KAHULUI/MAUI HI	
Latitude = 20.90 N	WMO No. 911900
Longitude =156.40 W	Elevation = 66 feet
Period of Record = 1973 to 1996	Average Pressure = 29.90 inches Hg

Design Criteria Data

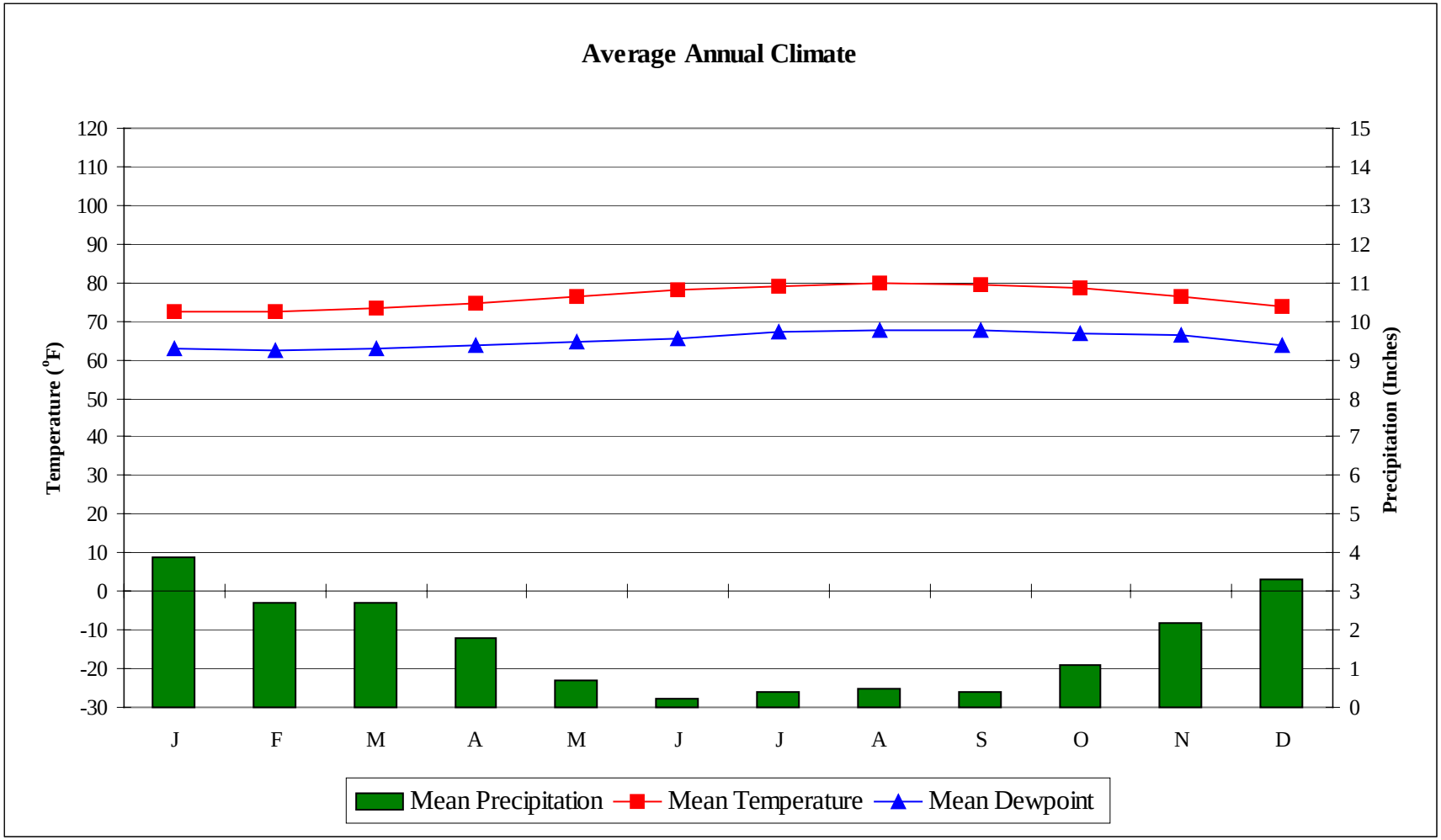
		Mean Coincident (Average) Values			
Dry Bulb Temperature (T)	**Design Value (^oF)**	Wet Bulb Temperature (^oF)	Humidity Ratio (gr/lb)	Wind Speed (mph)	Prevailing Direction (NSEW)
Median of Extreme Highs	92	75	105	17.4	ENE
0.4% Occurrence	90	75	105	18.0	ENE
1.0% Occurrence	89	74	104	18.3	ENE
2.0% Occurrence	88	74	104	18.5	ENE
Mean Daily Range	15	-	-	-	-
97.5% Occurrence	63	61	74	5.0	SSE
99.0% Occurrence	61	59	70	4.9	SSE
99.6% Occurrence	59	57	66	4.9	SSE
Median of Extreme Lows	55	53	58	5.0	SSE
		Mean Coincident (Average) Values			
Wet Bulb Temperature (T_{wb})	**Design Value (^oF)**	Dry Bulb Temperature (^oF)	Humidity Ratio (gr/lb)	Wind Speed (mph)	Prevailing Direction (NSEW)
Median of Extreme Highs	79	87	132	16.0	NE
0.4% Occurrence	77	86	122	16.1	NE
1.0% Occurrence	76	85	118	16.0	NE
2.0% Occurrence	76	85	118	16.0	NE
		Mean Coincident (Average) Values			
Humidity Ratio (HR)	**Design Value (gr/lb)**	Dry Bulb Temperature (^oF)	Vapor Pressure (in. Hg)	Wind Speed (mph)	Prevailing Direction (NSEW)
Median of Extreme Highs	146	83	0.97	12.1	NE
0.4% Occurrence	128	81	0.85	13.2	NE
1.0% Occurrence	125	80	0.83	14.8	SSW
2.0% Occurrence	123	81	0.82	13.5	NE
Air Conditioning/		$T \geq 93^oF$	$T \geq 80^oF$	$T_{wb} \geq 73^oF$	$T_{wb} \geq 67^oF$
Humid Area Criteria	# of Hours	3	2664	1414	6218

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^oF-RH 60% Latent + Sensible
10	3.0	105	6.8 + 2.4
Ground Water Temperature (^oF) 50 Foot Depth *	Frost Depth 50 Year Recurrence (in.)	Ground Snow Load 50 Year Recurrence (lb/ft^2)	Average Annual Freeze-Thaw Cycles (#)
78.7	0	0	0

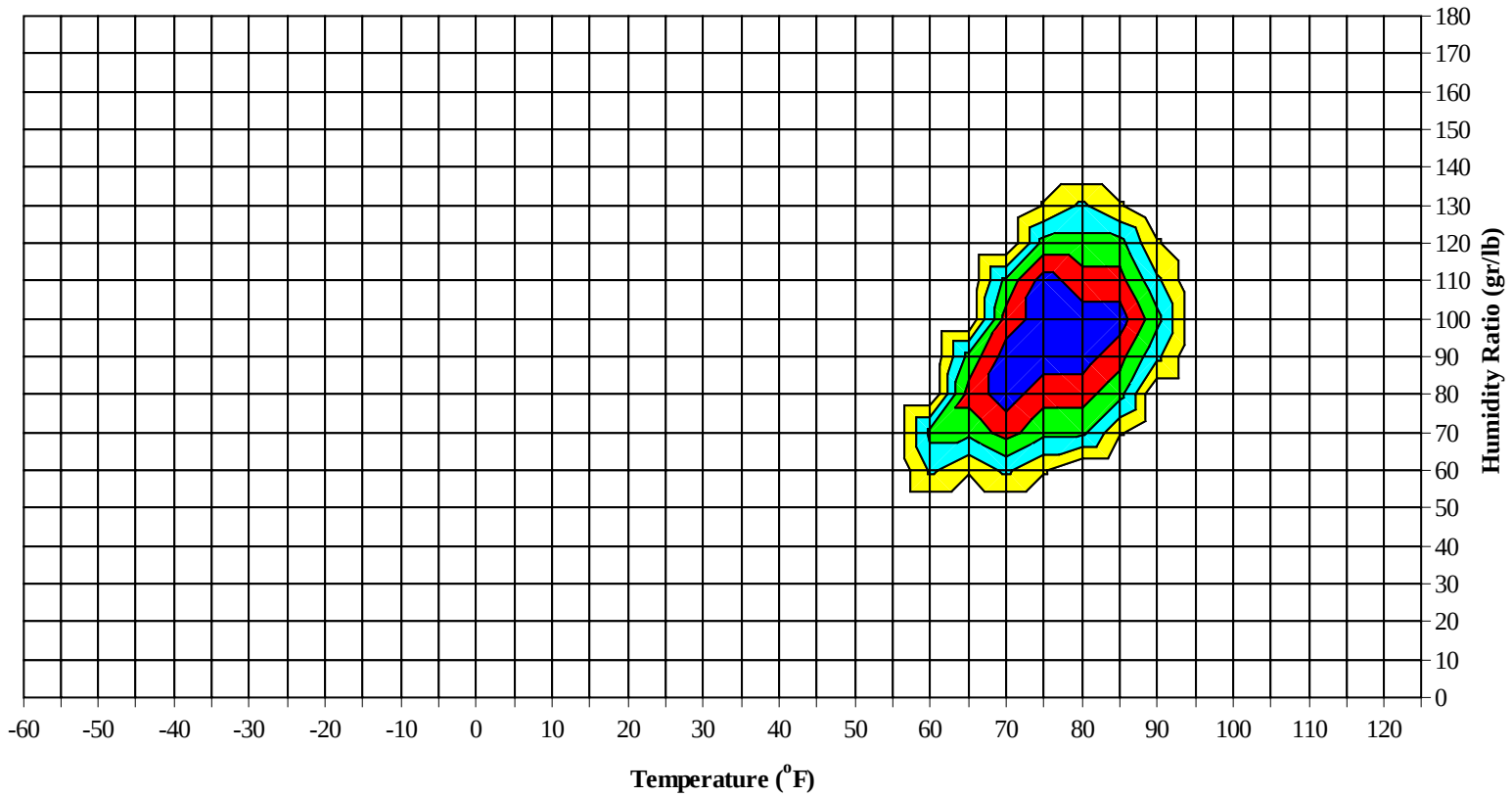
*Note: Temperatures at greater depths can be estimated by adding 1.5^oF per 100 feet additional depth.

KAHULUI/MAUI HI WMO No. 911900



KAHULUI/MAUI HI WMO No. 911900

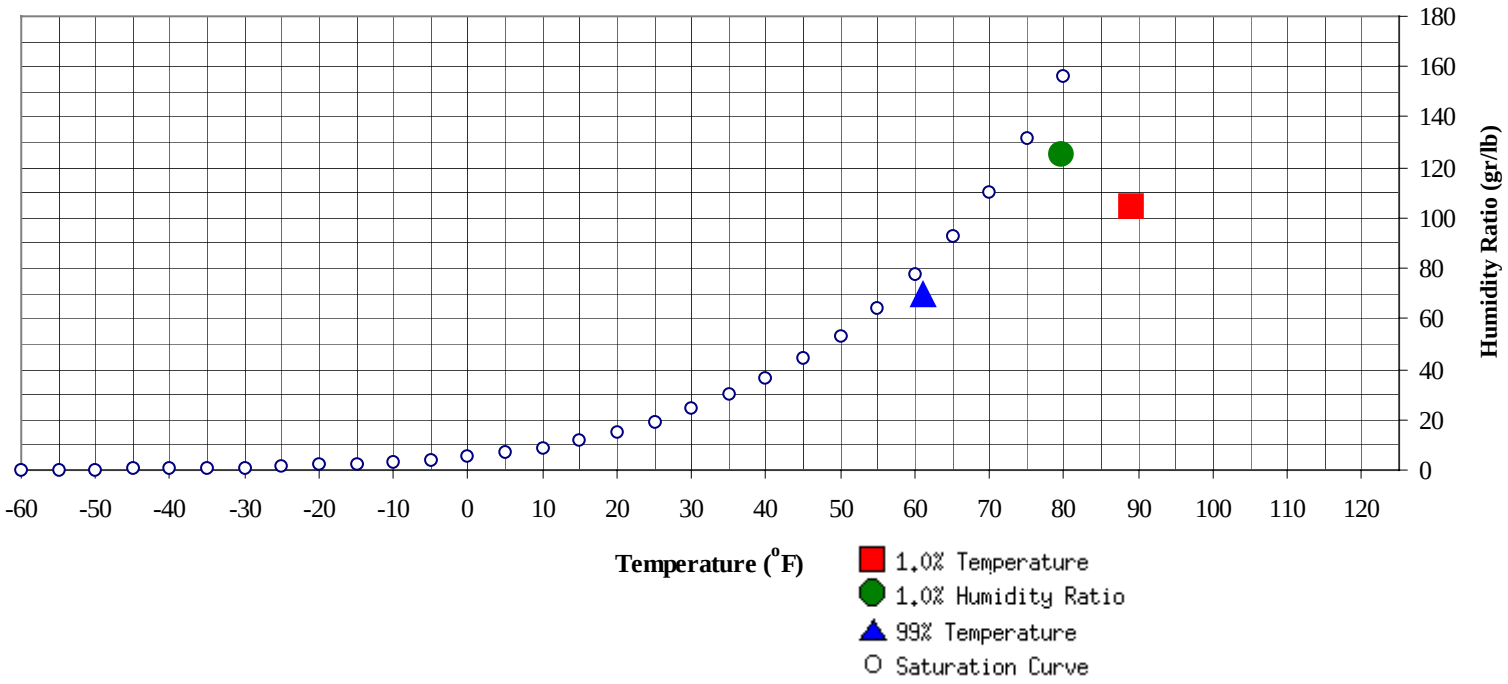
Long Term Psychrometric Summary



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

KAHULUI/MAUI HI WMO No. 911900

Psychrometric Summary of Peak Design Values



	(°F)	MCHR (gr/lb)	Enthalpy (btu/lb)
99% Dry Bulb	61	69.4	25.4

	(gr/lb)	MCDB (°F)	MCWB (°F)	MC Dewpt (°F)	Enthalpy (btu/lb)
1.0% Humidity Ratio	125.3	79.6	75	73.3	38.7

	(°F)	MCHR (gr/lb)	MCWB (°F)	Enthalpy (btu/lb)
1.0% Dry Bulb	89	105	74.6	37.9

KAHULUI/MAUI HI WMO No. 911900

Dry-Bulb Temperature Hours For An Average Year (Sheet 1 of 5)

Period of Record = 1973 to 1996

Temperature Range (°F)	January Hour Group (LST) 01 To 08	09 To 16	17 To 00	Total Obs	MCWB (°F)	February Hour Group (LST) 01 To 08	09 To 16	17 To 00	Total Obs	MCWB (°F)	March Hour Group (LST) 01 To 08	09 To 16	17 To 00	Total Obs	MCWB (°F)
95 / 99															
90 / 94												0		0	72.5
85 / 89		4	0	4	72.2		4	0	4	71.5		12	0	12	71.0
80 / 84	0	78	7	85	70.3	0	73	8	81	70.2	0	95	11	107	69.8
75 / 79	7	109	54	169	68.6	3	98	49	150	68.1	4	101	56	161	68.2
70 / 74	71	49	123	244	66.5	67	42	111	219	66.1	96	36	132	264	66.2
65 / 69	91	8	54	153	63.7	84	6	46	136	63.3	100	4	45	150	63.6
60 / 64	64	0	9	73	59.9	53	0	9	62	59.7	40	0	3	43	60.0
55 / 59	15		1	16	56.1	16		1	17	55.5	8		0	8	56.2
50 / 54	0			0	51.5	1			1	51.3	0			0	51.7

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.

KAHULUI/MAUI HI WMO No. 911900

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)				MCWB	Hour Group (LST)				MCWB	Hour Group (LST)				MCWB
	01 To 08	09 To 16	17 To 00	Total Obs	(°F)	01 To 08	09 To 16	17 To 00	Total Obs	(°F)	01 To 08	09 To 16	17 To 00	Total Obs	(°F)
95 / 99															
90 / 94		0		0	73.3		1	0	1	74.9		4		4	74.4
85 / 89		17	0	17	71.7		43	3	46	72.5		76	4	80	72.6
80 / 84	0	121	15	136	70.2	2	140	29	172	70.7	7	138	50	194	71.2
75 / 79	16	80	69	164	68.6	39	54	96	189	69.0	70	21	119	210	69.6
70 / 74	117	20	129	266	66.6	125	9	109	243	66.9	126	1	65	192	67.7
65 / 69	81	3	25	110	63.9	67	1	11	79	63.9	32		2	34	64.2
60 / 64	23	0	1	24	60.2	15	0	0	15	60.3	6		0	6	60.6
55 / 59	2		0	2	56.4	0		0	0	56.8	0			0	58.0
50 / 54	0			0	48.0										

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.

KAHULUI/MAUI HI WMO No. 911900

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)				MCWB	Hour Group (LST)				MCWB	Hour Group (LST)				MCWB
	01 To 08	09 To 16	17 To 00	Total Obs	(°F)	01 To 08	09 To 16	17 To 00	Total Obs	(°F)	01 To 08	09 To 16	17 To 00	Total Obs	(°F)
95 / 99		0		0	78.0		0		0	77.3		0		0	75.0
90 / 94		7		7	75.0	0	13	0	13	75.5		16		16	75.1
85 / 89	0	107	8	115	73.3	0	133	12	145	73.9	0	133	11	144	73.9
80 / 84	12	119	63	194	72.0	16	94	71	180	72.6	13	84	72	169	72.6
75 / 79	106	14	138	258	70.4	124	9	147	280	70.9	99	7	133	240	70.7
70 / 74	108	1	38	147	68.2	87	0	18	106	68.2	88	0	22	111	68.1
65 / 69	20	0	1	21	64.1	20		0	20	63.9	36		1	37	64.1
60 / 64	2			2	60.4	1		0	1	60.5	3		0	3	60.4
55 / 59											0			0	57.0
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.

KAHULUI/MAUI HI WMO No. 911900

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)				MCWB	Hour Group (LST)				MCWB	Hour Group (LST)				MCWB
	01 To 08	09 To 16	17 To 00	Total Obs	(°F)	01 To 08	09 To 16	17 To 00	Total Obs	(°F)	01 To 08	09 To 16	17 To 00	Total Obs	(°F)
95 / 99															
90 / 94		9	0	9	74.9		2		2	74.8					
85 / 89		94	4	98	73.6	0	46	1	47	73.1		12	0	12	72.8
80 / 84	6	122	51	179	72.3	1	126	25	151	72.0	0	101	10	111	70.9
75 / 79	88	21	146	255	70.4	49	57	124	230	70.1	15	103	73	191	69.0
70 / 74	107	2	45	153	68.1	116	9	82	207	68.0	108	30	131	269	66.8
65 / 69	44	0	2	46	64.0	63	0	9	72	64.1	77	2	31	109	63.8
60 / 64	4		0	4	60.1	11		0	11	60.3	42	0	3	46	60.0
55 / 59	0			0	56.7	0		0	0	55.6	6		0	6	55.9
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.

KAHULUI/MAUI HI WMO No. 911900

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

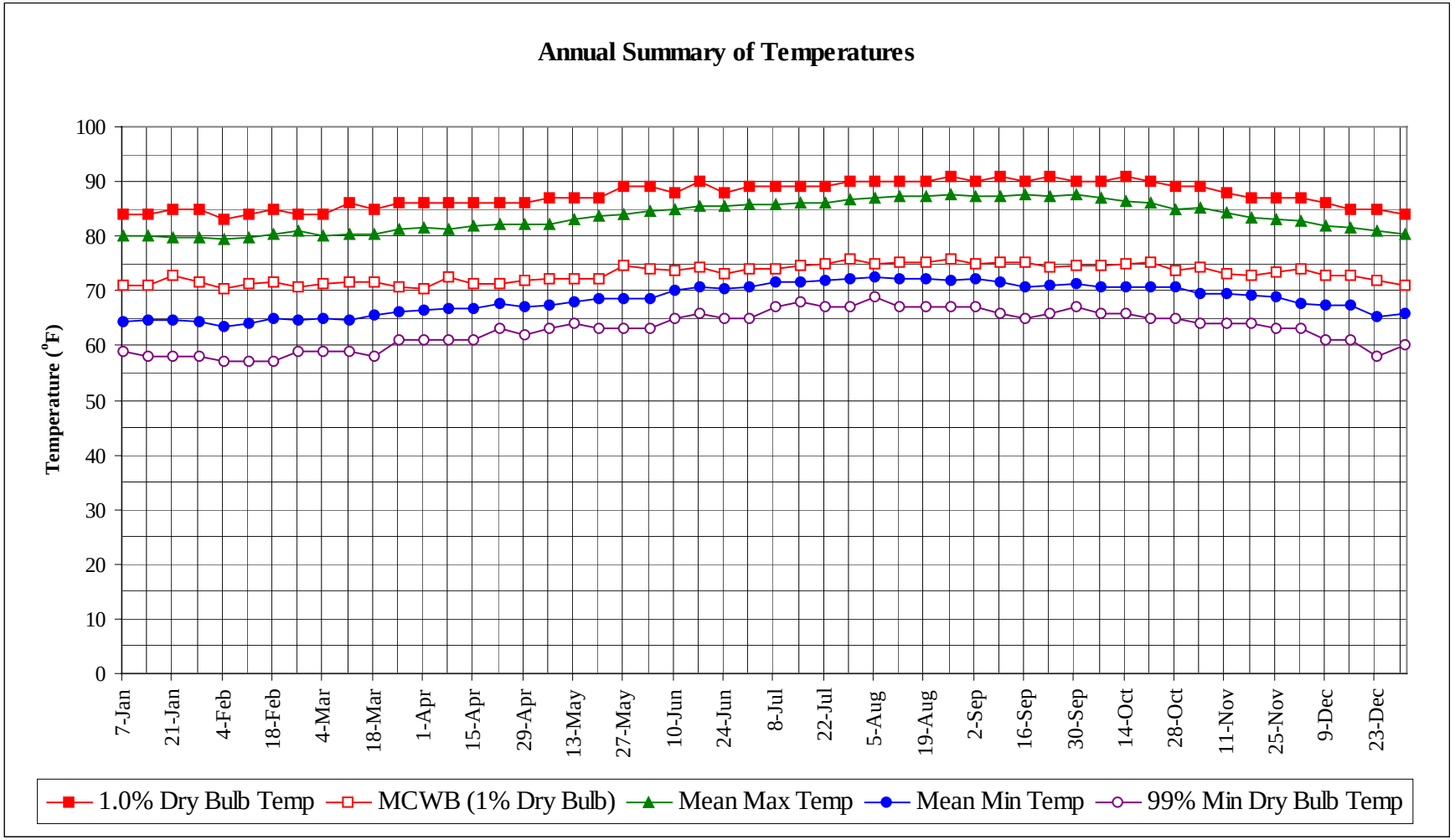
Period of Record = 1973 to 1996

Annual Totals

Temperature Range (°F)	Hour Group (LST) 01 To 08	09 To 16	17 To 00	Total Obs	MCWB (°F)
95 / 99		0		0	77.0
90 / 94	0	51	0	51	75.1
85 / 89	0	680	45	724	73.3
80 / 84	58	1290	411	1760	71.4
75 / 79	618	677	1202	2497	69.6
70 / 74	1215	198	1006	2420	67.1
65 / 69	715	23	227	966	63.8
60 / 64	265	1	26	293	60.0
55 / 59	46		2	48	55.9
50 / 54	2			2	51.3

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.

KAHULUI/MAUI HI WMO No. 911900



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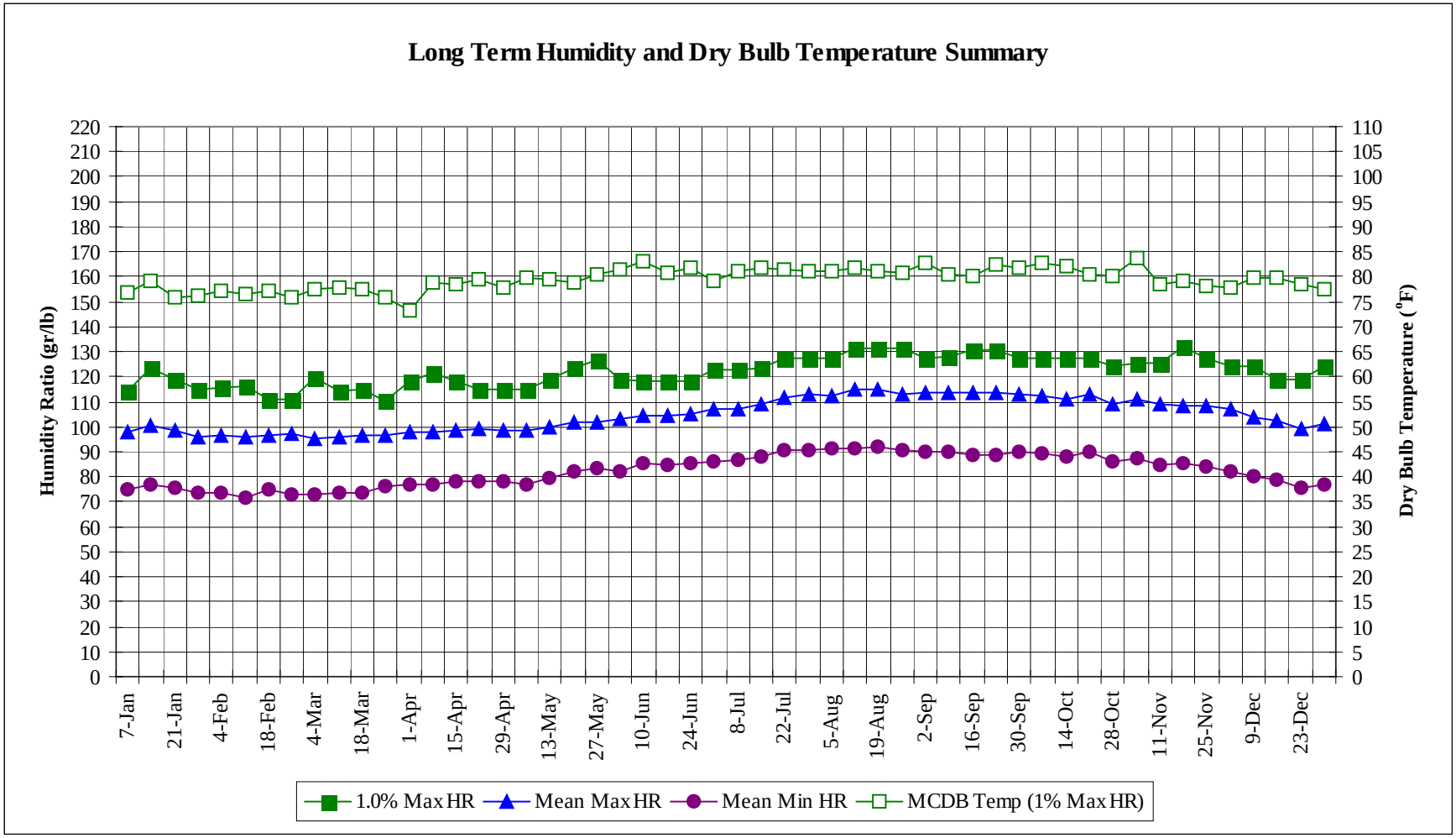
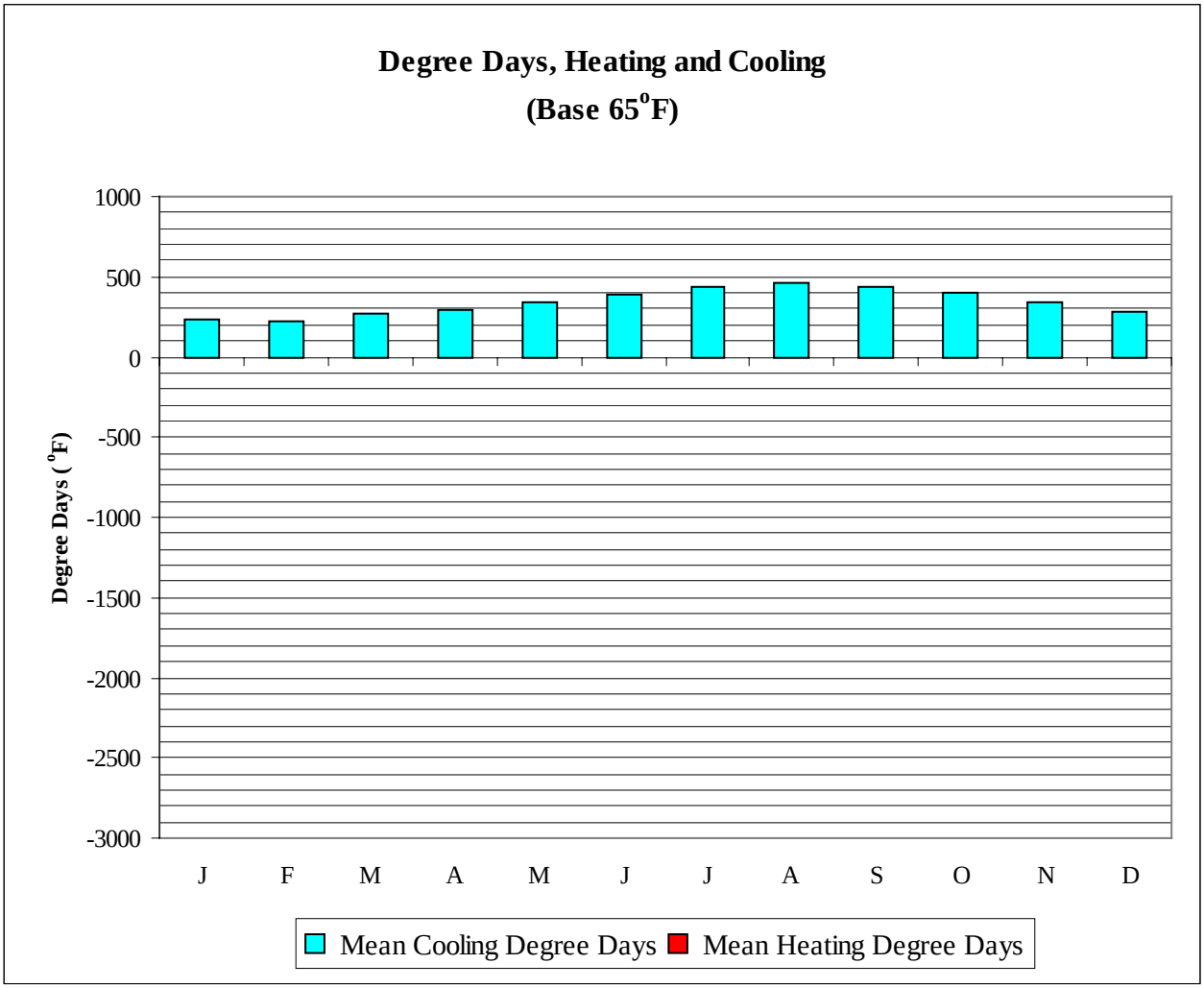


KAHULUI/MAUI HI WMO No. 911900

Long Term Dry Bulb Temperature and Humidity Summary

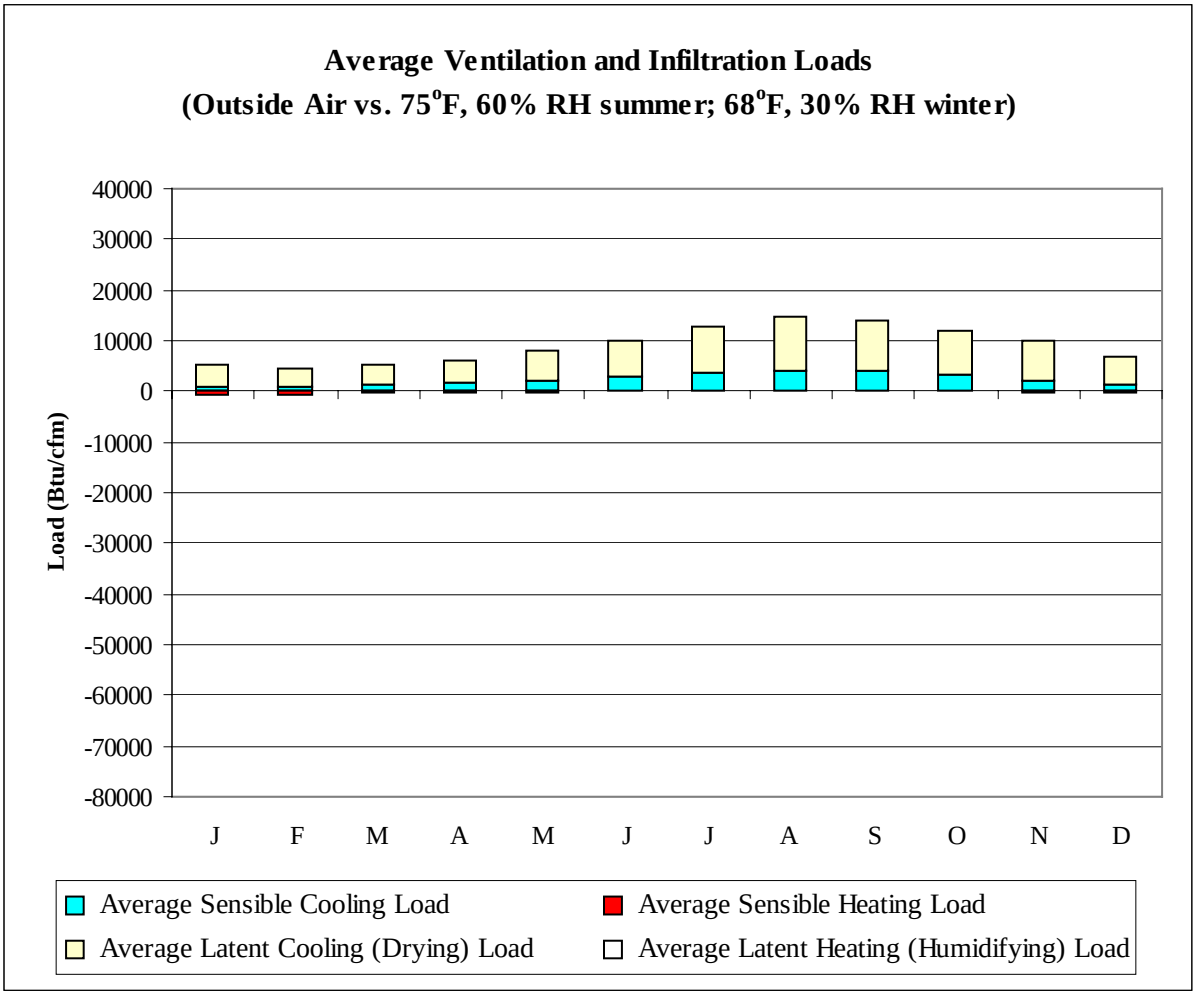
Week Ending	1.0% Temp (°F)	MCWB @ 1% Temp (°F)	Mean Max Temp (°F)	Mean Min Temp (°F)	99% Temp (°F)	1.0% HR (gr/lb)	MCDB @ 1% HR (°F)	Mean Max HR (gr/lb)	Mean Min HR (gr/lb)
7-Jan	84.0	70.9	80.1	64.4	59.0	114.1	76.9	97.6	75.0
14-Jan	84.0	71.1	80.1	64.8	58.0	123.2	79.2	100.7	76.9
21-Jan	85.0	72.7	79.8	64.7	58.0	119.0	75.8	98.2	75.5
28-Jan	85.0	71.7	79.8	64.4	58.0	114.8	76.2	96.0	73.5
4-Feb	83.0	70.3	79.3	63.6	57.0	115.5	77.2	96.4	73.5
11-Feb	84.0	71.2	79.7	64.0	57.0	116.2	76.4	95.6	71.5
18-Feb	85.0	71.6	80.5	64.9	57.0	111.3	77.2	96.4	74.7
25-Feb	84.0	70.6	80.8	64.8	59.0	111.3	75.8	97.1	73.0
4-Mar	84.0	71.2	79.9	64.8	59.0	119.7	77.5	95.2	72.9
11-Mar	86.0	71.5	80.5	64.8	59.0	114.1	77.9	96.2	73.7
18-Mar	85.0	71.7	80.3	65.5	58.0	114.8	77.4	96.6	73.8
25-Mar	86.0	70.8	81.2	66.2	61.0	110.6	75.8	96.8	76.0
1-Apr	86.0	70.3	81.5	66.5	61.0	118.3	73.1	97.5	77.1
8-Apr	86.0	72.4	81.4	66.6	61.0	121.8	78.9	98.1	76.9
15-Apr	86.0	71.4	81.9	66.7	61.0	118.3	78.6	98.6	77.8
22-Apr	86.0	71.4	82.2	67.8	63.0	114.8	79.3	99.2	78.0
29-Apr	86.0	72.0	82.1	67.2	62.0	114.8	77.7	98.6	78.0
6-May	87.0	72.2	82.3	67.5	63.0	114.8	79.8	98.4	76.7
13-May	87.0	72.1	83.2	67.8	64.0	119.0	79.6	99.7	79.6
20-May	87.0	72.4	83.8	68.5	63.0	123.2	78.7	102.0	82.1
27-May	89.0	74.7	84.1	68.7	63.0	126.7	80.4	102.1	83.2
3-Jun	89.0	74.2	84.6	68.6	63.0	119.0	81.5	102.8	82.1
10-Jun	88.0	73.6	85.0	70.2	65.0	118.3	83.0	104.7	85.4
17-Jun	90.0	74.2	85.5	70.6	66.0	118.3	80.9	104.3	84.8
24-Jun	88.0	73.1	85.4	70.5	65.0	118.3	81.9	105.2	85.2
1-Jul	89.0	74.2	85.8	70.7	65.0	122.5	79.2	107.0	85.8
8-Jul	89.0	74.1	85.7	71.7	67.0	122.5	81.1	107.0	86.8
15-Jul	89.0	74.6	86.2	71.7	68.0	123.2	81.6	109.2	88.1
22-Jul	89.0	74.8	86.2	72.0	67.0	127.4	81.3	111.6	90.7
29-Jul	90.0	75.8	86.8	72.1	67.0	127.4	81.1	112.8	90.8
5-Aug	90.0	74.9	86.9	72.6	69.0	127.4	81.2	112.4	91.1
12-Aug	90.0	75.2	87.2	72.1	67.0	131.6	81.8	114.8	91.1
19-Aug	90.0	75.3	87.3	72.3	67.0	131.6	81.0	114.6	92.2
26-Aug	91.0	75.7	87.6	71.9	67.0	131.6	80.9	113.2	90.5
2-Sep	90.0	75.1	87.2	72.3	67.0	127.4	82.8	113.4	90.3
9-Sep	91.0	75.2	87.5	71.6	66.0	128.1	80.4	113.3	90.0
16-Sep	90.0	75.1	87.7	70.8	65.0	130.9	80.2	113.8	88.9
23-Sep	91.0	74.2	87.2	70.9	66.0	130.9	82.5	113.4	88.8
30-Sep	90.0	74.8	87.5	71.3	67.0	127.4	81.8	112.8	90.3
7-Oct	90.0	74.6	87.1	70.8	66.0	127.4	82.8	112.6	89.1
14-Oct	91.0	74.8	86.5	70.7	66.0	127.4	82.2	110.7	87.7
21-Oct	90.0	75.1	86.0	70.8	65.0	127.4	80.3	113.3	89.8
28-Oct	89.0	73.7	85.0	70.7	65.0	123.9	80.1	108.9	86.3
4-Nov	89.0	74.4	85.2	69.6	64.0	125.3	83.6	110.8	87.4
11-Nov	88.0	73.2	84.4	69.5	64.0	125.3	78.3	109.0	84.6
18-Nov	87.0	72.7	83.3	69.1	64.0	132.3	79.3	108.6	85.3
25-Nov	87.0	73.3	83.0	69.0	63.0	127.4	78.2	108.3	84.4
2-Dec	87.0	73.9	82.8	67.5	63.0	123.9	77.7	107.0	81.9
9-Dec	86.0	73.0	81.8	67.3	61.0	123.9	79.7	104.0	80.3
16-Dec	85.0	72.8	81.6	67.4	61.0	119.0	79.6	102.1	79.1
23-Dec	85.0	72.0	81.0	65.3	58.0	119.0	78.4	99.4	75.2
31-Dec	84.0	71.1	80.4	65.9	60.0	123.9	77.3	100.9	76.9

KAHULUI/MAUI HI WMO No. 911900



	Mean Cooling Degree Days (°F)	Mean Heating Degree Days (°F)
JAN	239	10
FEB	220	10
MAR	265	6
APR	291	3
MAY	347	1
JUN	391	0
JUL	438	0
AUG	459	0
SEP	438	0
OCT	400	0
NOV	343	1
DEC	284	5
ANN	4114	36

KAHULUI/MAUI HI WMO No. 911900



	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	954	-600	4417	0
FEB	906	-579	3621	0
MAR	1210	-379	3966	0
APR	1527	-206	4629	0
MAY	2287	-122	5748	0
JUN	3040	-48	7041	0
JUL	3729	-20	9216	0
AUG	4204	-16	10639	0
SEP	4079	-35	9726	0
OCT	3277	-45	8806	0
NOV	2206	-104	7943	0
DEC	1331	-347	5573	0
ANN	28750	-2501	81325	0

Average Annual Solar Radiation – Nearest Available Site

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

City: KAHULUI
State: HI
WBAN No: 22516
Lat(N): 20.9
Long(W): 156.43
Elev(ft): 49

Stn Type: Secondary
SHADING GEOMETRY IN DIMENSIONLESS UNITS
Window: 1
Overhang: 1.175
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	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 Annual Solar Heat and Illumination – Nearest Available Site

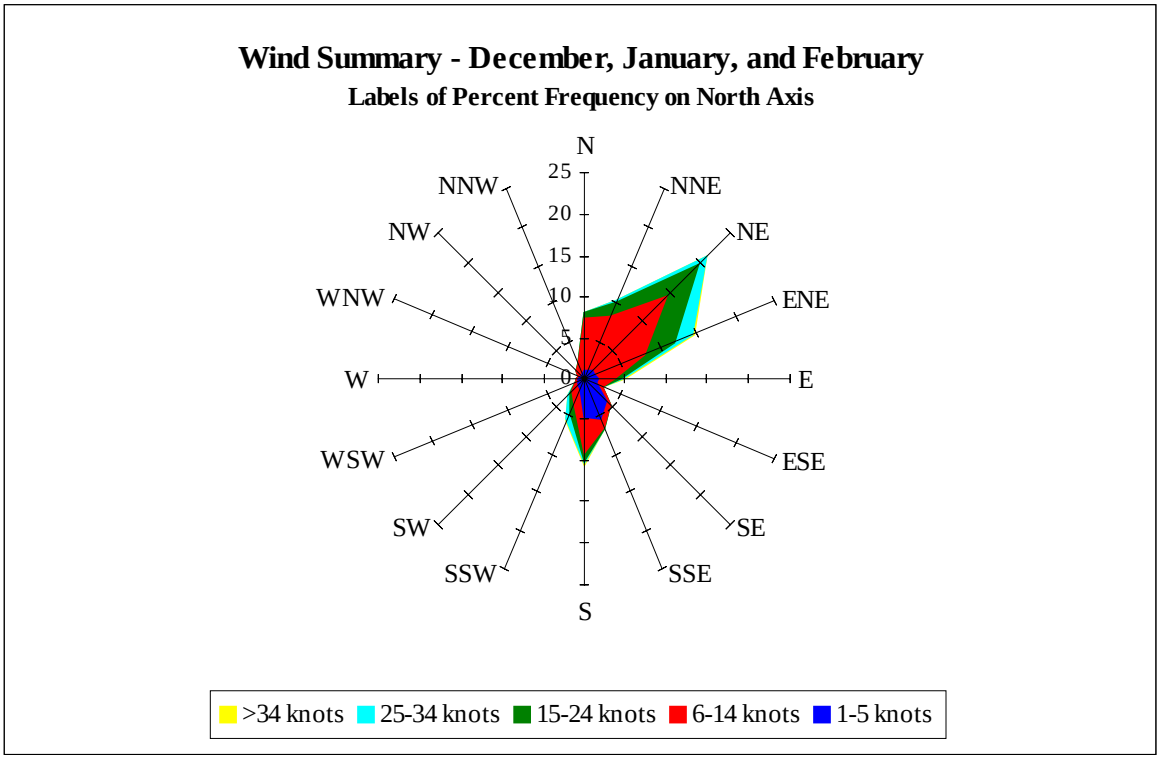
(Source: National Renewable Energy Laboratory, Golden CO, 1995)

AVERAGE TRANSMITTED SOLAR RADIATION (Btu/sq.ft./day) FOR DOUBLE GLAZING, Percentage Uncertainty = 9

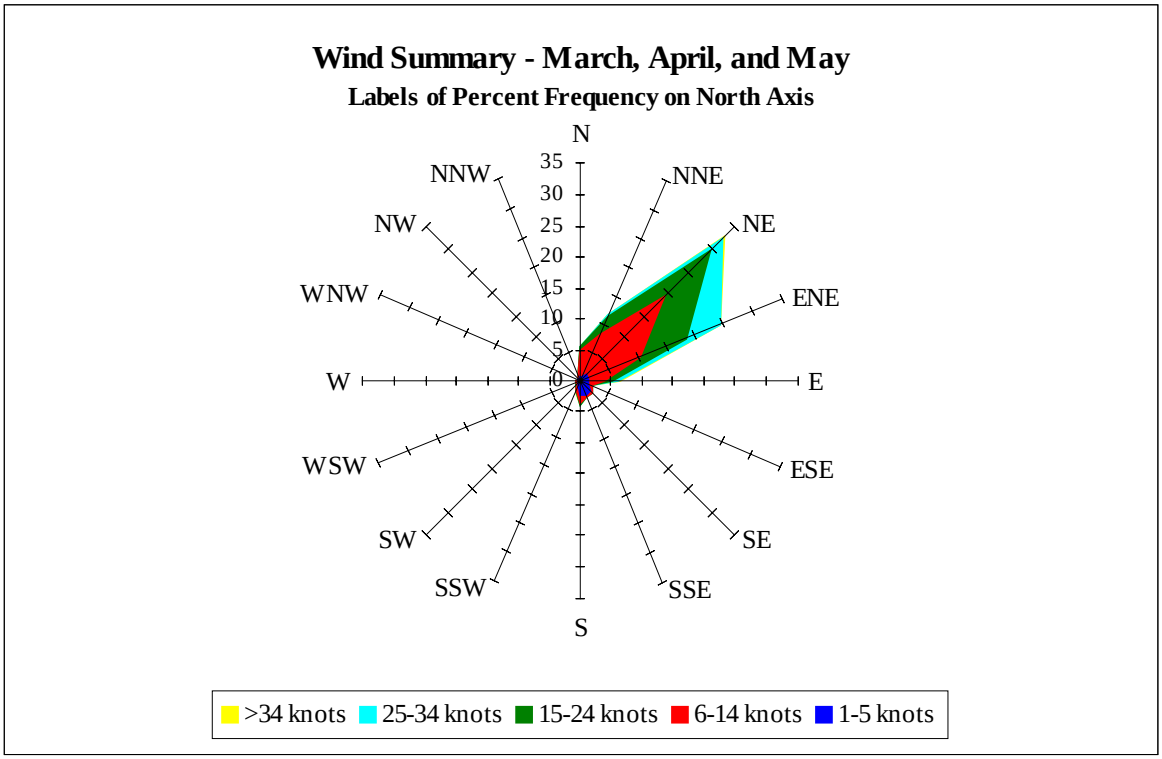
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
HORIZ	Unshaded	900	1080	1250	1370	1500	1560	1560	1520	1410	1180	960	860	1260
NORTH	Unshaded	210	240	270	300	370	440	400	310	270	250	220	200	290
	Shaded	160	190	210	230	260	290	280	240	220	200	170	160	220
EAST	Unshaded	550	640	710	760	810	810	810	810	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

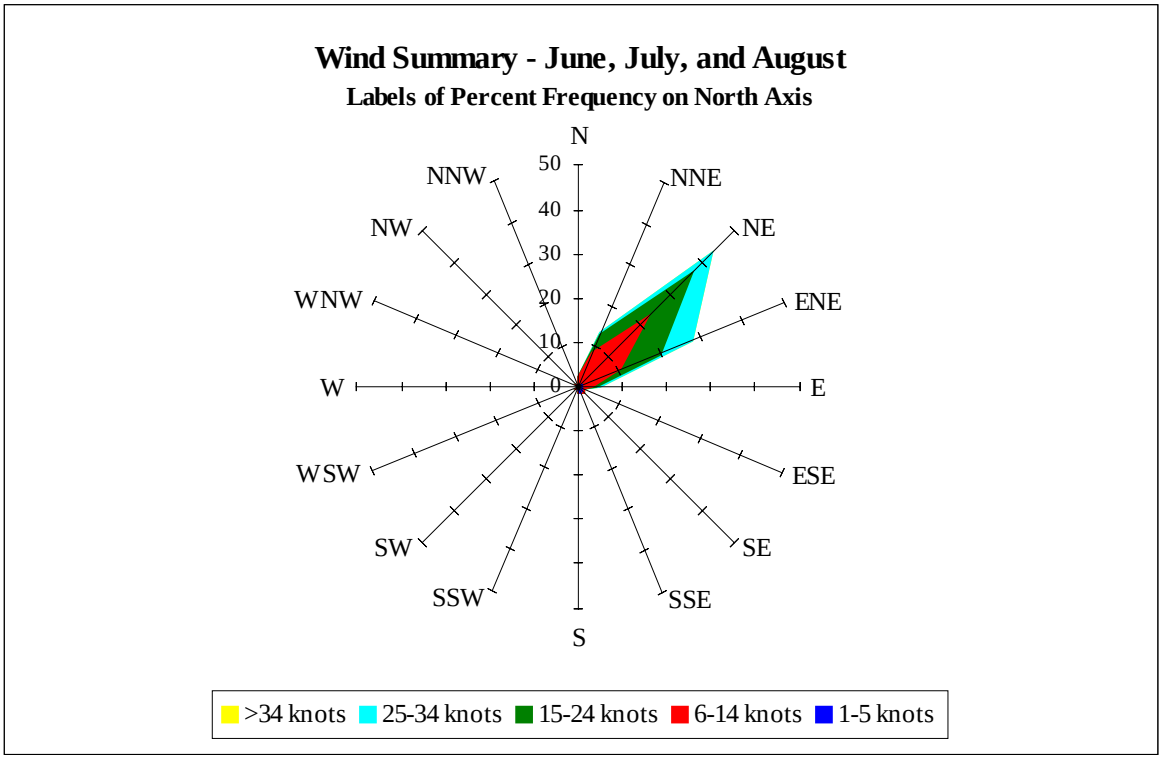
		March					June				
		9am	11am	1pm	3pm	5pm	9am	11am	1pm	3pm	5pm
HORIZ.	M.Clear	41	83	99	85	45	56	92	105	90	53
	M.Cloudy	28	56	71	60	29	43	73	86	71	40
NORTH	M.Clear	10	15	16	15	11	29	24	19	24	29
	M.Cloudy	10	17	18	17	11	24	23	19	23	23
EAST	M.Clear	80	67	18	15	11	80	61	15	15	12
	M.Cloudy	38	43	20	17	11	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



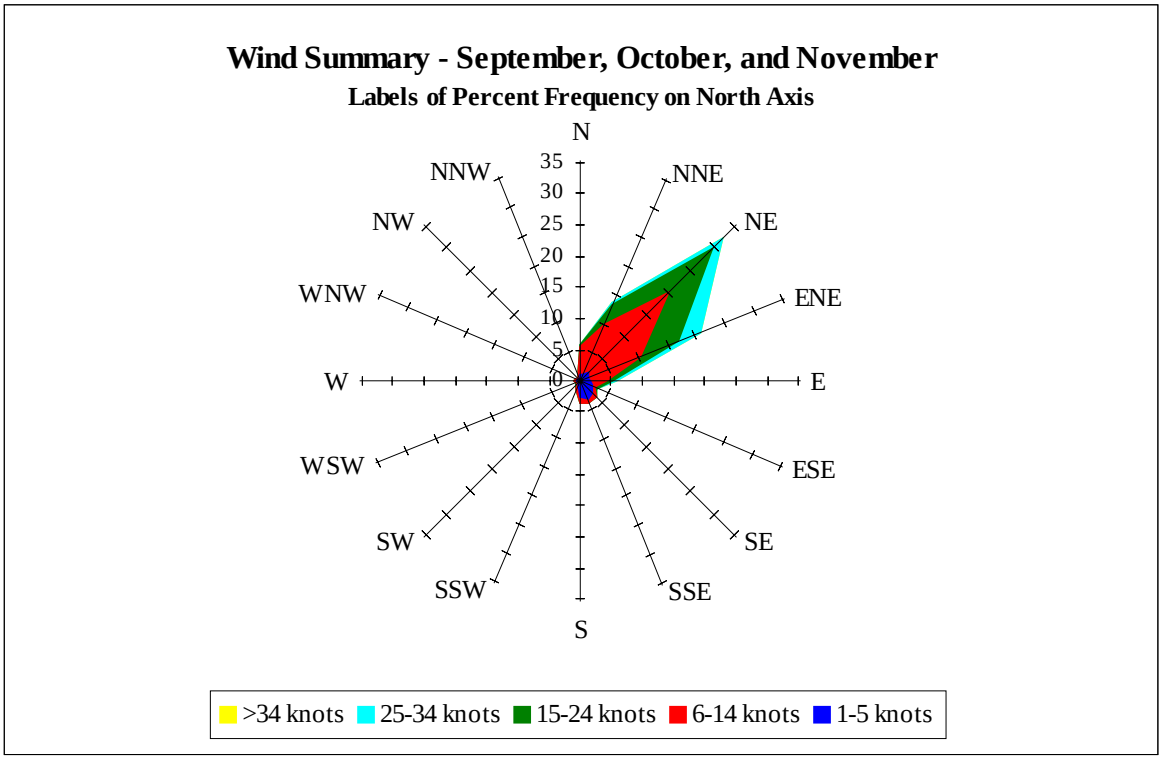
Percent Calm = 3.89



Percent Calm = 2.49



Percent Calm = 1.77



Percent Calm = 2.99