

2.0 Calendar Year 2004 Summary

This section summarizes weather conditions for calendar year 2004 (Table 2.1). More detailed information can be found in Section 3.0 – Temperature Climatology, Section 4.0 – Precipitation Climatology, and Section 5.0 – Wind Climatology.

The 2003-2004 winter season (December 2003, January and February 2004) was cooler and much wetter than normal. The average temperature of 33.0°F was 0.8° below normal (33.8°F). The warmest winter (1966-67) averaged 40.6°F, while the coldest (1948-49) averaged 24.2°F. Precipitation totaled 5.00 inches, 188% of normal (2.66 inches) and was the fourth wettest winter on record. The wettest winter (1996-97) received 5.45 inches, while the driest (1946-47) received 0.70 inch.

Spring 2004 (March, April, and May) was warmer than normal, with an average temperature of 55.4°, 1.6° above normal (53.8°F). The warmest spring (1992) averaged 58.2°F; the coolest (1955) averaged 48.0°F. Spring season precipitation totaled 1.46 inches, 92% of normal (1.58 inches). The wettest spring (1995) received 3.23 inches; the driest (1968) received only 0.09 inch.

The 2004 summer season (June, July, and August) was warmer than normal, averaging 75.9°F, 2.2° above normal (73.7°F). The warmest summer (1958) averaged 78.2°F, while the coolest (1980) averaged 70.2°F. The highest temperature was 107°F on August 13. Precipitation for the summer season totaled 1.80 inches, 190% of normal, and was the sixth wettest summer on record. The wettest summer (1950) received 2.99 inches, and the driest (1973) received only 0.03 inch.

The average temperature for autumn 2004 (September, October, and November) was 53.0°F, which was normal. The warmest autumn (1990) averaged 57.1°F, while the coolest (1985) averaged 44.5°F. Autumn 2004 precipitation totaled 1.29 inches, 72% of normal (1.80 inches). The wettest autumn (1973) received 4.79 inches, while the driest (1976) received only 0.04 inch.

The following are some additional statistics for 2004:

Category	Number of Days	Normal	Record	
			Maximum	Minimum
Maximum temperatures ≥100°F	22	12	28 (1958)	1 (1954)
Maximum temperatures ≥90°F	58	52	79 (1967)	29 (1980)
Maximum temperatures ≤32°F	17	23	58 (1984-85)	2 (1966-67)
Minimum temperatures ≥70°F	14	7	21 (1958)	0 (1954)
Minimum temperatures ≤32°F	113	105	143 (1984-85)	70 (1991-92)
Minimum temperatures ≤0°F	2	3	18 (1949-50)	0 (2001-02)
Thunderstorms	14	10	23(1948)	3 (1949)
Fog (visibility ≤6 mi)	64	47	84 (1985-86)	22 (1948-49)
Dense fog (visibility ≤0.25 mi)	39	24	42 (1950-51)	9 (1948-49)
Peak wind gusts ≤12 mph	52	50	87 (1952)	28 (1973)
Peak wind gusts ≥25 mph	146	156	192 (1999)	123 (1952)
Peak wind gusts ≥40 mph	22	27	57 (1990)	10 (1978)
Peak wind gusts ≥50 mph	3	6	18 (1990)	0 (1985)

Table 2.1. 2004 Climatological Data Summary

Month	Temperatures, °F								Degree Days Base 65, °F				Precipitation, inches								Relative Humidity, %	
	Averages				Extremes								Snow, Ice Pellets, inches									
	Daily Maximum	Daily Minimum	Monthly	Departure ^(a)	Highest	Date	Lowest	Date	Heating	Departure ^(a)	Cooling	Departure ^(a)	Total	Departure ^(a)	Greatest in 24 Hours	Date	Total	Departure ^(a)	Greatest in 24 Hours	Date	Average	Departure ^(a)
J	34.5	24.0	29.2	-2.6	61	29	-14	5	1110	+82	0	0	2.12	+1.25	1.17	1	19.1	+14.9	11.4	1	85.5	+8.2
F	44.7	29.3	37.0	-0.9	56	28 ^(b)	19	13	818	+51	0	0	0.92	+0.24	0.20	27	1.3	-1.3	0.6	14	84.4	+13.9
M	62.5	36.8	49.7	+3.6	73	22 ^(b)	27	3	473	-114	0	0	0.36	-0.22	0.19	25	0	-0.4	0	-	52.9	-3.7
A	70.0	39.8	54.9	+1.4	83	26	32	1	304	-46	0	-5	0.21	-0.23	0.15	20	0	-T ^(c)	0	-	47.3	0
M	74.1	48.9	61.5	-0.3	85	1	38	13	127	-29	17	-40	0.89	+0.34	0.35	22-23	0	0	0	-	51.1	+8.1
J	85.2	55.7	70.4	+1.1	105	23	45	7 ^(b)	41	+8	203	+40	0.82	+0.41	0.72	7-8	0	0	0	-	40.7	+1.1
J	94.8	64.3	79.5	+3.2	104	25 ^(b)	49	11	0	-4	454	+99	0.03	-0.24	0.03	19	0	0	0	-	32.1	-1.3
A	92.3	63.5	77.9	+2.5	107	13	54	27	0	-5	401	+75	0.95	+0.68	0.47	22	0	0	0	-	40.0	+4.4
S	78.7	51.1	64.9	-1.0	88	28 ^(b)	41	22	57	-18	52	-51	0.14	-0.19	0.07	13	0	0	0	-	45.6	+3.3
O	66.6	42.4	54.5	+1.5	83	5	27	25	335	-41	8	+4	0.86	+0.37	0.49	16-17	0	-0.1	0	-	59.0	+2.6
N	50.1	29.3	39.7	-0.4	63	2	17	29	762	+15	0	0	0.29	-0.69	0.12	15	T	-2.3	T	30	75.1	+1.4
D	43.6	28.1	35.9	+4.2	63	10	17	28	903	-129	0	0	0.37	-0.74	0.16	29	2.5	-3.3	2.0	29	81.0	+0.9
Year Total	66.4	42.8	54.6	+1.0	107	Aug 13	-14	Jan 5	4,930	-230	1,135	+121	7.96	+0.98	1.17	Jan 1	22.9	+7.5	11.4	Jan 1	57.9	+3.3

Table 2.1. (contd)

Month	Mean Sky Cover, Tenths		Solar Radiation, Langley's						50-ft Wind					Number of Days							
	Average	Departure ^(a)	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	
											Speed, mph	Direction	Date					≥90°F	≤32°F	≤32°F	≤0°F
J	9.4	+1.5	78	-29	142	24	16	1	5.4	-0.9	63	SW	30	0	15	4	3	0	13	29	2
F	7.9	+0.5	142	-42	289	28	23	16	5.3	-1.8	31	W	24	0	11	4	0	0	1	24	0
M	6.0	-0.8	290	-30	434	29	68	3	8.3	+0.3	51	SW	18	0	0	2	0	0	0	9	0
A	4.0	-2.4	437	-13	578	30	169	5	7.2	-1.6	55	W	27	1	0	1	0	0	0	1	0
M	6.4	+0.5	448	-101	628	9	194	26	8.4	-0.5	41	WNW	10	5	0	4	0	0	0	0	0
J	3.4	-1.7	587	-20	696	27	208	9	8.2	-0.9	42	NE	7	3	0	2	0	12	0	0	0
J	2.8	-0.2	627	-3	697	4	398	19	8.3	-0.3	40	NW	25	0	0	0	0	25	0	0	0
A	3.9	+0.7	499	-39	633	8	178	24	7.5	-0.5	44	WSW	14	4	0	3	0	21	0	0	0
S	4.5	+0.6	389	-15	512	5	196	17	7.7	+0.4	42	SW	18 ^(b)	0	0	0	0	0	0	0	0
O	5.1	-0.5	243	-9	373	1	52	16	6.9	+0.4	38	SSW	30	1	1	2	0	0	0	3	0
N	6.8	-0.7	140	+16	238	3	37	2	5.6	-0.9	44	WSW	24	0	8	1	0	0	0	22	0
D	7.5	-0.6	82	-2	140	27 ^(b)	23	18	5.5	-0.6	40	SSE	8	0	7	2	1	0	3	25	0
Year Total	5.6	-0.3	330	-24	697	Jul 4	16	Jan 1	7.0	-0.6	63	SW	Jan 30	14	42	25	4	58	17	113	2

(a) Departure columns indicate positive or negative departure of meteorological parameters from 30-year (1971-2000) climatological normals.
 (b) Latest date of multiple occurrences.
 (c) Trace of snowfall is normal; no occurrence in April.
 T = Trace.

2.1 Temperature

Calendar year 2004 was warmer than normal at the HMS. The average temperature was 54.6°F, 1.0° above normal (53.6°F). The warmest years on record are 1992 and 1998, which averaged 56.4°F; the coldest year on record is 1985, which averaged 49.6°F. The hottest temperature of 2004 was 107°F on August 13; the coldest was -14°F on January 5. Calendar year 2004 recorded 58 days with maximum temperatures $\geq 90^\circ\text{F}$ compared to a normal of 52 days, a maximum of 79 days in 1967, and a minimum of 29 days in 1980. There were 22 days with maximum temperatures $\geq 100^\circ\text{F}$ compared to a normal of 12 days, a maximum of 28 days in 1958, and a minimum of 1 day in 1954.

Seven months during the year were warmer than normal, and 5 months cooler than normal. Three months departed from normal by more than 3°, with December at 4.2° above normal. January 2004 was 2.6° below normal.

The average temperature for January 2004 was colder than normal, averaging 29.2°F, 2.6° below normal (31.8°F). The warmest January occurred in 1953 and averaged 42.5°F, while the coldest, in 1950, averaged 12.1°F. The minimum temperature of -14°F on January 5 was the coldest temperature recorded at the HMS since a low of -18°F on February 1, 1996, and the first subzero reading in more than five years (since -1°F on December 21, 1998). One of the Hanford Meteorological Monitoring Network stations (near the 200 West Area) recorded a minimum of -24°F.

The average temperature for February 2004 was colder than normal, averaging 37.0°F, 0.9° below normal (37.9°F). The warmest February occurred in 1958 and averaged 44.5°F, while the coldest (1956) averaged 25.6°F.

The 2003-2004 winter season (December 2003, January and February 2004) was cooler than normal. The average temperature of 33.0°F was 0.8° below normal (33.8°F). The warmest winter (1966-67) averaged 40.6°F, while the coldest (1948-49) averaged 24.2°F.

The average temperature for March 2004 was much warmer than normal, averaging 49.7°F, 3.6° above normal (46.1°F). This was the second warmest March on record. The warmest March (1992) averaged 51.5°F, while the coldest (1955) averaged 39.4°F. All but three days had average temperatures that were normal or above normal.

The average temperature for April 2004 was warmer than normal, averaging 54.9°F, 1.4° above normal (53.5°F). The warmest April (1994) averaged 58.2°F, while the coldest (1955) averaged 47.5°F.

The average temperature for May 2004 was near normal, averaging 61.5°, 0.3° below normal (61.8°F). The warmest May (1947) averaged 68.7°F, while the coolest (1984) averaged 56.0°F.

Spring 2004 (March, April, and May) was warmer than normal, with an average temperature of 55.4°, 1.6° above normal (53.8°F). The warmest spring (1992) averaged 58.2°F; the coolest (1955) averaged 48.0°F).

The average temperature for June 2004 was warmer than normal, averaging 70.4°F, 1.1° above normal (69.3°F). The warmest June (1992) averaged 76.8°F, while the coolest (1953) averaged 63.0°F. There were 12 days with maximum temperatures $\geq 90^\circ\text{F}$ and 3 days $\geq 100^\circ\text{F}$, compared to June normals of 8 days and 1 day, respectively, for those categories.

The average temperature for July 2004 was warmer than normal, averaging 79.5°F, 3.2° above normal (76.3°F). The warmest July (1985) averaged 82.2°F, while the coolest (1993) averaged 70.5°F. There were 25 days with maximum temperatures $\geq 90^\circ\text{F}$ and 9 days $\geq 100^\circ\text{F}$, compared to July normals of 19 days and 6 days, respectively, for those categories.

The average temperature for August 2004 was warmer than normal, averaging 77.9°F, 2.5° above normal (75.4°F). The warmest August (1967) averaged 81.5°F, while the coolest (1964) averaged 69.8°F. There were 21 days with maximum temperatures $\geq 90^\circ\text{F}$ and 10 days $\geq 100^\circ\text{F}$, compared to August normals of 17 days and 4 days, respectively, for those categories.

The 2004 summer season (June, July, and August) was warmer than normal, averaging 75.9°F, 2.2° above normal (73.7°F). The warmest summer (1958) averaged 78.2°F, while the coolest (1980) averaged 70.2°F. The highest temperature was 107°F on August 13.

The average temperature for September 2004 was cooler than normal, averaging 64.9°F, 1.0° below normal (65.9°F). The warmest September (1990) averaged 72.4°F, while the coolest (1985) averaged 58.8°F. There were no days during the month with maximum temperatures $\geq 90^\circ\text{F}$, compared to a September normal of six such days. This was only the sixth September on record without a 90° day.

The average temperature for October 2004 was slightly warmer than normal, averaging 54.5°F, 1.5° above normal (53.0°F). The warmest October (1988) averaged 59.6°F, while the coolest (1984) averaged 47.9°F.

The average temperature for November 2004 was slightly cooler than normal, averaging 39.7°F, 0.4° below normal (40.1°F). The warmest November (1990) averaged 46.5°F, while the coldest (1985) averaged 24.8°F.

The average temperature for autumn 2004 (September, October, and November) was 53.0°F, which was normal. The warmest autumn (1990) averaged 57.1°F, while the coolest (1985) averaged 44.5°F.

The average temperature for December 2004 was much warmer than normal, averaging 35.9°F, 4.2° above normal (31.7°F). The warmest December (1957) averaged 38.5°F, while the coldest (1985) averaged 21.0°F.

Table 2.2 lists the daily temperature records for 2004 along with the previous record and year of occurrence. Table 2.1 lists the monthly and annual totals for numerous meteorological variables for 2004. Table 2.3 lists the 2004 monthly and seasonal temperature and precipitation compared to normals and extremes. Tables 2.4, 2.5, and 2.6 list the 2004 monthly and annual average temperature, precipitation, and wind speed, respectively, from the Hanford Meteorological Monitoring Network.

Figure 2.1 depicts the 2004 observed daily maximum and minimum temperatures and the normal maximum, minimum, and mean daily temperatures for the HMS.

Table 2.2. 2004 Daily Temperature Records (previous record and year of occurrence in parentheses)

Date	Maximum (°F)		Minimum (°F)	
	High	Low	High	Low
Jan 4				-7 (-6, 1950)
Jan 5		8 (12, 1950)		-14 (-7, 1950)
Mar 7	66 ^(a) (66, 1953 ^(b))		42 ^(a) (42, 1986 ^(b))	
Mar 8	70 (67, 1953)			
Aug 13	107 (107, 1992 ^(a))			
Sep 27			60 ^(a) (60, 2003 ^(b))	
Oct 6			59 (57, 1960)	
Oct 14	78 ^(a) (78, 1945)			
Dec 11	61 (59, 1991 ^(b))			

(a) Ties record.

(b) Most recent of several occurrences.

Table 2.3. 2004 Monthly and Seasonal Temperature and Precipitation

Month/ Season	Average Temperature, °F	Departure ^(a)	Normal, °F	Warmest of Record, °F	Year	Coolest of Record, °F	Year	Precipitation, in.	Percent of Normal	Normal	Wettest of Record, in.	Year	Driest of Record, in.	Year
Jan	29.2	-2.6	31.8	42.5	1953	12.1	1950	2.12	244	0.87	2.47	1970	0.08	1977
Feb	37.0	-0.9	37.9	44.5	1958	25.6	1956	0.92	135	0.68	2.10	1961	T	1988 ^(b)
Mar	49.7	+3.6	46.1	51.5	1992	39.4	1955	0.36	62	0.58	1.86	1957	0.02	1968
Apr	54.9	+1.4	53.5	58.2	1994	47.5	1955	0.21	48	0.44	2.23	2003	T	1999 ^(b)
May	61.5	-0.3	61.8	68.7	1947	56.0	1984	0.89	162	0.55	2.03	1972	T	1992 ^(b)
Jun	70.4	+1.1	69.3	76.8	1992	63.0	1953	0.82	200	0.41	2.92	1950	T	2003 ^(b)
Jul	79.5	+3.2	76.3	82.2	1985	70.5	1993	0.03	11	0.27	1.76	1993	0	2003
Aug	77.9	+2.5	75.4	81.5	1967	69.8	1964	0.95	352	0.27	1.36	1977	0	1988 ^(b)
Sep	64.9	-1.0	65.9	72.4	1990	58.8	1985	0.14	42	0.33	1.34	1947	0	1999 ^(b)
Oct	54.5	+1.5	53.0	59.6	1988	47.9	1984	0.86	176	0.49	2.72	1957	T	1987 ^(b)
Nov	39.7	-0.4	40.1	46.5	1990	24.8	1985	0.29	30	0.98	2.67	1996	T	1976
Dec	35.9	+4.2	31.7	38.5	1957	21.0	1985	0.37	33	0.74	3.69	1996	0.07	1999
Winter ^(c)	33.0	-0.8	33.8	40.6	1966-67	24.2	1948-49	5.00	188	2.66	5.45	1996-97	0.70	1946-47
Spring	55.4	+1.6	53.8	58.2	1992	48.0	1955	1.46	92	1.58	3.28	1995	0.09	1968
Summer	75.9	+2.2	73.7	78.2	1958	70.2	1980	1.80	190	0.95	2.99	1950	0.03	1973
Autumn	53.0	0	53.0	57.1	1990	44.5	1985	1.29	72	1.80	4.79	1973	0.04	1976
Calendar Year Total	54.6	+1.0	53.6	56.4	1998 ^(b)	49.6	1985	7.96	114	6.98	12.31	1995	2.99	1976

(a) Departure indicates positive or negative departure from 30-year (1971-2000) climatological normals.

(b) Latest of multiple occurrences.

(c) Winter is December 2003, January and February 2004.

T = Trace.

Table 2.4. 2004 Monthly and Annual Average Temperatures (°F) from the Hanford Meteorological Monitoring Network

<u>Station</u>	<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>	<u>Annual</u>
1 PROS	29.9	36.4	49.6	54.8	61.9	71.2	79.7	77.1	64.3	54.2	38.9	35.7	54.5
2 EOC	29.2	36.9	50.4	55.8	60.8	70.4	79.3	77.3	65.1	56.0	41.5	37.0	55.0
3 ARMY	30.2	36.7	49.7	55.5	61.9	71.8	80.5	78.1	65.2	55.0	39.5	35.9	55.1
4 RSPG	30.2	36.3	49.4	55.0	61.4	71.1	79.6	77.3	64.7	55.6	39.7	35.9	54.7
5 EDNA	30.1	36.0	48.5	54.5	61.7	71.1	79.5	76.7	64.1	54.1	38.9	35.6	54.3
6 200E	30.3	37.2	50.7	57.2	62.7	72.6	81.3	79.0	66.4	56.1	41.2	36.9	56.0
7 200W	29.6	35.7	49.0	54.9	61.7	71.0	80.1	77.5	64.6	54.2	38.4	34.7	54.3
8 BVLY	31.3	37.6	49.8	56.2	62.0	71.2	79.0	76.5	64.9	55.0	40.8	38.0	55.3
9 FFTF	29.3	36.9	50.0	55.5	61.1	70.9	79.4	77.0	64.3	54.9	40.0	35.8	54.6
10 YAKB	29.9	36.9	49.8	56.1	61.8	72.1	83.1	78.6	65.9	55.2	40.0	36.4	55.0
11 300A	30.2	36.9	50.1	55.4	61.3	70.3	78.7	76.3	64.3	54.5	40.4	36.4	54.6
12 WYEB	29.8	36.5	50.1	56.0	62.1	71.6	80.4	77.8	65.2	55.1	39.8	36.1	55.1
13 100N	29.8	35.9	48.4	54.7	60.8	69.4	79.6	76.3	64.6	55.2	40.2	36.4	54.3
14 WPPS	30.2	36.3	49.3	55.1	61.7	71.3	80.1	77.6	64.7	54.8	39.4	36.1	54.7
15 FRNK	29.1	36.4	49.6	54.6	59.9	68.2	75.5	73.5	62.4	53.4	40.1	36.1	53.3
16 GABL	29.4	36.8	50.3	57.0	60.9	71.2	79.8	77.9	65.5	56.1	41.6	36.9	55.3
17 RING	29.9	36.4	48.9	54.1	60.3	69.1	75.7	73.6	62.5	53.2	39.3	35.7	53.3
18 RICH	31.2	37.8	51.4	56.7	62.4	71.3	79.8	77.2	65.6	56.0	41.7	37.8	55.8
19 PFP	29.6	36.5	49.7	56.2	61.9	72.0	80.6	78.2	65.5	55.2	39.9	35.9	55.1
20 RMTN	26.0	31.9	41.6	47.6	51.3	61.1	70.4	69.0	56.5	50.4	37.5	33.0	48.1
21 HMS	29.2	37.0	49.7	54.9	61.5	70.4	79.5	77.9	64.9	54.5	39.7	35.9	54.6
22 PASC	30.7	37.5	50.9	56.3	62.6	71.6	79.7	77.0	64.9	54.9	40.6	37.3	55.4
23 GABW	29.8	35.8	48.1	53.7	61.5	70.9	80.1	77.1	64.3	53.7	38.5	35.2	54.1
24 100F	30.3	36.9	48.6	54.6	61.7	71.1	79.7	76.9	64.5	54.2	39.1	35.9	54.5
25 VERN	31.5	37.5	49.9	56.3	62.4	72.1	81.0	79.0	66.7	56.2	41.7	37.9	56.1
26 BENT	29.5	37.1	49.7	55.3	60.2	68.9	76.5	74.4	62.8	54.1	40.6	36.3	53.8
27 VSTA	31.7	38.7	52.1	57.1	62.5	71.4	79.8	77.8	65.5	56.3	42.3	38.5	56.2
28 SURF	31.6	39.3	50.1	55.1	61.3	70.4	78.9	76.9	65.5	60.1	43.3	39.0	56.0
29 100K	30.4	36.5	49.1	55.1	62.0	71.4	80.5	77.7	65.4	55.3	40.2	36.3	55.0
30 HAMR	30.6	37.1	50.7	56.2	62.1	71.0	79.7	77.2	65.0	55.8	44.4	37.2	55.6

Table 2.5. 2004 Monthly and Annual Precipitation (inches) from the Hanford Meteorological Monitoring Network^(a)

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
1 PROS	0.48	0.66	0.18	0.10	1.06	1.06	0.00	0.34	0.28	0.35	0.30	0.54	5.35
2 EOC	0.98	1.47	0.63	0.26	1.01	0.89	0.00	0.59	0.37	0.29	0.27	1.08	7.84
3 ARMY	1.06	1.56	0.28	0.11	0.77	0.59	0.00	0.58	0.22	0.45	0.20	0.58	6.40
4 RSPG	0.66	0.98	0.27	0.07	0.32	0.61	0.06	0.59	0.26	0.47	0.21	0.76	5.26
6 200E	0.87	0.56	0.35	0.29	0.89	0.67	0.02	1.06	0.09	0.36	0.20	0.35	5.71
7 200W	0.41	0.95	0.31	0.14	0.60	0.71	0.07	0.61	0.02	0.73	0.22	0.38	5.15
8 BVLY	1.10	0.61	0.38	0.14	0.35	0.36	0.21	0.46	0.05	0.42	0.06	0.37	4.51
9 FFTF	0.21	0.63	0.12	0.09	0.82	0.91	0.00	0.54	0.28	0.18	0.20	0.63	4.61
10 YAKB	0.96	0.63	0.37	0.19	0.78	0.45	0.12	0.65	0.04	0.44	0.22	0.35	5.20
11 300A	1.23	1.03	0.19	0.56	0.97	0.99	0.00	0.31	0.10	0.00	0.09	0.43	5.90
12 WYEB	1.29	0.67	0.24	0.13	1.15	0.85	0.00	0.74	0.19	0.21	0.33	0.63	6.43
13 100N	0.85	0.47	0.33	0.23	0.42	0.84	0.03	0.63	0.11	0.36	0.21	0.37	4.85
14 WPPS	1.57	0.59	0.05	0.10	1.34	0.87	0.00	0.67	0.22	0.33	0.31	0.08	6.13
17 RING	0.88	0.74	0.27	0.31	0.61	0.98	0.00	0.81	0.20	0.53	0.46	0.53	6.32
18 RICH	0.86	1.11	0.13	0.54	1.19	1.21	0.00	0.48	0.10	0.33	0.30	0.39	6.64
20 RMTN	0.41	0.41	0.22	0.21	0.67	0.69	0.00	0.32	0.08	0.33	0.32	0.43	4.09
21 HMS	2.12	0.92	0.36	0.21	0.89	0.82	0.03	0.95	0.14	0.86	0.29	0.37	7.96
22 PASC	1.61	0.62	0.18	0.18	0.82	1.16	0.01	0.48	0.12	0.51	0.57	0.62	6.88
24 100F	1.05	0.81	0.30	0.25	0.51	0.73	0.00	0.71	0.09	0.37	0.28	0.53	5.63
26 BENT	1.32	0.93	0.37	0.17	0.46	1.32	0.00	0.72	0.32	0.42	0.21	0.60	6.84
27 VSTA	1.07	0.64	0.08	0.14	0.77	1.00	0.00	0.37	0.16	0.23	0.44	0.48	5.38
28 SURF	0.95	1.28	0.29	0.16	0.71	0.96	0.00	0.61	0.09	0.22	0.01	1.02	6.30
29 100K	1.17	0.69	0.35	0.23	0.84	0.64	0.04	0.53	0.04	0.63	0.28	0.47	5.91

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

Table 2.6. 2004 Monthly and Annual Average Wind Speed (mph) from the Hanford Meteorological Monitoring Network

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
1 PROS	7.3	5.5	8.5	6.9	7.9	7.8	7.6	7.1	6.4	6.7	5.0	5.7	6.9
2 EOC	9.3	6.5	11.2	8.8	9.3	9.0	8.1	8.9	9.3	9.4	7.4	7.5	8.7
3 ARMY	5.9	4.5	7.6	6.7	7.6	7.2	6.4	5.9	6.5	5.9	4.9	4.6	6.2
4 RSPG	5.9	5.0	8.6	8.4	8.7	8.4	7.8	8.2	8.1	7.5	6.6	5.4	7.4
5 EDNA	5.0	4.3	7.0	6.1	7.1	7.4	7.2	6.2	6.1	5.2	4.4	4.9	5.9
6 200E	5.4	5.3	8.4	7.1	8.7	8.4	8.3	7.4	7.7	6.4	5.5	5.3	7.0
7 200W	4.9	3.8	7.0	6.2	7.6	7.1	6.9	6.3	6.5	5.5	4.6	4.0	5.9
8 BVLY	3.9	5.0	6.8	5.4	6.3	6.0	6.5	5.4	5.8	4.5	4.4	4.9	5.4
9 FFTF	7.8	5.9	9.8	8.1	8.7	8.5	8.3	7.9	7.6	7.6	6.1	6.4	7.7
10 YAKB	5.6	5.4	8.3	7.7	8.9	8.3	8.7	7.6	7.9	6.9	5.4	5.4	7.2
11 300A	7.5	5.5	8.8	7.2	8.4	8.2	7.6	7.3	6.8	7.0	5.5	5.7	7.1
12 WYEB	6.4	5.2	8.2	7.3	7.8	7.5	7.5	7.1	7.0	6.8	5.4	5.7	6.8
13 100N	4.5	3.5	6.5	5.7	6.9	6.3	6.8	5.4	6.3	4.8	4.2	4.2	5.4
14 WPPS	6.4	4.9	8.0	7.0	7.5	7.3	7.1	6.6	6.3	6.1	4.8	5.4	6.5
15 FRNK	6.7	5.3	8.0	6.5	6.5	6.5	6.0	6.1	5.7	5.7	5.1	5.5	6.1
16 GABL	8.1	6.8	12.4	10.6	12.1	12.0	12.3	10.6	11.0	9.6	8.5	8.4	10.2
17 RING	5.8	4.6	7.8	6.3	6.8	6.6	6.0	5.7	5.8	5.8	4.9	5.0	5.9
18 RICH	6.1	4.5	7.4	5.8	7.2	6.6	5.9	5.9	5.5	5.7	4.3	4.8	5.8
19 PFP	4.0	3.1	5.3	4.9	5.9	5.7	5.2	5.1	4.9	4.2	3.3	3.2	4.6
20 RMTN	19.2	13.9	21.2	16.1	16.2	16.4	14.0	14.9	16.3	17.5	18.3	18.3	16.9
21 HMS	5.4	5.3	8.3	7.2	8.4	8.2	8.3	7.5	7.7	6.9	5.6	5.5	7.0
22 PASC	5.1	3.6	6.4	5.0	6.4	5.9	5.2	5.3	4.8	4.8	3.7	4.0	5.0
23 GABW	4.5	4.2	6.8	5.9	7.6	7.2	7.7	6.3	6.6	5.3	4.5	4.2	5.9
24 100F	4.6	3.7	6.8	5.8	7.0	7.3	7.0	5.9	6.0	5.2	4.3	4.5	5.7
25 VERN	5.2	5.7	7.5	6.9	8.5	7.7	9.1	7.6	8.1	5.8	5.5	5.5	6.9
26 BENT	5.5	5.2	7.4	6.6	6.3	6.4	6.1	5.8	5.8	5.7	5.8	6.0	6.1
27 VSTA	5.5	3.7	7.3	5.7	7.2	6.7	5.8	6.0	5.8	5.6	4.2	4.5	5.7
28 SURF	6.8	7.1	11.1	9.1	12.4	11.5	11.2	10.5	9.8	9.2	6.5	6.1	9.3
29 100K	4.3	3.7	6.4	5.7	7.5	6.9	7.2	5.7	6.4	4.9	4.0	4.0	5.6
30 HAMR	6.7	4.9	8.2	6.6	7.6	7.5	6.9	6.8	6.3	6.5	6.1	5.2	6.6

Daily Temperatures - 2004
Hanford Meteorological Station

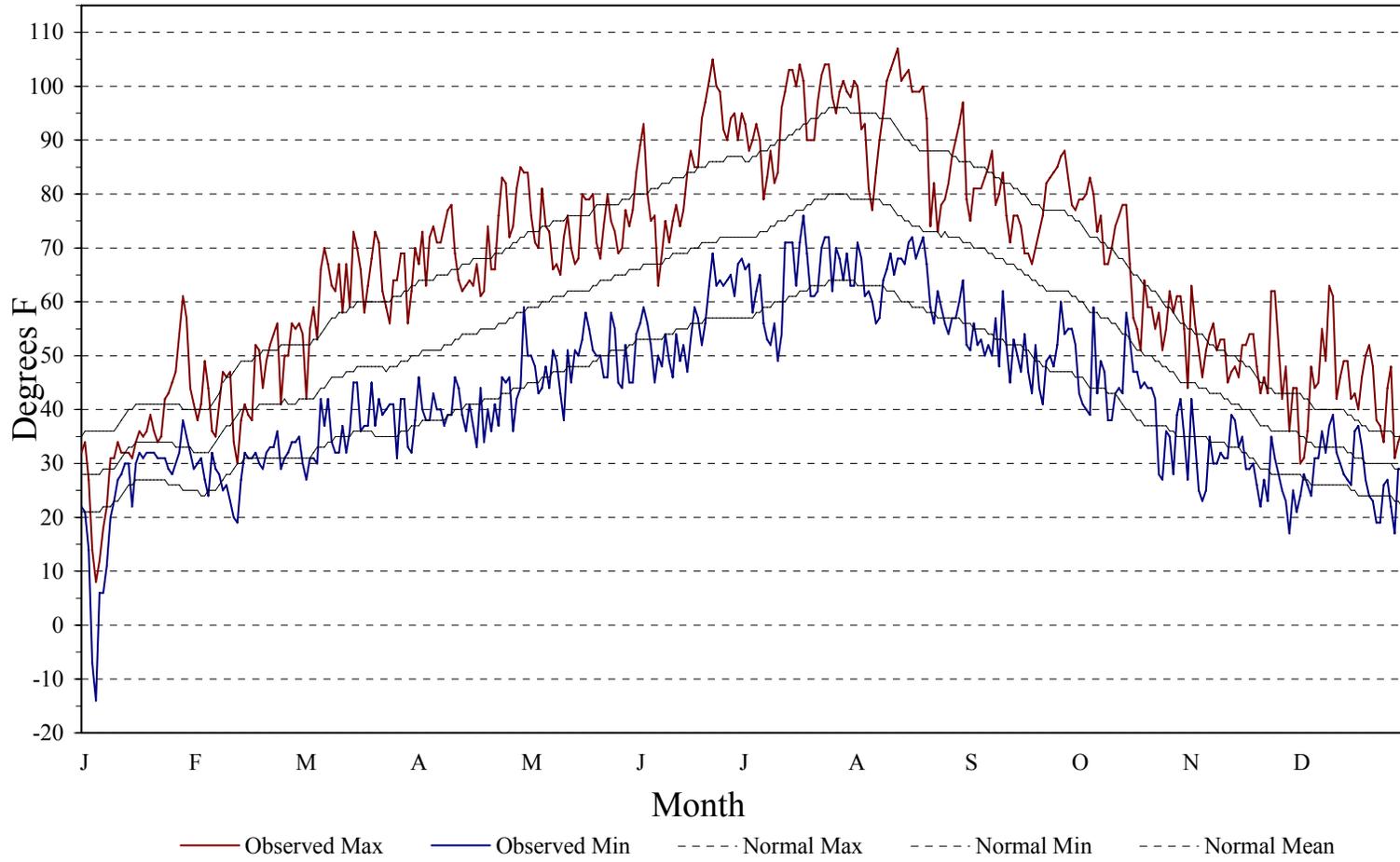


Figure 2.1. 2004 Observed Daily Temperatures from the Hanford Meteorology Station

2.2 Precipitation

Precipitation for 2004 totaled 7.96 inches, 114% of normal (6.98 inches). The wettest year was 1995 with 12.31 inches; the driest was 1976 with only 2.99 inches. Calendar year snowfall totaled 22.9 inches, compared to an annual normal snowfall of 15.4 inches. The greatest calendar year snowfall was 57.5 inches (1996); the least was 0.6 inch (1999).

Precipitation for January 2004 totaled 2.12 inches, 244% of normal (0.87 inches), the fourth wettest January on record. The wettest January (1970) received 2.47 inches, and the driest (1977) received 0.08 inch. Snowfall for January 2004 totaled 19.1 inches, compared to a normal of 4.2 inches, and was the second snowiest January on record. The snowiest January (1950) received 23.4 inches. The snowfall total of 11.4 inches on January 1 established a new 24-hour snowfall record at the HMS. The previous record was 10.2 inches on February 18-19, 1993.

Precipitation for February 2004 totaled 0.92 inch, 135% of normal (0.68 inch). The wettest February (1961) received 2.10 inches, and the driest (1988) received only a trace. Snowfall for February 2004 totaled 1.3 inches, compared to a normal of 2.6 inches. The snowiest February (1989) received 17.0 inches, while numerous Februarys (as recently as last year) have received no snowfall.

The 2003-2004 winter season (December 2003, January and February 2004) was much wetter than normal. Precipitation totaled 5.00 inches, 188% of normal (2.66 inches) and was the fourth wettest winter on record. The wettest winter (1996-97) received 5.45 inches, while the driest (1946-47) received 0.70 inch.

Precipitation for March 2004 totaled 0.36 inch, 62% of normal (0.58 inch). The wettest March (1957) received 1.86 inches, and the driest (1968) received only 0.02 inch. No snow was recorded during the month, compared to a March normal of 0.4 inch. The snowiest March (1951) received 4.2 inches, while numerous months of March (as recently as last year) have received no snowfall.

Precipitation for April 2004 totaled 0.21 inch, 48% of normal (0.44 inch). The wettest April (2003) received 2.23 inches, and the driest (1999 and prior years) received only a trace. No snow was recorded during the month, compared to an April normal of a trace. The snowiest April (1982) received 1.0 inches, while most months of April have received no snowfall.

Precipitation for May 2004 totaled 0.89 inch, 162% of normal (0.55 inch). The wettest May (1972) received 2.03 inches, and the driest (1992 and prior years) received only a trace. There were five thunderstorms recorded in May, compared to a normal of two and a record of seven in 1956.

Spring season (March, April, and May) precipitation totaled 1.46 inches, 92% of normal (1.58 inches). The wettest spring (1995) received 3.23 inches; the driest (1968) received only 0.09 inch.

Precipitation for June 2004 totaled 0.82 inch, 200% of normal (0.41 inch). The wettest June (1950) received 2.92 inches, and the driest (2003 and prior years) received only a trace. There were three thunderstorms recorded in June, compared to a normal of two and a record of eight in 1972 and earlier years.

Precipitation for July 2004 totaled 0.03 inch, 11% of normal (0.27 inch). The wettest July (1993) received 1.76 inches, and the driest (2003) received no precipitation.

Precipitation for August 2004 totaled 0.95 inch, 352% of normal (0.27 inch), and was the fifth wettest August on record. The wettest August (1977) received 1.36 inches, and the driest (1998 and earlier years) received no precipitation.

Precipitation for the summer season (June, July, and August) totaled 1.80 inches, 190% of normal, and was the sixth wettest summer on record. The wettest summer (1950) received 2.99 inches, and the driest (1973) received on 0.03 inch.

Precipitation for September 2004 totaled 0.14 inch, 42% of normal (0.33 inch). The wettest September (1947) received 1.34 inches, and the driest (1999 and earlier years) received no precipitation.

Precipitation for October 2004 totaled 0.86 inch, 176% of normal (0.49 inch). The wettest October (1957) received 2.72 inches, and the driest (1987 and earlier years) received only a trace.

Precipitation for November 2004 totaled 0.29 inch, 30% of normal (0.98 inch). The wettest November (1996) received 2.67 inches, and the driest (1976) received only a trace. There was a trace of snow recorded in November, compared to a normal of 2.3 inches, and a maximum of 18.3 inches in 1985.

Autumn 2004 (September, October, and November) precipitation totaled 1.29 inches, 72% of normal (1.80 inches). The wettest autumn (1973) received 4.79 inches, while the driest (1976) received only 0.04 inch.

Precipitation for December 2004 totaled 0.37 inch, 33% of normal (1.11 inches). The wettest December (1996) received 3.69 inches, and the driest (1999) received only 0.07 inch. There were 2.5 inches of snow recorded in December, compared to a normal of 5.8 inches, and a maximum of 22.6 inches in 1996.

2.3 Wind

The average wind speed (at the 50-foot level) for 2004 was 7.0 miles per hour (mph), which was 0.6 mph below normal (7.6 mph). The windiest year was 1999, which averaged 8.8 mph, while 1957 was the year with the lightest winds, averaging 6.3 mph. The peak gust for 2004 was 63 mph on January 30.

The average wind speed for January 2004 was 5.4 mph, 0.9 mph below normal (6.3 mph). The windiest January on record averaged 10.3 mph (1972), while the January with the lightest winds (1985) averaged 2.9 mph. The peak gust for the month was 63 mph on January 30. The record wind gust for January was 80 mph in 1972.

The average wind speed for February 2004 was 5.3 mph, 1.8 mph below normal (7.1 mph). The windiest February on record averaged 11.1 mph (1999), while the February with the lightest winds (1963) averaged 4.6 mph. The peak gust for the month was 31 mph on February 24. The record wind gust for February was 65 mph in 1971.

The average wind speed for March 2004 was 8.3 mph, 0.3 mph above normal (8.0 mph). The windiest March on record averaged 10.7 mph (1977 and earlier years), while the March with the lightest winds (1958) averaged 5.9 mph. The peak gust for the month was 51 mph on March 18. The record wind gust for March was 70 mph in 1956.

The average wind speed for April 2004 was 7.2 mph, 1.6 mph below normal (8.8 mph). This was the lowest average wind speed ever recorded for the month of April (the previous record low was 7.4 mph in 1958 and 1989). The windiest April on record averaged 11.1 mph (1972 and earlier years). The peak gust for the month was 55 mph on April 27. The record wind gust for April was 73 mph in 1972.

The average wind speed for May 2004 was 8.4 mph, 0.5 mph below normal (8.9 mph). The windiest May on record averaged 10.7 mph (1983), while the May with the lightest winds (1957) averaged 5.8 mph. The peak gust for the month was 41 mph on May 10. The record wind gust for May was 71 mph in 1948.

The average wind speed for June 2004 was 8.2 mph, 0.9 mph below normal (9.1 mph). The windiest June on record averaged 10.7 mph (1983 and earlier years), while the June with the lightest winds (1950 and earlier years) averaged 7.7 mph. The peak gust for the month was 42 mph on June 7. The record wind gust for June was 72 mph in 1957.

The average wind speed for July 2004 was 8.3 mph, 0.3 mph below normal (8.6 mph). The windiest July on record averaged 10.7 mph (1983 and earlier years), while the July with the lightest winds (1950) averaged 5.5 mph. The peak gust for the month was 40 mph on July 2 and 25. The record wind gust for July was 69 mph in 1979.

The average wind speed for August 2004 was 7.5 mph, 0.5 mph below normal (8.0 mph). The windiest August on record (1996) averaged 9.5 mph, while the August with the lightest winds (1956) averaged 6.0 mph. The peak gust for the month was 44 mph on August 14. The record wind gust for August was 66 mph in 1961.

The average wind speed for September 2004 was 7.7 mph, 0.4 mph above normal (7.3 mph). The windiest September on record (1961) averaged 9.2 mph, while the September with the lightest winds (1957) averaged 5.4 mph. The peak gust for the month was 42 mph on September 4 and 18. The record wind gust for September was 65 mph in 1953.

The average wind speed for October 2004 was 6.9 mph, 0.4 mph above normal (6.5 mph). The windiest October on record (1946) averaged 9.1 mph, while the October with the lightest winds (1952) averaged 4.4 mph. The peak gust for the month was 38 mph on October 30. The record wind gust for October was 72 mph in 1997.

The average wind speed for November 2004 was 5.6 mph, 0.9 mph below normal (6.5 mph). The windiest November on record (1990) averaged 10.0 mph, while the November with the lightest winds (1956) averaged 2.9 mph. The peak gust for the month was 44 mph on November 24. The record wind gust for November was 67 mph in 1993.

The average wind speed for December 2004 was 5.5 mph, 0.6 mph below normal (6.1 mph). The windiest Decembers on record (1949 and 1968) averaged 8.3 mph, while the December with the lightest winds (1983) averaged 3.3 mph. The peak gust for the month was 40 mph on December 8. The record wind gust for December was 71 mph in 1955.

A composite of the wind roses (at the 30-foot and 60-meter levels, respectively) from the Hanford Meteorological Monitoring Network for 2004 are presented in Figures 2.2 and 2.3. Appendix B gives the individual 2004 wind roses from the Hanford Meteorological Monitoring Network stations.

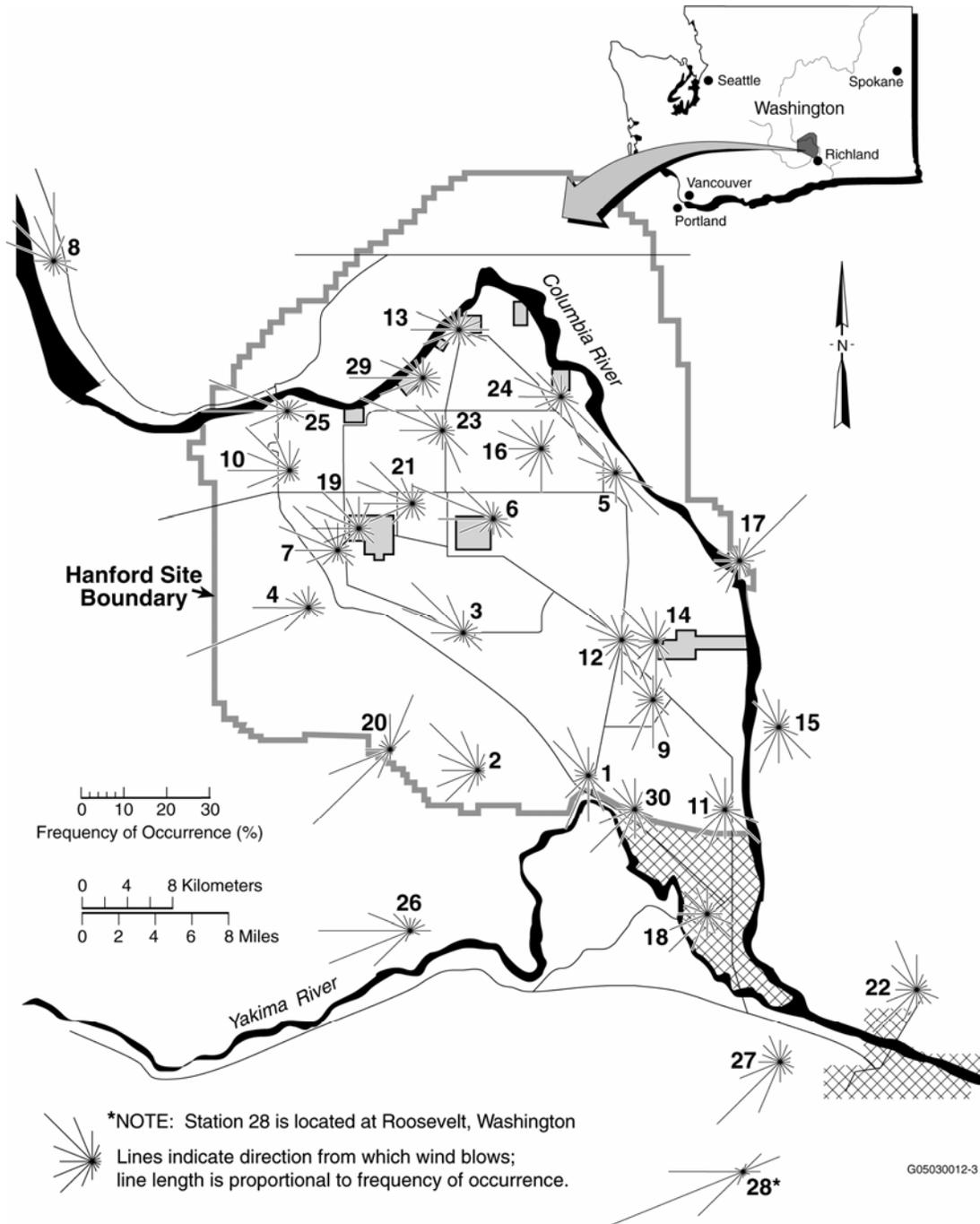
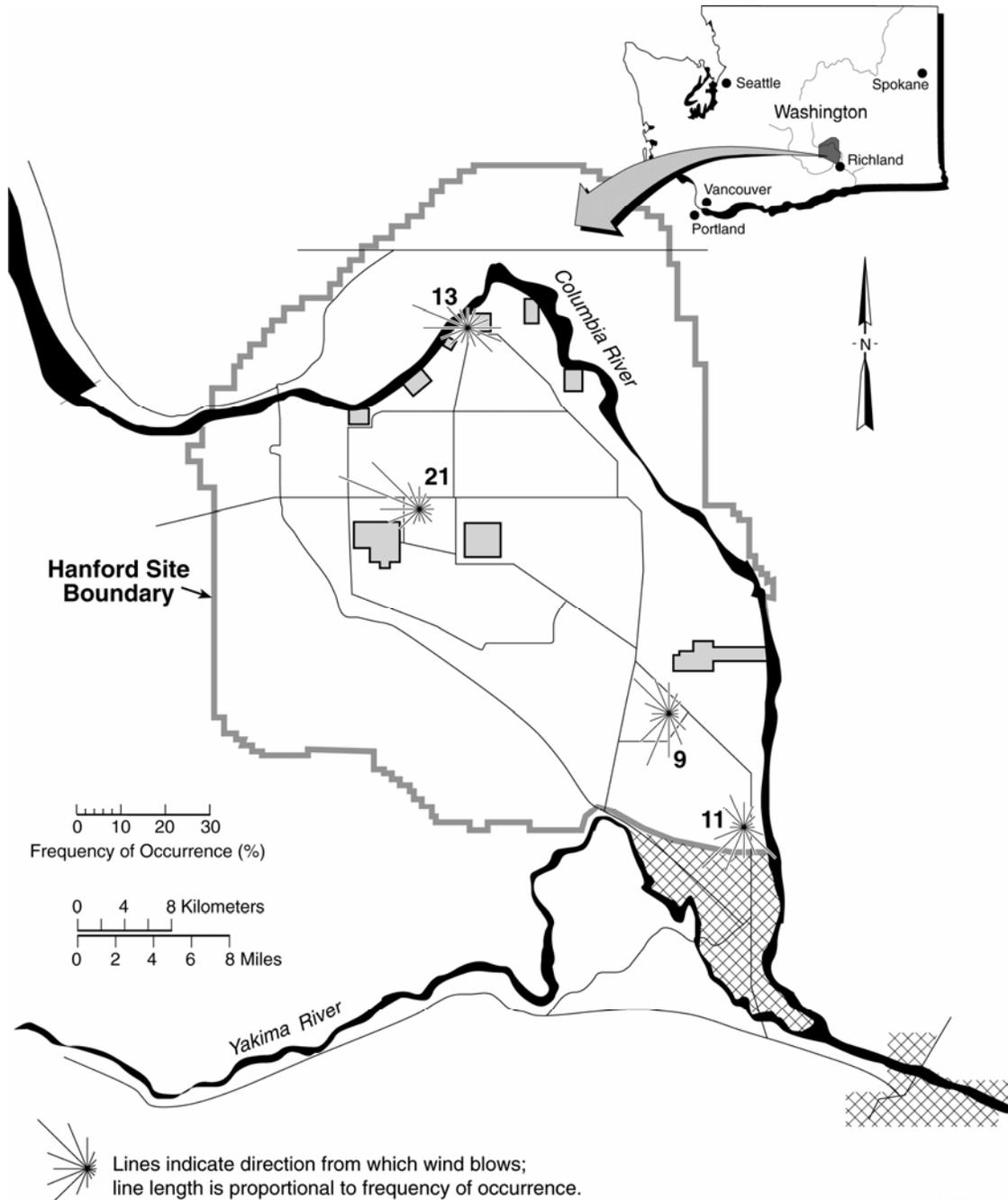


Figure 2.2. 2004 Hanford Meteorological Monitoring Network Wind Roses at 30 Feet (Refer to Table 1.1 for the names of the numbered locations on this map; see Appendix B for station-specific wind rose.)



G05030012-4

Figure 2.3. 2004 Hanford Meteorological Monitoring Network Wind Roses at 60-Meter Level (Refer to Table 1.1 for the names of the numbered locations on this map; see Appendix B for station-specific wind rose.)