

***EUREKA FIRE WEATHER
ANNUAL REPORT 2007
For
NORTHWEST CALIFORNIA***



Smoke column from the Wallow Fire, near Hayfork, CA.

September, 2007

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I. INCIDENT REVIEW

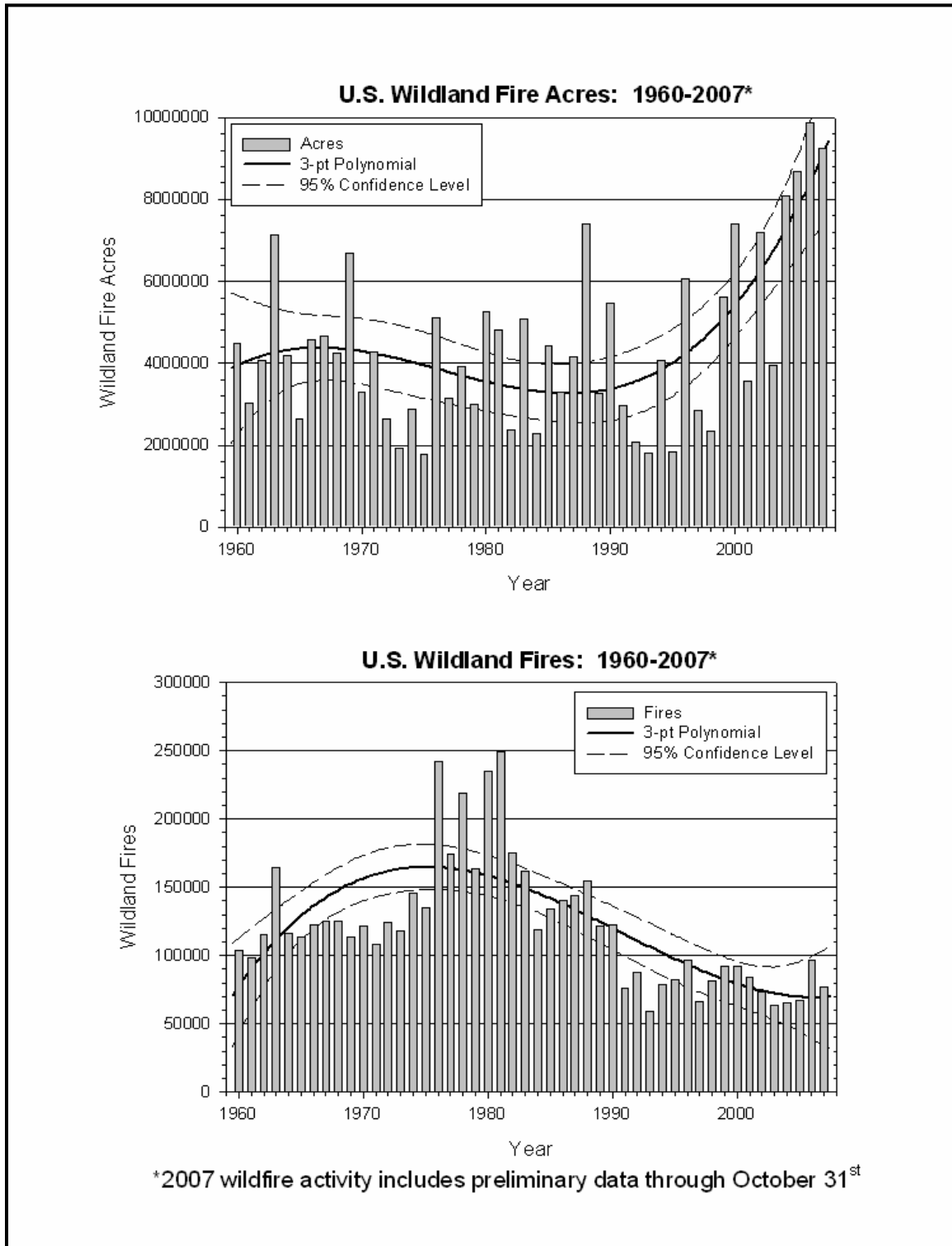
A relatively mild fire season was experienced across northwest California during 2007. The fire season was characterized by one significant lightning event occurring on July 10th that sparked numerous small fires over the northern portion of Six Rivers National Forest. Seven small fires were combined into the “7-11 Complex” which was managed by a Six Rivers National Forest Type 3 organization. The complex totaled about 200 acres mainly confined to the Gasquet RD and Smith River NRA. Initially, a Fire Weather Watch for Dry Lighting was issued on July 9th however due to an increase in air-mass moisture and ensuing rainfall, a Red Flag Warning was not warranted.

On August 29th the Wallow Fire was ignited in Trinity County. This fire was located approximately 7 miles southwest of Hayfork and totaled nearly 1500 acres before containment was achieved. The fire was managed by Northern California’s Incident Management Team II and included incident meteorological support provided by Incident Meteorologist (IMET) Ryan Walbrun from WFO Monterey. The fire caused brief closures to highways 36 and 3, and the cause of the fire remains under investigation. Various weak to moderate offshore wind events occurred during the late summer months however none warranted any Fire Weather Watch or Red Flag Warnings.

Although the 2007 fire season was locally quiet, nationally it was another exhausting year in terms of the number of wildfires and acres burned. 2007 ranks 2nd only to the previous year with over 9 million acres burned. (Fig 1.1)

The 2007 fire season also was one of the busiest on record for Incident Meteorologist (IMET) dispatches. There were 182 dispatches across the nation and Alaska making it the 3rd highest in the history of the IMET program.

Fig 1.1

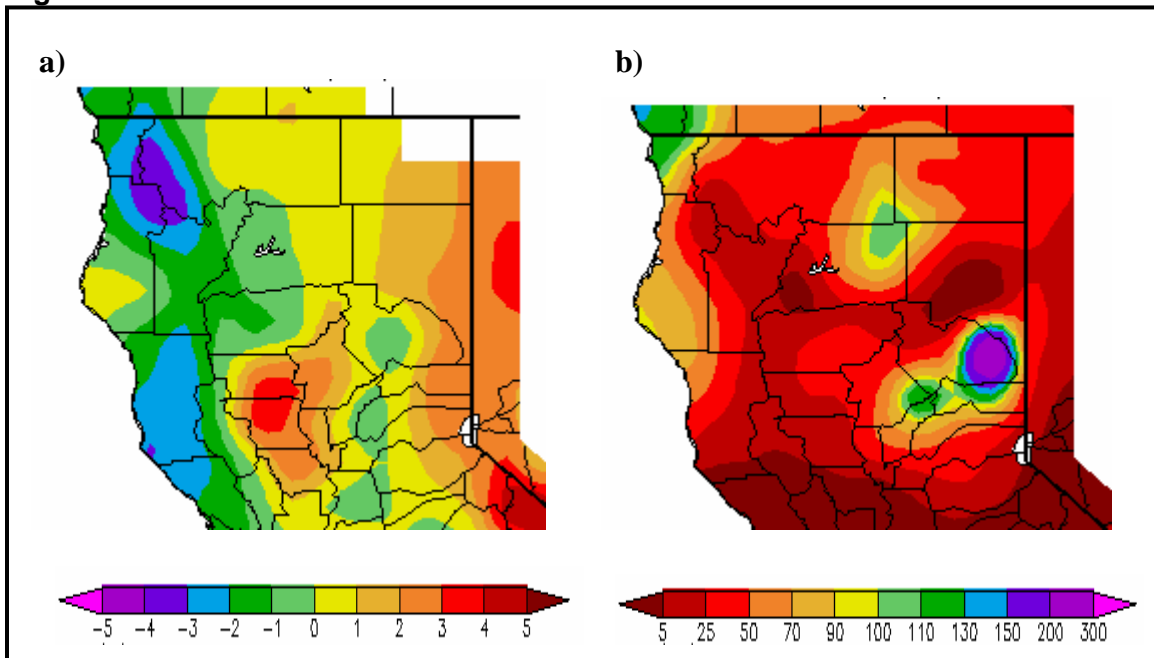


II. WEATHER REVIEW

Winter / Early Spring 2007 (Jan – Mar '07)

A series of Pacific storms brought wind and copious rainfall to northwest California during the first week of January. What began as a typical January quickly evolved into one of the driest January's on record for northern California. In the midst of a moderate El Nino pattern northwest California experienced the 3rd driest January on record at WFO Eureka. Dominant high pressure aloft kept skies generally clear thus cold nights and mornings brought a colder than average month as well. The peculiar month was also characterized by a summer type pattern with low clouds and fog hugging the north coast during the latter two weeks. The weather shifted back to a wetter pattern in February as broad trough of low pressure brought storms back to the region. The weather systems were generally from the west which brought plentiful rainfall to the area. Temperatures were slightly cooler than normal. The transitional nature during the early part of the year continued into March as a dominant ridge of high pressure developed off the coast. This resulted in a very dry early spring as well as higher than normal temperatures. For the three month period temperatures across northwest California were below normal over the interior while the coastal areas were slightly below normal. Despite the high rates of rainfall in early January...precipitation fell below average for the three month period. (Fig 2.1)

Fig. 2.1

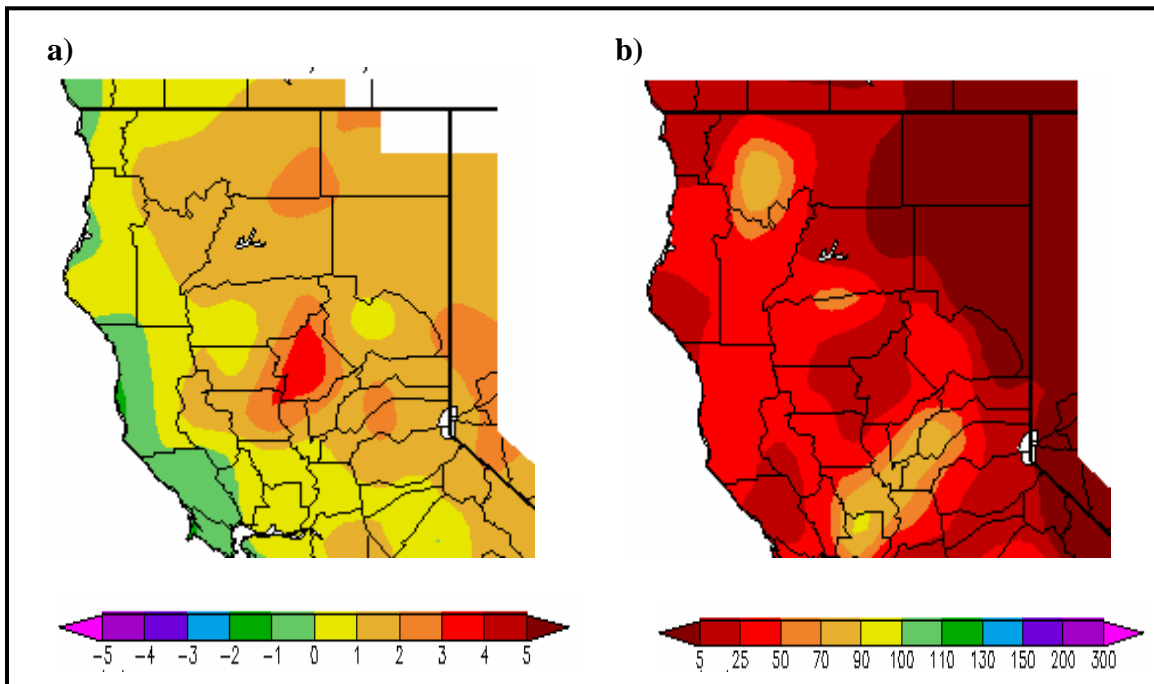


- (a) Departure from average temperature in degrees F for the period Jan 1, 2007 through March 31, 2007.
- (b) Departure from average precipitation in percent for the period Jan 1, 2007 through March 31, 2007.

Spring / Early Summer 2007 (Apr – June)

The significant swings in weather patterns relaxed during the early spring. April proved to be very close to climatologically normal values across the northern portion of the state. The beginning of April saw a warming trend due continued high pressure aloft, but a few minor episodes of rain brought cooler temperatures. Intermittent light rainfall occurred through the remainder of the month with near normal amounts recorded at most stations. Toward the beginning of May a strong and moist storm system brought close to an inch of rainfall to the coast. This system continued an eastward trek coating the interior with rain and late spring snow to the mountains. Finally by the middle of May the rains diminished while a blocking ridge of high pressure sustained itself across northern California for the latter half of the month. Although this brought a dry weather pattern to the region plenty of clouds and coastal low clouds lingered through the remainder of the month...keeping temperatures cooler than normal. June began fairly wet with a series of weak fronts bringing light rain amounts to the region during the first week. A typical early summer type weather pattern quickly grasped northern California during the second week as the Pacific High began to assert itself. Not another drop of precipitation fell for the remainder of the month bringing below normal rain totals for the rain year and the month. For the three month period temperatures were very near normal while rainfall fell well below normal (Fig 2.2)

Fig. 2.2



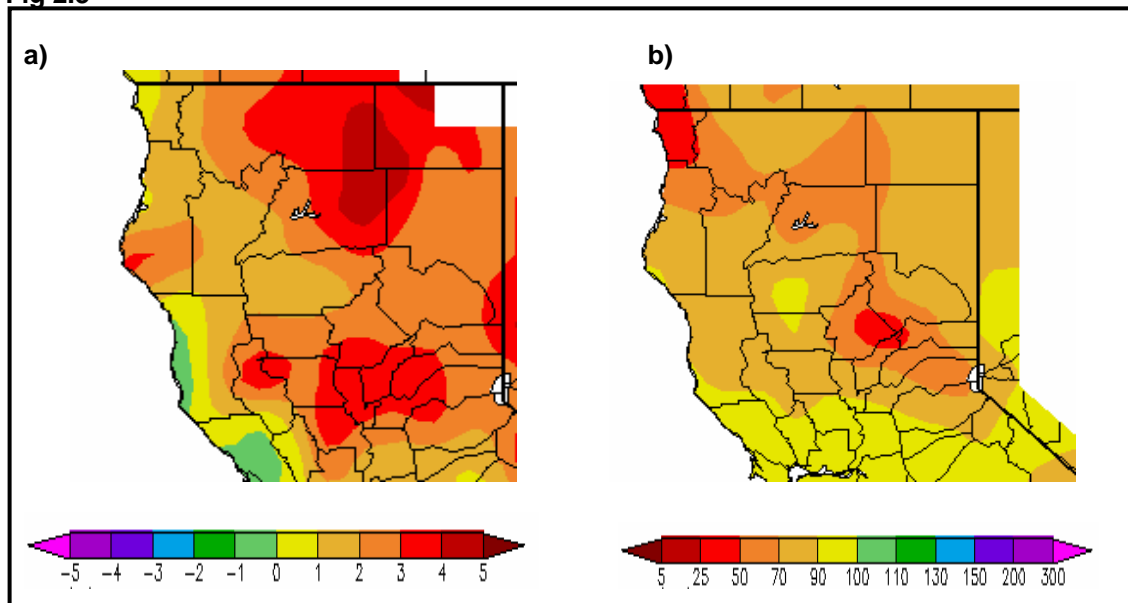
(a) Average temperature departure in degrees F for the period Apr 1, 2007 through June 30, 2007.

(b) Average precipitation departure in percent for the period Apr 1, 2007 through June 30, 2007.

Late Summer / Early Fall 2007 (July – Sept)

July was by far the wettest month of the summer as monsoonal moisture wrapped around a Great Basin ridge of high pressure and moved northwest through the state. This moisture contributed to the only significant lightning activity experienced during the summer. Along with the thunderstorms...showers were also present over much of the interior. An unseasonable strong front moved across northern California on the 17th and 18th and brought nearly an inch of rain to the coast as well as interior sites. High pressure returned in August which brought another long period of warm and dry conditions to the area. This pattern resulted in little or no rainfall to the CWA with bouts of weak offshore flow reflected along the coast and coastal interior. The month of September was characterized by a strong Pacific High pressure system over the Eastern Pacific. This pattern resulted in drier than normal conditions for the region. (Fig. 2.3) Toward the end of September the ridge finally broke down and gave way to an upper level trough. This trough was associated with a series of fronts brushing the region... supplying approximately 0.25 inches of rain to the north coast and north coast interior.

Fig 2.3



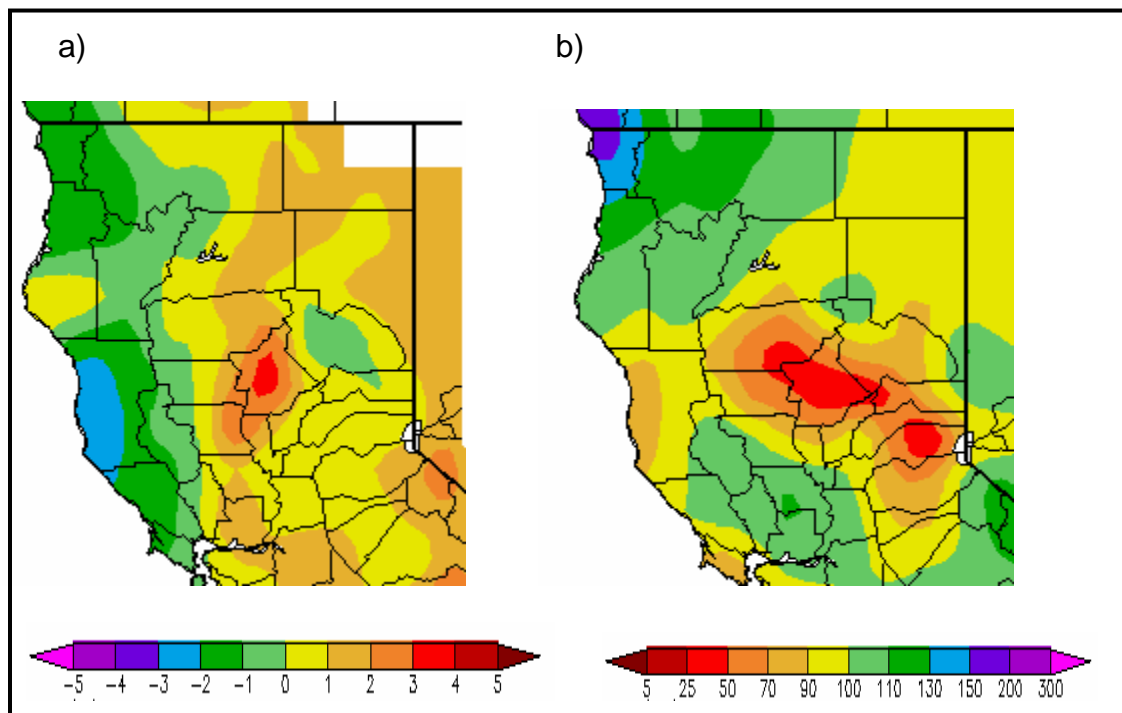
(a) Average temperature departure in degrees F for the period Apr 1, 2007 through June 30, 2007.

(b) Average precipitation departure in percent for the period Apr 1, 2007 through June 30, 2007.

Late Fall / Early Winter 2007 (Oct – Dec 2007)

Winter appeared to come early as a series of cold fronts approached the north coast in early October. Over three inches of rain fell over the coast through the first two weeks of the month while temperatures were noticeably cool. The cool and moist weather came to an abrupt end during the third and fourth weeks of the month when typical fall weather returned to northwest California as weak offshore flow brought warmer and drier weather to the area. Onshore flow typified the first week of November with cool and cloudy conditions combined with bouts of drizzle. Cooler than normal temperatures were observed inland as a series of weak troughs moved across the Pacific Northwest. Another weak offshore event occurred during the latter portion of November which provided warm afternoons but somewhat chilly mornings as the sun angle continued to lower. The drier weather was short lived as December saw a sharp transition into a winter type pattern. Much cooler weather was observed for much of the month as cold fronts brought rain, low elevation snow, and colder than normal temperatures to much of northern California. All in all temperature and precipitation data over the three month period averaged close to climatological norms as shown in Fig 2.4. Temperatures were near normal over the County Warning Area except for the Mendocino Coastal region, while precipitation was nearly average except for Del Norte County which received the brunt of rainfall from the various storms.

Fig. 2.4



(a) Average temperature departure in degrees F for the period Oct 1, 2007 through Dec 31, 2007. (b) Average precipitation departure in percent for the period Oct 1, 2007 through Dec 31, 2007.

III. RED FLAG VERIFICATION

Eureka Fire Weather issued only two individual zone Red Flag Warnings during the 2007 fire season. Both were issued for dry lightning and did not verify. The Red Flag Warnings were preceded by a Fire Weather Watch. There were no events that were considered missed.

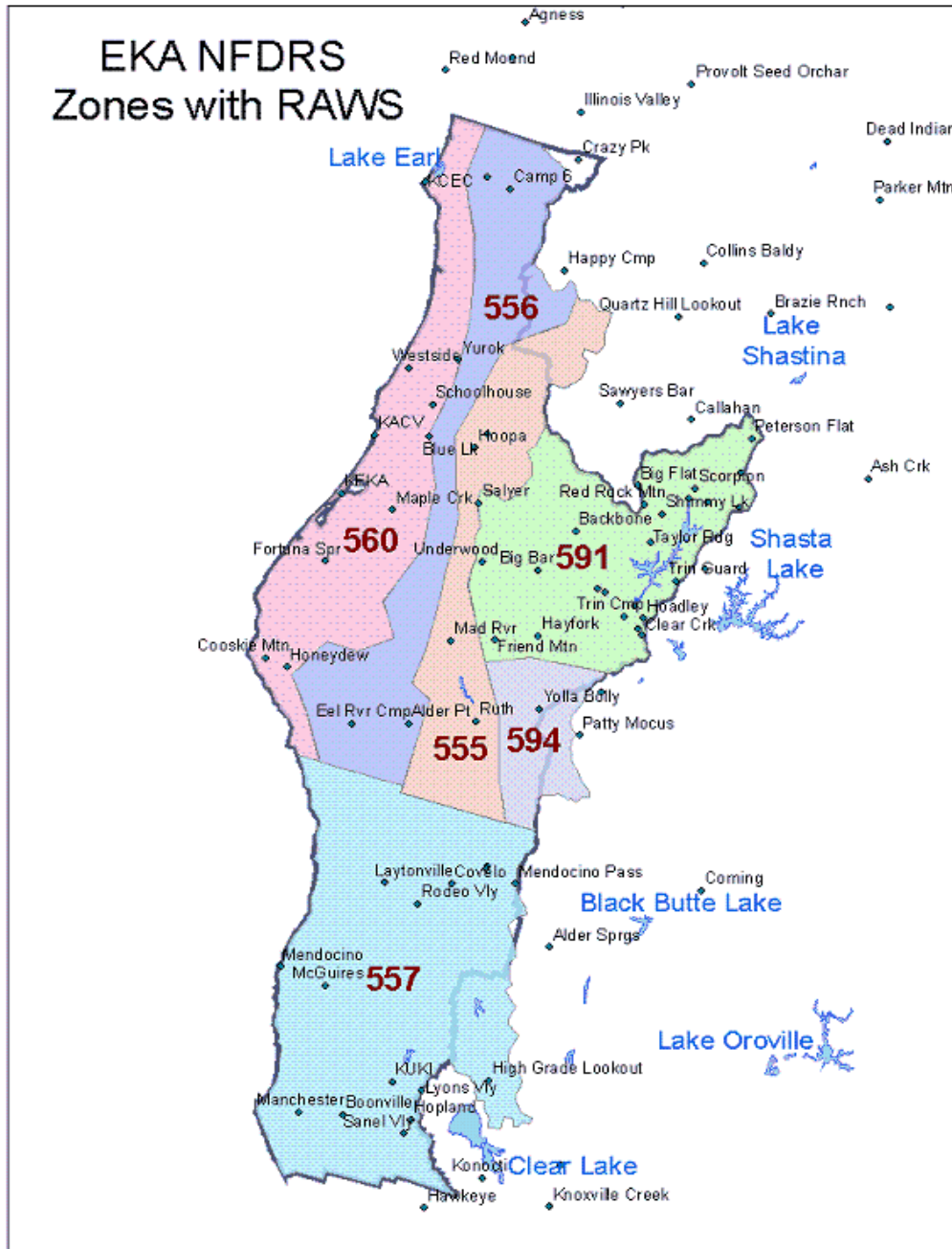
- Correct Warnings (Verified) = 0
- Incorrect Warnings (not verified) = 2
- Missed Events = 0

POD (Probability of Detection)...0 (Highest Accuracy = 1.0)
 CSI (Critical Success Index).....0 (Highest Accuracy = 1.0)
 FAR (False Alarm Ratio).....1 (Highest Accuracy = 0)

2007 WARNING VERIFICATION								
ZONE	# RFW	Correct RFW	Incorrect RFW	Missed Event	POD	CSI	FAR	# Watch
201	0.0	0.0	0.0	0.0				0.0
202	0.0	0.0	0.0	0.0				0.0
203	0.0	0.0	0.0	0.0				0.0
204	0.0	0.0	0.0	0.0				0.0
211	0.0	0.0	0.0	0.0				0.0
212	0.0	0.0	0.0	0.0				0.0
276	0.0	0.0	0.0	0.0				0.0
277	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0
283	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0
TOTALS	2.0	0.0	2.0	0.0	0.0	0.0	1.0	2.0

IV. NFDRS VERIFICATION

Verification was performed by comparing forecasted values for each zone and compared against the zone averaged observation at 1300 PDT the following day. The absolute mean difference is then compared to persistence. Persistence is defined as the absolute mean difference between the observation at 1300 PDT the day the forecast was issued and the observation at 1300 PDT the following day. Each zone is comprised of several RAWS observations that are used to calculate the zone averaged values. The zones and RAWS locations are depicted in the map below.



The graph below (Fig. 4.2) shows that an improvement over persistence ranged from 18-32% for all zones last summer, while relative humidity forecasts showed a general improvement of 10 to 15% over persistence. Wind speed forecasts were poor compare to persistence. In all cases persistence beat the forecasted wind speeds...with a strong negative bias across the interior zones. Clearly this is an area that requires immediate and significant improvement.

Fig. 4.2

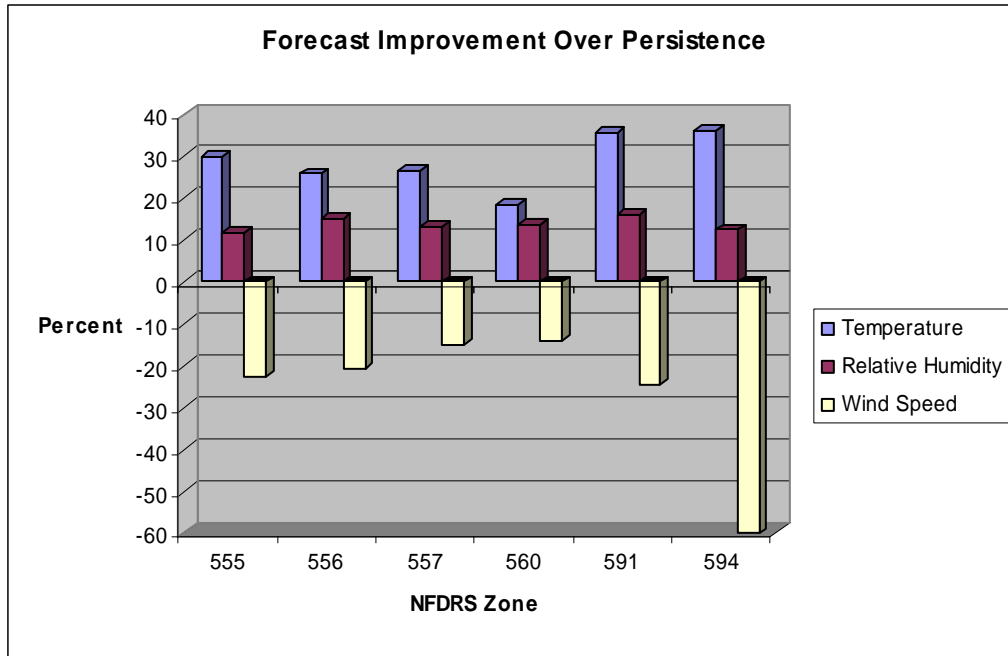
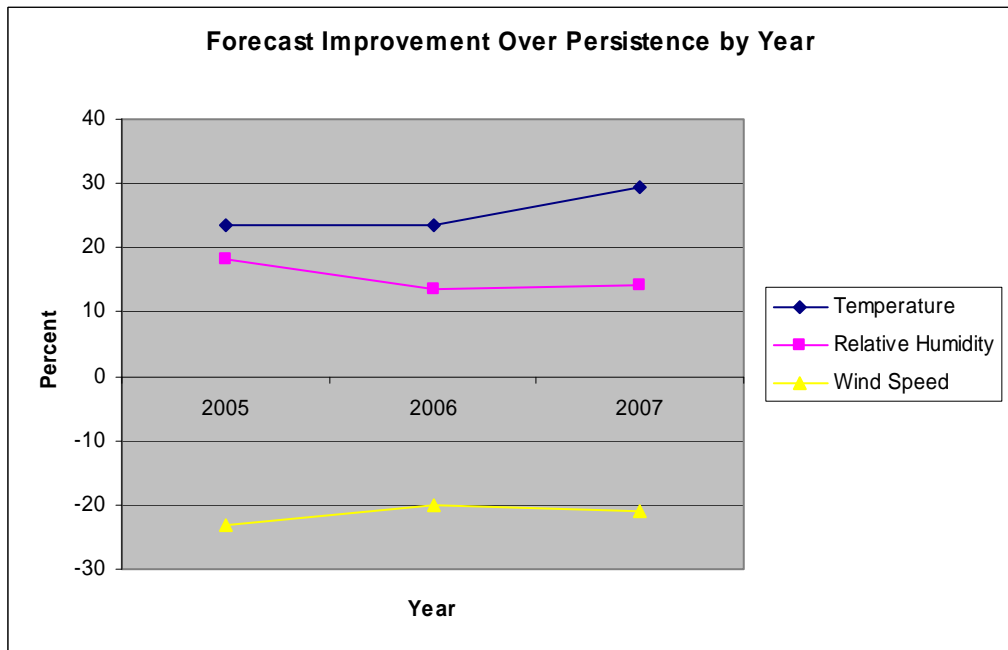


Fig. 4.3



V. SPOT FORECASTS

The National Weather Service Office in Eureka issued a total of 363 site specific or spot forecasts during the calendar year 2007. This amount represents nearly 50% increase over 2006 and is approximately three times the '03 – '06 average amount of 114 spots. The continued trend of increasing spot forecast requests is mainly attributed to Forest Service regulations requiring spot forecasts for all burn activity. Of this total, 57 spot forecast requests were for wildfires and 306 were for project burns. Similar to previous years, the majority of spot forecast requests came from the USFS and CDF with less than 5% distributed between the national and state parks and BIA. Most prescription forecast requests were for small burns or pile burns for the Forest Service. The National Park Service had one project of approximately 300 acres in Redwood National Park during October. CAL Fire also had two projects in excess of 100 acres within Southern Humboldt County during late fall, and one 500 acre project by the Mendocino Unit in late January. The majority of spot forecasts generated for wild fire support occurred after a July lightning bust. The Wallow Fire also required nearly 30 spot forecasts before onsite meteorological support was provided. (Fig 5.2 , 5.3)

The average “turn-around-time” for wildfire spot forecasts was 37 minutes while the average turn around time for project burns was 33 minutes. The turn around time showed a significant decrease for both categories while the total average was down 17 minutes from 2006. The reduction in turn around time may be attributed to an increase in forecaster experience with new and faster technology.

Turn around time is defined as the elapsed time between a spot forecast request receipt (or notification) and forecast transmission. There were 98 instances where spot forecasts were requested a day or more in advance of ignition time. These cases were omitted from the average turn around time calculation.

Table 5.1

Spots for Wildfires.....	57
Spots for Project Burns.....	306
Spots for Hazmat.....	0
Misc. / Training Spots.....	0
Average Turnaround Time	
For Wildfire.....	37 minutes
For Project Burns.....	33 minutes
For All Spots.....	35 minutes
Total Spots	363

Fig 4.2

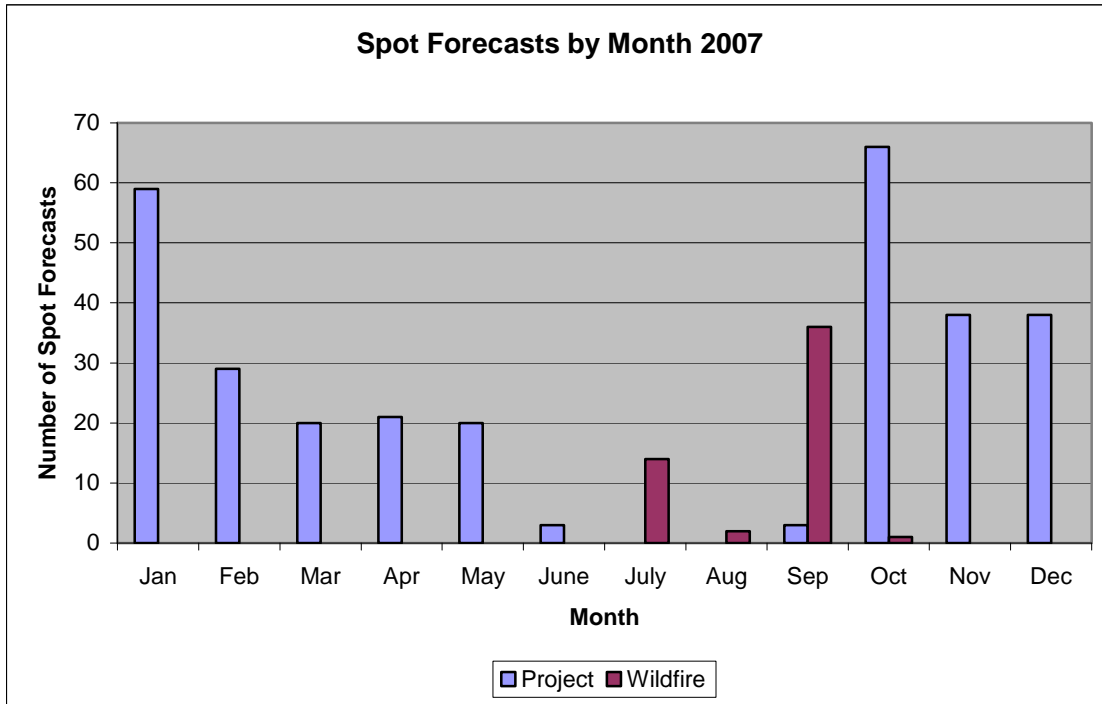
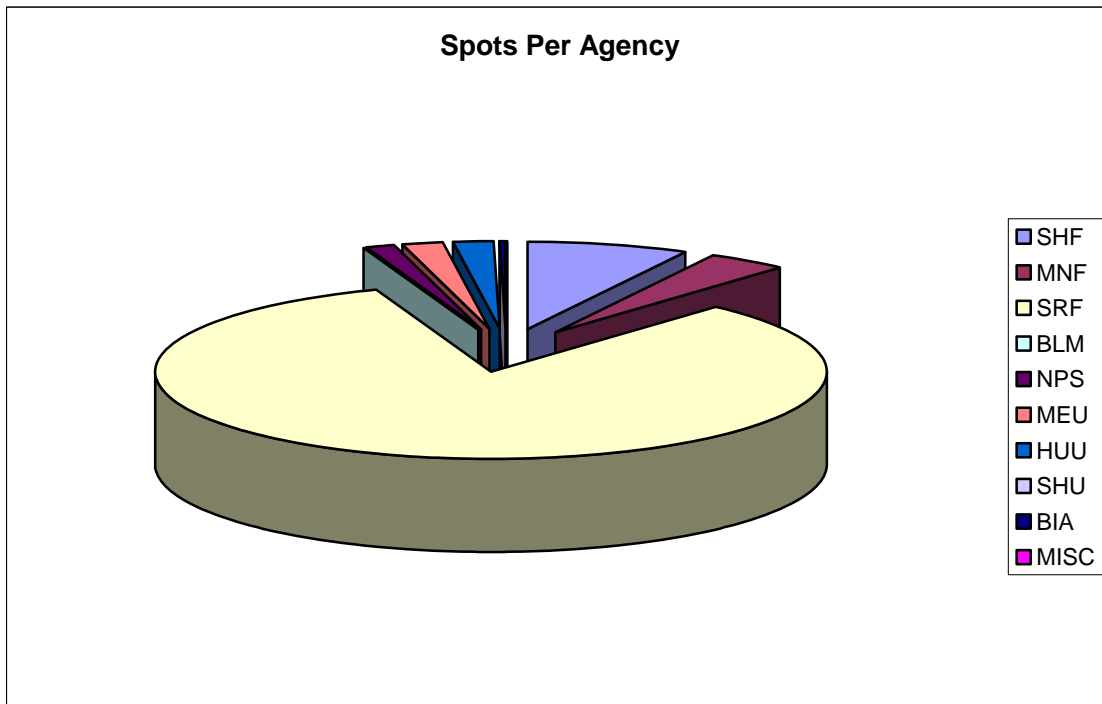
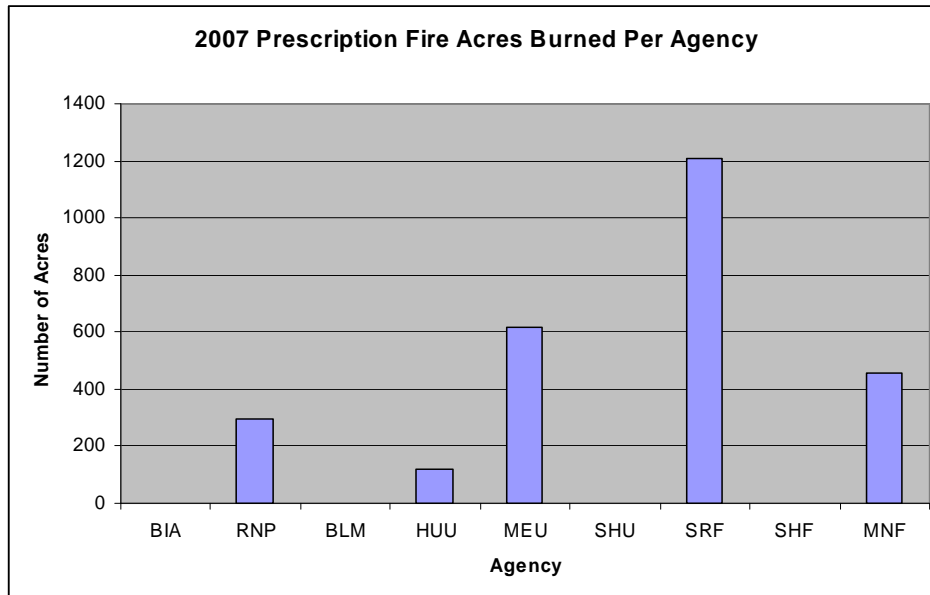
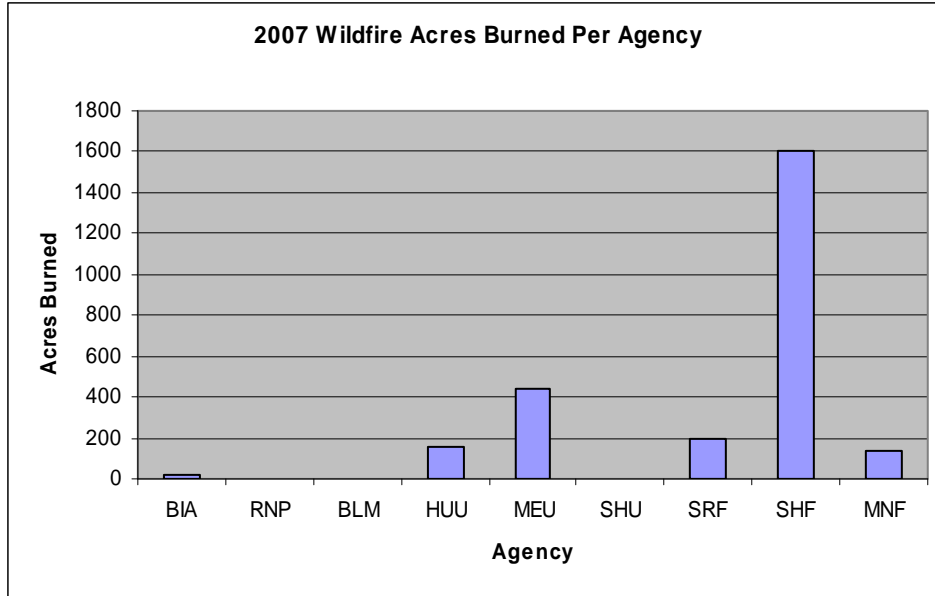


Fig. 4.3



VI. WILDFIRE / PROJECT BURN ACTIVITY

Two relatively small fire complexes impacted the Shasta-Trinity and Six Rivers National Forests. The 7-11 Complex and Wallow Fire combined to burn nearly 1800 acres. CAL Fire Mendocino Unit was busy during July handling a 400 acre wildfire near Covelo. The number of prescription acres burned was similar to last years' totals for most of the local agencies; except for the Mendocino and Six Rivers NF which saw an increase of nearly double from what was burned in 2006.



* These totals include acres burned within the Mendocino and Shasta-Trinity National Forests, portions of which overlap into WFO Sacramento's and WFO Medford's areas of responsibility.

VII. ON-SITE METEOROLOGICAL SUPPORT

In terms of wildfire activity the summer of 2007 was one of the more subdued years...especially when compared to 2006. Incident Meteorologist (IMET) support from WFO Eureka totaled 63 days, which was roughly half of the number of days offered by Eureka's IMETs last year. Eureka currently has two certified IMET's, Jeff Tonkin and Mark Burger. IMET Jeff Tonkin was dispatched to 4 separate incidents while Mark Burger was dispatched to 2 incidents. (Fig. 7.1)

During 2007 only the Wallow Fire required IMET support within Eureka's CWA. Ryan Walbrun from WFO Monterey was assigned to support the Wallow incident for approximately 7 days.

Table 7.1

WFO Eureka IMET Dispatches				
<u>IMET</u>	<u>Incident Name</u>	<u>Location</u>	<u>Dates</u>	<u>Local WFO</u>
Mark Burger	Poe Cabin Fire	White Bird, ID	July 21 - Aug 2	Missoula
Jeff Tonkin	Zaca II Fire	New Cuyama, CA	Aug 6 - Aug 20	Oxnard
Mark Burger	Black Cat Fire	Missoula, MT	Aug 17 - Aug 31	Missoula
Jeff Tonkin	Zaca II Fire	New Cuyama, CA	Aug 31 - Sep 9	Oxnard
Jeff Tonkin	Moonlight Fire	Chester, CA	Sep 17 - Sep 24	Reno
Jeff Tonkin	Poomacha Fire	Valley Center, CA	Nov 1 - Nov 8	San Diego

Table 7.2

IMET Dispatches Within WFO Eureka's CWA				
<u>IMET</u>	<u>Incident Name</u>	<u>Location</u>	<u>Dates</u>	<u>WFO</u>
Ryan Walbrun	Wallow Fire	Hayfork, CA	Aug 1 - Aug 8	Monterey

VIII. EUREKA FIRE WEATHER PROGRAM SUMMARY

The following table illustrates a comparison of activity and performance for the last two years and includes a five year average (2003 through 2007).

<u>ANNUAL COMPARISON TABLE</u>				
	<u>2006</u>	<u>2007</u>	<u>06 - '07 Diff</u>	<u>'03 - '07 Ave.</u>
<u>Warning / Watch</u>				
Red Flag Warnings Issued:	16	2	(-)14	8
Dry Lightning:	3	2	(-)1	1.2
Wind/RH	13	0	(-)13	6.8
Average Lead Time (hr)	13.6	0	(-)13.6	8.34
Fire Weather Watches Issued:	10	2	(-)8	5
Dry Lightning:	0	2	2	1.2
Wind/RH	10	0	(-)10	4.8
Average Lead Time (hr):	29.5	0	(-)29.5	18.7
Verification:				
POD	1.0	0.0	(-)1.0	0.8
CSI	0.86	0.0	(-)0.86	0.63
FAR	0.14	1.0	0.86	0.38
<u>SPOT Forecasts</u>				
Total Issued:	250	363	113	164
Wildfire Spots:	91	57	(-)34	53
Project Spots:	158	306	148	109
Overall Turn-Around-Time (min.)	52	35	(-)17	50
<u>IMET Support</u>				
Total Days	106	63	(-)43	51
Mark	53	28	(-)25	41
Jeff	53	35	(-)18	34
Dispatch Days within CWA:	127	7	(-)120	30

IX. TRAINING, EDUCATIONAL, OUTREACH AND FIELD ACTIVITIES

The following table summarizes various fire weather activities which the Eureka fire weather staff participated in during the 2007 calendar year.

Dates	Activity	Agency/User/Audience	Representative	Location
Jan 17	Smoke Management	Multiple Agency	Nancy, Jeff	Eureka, CA
Mar 5-6	Taught S-290	Marin County Fire	Mark	San Rafael, CA
Mar 7	User Meeting	Ukiah BLM, Mendocino ECC	Mark	Willits, CA
Mar 20-21	CA UAT Meeting	Multiple Agency	Nancy	Sacramento, CA
Mar 22	Taught RX-300	SRF	Jeff	Eureka, CA
Apr 14	User Meeting	Fortuna ECC	Mark	Fortuna, CA
Apr 17-19	NOAA Oil Spill Class	NOAA HAZMAT	Mark	Seattle, WA
Apr 21	Taught S-190	HUU	Mark	Arcata, CA
Apr 14	User Meeting	Fortuna ECC,	Mark	Seattle, WA
May 11	Agency Meeting	Redding Fire Weather	Mark, Jeff	Redding, CA
May 11	User Meeting	SHF	Mark, Jeff	Redding, CA
June 2-3	WR Program Visit	Roger Lamoni	Nancy, Jeff	Eureka, CA
June 6	Smoke Management	Multiple Agency	Nancy	Orick, CA
July 10-12	WMD Course	Multiple Agency	Jeff	Eureka, CA
July 19	Familiarization Trip	7-11 Complex SRF	Staff	Happy Camp, CA
July 21-Aug2	IMET Dispatch	Poe Cabin Fire	Mark	White Bird, ID
Aug 6-Aug20	IMET Dispatch	Zaca II	Jeff	New Cuyama, CA
Aug 14-Aug16	WMD Course	Multiple Agency	Mark	Fortuna, CA
Aug 17 - Aug 31	IMET Dispatch	Black Cat Fire	Mark	Missoula, MT
Sep 17 - Sep 24	IMET Dispatch	Moonlight Fire	Jeff	Chester, CA
Nov 1-9	IMET Dispatch	Poomacha Fire	Jeff	Valley Center, CA
Nov 13-15	CA UAT Meeting	Multiple Agency	Nancy	Orange Co, CA