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Hanford Site



Climatological
Data Summary 1995
With Historical Data

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Climatological Data Summary 1995 With Historical Data

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May 1996

Prepared for
the U.S. Department of Energy
under Contract DE-AC06-76RLO 1830

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Summary

This document presents the climatological data measured at the U.S. Department of Energy's Hanford Site for calendar year 1995. Pacific Northwest National Laboratory^(a) operates the Hanford Meteorology Station and the Hanford Meteorological Monitoring Network from which these data were collected. The information contained herein includes updated historical climatologies for temperature, precipitation, normal and extreme values of temperature and precipitation, and other miscellaneous meteorological parameters. Further, the data are adjunct to and update Hoitink and Burk (1994, 1995); however, Appendix B—Wind Climatology (1994) is excluded.

1995 was warmer than normal, averaging 54.7°F, 1.4°F above normal (53.3°F). For the 12-month period, 8 months were warmer than normal, and 4 were cooler than normal.

1995 was the wettest year on record. Precipitation totaled 12.31 in., 197% of normal (6.26 in.); snowfall totaled 7.7 in., compared to the normal of 13.8 in.

The average wind speed during 1995 was 7.8 mph, 0.1 mph above normal (7.7 mph). The peak gust during the year was 61 mph from the south-southwest on December 12. There were 27 days with peak gusts ≥ 40 mph, compared to a yearly average of 26.

(a) Pacific Northwest National Laboratory is operated by Battelle for the U.S. Department of Energy.

64: 27, 30, 71, 72

Notes on Units of Measure

This document uses English units (e.g., miles per hour [mph], inches [in.], degrees Fahrenheit [°F]) when presenting all information. This decision to use English units was based on the fact that English units are still the standard in National Oceanic and Atmospheric Administration (specifically, the National Climatic Data Center and National Weather Service) reporting and publications.

Throughout this document the term "normal" is used to indicate climatological normal, defined as an average value over a period of years of any meteorological element such as temperature, pressure, and rainfall. The accepted convention uses a 30-year time period, ending with the first year of each new decade (such as 1951-1980, 1961-1990, 1971-2000). The current time period used for climatological normals is 1961-1990.

Some useful conversions between English units and metric equivalents are:

1 foot (ft) = 0.3048 meter (m)
1 mile (mi) = 1.609 kilometers (km)
1 inch (in.) = 2.54 centimeters (cm)
1 mile per hour (mph) = 0.447 meter/second (m/s)
degrees Fahrenheit (°F) = $(9/5 \times ^\circ\text{C}) + 32$
degrees Celsius (°C) = $5/9 \times (^\circ\text{F} - 32)$.

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1.0 Introduction

The U.S. Department of Energy's Hanford Site lies within the semiarid shrub-steppe Pasco Basin of the Columbia Plateau in southeastern Washington state. The Hanford Site occupies an area of approximately 560 mi² north of the confluence of the Snake and Yakima rivers with the Columbia River. The Columbia River flows through the northern part of the Hanford Site and, turning south, forms part of the site's eastern boundary. The Yakima River runs along part of the southern boundary and joins the Columbia River below the city of Richland, which bounds the Hanford Site on the southeast. Rattlesnake Mountain, Yakima Ridge, and Umtanum Ridge form the southwestern and western boundaries. The Saddle Mountains form the northern boundary of the Hanford Site.

The Cascade Range, beyond Yakima to the west, greatly influences the climate of the Hanford Site area by means of its rain shadow effect. This mountain range also serves as a source of cold air drainage, which has a considerable effect on the wind regime on the Hanford Site. The regional temperatures, precipitation, and winds are greatly affected by the presence of mountain barriers. The Rocky Mountains and ranges in southern British Columbia are effective in protecting the inland basin from the more severe winter storms and associated cold polar air masses moving southward across Canada.

This document presents the calendar year 1995 climatological data summary for the Hanford Meteorology Station (HMS) and additional climatologies for temperature, wind, precipitation, and other meteorological parameters for the HMS and the automated stations of the Hanford Meteorological Monitoring Network (HMMN). Climatological normal and extreme values for temperature and precipitation are also presented. Currently, 28 monitoring stations are within and located near the U.S. Department of Energy's Hanford Site (Table 1.1, Figure 1.1). A detailed description of each of the monitoring stations, including photographs of the topography surrounding each site, is provided in Glantz and Islam (1988).

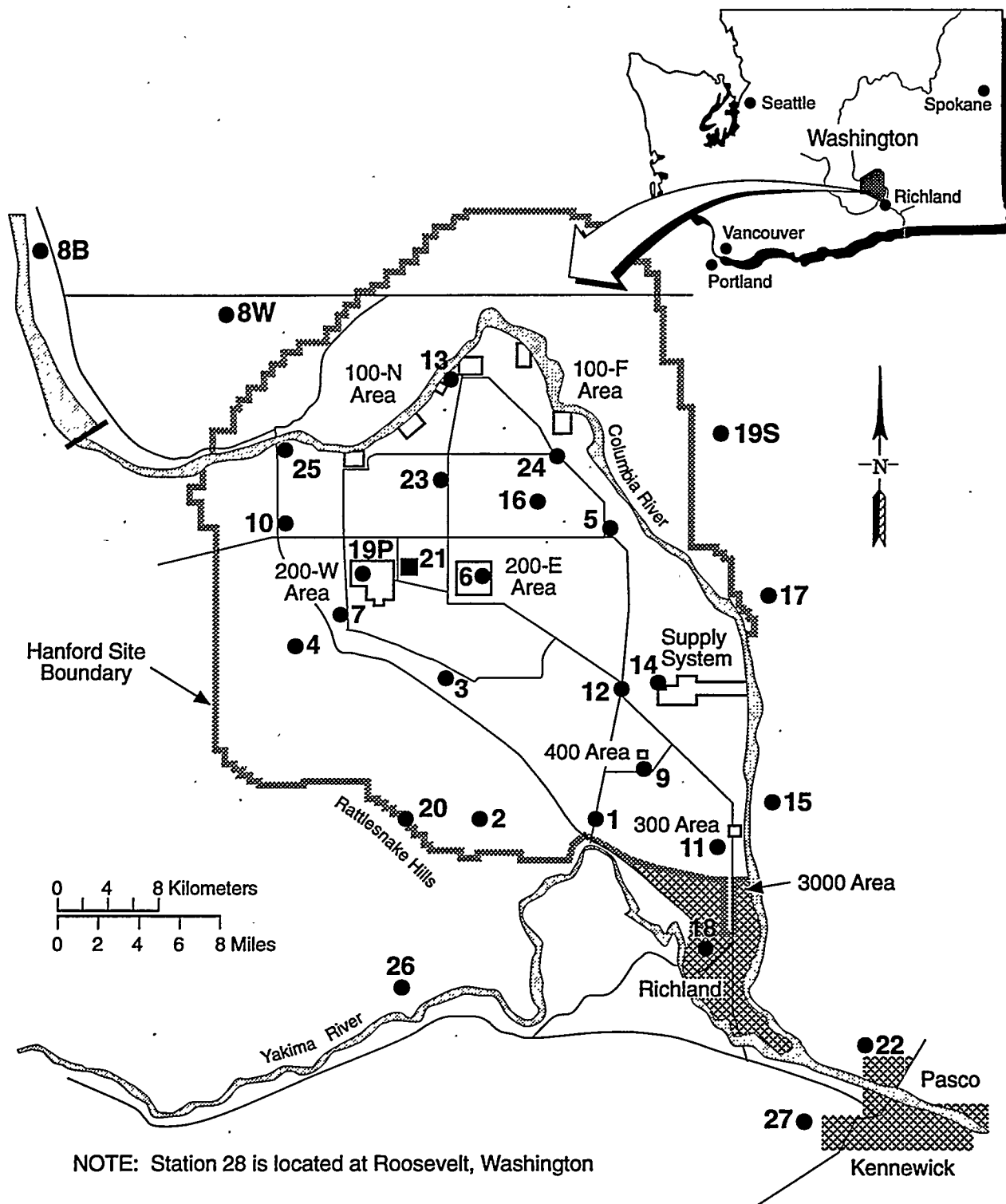
Operation of the HMS is a function of the Meteorological and Climatological Services Project funded by the U.S. Department of Energy. This project, managed by the Pacific Northwest National Laboratory, is responsible for providing the U.S. Department of Energy and Hanford Site contractors ongoing meteorological and climatological services support, primarily for emergency response activities, Hanford Site work scheduling, and general site safety. Detailed, real-time meteorological data are needed in the event of a release of hazardous material to the atmosphere from any of the Hanford Site facilities. These data can be used to model atmospheric dispersion and to estimate the environmental impacts of the release. Meteorological data and weather forecasts are also necessary to ensure that operations and activities on the Hanford Site are conducted safely, particularly where specific weather conditions might impact those operations or activities. The climatological database is also used in environmental studies, environmental impact reports, facility design, and planning operations.

**Table 1.1. Station Numbers, Names, and Codes for the Hanford
Meteorological Monitoring Network**

Station Number	Station Name	Station Code	Period of Operation
1	Prosser Barricade	PROS	1/82 - Present
2	Emergency Operations Center	EOC	1/82 - Present
3	Army Loop Road	ARMY	1/82 - Present
4	Rattlesnake Springs	RSPG	1/82 - Present
5	Edna	EDNA	1/82 - Present
6	200 East	200E	1/82 - Present
7	200 West	200W	1/82 - Present
8B	Beverly	BVLY	8/91 - Present
8W	Wahluke (no longer active)	WAHL	1/82 - 7/91
9	Fast Flux Test Facility	FFTF	1/82 - Present
10	Yakima Barricade	YAKB	1/82 - Present
11	300 Area	300A	1/82 - Present
12	Wye Barricade	WYEB	1/82 - Present
13	100-N	100N	1/82 - Present
14	WNP-2	WPPS	1/82 - Present
15	Franklin County	FRNK	1/82 - Present
16	Gable Mountain	GABL	1/82 - Present
17	Ringold	RING	1/82 - Present
18	Richland Airport	RICH	1/82 - Present
19P	Plutonium Finishing Plant-200W	PFP	2/94 - Present
19S	Sagehill (no longer active)	SAGE	3/82 - 1/93
20	Rattlesnake Mountain	RMTN	1/82 - Present
21	Hanford Meteorology Station	HMS	1/82 - Present
22	Pasco Airport	PASC	10/87 - Present
23	Gable West	GABW	3/86 - Present
24	100-F	100F	3/86 - Present
25	Vernita Bridge	VERN	2/88 - Present
26	Benton City	BENT	2/95 - Present
27	Tri-City Vocational Skills Center	VSTA	2/91 - Present
28	Roosevelt, WA	SURF	9/94 - Present

During the period April 1912 through March 1943, cooperative observers for the U.S. Weather Bureau (now the National Weather Service) recorded daily maximum and minimum temperatures and precipitation, including measurements of unmelted snow at the Hanford Townsite, approximately 10 mi east-northeast of the present HMS. From late-1943 until mid-1944, the U.S. Weather Bureau recorded some meteorological operations in Richland. Then, in 1944 as part of the Manhattan Project, the HMS was established. Hourly observations began on December 7, 1944.

The HMS and its 410-ft instrument tower are located near the center of the Hanford Site, between the 200 West and 200 East Areas (see Figure 1.1). Hourly observations of wind direction, wind speed, and air temperature are made at multiple levels on the 122-m (410-ft) tower. Throughout this document, wind measurements from the HMS are made at the 50-ft level and temperature measurements are made at the 3-ft level. A variety of other meteorological parameters are also measured or observed, including present weather, dew point temperature, relative humidity, precipitation, atmospheric



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Figure 1.1. Map of the Hanford Site and Surrounding Areas

pressure, cloud cover, visibility, and solar radiation. Several climatological summaries of data collected at the HMS, at the old Hanford Townsite, and Richland monitoring locations were published over the past 30 years (Jenne and Kerns 1959; Stone et al. 1972, 1983; Hoitink and Burk 1994, 1995).

This document is composed of the following information. The 1995 calendar year summary of climatological data for the Hanford Site is contained in Section 2.0. Temperature, precipitation, wind, and miscellaneous climatological statistics are contained in Sections 3.0 through 6.0, respectively. Section 7.0 lists the references cited in the document, and Section 8.0 gives a bibliography of database, computer code, and other pertinent reports. The Appendix gives the station-specific wind roses and joint frequency distributions for 1995.

2.0 Calendar Year 1995 Summary

Calendar year 1995 was warmer than normal. The average temperature for 1995 was 54.7°F, 1.4°F above normal (53.3°F). The warmest year on record is 1992, which averaged 56.4°F; the coldest is 1985, which averaged 49.6°F.

Eight months during 1995 were warmer than normal, 5 of which were at least 2.5°F above normal and 1 of which was more than 5.0°F above normal. Only 4 months were cooler than normal and only one by more than 2.5°F. February had the greatest positive departure (+5.1°F), and August the greatest negative departure (-3.1°F).

1995 was the wettest year on record. Precipitation totaled 12.31 in., 197% of normal (6.26 in.). The previous wettest year was 1950 with 11.45 in.; the driest was 1976 with only 2.99 in. Calendar year snowfall totaled 7.7 in., compared to an annual normal of 13.8 in. The highest was 37.1 in. in 1985.

January 1995 was warmer than normal, averaging 34.2°F, 2.9°F above normal (31.3°F). The warmest January, in 1953, averaged 42.5°F; the coldest January, in 1950, averaged only 12.1°F. During the period January 8 through 31, 1995, only 2 days had average temperatures that were below normal. Precipitation for the month totaled 2.14 in., 271% of normal (0.79 in.), the third wettest January on record. January 1970 was the wettest, receiving 2.47 in. There were 9 days in January 1995 with precipitation ≥ 0.10 in., the most such days on record. The previous record was 8 days in January 1970. Snowfall for the month totaled 2.7 in., compared to a January normal of 3.9 in.

February 1995 was much warmer than normal. The average temperature of 43.1°F was 5.1°F above normal (38.0°F), and the fifth warmest on record. There were 8 consecutive days from February 18 through 25 with maximum temperatures $\geq 60^\circ\text{F}$, a February record. The previous record was 7 such days in 1968. Precipitation for the month totaled 0.69 in., 111% of normal (0.62 in.). Snowfall for the month was only a trace, compared to a February normal of 2.0 in.

The winter of 1994-1995 (December 1994, January and February 1995) was much warmer than normal. The average temperature was 37.5°F, 3.9°F above normal (33.6°F), the sixth warmest on record. The warmest winter, in 1966-1967, averaged 40.6°F; the coldest, in 1948-1949, averaged 24.2°F. Winter season precipitation totaled 4.19 in., 172% of normal (2.44 in.), the sixth wettest on record. The wettest winter, 1958-1959, received 5.06 in.; the driest, 1946-1947, received only 0.70 in. Winter season snowfall totaled 7.0 in., compared to a normal of 13.8 in. The snowiest winter, 1992-1993, recorded 56.1 in.; the winter with the least snow, 1957-1958, recorded only 0.3 in.

March 1995 was slightly warmer than normal, averaging 46.1°F, 0.5°F above normal (45.6°F). The warmest March, in 1992, averaged 51.5°F. Precipitation for March 1995 totaled 0.95 in., 202% of normal (0.47 in.). The wettest March on record, in 1957, received 1.86 in.; the driest, March 1968, received 0.02 in.

April 1995's average temperature of 52.6°F was nearly normal (52.7°F). April 1995 was the wettest April on record, receiving 1.54 in., 376% of normal (0.41 in.). The previous wettest April, in 1969, received 1.22 in.

May 1995 was warmer than normal, averaging 64.5°F, 3.2°F above normal (61.3°F). The warmest May occurred in 1947 and averaged 68.8°F. Precipitation for May totaled 0.79 in., 155% of normal (0.51 in.). A thunderstorm on May 9 established a record 5-min rainfall amount of 0.25 in. The previous record 5-min rainfall amount was 0.23 in. recorded on July 29, 1991.

The spring season (March, April, and May) was warmer than normal, averaging 54.4°F, 1.2°F above normal (53.2°F). The warmest spring was 58.2°F in 1992; the coolest was 48.0°F in 1955. Spring season precipitation was the greatest on record, totaling 3.28 in., 234% of normal (1.40 in.). The previous wettest spring was 1957, with 3.06 in.; the driest was 1968, with 0.09 in.

June 1995 was cooler than normal, with an average temperature of 68.2°F, 1.5°F below normal (69.7°F). The period June 5 through 21 averaged 6.6°F below normal. Precipitation for June totaled 0.77 in., 203% of normal (0.38 in.).

July 1995 was slightly warmer than normal, averaging 77.1°F, 0.9°F above normal (76.2°F). There were no notable periods of either above- or below-normal temperatures. The warmest temperature of 1995 (105°F) occurred on July 19. Precipitation for July totaled 0.34 in., 189% of normal (0.18 in.).

August 1995 was cooler than normal, averaging 72.0°F, 3.1°F below normal (75.1°F). August 6 through 19, a 2-week period, averaged 7.9°F below normal. Precipitation for August totaled 0.07 in., 26% of normal (0.27 in.).

The summer months of 1995 (June, July, and August) were cooler than normal, averaging 72.4°F, 1.3°F below normal (73.7°F). The warmest summer (1958) averaged 78.2°F; the coolest (1980) averaged 70.2°F. Summer season precipitation totaled 1.18 in., 142% of normal (0.83 in.). The wettest summer (1950) received 2.99 in.; the driest (1973) received only 0.03 in.

September 1995 was the fifth warmest September on record, averaging 70.0°F, 4.3°F above normal (65.7°F). The period September 9 through 19 averaged 8.2°F above normal. The warmest September (1990) averaged 72.4°F; the coolest (1985) averaged 58.8°F. Precipitation for the month totaled 0.79 in., 255% of normal (0.31 in.), the sixth wettest September on record. The wettest (1947) received 1.34 in.; the driest (1991) received no rainfall.

October 1995 was slightly cooler than normal, averaging 52.2°F, 0.7°F below normal (52.9°F). October is the month with the greatest change in normal maximum temperatures, ranging from 75°F on October 1 to 56°F on October 31. October 1995 was another wet month, with precipitation totaling 0.87 in., 229% of normal (0.38 in.). The wettest October (1957) received 2.72 in.; the driest (1987) received only a trace.

November 1995 was much warmer than normal, averaging 44.2°F, 4.0°F above normal (40.2°F), the fifth warmest November on record. November was a month of extremes, with the period November 1 through 6 averaging 9.8°F below normal and the period November 24 through 30 averaging 14.9°F above normal. Ten daily temperature records were established. The warmest November (1990) averaged 46.5°F; the coldest (1985) averaged only 24.8°F. Precipitation for the month totaled 1.04 in., 114% of normal (0.91 in.). Snow totaled 1.0 in., compared to a November normal of 1.8 in.

The autumn months (September, October, and November) were warmer than normal, averaging 55.5°F, 2.6°F above normal (52.9°F). The warmest autumn (1990) averaged 57.1°F; the coolest (1985) averaged 44.5°F. Autumn season precipitation totaled 2.70 in., 169% of normal (1.60 in.). The wettest autumn received 4.79 in. (1973); the driest received only 0.04 in. (1976).

December 1995 was slightly warmer than normal, averaging 32.6°F, 1.2°F above normal (31.4°F). Precipitation for December 1995 totaled 2.32 in., 225% of normal (1.03 in.), the second wettest December on record. The wettest (1964) received 2.34 in.; the driest (1976) received only 0.11 in. Snowfall for the month totaled 4.0 in., compared to a December normal of 5.7 in. The peak wind gust of 61 mph on December 12 was the highest gust recorded at the HMS since a gust of 67 mph was recorded on November 3, 1993.

The following are some additional statistics for 1995:

Category	1995	Normal	Record	
			Maximum	Minimum
Days w/maximum temperatures $\geq 100^{\circ}\text{F}$	9	13	28	1
Days w/maximum temperatures $\geq 90^{\circ}\text{F}$	51	52	79	29
Days w/minimum temperatures $\leq 32^{\circ}\text{F}$	86	107	139	77
Days w/minimum temperatures $\leq 0^{\circ}\text{F}$	0	3	18	0
Days w/thunderstorms	9	10	23	3
Days w/fog (visibility ≤ 6 mi)	56	45	76	22
Days w/dense fog (visibility ≤ 0.25 mi)	30	24	42	9
Days w/peak wind gusts ≤ 12 mph	43	50	87	28
Days w/peak wind gusts ≥ 25 mph	158	155	190	123
Days w/peak wind gusts ≥ 40 mph	27	26	57	10
Days w/peak wind gusts ≥ 50 mph	6	5	18	0

Table 2.1 lists the daily temperature records for 1995, with the previous record and year of occurrence. Table 2.2 lists the monthly and annual totals for numerous meteorological parameters for 1995. Tables 2.3, 2.4, and 2.5 list 1995 monthly and annual average temperature, precipitation, and wind speed, respectively, from the HMMN.

Table 2.1. Daily Temperature Records for 1995 (previous record and year of occurrence in parentheses)

Date	Maximum		Minimum	
	High	Low	High	Low
Jan 27			36 ^(a) (36, 1982 ^(b))	
Feb 14				8 (11, 1990)
Feb 19	68 (66, 1991 ^(b))		56 (45, 1958)	
Feb 21			45 (43, 1968)	
Feb 22	62 ^(a) (62, 1947)			
Mar 11	67 ^(a) (67, 1989)		44 (42, 1989 ^(b))	
Apr 12		47 (52, 1968)		
Apr 28		54 (56, 1967)		
Jun 6		57 (62, 1951 ^(b))		
Jun 14		65 (67, 1965)		
Jun 19		63 (69, 1953)		
Jul 20			75 (74, 1956)	
Jul 31				52 (53, 1964 ^(b))
Aug 9				51 ^(a) (51, 1975)
Aug 12		77 (79, 1978)		
Aug 13				47 (49, 1984)
Aug 14				45 (49, 1984 ^(b))
Aug 17		76 (78, 1972 ^(b))		
Sep 3			71 (67, 1955 ^(b))	
Sep 14	94 (93, 1975 ^(b))			
Oct 10			54 ^(a) (54, 1994 ^(b))	
Oct 16			56 (54, 1988)	
Nov 1				20 (22, 1978)
Nov 2				17 (22, 1989 ^(b))
Nov 3				17 (24, 1961)
Nov 8	69 (64, 1980)			
Nov 14	65 (64, 1953)			
Nov 24	67 ^(a) (67, 1959)			
Nov 28	64 (62, 1973)			
Nov 29	62 (57, 1990 ^(b))		57 (40, 1994)	
Nov 30	62 ^(a) (62, 1994)			

(a) Ties record.

(b) Most recent of several occurrences.

Table 2.2. Summary of Miscellaneous Meteorological Parameters for 1995

Month	Temperatures (°F)						Degree Days Base 65 (°F)				Precipitation (in.)							Relative Humidity (%)				
	Averages			Extremes			Heating	Departure ^(a)	Cooling	Departure ^(a)	Total	Departure ^(a)	Greatest in 24 Hours	Date	Snow, Ice Pellets (in.)			Average	Departure ^(a)			
															Daily Maximum	Daily Minimum	Monthly			Departure ^(a)	Highest	Date
J	40.8	27.6	34.2	+2.9	67	31	8	4 ^(b)	954	-90	0	0	2.14	+1.35	0.41	9	2.7	-1.2	2.4	7-8	85.1	+8.7
F	53.1	33.0	43.1	+5.1	68	21 ^(b)	8	14	614	-150	0	0	0.69	+0.07	0.34	7	T	-2.0	T	15 ^(b)	66.7	-3.6
M	58.0	34.3	46.1	+0.5	69	30	21	6	581	-21	0	0	0.95	+0.48	0.42	9	0	-0.3	0		56.8	+0.9
A	65.2	40.0	52.6	-0.1	80	24	28	15	372	0	0	-3	1.54	+1.13	0.60	27-28	T	0	T	14	53.6	+6.4
M	78.5	50.5	64.5	+3.2	95	29	39	12	89	-75	73	+25	0.79	+0.28	0.53	9					45.2	+2.5
J	81.3	55.0	68.2	-1.5	98	30	47	12	46	+14	142	-33	0.77	+0.39	0.30	6					44.9	+6.1
J	92.1	62.2	77.1	+0.9	105	19	52	31	0	-5	376	+25	0.34	+0.16	0.24	8-9					37.8	+4.3
A	87.3	56.7	72.0	-3.1	102	4	45	14	1	-4	216	-101	0.07	-0.20	0.06	10					39.0	+3.2
S	85.0	54.9	70.0	+4.3	101	2	42	23	24	-54	174	+76	0.79	+0.48	0.51	6-7					45.4	+2.7
O	64.3	40.0	52.2	-0.7	74	15	16	31	398	+21	0	-3	0.87	+0.49	0.38	3	0	-0.1	0		61.0	+5.8
N	54.0	34.5	44.2	+4.0	69	8	17	3 ^(b)	623	-123	0	0	1.04	+0.13	0.24	6-7	1.0	-0.8	1.0	10	76.2	+2.8
D	38.5	26.7	32.6	+1.2	57	1	16	7	1003	-39	0	0	2.32	+1.29	1.04	11-12	4.0	-1.7	2.7	28-29	82.3	+2.0
Year	66.5	43.0	54.7	+1.4	105	Jul 19	8	Feb 14 ^(b)	4705	-526	981	-14	12.31	+6.05	1.04	Dec 11-12	7.7	-6.1	2.7	Dec 28-29	57.8	+3.5

Table 2.2. (contd)

Month	Mean Sky Cover Cover (Tenths)		Solar Radiation (Langleys)						50-ft Wind				Number of Days								
			Average Daily Total	Departure ^(a)	Greatest Daily Total	Date	Least Daily Total	Date	Average Speed (mph)	Departure ^(a)	Peak Gusts			Thunderstorms	Heavy Fog	Precipitation ≥ 0.10 in.	Snowfall ≥ 1 in.	Maximum Temperature (°F)		Minimum Temperature (°F)	
	Average	Departure ^(a)									Speed (mph)	Direction	Date					≥ 90°F	≤ 32°F		
J	7.1	-1.0	97	-12	179	19	28	28	6.8	+0.3	39	WSW	31	0	10	9	1	0	6	20	0
F	7.2	-0.4	177	-10	332	28	11	7	8.3	+1.1	44	SSW	17	0	1	2	0	0	2	11	0
M	5.8	-1.0	296	-28	457	29	94	9 ^(b)	8.4	+0.1	49	SW	9	0	0	3	0	0	0	13	0
A	6.8	+0.2	411	-41	562	22	78	12	8.6	-0.4	39	SW	4	0	0	4	0	0	0	2	0
M	4.8	-1.2	525	-35	662	26	186	1	8.9	-0.2	54	E	25	2	0	2	0	4	0	0	0
J	5.4	+0.2	512	-103	688	26	134	6	8.7	-0.5	42	NW	5	0	0	4	0	7	0	0	0
J	3.6	+0.3	587	-45	649	17	352	6	9.4	+0.6	52	WSW	6	4	0	1	0	17	0	0	0
A	3.4	-0.1	496	-42	599	1	155	10	8.5	+0.6	40	NW	23	0	0	0	0	11	0	0	0
S	2.9	-1.1	387	-21	495	1	137	28	6.9	-0.5	39	WSW	30	2	1	3	0	12	0	0	0
O	5.7	0	225	-34	353	1	46	17	7.0	+0.5	48	WNW	3	1	1	3	0	0	0	3	0
N	8.2	+0.4	96	-27	232	1	18	27	6.8	+0.4	56	SSW	29	0	7	5	1	0	0	12	0
D	8.3	+0.2	62	-24	142	4	11	30	5.6	-0.3	61	SSW	12	0	10	7	2	0	8	25	0
Year	5.8	-0.3	323	-35	688	Jun 26	11	Dec 30	7.8	+0.1	61	SSW	Dec 12	9	30	43	4	51	16	86	0

(a) Departure columns indicate positive or negative departure of meteorological parameters from 30-year (1961-1990) climatological normals.

(b) Latest date of multiple occurrences.

T = Trace.

(a) Departure columns indicate positive or negative departure of meteorological parameters from 30-year (1961-1990) climatological normals.

(b) Latest date of multiple occurrences.

T = Trace.

Table 2.3. Monthly and Annual Average Temperatures (°F) from the Hanford Meteorological Monitoring Network, 1995

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
1 PROS	33.4	41.4	44.1	51.0	63.1	67.3	76.1	70.2	67.0	49.6	43.3	33.3	53.2
2 EOC	33.9	42.2	44.9	51.0	63.1	66.2	75.9	70.4	68.9	51.5	45.2	32.8	53.7
3 ARMY	33.4	42.3	45.2	51.9	63.9	68.0	77.0	70.9	68.5	50.6	43.4	33.5	53.9
4 RSPG	33.8	42.6	44.9	51.0	63.1	67.1	76.0	70.1	67.8	50.2	43.5	33.3	53.6
5 EDNA	33.2	41.2	44.0	51.1	63.0	67.5	76.3	69.9	67.2	49.7	42.7	33.2	53.1
6 200E	33.8	43.0	46.1	52.7	65.0	68.4	77.5	71.7	69.4	51.8	44.0	33.4	54.6
7 200W	32.4	41.2	43.7	50.7	62.8	67.2	76.4	70.0	66.9	49.3	42.0	32.4	52.8
8 BVLY	34.2	42.2	45.5	51.9	64.2	67.9	76.5	70.6	68.4	52.2	43.2	33.2	54.1
9 FFTF	33.6	42.2	45.0	51.6	63.6	67.3	76.2	70.6	67.9	50.6	43.9	33.4	53.7
10 YAKB	33.8	42.4	45.0	51.3	64.0	67.8	77.1	71.0	69.2	51.1	43.0	32.3	53.9
11 300A	33.8	41.9	44.7	51.6	63.2	67.1	75.8	70.2	67.2	50.4	44.7	34.3	53.6
12 WYEB	33.3	42.0	44.9	51.7	63.7	67.7	76.7	70.7	67.9	50.4	43.3	33.2	53.7
13 100N	33.4	41.6	44.4	51.0	63.1	67.2	76.0	69.7	67.1	50.6	42.8	33.1	53.2
14 WPPS	33.1	41.2	44.0	50.9	62.5	67.1	75.9	69.7	66.5	49.4	42.8	33.2	52.9
15 FRNK	32.9	41.9	44.7	50.9	61.7	64.2	72.2	67.2	65.4	49.7	43.8	32.6	52.1
16 GABL	33.5	42.8	45.6	51.7	63.9	66.9	76.0	70.6	69.6	51.7	44.2	32.3	54.0
17 RING	33.8	41.7	44.6	50.7	62.2	65.7	73.3	67.3	64.9	49.2	43.2	33.2	52.4
18 RICH	34.1	42.9	45.7	52.5	63.7	67.2	76.1	70.8	68.0	51.6	45.7	34.6	54.3
19 PFP	33.1	42.4	45.3	51.8	64.1	67.8	76.9	71.0	68.8	50.9	43.0	32.6	53.9
20 RMTN	30.2	35.7	37.3	42.1	53.9	56.5	66.7	61.7	61.3	44.7	39.1	27.5	46.3
21 HMS	33.3	42.3	45.1	51.6	63.7	67.5	77.0	71.4	69.1	51.0	42.8	32.3	53.8
22 PASC	33.3	42.4	45.2	52.3	63.6	67.5	76.3	70.5	67.5	50.5	45.6	35.4	54.3
23 GABW	32.8	41.4	43.6	50.7	63.1	67.4	76.7	70.1	67.0	49.6	41.8	32.5	53.0
24 100F	33.2	41.6	44.4	51.4	63.4	67.6	76.5	70.1	67.4	50.2	42.7	33.2	53.4
25 VERN	34.5	42.6	45.5	51.8	64.2	68.5	77.2	71.4	69.3	52.4	43.8	34.2	54.5
26 BENT	--	42.3	44.8	50.5	62.0	65.2	73.5	68.4	66.0	49.5	44.0	32.6	(a)
27 VSTA	33.6	43.6	46.1	52.6	63.2	66.5	75.9	70.9	67.9	51.7	46.3	35.1	54.1
28 SURF	35.0	42.5	45.7	51.8	62.8	67.2	75.3	71.0	68.5	53.1	46.9	36.5	54.6

(a) Partial year, no annual average.

Figures 2.1 and 2.2 give a composite of the wind roses (at the 10- and 60-m levels, respectively) from the HMMN for 1995. The Appendix gives the individual 1995 wind roses from the HMMN stations.

Figure 2.3 depicts the 1995 observed daily maximum and minimum temperatures and the normal maximum, minimum, and mean daily temperatures for the HMS.

Table 2.4. Monthly and Annual Average Precipitation (in.) from the Hanford Meteorological Monitoring Network,^(a) 1995

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
1 PROS	1.34	0.62	0.94	1.27	0.30	0.96	0.11	0.06	0.54	0.55	0.96	1.71	9.36
2 EOC	2.14	0.99	1.04	1.50	0.21	1.08	0.14	0.07	0.66	0.57	1.58	1.96	11.94
3 ARMY	1.52	0.59	1.00	1.44	0.35	0.82	0.11	0.05	0.76	0.92	0.78	2.18	10.52
4 RSPG	2.13	0.70	0.95	1.78	0.63	0.95	0.33	0.03	0.77	0.98	0.82	2.29	12.36
6 200E	1.68	0.65	0.89	1.44	0.56	0.72	0.23	0.07	0.81	0.75	0.87	2.17	10.84
7 200W	1.74	0.69	0.78	1.00	0.62	0.82	0.42	0.06	0.81	0.72	0.94	1.81	10.41
8 BVLY	1.21	0.33	0.67	1.04	0.31	0.46	0.55	0.06	0.98	0.55	0.78	1.63	8.57
9 FFTF	1.33	0.50	0.93	1.04	0.32	0.64	0.08	0.06	0.49	0.88	0.88	1.99	9.14
10 YAKB	1.48	0.37	0.91	1.31	0.40	0.66	0.53	0.07	0.67	0.53	0.93	1.85	9.71
11 300A	1.31	0.41	0.94	1.25	0.26	0.82	0.14	0.07	0.49	0.53	0.97	1.79	8.98
12 WYEB	1.47	0.56	1.02	1.23	0.41	0.85	0.05	0.16	0.64	0.76	1.05	1.94	10.14
13 100N	1.58	0.36	0.91	0.89	0.27	0.75	0.35	0.08	0.84	0.68	0.87	1.78	9.36
14 WPPS	1.57	0.41	1.08	1.47	0.53	1.08	0.11	0.06	0.66	0.90	1.09	1.86	10.82
17 RING	1.78	0.65	1.24	1.03	0.32	1.35	0.15	0.10	1.33	0.69	0.99	2.12	11.75
20 RMTN	1.62	0.37	0.74	1.59	0.37	1.38	0.43	0.07	0.61	0.50	0.97	1.66	10.31
21 HMS	2.14	0.69	0.95	1.53	0.77	0.77	0.33	0.07	0.78	0.85	1.04	2.32	12.24
22 PASC	1.75	0.40	1.15	1.44	0.51	1.08	0.52	0.17	0.44	0.48	0.83	1.69	10.46
24 100F	1.96	0.66	1.19	1.24	0.26	0.93	0.25	0.13	0.71	0.89	1.09	1.58	10.89
26 BENT	0.0	0.31	0.98	1.61	0.35	1.00	0.15	0.08	0.85	0.81	1.33	1.76	(b)
27 VSTA	1.38	0.29	0.90	1.31	0.78	0.91	0.36	0.05	0.37	0.43	0.52	1.52	8.82
28 SURF	3.42	1.11	0.85	0.82	0.78	1.02	0.42	0.02	0.89	0.34	2.00	1.96	13.63

(a) Stations 5, 15, 16, 18, 19, 23, and 25 are solar powered; therefore, insufficient power is available to operate the heated tipping-bucket precipitation gauges.

(b) Partial year, no annual average.

Table 2.5. Monthly and Annual Average Wind Speed (mph) from the Hanford Meteorological Monitoring Network, 1995

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
1 PROS	6.8	7.8	7.3	7.7	7.7	8.0	7.9	7.0	6.3	5.9	7.6	6.3	7.2
2 EOC	9.4	10.4	9.9	9.5	9.1	9.1	8.3	8.4	8.1	8.5	10.8	7.4	9.1
3 ARMY	5.5	7.1	6.9	7.3	7.0	7.4	7.5	6.8	5.2	5.6	6.8	5.4	6.5
4 RSPG	5.1	7.3	7.6	7.5	7.7	7.5	7.6	7.6	6.8	7.0	7.3	4.8	7.0
5 EDNA	5.1	6.5	6.0	6.7	6.7	7.4	7.3	6.3	5.1	5.3	5.7	4.9	6.1
6 200E	6.1	7.6	7.7	8.1	8.5	8.6	9.5	8.1	6.0	6.6	6.6	5.4	7.4
7 200W	4.0	5.7	5.9	6.4	6.6	6.8	7.1	6.5	4.7	5.0	5.2	4.2	5.6
8 BVLY	6.2	6.5	7.1	7.9	7.7	8.2	9.4	7.5	5.8	6.5	5.7	4.8	6.9
9 FFTF	6.8	8.0	7.9	8.3	8.2	8.4	8.3	7.7	7.0	6.9	8.3	6.4	7.7
10 YAKB	6.1	7.1	7.4	8.0	8.8	8.3	8.9	8.3	6.7	6.5	6.2	5.0	7.3
11 300A	6.1	7.7	7.4	8.1	8.0	8.5	8.0	7.5	6.4	6.3	8.0	6.3	7.4
12 WYEB	6.2	7.6	7.3	7.7	7.6	7.9	8.0	7.1	6.2	6.4	7.5	5.9	7.1
13 100N	3.6	5.9	5.5	6.9	6.5	7.2	7.8	6.2	4.6	5.2	4.7	4.3	5.7
14 WPPS	6.0	6.8	6.8	7.2	6.7	7.2	7.3	6.5	5.7	5.5	6.9	5.6	6.5
15 FRNK	5.9	7.9	7.3	7.0	6.9	6.9	6.4	6.1	6.1	5.9	7.6	6.0	6.7
16 GABL	8.3	11.8	11.0	11.8	12.4	12.9	13.1	11.3	9.3	10.3	10.1	7.8	10.8
17 RING	4.6	6.6	6.8	6.8	6.3	6.7	6.7	5.6	5.3	5.2	6.3	5.3	6.0
18 RICH	5.0	6.3	6.3	7.1	6.6	7.0	6.7	6.1	5.5	5.1	7.0	5.8	6.2
19 PFP	3.5	4.7	4.8	5.1	5.2	5.3	5.4	4.8	3.7	3.8	3.7	3.2	4.4
20 RMTN	18.4	22.7	19.3	16.6	16.3	16.1	12.2	12.7	13.2	16.0	22.6	16.3	16.8
21 HMS	5.8	7.1	7.2	7.4	7.5	7.4	8.3	7.4	5.9	5.8	5.6	4.7	6.7
22 PASC	3.9	5.1	5.5	5.9	5.3	5.8	5.3	5.2	4.7	4.1	6.5	5.2	5.2
23 GABW	4.6	6.2	6.0	6.6	6.7	6.9	7.0	6.0	5.0	5.5	5.4	4.4	5.8
24 100F	4.0	6.0	5.7	6.9	6.4	7.3	7.4	6.3	5.0	5.3	5.3	4.3	5.8
25 VERN	6.9	7.4	7.5	8.3	8.5	8.7	10.2	8.4	6.3	6.3	5.8	5.5	7.5
26 BENT	0.0	6.9	6.4	7.1	7.4	6.8	6.4	6.2	6.1	5.8	7.3	5.7	(a)
27 VSTA	4.1	5.7	5.9	6.8	6.2	6.6	6.5	6.1	5.4	5.2	7.2	5.0	5.9
28 SURF	5.4	6.1	7.6	10.1	10.3	1.5	13.0	10.9	8.5	9.1	7.6	7.1	8.9

(a) Partial year, no annual average.

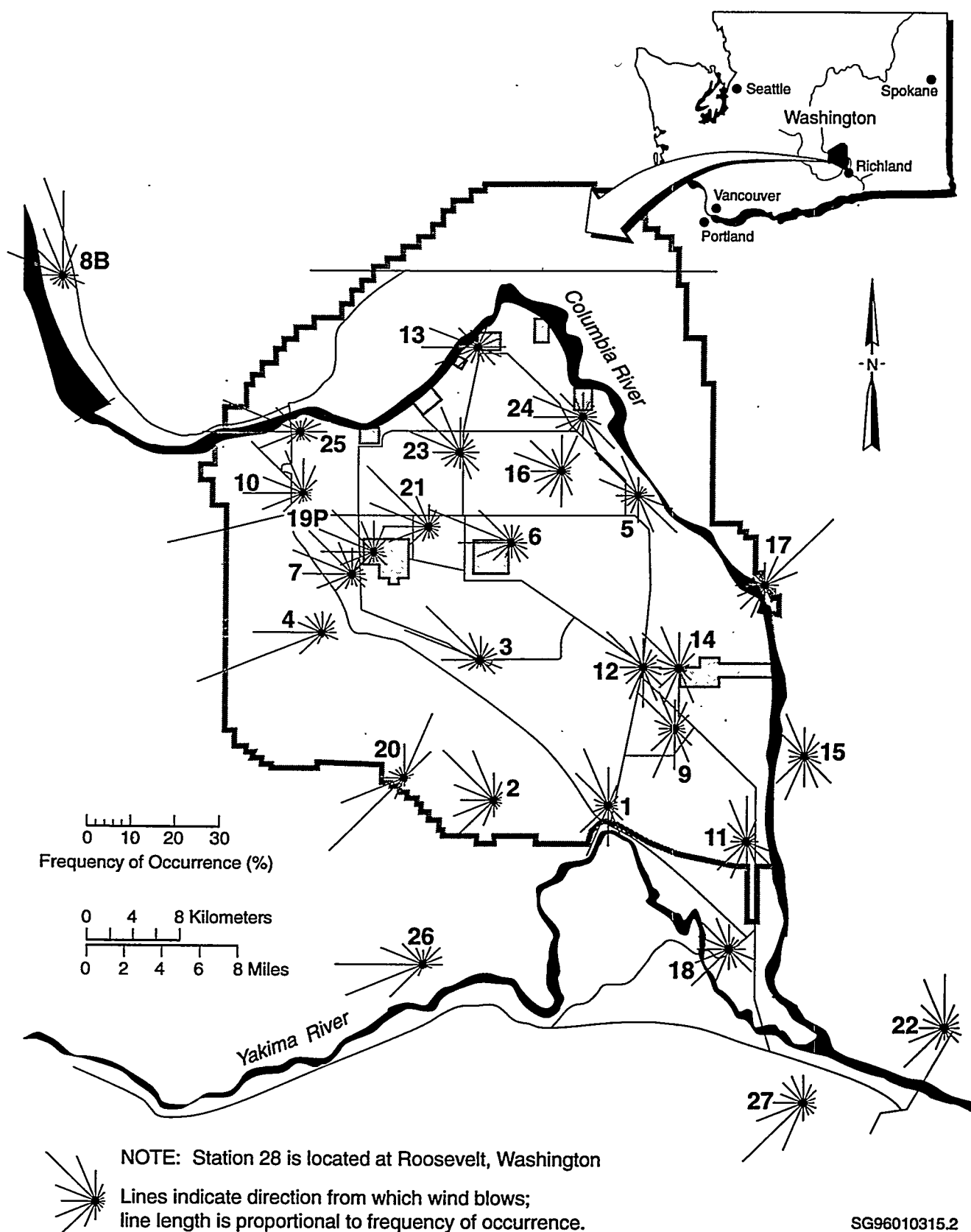
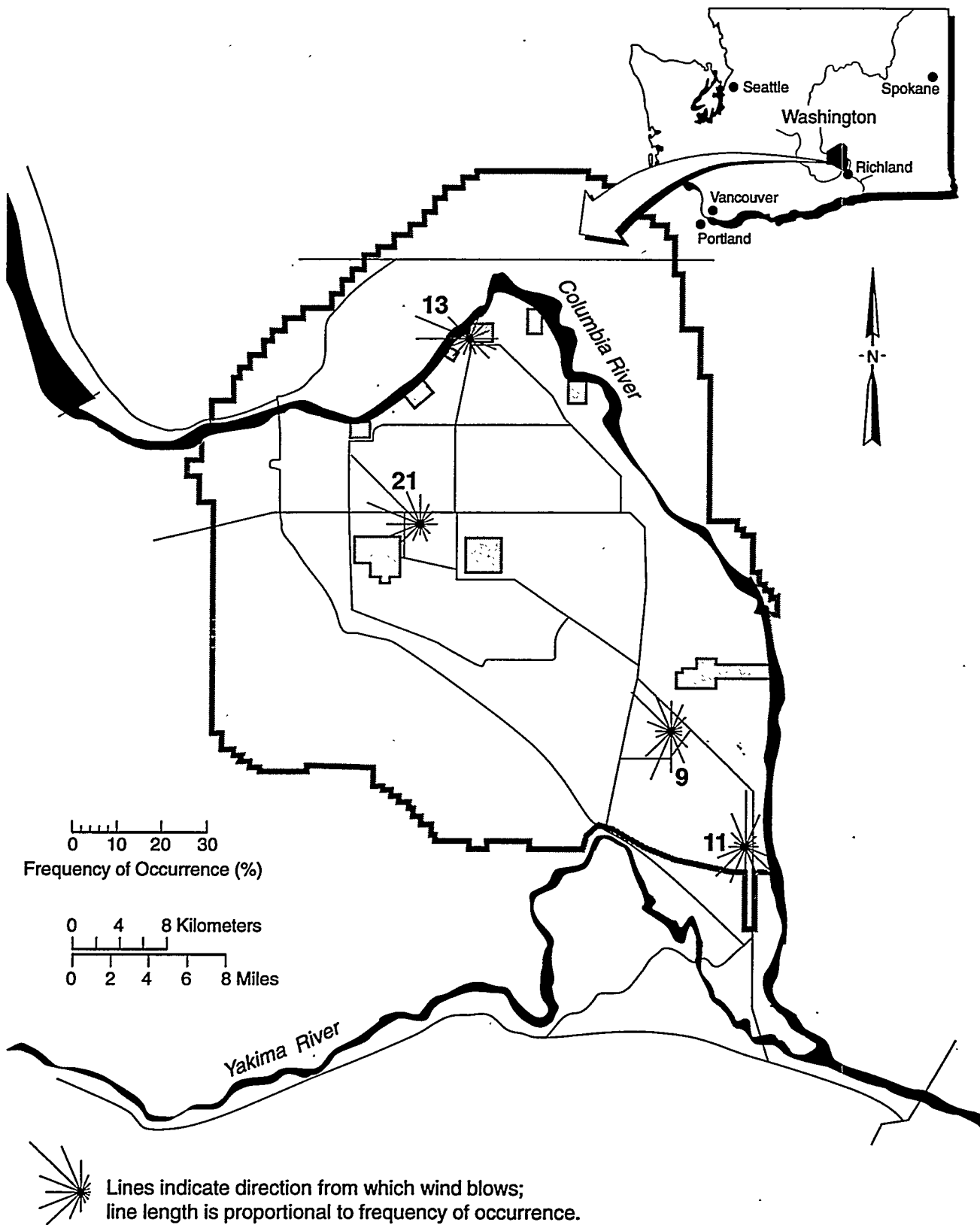


Figure 2.1. Hanford Meteorological Monitoring Network Wind Roses at 10-m Level, 1995
(see Appendix for station-specific wind rose)



SG96010315.1

Figure 2.2. Hanford Meteorological Monitoring Network Wind Roses at 60-m Level, 1995
(see Appendix for station-specific wind rose)

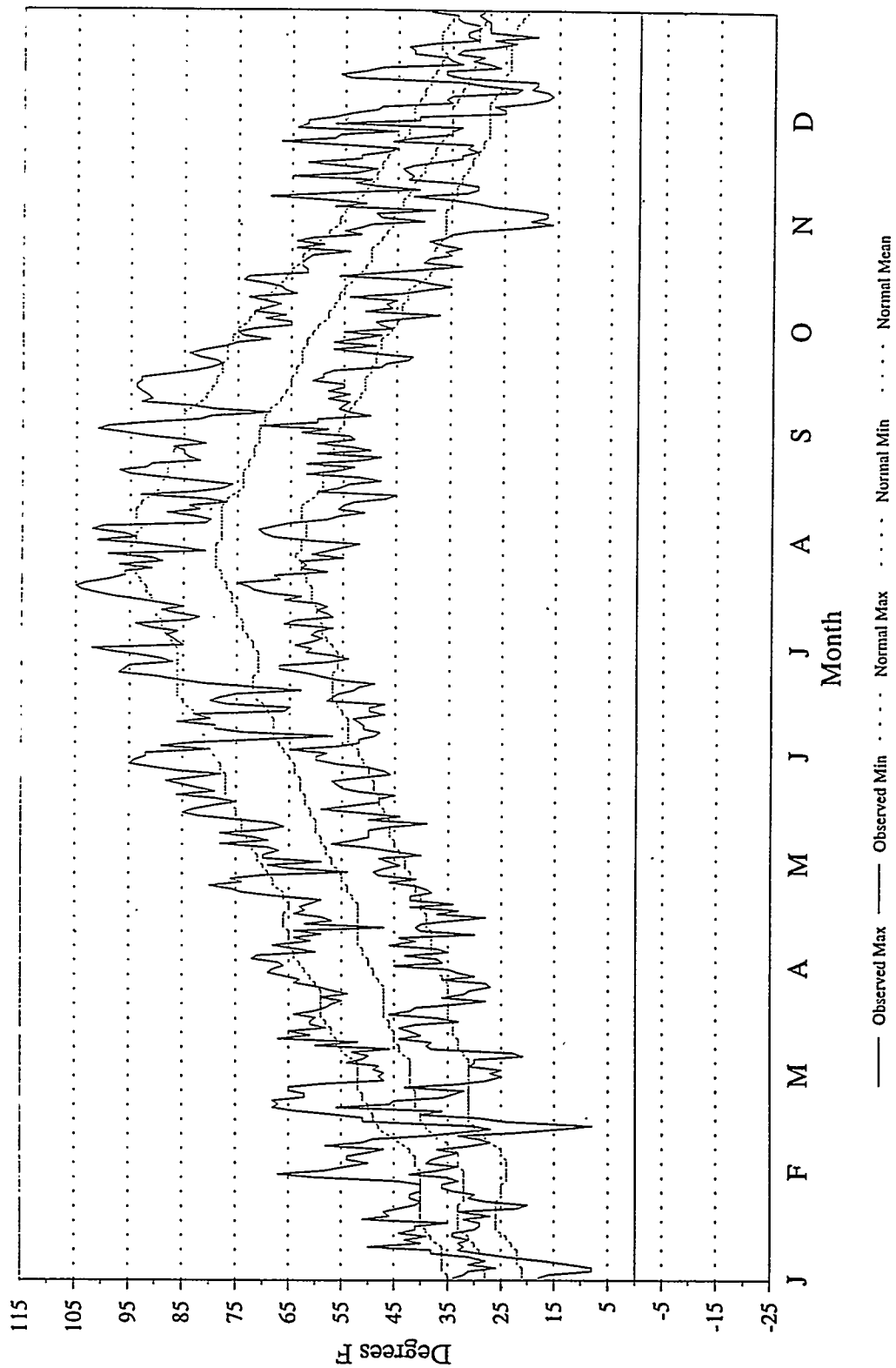


Figure 2.3. Observed Daily Temperatures from the Hanford Meteorology Station, 1995

3.0 Temperature Climatology

3.1 Monthly, Seasonal, and Annual Average Temperatures

Monthly, seasonal, and annual average temperatures, computed from observed daily maximum and minimum temperatures for the period 1945 through 1995, are presented in Tables 3.1 and 3.2. In these tables, the highest and lowest values, representing the warmest and coldest month, season, or year, are noted. Averages are based on the entire period of record, and climatological normal temperatures are based on the period 1961 through 1990.

As indicated in Table 3.1, a much wider range and variability in temperatures is found during the late autumn and winter months (November through February) than during the rest of the year. The range of average monthly temperatures for January is from 12.1°F (1950) to 42.5°F (1953), 30.4°F; for November 21.7°F; February 18.9°F; and December 17.5°F; whereas for the rest of the year, the monthly range is from a low of 10.5°F in April to a high of 13.8°F in June. The coldest month ever was January 1950 (12.1°F) and the hottest was July 1985 (82.2°F). As shown in Table 3.2, seasonal ranges are from 8.0°F during the summer (June, July, and August) to 16.4°F in winter (December, January, and February). The coldest season was the winter of 1948-1949 (24.2°F), and the hottest was the summer of 1958 (78.2°F).

3.2 Days with Maximum Temperatures $\geq 100^{\circ}\text{F}$, $\geq 90^{\circ}\text{F}$, and $\leq 32^{\circ}\text{F}$

Table 3.3 contains the number of days each year with maximum temperatures in the categories $\geq 100^{\circ}\text{F}$, $\geq 90^{\circ}\text{F}$, and $\leq 32^{\circ}\text{F}$.

Maximum temperatures $\geq 100^{\circ}\text{F}$ occurred as early as May 5 (1966) and as late as September 6 (1955). The annual number of days with maximum temperatures in this category ranged from 1 (1954) to 28 (1958). The greatest number of consecutive days with maximum temperatures $\geq 100^{\circ}\text{F}$ is 11 and occurred 3 times: July 22 through August 1, 1962; August 10 through 20, 1967; and August 6 through 16, 1981.

One particularly notable period of above-normal temperatures occurred July 15 through August 13, 1971. This 30-day period included 27 days with maximum temperatures $\geq 100^{\circ}\text{F}$ in 3 separate periods of 9 consecutive days each. The lowest maximum temperature during the 30-day period was 98°F and the highest was 112°F. The average maximum temperature during this period was 104.7°F.

Table 3.4 lists the dates of all occurrences of maximum temperatures $\geq 104^{\circ}\text{F}$.

Table 3.1. Monthly and Annual Average Temperatures (°F)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
1945	33.9	38.6	42.1	50.3	61.7	67.5	78.0	77.5	64.6	56.4	40.6	32.7	53.7
1946	34.4	39.6	45.5	53.7	64.2	66.9	76.1	76.6	63.5	49.5	35.8	34.8	53.4
1947	27.4	40.0	49.6	56.1	<u>68.7</u> ^(a)	67.8	75.3	71.8	65.4	53.4	41.2	33.1	54.2
1948	32.0	31.8	42.1	49.4	58.3	72.4	72.8	71.8	64.4	51.0	40.8	26.9	51.1
1949	13.9	31.8	45.2	55.5	67.0	69.3	74.9	74.8	68.3	50.2	45.2	35.1	52.6
1950	<u>12.1</u>	30.7	42.3	49.9	59.0	66.5	75.4	76.4	67.5	51.1	40.7	36.2	50.6
1951	33.0	36.9	40.1	54.1	61.1	69.4	76.7	74.2	66.8	51.5	39.5	27.4	52.6
1952	25.2	36.7	44.1	55.2	62.7	67.1	77.0	74.0	69.0	59.0	34.0	34.8	53.2
1953	<u>42.5</u>	41.2	46.2	51.0	58.0	<u>63.0</u>	75.8	74.0	67.8	55.4	43.4	37.6	54.7
1954	<u>28.9</u>	39.3	41.5	51.4	62.9	<u>65.5</u>	73.9	71.4	65.1	51.4	46.0	34.0	52.6
1955	30.0	35.3	<u>39.4</u>	<u>47.5</u>	57.0	70.2	73.0	75.5	66.4	53.3	31.3	29.4	50.7
1956	31.8	<u>25.6</u>	43.8	56.2	65.3	65.7	78.9	75.3	67.3	52.1	36.6	34.6	52.8
1957	16.5	<u>34.1</u>	44.0	55.2	65.9	70.8	74.3	72.9	69.0	50.7	40.4	<u>38.5</u>	52.7
1958	37.1	<u>44.5</u>	43.5	51.3	68.1	73.9	81.2	79.4	65.6	54.4	40.6	<u>35.2</u>	56.2
1959	32.0	<u>35.5</u>	45.1	54.2	57.5	68.6	77.7	71.8	62.6	53.4	36.5	33.1	52.3
1960	23.3	37.4	45.1	52.6	58.5	70.1	81.8	71.4	67.7	54.5	41.2	29.0	52.7
1961	35.0	43.7	46.1	52.3	60.0	74.0	79.4	80.2	63.8	51.6	35.3	33.7	54.6
1962	29.8	36.6	42.6	55.6	56.9	68.3	76.0	71.9	67.1	52.6	43.2	36.8	53.1
1963	25.4	38.3	46.4	49.8	61.7	69.4	72.4	75.7	71.1	56.0	42.8	30.2	53.3
1964	35.6	38.1	43.8	50.2	59.7	67.7	74.5	<u>69.8</u>	63.0	53.3	38.2	25.5	51.6
1965	32.3	40.5	42.9	54.8	60.5	69.3	76.5	<u>74.7</u>	62.4	57.1	43.1	33.0	53.9
1966	34.0	39.9	45.4	54.6	63.2	66.9	73.3	75.6	68.8	53.4	43.7	38.2	54.8
1967	39.8	43.7	44.3	47.6	60.5	72.5	78.6	<u>81.5</u>	71.8	55.1	41.5	33.1	55.8
1968	35.7	41.8	49.0	51.3	62.4	69.8	79.7	71.5	66.8	50.3	41.7	30.6	54.2
1969	19.8	31.7	45.8	52.2	64.6	75.1	76.0	72.8	67.4	51.0	40.2	34.6	52.6
1970	30.7	40.6	45.0	49.0	61.5	73.6	78.6	76.3	61.8	50.9	39.7	30.8	53.2
1971	35.8	39.1	40.7	52.0	64.0	65.3	78.7	80.5	61.5	51.7	40.4	30.6	53.4
1972	30.5	34.8	47.0	49.6	64.3	69.7	76.2	77.6	61.4	52.3	39.9	27.3	52.6
1973	29.1	38.5	47.4	53.6	63.1	68.7	78.2	73.9	65.7	52.4	38.4	38.1	53.9
1974	29.4	40.9	45.2	52.9	57.9	72.6	74.5	75.5	68.0	52.5	41.6	36.2	53.9
1975	32.5	33.7	42.5	48.2	60.2	67.2	79.5	71.0	68.0	52.5	39.5	34.5	52.4
1976	32.0	37.6	41.4	50.8	60.5	65.6	75.1	70.8	69.0	52.4	40.6	30.7	52.2
1977	25.2	40.5	45.4	57.3	56.9	72.6	73.7	79.2	61.5	52.0	38.9	33.8	53.1
1978	32.5	37.9	47.5	51.9	58.6	70.3	75.7	72.7	63.8	52.2	32.3	27.5	51.9
1979	13.9	34.2	46.5	52.8	64.1	70.8	77.2	74.6	69.2	56.5	34.2	36.4	52.5
1980	23.7	34.6	44.5	55.2	61.4	64.7	74.7	71.2	66.0	52.6	41.0	36.6	52.2
1981	38.0	39.7	48.7	54.0	60.5	66.0	73.9	79.0	66.3	52.0	42.7	32.8	54.5
1982	29.8	38.1	45.9	49.4	60.4	73.1	74.9	75.8	65.4	51.4	36.9	32.0	52.8
1983	37.5	40.9	48.5	51.1	63.8	65.4	71.3	74.4	61.7	52.6	43.6	21.2	52.7
1984	31.6	38.7	47.2	50.5	<u>56.0</u>	65.7	76.1	74.0	62.1	<u>47.9</u>	39.4	23.6	51.1
1985	25.0	29.9	44.0	55.5	63.2	70.2	<u>82.2</u>	70.5	<u>58.8</u>	49.8	<u>24.8</u>	<u>21.0</u>	<u>49.6</u>
1986	34.0	39.1	48.6	50.9	62.3	73.0	70.6	79.2	62.2	54.7	42.3	32.4	54.1
1987	30.7	40.1	48.3	58.0	66.2	73.4	74.3	76.6	69.9	55.5	43.6	31.5	55.7
1988	31.9	41.0	45.9	55.2	61.1	69.2	77.3	75.2	65.6	<u>59.6</u>	44.2	31.8	54.8
1989	37.2	27.3	43.8	56.6	61.5	72.0	75.5	73.4	67.4	54.0	44.3	33.3	53.9
1990	40.4	37.6	48.0	57.9	60.7	70.1	80.8	76.8	<u>72.4</u>	52.3	<u>46.5</u>	24.1	55.6
1991	28.7	<u>44.5</u>	44.1	54.0	60.4	65.6	78.0	78.9	69.7	52.9	41.3	37.8	54.7
1992	37.5	42.6	<u>51.5</u>	56.0	67.2	<u>76.8</u>	76.6	76.9	64.5	55.7	41.2	30.0	<u>56.4</u>
1993	24.8	30.8	43.2	52.5	66.5	<u>68.4</u>	<u>70.5</u>	73.1	66.4	55.4	34.6	35.4	51.8
1994	38.6	36.0	49.2	<u>58.2</u>	64.9	69.8	81.0	76.6	70.5	54.4	39.6	35.1	56.2
1995	34.2	43.1	46.1	<u>52.6</u>	64.5	68.1	77.1	72.0	69.9	52.1	44.1	32.6	54.7
Average	30.5	37.6	45.1	52.9	61.9	69.3	76.3	74.9	66.1	53.1	40.0	32.3	53.3
Normal ^(b)	31.3	38.0	45.6	52.7	61.3	69.7	76.2	75.1	65.7	52.9	40.2	31.4	53.3

(a) The highest and lowest averages in each column are underlined.

(b) Normal temperatures are averages for the period 1961-1990.

Table 3.2. Seasonal Average Temperatures (°F)

Year	Winter Dec-Feb	Spring Mar-May	Summer Jun-Aug	Autumn Sep-Nov
1945	--	51.4	74.3	53.9
1946	35.6	54.5	73.2	49.6
1947	34.1	58.1	71.6	53.3
1948	32.3	49.9	72.3	52.1
1949	<u>24.2^(a)</u>	55.9	73.0	54.6
1950	26.0	50.4	72.8	53.1
1951	35.4	51.8	73.4	52.6
1952	29.8	54.0	72.7	54.0
1953	39.5	51.7	70.9	55.5
1954	35.3	51.9	70.3	54.2
1955	33.1	<u>48.0</u>	72.9	50.3
1956	28.9	55.1	73.3	52.0
1957	28.4	55.0	72.7	53.4
1958	40.0	54.3	<u>78.2</u>	53.5
1959	34.2	52.3	<u>72.7</u>	50.8
1960	31.3	52.1	74.4	54.5
1961	35.9	52.8	77.9	50.2
1962	33.4	51.7	72.1	54.3
1963	33.5	52.6	72.5	56.6
1964	34.6	51.2	70.7	51.5
1965	32.8	52.7	73.5	54.2
1966	35.6	54.4	71.9	55.3
1967	<u>40.6</u>	50.8	77.5	56.1
1968	36.9	54.2	73.7	52.9
1969	27.4	54.2	74.6	52.9
1970	35.3	51.8	76.2	50.8
1971	35.2	52.2	74.8	51.2
1972	32.0	53.6	74.5	51.2
1973	31.6	54.7	73.6	52.2
1974	36.1	52.0	74.2	54.0
1975	34.1	50.3	72.6	53.3
1976	34.7	50.9	70.5	54.0
1977	32.1	53.2	75.2	50.8
1978	34.7	52.7	72.9	49.4
1979	25.2	54.5	74.2	53.3
1980	31.6	53.7	<u>70.2</u>	53.2
1981	38.1	54.4	73.0	53.7
1982	33.6	51.9	74.6	51.2
1983	36.8	54.5	70.4	52.6
1984	30.5	51.2	71.9	49.8
1985	26.2	54.2	74.3	<u>44.5</u>
1986	31.4	53.9	74.3	53.1
1987	34.4	57.5	74.8	56.3
1988	34.8	54.1	73.9	56.5
1989	32.1	54.0	73.6	55.2
1990	37.1	55.5	75.9	<u>57.1</u>
1991	32.4	52.8	74.2	54.6
1992	39.3	<u>58.2</u>	76.8	53.8
1993	28.5	<u>54.1</u>	70.7	52.1
1994	36.7	57.4	75.8	54.8
1995	37.5	54.4	72.4	55.4
Average	33.4	53.3	73.5	53.1
Normal ^(b)	33.6	53.2	73.7	52.9

(a) The highest and lowest averages in each column are underlined.

(b) Normal temperatures are averages for the period 1961-1990.

Table 3.3. Monthly and Seasonal Number of Days with Maximum Temperature (°F) Above or Below Certain Thresholds

Year	Maximum Temperature $\geq 100^{\circ}\text{F}$							Maximum Temperature $\geq 90^{\circ}\text{F}$							Maximum Temperature $\leq 32^{\circ}\text{F}$								
	May	Jun	Jul	Aug	Sep	Total		Apr	May	Jun	Jul	Aug	Sep	Oct	Total	Year	Oct	Nov	Dec	Jan	Feb	Mar	Total
1945	0	0	8	4	0	12		1	1	7	22	21	5	0	56	1944-45	--	--	--	12	1	1	14
1946	0	0	7	6	0	13		1	0	4	15	18	0	0	38	1945-46	0	2	9	0	0	0	11
1947	1	0	2	0	0	3		0	8	4	17	11	2	0	42	1946-47	0	4	4	14	0	0	22
1948	0	2	0	0	0	2		0	1	9	14	7	7	0	38	1947-48	0	0	6	8	9	0	23
1949	0	1	6	2	1	10		0	8	8	15	18	8	0	57	1948-49	0	0	13	28	8	0	49
1950	0	0	2	3	2	7		0	1	5	20	22	8	0	56	1949-50	0	0	5	24	5	1	35
1951	0	0	8	3	0	11		0	1	8	23	19	5	0	56	1950-51	0	0	2	8	2	0	12
1952	0	0	9	4	0	13		0	2	5	21	17	12	0	57	1951-52	0	0	16	19	0	0	35
1953	0	0	4	4	0	8		0	0	0	21	13	11	0	45	1952-53	0	9	6	1	0	0	16
1954	0	0	1	0	0	1 ^(a)		0	2	3	20	9	3	0	37	1953-54	0	0	2	12	4	0	18
1955	0	2	5	2	2	11		0	0	9	12	19	8	0	48	1954-55	0	0	5	13	2	1	21
1956	0	0	10	5	0	15		0	7	2	22	16	7	0	54	1955-56	0	15	16	7	15	0	53
1957	0	1	1	0	0	2		0	3	8	14	8	6	0	39	1956-57	0	7	10	22	7	0	46
1958	1	6	10	11	0	28		0	8	11	28	25	5	0	77	1957-58	0	0	2	2	0	0	4
1959	0	0	8	1	0	9		0	1	7	21	12	3	0	44	1958-59	0	3	5	8	2	0	18
1960	0	0	16	5	0	21		0	1	12	28	12	5	0	58	1959-60	0	5	7	23	1	2	38
1961	0	7	8	10	0	25		0	1	15	26	24	1	0	67	1960-61	0	0	14	10	0	0	24
1962	0	0	10	1	0	11		0	0	11	17	10	8	0	46	1961-62	0	0	7	12	2	0	21
1963	0	3	0	3	0	6		0	4	7	8	18	11	0	48	1962-63	0	0	3	14	3	0	20
1964	0	0	6	0	0	6		0	0	5	14	10	2	0	31	1963-64	0	1	11	3	0	0	15
1965	0	0	6	5	0	11		0	1	7	20	12	1	0	41	1964-65	0	0	14	5	0	0	19
1966	1	0	2	4	0	7		0	5	2	15	21	7	0	50	1965-66	0	1	8	3	0	0	12
1967	0	2	6	15	0	23		0	2	13	25	27	12	0	79	1966-67	0	0	2	0	0	0	2
1968	0	0	10	3	0	13		1	1	5	22	12	4	0	45	1967-68	0	0	10	4	0	0	14
1969	0	3	4	2	0	9		0	6	17	20	15	7	0	65	1968-69	0	0	7	20	4	0	31
1970	0	9	11	5	0	25		0	2	15	22	19	0	0	58	1969-70	0	3	9	15	0	0	27
1971	0	0	16	11	0	27		0	2	2	20	26	2	0	52	1970-71	0	3	11	9	1	0	24
1972	0	0	5	10	0	15		0	5	8	21	19	5	0	58	1971-72	1	0	10	9	7	0	27
1973	0	2	10	5	0	17		0	6	7	21	18	4	0	56	1972-73	0	0	14	10	0	0	24
1974	0	6	5	3	0	14		0	0	18	16	18	6	0	58	1973-74	0	4	1	12	0	0	17
1975	0	0	9	0	0	9		0	2	4	22	12	8	0	48	1974-75	0	0	0	6	6	0	12
1976	10	1	2	0	1	4		0	1	4	17	9	4	0	35	1975-76	0	3	5	7	0	0	15
1977	0	1	2	13	0	16		1	0	13	16	22	0	0	52	1976-77	0	0	12	20	3	0	35
1978	0	1	6	6	0	13		0	0	12	17	11	2	0	42	1977-78	0	5	9	6	2	0	22
1979	0	2	7	1	0	10		0	1	13	23	20	7	0	64	1978-79	0	7	11	30	4	0	52
1980	0	0	3	0	0	3		0	0	0	18	9	2	0	29	1979-80	0	7	3	16	6	0	32

Table 3.3. (contd)

Year	Maximum Temperature $\geq 100^{\circ}\text{F}$						Maximum Temperature $\geq 90^{\circ}\text{F}$						Maximum Temperature $\leq 32^{\circ}\text{F}$									
	May	Jun	Jul	Aug	Sep	Total	Apr	May	Jun	Jul	Aug	Sep	Oct	Total	Year	Oct	Nov	Dec	Jan	Feb	Mar	Total
1981	0	0	3	13	0	16	1	0	4	19	22	11	0	57	1980-81	0	1	6	0	2	0	9
1982	0	2	5	3	0	10	0	0	15	16	17	5	0	53	1981-82	0	0	8	10	2	0	20
1983	1	0	1	0	0	2	0	8	2	9	13	0	0	32	1982-83	0	3	10	5	0	0	18
1984	0	0	3	3	0	6	0	1	4	21	16	4	0	46	1983-84	0	0	25	12	1	0	38
1985	0	1	15	0	0	16	0	3	10	30	7	0	0	50	1984-85	0	2	18	29	9	0	58
1986	3	1	0	6	0	10	0	6	11	9	27	3	0	56	1985-86	0	15	25	5	1	0	46
1987	1	5	3	4	1	14	2	6	15	14	19	12	0	68	1986-87	0	0	7	9	0	0	16
1988	0	0	8	3	3	14	0	4	11	19	20	7	0	61	1987-88	0	0	16	11	1	0	28
1989	0	0	2	2	0	4	0	0	13	20	9	3	0	45	1988-89	0	0	11	2	8	1	22
1990	0	0	11	9	0	20	0	1	8	24	15	12	0	60	1989-90	0	2	6	0	1	0	9
1991	0	0	4	8	0	12	0	0	1	25	23	5	0	54	1990-91	0	0	15	13	0	0	28
1992	0	7	5	9	0	21	0	8	16	15	17	3	0	59	1991-92	0	0	3	0	0	0	3
1993	1	0	0	2	0	3	0	7	6	4	15	11	0	43	1992-93	0	1	11	20	8	2	42
1994	0	1	13	7	0	21	0	5	8	25	18	12	0	68	1993-94	0	6	4	1	8	0	19
1995	0	0	5	3	1	9	0	4	7	17	11	12	0	51	1994-95	0	0	5	6	2	0	13
1996	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1995-96	0	0	8	--	--	--	--
Average	0	1	6	4	0	12	0	3	8	19	16	6	0	51	Average	0	2	9	10	3	0	24
Normal ^(a)	0	2	6	5	0	13	0	2	9	19	17	5	0	52	Normal	0	2	10	10	2	0	24

(a) Greatest and least seasonal totals are underlined.
(b) Normal temperatures are averages for the period 1961-1990.

Table 3.4. Days with Maximum Temperatures $\geq 104^{\circ}\text{F}$

Temperature ($^{\circ}\text{F}$)	Date(s) of Occurrence					
113	08/04/61					
112	08/09/71					
111	07/22/94	06/23/92	07/31/71			
110	07/12/90 07/17/60	07/20/79	07/09/75	08/08/72	07/06/68	07/18/60
109	07/21/94 08/07/72	07/23/94 08/10/71	07/24/94 08/01/71	08/14/92	07/11/90	07/19/79
108	06/24/92 08/11/71 08/18/67	08/05/90 07/27/71 08/17/67	07/18/79 07/19/71 08/16/67	07/27/75 07/28/68 07/31/65	07/05/75 07/08/68 07/13/61	08/12/71 07/04/68 06/17/61
107	08/13/92 07/28/82 07/28/71 07/28/58	08/01/92 08/08/81 07/05/68 07/14/55	07/31/92 07/17/79 08/03/61	06/25/92 08/18/77 07/22/59	07/14/87 08/08/71 07/20/59	07/29/82 07/30/71 07/19/59
106	08/02/94 07/09/85 08/13/77 07/04/70 07/19/56	08/18/92 07/25/84 07/10/75 08/01/65 07/09/52	07/18/92 07/22/80 07/29/73 07/12/64	06/22/92 08/09/78 07/15/73 07/24/62	09/01/87 07/23/78 08/06/72 06/16/61	06/30/87 08/17/77 07/20/71 06/22/58
105	07/19/95 08/09/87 08/12/81 08/23/70 07/03/68 07/03/67 08/04/52	07/17/92 07/20/85 08/04/78 07/19/70 08/30/67 08/02/61 07/30/52	07/03/91 07/27/82 08/03/78 07/16/70 08/20/67 08/11/60 07/10/52	07/22/90 07/26/82 07/04/75 07/08/70 08/19/67 07/19/60	07/15/90 08/16/81 07/21/71 07/27/68 08/15/67 07/07/60	07/26/88 08/13/81 07/18/71 07/07/68 08/13/67 07/13/55
104	07/18/95 05/31/86 08/07/82 08/08/78 08/01/73 08/13/71 06/21/70 07/23/62 08/25/58 07/24/56 07/17/51 08/20/46	07/20/94 05/30/86 08/11/81 07/25/78 07/27/73 08/07/71 08/31/67 08/14/61 08/24/58 07/23/56 08/01/49	07/10/90 07/29/85 08/10/81 08/20/77 07/19/73 07/16/71 08/11/67 06/18/61 08/11/58 07/21/56 07/31/49	07/25/88 07/21/85 08/07/81 08/12/77 06/22/73 07/09/70 07/12/67 08/10/60 07/17/58 07/22/55 07/30/49	07/21/88 07/08/85 07/27/81 07/30/74 08/28/72 07/03/70 07/30/65 07/16/60 07/11/58 08/15/53 07/15/49	07/20/88 07/04/85 07/04/81 07/28/74 08/09/72 06/23/70 07/25/62 07/18/59 08/22/56 07/23/51 06/29/48

Maximum temperatures $\geq 90^{\circ}\text{F}$ occur an average of 51 times per year and vary from a low of 29 (1980) to a high of 79 (1967). The earliest occurrences varied from April 24 (1977) through July 2 (1953), with an average annual date of May 21 (Table 3.5). The latest annual occurrence of maximum temperatures $\geq 90^{\circ}\text{F}$ varied from August 17 (1983) through September 29 (1993 and earlier years). The average date for the period 1946 through 1995 is September 15. The longest period of consecutive maximum temperatures $\geq 90^{\circ}\text{F}$ is 32 days from July 13 through August 13, 1971.

The average seasonal number of days with maximum temperatures $\leq 32^{\circ}\text{F}$ is 25. The earliest seasonal occurrence of a day with a maximum temperature $\leq 32^{\circ}\text{F}$ was October 30 (1971) and the latest March 11 (1950). The number of winter days with maximum temperatures $\leq 32^{\circ}\text{F}$ varied from 2 (winter of 1966-1967) to 58 (winter of 1984-1985). The greatest consecutive number of days with maximum temperatures $\leq 32^{\circ}\text{F}$ is 29 days, from December 30, 1984 through January 27, 1985. During the period December 27, 1978 through February 4, 1979 (40 days), only 1 maximum temperature $> 32^{\circ}\text{F}$ occurred. The average maximum temperature for that period was 21°F .

Table 3.6 lists the monthly and annual maximum temperatures. Only 6 days were recorded when the daily maximum temperature was $\leq 0^{\circ}\text{F}$. These days were:

Date	Maximum Temperature	Date	Maximum Temperature
Jan. 31, 1950	-2°F	Jan. 27, 1957	0°F
Feb. 1, 1950	-3°F	Dec. 29, 1968	-2°F
Feb. 2, 1950	-3°F	Dec. 30, 1968	-2°F

3.3 Days with Minimum Temperatures $\leq 32^{\circ}\text{F}$ or $\leq 0^{\circ}\text{F}$

The monthly and seasonal number of days with minimum temperatures at or below 32°F or 0°F are listed in Table 3.7.

Table 3.5. Record of Annual First and Last Dates with Maximum Temperatures $\geq 90^{\circ}\text{F}$ and Minimum Temperatures $\leq 32^{\circ}\text{F}$

Year	Maximum Temperature $\geq 90^{\circ}\text{F}$		Minimum Temperature $\leq 32^{\circ}\text{F}$		Growing Days ^(a)
	First in Spring	Last in Summer	Last in Spring	First in Autumn	
1945	May 30	Sep 14	Apr 10	Oct 18	190
1946	Apr 25	Aug 24	Apr 7	Oct 11	186
1947	May 6	Sep 12	Apr 7	Nov 4	210
1948	May 26	Sep 13	May 2	Oct 17	167
1949	May 8	Sep 27	May 3	Oct 8	157
1950	May 26	Sep 23	Apr 27	Nov 8	194
1951	May 22	Sep 19	Apr 21	Oct 15	176
1952	May 24	Sep 26	Apr 29	Nov 1	185

Table 3.5. (contd)

Year	Maximum Temperature $\geq 90^{\circ}\text{F}$		Minimum Temperature $\leq 32^{\circ}\text{F}$		Growing Days ^(a)
	First in Spring	Last in Summer	Last in Spring	First in Autumn	
1953	<u>Jul 2^(b)</u>	Sep 15	Apr 15	Oct 24	191
1954	May 17	Sep 10	May 1	Oct 1	152
1955	Jun 6	Sep 10	May 14	Oct 31	169
1956	May 16	Sep 19	Apr 6	Oct 22	198
1957	May 29	Sep 15	Mar 26	Oct 22	209
1958	May 18	Sep 10	<u>Mar 19</u>	Oct 21	215
1959	May 13	Sep 13	May 5	Oct 30	177
1960	May 10	Sep 18	Apr 21	Oct 11	172
1961	May 25	Sep 4	Apr 19	Oct 20	183
1962	Jun 8	Sep 26	May 4	<u>Nov 12</u>	191
1963	May 20	Sep 29	Apr 16	Oct 25	191
1964	Jun 23	Sep 24	Apr 19	Oct 16	179
1965	May 28	Sep 1	May 5	Oct 16	163
1966	May 3	Sep 22	Apr 19	Oct 14	177
1967	May 20	Sep 28	Apr 28	Oct 26	180
1968	Apr 29	Sep 9	Apr 22	Oct 21	181
1969	May 9	Sep 12	Apr 26	Oct 13	169
1970	May 16	Aug 31	May 11	Oct 7	148
1971	May 11	Sep 10	Apr 22	Oct 16	176
1972	May 13	Sep 16	Apr 30	<u>Sep 25</u>	147
1973	May 13	Sep 11	Apr 8	Oct 4	178
1974	Jun 10	Sep 25	<u>May 16</u>	Oct 6	142
1975	May 30	Sep 15	Apr 29	Oct 23	176
1976	May 16	Sep 29	Apr 23	Oct 19	178
1977	<u>Apr 24</u>	Aug 22	Apr 14	Oct 27	195
1978	Jun 2	Sep 3	Apr 23	Oct 7	166
1979	May 22	Sep 20	Apr 19	Oct 31	194
1980	Jun 1	Sep 6	Apr 11	Oct 22	193
1981	Apr 30	Sep 18	Apr 13	Oct 14	183
1982	Jun 10	Sep 8	Apr 21	Oct 18	179
1983	May 23	<u>Aug 17</u>	Apr 16	Oct 11	177
1984	May 29	Sep 18	Apr 13	Oct 14	183
1985	May 18	Aug 29	Apr 21	Oct 7	168
	May 25	Sep 4	Apr 30	Nov 9	192
1986					
1987	Apr 27	Sep 23	Apr 20	Oct 16	178
1988	May 11	Sep 14	Apr 9	Oct 27	200
1989	Jun 1	Sep 24	Mar 30	Oct 29	212
1990	May 5	Sep 29	Mar 27	Oct 17	203
1991	Jun 10	Sep 26	Apr 8	Oct 22	196
1992	May 4	Sep 3	Apr 8	Oct 15	189
1993	May 10	<u>Sep 29^(c)</u>	Apr 6	Oct 20	196
1994	May 7	Sep 28	Mar 26	Oct 29	216
1995	May 28	Sep 17	Apr 15	Oct 29	196
Average	May 21	Sep 15	Apr 19	Oct 20	183
Normal	May 21	Sep 14	Apr 21	Oct 18	179

(a) Days between last freezing temperature in spring and first freezing temperature in autumn.

(b) The earliest and latest dates in each column are underlined.

(c) Also in previous years.

Table 3.6. Monthly and Annual Maximum Temperatures (°F)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
1945	61	65	72	76	90	98	104	105	93	84	72	57	105
1946	57	60	76	91	89	98	105	104	89	75	64	64	105
1947	57	68	76	88	101	97	103	98	94	83	63	55	103
1948	60	64	73	76	91	104	98	97	98	78	57	52	104
1949	48	56	64	84	98	102	104	104	100	74	65	60	104
1950	50	63	64	78	90	99	102	103	102	76	62	55	103
1951	55	65	65	82	94	97	104	101	97	79	60	58	104
1952	50	55	70	89	92	94	106	105	97	85	62	54	106
1953	63	65	69	78	88	86	103	104	97	81	65	59	104
1954	59	63	65	83	98	94	100	99	92	73	62	54	100
1955	50	58	63	77	86	102	107	101	101	75	66	56	107
1956	59	56	64	85	96	95	106	104	94	79	64	59	106
1957	48	65	66	89	97	100	102	96	98	73	60	59	102
1958	60	63	63	78	101	106	107	104	97	89	67	60	107
1959	59	60	65	79	91	97	107	103	92	77	70	64	107
1960	55	55	83	82	90	96	110	105	94	82	63	52	110
1961	60	64	68	75	94	108	108	113	90	81	58	56	113
1962	63	60	70	85	81	98	106	100	97	76	67	56	106
1963	56	64	70	72	93	102	96	101	98	83	61	57	102
1964	57	60	74	73	88	95	106	97	90	80	60	57	106
1965	60	67	71	82	91	96	108	106	91	84	64	56	108
1966	56	59	78	81	100	95	100	102	99	82	64	56	102
1967	62	67	65	71	92	101	105	108	98	78	65	62	108
1968	66	64	68	90	90	99	110	102	97	73	60	59	110
1969	44	46	74	80	95	103	101	102	96	74	63	54	103
1970	56	60	67	71	92	104	106	105	89	86	63	58	106
1971	72	66	65	76	92	99	111	112	91	85	64	50	112
1972	59	68	76	78	96	98	103	110	95	83	58	65	110
1973	51	61	68	80	98	104	106	104	98	76	62	58	106
1974	61	59	69	77	86	103	104	103	92	80	64	60	104
1975	56	58	65	75	90	95	110	98	96	82	75	62	110
1976	59	59	69	80	90	100	102	98	102	84	71	57	102
1977	61	70	73	94	82	100	101	107	87	75	68	64	107
1978	51	57	74	76	87	101	106	106	90	81	69	54	106
1979	37	62	76	83	94	102	110	101	96	84	59	59	110
1980	51	59	68	87	87	88	106	98	95	89	65	69	106
1981	55	66	70	91	89	96	104	107	99	83	65	58	107
1982	57	68	71	81	88	102	107	104	94	75	63	62	107
1983	61	62	64	77	103	92	100	99	87	78	67	46	103
1984	60	62	67	79	94	96	106	103	92	81	61	52	106
1985	36	60	68	82	95	102	106	97	86	74	66	39	106
1986	57	72	74	84	104	103	99	103	95	84	63	52	104
1987	55	60	70	93	102	106	107	105	106	87	66	59	107
1988	54	71	71	83	94	99	105	102	102	88	69	57	105
1989	67	53	67	80	88	97	101	103	94	80	73	58	103
1990	60	64	76	81	94	96	110	108	98	80	68	57	110
1991	59	66	69	82	83	93	105	103	95	88	65	59	105
1992	60	62	78	85	98	111	107	109	91	87	62	53	111
1993	56	52	66	73	100	98	96	100	98	86	65	67	100
1994	61	63	79	88	95	101	111	106	94	84	62	64	111
1995	67	68	69	80	95	98	105	102	101	74	69	57	105

Table 3.7. Monthly and Seasonal Number of Days with Minimum Temperature (°F) Below Certain Thresholds

Season	Minimum Temperature $\leq 32^{\circ}\text{F}$										Minimum Temperature $\leq 0^{\circ}\text{F}$				
	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Total	Nov	Dec	Jan	Feb	Total
1944-1945	--	--	--	--	27	18	12	6	0	63	--	--	0	0	0
1945-1946	0	5	14	25	27	20	10	2	0	103	0	0	0	0	0
1946-1947	0	8	23	24	27	19	6	1	0	108	0	0	1	0	1
1947-1948	0	0	11	26	25	24	21	7	1	115	0	0	0	0	0
1948-1949	0	8	15	30	31	25	11	4	1	125	0	2	9	0	11
1949-1950	0	10	4	25	30	22	18	4	0	113	0	0	14	4	18 ^(a)
1950-1951	0	0	13	19	26	25	21	2	0	106	0	0	0	0	0
1951-1952	0	6	19	26	31	24	20	6	0	132	0	0	0	0	0
1952-1953	0	0	25	19	9	15	12	4	0	84	0	0	0	0	0
1953-1954	0	1	14	22	23	16	19	4	1	100	0	0	2	0	2
1954-1955	0	6	6	26	30	25	22	10	1	126	0	0	0	0	0
1955-1956	0	1	22	28	25	26	14	2	0	118	1	0	2	3	6
1956-1957	0	3	18	21	31	23	11	0	0	107	0	0	12	1	13
1957-1958	0	2	17	16	19	5	16	0	0	75	0	0	0	0	0
1958-1959	0	4	14	24	25	24	14	2	1	108	0	0	2	0	2
1959-1960	0	2	24	26	31	21	10	4	0	118	0	0	1	0	1
1960-1961	0	4	15	29	23	10	7	5	0	93	0	0	0	0	0
1961-1962	0	7	28	26	27	17	19	0	1	125	0	0	1	0	1
1962-1963	0	0	13	17	27	17	11	2	0	87	0	0	2	0	2
1963-1964	0	5	8	31	26	26	16	4	0	116	0	0	0	0	0
1964-1965	0	5	13	29	25	18	19	1	1	111	0	2	0	0	2
1965-1966	0	1	8	25	26	22	13	3	0	98	0	0	0	0	0
1966-1967	0	3	11	18	20	17	18	9	0	96	0	0	0	0	0
1967-1968	0	1	17	25	23	13	6	5	0	90	0	0	0	0	0
1968-1969	0	4	8	24	30	25	15	1	0	107	0	4	5	1	10
1969-1970	0	5	19	21	28	13	16	7	1	110	0	0	0	0	0
1970-1971	0	8	14	28	24	19	20	7	0	120	0	0	0	0	0
1971-1972	0	9	18	27	25	23	13	6	0	121	0	0	3	1	4
1972-1973	3	6	13	23	30	23	10	4	0	112	0	7	1	0	8
1973-1974	0	4	14	16	19	15	12	0	1	81	0	0	8	0	8
1974-1975	0	4	12	26	29	24	17	7	0	119	0	0	0	0	0
1975-1976	0	2	23	28	30	22	19	6	0	130	0	0	0	0	0
1976-1977	0	8	17	30	30	19	14	1	0	119	0	0	0	0	0
1977-1978	0	3	18	25	22	17	11	4	0	100	0	1	2	0	3
1978-1979	0	7	26	31	31	21	13	2	0	131	0	3	8	2	13
1979-1980	0	1	23	22	31	22	13	3	0	115	0	0	1	0	1
1980-1981	0	4	16	16	17	17	11	6	0	87	0	0	0	0	0
1981-1982	0	5	13	23	27	17	12	12	0	109	0	0	2	0	2
1982-1983	0	4	21	26	20	13	4	9	0	97	0	0	0	0	0
1983-1984	0	3	11	31	26	17	5	2	0	95	0	4	0	0	4
1984-1985	0	14	20	31	31	25	20	2	0	143	0	4	0	3	7
1985-1986	0	7	23	31	23	17	8	4	0	113	5	1	0	0	6
1986-1987	0	0	11	29	25	17	9	2	0	93	0	0	0	0	0
1987-1988	0	3	11	25	29	22	13	2	0	105	0	0	0	0	0
1988-1989	0	1	12	23	24	25	11	0	0	96	0	0	0	4	4
1989-1990	0	2	11	25	18	20	11	0	0	87	0	0	0	0	0
1990-1991	0	2	11	27	27	14	14	2	0	97	0	8	0	0	8
1991-1992	0	6	8	18	22	11	3	2	0	70	0	0	0	0	0 ^(b)

Table 3.7. (contd)

Season	Minimum Temperature $\leq 32^{\circ}\text{F}$										Minimum Temperature $\leq 0^{\circ}\text{F}$				
	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Total	Nov	Dec	Jan	Feb	Total
1992-1993	0	1	9	29	27	23	10	1	0	100	0	0	2	0	2
1993-1994	0	5	26	22	21	21	12	0	0	107	1	0	0	0	1
1994-1995	0	2	20	24	20	11	13	2	0	92	0	0	0	0	0
1995-1996	0	3	12	25	--	--	--	--	--	--	0	0	--	--	--
Average	0	4	15	24	26	20	14	4	0	106	0	1	2	0	3
Normal ^(c)	0	4	15	25	26	19	13	4	0	107	0	1	1	0	3

- (a) Greatest and least seasonal totals are underlined.
 (b) Most recent of numerous occurrences.
 (c) Normals are averages for the period 1961-1990.

The seasonal average number of days with minimum temperatures $\leq 32^{\circ}\text{F}$ is 106; however, the number ranges from 70 (winter of 1991-1992) to 143 (winter of 1984-1985). The greatest consecutive number of days with minimum temperatures of $\leq 32^{\circ}\text{F}$ is 93 days, from November 9, 1978 through February 9, 1979.

The first autumn temperature $\leq 32^{\circ}\text{F}$ occurred as early as September 25 (1972) and as late as November 12 (1962). The average date is October 20 (see Table 3.5). The last date in spring for minimum temperatures $\leq 32^{\circ}\text{F}$ varied from March 19 (1958) to May 16 (1974), with an average date of April 19. The average number of days between last freezing temperature in the spring and first freezing temperature in the autumn is 183 days.

An average of 3 days per winter season have a minimum temperature $\leq 0^{\circ}\text{F}$; however, nearly half of all winters have no minimum temperatures in this category (see Table 3.7). The most of those days in any season was 18 (winter of 1949-1950) and the least of those days was 0 (as recently as the winter of 1991-1992). The greatest number of consecutive days with minimum temperatures $\leq 0^{\circ}\text{F}$ is 11 days, from January 25 through February 4, 1950. During this same period, 4 consecutive days had minimum temperatures $\leq -20^{\circ}\text{F}$. Table 3.8 lists all days with minimum temperatures $\leq 0^{\circ}\text{F}$. Table 3.9 lists monthly and annual minimum temperatures.

3.4 Monthly Extreme Daily Maximum and Minimum Temperatures

Monthly extreme daily maximum and minimum temperatures are presented in Table 3.10. Note that a greater temperature range exists during the winter months than in summer. February temperatures ranged from 72°F to -23°F , a range of 95°F . July temperatures ranged from 111°F to 39°F , a range of 82°F . August also has an 82°F range, from 113°F to 41°F .

Table 3.8. Days with Minimum Temperatures $\leq 0^{\circ}\text{F}$

Temperature ($^{\circ}\text{F}$)	Date(s) of Occurrence					
-23	02/03/50	02/01/50				
-22	01/26/57					
-21	01/27/57	02/02/50	01/31/50			
-18	01/29/50					
-14	12/30/68	01/29/57	01/28/57			
-13	11/23/85	12/22/83	01/09/74	12/16/64	01/30/50	
-12	12/22/90	11/24/85	02/01/79	12/17/64	01/25/57	
-11	01/01/79	01/17/50	01/14/50	01/25/49		
-10	12/29/90 02/02/56	12/21/90 02/01/56	02/02/79	12/30/78	01/06/74	12/29/68
-9	12/23/83	01/06/79	12/31/78	01/02/78	01/08/74	
-8	12/01/85 01/16/50	01/06/82	01/07/74	12/10/72	01/23/69	01/30/57
-7	01/07/79	01/31/56	01/28/50	01/05/50		
-6	11/22/85 01/28/69	01/31/79 01/18/57	01/05/74 01/20/54	12/13/72 01/04/50	12/08/72 01/24/49	01/29/69 01/11/49
-5	02/05/89 01/15/50	02/04/85	01/01/78	1/10/74	12/12/72	12/09/72
-4	01/13/93 01/11/74 01/12/49	12/23/90 12/11/72	02/04/89 01/28/72	12/19/84 01/12/63	12/21/83 01/28/49	01/27/79 01/13/49
-3	02/06/89 12/29/78 01/11/63	11/25/85 12/31/77 01/17/57	02/03/85 01/31/69	12/18/84 01/30/69	01/10/80 12/31/68	01/08/79 12/28/68
-2	12/31/90 01/04/74 01/10/49	12/30/90 12/14/72 12/27/48	12/20/90 01/22/62	12/21/84 01/31/57	12/20/84 01/19/57	01/05/79 01/20/49
-1	11/24/93 01/18/60 11/14/55	11/26/85 01/04/59 02/04/50	01/08/73 02/02/57 01/25/50	02/03/72 01/16/57 01/13/50	01/26/72 02/03/56	02/01/69 01/30/56
0	01/11/93 01/28/79 01/26/50	12/24/90 01/27/72 01/04/49	02/02/89 01/03/59 12/26/48	02/06/85 01/24/57 01/15/47	12/27/83 01/21/54	01/07/82 01/27/50

Table 3.9. Monthly and Annual Minimum Temperatures (°F)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
1945	21	14	10	28	38	46	53	47	35	26	16	13	10
1946	18	18	25	30	33	44	50	49	35	21	16	6	6
1947	0	11	23	32	42	45	53	50	40	34	22	16	0
1948	14	1	13	28	32	51	49	47	34	22	20	-2	-2
1949	-11	3	27	30	31	42	49	47	38	23	28	10	-11
1950	-21	-23	20	27	38	44	49	51	38	34	21	22	-23
1951	6	18	22	26	37	41	51	47	39	27	23	4	4
1952	5	16	24	27	37	42	49	46	42	34	7	17	5
1953	24	20	23	27	36	40	52	51	37	30	24	20	20
1954	-6	17	18	26	28	41	45	48	36	26	23	14	-6
1955	18	15	6	26	31	42	43	48	37	32	-1	9	-1
1956	-7	-10	15	28	38	40	54	49	39	31	15	2	-10
1957	-22	-1	28	34	48	48	51	52	36	32	20	23	-22
1958	16	29	23	34	38	47	49	53	34	30	9	21	9
1959	-1	19	25	30	30	41	49	49	41	26	6	14	-1
1960	-1	10	13	30	33	46	52	41	40	30	22	14	-1
1961	16	27	25	31	38	44	50	56	36	26	10	3	3
1962	-2	7	15	33	31	37	42	49	40	34	16	16	-2
1963	-4	8	22	28	36	45	49	49	45	23	17	7	-4
1964	15	19	15	30	35	45	50	44	39	30	20	-13	-13
1965	10	18	14	32	32	48	50	42	33	30	26	10	10
1966	17	19	19	26	37	38	48	50	43	29	22	22	17
1967	23	20	20	27	34	47	52	56	43	30	17	6	6
1968	10	15	25	23	33	42	51	47	39	30	23	-14	-14
1969	-8	-1	22	31	38	52	53	45	41	29	19	19	-8
1970	8	21	24	26	30	46	50	52	34	23	11	8	8
1971	8	15	15	27	36	44	44	51	38	13	21	5	5
1972	-4	-1	24	26	36	45	50	49	30	20	24	-8	-8
1973	-1	21	26	27	34	45	46	46	43	31	16	14	-1
1974	-13	23	21	33	32	41	48	48	40	29	24	17	-13
1975	14	10	19	21	33	38	53	46	44	26	15	14	10
1976	16	10	11	25	35	37	47	44	42	28	13	12	10
1977	4	21	24	31	34	39	49	48	36	28	9	-3	-3
1978	-9	17	25	30	37	44	50	47	41	21	7	-10	-10
1979	-11	-12	20	29	38	45	39	53	42	32	13	19	-12
1980	-3	19	25	28	38	40	47	42	41	30	18	9	-3
1981	23	8	24	24	35	40	45	48	34	27	19	8	8
1982	-8	9	24	24	33	47	45	51	41	26	18	13	-8
1983	12	15	29	27	37	40	49	50	35	29	22	-13	-13
1984	10	24	25	30	33	37	51	47	36	12	25	-4	-4
1985	5	-5	21	26	33	44	56	46	33	26	-13	-8	-13
1986	12	15	29	28	37	43	48	54	38	33	16	18	12
1987	9	18	24	30	38	43	49	51	41	31	17	9	9
1988	14	9	24	31	35	42	47	52	38	32	28	8	8
1989	15	-5	14	35	39	46	49	52	44	27	21	19	-5
1990	22	9	24	37	39	47	46	52	48	31	28	-12	-12
1991	5	26	22	31	38	44	55	47	42	23	23	20	5
1992	19	22	32	27	37	49	54	43	40	30	17	12	12
1993	-4	3	17	32	35	46	50	43	37	29	-1	21	-4
1994	20	5	19	35	36	44	50	53	47	30	19	8	5
1995	8	8	21	28	39	47	52	45	42	16	17	16	8

Table 3.10. Monthly Normal Temperatures (°F) and Monthly Extremes of Maximum and Minimum Temperatures (°F)

Month	Normal (1961-1990)			Daily Extreme											
	Maximum	Minimum	Mean	Maximum						Minimum					
				High	Day	Year	Low	Day	Year	High	Day	Year	Low	Day	Year
Jan	38.4	24.0	31.3	72	31	1971	-2	31	1950	53	30	1971	-22	26	1957
Feb	47.3	28.8	38.0	72	25	1986	-3	1	1950	60	24	1986	-23	3	1950
				72	24	1986							-23	1	1950
Mar	57.3	33.9	45.6	83	25	1960	24	3	1960	50	15	1992	6	5	1955
										50	5	1987			
										50	3	1987			
Apr	66.0	39.6	52.7	94	24	1977	41	7	1945	64	28	1987	21	5	1975
May	75.2	47.4	61.3	104	31	1986	51	11	1967	71	29	1986	28	1	1954
				104	30	1986									
Jun	83.9	55.3	69.7	111	23	1992	55	3	1966	80	24	1992	37	3	1962
													37	2	1976
													37	1	1984
Jul	91.4	60.9	76.2	111	22	1994	59	2	1966	82	23	1994	39	2	1979
					31	1971									
Aug	90.2	59.9	75.1	113	4	1961	67	20	1959	81	4	1961	41	22	1960
Sep	80.1	51.2	65.7	106	1	1987	52	22	1984	72	7	1955	30	27	1972
													30	25	1972
Oct	65.7	40.3	52.9	89	4	1980	32	30	1971	60	25	1945	12	31	1984
				89	3	1958				60	15	1988			
										60	2	1988			
Nov	48.7	31.9	40.2	75	3	1975	6	24	1985	60	9	1989	-13	23	1985
Dec	38.1	24.7	31.4	69	26	1980	-2	30	1968	56	2	1975	-14	30	1968
							-2	29	1968						
Annual			53.3	113		8/4/61	-3		2/1/50	82		7/23/94	-23		2/3/50 2/1/50

3.5 Normal and Extreme Daily Temperatures

Table 3.11 lists the normal and extreme daily maximum and minimum temperatures. Climatological normals are computed every 10 years and are based on a 30-year period, ending with the first year of each new decade. The current normal period is 1961 through 1990, and the next will be 1971 through 2000. The normal temperatures in Table 3.11 are computed using a 7-day running mean, centered about each day.

Four possible temperature extremes are presented for each day, a record high and low maximum and a record high and low minimum. These daily records, plus the year of occurrence, are also indicated in Table 3.11.

Table 3.11. Normal and Extreme Daily Maximum and Minimum Temperatures (°F)

Day	Normal (1961-1990)			Extreme (1945-1995)							
	Maximum	Minimum	Mean	Maximum				Minimum			
				High	Year	Low	Year	High	Year	Low	Year
January											
1	35	21	28	57	64	8	69	38	81 ^(a)	-11	79
2	35	21	28	56	63	15	69	42	63	-9	78
3	36	21	28	63	89	12	50	41	81	0	59
4	36	21	29	60	94 ^(a)	13	59	39	54	-6	50
5	36	22	29	59	90 ^(a)	12	50	39	81	-7	50
6	36	22	29	59	90 ^(a)	10	82	39	56	-10	74
7	36	22	29	63	62	9	79	45	90	-8	74
8	36	22	29	56	83 ^(a)	5	74	44	53	-9	74
9	36	22	29	60	90 ^(a)	5	74	41	90	-13	74
10	36	23	30	61	83	10	74	40	83	-5	74
11	37	23	30	60	83 ^(a)	13	63	37	90	-6	49
12	38	24	31	59	53	15	63	47	53	-4	63 ^(a)
13	38	24	31	61	94	10	50	42	66	-4	93 ^(a)
14	39	25	32	60	61	7	50	48	61	-11	50
15	39	26	33	60	74 ^(a)	5	50	50	74	-5	50
16	40	26	33	61	74	8	50	48	89	-8	50
17	40	26	33	56	89	5	50	40	89	-11	50
18	40	26	33	62	89	10	50	38	89	-6	57
19	40	26	33	63	68	13	50	47	68	-2	57
20	40	26	33	66	68	11	54	47	72	-6	54
21	40	26	33	65	68	14	54	42	72	0	54
22	40	26	33	56	90	16	69	43	81	-2	62
23	40	26	32	63	53	10	69	43	81	-8	69
24	40	25	32	59	84 ^(a)	13	57	43	58	-6	49
25	40	25	32	59	92 ^(a)	6	50	41	74 ^(a)	-12	57
26	40	25	32	61	71	2	57	46	62	-22	57
27	40	25	32	60	84 ^(a)	0	57	36	95 ^(a)	-21	57
28	40	25	32	61	67	6	57	41	53	-14	57
29	40	24	32	62	67	3	50	44	92 ^(a)	-18	50
30	40	24	32	67	89 ^(a)	11	57	53	71	-13	50
31	40	24	32	72	71	-2	50	45	53	-21	50
February											
1	40	24	32	63	71	-3	50	42	92	-23	50
2	41	24	33	61	91 ^(a)	0	50	42	68	-21	50
3	41	24	33	60	67 ^(a)	1	50	46	91	-23	50
4	41	24	33	65	67	11	85	43	68	-5	85
5	41	25	33	61	65	23	85	39	61	-5	89
6	42	25	33	61	67	19	85	37	61	-3	89
7	42	25	34	65	45	20	48	41	55	2	89
8	43	26	35	60	45	22	56	45	45	5	94 ^(a)
9	44	27	35	65	51	23	56	39	61 ^(a)	4	85
10	45	28	37	65	77	30	56 ^(a)	50	51	7	85
11	46	28	37	66	88	27	54	39	93 ^(a)	9	48
12	47	29	38	70	77	24	49	40	77	6	48
13	48	30	39	66	71	25	49	42	47	3	49
14	48	30	39	62	82	22	80	54	82	8	95
15	49	31	40	67	82	19	56	48	81	5	56
16	49	31	40	69	77	20	56	48	81	4	56
17	49	31	40	67	77 ^(a)	22	56	48	48	9	56
18	50	31	40	66	81	24	56	46	81	9	90
19	50	31	41	68	95	28	56	56	95	14	90 ^(a)
20	50	31	41	68	82	32	57 ^(a)	51	61	15	86
21	51	31	41	71	88	29	57	45	95	13	57
22	51	31	41	62	95 ^(a)	29	57	42	58	11	93

Table 3.11. (contd)

Day	Normal (1961-1990)			Extreme (1945-1995)							
	Maximum	Minimum	Mean	Maximum				Minimum			
				High	Year	Low	Year	High	Year	Low	Year
23	51	31	41	68	47	34	93 ^(a)	43	83 ^(a)	19	93
24	52	31	41	72	86	32	62	60	86	11	93 ^(a)
25	52	31	42	72	86	28	93	49	86	4	93
26	52	31	42	65	57 ^(a)	28	93 ^(a)	46	92	10	93
27	52	31	42	68	72	26	93	44	92	7	62
28	52	31	42	67	67	25	93	48	72	3	93
29	52	31	42	63	88 ^(a)	40	60	43	92	12	60
March											
1	52	31	42	67	94	26	93	44	94	15	71 ^(a)
2	52	31	42	66	68	26	60	46	87	14	60
3	52	31	42	70	94	24	60	50	87	14	89
4	52	31	42	63	53	26	55	46	87	7	55
5	53	31	42	68	72	31	45	50	87	6	55
6	54	32	43	65	67 ^(a)	33	57	43	79	18	60
7	55	32	44	66	53	41	45	42	86 ^(a)	21	74 ^(a)
8	55	33	44	67	53	33	51	46	83	20	76
9	56	33	44	69	53	40	51	47	83	22	94 ^(a)
10	56	33	45	69	72	40	48	45	87 ^(a)	13	48
11	56	33	45	67	95 ^(a)	32	50	44	95	21	50
12	57	34	45	68	92	37	51	48	87	15	56
13	57	34	45	70	92	38	51	44	87 ^(a)	22	69 ^(a)
14	57	34	46	72	92	40	49	45	61	23	53
15	58	34	46	73	94	37	49	50	92	23	76
16	58	34	46	76	72	43	89	47	94	23	55
17	59	35	47	76	72	38	65	48	69	17	65
18	59	35	47	76	47	41	65	47	90	14	65
19	59	35	47	76	47	48	65 ^(a)	47	47	16	65
20	59	35	47	76	47	49	50	49	88	22	74
21	59	35	47	74	60	41	75	46	47	26	82 ^(a)
22	59	35	47	74	78 ^(a)	47	71	47	78	19	94
23	59	35	47	77	60	39	64	45	56 ^(a)	20	48
24	59	35	47	78	60	38	55	45	60 ^(a)	15	64
25	59	35	47	83	60	35	55	48	52	23	64 ^(a)
26	60	35	47	76	46	38	65	49	92 ^(a)	21	85
27	60	35	48	77	94	47	79	46	89	24	75
28	61	36	48	79	94	42	54	49	78	19	75
29	61	36	49	78	94 ^(a)	49	54	48	94 ^(a)	18	54
30	62	37	49	75	92	52	67	47	92 ^(a)	20	54
31	62	37	49	78	92	51	75	47	61	28	53
April											
1	63	37	50	80	90	45	76	50	59	24	82
2	63	37	50	83	92	48	82	50	87	25	76
3	64	37	50	76	77	50	63 ^(a)	48	77	23	75
4	64	38	51	82	60	45	75	56	91	27	50
5	64	38	51	78	77 ^(a)	51	75	54	60	21	75
6	65	38	51	82	77	50	82	51	62	28	67 ^(a)
7	65	38	52	85	77	41	45	53	60	26	54
8	65	38	52	81	66	51	53	47	60	27	92 ^(a)
9	65	38	52	80	85	48	92	49	74	29	75 ^(a)
10	65	38	52	85	68	52	45	47	57	24	81
11	65	38	52	79	88	52	83	51	56 ^(a)	27	83
12	66	39	52	83	88	47	95	48	82 ^(a)	28	71 ^(a)
13	66	39	52	88	47	54	55	59	88	23	68
14	66	39	52	85	62 ^(a)	47	75	55	85	29	83

Table 3.11. (contd)

Day	Normal (1961-1990)			Extreme (1945-1995)							
	Maximum	Minimum	Mean	Maximum				Minimum			
				High	Year	Low	Year	High	Year	Low	Year
15	66	39	52	82	88	55	75 ^(a)	54	87	27	55
16	66	39	52	83	54	53	63	54	92	28	82
17	65	40	52	88	94	48	63	52	90	26	55
18	65	40	52	88	94	51	67	60	94	29	68
19	65	40	52	78	56	50	51	56	94	27	66
20	66	40	53	84	56	45	67	53	90 ^(a)	28	82
21	66	40	53	85	56	52	67	60	56	26	85 ^(a)
22	66	41	54	81	82 ^(a)	53	88	52	81 ^(a)	28	72
23	67	41	54	88	81 ^(a)	56	79 ^(a)	58	77	30	78
24	68	41	54	94	77	53	75	56	52	28	86 ^(a)
25	68	42	55	91	46	56	58	59	52	31	55
26	68	42	55	85	92	53	48	57	78	28	48
27	69	42	55	90	87	50	90	57	92	27	70
28	69	42	56	93	87	54	95	64	87	27	67
29	70	43	56	90	68	47	67	60	87	29	52
30	70	43	57	91	81	56	67 ^(a)	56	81	29	86
May											
1	71	43	57	87	47	53	69	59	77	28	54
2	71	43	57	89	71	56	88	60	71	32	48
3	71	44	58	91	66	58	93	60	71	31	49
4	72	44	58	94	66	56	63	57	46	31	62
5	72	45	58	100	66	52	61	65	66	30	59
6	73	45	59	98	92	56	86	62	87	34	77
7	73	45	59	99	87	61	90	66	92	33	84
8	73	46	59	102	87	56	62	67	94 ^(a)	36	81
9	74	46	60	97	87	56	48	66	49	34	73
10	74	46	60	96	49	53	67	66	49	34	70
11	74	46	60	98	49	51	67	68	49	30	70
12	74	46	60	100	93	57	70	66	93	34	85
13	74	46	60	93	73 ^(a)	57	55	65	49	34	85
14	75	47	61	98	73	56	55	61	73 ^(a)	31	55
15	75	47	61	97	73	57	59	64	73 ^(a)	35	74
16	75	47	61	95	73	54	55	60	73	32	74
17	76	48	62	96	73	61	74	59	85	38	88 ^(a)
18	76	48	62	98	54	62	74	67	56	36	72
19	77	48	62	92	93	56	62	70	56	33	75
20	77	48	62	93	47	58	60	59	56	36	71
21	77	49	63	94	58	62	60 ^(a)	59	58	37	74 ^(a)
22	77	49	63	98	58	63	64	64	58	33	60
23	77	49	63	95	85 ^(a)	59	62	66	58	35	64
24	77	49	63	96	92	54	62	63	81	35	75
25	77	50	63	98	92 ^(a)	62	84	65	83	38	91 ^(a)
26	77	50	64	101	58 ^(a)	54	80	69	47	38	78
27	78	50	64	93	83	62	89	69	58	37	73
28	78	50	64	99	83	61	89	63	72 ^(a)	38	79 ^(a)
29	78	51	64	103	83	68	89 ^(a)	71	86	35	76
30	79	51	65	104	86	62	76 ^(a)	68	86	41	55 ^(a)
31	79	52	65	104	86	54	71	69	86	40	76 ^(a)
June											
1	80	52	66	103	86	64	76	69	86	37	84
2	80	52	66	99	70	65	80	69	89 ^(a)	37	76
3	81	53	67	103	70	55	66	68	86 ^(a)	37	62
4	81	54	67	103	69	60	74	66	86 ^(a)	40	80 ^(a)
5	81	54	68	101	78	60	88	73	69	43	76 ^(a)

Table 3.11. (contd)

Day	Normal (1961-1990)			Extreme (1945-1995)							
	Maximum	Minimum	Mean	Maximum				Minimum			
				High	Year	Low	Year	High	Year	Low	Year
6	81	54	68	102	70 ^(a)	57	95	68	77	46	62
7	82	54	68	100	77	56	50	69	77	44	61
8	82	54	68	100	48	59	64	69	69	40	53
9	82	54	68	98	55	68	59	68	69 ^(a)	44	85 ^(a)
10	82	54	68	98	55	69	72	68	79	41	59
11	82	54	68	100	55	64	61	70	55	40	56
12	83	55	69	98	74	68	54	67	87 ^(a)	42	68
13	83	55	69	99	74	59	80	67	89	42	52
14	84	56	70	103	74	65	95	68	87	44	78 ^(a)
15	85	56	70	102	61	70	65	72	63	44	54
16	85	57	71	106	61	62	49	70	63	41	54
17	86	57	72	108	61	70	73	75	61	40	81
18	86	57	72	104	61	69	64	75	58	41	54
19	86	57	72	102	85	63	95	73	58	43	86
20	86	57	72	102	82	63	91	73	59	42	53
21	86	57	72	104	70	62	84	73	58	45	56
22	86	57	72	106	92 ^(a)	71	93	74	92	46	87 ^(a)
23	86	57	72	111	92	68	72	75	58	44	52
24	86	57	71	108	92	66	72	80	92	40	83
25	86	56	71	107	92	70	46	79	92	42	76
26	86	56	71	103	87	70	75	74	70	41	76 ^(a)
27	86	56	71	102	92	68	47	75	87	45	64 ^(a)
28	86	56	71	102	87 ^(a)	64	46	68	87	38	75
29	86	56	71	104	48	65	52	74	87	46	71 ^(a)
30	86	56	71	106	87	71	55	71	87	42	49

July

1	86	57	72	103	87	66	66	75	87	46	73 ^(a)
2	87	57	72	102	67	59	66	70	45	39	79
3	87	58	72	105	91 ^(a)	71	66	70	67	46	90
4	88	58	73	108	68	71	86	75	70	48	66
5	88	59	73	108	75	66	51	76	75	47	80
6	89	59	74	110	68	71	55	76	68	44	71
7	89	59	74	105	68 ^(a)	75	81	73	68	45	71
8	89	59	74	108	68	71	72	74	85	45	81
9	89	60	74	110	75	76	55	78	75	50	72 ^(a)
10	90	60	75	106	75	67	74	79	75	49	76
11	90	60	75	109	90	76	74	78	75	46	81
12	90	60	75	110	90	75	88	75	90	50	74
13	90	60	75	108	61	77	93 ^(a)	73	90 ^(a)	49	76
14	90	61	76	107	87 ^(a)	77	83	78	61	50	83
15	91	61	76	106	73	71	82	76	55	45	82
16	91	61	76	105	70	68	86	74	90	48	74
17	92	61	76	110	60	73	93	77	58	48	86
18	92	61	77	110	60	78	87	79	60	49	86
19	92	61	77	109	79	72	49	77	79	51	77
20	93	62	77	110	79	75	65 ^(a)	75	95	53	68 ^(a)
21	93	62	78	109	94	68	65	77	88	49	49
22	94	62	78	111	94	74	92	75	94 ^(a)	47	82
23	94	63	78	109	94	69	92	82	94	49	63
24	94	63	79	109	94	78	63	75	62	52	52 ^(a)
25	95	63	79	106	84	73	90	77	62	51	49 ^(a)
26	95	63	79	105	88 ^(a)	66	55	76	88	54	48
27	95	64	79	108	75 ^(a)	74	48	74	73 ^(a)	52	86
28	95	64	79	108	68	77	50 ^(a)	76	68	49	59

Table 3.11. (contd)

Day	Normal (1961-1990)			Extreme (1945-1995)							
	Maximum	Minimum	Mean	Maximum				Minimum			
				High	Year	Low	Year	High	Year	Low	Year
29	95	63	79	107	82	80	93 ^(a)	78	82	52	50
30	95	63	79	107	71	78	75	74	90	49	50
31	94	63	79	111	71	75	85	74	71 ^(a)	52	95
August											
1	94	63	78	109	71	77	76 ^(a)	80	49	51	87
2	94	62	78	106	94	75	56	75	77 ^(a)	46	64
3	94	62	78	107	61	77	62	75	94	52	59
4	93	62	78	113	61	78	64 ^(a)	81	61	48	54
5	93	62	78	108	90	80	69 ^(a)	72	91	45	69
6	94	62	78	106	72	77	46	77	90	51	47
7	94	63	78	109	72	70	62	75	45	49	46
8	94	63	78	110	72	75	62	79	82 ^(a)	48	49
9	94	63	78	112	71	78	47	78	90	51	95 ^(a)
10	94	63	78	109	71	76	85	77	71	52	47
11	93	63	78	108	71	79	83	73	58	50	85
12	93	62	77	108	71	77	95	77	92	52	57
13	92	61	77	107	92	74	68	79	92	47	95
14	91	60	76	109	92	70	68	78	92 ^(a)	45	95
15	90	60	75	105	67	72	60	74	92	51	74
16	89	59	74	108	67	68	93	76	45	48	76
17	89	59	74	108	67	76	95	68	91	47	76
18	89	59	74	108	67	71	80	70	91 ^(a)	47	76
19	88	59	74	105	67	70	68	76	91	46	80 ^(a)
20	88	59	74	105	67	67	59	77	82	49	52
21	88	59	74	104	46	70	60	75	46	47	85 ^(a)
22	88	59	73	104	56 ^(a)	70	92	76	61 ^(a)	41	60
23	88	58	73	105	70	69	92	76	46	45	92
24	87	58	73	104	58	70	68	71	66	43	92
25	87	58	72	104	58	72	77	70	46	43	93
26	87	58	72	100	84	68	56	67	58	44	93 ^(a)
27	87	57	72	101	72	73	68	71	67	47	78 ^(a)
28	86	57	72	104	72	70	51	74	86	42	80
29	86	56	71	102	67	72	51	73	67	42	65
30	86	56	71	105	67	68	51	71	67	44	64
31	85	56	71	104	67	72	71	73	67	45	65
September											
1	85	56	71	106	87	61	71	70	87	44	80
2	85	56	71	102	50	70	71	70	49	47	75 ^(a)
3	85	55	70	101	88	72	70	71	95	44	80 ^(a)
4	85	55	70	102	88	68	59	68	55	44	80
5	85	55	70	100	55	72	60	68	63	43	69
6	85	55	70	101	55	69	46	65	57 ^(a)	44	83
7	85	54	69	97	58	60	78	72	55	42	92 ^(a)
8	84	54	69	99	81	61	85	69	63	42	76 ^(a)
9	83	53	68	98	81 ^(a)	66	85	68	69	40	62
10	82	53	67	97	93	68	85	65	63	43	82 ^(a)
11	81	52	67	98	90 ^(a)	62	85	66	69	41	88
12	81	52	66	96	69	62	70	67	53	38	49
13	80	51	66	98	48	59	80	62	60 ^(a)	40	74
14	80	51	65	94	95	62	92	61	90 ^(a)	38	70
15	79	51	65	96	79 ^(a)	58	59	61	45	35	70
16	79	51	65	96	81 ^(a)	61	46	65	79	35	65
17	79	51	65	97	81	59	86	62	51	33	65
18	78	50	64	98	81	57	83	61	79	34	65

Table 3.11. (contd)

Day	Normal (1961-1990)			Extreme (1945-1995)							
	Maximum	Minimum	Mean	Maximum				Minimum			
				High	Year	Low	Year	High	Year	Low	Year
19	78	50	64	96	67	62	83	67	56	36	57
20	78	50	64	94	94	66	72 ^(a)	67	94	37	83
21	78	49	63	98	67	66	45	65	62	38	93 ^(a)
22	77	49	63	93	66	52	84	68	66	36	81 ^(a)
23	77	49	63	93	87	54	77	62	92	34	81
24	77	49	63	94	52	60	72	60	50	34	72 ^(a)
25	77	48	63	97	52	56	77	66	49	30	72
26	77	48	62	93	52	57	48	61	79	32	72
27	76	48	62	92	63 ^(a)	58	77	60	49	30	72
28	76	48	62	92	67	58	77	62	76	33	85
29	76	47	61	92	93	57	77	61	89	34	85 ^(a)
30	75	46	61	88	93 ^(a)	63	54 ^(a)	64	93	35	85
October											
1	75	46	60	88	91 ^(a)	61	59	59	92	30	54
2	74	45	60	86	93 ^(a)	56	67	60	88	32	54
3	73	45	59	89	58	55	50	58	88 ^(a)	33	73 ^(a)
4	73	44	58	89	80	55	50	57	88	32	73
5	72	44	58	87	58	52	57	52	88 ^(a)	34	82 ^(a)
6	72	44	58	85	80	53	57 ^(a)	57	60	30	74
7	71	44	57	86	80	48	57	57	88	29	74
8	70	44	57	84	65	51	85	58	87	26	85
9	70	43	56	84	45	52	58	54	53	26	85
10	69	43	56	82	88	50	62	54	95 ^(a)	33	59
11	69	43	56	84	52	52	68 ^(a)	55	63	30	60
12	68	43	55	84	45	54	66	56	52	34	85 ^(a)
13	68	42	55	79	45	57	69	55	88	31	69
14	67	41	54	78	45	58	90 ^(a)	59	88	24	69
15	66	40	53	81	63	53	92	60	88	29	70
16	66	39	53	79	63	54	92 ^(a)	56	95	26	46
17	65	39	52	76	63	49	50	49	55	29	71 ^(a)
18	65	38	51	76	73	47	49	50	52	27	49
19	64	38	51	78	92 ^(a)	50	45	52	92	27	69 ^(a)
20	63	38	50	74	78	45	47	54	73	23	49
21	63	38	50	73	91 ^(a)	49	45	54	63	20	84
22	63	38	50	74	59	46	50	51	52	20	84
23	62	38	50	73	66 ^(a)	39	84	51	60	25	84
24	61	38	50	75	77 ^(a)	49	57	49	46	26	75
25	61	37	49	75	55 ^(a)	49	57	60	45	26	78
26	60	37	48	69	92	49	46	52	94	21	78
27	59	36	48	74	85	43	93 ^(a)	54	81	23	70
28	58	36	47	68	65 ^(a)	35	91	52	49	18	71
29	58	36	47	70	53	42	91 ^(a)	48	74	13	71
30	57	36	46	75	67	32	71	49	86 ^(a)	20	72
31	56	36	46	75	67	34	84	54	67	12	84
November											
1	56	36	46	69	88	31	84	49	87	20	95
2	56	36	46	70	45	38	91	51	85	17	95
3	55	36	45	75	75	36	73	53	83	17	95
4	55	36	45	71	75	32	73	46	89 ^(a)	16	73
5	54	35	44	63	89	31	73	48	88	20	73 ^(a)
6	53	35	44	64	58	32	73	49	89	19	73
7	53	35	44	69	78	34	45	48	80	19	93 ^(a)
8	52	34	43	69	95	34	45	48	89	16	45
9	51	34	43	73	89	30	45	60	89	18	86

Table 3.11. (contd)

Day	Normal (1961-1990)			Extreme (1945-1995)							
	Maximum	Minimum	Mean	Maximum				Minimum			
				High	Year	Low	Year	High	Year	Low	Year
10	51	34	42	73	89	32	45	56	89	16	86
11	50	34	42	66	89	32	85	48	89	14	78
12	50	33	42	65	91	20	55	52	49	6	55
13	49	33	41	64	87	14	55	46	90	6	59
14	49	33	41	65	95	19	55	47	45	-1	55
15	49	32	40	65	53	18	55	46	83	1	55
16	48	32	40	65	76	18	55	49	54	7	59
17	48	31	40	71	76	22	55	46	83 ^(a)	10	61
18	48	31	39	64	46	25	55	47	54	11	55
19	47	31	39	67	62	22	85	44	54	14	85
20	47	30	38	65	58	24	85	47	74	3	85
21	46	30	38	63	58	17	85	46	65	3	85
22	46	29	38	65	67 ^(a)	17	85	53	90	-6	85
23	45	29	37	70	59	11	85	54	90	-13	85
24	45	29	37	67	95 ^(a)	6	85	57	90	-12	85
25	44	28	36	65	62	11	85	48	62	-3	85
26	43	28	36	65	49	15	85	45	49	-1	85
27	43	28	35	63	49	12	85	46	49	8	85
28	43	28	35	64	95	11	85	43	73	7	85
29	42	28	35	62	95	14	85	57	95	8	85
30	42	28	35	62	95 ^(a)	15	85	46	94	6	85
December											
1	42	28	35	65	72	14	85	45	81	-8	85
2	42	28	35	64	77	20	85	56	75	8	85
3	42	28	35	62	82 ^(a)	27	85 ^(a)	54	75	8	85
4	42	28	35	60	75 ^(a)	23	72	41	52	1	72
5	41	28	34	58	91 ^(a)	21	72	41	87	7	72
6	41	27	34	59	87	16	56	43	87	8	56
7	40	27	33	58	73 ^(a)	18	56	40	52	2	56
8	40	26	33	58	89	17	72	48	46	-6	72
9	40	26	33	59	87 ^(a)	13	72	44	56	-5	72
10	39	25	32	67	93	13	72	48	46	-8	72
11	39	25	32	59	91 ^(a)	11	72	45	46	-4	72
12	39	25	32	57	88	22	72	42	77 ^(a)	-5	72
13	38	25	31	59	46	13	72	42	46	-6	72
14	38	24	31	57	79 ^(a)	15	72	48	79	-2	72
15	37	24	31	64	59	16	72	41	56	2	72
16	37	24	30	56	73	4	64	43	73	-13	64
17	37	24	30	57	71 ^(a)	5	64	41	62	-12	64
18	36	24	30	56	56	13	64	38	94 ^(a)	-3	84
19	36	24	30	59	94	17	84	41	94	-4	84
20	37	24	30	64	94	11	84	47	94	-2	90 ^(a)
21	37	24	30	61	72	11	90	43	73	-10	90
22	37	24	30	59	80	7	90	42	72	-13	83
23	37	24	30	57	63	6	83	40	72	-9	83
24	37	24	30	55	61 ^(a)	15	90 ^(a)	39	80 ^(a)	0	90
25	37	23	30	65	80	16	90	41	72	1	90
26	36	23	30	69	80	20	90 ^(a)	53	80	0	48
27	36	23	29	62	80 ^(a)	19	48	40	94 ^(a)	-2	48
28	35	22	29	56	57 ^(a)	14	68	38	49	-3	68
29	35	22	28	60	49	-2	68	39	62	-10	90 ^(a)
30	35	21	28	54	70	-2	68	39	88 ^(a)	-14	68
31	35	21	28	56	62	4	68	44	80	-9	78

(a) Latest of several occurrences.

3.6 Subsurface Soil Temperatures

Hourly subsurface soil temperatures have been recorded at a depth of approximately 0.5 in. since 1944, and at the 15- and 36-in. depths since 1952. The subsurface soil temperature sensors are installed in the natural soil of the area with the vegetation cover removed. The soil is sandy and mixed with large gravel.

Monthly averages and extremes of monthly averages are presented in Table 3.12. The absolute hourly extremes are also indicated in that table.

Table 3.12. Subsurface Soil Temperatures (°F) at Depths of 0.5, 15, and 36 Inches

Month	Monthly Averages			0.5-in. Depth			15-in. Depth			36-in. Depth		
	0.5 in.	15 in.	36 in.	Highest Monthly Average	Lowest Monthly Average	Year	Highest Monthly Average	Lowest Monthly Average	Year	Highest Monthly Average	Lowest Monthly Average	Year
Jan	32.4	36.0	42.5	39.4	19.2	1967	42.7	25.5	1981	48.7	36.3	1979
Feb	38.3	38.7	41.9	45.1	1958	1989	44.9	29.6	1967	46.9	33.5	1957
Mar	48.3	46.4	46.0	54.3	1992	1955	52.6	37.7	1968	51.7	38.0	1956
Apr	60.0	55.7	53.2	69.4	1977	1984	62.1	48.7	1977	57.4	47.3	1955
May	72.1	65.6	60.9	81.4	1992	1984	71.4	58.7	1992	65.1	54.8	1955
Jun	82.6	75.2	68.9	90.4	1986	1956	84.5	70.2	1966	73.4	62.8	1984
Jul	90.7	81.8	75.4	96.2	1973	1993	88.2	75.4	1967	81.1	70.8	1955
Aug	87.5	82.7	78.7	94.9	1971	1960	89.2	77.5	1967	83.9	75.3	1978
Sep	74.0	74.7	75.0	81.0	1967	1985	82.2	68.8	1967	81.4	70.1	1978
Oct	56.5	62.3	67.2	62.6	1988	1985	66.6	57.9	1967	72.3	62.9	1959
Nov	40.5	48.0	56.6	45.2	1987	1985	54.0	42.5	1974	62.7	51.2	1955
Dec	33.3	39.0	47.6	38.7	1974	1984	45.0	34.1	1974	54.6	41.4	1955
Annual	59.6	58.8	59.7	62.8	1967	1955	63.0	54.6	1967	67.3	55.5	1955

Absolute Hourly Extremes				
153.2	1995	-2.0	1972	1979
			93.0	1967
			16.1	1979
			85.3	1967
			32.2	1957

4.0 Precipitation Climatology

4.1 Monthly and Annual Totals

Table 4.1 shows monthly and annual precipitation totals for the period of record, 1946 through 1995. Normal monthly precipitation amounts for the period 1961 through 1990 and averages for the entire period of record are noted on the table, as are monthly and annual extremes. Normal annual precipitation at the HMS is 6.26 in. The wettest year on record was 1995, with 12.31 in.; the driest was 1976, with 2.99 in.

The months of November through February provide 3.35 in. (54%) of the normal annual precipitation. December is the wettest month, receiving 1.03 in.; July is the driest, receiving only 0.18 in. The wettest month on record was June 1950, with 2.92 in.; September 1991, August 1988, and August 1955 received no precipitation.

4.2 Seasonal Precipitation

Table 4.2 provides seasonal precipitation information, with normal and average seasonal data noted. The extremes for each season are also noted. The wettest season was the winter of 1958-1959, with 5.06 in.; the driest received only 0.03 in. (summer 1973).

4.3 Average Number of Days with Specified Amounts of Precipitation

Table 4.3 presents information on the average number of days per year with precipitation events in six categories. A trace is less than 0.005 in. of precipitation. An average of 125 days per year have a trace or more of precipitation; however, only 24 days receive totals of 0.10 in. or more. During the 50-year period of record, only 3 days have had an inch or more of precipitation.

4.4 Total Time with Precipitation Observed

The total time during which precipitation was observed at the HMS includes all types of precipitation. Observations of precipitation are recorded in hours and minutes, with the weather observer recording the starting and ending time of each precipitation event. These data are presented in Table 4.4. No record was kept for the hours 1600 through 2400 from July 1971 through June 1974; therefore, a 3-year gap exists in the record for those hours. Also, beginning in late-April 1995, operating hours at the HMS were decreased to 0600 to 1400 on weekends and holidays. However, a combination of precipitation sensors and computer programs was initiated to help ascertain the beginning and ending times of precipitation events during periods when the HMS is not staffed.

The months of November through February, which contribute more than half of the annual precipitation, received precipitation more than 10% of the time (10.4%), more than 3 times greater than the other 8 months of the year (3.4%).

Table 4.1. Monthly and Annual Precipitation (in.)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
1946	--	--	--	--	--	--	0.15	0.35	0.52	0.65	0.66	0.11	--
1947	0.32	0.27	0.42	0.70	0.02	1.07	0.71	0.68	<u>1.34^(b)</u>	2.20	0.81	0.75	9.29
1948	1.36	0.69	0.07	0.95	1.71	1.47	0.40	0.39	0.16	0.45	0.95	1.11	9.71
1949	0.13	0.68	1.12	0.02	0.16	0.01	0.01	0.03	0.23	0.10	1.47	0.16	4.12
1950	1.80	1.06	0.87	0.47	0.27	<u>2.92</u>	0.07	T	0.01	2.46	0.55	0.97	11.45
1951	0.84	0.51	0.46	0.53	0.43	1.38	0.37	0.15	0.10	0.71	0.82	0.70	7.00
1952	0.65	0.50	0.06	0.13	0.58	1.07	T	0.08	0.08	0.04	0.20	0.77	4.16
1953	2.16	0.25	0.17	0.77	0.28	0.55	T	0.96	0.13	0.20	0.96	0.49	6.92
1954	1.48	0.28	0.59	0.07	0.41	0.10	0.22	0.42	0.51	0.42	0.86	0.35	5.71
1955	0.56	0.22	0.17	0.40	0.59	0.28	0.57	0	0.77	0.40	1.54	2.03	7.53
1956	1.71	0.56	0.10	T	0.22	0.86	T	0.38	0.01	1.03	0.15	0.58	5.60
1957	0.48	0.23	<u>1.86</u>	0.38	0.82	0.47	0.05	0.02	0.34	<u>2.72</u>	0.39	0.53	8.29
1958	1.74	1.48	0.46	0.64	0.74	0.81	0.02	T	0.05	0.19	0.77	1.84	8.74
1959	2.05	1.17	0.40	0.20	0.50	0.23	T	0.03	1.26	0.56	0.41	0.26	7.07
1960	0.51	0.58	0.67	0.53	0.71	0.14	T	0.26	0.23	0.23	0.92	0.64	5.42
1961	0.33	<u>2.10</u>	1.02	0.48	0.80	0.42	0.15	0.09	T	0.07	0.49	0.89	6.84
1962	0.13	<u>0.90</u>	0.14	0.34	1.35	0.12	T	0.50	0.38	0.95	0.65	0.60	6.06
1963	0.95	0.69	0.53	1.17	0.43	0.28	0.31	0.01	0.02	0.04	0.74	1.14	6.31
1964	0.37	0.01	0.03	0.11	0.04	0.90	0.04	0.24	0.09	0.28	0.94	<u>2.34</u>	5.39
1965	0.93	0.14	0.03	0.09	0.15	0.49	0.11	0.03	0.11	0.01	1.17	0.39	3.65
1966	0.68	0.03	0.39	0.03	0.05	0.43	0.81	T	0.27	0.39	2.25	0.60	5.93
1967	0.32	T	0.14	0.90	0.56	0.57	T	T	0.05	0.13	0.16	0.43	3.26
1968	0.88	0.58	<u>0.02</u>	0.01	0.06	0.19	0.04	0.51	0.25	0.93	1.23	1.25	5.95
1969	1.24	0.54	0.10	1.22	0.51	0.75	T	T	0.48	0.10	0.13	1.29	6.36
1970	<u>2.47</u>	0.75	0.27	0.45	0.54	0.25	0.01	T	0.03	0.24	0.71	0.61	6.33
1971	0.78	0.10	1.02	0.07	0.56	0.71	0.13	0.09	1.13	0.18	0.46	1.07	6.30
1972	0.19	0.27	0.58	0.10	<u>2.03</u>	0.66	0.16	0.56	0.02	T	0.55	1.27	6.39
1973	0.90	0.21	0.08	T	0.24	0.01	T	0.02	0.43	1.72	<u>2.64</u>	2.02	8.27
1974	0.90	0.41	0.52	0.46	0.28	0.12	0.71	T	0.01	0.21	<u>0.71</u>	0.97	5.30
1975	1.70	0.98	0.33	0.42	0.38	0.24	0.32	1.16	0.03	0.87	0.60	0.70	7.73
1976	0.56	0.36	0.23	0.41	0.08	0.11	0.13	0.96	T	0.04	T	<u>0.11</u>	<u>2.99</u>
1977	<u>0.08</u>	0.57	0.41	T	0.65	0.37	0.06	<u>1.36</u>	0.66	0.15	0.63	<u>1.47</u>	6.41
1978	1.52	0.92	0.30	0.46	0.41	0.09	0.52	0.57	0.11	T	1.21	0.26	6.37
1979	0.54	0.17	0.54	0.52	0.10	T	0.09	0.38	0.20	0.67	1.36	0.99	5.56
1980	1.32	1.30	0.30	0.86	1.41	0.96	<u>T^(b)</u>	0.02	0.85	0.33	0.44	1.89	9.68
1981	0.56	0.60	0.70	0.02	0.99	0.43	0.19	0.03	0.60	0.39	1.08	1.45	7.04
1982	0.33	0.57	0.30	0.75	0.28	0.75	0.22	0.20	0.55	1.33	0.91	1.79	7.98
1983	1.44	1.36	1.00	0.42	0.52	0.68	0.31	0.12	0.46	0.52	2.12	2.12	1.07
1984	0.23	0.94	1.01	0.60	0.55	0.99	0.06	T	0.42	0.07	1.83	0.57	7.27
1985	0.34	0.82	0.36	0.01	0.12	0.15	0.12	0.01	0.63	0.46	1.24	0.84	5.10
1986	1.76	1.37	0.76	<u>T^(b)</u>	0.30	<u>T^(b)</u>	0.21	0.02	0.96	0.29	0.65	0.77	7.09
1987	0.80	0.19	1.05	0.14	0.17	0.11	0.50	0.07	0.01	<u>T^(b)</u>	0.40	1.63	5.07
1988	0.48	<u>T^(b)</u>	0.39	1.12	0.33	0.11	0.13	<u>0^(b)</u>	0.39	0.01	0.82	0.40	4.18
1989	0.21	1.67	1.56	0.84	0.59	0.01	0.01	0.26	0.02	0.42	1.04	0.29	6.92
1990	0.77	0.09	0.10	0.40	0.86	0.36	0.14	0.83	T	0.78	0.02	0.72	5.07
1991	0.33	0.19	1.12	0.45	0.49	1.44	0.29	0.07	0	0.53	1.44	0.40	6.75
1992	0.44	0.94	0.09	0.94	T	1.14	0.38	0.20	0.27	0.61	1.07	1.82	7.90
1993	1.30	1.17	0.67	0.71	0.60	0.12	<u>1.76</u>	0.24	0.04	0.09	0.19	0.94	7.83
1994	0.44	0.11	0.03	0.61	1.27	0.38	<u>0.15</u>	0.08	0.08	0.93	0.68	1.36	6.12
1995	2.14	0.69	0.95	<u>1.54</u>	0.79	0.77	0.34	0.07	0.79	0.87	1.04	2.32	<u>12.31</u>
Average	0.98	0.62	0.50	0.46	0.53	0.54	0.22	0.25	0.32	0.54	0.86	0.98	6.73
Normal ^(c)	0.79	0.62	0.47	0.41	0.51	0.38	0.18	0.27	0.31	0.39	0.91	1.03	6.26

(a) Greatest and least values for each column are underlined.

(b) Most recent of multiple occurrences.

(c) Normal precipitation figures are averages for the period 1961-1990.

T = Trace.

Table 4.2. Seasonal Precipitation (in.)

Year	Winter ^(a) Dec-Feb	Spring Mar-May	Summer Jun-Aug	Autumn Sep-Nov
1946	--	--	--	1.83
1947	<u>0.70^(b)</u>	1.14	2.46	4.35
1948	2.80	2.73	2.26	1.56
1949	1.92	1.30	0.05	1.80
1950	3.02	1.61	<u>2.99</u>	3.02
1951	2.32	1.42	1.90	1.63
1952	1.85	0.77	1.15	0.32
1953	3.18	1.22	1.51	1.29
1954	2.25	1.07	0.74	1.79
1955	1.13	1.16	0.85	2.71
1956	4.30	0.32	1.24	1.19
1957	1.29	3.06	0.54	3.45
1958	3.75	1.84	0.83	1.01
1959	<u>5.06</u>	1.10	0.26	2.23
1960	1.35	1.91	0.40	1.38
1961	3.07	2.30	0.66	0.56
1962	1.92	1.83	0.62	1.98
1963	2.24	2.13	0.60	0.80
1964	1.52	0.18	1.18	1.31
1965	3.41	0.27	0.63	1.29
1966	1.10	0.47	1.24	2.91
1967	0.92	1.60	0.57	0.34
1968	1.89	<u>0.09</u>	0.74	2.41
1969	3.03	1.83	0.75	0.71
1970	4.51	1.26	0.26	0.98
1971	1.49	1.65	0.93	1.77
1972	1.53	2.71	1.38	0.57
1973	2.38	0.32	<u>0.03</u>	<u>4.79</u>
1974	3.33	1.26	0.83	0.93
1975	3.65	1.13	1.72	1.50
1976	1.62	0.72	1.20	<u>0.04</u>
1977	0.76	1.06	1.79	1.44
1978	3.91	1.17	1.18	1.32
1979	0.97	1.16	0.47	2.23
1980	3.61	2.57	0.98	1.62
1981	3.05	1.71	0.65	2.07
1982	2.35	1.33	1.17	2.79
1983	4.59	1.94	1.11	3.10
1984	3.29	2.16	1.05	2.32
1985	1.73	0.49	0.28	2.33
1986	3.97	1.06	0.23	1.90
1987	1.76	1.36	0.68	0.41
1988	2.11	1.84	0.24	1.22
1989	2.28	2.99	0.28	1.48
1990	1.15	1.36	1.33	0.80
1991	1.24	2.06	1.80	1.97
1992	1.78	1.03	1.72	1.95
1993	4.29	1.98	2.12	0.32
1994	1.49	1.91	0.61	1.69
1995	4.19	<u>3.28</u>	1.18	2.70
Average	2.47	1.49	1.01	1.72
Normal ^(c)	2.44	1.40	0.83	1.60

(a) For the winter season, December is included in the previous year.

(b) Greatest and least values for each column are underlined.

(c) Normal precipitation figures are averages for the period 1961-1990.

Table 4.3. Average Number of Days with Precipitation of Specified Amount

Month	Trace or more	0.01 in. or more	0.10 in. or more	0.25 in. or more	0.50 in. or more	1.00 in. or more
Jan	16	9	3	1	(a)	0
Feb	12	7	2	1	(a)	0
Mar	11	6	2	(a)	(a)	0
Apr	10	5	2	(a)	(a)	0
May	10	5	2	1	(a)	0
Jun	9	4	2	1	(a)	(b)
Jul	5	2	1	(a)	(a)	(b)
Aug	6	3	1	(a)	(a)	0
Sep	6	3	1	(a)	(a)	0
Oct	9	5	2	1	(a)	(b)
Nov	14	9	3	1	(a)	0
Dec	<u>17</u>	<u>10</u>	<u>3</u>	<u>1</u>	<u>(a)</u>	<u>0</u>
Annual	125	68	24	7	1 ^(b)	(b)

(a) Used to denote an average of less than 1/2 day.

(b) Although the number of days with 0.50 in. or more averages less than 1/2 day for any one month, 63 such days were recorded during 50 years of record.

Table 4.4. Monthly and Annual Averages and Extremes in Total Time with Precipitation Observed: July 1946 Through June 1971, July 1974 Through December 1995

Month	Averages		Greatest			Least		
	No. of Hours	% of Time	No. of Hours	% of Time	Year	No. of Hours	% of Time	Year
Jan	91.1	12.2	212.0	28.5	1969	29.2	3.9	1949
Feb	56.3	8.4	106.8	15.9	1958	4.7	0.7	1967
Mar	39.7	5.3	135.2	18.2	1957	7.3	1.0	1968
Apr	30.5	4.2	69.2	9.6	1953	1.6	0.2	1985
May	31.3	4.2	89.9	12.1	1948	1.2	0.2	1992
Jun	28.2	3.9	80.8	11.2	1950	2.9	0.4	1986
Jul	10.7	1.4	38.2	5.1	1966	0.5	0.1	1984
Aug	12.7	1.7	61.7	8.3	1968	0.0	0.0	1988 ^(a)
Sep	16.1	2.2	52.2	7.2	1959	0.0	0.0	1991
Oct	32.0	4.3	119.9	16.1	1947	0.4	0.1	1978
Nov	61.7	8.6	146.5	20.3	1985	7.1	1.0	1990
Dec	90.9	12.2	230.5	31.0	1985	25.8	3.5	1976
Annual	501.2	5.7	738.0	8.4	1950	286.7	3.3	1990

(a) Most recent of several occurrences.

4.5 Notable Wet Periods

Seven periods are listed when precipitation was abnormally high:

Period	Number of Days with Trace or More			Total Amount (in.)	
	Altogether	Greatest Consecutive	Measurable Precipitation	Water Equivalent	Snow-fall
Oct 7 - Nov 4, 1947	23 out of 29	10	17	2.21	0
Jan 3 - 28, 1950	21 out of 26	10	15	1.80	23.4
Nov 11 - Dec 19, 1950	33 out of 39	12	20	1.37	3.7
Nov 16 - Dec 22, 1955	31 out of 37	15	24	3.19	22.7
Oct 31 - Dec 7, 1973	32 out of 38	14	20	3.45	8.1
Nov 15 - Dec 7, 1985	17 out of 23	8	14	1.96	25.2
Dec 27, 1992 - Jan 23, 1993	26 out of 29	12	19	2.02	26.8

From a precipitation standpoint, 1973 was an unusual year. Total precipitation for the year was 8.27 in., 132% of normal (6.26 in.). The period March 30 through September 18 was extremely dry, receiving only 0.29 in. of precipitation during that 173-day period; while the period October 31 through December 7 was a notable wet period. During the months of October, November, and December 1973, 6.38 in. of precipitation were recorded, 289% of normal (2.21 in.) for those months.

4.6 Notable Dry Periods

The HMS is in a semiarid region, thus it experiences many dry periods. January, March, and December are the only months that have always received measurable precipitation (1946 through 1995). A total of 37 months during the period of record have been without measurable precipitation, with the months of July and August accounting for 20 of those months. The record number of consecutive days with zero precipitation (not even a trace) occurred in 1988, when the period July 14 through September 17 (66 days) was totally dry. The following list indicates some long periods with small amounts of precipitation.

Notable Dry Periods				
Year	From	To	Number of Days	Total Precipitation (in.)
1952	Jun 30	Nov 10	134	0.20
1967	Jun 22	Nov 7	139	0.18
1968	Feb 24	Aug 13	172	0.32
1973	Mar 30	Sep 18	173	0.29
1976	Aug 26	Dec 31	128	0.15
1985	Mar 31	Sep 7	161	0.43
1986	May 6	Sep 12	129	0.30
1987	Jul 19	Oct 31	105	0.08
1988	Jun 6	Sep 17	105	0.13

The driest year on record (1946 through 1995) was 1976. Total precipitation for that year was 2.99 in., less than half of normal. During the period September through December, total precipitation was 0.15 in., which was 6% of normal (2.52 in.) for those months.

4.7 Snowfall

Snowfall, which includes all frozen precipitation, varied from a seasonal total of 0.3 in. in 1957-1958 to 56.1 in. in 1992-1993. Table 4.5 provides information on monthly and seasonal snowfall amounts, as well as the dates and amounts of earliest and latest snowfall each season. The earliest measurable snowfall (0.3 in.) was recorded on October 26, 1957; the latest measurable snowfall (1.0 in.) was recorded on April 6, 1982. The average date of the first measurable snow is November 30, and the last measurable snow date is February 13. Normal snowfall for the period 1961 through 1990 and averages for the entire period of record are noted on the table, as are monthly and seasonal extremes.

Table 4.6 lists some miscellaneous snowfall statistics for the HMS for the period 1946 through 1995. Included in this table are average number of days per month with snow depth above certain threshold values, greatest number of days per month with snow depth above certain threshold values, record number of consecutive days with snow depth above certain threshold values, record monthly snow depth, and 24-h snowfall amounts. The record snow depth at the HMS is 15.6 in., recorded in December 1985. The record number of days with snow depth ≥ 6 in. was 43 days in the winter of 1992-1993.

4.8 Normal and Maximum Daily Precipitation

Table 4.7 contains normal and maximum values of precipitation (minimum values are not needed because every day of the year has a minimum value of zero). The normal precipitation values are based on the period 1961 through 1990, while the daily maximum values are for the entire period of record (1945 through 1995). The maximum daily value for each month is noted on the table.

Every day during the year received at least a trace of precipitation; however, there are five days during the period of record that have never received a measurable amount. Those days are July 12, 22; 30 and August 5 and 17. The day with the most measurable precipitation events (17) is December 15. Climatologically speaking, the wettest period of the year is from December 14 through 24, each day with a normal precipitation value of 0.04 in.; the driest period is from July 23 through August 11, with each day having a normal value of only a trace. October 1, 1957 recorded the greatest 1-day precipitation, 1.60 in.

Table 4.5. Monthly and Seasonal Snowfall (in.), Including First and Last Dates of Both Trace and Measurable Snowfalls

Season	First												Last	
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Total	First		Measurable		Last	
									Date	Amount	Date	Amount	Date	Amount
1945-1946	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1946-1947	T	7.2	0.5	3.3	T	T	0	11.0	11/17	0.2	11/31	2.2	04/07	T
1947-1948	0	T	3.0	2.6	5.5	0.1	T	11.2	12/03	0.1	03/09	0.1	03/15	T
1948-1949	0	1.7	8.1	1.8	6.9	T	0	18.5	11/18	0.2	02/21	0.2	04/02	T
1949-1950	T	0	0.7	23.4 ^(a)	3.1	1.5	T	28.7	12/16	0.1	03/13	0.3		
1950-1951	0	0.8	2.9	5.3	5.3	4.2	0	18.5	11/30	0.8	03/12		1.1	
1951-1952	0	0.5	4.4	7.5	3.1	T	0	15.5	11/25	0.5	02/24	0.1	03/20	T
1952-1953	0	T	3.1	2.7	0	T	0	5.8	12/01	0.3	01/02	2.7	03/31	T
1953-1954	0	0	1.0	14.3	1.6	T	0	16.9	12/08	1.0	02/11	1.6	03/10	T
1954-1955	0	0	1.8	6.0	2.4	0.7	T	10.9	12/04	1.8	03/25	0.7	04/02	T
1955-1956	0	12.7	13.4	10.2	2.2	T	0	38.5	11/02	0.2	02/23	0.1	03/26	T
1956-1957	T	0.1	2.5	7.9	1.4	4.0	T	15.9	11/26	0.1	03/06	1.7	03/12	T
1957-1958	0.3	0	T	T	0	T	0	0.3	10/26	0.3	10/26	0.3	03/16	T
1958-1959	0	T	0.9	4.5	12.7	0	0	18.1	11/14	0.4	02/19		1.2	
1959-1960	0	0.3	1.0	5.9	T	1.5	0	8.7	11/15	0.1	03/05		1.4	
1960-1961	0	0	3.3	1.9	0	1.6	0	6.8	12/10	0.1	03/05		1.6	
1961-1962	0	0.5	6.1	0.4	2.4	0.9	0	10.3	11/23	0.1	03/09	0.1	03/11	T
1962-1963	0	T	T ^(b)	7.1	0.6	0	0	7.7	01/30	0.4	02/01	0.6	02/13	T
1963-1964	0	T	6.4	2.9	T	T	T	9.3	12/08	4.3	01/24	1.5	03/22	T
1964-1965	0	0.1	19.1	6.6	T	T	0	25.8	11/29	0.1	01/23	3.1	03/27	T
1965-1966	0	T	6.9	2.6	T	T	0	9.5	12/23	0.6	01/22	0.2	03/21	T
1966-1967	0	0.4	2.8	0.1	0	0	0	3.3	11/11	0.2	01/26		0.1	
1967-1968	0	0	5.7	4.5	0.3	0	T	10.5	12/09	0.6	02/17	0.3	04/16	T
1968-1969	0	T	9.7	15.9	2.1	0	0	27.7	12/19	0.1	02/23	2.0	02/28	T
1969-1970	0	T	2.7	6.6	T	0.2	0	9.5	12/08	1.3	03/01		0.2	
1970-1971	0	0.5	4.4	2.0	T	0.6	0	7.5	11/30	0.5	03/14	0.1	03/22	T
1971-1972	0.6	T	8.1	4.9	1.4	0.1	T	15.1	11/29	0.1	02/05	0.1	04/12	T
1972-1973	0	T	7.2	4.3	1.7	0	0	13.2	12/03	1.7	02/10	1.7	02/13	T
1973-1974	1.5	6.6	7.5	3.9	0	T	0	19.5	10/31	1.5	01/12	2.3	03/06	T
1974-1975	0	0	0.7	2.5	12.1	T	T	15.3	12/12	0.3	02/09	1.7	04/04	T

Table 4.5. (contd)

Season	First												Last Measurable		Last	
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Total	Date	Amount	Date	Amount	Date	Amount	Date	Amount
1975-1976	0	1.7	3.8	6.0	0.2	T	T	11.7				0.2	02/03	0.2	04/01	T
1976-1977	0	0	0.2	2.9	T	T	0	3.1	12/04	T	11/10	0.6	01/31	0.2	03/27	T
1977-1978	0	2.1	3.4	2.9	0.9	T	0	9.3	11/15	T	11/18	0.1	02/26	0.1	03/05	T
1978-1979	0	10.1	1.4	10.3	0.5	0.1	0	22.6	11/15	T	11/18	5.3	03/03	0.1		
1979-1980	0	5.6	7.3	8.7	4.5	0.3	0	26.2			11/22	1.4	03/05	0.3		
1980-1981	0	0.3	2.2	T	T	0	0	2.5			11/14	0.3	12/06	0.3	02/13	T
1981-1982	0	0	12.1	2.4	T	T	1.0	15.5	12/03	T	12/13	2.5	04/06	1.0		
1982-1983	0	0.2	4.6	3.2	2.3	0	0	10.3	11/12	T	11/26	0.2	02/09	0.3		
1983-1984	0	T	17.8	1.5	T	0	0	19.3	11/28	T	12/02	0.5	01/21	1.5	02/09	T
1984-1985	T	4.9	5.8	1.3	8.5	1.4	0	21.9	10/23	T	11/24	0.2	03/04	1.4		
1985-1986	0	18.3	7.6	2.7	5.5	0	0	34.1			11/10	0.6	02/21	0.9		
1986-1987	0	0	5.1	3.3	0	0	0	8.4			12/04	0.4	01/26	0.1		
1987-1988	0	1.1	4.7	5.6	0	0	0.2	11.6			11/30	1.1	01/20	0.1	01/31	T
1988-1989	0	0	3.5	0.2	17.0	3.1	T	23.8			12/18	0.3	03/05	0.2	05/18	T
1989-1990	0	0	1.4	0.6	0.7	T	0	2.7	12/25	T	12/26	0.3	02/17	0.2		
1990-1991	0	0 ^(b)	6.1	3.8	0 ^(b)	0.1	0	10.0			12/18	0.1	03/02	0.1		
1991-1992	1.2	T	0.6	0.3	T	0	0	2.1			10/28	0.8	01/05	0.3	02/07	T
1992-1993	0	2.1	21.0	17.1	12.4	3.5	0	56.1			11/21	0.2	03/03	1.5	03/16	T
1993-1994	0	1.4	1.8	0	0.9	0	0 ^(b)	4.1			11/22	0.6	02/26	0.3		
1994-1995	0	0.1	4.2	T	T	0 ^(b)	T	4.3			11/17	0.1	12/14	0.7	04/14	T
1995-1996	0 ^(b)	1.0	4.0	--	--	--	--	--			11/10	1.0				
Average	0.1	1.5	5.3	5.0	2.5	0.5	T	15.0	11/20				02/13		03/11	
Normal ^(c)	0.1	1.7	5.7	3.9	2.0	0.3	T	13.8	11/24				02/12		03/08	

(a) Greatest and least values for each column are underlined.

(b) Most recent of multiple occurrences.

(c) Normal snowfall figures are averages for 1961-1990.

T = Trace.

Table 4.6. Miscellaneous Snowfall Statistics, 1946 Through 1995

	Oct	Nov	Dec	Jan	Feb	Mar	Season
Average Number of Days of Given Depth at 0400 PST							
≥ 1 in.	(a)	1	7	9	4	(a)	21
≥ 3 in.	0	1	3	5	2	(a)	12
≥ 6 in.	0	(a)	1	2	1	(a)	5
≥ 12 in.	0	0	(a)	(a)	0	0	(a)
Record Greatest Number of Days of Given Depth at 0400 PST							
≥ 1 in.	0	12 (1978) ^(b)	31 (1985)	31 (1969)	20 (1989)	7 (1989)	72 (1992-93)
≥ 3 in.	0	12 (1978)	31 (1985)	27 (1993)	16 (1950)	6 (1993)	58 (1985-86)
≥ 6 in.	0	6 (1978)	23 (1985)	25 (1993)	9 (1993)	5 (1993)	43 (1992-93)
≥ 12 in.	0	0	4 (1964)	10 (1993)	0	0	10 (1992-93)
Record Greatest Depth	1.5 (1973)	10.0 (1985)	15.6 (1985)	15.0 (1993)	10.0 (1969)	9.1 (1993)	15.6 (Dec 1985)
Greatest in 24 h	1.5 (1973)	8.8 (1985)	6.6 (1985)	7.1 (1954)	10.2 (1993)	2.7 (1989)	10.2 (Feb 1993)
Record Consecutive Number of Days of Given Depth at 0400 PST	Number of Days	From		To			
≥ 1 in.	60	November 20, 1985		January 18, 1986			
≥ 3 in.	57	November 22, 1985		January 17, 1986			
≥ 6 in.	32	December 20, 1964		January 20, 1965			
≥ 12 in.	6	January 15, 1993		January 20, 1993			

(a) Denotes less than 1/2 day.

(b) Year of occurrence in parentheses.

PST = Pacific Standard Time.

Table 4.7. Normal and Maximum Daily Precipitation (in.)

Normal Period (1961-1990)						Historical Period (1945-1995)	
Day	Normal	Number of Years		Maximum	Year	Maximum	Year
		W/Meas.	W/Trace				
January							
1	0.02	5	10	0.20	1987	0.20	1987
2	0.02	9	9	0.17	1983	0.27	1953
3	0.02	8	7	0.28	1966	0.28	1966
4	0.02	7	10	0.17	1976	0.25	1956
5	0.02	9	8	0.23	1966	0.23	1966
6	0.02	4	8	0.50	1983	0.87	1948
7	0.02	8	5	0.31	1990	0.31	1990
8	0.02	7	9	0.25	1978	0.59	1953
9	0.02	8	9	0.20	1980 ^(a)	0.41	1995 ^(a)
10	0.03	10	5	0.20	1979 ^(a)	0.22	1995
11	0.03	4	10	0.17	1980	0.48	1959
12	0.03	9	10	0.32	1973	0.58	1958
13	0.03	10	8	0.33	1980	0.37	1950
14	0.03	10	3	0.43	1978	0.43	1978
15	0.03	7	5	0.18	1968	0.34	1956
16	0.03	10	6	0.53	1971	0.70	1954
17	0.02	5	7	0.10	1986	0.18	1958
18	0.02	7	8	0.25	1974	0.25	1974
19	0.02	8	1	0.32	1970	0.39	1950
20	0.02	5	6	0.26	1985	0.32	1953
21	0.02	6	5	0.15	1984	0.16	1954
22	0.02	6	7	0.54	1970	0.54	1970
23	0.03	8	9	0.27	1965	0.27	1965
24	0.03	8	6	0.22	1970	0.22	1970
25	0.03	6	6	0.72	1975	0.72	1975
26	0.03	8	4	0.36	1970	0.36	1970
27	0.03	6	6	0.20	1981	0.32	1954
28	0.03	6	7	0.19	1986	0.19	1995 ^(a)
29	0.03	9	4	0.31	1965	0.33	1958
30	0.03	8	8	0.12	1986	0.24	1995
31	0.03	9	10	0.94	1963	0.94	1963
February							
1	0.03	8	4	0.72	1961	0.72	1961
2	0.02	5	8	0.26	1963	0.26	1963
3	0.02	5	6	0.06	1990	0.12	1950
4	0.02	5	5	0.28	1975	0.28	1975
5	0.02	7	7	0.07	1978	0.15	1953
6	0.02	10	2	0.18	1961	0.18	1961
7	0.02	5	4	0.27	1985	0.27	1985
8	0.02	5	8	0.12	1985	0.12	1985
9	0.02	9	5	0.37	1962	0.43	1959
10	0.02	5	5	0.64	1961	0.64	1961
11	0.02	10	3	0.30	1969	0.30	1969
12	0.03	9	6	0.20	1986	0.42	1958
13	0.02	10	6	0.21	1981	0.21	1981
14	0.03	5	11	0.39	1986	0.39	1986
15	0.03	12	7	0.30	1970	0.30	1970
16	0.03	7	7	0.42	1989	0.42	1989
17	0.03	10	7	0.42	1989	0.42	1989
18	0.03	9	2	0.34	1983	0.34	1983 ^(a)
19	0.02	9	5	0.14	1989	0.78	1993
20	0.02	5	3	0.18	1984	0.18	1984
21	0.02	8	3	0.20	1986	0.36	1956
22	0.02	4	5	0.15	1989	0.21	1949
23	0.02	5	4	0.22	1968	0.22	1968
24	0.02	5	5	0.10	1981	0.33	1950
25	0.02	9	3	0.22	1983	0.25	1948
26	0.02	6	4	0.30	1976	0.30	1976
27	0.02	9	3	0.24	1980	0.24	1980

Table 4.7. (contd)

Day	Normal Period (1961-1990)					Historical Period (1945-1995)	
	Normal	Number of Years		Maximum	Year	Maximum	Year
		W/Meas.	W/Trace				
28	0.02	7	4	0.33	1977	0.33	1977
29	0.02	1	1	0.04	1984	0.04	1984
March							
1	0.02	8	4	0.15	1972	0.15	1972
2	0.01	4	8	0.07	1989	0.20	1991 ^(a)
3	0.01	3	7	0.15	1977	0.15	1991 ^(a)
4	0.01	9	6	0.16	1985	0.44	1957
5	0.01	6	7	0.23	1989	0.23	1989
6	0.02	7	3	0.07	1971 ^(a)	0.24	1957
7	0.02	6	4	0.21	1986	0.21	1986
8	0.02	8	2	0.19	1988	0.23	1951
9	0.02	6	6	0.31	1989	0.42	1995
10	0.02	11	4	0.06	1980 ^(a)	0.21	1995
11	0.02	8	6	0.24	1989	0.24	1989
12	0.02	9	6	0.42	1987	0.42	1987
13	0.02	7	8	0.35	1983	0.35	1983
14	0.02	9	3	0.14	1970	0.16	1995
15	0.02	7	4	0.18	1987	0.25	1949
16	0.01	7	5	0.22	1989	0.34	1949
17	0.01	3	7	0.05	1967	0.16	1949
18	0.01	7	5	0.04	1989	0.25	1949
19	0.01	3	4	0.12	1987	0.12	1987
20	0.01	5	4	0.43	1984	0.43	1984
21	0.01	5	2	0.10	1984 ^(a)	0.18	1958
22	0.02	4	8	0.22	1961	0.22	1961
23	0.02	7	4	0.26	1986	0.26	1986
24	0.02	4	2	0.12	1961	0.52	1991
25	0.02	9	3	0.43	1971	0.43	1971
26	0.02	5	6	0.50	1981	0.50	1981
27	0.02	5	4	0.42	1979	0.42	1979
28	0.02	5	3	0.13	1982	0.13	1982
29	0.01	8	1	0.15	1983	0.15	1983
30	0.01	4	7	0.23	1974	0.23	1974
31	0.01	4	6	0.14	1976	0.14	1976
April							
1	0.01	3	12	0.18	1983	0.22	1958
2	0.01	6	3	0.10	1979	0.18	1948
3	0.01	2	3	0.03	1963	0.18	1947
4	0.01	5	9	0.13	1984	0.18	1948
5	0.01	6	6	0.44	1969	0.44	1969
6	0.01	6	3	0.36	1982	0.36	1982
7	0.01	3	1	0.22	1984	0.30	1953
8	0.01	5	2	0.17	1976	0.18	1991
9	0.01	3	10	0.12	1980	0.32	1992
10	0.01	2	6	0.03	1969	0.10	1958
11	0.01	4	9	0.23	1982	0.23	1982
12	0.01	4	5	0.08	1961	0.36	1995
13	0.01	1	3	0.01	1990	0.39	1992
14	0.01	4	4	0.17	1975 ^(a)	0.17	1975 ^(a)
15	0.01	3	8	0.09	1962	0.17	1991
16	0.02	4	7	0.08	1979 ^(a)	0.11	1948
17	0.02	6	6	0.36	1988	0.36	1988
18	0.02	4	6	0.31	1967	0.31	1967
19	0.02	7	9	0.41	1970	0.41	1970
20	0.02	6	6	0.56	1980	0.56	1980
21	0.02	2	7	0.07	1989	0.07	1989
22	0.02	7	6	0.12	1974	0.22	1960
23	0.01	6	5	0.22	1974	0.22	1974
24	0.01	4	8	0.22	1975	0.22	1975

Table 4.7. (contd)

Day	Normal Period (1961-1990)					Historical Period (1945-1995)	
	Normal	Number of Years		Maximum	Year	Maximum	Year
		W/Meas.	W/Trace				
25	0.02	3	6	0.35	1989	0.35	1989
26	0.02	2	7	0.04	1989	0.25	1955
27	0.02	7	5	0.28	1989 ^(a)	0.34	1995
28	0.02	6	5	0.48	1988	0.51	1951
29	0.02	2	3	0.30	1961	0.30	1961
30	0.02	6	4	0.12	1984	0.12	1984
May							
1	0.02	5	6	0.19	1984	0.19	1984
2	0.01	5	1	0.17	1975	0.17	1975
3	0.01	4	3	0.29	1977	0.29	1977
4	0.01	6	5	0.10	1967	0.10	1967
5	0.02	8	3	0.28	1963	0.28	1963
6	0.02	4	6	0.20	1986	0.20	1986
7	0.02	3	1	0.39	1983	0.39	1983
8	0.02	5	7	0.55	1972	0.55	1972
9	0.02	5	5	0.25	1961	0.53	1995
10	0.02	6	7	0.39	1961	0.39	1961
11	0.02	4	4	0.19	1967	0.39	1951
12	0.02	4	7	0.50	1970	0.50	1970
13	0.01	4	2	0.11	1985	0.15	1952
14	0.01	4	6	0.25	1978	0.25	1978
15	0.01	3	6	0.06	1975	0.58	1994
16	0.01	0	8	T	1988 ^(a)	0.14	1991
17	0.01	4	3	0.13	1982	0.25	1959
18	0.01	5	2	0.13	1981	0.13	1981
19	0.01	7	3	0.15	1965	0.55	1948
20	0.02	4	1	0.70	1972	0.70	1972
21	0.02	3	4	0.69	1972	0.69	1972
22	0.02	6	5	0.12	1984	0.12	1984
23	0.03	5	6	0.33	1990	0.33	1990
24	0.03	4	5	0.51	1962	0.51	1962
25	0.02	6	2	0.74	1981	0.74	1981
26	0.02	4	6	0.79	1980	0.79	1980
27	0.02	6	2	0.11	1990	0.11	1990
28	0.02	5	7	0.28	1988	0.28	1988
29	0.02	5	3	0.11	1961	0.11	1961
30	0.01	6	1	0.14	1987	0.14	1987
31	0.02	2	5	0.35	1971	0.35	1971
June							
1	0.02	3	5	0.29	1977	0.29	1977
2	0.02	5	6	0.12	1966	0.12	1966
3	0.02	6	9	0.30	1971	0.30	1971
4	0.02	6	3	0.25	1984	0.45	1951
5	0.02	4	4	0.14	1981	0.49	1991
6	0.02	6	3	0.36	1990	0.54	1951
7	0.01	5	5	0.15	1972	0.71	1947
8	0.01	6	6	0.49	1964	0.49	1964
9	0.02	3	4	0.07	1963	0.22	1948
10	0.02	2	7	0.08	1983	0.14	1956
11	0.01	3	5	0.13	1961	0.39	1950
12	0.01	4	8	0.60	1969	0.79	1992
13	0.01	6	4	0.35	1980	0.49	1948
14	0.01	4	2	0.04	1983	0.37	1956
15	0.01	4	1	0.15	1964	0.15	1964
16	0.01	2	5	0.14	1980	0.18	1948
17	0.01	2	5	0.48	1965	1.09	1950
18	0.01	2	5	0.07	1983	0.09	1994
19	0.01	1	3	0.01	1983	0.12	1995
20	0.01	5	2	0.24	1984	0.24	1984

Table 4.7. (contd)

Day	Normal Period (1961-1990)					Historical Period (1945-1995)	
	Normal	Number of Years		Maximum	Year	Maximum	Year
		W/Meas.	W/Trace				
21	0.01	5	2	0.32	1967	0.32	1967
22	0.01	4	7	0.14	1971	0.14	1971
23	0.01	7	2	0.17	1963	0.17	1963
24	0.01	5	3	0.21	1972	0.21	1972
25	0.01	3	4	0.02	1980	0.03	1954
26	0.01	2	6	0.27	1982	0.27	1982
27	0.01	4	3	0.37	1983	0.37	1983
28	0.01	2	8	0.23	1984	0.24	1992
29	0.01	4	2	0.16	1984	0.53	1991
30	0.01	1	1	0.06	1976	0.06	1976
July							
1	0.01	5	3	0.31	1966	0.31	1966
2	0.01	3	6	0.34	1966	0.34	1966
3	0.01	3	3	0.31	1978	0.31	1978
4	0.01	3	4	0.10	1986	0.10	1986
5	0.01	1	3	0.19	1981	0.36	1951
6	0.01	1	3	0.02	1979	0.04	1993
7	0.01	3	2	0.30	1963	0.30	1963
8	0.01	5	3	0.14	1974	0.20	1995
9	0.01	3	2	0.27	1987	0.27	1987
10	0.01	2	5	0.05	1972	0.16	1954
11	0.01	2	4	0.04	1979	0.04	1979
12	T	0	4	T	1982 ^(a)	T	1982 ^(a)
13	T	2	5	0.28	1975	0.28	1975
14	T	1	2	0.03	1966	0.05	1957
15	T	2	2	0.04	1975	0.08	1991
16	T	4	3	0.07	1966	0.50	1993
17	T	3	1	0.05	1987 ^(a)	0.89	1993
18	T	2	2	0.12	1987	0.12	1987
19	T	2	2	0.45	1974	0.45	1974
20	T	2	2	0.09	1965	0.09	1965
21	T	1	2	0.02	1965	0.02	1965
22	T	0	2	T	1987 ^(a)	T	1993 ^(a)
23	T	2	0	0.15	1961	0.28	1992
24	T	2	2	0.06	1990	0.07	1955
25	T	3	2	0.23	1983	0.23	1983
26	T	0	1	T	1978	0.22	1955
27	T	1	1	0.02	1983	0.31	1947
28	T	1	3	0.06	1984	0.28	1947
29	T	1	1	0.01	1964	0.01	1993 ^(a)
30	T	0	3	T	1987 ^(a)	T	1987 ^(a)
31	T	1	2	0.12	1985	0.12	1991 ^(a)
August							
1	T	2	1	0.08	1976 ^(a)	0.08	1976 ^(a)
2	T	1	3	0.01	1976	0.01	1976
3	T	1	2	0.29	1962	0.29	1962
4	T	1	2	0.01	1985	0.04	1948
5	T	0	3	T	1984 ^(a)	T	1991 ^(a)
6	T	1	2	0.11	1976	0.11	1976
7	T	2	1	0.33	1976	0.33	1976
8	T	0	4	T	1989 ^(a)	0.08	1952
9	T	2	2	0.10	1982	0.10	1982
10	T	0	3	T	1984 ^(a)	0.01	1947
11	T	1	4	0.01	1983	0.11	1947
12	0.01	3	5	0.18	1962	0.18	1962
13	0.01	4	2	0.04	1987 ^(a)	0.06	1995
14	0.01	5	3	0.09	1979	0.09	1979
15	0.01	3	1	0.42	1972	0.42	1972
16	0.01	1	1	0.01	1968	0.24	1993

Table 4.7..(contd)

Day	Normal Period (1961-1990)					Historical Period (1945-1995)	
	Normal	Number of Years		Maximum	Year	Maximum	Year
		W/Meas.	W/Trace				
17	0.01	0	3	T	1980 ^(a)	T	1995 ^(a)
18	0.01	4	3	0.69	1975	0.69	1975
19	0.01	3	5	0.05	1979	0.18	1954
20	0.01	4	6	0.03	1978	0.22	1953
21	0.02	3	4	0.76	1990	0.76	1990
22	0.01	6	1	0.18	1978	0.18	1978
23	0.02	4	1	0.14	1975	0.14	1975
24	0.02	6	1	0.38	1977	0.38	1977
25	0.01	2	6	0.29	1976	0.29	1976
26	0.01	3	4	0.19	1968	0.38	1953
27	0.01	5	3	0.14	1989	0.14	1989
28	0.01	2	4	0.13	1975	0.13	1975
29	0.01	6	1	0.28	1977	0.51	1947
30	0.01	2	4	0.61	1977	0.61	1977
31	0.01	2	3	0.02	1961	0.02	1961 ^(a)
September							
1	0.01	7	2	0.43	1971	0.43	1971
2	0.01	2	4	0.17	1971	0.17	1971
3	0.01	3	1	0.13	1979	0.13	1979
4	0.01	1	1	0.02	1977	0.19	1960
5	T	3	2	0.19	1971	0.19	1971
6	T	3	0	0.29	1971	0.48	1995
7	T	2	0	0.04	1978	0.23	1947
8	T	2	3	0.10	1985	0.10	1985
9	T	2	4	0.07	1985	0.07	1985
10	0.01	3	3	0.06	1985	0.06	1985
11	0.01	4	1	0.10	1966	0.10	1966
12	0.01	0	3	T	1980 ^(a)	0.03	1958
13	0.01	5	2	0.79	1980	0.79	1980
14	0.01	3	4	0.04	1985	0.41	1959
15	0.01	2	5	0.54	1986	0.54	1986
16	0.02	2	7	0.03	1985	0.66	1947
17	0.01	4	5	0.26	1969	0.26	1969
18	0.01	4	6	0.22	1983	0.41	1959
19	0.01	6	4	0.26	1973	0.26	1973
20	0.01	4	8	0.13	1988	0.13	1988
21	0.01	2	4	0.03	1971	0.03	1971
22	0.01	4	4	0.20	1984	0.20	1984
23	0.01	4	2	0.21	1986	0.21	1986
24	0.01	4	0	0.10	1977	0.10	1977
25	0.01	3	3	0.25	1982	0.25	1982
26	0.01	4	1	0.22	1981	0.22	1981
27	0.01	4	2	0.38	1981	0.43	1955
28	0.01	5	3	0.34	1962	0.34	1962
29	0.01	3	1	0.07	1986	0.07	1986
30	0.01	2	3	0.02	1969	0.03	1953 ^(a)
October							
1	T	2	5	0.01	1969 ^(a)	1.60	1957
2	T	5	5	0.06	1967	0.31	1957
3	T	2	1	0.04	1975	0.38	1995
4	T	1	4	0.01	1970	0.15	1950
5	T	0	9	T	1981 ^(a)	0.25	1950
6	T	5	4	0.22	1973	0.22	1973
7	0.01	3	3	0.25	1985	0.25	1985
8	0.01	1	5	0.06	1964	0.49	1950
9	0.01	5	2	0.09	1968	0.32	1947
10	0.01	5	4	0.09	1985	0.32	1959
11	0.01	3	7	0.43	1968	0.43	1968
12	0.01	6	3	0.52	1962	0.52	1962

Table 4.7. (contd)

Day	Normal Period (1961-1990)					Historical Period (1945-1995)	
	Normal	Number of Years		Maximum	Year	Maximum	Year
		W/Meas.	W/Trace				
13	0.01	2	3	0.04	1980	0.16	1994
14	0.01	4	3	0.11	1962	0.43	1950
15	0.01	1	1	0.01	1980	0.15	1947
16	0.01	0	1	T	1975	0.24	1947
17	0.01	2	3	0.16	1968	0.23	1950
18	0.01	4	3	0.28	1979	0.28	1979
19	0.02	5	4	0.12	1979	0.64	1947
20	0.02	5	5	0.15	1968	0.37	1947
21	0.02	8	3	0.45	1975	0.45	1975
22	0.02	5	9	0.20	1983	0.23	1957
23	0.02	4	2	0.39	1973	0.39	1973
24	0.02	4	5	0.11	1979	0.12	1991
25	0.02	5	3	0.22	1975	0.22	1975
26	0.02	6	3	0.12	1989	0.18	1956
27	0.02	7	4	0.09	1969	0.33	1956
28	0.02	4	6	0.93	1982	0.93	1982
29	0.02	7	8	0.18	1986	0.38	1950
30	0.02	3	7	0.52	1990	0.52	1990
31	0.02	3	6	0.64	1973	0.64	1973
November							
1	0.02	7	3	0.18	1987	0.26	1948
2	0.02	6	2	0.25	1984	0.25	1984
3	0.02	8	3	0.28	1965	0.28	1965
4	0.02	9	5	0.19	1973	0.24	1991
5	0.02	9	2	0.19	1963	0.19	1963
6	0.02	8	4	0.30	1980	0.30	1980 ^(a)
7	0.03	5	7	0.23	1963	0.23	1963
8	0.03	9	6	0.50	1968	0.50	1968
9	0.04	8	7	0.16	1973	0.27	1949
10	0.04	11	4	0.66	1983	0.66	1983
11	0.04	12	3	0.26	1970	0.26	1970
12	0.04	10	4	0.57	1973	0.57	1973
13	0.04	7	4	0.47	1981	0.47	1981
14	0.04	7	6	0.35	1966	0.35	1966
15	0.04	12	5	0.17	1985	0.19	1994
16	0.03	9	5	0.42	1979	0.42	1979
17	0.03	9	7	0.12	1974	0.18	1955
18	0.03	7	4	0.46	1982	0.46	1982
19	0.03	7	5	0.37	1966	0.37	1966
20	0.03	4	7	0.42	1966	0.42	1966
21	0.03	6	8	0.50	1985	0.50	1985
22	0.03	6	10	0.30	1979	0.30	1979
23	0.03	12	5	0.42	1983	0.63	1949
24	0.03	10	7	0.37	1965	0.37	1965
25	0.03	5	10	0.25	1977	0.25	1977
26	0.03	8	6	0.11	1986 ^(a)	0.54	1955
27	0.03	9	6	0.49	1984	0.49	1984
28	0.02	9	7	0.19	1986	0.19	1986
29	0.03	8	7	0.18	1978	0.18	1978
30	0.03	9	5	0.30	1962	0.30	1962
December							
1	0.03	8	4	0.19	1966	0.29	1955
2	0.04	8	8	0.34	1985 ^(a)	0.34	1985 ^(a)
3	0.04	7	9	0.56	1980	0.56	1980
4	0.03	13	3	0.28	1974	0.28	1974
5	0.04	11	7	0.43	1963	0.43	1963
6	0.04	12	8	0.18	1985	0.18	1985
7	0.03	8	5	0.32	1983	0.36	1948
8	0.03	5	7	0.36	1963	0.36	1963

Table 4.7. (contd)

Day	Normal Period (1961-1990)					Historical Period (1945-1995)	
	Normal	Number of Years		Maximum	Year	Maximum	Year
		W/Meas.	W/Trace				
9	0.03	9	8	0.55	1987	0.55	1987
10	0.03	9	4	0.25	1990	0.54	1958
11	0.04	6	8	0.33	1969	0.53	1958
12	0.04	10	5	0.29	1982	0.65	1995
13	0.03	8	5	0.76	1977	0.76	1977
14	0.04	12	5	0.25	1964	0.25	1964
15	0.04	15	2	0.22	1981	0.22	1981
16	0.04	9	9	0.30	1961	0.37	1994
17	0.04	10	5	0.22	1973	0.22	1973
18	0.04	11	8	0.22	1981	0.27	1960
19	0.04	15	7	0.19	1964	0.20	1953
20	0.04	13	7	0.33	1982	0.33	1982
21	0.04	10	10	0.54	1964	0.61	1955
22	0.04	9	5	0.59	1964	0.59	1964
23	0.04	7	7	0.31	1975	0.31	1975
24	0.04	11	8	0.36	1968	0.36	1968
25	0.03	12	6	0.26	1980	0.26	1980
26	0.03	9	6	0.19	1973	0.54	1994
27	0.03	11	7	0.36	1973	0.36	1973
28	0.02	10	11	0.09	1990 ^(a)	0.10	1951
29	0.02	9	7	0.55	1983	0.55	1983
30	0.02	5	9	0.15	1979	0.28	1995
31	0.02	4	9	0.29	1968	0.29	1968

(a) Latest of several occurrences.

T = Trace.

5.0 Wind Climatology

5.1 Monthly and Annual Prevailing Wind Directions, Average Speeds, and Peak Gusts

At the HMS, the prevailing wind direction for every month of the year is either WNW or NW (Table 5.1), and the peak gusts for every month are from the SSW, SW, or WSW. The highest monthly average wind speeds occur in June and the lowest in December. The variability in monthly average wind speeds is much greater in the winter months than during the remainder of the year. The highest January average (10.3 mph) is more than 3.5 times greater than the lowest (2.9 mph); however, in June, the highest average (10.7 mph) is only 1.4 times greater than the lowest (7.7 mph).

5.2 Number of Days with Peak Gusts Above or Below Specific Thresholds

Table 5.2 lists the number of days by month and year with peak wind gusts (at 50 ft) above or below specific threshold wind speeds. June and July have the highest average number of days with gusts ≥ 25 mph (nearly 20 each); however, January, March and April have the highest average number of days with gusts ≥ 40 mph (nearly 3 days) and January has the highest average number of days with gusts ≥ 50 mph (0.9 day). January also has the record highest number of gusts ≥ 40 and ≥ 50 mph at 11 and 7 days, respectively, in 1990. Calendar year 1990 recorded the most days with gusts ≥ 40 and ≥ 50 mph at 57 and 18 days, respectively. Of particular interest is that previous records for these categories were 41 days ≥ 40 mph in 1961 and 10 days ≥ 50 mph in 1972.

5.3 Percent Frequency of Monthly and Annual Wind Direction and Speed at 50 Feet

Table 5.3 presents HMS data on the percent frequency of monthly and annual wind direction and wind speed at 50 ft. This table shows that for every month of the year the prevailing wind direction is either from the WNW or NW. Winds are relatively evenly distributed from the NNE through the SSW at between 2% and 4% on an annual average for each direction.

The wind speed class with the highest frequency of occurrence is 4 to 7 mph, with winds in that category 36% of the time. The speed class with the second highest frequency is 8 to 12 mph, at 25%. Winds averaging over 25 mph occur only 1% of the time on an annual basis, with the highest frequency occurring in March and April (1.5%).

Table 5.1. Monthly and Annual Prevailing Wind Directions, Average Speeds (mph), and Peak Gusts (mph) at 50 Feet, 1945 Through 1995

Month	Prevailing Direction	Average Speed	Highest Average	Year	Lowest Average	Year	Peak Gusts		
							Speed	Direction	Year
Jan	NW	6.2	10.3	1972	2.9	1985	80	SW	1972
Feb	NW	7.0	10.8	1976	4.6	1963	65	SW	1971
Mar	WNW	8.2	10.7	1977 ^(a)	5.9	1958	70	SW	1956
Apr	WNW	8.9	11.1	1972 ^(a)	7.4	1989 ^(a)	73	SSW	1972
May	WNW	8.8	10.7	1983	5.8	1957	71	SSW	1948
Jun	NW	9.1	10.7	1983 ^(a)	7.7	1950 ^(a)	72	SW	1957
Jul	NW	8.6	10.7	1983	6.8	1955	69	WSW	1979
Aug	WNW	7.9	9.1	1946	6.0	1956	66	SW	1961
Sep	WNW	7.5	9.2	1961	5.4	1957	65	SSW	1953
Oct	NW	6.5	9.1	1946	4.4	1952	63	SSW	1950
Nov	NW	6.3	10.0	1990	2.9	1956	67	WSW	1993
Dec	NW	5.9	8.3	1968	3.3	1985	71	SW	1955
Annual	NW	7.6	8.4	1983	6.2	1989	80	SW	Jan 1972

(a) Also in earlier years.

5.4 Composite Wind Roses and Joint Frequency Distributions for the Hanford Meteorological Monitoring Network

Figure 5.1 and Table 5.4 contain composite wind roses and joint frequency distributions at the 10-m level for the entire HMMN (see Table 1.1 and Figure 1.1) for the period 1982 through 1995.

Figure 5.2 and Table 5.5 contain composite wind roses and joint frequency distributions at the 60-m level for stations 9, 11, 13, and 21 for the period 1986 through 1995.

Table 5.2. Number of Days with Peak Gusts Above or Below Specific Thresholds at 50 Feet, 1945 Through 1995

Month	Days with Peak Gusts ≤12 mph				Days with Peak Gusts ≥25 mph				Days with Peak Gusts ≥40 mph				Days with Peak Gusts ≥50 mph							
	Avg	Max	Year	Min	Year	Avg	Max	Year	Min	Year	Avg	Max	Year	Min	Year	Avg	Max	Year	Min	Year
Jan	10.0	29	1985	3	1968	7.6	21	1953	0	1985 ^(a)	2.8	11	1990 ^(a)	0	1995 ^(a)	0.9	7	1990	0	1995 ^(a)
Feb	6.5	16	1963	0	1990	8.6	17	1976 ^(a)	2	1952 ^(a)	2.4	10	1976	0	1993 ^(a)	0.6	4	1972	0	1995 ^(a)
Mar	2.8	8	1992	0	1983 ^(a)	12.9	21	1977	4	1992	2.8	9	1956	0	1992 ^(a)	0.6	4	1956	0	1995 ^(a)
Apr	0.6	6	1951	0	1995 ^(a)	17.2	26	1954	8	1946	2.9	8	1991	0	1995 ^(a)	0.4	2	1972 ^(a)	0	1995 ^(a)
May	0.3	3	1955	0	1995 ^(a)	18.4	26	1978	9	1945	2.2	6	1990 ^(a)	0	1982 ^(a)	0.2	2	1993 ^(a)	0	1994 ^(a)
Jun	0.1	1	1980 ^(a)	0	1994 ^(a)	19.5	26	1963	11	1950 ^(a)	2.3	7	1985	0	1982 ^(a)	0.3	2	1992 ^(a)	0	1995 ^(a)
Jul	0.1	1	1957 ^(a)	0	1995 ^(a)	19.6	26	1995	11	1955	1.8	5	1995 ^(a)	0	1981 ^(a)	0.2	1	1995 ^(a)	0	1993 ^(a)
Aug	0.3	2	1972	0	1995 ^(a)	15.6	22	1988 ^(a)	7	1945	1.1	5	1951	0	1993 ^(a)	0.1	1	1984 ^(a)	0	1995 ^(a)
Sep	2.5	9	1987	0	1991 ^(a)	11.2	17	1971	7	1975 ^(a)	1.3	4	1946	0	1995 ^(a)	0.2	2	1953	0	1995 ^(a)
Oct	6.9	15	1974	2	1975 ^(a)	8.7	17	1985 ^(a)	3	1987 ^(a)	1.7	8	1967	0	1993 ^(a)	0.2	2	1967	0	1995 ^(a)
Nov	9.3	20	1956 ^(a)	2	1977 ^(a)	8.4	16	1990	0	1979	2.3	8	1990	0	1982 ^(a)	0.5	4	1990	0	1992 ^(a)
Dec	11.1	23	1985	3	1968	7.4	15	1968	0	1985	2.4	8	1957 ^(a)	0	1989 ^(a)	0.7	3	1995 ^(a)	0	1994 ^(a)
Annual	50.5	87	1952	28	1973	155.0	190	1953	123	1952	26.0	57	1990	10	1978	4.7	18	1990	0	1985

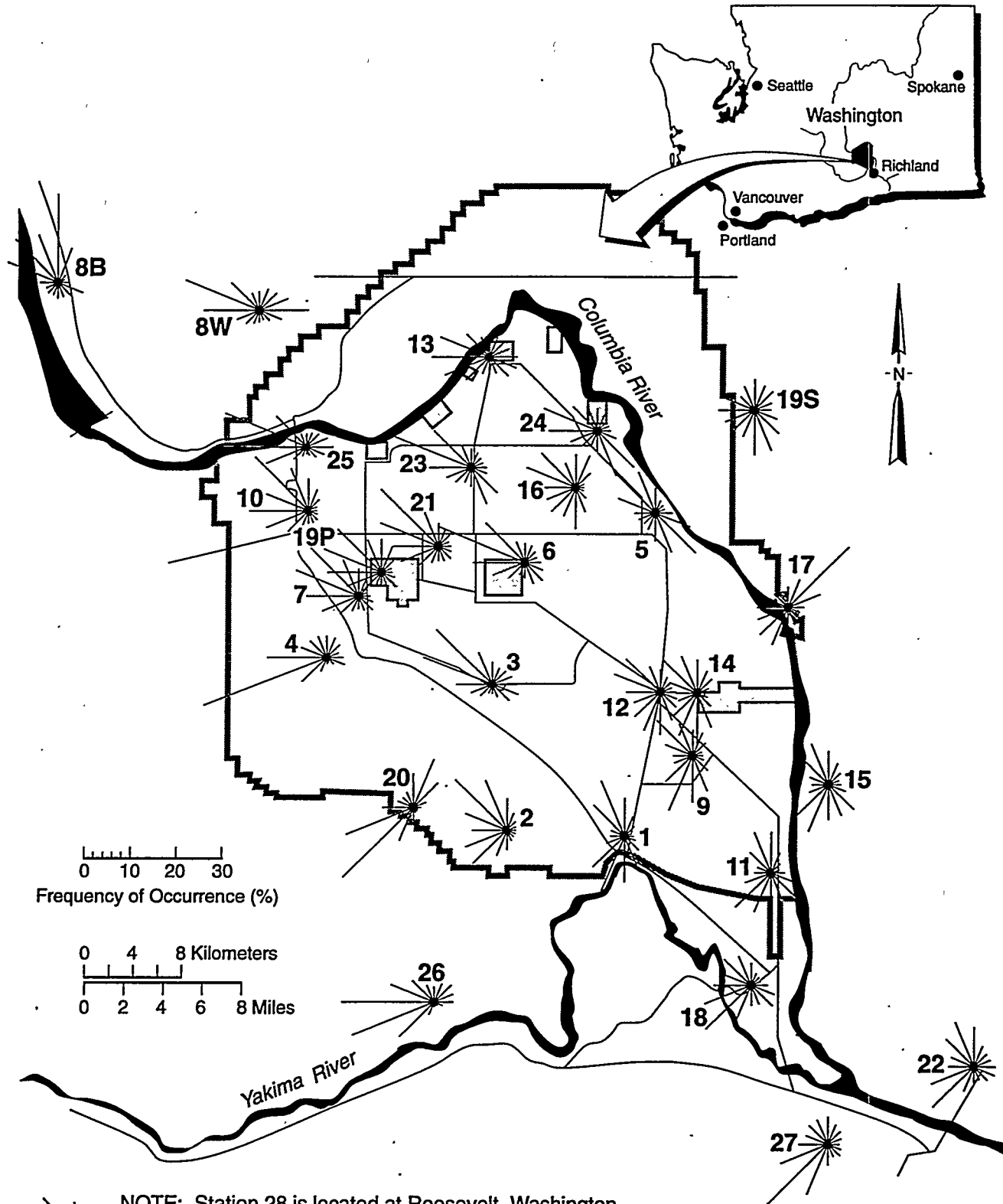
(a) Most recent of multiple occurrences.

Table 5.3. Percent Frequency of Monthly and Annual Wind Direction and Wind Speed at 50 Feet, 1955 Through 1995

Direction	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
N	4.5	5.0	4.8	4.2	3.9	3.7	4.8	4.8	5.8	5.1	4.5	4.4	4.6
NNE	3.5	4.6	4.5	3.5	3.5	3.2	4.2	4.0	5.5	4.2	3.5	3.2	4.0
NE	3.0	3.8	3.5	3.5	3.4	3.2	3.6	3.5	4.3	3.6	2.9	2.8	3.4
ENE	2.3	2.1	2.1	2.3	2.4	2.1	2.5	2.4	2.4	2.6	2.5	2.4	2.3
E	2.6	2.1	2.2	2.5	2.4	2.4	2.8	3.0	3.0	2.9	2.7	2.6	2.6
ESE	2.8	2.6	2.7	2.4	2.6	2.7	2.8	3.3	3.1	3.7	3.3	3.1	2.9
SE	4.2	3.7	3.8	3.1	3.2	3.0	3.1	3.6	3.9	5.2	4.5	4.6	3.8
SSE	3.3	3.3	3.3	2.9	2.8	2.6	2.3	2.8	3.0	3.9	3.8	3.7	3.1
S	3.3	3.3	3.6	3.1	2.8	2.7	2.4	2.6	2.6	3.5	4.0	3.5	3.1
SSW	4.7	4.5	5.1	4.3	3.5	3.4	2.7	3.0	3.3	4.2	5.2	4.7	4.0
SW	6.5	7.7	9.2	8.8	6.7	6.7	5.8	6.1	5.8	6.8	7.6	6.7	7.0
WSW	6.6	7.2	10.3	11.8	10.3	9.7	8.4	8.9	9.2	8.5	7.9	7.0	8.8
W	6.6	8.2	9.7	11.8	11.6	11.0	9.8	10.7	11.4	10.4	8.3	7.1	9.7
WNW	14.9	14.5	14.5	16.5	18.7	19.2	19.6	18.0	15.1	13.2	12.5	13.7	15.9
NW	19.4	17.9	14.2	14.3	17.5	19.3	19.9	17.6	14.8	13.4	15.6	18.0	16.8
NNW	7.2	6.9	5.7	4.6	4.2	4.6	5.2	5.3	5.9	6.5	7.0	7.1	5.8
Calm	4.5	2.6	0.9	0.5	0.5	0.4	0.3	0.5	1.0	2.4	4.1	5.2	1.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Percent Frequency of Monthly and Annual Wind Speed (mph) at 50 ft, 1955-1995

Speed	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Calm	4.5	2.6	0.9	0.5	0.5	0.4	0.3	0.5	1.0	2.4	4.1	5.2	1.9
1-3	31.5	25.6	17.5	13.6	12.4	10.2	11.4	14.4	18.9	27.4	30.4	34.0	20.6
4-7	33.8	34.7	35.9	34.0	34.6	35.4	38.4	41.4	40.5	38.5	34.6	32.7	36.2
8-12	19.6	23.6	27.2	28.5	30.2	29.9	29.0	27.4	25.7	21.0	20.0	18.1	25.0
13-18	6.7	8.6	12.1	15.8	15.8	16.7	14.5	11.8	10.0	7.6	7.0	6.2	11.1
19-24	2.5	3.2	4.5	6.0	5.6	6.2	5.4	4.0	3.2	2.6	2.7	2.5	4.0
25-31	1.0	1.3	1.5	1.5	1.0	1.1	0.9	0.6	0.6	0.6	1.0	0.9	1.0
32-38	0.3	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.1
39-46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
>46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0



NOTE: Station 28 is located at Roosevelt, Washington



Lines indicate direction from which wind blows;
line length is proportional to frequency of occurrence.

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Figure 5.1. Hanford Meteorological Monitoring Network Wind Roses at 10-m Level, 1982 Through 1995

Table 5.4. Joint Frequency Distributions for Meteorological Monitoring Network Wind Stations at 10-m Level, 1982 Through 1995

Station: (1) PROS

	Begin: 1/82								End: 12/95								Total Hours: 118207	
	Direction																	
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Calm	Total
Calm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	1.3
1-3	2.2	1.6	1.4	1.0	1.1	1.3	1.8	2.3	2.5	2.3	1.8	1.2	1.1	1.3	2.1	2.6	0.0	27.6
4-7	3.4	1.9	1.0	0.7	0.8	1.0	2.1	3.9	4.6	3.6	2.1	0.8	0.7	0.9	2.9	5.0	0.0	35.4
8-12	2.0	0.9	0.3	0.1	0.1	0.2	0.4	0.9	2.3	4.4	2.5	0.8	0.5	0.5	2.5	4.0	0.0	22.5
13-18	0.6	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.4	2.3	2.0	0.9	0.4	0.2	1.5	1.2	0.0	9.9
19-24	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.7	0.4	0.1	0.0	0.4	0.2	0.0	2.4
25-31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.1	0.0	0.0	0.1	0.0	0.0	0.7
32-38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1
39-46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
> 46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	8.2	4.7	2.9	1.8	2.0	2.5	4.3	7.1	9.9	13.1	9.5	4.2	2.9	3.1	9.4	13.1	1.3	100.0

Station: (2) EOC

	Begin: 1/82								End: 12/95								Total Hours: 119071	
	Direction																	
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Calm	Total
Calm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.9
1-3	1.4	1.3	1.3	1.1	1.0	0.9	0.8	0.9	1.2	1.2	1.2	1.2	1.6	1.9	1.9	1.5	0.0	20.2
4-7	2.9	1.9	1.2	0.9	1.0	1.1	1.1	1.2	1.9	2.0	1.4	1.2	1.9	3.5	4.2	3.4	0.0	30.8
8-12	1.8	0.6	0.2	0.1	0.0	0.1	0.2	0.3	0.9	2.1	2.6	1.9	1.4	3.1	6.0	4.1	0.0	25.5
13-18	0.6	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.6	2.1	2.2	1.4	0.7	3.1	2.4	0.0	13.5
19-24	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.5	1.9	0.8	0.2	0.5	0.4	0.0	5.8
25-31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.9	0.3	0.1	0.1	0.0	0.0	2.5
32-38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.6
39-46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1
> 46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	6.9	4.0	2.8	2.0	2.0	2.0	2.2	2.5	4.2	6.1	10.2	9.6	7.4	9.5	15.8	11.9	0.9	100.0

Station: (3) ARMY

	Begin: 1/82								End: 12/95								Total Hours: 118969	
	Direction																	
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Calm	Total
Calm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.1
1-3	1.9	1.7	2.1	2.3	2.7	2.5	1.9	1.2	0.9	0.8	0.9	1.2	2.1	3.1	3.1	2.4	0.0	30.9
4-7	2.1	1.5	1.6	1.9	2.6	2.8	2.2	1.0	0.6	0.5	0.6	0.9	2.4	7.2	7.6	3.4	0.0	38.6
8-12	0.9	0.5	0.3	0.2	0.4	0.7	0.9	0.5	0.4	0.4	0.6	1.1	1.8	4.6	4.0	1.4	0.0	18.7
13-18	0.2	0.1	0.1	0.0	0.0	0.1	0.2	0.2	0.1	0.2	0.6	1.1	1.0	1.1	1.6	0.4	0.0	7.1
19-24	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.5	0.6	0.3	0.2	0.6	0.1	0.0	2.6
25-31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.2	0.1	0.0	0.1	0.0	0.0	0.9
32-38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2
39-46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
> 46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	5.0	3.8	4.0	4.5	5.6	6.0	5.1	2.9	2.1	2.2	3.6	5.1	7.8	16.2	17.1	7.8	1.1	100.0

Table 5.4. (contd)

Station: (4) RSPG

Begin: 1/82

End: 12/95

Total Hours: 118773

	Begin: 1702								Direction				End: 1755				Total Hours: 1755			
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Calm	Total		
Calm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	1.2		
1-3	1.8	2.0	2.1	1.7	1.9	1.8	1.2	0.8	0.8	1.1	2.0	2.9	1.9	1.1	1.1	1.3	0.0	25.7		
4-7	2.5	2.1	1.5	1.0	1.6	2.0	0.8	0.4	0.5	0.8	2.5	10.2	4.5	1.8	1.8	2.2	0.0	36.0		
8-12	0.5	0.4	0.2	0.1	0.1	0.3	0.1	0.1	0.2	0.6	1.7	13.5	4.9	2.2	1.5	1.1	0.0	27.5		
13-18	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.5	1.0	1.9	1.7	0.9	0.8	0.4	0.0	7.5		
19-24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.5	0.4	0.2	0.1	0.1	0.1	0.0	1.6		
25-31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.4		
32-38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1		
39-46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
> 46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total	4.8	4.6	4.0	2.8	3.6	4.2	2.1	1.2	1.6	3.4	7.8	29.0	13.2	6.1	5.3	5.0	1.2	100.0		

Station: (5) EDNA

Begin: 1/82

End: 12/95

Total Hours: 119300

									Direction																Calm	Total
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW										
Calm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	1.4								
1-3	1.4	0.9	0.8	0.9	1.2	2.2	3.7	4.0	3.1	1.9	1.4	1.2	1.7	2.8	3.4	2.5	0.0	33.1								
4-7	2.5	1.2	0.9	1.0	1.9	4.4	7.1	3.8	1.7	0.8	0.7	0.8	1.0	2.3	5.6	5.0	0.0	40.4								
8-12	1.2	0.6	0.4	0.2	0.6	1.6	1.4	1.1	0.9	0.6	0.6	0.9	1.1	1.6	2.2	1.8	0.0	16.7								
13-18	0.2	0.2	0.2	0.1	0.0	0.1	0.1	0.2	0.4	0.4	0.4	0.6	0.6	1.3	1.0	0.2	0.0	6.2								
19-24	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.1	0.5	0.3	0.0	0.0	1.8								
25-31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.3								
32-38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0								
39-46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0								
> 46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0								
Total	5.4	2.9	2.4	2.2	3.8	8.2	12.3	9.1	6.2	3.9	3.4	3.7	4.5	8.5	12.5	9.5	1.4	100.0								

Station: (6) 200E

Begin: 1/82

End: 12/95

Total Hours: 118768

	Direction									Direction								Calm	Total
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW			
Calm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.7	
1-3	1.6	1.4	1.6	1.6	1.8	1.8	1.7	1.3	1.1	1.0	1.1	1.1	1.5	1.8	2.1	1.8	0.0	24.1	
4-7	1.7	1.4	1.1	1.0	1.5	2.1	3.0	2.4	1.5	1.1	1.5	2.2	4.1	6.2	4.6	2.2	0.0	37.6	
8-12	0.7	0.7	0.3	0.1	0.2	0.4	0.8	1.1	0.6	0.5	0.9	2.0	4.0	7.6	2.9	0.7	0.0	23.6	
13-18	0.2	0.2	0.1	0.0	0.0	0.0	0.1	0.2	0.2	0.3	0.8	1.2	1.2	3.5	1.5	0.1	0.0	9.7	
19-24	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.5	0.6	0.2	1.0	0.8	0.0	0.0	3.4	
25-31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.0	0.1	0.2	0.0	0.0	0.8	
32-38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	
39-46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
> 46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total	4.2	3.9	3.2	2.8	3.5	4.2	5.5	5.0	3.5	3.0	4.9	7.4	11.1	20.3	12.1	4.8	0.7	100.0	

Table 5.4. (contd)

Station: (7) 200W

	Begin: 1/82								End: 12/95								Total Hours: 105160	
	Direction								Direction								Calm	Total
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
Calm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	1.6
1-3	2.2	1.8	1.5	1.4	1.6	1.7	2.2	2.0	1.8	1.8	2.1	2.7	3.7	4.5	3.7	2.6	0.0	37.3
4-7	2.9	1.6	1.0	0.7	0.8	1.4	1.7	1.0	0.7	0.8	1.2	2.0	4.1	6.9	5.2	3.5	0.0	35.4
8-12	0.7	0.5	0.2	0.1	0.1	0.2	0.4	0.2	0.2	0.5	1.0	1.7	2.5	2.8	3.2	1.8	0.0	16.2
13-18	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.9	1.4	0.8	0.7	2.0	0.4	0.0	7.0
19-24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.4	0.2	0.1	0.8	0.1	0.0	2.1
25-31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.4
32-38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39-46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
> 46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	5.9	4.1	2.8	2.1	2.5	3.3	4.2	3.2	2.8	3.5	5.8	8.4	11.3	15.0	14.9	8.4	1.6	100.0

Station: (8) BVLY

	Begin: 8/91								End: 12/95								Total Hours: 38026	
	Direction								Direction								Calm	Total
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
Calm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	1.2
1-3	2.6	2.1	1.5	1.2	1.5	1.8	2.1	1.8	1.8	1.4	1.2	1.2	1.2	1.5	1.9	2.3	0.0	27.3
4-7	8.3	3.2	0.5	0.3	0.9	3.2	2.0	1.2	1.2	0.9	0.7	0.8	1.3	2.1	4.2	6.3	0.0	37.2
8-12	7.3	2.2	0.2	0.0	0.3	1.1	0.4	0.2	0.2	0.2	0.3	0.4	0.9	2.8	3.0	2.2	0.0	21.8
13-18	0.5	0.4	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.4	0.3	0.4	3.1	2.5	0.1	0.0	8.2
19-24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.1	1.7	1.2	0.0	0.0	3.3
25-31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.6	0.2	0.0	0.0	1.0
32-38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1
39-46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
> 46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	18.8	7.9	2.3	1.6	2.7	6.1	4.4	3.4	3.3	2.8	2.9	2.7	4.0	11.9	13.1	11.0	1.2	100.0

Station: (9) FFTF

	Begin: 1/82								End: 12/95								Total Hours: 118473	
	Direction								Direction								Calm	Total
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
Calm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5
1-3	1.2	1.1	1.0	0.8	0.9	1.0	1.1	1.1	1.2	1.2	1.2	1.0	1.0	1.1	1.3	1.3	0.0	17.6
4-7	2.8	2.5	2.0	1.1	1.1	1.4	2.6	3.8	4.1	3.6	2.0	1.2	1.5	2.1	3.5	3.2	0.0	38.5
8-12	1.4	1.4	0.7	0.2	0.2	0.2	1.0	3.1	3.9	4.4	1.8	0.8	0.9	2.0	4.0	2.5	0.0	28.6
13-18	0.2	0.3	0.2	0.0	0.0	0.0	0.1	0.3	0.9	3.0	1.8	0.7	0.5	0.9	1.5	0.5	0.0	11.0
19-24	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.6	0.8	0.3	0.2	0.2	0.5	0.0	0.0	2.9
25-31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.1	0.0	0.0	0.1	0.0	0.0	0.8
32-38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2
39-46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
> 46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	5.7	5.5	3.9	2.2	2.2	2.6	4.8	8.3	10.1	13.0	8.1	4.2	4.1	6.3	10.9	7.5	0.5	100.0

Table 5.4. (contd)

Station: (10) YAKB

Begin: 1/82

End: 12/95

Total Hours: 119123

	Direction																Calm	Total
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
Calm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.6
1-3	1.8	1.7	1.6	1.2	1.0	1.1	1.2	1.3	1.3	1.2	1.5	2.0	2.7	2.1	1.8	1.7	0.0	25.2
4-7	3.7	2.8	1.6	0.9	0.8	1.0	1.4	1.2	1.0	1.0	1.6	3.3	6.8	4.5	3.8	3.6	0.0	39.0
8-12	1.3	0.5	0.2	0.1	0.1	0.1	0.3	0.2	0.3	0.5	1.5	2.4	2.9	2.3	5.4	3.4	0.0	21.6
13-18	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.3	1.1	1.4	0.6	0.8	3.6	1.1	0.0	9.5
19-24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5	0.4	0.1	0.2	1.8	0.2	0.0	3.4
25-31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.3	0.0	0.0	0.7
32-38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
39-46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
> 46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	7.0	5.2	3.5	2.2	1.9	2.2	2.8	2.8	2.7	3.3	6.4	9.7	13.1	9.9	16.7	10.0	0.7	100.0

Station: (11) 300A

Begin: 1/82

End: 12/95

Total Hours: 105862

	Direction																Calm	Total
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
Calm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.6
1-3	1.2	0.7	0.6	0.6	0.8	1.2	1.8	1.9	1.8	1.5	1.5	1.3	1.3	1.4	1.7	1.7	0.0	20.8
4-7	3.5	1.6	1.1	1.1	1.8	4.3	6.7	3.7	3.0	2.5	2.0	1.3	0.9	1.0	2.2	4.0	0.0	40.8
8-12	3.5	1.9	0.8	0.3	0.4	1.2	1.6	0.8	1.6	3.1	3.3	1.7	0.6	0.4	1.2	2.6	0.0	24.9
13-18	0.6	0.5	0.2	0.1	0.0	0.0	0.1	0.1	0.4	1.5	2.4	1.3	0.4	0.2	0.8	0.8	0.0	9.2
19-24	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.9	0.4	0.2	0.0	0.3	0.2	0.0	2.6
25-31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.1	0.1	0.0	0.1	0.0	0.0	0.8
32-38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2
39-46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
> 46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	8.8	4.8	2.7	2.0	3.0	6.7	10.2	6.5	6.8	9.1	10.5	6.0	3.5	3.1	6.3	9.4	0.6	100.0

Station: (12) WYEB

Begin: 1/82

End: 12/95

Total Hours: 118428

	Direction																Calm	Total
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
Calm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4
1-3	1.3	1.1	1.1	1.1	1.3	1.5	1.4	1.5	1.5	1.3	1.3	1.2	1.2	1.2	1.3	1.3	0.0	20.7
4-7	2.4	1.5	1.2	1.2	1.9	1.9	2.5	3.3	3.9	3.0	2.6	2.3	2.7	3.2	3.7	2.9	0.0	40.4
8-12	1.2	0.6	0.4	0.2	0.3	0.3	0.7	1.7	2.8	2.6	1.8	1.4	2.2	4.2	3.2	1.5	0.0	25.0
13-18	0.3	0.2	0.1	0.0	0.0	0.0	0.1	0.3	0.9	1.5	1.1	0.8	0.9	1.6	1.4	0.3	0.0	9.5
19-24	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.6	0.3	0.2	0.4	0.6	0.1	0.0	3.0
25-31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.1	0.1	0.1	0.2	0.0	0.0	0.8
32-38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1
39-46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
> 46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	5.1	3.6	2.9	2.6	3.5	3.7	4.7	6.7	9.2	9.1	7.7	6.2	7.2	10.6	10.5	6.2	0.4	100.0

Table 5.4. (contd)

Station: (13) 100N

Begin: 1/82

End: 12/95

Total Hours: 118856

	Direction																Calm	Total
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
Calm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.9
1-3	2.1	1.7	1.9	2.2	3.0	3.1	2.6	1.9	1.8	1.8	2.3	2.8	3.2	3.3	3.0	2.5	0.0	39.3
4-7	1.5	1.6	1.6	1.9	2.6	2.6	2.3	1.3	0.9	1.1	2.4	4.6	4.8	3.1	2.0	1.5	0.0	35.8
8-12	0.4	0.8	0.6	0.3	0.3	0.4	0.8	0.4	0.3	0.5	1.2	2.1	3.1	2.2	0.7	0.4	0.0	14.6
13-18	0.2	0.4	0.2	0.1	0.0	0.0	0.1	0.1	0.1	0.2	0.8	0.6	1.2	1.9	0.6	0.1	0.0	6.7
19-24	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.2	0.2	0.7	0.4	0.0	0.0	2.2
25-31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.5
32-38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39-46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
> 46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	4.2	4.6	4.5	4.5	6.0	6.2	5.8	3.7	3.1	3.8	7.0	10.3	12.5	11.3	6.9	4.6	0.9	100.0

Station: (14) WPPS

Begin: 1/82

End: 12/95

Total Hours: 119237

	Direction																Calm	Total
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
Calm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.8
1-3	2.6	2.1	1.9	1.4	1.2	1.2	1.5	2.0	2.4	2.1	1.8	1.5	1.7	1.9	2.8	2.9	0.0	31.1
4-7	3.3	2.3	2.0	1.1	0.7	0.9	1.8	4.2	5.2	3.1	1.7	1.2	1.3	1.9	3.8	4.3	0.0	38.9
8-12	1.2	0.7	0.4	0.2	0.1	0.2	0.6	1.7	3.1	2.6	1.4	0.8	0.9	1.6	2.2	1.3	0.0	19.2
13-18	0.3	0.2	0.1	0.0	0.0	0.0	0.1	0.2	0.6	1.5	1.1	0.5	0.4	0.7	1.3	0.3	0.0	7.3
19-24	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.5	0.2	0.1	0.1	0.5	0.0	0.0	2.0
25-31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.0	0.0	0.1	0.0	0.0	0.5
32-38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
39-46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
> 46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	7.4	5.4	4.5	2.7	2.0	2.3	4.0	8.0	11.4	9.8	6.9	4.3	4.5	6.4	10.6	8.9	0.9	100.0

Station: (15) FRNK

Begin: 1/82

End: 12/95

Total Hours: 118713

	Direction																Calm	Total
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
Calm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.9
1-3	1.2	1.0	1.0	0.8	0.9	1.1	1.5	1.5	1.3	1.1	1.2	1.2	1.4	1.4	1.6	1.4	0.0	19.6
4-7	4.1	2.7	1.7	1.1	1.4	2.2	4.7	4.2	3.5	2.9	2.5	1.3	1.4	2.0	4.4	5.3	0.0	45.5
8-12	1.8	1.0	0.6	0.3	0.3	0.6	1.6	1.4	2.4	4.6	3.6	1.0	0.5	0.6	2.2	2.6	0.0	25.0
13-18	0.1	0.2	0.2	0.1	0.0	0.0	0.1	0.1	0.4	1.9	2.1	0.7	0.2	0.2	0.5	0.2	0.0	7.1
19-24	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.6	0.2	0.1	0.0	0.1	0.0	0.0	1.4
25-31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.5
32-38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
39-46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
> 46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	7.2	5.0	3.5	2.4	2.7	4.0	7.8	7.3	7.5	10.9	10.2	4.5	3.6	4.3	8.7	9.6	0.9	100.0

Table 5.4. (contd)

Station: (16) GABL

Begin: 1/82

End: 12/95

Total Hours: 118228

	Direction																Calm	Total
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
Calm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.7
1-3	1.0	0.9	0.9	0.7	0.7	0.6	0.7	0.8	1.0	1.0	1.0	0.9	0.8	0.8	0.9	0.9	0.0	13.6
4-7	2.3	2.3	1.6	0.9	0.9	0.9	1.3	2.1	3.2	2.5	1.8	1.5	1.5	1.7	2.2	2.2	0.0	29.0
8-12	2.1	2.2	1.0	0.3	0.3	0.5	0.8	1.6	2.4	1.5	1.5	1.5	1.7	2.2	2.8	1.8	0.0	24.4
13-18	1.3	1.4	0.5	0.1	0.1	0.1	0.3	0.9	1.4	0.9	1.3	1.5	1.7	2.8	2.5	0.8	0.0	17.5
19-24	0.4	0.5	0.3	0.0	0.0	0.0	0.0	0.3	0.6	0.4	0.8	0.8	0.9	2.7	1.6	0.2	0.0	9.6
25-31	0.1	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.6	0.4	0.2	1.3	0.5	0.0	0.0	3.9
32-38	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.1	0.0	0.2	0.0	0.0	0.0	1.0
39-46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.3
> 46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	7.2	7.6	4.6	2.0	1.9	2.1	3.1	5.8	8.9	6.8	7.3	6.8	6.9	11.6	10.6	5.9	0.7	100.0

Station: (17) RING

Begin: 1/82

End: 12/95

Total Hours: 118352

	Direction																Calm	Total
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
Calm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	1.2
1-3	2.3	3.8	8.0	4.0	2.4	1.8	1.6	1.5	1.7	1.8	2.2	2.6	2.3	1.6	1.6	1.9	0.0	41.2
4-7	1.5	2.0	9.5	3.1	1.1	0.8	1.1	1.4	1.8	3.0	2.6	2.7	2.4	1.4	1.3	1.1	0.0	36.6
8-12	0.5	0.5	0.8	0.3	0.1	0.1	0.2	0.4	1.0	3.1	2.1	1.1	1.4	1.9	0.9	0.1	0.0	14.4
13-18	0.1	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.1	0.8	0.9	0.4	0.5	1.3	0.4	0.0	0.0	5.1
19-24	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.1	0.1	0.3	0.1	0.0	0.0	1.2
25-31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2
32-38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39-46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
> 46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	4.4	6.5	18.6	7.5	3.5	2.7	2.9	3.3	4.6	8.8	8.2	7.0	6.7	6.6	4.2	3.1	1.2	100.0

Station: (18) RICH

Begin: 1/82

End: 12/95

Total Hours: 119367

	Direction																Calm	Total
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
Calm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	1.2
1-3	1.3	0.8	0.9	1.0	1.6	2.6	3.1	2.5	2.1	2.1	2.5	2.7	2.7	2.7	2.5	1.9	0.0	32.8
4-7	1.8	0.9	0.9	0.9	1.7	2.7	3.0	1.7	1.6	2.9	4.2	3.3	2.5	2.9	3.0	2.5	0.0	36.5
8-12	1.3	0.7	0.4	0.3	0.2	0.1	0.3	0.2	0.6	2.5	3.9	2.9	1.6	0.9	1.4	1.6	0.0	18.7
13-18	0.4	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.1	1.1	2.3	1.3	0.9	0.3	0.8	0.7	0.0	8.3
19-24	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.7	0.3	0.2	0.1	0.2	0.2	0.0	2.0
25-31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.1	0.0	0.0	0.4
32-38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39-46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
> 46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	4.8	2.7	2.3	2.2	3.5	5.4	6.3	4.4	4.4	8.9	13.7	10.9	7.9	6.9	8.0	6.8	1.2	100.0

Table 5.4. (contd)

Station: (19) PFP

Begin: 2/94

End: 12/95

Total Hours: 16462

	Direction																Calm	Total
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
Calm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	2.1
1-3	3.4	3.3	2.3	1.4	1.5	1.8	2.4	2.0	1.9	1.7	2.5	3.4	5.9	5.6	4.0	3.0	0.0	46.1
4-7	3.5	2.2	1.0	0.6	0.7	1.2	1.9	0.8	0.5	0.7	1.3	2.1	3.9	6.5	4.9	3.4	0.0	35.3
8-12	0.3	0.5	0.3	0.2	0.1	0.1	0.2	0.1	0.2	0.5	1.3	1.8	1.5	1.4	3.2	1.2	0.0	12.9
13-18	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.5	0.7	0.4	0.1	1.3	0.2	0.0	3.6
19-24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
25-31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
32-38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39-46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
> 46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	7.2	6.1	3.8	2.3	2.3	3.1	4.5	2.9	2.5	3.1	5.7	8.0	11.6	13.6	13.4	7.8	2.1	100.0

Station: (20) RMTN

Begin: 1/82

End: 12/95

Total Hours: 117003

	Direction																Calm	Total
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
Calm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3
1-3	0.4	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.5	0.6	0.7	0.5	0.4	0.3	0.4	0.4	0.0	7.2
4-7	1.4	1.5	1.4	1.0	0.7	0.5	0.5	0.5	0.8	1.4	2.1	1.4	1.0	0.7	0.7	0.9	0.0	16.5
8-12	2.2	2.4	1.8	0.8	0.4	0.2	0.2	0.3	0.7	1.8	3.5	2.3	1.4	0.9	0.8	1.1	0.0	20.8
13-18	1.9	2.7	1.4	0.3	0.1	0.0	0.1	0.1	0.5	1.5	4.4	3.0	1.6	0.9	0.8	0.9	0.0	20.1
19-24	0.9	2.0	0.9	0.1	0.0	0.0	0.0	0.0	0.2	0.9	3.3	2.7	1.2	0.6	0.3	0.3	0.0	13.4
25-31	0.4	1.3	0.7	0.1	0.0	0.0	0.0	0.0	0.1	0.7	3.0	2.6	0.8	0.2	0.1	0.1	0.0	9.9
32-38	0.1	0.6	0.4	0.1	0.0	0.0	0.0	0.0	0.1	0.4	2.2	1.7	0.3	0.0	0.0	0.0	0.0	6.0
39-46	0.0	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.5	0.9	0.1	0.0	0.0	0.0	0.0	3.5
> 46	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.0	0.5	0.1	0.0	0.0	0.0	0.0	2.2
Total	7.4	11.4	7.6	2.9	1.6	1.1	1.2	1.3	2.9	7.8	21.6	15.7	6.8	3.7	3.1	3.7	0.3	100.0

Station: (21) HMS

Begin: 1/82

End: 12/95

Total Hours: 121457

	Direction																Calm	Total
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
Calm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	1.4
1-3	2.1	1.8	1.8	1.4	1.5	1.6	1.7	1.3	1.2	1.2	1.4	1.4	1.7	2.0	2.3	2.2	0.0	26.8
4-7	2.3	1.5	1.1	0.9	1.2	1.3	1.7	1.5	1.3	1.4	2.1	3.5	4.8	6.2	6.8	4.0	0.0	41.7
8-12	0.5	0.5	0.3	0.1	0.1	0.1	0.3	0.4	0.4	0.6	1.3	2.2	2.4	4.0	5.4	1.3	0.0	19.7
13-18	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.1	0.2	0.4	1.0	1.1	0.6	1.3	2.5	0.3	0.0	7.9
19-24	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.4	0.3	0.1	0.2	0.7	0.0	0.0	2.1
25-31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.3
32-38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39-46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
> 46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	5.0	4.1	3.3	2.6	2.8	3.0	3.7	3.3	3.1	3.8	6.3	8.6	9.7	13.8	17.6	7.9	1.4	100.0

Table 5.4. (contd)

Station: (22) PASC

Begin: 10/87

End: 12/95

Total Hours: 67202

	Direction																Calm	Total
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
Calm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.1
1-3	3.9	2.6	2.4	2.5	2.6	2.1	1.7	1.2	1.2	1.1	1.0	1.1	1.4	1.8	2.7	3.6	0.0	32.9
4-7	3.2	1.6	0.9	1.1	1.8	2.4	1.9	1.4	1.6	2.0	2.2	1.6	1.9	2.3	3.7	4.3	0.0	34.0
8-12	1.2	0.5	0.2	0.1	0.1	0.3	0.4	0.4	0.6	1.9	3.8	2.2	1.0	0.8	1.4	1.8	0.0	16.7
13-18	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.7	3.2	2.3	0.7	0.3	0.5	0.6	0.0	9.1
19-24	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.4	1.5	0.4	0.1	0.1	0.1	0.0	3.8
25-31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.9	0.1	0.0	0.0	0.0	0.0	1.7
32-38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.0	0.0	0.0	0.0	0.0	0.5
39-46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1
> 46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	8.6	4.9	3.7	3.8	4.6	4.8	4.0	2.9	3.5	5.8	12.5	10.0	5.5	5.4	8.5	10.4	1.1	100.0

Station: (23) GABW

Begin: 3/86

End: 12/95

Total Hours: 83382

	Direction																Calm	Total
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
Calm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	1.4
1-3	1.6	1.3	1.3	1.4	1.6	1.7	2.4	2.6	2.1	1.7	1.6	1.7	2.5	3.5	3.2	2.1	0.0	32.2
4-7	1.7	1.2	1.0	1.0	1.4	1.4	4.0	4.9	1.6	0.8	1.0	1.4	2.8	6.8	4.2	2.1	0.0	37.2
8-12	0.6	0.6	0.3	0.2	0.2	0.3	1.2	0.9	0.3	0.5	1.0	1.4	2.4	4.8	2.0	0.7	0.0	17.4
13-18	0.2	0.2	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.3	0.7	0.9	1.0	3.1	1.3	0.2	0.0	8.4
19-24	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.3	0.2	1.0	0.5	0.0	0.0	2.7
25-31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.2	0.1	0.0	0.0	0.5
32-38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39-46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
> 46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	4.1	3.4	2.7	2.6	3.2	3.5	7.8	8.5	4.1	3.4	4.7	5.8	9.0	19.4	11.2	5.2	1.4	100.0

Station: (24) 100F

Begin: 3/86

End: 12/95

Total Hours: 83486

	Direction																Calm	Total
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
Calm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	1.2
1-3	1.8	1.4	1.2	1.1	1.5	1.9	2.9	2.9	2.3	1.8	1.8	2.4	3.6	4.1	3.6	2.4	0.0	36.7
4-7	2.0	1.4	1.1	1.2	1.2	1.7	5.5	5.8	1.5	0.9	0.9	1.6	3.3	3.7	2.6	1.9	0.0	36.3
8-12	1.0	0.7	0.3	0.3	0.2	0.6	2.5	2.4	0.5	0.5	0.7	1.2	2.5	2.5	0.6	0.5	0.0	17.0
13-18	0.2	0.3	0.1	0.0	0.0	0.0	0.3	0.2	0.3	0.2	0.6	0.8	1.0	1.8	0.4	0.1	0.0	6.4
19-24	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.3	0.2	0.6	0.2	0.0	0.0	2.0
25-31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.4
32-38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39-46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
> 46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	5.0	3.9	2.8	2.6	2.9	4.2	11.1	11.4	4.6	3.6	4.4	6.3	10.6	12.8	7.4	5.0	1.2	100.0

Table 5.4. (contd)

Station: (25) VERN

Begin: 2/88

End: 12/95

Total Hours: 67591

	Direction																Calm	Total
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
Calm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	1.2
1-3	1.1	1.3	1.4	1.8	2.3	2.1	1.9	1.3	0.9	0.9	1.3	2.5	2.9	1.7	1.2	1.0	0.0	25.5
4-7	0.8	1.3	2.0	2.8	3.4	2.0	1.0	0.4	0.4	0.4	0.6	4.0	7.3	3.9	2.0	1.0	0.0	33.5
8-12	0.5	0.4	0.4	0.5	0.3	0.2	0.1	0.1	0.2	0.4	0.7	2.0	7.3	6.9	2.7	0.7	0.0	23.3
13-18	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.7	0.7	2.2	5.1	2.4	0.3	0.0	12.3
19-24	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.4	0.2	0.4	1.4	0.7	0.1	0.0	3.5
25-31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.6
32-38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
39-46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
> 46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	2.8	3.2	4.0	5.1	6.1	4.3	3.0	1.9	1.6	2.1	3.7	9.4	20.1	19.2	9.2	3.1	1.2	100.0

Station: (26) BENT

Begin: 2/95

End: 12/95

Total Hours: 7858

	Direction																Calm	Total
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
Calm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3
1-3	1.0	0.7	0.8	0.8	0.8	0.7	0.6	0.4	0.5	0.7	1.2	1.6	2.1	2.1	2.1	1.5	0.0	17.5
4-7	1.3	1.2	1.7	2.4	2.6	1.3	0.4	0.2	0.5	1.1	4.6	11.5	12.9	5.8	3.2	1.9	0.0	52.5
8-12	0.5	1.1	1.8	1.1	0.7	0.1	0.0	0.0	0.1	0.6	2.7	5.4	4.8	2.0	1.3	0.5	0.0	22.9
13-18	0.4	1.1	0.8	0.0	0.0	0.0	0.0	0.0	0.1	0.4	1.2	0.5	0.2	0.2	0.1	0.1	0.0	5.2
19-24	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.1	0.0	0.0	0.0	0.0	0.0	1.3
25-31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2
32-38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39-46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
> 46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	3.4	4.3	5.3	4.4	4.2	2.1	1.0	0.7	1.1	2.8	10.4	19.1	20.1	10.1	6.6	4.0	0.3	100.0

Station: (27) VSTA

Begin: 2/91

End: 12/95

Total Hours: 41859

	Direction																Calm	Total
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
Calm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.9
1-3	2.2	2.3	2.2	1.8	1.7	1.9	2.1	1.7	2.0	2.3	2.7	2.6	2.4	1.9	1.8	1.6	0.0	33.0
4-7	3.1	2.0	1.5	1.3	0.8	1.1	1.3	1.2	1.9	3.9	6.0	4.4	2.7	2.6	3.0	2.9	0.0	39.7
8-12	0.6	0.3	0.2	0.0	0.0	0.1	0.1	0.1	0.5	3.7	5.7	2.7	0.8	0.4	0.9	1.2	0.0	17.3
13-18	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.6	3.5	1.1	0.3	0.2	0.1	0.2	0.0	7.3
19-24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.9	0.3	0.0	0.0	0.0	0.0	0.0	1.5
25-31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2
32-38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39-46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
> 46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	6.0	4.6	3.9	3.1	2.5	3.1	3.5	3.1	4.5	11.8	18.9	11.1	6.3	5.1	5.9	5.9	0.9	100.0

Table 5.4. (contd)

Station: (28) SURF

Begin: 9/94

End: 12/95

Total Hours: 11536

	Direction																Calm	Total
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
Calm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	1.2
1-3	0.3	0.6	1.6	1.8	1.6	1.1	0.8	0.7	1.5	2.9	4.4	4.8	2.0	0.6	0.4	0.2	0.0	25.5
4-7	0.1	0.5	2.6	4.4	2.1	0.5	0.2	0.1	0.4	0.9	4.1	5.9	1.2	0.1	0.0	0.1	0.0	23.1
8-12	0.3	0.9	1.9	2.9	0.9	0.1	0.0	0.0	0.0	0.1	4.1	9.6	3.2	0.2	0.0	0.0	0.0	24.2
13-18	0.2	0.3	0.3	0.7	0.2	0.0	0.0	0.0	0.0	0.0	1.8	7.8	5.1	0.3	0.0	0.0	0.0	16.8
19-24	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.3	3.8	2.3	0.2	0.0	0.0	0.0	7.0
25-31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.3	0.6	0.1	0.0	0.1	0.0	2.1
32-38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1
39-46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
> 46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	1.0	2.4	6.4	9.9	4.9	1.7	1.0	0.9	1.9	3.9	14.9	33.2	14.4	1.5	0.4	0.4	1.2	100.0

Station: (8W) WAHL

Begin: 1/82

End: 7/91

Total Hours: 79579

	Direction																Calm	Total
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
Calm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	1.3
1-3	1.9	2.0	2.9	3.4	4.6	3.1	2.2	1.6	1.7	1.7	1.8	2.1	2.8	2.7	2.4	2.1	0.0	39.2
4-7	1.3	1.7	1.8	2.8	5.2	1.9	0.8	0.5	0.6	0.8	0.9	1.8	4.7	5.3	2.7	1.2	0.0	33.8
8-12	0.6	0.9	0.5	0.5	0.8	0.1	0.1	0.1	0.2	0.3	0.5	0.7	2.9	4.4	1.5	0.5	0.0	14.5
13-18	0.3	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.1	0.2	0.5	0.4	1.2	3.3	1.2	0.2	0.0	7.8
19-24	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.2	1.2	0.5	0.1	0.0	2.6
25-31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.3	0.1	0.0	0.0	0.6
32-38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
39-46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
> 46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	4.0	5.0	5.3	6.7	10.7	5.2	3.1	2.2	2.5	3.0	4.0	5.2	11.9	17.2	8.4	4.1	1.3	100.0

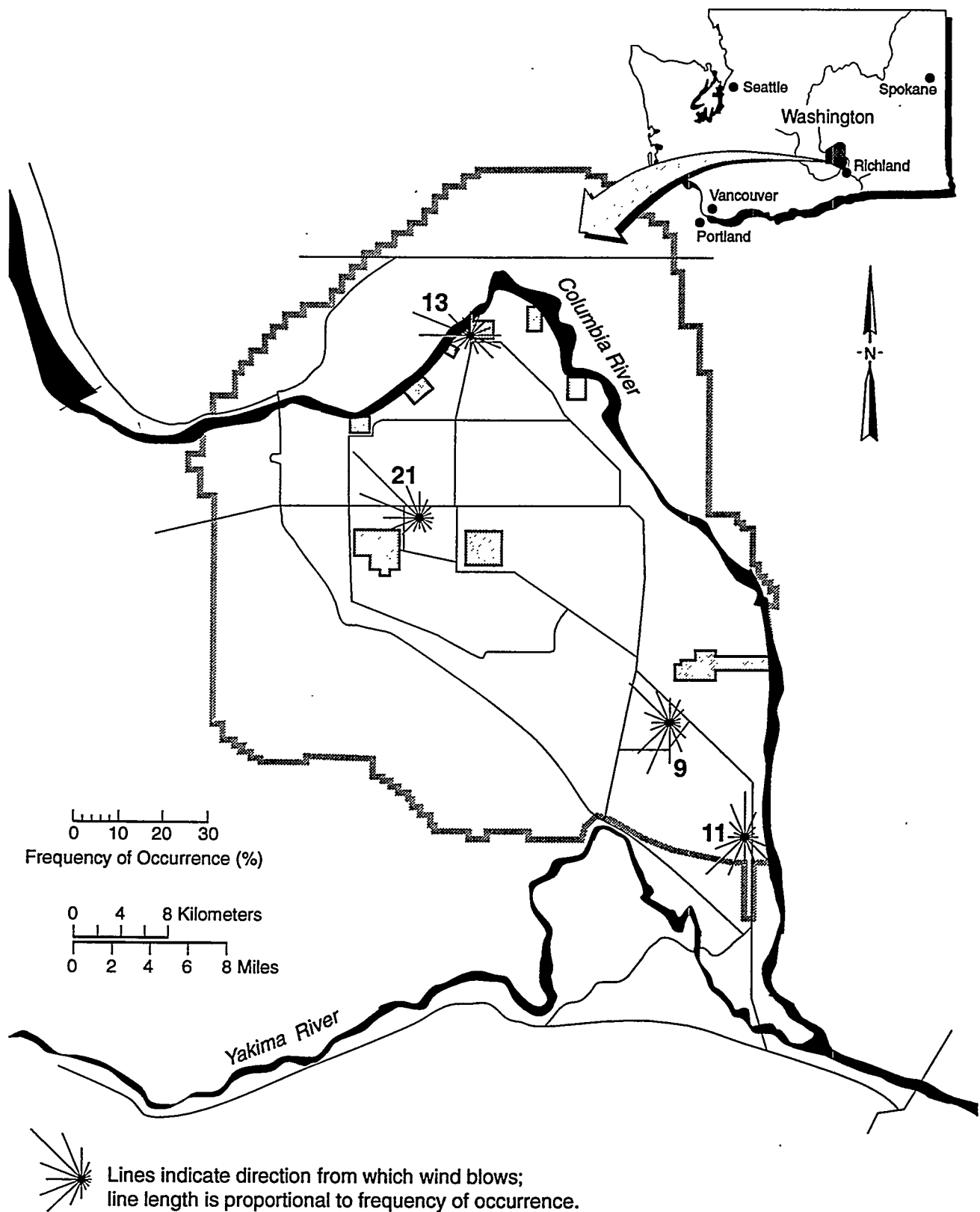
Station: (19S) SAGE

Begin: 3/82

End: 12/92

Total Hours: 91756

	Direction																Calm	Total
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
Calm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.7
1-3	1.3	1.1	1.2	1.0	1.1	1.4	1.7	1.9	1.8	1.6	1.7	1.5	1.5	1.3	1.6	1.6	0.0	23.3
4-7	3.6	2.9	3.3	2.5	2.1	3.2	4.2	4.9	4.3	2.4	2.2	3.4	4.4	2.5	1.9	3.4	0.0	51.2
8-12	1.4	1.3	0.9	0.4	0.4	0.5	1.3	2.3	2.7	1.3	1.1	1.3	1.5	1.8	0.4	0.6	0.0	19.1
13-18	0.2	0.3	0.1	0.0	0.0	0.0	0.1	0.3	0.7	0.6	0.5	0.5	0.2	0.8	0.2	0.1	0.0	4.5
19-24	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.1	0.0	0.1	0.0	0.0	0.0	0.9
25-31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2
32-38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39-46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
> 46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	6.6	5.7	5.6	3.9	3.6	5.2	7.2	9.3	9.6	6.1	5.9	6.8	7.5	6.5	4.1	5.7	0.7	100.0



SG96010315.4

Figure 5.2. Hanford Meteorological Monitoring Network Wind Roses at 60-m Level, 1986 Through 1995

**Table 5.5. Joint Frequency Distributions for Meteorological Monitoring
Network Wind Stations at 60-m Level, 1986 Through 1995**

Tower: 100 Area

	Begin: 1/86								End: 12/95								Total Hours: 82201	
	Direction																	
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Calm	Total
Calm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.7
1-3	1.8	1.7	1.8	2.2	2.9	2.8	2.2	1.6	1.3	1.2	1.2	1.4	1.7	1.8	1.8	1.7	0.0	29.3
4-7	1.9	2.1	1.6	1.7	2.9	3.1	2.6	1.5	1.0	0.8	1.2	1.9	2.8	3.0	2.2	1.5	0.0	31.6
8-12	0.8	1.2	0.8	0.5	0.6	0.8	1.3	0.7	0.4	0.4	0.9	1.2	2.5	2.6	1.0	0.6	0.0	16.2
13-18	0.5	0.7	0.4	0.2	0.2	0.3	0.5	0.4	0.2	0.3	0.8	0.8	2.5	3.1	0.7	0.2	0.0	11.8
19-24	0.3	0.4	0.3	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.4	0.4	1.1	2.1	0.6	0.1	0.0	6.7
25-31	0.1	0.2	0.2	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.2	0.2	0.4	0.8	0.4	0.1	0.0	2.9
32-38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.1	0.0	0.0	0.7
39-46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
> 46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	5.4	6.2	5.0	4.7	6.8	7.1	6.9	4.3	3.1	3.1	4.9	5.9	11.1	13.7	6.8	4.3	0.7	100.0

Tower: 200 Area

	Begin: 1/86								End: 12/95								Total Hours: 87568		
	Direction																		
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Calm	Total	
Calm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5	
1-3	1.5	1.3	1.3	1.1	1.1	1.2	1.2	0.9	0.7	0.7	0.7	0.7	0.9	1.0	1.3	1.5	0.0	17.2	
4-7	2.9	1.9	1.5	1.2	1.4	1.4	1.7	1.4	0.9	0.9	1.1	1.3	1.9	2.9	4.2	3.8	0.0	30.6	
8-12	1.1	0.7	0.4	0.3	0.3	0.3	0.4	0.7	0.4	0.6	1.1	1.7	2.6	4.5	6.2	2.4	0.0	23.9	
13-18	0.3	0.3	0.2	0.1	0.0	0.0	0.1	0.3	0.2	0.5	1.0	1.8	1.9	4.0	5.7	0.7	0.0	17.2	
19-24	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.3	0.8	0.9	0.5	1.5	2.5	0.1	0.0	6.9	
25-31	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.5	0.4	0.1	0.5	1.1	0.0	0.0	3.0	
32-38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.0	0.1	0.1	0.0	0.0	0.6	
39-46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	
> 46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total	5.9	4.3	3.5	2.7	3.0	2.9	3.5	3.4	2.5	3.3	5.6	6.9	7.9	14.5	21.1	8.6	0.5	100.0	

Tower: 300 Area

	Begin: 1/86								End: 12/95								Total Hours: 82162			
	Direction																			
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Calm	Total		
Calm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5		
1-3	1.1	0.8	0.7	0.6	0.8	1.1	1.2	1.3	1.2	0.9	0.8	0.6	0.7	0.7	0.9	1.0	0.0	14.6		
4-7	3.0	1.9	1.2	1.1	1.7	2.7	4.1	3.2	2.7	2.3	1.9	1.3	0.9	0.8	1.2	2.3	0.0	32.8		
8-12	3.5	2.2	0.9	0.4	0.4	1.2	2.7	1.4	1.8	3.1	3.2	1.8	0.8	0.5	0.9	2.3	0.0	27.7		
13-18	2.0	1.0	0.2	0.1	0.0	0.2	0.4	0.2	0.5	1.9	3.2	2.0	0.7	0.4	1.0	1.7	0.0	15.8		
19-24	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.6	1.4	0.9	0.3	0.1	0.6	0.5	0.0	5.4		
25-31	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.8	0.3	0.2	0.0	0.2	0.1	0.0	2.2		
32-38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.6		
39-46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2		
> 46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1		
Total	10.0	6.2	3.2	2.3	2.9	5.2	8.5	6.2	6.2	9.1	11.7	7.0	3.6	2.6	4.8	8.0	0.6	100.0		

Table 5.5. (contd)

Tower: 400 Area

Begin: 1/86

End: 12/95

Total Hours: 82532

	Direction																Calm	Total
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
Calm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3
1-3	0.8	0.7	0.7	0.7	0.8	0.8	1.0	1.0	0.9	0.8	0.8	0.7	0.7	0.6	0.7	0.8	0.0	12.4
4-7	2.0	1.9	1.7	1.1	1.1	1.3	2.0	2.8	2.9	2.3	1.6	1.2	1.3	1.4	2.1	2.1	0.0	28.5
8-12	1.8	1.8	1.2	0.4	0.3	0.3	1.3	2.3	3.2	3.6	2.1	0.9	0.9	1.4	3.0	2.5	0.0	27.0
13-18	0.7	0.7	0.3	0.1	0.0	0.0	0.5	0.8	1.6	3.7	2.4	0.8	0.6	1.4	3.7	1.8	0.0	19.1
19-24	0.1	0.2	0.2	0.0	0.0	0.0	0.1	0.1	0.3	1.4	1.4	0.6	0.3	0.9	2.3	0.4	0.0	8.4
25-31	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.8	0.3	0.1	0.2	0.7	0.1	0.0	3.0
32-38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.1	0.0	0.0	0.1	0.0	0.0	0.9
39-46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.3
> 46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Total	5.4	5.5	4.2	2.4	2.2	2.5	4.8	7.0	9.0	12.3	9.6	4.5	3.9	6.0	12.6	7.7	0.3	100.0

6.0 Miscellaneous Climatological Statistics

6.1 Sky Cover

The term sky cover is used to express the portion of the celestial dome that is 1) covered, but not necessarily hidden, by clouds or obscuring phenomena aloft; 2) hidden by an obscuring phenomenon on the ground (such as fog or smoke); 3) or a combination of both 1 and 2. The sky cover is determined hourly by scanning the sky and estimating the number of tenths that are covered (0 denotes clear sky and 10 denotes overcast). Average monthly sunrise-to-sunset sky covers for the period 1946 through 1995 are shown in Table 6.1. Also shown in Table 6.1 are the number of clear, partly cloudy, and cloudy days for the period 1954 through 1995. The number of clear, partly cloudy, and cloudy days is the result of assigning each day to one of the following categories, based on its average sky cover for that day:

<u>Category</u>	<u>Average Sky Cover</u>
Clear	0 - 3 tenths
Partly cloudy	4 - 7 tenths
Cloudy	8 - 10 tenths

During the period of record (1954 through 1995), an average of 199 sunny days (the sum of the clear and partly cloudy days) were recorded per year at the HMS.

6.2 Fog and Dense Fog

Table 6.2 shows the average monthly and annual number of days with fog and dense fog. Fog is reported any time horizontal visibility is reduced to 6 mi or less because of the suspension of water droplets in the surface layer of the atmosphere. Dense fog is reported when horizontal visibility is reduced to 0.25 mi or less. Most fog at the HMS is radiation fog, a common type of fog that forms on nights characterized by light wind, clear sky, and moist air in the lower levels of the atmosphere. Nearly 90% of both fog and dense fog at the HMS occurs during the late autumn and winter months, though fog is observed every month of the year.

6.3 Psychrometric Data

Psychrometric data include observations of dry bulb, wet bulb, and dew point temperatures and relative humidity. The dry bulb temperature is the temperature of the ambient air; the wet bulb temperature is the lowest temperature to which a parcel of air, under constant pressure, can be cooled by evaporating water into it. The dew point temperature is the temperature to which a given parcel of air, under constant pressure and water-vapor content, must be cooled to attain saturation. Relative humidity is the ratio of the actual water-vapor content of the air to the one where saturation would occur if the pressure and temperature remained unchanged.

Table 6.1. Average Sky Cover (sunrise to sunset), 1946 Through 1995, and Number of Days Clear, Partly Cloudy, and Cloudy, 1954 Through 1995

Month	Sky Cover (Scale 0-10)			Number of Clear Days			Partly Cloudy Days	Number of Cloudy Days								
	Average	Maximum	Year	Minimum	Year	Year		Average	Maximum	Year	Minimum	Year				
Jan	8.0	9.2	1978	4.3	1949	3	9	1984	0	1955 ^(a)	5	22	28	1978	17	1963
Feb	7.6	9.3	1980	6.1	1989	4	9	1991 ^(a)	0	1984 ^(a)	5	19	26	1980 ^(a)	12	1964
Mar	6.8	8.5	1978	4.9	1965	6	12	1979 ^(a)	1	1978 ^(a)	8	17	24	1993	9	1979 ^(a)
Apr	6.4	8.1	1963	3.7	1951	6	12	1962	1	1963	9	15	21	1979 ^(a)	6	1956
May	5.9	8.1	1993	3.6	1992	8	18	1992	1	1977	11	12	19	1977 ^(a)	3	1992
Jun	5.2	7.0	1950	2.8	1961	10	21	1961	5	1972 ^(a)	10	10	15	1983 ^(a)	5	1979 ^(a)
Jul	3.1	5.0	1983	0.9	1953	19	26	1960	12	1987 ^(a)	8	5	12	1976	0	1984 ^(a)
Aug	3.3	5.9	1968	0.6	1955	18	30	1955	9	1978	8	5	13	1983 ^(a)	0	1994 ^(a)
Sep	3.9	6.7	1978	1.4	1990 ^(a)	16	27	1975	6	1978	7	7	16	1977	0	1990
Oct	5.7	8.0	1975	3.3	1987	10	20	1987	1	1975	8	13	22	1973	6	1986
Nov	7.5	9.1	1972	5.2	1993	5	12	1993	1	1973 ^(a)	6	20	25	1973 ^(a)	13	1993
Dec	8.0	9.3	1985	6.4	1978	4	9	1978	1	1985 ^(a)	4	23	29	1985	17	1978
Annual	5.9	6.6	1978 ^(a)	5.1	1949	110	134	1967	80	1977	89	166	193	1978	146	1991

(a) Most recent of multiple occurrences.

Table 6.2. Monthly and Annual Number of Days with Fog and Dense Fog, 1945 Through 1995

Month	Days with Fog (Visibility ≤ 6 mi)					Days with Dense Fog (Visibility ≤ 0.25 mi)				
	Average	Maximum	Year	Minimum	Year	Average	Maximum	Year	Minimum	Year
Jan	11.3	25	1979	0	1949	6.1	15	1994 ^(a)	0	1949
Feb	6.6	20	1963	0	1988 ^(a)	3.2	11	1963	0	1988 ^(a)
Mar	2.1	10	1993	0	1994 ^(a)	1.1	5	1993 ^(a)	0	1995 ^(a)
Apr	0.4	3	1992	0	1987 ^(a)	0.1	1	1993 ^(a)	0	1995 ^(a)
May	0.2	3	1948	0	1995 ^(a)	<0.1	1	1958	0	1995 ^(a)
Jun	0.1	2	1971	0	1995 ^(a)	<0.1	1	1971	0	1995 ^(a)
Jul	<0.1	1	1966	0	1995 ^(a)	0	0	0		
Aug	0.1	1	1985 ^(a)	0	1995 ^(a)	<0.1	1	1985 ^(a)	0	1995 ^(a)
Sep	0.3	2	1985 ^(a)	0	1994 ^(a)	0.1	1	1995 ^(a)	0	1994 ^(a)
Oct	2.0	9	1962	0	1989 ^(a)	1.0	7	1980	0	1991 ^(a)
Nov	9.5	19	1985 ^(a)	0	1990	5.4	13	1965	0	1990 ^(a)
Dec	14.2	25	1989 ^(a)	2	1968	7.7	17	1950	2	1968 ^(a)
Annual	46.8	84	1985-86	22	1948-49	24.5	42	1950-51	9	1948-49

(a) Most recent of multiple occurrences.

Longest duration of fog: 113.7 h, December 16-20, 1985.

Longest duration of dense fog: 47.0 h, December 1957.

Table 6.3 presents monthly averages and extremes of dry bulb, wet bulb, dew point temperatures, and relative humidity from the HMS for the period 1950 through 1995. These parameters are collected hourly, and are averaged on a monthly (as opposed to a daily) basis.

6.4 Solar Radiation

Table 6.4 presents average and extreme daily solar radiation values by month for the period 1953 through 1995. These data are reported in langleys (a langley is a unit defined as 1 gram calorie per square centimeter.)

The highest daily values occur with a clear sky and clean air, and the lowest daily values commonly occur on days overcast with low stratus clouds. The lowest midday values of hourly solar radiation occurred on May 18, 1980, as the dense ash cloud from the morning eruption of Mount St. Helens passed over eastern Washington. Hourly solar radiation values dropped to zero at 1100 h and remained at zero for the rest of that day.

Table 6.3. Monthly Averages and Extremes of Psychrometric Data, 1950 Through 1995

Category ^(a)	Monthly Averages												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Dry bulb	30.9	37.5	45.0	53.2	62.2	69.9	77.1	75.5	66.4	53.1	39.9	32.4	53.6
Wet bulb	28	34	38	44	50	55	58	58	53	45	36	30	44
Rel. hum.	77.3	70.5	56.6	47.2	42.8	39.6	33.3	35.6	42.0	56.3	73.4	80.2	54.5
Dew point	24.1	27.7	28.8	31.6	36.9	41.5	43.5	43.8	40.2	36.0	31.2	26.4	34.3
Extremes of Monthly Averages													
<u>Dry Bulb</u>													
Highest	43.0	44.6	51.6	58.6	68.7	77.3	83.3	82.5	72.7	59.5	46.3	38.8	56.6
Year	1953	1991	1992	1987	1958	1992	1985	1967	1990	1988	1990	1953	1992
Lowest	12.9	25.8	39.6	48.3	57.0	64.2	71.3	70.6	58.9	48.1	25.7	21.9	50.2
Year	1950	1956	1955	1955	1984	1953	1986	1964	1985	1984	1985	1985	1985
<u>Wet Bulb</u>													
Highest	39	41	44	47	55	59	62	61	56	50	42	36	47
Year	1953	1956	1992	1992	1958	1992 ^(b)	1985 ^(b)	1991 ^(b)	1995 ^(b)	1988	1954	1991 ^(b)	1992
Lowest	12	23	33	39	45	51	56	55	48	40	24	21	41
Year	1950	1956	1955	1955	1959	1983 ^(b)	1986 ^(b)	1980 ^(b)	1970	1984	1985	1985	1985
<u>Rel. Hum.</u>													
Highest	88.8	86.9	69.1	64.5	61.9	53.5	45.6	47.8	55.5	74.2	88.7	90.5	58.9
Year	1960	1963	1993	1963	1948	1950	1993	1976	1977	1962	1979	1950	1978
Lowest	60.0	54.0	44.0	36.9	31.2	30.0	21.9	24.5	33.2	42.5	62.8	69.0	49.4
Year	1963	1967	1965	1966	1966	1949	1959	1967	1974	1952	1976	1968	1967
<u>Dew Point</u>													
Highest	34.4	36.7	37.2	37.1	43.8	47.5	50.1	48.4	45.4	43.5	38.3	34.3	37.7
Year	1953	1992 ^(b)	1986	1992 ^(b)	1957	1958	1975	1976	1963	1962	1954	1950	1958
Lowest	6.5	17.3	20.8	26.0	30.4	37.5	35.4	38.4	33.8	30.2	19.4	15.1	31.5
Year	1950	1956	1965 ^(b)	1982	1964	1954	1959	1955	1970	1984	1985	1983	1955

(a) Dry bulb, wet bulb, and dew point temperatures in °F, relative humidity in %.

(b) Most recent of multiple occurrences.

Table 6.4. Average and Extreme Solar Radiation Daily Values, 1953 Through 1995

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average	109	186	324	453	556	609	633	540	408	256	126	85	358
Highest	277	422	542	704	838	821	808	721	591	434	295	196	838
Year	1969	1958	1968	1972	1977	1971	1974	1957	1970	1973	1971	1972	May 1977
Lowest	16	11	44	75	67	92	118	104	61	33	14	9	9
Year	1976 ^(a)	1995	1979	1974	1962	1992	1972	1993	1957	1974	1969	1973	Dec 1973

(a) Most recent of multiple occurrences.

6.5 Thunderstorms

A thunderstorm day is one in which thunder is heard at the observing station one or more times during a calendar day. If a thunderstorm were to begin before midnight and continue until after midnight, it is possible to have two thunderstorm days from a single storm.

Table 6.5 shows that thunderstorms occurred in every month of the year, except January and November. The thunderstorm season is essentially from April through September. The average number of thunderstorm days per year is 10; however, the total varies from a low of 3 in 1949 to a high of 23 in 1948. The largest number of thunderstorms in any single month was 8 in June 1972, July 1983, and August 1953.

Table 6.5. Average Number of Days of Various Meteorological Phenomena, 1945 Through 1995

Phenomenon	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Thunderstorm	0	≤0.1	0.2	0.8	1.6	2.4	2.1	2.1	0.8	0.2	0	≤0.1	10.1
Dust or blowing dust	0.4	0.4	0.5	0.6	0.7	0.4	0.4	0.3	0.5	0.3	0.2	0.2	4.6
Glaze	2.2	0.7	0.1	0	0	0	0	0	0	0	0.8	2.5	6.3

Prior to 1975, wet bulb temperatures $\geq 75^{\circ}\text{F}$ had never been observed at the HMS. On July 8, 9, and 10 of that year, 7 hourly observations were made of wet bulb temperature $\geq 75^{\circ}\text{F}$.

6.6 Dust and Blowing Dust

The criterion for both dust and blowing dust is that horizontal visibility be reduced to 6 mi or less. Dust is carried into the area from a distant source and may occur without strong winds. Blowing dust occurs when dust is being picked up locally and occurs with stronger winds. Both dust and blowing dust occurred at the HMS; however, in most cases, it is blowing dust. Table 6.5 presented the average number of days per month and year of dust and blowing dust during the period 1945 through 1995. The average number of days per year with dust or blowing dust is 5. The greatest number of such days in any year was 20 days in 1980; the fewest was 0 in 1987 and earlier years. The greatest number of days with dust or blowing dust in any month was 9 in May 1980.

6.7 Glaze

Glaze is a coating of ice formed when rain or drizzle freezes on contact with any surface having a temperature that is below freezing. Table 6.5 provided data on the number of days per month and year with glaze for the period 1945 through 1995. The average number of days with freezing rain or freezing drizzle is 6. The highest number of days with glaze in any winter season was 18 during the winter of 1969-1970; the least, 1 day during the winter of 1987-1988 and earlier winters. The greatest number of such days in any single month was 9 in January 1970.

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Appendix

1995 Wind Climatology

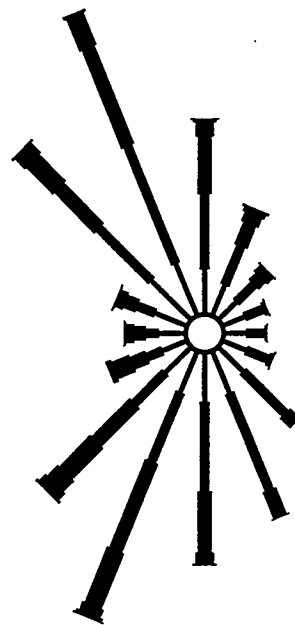
Appendix

1995 Wind Climatology

This appendix gives the 1995 station-specific wind roses (Figures A.1 [a] and A.2 [a]) from the Hanford Meteorological Monitoring Network. Each petal of the wind rose represents the proportional amount of time that the wind blew from that direction. The width of the petal corresponds to each wind speed category. Starting from the center of the rose, the narrowest petal represents winds in the 1- to 3-mph class, the next widest represents the 4- to 7-mph class, and so forth. The length of each of these petals is proportional to the frequency of occurrence for each speed class.

The wind speed histograms (Figures A.1 [b] and A.2 [b]) represent the proportional amount of time in each speed class.

Table A.1 lists joint frequency distributions (at 10 m) of wind direction versus wind speed class for the individual stations, and Table A.2 lists joint frequency distribution (at 60 m) for stations 9, 11, 13, and 21.



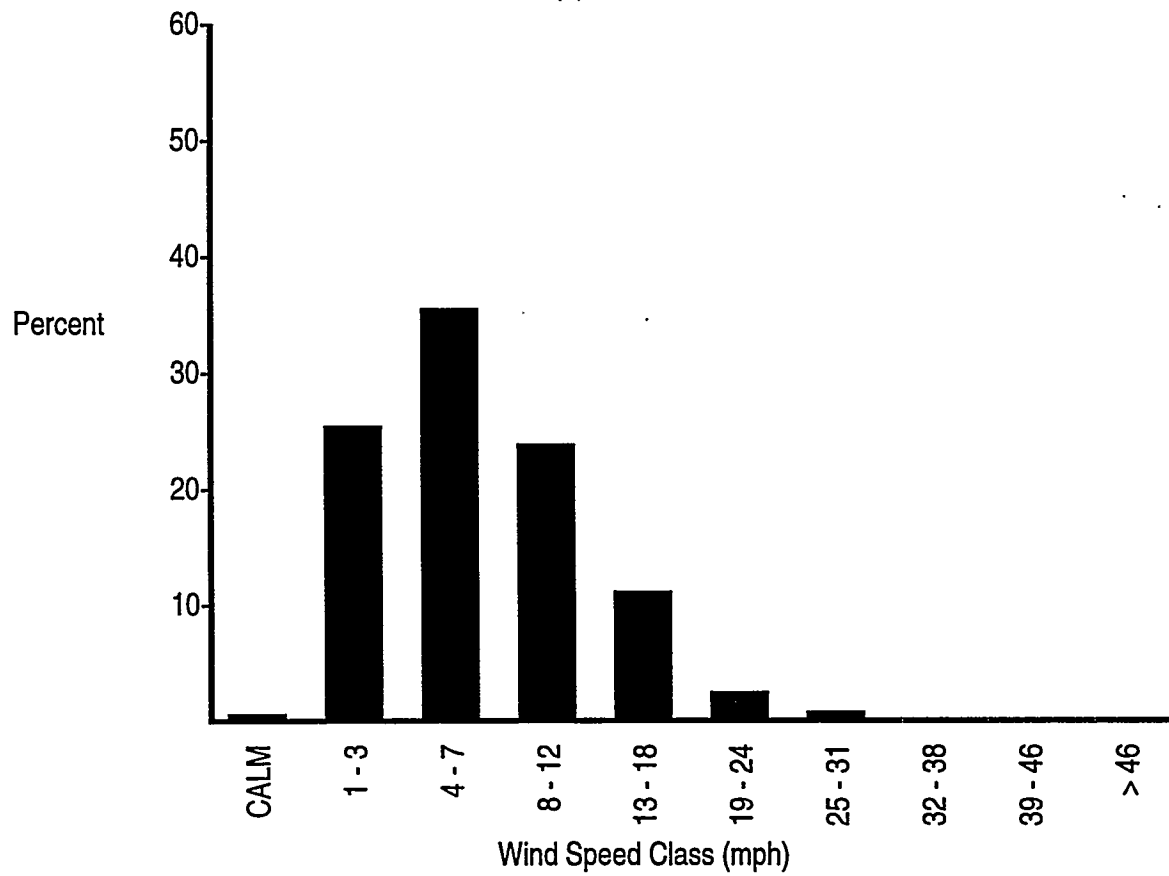
N



Station # 1 - PROS

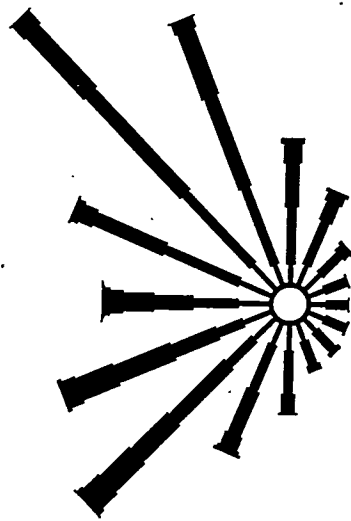
(a) Wind Rose

Period: 1/95 - 12/95



(b) Wind Speed Histogram

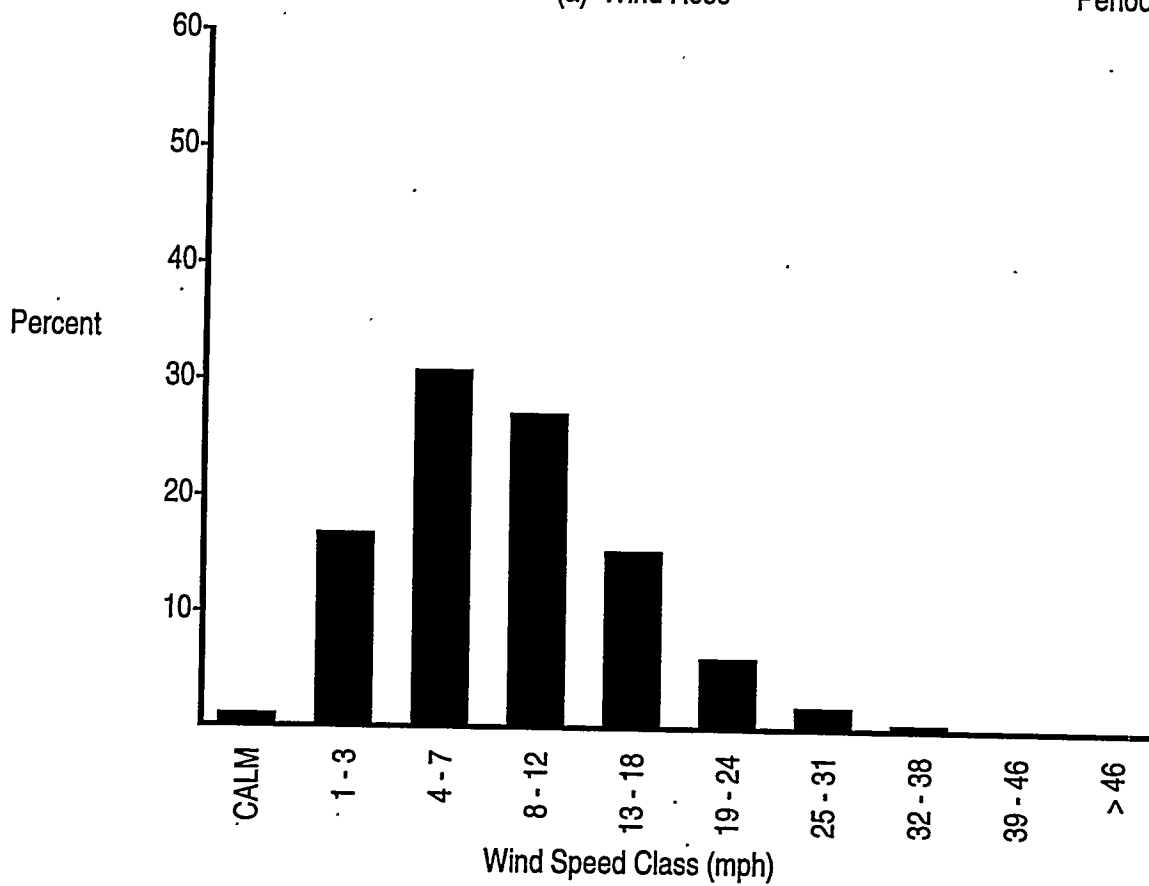
Figure A.1. Wind Rose and Wind Speed Histogram (10 m)



Station # 2 - EOC

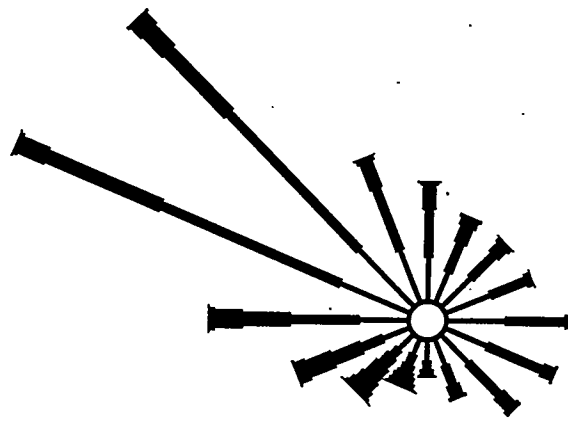
(a) Wind Rose

Period: 1/95 - 12/95



(b) Wind Speed Histogram

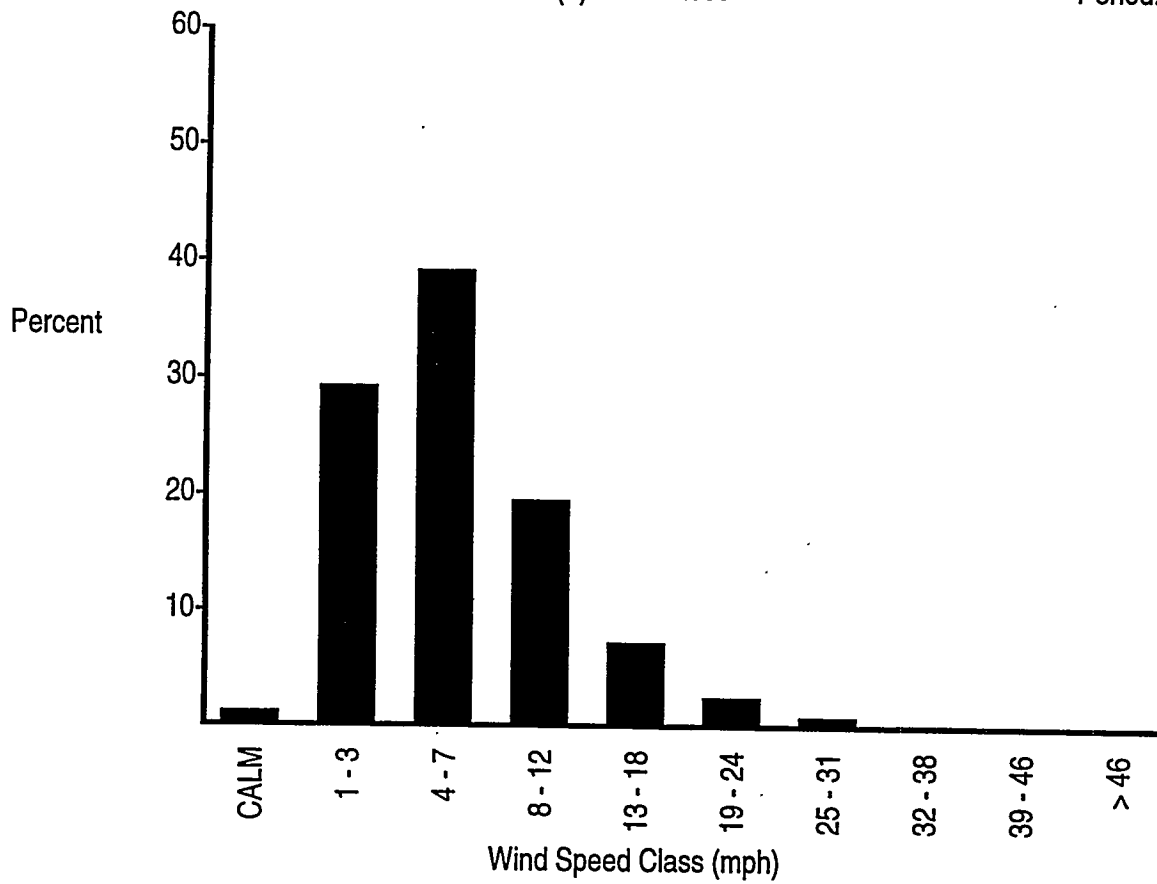
Figure A.1. (contd)



Station # 3 - ARMY

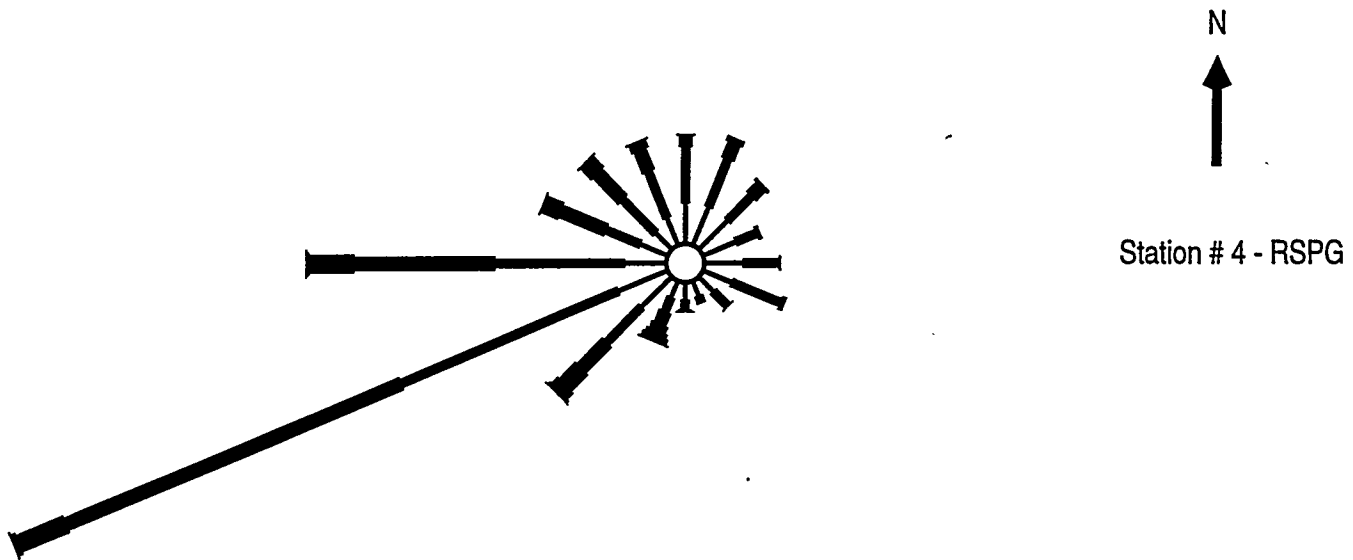
(a) Wind Rose

Period: 1/95 - 12/95



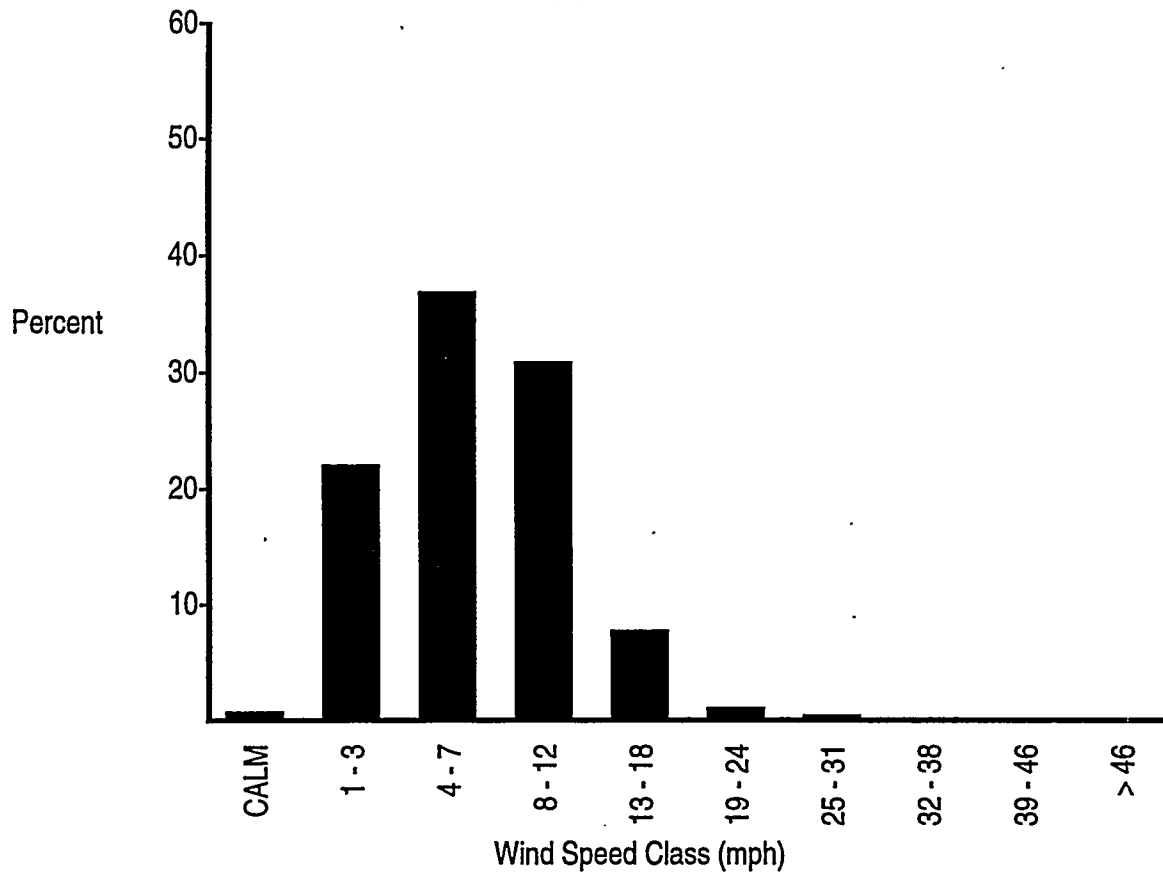
(b) Wind Speed Histogram

Figure A.1. (contd)



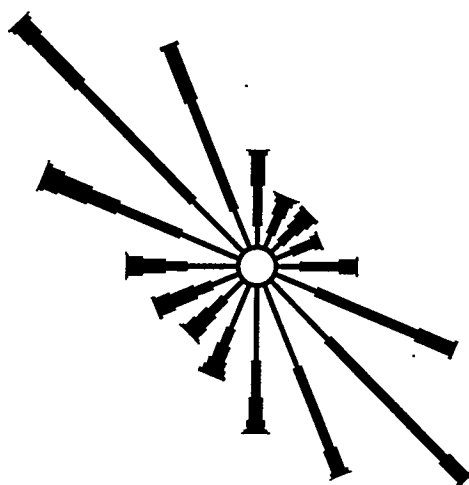
(a) Wind Rose

Period: 1/95 - 12/95



(b) Wind Speed Histogram

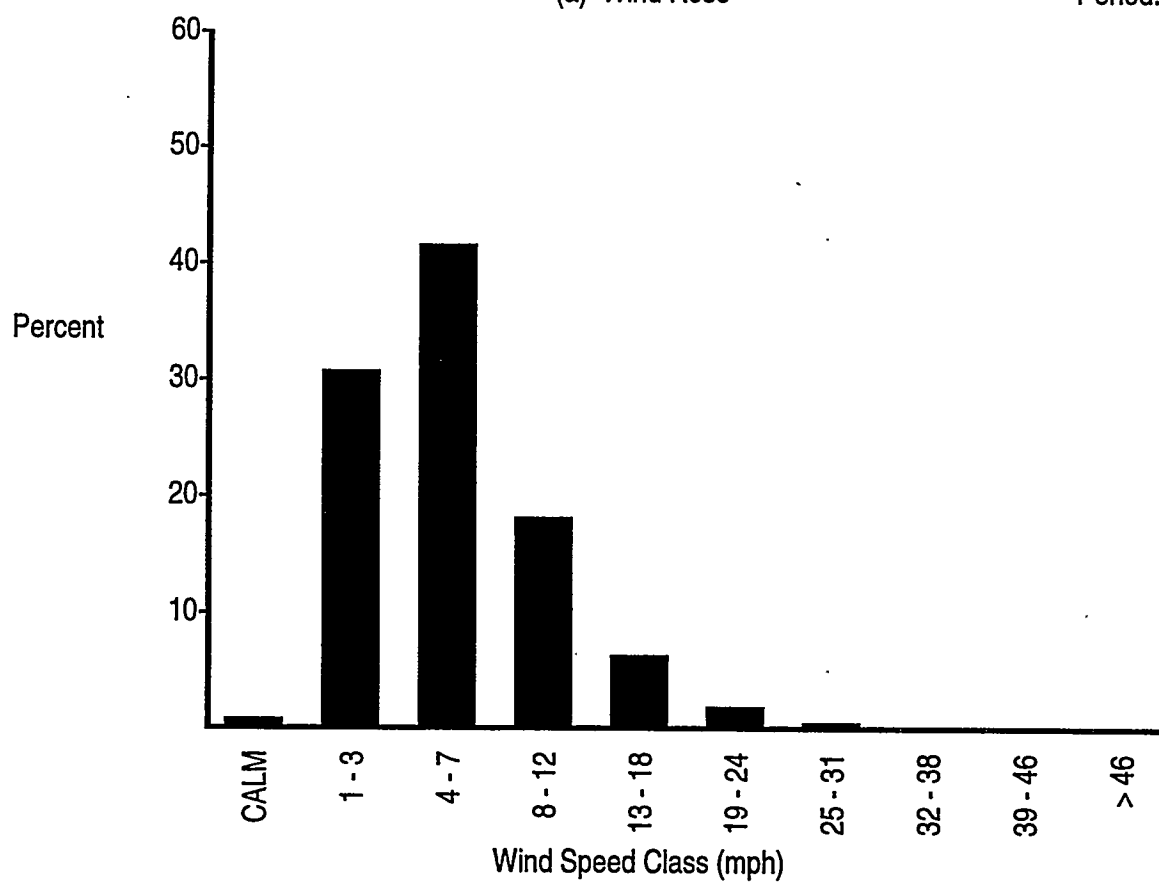
Figure A.1. (contd)



Station # 5 - EDNA

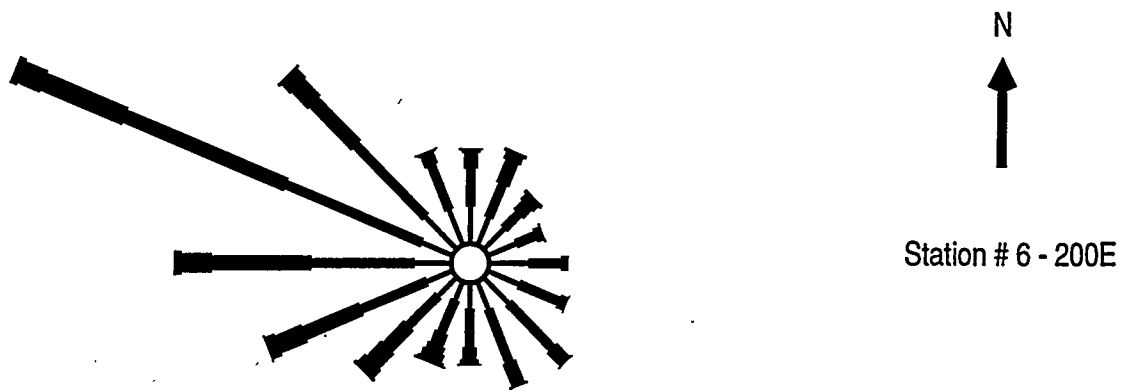
(a) Wind Rose

Period: 1/95 - 12/95



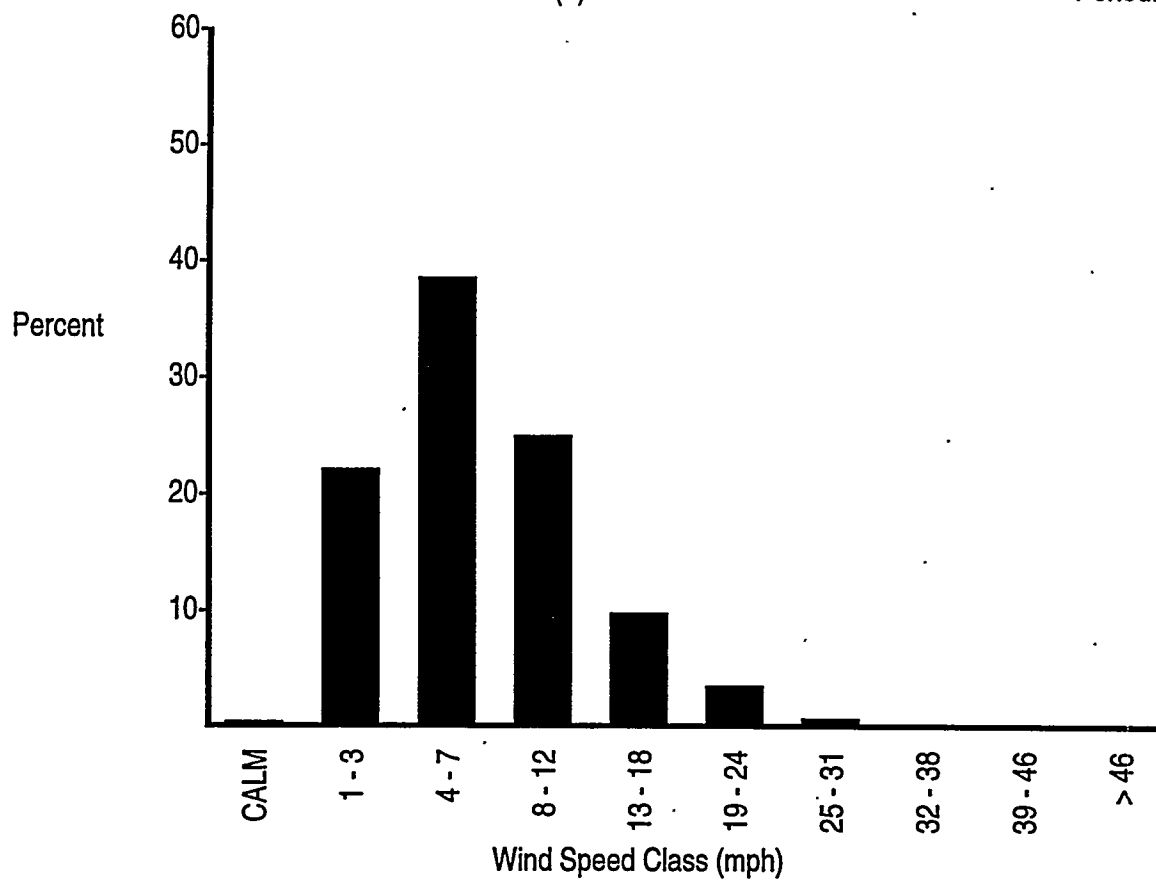
(b) Wind Speed Histogram

Figure A.1. (contd)



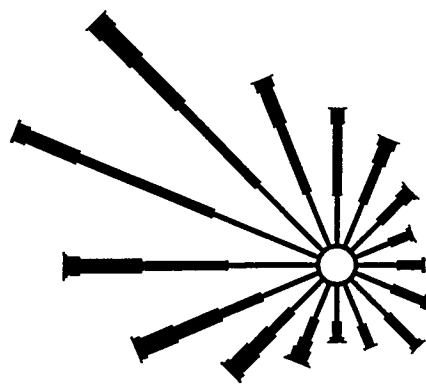
(a) Wind Rose

Period: 1/95 - 12/95



(b) Wind Speed Histogram

Figure A.1. (contd)



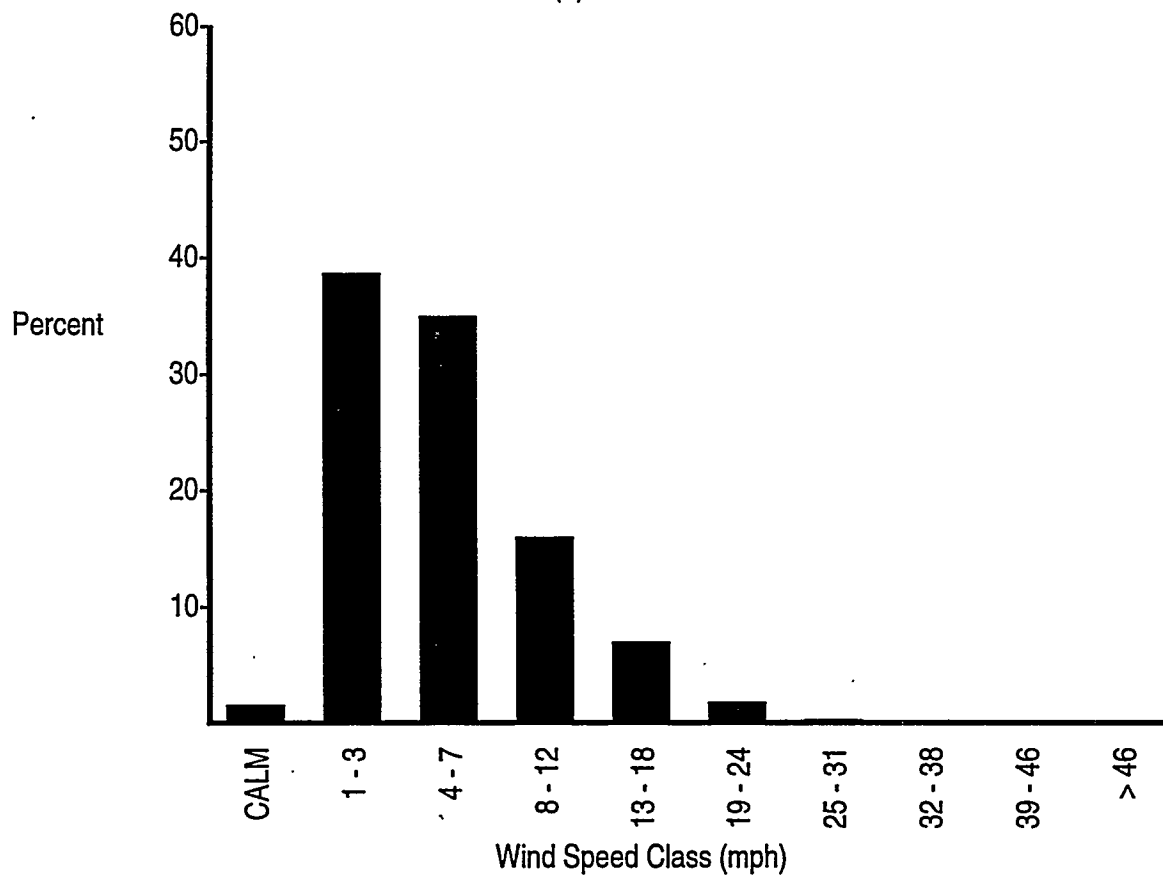
N



Station # 7 - 200W

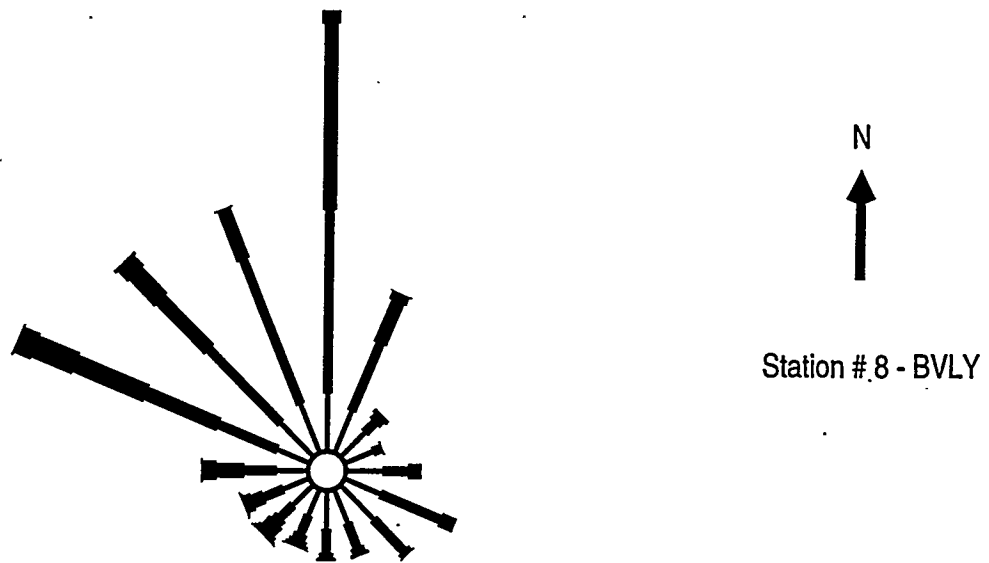
(a) Wind Rose

Period: 1/95 - 12/95



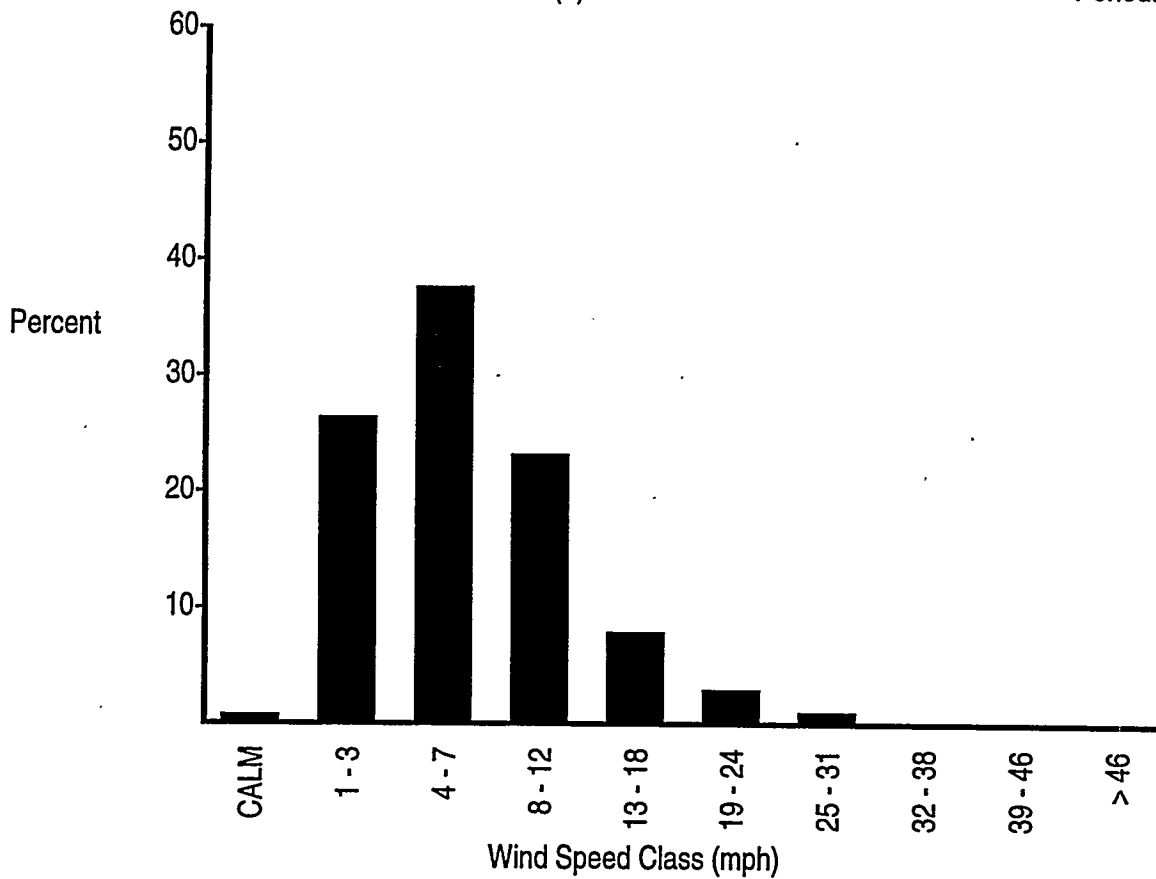
(b) Wind Speed Histogram

Figure A.1. (contd)



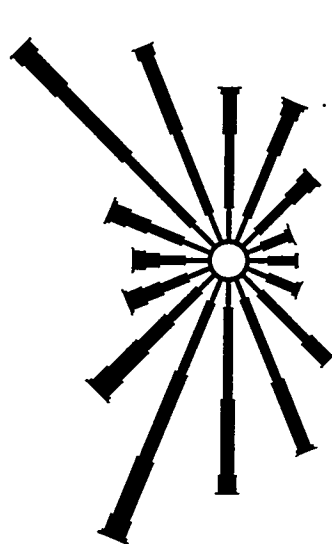
(a) Wind Rose

Period: 1/95 - 12/95



(b) Wind Speed Histogram

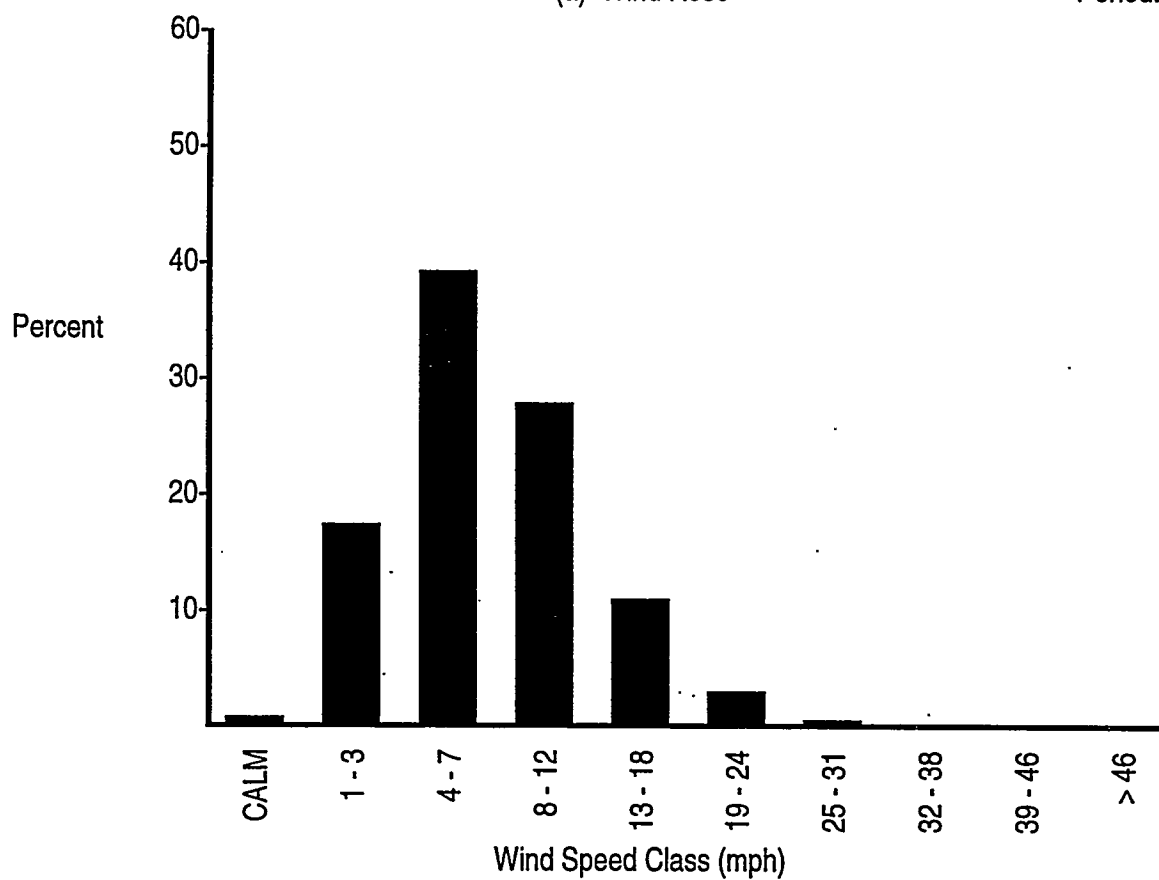
Figure A.1. (contd)



Station # 9 - FFTF

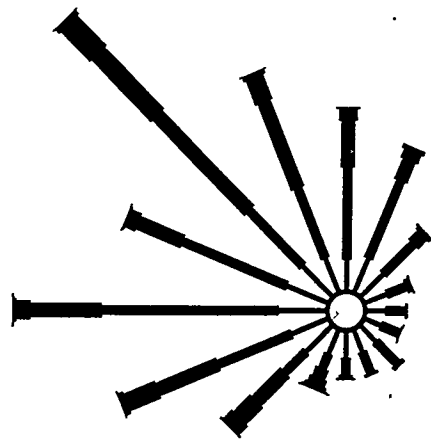
(a) Wind Rose

Period: 1/95 - 12/95



(b) Wind Speed Histogram

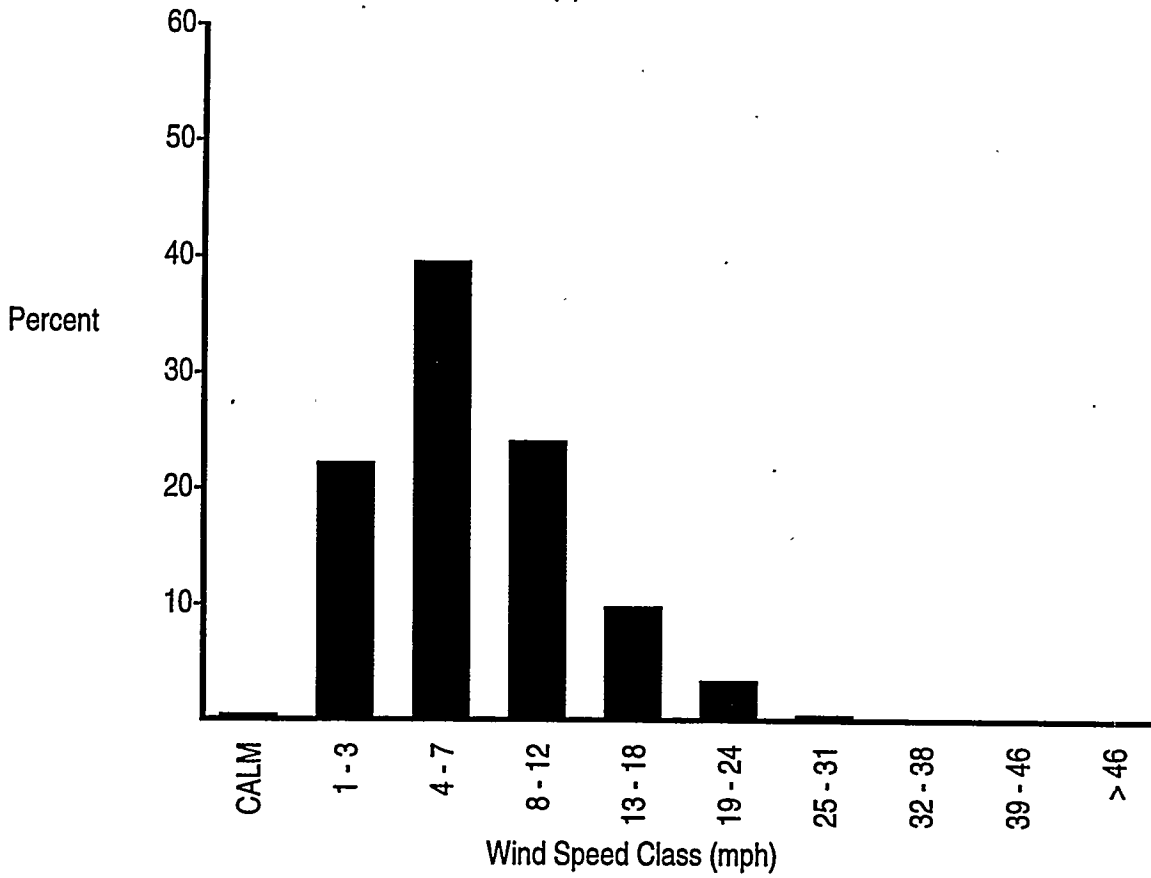
Figure A.1. (contd)



Station #10 - YAKB

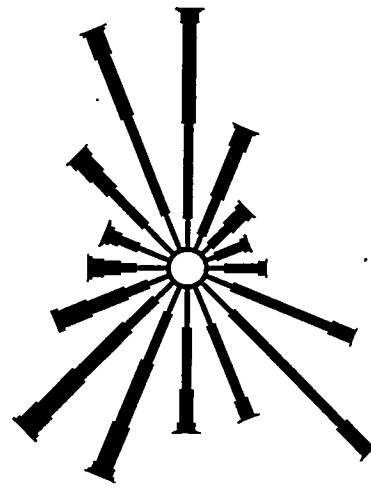
(a) Wind Rose

Period: 1/95 - 12/95



(b) Wind Speed Histogram

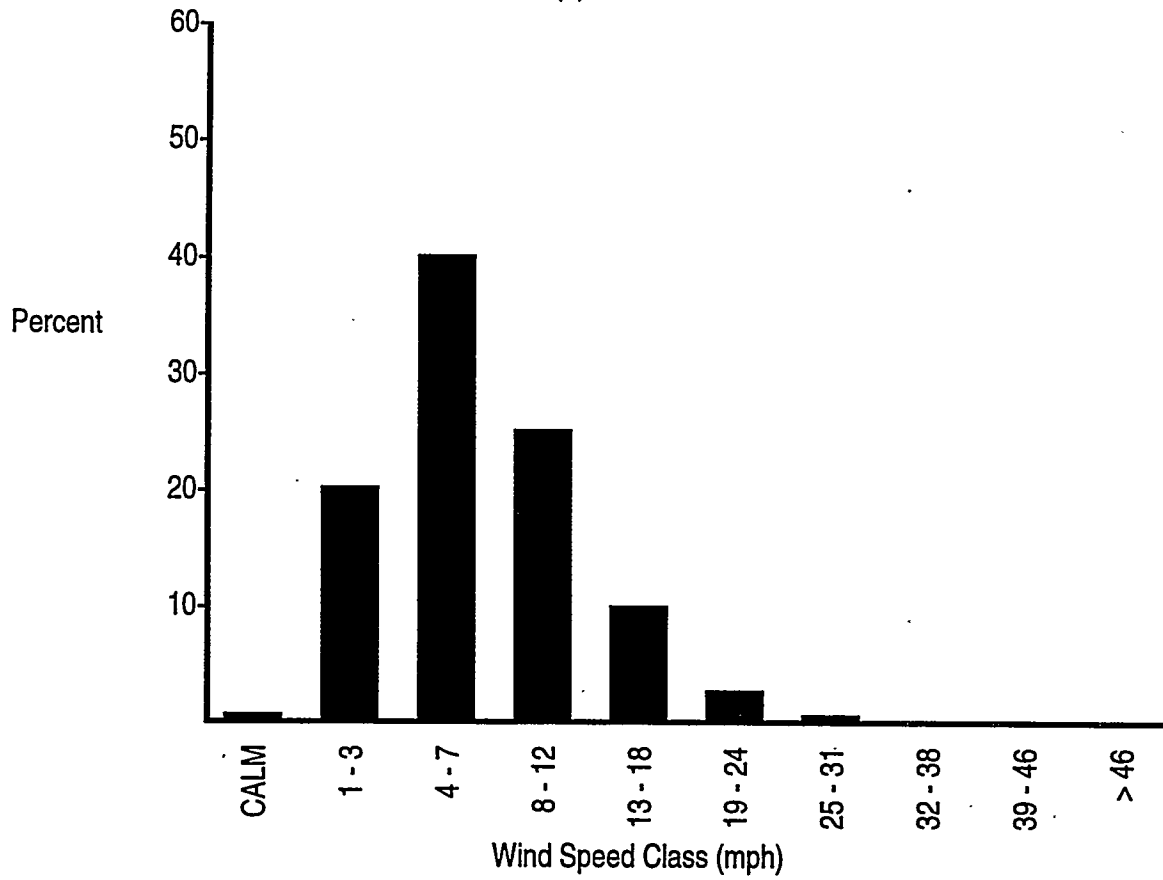
Figure A.1. (contd)



Station #11 - 300A

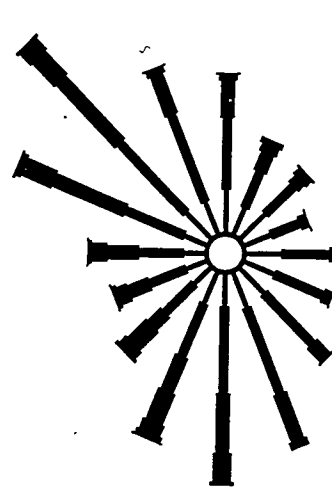
(a) Wind Rose

Period: 1/95 - 12/95



(b) Wind Speed Histogram

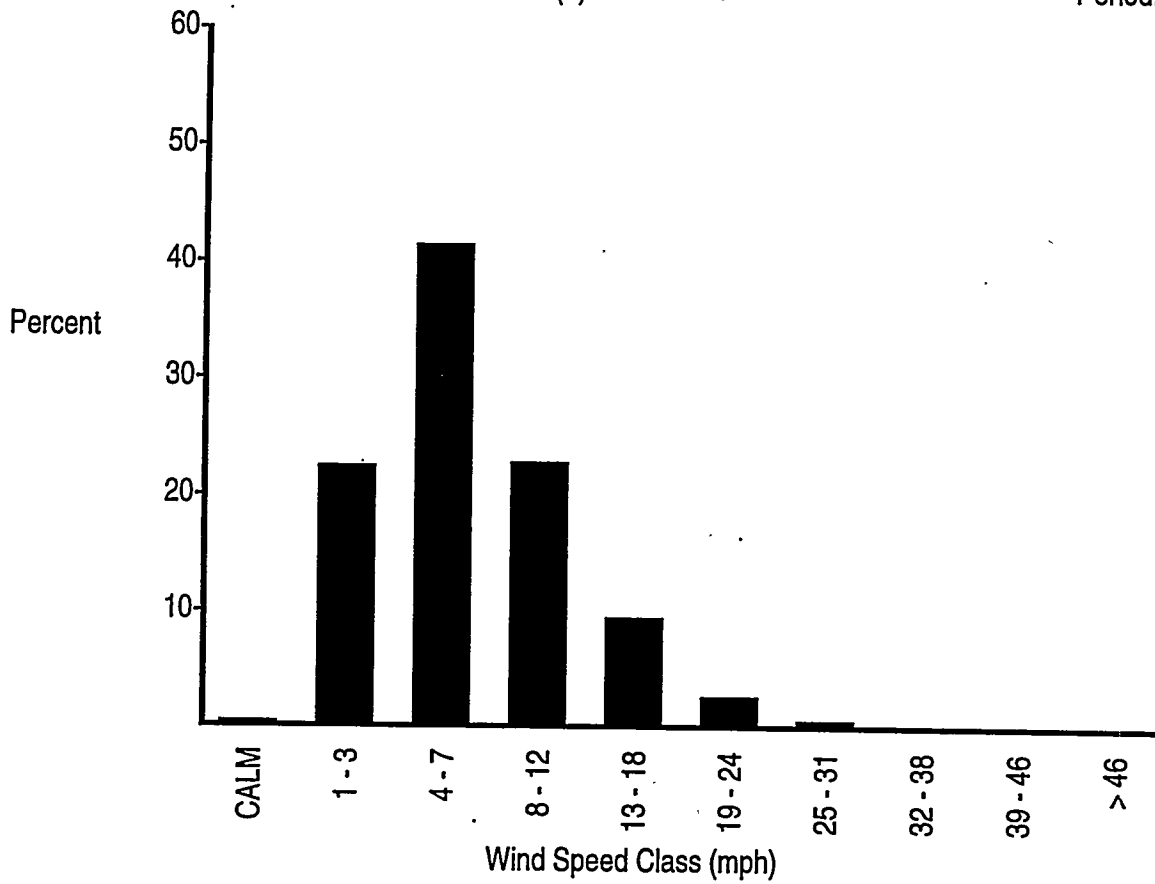
Figure A.1. (contd)



Station #12 - WYEB

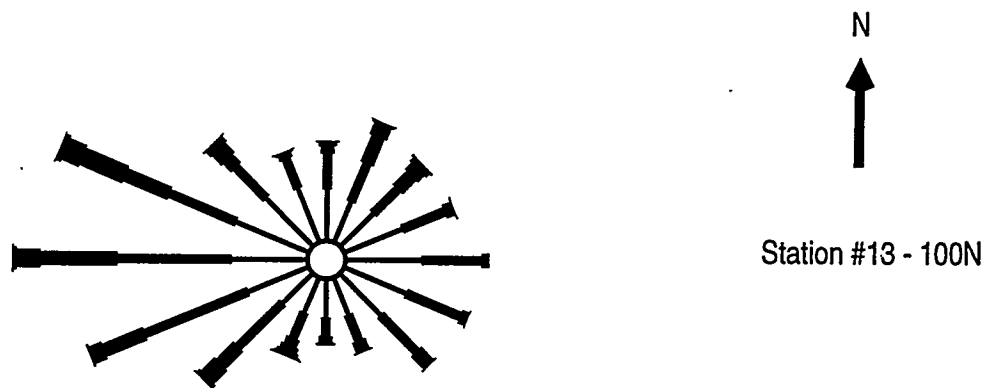
(a) Wind Rose

Period: 1/95 - 12/95



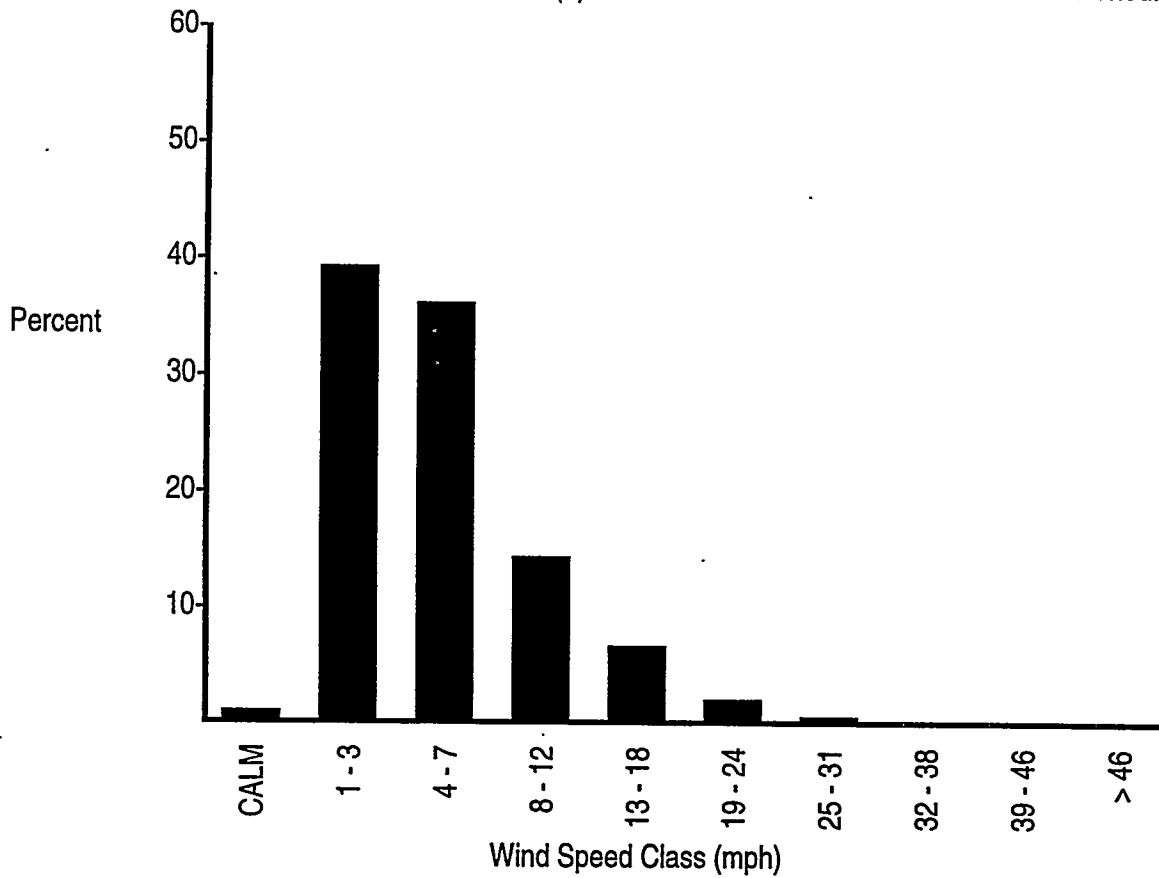
(b) Wind Speed Histogram

Figure A.1. (contd)



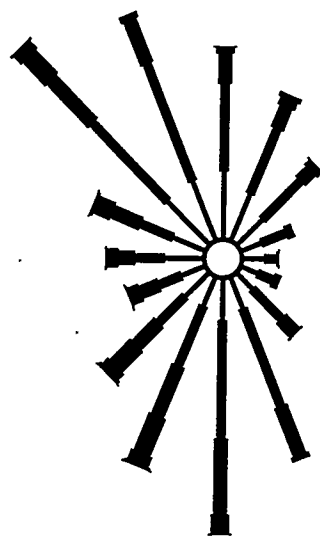
(a) Wind Rose

Period: 1/95 - 12/95



(b) Wind Speed Histogram

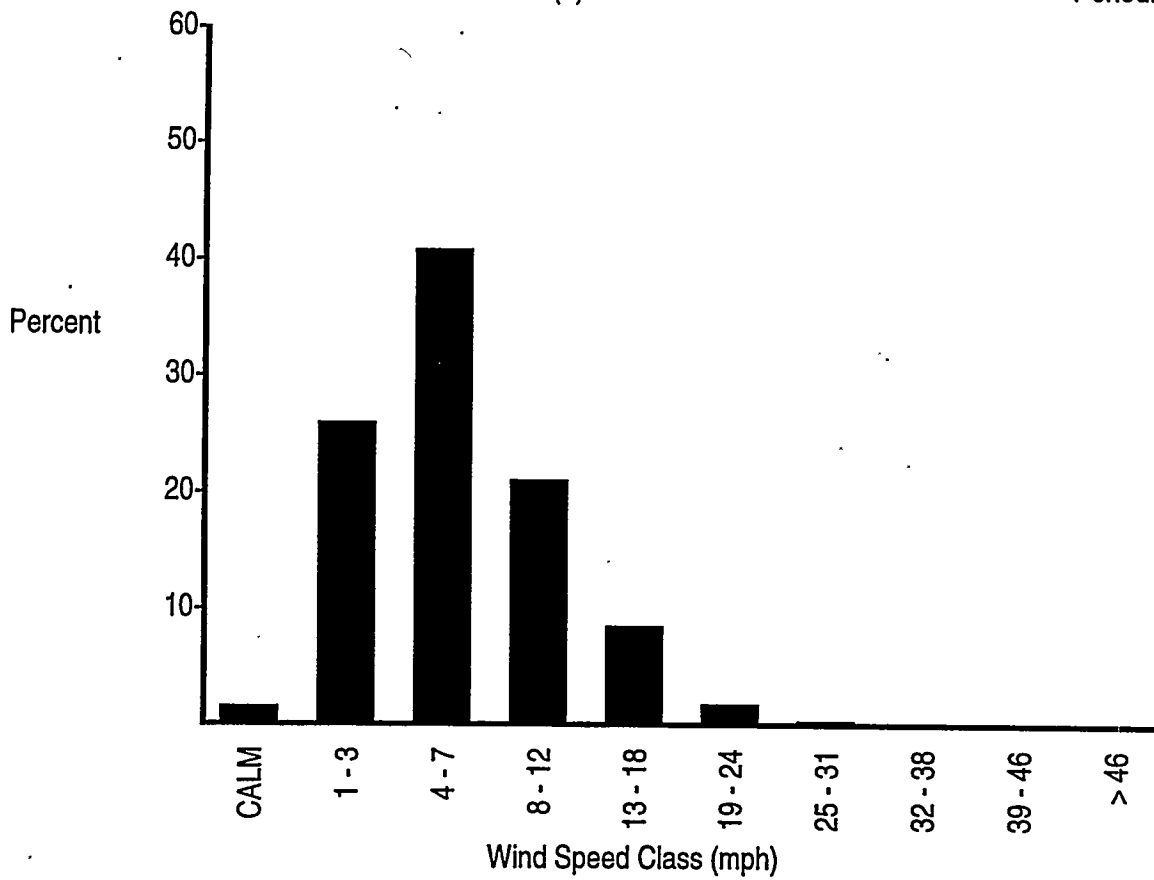
Figure A.1. (contd)



Station #14 - WPPS

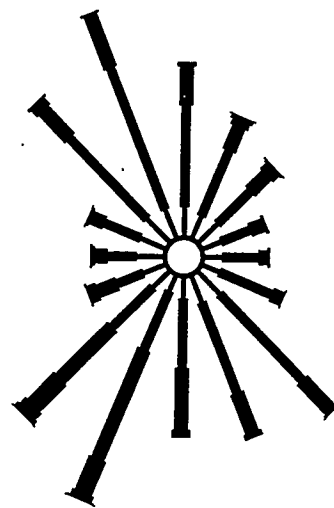
(a) Wind Rose

Period: 1/95 - 12/95



(b) Wind Speed Histogram

Figure A.1. (contd)



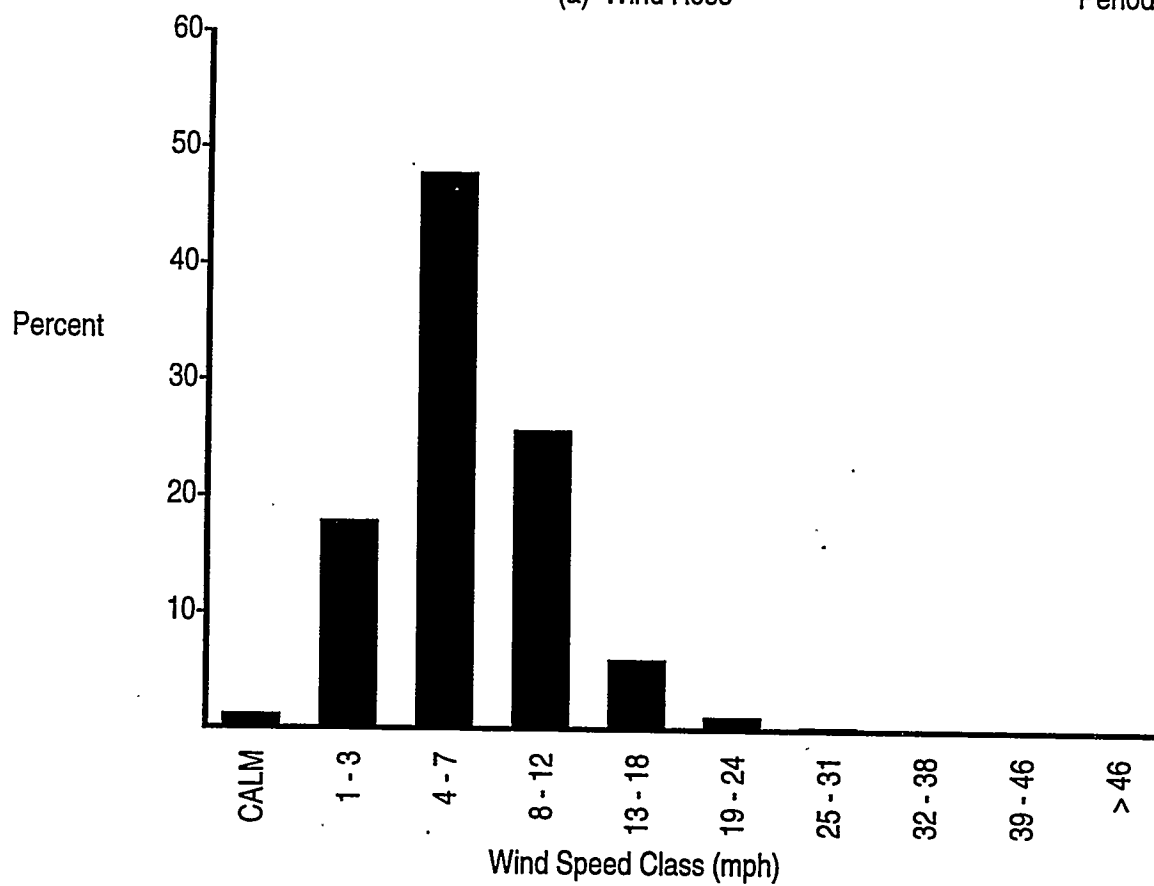
N



Station #15 - FRNK

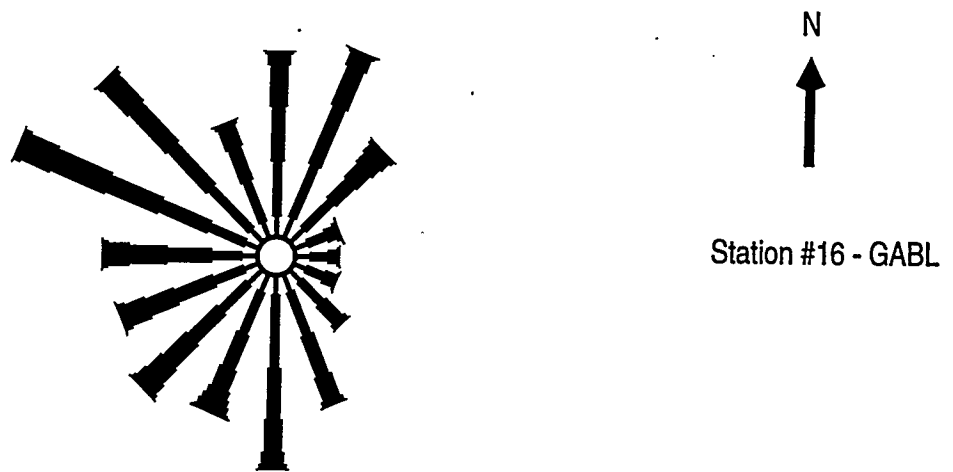
(a) Wind Rose

Period: 1/95 - 12/95



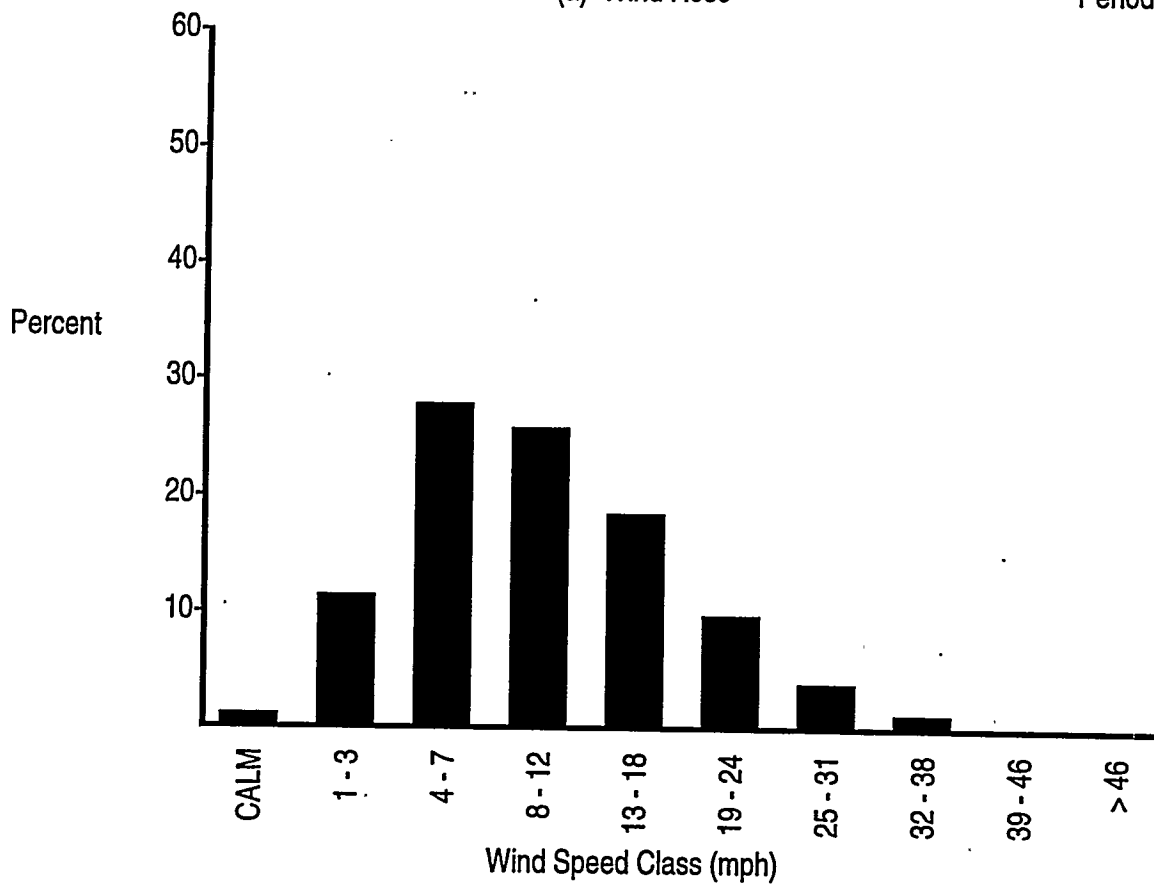
(b) Wind Speed Histogram

Figure A.1. (contd)



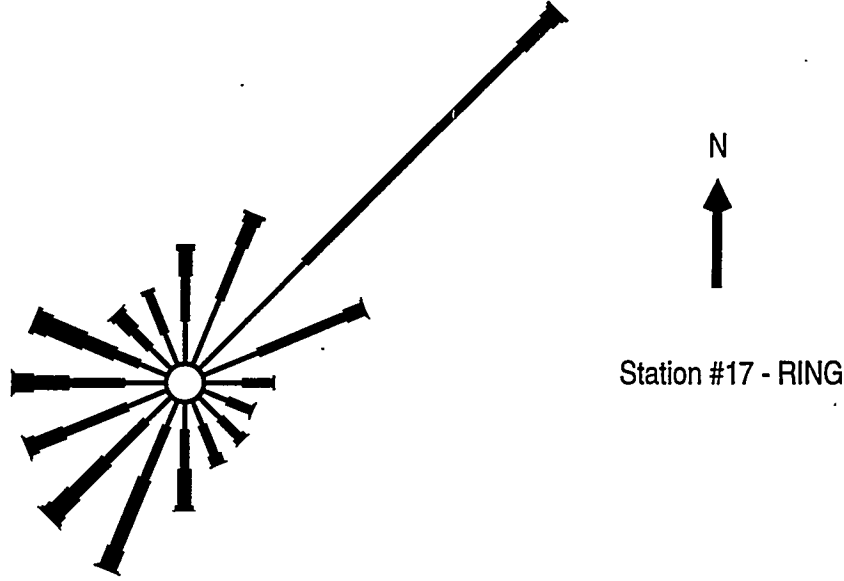
(a) Wind Rose

Period: 1/95 - 12/95



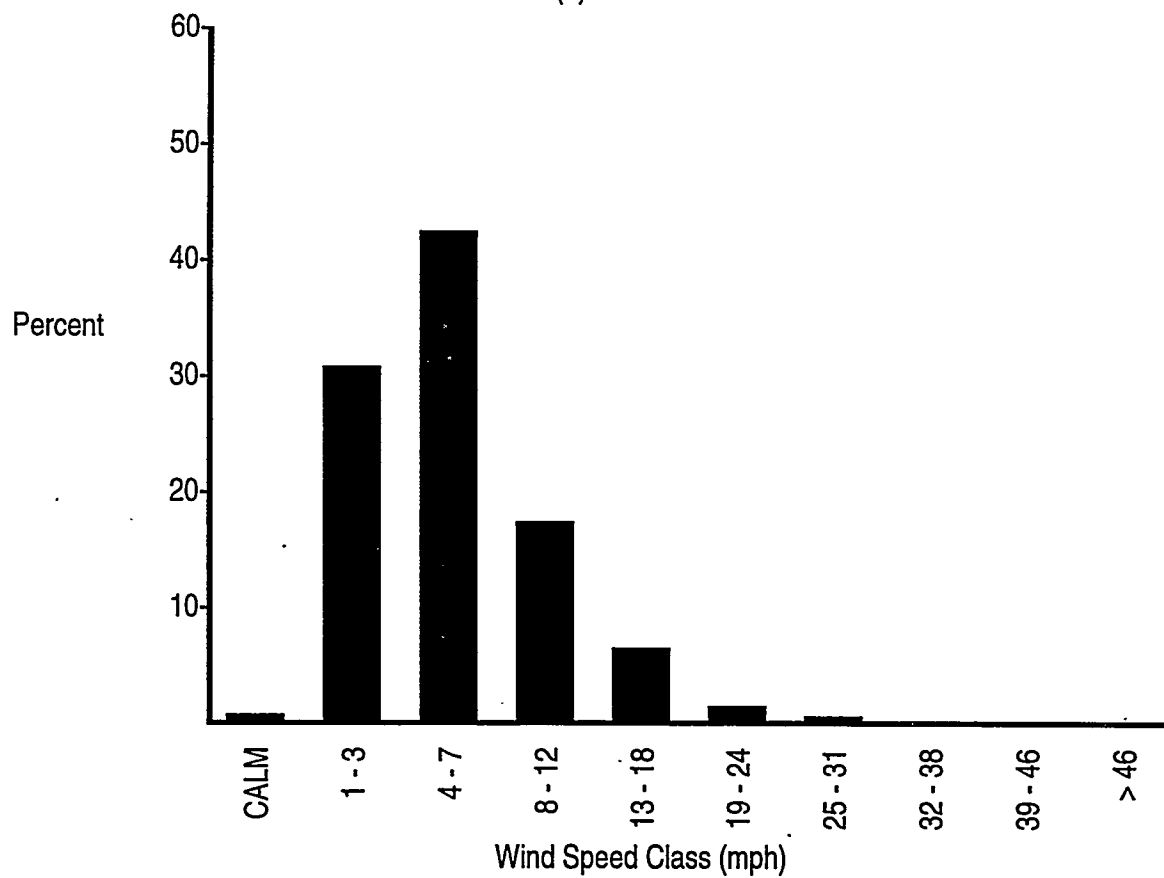
(b) Wind Speed Histogram

Figure A.1. (contd)



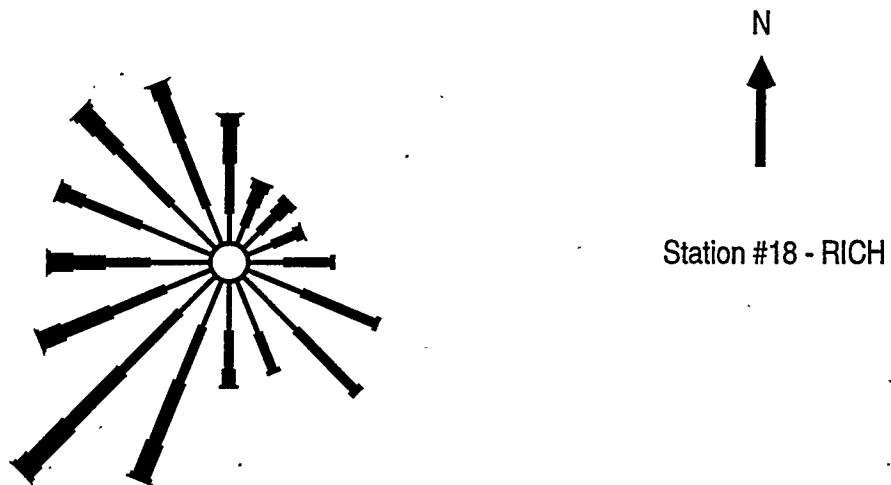
(a) Wind Rose

Period: 1/95 - 12/95



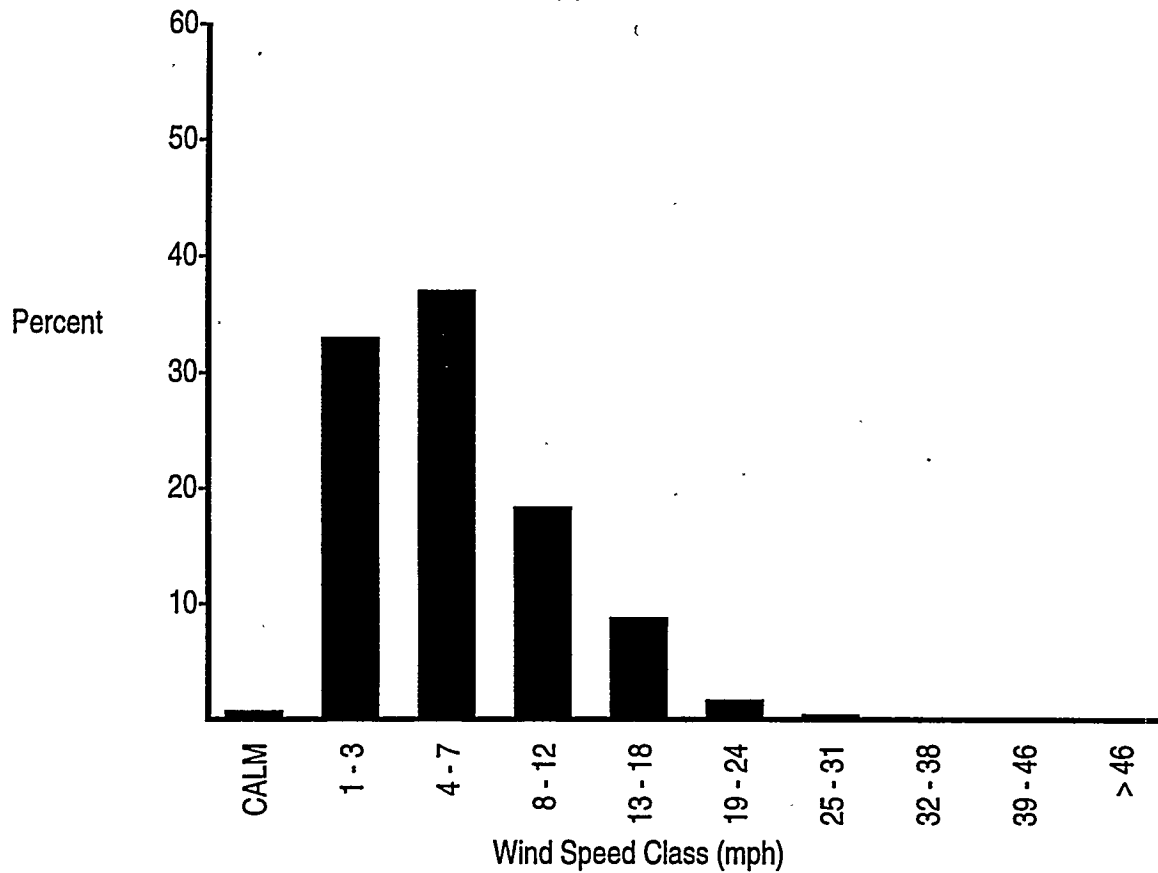
(b) Wind Speed Histogram

Figure A.1. (contd)



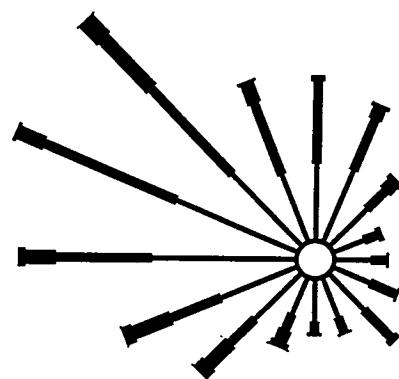
(a) Wind Rose

Period: 1/95 - 12/95



(b) Wind Speed Histogram

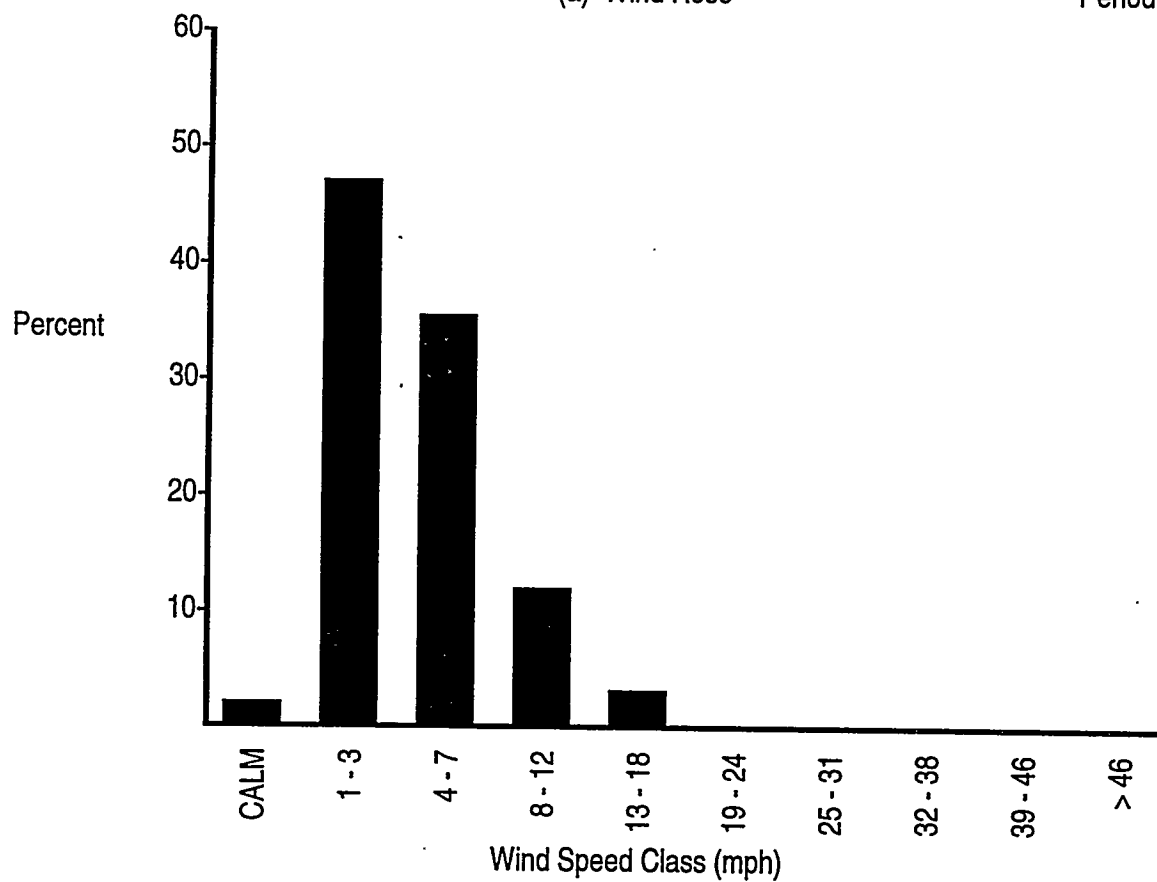
Figure A.1. (contd)



Station #19 - PFP

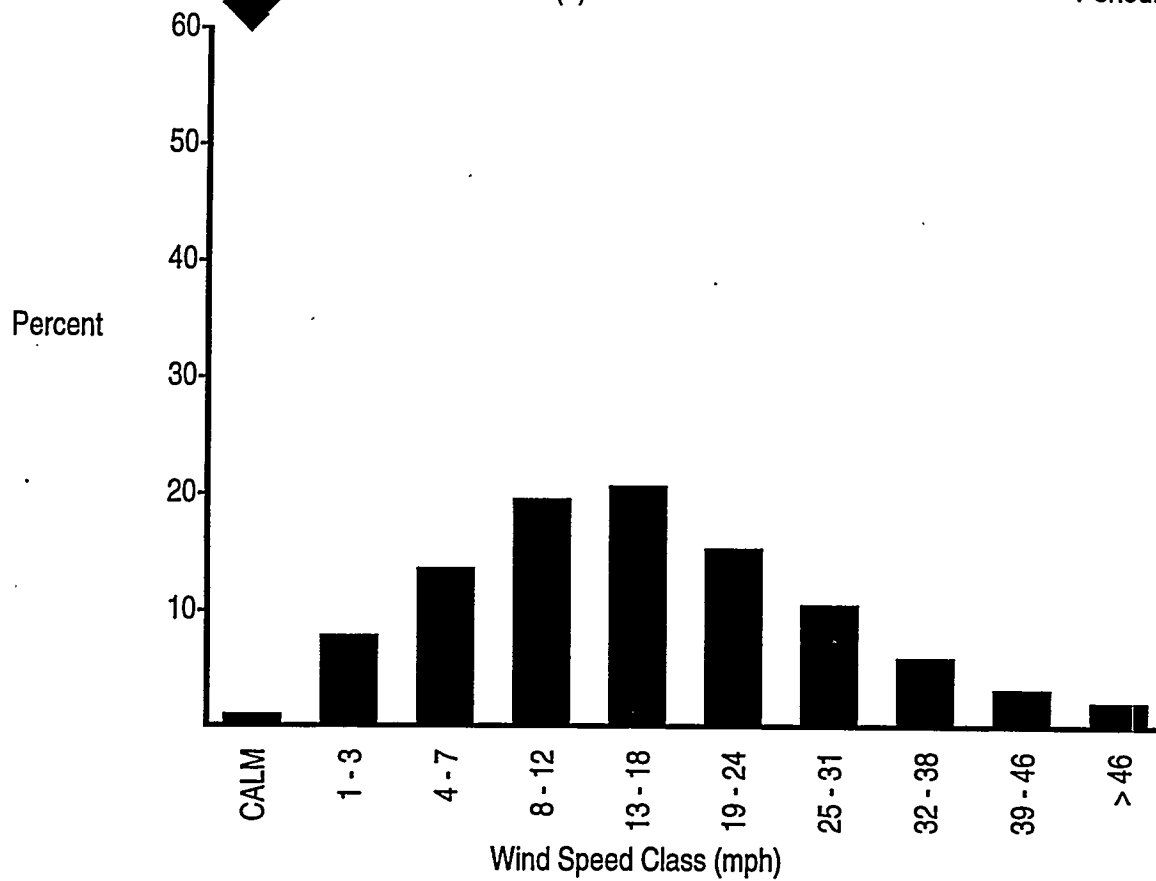
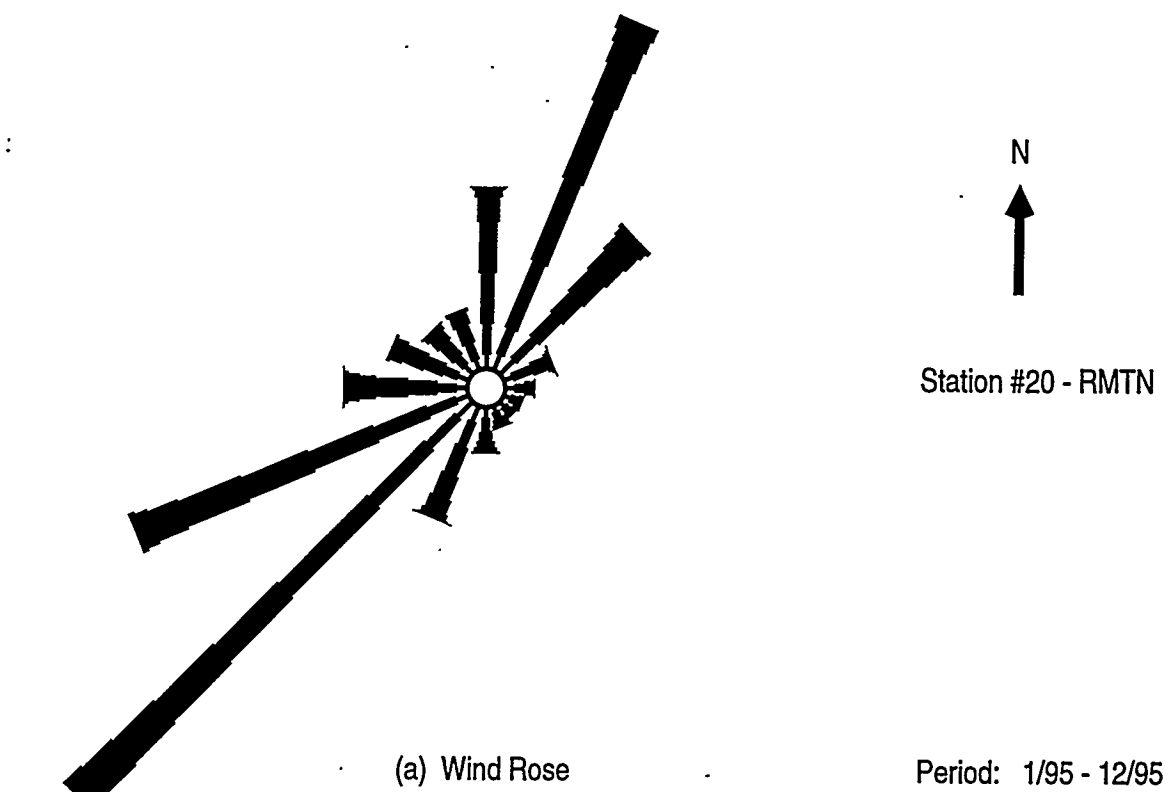
(a) Wind Rose

Period: 1/95 - 12/95



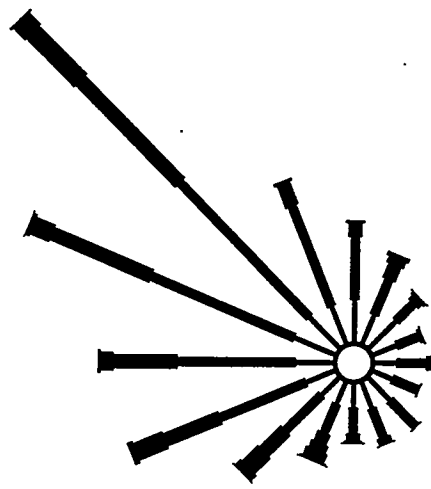
(b) Wind Speed Histogram

Figure A.1. (contd)



(b) Wind Speed Histogram

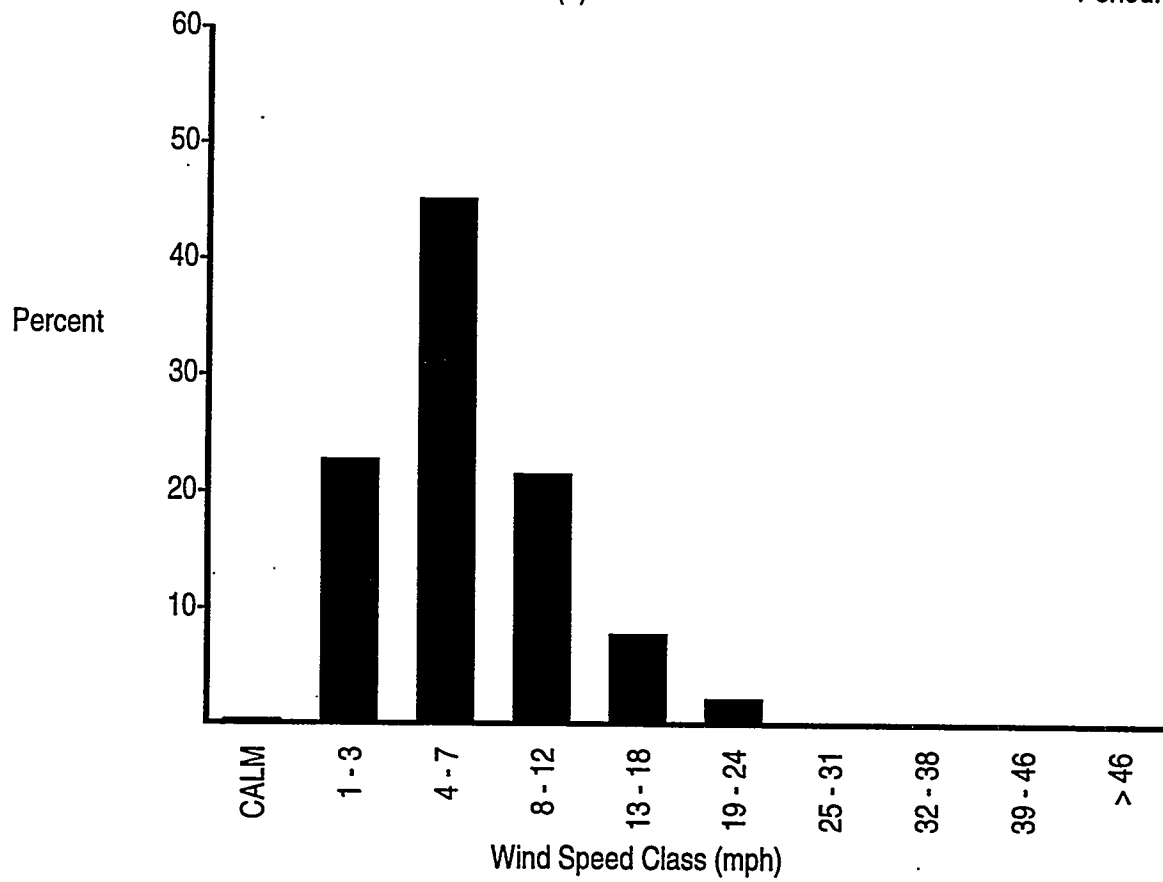
Figure A.1. (contd)



Station #21 - HMS

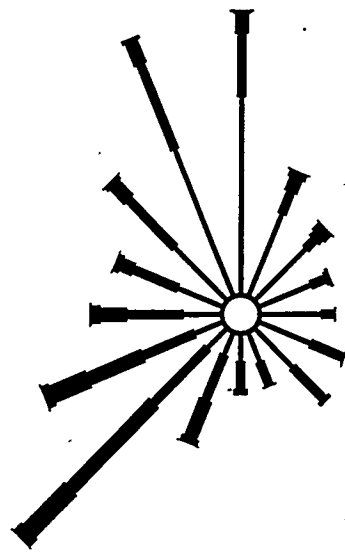
(a) Wind Rose

Period: 1/95 - 12/95、



(b) Wind Speed Histogram

Figure A.1. (contd)



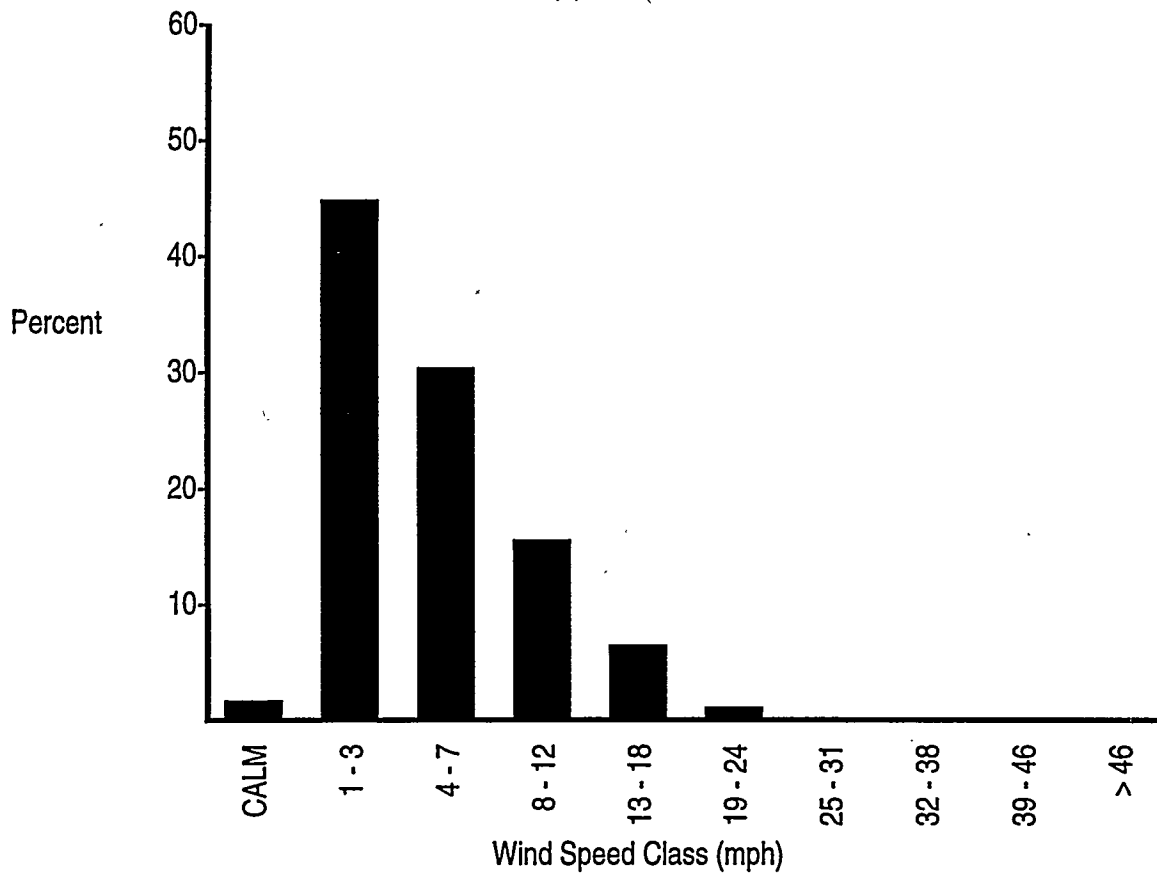
N



Station #22 - PASC

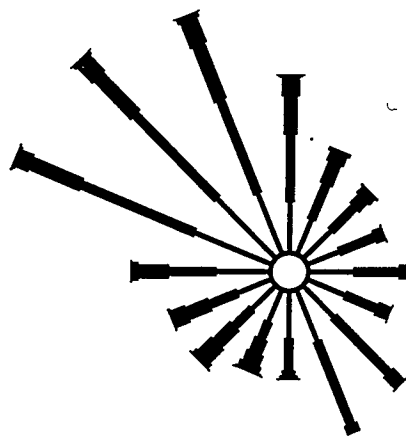
(a) Wind Rose

Period: 1/95 - 12/95



(b) Wind Speed Histogram

Figure A.1. (contd)



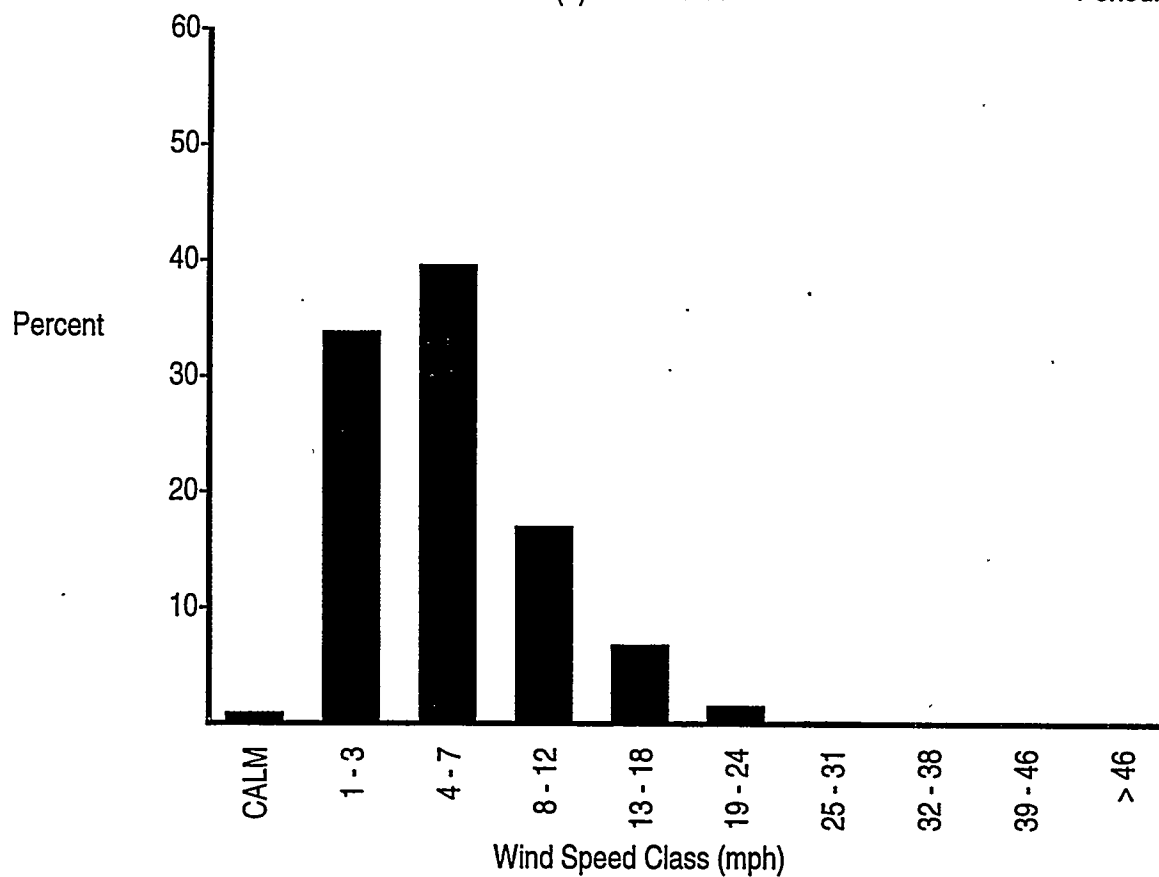
N



Station #23 - GABW

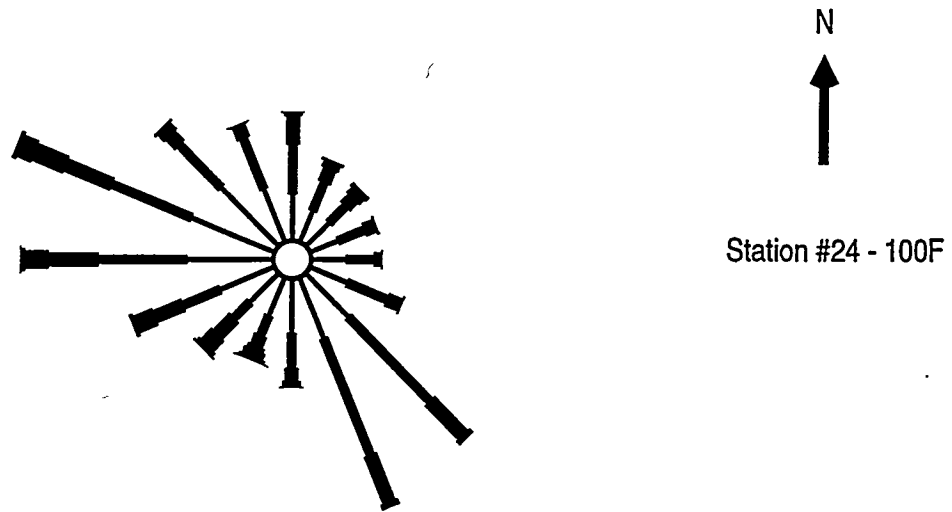
(a) Wind Rose

Period: 1/95 - 12/95



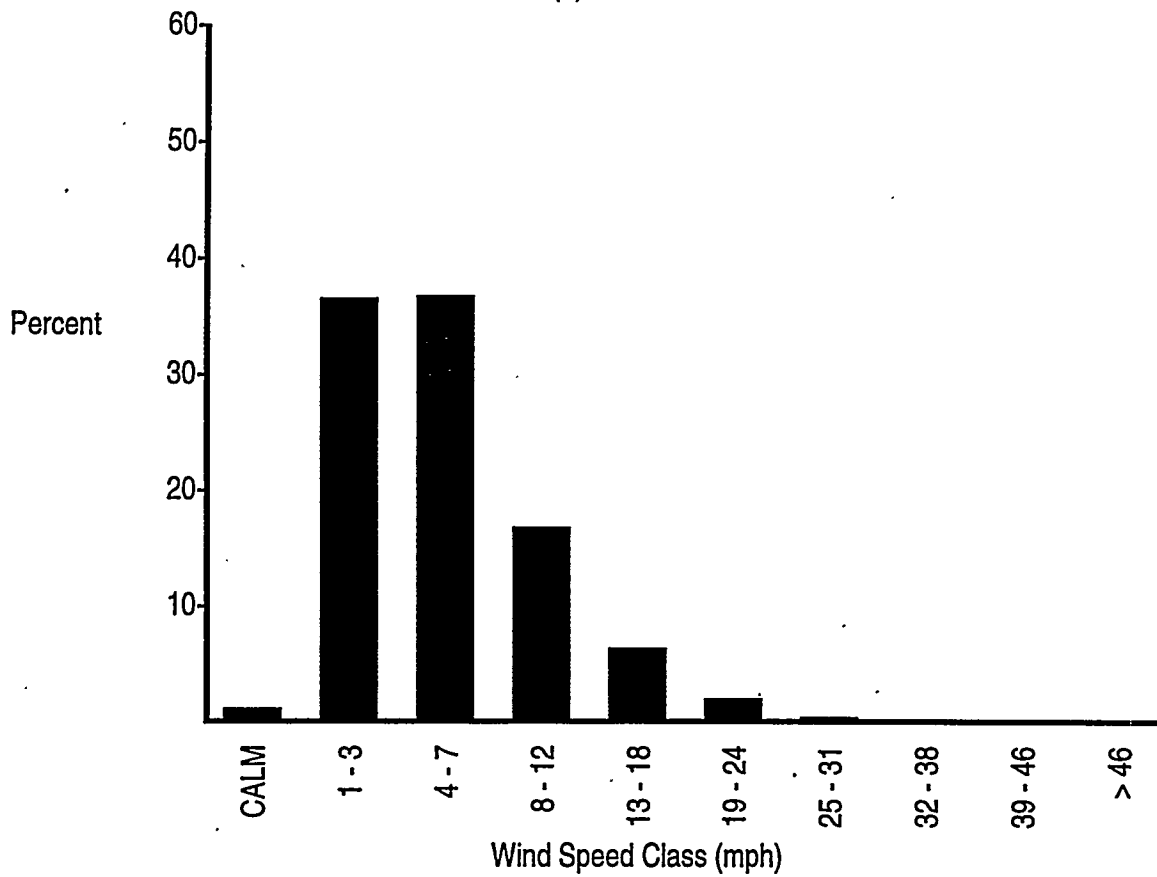
(b) Wind Speed Histogram

Figure A.1. (contd)



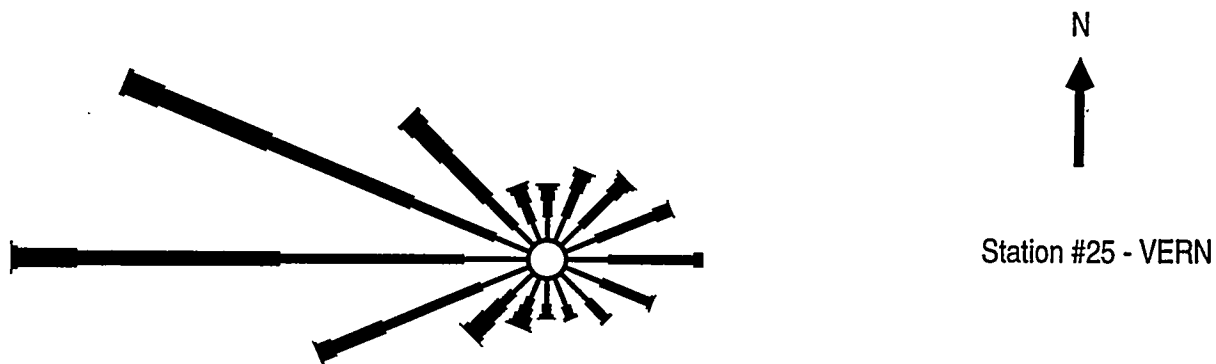
(a) Wind Rose

Period: 1/95 - 12/95



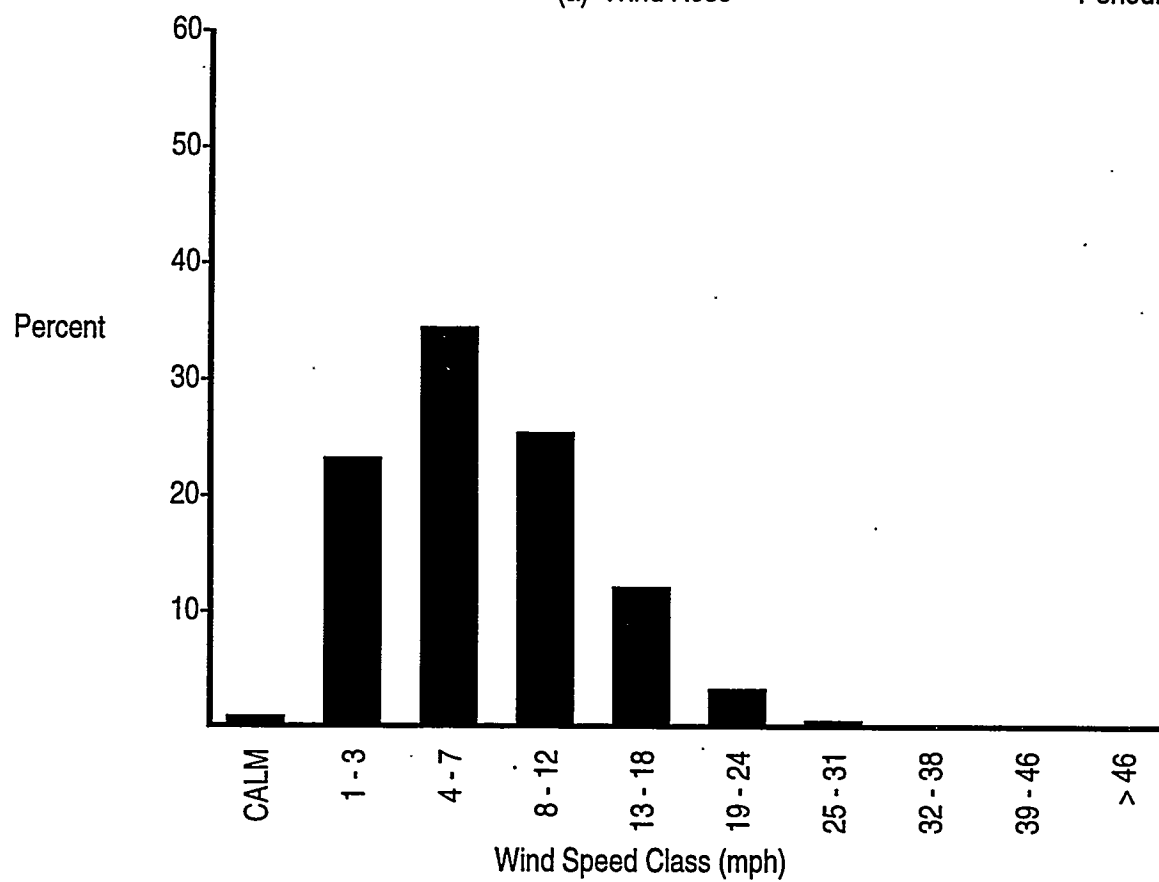
(b) Wind Speed Histogram

Figure A.1. (contd)



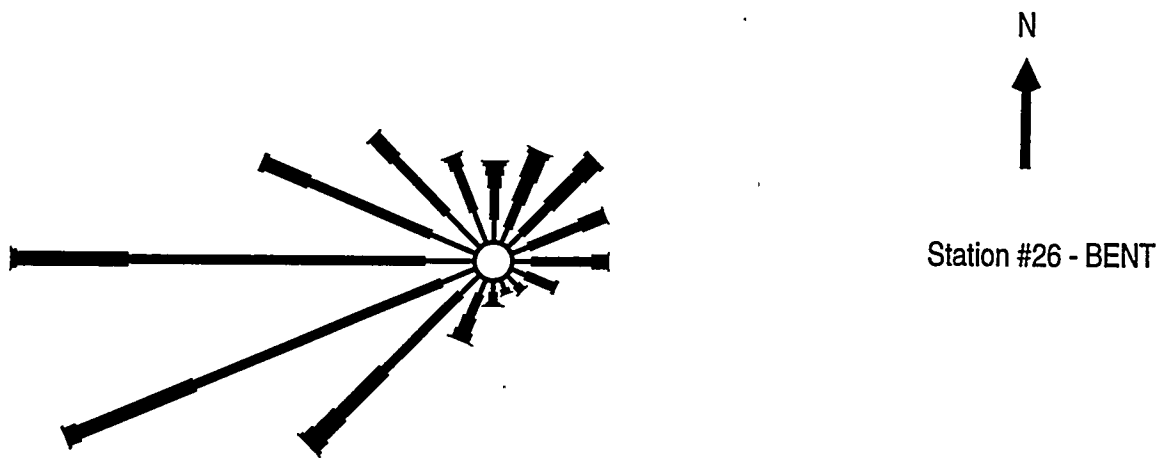
(a) Wind Rose

Period: 1/95 - 12/95



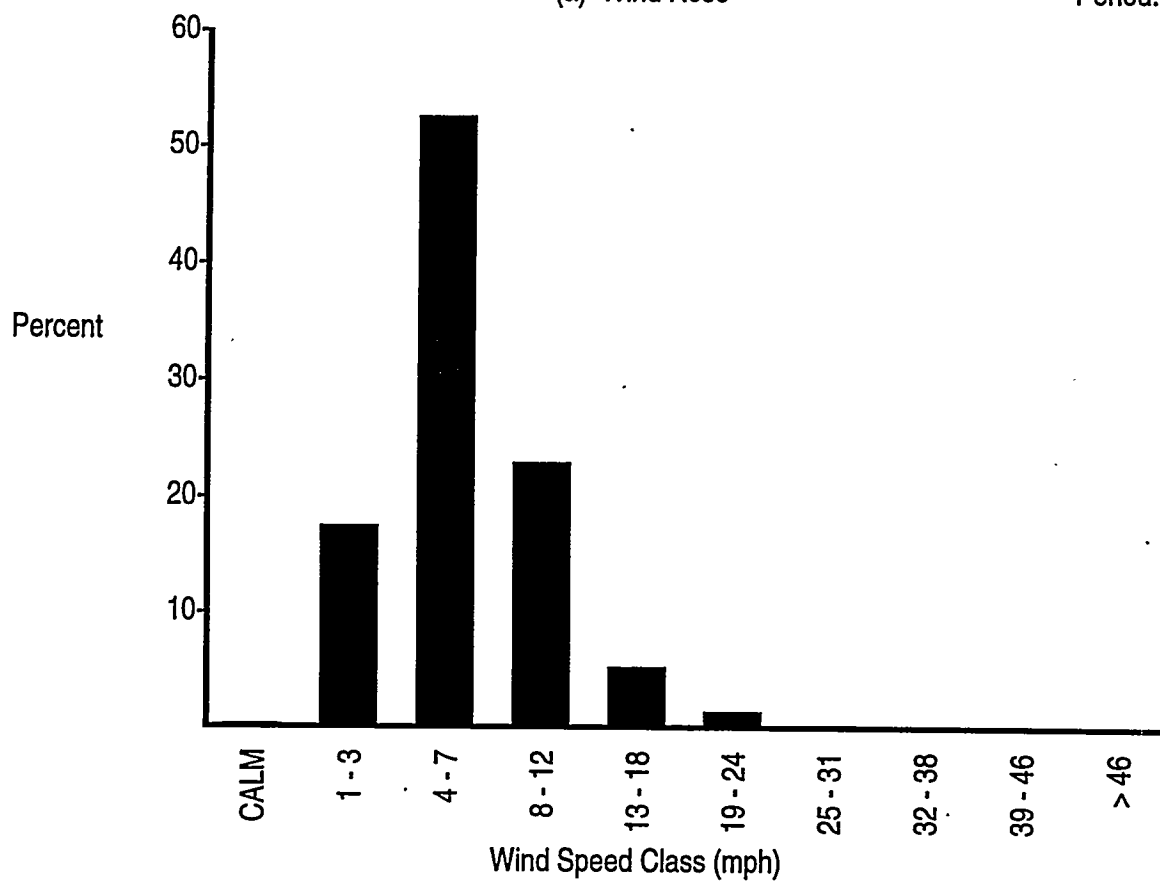
(b) Wind Speed Histogram

Figure A.1. (contd)



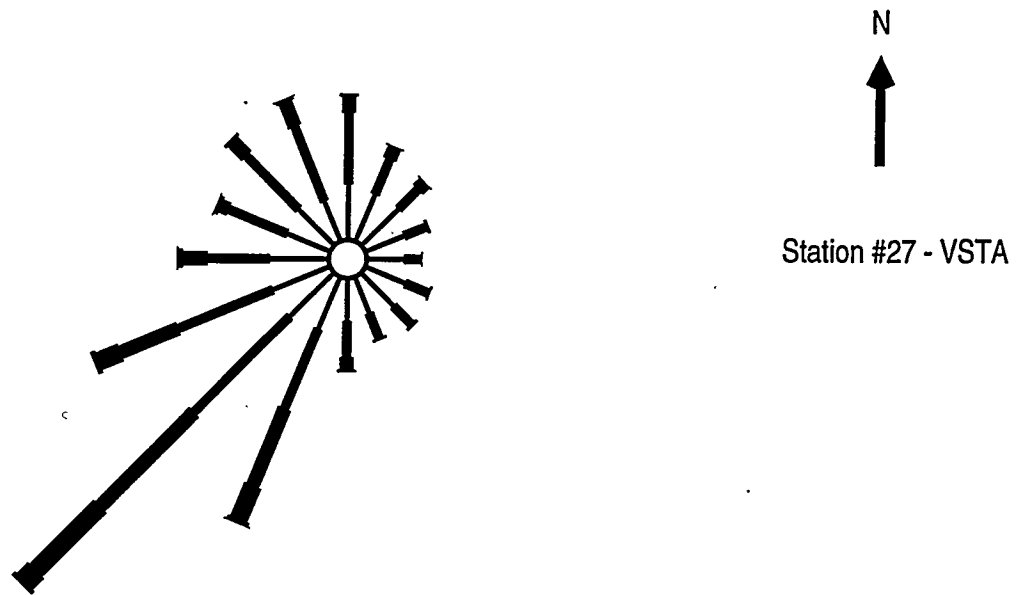
(a) Wind Rose

Period: 2/95 - 12/95



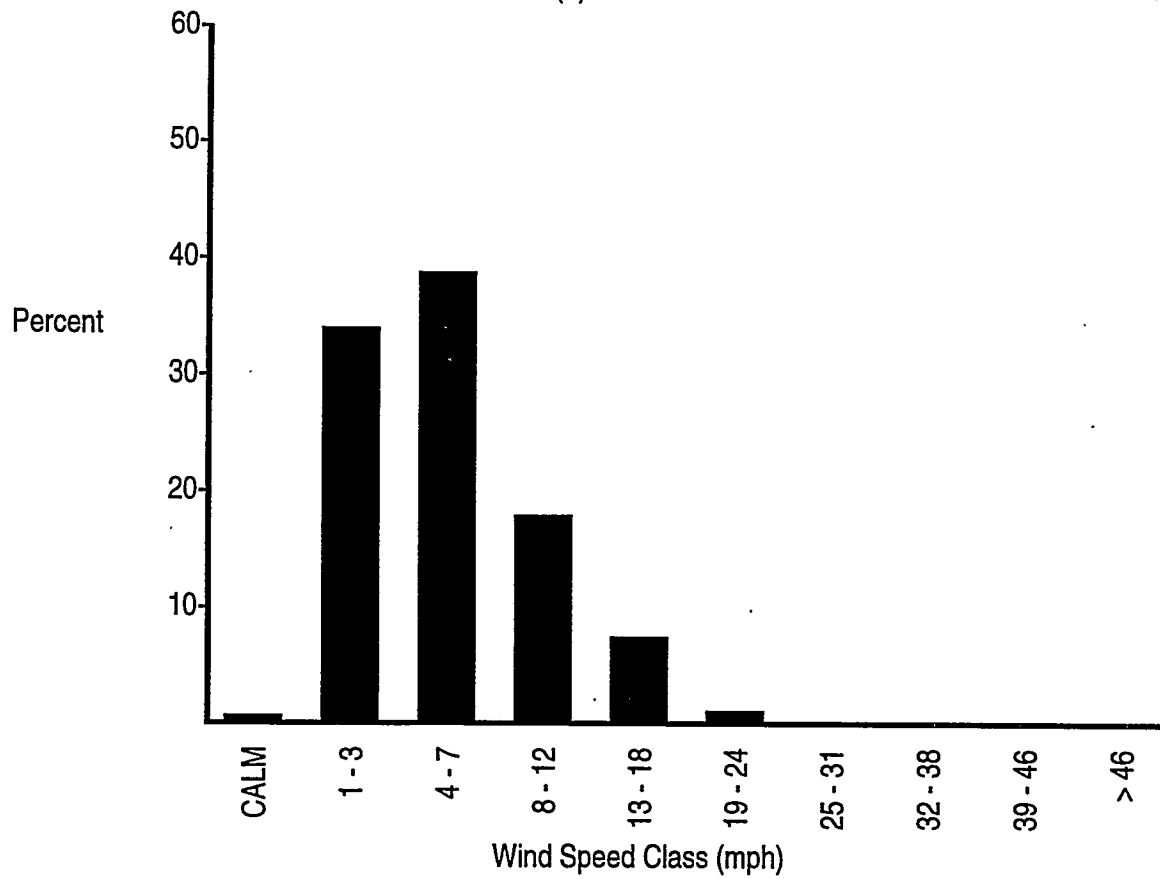
(b) Wind Speed Histogram

Figure A.1. (contd)



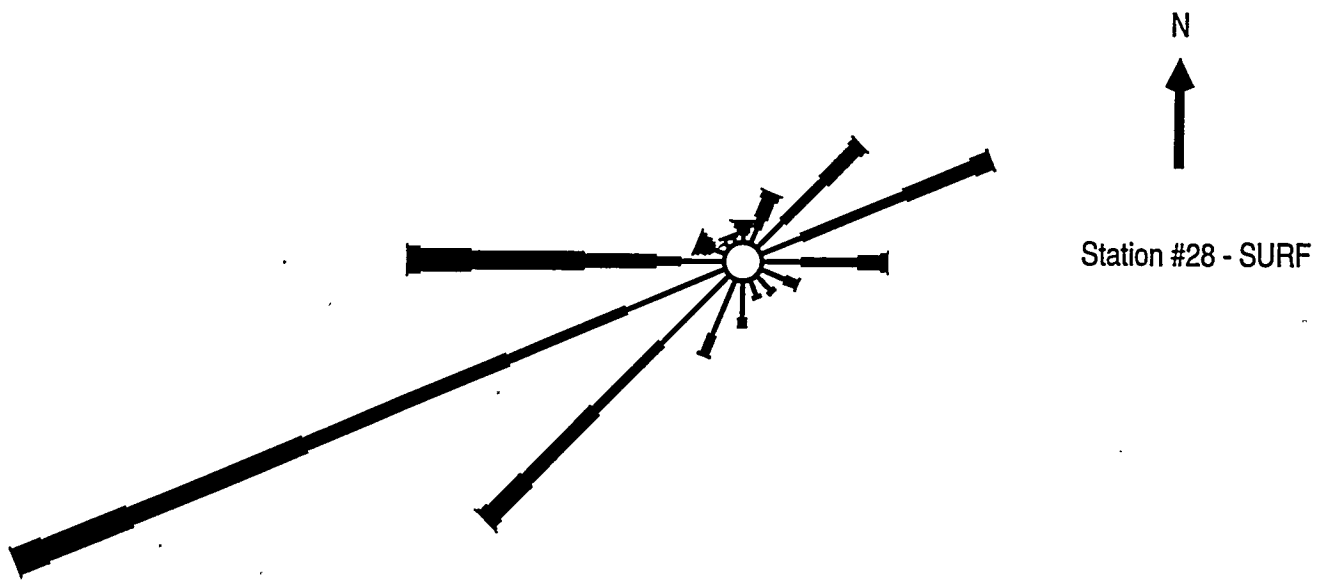
(a) Wind Rose

Period: 1/95 - 12/95



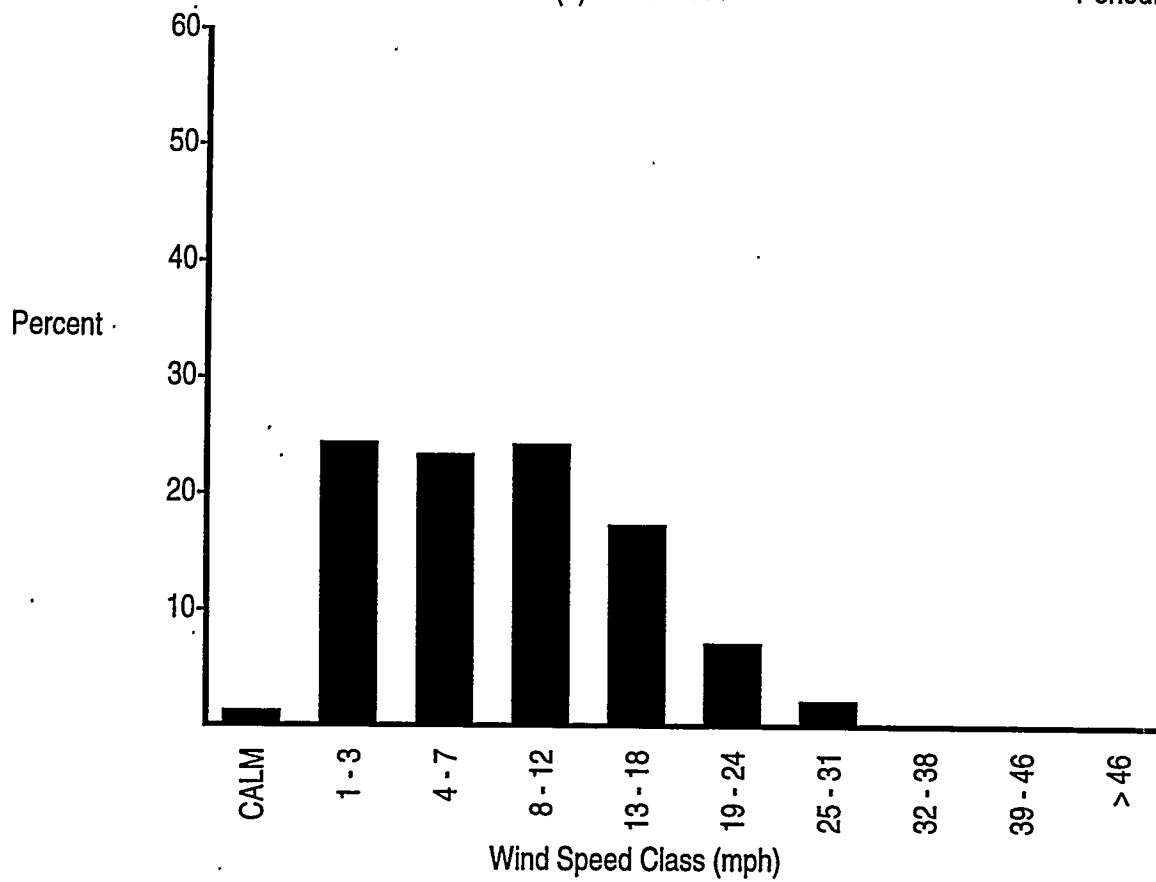
(b) Wind Speed Histogram

Figure A.1. (contd)



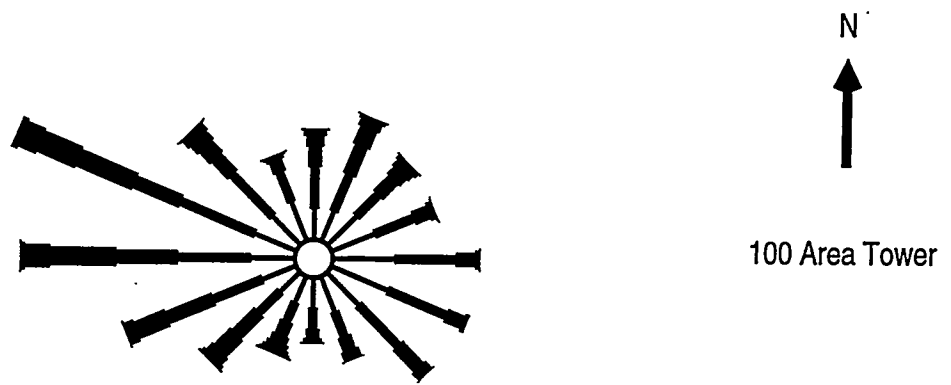
(a) Wind Rose

Period: 1/95 - 12/95



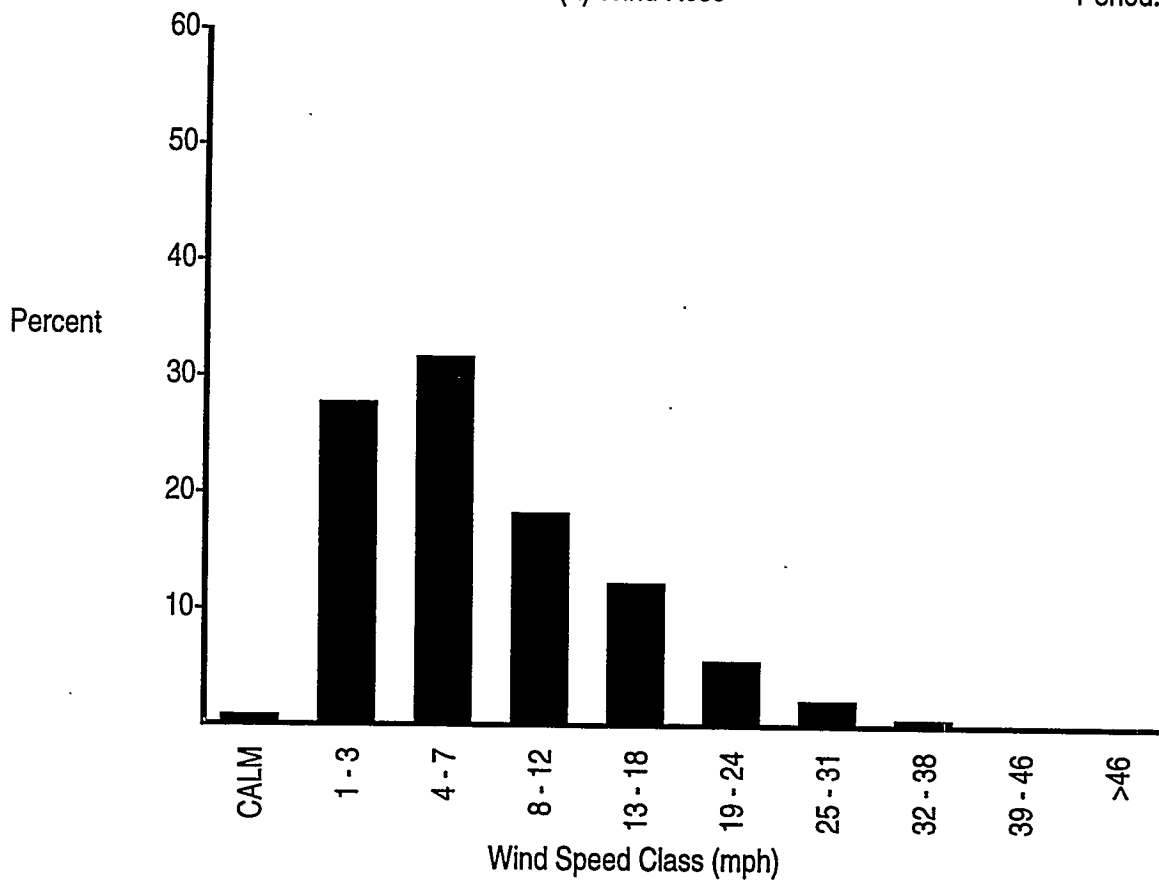
(b) Wind Speed Histogram

Figure A.1. (contd)



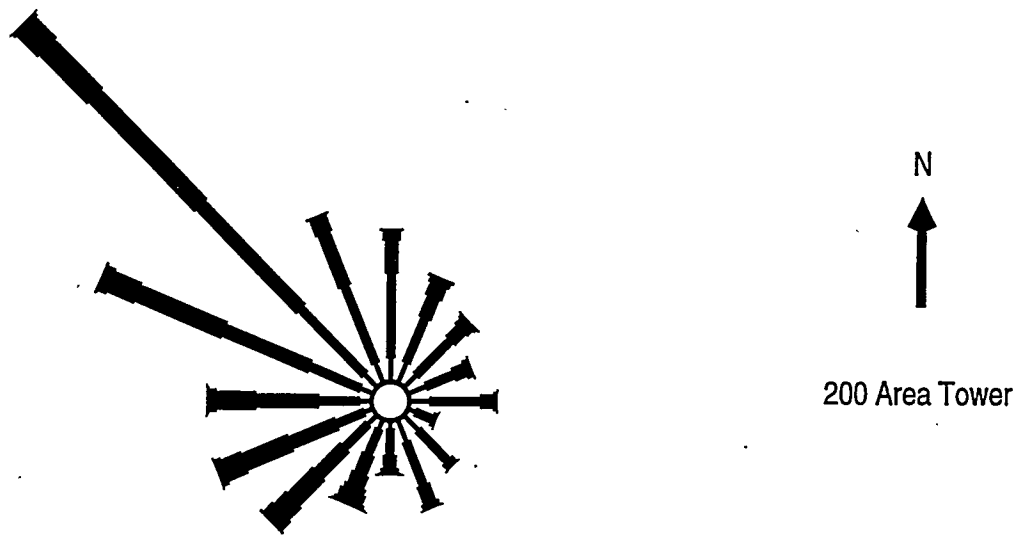
(a) Wind Rose

Period: 1/95 - 12/95



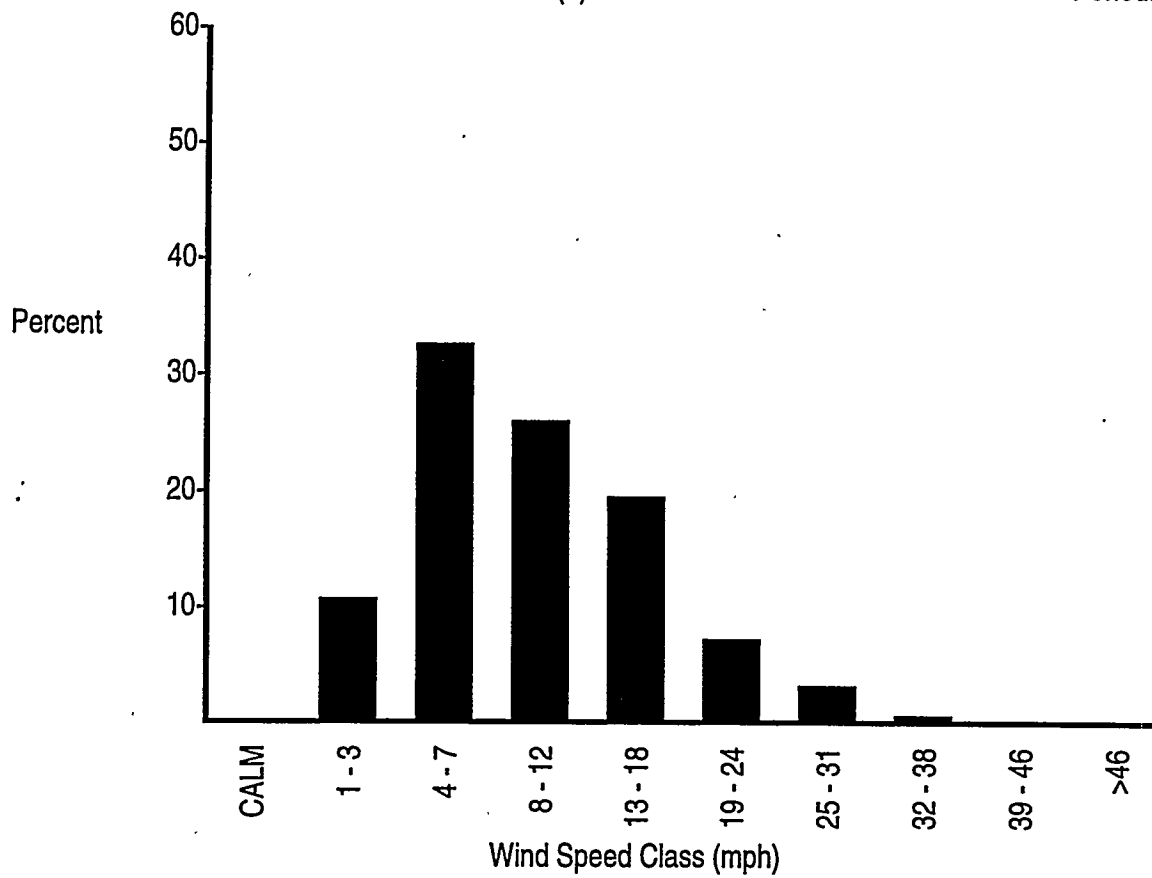
(b) Wind Speed Histogram

Figure A.2. Wind Rose and Wind Speed Histogram (60 m)



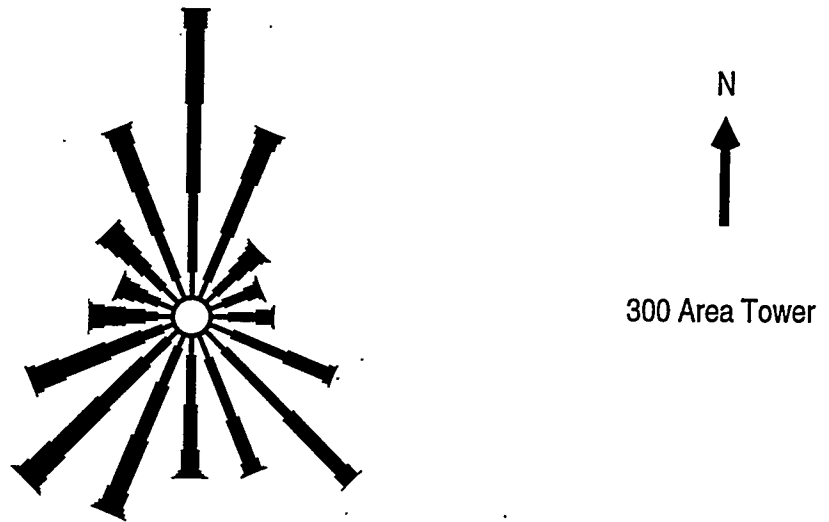
(a) Wind Rose

Period: 1/95 - 12/95



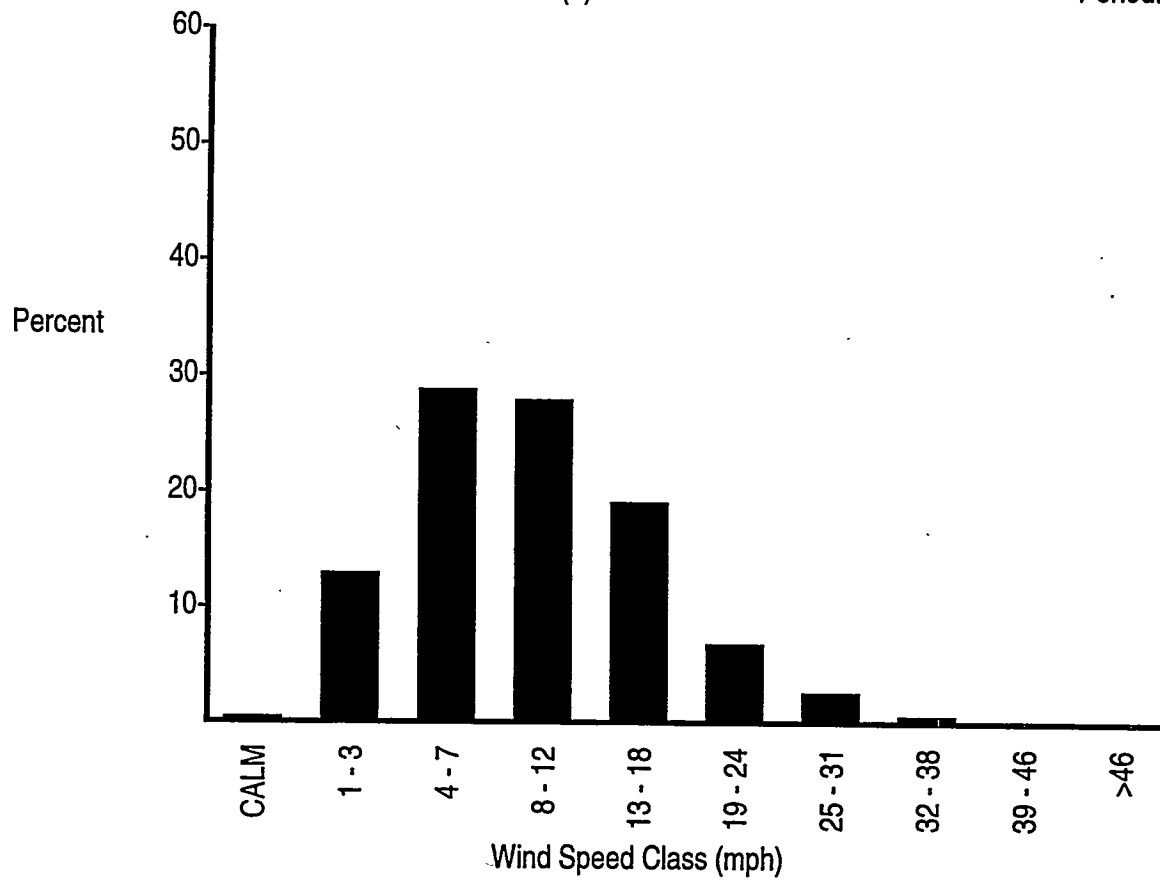
(b) Wind Speed Histogram

Figure A.2. (contd)



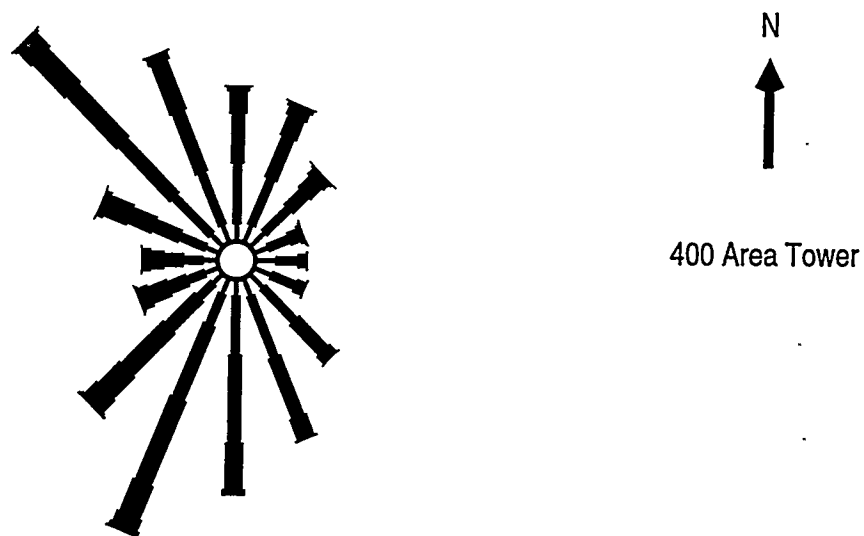
(a) Wind Rose

Period: 1/95 - 12/95



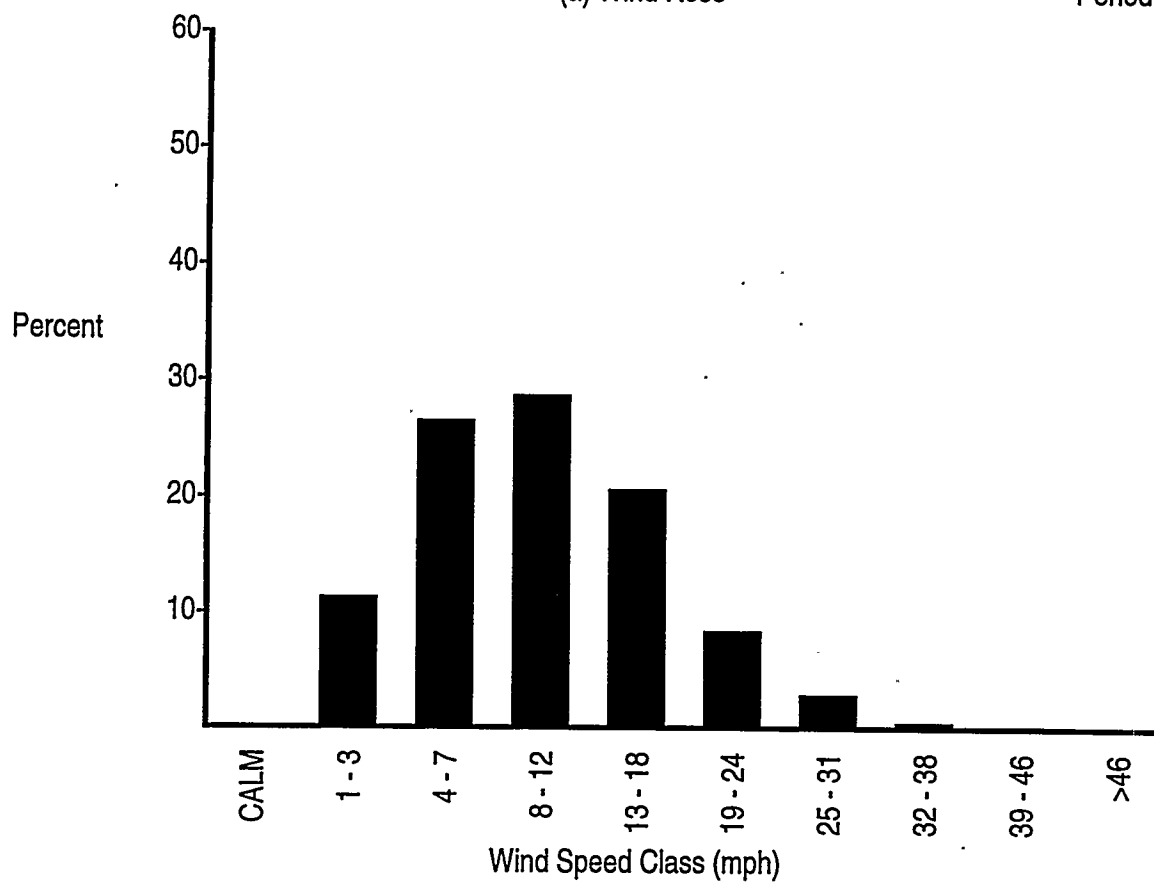
(b) Wind Speed Histogram

Figure A.2. (contd)



(a) Wind Rose

Period: 1/95 - 12/95



(b) Wind Speed Histogram

Figure A.2. (contd)

Table A.1. Joint Frequency Distribution (%) for Meteorological Monitoring Network Wind Stations at 10-m Level, 1995

Station: (1) PROS

	Begin: 1/95									End: 12/95						Total Hours: 8641			
	Direction																		
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Calm	Total	
Calm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.6	
1-3	2.0	1.5	1.1	1.0	0.9	1.1	1.5	2.0	2.2	1.9	1.6	1.1	1.2	1.5	2.4	2.5	0.0	25.5	
4-7	3.2	1.8	1.1	0.9	0.8	1.0	2.6	4.5	3.8	3.2	1.9	0.7	0.6	0.8	3.2	5.4	0.0	35.5	
8-12	2.4	1.0	0.4	0.2	0.1	0.2	0.6	1.2	2.6	4.1	2.3	0.7	0.5	0.6	2.4	4.5	0.0	23.9	
13-18	0.6	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.5	2.6	1.9	0.8	0.4	0.3	1.6	1.5	0.0	11.1	
19-24	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.6	0.2	0.1	0.1	0.6	0.1	0.0	2.5	
25-31	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.4	0.0	0.0	0.0	0.1	0.0	0.0	0.8	
32-38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	
39-46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
> 46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total	8.4	5.0	3.0	2.1	1.9	2.3	4.7	7.7	9.1	12.4	8.8	3.6	2.7	3.3	10.4	14.0	0.6	100.0	

Station: (2) EOC

	Begin: 1/95									End: 12/95						Total Hours: 8608			
	Direction																		
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Calm	Total	
Calm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.1	
1-3	0.9	1.0	1.0	0.7	0.7	0.8	0.7	0.9	1.2	1.0	1.3	1.3	1.4	1.5	1.5	1.0	0.0	16.8	
4-7	2.4	2.0	1.2	1.0	1.0	1.0	1.1	1.1	1.8	2.1	1.5	1.2	2.0	3.5	4.2	3.5	0.0	30.8	
8-12	1.9	0.8	0.3	0.1	0.0	0.1	0.2	0.3	0.8	2.1	3.3	2.1	1.7	3.3	6.0	4.2	0.0	27.1	
13-18	0.8	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.6	2.2	2.6	1.3	0.6	3.6	3.0	0.0	15.4	
19-24	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.8	1.7	0.6	0.3	0.8	0.5	0.0	6.1	
25-31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.9	0.6	0.2	0.1	0.0	0.0	0.0	2.0	
32-38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.6	
39-46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	
> 46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total	6.2	4.4	2.6	1.9	1.7	1.9	2.0	2.2	3.8	6.1	11.4	9.7	7.3	9.4	16.1	12.1	1.1	100.0	

Station: (3) ARMY

	Begin: 1/95									End: 12/95					Total Hours: 8641				
	Direction									SW	WSW	W	WNW	NW	NNW	Calm	Total		
	N	NNE	NE	ENE	E	ESE	SE	SSE	S									SSW	
Calm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	1.2	
1-3	1.9	1.4	1.7	2.1	2.5	2.0	1.7	1.2	0.9	0.7	0.9	1.2	2.1	3.3	3.4	2.4	0.0	29.3	
4-7	2.0	1.3	1.4	1.6	2.6	2.6	1.9	0.9	0.4	0.5	0.4	1.0	3.0	8.4	8.1	2.8	0.0	39.1	
8-12	1.1	0.7	0.5	0.3	0.4	0.5	0.7	0.5	0.3	0.3	0.6	1.3	2.1	5.4	3.7	1.2	0.0	19.5	
13-18	0.1	0.3	0.2	0.0	0.0	0.1	0.2	0.1	0.1	0.2	0.7	1.2	1.2	1.2	1.2	0.2	0.0	7.2	
19-24	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.5	0.5	0.2	0.2	0.6	0.0	0.0	2.5	
25-31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.1	0.1	0.0	0.1	0.0	0.0	0.8	
32-38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	
39-46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
> 46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total	5.1	4.0	3.9	4.0	5.5	5.2	4.6	2.8	1.6	2.2	3.5	5.3	8.7	18.5	17.3	6.7	1.2	100.0	

Table A.1. (contd)

Station: (4) RSPG

	Begin: 1/95								End: 12/95								Total Hours: 8588	
	Direction																Calm	Total
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
Calm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.8
1-3	1.7	1.7	1.7	1.5	1.6	1.3	0.9	0.7	0.7	0.7	1.8	2.3	1.8	1.3	1.0	1.2	0.0	22.0
4-7	2.4	2.2	1.5	1.0	1.6	2.3	0.9	0.4	0.4	0.7	2.1	10.2	5.6	1.6	2.0	2.1	0.0	36.9
8-12	0.5	0.7	0.6	0.2	0.1	0.2	0.0	0.0	0.1	0.6	1.6	15.6	6.1	2.1	1.5	1.0	0.0	30.9
13-18	0.1	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.0	2.2	1.9	0.8	0.7	0.4	0.0	7.8
19-24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.4	0.2	0.1	0.1	0.1	0.1	0.0	1.1
25-31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.5
32-38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
39-46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
> 46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	4.6	4.9	3.9	2.7	3.3	3.8	1.8	1.0	1.3	2.8	7.0	30.5	15.6	5.9	5.3	4.8	0.8	100.0

Station: (5) EDNA

	Begin: 1/95								End: 12/95								Total Hours: 8639			
	Direction																Calm	Total		
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW				
Calm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.9		
1-3	0.9	0.6	0.6	0.8	1.0	2.0	3.6	3.8	3.2	2.0	1.1	1.3	2.2	2.7	3.1	1.8	0.0	30.7		
4-7	1.7	0.8	0.7	1.0	1.7	4.7	7.2	3.8	1.6	0.8	0.8	0.8	0.9	3.0	7.0	5.0	0.0	41.5		
8-12	1.3	0.5	0.5	0.3	0.8	1.6	1.2	1.0	1.0	0.7	0.7	1.1	1.0	1.3	2.8	2.5	0.0	18.1		
13-18	0.2	0.2	0.4	0.1	0.1	0.1	0.2	0.2	0.4	0.3	0.5	0.7	0.6	1.3	0.7	0.2	0.0	6.3		
19-24	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.1	0.1	0.6	0.2	0.0	0.0	1.9		
25-31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.5		
32-38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
39-46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
> 46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total	4.1	2.4	2.4	2.1	3.5	8.5	12.1	8.9	6.3	4.2	3.3	3.9	4.9	9.3	13.9	9.4	0.9	100.0		

Station: (6) 200E

	Begin: 1/95								End: 12/95						Total Hours: 8641				
	Direction																Calm	Total	
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW			
Calm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4	
1-3	1.6	1.2	1.2	1.3	1.7	1.5	1.5	1.3	1.1	0.8	1.1	1.2	1.6	1.4	1.9	1.6	0.0	22.1	
4-7	1.6	1.5	0.9	0.9	1.4	1.9	2.7	2.4	1.6	1.5	1.8	3.1	4.5	6.4	4.3	2.0	0.0	38.5	
8-12	0.7	1.0	0.5	0.3	0.3	0.3	0.8	1.0	0.5	0.6	1.3	2.7	4.3	7.6	2.6	0.5	0.0	25.0	
13-18	0.1	0.3	0.3	0.1	0.0	0.0	0.0	0.1	0.2	0.3	0.9	1.2	1.3	3.8	1.0	0.1	0.0	9.8	
19-24	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.5	0.4	0.3	1.0	0.5	0.0	0.0	3.5	
25-31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.3	0.1	0.0	0.0	0.7	
32-38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	
39-46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
> 46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total	4.0	4.3	3.1	2.6	3.4	3.7	5.1	4.8	3.5	3.7	5.7	8.6	12.0	20.5	10.4	4.3	0.4	100.0	

Table A.1. (contd)

Station: (7) 200W

Begin: 1/95

End: 12/95

Total Hours: 8634

	Direction																Calm	Total
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
Calm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	1.6
1-3	2.2	2.1	1.8	1.6	1.8	1.7	2.2	2.0	1.6	1.6	1.9	2.7	3.9	5.0	4.0	2.5	0.0	38.6
4-7	3.0	1.8	1.3	0.9	1.1	1.4	1.6	1.0	0.7	1.0	1.3	2.0	3.7	6.4	4.8	3.1	0.0	34.9
8-12	0.7	0.7	0.5	0.2	0.1	0.3	0.2	0.1	0.2	0.4	1.1	2.1	2.7	2.3	2.7	1.6	0.0	15.9
13-18	0.0	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.5	1.1	1.5	0.6	0.5	1.7	0.4	0.0	6.9
19-24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.3	0.1	0.1	0.7	0.0	0.0	1.8
25-31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.3
32-38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39-46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
> 46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	5.9	5.0	3.7	2.7	3.0	3.5	4.2	3.0	2.5	3.7	5.7	8.6	11.0	14.3	14.0	7.8	1.6	100.0

Station: (8) BVLY

Begin: 1/95

End: 12/95

Total Hours: 8641

	Direction																Calm	Total
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
Calm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.8
1-3	2.5	1.9	1.5	1.3	1.6	1.7	2.1	1.6	1.6	1.2	1.2	1.2	1.3	1.5	2.0	2.2	0.0	26.4
4-7	7.8	3.1	0.6	0.4	1.1	2.8	1.9	1.1	1.0	0.8	0.7	0.9	1.4	2.8	4.4	6.7	0.0	37.6
8-12	8.0	1.9	0.3	0.1	0.6	0.7	0.2	0.2	0.2	0.3	0.3	0.5	1.2	3.4	3.0	2.3	0.0	23.2
13-18	0.6	0.4	0.2	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.5	0.3	0.6	3.3	1.5	0.0	0.0	7.9
19-24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.0	1.9	0.6	0.0	0.0	3.0
25-31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.8	0.1	0.0	0.0	1.0
32-38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1
39-46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
> 46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	18.9	7.4	2.5	1.7	3.3	5.2	4.1	3.0	3.0	2.6	3.0	3.0	4.6	13.7	11.8	11.2	0.8	100.0

Station: (9) FFTF

Begin: 1/95

End: 12/95

Total Hours: 8639

	Direction																Calm	Total
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
Calm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.8
1-3	1.4	1.2	0.9	0.7	0.9	1.0	1.1	0.9	1.2	1.1	0.9	1.1	1.0	1.3	1.3	1.3	0.0	17.4
4-7	3.2	3.0	2.0	1.2	1.2	1.2	2.9	3.8	4.0	3.3	1.8	1.2	1.1	1.6	4.1	3.8	0.0	39.3
8-12	1.7	1.7	0.8	0.2	0.2	0.2	1.3	3.1	3.2	4.0	1.6	0.8	0.6	1.0	4.0	3.4	0.0	27.9
13-18	0.2	0.5	0.5	0.0	0.0	0.0	0.0	0.2	0.8	2.7	1.7	0.7	0.5	0.7	1.9	0.5	0.0	11.0
19-24	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.9	0.1	0.1	0.2	0.6	0.0	0.0	3.0
25-31	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.1	0.1	0.0	0.0	0.5
32-38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2
39-46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
> 46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	6.6	6.5	4.3	2.1	2.2	2.5	5.3	8.1	9.2	12.1	7.2	3.9	3.3	4.8	12.0	9.1	0.8	100.0

Table A.1. (contd)

Station: (10) YAKB

Begin: 1/95

End: 12/95

Total Hours: 8640

	Direction																Calm	Total
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
Calm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5
1-3	1.4	1.6	1.4	1.0	0.9	0.8	1.0	1.0	1.2	1.1	1.6	1.7	2.1	2.0	1.8	1.6	0.0	22.2
4-7	3.9	3.6	1.8	0.9	0.9	0.9	1.3	1.0	0.7	0.7	1.3	3.4	7.7	4.9	3.3	3.2	0.0	39.5
8-12	2.0	0.9	0.5	0.2	0.1	0.1	0.2	0.1	0.1	0.4	1.7	2.8	3.1	2.1	5.7	4.0	0.0	24.1
13-18	0.5	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.0	1.5	0.6	0.5	3.7	1.1	0.0	9.8
19-24	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5	0.2	0.1	0.1	1.8	0.2	0.0	3.4
25-31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.2	0.0	0.0	0.5
32-38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
39-46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
> 46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	7.8	6.7	4.0	2.2	1.8	1.7	2.5	2.1	2.1	2.8	6.2	9.7	13.6	9.5	16.6	10.1	0.5	100.0

Station: (11) 300A

Begin: 1/95

End: 12/95

Total Hours: 8638

	Direction																Calm	Total
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
Calm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.7
1-3	1.3	0.7	0.5	0.5	0.8	1.3	1.9	1.9	1.8	1.3	1.1	1.0	1.4	1.5	1.8	1.7	0.0	20.3
4-7	4.0	1.7	1.1	1.2	1.5	4.6	6.8	3.5	2.6	2.3	1.7	1.0	0.7	0.9	2.1	4.4	0.0	40.2
8-12	4.2	2.2	0.8	0.2	0.3	1.1	1.6	0.8	1.4	2.9	2.9	1.7	0.7	0.4	0.9	2.8	0.0	25.2
13-18	0.5	0.8	0.3	0.1	0.0	0.0	0.1	0.1	0.4	1.9	2.1	1.3	0.5	0.2	0.8	1.1	0.0	10.1
19-24	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.9	0.3	0.2	0.1	0.4	0.2	0.0	2.8
25-31	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.0	0.0	0.1	0.0	0.0	0.0	0.7
32-38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1
39-46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
> 46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	10.2	5.6	2.8	2.1	2.6	7.0	10.4	6.2	6.3	8.9	9.1	5.4	3.5	3.1	6.0	10.1	0.7	100.0

Station: (12) WYEB

Begin: 1/95

End: 12/95

Total Hours: 8640

	Direction																Calm	Total
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
Calm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5
1-3	1.9	1.3	1.6	1.3	1.6	1.5	1.6	1.7	1.5	1.5	1.0	1.0	1.0	1.1	1.6	1.5	0.0	22.5
4-7	3.0	1.7	1.7	1.3	2.1	2.3	3.0	3.9	3.7	2.4	1.8	1.7	1.9	2.8	4.1	4.0	0.0	41.5
8-12	1.6	0.8	0.4	0.3	0.3	0.4	0.8	2.1	2.5	1.6	0.8	1.0	1.4	3.4	3.7	1.8	0.0	22.8
13-18	0.3	0.4	0.3	0.0	0.0	0.0	0.1	0.3	1.2	1.4	1.1	0.5	0.7	1.4	1.4	0.3	0.0	9.5
19-24	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.5	0.4	0.2	0.2	0.2	0.7	0.0	0.0	2.6
25-31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.6
32-38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
39-46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
> 46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	6.8	4.4	4.1	3.0	4.0	4.2	5.5	8.0	9.0	7.7	5.2	4.3	5.2	9.0	11.6	7.6	0.5	100.0

Table A.1. (contd)

Station: (13) 100N

Begin: 1/95

End: 12/95

Total Hours: 8638

	Direction																Calm	Total
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
Calm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0
1-3	2.2	1.9	2.0	2.7	3.3	2.9	2.5	1.7	1.7	1.6	1.8	2.8	3.3	3.4	2.9	2.5	0.0	39.2
4-7	1.5	1.8	1.5	2.0	2.6	2.5	2.2	1.2	0.8	1.2	2.7	4.8	4.9	3.1	1.9	1.4	0.0	36.1
8-12	0.3	1.2	0.8	0.4	0.3	0.3	0.8	0.5	0.3	0.3	1.1	1.9	3.3	2.1	0.5	0.2	0.0	14.3
13-18	0.2	0.5	0.4	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.8	0.6	1.0	2.0	0.6	0.1	0.0	6.7
19-24	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.1	0.1	0.8	0.3	0.0	0.0	2.0
25-31	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.2	0.0	0.0	0.0	0.6
32-38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39-46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
> 46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	4.3	5.5	5.0	5.1	6.2	5.8	5.5	3.5	2.8	3.7	6.6	10.2	12.8	11.7	6.2	4.2	1.0	100.0

Station: (14) WPPS

Begin: 1/95

End: 12/95

Total Hours: 8640

	Direction																Calm	Total
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
Calm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	1.6
1-3	2.9	2.2	1.6	0.9	1.0	0.8	1.0	1.5	1.8	1.4	1.5	1.1	1.7	1.5	2.6	2.7	0.0	25.9
4-7	3.7	3.0	2.3	1.1	0.5	0.7	1.8	4.4	5.0	2.8	1.6	1.1	1.3	1.5	4.7	5.3	0.0	40.8
8-12	1.3	1.0	0.6	0.3	0.1	0.3	0.8	2.2	3.2	2.3	1.3	0.8	0.7	1.3	2.6	2.0	0.0	21.0
13-18	0.3	0.3	0.3	0.0	0.0	0.0	0.1	0.2	0.8	1.7	1.3	0.5	0.5	0.8	1.4	0.3	0.0	8.5
19-24	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.3	0.1	0.0	0.1	0.5	0.0	0.0	1.8
25-31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.0	0.1	0.0	0.0	0.4
32-38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39-46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
> 46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	8.2	6.7	4.8	2.4	1.6	1.8	3.7	8.3	10.9	8.7	6.2	3.6	4.3	5.3	11.7	10.3	1.6	100.0

Station: (15) FRNK

Begin: 1/95

End: 12/95

Total Hours: 8640

	Direction																Calm	Total
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
Calm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	1.2
1-3	1.3	1.1	1.2	0.9	0.8	0.8	1.4	1.3	1.0	0.8	1.0	1.0	1.2	1.2	1.5	1.4	0.0	17.9
4-7	4.3	3.0	2.0	1.4	1.6	2.5	5.1	4.2	3.0	2.8	2.5	1.2	1.3	1.7	4.8	6.5	0.0	47.8
8-12	1.6	1.1	1.0	0.6	0.4	0.5	1.8	1.8	2.6	5.0	3.1	0.9	0.5	0.6	1.6	2.4	0.0	25.6
13-18	0.2	0.3	0.4	0.1	0.1	0.0	0.1	0.2	0.3	1.6	1.6	0.4	0.1	0.1	0.4	0.1	0.0	6.0
19-24	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.4	0.0	0.0	0.0	0.1	0.0	0.0	1.1
25-31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.3
32-38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39-46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
> 46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	7.5	5.6	4.6	3.0	2.9	3.8	8.4	7.5	6.9	10.5	8.8	3.6	3.2	3.7	8.4	10.3	1.2	100.0

Table A.1. (contd)

Station: (16) GABL

Begin: 1/95

End: 12/95

Total Hours: 8640

	Direction																Calm	Total
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
Calm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	1.2
1-3	0.9	0.9	0.8	0.6	0.6	0.5	0.6	0.8	0.8	0.8	0.8	0.6	0.6	0.6	0.7	0.7	0.0	11.4
4-7	2.4	2.4	1.7	0.9	0.8	0.8	1.3	2.0	3.1	2.0	1.6	1.4	1.3	1.7	2.5	1.9	0.0	27.8
8-12	2.3	2.7	1.1	0.4	0.4	0.5	1.0	1.8	2.2	1.6	1.7	1.8	1.9	2.3	2.4	1.5	0.0	25.8
13-18	1.8	1.8	0.8	0.2	0.1	0.1	0.3	1.1	1.4	1.0	1.4	1.3	1.6	2.5	2.3	1.0	0.0	18.5
19-24	0.5	0.6	0.5	0.0	0.0	0.0	0.0	0.2	0.5	0.4	0.9	0.9	0.9	2.6	1.5	0.2	0.0	9.7
25-31	0.1	0.1	0.4	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.5	0.3	0.2	1.3	0.3	0.0	0.0	3.9
32-38	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.2	0.1	0.0	0.3	0.0	0.0	0.0	1.3
39-46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
> 46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Total	7.9	8.6	5.6	2.1	1.9	2.0	3.2	6.0	8.2	6.4	7.3	6.4	6.7	11.3	9.8	5.3	1.2	100.0

Station: (17) RING

Begin: 1/95

End: 12/95

Total Hours: 8640

	Direction																Calm	Total
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
Calm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.8
1-3	1.8	3.0	6.5	2.6	1.6	1.2	1.3	1.1	1.2	1.2	1.5	1.8	1.8	1.3	1.3	1.5	0.0	30.8
4-7	1.9	2.4	13.1	4.1	1.3	1.1	1.1	1.4	1.7	2.5	2.4	3.0	2.4	1.1	1.0	1.9	0.0	42.4
8-12	1.1	1.0	1.5	0.8	0.1	0.1	0.3	0.4	1.6	3.2	2.0	1.3	1.5	1.4	0.8	0.2	0.0	17.4
13-18	0.3	0.4	0.4	0.1	0.0	0.0	0.0	0.1	0.2	0.9	1.0	0.4	0.8	1.7	0.2	0.0	0.0	6.5
19-24	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.1	0.1	0.5	0.0	0.0	0.0	1.5
25-31	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.2	0.0	0.0	0.0	0.6
32-38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39-46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
> 46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	5.1	7.0	21.8	7.6	3.1	2.4	2.7	3.0	4.7	7.9	7.4	6.6	6.7	6.3	3.4	3.5	0.8	100.0

Station: (18) RICH

Begin: 1/95

End: 12/95

Total Hours: 8631

	Direction																Calm	Total
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
Calm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.7
1-3	1.3	0.8	1.0	1.2	1.5	2.6	3.3	2.5	2.1	2.2	2.2	2.1	2.6	3.3	2.7	1.7	0.0	33.0
4-7	2.1	1.0	1.0	1.1	2.0	3.4	3.5	1.7	1.6	2.6	3.6	2.6	1.9	2.7	3.3	3.1	0.0	37.0
8-12	1.6	0.7	0.6	0.3	0.2	0.2	0.3	0.2	0.7	2.8	3.2	2.3	1.4	0.7	1.2	1.9	0.0	18.4
13-18	0.4	0.3	0.4	0.1	0.0	0.0	0.0	0.0	0.1	1.5	2.1	1.0	1.0	0.4	0.9	0.6	0.0	8.8
19-24	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.6	0.1	0.2	0.1	0.3	0.1	0.0	1.7
25-31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.4
32-38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39-46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
> 46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	5.5	2.9	2.9	2.6	3.8	6.2	7.1	4.3	4.6	9.3	11.9	8.1	7.1	7.3	8.4	7.4	0.7	100.0

Table A.1. (contd)

Station: (19) PFP

Begin: 1/95

End: 12/95

Total Hours: 8633

	Direction																Calm	Total
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
Calm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	2.1
1-3	3.3	3.3	2.3	1.4	1.6	1.7	2.2	1.8	1.8	1.7	2.8	3.6	6.3	5.7	4.3	3.1	0.0	47.1
4-7	3.5	2.3	1.1	0.6	0.7	1.2	1.7	0.7	0.5	0.8	1.5	2.3	4.1	6.2	5.1	3.3	0.0	35.6
8-12	0.2	0.5	0.5	0.2	0.1	0.1	0.2	0.1	0.1	0.5	1.3	1.7	1.3	1.2	3.0	0.9	0.0	12.0
13-18	0.0	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.5	0.4	0.3	0.1	1.1	0.1	0.0	3.2
19-24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
25-31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
32-38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39-46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
> 46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	7.0	6.4	4.1	2.3	2.3	3.0	4.1	2.6	2.5	3.3	6.1	8.1	12.0	13.3	13.5	7.4	2.1	100.0

Station: (20) RMTN

Begin: 1/95

End: 12/95

Total Hours: 8614

	Direction																Calm	Total
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
Calm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0
1-3	0.6	0.7	0.8	0.4	0.4	0.3	0.2	0.2	0.4	0.7	0.9	0.5	0.4	0.5	0.5	0.4	0.0	7.8
4-7	1.3	1.2	1.3	0.9	0.4	0.3	0.3	0.3	0.6	1.1	1.7	1.3	0.8	0.7	0.5	0.8	0.0	13.6
8-12	2.2	3.1	1.4	0.7	0.4	0.2	0.2	0.2	0.4	1.3	3.4	2.4	1.3	0.8	0.8	0.8	0.0	19.5
13-18	2.1	3.7	1.2	0.1	0.1	0.0	0.1	0.2	0.3	1.0	5.4	3.0	1.4	1.0	0.5	0.5	0.0	20.7
19-24	1.1	3.5	1.3	0.1	0.0	0.0	0.0	0.0	0.2	0.6	3.8	3.1	0.7	0.5	0.3	0.2	0.0	15.3
25-31	0.3	1.7	1.1	0.0	0.0	0.0	0.0	0.0	0.1	0.2	3.5	2.9	0.5	0.1	0.0	0.0	0.0	10.5
32-38	0.1	1.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.1	2.5	1.4	0.2	0.0	0.0	0.0	0.0	6.0
39-46	0.0	0.6	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	0.6	0.0	0.0	0.0	0.0	0.0	3.3
> 46	0.0	0.6	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.3	0.0	0.0	0.0	0.0	0.0	2.2
Total	7.7	16.0	8.2	2.2	1.3	0.8	0.8	1.0	1.9	5.2	23.9	15.5	5.4	3.6	2.6	2.7	1.0	100.0

Station: (21) HMS

Begin: 1/95

End: 12/95

Total Hours: 8671

	Direction																Calm	Total
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
Calm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3
1-3	1.9	1.4	1.7	1.1	1.0	1.0	1.4	1.3	1.1	1.1	1.1	1.4	1.7	2.0	1.9	1.8	0.0	22.7
4-7	2.7	1.6	1.0	1.0	1.3	1.2	1.6	1.4	1.1	1.4	2.2	4.0	5.1	6.8	8.0	4.6	0.0	45.1
8-12	0.6	0.7	0.2	0.1	0.3	0.0	0.0	0.3	0.3	0.5	1.3	2.6	2.8	4.7	6.1	1.0	0.0	21.5
13-18	0.1	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.9	1.4	0.6	0.9	2.9	0.1	0.0	7.8
19-24	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.3	0.2	0.1	0.2	0.7	0.0	0.0	2.2
25-31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.2
32-38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39-46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
> 46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	5.2	4.2	3.1	2.4	2.6	2.2	3.0	2.9	2.6	3.7	5.9	9.6	10.2	14.5	19.8	7.5	0.3	100.0

Table A.1. (contd)

Station: (22) PASC

Begin: 1/95

End: 12/95

Total Hours: 8503

	Direction																Calm	Total
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
Calm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	1.7
1-3	8.4	3.8	3.1	2.4	2.6	2.4	2.4	1.3	1.2	1.0	1.2	1.3	1.6	2.1	3.2	6.7	0.0	44.8
4-7	2.7	1.0	0.5	0.7	0.6	1.5	1.9	1.1	1.2	2.1	3.3	2.4	2.5	2.1	2.9	3.9	0.0	30.4
8-12	0.9	0.6	0.3	0.1	0.0	0.1	0.2	0.1	0.3	1.7	5.1	2.6	1.2	0.6	0.9	1.1	0.0	15.5
13-18	0.1	0.3	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.3	2.5	1.7	0.4	0.3	0.2	0.2	0.0	6.4
19-24	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.3	0.1	0.0	0.0	0.0	0.0	1.1
25-31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
32-38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39-46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
> 46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	12.1	5.7	4.4	3.3	3.3	4.0	4.4	2.5	2.6	5.1	12.6	8.4	5.7	5.1	7.2	11.9	1.7	100.0

Station: (23) GABW

Begin: 1/95

End: 12/95

Total Hours: 8640

	Direction																Calm	Total
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
Calm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.9
1-3	2.2	1.6	1.7	1.5	2.0	1.8	1.9	2.4	2.0	1.5	1.4	1.6	2.3	3.6	3.6	2.8	0.0	33.9
4-7	2.9	1.6	1.4	1.7	1.9	1.5	3.4	3.8	1.4	0.8	1.1	1.3	2.0	5.4	5.1	4.3	0.0	39.6
8-12	1.6	1.0	0.5	0.4	0.4	0.6	0.7	0.4	0.2	0.7	1.0	1.0	1.3	2.4	2.2	2.5	0.0	17.0
13-18	0.8	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.1	0.5	0.8	0.7	0.3	0.6	0.9	1.1	0.0	6.8
19-24	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.2	0.1	0.0	0.1	0.2	0.2	0.0	1.6
25-31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
32-38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39-46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
> 46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	7.6	4.8	4.1	3.6	4.3	3.9	6.0	6.6	3.8	3.8	4.6	4.7	6.1	12.0	12.1	11.0	0.9	100.0

Station: (24) 100F

Begin: 1/95

End: 12/95

Total Hours: 8640

	Direction																Calm	Total
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
Calm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	1.2
1-3	2.0	1.4	1.4	1.3	1.5	1.7	2.6	2.8	2.3	1.8	1.7	2.5	3.7	3.9	3.5	2.4	0.0	36.6
4-7	2.1	1.3	1.0	1.2	1.2	1.9	5.0	5.3	1.5	0.9	1.0	1.7	3.8	3.8	2.6	2.3	0.0	36.8
8-12	1.2	0.6	0.5	0.5	0.3	0.6	2.0	2.2	0.5	0.5	1.0	1.3	2.2	2.2	0.6	0.6	0.0	16.8
13-18	0.2	0.3	0.3	0.1	0.0	0.1	0.2	0.2	0.3	0.2	0.6	0.9	1.0	1.5	0.4	0.1	0.0	6.3
19-24	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.2	0.2	0.2	0.7	0.1	0.0	0.0	2.0
25-31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.2	0.0	0.0	0.0	0.4
32-38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39-46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
> 46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	5.5	3.7	3.4	3.1	3.1	4.3	9.9	10.5	4.6	3.8	4.6	6.6	11.0	12.1	7.2	5.4	1.2	100.0

Table A.1. (contd)

Station: (25) VERN

Begin: 1/95

End: 12/95

Total Hours: 8639

	Direction																Calm	Total
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
Calm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.9
1-3	1.0	1.1	1.2	1.5	1.8	1.7	1.7	1.3	1.1	1.0	1.2	2.2	2.8	1.6	1.1	0.9	0.0	23.2
4-7	0.7	1.2	1.9	2.7	3.7	2.2	1.0	0.5	0.4	0.4	0.7	4.6	8.0	3.9	1.7	0.8	0.0	34.5
8-12	0.4	0.5	0.5	0.7	0.4	0.2	0.1	0.1	0.2	0.4	0.8	2.3	8.7	6.7	2.6	0.6	0.0	25.5
13-18	0.2	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.8	0.6	2.5	5.0	1.6	0.3	0.0	12.1
19-24	0.1	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.1	0.3	1.5	0.6	0.1	0.0	3.3
25-31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.2	0.2	0.0	0.0	0.5
32-38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
39-46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
> 46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	2.4	3.3	4.0	5.0	5.9	4.1	2.9	2.0	1.7	2.3	3.8	9.9	22.3	19.0	7.8	2.6	0.9	100.0

Station: (26) BENT

Begin: 2/95

End: 12/95

Total Hours: 7858

	Direction																Calm	Total
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
Calm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3
1-3	1.0	0.7	0.8	0.8	0.8	0.7	0.6	0.4	0.5	0.7	1.2	1.6	2.1	2.1	2.1	1.5	0.0	17.5
4-7	1.3	1.2	1.7	2.4	2.6	1.3	0.4	0.2	0.5	10.1	4.6	11.5	12.9	5.8	3.2	1.9	0.0	52.5
8-12	0.5	1.1	1.8	1.1	0.7	0.1	0.0	0.0	0.1	0.6	2.7	5.4	4.8	2.0	1.3	0.5	0.0	22.9
13-18	0.4	1.1	0.8	0.0	0.0	0.0	0.0	0.0	0.1	0.4	1.2	0.5	0.2	0.2	0.1	0.1	0.0	5.2
19-24	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.1	0.0	0.0	0.0	0.0	0.0	1.3
25-31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2
32-38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39-46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
> 46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	3.4	4.3	5.3	4.4	4.2	2.1	1.0	0.7	1.1	2.8	10.4	19.1	20.1	10.1	6.6	4.0	0.3	100.0

Station: (27) VSTA

Begin: 1/95

End: 12/95

Total Hours: 8385

	Direction																Calm	Total
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
Calm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.7
1-3	2.4	2.2	2.3	1.8	1.6	1.9	2.0	1.7	1.8	2.4	2.7	2.6	2.5	2.0	2.2	1.9	0.0	33.9
4-7	3.0	1.6	1.2	1.0	0.8	1.1	1.1	1.2	1.6	3.7	5.8	4.4	2.7	2.8	3.2	3.4	0.0	38.7
8-12	0.7	0.5	0.4	0.1	0.0	0.1	0.1	0.1	0.5	3.5	5.7	2.7	1.1	0.4	0.9	1.1	0.0	17.9
13-18	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.6	3.9	1.0	0.2	0.2	0.1	0.1	0.0	7.4
19-24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.7	0.2	0.0	0.0	0.0	0.0	0.0	1.1
25-31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2
32-38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39-46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
> 46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	6.2	4.4	3.9	2.9	2.4	3.0	3.2	2.9	4.0	11.5	19.0	11.0	6.6	5.3	6.4	6.5	0.7	100.0

Table A.1. (contd)

Station: (28) SURF

Begin: 1/95

End: 12/95

Total Hours: 8635

	Direction																Calm	Total
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
Calm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	1.3
1-3	0.3	0.7	1.6	1.9	1.7	1.1	0.8	0.7	1.5	2.5	4.1	4.6	1.9	0.5	0.3	0.2	0.0	24.4
4-7	0.1	0.5	2.5	4.8	2.5	0.5	0.2	0.2	0.4	0.9	4.0	5.5	1.1	0.1	0.0	0.1	0.0	23.4
8-12	0.2	0.9	1.8	3.2	1.0	0.1	0.0	0.0	0.0	0.1	4.2	9.5	3.1	0.2	0.0	0.0	0.0	24.3
13-18	0.2	0.3	0.3	0.8	0.3	0.0	0.0	0.0	0.0	0.0	2.0	8.1	4.9	0.3	0.0	0.0	0.0	17.3
19-24	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.4	3.9	2.2	0.2	0.0	0.0	0.0	7.1
25-31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.4	0.5	0.1	0.0	0.1	0.0	2.2
32-38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.2
39-46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
> 46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	0.9	2.4	6.3	10.7	5.4	1.8	1.0	0.9	2.0	3.5	14.8	33.1	13.8	1.3	0.4	0.5	1.3	100.0

Table A.2. Joint Frequency Distribution (%) for Meteorological Monitoring Network Wind Stations at 60-m Level, 1995

Tower: 100 Area

	Begin: 1/95								End: 12/95								Total Hours: 8691	
	Direction								Direction								Calm	Total
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
Calm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.9
1-3	1.3	1.4	1.7	2.0	2.7	2.6	2.0	1.6	1.3	1.2	1.2	1.5	1.9	1.9	1.7	1.8	0.0	27.8
4-7	1.8	1.7	1.3	1.8	2.7	2.8	2.4	1.1	0.9	0.9	1.3	2.3	3.2	3.5	2.5	1.4	0.0	32.0
8-12	0.9	1.3	0.9	0.7	0.8	0.8	1.3	0.6	0.4	0.6	1.3	2.1	2.7	2.2	1.0	0.5	0.0	18.4
13-18	0.5	0.8	0.4	0.2	0.2	0.2	0.4	0.4	0.2	0.3	1.0	1.4	2.9	2.6	0.7	0.1	0.0	12.4
19-24	0.2	0.3	0.3	0.1	0.0	0.0	0.0	0.0	0.1	0.2	0.4	0.4	1.1	1.8	0.5	0.1	0.0	5.6
25-31	0.1	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.2	0.8	0.4	0.0	0.0	2.3
32-38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.3	0.1	0.0	0.0	0.7
39-46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
> 46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	4.7	5.7	5.0	4.8	6.4	6.4	6.1	3.8	2.8	3.6	5.4	7.9	11.9	13.1	6.8	3.9	0.9	100.0

Tower: 200 Area

	Begin: 1/95								End: 12/95								Total Hours: 8755	
	Direction								Direction								Calm	Total
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
Calm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1-3	1.0	0.9	0.7	0.8	0.8	0.3	0.9	1.0	0.3	0.4	0.5	0.4	0.5	0.6	0.7	0.9	0.0	10.7
4-7	3.6	2.1	2.1	1.3	2.2	0.8	1.8	2.0	1.1	1.2	1.4	1.3	1.8	2.4	4.0	3.6	0.0	32.6
8-12	1.4	1.0	0.7	0.5	0.6	0.2	0.3	0.8	0.6	0.9	1.6	2.2	2.7	4.1	6.2	2.4	0.0	26.0
13-18	0.4	0.6	0.3	0.2	0.1	0.0	0.0	0.2	0.2	0.5	1.5	2.2	1.7	4.1	6.5	0.8	0.0	19.5
19-24	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.2	0.7	0.9	0.3	1.3	3.0	0.1	0.0	7.2
25-31	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.6	0.3	0.1	0.4	1.3	0.0	0.0	3.2
32-38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.1	0.2	0.0	0.0	0.6
39-46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
> 46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	6.5	4.9	4.0	3.0	3.8	1.3	3.0	4.0	2.3	3.9	6.4	7.3	7.2	12.8	21.9	7.7	0.0	100.0

Tower: 300 Area

	Begin: 1/95								End: 12/95								Total Hours: 8691	
	Direction								Direction								Calm	Total
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
Calm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5
1-3	1.1	0.9	0.6	0.6	0.7	1.1	1.2	1.1	0.8	0.6	0.6	0.5	0.6	0.7	0.9	0.9	0.0	13.0
4-7	3.4	2.2	1.1	1.1	1.2	2.5	4.0	2.8	2.2	1.8	1.4	0.9	0.5	0.6	1.0	2.1	0.0	29.1
8-12	3.8	2.5	0.7	0.5	0.7	1.9	3.3	1.9	1.9	2.5	2.5	1.6	0.9	0.4	0.7	2.0	0.0	28.1
13-18	3.3	1.6	0.5	0.1	0.1	0.3	0.6	0.4	0.9	2.4	2.8	2.1	0.9	0.5	0.6	1.9	0.0	19.1
19-24	0.8	0.4	0.2	0.1	0.1	0.1	0.0	0.1	0.2	0.7	1.2	1.1	0.5	0.2	0.6	0.7	0.0	6.8
25-31	0.1	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.5	0.4	0.1	0.1	0.4	0.2	0.0	2.6
32-38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.6
39-46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2
> 46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	12.4	7.8	3.3	2.4	2.8	5.8	9.1	6.4	6.1	8.3	9.2	6.7	3.6	2.6	4.4	7.9	0.6	100.0

Table A.2. (contd)

Tower: 400 Area

Begin: 1/95

End: 12/95

Total Hours: 8692

	Direction																Calm	Total
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
Calm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2
1-3	0.7	0.8	0.8	0.6	0.8	0.8	0.8	0.8	0.7	0.7	0.5	0.6	0.6	0.6	0.7	0.8	0.0	11.3
4-7	2.6	2.2	1.5	1.0	1.0	1.1	2.0	2.8	2.5	1.4	0.9	0.8	0.9	1.2	2.3	2.5	0.0	26.8
8-12	2.1	1.9	1.0	0.5	0.4	0.4	1.8	2.7	3.7	3.4	1.8	0.8	0.8	1.2	3.2	2.8	0.0	28.8
13-18	0.9	0.9	0.7	0.1	0.1	0.1	0.4	1.0	2.0	3.9	2.6	0.9	0.6	1.1	3.1	2.3	0.0	20.7
19-24	0.2	0.4	0.3	0.1	0.0	0.0	0.0	0.1	0.3	1.5	1.3	0.4	0.4	1.1	2.0	0.4	0.0	8.4
25-31	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.7	0.1	0.0	0.3	0.8	0.0	0.0	2.9
32-38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.2	0.0	0.0	0.6
39-46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2
> 46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	6.6	6.3	4.4	2.3	2.3	2.4	5.0	7.4	9.2	11.7	8.0	3.7	3.3	5.6	12.3	8.6	0.2	100.0

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