

Fall Smoke Management Program conditions:

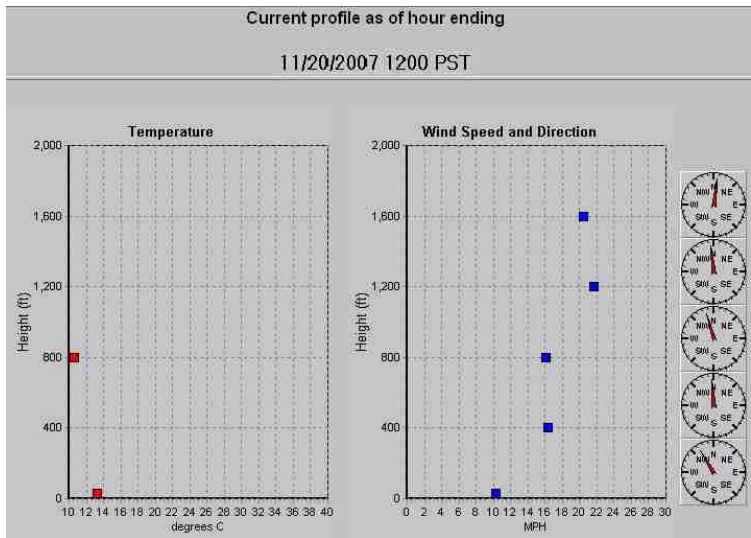
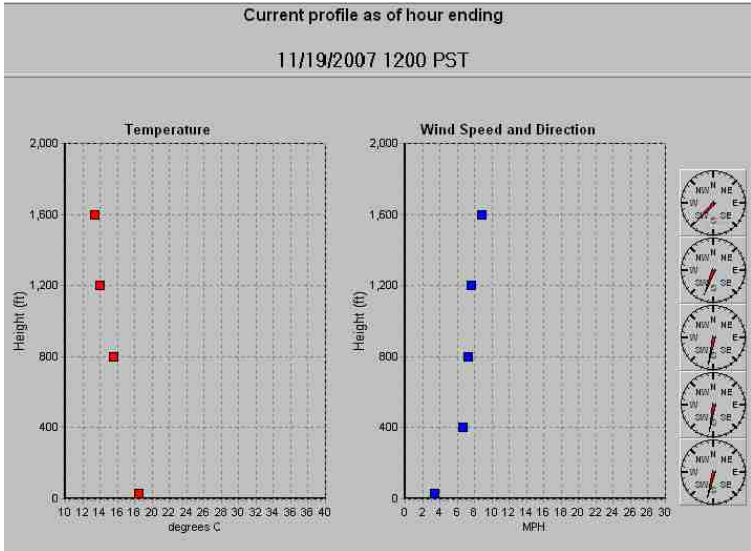
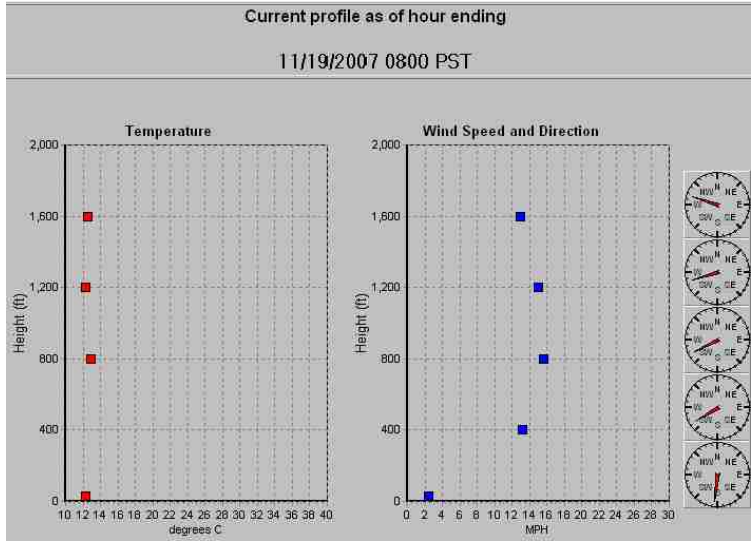
The 2007 fall burn season was characterized by early and frequent rainfall into the middle of October then stagnant atmospheric conditions in November. Minimal burning was conducted during this time due to wet fields. Air quality conditions were good through October. However, cold temperatures, poor dispersion and wood heating emissions caused high PM_{2.5} particulate levels at the end of November. Violations of the 24-hour EPA air quality standard were recorded.

Types of Days: There were two no burn days declared (November 23 and November 26) by the Air Resources Board. The November 23 decision was due to north winds of 22 mph in the Valley. On November 26 the morning inversion strength was 26 degrees F and the midnight to 6:00 a.m. average Valley PM_{2.5} particulate level was 35.8 micrograms per cubic meter of air. These conditions combined dictated a no burn day. Restricted field burning days (limiting field residue burning to 50 acres per county) are called when north winds of 15 mph or greater occur. High morning stability equal to or exceeding 25 degrees Fahrenheit also trigger restricted field days. Eight restricted field day decisions were made. No prunings only days occurred. There were two days in September when the acreage was shifted to the northern end of the Valley. South acreage shifts occurred on three days. On four days, burning hours were extended. Late burning was authorized on October 15. The Air Resources Board, prior to storm activity, permitted early burning on three other days.

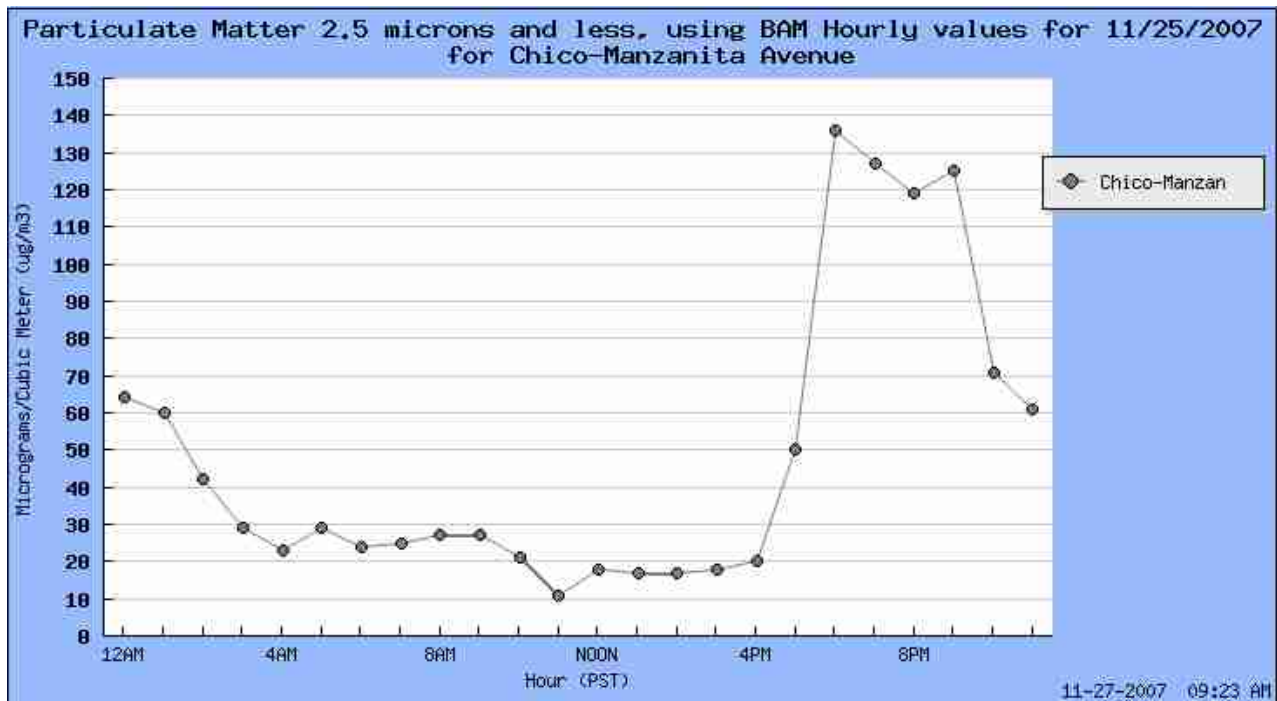
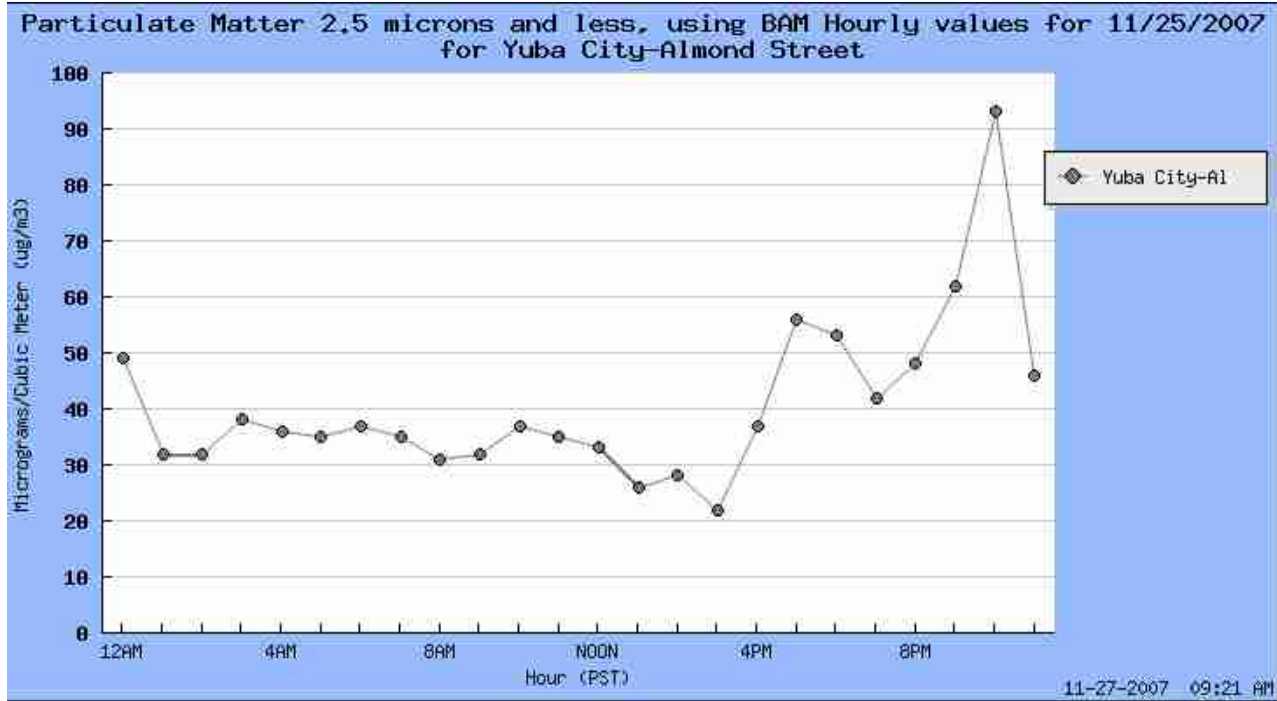
Weather: The first rain event was on September 19th and continued the following day. Rainfall was recorded in the Sacramento Valley on five days in September but the amounts were minimal. On October 10th a stronger storm system hit the Valley with average rainfall of 0.66 inches. On days following significant storms "wet days" are called with a reduced daily allocation of 2,000 acres. After sufficient drying, as determined by the formula in the Smoke Management Program plan, normal acreage allocations resume. Ten wet days were called during the fall program. As is typical of the fall, several days with strong north wind were recorded. Good south winds were infrequent even prior to approaching storm fronts. Toward the end of November colder temperatures in the Valley were common producing isolated areas with morning frost.

The following graphs show the temperature profile, wind speed and direction for two consecutive November days (19th and 20th). The first two graphs show the change in the temperature profile from isothermal (i.e., little difference in temperature Vs elevation) in the morning to an unstable atmosphere by noon. There is also a noticeable decrease in the wind speed through the vertical mixing layer from 8:00 a.m. to 12:00 p.m.

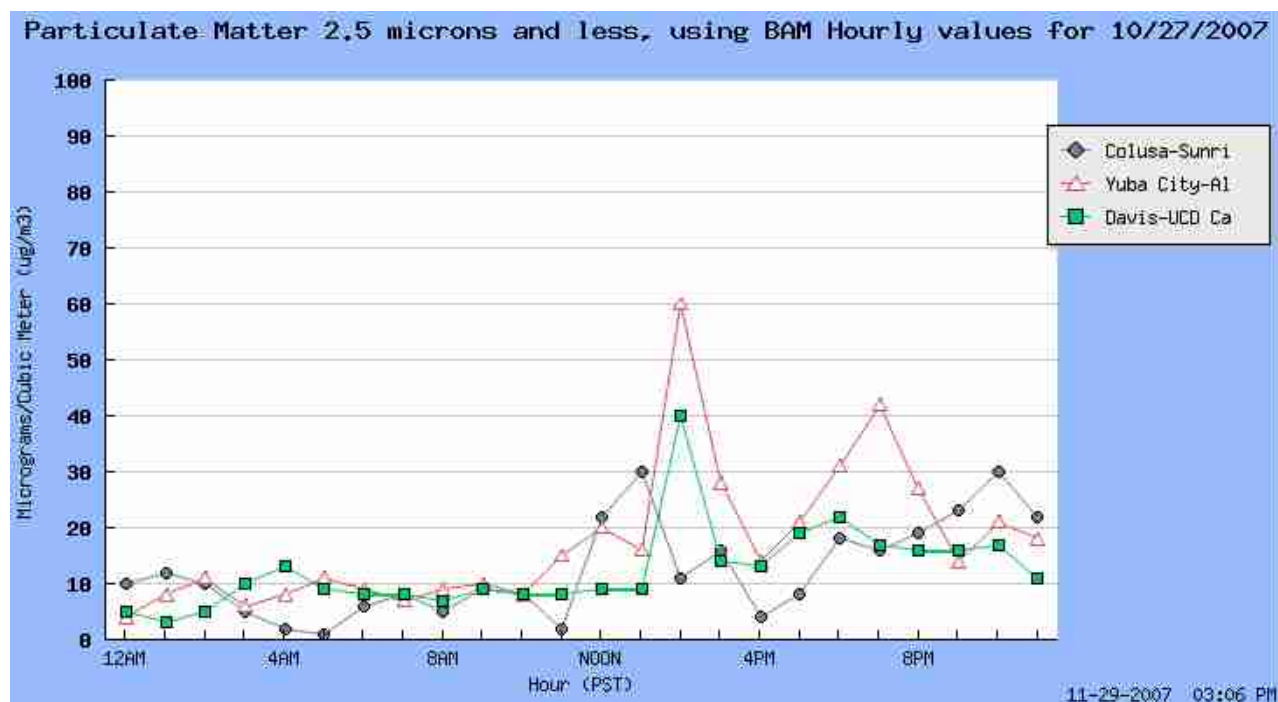
The last graph illustrates how in the span of 24 hours the temperature and winds can change. Temperature aloft is so cold that it falls off the scale. And reverse, in the case of wind direction, from a strong southwesterly wind to a gusty north wind.



Air Quality: Fall air quality levels of particulate $PM_{2.5}$ both the 24-hour average and the midnight to 6:00 a.m. average were generally good. From September 15 through the end of October most $PM_{2.5}$ readings were either single digit or lower teens. As expected, the trend from September through October was gradually increasing numbers. The $PM_{2.5}$ particulate levels became seriously elevated only during the later part of November. On those November days smoke from agricultural burning and more importantly residential fireplace emissions impacted many air districts. Diurnal patterns of $PM_{2.5}$ values clearly pointed to home heating emissions starting in the evening and lingering overnight. See the following graphs for Yuba City and Chico on November 25 (cold temperature, light wind, strong inversion, high morning particulate readings and reduced 1,000 acre burn allocation).



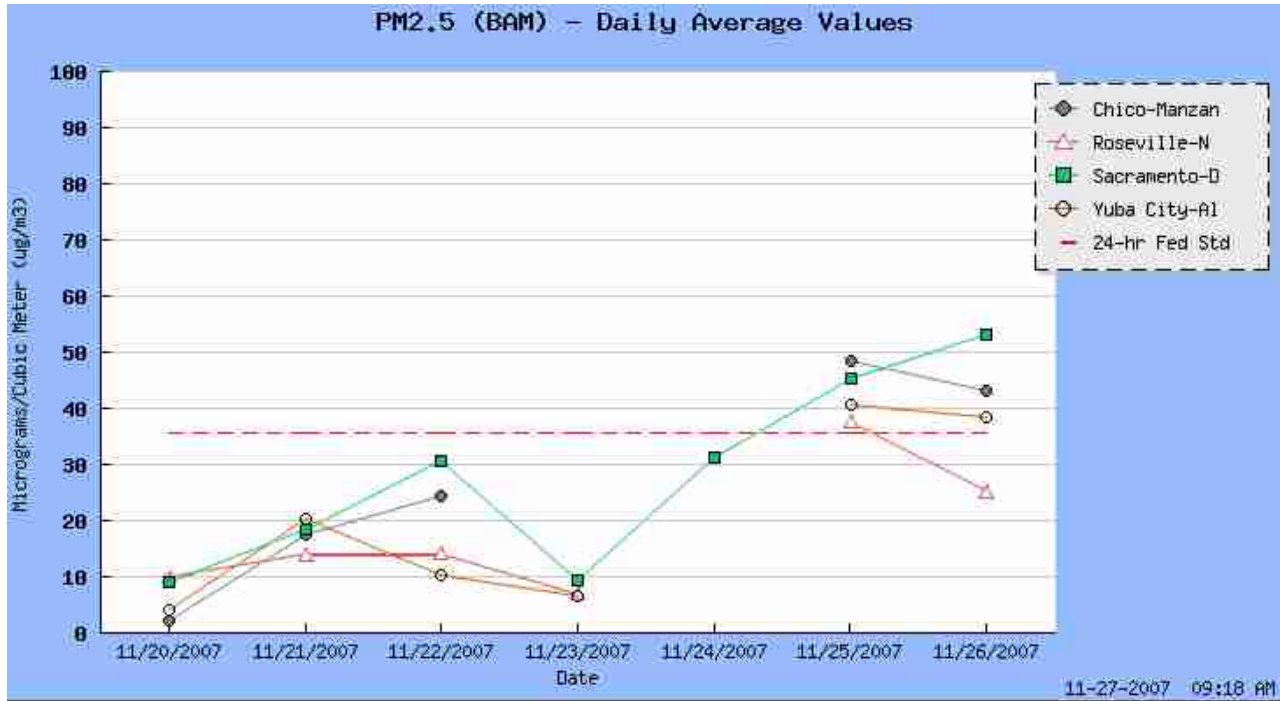
There were also several afternoon hours with high PM_{2.5} values that are solely attributable to agricultural burning. These spikes in PM_{2.5} levels are due to fires placed in incorrect locations relative to wind direction, smoke transport, over concentration of burning in an area or unfavorable vertical smoke dispersal conditions. See the following graph for October 27 (warm temperature, moderate north wind, strong inversion, low morning particulate readings and 2,500 acre burn allocation).



Late November had the highest 24-hour PM_{2.5} values. The following table shows values for several monitoring sites.

Sacramento Valley Air Basin Daily PM _{2.5} (BAM) - Daily Average Data Seven Day Display Ending 11/26/2007 Micrograms/Cubic Meter (ug/m3)									
Bas Cnty	Site Name	7 Day Max	11/20/2007	11/21/2007	11/22/2007	11/23/2007	11/24/2007	11/25/2007	11/26/2007
SV BUT	Chico-Manzanita Avenue	48.4	2.3	17.4	24.5			48.4	43.0
SV BUT	Gridley-Cowee Avenue	34.2	4.6	7.8				31.4	34.2
SV COL	Colusa-Sunrise Blvd	21.5				3.1		20.6	21.5
SV GLE	Willows-E Laurel Street	20.2	18.8	4.0	4.3	6.3		16.7	20.2
SV PLA	Roseville-N Sunrise Blvd	37.6	10.0	14.0	14.2	7.0		37.6	25.2
SV SAC	Elk Grove-Bryceville Road	43.7	8.4	11.6	12.2	7.9	17.6	33.6	43.7
SV SAC	Folsom-Natoma Street	30.9	9.4	11.9	10.0	6.8	18.7	30.9	26.5
SV SAC	Sacramento-Del Paso Manor	63.3	9.1	18.4	30.6	9.3	31.4	45.3	63.3
SV SAC	Sacramento-T Street	10.8	3.5	10.8	7.7				
SV SHA	Anderson-North Street	24.2			6.7	5.1	16.5	24.2	20.9
SV SOL	Vacaville-Ulatis Drive	22.2	1.9	7.4	8.7	0.9	12.3	22.2	
SV SUT	Yuba City-Almond Street	40.6	4.0	20.2	10.4	6.6		40.6	38.6
SV YOL	Davis-UCD Campus	20.8	3.9	6.1	4.7	3.2		20.8	17.7
SV YOL	Woodland-Gibson Road	21.9				2.7	16.6	21.9	19.4

The graph below compares PM_{2.5} data for four Sacramento Valley air monitoring sites with the federal EPA 24-hour ambient air quality standard (35 micrograms per cubic meter of air).



The maximum average, basin wide midnight to 6:00 a.m. PM_{2.5} value was 35.8 on November 26th. Only four other days exceeded 20 micrograms all during the last ten days of November. However, the average, basin wide midnight to 6:00 a.m. PM_{2.5} value was 10.3 micrograms per cubic meter.

In the Smoke Management Program Plan the provisions below restrict acreage allocations to individual counties based upon their midnight to 6:00 a.m. particulate readings.

When any district's midnight to 6:00 a.m. average PM_{2.5} is ≥ 27 micrograms per cubic meter (ug/m³) increasing concentrations will result in increasing reductions in allocated acres (e.g., 27-28 is 20%, 29-30 is 40%, 31-32 is 60% and 33-34 is 80%). When any district's midnight to 6:00 a.m. average PM_{2.5} is ≥ 35 ug/m³ a no burn day will be declared in that district.

The first air quality reduction occurred on October 31 for one county. On November 25, 27 and 29 multiple counties received reduced allocations because of high morning particulate levels. See the table below for November 27.

ARB/CCO REVISED Basinwide Allocation _____ = 2000

District	Yesterday's 24-Hr Avg PM _{2.5}	Yesterday's PM _{2.5} (0-6 PST)	Reduction Factor	Yesterday's PM _{2.5}	Hour of Yesterday's MAX	Avg PM _{2.5} (0-6 PST)	
	PM _{2.5}	PM _{2.5}		PM _{2.5}	MAX	Conc	Stn
Colusa	21	15	0.6	36	9	29.0	COL
Butte	39	54	0.6	76	0	29.0	CIC-GRD
Glenn	20	13	1	67	17	23.0	WLW
Placer	25	27	1	45	0	20.0	ROS
Sacramento	35	0	0.2	51	20	33.0	SAC
Sutter	39	49	0.8	56	1	27.0	YUB
Yolo/Solano	19	22	0.4	63	19	31.0	DAV-WOO
Yuba	39	49	0.8	56	1	27.0	YUB
Tehama	21	28	0.8	39	18	27.0	AND
Shasta	21	28	0.8	39	18	27.0	AND

When any district's 0-6 am average PM_{2.5} is ≥ 27 ug/m increasing concentrations will result in a reduction in allocation acres (e.g. 27-28 : 20%, 29-30 : 40%, 31-32 : 60%, 33-34 : 80%)

Burning data: The total ARB acreage allocation for burning from September 15th through November 30th was 160,462 acres. The average daily allocation was 2,139 acres. Total acres burned as of November 30th was 57,070.5 (compared to 42,954.2 acres in 2006) with 771.2 acres the average daily burning. Air districts requested burn acreage increases or updates on 16 days for an additional 6,239 acres. The tables below show burning by county zone and crop residue for the entire fall burn season.

ZONES - SEASON TO DATE - September 15 through November 30, 2007

COUNTY	1	2	3	4	5	6	TOTAL
Butte	3499.8	3159.0	3737.3				10396.0
Colusa	4354.0	3479.0	512.0	3166.0	3255.0		14766.0
Glenn	2683.0	3617.1	3240.0	2725.3			12265.4
Placer	140.0	347.0	124.0				611.0
Sacto	287.9	642.7	1068.5				1999.1
Shasta	0.0	1607.0					1607.0
Sutter	1346.0	2673.0	197.0	911.0	585.0	1301.0	7013.0
Tehama	2375.0						2375.0
Yolo/Sol.	568.0	1022.0	1339.0	323.0	83.0	311.0	3646.0
Yuba	1166.0	1154.0	72.0				2392.0
							57070.5

CROPS - SEASON TO DATE - September 1 through November 30, 2007 (rice)

COUNTY	Other Prunings					TOTAL
	Rice	Field	Removal	Prescribed	Misc	
Butte	6847.0	307.0	3101.3	90.0	50.8	10396.0
Colusa	14890.0	90.0	22.0	142.0	2.0	15146.0
Glenn	8522.3	3089.0	704.5	208.5	84.0	12608.3
Placer	651.0	0.0	0.0	0.0	0.0	651.0
Sacto	287.0	1481.7	205.3	0.0	25.1	1999.1
Shasta	0.0	4.0	2.0	1601.0	0.0	1607.0
Sutter	5254.0	468.0	872.0	0.0	419.0	7013.0
Tehama	0.0	97.0	1854.0	424.0	0.0	2375.0
Yolo/Sol.	823.5	533.0	1965.5	55.0	269.0	3646.0
Yuba	1855.0	15.0	242.0	172.0	362.0	2646.0
						58087.4

Program operations proceeded smoothly with only minor problems when ARB computers were shutdown or PM_{2.5} values were missing or entered incorrectly. The Western Weather Group operations worked well in providing meteorological services and hosting web files. But a few of the AMOS stations experienced some radio problems that resulted in loss of data. Overall, air district ready files were provided promptly and without significant problems.

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