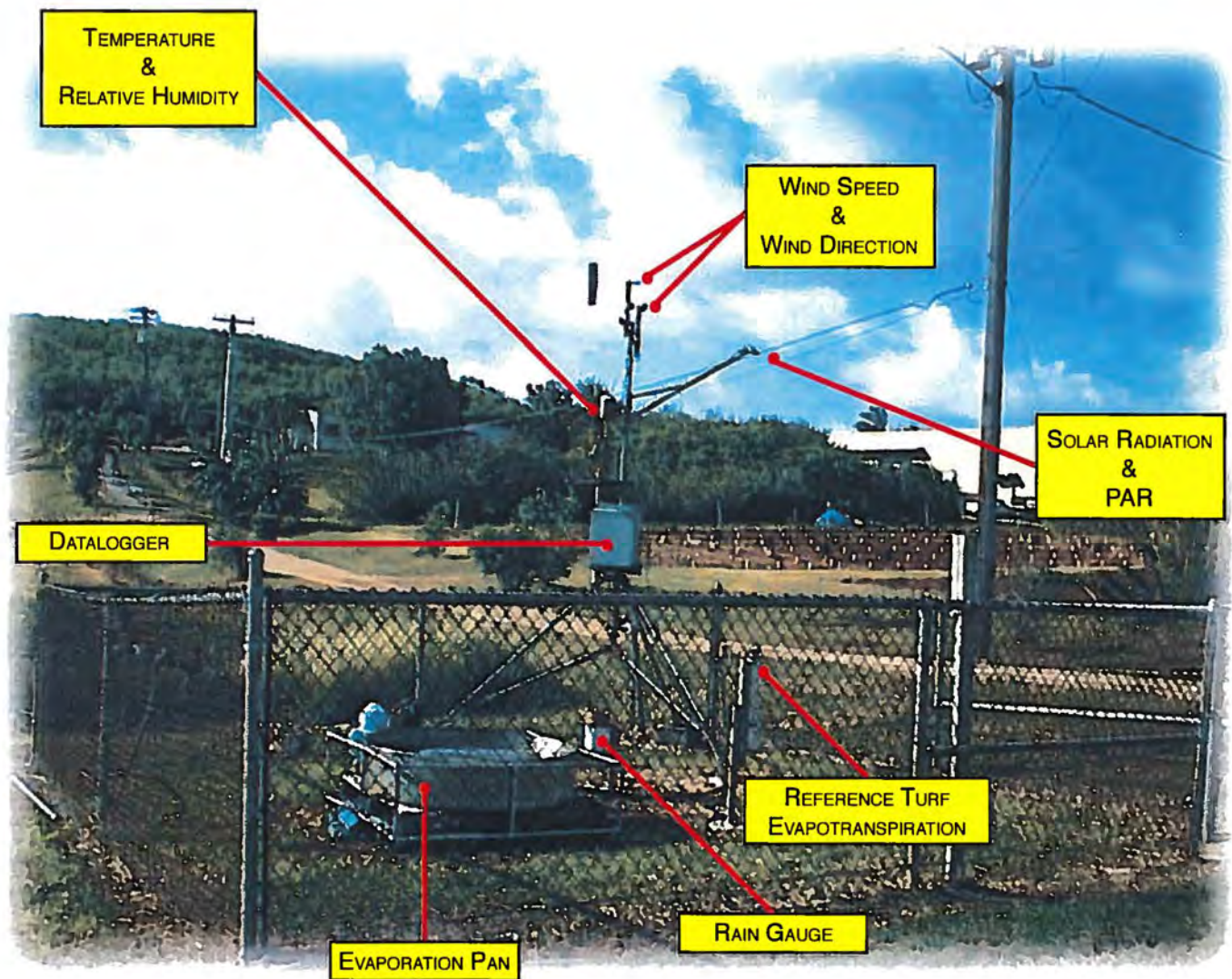


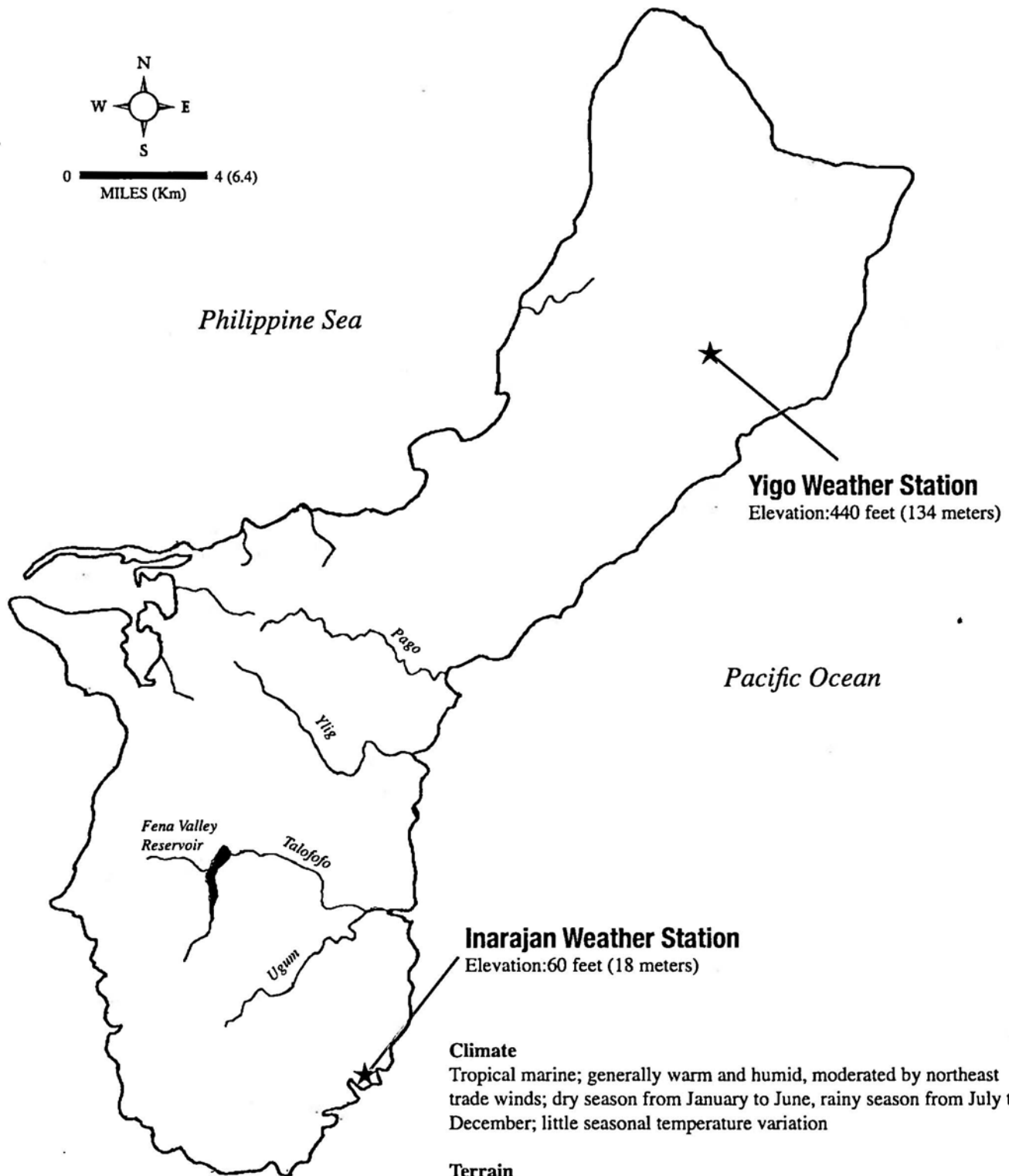
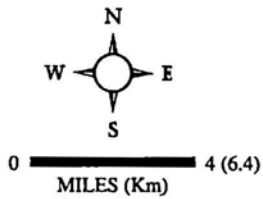
Guam Agricultural Climatic Data System 2001 Climatic Data and Summaries

Dr. Prem Singh, Roger W. Brown, Frankie Matanane



Agricultural Engineering
Agricultural Experiment Station
College of Natural and Applied Sciences
University of Guam

Guam Agricultural Weather Stations



Climate

Tropical marine; generally warm and humid, moderated by northeast trade winds; dry season from January to June, rainy season from July to December; little seasonal temperature variation

Terrain

Volcanic origin, surrounded by coral reefs; relatively flat coralline limestone plateau (source of most fresh water), with steep coastal cliffs and narrow coastal plains in north, low hills in center, mountains in south

Adapted from Wikitravel

<http://www.wikitravel.org/en/guam>

University of Guam
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Acknowledgements

The authors would like to thank the following people for their support of weather station operations and maintenance:

Dr. Lee S. Yudin, Dean CNAS
Dr. John Brown, Associate Dean CNAS/AES
Dr. Greg Weicko, Associate Director CNAS/AES (Acting)
John Borja, Station Manager

Editorial Assistance Robert Schlub
Peggy Denny
R. Barber Jr.

AES Technicians Gil Cruz
Ken Paulino
Glenn Meno
Jesse Manglona
Norman Santos

AES Technicians Rudy Villalon
Frank Paulino
Glenn Alianza
Ray Gumatao
Edwin Paulino

Guam Agricultural Climatic Data System: 2001 Climatic Data and Summaries

***Dr. Prem Singh, Roger W. Brown, Frankie Matanane**

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 Experimental 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

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.

Uploading Data from Weather Station Dataloggers to Centrally Located Computer

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 is stored in our weather stations are given in Table 1.

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" ASCII file in comma delineated format.

Formatting Data and Updating GACDS

From the *.dat file, data is transferred to a spreadsheet program and sorted. Here, data is checked for accuracy. Once the data has been checked, the data is put into a library. From the library file, data is 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.

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Degree Days

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

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

where: T_{Max} is maximum daily temperature
 T_{Min} is minimum daily temperature

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

Growing degree days (GDD) 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:

$$\text{GDD}_{50} = \{ (T_{\text{Max}} [^{\circ}\text{F}] + T_{\text{Min}} [^{\circ}\text{F}]) / 2 \} - 50^{\circ}\text{F}$$
$$\text{GDD}_{60} = \{ (T_{\text{Max}} [^{\circ}\text{F}] + T_{\text{Min}} [^{\circ}\text{F}]) / 2 \} - 60^{\circ}\text{F}$$

where: T_{Max} is maximum daily temperature
 T_{Min} is minimum daily temperature

New for the GACDS 2001 Guide

Comparative monthly total or average graphs for the years 1999, 2000, and 2001 for all sensors.

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

Hourly and 24 hour Output

Average Air Temperature

Average Relative Humidity

Photosynthetically Active Radiation (PAR) Average Flux Density

Global Solar Radiation Average Flux Density

Average Wind Speed

Average Wind Direction

Total Rainfall

Total Antmometer Evaporation (ET Gauge)

Total Pan Evaporation

**Yigo Weather Station
Daily and Monthly Total Rainfall (mm) for Year 2001**

Day	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1	2.54	2.54	2.54	0.00	0.00	2.03	4.57	0.25	10.92	0.00	N/A	N/A
2	0.25	5.59	0.00	0.00	0.00	2.54	1.02	2.03	0.51	0.00	N/A	N/A
3	0.00	0.00	4.06	0.25	2.29	0.00	11.94	1.27	0.00	5.59	N/A	N/A
4	0.00	0.25	0.00	1.02	0.25	0.76	5.84	12.45	1.52	1.02	N/A	N/A
5	0.00	5.59	0.00	3.56	0.00	5.59	32.77	3.05	0.25	1.78	N/A	6.35
6	9.40	3.56	0.00	2.03	1.52	38.35	4.83	0.00	0.25	24.13	N/A	0.00
7	7.62	8.64	11.94	0.25	0.25	19.05	61.47	5.33	0.51	11.94	0.51	0.00
8	8.13	0.00	0.00	4.57	5.59	55.88	1.52	18.29	6.01	1.52	24.89	10.67
9	8.84	1.02	0.00	0.00	0.00	32.26	17.53	2.03	6.35	3.81	1.27	0.76
10	0.00	0.51	0.00	0.00	0.25	11.18	23.62	6.01	38.35	18.03	0.00	3.56
11	0.00	5.33	0.00	0.00	2.03	8.38	7.37	56.90	0.76	0.81	1.27	0.25
12	1.27	0.00	3.30	0.00	6.35	1.27	1.52	40.64	0.25	11.18	2.29	14.99
13	0.00	0.76	0.00	0.51	6.35	50.55	36.07	36.32	0.00	0.25	0.00	7.62
14	0.00	6.60	0.00	2.03	1.02	3.30	0.51	46.74	0.00	84.84	3.05	0.00
15	0.00	1.02	0.00	1.78	9.14	4.57	7.62	31.50	0.00	4.83	1.02	0.00
16	1.52	0.51	9.65	0.00	1.02	0.51	0.51	34.54	0.25	1.02	1.02	0.00
17	0.00	0.00	9.65	11.43	0.00	3.81	4.83	1.78	17.78	0.51	26.16	1.02
18	0.00	1.02	3.30	0.00	0.00	14.99	1.78	0.00	9.14	1.02	40.39	4.83
19	0.00	0.00	0.00	0.00	0.00	11.94	0.00	16.00	12.45	49.78	44.45	7.87
20	0.25	0.00	0.00	0.00	3.30	21.34	0.00	3.81	3.81	8.38	8.13	8.89
21	0.25	0.00	0.00	1.02	8.86	5.33	0.00	17.27	11.68	1.27	8.38	2.29
22	0.00	0.00	0.00	5.59	0.51	15.24	0.25	30.99	1.78	0.00	22.61	0.00
23	0.00	0.00	0.00	0.00	11.68	6.60	8.38	96.27	0.00	6.60	4.06	1.02
24	0.00	22.61	0.00	0.51	0.00	1.78	11.43	26.67	13.46	0.51	0.00	4.32
25	0.51	0.25	1.02	0.51	2.29	3.81	6.60	18.80	6.60	4.57	1.52	0.00
26	12.45	0.76	14.22	0.25	0.25	4.06	0.00	8.89	3.30	0.00	N/A	4.06
27	1.02	5.59	0.00	0.00	3.05	5.08	11.94	12.45	6.35	N/A	N/A	30.99
28	0.25	4.57	0.00	8.64	0.25	3.30	0.51	0.51	0.00	N/A	N/A	24.13
29	0.00		0.00	1.27	0.51	28.96	34.04	2.54	0.51	N/A	N/A	0.25
30	11.18		0.00	0.00	2.54	0.25	16.51	0.00	3.56	N/A	N/A	1.52
31	2.29		0.25		2.54		4.32	6.01		N/A		9.65
Mo. Total	64.77	76.71	59.94	43.94	64.52	347.98	319.28	549.40	158.50	289.82	301.59	166.52

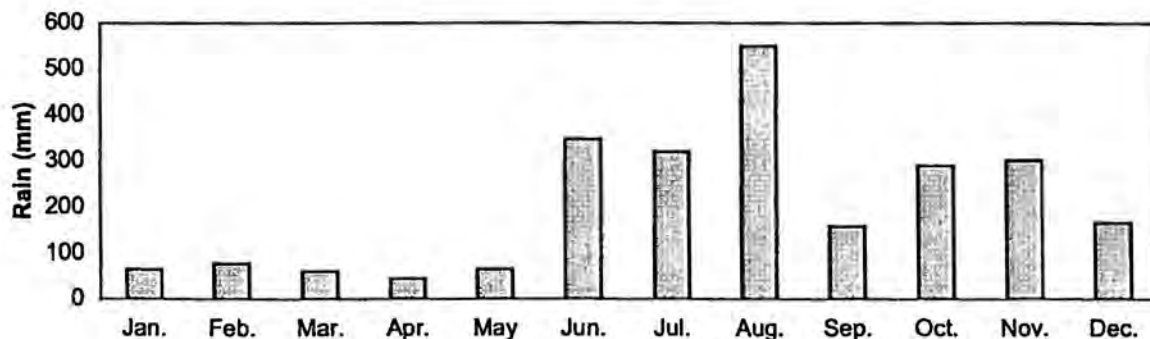


Figure 1: Monthly Total Rainfall

Yigo Weather Station
Daily and Monthly Average Air Temperature (°C) for Year 2001

Day	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1	25.74	24.96	25.25	25.41	26.44	26.91	26.72	25.65	25.58	26.14	N/A	N/A
2	25.46	24.52	25.39	25.79	26.19	26.87	26.05	26.46	25.83	26.39	N/A	N/A
3	24.71	25.01	25.13	26.01	26.47	26.83	25.83	25.41	25.74	26.00	N/A	N/A
4	24.28	25.34	25.51	25.74	26.81	26.31	25.73	25.24	26.29	25.58	N/A	N/A
5	23.92	24.94	25.50	25.41	26.82	26.02	25.85	26.31	25.95	26.16	N/A	25.76
6	25.33	25.00	25.27	26.06	26.24	25.93	26.13	25.94	26.03	25.83	N/A	25.40
7	24.47	24.69	24.45	26.11	25.48	25.78	24.78	25.98	26.47	25.36	24.94	25.62
8	24.16	25.23	25.24	25.79	25.69	26.49	25.61	26.15	24.18	25.29	25.21	25.01
9	25.18	25.09	25.22	26.27	26.36	25.45	24.81	26.56	24.07	25.87	25.78	25.91
10	25.65	25.55	25.30	26.14	26.60	25.88	24.38	26.38	24.22	24.76	25.67	25.45
11	25.80	24.79	25.34	25.76	26.42	25.87	24.47	25.22	24.62	25.16	24.84	25.61
12	25.20	25.44	25.01	25.17	26.25	26.18	25.48	25.02	24.61	25.77	25.57	25.53
13	25.44	25.29	24.85	25.91	26.17	24.49	23.88	24.50	25.56	25.72	24.96	25.43
14	25.58	25.16	24.86	26.11	26.79	26.18	25.11	24.47	25.46	25.49	25.12	25.77
15	25.14	25.30	25.56	26.21	26.37	25.59	25.68	24.83	25.45	25.92	26.28	25.40
16	24.84	25.26	24.53	26.25	26.63	27.05	25.89	24.77	25.76	26.97	26.28	25.72
17	25.57	25.31	24.59	25.27	26.53	26.86	26.13	26.45	25.19	26.83	25.70	25.29
18	25.17	25.34	25.33	25.77	26.40	26.31	25.88	26.94	24.73	26.96	24.75	25.69
19	25.53	24.98	25.39	26.49	26.53	25.80	25.73	25.76	26.29	25.71	24.17	25.58
20	25.48	24.98	25.46	26.43	26.27	25.76	25.49	26.02	24.06	25.84	25.57	24.97
21	25.76	25.47	24.95	26.33	25.86	26.09	26.73	26.67	24.62	26.52	25.98	25.40
22	25.69	25.50	23.94	26.17	26.72	26.11	27.37	25.41	25.41	26.15	25.91	25.22
23	25.31	25.18	23.87	26.34	26.38	25.36	25.59	24.21	25.66	25.90	26.66	25.01
24	24.95	24.51	24.99	26.51	27.06	26.99	25.45	25.41	25.00	25.48	26.91	25.20
25	25.16	24.97	24.31	26.68	26.29	26.53	25.77	25.87	25.15	25.49	26.37	24.64
26	24.98	24.92	24.73	26.60	26.38	26.39	25.84	26.05	25.16	25.25	N/A	24.60
27	25.35	25.09	24.40	26.67	26.46	26.60	25.69	24.60	25.47	N/A	N/A	23.56
28	25.62	24.83	25.47	26.07	26.47	26.85	26.16	26.70	25.34	N/A	N/A	23.85
29	25.35		25.38	25.92	27.07	25.42	26.11	26.51	25.76	N/A	N/A	25.37
30	23.48		25.73	26.55	26.62	27.53	24.71	26.58	26.17	N/A	N/A	24.89
31	25.29		25.58		26.48		24.29	25.77		N/A		24.98
Mo.Avg	25.15	25.09	25.05	26.07	26.43	26.21	25.59	25.74	25.33	25.87	25.61	25.22

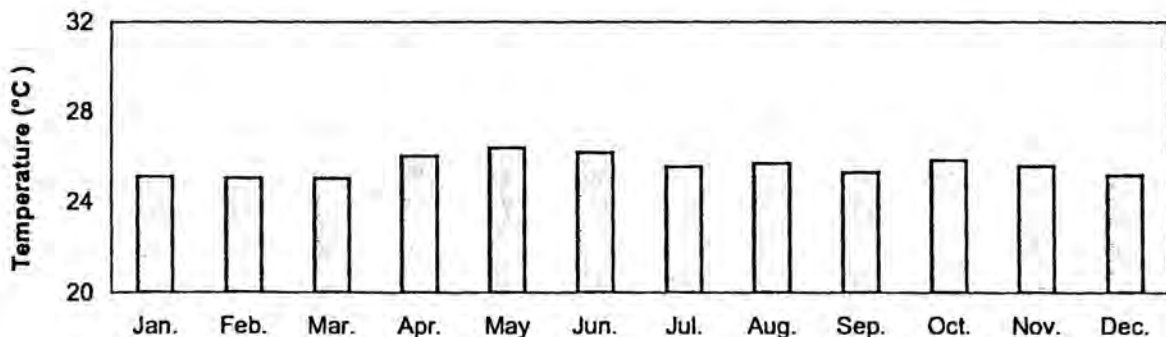


Figure 2: Monthly Average Temperature

Yigo Weather Station
Daily and Monthly Average Relative Humidity (%) for Year 2001

Day	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1	88.26	80.69	84.29	82.75	79.83	82.56	83.56	85.76	89.06	86.63	N/A	N/A
2	88.89	84.17	81.74	80.40	81.49	81.45	83.96	84.33	88.60	85.75	N/A	N/A
3	88.23	79.01	82.36	80.34	82.85	83.12	84.90	90.04	88.68	88.42	N/A	N/A
4	87.70	77.42	78.66	83.85	80.21	84.90	87.74	92.87	85.76	89.99	N/A	N/A
5	80.43	81.09	80.27	84.66	79.22	83.31	89.23	88.61	87.71	89.72	N/A	84.82
6	80.56	82.42	76.51	81.21	79.28	88.37	88.40	87.30	87.98	88.67	N/A	75.01
7	85.09	88.04	83.44	78.45	78.29	89.40	93.34	87.44	87.03	90.81	89.47	80.67
8	88.91	81.18	79.12	82.73	80.40	85.12	85.84	89.15	92.64	91.98	94.14	83.34
9	80.18	81.42	79.98	79.07	76.06	89.39	90.26	84.66	92.55	89.81	88.73	82.44
10	74.65	75.11	75.90	78.80	75.67	87.62	91.36	87.09	92.02	93.73	87.91	85.13
11	82.30	82.06	75.29	76.25	79.86	86.39	91.49	91.04	89.64	89.52	90.26	85.94
12	87.18	79.09	79.67	77.27	81.35	86.21	88.90	93.43	89.67	87.53	87.60	87.72
13	82.05	80.46	79.48	77.87	83.29	92.89	91.62	94.18	86.01	84.82	85.85	78.41
14	83.42	86.26	80.47	80.98	81.40	85.88	87.91	94.86	85.54	94.30	88.67	73.15
15	79.99	84.17	74.71	82.54	83.63	90.98	87.58	91.97	85.68	91.22	82.55	70.85
16	81.52	77.29	89.05	77.59	81.10	81.40	88.39	91.70	88.06	84.12	82.55	70.51
17	76.18	77.81	90.41	80.77	78.30	83.61	87.37	84.63	90.24	82.50	87.99	78.31
18	82.70	79.86	85.22	80.22	78.86	84.73	87.94	84.29	90.45	82.85	92.47	84.53
19	78.88	76.57	81.91	79.55	76.68	87.43	84.29	89.56	86.30	87.79	96.36	84.50
20	77.36	75.98	81.48	77.86	87.96	89.41	84.84	88.91	95.09	85.49	91.69	86.22
21	78.11	78.33	80.74	80.51	88.79	88.45	82.29	87.99	87.22	82.03	88.47	83.91
22	80.96	79.98	81.52	83.12	84.58	87.04	81.19	93.44	85.88	81.92	87.49	85.15
23	79.65	77.31	81.51	79.37	85.14	88.04	87.95	95.26	86.92	86.94	87.38	86.13
24	79.22	83.59	80.58	79.44	82.24	81.98	86.97	91.05	90.66	84.57	84.57	86.59
25	77.37	82.23	82.73	79.64	83.29	87.00	88.68	90.22	88.65	84.93	88.19	85.82
26	82.53	83.78	83.28	80.45	82.65	86.52	84.43	86.07	87.27	86.06	N/A	89.94
27	84.03	82.32	80.16	77.45	81.58	84.65	87.97	92.67	89.21	N/A	N/A	93.86
28	82.11	83.51	79.91	81.61	81.91	83.58	86.52	84.06	87.47	N/A	N/A	92.60
29	77.94		80.36	82.09	80.23	90.12	87.14	86.26	87.92	N/A	N/A	83.74
30	86.77		81.47	79.69	83.83	81.75	88.23	86.39	87.66	N/A	N/A	84.13
31	75.43		81.54		83.68		92.16	91.30		N/A		83.33
Mo. Avg.	81.70	80.76	81.09	80.22	81.38	86.11	87.50	89.24	88.59	87.39	88.54	83.21

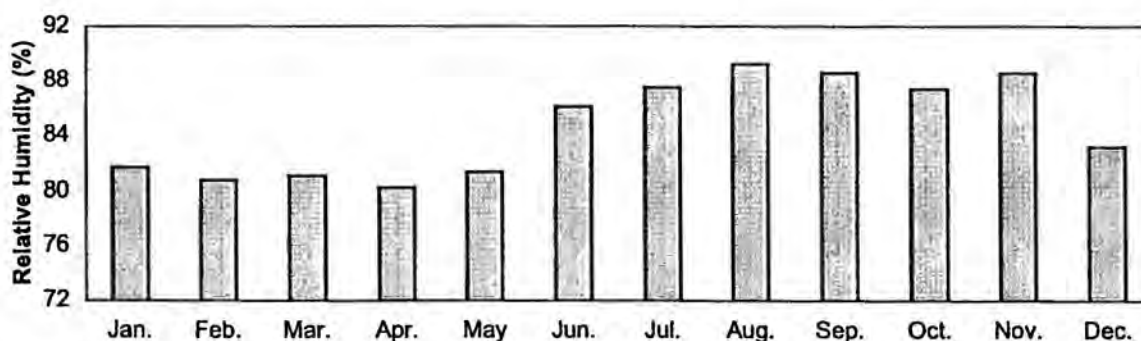


Figure 3: Monthly Average Relative Humidity

Yigo Weather Station
Photosynthetically Active Radiation (PAR) Average Flux Density ($\mu\text{mol/s/m}^2$) for Year 2001

Day	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1	316	318	370	360	390	411	263	432	361	362	N/A	N/A
2	365	265	374	377	370	437	153	354	365	369	N/A	N/A
3	342	365	403	385	353	395	250	249	341	348	N/A	N/A
4	251	355	373	391	374	293	279	203	385	315	N/A	N/A
5	353	345	389	354	354	285	324	399	424	282	N/A	271
6	315	330	395	391	388	289	311	413	259	380	N/A	347
7	280	256	321	425	434	245	89	331	365	263	283	268
8	191	300	420	404	474	319	377	364	178	292	202	209
9	343	329	333	411	441	255	188	393	189	360	297	297
10	324	345	395	364	436	316	164	347	232	139	323	273
11	255	327	399	460	369	364	140	164	243	328	213	279
12	273	334	385	437	418	382	425	220	328	408	303	286
13	270	317	417	396	393	130	207	93	440	381	355	249
14	276	291	387	371	407	337	354	95	431	145	309	267
15	331	308	420	400	368	200	379	93	290	221	312	322
16	320	322	264	389	416	392	299	83	359	364	312	313
17	374	369	345	322	450	419	409	170	272	370	275	282
18	198	390	348	409	377	342	370	283	100	373	141	301
19	317	387	392	453	466	151	365	264	359	285	44	278
20	338	365	385	432	271	238	378	336	90	353	195	258
21	319	346	410	360	289	365	415	371	286	349	282	303
22	290	346	446	380	297	377	403	216	342	337	223	264
23	353	408	415	439	441	315	302	155	408	348	272	204
24	340	330	367	403	436	402	348	308	238	354	347	283
25	341	373	229	425	459	373	365	347	349	384	302	330
26	321	357	424	394	428	416	407	312	256	389	N/A	287
27	317	407	386	402	398	381	361	180	353	N/A	N/A	175
28	320	364	385	417	372	234	347	320	294	N/A	N/A	74
29	370		365	404	399	254	334	278	288	N/A	N/A	282
30	228		349	405	363	377	388	360	394	N/A	N/A	264
31	390		390		286		263	260		N/A		283
Mo.Avg.	310	341	377	399	391	323	312	271	307	327	263	268

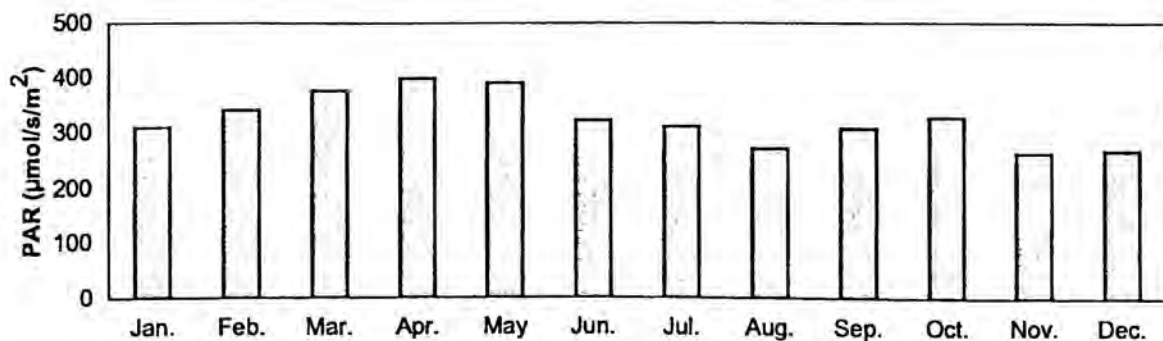


Figure 4: Monthly Average PAR

Yigo Weather Station
Global Solar Radiation Average Flux Density (W/m²) for Year 2001

Day	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1	200	206	242	235	266	282	179	286	228	242	N/A	N/A
2	235	172	251	255	255	300	100	240	229	249	N/A	N/A
3	218	242	270	260	240	270	165	165	211	229	N/A	N/A
4	166	234	252	262	257	200	191	131	239	202	N/A	N/A
5	231	226	263	235	243	199	220	264	263	181	N/A	176
6	203	214	267	264	267	198	210	275	155	250	N/A	237
7	180	164	212	293	299	166	56	216	229	173	194	176
8	124	195	280	270	324	219	253	243	104	186	131	136
9	218	214	216	281	305	178	125	267	113	236	194	199
10	209	225	259	248	302	220	107	232	141	86	217	182
11	164	214	263	312	250	247	90	105	147	216	140	185
12	177	217	256	300	285	263	283	144	203	277	206	190
13	175	205	278	270	265	84	135	56	284	260	247	166
14	180	188	262	250	279	229	239	57	280	92	209	180
15	218	197	283	267	252	133	252	57	185	140	211	215
16	207	206	174	263	287	270	204	50	228	246	211	210
17	244	243	227	216	311	286	273	109	174	250	181	187
18	123	257	232	280	260	232	248	180	54	248	87	199
19	204	258	264	310	321	97	240	173	231	193	22	183
20	217	245	262	300	178	157	252	224	49	242	123	168
21	203	228	278	246	193	253	278	248	182	233	185	202
22	188	232	304	255	198	258	273	136	227	224	145	174
23	233	273	281	301	296	208	204	97	267	238	181	131
24	222	216	244	273	298	276	230	199	150	242	234	186
25	224	248	152	293	312	257	244	223	228	266	202	220
26	204	232	287	269	294	283	271	204	164	270	N/A	189
27	201	268	264	278	275	264	237	114	237	N/A	N/A	116
28	210	242	263	286	255	155	234	212	190	N/A	N/A	43
29	241		245	273	278	167	221	184	186	N/A	N/A	185
30	147		233	275	246	262	256	241	263	N/A	N/A	173
1	255		265		190		178	168		N/A		188
Mo. Avg.	201	224	252	271	267	220	208	177	195	218	175	178

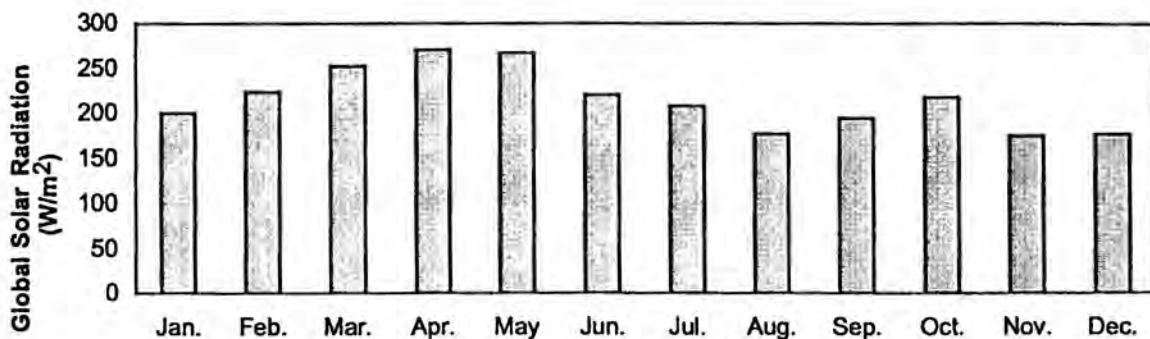


Figure 5: Monthly Average Global Solar Radiation

Yigo Weather Station
Daily and Monthly Average Wind Speed (m/s) for Year 2001

Day	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1	2.30	3.43	4.77	2.13	2.58	1.85	4.98	1.36	1.67	1.27	N/A	N/A
2	1.16	2.72	2.79	3.06	2.24	1.78	3.40	1.55	1.63	1.40	N/A	N/A
3	1.27	3.18	3.21	3.27	3.00	1.60	1.38	1.05	1.45	2.16	N/A	N/A
4	1.22	3.80	4.02	2.57	3.22	1.02	1.47	1.06	1.34	1.10	N/A	N/A
5	1.85	4.22	3.15	2.37	2.63	0.66	1.84	1.64	1.69	1.01	N/A	2.61
6	3.31	4.12	3.39	3.50	2.26	0.54	2.94	1.02	1.30	1.37	N/A	1.45
7	4.77	3.60	3.40	3.20	1.63	0.77	1.99	0.89	1.47	0.65	1.52	1.42
8	4.31	4.08	2.98	2.82	1.44	0.78	1.89	1.72	0.65	0.74	2.01	2.55
9	3.00	4.41	3.04	3.28	1.92	0.78	2.47	1.80	0.39	1.22	2.04	2.62
10	3.80	5.61	3.85	2.70	2.45	0.56	2.63	2.47	0.46	1.64	1.01	1.20
11	3.63	4.23	4.22	2.38	3.07	1.19	0.85	3.12	0.53	0.78	0.72	0.62
12	2.73	4.85	3.41	2.06	2.90	1.15	1.86	2.59	0.75	1.33	1.02	1.74
13	3.27	4.75	2.35	2.47	2.47	1.03	1.97	3.12	1.02	1.48	0.96	4.05
14	2.42	4.01	2.87	3.95	2.95	1.40	1.34	3.34	0.86	1.31	1.39	2.92
15	2.41	3.85	3.80	3.37	2.24	0.85	1.92	4.17	0.71	1.24	2.44	2.66
16	3.01	4.24	3.35	3.74	2.13	2.18	0.89	4.14	0.90	3.15	2.44	3.48
17	3.15	4.51	3.56	2.58	2.11	2.71	1.34	4.47	1.03	2.75	3.51	2.50
18	3.85	3.94	3.42	2.29	2.00	2.83	1.29	3.70	2.37	2.59	2.97	3.32
19	3.43	3.08	3.07	2.84	2.16	2.32	0.90	1.07	2.15	2.11	1.87	2.41
20	3.94	3.26	3.17	3.37	2.07	1.50	1.04	2.20	0.99	2.18	2.24	3.00
21	3.59	4.20	2.38	3.44	1.94	1.56	2.28	2.29	0.88	2.65	2.69	2.29
22	3.22	3.86	1.26	2.94	3.14	1.50	3.01	0.81	0.89	2.21	3.58	0.64
23	2.90	3.06	1.72	3.50	2.44	2.11	2.09	1.60	1.39	1.68	3.64	2.28
24	2.65	2.72	1.95	4.05	2.77	2.52	2.38	1.62	0.38	1.79	2.95	1.51
25	3.41	2.82	2.32	3.49	1.20	2.27	1.65	1.82	0.67	1.82	2.68	0.91
26	3.88	2.06	1.96	3.67	1.61	2.01	1.02	2.60	0.68	0.97	N/A	0.51
27	3.24	3.47	2.14	3.40	1.51	2.49	1.22	2.38	0.90	N/A	N/A	3.44
28	3.78	4.09	2.97	3.28	2.01	2.99	1.15	3.65	0.56	N/A	N/A	2.37
29	3.21		2.61	3.45	2.55	2.65	1.71	2.96	1.38	N/A	N/A	2.04
30	2.74		2.28	3.00	2.01	4.81	1.35	2.04	1.10	N/A	N/A	1.20
31	4.01		2.84		1.80		0.91	0.57		N/A		1.87
Mo. Avg.	3.08	3.79	2.98	3.07	2.27	1.75	1.84	2.22	1.07	1.64	2.19	2.13

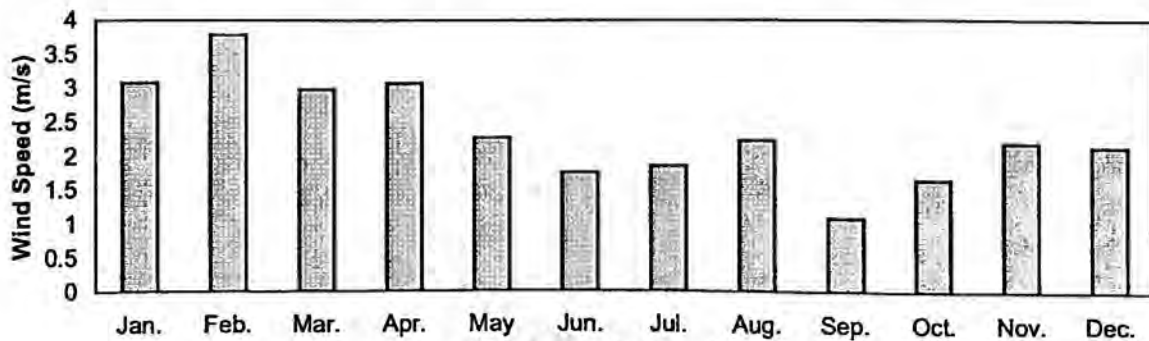


Figure 6: Monthly Average Wind Speed

Yigo Weather Station

Daily and Monthly Average Wind Direction (0–360 Degrees from North) for Year 2001

Day	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1	156	62	211	81	185	90	98	97	108	82	N/A	N/A
2	108	74	183	74	158	84	121	95	147	110	N/A	N/A
3	96	81	132	98	109	89	127	206	225	174	N/A	N/A
4	78	64	120	126	113	102	179	190	256	183	N/A	N/A
5	89	67	146	89	143	162	86	168	263	145	N/A	107
6	70	67	131	106	118	198	102	126	229	112	N/A	67
7	83	100	106	103	101	224	164	139	226	161	107	77
8	100	91	145	101	112	213	258	99	182	126	126	80
9	119	78	133	93	99	141	266	66	160	120	149	100
10	75	66	95	105	71	175	277	89	135	167	120	110
11	51	81	116	112	78	112	214	110	160	142	128	80
12	104	81	126	81	95	98	183	137	183	106	119	87
13	87	100	159	88	96	165	195	224	189	94	97	60
14	61	93	125	70	106	97	194	190	206	92	93	61
15	78	107	123	78	100	89	279	178	167	92	58	61
16	61	63	158	100	111	92	139	197	142	74	58	63
17	63	62	119	90	126	93	126	139	76	70	77	60
18	59	73	134	109	115	88	133	165	83	77	97	76
19	67	73	137	105	84	87	116	192	100	73	113	88
20	57	65	111	97	84	94	141	125	126	80	134	89
21	72	79	119	82	104	79	107	68	201	59	123	98
22	60	149	148	102	95	85	93	175	251	57	115	110
23	54	109	135	111	123	87	154	247	236	93	117	234
24	67	118	132	73	127	88	134	256	130	180	95	310
25	57	133	105	109	108	76	113	236	108	260	108	280
26	86	150	103	86	88	94	102	184	89	219	N/A	111
27	76	162	118	97	79	67	105	206	174	N/A	N/A	131
28	71	159	95	124	88	63	76	144	153	N/A	N/A	146
29	92		92	153	87	75	160	191	97	N/A	N/A	110
30	70		97	147	70	66	138	160	87	N/A	N/A	147
31	112		79		72		161	142		N/A		111
Mo.Avg.	80	93	127	100	105	109	153	159	163	121	107	113

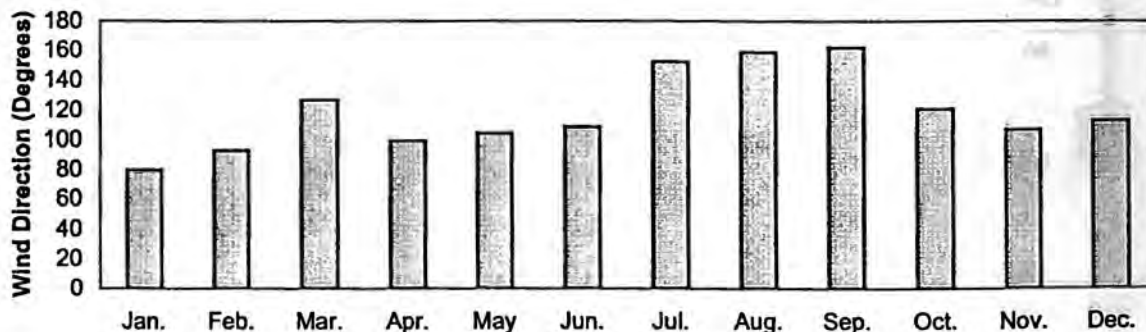


Figure 7: Monthly Average Wind Direction

Yigo Weather Station
Daily and Monthly Total Atmometer Evaporation (ET Gauge) (mm) for Year 2001

Day	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1	3.30	3.30	2.79	4.06	4.83	4.32	2.79	4.57	2.79	4.06	N/A	N/A
2	3.81	2.03	4.32	4.32	4.57	4.83	1.78	4.06	3.05	4.57	N/A	N/A
3	3.56	4.32	3.30	4.57	3.56	4.32	2.54	2.29	3.56	2.79	N/A	N/A
4	2.54	4.57	5.08	3.81	4.57	3.05	2.79	1.27	4.32	2.79	N/A	N/A
5	4.06	3.30	4.57	6.35	4.83	2.54	2.54	4.06	3.81	2.54	N/A	1.52
6	4.06	3.05	4.57	4.06	4.57	1.02	2.29	4.57	2.54	3.56	N/A	4.83
7	2.03	1.27	2.29	4.57	5.08	1.52	0.93	3.81	3.81	2.29	3.05	3.30
8	0.25	3.05	5.08	3.81	5.08	5.08	3.30	2.54	1.27	2.54	0.25	2.29
9	4.57	3.56	4.06	4.57	5.59	2.54	1.02	4.32	1.52	3.56	2.29	3.30
10	4.57	3.81	5.33	4.57	5.33	2.79	1.27	3.30	1.27	0.25	4.06	2.54
11	3.30	3.05	5.08	5.33	3.81	3.81	0.76	0.76	2.03	3.30	2.03	3.05
12	2.54	4.06	4.32	5.33	4.06	3.81	4.06	1.52	3.30	4.06	3.30	2.29
13	3.30	3.56	4.32	4.57	3.56	0.00	1.52	0.00	4.83	4.32	4.57	3.30
14	1.78	2.54	4.06	4.06	4.57	3.56	3.81	0.00	5.08	0.25	3.05	4.57
15	4.32	2.79	5.33	3.81	3.56	1.02	3.81	4.95	3.56	0.00	3.81	4.83
16	3.05	3.81	1.27	4.83	4.83	4.32	2.79	0.00	3.56	4.08	3.81	5.33
17	4.83	4.06	1.52	2.79	5.33	4.32	4.32	2.29	1.78	4.31	1.78	3.81
18	2.54	4.06	2.79	4.57	1.27	3.05	3.30	3.30	0.51	4.01	0.51	3.05
19	4.06	4.83	4.32	5.33	5.84	1.27	4.32	2.29	3.81	N/A	0.00	2.29
20	4.32	4.57	4.57	5.33	1.52	2.29	4.32	2.79	0.00	N/A	0.76	2.79
21	4.32	4.57	4.83	2.79	2.54	3.30	4.83	3.56	2.79	4.04	2.29	2.79
22	3.81	4.06	4.32	4.15	3.05	2.29	4.57	1.27	3.81	3.52	2.03	3.05
23	4.57	5.08	4.57	4.36	3.81	2.79	2.54	0.51	4.57	2.95	2.29	1.78
24	4.57	3.05	4.06	4.57	5.08	4.83	2.29	2.03	1.52	3.52	4.57	2.79
25	4.06	4.06	2.29	5.08	4.57	3.05	2.79	3.05	3.56	4.21	3.05	3.56
26	3.05	3.81	4.06	4.32	4.57	1.52	4.32	3.05	2.79	3.13	N/A	2.79
27	3.30	3.81	4.83	5.33	4.32	3.56	3.30	0.25	3.30	N/A	N/A	0.25
28	4.06	3.30	4.32	4.32	4.32	2.54	3.81	3.56	3.30	N/A	N/A	0.00
29	5.33		4.32	4.06	4.57	1.27	3.05	2.54	2.79	N/A	N/A	3.30
30	1.27		4.57	4.83	3.56	4.06	3.81	4.06	3.56	N/A	N/A	3.05
31	.32		4.06		2.79		2.29	1.78		N/A		3.30
Mo. Total	109.47	101.35	125.22	134.50	129.54	88.65	91.86	78.36	88.39	96.69	75.00	91.57

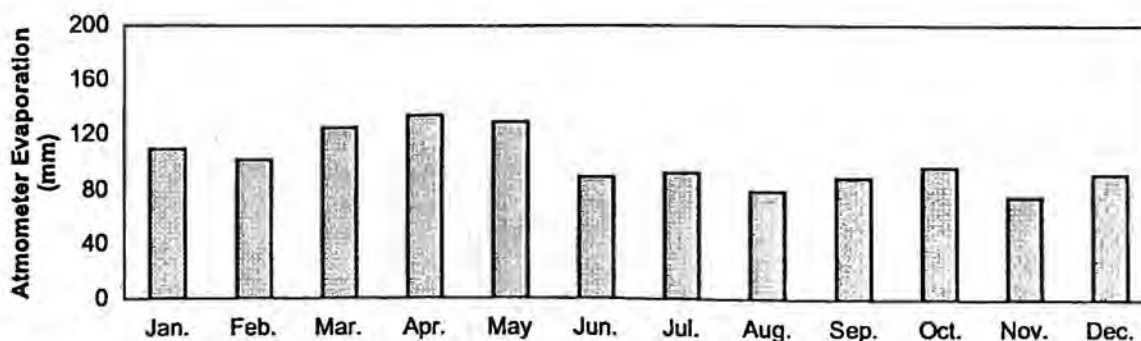


Figure 8: Monthly Total Atmometer Evaporation

**Yigo Weather Station
Daily and Monthly Total Pan Evaporation (mm) for Year 2001**

Day	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1	3.80	3.80	3.21	4.67	5.55	4.97	4.17	4.88	4.29	5.72	N/A	N/A
2	4.38	2.34	4.97	4.97	5.26	5.55	2.09	4.12	3.71	5.20	N/A	N/A
3	4.09	4.97	3.80	5.26	4.09	4.97	0.35	2.46	4.42	3.64	N/A	N/A
4	2.92	5.26	5.84	4.38	5.26	3.51	3.62	1.63	4.61	2.96	N/A	N/A
5	4.67	3.80	5.26	3.56	5.55	3.05	3.25	3.23	5.14	2.79	N/A	N/A
6	4.67	3.51	5.26	4.67	5.26	1.22	2.63	4.80	2.82	3.02	N/A	5.20
7	2.34	1.46	2.63	5.26	5.84	1.83	1.17	3.32	3.76	3.00	3.72	3.38
8	0.29	3.51	5.84	4.38	5.84	6.01	3.96	3.97	1.75	2.76	0.86	3.65
9	5.26	4.09	4.67	5.26	6.43	3.10	0.67	4.98	0.71	3.66	2.41	3.86
10	5.26	4.38	6.13	4.85	6.13	3.70	1.46	4.25	3.47	1.96	3.46	3.29
11	3.80	3.51	5.84	7.14	4.38	4.08	0.88	0.91	1.90	3.51	2.00	2.69
12	2.92	4.67	4.97	3.24	4.67	4.60	4.32	2.31	3.34	3.85	3.04	3.92
13	3.80	4.09	4.97	6.03	4.09	0.00	4.38	0.30	5.87	4.97	4.32	4.92
14	2.04	2.92	4.67	5.40	5.26	3.59	3.84	0.66	6.00	0.29	3.48	5.34
15	4.97	3.21	6.13	2.71	4.09	1.29	6.76	5.83	3.88	0.27	4.29	5.65
16	3.51	4.38	1.46	2.54	5.55	4.79	3.36	0.34	3.74	4.80	4.29	6.07
17	5.55	4.67	1.75	1.35	6.13	5.29	4.83	1.68	1.95	5.31	4.15	4.01
18	2.92	4.67	3.21	4.34	1.46	4.70	4.56	4.45	0.74	5.01	3.24	4.36
19	4.67	5.55	4.97	4.18	6.72	1.08	4.91	1.30	3.77	N/A	0.06	4.72
20	4.97	5.26	5.26	6.64	1.75	1.45	5.22	3.80	0.98	N/A	1.32	4.43
21	4.97	5.26	5.55	2.51	2.92	4.02	5.97	3.72	2.44	5.05	2.79	3.46
22	4.38	4.67	4.97	5.19	3.51	2.54	6.17	0.02	4.67	4.40	2.78	2.55
23	5.26	5.84	5.26	5.45	4.38	4.65	4.70	0.61	6.54	3.68	3.35	2.58
24	5.26	3.51	4.67	4.43	5.84	5.21	2.98	1.79	1.39	4.40	4.70	3.25
25	4.67	4.67	2.63	6.01	5.26	4.42	4.14	2.56	4.19	5.26	3.67	3.73
26	3.51	4.38	4.67	5.18	5.26	2.90	5.98	3.62	1.99	3.91	N/A	2.99
27	3.80	4.38	5.55	5.59	4.97	4.81	3.80	0.30	4.26	N/A	N/A	0.24
28	4.67	3.80	4.97	4.97	4.97	3.37	4.38	4.00	4.22	N/A	N/A	0.35
29	6.13		4.97	4.67	5.26	2.63	3.01	5.17	4.97	N/A	N/A	3.11
30	1.46		5.26	5.55	4.09	5.98	3.94	5.35	5.44	N/A	N/A	3.07
31	4.97		4.67		3.21		2.83	0.99		N/A		3.75
Mo. Total	125.90	116.55	144.01	140.48	148.97	109.38	114.41	87.35	106.67	115.47	91.41	112.75

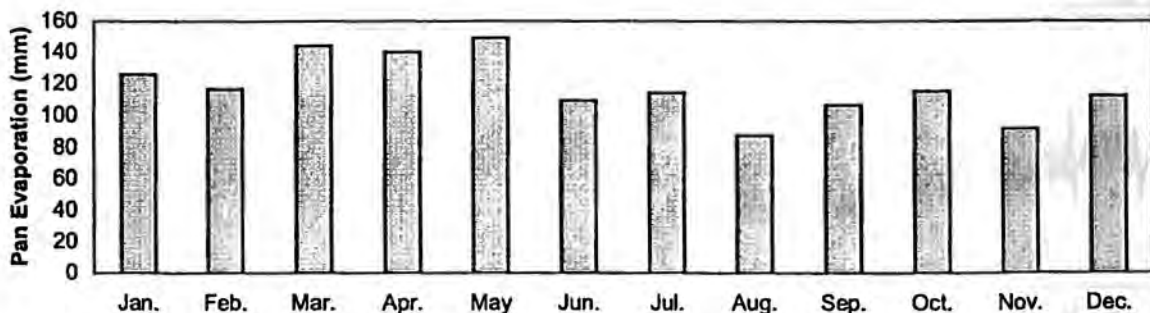


Figure 9: Monthly Total Pan Evaporation

Yigo Weather Station
Daily Maximum and Minimum Graphs for Specified Climatic Parameters
January 2001 through December 2001

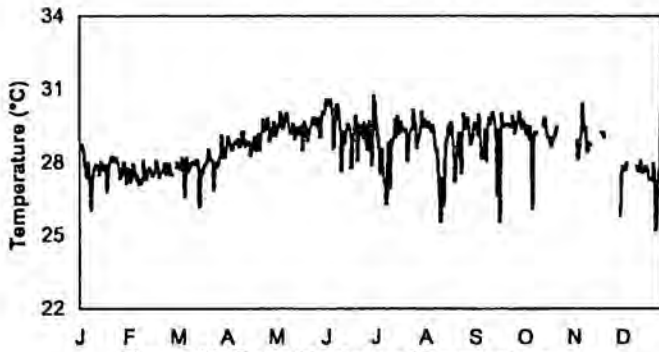


Figure 10: Daily Maximum Temperature

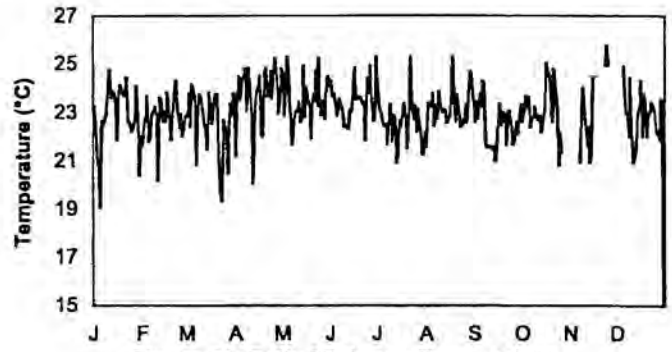


Figure 11: Daily Minimum Temperature

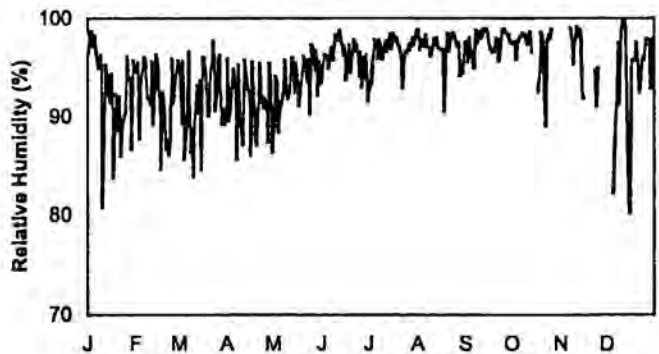


Figure 12: Daily Maximum Relative Humidity

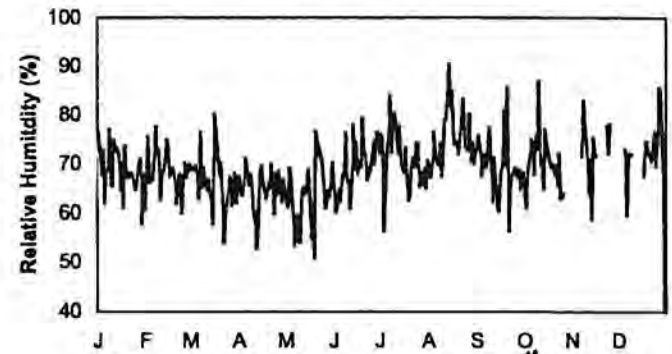


Figure 13: Daily Minimum Relative Humidity

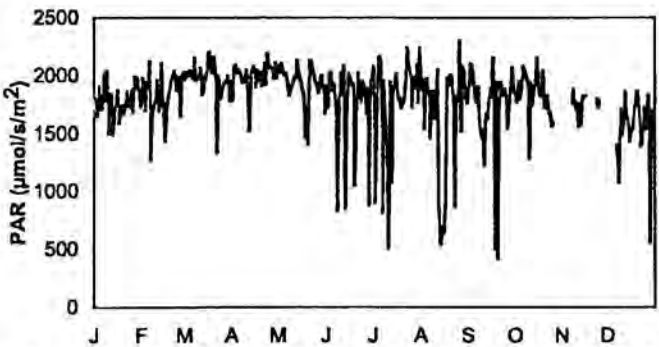


Figure 14: Daily Maximum Photosynthetically Active Radiation (PAR)

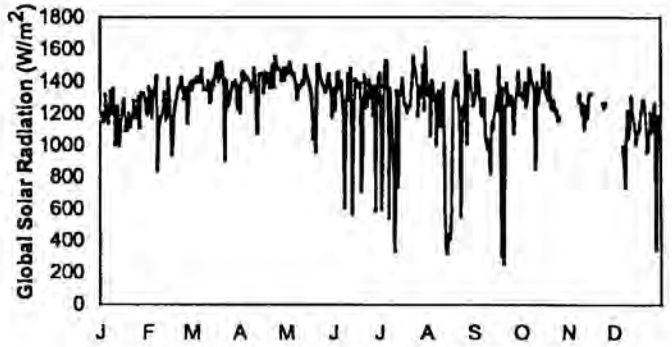


Figure 15: Daily Maximum Global Solar Radiation

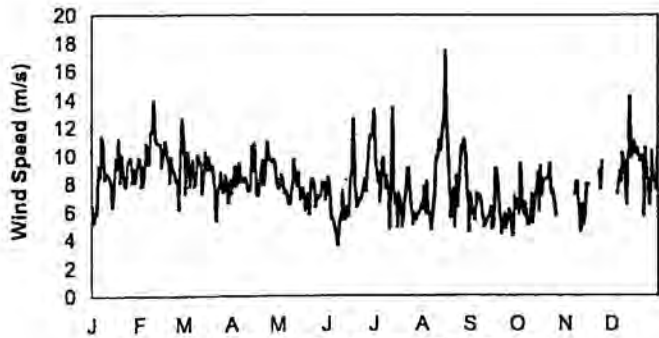


Figure 16: Daily Maximum Wind Speed

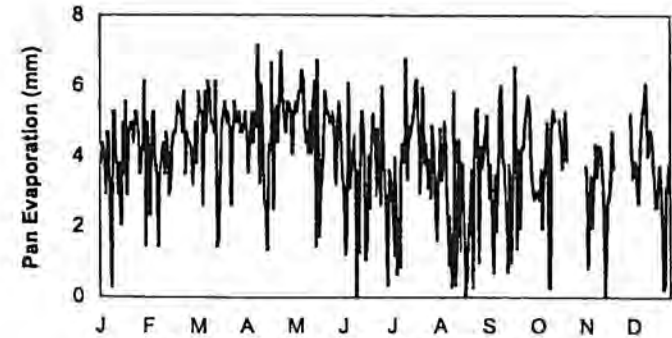


Figure 17: Daily Pan Evaporation

**Yigo Weather Station
Degree Days Graphics with Tables for Year 2001**

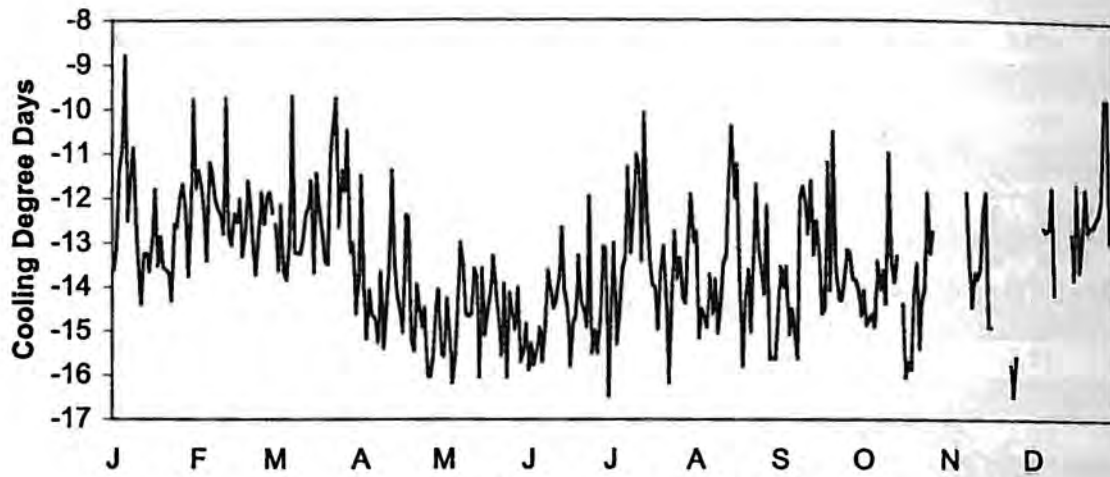


Figure 18: Cooling Degree Days

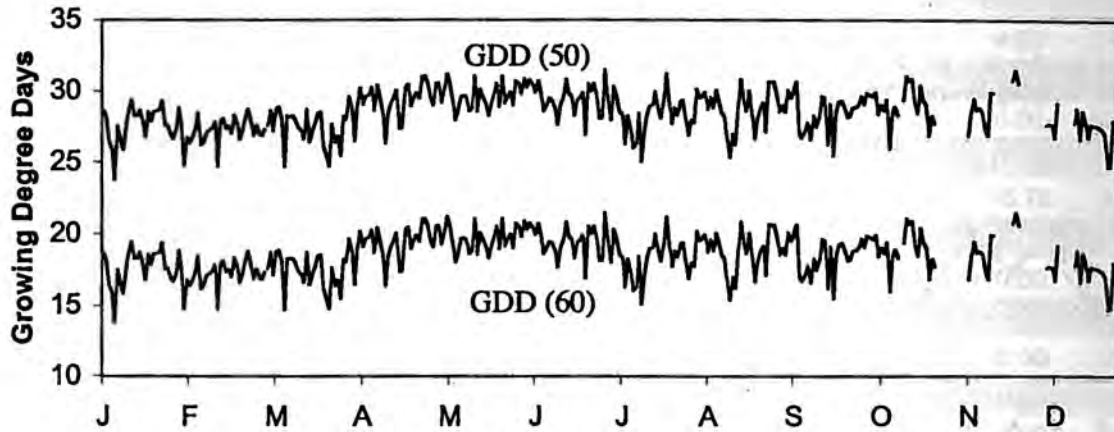


Figure 19: Growing Degree Days

Degree Days	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Cooling	389	344	387	430	454	437	413	428	404	436	421	383
Growing (50)	854	764	852	880	919	887	878	893	854	901	871	848
Growing (60)	544	484	542	580	609	587	568	583	554	591	571	538

Yigo Weather Station Graphs showing year to year variations in weather data for 1999 to 2001

—x— 1999 - - o - - 2000 - - Δ - - 2001

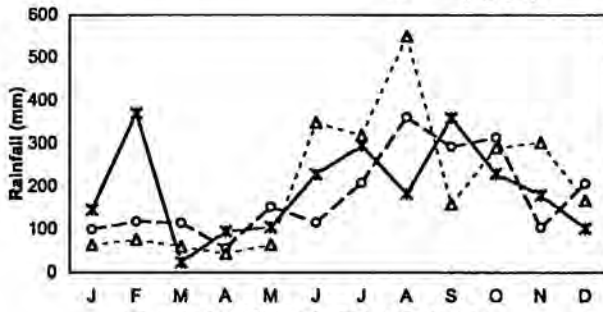


Figure 20: Monthly Total Rainfall

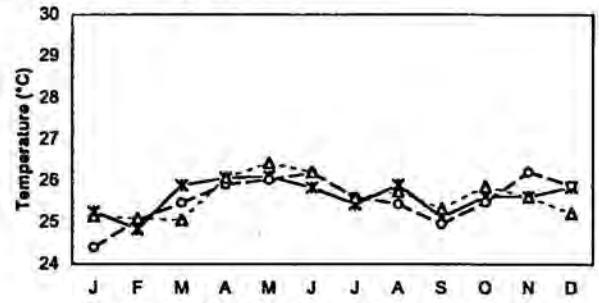


Figure 21: Monthly Average Temperature

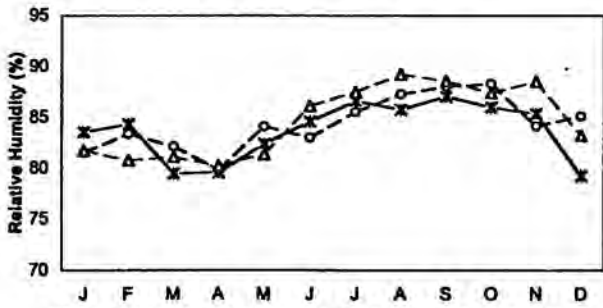


Figure 22: Monthly Average Relative Humidity

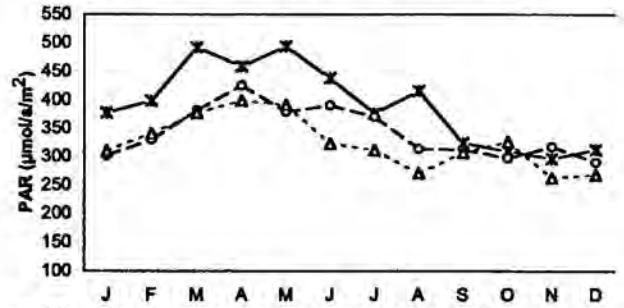


Figure 23: Monthly Average Photosynthetically Active Radiation (PAR)

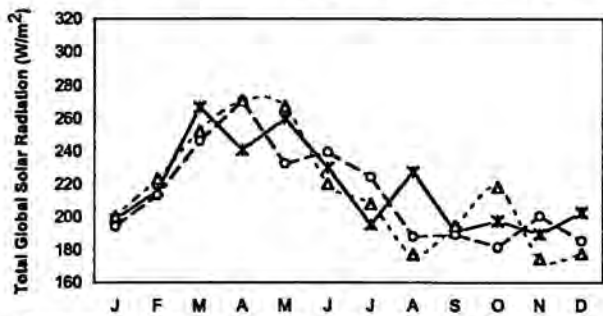


Figure 24: Monthly Average Global Solar Radiation

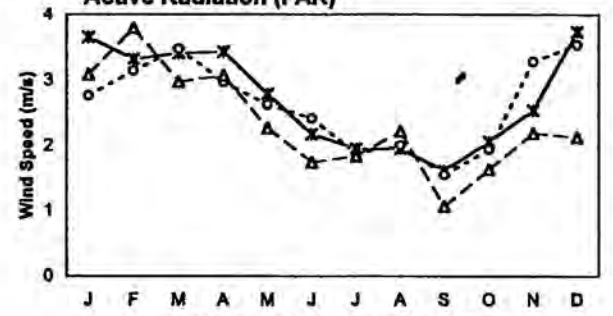


Figure 25: Monthly Average Wind Speed

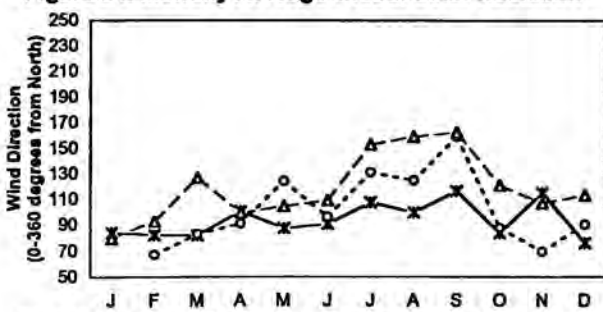


Figure 26: Monthly Average Wind Direction

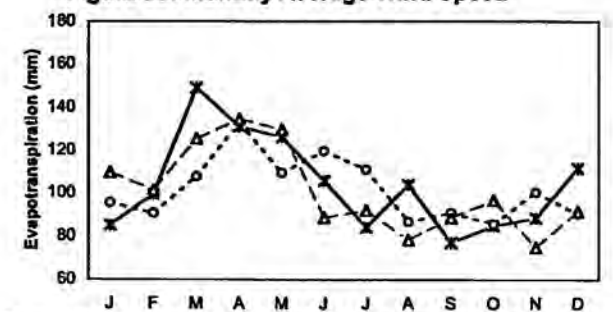


Figure 27: Monthly Total Atmometer Evaporation (ET Gauge)

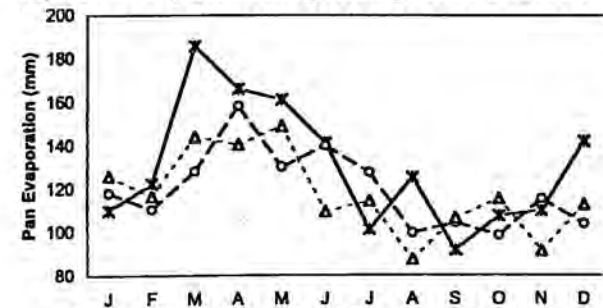


Figure 28: Monthly Total Pan Evaporation

Inarajan Weather Station
Daily and Monthly Total Rainfall (mm) for Year 2001

Day	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1	2.29	0.00	1.52	0.00	0.00	0.00	4.83	0.00	N/A	0.00	34.29	0.76
2	0.00	2.54	0.00	0.76	0.00	0.00	0.25	8.13	N/A	0.00	14.22	9.14
3	0.00	0.00	0.51	1.27	0.00	0.00	5.59	0.25	N/A	3.05	12.70	0.00
4	0.25	0.00	0.00	0.25	0.00	8.38	9.91	4.83	N/A	0.25	70.36	0.76
5	0.00	7.37	0.00	0.00	0.00	1.02	N/A	2.79	N/A	2.03	2.54	1.78
6	0.00	0.25	0.00	0.00	0.00	10.16	N/A	0.00	1.27	1.52	0.25	0.00
7	7.87	0.51	0.00	0.00	N/A	3.50	N/A	2.29	2.54	5.84	0.00	0.00
8	17.02	0.00	0.00	1.52	N/A	16.76	N/A	3.56	10.16	6.01	42.42	5.33
9	0.76	0.76	10.41	0.00	N/A	0.00	N/A	3.56	4.32	1.27	3.05	0.25
10	0.00	3.05	0.00	0.00	N/A	36.32	N/A	5.33	0.25	7.11	0.00	1.02
11	0.00	6.36	0.00	0.00	N/A	0.00	N/A	8.64	0.00	3.05	0.00	0.00
12	0.25	1.52	0.00	0.00	7.37	N/A	N/A	8.38	0.51	2.03	10.92	19.56
13	0.00	0.00	0.00	0.76	4.06	N/A	N/A	7.37	0.00	0.00	0.00	4.83
14	0.00	2.79	0.00	12.70	0.51	N/A	N/A	10.41	0.00	48.77	0.00	0.00
15	0.00	0.00	0.00	1.27	1.78	10.41	N/A	54.86	0.00	0.25	0.00	0.00
16	0.00	0.51	1.78	0.25	0.00	15.49	N/A	48.77	0.00	4.32	28.19	0.00
17	0.00	0.00	2.54	4.67	0.00	1.02	7.62	5.33	15.75	1.27	52.07	0.51
18	0.51	0.00	0.25	0.00	0.00	3.30	3.81	0.00	0.25	0.00	52.83	5.08
19	0.00	0.51	1.02	0.00	0.00	20.83	0.00	1.27	3.30	10.16	19.05	10.92
20	0.00	0.51	0.00	0.00	15.49	8.89	0.00	0.00	0.51	15.75	9.40	5.33
21	0.00	0.00	0.00	2.54	6.36	6.36	3.30	49.28	5.84	7.87	22.01	0.00
22	0.00	0.00	0.00	4.06	0.00	20.07	1.27	26.42	0.00	0.00	3.56	2.54
23	0.00	0.00	0.00	0.00	13.46	0.00	38.10	48.77	0.25	1.27	0.00	0.25
24	0.00	0.00	0.00	0.25	2.03	0.00	0.25	7.11	0.00	0.00	0.00	1.78
25	0.25	0.00	0.25	0.76	0.00	0.00	4.83	5.59	0.00	0.00	9.91	0.00
26	0.76	0.00	1.52	6.60	11.18	10.92	0.00	0.00	1.78	0.00	0.00	0.00
27	0.25	0.00	0.00	0.25	1.27	1.52	6.86	45.47	4.32	0.00	0.00	19.56
28	0.00	1.52	0.76	7.11	0.25	13.97	13.46	0.51	5.59	1.02	0.00	53.09
29	0.00		0.00	5.08	0.00	3.30	27.43	4.83	0.00	0.00	0.00	3.30
30	15.24		0.00	0.00	0.76	2.54	36.32	1.78	0.00	0.00	0.00	2.79
31	1.02		0.00		5.59		2.79	N/A		0.00		26.16
Mo.Total	46.48	28.19	20.57	50.04	83.59	216.40	271.86	377.69	67.97	122.94	387.86	174.75

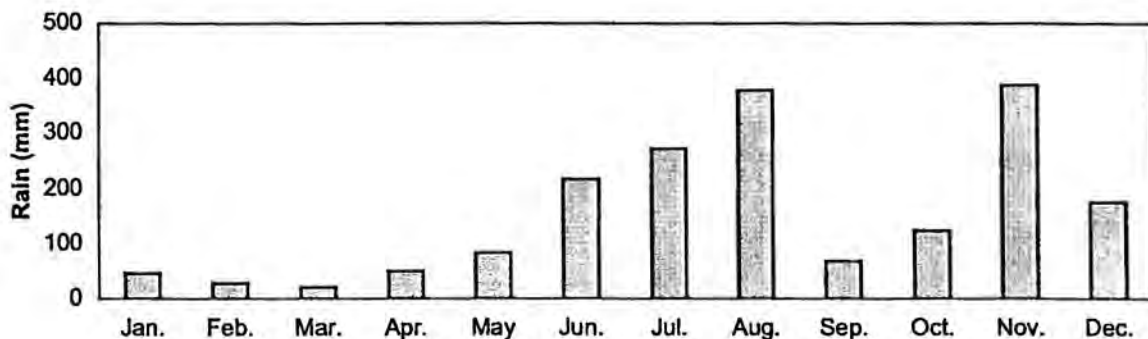


Figure 29: Monthly Total Rainfall

Inarajan Weather Station
Daily and Monthly Average Air Temperature (°C) for Year 2001

Day	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1	26.63	26.82	26.17	26.11	27.26	27.83	27.32	25.99	25.93	26.87	N/A	N/A
2	26.54	26.32	26.28	26.48	27.00	27.78	26.54	27.04	26.24	27.13	N/A	N/A
3	26.30	26.88	26.07	26.78	27.29	27.73	26.29	25.68	26.13	26.72	N/A	N/A
4	26.16	27.24	26.37	26.43	27.64	27.10	26.17	25.47	26.80	26.26	N/A	N/A
5	26.05	26.80	26.36	26.11	27.65	26.75	26.31	26.84	26.38	26.89	N/A	26.62
6	26.50	26.86	26.18	26.74	27.05	26.64	26.63	26.38	26.48	26.54	N/A	26.41
7	26.23	26.51	25.56	26.79	26.27	26.45	25.09	26.42	27.02	26.03	25.47	26.54
8	26.13	27.12	26.16	26.48	26.48	27.32	26.03	26.64	24.22	25.96	25.78	26.17
9	26.45	26.96	26.15	26.94	27.17	26.05	25.12	27.17	24.08	26.58	26.42	26.71
10	26.60	27.48	26.21	26.81	27.42	26.57	24.63	26.94	24.27	25.39	26.30	26.43
11	26.65	26.62	26.24	26.45	27.23	26.57	24.73	25.43	24.76	25.82	25.35	26.53
12	26.46	27.35	25.99	25.89	27.06	26.94	25.89	25.18	24.75	26.47	26.18	26.48
13	26.53	27.19	25.87	26.59	26.98	24.89	24.04	24.51	25.91	26.42	25.49	26.42
14	26.58	27.05	25.87	26.78	27.62	26.94	25.46	24.47	25.78	26.17	25.67	26.62
15	26.44	27.20	26.40	26.88	27.18	26.23	26.12	24.93	25.77	26.63	27.00	26.40
16	26.34	27.16	25.62	26.92	27.45	28.00	26.36	24.85	26.15	27.76	27.00	26.60
17	26.58	27.21	25.67	25.98	27.35	27.76	26.64	27.03	25.45	27.61	26.34	26.34
18	26.45	27.24	26.23	26.46	27.21	27.10	26.35	27.67	24.89	27.75	25.25	26.58
19	26.57	26.84	26.27	27.15	27.35	26.48	26.17	26.14	26.80	26.41	24.58	26.52
20	26.55	26.83	26.33	27.09	27.08	26.43	25.90	26.47	24.07	26.55	26.49	26.15
21	26.64	27.39	25.94	27.00	26.66	26.83	27.32	27.32	24.76	27.27	26.66	26.40
22	26.61	27.42	25.17	26.84	27.55	26.85	28.06	25.68	25.72	26.88	26.58	26.30
23	26.49	27.07	25.12	27.00	27.19	25.95	26.02	24.13	26.02	26.61	27.43	26.23
24	26.38	26.31	25.97	27.17	27.90	27.93	25.85	25.68	25.22	26.16	27.72	26.29
25	26.45	26.83	25.46	27.33	27.01	27.36	26.22	26.27	25.41	26.17	27.11	25.95
26	26.39	26.77	25.77	27.26	27.20	27.20	26.30	26.52	25.41	25.92	N/A	25.93
27	26.51	26.96	25.52	27.33	27.28	27.45	26.13	24.64	25.80	N/A	N/A	25.31
28	26.59	26.67	26.33	26.74	27.29	27.76	26.67	27.36	25.64	N/A	N/A	25.48
29	26.51		26.27	26.60	27.91	26.02	26.62	27.11	26.16	N/A	N/A	26.38
30	25.91		26.54	27.21	27.44	28.59	25.00	27.20	26.66	N/A	N/A	26.10
31	26.49		26.42		27.30		24.52	26.15		N/A		26.15
Mo. Avg.	26.44	26.97	26.02	26.75	27.24	26.98	26.02	26.11	25.62	26.58	26.24	26.30

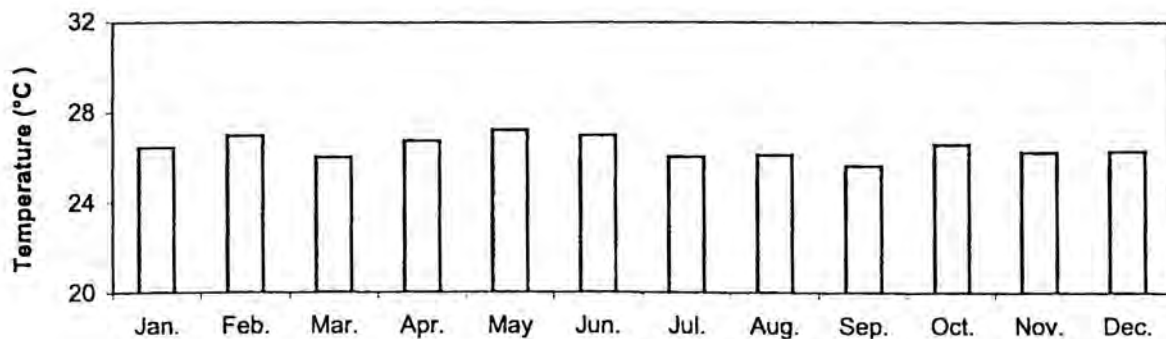


Figure 30: Monthly Average Temperature

Inarajan Weather Station
Daily and Monthly Average Relative Humidity (%) for Year 2001

Day	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1	87.38	81.32	85.69	85.82	81.68	84.42	87.07	88.94	93.02	90.49	N/A	N/A
2	87.90	84.91	83.72	83.79	83.49	83.13	87.44	86.95	92.45	89.58	N/A	N/A
3	87.35	79.67	84.20	83.74	84.9	85.07	88.33	94.96	92.55	92.36	N/A	N/A
4	86.91	77.93	81.33	86.77	82.09	87.12	91.00	98.93	88.84	94.01	N/A	N/A
5	80.91	81.73	82.58	87.47	81.03	85.29	92.41	92.95	91.31	93.72	N/A	87.25
6	81.02	83.10	79.67	84.49	81.08	91.14	91.62	91.11	91.65	92.63	N/A	78.40
7	84.75	88.91	85.03	82.10	80.01	92.32	96.28	91.31	90.45	94.86	91.53	83.51
8	87.91	81.82	81.69	85.80	82.31	87.37	89.21	93.70	97.56	96.08	95.87	85.91
9	80.70	82.07	82.36	82.63	77.59	92.32	93.38	87.40	97.45	93.81	90.84	85.10
10	76.13	75.55	79.20	82.40	77.17	90.27	94.42	90.81	96.77	97.91	90.08	87.53
11	82.45	82.73	78.73	80.20	81.71	88.84	94.53	96.36	93.76	93.51	92.27	88.26
12	86.48	79.66	82.11	81.09	83.34	88.63	92.09	99.72	93.79	91.43	89.80	89.87
13	82.24	81.08	81.97	81.61	85.44	96.36	94.68	100.76	89.18	88.60	88.16	81.47
14	83.37	87.07	82.74	84.29	83.39	88.26	91.16	101.72	88.56	98.50	90.79	76.72
15	80.54	84.91	78.27	85.64	85.80	94.15	90.85	97.67	88.75	95.29	85.10	74.66
16	81.80	77.80	89.39	81.36	83.06	83.08	91.62	97.29	91.76	87.87	85.10	74.35
17	77.39	78.34	90.44	84.11	80.03	85.63	90.65	87.36	94.52	86.18	90.15	81.38
18	82.78	80.46	86.42	83.63	80.63	86.93	91.19	86.88	94.78	86.54	94.32	86.99
19	79.62	77.05	83.85	83.05	77.18	90.04	87.75	94.28	89.53	91.71	97.93	86.96
20	78.37	76.45	83.52	81.59	90.51	92.33	88.27	93.36	100.66	89.31	93.59	88.51
21	78.98	78.88	82.95	83.89	91.41	91.22	85.87	92.08	90.69	85.68	90.60	86.43
22	81.35	80.58	83.55	86.14	86.83	89.60	84.83	99.73	89.00	85.57	89.69	87.54
23	80.26	77.82	83.54	82.90	87.44	90.75	91.20	99.95	90.32	90.82	89.59	88.43
24	79.91	84.31	82.82	82.95	84.30	83.75	90.28	96.37	95.05	88.34	86.97	88.85
25	78.38	82.90	84.48	83.13	85.44	89.55	91.89	95.21	92.50	88.72	90.34	88.15
26	82.64	84.51	84.91	83.83	84.74	88.99	87.89	89.38	90.75	89.90	N/A	91.87
27	83.88	83.00	82.49	81.24	83.58	86.84	91.22	98.65	93.22	N/A	N/A	95.40
28	82.29	84.23	82.30	84.83	83.94	85.60	89.86	86.56	91.01	N/A	N/A	94.26
29	73.89		82.65	85.25	82.12	93.16	90.44	89.65	91.57	N/A	N/A	86.28
30	86.14		83.51	83.18	86.02	83.48	91.47	89.83	91.25	N/A	N/A	86.63
31	76.77		83.56		85.86		95.17	96.73		N/A		85.91
Mo. Avg.	81.95	81.39	83.22	83.63	83.36	88.52	90.78	93.84	92.42	91.29	90.67	85.80

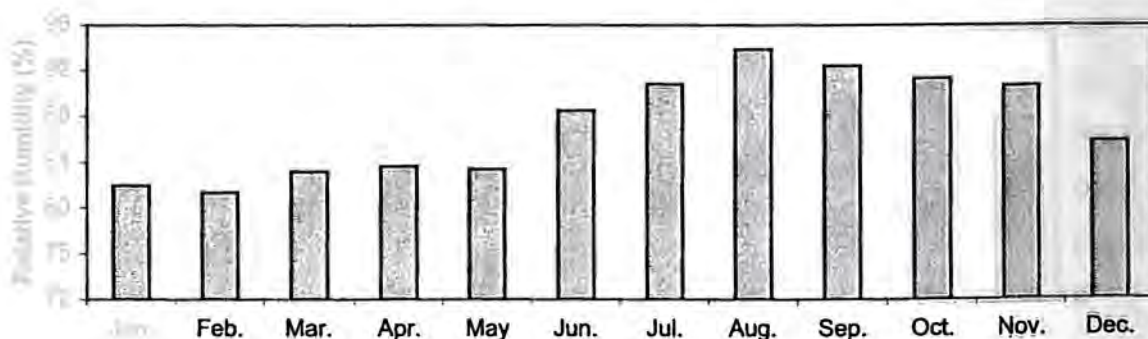


Figure 31: Monthly Average Relative Humidity

Inarajan Weather Station
Photosynthetically Active Radiation (PAR) Average Flux Density ($\mu\text{mol/s/m}^2$) for Year 2001

Day	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1	347.65	376.46	408.00	451.94	405.69	422.52	290.48	424.00	397.44	442.20	N/A	N/A
2	403.58	327.36	412.88	461.93	380.53	451.18	194.32	346.39	401.56	451.63	N/A	N/A
3	377.15	419.39	441.45	466.24	358.04	404.28	279.34	241.20	376.67	425.98	N/A	N/A
4	273.26	410.40	411.57	469.84	384.88	291.06	304.82	194.83	422.56	385.72	N/A	N/A
5	389.23	401.21	428.17	448.54	360.47	282.53	344.46	391.48	463.36	345.88	N/A	269.67
6	346.11	387.62	433.79	469.59	402.68	287.19	332.50	405.68	290.59	464.37	N/A	339.14
7	306.99	319.10	359.16	489.64	460.69	237.76	137.54	323.14	401.62	321.67	301.97	266.81
8	205.27	359.39	458.90	477.15	511.10	319.86	390.90	356.25	206.34	357.13	230.29	212.64
9	378.57	386.37	371.31	481.37	469.62	249.25	224.60	385.35	217.51	440.50	314.00	293.47
10	356.52	401.36	434.19	454.36	463.21	317.30	203.87	339.52	262.80	171.82	336.88	270.79
11	277.65	384.55	437.76	509.66	379.41	370.00	182.44	155.55	274.41	401.14	240.33	276.94
12	298.42	390.85	424.00	496.09	441.33	390.61	432.80	211.90	362.67	498.62	319.33	282.79
13	295.00	375.37	456.18	472.94	409.51	109.59	241.39	83.81	480.61	465.66	364.95	249.13
14	301.96	351.69	425.96	458.27	426.74	340.67	370.71	86.22	470.59	178.93	324.48	265.54
15	365.03	366.89	458.76	474.83	377.04	188.99	392.67	84.46	323.04	271.76	326.69	316.17
16	352.03	379.72	300.58	468.82	438.56	401.60	322.04	74.67	395.35	445.25	326.69	308.00
17	414.07	423.49	383.06	430.24	481.21	431.46	418.99	161.65	303.89	452.28	294.09	279.70
18	212.64	442.59	386.49	480.43	389.36	345.69	384.88	274.60	124.35	455.53	176.93	297.30
19	348.35	440.50	431.23	505.72	501.28	132.87	380.65	255.57	395.64	348.76	91.18	275.76
20	372.54	420.21	423.82	493.58	254.73	229.52	391.54	328.64	113.95	432.28	224.15	257.14
21	351.29	402.54	449.16	452.22	278.10	371.55	424.30	363.70	319.29	426.84	301.05	298.68
22	318.14	402.34	485.34	463.45	288.03	384.43	413.56	207.73	377.85	412.11	248.57	262.76
23	389.68	459.25	454.14	497.18	469.52	315.20	324.71	146.16	446.83	425.80	291.88	207.39
24	375.37	387.54	405.03	476.77	463.16	412.65	365.62	300.49	268.58	432.97	357.56	280.05
25	375.92	426.80	265.40	489.20	492.58	379.94	380.57	338.88	384.69	469.31	318.62	323.75
26	353.13	412.27	463.29	471.67	453.76	427.97	417.58	304.48	287.86	475.69	N/A	283.64
27	348.95	458.46	425.08	476.19	415.64	388.70	376.37	172.09	389.57	N/A	N/A	181.06
28	351.73	418.92	423.36	484.66	382.21	225.76	364.13	312.58	327.32	N/A	N/A	87.66
29	408.97		403.86	477.50	417.23	247.20	352.75	269.75	321.68	N/A	N/A	279.11
30	247.16		386.91	477.62	371.14	385.07	400.84	352.06	432.21	N/A	N/A	263.28
31	432.14		428.60		274.61		290.32	251.49		N/A	N/A	280.12
Mo.Avg.	341.11	397.59	415.40	474.25	406.52	324.68	333.28	262.72	341.36	399.99	283.67	266.98

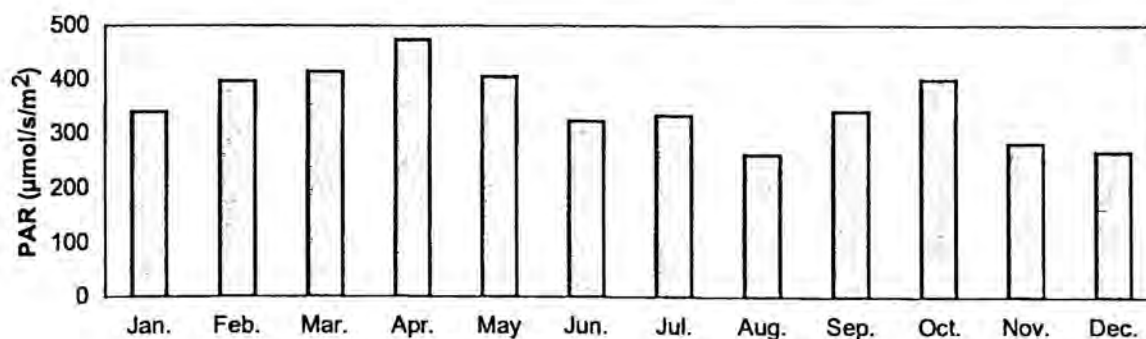


Figure 32: Monthly Average PAR

Inarajan Weather Station
Global Solar Radiation Average Flux Density (W/m²) for Year 2001

Day	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1	219	252	266	252	316	311	217	300	N/A	294	120	216
2	236	210	303	298	303	309	98	258	N/A	277	175	186
3	231	26	297	30	279	7	6	12	N/A	148	91	225
4	195	255	294	297	300	277	222	216	N/A	231	24	228
5	241	255	288	292	282	209	N/A	308	N/A	231	217	211
6	206	229	289	309	306	234	N/A	274	250	294	246	244
7	187	186	238	304	N/A	224	N/A	242	251	237	267	175
8	143	234	290	282	N/A	300	N/A	298	160	266	175	156
9	244	242	159	312	N/A	306	N/A	278	191	245	212	212
10	213	227	294	308	N/A	176	N/A	203	197	126	241	207
11	173	216	287	319	N/A	271	N/A	89	208	238	199	229
12	198	231	277	315	302	N/A	N/A	160	209	282	208	214
13	188	188	298	314	300	N/A	N/A	71	258	283	259	188
14	214	228	290	256	297	N/A	N/A	41	284	79	222	216
15	250	228	304	290	294	129	N/A	57	300	222	237	226
16	211	225	225	307	316	261	N/A	49	225	252	194	223
17	238	260	231	301	328	292	303	119	175	271	104	223
18	133	270	227	312	318	222	275	206	67	171	27	199
19	243	268	268	324	326	109	282	244	246	233	172	203
20	205	282	289	319	207	147	307	261	57	259	157	172
21	220	241	307	301	179	279	289	274	208	230	190	228
22	243	265	317	302	213	269	297	184	274	264	214	219
23	253	281	281	32	242	237	243	110	269	241	233	170
24	254	270	287	293	305	305	183	219	207	270	237	215
25	247	273	240	308	317	250	279	224	244	271	239	233
26	220	243	287	291	312	261	308	242	250	218	238	182
27	176	283	310	288	274	295	249	100	155	240	223	144
28	255	270	308	287	265	162	238	232	257	278	240	34
29	257		305	288	306	183	287	260	214	273	246	173
30	158		244	310	222	294	284	241	287	261	236	160
31	260		288		229		198	N/A		278		185
Mo. Avg.	217	246	277	300	282	244	249	196	218	241	195	197

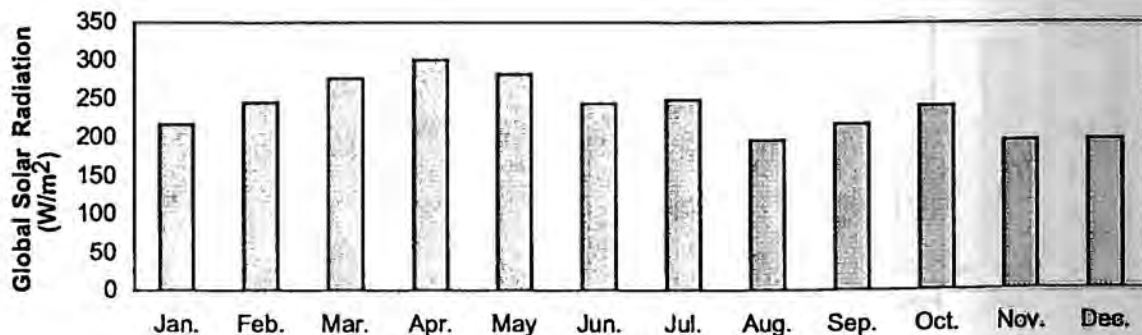


Figure 33: Monthly Average Global Solar Radiation

Inarajan Weather Station
Daily and Monthly Average Wind Speed (m/s) for Year 2001

Day	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1	1.04	2.71	3.52	1.65	2.53	2.03	3.48	1.01	N/A	1.27	1.83	2.69
2	0.86	2.28	2.27	2.19	2.30	1.91	1.92	1.14	N/A	1.32	2.56	2.79
3	1.45	2.30	2.43	2.34	2.72	1.68	1.41	0.42	N/A	1.01	2.75	3.03
4	1.55	2.84	2.75	2.08	2.55	1.28	1.54	0.66	N/A	0.54	1.49	3.00
5	1.93	2.95	2.41	2.17	2.10	1.20	N/A	0.64	N/A	0.63	1.58	2.62
6	2.56	2.90	2.53	2.62	2.52	1.32	N/A	0.45	1.35	1.04	0.90	2.32
7	3.31	2.52	2.59	2.39	N/A	1.01	N/A	0.56	1.27	0.83	1.81	2.38
8	3.13	3.02	2.34	2.48	N/A	1.05	N/A	0.65	0.71	0.76	1.30	2.71
9	3.06	3.03	2.06	2.88	N/A	1.05	N/A	1.38	0.77	0.73	0.99	2.68
10	3.34	3.59	2.70	2.52	N/A	0.96	N/A	1.50	0.62	1.16	1.00	2.17
11	2.73	2.89	2.87	2.22	N/A	1.44	N/A	2.28	1.02	0.87	0.99	1.71
12	2.03	3.10	2.58	1.77	2.63	N/A	N/A	1.56	0.51	1.31	0.91	2.13
13	3.15	3.26	2.08	2.25	2.46	N/A	N/A	3.01	0.76	1.49	1.18	3.49
14	2.26	3.71	2.31	2.70	2.45	N/A	N/A	2.76	1.06	1.06	1.54	2.90
15	2.04	3.45	2.68	2.45	2.58	0.97	N/A	3.65	1.33	1.28	1.89	2.92
16	2.57	3.41	2.47	2.67	2.46	2.01	N/A	3.42	1.07	2.58	2.64	3.21
17	2.37	3.00	2.40	2.38	2.44	2.62	0.89	3.01	0.70	2.40	1.83	2.84
18	2.74	2.72	2.43	2.71	2.37	2.35	0.51	2.34	1.97	2.41	1.25	2.87
19	2.70	2.31	2.19	2.87	2.07	1.81	0.58	1.02	1.48	1.82	0.90	2.63
20	2.75	2.37	2.34	2.85	1.63	1.16	1.02	1.37	0.90	1.78	1.87	2.76
21	3.19	2.83	2.00	2.60	1.48	1.48	1.11	1.79	1.03	2.07	2.85	2.69
22	2.74	2.62	1.57	2.48	2.67	1.21	2.71	0.80	0.74	1.73	2.57	1.64
23	2.25	2.33	1.83	2.78	1.89	1.54	0.96	0.98	1.17	1.53	2.43	2.22
24	2.17	2.12	1.80	2.93	1.50	1.99	0.84	1.43	0.98	1.62	1.55	2.27
25	2.54	2.20	2.03	2.64	1.09	1.88	0.54	1.73	1.34	1.60	0.76	1.97
26	2.85	1.90	1.76	2.74	1.86	1.77	0.84	2.52	1.04	1.27	1.06	1.07
27	2.39	2.57	2.00	2.57	1.73	2.12	0.55	2.21	0.71	1.21	1.89	2.51
28	2.67	2.77	2.44	2.49	1.98	2.39	0.77	2.74	1.01	1.01	2.19	2.29
29	2.95		2.41	2.52	2.27	2.47	0.84	2.49	1.27	1.54	2.40	2.45
30	2.37		2.12	2.37	1.96	3.43	0.66	1.81	1.11	2.08	2.43	2.37
31	3.16		2.17		1.79		0.46	N/A		2.31		2.56
Mo. Avg.	2.48	2.78	2.32	2.48	2.16	1.71	1.14	1.71	1.04	1.43	1.71	2.51

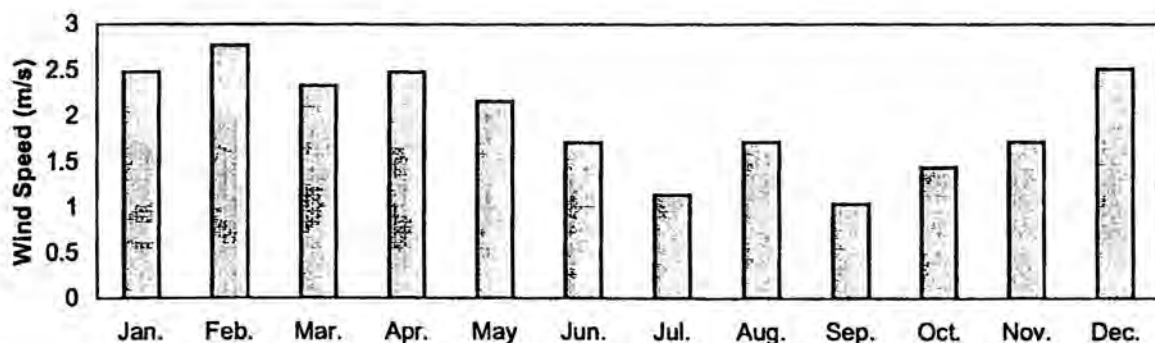


Figure 34: Monthly Average Wind Speed

Inarajan Weather Station
Daily and Monthly Average Wind Direction (0–360 Degrees from North) for Year 2001

Day	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1	193	89	88	114	90	87	120	160	N/A	102	140	89
2	187	90	88	93	87	88	139	141	N/A	190	99	90
3	171	86	92	89	88	n/a	159	251	N/A	256	90	87
4	105	88	87	N/A	87	211	240	223	N/A	230	145	90
5	96	89	89	N/A	85	228	N/A	204	N/A	189	134	96
6	91	88	90	N/A	90	243	N/A	230	237	186	155	94
7	89	92	94	87	N/A	218	N/A	222	238	216	169	95
8	90	89	91	N/A	N/A	243	N/A	175	255	205	118	94
9	91	92	109	86	N/A	240	N/A	125	245	201	157	92
10	89	91	90	95	N/A	258	N/A	127	250	197	175	104
11	89	99	87	98	N/A	220	N/A	135	263	216	248	131
12	97	88	90	129	89	N/A	N/A	173	246	155	205	111
13	89	88	87	88	89	N/A	N/A	231	251	115	208	98
14	97	96	90	88	87	N/A	N/A	222	261	217	175	95
15	98	90	90	74	89	153	N/A	231	218	110	93	100
16	94	89	94	N/A	86	94	N/A	224	231	93	94	99
17	92	91	88	N/A	91	97	181	210	176	92	119	110
18	103	88	88	93	89	119	223	201	133	94	123	97
19	89	92	90	95	97	113	224	225	155	131	137	108
20	88	89	91	89	135	127	211	222	221	143	127	109
21	90	89	94	84	108	121	155	116	221	109	93	92
22	88	86	193	95	91	145	100	221	239	148	112	141
23	92	99	128	83	115	155	183	247	246	196	103	278
24	96	96	92	85	126	96	153	247	256	265	138	290
25	94	89	91	82	178	87	191	237	241	282	169	294
26	89	87	99	82	152	106	192	225	222	246	146	196
27	87	86	89	84	92	109	210	218	204	224	91	147
28	87	89	89	91	92	92	204	216	250	149	96	124
29	88		90	85	83	93	179	224	142	110	91	91
30	103		94	85	86	82	187	237	136	90	94	103
31	88		90		99		255	N/A		90		91
Mo.Avg.	101	90	95	90	100	147	185	204	221	169	135	124

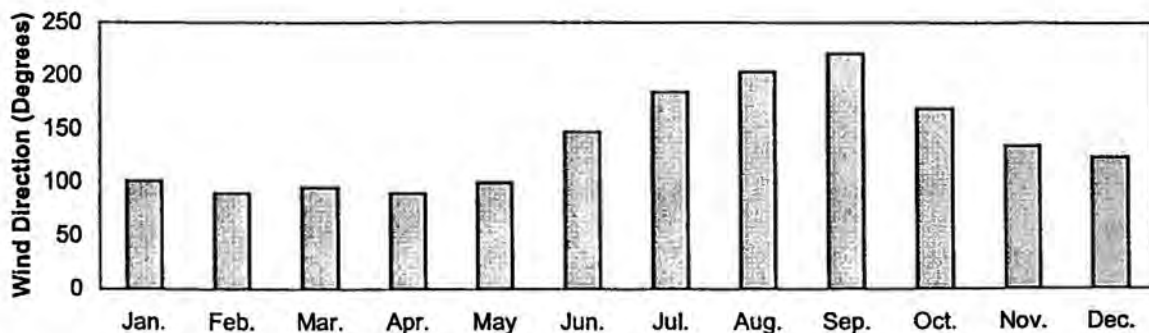


Figure 35: Monthly Average Wind Direction

Inarajan Weather Station
Daily and Monthly Total Atmometer Evaporation (ET Gauge) (mm) for Year 2001

Day	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1	2.70	4.74	5.44	4.16	6.60	N/A	3.30	5.84	N/A	5.84	1.52	3.81
2	3.13	3.07	5.61	5.33	6.01	N/A	2.03	4.32	N/A	5.08	2.54	3.81
3	3.35	4.96	4.77	5.63	5.84	N/A	3.05	1.78	N/A	2.03	0.51	4.32
4	3.11	4.68	5.40	5.59	6.01	N/A	3.56	3.56	N/A	4.06	0.25	4.32
5	4.66	4.47	5.03	5.59	6.01	N/A	N/A	5.59	N/A	4.32	3.81	3.56
6	4.01	3.95	5.73	6.60	6.60	N/A	N/A	5.08	3.56	5.08	4.06	4.83
7	3.80	N/A	3.53	6.35	N/A	4.32	N/A	4.83	4.32	3.81	4.83	4.06
8	2.36	4.43	5.30	5.59	N/A	5.59	N/A	5.33	1.78	4.57	2.03	3.56
9	4.15	3.37	N/A	6.60	N/A	6.01	N/A	4.57	3.05	4.06	2.79	4.06
10	4.57	5.34	5.92	6.60	N/A	1.78	N/A	3.05	3.30	1.52	4.83	3.56
11	3.30	3.13	5.53	6.86	N/A	5.08	N/A	0.76	3.30	3.56	3.56	4.57
12	3.07	4.71	5.01	6.60	6.42	N/A	N/A	2.03	3.56	4.83	3.30	3.81
13	3.72	3.51	5.34	6.35	5.84	N/A	N/A	0.25	4.83	5.84	4.83	3.56
14	3.26	3.15	5.38	4.06	5.59	N/A	N/A	0.00	5.59	1.02	4.06	5.08
15	4.81	4.00	6.12	5.08	5.33	2.03	N/A	0.00	5.84	3.56	5.08	5.59
16	3.88	4.28	2.79	6.35	6.86	4.83	N/A	0.25	4.32	3.81	2.79	5.33
17	4.01	5.12	2.48	5.59	6.86	5.59	5.33	2.29	2.79	5.33	1.27	4.57
18	2.01	4.73	4.22	6.35	6.86	3.81	4.32	4.32	1.02	2.29	0.00	3.05
19	4.94	4.93	4.65	6.60	7.11	1.52	5.33	4.57	4.32	3.81	2.29	3.81
20	4.25	4.64	N/A	6.60	3.30	1.78	5.84	4.06	0.51	3.81	1.78	3.05
21	4.01	4.72	5.34	5.84	3.05	4.32	5.08	4.32	3.56	3.56	3.05	4.57
22	4.47	4.74	5.27	4.83	4.32	4.32	5.59	2.54	5.08	5.33	3.30	4.06
23	4.55	5.38	4.69	6.60	2.64	4.06	3.05	1.02	4.83	4.06	4.57	2.79
24	4.76	3.95	4.88	5.84	4.83	6.01	3.30	3.05	3.56	5.08	4.57	3.30
25	3.49	4.70	3.96	6.35	5.05	4.83	4.57	3.30	4.57	5.08	4.32	4.06
26	5.61	3.68	4.59	5.59	6.16	3.81	5.33	4.83	4.83	4.57	4.32	3.05
27	2.64	5.90	5.30	5.59	5.41	5.84	4.06	0.76	2.29	4.57	4.57	1.02
28	4.86	2.84	5.23	5.33	4.34	2.29	4.06	3.81	4.57	5.08	5.08	0.25
29	5.37		5.92	5.08	5.30	2.79	5.08	4.32	3.56	5.33	5.33	3.05
30	1.68		4.08	6.01	N/A	5.59	5.08	3.81	5.59	5.59	4.57	2.79
31	5.86		5.16		N/A		2.79	N/A		5.84		3.81
Mo. Total	120.42	121.47	152.61	175.64	171.30	123.37	131.79	97.38	113.39	132.33	99.82	115.06

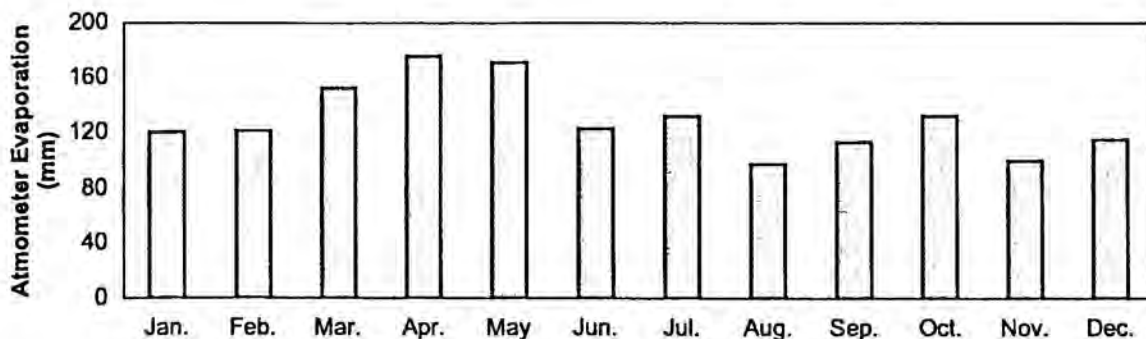


Figure 36: Monthly Total Atmometer Evaporation

Inarajan Weather Station
Daily and Monthly Total Pan Evaporation (mm) for Year 2001

Day	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1	3.18	5.58	6.40	4.90	6.95	N/A	3.79	6.72	N/A	6.72	1.75	4.38
2	3.69	3.61	6.60	6.26	6.39	N/A	1.77	4.97	N/A	5.84	2.92	4.38
3	3.94	5.84	5.61	6.62	5.52	N/A	2.30	2.04	N/A	2.34	0.58	4.97
4	3.65	5.50	6.36	5.54	6.80	N/A	3.95	4.09	N/A	4.67	0.29	4.97
5	5.48	5.26	5.92	5.47	6.12	N/A	N/A	6.43	N/A	4.97	4.38	4.09
6	4.72	4.64	6.75	6.78	6.46	N/A	N/A	5.84	4.09	5.84	4.67	5.55
7	4.47	N/A	4.16	6.28	N/A	6.65	N/A	5.55	4.97	4.38	5.55	4.67
8	2.78	5.21	6.23	5.08	N/A	6.65	N/A	6.13	2.04	5.26	2.34	4.09
9	4.89	3.97	N/A	6.70	N/A	7.25	N/A	5.26	3.51	4.67	3.21	4.67
10	5.38	6.28	6.96	6.57	N/A	2.12	N/A	3.51	3.80	1.75	5.55	4.09
11	3.88	3.68	6.51	6.16	N/A	6.05	N/A	0.88	3.80	4.09	4.09	5.26
12	3.61	5.54	6.00	5.79	7.56	N/A	N/A	2.34	4.09	5.55	3.80	4.38
13	4.38	4.13	6.28	6.62	5.80	N/A	N/A	0.29	5.55	6.72	5.55	4.09
14	3.83	3.71	6.33	3.07	7.41	N/A	N/A	0.00	6.43	1.17	4.67	5.84
15	6.66	4.71	7.20	5.54	6.84	2.40	N/A	0.00	6.72	4.09	5.84	6.43
16	4.57	5.03	3.29	7.12	6.81	5.50	N/A	0.29	4.97	4.38	3.21	6.13
17	4.72	6.03	2.91	5.69	7.50	4.64	3.74	2.74	3.21	6.13	1.46	5.26
18	2.36	5.56	4.96	6.71	7.18	4.71	7.02	4.97	1.17	2.63	0.00	3.51
19	5.82	5.81	5.47	6.65	7.93	1.44	5.25	5.26	4.97	4.53	2.63	4.38
20	5.00	5.46	N/A	6.43	2.45	0.98	5.92	4.84	0.58	4.38	2.04	3.51
21	4.72	5.55	6.28	6.12	3.67	5.48	4.90	6.58	4.09	4.09	3.51	5.26
22	5.26	5.58	6.20	4.89	4.96	4.25	6.08	2.92	5.84	6.13	3.80	4.67
23	5.35	6.33	5.52	7.46	3.11	4.47	2.27	1.17	5.55	4.67	5.26	3.21
24	5.60	4.64	5.75	5.99	5.68	6.03	2.18	3.51	4.09	5.84	5.26	3.80
25	4.11	5.53	4.65	6.84	5.95	4.58	4.64	3.80	5.26	5.84	4.97	4.67
26	6.60	4.33	5.40	6.45	7.25	3.80	5.20	5.55	5.55	5.26	4.97	3.51
27	3.10	6.94	6.24	5.99	6.37	6.08	3.64	0.91	2.63	6.26	5.26	1.17
28	5.72	3.34	6.15	5.67	5.11	2.57	4.55	4.38	5.26	5.84	5.84	0.29
29	6.32		6.97	5.81	6.23	3.43	5.84	6.81	4.09	6.13	6.13	3.51
30	1.98		4.80	6.23	N/A	6.34	5.84	3.75	6.43	6.43	5.26	3.21
31	6.89		6.07		N/A		3.21	N/A		6.72		4.38
Mo. Tot.	141.67	142.90	179.54	181.43	188.63	136.30	133.97	115.23	130.39	152.34	114.80	132.32

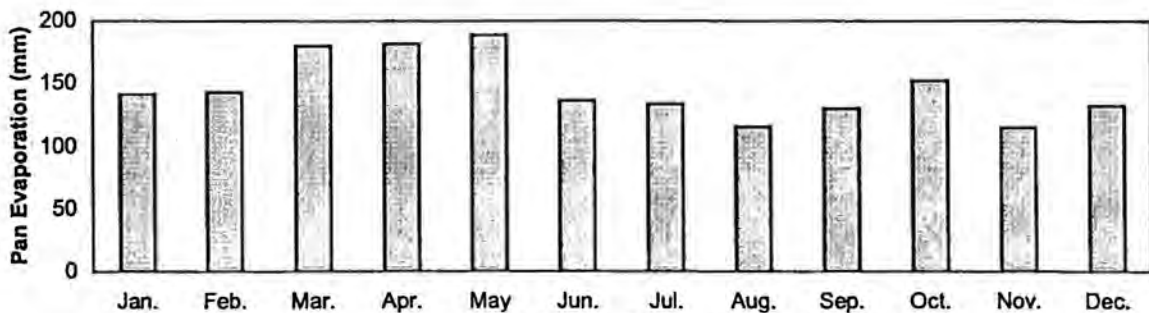


Figure 37: Monthly Total Pan Evaporation

Inarajan Weather Station
Daily Maximum and Minimum Graphs for Specified Climatic Parameters
January 2001 through December 2001

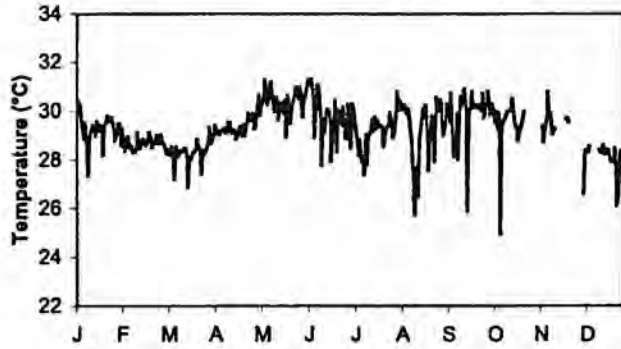


Figure 38: Daily Maximum Temperature

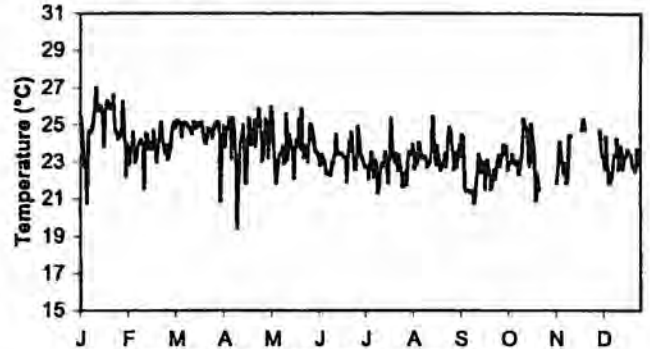


Figure 39: Daily Minimum Temperature

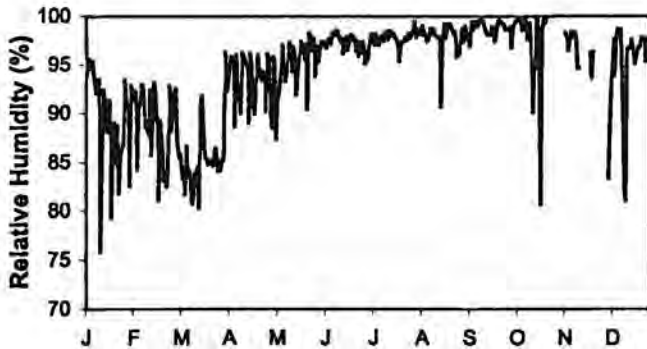


Figure 40: Daily Maximum Relative Humidity

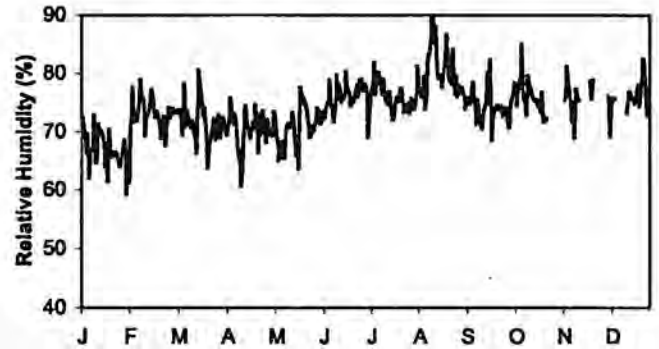


Figure 41: Daily Minimum Relative Humidity

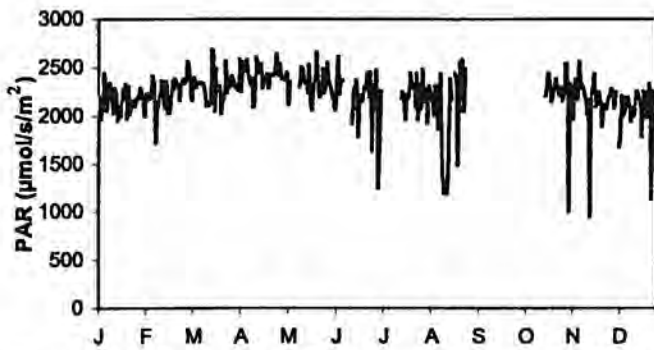


Figure 42: Daily Maximum Photosynthetically Active Radiation (PAR)

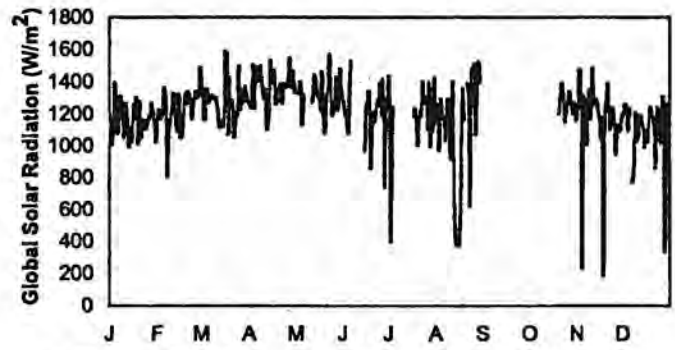


Figure 43: Daily Maximum Global Solar Radiation

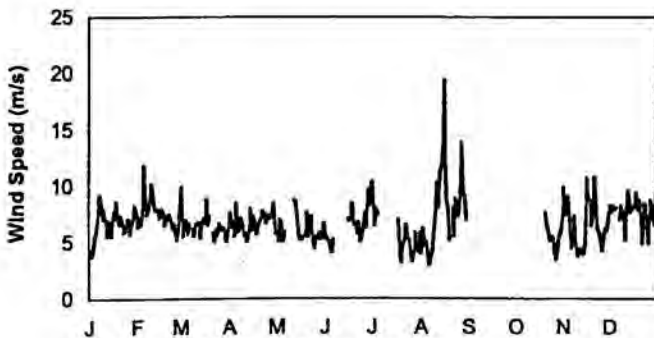


Figure 44: Daily Maximum Wind Speed

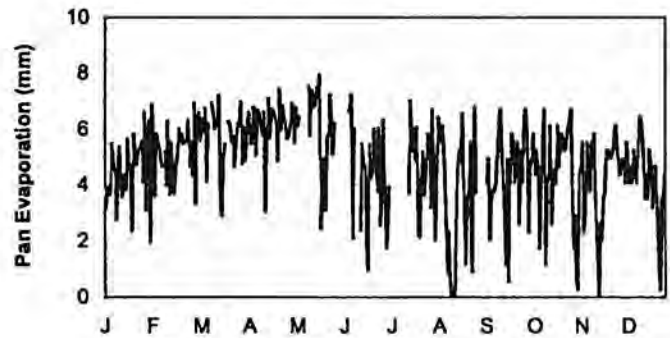


Figure 45: Daily Pan Evaporation

**Inarajan Weather Station
Degree Days Graphics with Tables for Year 2001**

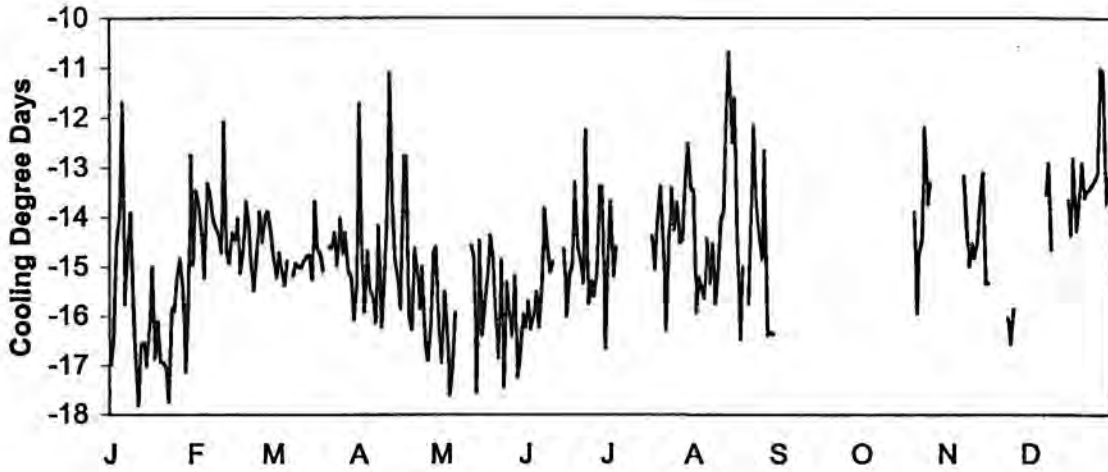


Figure 46: Cooling Degree Days

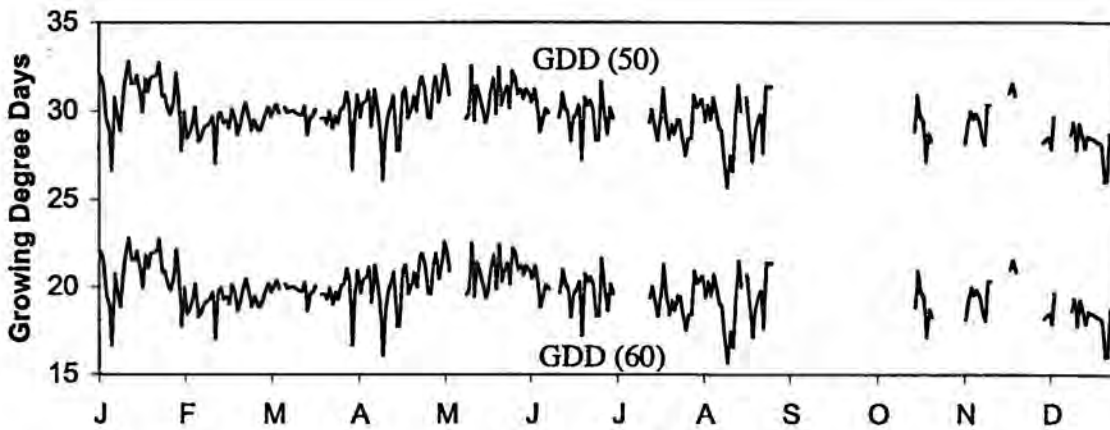


Figure 47: Growing Degree Days

Degree Days	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Cooling	488	399	461	449	494	451	439	448	N/A	435	443	411
Growing (50)	953	819	926	899	959	901	904	913	N/A	900	893	876
Growing (60)	643	539	616	599	649	601	594	603	N/A	590	593	566

Inarajan Weather Station Graphs showing year to year variations in weather data for 1999 to 2001

—x— 1999 -o- 2000 -Δ- 2001

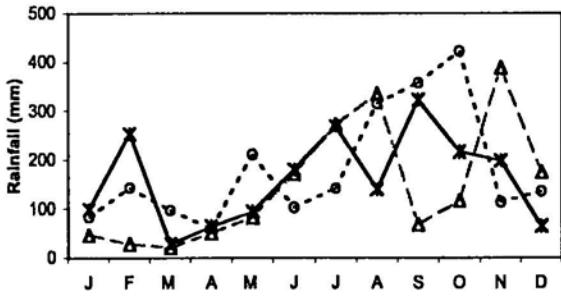


Figure 48: Monthly Total Rainfall

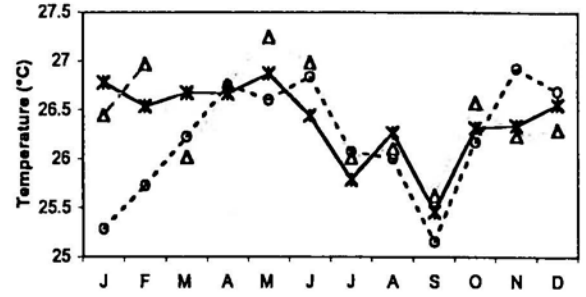


Figure 49: Monthly Average Temperature

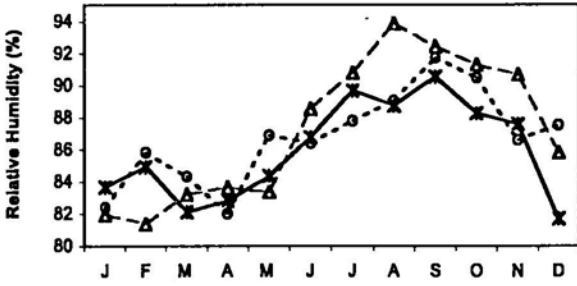


Figure 50: Monthly Average Relative Humidity

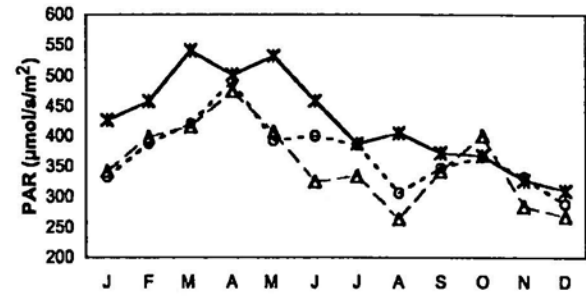


Figure 51: Monthly Average Photosynthetically Active Radiation (PAR)

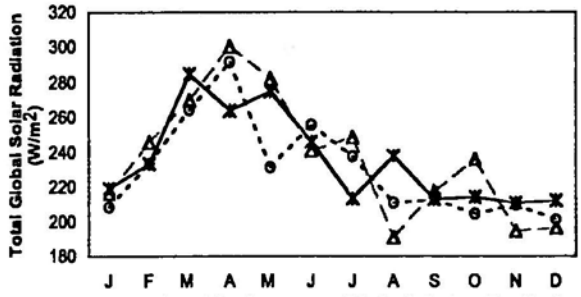


Figure 52: Monthly Average Global Solar Radiation

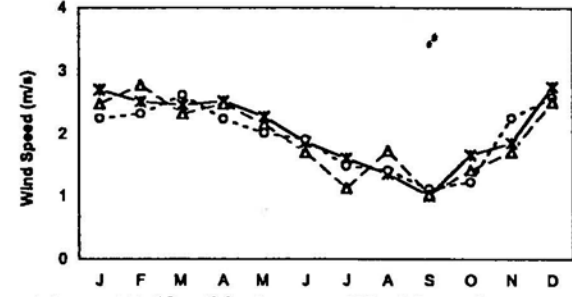


Figure 53: Monthly Average Wind Speed

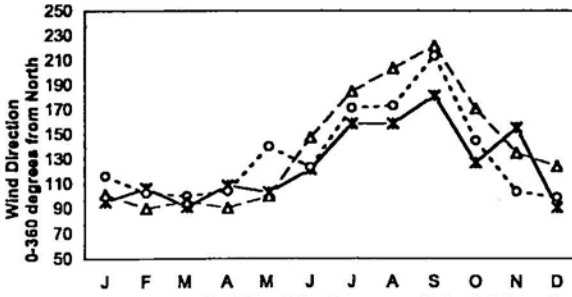


Figure 54: Monthly Average Wind Direction

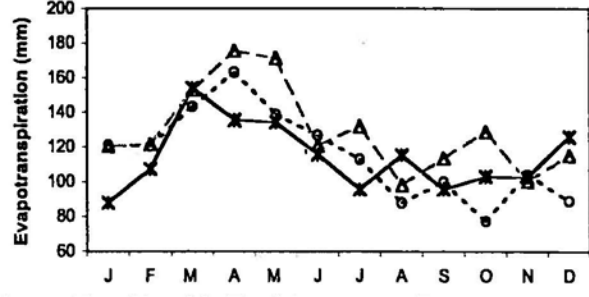


Figure 55: Monthly Total Atmometer Evaporation (ET Gauge)

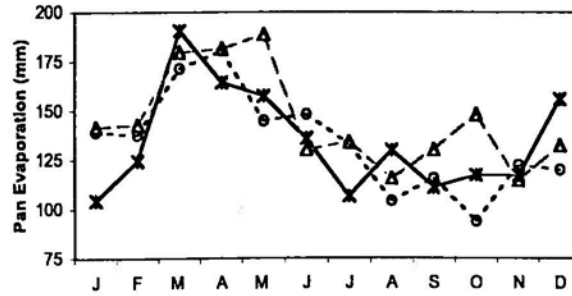


Figure 56: Monthly Total Pan Evaporation

Data missing due to sensor or weather station problems that could not be estimated are marked with an “N/A” (not available) in tables and a line discontinuity in graphs. The PAR sensor at Inarajan shows degradation in accuracy over time (see *Figure 51: Monthly Average Photosynthetically Active Radiation[PAR]* on page 28). Monthly averages containing missing data were estimated by taking the average of the available data for that month. Monthly totals containing missing data were estimated by taking the average of the available data times the number of days in the month.

Events

January 1999	Installed all new sensors at Yigo and Inarajan Weather Stations
June 6, 2000	Changed Total Global Radiation sensor at Inarajan Station
August 30, 2000	Changed Inarajan Temperature and RH sensor at Inarajan Station
April 5, 2001	Changed Evaporation Pan sensor at Yigo Station

**Addendum: Corrections to Inarajan Weather Station Data
for the Year 2000 (Publication 463)**

The Inarajan Weather Station data published in Publication 463 (October 2004) were incorrect due to sensor recalibration. The addendum that follows contains the corrected data for the indicated sensors:

- Daily and Monthly Average Air Temperature
- Daily and Monthly Average Relative Humidity
- Daily Maximum and Minimum Graphs for Specified Climatic Parameters
- Cooling and Growing Degree Days

Inarajan Weather Station

Daily and Monthly Average Air Temperature for Year 2000 (revised)*

Day	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1	25.09	25.76	25.61	26.62	27.28	27.48	N/A	26.02	<i>25.18</i>	<i>26.46</i>	<i>26.82</i>	<i>26.61</i>
2	25.76	26.28	24.92	26.28	27.39	27.13	N/A	25.20	<i>24.25</i>	<i>26.63</i>	<i>26.77</i>	<i>26.65</i>
3	<i>26.03</i>	<i>25.99</i>	<i>26.55</i>	<i>26.71</i>	<i>27.08</i>	<i>27.21</i>	N/A	N/A	<i>25.39</i>	<i>26.21</i>	<i>25.95</i>	<i>26.81</i>
4	25.55	25.70	25.74	26.78	27.46	25.91	N/A	26.17	<i>25.88</i>	<i>26.08</i>	<i>26.77</i>	<i>26.97</i>
5	25.94	24.86	<i>26.37</i>	<i>26.55</i>	27.40	26.28	N/A	25.83	<i>26.13</i>	<i>26.04</i>	<i>26.58</i>	<i>26.92</i>
6	26.32	24.47	26.20	26.89	27.66	25.43	N/A	25.77	<i>23.40</i>	<i>25.49</i>	<i>26.79</i>	<i>27.17</i>
7	<i>26.38</i>	<i>26.18</i>	<i>25.84</i>	<i>26.70</i>	<i>26.15</i>	<i>27.45</i>	N/A	<i>25.64</i>	<i>22.95</i>	<i>24.85</i>	<i>26.77</i>	<i>27.07</i>
8	26.53	25.93	25.97	26.88	26.74	27.53	N/A	24.71	<i>24.20</i>	<i>24.74</i>	<i>26.53</i>	<i>26.98</i>
9	<i>24.32</i>	<i>25.06</i>	<i>26.24</i>	<i>26.54</i>	<i>26.33</i>	<i>27.67</i>	N/A	<i>25.35</i>	<i>23.88</i>	<i>26.21</i>	<i>26.78</i>	<i>26.97</i>
10	25.92	24.80	26.25	26.84	26.22	27.63	N/A	25.00	<i>23.63</i>	<i>26.47</i>	<i>27.15</i>	<i>26.65</i>
11	<i>25.75</i>	<i>25.62</i>	<i>26.06</i>	<i>25.66</i>	<i>25.24</i>	<i>27.15</i>	N/A	<i>27.14</i>	<i>23.29</i>	<i>26.11</i>	<i>27.16</i>	<i>26.55</i>
12	25.32	25.03	26.22	26.74	26.67	25.40	N/A	25.54	<i>24.57</i>	<i>25.06</i>	<i>27.30</i>	<i>26.55</i>
13	<i>24.64</i>	<i>26.66</i>	<i>26.02</i>	<i>26.80</i>	<i>25.99</i>	<i>26.66</i>	N/A	<i>26.51</i>	<i>24.65</i>	<i>26.34</i>	<i>26.77</i>	<i>26.94</i>
14	26.11	25.52	26.54	26.95	23.78	27.22	N/A	27.26	<i>26.26</i>	<i>26.11</i>	<i>27.40</i>	<i>26.92</i>
15	<i>25.18</i>	<i>26.02</i>	<i>25.92</i>	<i>27.00</i>	<i>25.31</i>	<i>27.00</i>	N/A	<i>26.92</i>	<i>26.30</i>	<i>25.04</i>	<i>27.37</i>	<i>26.57</i>
16	25.71	25.72	26.21	27.12	25.27	26.82	N/A	26.90	<i>26.11</i>	<i>26.63</i>	<i>27.14</i>	<i>26.88</i>
17	<i>24.23</i>	<i>25.65</i>	<i>26.70</i>	<i>26.85</i>	<i>26.03</i>	<i>26.28</i>	N/A	<i>26.68</i>	<i>25.75</i>	<i>26.92</i>	<i>26.54</i>	<i>26.70</i>
18	23.26	25.13	26.43	26.81	25.52	N/A	N/A	24.72	<i>26.07</i>	<i>26.84</i>	<i>26.55</i>	<i>26.50</i>
19	<i>23.89</i>	<i>26.62</i>	<i>26.25</i>	<i>26.92</i>	<i>26.75</i>	N/A	<i>26.56</i>	<i>26.12</i>	<i>26.91</i>	<i>26.31</i>	<i>26.84</i>	<i>27.08</i>
20	25.55	25.16	26.22	26.93	26.30	N/A	26.23	26.97	<i>26.23</i>	<i>25.69</i>	<i>27.18</i>	<i>26.67</i>
21	<i>24.08</i>	<i>26.24</i>	<i>25.91</i>	<i>26.06</i>	<i>27.21</i>	N/A	<i>24.31</i>	<i>26.61</i>	<i>26.15</i>	<i>25.99</i>	<i>27.03</i>	<i>26.87</i>
22	24.37	25.57	26.74	25.30	27.13	N/A	25.93	26.84	<i>26.09</i>	<i>24.36</i>	<i>26.88</i>	<i>26.51</i>
23	<i>24.31</i>	<i>26.39</i>	<i>25.87</i>	<i>26.49</i>	<i>26.65</i>	N/A	<i>26.03</i>	<i>26.69</i>	<i>25.06</i>	<i>27.46</i>	<i>27.17</i>	<i>26.31</i>
24	24.62	26.47	26.61	26.49	26.65	N/A	24.36	26.00	<i>25.25</i>	<i>26.45</i>	<i>27.34</i>	<i>26.66</i>
25	N/A	25.94	26.79	<i>27.27</i>	<i>26.84</i>	N/A	25.15	24.65	<i>24.83</i>	<i>26.63</i>	<i>27.35</i>	<i>26.23</i>
26	N/A	26.14	26.14	27.48	27.20	N/A	25.25	26.45	<i>24.53</i>	<i>26.66</i>	<i>27.32</i>	<i>26.47</i>
27	N/A	26.51	<i>26.32</i>	<i>27.28</i>	<i>27.32</i>	N/A	<i>26.86</i>	<i>27.18</i>	<i>24.46</i>	<i>26.62</i>	<i>27.23</i>	<i>26.54</i>
28	N/A	26.27	26.67	27.20	27.55	N/A	26.84	25.16	<i>25.58</i>	<i>26.61</i>	<i>26.64</i>	<i>25.95</i>
29	26.03	26.46	26.58	<i>27.01</i>	<i>27.50</i>	N/A	<i>26.67</i>	<i>25.87</i>	<i>26.15</i>	<i>26.08</i>	<i>26.60</i>	<i>26.53</i>
30	25.88		26.64	27.37	27.06	N/A	27.86	24.82	<i>25.56</i>	<i>26.98</i>	<i>27.05</i>	<i>26.48</i>
31	25.90		26.39		26.96		26.91	25.45		<i>27.28</i>		<i>26.83</i>
Mo.Avg	25.28	25.72	26.22	26.75	26.60	26.83	26.07	26.00	<i>25.16</i>	<i>26.17</i>	<i>26.92</i>	<i>26.69</i>

* The revised data is italicized in the table.

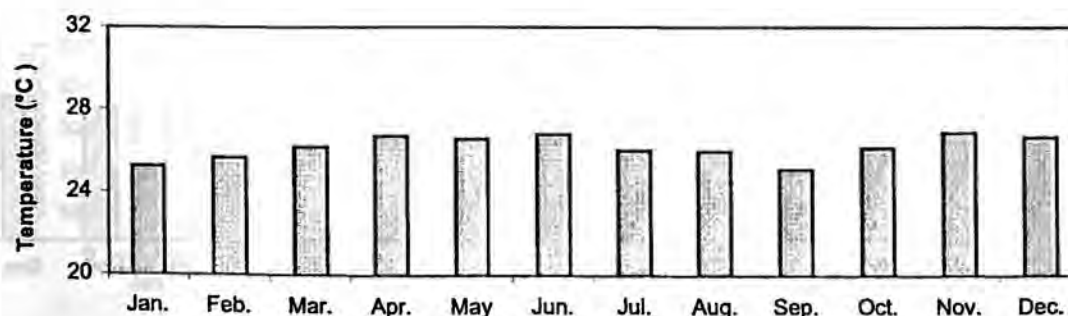


Figure 2: Monthly Average Temperature

Inarajan Weather Station
Daily and Monthly Average Relative Humidity (%) for Year 2000 (revised)*

Day	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1	88.45	87.21	82.15	81.76	78.60	81.62	N/A	85.50	<i>91.54</i>	<i>90.44</i>	<i>87.49</i>	<i>93.40</i>
2	81.93	85.57	89.12	83.36	79.96	84.73	N/A	91.08	<i>95.90</i>	<i>90.79</i>	<i>88.50</i>	<i>92.64</i>
3	80.61	80.62	79.84	82.61	83.08	83.53	N/A	N/A	<i>91.71</i>	<i>89.64</i>	<i>92.18</i>	<i>87.46</i>
4	79.55	80.77	88.16	82.06	82.34	89.47	N/A	87.07	<i>90.76</i>	<i>90.68</i>	<i>88.57</i>	<i>90.78</i>
5	78.20	85.75	82.56	83.83	84.11	88.16	N/A	89.69	<i>90.77</i>	<i>91.95</i>	<i>89.80</i>	<i>92.31</i>
6	82.79	96.23	82.80	81.83	83.61	92.18	N/A	88.45	<i>99.93</i>	<i>93.53</i>	<i>88.95</i>	<i>90.11</i>
7	84.02	89.16	85.63	84.93	90.41	85.36	N/A	90.31	<i>99.99</i>	<i>92.99</i>	<i>82.19</i>	<i>86.56</i>
8	84.15	88.26	85.77	81.49	88.39	85.46	N/A	91.89	<i>97.07</i>	<i>95.45</i>	<i>86.40</i>	<i>84.06</i>
9	90.16	89.13	86.55	82.36	89.85	84.46	N/A	89.89	<i>92.88</i>	<i>90.97</i>	<i>89.62</i>	<i>84.43</i>
10	86.25	88.94	81.72	82.19	90.55	84.72	N/A	92.27	<i>96.53</i>	<i>89.99</i>	<i>85.97</i>	<i>88.99</i>
11	86.35	88.11	84.48	89.26	94.40	84.40	N/A	86.26	<i>99.32</i>	<i>90.63</i>	<i>84.61</i>	<i>86.68</i>
12	87.47	92.80	86.88	82.08	88.42	94.15	N/A	90.70	<i>91.91</i>	<i>96.11</i>	<i>84.67</i>	<i>86.54</i>
13	89.38	89.74	86.30	80.64	92.34	87.54	N/A	85.94	<i>91.38</i>	<i>88.11</i>	<i>88.66</i>	<i>87.21</i>
14	77.57	89.20	83.59	79.35	99.42	85.25	N/A	83.34	<i>86.42</i>	<i>90.25</i>	<i>80.99</i>	<i>83.81</i>
15	79.67	86.24	90.58	79.34	93.46	85.74	N/A	84.95	<i>89.03</i>	<i>91.19</i>	<i>86.39</i>	<i>86.41</i>
16	75.67	85.01	88.19	80.85	94.13	85.28	N/A	85.93	<i>90.00</i>	<i>90.58</i>	<i>86.68</i>	<i>84.49</i>
17	78.61	85.48	82.14	83.26	90.83	86.64	N/A	85.18	<i>92.11</i>	<i>89.78</i>	<i>89.57</i>	<i>89.92</i>
18	82.61	90.09	85.23	80.40	91.30	N/A	N/A	94.05	<i>90.78</i>	<i>88.74</i>	<i>89.87</i>	<i>88.38</i>
19	83.65	89.46	81.74	79.51	87.77	N/A	85.37	88.31	<i>87.43</i>	<i>89.65</i>	<i>88.76</i>	<i>84.67</i>
20	70.02	89.11	84.37	81.30	88.68	N/A	86.26	86.12	<i>90.58</i>	<i>91.11</i>	<i>87.91</i>	<i>87.32</i>
21	76.46	80.09	86.65	83.42	84.19	N/A	96.06	87.98	<i>87.42</i>	<i>92.40</i>	<i>86.23</i>	<i>82.90</i>
22	78.14	80.87	80.48	83.53	83.65	N/A	87.81	87.47	<i>82.45</i>	<i>97.36</i>	<i>86.71</i>	<i>89.13</i>
23	82.99	84.00	85.57	83.43	86.41	N/A	86.84	87.49	<i>86.84</i>	<i>82.58</i>	<i>84.87</i>	<i>89.27</i>
24	87.59	84.21	79.78	85.47	85.98	N/A	93.37	91.01	<i>87.31</i>	<i>91.35</i>	<i>82.32</i>	<i>86.65</i>
25	N/A	83.48	80.27	81.92	85.04	N/A	90.67	95.76	<i>94.06</i>	<i>89.30</i>	<i>84.44</i>	<i>87.97</i>
26	N/A	80.40	84.88	79.50	83.23	N/A	92.98	90.57	<i>93.53</i>	<i>87.64</i>	<i>82.22</i>	<i>85.27</i>
27	N/A	80.36	86.72	79.63	82.46	N/A	85.22	87.81	<i>94.42</i>	<i>86.89</i>	<i>82.65</i>	<i>84.46</i>
28	N/A	79.83	82.82	81.14	81.36	N/A	85.04	92.00	<i>88.34</i>	<i>88.94</i>	<i>87.93</i>	<i>91.12</i>
29	83.72	78.21	83.24	80.54	81.73	N/A	87.00	88.15	<i>87.80</i>	<i>93.08</i>	<i>87.17</i>	<i>82.50</i>
30	83.85		82.53	78.96	82.72	N/A	81.17	93.34	<i>92.68</i>	<i>88.55</i>	<i>85.09</i>	<i>89.59</i>
31	84.59		82.59		84.10		83.02	92.63		<i>84.20</i>		<i>88.19</i>
Mo. Avg.	82.39	85.81	84.30	82.00	86.86	86.39	87.75	89.04	<i>91.70</i>	<i>90.48</i>	<i>86.58</i>	<i>87.52</i>

* The revised data is italicized in the table.

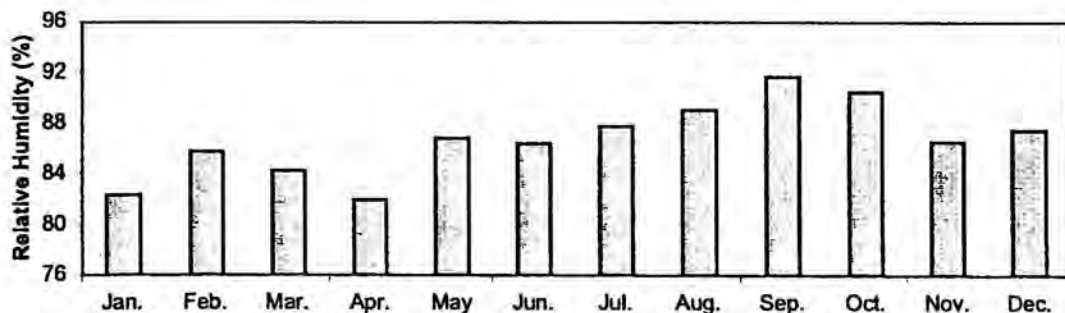


Figure 3: Monthly Average Relative Humidity

Photosynthetically Active Radiation (PAR) Average Flux Density ($\mu\text{mol/s/m}^2$) for Year 2000 (revised)*

Day	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1	348.71	416.06	389.18	486.02	425.93	443.37	383.82	260.93	397.37	360.24	362.01	250.32
2	330.81	370.97	306.31	465.37	459.14	491.91	343.24	202.04	239.87	415.56	335.36	293.39
3	332.49	371.69	481.36	501.67	225.95	289.65	426.92	333.20	459.18	394.07	267.72	325.37
4	393.58	362.62	322.79	468.21	490.96	176.13	360.61	364.11	405.67	401.36	273.55	265.96
5	3.85	230.81	433.30	486.47	384.77	244.94	402.78	244.52	318.00	323.43	270.13	256.19
6	324.38	222.47	428.14	496.21	421.29	373.92	348.43	294.65	59.28	190.92	384.68	266.49
7	358.99	398.12	395.79	493.79	322.21	451.22	425.21	410.16	124.57	407.30	380.54	300.41
8	299.82	438.63	454.00	494.78	470.21	428.85	372.46	183.42	253.82	137.18	348.37	334.43
9	252.91	434.00	422.35	482.74	248.29	437.85	453.49	260.99	245.19	431.03	305.07	345.00
10	326.34	416.39	406.97	474.51	381.07	384.88	420.43	92.97	182.80	434.99	372.19	280.20
11	283.90	636.47	417.00	466.52	103.94	365.72	424.15	342.89	119.25	382.96	374.30	260.31
12	304.72	269.64	385.78	503.62	317.38	310.47	349.92	365.92	338.40	256.88	374.42	311.44
13	320.77	355.79	328.58	502.07	366.68	441.26	452.61	465.85	369.31	477.22	356.01	318.74
14	360.38	N/A	417.32	505.00	143.76	422.26	411.72	400.92	453.67	424.16	337.78	312.30
15	253.47	N/A	338.25	481.11	272.48	422.75	279.74	349.26	386.59	235.77	338.09	261.67
16	396.67	273.67	347.93	495.38	260.59	457.33	311.56	416.66	462.78	427.99	323.99	280.01
17	367.57	406.54	426.80	453.70	505.55	418.97	456.79	253.51	379.00	399.96	356.89	296.75
18	333.25	219.68	434.46	499.61	431.66	276.83	390.94	146.37	416.51	454.47	320.79	185.33
19	360.67	317.16	438.59	500.87	453.89	460.00	426.67	445.16	489.78	360.27	335.10	309.80
20	363.03	434.56	500.62	475.20	516.35	359.68	353.10	360.47	482.49	342.09	341.39	275.87
21	335.79	430.15	472.22	514.41	419.33	412.02	185.79	332.32	427.84	475.81	338.88	327.89
22	422.28	494.13	461.35	525.16	456.24	442.72	472.44	301.67	530.67	84.24	338.62	249.31
23	340.28	420.57	423.63	471.93	440.83	459.48	495.87	374.81	434.99	471.37	346.68	302.70
24	247.69	453.67	501.67	487.30	405.93	423.14	250.63	268.25	417.73	384.05	352.92	308.55
25	300.62	421.32	417.84	486.80	432.55	428.06	307.20	163.83	342.86	276.78	249.68	286.81
26	370.43	431.12	387.95	497.13	485.59	305.67	336.70	412.30	254.01	464.95	274.86	292.75
27	337.23	448.34	447.68	516.78	492.03	436.38	401.63	303.28	272.79	427.40	378.49	303.21
28	324.21	447.15	457.17	475.57	480.66	448.43	422.57	251.87	405.77	398.46	283.42	248.96
29	345.0	7.72	503.0	499.40	424.78	521.00	437.32	471.53	422.40	211.87	309.39	309.40
30	315.75		449.40	482.97	473.25	460.29	466.33	264.80	322.98	438.61	322.36	272.97
31	33 10		423.92		435.72		366.60	149.25		401.17		286.41
Mo.Avg.	331.80	387.39	420.05	489.68	391.90	399.84	385.09	306.06	347.19	364.28	331.79	287.71

* The revised data for the months of January through December 2000 are shown above.

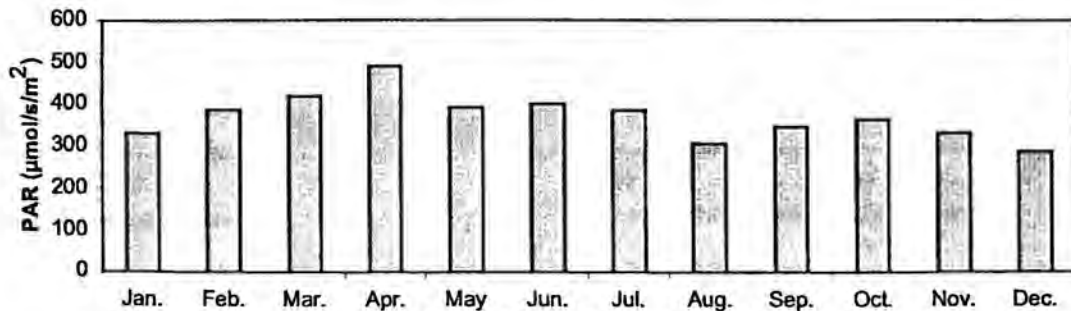


Figure 4: Monthly Average PAR

Inarajan Weather Station
Daily Maximum and Minimum Graphs for Specified Climatic Parameters
January through December 2000 (revised)

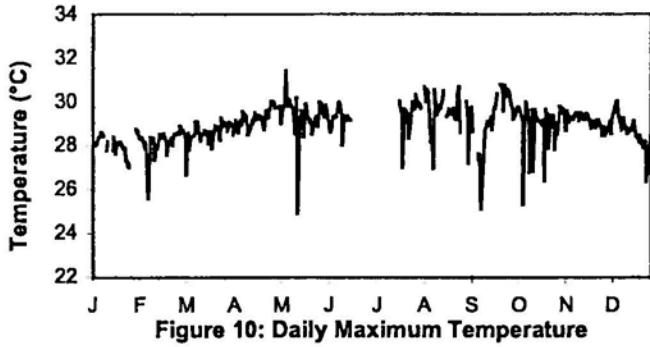


Figure 10: Daily Maximum Temperature

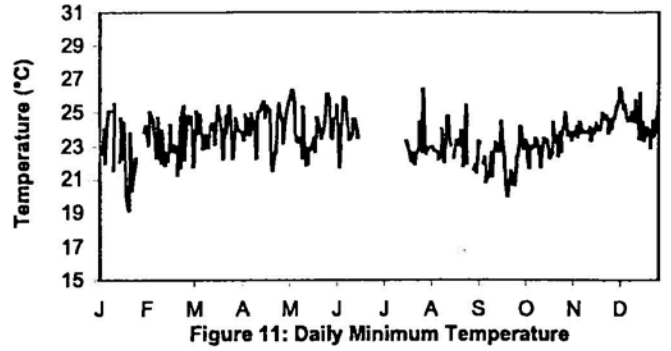


Figure 11: Daily Minimum Temperature

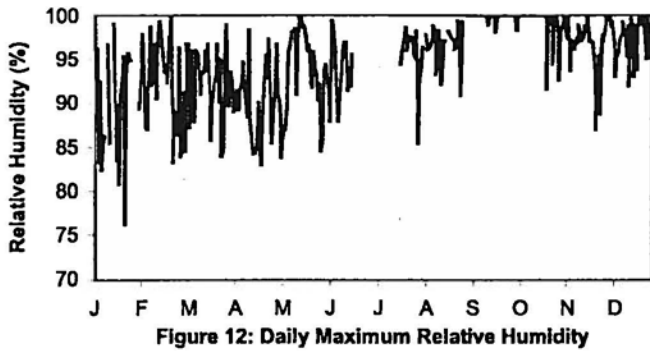


Figure 12: Daily Maximum Relative Humidity

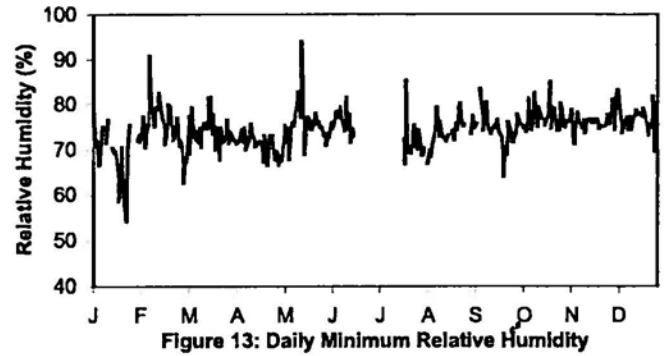


Figure 13: Daily Minimum Relative Humidity

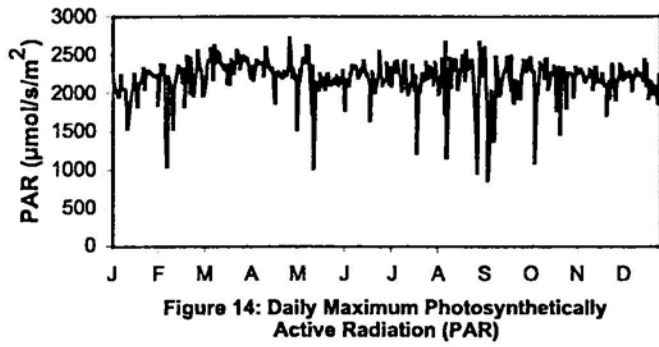


Figure 14: Daily Maximum Photosynthetically Active Radiation (PAR)

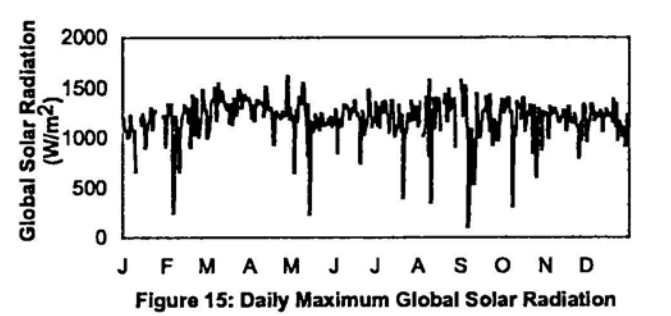


Figure 15: Daily Maximum Global Solar Radiation

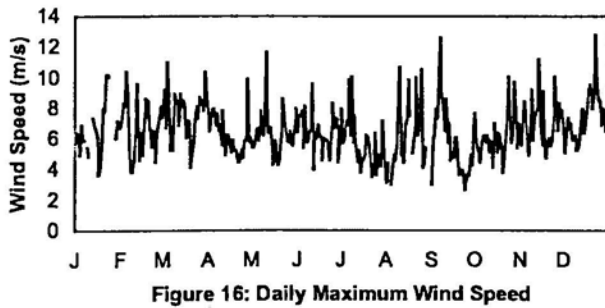


Figure 16: Daily Maximum Wind Speed

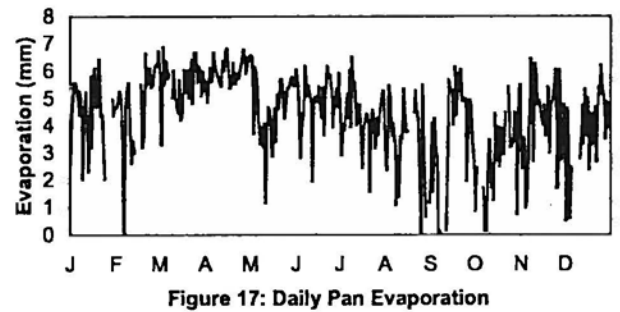


Figure 17: Daily Pan Evaporation

**Inarajan Weather Station
Degree Days Graphs with Tables for 2000 (revised)**

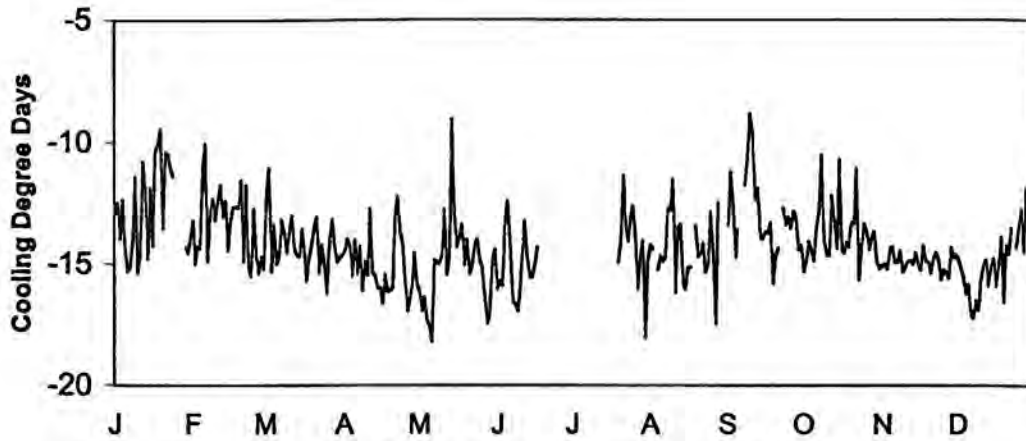


Figure 18: Cooling Degree Days

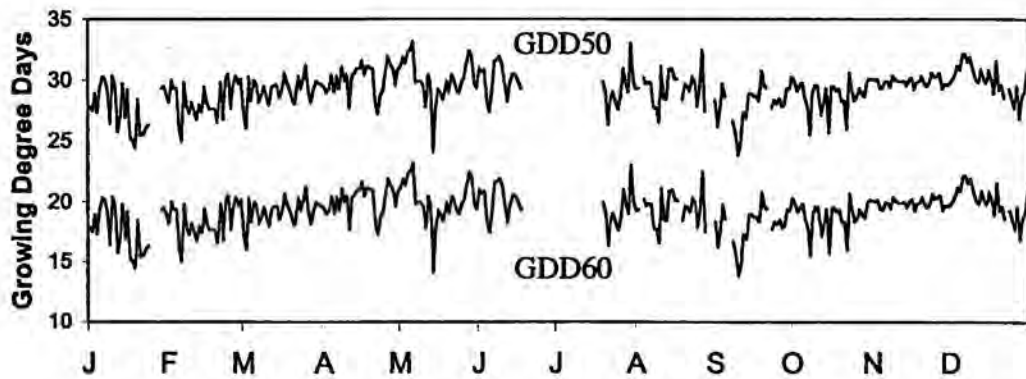


Figure 19: Growing Degree Days

Degree Days	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Cooling	396	388	439	452	466	453	441	445	390	428	447	450
Growing (50)	861	823	904	902	931	903	906	910	840	893	897	901
Growing (60)	551	533	594	602	621	603	596	600	540	583	597	601



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Funding for this publication has been provided by Hatch-Multistate Research funds under Project number W-1128.

Any opinions, findings, conclusions or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the views of the U.S. Department of Agriculture or the University of Guam.