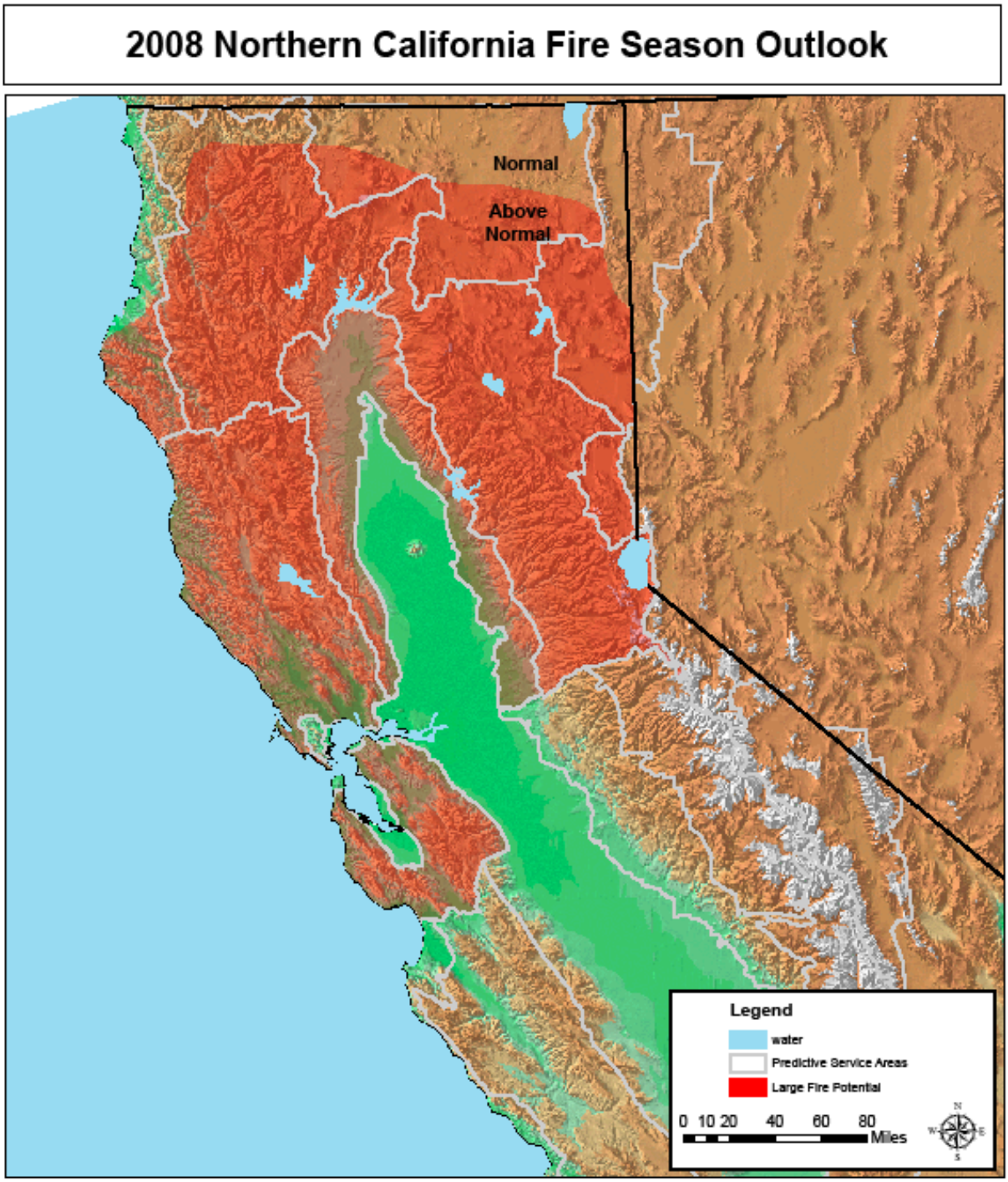
2008 California Fire Season Outlook

For July through October 2008 (issued 6/25/08)



North Ops Concerns and Implications for Management

- NOPS currently in a worsening drought, due to the driest spring on record in many areas
- 1000-hr dead fuel moistures are below to much-below normal for late June, especially below 4000' elevation
- We have high to record-setting ERC values; biggest anomalies at low to mid elevations
- Measured live woody fuel moistures are peaking at lower levels than average. As the season progresses, these fuels will fall into the critical range earlier than normal.
- Live woody vegetation is putting on less new growth in response to less available soil moisture.
- A longer than average fire season can be expected, due primarily to the early onset at lower elevations associated with the curing of annual grasses by mid May.
- A major widespread dry lightning event occurred June 20-21. This event alone will produce weeks to months of suppression efforts in the areas hit hardest. Other events this summer, should they occur, will exacerbate an already above normal season.
- Springtime was fairly windy, and due to the early fuel drying this made late May and June foehn events at low elevations more critical than usual. Any gradient wind events lingering into early summer will do the same.

I. EXECUTIVE SUMMARY:

This Assessment is an update from, and expands upon, the preliminary outlook produced in late April 2008. It should be considered the primary assessment of expected fire season severity for the remainder of the Northern California fire season. It will only be updated again if necessary. The Assessment is produced by subject matter experts in fire weather meteorology, climate, fuels, fire danger and GIS technology. It is based on past developments, current conditions, recent trends, and present predictions for the next four months (July through October).

Objectives of this Assessment are to:

- Provide a prognosis for the core of the 2008 wildland fire season in northern California, based on fuel conditions and available weather and climate forecasts.
- Highlight the key concerns and implications for management (see bullets above).
- Point out factors and conditions that could have direct bearing on firefighter safety.
- Provide supporting documentation regarding weather and fuels information.

This contents of this Assessment are consistent with that of a California Fuels and Fire Behavior Advisory issued just prior. This document is available as a link from the North Ops "Outlook" web page, as will be the region-wide document after combination with South Ops. In addition to Seasonal Assessments such as this one, the GACC Predictive Service Units at Riverside and Redding issue detailed Monthly Outlooks of fire weather and fire danger.

II. REVIEW OF NORTH OPS 2008 FIRE SEASON TO DATE:

The fire season got off to an early and active start at elevations below 3000'. This has been most evident to date in the above-average acreage burned in the Sacramento Valley / Foothills PSA, in the Bay Area PSA, and in portions of the Mid Coast to Mendocino PSA. Most of the large fires prior to the June 20-21 lightning bust, occurred during foehn wind events (i.e. those with dry North to NE winds directed downslope). We have seen several of these foehn wind events reach the moderate or stronger wind speed category. Also, the 2008 spring season has in general been a

breezy one across much of northern CA, not just the lower elevations. This has been mainly due to being in the proximity of a West to NW jet stream stretching from the north Pacific to the central Great Basin, a path which crosses the northern quarter of CA.

After a dry late-February to April period, it was expected that May would receive closer to normal precipitation, but this did not occur in a significant portion of northern CA. What had been a promising mountain snow pack through early February quickly became a dwindling one by the start of June. This was primarily due to the lowest March through May total precipitation since record-keeping began, in many north state locations. The late winter to spring dryness, in addition to causing early curing of low elevation annual grasses, also led to generally lower than normal peak values in springtime live fuel moistures, another contributing factor to the early and active fire season at lower elevations.

With the extended dry period this spring, 1000 hr fuels were consumed during early season prescribed burning. Some planned ignitions were canceled due to overly dry conditions at the lower elevations. Wildland fires at lower elevations have exhibited fuel driven runs even in the absence of alignment with wind and/or topography. Potential for large fires will continue in lower elevations, but will also progress into higher elevations during July. Except in the counties bordering Oregon, where the winter was wet, our large dead fuel moistures below 5000 feet are currently below or much below normal for the date. Energy Release Component (ERC) values are ranging from above normal to record highs for the date (see **Figure 1**). As always, it is recognized that even a single significant lightning episode can quickly cause any fire season to become critical. Such an event this year would most likely put us into a 90th percentile type of season.

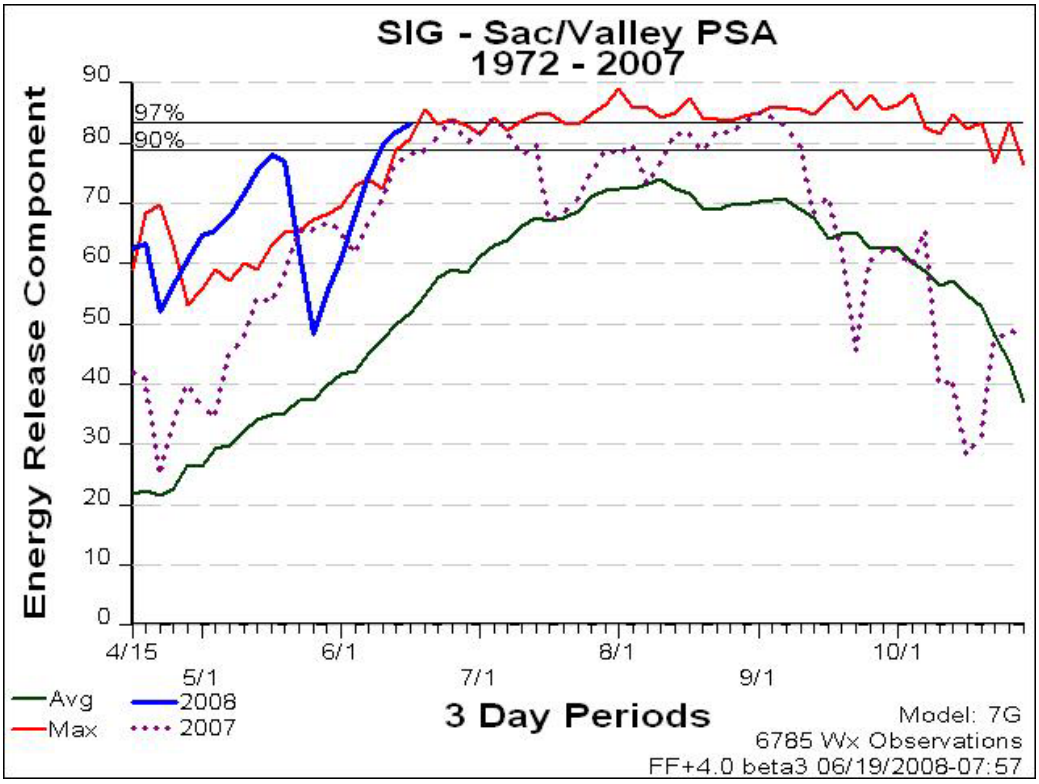


Figure 1, Energy Release Component for Sacramento Valley PSA

III. Present (late-June) weather, and the July through October NOPS Weather Forecast:

As stated above, North Ops heads into the core of fire season 2008 having had unprecedented dryness for March through mid-June. **Figure 2** shows that California has been, by far, the driest portion of the country compared to normal this spring. The Redding March to May 2008 precipitation total of just 1.08" was only about half as much as in the next driest year seen in 100+ years of rainfall records. **Figure 3** shows the latest Drought Monitor map, which depicts much-increased California drought coverage compared to just 3-4 months ago. The same storm track that kept much of the Pacific NW wetter than normal this spring, produced an above-normal frequency of drier West to North wind events to areas just south of it, i.e. across northern CA. The La Nina event (cold Pacific ocean water) of this past winter continues to steadily decline.

NOTE - The magnitude and scope of the major dry lightning event of June 20-21 was not foreseen by meteorologists. Most events under southwesterly upper flow have only minimal North Ops lightning, with the counties bordering Oregon an occasional exception. Weather maps didn't reveal the typical precursors for a major event in this case, and did not indicate the level of instability that would occur. However, the resulting 950+ wildland fires will now be a major player in what appears to be a very busy and possibly lengthy fire season across northern CA.

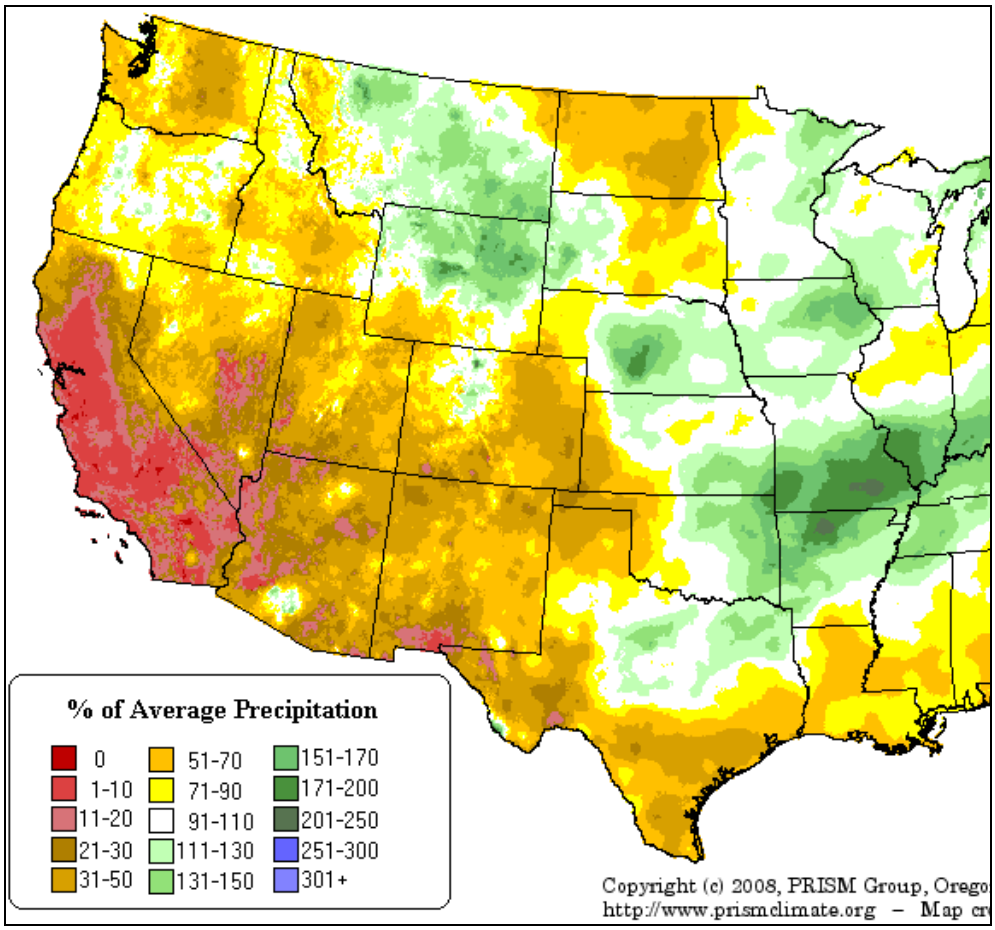


Figure 2, March to May 2008 Percent of Normal Precipitation

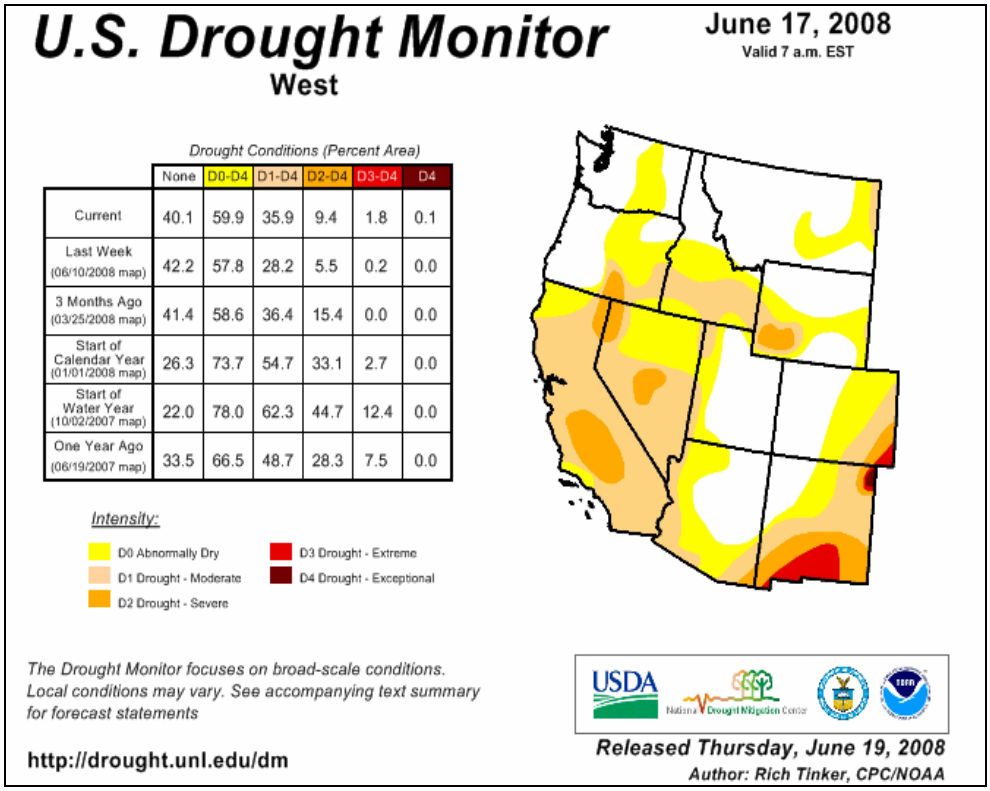


Figure 3, Drought Monitor map

Temperature forecast guidance from the Climate Prediction Center of NOAA, for both July to September and August to October, is shown in **Figure 4.** The thinking here is that overall, northern CA will probably average a little warmer than indicated by this CPC guidance, at least for the inland areas. [Note: Even if July and/or August do end up having slightly 'below normal' temperatures, in our hot summertime climate those are still temperatures supporting higher, not lower, fire potential. For example, from July 13 to Aug. 7th, daily maximum temps of 98º F in Redding would technically be 'below normal'].

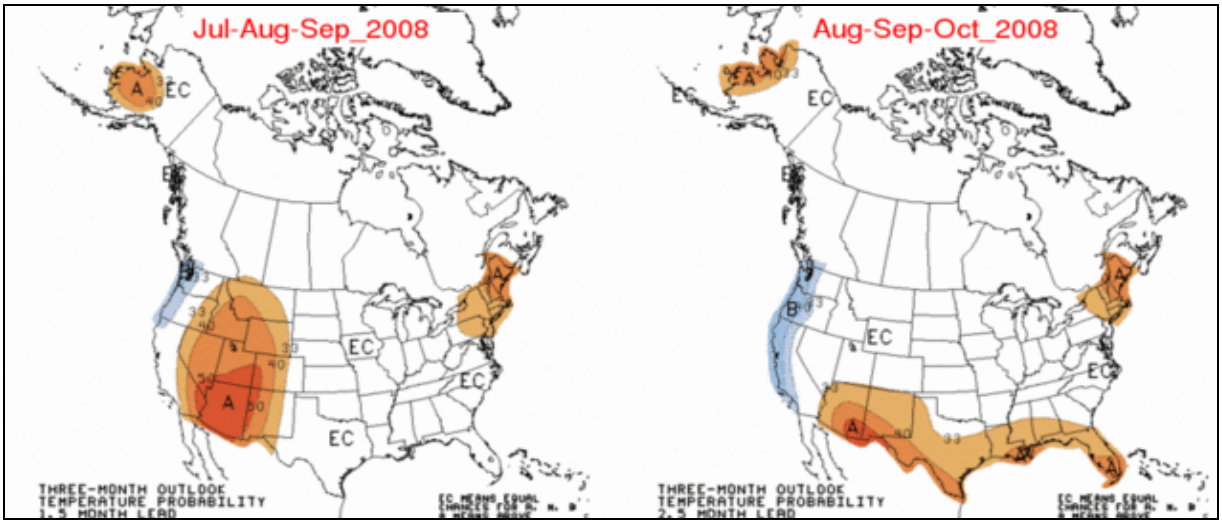


Figure 4: NOAA / CPC Temperature anomaly forecasts

Figure 5 shows **Precipitation** forecast guidance from the CPC, for July to September and August to October. See **Table 1** for representative NOPS summer normals. **Table 2** shows this Assessment's temperature and precipitation anomaly forecasts for North Ops, July - October.

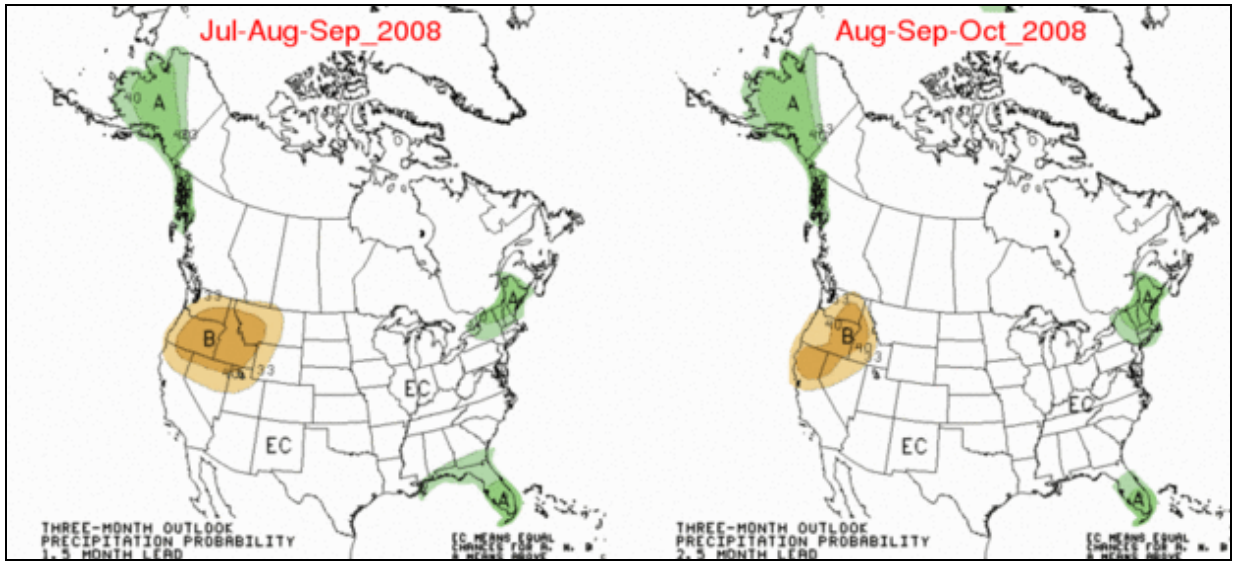


Figure 5: NOAA / CPC Precipitation anomaly forecasts

	July Normals		August Normals		Sept Normals		October Normals	
LOCATION	Precip	Max Temps	Precip	Max Temps	Precip	Max Temps	Precip	Max Temps
Yreka	.44	91º	.56	90º	.62	82º	1.24	70º
Eureka	.16	63º	.38	64º	.86	64º	2.36	61º
Susanville	.25	89º	.16	88º	.38	80º	1.04	67º
Redding	.05	99º	.22	97º	.48	90º	2.18	78º
Ukiah	.04	93º	.09	92º	.43	87º	1.85	78º
Sacramento	.05	93º	.07	92º	.37	87º	1.08	78º
Quincy	.18	91º	.30	90º	.72	84º	2.59	73º
Livermore	.02	90º	.05	89º	.16	86º	.71	78º

Table 1, Representative NOPS normals

MONTH in 2008	TEMPERATURE Departures from Normal (DFN)	PRECIPITATION Percent-of-Normal (PON)
July	-1.5 to + 1.0º F	For the 3 months as a whole, varying from 40% to 95% around North Ops
August	- 0.5 to +1.5º F	
September	+0.5 to +2.0º F	
October	- 0.5 to +1.5º F	60-105%

Table 2, NOPS Predictions for 2008

Forecaster Confidence for above = Temperatures 55%, Precipitation 60%

An early June conference call among southwest U.S. monsoon experts called for a most likely scenario of a 'normal' location for the primary summer monsoon moisture influx this year. There was thought that timing-wise, the monsoon might start a little earlier than average, perhaps in late June. If the monsoon does track in the most-typical location, then northern CA will see variations during July and August ranging from periods with near-zero monsoon moisture, to several 1-4 day periods in which the eastern half of NOPS is under the western flank or fringes of the monsoon stream moving NW or North. Our most widespread and/or critical lightning events often occur in late July or August, and we have no reason to deviate from that in this 2008 forecast.

Regarding wind patterns, the early part of July might continue a little breezier than average, perhaps with one final near-moderate foehn wind event. Otherwise we expect fairly normal winds through the months of July and August, favoring local terrain driven breezes in the warm to hot interior, and sea breezes west of the coast range crest and through the Sacramento Delta. When significant foehn events begin to return in September or early October (as is typical) we can expect **lower elevation PSAs to have a secondary maximum in potential for wind driven large fires.**

Fuels Discussion: The season started early this year, with the dry conditions causing annual grasses to cure earlier than normal at the lower elevations. The NDVI greenness imagery from satellite data portrays this well: an image from this spring is shown in **Figure 6**. As can be seen in this Departure-from-Average image, the yellow to orange colors in the Sacramento Valley down through the Mid Coast and Bay area, indicate lower than normal plant greenness in these areas.

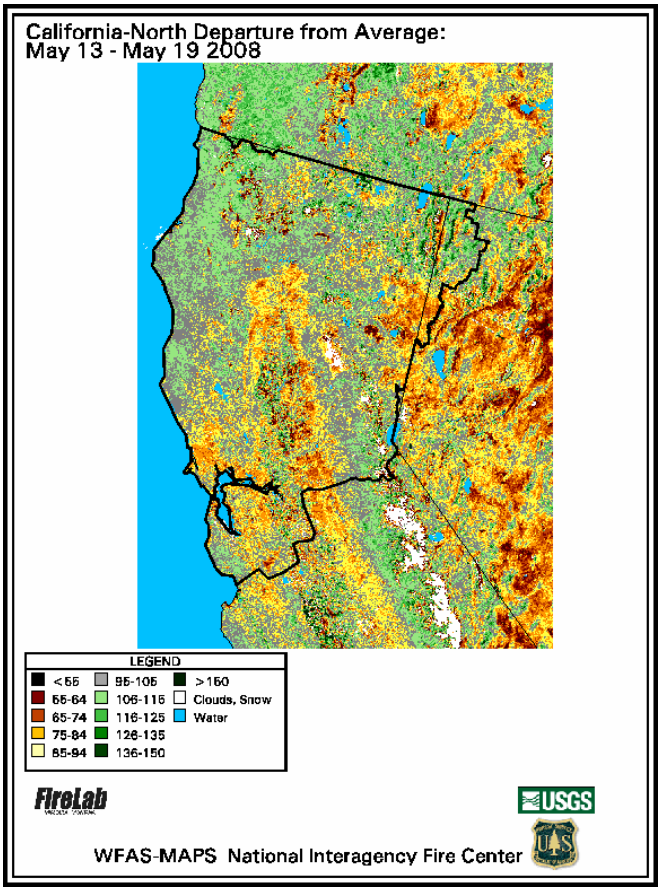


Figure 6: NDVI – Greeness Departure from Average

Measured live woody fuels are indicating a trend towards lower peak live moisture values as the plants go through the green-up process this season. As these plants peak at lower values, they will fall to critical moisture values earlier in the year than normal. The woody plant species are not putting on the normal amount of new growth. With a lack of lush new growth in the live vegetation to retard fire behavior, these fuels should contribute to fire spread due to the change in live to dead fuel ratios. We expect this trend to extend from the lower elevations where it has already been observed, to the higher elevations as we move into July.

Observed fire behavior includes consumption of 1000 and 100 hour fuels, fuel driven spread, active night time burning, spotting well ahead of the main fire, and group torching.

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