

August – November 2023 South Ops Highlights

- Temperatures will likely average above normal through October then become near normal
- Monsoonal activity will be a little above normal in August and September and end later than normal
- Neither above nor below normal Santa Ana wind activity is favored at this time for Oct-Nov
- Large fire potential will continue to run below normal above 7,000'



Weather Discussion

Summer arrived in full force across California in July. After a long stretch of cooler than average months dating back to last year, the first significant heat of the season arrived right at the start of July. From there, other than a brief cooldown after the 4th of July holiday, persistently warmer than average temperatures continued for the entire remainder of the month (**Fig 1**). The large scale pattern became characterized by an anomalously strong ridge of high pressure which mainly fluctuated being centered between California, the Desert Southwest, and the Four Corners. The marine layer was near normal in depth early in the month, then became shallower than normal for most of the remainder of the month. However, it did keep weather persistently much colder within 15 miles of the coast, with near to below normal temperatures in most coastal areas in July.

The monsoon has been slow to start this season. In fact, there was little hint of it at all for California until the third week of the month. And while there were a couple surges of monsoonal moisture during the second half of the month, there was well below average shower and thunderstorm activity across the region (**Fig 2**). Winds in July followed typical patterns. There was little to no offshore flow and little in the way of windy conditions outside of typical breeziness through gaps, canyons, and desert passes during periods of stronger onshore gradients. While rapid snowmelt continued across the higher elevations in July, and most areas are snow free, there remains some snow cover present at elevations above 8000 to 9000 feet (**Fig 3**).

El Nino conditions remain present in the equatorial Pacific. While the pace of warming has slowed, the sea surface temperature profile of the Pacific resembles that of a classic El Nino event. However, waters in the subtropical and middle latitudes off the West Coast of North America remain mostly colder than average, which is typically not favored in El Nino. All indications are that El Nino conditions will continue into the winter and will probably strengthen a little more.

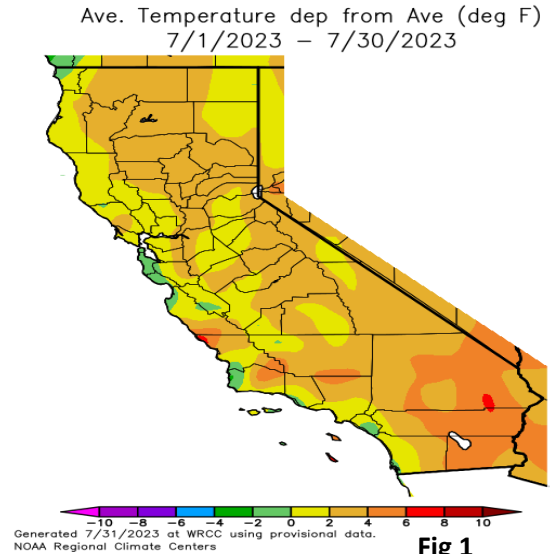


Fig 1

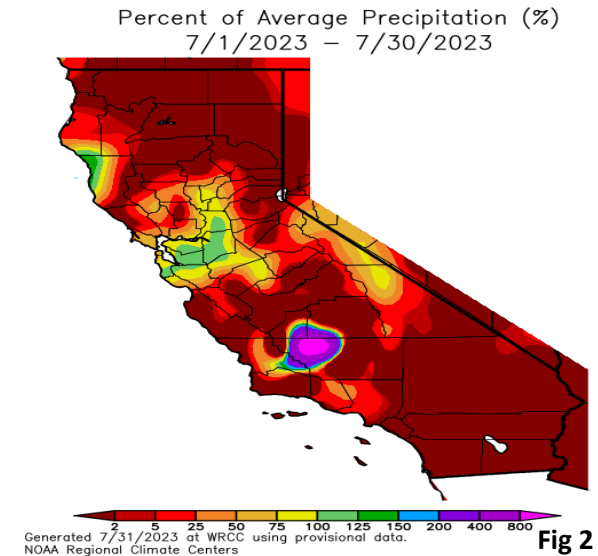


Fig 2

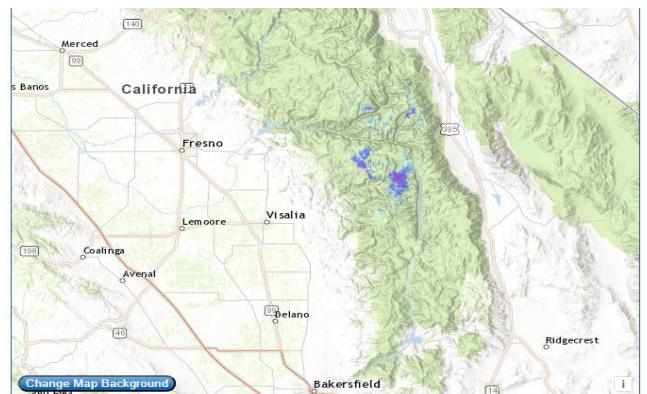


Fig 3



Fuels Discussion

Moderate (D1) drought expanded slightly across the region in July (Fig 4), with the increase concentrated over the high desert. However, the vast majority of California is not in a drought status.

The hot weather led to rapid drying of fuels in July. Below 3,000 to 4,000 feet, and away from the marine influence, the grass crop is now fully cured and had mostly cured by the middle of the month. Field reports continue to confirm that fine fuel loading is very heavy this year, a result of the past winter.

All classes of dead fuel moisture saw noticeable downward movement thanks to the hot weather in July. 100 hr and 1000 hr dead fuel moisture are now running near or drier than normal in most areas after being well above normal most of this year (Fig 5). ERC values have rocketed higher thanks to the hot weather and the drier fuels, and are now more in line with typical peak fire season values, on either side of the 90th percentile. However, live fuel factors continue to play a major role in fire behavior (Fig 6). Despite the much drier dead fuels and higher ERCs, moist live fuels continue to greatly limit fire activity at elevations above 3000 to 4000 feet where non-grass fuel types are dominant. Fire activity was below normal for most of the region in July, and what fires occurred were almost exclusively confined to light, flashy fuels. In an exception to the mostly below normal fire activity, the York Fire, which began on July 28, quickly became by far the largest fire in the geographic area this year, and will go down as one of the largest, if not the largest, desert fires the region has seen in recent memory.

Fuel drying will continue in August, although most fuel types will still run wetter than normal. With the grass fully cured, attention will be turning to shrub and brush species such as sage and chamise. Expect fuel moistures in these species to trend closer to normal due to the heat, but they will likely remain wetter than normal overall due to such a slow start to the drying season, and will reach critical/near critical levels later than normal this year. The most pronounced differences from normal conditions continue to be in higher elevations, above 7000 feet, where the winter's record snowpack continues to keep fuels and soils much wetter than normal.

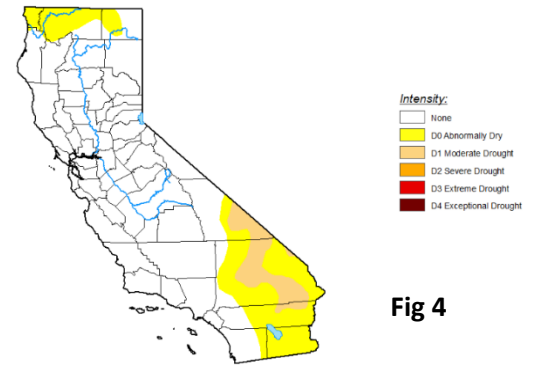


Fig 4

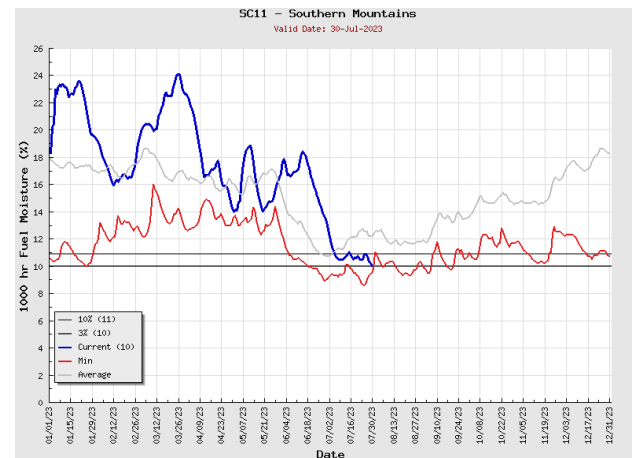


Fig 5

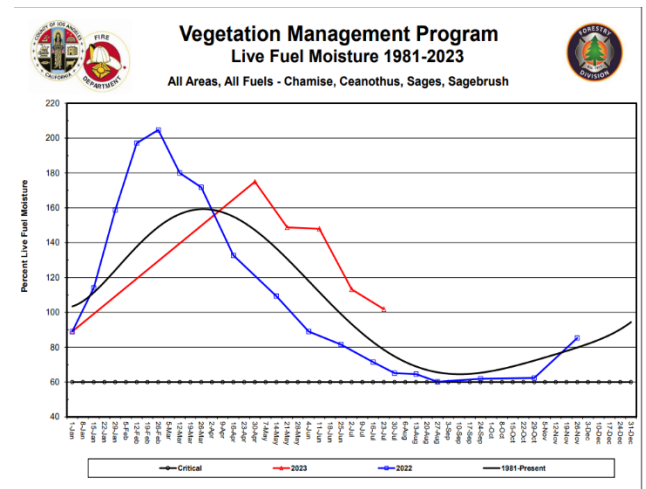


Fig 6

SOUTH OPS OUTLOOK

Climate models and the current SST profile (**Fig 7**) support a ridge-dominant pattern across the West in the coming months. However, the ridge center should trend more towards the Intermountain West and Four Corners in part due to lingering cold water off the West Coast. While it will be shallow, there should remain a persistent marine layer bringing much cooler weather within 15 miles of the coast through August, also due in part to those cold SSTs. As a whole, temperatures will likely run above normal the next few months due to the ridging, but not dramatically above normal. Expect an increase in monsoonal activity in August and continuing into September as the mean ridge center settles close to the Four Corners, bringing more southeast flow aloft. Thunderstorm activity, which has been well below normal so far, will likely be above normal in August and September, but not as active as in 2022. The monsoon will also likely continue later than normal, through most of September, as the seasons continue to show some lag compared to normal.

Lingering effects from winter will bring below normal fire activity at elevations above 7,000 feet through the summer. At lower elevations, the high fine fuel load and expectations of above normal temperatures will likely lead to near or a little above normal grass fire activity through the rest of the summer. Above normal live fuel moisture in shrubs will continue to limit fire behavior in grass-shrub types through much of August, but fuel moistures will trend towards critical values by late August. This should allow mid-elevation fire activity to increase by later August and September, at least to levels closer to normal. Because of below normal activity in timber-dominated fuels, resource demand will likely remain below average for the geographic area.

This time of year, a focus becomes expectations for the coming transitional season, including Santa Ana winds for Southern California. Currently, there are no strong indications on whether the timing or frequency of Santa Ana winds will differ notably compared to normal. With expectations for a later end to monsoon season and a ridge-dominated pattern across the Intermountain West, and with the general trend in recent months of a “seasonal lag”, this may tilt the odds towards Santa Ana winds arriving later than normal. But confidence is not high of that at this time. A wetter than normal winter remains likely, driven by El Nino (**Fig 8**). However, most modeling is favoring a more “back-loaded” winter with precipitation arriving later but still delivering a wetter than normal rainy season. Once again, this would follow the recent trend of lagging seasonal transitions. As always, balancing the competing arrivals of the winds and the rains will be vital in dictating this fall’s fire potential.

NOAA Coral Reef Watch Daily 5km SST Anomalies (v3.1) 23 Jul 2023

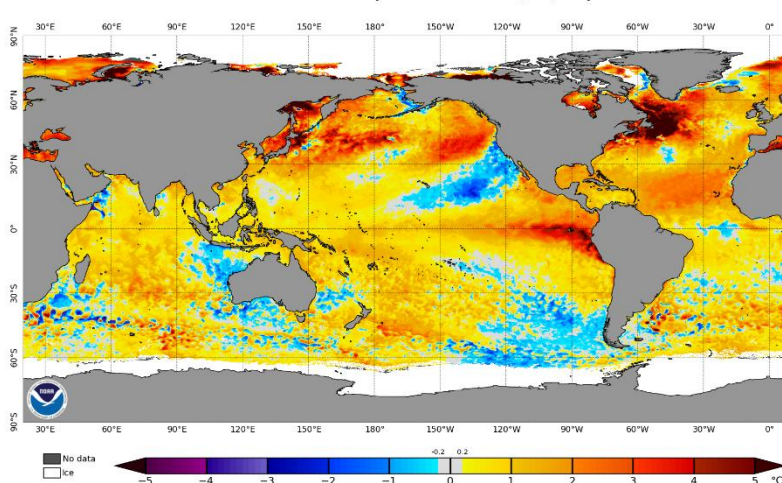


Fig 7

CFSv2 Sea Surface Temperature Anomaly (°C) (based on 1984-2009 Model Climatology)

Average of last 12 forecasts (12 runs x 1 members)

Init: 00z Jul 21 2023 through 18z Jul 23 2023 Valid for: Nov 2023

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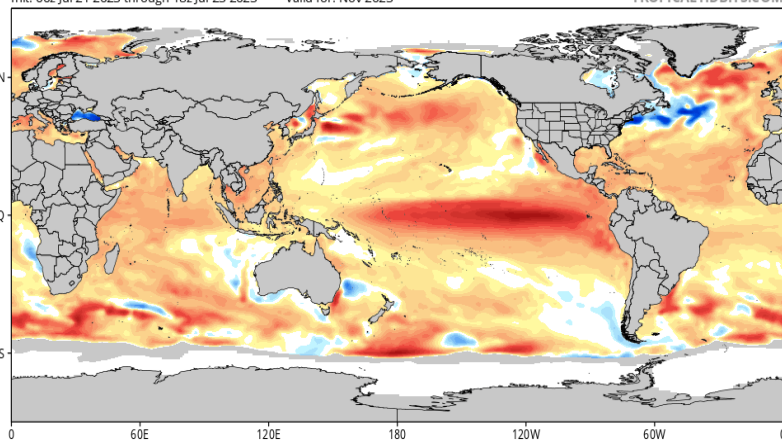


Fig 8



REFERENCES

Climate Maps: https://wrcc.dri.edu/anom/cal_anom.html

Snow depth: [CNRFC - California Nevada River Forecast Center \(noaa.gov\)](https://www.cnrfc.noaa.gov/)

Drought Monitor: <https://droughtmonitor.unl.edu/CurrentMap.aspx>

Fuel Moisture: <https://gacc.nifc.gov/oscc/fuelsFireDanger.php>

SSTs: <https://www.ospo.noaa.gov/Products/ocean/sst/anomaly/>