KAHULUI, HI

Latitude = 20.90 N	Station ID = ICAO_PHOG
Longitude =156.43 W	Elevation = 54 Feet
Period of Record = 1988 To 2017	Average Pressure = 29.94 inches Hg

Design Criteria Data

	Mean Coincident (Average) Values				
Dry Bulb Temperature (T)	**Design Value (°F)**	**Wet Bulb Temperature (°F)**	**Humidity Ratio (gr/lb)**	**Wind Speed (mph)**	**Prevailing Direction (NSEW)**
Median of Extreme Highs	91	75	107	16.7	NE
0.4% Occurrence	90	75	107	17	NE
1.0% Occurrence	88	74	104	18.4	NE
2.0% Occurrence	88	74	104	18.4	NE
Mean Daily Range	15	-	-	-	SE
97.5% Occurrence	63	61	76	4.8	SE
99.0% Occurrence	61	59	70	4.7	SSE
99.6% Occurrence	59	57	65	4.7	SSE
Median of Extreme Lows	55	53	57	4.3	SE

Wet Bulb Temperature (T_{wb})	**Design Value (°F)**	**Dry Bulb Temperature (°F)**	**Humidity Ratio (gr/lb)**	**Wind Speed (mph)**	**Prevailing Direction (NSEW)**
Median of Extreme Highs	78	86	127	15.6	NE
0.4% Occurrence	77	85	122	15.7	NE
1.0% Occurrence	76	84	118	15.7	NE
2.0% Occurrence	76	84	118	15.7	NE

Humidity Ratio (HR)	**Design Value (gr/lb)**	**Dry Bulb Temperature (°F)**	**Vapor Pressure (in. Hg)**	**Wind Speed (mph)**	**Prevailing Direction (NSEW)**
Median of Extreme Highs	141	82	0.94	13.5	NE
0.4% Occurrence	131	81	0.87	13.3	NE
1.0% Occurrence	125	80	0.83	12.8	NE
2.0% Occurrence	123	80	0.82	12.9	NE

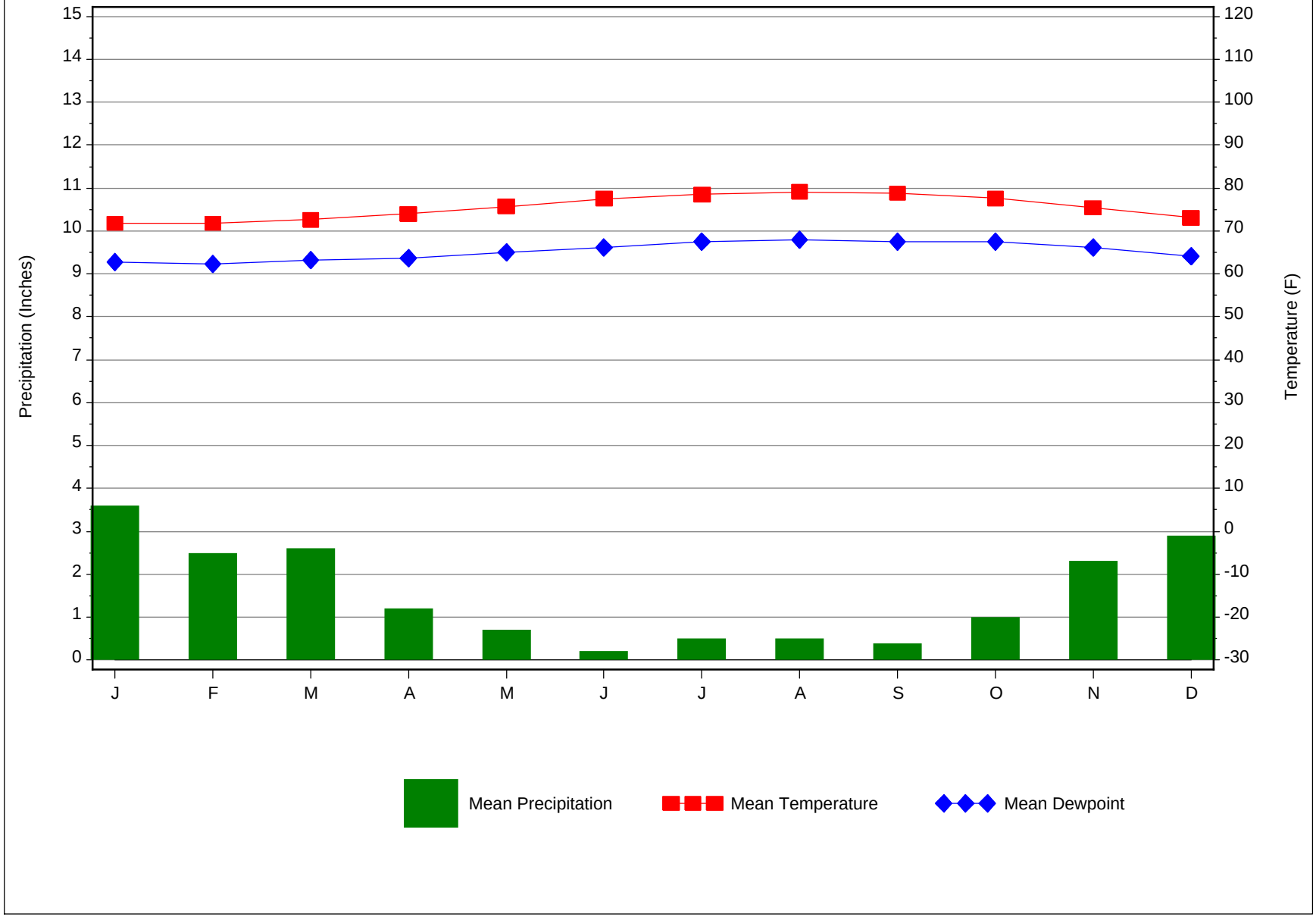
Air Conditioning/ Humid Area Criteria	**Threshold**	**T ≥ 93°F**	**T ≥ 80°F**	**Twb ≥ 73°F**	**Twb ≥ 67°F**
	# of Hours	4	2371	1350	6261

Other Site Data

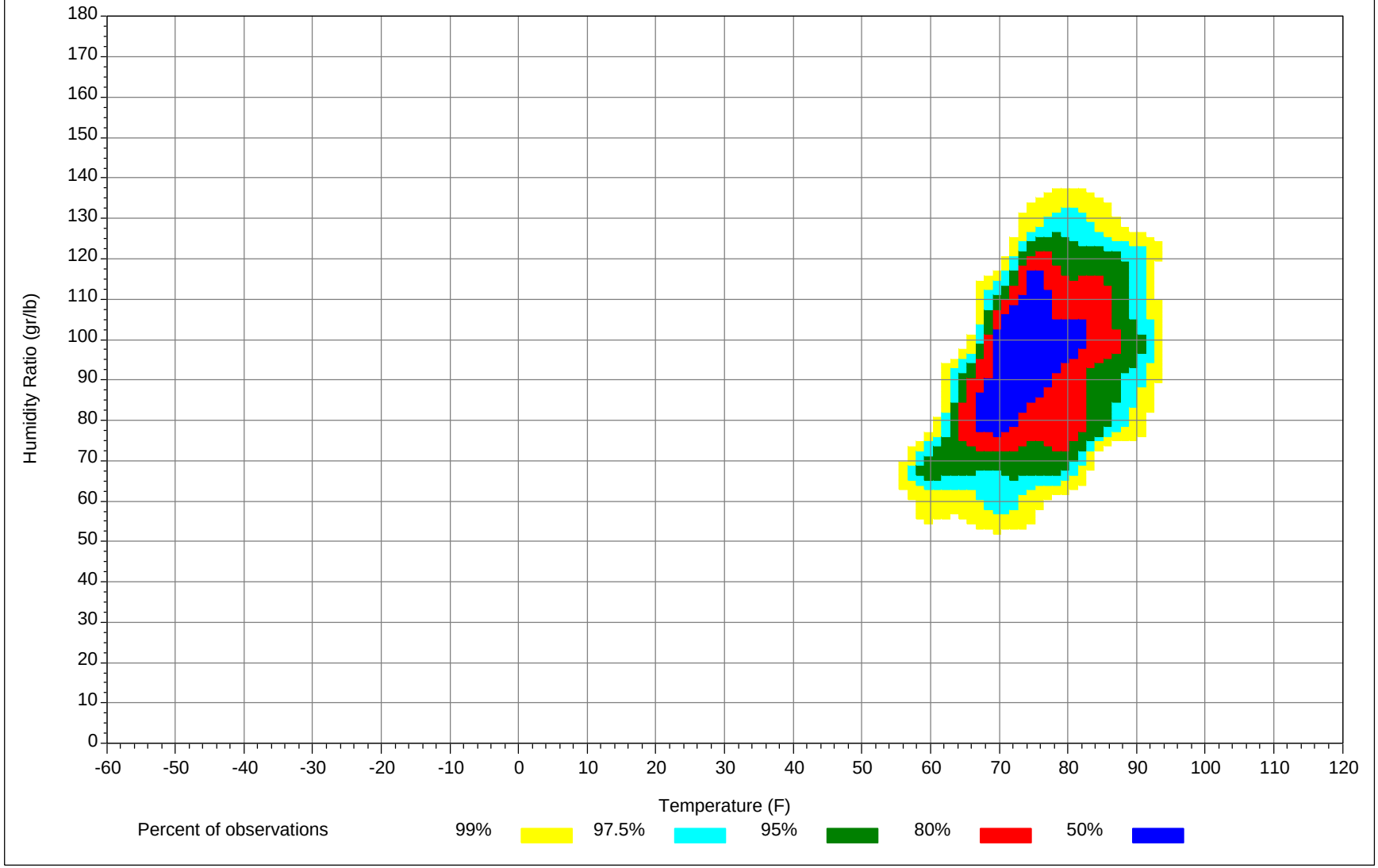
Weather Region	Rain Rate 100 Year Recurrence (in./hr)	Basic Wind Speed 3 sec gust @ 33 ft 50 Year Recurrence (mph)	Ventilation Cooling Load Index (Ton-hr/cfm/yr) Base 75°F-RH 60% Latent + Sensible
10	3	105	8.3 + 2.1
Ground Water Temperature (°F) 50 Foot Depth*	Frost Depth 50 Year Recurrence (in)	Ground Snow Load 50 Year Recurrence (lb/ft^2)	Average Annual Freeze-Thaw Cycles (#)
78	0	0	0

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

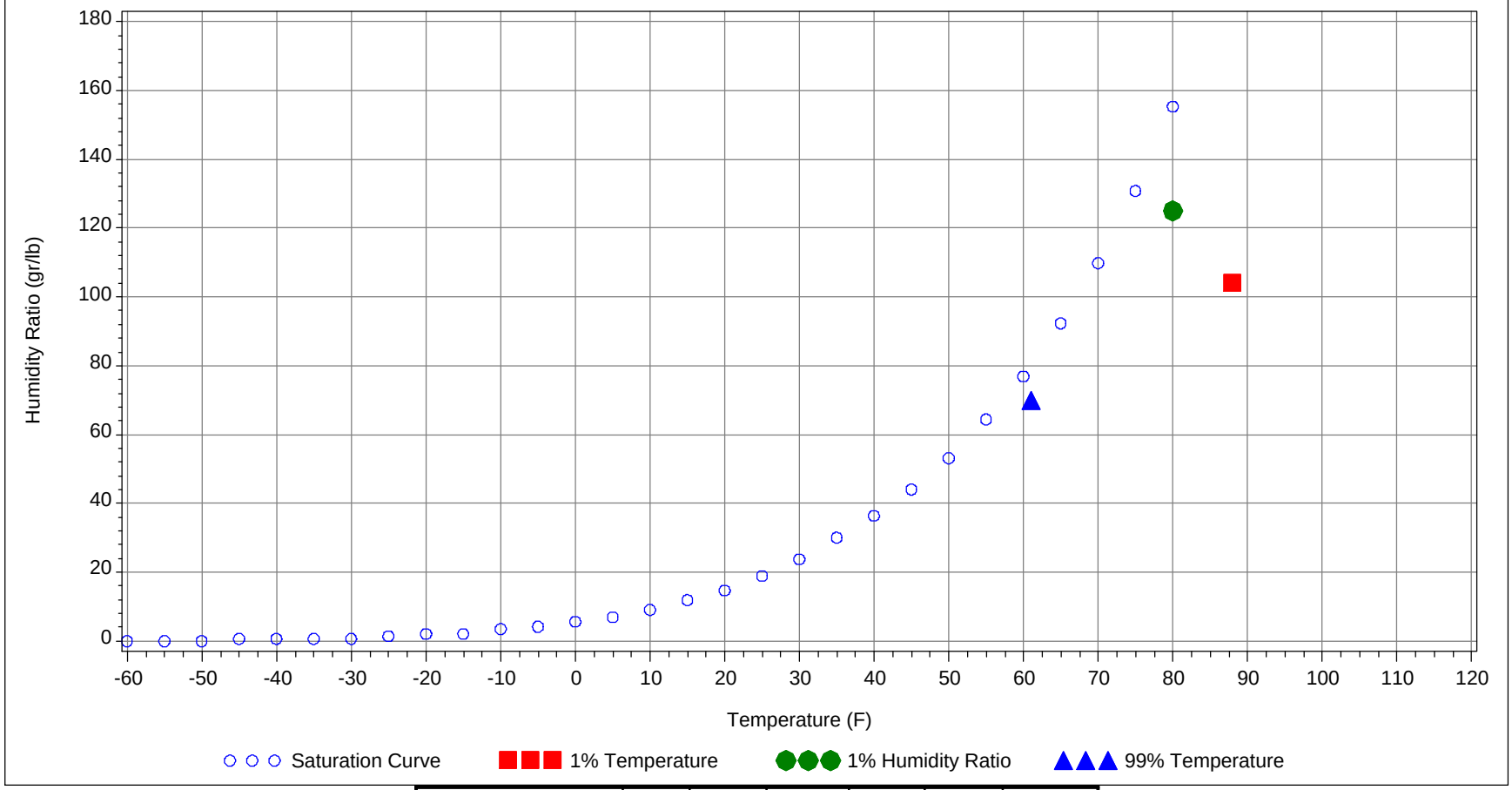
Average Annual Climate



Long Term Psychrometric Summary



Psychrometric Summary of Peak Design Values



	(°F) / (gr/lb)	MCDB (°F)	MCWB (°F)	MCDP (°F)	MCHR (gr/lb)	Enthalpy (btu/lb)
1.0% Dry Bulb	88.0		74		104.0	37.2
99.0% Dry Bulb	61.0				70.0	25.4
1.0% Humidity Ratio	125.0	80.0	75.4	73.6		38.9

Dry-Bulb Temperature Hours For An Average Year

	January					February					March				
Temperature Range (°F)	**01 To 08 LST**	**09 To 16 LST**	**17 to 00 LST**	**Total Obs**	**MCWB (°F)**	**01 To 08 LST**	**09 To 16 LST**	**17 to 00 LST**	**Total Obs**	**MCWB (°F)**	**01 To 08 LST**	**09 To 16 LST**	**17 to 00 LST**	**Total Obs**	**MCWB (°F)**
95/ 99															
90/ 94												0		0	73
85/ 89		2		2	72		2		2	71.9		5	0	5	71.6
80/ 84		74	3	77	70		67	4	71	70	0	93	7	100	70.1
75/ 79	4	117	45	166	68.3	3	106	40	149	68	3	107	49	159	68.4
70/ 74	80	49	134	263	66.6	72	44	125	241	66.1	100	39	146	285	66.6
65/ 69	74	6	49	129	63.9	73	4	42	119	63.5	86	4	40	130	64
60/ 64	77	0	16	93	60.2	61	0	13	74	60.2	51	1	6	58	60.7
55/ 59	14		1	15	55.9	14		1	15	55.7	7		0	7	56.4
50/ 54	0			0	52	1		0	1	52.1	0		0	0	52.2

Caution: This summary reflects the typical distribtion of temperature in a typical year. It does not reflect the typical mositure 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.

Dry-Bulb Temperature Hours For An Average Year

	April					May					June				
Temperature Range (°F)	**01 To 08 LST**	**09 To 16 LST**	**17 to 00 LST**	**Total Obs**	**MCWB (°F)**	**01 To 08 LST**	**09 To 16 LST**	**17 to 00 LST**	**Total Obs**	**MCWB (°F)**	**01 To 08 LST**	**09 To 16 LST**	**17 to 00 LST**	**Total Obs**	**MCWB (°F)**
95/ 99															
90/ 94	0	0		0	73		1		1	74.5		2		2	74.1
85/ 89	0	12	0	12	72.3		31	1	32	72.6		61	2	63	72.6
80/ 84	0	122	12	134	70.3	1	161	24	186	70.8	5	159	41	205	71.4
75/ 79	12	85	59	156	68.4	30	48	92	170	69.4	62	18	128	208	69.9
70/ 74	127	19	147	293	66.6	145	7	125	277	67.3	151	1	68	220	68
65/ 69	68	2	20	90	64.2	54	0	6	60	64.5	19		0	19	64.4
60/ 64	31	0	2	33	60.9	17		0	17	61	4			4	61.5
55/ 59	1			1	56.6	0			0	55					
50/ 54															

Caution: This summary reflects the typical distribtion of temperature in a typical year. It does not reflect the typical mositure 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.

Dry-Bulb Temperature Hours For An Average Year

	July					August					September				
Temperature Range (°F)	**01 To 08 LST**	**09 To 16 LST**	**17 to 00 LST**	**Total Obs**	**MCWB (°F)**	**01 To 08 LST**	**09 To 16 LST**	**17 to 00 LST**	**Total Obs**	**MCWB (°F)**	**01 To 08 LST**	**09 To 16 LST**	**17 to 00 LST**	**Total Obs**	**MCWB (°F)**
95/ 99		0		0	78		0		0	79		0		0	77
90/ 94		8	0	8	75.8		12	0	12	75.6		14	0	14	75
85/ 89	0	88	5	93	73.6		109	7	116	74		104	6	110	73.9
80/ 84	9	139	55	203	72.2	11	118	61	190	72.7	10	114	56	180	72.5
75/ 79	107	13	152	272	70.8	128	9	161	298	71	100	8	147	255	70.8
70/ 74	119	0	36	155	68.6	96	0	19	115	68.7	106	0	30	136	68.2
65/ 69	11		0	11	64.5	11		0	11	64.8	20	0	0	20	64.5
60/ 64	2			2	61.2	1			1	61.3	4			4	60.4
55/ 59															
50/ 54															

Caution: This summary reflects the typical distribtion of temperature in a typical year. It does not reflect the typical mositure 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.

Dry-Bulb Temperature Hours For An Average Year

	October					November					December				
Temperature Range (°F)	**01 To 08 LST**	**09 To 16 LST**	**17 to 00 LST**	**Total Obs**	**MCWB (°F)**	**01 To 08 LST**	**09 To 16 LST**	**17 to 00 LST**	**Total Obs**	**MCWB (°F)**	**01 To 08 LST**	**09 To 16 LST**	**17 to 00 LST**	**Total Obs**	**MCWB (°F)**
95/ 99															
90/ 94		8		8	75.2		1		1	75.3					
85/ 89		77	2	79	73.9		24	0	24	73.5		5	0	5	72.7
80/ 84	4	142	38	184	72.4	1	139	13	153	71.7		95	4	99	70.6
75/ 79	74	20	153	247	70.8	35	65	108	208	70.3	7	115	56	178	69.1
70/ 74	129	1	54	184	68.5	139	10	109	258	68.1	123	31	152	306	67.1
65/ 69	35		2	37	64.7	46	0	8	54	64.5	59	3	29	91	64.3
60/ 64	6		0	6	61.2	19		1	20	61.2	55	0	7	62	60.6
55/ 59	0			0	57	0			0	57.2	4		0	4	56.3
50/ 54															

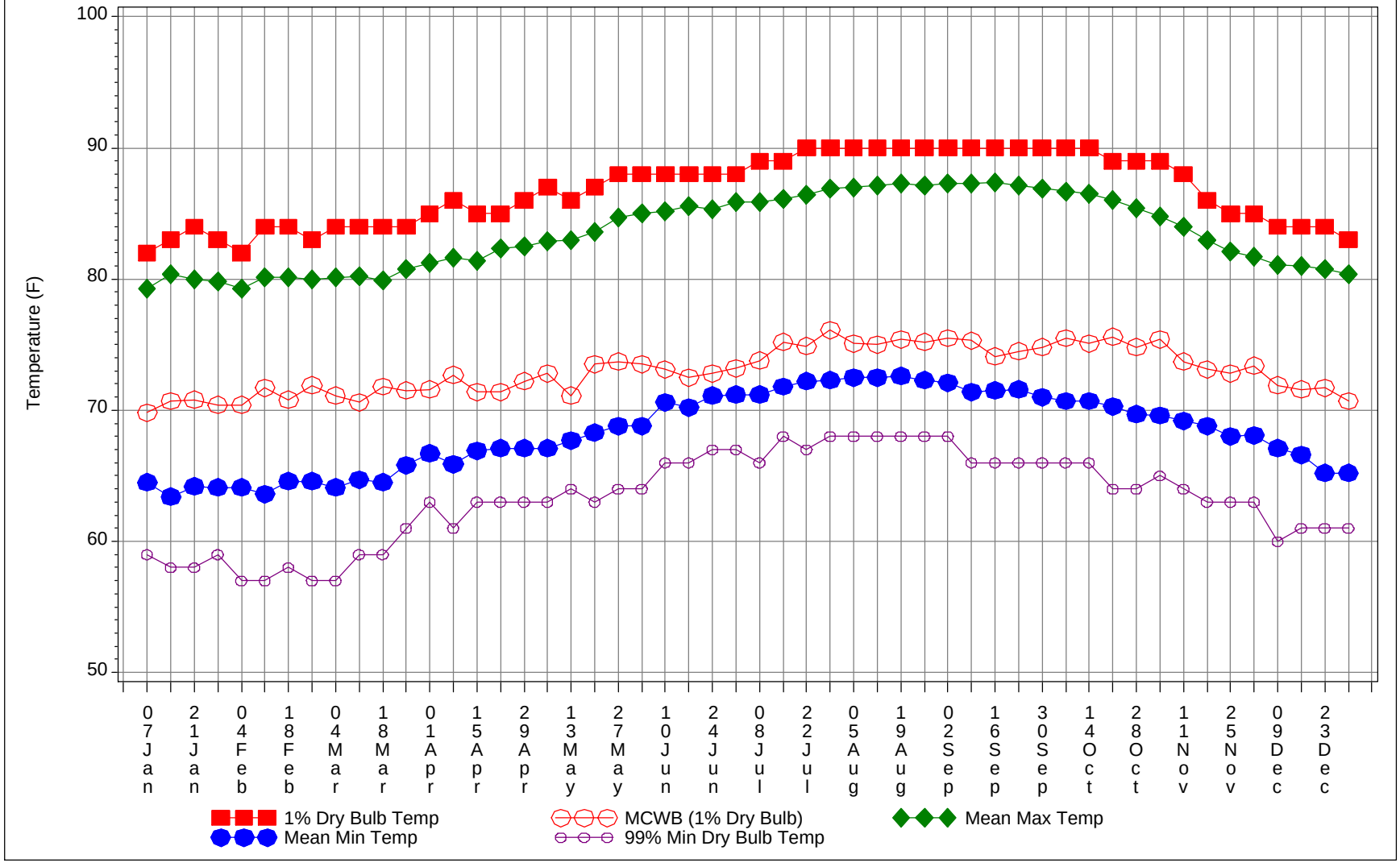
Caution: This summary reflects the typical distribtion of temperature in a typical year. It does not reflect the typical mositure distribution. Because wet bulb temperatures are averaged, this summary understates the annual moisture load. For accurate moisture load data, see the long-term humidity summary and the ventilation and infiltration load pages in this manual.

Dry-Bulb Temperature Hours For An Average Year

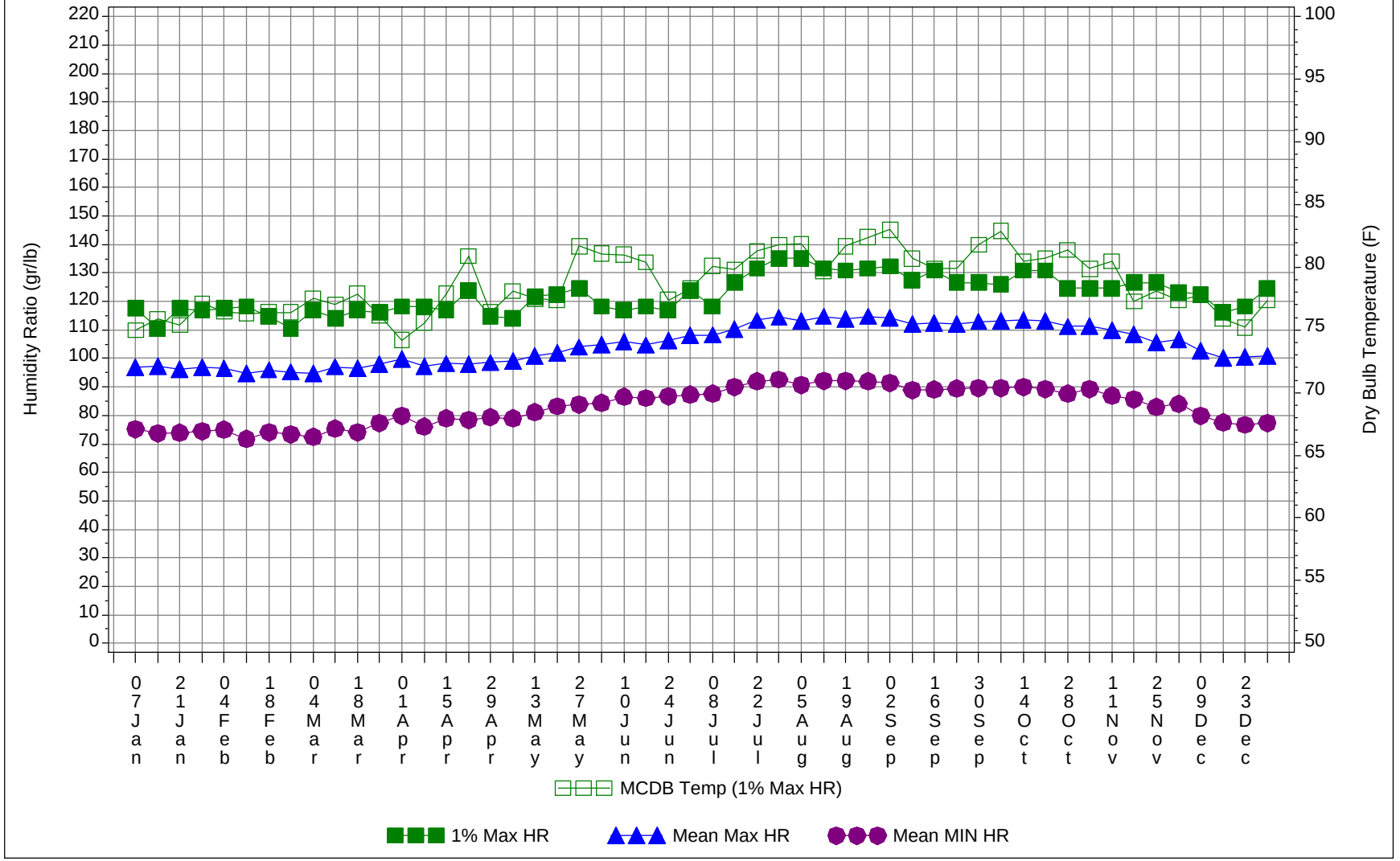
	Annual				
Temperature Range (°F)	**01 To 08 LST**	**09 To 16 LST**	**17 to 00 LST**	**Total Obs**	**MCWB (°F)**
95/ 99		0		0	78.2
90/ 94	0	46	0	46	75.3
85/ 89	0	519	22	541	73.5
80/ 84	41	1423	319	1783	71.5
75/ 79	564	711	1190	2465	69.8
70/ 74	1387	201	1145	2733	67.3
65/ 69	558	19	196	773	64.1
60/ 64	327	2	46	375	60.5
55/ 59	41		2	43	56
50/ 54	2		0	2	52.1

Caution: This summary reflects the typical distribtion of temperature in a typical year. It does not reflect the typical mositure 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



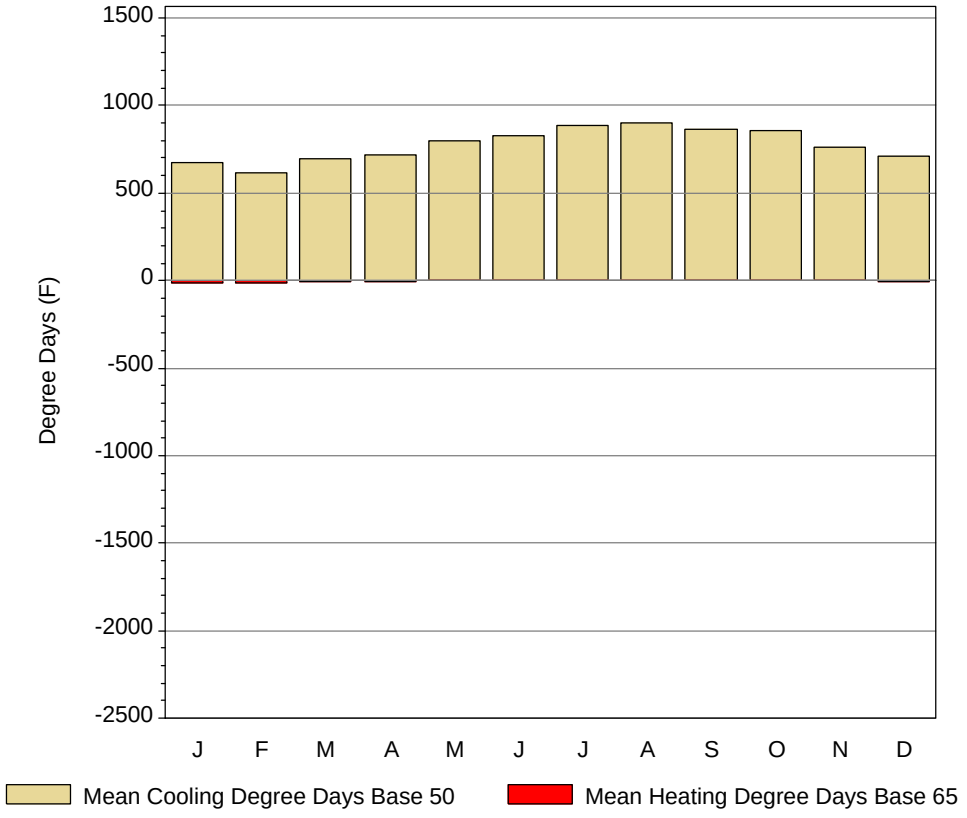
Long Term Humidity and Dry Bulb Temperature Summary



Long Term Humidity and Dry Bulb Temperature Summary

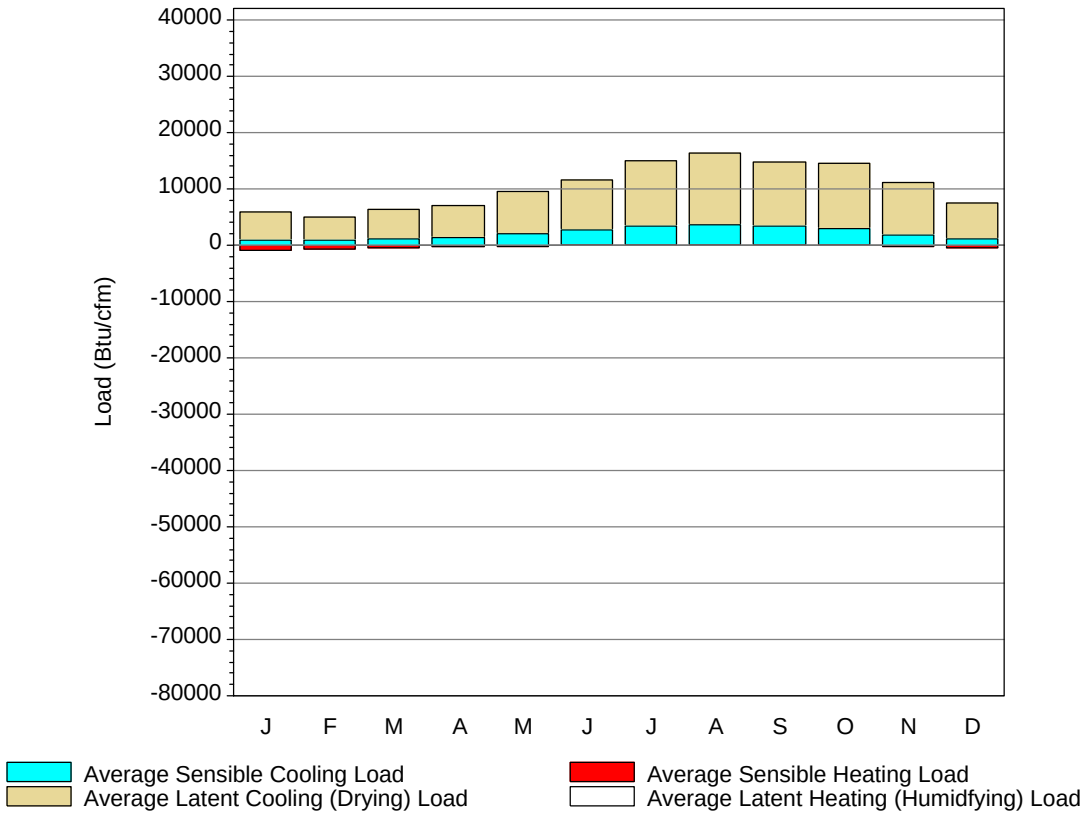
Week Ending	1.0% Temp (°F)	MCWB@ 1% Temp (°F)	Mean Max Temp (°F)	Mean Min Temp (°F)	99% Temp (°F)	1.0% HR (gr/lb)	MCDB@ 1% HR (°F)	Mean Max HR (gr/lb)	Mean Min HR (gr/lb)
7-Jan	82	69.8	79.3	64.5	59	117.6	75	96.9	75.2
14-Jan	83	70.7	80.4	63.4	58	110.6	75.9	97.2	73.7
21-Jan	84	70.8	80	64.2	58	117.6	75.4	96.2	73.9
28-Jan	83	70.4	79.8	64.1	59	116.9	77.1	96.9	74.5
4-Feb	82	70.4	79.3	64.1	57	117.6	76.5	96.6	75
11-Feb	84	71.7	80.1	63.6	57	118.3	76.3	94.7	71.7
18-Feb	84	70.8	80.1	64.6	58	114.8	76.4	96	74
25-Feb	83	71.9	80	64.6	57	110.6	76.4	95.3	73.3
4-Mar	84	71.1	80.1	64.1	57	116.9	77.5	94.9	72.5
11-Mar	84	70.6	80.2	64.7	59	114.1	77	97.1	75.3
18-Mar	84	71.8	79.9	64.5	59	116.9	77.9	96.5	74
25-Mar	84	71.5	80.8	65.8	61	116.2	76.2	98.1	77.4
1-Apr	85	71.6	81.2	66.7	63	118.3	74.2	99.8	79.9
8-Apr	86	72.7	81.6	65.9	61	118.3	75.6	97.3	76
15-Apr	85	71.4	81.4	66.9	63	116.9	77.9	98.2	78.9
22-Apr	85	71.4	82.3	67.1	63	123.9	80.9	97.9	78.4
29-Apr	86	72.2	82.5	67.1	63	114.8	76.4	98.6	79.4
6-May	87	72.8	82.9	67.1	63	114.1	78.1	99	78.9
13-May	86	71.1	83	67.7	64	121.8	77.5	101	81.2
20-May	87	73.5	83.6	68.3	63	122.5	77.4	101.9	83.2
27-May	88	73.7	84.7	68.8	64	124.6	81.7	104	83.9
4-Jun	88	73.5	85	68.8	64	118.3	81.1	104.9	84.4
10-Jun	88	73.1	85.2	70.6	66	116.9	81	105.9	86.6
17-Jun	88	72.5	85.6	70.2	66	118.3	80.4	104.7	86.1
24-Jun	88	72.8	85.3	71.1	67	116.9	77.4	106.3	86.7
1-Jul	88	73.2	85.9	71.2	67	123.9	78.3	108	87.3
8-Jul	89	73.8	85.9	71.2	66	118.3	80.1	108.3	87.7
15-Jul	89	75.2	86.1	71.8	68	126.7	79.8	110.4	90
22-Jul	90	74.9	86.4	72.2	67	131.6	81.3	113.4	91.9
29-Jul	90	76.1	86.9	72.3	68	135.1	81.8	114.5	92.6
5-Aug	90	75.1	87	72.5	68	135.1	81.9	113.1	90.7
12-Aug	90	75	87.1	72.5	68	131.6	79.7	114.8	92.1
19-Aug	90	75.4	87.3	72.6	68	130.9	81.7	114	92.2
26-Aug	90	75.2	87.1	72.3	68	131.6	82.4	114.8	92
2-Sep	90	75.5	87.3	72.1	68	132.3	83	114.2	91.4
9-Sep	90	75.3	87.3	71.4	66	127.4	80.7	112.2	88.9
16-Sep	90	74.1	87.4	71.5	66	130.9	79.9	112.5	89.1
23-Sep	90	74.5	87.1	71.6	66	126.7	79.9	112	89.5
30-Sep	90	74.8	86.9	71	66	126.7	81.8	113	89.6
7-Oct	90	75.5	86.7	70.7	66	126	82.9	113.1	89.6
14-Oct	90	75.1	86.5	70.7	66	130.9	80.5	113.7	90
21-Oct	89	75.6	86	70.3	64	130.9	80.7	113.1	89.2
28-Oct	89	74.8	85.4	69.7	64	124.6	81.4	111.2	87.7
4-Nov	89	75.4	84.8	69.6	65	124.6	79.9	111.5	89.2
11-Nov	88	73.7	84	69.2	64	124.6	80.5	109.9	86.9
18-Nov	86	73.1	83	68.8	63	126.7	77.3	108.5	85.6
25-Nov	85	72.8	82.1	68	63	126.7	78.1	105.7	82.9
2-Dec	85	73.4	81.7	68.1	63	123.2	77.4	106.6	84.1
9-Dec	84	71.9	81.1	67.1	60	122.5	77.8	102.7	79.8
16-Dec	84	71.6	81	66.6	61	116.2	75.9	100.1	77.5
23-Dec	84	71.7	80.8	65.2	61	118.3	75.2	100.5	76.7
31-Dec	83	70.7	80.4	65.2	61	124.6	77.4	100.9	77.3

Degree Days, Heating and Cooling
(Base 65 F) & Cooling (Base 50F)



Month	Mean Cooling Degree Days (°F) Base 50	Mean Cooling Degree Days (°F) Base 65	Mean Heating Degree Days (°F) Base 65
JAN	673.6	221.7	13.1
FEB	615.1	203.1	12
MAR	699.4	241.6	7.2
APR	719.5	272.2	2.7
MAY	796.4	332.5	1.1
JUN	826.5	376.6	0.2
JUL	885.3	420.4	0.1
AUG	902.8	437.9	0.1
SEP	864.1	414.3	0.2
OCT	857.4	392.7	0.3
NOV	763.3	314.7	1.4
DEC	714	255.9	6.8
ANN	9317.4	3883.6	45.2

Average Ventilation and Infiltration Loads
(Outside Air vs 75F, 60% RH summer; 68F, 30% RH winter)



Month	Average Sensible Cooling Load (Btu/cfm)	Average Sensible Heating Load (Btu/cfm)	Average Latent Cooling Load (Btu/cfm)	Average Latent Heating Load (Btu/cfm)
JAN	900	-833	5038	0
FEB	833	-724	4113	0
MAR	1085	-525	5334	0
APR	1461	-269	5523	-4
MAY	2158	-147	7468	0
JUN	2755	-35	8897	0
JUL	3355	-20	11714	0
AUG	3702	-14	12692	0
SEP	3534	-32	11335	0
OCT	3015	-57	11484	0
NOV	1825	-158	9308	0
DEC	1111	-492	6451	0
ANN	25734	-3306	99357	-4

Station Information		Shading Geometry in Dimensionless Units	
City, State, WBAN	KAHULUI, HI 22516	Window:	1.000
Lat, Lon, Elev	20.90N 156.43W 49ft	Overhang:	1.175
Press, Stn_Type	14.7psia Secondary	Vert Gap:	0.200

AVERAGE INCIDENT SOLAR RADIATION (Btu/sq.ft./day) Percentage Uncertainty = 9

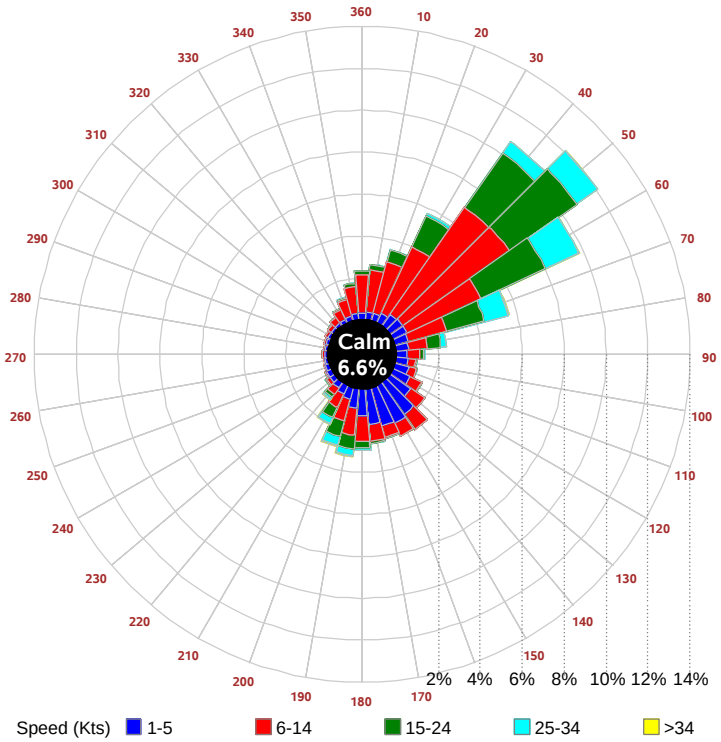
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
HORIZ.	Global	1280	1500	1710	1870	2030	2120	2110	2070	1920	1630	1350	1230	1740
	Std.Dev.	101	126	163	140	112	101	102	99	71	98	106	77	62
	Minimum	1040	1210	1330	1450	1780	1950	1910	1840	1760	1420	1130	1050	1600
	Maximum	1480	1710	1990	2120	2230	2360	2290	2240	2050	1810	1530	1370	1850
	Diffuse	420	470	560	640	610	580	560	540	510	490	440	400	520
Clear Day	Global	1670	1940	2260	2500	2590	2610	2590	2510	2320	2020	1720	1580	2190
NORTH	Global	300	340	390	460	620	800	710	500	390	360	320	290	460
	Diffuse	300	340	390	430	460	480	460	420	390	360	320	290	390
Clear Day	Global	280	310	350	430	690	930	810	500	350	320	280	270	460
EAST	Global	780	900	990	1060	1130	1130	1130	1130	1110	970	820	750	990
	Diffuse	380	420	480	530	530	530	520	510	490	450	390	360	470
Clear Day	Global	1020	1150	1300	1390	1410	1400	1390	1380	1320	1200	1050	980	1250
SOUTH	Global	1390	1280	990	650	450	420	420	540	880	1200	1370	1430	920
	Diffuse	470	480	490	460	430	420	410	420	460	490	480	460	460
Clear Day	Global	2000	1770	1310	720	410	380	380	560	1060	1610	1930	2030	1180
WEST	Global	740	850	950	990	1060	1120	1120	1110	1040	910	790	720	950
	Diffuse	370	430	490	530	540	530	530	520	490	450	400	360	470
Clear Day	Global	1020	1150	1300	1390	1410	1400	1390	1380	1320	1200	1050	980	1250

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	900	1080	1250	1370	1500	1560	1560	1520	1410	1180	960	860	1260
NORTH	Unshaded	210	240	270	300	370	440	400	310	270	250	220	200	290
	Shaded	160	190	210	230	260	290	280	240	220	200	170	160	220
EAST	Unshaded	550	640	710	760	810	810	810	810	800	690	580	530	710
	Shaded	330	380	410	420	450	460	450	460	450	400	340	320	410
SOUTH	Unshaded	1000	870	600	370	300	290	290	320	490	780	970	1040	610
	Shaded	300	240	240	240	240	240	240	240	250	240	270	340	260
WEST	Unshaded	520	600	670	700	750	800	800	790	740	640	550	500	670
	Shaded	320	350	390	400	420	450	450	440	430	380	330	300	390

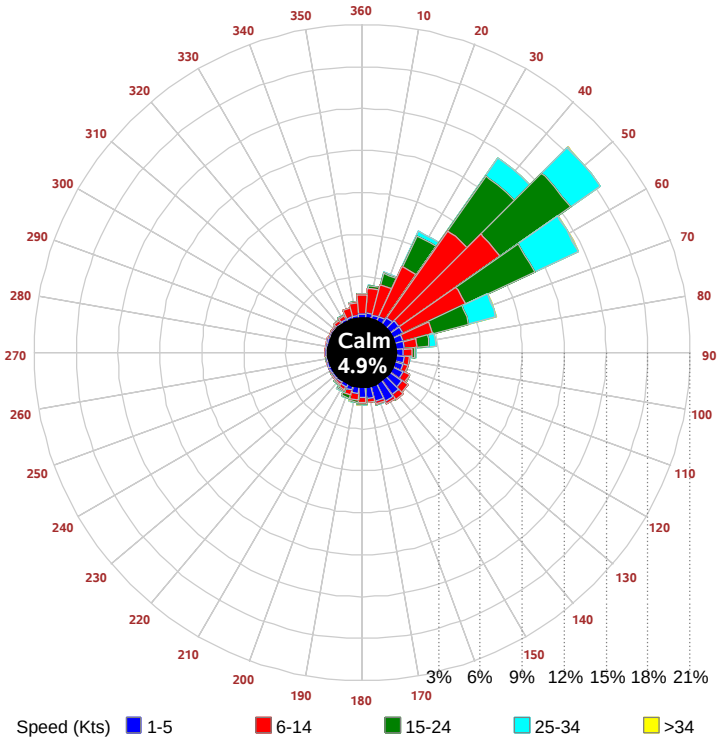
AVERAGE INCIDENT ILLUMINANCE (klux-hr) FOR MOSTLY CLEAR AND MOSTLY CLOUDY CONDITIONS Percentage Uncertainty = 9											
				March					June		
		9am	11am	1pm	3pm	5pm	9am	11am	1pm	3pm	5pm
HORIZ.	M.Clear	41	83	99	85	45	56	92	105	90	53
	M.Cloudy	28	56	71	60	29	43	73	86	71	40
NORTH	M.Clear	10	15	16	15	11	29	24	19	24	29
	M.Cloudy	10	17	18	17	11	24	23	19	23	23
EAST	M.Clear	80	67	18	15	11	80	61	15	15	12
	M.Cloudy	38	43	20	17	11	54	50	16	17	13
SOUTH	M.Clear	26	49	58	51	29	12	16	15	15	12
	M.Cloudy	17	34	43	36	18	13	17	16	17	13
WEST	M.Clear	10	15	16	64	79	12	16	17	63	80
	M.Cloudy	10	17	18	44	38	13	17	17	51	51
M.Clear	(% hrs)	52	50	43	43	44	50	48	50	52	51

				Sept					Dec		
		9am	11am	1pm	3pm	5pm	9am	11am	1pm	3pm	5pm
HORIZ.	M.Clear	51	89	102	85	42	29	66	77	61	22
	M.Cloudy	39	71	82	66	30	19	45	55	41	14
NORTH	M.Clear	11	15	16	15	10	8	13	15	13	7
	M.Cloudy	12	17	18	17	11	8	14	16	14	6
EAST	M.Clear	84	63	16	15	10	63	55	15	13	7
	M.Cloudy	55	51	18	17	11	27	34	16	14	6
SOUTH	M.Clear	23	42	48	39	19	46	77	84	72	37
	M.Cloudy	20	37	43	35	15	21	45	54	41	16
WEST	M.Clear	11	15	20	68	79	8	13	18	58	55
	M.Cloudy	12	17	21	53	44	8	14	18	34	21
M.Clear	(% hrs)	59	58	56	52	48	53	53	51	50	48

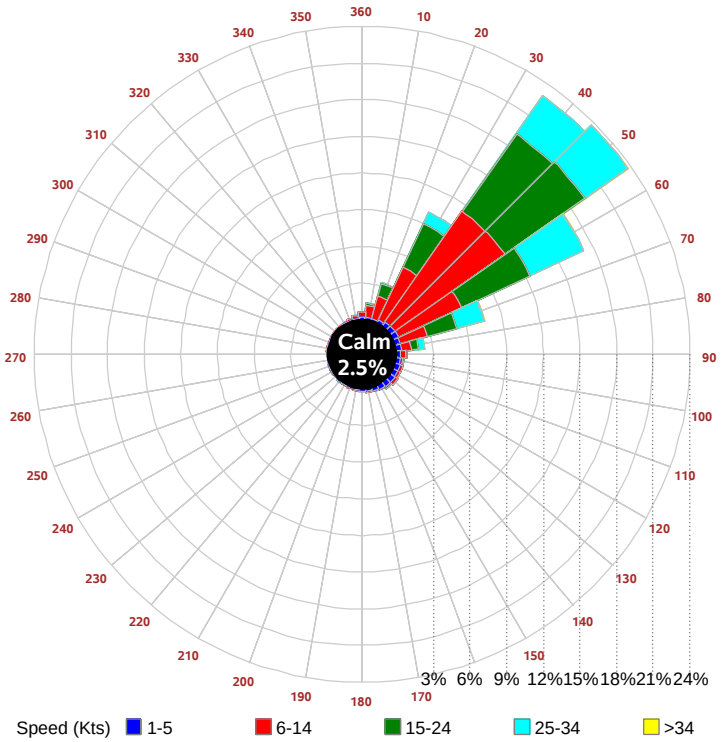
Wind Summary - December, January, and February



Wind Summary - March, April, and May



Wind Summary - June, July, and August



Wind Summary - September, October, and November