

FIRE ENVIRONMENT

LOCATION:

The Valley Fire footprint was within Sonoma, Lake and Napa Counties.

The Valley Fire would encompass parts of eight USGS Quadrangle maps. Identifying landmarks within those maps, beginning west and working clockwise: Burned Mountain, Geysers Rock, Pine Grove, Glenbrook, Adams, Ettawa Springs, Seigler Springs, Wildcat Canyon, Childers Peak, Cockerell Canyon, Coyote Valley, Hidden Valley Lake, Hells Half Acre, Jim Davis Peak, Goat Hill, Butts Canyon, Snelly Peak, Mcguire Peak, Collayomi Valley, Dog Rock, Buck Rock, Wardlow Rock and Mayacamas Mountains.

Prominent drainages and valleys include the Big Canyon Creek, Putah Creek, Long Valley and Butts Canyon.

Utilizing GPS technology, a perimeter shape file of the Valley Fire was entered into a mapping software program (ARCMAP). Based on the National Fire Danger Rating System grouping of slope, the Valley Fire had 92% within class 1 (0 – 25%), 7% within class 2 (26 – 40%) and <1% within class 3 (41 – 55%).

WEATHER:

The climate around the Middletown area during September is characterized as a semi-arid region. As with much of northern California, little rainfall is observed during the summer months following normally moist winters. This area experienced an unusually dry winter and spring, which compounded consecutive years of below average precipitation. This has pushed the region into severe to extreme drought conditions and the U.S. Drought Monitor classified the Valley Incident area as being in severe drought on September 15, 2015.

The weather leading up to September 12, 2015 in the Middletown area was warm and dry. The Konocoti RAWS is the nearest weather observation to the point of origin of the fire (Figure 1). The orange line in both Figure 1 and Figure 2 is the estimated time of ignition. The day before ignition the high temperature exceeded 100° F and the RH was in the single digits. The humidity recovery overnight was very poor the previous four nights with a maximum observation of 26%. For the eight hours following ignition the RAWS reported relative humidity below 25% and wind gusts in excess of 25 mph. The wind gust of 36 mph observed at 1757 PDT was the strongest gust in the month of September reported by the Konocoti RAWS in the past 13 years (data courtesy of mesowest.org).

Dr. Neil Lareau from San Jose State University noted that the remnant moisture of Hurricane Linda likely contributed to the strong winds associated with the growth of the fire on September 12, 2015. Two things contributed to an increase in wind over the fire: rain falling and evaporating before it reached the ground (virga) increased the surface pressure gradient over the fire which resulted in stronger winds and outflow winds from the virga. (Lareau, <http://www.fireweather.org/blog/2015/9/15/did-tropical-moisture-contribute-to-the-valley-fire-blow-up>, Note: reference of Kayesville RAWS in Dr. Lareau's post is likely the Konocoti RAWS)

The rainfall observed on September 16, 2015 accumulated more than a half inch of rain over much of the fire and is considered an anomaly for September. Most late summer and early fall rainfall events result in less than 0.5" of precipitation in a day prior to October when heavier rainfall events become more likely.

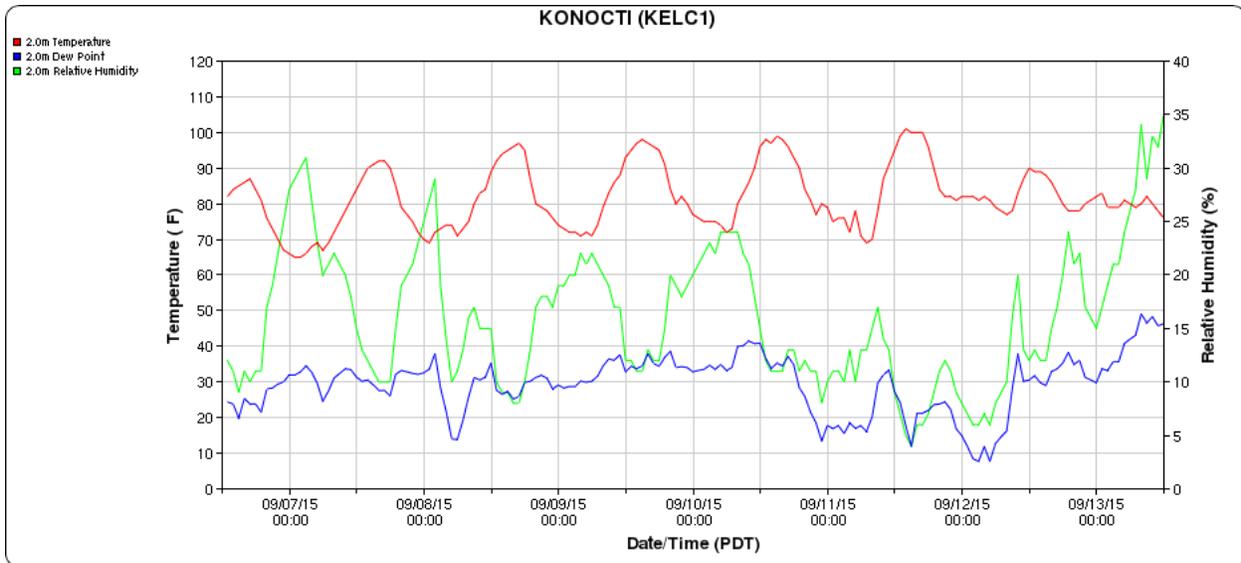


Figure 1. Konocti RAWS Temperature (F), Dew Point (F), and Relative Humidity (%) for 9/06/15 1200 to 9/13/15 1200 PDT. The orange line is the estimated time of ignition. Graphic courtesy of mesowest.utah.edu.

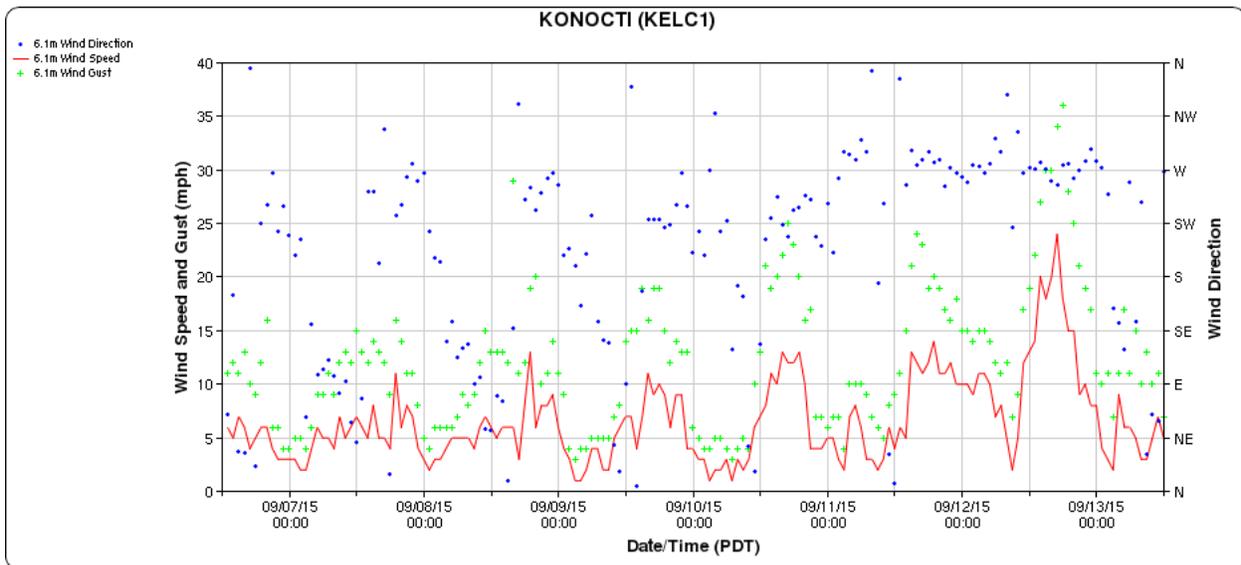


Figure 2. Konocti RAWS Wind Speed, Wind Gust, and Wind Direction for 9/11/15 1200 to 9/13/15 1200 PDT. The orange line is the estimated time of ignition.

FUELS

Fuels at the incident were a mix of Shrub 35%, Grass 22%, Grass Shrub 16%, Timber Understory 13%, Timber litter 10% and other 4%. The area is also integrated within the urban intermix. This component added a fuel type in the form of structures, vehicles and improvements. These products will burn at much higher levels of intensity and produce ember casts at much higher levels than natural fuels.

Data from the Konocti RAWs recorded a 14 day temperature average of 73° maximum, average 87°, and a relative humidity average of 30%, minimum average 15%. Konocti RAWs reports an average rain total of 30 inches, at the time of the fire only 10.07 inches had been recorded and since June 30 the recorded value was .27". This value is very important as it is a key factor in determining the fuel moisture levels in the area vegetation. Data provided by the Unit PFE, had area Chemise fuel moistures, as of July 9th, at 68.75% (60% represents critical). One can infer that by the time of the Valley Fire those readings would have been below the critical level.

During the first burn period the fire grew to over 54,000 acres. This rate of spread was the result of a number of factors. A westerly wind influence was present for a majority of the period (estimated 18 hours). Wind gusts averaged 18 mph (maximum 36 mph) and average winds were at 10 mph with the relative humidity average of 21% with a minimum recording of 12%. Extreme fire behavior was observed with critical rates of spread, high flame lengths, and long range spotting. In addition to the natural fuel types, structures, vehicles and improvements became fully involved which broadcast embers into a receptive fuel bed that was at an 89% probability of ignition. Fires of this nature exceed suppression capabilities and require resources to look for opportunities to engage in a safer environment.

SPECIAL HAZARDS:

A unique hazard existed on the western portion of the fire in the form of The Geysers Geothermal Fields. The Geysers is the world's largest geothermal field. Calpine owns and operates 14 power plants at The Geysers with a net generating capacity of about 725 megawatts of electricity. There are several known special hazards associated with the Calpine facility. These special hazards include hazardous materials stored within the facility as well as pipelines and high voltage power lines. Exhaust chimney and thermal vents associated with the geothermal activities also pose a significant hazard.

There are several mine shafts both vertical and horizontal within the fire and surrounding area.

Narrow, steep and windy roads pose hazards as well.

AREA FIRE HISTORY:

The 2015 fire season has been severe in the Sonoma-Lake-Napa Unit; In July the Wragg Fire burned 8,051 acres and the Rocky Fire burned 69,438 acres. In August, the Jerusalem Fire burned 25,118 acres. The Valley Fire parallels the Rocky Fire in the northeast separated by just over 3.5 miles and the Jerusalem in the southeast by approximately 1 mile.

In 2014 the Butts Fire (4,300 acres) and Monticello Fire (6,488 acres) were incidents that required an IMT activation. The Butts Fire was utilized as part of the southern containment lines for the Valley Fire. Since 1985 there have been 39 fires over 100 acres within 5 miles of the Valley Fire. Some of the more significant fires include 2004 Rumsey - 39,138 acres; Geysers - 12,525 acres; 2012 Wye - 7,934 acres; 2013 McCabe - 3,505 acres; and 2013 Pine - 1,024 acres.

In many respects, the Valley Fire was very similar to the September 1964 Hanley Fire, which burned over 52,000 acres and destroyed many homes in a short period of time. The Hanley Fire started on Mt. St. Helena in Napa County and was carried by high easterly winds across Napa Valley into Sonoma County to the northern outskirts of Santa Rosa.

INCIDENT POTENTIAL:

The 2015-2014 fire history for the immediate area, as well as the overall Northern Region, provides the

expectation that wildland fires not in a suppression mode action will become or exceed Class G (5,000+ acres) fires and become a major fire events. Due to the unprecedented levels of fire behavior, suppression efforts would have been futile. The emphasis to focus on life safety through notification and evacuation undoubtedly saved thousands of lives. During the time frame, the Valley Fire was the third fire in California that required the activation of a CAL FIRE Incident Management Team and during the incident a fourth CAL FIRE Incident Management Team was activated. The Valley Fire would be one of eight major attack fires (3 SRA – 5 FRA) competing for resources, which does not count the IA fires. Weather, with the reduction of wind, played an important role in allowing crews to establish containment lines. During the initial operational periods resources were engaged in discovery and extinguishments of heat sources in and around structures and securing control lines in areas that were threatening communities. The fire was contained prior to continuing further into Lake County which would have impacted the Aetna Springs and Pope Valley.

FIRE CAUSE:

The fire cause currently remains under investigation.

OWNERSHIP:

The majority of the lands within the Valley Fire perimeter are privately owned (90%). Also included within the fire area are Boggs State Demonstration Forest (3,493 acres), Bureau of Land Management (1,888 acres), Army Corps of Engineers (1,144 acres), and other federal, state, and local lands. The entire fire was within designated State Direct Protection Area (DPA).

VALUES AT RISK:

During the early stages of the fire, the most important values at risk were associated with the communities of Cobb, Middletown and Hidden Valley, as well as many rural neighborhoods in the path of the fire. At this time the fire was running with long range spotting. A significant number of homes, businesses and other structures within these communities were consumed by the fire within the first day. As the fire progressed, additional communities were threatened including Berryessa Estates, Twin Lakes, Noble Ranch Estates, Jerusalem Valley, Pope Valley and Aetna Springs.

Other values at risk included Boggs Demonstration State Forest, the Geysers Geothermal Fields, the LNU communication tower atop Mt. St. Helena, critical infrastructure, and cultural, historic and natural resources.