

# The Month In Review

**September  
2019**

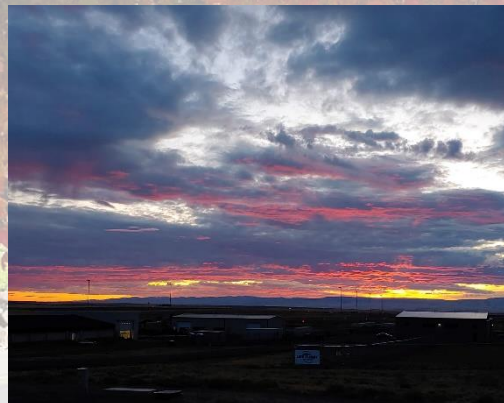
National Weather Service  
Pendleton, Oregon

# September, 2019 Climate Summary

The month of September, 2019 was a little cooler than normal overall for the month. It started out quite a bit warmer than normal for the first 7 days, with temperatures mostly in the 80s and lower 90s. This was a continuation of the late August hot spell which extended into September. For WFO Pendleton, the average temperature for the month was only -0.6 degrees below normal. This was due to the cool periods that occurred during the middle of the month, and then a significant cold spell at the end of the month. At the end of the month there was a 3 day period where the daily average temperature was -10 to -20 degrees below normal, with one day having a low temperature below freezing at WFO Pendleton. Precipitation amounts for the month were mostly above normal. WFO Pendleton had over a half inch of rainfall greater than normal. There were a couple of weather systems that brought late season thunderstorms on the 8<sup>th</sup> and 10<sup>th</sup>. There were many record low maximum temperatures broken. Below are a few photos of the weather in September, 2019.



Late season thunderstorms.



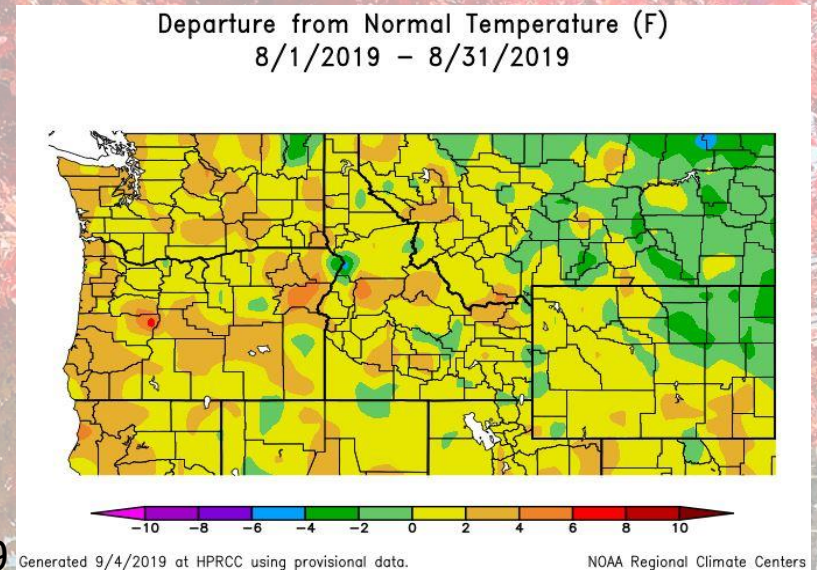
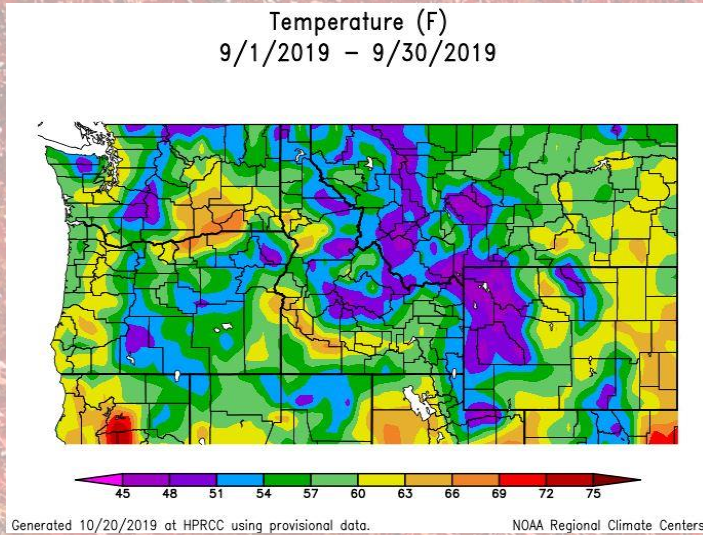
Alto-Cumulus with red skies in the evening indicating a nice day on the next day.



Early season snowfall on top of Mount Bachelor in central Oregon.

# September 2019 Departure from Normal Temperatures

Departure from normal for September, 2019

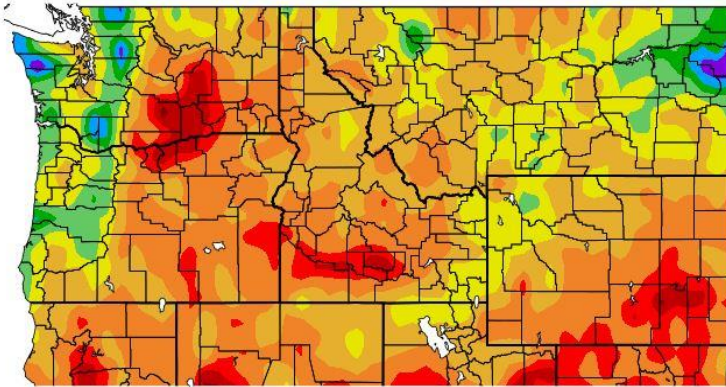


Departure from normal for August, 2019

The images above show a comparison of the departure from normal of average temperature for August vs. September, 2019. As the images shows, average temperatures for September were mostly much below normal for the higher elevations and above normal for the Lower Columbia Basin. Departures for August were more uniform in area.

# September 2019 Departure from Normal Precipitation

Precipitation (in)  
9/1/2019 – 9/30/2019

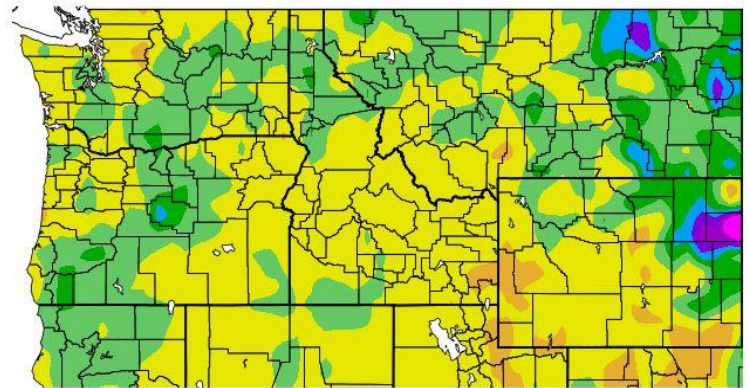


Generated 10/20/2019 at HPRCC using provisional data.

NOAA Regional Climate Centers

Departure from normal precipitation for September

Departure from Normal Precipitation (in)  
8/1/2019 – 8/31/2019



Generated 9/4/2019 at HPRCC using provisional data.

NOAA Regional Climate Centers

Departure from normal precipitation for August

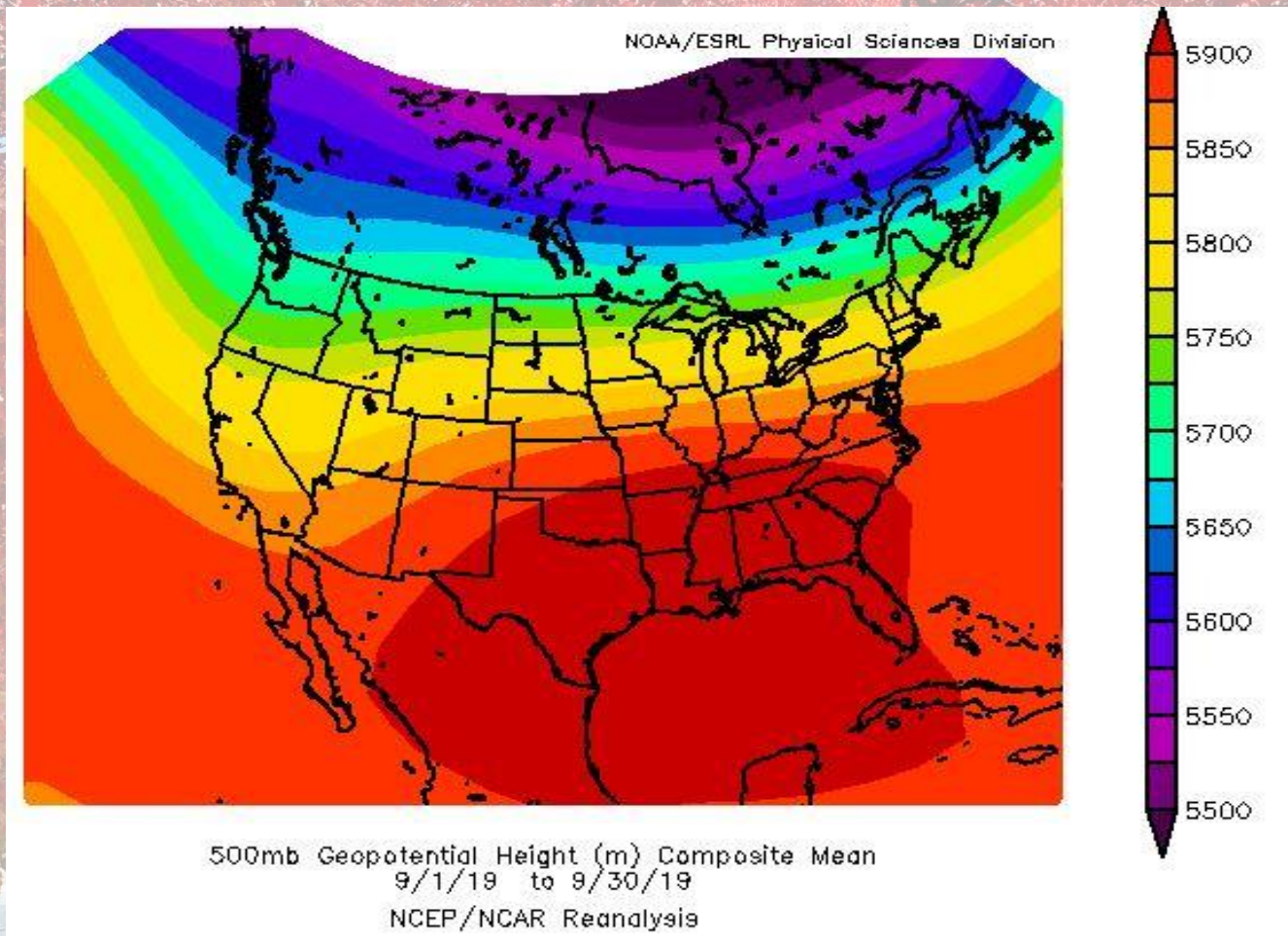
**The above images shows that September had well below normal precipitation for the month, compared to near to slightly above normal for August.**

# September 2019 Departures from Normals for Select Cites

	Max T	Max T D	Min T	Min T D	Ave T	Ave T D	PCPN	PCPN D
Yakima	74.9	-3.1	47.3	3.8	61.1	0.3	0.52	0.16
Kennewick	79.0	-0.9	57.0	4.7	68.0	1.9	0.76	0.46
Walla Walla	75.5	-2.4	55.3	2.7	65.4	0.2	1.48	-0.75
The Dalles	76.0	-4.1	55.0	3.4	65.5	-0.3	0.91	0.44
Redmond	73.5	-2.7	43.8	5.6	58.7	1.5	1.53	1.12
Pendleton Airport	74.6	-2.8	51.1	1.7	62.9	-0.5	1.11	0.54
La Grande	75.2	-1.0	47.3	3.6	61.3	1.3	1.48	0.81

The data above show that all stations in the list had below normal average maximum temperatures, and above normal average minimum temperatures for all the stations in the list. The greatest departure average maximum was at The Dalles, OR and the greatest departure average minimum was at Redmond, OR. The average temperatures were mostly above normal, except for The Dalles and the Pendleton Airport. Precipitation departures were all above normal for totals, except for Walla Walla, WA, which received below normal precipitation.

# September 2019 Average 500 MB Weather Pattern



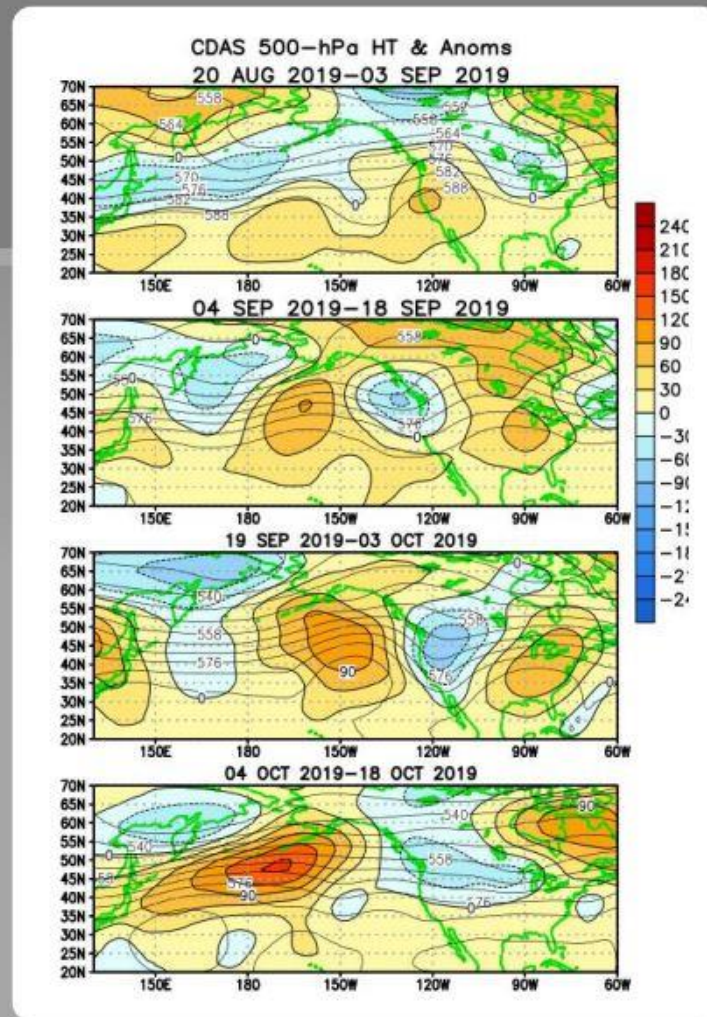
The image above shows a mean upper trough over the western USA including the Pacific Northwest and the forecast area. This corresponds with the cooler than normal maximum temperatures for the month. However, it also resulted in more weather systems and cloud cover, which resulted in above normal minimum temperatures. It also corresponds with the mostly above normal precipitation for the month.

# More Detailed 500 MB Plots for September, 2019

## Atmospheric anomalies over the North Pacific and North America During the Last 60 Days

From mid-August to early September, below-average heights and temperatures were evident over the north-central or northeastern U.S., while above-average heights and temperatures were present across the southern tier of the U.S.

Since mid-September, above-average heights and temperatures were observed over most of the eastern U.S., while below-average heights and temperatures were located over the western U.S.



The Pacific Northwest had an upper trough through the month of September, with the flow becoming more zonal in the beginning of October.

# Significant Weather Events/Records for September, 2019

## Significant Weather Events

Event	Date	Report	Where	Misc
Thunderstorm	8-Sep-19	1 inch hail	Trout Lake, WA	dime to quarter sized hail, power outages
Funnel Cloud	10-Sep-19	funnel cloud	15 ENE Ellensburg, WA	public reported funnel cloud

## Record Weather Reports

Event	Date	Where	Previous Record	New Record	Records Began
Precip	6-Sep-19	Redmond, OR	.48 / 2019	0.48	1941
Low Max	20-Sep-19	Yakima, WA	56 / 1959	45	1946
		Walla Walla, WA	57 / 1971	48	1949
		Ellensburg, WA	57 / 1956	45	1940
		Pasco, WA	56 / 1977	50	1894
		Redmond, OR	51 / 1971	47	1948
		Bend, OR	49 / 2013	45	1901
		The Dalles, OR	59 / 2013	49	1948
		Pendleton, OR	58 / 1977	47	1928
Low Max	29-Sep-19	Yakima, WA	58 / 1977	55	1946
		Walla Walla, WA	55 / 1977	51	1949
		Ellensburg, WA	56 / 1948	50	1940
		Redmond, OR	51 / 1977	51 (tied)	1948
		Bend, OR	50 / 1940	50 (tied)	1901
Low Min	30-Sep-19	Walla Walla, WA	35 / 1954	34	1930



# September, 2019 Observed Monthly Max & Min Temperatures

Location	Highest Maximum Temperature	Lowest Minimum Temperature
Pendleton, OR	92	31
Redmond, OR	92	34
Pasco, WA	94	39
Yakima, WA	90	32
Walla Walla, WA	93	34
Bend, OR	88	31
Ellensburg, WA	91	31
Hermiston, OR	93	33
John Day, OR	90	32
La Grande, OR	95	34
The Dalles, OR	94	42
Mt Adams RS, WA	86	30

**All stations, except for Bend, OR, and the Mt Adams RS, WA, all had highest maximum temperatures of 90 or greater. The lowest minimum temperatures were all in the 30s, Except for The Dalles, OR, which had a minimum monthly low temperature of 42 degrees.**

# September, 2019, Monthly Total Precipitation and Snowfall Totals

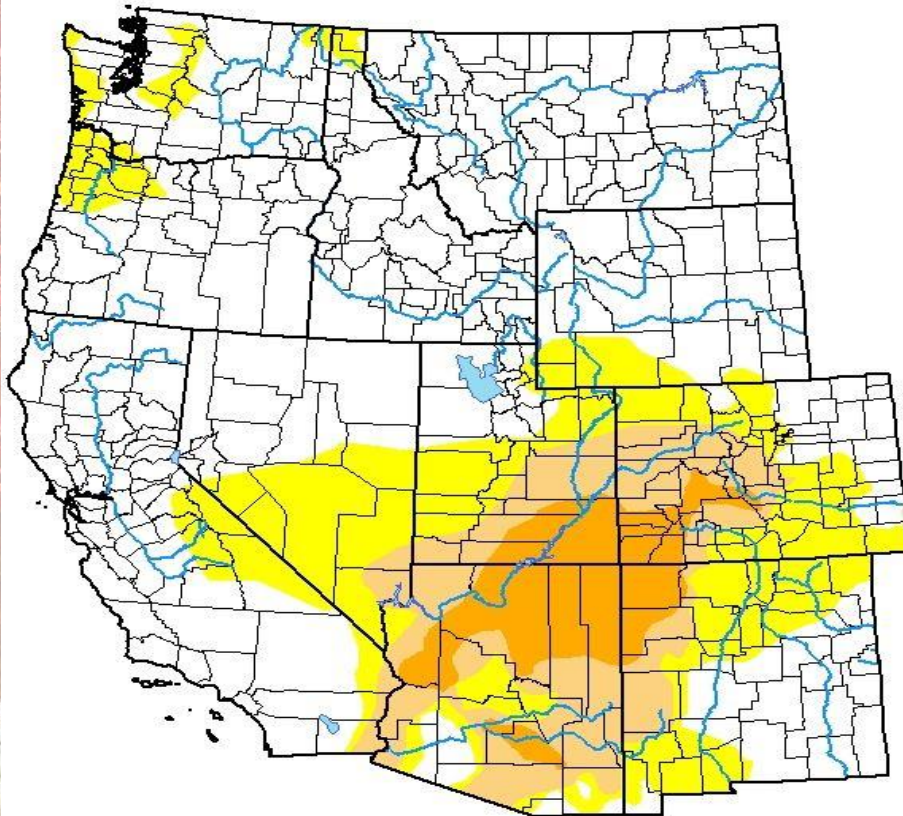
Location	Total Monthly Precip	Total Snowfall
Pendleton, OR	1.11	0
Redmond, OR	1.53	0
Pasco, WA	0.55	0
Yakima, WA	0.52	0
Walla Walla, WA	1.48	0
Bend, OR	1.17	0
Ellensburg, WA	0.47	0
Hermiston, OR	0.15	0
John Day, OR	1.96	0
La Grande, OR	1.65	0
The Dalles, OR	0.90	0
Mt Adams RS, WA	3.64	0

**Seven stations had greater than an inch of precipitation in September, and five had less than an inch. The greatest (except for the Mt. Adams RS) was 1.96 inches at John Day, OR, and the least was 0.15 inch at Hermiston, OR. These are typical values for September.**

# September-mid October, 2019 - Drought Monitor

## U.S. Drought Monitor West

**October 15, 2019**  
(Released Thursday, Oct. 17, 2019)  
Valid 8 a.m. EDT



Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
<b>Current</b>	64.37	35.63	16.07	6.27	0.00	0.00
<b>Last Week</b> <small>10-08-2019</small>	69.63	30.37	16.07	5.31	0.00	0.00
<b>3 Months Ago</b> <small>07-16-2019</small>	85.38	14.62	6.01	1.26	0.00	0.00
<b>Start of Calendar Year</b> <small>01-01-2019</small>	28.03	71.97	53.25	27.22	8.35	2.88
<b>Start of Water Year</b> <small>10-01-2019</small>	68.40	31.60	16.32	3.16	0.00	0.00
<b>One Year Ago</b> <small>10-16-2018</small>	21.04	78.96	56.09	33.16	12.40	3.42

Intensity:

- None
- 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:

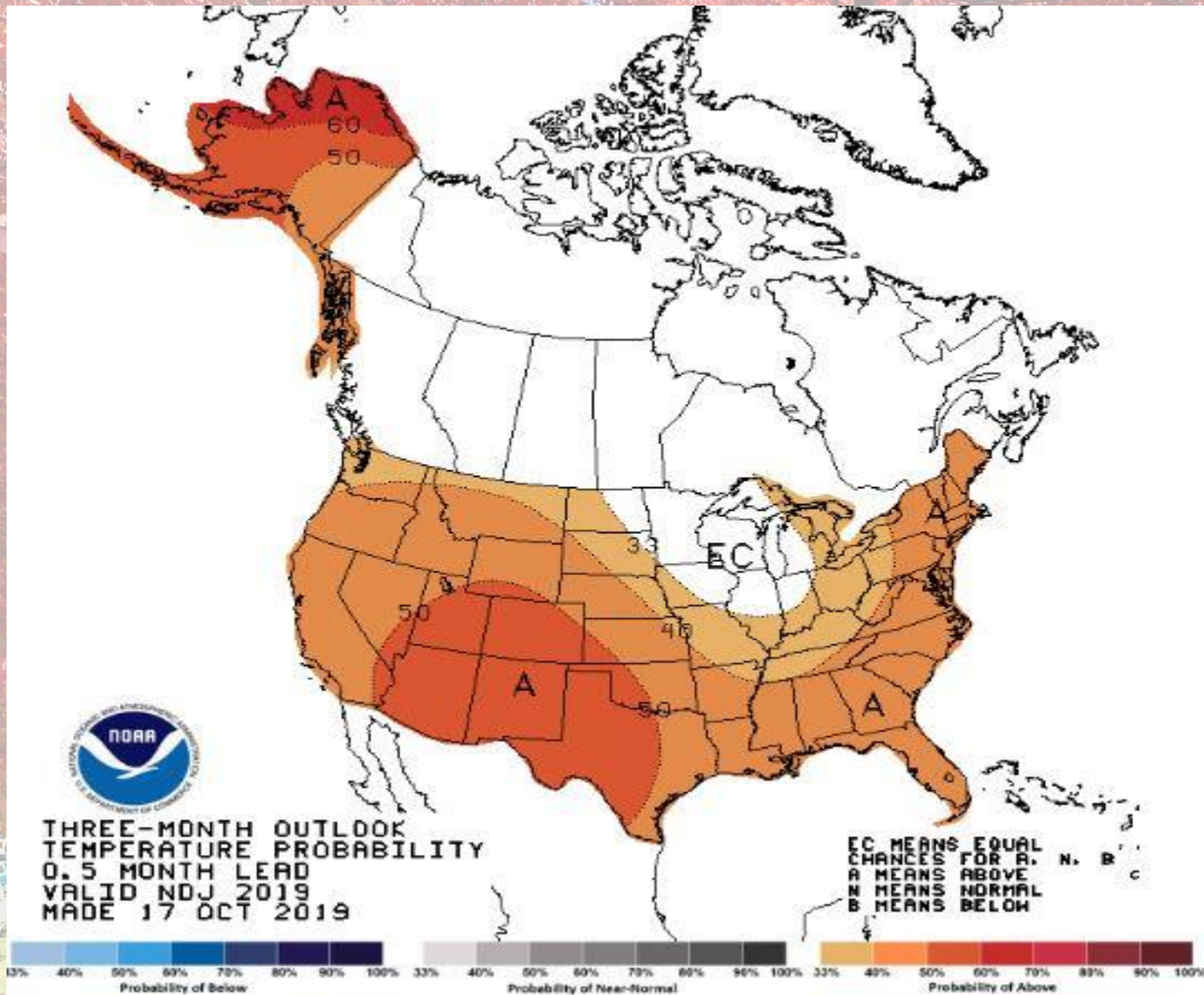
Richard Heim  
NCEI/NOAA



[droughtmonitor.unl.edu](http://droughtmonitor.unl.edu)

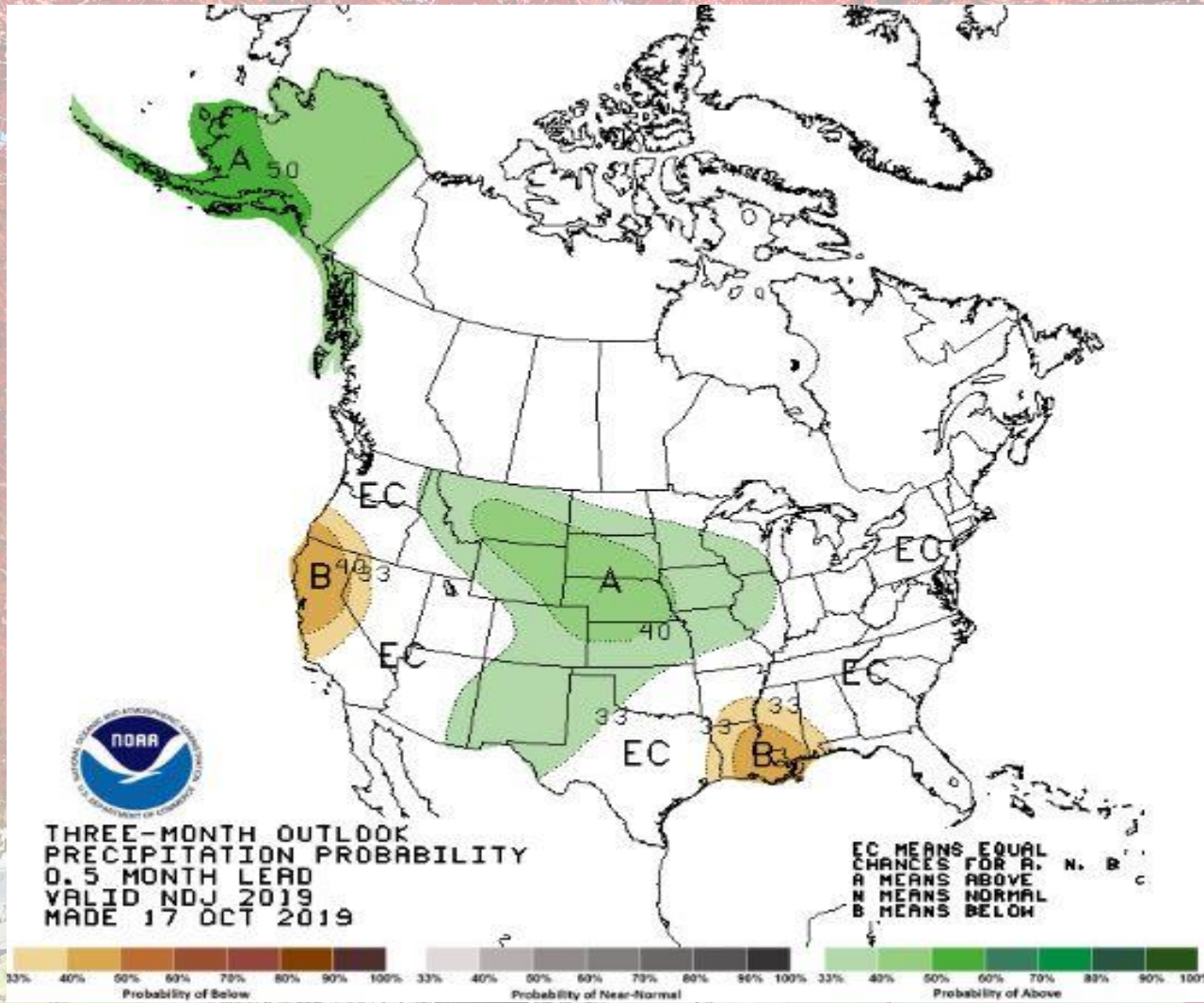
Most of the forecast area was classified as “none” or “neutral” (no drought). Only a small portions of the Cascades had “D0” conditions (“Abnormally Dry”).

# USA Three Month Temperature Outlook



The temperature outlook for the next three months shows a greater chance of having above normal temperatures from the four corners area to the Pacific Northwest, including the forecast area.

# USA Three Month Precipitation Outlook

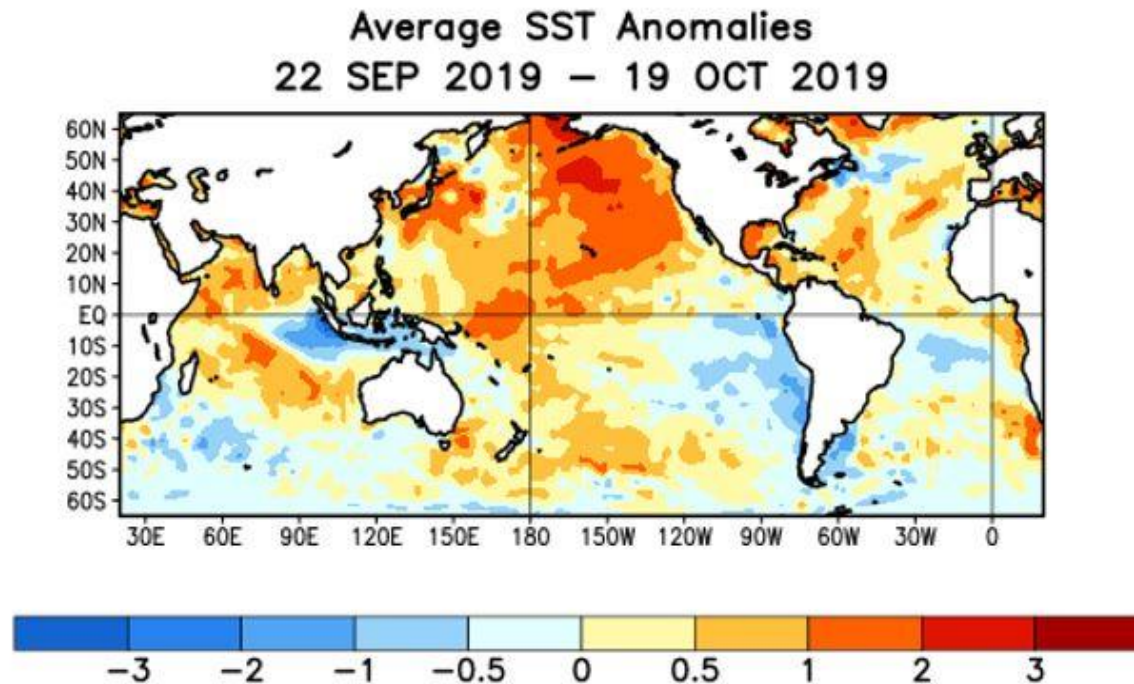


The precipitation outlook for the next three months shows an equal chance of above or below normal precipitation for most of the Pacific Northwest and the forecast area.

# Sea Surface Temperature (SST) analysis early for late September, 2019

## Global SST Departures (°C) During the Last Four Weeks

During the last four weeks, equatorial SSTs were above average across the western and central Pacific Ocean, the eastern Atlantic Ocean, and the western Indian Ocean. SSTs were below average near Indonesia and in the eastern Pacific.



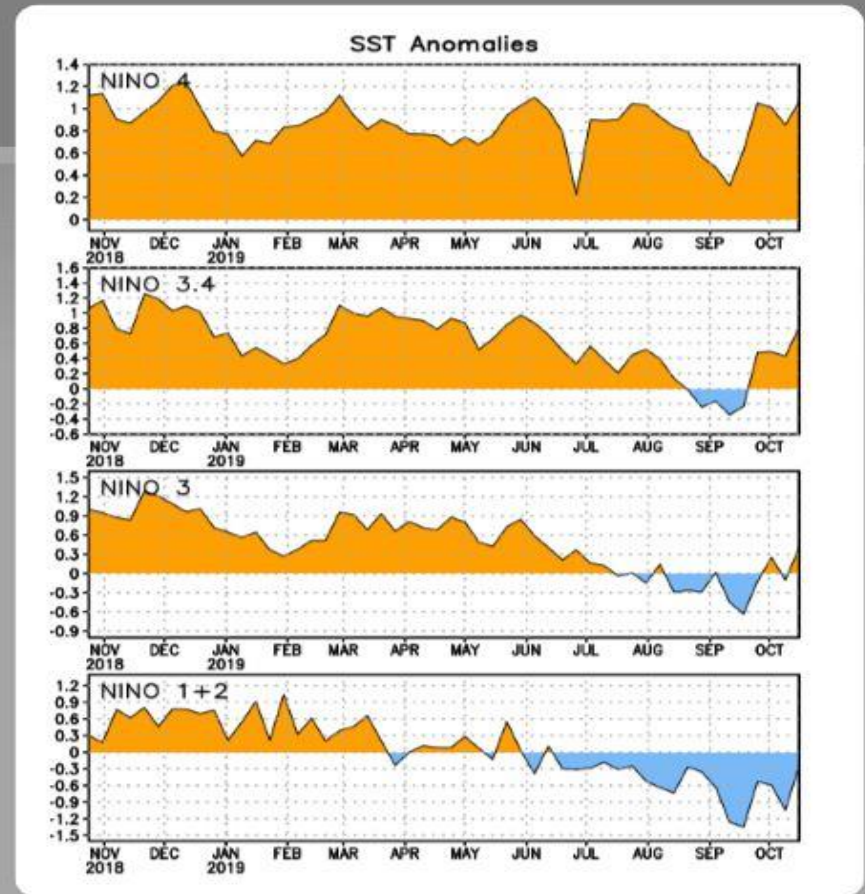
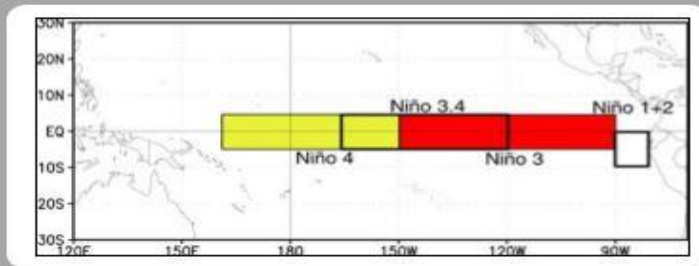
This indicates that El-Nino conditions are diminishing in the tropical eastern Pacific.

# El Nino/ La Nina Regions, Showing SST Anomalies for Each Nino Region

## Niño Region SST Departures (°C) Recent Evolution

The latest weekly SST departures are:

Niño 4	1.1°C
Niño 3.4	0.8°C
Niño 3	0.4°C
Niño 1+2	-0.2°C



The above images show that Niño regions 3.4 and 4 have mostly all positive (warmer than normal) SSTs, while Niño 1 + 2, and 3 have some below normal SSTs for September. The image to the bottom left shows where the Niño regions are over the tropical Pacific. The cooling in Niño regions 1 + 2, and 3 during September indicates that El-Niño conditions continued to weaken.



Thank You!