National Weather Service Medford

August 2018 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).

August 2018 Weather Review

August picked up right where July left off. If one word could define what it was like, "smoky" would have to be it. Unless you were among the luckier who lived north of the Umpqua Divide and along the coast, area wildfires continued to generate copious amounts of smoke which brought multiple days of degraded air quality. The main culprits of all the smoke, especially west of the Cascades, were the Klondike/Taylor Creek fires burning in the Kalmiopsis Wilderness, the Natchez fire burning in northwest Siskiyou County, and the South Umpqua complex of fires, including the Miles and Sugarpine fires, burning along the Douglas/Jackson County borders about halfway between Tiller and Prospect. Two additional wildfires started around mid-August: Watson Creek which burned in the Fremont-Winema National Forest just west of Paisley, and the Stone Fire which burned in the Modoc NF, southwest of Canby. These fires also contributed to the poor air quality east of the Cascades through the end of the month. There were a few brief periods of respite from the smoke due to some weak fronts, but conditions, for the most part were difficult for outdoor activities due to the extremely poor air quality. Through the 31st and dating back to July 17th, there were 46 consecutive days of smoke-filled air reported at the Medford airport, which essentially forced many locals to remain indoors, wear smoke-approved masks, or seek cleaner air elsewhere.

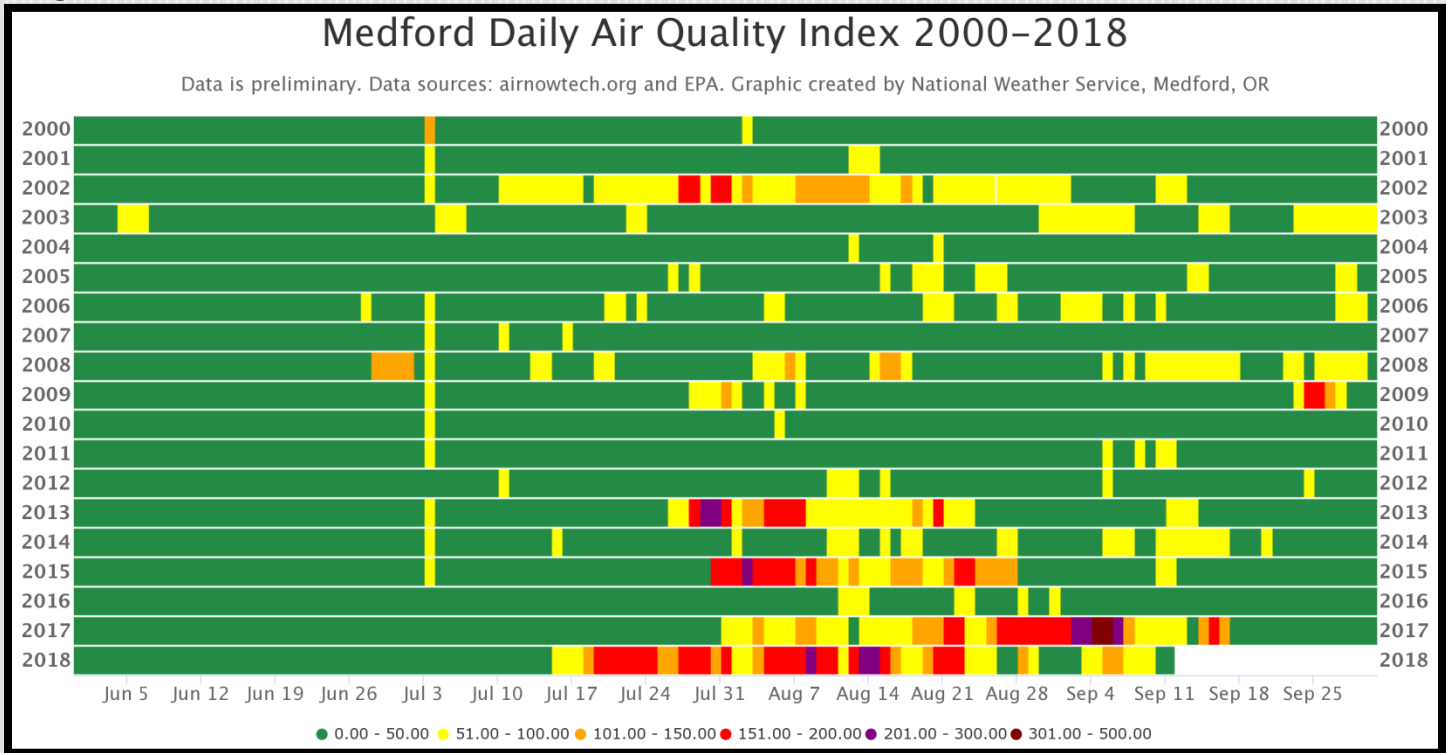
As for the overall weather pattern, the month started off under the influence of a ridge. As the first week progressed, low pressure lingered offshore and this ushered in moist monsoonal air. The trough finally moved inland around mid-month, during which thunderstorms were triggered mainly over northern California and east of the Cascades, where smoke was not as thick. The potential was there for thunderstorms west of the Cascades, but thick smoke does very well at inhibiting surface warming and resultant instability. After this trough moved through, a period of upper level ridging returned. Around the 21st, an upper level low settled over the area and brought another round of thunderstorm concerns to the forecast area. However, with the thick smoke around, as well as limited moisture from the trajectory of the low (from north to south over land), only a few extremely isolated thunderstorms materialize and, instead, the area saw a trend to cooler temperatures. A weak front finally moved through towards the end of the month and this brought a good marine push with higher humidities and some very light precipitation to areas north of the Umpqua Divide and along the coast north of Cape Blanco.

Overall, it wasn`t an extremely hot month, mainly due to the smoke and most of the forecast area saw a dry month. Trace amounts of precipitation were a result of the few thunderstorms during the month, and precipitation along the coast and north of the Umpqua Divide were due to either the marine layer or to the few weak fronts that moved through the area.

Weeks of Unhealthy Air

Number of Days of Unhealthy or Worse
2018→24
2017→15

This summer's smoke event in Medford ranks as the longest period of "unhealthy" air quality per EPA and airnowtech.org data (since EPA records began in 2000). Other years with significant smoke were 2017, 2015, 2013, and 2002. This graphic focuses on the summer period, but the most number of days with unhealthy air quality in the winter is only 2, which occurred in 2013. In other words, summer smoke events have delivered worse air quality than wintertime stagnant air events. Check out July 4th's impact to air quality!



Good

Moderate

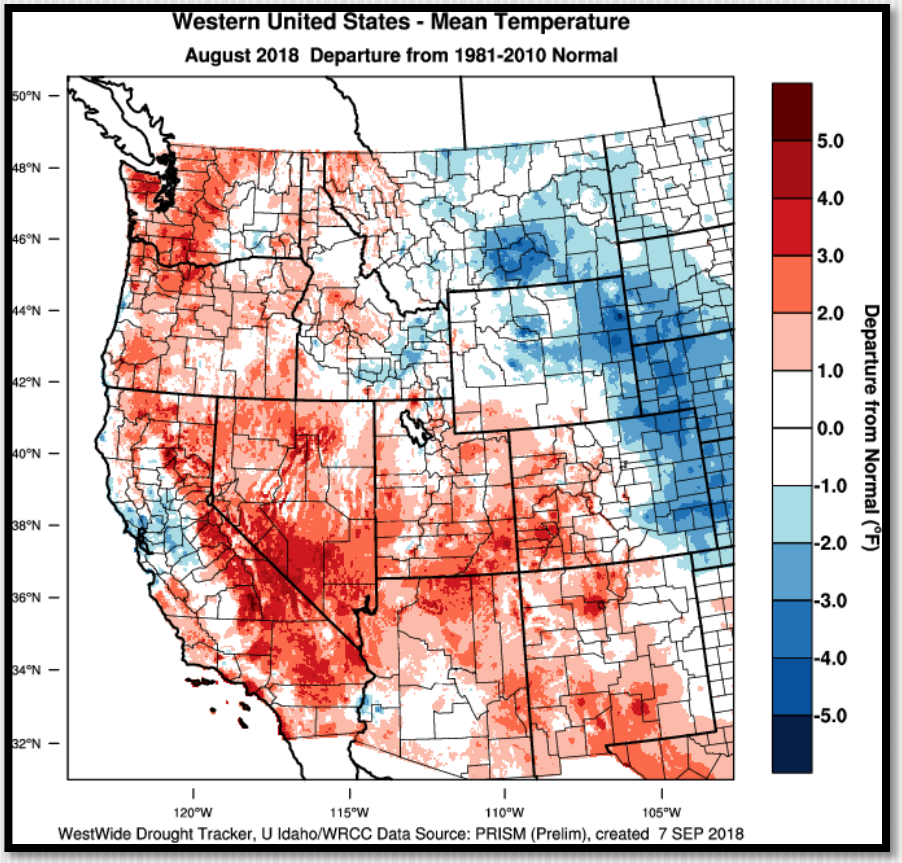
Unhealthy for Sensitive Groups

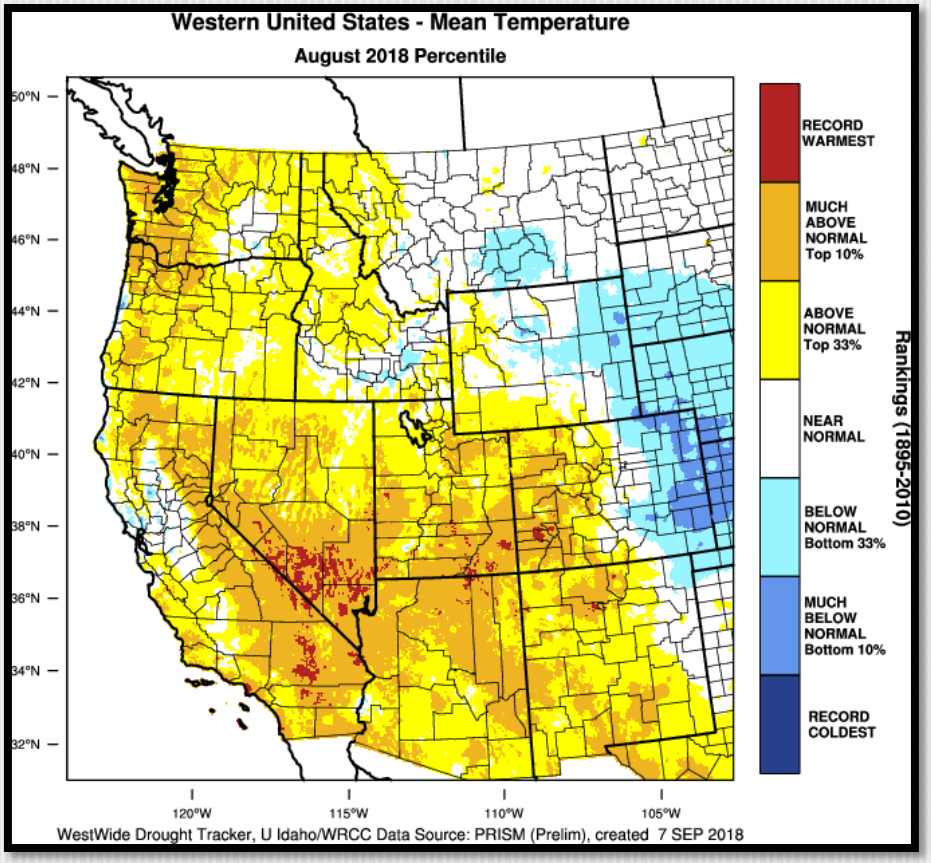
Unhealthy

Very Unhealthy

Credit: Shad Keene, NWS Medford Meteorologist

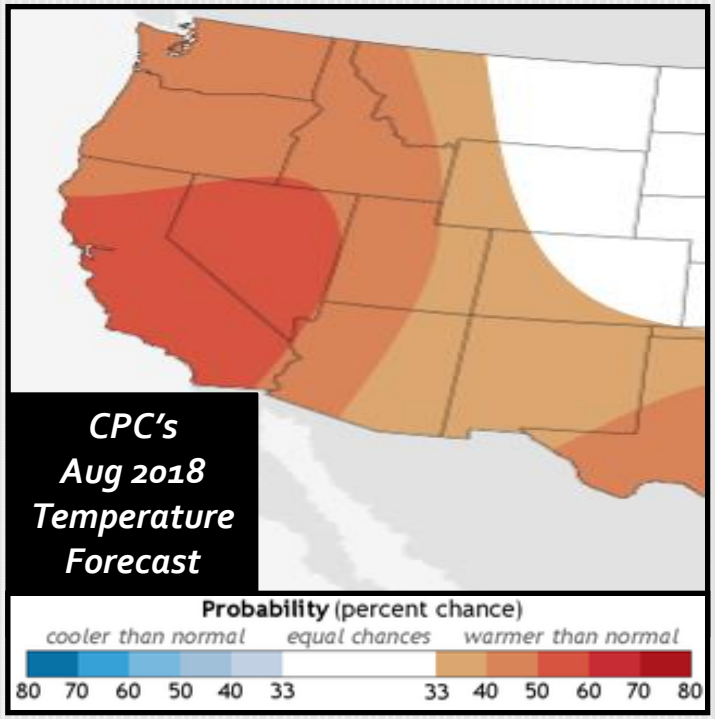
August 2018 *Observed Temperatures*

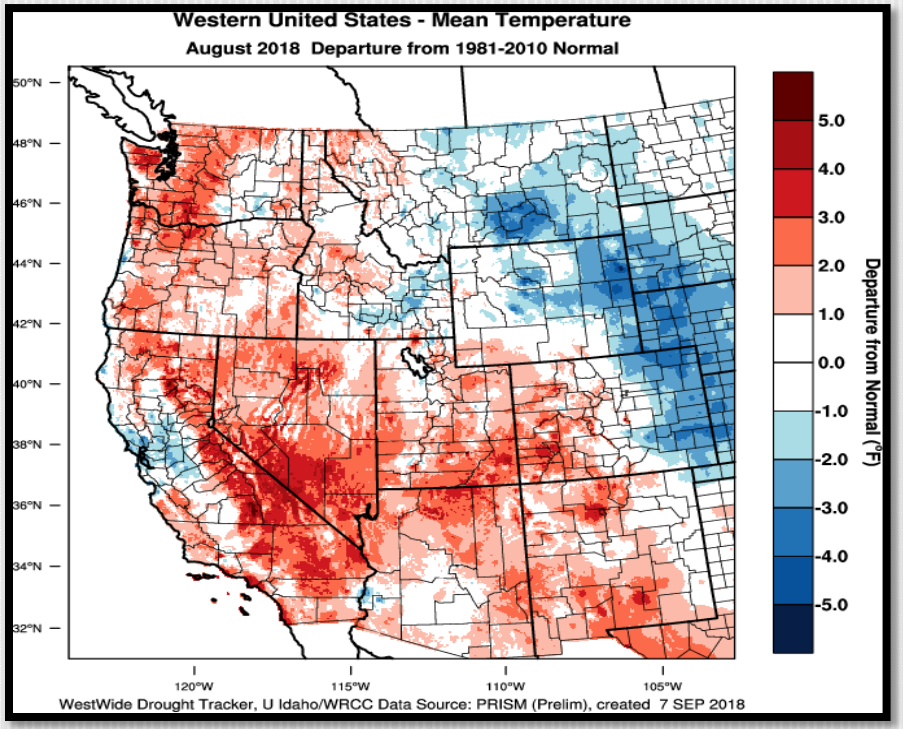




A Look Back at the August 2018 Temperature Outlook

- ***Was the forecast anomaly correct?*** CPC's forecast was right for the sign of the anomaly. Our easier than normal forecast for above normal temperatures was correct. Temperatures were 0-4 degrees Fahrenheit above normal, so the 3-6 degree above normal forecast was too warm. The smoke kept temperatures down.
- ***Was the expected impact correct?*** Yes.
- ***Did our forecast improve upon the CPC forecast?*** Our mid-month forecast of high confidence in temperatures being above normal was helpful because it improved upon CPC's prediction of a 40-50% chance of above normal temperatures. In our updated forecast, the forecast anomaly was too high, however, due to smoke limiting surface heating and a late month marine layer influence.





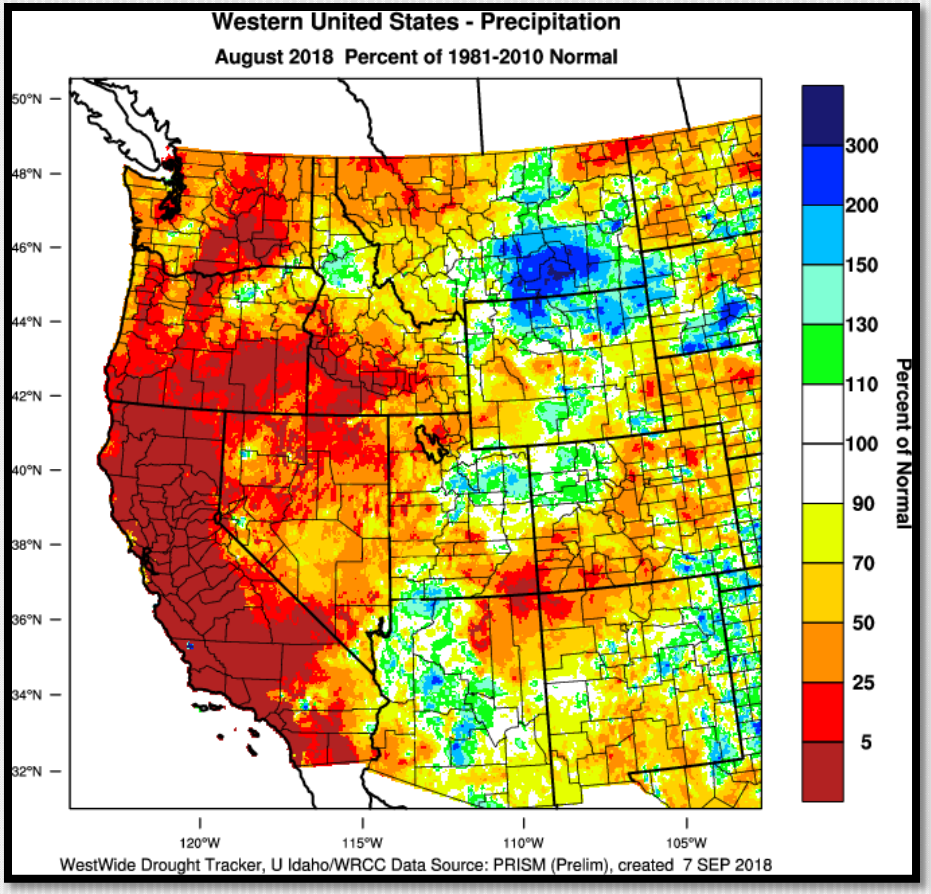
Average Temperatures

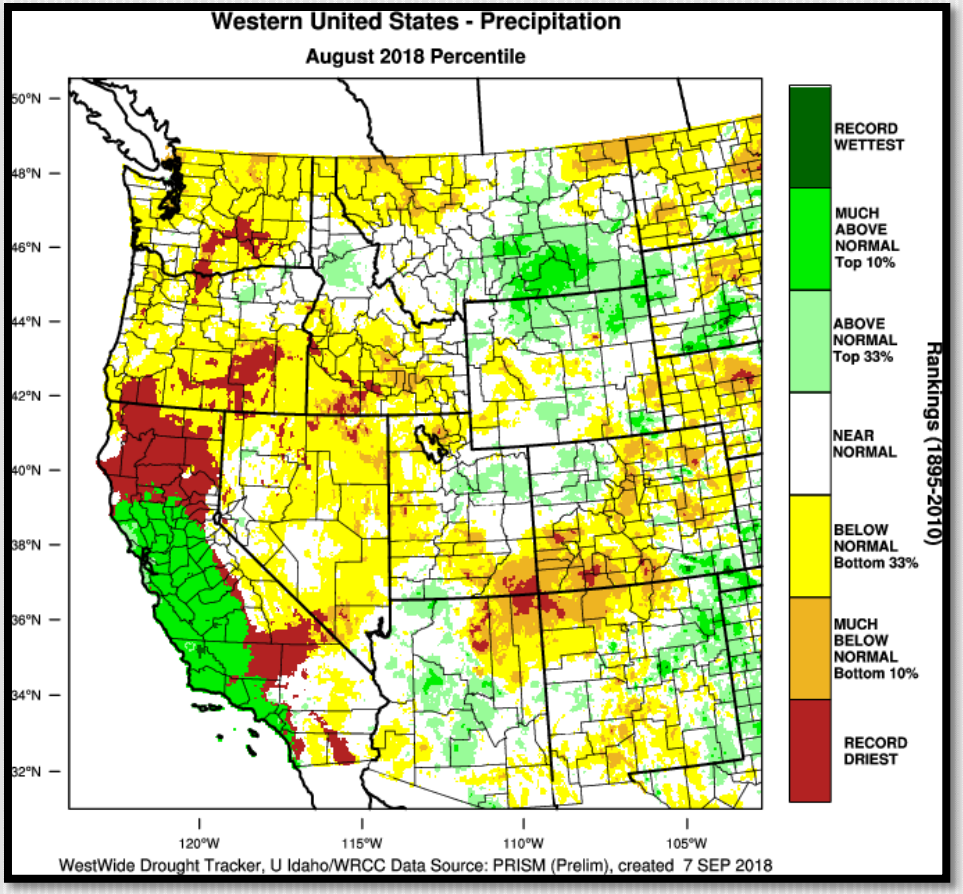
	Average (°F)	Departure from Normal	Average Max (°F)	Departure from Normal	Average Min (°F)	Departure from Normal
North Bend	60.5	***1.4°***	66.6	***1.2°***	54.5	***1.6°***
Roseburg	72.6	***2.5°***	87.3	***2.6°***	57.9	***2.4°***
Medford	75.0	***1.3°***	91.4	***0.7°***	58.5	***1.7°***
Klamath Falls	65.9	***1.0°***	86.2	***3.0°***	45.6	***-1.0°***
Montague, CA	72.4	***1.7°***	92.0	***2.3°***	52.9	***1.3°***
Mt. Shasta City, CA	68.0	***1.4°***	86.6	***1.4°***	49.4	***1.4°***
Alturas, CA	65.8	***1.2°***	89.0	***2.6°***	42.6	***-0.1°***

Monthly Max & Min Temperatures

	Max (°F)	Date(s)	Min (°F)	Date(s)
North Bend	75°	21st	46°	25th
Roseburg	98°	9th	50°	25th
Medford	100°	9th	49°	25th
Klamath Falls	96°	8th & 9th	37°	26th
Montague, CA	99°	8th & 9th	45°	26th
Mt. Shasta City, CA	95°	9th	43°	26th
Alturas, CA	102°	9th	37°	25th

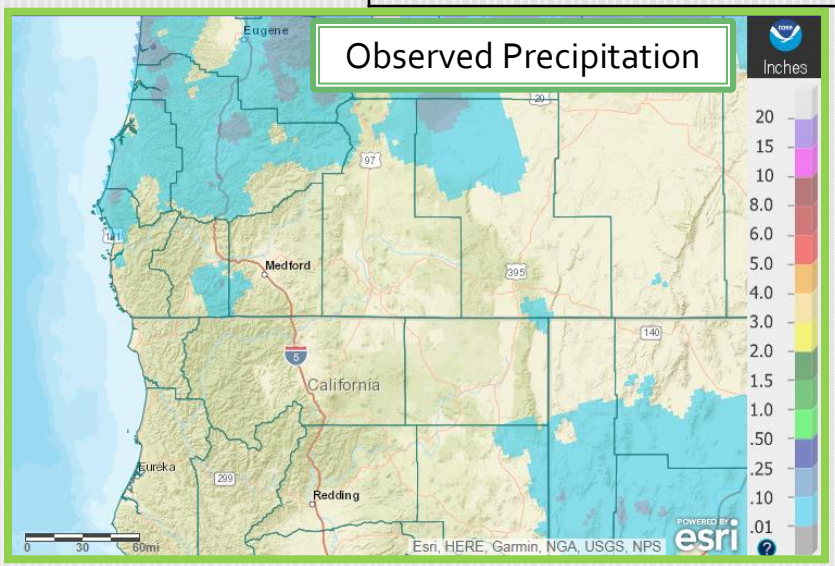
August 2018 *Observed Precipitation*

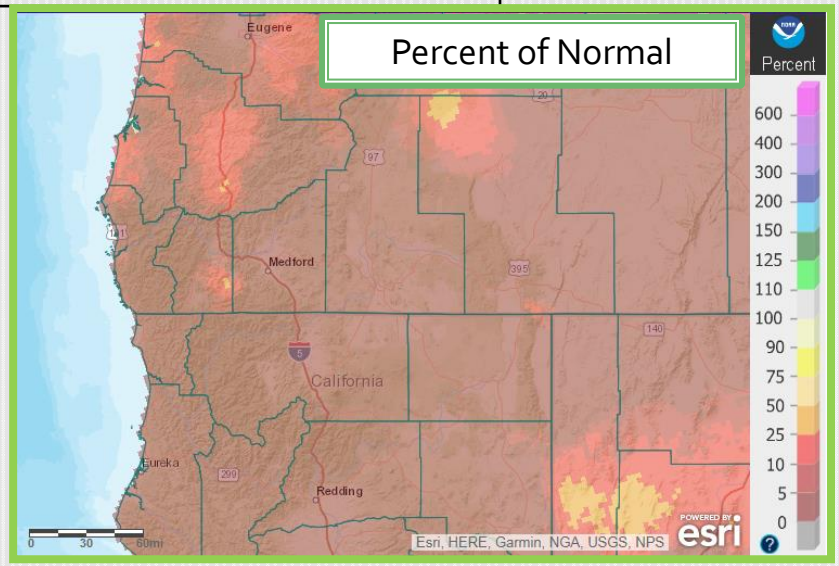




August Precipitation

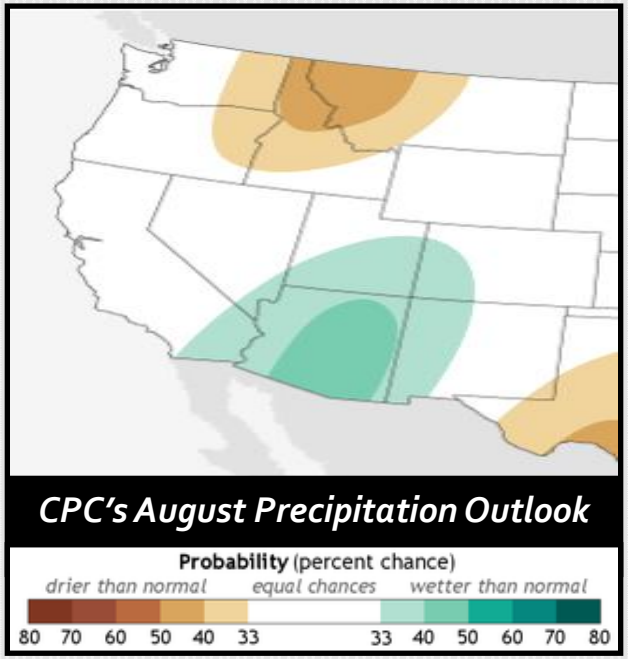
	Total	Departure from Normal	Greatest 24-hr Total	Date(s)
North Bend	0.01"	-0.61"	0.01"	27th
Roseburg	0.03"	-0.44"	0.02"	27th
Medford	0.00"	-0.40"	N/A	N/A
Klamath Falls	Trace	-0.43"	Trace	15th
Montague, CA	Trace	-0.34"	Trace	15th
Mt. Shasta City, CA	Trace	-0.34"	Trace	15th
Alturas, CA	Trace	-0.36"	Trace	15th

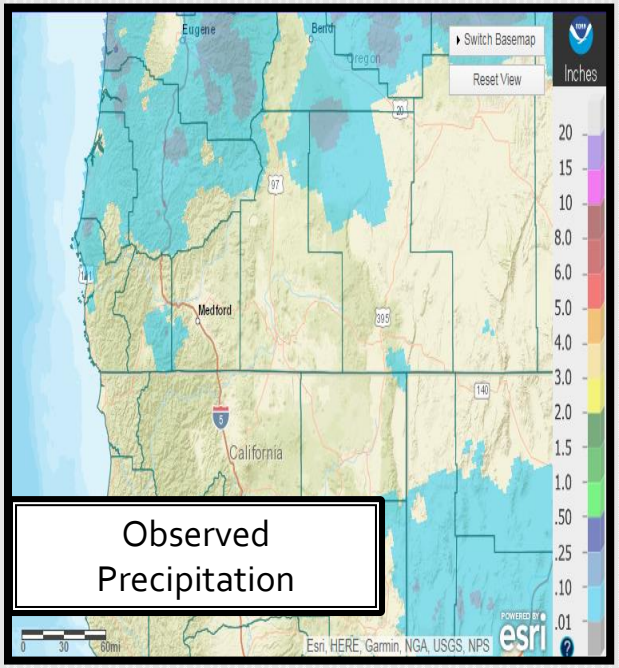


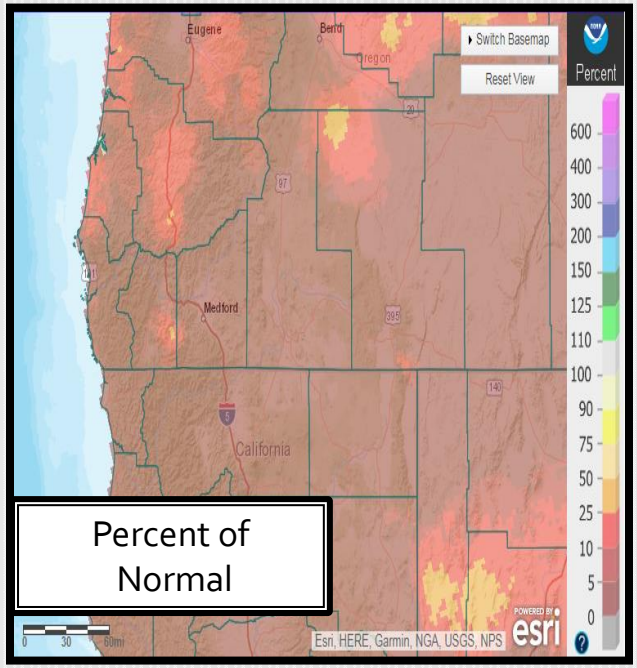


A Look Back at the August 2018 Precipitation Outlook

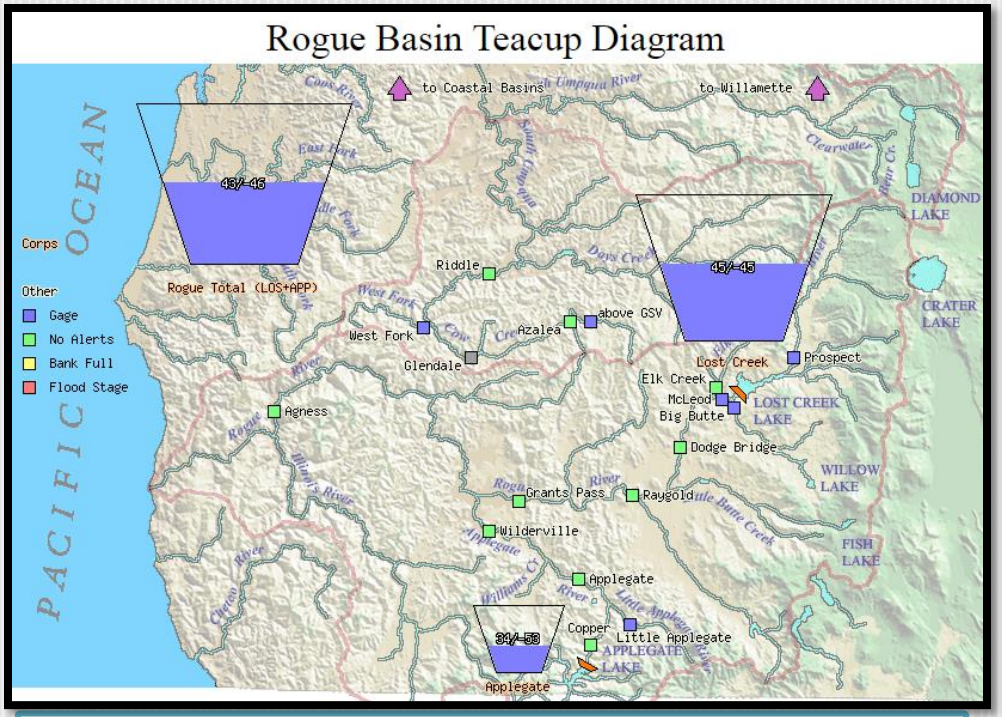
- ***Was the forecast anomaly correct?*** CPC's forecast for equal chances of below, above, and near normal precipitation was not weighted dry enough. In fact, if you look at the preceding slide, because there was no precipitation on a large portion of the area, it could not have been drier for most area. According to the Westwide Drought Tracker, even some areas that got light precipitation this month saw their driest August on record when compared to the 1895-2010 climate record.
- ***Was the expected impact correct?*** Our updated forecast did a good job detailing high confidence in drier than normal conditions, as well as the light precipitation amounts that occurred. We did not recognize that this would be record driest in some areas, especially where precipitation did occur. However, with August being one of our driest months, the impact to water supply is low. However, the impact to overall dryness and fire season is significant.
- ***Did our forecast improve upon the CPC forecast?*** Yes. Greatly. We made it mid-month, however, so that made it much easier for us.





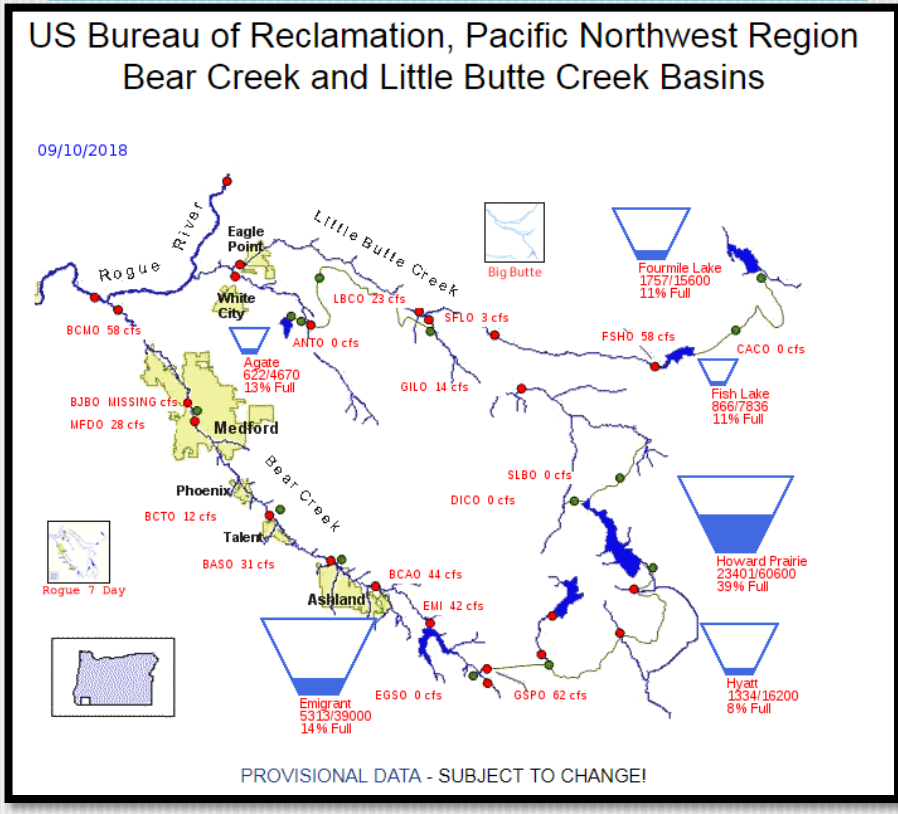


Reservoir Status



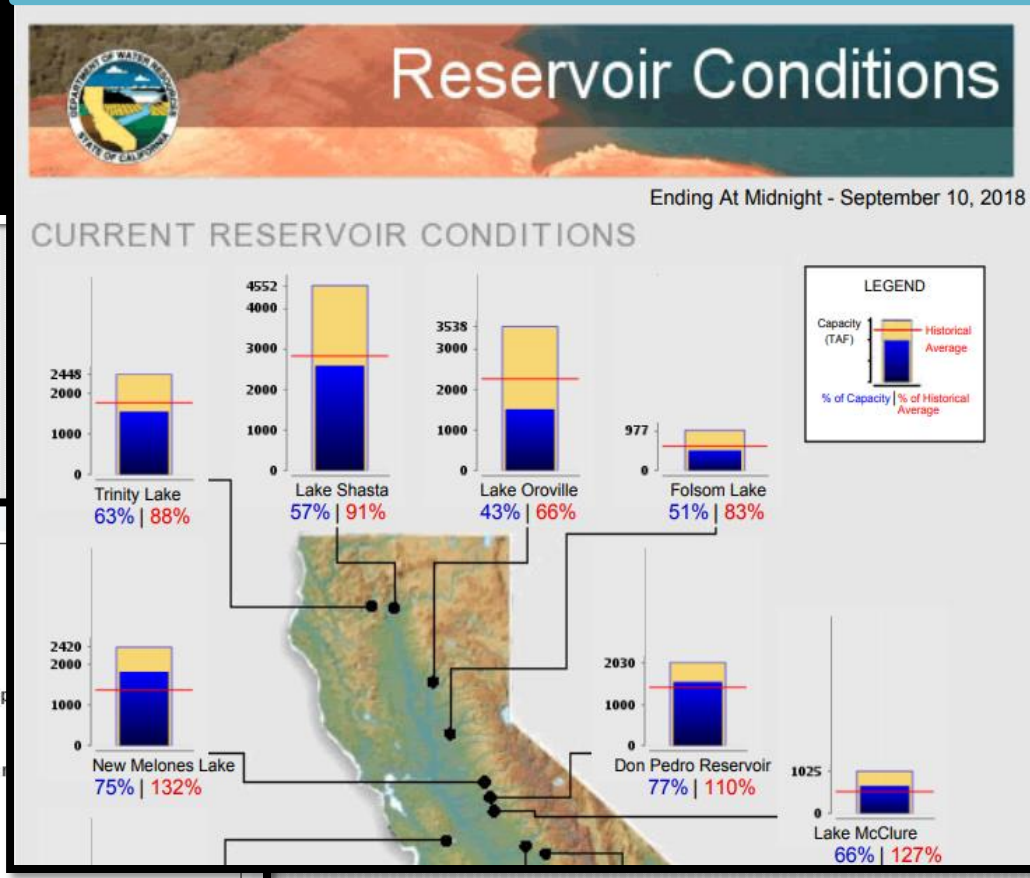
Data above courtesy of US Army Corps of Engineers

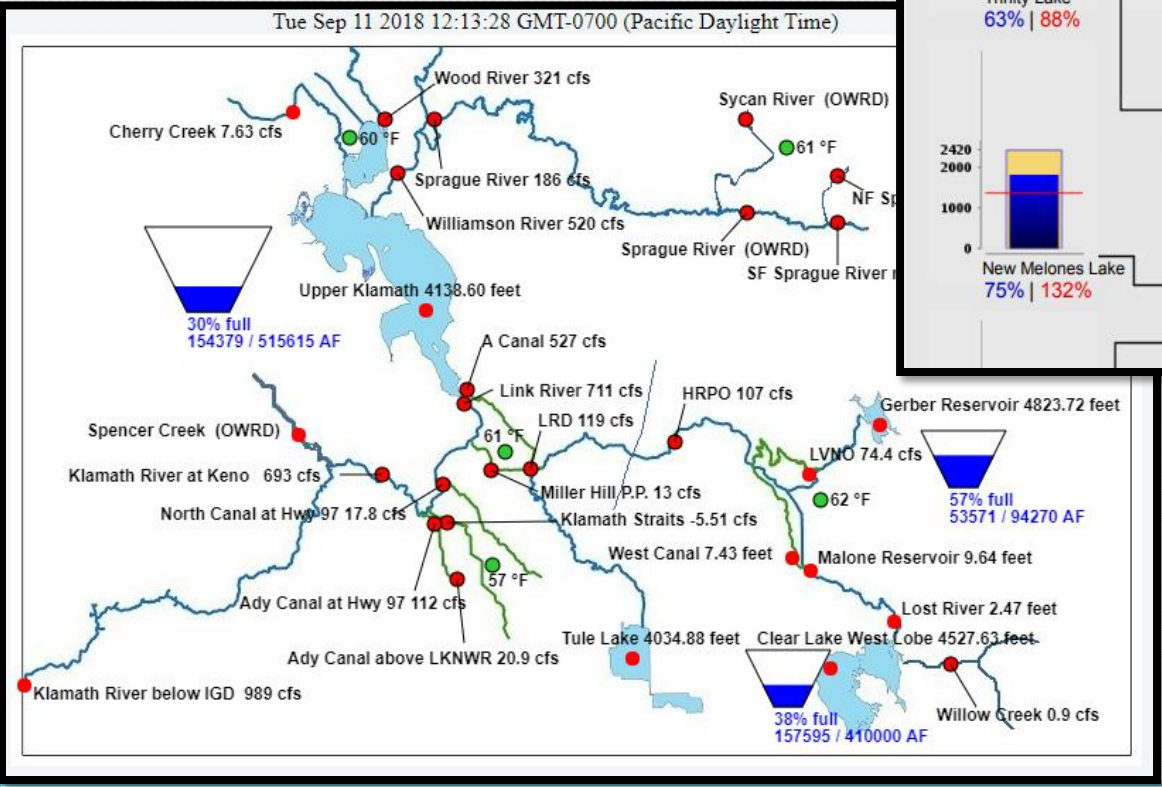
Data below courtesy of Bureau of Reclamation



Reservoir Status

Northern California. [California Data Exchange Center]





Klamath River Basin. Data courtesy of [Bureau of Reclamation]

Crater Lake

	Average Max Temp (°F)	Average Min Temp (°F)	Total Precipitation	Total Snowfall	Snow Depth as of: 8/31/18	Highest Max/ Lowest Min
August	*71.5°*	*43.5°*	*0.00″*	0.0″	0″	85° (10th) / 36° (25th & 31st)
Normal (1981-2010)	*69.7°*	*40.5°*	*1.00″*	*0.0″*	*0″*	*N/A*

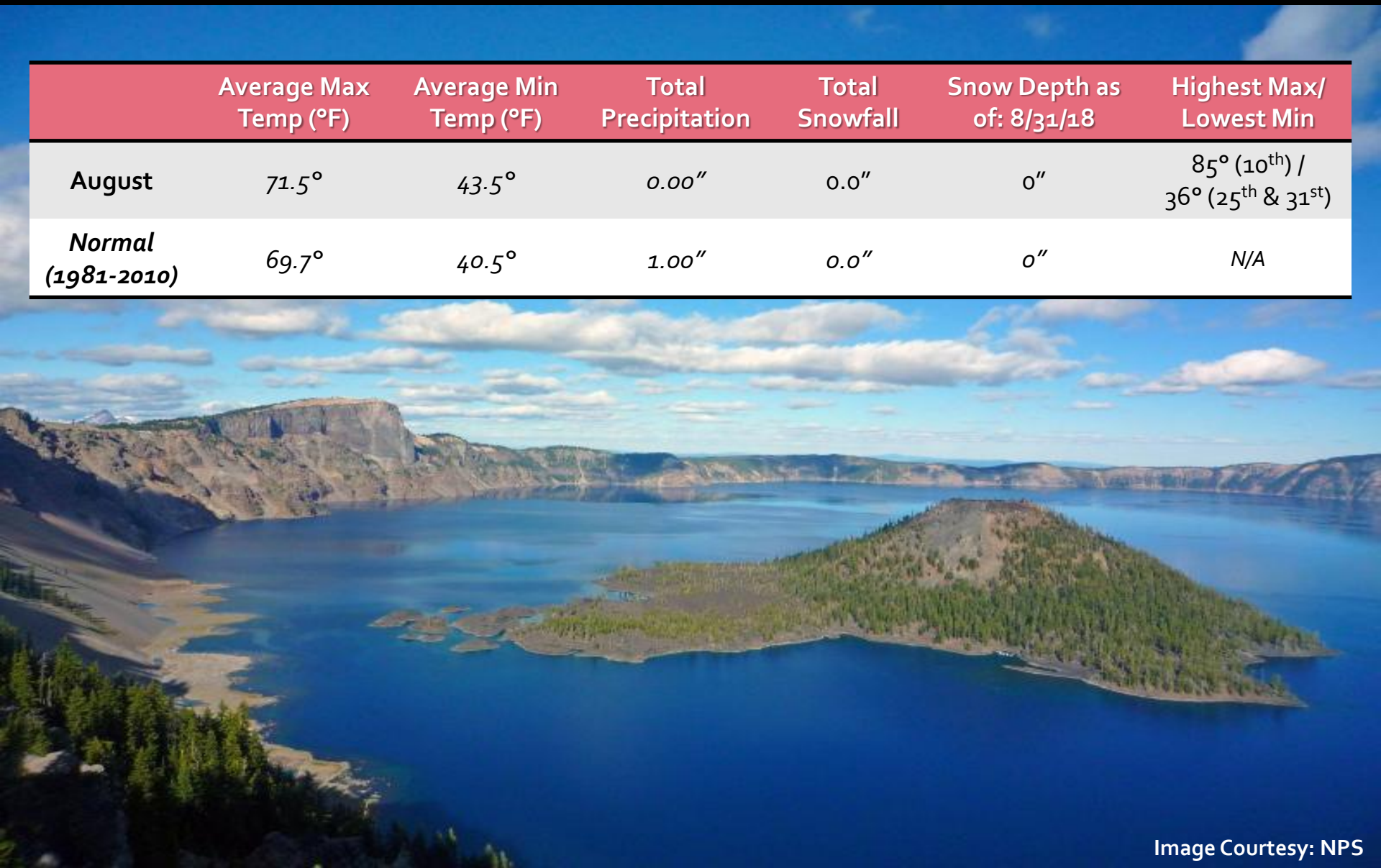
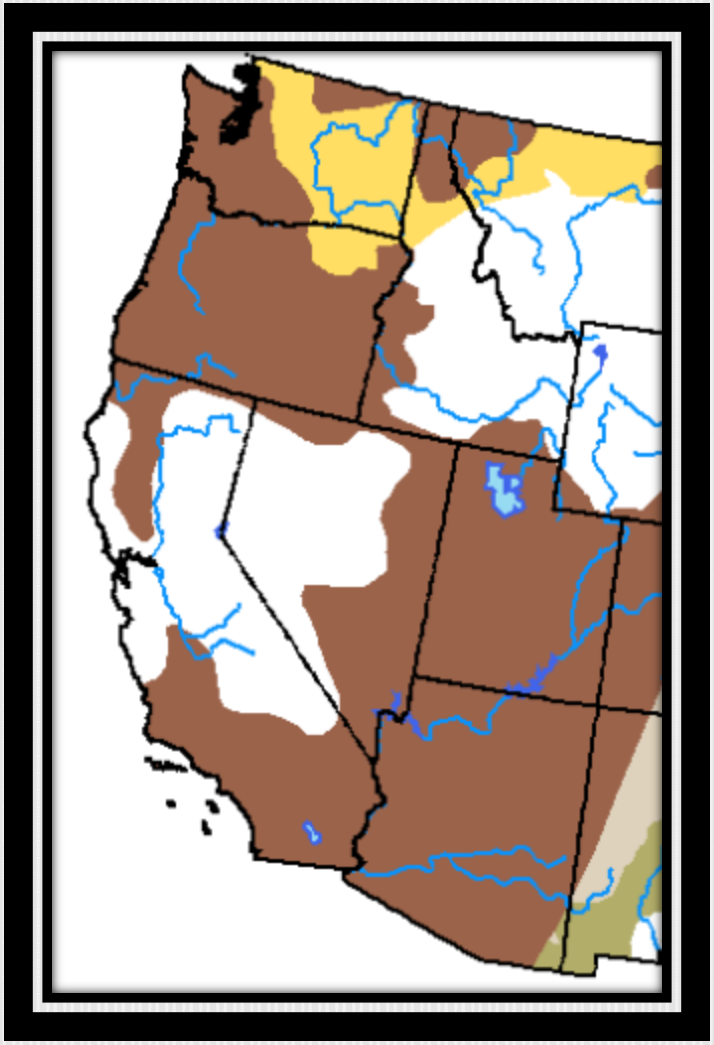


Image Courtesy: NPS

Drought Outlook: September



Drought persists

Drought remains but improves

Drought removal likely

Drought development likely

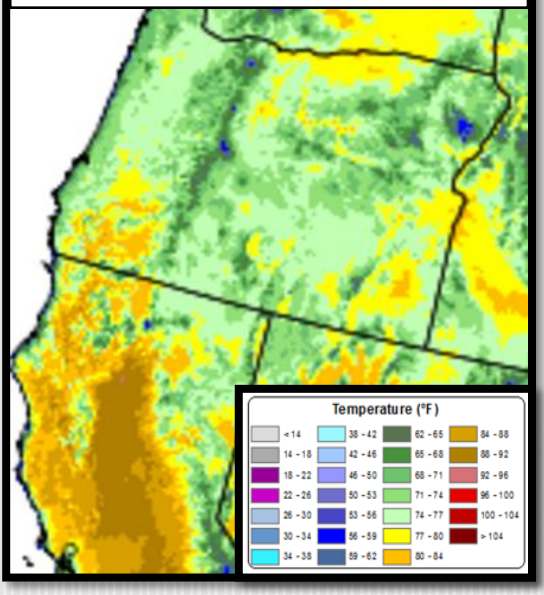
Valid for September 2018
Released August 31, 2018

http://www.cpc.ncep.noaa.gov/products/expert_assessment/month_drought.png

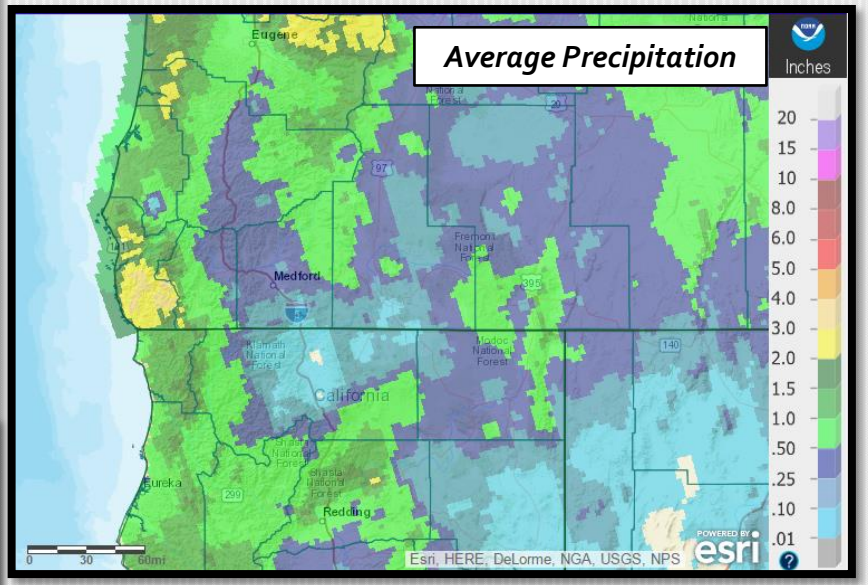
Looking Ahead: September Normals (1981-2010)

September typically marks the end of summer both astronomically and meteorologically. Longer nights and shorter days yield cooler conditions than August and the chance of rainfall increases, especially during the 2nd half of the month. Typically, daily high temperatures are in the 80s in the interior valleys west of the Cascades, in the 70s across the valleys east of the Cascades, and in the 60s and 70s in the mountains and along and near the coast. Daily low temperatures reach frosty low to mid 30s in much of Klamath and northern Lake Counties, and 35-45°F for most of the rest of the area from the Cascades eastward. 40s and lower 50s are normal west of the Cascades, with the warmest nights typically along the Curry County coast at 52-55°F, on average. Precipitation is usually half an inch or more for most of the forecast area, with an inch or more for the highest terrain of the Cascades westward, coastal counties, and coastal mountains. 2-4 inches is normal in the wetter portions of the Coastal Mountains. Northeast and east winds related to enhanced seasonal pressure gradients can result in periods of cool nights and warm days in the valleys along with low relative humidities. This pattern often yields relatively warm days along and near the coast, as well.

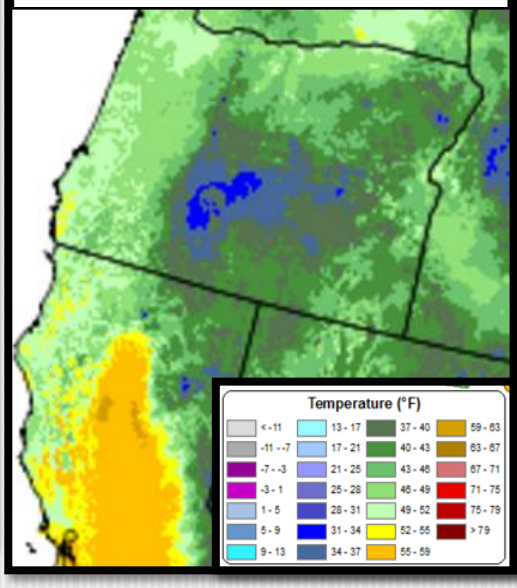
Average Maximum Temperatures



Average Precipitation

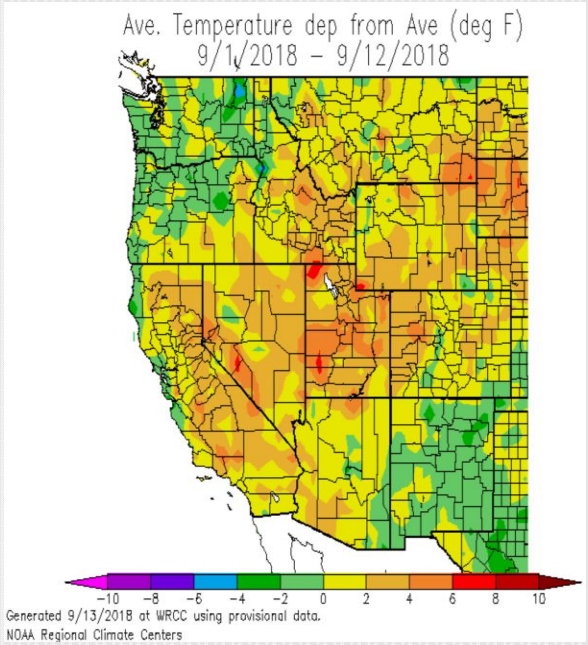


Average Minimum Temperatures

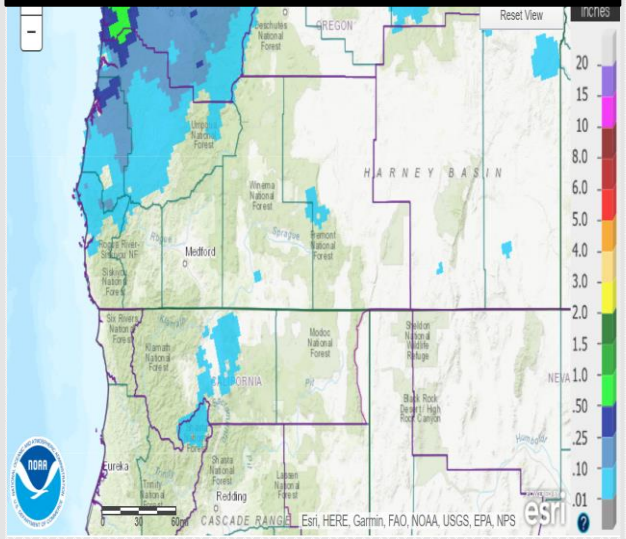


Observed Weather: Sep 1-12th, 2018

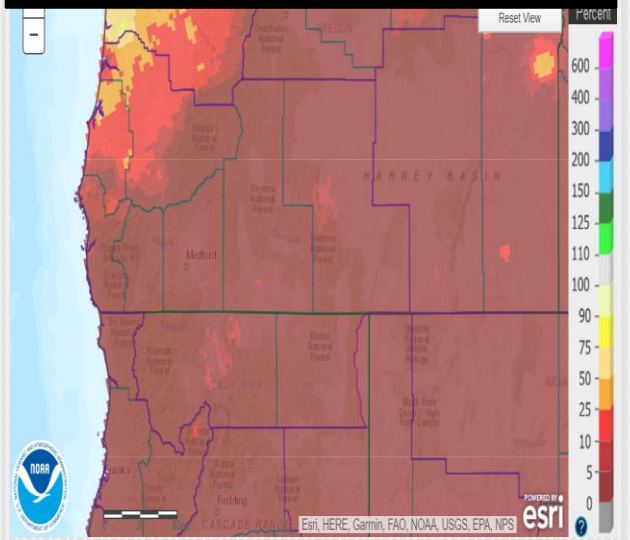
Temperatures for the first half of September have been near normal over most of the forecast area, but it has been 2-4 degrees above normal across portions of Siskiyou, Modoc, Lake, and Harney counties. Precipitation amounts have been well below normal, except over mainly northern portions of Coos and Douglas counties. It should be noted that, because the second half of September is typically wetter than the first half, and the daily normal totals are determined by averaging an entire month's worth of precipitation by the # of days in a month, the below normal anomalies look a bit worse than they actually are. Altogether, a low pressure trough that has settled onto the west coast has been resulting in seasonably cooler conditions, but abnormal dryness continues, keeping some wildfires burning. Light precipitation amounts have helped lessen the dryness and fire spread potential some.



1981-2010 Observed Precipitation In Inches, Sep 1-12, 2018

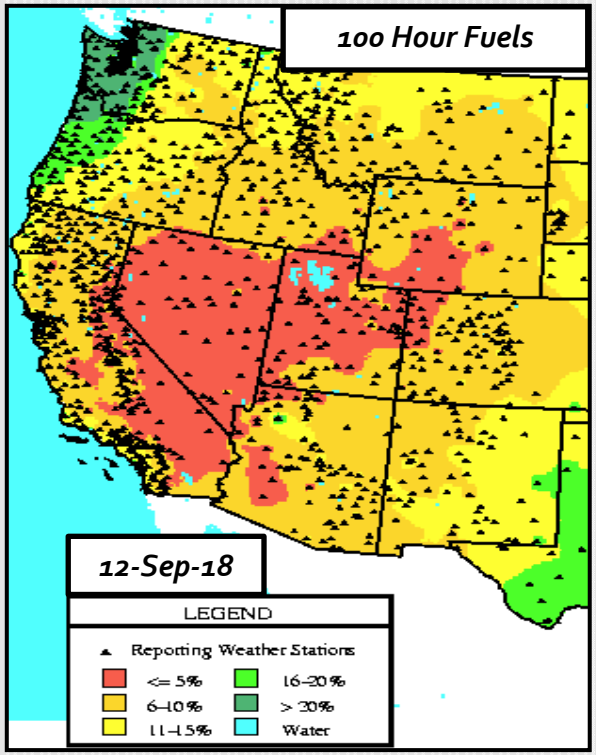


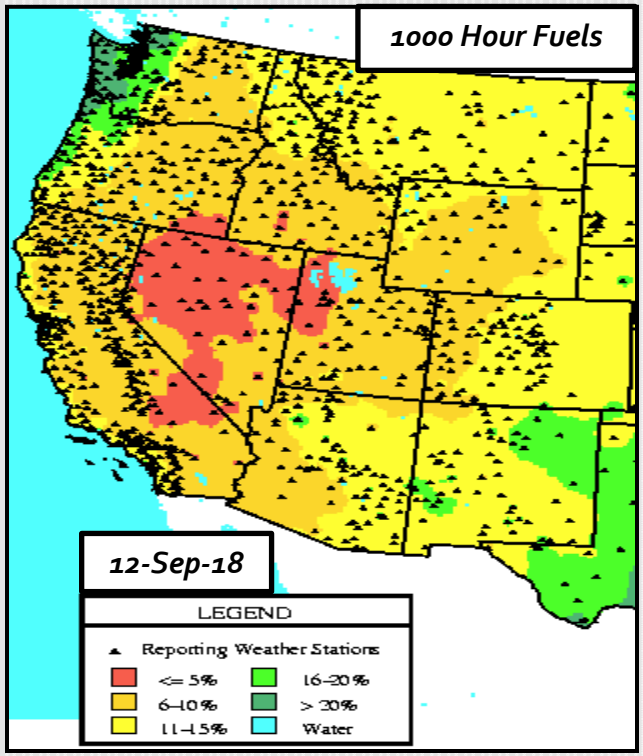
Observed Precipitation % of Normal, Sep 1-12, 2018

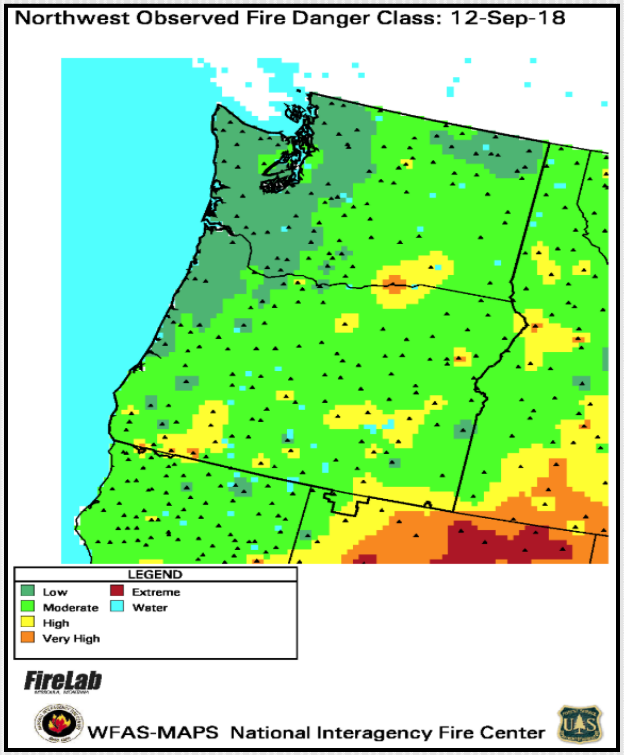


Fuel & Fire Potential Status as of September 11th, 2018

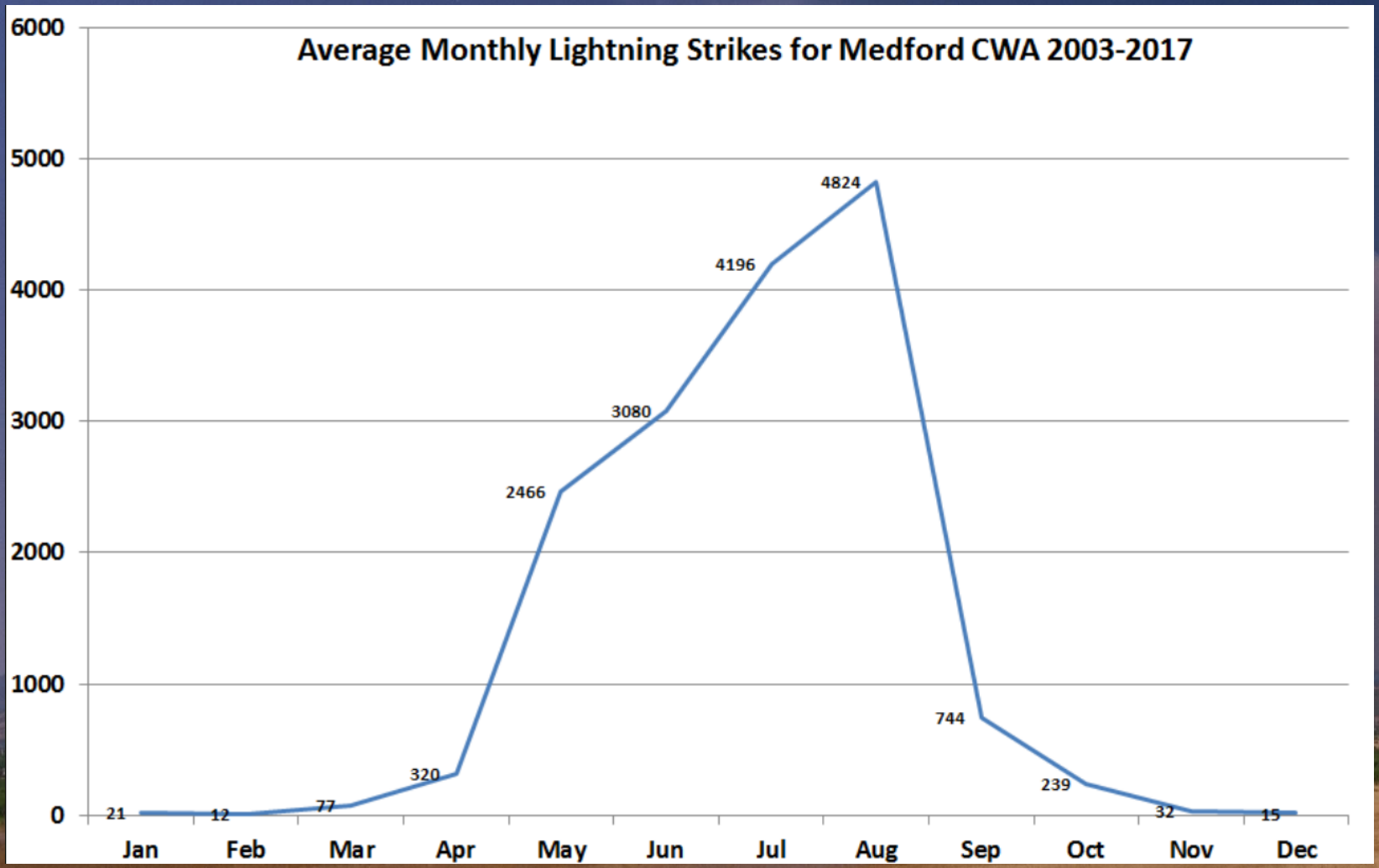
Areas west of the Cascades finally did receive some measurable rainfall during the first week of September. This early September rainfall and cooler temperatures with higher humidities has begun diminishing fire danger as well as lightning ignition probability. However, with more hot weather expected early this month, more fire starts will be possible until widespread wetting rain occurs across the area. Also, existing fires will continue to burn until this rain occurs.





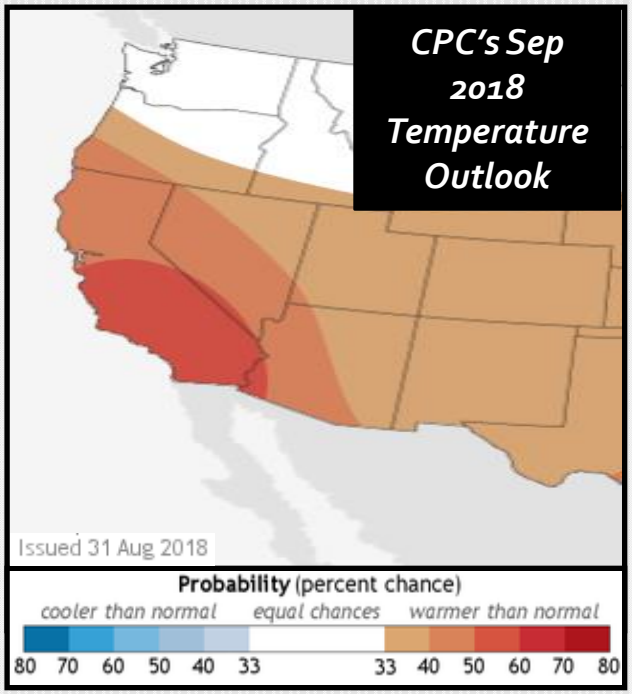


Average Cloud to Ground Strikes



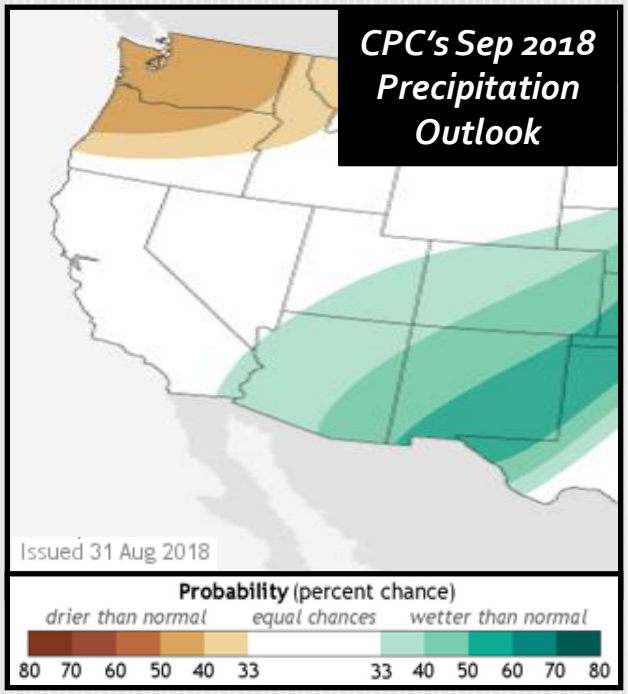
September 2018 Outlook

The official CPC forecast for September 2018 calls for increased chances for warmer than normal temperatures (40-50%) and equal chances for at, below, or above normal precipitation, except over portions of the area from roughly Cape Blanco, Crater Lake, and Silver Lake northward, where odds are slightly enhanced toward the below normal category. Based on what has been observed early in the month, and continued low pressure troughing being indicated by the GEFS and the CFSv2, it appears that temperatures are likely to be near (+/- 2 degrees F) normal to slightly below normal (2-3 degrees F) this month. The precipitation forecast is more tricky in that the trough of low pressure that has caused above average wetness, thus far, this month for portions of the Portland and Seattle NWS forecast areas, is projected to generally shift southward for the week of Sep 21st-27th. This will bring some precipitation with it, and this precipitation could be significant enough to greatly diminish fire activity. However, it also appears that this precipitation will not be enough to prevent yet another below normal precipitation month.



Expected Impact, September 2018:

Smoke impacts are expected to continue to decrease through month's end. The expected weather pattern for the next two weeks does not look favorable for any major east wind events, so this should limit dryness and fire spread potential. Below normal precipitation this month, however, means that dwindling water supplies will continue to diminish, and fire season is unlikely to definitively end.



*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 August 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 August 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: 1/1/1948 – Present**
  - *Missing:*
    - *08-10/1970*
    - *1971-10/1997*
- **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*