

The Month In Review

August 2019

National Weather Service
Pendleton, Oregon

August, 2019 Climate Summary

The month of August, 2019 was a little warmer than normal for most high, low and mean monthly average temperatures. The month was also drier than normal for most stations by an average of mostly a quarter to near a half inch of rainfall for the month. Despite these anomalies, the month was actually fairly benign with many quiet and fair weather days with near normal temperatures. There were only two days in which the city of Pendleton had an official high temperature of 100 degrees or greater. This compares to zero in the month of July. The fact that both July and August were not much hotter or drier than normal, there were only a few project wildfires during the month in the forecast area. There were a couple thunderstorm episodes where there were a few severe thunderstorm warnings issued, but it was not a high thunderstorm activity month either. Below are several photos that show what a typical day was like for the month.



Colorful Sunset with dissipating thunderstorms.



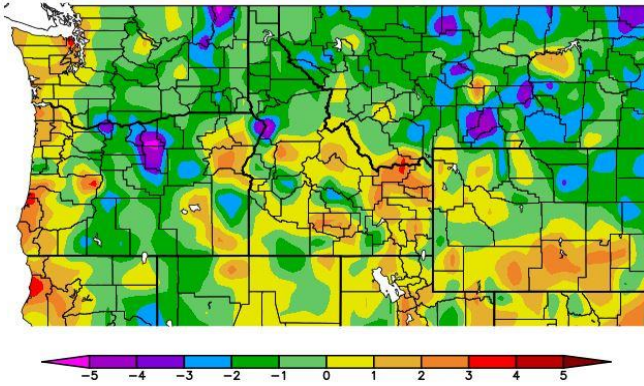
Alto-Cumulus in the morning indicating an unstable atmosphere aloft which may result in afternoon thunderstorms.



Quiet evening over Pendleton, OR with an early crescent moon.

August 2019 Departure from Normal Temperatures

Departure from Normal Temperature (F)
7/1/2019 – 7/31/2019

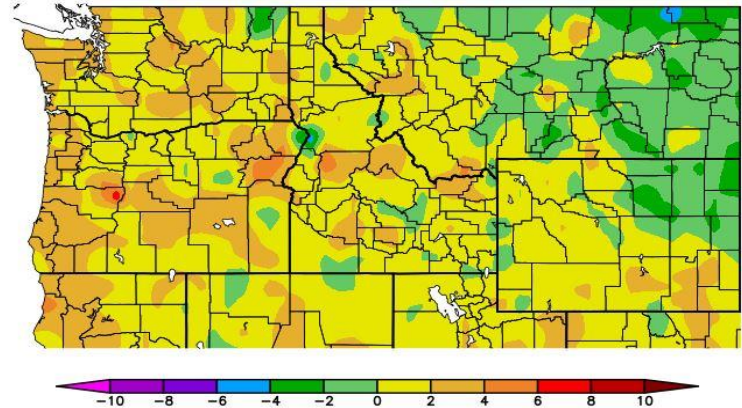


Generated 8/2/2019 at HPRCC using provisional data.

NOAA Regional Climate Centers

Departure from normal for July, 2019

Departure from Normal Temperature (F)
8/1/2019 – 8/31/2019



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

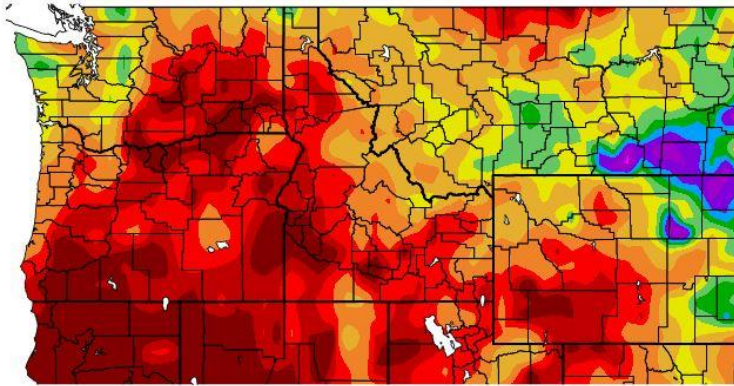
NOAA Regional Climate Centers

Departure from normal for August, 2019

The images above show a comparison of the departure from normal of average temperature for July vs. August, 2019. As the images show, average temperatures for July was mostly cooler than normal, while August was mostly warmer than normal for the Pacific Northwest.

August 2019 Departure from Normal Precipitation

Precipitation (in)
7/1/2019 – 7/31/2019

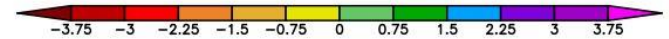
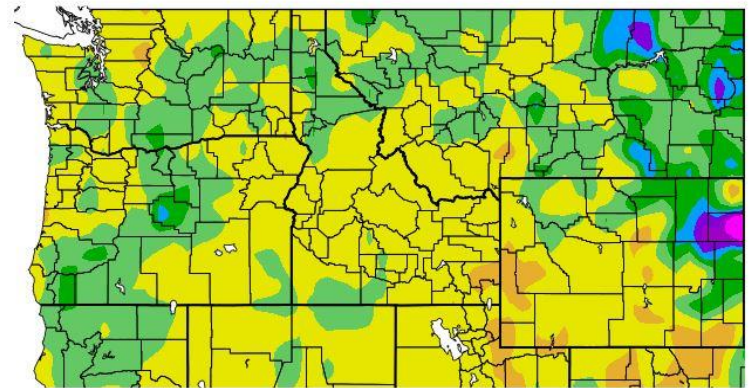


Generated 8/4/2019 at HPRCC using provisional data.

NOAA Regional Climate Centers

Departure from normal precipitation for July

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

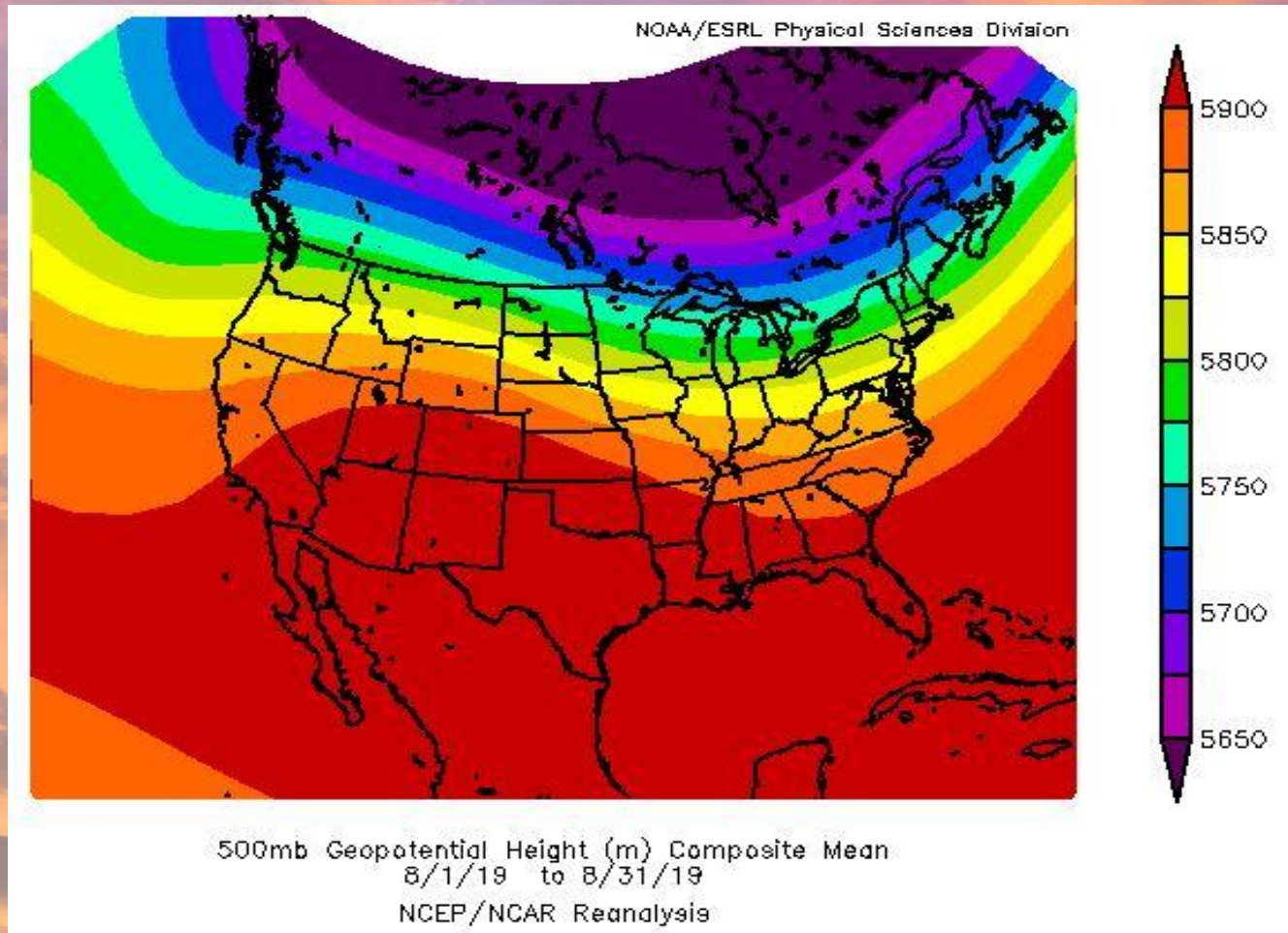
The above images show a comparison of July vs. August 2019 precipitation departure from normal. July was significantly drier than normal over the region than August. In fact August had near to slightly above normal precipitation for the month in the Pacific Northwest.

Aug 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 | 89.1 | 2.3 | 56.4 | 4.6 | 72.7 | 3.4 | 0.75 | -0.26 |
| Kennewick | 91.1 | 1.8 | 63.7 | 2.9 | 77.4 | 2.4 | 0.14 | -0.04 |
| Walla Walla | 89.9 | 1.8 | 63.5 | 3.1 | 76.7 | 2.5 | 0.33 | -0.24 |
| The Dalles | 87.7 | 0.4 | 61.7 | 2.2 | 74.7 | 1.3 | 0.53 | 0.30 |
| Redmond | 88.9 | 4.1 | 49.4 | 4.2 | 69.1 | 4.1 | Trace | -0.50 |
| Pendleton Airport | 88.8 | 2 | 57.8 | 1 | 73.3 | 1.5 | 0.13 | -0.25 |
| La Grande | 88.7 | 3 | 54.3 | 2 | 71.5 | 2.5 | 1.11 | 0.26 |

The data above shows that all stations in the list had above normal average maximum, minimum, and mean temperatures. The greatest departure was at Yakima with an average minimum departure from normal of 4.6 degrees. Most departures for temperatures were in the +1 to +3 degree F range. For precipitation all stations except for The Dalles and La Grande Oregon had below normal precipitation for the month. Most departures for precipitation totals ranged from a quarter of an inch to almost a half inch. La Grande reported 1.11 inches for the month, likely caused by a thunderstorm core over the station.

August 2019 Average 500 MB Weather Pattern



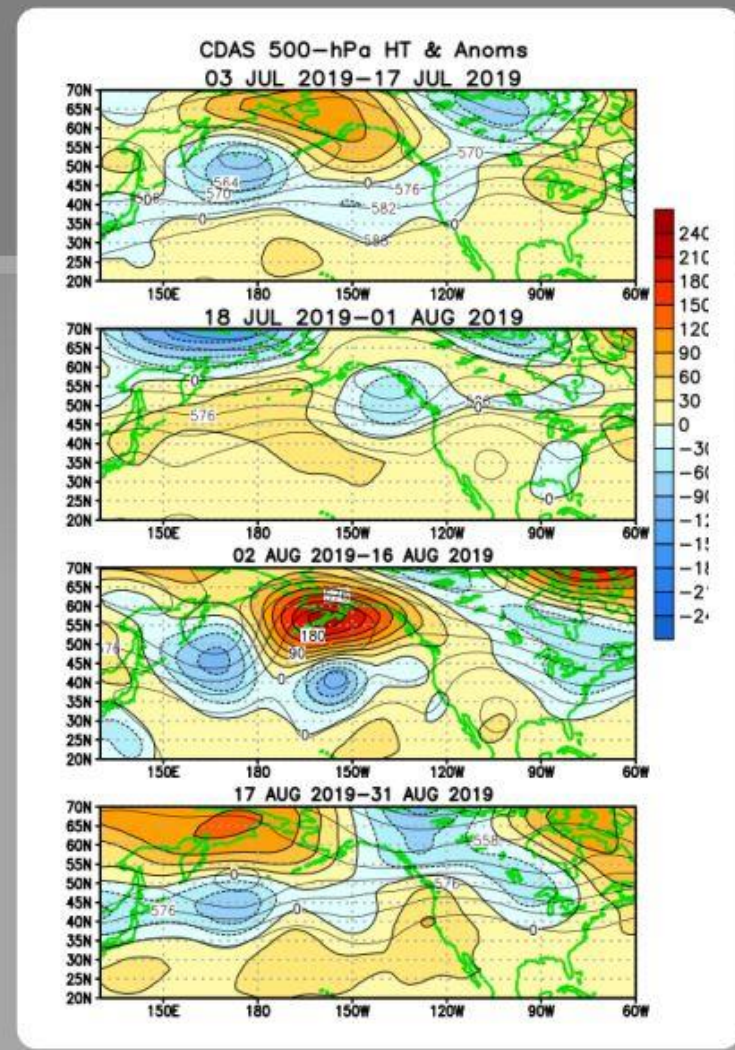
The image above shows a mean upper southwest flow over the Pacific Northwest during the month of August. This flow resulted in above normal temperatures from the Rocky Mountains westward. Precipitation for the month, as described in a previous slide, was near to slightly above normal in this flow pattern, mainly due to thunderstorms.

More Detailed 500 MB Plots for July & August, 2019

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

During the second half of July, below-average heights and temperatures were present over the south-central and southeastern U.S., while above average temperatures were evident in the northeast.

During August, below-average temperatures were present over the north-central U.S. and much of central/ western Canada, while above-average heights and temperatures were present across the southern tier of the U.S.



The Pacific Northwest had an upper ridge through the month of August, which was the likely reason for having above normal temperatures.

Significant Weather Events for August, 2019

| <u>SIGNIFICANT WEATHER EVENTS</u> | | | | | | |
|-----------------------------------|---------|---|---------------------|-----------------------------------|---------------|----------------|
| | | PRELIMINARY LOCAL STORM REPORT | | | | |
| | | NATIONAL WEATHER SERVICE PENDLETON OR | | | | |
| DATE | TIME | ...EVENT... | ...CITY LOCATION... | ...LAT.LON... | | |
| | | ..DATE... | ...MAG.... | ..COUNTY LOCATION..ST.. | ...SOURCE.... | |
| | | ..REMARKS.. | | | | |
| 8/2/2019 | 0355 PM | E0.75 INCH | HAIL | JOSEPH WALLOWA, OR | | PUBLIC |
| | | NORTH END OF WALLOWA LAKE. DIME SIZE HAIL. | | | | |
| 8/4/2019 | 0506 PM | E1.50 INCH | HAIL | 15 NW LA PINE DESCHUTES, OR | | PUBLIC |
| | | PUBLIC ON EAST SIDE OF CRANE PRAIRIE RESERVOIR REPORTED UP TO 1 1/2 INCH HAIL. | | | | |
| 8/7/2019 | 0630 PM | E0.88 INCH | HAIL | 5 NNW KENT SHERMAN, OR | | PUBLIC |
| | | HAIL LASTED FOR APPROXIMATELY 20 MINUTES. 0.70 INCHES OF PRECIPITATION. | | | | |
| 8/8/2019 | 0400 PM | E0.25 INCH | HAIL | 3 ENE PRINEVILLE, OR CROOK, OR | | PUBLIC |
| | 0515 PM | E0.75 INCH | HAIL | POWELL BUTTE CROOK, OR | | PUBLIC |
| | | LARGEST HAIL THE SIZE OF A MARBLE. DEBRIS ON ROADWAY DUE TO SOME FLOODING. GUSTY WINDS BROKE SMALL BRANCHES FROM TREES. | | | | |
| | 0505 PM | | FLASH FLOOD | 3 SSW POWELL BUTTE CROOK, OR | | EMERGENCY MNGR |
| | | PORTIONS OF ROAD WASHED OUT NEAR SHUMWAY AND BUSSET IN POWELL BUTTE. BOWLING BALL SIZED ROCKS IN ROAD. PEA TO MARBLE SIZE HAIL ALSO REPORTED. SMALL TREE BRANCHES DOWN. | | | | |

Significant Weather Events for August, 2019

| SIGNIFICANT WEATHER EVENTS | | | | | |
|---------------------------------------|---------|--|---------------------|-----------------------------------|-----------------|
| PRELIMINARY LOCAL STORM REPORT | | | | | |
| NATIONAL WEATHER SERVICE PENDLETON OR | | | | | |
| DATE | TIME | ...EVENT... | ...CITY LOCATION... | ...LAT.LON... | |
| | | ..DATE... |MAG.... | ..COUNTY LOCATION..ST.. | ...SOURCE.... |
| | | ..REMARKS.. | | | |
| 8/9/2019 | 0100 PM | M0.50 INCH | HAIL | 9 ESE BEND DESCHUTES, OR | TRAINED SPOTTER |
| | | BRIEF PERIOD OF MARBLE SIZED HAIL. | | | |
| | 0846 PM | M70.00 MPH | TSTM WIND GUST | 7 NNE TYGH VALLEY WASCO, OR | MESONET |
| | | US97 NB AT MP21 | | | |
| | 0537 PM | E0.75 INCH | HAIL | 3 N TUMALO DESCHUTES, OR | PUBLIC |
| | 0550 PM | E0.75 INCH | HAIL | 5 NNW BEND DESCHUTES, OR | TRAINED SPOTTER |
| | | MOSTLY 1/2 INCH SIZE HAIL THAT COVERS THE GROUND. LARGEST HAIL SIZE OF A DIME. | | | |
| | 0639 PM | M1.05 INCH | HEAVY RAIN | 9 NW TERREBONNE JEFFERSON, OR | TRAINED SPOTTER |
| | | 1.05 INCHES OF RAIN IN 20 MINUTES. | | | |
| | 0540 PM | M1.00 INCH | HAIL | 5 NNW BEND DESCHUTES, OR | PUBLIC |
| | | REPORT VIA SOCIAL MEDIA. | | | |
| | 0846 PM | M70.00 MPH | TSTM WIND GUST | 7 NNE TYGH VALLEY WASCO, OR | MESONET |
| | 0848 PM | M60.00 MPH | TSTM WIND GUST | 8 WSW GRASS VALLEY SHERMAN, OR | MESONET |

Significant Weather Events for August, 2019

| SIGNIFICANT WEATHER EVENTS | | | | | |
|---------------------------------------|---------|--|------------------|-------------------------------------|-----------------|
| PRELIMINARY LOCAL STORM REPORT | | | | | |
| NATIONAL WEATHER SERVICE PENDLETON OR | | | | | |
| DATE | TIME | ...EVENT... ..CITY LOCATION... ..LAT.LON... | | | |
| | | ..DATE... ..MAG.... ..COUNTY LOCATION..ST.. ..SOURCE.... | | | |
| | | ..REMARKS.. | | | |
| 8/9/2019 | 0940 PM | M1.09 INCHES | FLOOD | 2 S DALLESPORT WASCO, OR | EMERGENCY MNGR |
| | | EMERGENCY MANAGER REPORTS FLOODING IN THE DALLES. SOCIAL MEDIA REPORT OF 1.09 INCHES OF RAIN IN LESS THAN ONE HOUR. | | | |
| | 0845 PM | E0.90 INCHE | HEAVY RAIN | PILOT ROCK UMATILLA, OR | PUBLIC |
| | | NEARLY ONE INCH OF RAIN REPORTED VIA SOCIAL MEDIA. | | | |
| 8/10/2019 | 0332 PM | E1.00 INCH | HAIL | 1 WNW WAITSBURG WALLA WALLA, WA | TRAINED SPOTTER |
| | 0530 PM | M1.00 INCH | HAIL | 5 NNW BEND DESCHUTES, OR | COCORAHS |
| | | HAIL UP TO 1 INCH IN DIAMETER COVERED FLAT SURFACES IN 3 INCH LAYER OF HAIL AND SHREDDED BRANCHES AND LEAVES OFF TREES AND SHRUBS. | | | |
| 8/9/2019 | 0700 PM | | TSTM WIND DAMAGE | 3 SSE WARM SPRINGS JEFFERSON, OR | TRAINED SPOTTER |
| | | HEAVY RAIN LEAD TO DEBRIS COVERING JACKSON TRAIL ROAD AND GOING INTO THE DESCHUTES RIVER. SPOTTER ALSO HAD A LOT OF ROAD AND FENCE DAMAGE FROM HEAVY RAIN, HAIL (SMALLER THAN AN INCH) AND STRONG WINDS. TIME ESTIMATED BASED OFF RADAR. | | | |
| | 0630 PM | | FLASH FLOOD | PRINEVILLE CROOK, OR | TRAINED SPOTTER |
| | | REPORT RELAYED VIA NWSCHAT OF HOUSE FLOODED IN PRINEVILLE WITH 4 FEET OF WATER IN THE BASEMENT. TIME ESTIMATED BASED OFF RADAR. | | | |

Significant Weather Events for August, 2019

SIGNIFICANT WEATHER EVENTS

| | | PRELIMINARY LOCAL STORM REPORT | | | |
|----------|---|--|--------------------|--|-----------------|
| | | NATIONAL WEATHER SERVICE PENDLETON OR | | | |
| DATE | TIME | ...EVENT... ..CITY LOCATION... ..LAT.LON... | | | |
| | | ..DATE... ..MAG.... ..COUNTY LOCATION..ST.. ..SOURCE.... | | | |
| | | ..REMARKS.. | | | |
| 8/9/2019 | 0540 PM | M1.00 INCH | HAIL | 6N BEND DESCHUTES, OR | TRAINED SPOTTER |
| | | REPORT RELAYED VIA NWSCHAT OF HAIL DAMAGE TO CARS IN TUMALO AS WELL AS LOCALIZED FLASH FLOODING. TIME ESTIMATED BASED OFF RADAR. | | | |
| | 0537 PM | M1.00 INCH | HAIL | 3 NNE BEND DESCHUTES, OR | TRAINED SPOTTER |
| | | REPORT VIA SOCIAL MEDIA OF 1 INCH HAIL IN NORTHEAST BEND. | | | |
| | 0545 PM | | FREQUENT LIGHTNING | 2 NNE DESCHUTES RIVER DESCHUTES, OR | BROADCAST MEDIA |
| | | LIGHTNING STRUCK A CAR IN BEND THAT WAS UNOCCUPIED IN A DRIVEWAY THROUGH THE WINDSHIELD AND FIRE STARTED IN THE INTERIOR. ROUGHLY \$7,000 DOLLARS WORTH OF DAMAGE. | | | |
| | 0600 PM | | TSTM WIND DAMAGE | 3 WNW REDMOND DESCHUTES, OR | BROADCAST MEDIA |
| | | WIND AND HAIL TORE ROOF OFF A PORCH ON WEST SIDE OF REDMOND. TIME ESTIMATED BASED OFF RADAR. | | | |
| 8/9/2019 | THERE WERE MANY OTHER REPORTS OF HEAVY RAIN, DAMAGING WIND, AND HAIL THAT ARE TOO NUMEROUS TO LIST HERE | | | | |

Note: There were not any records broken or tied during August except for a record rainfall event of 1.72 inches at the Hanford Meteorological Station on Aug 11th, likely caused by a thunderstorm core.

August, 2019 Observed Monthly Max & Min Temperatures

| Location | Highest Maximum Temperature | Lowest Minimum Temperature |
|-----------------|-----------------------------|----------------------------|
| Pendleton, OR | 101 | 49 |
| Redmond, OR | 100 | 36 |
| Pasco, WA | 103 | 49 |
| Yakima, WA | 102 | 47 |
| Walla Walla, WA | 104 | 54 |
| Bend, OR | 95 | 43 |
| Ellensburg, WA | 102 | 46 |
| Hermiston, OR | 103 | 47 |
| John Day, OR | 102 | 46 |
| La Grande, OR | 98 | 45 |
| The Dalles, OR | 101 | 52 |
| MT Adams RS, WA | 95 | 41 |

All stations, except for Bend, OR, La Grande, OR, and Mt Adams RS, WA all had highest maximum temperatures of 100 or greater. Lowest minimum temperatures were mostly in the 40s and 50s, except for 36 at Redmond, OR (which is a normally colder spot).

August, 2019, Monthly Total Precipitation and Snowfall Totals

| Location | Total Monthly Precip | Total Snowfall |
|-----------------|----------------------|----------------|
| Pendleton, OR | 0.13 | 0 |
| Redmond, OR | Trace | 0 |
| Pasco, WA | 0.19 | 0 |
| Yakima, WA | 0.75 | 0 |
| Walla Walla, WA | 0.33 | 0 |
| Bend, OR | 1.08 | M |
| Ellensburg, WA | 0.34 | M |
| Hermiston, OR | 0.05 | 0 |
| John Day, OR | 0.70 | M |
| La Grande, OR | 1.11 | 0 |
| The Dalles, OR | 0.53 | M |
| Mt Adams RS, WA | 1.16 | 0 |

Every station, except Redmond, OR reported greater than a trace of precipitation during August. Some reports were greater than an inch, which were likely the result of thunderstorm cores moving directly over that station.

August, 2019 - Drought Monitor

U.S. Drought Monitor West

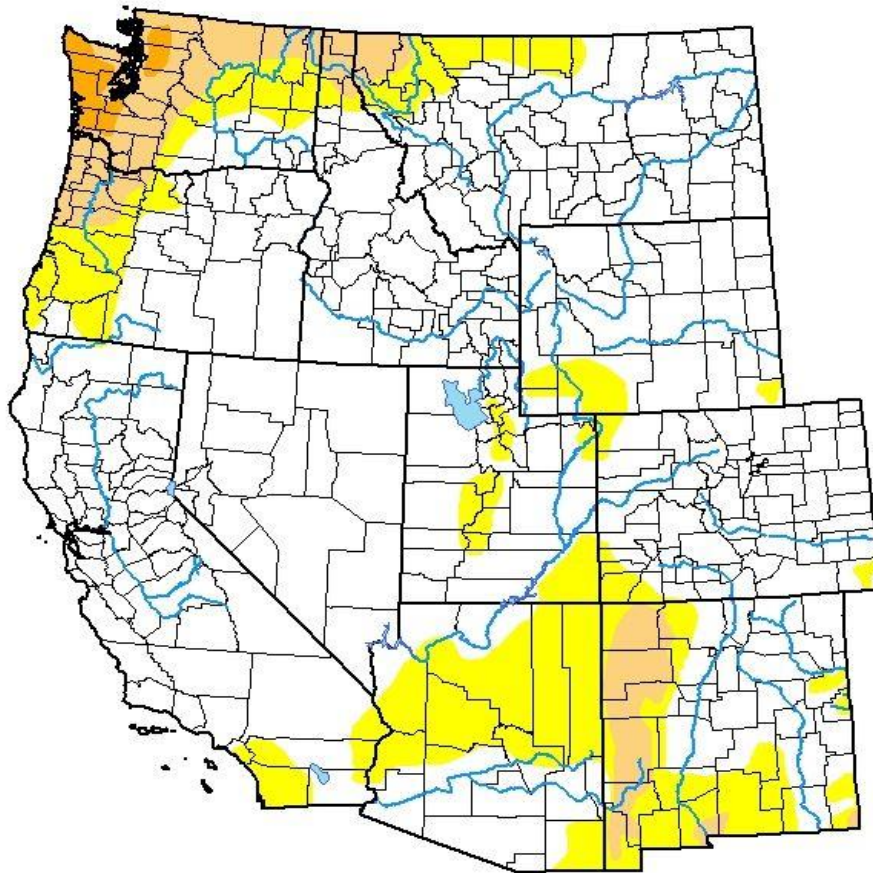
August 20, 2019

(Released Thursday, Aug. 22, 2019)

Valid 8 a.m. EDT

Drought Conditions (Percent Area)

| | None | D0-D4 | D1-D4 | D2-D4 | D3-D4 | D4 |
|--|-------|-------|-------|-------|-------|------|
| Current | 76.68 | 23.32 | 6.83 | 0.77 | 0.00 | 0.00 |
| Last Week <i>08-13-2019</i> | 78.30 | 21.70 | 6.28 | 0.77 | 0.00 | 0.00 |
| 3 Months Ago <i>05-21-2019</i> | 86.58 | 13.42 | 5.07 | 0.00 | 0.00 | 0.00 |
| Start of Calendar Year <i>01-01-2019</i> | 28.03 | 71.97 | 53.25 | 27.22 | 8.35 | 2.88 |
| Start of Water Year <i>09-25-2018</i> | 13.91 | 86.09 | 59.57 | 39.68 | 18.15 | 4.36 |
| One Year Ago <i>08-21-2018</i> | 15.80 | 84.20 | 58.07 | 35.87 | 15.87 | 3.58 |



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.

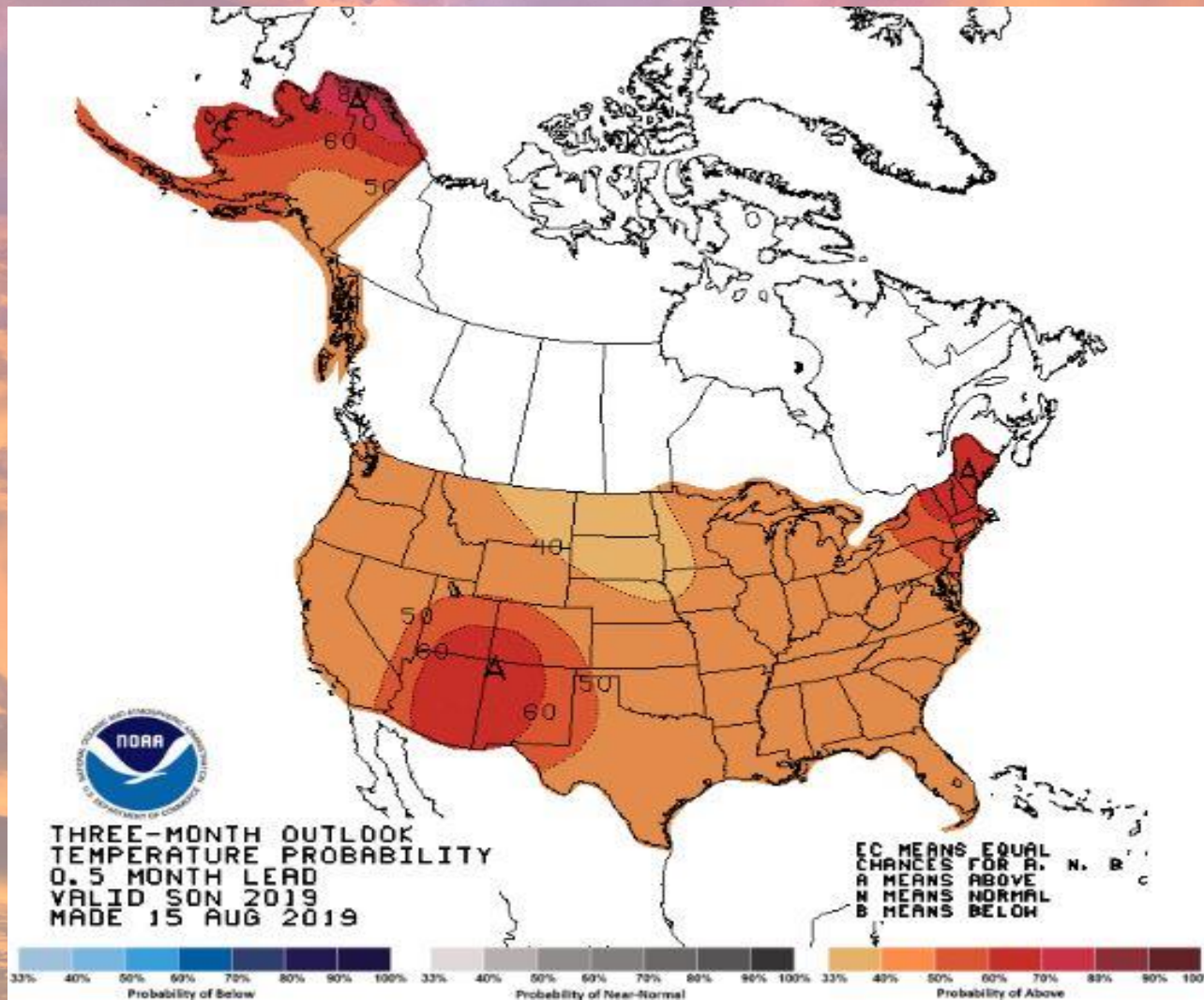
Author:

Jessica Blunden
NCEI/NOAA



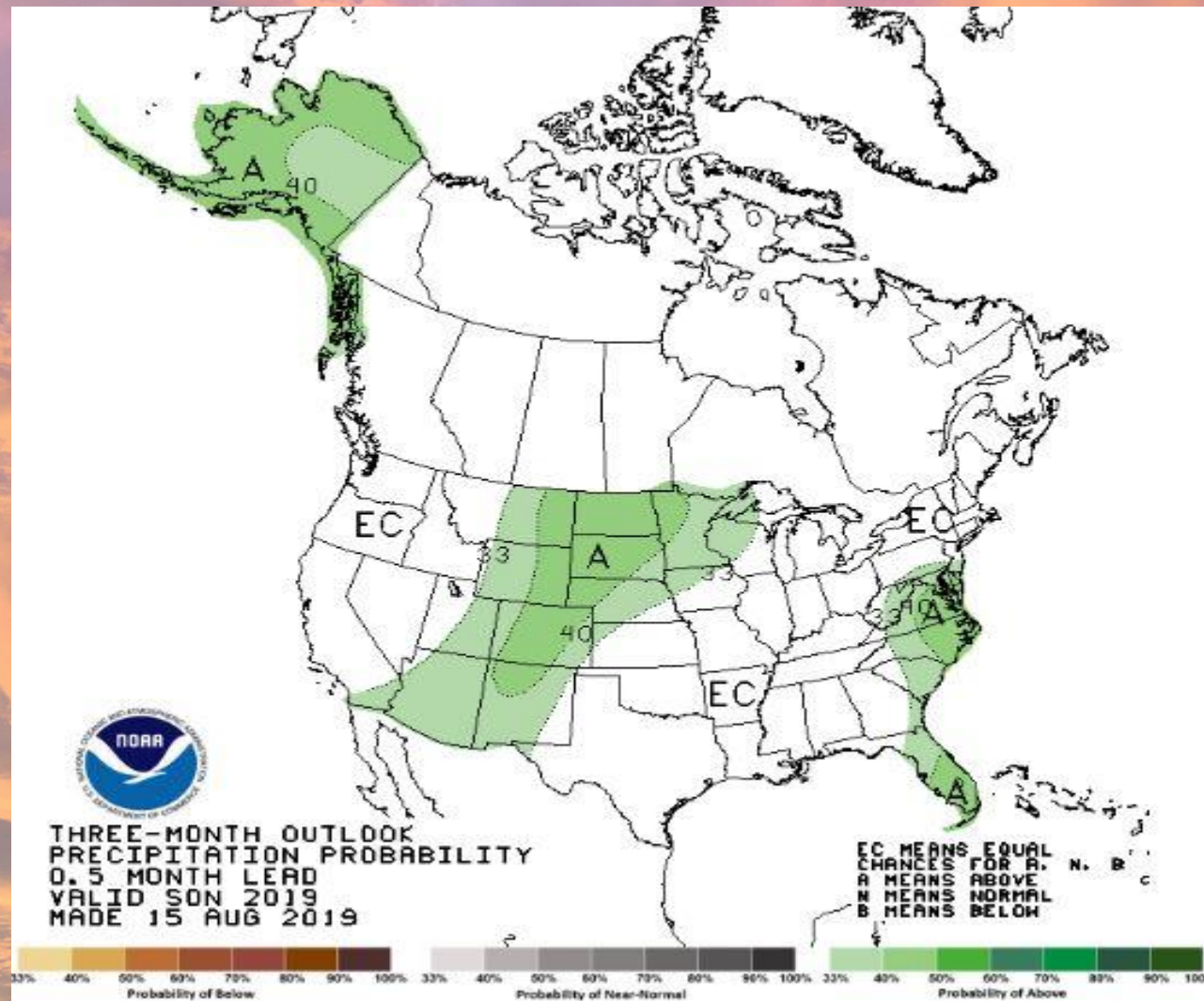
During August, 2019, most of the forecast area was classified as “none” or “neutral” to slightly drier than normal (None to D0). D0 means “Abnormally Dry”. The driest locations were along the Cascade East Slopes, especially in Washington.

USA Three Month Temperature Outlook (September, October & November)



The temperature outlook for the next three months shows a greater chance of having a 40-50 percent chance of above normal temperatures across the entire Pacific Northwest and the forecast area.

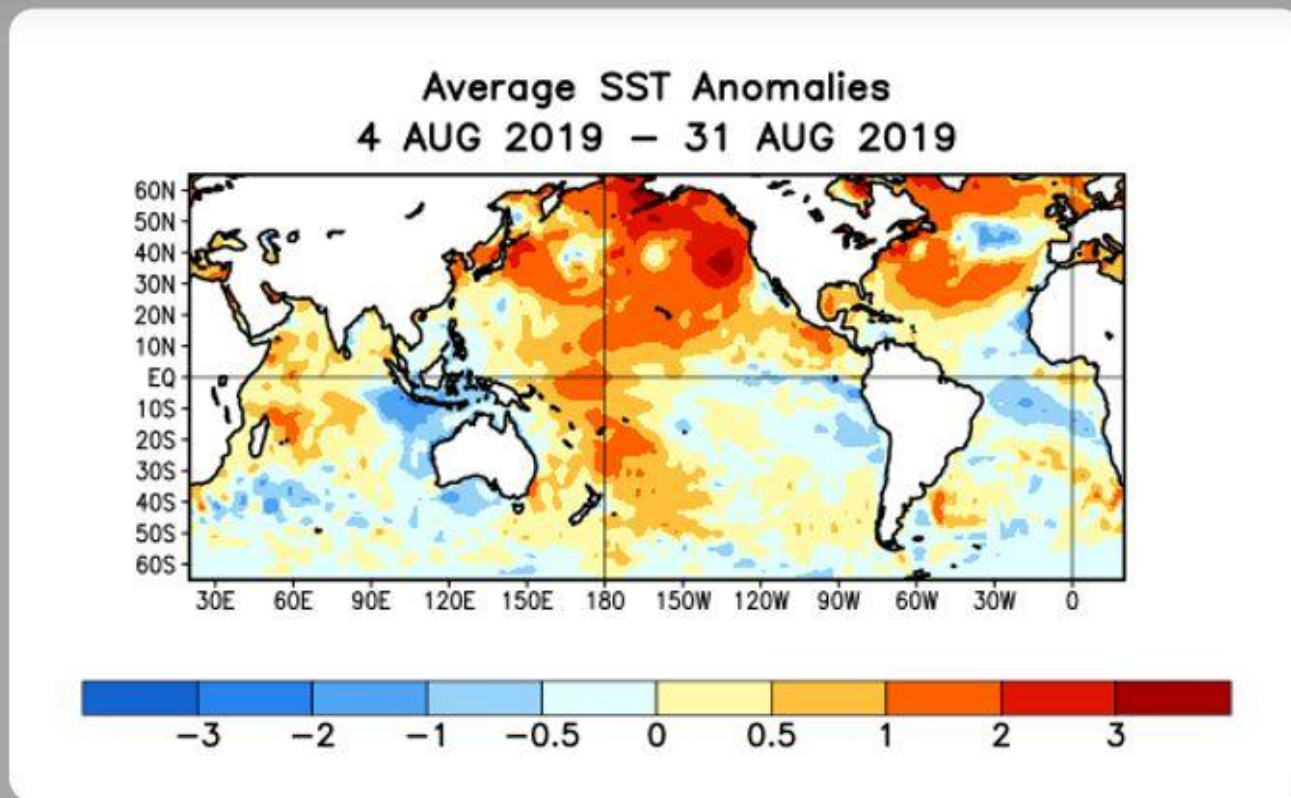
USA Three Month Precipitation Outlook (September, October & November)



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

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

During the last four weeks, equatorial SSTs were above average across the west-central Pacific Ocean and also the far eastern Atlantic. SSTs were below average near Indonesia and in the eastern Pacific.



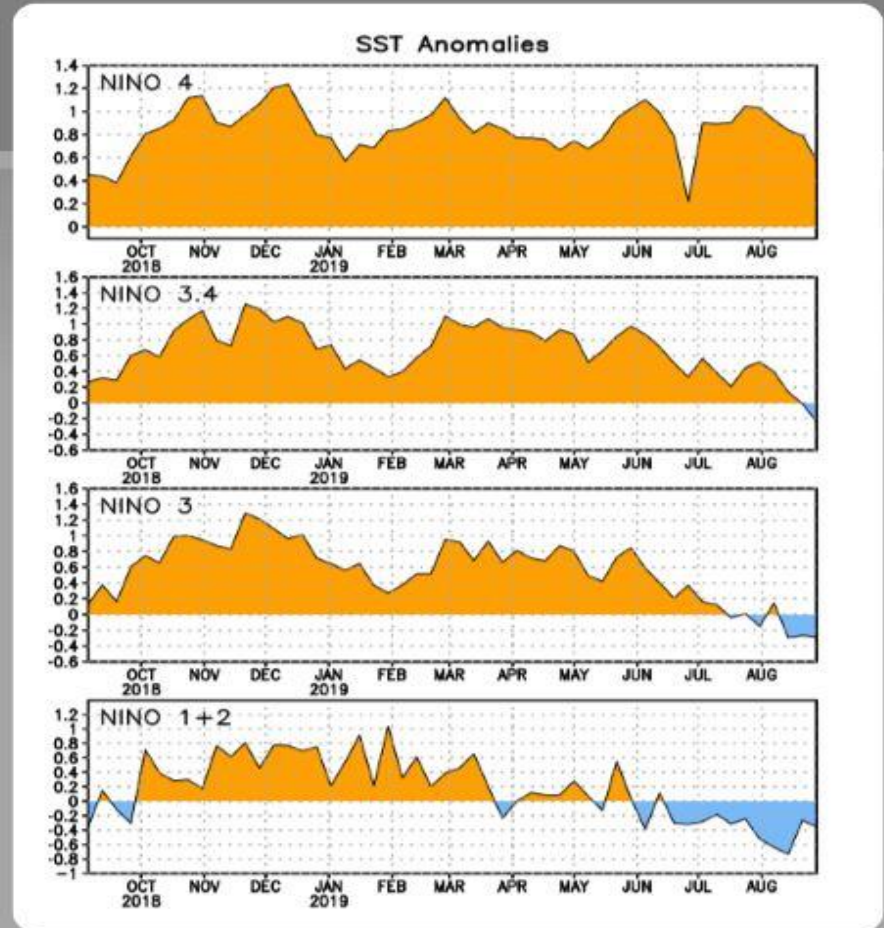
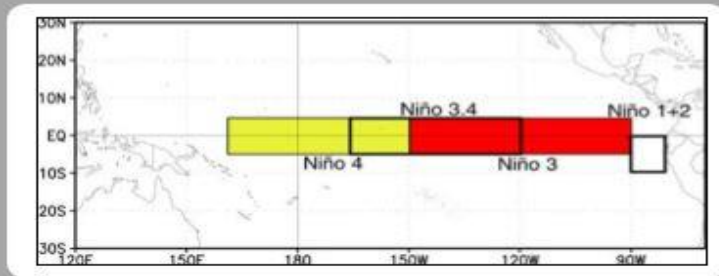
This indicates continued El-Nino conditions in the eastern and northeast Pacific.

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 | 0.6°C |
| Niño 3.4 | -0.2°C |
| Niño 3 | -0.3°C |
| Niño 1+2 | -0.4°C |



The above images shows that Niño regions 3.4 and 4 has mostly all positive (warmer than normal) SST's, while Niño 1 & 2 and 3 have some below normal SSTs for August. The image to the bottom Left shows where the Niño regions are over the tropical Pacific. The cooling in Niño region 1 & 2, and 3 during July and August indicates some continued weakening of the current El-Niño.



Thank You!