

NAGOYA JP

Latitude = 35.25 N

Longitude = 136.93 E

Period of Record = 1973 to 1996

WMO No. 476350

Elevation = 56 feet

Average Pressure = 29.86 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	97	77	112	8.7	W
0.4% Occurrence	93	77	115	8.6	W
1.0% Occurrence	91	77	116	8.2	VARIABLE
2.0% Occurrence	90	77	116	8.2	VARIABLE
Mean Daily Range	16	-	-	-	-
97.5% Occurrence	30	28	17	3.9	NNW
99.0% Occurrence	28	26	16	3.0	N
99.6% Occurrence	27	26	16	3.0	N
Median of Extreme Lows	23	21	13	2.8	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	81	90	140	8.2	VARIABLE
0.4% Occurrence	79	87	134	7.8	VARIABLE
1.0% Occurrence	78	86	130	7.5	VARIABLE
2.0% Occurrence	78	86	130	7.5	VARIABLE
	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	152	84	0.99	9.6	SSE
0.4% Occurrence	142	83	0.94	7.2	SSE
1.0% Occurrence	134	82	0.88	7.2	SSE
2.0% Occurrence	133	82	0.88	6.2	SSE
Air Conditioning/ Humid Area Criteria	# of Hours	T ≥ 93°F	T ≥ 80°F	T _{wb} ≥ 73°F	T _{wb} ≥ 67°F
		57	991	1160	2252

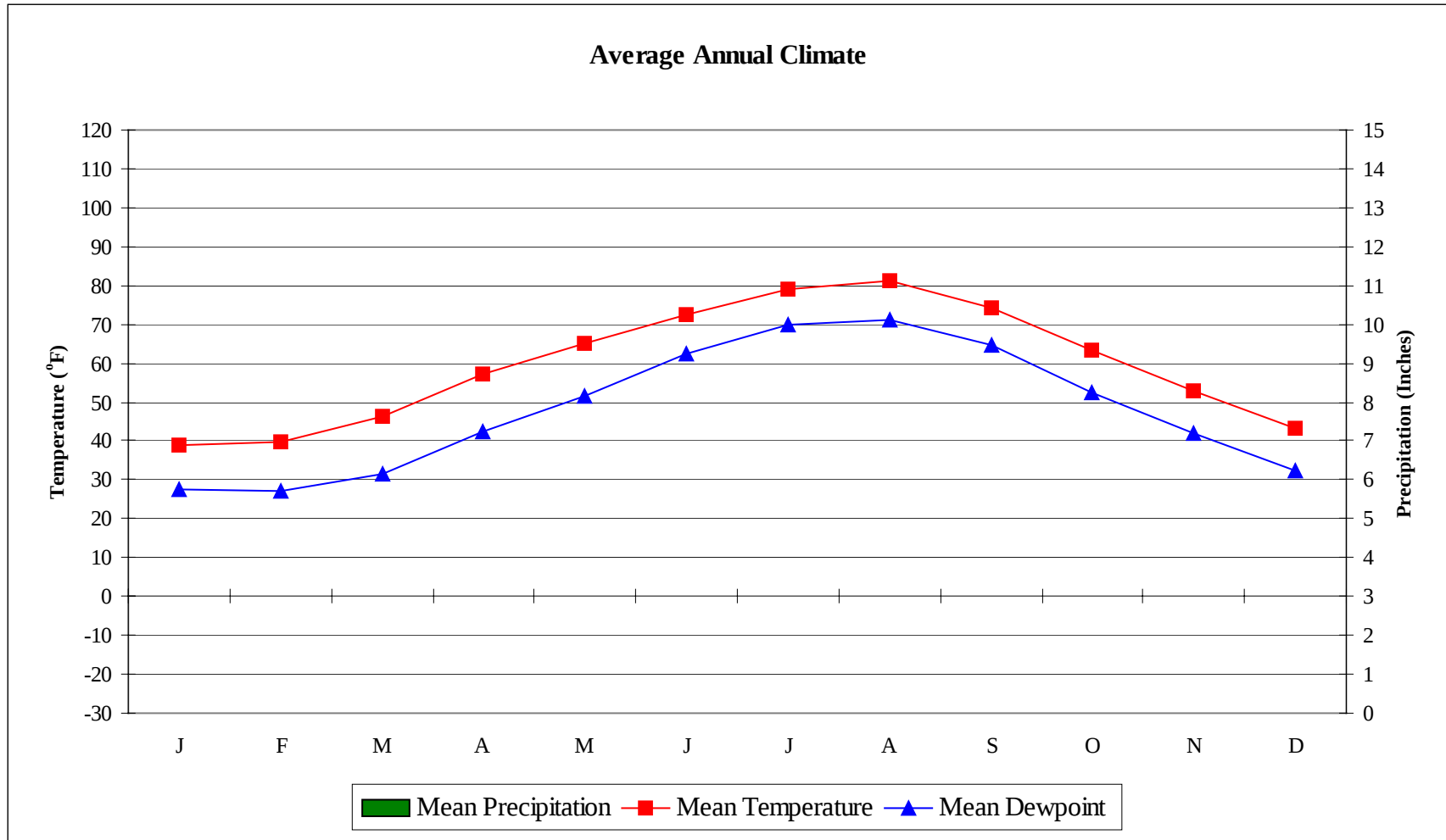
Other Site Data

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
8	N/A	N/A	4.0 + 1.1
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 (#)
62.1	N/A	N/A	36

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

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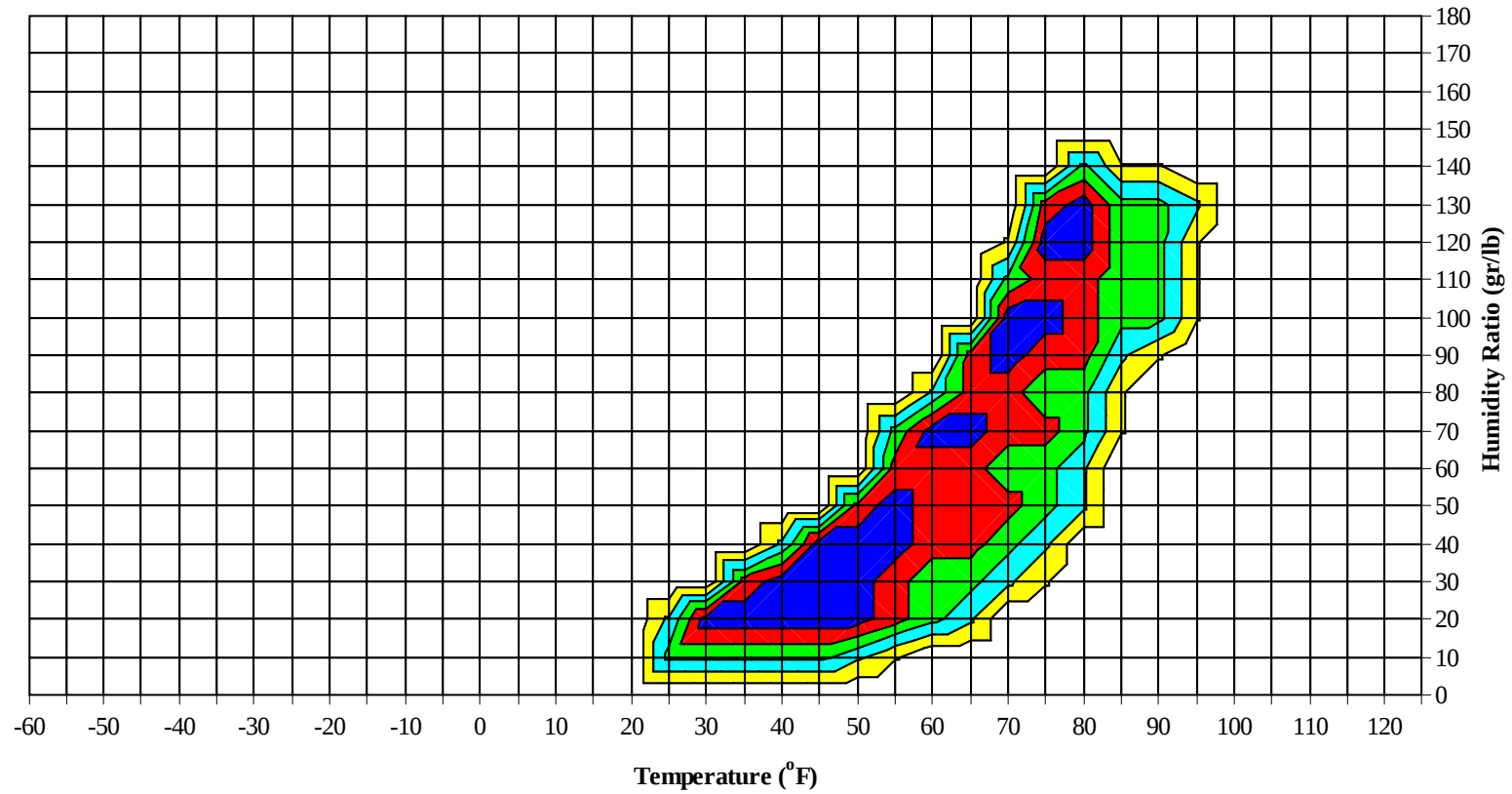


No Precipitation Data Available

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Long Term Psychrometric Summary

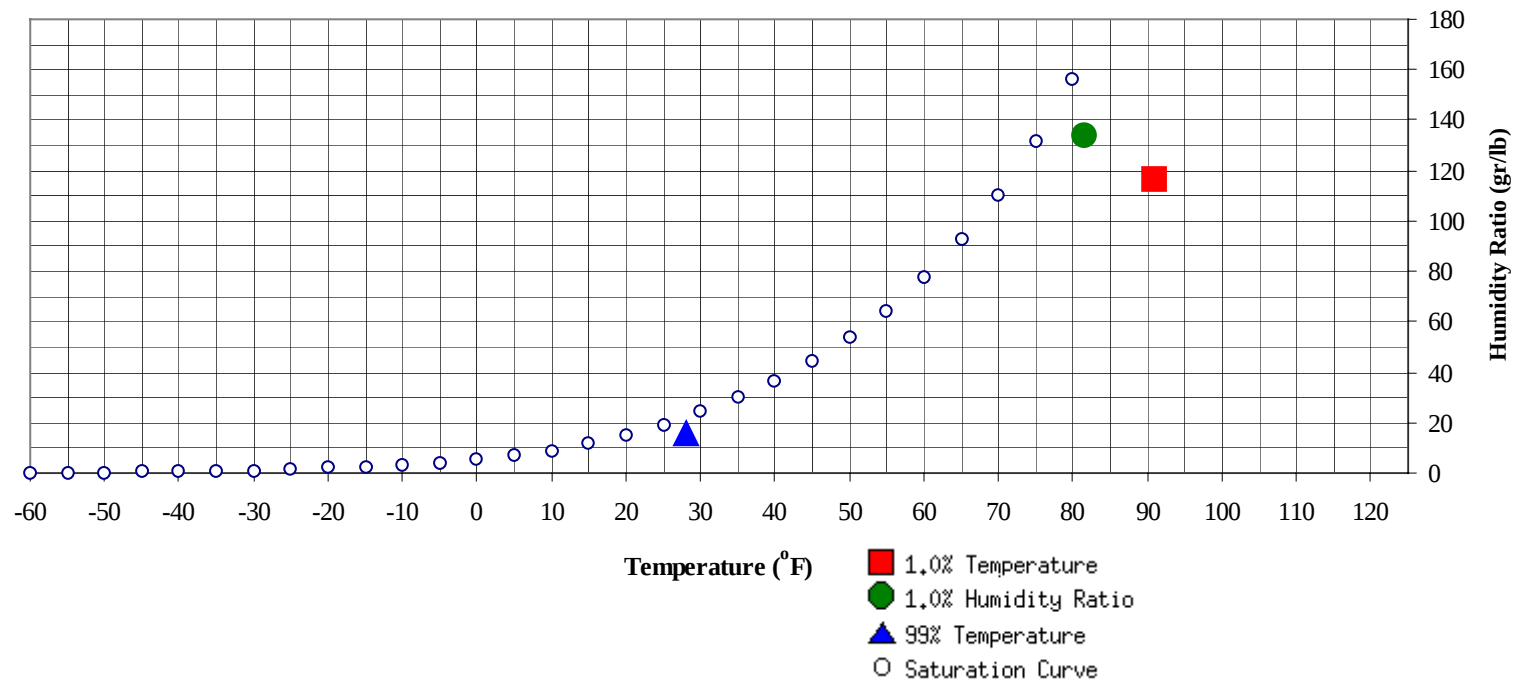


- 50% of all observations
- 80% of all observations
- 95% of all observations
- 97.5% of all observations
- 99% of all observations

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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	28	16.2	9.2		134.4	81.5	77	75.2	40.6

1.0% Dry Bulb	(°F)	MCHR (gr/lb)	MCWB (°F)	Enthalpy (btu/lb)
	91	116.3	76.8	40.1

NAGOYA JP

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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		
100 / 104															
95 / 99															
90 / 94															
85 / 89															
80 / 84															
75 / 79															
70 / 74												1	0	1	53.3
65 / 69							0		0	54.2		3	1	4	52.8
60 / 64		1		1	51.6	0	3	1	4	51.7	0	23	5	28	50.1
55 / 59	0	7	1	8	47.6	1	13	3	17	48.2	6	55	28	89	47.6
50 / 54	3	34	11	48	43.8	5	40	18	63	43.7	25	77	60	162	44.6
45 / 49	11	78	40	129	39.7	15	68	43	126	39.7	56	62	71	189	40.6
40 / 44	22	58	48	128	36.7	20	46	42	108	36.3	43	18	40	101	36.7
35 / 39	67	55	90	212	33.3	57	41	70	169	33.0	68	7	36	111	33.1
30 / 34	98	15	53	166	29.6	87	12	41	141	29.2	42	2	7	51	29.5
25 / 29	44	1	5	50	25.2	36	1	5	42	25.0	7		0	7	25.7
20 / 24	3		0	3	20.9	2	0	0	2	21.0	0			0	22.5
15 / 19	0			0	18.5	0			0	18.0					

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.

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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		
100 / 104															
95 / 99															
90 / 94							0		0	67.2		0	0	0	78.0
85 / 89							2	0	2	66.9		4	1	5	73.5
80 / 84		1	0	1	62.6		17	3	20	64.1		13	3	16	71.1
75 / 79		10	1	11	59.4		54	16	70	62.4	1	59	18	78	69.3
70 / 74	0	36	9	45	57.2	0	79	48	138	60.9	18	86	58	162	68.3
65 / 69	3	42	20	65	56.1	11	43	54	125	59.6	83	58	101	243	66.4
60 / 64	23	67	60	150	54.3	28	43	54	125	59.6	77	16	42	135	63.6
55 / 59	58	55	71	184	51.1	80	42	77	199	57.2	53	4	15	72	59.9
50 / 54	70	24	47	141	46.7	84	11	41	136	53.2	7	0	1	8	54.3
45 / 49	47	6	23	76	41.2	35	0	7	42	47.7	0			0	48.8
40 / 44	20	0	6	26	37.4	9		1	10	43.0					
35 / 39	16		2	18	34.0	1			1	38.8					
30 / 34	2			2	30.4	0			0	35.0					
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 = 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		
100 / 104						0			0	76.6					
95 / 99		9	1	10	77.6	0	13	1	14	77.4		1		1	76.5
90 / 94		46	13	59	77.0	0	65	14	79	76.8		11	1	12	75.5
85 / 89	0	47	22	69	75.6	1	70	27	98	75.8	0	29	4	33	73.4
80 / 84	28	70	70	169	74.2	46	70	103	219	75.0	5	67	30	102	71.9
75 / 79	108	52	92	251	72.5	148	24	87	259	73.1	49	71	74	194	70.1
70 / 74	90	22	44	156	69.1	50	6	14	70	69.5	84	45	83	212	67.1
65 / 69	20	3	6	29	64.9	4	1	1	6	65.0	55	13	32	100	63.7
60 / 64	2		0	2	62.0	0			0	61.1	36	4	15	55	59.7
55 / 59											9	0	1	10	54.2
50 / 54											1			1	50.0
45 / 49															
40 / 44															
35 / 39															
30 / 34															
25 / 29															
20 / 24															
15 / 19															

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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		
100 / 104															
95 / 99															
90 / 94															
85 / 89		0		0	69.5										
80 / 84		7	0	7	66.9										
75 / 79	1	42	6	49	64.2		1		1	62.3					
70 / 74	9	72	35	117	61.9	0	14	1	15	60.2					
65 / 69	19	54	47	120	60.2	1	25	5	31	57.3		1		1	54.3
60 / 64	73	55	85	213	57.6	10	61	30	102	54.6	0	11	1	12	52.0
55 / 59	77	17	51	145	53.2	34	68	63	166	51.1	1	33	9	43	48.0
50 / 54	47	2	18	67	48.4	56	50	65	170	46.9	12	68	31	111	44.8
45 / 49	19	0	5	24	43.5	62	18	48	128	42.5	29	79	71	179	40.9
40 / 44	3		0	3	39.4	37	3	20	60	38.7	38	33	56	127	37.9
35 / 39	1			1	36.8	35	0	8	43	35.1	90	20	60	170	34.2
30 / 34						4	0	0	4	30.7	65	4	19	88	30.2
25 / 29						0			0	27.0	12	0	1	13	25.8
20 / 24											0			0	20.7
15 / 19															

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NAGOYA JP

WMO No. 476350

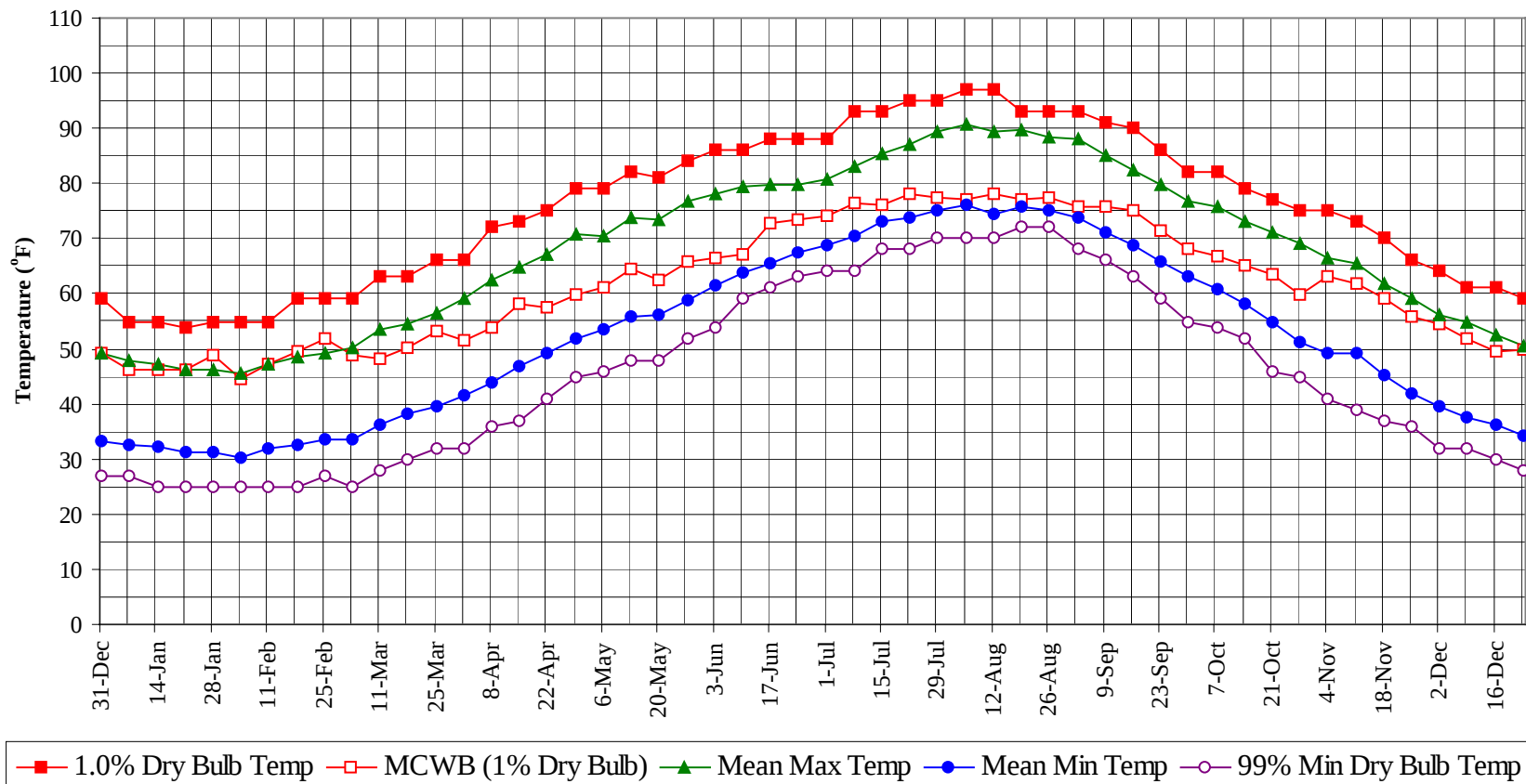
Dry-Bulb Temperature Hours For An Average Year (Sheet 5 of 5)

Period of Record = 1973 to 1996

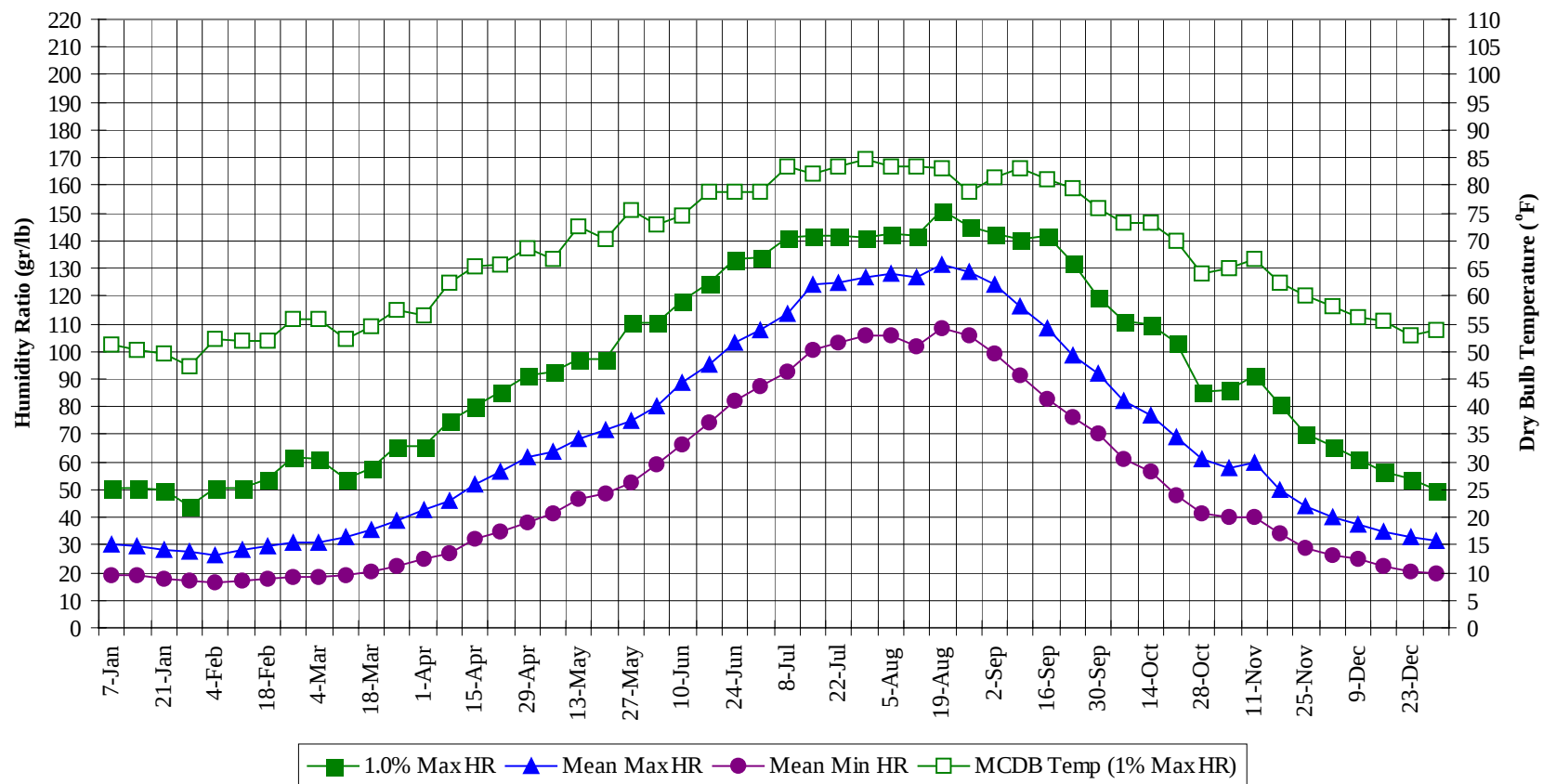
Annual Totals					
Temperature Range (°F)	Hour Group (LST)			Total Obs	M C W B (°F)
	01 To 08	09 To 16	17 To 00		
100 / 104	0			0	76.6
95 / 99	0	23	2	25	77.5
90 / 94	0	125	29	154	76.6
85 / 89	2	160	57	219	74.9
80 / 84	80	290	224	594	73.0
75 / 79	322	339	334	996	70.2
70 / 74	326	332	336	995	65.3
65 / 69	208	200	207	615	61.0
60 / 64	278	269	289	836	56.5
55 / 59	278	259	269	806	51.2
50 / 54	254	296	256	806	45.8
45 / 49	248	311	302	861	40.8
40 / 44	185	159	213	557	37.2
35 / 39	334	122	267	724	33.6
30 / 34	300	33	120	453	29.6
25 / 29	98	2	11	111	25.2
20 / 24	5	0	0	5	21.0
15 / 19	0			0	18.3

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.

Annual Summary of Temperatures

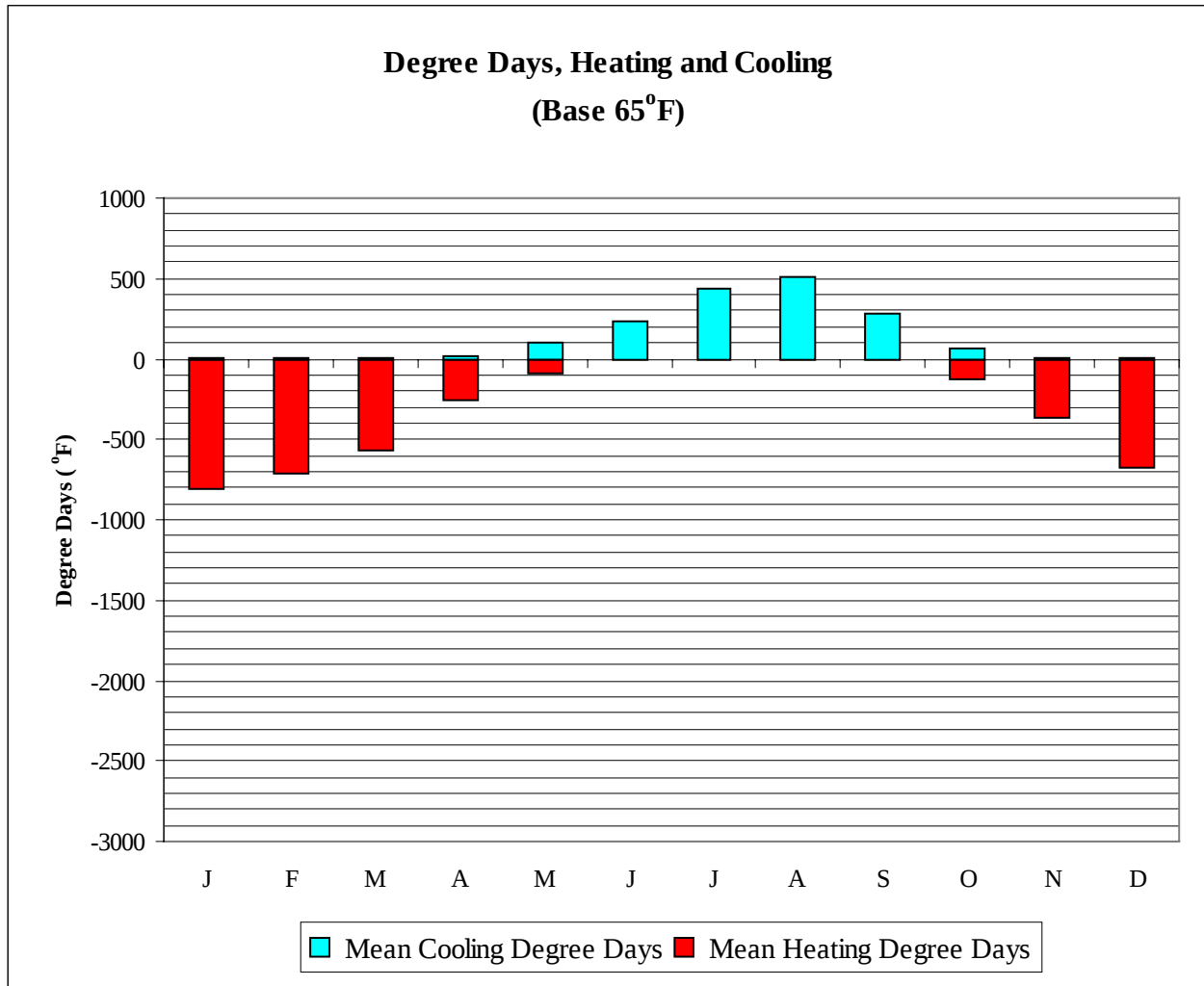


Long Term Humidity and Dry Bulb Temperature Summary

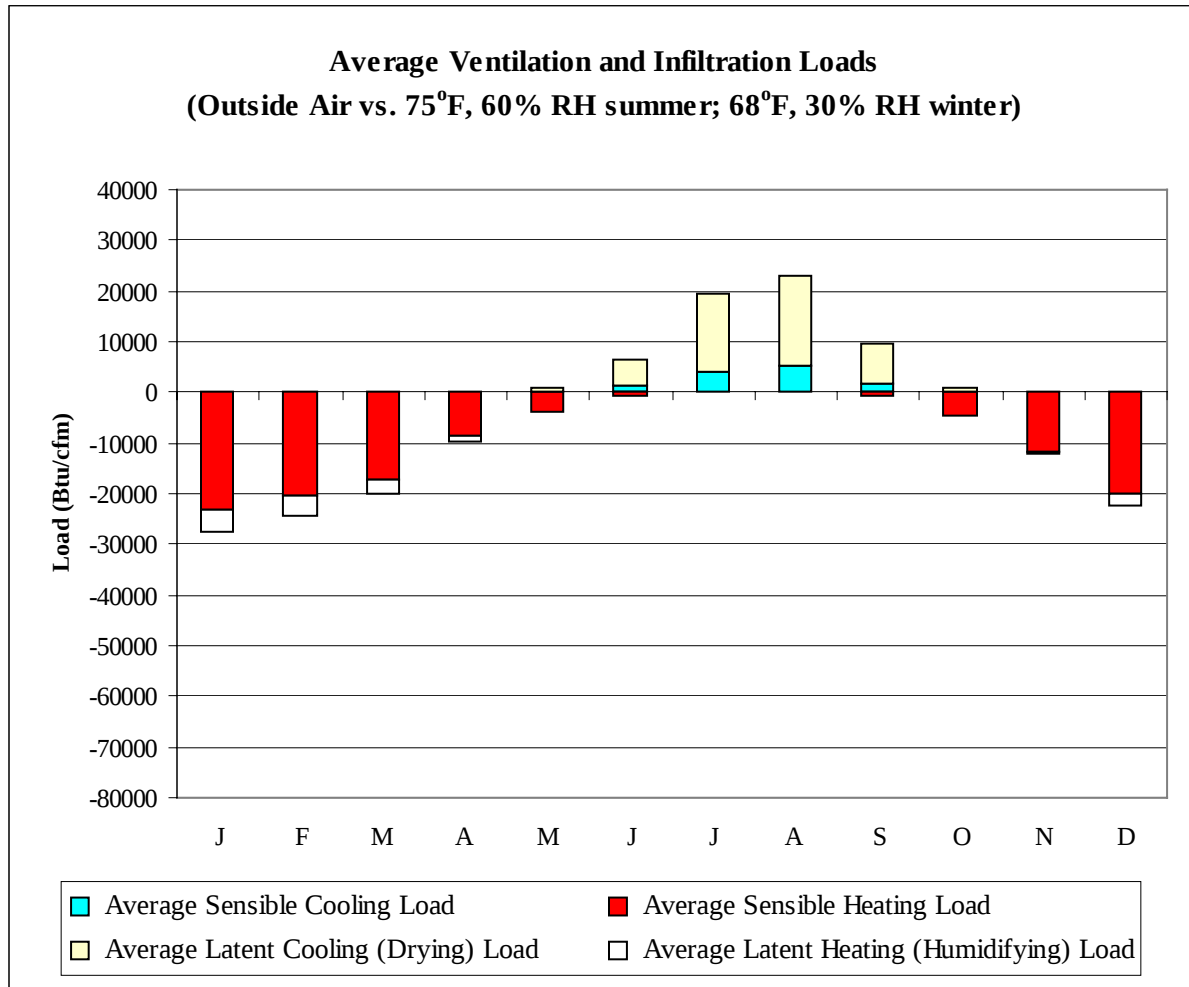


NAGOYA JP**WMO No. 476350****Long Term Dry Bulb Temperature and Humidity Summary**

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	55.0	46.3	47.8	32.5	27.0	50.4	51.2	30.0	18.8
14-Jan	55.0	46.4	47.0	32.2	25.0	50.4	50.1	29.4	19.1
21-Jan	54.0	46.1	46.1	31.2	25.0	49.7	49.7	28.0	17.7
28-Jan	55.0	48.7	46.3	31.2	25.0	44.1	47.3	27.4	17.1
4-Feb	55.0	44.4	45.7	30.3	25.0	50.4	52.3	26.1	16.2
11-Feb	55.0	47.1	47.3	31.8	25.0	50.4	52.0	28.1	17.3
18-Feb	59.0	49.7	48.6	32.5	25.0	53.9	51.9	29.6	17.9
25-Feb	59.0	51.8	49.2	33.4	27.0	61.6	55.7	30.7	18.5
4-Mar	59.0	49.0	50.2	33.5	25.0	60.9	55.9	30.6	18.4
11-Mar	63.0	48.2	53.4	36.2	28.0	53.9	52.3	32.7	19.2
18-Mar	63.0	50.3	54.6	38.2	30.0	58.1	54.4	35.2	20.4
25-Mar	66.0	53.3	56.5	39.5	32.0	65.8	57.6	38.8	22.6
1-Apr	66.0	51.4	59.1	41.5	32.0	65.8	56.6	42.6	24.9
8-Apr	72.0	54.0	62.5	44.0	36.0	74.9	62.6	46.3	27.2
15-Apr	73.0	58.0	64.6	47.0	37.0	79.8	65.3	51.9	32.1
22-Apr	75.0	57.6	67.1	49.3	41.0	85.4	65.8	56.2	34.7
29-Apr	79.0	59.9	70.7	52.0	45.0	91.0	68.8	61.5	37.8
6-May	79.0	61.2	70.3	53.4	46.0	92.4	66.6	63.8	41.5
13-May	82.0	64.5	73.8	55.8	48.0	97.3	72.6	68.2	46.6
20-May	81.0	62.5	73.4	56.1	48.0	97.3	70.2	71.5	48.8
27-May	84.0	65.9	76.8	58.8	52.0	110.6	75.7	74.8	52.7
3-Jun	86.0	66.5	78.0	61.3	54.0	110.6	72.9	80.2	59.1
10-Jun	86.0	67.1	79.4	63.9	59.0	118.3	74.5	88.6	66.5
17-Jun	88.0	72.6	79.7	65.6	61.0	124.6	78.8	95.0	74.3
24-Jun	88.0	73.6	79.8	67.5	63.0	133.0	78.9	103.2	82.4
1-Jul	88.0	74.1	80.8	68.9	64.0	133.7	78.9	107.5	87.5
8-Jul	93.0	76.3	83.1	70.3	64.0	141.4	83.3	113.5	92.4
15-Jul	93.0	76.2	85.4	73.0	68.0	142.1	82.1	124.2	100.3
22-Jul	95.0	78.2	86.9	73.7	68.0	142.1	83.5	125.0	103.4
29-Jul	95.0	77.5	89.3	75.2	70.0	141.4	84.7	127.0	105.5
5-Aug	97.0	77.1	90.9	76.0	70.0	142.8	83.3	128.3	105.7
12-Aug	97.0	78.0	89.3	74.5	70.0	142.1	83.5	126.5	101.5
19-Aug	93.0	77.1	89.6	75.8	72.0	151.2	83.1	131.6	108.5
26-Aug	93.0	77.6	88.5	75.0	72.0	144.9	78.7	128.7	105.4
2-Sep	93.0	75.8	88.1	73.6	68.0	142.8	81.5	123.9	99.3
9-Sep	91.0	75.9	85.0	71.0	66.0	140.7	83.1	116.1	91.4
16-Sep	90.0	75.1	82.5	68.7	63.0	142.1	81.2	108.2	83.0
23-Sep	86.0	71.6	79.8	65.9	59.0	132.3	79.5	98.3	76.1
30-Sep	82.0	68.0	76.8	63.1	55.0	119.7	76.0	92.0	70.0
7-Oct	82.0	66.8	75.8	60.7	54.0	111.3	73.3	81.9	61.3
14-Oct	79.0	65.0	73.1	58.3	52.0	109.9	73.3	77.1	56.5
21-Oct	77.0	63.4	71.3	54.9	46.0	102.9	69.8	68.7	48.2
28-Oct	75.0	59.9	69.1	51.2	45.0	85.4	64.2	60.8	41.5
4-Nov	75.0	63.0	66.6	49.2	41.0	86.1	65.2	57.8	39.8
11-Nov	73.0	61.9	65.6	49.2	39.0	91.0	66.6	59.7	39.8
18-Nov	70.0	59.2	61.7	45.2	37.0	80.5	62.5	50.0	33.9
25-Nov	66.0	55.7	59.2	42.0	36.0	70.0	60.1	43.8	28.9
2-Dec	64.0	54.6	56.1	39.6	32.0	65.8	58.1	40.3	26.5
9-Dec	61.0	51.9	54.7	37.4	32.0	60.9	56.3	37.4	24.9
16-Dec	61.0	49.5	52.5	36.1	30.0	56.7	55.5	34.6	22.4
23-Dec	59.0	49.8	50.5	34.3	28.0	53.9	52.9	32.7	20.6
31-Dec	59.0	49.2	49.2	33.2	27.0	49.7	53.8	31.4	19.8



	Mean Cooling Degree Days (°F)	Mean Heating Degree Days (°F)
JAN	0	807
FEB	0	707
MAR	0	574
APR	22	259
MAY	98	89
JUN	232	8
JUL	439	0
AUG	509	0
SEP	281	8
OCT	69	120
NOV	6	362
DEC	0	674
ANN	1657	3608



	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	-23326	0	-4113
FEB	0	-20522	0	-3914
MAR	0	-17279	1	-2908
APR	21	-8747	56	-908
MAY	298	-3682	579	-84
JUN	1142	-576	5131	0
JUL	4066	-31	15266	0
AUG	5404	-5	17670	0
SEP	1789	-492	7922	0
OCT	122	-4695	765	-41
NOV	0	-11581	62	-636
DEC	0	-19878	0	-2530
ANN	12842	-110814	47452	-15134

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

No Solar Radiation
Data Available

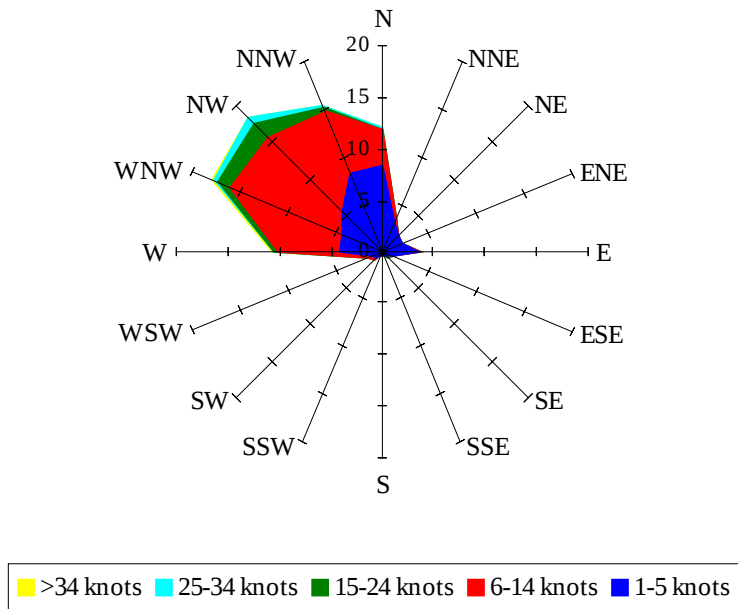


Average Annual Solar Heat and Illumination – Nearest Available Site

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

Wind Summary - December, January, and February

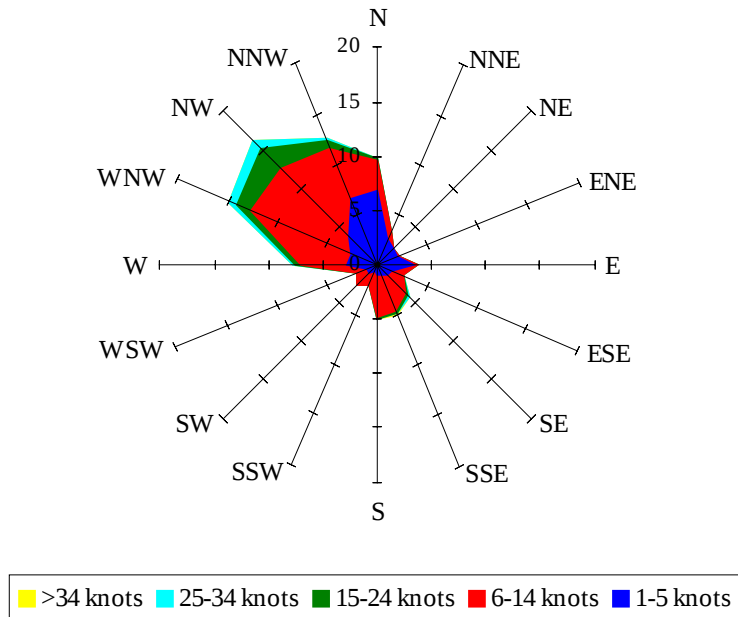
Labels of Percent Frequency on North Axis



Percent Calm = 8.64

Wind Summary - March, April, and May

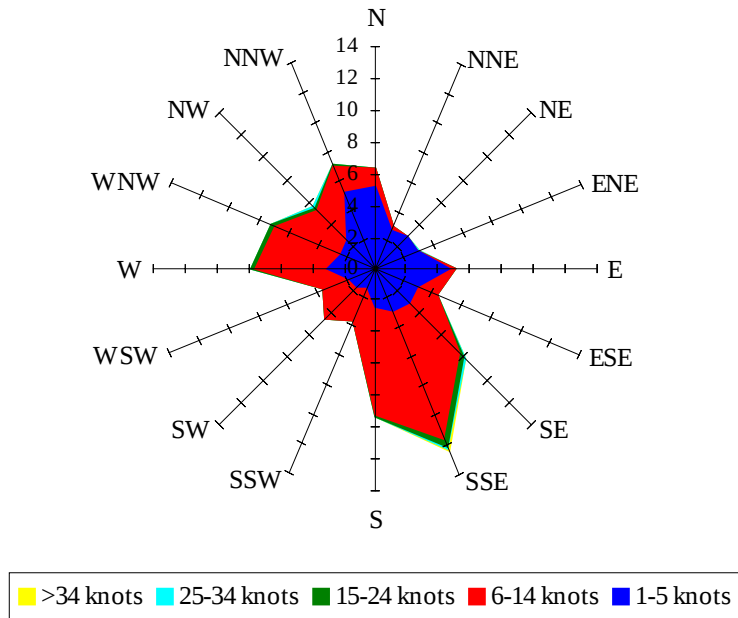
Labels of Percent Frequency on North Axis



Percent Calm = 5.33

Wind Summary - June, July, and August

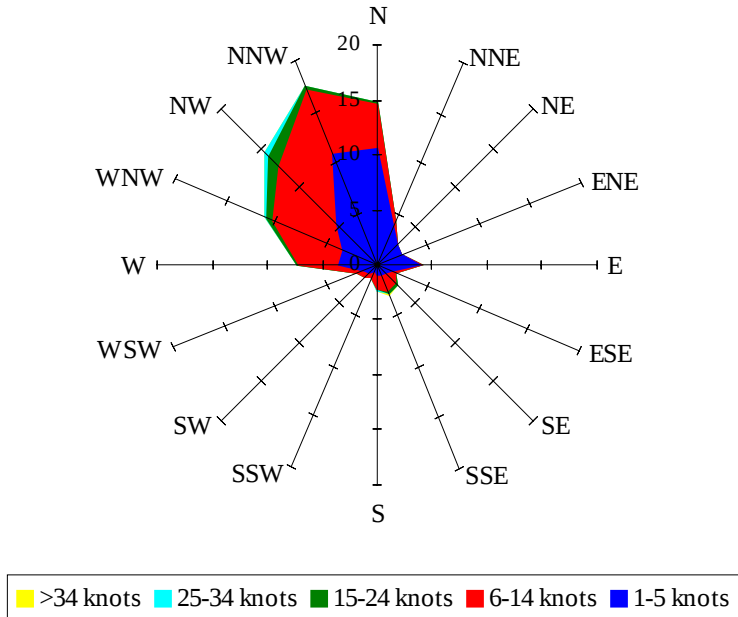
Labels of Percent Frequency on North Axis



Percent Calm = 6.64

Wind Summary - September, October, and November

Labels of Percent Frequency on North Axis



Percent Calm = 7.01