National Weather Service Medford

July 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).

July 2018 Weather Review

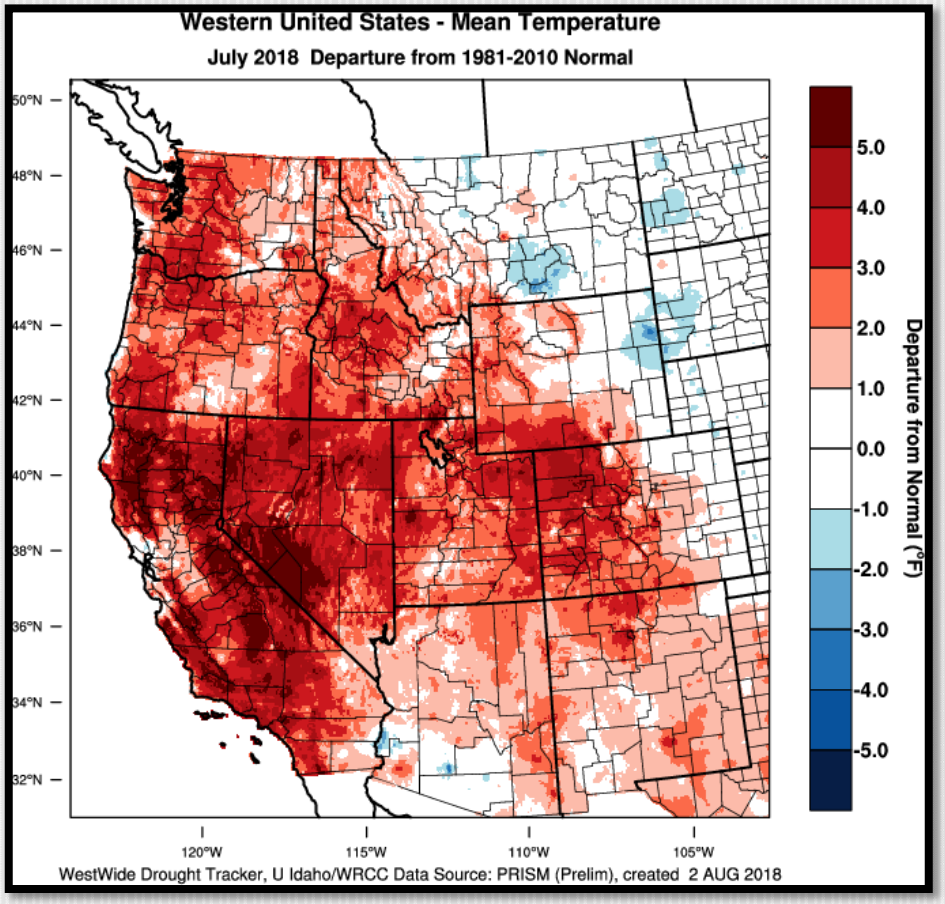
Considering how busy July was at the WFO MFR office, it seems ironic how easily the month can be summarized: hot, dry and smoky. The first week of the month was relatively uneventful, other than the fact that the Klamathon Fire near Hornbrook was initiated. Strong southerly winds that funneled into the Shasta Valley fueled the fire, and it burned tens of thousands of acres under Red Flag conditions and even pushed into southern Oregon.

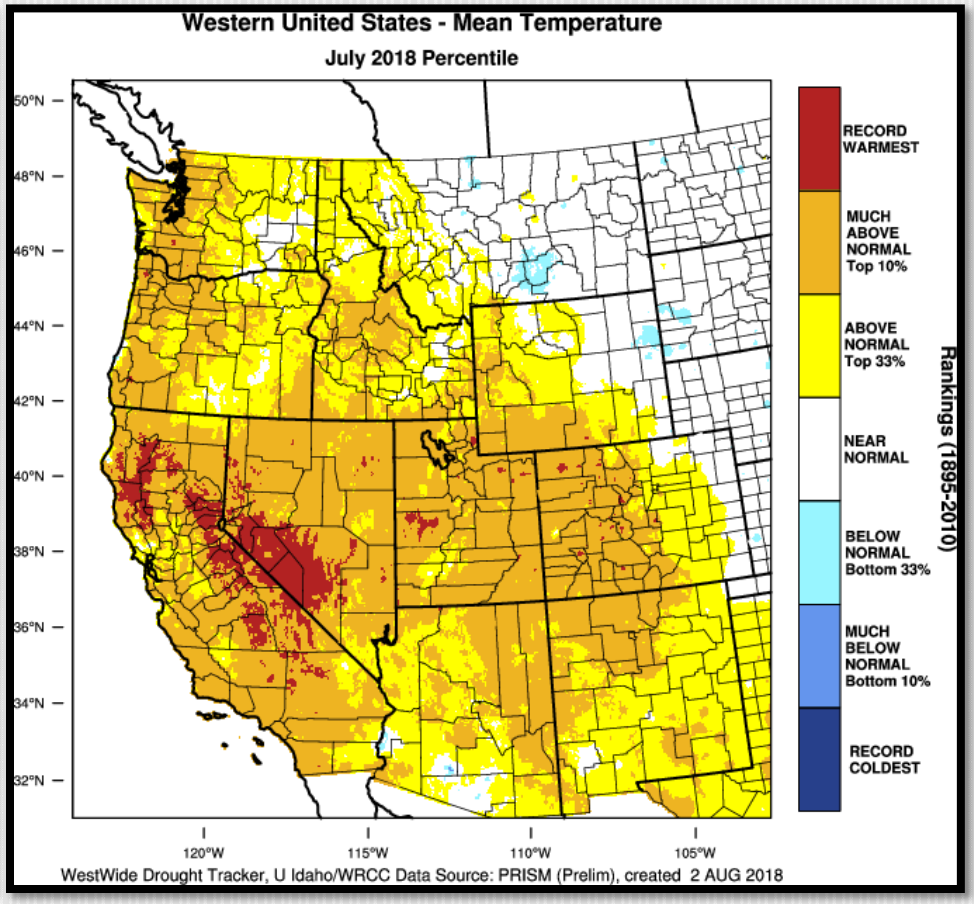
During the second week of the month, a strong ridge over the Great Basin brought scorching conditions to the area. Temperatures were well above normal for the forecast area, with temperatures in the Medford area reaching 104 degrees on July 12th. Temperatures thereafter were at or above 100 degrees for 4 of the 5 following days. July 15th didn't reach 100 due to ample cloud cover as a potent shortwave passed through the region, and triggered numerous thunderstorms. Over 2000 lightning strikes were recorded over the Medford CWA, with 300 strikes observed in Jackson County alone. The on July 16th, a strong thunderstorm moved through Montague, CA which brought damaging winds that felled multiple large trees.

This thunderstorm outbreak resulted in numerous fire starts. Most were brought under control, but some turned into larger wildfires that burned thousands of acres and were still not fully contained by month's end. In fact, these wildfires brought very smoky conditions to everywhere south and east of the Umpqua Divide, leading to very unhealthy air quality for the last half of July. The same pattern stuck around for the remainder of the month, bringing unrelenting heat. There was one benefit to the smoke, however, in that it moderated the scorching temperatures; by filtering the sun's rays, it prevented temperatures from reaching their full potential.

The fire danger hit close to home on July 17th when the Penninger Fire, which started near the Central Point Expo, almost reached the WFO. Forecasters abandoned station for the first time in at least 20 years, for close to three hours. A few spots did make it across Biddle Road, but fortunately that was as close as the fire came to the office and fire crews were able to prevent any further spread.

July 2018 *Observed Temperatures*





Average Temperatures

	Average (°F)	Departure from Normal	Average Max (°F)	Departure from Normal	Average Min (°F)	Departure from Normal
North Bend	59.6	**+1.0°**	65.9	**+1.4°**	53.2	**+0.4°**
Roseburg	74.6	**+4.3°**	90.6	**+6.3°**	58.6	**+2.4°**
Medford	78.1	**+4.0°**	95.4	**+4.7°**	60.8	**+3.4°**
Klamath Falls	69.1	**+3.1°**	89.6	**+5.7°**	48.7	**+0.5°**
Montague, CA	75.5	**+2.8°**	95.5	**+4.2°**	55.4	**+1.3°**
Mt. Shasta City, CA	72.6	**+4.7°**	91.5	**+5.7°**	53.8	**+3.8°**
Alturas, CA	70.2	**+3.8°**	92.7	**+4.7°**	47.7	**+2.9°**

Monthly Max & Min Temperatures

	Max (°F)	Date(s)	Min (°F)	Date(s)
North Bend	70°	10th	48°	22nd
Roseburg	101°	25th & 26th	52°	3rd & 7th
Medford	105°	16th	49°	3rd
Klamath Falls	95°	26th & 29th	40°	3rd & 7th
Montague, CA	103°	12th & 26th	46°	5th
Mt. Shasta City, CA	97°	23rd & 26th	45°	7th
Alturas, CA	98°	12th & 26th	39°	7th & 9th

Record Temperatures

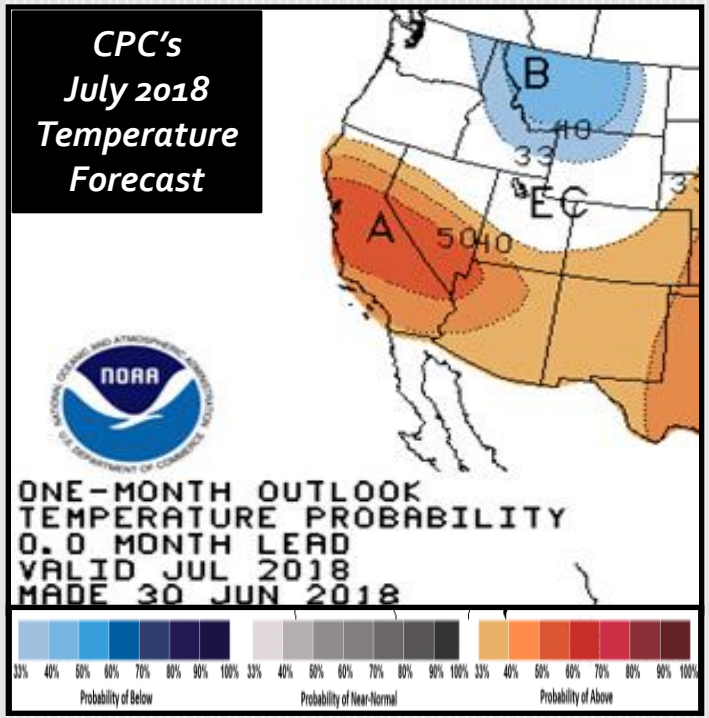
	Record High / Date	Old Record/Year
Roseburg	101° / 25th	99° / 2013
Montague	103° / 12th	Ties with 2002

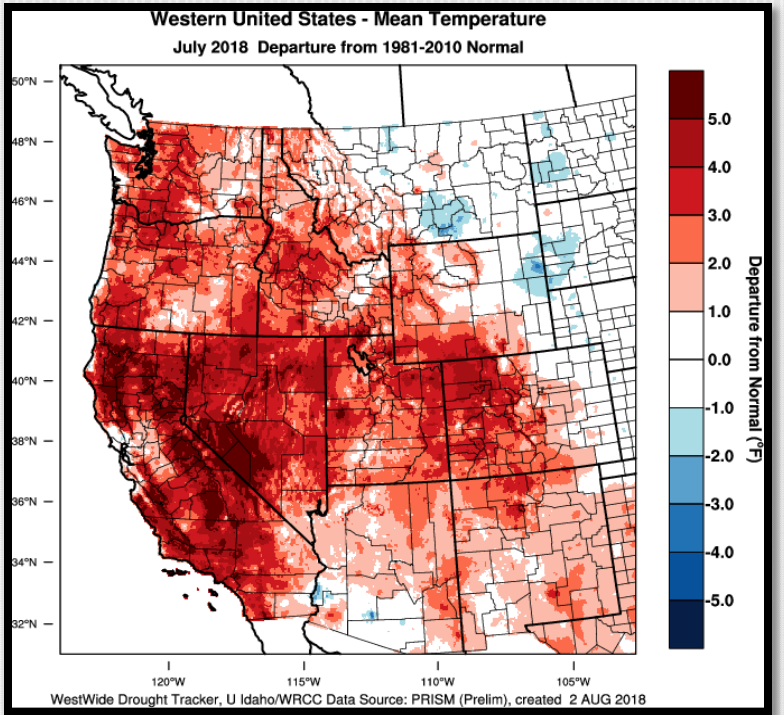
A Look Back at the July 2018 Temperature Outlook

- ***Was the forecast anomaly correct?*** CPC's forecast for equal chances of above, near, and below normal temperatures, but with a slight tilt toward above normal temperatures in our NorCal areas was generally misleading, though an EC forecast is never, technically, incorrect. It certainly was not as good as our localized forecast "that temperatures will be above normal for the month, likely on the order of 3-6 degrees." Altogether, most of the area was 2-6 degrees above normal, except along the immediate coast and portions of the east side.

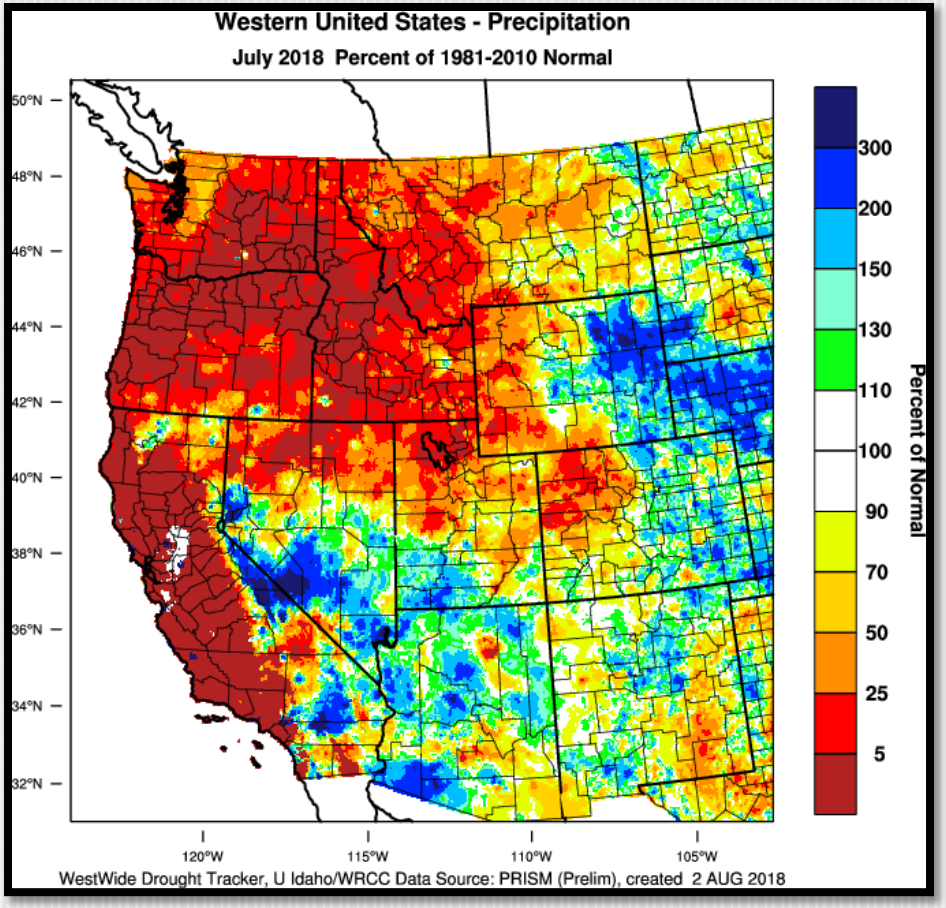
- ***Was the expected impact correct?*** Yes. Fuel dryness combined with lightning started many fires across the area, especially from the Cascades westward.

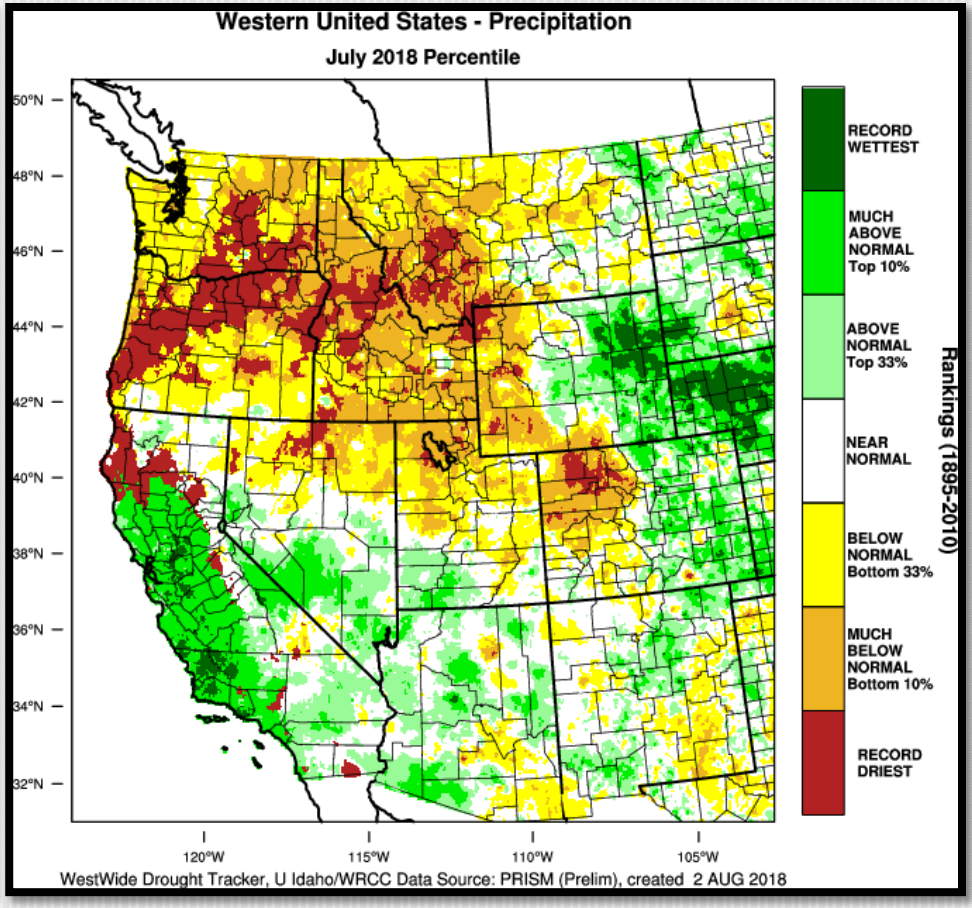
- ***Did our forecast improve upon the CPC forecast?*** Yes, very much so. The much warmer than normal temperatures continued to dry our vegetation across the area, which made wildland fuels very receptive to the lightning outbreak that occurred mid-month. These warm temperatures also hampered fire fighting efforts. It should be noted that the observed temperature graphic, below, appears underdone.





July 2018 *Observed Precipitation*



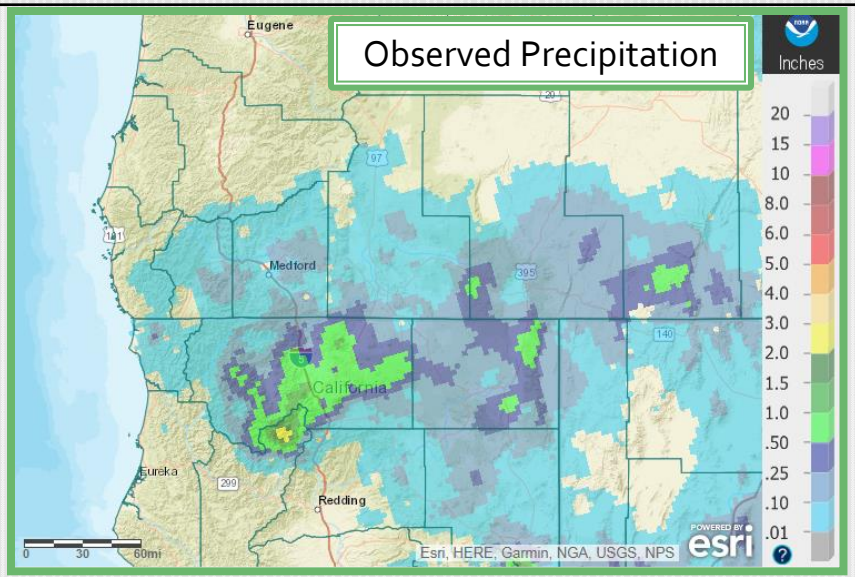


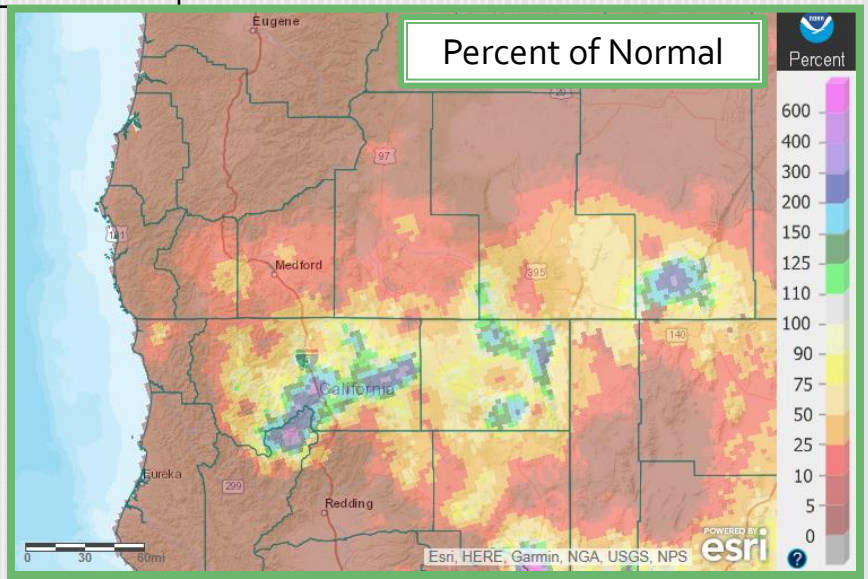
July Precipitation

	Total	Departure from Normal	Greatest 24-hr Total	Date(s)
North Bend	Trace	-0.50"	Trace	18th
Roseburg	0.00"	-0.42"	0.00"	N/A
Medford	0.01"	-0.27"	0.01"	15th
Klamath Falls	0.02"	-0.46"	0.02"	15th
Montague, CA	0.22"	-0.23"	0.22"	23rd
Mt. Shasta City, CA	0.47"	0.08"	0.47"	24th
Alturas, CA	0.13"	-0.21"	0.13"	15th

Record Daily Precipitation

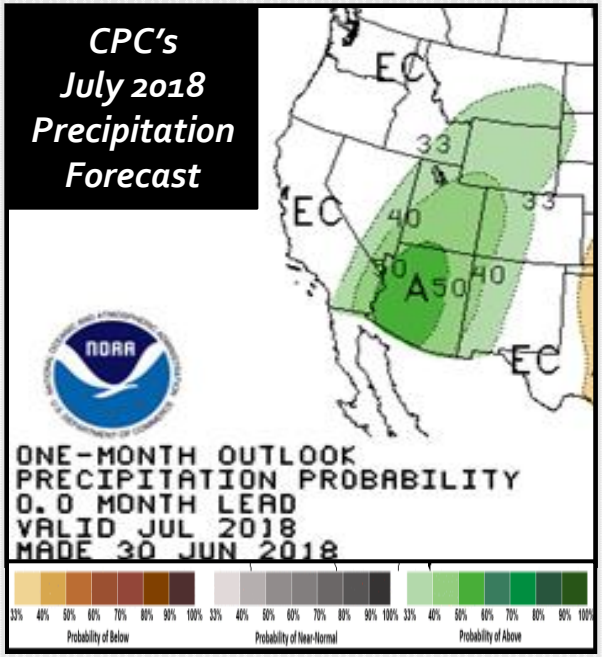
	New Record	Date	Old Record	Year
Alturas	0.13"	15th	0.09"	1996
Montague	0.12"	23rd	0.02"	1994
Mt Shasta City	0.13"	15th	0.12"	1975

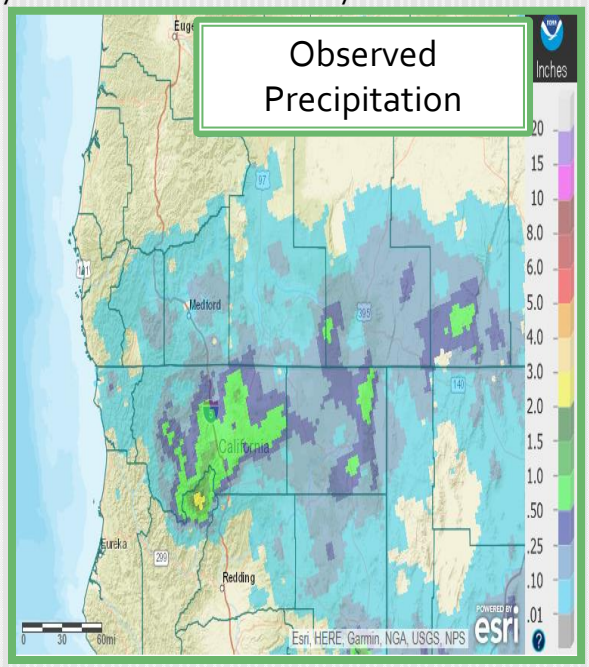


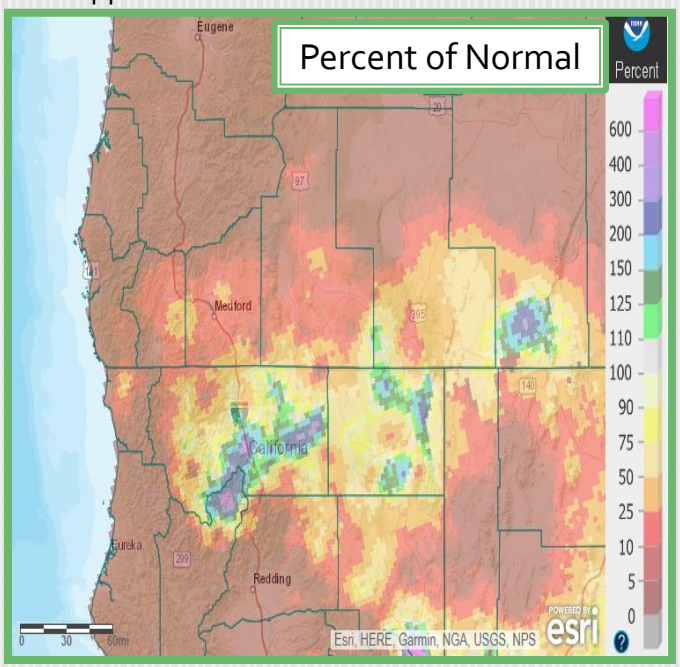


A Look Back at the July 2018 Precipitation Outlook

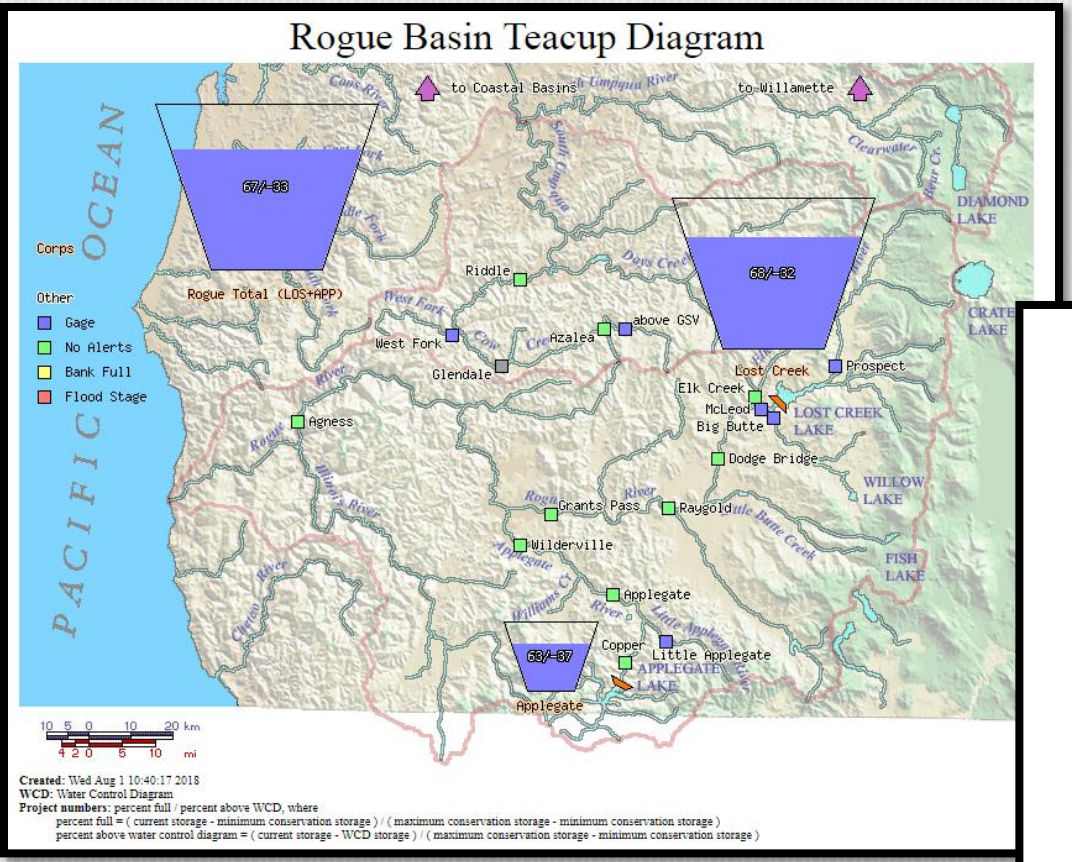
- ***Was the forecast anomaly correct?*** CPC's forecast for equal chances of below, above, and near normal precipitation was generally correct. Our localized forecast for an increased probability of above normal precipitation east of the Cascades" that "could extend to the Cascades west, but equal chances appears to be the best forecast there" was somewhat correct, but also somewhat incorrect. All in all, the rainfall was less than expected in that showers and thunderstorms did not make it as far north and west as we expected. This was likely, at least in part, due to wildfire smoke limiting convective potential.
- ***Was the expected impact correct?*** Yes. Fire activity was above normal west of the Cascades. Some moisture with storms east of the Cascades did help mitigate wildfire severity there, though it is unclear how much precipitation played a role in limiting fires east of the Cascades.
- ***Did our forecast improve upon the CPC forecast?*** Somewhat. We correctly indicated there would be "periods of anomalous southeast flow" and resultant lightning. It remains to be determined if lightning was above or below climatological normals. The prediction of "lower than normal water supplies will become an impact in some smaller drainages that depend on mid-elevation snowpack" held true, as the Talent Irrigation District shut down their McDonald System. We do not have any further information to support that forecast.





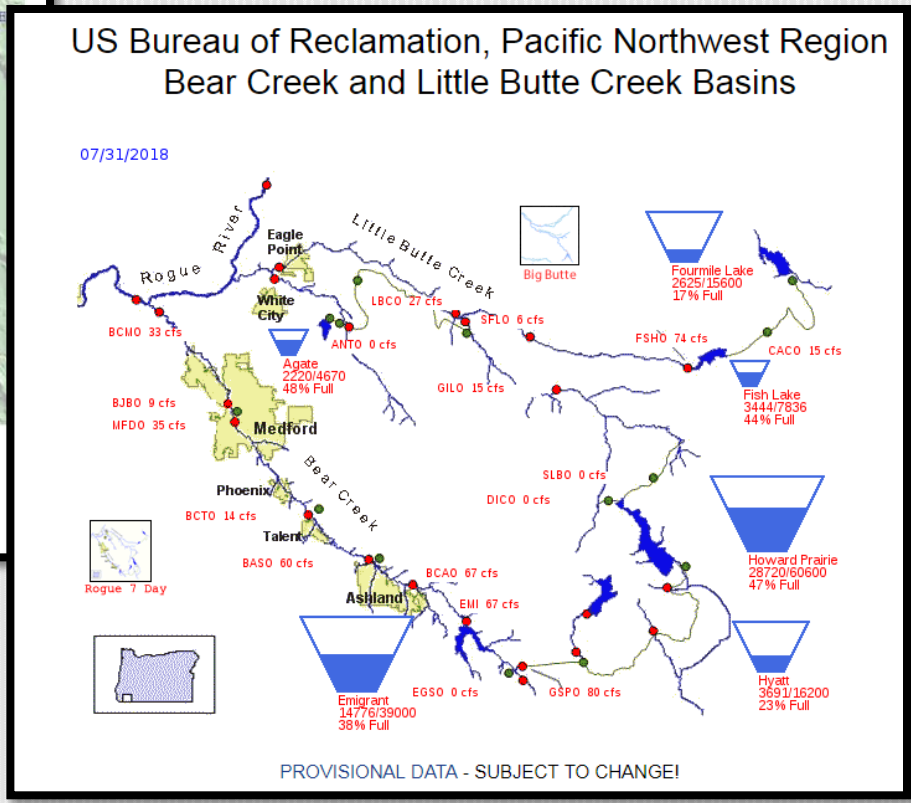


Reservoir Status



Data above courtesy of US Army Corps of Engineers

Data below courtesy of Bureau of Reclamation



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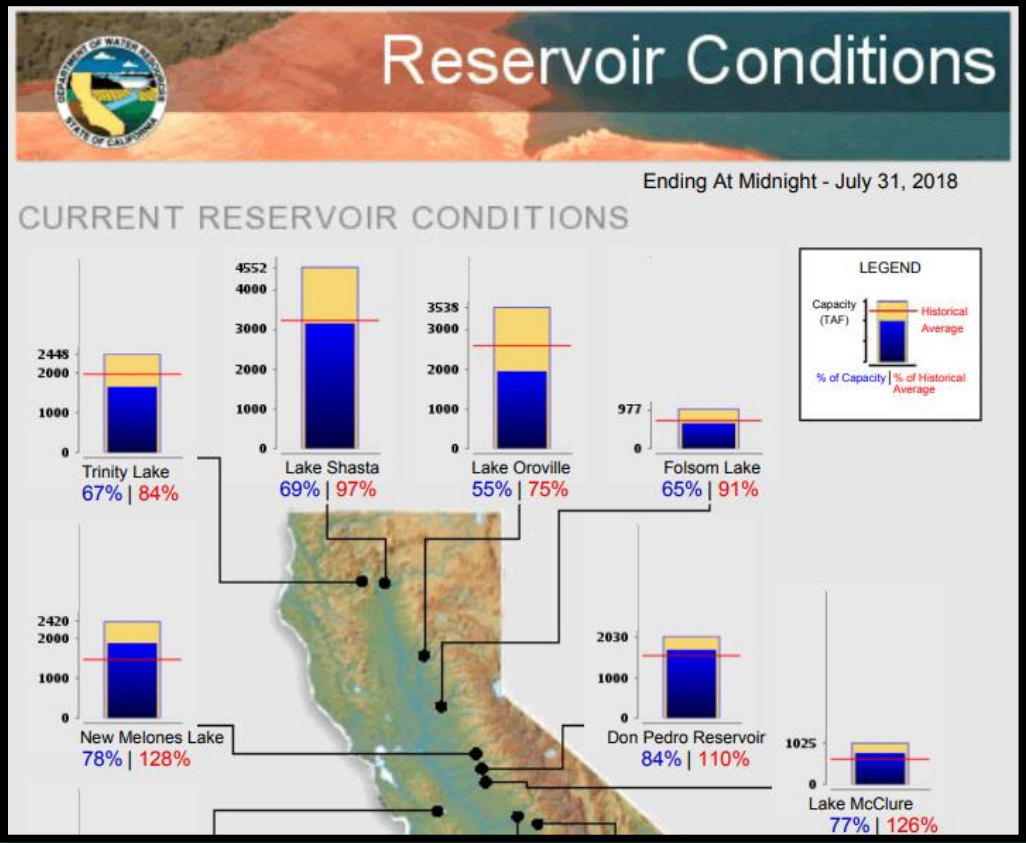
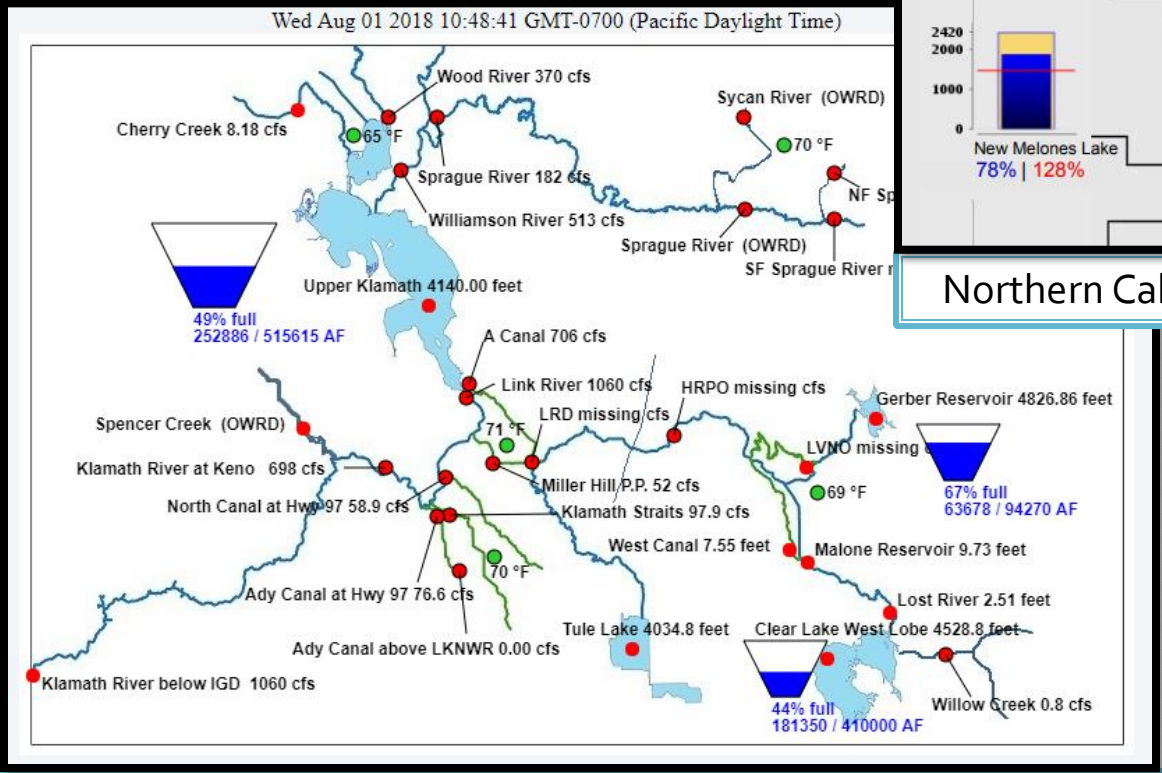


Northern California. [California Data Exchange Center]



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: 7/31/18	Highest Max/ Lowest Min
July	73.7°	44.2°	0.01"	0.0"	0"	81° (13th & 30th) / 34° (3rd)
Normal (1981-2010)	68.7°	40.5°	1.03"	0.1"	0"	N/A

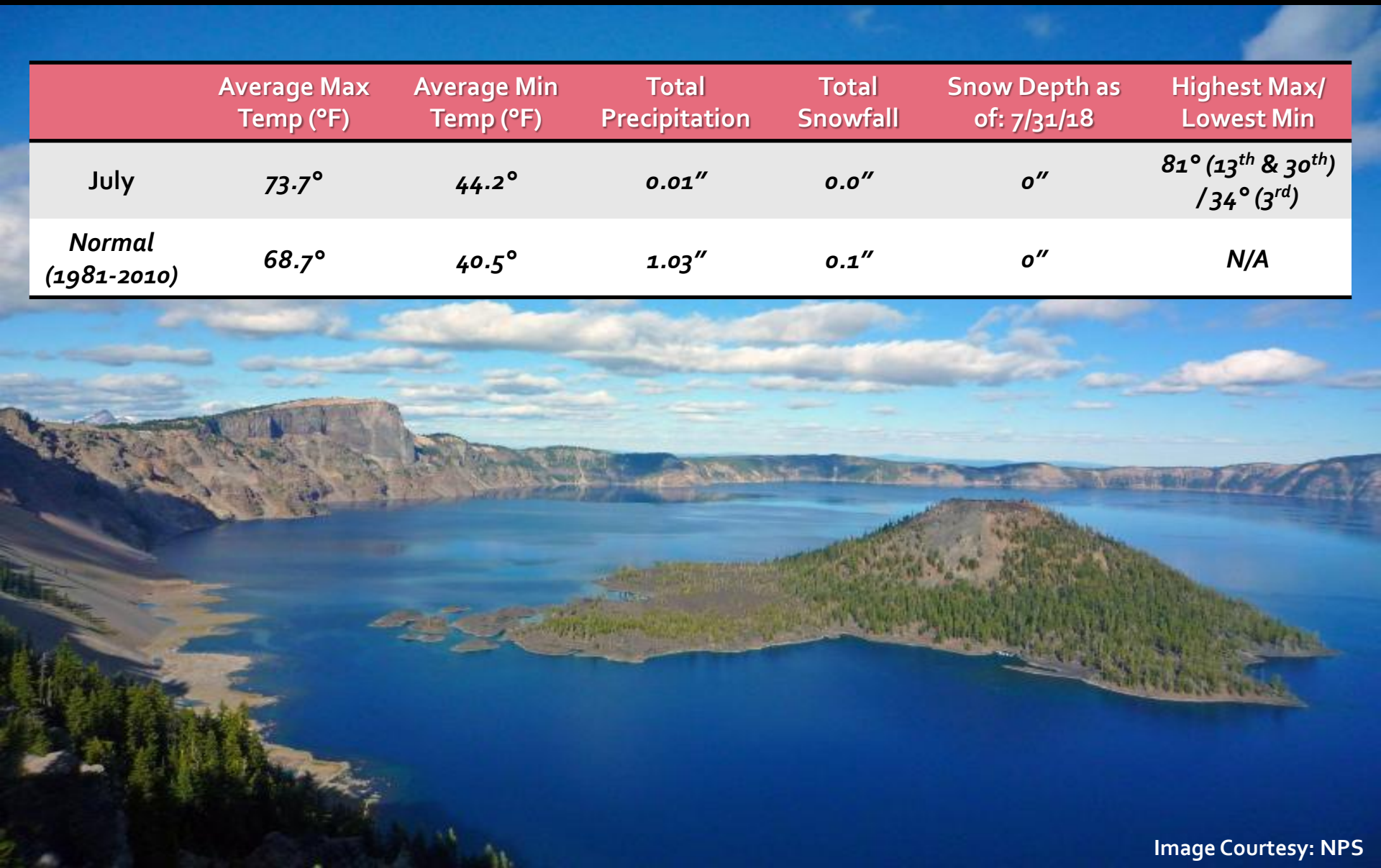


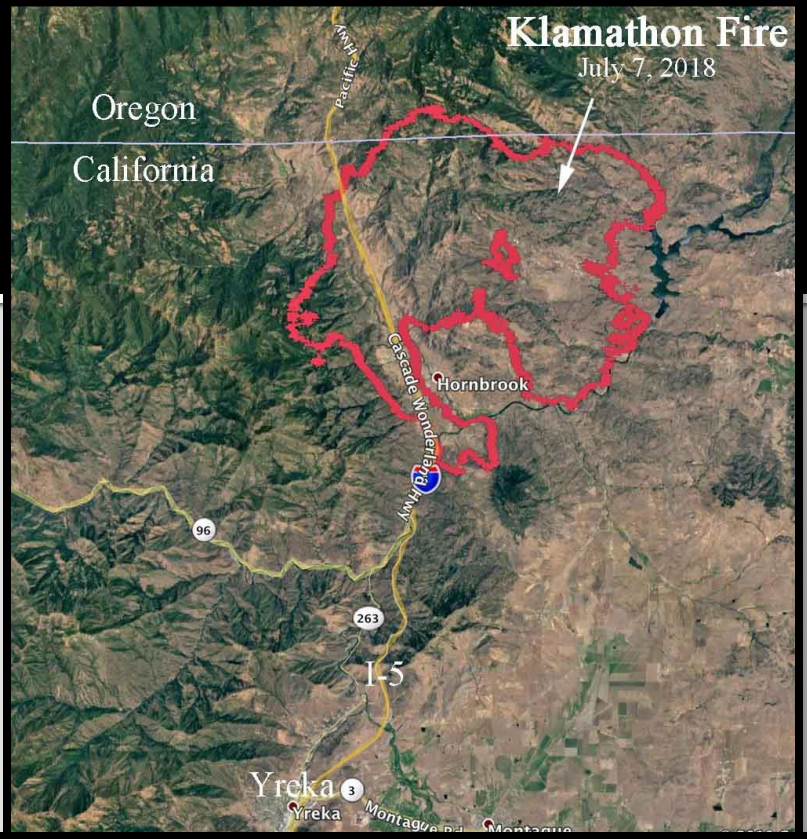
Image Courtesy: NPS

Significant July 2018 Events

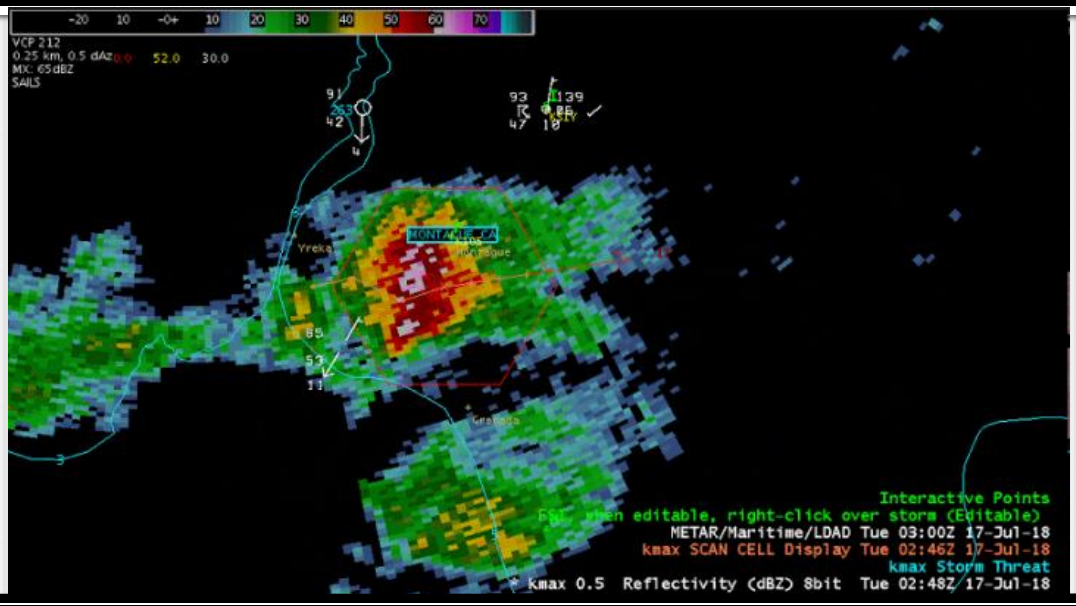
- Klamathon Fire
- Severe T-storm leads to wind damage in Montague, CA
- Penniger Fire causes WFO Medford to Abandon Station
- Numerous Wildfires, brings weeks of unhealthy air quality
- Record Breaking heat for mid-July

Klamathon Fire

- Started July 5th
- Fully contained on July 21st at 38,008 acres
- Destroyed 82 structures, and damaged 12, killed one civilian and injured 2 firefighters
- Overnight closure of I-5



Wet Microburst leads to Wind Damage in Montague, CA



Large, healthy trees were toppled from the wet microburst. Images sent to NWS Medford from Jasen Vela, Siskiyou County Emergency Manager.

A wet microburst from a strong thunderstorm (depicted on radar, far left), brought damaging winds to the city of Montague, CA on July 16th. Numerous downed trees and power outages were reported. NWS Birmingham has an excellent description of what a microburst is. Sometimes updrafts in thunderstorms are strong enough hold rain/hail aloft. Eventually the updraft weakens, and all the rain/hail that was suspended aloft, falls very quickly to the ground, bringing very strong winds with it. NWS Las Vegas shared a great video from the Nevada Seismological Laboratory where they captured a wet microburst on camera.

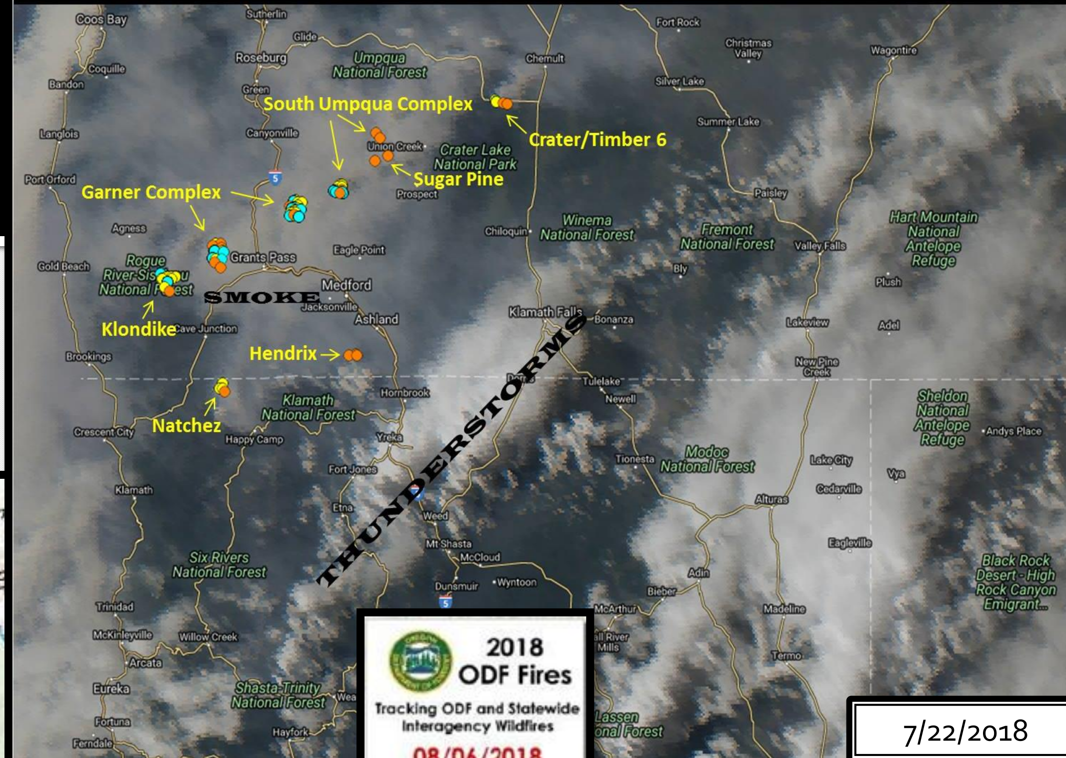
Medford WFO Staff Abandons Station

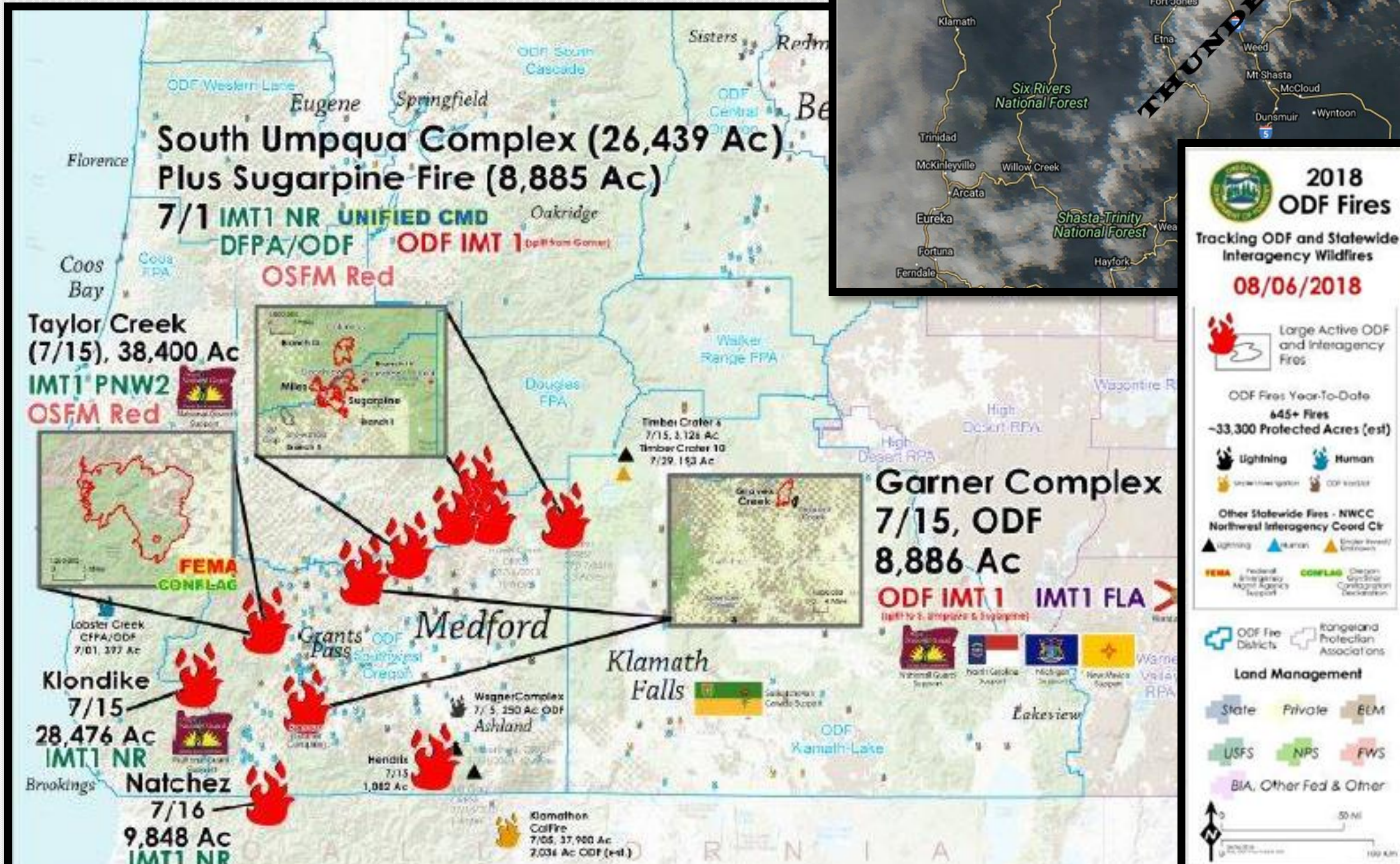
Top Left: View from inside the WFO
Top Right: View from Inflation Building
Bottom: View of across the street from the Office after the fire was put out. Notice the burnt field across the road, which is Biddle Rd.

A grass fire that started near the Expo, quickly spread to the south and east due to the northwest valley winds. Locations within a 2 mile radius of the Expo were evacuated, and this include the Medford Weather Forecast Office. Thankfully, Biddle road was a successful fire block, but a few spots did make it across the street and burned the grass near the office. This was the first time in at least 20 years that the office had to be abandoned.

Numerous Wildfires…

GOES-16 IMAGE SHOWING FIRES ACROSS THE AREA





…brought weeks of smoke & unhealthy air quality

Record Breaking Heat: July 10-26th

Medford, Mount Shasta City, and Roseburg *just experienced* the hottest average temperature on record for the July 10th – 26th, 2018 time period:

Roseburg, OR Average Temperature July 10-26, 2018:

Maximum 17-Day Mean Avg Temperature for ROSEBURG REGIONAL AP, OR

Rank	Value	Ending Date	Missing Days
1	76.9	2018-07-26	0
2	76.6	1938-07-26	0
3	75.4	2013-07-26	0
4	75.0	2006-07-26	0
5	74.6	1941-07-26	0
6	74.4	2003-07-26	0
7	74.3	2002-07-26	0
8	73.6	2004-07-26	0
9	73.4	1959-07-26	0
10	73.3	1935-07-26	0

Period of record: 1900-04-01 to 2018-07-26

Medford, OR Average Temperature July 10-26, 2018:

Maximum 17-Day Mean Avg Temperature for MEDFORD ROGUE VALLEY INTL AP, OR

Rank	Value	Ending Date	Missing Days
1	80.8	2018-07-26	0
2	80.1	1938-07-26	0
3	79.8	2013-07-26	0
4	79.7	2006-07-26	0
5	79.4	1959-07-26	0
6	79.4	1990-07-26	0
7	79.0	2002-07-26	0
8	78.8	2014-07-26	0
9	78.7	1994-07-26	0
10	78.4	2003-07-26	0

Period of record: 1911-03-11 to 2018-07-26

Mount Shasta City, CA Average Temperature July 10-26, 2018:

Maximum 17-Day Mean Avg Temperature for MOUNT SHASTA, CA

Rank	Value	Ending Date	Missing Days
1	75.1	2018-07-26	0
2	74.9	1959-07-26	0
3	73.4	2014-07-26	0
4	73.1	2006-07-26	0
5	72.7	2003-07-26	0
6	72.7	2010-07-26	0
7	72.5	1985-07-26	0
8	72.3	1960-07-26	0
9	72.1	1961-07-26	0
10	72.0	2013-07-26	0

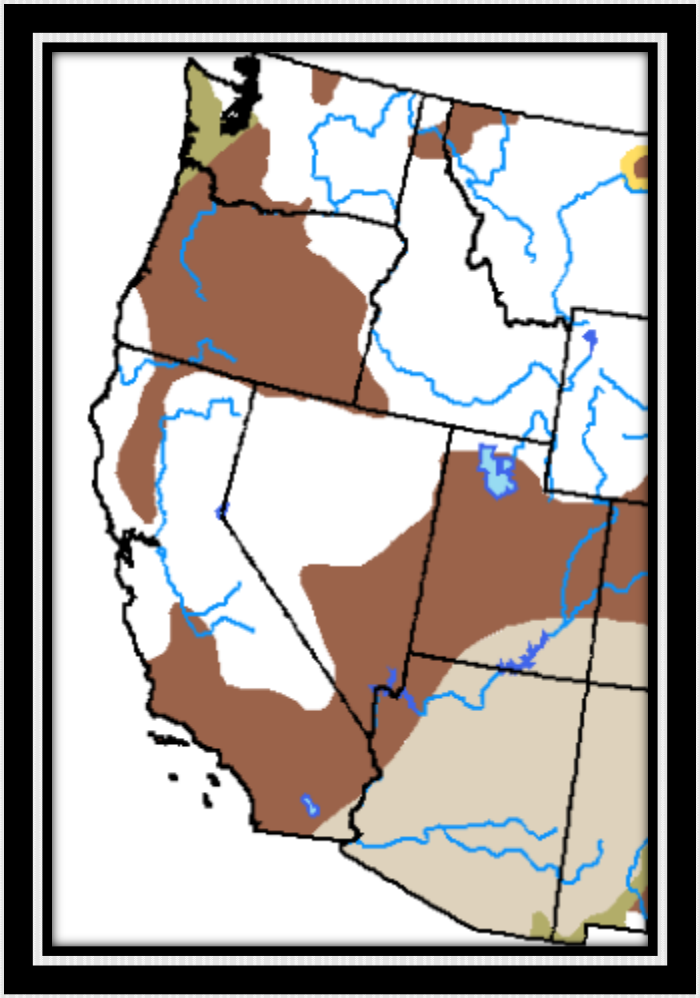
Period of record: 1948-04-15 to 2018-07-26

How to Beat the Heat & Smoke:

- Stay hydrated- Drink plenty of water.
- Wear a smoke mask if working in poor quality air.
- Plan outdoor activities before 10 am and after 8 pm and/or during periods of moderate to good air quality.
- Take frequent breaks.
- Seek shade or air conditioning and make sure air filters have been changed as is needed.
- Help elderly, kids, & pets stay cool.
- ***NEVER*** leave kids or pets in a closed vehicle!

Created: 7/27/2018

Drought Outlook: August



Drought persists

Drought remains but improves

Drought removal likely

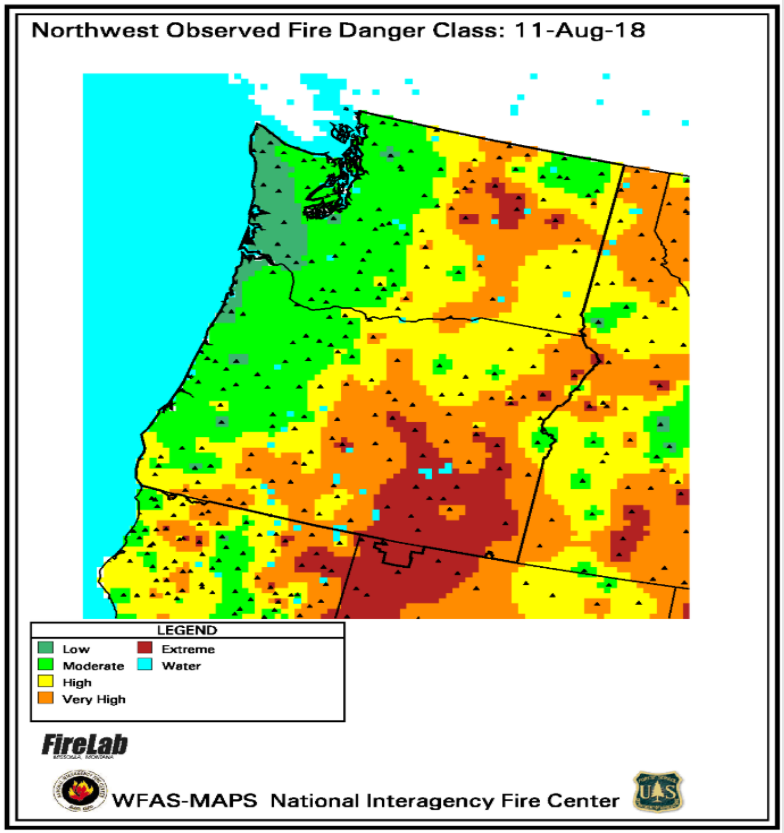
Drought development likely

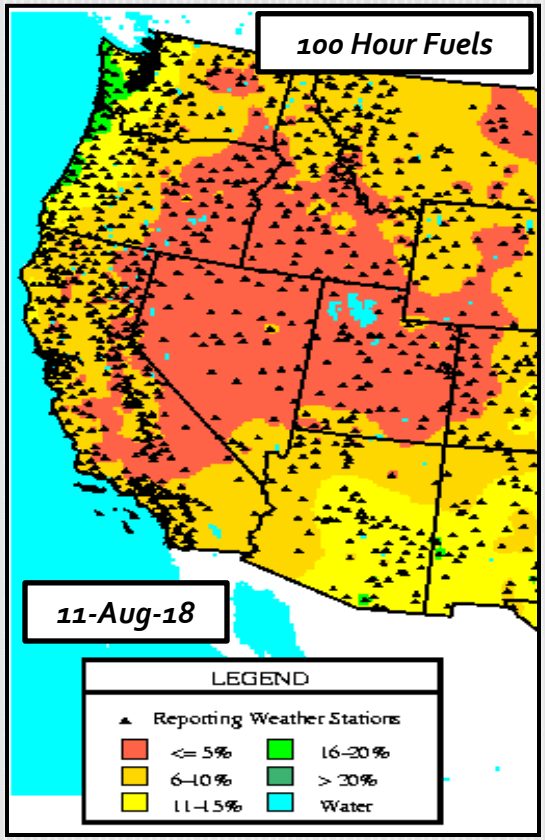
Valid for August 2018
Released July 31, 2018

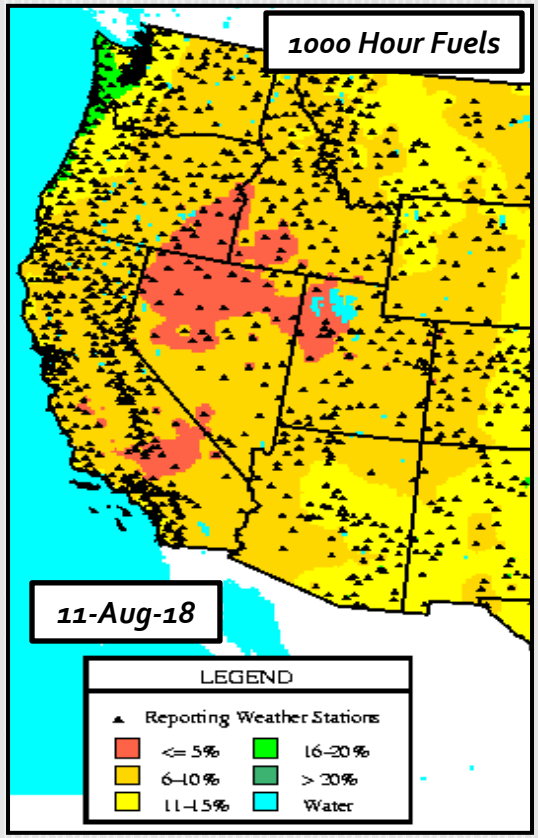
http://www.cpc.ncep.noaa.gov/products/expert_assessment/month_drought.png

Fuel & Fire Potential Status as of August 11, 2018

ERCs and 1000 hour fuels continue to be at or near record values and are generally above the 90th percentile, especially west of the Cascades. Cooler temperatures and higher RHs brought temporary relief on the 11th when the marine layer made it roughly to the areas that showed "Moderate" on the WFAS map for the 11th. Current and forecast conditions for this next week mean the area will remain primed for ignitions. Lightning is expected August 15th and 16th, and, possibly on the 14th. While some rainfall is expected then, new fire ignitions appear highly likely along and east of the Cascades, and possible west of the Cascades. Ongoing large fires west of the Cascades will continue until significant wetting rain arrives.

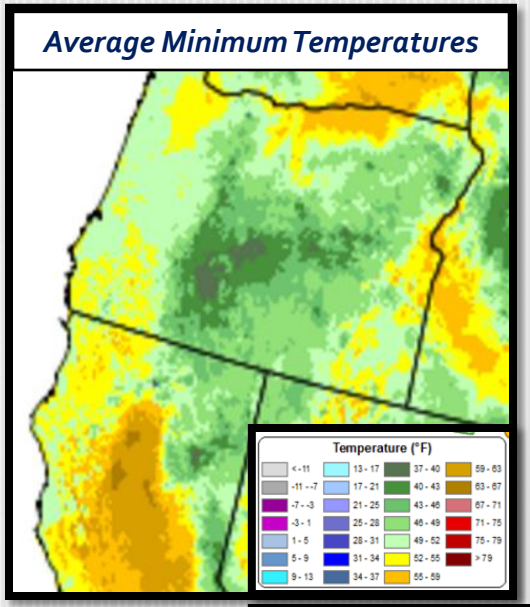


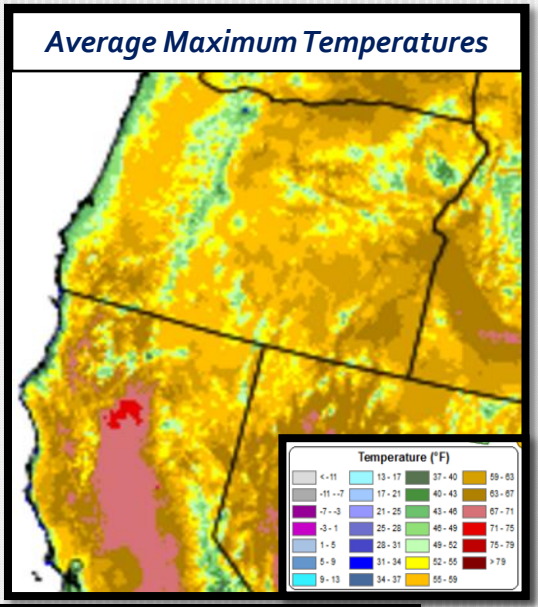


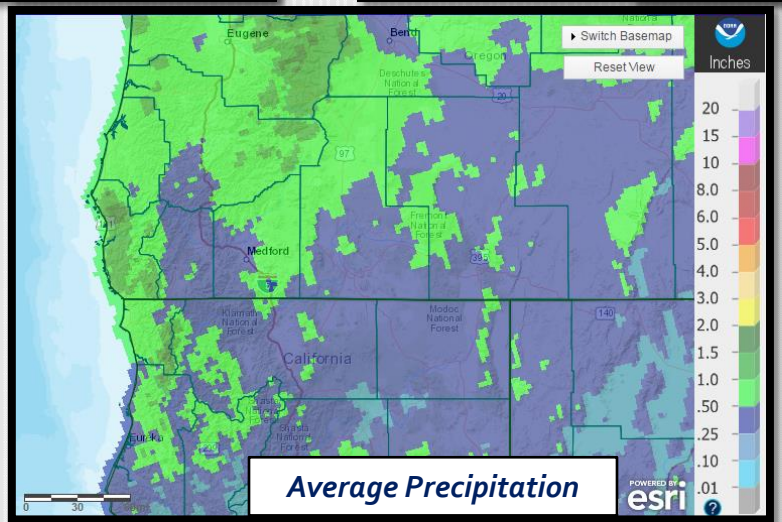


Looking Ahead: Normals for August (1981-2010)

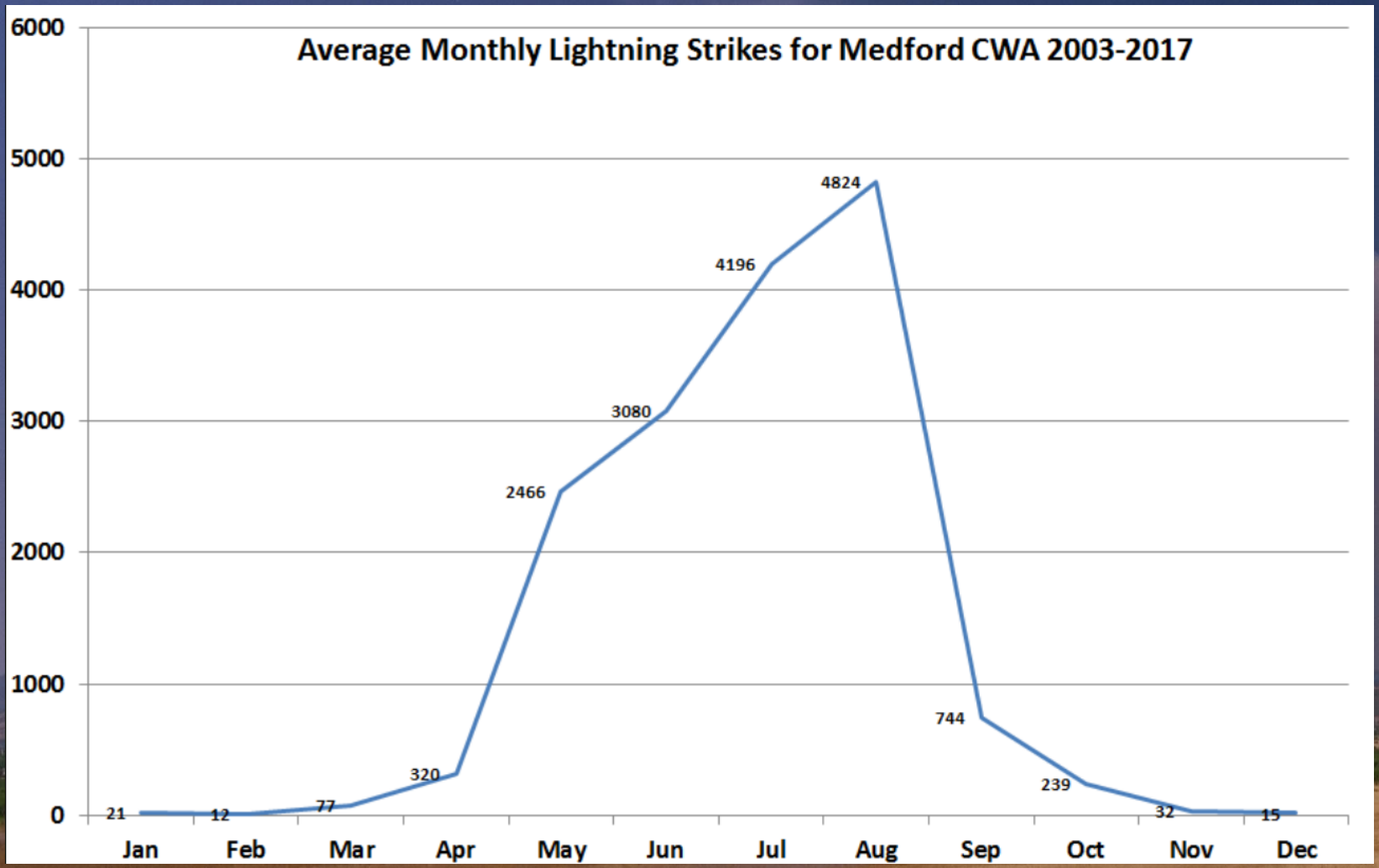
August is typically one of the two driest dry months across the forecast area, but is not as dry as July for areas west from the coastal mountain ranges westward. Lightning (see next slide) and fire activity usually peaks in August. High temperatures are typically at their warmest of the year, generally very similar to July's normals. Valley high temperatures are typically in the 80s to lower 90s. Average minimum temperatures are slightly cooler than those of July as nights become increasingly longer. Average minimum temperatures are mostly in the 40s for east side valleys, and in the 40s and 50s for west side valleys. Most of the forecast area usually receives an inch or less of precipitation. Exceptions include portions of the coastal mountain ranges and the higher terrain of eastern Douglas county.





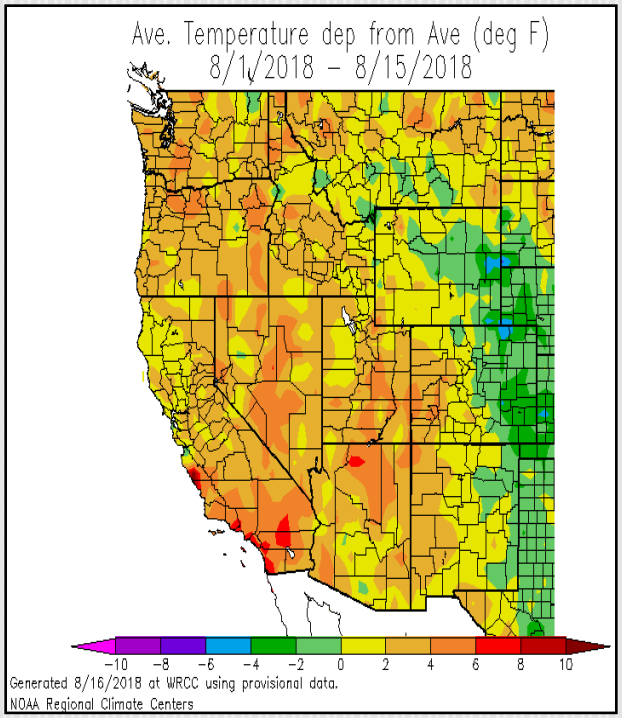


Average Cloud to Ground Strikes

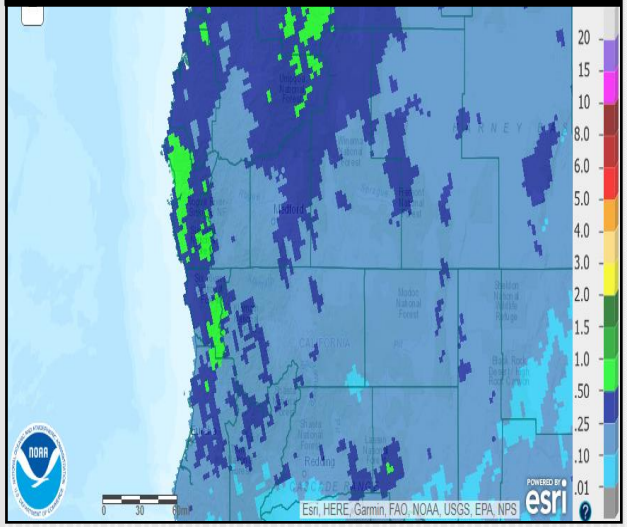


Observed Weather: August 1-15th, 2018

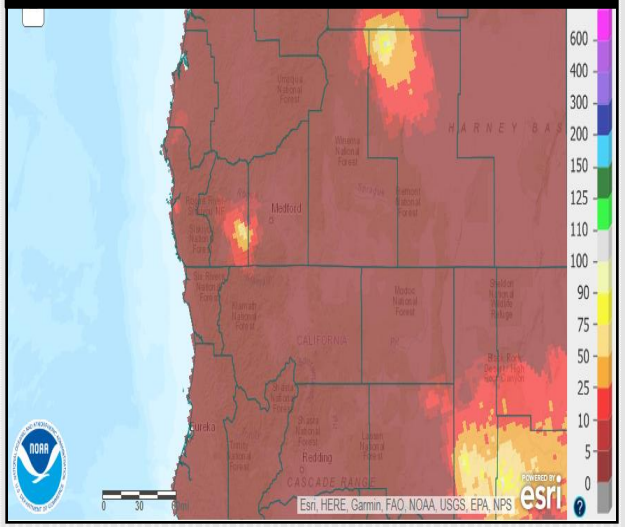
The first half of August has been warmer and drier than normal across the entire forecast area. Average temperatures (daily minimums and maximums averaged together) have been mostly 2-4 degrees Fahrenheit above normal, with some areas above and below that range. Normal precipitation, to date, is mostly in the 0.25" to 1.00" range for the coastal counties as well as for some of the areas along and over the Cascades and other higher mountains. Very little precipitation has occurred outside of marine layer drizzle (which is under-represented in these observed precipitation graphics). Widespread smoke at the surface and aloft has greatly limited convective showers and thunderstorms, thus far, this month by limiting surface heating and over-seeding clouds. Altogether, it has been warmer, drier, and smokier than normal as wildfires on the west side and in California burn. The Stone and Watson Creek fires, which began on August 15th east of the Cascades, are also contributors to the smoke now. There are also fires in Canada that have caused smoke aloft for us.



1981-2010 Normal Precipitation In Inches Aug 1st-15th

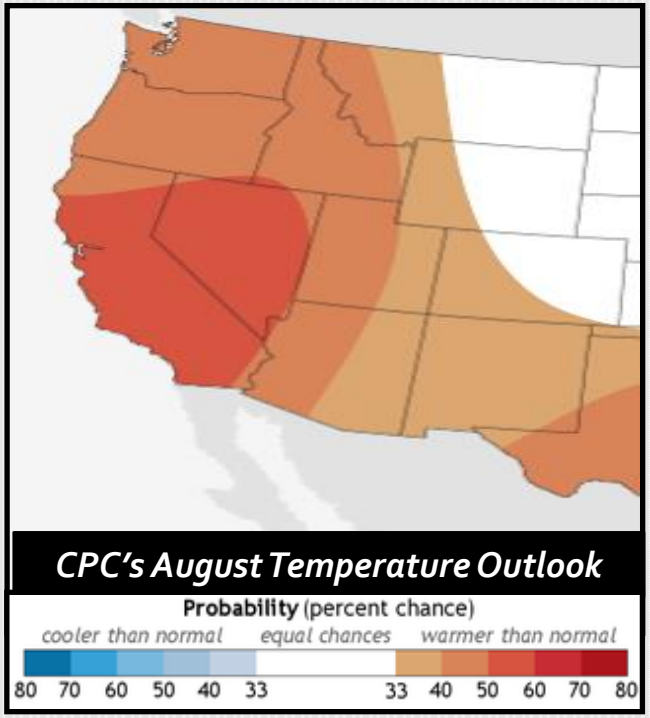


Observed Precipitation % of Normal



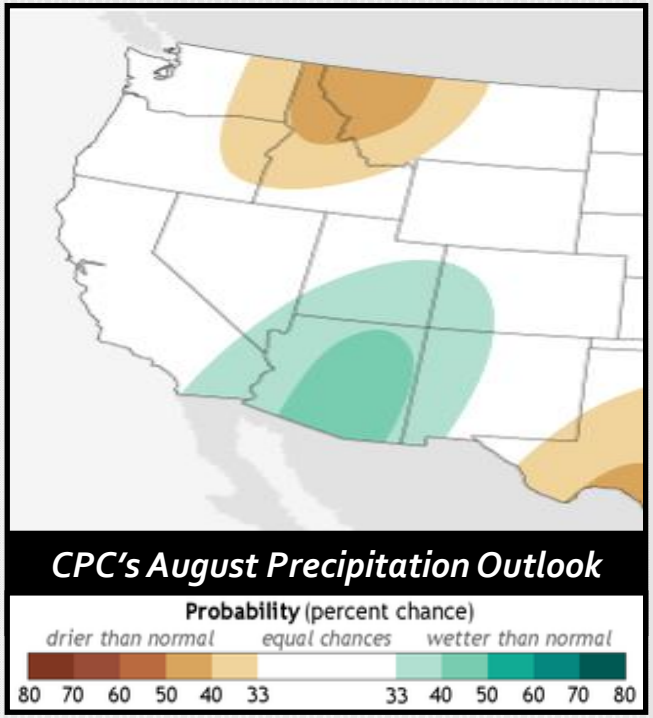
August 2018 Outlook

The official CPC forecast for August 2018 calls for substantially increased chances for warmer than normal temperatures and equal chances of at, below, and above normal precipitation. As of today, August 17th, the temperature forecast appears to be on track. Temperatures across the forecast area are likely to end the month between 3 and 6 degrees above normal. However, confidence is increasing that temperatures will gradually cool after about the 22nd, and then are likely to fall to below normal during the last week of the month, especially over the northwestern half of the area. This forecast is supported by troughing along the west coast shown by the GEFS. The CFSv2 and ECMWF indicate a slower/lesser downward trend in temperatures toward the end of the month. We have high confidence that precipitation will be below normal across the forecast area for the month of August, though there is a shower and thunderstorm threat from the 20th to the 23rd over Oregon, and a possibility of rain on the west side from a cold front/marine push from the 27th to the 31st.



Expected Impacts August 17th-31st, 2018:

Ongoing wildfires and related smoke are likely to impact the area, except Coos and most of Douglas counties through month's end. Additional lighting possible from the 20th-23rd could start more fires, increasing smoke impacts. Cooler weather and an increased marine influence the last week of the month should begin to diminish fire activity, but it will take wetting precipitation to bring an end to smoke impacts- which is not currently expected. Water shortages are expected in smaller snow melt influenced inland drainages.



*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 July 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 July 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*