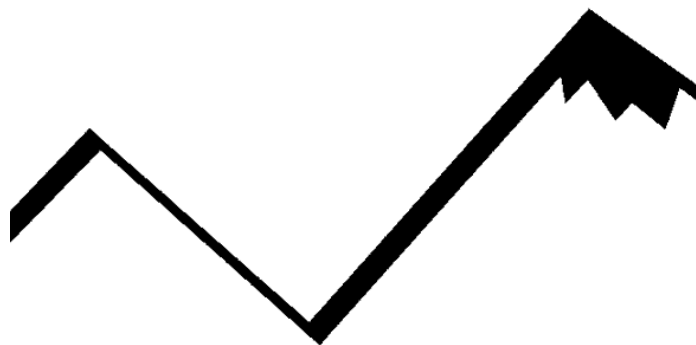
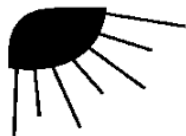


# Natural Event Documentation

Bakersfield, California  
January 4, 2008



San Joaquin Valley Unified  
Air Pollution Control District

February 22, 2008

**Prepared By**

David Nunes, Senior Air Quality Specialist/Atmospheric Scientist

**Reviewed By**

Scott Nester, Director of Planning

Errol Villegas, Program Manager

Stephen Shaw, Supervising Air Quality Specialist

*San Joaquin Valley Unified Air Pollution Control District  
1990 E. Gettysburg Avenue  
Fresno, California 93726*

*(559) 230-5800*

*[www.valleyair.org](http://www.valleyair.org)*

**TABLE OF CONTENTS**

List of Figures..... 3

1. Summary..... 4

2. Background..... 5

3. NEAP Criteria..... 6

4. Summary of Natural Event..... 7

    4.1 PM10 Data Summary..... 7

    4.2 Analysis of PM10 NAAQS Exceedance..... 8

5. NEAP Criteria - Meteorological Data..... 12

6. Emissions Sources and Activity Data..... 17

7. Exceptional Event Criteria Background..... 18

8. Exceptional Event Criteria summary..... 19

9. References..... 20

10. Appendix - Supporting Documents..... 21

    10.1 Newspaper Articles..... 21

    10.2 National Weather Service January 4-5, 2008 Winter Storm Summary..... 24

    10.3 Climate Summaries..... 36

    10.4 Wind Profiles..... 38

    10.5 Surface Weather Maps..... 41

    10.6 Surface Weather Observations..... 45

    10.7 Television News Coverage..... 46

**LIST OF FIGURES**

Figure 1. San Joaquin Valley PM10 monitors. .... 7

Figure 2. Hourly PM10 concentrations at Bakersfield-Golden State Highway and hourly wind speed at Bakersfield-Meadows Airport on January 4, 2008..... 11

Figure 3. Central California annual average precipitation in inches. The San Joaquin Valley Air Basin is outlined in black. .... 14

Figure 4. Wind Advisory issued by the National Weather Service in Hanford, CA on January 4, 2008. .... 15

**LIST OF TABLES**

Table 1. PM10 daily averages in  $\mu\text{g}/\text{m}^3$  recorded by continuous samplers. .... 8

Table 2. January 4, 2008 hourly PM10, wind speed, wind direction and weather observations. .... 10

Table 3. Days prior to January 4, 2008 with precipitation recorded at Bakersfield, Hanford and Fresno (precipitation in inches). .... 12

Table 4. Summary of dust-related complaints for January 4, 2008. .... 17

## 1. SUMMARY

A PM10 exceedance recorded in the San Joaquin Valley on January 4, 2008 meet the criteria for natural events as defined by federal policies. The Bakersfield Meadows Airport reported SSE wind gusts of 28 mph or greater from 9:00 am to 8:00 PM. Peak winds gusted to 41 miles per hour, entraining dust from the desiccated soil in the area. This report demonstrates that without the natural event, there would not have been an exceedance of the PM10 National Ambient Air Quality Standard (NAAQS) on January 4, 2008.

Bakersfield television news coverage from the day confirms the blowing dust as natural exceptional event with video footage and eyewitness accounts. Television weather coverage described the meteorology producing the event as well as wind and rain observations. News coverage also confirmed road closures due to blowing dust on State Route 166 and State Route 46, with travel not recommend on portions of Interstate 5. A DVD of the news coverage is available upon request.



The District investigated emission-generating activities during the episode, and found PM10 emissions for BACM controlled sources were approximately constant before, during and after the event. The District concludes that the PM10 exceedance would not have occurred without the high winds and wind-entrained dust.

## 2. BACKGROUND

The San Joaquin Valley Unified Air Pollution Control District (District) adopted its *Natural Events Action Plan (NEAP) for High Wind Events in the San Joaquin Valley Air Basin* in February 2006. The 1996 EPA memorandum, *Areas Affected by PM10 Natural Events*, describes the requirements for natural event data flagging as well as the requirements for a NEAP. The policy allows air quality data to be flagged so that it does not count toward an area's attainment status if it can be shown that there was a clear, causal relationship between the data and one of three categories of natural events: volcanic and seismic activity, unwanted wildland fires, and high wind events.

The purpose of this report is to demonstrate that there was a clear, causal relationship between the exceedance of the PM10 standard on January 4, 2008 in the San Joaquin Valley Air Basin and a high wind and blowing dust, and demonstrate that without the high winds and blowing dust, PM10 would not have exceeded the standard. Although a combination of several factors contributed to the total PM10 concentrations, the District concludes that the exceedance would not have occurred in the absence of high winds and blowing dust.

Data flagging serves multiple purposes. According to the 1986 U. S. Environmental Protection Agency (EPA) guidance document, *Guideline on the Identification and Use of Air Quality Data Affected by Exceptional Events*, knowledge and understanding of what data represent are critical in the overall air quality process. The major thrust of a data flagging system is information exchange, and data flags are meant to prevent the misuse of data. Flagging the January 4, 2008 exceedance will ensure that the data is not misinterpreted.

### 3. NEAP CRITERIA

The NEAP requires the District, in consultation with California Air Resources Board (CARB) meteorologists, to declare a NEAP episode if criteria five and most or all of criteria one through four are met:

- 1. There has been no recent, measurable precipitation in the potential source region for fugitive dust**
- 2. The National Weather Service in Hanford and/or Sacramento has issued either a High Wind Warning, Wind Advisory, or Blowing Dust Advisory for certain parts of the San Joaquin Valley, and the predicted duration of high winds is sufficient to establish a NEAP episode**
- 3. The surface weather maps show a potential for high winds to occur in the near future**
- 4. Strong winds exist higher in the atmosphere in conjunction with other weather phenomena that can drive the higher wind speeds closer to the surface**
- 5. The 24-hour average PM10 level is forecast to be above the National Ambient Air Quality Standard at one or more San Joaquin Valley sites**

On January 4, 2008 all of the NEAP criteria were met:

Criteria 1. No precipitation had been reported in Bakersfield for the 6 consecutive days prior to the January 4, 2008 event, and only 0.01 inches had been reported for 14 days prior to the event.

Criteria 2. The National Weather Service in Hanford issued a Wind Advisory for the Central and Southern San Joaquin Valley.

Criteria 3 and Criteria 4. Strong winds were reported in the San Joaquin Valley Air Basin. Winds gusted to 41 miles per hour in Bakersfield.

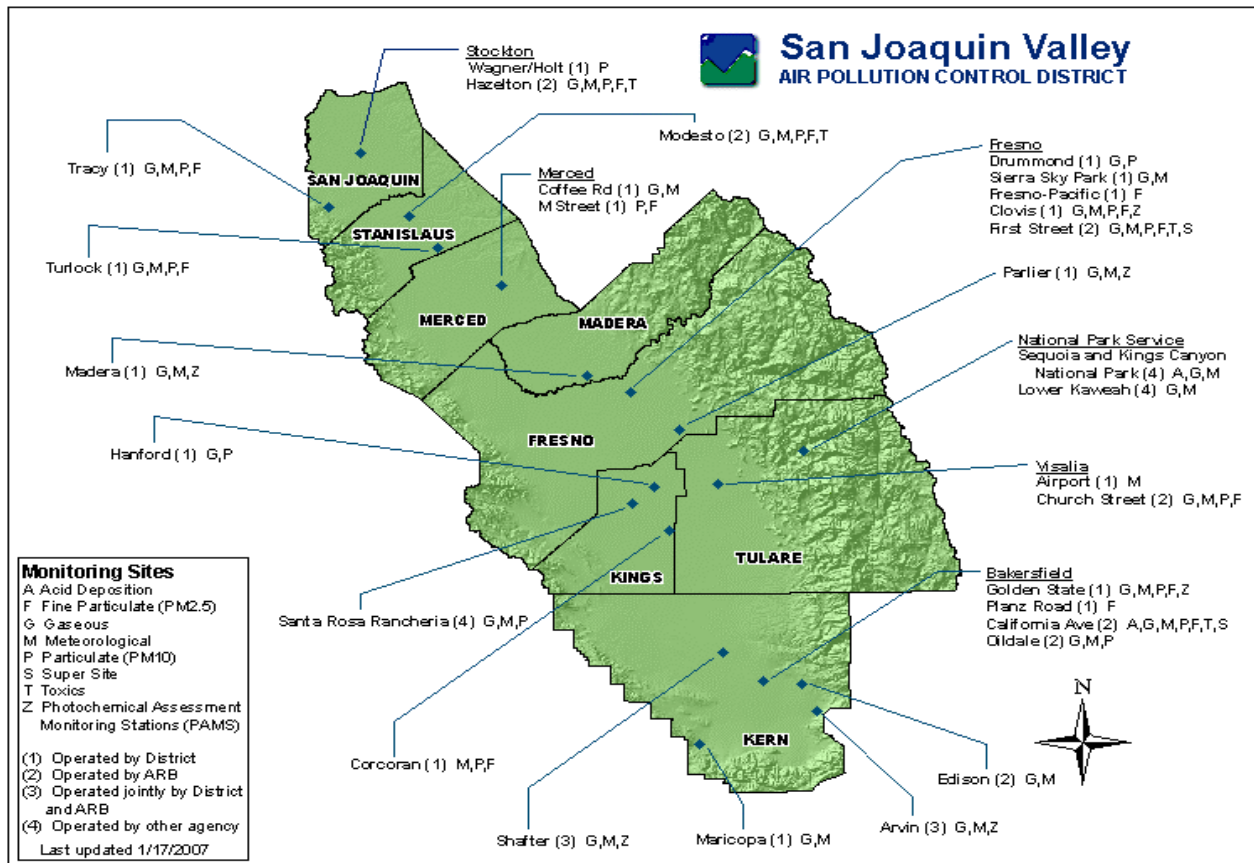
Criteria 5. The PM10 NAAQS was exceeded in Bakersfield.

## 4. SUMMARY OF NATURAL EVENT

### 4.1 PM10 Data Summary

On January 4, 2008, Federal Equivalent Method (FEM) samplers recorded concentrations in excess of the 24-hour NAAQS for PM10 in the San Joaquin Valley. The NAAQS is 150  $\mu\text{g}/\text{m}^3$  rounded to the nearest 10  $\mu\text{g}/\text{m}^3$ , which equates to 155  $\mu\text{g}/\text{m}^3$ . A map of San Joaquin Valley monitoring stations is provided in Figure 1.

Figure 1. San Joaquin Valley PM10 monitors.



The District and ARB collect hourly PM10 concentrations recorded by PM10 Tapered Element Oscillating Microbalance (TEOM) type monitors and Beta Attenuation Mass (BAM) type monitors. PM10 concentrations for continuous analyzers are presented Table 1. On January 4, 2008, the 24-hour averaged PM10 concentration reached 338  $\mu\text{g}/\text{m}^3$  at Bakersfield-Golden State Highway TEOM type monitor.

EPA certifies TEOM type monitors to be equivalent to Federal Reference Method (FRM) samplers making them Federal Equivalent Method (FEM) samplers (EQPM-1090-079).

TEOM monitors are located at Tracy, Corcoran and Bakersfield-Golden State. A BAM monitor is operated by CARB at the Fresno-First Street monitoring station (EQPM-0798-122).

The only FRM collecting samples on January 4, 2008 in the San Joaquin Valley was at Corcoran. The FRM in Corcoran measured 110  $\mu\text{g}/\text{m}^3$  of PM10.

Table 1 shows that PM10 was gradually decreasing in Bakersfield from January 1 to January 3 due to improving dispersion weather conditions. On January 4, a frontal passage accompanied by high winds, created blowing dust in portions of the San Joaquin Valley that received limited rain.

**Table 1. PM10 daily averages in  $\mu\text{g}/\text{m}^3$  recorded by samplers.**

Station	Type	Jan 1	Jan 2	Jan 3	Jan 4	Jan 5	Jan 6	Jan 7
Tracy	TEOM	14	24	24	8	9	6	7
Fresno - First Street	BAM	64	68	40	59	16	21	20
Corcoran	TEOM	19	32	52	118 <sup>1</sup>	12	7	11
Bakersfield - Golden State	TEOM	95	61	70	338	12	6	17

#### 4.2 Analysis of PM10 NAAQS Exceedance

As described in the District's NEAP and in EPA policy, the following sources of documentation, if available, may be used to establish a clear, causal relationship between an exceedance and a natural event:

- Meteorological data (e.g., wind speed and wind direction to support a source receptor relationship)
- Modeling and receptor analysis
- Videos and/or photographs of the event and the resulting emissions
- Maps of the areas showing sources of emissions and the area affected by the event
- News accounts of the event
- Filter analysis

<sup>1</sup> The FRM filter based sampler in Corcoran measured a PM10 24-hr average of 110  $\mu\text{g}/\text{m}^3$  January 4, 2008.



- In the case of high-wind events, states must document that BACM were required for anthropogenic sources at the time of the high-wind event

In consultation with the ARB, the District compiled documentation of the causal relationship between the PM10 NAAQS exceedance and the natural event. The District has determined that the cause of this PM10 event was wind-entrained dust from local sources. PM10 emissions for BACM controlled sources were approximately constant before, during and after the event, indicating the significant increase in PM10 concentrations was caused by the wind entrained dust. This report will provide evidence of high winds in the Southern San Joaquin Valley on January 4, 2008, coinciding with observations of blowing dust and an increase in PM10 at Bakersfield.

PM10 at Bakersfield rapidly increased from  $36 \mu\text{g}/\text{m}^3$  at hour 6 to  $876 \mu\text{g}/\text{m}^3$  at hour 10, as shown in Table 2 and Figure 2. The increase in Bakersfield PM10 concentrations coincided with a significant increase in wind speed at Bakersfield, which reported SSE wind gusts of 28 mph or greater starting during hour 9 and continuing to hour 20. A peak gust of 41 mph was reported during hour 14. A cold front passed through the Bakersfield area during hour 22, accompanied by strong winds from the WNW. The trained weather observers at Bakersfield Meadows Airport reported weather observations of blowing dust from hour 8 to hour 15. Light rain began during hour 16 and PM 10 concentrations decreased. The rain ceased during hour 17 and PM10 concentrations increased until hour 20 when light rain again was reported. PM10 concentrations then decreased to a concentration of  $0 \mu\text{g}/\text{m}^3$  by hour 23.

Television news coverage of the storm confirms high wind and blowing dust through video documentation and eyewitness accounts.

**Table 2. January 4, 2008 hourly PM10, wind speed, wind direction and weather observations.**

Hour	Bakersfield – Golden State PM10 ( $\mu\text{g}/\text{m}^3$ )	Bakersfield Meadows Airport			
		Wind Speed (mph)	Wind Direction	Wind Gust (mph)	Weather Observation
0	67	5	E	-	Partly Cloudy
1	47	8	SSE	-	Overcast
2	42	6	SE	-	Mostly Cloudy
3	39	5	ESE	-	Overcast
4	35	6	ESE	-	Overcast
5	43	7	SE	-	Overcast
6	36	6	ESE	-	Mostly Clear
7	400	3	SSE	-	Overcast
8	694	18	SSE	-	Blowing Dust
9	302	26	SSE	37	Blowing Dust
10	876	23	SSE	36	Blowing Dust
11	950*	28	SSE	38	Blowing Dust
12	943*	25	SSE	37	Blowing Dust
13	643	20	SSE	29	Blowing Dust
14	945*	30	SSE	41	Blowing Dust
15	387	25	SSE	39	Blowing Dust
16	200	29	SSE	33	Light Rain
17	55	30	SSE	35	Overcast
18	225	24	SSE	33	Mostly Cloudy
19	362	22	SSE	37	Overcast
20	541	21	SSE	28	Light Rain
21	241	3	Variable	-	Overcast
22	41	32	WNW	37	Light Rain
23	0	22	NW	-	Light Rain
<b>Avg.</b>	<b>338</b>				-

Hour 0 is Midnight to 12:59:59 AM, Pacific Standard Time. Data is preliminary. An asterisk indicates PM10 reached the top of the instruments range. Gust is a peak 3 second average and wind speed is a 10 minute average ending on the hour. Weather data at Bakersfield-Meadows was obtained from the Mesowest website and the National Weather Service.

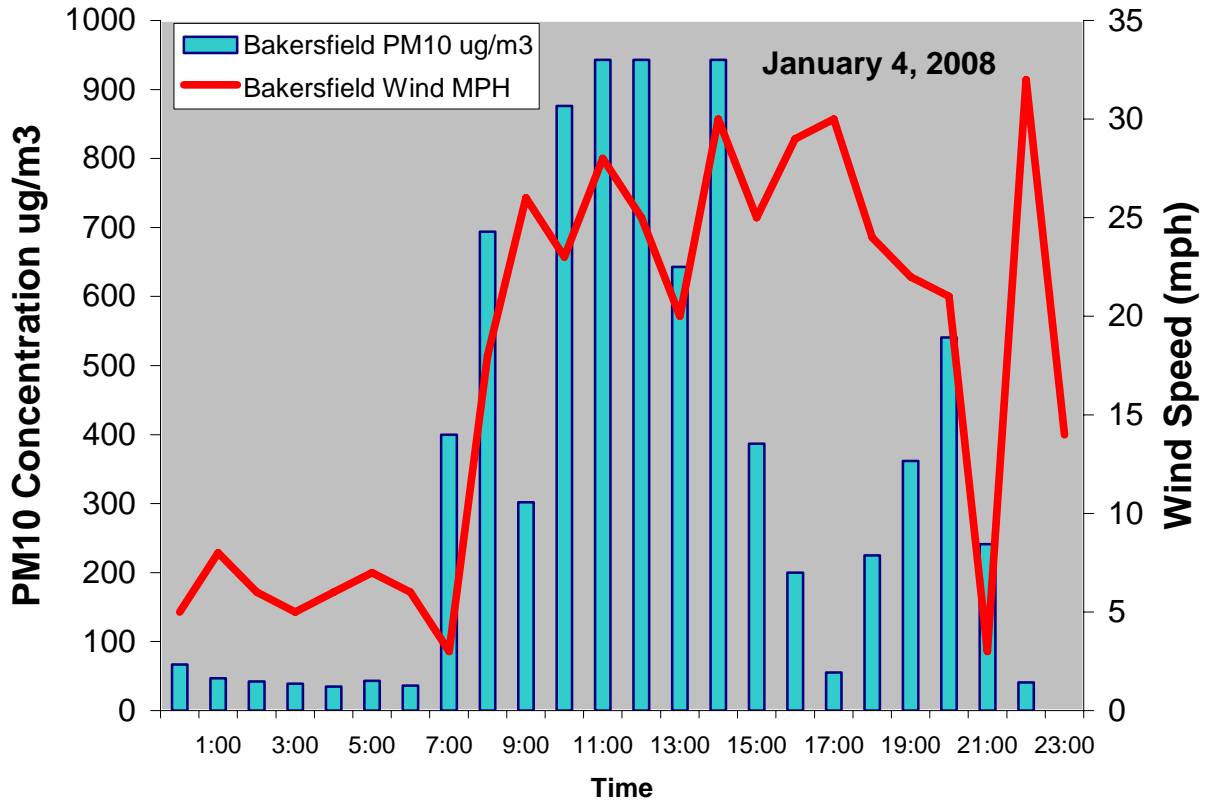


Figure 2. Hourly PM10 concentrations at Bakersfield-Golden State Highway and hourly wind speed at Bakersfield-Meadows Airport on January 4, 2008.

**5. NEAP CRITERIA - METEOROLOGICAL DATA**

The following meteorological information is presented to demonstrate that the NEAP meteorological flagging criteria were met.

**Criteria 1 - No recent, measurable precipitation in the potential source region for fugitive dust**

Precipitation data is provided to demonstrate that the period preceding the blowing dust event was not significantly wet in the Bakersfield area to limit blowing dust. Moisture content of soils is a very significant factor in a blowing dust event. Soils that have lower than normal moisture content during the driest time of the year would be more easily entrained by strong winds.

***Precipitation***

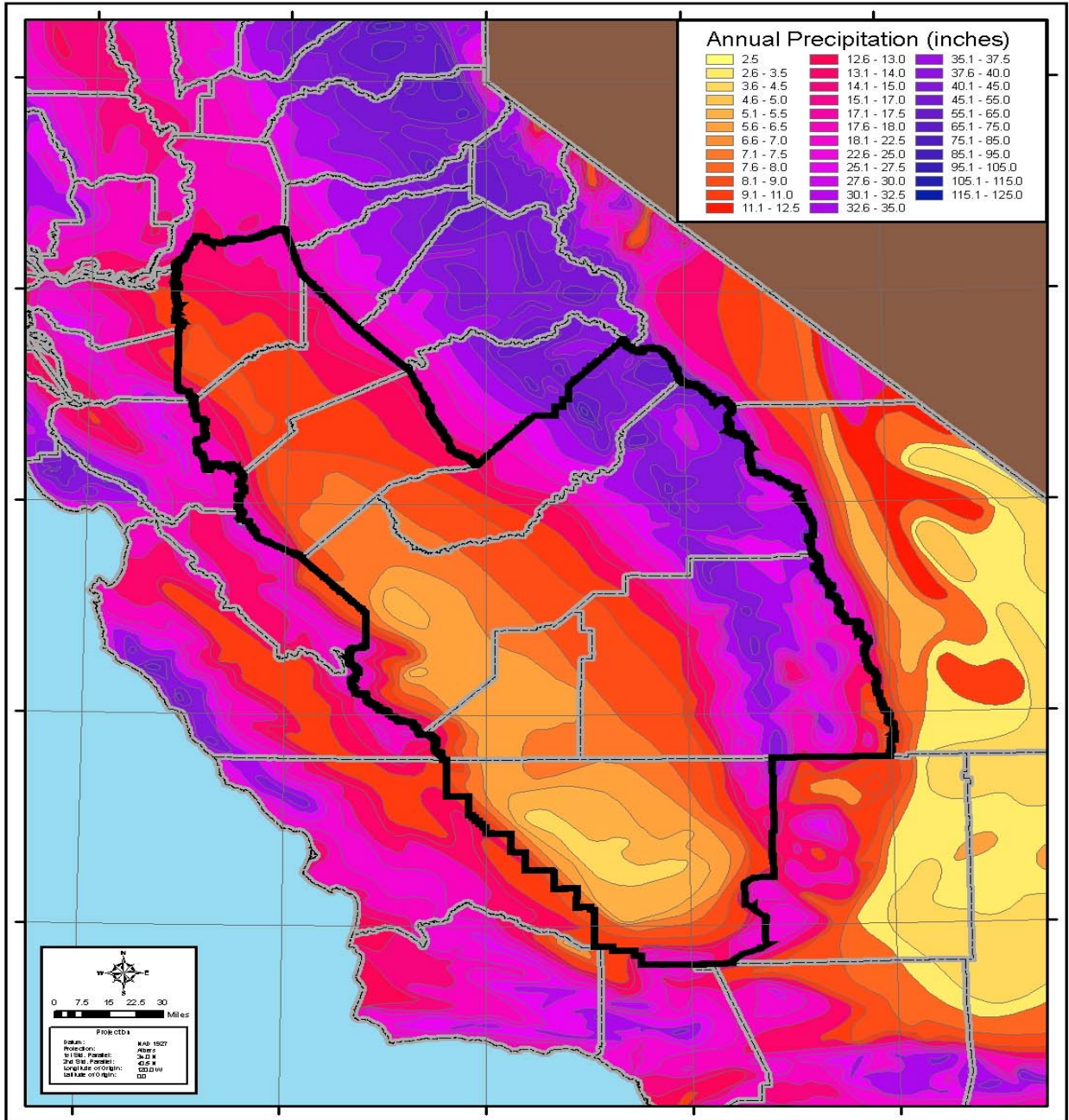
During the 6 consecutive days prior to the January 4, 2008 event, Bakersfield received no measurable precipitation. During the 14 consecutive days prior to the January 4, 2008 event, Bakersfield only received 0.01 inches of measurable precipitation. Table 3 shows daily precipitation totals in the Bakersfield area for the days prior to the blowing dust event.

**Table 3. Days prior to January 4, 2008 with precipitation recorded at Bakersfield, Hanford and Fresno (precipitation in inches).**

<b>Date</b>	<b>Bakersfield</b>	<b>Hanford</b>	<b>Fresno</b>
January 4, 2008	0.09	0.55	1.23
January 3, 2008	0	0	Trace
January 2, 2008	0	0	0
January 1, 2008	0	0	0
December 31, 2007	0	0	0
December 30, 2007	0	0	0
December 29, 2007	0	Trace	Trace
December 28, 2007	0.01	0.04	0.01
December 27, 2007	0	0	0
December 26, 2007	0	Trace	0.01
December 25, 2007	0	0	0
December 24, 2007	0	0	0
December 23, 2007	0	0	0
December 22, 2007	0	0	0
December 21, 2007	0	0	0

Because precipitation in the Southern San Joaquin Valley was minimal before the dust event, soils were dry enough to become entrained into the atmosphere during the high winds.

Figure 3 is a map of annual precipitation for the San Joaquin Valley Air Basin. The map demonstrates that the west side of the Central and Southern San Joaquin Valley has the lowest annual precipitation of any area west of the desert areas of Owens Valley, Mojave Desert and Antelope Valley. Since the west side of Kern County has the lowest annual precipitation in the San Joaquin Valley, the undisturbed soils, on the average, are drier than other parts of the valley.



**Figure 3. Central California annual average precipitation in inches. The San Joaquin Valley Air Basin is outlined in black.**

## **Criteria 2 – Wind Advisory issued by the National Weather Service**

The National Weather Service in Hanford, CA issued a Wind Advisory at 12:30 pm PST on January 4, 2008 to notify the public of gusty winds throughout the San Joaquin Valley and surrounding mountains and deserts (see Figure 4).

### **Figure 4. Wind Advisory issued by the National Weather Service in Hanford, CA on January 4, 2008.**

#### Wind Advisory

URGENT - WEATHER MESSAGE  
NATIONAL WEATHER SERVICE SAN JOAQUIN VALLEY - HANFORD CA  
1230 PM PST FRI JAN 4 2008

.A LARGE PACIFIC STORM WILL BRING VERY STRONG WINDS TO THE AREA TODAY AND INTO TONIGHT. WINDS WILL CONTINUE TO STRENGTHEN EARLY THIS AFTERNOON...WITH THE STRONGEST WINDS LATER IN THE DAY. GUSTY WINDS OF 50 MPH WILL BE LIKELY IN THE SAN JOAQUIN VALLEY...SIERRA NEVADA FOOTHILLS...AND KERN COUNTY MOUNTAINS AND DESERTS. WINDS ARE EXPECTED TO TAPER OFF LATE TONIGHT.

CAZ089>095-098-099-050500-  
/O.CON.KHNX.WI.Y.0001.000000T0000Z-080105T0600Z/  
WEST CENTRAL SAN JOAQUIN VALLEY-EAST CENTRAL SAN JOAQUIN VALLEY-  
SOUTHWESTERN SAN JOAQUIN VALLEY-SOUTHEASTERN SAN JOAQUIN VALLEY-  
MARIPOSA MADERA AND FRESNO COUNTY FOOTHILLS-  
TULARE COUNTY FOOTHILLS-KERN COUNTY MOUNTAINS-INDIAN WELLS VALLEY-  
SOUTHEASTERN KERN COUNTY DESERT-  
1230 PM PST FRI JAN 4 2008

...WIND ADVISORY REMAINS IN EFFECT UNTIL 10 PM PST THIS EVENING FOR THE SAN JOAQUIN VALLEY...SIERRA NEVADA FOOTHILLS...KERN COUNTY MOUNTAINS AND DESERTS..

THE NATIONAL WEATHER SERVICE IN HANFORD WILL ALLOW A WIND ADVISORY FOR THE SAN JOAQUIN VALLEY...SIERRA NEVADA FOOTHILLS...KERN COUNTY MOUNTAINS AND DESERTS TO REMAIN IN EFFECT UNTIL 10 PM PST THIS EVENING.

A VERY STRONG PACIFIC STORM FRONT WAS CROSSING THE REGION TODAY. STRONG WINDS WERE DEVELOPING ACROSS INTERIOR CENTRAL CALIFORNIA...AND WILL CONTINUE TO STRENGTHEN LATER TODAY. SUSTAINED SOUTHEAST WINDS OF 25 TO 35 MPH WITH FREQUENT GUSTS TO 50 MPH WERE OCCURRING IN MERCED COUNTY AND THE HIGHER ELEVATIONS AND WILL LIKELY OCCUR OVER THE REST OF THE VALLEY LATER THIS AFTERNOON. LOCALLY HIGHER GUSTS OF UP TO 60 MPH WILL ALSO BE POSSIBLE BELOW PASSES AND THROUGH CANYONS.

A WIND ADVISORY MEANS THAT SUSTAINED WIND SPEEDS OF AT LEAST 35 MPH OR GUSTS OF 45 MPH OR MORE ARE EXPECTED. WINDS THIS STRONG CAN MAKE DRIVING DIFFICULT...ESPECIALLY FOR HIGH PROFILE VEHICLES. SMALL BRANCHES OR SHALLOW ROOTED TREES COULD EVEN BE

DOWNED BY WINDS OF THIS MAGNITUDE. CONTINUE TO MONITOR THE LATEST FORECASTS FROM THE NATIONAL WEATHER SERVICE IN HANFORD.

\$\$

MOLINA

WEATHER.GOV/HANFORD

### **Criteria 3 and 4 - Strong winds**

As shown in Table 2, strong gusty winds occurred in Bakersfield during the January 4, 2008 blowing dust event. Observations at Bakersfield, Meadows Field Airport indicate 14 hours of sustained winds greater than 20 mph and 10 hours with gusts greater than 30 mph. The highest record gust was 41 mph. The high wind event resulted in entrainment of dust and reports of blowing dust in the Bakersfield area. Television news coverage from the day documented the high winds with video footage and eyewitness reports.

Wind profiles documenting strong winds aloft in the San Joaquin Valley on January 4, 2008 are provided in the appendix. Strong winds associated with the frontal passage are evident in the wind profiles.

Surface weather maps for the event are provided in the appendix. Closely packed isobars, which are indicators of strong surface winds, are evident in these maps.



## 6. EMISSIONS SOURCES AND ACTIVITY DATA

The District has best available control measures (BACM) in place as described in the *2006 PM10 Plan*, the NEAP, and previous plans. Most notable among the District's dust controls are Regulation VIII (the fugitive dust rules, which were last amended in August 2004), and Conservation Management Practices (CMPs, District Rule 4550, adopted May 2004 and re-adopted August 2004), through which the District has documented CMPs on over three million acres of agricultural land in the San Joaquin Valley Air Basin.

Agricultural burning was permitted in the San Joaquin Valley on January 4, 2008 as part of the District's Smoke Management Allocation System (Rule 4103). Burning was limited to 10.7 tons of PM10 emissions for the entire San Joaquin Valley with 2.3 tons of PM10 emissions in Kern County.

Rule 4901, Wood Burning Fireplaces and Wood Burning Heaters, includes episodic wood burning curtailment during the months of November through February. This rule prohibits anyone from operating a wood burning fireplace or wood burning heater whenever the District notifies the public that an episodic curtailment is in effect, as determined by the Air Quality Index (AQI). The District issues curtailments by county, and the District may prohibit or discourage burning. Due to excellent dispersion conditions the District did not issue voluntary or mandatory curtailments during this event.

Based on a survey of the available information, there is no evidence of unusual emissions on January 4, 2008, other than the blowing dust event. Smoke from agricultural burns and residential wood combustion does not appear to have added any significant amount of PM10 to the samples recorded at Bakersfield.

PM10 was emitted from BACM controlled sources. BACM controls were overwhelmed by the high winds. The Conservation Management Practices program was in place for agricultural operations on January 4, 2008. Based on reports from District field staff and from industry and agricultural operations, the District estimates that activities that generate anthropogenic fugitive PM10 were approximately constant before, during and after the event, indicating the significant increase in PM10 concentrations was caused by the wind entrained dust. A summary of the dust related complaints reported on January 4, 2008 in the Central and Southern San Joaquin Valley Air Basin is provided in Table 4.

**Table 4. Summary of dust-related complaints for January 4, 2008.**

Location	Time Reported	Nature Of Complaint
Taft	12:03 PM	Portable concrete crusher operating in wind storm. Dust coming from crushing, conveyor and pile.

## 7. EXCEPTIONAL EVENT CRITERIA BACKGROUND

In the March 22, 2007 Federal Register, the Environmental Protection Agency (EPA) presented the final rule addressing the review and handling of air quality monitoring data influenced by exceptional events. Exceptional events are events for which the normal planning and regulatory process established by the Clean Air Act (CAA) is not appropriate. In this rulemaking action, EPA finalized the proposal to:

- Implement section 319(b)(3)(B) and section 107(d)(3) authority to exclude air quality monitoring data from regulatory determinations related to exceedances or violations of the NAAQS; and,
- Avoid designating an area as nonattainment, redesignating an area as nonattainment, or reclassifying an existing nonattainment area to a higher classification if a State adequately demonstrates that an exceptional event has caused an exceedance or violation of a NAAQS.

The EPA requires states to take reasonable measures to mitigate the impacts of an exceptional event. In accordance with the language in section 319, EPA defines the term "exceptional event" to mean an event that:

- (i) Affects air quality;
- (ii) Is not reasonably controllable or preventable;
- (iii) Is an event caused by human activity that is unlikely to recur at a particular location or a natural event; and
- (iv) Is determined by EPA through the process established in the regulations to be an exceptional event.

Data flagging serves multiple purposes. According to the 1986 U. S. Environmental Protection Agency (EPA) guidance document, *Guideline on the Identification and Use of Air Quality Data Affected by Exceptional Events*, knowledge and understanding of what data represent are critical in the overall air quality process. The major thrust of a data flagging system is information exchange, and data flags are meant to prevent the misuse of data. Flagging the January 4, 2008 exceedance will ensure that the data is not misinterpreted.

EPA notes that natural events, which are one form of exceptional events according to this definition, may recur, sometimes frequently (e.g., western wildfires). For the purposes of this rule, EPA defines "natural event" as an event in which human activity plays little or no direct causal role to the event in question. The EPA recognizes that over time, certain human activities may have had some impact on the conditions which later give rise to a "natural" air pollution event. However, EPA does not believe that small historical human contributions should preclude an event from being deemed "natural."

## 8. EXCEPTIONAL EVENT CRITERIA SUMMARY

The District demonstrated that the exceedance of the PM10 NAAQS in Bakersfield on January 4, 2008 satisfied the following exceptional event criteria referenced in the previous section:

1) The event affected air quality.

Table 1 shows that PM10 concentrations in Bakersfield were low on days before and after the high wind event. Table 2 and Figure 2 show that PM10 concentrations increased rapidly with the arrival of high winds.

2) The event is not reasonably controllable or preventable.

As described in Section 6 there were no unusual emission activities on January 4, 2008 that if controlled would have prevented the event. The event overcame BACM controls.

3) There is a clear causal connection between the exceedances and the claimed exceptional event.

The causal connection was demonstrated by showing the dramatic increase in hourly PM10 concentrations that coincided with high winds.

4) The event is associated with measured concentration in excess of normal historical fluctuations including background.

The 24-hour average PM10 concentration of 338  $\mu\text{g}/\text{m}^3$  at Bakersfield on January 4, 2008 was the highest 24-hour average PM10 concentration recorded in the San Joaquin Valley Air Basin for the period 1991 to 2008. The District concludes that the natural event was unusual because the concentration was the highest 24-hour average PM10 concentration recorded in a 17-year period.

5) There would have been no exceedance “but for” the event.

There are several indications that there would not have been an exceedance of the PM10 NAAQS in Bakersfield on January 4, 2008, but for the presence of high winds. Data presented in this report presents the impact of high winds on air quality on January 4, 2008. PM10 concentrations in Bakersfield were low until wind began to increase in the area.

Based on the data provided in this report, the District concludes that there would not have been an exceedance of the PM10 NAAQS in Bakersfield on January 4, 2008 if high winds were not present.

## 9. REFERENCES

California Department of Water Resources, *California Irrigation Management Information System (CIMIS)*, <http://www.cimis.water.ca.gov/cimis/welcome.jsp>

Desert Research Institute (DRI), Western Regional Climate Center, <http://www.wrcc.dri.edu> , *Western Climate Summaries*

Environmental Protection Agency (EPA). *Guideline on the Identification and Use of Air Quality Data Affected by Exceptional Events*. July 1986.

Environmental Protection Agency (EPA). *Memorandum: Areas Affected by PM10 Natural Events*. May 1996.

Mesowest historical meteorological data, *Mesowest*, <http://www.met.utah.edu/mesowest>

National Oceanic and Atmospheric Administration (NOAA): ESRL/Physical Sciences Division, Profiler Data

Department of Earth and Atmospheric Sciences, University at Albany, State University of New York, <http://www.atmos.albany.edu/weather/difax.html> : Surface weather maps

National Oceanic and Atmospheric Administration (NOAA): Weather data, <http://www.weather.gov>

Naval Postgraduate School, Department of Meteorology, Profiler Data, <http://www.weather.nps.navy.mil/profiler/coastprof.html>

KERO Channel 23 (ABC), Bakersfield: Television news coverage

KGET Channel 17 (NBC), Bakersfield: Television news coverage

KBAK Channel 29 (CBS), Bakersfield: Television news coverage

## 10. APPENDIX - SUPPORTING DOCUMENTS

### 10.1 Newspaper Articles

#### **First major storm of '08 blows into Kern County**

UPDATED: January 4, 2008 9:42 pm

SOURCE: KGET.COM

[http://www.kget.com/mostpopular/story.aspx?content\\_id=c5360e96-bea8-4a9d-8b77-ef82eae430ad](http://www.kget.com/mostpopular/story.aspx?content_id=c5360e96-bea8-4a9d-8b77-ef82eae430ad)

Brutal weather blew into Bakersfield  
Friday

The wind downed power lines, snapped trees, and kicked up massive amounts of dust.

Dust clouded the sky and power lines were down across roads throughout town.

PG&E says within a 24-hour period, around 7,800 customers were without power at some point.



In northeast Bakersfield, the Casa Loma Water Company's small office building was engulfed in flames, but all firefighters could do was watch. That's because wind knocked a power line onto a nearby fence, separating firefighters from the structure.

"The wire has energized the fence and we can't make entry at this point until PG&E shuts the power down," said Chief Garth Milam from the Bakersfield Fire Department. "The moment the shut the power down, we'll be able to move inside and confirm what we have inside this building."

But many people said the worst thing about the weather Friday was the dust.

"It's ugly," said Melissa Campbell. "As Winnie the Pooh would say, 'it's a blustery day!'"

The bad conditions had a group of Canadian RVers sidelined, forced to wait out the storm in the Wal-Mart parking lot.

"Our RV was going back and forth on the road," said Mary Lyons

"The wind here today is very strong," said Ellen Clark. "It's like hurricane weather almost. It's very strong."

**Storm Brings Dust, Wind Gusts, Rain: Dust, Wind Storm Closes Highways, Causes Outages**

POSTED: 5:48 pm PST January 3, 2008

UPDATED: 1:39 pm PST January 7, 2008

SOURCE: TurnTo23.com

<http://www.turnto23.com/news/14974824/detail.html>

**BAKERSFIELD, Calif.** -- Dust, wind and rain blew into Kern County Friday closing two highways and causing outages. Visibility around the Central Valley, including Bakersfield, was low at times from gusts of wind that carried dust and debris.

Averaging about 20 mile-an-hour winds, the dust storm blasted up to 40 miles per hour and reminded some of the powerful dust storm 30 years ago in 1977 that wreaked havoc on the southern Central Valley's cities and towns. Winds then reached 70 and 80 miles per hour with reported gusts of over 100 miles an hour.

John Rios, who commented on an ABC23 YouTube video, said about

Friday's winds just south of Bakersfield, "You should have filmed in Pumpkin Center near Taft Highway and Wible. Now that was a dust storm."



There were two road closures Friday on highways 46 and 166 in western Kern County as a result of stormy weather. Both have since re-opened.

PG&E said 7,400 customers lost power due to the storm. They sent two dozen crews around the area to make repairs and assess damage. They also said residents should be on the lookout for broken poles, tree limbs fallen into wires and downed power lines. Anyone who sees a downed line, call PG&E at 800-PGE-5000.

Tree limbs could be seen broken and lying along roadsides around the Bakersfield area, with one large limb having crashed into an alleyway near Gosford Road and South Laurelglen.

Bakersfield.com reported that some outlying areas made use of sandbags to shore up creeks that might swell from the possible heavy amount of forecasted rain.

In the wake of a major threat of flooding and power outages for the next two to three days in Kern County, several local agencies have urged residents to be prepared.

The Kern County Fire Department offers sandbags in case of flooding in many outlying areas.

PG&E has recommended that people have plenty of fresh water and battery-operated radios and flashlights in the event of a power outage.

In the event of flooding in outlying areas of the county, people should be prepared to evacuate.

There's no question rain is needed as 2007 was the driest year since 1961. Kern County could get more rain during the coming early 2008 storms than in all of 2007.



The precipitation being forecast can be dangerous and that's why officials are urging people to be prepared.

**Reminder:** Kern County residents can get emergency weather information by dialing 211.

### **Highways 33, 46 Re-Open After Weather Closures**

POSTED: 2:14 pm PST January 4, 2008

UPDATED: 9:08 am PST January 5, 2008

SOURCE: TurnTo23.com

<http://www.turnto23.com/news/14981535/detail.html>

**KERN COUNTY, Calif.** -- Highway 166 in Kern County has re-opened after being closed due to poor visibility and high winds Friday.

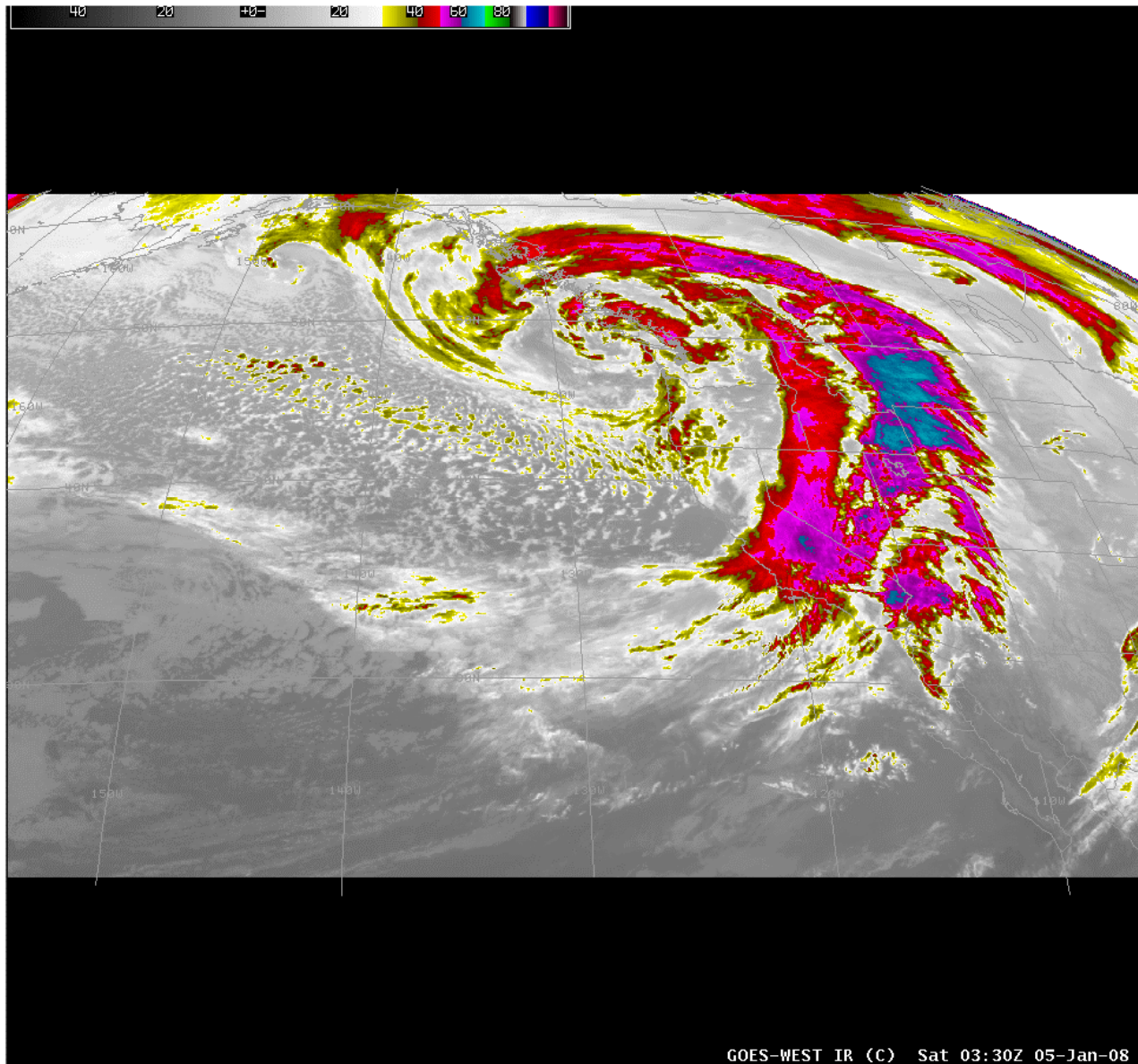
Highway 46 was also closed Friday between Highways 33 and 41, but is also now open.

## 10.2 National Weather Service January 4-5, 2008 Winter Storm Summary

SOURCE: National Weather Service, weather.gov

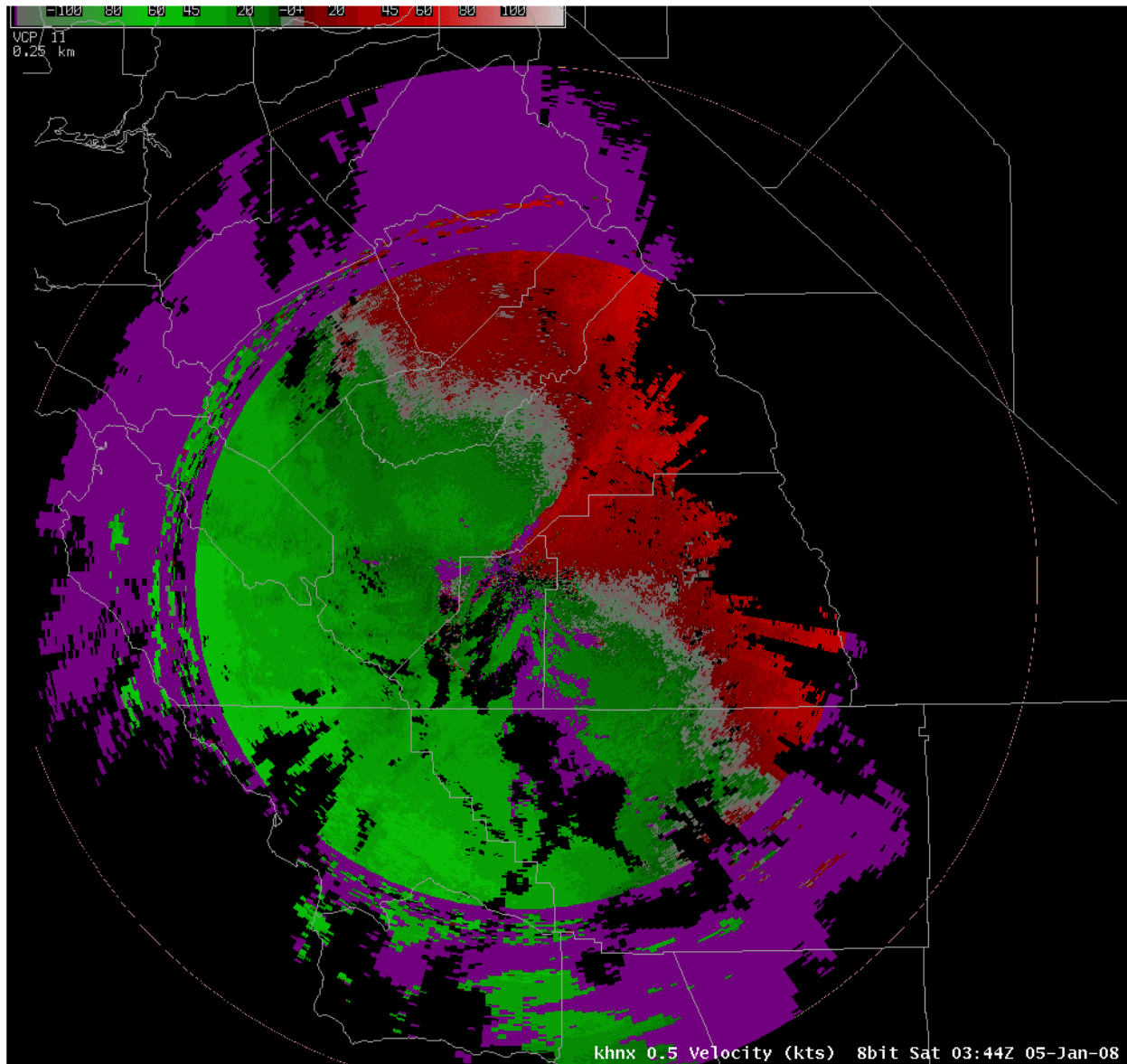
On the morning of January 4, 2008, a strong cold front associated with an intense low pressure center off the Pacific Northwest Coast crossed Central California. This storm produced strong winds throughout the Central California Interior from the morning of the 4th through the morning of the 5th. The high wind reports can be found here below. This storm also produced heavy rainfall over much of the area for several hours with most of the precipitation falling as snow above 7000 feet. Up to 8 1/2 feet of new snowfall was reported near the Southern Sierra Nevada Crest on the January 4th and 5th. Precipitation totals from this storm can be found below.

The IR image of the storm at 730 pm PST January 4, 2008 is shown below.





The 0.5 Degree Base Velocity from KHNX at 744 pm PST January 4, 2008.



The following pictures below are presented courtesy of the Kings County Fire Department. They contain damage that occurred in Avenal during the afternoon and evening of January 4, 2008.

Large portion of tree falls on building.



Roof torn off of building.



Damage to airplane.



Frame torn down.



Utility poles torn down.



Roof collapses.



**PRELIMINARY LOCAL STORM REPORT...SUMMARY**

NATIONAL WEATHER SERVICE SAN JOAQUIN VALLEY CA  
937 PM PST SAT JAN 05 2008

..TIME...	...EVENT...	...CITY LOCATION...	...LAT.LON...
..DATE...	....MAG....	..COUNTY LOCATION..ST..	...SOURCE....
	..REMARKS..		
0849 AM 01/04/2008	NON-TSTM WND GST M55.00 MPH	RIDGECREST KERN CA	35.63N 117.66W MESONET
0953 AM 01/04/2008	NON-TSTM WND GST M45.00 MPH	MERCED MERCED CA	37.30N 120.48W ASOS
1035 AM 01/04/2008	NON-TSTM WND GST M43.00 MPH	MADERA MADERA CA	36.97N 120.08W ASOS
1100 AM 01/04/2008	NON-TSTM WND DMG MERCED	MERCED MERCED CA	37.30N 120.48W BROADCAST MEDIA
A FEW SMALL TREES DOWN. TIME ESTIMATED.			
1236 PM 01/04/2008	NON-TSTM WND GST M51.00 MPH	COALINGA FRESNO CA	36.14N 120.36W MESONET
1245 PM 01/04/2008	NON-TSTM WND GST M44.00 MPH	MERCED MERCED CA	37.30N 120.48W OTHER FEDERAL
MEASURED AT CASTLE AIRPORT /KMER/.			
0102 PM 01/04/2008	NON-TSTM WND GST M48.00 MPH	6 W LOS BANOS MERCED CA	37.06N 120.94W MESONET
0131 PM 01/04/2008	NON-TSTM WND GST M37.00 MPH	SAN LUIS NWR RAW MERCED CA	37.18N 120.79W MESONET
0236 PM 01/04/2008	NON-TSTM WND GST M51.00 MPH	KEENE KERN CA	35.25N 118.61W MESONET
0252 PM 01/04/2008	NON-TSTM WND GST M41.00 MPH	BAKERSFIELD KERN CA	35.36N 119.00W ASOS
0352 PM 01/04/2008	NON-TSTM WND GST M60.00 MPH	MOUNT TOM RAW FRESNO CA	37.38N 119.18W MESONET
0400 PM 01/04/2008	NON-TSTM WND GST M47.00 MPH	1 W TIOGA PASS TUOLUMNE CA	37.91N 119.28W MESONET
0405 PM 01/04/2008	NON-TSTM WND GST M39.00 MPH	WASCO KERN CA	35.59N 119.34W MESONET
0413 PM 01/04/2008	NON-TSTM WND GST M68.00 MPH	INDIAN WELLS CANYON RAW KERN CA	35.69N 117.89W MESONET
0450 PM 01/04/2008	NON-TSTM WND GST M66.00 MPH	KETTLEMAN HILLS RAW KINGS CA	36.03N 120.06W MESONET

0500 PM NON-TSTM WND DMG AVENAL 36.03N 120.11W  
 01/04/2008 KINGS CA NWS EMPLOYEE

AT LEAST TWO GLIDER PLANES BLEW OVER AT THE AVENAL  
 GLIDERPORT. THE GLIDER PLANES WERE PICKED UP AND THROWN  
 OVER SOME BUSHES AND ROLLED INTO A BALL. WINDS AT NEARBY  
 MESONET SITE AT COALINGA WERE 45 MPH. DAMAGE ESTIMATED AT  
 40,000 DOLLARS.

0500 PM NON-TSTM WND DMG AVENAL 36.03N 120.11W  
 01/04/2008 KINGS CA COUNTY OFFICIAL

\*\*\* 2 INJ \*\*\* UPDATE TO PREVIOUS INFO...CONFIRMED  
 SCATTERED DAMAGE THROUGHOUT THE TOWN OF AVENAL. SMALL  
 AIRPORT HANGAR AND 2 SMALL PLANES BLOWN ACROSS HWY 33.  
 SCHOOL ROOF DESTROYED. NUMEROUS INSTANCES OF SHINGLES  
 REMOVED FROM ROOFS. SEVERAL TREES AND POWER POLES DOWNED.  
 DAMAGE ESTIMATE 2 MILLION DOLLARS. 2-3 HRS OF SYNOPTIC  
 WINDS ASSOC WITH FAST MOVING COLD FRONT. PEAK WIND 70 MPH  
 EST BY DAMAGE AND MESONET OBS. A BOY WAS INJURED BY A  
 TREE BRANCH AND A MAN WAS INJURED WHEN A TREE FELL ON HIS  
 MOBILE HOME.

0514 PM NON-TSTM WND GST CRANE FLAT RAWS 37.76N 119.82W  
 01/04/2008 M75.00 MPH TUOLUMNE CA MESONET

0534 PM NON-TSTM WND GST LEMOORE 36.30N 119.79W  
 01/04/2008 M38.00 MPH KINGS CA ASOS

0559 PM NON-TSTM WND GST 8 NNW AHWAHNEE/OAKHURST 37.50N 119.77W  
 01/04/2008 M69.00 MPH MARIPOSA CA MESONET

MEASURED AT THE MIAMI MOUNTAIN RAWS AT 4334 FEET.

0600 PM NON-TSTM WND GST 3 W TEHACHAPI 35.13N 118.49W  
 01/04/2008 M50.00 MPH KERN CA MESONET

0655 PM NON-TSTM WND GST SHADEQUARTER RAWS 36.57N 118.96W  
 01/04/2008 M45.00 MPH TULARE CA MESONET

0932 PM NON-TSTM WND GST 10 WNW RIDGECREST 35.69N 117.83W  
 01/04/2008 M62.00 MPH KERN CA MESONET

MEASURED AT THE CLASS III-16C RAWS.

0945 PM NON-TSTM WND GST INYOKERN 35.65N 117.81W  
 01/04/2008 M52.00 MPH KERN CA OTHER FEDERAL

MEASURED AT KIYK.

1213 AM NON-TSTM WND GST INDIAN WELLS CANYON RAW 35.69N 117.89W  
 01/05/2008 M69.00 MPH KERN CA MESONET

0453 AM NON-TSTM WND GST INYOKERN 35.65N 117.81W  
 01/05/2008 M67.00 MPH KERN CA OTHER FEDERAL

MEASURED AT KIYK.

&&

SELECTED PEAK WIND GUSTS FROM ACROSS THE AREA ON 1/4/2008 AND  
1/5/2008 ASSOCIATED WITH A POWERFUL PACIFIC STORM SYSTEM.

\$\$

**SNOWFALL**

NOUS46 KHNX 091206  
PNSHNX  
CAZ089>099-071800-

PUBLIC INFORMATION STATEMENT  
NATIONAL WEATHER SERVICE SAN JOAQUIN VALLEY - HANFORD CA  
405 AM PST WED JAN 9 2008

...A SERIES OF SYSTEMS BROUGHT SOME SIGNIFICANT PRECIPITATION AMOUNTS TO PARTS OF INTERIOR CENTRAL CALIFORNIA...

BEGINNING IN THE AFTERNOON HOURS OF THURSDAY JANUARY 3RD AND CONTINUING INTO THE EARLY HOURS OF MONDAY JANUARY 7TH...A SERIES OF SYSTEMS BROUGHT SEVERAL ROUNDS OF PRECIPITATION TO INTERIOR CENTRAL CALIFORNIA. THE MOST SIGNIFICANT AMOUNTS WERE GENERALLY RECORDED ON FRIDAY JANUARY 4TH WHEN A POWERFUL PACIFIC STORM SYSTEM AFFECTED THE AREA. IN PARTS OF THE LOWER ELEVATIONS OF THE SIERRA NEVADA RAINFALL TOTALS WERE IN EXCESS OF 9 INCHES IN JUST A 24 HOUR PERIOD! SNOW LEVELS WERE GENERALLY AT OR ABOVE 7000 FEET FROM JANUARY 3RD THROUGH THE 4TH BUT FOLLOWING THE PASSAGE OF A COLD FRONT LATE ON THE 4TH BEGAN TO LOWER AND DROPPED AS LOW AS 3000 FEET BY THE EVENING OF JANUARY 6TH. SOME AREAS IN THE 5000 TO 7000 FOOT ELEVATION RANGE SAW OVER 5 INCHES OF RAIN FALL FROM JANUARY 3RD TO THE 4TH FOLLOWED BY AS MUCH AS 2 FEET OF SNOW FROM THE LATER PORTION OF THE 4TH INTO THE 6TH. PRECIPITATION AMOUNTS VARIED GREATLY OVER THE AREA OVER THE COURSE OF THESE EVENTS AND DEPENDED UPON TOPOGRAPHICAL INFLUENCES AS WELL AS WHERE THE BEST MOISTURE IN THE ATMOSPHERE WAS PRESENT IN ADDITION TO WHERE THESE SYSTEMS TRACKED.

FOLLOWING IS A LIST OF PRECIPITATION TOTALS FROM JANUARY 3RD THROUGH THE MORNING OF THE 7TH ACROSS THE AREA. THANKS TO OUR SPOTTERS...COOPERATIVE OBSERVERS AND MESONET OBSERVERS FOR MANY OF THESE REPORTS!

...SIERRA NEVADA...

WAWONA /MESONET/.....11.32 INCHES  
LODGEPOLE /CO-OP/.....10.89  
YOSEMITE SOUTH ENTRANCE /CO-OP/.....8.48  
GRANT GROVE /CO-OP/.....8.16  
HUME LAKE /SPOTTER/.....6.97  
YOSEMITE VALLEY /MESONET/.....5.18

...FOOTHILLS...

BASS LAKE /MESONET/.....7.97 INCHES  
NORTH FORK /MESONET/.....6.90  
JERSEYDALE /MESONET/.....6.51  
PONDEROSA BASIN /SPOTTER/.....6.31  
BALD MOUNTAIN /MESONET/.....5.80  
EL PORTAL /MESONET/.....5.78  
TRIMMER /MESONET/.....5.13  
MARIPOSA /MESONET/.....4.43  
SHADEQUARTER /MESONET/.....4.22  
ASH MOUNTAIN /MESONET/.....3.68  
CATHEYS VALLEY /MESONET/.....1.79



...KERN COUNTY MOUNTAINS...

WOFFORD HEIGHTS /MESONET/.....4.75 INCHES  
KEENE /MESONET/.....3.93  
PIUTES /MESONET/.....2.66  
MOUNT MESA /SPOTTER/.....2.14  
JAWBONE /MESONET/.....1.20

...CENTRAL AND SOUTHERN SAN JOAQUIN VALLEY...

SPANISH LAKE /MESONET/.....3.85 INCHES  
PANOCHÉ ROAD /MESONET/.....2.76  
GUSTINE AIRPORT /MESONET/.....2.40  
FRIANT DAM /CO-OP/.....2.00  
LINDSAY /CO-OP/.....1.67  
LEMON COVE /CO-OP/.....1.60  
SELMA /MESONET/.....1.59  
FRESNO /ASOS KFAT/.....1.56  
MERCED /ASOS KMCE/.....1.54  
SAN LUIS NWR /MESONET/.....1.48  
NORTHWEST FRESNO /NWS EMPLOYEE/.....1.45  
NORTHEAST EXETER /SPOTTER/.....1.40  
ORANGE COVE /MESONET/.....1.31  
MADERA /ASOS KMAE/.....1.23  
SOUTHWEST VISALIA /SPOTTER/.....1.07  
LOS BANOS /CO-OP/.....1.02  
PORTERVILLE /AWOS KPTV/.....0.82  
HANFORD 0.6 WEST /NWS EMPLOYEE/.....0.70  
ARVIN /CO-OP/.....0.67  
COALINGA /MESONET/.....0.67  
HANFORD /NWS OFFICE KHNX/.....0.65  
FIVE POINTS /MESONET/.....0.61  
HANFORD /ASOS KHJO/.....0.61  
TAFT /CO-OP/.....0.59  
VISALIA /AWOS KVIS/.....0.58  
BAKERSFIELD /ASOS KBFL/.....0.32

...KERN COUNTY DESERT...

INDIAN WELLS CANYON /MESONET/.....2.24 INCHES  
LAURAL MOUNTAIN /MESONET/.....1.46  
EDWARDS AFB /ASOS KEDW/.....0.86  
ROSAMOND /MESONET/.....0.66  
MOJAVE /MESONET/.....0.29

\$\$

STACHELSKI/DUDLEY

WEATHER.GOV/HANFORD

**PRECIPITATION TOTALS**

NOUS46 KHNX 091206  
PNSHNX  
CAZ089>099-071800-

PUBLIC INFORMATION STATEMENT  
NATIONAL WEATHER SERVICE SAN JOAQUIN VALLEY - HANFORD CA  
405 AM PST WED JAN 9 2008

...A SERIES OF SYSTEMS BROUGHT SOME SIGNIFICANT PRECIPITATION AMOUNTS TO PARTS OF INTERIOR CENTRAL CALIFORNIA...

BEGINNING IN THE AFTERNOON HOURS OF THURSDAY JANUARY 3RD AND CONTINUING INTO THE EARLY HOURS OF MONDAY JANUARY 7TH...A SERIES OF SYSTEMS BROUGHT SEVERAL ROUNDS OF PRECIPITATION TO INTERIOR CENTRAL CALIFORNIA. THE MOST SIGNIFICANT AMOUNTS WERE GENERALLY RECORDED ON FRIDAY JANUARY 4TH WHEN A POWERFUL PACIFIC STORM SYSTEM AFFECTED THE AREA. IN PARTS OF THE LOWER ELEVATIONS OF THE SIERRA NEVADA RAINFALL TOTALS WERE IN EXCESS OF 9 INCHES IN JUST A 24 HOUR PERIOD! SNOW LEVELS WERE GENERALLY AT OR ABOVE 7000 FEET FROM JANUARY 3RD THROUGH THE 4TH BUT FOLLOWING THE PASSAGE OF A COLD FRONT LATE ON THE 4TH BEGAN TO LOWER AND DROPPED AS LOW AS 3000 FEET BY THE EVENING OF JANUARY 6TH. SOME AREAS IN THE 5000 TO 7000 FOOT ELEVATION RANGE SAW OVER 5 INCHES OF RAIN FALL FROM JANUARY 3RD TO THE 4TH FOLLOWED BY AS MUCH AS 2 FEET OF SNOW FROM THE LATER PORTION OF THE 4TH INTO THE 6TH. PRECIPITATION AMOUNTS VARIED GREATLY OVER THE AREA OVER THE COURSE OF THESE EVENTS AND DEPENDED UPON TOPOGRAPHICAL INFLUENCES AS WELL AS WHERE THE BEST MOISTURE IN THE ATMOSPHERE WAS PRESENT IN ADDITION TO WHERE THESE SYSTEMS TRACKED.

FOLLOWING IS A LIST OF PRECIPITATION TOTALS FROM JANUARY 3RD THROUGH THE MORNING OF THE 7TH ACROSS THE AREA. THANKS TO OUR SPOTTERS...COOPERATIVE OBSERVERS AND MESONET OBSERVERS FOR MANY OF THESE REPORTS!

...SIERRA NEVADA...

WAWONA /MESONET/.....11.32 INCHES  
LODGEPOLE /CO-OP/.....10.89  
YOSEMITE SOUTH ENTRANCE /CO-OP/.....8.48  
GRANT GROVE /CO-OP/.....8.16  
HUME LAKE /SPOTTER/.....6.97  
YOSEMITE VALLEY /MESONET/.....5.18

...FOOTHILLS...

BASS LAKE /MESONET/.....7.97 INCHES  
NORTH FORK /MESONET/.....6.90  
JERSEYDALE /MESONET/.....6.51  
PONDEROSA BASIN /SPOTTER/.....6.31  
BALD MOUNTAIN /MESONET/.....5.80  
EL PORTAL /MESONET/.....5.78  
TRIMMER /MESONET/.....5.13  
MARIPOSA /MESONET/.....4.43  
SHADEQUARTER /MESONET/.....4.22  
ASH MOUNTAIN /MESONET/.....3.68

CATHEYS VALLEY /MESONET/.....1.79

...KERN COUNTY MOUNTAINS...

WOFFORD HEIGHTS /MESONET/.....4.75 INCHES  
KEENE /MESONET/.....3.93  
PIUTES /MESONET/.....2.66  
MOUNT MESA /SPOTTER/.....2.14  
JAWBONE /MESONET/.....1.20

...CENTRAL AND SOUTHERN SAN JOAQUIN VALLEY...

SPANISH LAKE /MESONET/.....3.85 INCHES  
PANOCHÉ ROAD /MESONET/.....2.76  
GUSTINE AIRPORT /MESONET/.....2.40  
FRIANT DAM /CO-OP/.....2.00  
LINDSAY /CO-OP/.....1.67  
LEMON COVE /CO-OP/.....1.60  
SELMA /MESONET/.....1.59  
FRESNO /ASOS KFAT/.....1.56  
MERCED /ASOS KMCE/.....1.54  
SAN LUIS NWR /MESONET/.....1.48  
NORTHWEST FRESNO /NWS EMPLOYEE/.....1.45  
NORTHEAST EXETER /SPOTTER/.....1.40  
ORANGE COVE /MESONET/.....1.31  
MADERA /ASOS KMAE/.....1.23  
SOUTHWEST VISALIA /SPOTTER/.....1.07  
LOS BANOS /CO-OP/.....1.02  
PORTERVILLE /AWOS KPTV/.....0.82  
HANFORD 0.6 WEST /NWS EMPLOYEE/.....0.70  
ARVIN /CO-OP/.....0.67  
COALINGA /MESONET/.....0.67  
HANFORD /NWS OFFICE KHNX/.....0.65  
FIVE POINTS /MESONET/.....0.61  
HANFORD /ASOS KHJO/.....0.61  
TAFT /CO-OP/.....0.59  
VISALIA /AWOS KVIS/.....0.58  
BAKERSFIELD /ASOS KBFL/.....0.32

...KERN COUNTY DESERT...

INDIAN WELLS CANYON /MESONET/.....2.24 INCHES  
LAURAL MOUNTAIN /MESONET/.....1.46  
EDWARDS AFB /ASOS KEDW/.....0.86  
ROSAMOND /MESONET/.....0.66  
MOJAVE /MESONET/.....0.29

\$\$

STACHELSKI/DUDLEY

WEATHER.GOV/HANFORD

### 10.3 Climate Summaries

#### BAKERSFIELD WSO AIRPORT, CALIFORNIA (040442)

Period of Record Monthly Climate Summary

Period of Record: 10/1/1937 to 12/31/2005

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	57.4	63.6	68.8	75.8	84.2	92.1	98.6	96.6	90.9	80.7	67.3	57.9	77.8
Average Min. Temperature (F)	38.5	42.1	45.4	49.7	56.5	63.1	69.0	67.5	62.9	54.0	44.0	38.5	52.6
Average Total Precipitation (in.)	1.08	1.17	1.16	0.66	0.22	0.08	0.01	0.04	0.11	0.30	0.61	0.80	6.23
Average Total SnowFall (in.)	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Average Snow Depth (in.)	0	0	0	0	0	0	0	0	0	0	0	0	0

Percent of possible observations for period of record:

Max. Temp.: 99.6% Min. Temp.: 99.6% Precipitation: 99.7% Snowfall: 92.4% Snow Depth: 92.2%

Source: Western Regional Climate Center

#### FRESNO WSO AIRPORT, CALIFORNIA (043257)

Period of Record Monthly Climate Summary

Period of Record: 7/ 1/1948 to 12/31/2005

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	54.4	61.5	66.9	74.6	83.4	91.6	98.1	96.2	90.5	79.8	65.2	54.6	76.4
Average Min. Temperature (F)	37.6	40.6	43.7	47.8	54.1	60.2	65.4	63.7	59.3	50.9	42.2	37.2	50.2
Average Total Precipitation (in.)	2.13	1.88	1.94	1.00	0.37	0.15	0.01	0.01	0.17	0.53	1.17	1.58	10.94
Average Total SnowFall (in.)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1

Average Snow Depth (in.)      0   0   0   0   0   0   0   0   0   0   0   0   0   0

Percent of possible observations for period of record:  
 Max. Temp.: 100% Min. Temp.: 100% Precipitation: 100% Snowfall: 91.2% Snow Depth: 91.3% Source:  
 Western Regional Climate Center

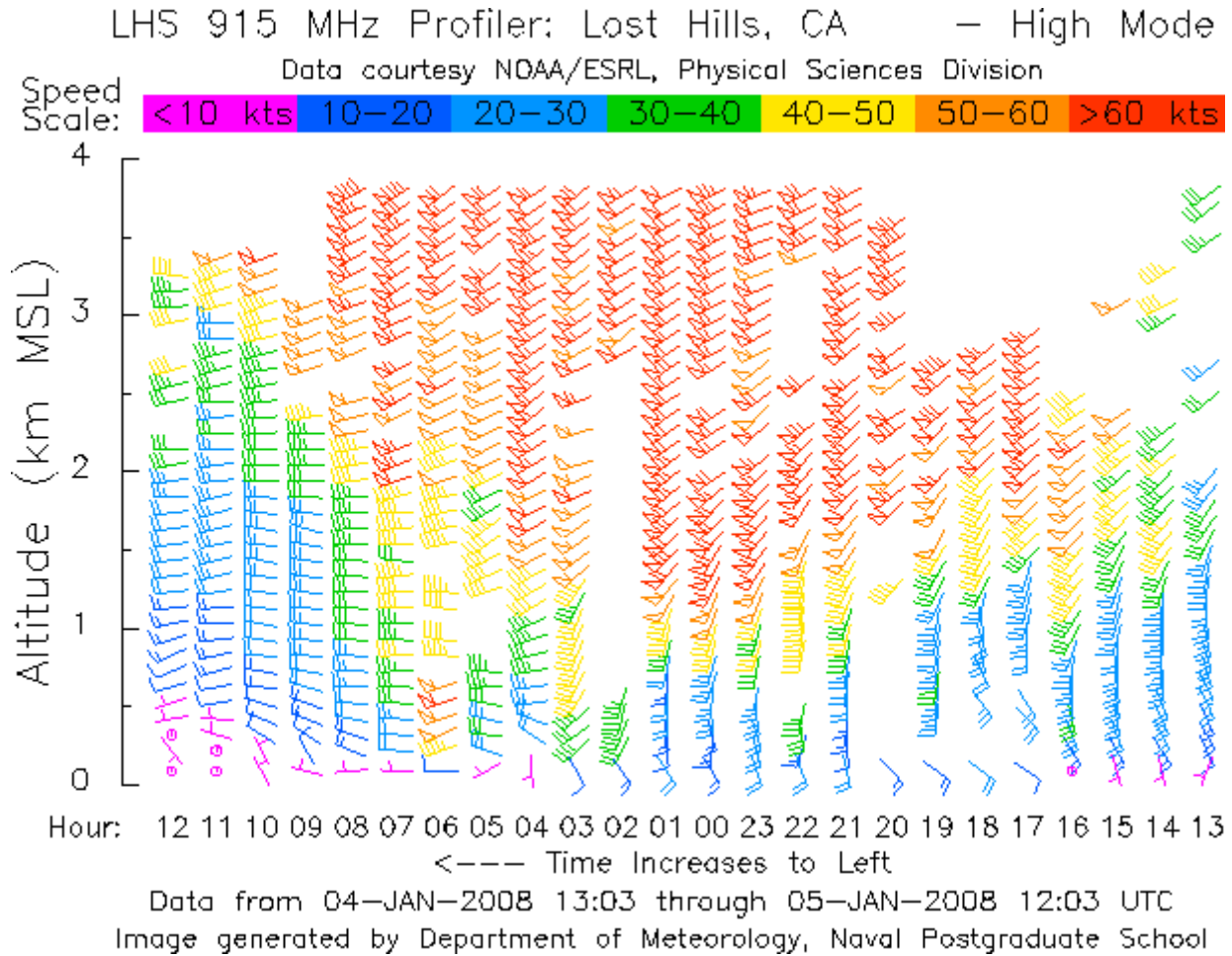
HANFORD 1 S, CALIFORNIA (043747)

Period of Record Monthly Climate Summary  
 Period of Record: 12/1/1927 to 12/31/2005

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	54.4	61.5	67.6	75.3	83.7	91.0	97.4	95.7	90.1	80.4	66.2	55.2	76.6
Average Min. Temperature (F)	35.7	38.8	42.4	46.6	52.7	58.3	62.6	60.6	55.8	47.8	38.8	35.0	47.9
Average Total Precipitation (in.)	1.58	1.53	1.46	0.72	0.24	0.08	0.01	0.01	0.13	0.37	0.82	1.28	8.22
Average Total SnowFall (in.)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Average Snow Depth (in.)	0	0	0	0	0	0	0	0	0	0	0	0	0

Percent of possible observations for period of record  
 Max. Temp.: 98.4% Min. Temp.: 98.1% Precipitation: 98.8% Snowfall: 98.2% Snow Depth: 98.2%  
 Source: Western Regional Climate Center

### 10.4 Wind Profiles



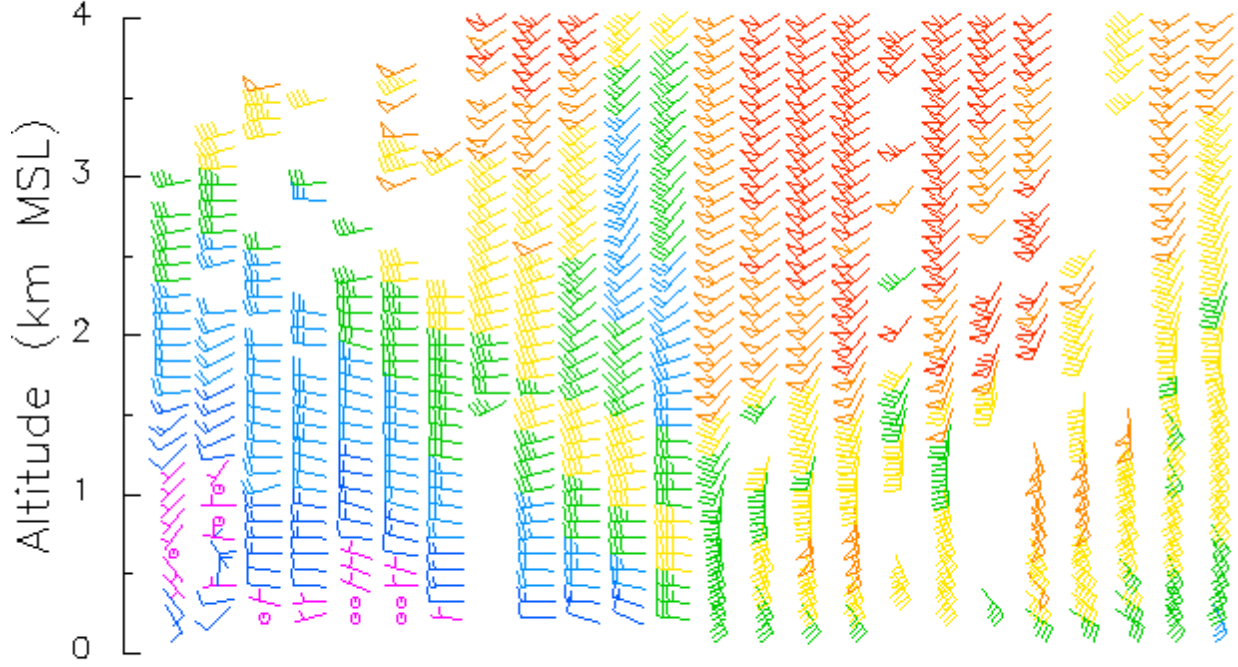
Time in UTC (Coordinated Universal Time, also abbreviated with "Z" or "GMT") is also called Greenwich Mean Time (Mean Solar Time at the Royal Observatory in Greenwich, England). Greenwich Mean Time is eight hours ahead of Pacific Standard Time (PST) and seven hours ahead of Pacific Daylight Time (PDT). For example, 12 UTC or 12 Z is 4 AM PST or 5 AM PDT. The above image is from 5 AM PST on Jan 4 to 4 AM PST on Jan 5.

Wind bars point in the direction "from" which the wind is blowing. A circle represents calm conditions. Flags (straight lines) attached at the end of the wind bars indicate wind speed. Each short flag represents 5 knots, and each long flag represents 10 knots. A long flag and a short flag represent 15 knots, simply by adding the value of each flag together (10 knots + 5 knots = 15 knots). The color-coded speed scale is also provided on top of the plot. A triangular flag at the end of a wind barb represents a 50-knot wind. This wind barb is color-coded orange in the plot shown above.

CCL 915 MHz Profiler: Chowchilla, CA – High Mode

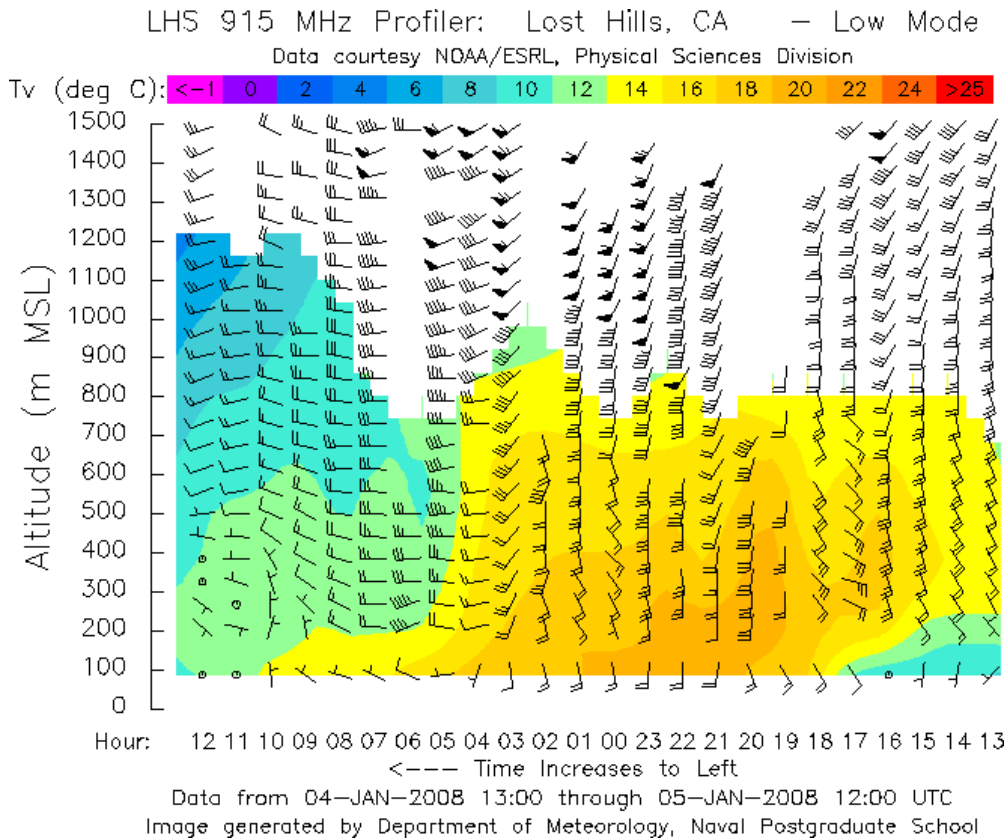
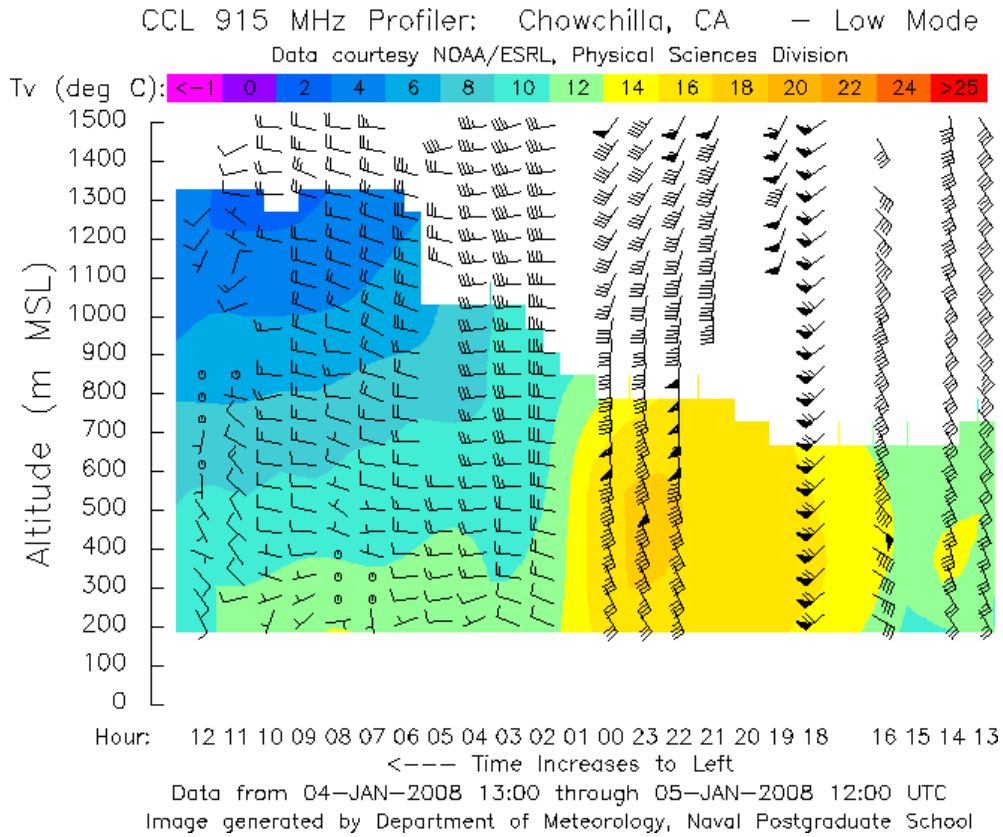
Data courtesy NOAA/ESRL, Physical Sciences Division

Speed scale: <10 kts 10-20 20-30 30-40 40-50 50-60 >60 kts



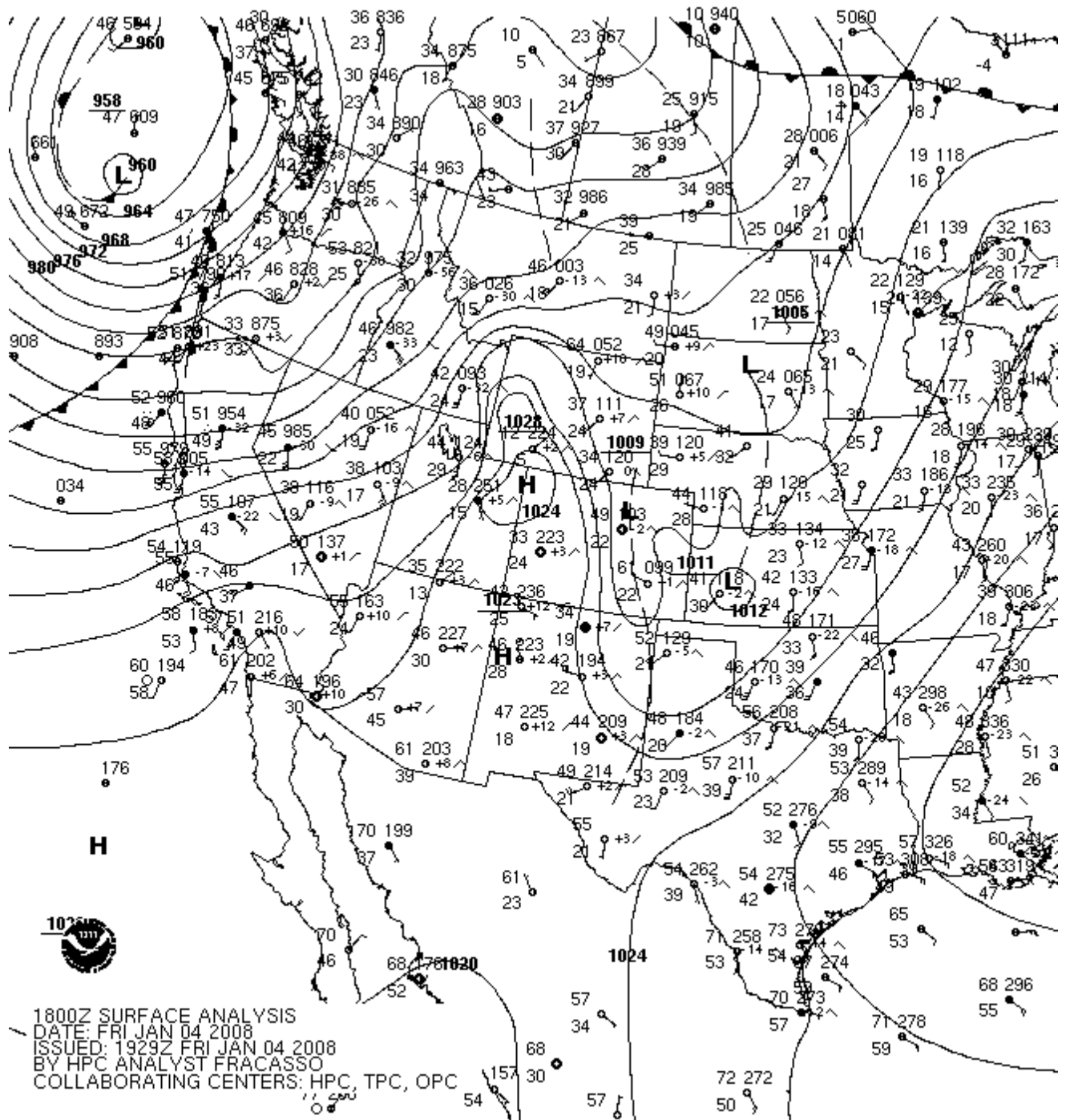
Hour: 12 11 10 09 08 07 06 05 04 03 02 01 00 23 22 21 20 19 18 17 16 15 14 13  
 <--- Time Increases to Left

Data from 04-JAN-2008 13:03 through 05-JAN-2008 12:03 UTC  
 Image generated by Department of Meteorology, Naval Postgraduate School

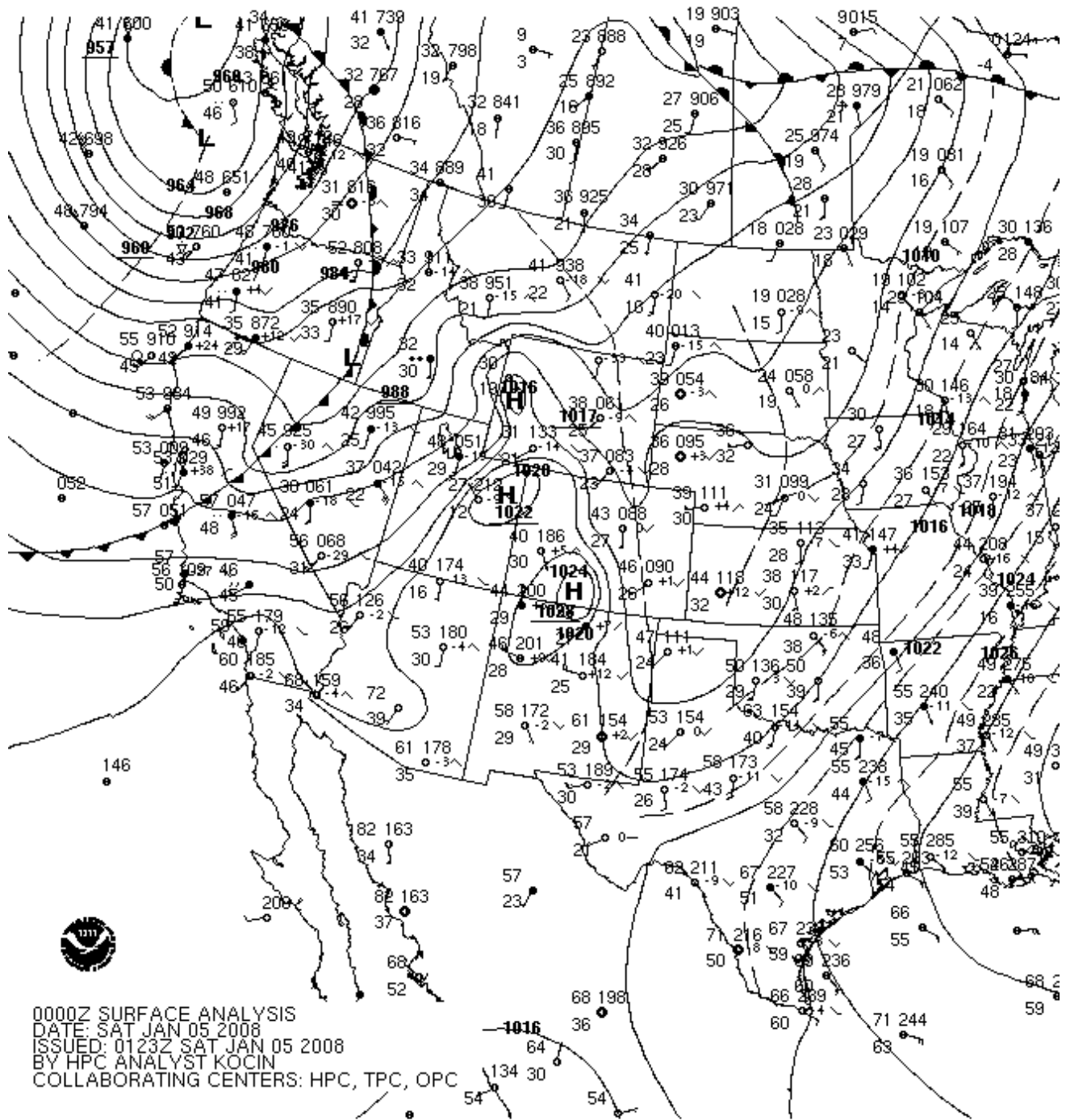








Surface weather map for 10 AM PST on January 4, 2008.



Surface weather map for 4 PM PST on January 4, 2008.



## 10.6 Surface Weather Observations

### BAKERSFIELD - MEADOWS FIELD - METEOROLOGICAL DATA - JANUARY 4, 2008

Elev: 509 ft; Latitude: 35.43361; Longitude: -119.05667

Time(PST)	Temperature	Dew	Relative	Wind	Wind	Wind	Quality	Sea level	Weather	Visibility	Precipitation	Ceiling
	° F	° F	%	Speed	Gust	Direction	check	pressure	conditions	miles	1hr	feet
22:13	55.4	51.8	88	22		NW	OK		mod rain	3.00	0.050	2600
21:54	60.1	51.1	72	32	37	WNW	OK	29.76	lt rain	10.00	0.001	4800
20:54	62.1	46.9	58	3			OK	29.71	overcast	9.00	0.001	6000
19:54	62.1	45.0	53	21	28	SSE	OK	29.69	lt rain	4.00	0.001	7000
18:54	62.1	45.0	53	22	37	SSE	OK	29.70	overcast	5.00	0.001	9000
17:54	62.1	42.1	48	24	33	SSE	OK	29.68	mostly cloudy	10.00		10000
16:54	60.1	45.0	57	30	35	SSE	OK	29.71	overcast	10.00	0.001	11000
15:54	62.1	44.1	52	29	33	SSE	OK	29.77	lt rain	10.00	0.001	7000
14:54	64.0	39.9	41	25	39	SSE	OK	29.76	blowing dust	10.00		
14:43	64.4	39.2	39	26	39	SSE	OK		blowing dust	5.00		7500
14:35	64.4	39.2	39	30	39	SSE	OK		blowing dust	2.00		7500
14:23	64.4	39.2	39	24	35	SSE	OK		blowing dust	1.25		
14:20	62.6	39.2	42	24	35	SSE	OK		blowing dust	1.75		
13:54	63.0	39.9	43	30	41	SSE	OK	29.75	blowing dust	6.00		
13:46	62.6	39.2	42	28	38	SSE	OK		blowing dust	3.00		
13:39	62.6	39.2	42	30	40	SSE	OK		blowing dust	2.00		
13:22	62.6	39.2	42	28	40	SSE	OK		blowing dust	1.25		
12:54	61.0	39.9	46	20	29	SSE	OK	29.81	blowing dust	0.75		800
12:41	60.8	39.2	45	20	28	SSE	OK		blowing dust	0.75		1000
12:29	60.8	39.2	45	23		SSE	OK		blowing dust	0.75		
11:54	62.1	39.0	43	25	37	SSE	OK	29.83	blowing dust	1.50		
10:54	61.0	39.0	44	28	38	SSE	OK	29.86	blowing dust	1.50		
9:54	61.0	39.9	46	23	36	SSE	OK	29.87	blowing dust	6.00		
8:54	59.0	39.2	48	26	37	SSE	OK	29.85	blowing dust	4.00		
7:54	57.0	35.1	44	18		SSE	OK	29.89	blowing dust	7.00		9000
6:54	51.1	33.1	50	3		SSE	OK	29.90	overcast	10.00		8500
5:54	54.0	32.0	43	6		ESE	OK	29.89	mostly clear	10.00		
4:54	51.1	33.1	50	7		SE	OK	29.93	overcast	10.00		

### 10.7 Television News Coverage

News Broadcast Retrieval Service of Fresno has collected over 45 minutes of local television news coverage of the January 4, 2008 wind event for the SJVAPCD. The coverage is from KGET Channel 17 (NBC), KERO Channel 23 (ABC) and KBAK Channel 29 (CBS) news broadcasts at noon, 5:00 PM and 6:00 PM on January 4, 2008. A DVD of the coverage is available upon request. The following images are from video shown during these broadcasts:





