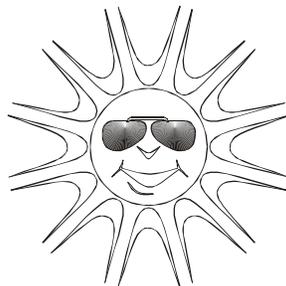


**Smithsonian Tropical Research Institute**

**1994 Meteorological and Hydrological  
Summary for  
Barro Colorado Island**

**Prepared by: Steven Paton**



## Introduction

This is the second of a new series of yearly reports summarising each past year's meteorological and hydrological monitoring program on Barro Colorado Island (BCI) that the Smithsonian Tropical Research Institute maintains as part of its Terrestrial-Environmental Sciences Program (T-ESP). This report is not meant to be exhaustive in its coverage in that it summaries only some of the most 'important' or interesting parameters available. Any comments on how future yearly summaries could be improved would be appreciated.

## Setting

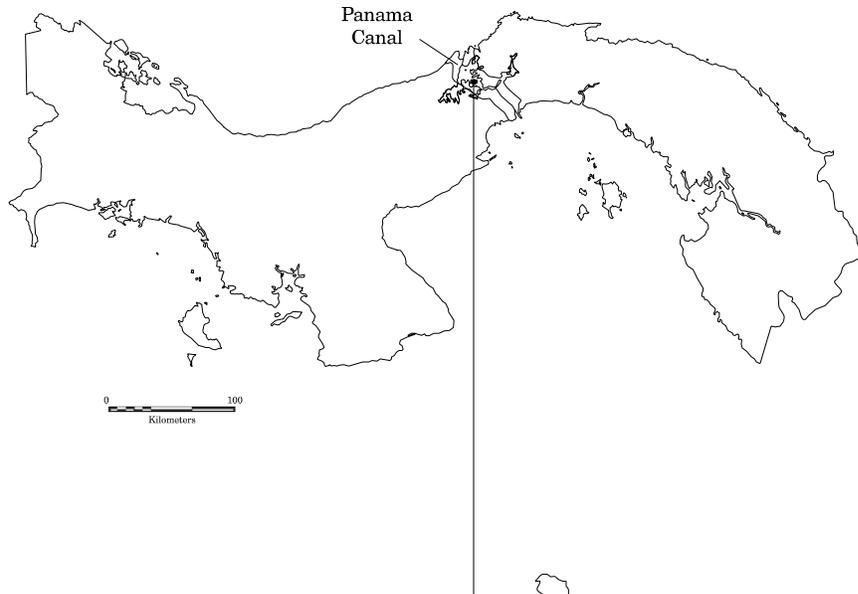
The meteorology and hydrology monitoring programs on BCI are described in detail in Climate and Moisture Variability in a Tropical Forest: Long-term Records from Barro Colorado Island, Panamá. Windsor (1990). Much of the information on the next five pages has been extracted from this source.

BCI (lat. 9°10'N lon. 79°51'W) is a completely forested, 1500 ha island, rising 137m above Lake Gatun. The island receives an average of over 2600mm of rain per year. The meteorological year is divided into two parts: a pronounced dry season (approximately from mid-December to the end of April), and a wet season (May to mid-December). On average, only 230mm of rain falls during the dry season. Relative humidity, soil moisture, air pressure, solar radiation, wind speed and direction all show marked wet/dry season differences. On the other hand, temperature varies relatively little throughout the year.

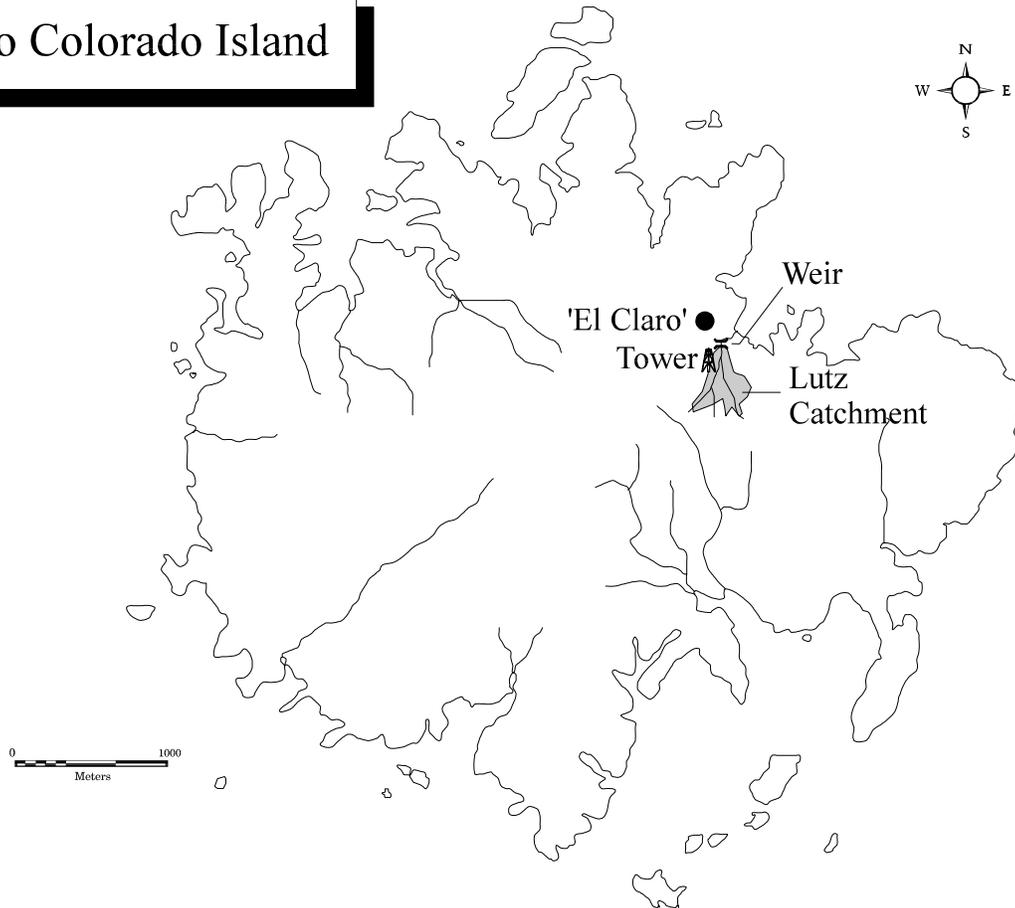
This report summarises data taken from two locations: a 42 m walk-up tower located within the Lutz catchment, and a small clearing ('El Claro') located among several laboratory buildings (see map on the following page). The tower, with sensors at 10 m intervals, provides a vertical meteorological transect through the forest canopy. The Lutz 10.1 ha catchment on the Northeast slope of BCI and is probably typical of many small catchment areas on the island. The Lutz catchment is located immediately southwest of the laboratory clearing and dormitory area. The Clearing is a grass-covered area located near several laboratory buildings. The physical aspects of the Clearing have changed little over time, however, the proximity of nearby buildings is less than ideal for long-term meteorological measurements. Furthermore, the recent removal of a nearby building (and possibly others in the near future) may have affected the local climate around the Clearing.

Data were collected using two different methods: electro-mechanically (electronic sensors, data loggers, chart recorders, ETgages, etc.), and manually by a technician - Mr. Raúl Ríos. In general, manual readings tend to provide the most accurate measurements over the long-term and as a result, when both types of data are available, the manual readings are used. The disadvantage of these measurements is that they are not available for each day. Some summaries (temperature, relative humidity, and soil humidity) are based entirely on manual measurements. Other summaries (solar radiation, wind direction) are based entirely on electro-mechanical measurements. Finally, some

summaries (rainfall and wind speed) are based on a combinations of manual and electro-mechanical measurements.



**Barro Colorado Island**



## The Data

This report summarises the following data:

<b>Lutz Tower</b>	<b>1m</b>	<b>temperature relative humidity</b>
	<b>40m</b>	<b>temperature relative humidity wind speed and direction solar radiation evapotranspiration</b>
<b>Lutz catchment</b>		<b>run-off soil moisture</b>
<b>'El Claro'</b>		<b>temperature relative humidity rainfall air pressure evapotranspiration</b>

### Rainfall

Rainfall was collected by rain gauges in the Clearing, and by tipping buckets in both the Clearing and near the Lutz weir. The rain gauges were read at approximately 9:00 am every day except weekends and holidays. Tipping buckets provide continuous rainfall information, but tend to underestimate total rainfall by between 2% and 12% and for that reason are not used to provide data on absolute rainfall totals. Tipping buckets generate 'events' for every 0.254 mm of rainfall recorded. The underestimation seems to be due to the instruments' inability to properly record intense periods of rainfall. In order to 'fill in' the missing rain gauge data, a computer program was written by the author that uses tipping bucket rainfall data to distribute the rain gauge data for those days when readings were not made. The program takes the total rainfall collected in the rain gauge and divides it up proportionally according to the rainfall patterns detected by the tipping buckets. The estimated rainfall for the missing days is exactly equal to the rainfall collected by the rain gauge. The daily rainfall for the Clearing is shown on page 7.

Page 8 shows the monthly totals for this year. The graph on the same page compares this year's monthly totals with the average monthly totals ( $\pm$ SD) for the period 1929 to 1994.

Page 9 breaks rainfall approximately into wet and dry seasons. The seasons were defined, somewhat arbitrarily, as: Dry Season (Jan. 1 to April 30) and Wet Season (May 1 to Dec. 31). The three graphs on this page are frequency histograms showing the distribution of rainfalls (1929 to 1993) for the Dry and Wet Seasons as well as the yearly totals. The arrow in each graph shows the rainfall for 1994 in relation to previous years. The small cross bar above each graph represents the mean (vertical bar) and the standard deviation (horizontal bar) for the period 1929 - 1993.

Pages 10 and 11 show an analysis of rainfall 'events' (*storms*). For convenience, and again somewhat arbitrarily, I have defined a storm as any continuous period of rain separated by at least an hour from any other rainfall. Since this analysis required the timing of rainfall events, tipping bucket data were used. As a result, the absolute size of rainfall events should be considered as only a rough comparison since they will tend to disproportionately underestimate the size of storms - larger storms will be more underestimated than smaller ones. Keeping this in mind, the tables and graphs on this page compare the maximum storm size and the average storm size and duration per month for the period 1972 to 1993 and for the year 1994.

### Run-off

Run-off at the Lutz catchment area was determined from the water level in a 120° V-notch weir. The height of the water was recorded by three separate instruments: continuously by a Stevens A-71 strip-chart, water level recorder, at five-minute intervals with a datalogger, and at five-minute intervals with an ISCO Bubble Flow Meter. Data from each of these devices are converted (either directly or through a digitizing process) into run-off (m<sup>3</sup>) and then into rainfall equivalents.

Daily Lutz creek weir run-off totals are shown on page 12. These data are shown in terms of the equivalents of precipitation in mm. These values are calculated by taking the run-off and dividing by the total surface area of the catchment area (10.1 ha). In this way, the run-off can be more conveniently compared to the amount of rainfall.

Pages 13 and 14 show the total monthly run-off. The graph on the same page compares average monthly run-off for the period 1973 to 1993 with 1994.

### Soil Moisture

Soil moisture was determined gravimetrically based on samples collected every two weeks. Samples are taken at two depths (0-10cm and 30-40cm) from ten sites in the Lutz catchment area. Samples of approximately 2.5 cm soil cores are made with an 'Oakfield punch'. Page 15 shows the average soil moistures (% water by wet weight of soil) per month at each sample depth. The graph on the same page compares monthly averages for the period 1986 to 1993 with those for 1994.

## **Relative Humidity**

Relative humidity was measured using the traditional method of wet and dry-bulb psychrometry. Measurements in the Clearing, at the base and top of the Lutz tower (1m and 40m, respectively) were made at approximately 12:30 p.m. using a Taylor Sling Psychrometer. Data were also collected on an hourly basis by dataloggers attached to electronic sensors. These data are not reported in this yearly summary.

The average monthly relative humidities are shown in tabular and graphical form on pages 16 and 17, respectively.

## **Air Pressure**

Air pressure was determined by reading a full-range mercurial barometer at approximately 12:30 P.M.. The average monthly air pressures are shown in tabular and graphical form on page 18.

## **Temperature**

Shaded air temperature was measured in the Clearing, at the base and the top of the Lutz tower by Taylor max-min thermometers. Measurements were made by hand at approximately 8:15 am. Data were also collected on an hourly basis by dataloggers attached to electronic sensors. These data are not reported in this yearly summary. The average monthly maximum and minimum temperatures for these three locations are shown in tabular and graphical form on page 19 and 20, respectively.

## **Solar Radiation**

Global solar radiation was measured at the top of the Lutz tower using a Li-Cor LI200SB pyrranometer attached to a datalogger. Hourly average (wh/m<sup>2</sup>/h), maximum and minimum ( $\mu$ Wh/m<sup>2</sup>/min) was recorded. A Li-Cor 190SB sensor recorded Photosynthetically Active Radiation (PAR) similarly. A failure of the datalogger during the month of November resulted in the loss of two weeks of data.

Page 21 shows the Daily PAR values and Page 22 shows the Daily Global Radiation values. The following page shows total monthly Global radiation and PAR.

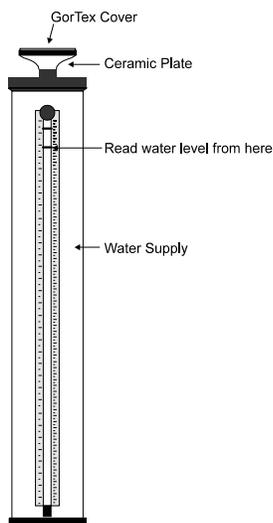
## Wind Speed and Direction

Hourly average, maximum and minimum wind speed plus average wind direction was recorded at the top of the Lutz tower using a Model 05035 Young Anemometer connected to a data logger.

Page 24 shows the average and maximum daily wind speeds. The next page shows average wind direction. The angles indicated in the table and graph on this page represent the direction from which the wind was predominately blowing on a given day. Page 26 shows the monthly average wind speeds and directions for the year.

## Estimated Evapotranspiration and Water Balance

### ETgauge



Evapotranspiration was added to the meteorological program on BCI beginning on November of 1992 and is estimated using ceramic plate atmometers known as ETgages. ETgages estimate evapotranspiration by allowing water to be drawn up through a ceramic disk and out through a GorTex cover. A recent study by Fontain and Todd (Measuring Evaporation with Ceramic Bellani Plate Atmometers, 1993, Water Resources Bulletin, Vol. 29, No. 5, p. 785-795) found that such devices perform very well compared with more traditional methods of measuring evaporation.

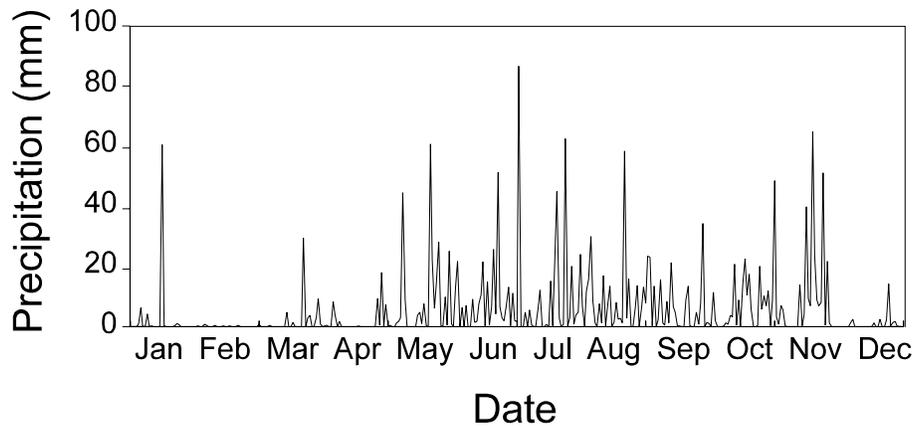
There are two ETgages currently being used on BCI: one in the Clearing located at a height of 1.5m and a second on the top of the 40m tower near the Lutz weir. ETgages are read at approximately the same time of day and with the same frequency and the rain gauges on BCI. In addition, the ETgage located on the tower is equipped to electronically record (in conjunction with a Datalogger) the timing of the evaporation of every 0.254mm.

The data from the ETgages are used to estimate the total water balance for the Lutz catchment. Water balance is calculated as: Rainfall - Weir run-off - Evapotranspiration.

The results from the ETgages and the estimated water balance for 1994 are given on page 27.

### Daily Rainfall (mm) on BCI recorded at 900 hrs

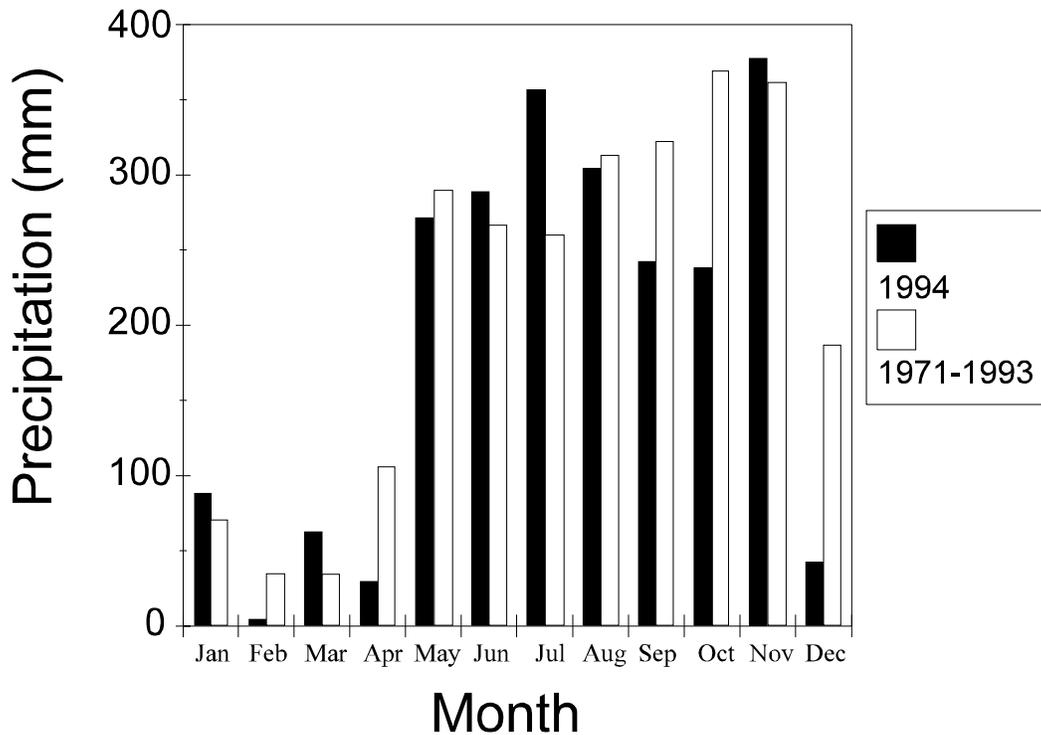
	Jan.	Feb.	Mar	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	0.0	0.3	0.0	0.0	7.4	1.0	2.0	24.1	7.9	1.0	48.5	0.0
2	0.0	0.0	0.8	0.3	0.0	0.0	1.8	6.9	23.4	0.0	3.3	0.0
3	0.0	0.0	0.0	0.5	0.5	13.5	86.6	0.0	23.1	11.4	0.8	0.0
4	1.0	0.8	0.0	0.0	0.0	21.8	0.0	11.7	0.3	2.0	7.1	0.0
5	6.3	0.5	0.0	0.0	0.0	0.0	0.0	15.7	13.5	0.0	5.6	0.0
6	0.0	0.0	0.0	8.4	1.3	6.4	4.8	30.0	0.0	0.0	0.3	0.0
7	0.0	0.0	0.5	3.8	1.8	0.0	0.0	8.6	2.3	0.0	0.0	1.3
8	4.3	0.0	0.0	0.0	3.0	7.1	5.6	1.3	15.7	0.3	0.0	2.5
9	0.0	0.5	0.0	1.8	44.5	0.0	0.5	0.0	1.3	1.3	0.0	0.0
10	0.3	0.0	0.0	0.0	8.9	0.0	0.0	7.6	0.5	0.8	0.0	0.0
11	0.0	0.0	0.0	0.0	0.0	9.1	0.0	1.3	8.4	3.8	0.0	0.0
12	0.0	0.0	0.0	0.0	0.0	1.5	6.1	17.0	1.3	3.3	0.0	0.0
13	0.0	0.3	0.0	0.0	0.0	1.8	12.2	0.3	21.3	20.8	14.0	0.0
14	0.0	0.0	0.0	0.0	0.0	7.6	0.0	6.6	6.6	0.5	0.3	0.0
15	60.5	0.0	4.8	0.0	0.0	10.7	0.0	13.5	4.8	8.9	4.1	0.0
16	0.3	0.3	0.0	0.0	3.8	21.6	0.8	0.0	0.3	0.0	39.9	0.0
17	0.0	0.0	0.0	0.0	4.8	0.3	0.0	1.5	0.3	14.5	9.4	0.0
18	0.0	0.0	1.5	0.3	1.0	15.0	15.2	8.1	0.0	22.6	6.9	1.3
19	0.0	0.0	0.0	0.0	7.6	0.5	0.3	2.5	0.0	10.4	64.8	0.0
20	0.0	0.5	0.0	0.0	0.3	6.6	24.4	2.8	8.9	17.5	23.6	0.0
21	0.3	0.0	0.0	0.0	0.0	25.7	45.0	1.3	13.5	5.8	8.9	2.5
22	1.0	0.0	0.0	0.0	60.7	4.3	2.8	58.4	0.3	0.0	6.9	0.0
23	0.8	0.0	29.5	0.0	22.1	51.3	0.0	2.8	0.0	0.0	8.1	0.0
24	0.0	0.0	0.0	0.0	6.1	6.6	0.8	16.0	0.0	0.3	51.1	2.3
25	0.0	0.0	2.8	0.0	14.5	2.8	62.5	0.0	4.8	20.1	0.5	14.2
26	0.0	0.0	3.8	0.0	28.2	2.0	0.3	0.0	0.8	5.8	21.8	0.3
27	0.0	0.0	0.0	9.4	0.3	6.9	3.0	6.1	8.1	10.2	1.3	1.5
28	0.0	0.0	0.0	0.5	0.0	13.2	20.1	13.7	34.3	6.9	0.0	1.8
29	0.0		3.0	18.0	9.9	0.3	0.8	0.0	0.0	11.9	0.0	0.3
30	0.0		9.4	0.3	0.5	11.2	3.8	6.3	1.5	0.3	0.0	0.0
31	0.0		0.8		25.1		4.8	13.2		8.9		0.0



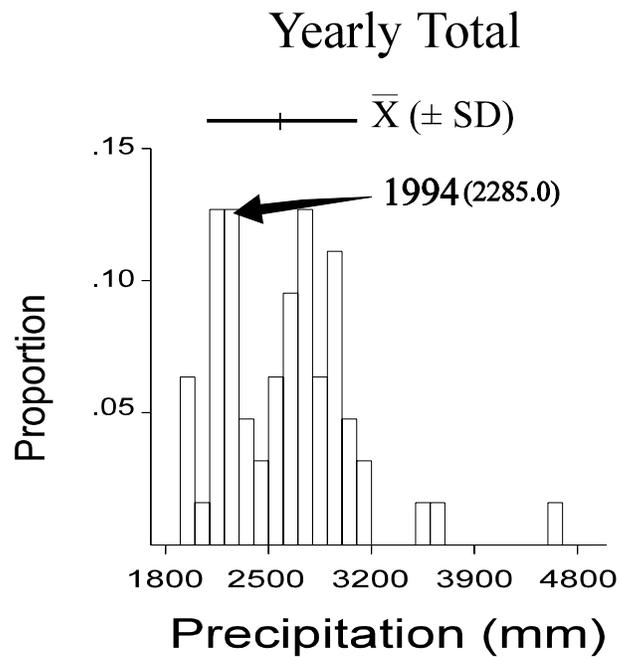
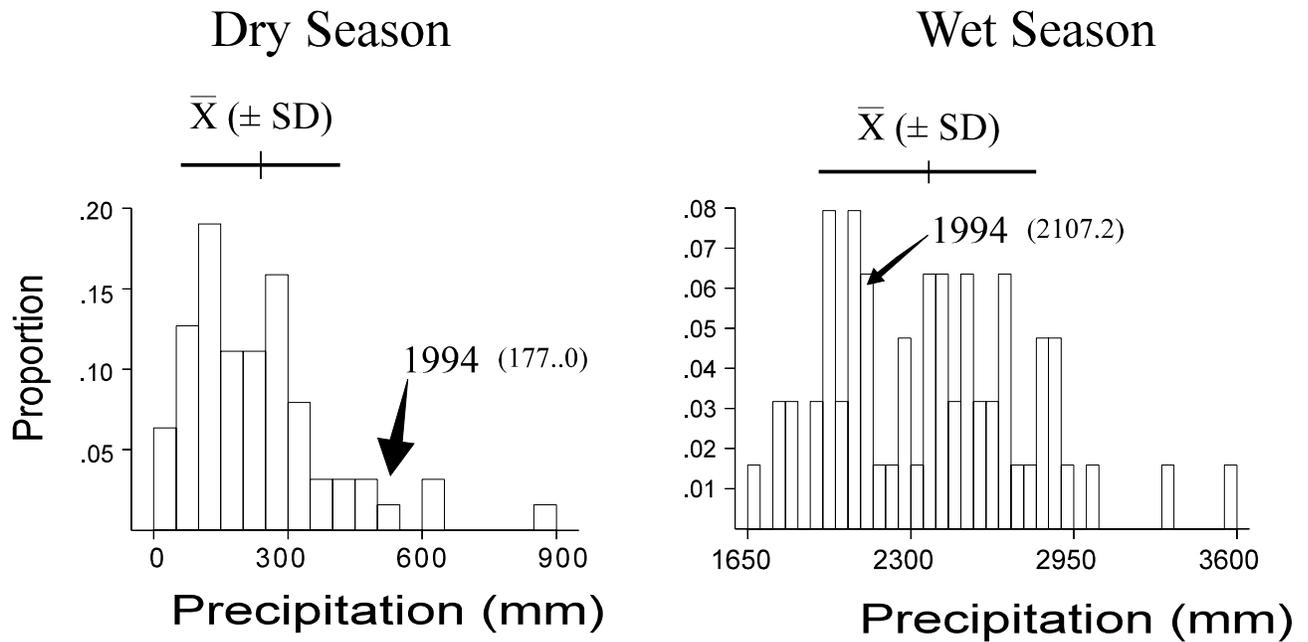
## Monthly Rainfall at 'El Claro' - Rain Guage

### Rainfall (mm)

	Average	S.D.	1994
<b>January</b>	63.1	85.1	86.4
<b>February</b>	31.9	25.6	2.5
<b>March</b>	33.2	37.7	61.0
<b>April</b>	92.6	104.1	27.9
<b>May</b>	278.3	113.9	269.7
<b>June</b>	265.7	85.0	287.0
<b>July</b>	276.9	78.4	354.9
<b>August</b>	310.9	88.4	302.4
<b>September</b>	274.6	92.9	240.5
<b>October</b>	357.8	79.1	236.2
<b>November</b>	417.1	139.6	375.9
<b>December</b>	239.4	142.3	40.6
<b>Total</b>	<b>2647.0</b>		<b>2285.0</b>



# Seasonal Distribution of Precipitation

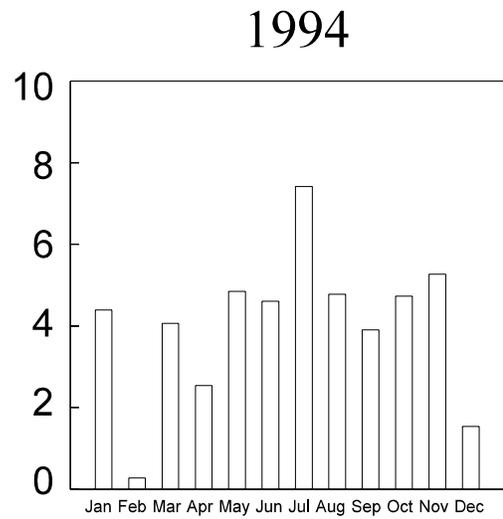
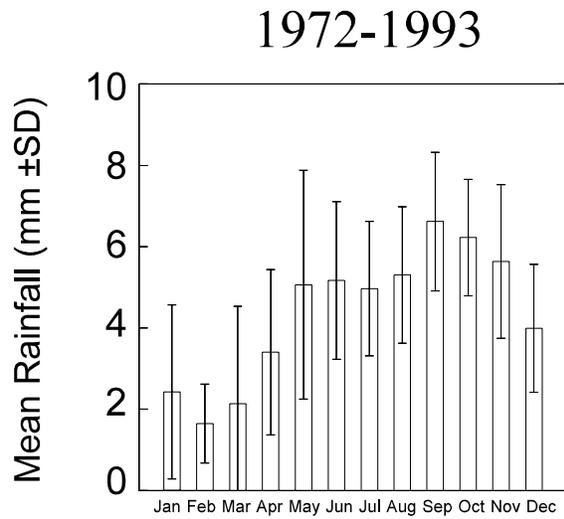


## Storm Analysis

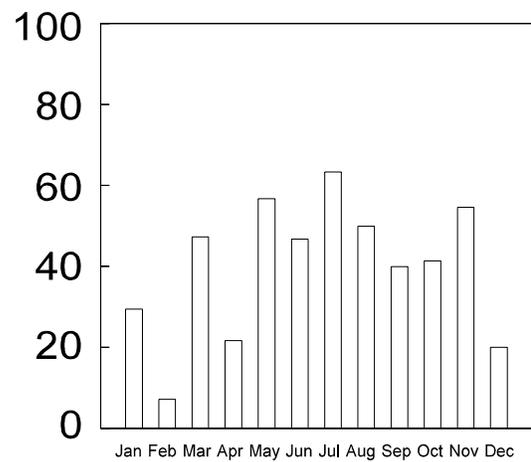
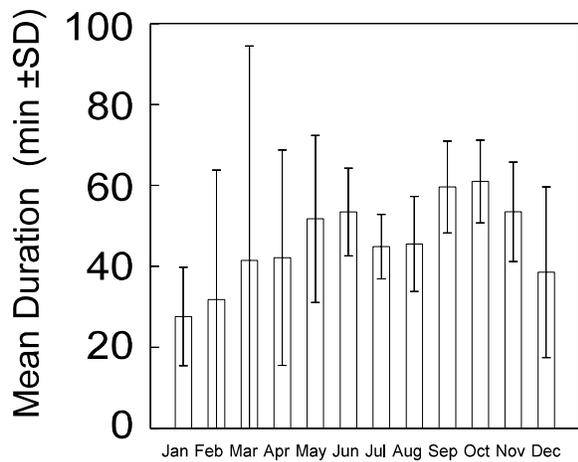
	<b>Max. Rainfall per Storm</b>			<b>Storm Duration (min.)</b>		
	<b>1972-93</b>		<b>1994</b>	<b>1972-93</b>		<b>1994</b>
	<b>Mean</b>	<b>S.D.</b>		<b>Mean</b>	<b>S.D.</b>	
<b>January</b>	13.2	11.8	37.8	27.6	12.2	29.5
<b>February</b>	9.7	6.8	0.5	31.8	32.0	7.2
<b>March</b>	11.2	12.5	24.1	41.5	52.9	47.3
<b>April</b>	29.2	37.2	18.0	42.1	26.6	21.7
<b>May</b>	47.4	34.4	60.7	51.7	20.6	56.7
<b>June</b>	44.2	15.9	49.0	53.4	10.8	46.8
<b>July</b>	49.7	27.7	76.5	44.9	8.0	63.3
<b>August</b>	49.3	15.9	53.6	45.5	11.7	49.9
<b>September</b>	54.1	23.2	33.3	59.6	11.3	39.9
<b>October</b>	48.6	29.2	22.6	61.0	10.2	41.4
<b>November</b>	44.3	11.1	48.8	53.5	12.3	54.6
<b>December</b>	44.3	27.0	12.7	38.5	21.1	20.0

	<b>Av. Rainfall per Storm (mm)</b>		
	<b>1972-93</b>		<b>1994</b>
	<b>Mean</b>	<b>S.D.</b>	
<b>January</b>	2.4	2.1	4.4
<b>February</b>	1.6	1.0	0.3
<b>March</b>	2.1	2.4	4.1
<b>April</b>	3.4	2.0	2.5
<b>May</b>	5.1	2.8	4.9
<b>June</b>	5.1	2.0	4.6
<b>July</b>	5.0	1.7	7.4
<b>August</b>	5.3	1.7	4.8
<b>September</b>	6.6	1.7	3.9
<b>October</b>	6.2	1.4	4.7
<b>November</b>	5.6	1.9	5.3
<b>December</b>	4.0	1.6	1.5

## Average Monthly Storm Size

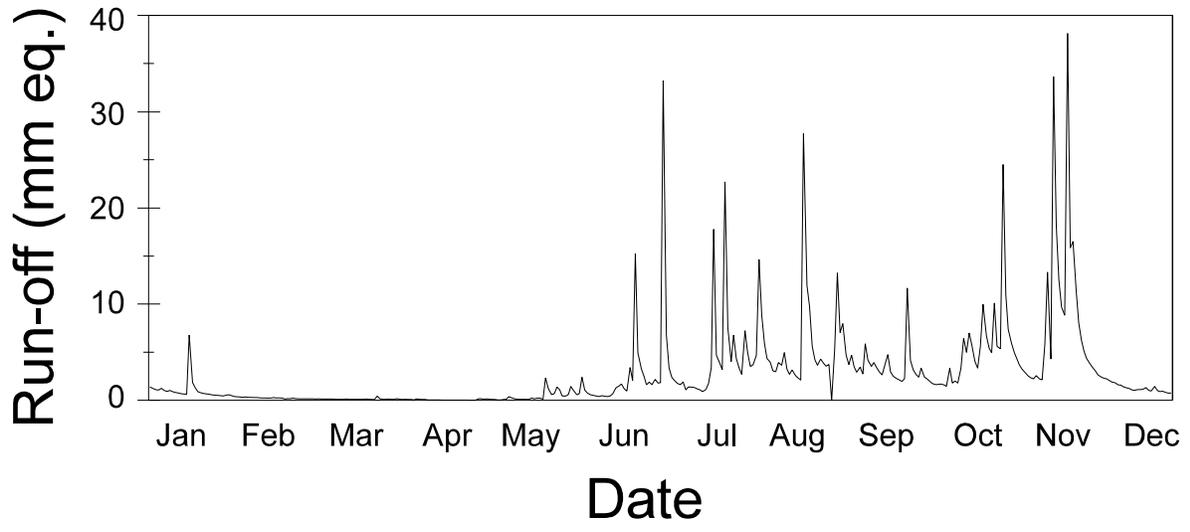


## Average Monthly Storm Duration



### Daily Lutz Weir Run-off (mm .eq.)

	Jan.	Feb.	Mar	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	1.13	0.30	0.09	0.05	0.06	0.64	1.23	5.83	5.87	1.88	21.31	4.36
2	1.13	0.30	0.10	0.05	0.06	0.32	1.29	3.81	6.82	1.67	8.48	3.75
3	1.02	0.25	0.09	0.04	0.04	0.43	30.06	2.55	13.24	2.56	5.55	3.42
4	0.86	0.24	0.09	0.04	0.03	1.83	5.24	2.78	7.03	1.69	4.44	3.05
5	1.00	0.23	0.08	0.03	0.03	0.66	2.40	3.69	7.98	1.52	4.06	2.63
6	0.91	0.22	0.09	0.07	0.03	0.46	1.65	12.42	4.67	1.32	3.45	2.40
7	0.75	0.21	0.07	0.05	0.04	0.36	1.32	7.11	3.69	1.21	2.57	2.29
8	0.71	0.21	0.06	0.04	0.05	0.31	1.24	4.61	4.70	1.13	2.22	2.22
9	0.67	0.21	0.07	0.05	0.23	0.28	1.14	3.27	3.51	1.16	1.92	2.07
10	0.67	0.20	0.06	0.03	0.09	0.22	1.05	3.02	2.90	1.20	1.70	1.90
11	0.63	0.16	0.06	0.03	0.06	0.33	0.71	2.23	3.44	1.07	1.53	1.81
12	0.56	0.14	0.09	0.03	0.04	0.29	0.93	2.21	2.73	1.00	1.41	1.61
13	0.53	0.16	0.08	0.03	0.04	0.23	0.92	2.96	5.87	2.66	1.71	1.56
14	0.48	0.20	0.05	0.03	0.05	0.29	1.25	2.79	4.17	1.18	1.40	1.41
15	5.75	0.12	0.06	0.02	0.05	0.37	0.89	3.89	3.53	1.41	1.37	1.31
16	1.49	0.10	0.05	0.00	0.04	0.88	1.05	2.40	2.91	1.20	6.40	1.23
17	1.03	0.10	0.05	0.00	0.13	0.92	0.53	2.00	2.52	2.67	8.94	1.06
18	0.68	0.07	0.06	0.00	0.07	1.16	0.75	2.38	2.13	5.37	3.11	1.02
19	0.57	0.11	0.08	0.00	0.12	0.76	0.79	1.86	1.84	3.76	29.27	1.13
20	0.53	0.10	0.05	0.00	0.09	0.64	2.19	1.62	2.94	5.60	14.99	1.13
21	0.52	0.14	0.05	0.00	0.05	2.65	15.68	1.39	3.75	4.40	10.00	1.16
22	0.50	0.12	0.03	0.00	1.96	1.45	3.56	25.76	2.11	2.96	7.55	1.33
23	0.45	0.11	0.31	0.00	0.86	13.42	2.36	9.78	1.74	2.41	6.86	1.01
24	0.39	0.11	0.07	0.00	0.37	3.75	1.74	8.04	1.55	4.44	33.69	0.97
25	0.37	0.10	0.06	0.00	0.42	2.34	20.95	4.40	1.46	5.42	12.60	1.44
26	0.33	0.10	0.06	0.00	1.02	1.68	5.96	3.20	1.34	5.07	13.25	0.98
27	0.31	0.10	0.06	0.01	0.69	1.05	3.00	2.75	1.63	4.08	8.81	0.90
28	0.35	0.10	0.05	0.08	0.24	1.33	5.44	3.34	11.07	3.58	6.05	0.95
29	0.40		0.07	0.09	0.23	1.09	3.29	2.73	3.10	8.38	4.65	0.82
30	0.39		0.12	0.03	0.36	1.55	2.47	2.35	2.31	4.12	3.72	0.73
31	0.34		0.05		1.06		1.92	3.00		4.02		0.74



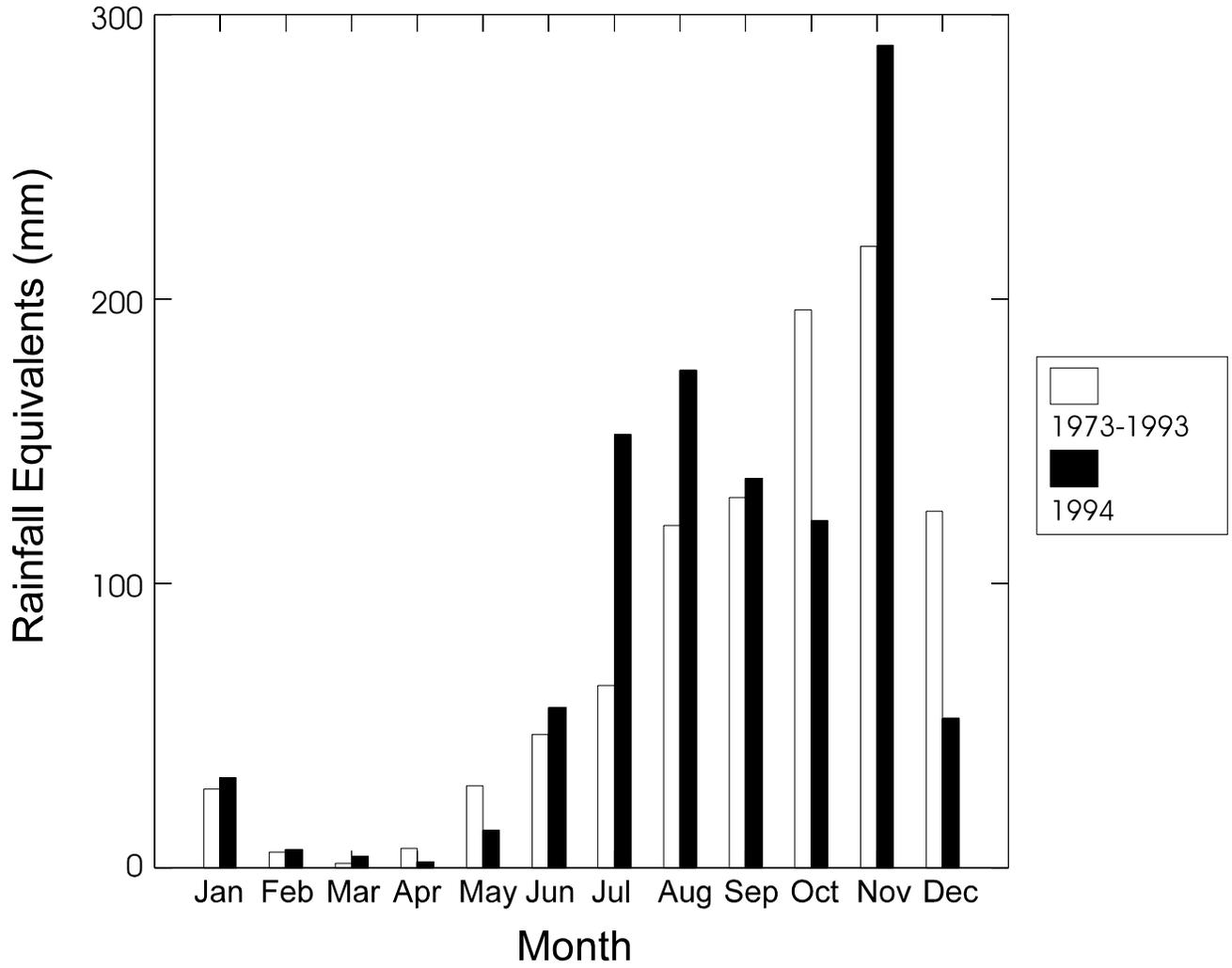
## Monthly Run-off at Lutz Weir

### Run-off (mm eq.)

	<b>Long-term Averages (1972 - 1993)</b>				
	<b>Peak</b>	<b>Delayed</b>	<b>Base</b>	<b>Total</b>	<b>S.D.</b>
<b>January</b>	9.9	171.2	16.1	27.7	4873.7
<b>February</b>	0.1	36.3	5.1	5.5	1237.9
<b>March</b>	.15	22.9	1.2	1.6	254.7
<b>April</b>	4.3	75.5	1.8	6.9	2420.1
<b>May</b>	13.1	475.3	10.9	28.8	4999.0
<b>June</b>	20.9	573.1	20.2	46.8	7765.5
<b>July</b>	22.5	778.4	33.7	64.0	5100.7
<b>August</b>	51.5	1297.5	55.9	120.3	8290.6
<b>September</b>	52.5	1310.6	64.7	130.2	7317.7
<b>October</b>	77.4	1769.2	101.1	196.2	8447.4
<b>November</b>	82.3	2007.9	116.1	218.5	10479.1
<b>December</b>	44.9	935.2	71.1	125.4	10694.2
<b>Total</b>	<b>379.5</b>	<b>94.5</b>	<b>497.8</b>	<b>971.8</b>	

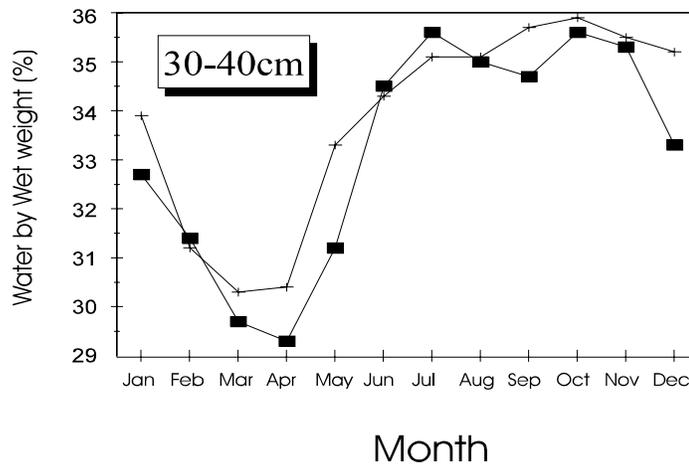
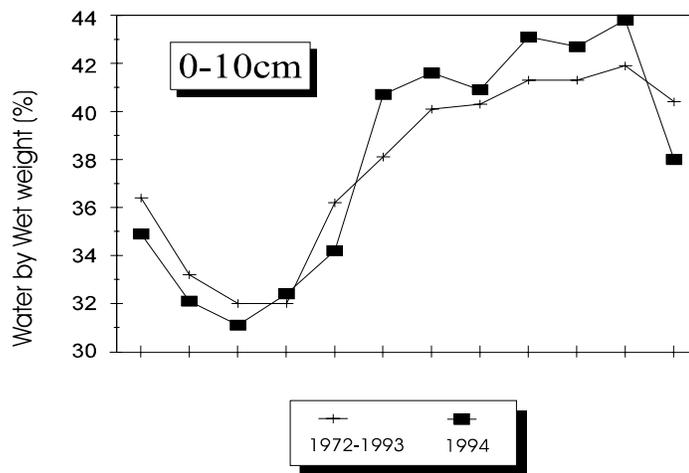
	<b>1994</b>			
	<b>Peak</b>	<b>Delayed</b>	<b>Base</b>	<b>Total</b>
<b>January</b>	4.0	1.4	19.9	25.4
<b>February</b>	0.0	0.0	4.4	4.4
<b>March</b>	0.1	0.3	2.0	2.3
<b>April</b>	0.0	0.1	0.7	0.8
<b>May</b>	2.4	3.1	3.1	8.6
<b>June</b>	14.0	6.7	20.9	41.7
<b>July</b>	59.8	11.4	51.7	123.0
<b>August</b>	43.6	15.8	80.8	140.1
<b>September</b>	28.4	12.9	81.2	122.5
<b>October</b>	17.8	8.9	63.4	90.1
<b>November</b>	81.0	20.3	131.8	233.0
<b>December</b>	0.1	0.3	34.1	34.4
<b>Total</b>	<b>251.3</b>	<b>81.2</b>	<b>494.0</b>	<b>826.4</b>

### Monthly Run-off at Lutz Weir



## Lutz Catchment Soil Moisture

	Long-term Average (1972-1993)				1994	
	0-10 cm		30-40 cm		0-10 cm	30-40 cm
	Mean	S.D.	Mean	S.D.		
<b>January</b>	35.5	2.6	33.9	3.3	34.9	32.7
<b>February</b>	32.9	2.3	31.2	1.6	32.1	31.4
<b>March</b>	31.4	2.2	30.3	1.9	31.1	29.7
<b>April</b>	32.0	2.9	30.4	2.0	32.4	29.3
<b>May</b>	36.9	2.6	33.3	1.7	34.2	31.2
<b>June</b>	39.4	2.3	34.3	2.4	40.7	34.5
<b>July</b>	40.8	1.7	35.1	1.4	41.6	35.6
<b>August</b>	41.7	2.1	35.1	1.1	40.9	35.0
<b>September</b>	42.3	1.8	35.7	1.8	43.1	34.7
<b>October</b>	42.6	2.2	35.9	0.9	42.7	35.6
<b>November</b>	42.8	1.7	35.5	2.2	43.8	35.3
<b>December</b>	40.7	1.8	35.2	2.3	38.0	33.3



Month

## Relative Humidity (%)

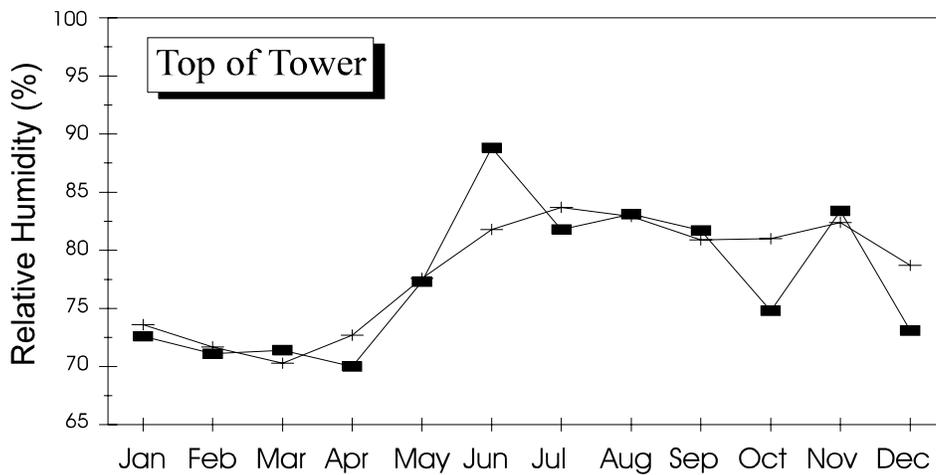
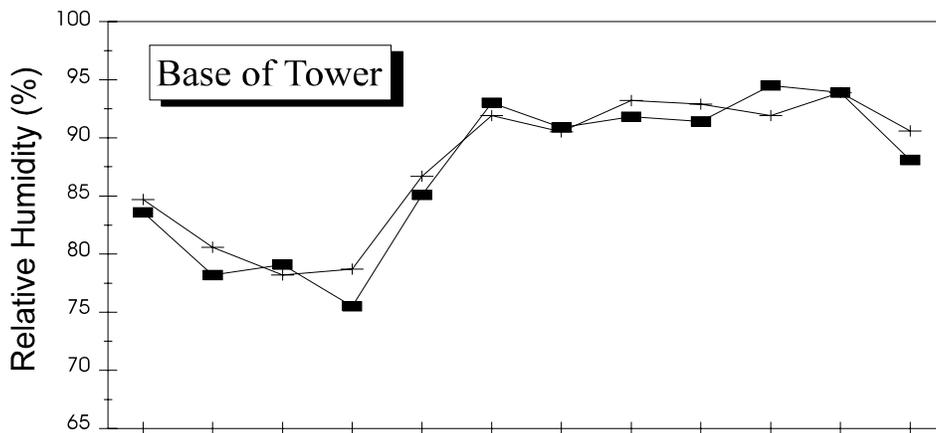
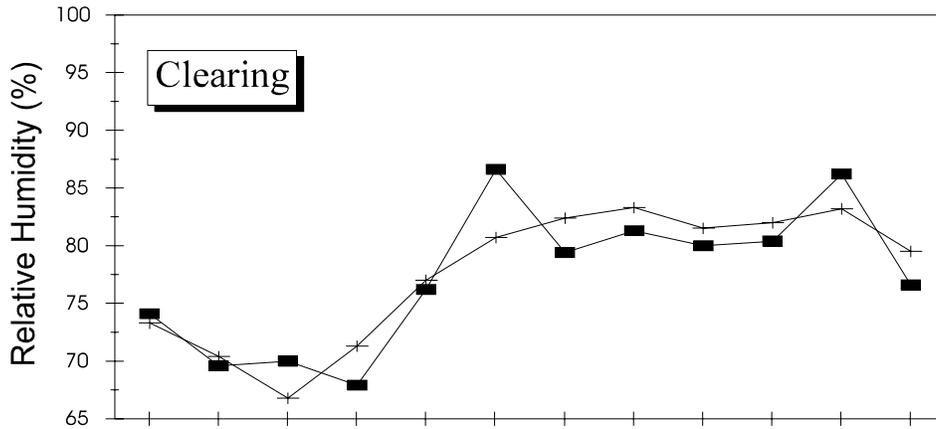
### Long-term Average (1972-1993)

	<b>'El Claro'</b>		<b>1m</b>		<b>40m</b>	
	<b>Mean</b>	<b>S.D.</b>	<b>Mean</b>	<b>S.D.</b>	<b>Mean</b>	<b>S.D.</b>
<b>January</b>	73.3	4.3	84.7	3.4	73.6	3.3
<b>February</b>	70.4	3.5	80.6	3.2	71.7	4.0
<b>March</b>	66.8	3.4	78.2	3.7	70.3	2.8
<b>April</b>	71.3	5.0	78.7	5.0	72.7	2.4
<b>May</b>	77.0	5.1	86.7	4.1	77.6	4.0
<b>June</b>	80.7	4.1	91.9	2.6	81.8	3.4
<b>July</b>	82.4	4.9	90.5	7.6	83.7	2.1
<b>August</b>	83.3	5.2	93.2	2.8	82.9	2.5
<b>September</b>	81.5	5.6	92.9	2.0	80.9	3.7
<b>October</b>	82.0	4.3	91.9	6.6	81.0	3.3
<b>November</b>	83.2	3.6	93.9	2.9	82.4	4.1
<b>December</b>	79.5	4.1	90.6	2.7	78.7	3.2

### 1994

	<b>'El Claro'</b>	<b>1m</b>	<b>40m</b>
<b>January</b>	74.1	83.6	72.6
<b>February</b>	69.6	78.2	71.1
<b>March</b>	70.0	79.1	71.4
<b>April</b>	67.9	75.5	70.0
<b>May</b>	76.2	85.1	77.3
<b>June</b>	86.6	93.0	88.8
<b>July</b>	79.4	90.9	81.8
<b>August</b>	81.3	91.8	83.1
<b>September</b>	80.0	91.4	81.7
<b>October</b>	80.4	94.5	74.8
<b>November</b>	86.2	93.9	83.4
<b>December</b>	76.6	88.1	73.1

### Relative Humidity (%)

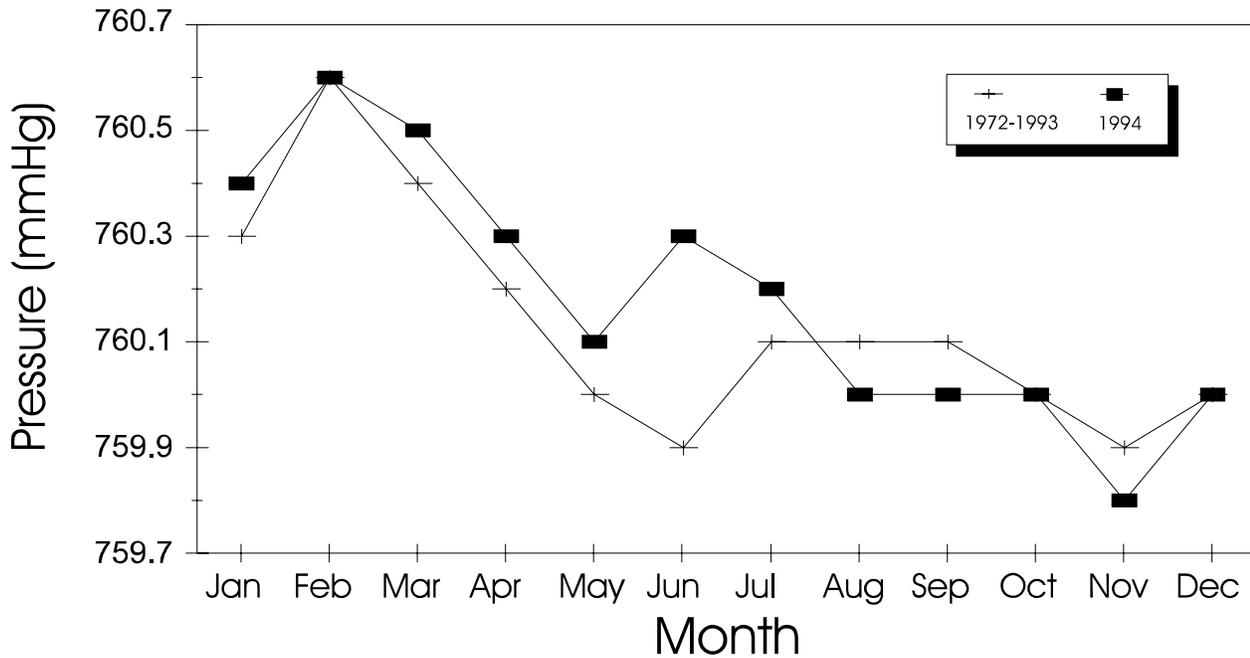


Month



### Average Monthly Air Pressure (mm Hg)

	Long-term Av. (1990-1993)		1994
	Mean	S.D.	
January	760.3	0.16	760.4
February	760.6	0.15	760.6
March	760.4	0.17	760.5
April	760.2	0.20	760.3
May	760.0	0.04	760.1
June	759.9	0.04	760.3
July	760.1	0.19	760.2
August	760.1	0.05	760.0
September	760.1	0.12	760.0
October	760.0	0.09	760.0
November	759.9	0.03	759.8
December	760.0	0.06	760.0



## Temperature Maximum & Minimum (°C)

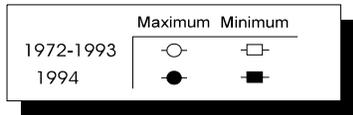
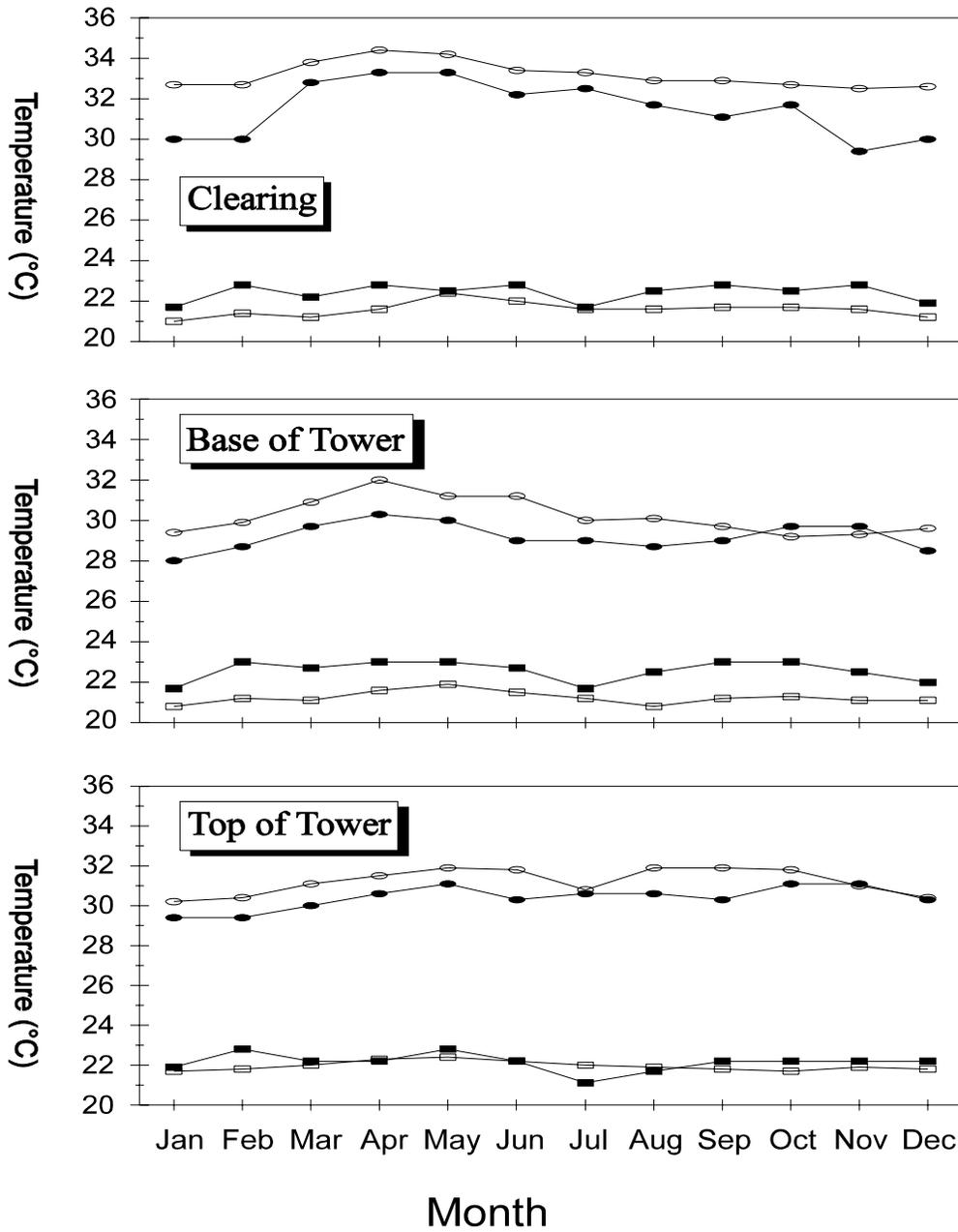
### Long-term Average (1972-1993)

	<b>‘El Claro’</b>		<b>1m</b>		<b>40m</b>	
	<b>Maximum</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Minimum</b>
<b>January</b>	32.7	21.0	29.4	20.8	30.2	21.7
<b>February</b>	32.7	21.4	29.9	21.2	30.4	21.8
<b>March</b>	33.8	21.2	30.9	21.1	31.1	22.0
<b>April</b>	34.4	21.6	32.0	21.6	31.5	22.3
<b>May</b>	34.2	22.4	31.2	21.9	31.9	22.4
<b>June</b>	33.4	22.0	31.2	21.5	31.8	22.2
<b>July</b>	33.3	21.6	30.0	21.2	30.8	22.0
<b>August</b>	32.9	21.6	30.1	20.8	31.9	21.9
<b>September</b>	32.9	21.7	29.7	21.2	31.9	21.8
<b>October</b>	32.7	21.7	29.2	21.3	31.8	21.7
<b>November</b>	32.5	21.6	29.3	21.1	31.0	21.9
<b>December</b>	32.6	21.2	29.6	21.1	30.4	21.8

### 1994

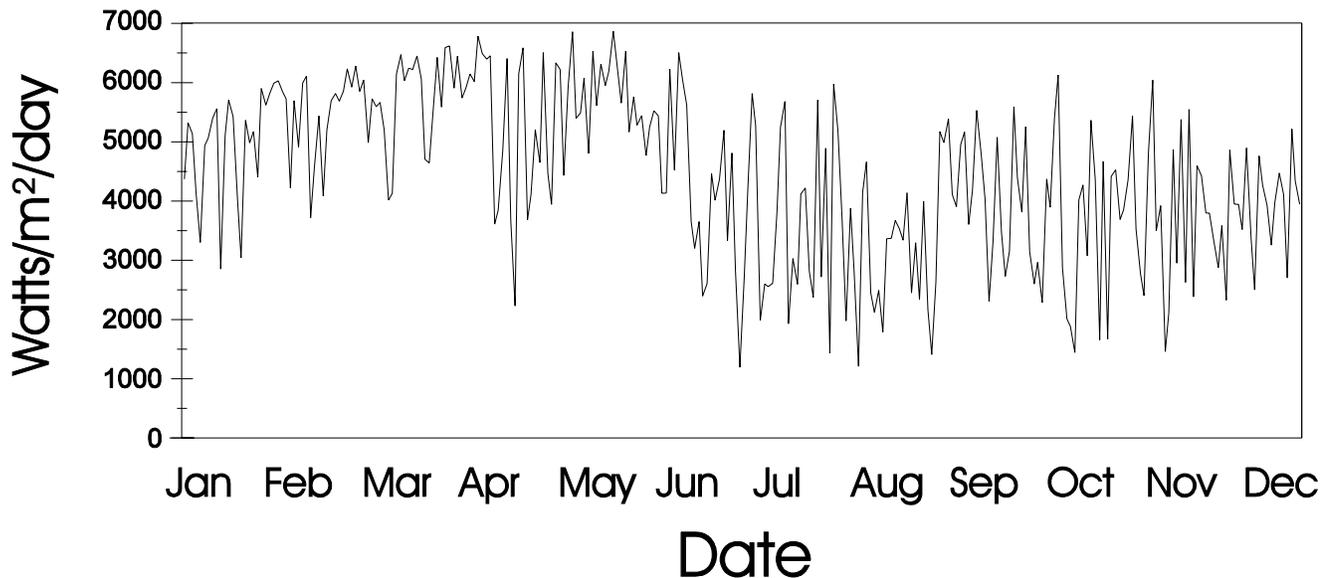
	<b>‘El Claro’</b>		<b>1m</b>		<b>40m</b>	
	<b>Maximum</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Minimum</b>
<b>January</b>	30.0	21.7	28.0	21.7	29.4	21.9
<b>February</b>	30.0	22.8	28.7	23.0	29.4	22.8
<b>March</b>	32.8	22.2	29.7	22.7	30.0	22.2
<b>April</b>	33.3	22.8	30.3	23.0	30.6	22.2
<b>May</b>	33.3	22.5	30.0	23.0	31.1	22.8
<b>June</b>	32.2	22.8	29.0	22.7	30.3	22.2
<b>July</b>	32.5	21.7	29.0	21.7	30.6	21.1
<b>August</b>	31.7	22.5	28.7	22.5	30.6	21.7
<b>September</b>	31.1	22.8	29.0	23.0	30.3	22.2
<b>October</b>	31.7	22.5	29.7	23.0	31.1	22.2
<b>November</b>	29.4	22.8	29.7	22.5	31.1	22.2
<b>December</b>	30.0	21.9	28.5	22.0	30.3	22.2

### Temperature Maximum & Minimum (°C)



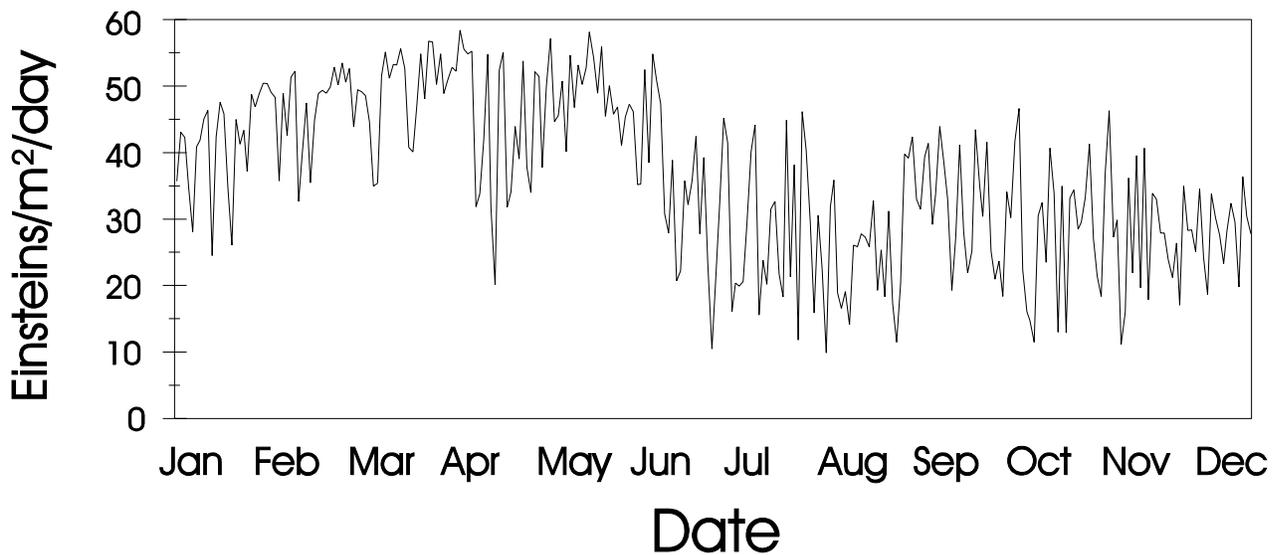
### Daily Total Radiation (W/m<sup>2</sup>/day)

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	4372.7	3717.3	4706.7	3943.7	4522.3	4119.4	3996.0	3898.1	2956.9	3946.7	2992.0	5103.2
2	5320.2	4586.3	4644.0	6333.2	6507.2	4224.2	2164.7	5408.3	5380.9		2862.5	4342.3
3	5137.7	5438.2	5512.3	6223.6	6067.6	2818.9	1411.9	6127.5	2630.7		4231.1	5974.7
4	4153.1	4087.1	6427.8	4432.9	5623.1	2373.5	2631.0	2881.1	5548.0		3773.8	4599.3
5	3303.5	5201.6	5590.3	5914.2	3657.5	5706.3	5173.9	2014.7	2382.1	2381.9	2831.1	5951.3
6	4937.6	5696.0	6593.8	6862.9	3200.0	2716.8	4984.7	1883.3	4596.1	4596.1	3631.8	5481.8
7	5067.1	5815.3	6618.5	5395.1	3657.0	4893.8	5388.3	1442.8	4428.2	4428.2	3990.1	3213.8
8	5400.2	5685.3	5907.1	5491.5	2395.8	1436.3	4111.5	4021.9	3800.5	3800.5	5189.5	4196.1
9	5560.6	5859.2	6442.7	6075.8	2605.0	5977.3	3908.3	4273.4	3794.3	3794.3	5432.7	3892.8
10	2852.5	6230.1	5739.3	4805.8	4462.8	5184.0	4955.3	3077.4	3319.3	3319.3	4968.1	5721.1
11	5111.2	5923.3	5905.8	6533.6	4012.7	3690.8	5166.0	5364.0	2879.1	2879.1	5073.2	3862.2
12	5704.2	6283.4	6145.1	5613.8	4370.9	1978.6	3602.0	4365.2	3589.6	3589.6	5221.1	5321.9
13	5428.3	5853.2	6017.2	6311.8	5195.4	3880.9	4187.3	1657.5	2325.3	2325.3	2799.9	5228.4
14	4011.6	6042.7	6785.0	5949.4	3328.2	2837.5	5529.8	4671.5	4863.2	4863.2	3682.0	4635.6
15	3040.6	4988.0	6493.1	6198.3	4811.8	1208.4	4811.8	1670.2	3952.4	3952.4	3627.8	5995.7
16	5367.0	5728.8	6395.9	6871.6	2837.4	4146.5	4030.7	4417.3	3943.8	3943.8	3000.0	5223.9
17	4983.1	5593.7	6457.2	6335.0	1190.6	4659.0	2304.2	4526.5	3521.6	3521.6	2116.2	6107.3
18	5172.0	5666.1	3612.0	5655.6	2691.7	2449.1	3323.1	3685.7	4896.6	4896.6	4712.6	5344.6
19	4405.4	5199.3	3848.3	6529.2	4203.4	2122.0	5076.2	3854.8	3366.9	3366.9	2724.7	2770.4
20	5902.0	4019.3	4863.0	5166.4	5818.4	2493.7	3467.0	4357.6	2498.0	2498.0	2121.3	4442.9
21	5618.7	4127.4	6406.6	5762.5	5275.2	1791.1	2727.5	5437.0	4763.4	4763.4	2990.6	2681.0
22	5825.0	6149.2	3675.0	5282.8	1981.5	3362.5	3151.7	3531.4	4273.3	4273.3	2311.2	5558.1
23	5990.7	6474.0	2227.1	5442.9	2604.9	3375.9	5592.1	2778.7	3929.5	3929.5	2012.3	5043.8
24	6031.1	6034.5	6151.8	4769.6	2555.2	3669.1	4393.6	2404.2	3252.8	3252.8	2565.5	4835.0
25	5854.8	6243.2	6589.7	5248.4	2612.0	3533.6	3810.4	4817.1	3982.5	3982.5	2421.9	4295.0
26	5728.5	6224.4	3685.2	5528.3	3819.0	3337.5	5256.9	6041.3	4472.1	4472.1	2383.7	5750.6
27	4219.1	6451.1	4101.5	5439.3	5250.0	4144.4	3146.3	3495.2	4112.5	4112.5	4084.2	5742.3
28	5694.9	6065.8	5199.8	4129.2	5683.6	2450.4	2601.3	3921.9	2700.0	2700.0	4091.2	5236.0
29	4911.0		4654.0	4134.3	1927.7	3295.0	2969.4	1459.4	5220.4	5220.4	4633.3	4353.6
30	5994.5		6508.7	6228.2	3030.3	2339.6	2287.5	2118.2	4340.0	4340.0	5192.7	5465.7
31	6110.5		4466.2		2593.7		4370.9	4869.9		3946.7		5765.6



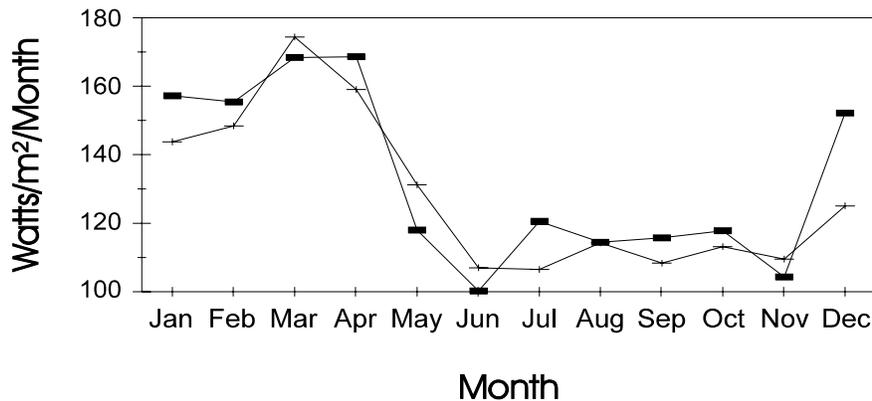
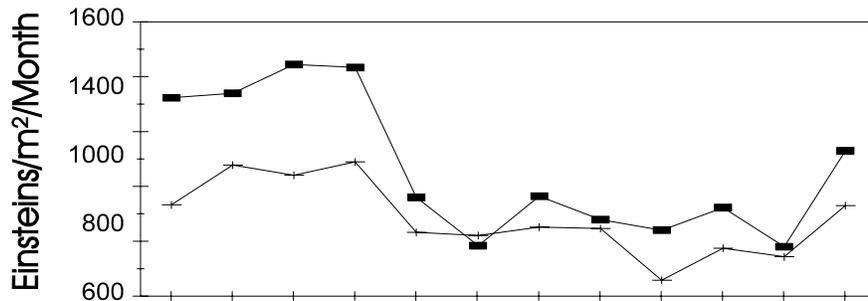
### Daily Total PAR (Einsteins/m<sup>2</sup>/day)

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	35.8	32.8	40.9	34.1	38.6	31.6	31.3	30.3	22.0	27.9	24	41.7
2	43.2	40.0	40.2	52.3	55.0	32.8	17.4	41.9	39.7		20.0	39.4
3	42.4	47.6	47.1	51.6	50.9	21.8	11.6	46.8	19.8		29.8	42.8
4	34.7	35.6	55.0	37.9	47.5	18.4	20.4	22.5	40.8		26.3	34.4
5	28.2	45.0	48.2	50.1	30.9	45.0	39.9	16.2	18.0	20.0	20.1	42.8
6	41.0	49.0	56.9	57.3	28.0	21.4	39.3	14.9	34.0	41.7	25.0	39.6
7	42.0	49.5	56.8	44.8	30.9	38.3	42.5	11.6	33.1	33.4	27.9	23.9
8	45.2	49.1	50.4	45.7	20.8	11.9	33.1	30.6	28.0	36.0	36.0	31.4
9	46.5	50.0	55.0	50.9	22.3	46.3	31.6	32.6	28.0	30.3	37.7	29.3
10	24.6	53.0	49.0	40.3	35.9	40.5	39.5	23.6	24.0	36.4	35.0	41.0
11	42.5	50.3	51.1	54.8	32.3	29.5	41.5	40.8	21.3	24.0	35.9	29.3
12	47.7	53.6	53.0	46.9	35.8	16.0	29.3	34.0	26.5	32.0	37.5	39.1
13	46.0	50.7	52.4	53.3	42.6	30.7	33.9	13.1	17.2	32.8	21.3	38.0
14	34.8	52.8	58.6	50.4	27.9	22.7	44.1	35.1	35.1	32.0	28.2	34.1
15	26.2	44.0	55.7	52.9	39.4	10.0	38.8	13.0	28.4	27.6	26.0	43.1
16	45.1	49.6	55.0	58.3	23.4	32.0	33.0	33.3	28.5	18.2	24.1	37.4
17	41.4	49.3	55.4	54.4	10.6	36.0	19.4	34.5	25.2	31.5	17.8	43.9
18	43.5	48.7	32.0	49.1	21.6	19.0	27.3	28.6	34.7	30.0	39.0	39.1
19	37.3	44.8	33.9	56.1	32.6	16.7	41.3	29.7	24.3	19.1	22.9	21.6
20	48.9	35.1	42.1	45.6	45.3	19.2	28.2	33.4	18.8	38.9	18.0	33.1
21	47.0	35.5	54.9	50.2	41.6	14.2	22.0	41.4	33.9	38.0	25.2	22.3
22	49.0	51.7	31.9	45.9	16.2	26.2	25.3	27.2	30.3	36.0	19.2	41.3
23	50.6	55.3	20.2	47.0	20.5	26.0	43.6	21.5	27.7	37.2	17.4	37.0
24	50.5	51.3	52.5	41.2	20.0	27.9	35.1	18.5	23.4	27.4	22.1	35.7
25	49.2	53.4	55.2	45.5	20.7	27.4	30.5	37.0	28.4	27.1	21.0	32.5
26	48.4	53.3	31.9	47.4	29.5	26.0	41.7	46.4	32.5	27.0	20.4	41.9
27	35.9	55.8	34.2	46.3	40.3	32.9	25.3	27.4	29.7	31.1	34.2	42.0
28	49.1	52.8	44.1	35.3	44.3	19.4	21.1	30.0	19.9	21.0	34.3	38.3
29	42.7		39.2	35.4	15.7	25.5	23.8	11.2	36.5	28.1	38.6	32.8
30	51.5		53.9	52.6	23.9	18.4	18.5	16.1	30.5	24.9	42.3	39.6
31	52.4		37.9		20.3		34.2	36.3		29.5		41.3



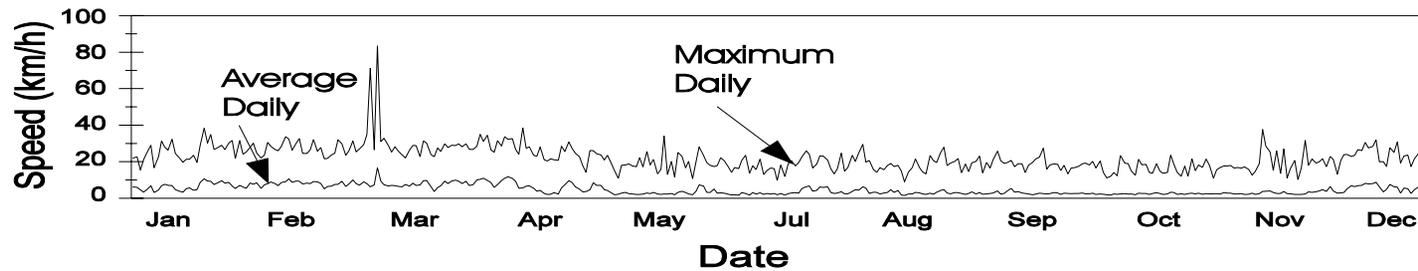
## Total Monthly Solar Radiation

	Long-term Average (1972-1993)				1994	
	PAR_____		Pyranometer _		PAR	Pyran.
	(Einsteins/m <sup>2</sup> /month)		(Wh/m <sup>2</sup> /month)			
	Mean	S.D.	Mean	S.D.		
<b>January</b>	932.7	313.4	143780.7	38168.9	1323.3	157209.6
<b>February</b>	1077.7	140.0	148386.4	27871.2	1339.7	155383.9
<b>March</b>	1040.8	421.7	174322.0	39171.7	1444.5	168370.8
<b>April</b>	1089.4	256.1	159052.1	15085.8	1433.9	168608.8
<b>May</b>	832.7	291.8	131243.6	16883.8	965.3	118491.9
<b>June</b>	820.8	82.7	107009.7	19126.7	783.7	100216.1
<b>July</b>	851.6	103.0	106550.0	26460.2	964.5	120531.6
<b>August</b>	846.3	65.9	114268.4	10571.1	879.2	114473.3
<b>September</b>	657.9	364.8	108350.9	34522.0	840.3	115720.0
<b>October</b>	774.4	147.9	113171.3	11006.4	929.0	118571.4
<b>November</b>	743.2	180.8	109485.4	9625.6	827.2	107668.1
<b>December</b>	930.1	104.7	125039.4	15227.2	1129.7	152135.7



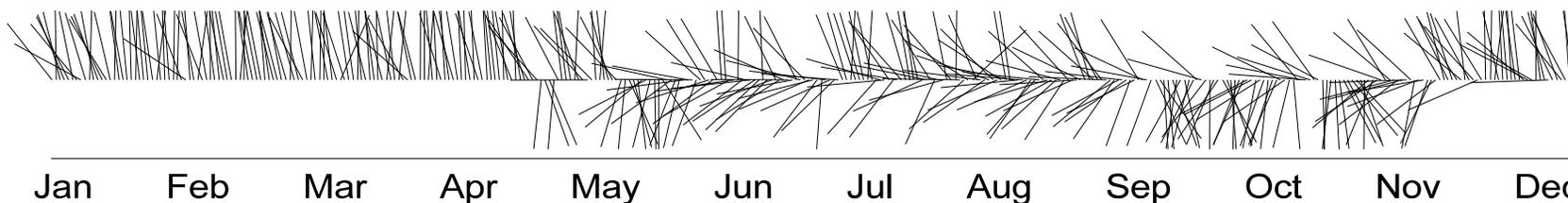
## Daily Average and Maximum Wind Speed

	Jan.		Feb.		Mar.		Apr.		May		June		July		Aug.		Sep.		Oct.		Nov.		Dec.	
1	6.16	21.80	6.07	24.04	9.31	29.71	9.41	28.94	2.33	20.70	2.17	12.91	2.56	16.18	2.80	15.56	2.84	21.02	2.38	20.43	2.25	18.04	3.51	19.16
2	5.99	22.70	5.35	25.30	6.44	23.52	9.91	28.78	5.63	28.47	2.56	20.22	1.95	9.77	3.13	17.77	3.95	25.76	2.10	14.13	2.46	10.88	4.02	19.99
3	4.56	15.40	8.33	27.85	7.90	25.94	9.30	29.79	7.36	25.51	1.95	11.52	2.65	18.17	4.71	19.08	2.19	20.57	1.95	11.08	2.49	15.47	4.65	21.66
4	3.29	20.99	7.65	30.09	9.92	31.33	8.03	28.12	9.56	30.84	3.21	25.09	1.73	11.84	3.19	17.30	2.58	19.08	1.71	12.03	2.16	16.74	3.65	17.22
5	4.99	25.62	8.42	24.71	8.02	25.35	9.27	29.82	8.68	27.29	3.77	22.85	2.51	18.81	4.21	17.97	3.95	19.43	2.39	14.05	3.01	17.62	6.43	22.91
6	6.78	28.94	5.35	22.05	7.15	27.05	6.95	26.84	6.27	24.66	3.11	16.63	2.82	20.59	1.81	14.88	5.32	20.75	2.13	12.27	2.69	17.65	3.83	21.05
7	3.03	16.63	7.30	23.52	8.93	29.31	7.36	26.65	4.96	22.80	2.26	20.15	2.98	17.62	1.42	8.94	3.32	17.19	2.35	23.39	2.76	17.93	2.68	13.07
8	4.40	22.77	7.97	30.57	7.95	34.93	9.94	28.50	3.49	17.73	1.85	10.65	2.76	19.48	2.23	14.40	3.57	18.92	2.50	19.11	2.36	16.53	2.92	20.57
9	6.79	31.31	8.87	28.39	8.03	94.17	10.3	34.97	3.60	14.21	3.75	20.11	5.25	22.60	2.35	16.63	2.83	18.71	2.18	19.00	2.39	16.82	3.14	23.87
10	7.64	27.88	8.07	26.76	7.29	26.46	10.9	31.07	4.58	26.10	7.24	28.12	6.38	26.00	3.19	21.50	2.56	14.00	2.33	14.85	2.53	16.47	5.16	23.95
11	6.99	26.30	6.79	26.02	16.8	83.43	9.67	34.56	8.46	26.05	6.66	23.36	6.70	23.92	2.92	16.79	2.37	18.09	1.87	12.54	2.04	17.14	6.80	22.88
12	6.94	32.32	8.51	28.39	9.42	30.96	8.50	26.41	6.99	24.42	3.20	19.45	3.74	16.58	2.33	14.29	1.95	19.64	2.71	21.34	2.11	15.71	6.33	23.50
13	4.65	24.47	9.04	33.73	7.39	32.78	5.84	25.19	7.03	23.71	3.14	18.04	4.32	18.79	2.08	13.34	2.19	21.53	2.55	18.28	2.70	12.67	6.81	26.67
14	3.88	22.26	10.6	32.43	6.67	28.75	7.47	31.52	4.70	20.86	5.03	17.30	6.11	23.12	2.69	23.36	2.78	22.37	2.65	18.49	2.03	14.69	6.97	26.08
15	3.30	19.72	8.75	26.25	7.00	25.27	9.61	28.59	4.23	23.49	2.73	17.85	5.83	23.07	2.10	20.54	2.50	27.32	1.98	14.08	2.52	18.84	8.14	30.63
16	5.20	21.35	9.37	30.01	6.88	28.12	11.0	33.73	3.09	19.72	2.92	22.17	6.25	20.86	3.28	19.43	2.24	15.87	2.58	13.61	3.66	37.73	7.86	27.54
17	5.67	21.39	9.24	32.67	6.40	25.43	11.8	32.27	1.90	15.17	2.75	20.67	3.09	16.07	4.26	24.98	2.52	18.17	2.98	18.92	3.72	28.58	7.99	28.42
18	4.33	23.52	7.85	24.60	6.29	23.76	10.8	32.59	2.09	10.77	2.11	17.19	2.60	13.22	4.73	27.91	3.02	18.76	2.62	14.96	3.96	25.38	8.80	31.90
19	4.71	19.64	8.30	24.47	7.50	22.09	9.19	26.68	2.72	18.04	1.79	14.13	2.83	16.10	2.85	17.77	2.85	18.49	2.00	13.69	3.02	15.28	6.21	19.99
20	8.65	28.94	7.96	26.49	6.56	26.38	5.46	24.03	3.20	18.25	1.90	16.74	3.52	24.71	2.42	19.16	2.05	15.15	2.35	14.08	2.62	26.08	3.47	20.02
21	10.6	38.46	9.09	32.16	8.27	28.91	5.66	38.60	2.49	18.73	1.69	16.15	2.45	14.77	3.11	20.19	2.67	18.01	3.33	23.60	2.57	13.53	4.91	17.30
22	9.36	30.09	8.97	25.70	6.90	28.83	6.52	27.29	2.33	17.69	2.95	20.75	2.47	16.74	2.98	21.69	2.64	13.29	3.02	18.41	3.69	26.95	7.59	27.59
23	9.31	34.89	8.06	27.80	7.29	22.77	6.76	28.02	2.04	17.22	2.63	23.52	3.64	23.52	2.55	13.84	2.48	16.55	2.07	14.21	2.52	11.04	6.29	25.01
24	7.46	26.73	5.04	21.62	9.59	31.33	5.53	23.41	2.05	22.21	1.74	13.70	4.63	20.11	2.08	18.68	2.61	16.71	2.46	11.98	2.44	16.10	6.03	30.87
25	8.57	27.85	6.44	21.74	9.74	30.14	3.79	23.01	2.21	17.14	3.15	17.73	4.35	24.82	2.62	14.53	2.56	17.46	1.99	17.57	2.08	20.73	2.67	19.16
26	9.57	28.99	6.59	23.68	6.26	23.84	4.30	27.99	2.80	25.54	2.21	15.59	6.32	29.53	3.49	19.35	2.82	18.79	2.48	12.11	1.98	10.17	5.57	23.07
27	8.21	26.52	7.54	24.63	3.61	22.69	2.61	21.02	2.48	18.17	2.90	21.42	5.56	19.80	2.30	20.22	2.44	19.19	2.75	21.61	2.08	16.45	5.15	23.60
28	8.65	30.17	7.49	31.92	5.75	27.56	2.04	20.35	3.20	21.26	2.04	12.94	2.60	20.67	3.07	23.07	2.41	18.25	2.30	15.04	2.22	31.70	2.63	17.25
29	6.68	31.65			6.72	25.57	2.12	21.61	2.23	13.22	2.61	15.09	3.35	15.63	2.10	13.77	2.76	20.15	2.78	18.20	3.49	18.01	4.76	21.61
30	5.25	21.78			9.34	29.85	2.96	21.02	2.01	15.72	2.16	16.55	3.19	14.24	2.32	19.52	1.96	16.53	2.15	16.85	3.22	21.53	6.25	24.70
31	7.06	31.63			7.98	27.72			2.26	34.08			2.27	16.66	2.64	16.58			2.49	21.45			7.44	27.86



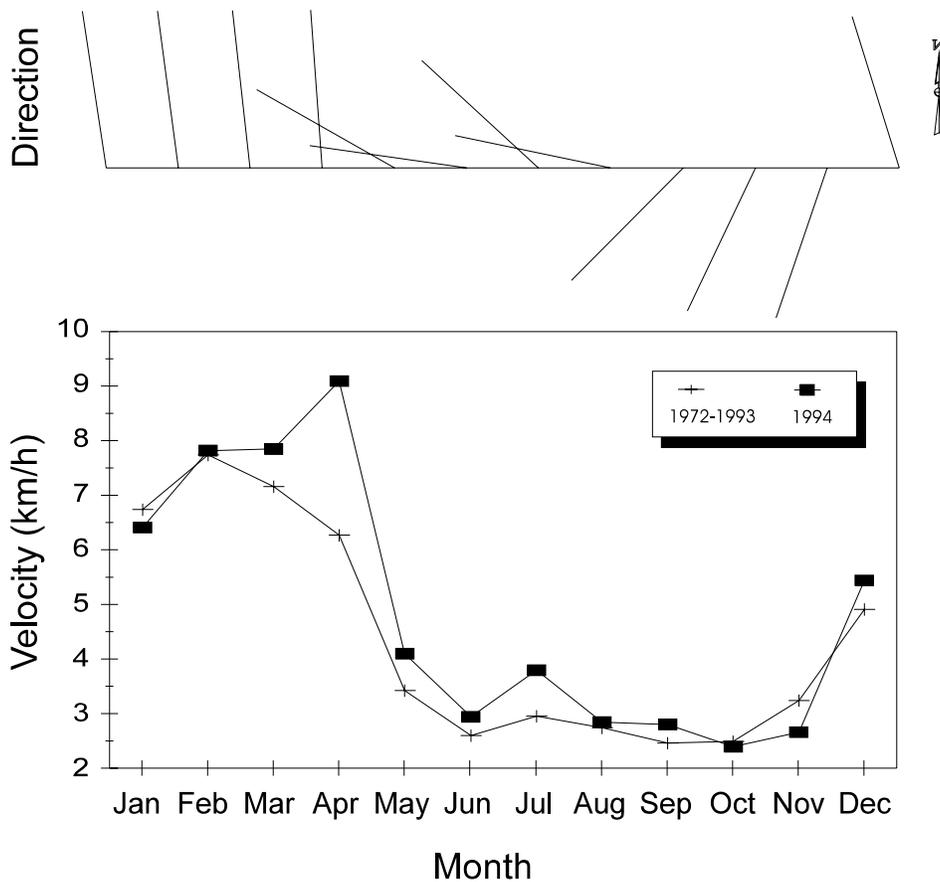
### Average Daily Wind Direction

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	324.6	341.6	347.3	3.8	184.4	261.8	245.0	284.1	320.9	204.8	178.7	336.1
2	359.2	306.6	334.6	355.5	335.0	281.6	254.3	253.0	243.7	314.6	182.3	343.6
3	347.4	356.2	350.6	357.5	353.6	270.5	214.1	349.7	266.0	287.5	186.4	330.4
4	339.8	351.1	1.5	343.8	353.4	198.0	183.8	322.3	298.0	214.4	177.2	312.4
5	335.4	7.0	354.8	357.0	351.4	314.8	277.2	0.6	341.3	180.3	172.8	353.9
6	349.9	340.5	0.8	352.7	2.5	330.5	243.6	271.0	346.0	200.7	155.4	333.9
7	323.6	350.9	359.9	345.6	342.1	250.6	222.8	225.0	314.6	211.3	154.0	320.6
8	301.2	359.7	350.3	351.8	321.1	230.5	275.0	304.9	334.9	154.3	143.7	244.2
9	344.7	352.8	354.1	357.6	269.8	332.3	339.9	44.0	325.0	161.1	140.4	331.3
10	1.4	354.6	344.7	358.7	318.2	356.7	345.8	338.8	272.7	176.0	163.1	358.9
11	350.7	349.6	21.6	351.7	356.9	357.2	3.2	277.9	227.8	181.5	180.4	0.8
12	342.0	351.2	343.9	357.7	4.1	238.6	343.5	232.1	211.8	199.7	226.4	6.4
13	336.4	350.7	352.2	343.0	354.5	260.8	345.2	290.6	239.2	202.9	200.4	348.4
14	331.1	359.6	353.1	350.0	346.4	0.4	349.3	317.1	276.9	240.3	233.0	357.3
15	348.2	5.2	0.8	357.2	335.7	229.7	3.3	244.1	232.7	240.0	291.1	355.8
16	1.2	0.5	355.4	354.9	319.1	284.5	349.0	305.3	198.2	189.8	331.1	357.0
17	353.3	352.5	347.3	354.3	195.1	262.9	218.7	351.3	241.4	234.9	313.4	353.0
18	350.9	349.9	356.6	354.8	185.2	233.4	287.8	352.4	330.6	197.7	253.8	354.2
19	355.0	350.2	353.1	358.9	158.4	223.9	264.2	282.2	297.5	185.5	229.6	313.5
20	358.7	350.3	358.7	350.5	166.5	357.7	328.6	263.6	281.6	196.7	253.7	300.1
21	1.1	356.0	347.3	340.2	174.1	221.7	214.5	275.1	198.1	201.2	267.9	302.4
22	353.5	352.8	5.2	358.0	227.1	247.7	280.7	244.4	157.1	298.3	316.1	359.9
23	355.3	347.4	349.5	352.3	240.2	336.4	321.7	211.9	148.0	232.4	189.4	353.1
24	355.2	346.9	354.1	343.9	193.0	235.0	345.6	218.3	176.9	192.2	247.4	347.8
25	352.5	350.0	5.1	329.4	179.2	295.8	351.2	276.8	175.8	175.4	259.5	267.8
26	6.4	345.6	333.1	334.5	179.9	270.2	352.9	314.5	161.9	323.4	197.2	336.7
27	354.8	0.5	314.9	321.0	150.2	258.3	349.0	251.3	188.0	282.3	203.3	341.8
28	358.2	345.7	349.8	185.5	283.8	335.5	243.2	238.4	206.5	274.9	229.7	323.9
29	356.3		347.0	162.2	230.8	286.3	282.7	224.9	168.9	289.4	332.8	334.6
30	0.9		0.2	159.3	199.3	318.3	330.0	286.1	193.2	327.6	347.2	356.4
31	1.5		360.0		191.7		202.1	210.5		300.4		352.3



## Average Monthly Wind Speed and Direction

	Long-term Av. (1972-1993)			1994	
	Speed	S.D.	Direction	Speed	Direction
<b>January</b>	6.7	2.3	4.5	6.4	351.4
<b>February</b>	7.7	2.5	8.6	7.8	352.5
<b>March</b>	7.3	2.6	8.8	7.9	353.6
<b>April</b>	6.3	1.7	352.6	9.1	355.8
<b>May</b>	3.4	1.1	308.5	4.1	299.6
<b>June</b>	2.6	0.9	285.3	2.9	278.1
<b>July</b>	3.0	1.2	320.1	3.8	312.7
<b>August</b>	2.8	0.9	265.8	2.8	281.8
<b>September</b>	2.5	1.1	239.3	2.8	224.5
<b>October</b>	2.5	1.1	235.4	2.4	205.4
<b>November</b>	3.3	1.3	265.3	2.7	198.8
<b>December</b>	4.9	1.8	342.1	5.4	342.7



## Estimated Evapotranspiration and Water Balance

	Evapotranspiration (mm eq.)		Net Water Balance (mm eq.)	
	'El Claro'	40 m	'El Claro'	40 m
January	94.0	158.0	-39.0	-103.0
February	107.0	153.0	-110.9	-156.9
March	124.0	192.0	-66.6	-134.6
April	120.0	178.0	-93.8	-151.8
May	63.0	108.0	193.5	148.5
June	45.5	72.5	185.4	158.4
July	55.0	78.5	147.6	124.1
August	50.5	84.5	77.2	43.2
September	52.5	86.0	60.9	27.4
October	59.5	86.5	54.6	27.6
November	41.1	74.5	45.7	12.3
December	55.5	126.5	-67.3	-138.3

