

ROOSEVELT ROADS NAS PU

Latitude = 18.25 N

WMO No. 785350

Longitude = 65.63 W

Elevation = 39 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	91	78	124	11.0	E
0.4% Occurrence	90	78	124	11.0	E
1.0% Occurrence	89	77	121	10.8	E
2.0% Occurrence	88	77	119	10.6	E
Mean Daily Range	10	-	-	-	-
97.5% Occurrence	72	68	94	3.8	E
99.0% Occurrence	70	65	87	2.0	NNW
99.6% Occurrence	68	64	82	1.5	NNW
Median of Extreme Lows	66	62	77	1.3	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	83	88	159	9.8	E
0.4% Occurrence	80	87	139	9.5	E
1.0% Occurrence	79	86	135	9.0	E
2.0% Occurrence	79	86	135	9.0	E
	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	169	86	1.12	9.8	ESE
0.4% Occurrence	149	85	0.99	8.5	E
1.0% Occurrence	141	84	0.94	7.9	E
2.0% Occurrence	140	84	0.94	8.0	E
Air Conditioning/ Humid Area Criteria	# of Hours	T ≥ 93°F	T ≥ 80°F	T _{wb} ≥ 73°F	T _{wb} ≥ 67°F
		0	4548	4078	7996

Other Site Data

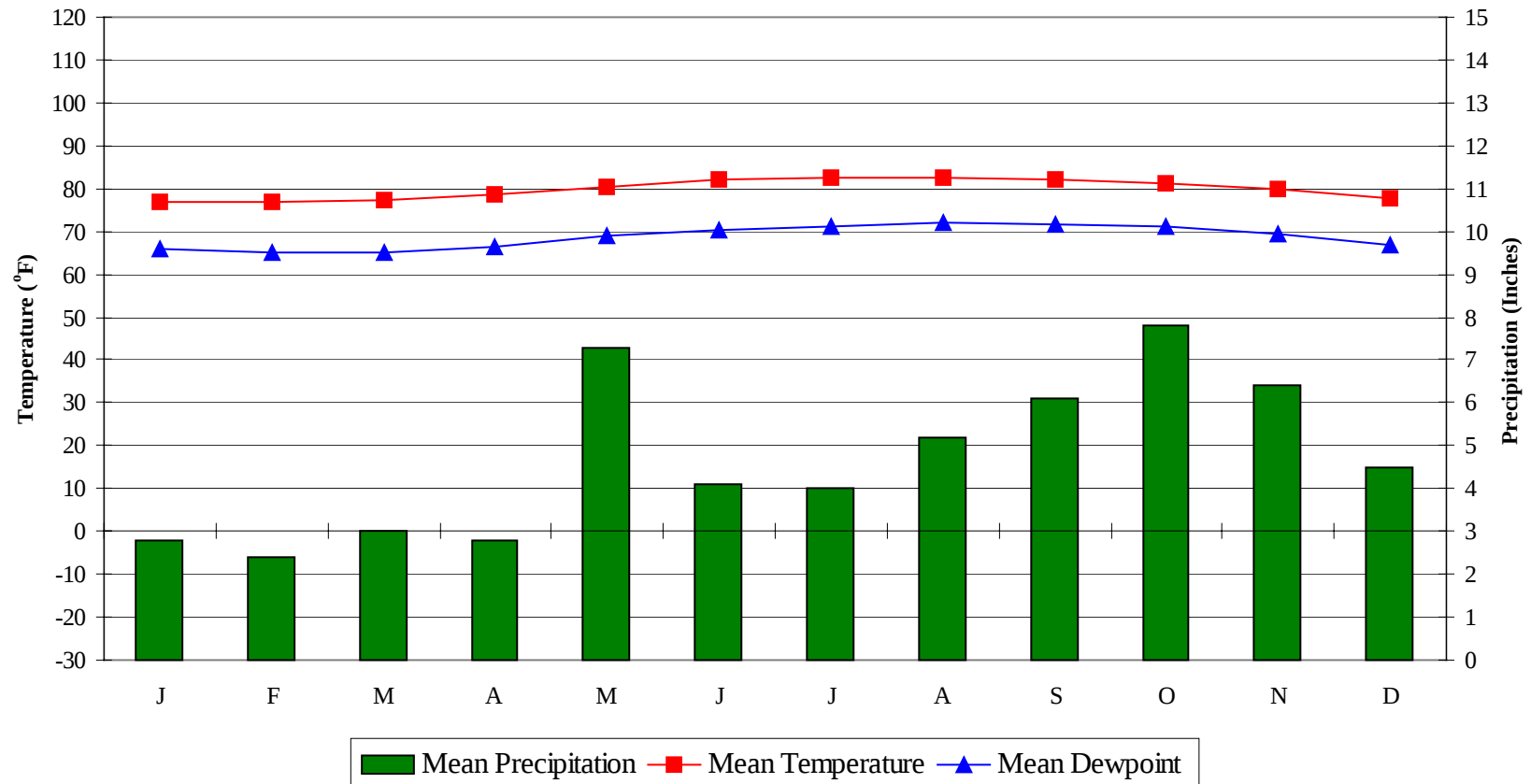
Weather Region	Rain Rate 100 Year Recurrence (in./hr)	Basic Wind Speed 3 sec gust @ 33 ft 50 Year Recurrence (mph)	Ventilation Cooling Load Index (Ton-hr/cfm/yr) Base 75°F-RH 60% Latent + Sensible
10	N/A	N/A	11.3 + 4.1
Ground Water Temperature (°F) 50 Foot Depth *	Frost Depth 50 Year Recurrence (in.)	Ground Snow Load 50 Year Recurrence (lb/ft ²)	Average Annual Freeze-Thaw Cycles (#)
82.4	N/A	N/A	0

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

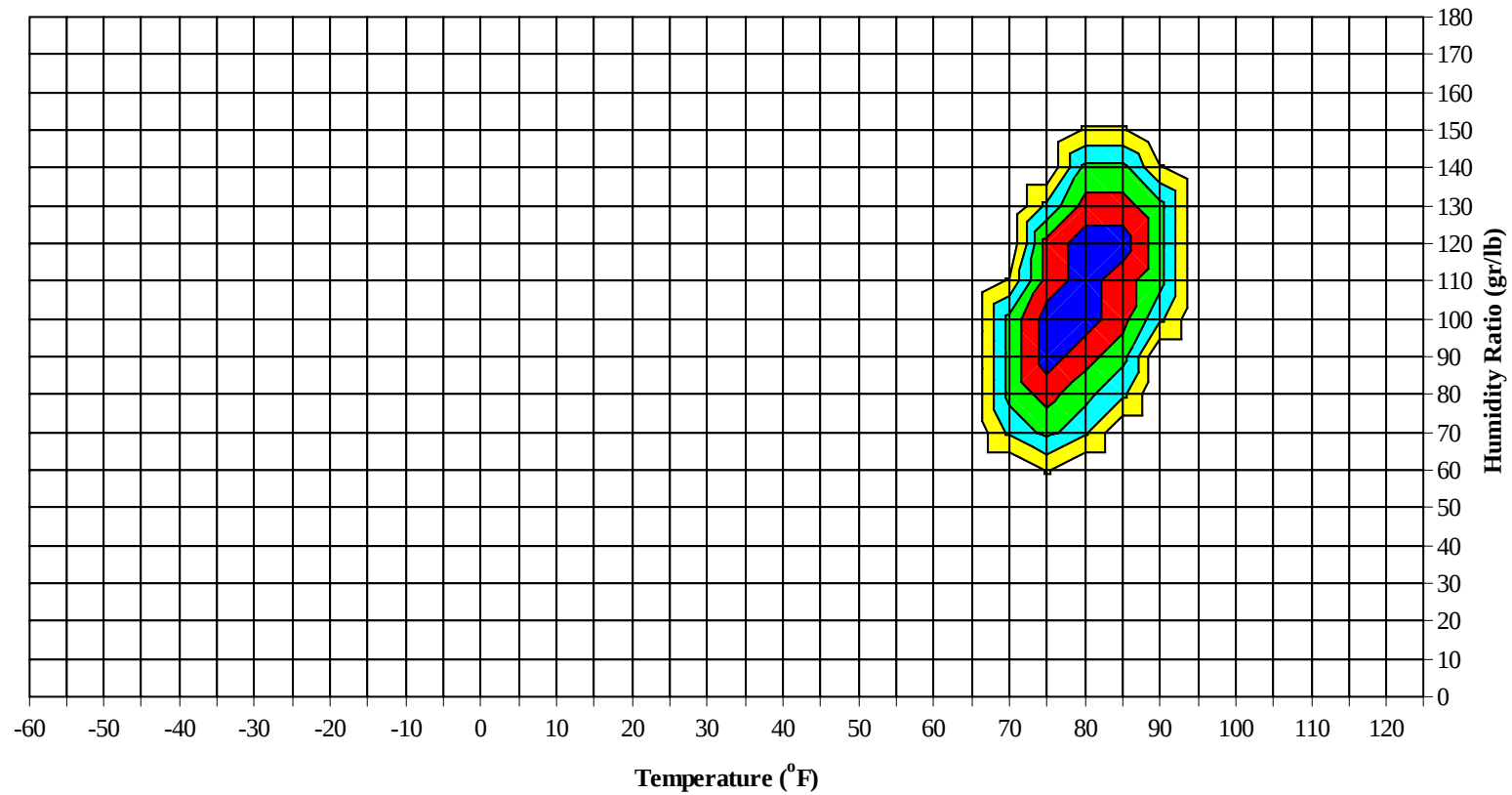
ROOSEVELT ROADS NAS PU

WMO No. 785350

Average Annual Climate

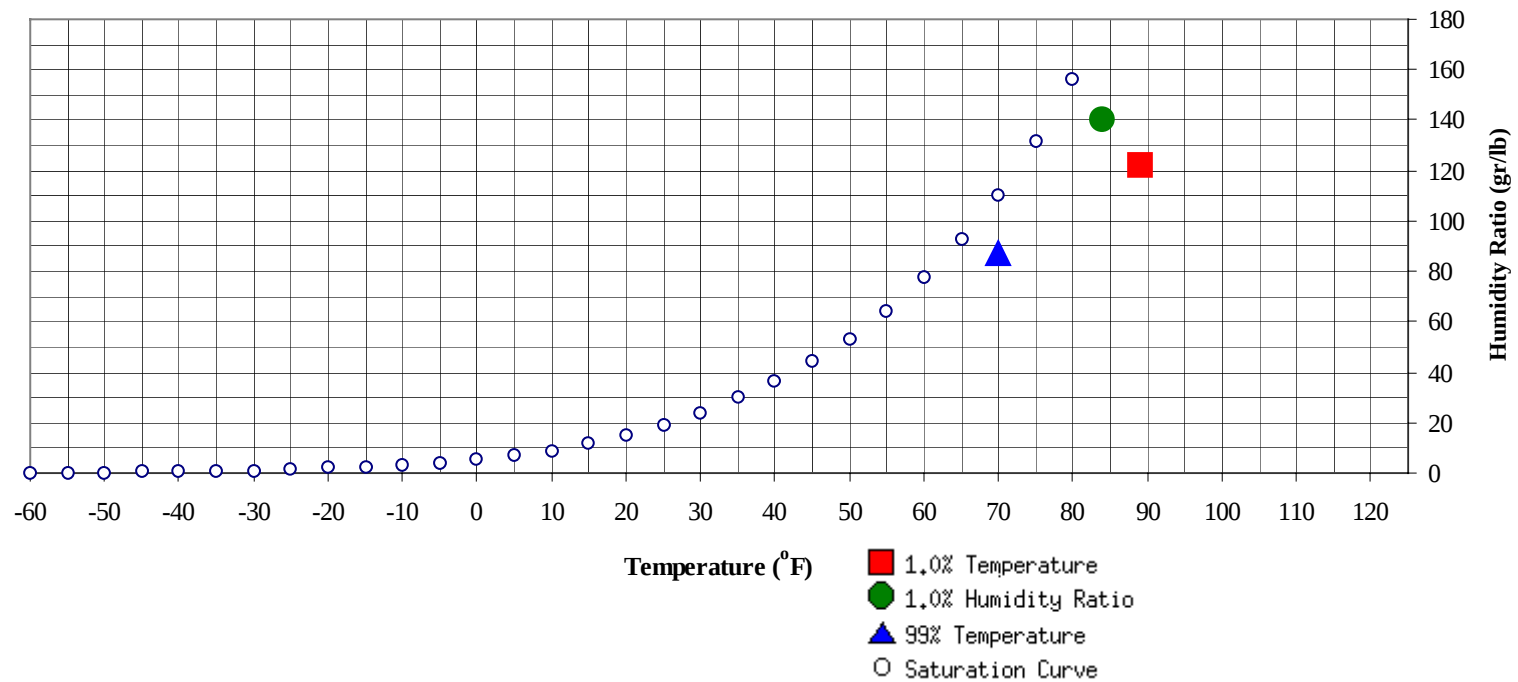


Long Term Psychrometric Summary



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

Psychrometric Summary of Peak Design Values



99% Dry Bulb	(°F)	MCHR (gr/lb)	Enthalpy (btu/lb)	1.0% Humidity Ratio	(gr/lb)	MCDB (°F)	MCWB (°F)	MC Dewpt (°F)	Enthalpy (btu/lb)
	70	87.2	30.4		140.7	84	78.8	77	42.2

1.0% Dry Bulb	(°F)	MCHR (gr/lb)	MCWB (°F)	Enthalpy (btu/lb)
	89	122.5	77.4	40.6

ROOSEVELT ROADS NAS PU

WMO No. 785350

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			0	0		0			0						
85 / 89	0	8	0	8	73.3	0	7	0	7	71.8	0	14	0	14	72.8
80 / 84	1	170	17	188	71.6	1	158	18	177	70.9	5	182	26	213	71.1
75 / 79	143	65	178	386	69.5	121	55	158	334	68.9	143	46	172	362	68.9
70 / 74	87	5	50	142	67.3	87	4	45	136	66.9	90	5	49	144	66.7
65 / 69	16	0	3	19	63.7	14	0	3	17	63.5	9	0	1	10	62.7
60 / 64	1		0	1	59.5	1	0	0	1	61.2	1		0	1	56.9
55 / 59						0			0	53.0	0		0	0	53.0

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.

ROOSEVELT ROADS NAS PU

WMO No. 785350

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		0		0	75.3		3		3	77.2		8		8	77.9
85 / 89	0	47	2	49	73.5	2	91	5	98	74.9	5	145	13	163	75.6
80 / 84	21	167	51	238	71.7	60	135	109	303	73.2	129	78	177	384	73.8
75 / 79	167	24	166	357	69.6	161	16	123	299	71.2	103	7	48	158	72.3
70 / 74	48	2	20	70	67.5	24	3	12	39	69.1	4	1	2	7	70.0
65 / 69	5	0	1	6	64.0	1	0	0	1	64.9	0	0	0	0	63.3
60 / 64	0		0	0	62.6										
55 / 59															

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ROOSEVELT ROADS NAS PU

WMO No. 785350

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															
90 / 94		13	0	13	78.0		22	0	22	78.4	0	19	0	19	78.0
85 / 89	7	166	18	191	76.1	8	168	18	194	76.7	6	151	14	171	76.6
80 / 84	162	59	195	416	74.2	158	50	190	398	74.9	125	59	169	353	74.6
75 / 79	78	8	34	120	72.9	79	6	37	123	73.3	102	10	54	166	72.9
70 / 74	2	1	1	4	70.0	3	1	2	6	69.6	8	1	3	12	70.0
65 / 69	0	0	0	0	67.0	0		0	0	68.0	0		0	0	68.0
60 / 64															
55 / 59															

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.

ROOSEVELT ROADS NAS PU

WMO No. 785350

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	0			0	79.0										
90 / 94	0	12	0	12	77.3	0	1	0	1	76.7					
85 / 89	6	145	7	157	76.2	1	80	2	83	75.5	0	23	0	23	74.5
80 / 84	81	79	146	306	74.4	50	133	90	273	73.5	10	171	32	213	72.3
75 / 79	142	10	89	242	72.5	150	24	131	305	71.8	158	49	173	380	70.2
70 / 74	19	2	6	27	69.8	37	2	17	56	69.3	72	5	41	118	68.0
65 / 69						2		0	2	65.1	8	0	2	10	63.8
60 / 64											0			0	60.2
55 / 59															

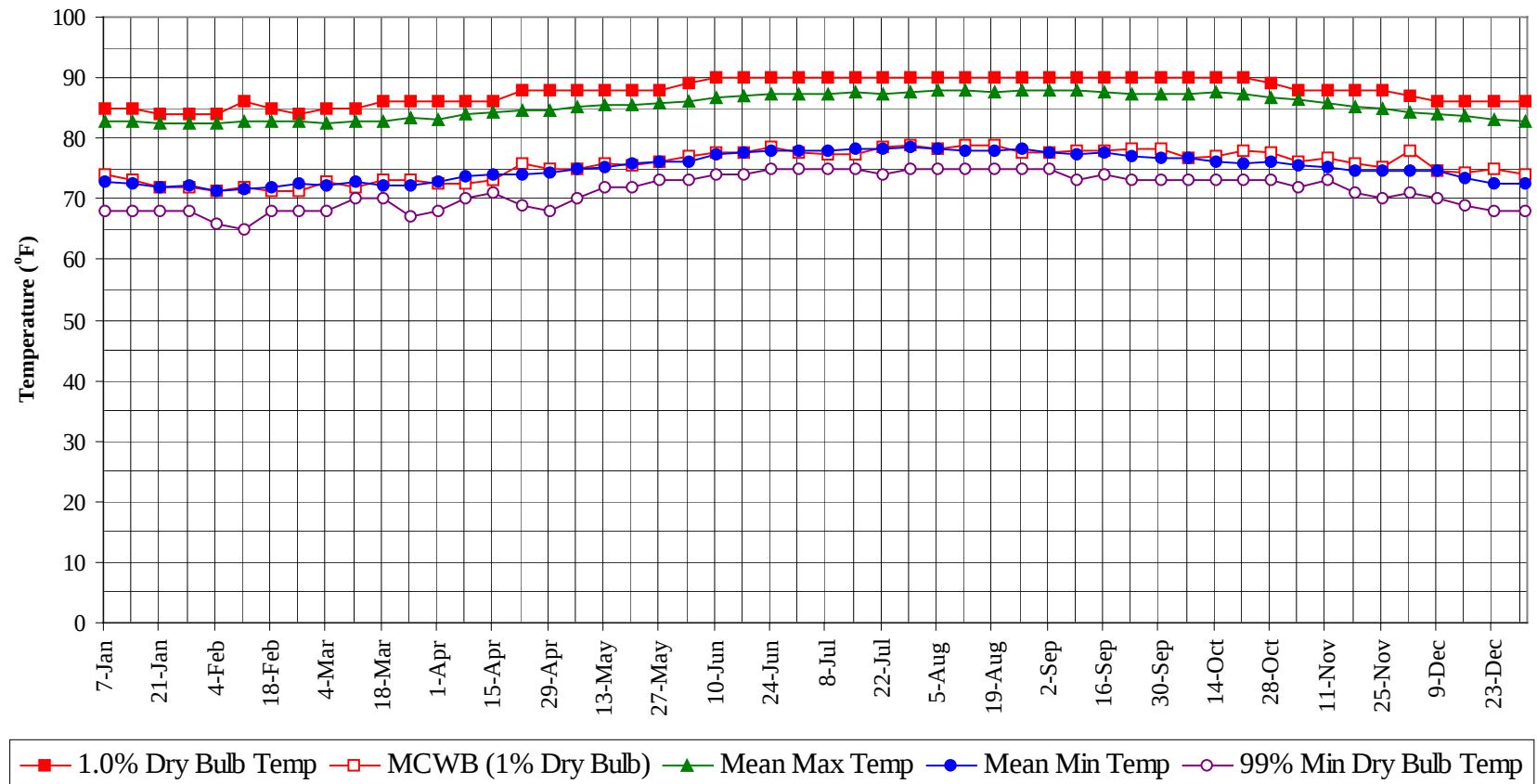
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WMO No. 785350

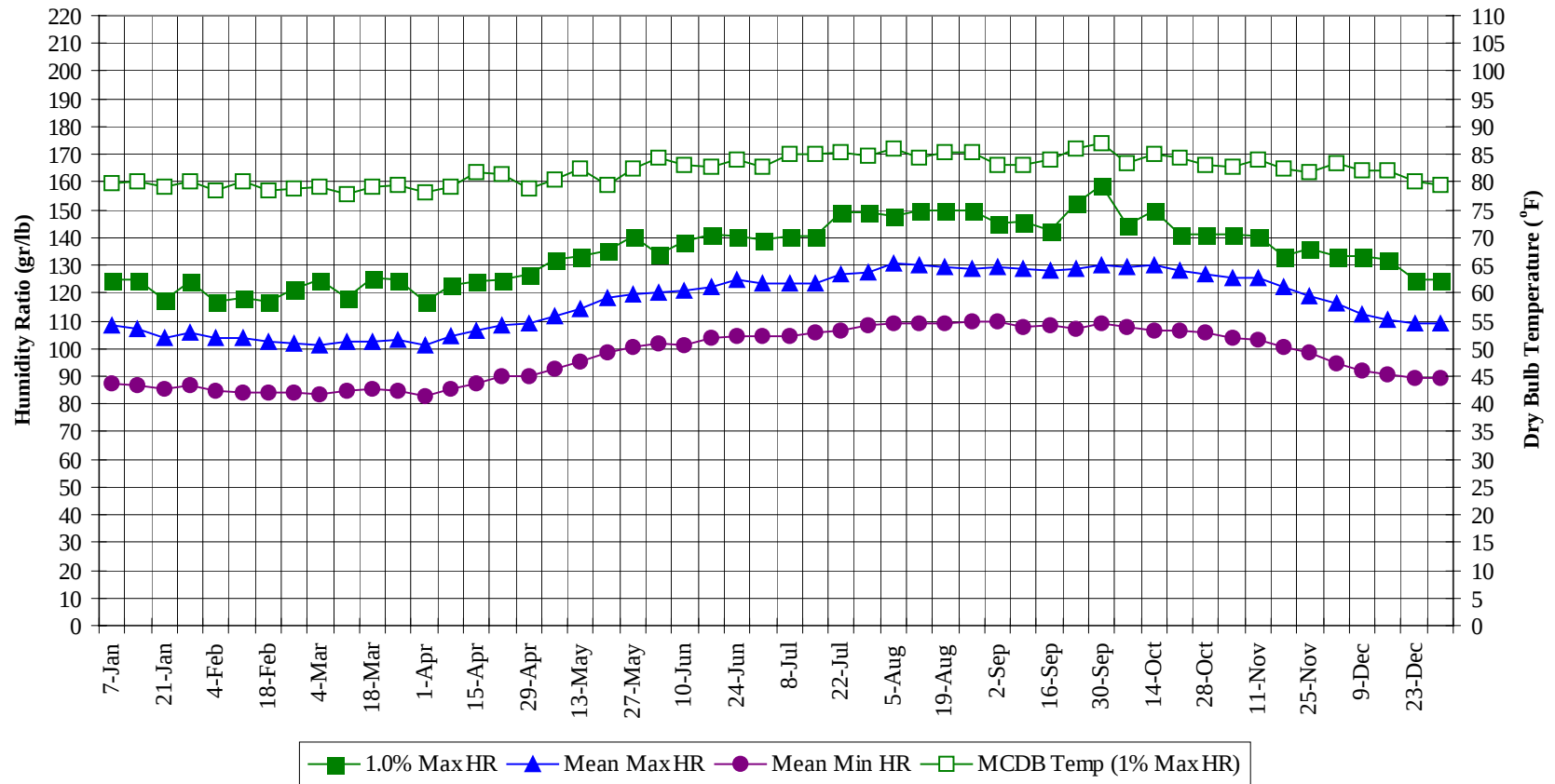
Period of Record = 1973 to 1996

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Annual Summary of Temperatures



Long Term Humidity and Dry Bulb Temperature Summary

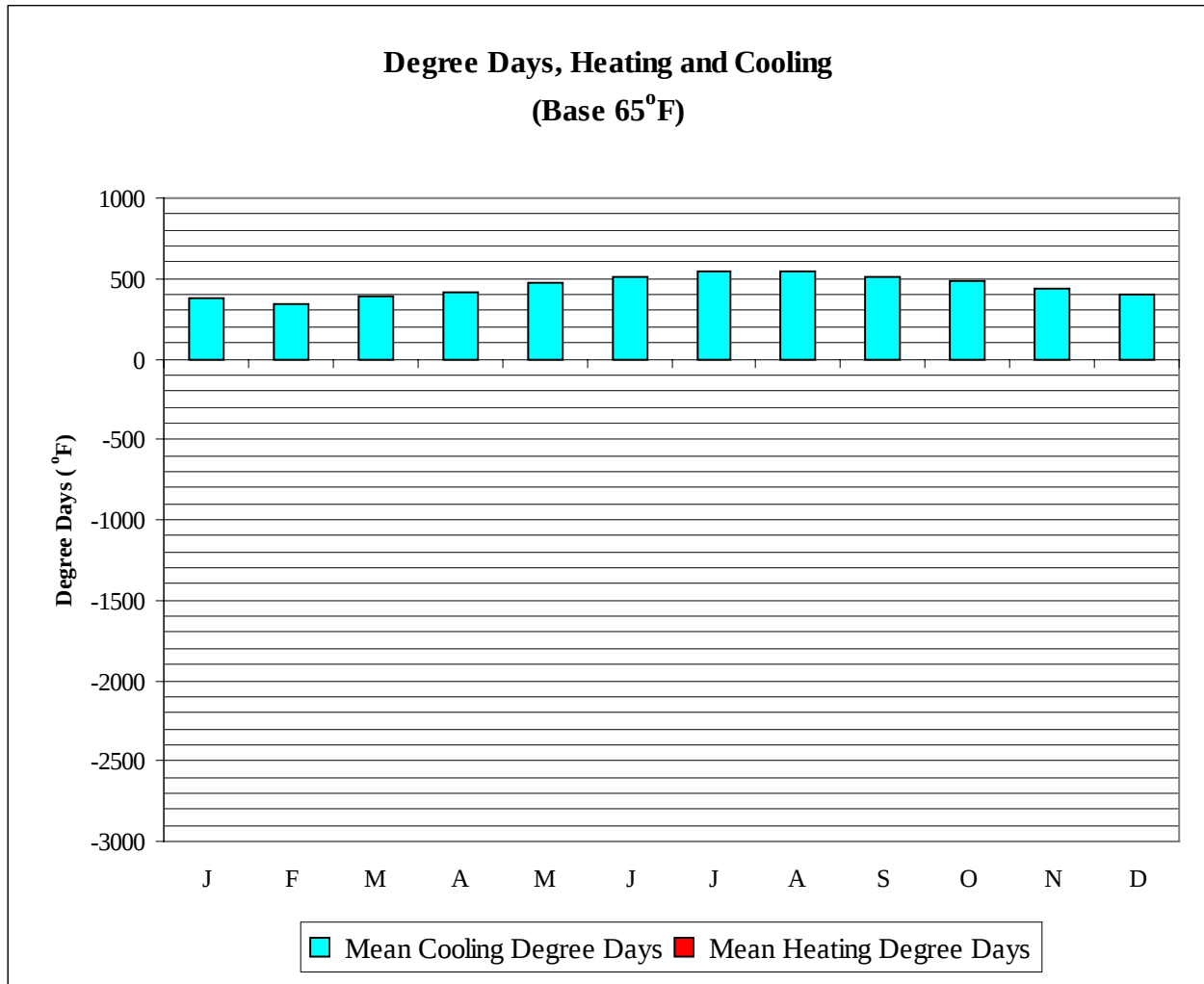


ROOSEVELT ROADS NAS PU

WMO No. 785350

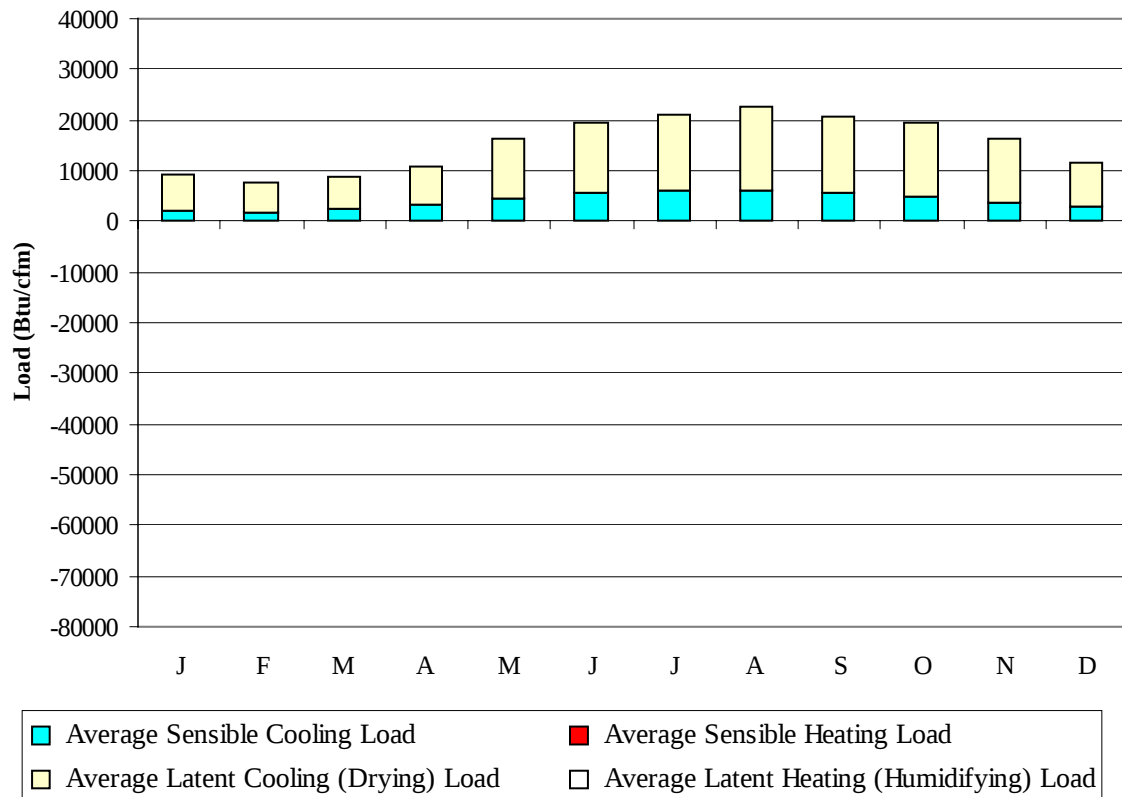
Long Term Dry Bulb Temperature and Humidity Summary

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	85.0	74.1	82.7	72.8	68.0	124.6	79.6	108.5	87.7
14-Jan	85.0	73.2	82.7	72.6	68.0	124.6	80.2	106.9	87.0
21-Jan	84.0	71.8	82.5	71.8	68.0	117.6	79.0	103.9	85.5
28-Jan	84.0	71.9	82.4	72.1	68.0	123.9	80.1	105.5	86.6
4-Feb	84.0	71.5	82.5	71.3	66.0	116.9	78.5	103.9	84.5
11-Feb	86.0	71.8	82.6	71.7	65.0	118.3	80.1	104.1	84.2
18-Feb	85.0	71.4	82.7	72.0	68.0	116.9	78.5	102.4	83.8
25-Feb	84.0	71.4	82.8	72.6	68.0	121.8	78.9	102.0	84.3
4-Mar	85.0	72.9	82.6	72.2	68.0	124.6	79.1	100.9	83.1
11-Mar	85.0	72.0	82.8	72.8	70.0	118.3	77.9	102.6	84.7
18-Mar	86.0	73.1	82.6	72.3	70.0	125.3	79.1	102.2	85.1
25-Mar	86.0	73.0	83.5	72.1	67.0	124.6	79.6	103.4	84.8
1-Apr	86.0	72.5	83.2	72.7	68.0	116.9	78.3	101.5	82.9
8-Apr	86.0	72.5	84.0	73.6	70.0	122.5	79.2	104.3	85.7
15-Apr	86.0	73.0	84.1	73.9	71.0	123.9	81.9	106.1	87.6
22-Apr	88.0	75.7	84.7	73.9	69.0	124.6	81.3	108.6	89.7
29-Apr	88.0	74.9	84.7	74.3	68.0	126.7	78.7	109.2	89.9
6-May	88.0	75.0	85.2	74.9	70.0	132.3	80.5	111.9	92.8
13-May	88.0	75.7	85.4	75.1	72.0	133.0	82.3	114.5	95.5
20-May	88.0	75.6	85.4	75.7	72.0	135.1	79.4	118.3	98.8
27-May	88.0	76.2	85.9	76.2	73.0	140.7	82.3	119.9	100.8
3-Jun	89.0	77.1	86.2	76.3	73.0	133.7	84.4	120.2	101.7
10-Jun	90.0	77.6	86.8	77.3	74.0	138.6	83.0	120.6	101.5
17-Jun	90.0	77.5	86.9	77.7	74.0	141.4	82.8	122.0	103.6
24-Jun	90.0	78.5	87.3	78.0	75.0	140.7	84.0	124.5	104.7
1-Jul	90.0	77.6	87.4	77.9	75.0	139.3	82.8	123.3	104.5
8-Jul	90.0	77.4	87.3	78.1	75.0	140.7	84.9	123.6	104.6
15-Jul	90.0	77.4	87.6	78.3	75.0	140.7	85.1	123.7	105.8
22-Jul	90.0	78.5	87.3	78.1	74.0	149.1	85.4	126.9	106.4
29-Jul	90.0	78.7	87.6	78.5	75.0	149.1	84.7	127.2	108.3
5-Aug	90.0	78.3	87.9	78.2	75.0	147.7	86.0	131.0	109.0
12-Aug	90.0	78.8	87.9	78.0	75.0	149.8	84.5	130.1	109.3
19-Aug	90.0	79.0	87.7	78.0	75.0	149.8	85.2	129.4	108.8
26-Aug	90.0	77.7	87.9	78.2	75.0	149.8	85.4	128.5	109.6
2-Sep	90.0	77.7	88.0	77.7	75.0	144.9	83.0	129.3	109.4
9-Sep	90.0	77.9	87.9	77.4	73.0	145.6	83.0	128.7	107.7
16-Sep	90.0	77.9	87.7	77.6	74.0	142.8	84.1	128.2	108.2
23-Sep	90.0	78.1	87.3	77.1	73.0	152.6	86.1	128.4	107.3
30-Sep	90.0	78.4	87.3	76.9	73.0	158.9	86.9	130.3	108.9
7-Oct	90.0	76.8	87.4	76.7	73.0	144.2	83.3	129.3	107.8
14-Oct	90.0	77.0	87.5	76.2	73.0	149.8	85.1	129.8	106.4
21-Oct	90.0	78.1	87.3	75.8	73.0	141.4	84.3	127.8	106.1
28-Oct	89.0	77.5	86.7	76.0	73.0	141.4	83.1	126.9	105.6
4-Nov	88.0	76.3	86.3	75.5	72.0	141.4	82.8	125.7	103.5
11-Nov	88.0	76.7	85.9	75.4	73.0	140.7	84.2	125.4	103.2
18-Nov	88.0	75.9	85.2	74.7	71.0	133.0	82.5	122.0	100.4
25-Nov	88.0	75.3	84.9	74.8	70.0	135.8	81.7	118.9	98.2
2-Dec	87.0	77.9	84.2	74.7	71.0	133.0	83.5	116.3	94.8
9-Dec	86.0	74.5	83.9	74.5	70.0	133.0	82.1	112.2	92.0
16-Dec	86.0	74.3	83.6	73.5	69.0	132.3	82.1	110.5	90.7
23-Dec	86.0	74.9	83.0	72.5	68.0	124.6	80.0	108.9	89.1
31-Dec	86.0	74.2	82.7	72.5	68.0	124.6	79.5	108.8	89.1



	Mean Cooling Degree Days (°F)	Mean Heating Degree Days (°F)
JAN	372	0
FEB	336	0
MAR	385	0
APR	414	0
MAY	472	0
JUN	510	0
JUL	545	0
AUG	546	0
SEP	512	0
OCT	482	0
NOV	443	0
DEC	401	0
ANN	5417	0

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	2129	-11	7211	0
FEB	1902	-19	5721	0
MAR	2371	-10	6567	0
APR	3172	-6	7739	0
MAY	4317	-1	11830	0
JUN	5481	0	13833	0
JUL	6106	0	14895	0
AUG	6156	0	16545	0
SEP	5531	0	15177	0
OCT	4851	0	14577	0
NOV	3853	0	12572	0
DEC	2748	-6	8954	0
ANN	48617	-53	135621	0

Average Annual Solar Radiation – Nearest Available Site

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

City: SAN JUAN
 State: PR
 WBAN No: 11641
 Lat(N): 18.43
 Long(W): 66
 Elev(ft): 62

Stn Type: Primary
 SHADING GEOMETRY IN DIMENSIONLESS UNITS
 Window: 1
 Overhang: 1.078
 Vert Gap: 0.2

AVERAGE INCIDENT SOLAR RADIATION (Btu/sq.ft./day), Percentage Uncertainty = 9		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
HORIZ	Global	1360	1550	1810	1930	1830	1920	1930	1890	1750	1560	1370	1250	1680
	Std Dev	51	50	77	95	182	127	81	91	91	89	88	65	43
	Minimum	1260	1480	1640	1730	1400	1670	1750	1660	1500	1370	1160	1080	1560
	Maximum	1460	1670	1950	2070	2080	2150	2060	2070	1930	1710	1550	1430	1750
	Diffuse	570	640	710	770	850	840	820	800	770	710	610	570	720
Clear Day	Global	1690	1940	2240	2440	2500	2500	2490	2440	2280	2020	1740	1610	2160
NORTH	Global	360	400	430	490	640	810	740	540	450	410	370	350	500
	Diffuse	360	400	430	470	520	560	540	480	440	410	370	350	440
Clear Day	Global	320	350	380	450	730	970	870	520	390	360	320	310	500
EAST	Global	770	860	980	1040	990	1030	1010	1010	990	900	780	710	920
	Diffuse	450	500	560	590	600	610	610	600	570	530	470	430	540
Clear Day	Global	990	1110	1230	1310	1320	1300	1290	1290	1250	1150	1010	950	1180
SOUTH	Global	1350	1230	990	640	480	470	470	530	780	1060	1240	1300	880
	Diffuse	580	580	560	500	470	470	470	480	530	580	580	570	530
Clear Day	Global	1850	1630	1200	650	410	410	410	500	960	1480	1790	1890	1100
WEST	Global	780	880	980	1000	920	950	970	960	880	820	750	710	880
	Diffuse	450	500	560	590	600	600	600	590	560	520	470	430	540
Clear Day	Global	990	1110	1230	1310	1320	1300	1290	1290	1250	1150	1010	950	1180

Average Annual Solar Heat and Illumination – Nearest Available Site

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

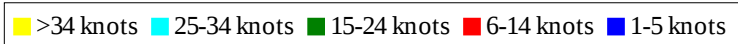
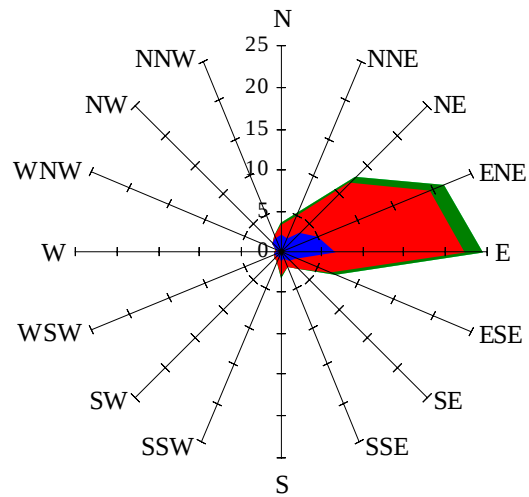
AVERAGE TRANSMITTED SOLAR RADIATION (Btu/sq.ft./day) FOR DOUBLE GLAZING, Percentage Uncertainty = 9		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
HORIZ	Unshaded	970	1120	1320	1410	1330	1400	1410	1380	1280	1130	980	890	1220
NORTH	Unshaded	250	270	300	330	390	470	430	350	310	290	260	240	320
	Shaded	190	210	240	250	270	300	290	260	240	220	190	180	240
EAST	Unshaded	540	610	690	740	700	730	720	720	710	640	550	490	650
	Shaded	330	370	420	440	410	430	420	420	410	380	330	300	390
SOUTH	Unshaded	960	830	590	380	330	330	330	340	460	690	870	930	590
	Shaded	320	280	280	270	250	260	250	260	270	270	290	330	280
WEST	Unshaded	540	620	700	710	650	670	690	680	620	580	530	500	620
	Shaded	330	370	410	420	380	390	400	400	370	350	320	300	370

AVERAGE INCIDENT ILLUMINANCE (klux-hr) FOR MOSTLY CLEAR AND MOSTLY CLOUDY CONDITIONS, Percentage Uncertainty = 9		March					June				
		9am	11am	1pm	3pm	5pm	9am	11am	1pm	3pm	5pm
HORIZ.	M.Clear	40	84	101	86	43	54	92	106	89	49
	M.Cloudy	30	67	80	68	31	42	72	84	69	35
NORTH	M.Clear	12	18	18	18	12	31	30	26	30	30
	M.Cloudy	11	19	20	19	12	24	27	25	27	21
EAST	M.Clear	70	67	19	18	12	74	62	16	18	14
	M.Cloudy	40	52	21	19	12	49	49	18	19	13
SOUTH	M.Clear	24	47	56	48	26	14	18	16	18	14
	M.Cloudy	17	38	45	39	18	14	19	18	19	13
WEST	M.Clear	12	18	18	65	72	14	18	19	65	71
	M.Cloudy	11	19	20	50	39	14	19	20	49	41
M.Clear	(% hrs)	49	43	48	49	51	37	30	29	28	27

		Sept					Dec				
		9am	11am	1pm	3pm	5pm	9am	11am	1pm	3pm	5pm
HORIZ.	M.Clear	49	90	103	84	40	29	66	78	61	21
	M.Cloudy	38	71	80	63	27	21	51	62	47	15
NORTH	M.Clear	14	18	18	18	12	10	16	17	15	8
	M.Cloudy	14	19	20	19	11	9	17	19	16	7
EAST	M.Clear	75	64	18	18	12	52	52	17	15	8
	M.Cloudy	48	50	20	19	11	28	38	19	16	7
SOUTH	M.Clear	22	41	46	38	18	38	70	79	66	31
	M.Cloudy	19	35	39	31	13	22	49	58	45	16
WEST	M.Clear	14	18	23	70	69	10	16	21	56	45
	M.Cloudy	14	19	23	49	34	9	17	21	39	22
M.Clear	(% hrs)	42	35	31	26	21	40	35	39	40	44

Wind Summary - December, January, and February

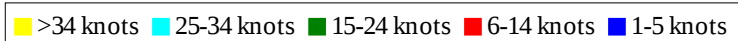
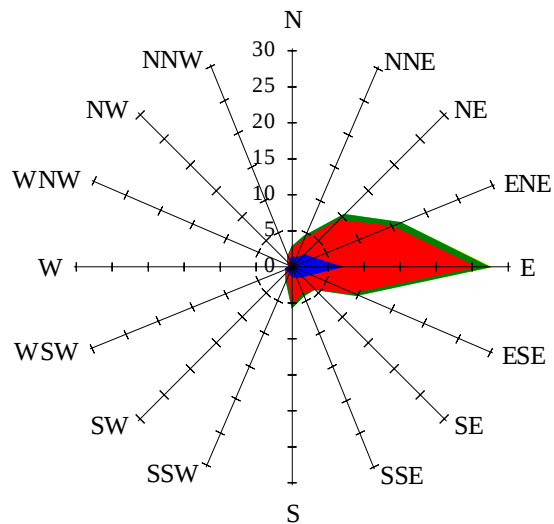
Labels of Percent Frequency on North Axis



Percent Calm = 10.84

Wind Summary - March, April, and May

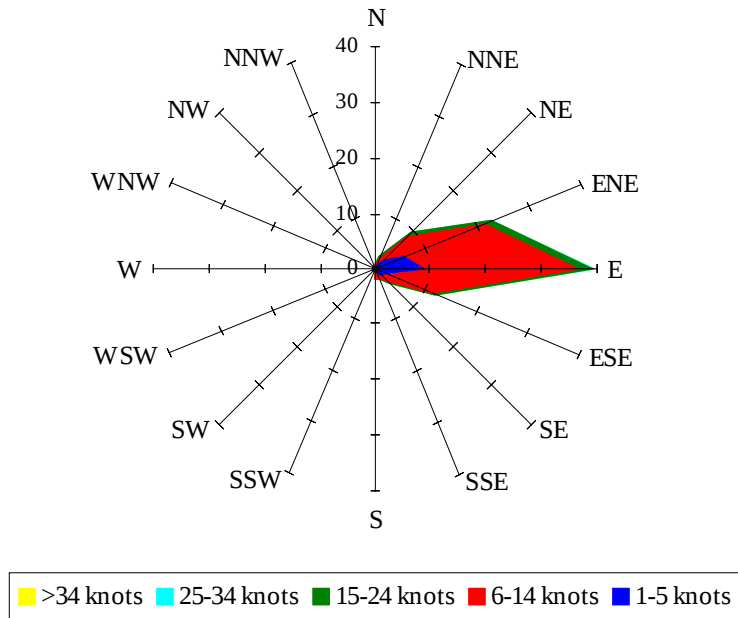
Labels of Percent Frequency on North Axis



Percent Calm = 8.74

Wind Summary - June, July, and August

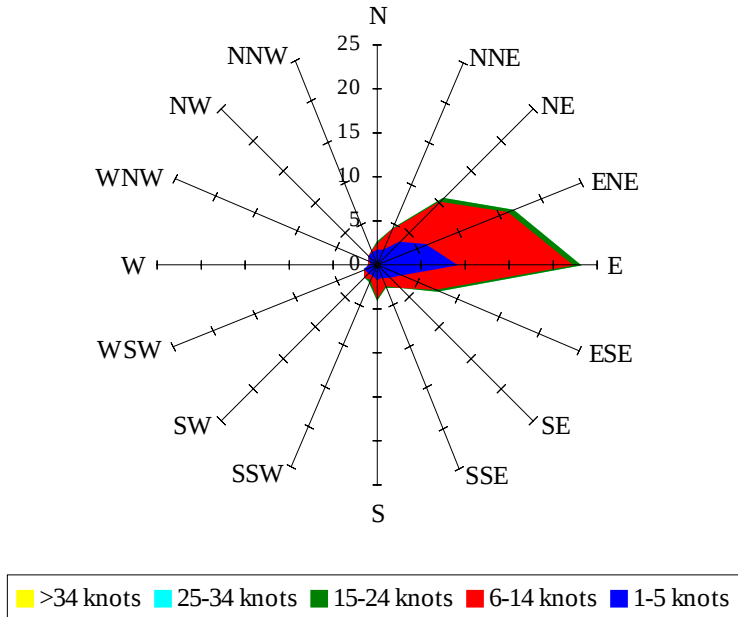
Labels of Percent Frequency on North Axis



Percent Calm = 4.79

Wind Summary - September, October, and November

Labels of Percent Frequency on North Axis



Percent Calm = 15.37