

# Southern California Seasonal Fire Weather/ Fire Danger Outlook

July 1, 2004



## Executive Summary

This report was initially prepared and issued in early April and was based mainly on the work done at the National Seasonal Assessment Workshop held March 30 - April 2, 2004 in Phoenix, Arizona. This workshop brought together experts in the field of climatology, meteorology, fuels and fire danger.

This July update looks at the weather and fuel conditions since April, along with updated weather projections for the remainder of the summer.

The objective of this report is to assess the factors that will affect wildland fire potential in Southern California during the 2004 wildland fire season. The assessment is based on past developments, current conditions, trends and predictions for the next several months. It provides information and recommendations that can improve preparedness for wildland fire management agencies.

The specific objectives of this report are to:

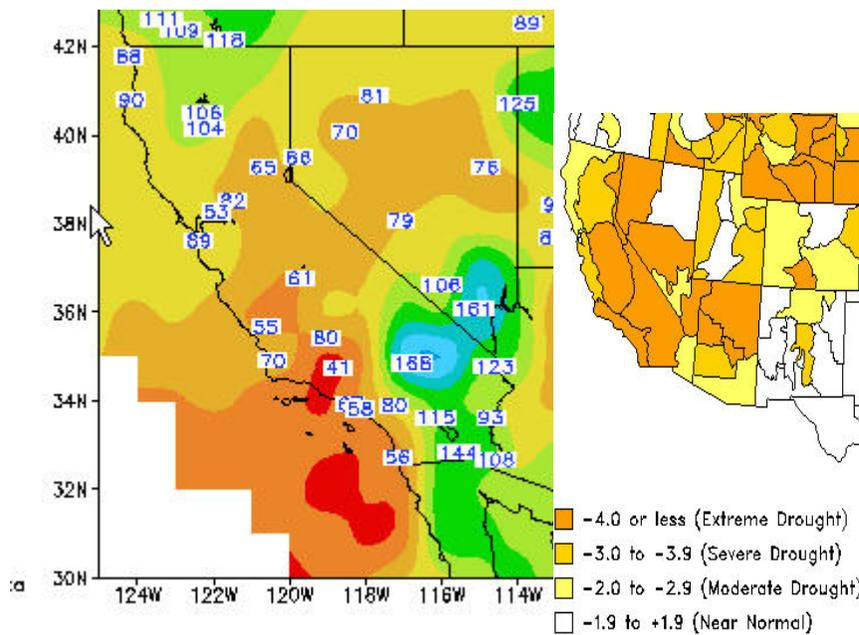
- State current fire weather and fuel conditions.
- Develop fire weather predictions for the remainder of the summer.
- Develop a statement of probable fuel conditions for the summer, and identify areas of concern for fuel conditions across the area.
- Develop a prognosis of the wildland fire potential based on available fire weather and fuel predictions.
- Provide a general statement on resource availability for wildland fire agencies.

For the summer period, we can expect a continuation of near normal temperatures in the coastal vicinity, while interior portions of the state will likely experience higher than normal temperatures. Precipitation for this period is anticipated to be near normal, but it should be noted that average rainfall during the summer for much of the state is insignificant. Confidence factor in these weather forecasts remain about 60%.

The potential for continuing near-normal precipitation, bark beetle attack on conifers and meteorological events have produced several areas of concern in the State. In Southern California, an extensive area of brush dieback and dead/dying timber exists. Mortality in stands of timber and brush will continue to contribute to extreme fire behavior even with moderate fire weather / fire danger conditions.

## Weather Conditions

Precipitation during the past 9-months (October 1, 2003 through June 30, 2004) was about 60 to 80 percent of normal across southern and central California, excluding the southern and eastern deserts (Fig. 1). This is the fifth year in a row in which most of the southern half of the state has experienced below normal precipitation. Long-term drought conditions continue to persist across the southern portions of the state. See the Palmer Drought Index in Fig. 2.



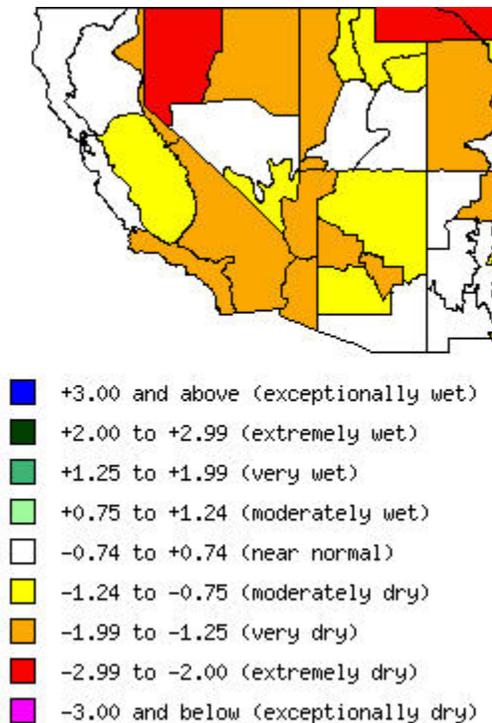
**Fig. 1**

**Fig. 2**

The dry weather pattern continued over the northern portions of the area from April through June. The southern areas had near to a little above normal precipitation in April, and then below normal precipitation in May and June. Temperatures for April through June were generally above normal throughout much of the area. June started off very warm with temperatures well above normal. However, after about the first week, a series of troughs moving through brought stronger onshore flow and the cooling effects of the marine air well inland. Over the last few weeks of June, temperatures averaged below normal over much of the area. However, in the higher elevations, above the marine layer, temperatures remained near to only slightly below normal.

## Fuel Conditions

The 1000-hour fuel moistures at severity weather stations throughout most of the Geographic Area are approaching record low levels. These levels are indicative of the long-term drought throughout the area. The 60-month Standardized Precipitation Index (SPI) chart through the end of June 2004 is shown in **Fig. 3**. Moderately dry to very dry conditions exist over all areas, except along the central coast where conditions are near normal. These long-term drought conditions have caused widespread stress in both timber and brush species throughout the Southern Sierras and most areas to the south. This stress is manifested in low foliar moisture resulting in more available fuel for combustion and fire spread. Drought stress on the vegetation has resulted in varying and extensive brush and timber mortality throughout the Angeles, Cleveland, San Bernardino, and Sequoia National Forests and surrounding state and local responsibility areas. Much of the forested area in southern California has been significantly altered from its historic fire return interval and absence of other management options, leading to over-densification and heavy fuel loading with the potential for stand-replacing fires and ecotype conversion.



**Fig. 3**

The combination of drought and resulting heavy fuel loads have contributed significantly to large fire occurrence in the past four years. Cumulative drought produced extreme dryness in dense vegetation resulting in extreme fire growth. Moderate winds exacerbated the fire behavior leading to unprecedented rates of spread. Fuel conditions have not changed significantly for the upcoming fire season, and current conditions in most areas are generally worse than at this time last year.

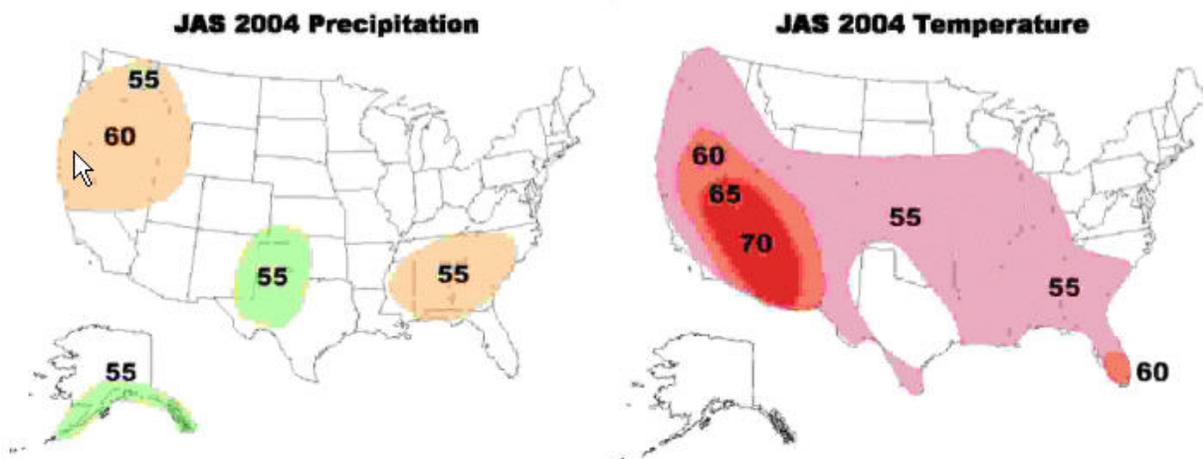
Winter precipitation produced a moderate grass crop, but not to the degree we saw last year. The well-above normal temperatures in March led to an early then normal curing of fine fuels. Based on the past weather and fuel conditions described above and the weather and fuel conditions expected this summer which are discussed below, the expected areas of above normal fire potential this summer are shown in **Fig. 4**.



**Fig 4.**

## Climate and Weather Outlook July through September

Although we have experienced lower than normal temperatures and higher than normal humidity between mid and late June, it has not had much affect on the dryness of the heavier fuels, or the fuels in elevations above the influence of the marine layer. The hot, upper high over the Desert Southwest and northern Mexico usually expands west and north during July, and becomes the dominate weather feature through August and much of September. This is expected to be the case this year, beginning around the second week of July. The Consensus Forecasts for temperatures and precipitation were developed back in late March at the National Seasonal Assessment Workshop for July-August-September (JAS). These were produced by a group of expert climatologists from both the federal government and climate research community. The Southern California weather narratives contained in this document do not significantly deviate from any of the consensus forecast graphics shown in **Fig. 5**. These two charts were considered to be the best available longer-range guidance at the National Seasonal Assessment Workshop, and subsequent climatological forecasts from numerous sources indicate that these earlier forecasts are still valid.



**Fig. 5**

**The color-coding in Fig. 4 is as follows:** For the precipitation graphic, numbers in green areas indicate percent chance of above normal, while numbers in brown areas indicate percent chance of below normal. For the temperature graphic, numbers in the pink to red indicate percent chance of above normal.

As we move into July and August, one of the most significant factors contributing to wildland fire ignitions will be the amount of thunderstorm activity present. Consensus forecasts from climatologists suggest that there is a large degree of uncertainty as to the placement, amount, and duration of monsoonal moisture over the southwest United States that may produce these thunderstorms. During a normal summer, southern and central California experiences at least several episodes (3 to 5 days) of thunderstorm activity. We would expect this summer to average around near normal in terms of the amount of thunderstorm activity. Forecasting whether thunderstorms will be wet or dry,

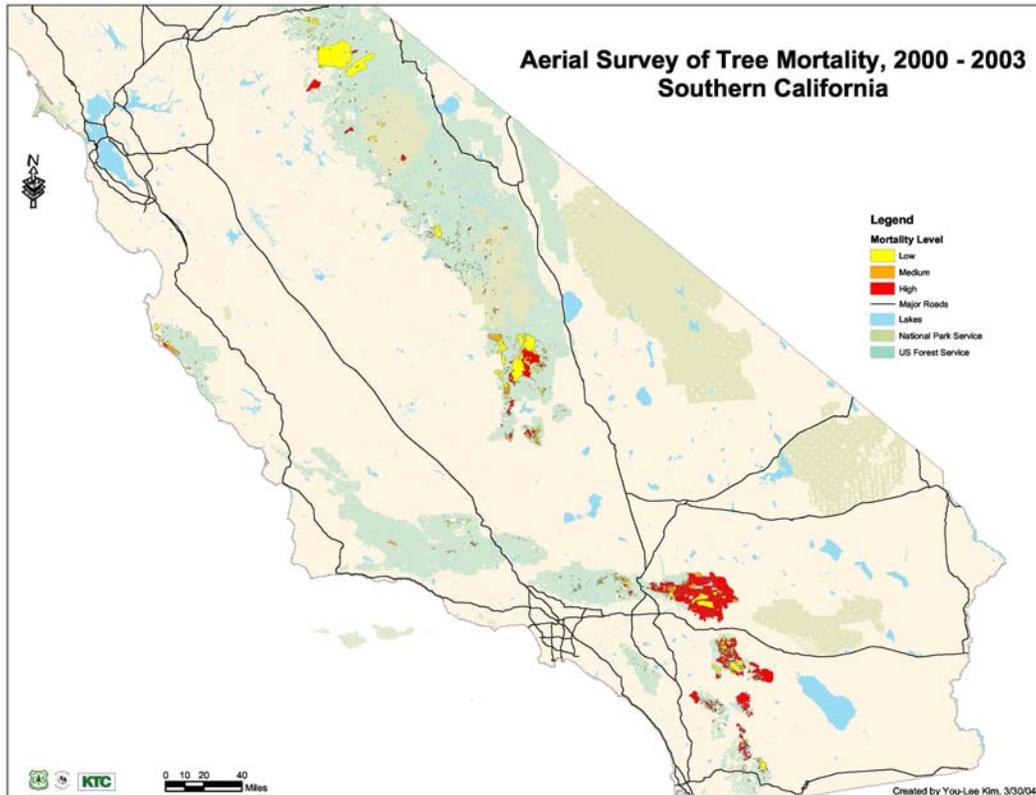
can only be done within 12 to 24 hours or less of the event, and is beyond the scope of this report.

Temperatures over the region are expected to average near normal over the coastal areas with continued above normal conditions across the inland areas. Very little rainfall usually occurs during this period and we don't anticipate any significant increase in rainfall activity other than what we would normally experience. As mentioned previously, even normal rainfall amount is minimal throughout the area at this time of year.

### **Fuels Outlook**

There are three primary factors that raise the fire potential for this season to above normal levels over most of the area, including expected above normal temperatures, long-term drought stress on the vegetation, and widespread brush and timber mortality.

The most critical areas are those experiencing brush die-back and tree mortality in urban interface areas in and around the four southern Forests (**Fig. 6**). Timber mortality continues to spread, notably in high-density urban interface areas. Existing fuel conditions in these areas indicate abnormally high resistance to control and the potential for high rates of spread. These conditions are likely to persist or increase throughout the summer and fall months. Many of these mountain and foothill communities have significant populations and limited means of egress, and firefighting efforts in these communities will be difficult and dangerous as demonstrated by the destructive fires in October of 2003. These fires burned over 720,000 acres in ten days, with the majority of acres burning in brush. However, most areas that are currently affected by timber and brush mortality did not burn. These heavily populated areas also bring increased potential for human-caused wildfires.



**Fig. 6**

### **Fire Occurrence and Resource Outlooks**

Given the current conditions and predicted fire weather in Operations Southern California (OSC), fire occurrence will most likely be higher than normal for the 2004 fire season. Historically, Incident Management Team (IMT) deployments have occurred throughout the year, although they are most likely between April and November. The months of July and September typically result in two or more IMT deployments in the area at the same time. August historically results in three or more incident management teams activated at the same time. This is also true for Operations Northern California (ONC) during August, creating competition for resources. Although large fire activity typically decreases in late fall, the potential for Santa Ana winds remains through the fall and winter months and can result in significant, complex events with large resource demands.

### **Federal Suppression Resources**

In general, numbers of fire suppression resources (engines and crews) in California for the 2004 fire season will be equivalent to 2003. The loss of federal air tankers this year will be offset by an increase in the number of helicopters contracted for exclusive use. Increases in resource numbers may be accomplished through severity funding, as

necessary. Federal resources will be at full strength by approximately the first of July. California has five Type 1 and six Type 2 federal Incident Management Teams.

### **State Suppression Resources**

California Department of Forestry and Fire Protection fire engine, helicopter and air tanker levels are expected to be similar to 2003. Type I fire crews available in Southern California have decreased from 104 to 95 with the loss of two camps. CDF has 10 Incident Management Teams available.

### **Future Scenarios and Probabilities**

The only time longer-range precipitation forecasting becomes easier in California is when a strong El Nino or La Nina pattern is in place. This is not the case this year, so confidence in the weather forecasts contained herein do not exceed 60% for this time frame. Forecast confidence is relatively low in the spring months due to the problems weather models normally have with the changeable, high-amplitude upper level wind patterns that exist. Forecast confidence stays fairly low in the summer months due to the fact that models do not perform as well during the summer, because our upper airflow is far removed from the jet stream. So, the trend of the longer-range precipitation forecasts that was shown in **(Fig. 5)** toward climatology is mainly a concession to the lack of dependable tools and proven skill in these forecasts. With these forecasts not deviating too far from normal, it isn't easy at this time to offer other alternatives or scenarios that are significantly different, and yet realistic.

### **Management Implications and Concerns**

- Strategic reviews of both GACC's, and of CDF units during 2003 Fire Season show the need to better manage drawdown levels for all resources. Movement of resources outside of the GACC's / Regions will be monitored closely.
- The Southern California fire reviews indicated that only 7% of national shared resources were available during the fall fire season. This resulted in reduced suppression capability and contributed to large fire costs.
- Due to financial constraints CDF will staff lookouts only when predicted weather and fire danger reach critical thresholds.
- Due to financial constraints BLM will have 5-day effective staffing on engines in the Bakersfield and Owens Valley Districts, but 7-day staffing will commence in July in the California Desert District.
- Modification of resource drawdown levels to compensate for lack of air tanker and lead plane availability.

- Aircraft from the military and private industry may not be as readily available to support large fires due to military deployment.

## **Final Summary of Expected Summer Weather and Fuel Conditions**

### **Weather**

The current expectations are that temperatures across the area will average above normal, with the only exception being near to possibly slightly below normal along the coastal areas. Precipitation is expected to be near normal, but realizing, as stated earlier, that “normal” in all areas is minimal.

### **Fuels**

Even after a relatively cool mid to late June weather condition, fuels in most areas are drier than they were at this time last year. Even normal July and August heat will send fuel dryness to record levels. The drought is an ongoing process for fuel conditions. It is important to note that in many areas we broke dry fuel condition records in 2001, and then broke the 2001 records in 2002 and those of 2002 in 2003. We should expect this trend to continue this fire season.

### **Concerns**

It will take a lot of precipitation over a number of consecutive years to reverse this drying trend in fuels. The most critical element with respect to fire potential for the northern areas (mainly the mountains) is dry lightning activity. This should be closely monitored using the fire weather forecast products between mid July and Mid October. The most critical element with respect to fire potential for the southern areas is the Santa Ana wind events. This should be closely monitored using the fire weather forecast products between mid September and a fire season ending precipitation event.

### **Team Members**

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