

WURZBURG AAF, GERMANY

Latitude = 49.77 N

Longitude = 9.97 E

Period of Record = 1973 to 1996

WMO No. 106550

Elevation = 879 feet

Average Pressure = 29.05 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	90	68	73	7.0	S
0.4% Occurrence	86	67	72	7.1	E
1.0% Occurrence	82	65	69	7.1	E
2.0% Occurrence	79	64	68	7.2	E
Mean Daily Range	14	-	-	-	-
97.5% Occurrence	21	20	13	5.4	NE
99.0% Occurrence	16	15	10	4.6	NE
99.6% Occurrence	11	10	8	4.2	NNE
Median of Extreme Lows	10	9	8	4.3	NNE
	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	72	85	97	6.0	SSW
0.4% Occurrence	69	81	88	6.2	W
1.0% Occurrence	67	78	83	6.2	E
2.0% Occurrence	66	77	80	6.1	W
	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	101	75	0.66	4.9	S
0.4% Occurrence	95	73	0.62	5.0	W
1.0% Occurrence	90	72	0.59	5.4	W
2.0% Occurrence	84	70	0.55	5.4	W
Air Conditioning/ Humid Area Criteria	# of Hours	T ≥ 93°F	T ≥ 80°F	T _{wb} ≥ 73°F	T _{wb} ≥ 67°F
		3	172	3	113

Other Site Data

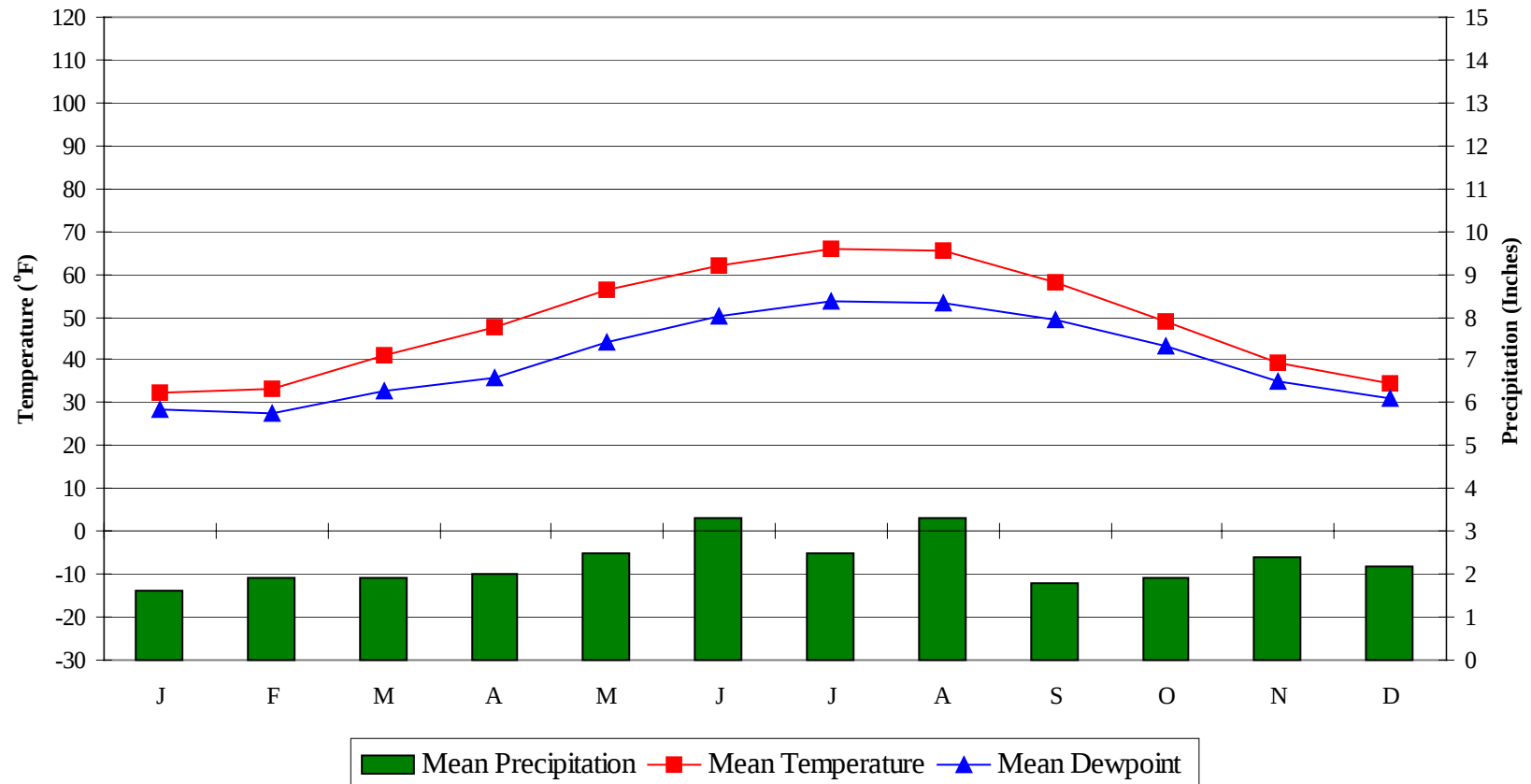
Weather Region	Rain Rate 100 Year Recurrence (in./hr)	Basic Wind Speed 3 sec gust @ 33 ft 50 Year Recurrence (mph)	Ventilation Cooling Load Index (Ton-hr/cfm/yr) Base 75°F-RH 60% Latent + Sensible
6	N/A	N/A	0.1 + 0.1
Ground Water Temperature (°F) 50 Foot Depth *	Frost Depth 50 Year Recurrence (in.)	Ground Snow Load 50 Year Recurrence (lb/ft ²)	Average Annual Freeze-Thaw Cycles (#)
51.1	N/A	N/A	41

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

WURZBURG AAF, GERMANY

WMO No. 106550

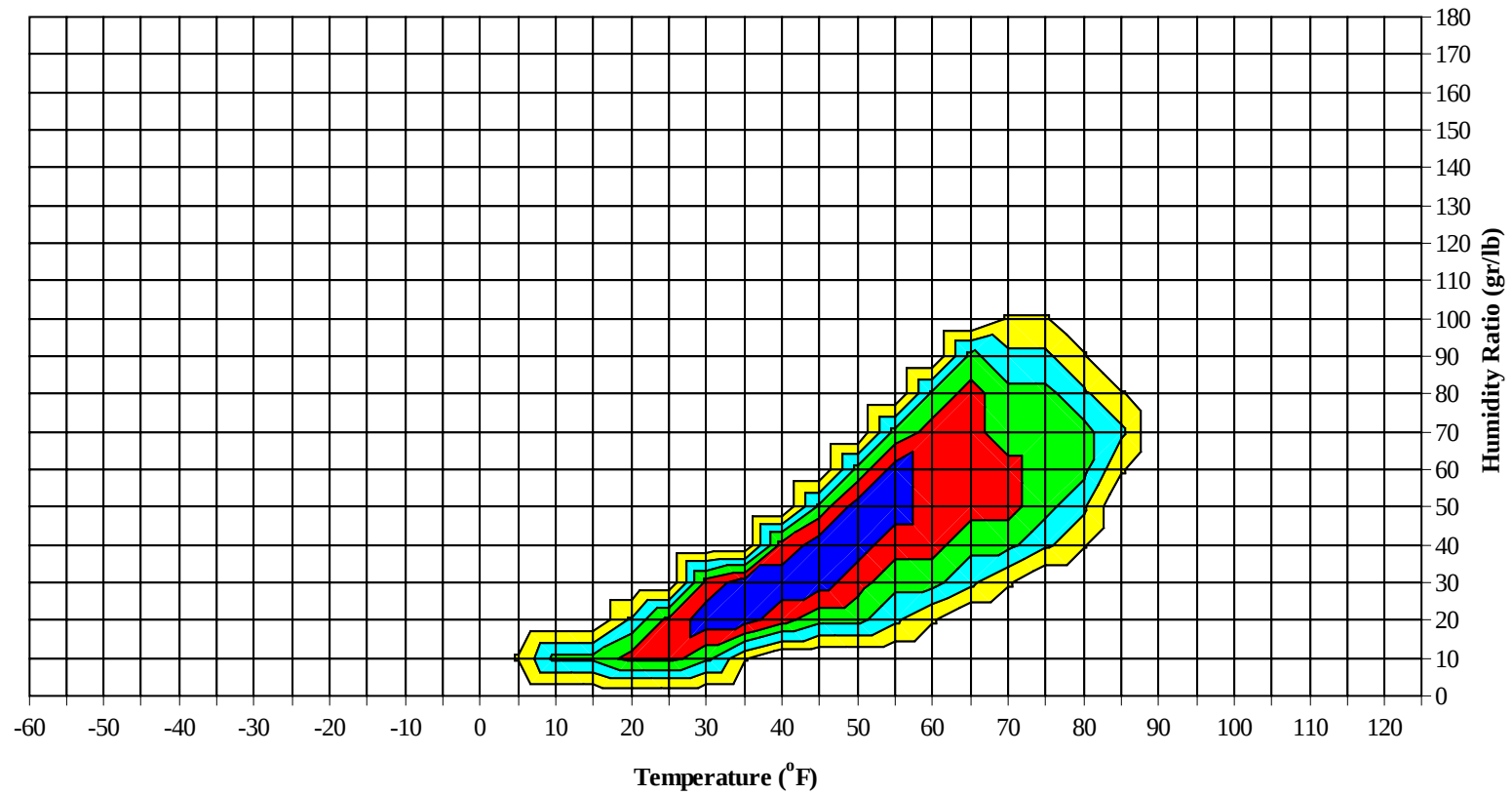
Average Annual Climate



WURZBURG AAF, GERMANY

WMO No. 106550

Long Term Psychrometric Summary

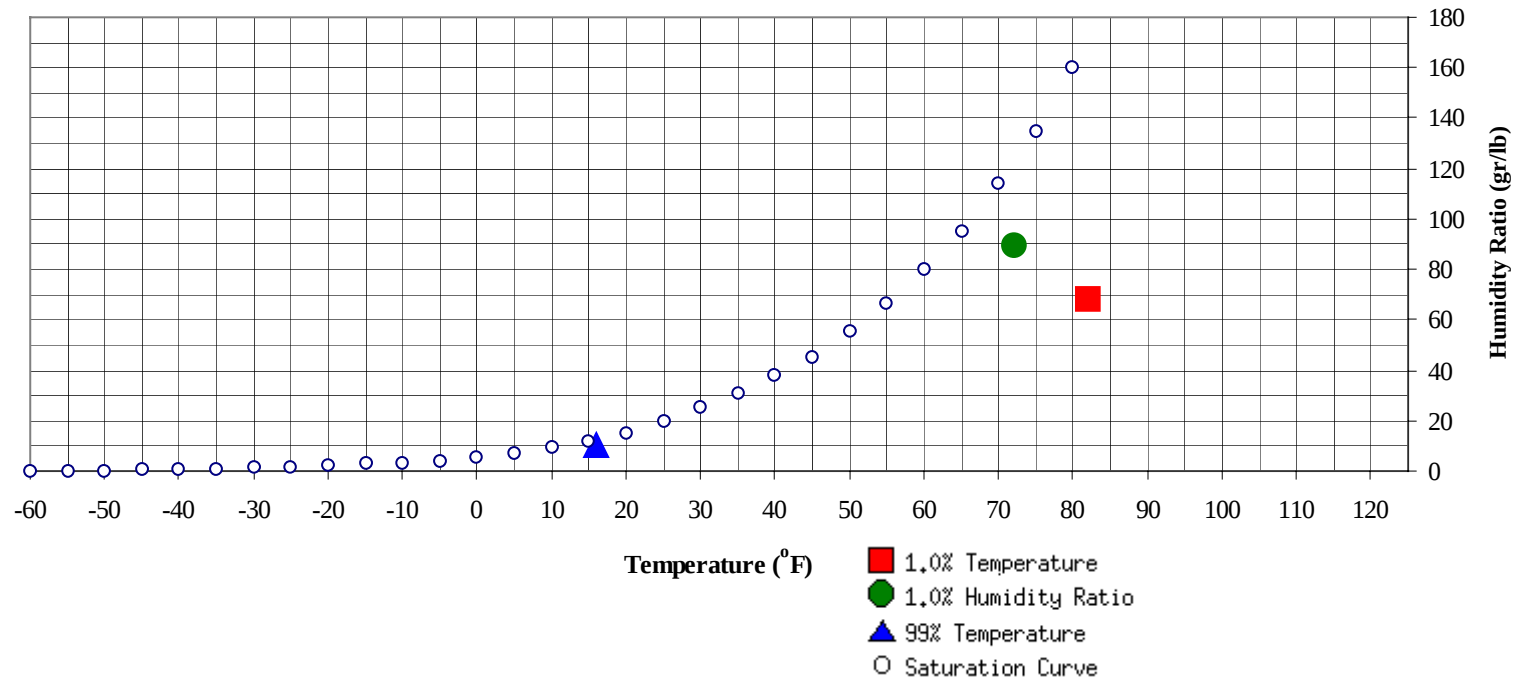


- 50% of all observations
- 80% of all observations
- 95% of all observations
- 97.5% of all observations
- 99% of all observations

WURZBURG AAF, GERMANY

WMO No. 106550

Psychrometric Summary of Peak Design Values



	(°F)	MCHR	Enthalpy	1.0% Humidity Ratio	(gr/lb)	MCDB	MCWB	MC Dewpt	Enthalpy
		(gr/lb)	(btu/lb)			(°F)	(°F)	(°F)	(btu/lb)
99% Dry Bulb	16	10.5	5.4		89.6	72	66.1	63.2	31.3

1.0% Dry Bulb	(°F)	MCHR	MCWB	Enthalpy
		(gr/lb)	(°F)	(btu/lb)
	82	68.2	64.9	30.4

WURZBURG AAF, GERMANY

WMO No. 106550

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		
95 / 99															
90 / 94															
85 / 89															
80 / 84															
75 / 79															
70 / 74												0	0	0	55.8
65 / 69												2	1	3	53.1
60 / 64							1	0	1	51.9		8	6	14	50.9
55 / 59	0	1	0	1	49.5	0	2	1	3	48.5	1	18	13	33	48.7
50 / 54	4	5	6	14	47.7	1	7	6	14	46.0	10	33	31	75	45.9
45 / 49	13	21	17	51	43.7	8	22	18	47	42.7	27	51	49	127	42.3
40 / 44	24	34	32	90	39.6	17	31	31	80	39.2	44	53	58	156	38.5
35 / 39	48	58	52	158	35.1	43	50	55	148	35.0	68	52	53	172	34.7
30 / 34	70	63	72	206	30.8	67	56	60	183	30.3	61	24	27	112	30.5
25 / 29	36	30	34	99	25.8	41	32	32	106	25.3	24	5	8	36	25.4
20 / 24	19	15	15	49	20.9	19	13	13	45	20.6	8	2	2	12	20.7
15 / 19	17	11	11	39	16.6	15	6	4	26	16.1	3	0	0	3	16.9
10 / 14	10	5	5	20	11.5	7	3	2	12	11.3	1	0	0	1	12.5
5 / 9	5	3	3	11	6.4	3	1	1	5	6.4					
0 / 4	2	1	1	4	1.6	1	0	0	1	1.9					
-5 / -1	1	1	0	2	-2.6	1	0		1	-2.6					
-10 / -6			0	0	-6.0	0			0	-5.0					

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.

WURZBURG AAF, GERMANY

WMO No. 106550

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		
95 / 99															
90 / 94												1	0	1	64.9
85 / 89							0	0	0	66.8		3	2	6	67.0
80 / 84		0		0	58.0		4	2	6	62.3		13	9	22	65.2
75 / 79		2	1	3	56.3		13	9	22	59.7	0	28	22	50	62.6
70 / 74		6	4	11	54.8	0	28	20	48	57.5	2	38	32	72	60.4
65 / 69		14	11	25	52.8	1	37	29	67	55.6	10	37	36	83	58.4
60 / 64	1	25	21	47	50.4	8	49	45	103	53.4	41	52	53	146	56.1
55 / 59	5	35	32	73	48.0	41	51	53	145	51.2	70	47	52	169	53.0
50 / 54	25	45	46	116	45.7	73	40	51	163	48.2	76	20	29	124	49.8
45 / 49	48	51	49	148	42.3	69	19	29	117	44.2	35	2	6	42	45.4
40 / 44	58	37	44	139	38.9	35	5	9	49	40.2	5		0	5	41.1
35 / 39	65	22	25	111	35.2	17	1	2	21	36.1	1			1	37.6
30 / 34	33	3	7	42	30.7	3		0	3	31.9					
25 / 29	5	0	0	5	26.0										
20 / 24	0			0	24.0										
15 / 19															
10 / 14															
5 / 9															
0 / 4															
-5 / -1															
-10 / -6															

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WURZBURG AAF, GERMANY

WMO No. 106550

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		
95 / 99		0	0	0	70.4		0	0	0	70.8					
90 / 94		3	2	6	68.2		3	1	4	69.1		0		0	62.0
85 / 89		11	8	19	66.9		8	5	13	67.1		0		0	65.1
80 / 84		25	20	45	65.4		24	16	40	65.1		4	1	6	64.0
75 / 79	0	39	33	72	63.6	0	39	30	69	63.1		14	8	22	63.1
70 / 74	6	47	47	100	61.2	3	50	46	99	61.3		27	18	45	60.4
65 / 69	27	44	44	115	59.8	18	47	52	117	59.7	1	34	28	62	58.2
60 / 64	69	49	50	168	57.5	75	47	55	177	57.7	17	57	51	125	56.0
55 / 59	84	26	35	145	54.2	85	26	34	145	54.2	58	61	67	186	53.3
50 / 54	53	4	9	66	50.5	51	4	8	63	50.4	83	33	50	166	49.7
45 / 49	9		0	9	46.4	14	0	1	15	46.0	60	9	17	85	45.8
40 / 44	0			0	42.0	2			2	41.7	17	1	1	19	41.7
35 / 39											4	0	0	4	37.8
30 / 34															
25 / 29															
20 / 24															
15 / 19															
10 / 14															
5 / 9															
0 / 4															
-5 / -1															
-10 / -6															

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WURZBURG AAF, GERMANY

WMO No. 106550

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		
95 / 99															
90 / 94															
85 / 89															
80 / 84		0	0	0	62.2										
75 / 79		1	0	1	61.2										
70 / 74		4	1	5	60.1										
65 / 69		9	4	13	57.7										
60 / 64	1	23	15	40	55.4	0	1	0	1	53.8					
55 / 59	13	49	44	106	52.5	2	8	4	15	51.6	0	2	1	3	50.2
50 / 54	50	63	65	178	49.0	12	25	19	56	48.5	10	10	9	29	47.9
45 / 49	66	56	60	182	44.5	28	48	42	119	44.1	17	26	23	67	44.3
40 / 44	51	26	37	114	40.5	47	52	54	154	40.1	27	34	29	90	39.9
35 / 39	42	12	18	73	36.5	62	57	60	179	35.6	54	63	60	177	35.4
30 / 34	21	3	3	27	31.5	53	33	39	125	31.1	71	66	71	208	30.9
25 / 29	4	0	0	4	27.5	24	13	17	54	26.0	36	29	30	95	25.9
20 / 24						9	3	4	16	21.6	15	9	13	38	21.2
15 / 19						2	0	0	2	17.6	11	5	7	23	16.7
10 / 14						0	0		0	13.4	6	3	3	12	12.0
5 / 9											1	1	0	2	7.1
0 / 4											0	0		0	1.6
-5 / -1															
-10 / -6															

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WURZBURG AAF, GERMANY

WMO No. 106550

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

Period of Record = 1973 to 1996

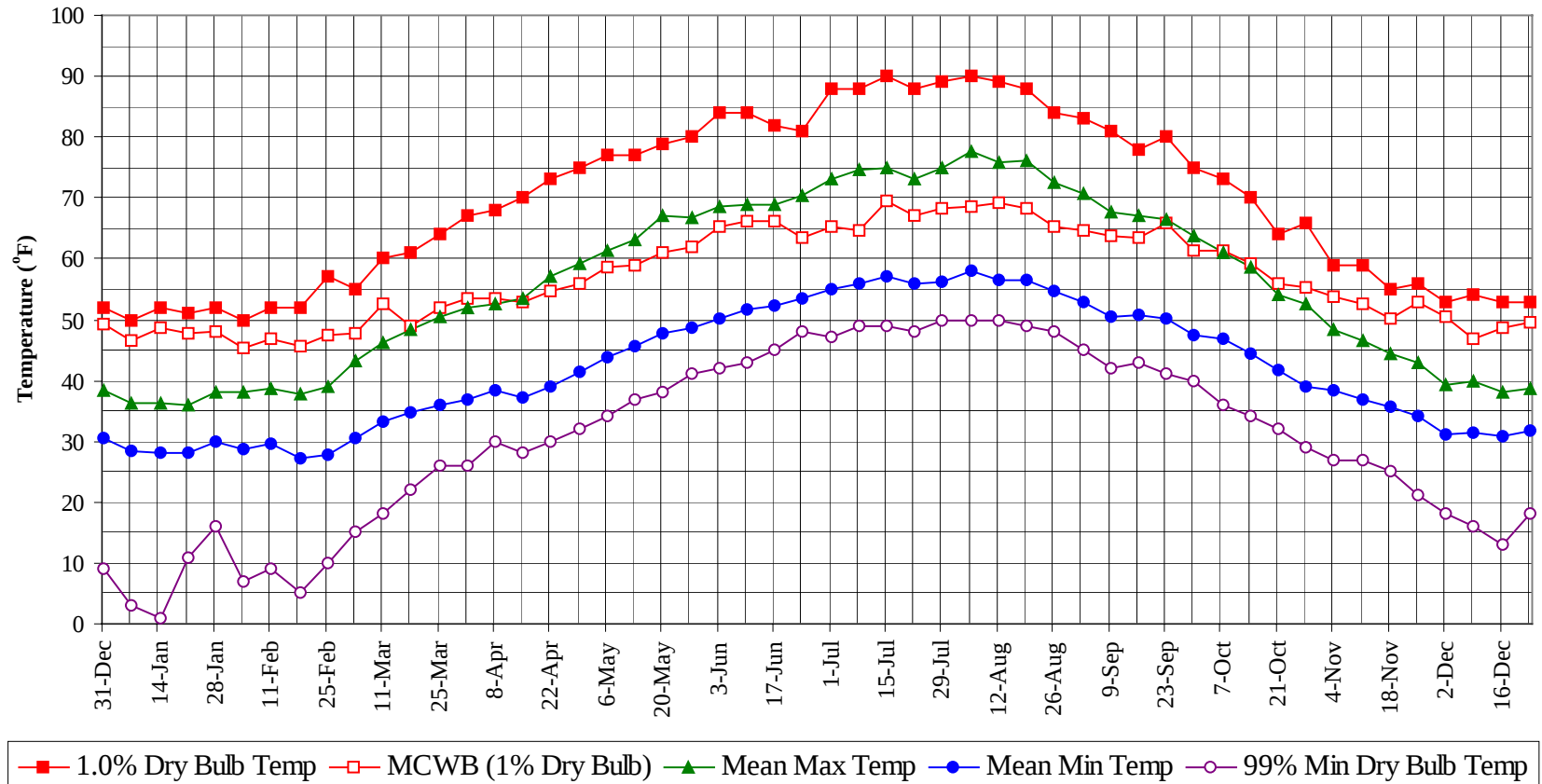
Annual Totals					
Temperature Range (°F)	Hour Group (LST)			Total Obs	M C W B (°F)
	01 To 08	09 To 16	17 To 00		
95 / 99		1	0	1	70.5
90 / 94		6	3	10	68.3
85 / 89		22	16	38	66.9
80 / 84		70	48	118	65.0
75 / 79	0	137	102	239	62.7
70 / 74	11	202	168	381	60.3
65 / 69	54	223	204	480	58.3
60 / 64	203	313	293	810	55.9
55 / 59	343	328	334	1006	52.5
50 / 54	434	289	329	1052	48.5
45 / 49	391	305	312	1008	43.9
40 / 44	334	273	296	902	39.6
35 / 39	416	313	327	1056	35.3
30 / 34	392	247	280	919	30.7
25 / 29	177	109	122	408	25.7
20 / 24	73	41	48	162	20.9
15 / 19	51	23	23	98	16.5
10 / 14	25	11	10	45	11.6
5 / 9	10	4	4	19	6.5
0 / 4	4	2	1	7	1.7
-5 / -1	1	1	0	2	-2.6
-10 / -6	0		0	0	-5.7
		</			

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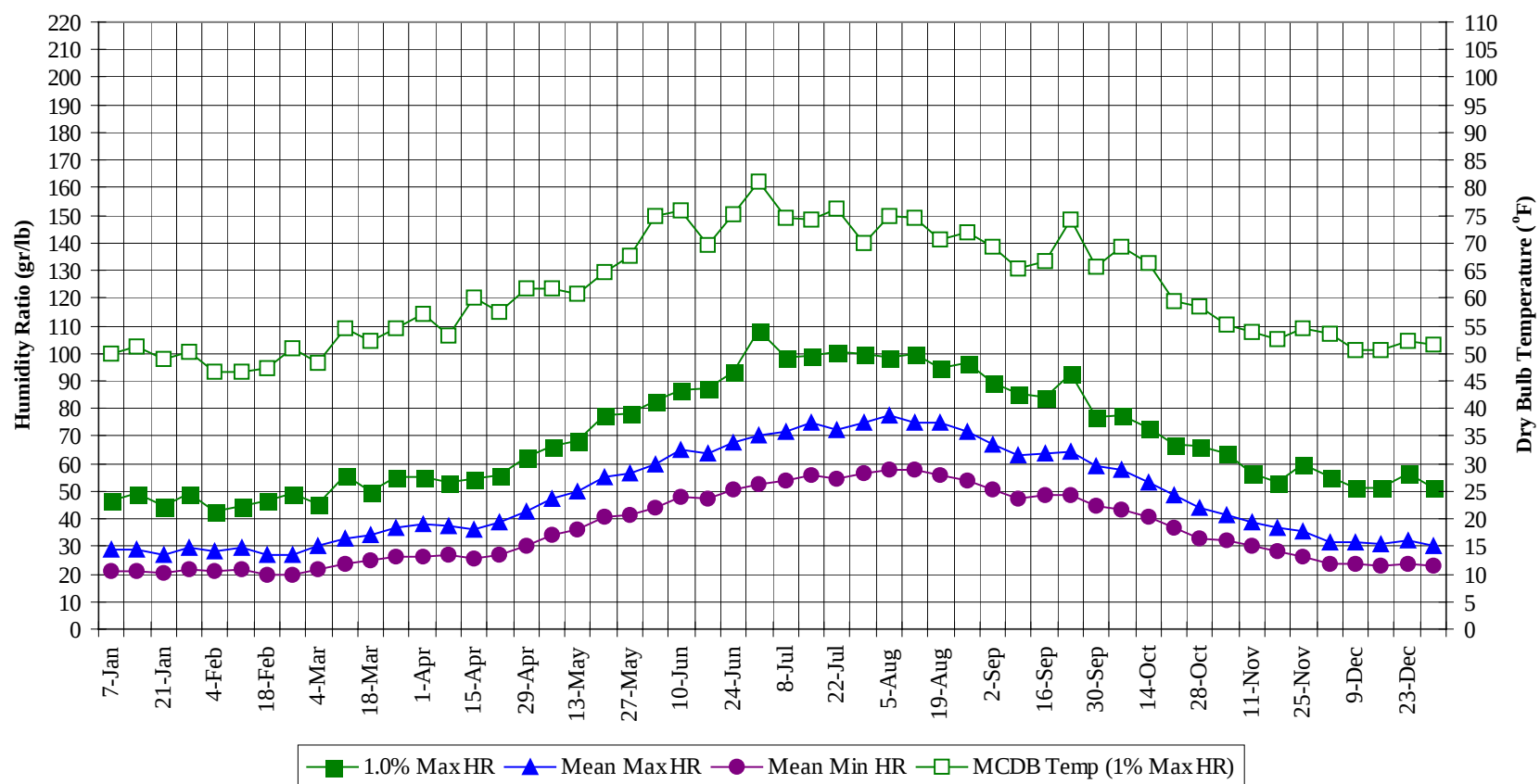
WURZBURG AAF, GERMANY

WMO No. 106550

Annual Summary of Temperatures



Long Term Humidity and Dry Bulb Temperature Summary



WURZBURG AAF, GERMANY

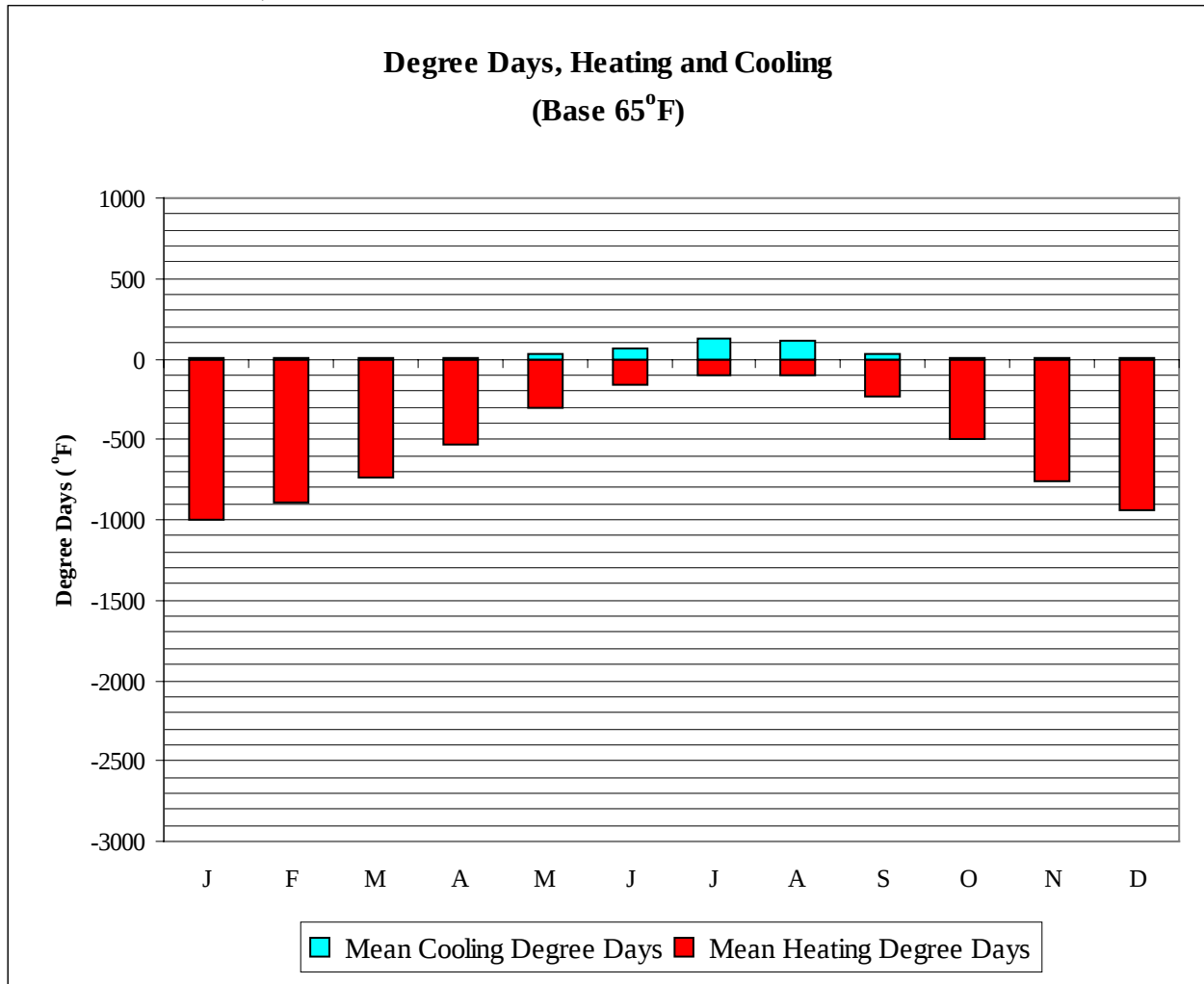
WMO No. 106550

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	50.0	46.6	36.4	28.5	3.0	46.9	49.8	28.9	21.3
14-Jan	52.0	48.5	36.3	28.2	1.0	49.0	51.3	28.7	21.2
21-Jan	51.0	47.6	35.9	28.2	11.0	44.8	48.9	26.8	20.4
28-Jan	52.0	48.0	38.1	29.9	16.0	49.0	50.1	29.8	21.4
4-Feb	50.0	45.3	38.0	28.6	7.0	42.7	46.8	28.1	20.7
11-Feb	52.0	46.7	38.8	29.7	9.0	44.8	46.5	29.7	21.4
18-Feb	52.0	45.8	37.7	27.3	5.0	46.9	47.4	26.6	19.6
25-Feb	57.0	47.3	39.0	27.7	10.0	49.0	50.7	26.7	19.8
4-Mar	55.0	47.7	43.3	30.5	15.0	45.5	48.4	30.4	21.9
11-Mar	60.0	52.6	46.3	33.2	18.0	56.0	54.4	32.7	23.8
18-Mar	61.0	49.1	48.5	34.8	22.0	49.7	52.1	34.5	24.9
25-Mar	64.0	52.1	50.5	36.0	26.0	55.3	54.4	36.5	26.0
1-Apr	67.0	53.4	52.0	36.9	26.0	55.3	57.1	37.9	26.4
8-Apr	68.0	53.4	52.5	38.4	30.0	53.2	53.2	37.6	26.9
15-Apr	70.0	52.9	53.5	37.1	28.0	54.6	59.9	36.4	25.6
22-Apr	73.0	54.8	57.0	39.0	30.0	56.0	57.4	38.8	26.7
29-Apr	75.0	55.9	59.3	41.5	32.0	62.3	61.6	42.7	30.1
6-May	77.0	58.7	61.2	43.7	34.0	66.5	61.9	47.5	34.3
13-May	77.0	59.0	63.3	45.5	37.0	68.6	60.6	50.2	36.2
20-May	79.0	61.0	67.1	47.8	38.0	77.7	64.8	55.2	40.4
27-May	80.0	61.9	66.8	48.8	41.0	78.4	67.7	56.4	41.5
3-Jun	84.0	65.2	68.5	50.1	42.0	82.6	74.8	59.5	43.9
10-Jun	84.0	66.3	68.9	51.7	43.0	86.8	75.7	64.7	48.1
17-Jun	82.0	66.2	69.0	52.1	45.0	87.5	69.6	63.9	47.2
24-Jun	81.0	63.5	70.3	53.6	48.0	93.1	75.2	67.7	50.9
1-Jul	88.0	65.2	73.0	54.9	47.0	108.5	81.3	70.3	52.3
8-Jul	88.0	64.6	74.6	56.0	49.0	98.7	74.6	71.9	54.1
15-Jul	90.0	69.4	74.9	57.0	49.0	99.4	74.1	74.7	55.6
22-Jul	88.0	67.1	73.3	56.0	48.0	100.8	76.3	72.0	54.4
29-Jul	89.0	68.2	75.0	56.1	50.0	100.1	69.9	74.6	56.5
5-Aug	90.0	68.7	77.6	57.9	50.0	98.7	75.0	77.6	57.6
12-Aug	89.0	69.2	75.8	56.5	50.0	100.1	74.5	75.2	57.7
19-Aug	88.0	68.2	76.1	56.4	49.0	94.5	70.7	74.8	55.9
26-Aug	84.0	65.4	72.6	54.6	48.0	96.6	71.8	71.3	54.1
2-Sep	83.0	64.8	70.6	53.0	45.0	89.6	69.4	66.8	50.4
9-Sep	81.0	63.6	67.8	50.5	42.0	85.4	65.4	63.1	47.0
16-Sep	78.0	63.5	67.0	50.7	43.0	84.0	66.8	64.0	48.7
23-Sep	80.0	66.0	66.6	50.0	41.0	92.4	74.1	64.6	48.5
30-Sep	75.0	61.3	63.6	47.5	40.0	77.0	65.8	59.0	44.7
7-Oct	73.0	61.5	61.0	46.8	36.0	77.7	69.2	57.5	43.6
14-Oct	70.0	59.1	58.6	44.4	34.0	72.8	66.3	52.9	40.6
21-Oct	64.0	55.8	54.1	41.8	32.0	67.2	59.4	48.9	37.1
28-Oct	66.0	55.3	52.7	39.1	29.0	66.5	58.3	43.7	33.0
4-Nov	59.0	53.6	48.4	38.3	27.0	63.7	55.2	41.7	31.9
11-Nov	59.0	52.6	46.4	36.7	27.0	56.7	53.7	38.8	30.0
18-Nov	55.0	50.1	44.5	35.6	25.0	53.2	52.7	36.8	28.0
25-Nov	56.0	52.8	42.8	34.0	21.0	59.5	54.4	35.2	26.2
2-Dec	53.0	50.4	39.2	31.2	18.0	55.3	53.4	31.5	23.8
9-Dec	54.0	46.7	39.9	31.3	16.0	51.1	50.6	31.7	23.6
16-Dec	53.0	48.7	38.2	30.9	13.0	51.1	50.5	31.1	22.9
23-Dec	53.0	49.4	38.8	31.6	18.0	56.7	52.2	32.3	23.9
31-Dec	52.0	49.2	38.2	30.6	9.0	51.1	51.5	30.1	23.2

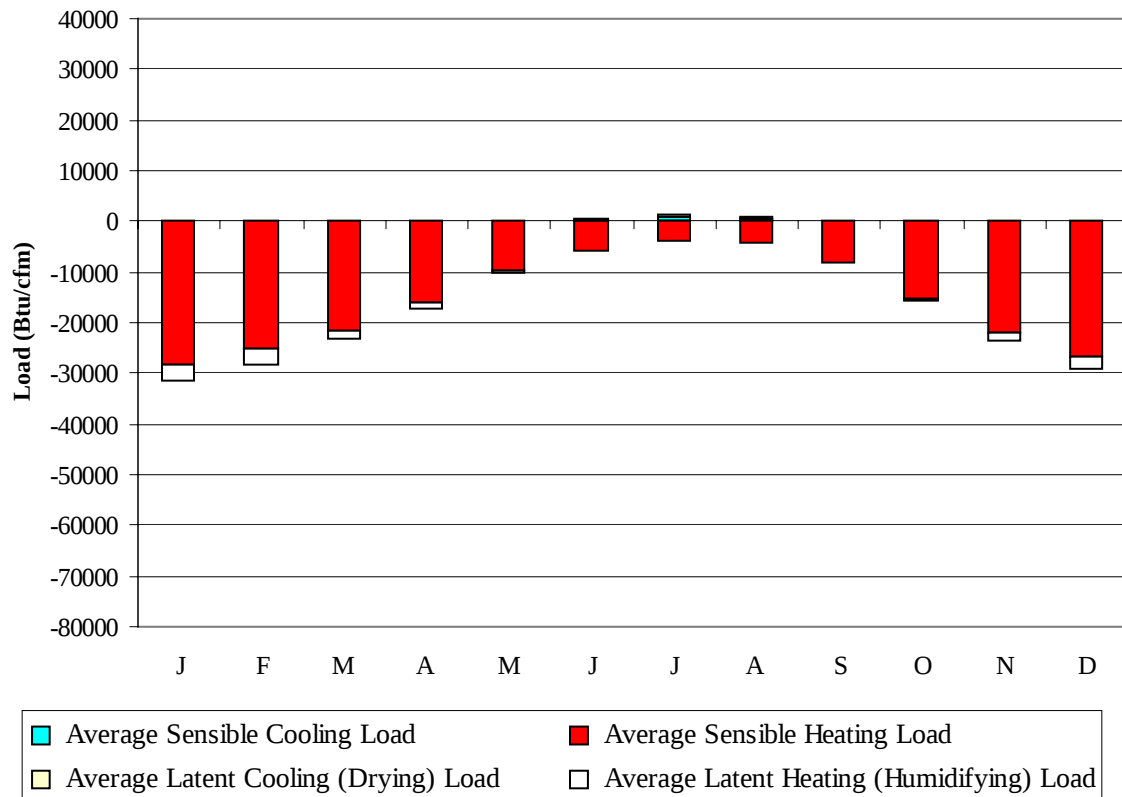
WURZBURG AAF, GERMANY

WMO No. 106550



	Mean Cooling Degree Days (°F)	Mean Heating Degree Days (°F)
JAN	0	1000
FEB	0	893
MAR	0	736
APR	6	534
MAY	31	301
JUN	69	165
JUL	124	97
AUG	112	104
SEP	32	238
OCT	3	502
NOV	0	764
DEC	0	936
ANN	377	6270

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	-28334	0	-2975
FEB	0	-25318	0	-2967
MAR	0	-21461	0	-1826
APR	5	-16077	0	-1023
MAY	76	-9856	3	-154
JUN	301	-5952	154	-10
JUL	739	-3877	398	-1
AUG	587	-4111	269	-1
SEP	78	-8126	42	-4
OCT	3	-15370	0	-259
NOV	0	-22133	0	-1271
DEC	0	-26679	0	-2348
ANN	1789	-187294	866	-12839

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

No Solar Radiation
Data Available

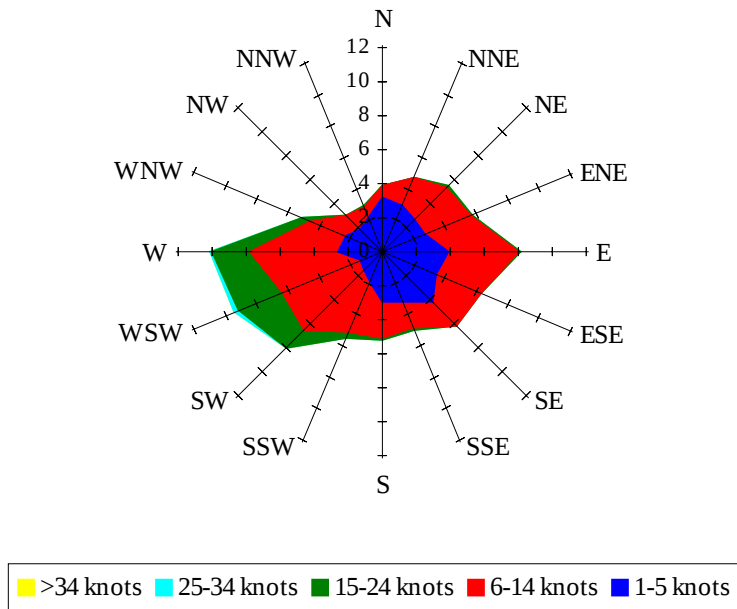


Average Annual Solar Heat and Illumination – Nearest Available Site

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

Wind Summary - December, January, and February

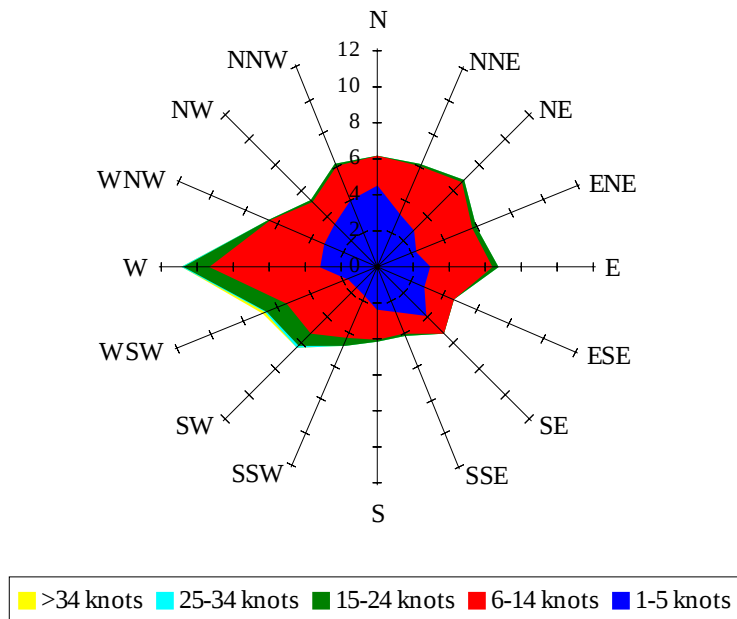
Labels of Percent Frequency on North Axis



Percent Calm = 6.15

Wind Summary - March, April, and May

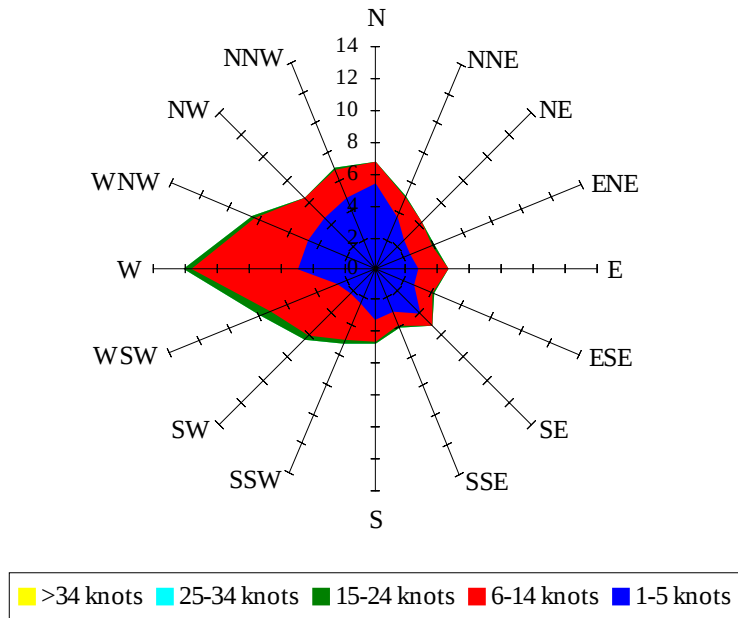
Labels of Percent Frequency on North Axis



Percent Calm = 4.94

Wind Summary - June, July, and August

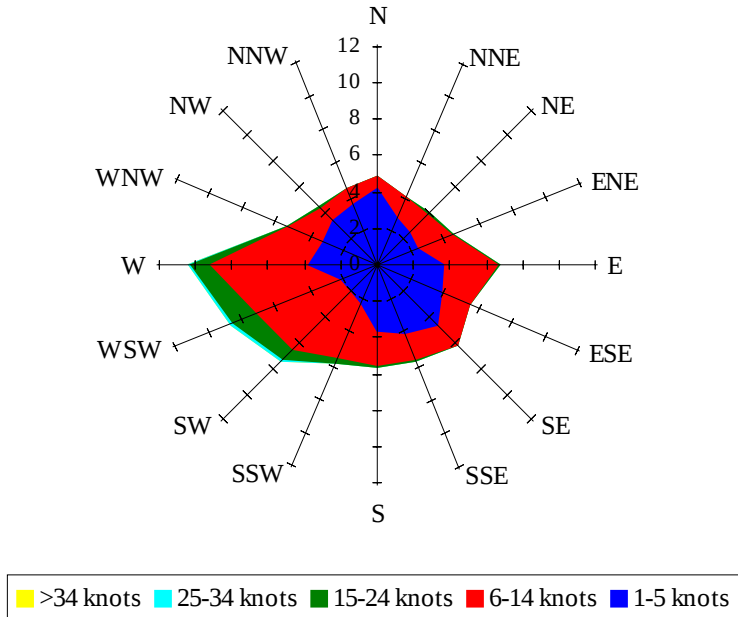
Labels of Percent Frequency on North Axis



Percent Calm = 6.21

Wind Summary - September, October, and November

Labels of Percent Frequency on North Axis



Percent Calm = 6.88