

WENDELSTEIN MTN, GERMANY

Latitude = 47.70 N

Longitude = 12.02 E

Period of Record = 1973 to 1996

WMO No. 109800

Elevation = 6021 feet

Average Pressure = 24.02 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	72	57	61	8.3	S
0.4% Occurrence	67	55	62	7.9	S
1.0% Occurrence	64	54	60	8.3	SSW
2.0% Occurrence	62	53	58	8.7	SSW
Mean Daily Range	9	-	-	-	-
97.5% Occurrence	11	11	10	13.4	W
99.0% Occurrence	7	6	8	11.7	W
99.6% Occurrence	3	2	7	10.5	W
Median of Extreme Lows	1	1	6	9.6	W
	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	61	67	86	5.3	N
0.4% Occurrence	58	64	77	5.8	N
1.0% Occurrence	56	62	71	6.5	N
2.0% Occurrence	54	59	67	7.5	N
	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	84	63	0.46	5.5	NNW
0.4% Occurrence	79	61	0.43	6.1	NNW
1.0% Occurrence	74	59	0.41	7.2	N
2.0% Occurrence	70	57	0.38	8.5	N
Air Conditioning/ Humid Area Criteria	# of Hours	T ≥ 93°F	T ≥ 80°F	T _{wb} ≥ 73°F	T _{wb} ≥ 67°F
		0	0	0	0

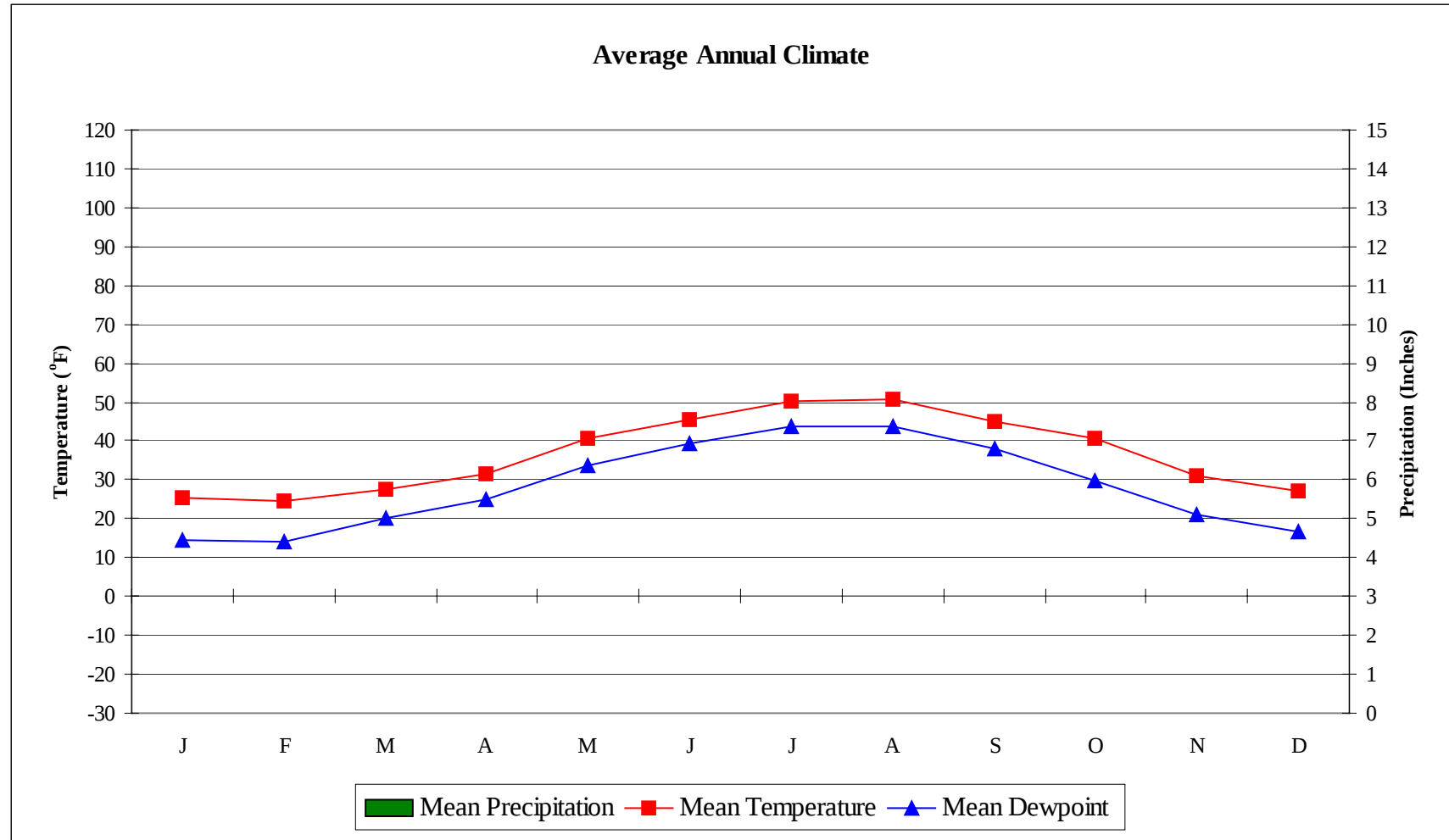
Other Site Data

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
4	N/A	N/A	0.0 + 0.0
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 (#)
39.2	N/A	N/A	57

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

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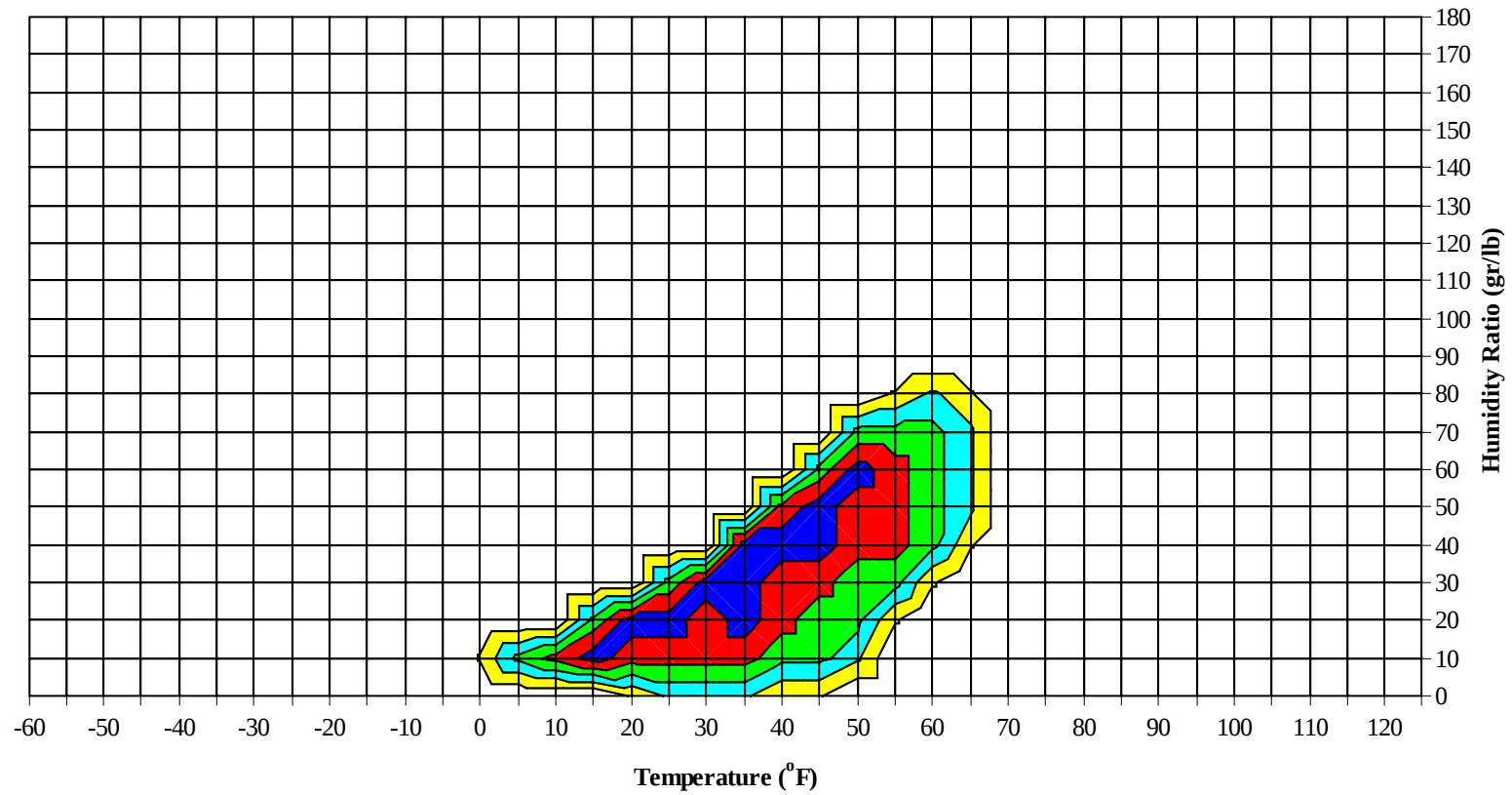


No Precipitation Data Available

WENDELSTEIN MTN, GERMANY

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Long Term Psychrometric Summary

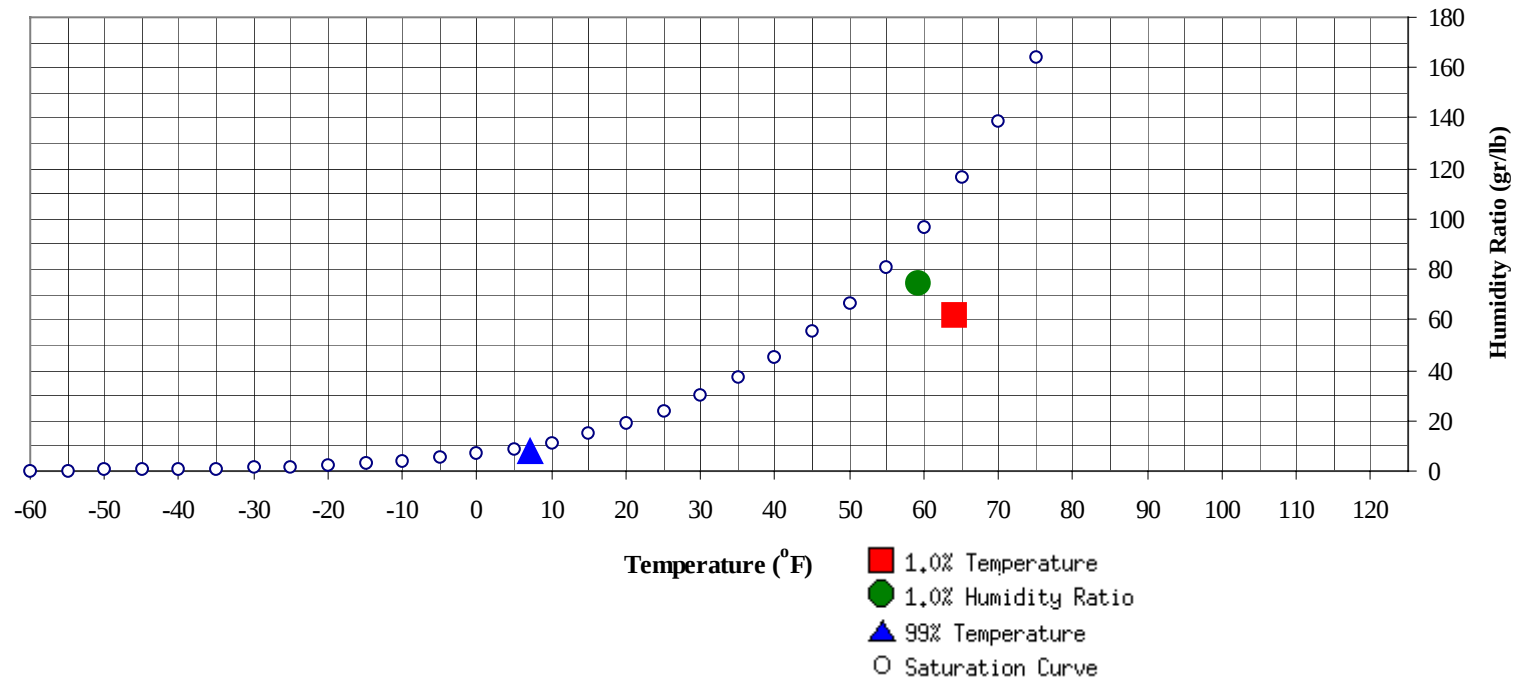


- 50% of all observations
- 80% of all observations
- 95% of all observations
- 97.5% of all observations
- 99% of all observations

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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	7	7.8	2.9		74.2	59.2	55.3	53.1	25.7

1.0% Dry Bulb	(°F)	MCHR (gr/lb)	MCWB (°F)	Enthalpy (btu/lb)
	64	61.6	54	24.9

WENDELSTEIN MTN, GERMANY

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

Period of Record = 1973 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		
75 / 79															
70 / 74															
65 / 69															
60 / 64															
55 / 59															
50 / 54		0		0	33.4		1	0	1	35.3		0		0	40.0
45 / 49															
40 / 44	1	2	1	5	32.6	2	5	5	12	33.3	1	2	1	5	39.4
35 / 39	7	13	9	30	31.2	7	13	9	30	31.2	5	12	11	27	36.8
30 / 34	26	34	29	90	29.4	17	23	22	62	29.6	11	22	18	51	34.3
25 / 29	45	50	49	145	26.9	34	36	38	107	27.3	25	34	37	96	31.9
20 / 24	58	51	61	170	24.2	43	43	39	125	24.3	44	46	47	137	28.9
15 / 19	38	33	32	103	20.6	35	38	35	108	20.4	53	46	47	146	25.2
10 / 14	33	33	32	98	16.7	35	33	35	103	16.3	40	36	35	112	20.9
5 / 9	19	18	20	58	11.5	25	21	24	70	11.4	38	32	33	103	16.7
0 / 4	12	8	7	27	6.5	18	9	12	39	6.5	18	14	14	46	11.8
-5 / -1	5	3	5	13	1.5	6	2	4	12	1.8	11	3	5	18	7.2
-10 / -6	1	1	1	3	-2.8	0	1	1	2	-2.6	2	0	1	4	2.2
-15 / -11	1	2	1	4	-7.4	1	0	0	1	-6.6			0	0	-1.5
-20 / -16	0	0	0	0	-12.0										
	0	0		0	-17.6										

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 2 of 5)

Period of Record = 1973 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		
75 / 79															
70 / 74												1	0	1	50.8
65 / 69							0		0	49.3	0	4	2	6	54.6
60 / 64		0		0	45.0		4	2	6	50.3	5	14	14	32	51.8
55 / 59		2	1	3	42.5	4	15	12	31	47.1	15	33	32	80	49.9
50 / 54	1	8	5	14	40.4	14	33	30	78	44.5	35	39	35	108	47.3
45 / 49	11	21	21	53	37.9	42	51	51	144	41.7	50	44	51	145	44.4
40 / 44	21	30	26	77	36.0	54	42	47	143	39.0	48	40	42	129	40.5
35 / 39	41	41	40	122	33.6	58	43	46	147	35.7	51	37	38	127	36.5
30 / 34	43	42	39	125	30.1	43	38	37	118	31.3	29	25	24	78	31.6
25 / 29	46	46	51	143	25.9	25	18	19	62	26.8	7	3	2	12	27.7
20 / 24	41	32	32	105	21.6	7	3	4	14	22.4					
15 / 19	30	18	23	71	17.4	1	0	0	1	17.9					
10 / 14	6	2	1	9	13.2		0		0						
5 / 9	0			0	9.0										
0 / 4															
-5 / -1															
-10 / -6															
-15 / -11															
-20 / -16															

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WENDELSTEIN MTN, GERMANY

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

Period of Record = 1973 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		
75 / 79		1	0	1	57.2		0	0	0	61.3					
70 / 74	1	3	2	7	57.0	0	3	2	5	56.9		0	0	0	51.7
65 / 69	2	11	10	23	55.8	2	11	8	22	55.4	1	4	1	6	52.4
60 / 64	13	31	30	75	53.4	13	32	27	71	53.1	2	15	10	27	50.8
55 / 59	39	51	49	139	51.2	37	51	46	133	50.7	16	34	28	77	48.7
50 / 54	58	49	57	164	48.8	61	54	62	176	48.6	39	44	47	131	46.1
45 / 49	54	43	46	143	45.2	61	45	50	156	45.2	54	46	42	142	43.9
40 / 44	40	29	30	100	41.0	43	27	30	100	41.0	42	34	41	117	40.3
35 / 39	32	22	18	73	37.0	24	20	18	62	36.9	44	31	39	114	36.2
30 / 34	8	7	5	20	32.7	7	5	5	17	32.1	31	27	27	85	31.8
25 / 29						0	0		0	28.0	11	6	6	23	27.4
20 / 24															
15 / 19															
10 / 14															
5 / 9															
0 / 4															
-5 / -1															
-10 / -6															
-15 / -11															
-20 / -16															

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WENDELSTEIN MTN, GERMANY

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

Period of Record = 1973 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		
75 / 79															
70 / 74															
65 / 69		0		0	50.0										
60 / 64		8	2	10	48.3										
55 / 59	7	20	13	41	45.0		1	0	1	41.3					
50 / 54	26	38	30	94	42.2	2	8	4	14	38.6	0	2	1	3	37.8
45 / 49	44	41	45	130	39.4	19	24	23	65	36.7	4	6	4	13	34.0
40 / 44	42	37	45	124	37.3	28	28	25	81	34.3	15	22	15	53	32.1
35 / 39	48	36	39	123	34.6	41	39	42	122	32.0	36	41	41	119	30.0
30 / 34	35	31	33	99	30.8	41	38	43	121	29.3	49	45	52	146	27.9
25 / 29	30	26	28	85	26.5	38	36	36	110	25.4	43	39	39	121	25.0
20 / 24	11	9	10	29	21.7	29	29	27	86	21.0	34	34	32	100	20.7
15 / 19	5	2	4	10	17.9	24	23	25	73	16.9	32	33	33	98	16.5
10 / 14	0			0	14.0	14	11	12	37	11.9	22	19	21	62	11.9
5 / 9						2	2	4	7	7.9	8	5	7	21	6.8
0 / 4						1	1	0	2	2.5	2	2	2	6	2.0
-5 / -1											1	0	0	1	-3.4
-10 / -6											0		0	0	-6.3
-15 / -11															
-20 / -16															

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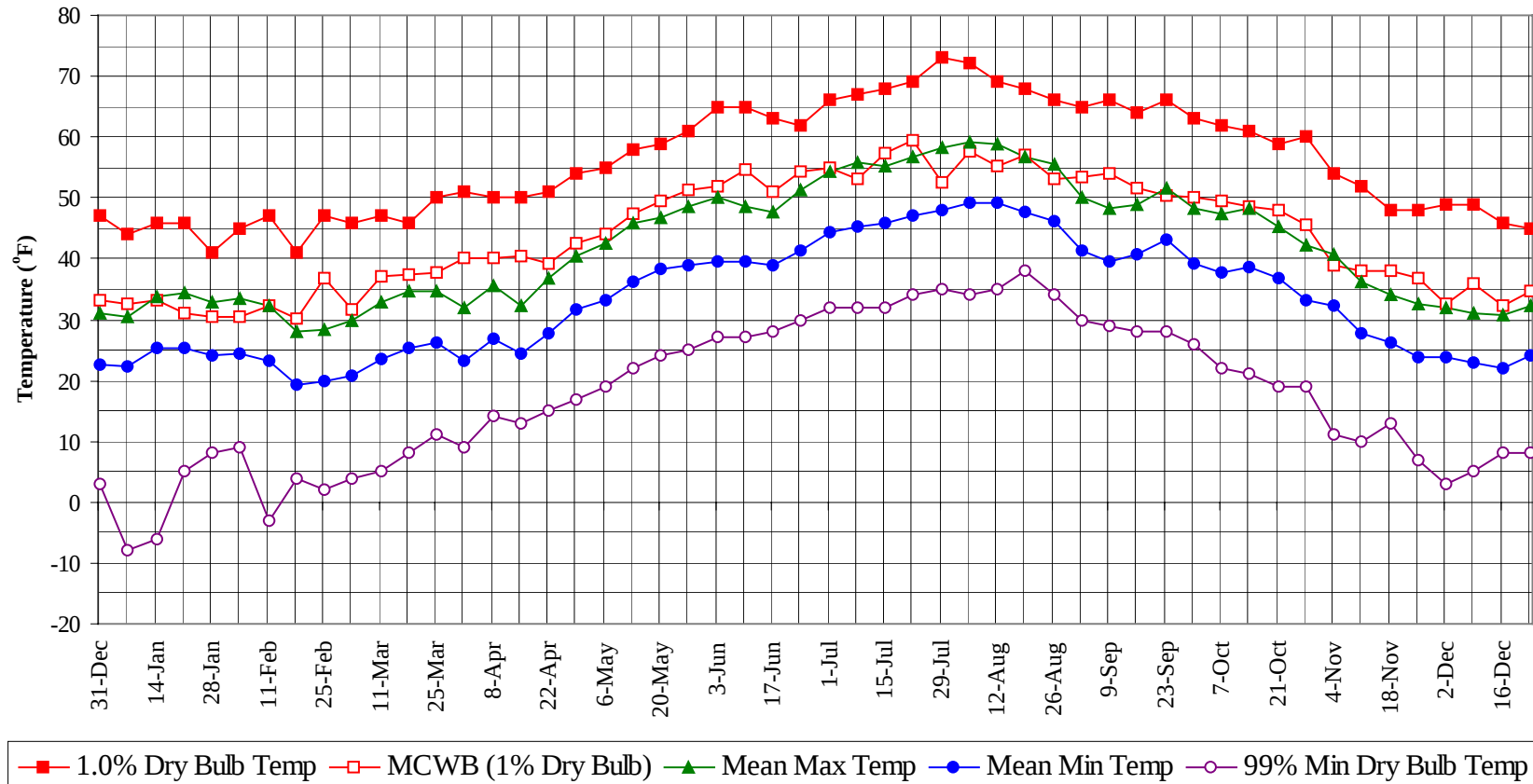
Dry-Bulb Temperature Hours For An Average Year (Sheet 5 of 5)

Period of Record = 1973 to 1996

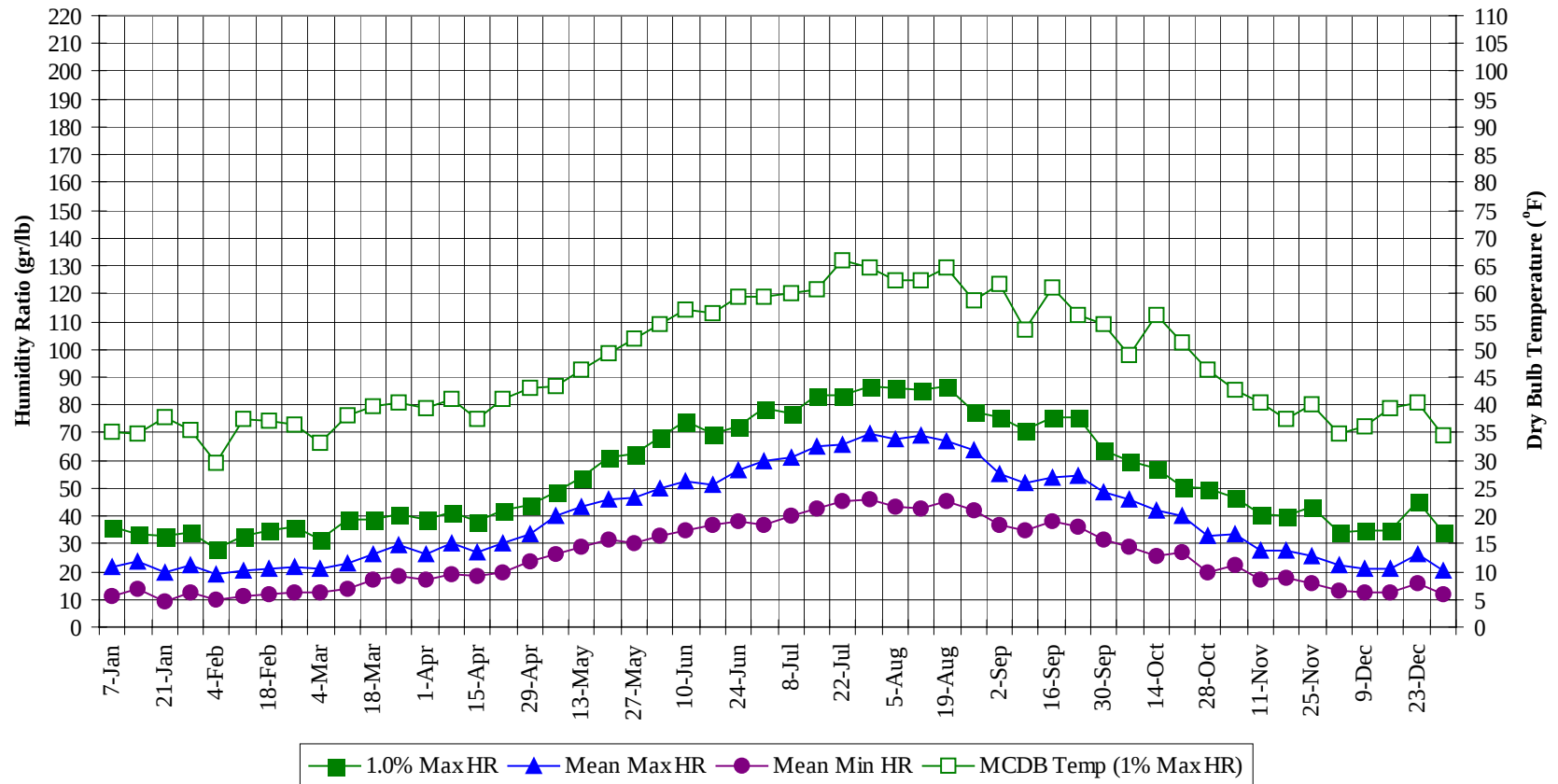
Annual Totals					
Temperature Range (°F)	Hour Group (LST)			Total Obs	M C W B (°F)
	01 To 08	09 To 16	17 To 00		
75 / 79		1	0	1	57.7
70 / 74	1	7	5	13	56.5
65 / 69	6	30	22	58	55.2
60 / 64	32	104	82	218	52.5
55 / 59	116	207	177	499	49.6
50 / 54	238	280	269	787	46.4
45 / 49	343	343	343	1029	42.3
40 / 44	358	338	336	1032	37.9
35 / 39	446	401	411	1258	33.8
30 / 34	410	389	398	1197	29.5
25 / 29	355	313	335	1002	25.3
20 / 24	238	213	209	659	20.9
15 / 19	199	173	188	559	16.7
10 / 14	105	83	94	282	11.7
5 / 9	52	27	36	115	6.8
0 / 4	17	8	12	36	1.8
-5 / -1	2	2	2	6	-2.8
-10 / -6	2	2	2	6	-7.1
-15 / -11	0	0	0	0	-12.0
-20 / -16	0	0		0	-17.6

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Annual Summary of Temperatures



Long Term Humidity and Dry Bulb Temperature Summary

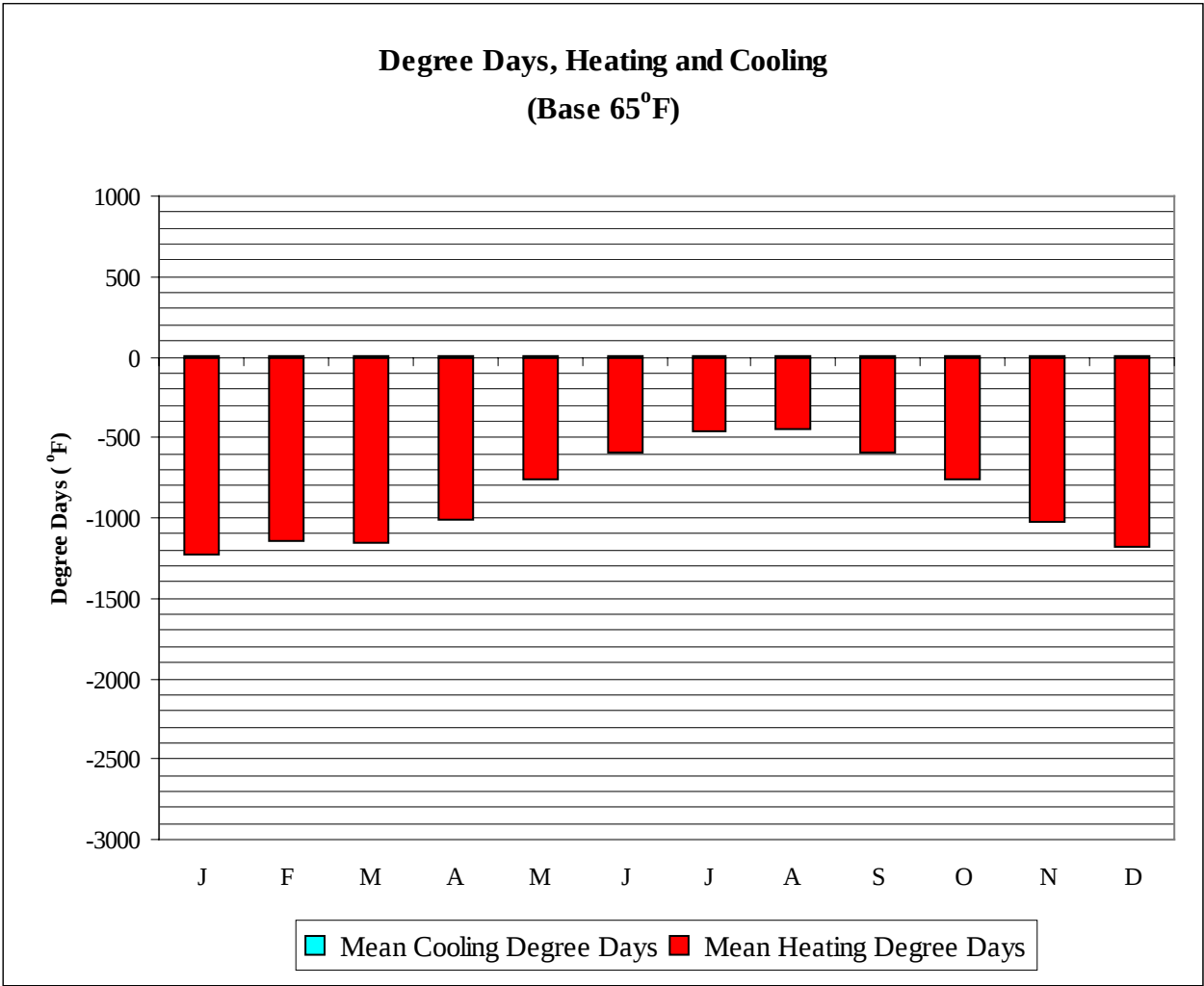


WENDELSTEIN MTN, GERMANY

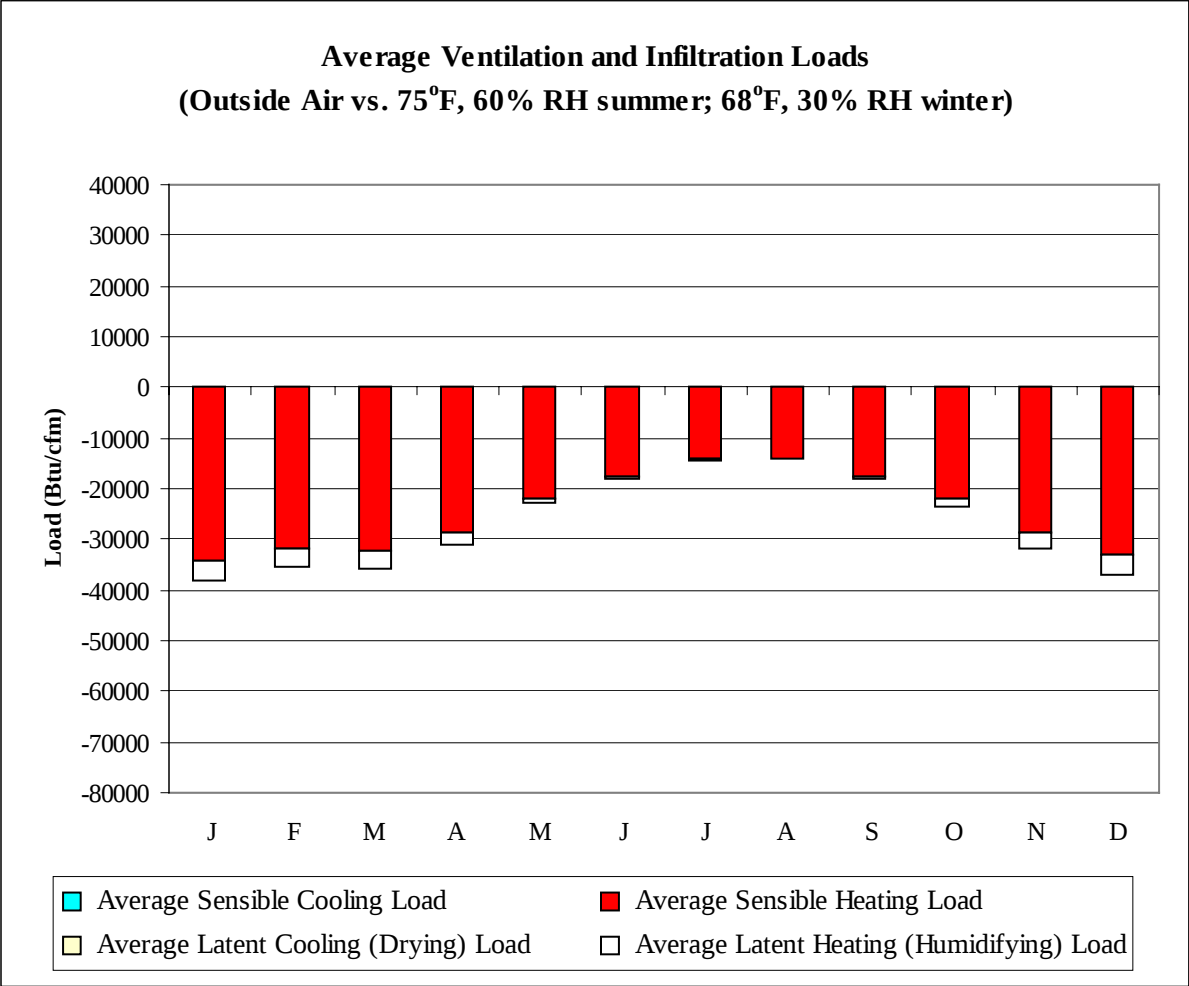
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Long Term Dry Bulb Temperature and Humidity Summary

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	44.0	32.6	30.6	22.2	-8.0	36.4	35.3	21.6	11.2
14-Jan	46.0	33.1	33.7	25.2	-6.0	33.6	34.8	23.5	13.5
21-Jan	46.0	30.9	34.4	25.2	5.0	32.9	37.9	20.0	9.3
28-Jan	41.0	30.4	32.9	24.2	8.0	34.3	35.4	22.2	12.3
4-Feb	45.0	30.5	33.5	24.5	9.0	28.0	29.7	19.1	10.0
11-Feb	47.0	32.3	32.3	23.1	-3.0	32.9	37.4	20.2	11.4
18-Feb	41.0	30.2	27.9	19.2	4.0	35.0	37.2	20.7	11.8
25-Feb	47.0	36.9	28.4	19.8	2.0	36.4	36.6	21.9	12.6
4-Mar	46.0	31.7	29.9	20.8	4.0	31.5	33.1	20.7	12.7
11-Mar	47.0	37.1	32.7	23.4	5.0	38.5	38.0	22.8	13.6
18-Mar	46.0	37.6	34.6	25.3	8.0	38.5	39.9	26.6	17.1
25-Mar	50.0	37.6	34.8	26.3	11.0	40.6	40.5	29.5	18.7
1-Apr	51.0	40.0	32.1	23.1	9.0	38.5	39.5	26.3	17.0
8-Apr	50.0	40.1	35.6	26.9	14.0	41.3	40.9	30.2	19.3
15-Apr	50.0	40.4	32.3	24.4	13.0	37.8	37.5	27.0	18.3
22-Apr	51.0	39.1	36.9	27.7	15.0	42.0	41.0	30.4	19.8
29-Apr	54.0	42.5	40.3	31.7	17.0	44.1	43.0	33.8	23.4
6-May	55.0	44.2	42.6	33.3	19.0	48.3	43.3	39.7	26.0
13-May	58.0	47.4	46.0	36.3	22.0	53.9	46.1	43.3	28.7
20-May	59.0	49.5	46.8	38.3	24.0	60.9	49.3	46.0	31.7
27-May	61.0	51.3	48.6	39.0	25.0	62.3	51.8	46.4	30.1
3-Jun	65.0	52.0	50.2	39.4	27.0	68.6	54.4	50.1	32.8
10-Jun	65.0	54.7	48.6	39.6	27.0	74.2	57.2	52.7	35.1
17-Jun	63.0	51.0	47.5	38.8	28.0	69.3	56.6	51.4	36.7
24-Jun	62.0	54.4	51.3	41.3	30.0	72.1	59.4	56.8	37.8
1-Jul	66.0	55.0	54.4	44.4	32.0	79.1	59.6	59.8	37.0
8-Jul	67.0	53.1	56.0	45.2	32.0	77.0	60.0	61.3	39.9
15-Jul	68.0	57.3	55.2	46.0	32.0	83.3	60.6	65.1	42.8
22-Jul	69.0	59.6	56.7	47.0	34.0	83.3	66.1	65.9	45.1
29-Jul	73.0	52.6	58.1	48.0	35.0	86.8	64.8	69.9	45.7
5-Aug	72.0	57.7	59.0	49.1	34.0	86.1	62.3	67.7	43.2
12-Aug	69.0	55.3	59.0	49.2	35.0	85.4	62.4	69.0	42.9
19-Aug	68.0	56.9	56.9	47.6	38.0	86.8	64.8	66.9	45.6
26-Aug	66.0	53.0	55.6	46.3	34.0	77.7	58.6	63.8	42.1
2-Sep	65.0	53.4	50.2	41.5	30.0	75.6	61.8	55.1	36.6
9-Sep	66.0	54.0	48.2	39.4	29.0	70.7	53.4	52.1	34.5
16-Sep	64.0	51.6	49.0	40.7	28.0	75.6	61.0	54.0	38.1
23-Sep	66.0	50.3	51.6	43.1	28.0	75.6	56.0	54.2	36.0
30-Sep	63.0	50.0	48.2	39.1	26.0	63.7	54.5	48.8	31.5
7-Oct	62.0	49.6	47.5	37.7	22.0	59.5	49.0	45.8	29.1
14-Oct	61.0	48.7	48.2	38.6	21.0	57.4	56.0	41.8	25.6
21-Oct	59.0	47.9	45.3	36.9	19.0	50.4	51.4	39.7	26.7
28-Oct	60.0	45.5	42.2	33.2	19.0	49.7	46.3	33.1	19.4
4-Nov	54.0	39.0	40.8	32.2	11.0	46.9	42.5	33.5	22.1
11-Nov	52.0	38.0	36.2	27.9	10.0	40.6	40.3	27.8	16.9
18-Nov	48.0	37.9	34.1	26.1	13.0	39.9	37.5	27.9	17.5
25-Nov	48.0	36.7	32.4	23.7	7.0	43.4	40.1	25.8	15.9
2-Dec	49.0	32.7	31.9	23.7	3.0	34.3	34.7	22.2	13.1
9-Dec	49.0	36.0	31.0	22.9	5.0	35.0	36.3	20.8	12.3
16-Dec	46.0	32.2	30.8	21.9	8.0	35.0	39.3	20.8	12.2
23-Dec	45.0	34.8	32.3	24.2	8.0	45.5	40.4	26.6	15.9
31-Dec	47.0	33.1	31.0	22.5	3.0	34.3	34.6	20.5	11.8



	Mean Cooling Degree Days (°F)	Mean Heating Degree Days (°F)
JAN	0	1230
FEB	0	1148
MAR	0	1157
APR	0	1010
MAY	0	758
JUN	0	596
JUL	3	458
AUG	3	454
SEP	0	591
OCT	0	759
NOV	0	1021
DEC	0	1176
ANN	7	10358



	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	-34292	0	-3689
FEB	0	-31943	0	-3532
MAR	0	-32411	0	-3225
APR	0	-28519	0	-2376
MAY	0	-22061	0	-820
JUN	0	-17763	0	-250
JUL	2	-14203	0	-94
AUG	0	-14129	0	-105
SEP	0	-17641	0	-431
OCT	0	-22078	0	-1455
NOV	0	-28798	0	-2973
DEC	0	-32894	0	-3979
ANN	2	-296732	0	-22929

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

No Solar Radiation
Data Available

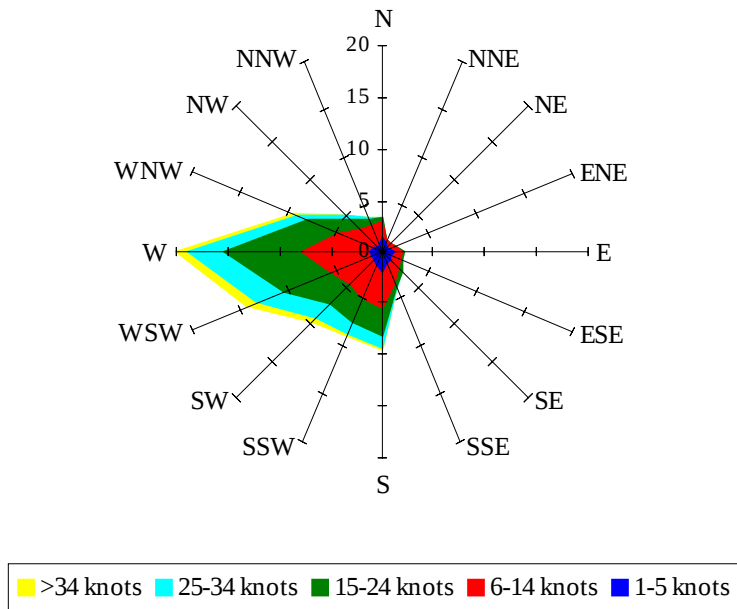


Average Annual Solar Heat and Illumination – Nearest Available Site

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

Wind Summary - December, January, and February

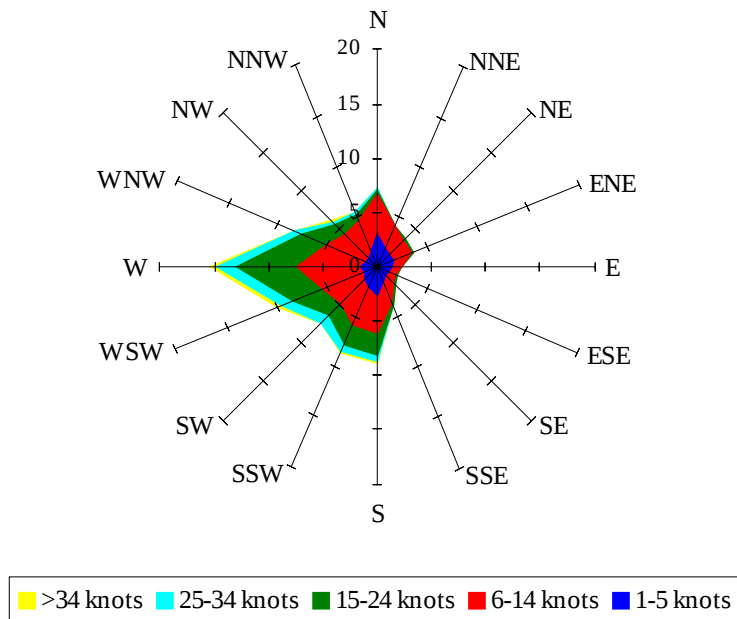
Labels of Percent Frequency on North Axis



Percent Calm = 2.42

Wind Summary - March, April, and May

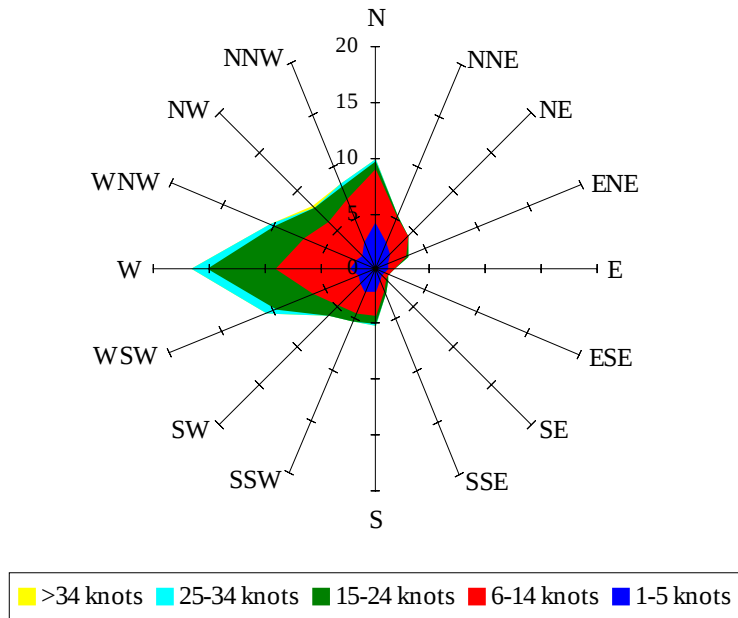
Labels of Percent Frequency on North Axis



Percent Calm = 2.07

Wind Summary - June, July, and August

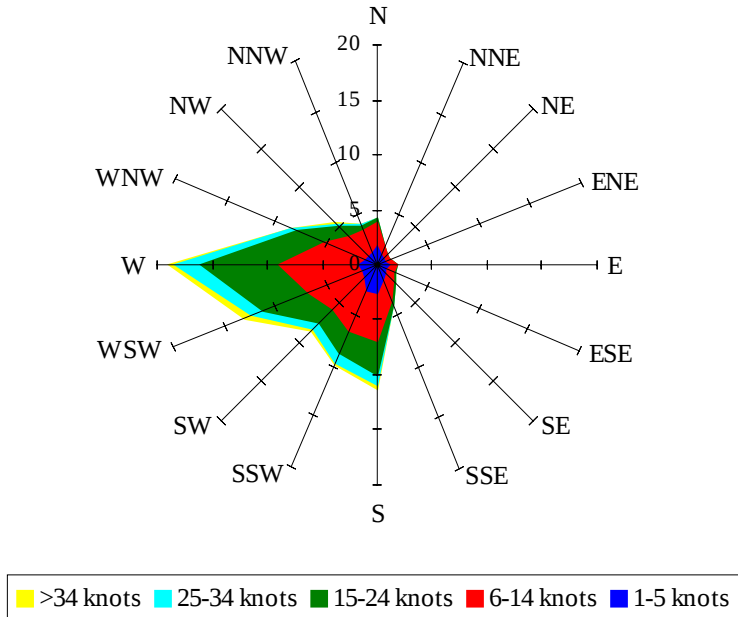
Labels of Percent Frequency on North Axis



Percent Calm = 2.47

Wind Summary - September, October, and November

Labels of Percent Frequency on North Axis



Percent Calm = 2.70