BISHOP TRIBAL COUNCIL

Laura Yoshii,
Acting Regional Administrator
US EPA Region 9
75 Hawthorne Street -ORA-1
San Francisco, CA 94105

February 26, 2009

Subject: Area designation for 2008 Ozone NAAQS for the Bishop Paiute Reservation

Dear Ms Yoshii:

The Bishop Paiute Tribe is pleased to have the opportunity to make a recommendation to the US Environmental Protection Agency on the nonattainment boundaries for the 2008 revised National Ambient Air Quality Standard (NAAQS) for ozone.

The Bishop Paiute Tribe is federally recognized tribe and a sovereign nation. The Bishop Paiute Reservation is located in Inyo County, immediately adjacent to the town of Bishop. The area is commonly referred to as the Owens Valley and is in eastern California, near the Nevada border. Known also as "the deepest valley," the area is flanked by two 14,000-foot ranges – the Sierra Nevada to the west, and the White Mountains to the East. The Reservation consists of 875 contiguous acres, with a resident population of approximation 2,500 of which approximately 1,500 are enrolled tribal members. This is a remote rural region, known for its scenic beauty.

The Tribe is aware that the ozone designations are typically based on large units, such as counties and that Inyo County. However, Inyo County covers over 10,000 square miles and is one of the largest counties in the nation in terms of geographic are, with a population density of less than 2 persons per square mile (US Bureau of the Census, 2000).

The Tribe is also aware that the only monitor with regulatory status in Inyo County is located in Death Valley National Park and that ozone measurements from monitor have exceeded the NAAQS in recent years. However, this monitor is over 100 miles from the Bishop Reservation, and is impacted by air pollution by the South Coast and San Joaquin Valley air basins. (See the attached recommendations from the Great Basin Unified Air Pollution Control District, GBUAPCD, January 13, 2009.)

In addition, the Tribe has been operating an ozone monitor since the fall of 2007. In 2008, the Tribe's monitor had 7 days that exceeded the federal ozone standard. However, our analyses (attached) showed that all of these days were associated with exceptional events, either stratospheric intrusion associated with frontal passage in April or wildfires in June and July.

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In view of the large size of the county, the distance from the nearest regulatory monitor, analyses of the Tribe's own data, and the recommendations of the Great Basin Unified Air Pollution Control District, the Bishop Tribe is recommending that the Bishop Paiute Reservation be designated as attainment/unclassifiable for ozone. A detailed discussion of the 9 factors is given below.

Review of the 9 factors for evaluating non-attainment boundaries

The staff of the Tribe's Environmental Management Office and Air Quality Program has reviewed the 9 factors recommended by EPA for evaluating non-attainment boundaries. The results of their investigations are summarized below. The order of the factors has been modified so that some of the most important considerations are discussed first.

Geography and Topography

Geography is discussed first due to the remote location of the Bishop Paiute Reservation. Figures 1a through 1c shows the location at increasing levels of detail. As noted earlier, the Reservation is located in a remote, rural region of Inyo County, on the California-Nevada border (Figure 1A). The area is flanked by 14,000-foot mountain ranges to the East and to the West (Figure 1B). These mountain ranges substantially limit transport (discussed below). The typical pattern of diurnal winds is upslope through the valley in the morning and downslope in the afternoon. During frontal passage, the region may experience extreme winds and barometric changes (also discussed below). The Reservation is immediately adjacent to the town of Bishop (Figure 1C).

FIGURE 1A. The Bishop Paiute Reservation is located in Eastern California, near the California-Nevada Border

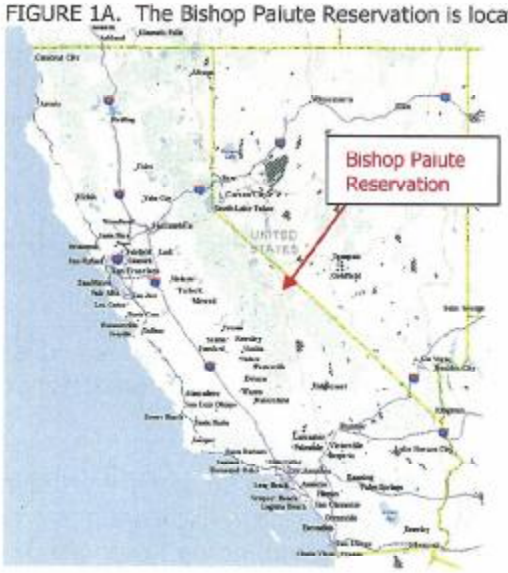


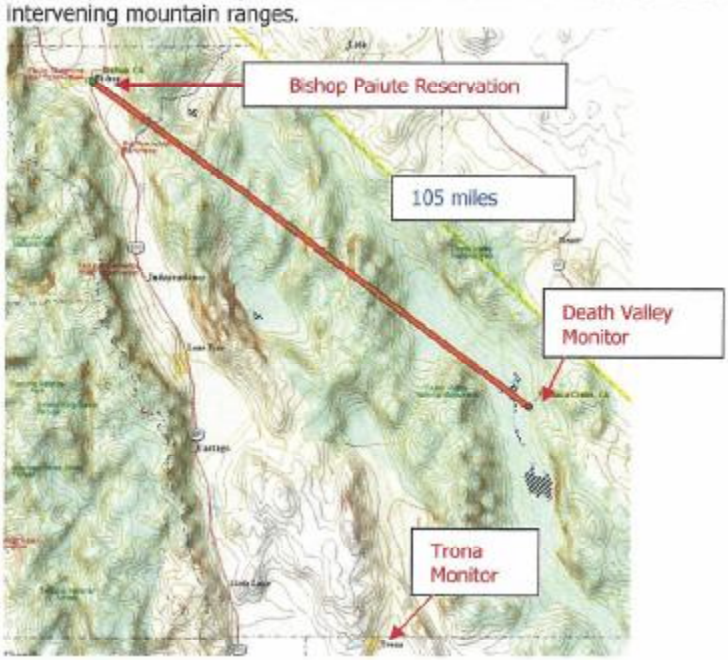
FIGURE 1B. This region, known as the Owens Valley, is also called the "deepest valley." It is located at an elevation of approximately 4,000ft. It is located between two 14,000ft mountain ranges, he Sierra Nevada rise to the West and the White Mountains to the East.

FIGURE 1C. The Bishop Paiute Reservation is comprised on 875 contiguous acres and is located immediately West of the Town of Bishop in Inyo County, California.

The Reservation operates an ozone monitor, located in the Environmental Management Office. However, the nearest regulatory ozone monitor is located in Death Valley, approximately 100 miles away, as the crow flies. Curiously, this monitor is sometimes known as the "Bishop" monitor probably because "Bishop" is the name attached to the US Census micrometropolitan area that comprises Inyo County. Figure 1D shows the location of the Death Valley monitor and even more distant Trona monitor in relation to Bishop. The figure also reveals, the presence of a number of substantial terrain features between Bishop and the two closest

monitors. The Tribe contends that the data from these monitors are not representative of air quality on the Bishop Paiute Reservation.

FIGURE 1D. The Bishop Paiute Reservation is over 100 miles from the nearest regulatory monitors, with several intervening mountain ranges.



Air Quality Data

The attached analysis prepared by GBUAPCD reviews the data from the nearest regulatory site, located at Death Valley National Park and concluded that the exceedances at this site for the period 2004 to 2008 could not be attributed to sources from the northwestern portion of Inyo county. Figures 1A-D, just reviewed show the location of the Bishop Paiute Reservation in relation to the nearest monitors, and the intervening terrain. The Tribe contends that the data from these monitors is not representative of the Bishop Paiute Reservation.

In 2008, the Tribe's own monitor had 7 days that exceeded the 8-hour NAAQS for ozone. However, our analyses have shown that the 4 days in April were due to extreme meteorological conditions, associated with frontal passage and the 2 days in June and 1 in July were due to forest fires. (See attached reports.) The Tribe believes that the April exceedances were due to stratospheric intrusion due to the meteorological conditions and do not reflect transport because April is characteristically a low ozone month. The June and July wildfires in California are well documented. The Tribe contends that these exceedances should be classified as exceptional events. Once theses exceptional events are removed, the Bishop Reservation has no exceedances of the federal standard.

Meteorology and Transport

While transport of ozone from the South Coast and San Joaquin air basins is not impossible, the Tribe's data for 2008 do not indicate that such transport has been sufficient to lead to exceedances of the NAAQS. As noted earlier, the exceedances observed were all associated with unusual natural events, some associated with the unusual regional meteorology associated with the Sierra Nevada. (See attached reports.)

Emissions Data

Because only 2 percent of the land in Inyo County is privately held, the remainder being owned by the Los Angeles Department of Water and Power, the US Forest Service, and the Bureau of Land Management, the population is extremely sparse with only 17,945 people living in the county in 2000 according to the US Census. There is little industry and no Title V sources. The principal source of emissions for ozone is primarily from motor vehicles traveling along Highway 395 which runs the length of the county. US 395 averages 10,000 vehicles per day, most of it from travelers going to and from Reno, NV, to the North and Los Angeles to the South.

Population Density and Degree of Urbanization

The Bishop Paiute Reservation is located in a remote rural area with extremely low population density.

Traffic and Commuting Patterns

Due to the remote rural area and low population density, daily commuting involves only a small number of vehicles. Most traffic is from travelers in transit through the county along the North-South route.

Growth Rates and Patterns

Due to the lack of available privately held land, the county's population is stagnant or declining. According to the US Census Bureau, the Inyo County population declined by nearly 3 percent between 2000 and 2007, the most recent year for which data are available. The Tribe is similarly constrained by an extremely small land base of 875 acres. Tribal assignments are already crowded and housing opportunities are limited. Off-reservation housing is prohibitively expensive and opportunities are extremely limited.

The Tribe operates a small Casino. As with housing and population, opportunities for economic growth are severely constrained. While improvements to the Casino are planned, substantial expansion is unlikely due to the limited local population base and the limited number of visitors who travel along 395.

Jurisdictional Boundaries

The Bishop Paiute Tribe is a federally-recognized tribe and a sovereign nation. The Reservation is comprised of 875 contiguous acres and is located immediately to the West of the town of Bishop. Both the Bishop Paiute Reservation and the Town of Bishop are located at the extreme North end of Inyo County. The Tribe has an active Air Quality Program and has adopted air quality standards for PM-10, PM-2.5, ozone and carbon monoxide. The Air Quality Program monitors PM-10, PM-2.5, ozone and meteorological conditions. GBUAPCD is responsible for monitoring and regulating air quality in Inyo, Mono and Alpine counties (excluding Tribal lands).

Level of Control of Emission Sources

Due to the remote nature of the Reservation, low population density and generally good air quality, the Bishop Paiute Tribe does not have an extensive regulatory program for air quality. However, the Air Program does operate a permitting program for open burning and cooperates with various tribal programs to reduce emissions whenever possible.

Please contact Brian Adkins, Environmental Manager or Toni Richards, Air Quality Specialist at 760 873 3584 if you have any questions.

Thank you for your consideration.

Sincerely,

M Bengochia

Monty Bengochia,
Tribal Chairman

Cc: Deborah Jordan, US EPA Region 9, Air Division Director
John Kelly, US EPA Region 9, Air Division
Asia Yeary, US EPA Region 9, Air Division
Darrel Harmon, US EPA, OAR, Senior Indian Program Manager
Ted Schade, GBUAPCD, Air Pollution Control Officer
Duane Ono, GBUAPCD, Deputy Air Pollution Control Officer

Whose Ozone is this?
High Ozone Concentrations in the Owens Valley: April 2008

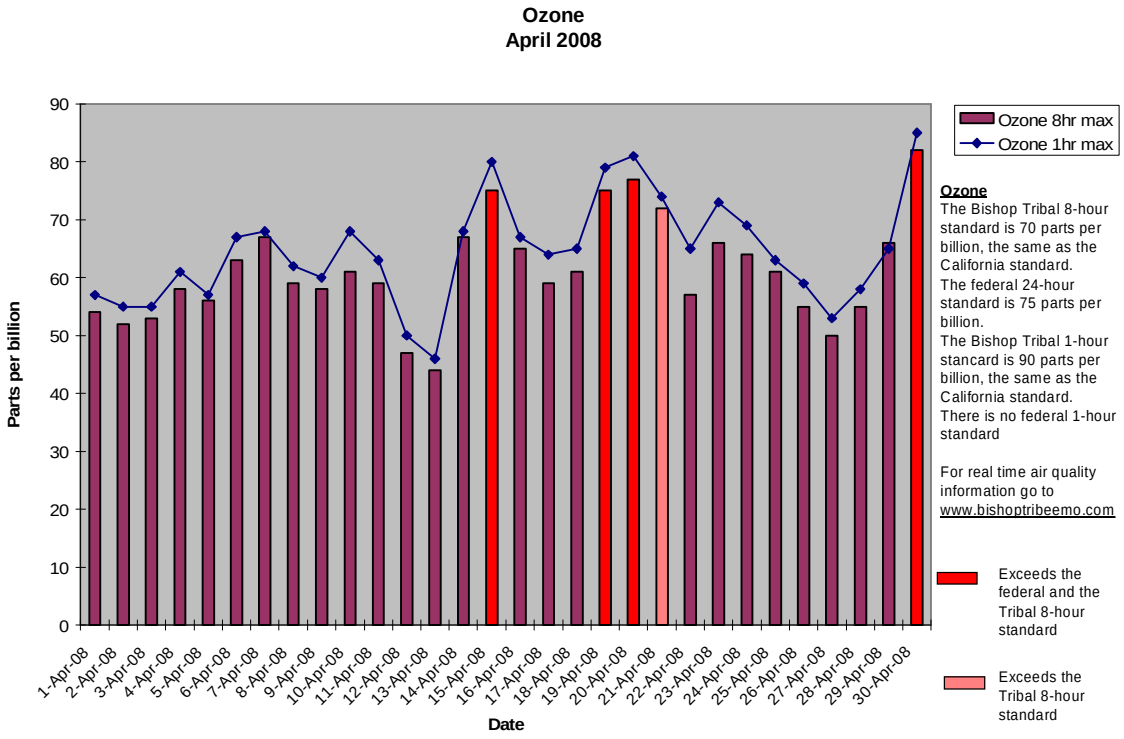
Prepared by Toni Richards, Air Quality Specialist
Environmental Management Office
Bishop Paiute Tribe
May 8, 2008

April is typically a time of unsettled weather in the Owens Valley. The Bishop Tribe's Air Program installed an ozone monitor in September 2007. Programming was completed and real time data were available in October 2007. Assessment of the instrument is still in progress and results are being closely studied. As the start of the ozone season approached, some unexpectedly high concentrations were observed. This report is a preliminary examination of the weather associated with these high concentration days. The goal of this exercise is to improve our understanding in this assessment phase of the ozone monitor.

Technical assistance for this report was graciously provided by Duane Ono, Deputy Air Pollution Control Officer for Great Basin Unified Air Pollution Control District, and Bob Baxter and Don Lehrman, Certified Consulting Meteorologists with Technical and Business Systems.

Figure 1 shows daily ozone concentrations as measured on the Bishop Paiute Reservation during the month of April 2008. Four days (April 15, 19, 20 and 30), exceeded the federal standard. In addition, one day (April 21) exceeded the Tribal and State of California standard.

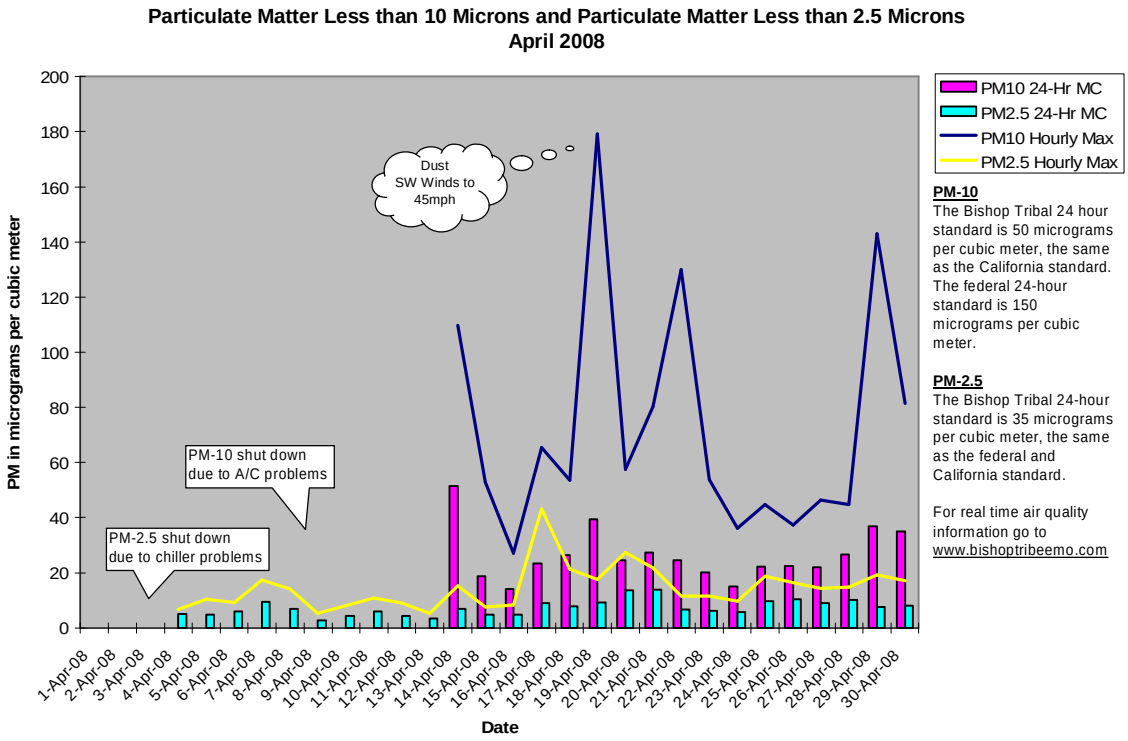
FIGURE 1



For comparison, Figure 2 shows particulate matter concentrations during the same month. Unfortunately both particulate monitors experienced separate but unrelated mechanical problems during the early part of the month, so the data are not complete. Nevertheless, corresponding relatively high PM-10 concentrations are observed on April 14, 19 and 29. As we shall see, all of these days are associated with relatively high winds and frontal passage.

Because of the time of year and the weather conditions, we suspect that the high ozone could be caused by stratospheric ozone intrusion. The PM and ozone events may not be related, but it's interesting that they both happened at about the same time.

FIGURE 2



The discussion below reviews the results for each of the high ozone days separately, including information on wind speed, direction and barometric pressure as well as model results from Hysplit and visibility information.

APRIL 15, 2008

Figure 4 shows the particulate matter and ozone concentrations for April 15. Interestingly, the ozone and PM-10 peaks are within one hour of each other, with peak ozone concentrations at 9:00AM and peak PM-10 concentrations at 10:00AM.

FIGURE 4

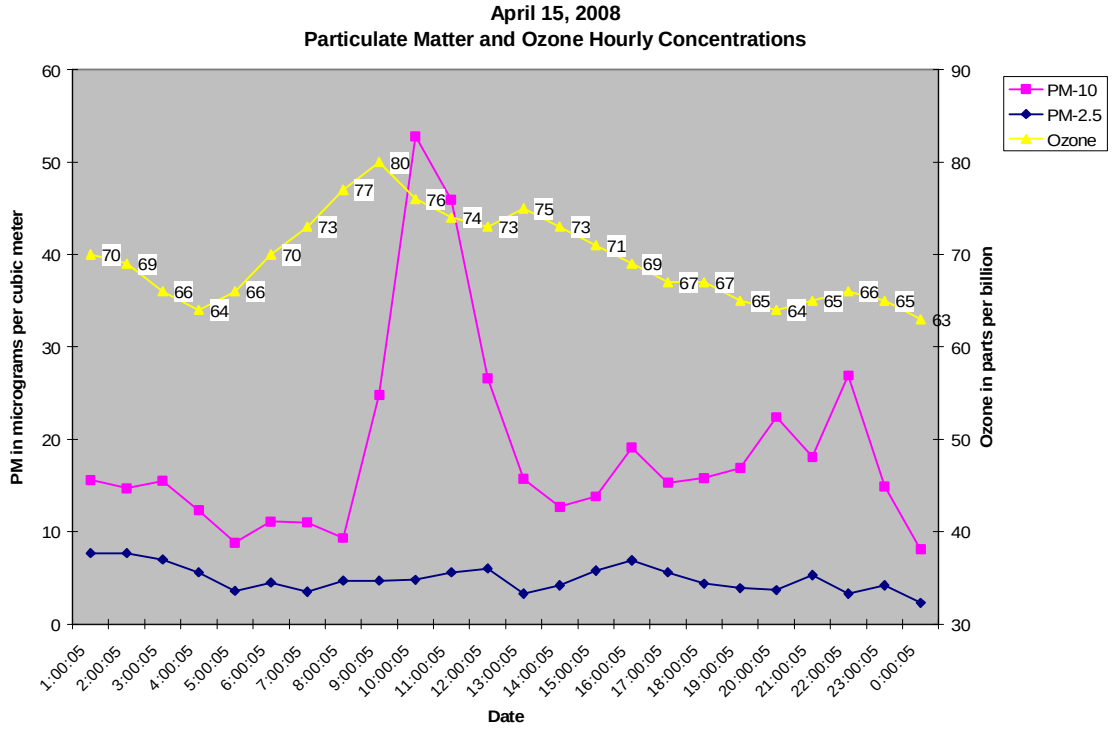


Figure 5 shows wind speed, gust and direction. Winds were out of the North nearly the entire day with peak gusts over 30 miles per hour. Wind speeds peak at nearly the same time as ozone and PM-10 concentrations, near 9:00 or 10:00 AM PST. However, even higher PM-10 concentrations were observed on the previous day at 6:00 PM PST.

FIGURE 5

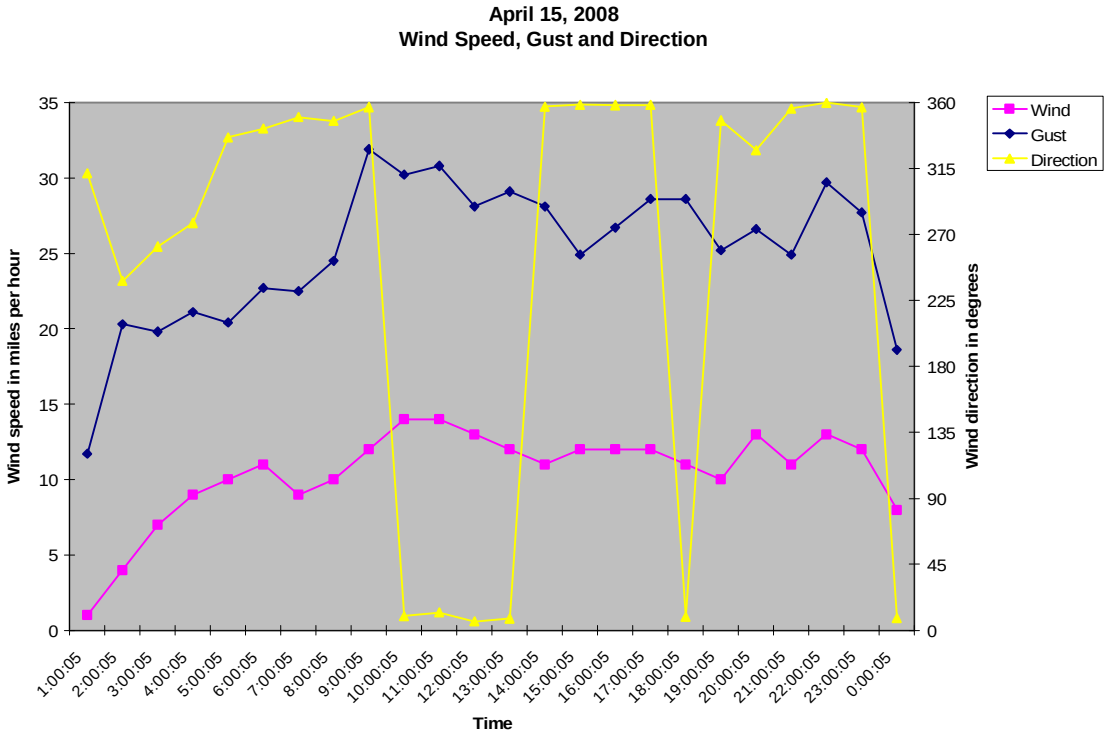
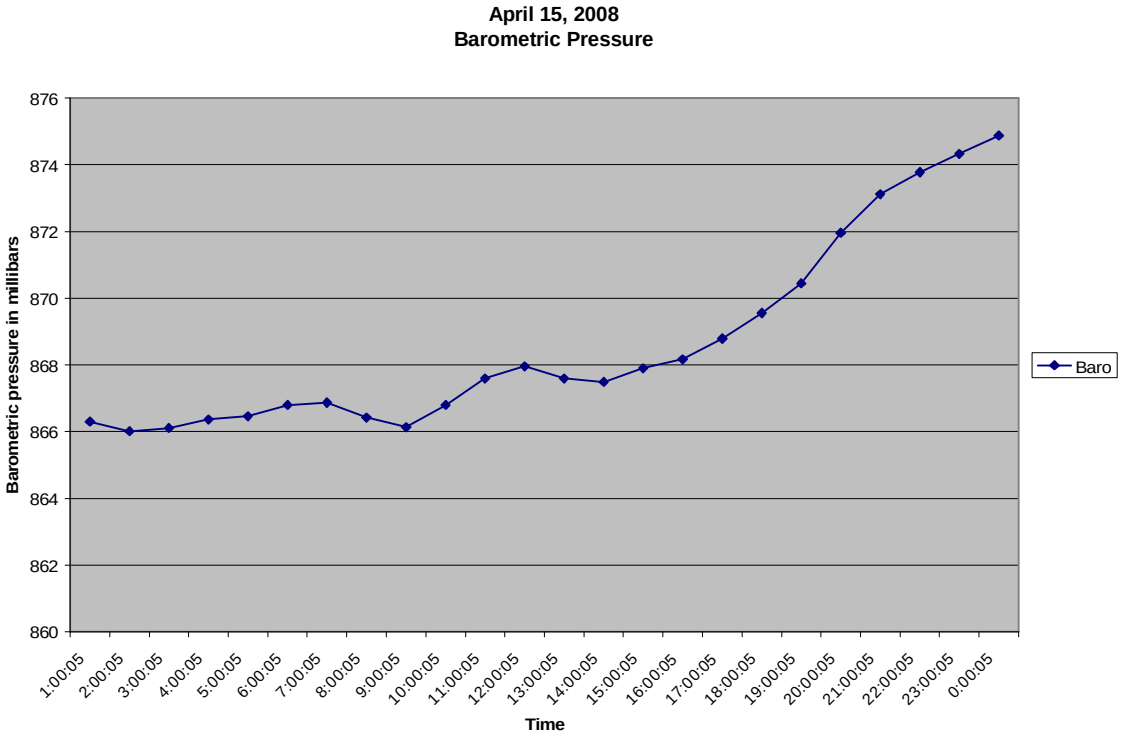


Figure 6 shows barometric pressure. Looking at just the data for April 15, it appears to be a period of rising barometric pressure.

FIGURE 6



However, if we extend the time frame to include April 14, the frontal passage becomes more apparent as shown in Figure 7.

FIGURE 7

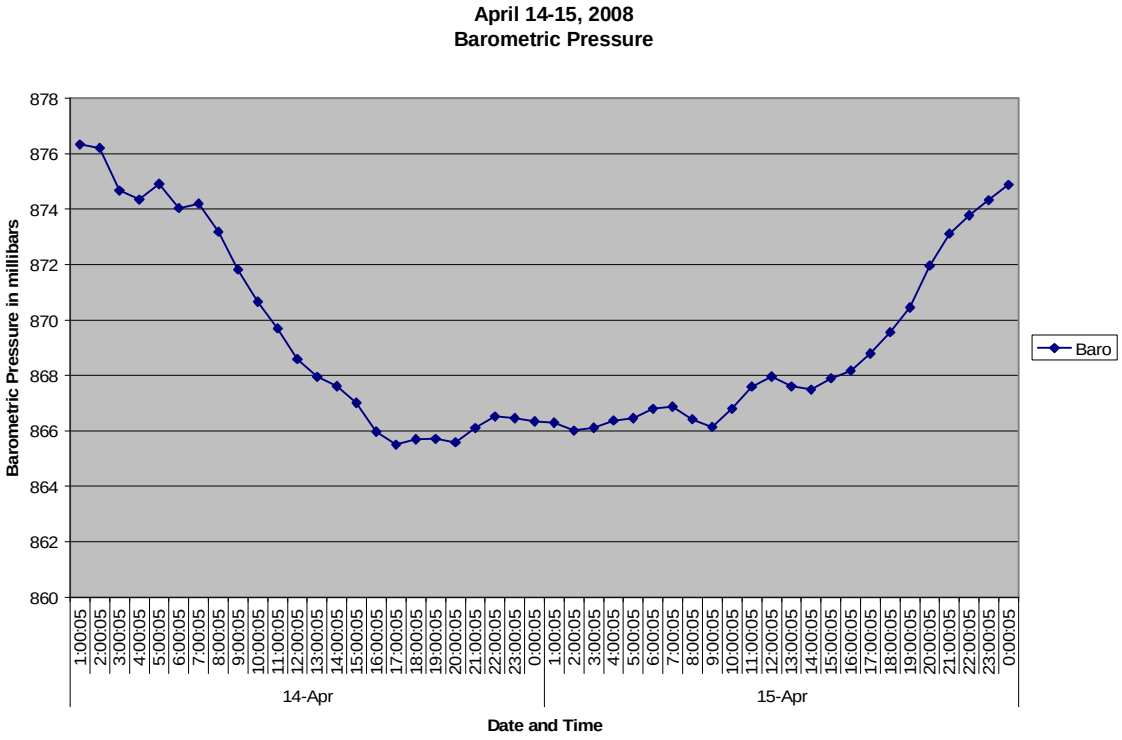


Figure 8 shows the 8-hour Hysplit back trajectories, computed at 2-hour intervals for the 6-hour period starting at 7:00 AM PST. All trajectories point westward, with a slight northward trend in the latest trajectory.

FIGURE 8
Hysplit Trajectories April 15, 7:00 – 13:00 PST

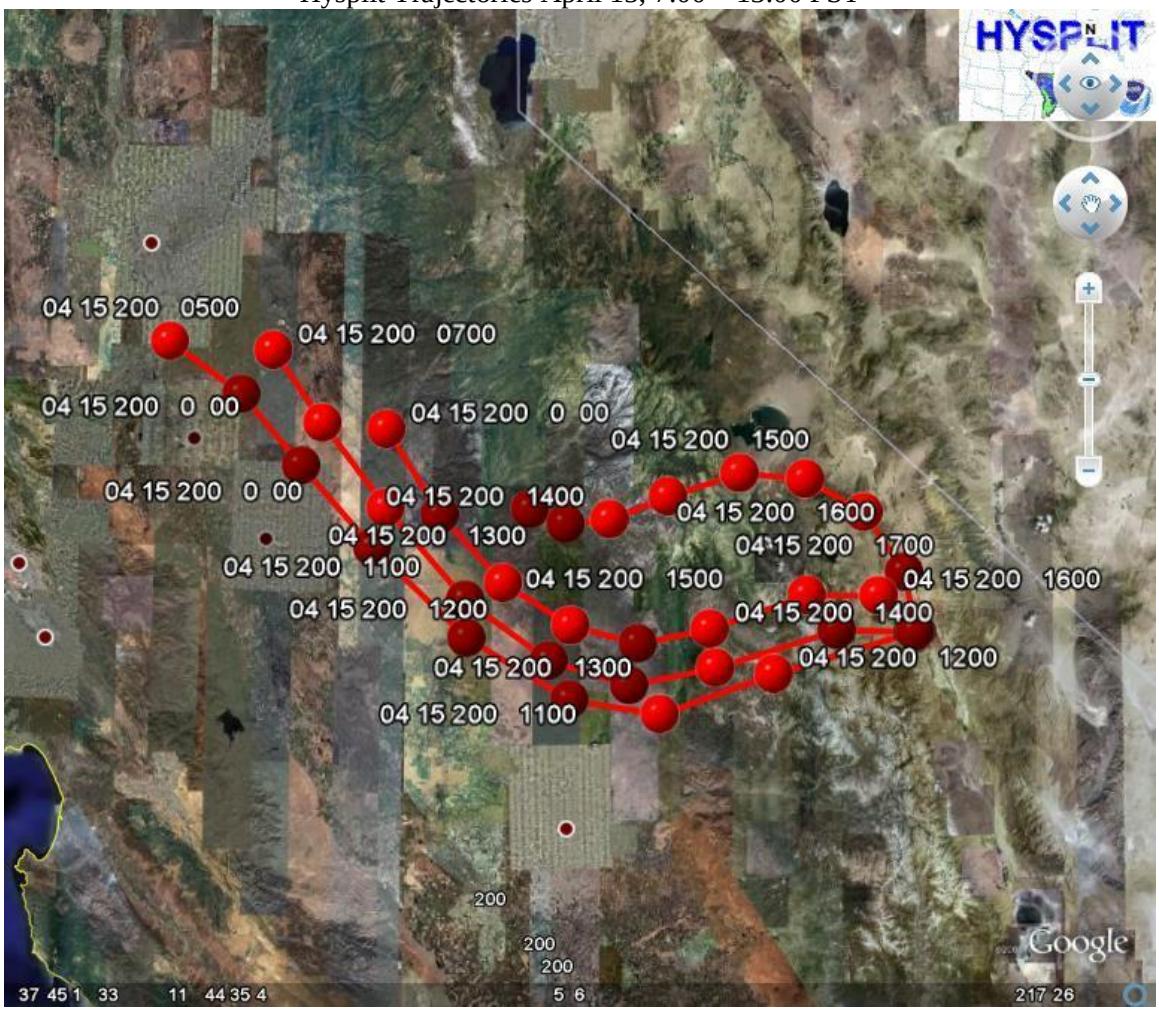
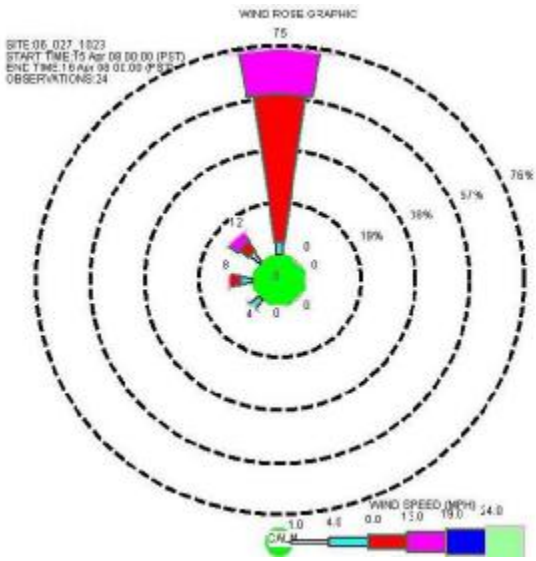


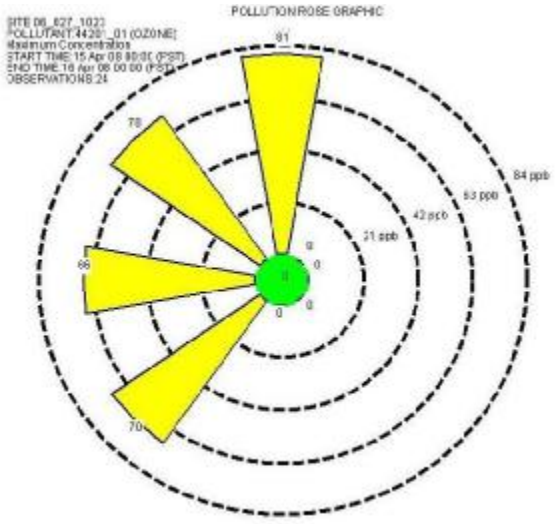
Figure 10 shows the corresponding wind and pollution roses. The wind rose confirms the predominant local wind direction from the North. Interestingly, while the pollution rose shows the highest concentrations to be from the North, high concentrations are also observed from the West quadrant.

FIGURE 10

Wind Rose April 15



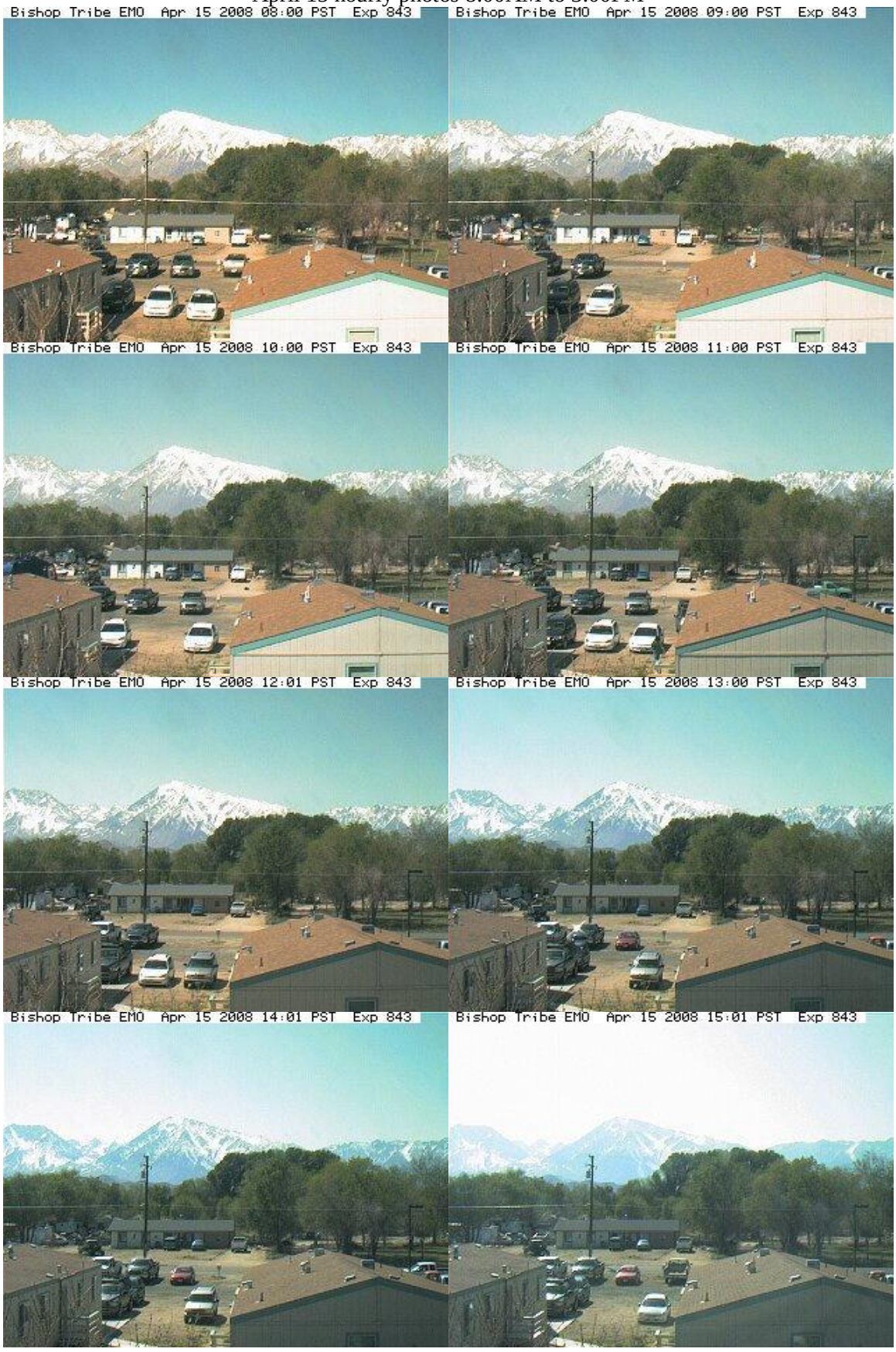
Pollution Rose April 15



April 2008 was consistently hazy. Therefore visibility images are included for each high ozone day to see if they provides additional information. In response to our inquiry, Duane Ono from GBUAPCD consulted with California Air Resources Board who confirmed the impact of a plume of Chinese dust during the period, indicating that "TOMS Absorbing Aerosol data show large dust export from Asia from April 14 to about the May 4, with persistent North American impacts."

The camera is mounted on the roof of the Environmental Management Office and downloads a picture of Mt. Tom (approximately 13 miles to West) at the start of each hour. The images are archived. Figure 11 shows the images for April 15. Some evidence of the haze is evident in the later afternoon photographs.

FIGURE 11
April 15 hourly photos 8:00AM to 3:00PM



April 19, 2008

Figure 12 shows the particulate matter and ozone concentrations for April 19. This information is part of a 2-day pattern that includes April 20 (discussed below). As on April 15, high PM-10 concentrations precede the high ozone concentrations with high PM-10 concentration occurring 4:00 PM PST, and ozone concentrations continuing to rise at midnight.

FIGURE 12

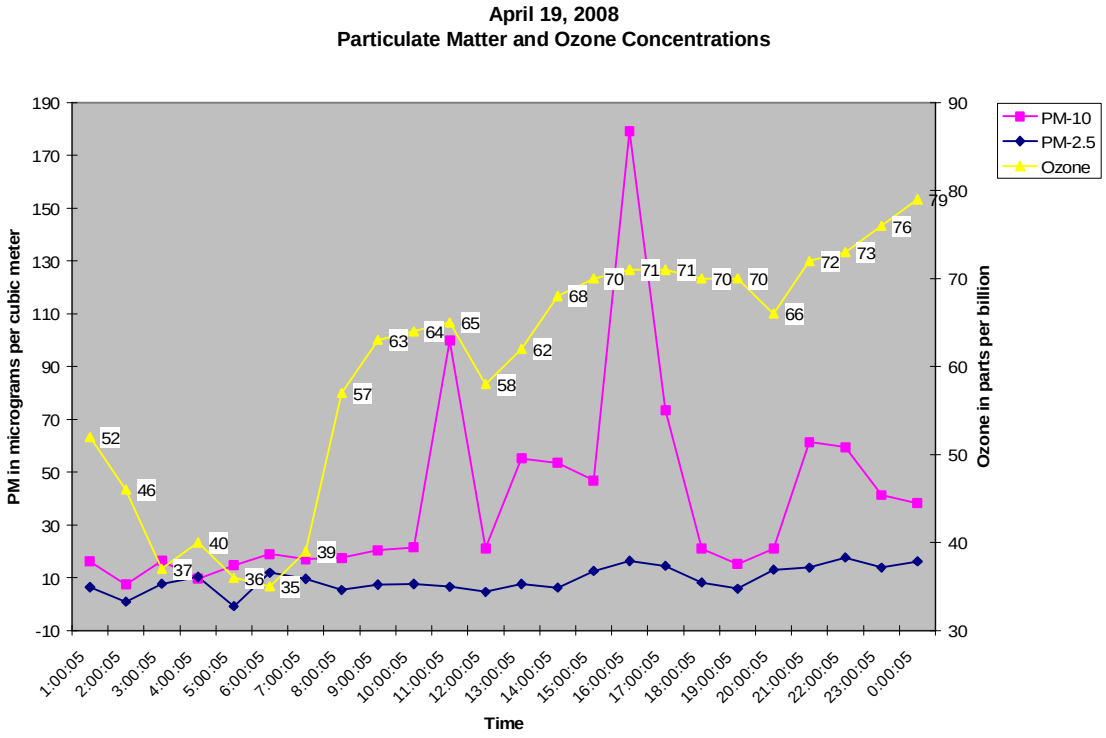


Figure 13 shows wind speed, gust and direction. On the 19th, winds were predominantly from the West Northwest gusting over 40 miles per hour.

FIGURE 13

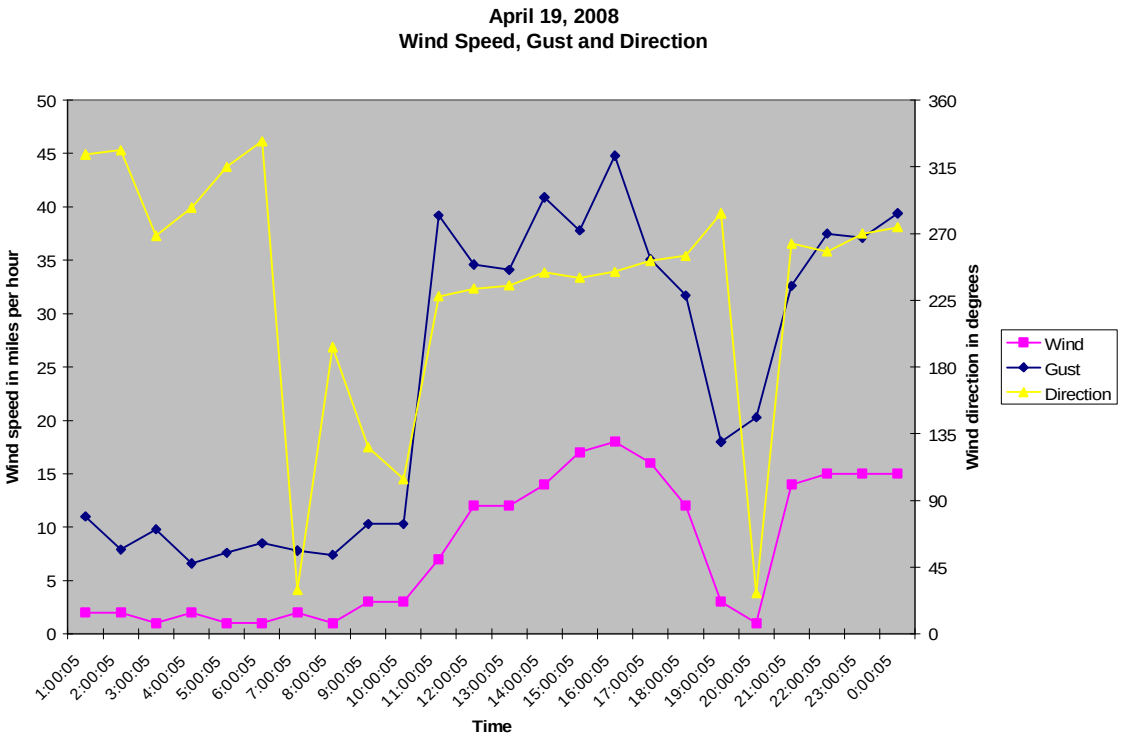


Figure 14 shows barometric pressure and frontal passage is clearly apparent.

FIGURE 14

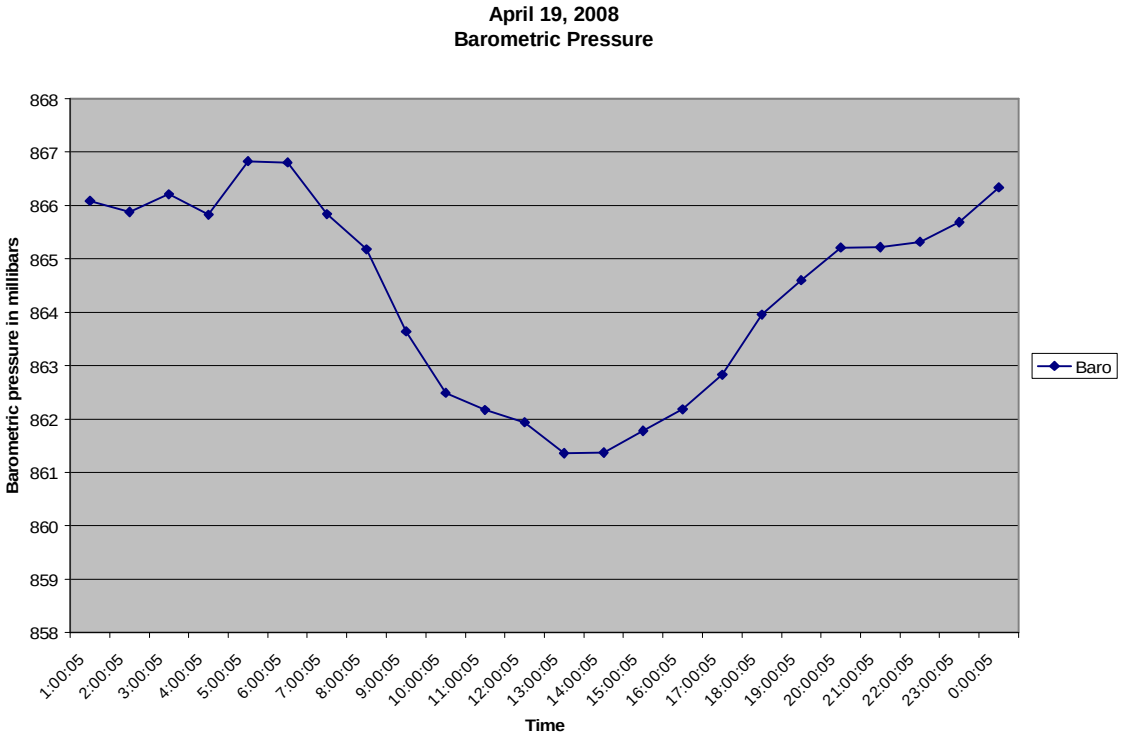


Figure 15 shows the 8-hour Hysplit back trajectories, computed at 2-hour intervals for the 6-hour period starting at 8:00 PM PST on April 19. All trajectories point directly westward.

FIGURE 15
Hysplit Trajectories April 19, 20:00 to April 20, 2:00 PST

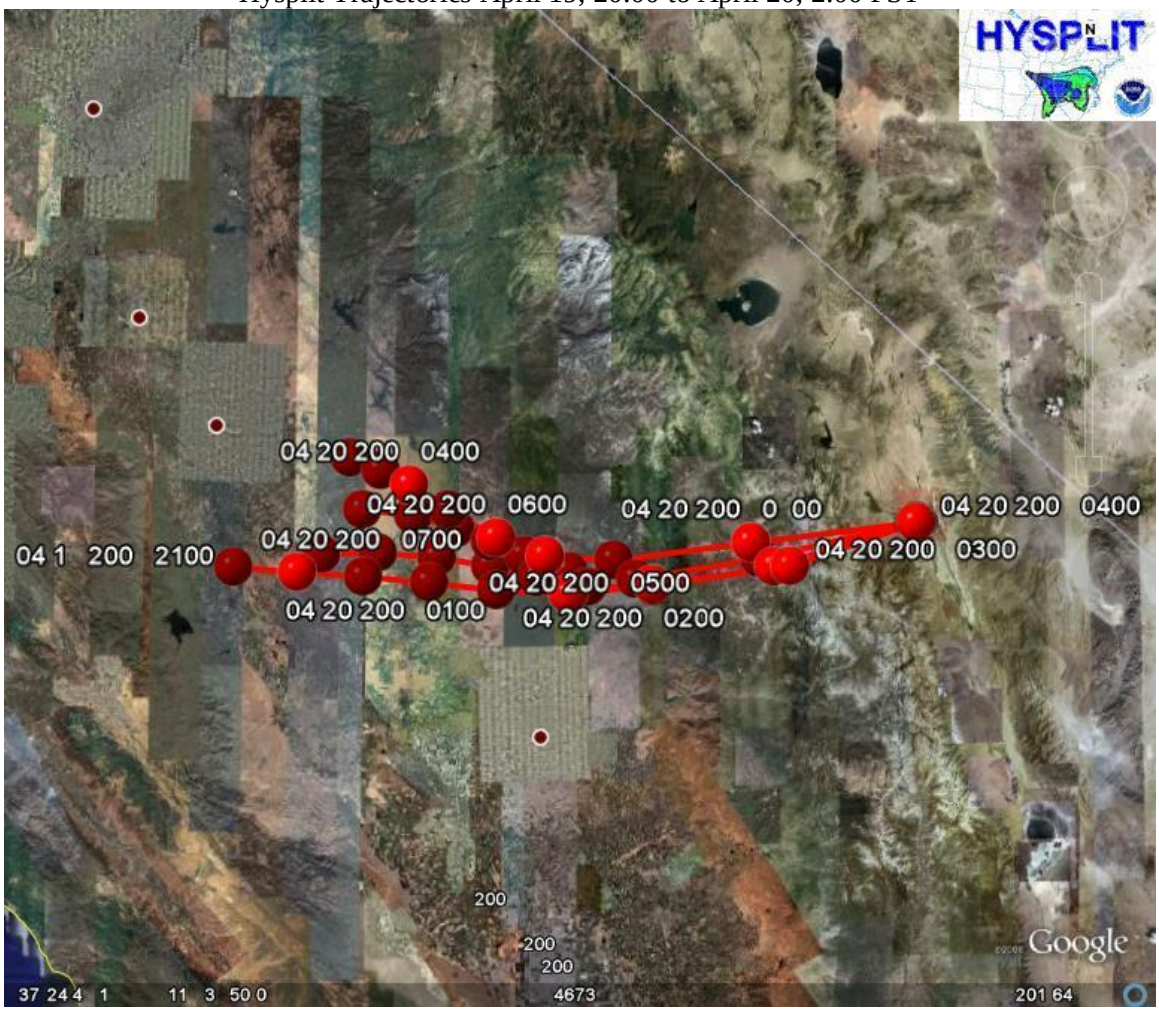
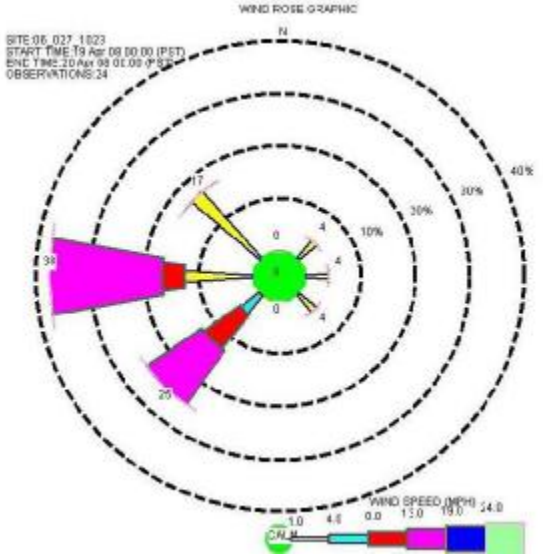


Figure 16 shows the wind and pollution roses for the 19th. The wind roses confirm predominant local winds from the West and Southwest. The pollution roses indicate ozone from a variety of directions, with West dominanting.

FIGURE 16

Wind Rose April 19



Pollution Rose April 19

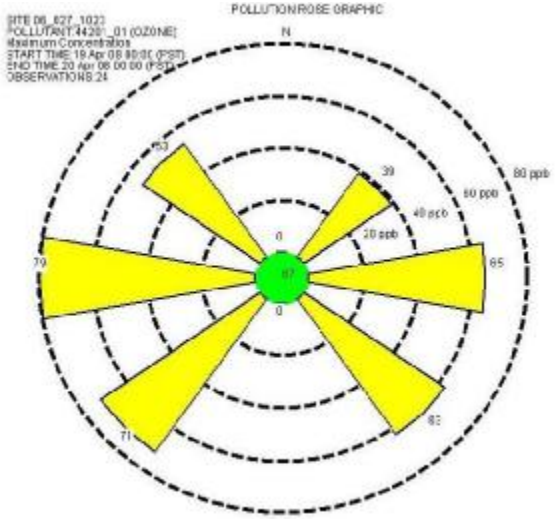
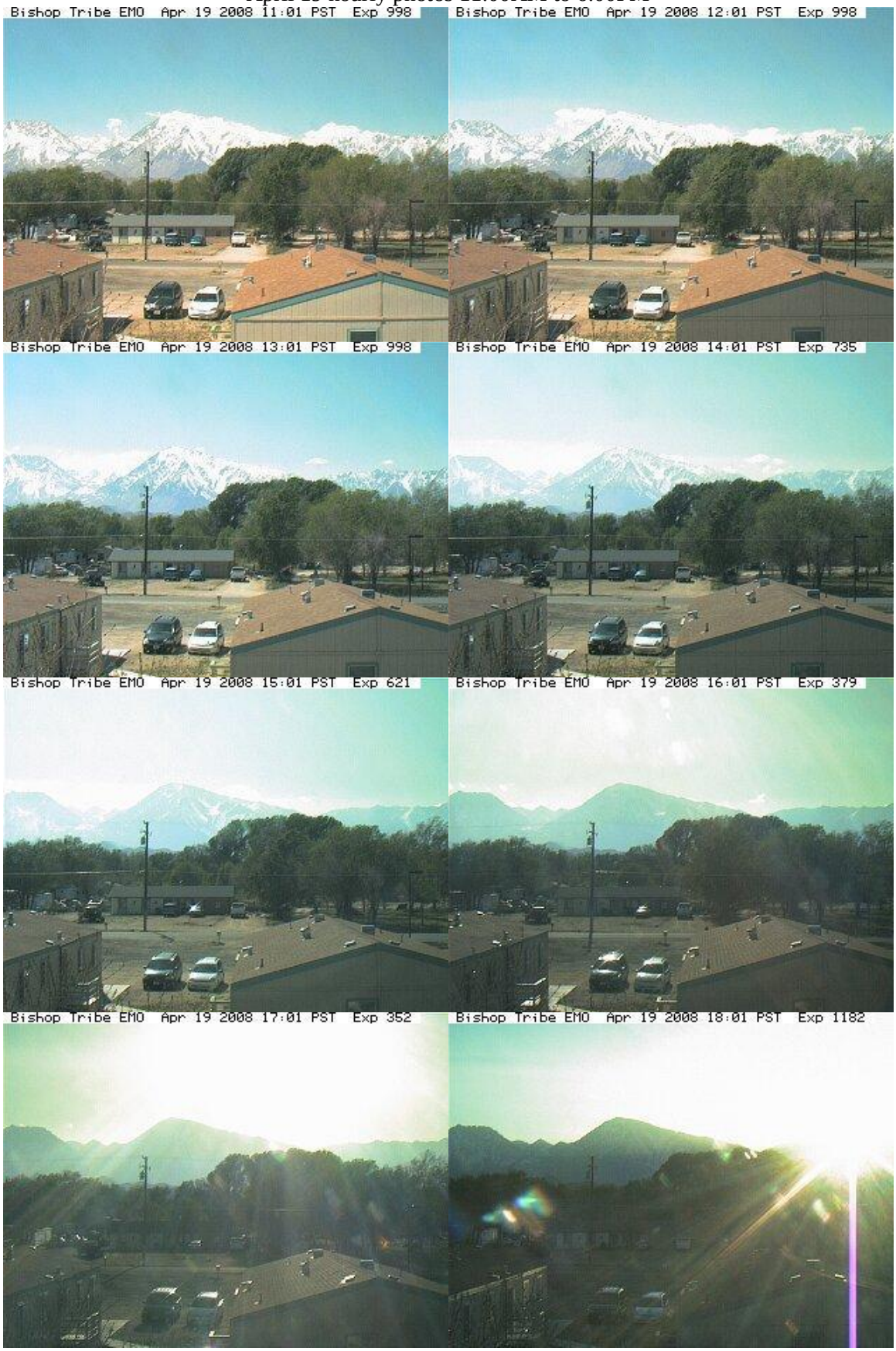


Figure 17 shows the visibility images for April 19. Again, the hazy conditions are more apparent in the later afternoon, and these images clearly show the low visibility that prevailed in April.

FIGURE 17
April 19 hourly photos 11:00AM to 6:00PM



April 20, 2008

Figure 18 shows the particulate matter and ozone concentrations for April 20. The April 20th episode appears to be a continuation of the episode that started on the 19th, with peak ozone concentrations at 1:00 AM PST, more or less coinciding with peak PM-10 concentrations, although values remain high throughout the 24-hour period. However, once again, much higher PM-10 concentrations are observed on the previous day, April 19th.

FIGURE 18

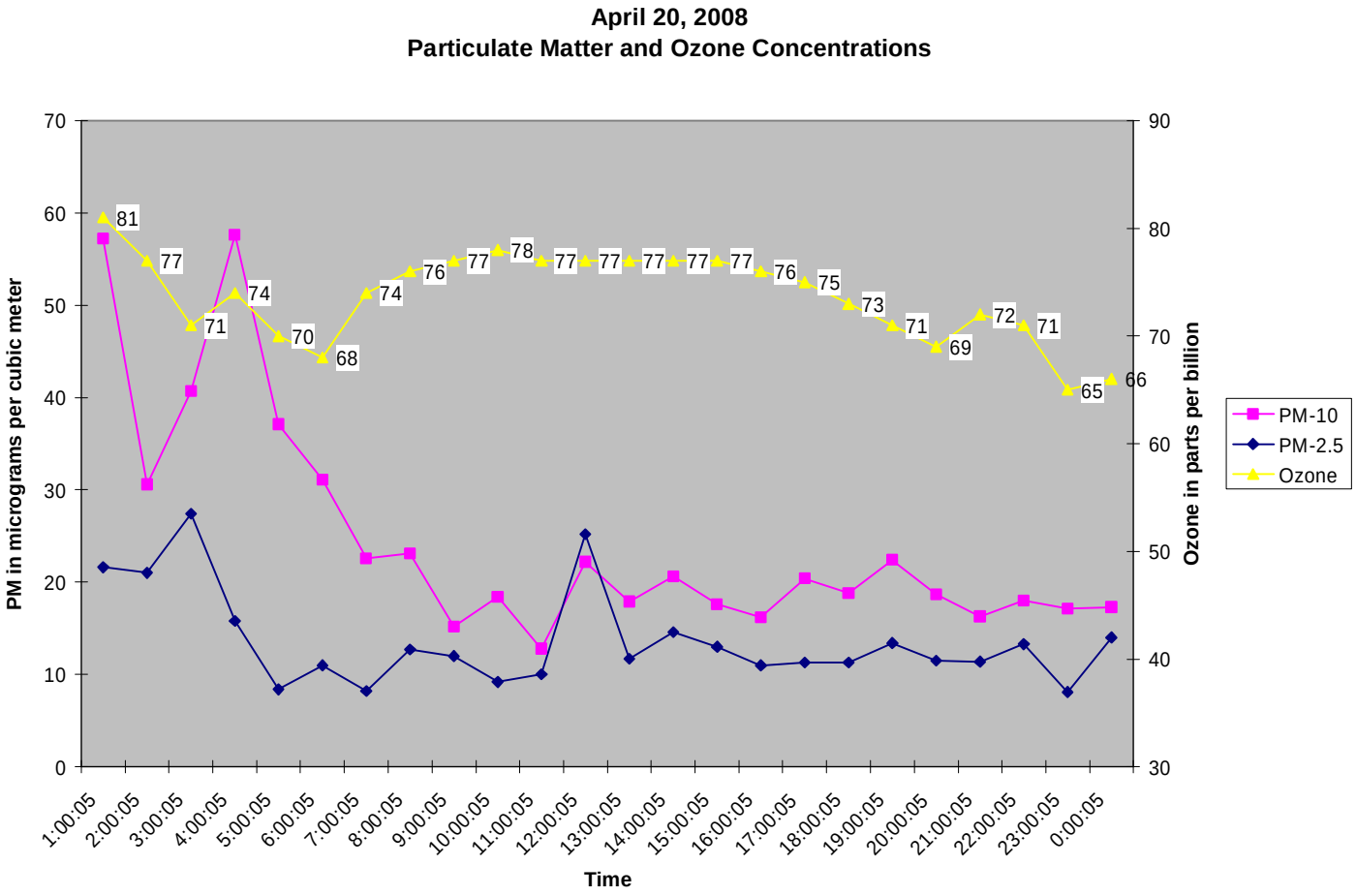


Figure 19 shows wind speed, gust and direction. As on April 15th, winds are predominantly from the North, gusting to 35 miles per hour. The wind speeds had dropped slightly from 19th.

FIGURE 19

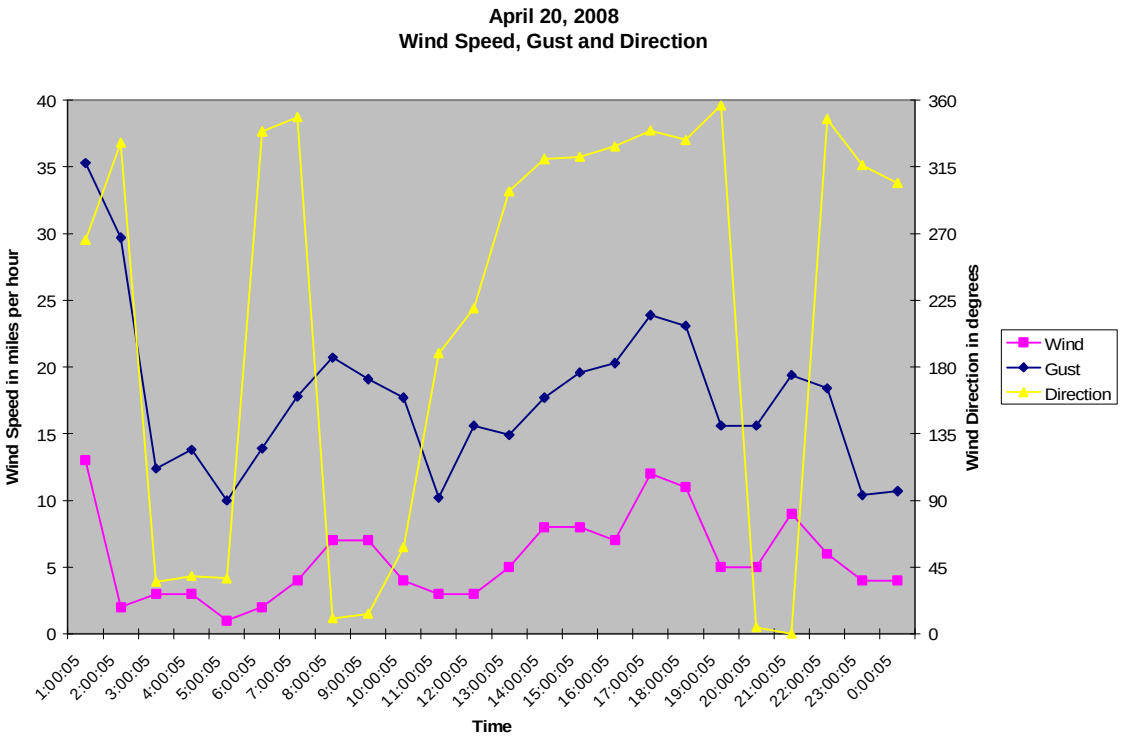


Figure 20 shows barometric pressure. The frontal passage initiated on the 19th is clearly apparent.

FIGURE 20

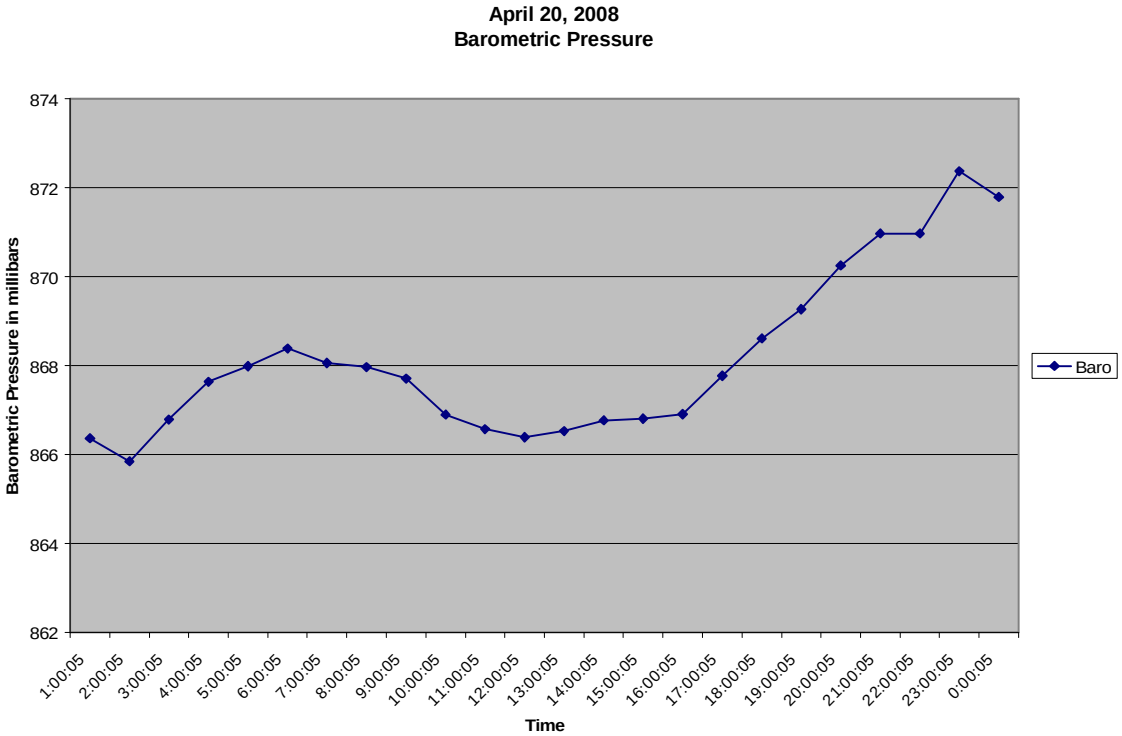


Figure 21 shows the 8-hour Hysplit back trajectories, computed at 2-hour intervals for the 6-hour period starting at 7:00 AM PST. All trajectories point directly westward, with a slight northward trend in the later ones.

FIGURE 21
Hysplit Trajectories April 20, 7:00 to 13:00 PST

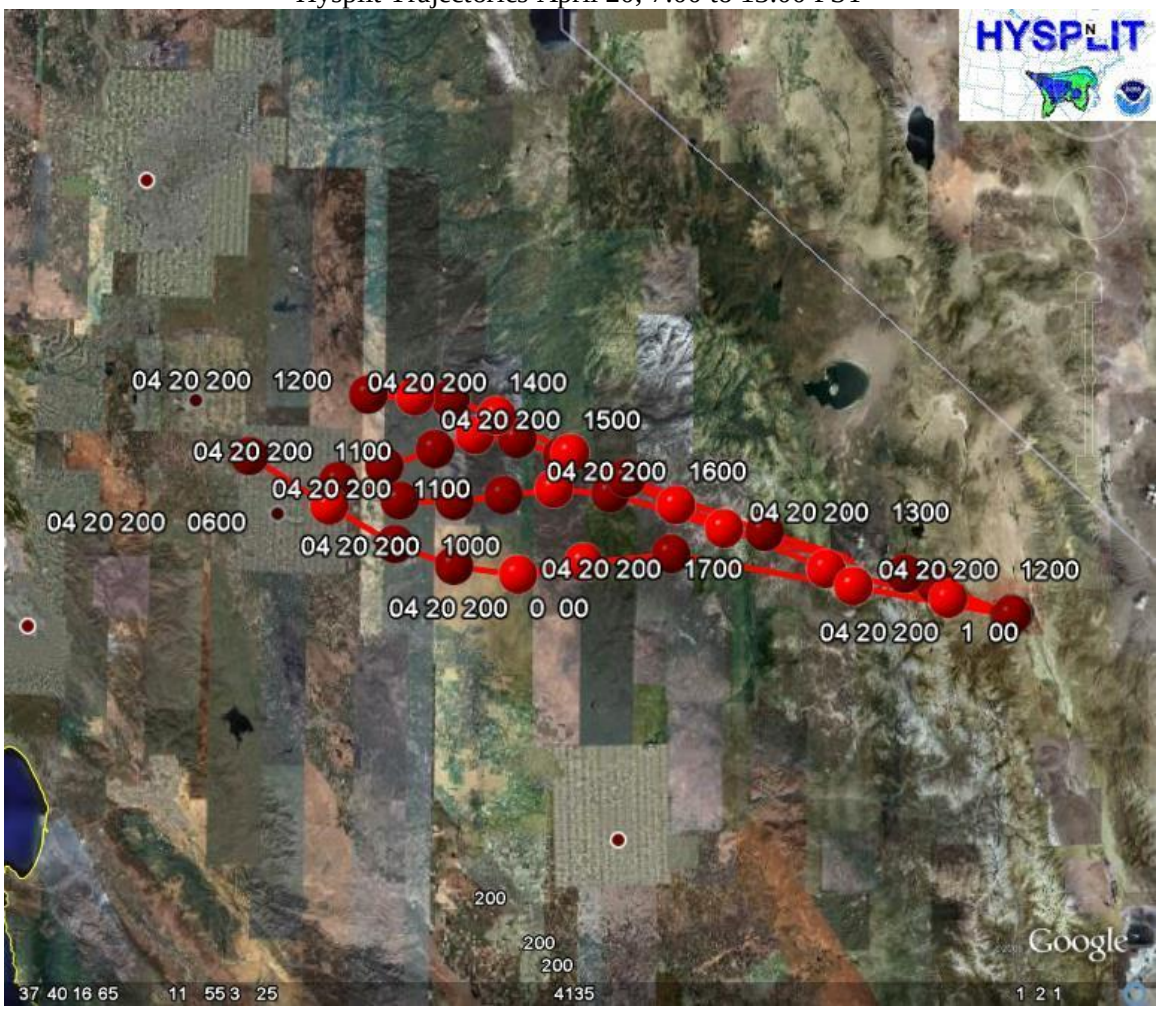
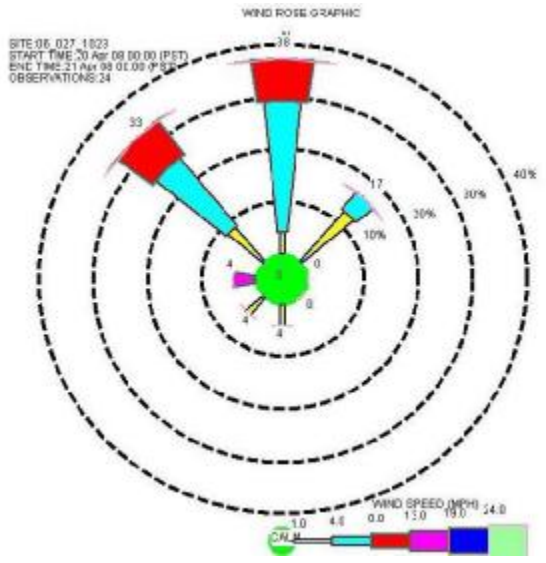


Figure 22 shows the wind and pollution roses. The wind rose shows predominant North and Northwest winds, but the pollution rose indicates high ozone concentrations coming from a multiplicity of directions.

FIGURE 22

Wind Rose April 20



Pollution Rose April 20

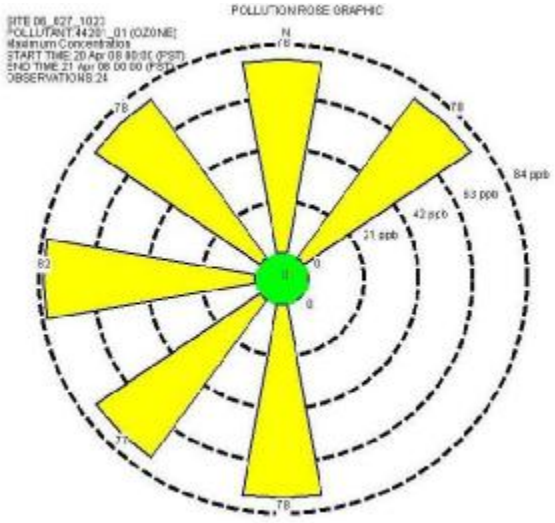
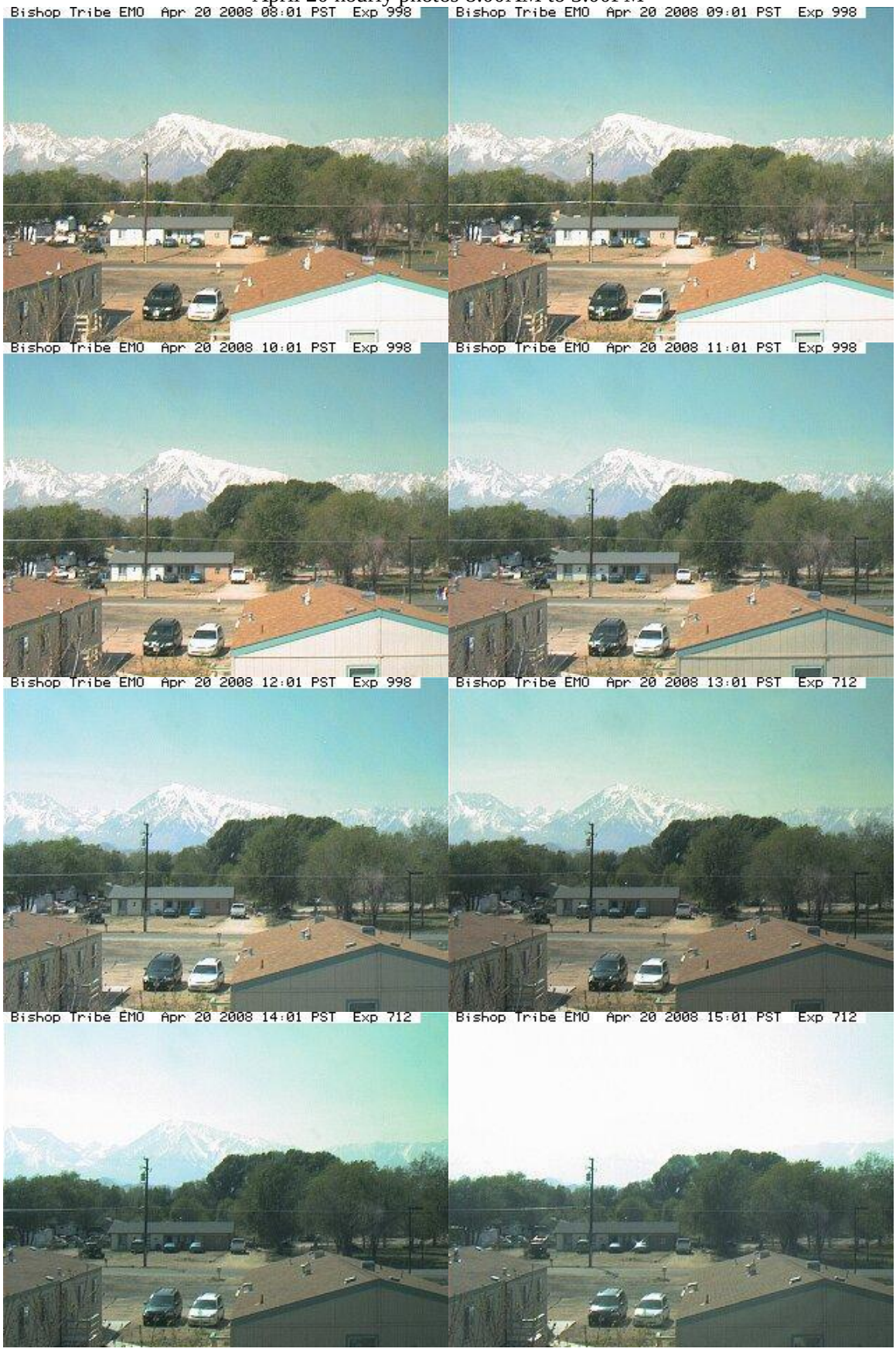


Figure 23 shows the visibility images.

FIGURE 23
April 20 hourly photos 8:00AM to 3:00PM



April 30, 2008

Figure 24 shows the particulate matter and ozone concentrations for April 30. These are the highest ozone concentrations observed in April. While the ozone concentrations peak prior to the PM-10 concentrations, much higher PM-10 concentrations are observed on the 29th, a pattern similar to the other high ozone days examined.

FIGURE 24

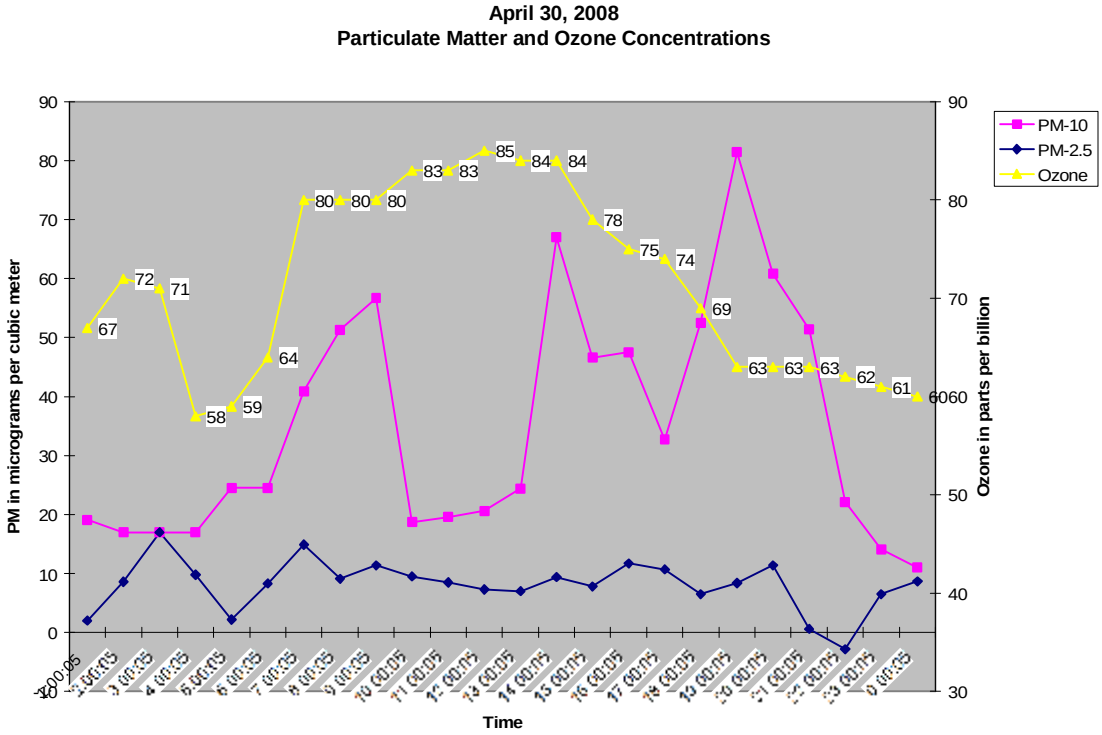


Figure 25 shows the wind speed, gust and direction. Winds are consistently from the North, gusting over 35 miles per hour.

FIGURE 25

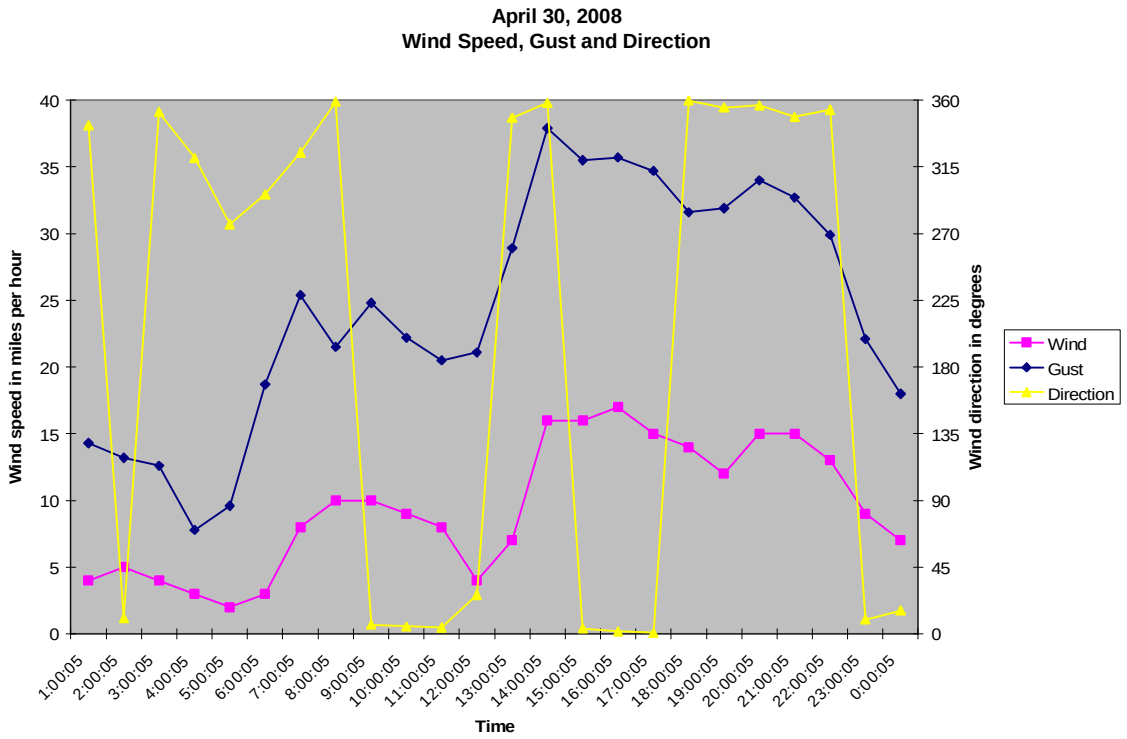


Figure 26 shows barometric pressure. Once again, frontal passage is apparent.

FIGURE 26

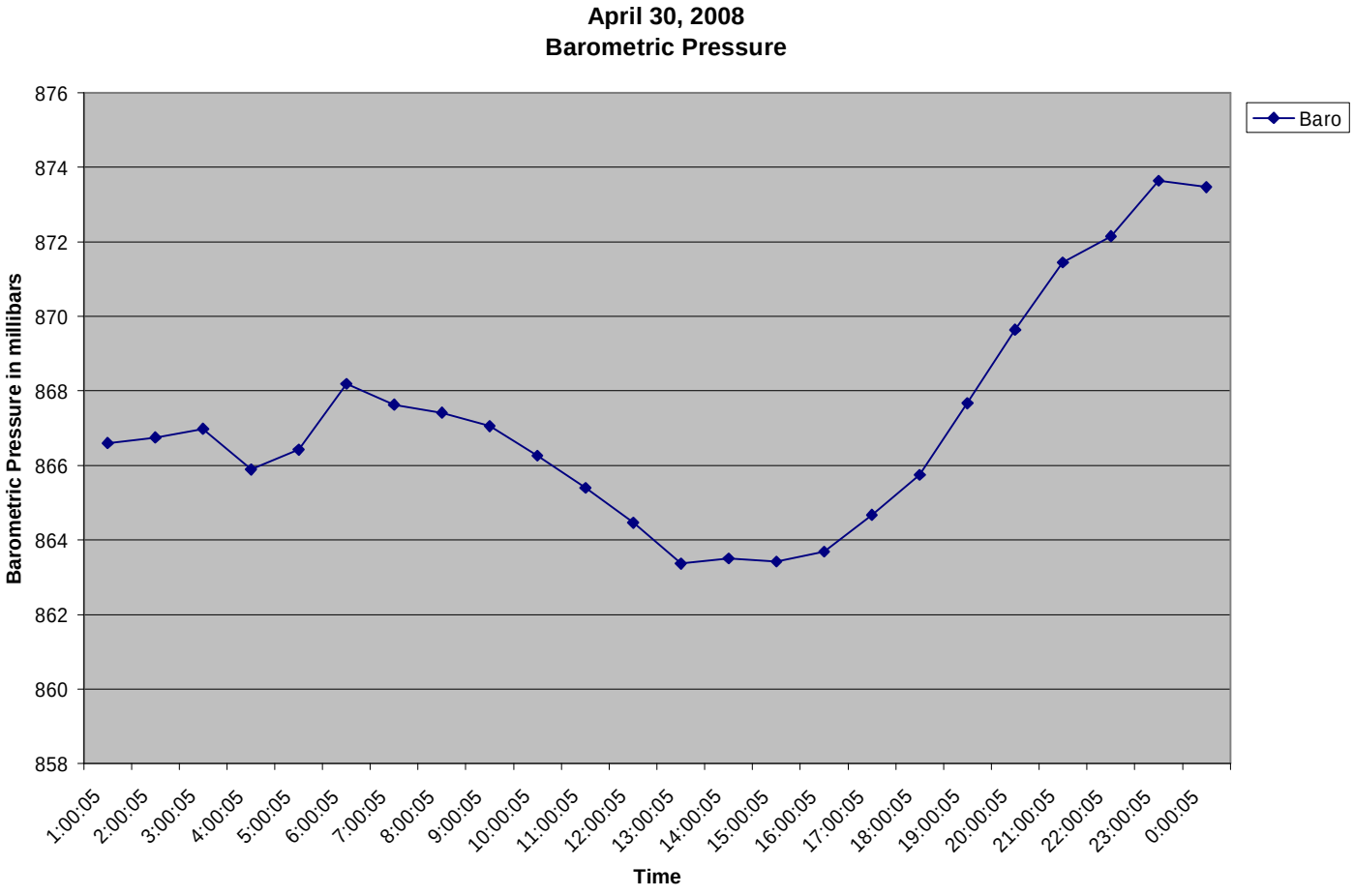


Figure 27 shows the 8-hour Hysplit back trajectories, computed at 2-hour intervals for the 6-hour period starting at 6:00 AM PST. All trajectories point northwestward, with a slight increase in the northward trend in the later ones.

FIGURE 27
Hysplit Trajectories April 30 6:00 to 12:00 PST

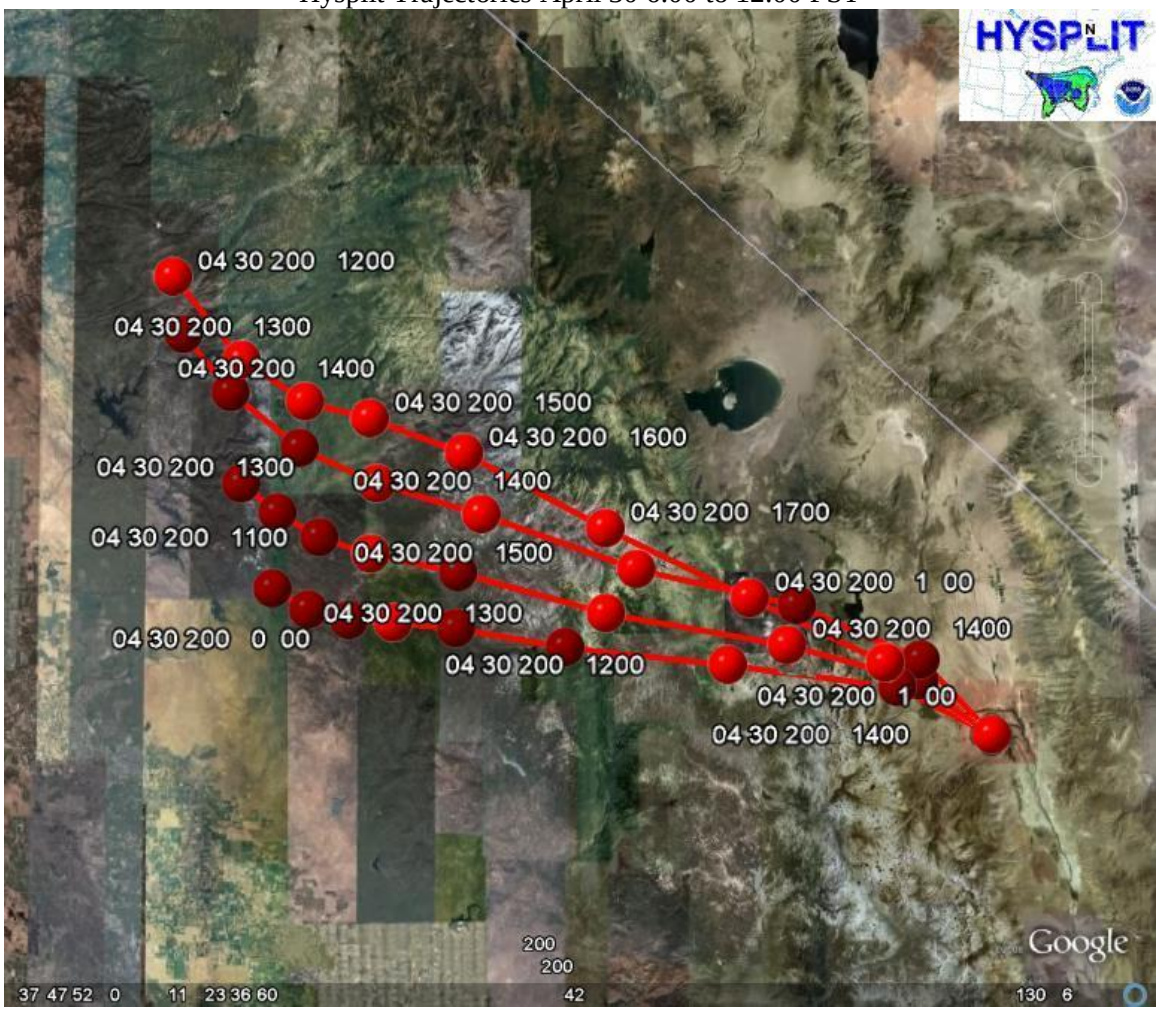
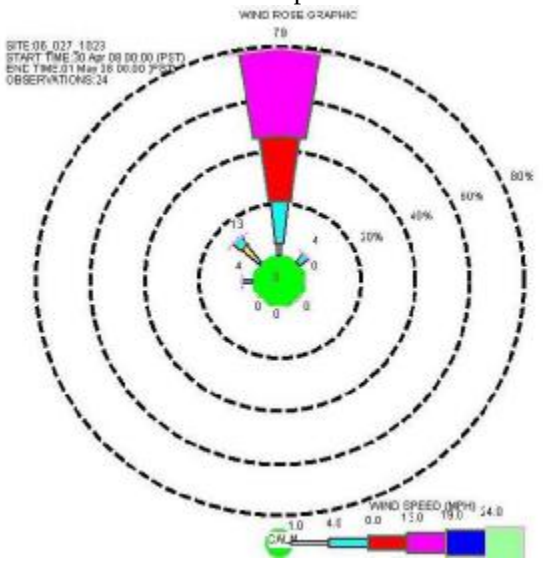


Figure 29 shows the wind and pollution roses. The wind roses confirm local North winds. The pollution roses show a predominant northern direction for the ozone, but with considerable variation from Northwest to Northeast.

FIGURE 28

Wind Rose April 30



Pollution Rose April 30

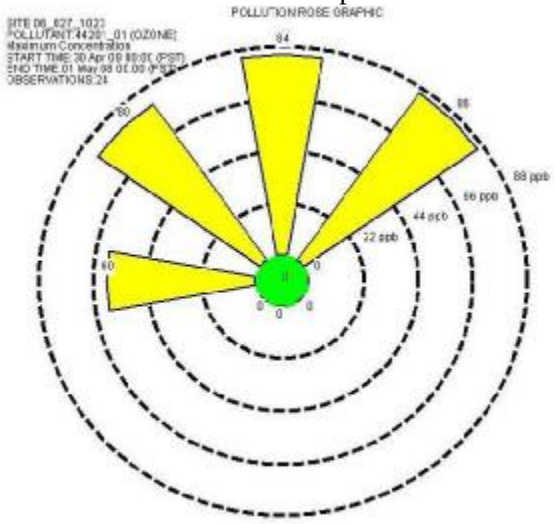
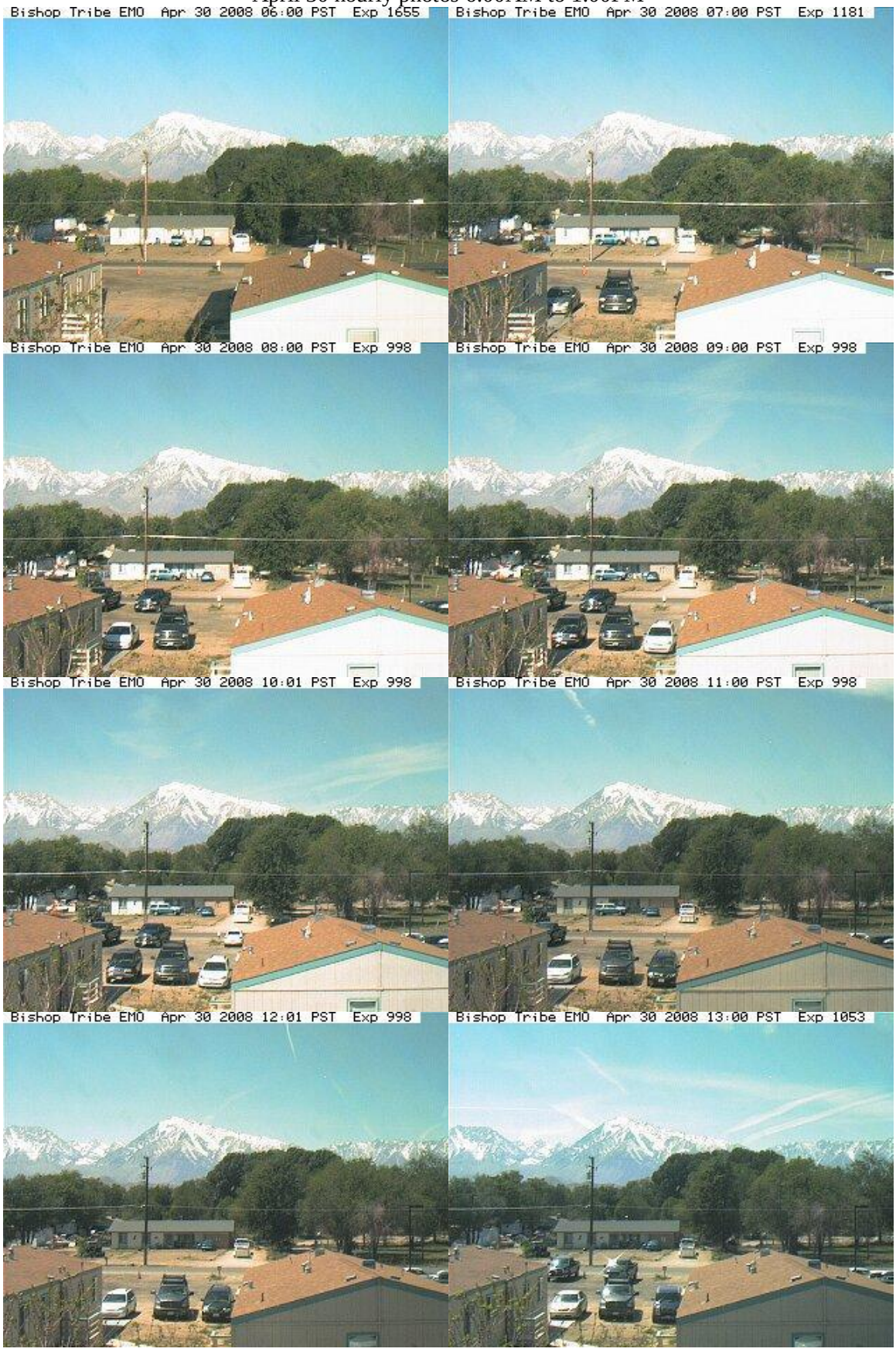


Figure 29 shows the visibility images.

FIGURE 29
April 30 hourly photos 6:00AM to 1:00PM



HIGH OZONE EPISODES ON THE BISHOP PAIUTE RESERVATION
JUNE AND JULY 2008
WILDFIRE IMPACTS

Prepared by Toni Richards, Air Quality Specialist
Bishop Paiute Tribe
Environmental Management Office
February 24, 2009

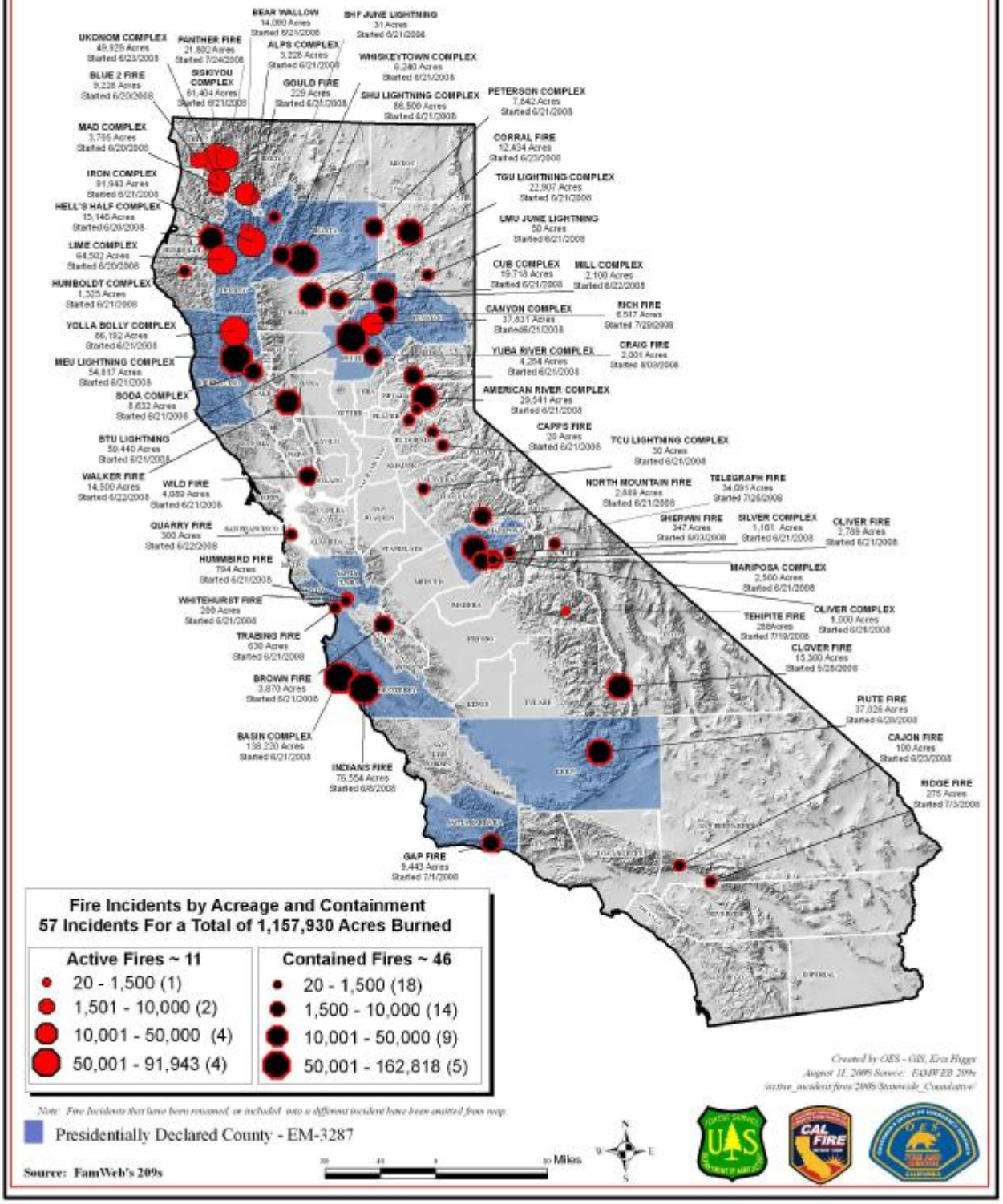
In June and July of 2008, ozone monitors registered high values on the Bishop Paiute Reservation, with values exceeding the Tribal standard on June 10 and July 11 (73ppb and 74ppb), exceeding both the Tribal and federal standard on June 25 and 26, and on July 12 (76, 79 and 76ppb, respectively).

In 2008, both June and July were active wildfire periods. According to the CalFire website: "On June 20, 2008, a severe thunderstorm system moved through northern and central California resulting in over 6,000 total lightning strikes in more than 26 counties. The overwhelming number of lightning strikes, along with record dry conditions sparked over two thousand lightning fires." (http://www.fire.ca.gov/index_incidents_overview.php)

The map below shows the fires that were ignited following the June 20th incident, known as the "lightening siege," and August 11, 2008. The Bishop area was impacted by fires in Mariposa County, including the North Mountain, Silver, Mariposa and Oliver fires, all started 6/21/2008. Many of these fires were still burning in early July. Additional impacts came from the Clover fire which started in May, 2008 but continued to burn for through the middle of July for resource management purposes, and from the Piute Fire started on June 28, 2008.

This report focuses the days 3 days that exceeded the tribal and federal 8-hour standard to improve our understanding of these high ozone episodes.

CALIFORNIA WILDFIRES ~ FEMA EM - 3287-CA
Total Incidents from 6/22/08 - 8/11/08



JUNE 2008

Figure 1 below shows ozone concentrations for June, 2008.

FIGURE 1

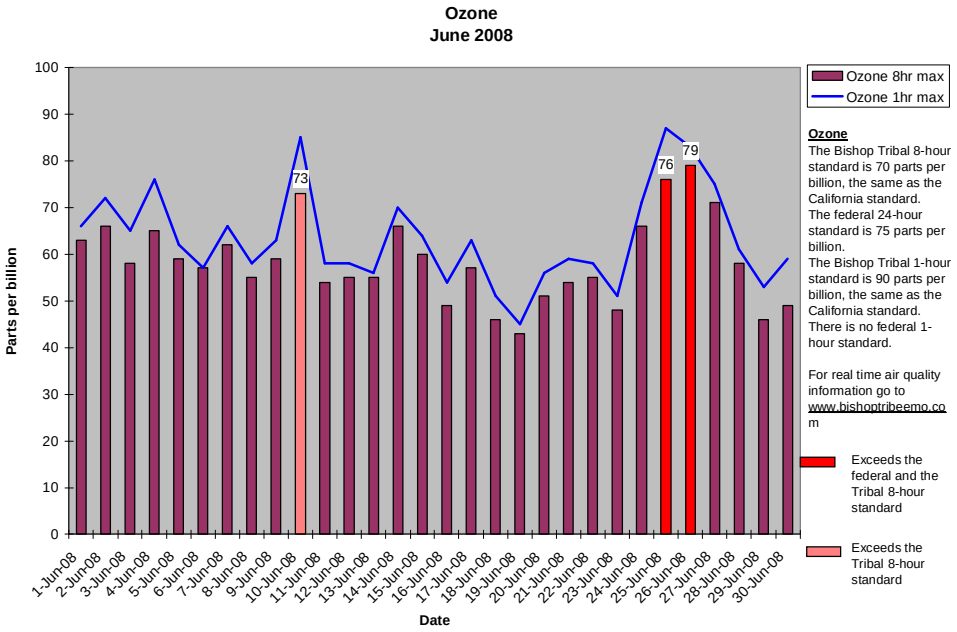
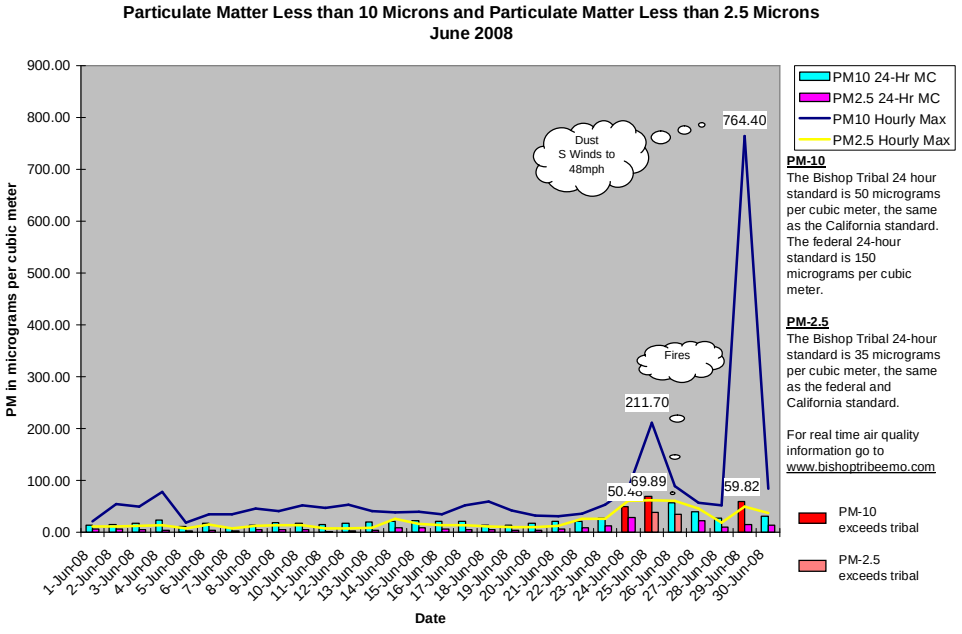


Figure 2 shows the corresponding PM concentrations. The 24-hour PM-2.5 standards on both days exceeded the Tribal and federal standards with concentrations of 39.23 and 35.54 µg/m³, respectively.

FIGURE 2



June 25, 2008

Figure 3 shows the hourly ozone and PM concentrations for June 25. On that day, PM-2.5 values were quite high in the early morning hours, and PM-10 shows a peak at 7:00 AM. The peak in PM-10 and the rising ozone levels coincide with a change in wind direction from the North to the South,

Southeast, and an increase in wind speeds, as shown in Figure 4. The barometer is fairly stable, as seen in Figure 5.

FIGURE 3

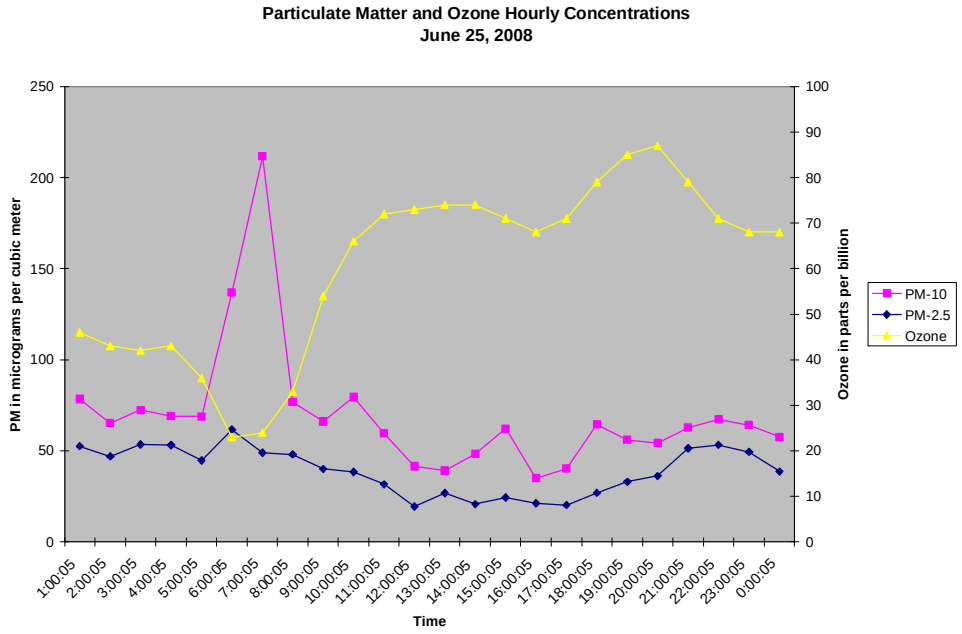


FIGURE 4

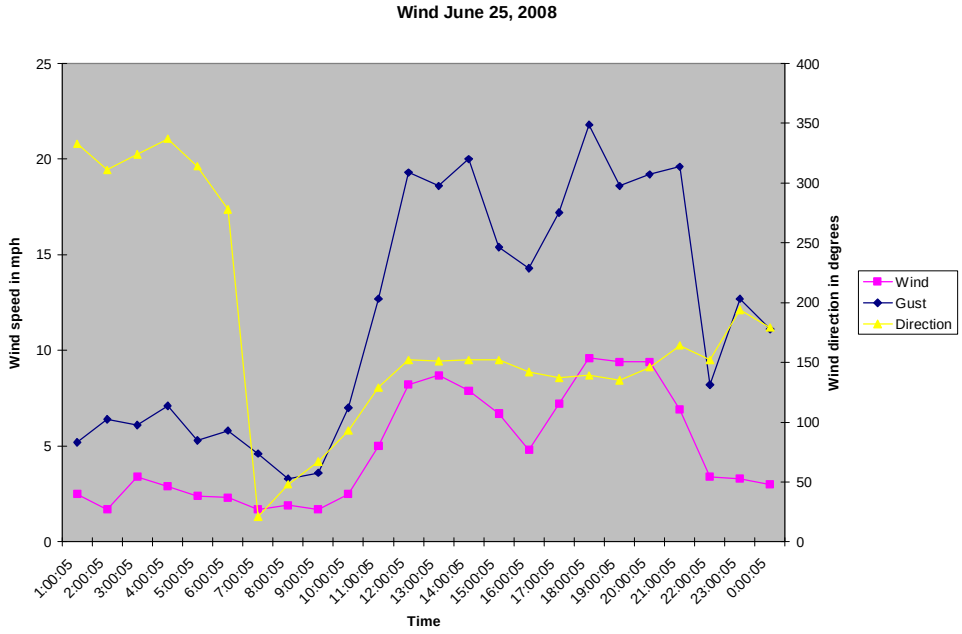
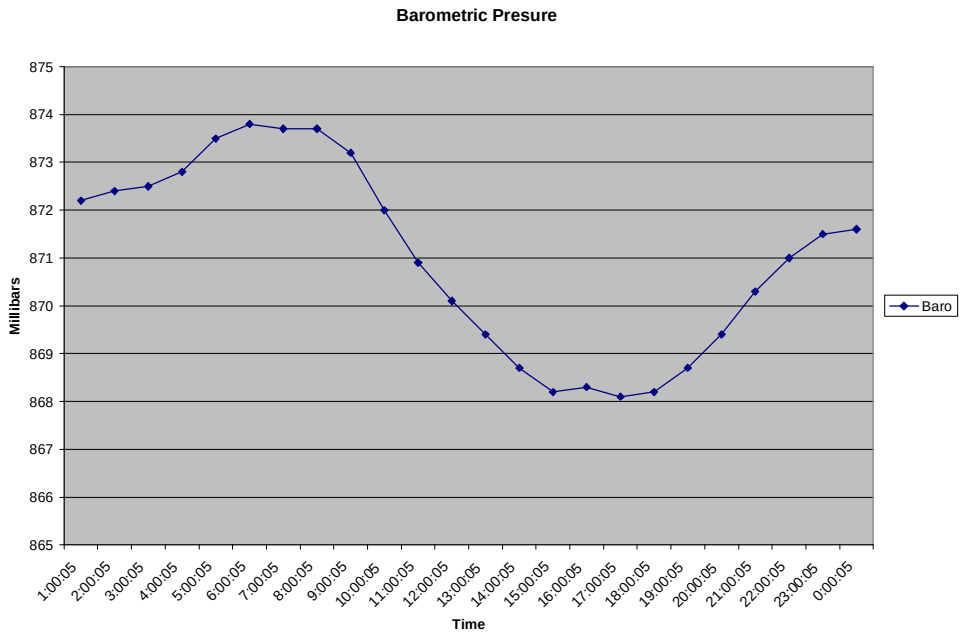
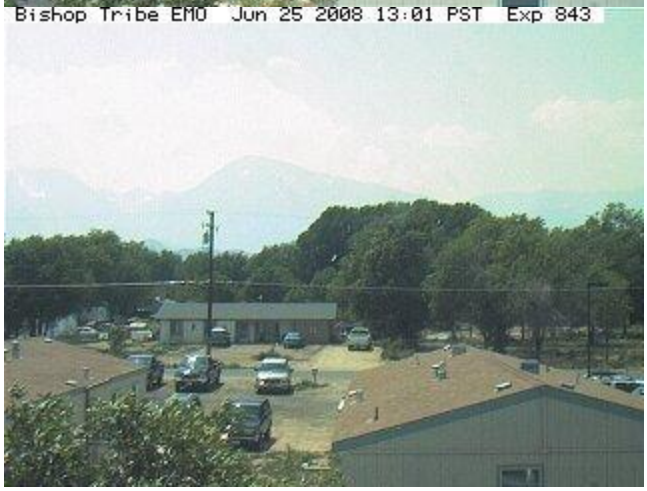


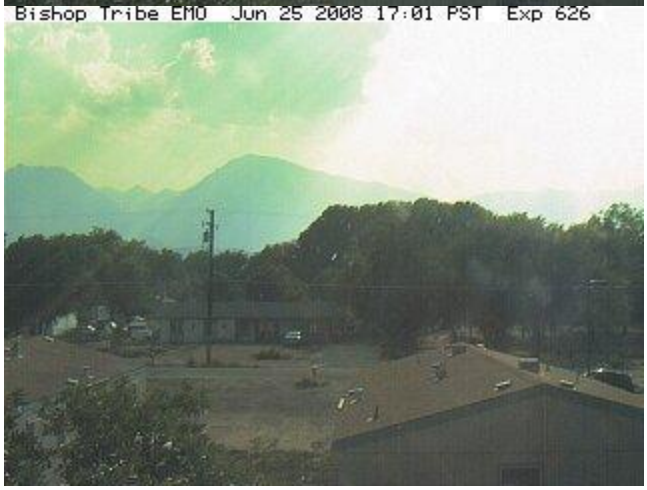
FIGURE 5

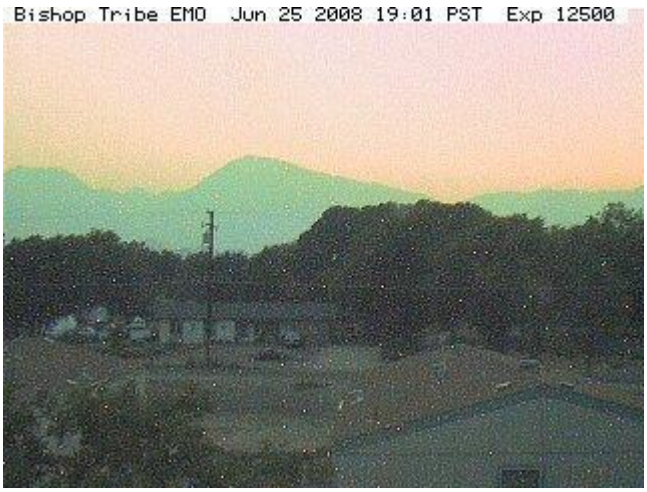


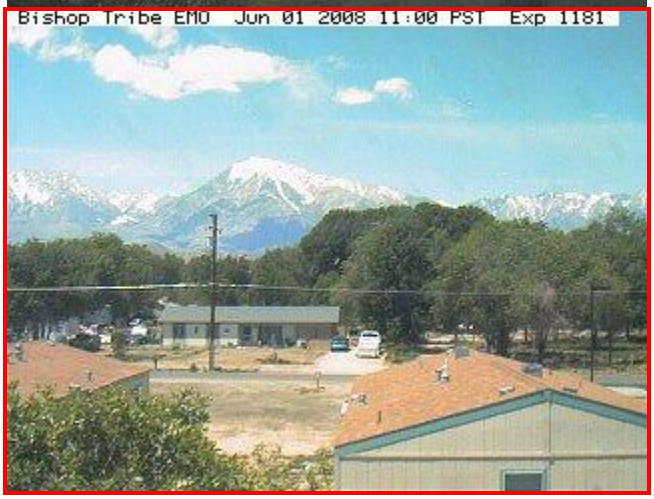
The hourly photographs shown in Figure 6 reveal a substantial reduction in visibility associated with the wildfires. The camera focuses on Mt. Tom at 13,500ft and at a distance of about 13 miles to the West of the Reservation. Its silhouette which usually dominates the landscape is barely apparent. The last photograph is photograph from June 1, 2008 with clear weather and good air quality for comparison.

FIGURE 6









Clear air day June 1, 2008

June 26, 2008

Figure 7 shows the hourly PM and ozone concentrations for June 26. In this case, there is a pattern of rising PM-2.5 concentrations followed by a period of high ozone concentrations. As on the 25th, winds are moderate, increasing in the afternoon, and the barometer is fairly stable (Figures 8 and 9). Figure 10 shows the corresponding sequence of photographs for the 26th. As on the previous day, Mt. Tom is nearly completely obscured.

FIGURE 7

Particulate Matter and Ozone Hourly Concentrations
June 26, 2008

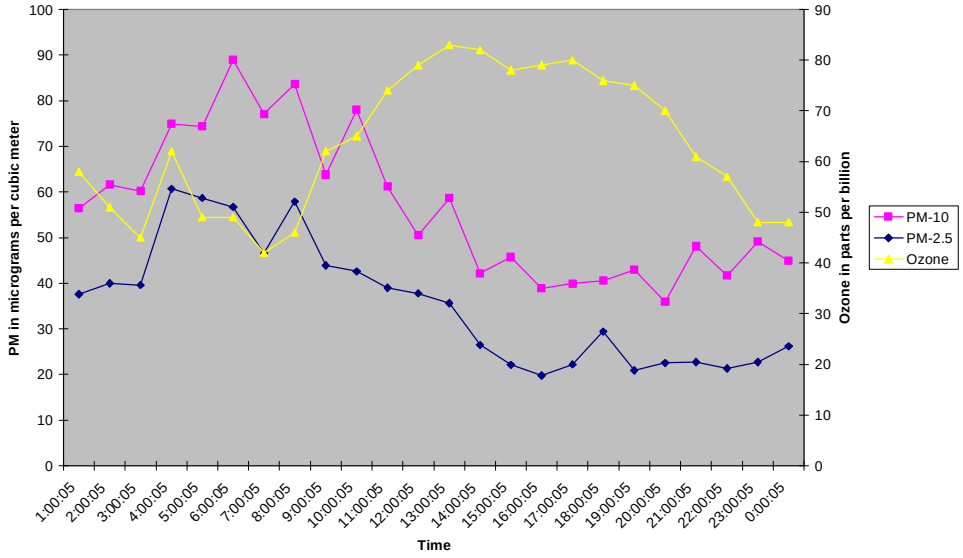


FIGURE 8

Wind June 26, 2008

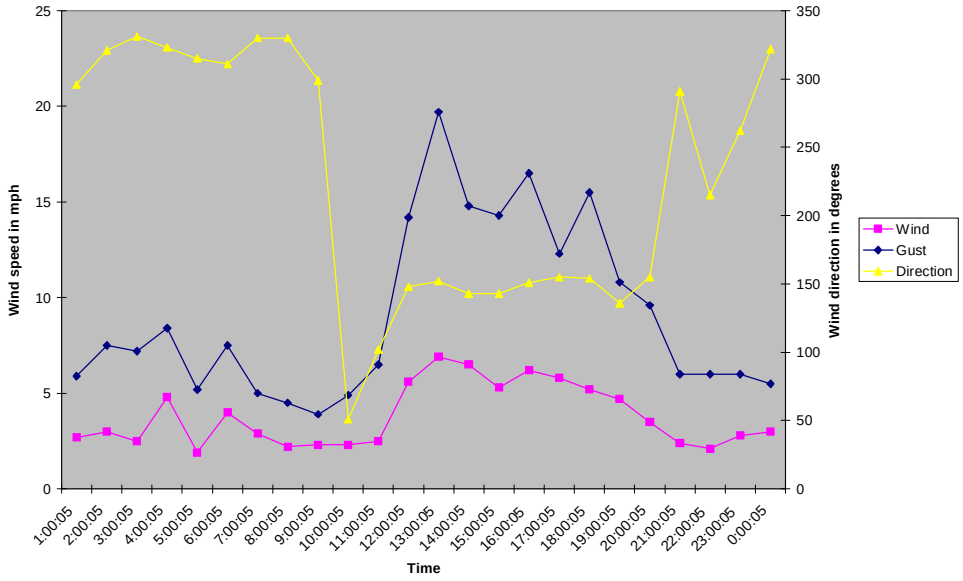


FIGURE 9

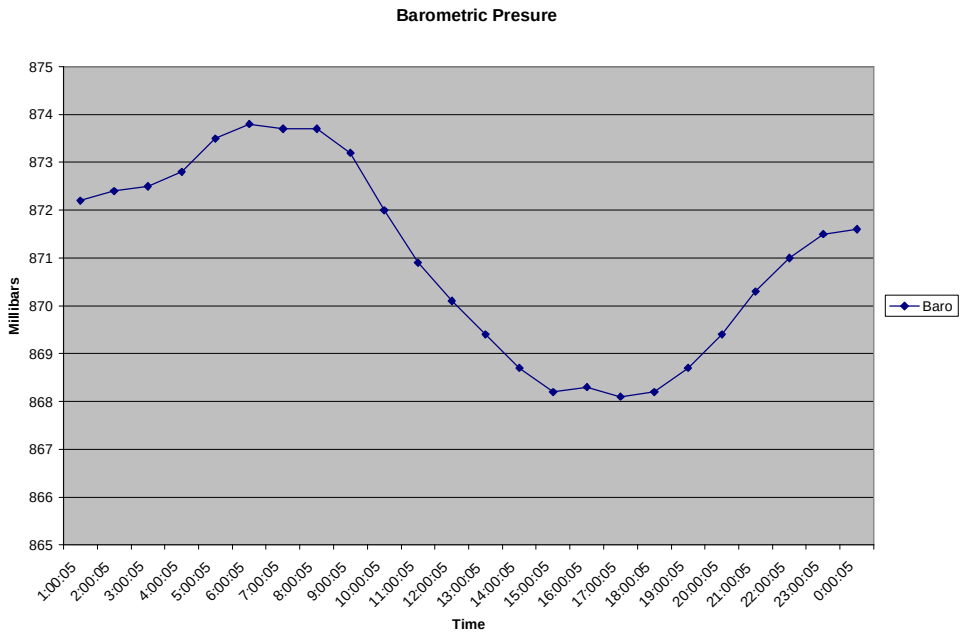
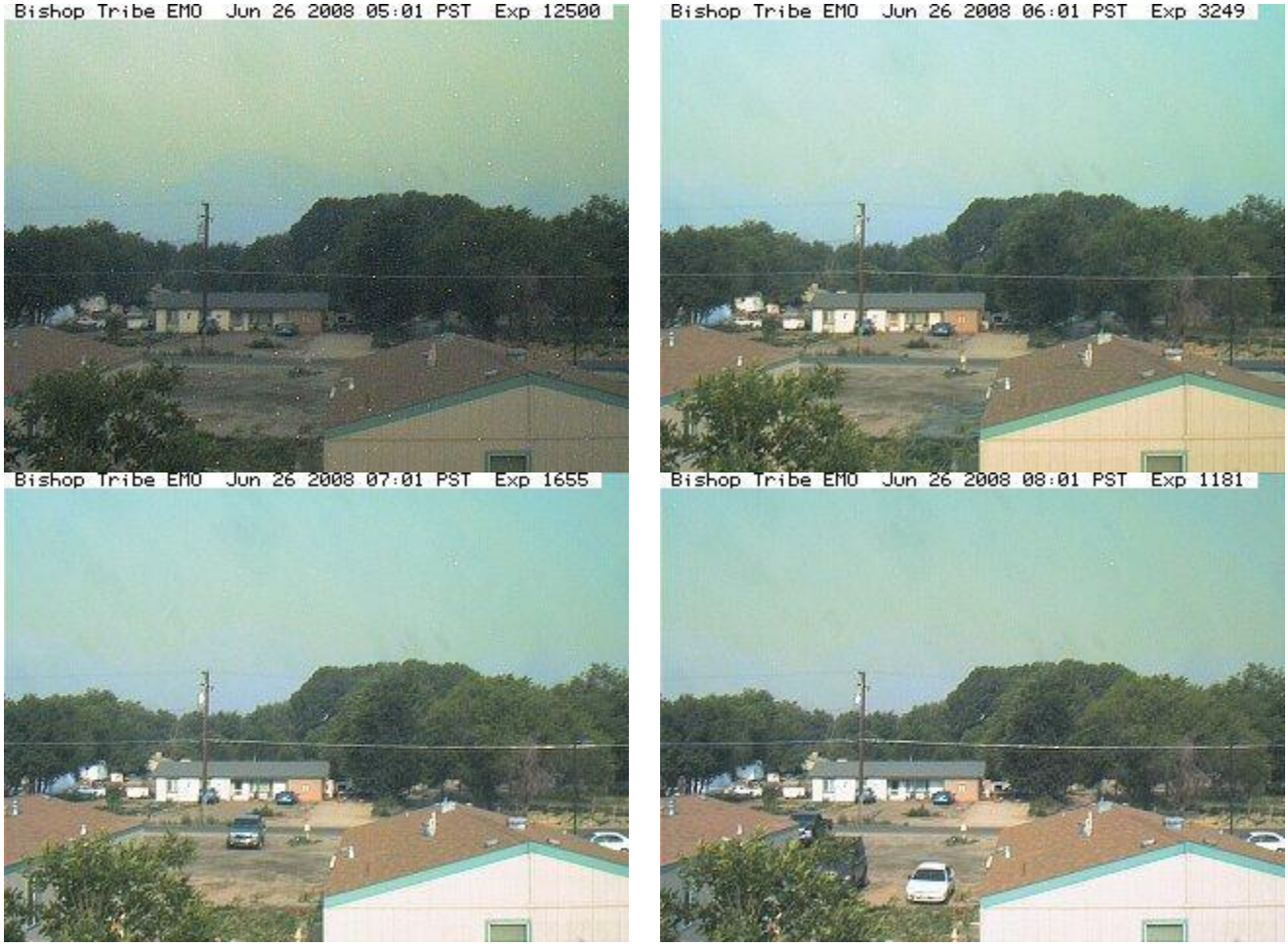


FIGURE 10



JULY 2008

Figure 11 below shows the ozone concentrations for July 2008, with an exceedance of the Tribal 8-hour standard on July 11 (74ppb) and exceedances of both the Tribal and federal standard on July 12 (76ppb). On July 10, the Tribal 24-hour PM-10 was exceeded, and the PM-2.5 standard was approached but not exceeded. The high ozone values follow on the two succeeding days. We focus on the 12th when the federal 8-hour ozone standard was exceeded.

FIGURE 11

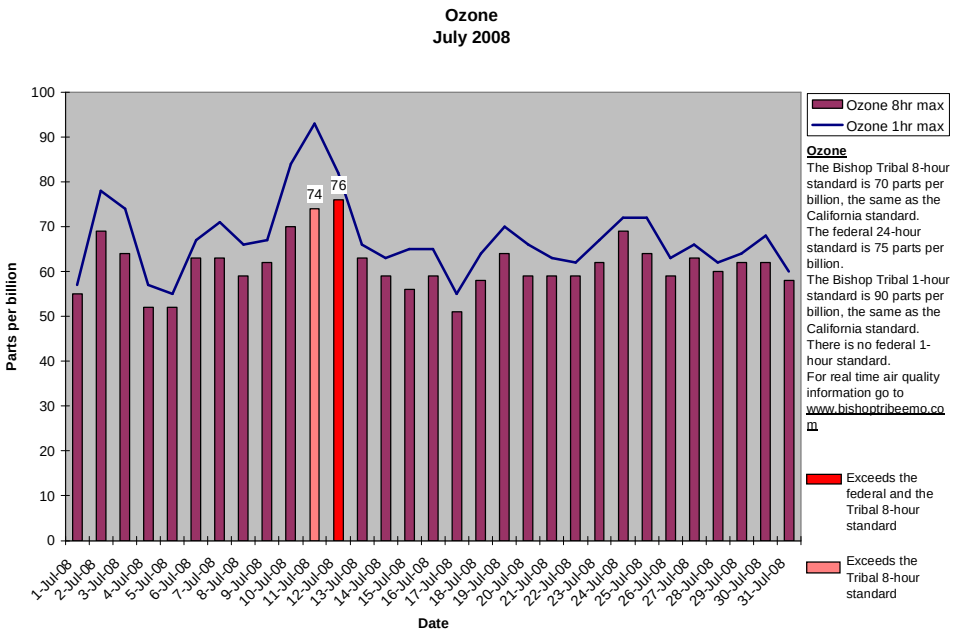
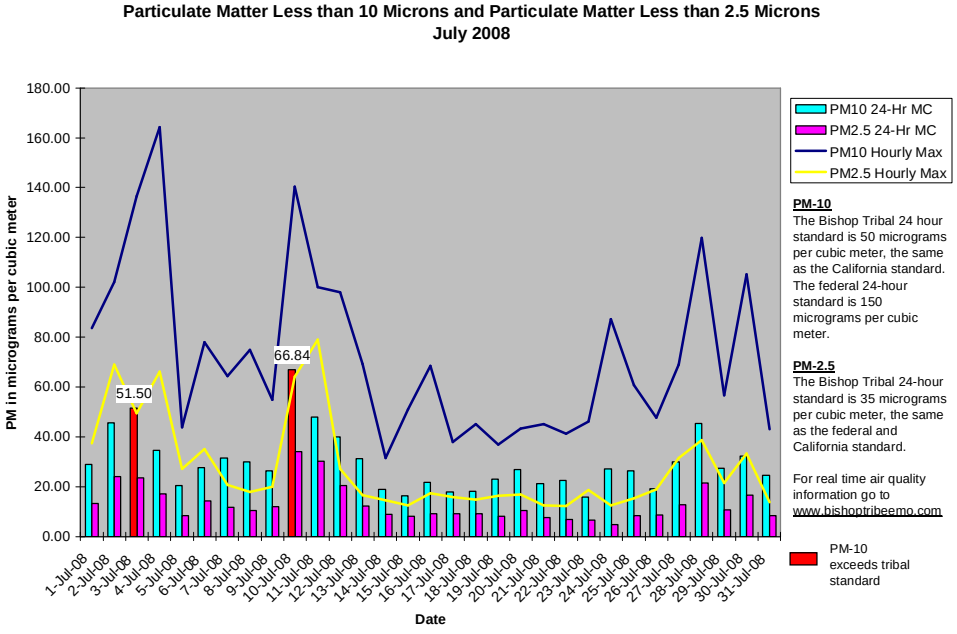


FIGURE 12



July 12, 2008

Figure 13 shows the hourly particulate matter and ozone concentrations. While the PM-2.5 concentrations are moderately high, they had been even higher in the 2 days prior. Figure 14 shows wind speed and direction revealing light to moderate winds increasing in the afternoon. Figure 15 shows barometric pressure. Figure 16 shows the corresponding visibility information, revealing substantially reduced visibility throughout the day.

FIGURE 13

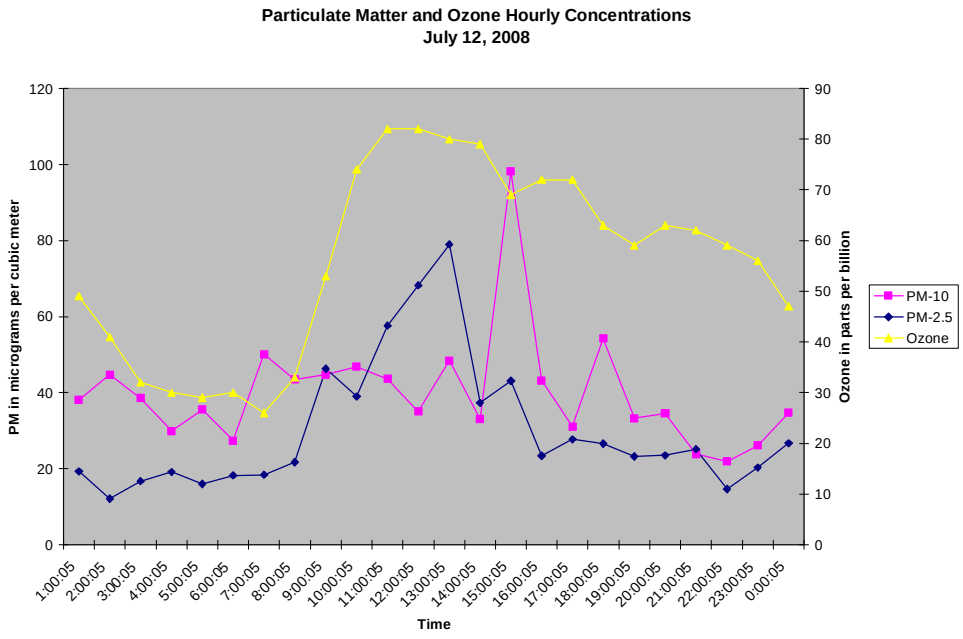


FIGURE 14

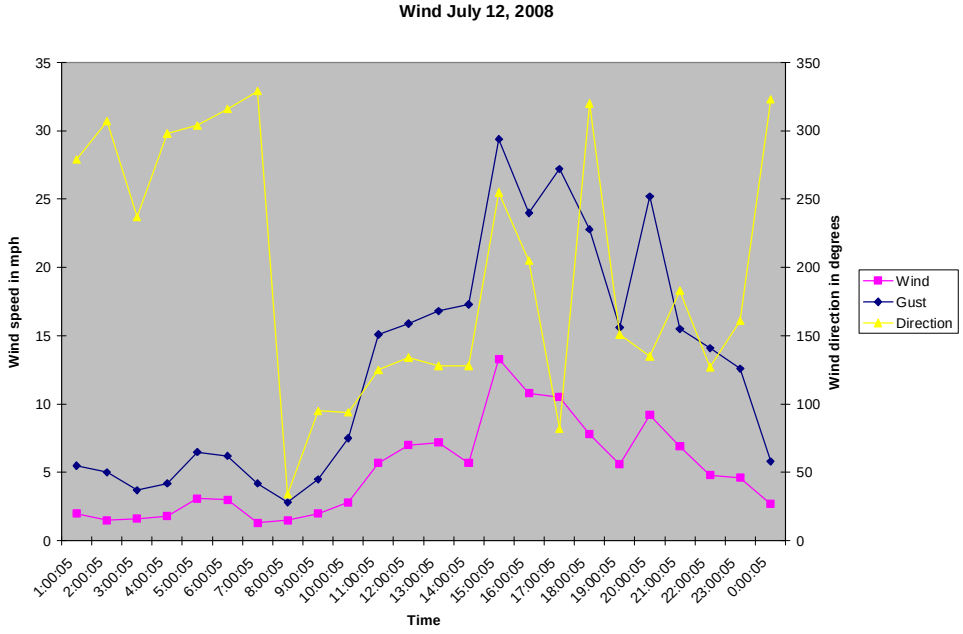


FIGURE 15

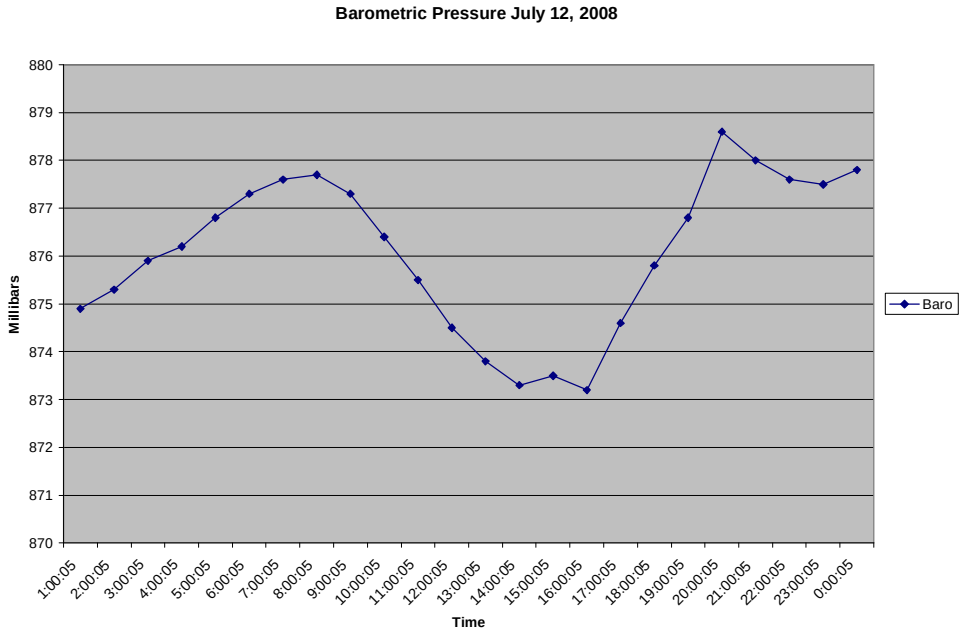


FIGURE 16