

FRESNO CA

Latitude = 36.77 N

Longitude = 119.70 W

Period of Record = 1972 to 1996

WMO No. 723890

Elevation = 328 feet

Average Pressure = 29.62 inches Hg

Design Criteria Data

	Design Value	Mean Coincident (Average) Values			
		Wet Bulb Temperature (°F)	Humidity Ratio (gr/lb)	Wind Speed (mph)	Prevailing Direction (NSEW)
Dry Bulb Temperature (T)	(°F)				
Median of Extreme Highs	107	73	69	8.7	WNW
0.4% Occurrence	104	71	63	8.4	WNW
1.0% Occurrence	101	70	63	8.1	WNW
2.0% Occurrence	99	69	62	8.2	WNW
Mean Daily Range	24	-	-	-	-
97.5% Occurrence	36	35	29	3.4	E
99.0% Occurrence	33	32	25	3.2	E
99.6% Occurrence	30	29	22	3.3	E
Median of Extreme Lows	28	27	20	3.5	E
	Design Value	Mean Coincident (Average) Values			
		Dry Bulb Temperature (°F)	Humidity Ratio (gr/lb)	Wind Speed (mph)	Prevailing Direction (NSEW)
Wet Bulb Temperature (T_{wb})	(°F)				
Median of Extreme Highs	77	102	97	7.7	WNW
0.4% Occurrence	74	99	85	7.6	WNW
1.0% Occurrence	72	96	79	7.6	WNW
2.0% Occurrence	71	95	75	7.5	WNW
	Design Value	Mean Coincident (Average) Values			
		Dry Bulb Temperature (°F)	Vapor Pressure (in. Hg)	Wind Speed (mph)	Prevailing Direction (NSEW)
Humidity Ratio (HR)	(gr/lb)				
Median of Extreme Highs	109	81	0.72	6.8	WNW
0.4% Occurrence	94	84	0.62	6.5	WNW
1.0% Occurrence	88	84	0.58	6.7	WNW
2.0% Occurrence	81	82	0.54	6.6	WNW
Air Conditioning/ Humid Area Criteria	# of Hours	T ≥ 93°F	T ≥ 80°F	T _{wb} ≥ 73°F	T _{wb} ≥ 67°F
		514	1701	69	789

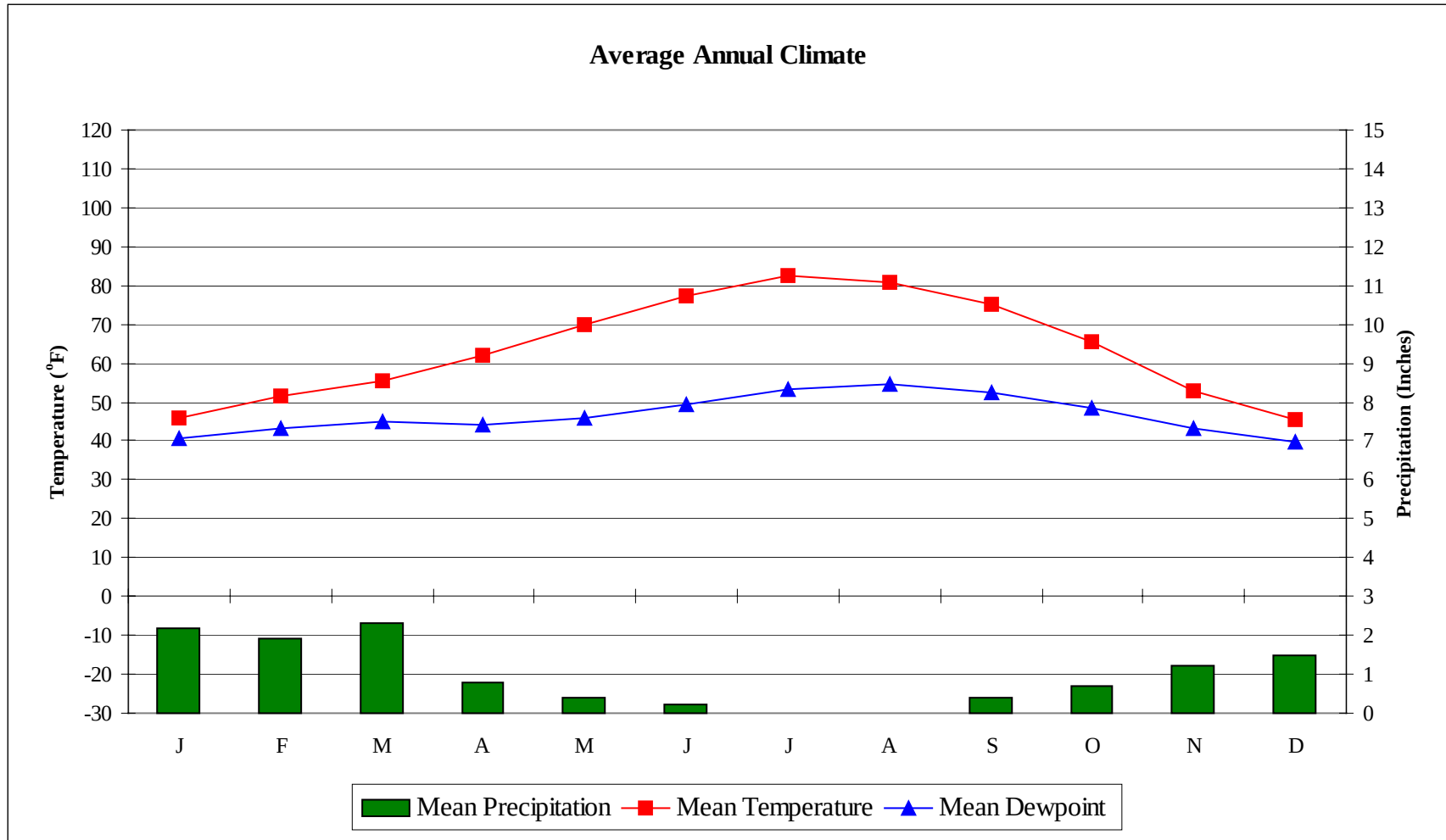
Other Site Data

Weather Region	Rain Rate 100 Year Recurrence (in./hr)	Basic Wind Speed 3 sec gust @ 33 ft 50 Year Recurrence (mph)	Ventilation Cooling Load Index (Ton-hr/cfm/yr) Base 75°F-RH 60% Latent + Sensible
11	1.1	85	0.1 + 2.3
Ground Water Temperature (°F) 50 Foot Depth *	Frost Depth 50 Year Recurrence (in.)	Ground Snow Load 50 Year Recurrence (lb/ft ²)	Average Annual Freeze-Thaw Cycles (#)
66.1	N/A	N/A	10

*Note: Temperatures at greater depths can be estimated by adding 1.5°F per 100 feet additional depth.

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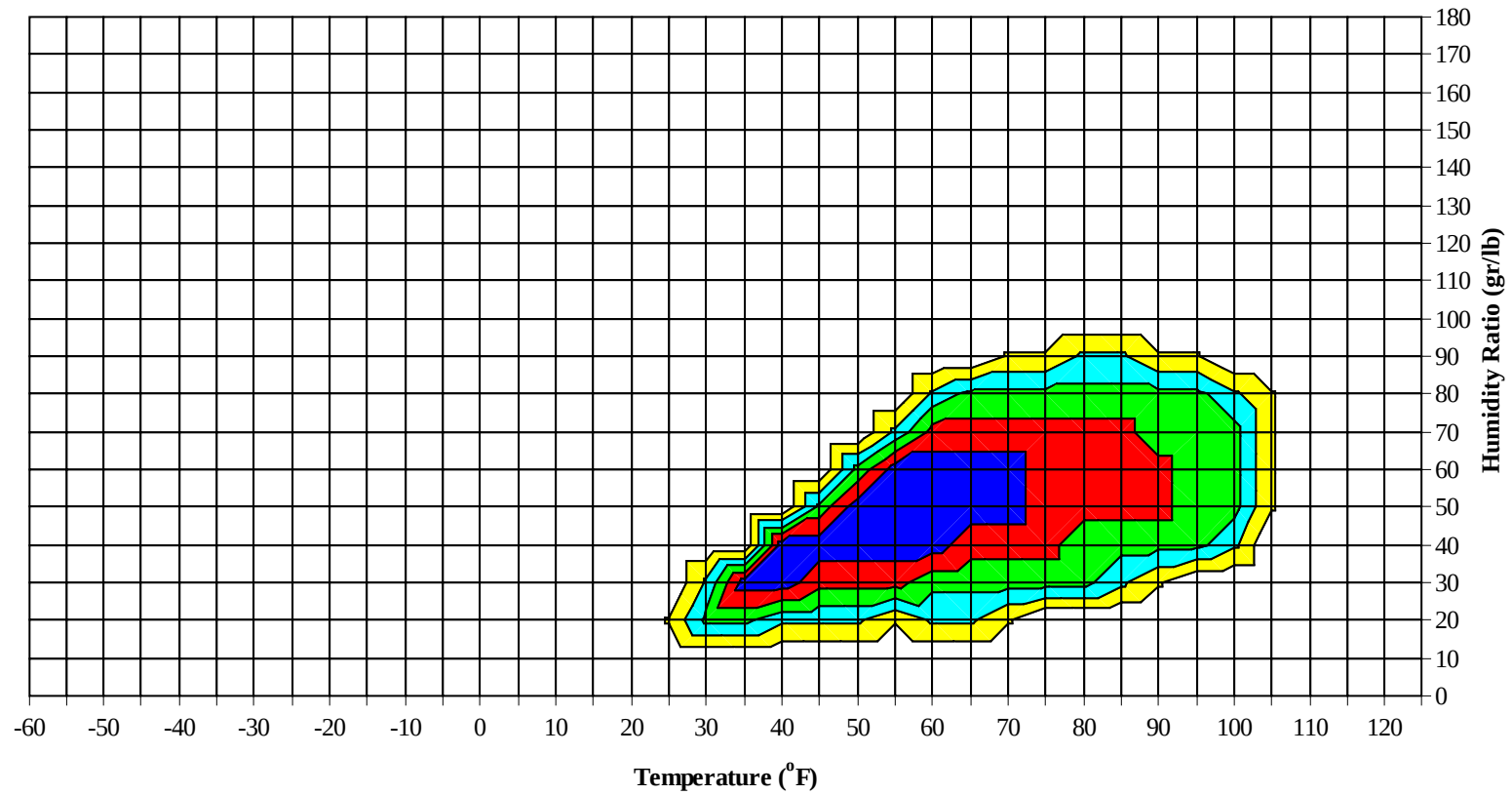
WMO No. 723890



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WMO No. 723890

Long Term Psychrometric Summary

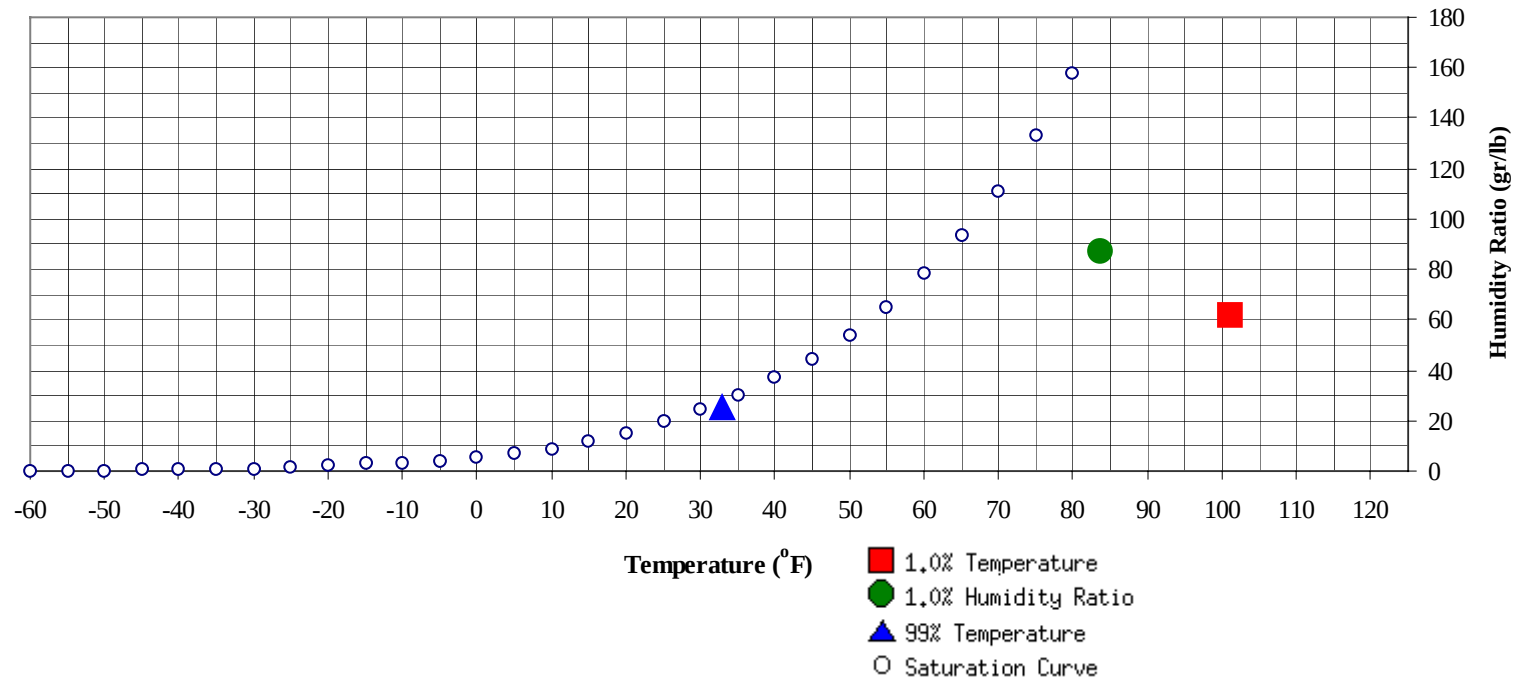


- 50% of all observations
- 80% of all observations
- 95% of all observations
- 97.5% of all observations
- 99% of all observations

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Psychrometric Summary of Peak Design Values



	(°F)	MCHR (gr/lb)	Enthalpy (btu/lb)	1.0% Humidity Ratio	(gr/lb)	MCDB (°F)	MCWB (°F)	MC Dewpt (°F)	Enthalpy (btu/lb)
99% Dry Bulb	33	25.2	11.8		87.5	83.7	69.6	63	33.8

1.0% Dry Bulb	(°F)	MCHR (gr/lb)	MCWB (°F)	Enthalpy (btu/lb)
	101	61.8	70.1	34.0

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Dry-Bulb Temperature Hours For An Average Year (Sheet 1 of 5)

Period of Record = 1972 to 1996

Temperature Range (°F)	January					February					March				
	Hour Group (LST)			Total Obs	M C W B (°F)	Hour Group (LST)			Total Obs	M C W B (°F)	Hour Group (LST)			Total Obs	M C W B (°F)
	01 To 08	09 To 16	17 To 00			01 To 08	09 To 16	17 To 00			01 To 08	09 To 16	17 To 00		
110 / 114															
105 / 109															
100 / 104															
95 / 99															
90 / 94															
85 / 89												0	0	0	64.5
80 / 84												2	0	2	61.6
75 / 79		0		0	57.7		3	1	4	58.8		12	3	15	60.0
70 / 74		1	0	1	56.5		10	3	13	57.8		28	10	38	58.4
65 / 69		7	1	8	55.2	0	26	8	34	55.9	0	44	25	69	56.0
60 / 64	1	21	6	28	54.2	1	45	25	71	54.1	4	59	44	107	53.9
55 / 59	7	42	24	73	51.5	15	54	49	118	51.7	31	54	65	150	51.5
50 / 54	23	53	47	124	48.3	39	48	63	150	48.5	75	34	59	168	48.5
45 / 49	48	57	69	175	44.7	59	26	47	132	44.9	75	13	31	119	44.7
40 / 44	60	42	63	166	40.7	59	10	22	91	40.6	45	3	10	58	40.6
35 / 39	65	20	32	117	36.5	39	2	6	47	36.2	16	0	1	17	36.2
30 / 34	37	3	5	45	31.8	11	0	1	12	31.8	1		0	1	32.3
25 / 29	6	0	0	6	27.0	1	0		1	26.2					
20 / 24	1			1	22.1	0			0	24.0					
15 / 19															

Caution: This summary reflects the typical distribution of temperature in a typical year. It does not reflect the typical moisture distribution. Because wet bulb temperatures are averaged, this summary understates the annual moisture load. For accurate moisture load data, see the long-term humidity summary and the ventilation and infiltration load pages in this manual.

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WMO No. 723890

Dry-Bulb Temperature Hours For An Average Year (Sheet 2 of 5)

Period of Record = 1972 to 1996

Temperature Range (°F)	April					May					June				
	Hour Group (LST)			Total Obs	M C W B (°F)	Hour Group (LST)			Total Obs	M C W B (°F)	Hour Group (LST)			Total Obs	M C W B (°F)
	01 To 08	09 To 16	17 To 00			01 To 08	09 To 16	17 To 00			01 To 08	09 To 16	17 To 00		
110 / 114															
105 / 109							0	0	0	70.4		3	1	4	70.7
100 / 104							2	1	3	68.8		15	9	24	69.5
95 / 99		1	0	1	67.3		11	4	15	67.1		27	15	42	67.6
90 / 94		4	1	5	64.5		21	10	31	65.2		43	26	69	65.9
85 / 89		12	4	16	62.7	0	33	19	52	63.4	1	47	36	84	64.4
80 / 84		24	9	33	60.6	1	42	28	71	61.2	6	42	41	89	62.7
75 / 79	0	33	17	50	58.8	5	46	39	90	59.4	20	30	41	91	60.9
70 / 74	1	44	28	73	56.9	15	38	42	95	57.6	44	20	35	99	59.2
65 / 69	6	47	40	93	55.0	34	29	41	104	55.8	63	9	21	93	57.0
60 / 64	23	40	49	112	53.1	56	18	33	107	53.5	63	4	11	78	54.6
55 / 59	58	24	49	132	50.9	70	6	23	99	51.0	33	0	4	37	51.6
50 / 54	79	10	29	119	47.9	50	1	7	58	47.8	10	0	0	10	48.3
45 / 49	52	2	10	64	44.5	14		1	15	44.2	1			1	45.7
40 / 44	17	0	2	19	40.6	2			2	40.0					
35 / 39	3		0	3	36.5	0			0	37.5					
30 / 34	0			0	32.8										
25 / 29															
20 / 24															
15 / 19															

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Dry-Bulb Temperature Hours For An Average Year (Sheet 3 of 5)

Period of Record = 1972 to 1996

Temperature Range (°F)	July					August					September				
	Hour Group (LST)			Total Obs	M C W B (°F)	Hour Group (LST)			Total Obs	M C W B (°F)	Hour Group (LST)			Total Obs	M C W B (°F)
	01 To 08	09 To 16	17 To 00			01 To 08	09 To 16	17 To 00			01 To 08	09 To 16	17 To 00		
110 / 114		0	0	0	74.5		0	0	0	74.1					
105 / 109		8	4	12	72.2		6	2	8	73.2		0	0	0	72.6
100 / 104		32	17	49	70.7		22	11	33	71.0		8	2	10	70.4
95 / 99		48	29	77	69.1		45	23	68	69.2		23	8	31	68.3
90 / 94	0	57	41	98	67.6	0	53	34	87	67.8		41	18	59	66.9
85 / 89	3	47	45	95	66.2	2	48	42	92	66.5	0	44	25	69	65.4
80 / 84	19	32	47	98	64.8	12	37	50	99	65.2	2	46	40	88	63.8
75 / 79	46	16	36	98	63.1	35	22	44	101	63.6	9	39	47	95	62.2
70 / 74	75	6	21	102	61.1	64	11	29	104	61.6	31	24	50	105	60.8
65 / 69	63	1	6	70	58.3	74	2	11	87	59.3	66	12	34	111	58.9
60 / 64	35	0	1	36	55.4	51	0	2	53	57.1	84	3	15	102	56.4
55 / 59	7		0	7	52.5	9		0	9	54.1	40	0	2	42	53.0
50 / 54	0			0	49.0	0			0	51.3	7		0	7	49.3
45 / 49											1			1	43.6
40 / 44															
35 / 39															
30 / 34															
25 / 29															
20 / 24															
15 / 19															

Caution: This summary reflects the typical distribution of temperature in a typical year. It does not reflect the typical moisture distribution. Because wet bulb temperatures are averaged, this summary understates the annual moisture load. For accurate moisture load data, see the long-term humidity summary and the ventilation and infiltration load pages in this manual.

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Dry-Bulb Temperature Hours For An Average Year (Sheet 4 of 5)

Period of Record = 1972 to 1996

Temperature Range (°F)	October					November					December				
	Hour Group (LST)			Total Obs	M C W B (°F)	Hour Group (LST)			Total Obs	M C W B (°F)	Hour Group (LST)			Total Obs	M C W B (°F)
	01 To 08	09 To 16	17 To 00			01 To 08	09 To 16	17 To 00			01 To 08	09 To 16	17 To 00		
110 / 114															
105 / 109															
100 / 104		0		0	69.2										
95 / 99		5	1	6	68.0										
90 / 94		10	2	12	66.3										
85 / 89		22	6	28	64.3										
80 / 84		38	13	51	62.6		2		2	59.2					
75 / 79	0	48	24	72	60.9		10	0	10	58.6		0		0	54.0
70 / 74	3	47	38	88	59.1		24	4	28	57.4		1		1	53.4
65 / 69	17	38	51	106	57.3	0	35	13	48	55.5		6	0	6	54.2
60 / 64	50	25	56	131	55.3	3	46	29	78	53.7	0	24	3	27	53.2
55 / 59	77	11	36	124	52.3	16	53	50	119	51.4	6	41	20	67	51.2
50 / 54	63	3	17	83	48.5	50	41	65	156	48.5	22	57	47	126	48.2
45 / 49	28	0	4	32	44.5	73	22	51	145	44.7	41	52	65	158	44.6
40 / 44	8		0	8	40.2	56	7	23	86	40.7	61	42	65	168	40.7
35 / 39	1		0	1	35.3	33	1	6	40	36.2	68	19	35	122	36.3
30 / 34						8	0	0	8	31.9	40	5	11	56	31.5
25 / 29						0			0	27.2	9	1	1	11	26.6
20 / 24											1	0	0	1	21.9
15 / 19											0			0	17.7

Caution: This summary reflects the typical distribution of temperature in a typical year. It does not reflect the typical moisture distribution. Because wet bulb temperatures are averaged, this summary understates the annual moisture load. For accurate moisture load data, see the long-term humidity summary and the ventilation and infiltration load pages in this manual.

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Dry-Bulb Temperature Hours For An Average Year (Sheet 5 of 5)

Period of Record = 1972 to 1996

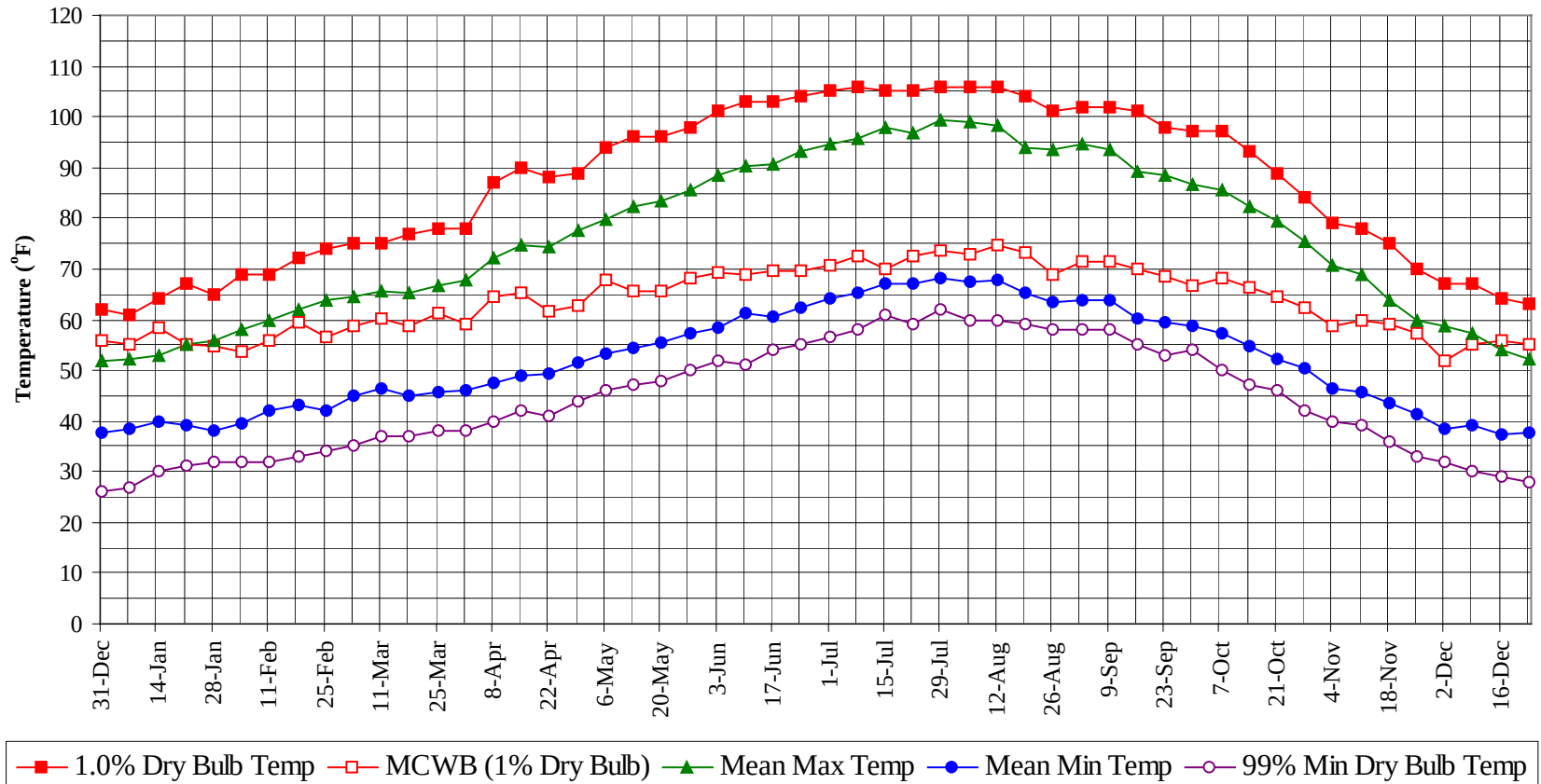
Annual Totals					
Temperature Range (°F)	Hour Group (LST)			Total Obs	M C W B (°F)
	01 To 08	09 To 16	17 To 00		
110 / 114		0	0	0	74.3
105 / 109		17	7	24	72.3
100 / 104		79	39	118	70.5
95 / 99		158	79	237	68.6
90 / 94	0	227	130	357	66.9
85 / 89	6	252	177	435	65.2
80 / 84	39	265	226	530	63.4
75 / 79	114	259	252	625	61.4
70 / 74	233	255	260	748	59.4
65 / 69	321	256	253	830	57.0
60 / 64	372	286	275	932	54.5
55 / 59	372	287	322	980	51.6
50 / 54	420	248	337	1004	48.3
45 / 49	392	174	279	844	44.7
40 / 44	309	105	186	600	40.7
35 / 39	226	43	81	350	36.3
30 / 34	98	8	18	124	31.7
25 / 29	16	1	2	19	26.8
20 / 24	2	0	0	2	22.0
15 / 19	0			0	17.7

Caution: This summary reflects the typical distribution of temperature in a typical year. It does not reflect the typical moisture distribution. Because wet bulb temperatures are averaged, this summary understates the annual moisture load. For accurate moisture load data, see the long-term humidity summary and the ventilation and infiltration load pages in this manual.

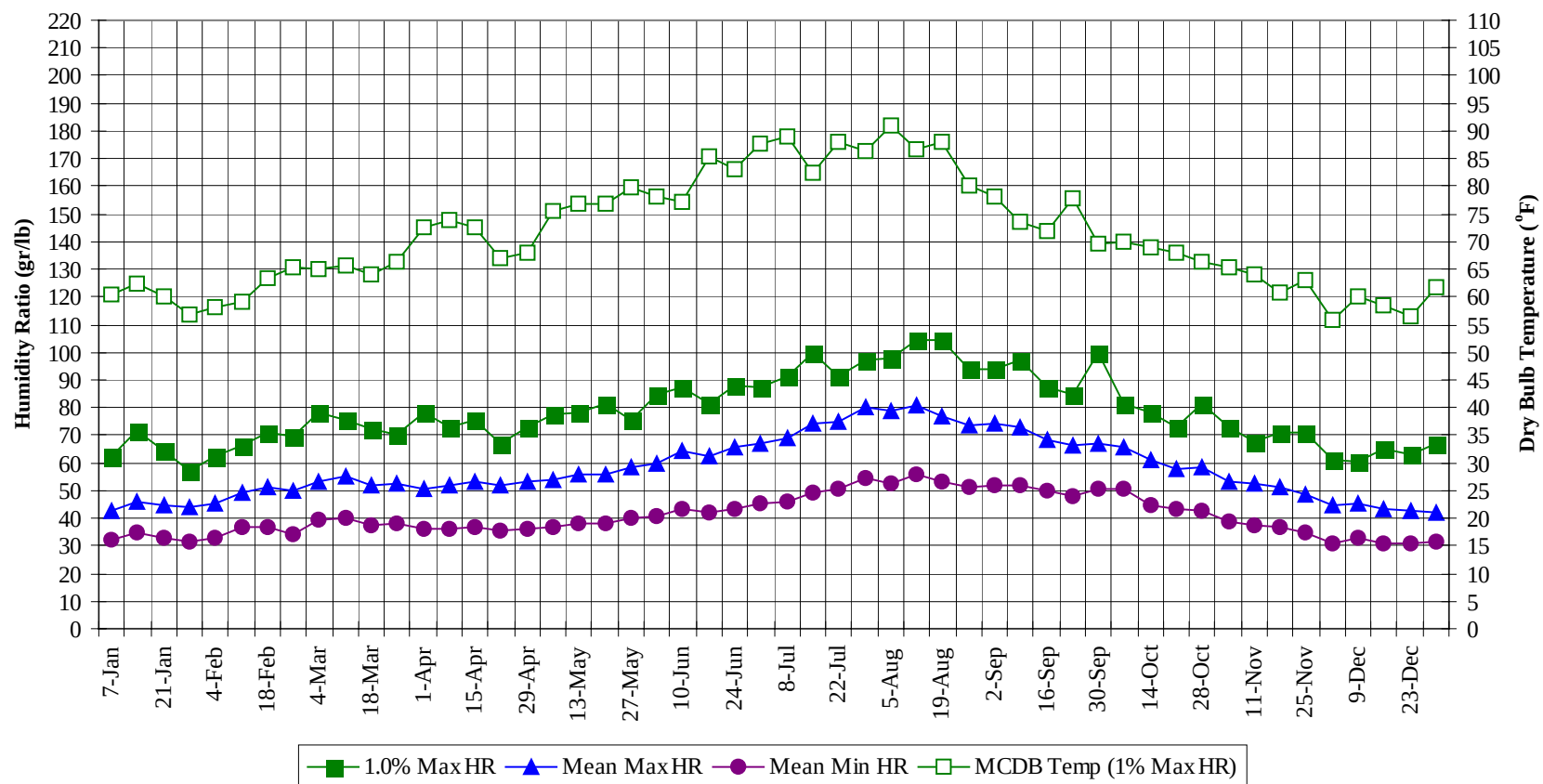
FRESNO CA

WMO No. 723890

Annual Summary of Temperatures



Long Term Humidity and Dry Bulb Temperature Summary

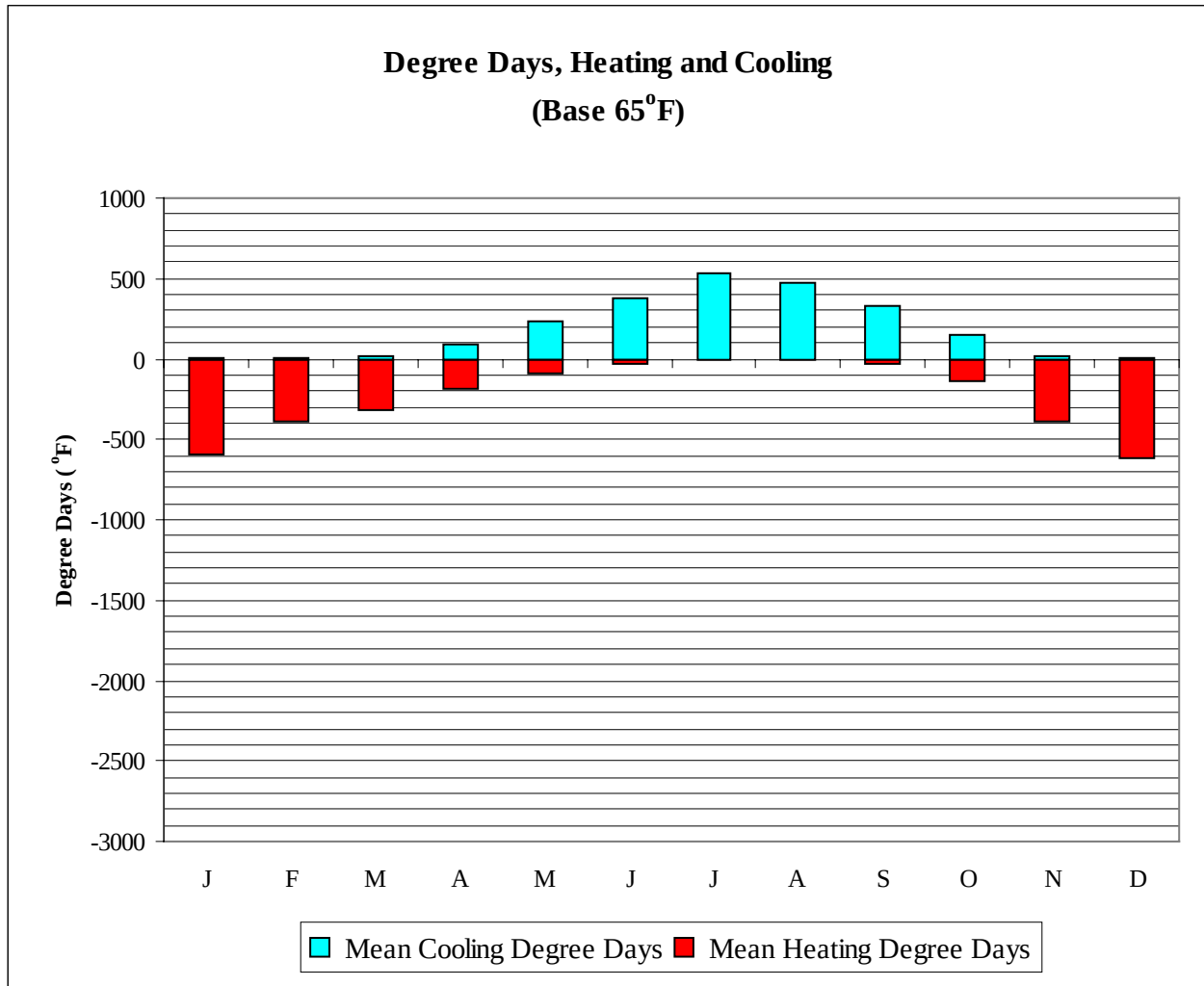


FRESNO CA**WMO No. 723890****Long Term Dry Bulb Temperature and Humidity Summary**

Week Ending	1.0% Temp (°F)	MCWB @ 1% Temp (°F)	Mean Max Temp (°F)	Mean Min Temp (°F)	99% Temp (°F)	1.0% HR (gr/lb)	MCDB @ 1% HR (°F)	Mean Max HR (gr/lb)	Mean Min HR (gr/lb)
7-Jan	61.0	55.1	52.1	38.5	27.0	62.3	60.3	42.9	32.3
14-Jan	64.0	58.3	52.8	40.0	30.0	71.4	62.4	45.9	34.5
21-Jan	67.0	55.2	55.1	39.2	31.0	64.4	60.2	44.5	32.9
28-Jan	65.0	54.6	55.9	38.2	32.0	57.4	56.8	44.1	31.4
4-Feb	69.0	53.8	57.9	39.4	32.0	62.3	58.0	45.1	32.6
11-Feb	69.0	56.0	59.8	41.9	32.0	66.5	59.1	49.4	36.5
18-Feb	72.0	59.5	62.1	43.0	33.0	70.7	63.4	51.3	36.7
25-Feb	74.0	56.6	63.6	42.2	34.0	69.3	65.2	49.9	34.5
4-Mar	75.0	58.6	64.6	45.0	35.0	78.4	65.0	53.3	39.2
11-Mar	75.0	60.3	65.5	46.3	37.0	75.6	65.7	55.0	40.2
18-Mar	77.0	58.9	65.3	44.9	37.0	72.1	64.0	51.8	37.4
25-Mar	78.0	61.3	66.8	45.7	38.0	70.0	66.3	52.8	37.8
1-Apr	78.0	58.9	67.8	46.0	38.0	78.4	72.7	50.8	36.0
8-Apr	87.0	64.4	72.1	47.4	40.0	72.8	73.8	52.1	36.4
15-Apr	90.0	65.2	74.8	48.8	42.0	75.6	72.5	53.3	36.9
22-Apr	88.0	61.5	74.4	49.2	41.0	67.2	67.1	52.0	35.3
29-Apr	89.0	62.7	77.5	51.3	44.0	72.8	68.0	53.3	35.9
6-May	94.0	67.9	79.9	53.1	46.0	77.7	75.4	54.0	36.7
13-May	96.0	65.6	82.3	54.4	47.0	78.4	76.8	55.7	37.8
20-May	96.0	65.8	83.6	55.6	48.0	81.2	76.8	55.7	38.0
27-May	98.0	68.1	85.7	57.1	50.0	75.6	79.6	58.2	40.0
3-Jun	101.0	69.3	88.3	58.5	52.0	84.7	78.2	59.8	40.8
10-Jun	103.0	68.9	90.4	61.2	51.0	87.5	77.2	64.5	43.0
17-Jun	103.0	69.5	90.8	60.7	54.0	81.2	85.4	62.6	42.0
24-Jun	104.0	69.5	93.3	62.3	55.0	88.2	83.2	65.4	43.4
1-Jul	105.0	70.8	94.5	64.3	56.5	87.5	87.8	66.9	45.1
8-Jul	106.0	72.6	95.8	65.2	58.0	91.0	88.9	68.8	46.2
15-Jul	105.0	69.8	97.8	67.1	61.0	100.1	82.6	74.1	49.6
22-Jul	105.0	72.3	96.8	66.9	59.0	91.0	87.9	75.2	50.5
29-Jul	106.0	73.6	99.3	68.2	62.0	97.3	86.2	79.8	54.6
5-Aug	106.0	73.0	98.8	67.5	60.0	98.0	91.0	79.1	52.4
12-Aug	106.0	74.7	98.3	67.7	60.0	104.3	86.5	80.7	55.6
19-Aug	104.0	73.3	93.9	65.2	59.0	104.3	87.9	76.7	52.9
26-Aug	101.0	69.0	93.4	63.5	58.0	93.8	80.0	73.5	51.0
2-Sep	102.0	71.4	94.7	63.8	58.0	93.8	78.3	73.9	52.1
9-Sep	102.0	71.3	93.5	63.8	58.0	97.3	73.4	73.1	52.2
16-Sep	101.0	70.1	89.1	60.2	55.0	87.5	72.0	68.2	50.0
23-Sep	98.0	68.6	88.6	59.6	53.0	84.7	77.9	66.2	47.6
30-Sep	97.0	66.9	86.8	58.8	54.0	100.1	69.7	66.9	50.7
7-Oct	97.0	68.2	85.4	57.4	50.0	81.2	69.8	65.9	50.5
14-Oct	93.0	66.2	82.4	54.6	47.0	78.4	68.9	61.1	44.9
21-Oct	89.0	64.4	79.4	52.2	46.0	72.8	67.9	57.5	43.1
28-Oct	84.0	62.4	75.4	50.3	42.0	81.2	66.4	58.2	42.4
4-Nov	79.0	58.7	70.7	46.5	40.0	72.8	65.3	53.2	39.0
11-Nov	78.0	59.9	68.8	45.7	39.0	67.9	64.0	52.7	37.7
18-Nov	75.0	59.0	63.7	43.7	36.0	70.7	60.8	51.4	37.1
25-Nov	70.0	57.3	59.9	41.5	33.0	70.7	63.0	48.5	34.9
2-Dec	67.0	52.0	58.7	38.5	32.0	60.9	55.8	44.4	30.7
9-Dec	67.0	55.0	57.1	39.2	30.0	60.2	60.1	45.1	32.6
16-Dec	64.0	56.0	54.1	37.4	29.0	65.1	58.4	43.4	30.9
23-Dec	63.0	55.0	52.4	37.8	28.0	63.0	56.4	42.6	31.0
31-Dec	62.0	56.0	51.9	37.8	26.0	67.2	61.8	42.1	31.6

FRESNO CA

WMO No. 723890

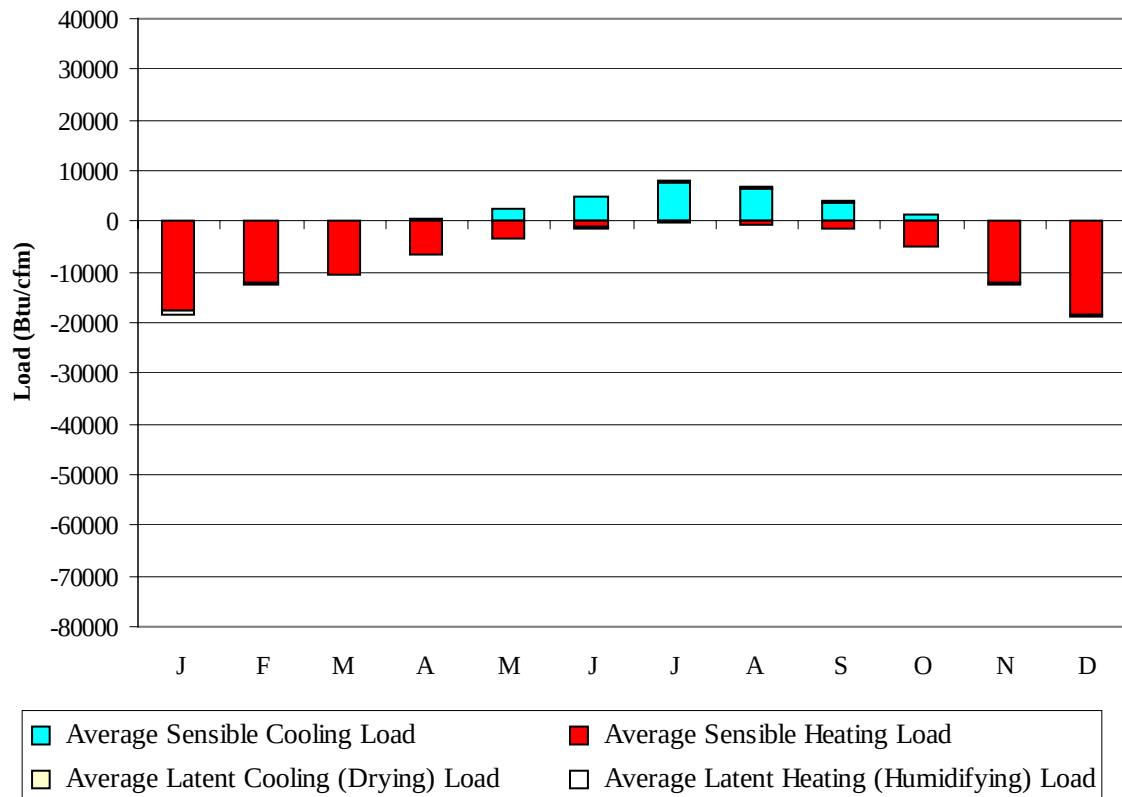


	Mean Cooling Degree Days (°F)	Mean Heating Degree Days (°F)
JAN	1	594
FEB	7	391
MAR	23	319
APR	93	191
MAY	228	89
JUN	380	26
JUL	530	6
AUG	476	9
SEP	334	29
OCT	151	134
NOV	17	385
DEC	1	613
ANN	2241	2786

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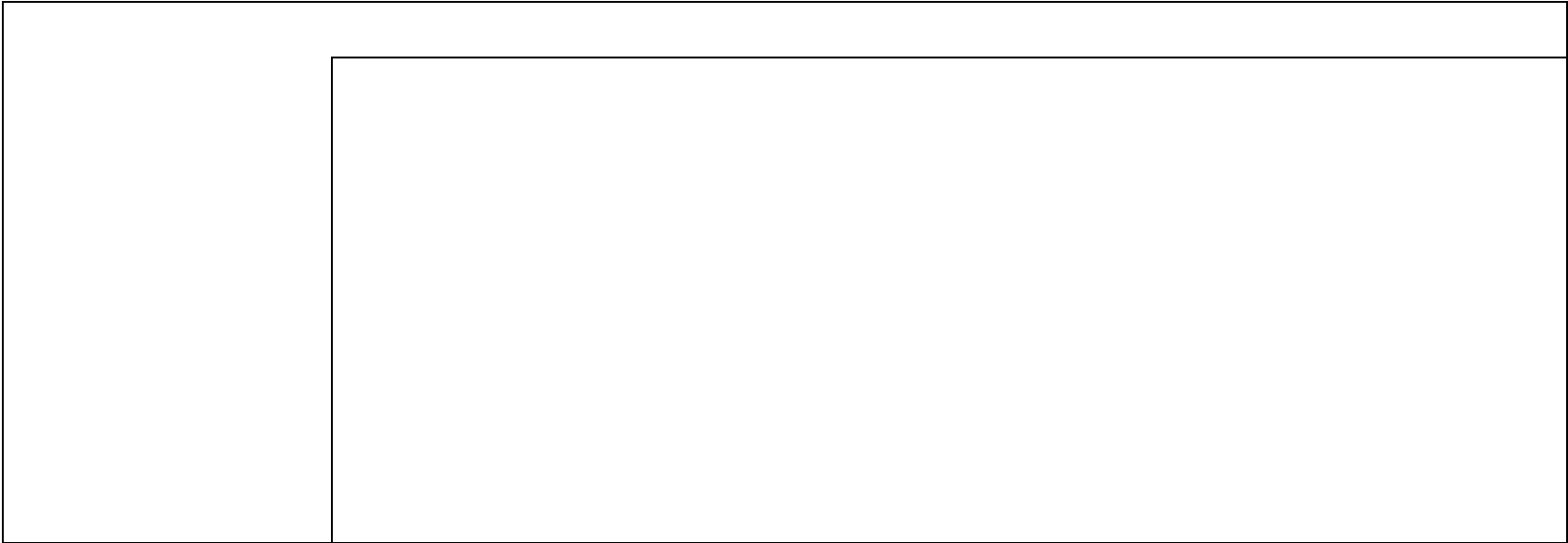
Average Ventilation and Infiltration Loads
(Outside Air vs. 75°F, 60% RH summer; 68°F, 30% RH winter)



	Average Sensible Cooling Load	Average Sensible Heating Load	Average Latent Cooling Load	Average Latent Heating Load
	(Btu/cfm)	(Btu/cfm)	(Btu/cfm)	(Btu/cfm)
JAN	0	-17780	0	-457
FEB	5	-12218	3	-248
MAR	40	-10384	5	-225
APR	644	-6528	4	-228
MAY	2374	-3345	21	-140
JUN	4963	-1210	75	-60
JUL	7647	-370	377	-6
AUG	6319	-517	519	-3
SEP	3829	-1389	166	-10
OCT	1216	-4860	13	-75
NOV	25	-12086	3	-287
DEC	0	-18294	0	-643
ANN	27062	-88981	1186	-2382

Average Annual Solar Radiation – Nearest Available Site
(Source: National Renewable Energy Laboratory, Golden CO, 1995)

No Solar Radiation
Data Available

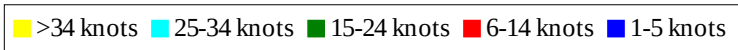
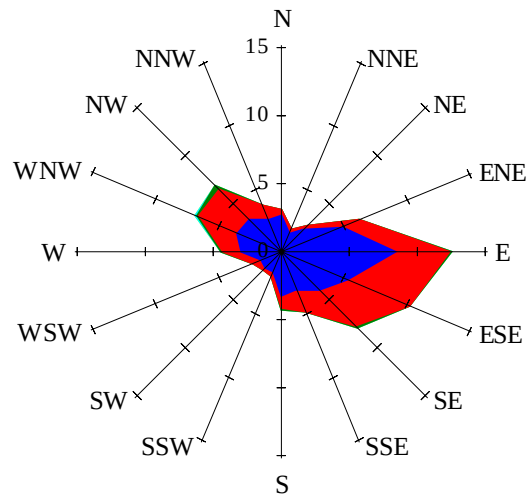


Average Annual Solar Heat and Illumination – Nearest Available Site

(Source: National Renewable Energy Laboratory, Golden CO, 1995)

Wind Summary - December, January, and February

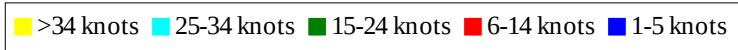
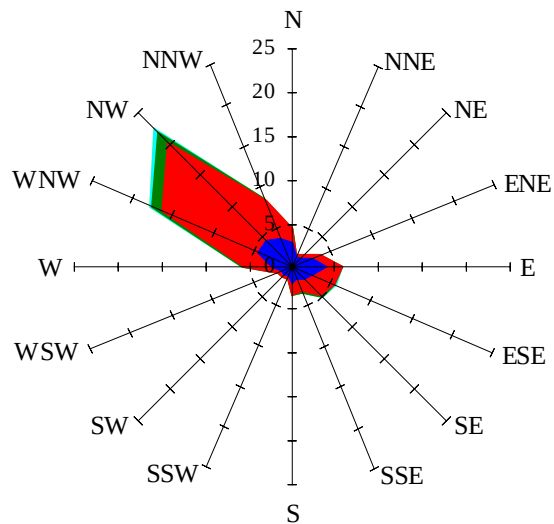
Labels of Percent Frequency on North Axis



Percent Calm = 19.51

Wind Summary - March, April, and May

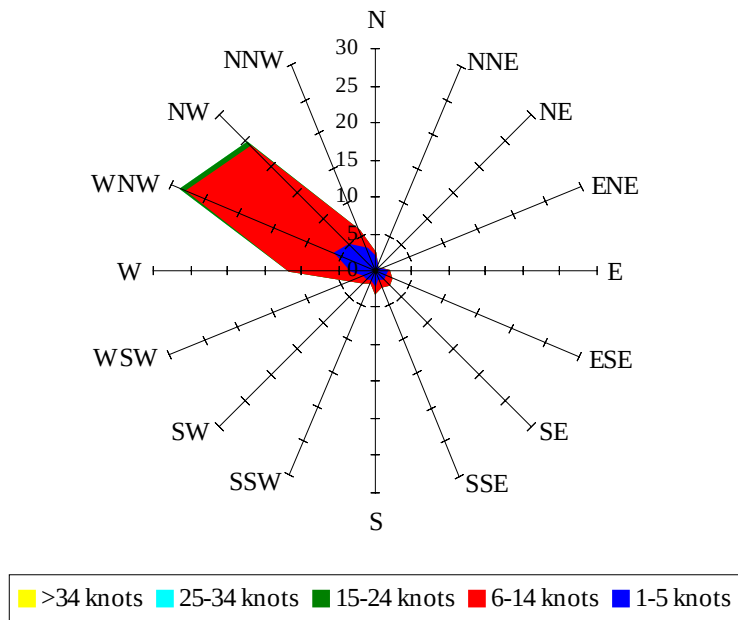
Labels of Percent Frequency on North Axis



Percent Calm = 7.82

Wind Summary - June, July, and August

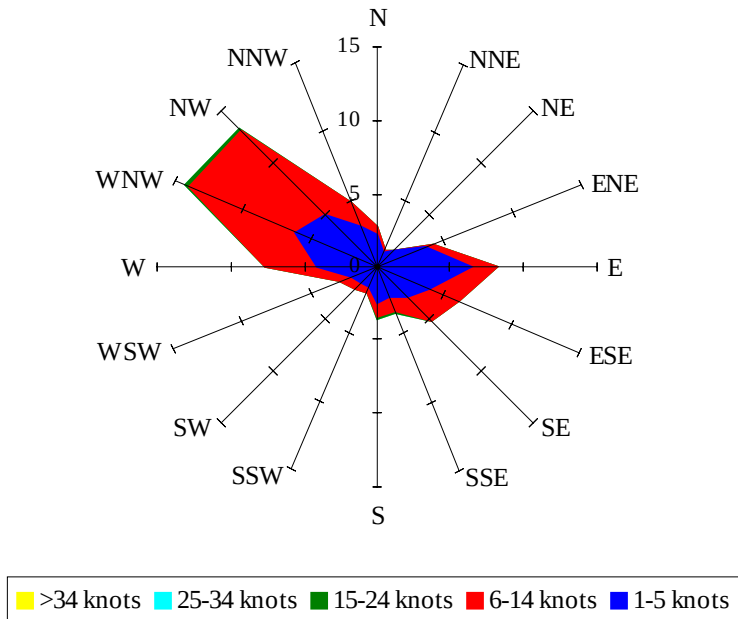
Labels of Percent Frequency on North Axis



Percent Calm = 5.48

Wind Summary - September, October, and November

Labels of Percent Frequency on North Axis



Percent Calm = 17.23