

SANTOS DUMONT/RIO DE JANEIRO BZ

Latitude = 22.90 S

WMO No. 837550

Longitude = 43.17 W

Elevation = 10 feet

Period of Record = 1973 to 1996

Average Pressure = 29.92 inches Hg

Design Criteria Data

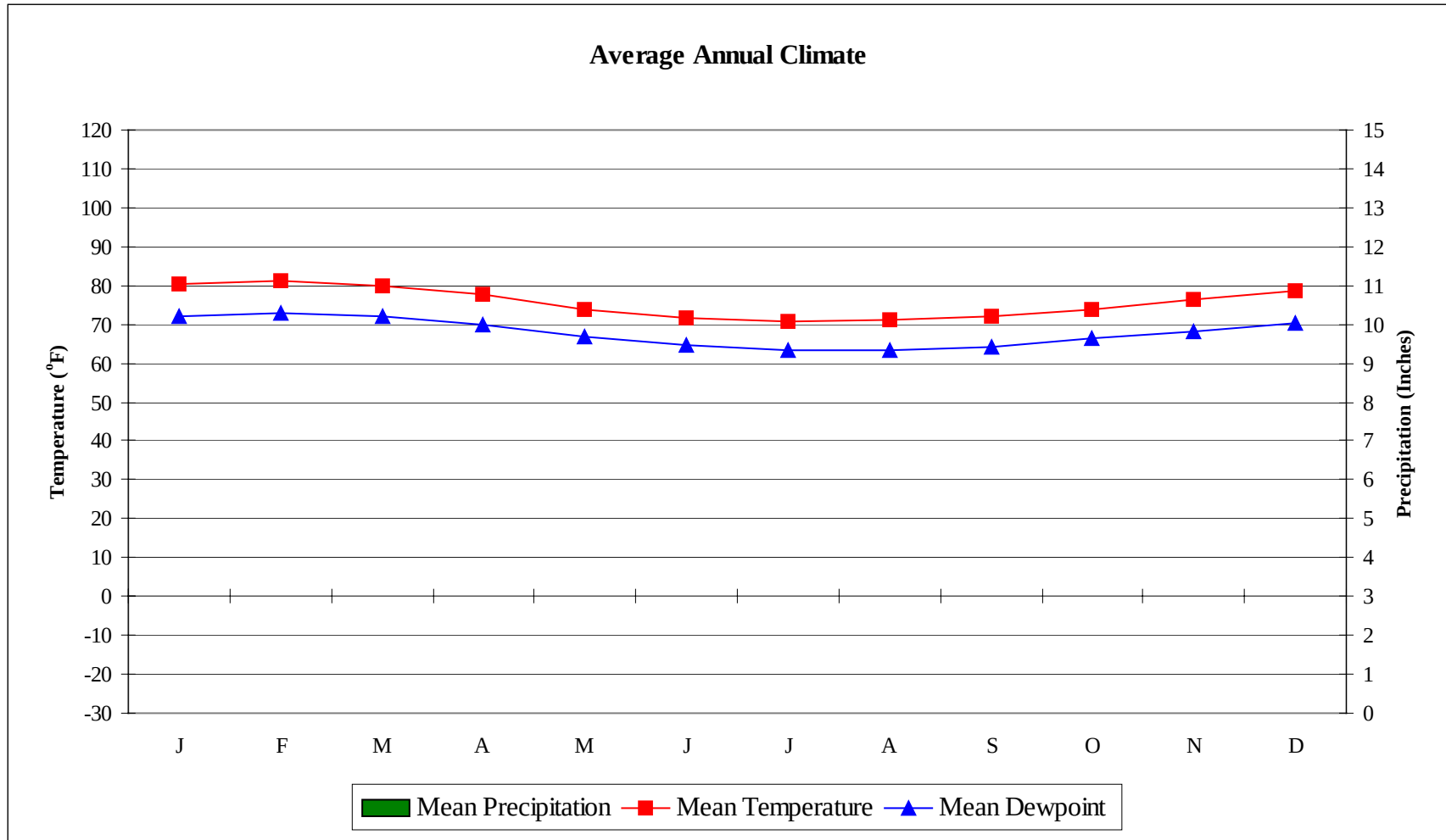
	Design Value	Mean Coincident (Average) Values			
		Wet Bulb Temperature (°F)	Humidity Ratio (gr/lb)	Wind Speed (mph)	Prevailing Direction (NSEW)
Dry Bulb Temperature (T)	(°F)				
Median of Extreme Highs	98	77	109	9.0	NE
0.4% Occurrence	93	77	115	8.0	NNE
1.0% Occurrence	91	77	117	8.9	S
2.0% Occurrence	90	77	118	8.9	S
Mean Daily Range	9	-	-	-	-
97.5% Occurrence	64	61	77	4.2	N
99.0% Occurrence	63	61	76	4.2	N
99.6% Occurrence	61	59	70	4.1	NNW
Median of Extreme Lows	57	54	57	5.7	NW
	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	82	89	149	10.0	SSE
0.4% Occurrence	80	88	138	9.5	S
1.0% Occurrence	79	86	135	8.5	S
2.0% Occurrence	78	85	131	7.7	S
	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	160	86	1.06	10.1	SSE
0.4% Occurrence	142	84	0.94	8.4	S
1.0% Occurrence	141	84	0.94	8.2	S
2.0% Occurrence	136	82	0.90	5.7	S
Air Conditioning/ Humid Area Criteria	# of Hours	T ≥ 93°F	T ≥ 80°F	T _{wb} ≥ 73°F	T _{wb} ≥ 67°F
		45	2154	3008	6741

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
10	N/A	N/A	6.6 + 2.1
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 (#)
78.0	N/A	N/A	0

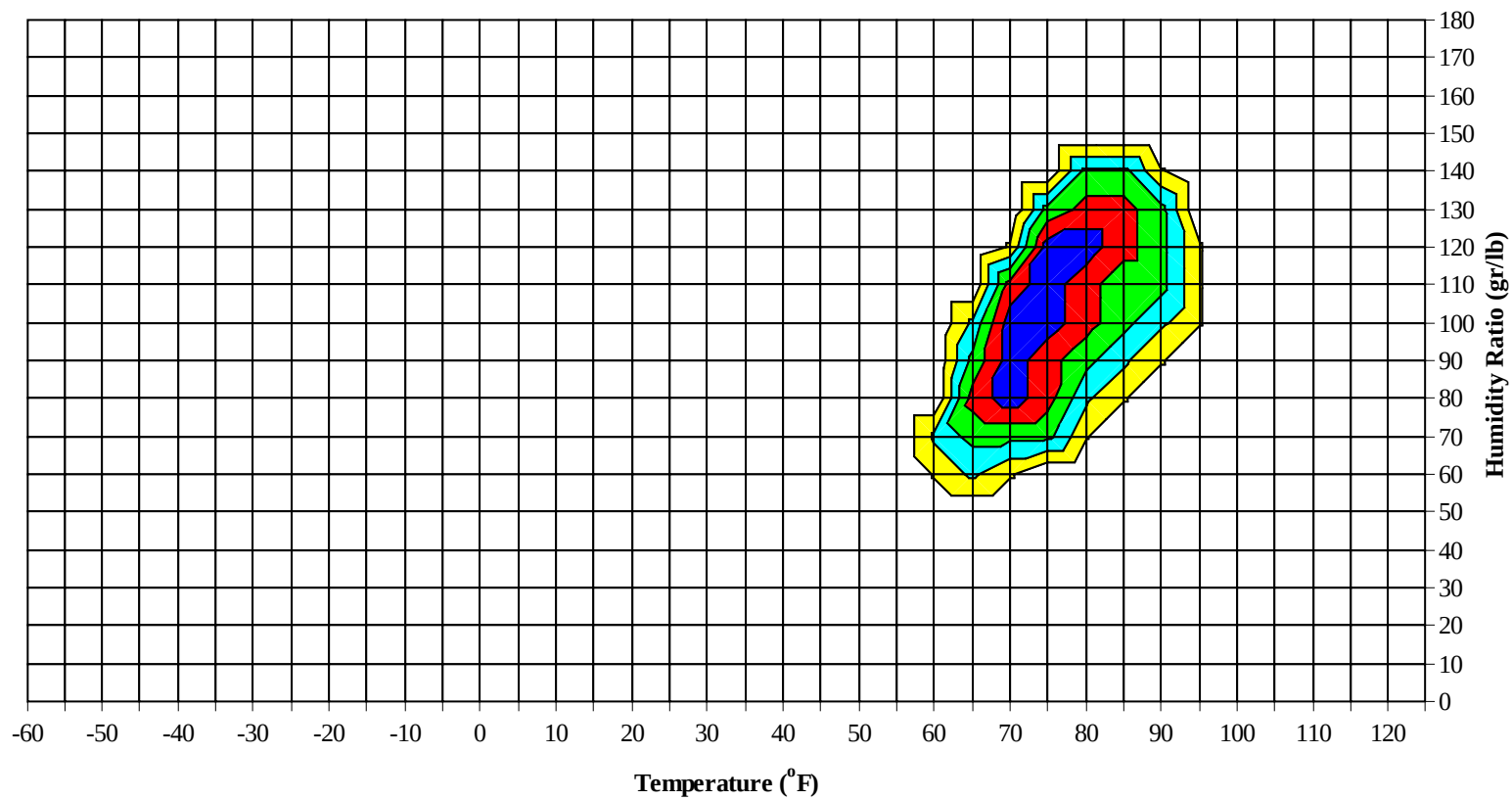
*Note: Temperatures at greater depths can be estimated by adding 1.5°F per 100 feet additional depth.

SANTOS DUMONT/RIO DE JANEIRO BZ WMO No. 837550



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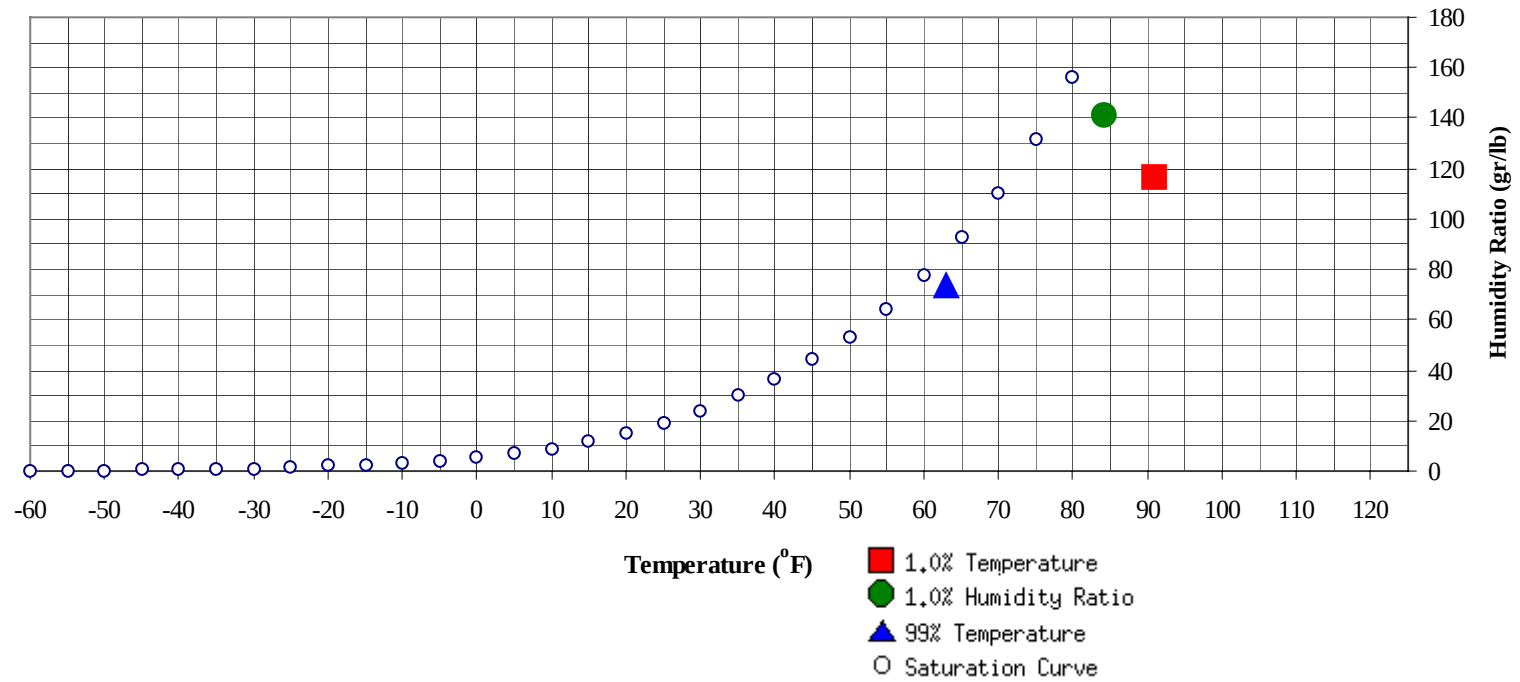
Long Term Psychrometric Summary



- 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	Enthalpy	1.0% Humidity Ratio	(gr/lb)	MCDB	MCWB	MC Dewpt	Enthalpy
		(gr/lb)	(btu/lb)			(°F)	(°F)	(°F)	(btu/lb)
99% Dry Bulb	63	73.8	26.6	Ratio	141.4	84.1	78.8	77	42.4

1.0% Dry Bulb	(°F)	MCHR	MCWB	Enthalpy
		(gr/lb)	(°F)	(btu/lb)
	91	116.7	77	40.2

SANTOS DUMONT/RIO DE JANEIRO BZ WMO No. 837550

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		7	0	7	78.1		4		4	78.4	0	2		2	78.1
90 / 94	0	33	7	40	77.6		31	6	37	78.1	0	14	1	15	77.2
85 / 89	2	57	26	85	76.8	2	70	32	104	77.3	0	56	14	69	76.8
80 / 84	55	102	95	252	75.4	67	96	104	267	75.6	33	124	111	267	75.3
75 / 79	145	41	99	285	73.4	131	21	76	228	73.8	170	46	105	320	73.4
70 / 74	43	9	20	71	70.3	22	2	7	31	71.0	44	7	18	69	70.6
65 / 69	3	0	1	4	66.7	1	0		1	66.8	1	0		1	66.2
60 / 64	0			0	61.0	0			0	63.0					
55 / 59						0			0						
50 / 54															

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.

SANTOS DUMONT/RIO DE JANEIRO BZ WMO No. 837550

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		1		1	77.4		0		0	78.0					
90 / 94		9	1	10	76.6	0	3	0	3	73.8		1		1	71.3
85 / 89	0	23	7	30	76.5	0	8	1	9	73.8	0	5	1	6	71.6
80 / 84	16	98	60	174	74.8	3	47	18	68	72.9	1	25	8	34	70.7
75 / 79	114	85	122	321	72.3	36	111	99	246	71.0	10	86	54	151	69.6
70 / 74	96	24	47	167	69.1	137	66	109	313	68.3	104	89	124	318	67.5
65 / 69	14	1	3	18	66.0	64	12	20	95	65.3	85	29	43	158	64.5
60 / 64	0	0		0	60.0	8	1	1	10	61.4	37	4	9	50	61.0
55 / 59											2	0	0	2	54.4
50 / 54											0		0	0	50.5

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SANTOS DUMONT/RIO DE JANEIRO BZ WMO No. 837550

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															
95 / 99							0		0	70.8		1		1	72.0
90 / 94		0		0	70.3		2	0	2	71.0		3	0	3	72.3
85 / 89		7	0	7	70.3	0	7	2	9	71.1	0	8	3	11	71.6
80 / 84	1	27	9	37	70.0	1	27	13	40	70.4	2	26	14	42	71.1
75 / 79	7	70	46	123	68.9	9	75	46	130	69.0	14	79	45	138	69.5
70 / 74	82	90	118	290	67.1	84	98	112	295	67.0	96	88	111	294	67.3
65 / 69	91	37	54	182	64.2	101	31	60	192	64.2	90	28	52	171	64.2
60 / 64	61	15	20	97	60.4	50	8	15	73	60.6	38	7	16	61	61.5
55 / 59	5	1	2	8	55.8	2	0	1	3	57.6	0		0	0	56.4
50 / 54	0			0	52.0	0			0	52.0	0			0	54.0

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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						0			0	76.0					
95 / 99		1		1	76.2	2	0		2	75.8		4	0	4	77.3
90 / 94		7	1	8	75.1	0	13	3	16	76.0	0	22	3	25	76.7
85 / 89	0	12	5	17	73.9	2	23	9	34	75.0	2	40	17	60	76.0
80 / 84	3	42	21	66	72.6	14	71	35	120	73.7	33	103	63	199	74.5
75 / 79	35	105	66	207	70.6	74	95	96	266	71.5	125	63	121	309	72.5
70 / 74	137	66	123	327	68.1	118	30	85	234	68.6	83	14	42	138	69.6
65 / 69	58	13	27	98	64.8	29	6	11	46	65.5	5	1	2	8	66.3
60 / 64	15	2	5	22	62.1	2		1	3	63.2	0			0	63.0
55 / 59															
50 / 54															

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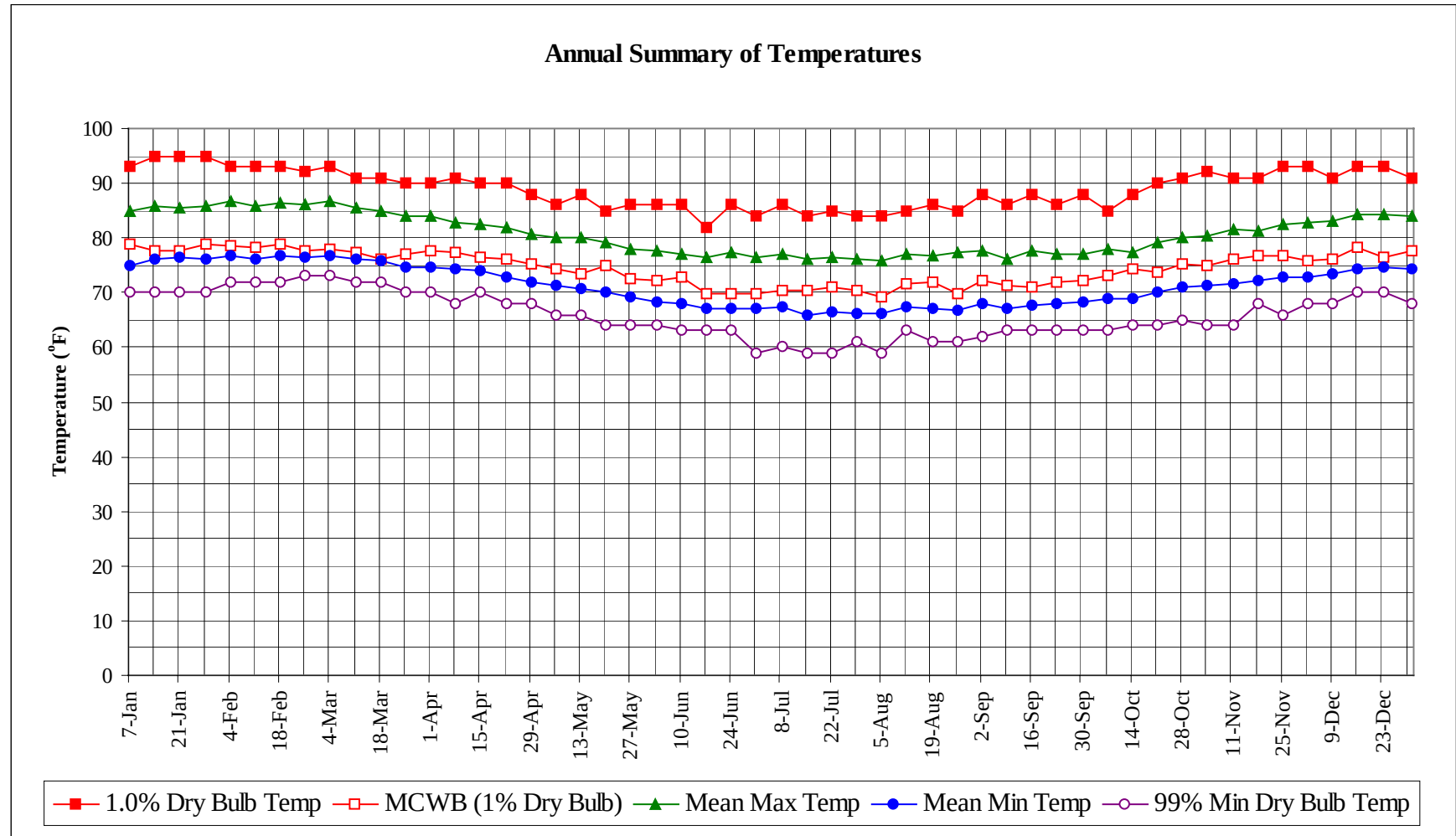
Dry-Bulb Temperature Hours For An Average Year (Sheet 5 of 5)

Period of Record = 1973 to 1996

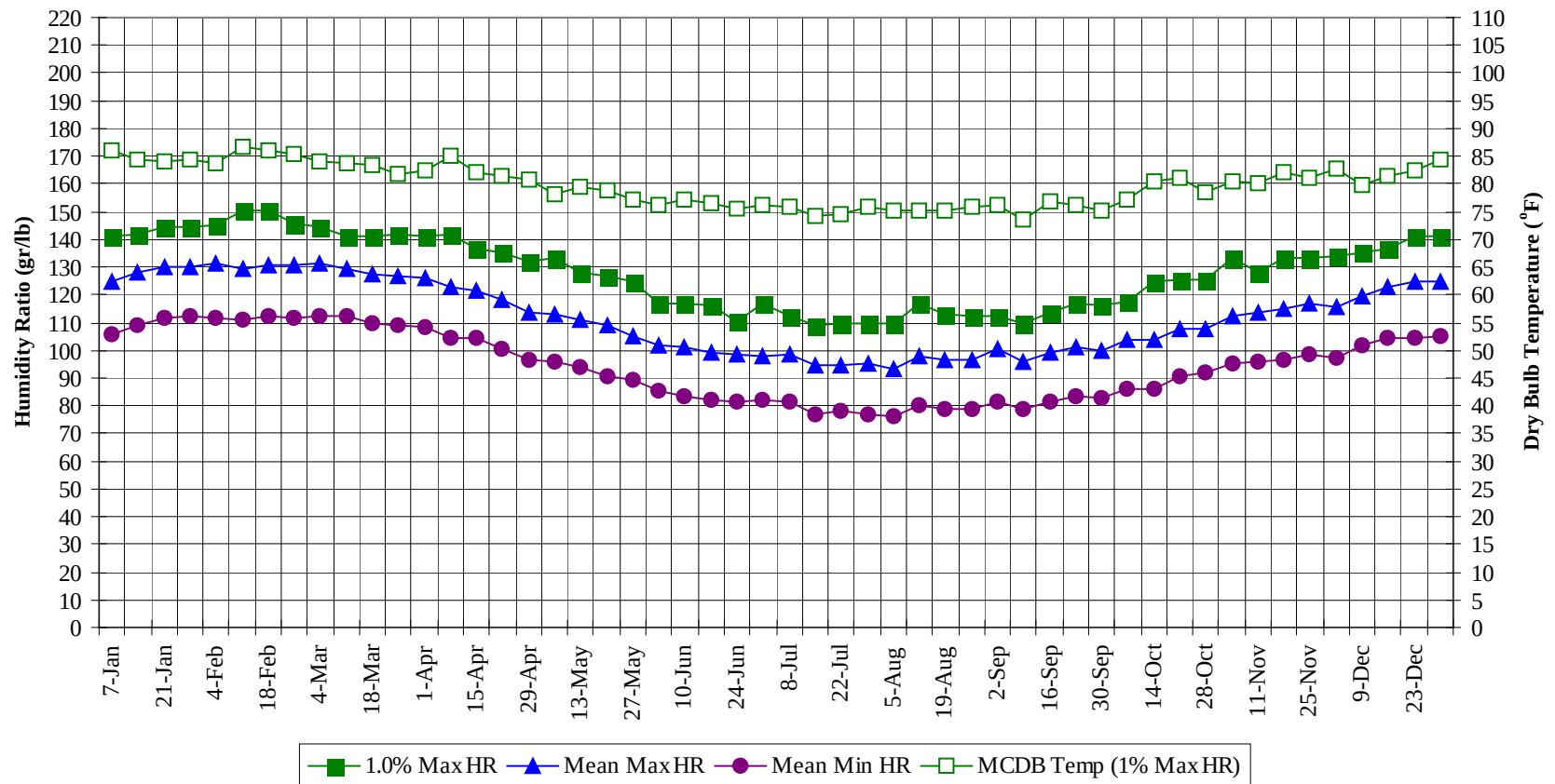
Annual Totals					
Temperature Range (°F)	Hour Group (LST)			Total Obs	M C W B (°F)
	01 To 08	09 To 16	17 To 00		
100 / 104		0		0	76.0
95 / 99	0	21	0	21	77.4
90 / 94	1	134	22	156	76.9
85 / 89	11	309	113	433	76.0
80 / 84	219	784	537	1540	74.4
75 / 79	852	882	970	2704	71.7
70 / 74	1056	590	927	2573	68.0
65 / 69	555	161	280	995	64.5
60 / 64	218	39	68	324	60.9
55 / 59	9	1	3	13	55.9
50 / 54	0		0	0	51.8

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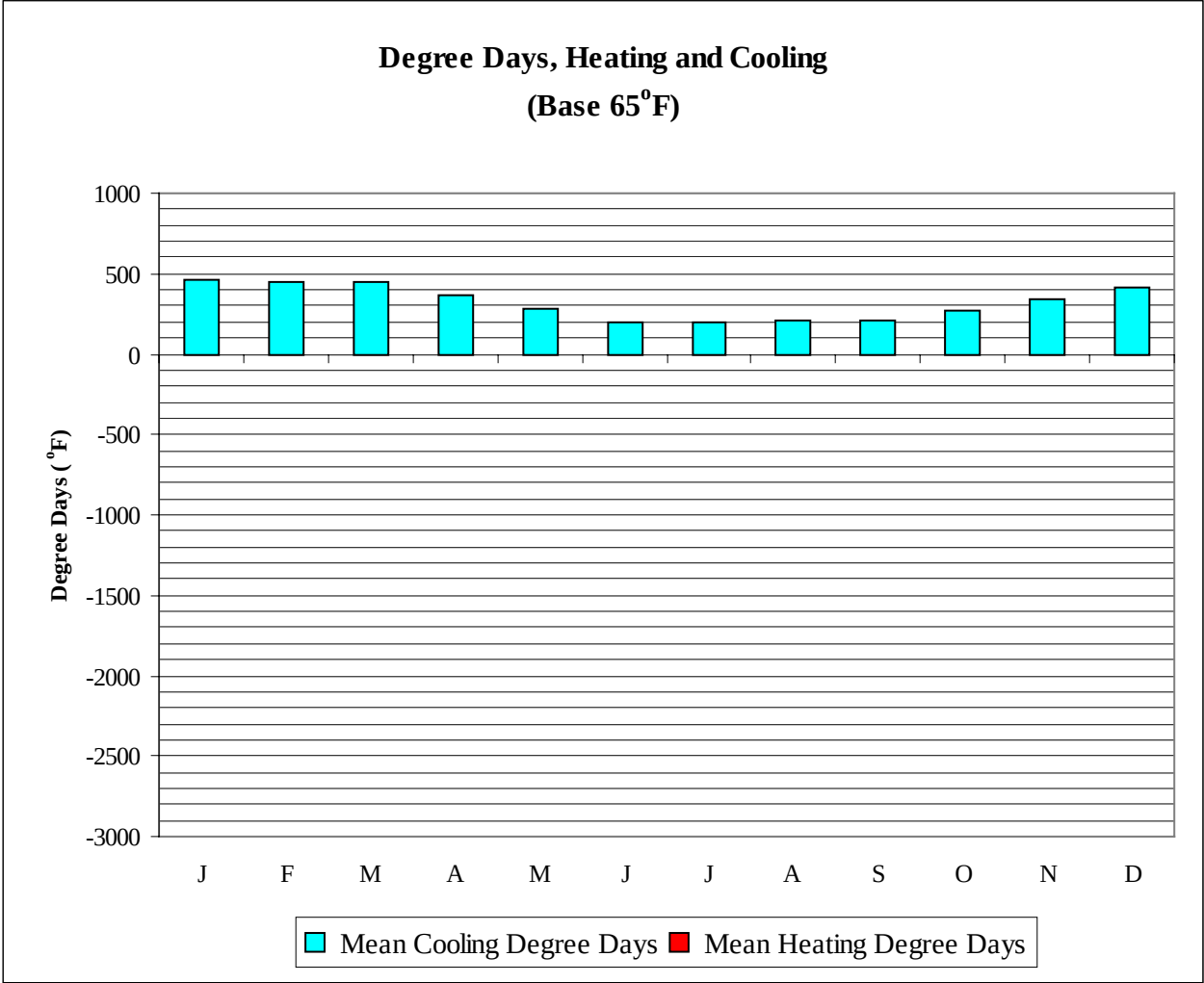
Long Term Humidity and Dry Bulb Temperature Summary



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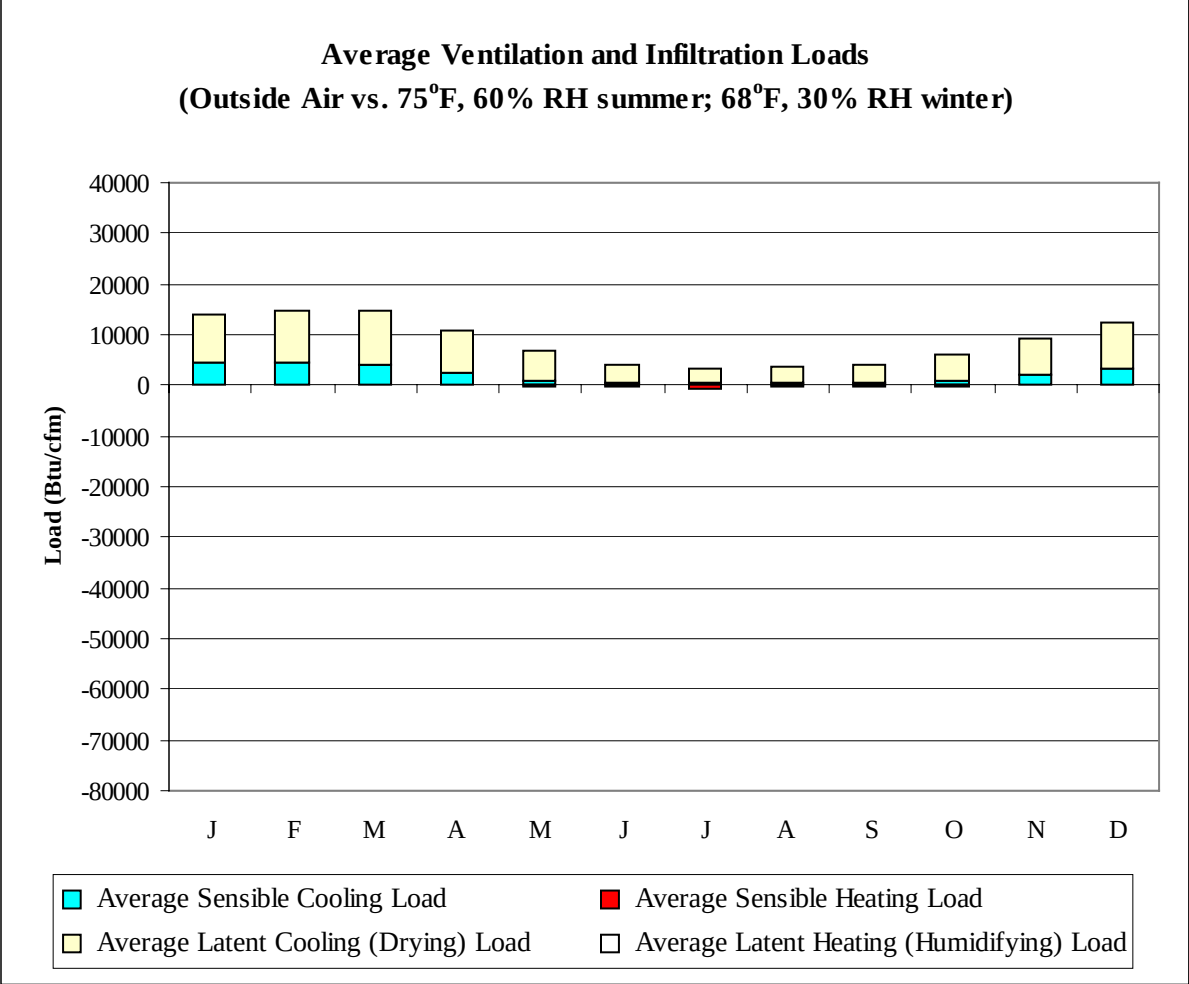
Long Term Dry Bulb Temperature and Humidity Summary

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	93.0	78.9	84.8	75.0	70.0	141.4	86.0	124.8	105.6
14-Jan	95.0	77.7	85.9	76.2	70.0	142.1	84.3	128.3	109.2
21-Jan	95.0	77.8	85.4	76.5	70.0	144.2	84.1	129.9	111.6
28-Jan	95.0	79.0	85.8	76.0	70.0	144.2	84.5	130.1	112.5
4-Feb	93.0	78.6	86.6	76.9	72.0	144.9	83.9	131.4	111.8
11-Feb	93.0	78.3	85.7	76.1	72.0	150.5	86.7	129.6	111.3
18-Feb	93.0	79.0	86.5	76.8	72.0	150.5	86.1	130.9	112.3
25-Feb	92.0	77.8	86.1	76.5	73.0	145.6	85.3	130.6	111.9
4-Mar	93.0	78.1	86.6	76.9	73.0	144.2	84.0	131.6	112.4
11-Mar	91.0	77.4	85.4	76.1	72.0	141.4	83.8	129.3	112.2
18-Mar	91.0	76.0	85.0	75.7	72.0	141.4	83.3	127.3	109.7
25-Mar	90.0	77.2	83.9	74.6	70.0	142.1	81.7	127.1	109.0
1-Apr	90.0	77.6	83.9	74.7	70.0	141.4	82.5	126.3	108.5
8-Apr	91.0	77.3	82.8	74.2	68.0	142.1	84.9	122.7	104.4
15-Apr	90.0	76.5	82.4	73.9	70.0	136.5	82.3	121.5	104.5
22-Apr	90.0	76.1	81.7	73.0	68.0	135.1	81.6	118.2	100.6
29-Apr	88.0	75.2	80.8	71.8	68.0	132.3	80.8	113.8	96.7
6-May	86.0	74.4	80.1	71.2	66.0	133.0	78.2	113.1	95.8
13-May	88.0	73.5	80.0	70.7	66.0	128.1	79.5	111.2	93.8
20-May	85.0	75.0	79.1	70.1	64.0	126.7	78.7	109.0	90.9
27-May	86.0	72.5	77.8	69.1	64.0	124.6	77.1	105.3	89.1
3-Jun	86.0	72.3	77.5	68.4	64.0	116.9	76.1	101.9	85.1
10-Jun	86.0	72.8	77.0	67.9	63.0	116.9	77.1	101.4	83.7
17-Jun	82.0	69.9	76.6	67.1	63.0	116.2	76.4	99.2	82.2
24-Jun	86.0	69.8	77.3	67.2	63.0	110.6	75.5	98.8	81.6
1-Jul	84.0	69.8	76.5	67.0	59.0	116.9	76.2	98.0	81.8
8-Jul	86.0	70.4	77.0	67.4	60.0	112.0	75.9	98.5	81.7
15-Jul	84.0	70.5	76.0	65.9	59.0	109.2	74.1	94.4	77.0
22-Jul	85.0	71.0	76.3	66.6	59.0	109.9	74.4	94.7	78.0
29-Jul	84.0	70.4	76.1	66.2	61.0	109.9	76.0	95.0	77.0
5-Aug	84.0	69.3	76.0	66.2	59.0	109.9	75.1	93.5	76.3
12-Aug	85.0	71.5	77.2	67.3	63.0	116.9	75.3	97.6	80.1
19-Aug	86.0	71.8	76.8	67.1	61.0	112.7	75.4	96.4	78.8
26-Aug	85.0	69.9	77.3	66.7	61.0	112.0	75.9	96.8	78.6
2-Sep	88.0	72.3	77.8	68.0	62.0	112.0	76.2	100.5	81.6
9-Sep	86.0	71.3	76.2	66.9	63.0	109.9	73.6	95.9	79.1
16-Sep	88.0	71.1	77.6	67.5	63.0	113.4	76.8	98.9	81.2
23-Sep	86.0	72.0	77.1	67.9	63.0	116.9	76.2	101.4	83.5
30-Sep	88.0	72.1	77.2	68.2	63.0	116.2	75.3	99.8	82.9
7-Oct	85.0	73.3	77.9	68.8	63.0	117.6	77.2	103.5	86.3
14-Oct	88.0	74.2	77.2	68.8	64.0	124.6	80.3	103.9	85.8
21-Oct	90.0	73.8	79.2	70.1	64.0	125.3	81.1	107.9	90.6
28-Oct	91.0	75.3	80.1	71.1	65.0	125.3	78.5	107.5	91.7
4-Nov	92.0	75.0	80.5	71.3	64.0	133.0	80.4	112.4	95.4
11-Nov	91.0	76.1	81.5	71.6	64.0	128.1	80.1	113.5	95.8
18-Nov	91.0	76.8	81.2	72.1	68.0	133.0	82.2	114.7	96.5
25-Nov	93.0	76.8	82.4	72.8	66.0	133.0	81.1	116.8	98.7
2-Dec	93.0	75.8	82.8	72.8	68.0	133.7	82.8	115.7	97.3
9-Dec	91.0	76.3	83.0	73.3	68.0	135.1	79.8	119.6	101.7
16-Dec	93.0	78.1	84.2	74.4	70.0	136.5	81.4	122.7	104.5
23-Dec	93.0	76.3	84.4	74.7	70.0	141.4	82.5	125.0	104.6
31-Dec	91.0	77.7	83.9	74.2	68.0	141.4	84.5	124.9	105.3



	Mean Cooling Degree Days (°F)	Mean Heating Degree Days (°F)
JAN	457	0
FEB	452	0
MAR	450	0
APR	367	0
MAY	281	0
JUN	197	3
JUL	192	7
AUG	208	4
SEP	211	3
OCT	268	1
NOV	341	0
DEC	417	0
ANN	3841	18

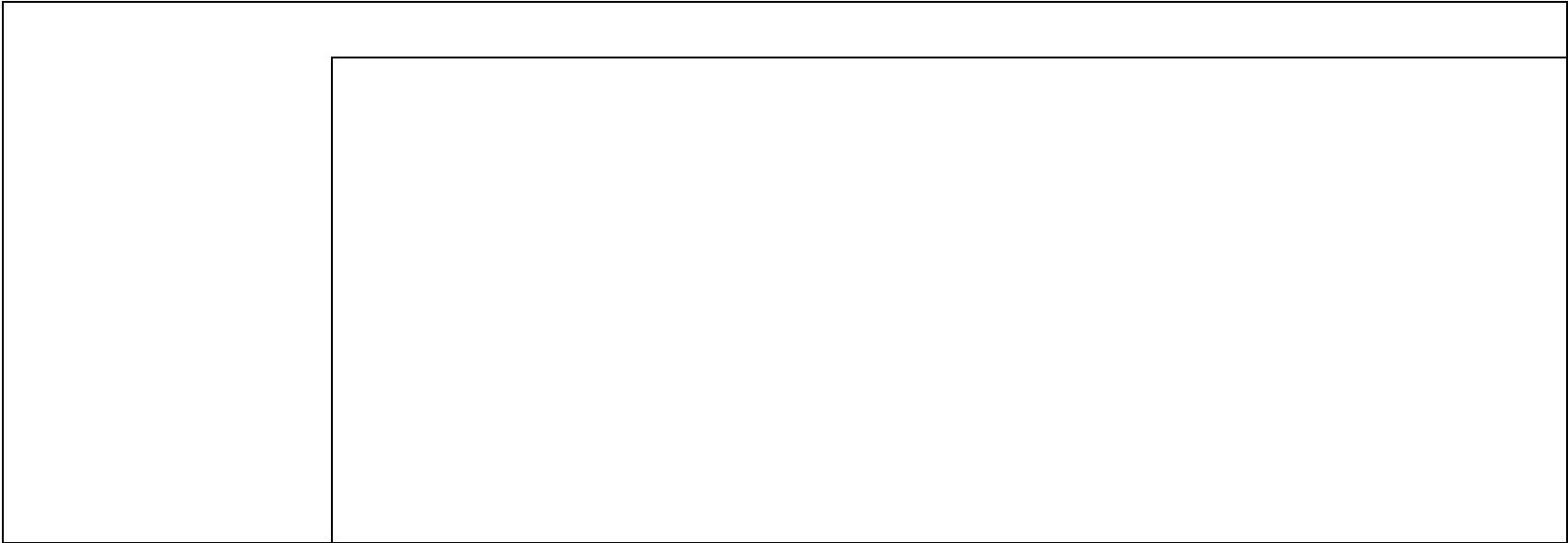
SANTOS DUMONT/RIO DE JANEIRO BZ WMO No. 837550



	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	4414	-1	9697	0
FEB	4615	-1	10042	0
MAR	3967	0	10754	0
APR	2375	-5	8439	0
MAY	1021	-78	5850	0
JUN	443	-323	3634	0
JUL	494	-582	2878	0
AUG	616	-431	3073	0
SEP	651	-345	3537	0
OCT	1076	-107	4925	0
NOV	2130	-26	6933	0
DEC	3333	-2	8918	0
ANN	25135	-1901	78680	0

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

No Solar Radiation
Data Available

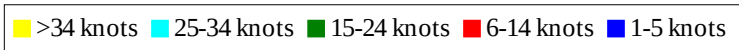
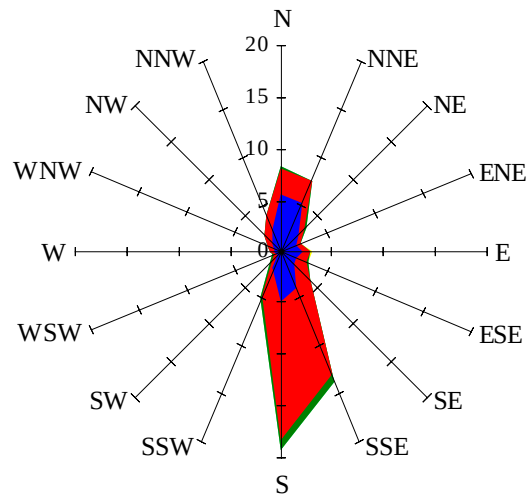


Average Annual Solar Heat and Illumination – Nearest Available Site

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

Wind Summary - December, January, and February

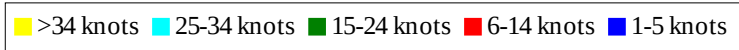
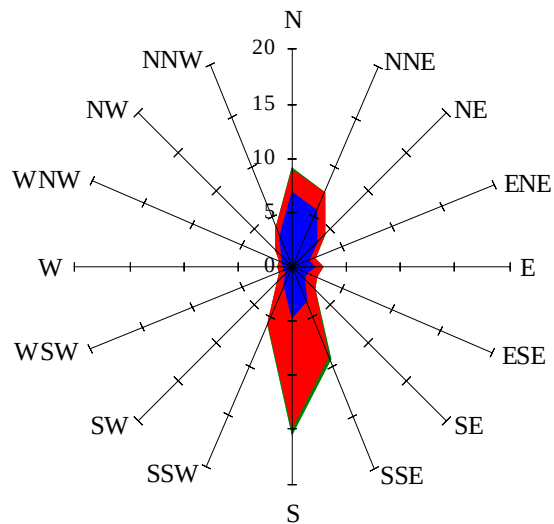
Labels of Percent Frequency on North Axis



Percent Calm = 22.16

Wind Summary - March, April, and May

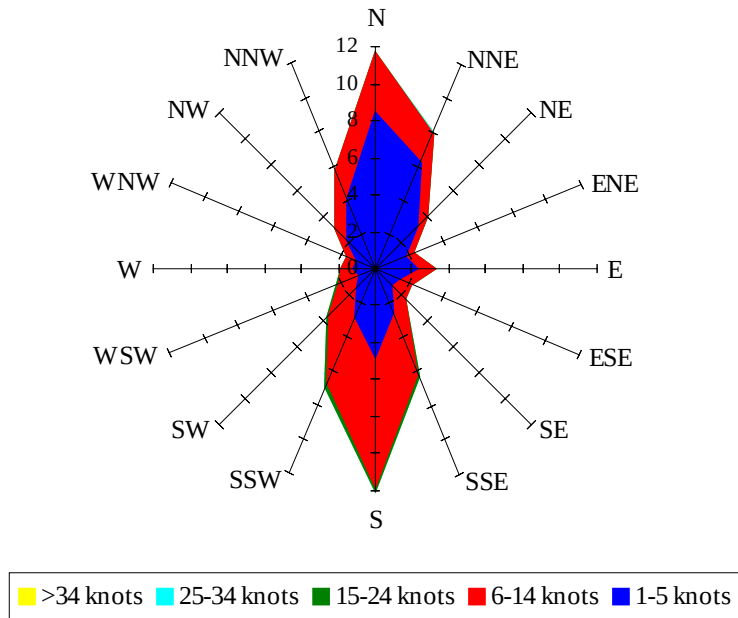
Labels of Percent Frequency on North Axis



Percent Calm = 27.78

Wind Summary - June, July, and August

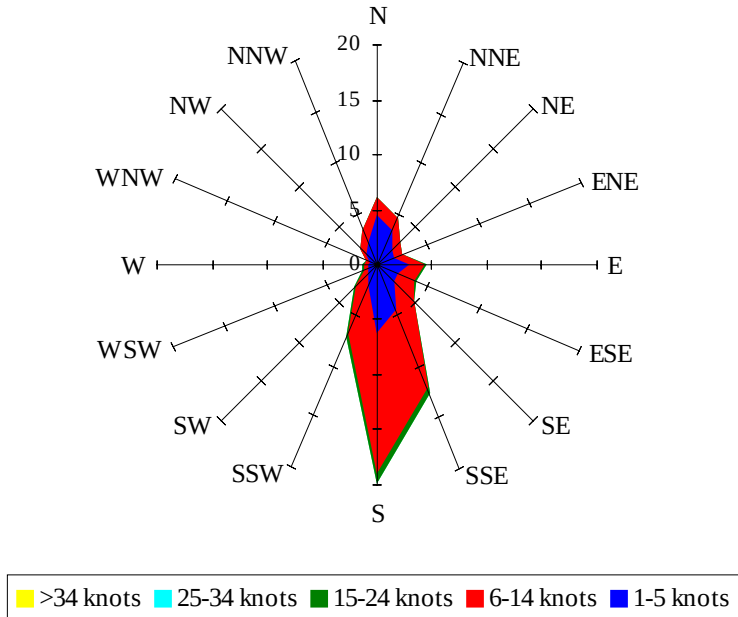
Labels of Percent Frequency on North Axis



Percent Calm = 23.08

Wind Summary - September, October, and November

Labels of Percent Frequency on North Axis



Percent Calm = 20.72