Final Report
Contract 00-1CCOS

Meteorological Support for the Central California Ozone Study

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Abstract

In support of the Central California Ozone Study (CCOS), the Regional Weather and Climate Applications Division of NOAA's Environmental Technology Laboratory deployed an array of wind profilers, sodars, and surface meteorological stations in and around the Central Valley of California. In particular, from June 1, 2000 to October 15, 2000, six 915-MHz radar wind profilers with RASS and supporting surface meteorological stations were deployed together with a 449-MHz wind profiler, RASS and surface meteorology site. In addition, three Doppler sodars, collocated with wind profiler sites, were deployed within the Central Valley. One stand alone Doppler sodar with supporting surface meteorology was deployed in the Sierra Nevada foothills, and one Doppler sodar collocated with a wind profiler/surface meteorology site was deployed in the San Francisco Bay area.

1. Introduction

The Central California Ozone Study (CCOS) sought to develop a database suitable to meet State Implementation Plan (SIP) requirements for Central California. The measurement portion of the study ran from 1 June 2000 through 30 September 2000. It was coordinated with the California Regional $PM_{2.5}/PM_{10}$ Air Quality Study (CRPAQS) which sought to improve scientific understanding of high fine-particulate concentration episodes in central California through a coordinated air quality/meteorology field program extending from 1 December 1999 through 31 January 2001.

The CCOS extends the domain of CRPAQS with additional upper-air meteorological measurements to the north to encompass a major portion of the California Central Valley. Within the study domains a number of study objectives were developed that overlap strongly with long-term scientific objectives of NOAA/ETL. These include:

- Understanding the structure and evolution of the atmospheric boundary layer over a range of stability conditions and over a range of terrain and land-surface characteristics with the goal of improving remote sensing techniques and model parameterizations.
- Contributing to a suite of conceptual models that explain the role of meteorology in producing high ozone and fine particulate concentrations in a variety of climatic conditions from the high-humidity southeast, to the Rocky Mountains, to coastal areas dominated by terrain and land-sea circulations.

The CCOS project required that the Environmental Technology Laboratory (ETL) deploy six 915-MHz wind profilers with RASS and supporting surface meteorological instrumentation, one 449-MHz wind profiler with RASS and supporting surface meteorological instrumentation, four Doppler sodars collocated with the wind profiler sites, and one stand-alone Doppler sodar and instrumented 10-m tower site. All ETL profilers were installed on schedule by early June 2000.

2. Near Real-Time Data Services

The implementation of near-real-time data services have provided a way for scientists and engineers of CARB and NOAA/ETL to closely monitor the operations and performance of the Boundary Layer Radar (BLR) and near-surface in situ instrumentation present at every ETL BLR site. On an hourly basis, these data are graphically visualized and made accessible to end users via the internet (www7.etl.noaa.gov/data), and are distributed to NOAA/FSL for initialization in the RUC-2 numerical weather forecast model (maps.fsl.noaa.gov/#RTimages40). These access points provide an efficient and reliable way for the BLR and in situ data to be used in real-time operational applications, such as weather and air pollution forecasting and assessment.

ETL's near-real-time data services consist of four components, namely extraction, distribution, visualization, and internet interfacing. Data extraction establishes communication between the laboratory and the various remote meteorological sites. Currently, ETL has the technological ability to transfer data using modems with phone lines or cellular, the internet, and GOES satellites. The timeliness of the data extraction

process is critical for meeting the RUC-2 initialization deadline (a quarter past the top of the hour), and for producing diagnostic visualization products that represent the latest data available from the instruments (e.g., the BLR consensus calculations for winds and temperature are produced at the top of every hour). These time constraints pose the challenging task of having to transfer data from over thirty different sites in a matter of minutes. To meet these requirements, ETL developed and implemented a scaleable, fault tolerant telecommunication system that simultaneously transfers data from multiple remote sites (currently scaled to eight) at any given time. The current system configuration takes approximately three to five minutes per hour to transfer data from every CARB site in the state. Once the data are extracted, scripting languages (such as C Shell and Perl) are used to distribute the data to NOAA/FSL for model initialization, and to the NOAA/ETL file management system, where HTTP and FTP connectivity to the internet outside of NOAA/ETL are established. Here, the data are stored in their native formats and are organized by simple directory hierarchies based on information such as instrument type, data type, and site name. Next the data are visualized using FORTRAN programs developed by ETL. Currently, the BLR graphical displays include time-height sections of wind barbs overlaid on color contours of SNR, wind barbs color coded by wind speed, and wind barbs overlaid on color contours of RASS virtual temperature. The time-height domain includes data from the latest 24-hr period up to the maximum unambiguous range of the BLR. After the graphics images are produced, they are processed by a series of image filters that compress the image-file size while preserving the spatial and color resolution. This step produces images in the GIF format that can be quickly downloaded from even the slowest of network connections (such as PPB modem connections). Lastly, after all of the images are created for every site, an HTML page is dynamically constructed with a table of hyper-links that provide access to each of the real-time images.

In addition to the near-real-time access, the real-time data and images are archived and made accessible through a link titled "DATA AND IMAGE ARCHIVE" (located below the real-time data access table at www7.etl.noaa.gov/data). This link provides a HTML request form, which allows the user to manually specify the date and choose the image/data type from a scrolled list of available types. This information is then passed to a Common Gateway Interface (CGI) program which queries the NOAA/ETL file management system for the requested data and displays the data back to the internet browser.

3. Overview of field program

Table 1 shows the instrumentation, location, and installation and removal dates for the NOAA/ETL CCOS measurement sites. Figure 1 shows a graphical depiction of the location of the ETL CCOS sites. Most sites were installed by May 2000 although problems encountered with the installation of line power at Waterford delayed the start of sodar and profiler data collection to 22 June. The Fresno and Waterford sodar installations were delayed by both hardware and software problems. The Fresno Doppler sodar experienced serious data contamination because of airport noise. At the time of this writing (6/16/03), the Chico site was still operational. The Waterford site was removed in December 2002.

During the measurement campaign, site visits occurred at approximate one-month-intervals. Radar antenna levels and orientations were verified as well as RASS source levels. Meteorological tower checks included comparisons with calibrated standards.

Table 1. NOAA Environmental Technology Laboratory CCOS measurement sites.

Site Name	Instrument	Latitude	Longitude	Elevation (m)	Date installed	Date of removal
Angiola	Profiler	35° 56' 50"	119° 32' 13"	60	11/13/99	12/11/01
	100-m met				2/22/00	3/11/01
	Mini-Sodar				5/22/00	12/4/00
	Sodar				12/14/00	12/31/00
Arbuckle	Profiler	39° 49' 32"	122° 2' 15"	33	4/28/00	10/19/00
	10-m met				4/28/00	10/19/00
Chico	Profiler	39° 41' 55"	121° 54' 42"	41	6/2/00	Operating
	10-m met				6/2/00	Operating
	Sodar				12/20/00	Operating
Fresno	Profiler	36° 46' 5"	119° 42' 41"	100	5/23/00	3/12/01
	10-m met				5/23/00	3/12/01
	Sodar				6/6/00	12/4/00
	Mini-Sodar				12/15/00	3/12/01
New Melones Lake	Sodar	38° 0' 24"	120° 29' 41"	320	5/10/00	4/5/01
	10-m met				5/10/00	4/5/01
Pleasant Grove	Profiler	38° 45' 57"	121° 31' 10"	10	4/15/00	10/16/00
	10-m met				4/15/00	10/16/00
Redding	Profiler	40° 30' 59"	122° 17' 59"	154	4/26/00	10/20/00
	10-m met				4/26/00	10/20/00
Richmond	Profiler	37° 56' 41"	122° 24' 14"	111	2/10/00	1/10/02
	10-m met				2/10/00	1/10/02
	Sodar				1/6/00	2/8/01
Waterford	Profiler	37° 39' 12"	120° 40' 24"	60	6/22/00	12/19/02
	10-m met				5/10/00	12/19/02
	Sodar				6/22/00	2/13/01

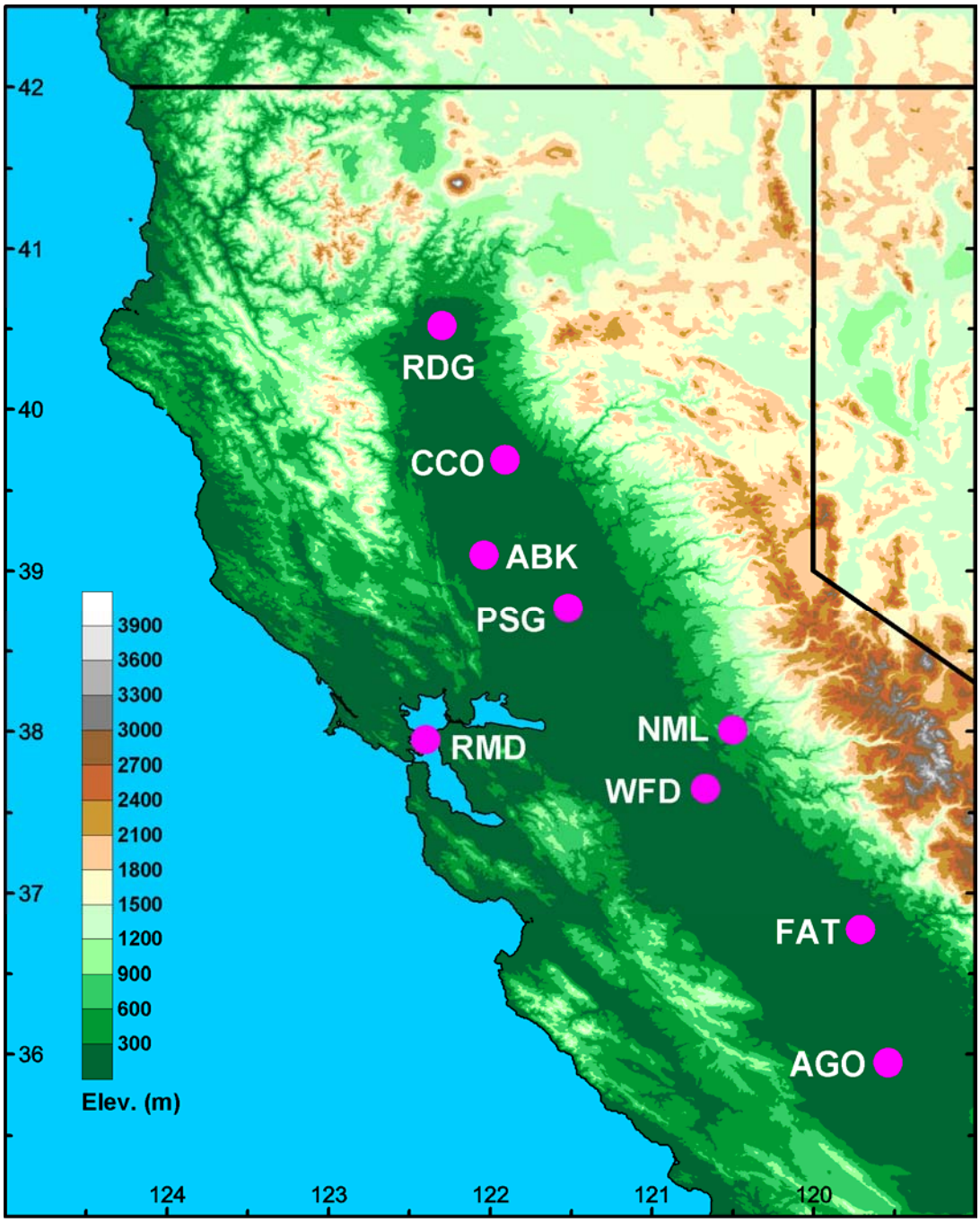

Fig.1. ETL CCOS sites.

3.1 Description of Instrumentation

3.1.1 915-MHz wind profiler with RASS

During the CCOS measurement period (6/1/00-10/15/00), NOAA/ETL operated seven 915-MHz wind profilers with RASS providing continuous high-resolution wind and virtual temperature profiles in the lowest 2-4 km of the atmosphere during most of the study period. The wind profilers were located at Angiola, Arbuckle, Chico, Pleasant Grove, Redding, Richmond, and Waterford. Six of the wind profilers consisted of two oblique antennas tilted 15° off zenith and one vertical antenna while one profiler consisted of a single phased-array antenna. Four RASS sources surrounded the profiler antennas (Figure 3.1). The profilers obtained wind data using two modes, one with 60-m resolution and the other with 100-m resolution. The height coverage for the 60-m mode ranged from 0.1 to 2.2 km AGL while for the 100-m mode ranged from 0.15 to 3.8 km AGL. Actual height coverage depended on the atmospheric conditions. Hourly virtual temperature profilers were obtained with a 60-m range resolution between 0.1 and 1.5 km AGL. As with the winds from the wind profiler, height coverage is dependent on the existing atmospheric conditions.

Fig. 3.1. NOAA/ETL 915-MHz wind profiler with RASS in Concord, New Hampshire.

3.1.2 449-MHz wind profiler with RASS

The NOAA/ETL 449-MHz wind profiler operated at the Fresno Air Terminal (FAT) in Fresno during the CCOS measurement period. The 449-MHz wind profiler consists of a single, fixed antenna array measuring 6 m x 6 m (Fig. 3.2). The antenna subsystem is formed from two coaxial collinear arrays arranged orthogonal to each other to form two orthogonal beams and one vertical beam. A steel mesh ground plane is positioned a quarter wavelength below the arrays. Beam steering is achieved electronically by altering the phase of the signals fed to and from different parts of the array. A gate spacing of 203 m resulted in wind data from 0.5 to 10.5 km AGL. RASS was operated using 209-m gates with a height range from 0.5 to 4.5 km AGL. As with the 915-MHz wind profiler, wind and virtual temperature height coverage was highly dependent on the atmospheric conditions.

Fig. 3.2. NOAA/ETL 449-MHz wind profiler with RASS at the Fresno Air Terminal (FAT) in Fresno, CA.

3.1.3 ETL Doppler Sodar

NOAA/ETL deployed four two-beam Doppler sodars during CCOS. The sodar consists of two orthogonal-tilted antennas operating in a monostatic mode in which the transmitter and receiver are collocated (Fig. 3.3). The acoustic pulse emitted by the transmitter is scattered by temperature inhomogeneities in the atmosphere and is received as a frequency shift from the transmitted frequency. The frequency shift is then converted to a radial wind speed along the transmitted beam. Because the sodar is a two-beam system, averaged vertical velocities are assumed to be zero as there is no vertical correction applied. The radial velocities are then converted to horizontal wind speeds and direction. Data were obtained over 15-m range gates with the lowest gate at 15 m and the highest gate at 765 m. Measurement locations included Chico, Fresno, New Melones Lake, and Waterford.

Fig. 3.3. NOAA/ETL Doppler sodar antennas at the Fresno Air Terminal (FAT) in Fresno, California.

3.1.4 Aerovironment Doppler Sodar

NOAA deployed an Aerovironment 3-beam Doppler sodar at the Richmond site during CCOS (Fig. 3.4). The system works on the same principals as the ETL Doppler sodar although the system utilizes a vertical antenna allowing for the vertical correction of the horizontal winds. The first range gate was at 60 m with data available in 20-m range gates up to 400 m.

Fig. 3.4. Aerovironment three-beam Doppler sodar at Richmond, California CCOS site.

3.1.5 Aerovironment mini Doppler sodar

The mini sodar operates at a higher frequency (4500 Hz) than the previously discussed sodar systems, thus achieving greater height resolution (5 m) but less height coverage (200 m). The system utilizes a 32-element phased array antenna to form the three orthogonal beams necessary to calculate the three dimensional wind field. The higher frequency allows the system to perform well at sites with moderate ambient noise. This system operated at the Angiola site during the CCOS measurement period (Fig. 3.5).

Fig. 3.5. Aerovironment mini Doppler sodar at Angiola site during CCOS.

3.1.6 ETL 10-m Meteorological Tower

Eight 10-m meteorological towers (Fig. 3.6) operated during the CCOS measurement period and were located at wind profiler and Doppler sodar sites. Each tower sampled the standard meteorological parameters including pressure, temperature, relative humidity, wind speed, wind direction, solar radiation, net radiation, and precipitation. All parameters were sampled every 5 s and averaged over 5 min. Temperature and relative humidity sensors housed in aspirated shields at 2 and 10 m allowed for the determination of stability near the surface at all sites except New Melones Lake and Richmond. These two sites obtained temperature and relative humidity data only at 2 m. All meteorological instrumentation met manufacturer recommended standards prior to deployment. Instrumentation requiring recalibration during the field phase of the experiment were removed and replaced by newly calibrated instrumentation. Instrumentation not meeting accepted standards were removed as soon as possible and replaced.

Fig. 3.6 Standard ETL 10-m meteorological tower.

3.1.7 Angiola 100-m and 20-m Towers

ETL installed six levels of standard meteorological instrumentation on the 100-m Angiola tower. Pressure and aspirated temperature and relative humidity operated at the 2-m level while aspirated temperature and relative humidity and wind speed and direction were obtained at the 10, 23, 43, 72 and 98-m levels. In addition to these instruments, fast response sonic anemometer and pressure sensors were installed at the 25, 50 and 98-m levels. The 20-m tower was instrumented with seven levels of standard meteorological sensors (temperature, relative humidity, wind speed and direction) and four levels of fast response sonic anemometer and pressure sensors.

The following is a summary of Angiola tower installation and operations:

February 22, 2000:
Fiber optic cabling was installed on the 100-m tower for transmission of meteorological data to the main computer data acquisition system.

Six levels of slow met were installed on the tower and data collection of the slow met instruments began.

26-m level fast response sonic anemometer and pressure was installed and data collection began.

April 29, 2000:
The 50- and 98-m levels of fast response sonic on the 100-m tower were installed and collection of this data began.

June 23, 2000:
Fixed a communications problem with one of the slow met levels on the 100-m tower.

July 26, 2000:
Installed the remaining two levels of fast response pressure at the 50- and 98-m levels and data collection began.

October 2-4, 2000:
Took special rawinsonde observations to use for verification of boundary layer depth against radar and sodar measurements.

December 8, 2000:
Temperature and relative humidity calibrations checked on 100-m mean meteorological instrumentation.

March 11, 2001:
Last data collected on 100-m tower.

June 5, 2001:
100-m tower meteorological sensors removed.

Angiola 20-m tower meteorological instrumentation

April 29, 2000:
The 20-m tower foundation was poured. Due to difficulties in getting Kings County to approve a building permit for the 20-m tower, the tower installation was delayed by several months from the original plan. Eventually an engineering analysis had to be performed on the tower and structural modifications made to meet Kings County requirements.

May 9, 2000:
20-m tower erected.

June 23, 2000:
Installed 7 levels of mean speed, direction, T, and RH and data collection began. Installed 4 levels of fast response sonic anemometers and pressure and data collection began.

December 8, 2000:
Temperature and relative humidity calibrations checked on 20-m tower mean meteorological instrumentation.

March 9, 2001:
End of winter 2000-2001 20-m tower data collection.

October 11, 2001:
Replaced all mean speed, direction, T and RH instrumentation with newly calibrated instruments. 20-m tower data collection restarted.

December 11, 2001:
End of 20-m tower data collection.

December 12, 2001:
20-m tower removed from Gilkey property.

3.1.8 Radiation and Flux Instrumentation

At the Angiola and Pleasant Grove CCOS monitoring sites, ETL installed instrumentation for the measurement of energy balance and radiation budgets. Instrumentation included sonic anemometers, hygrometers, pyranometers, pyrgeometers, net radiometers, soil heat flux sensors, soil moisture sensors, and sub-surface temperature sensors. Figure 3.7 shows the instrument setup at the Pleasant Grove site. The sonic anemometer, hygrometer, and downward looking pyramometer were all mounted at the 9-m level on the meteorological tower. The upward looking pyranometer and the pyrgeometers were mounted on the 2-m radiation stand.

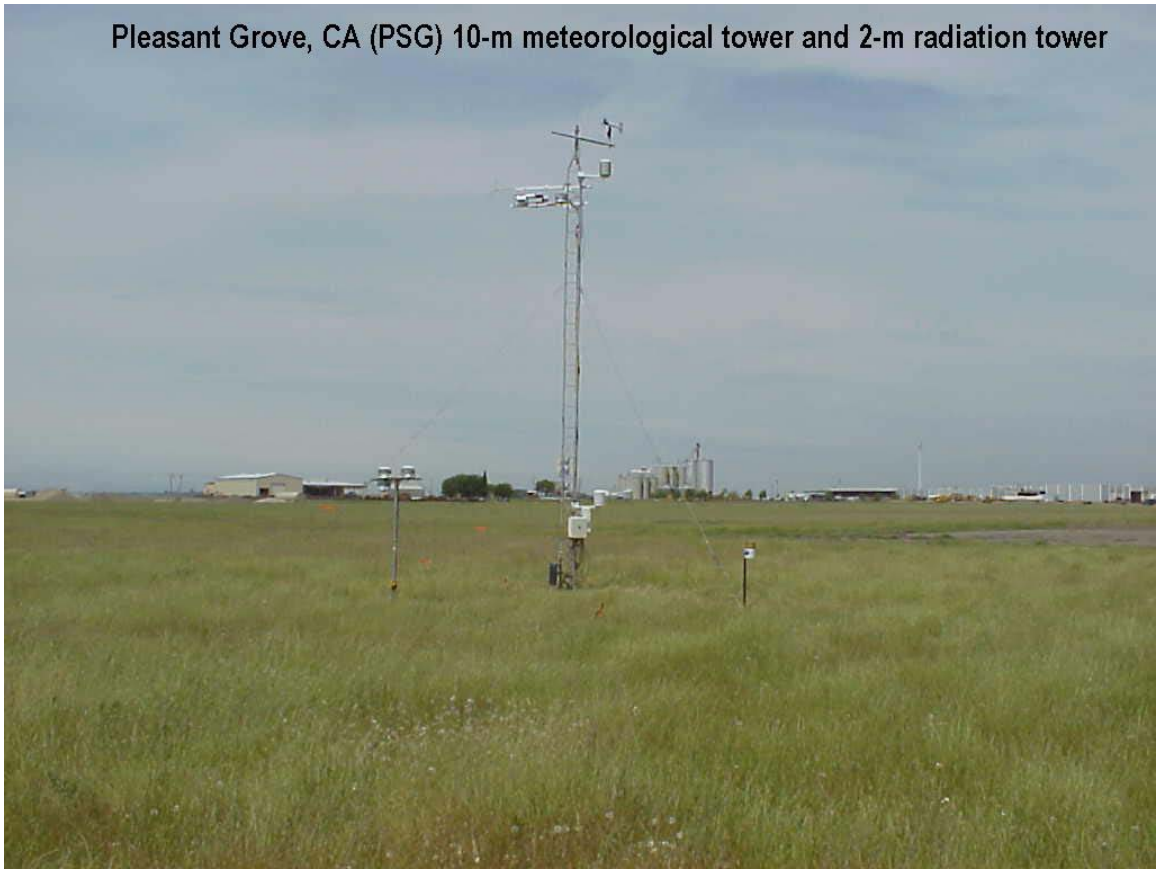

Fig. 3.7 ETL 10-m meteorological tower with fast response sonic anemometer and hygrometer and 2-m radiation stand at Pleasant Grove, California site.

4. Measurement Sites

ETL deployed a total of nine meteorological monitoring sites for CCOS from Redding in the northernmost part of the Sacramento Valley to Angiola in the southern San Joaquin Valley to New Melones Lake in the Sierra Nevada foothills to Richmond in the San Francisco Bay Area.

4.1 Angiola

The ETL site at Angiola represented the most extensive deployment of instrumentation of any of the ETL CCOS sites. Instrumentation included a 915-MHz wind profiler with RASS (Fig. 4.1), S-band radar, ceilometer, instrumented 100-m and 20-m towers, radiation and flux instruments, and a Doppler sodar. The wind profiler/RASS system was installed on 11/13/99 and operated nearly continuously until site removal on 12/11/01.

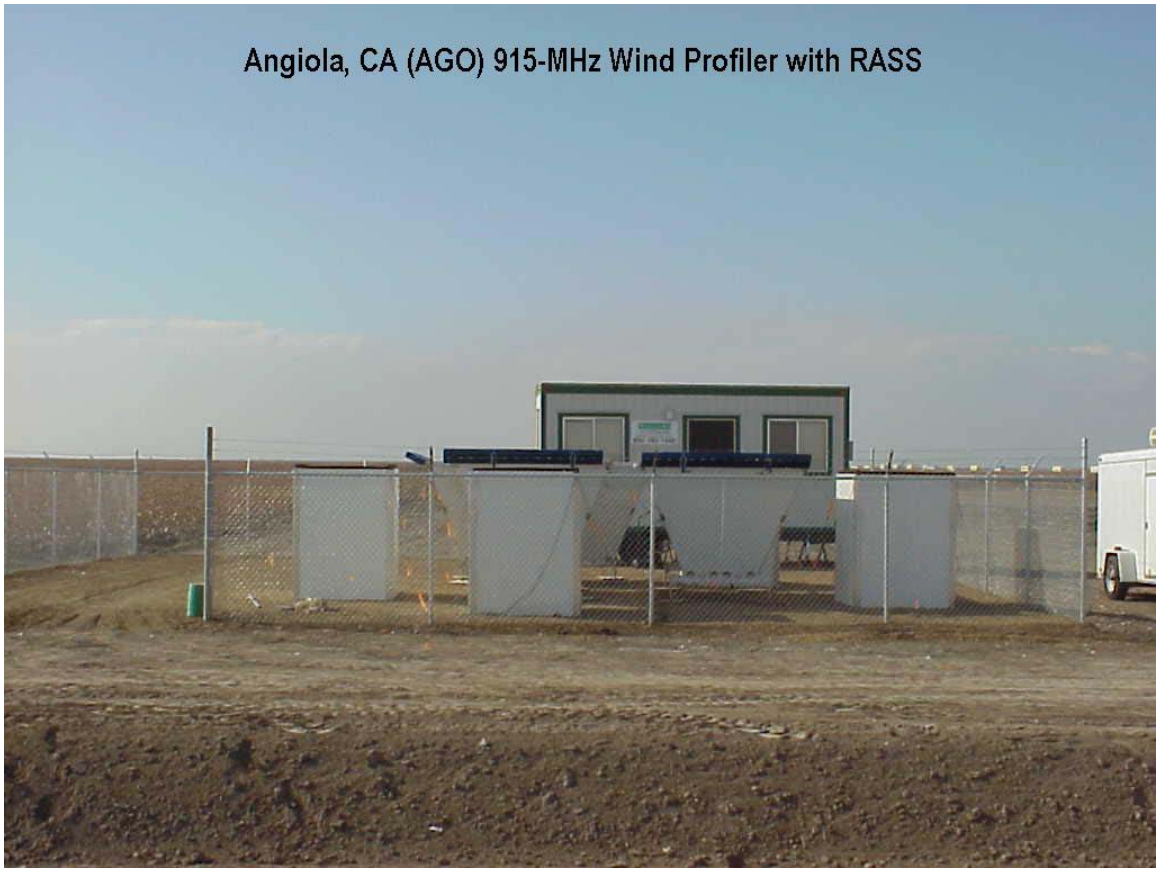

Fig. 4.1. Equipment trailer and wind profiler/RASS antennas at ETL Angiola site.

4.2 Arbuckle

The monitoring site was at the PG&E Arbuckle Dehydrator Station on Grimes-Arbuckle road approximately 1 mile southeast of the town of Arbuckle. Instrumentation included a 915-MHz phased array wind profiler with RASS (Fig. 4.2) and a 10-m meteorological tower (Fig. 4.3). The site was installed and operational on 4/28/00 and removed on 10/19/00. As shown in Figs. 4.2 and 4.3, the site was free of any obstructions in a region of irrigated crops.

Fig. 4.2. Phased array wind profiler antenna and RASS enclosures at Arbuckle monitoring site.

Fig. 4.3. Meteorological tower at Arbuckle monitoring site.

4.3 Chico

The monitoring site is at the City of Chico Water Pollution Control Plant on 4827 Chico River Road located 7.5 km southwest of downtown Chico and 2 km east of the Sacramento River. Site instrumentation includes a 915-MHz wind profiler with RASS and a 10-m meteorological tower (Fig. 4.4). The site was installed and operational on 6/2/00 and has operated continuously to this date (6/16/03).

Fig. 4.4. ETL meteorological monitoring site at Chico, California CCOS site.

4.4 Fresno

The site, at the California Air National Guard Base on the south side of the Fresno Air Terminal (FAT) was located on the eastern edge of the City of Fresno, CA in an urban environment. Because of the site location at an airport, there were few obstructions to the flow although the high levels of ambient noise negatively impacted the Doppler sodar performance. Instrumentation at the site included a 449-MHz wind profiler with RASS and a Doppler sodar (Fig. 4.5), and a 10-m meteorological tower (Fig. 4.6). The site was installed on 5/23/00 and removed on 3/12/01.

Fig. 4.5. Wind profiler, RASS, and Doppler sodar antennas at Fresno CCOS site.

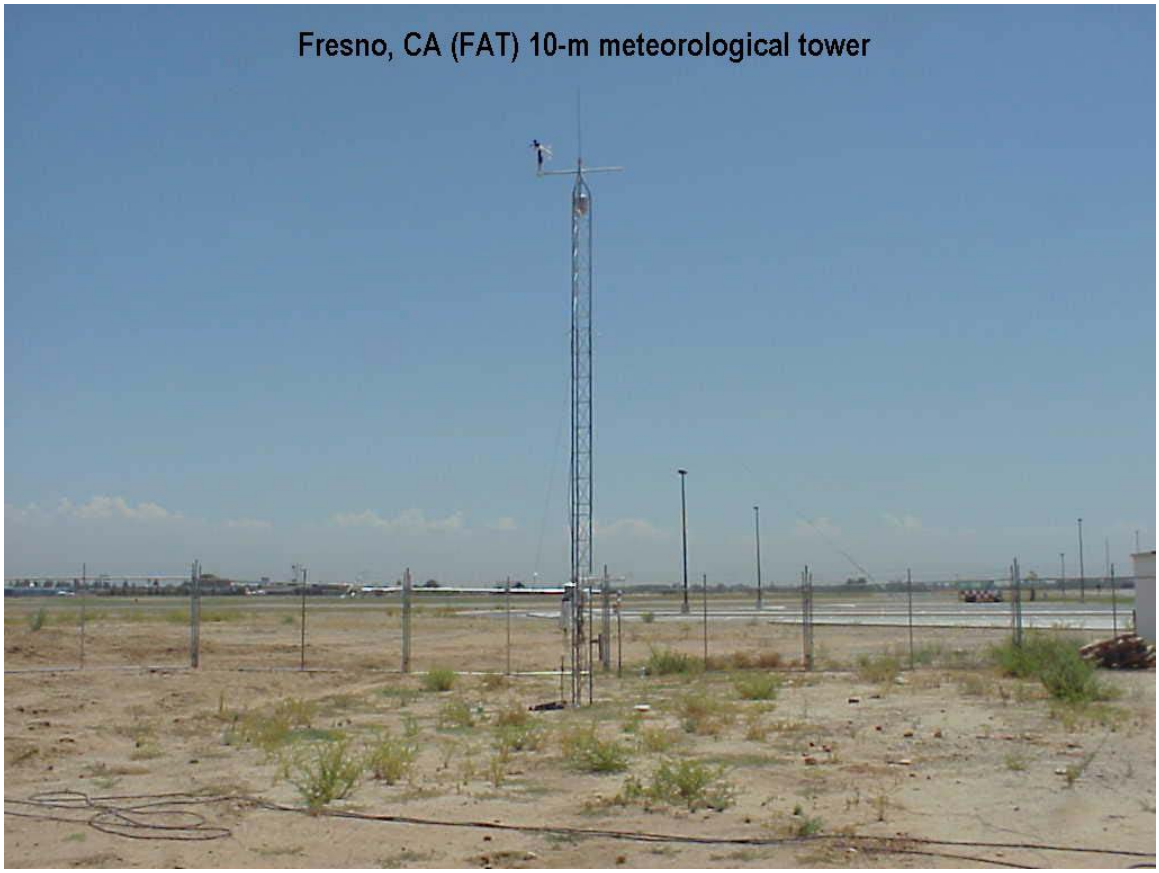

Fig. 4.6. Meteorological tower (10 m) at the Fresno CCOS site.

4.5 New Melones Lake

A Doppler sodar and 10-m meteorological tower (Fig 4.7) operated at this site between 5/10/00 and 4/5/01. The site was at the Bureau of Reclamation Headquarters/Visitor Center was on the eastern shore of New Melones Lake and approximately 10 km west of the town of Sonora. The terrain was hilly and tree covered with some flow blocking east of the site. During the CCOS study period, dominant flows were thermally forced circulations along the southwest to northeast oriented Stanislaus River valley in which New Melones Lake is embedded.

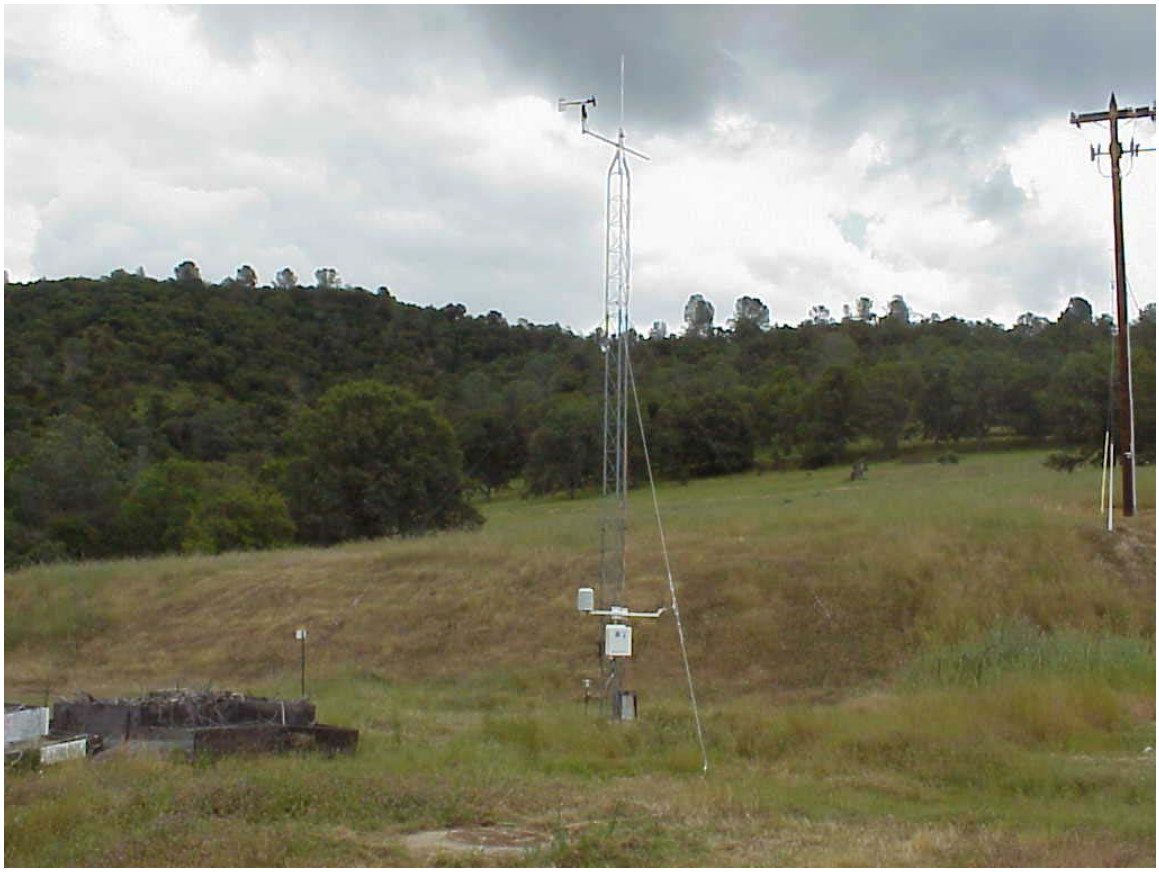

Fig. 4.7. Meteorological tower (10 m) at the New Melones Lake CCOS monitoring site.

4.6 Pleasant Grove

The Pleasant Grove site was located near a small landing strip at 7310 Pacific Ave. in Pacific Grove on property owned by Holt of California approximately 20 km north of downtown Sacramento. Irrigated rice fields dominated the land use to the south and east with light industry and open grass fields to the north and west. On 4/15/00 ETL installed a 915-MHz wind profiler with RASS (Fig. 4.8), a 10-m meteorological tower, and radiation and flux instrumentation (Fig. 3.7). The site was removed on 10/16/00.

Fig. 4.8. Wind profiler and RASS enclosures at Pleasant Grove CCOS monitoring site.

4.7 Redding

This site was at the U.S. Forest Service Northern California Service Center on the west side of the Redding Airport and approximately 12 km southeast of downtown Redding. The site was heavily forested to the west but wide open from the north to east to south. On 4/26/00 ETL installed a 915-MHz wind profiler with RASS and a 10-m meteorological tower (Fig. 4.9). The equipment was removed on 10/20/00.

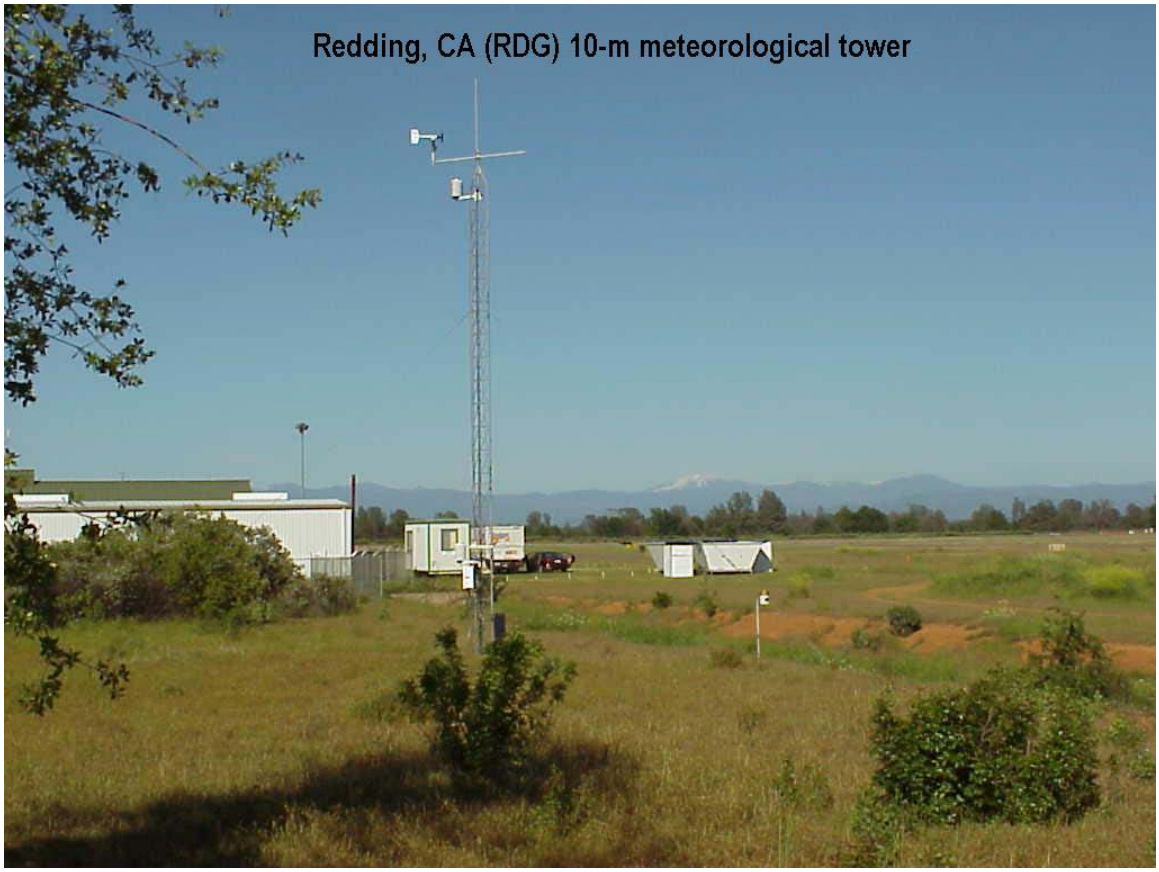

Fig. 4.9. ETL CCOS monitoring site at Redding Airport near Redding, CA.

4.8 Richmond

The Richmond site was on property owned by the Chevron Richmond Refinery on the east side of San Pablo Bay just north of the Richmond San Rafael Bridge and 15 km north of downtown San Francisco. ETL installed a 915-MHz wind profiler with RASS, a 10-m meteorological tower (Fig. 4.10), and a Doppler sodar (Fig. 3.4). The instruments were installed on 2/10/00 and removed on 1/10/02. The sites location at an elevation of 111 m on a ridge above San Pablo Bay allowed for good exposure to the ambient flows although the topography may have affected the winds in the lower levels.

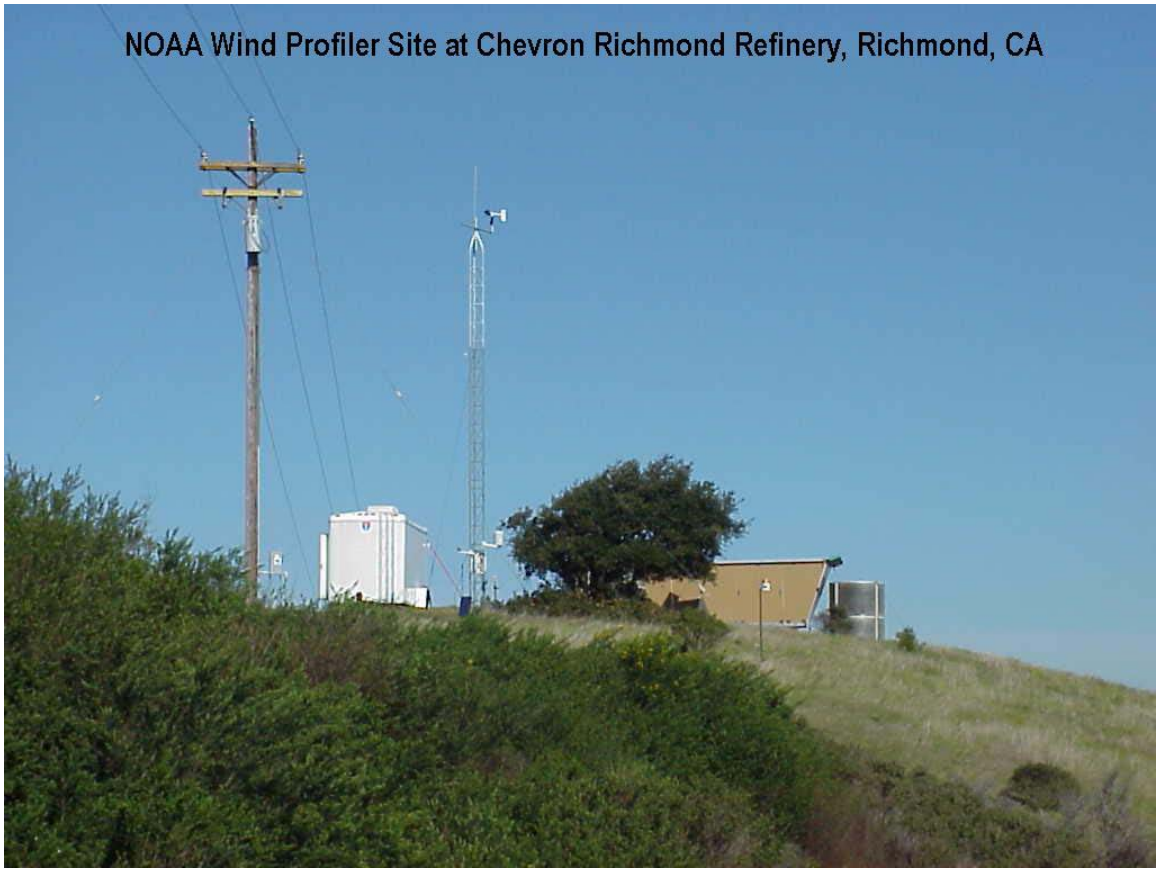

Fig. 4.10. Equipment shelter, 10-m meteorological tower and radar and RASS antennas at Richmond CCOS monitoring site.

4.9 Waterford

The Waterford site was at the Modesto Regional Water Treatment Plant approximately 30 km east of Modesto between the Tuolumne River and Modesto Reservoir. At the site ETL installed a 915-MHz wind profiler with RASS, a 10-m meteorological tower, and a Doppler sodar (Fig. 4.11). A delay in the installation of line power delayed the start of data acquisition until 6/22/00. The site was removed on 12/19/02.

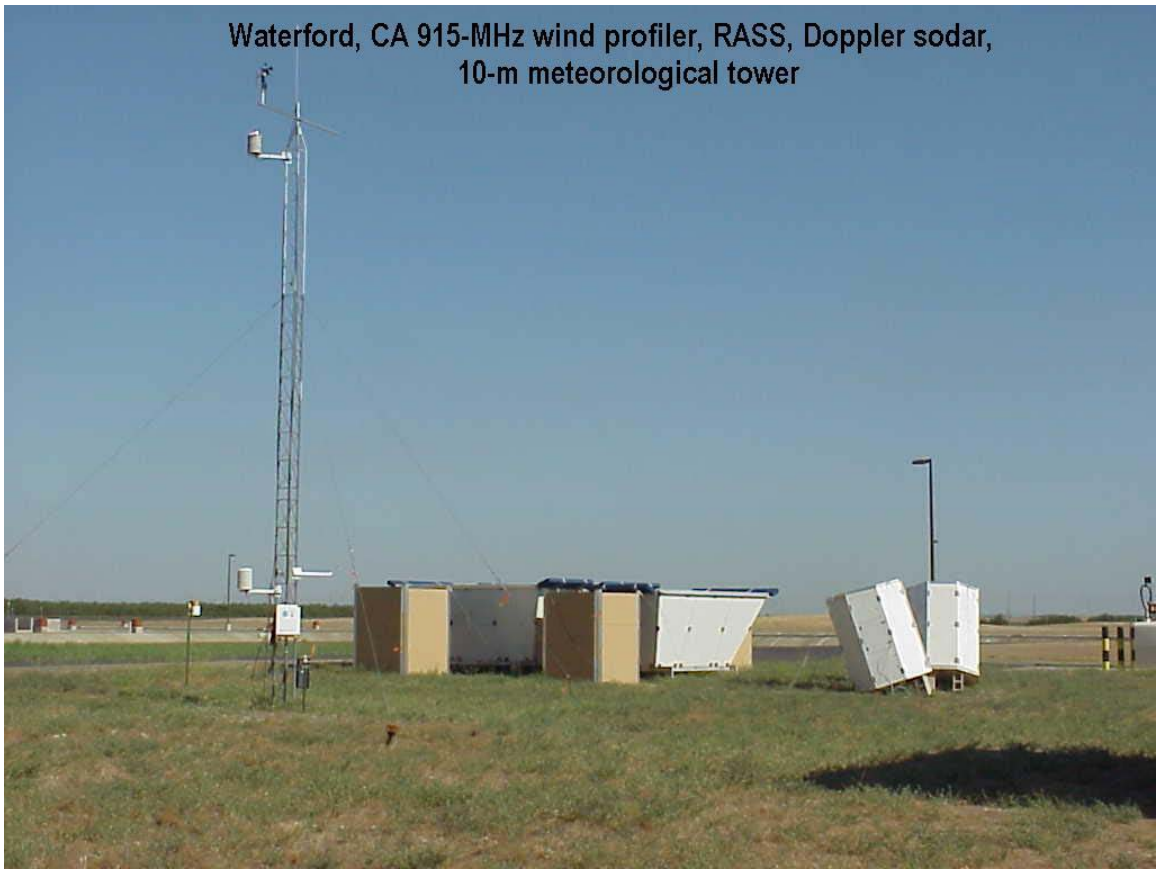

Fig. 4.11. Wind profiler, RASS, and Doppler sodar antennas and 10-m meteorological tower at Waterford CCOS monitoring site.

5.0 Surface Climatologies

The following section presents an overview of the surface meteorological conditions observed during the CCOS measurement period (6/1/00 – 9/30/00) using data from the nine ETL 10-m meteorological towers. A comparison of climatological data from the seven Central Valley sites (ABK, AGO, CCO, FAT, PSG, RDG, WFD) showed Fresno (FAT) with the highest mean temperature (26.6 ^{o}C), the highest mean maximum temperature (33.8 ^{o}C), and the highest mean minimum temperature (18.8 ^{o}C). The highest temperature during the four-month period occurred at Redding (RDG) with a high of 44.4 ^{o}C on 7/31/00. Pleasant Grove (PSG) recorded the lowest temperatures with a mean temperature of 21.8 ^{o}C, a mean maximum temperature of 30.7 ^{o}C, and a mean minimum temperature of 14.5 ^{o}C. Pleasant Grove's proximity to the inflow of cooler marine air through the Carquinez Straits likely accounted for the lower temperatures. Relative humidities at PSG averaged 20% higher than at FAT. The two sites with the strongest average winds, Waterford (WFD) with an average of 3.5 m s^{-1} and PSG with an average of 3.2 m s^{-1}, were the two sites most exposed to the inflow of marine air through the Straits. Redding recorded the weakest winds with an average of 1.9 m s^{-1}. An examination of inversion strengths between the 2 and 10-m levels of the towers showed RDG with the strongest inversion (1.8 ^{o}C) and FAT with the weakest (0.0 ^{o}C). The absence of any inversion at FAT likely results from the surface characteristics with a large percentage of the surrounding area covered by concrete and asphalt. This allows for the storage of heat during the daytime hours with a slow release of that heat throughout the nighttime hours. In contrast, the RDG site was covered by a mostly low grass surface allowing for efficient cooling during the night.

The following tables summarize the daily and monthly climatological data for the nine ETL 10-m meteorological tower sites. All temperatures are ^{o}C, pressures are mb, wind speeds are m s^{-1}, solar (kd) and net radiation (nr) are W m^{-2}, and mixing ratios are g kg^{-1}. Days are indicated by Julian Day and times are in UTC (PDT + 7). The first part of the table presents the daily climatology, the second part the average data for each hour of the day based on the entire month of data, and the last part shows the monthly averages for selected parameters.

5.1 Arbuckle Surface Climatology

The climatological data for Arbuckle (ABK) are presented in Tables 5.1, 5.2, 5.3, and 5.4. For the CCOS study period, daytime high temperatures averaged 32 ^{o}C with nighttime lows averaging 15 ^{o}C. The wind pattern was fairly complicated at this site when compared with the other sites within the Central Valley. This may be the result of the sites location on the western side of the Sacramento Valley where it is somewhat blocked from the inflow of marine air. In general, late afternoon winds were southeasterly changing to a more westerly flow during the evening. The westerly flow may be a thermally induced drainage wind off the higher terrain to the west. Afternoon winds were from the northeast. The highest winds speeds were observed in the early evening (0100 UTC). Wind speeds averaged 2.6 m s^{-1}.

Table 5.1 Climatological data for ABK during June 00

JD	temp	pres	ws	wd	gust	mr	nr	tmin	tmax	prec
153	22.7	1007.0	3.2	334.	10.2	4.9	158.0	12.1	31.4	.000
154	22.3	1009.8	2.6	149.	7.7	6.3	155.6	11.5	32.7	.000
155	21.3	1013.2	1.8	148.	6.3	6.6	151.9	9.5	32.7	.000
156	21.2	1011.6	2.2	124.	7.0	7.7	154.6	10.1	32.3	.000
157	19.3	1011.3	2.9	132.	7.7	6.8	150.2	9.7	28.3	.000
158	20.5	1011.5	2.6	126.	8.3	8.5	162.9	10.9	29.4	.000
159	20.7	1008.4	3.9	151.	9.1	8.0	137.8	11.5	26.7	.000
160	17.9	1007.3	3.0	226.	13.2	8.5	118.8	13.6	22.4	3.556
161	17.0	1010.2	2.5	144.	7.6	8.5	171.4	10.9	25.2	.000
162	18.2	1010.9	2.8	188.	8.7	7.8	155.6	10.5	25.1	.000
163	20.5	1011.4	2.7	326.	8.0	7.6	155.0	12.6	29.1	.000
164	23.0	1012.9	2.1	134.	6.2	9.1	138.4	15.5	31.9	.000
165	27.6	1011.3	6.4	336.	18.9	9.2	188.1	19.4	37.3	.000
166	31.8	1008.2	6.3	337.	13.3	8.9	183.7	23.6	41.4	.000
167	32.2	1006.1	4.7	326.	10.8	9.2	175.9	22.2	39.6	.000
168	31.8	1001.0	7.2	330.	15.5	7.1	178.0	26.2	36.6	.000
169	29.6	999.3	5.1	332.	11.9	6.1	167.9	22.4	36.5	.000
170	22.9	1003.9	3.0	109.	9.4	10.5	166.0	15.0	28.6	.000
171	22.8	1007.3	3.2	43.	8.5	9.7	173.3	13.2	34.6	.000
172	27.9	1006.5	3.2	329.	7.9	7.4	167.2	18.1	37.7	.000
173	27.1	1005.9	1.8	136.	5.3	9.8	157.6	17.2	37.4	.000
174	26.1	1004.0	2.4	138.	6.6	10.2	163.4	15.5	34.3	.000
175	21.7	1005.6	2.4	114.	7.9	10.3	162.5	13.0	32.3	.000
176	23.6	1009.7	2.0	112.	6.1	10.1	160.1	13.4	33.5	.000
177	24.2	1010.4	2.2	131.	6.3	10.2	159.3	13.4	34.4	.000
178	27.2	1008.0	2.6	135.	8.2	11.9	167.5	18.0	36.3	.000
179	27.7	1006.2	2.3	134.	8.2	11.5	166.0	18.3	36.4	.000
180	27.4	1006.5	2.3	140.	6.5	12.4	163.0	17.3	37.0	.000
181	26.0	1006.2	2.8	136.	7.4	11.8	167.0	16.4	34.1	.000
182	21.7	1005.7	3.0	124.	8.7	10.7	167.0	13.5	30.5	.000

End hr	t2	t10	pres	ws	wd	rh2	rh10	kd	nr
1	32.3	31.5	1006.6	4.4	105.	29.6	30.5	481.3	254.8
2	31.7	31.2	1006.2	4.2	125.	31.5	32.1	315.7	137.8
3	30.2	30.0	1006.2	3.6	152.	36.6	36.0	143.4	14.7
4	27.2	27.7	1006.4	3.3	196.	44.3	41.7	17.0	-76.9
5	24.4	25.4	1006.7	3.3	218.	49.8	45.5	.0	-88.1
6	23.0	24.0	1007.1	3.3	231.	50.7	46.6	.0	-82.4
7	21.7	22.5	1007.3	3.3	215.	55.5	52.3	.0	-80.5
8	20.1	20.6	1007.5	3.1	170.	63.5	61.5	.0	-80.3
9	18.8	19.3	1007.6	2.9	173.	67.2	64.9	.0	-79.6
10	17.8	18.3	1007.7	2.7	187.	70.6	68.7	.0	-78.8
11	16.9	17.5	1007.8	2.4	281.	73.5	71.4	.0	-77.0
12	16.2	17.0	1008.0	2.3	306.	75.2	73.1	.0	-74.7
13	15.7	16.5	1008.3	1.9	311.	76.6	74.7	1.9	-70.8
14	16.4	16.7	1008.7	1.9	314.	75.0	73.8	74.6	-16.6
15	18.6	18.1	1009.1	2.2	351.	67.6	68.6	202.8	57.3
16	20.5	19.8	1009.5	2.5	2.	61.8	63.2	400.8	231.7
17	22.6	21.8	1009.7	2.9	4.	54.6	56.6	595.4	353.4
18	24.7	23.6	1009.5	3.2	11.	48.4	50.7	744.1	459.0
19	26.7	25.6	1009.4	3.5	23.	42.9	45.2	859.8	546.1
20	28.4	27.2	1009.1	3.5	36.	38.3	40.6	924.4	589.7
21	29.8	28.7	1008.7	3.7	54.	35.1	37.2	941.9	598.1
22	31.1	30.0	1008.1	3.9	66.	32.1	34.0	894.5	560.7
23	32.0	30.9	1007.5	4.1	79.	29.9	31.5	801.7	491.3
24	32.5	31.5	1006.9	4.2	94.	29.6	30.9	650.5	387.3

Average for Jun 00

temp	ws	wd	nr	mr	prec
24.1	3.2	58.4	161.5	8.9	3.556

Table 5.2 Climatological data for ABK during July 00

JD	temp	pres	ws	wd	gust	mr	nr	tmin	tmax	prec
183	19.9	1007.6	3.1	111.	9.5	9.6	163.6	12.1	29.1	.000
184	20.2	1008.3	2.5	110.	8.7	9.2	159.8	12.0	27.9	.000
185	18.3	1009.0	2.8	102.	8.2	8.7	144.5	11.4	26.3	.000
186	20.3	1010.1	2.5	125.	9.6	9.3	165.4	11.9	30.3	.000
187	20.7	1008.2	3.3	133.	10.1	8.4	162.3	13.3	27.5	.000
188	19.5	1009.2	2.3	107.	10.7	9.0	141.3	11.5	26.9	.000
189	19.1	1009.3	2.1	111.	6.1	8.6	149.0	11.8	27.4	.000
190	19.7	1010.7	1.9	108.	6.8	8.4	162.6	11.1	29.3	.000
191	22.9	1009.2	1.9	160.	5.4	8.6	158.6	12.9	32.4	.000
192	23.7	1007.4	2.5	137.	6.4	9.3	160.6	13.6	31.9	.000
193	22.7	1008.3	2.1	115.	6.2	9.7	158.2	12.4	32.3	.000
194	23.8	1009.1	2.9	145.	8.2	9.7	161.4	13.8	32.7	.000
195	21.9	1012.3	2.5	118.	8.0	10.3	158.8	12.7	30.4	.000
196	21.5	1013.8	2.3	107.	6.9	8.7	157.5	11.1	32.2	.000
197	22.7	1011.5	2.1	107.	6.9	9.4	147.9	13.6	32.9	.000
198	21.5	1009.2	2.5	120.	8.9	10.0	131.8	14.7	28.4	.000
199	18.3	1012.4	2.4	98.	8.8	9.6	128.1	11.7	28.0	.000
200	20.6	1015.2	2.0	110.	8.2	9.0	162.7	11.2	32.0	.000
201	24.4	1013.1	2.0	123.	6.5	9.0	157.0	13.9	34.4	.000
202	25.1	1009.8	2.0	133.	6.9	10.0	153.7	14.7	35.3	.000
203	23.2	1007.0	2.5	129.	7.8	10.5	153.6	13.0	32.8	.000
204	21.7	1009.8	2.2	110.	8.6	10.4	153.4	12.0	31.7	.000
205	24.8	1011.8	1.8	111.	5.9	10.3	151.9	15.1	35.1	.000
206	26.4	1010.7	1.9	130.	5.6	9.8	144.9	15.9	36.4	.000
207	26.3	1007.7	1.9	136.	6.0	10.1	135.1	17.1	35.2	.000
208	24.1	1006.2	2.4	125.	10.2	9.9	150.6	14.4	32.4	.000
209	21.5	1009.7	2.1	95.	9.4	9.0	146.8	12.1	33.0	.000
210	24.6	1010.0	1.8	123.	5.0	9.6	145.3	14.4	35.2	.000
211	27.0	1008.1	2.2	126.	6.9	10.8	147.7	17.2	36.9	.000
212	27.2	1007.0	2.1	121.	7.4	10.9	124.3	17.6	37.0	.000
213	28.3	1006.8	1.9	313.	4.1	11.4	142.9	19.3	40.8	.000

End hr	t2	t10	pres	ws	wd	rh2	rh10	kd	nr
1	31.3	30.6	1008.2	4.3	124.	32.8	33.9	466.5	254.9
2	30.7	30.2	1007.8	3.9	127.	35.2	36.1	294.1	133.0
3	29.0	28.7	1007.8	3.3	132.	41.3	41.4	123.1	9.6
4	26.1	26.4	1008.0	2.7	148.	50.3	48.4	14.4	-72.4
5	23.3	24.3	1008.3	2.6	166.	56.1	52.0	.0	-81.3
6	21.3	22.4	1008.7	2.6	165.	62.3	57.8	.0	-77.9
7	19.7	20.9	1008.9	2.5	165.	67.0	62.1	.0	-75.5
8	18.4	19.1	1009.2	2.4	129.	73.1	70.1	.0	-73.9
9	16.8	16.9	1009.4	2.0	123.	81.2	80.9	.0	-73.9
10	15.7	16.0	1009.5	1.6	145.	83.8	83.3	.0	-71.2
11	15.0	15.4	1009.7	1.3	97.	85.7	84.3	.0	-68.2
12	14.4	15.0	1009.8	1.1	40.	86.7	86.1	.0	-64.9
13	14.1	14.9	1010.1	1.2	325.	87.2	86.3	.6	-61.3
14	14.4	14.9	1010.5	1.4	334.	87.5	86.1	47.3	-24.3
15	16.4	16.0	1010.9	1.5	6.	83.1	83.4	159.8	47.0
16	18.6	18.0	1011.3	1.4	22.	73.2	74.6	368.1	182.6
17	20.9	20.1	1011.5	1.4	41.	64.6	66.8	551.0	307.6
18	23.1	22.2	1011.4	1.6	66.	57.3	59.9	698.5	415.9
19	25.2	24.2	1011.3	1.7	72.	50.6	53.2	816.4	505.3
20	27.2	26.1	1010.9	1.8	80.	44.6	46.9	897.2	560.2
21	28.8	27.7	1010.4	2.1	95.	41.1	43.1	912.7	567.9
22	30.2	29.1	1009.8	2.8	110.	36.7	38.5	878.7	542.7
23	31.2	30.2	1009.2	3.4	117.	33.0	34.3	771.5	467.2
24	31.7	30.8	1008.6	3.9	122.	31.6	32.7	630.7	374.8

Average for Jul 00

temp	ws	wd	nr	mr	prec
22.6	2.3	107.9	151.0	9.6	.000

Table 5.3 Climatological data for ABK during August 00

JD	temp	pres	ws	wd	gust	mr	nr	tmin	tmax	prec
214	29.7	1006.7	2.1	204.	7.3	12.1	115.6	21.4	37.9	.000
215	29.4	1005.8	2.1	139.	8.4	13.5	141.8	20.4	38.7	.000
216	26.3	1004.6	2.7	119.	9.1	11.5	145.2	16.9	36.4	.000
217	25.3	1008.1	2.5	137.	7.6	9.0	150.3	15.0	34.9	.000
218	25.2	1010.6	1.9	114.	7.1	10.0	146.2	15.1	36.1	.000
219	25.8	1007.6	2.1	128.	7.6	10.4	145.8	15.7	36.5	.000
220	22.6	1005.9	2.5	125.	8.6	10.3	137.2	13.2	31.2	.000
221	19.8	1008.7	2.5	112.	8.8	9.9	144.5	12.5	31.2	.000
222	21.8	1009.4	2.3	122.	8.7	9.7	149.4	12.9	32.0	.000
223	20.9	1009.8	2.4	123.	7.2	7.9	143.4	11.2	29.6	.000
224	22.9	1010.9	2.0	55.	7.0	9.3	144.1	13.4	34.7	.000
225	25.9	1008.5	2.2	144.	6.9	9.0	142.3	16.1	36.7	.000
226	23.7	1007.8	2.4	101.	7.7	7.7	139.5	11.8	35.3	.000
227	26.1	1006.9	2.4	336.	6.9	8.3	140.7	15.4	36.4	.000
228	25.0	1009.4	2.1	144.	6.4	7.9	134.4	13.8	35.7	.000
229	26.3	1010.7	2.4	329.	6.5	8.1	138.4	16.5	37.6	.000
230	26.2	1008.7	2.1	140.	6.0	8.1	131.8	14.7	35.4	.000
231	22.7	1008.8	2.0	101.	6.7	8.5	126.4	11.3	32.2	.000
232	21.3	1010.8	2.2	111.	9.9	8.9	132.7	11.9	31.3	.000
233	20.9	1012.6	2.1	95.	9.5	8.1	129.4	11.9	31.4	.000
234	23.3	1008.6	1.7	92.	5.8	8.6	122.4	14.0	33.2	.000
235	23.0	1006.7	2.0	131.	6.0	8.7	126.5	13.4	33.4	.000
236	22.0	1008.6	2.2	126.	8.3	8.8	128.2	12.1	32.1	.000
237	20.7	1013.3	2.2	67.	8.2	8.7	131.2	10.9	33.3	.000
238	24.3	1011.8	2.4	300.	6.1	8.1	121.0	14.7	35.7	.000
239	23.2	1007.7	2.0	122.	6.6	8.5	125.1	12.8	34.4	.000
240	22.6	1005.0	1.9	115.	6.8	7.8	132.2	11.7	34.2	.000
241	23.3	1005.2	1.8	84.	4.7	8.5	129.8	13.4	33.7	.000
242	20.0	1007.7	2.5	132.	7.2	9.3	15.7	14.5	21.6	.000
243	17.7	1009.4	2.2	128.	8.2	9.4	27.2	15.7	21.7	.000
244	19.2	1008.7	2.6	114.	9.6	9.5	131.8	13.3	27.4	.000

End hr	t2	t10	pres	ws	wd	rh2	rh10	kd	nr
1	33.2	32.6	1006.9	3.9	123.	27.6	28.3	393.4	216.9
2	32.3	31.9	1006.6	3.5	128.	30.6	31.0	228.5	93.3
3	29.9	29.9	1006.5	2.8	137.	37.8	36.9	64.0	-30.8
4	26.3	27.4	1006.8	2.6	164.	45.8	41.8	1.8	-76.6
5	23.9	25.5	1007.3	2.5	177.	52.1	46.9	.0	-72.9
6	22.0	23.6	1007.5	2.3	179.	57.8	51.9	.0	-69.9
7	20.5	22.1	1007.7	2.3	169.	62.5	56.3	.0	-67.9
8	18.9	19.8	1008.0	2.1	130.	70.1	66.4	.0	-67.3
9	17.6	18.2	1008.3	1.8	123.	76.2	74.3	.0	-66.1
10	16.5	17.3	1008.4	1.5	114.	79.8	77.6	.0	-64.4
11	15.8	16.6	1008.6	1.4	7.	81.9	79.9	.0	-63.3
12	15.2	16.3	1008.8	1.4	331.	83.1	80.3	.0	-60.8
13	14.8	16.0	1009.0	1.4	315.	83.4	80.6	.0	-58.8
14	14.7	15.8	1009.5	1.5	313.	84.1	80.5	13.1	-46.3
15	16.5	16.7	1010.0	1.4	323.	79.6	77.3	127.4	27.7
16	19.3	18.8	1010.3	1.4	13.	68.5	69.4	300.5	133.7
17	21.6	20.8	1010.5	1.5	30.	59.5	61.3	471.7	258.7
18	23.9	23.1	1010.6	1.7	54.	51.9	53.8	617.7	369.4
19	26.1	25.1	1010.4	1.9	52.	45.8	47.7	740.7	463.6
20	28.2	27.2	1010.0	1.9	68.	39.9	41.6	813.1	513.4
21	29.8	28.8	1009.4	2.3	87.	35.5	36.8	814.3	512.0
22	31.2	30.3	1008.8	2.7	106.	31.9	33.0	768.6	479.2
23	32.4	31.5	1008.0	3.2	114.	28.7	29.6	692.0	425.4
24	32.8	32.0	1007.4	3.8	118.	28.0	28.8	545.1	325.4

Average for Aug 00

temp	ws	wd	nr	mr	prec
23.5	2.2	112.2	128.1	9.2	.000

Table 5.4 Climatological data for ABK during September 00

JD	temp	pres	ws	wd	gust	mr	nr	tmin	tmax	prec
245	18.3	1008.1	3.2	177.	8.7	8.9	25.6	14.3	19.6	4.826
246	17.3	1012.0	2.5	172.	8.3	8.6	101.6	14.0	23.1	.254
247	17.2	1011.7	2.4	336.	8.1	7.9	130.4	11.4	24.7	.000
248	16.9	1012.3	2.4	335.	8.2	6.8	133.8	8.9	24.6	.000
249	18.1	1015.0	3.8	341.	10.3	7.0	139.4	9.1	25.9	.000
250	21.2	1013.2	6.0	335.	14.2	6.1	140.6	15.3	29.7	.000
251	22.5	1008.6	2.9	318.	6.9	6.2	132.8	13.2	33.3	.000
252	21.9	1004.6	2.2	183.	8.0	6.7	122.8	11.6	33.4	.000
253	21.3	1003.8	2.0	23.	8.6	7.5	123.2	11.5	30.8	.000
254	20.8	1006.6	1.4	130.	5.1	7.6	118.6	10.4	31.6	.000
255	21.8	1009.0	1.7	333.	4.2	7.7	119.5	11.3	33.7	.000
256	23.0	1009.4	2.4	317.	5.5	7.4	104.2	14.0	34.1	.000
257	25.9	1006.7	2.4	326.	6.1	8.1	69.9	18.7	33.6	.000
258	24.8	1006.9	2.9	145.	10.1	9.8	109.9	18.5	32.1	.000
259	22.0	1011.6	2.7	178.	8.7	9.5	121.4	12.6	29.9	.000
260	21.3	1010.7	1.9	62.	7.2	9.3	116.2	12.8	30.2	.000
261	24.0	1008.6	3.2	331.	9.0	8.8	122.3	15.4	35.4	.000
262	27.4	1007.4	3.2	327.	6.4	8.4	117.8	18.6	37.7	.000
263	29.2	1005.7	3.3	318.	8.7	8.2	117.8	21.3	39.1	.000
264	28.7	1000.7	2.7	315.	7.9	8.9	108.3	20.8	38.0	.000
265	23.8	997.3	2.9	157.	8.6	9.2	108.9	13.7	30.9	.000
266	19.4	999.8	3.5	176.	8.9	9.1	51.1	16.3	23.7	.000
267	18.2	1008.0	3.4	333.	9.5	7.2	114.0	10.1	26.8	.000
268	17.7	1012.7	2.1	306.	6.1	5.1	99.4	7.9	29.3	.000
269	20.8	1012.5	2.7	321.	7.8	5.8	107.1	11.0	32.5	.000
270	21.8	1010.4	2.4	317.	6.4	6.2	105.9	13.7	32.9	.000
271	22.1	1010.4	2.5	240.	7.6	6.6	100.8	13.4	31.5	.000
272	18.0	1012.9	2.3	84.	7.5	8.3	95.0	10.5	25.7	.000
273	20.6	1010.5	3.2	340.	10.6	7.6	103.1	11.5	35.0	.000
274	24.7	1006.5	2.8	336.	7.7	7.4	102.2	13.2	35.6	.000

End hr	t2	t10	pres	ws	wd	rh2	rh10	kd	nr
1	29.6	29.3	1007.0	3.2	96.	29.7	29.1	288.7	130.4
2	27.9	28.2	1006.9	3.0	106.	35.1	32.4	111.1	7.1
3	24.6	26.3	1006.9	2.5	187.	43.0	37.2	7.2	-61.7
4	22.1	23.9	1007.2	2.9	227.	49.5	43.0	.0	-61.6
5	20.9	22.3	1007.5	2.9	238.	51.1	45.3	.0	-58.5
6	19.9	21.5	1007.7	2.8	260.	52.6	46.6	.0	-56.4
7	18.9	20.5	1007.8	2.6	272.	55.7	49.9	.0	-54.8
8	17.5	19.0	1008.1	2.3	292.	61.8	56.1	.0	-54.7
9	16.7	18.1	1008.3	2.5	286.	66.0	61.0	.0	-53.1
10	16.3	17.7	1008.5	2.5	291.	67.5	62.3	.0	-51.8
11	15.7	16.9	1008.5	2.5	308.	69.4	65.1	.0	-50.8
12	15.2	16.6	1008.6	2.4	304.	71.2	66.0	.0	-48.8
13	14.6	16.3	1008.8	2.4	308.	73.3	67.7	.0	-47.8
14	14.5	16.1	1009.1	2.5	306.	73.9	68.1	1.3	-45.0
15	15.2	16.2	1009.6	2.5	309.	72.3	67.3	71.9	.7
16	18.3	18.1	1009.9	2.4	333.	64.8	63.5	243.4	111.7
17	20.9	20.3	1010.1	3.0	353.	55.2	55.7	426.8	240.1
18	22.9	22.2	1010.1	3.2	352.	48.9	49.6	575.2	348.4
19	24.9	24.1	1009.9	3.3	359.	43.2	44.0	698.2	431.6
20	26.7	25.9	1009.5	3.2	9.	38.4	39.1	754.2	464.0
21	28.1	27.3	1009.0	3.0	12.	33.9	34.6	783.1	477.4
22	29.3	28.4	1008.4	2.9	32.	30.8	31.4	708.7	423.6
23	30.0	29.2	1007.8	2.9	58.	28.9	29.4	616.9	357.5
24	30.3	29.7	1007.3	3.0	80.	28.0	28.1	484.7	263.5

Average for Sep 00

temp	ws	wd	nr	mr	prec
21.7	2.8	320.2	108.8	7.7	5.080

5.2 Angiola Surface Climatology

During the CCOS measurement period, only 10-m data (except for pressure) were available from the Angiola site. The result of using 10-m temperatures is that the maximum temperatures will be slightly lower than what would be observed at 2 m and the minimum temperatures will be slightly higher. The data for September ’00 was incomplete. For the first three months of the CCOS measurement period, maximum temperatures averaged 33 ^{o}C with minimum temperatures averaging 18 ^{o}C. Winds were northwesterly from the late morning until the late evening switching to a more westerly direction during the morning hours. Wind speeds averaged 2.8 m s^{-1} with maximum speeds during the late evening hours.

Table 5.5 Climatological data for AGO during June 00

JD	temp	pres	ws	wd	gust	mr	nr	tmin	tmax	prec
153	22.3	1004.3	2.6	305.	8.3	4.8	.0	12.7	32.0	.000
154	25.1	1006.8	2.8	313.	8.2	5.1	.0	13.6	34.4	.000
155	24.8	1009.5	3.2	318.	7.3	6.3	.0	14.9	33.4	.000
156	26.6	1008.6	2.6	319.	6.6	6.7	.0	17.1	37.9	.000
157	22.3	1008.8	3.7	308.	9.3	6.4	.0	12.5	27.6	.000
158	-99.9	-99.9	-9.9	-99.	-9.9	-99.9	-999.9	-99.9	-99.9	.000
159	23.4	1006.2	3.0	325.	7.3	6.9	.0	14.3	31.0	.000
160	18.1	1005.6	5.1	271.	14.8	7.6	.0	13.7	18.5	22.860
162	18.5	1007.8	3.3	339.	8.0	8.2	.0	12.6	25.4	.000
163	20.0	1007.9	2.9	333.	8.4	7.3	.0	12.0	28.0	.000
164	22.6	1009.2	3.1	332.	7.9	8.1	.0	16.5	30.0	.000
165	25.7	1006.5	2.6	339.	8.1	10.8	.0	18.8	34.0	.000
166	29.2	1004.6	2.3	331.	6.2	12.7	.0	20.0	38.5	.000
167	32.2	1002.9	3.0	318.	8.4	11.2	.0	21.5	39.6	.000
168	30.5	997.5	3.1	298.	8.1	10.7	.0	22.1	37.7	.000
169	28.4	996.1	3.5	307.	7.7	10.0	.0	19.5	35.3	.000
170	25.2	1001.2	3.6	308.	8.8	10.5	.0	18.2	31.9	.000
171	24.4	1003.8	3.0	320.	7.5	10.4	.0	16.7	32.2	.000
172	26.8	1003.4	2.9	322.	8.9	10.8	.0	19.0	34.8	.000
175	28.5	1002.5	2.6	295.	6.5	8.6	.0	19.3	37.1	.000
176	26.1	1006.2	3.3	280.	9.1	9.2	.0	18.2	33.6	.000
177	26.5	1007.4	2.9	309.	6.6	10.6	.0	18.5	34.5	.000
178	27.9	1005.4	2.9	312.	7.1	9.2	.0	19.7	35.5	.000
179	29.5	1003.5	2.5	308.	7.4	9.4	.0	20.7	37.3	.000
180	30.0	1003.6	2.7	331.	7.1	9.5	.0	21.1	38.2	.000
181	29.9	1003.6	2.5	292.	6.2	8.3	.0	19.9	38.4	.000
182	28.5	1003.2	2.6	312.	6.2	8.5	.0	19.5	35.6	.000

End hr	t10		pres	ws	wd	rh10		kd	nr
1	33.3	-99.9	1003.2	3.9	349.	23.2	-99.9	.0	.0
2	32.7	-99.9	1003.0	4.0	346.	25.3	-99.9	.0	.0
3	31.2	-99.9	1003.1	3.3	337.	30.3	-99.9	.0	.0
4	28.6	-99.9	1003.4	3.1	308.	37.3	-99.9	.0	.0
5	26.7	-99.9	1003.9	3.2	296.	41.8	-99.9	.0	.0
6	25.1	-99.9	1004.5	3.3	288.	46.0	-99.9	.0	.0
7	23.6	-99.9	1004.7	3.2	280.	50.5	-99.9	.0	.0
8	22.4	-99.9	1004.8	3.1	284.	54.9	-99.9	.0	.0
9	21.6	-99.9	1004.9	3.0	286.	57.9	-99.9	.0	.0
10	20.8	-99.9	1005.0	2.7	286.	60.2	-99.9	.0	.0
11	20.0	-99.9	1005.0	2.7	268.	62.9	-99.9	.0	.0
12	19.4	-99.9	1005.2	2.7	264.	64.4	-99.9	.0	.0
13	18.4	-99.9	1005.5	2.8	264.	67.8	-99.9	.0	.0
14	17.9	-99.9	1006.0	2.5	254.	68.9	-99.9	.0	.0
15	19.8	-99.9	1006.3	2.2	285.	62.9	-99.9	.0	.0
16	21.9	-99.9	1006.7	2.5	315.	54.8	-99.9	.0	.0
17	24.0	-99.9	1006.7	2.4	334.	48.8	-99.9	.0	.0
18	25.8	-99.9	1006.7	2.6	334.	43.3	-99.9	.0	.0
19	27.7	-99.9	1006.5	2.9	331.	37.4	-99.9	.0	.0
20	29.4	-99.9	1006.0	2.9	334.	33.5	-99.9	.0	.0
21	30.6	-99.9	1005.6	3.0	332.	30.2	-99.9	.0	.0
22	31.8	-99.9	1004.9	3.2	343.	27.0	-99.9	.0	.0
23	32.6	-99.9	1004.3	3.3	348.	25.3	-99.9	.0	.0
24	33.1	-99.9	1003.7	3.7	351.	24.0	-99.9	.0	.0

Average for Jun 00

temp	ws	wd	nr	mr	prec
25.9	3.0	319.4	.0	8.7	22.860

Table 5.6 Climatological data for AGO during July 00

JD	temp	pres	ws	wd	gust	mr	nr	tmin	tmax	prec
184	24.6	1005.5	2.7	320.	7.7	7.9	.0	16.2	32.5	.000
185	21.8	1006.3	2.8	260.	10.1	7.1	.0	13.5	28.5	.000
186	21.1	1007.3	2.5	324.	5.3	7.5	.0	13.4	28.3	.000
187	21.9	1006.0	2.7	310.	8.1	7.8	.0	14.2	28.4	.000
188	21.1	1006.0	3.2	330.	8.5	8.6	.0	13.8	28.5	.000
189	-99.9	-99.9	-9.9	-99.	-9.9	-99.9	-999.9	-99.9	-99.9	.000
190	21.4	1007.2	2.7	329.	6.5	8.6	.0	14.5	28.6	.000
191	23.4	1005.9	2.2	326.	5.9	9.0	.0	16.0	31.4	.000
192	25.2	1004.5	2.9	279.	6.6	9.1	.0	16.8	32.3	.000
193	25.5	1005.0	2.8	309.	6.5	9.5	.0	17.1	32.6	.000
194	25.0	1006.4	2.9	282.	8.9	9.3	.0	16.5	32.3	.000
195	24.1	1009.5	3.1	307.	6.5	9.0	.0	15.7	32.0	.000
196	24.3	1010.5	2.7	328.	7.0	10.6	.0	16.8	33.2	.000
197	26.8	1008.4	2.5	311.	5.0	10.1	.0	19.3	34.4	.000
198	25.4	1006.2	2.8	307.	6.0	9.1	.0	17.7	32.2	.000
199	22.0	1008.9	3.4	324.	7.9	9.1	.0	13.9	29.8	.000
200	22.7	1011.4	3.0	330.	6.2	9.5	.0	14.6	31.8	.000
201	25.2	1009.9	3.1	319.	6.7	8.4	.0	15.1	33.9	.000
202	25.8	1006.9	2.7	322.	5.6	8.7	.0	16.1	34.1	.000
203	27.4	1004.4	2.6	322.	5.1	9.3	.0	17.9	35.9	.000
207	27.7	1004.8	2.8	331.	5.5	10.0	.0	19.3	35.3	.000
208	-99.9	-99.9	-9.9	-99.	-9.9	-99.9	-999.9	-99.9	-99.9	.000
209	23.5	1006.5	2.8	326.	6.7	8.5	.0	15.1	31.2	.000
210	25.7	1006.8	2.6	319.	5.0	9.5	.0	17.5	34.0	.000
211	27.4	1005.3	2.5	314.	5.3	10.2	.0	18.9	35.1	.000
212	29.1	1004.0	2.5	305.	5.4	10.6	.0	20.2	36.0	.000
213	29.0	1003.6	2.9	304.	5.8	11.1	.0	20.8	36.4	.000

End hr	t10		pres	ws	wd	rh10		kd	nr
1	32.0	-99.9	1004.9	2.9	352.	28.9	-99.9	.0	.0
2	31.4	-99.9	1004.8	2.8	351.	32.0	-99.9	.0	.0
3	30.2	-99.9	1004.9	2.9	341.	35.5	-99.9	.0	.0
4	28.2	-99.9	1005.2	3.1	324.	40.4	-99.9	.0	.0
5	25.9	-99.9	1005.8	3.3	307.	48.0	-99.9	.0	.0
6	24.4	-99.9	1006.1	3.4	301.	51.2	-99.9	.0	.0
7	22.7	-99.9	1006.3	3.4	294.	56.3	-99.9	.0	.0
8	21.5	-99.9	1006.5	3.1	295.	59.2	-99.9	.0	.0
9	20.5	-99.9	1006.5	2.7	294.	62.8	-99.9	.0	.0
10	19.5	-99.9	1006.4	2.4	275.	66.4	-99.9	.0	.0
11	19.1	-99.9	1006.6	2.1	259.	67.2	-99.9	.0	.0
12	18.4	-99.9	1006.7	2.4	247.	69.0	-99.9	.0	.0
13	17.5	-99.9	1007.0	2.9	247.	72.5	-99.9	.0	.0
14	17.0	-99.9	1007.4	2.8	258.	72.8	-99.9	.0	.0
15	18.5	-99.9	1007.8	2.3	277.	67.6	-99.9	.0	.0
16	20.7	-99.9	1008.3	2.4	306.	58.3	-99.9	.0	.0
17	22.5	-99.9	1008.4	2.5	328.	51.4	-99.9	.0	.0
18	24.3	-99.9	1008.3	2.6	337.	46.3	-99.9	.0	.0
19	26.3	-99.9	1008.1	2.7	340.	40.4	-99.9	.0	.0
20	27.9	-99.9	1007.7	2.7	336.	36.7	-99.9	.0	.0
21	29.2	-99.9	1007.1	2.7	344.	34.1	-99.9	.0	.0
22	30.5	-99.9	1006.5	2.8	347.	31.9	-99.9	.0	.0
23	31.4	-99.9	1005.9	2.9	353.	30.1	-99.9	.0	.0
24	31.9	-99.9	1005.3	3.0	353.	29.2	-99.9	.0	.0

Average for Jul 00

temp	ws	wd	nr	mr	prec
24.7	2.8	314.8	.0	9.1	.000

Table 5.7 Climatological data for AGO during August 00

JD	temp	pres	ws	wd	gust	mr	nr	tmin	tmax	prec
214	30.7	1003.9	2.3	314.	10.5	11.5	.0	22.7	38.1	.000
215	31.0	1003.2	2.5	305.	6.3	11.4	.0	23.3	38.6	.000
216	31.7	1002.4	2.5	279.	7.2	9.4	.0	23.5	38.3	.000
217	28.6	1005.2	3.8	277.	10.6	9.6	.0	20.7	35.7	.000
218	28.1	1007.2	2.8	319.	6.0	11.7	.0	20.3	35.7	.000
219	27.8	1004.9	2.8	324.	5.6	9.9	.0	19.9	35.9	.000
220	27.5	1003.4	2.3	322.	5.6	9.3	.0	17.7	35.0	.000
221	-99.9	-99.9	-9.9	-99.	-9.9	-99.9	-999.9	-99.9	-99.9	.000
222	25.1	1006.3	2.6	313.	7.3	9.4	.0	17.0	34.1	.000
223	23.9	1006.7	3.2	315.	8.1	8.9	.0	15.0	30.7	.000
224	23.5	1007.4	2.9	312.	5.6	9.5	.0	15.2	32.0	.000
225	26.4	1005.9	1.9	332.	4.6	9.0	.0	16.9	34.8	.000
226	27.2	1004.8	2.5	308.	6.1	8.3	.0	17.7	34.3	.000
227	25.5	1003.8	2.8	307.	5.9	8.3	.0	15.6	34.1	.000
228	27.7	1006.2	2.7	317.	5.5	8.8	.0	18.6	34.8	.000
229	27.7	1007.4	2.5	319.	6.0	9.2	.0	18.3	36.0	.000
230	28.4	1005.9	2.5	313.	5.4	9.4	.0	19.8	37.6	.000
231	26.9	1006.2	2.6	323.	5.5	8.1	.0	18.9	33.2	.000
232	23.7	1008.2	2.9	320.	5.6	7.7	.0	16.8	31.9	.000

End hr	t10		pres	ws	wd	rh10		kd	nr
1	34.8	-99.9	1003.5	2.8	359.	29.5	-99.9	.0	.0
2	33.9	-99.9	1003.3	2.9	353.	32.1	-99.9	.0	.0
3	32.7	-99.9	1003.4	2.8	332.	32.8	-99.9	.0	.0
4	30.6	-99.9	1003.9	3.2	303.	35.0	-99.9	.0	.0
5	28.8	-99.9	1004.5	3.5	289.	37.3	-99.9	.0	.0
6	26.9	-99.9	1004.9	3.5	282.	42.7	-99.9	.0	.0
7	25.3	-99.9	1005.2	3.3	288.	47.3	-99.9	.0	.0
8	24.0	-99.9	1005.5	2.7	295.	52.9	-99.9	.0	.0
9	22.9	-99.9	1005.5	2.2	275.	56.2	-99.9	.0	.0
10	22.2	-99.9	1005.5	2.0	251.	58.3	-99.9	.0	.0
11	21.4	-99.9	1005.6	2.4	243.	60.9	-99.9	.0	.0
12	20.5	-99.9	1005.7	2.7	243.	63.7	-99.9	.0	.0
13	20.0	-99.9	1005.9	2.7	237.	63.4	-99.9	.0	.0
14	19.8	-99.9	1006.4	2.4	252.	62.7	-99.9	.0	.0
15	20.2	-99.9	1006.8	1.9	270.	62.6	-99.9	.0	.0
16	22.8	-99.9	1007.2	1.8	319.	55.7	-99.9	.0	.0
17	25.2	-99.9	1007.3	2.1	340.	45.8	-99.9	.0	.0
18	27.4	-99.9	1007.3	2.6	333.	39.5	-99.9	.0	.0
19	29.3	-99.9	1007.1	2.8	339.	35.2	-99.9	.0	.0
20	30.8	-99.9	1006.7	2.7	348.	31.9	-99.9	.0	.0
21	32.3	-99.9	1006.1	2.6	352.	28.8	-99.9	.0	.0
22	33.5	-99.9	1005.5	2.7	1.	27.4	-99.9	.0	.0
23	34.2	-99.9	1004.8	2.9	356.	27.4	-99.9	.0	.0
24	34.7	-99.9	1004.2	2.8	357.	28.0	-99.9	.0	.0

Average for Aug 00

temp	ws	wd	nr	mr	prec
27.3	2.7	312.0	.0	9.4	.000

Table 5.8 Climatological data for AGO during September 00

JD	temp	pres	ws	wd	gust	mr	nr	tmin	tmax	prec
258	26.2	1004.4	3.3	316.	8.3	8.5	.0	17.7	32.2	.000
259	23.7	1008.5	3.5	329.	8.3	10.9	.0	16.8	29.9	.000
260	22.2	1007.2	3.3	326.	8.4	9.3	.0	14.3	30.7	.000

End hr	t10		pres	ws	wd	rh10		kd	nr
1	32.2	-99.9	1003.6	3.8	344.	34.2	-99.9	.0	.0
2	31.0	-99.9	1003.6	2.7	338.	38.4	-99.9	.0	.0
3	29.0	-99.9	1004.0	3.0	326.	42.5	-99.9	.0	.0
4	26.5	-99.9	1004.7	3.2	307.	45.9	-99.9	.0	.0
5	25.2	-99.9	1005.2	3.4	303.	47.9	-99.9	.0	.0
6	23.5	-99.9	1005.6	3.5	317.	52.8	-99.9	.0	.0
7	22.5	-99.9	1006.0	3.7	315.	54.9	-99.9	.0	.0
8	21.3	-99.9	1006.4	3.4	326.	58.5	-99.9	.0	.0
9	20.6	-99.9	1006.7	3.3	323.	62.1	-99.9	.0	.0
10	19.9	-99.9	1006.9	2.8	331.	65.3	-99.9	.0	.0
11	19.8	-99.9	1007.0	2.1	328.	65.0	-99.9	.0	.0
12	19.0	-99.9	1007.3	2.3	275.	67.1	-99.9	.0	.0
13	18.0	-99.9	1007.6	2.3	258.	69.6	-99.9	.0	.0
14	17.4	-99.9	1008.1	2.9	262.	68.0	-99.9	.0	.0
15	16.9	-99.9	1008.7	2.7	267.	70.7	-99.9	.0	.0
16	19.3	-99.9	1009.0	3.0	298.	64.2	-99.9	.0	.0
17	21.3	-99.9	1009.1	3.6	331.	60.7	-99.9	.0	.0
18	23.4	-99.9	1009.1	3.8	338.	55.2	-99.9	.0	.0
19	25.3	-99.9	1008.7	4.0	333.	49.8	-99.9	.0	.0
20	26.9	-99.9	1008.0	4.0	342.	44.9	-99.9	.0	.0
21	28.3	-99.9	1007.3	4.1	351.	41.0	-99.9	.0	.0
22	29.4	-99.9	1006.6	4.2	350.	39.2	-99.9	.0	.0
23	30.2	-99.9	1006.1	4.3	343.	37.5	-99.9	.0	.0
24	30.7	-99.9	1005.6	4.2	338.	36.4	-99.9	.0	.0

Average for Sep 00

temp	ws	wd	nr	mr	prec
24.1	3.4	324.0	.0	9.6	.000

5.3 Chico Surface Climatology

Chico maximum daytime temperatures averaged 31 ^{o}C with nighttime lows averaging 16 ^{o}C. The highest temperature (41.2 ^{o}C) occurred on 6/14/00. Winds were from the south-southeast during a majority of the time, turning to a more easterly direction during the nighttime hours. The southerly flow resulted from a combination of marine air inflow and thermally induced flows resulting from the slope of the Sacramento Valley to the north. Higher terrain to the east induced the easterly flows (drainage winds) during the nighttime hours. Wind speeds averaged 2.6 m s^{-1} with maximum speeds during the late afternoon.

Table 5.9 Climatological data for CCO during June 00

JD	temp	pres	ws	wd	gust	mr	nr	tmin	tmax	prec
154	23.2	1008.8	2.3	135.	6.7	7.3	173.3	13.1	30.4	.000
155	23.2	1011.9	1.9	132.	6.7	7.7	174.4	12.3	31.7	.000
156	23.5	1010.3	2.2	146.	6.7	8.7	175.4	15.2	31.3	.000
157	20.0	1010.1	4.4	148.	12.0	8.2	175.6	12.2	25.3	.000
158	21.7	1010.2	2.6	140.	7.1	8.8	182.3	13.3	28.5	.000
159	21.2	1007.1	5.0	147.	12.1	8.6	166.8	14.5	25.0	.000
160	17.7	1005.6	4.0	141.	11.0	9.5	119.2	13.7	21.0	6.350
161	17.7	1009.0	4.1	150.	8.6	9.2	179.0	14.2	22.6	.000
162	18.7	1009.6	3.1	142.	8.1	8.9	162.8	13.5	24.0	.000
163	20.0	1010.2	1.2	96.	5.0	7.8	136.4	11.8	28.1	.000
164	23.6	1011.5	1.8	147.	5.2	10.4	162.8	18.1	30.5	.000
165	26.9	1010.3	5.7	332.	14.4	9.0	191.5	20.1	37.7	.000
166	31.1	1007.3	4.0	330.	10.3	8.9	188.9	19.5	41.2	.000
167	31.5	1004.4	3.7	330.	10.5	9.3	185.3	20.3	38.5	.000
168	30.9	999.6	5.6	331.	12.1	6.9	186.3	24.4	36.0	.000
169	27.6	998.1	3.1	325.	10.5	7.0	176.5	18.1	36.7	.000
170	23.6	1002.7	4.2	152.	8.7	11.5	178.5	16.7	26.7	.000
171	24.2	1005.9	3.0	70.	7.4	10.0	184.9	15.1	34.9	.000
172	-99.9	-99.9	-9.9	-99.	-9.9	-99.9	-999.9	-99.9	-99.9	.000
173	27.4	1004.6	1.8	173.	5.2	10.9	175.1	17.8	34.5	.000
174	28.1	1002.7	2.8	148.	7.3	12.0	180.5	20.5	33.0	.000
175	24.3	1004.3	2.6	156.	7.0	11.5	175.4	14.7	31.2	.000
176	25.0	1008.4	2.1	151.	5.9	11.6	175.8	17.1	33.0	.000
177	26.2	1009.0	2.3	149.	7.7	12.7	177.1	17.7	33.4	.000
178	28.0	1006.7	2.2	152.	6.0	13.1	179.5	20.3	34.4	.000
179	28.9	1004.9	2.2	158.	6.2	14.1	182.5	20.6	34.8	.000
180	29.2	1005.2	2.0	155.	5.3	14.8	178.8	22.4	35.8	.000
181	28.3	1004.8	2.9	144.	6.1	13.2	182.3	21.9	33.2	.000
182	24.0	1004.4	3.8	160.	7.8	12.3	183.8	16.4	29.8	.000

End hr	t2	t10	pres	ws	wd	rh2	rh10	kd	nr
1	31.6	30.9	1005.3	3.8	160.	35.5	35.1	525.9	278.3
2	31.1	30.7	1004.9	3.7	159.	37.5	36.7	335.9	143.9
3	30.2	30.0	1004.9	3.1	153.	41.6	40.5	151.7	15.0
4	28.2	28.4	1005.0	2.7	135.	48.7	46.7	19.9	-71.4
5	26.3	26.6	1005.3	2.9	107.	53.4	51.3	.0	-81.8
6	25.0	25.3	1005.9	3.1	95.	53.1	51.1	.0	-77.6
7	23.8	24.2	1006.1	3.1	108.	54.0	51.6	.0	-75.6
8	22.6	22.9	1006.3	3.0	111.	57.9	55.4	.0	-74.0
9	21.2	21.6	1006.4	2.8	125.	63.1	59.9	.0	-72.6
10	20.2	20.6	1006.5	2.6	132.	66.7	64.1	.0	-71.8
11	19.2	19.7	1006.6	2.4	143.	70.1	67.4	.0	-69.2
12	18.5	18.9	1006.8	2.2	111.	72.3	69.3	.0	-68.2
13	18.0	18.3	1007.1	2.2	84.	73.6	71.4	2.4	-64.4
14	18.1	18.2	1007.6	2.2	89.	73.3	72.0	77.3	-8.9
15	19.7	19.4	1007.9	2.5	134.	66.7	67.0	242.4	105.4
16	21.4	20.9	1008.2	2.5	157.	61.6	62.4	424.2	232.1
17	23.0	22.4	1008.3	2.9	207.	56.5	57.7	608.9	363.4
18	24.7	23.8	1008.2	3.1	216.	52.0	53.3	792.4	490.6
19	26.4	25.4	1008.1	3.4	192.	47.8	49.1	917.0	573.1
20	27.8	26.8	1007.8	3.7	182.	44.1	45.2	971.4	608.6
21	29.3	28.2	1007.3	3.8	188.	40.8	41.6	997.2	612.2
22	30.2	29.2	1006.8	3.9	174.	39.0	39.5	951.1	581.1
23	30.9	30.0	1006.3	4.1	169.	37.0	37.1	859.0	516.0
24	31.4	30.6	1005.7	4.0	167.	36.1	35.9	713.9	413.2

Average for Jun 00

temp	ws	wd	nr	mr	prec
24.8	3.1	147.3	174.7	10.1	6.350

Table 5.10 Climatological data for CCO during July 00

JD	temp	pres	ws	wd	gust	mr	nr	tmin	tmax	prec
183	21.2	1006.5	3.7	154.	7.7	10.3	178.4	13.9	27.1	.000
184	21.8	1007.2	2.9	152.	7.2	9.7	174.5	15.1	27.3	.000
185	19.4	1007.8	3.3	151.	8.5	9.5	169.4	12.6	24.6	.000
186	21.4	1008.8	2.4	159.	6.6	10.7	176.8	14.7	27.8	.000
187	20.5	1007.0	4.0	144.	8.8	9.6	151.1	14.7	26.0	.000
188	20.4	1008.1	2.3	148.	5.6	9.6	140.1	13.9	26.2	.000
189	20.3	1008.0	2.7	151.	7.3	9.3	145.9	13.8	26.5	.000
190	20.8	1009.4	2.2	154.	5.5	9.1	180.6	13.5	29.4	.000
191	22.7	1007.9	1.6	166.	5.1	9.3	179.1	13.4	31.5	.000
192	24.6	1006.1	2.4	146.	5.5	10.0	177.9	16.0	31.7	.000
193	25.0	1006.9	2.4	147.	5.8	10.9	174.6	16.7	32.4	.000
194	25.4	1007.7	2.5	149.	7.4	11.0	178.1	17.1	31.7	.000
195	23.3	1011.0	3.6	147.	9.0	10.9	179.5	15.7	29.9	.000
196	24.1	1012.5	2.4	142.	6.7	9.2	175.4	13.0	32.3	.000
197	24.5	1010.2	1.9	159.	6.3	9.8	166.2	15.0	31.2	.000
198	23.5	1007.9	3.3	155.	7.5	10.7	183.1	16.5	27.4	.000
199	19.9	1011.1	3.4	159.	8.4	10.4	165.3	13.7	26.8	.000
200	22.1	1013.9	2.1	149.	6.6	9.9	173.9	13.5	31.5	.000
201	24.8	1011.8	1.6	159.	5.3	10.1	176.1	15.7	33.4	.000
202	25.5	1008.5	1.9	154.	5.6	11.2	176.9	16.2	33.6	.000
203	25.6	1005.7	2.8	150.	6.9	12.1	180.3	16.2	31.3	.000
204	23.4	1008.5	3.0	144.	8.1	11.0	176.4	14.7	29.9	.000
205	25.2	1010.5	1.3	181.	4.6	10.6	174.7	15.4	34.5	.000
206	26.9	1009.4	1.5	158.	4.5	9.6	171.7	16.3	35.8	.000
207	27.0	1006.4	1.7	155.	5.0	10.8	164.8	18.8	34.3	.000
208	25.7	1005.0	3.0	143.	8.0	11.7	171.1	18.4	31.1	.000
209	23.1	1008.3	2.3	144.	7.8	9.8	165.8	14.2	31.6	.000
210	25.0	1008.7	1.5	162.	4.5	10.7	169.8	14.8	34.3	.000
211	25.9	1006.8	1.7	158.	6.1	10.7	168.0	14.8	35.3	.000
212	28.1	1005.7	1.9	134.	5.2	10.8	155.2	17.4	36.4	.000
213	28.2	1005.5	1.2	151.	3.8	12.5	154.6	18.1	38.8	.000

End hr	t2	t10	pres	ws	wd	rh2	rh10	kd	nr
1	30.5	29.8	1006.9	3.6	160.	39.3	38.5	514.2	275.5
2	30.2	29.6	1006.6	3.3	157.	42.8	41.7	326.2	143.4
3	29.1	28.9	1006.5	2.6	158.	47.9	46.4	140.6	11.6
4	26.9	27.1	1006.7	2.0	146.	56.5	53.6	16.9	-71.2
5	24.9	25.3	1007.1	2.2	111.	60.8	58.0	.0	-78.0
6	23.8	24.0	1007.6	2.9	110.	58.9	56.4	.0	-74.0
7	22.6	22.8	1007.7	2.9	116.	57.7	54.9	.0	-71.5
8	21.1	21.5	1008.0	2.4	127.	63.3	59.4	.0	-69.8
9	19.6	20.1	1008.1	2.2	139.	69.8	65.1	.0	-68.6
10	18.4	18.8	1008.3	2.1	142.	74.9	71.0	.0	-67.5
11	17.4	17.9	1008.5	1.9	151.	78.6	74.9	.0	-66.6
12	16.8	17.3	1008.7	1.5	140.	80.3	77.5	.0	-64.7
13	16.3	16.7	1009.0	1.5	110.	82.5	79.8	.7	-62.1
14	16.0	16.5	1009.3	1.2	114.	83.0	80.1	49.6	-23.6
15	17.8	17.6	1009.6	1.6	133.	75.6	75.6	207.6	84.9
16	19.9	19.4	1009.9	2.0	158.	66.4	67.4	395.9	214.2
17	21.9	21.2	1010.0	2.0	170.	59.7	61.1	591.7	351.0
18	23.9	23.0	1009.9	2.0	174.	54.4	56.0	760.2	467.8
19	25.7	24.9	1009.7	2.1	175.	49.8	51.5	878.2	547.7
20	27.4	26.4	1009.4	2.3	170.	46.3	47.8	951.8	594.4
21	28.6	27.5	1009.0	2.9	169.	43.8	45.1	983.3	604.4
22	29.5	28.4	1008.5	3.3	168.	42.3	43.1	949.4	584.8
23	30.2	29.2	1007.9	3.6	166.	40.3	40.4	849.1	512.5
24	30.7	29.8	1007.4	3.6	164.	38.6	38.2	702.3	409.4

Average for Jul 00

temp	ws	wd	nr	mr	prec
23.7	2.4	149.9	170.2	10.4	.000

Table 5.11 Climatological data for CCO during August 00

JD	temp	pres	ws	wd	gust	mr	nr	tmin	tmax	prec
214	28.6	1005.4	2.2	157.	8.3	14.3	152.8	19.4	37.4	.000
215	29.1	1004.5	2.2	159.	6.0	15.3	155.6	21.7	37.2	.000
216	28.1	1003.4	3.6	144.	8.2	12.0	159.8	19.2	34.4	.000
217	26.5	1006.9	4.0	147.	8.3	9.4	164.0	18.1	32.5	.000
218	27.3	1009.3	1.8	149.	5.4	11.4	160.1	18.0	35.2	.000
219	27.8	1006.3	2.1	146.	5.8	11.6	159.4	18.0	35.0	.000
220	24.8	1004.5	3.3	153.	7.9	12.0	151.8	17.4	29.2	.000
221	21.8	1007.3	2.5	148.	7.4	11.5	166.2	14.6	30.1	.000
222	23.5	1008.1	2.6	150.	6.4	10.5	159.8	14.5	30.8	.000
223	22.4	1008.5	3.6	144.	7.8	9.7	159.7	14.6	28.5	.000
224	23.3	1009.5	1.5	195.	5.8	9.5	155.1	14.0	34.2	.000
225	25.5	1007.2	1.5	158.	4.9	10.0	150.4	15.1	34.6	.000
226	25.9	1006.5	2.4	147.	8.0	8.5	148.2	13.6	33.7	.000
227	24.7	1005.5	1.6	170.	5.5	9.1	147.8	14.5	34.6	.000
228	25.6	1008.1	1.6	149.	5.1	8.7	143.9	14.9	35.2	.000
229	25.6	1009.4	1.3	292.	4.0	8.7	143.3	13.9	36.9	.000
230	25.9	1007.4	1.7	163.	5.9	9.2	142.4	14.4	33.7	.000
231	24.6	1007.5	2.0	137.	5.9	9.3	140.6	16.8	30.1	.000
232	22.4	1009.6	2.4	151.	7.4	9.5	138.1	15.1	28.8	.000
233	21.8	1011.3	1.8	144.	6.7	9.0	130.0	11.9	30.7	.000
234	21.9	1007.3	1.6	158.	5.9	9.1	122.7	12.1	30.5	.000
235	23.7	1005.4	1.8	158.	5.4	9.8	137.4	13.4	33.1	.000
236	23.3	1007.3	2.1	151.	6.3	9.7	126.2	15.7	30.9	.000
237	22.6	1012.0	2.1	141.	6.4	9.3	135.8	12.6	32.9	.000
238	24.1	1010.5	1.5	225.	4.7	8.0	133.0	13.0	34.7	.000
239	25.0	1006.5	1.9	141.	5.6	8.2	132.1	14.5	33.7	.000
240	24.3	1003.7	1.4	170.	4.9	9.0	136.2	13.4	34.1	.000
241	24.5	1003.9	1.4	166.	4.1	8.7	131.0	13.9	33.8	.000
242	21.7	1006.3	2.8	147.	7.1	10.2	28.2	16.8	25.9	.000
243	18.3	1008.1	2.3	163.	7.6	9.7	91.1	14.3	21.9	.000
244	19.0	1007.6	2.9	151.	7.5	10.1	111.8	16.0	24.6	.000

End hr	t2	t10	pres	ws	wd	rh2	rh10	kd	nr
1	32.0	31.4	1005.7	3.3	162.	36.0	34.6	447.7	227.4
2	31.4	31.0	1005.3	2.8	154.	39.2	37.6	251.8	89.6
3	29.6	29.7	1005.3	2.3	146.	47.4	43.9	72.9	-36.3
4	26.4	27.4	1005.5	1.8	132.	57.4	51.4	2.2	-73.5
5	24.9	25.8	1006.1	2.0	104.	58.3	52.8	.0	-67.6
6	24.0	24.7	1006.4	2.4	102.	54.6	49.3	.0	-63.5
7	22.9	23.6	1006.6	2.5	112.	55.8	50.0	.0	-61.2
8	21.4	22.4	1006.8	2.4	127.	61.3	53.9	.0	-59.7
9	20.1	21.2	1007.0	2.0	139.	66.3	58.3	.0	-58.3
10	18.7	19.7	1007.2	1.7	170.	72.1	64.8	.0	-57.0
11	18.1	18.9	1007.4	1.5	119.	73.8	68.1	.0	-55.5
12	17.5	18.3	1007.5	1.3	110.	75.8	71.2	.0	-54.7
13	16.7	17.6	1007.8	1.1	100.	79.1	73.3	.0	-53.5
14	16.3	17.1	1008.2	1.2	78.	79.9	75.0	13.7	-41.4
15	17.4	17.5	1008.7	1.4	121.	76.4	73.9	142.9	45.4
16	20.2	19.7	1009.0	1.8	148.	64.1	64.6	328.9	163.3
17	22.4	21.8	1009.1	1.9	175.	56.2	57.2	516.5	287.8
18	24.5	23.8	1009.1	2.0	177.	50.2	51.4	676.0	395.5
19	26.7	25.8	1008.9	2.2	174.	44.4	45.5	803.4	477.3
20	28.5	27.6	1008.4	2.3	178.	40.6	41.6	875.1	524.9
21	30.0	29.0	1008.0	2.5	182.	38.0	39.0	897.2	529.4
22	30.7	29.8	1007.5	3.0	174.	36.6	36.9	847.2	505.2
23	31.4	30.5	1006.8	3.4	167.	34.8	34.5	744.0	434.5
24	31.7	30.9	1006.2	3.5	165.	35.1	34.3	611.5	342.0

Average for Aug 00

temp	ws	wd	nr	mr	prec
24.3	2.2	150.2	139.2	10.0	.000

Table 5.12 Climatological data for CCO during September 00

JD	temp	pres	ws	wd	gust	mr	nr	tmin	tmax	prec
245	18.1	1006.4	7.3	141.	13.5	9.9	52.5	15.4	18.4	3.556
246	16.4	1010.5	4.9	139.	11.9	9.3	140.0	14.1	22.0	.000
247	17.3	1010.4	2.3	130.	7.7	8.1	134.5	10.9	23.9	.000
248	18.1	1010.9	2.5	142.	7.3	7.4	137.9	10.7	23.5	.000
249	17.6	1013.7	2.5	330.	9.8	7.0	145.1	8.6	26.8	.000
250	21.0	1012.0	4.2	325.	10.6	6.1	145.0	12.3	31.2	.000
251	22.1	1007.2	2.2	320.	8.9	6.8	134.7	11.2	32.1	.000
252	21.1	1003.3	1.5	193.	6.1	8.0	125.8	10.7	30.1	.000
253	22.8	1002.5	2.0	136.	5.4	8.0	128.0	12.4	29.9	.000
254	21.2	1005.3	1.2	200.	4.4	8.5	128.0	11.2	31.7	.000
255	22.5	1007.7	1.1	265.	3.9	8.7	126.8	12.0	34.3	.000
256	23.0	1008.1	1.5	334.	4.3	8.2	109.7	12.1	35.3	.000
257	24.4	1005.4	2.0	357.	6.6	9.1	48.2	17.2	32.6	.000
258	24.4	1005.6	4.7	143.	11.1	11.3	100.0	19.3	29.0	.000
259	22.4	1010.4	3.2	146.	6.8	11.1	132.4	15.7	28.3	.000
260	22.0	1009.4	1.5	127.	4.7	9.3	121.6	13.7	31.9	.000
261	24.3	1007.1	2.9	330.	9.5	9.2	129.9	15.3	36.2	.000
262	28.0	1006.0	2.6	332.	6.7	8.4	124.4	19.3	39.5	.000
263	28.6	1004.3	2.7	331.	7.5	9.3	122.9	20.0	39.3	.000
264	28.4	999.3	2.3	326.	5.1	9.6	112.4	20.3	36.7	.000
265	23.7	996.2	5.1	142.	10.7	11.0	115.5	16.5	29.1	.000
266	19.5	998.7	5.2	139.	11.5	10.0	55.8	16.9	22.7	.000
267	17.4	1006.7	2.5	329.	7.6	7.0	124.1	9.8	27.1	.000
268	16.9	1011.3	1.1	264.	4.1	5.7	106.3	6.2	29.2	.000
269	20.1	1011.2	1.6	350.	4.7	6.3	107.9	10.1	33.2	.000
270	20.7	1009.1	1.6	325.	5.4	7.1	106.6	9.9	33.0	.000
271	21.0	1009.1	1.6	161.	6.4	7.9	103.6	11.5	29.7	.000
272	19.6	1011.6	2.8	142.	10.0	9.0	102.7	11.5	26.2	.000
273	20.8	1009.1	2.5	334.	10.7	8.3	110.8	10.2	34.9	.000
274	25.2	1005.0	2.1	341.	8.6	8.0	100.3	13.4	36.9	.000

End hr	t2	t10	pres	ws	wd	rh2	rh10	kd	nr
1	28.9	28.6	1005.7	3.3	174.	35.9	34.0	290.1	135.0
2	27.5	27.8	1005.5	2.9	159.	41.4	36.9	111.4	4.8
3	24.6	25.8	1005.5	2.5	150.	50.2	42.8	7.5	-56.2
4	22.8	23.9	1005.8	2.4	95.	54.8	48.3	.0	-55.6
5	21.3	22.3	1006.2	2.6	90.	57.2	51.4	.0	-52.8
6	19.8	21.0	1006.4	2.3	104.	62.0	54.9	.0	-50.5
7	18.8	20.0	1006.7	2.4	115.	65.6	58.4	.0	-48.2
8	17.8	18.9	1006.9	2.6	118.	69.7	62.4	.0	-46.6
9	17.0	17.8	1007.1	2.6	113.	71.6	65.8	.0	-45.5
10	16.6	17.2	1007.3	2.6	101.	72.0	67.7	.0	-45.2
11	15.9	16.6	1007.4	2.3	83.	73.2	69.1	.0	-45.4
12	15.1	16.0	1007.4	2.2	74.	76.3	71.6	.0	-45.0
13	14.7	15.4	1007.6	2.1	75.	77.8	74.0	.0	-43.1
14	14.4	15.1	1007.9	2.2	60.	78.9	75.3	1.3	-40.3
15	14.7	15.1	1008.3	2.2	72.	77.7	74.9	68.2	8.3
16	17.4	17.2	1008.6	2.4	80.	68.0	67.7	234.5	114.6
17	20.2	19.8	1008.7	2.7	163.	58.4	58.8	406.5	236.8
18	22.8	22.2	1008.7	2.9	219.	50.1	50.8	556.9	345.1
19	25.0	24.3	1008.5	3.0	272.	43.5	44.3	678.1	426.7
20	26.8	26.0	1008.1	3.0	264.	39.0	39.7	745.0	472.3
21	28.2	27.4	1007.5	3.2	223.	35.8	36.3	780.1	486.6
22	29.2	28.4	1006.9	3.5	196.	33.6	33.8	742.6	460.3
23	29.6	29.0	1006.4	3.6	192.	32.2	31.9	619.5	372.2
24	29.7	29.2	1005.9	3.4	195.	32.6	31.8	462.4	258.5

Average for Sep 00

temp	ws	wd	nr	mr	prec
21.6	2.7	148.1	114.4	8.5	3.556

5.4 Fresno Surface Climatology

The Fresno (FAT) site recorded the highest mean temperatures of any of the ETL CCOS sites. Daytime maximums averaged 34 ^{o}C with nighttime minimums averaging 19 ^{o} C. An interesting feature of this site compared to the others was the absence of a nighttime inversion between the 2 and 10-m levels of the meteorological tower. The temperature structure tended toward isothermal during the coldest time of the night. The region surrounding the tower was dominated by concrete and asphalt. The resulting daytime heat storage and release during the nighttime hours effectively canceled any near-surface cooling. Winds were generally west-northwest becoming more southerly during the late morning/early afternoon hours. Wind speeds averaged 2.6 m s^{-1} with the highest speeds during the late evening hours.

Table 5.13 Climatological data for FAT during June 00

JD	temp	pres	ws	wd	gust	mr	nr	tmin	tmax	prec
153	23.5	999.4	1.9	294.	7.1	4.8	149.9	13.8	33.3	.000
154	26.1	1001.9	2.2	299.	6.2	5.5	149.0	16.5	35.3	.000
155	25.7	1004.5	3.2	305.	8.4	6.3	138.0	16.5	34.9	.000
156	27.4	1003.6	2.6	285.	7.1	6.7	136.9	17.6	37.1	.000
157	23.6	1003.7	3.8	301.	10.3	5.9	136.4	13.5	29.0	.000
158	23.8	1003.6	2.7	306.	7.7	7.2	138.5	15.8	32.2	.000
159	24.5	1001.3	2.9	294.	8.4	6.3	132.7	17.4	30.8	.000
160	18.3	1000.4	3.8	303.	13.1	8.4	64.1	12.9	19.2	17.272
161	17.2	1003.4	3.1	305.	8.0	8.1	172.1	12.2	24.1	.000
162	19.4	1002.9	4.1	303.	10.4	7.6	161.1	12.8	26.4	.000
163	21.3	1003.0	3.1	305.	8.2	6.6	153.2	13.4	29.4	.000
164	23.9	1004.3	3.1	306.	9.2	7.7	97.3	17.6	30.8	.000
165	26.9	1001.6	2.7	295.	7.5	10.7	158.6	19.8	35.6	.000
166	30.8	999.9	1.7	279.	5.9	12.5	159.8	22.2	40.1	.000
167	33.2	998.1	2.1	300.	8.2	11.7	157.7	24.4	40.7	.000
168	32.1	992.6	2.7	297.	8.8	10.0	153.5	23.6	38.2	.000
169	30.2	991.2	2.5	293.	7.3	9.9	150.9	22.7	37.2	.000
170	26.3	996.3	4.0	304.	10.9	9.5	152.5	19.0	32.3	.000
171	25.2	998.9	3.3	302.	8.8	9.7	151.4	17.7	32.7	.000
172	28.9	998.6	2.2	305.	6.9	10.5	151.0	22.3	36.7	.000
173	30.9	997.9	2.4	297.	6.6	9.9	149.8	22.7	38.5	.000
174	31.5	996.5	2.9	300.	7.9	7.8	145.2	22.6	39.3	.000
175	29.1	997.6	2.9	297.	8.1	8.3	135.8	19.5	36.9	.000
176	28.0	1001.2	2.5	299.	7.7	9.5	139.4	19.1	35.8	.000
177	28.2	1002.3	2.8	299.	8.8	9.4	144.6	20.2	36.9	.000
178	29.7	1000.4	2.5	303.	7.3	8.7	144.7	21.9	37.4	.000
179	31.7	998.5	2.6	302.	7.5	9.4	145.1	24.1	39.3	.000
180	32.4	998.7	2.8	301.	8.2	8.2	145.3	24.5	39.5	.000
181	31.4	998.6	2.5	296.	7.9	8.9	145.3	23.5	38.4	.000
182	29.4	998.3	2.7	299.	7.9	8.7	142.8	20.9	37.6	.000

End hr	t2	t10	pres	ws	wd	rh2	rh10	kd	nr
1	34.1	33.4	998.6	3.0	299.	22.0	22.7	493.7	208.0
2	33.8	33.3	998.2	3.3	297.	22.0	22.5	300.2	88.1
3	32.6	32.3	998.3	3.8	297.	23.7	24.0	108.4	-24.3
4	30.7	30.7	998.5	3.4	294.	27.8	27.9	5.4	-85.2
5	28.9	28.9	998.9	3.6	298.	32.3	32.3	.0	-83.3
6	27.3	27.3	999.5	4.0	306.	38.3	38.3	.0	-80.6
7	25.6	25.6	999.6	4.0	304.	43.2	43.1	.0	-77.3
8	24.3	24.3	999.7	3.7	306.	47.2	47.2	.0	-74.4
9	23.1	23.1	999.8	3.5	309.	50.1	50.2	.0	-72.1
10	22.0	22.0	999.7	3.0	310.	53.2	53.3	.0	-72.3
11	21.0	21.0	999.8	2.7	310.	57.1	57.1	.0	-71.1
12	20.2	20.2	999.9	2.3	313.	60.5	60.5	.0	-69.9
13	19.5	19.5	1000.3	2.1	315.	63.2	63.2	2.3	-66.7
14	19.5	19.3	1000.7	1.8	321.	63.6	63.9	81.5	-11.8
15	20.9	20.6	1001.1	1.9	323.	58.9	59.8	259.0	98.4
16	22.9	22.4	1001.5	2.2	338.	54.0	55.2	461.9	222.6
17	24.7	24.2	1001.7	2.4	158.	48.9	50.3	648.5	340.8
18	26.6	26.0	1001.6	2.2	205.	43.6	45.0	797.1	431.9
19	28.5	27.9	1001.5	2.0	243.	38.1	39.3	906.9	495.5
20	30.1	29.5	1001.2	2.0	263.	33.2	34.2	962.0	527.6
21	31.7	31.0	1000.7	2.2	282.	28.9	29.8	971.2	535.2
22	32.9	32.2	1000.0	2.4	284.	25.8	26.5	939.5	502.3
23	33.7	33.0	999.4	2.6	292.	23.5	24.2	853.5	447.3
24	34.2	33.4	999.0	2.9	299.	22.3	23.1	681.2	331.9

Average for Jun 00

temp	ws	wd	nr	mr	prec
27.0	2.8	252.1	143.5	8.5	17.272

Table 5.14 Climatological data for FAT during July 00

JD	temp	pres	ws	wd	gust	mr	nr	tmin	tmax	prec
183	26.7	1000.0	3.3	304.	9.2	6.1	140.0	16.9	33.7	.000
184	26.1	1000.6	3.4	304.	8.3	6.0	142.9	18.0	32.9	.000
185	22.3	1001.4	3.5	308.	9.8	6.7	142.9	14.1	29.6	.000
186	21.6	1002.4	2.8	303.	8.9	7.2	141.4	13.7	29.9	.000
187	23.1	1001.0	3.3	307.	8.2	6.9	144.9	15.4	29.5	.000
188	22.4	1001.1	3.4	307.	10.0	8.2	148.5	15.0	30.2	.000
189	22.9	1000.9	3.3	307.	8.5	7.7	145.7	15.5	29.7	.000
190	22.8	1002.2	3.2	306.	9.2	8.0	145.6	15.2	30.7	.000
191	25.5	1000.9	2.8	312.	7.9	8.2	145.0	17.6	33.6	.000
192	26.9	999.4	2.9	304.	8.0	8.1	145.8	19.3	34.2	.000
193	27.4	999.9	2.7	299.	7.5	9.0	141.7	19.0	36.0	.000
194	27.2	1001.3	2.7	293.	7.7	8.6	145.5	18.8	34.9	.000
195	25.8	1004.4	2.8	302.	8.0	9.1	142.9	17.9	33.8	.000
196	26.5	1005.4	2.8	300.	7.3	8.9	142.8	17.9	35.8	.000
197	29.1	1003.3	2.4	303.	6.0	7.9	143.3	21.5	36.5	.000
198	27.0	1001.3	3.2	305.	8.7	7.3	135.9	20.2	33.2	.000
199	23.7	1004.0	3.7	312.	8.5	8.2	145.4	15.7	32.1	.000
200	24.8	1006.4	3.0	306.	7.8	8.9	144.5	16.6	34.0	.000
201	27.4	1004.8	2.7	302.	8.2	7.5	142.1	18.2	36.2	.000
202	28.2	1001.7	2.5	299.	7.6	8.3	140.4	19.3	36.6	.000
203	29.6	999.4	2.4	302.	8.7	9.5	142.0	20.8	37.9	.000
204	27.4	1001.6	3.3	308.	10.7	8.2	139.6	17.8	36.2	.000
205	28.7	1003.4	2.6	303.	7.6	8.1	139.3	20.0	37.5	.000
206	30.5	1002.4	2.1	303.	6.5	8.7	140.3	21.2	39.2	.000
207	30.3	999.8	2.2	298.	6.9	7.5	134.3	20.9	37.8	.000
208	28.7	999.0	3.2	310.	9.3	7.2	139.9	19.7	35.8	.000
209	25.4	1001.5	3.6	312.	9.4	6.7	138.1	16.5	34.3	.000
210	28.0	1001.8	2.1	307.	6.4	8.6	132.4	19.4	37.1	.000
211	29.4	1000.2	2.1	298.	6.9	9.0	131.4	20.1	38.1	.000
212	31.4	998.9	2.4	304.	6.5	9.3	132.4	23.4	39.5	.000
213	31.3	998.6	2.4	301.	7.1	10.3	102.4	23.1	38.1	.000

End hr	t2	t10	pres	ws	wd	rh2	rh10	kd	nr
1	34.3	33.6	1000.1	3.4	303.	20.3	21.2	493.8	221.3
2	33.8	33.2	999.8	3.8	306.	21.1	21.9	285.4	93.2
3	32.5	32.2	999.9	4.0	304.	23.5	24.0	96.1	-20.4
4	30.5	30.4	1000.2	3.7	304.	27.9	28.1	3.8	-83.1
5	28.6	28.6	1000.7	3.9	305.	32.3	32.4	.0	-80.8
6	26.9	26.9	1001.2	4.3	308.	38.1	38.3	.0	-76.0
7	25.2	25.2	1001.4	4.0	305.	42.8	42.9	.0	-73.0
8	23.7	23.7	1001.5	3.9	307.	46.1	46.3	.0	-71.1
9	22.5	22.4	1001.4	3.8	311.	49.7	50.0	.0	-69.8
10	21.3	21.2	1001.4	3.3	314.	53.7	54.0	.0	-68.6
11	20.3	20.2	1001.4	2.9	315.	56.6	56.8	.0	-66.8
12	19.4	19.4	1001.5	2.6	317.	59.8	60.1	.0	-65.7
13	18.8	18.8	1001.8	2.2	322.	62.6	62.8	.7	-63.9
14	18.6	18.5	1002.3	1.9	323.	63.6	64.0	50.9	-24.9
15	19.7	19.4	1002.7	1.8	325.	59.2	60.2	209.4	80.4
16	22.1	21.6	1003.1	1.5	323.	52.2	53.6	413.3	198.2
17	24.5	23.9	1003.3	1.7	208.	46.1	47.7	617.0	316.4
18	26.5	25.9	1003.2	1.9	197.	40.6	42.3	790.0	414.2
19	28.5	27.9	1003.0	1.7	249.	34.8	36.3	919.9	485.0
20	30.4	29.7	1002.7	1.9	270.	29.5	30.7	988.4	523.2
21	32.0	31.2	1002.2	2.3	279.	26.0	27.2	984.3	527.9
22	33.0	32.2	1001.7	2.6	288.	24.0	25.0	938.4	494.0
23	33.7	32.9	1001.1	2.9	300.	22.2	23.2	825.9	432.4
24	34.3	33.5	1000.6	3.0	297.	20.9	21.9	673.7	337.1

Average for Jul 00

temp	ws	wd	nr	mr	prec
26.7	2.9	303.3	140.0	8.1	.000

Table 5.15 Climatological data for FAT during August 00

JD	temp	pres	ws	wd	gust	mr	nr	tmin	tmax	prec
214	33.0	999.0	2.4	274.	8.3	11.4	129.0	25.2	40.8	.000
215	32.7	998.3	2.1	284.	6.1	11.6	109.2	25.3	41.0	.000
216	32.5	997.5	2.3	265.	7.6	10.8	125.9	24.4	39.5	.000
217	31.3	1000.2	2.0	272.	6.9	11.4	133.2	23.3	38.3	.000
218	30.5	1002.2	3.2	303.	8.4	9.7	137.8	23.2	38.3	.000
219	30.2	999.9	2.9	306.	8.5	7.3	134.4	21.1	37.8	.000
220	29.3	998.4	2.7	300.	7.9	7.7	130.4	20.3	36.1	.000
221	27.0	1000.4	2.7	299.	7.4	8.9	131.2	18.5	36.0	.000
222	27.7	1001.4	2.1	285.	7.1	8.4	128.7	19.4	35.7	.000
223	26.1	1001.6	3.0	307.	8.6	8.4	130.6	17.4	33.4	.000
224	25.8	1002.2	2.7	304.	8.6	8.1	129.1	17.5	35.0	.000
225	28.4	1000.9	1.8	281.	6.1	8.5	130.2	18.8	37.6	.000
226	29.6	999.9	2.4	302.	9.9	6.5	128.6	19.5	37.8	.000
227	28.7	998.8	2.4	303.	8.9	6.8	123.9	19.1	37.9	.000
228	30.0	1001.2	2.2	300.	7.4	7.1	124.5	19.9	38.3	.000
229	29.5	1002.4	2.0	304.	6.5	7.7	122.7	19.9	38.7	.000
230	30.0	1001.0	2.0	283.	6.6	8.0	123.5	19.9	39.0	.000
231	28.5	1001.3	2.5	303.	6.6	5.9	122.0	20.1	35.8	.000
232	25.9	1003.2	2.9	308.	9.1	6.0	122.2	16.7	33.7	.000
233	24.8	1004.4	2.9	304.	7.9	5.5	123.8	16.5	32.5	.000
234	25.5	1000.9	1.8	295.	5.4	6.7	120.5	16.5	34.3	.000
235	27.2	998.8	1.7	274.	5.1	7.2	120.8	18.1	36.8	.000
236	26.9	1000.7	1.9	285.	5.7	8.6	118.3	18.4	34.9	.000
237	25.8	1004.5	2.8	305.	8.0	8.9	119.3	16.5	35.2	.000
238	28.0	1003.4	1.9	277.	6.3	9.1	118.0	19.7	36.8	.000
239	29.4	999.9	2.1	290.	6.3	7.7	118.6	21.2	37.4	.000
240	28.7	996.7	2.4	299.	7.7	8.1	118.8	20.6	36.8	.000
241	28.6	997.3	2.2	305.	7.4	8.0	103.0	20.2	35.8	.000
242	26.7	999.8	2.7	305.	7.8	7.8	57.2	22.2	28.8	.000
243	22.1	1001.0	2.5	304.	7.7	9.3	117.6	16.8	28.2	.000
244	21.5	1001.4	2.7	303.	7.7	9.1	105.8	15.9	27.6	.000

End hr	t2	t10	pres	ws	wd	rh2	rh10	kd	nr
1	36.0	35.3	999.0	3.0	299.	17.7	18.5	398.6	171.8
2	35.3	34.9	998.7	3.3	302.	18.6	19.2	198.8	52.6
3	33.8	33.7	998.8	3.2	301.	21.7	22.0	39.7	-43.9
4	31.6	31.7	999.2	3.0	300.	26.9	26.9	.5	-69.6
5	29.9	29.9	999.8	3.4	307.	32.0	32.0	.0	-65.3
6	28.3	28.3	1000.1	3.4	306.	36.0	36.1	.0	-62.5
7	26.7	26.8	1000.3	3.1	302.	40.0	40.0	.0	-60.7
8	25.3	25.3	1000.5	2.9	306.	44.4	44.5	.0	-59.2
9	24.0	24.0	1000.6	2.7	313.	48.3	48.4	.0	-57.8
10	22.9	22.8	1000.6	2.4	312.	51.6	51.7	.0	-56.5
11	21.9	21.9	1000.6	2.0	314.	54.4	54.6	.0	-55.2
12	21.2	21.2	1000.6	1.8	326.	56.9	57.0	.0	-54.4
13	20.5	20.5	1000.8	1.6	326.	59.4	59.4	.0	-53.3
14	20.1	20.1	1001.3	1.6	327.	60.8	60.9	15.9	-39.5
15	20.8	20.6	1001.8	1.4	322.	58.4	59.2	144.4	51.2
16	23.2	22.8	1002.2	1.2	102.	51.2	52.4	335.9	159.9
17	25.6	25.1	1002.3	1.7	144.	44.3	45.9	530.6	270.0
18	27.7	27.1	1002.4	1.8	168.	38.8	40.4	699.5	361.2
19	29.8	29.1	1002.2	1.8	214.	33.7	35.2	833.5	430.0
20	31.7	31.0	1001.7	1.9	251.	28.1	29.4	905.4	469.9
21	33.4	32.6	1001.1	2.2	268.	23.8	24.9	917.6	482.7
22	34.6	33.8	1000.6	2.4	279.	21.0	22.0	870.6	452.5
23	35.2	34.5	1000.0	2.6	283.	19.7	20.5	752.6	391.5
24	35.6	34.8	999.4	2.8	294.	18.7	19.6	594.7	294.9

Average for Aug 00

temp	ws	wd	nr	mr	prec
28.1	2.4	302.2	121.3	8.3	.000

Table 5.16 Climatological data for FAT during September 00

JD	temp	pres	ws	wd	gust	mr	nr	tmin	tmax	prec
245	20.6	1002.0	3.0	321.	8.9	9.3	121.9	15.5	25.0	6.604
246	20.5	1004.3	2.9	304.	9.5	9.1	112.2	17.1	25.3	.000
247	20.7	1003.5	3.2	308.	7.6	7.5	139.8	16.0	27.1	.000
248	20.3	1004.0	4.2	313.	9.2	6.6	133.7	13.9	26.3	.000
249	19.7	1005.6	3.5	308.	9.2	6.5	129.9	12.7	27.6	.000
250	21.1	1003.9	2.3	282.	8.4	5.8	125.1	12.5	30.1	.000
251	23.9	1000.6	1.4	312.	5.4	6.3	123.2	14.6	34.1	.000
252	25.2	996.9	1.7	279.	5.8	6.8	119.2	15.2	35.3	.000
253	25.7	995.9	2.2	302.	6.5	6.1	116.4	16.9	34.5	.000
254	25.3	998.3	1.9	295.	7.3	6.7	116.5	16.4	34.8	.000
255	26.0	1000.8	1.7	299.	5.0	7.1	115.3	16.8	35.5	.000
256	25.9	1001.2	1.2	86.	4.3	6.8	52.5	17.2	31.7	.000
257	26.5	998.5	1.4	184.	4.1	9.4	101.7	18.7	37.7	.000
258	28.6	999.4	3.6	314.	9.4	8.4	122.2	22.1	32.9	.000
259	25.0	1003.5	4.0	310.	10.2	10.6	120.0	19.2	31.2	.000
260	24.4	1002.2	3.0	310.	8.7	8.5	115.1	16.8	32.8	.000
261	25.7	1000.2	1.5	282.	5.6	9.5	112.1	17.3	34.7	.000
262	27.6	999.5	1.4	327.	5.2	9.8	111.1	18.4	37.8	.000
263	28.8	998.2	1.7	290.	5.4	9.1	108.8	19.5	38.4	.000
264	29.6	993.4	1.6	160.	5.5	9.4	107.5	20.4	38.7	.000
265	26.7	991.0	1.9	298.	6.0	9.1	101.7	19.1	29.7	.000
266	21.4	993.1	2.5	278.	7.7	9.4	48.9	17.9	24.2	.000
267	20.2	999.0	2.2	309.	6.8	8.9	101.8	14.6	27.1	.000
268	22.4	1004.2	1.4	300.	5.1	7.8	102.0	15.5	30.5	.000
269	24.1	1003.8	1.6	265.	4.7	7.5	101.8	15.4	32.8	.000
270	24.6	1001.8	.9	295.	4.8	6.7	95.4	16.9	33.4	.000
271	24.6	1002.3	1.9	298.	5.7	7.9	94.8	16.2	31.8	.000
272	21.3	1004.7	4.0	313.	8.0	8.4	99.4	15.2	25.9	.000
273	20.0	1002.7	2.4	306.	7.1	8.2	92.6	13.5	28.1	.000
274	23.1	999.3	1.3	97.	4.5	8.6	93.8	16.0	32.0	.000

End hr	t2	t10	pres	ws	wd	rh2	rh10	kd	nr
1	31.0	30.4	998.8	2.7	305.	25.6	26.6	263.7	110.2
2	30.1	29.9	998.7	3.0	303.	27.3	27.8	79.0	-7.0
3	28.3	28.3	998.9	2.6	301.	31.6	31.6	2.6	-60.2
4	26.5	26.6	999.4	2.7	307.	36.7	36.5	.0	-57.9
5	25.0	25.1	999.8	2.9	311.	40.6	40.3	.0	-55.0
6	23.6	23.7	1000.0	2.7	309.	44.8	44.4	.0	-53.3
7	22.2	22.4	1000.2	2.5	310.	49.7	49.2	.0	-51.3
8	21.1	21.2	1000.3	2.4	311.	54.1	53.7	.0	-50.2
9	20.0	20.1	1000.4	2.3	314.	58.3	58.0	.0	-49.3
10	19.2	19.2	1000.5	2.2	316.	61.7	61.4	.0	-47.1
11	18.5	18.6	1000.5	2.0	323.	64.2	63.9	.0	-45.6
12	17.9	18.0	1000.5	1.9	331.	66.8	66.6	.0	-45.0
13	17.3	17.4	1000.7	1.7	331.	69.5	69.2	.0	-44.6
14	16.9	16.9	1001.0	1.7	320.	71.1	70.9	2.2	-42.3
15	17.3	17.2	1001.5	1.7	319.	69.5	69.8	81.7	16.9
16	19.3	19.0	1001.9	1.9	357.	62.0	63.2	258.4	131.7
17	21.8	21.3	1002.1	2.2	98.	53.6	55.2	459.9	258.1
18	24.1	23.5	1002.2	2.2	175.	45.9	47.5	635.6	365.8
19	26.0	25.4	1002.0	2.0	215.	40.1	41.7	742.3	426.4
20	27.7	27.1	1001.5	1.9	252.	35.3	36.8	791.2	452.7
21	29.2	28.5	1000.9	2.0	284.	31.4	32.7	786.0	448.3
22	30.3	29.6	1000.2	2.2	299.	28.3	29.6	755.5	420.7
23	30.9	30.3	999.6	2.4	305.	26.5	27.5	618.4	338.3
24	31.2	30.6	999.1	2.5	311.	25.4	26.3	448.5	228.8

Average for Sep 00

temp	ws	wd	nr	mr	prec
24.0	2.3	303.0	107.9	8.1	6.604

5.5 New Melones Lake Surface Climatology

The site, located in the Sierra Nevada foothills along the southwest to northeast oriented Stanislaus River at an elevation of 320 m ASL, recorded temperatures quite similar to those found at the Central Valley sites. Maximum daytime temperatures averaged 32 ^{o}C with nighttime minimums averaging 18 ^{o}C. Mean wind speeds were low, averaging 1.6 m s^{-1}, in part due to the sheltering effects of the surrounding terrain. Thermally forced circulations dominated the wind field with southwest up-valley flows during the late morning to early evening rapidly transitioning to a northeast down-valley flows during the evening and morning hours. Maximum wind speeds occurred in the mid afternoon during the time of maximum solar forcing.

Table 5.17 Climatological data for NML during June 00

JD	temp	pres	ws	wd	gust	mr	nr	tmin	tmax	prec
153	21.3	971.9	1.9	10.	6.0	5.1	173.4	14.3	30.6	.000
154	23.5	974.8	2.0	56.	7.0	4.9	170.5	16.1	32.2	.000
155	23.8	977.4	1.4	305.	5.2	6.1	174.6	14.6	32.5	.000
156	25.3	976.3	1.7	314.	5.8	6.6	174.3	17.9	34.8	.000
157	19.9	976.2	1.5	292.	6.7	5.5	173.0	9.8	27.4	.000
158	21.0	976.0	1.5	308.	5.4	6.9	174.4	13.4	29.7	.000
159	20.6	974.0	1.4	259.	7.2	6.2	157.1	12.4	26.2	.000
160	15.1	972.5	1.5	283.	6.7	8.2	89.7	11.1	19.3	10.160
161	15.4	975.0	1.4	255.	4.9	7.3	191.2	9.4	23.5	.000
162	16.9	975.3	1.7	294.	5.6	7.0	185.5	10.5	24.8	.000
163	19.4	975.2	1.3	337.	5.6	5.8	170.8	12.0	28.4	.000
164	22.6	976.8	1.5	356.	7.4	7.8	139.5	16.0	31.3	.000
165	25.1	974.3	1.8	332.	9.1	9.4	185.9	17.6	34.8	.000
166	28.6	973.0	1.3	265.	6.1	9.1	182.0	18.2	41.3	.000
167	31.7	971.6	2.2	66.	7.2	9.0	180.8	24.6	39.5	.000
168	29.8	965.8	1.7	359.	6.6	9.0	182.8	22.4	37.7	.000
169	27.7	964.4	1.3	271.	5.7	9.1	183.7	18.6	35.4	.000
170	23.1	969.2	1.5	266.	6.1	9.2	179.2	15.4	30.9	.000
171	22.9	971.5	1.4	280.	6.0	9.4	184.3	15.4	32.5	.000
172	26.6	971.5	1.6	337.	7.2	9.0	182.8	18.9	36.6	.000
173	29.0	971.2	1.9	43.	6.5	8.7	176.0	21.2	38.4	.000
174	28.8	969.9	1.9	38.	6.1	7.3	177.3	21.2	37.0	.000
175	27.1	970.6	1.7	273.	5.9	7.0	177.3	18.7	35.3	.000
176	26.6	974.1	1.3	271.	6.3	7.9	181.9	18.3	34.6	.000
177	26.4	975.3	1.4	296.	6.3	8.3	178.3	18.4	35.1	.000
178	28.0	973.5	1.8	36.	6.2	7.2	171.7	20.8	36.2	.000
179	29.1	971.7	1.9	34.	5.9	8.9	147.7	22.6	37.7	.000
180	29.8	972.0	1.3	298.	5.7	9.2	170.1	22.4	38.1	.000
181	29.5	971.8	1.6	2.	7.5	8.0	172.3	22.6	36.4	.000
182	26.8	971.3	1.3	249.	6.1	8.3	175.3	19.4	33.8	.000

End hr	t2	t10	pres	ws	wd	rh2	rh10	kd	nr
1	31.8	-99.9	971.9	2.0	283.	20.8	-99.9	509.7	268.3
2	30.8	-99.9	971.7	1.9	309.	23.3	-99.9	307.1	136.0
3	28.9	-99.9	971.8	1.6	334.	28.0	-99.9	104.8	8.7
4	26.0	-99.9	972.0	1.0	6.	35.5	-99.9	7.1	-52.2
5	23.8	-99.9	972.5	1.0	32.	42.0	-99.9	.0	-52.6
6	22.3	-99.9	972.9	1.0	43.	48.5	-99.9	.0	-52.2
7	21.1	-99.9	972.9	1.0	57.	53.9	-99.9	.0	-50.2
8	20.2	-99.9	972.9	1.0	54.	57.8	-99.9	.0	-49.1
9	19.3	-99.9	972.8	1.1	66.	62.0	-99.9	.0	-49.6
10	18.6	-99.9	972.7	1.3	64.	64.5	-99.9	.0	-50.3
11	18.1	-99.9	972.6	1.3	63.	65.7	-99.9	.0	-49.3
12	17.8	-99.9	972.6	1.5	68.	66.3	-99.9	.0	-49.3
13	17.6	-99.9	972.7	1.5	67.	66.1	-99.9	2.1	-48.0
14	17.7	-99.9	973.1	1.6	68.	64.1	-99.9	23.8	-24.9
15	19.9	-99.9	973.3	1.4	71.	55.5	-99.9	246.4	105.6
16	22.4	-99.9	973.6	1.4	43.	47.5	-99.9	457.4	237.5
17	24.7	-99.9	973.7	1.3	279.	41.4	-99.9	641.7	359.1
18	26.4	-99.9	973.7	2.0	261.	36.5	-99.9	786.6	458.2
19	28.2	-99.9	973.7	2.2	260.	32.0	-99.9	909.3	537.1
20	29.8	-99.9	973.5	2.2	259.	27.9	-99.9	970.8	571.9
21	30.8	-99.9	973.3	2.3	255.	24.8	-99.9	981.5	581.7
22	31.7	-99.9	972.9	2.3	255.	22.4	-99.9	935.0	542.2
23	32.2	-99.9	972.6	2.2	257.	20.4	-99.9	836.0	482.6
24	32.5	-99.9	972.2	2.0	264.	19.6	-99.9	695.2	390.7

Average for Jun 00

temp	ws	wd	nr	mr	prec
24.7	1.6	317.8	172.2	7.7	10.160

Table 5.18 Climatological data for NML during July 00

JD	temp	pres	ws	wd	gust	mr	nr	tmin	tmax	prec
183	24.2	972.8	1.7	274.	5.9	5.4	170.8	16.4	31.0	.000
184	23.0	973.4	1.7	279.	5.6	6.3	169.9	15.8	28.9	.000
185	20.3	973.5	1.6	257.	6.4	6.9	173.6	12.0	27.2	.000
186	20.8	974.4	1.4	270.	5.8	6.8	171.7	12.9	28.4	.000
187	20.5	973.5	1.5	259.	5.5	6.7	168.9	12.0	26.4	.000
188	19.7	973.6	1.5	287.	6.5	7.6	175.5	11.5	27.9	.000
189	19.9	973.6	1.5	288.	5.6	7.0	166.8	12.2	27.2	.000
190	20.4	974.6	1.5	273.	6.1	7.3	171.1	12.6	29.1	.000
191	23.5	973.6	1.6	288.	5.9	6.8	171.3	16.3	32.3	.000
192	25.8	972.3	1.6	247.	7.3	6.9	178.8	18.3	32.4	.000
193	26.2	973.0	1.6	9.	6.6	6.9	169.1	18.0	34.2	.000
194	25.7	974.0	1.7	285.	6.1	7.7	169.4	18.0	32.7	.000
195	23.9	977.0	1.6	265.	5.4	8.2	166.5	15.1	31.4	.000
196	25.1	978.1	1.5	291.	5.3	7.3	164.6	16.7	34.4	.000
197	26.7	976.3	1.5	267.	5.5	6.3	164.9	18.8	34.2	.000
198	25.1	974.1	1.3	262.	6.3	5.9	148.2	19.4	31.6	.000
199	20.7	976.5	1.5	289.	5.8	7.7	162.2	12.8	30.1	.000
200	23.3	978.9	1.4	259.	5.2	7.6	164.7	14.9	33.4	.000
201	26.3	977.8	1.5	312.	5.7	5.7	162.4	17.1	35.5	.000
202	27.2	974.7	1.5	301.	5.8	6.2	161.6	17.1	36.4	.000
203	28.0	972.5	1.9	345.	5.9	6.7	160.5	20.9	35.6	.000
204	25.7	974.8	1.3	256.	5.5	6.6	158.9	16.9	34.8	.000
205	27.3	976.5	1.7	321.	5.2	5.9	158.4	19.0	36.8	.000
206	29.3	975.7	2.0	50.	6.5	5.1	152.1	22.0	37.8	.000
207	28.6	973.0	2.1	22.	6.6	5.5	156.1	21.5	36.0	.000
208	26.1	972.1	1.4	263.	7.2	7.2	161.1	16.6	32.8	.000
209	23.8	974.2	1.2	263.	5.7	6.4	156.4	14.9	33.7	.000
210	27.0	974.7	2.0	3.	6.7	6.0	155.8	20.3	36.3	.000
211	28.5	973.3	1.7	2.	5.4	5.9	149.9	20.4	37.7	.000
212	29.9	972.4	1.4	248.	6.2	6.4	147.7	21.9	38.7	.000
213	30.6	972.0	1.6	29.	6.3	6.6	137.2	22.5	40.0	.000

End hr	t2	t10	pres	ws	wd	rh2	rh10	kd	nr
1	32.0	-99.9	973.5	2.3	261.	17.8	-99.9	520.3	258.0
2	31.0	-99.9	973.3	2.0	285.	19.1	-99.9	302.9	123.0
3	29.4	-99.9	973.5	1.6	321.	22.6	-99.9	113.1	9.8
4	26.4	-99.9	973.7	1.0	2.	29.7	-99.9	5.8	-52.9
5	24.1	-99.9	974.2	.9	41.	35.9	-99.9	.0	-52.5
6	22.6	-99.9	974.6	.9	36.	40.9	-99.9	.0	-50.4
7	21.2	-99.9	974.7	.9	39.	46.2	-99.9	.0	-48.6
8	19.9	-99.9	974.7	.8	56.	52.1	-99.9	.0	-46.6
9	19.2	-99.9	974.5	1.0	69.	55.5	-99.9	.0	-46.9
10	18.7	-99.9	974.3	1.2	70.	57.2	-99.9	.0	-46.9
11	18.4	-99.9	974.2	1.3	71.	58.3	-99.9	.0	-46.8
12	18.0	-99.9	974.2	1.1	69.	60.6	-99.9	.0	-45.9
13	17.5	-99.9	974.3	1.0	73.	61.8	-99.9	.7	-45.2
14	17.7	-99.9	974.6	1.2	76.	60.7	-99.9	17.3	-29.0
15	19.7	-99.9	974.9	1.4	78.	52.3	-99.9	202.2	76.0
16	22.6	-99.9	975.1	1.4	67.	42.4	-99.9	428.1	205.2
17	25.0	-99.9	975.2	1.4	264.	35.9	-99.9	617.3	323.9
18	27.0	-99.9	975.2	2.0	257.	29.6	-99.9	792.3	437.8
19	29.1	-99.9	975.1	2.3	261.	24.1	-99.9	914.3	511.2
20	30.5	-99.9	975.0	2.4	258.	20.8	-99.9	988.0	551.3
21	31.4	-99.9	974.7	2.5	258.	19.5	-99.9	986.1	553.9
22	32.1	-99.9	974.4	2.5	256.	18.0	-99.9	954.8	525.0
23	32.5	-99.9	974.1	2.7	259.	17.3	-99.9	854.4	468.6
24	32.5	-99.9	973.8	2.5	257.	17.1	-99.9	702.8	374.9

Average for Jul 00

temp	ws	wd	nr	mr	prec
24.9	1.6	278.5	162.8	6.6	.000

Table 5.19 Climatological data for NML during August 00

JD	temp	pres	ws	wd	gust	mr	nr	tmin	tmax	prec
214	31.7	972.4	1.4	18.	5.7	7.0	119.9	25.1	41.2	.000
215	31.7	971.6	1.6	322.	8.6	8.9	134.9	23.4	39.4	.000
216	30.5	970.8	1.2	267.	5.9	9.4	133.0	23.2	37.2	.000
217	28.9	973.4	1.3	264.	5.9	9.0	148.3	21.6	36.3	.000
218	28.9	975.5	1.4	263.	6.8	8.7	153.1	20.4	37.0	.000
219	28.8	973.1	1.8	289.	6.8	6.4	153.0	21.0	36.9	.000
220	26.8	971.3	1.4	253.	5.7	7.5	150.0	19.0	33.6	.000
221	25.3	973.1	1.4	237.	7.1	7.6	150.7	17.9	33.6	.000
222	25.3	974.1	1.5	268.	7.5	7.2	151.2	17.9	33.1	.000
223	23.3	974.5	1.6	275.	5.8	7.0	147.3	14.2	31.7	.000
224	25.2	975.0	1.7	3.	6.3	5.4	146.6	17.9	35.1	.000
225	27.5	973.8	2.1	45.	5.9	5.1	144.1	20.4	36.5	.000
226	27.9	973.3	2.2	69.	7.7	4.3	145.5	20.9	36.0	.000
227	27.7	972.0	2.2	44.	6.9	4.3	143.3	20.5	36.4	.000
228	-99.9	-99.9	-9.9	-99.	-9.9	-99.9	-999.9	-99.9	-99.9	.000
229	28.9	975.5	2.1	56.	6.0	4.3	139.9	21.8	37.7	.000
230	28.6	974.2	2.0	329.	6.0	4.7	139.8	21.8	36.2	.000
231	26.3	974.3	1.9	311.	7.1	4.4	141.1	19.4	33.4	.000
232	23.6	975.9	1.6	269.	6.5	4.4	141.9	16.4	30.5	.000
233	22.6	977.0	1.6	266.	5.4	5.5	141.6	14.9	30.8	.000
234	24.0	973.4	1.8	302.	6.9	5.0	140.3	16.7	32.4	.000
235	25.7	971.7	2.1	37.	6.4	5.4	139.4	19.2	33.7	.000
236	25.1	973.5	1.5	268.	6.3	7.1	139.1	17.2	32.3	.000
237	24.7	977.3	1.4	264.	5.3	6.7	139.3	16.5	34.5	.000
238	27.8	976.4	2.2	35.	6.8	5.2	131.4	21.7	35.8	.000
239	27.7	973.1	1.8	359.	5.9	5.2	138.2	20.6	35.5	.000
240	27.5	970.0	1.6	283.	5.6	5.8	138.8	19.6	35.5	.000
241	26.7	970.3	1.4	287.	6.7	6.2	134.5	18.5	33.7	.000
242	23.9	972.8	1.1	320.	5.3	5.3	21.1	20.3	24.5	.000
243	19.9	973.6	1.0	30.	4.6	8.1	54.4	15.4	23.8	1.016
244	18.2	973.6	1.2	293.	5.6	7.8	106.0	13.7	25.0	.000

End hr	t2	t10	pres	ws	wd	rh2	rh10	kd	nr
1	33.6	-99.9	972.5	2.1	274.	15.2	-99.9	417.9	194.1
2	32.5	-99.9	972.3	1.9	285.	17.3	-99.9	220.4	79.2
3	30.4	-99.9	972.4	1.5	302.	22.0	-99.9	47.1	-19.8
4	27.5	-99.9	972.7	.8	63.	27.0	-99.9	.8	-45.0
5	25.6	-99.9	973.3	.7	41.	31.1	-99.9	.0	-41.6
6	24.0	-99.9	973.6	.9	53.	35.1	-99.9	.0	-41.2
7	22.7	-99.9	973.7	.9	63.	39.7	-99.9	.0	-39.9
8	21.8	-99.9	973.8	1.1	66.	43.7	-99.9	.0	-40.2
9	21.2	-99.9	973.8	1.3	63.	45.4	-99.9	.0	-40.2
10	20.8	-99.9	973.6	1.5	66.	45.8	-99.9	.0	-40.6
11	20.5	-99.9	973.6	1.5	69.	46.5	-99.9	.0	-40.3
12	20.3	-99.9	973.5	1.5	66.	45.9	-99.9	.0	-39.8
13	20.1	-99.9	973.5	1.6	66.	45.8	-99.9	.0	-40.1
14	20.0	-99.9	973.9	1.6	69.	45.9	-99.9	7.8	-32.3
15	20.9	-99.9	974.2	1.6	73.	42.6	-99.9	108.7	30.2
16	23.6	-99.9	974.5	1.4	65.	36.7	-99.9	331.2	150.9
17	26.1	-99.9	974.6	1.3	321.	31.2	-99.9	529.2	269.3
18	28.1	-99.9	974.6	1.9	258.	26.9	-99.9	681.2	366.8
19	30.1	-99.9	974.4	2.3	258.	22.0	-99.9	813.2	445.4
20	31.6	-99.9	974.1	2.4	256.	19.6	-99.9	891.8	487.8
21	32.4	-99.9	973.8	2.6	254.	18.0	-99.9	884.4	487.0
22	33.0	-99.9	973.5	2.6	256.	16.9	-99.9	839.3	451.6
23	33.4	-99.9	973.0	2.4	259.	16.1	-99.9	745.4	396.7
24	33.5	-99.9	972.6	2.2	264.	16.0	-99.9	602.1	309.3

Average for Aug 00

temp	ws	wd	nr	mr	prec
26.4	1.6	284.9	133.6	6.3	1.016

Table 5.20 Climatological data for NML during September 00

JD	temp	pres	ws	wd	gust	mr	nr	tmin	tmax	prec
245	17.1	973.9	1.5	273.	8.7	8.7	44.9	13.7	21.0	.762
246	15.0	976.8	.8	45.	4.0	9.2	75.4	12.5	21.0	10.668
247	17.2	975.9	1.1	281.	5.0	7.5	113.9	13.0	23.4	.000
248	16.7	976.8	1.5	232.	5.1	6.0	135.5	10.7	23.4	.000
249	17.8	977.9	1.8	29.	7.8	5.1	137.8	11.2	26.1	.000
250	19.8	976.1	1.8	347.	7.0	4.8	135.8	12.0	28.9	.000
251	23.5	973.3	2.1	65.	7.3	4.8	133.1	17.2	34.0	.000
252	25.0	970.0	2.3	57.	7.1	4.1	130.5	18.0	33.7	.000
253	24.3	969.0	2.3	60.	7.4	4.0	130.0	18.0	32.2	.000
254	24.3	971.2	2.2	46.	6.8	4.9	129.0	18.2	32.4	.000
255	25.2	973.7	2.2	60.	6.6	5.2	129.0	19.3	33.9	.000
256	25.8	974.3	2.3	65.	7.5	4.5	77.4	19.9	34.5	.000
257	27.2	971.5	1.7	41.	7.4	5.3	101.0	22.2	36.6	.000
258	25.1	972.7	1.1	244.	5.6	7.7	127.2	17.4	30.2	.000
259	22.1	976.6	1.4	291.	6.2	9.3	127.5	16.0	29.2	.000
260	22.0	975.1	1.1	283.	4.9	7.5	125.4	14.1	31.9	.000
261	25.1	973.0	1.8	39.	7.0	6.2	120.6	17.2	35.4	.000
262	27.3	972.5	1.2	270.	5.4	6.1	120.8	20.0	37.6	.000
263	28.8	971.3	1.9	30.	6.8	5.9	117.8	21.4	37.4	.000
264	28.7	966.7	2.0	35.	7.0	6.8	114.9	22.1	37.2	.000
265	23.5	964.0	1.3	257.	5.4	8.2	116.6	15.6	27.4	.000
266	18.0	965.2	1.3	41.	6.7	8.9	40.1	14.8	22.6	.000
267	18.5	971.2	1.9	48.	6.8	7.4	116.9	13.1	25.8	.000
268	20.5	976.6	2.0	41.	6.5	5.6	112.4	14.8	29.3	.000
269	23.4	976.5	2.2	58.	6.4	5.5	110.2	18.0	31.9	.000
270	24.3	974.7	2.3	63.	7.3	4.7	106.5	18.2	32.9	.000
271	24.1	975.1	2.1	44.	7.4	5.0	102.5	19.3	29.6	.000
272	18.4	977.1	1.2	290.	5.0	7.9	102.4	12.1	24.8	.000
273	18.3	974.7	1.1	289.	5.8	7.7	104.3	12.0	27.9	.000
274	21.4	971.8	1.1	335.	6.2	7.7	98.3	14.8	31.9	.000

End hr	t2	t10	pres	ws	wd	rh2	rh10	kd	nr
1	28.5	-99.9	972.0	1.8	271.	25.7	-99.9	268.0	123.3
2	27.0	-99.9	972.0	1.4	277.	29.2	-99.9	86.6	13.8
3	24.3	-99.9	972.2	.9	11.	35.4	-99.9	3.0	-35.2
4	22.1	-99.9	972.6	.8	32.	41.9	-99.9	.0	-35.1
5	21.0	-99.9	972.9	1.1	48.	46.6	-99.9	.0	-35.8
6	20.0	-99.9	973.0	1.4	59.	49.9	-99.9	.0	-36.0
7	19.4	-99.9	973.1	1.6	61.	51.3	-99.9	.0	-36.0
8	18.7	-99.9	973.2	1.6	63.	53.3	-99.9	.0	-35.9
9	18.1	-99.9	973.3	1.7	63.	54.8	-99.9	.0	-36.3
10	17.8	-99.9	973.3	1.8	64.	55.3	-99.9	.0	-35.5
11	17.5	-99.9	973.2	1.9	63.	55.3	-99.9	.0	-35.3
12	17.1	-99.9	973.1	1.9	62.	56.2	-99.9	.0	-35.1
13	16.9	-99.9	973.2	1.8	62.	56.2	-99.9	.0	-34.9
14	16.7	-99.9	973.5	1.9	64.	55.4	-99.9	1.5	-33.4
15	16.9	-99.9	973.9	1.9	63.	53.8	-99.9	43.4	-.8
16	18.8	-99.9	974.2	1.9	61.	47.7	-99.9	249.7	118.8
17	21.4	-99.9	974.3	1.4	59.	40.8	-99.9	431.8	232.1
18	23.8	-99.9	974.3	1.3	260.	35.6	-99.9	601.5	338.2
19	25.7	-99.9	974.1	1.9	256.	31.3	-99.9	714.7	412.2
20	27.3	-99.9	973.8	2.1	252.	27.7	-99.9	769.5	445.7
21	28.2	-99.9	973.4	2.3	252.	25.4	-99.9	756.9	440.9
22	29.0	-99.9	972.9	2.2	254.	23.8	-99.9	701.1	397.4
23	29.4	-99.9	972.5	2.1	258.	22.8	-99.9	606.2	339.9
24	29.3	-99.9	972.2	1.9	260.	23.7	-99.9	442.0	233.4

Average for Sep 00

temp	ws	wd	nr	mr	prec
22.3	1.7	307.5	111.3	6.4	11.430

5.6 Pleasant Grove Surface Climatology

The Pleasant Grove (PSG) site, 20 km north of Sacramento, experienced the lowest temperatures of those observed from the seven ETL CCOS Central Valley sites. The site's proximity to the Carquinez Strait, located 100 km to the southwest, allowed the site to be ventilated by the cooler marine air entering the Sacramento Valley. Maximum daytime temperatures averaged 31 ^{o}C with nighttime minimums averaging 15 ^{o}C. Average wind speeds, at 3.2 m s^{-1}, were the highest of any of the ETL CCOS Sacramento Valley sites. Winds were south-southwest from the late morning to early evening turning to a more southeasterly direction during the evening and morning hours. The easterly component to the flow during the nighttime hours likely resulted from thermally forced drainage winds from the higher terrain to the east, superimposed on the southerly marine inflow. Maximum wind speeds occurred during the evening hours.

Fig. 5.21 Climatological data for PSG during June 00

JD	temp	pres	ws	wd	gust	mr	nr	tmin	tmax	prec
153	21.8	1009.5	2.6	186.	7.7	6.9	186.8	12.4	32.3	.000
154	22.8	1012.8	3.0	165.	7.9	7.7	185.1	13.6	31.4	.000
155	20.5	1016.1	3.3	180.	8.4	7.5	183.4	10.6	32.9	.000
156	20.9	1014.5	4.1	168.	8.4	8.3	183.9	12.2	30.9	.000
157	18.3	1014.7	5.8	158.	11.4	7.3	182.4	10.8	29.1	.000
158	20.1	1014.4	3.9	166.	8.3	8.8	188.9	11.6	29.2	.000
159	19.1	1012.0	6.2	163.	11.3	8.9	173.4	12.9	24.0	.000
160	17.4	1010.5	4.2	186.	10.9	9.2	116.7	13.3	21.7	2.540
161	17.2	1013.4	4.5	161.	9.5	8.2	192.0	11.7	24.6	.000
162	18.0	1013.9	4.1	158.	9.8	8.4	189.8	12.5	26.2	.000
163	19.9	1014.2	2.4	183.	6.9	7.8	166.5	11.9	29.0	.000
164	22.6	1015.6	2.3	180.	5.6	9.2	144.4	16.3	33.0	.000
165	28.1	1012.5	5.8	333.	15.3	9.6	199.2	19.5	38.2	.000
166	30.6	1009.8	3.9	326.	11.9	9.9	188.5	19.7	41.2	.000
167	31.0	1008.3	2.5	298.	7.3	13.0	193.0	20.8	39.0	.000
168	29.9	1002.9	3.3	308.	9.4	11.9	193.4	21.2	37.4	.000
169	26.1	1001.8	2.5	196.	8.7	10.9	189.0	17.8	33.8	.000
170	20.8	1007.1	5.7	152.	10.2	10.3	193.5	14.4	26.7	.000
171	20.7	1010.2	3.7	177.	11.5	10.0	187.3	13.2	33.8	.000
172	25.9	1009.0	2.4	246.	6.3	10.8	187.7	16.6	36.8	.000
173	27.1	1008.6	2.3	176.	5.1	11.1	183.6	17.3	38.2	.000
174	25.1	1006.9	4.0	171.	8.3	11.2	189.5	16.9	31.5	.000
175	20.3	1008.6	4.6	163.	10.4	10.0	188.7	12.6	30.5	.000
176	22.5	1012.5	3.3	164.	8.2	9.3	183.9	13.9	34.7	.000
177	23.5	1013.3	3.1	163.	7.9	10.2	179.9	14.9	35.4	.000
178	25.3	1011.0	2.9	173.	6.5	11.3	183.5	16.4	35.9	.000
179	27.0	1009.0	2.6	177.	6.2	11.0	182.5	18.5	36.6	.000
180	26.5	1009.3	2.8	173.	7.6	11.7	181.8	17.9	36.0	.000
181	24.2	1009.2	4.1	167.	22.0	11.3	190.2	16.4	31.8	.000
182	20.0	1008.9	5.4	160.	10.3	10.1	192.9	13.5	28.1	.000

End hr	t2	t10	pres	ws	wd	rh2	rh10	kd	nr
1	31.4	30.6	1009.5	4.1	206.	33.9	33.9	500.9	273.1
2	30.4	30.0	1009.3	4.2	200.	38.1	37.3	311.7	143.7
3	28.3	28.4	1009.3	4.5	189.	45.9	43.6	132.2	23.2
4	25.5	26.2	1009.4	4.6	185.	56.0	51.0	12.4	-43.1
5	23.1	24.0	1009.7	4.5	180.	63.2	56.9	.0	-50.0
6	21.2	21.9	1010.2	4.3	167.	67.6	62.7	.0	-48.6
7	19.9	20.5	1010.3	4.1	155.	70.9	66.6	.0	-46.8
8	18.8	19.4	1010.4	4.0	146.	72.3	68.5	.0	-45.9
9	18.0	18.5	1010.4	4.0	141.	73.7	70.3	.0	-45.2
10	17.1	17.7	1010.4	3.7	143.	77.0	73.8	.0	-44.5
11	16.4	16.9	1010.4	3.5	136.	80.1	77.1	.0	-43.5
12	15.8	16.4	1010.5	3.2	136.	81.6	78.7	.0	-42.1
13	15.4	16.0	1010.8	3.1	139.	83.7	80.6	3.4	-37.3
14	15.8	16.0	1011.2	3.2	136.	81.1	79.5	89.6	8.1
15	17.4	17.1	1011.6	3.4	148.	73.6	74.5	270.4	119.4
16	19.4	18.7	1012.0	3.2	163.	65.7	68.2	453.8	243.8
17	21.6	20.5	1012.2	3.1	184.	58.4	62.1	647.9	378.9
18	23.7	22.3	1012.1	3.3	195.	52.2	56.3	805.7	483.4
19	25.6	24.1	1012.1	3.4	201.	47.2	51.0	901.9	544.4
20	27.5	26.0	1011.9	3.4	214.	42.4	45.9	959.1	577.7
21	29.1	27.6	1011.4	3.5	233.	38.8	41.8	968.1	582.5
22	30.2	28.9	1010.9	3.5	229.	36.3	38.5	929.8	563.0
23	31.2	30.0	1010.4	3.5	221.	33.4	35.0	841.2	492.5
24	31.7	30.6	1009.9	3.6	205.	33.1	34.1	688.6	398.5

Average for Jun 00

temp	ws	wd	nr	mr	prec
23.1	3.7	170.1	182.7	9.7	2.540

Fig. 5.22 Climatological data for PSG during July 00

JD	temp	pres	ws	wd	gust	mr	nr	tmin	tmax	prec
183	18.9	1010.8	5.6	163.	10.7	9.2	186.8	13.0	27.7	.000
184	19.0	1011.5	5.0	165.	9.0	8.7	183.1	12.7	25.1	.000
185	17.4	1012.1	5.3	169.	10.3	8.8	171.0	12.5	25.6	.000
186	19.3	1013.1	3.1	166.	7.1	8.9	182.3	11.7	28.6	.000
187	19.0	1011.5	5.1	165.	8.8	9.2	171.8	13.1	25.6	.000
188	18.7	1012.2	4.0	157.	8.9	9.1	172.3	12.3	27.0	.000
189	18.4	1012.2	4.1	158.	7.8	8.6	167.9	12.4	26.9	.000
190	19.0	1013.5	3.5	155.	7.3	8.9	186.2	12.5	29.7	.000
191	22.7	1011.9	1.9	191.	6.4	9.4	184.5	14.0	32.2	.000
192	22.4	1010.3	3.0	172.	6.8	10.2	183.1	15.0	30.7	.000
193	21.9	1011.1	2.9	168.	7.3	10.2	181.7	13.9	32.5	.000
194	22.0	1012.2	3.8	168.	6.8	10.6	186.5	14.2	29.6	.000
195	20.8	1015.5	4.5	151.	9.1	9.7	184.7	13.8	30.0	.000
196	21.5	1016.7	2.8	161.	6.8	8.9	179.9	13.6	32.9	.000
197	22.5	1014.3	3.1	165.	6.3	9.8	177.0	14.4	31.8	.000
198	19.6	1012.4	5.1	162.	10.6	9.6	150.3	13.7	24.8	.000
199	18.0	1015.3	4.6	157.	9.4	9.4	181.3	13.0	26.0	.000
200	19.6	1018.0	2.7	160.	7.6	9.2	186.6	11.8	32.9	.000
201	23.6	1015.9	2.1	168.	4.7	9.2	180.4	14.4	35.1	.000
202	23.4	1012.7	2.4	173.	5.8	10.5	181.3	13.7	35.1	.000
203	21.7	1010.1	4.1	166.	7.8	10.9	184.5	13.5	30.2	.000
204	21.4	1012.8	3.7	155.	8.1	10.3	184.5	14.1	33.3	.000
205	23.4	1014.4	2.4	199.	5.6	10.2	185.1	14.6	35.8	.000
206	25.4	1013.3	2.1	192.	5.2	9.5	177.7	15.8	36.5	.000
207	24.8	1010.5	2.5	173.	5.9	11.3	174.3	16.2	35.3	.000
208	23.0	1009.2	4.3	161.	7.8	10.7	183.7	15.9	29.9	.000
209	20.2	1012.6	3.5	148.	9.8	8.8	179.0	12.9	32.5	.000
210	23.2	1012.7	2.2	193.	5.6	9.9	176.1	14.5	36.1	.000
211	25.2	1010.8	1.9	171.	4.6	11.6	176.5	16.2	36.2	.000
212	26.3	1009.7	2.5	179.	5.3	11.5	164.5	18.2	37.8	.000
213	27.7	1009.4	1.8	232.	4.1	11.8	163.7	18.7	39.0	.000

End hr	t2	t10	pres	ws	wd	rh2	rh10	kd	nr
1	29.7	29.1	1011.3	3.6	183.	40.5	38.3	505.1	274.3
2	28.4	28.3	1011.0	3.7	179.	46.8	42.1	315.8	146.7
3	26.0	26.7	1011.0	3.9	179.	55.3	48.3	126.6	17.7
4	22.7	23.9	1011.2	4.2	175.	64.7	56.8	10.1	-45.9
5	20.3	21.3	1011.6	4.2	169.	72.5	66.0	.0	-50.3
6	18.7	19.4	1012.0	4.1	158.	76.2	71.2	.0	-48.0
7	17.7	18.6	1012.2	4.0	139.	76.7	70.8	.0	-45.7
8	17.1	17.9	1012.3	3.9	138.	78.1	72.5	.0	-44.0
9	16.4	17.0	1012.3	3.8	141.	80.9	76.4	.0	-42.3
10	15.8	16.5	1012.3	3.6	140.	82.6	77.8	.0	-40.4
11	15.3	15.9	1012.3	3.4	139.	83.6	79.6	.0	-39.0
12	14.8	15.3	1012.4	3.1	139.	85.4	82.0	.0	-37.2
13	14.4	14.9	1012.6	2.9	138.	87.4	84.6	1.1	-33.5
14	14.5	14.8	1013.1	2.9	133.	86.6	85.4	63.9	-2.1
15	16.1	15.9	1013.5	3.3	142.	79.0	80.1	234.1	95.9
16	18.3	17.7	1013.9	3.0	152.	70.2	72.8	416.5	220.6
17	20.6	19.6	1014.1	2.9	168.	63.8	67.5	619.7	354.2
18	22.7	21.5	1014.1	2.8	186.	58.1	62.4	772.6	458.3
19	24.6	23.2	1014.0	2.9	195.	52.2	56.5	889.3	540.2
20	26.6	25.1	1013.7	2.9	216.	46.7	50.9	964.9	579.2
21	28.2	26.7	1013.3	3.0	218.	42.6	46.0	979.5	589.3
22	29.3	28.0	1012.8	3.0	212.	39.5	41.9	933.6	558.2
23	30.2	29.0	1012.2	3.1	206.	37.0	38.4	827.9	485.4
24	30.5	29.5	1011.7	3.3	192.	36.8	36.8	681.5	391.0

Average for Jul 00

temp	ws	wd	nr	mr	prec
21.6	3.4	167.5	178.3	9.8	.000

Fig. 5.23 Climatological data for PSG during August 00

JD	temp	pres	ws	wd	gust	mr	nr	tmin	tmax	prec
214	28.7	1009.3	2.2	170.	8.2	12.8	139.8	19.9	38.8	.000
215	28.6	1008.4	2.4	167.	6.2	13.4	160.0	20.8	36.6	.000
216	25.3	1007.7	4.2	163.	8.2	11.4	162.8	18.5	31.4	.000
217	23.3	1011.4	3.7	160.	7.3	10.2	171.7	15.8	33.2	.000
218	24.1	1013.4	2.5	172.	5.7	10.8	171.2	15.7	34.9	.000
219	24.2	1010.5	2.6	161.	5.3	11.1	170.9	15.8	34.9	.000
220	20.9	1008.9	4.5	162.	8.6	10.3	171.2	13.8	27.1	.000
221	18.8	1011.6	4.1	165.	9.4	10.1	170.4	13.2	29.4	.000
222	20.5	1012.4	3.8	164.	7.9	9.8	172.8	13.5	29.9	.000
223	19.8	1012.9	4.3	158.	8.3	9.0	172.4	13.3	27.9	.000
224	21.4	1013.5	2.0	217.	5.3	9.6	174.5	12.9	35.8	.000
225	25.9	1011.1	2.2	149.	5.0	9.0	168.6	16.2	36.1	.000
226	22.5	1010.6	3.0	163.	7.0	8.9	166.3	13.6	34.7	.000
227	24.6	1009.5	2.1	166.	4.3	9.3	165.4	15.2	36.0	.000
228	23.3	1012.1	2.9	160.	5.8	8.9	164.4	14.3	35.1	.000
229	24.8	1013.2	2.0	216.	4.8	9.1	165.3	15.0	37.5	.000
230	24.0	1011.4	2.6	154.	5.4	10.1	161.6	15.0	33.5	.000
231	21.9	1011.7	3.5	157.	7.4	9.1	161.2	13.7	32.0	.000
232	20.3	1013.7	3.7	157.	7.0	9.7	164.2	13.4	29.0	.000
233	19.6	1015.4	2.7	147.	7.2	8.2	157.4	12.1	30.7	.000
234	22.3	1011.3	1.9	147.	4.7	8.7	155.8	13.2	33.6	.000
235	22.1	1009.5	2.5	172.	4.9	9.6	156.8	13.8	33.2	.000
236	20.4	1011.6	4.0	163.	7.7	9.8	159.2	13.4	28.6	.000
237	19.8	1016.1	3.0	151.	7.0	9.1	159.4	12.5	33.1	.000
238	23.3	1014.4	2.1	258.	5.1	8.3	136.8	14.0	35.9	.000
239	22.4	1010.5	3.1	162.	6.0	9.8	155.1	14.3	33.0	.000
240	21.4	1007.6	2.4	167.	6.2	9.2	152.1	13.5	34.0	.000
241	22.2	1007.8	3.0	165.	7.3	9.3	147.9	14.3	32.9	.000
242	18.1	1010.6	4.4	154.	8.3	9.3	27.3	14.7	18.7	.000
243	16.8	1012.1	3.3	152.	7.6	9.1	16.9	15.0	20.3	.000
244	18.3	1011.7	3.9	153.	8.1	9.7	98.0	14.0	25.1	.000

End hr	t2	t10	pres	ws	wd	rh2	rh10	kd	nr
1	31.1	30.7	1010.0	2.9	186.	38.7	35.3	434.2	222.7
2	29.3	29.8	1009.6	3.0	181.	44.0	37.5	237.5	96.3
3	25.8	27.4	1009.6	3.3	179.	54.5	44.6	61.0	-10.0
4	22.4	24.6	1009.9	3.6	169.	64.1	51.7	1.2	-39.0
5	20.4	22.5	1010.3	3.7	163.	70.8	59.1	.0	-38.1
6	19.1	20.7	1010.6	3.5	156.	74.7	64.5	.0	-36.9
7	18.3	19.9	1010.8	3.6	140.	74.2	64.4	.0	-35.6
8	17.8	19.3	1011.0	3.7	134.	74.3	64.8	.0	-34.4
9	17.3	18.6	1011.1	3.5	138.	76.3	67.4	.0	-33.4
10	16.8	18.0	1011.0	3.5	137.	77.3	69.1	.0	-32.9
11	16.2	17.4	1011.1	3.2	136.	79.9	71.1	.0	-31.5
12	15.6	16.6	1011.3	2.8	136.	82.0	75.3	.0	-30.7
13	15.2	16.0	1011.5	2.7	132.	84.1	79.0	.0	-29.6
14	14.9	15.6	1012.0	2.5	124.	84.7	80.6	20.0	-16.8
15	16.4	16.5	1012.5	2.4	133.	78.0	77.3	162.5	54.0
16	18.8	18.4	1012.9	2.6	149.	67.9	69.4	348.1	168.1
17	21.3	20.5	1013.1	2.8	161.	59.5	62.2	553.6	302.1
18	23.5	22.4	1013.1	2.9	181.	54.2	57.4	705.9	405.4
19	25.5	24.2	1013.0	2.9	197.	49.6	53.1	821.0	479.1
20	27.2	25.8	1012.6	2.8	203.	45.5	48.7	884.9	515.2
21	28.7	27.4	1012.1	2.9	203.	41.8	44.4	885.6	515.9
22	30.1	28.9	1011.7	2.7	204.	38.4	40.0	834.4	484.0
23	31.0	29.9	1011.0	2.8	200.	36.3	36.9	743.6	426.8
24	31.2	30.5	1010.4	2.9	187.	36.7	35.4	605.6	331.6

Average for Aug 00

temp	ws	wd	nr	mr	prec
22.2	3.1	165.7	150.9	9.8	.000

Fig. 5.24 Climatological data for PSG during September 00

JD	temp	pres	ws	wd	gust	mr	nr	tmin	tmax	prec
245	16.3	1011.9	5.0	174.	11.1	9.6	-999.9	14.1	18.4	4.318
246	16.7	1015.2	3.4	159.	8.5	9.4	-999.9	13.4	23.6	.254
247	17.5	1014.6	2.2	180.	6.1	8.2	-999.9	12.5	25.3	.000
248	16.2	1015.2	2.5	162.	6.4	7.3	-999.9	9.7	24.8	.000
249	17.6	1017.3	2.7	326.	8.3	7.1	-999.9	10.5	26.8	.000
250	20.3	1014.9	3.9	318.	8.4	6.5	-999.9	11.9	31.1	.000
251	21.6	1011.1	1.9	334.	7.1	7.3	110.9	11.7	33.0	.000
252	21.7	1007.1	2.7	149.	6.2	7.8	106.9	11.9	31.5	.000
253	19.8	1006.5	2.7	152.	7.0	8.7	103.4	11.7	30.4	.000
254	20.2	1009.2	2.2	156.	5.1	8.1	102.3	11.5	32.0	.000
255	20.9	1011.5	2.3	138.	6.5	8.1	99.8	12.0	34.0	.000
256	22.8	1011.7	2.4	17.	6.7	7.9	73.4	12.8	33.2	.000
257	24.4	1008.8	2.0	323.	7.0	9.3	61.1	18.0	34.7	.000
258	23.2	1010.2	3.9	171.	9.4	10.8	103.1	17.9	28.8	.000
259	20.4	1014.7	3.2	157.	7.2	10.3	105.7	14.0	29.8	.000
260	20.0	1013.3	2.7	143.	6.9	9.9	102.6	12.8	29.9	.000
261	22.5	1010.9	1.8	327.	5.7	9.1	100.0	12.5	35.0	.000
262	24.7	1009.7	1.6	302.	5.0	9.3	96.3	14.5	38.0	.000
263	25.7	1008.1	1.8	300.	4.8	9.6	94.3	14.5	38.3	.000
264	26.6	1003.1	1.7	174.	5.2	10.4	93.2	16.6	37.3	.000
265	20.8	1000.9	5.1	167.	10.9	10.6	92.9	15.1	24.0	.000
266	18.3	1003.2	3.5	191.	7.8	10.1	79.3	15.3	23.8	.000
267	17.9	1010.2	2.6	330.	10.1	8.2	99.3	10.9	27.2	.000
268	18.1	1015.0	1.9	6.	5.0	6.3	84.0	9.7	29.4	.000
269	19.9	1014.6	1.9	328.	5.1	6.8	83.0	10.3	32.3	.000
270	21.2	1012.7	2.0	351.	5.6	7.3	84.6	11.7	32.8	.000
271	20.1	1013.1	2.4	158.	7.9	8.4	84.3	11.3	28.9	.000
272	16.9	1015.7	4.2	159.	8.8	8.7	79.5	12.0	24.6	.000
273	17.4	1013.1	1.8	165.	6.1	8.6	79.1	9.6	31.3	.000
274	21.4	1009.0	1.7	149.	5.3	9.2	77.0	12.7	33.1	.000

End hr	t2	t10	pres	ws	wd	rh2	rh10	kd	nr
1	28.5	28.3	1009.9	2.7	212.	36.4	35.5	282.0	94.0
2	26.7	27.2	1009.7	2.5	181.	42.1	39.2	94.0	-31.6
3	22.9	24.7	1009.7	2.6	174.	53.9	46.6	3.5	-62.6
4	20.0	22.6	1010.1	2.7	176.	65.2	53.1	.0	-58.9
5	18.4	20.9	1010.3	2.8	165.	70.2	58.2	.0	-56.6
6	17.3	19.4	1010.5	2.8	150.	73.5	63.2	.0	-55.0
7	16.7	18.8	1010.6	2.9	130.	73.9	64.2	.0	-54.1
8	16.2	18.0	1010.8	3.0	129.	75.4	67.9	.0	-52.3
9	15.6	17.3	1010.9	2.8	135.	77.9	70.6	.0	-52.2
10	15.0	16.5	1011.0	2.8	134.	80.6	74.5	.0	-51.6
11	14.5	15.9	1011.0	2.7	130.	82.1	76.3	.0	-50.1
12	14.2	15.4	1011.0	2.7	132.	82.6	78.4	.0	-50.0
13	13.7	15.0	1011.2	2.6	132.	84.0	79.1	.0	-48.3
14	13.4	14.4	1011.5	2.3	108.	85.0	81.8	1.8	-45.8
15	13.9	14.3	1012.0	1.9	102.	84.1	83.0	82.8	-3.1
16	16.8	16.5	1012.4	2.2	137.	74.9	76.2	257.8	93.4
17	19.5	18.9	1012.6	2.5	197.	64.8	67.5	435.8	201.5
18	22.0	21.2	1012.7	2.6	228.	55.5	58.8	594.8	302.8
19	24.1	23.2	1012.5	2.8	234.	48.5	51.7	709.7	376.2
20	25.7	24.7	1012.2	2.9	250.	43.5	46.5	794.7	426.4
21	27.1	26.1	1011.7	2.9	254.	39.4	42.1	788.7	425.5
22	28.3	27.3	1011.1	2.8	253.	36.3	38.5	733.0	394.9
23	29.1	28.2	1010.5	2.7	243.	34.1	35.7	626.7	325.2
24	29.3	28.6	1010.1	2.6	235.	33.9	34.5	476.9	216.4

Average for Sep 00

temp	ws	wd	nr	mr	prec
20.4	2.7	166.4	91.5	8.6	4.572

5.7 Redding Surface Climatology

Redding's location, on the far northern end of the Sacramento Valley, negated the effect of the marine inflow on the site's climate. Thermally forced circulations dominated the wind field with southerly winds from the early afternoon to evening hours and northwesterly flows from the late evening to late morning hours. Mean wind speeds were rather light, averaging 1.9 m s^{-1}, with the strongest flows occurring during the early evening. Daytime maximum temperatures averaged 34 ^{o}C (similar to FAT), while nighttime minimum temperatures averaged 16 ^{o}C. Maximum temperatures exceeding 40 ^{o}C occurred 14 times at this site with a maximum of 44.4 ^{o}C recorded on 7/31/00.

Fig 5.25 Climatological data for RDG during June 00

JD	temp	pres	ws	wd	gust	mr	nr	tmin	tmax	prec
153	23.3	993.5	2.0	315.	7.0	3.9	172.7	12.1	33.4	.000
154	22.9	995.9	2.1	199.	9.1	6.2	178.6	11.3	32.3	.000
155	23.3	999.1	1.4	220.	6.7	5.9	179.0	10.6	35.1	.000
156	23.7	997.4	2.0	179.	10.3	5.8	175.1	11.1	33.4	.000
157	22.0	996.6	3.1	184.	10.6	6.2	176.4	12.9	27.5	.000
158	21.2	997.4	1.6	187.	8.4	7.0	173.9	11.2	30.9	.000
159	21.8	994.1	3.0	174.	11.0	7.0	160.6	12.0	26.5	.000
160	16.3	992.7	2.4	180.	9.6	9.4	107.5	13.4	22.1	23.368
161	16.9	995.7	2.5	183.	8.4	8.1	142.3	13.0	22.5	2.032
162	18.2	996.6	1.7	272.	7.3	7.1	184.2	14.0	25.0	1.270
163	19.2	997.5	1.4	268.	5.5	6.6	159.8	9.9	27.9	.000
164	23.3	998.8	1.1	251.	6.3	8.9	121.2	18.1	29.2	.000
165	25.6	999.9	2.6	331.	12.1	8.1	210.2	16.6	38.3	.000
166	33.4	996.7	2.8	341.	9.0	7.5	199.2	27.0	42.2	.000
167	33.2	993.9	3.0	342.	10.5	7.3	199.9	25.9	40.0	.000
168	31.5	989.7	3.9	347.	14.3	5.0	188.9	26.3	36.3	.000
169	31.4	987.2	2.5	345.	9.2	4.0	182.4	25.1	38.4	.000
170	25.8	989.4	2.1	192.	8.7	9.1	193.4	17.8	31.4	.000
171	24.9	993.6	2.4	331.	8.8	9.1	200.0	15.5	35.1	10.668
172	30.2	993.6	2.5	336.	8.3	5.4	180.0	24.5	39.3	.000
173	28.1	992.0	1.4	242.	5.9	7.7	185.5	14.6	39.2	.000
174	29.1	990.1	1.8	196.	7.8	9.4	186.5	17.6	38.3	.000
175	27.7	991.3	2.0	172.	9.0	9.2	187.7	16.4	37.0	.000
176	26.7	995.5	1.8	194.	7.9	7.6	184.4	14.9	37.5	.000
177	27.7	996.2	1.5	194.	6.2	8.6	183.5	16.3	38.5	.000
178	30.4	994.1	1.8	252.	7.3	9.5	185.2	19.6	41.4	.000
179	31.7	992.2	2.0	215.	7.8	10.3	183.3	21.5	40.8	.000
180	31.6	992.5	1.5	271.	6.9	10.3	183.9	21.0	42.4	.000
181	32.1	991.9	2.1	195.	8.0	10.5	181.8	20.9	39.8	.000
182	28.8	991.2	2.8	182.	9.9	10.0	184.9	18.8	33.9	.000

End hr	t2	t10	pres	ws	wd	rh2	rh10	kd	nr
1	33.7	32.9	992.6	3.4	187.	20.8	20.9	505.4	277.6
2	32.9	32.3	992.3	3.5	189.	23.3	23.2	321.4	144.5
3	31.3	31.3	992.4	3.1	188.	27.9	26.6	153.6	28.8
4	28.5	29.3	992.7	2.5	190.	33.7	31.0	21.2	-59.6
5	26.0	27.1	993.2	1.9	194.	40.8	37.4	.1	-68.4
6	23.9	25.5	993.9	1.4	338.	47.5	41.5	.0	-62.5
7	22.5	24.3	994.2	1.5	354.	51.1	43.9	.0	-59.3
8	21.7	23.3	994.3	1.4	333.	53.2	46.3	.0	-57.9
9	20.8	22.4	994.4	1.5	326.	56.1	48.8	.0	-57.1
10	19.8	21.5	994.5	1.5	318.	59.2	51.1	.0	-56.3
11	19.2	20.8	994.5	1.6	319.	60.2	53.2	.0	-55.6
12	18.5	20.0	994.6	1.5	326.	62.4	55.6	.0	-56.0
13	17.7	19.2	994.9	1.4	325.	65.5	58.4	2.3	-53.7
14	18.2	19.1	995.2	1.4	319.	65.0	59.5	70.9	-12.7
15	21.0	20.8	995.6	1.5	324.	55.4	54.7	226.8	90.6
16	23.6	23.0	995.8	2.0	333.	44.6	45.5	415.4	223.6
17	25.7	25.0	995.8	2.2	332.	38.1	39.1	585.8	351.4
18	27.6	26.7	995.5	2.1	330.	34.3	35.4	749.4	470.7
19	29.4	28.4	995.3	2.2	297.	30.7	31.8	893.2	574.2
20	30.9	29.8	994.9	2.4	234.	27.7	28.7	929.1	601.0
21	32.0	30.9	994.4	2.7	197.	24.9	25.7	961.8	612.1
22	33.0	31.9	993.9	2.9	199.	23.1	23.9	915.6	580.3
23	33.8	32.6	993.4	3.1	195.	21.7	22.3	813.6	504.6
24	34.1	33.0	992.9	3.2	191.	21.1	21.6	677.4	405.3

Average for Jun 00

temp	ws	wd	nr	mr	prec
26.1	2.2	264.9	177.7	7.7	37.338

Fig. 5.26 Climatological data for RDG during July 00

JD	temp	pres	ws	wd	gust	mr	nr	tmin	tmax	prec
183	24.8	993.2	2.9	188.	8.5	8.5	181.5	15.2	30.5	.000
184	23.6	994.1	2.3	179.	8.4	8.3	183.6	15.9	31.3	.000
185	22.0	994.5	2.1	171.	9.2	7.6	167.1	14.0	28.9	.000
186	22.1	995.9	1.9	211.	8.6	7.6	133.8	13.6	29.2	.000
187	19.0	994.5	2.2	176.	10.2	10.2	130.5	13.9	25.2	2.286
188	19.7	995.4	1.3	264.	6.7	8.9	161.9	12.4	28.5	.000
189	21.6	995.1	1.6	192.	6.2	7.8	123.1	15.8	28.5	.000
190	21.2	996.4	1.5	194.	6.9	6.4	190.6	10.9	31.6	.000
191	24.2	995.0	1.6	261.	6.4	6.6	190.8	13.2	35.8	.000
192	25.7	993.2	2.0	188.	8.4	6.9	189.4	14.2	35.9	.000
193	25.9	994.1	1.7	181.	8.3	7.9	187.1	14.1	36.5	.000
194	26.7	995.0	1.9	189.	7.6	7.2	188.2	15.1	36.7	.000
195	26.6	997.8	2.5	179.	7.4	8.9	186.1	17.9	33.3	.000
196	25.2	999.7	1.8	196.	7.5	7.9	187.0	13.9	35.0	.000
197	26.1	997.5	1.6	190.	6.9	6.2	186.0	14.3	36.0	.000
198	26.2	994.8	2.0	190.	8.4	7.0	172.1	19.2	34.2	.000
199	23.8	997.7	2.9	181.	8.6	8.3	186.5	14.2	31.1	.000
200	23.8	1000.9	1.7	188.	7.8	7.1	184.0	13.1	34.3	.000
201	26.6	999.2	1.5	227.	7.9	6.4	182.3	15.1	37.8	.000
202	28.7	995.7	1.6	217.	6.8	7.4	182.9	16.3	41.1	.000
203	28.6	992.7	2.3	180.	8.6	8.8	184.7	17.6	37.0	.000
204	27.2	995.6	2.5	181.	9.8	7.9	181.0	16.2	35.1	.000
205	26.8	997.9	1.7	225.	5.9	6.0	179.5	16.0	37.6	.000
206	27.4	996.9	1.6	177.	6.3	6.2	176.6	14.6	38.8	.000
207	29.2	993.7	1.7	160.	6.8	7.0	174.6	16.2	39.0	.000
208	27.4	992.1	2.0	187.	8.3	6.9	179.3	14.8	35.1	.000
209	26.4	995.3	2.1	177.	7.3	7.8	171.9	15.7	36.9	.000
210	27.4	995.9	1.7	185.	7.5	6.9	175.1	15.7	39.0	.000
211	28.4	994.2	1.8	176.	6.9	7.1	170.3	14.7	41.5	.000
212	29.1	993.4	1.9	168.	8.3	7.0	155.9	17.4	40.1	.000
213	31.1	993.1	1.3	286.	5.8	8.1	167.6	19.0	44.4	.000

End hr	t2	t10	pres	ws	wd	rh2	rh10	kd	nr
1	33.9	32.8	993.8	3.8	174.	19.2	19.8	503.5	280.0
2	33.1	32.3	993.5	4.1	175.	21.2	21.5	315.8	145.6
3	31.5	31.3	993.7	3.6	175.	24.9	24.6	146.7	29.5
4	28.7	29.3	993.9	2.4	176.	31.0	29.2	18.7	-57.2
5	25.8	27.0	994.5	1.6	167.	38.5	35.3	.1	-63.3
6	23.4	25.3	995.1	1.2	129.	45.9	40.7	.0	-57.5
7	21.8	24.1	995.4	1.2	316.	51.6	44.3	.0	-53.2
8	20.6	22.6	995.6	1.3	326.	54.0	46.9	.0	-52.1
9	19.5	21.5	995.8	1.3	312.	57.3	49.2	.0	-51.6
10	18.6	20.6	995.9	1.3	316.	59.5	51.0	.0	-50.0
11	17.6	19.6	996.0	1.3	296.	63.7	55.4	.0	-49.5
12	16.7	18.8	996.2	1.0	325.	68.2	59.8	.0	-48.7
13	16.0	17.9	996.4	.8	331.	71.9	63.9	.7	-47.0
14	15.9	17.5	996.7	.9	309.	73.3	66.0	42.9	-22.2
15	19.3	19.3	997.0	1.1	231.	61.6	60.6	194.0	73.5
16	22.6	21.9	997.1	1.2	238.	49.8	51.3	376.1	203.1
17	25.1	24.3	997.0	1.4	246.	42.3	44.0	557.0	334.9
18	27.5	26.6	996.7	1.4	249.	36.0	37.6	723.9	453.7
19	29.6	28.6	996.4	1.5	210.	30.5	31.9	849.0	537.5
20	31.3	30.2	996.0	1.8	194.	26.2	27.5	928.0	593.0
21	32.7	31.4	995.6	2.4	196.	22.4	23.5	966.5	606.3
22	33.6	32.4	995.1	2.8	192.	19.7	20.6	930.4	583.6
23	34.3	33.0	994.6	3.2	182.	18.1	18.9	818.9	504.9
24	34.4	33.2	994.1	3.4	175.	18.0	18.6	664.8	396.0

Average for Jul 00

temp	ws	wd	nr	mr	prec
25.6	1.9	223.5	174.6	7.5	2.286

Fig. 5.27 Climatological data for RDG during August 00

JD	temp	pres	ws	wd	gust	mr	nr	tmin	tmax	prec
214	33.8	992.9	2.0	287.	8.1	8.4	153.8	24.1	40.4	.000
215	32.2	992.0	1.9	177.	8.2	10.3	162.4	21.8	42.4	.000
216	30.3	990.9	2.2	186.	8.8	9.9	168.1	19.7	38.0	.000
217	27.7	994.4	2.1	182.	8.5	6.8	157.0	16.2	36.3	.000
218	28.5	996.8	1.5	221.	5.8	7.1	170.9	17.8	39.6	.000
219	29.3	993.7	1.6	166.	6.9	8.2	169.4	17.1	40.7	.000
220	28.0	991.4	2.4	176.	9.1	10.0	157.6	17.7	35.7	.000
221	26.6	994.1	2.5	169.	9.2	9.3	169.5	16.0	35.6	.000
222	25.7	995.3	2.2	166.	10.1	8.3	170.9	17.3	34.9	.000
223	23.8	995.5	2.3	180.	9.1	7.0	168.1	13.3	31.9	.000
224	24.8	997.1	1.6	228.	8.3	6.7	166.5	12.8	37.3	.000
225	27.1	994.7	1.6	192.	7.9	6.3	165.9	15.3	38.1	.000
226	26.9	994.0	1.6	170.	7.5	6.6	164.8	14.5	37.2	.000
227	27.1	993.1	1.8	156.	8.0	5.2	163.1	14.3	37.7	.000
228	27.5	995.6	1.7	181.	7.6	5.9	162.1	15.4	38.0	.000
229	28.1	997.1	1.4	316.	6.0	5.2	159.8	14.5	40.0	.000
230	28.1	994.9	1.5	165.	8.0	5.7	159.1	15.6	37.7	.000
231	25.8	994.8	1.9	194.	8.5	4.7	156.4	13.6	34.2	.000
232	24.5	996.6	2.2	164.	8.3	6.2	157.7	13.5	32.6	.000
233	25.0	998.3	1.8	195.	8.3	6.5	156.8	14.6	34.7	.000
234	25.7	994.4	1.7	171.	7.0	6.5	150.3	13.6	36.0	.000
235	25.2	992.8	1.7	165.	7.9	7.4	148.8	13.9	36.1	.000
236	24.8	994.5	1.9	183.	9.2	6.3	153.4	12.7	34.6	.000
237	24.5	999.3	1.8	181.	7.6	7.5	153.1	13.0	35.1	.000
238	24.6	998.2	1.4	147.	5.9	5.5	151.5	12.3	36.8	.000
239	25.8	994.0	1.7	172.	6.6	5.5	151.5	13.7	36.1	.000
240	25.5	991.3	1.6	162.	6.7	5.7	152.5	13.8	37.1	.000
241	25.6	991.5	1.5	158.	6.3	5.3	149.0	13.3	38.2	.000
242	24.4	993.3	1.9	171.	8.5	7.8	76.7	15.4	29.0	.000
243	20.6	994.9	2.0	185.	9.5	8.3	137.0	12.6	28.7	.000
244	18.2	994.9	1.9	167.	9.5	8.9	72.6	12.8	22.2	.000

End hr	t2	t10	pres	ws	wd	rh2	rh10	kd	nr
1	35.7	34.7	992.6	4.0	166.	15.9	16.3	446.1	240.8
2	34.8	34.2	992.4	4.0	167.	17.0	17.1	253.2	107.6
3	32.5	32.6	992.4	3.1	170.	20.9	20.4	55.2	-22.3
4	29.1	30.1	992.9	2.0	176.	27.6	25.8	2.4	-57.6
5	26.7	28.3	993.6	1.4	191.	34.0	30.7	.0	-53.0
6	24.5	26.9	994.1	1.2	42.	40.0	34.2	.0	-48.3
7	22.9	25.3	994.4	1.1	11.	43.9	37.2	.0	-46.1
8	21.3	23.5	994.8	1.1	347.	47.6	40.4	.0	-45.6
9	19.9	22.2	994.9	1.0	330.	51.8	44.0	.0	-43.8
10	18.8	21.2	995.0	1.0	324.	55.5	46.7	.0	-42.5
11	18.1	20.4	995.1	.9	343.	58.4	50.0	.0	-41.8
12	17.2	19.5	995.2	.8	344.	62.3	53.6	.0	-40.9
13	16.5	18.6	995.3	.8	350.	65.7	57.3	.0	-41.1
14	15.8	17.9	995.7	.7	356.	68.8	59.9	12.6	-33.7
15	18.3	19.0	996.1	.7	347.	61.2	57.3	132.2	35.7
16	22.8	22.3	996.3	1.0	317.	45.2	46.2	316.6	163.1
17	26.1	25.4	996.3	1.3	328.	35.7	36.9	500.4	294.7
18	28.6	27.8	996.1	1.4	350.	30.3	31.5	667.8	412.2
19	30.7	29.7	995.8	1.6	202.	26.5	27.7	794.4	496.9
20	32.4	31.3	995.3	2.0	183.	22.9	24.0	862.0	543.7
21	33.7	32.5	994.7	2.6	190.	20.1	21.1	896.1	554.9
22	34.5	33.3	994.2	3.1	180.	18.1	19.0	861.7	535.6
23	35.2	33.9	993.6	3.5	174.	17.3	18.1	744.0	455.4
24	35.3	34.1	993.0	3.8	168.	17.0	17.7	606.8	358.2

Average for Aug 00

temp	ws	wd	nr	mr	prec
26.3	1.8	206.9	153.4	7.1	.000

Fig. 5.28 Climatological data for RDG during September 00

JD	temp	pres	ws	wd	gust	mr	nr	tmin	tmax	prec
245	17.4	992.7	4.1	186.	11.8	9.9	-999.9	14.4	21.5	18.796
246	15.5	997.1	2.8	188.	15.9	8.4	-999.9	11.2	22.5	41.910
247	16.6	998.1	1.3	317.	6.4	8.2	-999.9	12.7	23.9	5.080
248	17.0	998.4	1.3	347.	7.2	7.9	-999.9	11.7	23.8	3.302
249	16.6	1001.8	1.8	342.	7.3	6.4	-999.9	8.6	26.6	.000
250	21.6	1001.2	2.5	352.	10.9	5.7	-999.9	14.0	31.3	.000
251	23.6	995.4	1.5	334.	8.5	6.0	-999.9	13.5	33.7	.000
252	21.2	990.9	1.5	181.	7.7	6.4	-999.9	10.9	31.8	.000
253	23.2	990.2	1.9	294.	7.5	6.7	-999.9	14.7	31.5	.000
254	21.3	992.9	1.0	307.	4.4	7.5	-999.9	10.8	33.0	.000
255	23.3	995.3	1.2	338.	4.8	7.8	-999.9	12.4	35.2	.000
256	23.7	995.8	1.3	303.	5.5	7.1	-999.9	12.9	35.5	.000
257	25.8	993.8	1.5	332.	6.7	7.1	-999.9	18.5	34.7	.000
258	22.1	993.1	.9	309.	4.7	11.3	-999.9	16.3	28.1	.000
259	22.4	997.8	1.3	187.	5.6	11.3	-999.9	17.6	29.5	.000
260	21.6	996.9	1.1	41.	5.2	8.2	-999.9	13.5	32.3	.000
261	26.6	995.8	2.4	344.	10.7	8.3	-999.9	20.0	37.0	.000
262	31.3	995.2	2.2	350.	7.3	6.7	-999.9	24.4	40.1	.000
263	32.2	993.3	2.5	345.	9.4	7.7	-999.9	25.3	39.6	.000
264	32.1	988.0	2.4	351.	7.4	7.5	-999.9	27.4	38.7	.000
265	24.6	983.5	2.4	194.	9.3	8.8	102.5	19.0	26.9	.000
266	19.4	986.2	3.1	198.	9.4	9.2	20.0	15.5	20.9	.000
267	16.9	994.8	1.9	352.	8.1	5.6	100.3	9.9	26.5	.000
268	16.7	998.9	1.0	3.	4.4	4.5	85.8	5.4	29.3	.000
269	19.5	999.2	1.2	336.	4.4	5.3	92.6	9.2	32.6	.000
270	21.0	996.9	1.3	321.	4.4	5.6	91.8	11.3	32.2	.000
271	21.6	996.6	1.2	319.	5.4	6.6	89.3	10.8	33.5	.000
272	21.9	998.4	1.8	181.	6.5	8.1	85.5	12.7	29.4	.000
273	22.8	997.4	2.2	340.	9.4	7.4	90.8	13.1	35.0	.000
274	28.4	993.7	2.1	337.	7.2	6.5	83.0	20.1	37.4	.000

End hr	t2	t10	pres	ws	wd	rh2	rh10	kd	nr
1	29.6	29.3	993.2	2.3	162.	28.1	27.2	281.8	-999.9
2	28.0	28.6	993.1	1.9	176.	31.4	28.6	82.1	-999.9
3	24.6	26.3	993.2	1.5	205.	40.0	34.4	5.0	-999.9
4	22.2	24.1	993.7	1.5	254.	46.5	40.1	.0	-999.9
5	20.7	22.6	994.2	1.5	327.	52.4	45.4	.0	-999.9
6	19.6	21.3	994.5	1.6	311.	56.4	49.8	.0	-999.9
7	18.9	20.4	994.8	1.5	311.	58.9	53.0	.0	-999.9
8	18.5	19.8	995.0	1.6	320.	61.5	55.8	.0	-999.9
9	17.8	19.0	995.2	1.7	318.	64.4	59.1	.0	-999.9
10	17.2	18.4	995.3	1.7	315.	66.9	61.3	.0	-999.9
11	16.9	18.1	995.3	1.5	319.	67.3	61.4	.0	-999.9
12	16.3	17.6	995.4	1.5	308.	68.7	62.5	.0	-999.9
13	16.0	17.2	995.5	1.5	309.	69.3	63.4	.0	-999.9
14	15.8	16.9	995.8	1.6	312.	69.9	64.5	1.0	-999.9
15	16.4	17.0	996.2	1.5	323.	68.6	64.7	58.4	-999.9
16	19.0	18.8	996.5	1.6	329.	59.5	59.0	208.7	-999.9
17	21.6	21.2	996.6	1.9	331.	50.1	50.5	380.1	-999.9
18	23.7	23.1	996.6	2.1	338.	43.7	44.1	519.4	-999.9
19	25.6	24.9	996.3	2.1	353.	38.8	39.4	661.1	-999.9
20	27.3	26.6	995.8	2.2	7.	34.1	34.5	723.3	-999.9
21	28.6	27.9	995.2	2.3	6.	30.8	31.0	738.3	-999.9
22	29.6	28.9	994.6	2.4	165.	28.3	28.5	700.7	-999.9
23	30.2	29.6	993.9	2.5	167.	26.4	26.4	596.0	-999.9
24	30.4	29.9	993.4	2.4	152.	26.1	25.8	445.8	-999.9

Average for Sep 00

temp	ws	wd	nr	mr	prec
22.3	1.8	318.0	84.1	7.5	69.088

5.8 Richmond Surface Climatology

The Richmond site, 15 km north of downtown San Francisco, is representative of a marine west coast climate. Temperatures are relatively cool, relative humidities are high, the diurnal temperature range is small, and the winds are fairly strong from the southwest. While temperatures are relatively cool, values exceeding 30 ^{o}C occurred eleven times during the CCOS measurement period with a maximum of 41.9 ^{o}C recorded on 6/14/00. Maximum daytime temperatures averaged 21 ^{o}C with nighttime lows averaging 13 ^{o}C. Southwest winds dominated at all times of the day, averaging 5.3 m s^{-1}, with maximum speeds occurring in the late afternoon.

Fig. 5.29 Climatological data for RMD during June 00

JD	temp	pres	ws	wd	gust	mr	nr	tmin	tmax	prec
153	17.6	997.6	3.9	207.	11.3	6.8	184.8	11.6	24.4	.000
154	14.0	1001.7	4.7	212.	8.8	7.4	189.0	9.7	20.3	.000
155	13.5	1004.9	3.5	216.	6.9	7.5	186.5	9.2	19.7	.000
156	13.0	1003.7	4.0	219.	10.4	7.4	185.2	8.7	17.8	.000
157	14.2	1004.1	6.0	225.	11.5	7.8	177.5	10.7	19.8	.000
158	15.4	1003.0	4.4	202.	10.5	8.2	193.3	11.2	22.9	.000
159	15.7	1001.1	4.9	228.	13.2	8.4	127.4	11.9	19.1	.000
160	13.9	998.8	6.0	238.	10.7	8.6	163.4	11.2	18.7	6.350
161	14.1	1001.6	6.4	239.	11.7	7.6	193.7	10.5	19.8	.000
162	14.4	1002.3	5.3	237.	11.3	7.4	193.1	10.0	20.4	.000
163	15.1	1002.5	4.3	234.	10.3	6.9	183.1	11.0	23.4	.000
164	17.3	1004.3	4.5	230.	11.4	8.5	178.9	13.1	26.0	.000
165	21.4	1001.0	4.0	247.	13.6	9.5	197.6	16.8	34.6	.000
166	32.6	997.5	3.1	340.	6.9	8.0	180.4	26.2	41.9	.000
167	24.3	997.1	6.0	226.	14.2	8.5	194.3	16.6	32.5	.000
168	14.9	992.9	6.1	223.	11.9	9.4	205.5	12.1	18.6	.000
169	15.2	992.2	9.3	225.	14.6	9.6	199.2	12.3	20.5	.000
170	16.4	996.8	8.8	225.	13.8	9.4	157.5	14.0	19.8	.000
171	14.7	998.6	6.0	220.	12.7	8.9	209.3	11.0	20.4	.000
172	15.2	998.1	5.2	216.	9.3	9.0	205.8	11.4	24.9	.000
173	16.0	997.8	4.6	207.	8.8	9.2	211.9	12.0	23.4	.000
174	14.0	996.6	6.8	214.	13.8	8.7	168.5	11.2	15.6	.000
175	12.9	997.6	8.6	218.	13.2	8.1	171.5	11.0	17.1	.000
176	14.3	1001.7	8.2	225.	14.1	8.7	174.0	12.1	19.2	.000
177	15.3	1002.5	5.4	219.	12.7	9.2	185.6	12.1	21.6	.000
178	15.3	1000.4	4.7	216.	8.5	9.2	196.5	11.8	22.6	.000
179	15.4	998.3	5.0	204.	8.9	9.3	198.5	12.3	20.8	.000
180	14.9	998.9	5.4	216.	10.4	9.4	193.5	11.9	20.8	.254
181	14.0	999.2	8.0	221.	14.4	9.1	161.0	12.0	17.1	.000
182	13.6	998.8	7.7	218.	14.0	8.4	212.4	11.3	17.9	.000

End hr	t2	t10	pres	ws	wd	rh2	rh10	kd	nr
1	19.8	-99.9	999.2	6.8	222.	61.2	-99.9	527.8	311.1
2	18.8	-99.9	999.0	6.2	224.	64.7	-99.9	325.6	172.9
3	17.5	-99.9	999.0	5.7	226.	70.1	-99.9	145.2	54.0
4	16.1	-99.9	999.1	5.7	228.	75.7	-99.9	16.2	-41.6
5	15.0	-99.9	999.3	5.6	231.	81.3	-99.9	.0	-50.3
6	14.7	-99.9	999.7	5.3	228.	83.0	-99.9	.0	-45.3
7	14.4	-99.9	999.6	5.4	224.	83.8	-99.9	.0	-41.4
8	14.0	-99.9	999.5	5.5	223.	85.5	-99.9	.0	-38.6
9	13.5	-99.9	999.4	5.5	222.	87.0	-99.9	.0	-34.8
10	13.2	-99.9	999.2	5.2	223.	88.1	-99.9	.0	-32.3
11	12.9	-99.9	999.2	5.2	221.	89.6	-99.9	.0	-29.5
12	12.7	-99.9	999.1	5.4	222.	90.8	-99.9	.0	-27.8
13	12.5	-99.9	999.3	5.4	225.	91.0	-99.9	.8	-24.5
14	12.7	-99.9	999.7	5.0	224.	90.4	-99.9	39.4	.6
15	13.2	-99.9	1000.0	4.6	223.	88.8	-99.9	146.7	73.1
16	13.9	-99.9	1000.4	4.7	221.	85.8	-99.9	277.6	165.1
17	14.9	-99.9	1000.6	5.0	220.	81.7	-99.9	447.2	282.7
18	16.3	-99.9	1000.6	5.6	217.	75.8	-99.9	663.7	431.3
19	17.5	-99.9	1000.7	5.8	216.	71.0	-99.9	810.0	530.2
20	18.6	-99.9	1000.7	6.1	215.	66.8	-99.9	936.3	611.8
21	19.5	-99.9	1000.5	6.5	218.	63.2	-99.9	975.1	636.1
22	20.4	-99.9	1000.2	6.4	219.	60.6	-99.9	926.9	596.5
23	20.5	-99.9	999.9	6.8	221.	59.6	-99.9	835.6	525.0
24	20.3	-99.9	999.5	7.0	222.	59.9	-99.9	707.2	439.0

Average for Jun 00

temp	ws	wd	nr	mr	prec
16.0	5.7	222.1	186.0	8.5	6.604

Fig. 5.30 Climatological data for RMD during July 00

JD	temp	pres	ws	wd	gust	mr	nr	tmin	tmax	prec
183	14.6	999.8	5.5	212.	11.4	8.4	201.3	11.7	21.8	.000
184	13.6	1000.3	5.7	213.	12.6	8.0	162.3	10.7	15.8	.000
185	13.2	1000.4	6.2	203.	11.3	7.8	204.5	10.5	18.4	.000
186	13.7	1001.4	6.1	196.	10.5	7.8	200.6	10.5	19.4	.000
187	15.5	1000.6	5.0	234.	10.1	8.4	188.4	11.7	20.2	.000
188	14.7	1000.7	5.1	228.	12.9	8.0	163.6	11.1	19.7	.000
189	15.2	1000.9	5.0	232.	10.5	8.0	144.0	12.1	20.5	.000
190	14.8	1001.8	5.2	226.	10.4	8.6	146.4	12.6	19.4	.000
191	14.5	1000.4	6.4	213.	10.9	8.7	204.3	11.7	19.6	.000
192	13.6	999.3	7.1	222.	14.1	8.8	147.6	11.4	17.4	.000
193	13.7	1000.1	7.7	224.	13.8	8.8	180.2	11.7	18.5	.000
194	14.8	1002.0	8.3	224.	13.9	9.0	154.6	12.8	19.3	.000
195	16.1	1004.9	6.1	224.	12.9	8.5	184.2	13.1	22.2	.000
196	15.1	1005.2	4.5	219.	8.7	8.6	185.6	11.5	21.8	.000
197	15.0	1003.3	5.7	206.	11.3	8.8	189.4	12.0	18.2	.000
198	14.1	1001.6	6.0	218.	12.8	8.6	121.2	11.9	19.4	.000
199	15.1	1004.1	4.5	237.	8.3	8.7	85.0	13.8	19.7	.000
200	15.8	1006.2	4.6	207.	8.7	9.0	183.9	12.3	23.7	.000
201	16.5	1004.7	5.4	194.	10.4	8.4	188.6	11.9	21.5	.000
202	14.3	1001.9	5.7	195.	10.9	8.4	177.9	10.6	20.3	.000
203	12.7	999.6	6.5	180.	13.3	8.7	175.9	10.6	16.8	.000
204	14.3	1002.0	5.1	169.	10.8	9.1	177.4	11.7	20.1	.000
205	16.1	1002.8	5.6	179.	10.1	8.6	200.2	11.5	26.4	.000
206	16.2	1001.7	5.7	194.	12.7	8.9	204.7	12.1	24.0	.000
207	14.3	999.8	7.4	185.	13.8	8.6	216.3	10.7	22.0	.000
208	17.2	999.1	5.6	182.	10.4	8.4	192.7	12.2	24.0	.000
209	15.5	1001.2	4.4	204.	11.2	8.5	178.4	12.4	21.8	.000
210	15.4	1001.2	6.0	189.	11.8	8.8	197.5	11.2	23.1	.000
211	14.7	999.6	7.2	193.	12.4	9.2	198.4	11.5	23.8	.000
212	15.8	998.6	5.3	206.	10.4	9.1	187.1	11.6	27.2	.000
213	17.1	998.1	5.6	195.	10.8	9.4	201.4	11.7	31.9	.000

End hr	t2	t10	pres	ws	wd	rh2	rh10	kd	nr
1	18.8	-99.9	1001.0	6.1	205.	65.3	-99.9	502.7	300.9
2	18.2	-99.9	1000.7	5.5	210.	66.9	-99.9	318.1	172.4
3	16.8	-99.9	1000.7	5.5	211.	72.0	-99.9	140.1	53.2
4	15.2	-99.9	1000.7	5.6	206.	78.7	-99.9	14.4	-39.0
5	14.2	-99.9	1001.0	5.7	204.	83.7	-99.9	.0	-48.3
6	13.5	-99.9	1001.2	6.3	203.	87.7	-99.9	.0	-43.3
7	13.0	-99.9	1001.2	6.2	198.	90.9	-99.9	.0	-37.4
8	12.7	-99.9	1001.2	6.4	202.	91.8	-99.9	.0	-31.9
9	12.5	-99.9	1001.0	6.0	205.	93.2	-99.9	.0	-28.1
10	12.3	-99.9	1000.9	5.8	205.	94.5	-99.9	.0	-23.5
11	12.1	-99.9	1000.8	5.8	206.	95.1	-99.9	.0	-20.8
12	12.0	-99.9	1000.8	5.6	205.	95.2	-99.9	.0	-17.4
13	12.0	-99.9	1000.9	5.6	208.	95.2	-99.9	.2	-17.5
14	12.0	-99.9	1001.2	5.4	211.	95.5	-99.9	22.0	.8
15	12.2	-99.9	1001.6	5.3	210.	94.8	-99.9	96.4	56.4
16	12.7	-99.9	1002.0	5.3	209.	92.8	-99.9	215.6	141.0
17	13.5	-99.9	1002.3	5.5	206.	88.8	-99.9	403.6	269.9
18	14.6	-99.9	1002.4	5.7	206.	83.6	-99.9	578.7	390.7
19	15.9	-99.9	1002.5	5.9	207.	77.8	-99.9	746.6	505.2
20	17.1	-99.9	1002.4	6.2	208.	72.4	-99.9	861.1	579.9
21	18.3	-99.9	1002.2	6.2	208.	67.6	-99.9	917.0	610.8
22	19.3	-99.9	1001.9	6.1	210.	63.9	-99.9	879.4	577.6
23	20.1	-99.9	1001.5	6.1	210.	61.0	-99.9	814.0	519.7
24	19.8	-99.9	1001.2	6.2	208.	61.7	-99.9	670.9	420.5

Average for Jul 00

temp	ws	wd	nr	mr	prec
14.9	5.8	214.3	178.8	8.6	.000

Fig. 5.31 Climatological data for RMD during August 00

JD	temp	pres	ws	wd	gust	mr	nr	tmin	tmax	prec
214	20.8	997.8	4.2	195.	11.0	9.4	141.8	14.5	31.3	.000
215	20.6	997.5	5.6	213.	11.0	8.9	172.0	16.7	25.2	.000
216	15.6	997.3	8.1	223.	14.6	9.5	158.1	12.8	18.7	.000
217	15.3	1000.3	8.1	222.	15.8	9.5	170.7	13.6	19.8	.000
218	14.8	1002.4	5.6	205.	10.4	9.1	190.8	11.6	22.2	.000
219	13.8	1000.0	7.0	177.	14.2	8.9	169.9	11.6	18.1	.000
220	14.7	998.6	5.5	195.	10.3	9.1	180.3	12.2	20.8	.000
221	15.1	1000.5	4.6	216.	10.0	9.3	161.5	12.5	20.9	.000
222	15.8	1001.5	4.1	220.	10.4	8.8	189.7	13.0	21.6	.000
223	16.5	1002.0	4.4	221.	10.8	8.5	165.1	13.5	21.0	.000
224	17.8	1001.6	3.8	217.	8.4	9.2	185.3	12.6	29.2	.000
225	18.1	999.5	4.9	198.	10.5	8.6	179.9	13.5	23.8	.000
226	15.6	999.5	6.6	190.	13.7	8.5	180.2	11.7	23.5	.000
227	17.9	998.2	5.4	184.	10.6	8.1	172.9	12.6	27.0	.000
228	17.4	1000.7	5.3	190.	10.0	7.9	168.5	11.8	26.7	.000
229	19.3	1001.6	4.0	195.	9.0	8.2	164.1	13.1	30.1	.000
230	17.6	1000.3	5.4	182.	9.8	7.8	167.6	12.3	27.2	.000
231	17.0	1001.0	5.4	183.	12.9	7.7	164.9	11.9	25.9	.000
232	15.4	1002.6	6.3	188.	11.2	8.7	172.0	11.1	23.4	.000
233	15.7	1003.6	4.9	188.	9.7	8.2	175.0	11.1	22.3	.000
234	15.5	999.5	5.8	201.	10.8	8.4	173.7	11.9	20.4	.000
235	14.9	998.4	6.7	218.	11.0	9.0	157.8	12.7	19.1	.000
236	14.5	1000.9	7.3	223.	12.0	8.9	151.5	12.5	18.7	.000
237	16.6	1004.3	3.4	226.	10.6	9.1	162.3	12.9	27.5	.000
238	18.2	1002.5	3.3	196.	8.2	8.8	172.2	12.6	25.2	.000
239	15.4	999.5	6.4	201.	12.2	9.1	141.0	12.2	18.5	.000
240	14.0	996.4	6.0	214.	10.4	9.0	153.8	11.5	20.5	.000
241	14.6	997.2	7.2	222.	12.5	9.0	156.9	11.6	18.7	.000
242	13.8	1000.1	7.1	223.	12.0	8.7	42.8	12.3	15.7	.000
243	14.8	1000.5	4.7	221.	9.0	9.3	20.5	13.7	16.6	.000
244	15.7	1000.3	5.0	220.	11.0	10.1	131.6	13.5	21.0	.000

End hr	t2	t10	pres	ws	wd	rh2	rh10	kd	nr
1	20.7	-99.9	999.4	5.8	209.	59.9	-99.9	417.8	257.6
2	19.7	-99.9	999.2	5.3	211.	63.0	-99.9	232.1	124.2
3	18.2	-99.9	999.1	4.8	209.	67.9	-99.9	69.8	7.9
4	16.4	-99.9	999.3	5.3	199.	75.7	-99.9	1.6	-46.7
5	15.5	-99.9	999.7	5.8	197.	80.5	-99.9	.0	-45.1
6	14.7	-99.9	999.9	6.1	197.	84.8	-99.9	.0	-40.2
7	14.1	-99.9	1000.0	6.3	197.	88.0	-99.9	.0	-36.4
8	13.7	-99.9	1000.0	6.2	201.	90.2	-99.9	.0	-32.6
9	13.4	-99.9	1000.0	5.7	202.	91.2	-99.9	.0	-29.5
10	13.3	-99.9	999.8	5.6	204.	91.9	-99.9	.0	-24.2
11	13.2	-99.9	999.8	5.5	205.	92.1	-99.9	.0	-21.7
12	13.1	-99.9	999.8	5.6	209.	92.4	-99.9	.0	-21.1
13	13.0	-99.9	999.8	5.4	210.	92.6	-99.9	.0	-19.9
14	13.0	-99.9	1000.2	5.4	209.	92.5	-99.9	6.5	-14.5
15	13.3	-99.9	1000.6	5.0	211.	91.7	-99.9	79.6	35.8
16	13.8	-99.9	1001.0	4.8	210.	89.3	-99.9	196.6	123.4
17	14.7	-99.9	1001.2	5.0	210.	85.1	-99.9	339.2	227.8
18	16.0	-99.9	1001.4	5.2	211.	78.8	-99.9	515.3	351.7
19	17.5	-99.9	1001.5	5.3	208.	72.2	-99.9	701.7	478.1
20	18.9	-99.9	1001.3	5.7	208.	66.5	-99.9	824.6	560.1
21	20.1	-99.9	1001.0	5.5	211.	61.8	-99.9	844.5	569.3
22	20.7	-99.9	1000.7	5.8	207.	59.9	-99.9	800.6	533.5
23	21.1	-99.9	1000.2	5.9	208.	57.9	-99.9	719.2	474.3
24	21.1	-99.9	999.8	6.0	210.	58.3	-99.9	581.7	377.2

Average for Aug 00

temp	ws	wd	nr	mr	prec
16.2	5.5	211.6	157.9	8.8	.000

Fig. 5.32 Climatological data for RMD during September 00

JD	temp	pres	ws	wd	gust	mr	nr	tmin	tmax	prec
245	14.9	999.8	5.8	221.	9.2	10.2	47.0	13.4	16.5	1.778
246	16.2	1002.2	4.5	219.	8.4	9.8	161.3	14.0	21.4	1.016
247	16.3	1002.5	4.0	229.	8.8	7.8	157.1	12.2	22.4	.000
248	16.3	1003.2	4.5	241.	9.0	7.5	152.3	12.9	22.3	.000
249	17.0	1004.9	3.3	244.	10.1	7.7	153.0	12.5	25.2	.000
250	20.9	1002.5	2.4	281.	7.8	6.6	146.0	16.0	30.8	.000
251	23.5	998.5	1.9	268.	7.1	5.8	146.0	16.6	32.2	.000
252	18.3	995.3	5.6	207.	11.7	8.0	151.1	12.4	22.2	.000
253	15.2	995.0	6.4	197.	11.0	8.7	145.9	12.2	17.2	.000
254	14.8	997.5	6.1	218.	10.8	8.6	149.8	11.7	20.1	.000
255	16.1	999.6	3.9	217.	8.8	8.9	155.8	11.6	27.1	.000
256	18.9	999.4	2.0	205.	6.8	7.9	101.3	13.3	26.8	.000
257	22.9	996.5	2.9	338.	10.4	8.5	75.9	18.7	28.7	.000
258	19.3	998.8	6.0	207.	13.8	10.0	124.6	15.4	23.4	.000
259	17.4	1003.5	3.7	213.	7.5	10.0	141.8	13.7	23.4	.000
260	16.8	1001.5	4.1	213.	10.3	10.0	133.0	13.2	24.3	.000
261	22.7	998.4	1.8	343.	4.8	9.5	136.4	15.9	35.5	.000
262	26.4	997.3	1.9	217.	7.1	8.8	130.1	20.5	34.4	.000
263	25.0	996.5	2.8	192.	10.7	8.5	128.6	17.4	34.0	.000
264	21.6	991.6	4.5	214.	16.7	9.4	131.0	17.0	24.0	.000
265	16.4	990.6	10.6	223.	15.9	10.6	121.2	14.8	20.3	.254
266	15.4	990.5	6.4	219.	13.4	10.0	88.0	14.1	18.7	.508
267	16.4	997.7	2.7	224.	8.2	9.1	125.8	13.0	24.2	.000
268	17.6	1002.7	3.3	214.	7.6	9.1	114.7	12.8	25.7	.000
269	18.0	1002.1	2.7	210.	8.2	9.3	109.6	13.8	25.8	.000
270	16.7	1001.0	4.5	217.	8.8	9.7	114.1	13.5	20.8	.000
271	15.9	1002.3	5.3	223.	12.8	9.4	95.8	13.4	19.0	.000
272	14.7	1004.3	4.6	230.	11.0	8.4	34.6	13.3	17.1	.000
273	15.5	1001.1	4.6	202.	9.2	9.3	112.0	13.0	22.9	.000
274	20.2	996.7	2.8	187.	9.0	9.6	97.4	15.4	29.7	.000

End hr	t2	t10	pres	ws	wd	rh2	rh10	kd	nr
1	21.8	-99.9	998.3	5.2	220.	55.7	-99.9	288.8	155.3
2	20.5	-99.9	998.3	4.7	224.	60.2	-99.9	113.9	22.9
3	18.9	-99.9	998.3	4.5	225.	65.6	-99.9	8.6	-40.5
4	18.0	-99.9	998.6	4.4	222.	68.9	-99.9	.0	-46.4
5	17.5	-99.9	998.9	4.4	221.	71.7	-99.9	.0	-45.0
6	17.2	-99.9	998.9	4.1	222.	72.8	-99.9	.0	-44.1
7	16.8	-99.9	999.0	3.9	219.	75.3	-99.9	.0	-42.2
8	16.2	-99.9	999.0	4.3	207.	78.9	-99.9	.0	-40.5
9	15.7	-99.9	998.9	4.3	207.	81.9	-99.9	.0	-40.4
10	15.5	-99.9	998.9	4.0	213.	82.9	-99.9	.0	-37.6
11	15.3	-99.9	998.8	4.1	214.	84.3	-99.9	.0	-35.4
12	15.1	-99.9	998.7	4.1	218.	85.4	-99.9	.0	-34.5
13	14.9	-99.9	998.8	3.9	219.	86.2	-99.9	.0	-31.2
14	14.8	-99.9	999.0	3.5	221.	87.3	-99.9	.8	-27.9
15	15.0	-99.9	999.5	3.3	219.	86.9	-99.9	53.6	8.4
16	16.0	-99.9	999.8	3.2	219.	82.4	-99.9	202.4	110.2
17	17.2	-99.9	1000.1	3.4	217.	77.3	-99.9	370.1	230.2
18	18.6	-99.9	1000.4	3.3	217.	71.0	-99.9	512.1	335.0
19	19.9	-99.9	1000.3	3.7	215.	64.1	-99.9	646.0	430.3
20	21.5	-99.9	1000.1	4.1	214.	57.3	-99.9	735.3	490.7
21	22.4	-99.9	999.7	4.5	216.	53.8	-99.9	723.8	480.1
22	22.9	-99.9	999.2	5.0	218.	52.3	-99.9	695.5	454.7
23	23.0	-99.9	998.8	5.2	218.	51.8	-99.9	626.7	401.0
24	22.9	-99.9	998.4	5.4	219.	51.6	-99.9	484.0	291.9

Average for Sep 00

temp	ws	wd	nr	mr	prec
18.2	4.2	212.8	122.7	8.9	3.556

5.9 Waterford Surface Climatology

Waterford's location, 120 km southeast of the Carquinez Strait, directly exposed the site to the southern branch of marine air inflow into the San Joaquin Valley. Northwesterly winds dominated at all hours of the day, averaging 3.5 m s^{-1}. Maximum speeds occurred during the early evening hours. Temperatures were slightly cooler than Fresno to the south with daytime maximums averaging 32 ^{o}C and nighttime minimums averaging 16 ^{o}C.

Fig. 5.33 Climatological data for WFD during June 00

JD	temp	pres	ws	wd	gust	mr	nr	tmin	tmax	prec
169	26.1	996.3	4.4	318.	9.2	9.8	-999.9	18.7	32.6	.000
170	22.2	1001.8	5.7	321.	11.1	9.8	-999.9	15.8	29.3	.000
171	21.6	1004.2	4.5	310.	10.3	9.7	-999.9	14.4	32.0	.000
172	27.0	1003.4	2.4	305.	7.5	10.1	-999.9	18.9	36.0	.000
173	29.0	1002.8	3.7	316.	8.4	8.7	-999.9	19.8	37.8	.000
174	28.8	1001.4	2.7	312.	7.9	8.3	-999.9	18.2	37.0	.000
175	24.3	1002.7	3.7	310.	10.1	8.6	-999.9	14.7	34.1	.000
176	24.1	1006.4	4.5	312.	8.8	8.9	-999.9	15.3	33.1	.000
177	25.1	1007.5	4.7	313.	9.6	8.9	-999.9	17.4	34.6	.000
178	-99.9	1005.4	4.0	320.	8.5	8.5	-999.9	-99.9	-99.9	.000
179	29.2	1003.4	3.1	314.	8.0	7.8	169.7	19.1	37.7	.000
180	29.6	1003.6	3.5	316.	8.1	7.4	170.7	19.7	37.7	.000
181	28.2	1003.5	3.6	315.	9.6	8.3	168.2	19.0	35.4	.000
182	24.7	1003.5	3.5	315.	8.3	9.0	163.0	15.0	32.9	.000

End hr	t2	t10	pres	ws	wd	rh2	rh10	kd	nr
1	34.4	33.7	1001.8	5.1	308.	26.4	27.2	526.0	-999.9
2	33.2	32.8	1001.5	5.4	307.	29.5	30.1	324.8	-999.9
3	31.3	31.1	1001.7	5.2	309.	33.5	33.7	135.0	-999.9
4	28.4	28.6	1001.9	5.0	315.	40.2	39.8	13.3	-999.9
5	26.2	26.3	1002.4	5.0	325.	45.6	45.0	.0	-999.9
6	24.6	24.7	1002.9	4.6	331.	48.7	48.1	.0	-999.9
7	23.5	23.7	1003.0	4.2	333.	51.6	50.9	.0	-999.9
8	22.6	22.8	1003.0	3.6	332.	53.4	52.7	.0	-999.9
9	21.6	21.8	1003.0	3.1	328.	55.4	54.4	.0	-999.9
10	20.6	21.0	1002.9	3.1	328.	59.0	57.0	.0	-999.9
11	20.1	20.5	1003.0	3.2	329.	59.3	57.9	.0	-999.9
12	19.3	19.6	1003.0	3.0	325.	62.1	60.6	.0	-999.9
13	18.3	18.9	1003.3	2.7	325.	67.3	64.7	2.1	-999.9
14	18.1	18.4	1003.8	2.7	320.	68.8	67.0	79.5	-999.9
15	20.2	19.9	1004.3	3.2	318.	61.5	62.0	255.7	-999.9
16	22.7	22.3	1004.6	3.6	312.	52.5	54.0	454.4	-999.9
17	25.0	24.4	1004.8	3.6	307.	45.9	47.7	652.2	-999.9
18	27.0	26.3	1004.8	3.7	307.	39.4	41.2	813.4	-999.9
19	28.7	27.9	1004.7	3.6	300.	35.3	37.0	931.6	-999.9
20	30.5	29.7	1004.5	3.3	298.	31.5	32.9	995.2	-999.9
21	32.0	31.2	1004.1	3.4	297.	29.6	30.9	1001.8	-999.9
22	33.2	32.3	1003.6	3.6	296.	27.3	28.5	964.6	-999.9
23	34.1	33.2	1003.1	4.0	300.	25.7	26.8	863.5	-999.9
24	34.4	33.5	1002.7	4.5	308.	24.7	25.8	715.7	-999.9

Average for Jun 00

temp	ws	wd	nr	mr	prec
26.2	3.9	314.6	167.9	8.8	.000

Fig. 5.34 Climatological data for WFD during July 00

JD	temp	pres	ws	wd	gust	mr	nr	tmin	tmax	prec
183	22.3	1005.4	4.5	318.	8.9	7.2	163.8	13.6	30.4	.000
184	22.2	1006.0	4.2	317.	8.4	6.4	162.3	15.9	29.1	.000
185	19.2	1006.5	3.2	311.	9.4	7.5	160.2	11.6	27.3	.000
186	19.9	1007.3	3.3	312.	8.3	7.5	164.2	12.0	29.4	.000
187	20.5	1006.4	4.9	322.	9.3	7.8	166.0	14.0	26.0	.000
188	19.2	1006.6	4.1	314.	9.9	8.0	170.9	12.2	28.4	.000
189	19.7	1006.5	5.0	312.	10.2	7.9	166.9	13.5	27.1	.000
190	20.0	1007.5	4.8	314.	9.6	8.2	168.8	13.2	29.6	.000
191	23.3	1006.0	3.4	313.	8.1	8.1	168.0	14.8	32.2	.000
192	25.2	1004.4	3.4	311.	7.7	8.4	169.7	16.2	32.7	.000
193	24.7	1005.1	4.8	316.	9.4	8.6	169.3	15.7	33.7	.000
194	24.0	1006.5	4.7	317.	10.0	8.7	167.1	16.5	31.1	.000
195	22.0	1009.9	5.2	319.	9.3	8.9	169.2	14.7	30.0	.000
196	23.4	1010.6	4.1	312.	8.1	8.6	167.8	14.6	33.8	.000
197	26.3	1008.5	3.9	316.	7.6	6.8	164.7	18.5	33.3	.000
198	23.2	1006.7	4.7	314.	8.9	7.8	150.1	16.1	28.8	.000
199	20.0	1009.5	5.0	319.	10.1	8.6	168.2	13.7	29.1	.000
200	21.6	1011.8	4.5	314.	8.2	8.6	165.7	14.3	32.4	.000
201	25.1	1010.0	4.0	317.	7.7	6.9	163.8	16.8	34.6	.000
202	24.9	1006.8	4.2	314.	7.7	8.3	148.4	16.2	35.2	.000
203	25.4	1004.4	3.4	313.	7.8	9.0	148.0	15.6	34.0	.000
204	23.3	1007.1	4.7	319.	8.2	8.7	148.2	14.4	33.2	.000
205	26.1	1008.5	3.4	313.	8.6	8.1	146.5	16.1	35.8	.000
206	27.5	1007.4	2.7	312.	7.2	7.8	139.1	15.9	36.6	.000
207	27.3	1004.8	3.6	318.	7.3	8.3	141.9	18.5	35.2	.000
208	25.6	1004.2	4.0	317.	9.4	8.1	144.0	17.3	32.3	.000
209	21.2	1006.9	4.8	319.	9.8	7.7	164.7	13.1	31.6	.000
210	25.0	1006.8	3.0	312.	7.1	8.7	161.7	15.4	34.9	.000
211	27.2	1005.1	3.1	318.	7.1	9.0	153.9	19.3	36.9	.000
212	29.2	1003.9	3.5	312.	7.3	9.0	138.5	20.8	37.1	.000
213	28.7	1003.5	3.5	314.	8.4	10.4	148.4	20.7	38.6	.000

End hr	t2	t10	pres	ws	wd	rh2	rh10	kd	nr
1	31.5	30.8	1005.6	4.7	307.	25.9	27.0	515.4	257.1
2	30.5	30.0	1005.4	5.0	308.	28.7	29.6	306.5	114.5
3	28.5	28.4	1005.5	4.9	309.	33.1	33.4	116.7	-2.3
4	25.5	25.8	1005.8	4.5	313.	40.6	39.7	8.7	-70.6
5	23.1	23.4	1006.3	4.6	320.	48.0	47.0	.0	-72.4
6	21.5	21.6	1006.7	4.5	329.	54.1	53.4	.0	-69.2
7	20.4	20.6	1006.8	3.9	333.	58.5	58.0	.0	-67.4
8	19.6	19.8	1006.9	3.7	331.	60.9	60.1	.0	-65.5
9	18.8	19.1	1006.7	3.5	331.	63.3	62.1	.0	-63.9
10	18.1	18.5	1006.6	3.3	331.	65.4	64.0	.0	-61.9
11	17.4	17.7	1006.5	3.0	330.	68.0	66.7	.0	-61.1
12	16.7	17.1	1006.5	3.3	326.	70.1	68.7	.0	-60.9
13	16.1	16.4	1006.7	3.1	327.	72.7	71.6	.7	-59.3
14	16.1	16.3	1007.1	3.4	325.	73.3	72.7	57.7	-25.1
15	17.9	17.7	1007.5	4.0	324.	66.8	67.8	233.2	85.1
16	20.5	20.0	1007.9	4.3	321.	57.2	59.1	433.5	227.4
17	22.8	22.1	1008.0	4.3	314.	49.4	51.6	630.2	353.9
18	24.8	23.9	1008.0	4.3	305.	43.3	45.8	798.4	443.0
19	26.5	25.6	1008.0	4.1	302.	38.7	41.1	922.1	506.2
20	28.0	27.0	1007.7	4.1	301.	34.9	37.1	988.4	547.3
21	29.4	28.4	1007.3	4.1	301.	31.8	33.8	990.7	558.3
22	30.7	29.7	1006.9	4.1	301.	29.1	30.8	953.9	533.0
23	31.5	30.6	1006.4	4.3	301.	26.8	28.3	854.4	485.0
24	31.8	31.0	1006.0	4.5	303.	25.4	26.8	697.1	385.7

Average for Jul 00

temp	ws	wd	nr	mr	prec
23.7	4.1	315.2	159.0	8.2	.000

Fig. 5.35 Climatological data for WFD during August 00

JD	temp	pres	ws	wd	gust	mr	nr	tmin	tmax	prec
214	30.5	1003.6	2.9	312.	9.4	10.7	138.9	22.1	39.7	.000
215	30.9	1002.9	2.6	308.	8.0	10.4	132.3	21.7	39.0	.000
216	29.2	1002.3	3.1	310.	7.5	9.5	145.6	20.8	37.2	.000
217	25.6	1005.5	3.6	310.	7.8	10.1	154.1	16.5	34.6	.000
218	28.1	1007.4	4.8	315.	8.8	8.3	161.2	21.3	36.2	.000
219	27.0	1004.9	3.7	314.	8.8	7.6	158.3	17.0	34.9	.000
220	24.2	1003.6	4.2	317.	8.7	8.5	155.0	15.7	31.5	.000
221	22.0	1005.7	4.5	315.	9.7	9.4	153.6	14.5	32.0	.000
222	22.9	1006.5	3.7	312.	7.9	8.8	152.2	14.5	32.5	.000
223	22.0	1007.1	5.3	317.	9.8	8.7	154.2	14.8	30.0	.000
224	23.4	1007.3	4.3	315.	8.4	8.7	152.2	15.8	34.3	.000
225	26.2	1005.5	2.0	312.	7.2	8.0	150.2	14.5	36.4	.000
226	27.3	1005.0	3.5	316.	8.6	6.1	150.9	16.8	34.9	.000
227	26.3	1003.8	3.3	320.	9.0	7.2	148.1	18.3	35.7	.000
228	26.3	1006.3	3.1	314.	6.9	7.7	149.9	16.5	35.1	.000
229	26.5	1007.3	3.1	315.	7.4	7.8	147.5	16.9	36.7	.000
230	26.9	1005.9	2.5	317.	6.9	7.8	144.0	15.0	35.3	.000
231	25.1	1006.4	3.7	317.	7.7	6.2	143.9	15.1	32.1	.000
232	22.6	1008.4	3.6	315.	8.5	7.5	144.5	13.9	30.3	.000
233	21.3	1009.7	4.0	319.	8.1	6.9	144.7	13.3	29.9	.000
234	23.2	1005.6	1.8	301.	5.9	8.1	140.6	13.4	33.2	.000
235	24.4	1003.7	2.8	317.	7.1	8.4	140.2	16.3	33.4	.000
236	23.3	1005.8	3.9	315.	7.8	9.1	140.5	15.3	30.9	.000
237	22.1	1009.9	4.8	314.	8.5	9.2	145.2	14.5	33.0	.000
238	26.3	1008.3	3.5	313.	8.3	7.7	140.3	17.8	35.2	.000
239	26.7	1004.9	3.6	314.	7.5	7.7	142.6	17.9	34.5	.000
240	25.9	1001.7	3.5	313.	8.1	7.1	142.2	16.8	33.9	.000
241	24.8	1002.2	3.4	310.	8.1	7.5	142.2	16.1	32.8	.000
242	21.9	1005.1	4.0	316.	8.6	8.0	12.3	17.2	23.9	.000
243	18.4	1006.4	4.7	317.	11.4	9.4	69.4	15.8	22.5	.000
244	19.1	1006.5	3.6	321.	9.7	9.3	122.5	15.1	26.4	.000

End hr	t2	t10	pres	ws	wd	rh2	rh10	kd	nr
1	32.9	32.3	1004.3	4.5	304.	26.0	26.8	430.3	198.2
2	31.8	31.5	1004.1	4.5	307.	28.3	28.8	235.0	69.7
3	29.5	29.6	1004.1	4.0	308.	33.3	33.1	58.0	-29.4
4	26.5	27.0	1004.5	3.9	315.	40.9	39.2	1.0	-64.9
5	24.5	25.0	1005.0	4.1	324.	45.9	43.8	.0	-62.4
6	23.1	23.5	1005.4	3.6	331.	49.6	48.0	.0	-60.1
7	22.4	22.8	1005.5	3.5	334.	50.7	49.0	.0	-58.6
8	21.7	22.2	1005.6	3.3	333.	52.5	50.2	.0	-56.8
9	20.7	21.2	1005.6	2.9	332.	55.8	53.4	.0	-54.9
10	19.9	20.5	1005.4	2.8	331.	59.2	56.0	.0	-52.9
11	19.1	19.7	1005.4	2.8	328.	61.3	58.7	.0	-51.7
12	18.1	18.7	1005.4	2.8	322.	65.8	63.4	.0	-50.1
13	17.6	18.1	1005.6	2.8	325.	68.9	66.9	.0	-49.1
14	17.0	17.4	1006.0	2.7	323.	70.6	69.0	16.6	-38.0
15	18.2	18.1	1006.5	3.1	323.	66.1	66.4	152.8	45.1
16	21.0	20.6	1006.9	3.8	319.	55.9	57.3	339.7	173.0
17	23.5	22.9	1007.1	3.8	314.	48.1	49.9	526.9	297.2
18	25.4	24.8	1007.2	3.7	307.	42.4	44.3	690.3	401.7
19	27.3	26.6	1007.1	3.5	302.	37.5	39.3	815.7	477.7
20	29.1	28.2	1006.7	3.6	299.	33.4	35.1	891.8	525.5
21	30.5	29.6	1006.3	3.7	298.	30.7	32.3	897.1	531.1
22	31.6	30.8	1005.8	4.0	302.	28.5	30.0	864.2	498.4
23	32.4	31.6	1005.1	4.2	301.	26.5	27.8	756.7	429.4
24	32.7	31.9	1004.7	4.3	302.	26.4	27.6	607.5	326.0

Average for Aug 00

temp	ws	wd	nr	mr	prec
24.9	3.6	315.1	139.3	8.3	.000

Fig. 5.36 Climatological data for WFD during September 00

JD	temp	pres	ws	wd	gust	mr	nr	tmin	tmax	prec
245	19.6	1006.7	3.8	310.	9.6	9.2	69.0	16.3	23.8	.000
246	17.7	1009.6	2.0	339.	6.3	9.5	93.2	15.0	23.6	1.524
247	18.7	1008.9	3.6	317.	7.7	7.3	140.5	13.9	24.6	.000
248	17.6	1009.8	4.0	323.	8.4	7.0	139.9	10.6	23.9	.000
249	18.0	1010.9	4.5	313.	11.3	6.8	141.0	10.8	26.9	.000
250	19.6	1008.7	2.6	309.	9.4	6.1	131.9	10.8	29.9	.000
251	21.2	1005.3	1.2	307.	5.8	6.7	135.5	11.5	33.4	.000
252	23.9	1001.6	1.6	318.	5.5	6.6	128.1	12.8	34.7	.000
253	23.5	1000.9	3.0	318.	7.2	6.7	126.6	13.7	31.3	.000
254	22.3	1003.3	2.6	313.	6.3	7.1	128.1	12.0	31.6	.000
255	22.7	1005.6	1.9	312.	5.7	7.1	126.5	12.0	35.2	.000
256	23.6	1005.9	1.1	315.	4.3	7.8	64.8	13.3	31.8	.000
257	25.1	1003.1	1.6	300.	4.4	9.5	104.6	17.3	36.1	.000
258	24.7	1004.7	2.7	314.	9.5	10.0	130.9	18.3	29.9	.000
259	22.5	1009.2	5.1	320.	11.0	9.8	131.5	16.4	29.4	.000
260	21.8	1007.5	4.0	320.	9.3	9.1	127.3	13.9	30.9	.000
261	23.3	1004.9	2.2	309.	6.9	8.9	123.3	13.9	33.8	.000
262	24.8	1004.1	1.5	296.	5.8	8.9	121.8	14.6	36.8	.000
263	26.6	1002.7	1.4	289.	5.4	9.6	122.2	16.7	36.8	.000
264	27.5	997.8	1.4	247.	5.2	10.0	118.9	18.5	37.4	.000
265	23.2	996.0	3.8	316.	10.2	9.9	118.1	15.8	26.8	.000
266	20.7	997.5	3.5	334.	8.5	9.6	67.5	17.3	25.0	.000
267	19.0	1003.9	3.9	315.	9.6	8.7	117.2	12.9	26.7	.000
268	21.1	1009.1	2.4	321.	6.7	7.1	112.9	15.5	30.6	.000
269	22.2	1008.6	1.6	300.	4.6	7.6	109.1	13.1	32.8	.000
270	23.7	1006.6	2.9	319.	6.7	7.7	111.2	17.8	33.1	.000
271	22.6	1007.3	4.3	322.	7.9	8.3	106.7	16.4	28.0	.000
272	18.8	1010.2	5.0	322.	9.4	8.5	107.0	13.8	24.5	.000
273	18.4	1007.6	2.6	315.	7.7	8.6	102.7	12.1	27.9	.000
274	21.7	1003.8	1.1	133.	6.2	9.5	105.0	13.9	32.0	.000

End hr	t2	t10	pres	ws	wd	rh2	rh10	kd	nr
1	29.2	28.8	1004.1	3.5	304.	30.9	31.6	278.0	118.4
2	27.5	27.6	1004.0	3.2	305.	35.8	35.5	93.2	5.3
3	24.5	25.2	1004.1	3.0	309.	44.1	42.3	3.7	-52.4
4	22.1	23.0	1004.5	3.0	316.	53.0	49.7	.0	-50.9
5	20.6	21.4	1004.9	2.8	325.	59.7	56.2	.0	-48.2
6	19.3	20.1	1005.0	2.6	322.	64.2	60.9	.0	-46.4
7	18.8	19.5	1005.2	2.7	325.	65.9	63.1	.0	-45.3
8	18.2	18.8	1005.3	2.8	331.	67.8	65.4	.0	-44.2
9	17.9	18.6	1005.4	2.8	335.	68.1	65.4	.0	-42.9
10	17.4	18.0	1005.4	2.7	332.	69.2	66.6	.0	-42.1
11	16.7	17.3	1005.3	2.5	335.	71.8	69.7	.0	-41.8
12	16.0	16.6	1005.3	2.0	334.	75.1	72.7	.0	-40.3
13	15.4	16.0	1005.5	2.0	326.	78.3	76.3	.0	-39.0
14	14.9	15.5	1005.8	1.8	328.	80.1	78.0	1.8	-36.6
15	15.4	15.8	1006.3	1.7	334.	78.2	77.0	84.4	12.1
16	18.3	18.2	1006.6	2.3	332.	65.8	66.5	257.6	122.6
17	21.1	20.6	1006.9	3.0	326.	54.9	56.6	456.6	258.1
18	23.3	22.6	1006.9	3.1	307.	47.1	49.2	618.3	367.6
19	25.2	24.5	1006.7	3.0	296.	41.4	43.6	738.5	445.5
20	26.8	26.0	1006.3	3.0	295.	36.9	38.9	786.6	476.7
21	28.1	27.3	1005.8	3.0	296.	33.8	35.6	779.8	476.1
22	28.9	28.2	1005.3	3.1	297.	31.3	32.8	720.7	424.1
23	29.5	28.7	1004.7	3.3	304.	29.9	31.2	612.6	353.1
24	29.7	29.1	1004.2	3.3	307.	29.1	30.1	453.1	241.1

Average for Sep 00

temp	ws	wd	nr	mr	prec
21.9	2.8	315.3	115.4	8.3	1.524

6.0 Wind Profiler Winds Climatologies

The following section presents an overview of the upper-level winds obtained from the eight ETL wind profilers operating during the CCOS measurement period (6/1/00-9/30/00). Wind profiler sites included Arbuckle, Angiola, Chico, Fresno, Pleasant Grove, Redding, Richmond, and Waterford. All profilers operated at 915 MHz except for the system at Fresno which operated at 449 MHz. For each site, wind data for the entire measurement period were averaged to present one time/height section showing the average winds for the 4-month period. Winds are shown only if at least 50% of the data for a particular time and height were available. Using this criteria, height coverage ranged from 1.7 km at Richmond to approximately 3 km at Chico and Redding. The lower frequency (449 MHz) wind profiler at Fresno obtained data to an average height of 6 km. The data are presented graphically as wind barb plots. Each half barb represents winds of 2.5 m s^{-1} while each full barb represents winds of 5 m s^{-1}. The wind barb points in the direction from which the wind is coming from.

6.1 Arbuckle Upper-Level Winds

The average upper-level winds for Arbuckle are presented in Fig. 6.1. Similar to the surface winds discussed in Section 5.1, the wind pattern was quite complex at this site when compared to others in the Sacramento Valley (Chico, Pleasant Grove, Redding). Southeasterly winds to a depth of 500 m, possibly the intrusion of marine air into the Sacramento Valley, began at 2200 UTC and continued until 0300. Westerly flow followed and continued until 0800. These winds may represent the intrusion of marine air over the coastal range to the west or a thermally induced drainage wind or more likely a combination of the two. A fairly deep (1.4 km) region of north-northwest flow developed at 0900 and continued until 2000 and may represent an eddy circulation (Shultz ?) within the lower Sacramento Valley.

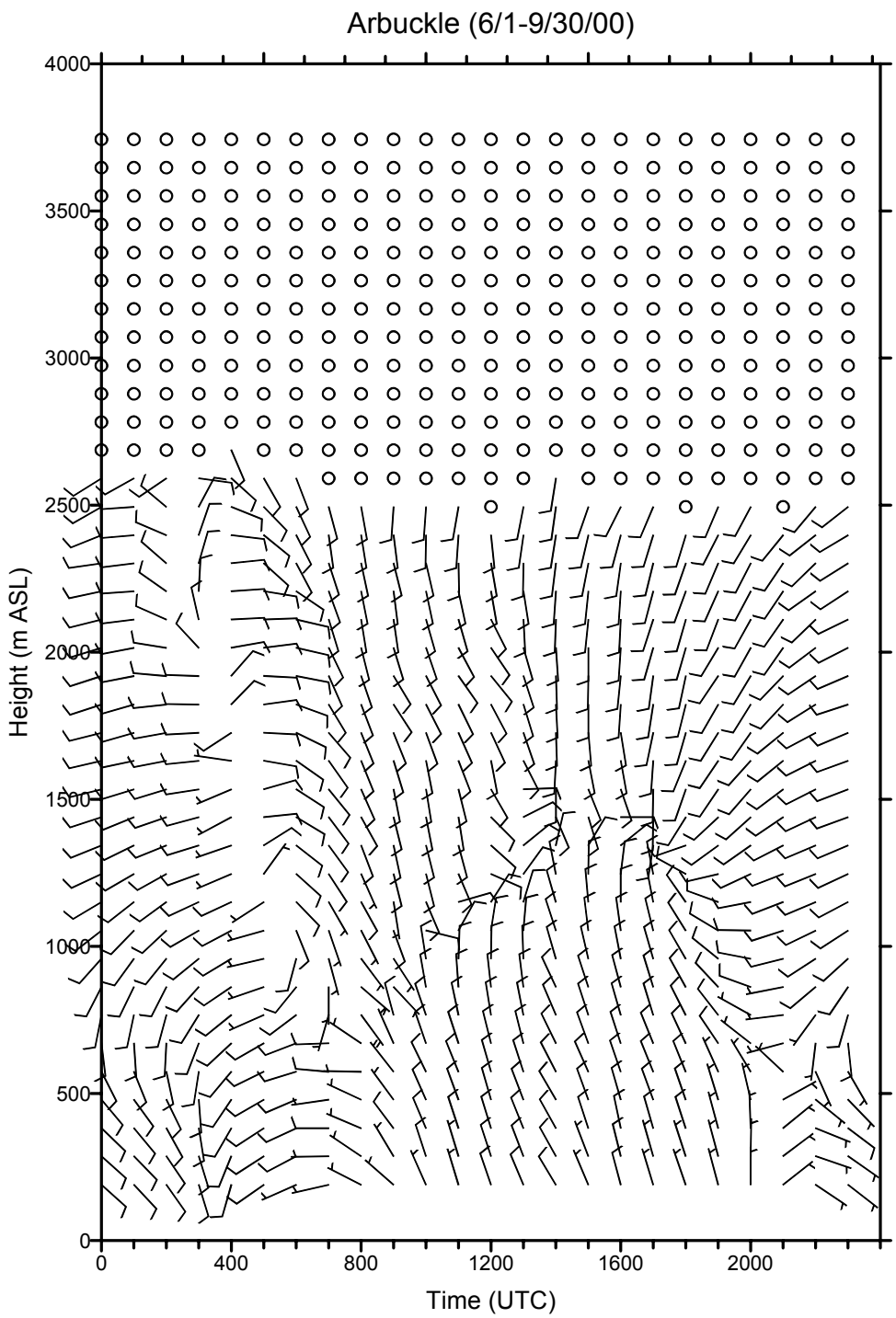

Fig. 6.1. Composite of Arbuckle winds for the CCOS study period (6/1 -9/30/00).

6.2 Angiola Upper-Level Winds

Figure 6.2 shows the composite winds for Angiola during CCOS. Winds in the lowest 2 km were generally northerly with evidence of a nocturnal jet in the lowest 500 m between 0500 and 1300 UTC. During the daytime hours, winds weakened and turned more westerly in the lowest km.

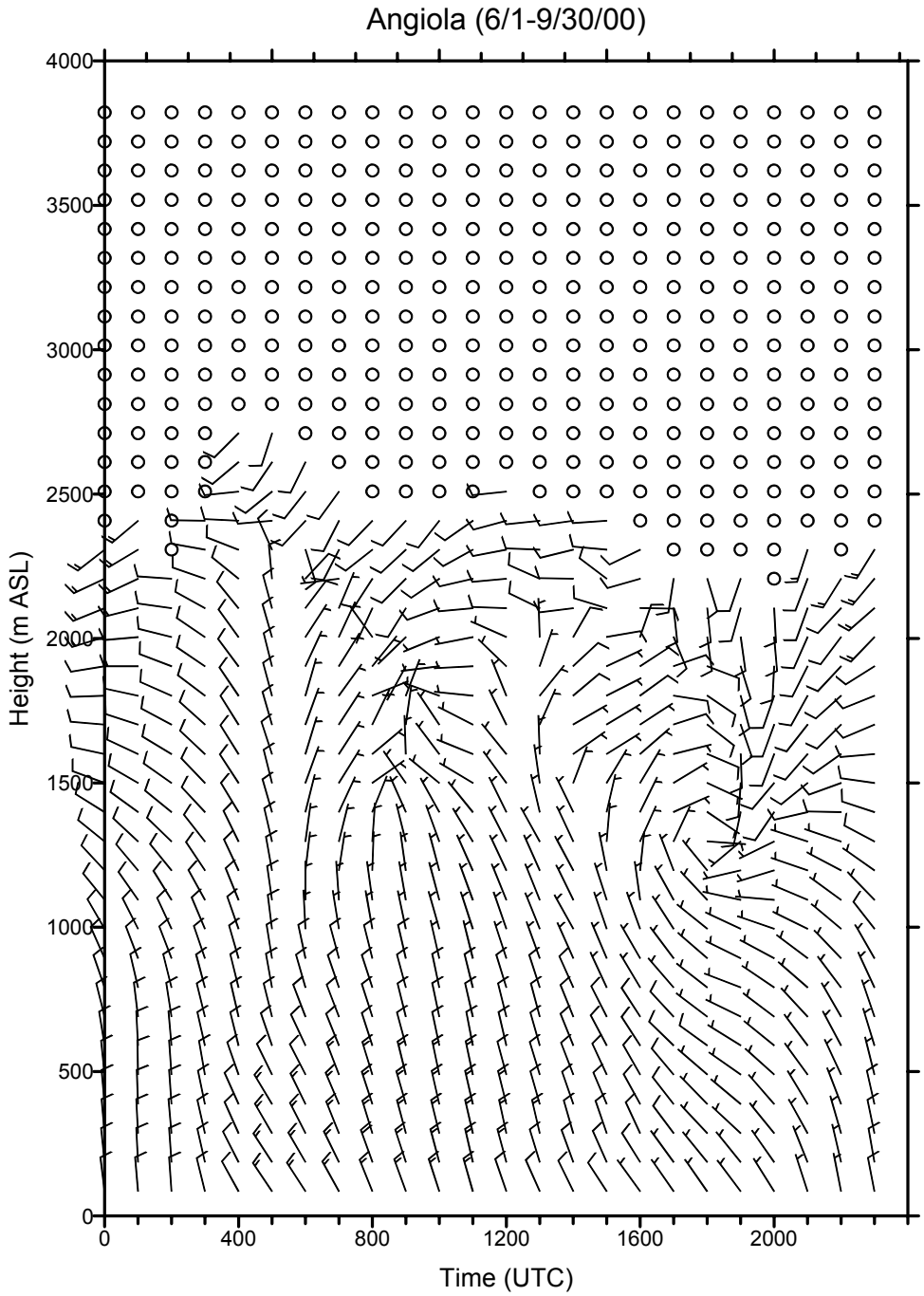

Fig. 6.2. Composite of Angiola winds for the CCOS study period (6/1-9/30/00).

6.3 Chico Upper-Level Winds

In many respects the composite of Chico winds for the CCOS study period (Fig. 6.3) appears as a mirror image to the winds observed at Angiola (Fig. 6.2). A southerly flow persists in the lowest 2 km with a nocturnal jet in the lowest 500 m between 0400 and 1000 UTC. During the daytime hours, in response to the heating of the higher terrain to the east, winds turn westerly in the lowest several hundred meters with a compensating return flow aloft.

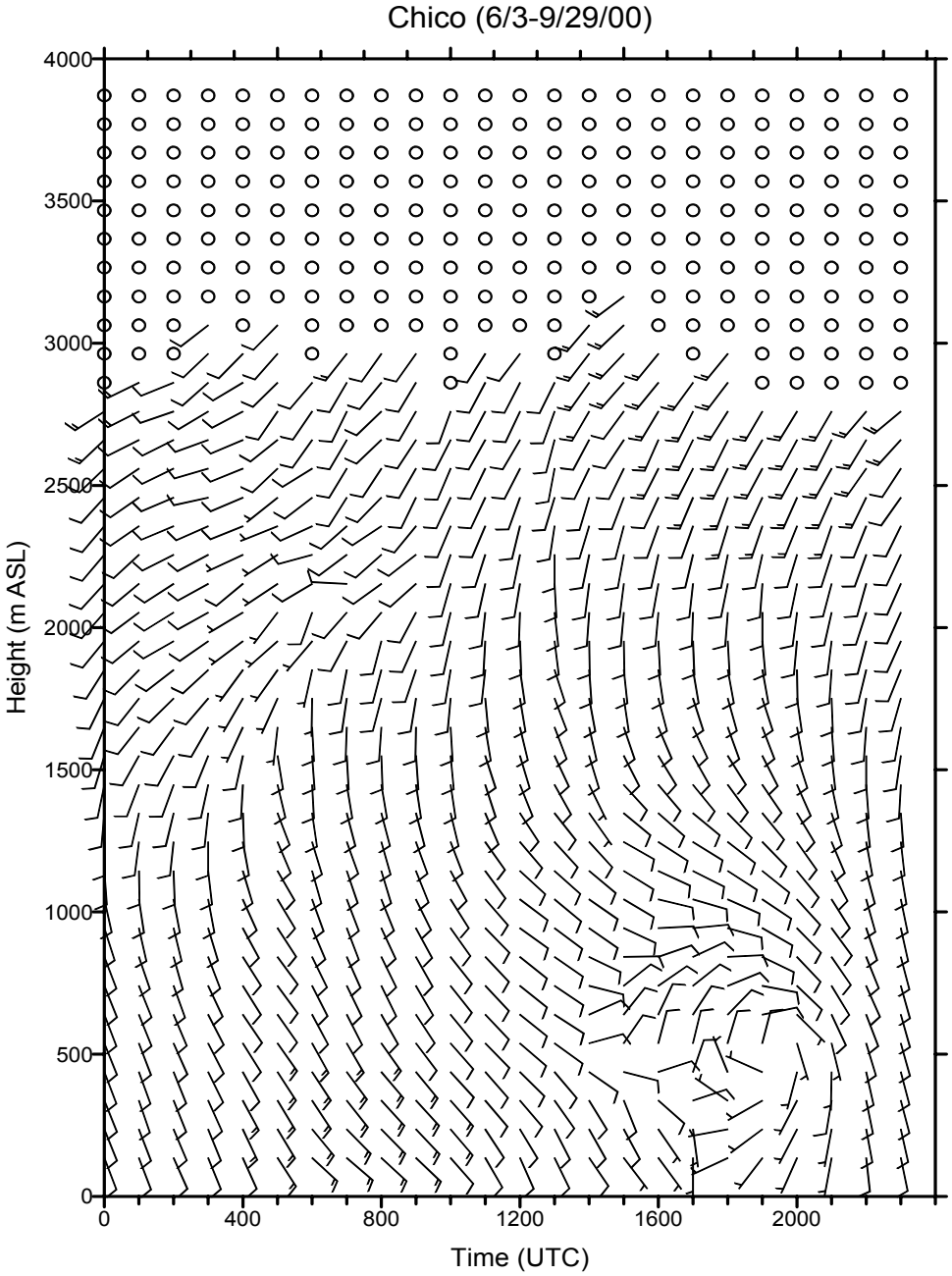

Figure 6.3. Composite of Chico winds for the CCOS study period (6/1 – 9/30/00).

6.4 Fresno Upper-Level Winds

The Fresno 449-MHz wind profiler provided good quality wind data to heights of approximately 6 km but with reduced data resolution when compared to the 915-MHz network (200 m vs. 100 m). A composite of winds for the first 3 months of the CCOS measurement period (Fig. 6.4) shows a sharp demarcation at 2 km between the northwesterly influx of marine air and the prevailing southerlies aloft. Evidence of a nocturnal jet appears between 0400 and 0900 UTC in the lowest km. During the morning hours (1500 – 1900 UTC), winds become light and variable in the lowest km. A composite of winds for the last month of CCOS (Fig. 6.5) shows a reduction in the depth of the marine air inflow and a weaker nocturnal jet.

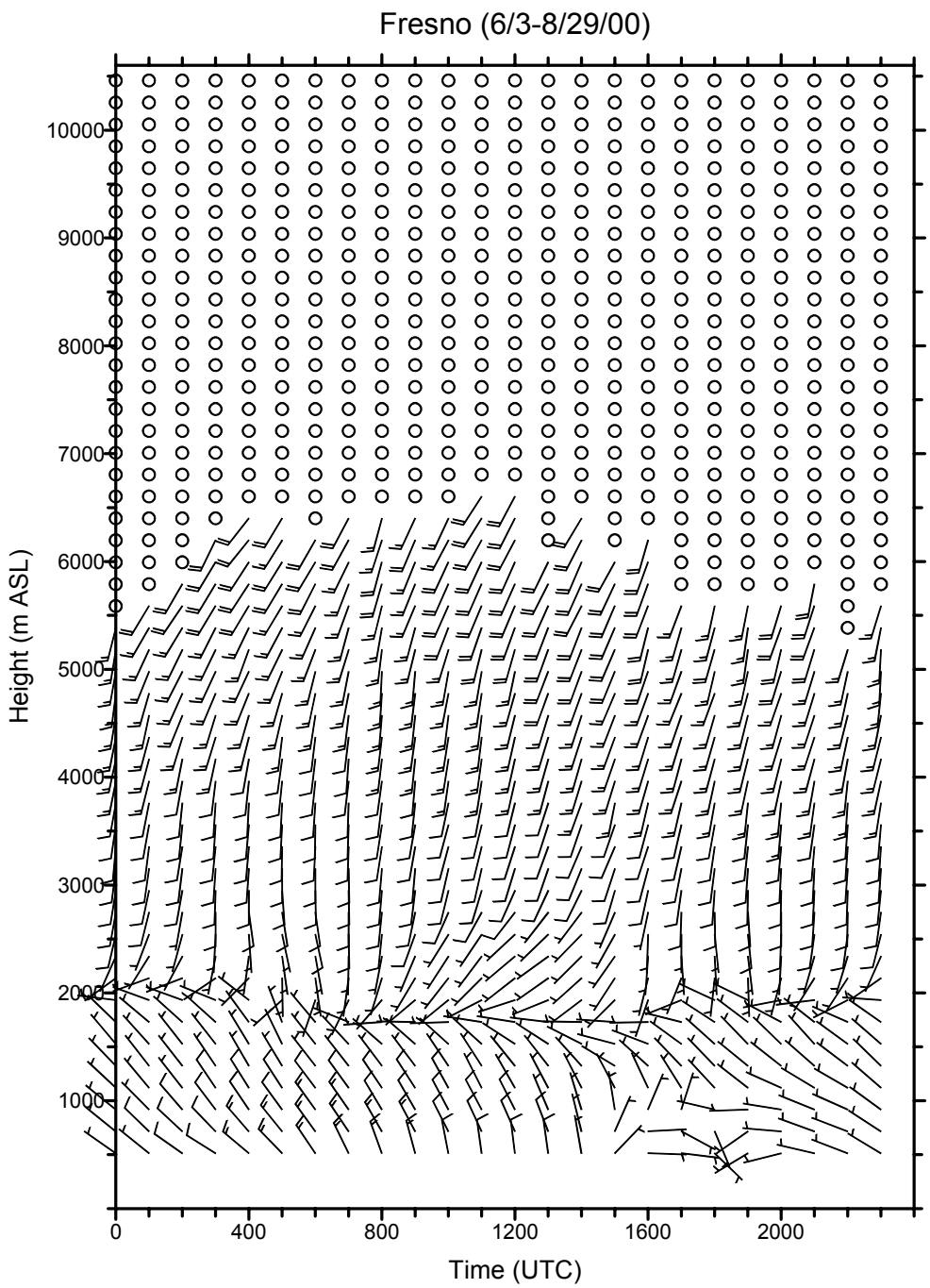

Fig. 6.4. Composite of Fresno 449-MHz wind profiler winds for the first three months of the CCOS study (6/3 – 8/29/00).

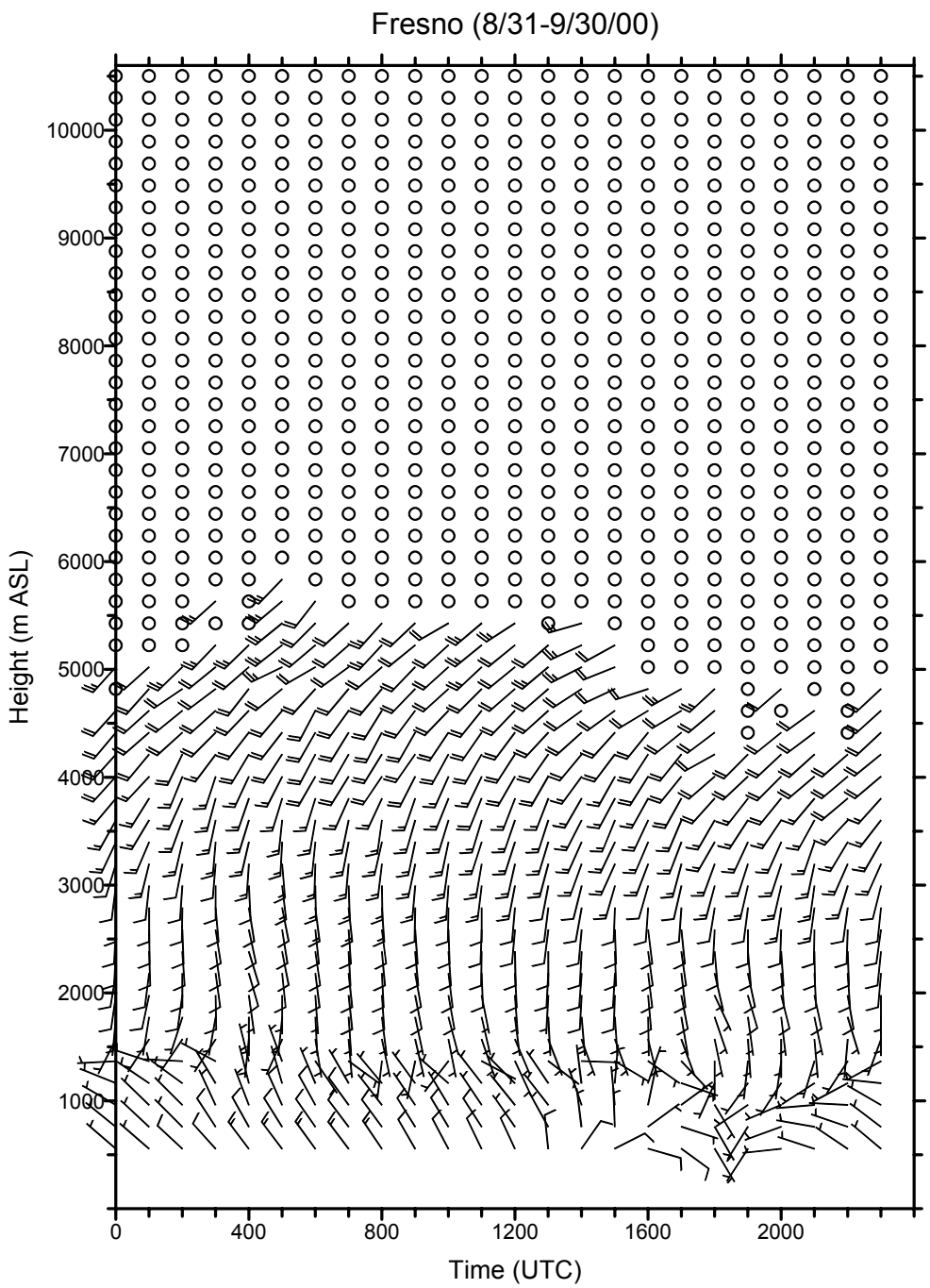

Fig. 6.5. Composite of Fresno 449-MHz wind profiler winds for the last month of the CCOS study (8/31 – 9/30/00).

6.5 Pleasant Grove Upper-Level Winds

A generally southerly flow persisted in the lowest 2 km during the CCOS study period (Fig. 6.6). Southwesterly flow occurred from 2000 to 0700 UTC gradually turning to a more southeasterly direction between 0800 and 1800. There seems to be no evidence of a nocturnal jet at this site.

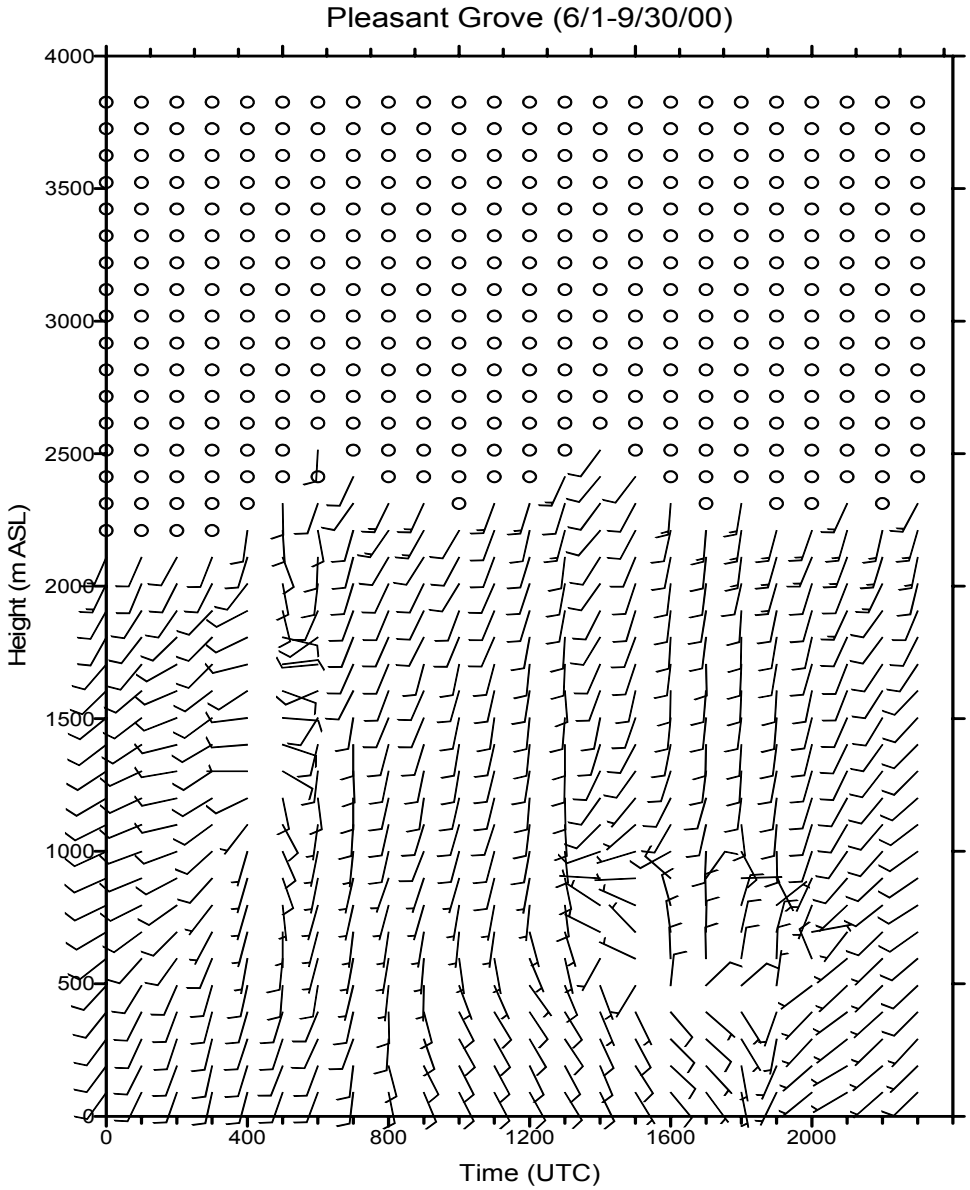

Fig. 6.6. Composite of Pleasant Grove winds for the CCOS study period (6/1 – 9/30/00).

6.6 Redding Upper-Level Winds

A distinct bimodal flow pattern existed in the lowest km at this site (Fig. 6.7). While southerly flows dominated above 1.0 km, a dominant upslope/downslope regime existed below that height. Beginning at 0800 UTC, winds switched from southerly (upslope) to northerly (downslope) and deepened throughout the nighttime hours, reaching a maximum depth of 1.0 km AGL at 1600 UTC (0900 PDT). With daytime heating the drainage winds weakened and were replaced by southerly winds by 2100 UTC.

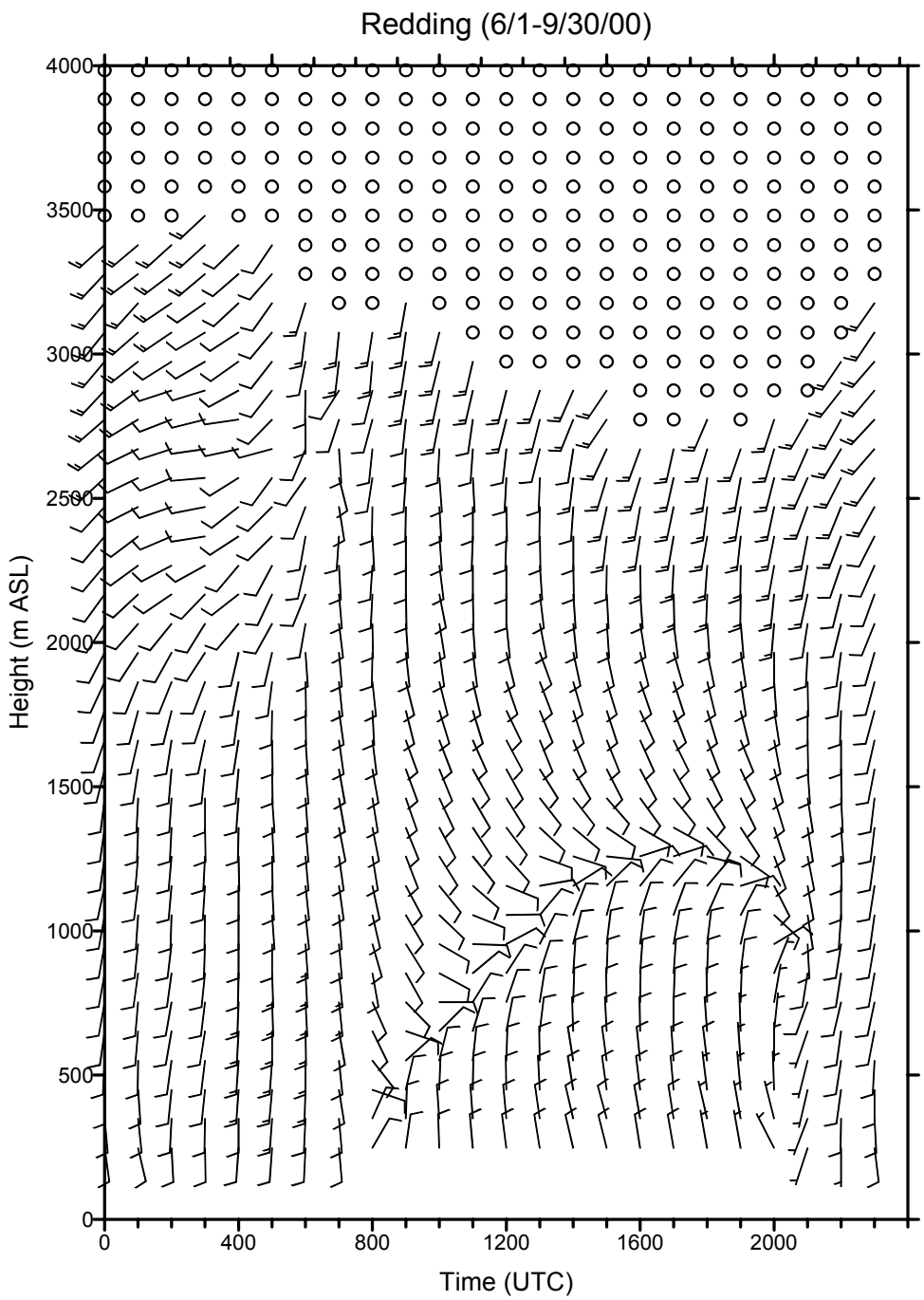

Fig. 6.7. Composite of Redding winds for the CCOS study period (6/1 – 9/30/00).

6.7 Richmond Upper-Level Winds

The upper-level winds at the Richmond site exhibited very little diurnal variation with generally westerly flow at all levels in the afternoon and evening hours becoming southwesterly within the marine boundary layer during the late night and morning hours with northwesterly flow aloft (Fig. 6.8).

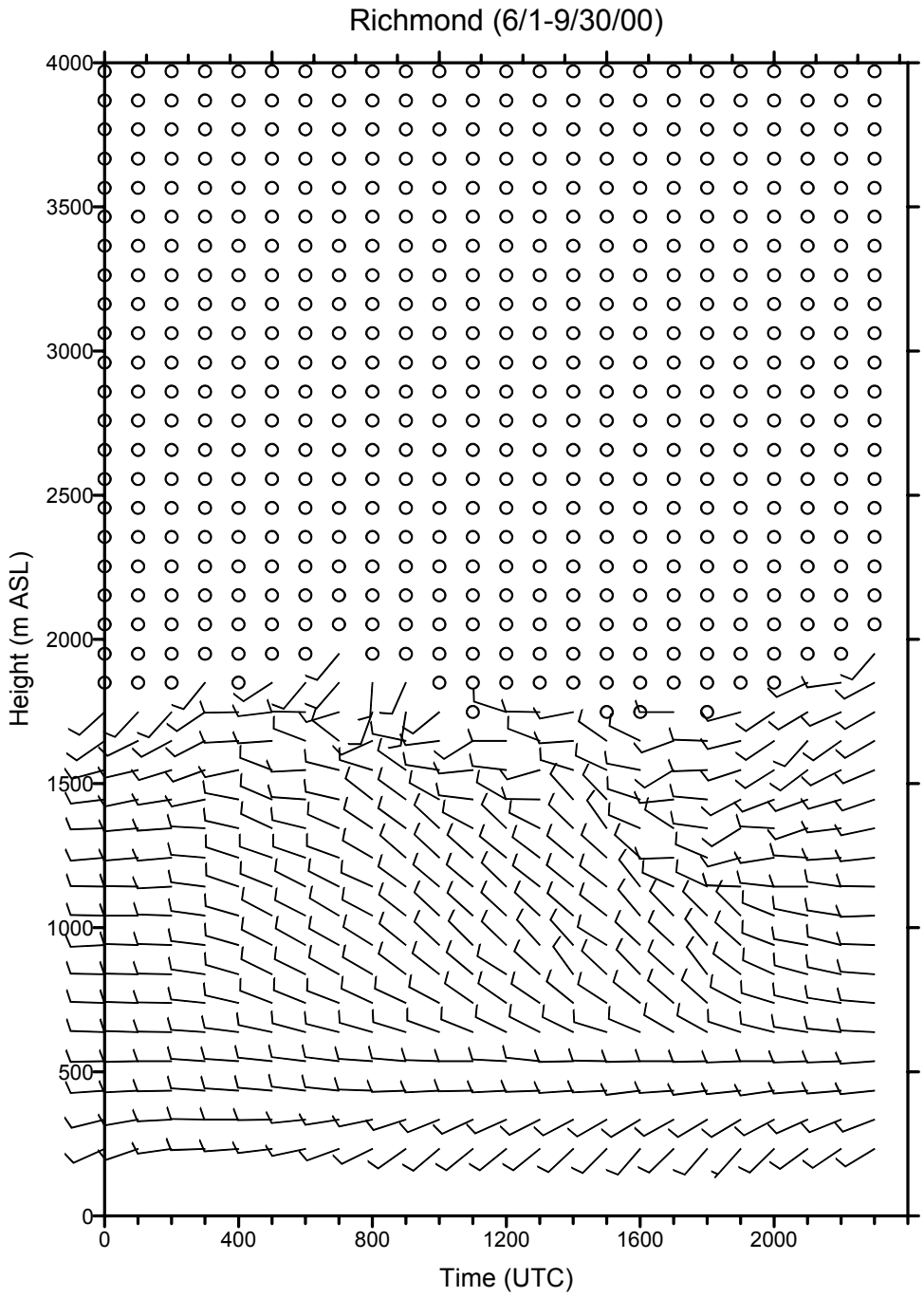

Fig. 6.8. Composite of Richmond winds for the CCOS study period (6/1 – 9/30/00).

6.8 Waterford Upper-Level Winds

Northwest winds, indicative of the influx of marine air through the Carquinez Strait, dominated the flow pattern in the lowest km during the CCOS study. The deepest and strongest flows occurred during the nighttime hours with evidence of a nocturnal jet in the lowest 500 m between 0300 and 0900 UTC (2000 – 0200 PDT). Weaker, more shallow northwesterly winds dominated the lower levels during the daytime hours. Southerly ambient flows persisted above 1 – 1.5 km.

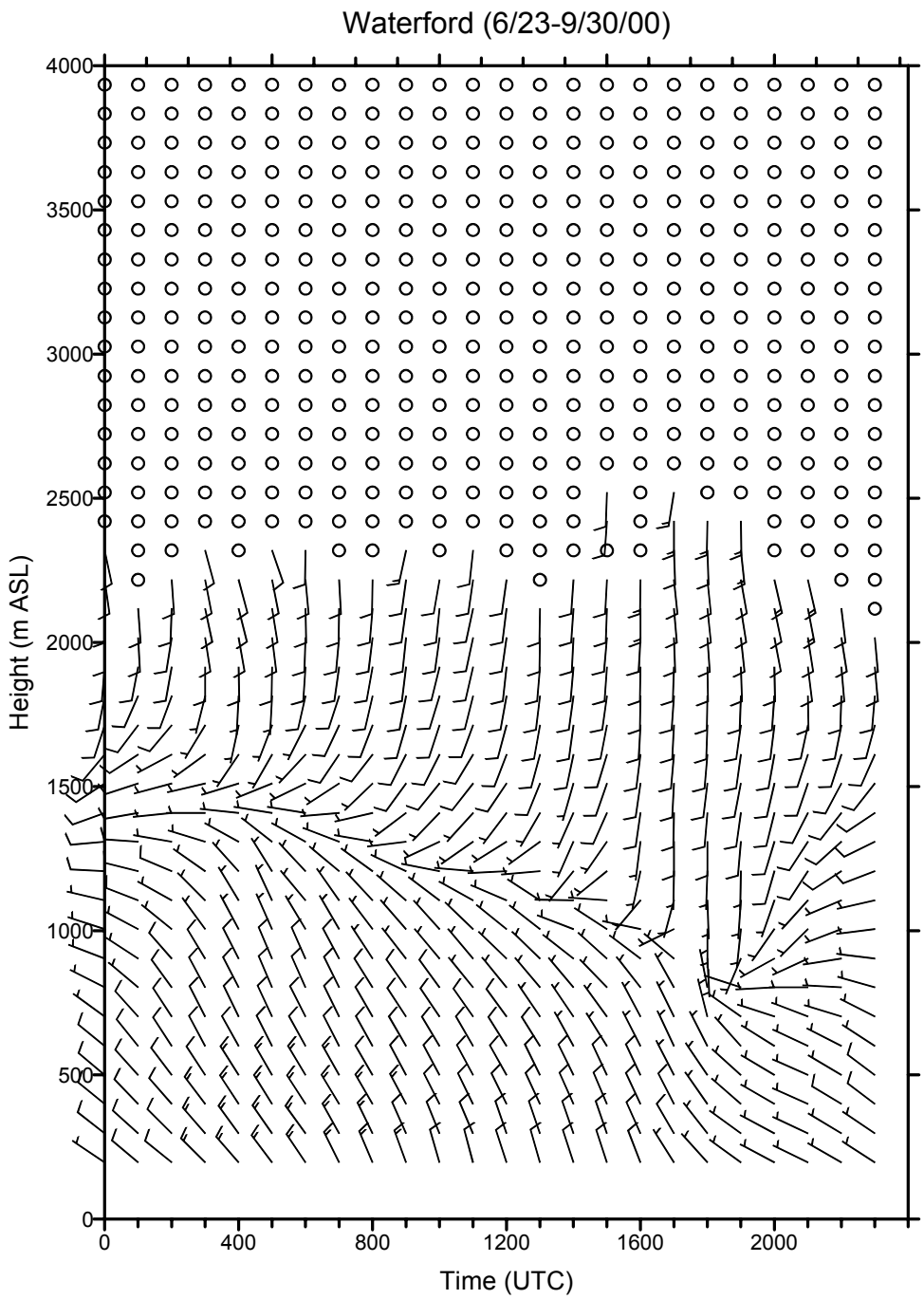

Fig. 6.9. Composite of Waterford winds for most of the CCOS study period (6/23 – 9/30/00).

7. ETL Data Collection, Processing, Storage, and Management

7.1 Data Collection

Daily radar, RASS and meteorological data (from the 10-m, 20-m, or 100-m instrumented towers) are transferred from the site computer hard drive to either JAZ cartridges or Panasonic optical disks on-site on approximately a monthly basis. One backup copy of the data remains on-site until such time that it is backed up at NOAA/ETL. Data are then transferred from JAZ or optical disk in duplicate to two separate media at NOAA/ETL: One copy of the data is transferred to a RAID protected hard drive, and a second copy to another optical drive. The data are separated into different directories based on their data types for later processing.

7.2 Data Processing

Level 1A processing of the radar and RASS data is accomplished by running the moments data through a modified Weber-Wuertz algorithm to remove obvious spurious data for wind speed, wind direction, and temperature. Three different formats for each daily file are created. One of those formats is used to further process the data to level 1B.

Level 1B processing involves visually inspecting daily wind and temperature files for inconsistencies not discovered with the Weber-Wuertz algorithm. Radian Corporation's LapGraph software is used. Approximately 5 days of data are displayed at once. Time and height consistency checks are performed and the suspect data is marked as invalid. Once a site has been processed to level 1B, the data are run through an in-house algorithm in order to send to CARB in their prescribed format. All radar and RASS data have been processed, packed, delivered and accepted by CARB.

Data were edited for bird removal during two time periods for the entire CCOS/CRPAQS experiments. Those periods were March 1 – May 31, 2000 and September 1 – November 30, 2000. They were edited with an algorithm that thresholds on spectral width and signal-to-noise ratio. The algorithm removed some birds but was not too powerful. Data were also visually examined during the LapGraph editing and any obvious birds were examined more closely and removed if deemed to exist.

Radar winds and RASS data for CCOS IOP2 and IOP3 have been re-processed to level 1C by visual inspection on a profile-by-profile basis and removing data deemed unacceptable or meteorologically improbable. Mixing depths were determined for both IOP's. Those data have been presented to CARB.

Level 1A processing of the meteorological data is carried out with an in-house algorithm to remove spurious suspect data and is flagged as such. Level 1B processing involves creating daily climatologies of the meteorological data and examining the data in time to try to identify any inconsistencies. All meteorological data, except for the mean met data from the 100-m Angiola tower, has been processed, packed, delivered and accepted by CARB.

Level 1A processing of the Doppler sodar data involves two different algorithms depending on the instrument manufacturer. Data from the ETL 2-axis Doppler sodars were processed using an algorithm developed in-house. Data obtained from the

Aerovironment Inc. 3-axis Doppler sodar at Richmond and the mini-sodar at Angiola and Fresno were processed using Aerovironment's Profiler Analysis and Display Software (PADS).

The ETL 2-beam Doppler sodar obtains, for each beam, the first moments, expressed as radial velocities along a sodar beam, in real time from the FFT spectra and saves these data. The editing of raw moment values was done by histogram, or consensus, editing. Radial velocity bins were defined, and the raw moments from one beam during the time period were placed into appropriate histogram bins. The acceptable histogram peak width was defined and the percentage of data points within the histogram peak was then computed. If this percentage is greater than the percentage threshold necessary to accept the data as good, then the moments within the histogram peak are considered to represent true wind moments. All moments outside this peak are considered to be noise. If an accepted histogram peak is present and contains at least a minimum number of points, the remaining good values are tested for realistic turbulence characteristics. If it fails this test, the values are considered to be too uniform to be coming from a meteorological source. After the moments for the entire hour and both beams are edited in this manner, the moment times for which the moments from both beams were found to be good are combined to form a wind. A vertical velocity of 0 ms^{-1} is assumed. All winds within the hour are then vector averaged, and a mean one-hour wind speed and direction is computed and written to file. The generated winds are then viewed and flagged as necessary (Level 1B).

The Aerovironment system performs, in real time, data quality checks on the incoming data according to preset data quality control limits. In post processing these data quality limits can be refined to obtain the cleanest data possible. Data are invalidated on a height by component by wind table basis according to reliability values, signal intensities, sigmas, component wind speeds, and signal-to-noise ratios. Level 1B processing involves displaying wind barbs in 24 hour time height sections, identifying suspicious data, and flagging those data as necessary

The following table (Table 7.1) lists the wind profiler, RASS, Doppler sodar, and surface meteorology sites for CCOS, the levels to which the data has been processed as of 6/16/03, and whether the data has been delivered and accepted by ARB.

Table 7.1. Data processing completion chart for ETL CCOS sites.

Winds

Site	Dates	Processing Level	Packed	Delivered	Accepted
Arbuckle	May 12, 2000-Oct 19, 2000	1B	YES	YES	YES
Angiola	Dec 8, 1999-Jan 31, 2001	1B	YES	YES	YES
Chico	Jun 1, 2000-Jan 31, 2001	1B	YES	YES	YES
Fresno	Jun 1, 2000-Jan 31, 2001	1B	YES	YES	YES
Pleasant Grove	Apr 16, 2000- Oct 16, 2000	1B	YES	YES	YES
Redding	Apr 27, 2000-Oct 19, 2000	1B	YES	YES	YES
Richmond	Feb 11, 2000-Jan 31, 2001	1B	YES	YES	YES
Waterford	Jun 22, 2000-Jan 31, 2001	1B	YES	YES	YES

RASS

Site	Dates	Processing Level	Packed	Delivered	Accepted
Arbuckle	May 12, 2000-Oct 19, 2000	1B	YES	YES	YES
Angiola	Dec 8, 1999-Jan 31, 2001	1B	YES	YES	YES
Chico	Jun 1, 2000-Jan 31, 2001	1B	YES	YES	YES
Fresno	Jun 1, 2000-Jan 31, 2001	1B	YES	YES	YES
Pleasant Grove	Apr 16, 2000- Oct 16, 2000	1B	YES	YES	YES
Redding	Apr 27, 2000-Oct 19, 2000	1B	YES	YES	YES
Richmond	Feb 11, 2000-Jan 31, 2001	1B	YES	YES	YES
Waterford	Jun 22, 2000-Jan 31, 2001	1B	YES	YES	YES

Met Tower

Site	Dates	Processing Level	Packed	Delivered	Accepted
Angiola	Feb 22, 2000-Mar 11, 2001	1B	YES	YES	YES
Arbuckle	Mar 1, 2000-Jan 31, 2001	1B	YES	YES	YES
Chico	Mar 1, 2000-Jan 31, 2001	1B	YES	YES	YES
Fresno	Jun 1, 2000-Jan 31, 2001	1B	YES	YES	YES
New Melones Lake	May 11, 2000-Jan 31, 2001	1B	YES	YES	YES
Pleasant Grove	Apr 15, 2000-Jan 31, 2001	1B	YES	YES	YES
Redding	Apr 27, 2000-Jan 31, 2001	1B	YES	YES	YES
Richmond	Feb 11, 2000-Jan 31, 2001	1B	YES	YES	YES
Waterford	Jun 16, 2000-Jan 31, 2001	1B	YES	YES	YES

Doppler

Sodar Winds

Site	Dates	Processing Level	Packed	Delivered	Accepted
Angiola (mini-sodar)	May 22, 2000-Dec 4, 2000	1B	YES	YES	YES
Fresno	Jun 6, 2000-Dec 4, 2000	1B	YES	YES	YES
New Melones Lake	May 11, 2000-Jan 31, 2001	1B	YES	YES	YES
Richmond	Feb 25, 2000-Feb 8, 2001	1B	YES	YES	YES
Waterford	Jun 22, 2000-Feb 13, 2001	1B	YES	YES	YES

7.3 Data Storage

Storage of the original moment data and the processed data in three formats are finally migrated to compact disk medium in duplicate. Original data are separated into a "field" copy on one CD that comes from the backup disks. The second copy is migrated to another CD as the "dms7" copy form the RAID protected hard drive copy.

7.4 Data Management

The data is managed with a Microsoft Access database to facilitate easy retrieval. Data can be accessed based on site code, project code, dates of operation of sites, the ETL in-house directory structure, instrument type, or physical parameter measured.

7.5 Data Coverage

The following graph (Fig. 7.1) shows all sites used for post processing for CARB, visualization, and Rapid Update Cycle II (RUC II) numerical forecast model, sites for post processing for CARB only, and sites used for visualization and RUC II only.

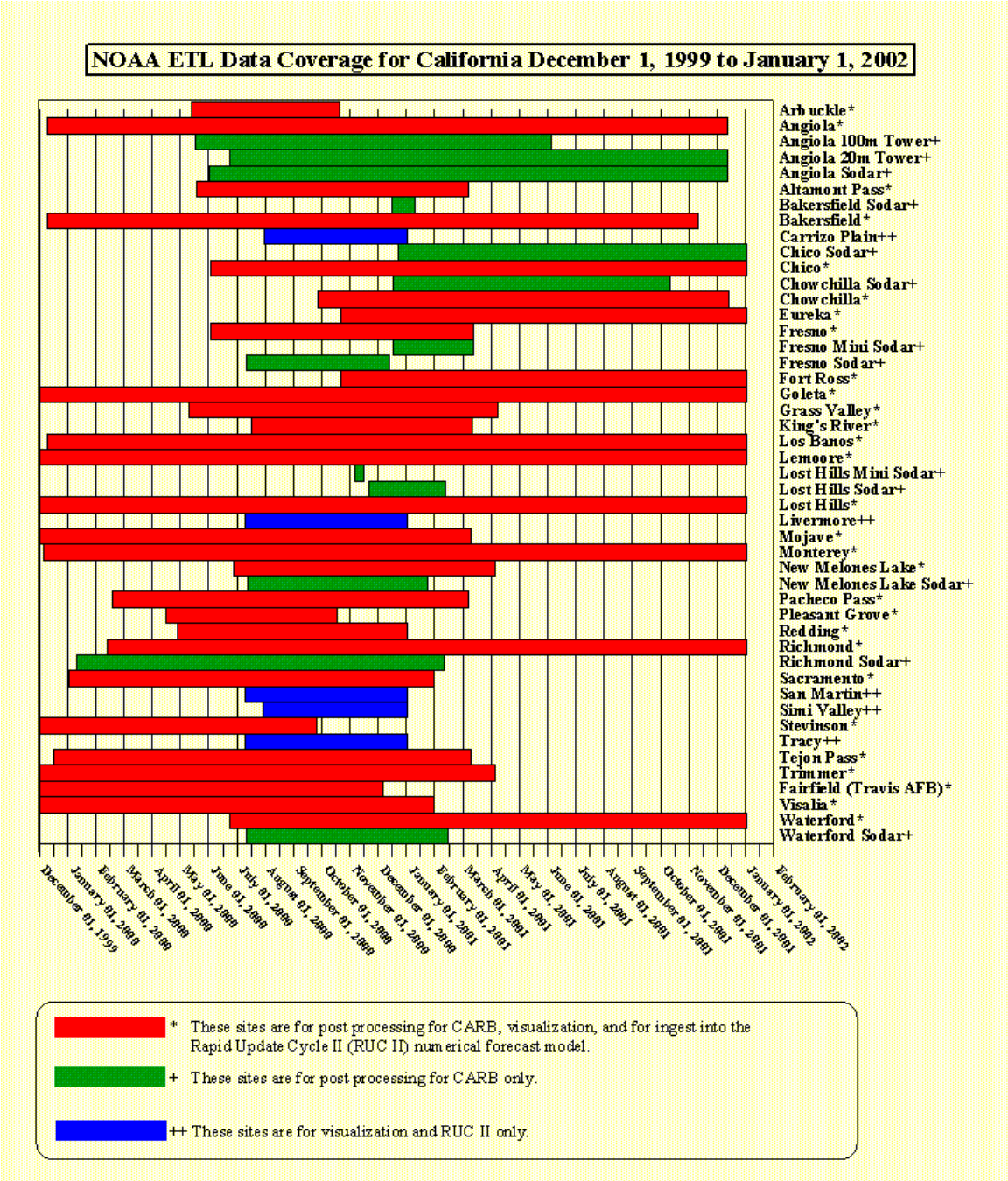

Fig. 7.1. ETL data coverage for CCOS/CRPAQS projects.