible that the POR is not encompassing another significant event that September have surpassed the event in question. Therefore, "record setting" should be considered relative to the completeness/length of POR. To help keep records in context, the POR for each climate site is listed below:

- **North Bend: 1/1/1902 – Present**
- **Roseburg: 4/1/1900 – Present**
 - ❖ *Missing*:
 - 05/1900-01/1901
 - 03/1901-06/1902
 - 08/1902-12/1930
 - 10/1965-06/1997
- **Medford: 3/11/1911 – Present**
- **Klamath Falls: 12/1/1897 – Present**
- **Montague, CA: 7/1/1948 – Present**
 - ❖ *Missing*:
 - 08-09/1952
 - 02/1953-06/2000
- **Mount Shasta City, CA: 4/15/1948 – Present**
 - ❖ *Missing*:
 - 10/1984-01/1985
 - 10/1985-03/1986
 - 09/1986-07/1997
- **Alturas, CA: 6/1/1998 – Present**
 - ❖ *Missing*:
 - 08/1998