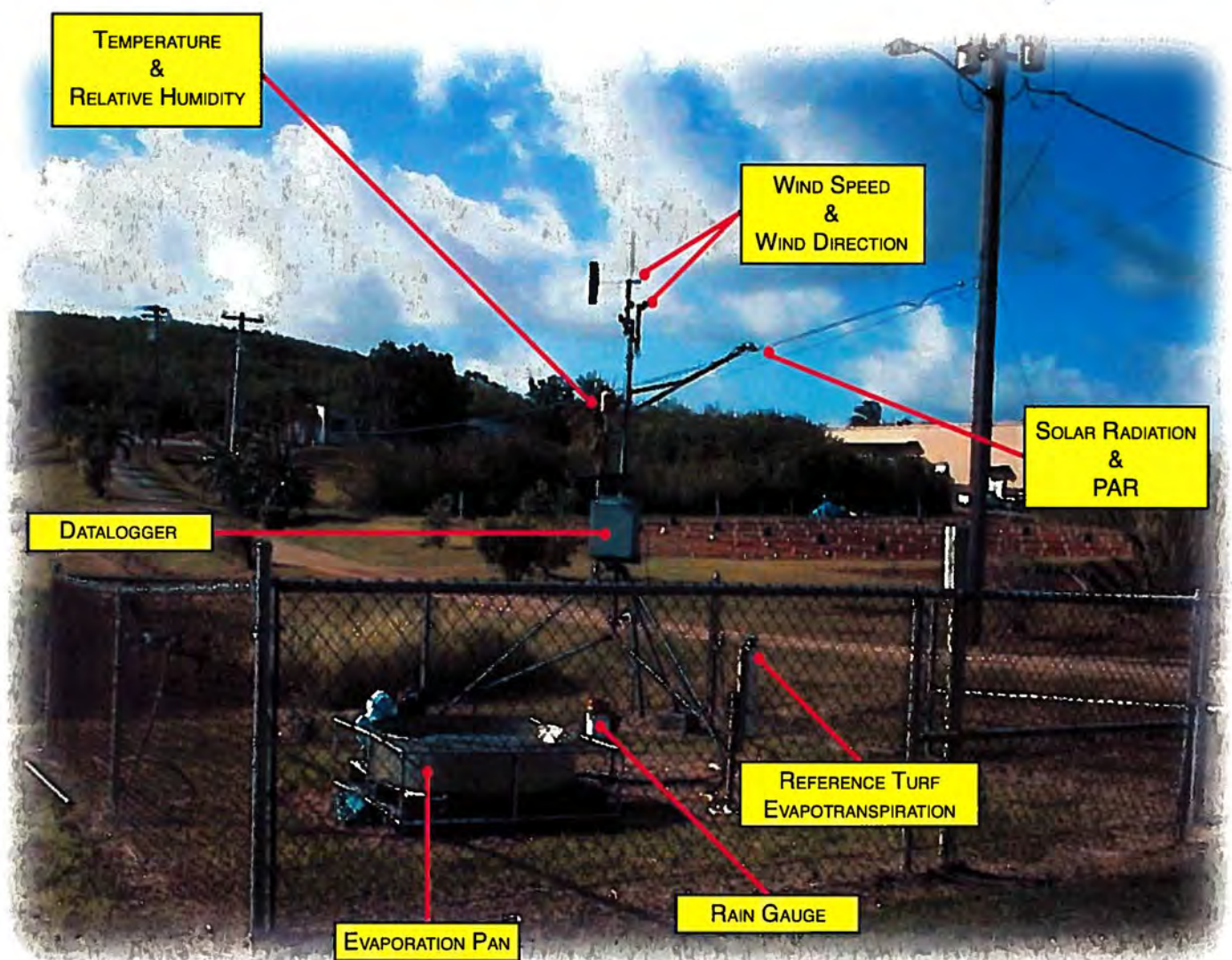


Guam Agricultural Climatic Data System

2000 Climatic Data and Summaries

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Introduction

The Agricultural Engineering division of the College of Natural and Applied Sciences at the University of Guam operates and maintains two agricultural weather stations, one located at the Yigo Agricultural Experiment Station and the other at the Inarajan Agricultural Experiment Station. These weather stations collect hourly and daily data on rainfall, wind speed, wind direction, temperature, percent relative humidity, global solar radiation, photosynthetically active radiation (PAR), pan evaporation, and atmometer evaporation for potential use by researchers, extension agents, teachers, farmers, agricultural consultants, water resource managers, and others.

The Guam Agricultural Climatic Data System (GACDS) was developed so that all divisions within the College of Natural and Applied Sciences could obtain climatic data without having to make a special request. These data can be accessed using in-house network shareware. Also, these data are presented in such a way that daily, monthly (to date), and yearly (to date) data for a given weather parameter can be viewed without having to scroll the screen, and therefore can be printed onto a single page. Unlike many weather summaries, daily data for the entire year are included. This is in response to the many requests we received, before the creation of the GACDS, for data on specific days. Finally, analysis such as number of rain days for the month can be calculated in seconds because of the way these data are formatted. Hourly data, although collected, are not included in the GACDS, as this would make the summary too lengthy.

In a few instances data had to be estimated. Where estimates could not be made, a N/A (not available) is placed in the data cell.

The GACDS (Guam Agricultural Climatic Data System)

The system comprises two agricultural weather stations and associated weather data storage, data retrieval, and data discrimination components. Automated weather stations specifically designed to gather weather data pertinent to agriculture are the bases of the system. Data are uploaded to a central location where quality control occurs. Then, data are organized in a spread sheet program. The explanation of this system follows.

Datalogger and Sensor Monitoring

Each weather station has a number of sensors for data collection. Sensor wiring terminates at, and is monitored by, a field datalogger (mini-computer) located at each weather station. Each sensor has its own program, which accommodates the electronic/mechanical features of the particular sensor. The sensor reading is placed in a memory location identified by this program.

Data Storage

The datalogger is programmable to store sensor readings as desired by the user. Typically, this program summarizes data into hourly and 24 hour averages and/or totals. These data remain in the datalogger until the storage space is full, at which time the oldest data are written over. The weather parameters on which data are stored in our weather stations are given in Table 1.

Uploading Data from Weather Station Dataloggers to Centrally Located Computer

The dataloggers can be accessed from a computer via a modem link and specialized communication program. Once a communications link is established, the user can monitor current sensor readings and/or upload data from the datalogger. The data collected are from the time of the last data collection, and are placed into a ".dat" file in comma delineated format.

From the *.dat ASCII file, data are transferred to a spreadsheet program and sorted. Here, data are checked for accuracy. Once the data has been checked, the data are put into a library. From the library file, data are transferred to another preprogrammed spreadsheet, which formats the data into the GACDS format. This spreadsheet is then copied to the in-house shareware network. The GACDS format devotes one page per sensor, which includes the daily readings for the entire year to date. Each of these sensor pages gives the name of the sensor (function of the sensor), the units used, and whether the daily readings are averages or totals. This bulletin also includes yearly graphs of monthly data for each sensor. The GACDS also includes a "Max and Min" sheet, which lists the daily maximum and minimum readings of each sensor, along with time of occurrence, for the entire year to date. For the purpose of this bulletin, the daily maximum and minimum graphs are given without the accompanying daily data table.

Degree Days

Cooling and growing degree days were calculated using daily temperature data. Cooling degree days are important for determining the amount of energy needed to cool buildings. The following fomula was used for calculations:

$$65^{\circ}\text{F} - (\text{Max T } [^{\circ}\text{F}] + \text{Min T } [^{\circ}\text{F}]) / 2$$

where: Max T is maximum daily temperature
Min T is minimum daily temperature

Values for Guam are always negative. Positive values would indicate heating degree days.

Growing degree days is an important temperature-based heat energy index used for correlating crop and insect growth. We use a base of 50°F and 60°F. The following formulas were used for calculations:

$$\{(\text{Max T } [^{\circ}\text{F}] + \text{Min T } [^{\circ}\text{F}]) / 2\} - 50^{\circ}\text{F}$$

$$\{(\text{Max T } [^{\circ}\text{F}] + \text{Min T } [^{\circ}\text{F}]) / 2\} - 60^{\circ}\text{F}$$

where: Max T is maximum daily temperature
Min T is minimum daily temperature

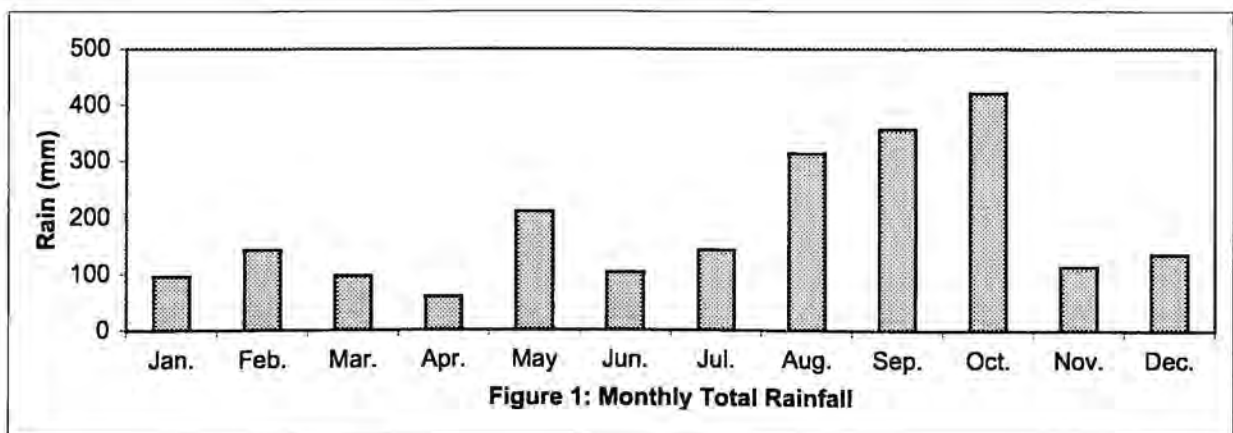
Table 1: Daily Weather Data Parameters (Sensors read every 5 seconds)

Hourly and 24 hour Output

Average Temperature
Average Humidity
Average PAR
Average Global Solar Radiation
Average Wind Speed
Average Wind Direction
Total Rainfall
Total Turf Grass Evaporation (ET Gauge)
Total Pan Evaporation

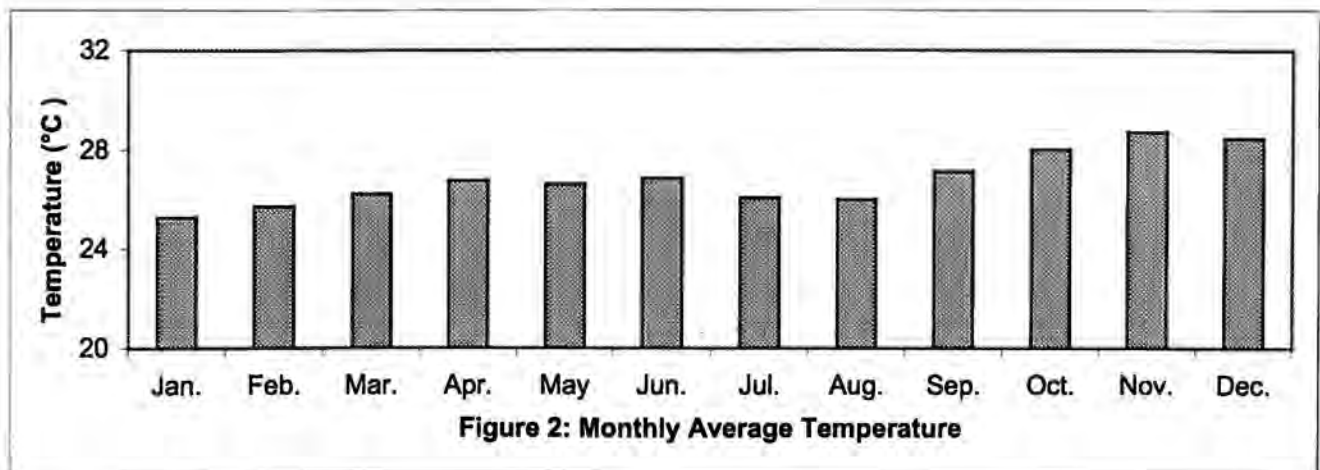
Inarajan Weather Station Daily and Monthly Total Rainfall (mm)

Day	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1	7.4	6.6	4.6	0.3	0.0	2.5	0.5	0.0	0.0	7.1	16.8	14.2
2	2.3	0.0	15.2	0.8	0.0	1.0	2.5	8.1	8.4	3.1	0.5	1.0
3	0.0	0.0	0.0	0.3	0.0	0.0	5.6	0.0	3.3	15.0	14.0	2.8
4	0.0	0.0	12.4	1.0	1.0	17.3	0.0	6.1	3.8	4.1	11.2	16.5
5	0.0	3.8	0.0	2.0	0.0	12.4	0.0	0.3	2.5	18.3	5.3	2.5
6	0.0	45.2	0.0	0.8	0.0	8.9	17.3	3.1	96.0	39.9	5.1	0.5
7	0.0	0.3	1.0	5.3	13.0	0.5	0.0	1.8	91.9	39.1	0.3	0.0
8	0.0	0.0	0.3	0.0	3.6	0.0	3.1	1.0	26.2	97.5	0.3	0.8
9	4.1	0.0	6.6	0.0	20.1	0.0	0.0	16.0	13.2	3.3	4.6	1.3
10	0.0	0.0	1.5	0.3	23.1	1.5	12.2	29.5	6.9	0.0	0.0	0.0
11	0.0	11.9	3.8	39.9	23.9	5.1	0.0	0.5	3.1	22.6	3.3	0.0
12	13.7	28.4	3.6	0.0	0.3	7.6	0.0	5.6	2.0	20.3	2.5	2.0
13	28.4	2.0	5.1	0.0	13.5	0.0	0.0	0.0	37.3	8.9	0.5	1.8
14	0.0	1.8	1.5	0.0	87.9	0.3	0.3	0.8	0.0	2.0	6.9	1.5
15	0.0	0.0	9.7	0.0	0.0	3.6	26.9	0.5	0.0	11.9	1.8	7.1
16	0.0	0.5	2.3	0.0	8.4	4.1	2.3	11.4	6.6	4.3	2.0	0.0
17	0.0	0.0	0.0	0.3	0.0	1.5	4.3	2.5	0.3	15.5	6.9	6.6
18	0.0	8.6	0.0	0.0	5.8	4.3	2.5	33.8	4.6	5.6	0.5	19.8
19	0.0	4.6	3.8	0.0	0.0	0.0	1.3	0.5	0.3	10.2	1.5	1.0
20	0.0	27.7	0.0	0.0	0.0	3.8	2.5	2.0	0.8	4.8	1.8	0.8
21	3.1	0.0	0.0	0.3	1.0	0.8	5.8	15.0	0.0	1.0	1.5	0.0
22	7.6	0.0	0.0	0.0	1.8	0.0	0.3	2.3	0.0	45.0	0.5	8.6
23	4.1	0.0	3.6	0.0	2.8	0.5	0.0	10.2	0.0	0.3	0.0	10.4
24	6.9	0.0	0.0	0.0	0.0	0.0	37.8	17.0	0.0	9.7	0.0	4.6
25	N/A	0.0	0.0	0.0	0.8	8.9	0.5	72.9	13.7	0.0	3.8	21.3
26	N/A	0.0	1.8	0.0	0.0	0.3	10.7	0.0	0.0	6.4	8.4	3.8
27	N/A	0.0	13.0	1.3	0.5	2.3	1.3	0.0	0.0	0.6	0.0	0.5
28	N/A	1.5	0.3	0.3	0.0	11.4	0.0	59.9	1.8	4.3	5.3	6.1
29	0.3	0.0	2.0	6.1	0.0	0.0	4.6	0.0	9.1	20.6	2.3	0.0
30	0.3		3.6	1.0	2.3	3.8	0.0	7.1	25.7	0.0	6.6	0.0
31	4.8		1.3		1.5		0.3	6.9		0.3		0.3
Mo.Total	95.1	143.0	96.8	59.7	211.1	102.4	142.5	314.7	357.4	421.6	114.1	135.9



Inarajan Weather Station Daily and Monthly Average Temperature (°C)

Day	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1	25.1	25.8	25.6	26.6	27.3	27.8	N/A	26.0	27.5	28.4	28.6	27.7
2	25.8	26.3	24.9	26.3	27.4	27.1	N/A	25.2	26.1	28.8	28.7	28.6
3	26.0	26.0	26.5	26.7	27.1	27.2	N/A	N/A	27.3	27.9	27.6	28.6
4	25.6	25.7	25.7	26.8	27.5	25.9	N/A	26.2	27.2	28.0	28.3	28.5
5	25.0	24.9	26.4	26.6	27.4	26.3	N/A	25.8	27.5	28.0	28.4	28.8
6	26.3	24.5	26.2	26.9	27.7	25.4	N/A	25.8	25.1	26.5	28.8	29.3
7	26.4	26.2	26.8	26.7	26.2	27.4	N/A	26.6	26.2	26.1	28.9	29.3
8	26.5	25.9	26.0	26.9	26.7	27.5	N/A	24.7	26.6	26.4	28.7	28.2
9	24.3	25.1	26.2	26.5	26.3	27.7	N/A	25.3	26.2	27.9	28.8	28.0
10	25.9	24.8	26.3	26.8	26.2	27.6	N/A	25.0	25.8	28.0	29.4	28.8
11	25.7	25.6	26.1	26.7	26.2	27.2	N/A	27.1	25.8	27.8	28.7	28.8
12	25.3	25.0	26.2	26.7	26.7	25.4	N/A	25.5	26.4	26.8	29.1	28.5
13	24.8	26.7	26.0	26.8	26.0	26.7	N/A	26.5	26.4	28.3	28.7	28.6
14	26.1	25.5	26.5	26.9	23.8	27.2	N/A	27.3	27.6	28.6	28.9	28.8
15	25.2	26.0	25.8	27.0	25.3	27.0	N/A	26.9	28.5	26.8	28.9	28.3
16	25.7	25.7	26.2	27.1	25.3	26.8	N/A	26.9	27.9	28.7	28.7	28.8
17	24.2	25.6	26.7	26.9	26.0	26.3	N/A	26.7	27.4	28.5	28.4	28.2
18	23.3	25.1	26.4	26.8	25.5	N/A	N/A	24.7	28.0	28.4	28.5	28.0
19	23.8	25.6	26.3	26.9	26.6	N/A	26.6	26.1	28.9	28.4	29.1	28.7
20	25.6	25.2	26.2	26.9	26.3	N/A	26.2	27.0	28.2	27.5	28.8	28.6
21	24.1	26.2	25.9	26.1	27.2	N/A	24.3	26.6	27.3	28.0	29.0	28.8
22	24.4	25.6	26.7	25.3	27.1	N/A	25.9	26.8	27.4	26.5	29.1	28.3
23	24.3	26.4	25.9	26.5	26.7	N/A	26.0	26.7	27.1	29.2	29.2	28.0
24	24.6	26.5	26.6	26.5	26.7	N/A	24.4	26.0	27.5	28.4	29.2	28.4
25	N/A	25.9	26.8	27.3	26.8	N/A	25.1	24.6	27.0	28.8	28.7	27.6
26	N/A	26.1	26.1	27.5	27.2	N/A	25.3	26.5	27.6	28.6	28.4	28.1
27	N/A	26.5	26.3	27.3	27.3	N/A	26.9	27.2	27.5	28.6	29.0	28.4
28	N/A	26.3	26.7	27.2	27.5	N/A	26.8	25.2	27.8	28.5	28.4	27.4
29	26.0	26.5	26.6	27.1	27.5	N/A	26.7	25.9	27.6	27.8	28.5	28.4
30	25.9		26.6	27.4	27.1	N/A	27.9	24.8	27.4	29.1	28.7	28.3
31	25.8		26.4		27.0		26.9	25.5		29.1		28.8
Mo.Avg	25.2	25.7	26.2	26.7	26.6	26.8	26.0	26.0	27.1	28.0	28.7	28.4



Inarajan Weather Station Daily and Monthly Percent Relative Humidity (%)

Day	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1	88.4	87.2	82.2	81.8	78.6	81.6	N/A	85.5	83.1	83.6	81.6	90.0
2	81.9	85.6	89.1	83.4	80.0	84.7	N/A	91.1	89.6	82.4	82.9	86.5
3	80.6	80.6	79.8	82.6	83.1	83.5	N/A	N/A	84.8	85.8	88.3	81.6
4	79.5	80.8	88.2	82.1	82.3	89.5	N/A	87.1	86.0	83.9	84.2	87.8
5	78.2	85.6	82.6	83.8	84.1	88.2	N/A	89.7	84.2	84.7	84.2	87.7
6	82.8	96.2	82.8	81.8	83.6	92.2	N/A	88.4	93.9	92.0	82.3	84.5
7	84.0	89.2	85.6	84.9	90.4	85.4	N/A	90.3	92.6	92.8	73.8	79.2
8	84.1	88.3	85.8	81.5	88.4	85.5	N/A	91.9	89.1	92.1	77.8	80.1
9	90.2	89.1	86.5	82.4	89.8	84.5	N/A	89.9	87.3	86.5	82.9	78.7
10	86.3	88.9	81.7	82.2	90.5	84.7	N/A	92.3	87.6	85.9	77.3	80.3
11	85.3	88.1	84.5	89.3	94.4	84.4	N/A	88.3	89.7	85.8	79.4	77.0
12	87.5	92.8	86.9	82.1	88.4	94.1	N/A	90.7	84.4	90.5	77.2	78.5
13	89.4	89.7	88.3	80.6	92.3	87.5	N/A	85.9	86.8	83.9	81.5	80.8
14	77.6	89.2	83.6	79.4	99.4	85.2	N/A	83.3	83.8	80.4	76.2	77.3
15	79.7	86.2	90.6	79.3	93.5	85.7	N/A	85.0	80.8	84.9	81.1	79.9
16	75.7	85.1	88.2	80.9	94.1	85.3	N/A	85.9	85.0	84.4	81.8	77.3
17	78.6	85.5	82.1	83.3	90.8	86.6	N/A	85.2	86.4	85.5	82.9	85.0
18	82.6	90.1	85.2	80.4	91.3	N/A	N/A	94.1	83.9	84.6	82.7	83.2
19	83.6	89.5	81.7	79.5	87.8	N/A	85.4	88.3	80.9	83.5	81.1	80.1
20	70.0	89.1	84.4	81.3	88.7	N/A	86.3	86.1	83.0	84.4	82.3	80.7
21	76.5	80.1	86.6	83.4	84.2	N/A	96.1	88.0	85.7	85.9	79.4	76.9
22	78.1	80.9	80.5	83.5	83.7	N/A	87.8	87.5	81.7	90.1	78.4	83.3
23	83.0	84.0	85.6	83.4	86.4	N/A	86.8	87.5	80.8	77.6	77.3	83.3
24	87.6	84.2	79.8	85.5	86.0	N/A	93.4	91.0	81.2	84.1	75.3	80.7
25	N/A	83.5	80.3	81.9	85.0	N/A	90.7	95.8	86.3	81.0	80.3	82.8
26	N/A	80.4	84.9	79.5	83.2	N/A	93.0	90.6	83.2	80.9	80.7	78.6
27	N/A	80.4	86.7	79.6	82.5	N/A	85.2	87.8	84.0	80.1	76.7	76.6
28	N/A	79.8	82.8	81.1	81.4	N/A	85.0	92.0	82.8	82.2	82.4	83.7
29	83.7	78.2	83.2	80.5	81.7	N/A	87.0	88.2	85.0	87.2	80.6	74.7
30	83.9		82.5	79.0	82.7	N/A	81.2	93.3	86.0	81.2	79.5	82.5
31	84.6		82.6		84.1		83.0	92.6		79.3		82.7
Mo. Avg.	82.4	85.8	84.3	82.0	86.9	86.4	87.8	89.0	85.3	84.8	80.4	81.3

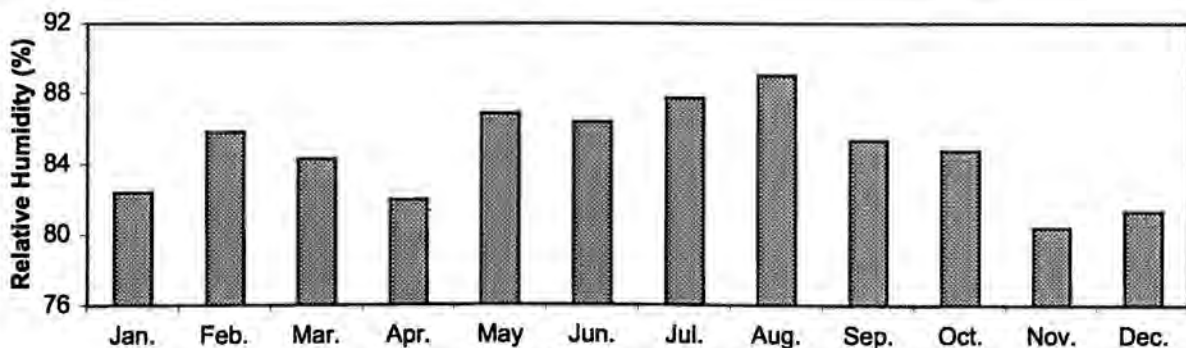


Figure 3: Monthly Average Relative Humidity

Inarajan Weather Station
Photosynthetically Active Radiation (PAR) ($\mu\text{mol/s/m}^2$)

Day	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1	288	403	361	430	472	459	383	363	392	297	318	225
2	353	385	269	389	473	438	289	240	191	368	271	336
3	353	393	470	434	256	309	323	N/A	389	366	302	288
4	372	350	367	464	438	194	289	460	280	309	208	241
5	330	171	454	452	407	293	322	368	302	250	223	287
6	288	69	465	478	432	325	326	375	34	246	333	319
7	358	411	443	479	298	468	398	329	88	241	349	358
8	359	422	470	444	353	433	355	188	197	71	341	248
9	272	445	422	470	300	442	427	253	190	304	285	329
10	354	433	416	468	379	442	416	108	149	376	358	336
11	386	316	408	379	215	359	474	367	98	267	340	285
12	383	250	406	488	237	258	390	311	241	200	343	298
13	274	427	345	475	372	408	446	435	305	302	330	313
14	370	415	425	495	66	438	389	392	393	380	259	313
15	207	402	304	492	282	452	257	365	356	239	318	265
16	382	410	383	467	277	442	245	410	395	350	318	317
17	410	440	457	436	413	437	385	313	404	337	329	259
18	342	239	406	396	343	432	331	282	360	375	322	152
19	387	368	413	455	413	466	408	366	413	325	351	265
20	405	388	470	450	411	270	376	373	397	304	296	282
21	347	456	482	490	429	444	112	367	386	354	330	298
22	391	444	477	484	424	473	483	301	341	68	330	243
23	313	429	357	481	364	481	461	315	408	358	323	292
24	304	421	470	487	382	459	177	204	379	279	336	299
25	N/A	459	479	479	428	434	262	244	273	204	177	301
26	N/A	442	423	492	422	316	369	408	382	356	129	281
27	N/A	453	465	474	431	380	345	314	372	356	336	306
28	N/A	427	455	443	434	421	439	257	411	359	287	276
29	382	455	440	485	445	405	399	431	343	171	301	305
30	322		447	465	457	447	454	265	265	348	322	274
31	363		379		440		425	126		310		311
Mo.Avg.	344	384	420	461	370	401	360	317	304	293	302	287

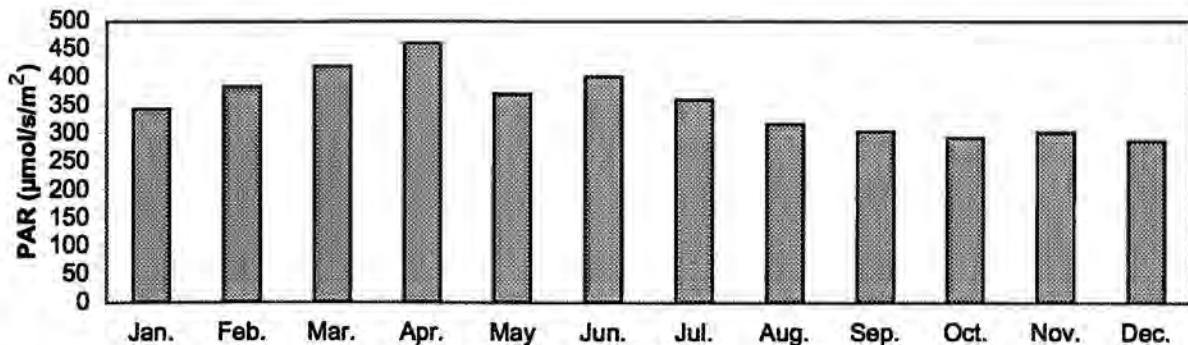


Figure 4: Monthly Average PAR

Inarajan Weather Station Global Solar Radiation (W/m^2)

Day	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1	188	247	220	275	300	288	244	239	264	209	219	151
2	234	232	159	245	302	275	181	155	125	262	184	230
3	233	240	290	273	156	190	206	N/A	265	262	207	199
4	248	214	219	295	274	115	203	306	188	219	141	164
5	217	97	278	284	254	180	236	245	203	176	150	196
6	186	36	284	304	270	201	232	253	18	173	230	220
7	230	248	273	301	182	307	277	219	55	187	246	259
8	229	255	289	281	217	283	239	123	130	47	238	170
9	166	272	258	295	165	291	285	189	127	215	194	232
10	220	262	259	296	239	290	272	69	99	268	252	238
11	241	199	256	233	131	233	309	248	62	188	237	262
12	239	146	259	309	161	161	250	208	166	138	242	211
13	165	259	218	303	232	261	290	297	213	212	231	221
14	229	253	274	315	31	281	252	264	276	269	182	223
15	124	245	191	312	173	291	164	244	249	166	222	187
16	236	254	244	293	170	286	156	278	280	247	220	226
17	266	264	296	273	256	281	260	209	267	236	230	182
18	215	138	260	248	213	276	213	186	255	266	223	104
19	239	219	266	289	258	298	268	245	291	228	246	185
20	253	236	303	284	257	166	247	249	282	208	204	196
21	214	285	311	312	269	262	70	238	276	246	231	210
22	243	276	309	313	265	305	319	199	248	42	230	168
23	189	262	221	304	220	312	304	208	296	252	226	205
24	180	257	300	308	238	293	115	131	274	192	238	213
25	N/A	285	303	304	288	274	169	157	190	140	120	213
26	N/A	274	265	312	264	196	243	271	274	250	87	198
27	N/A	279	295	302	270	240	228	206	267	247	236	217
28	N/A	265	288	280	272	267	291	169	296	250	196	193
29	230	283	278	308	260	261	264	291	244	114	206	220
30	193		286	294	287	287	302	175	186	241	223	195
31	221		237		276		252	60		212		229
Mo. Avg.	215	233	264	291	231	256	238	211	213	205	210	201

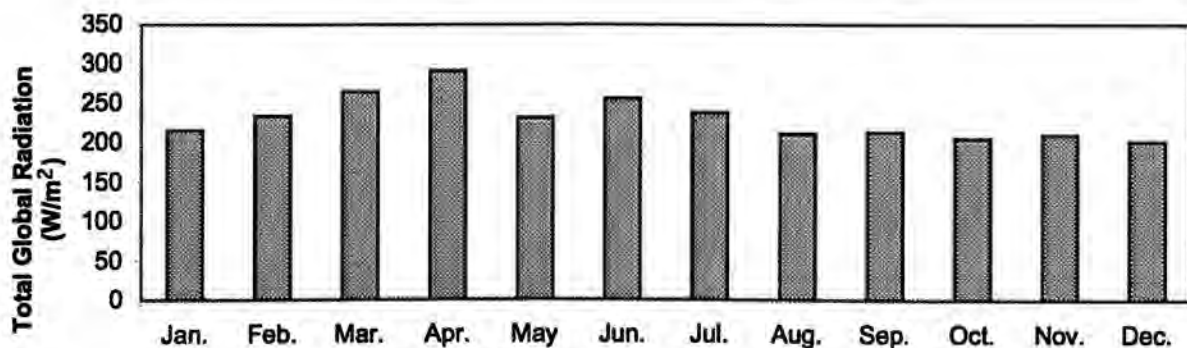
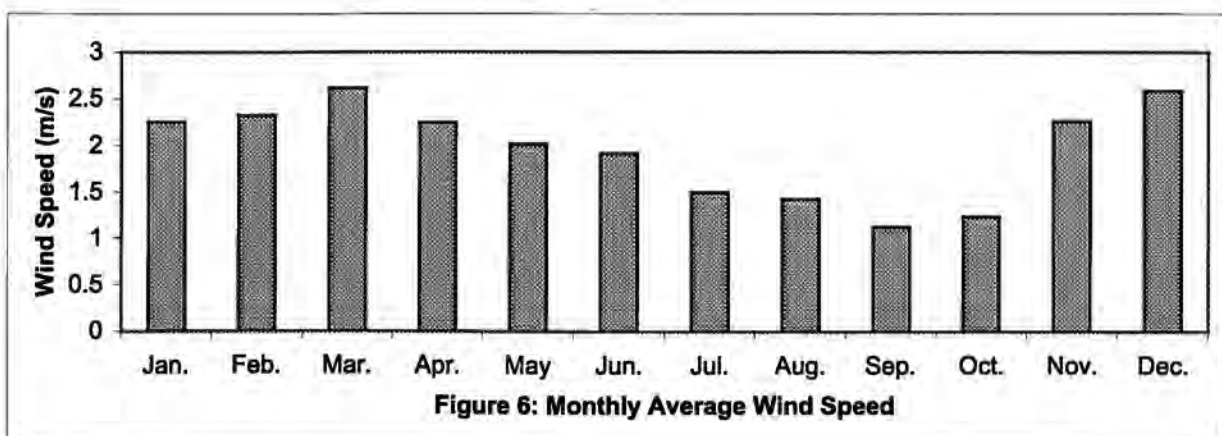


Figure 5: Monthly Average Global Solar Radiation

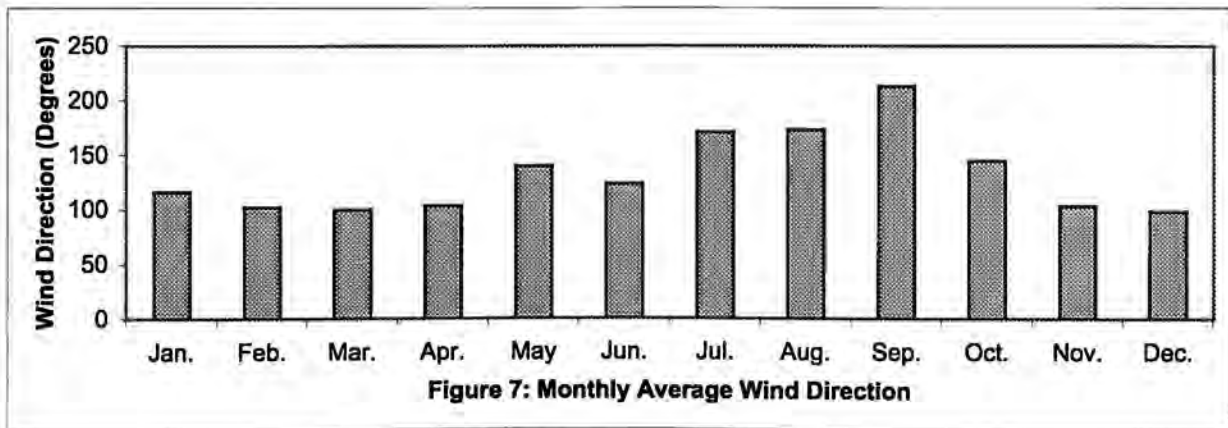
Inarajan Weather Station Average Wind Speed (m/s)

Day	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1	1.6	2.7	2.9	2.7	2.3	2.4	2.1	0.5	0.8	1.2	2.0	1.8
2	2.0	3.1	3.4	2.4	2.4	2.7	1.2	0.5	0.8	1.3	2.0	1.6
3	2.1	3.2	2.9	2.7	2.2	2.8	1.4	N/A	1.0	0.9	1.6	2.5
4	1.5	3.0	3.3	3.3	3.0	1.8	1.8	0.7	1.2	0.9	2.4	2.9
5	2.3	3.7	3.2	2.9	3.4	1.9	2.4	1.2	1.9	1.1	1.8	2.4
6	2.4	2.9	1.7	2.8	2.2	1.9	2.6	1.4	2.0	0.7	1.0	2.4
7	2.2	2.3	2.0	2.9	2.6	2.2	2.5	1.4	3.0	0.7	1.8	2.3
8	1.8	1.4	1.7	2.4	1.8	2.3	2.2	1.2	2.1	0.5	2.2	2.1
9	1.4	1.2	2.2	2.4	1.9	2.2	2.4	2.1	1.2	0.7	2.5	2.1
10	1.7	1.5	2.9	2.2	2.2	2.2	2.4	2.9	0.8	0.8	2.4	1.7
11	1.7	2.8	2.9	2.0	1.8	2.1	1.2	1.1	0.7	1.1	2.2	1.9
12	2.4	2.0	2.6	2.2	1.5	0.7	1.4	1.5	1.0	0.6	2.4	1.9
13	2.1	2.0	2.6	1.9	1.4	1.7	1.2	1.6	0.7	0.6	2.5	2.9
14	2.6	1.3	3.0	2.3	1.0	2.3	1.2	1.8	1.1	1.2	3.1	3.2
15	2.2	1.7	2.6	2.6	0.9	2.2	1.4	1.0	1.4	1.3	2.8	2.2
16	2.0	1.7	3.2	2.4	0.9	2.1	0.9	2.3	1.2	1.3	2.1	2.5
17	1.2	2.4	2.5	1.7	1.0	1.4	1.2	2.0	0.9	1.2	2.1	2.6
18	1.4	3.1	2.2	2.2	1.2	0.8	1.2	1.2	1.4	1.4	1.6	3.0
19	1.9	2.7	3.0	2.1	1.2	1.8	1.6	1.3	1.4	1.1	1.6	3.1
20	2.8	2.5	1.5	2.0	1.5	2.1	1.2	1.9	0.9	0.7	1.9	2.9
21	2.6	2.2	1.7	1.6	2.3	2.2	1.2	1.8	0.9	0.9	2.2	3.3
22	3.8	2.0	2.2	1.5	2.8	1.9	0.8	1.9	0.7	0.8	2.3	2.9
23	4.0	2.3	2.6	1.5	3.0	1.4	1.3	2.3	0.6	2.4	2.5	3.7
24	3.9	2.5	3.4	2.1	2.3	1.4	1.2	2.5	0.5	2.1	2.6	3.3
25	N/A	1.6	3.0	1.9	1.7	1.6	1.1	1.3	1.0	1.6	2.8	2.6
26	N/A	2.4	2.3	1.9	2.0	1.7	1.0	0.8	0.8	1.5	3.1	3.0
27	N/A	2.1	2.5	2.0	2.0	2.6	0.9	0.8	0.5	1.8	2.8	2.7
28	N/A	2.7	2.9	2.4	2.2	1.8	1.2	0.6	1.2	2.0	2.5	2.8
29	2.2	2.7	3.0	1.9	2.0	1.3	1.5	0.6	0.9	1.4	2.3	3.2
30	2.4		2.6	2.3	2.2	2.1	1.9	0.9	1.1	1.7	2.9	2.8
31	2.4		3.0		2.2		1.1	1.1		2.4		2.2
Mo. Avg.	2.3	2.3	2.6	2.2	2.0	1.9	1.5	1.4	1.1	1.2	2.3	2.6



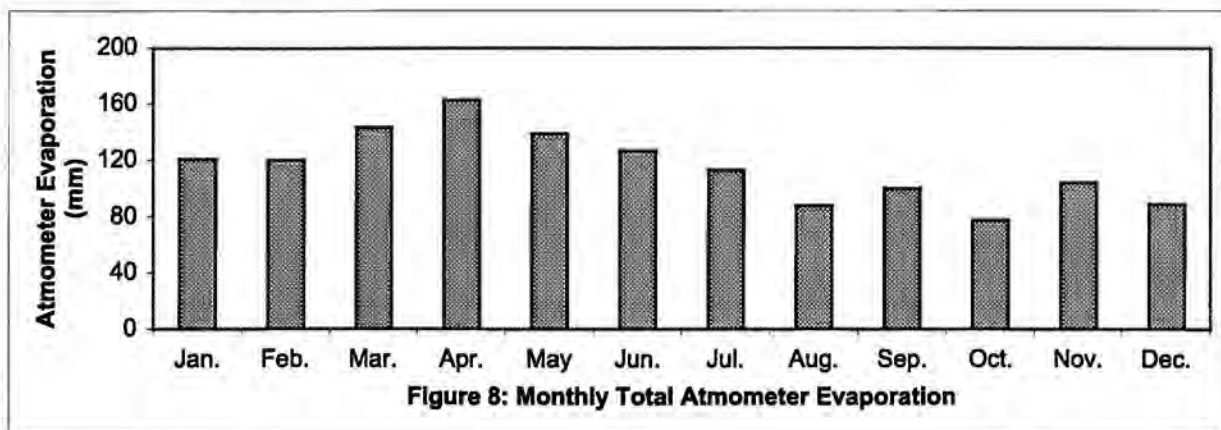
Inarajan Weather Station Daily and Monthly Average Wind Direction (0–360 Degrees from North)

Day	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1	121	85	90	98	91	109	109	222	224	132	106	136
2	101	84	91	92	93	100	182	245	274	125	98	114
3	94	85	85	92	91	124	125	N/A	269	156	151	84
4	117	87	86	105	96	120	140	232	274	167	98	98
5	89	93	91	98	112	137	90	256	268	143	131	104
6	85	91	94	95	131	154	104	229	267	217	134	100
7	93	102	122	90	111	92	110	233	227	198	102	92
8	90	120	131	94	143	133	95	265	194	180	104	114
9	192	190	90	92	175	118	87	202	185	151	94	83
10	115	162	85	93	191	85	113	175	223	164	91	112
11	93	95	86	103	210	90	163	165	192	133	103	87
12	106	97	86	93	214	206	247	179	250	194	104	109
13	117	99	87	91	212	132	183	147	240	156	107	94
14	88	132	88	91	245	111	231	104	100	122	91	91
15	107	92	121	112	251	106	249	113	131	145	91	99
16	87	118	98	99	243	100	249	100	177	132	98	104
17	197	116	93	111	187	149	218	126	208	151	105	103
18	252	90	105	93	173	223	175	192	134	149	115	102
19	192	90	99	90	149	144	206	134	105	136	100	90
20	98	92	132	92	163	105	214	108	190	209	98	90
21	157	91	157	154	93	104	283	106	230	212	93	89
22	107	103	88	179	85	96	202	112	237	153	92	92
23	92	86	90	136	94	174	209	91	246	92	91	95
24	90	90	93	157	104	124	230	113	241	95	97	91
25	N/A	124	121	100	108	135	246	154	240	102	94	91
26	N/A	91	91	92	98	119	210	162	241	120	96	89
27	N/A	86	98	92	102	89	170	135	253	114	95	89
28	N/A	87	89	91	98	96	134	220	205	111	97	93
29	85	88	102	97	90	125	122	207	203	145	108	97
30	86		97	92	94	100	88	235	168	93	119	89
31	86		115		96		154	235		93		118
Mo.Avg.	116	102	100	104	140	123	171	173	213	145	103	99



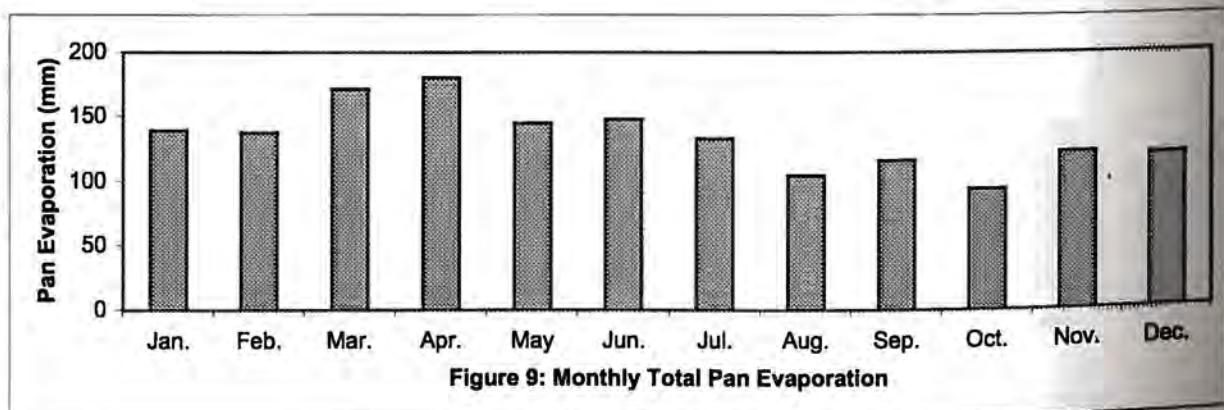
**Inarajan Weather Station
Total Atmometer Evaporation (ET Gage) (mm)**

Day	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1	2.3	4.1	4.1	5.3	5.8	6.1	3.8	2.2	3.5	0.8	2.1	0.4
2	4.1	4.3	2.0	4.3	6.1	4.6	2.5	2.0	1.3	2.0	2.6	3.9
3	4.8	4.6	5.6	5.1	3.8	4.1	3.4	4.7	3.6	N/A	3.0	3.6
4	4.8	4.1	4.7	5.1	5.3	2.3	3.3	4.3	2.6	N/A	0.8	0.5
5	4.6	2.3	6.4	4.8	5.1	3.1	4.4	3.1	2.3	N/A	1.3	2.1
6	3.8	0.0	4.9	5.3	5.6	3.8	3.6	3.4	0.0	1.5	3.5	N/A
7	4.6	4.1	5.0	4.8	2.3	5.3	5.1	2.7	0.0	0.0	5.5	1.8
8	4.1	4.6	N/A	5.1	3.3	4.3	3.4	0.9	N/A	0.0	4.1	N/A
9	1.8	4.8	4.3	5.6	2.8	4.6	5.5	2.4	N/A	2.4	2.3	N/A
10	4.1	3.6	5.1	5.3	3.6	4.4	4.8	1.2	N/A	3.0	5.3	N/A
11	4.6	2.3	4.3	3.3	1.0	4.1	4.7	3.1	0.1	1.5	5.0	2.4
12	3.1	2.9	4.0	5.8	3.3	1.7	3.4	3.0	2.2	N/A	4.0	4.0
13	2.0	2.6	3.8	5.8	4.1	4.2	3.6	4.5	4.8	1.1	4.2	2.8
14	5.1	N/A	4.8	6.1	4.1	4.3	4.1	3.8	4.5	3.7	3.7	4.5
15	2.8	N/A	3.6	6.1	3.3	4.1	3.0	3.2	4.5	2.3	3.4	3.1
16	5.1	N/A	3.7	5.6	3.3	4.6	2.1	3.2	3.4	3.4	4.1	4.2
17	5.3	4.7	5.1	6.1	5.3	4.0	3.3	N/A	5.2	2.1	3.1	2.0
18	4.1	2.8	4.4	5.1	3.3	3.7	3.6	N/A	3.7	3.3	3.3	3.8
19	4.3	3.1	6.2	5.8	5.6	4.6	3.8	N/A	5.0	3.2	4.6	2.8
20	5.6	5.6	4.3	5.3	4.8	3.1	3.5	3.8	4.5	2.5	2.6	3.7
21	3.8	4.7	5.1	5.8	5.3	4.6	1.4	4.6	5.3	3.8	4.1	4.0
22	3.8	5.3	6.1	5.8	5.1	5.3	3.7	3.9	5.3	N/A	4.2	2.3
23	3.1	5.3	3.6	5.8	4.1	4.9	3.9	3.6	4.2	4.6	4.6	4.6
24	1.8	5.3	5.6	5.6	4.3	5.0	3.3	1.6	4.2	2.7	5.2	4.4
25	N/A	5.3	6.1	5.8	5.1	4.7	2.7	0.0	1.7	2.7	1.5	5.3
26	N/A	5.3	4.8	6.4	5.6	3.4	3.6	4.7	4.2	3.0	1.5	4.6
27	N/A	5.6	5.1	5.6	5.3	4.2	3.1	2.8	4.2	3.8	6.1	4.3
28	N/A	4.8	5.1	5.3	5.6	4.5	4.0	0.0	4.0	3.8	2.3	3.0
29	4.3	5.8	4.3	5.8	5.8	4.0	4.3	N/A	2.9	0.6	3.2	4.1
30	3.8		5.1	6.1	5.6	5.0	4.5	N/A	2.4	4.3	4.0	3.4
31	4.1		3.8		5.1		3.8	1.0		4.7		3.3
Mo. Total	121.0	120.3	143.3	163.1	138.7	126.6	113.0	87.8	99.8	77.2	104.1	88.9



Inarajan Weather Station Total Pan Evaporation (mm)

Day	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1	2.6	4.7	5.5	5.6	6.6	6.1	4.2	2.6	4.1	0.9	2.4	0.5
2	4.7	5.0	3.3	4.9	6.5	5.5	2.9	2.4	1.6	2.5	3.1	4.6
3	5.6	5.3	6.9	6.1	3.7	4.5	4.0	5.5	4.3	N/A	3.6	4.2
4	5.6	4.7	5.5	6.0	6.1	2.8	3.9	5.0	3.1	N/A	1.0	0.6
5	5.3	2.6	6.3	5.6	5.8	4.0	5.2	3.7	2.8	N/A	1.5	2.5
6	4.4	0.1	5.7	6.6	4.9	4.5	4.3	4.1	0.1	1.7	4.1	N/A
7	5.3	4.7	5.9	6.2	3.3	6.2	6.0	3.2	0.1	0.2	6.4	2.1
8	4.7	5.3	N/A	5.9	3.9	5.1	4.0	1.1	N/A	0.1	4.8	N/A
9	2.1	5.6	5.0	5.8	3.2	5.5	6.5	2.9	N/A	2.6	2.7	N/A
10	4.7	4.1	6.0	5.6	4.1	5.2	5.6	1.4	N/A	3.5	6.3	N/A
11	5.3	2.6	5.1	5.5	1.2	4.9	5.6	3.6	0.2	1.7	5.8	2.6
12	3.5	3.4	4.7	6.4	3.8	2.0	4.0	3.6	2.6	N/A	4.8	4.8
13	2.3	3.0	4.5	6.0	4.7	6.0	4.3	5.3	5.7	1.3	4.9	3.3
14	5.8	N/A	5.7	6.7	4.5	5.1	4.8	4.4	5.3	4.4	4.3	5.3
15	3.2	N/A	4.2	6.3	3.5	4.9	3.5	3.8	5.3	2.7	4.0	3.6
16	5.8	N/A	4.4	5.9	2.9	5.4	2.4	3.8	4.0	4.0	4.8	5.0
17	6.1	5.5	6.1	5.4	4.6	4.8	3.9	N/A	6.2	2.5	3.6	2.4
18	4.7	3.2	5.2	5.6	3.4	4.3	4.3	N/A	4.4	3.9	3.8	4.4
19	5.0	3.6	6.1	6.3	5.2	5.4	4.4	N/A	5.9	3.7	6.4	3.8
20	6.4	6.6	5.0	5.6	4.6	3.7	4.1	4.5	5.3	3.0	8.0	4.4
21	4.4	5.5	6.1	5.6	5.6	5.4	1.6	5.3	6.1	4.5	4.8	4.7
22	4.4	5.6	6.4	5.9	5.7	6.2	4.4	4.5	4.9	N/A	5.0	2.7
23	3.5	6.1	4.8	6.7	4.9	5.8	4.6	4.2	4.9	5.4	5.5	5.4
24	2.1	5.4	6.6	6.2	4.3	5.9	3.9	1.8	5.0	3.2	6.1	5.1
25	N/A	5.5	6.7	6.5	4.8	5.5	3.2	0.1	2.0	3.2	1.7	6.1
26	N/A	6.1	5.6	6.8	5.3	4.0	4.3	5.5	4.9	3.5	1.7	5.4
27	N/A	6.3	6.2	6.5	5.4	4.9	3.7	3.3	4.9	4.5	6.0	5.2
28	N/A	6.2	6.0	5.9	5.6	5.4	4.7	0.6	4.7	4.4	2.7	3.5
29	5.0	6.7	5.1	6.5	5.8	4.7	5.0	N/A	3.4	0.8	3.8	4.2
30	4.4		6.0	6.4	5.4	5.9	5.3	N/A	2.8	5.1	4.7	4.0
31	4.7		5.3		5.5		4.5	1.2		5.5		
Mo. Total	139.2	137.7	171.4	180.2	144.9	148.1	132.9	104.1	115.8	94.1	122.5	120.1



Inarajan Weather Station
Daily Maximum and Minimum Graphs for Specified Climatic Parameters
January through December

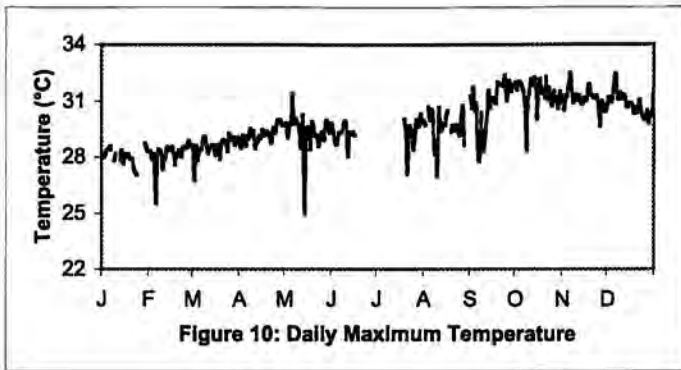


Figure 10: Daily Maximum Temperature

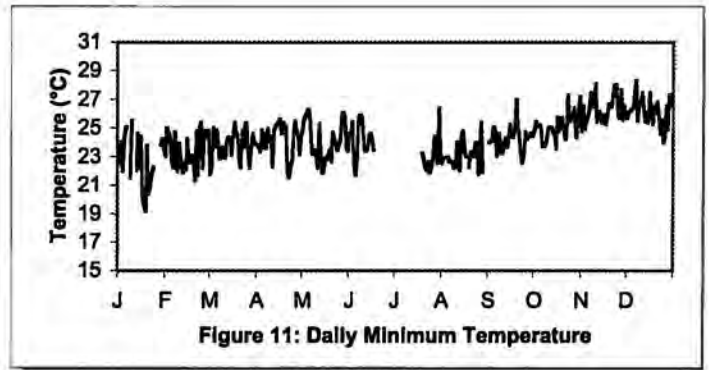


Figure 11: Daily Minimum Temperature

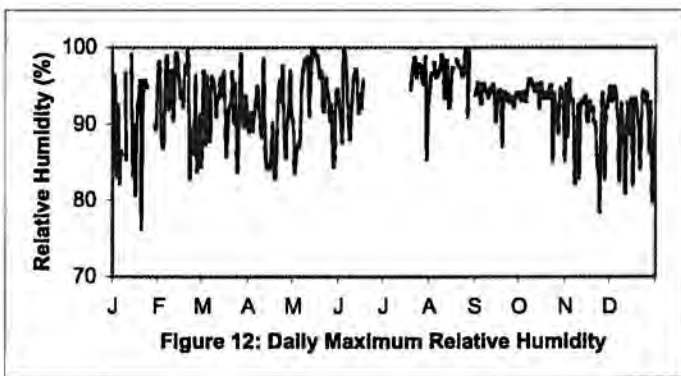


Figure 12: Daily Maximum Relative Humidity

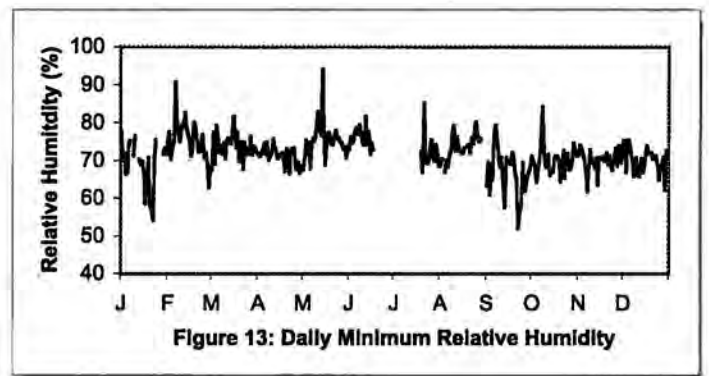


Figure 13: Daily Minimum Relative Humidity

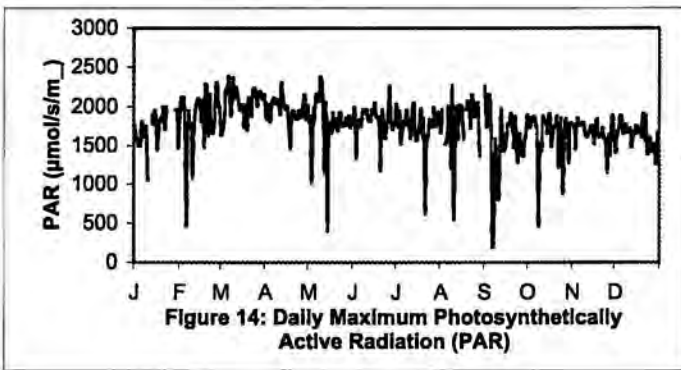


Figure 14: Daily Maximum Photosynthetically Active Radiation (PAR)

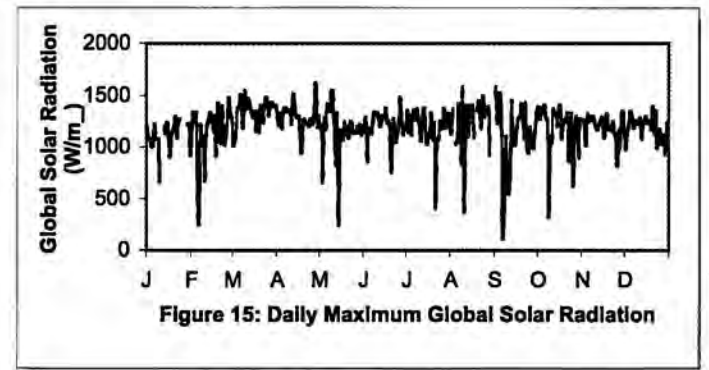


Figure 15: Daily Maximum Global Solar Radiation

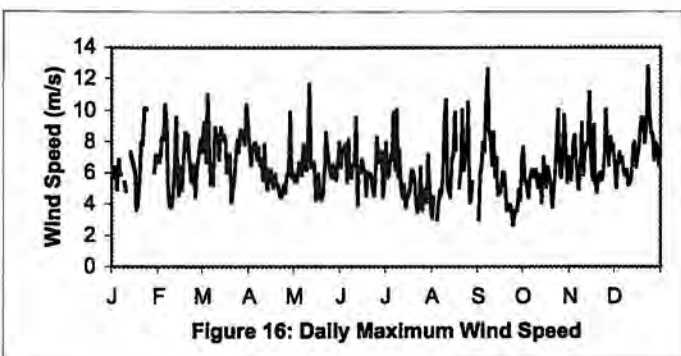


Figure 16: Daily Maximum Wind Speed

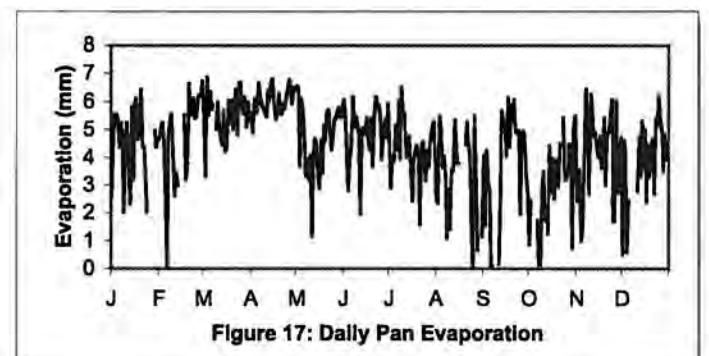
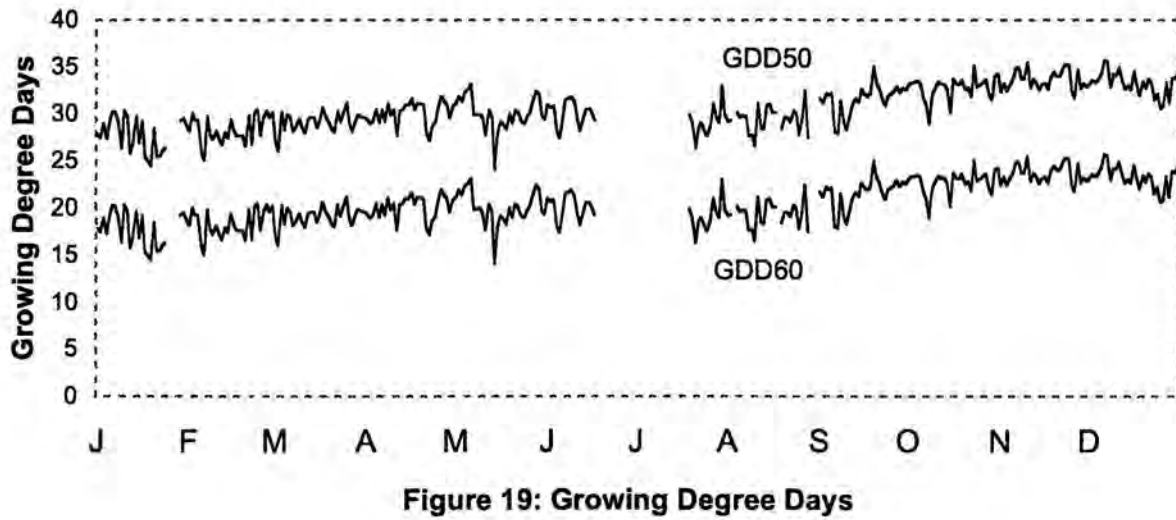
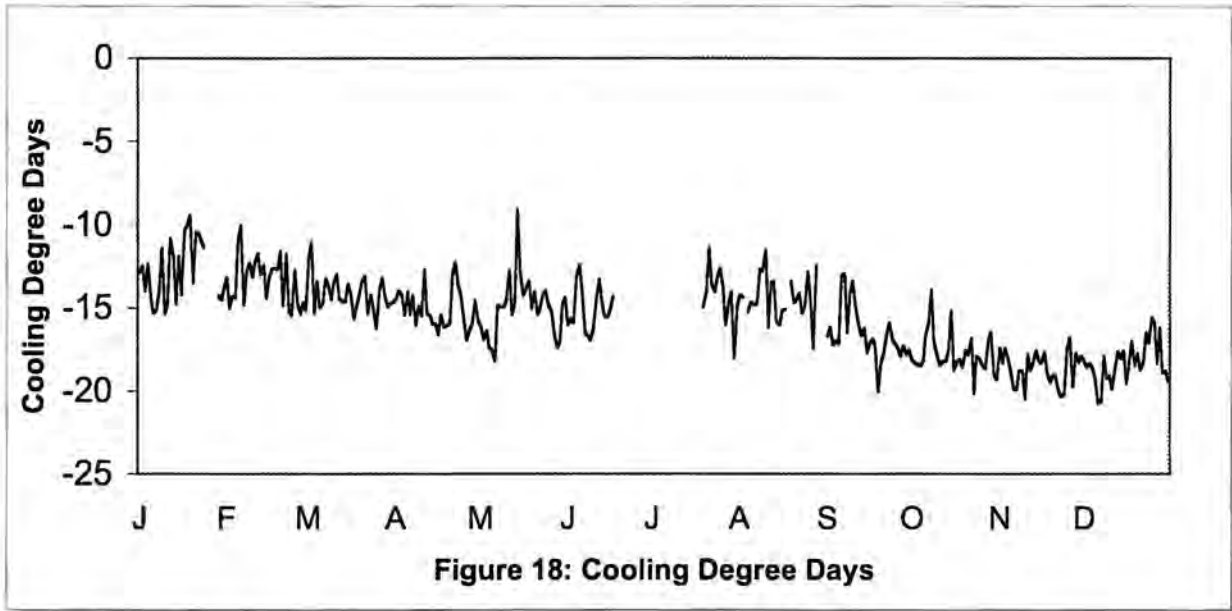


Figure 17: Daily Pan Evaporation

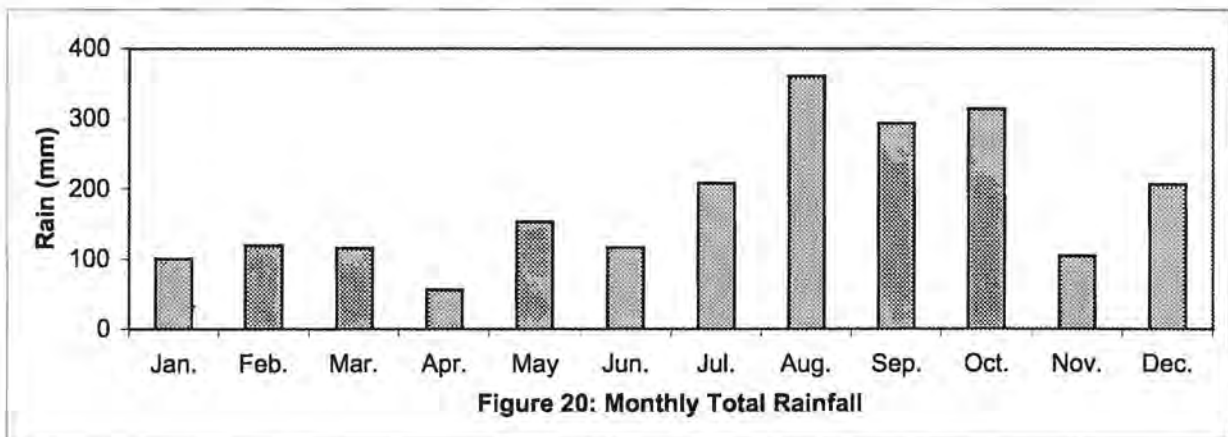
Inarajan Weather Station Degree Days Graphics with Tables



Degree Days	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Cooling	396	388	439	452	466	453	441	445	498	552	559	567
Growing (50)	861	823	904	02	931	903	906	910	948	1017	1009	1032
Growing (60)	551	533	594	602	621	603	596	600	648	707	709	722

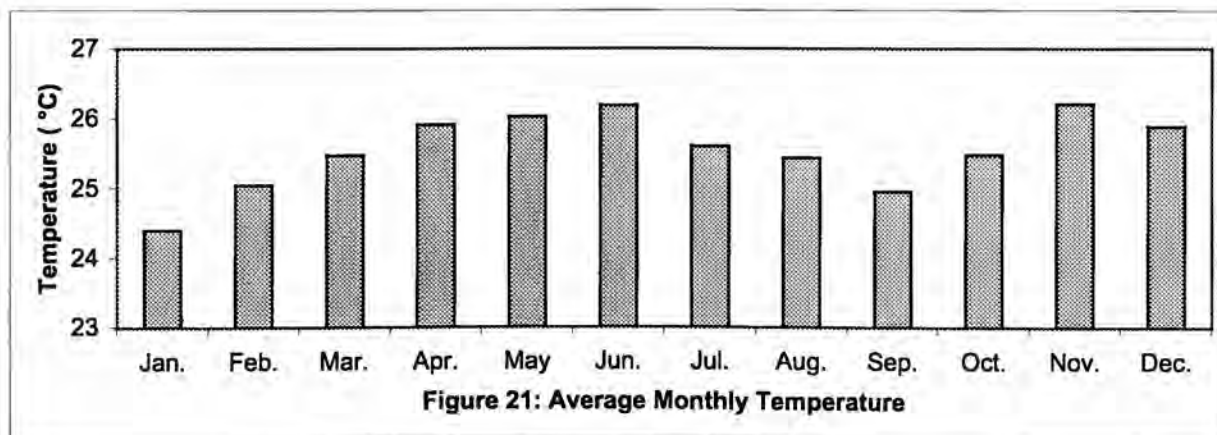
**Yigo Weather Station
Daily and Monthly Total Rainfall (mm)**

Day	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1	5.3	2.8	11.9	1.8	1.8	0.5	23.6	8.4	0.0	8.1	2.3	16.0
2	4.1	0.3	8.6	0.3	0.0	0.5	0.5	0.3	3.6	6.4	0.3	11.9
3	0.5	0.0	0.0	0.3	0.0	0.8	12.2	5.1	0.3	3.8	3.6	2.5
4	0.0	3.1	24.1	2.5	0.0	7.9	4.3	0.0	2.3	7.1	5.3	5.6
5	0.0	8.6	0.0	2.0	0.0	25.4	0.0	6.6	4.1	7.6	7.1	3.6
6	0.0	37.3	0.0	1.8	1.5	2.5	21.6	0.0	92.2	22.1	2.5	0.0
7	0.0	3.6	4.8	13.7	5.8	0.0	0.5	0.0	77.7	5.8	0.0	0.0
8	0.0	0.0	0.0	2.3	10.4	0.0	8.9	9.9	22.4	22.4	1.8	0.0
9	1.3	0.0	7.1	5.1	20.1	1.5	0.5	23.1	2.8	7.6	3.1	0.5
10	0.3	0.0	0.8	5.3	14.2	1.3	4.6	58.9	7.1	1.3	4.3	1.0
11	1.8	0.0	1.5	3.6	36.3	0.3	4.6	6.4	21.6	6.6	0.8	2.5
12	3.3	7.6	5.8	6.1	1.3	2.0	0.8	10.4	4.6	17.8	1.0	2.5
13	28.2	4.1	8.1	0.0	3.6	0.3	1.3	0.3	0.0	1.8	14.2	9.4
14	0.0	0.5	0.0	0.3	2.3	4.1	0.8	7.9	0.0	7.9	2.5	1.0
15	0.0	0.3	15.0	0.0	3.8	8.4	51.1	7.1	1.3	20.8	3.1	2.8
16	0.0	0.0	4.3	0.5	0.0	6.9	17.3	9.7	6.4	13.2	0.5	0.0
17	0.0	1.0	0.0	0.8	0.0	4.8	0.8	2.5	2.0	8.6	12.7	19.3
18	0.0	24.6	0.3	0.0	1.8	5.6	10.2	34.8	1.3	7.1	3.8	13.0
19	0.0	6.9	0.0	0.0	3.6	1.0	3.3	0.3	0.5	3.3	0.5	0.0
20	0.0	18.3	0.0	0.0	2.5	0.8	6.4	0.0	0.3	6.6	3.3	7.4
21	4.8	0.0	0.0	0.0	1.5	2.0	2.8	9.1	0.0	6.4	6.9	5.8
22	5.1	0.0	0.0	0.0	2.3	5.8	0.0	6.9	0.0	47.5	3.1	14.7
23	7.6	0.0	5.3	0.0	3.8	0.0	0.0	21.3	0.0	1.3	0.8	34.5
24	12.7	0.0	0.0	0.0	14.7	0.0	2.3	4.6	0.0	18.0	0.0	3.8
25	4.3	0.0	0.0	0.5	0.8	0.8	11.7	61.0	3.1	0.3	0.3	20.1
26	2.5	0.0	7.6	0.8	2.5	11.9	1.0	0.3	2.0	1.3	0.3	1.8
27	0.0	0.0	1.3	0.0	0.0	3.3	6.6	2.3	16.8	1.3	0.0	2.0
28	9.9	0.0	4.6	5.3	5.1	9.1	2.0	31.5	2.5	39.1	0.8	21.1
29	0.0	0.0	0.0	1.3	1.5	0.3	6.6	0.0	5.3	8.4	5.6	1.3
30	0.3		1.8	2.0	3.3	8.1	0.0	2.0	13.0	1.5	14.2	1.5
31	8.4		1.8		8.1		2.5	30.2		3.1		0.3
Mo. Total	100.3	118.9	114.8	56.1	152.7	115.8	208.5	360.7	292.9	313.9	104.4	206.0



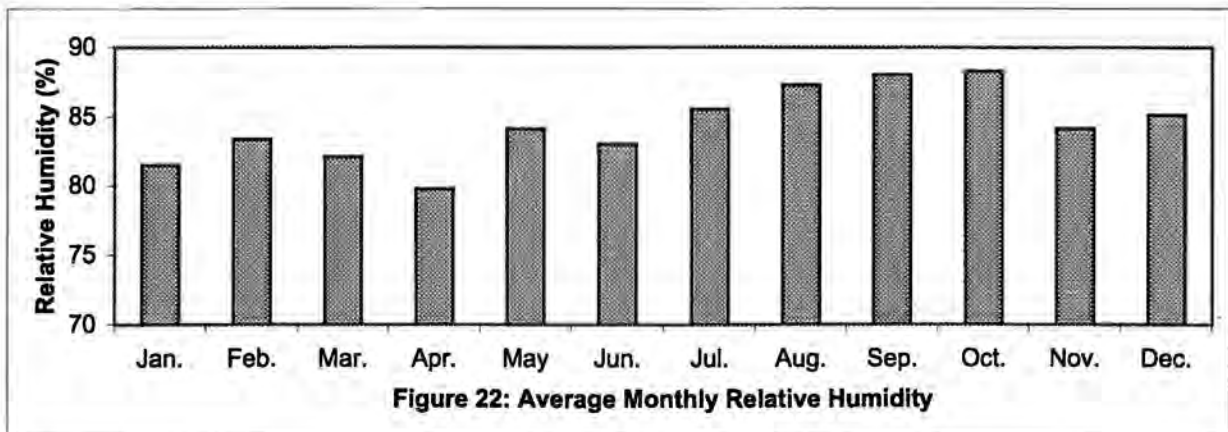
Yigo Weather Station Daily and Monthly Average Temperature (°C)

Day	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1	24.2	25.1	24.9	25.9	26.3	26.6	26.1	25.0	25.0	25.8	26.1	25.8
2	24.6	25.6	24.6	25.5	26.4	26.8	25.2	24.9	24.2	25.9	26.1	25.8
3	24.6	25.2	25.8	26.1	26.3	26.6	26.1	25.1	25.1	25.5	25.4	26.1
4	23.6	24.8	24.8	26.0	27.0	25.3	25.7	25.4	25.5	25.4	26.1	26.4
5	24.2	24.1	25.4	25.8	26.9	25.6	27.0	25.3	25.7	25.4	25.9	26.3
6	25.6	24.2	24.8	26.1	26.7	25.2	25.2	25.8	23.5	24.9	26.1	26.7
7	25.5	25.6	24.9	25.8	25.7	26.8	26.6	26.1	23.2	24.3	26.1	26.5
8	25.3	25.4	25.5	26.0	26.4	26.9	25.6	24.0	24.2	24.2	25.9	26.4
9	24.0	24.7	25.6	25.3	25.4	26.8	26.2	24.7	23.9	25.5	26.1	26.4
10	24.8	24.1	25.5	25.9	25.6	26.9	26.7	24.3	23.7	25.8	26.4	25.8
11	25.2	25.8	25.3	25.8	24.8	26.6	26.1	26.1	23.4	25.4	26.4	25.7
12	24.5	24.9	25.1	25.7	26.2	25.7	24.8	25.2	24.5	24.4	26.5	25.6
13	24.4	25.0	25.1	25.5	25.7	26.5	25.5	26.3	24.5	25.6	26.1	26.3
14	25.3	N/A	25.9	26.0	24.4	26.6	25.1	26.2	25.9	25.4	26.6	26.3
15	24.7	25.4	25.6	26.1	25.1	26.1	24.4	25.5	25.9	24.4	26.6	25.7
16	24.1	25.4	25.5	26.4	25.7	26.0	24.1	26.0	25.7	25.9	26.4	26.2
17	22.9	24.9	25.7	25.9	25.8	25.6	25.5	25.8	25.4	26.2	25.9	25.9
18	22.2	24.4	25.6	26.1	25.3	25.0	25.4	24.4	25.7	26.1	25.9	25.6
19	23.0	24.8	25.6	26.2	26.0	26.2	25.6	25.8	26.4	25.6	26.1	26.5
20	24.6	24.5	25.1	25.8	25.9	26.8	25.8	26.8	25.8	25.0	26.4	25.8
21	24.0	24.9	25.3	25.3	26.4	26.6	24.6	25.9	25.8	25.3	26.3	26.2
22	24.4	24.5	25.7	25.0	26.4	26.7	25.5	26.4	25.7	23.8	26.2	25.6
23	23.7	25.6	25.4	25.3	26.3	25.6	25.9	26.0	24.9	26.7	26.4	25.3
24	23.9	25.8	26.0	26.1	26.0	25.4	24.6	25.6	25.0	25.7	26.6	25.8
25	24.7	24.8	26.1	26.3	25.9	26.2	24.8	24.2	24.7	25.9	26.6	25.1
26	24.3	25.2	25.0	26.2	26.4	25.5	25.4	25.8	24.4	25.9	26.6	25.5
27	24.5	25.6	25.9	26.2	26.7	26.6	26.0	26.3	24.4	25.9	26.5	25.6
28	24.2	25.6	25.9	26.4	26.5	26.1	25.8	24.6	25.3	25.9	26.0	24.6
29	25.1	25.6	26.2	26.3	26.4	26.5	26.2	25.6	25.8	25.4	25.9	25.6
30	25.1		26.0	26.4	26.4	26.2	26.7	24.9	25.3	26.2	26.3	25.5
31	25.1		25.7		25.9		25.9	24.4		26.5		26.1
Mo. Avg.	24.4	25.0	25.5	25.9	26.0	26.2	25.6	25.4	25.0	25.5	26.2	25.9



**Yigo Weather Station
Daily and Monthly Percent Relative Humidity (%)**

Day	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1	88.9	84.2	78.5	78.6	77.8	80.0	84.3	87.7	87.9	88.3	85.1	91.6
2	81.6	83.4	85.2	79.9	77.9	79.9	86.4	88.8	91.3	88.6	86.2	90.8
3	80.8	77.7	77.2	79.2	80.4	80.5	83.9	87.0	88.0	87.5	90.2	85.1
4	81.9	79.1	87.9	79.4	77.2	87.2	86.3	86.0	87.3	88.5	86.3	88.7
5	80.9	84.7	83.2	81.3	79.4	86.8	79.9	87.9	87.3	89.7	87.6	90.4
6	79.8	92.3	83.6	79.5	82.3	88.6	88.3	83.8	94.5	91.2	86.7	88.0
7	82.9	88.3	84.9	83.9	86.2	83.0	80.6	83.2	94.9	90.7	79.4	84.1
8	83.7	86.5	81.8	79.6	84.9	82.5	83.8	91.2	92.3	93.1	83.9	81.3
9	87.2	86.6	84.7	83.2	89.3	83.3	80.8	89.2	89.0	88.8	87.4	81.7
10	85.9	85.6	78.9	80.6	88.9	82.0	79.6	91.4	91.8	87.8	83.5	86.8
11	84.3	82.3	83.3	83.0	92.8	81.1	83.9	85.8	94.0	88.4	82.0	84.2
12	86.6	89.1	86.9	82.9	86.9	87.9	86.2	88.2	88.2	93.7	82.1	84.0
13	84.7	88.1	85.5	80.4	88.8	83.0	84.4	83.4	87.8	86.0	86.4	84.8
14	74.8	N/A	80.4	78.1	92.6	82.8	85.3	84.1	83.8	88.1	78.1	81.0
15	75.0	85.0	87.1	76.3	90.2	83.9	90.1	89.1	85.9	89.0	83.9	83.9
16	76.2	80.0	86.2	78.2	86.7	83.8	90.6	85.7	86.7	88.4	84.3	81.8
17	79.4	84.1	80.5	81.5	86.1	85.4	85.7	83.4	88.3	87.6	87.4	87.8
18	82.4	87.9	82.8	77.7	87.4	88.6	89.3	91.0	87.3	86.6	87.7	86.1
19	81.0	88.1	78.9	75.9	85.2	83.7	85.8	86.6	84.6	87.5	86.5	82.0
20	67.8	85.6	83.7	79.2	86.8	81.2	84.6	81.9	87.1	88.9	85.6	84.9
21	71.4	79.7	84.3	79.7	83.1	81.4	92.2	86.5	84.6	90.1	83.8	80.0
22	70.7	80.2	79.4	79.2	81.6	80.8	86.0	85.2	80.7	94.9	84.3	86.9
23	79.6	82.7	81.0	81.9	82.0	82.7	82.9	86.8	84.2	80.7	82.3	87.1
24	85.1	80.3	75.8	81.6	84.4	82.0	89.6	87.9	84.6	89.1	79.6	84.2
25	86.6	83.0	77.6	80.2	83.5	80.7	88.9	93.1	89.9	87.2	81.8	85.6
26	83.7	78.9	86.0	79.2	80.9	83.9	87.3	87.4	89.5	85.6	79.4	82.6
27	88.5	78.4	83.3	78.7	78.6	80.4	86.7	87.4	90.2	84.9	79.9	81.7
28	90.4	77.0	80.9	79.6	80.7	82.6	85.6	89.7	85.4	86.8	85.6	89.1
29	83.8	75.9	77.7	78.0	81.2	79.2	84.9	85.3	84.9	90.8	84.8	79.6
30	82.1		79.3	77.4	79.9	81.6	83.0	88.7	88.8	86.5	82.5	87.4
31	83.3		79.0		83.8		85.2	92.2		82.3		85.9
Mo. Avg.	81.5	83.4	82.1	79.8	84.1	83.0	85.5	87.3	88.1	88.3	84.1	85.1



Yigo Weather Station
Daily and Monthly Photosynthetically Active Radiation (PAR) ($\mu\text{mol/s/m}^2$)

Day	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1	317	361	361	419	406	430	389	269	361	294	352	250
2	301	312	269	383	433	473	323	210	210	340	321	297
3	303	313	442	446	248	292	418	341	420	322	245	332
4	356	303	286	388	458	190	343	372	369	328	251	267
5	278	160	394	420	374	262	391	253	285	264	247	267
6	296	151	389	437	403	367	329	303	38	155	378	268
7	326	342	358	433	324	437	416	418	100	333	373	305
8	274	385	415	434	441	417	356	192	224	111	336	342
9	233	380	384	413	266	425	448	269	215	352	287	353
10	297	361	369	399	371	377	411	102	156	356	363	283
11	260	491	378	385	151	360	416	351	95	313	366	261
12	278	203	348	450	320	310	330	374	304	209	366	317
13	293	296	291	447	359	428	447	473	334	390	345	325
14	327	N/A	379	452	183	411	401	409	414	347	324	318
15	233	N/A	301	411	285	411	251	357	350	192	325	263
16	359	207	310	435	275	442	287	424	423	350	309	283
17	334	351	388	363	469	408	452	262	343	327	346	301
18	303	148	396	443	411	280	377	155	379	372	305	180
19	328	254	400	445	428	445	418	453	448	294	321	315
20	330	381	461	400	478	355	334	368	442	279	328	278
21	306	376	433	469	401	401	144	340	390	369	325	335
22	382	445	422	487	430	429	470	310	488	67	325	249
23	310	366	385	395	418	444	496	383	397	386	334	307
24	228	402	462	421	390	411	218	276	380	314	341	314
25	275	367	379	420	411	416	282	172	309	226	224	290
26	336	377	350	438	453	306	315	420	224	380	253	296
27	307	396	409	473	459	423	388	311	242	349	371	308
28	296	395	418	401	450	434	413	260	369	326	262	249
29	314	384	463	442	405	499	430	479	385	172	292	316
30	288		410	414	444	445	463	273	290	359	307	275
31	301		385		414		349	158		328		290
Mo. Avg.	302	330	381	426	379	391	370	314	313	298	317	291

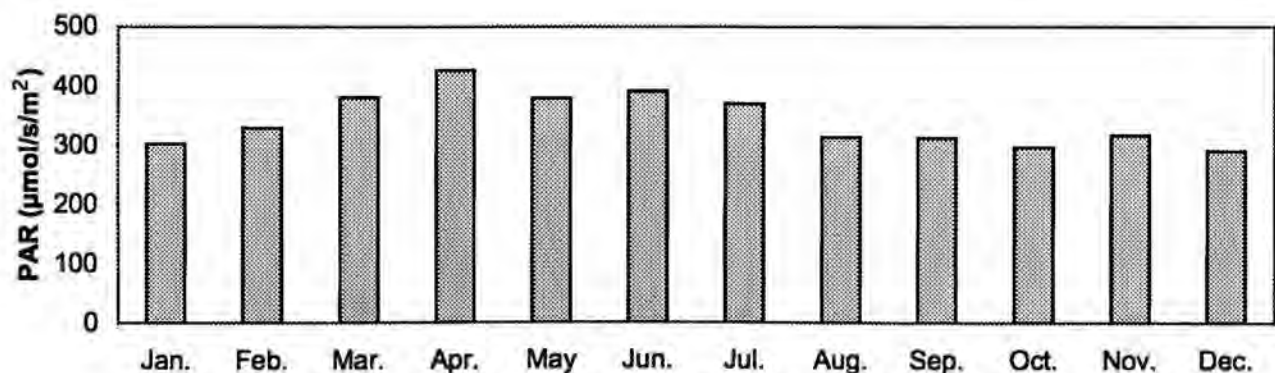


Figure 23: Average Monthly PAR

Yigo Weather Station
Daily and Monthly Global Solar Radiation (W/m²)

Day	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1	201	233	225	287	257	268	225	162	218	178	220	154
2	194	202	175	244	271	290	193	121	122	207	197	184
3	194	203	283	282	152	178	252	206	252	193	149	207
4	234	198	190	251	284	112	205	225	221	200	155	166
5	182	101	259	287	233	150	240	155	170	169	181	159
6	196	97	251	278	247	222	197	185	18	90	237	171
7	214	218	237	275	197	271	255	249	56	200	238	197
8	185	241	265	276	268	260	219	110	129	63	213	216
9	145	235	252	260	158	288	277	159	126	212	179	228
10	191	232	240	254	223	237	254	58	90	217	231	186
11	172	309	244	243	86	221	255	207	54	189	232	168
12	179	128	228	286	191	186	197	222	181	111	234	202
13	184	194	193	287	213	258	275	287	197	230	220	209
14	211	N/A	245	288	106	252	243	247	248	214	207	205
15	152	N/A	192	264	175	255	150	216	210	114	205	189
16	234	132	203	277	166	275	170	260	259	217	196	185
17	211	223	253	227	286	251	270	154	209	203	220	194
18	192	95	249	280	246	166	227	90	233	233	192	114
19	216	167	258	284	260	272	249	275	273	182	205	201
20	213	247	289	255	292	216	201	224	268	173	208	177
21	185	249	282	297	247	240	84	205	236	239	208	212
22	237	290	274	309	266	266	285	185	305	36	207	158
23	186	239	244	250	255	275	301	234	257	243	213	191
24	146	263	296	265	242	253	128	162	242	195	221	204
25	171	243	246	283	254	253	168	100	188	137	139	187
26	213	248	224	276	281	183	190	253	135	244	161	188
27	198	263	283	298	283	261	233	186	146	217	239	199
28	190	261	267	257	283	266	251	153	224	205	165	158
29	201	254	291	283	252	306	260	287	236	100	185	201
30	187		266	266	275	272	284	161	175	229	195	177
31	193		248		256		213	90		203		183
Mo. Avg.	194	213	246	270	232	240	224	188	189	182	201	185

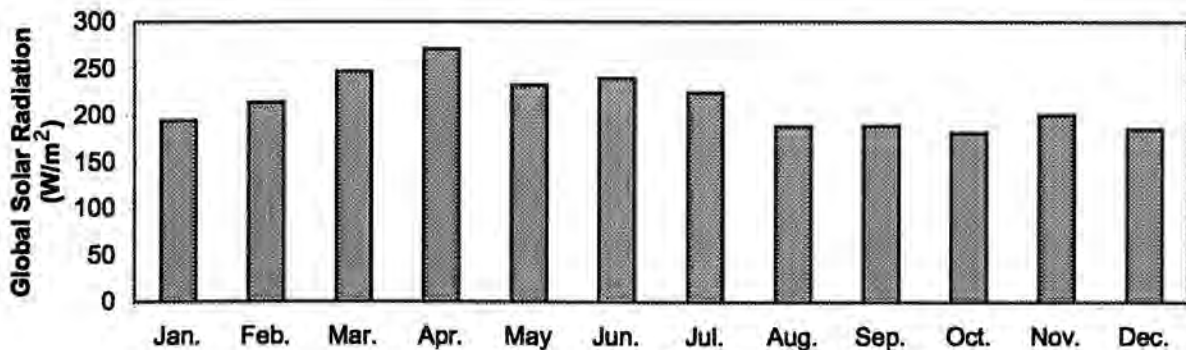
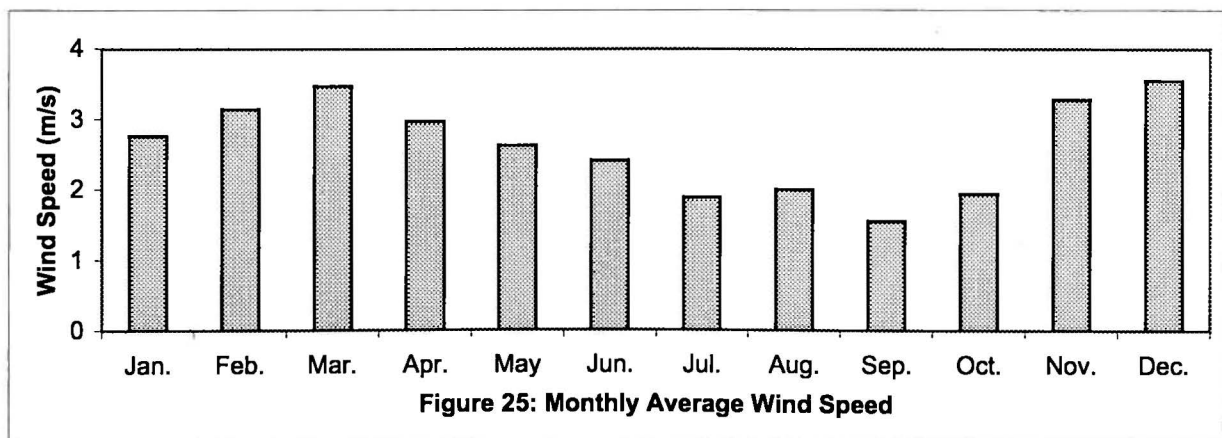


Figure 24: Average Monthly Global Solar Radiation

Yigo Weather Station Daily and Monthly Average Wind Speed (m/s)

Day	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1	1.6	4.1	4.0	4.1	2.5	2.9	2.3	0.7	0.8	1.6	3.1	2.5
2	2.7	4.9	4.9	3.5	2.4	3.5	1.7	0.8	0.9	1.6	2.5	2.4
3	2.1	4.8	4.8	4.0	2.6	3.3	2.3	0.9	1.4	1.5	2.4	3.8
4	1.5	4.3	4.8	3.9	3.3	2.4	2.2	0.9	2.1	1.5	3.5	4.1
5	2.6	4.5	3.3	4.1	3.6	2.2	3.1	1.0	2.6	1.4	3.1	3.5
6	3.5	3.9	1.6	4.4	3.7	2.1	3.5	1.2	3.4	1.3	1.8	3.3
7	2.6	2.6	2.6	4.5	3.7	3.2	3.4	1.4	3.4	1.7	2.5	3.5
8	2.3	1.8	2.0	3.7	3.5	3.1	2.4	1.4	3.0	1.3	3.0	3.2
9	1.6	1.1	3.0	3.2	3.0	3.1	3.0	3.3	2.3	1.6	3.3	3.0
10	2.4	1.6	4.0	2.8	3.8	3.2	3.1	4.8	1.1	1.6	3.4	2.0
11	2.1	3.8	4.3	2.6	2.5	2.8	1.6	2.2	1.2	2.1	3.4	2.4
12	3.0	2.9	3.8	2.5	2.4	1.1	0.9	1.8	1.5	1.8	3.3	2.5
13	3.1	2.6	3.5	2.3	2.4	2.1	1.5	2.0	1.4	1.7	3.6	4.6
14	3.6	1.8	4.3	3.3	1.5	2.8	0.9	2.1	2.0	1.5	4.9	4.9
15	2.8	2.3	3.6	3.4	0.8	2.6	1.3	1.8	1.8	1.8	4.5	3.1
16	2.2	2.2	3.7	3.6	0.9	2.4	1.3	2.6	1.9	2.1	3.1	3.6
17	0.8	3.1	2.9	2.3	1.5	1.6	1.9	2.7	1.4	1.9	3.0	4.2
18	0.7	4.1	2.8	3.0	2.3	1.1	2.0	2.2	2.0	2.4	2.1	4.5
19	2.0	3.8	3.1	3.0	2.3	2.1	1.5	1.9	1.9	1.7	2.0	5.1
20	3.3	3.2	1.5	2.3	2.2	3.0	1.4	2.5	1.3	0.9	2.7	4.3
21	3.9	2.2	1.9	1.5	2.5	3.0	1.3	2.3	1.3	1.8	3.2	4.1
22	5.1	2.5	2.5	1.5	3.8	2.5	1.4	2.7	0.9	1.4	3.2	4.0
23	5.0	3.5	3.6	1.7	3.4	1.5	1.3	3.2	0.9	3.8	3.6	3.8
24	4.8	3.5	4.1	2.1	2.5	1.6	1.7	3.7	0.8	3.3	3.8	3.5
25	3.6	1.8	3.2	2.1	1.9	1.9	1.0	3.0	0.9	1.9	4.3	3.4
26	2.3	3.1	2.9	2.1	2.3	2.2	1.6	1.9	0.5	2.0	4.7	4.1
27	2.3	3.3	3.8	2.6	3.3	3.1	1.6	1.7	0.7	2.4	3.7	3.7
28	2.3	4.1	4.2	3.3	2.9	2.1	1.6	1.3	1.0	2.7	3.7	3.3
29	3.1	4.0	4.7	2.7	2.5	1.9	2.2	1.1	1.4	1.8	3.1	3.1
30	3.3		4.0	3.2	3.0	2.1	2.4	1.2	1.6	2.6	3.7	2.8
31	3.4		4.4		2.5		1.1	2.0		3.7		3.5
Mo. Avg.	2.8	3.1	3.5	3.0	2.6	2.4	1.9	2.0	1.6	1.9	3.3	3.5



Yigo Weather Station Daily and Monthly Average Wind Direction (0–360 Degrees from North)

Day	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1	N/A	N/A	61	113	89	96	103	135	171	79	60	81
2	N/A	N/A	64	112	95	89	99	181	201	78	85	79
3	N/A	N/A	76	107	89	103	116	149	243	79	72	106
4	N/A	N/A	78	100	113	112	121	138	284	83	71	89
5	N/A	N/A	90	99	108	89	116	151	290	78	102	85
6	N/A	N/A	77	112	124	91	114	121	293	82	97	98
7	N/A	N/A	76	101	123	98	172	164	233	91	69	102
8	N/A	N/A	81	85	151	100	106	216	198	92	59	80
9	N/A	N/A	69	69	173	87	107	172	188	97	71	83
10	N/A	65	68	97	185	82	135	176	212	98	67	82
11	N/A	64	70	90	195	80	124	125	211	96	64	85
12	N/A	67	80	91	199	119	125	88	258	137	58	82
13	N/A	84	76	83	194	106	93	78	183	109	63	72
14	N/A	N/A	83	89	193	113	132	71	107	89	92	72
15	N/A	N/A	84	104	166	93	157	91	72	95	57	82
16	N/A	48	90	101	163	94	228	98	77	64	53	53
17	N/A	49	88	87	123	90	180	125	89	77	78	75
18	N/A	58	97	74	170	147	161	123	86	73	87	111
19	N/A	59	95	100	119	102	143	103	102	65	69	81
20	N/A	82	91	88	116	97	167	128	128	121	70	108
21	N/A	84	85	77	91	100	173	90	107	167	66	88
22	N/A	61	77	75	80	93	115	71	176	124	64	90
23	N/A	69	67	84	96	88	121	83	142	80	74	127
24	N/A	92	101	100	101	83	170	108	123	75	55	93
25	N/A	64	92	89	88	74	166	127	118	73	49	106
26	N/A	59	70	77	89	95	108	119	142	67	57	88
27	N/A	72	83	75	96	83	154	110	113	60	55	86
28	N/A	66	90	87	84	87	96	164	84	72	71	116
29	N/A	66	115	85	65	110	85	104	74	78	62	99
30	N/A		97	82	89	100	70	121	77	73	92	107
31	N/A		100		87		106	131		84		115
Mo. Avg.	N/A	67	83	91	124	97	131	125	159	88	70	90

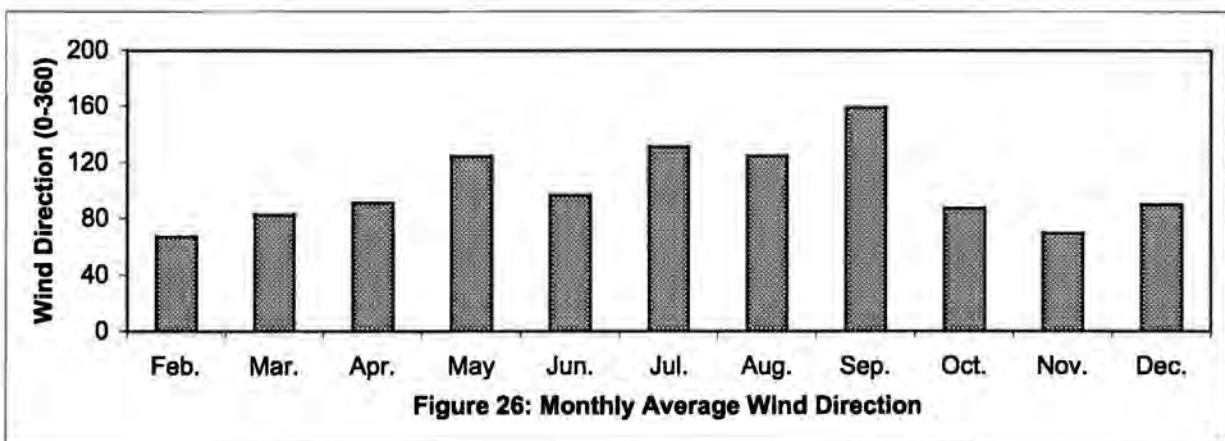


Figure 26: Monthly Average Wind Direction

Yigo Weather Station Daily and Monthly Total Atmometer Evaporation (ET Gage) (mm)

Day	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1	2.5	3.1	3.6	4.8	N/A	4.6	3.6	2.5	4.6	2.0	3.8	1.8
2	3.6	3.3	1.8	4.3	N/A	5.1	3.1	2.0	1.5	2.8	3.6	2.5
3	2.6	3.8	4.8	4.6	N/A	3.6	4.3	3.3	4.1	3.3	1.8	3.3
4	3.7	3.3	1.3	4.3	N/A	1.8	3.3	4.1	3.3	2.8	2.5	2.0
5	3.4	1.5	3.8	3.8	N/A	2.3	4.6	2.8	2.0	1.5	1.8	2.0
6	3.6	0.8	4.1	4.8	4.3	2.8	2.0	3.3	0.0	1.0	4.1	3.1
7	3.3	2.8	3.3	3.8	2.8	4.3	4.8	4.6	0.0	3.1	4.6	3.8
8	3.0	3.6	4.3	4.6	4.1	4.6	2.5	1.0	0.8	0.5	3.6	4.3
9	1.4	3.8	3.1	3.8	1.8	4.3	4.6	1.5	1.5	3.8	2.0	2.5
10	3.5	3.3	3.8	4.3	2.8	4.1	4.3	0.5	1.0	3.8	3.6	N/A
11	2.3	2.8	3.1	3.6	0.0	3.8	4.6	3.3	0.0	2.8	4.6	N/A
12	2.9	1.5	1.8	4.3	2.8	2.8	3.1	3.1	2.0	0.8	4.1	N/A
13	2.4	2.3	1.5	5.1	2.8	4.8	4.6	4.8	3.6	4.1	3.1	3.1
14	3.6	N/A	4.1	4.8	1.3	4.1	4.3	3.6	4.6	3.1	4.6	3.8
15	3.2	N/A	2.0	5.1	1.8	3.8	2.0	2.5	3.6	1.5	3.3	2.3
16	1.6	1.8	2.3	5.1	3.1	4.3	2.3	3.6	4.1	3.1	N/A	3.8
17	2.6	3.3	4.1	3.8	4.8	4.1	4.1	2.8	3.1	3.3	3.3	2.6
18	2.0	1.0	3.8	5.1	3.6	2.3	3.3	1.3	3.1	4.1	2.8	1.8
19	3.5	1.5	4.3	N/A	4.3	4.6	3.8	4.1	5.1	2.5	3.8	4.1
20	4.2	3.3	4.6	N/A	4.3	3.8	3.8	4.3	4.6	2.5	4.1	2.5
21	2.3	4.3	4.1	N/A	4.1	4.1	0.8	2.5	4.6	3.3	0.0	4.3
22	4.7	4.1	4.3	N/A	4.1	4.8	4.6	2.8	6.4	0.0	3.3	2.0
23	4.7	3.6	3.6	N/A	4.1	4.8	5.6	3.3	4.8	4.8	3.8	2.8
24	5.4	4.3	5.1	N/A	3.8	4.6	1.5	1.3	4.6	2.5	4.6	3.6
25	1.9	3.8	4.6	N/A	4.3	4.3	2.3	0.5	2.8	2.8	3.1	2.8
26	3.2	4.1	2.3	N/A	4.8	2.8	3.1	4.1	2.0	4.1	4.1	3.1
27	2.8	4.6	3.8	N/A	5.1	4.3	3.6	2.8	2.3	3.6	4.6	3.6
28	2.0	4.6	3.8	N/A	4.6	4.1	4.1	2.3	4.3	3.3	2.8	0.8
29	3.1	4.3	4.8	N/A	4.1	5.6	4.3	4.8	4.3	1.5	2.5	3.8
30	3.1		3.1	N/A	4.8	4.6	4.6	2.5	2.3	3.6	3.6	2.3
31	3.3		3.1		3.6		3.8	0.8		3.8		3.3
Mo. Total	95.4	90.6	107.7	132.9	109.3	119.6	111.0	86.6	90.7	85.6	100.4	90.3

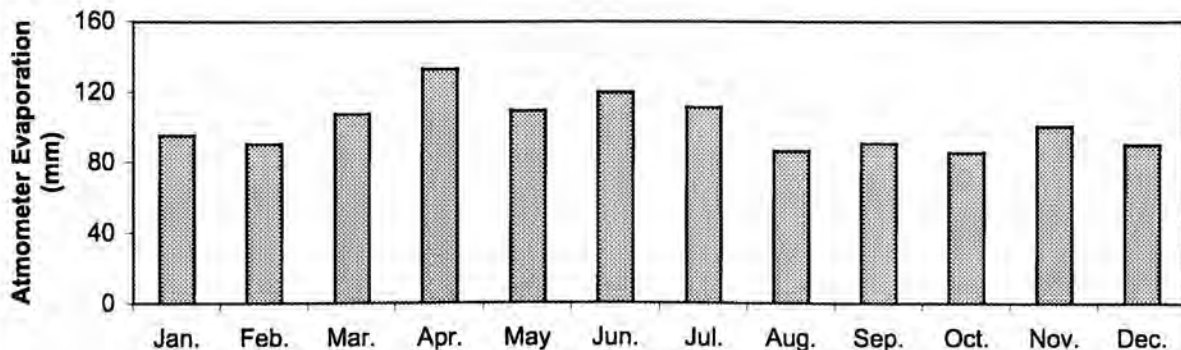


Figure 27: Monthly Average Atmometer Evaporation

Yigo Weather Station Daily and Monthly Total Pan Evaporation (mm)

Day	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1	3.1	5.0	4.2	5.7	N/A	5.4	4.1	2.9	5.3	2.3	4.4	2.1
2	4.5	4.9	2.1	5.1	N/A	6.1	3.5	2.3	1.8	3.2	4.1	2.9
3	3.2	5.9	5.7	5.4	N/A	4.2	5.9	3.8	4.7	3.8	2.1	3.8
4	4.5	2.5	1.5	5.1	N/A	2.1	3.8	4.7	3.8	3.2	2.9	2.3
5	4.2	2.1	4.5	4.5	N/A	2.7	5.3	3.2	2.3	1.8	2.1	2.3
6	4.4	0.9	4.8	5.7	5.1	3.3	2.3	3.8	0.0	1.2	4.7	3.5
7	4.1	3.3	3.9	4.2	3.3	5.1	5.8	5.3	0.0	3.5	5.3	4.4
8	3.7	4.0	5.1	5.4	4.8	5.4	2.9	1.2	0.9	0.6	4.1	5.0
9	1.7	4.5	3.6	4.5	2.1	5.1	5.3	1.6	1.8	4.4	2.3	2.9
10	4.3	3.9	4.5	5.1	3.3	4.8	5.0	0.6	1.2	4.4	4.1	N/A
11	2.8	3.3	3.6	4.2	0.0	4.5	5.3	3.8	0.0	3.2	5.3	N/A
12	3.6	1.8	2.1	5.1	3.3	3.3	3.5	3.5	2.3	0.9	4.7	N/A
13	3.0	2.7	1.8	6.1	3.3	5.7	5.3	5.6	4.1	4.7	3.5	3.5
14	4.5	N/A	4.8	5.7	1.5	4.8	5.0	4.1	5.3	3.5	5.3	4.4
15	4.0	N/A	2.4	6.1	2.1	4.5	2.3	2.9	4.1	1.8	3.8	2.6
16	2.0	2.1	2.7	6.1	3.6	5.0	2.6	4.1	4.7	3.5	N/A	4.4
17	3.2	3.9	4.8	4.5	5.7	4.7	4.7	3.2	3.5	3.8	3.8	2.9
18	2.5	1.2	4.5	6.1	4.2	2.6	3.8	1.5	3.5	4.7	3.2	2.1
19	4.3	1.8	5.1	N/A	5.1	5.3	4.4	4.7	5.8	2.9	4.4	4.7
20	5.2	3.9	5.4	N/A	5.1	4.4	4.4	5.0	5.3	2.9	4.7	2.9
21	2.8	5.1	4.8	N/A	4.8	4.7	0.9	2.9	5.3	3.8	0.0	5.0
22	5.8	4.8	5.1	N/A	4.8	5.6	5.3	3.2	7.3	0.0	3.8	2.3
23	5.8	4.2	4.2	N/A	4.8	5.6	6.4	3.8	5.6	5.8	4.4	3.2
24	6.7	5.1	6.1	N/A	4.5	5.3	1.8	1.5	5.3	2.9	5.3	4.1
25	2.4	4.5	5.4	N/A	5.1	5.0	2.6	0.8	3.2	3.2	3.5	3.2
26	4.0	4.8	2.7	N/A	5.7	3.2	3.5	4.7	2.3	4.7	4.7	3.5
27	3.4	5.4	4.5	N/A	6.1	5.0	4.1	3.2	2.6	4.1	5.3	4.1
28	2.7	5.4	4.5	N/A	5.4	4.7	4.7	2.6	5.0	3.8	3.2	0.9
29	3.9	5.1	5.7	N/A	4.8	6.4	5.0	5.6	5.0	1.8	2.9	4.4
30	3.6		3.6	N/A	5.7	5.3	5.3	2.9	2.6	4.1	4.1	2.6
31	4.2		3.6		4.2		4.4	0.9		4.4		3.8
Mo. Total	118.0	110.3	128.2	158.2	130.1	139.8	127.6	99.6	104.3	98.4	115.4	103.8

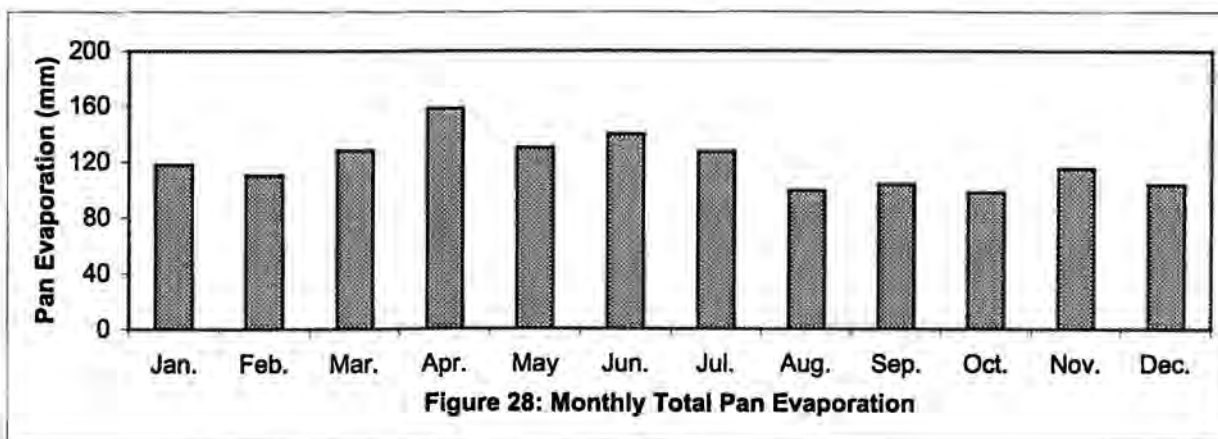
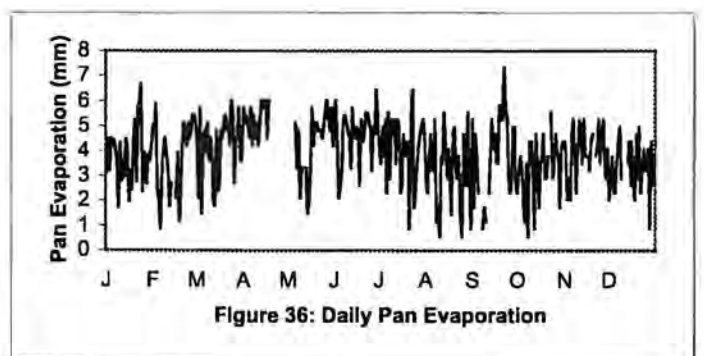
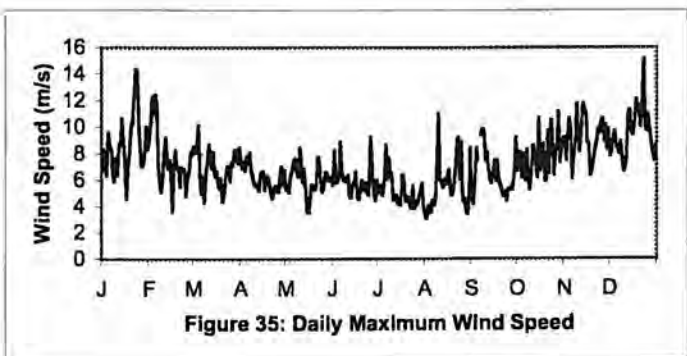
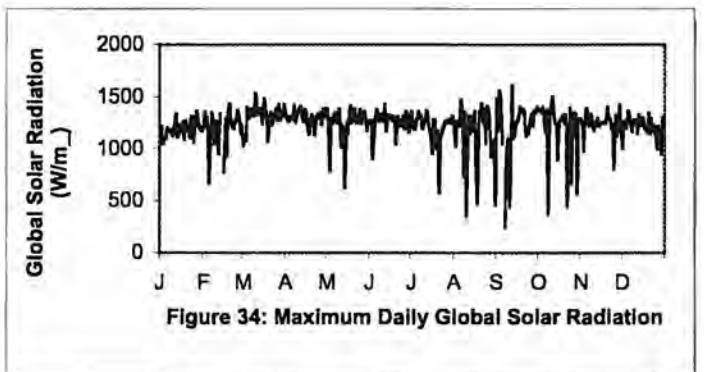
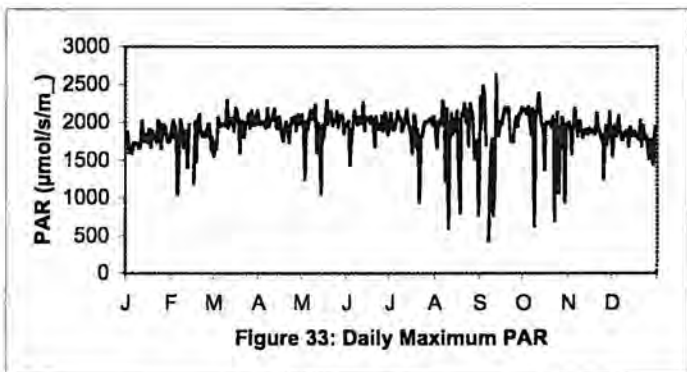
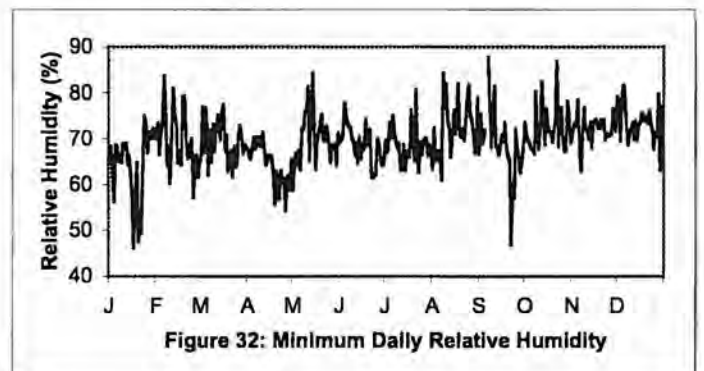
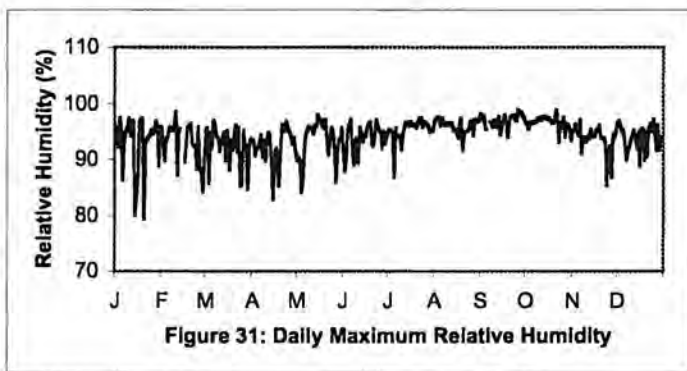
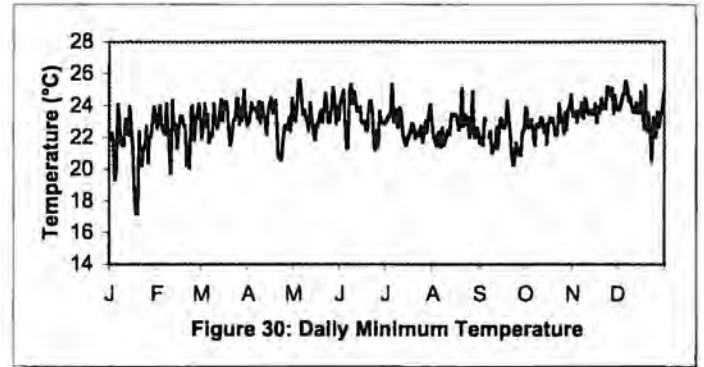
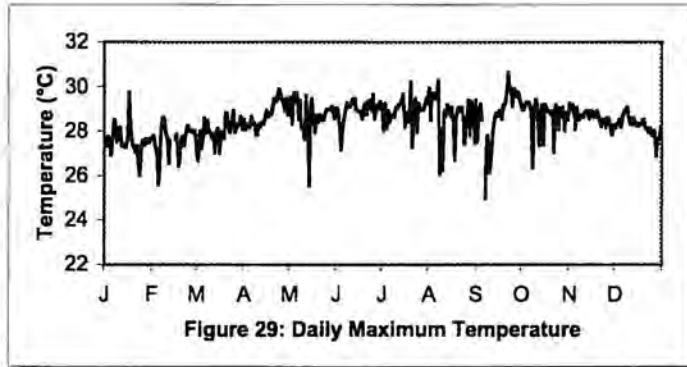
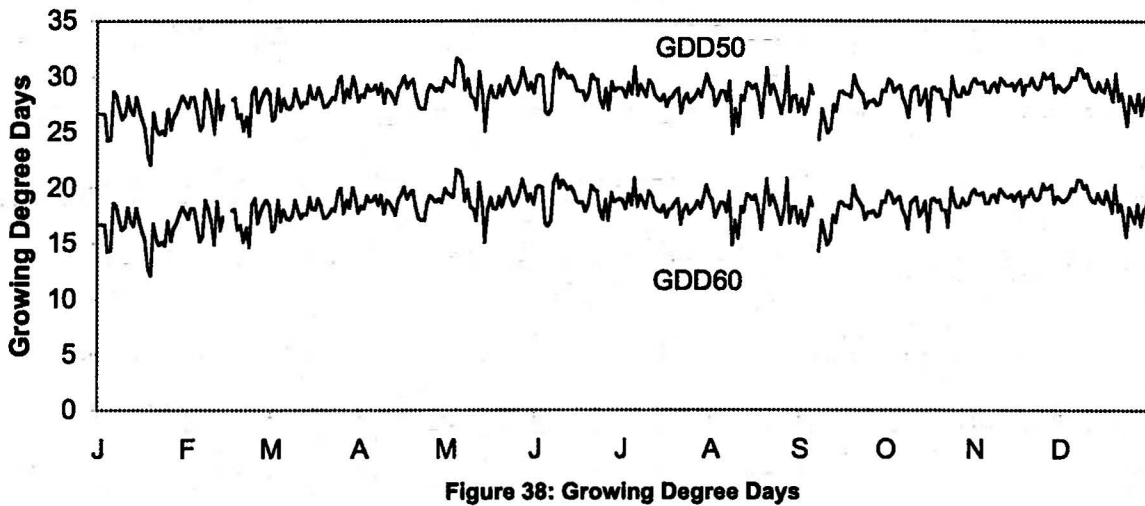
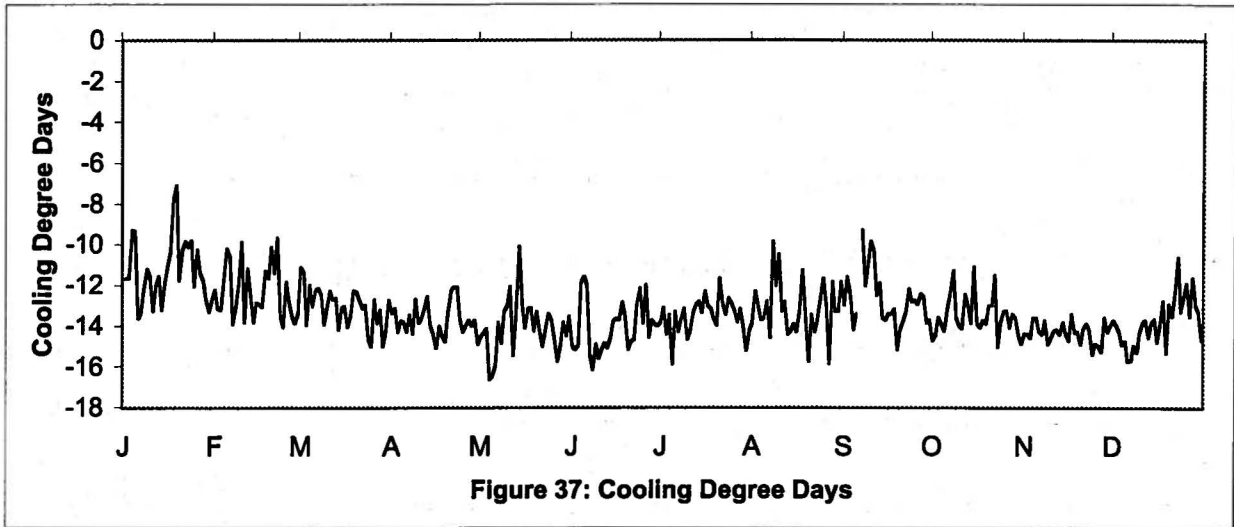


Figure 28: Monthly Total Pan Evaporation

Yigo Weather Station Daily Maximum and Minimum Graphs for Specified Climatic Parameters January through December



Yigo Weather Station Degree Days Graphics with Tables



Degree Days	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Cooling	350	357	405	411	436	422	420	408	368	419	429	427
Growing (50)	815	736	870	861	901	872	885	873	803	884	879	892
Growing (60)	505	466	560	561	591	572	575	563	513	574	579	582

The following table lists missing data for the Inarajan and Yigo weather stations that could not be estimated.

Weather Station	Missing Data	Dates for Missing Data
Inarajan	All sensors (all data)	Jan 25-Jan 28
	Temperature and Relative Humidity (all data)	Jun 18-July 18
	Pan evaporation and ET gage	Feb 14-16; Mar 8; Aug 17-19; Sep 8-10; Oct 3,5,12,22; Dec 6,8,10
	Daily maximum and minimum (all sensors)	Jan 8,11,12; Oct 18,29,31
Yigo	Temperature	Feb 14
	Relative Humidity	Feb 14
	Photosynthetically Active Radiation	Feb 14-15
	Global Solar Radiation	Feb 14-15
	Wind Direction	Feb 14-15
	Pan evaporation and ET gage	Feb 14-15; Apr 19-May 5; Nov 16; Dec 10-12
	Daily maximum and minimum	Feb 14-15; Sep 6

Note: Averages or totals for monthly accumulations were estimated where data was missing.



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