

Meteorological Conditions at VMC Sites in 1997

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Cooperators:

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Introduction:

Continuous monitoring of basic meteorological variables continued in 1997 at several VMC sites. Hourly meteorology data from Proctor Maple Research Center (PMRC) are available from 1988 to present, and daily temperature and precipitation data from the summit of Mt. Mansfield (1205 m) are available from 1954 to present. These two stations provide the longest records of meteorological data in close proximity to the VMC's Mt. Mansfield Study Area.

This report is based on data from the PMRC air quality monitoring station (PMRC AQ, 400 m), established in 1988; the VMC meteorological stations on the west side of Mt. Mansfield (MMWest, 880 m); Colchester Reef (CR, 38 m), established in 1996; and from the Clean Air Status and Trends Network (CASTNET) in the Lye Brook Wilderness Area. The principle purpose of these stations are to provide high-quality, continuous, and long-term records of basic meteorological variables to VMC cooperators, other researchers, and other interested user groups.

Other sources of meteorological data not included in the report, but available through the VMC data library, include within-forest meteorological data from the forest canopy tower at PMRC and Nettle Brook. The VMC has access to National Weather Service (NWS) data, via the National Climate Data Center (NCDC). The VMC archives data from 45 currently active cooperative observer stations in Vermont, including the Mount Mansfield summit station. Data are available in Excel, Lotus, ASCII and other formats by request from the VMC data manager.

Methods:

Campbell CR10X dataloggers are used to log either hourly (PMRC AQ) or 15 minute average (MMWest; CR) values for each parameter at each site. These three stations are remotely linked to the VMC server via telephone modem (PMRC AQ) or radio (MMWest; CR). CASTNET data are downloaded from the Environmental Protection Agency web site annually. Data files are continuously updated and are screened according to established QA/QC protocols. The meteorological stations are supervised by Tim Scherbatskoy and operated by Miriam Pendleton, Richard Furbush, and Carl Waite.

Variables collected at VMC sites:

	<u>VMC Site</u>			
	<u>CASTNET</u>	<u>Colchester Reef</u>	<u>Mount Mansfield (W)</u>	<u>PMRC</u>
<i>Start Of Data Collection:</i>	January 1994	November 1996	January 1997	January 1988
<i>Variables Collected:</i>	Air Temperature Relative Humidity Wind Speed Wind Direction Precipitation	Air Temperature Relative Humidity Wind Speed Wind Direction Barometric Pressure Water Temperature Solar Radiation	Air Temperature Relative Humidity Wind Speed Wind Direction Precipitation Solar Radiation Photosynthetically Active Radiation (PAR)	Air Temperature Relative Humidity Wind Speed Wind Direction Precipitation Barometric Pressure

The criteria for data completeness are as follows: each hour must include a minimum of one 15 minute interval data set and each day must have at least 75% of the hourly data. Number of days in the month are reported in Table 2. Data for MMWest in September 1997 has been excluded from this report due to lack of completeness.

Data are reported in a variety of temporal formats. Fifteen minute average data (from MMWest, CR and CASTNET) are arithmetically averaged to provide hourly means, which are then averaged into daily means. Monthly and yearly summaries are created from daily data. A number of summary statistics including means, maximum and minimum values, and number of observations are generated. Growing degree days are calculated by adding the degrees above freezing for a given day to the next day's above freezing value. Days when temperature does not go above freezing are given a value of zero.

Results and Discussion

Yearly and monthly 1997 data summaries for each of the sites are presented in Tables 1 and 2, respectively. Variables (mean air temperature, mean relative humidity, mean barometric pressure, mean total solar irradiance (pyranometer), and mean resultant wind speed) are summarized by month and displayed for site to site comparison (Figure 1); note that Y-axis scales vary. Figure 2 shows a comparison of several meteorological variables at individual sites.

Daily total precipitation by month for PMRC AQ is summarized in Figure 3; note that the Y-axis scale has been standardized to facilitate comparisons across time. Daily mean, minimum, and maximum temperatures at PMRC AQ are shown by month in Figure 4. Please note that the X-axis crosses the Y-axis at 0 degrees Celsius and the Y-axis scale is standardized for ease of comparison.

Cumulative growing degree days are based on start temperatures of 32 and 50 degrees Fahrenheit, temperature thresholds for plants and insects, respectively, and are plotted together in Figure 5.

The Northeast Regional Climate Center reported that in 1997 overall regional temperatures produced a warm winter and cold spring. Most of the northeast was dry, but Vermont was not, with flooding occurring in Montgomery in July 1997.

Two excellent resources for meteorological information are the VT Climatology web site, www.uvm.edu/~ldupigny/sc/, and the Northeast Regional Climate Center (NRCC). NRCC provides interpretive monthly climate summaries and can be accessed via www.nws.noaa.gov/.

Table 1: VMC Yearly Data Comparisons For 1997

<i>Site</i>	<i>Air Temp</i>	<i>H2O Temp</i>	<i>Barom Press</i>	<i>Rel Humd</i>	<i>Precip</i>	<i>Pyranom</i>	<i>Wind Speed:</i>		<i>Wind Direction:</i>		
							<i>Max</i>	<i>Mean Resultant</i>	<i>Mean Horizontal</i>	<i>Mean Resultant</i>	<i>Std Dev</i>
	<i>degrees C</i>		<i>mb</i>	<i>%</i>	<i>mm</i>	<i>watts/m²</i>	<i>m/second</i>		<i>degrees</i>		
<u>ColchReef</u>											
<i>Mean</i>	7.50	15.00	1010.87	73.07		121		6.25	6.00	201.00	8.00
<i>Max</i>	30.29	24	1039	102.6		953	25.00	21.05	21.00	360.00	78.00
<i>Min</i>	-21.15	-1	980	20.77		0	0.00	0.00	0.00	0.00	0.00
<i>N</i>	353	353	353	353		353	353	353	353	353	353
<i>Sum</i>											
<u>LYE145</u>											
<i>Mean</i>	4.64			76.40	0.13			2.72	3.00	211.00	26.00
<i>Max</i>	26.8			100	21.25			21.25	21.00	360.00	90.00
<i>Min</i>	-26.5			6.45	0			0.03	0.00	0.00	0.00
<i>N</i>	355			355	355			355	355	355	355
<i>Sum</i>					1118.52						
<u>PMRC AQ</u>											
<i>Mean</i>	6.64		948.84	63.60	2.70			1.90			
<i>Max</i>	28.1		978	99.6	9.70			7.50			
<i>Min</i>	-36.2		930	20	0			0.00			
<i>N</i>	321		321	321	321			321			
<i>Sum</i>					867.20						
<u>West2900</u>											
<i>Mean</i>	2.53			80.79	9.49	93		0.77	1.00	206.00	
<i>Max</i>	26.82			57.35	10.00	1140	12.00	8.50	9.00	360.00	
<i>Min</i>	-30.01			20.11	0	0	0.00	0.00	0.00	0.00	
<i>N</i>	300			300	300	300	300	300	300	300	
<i>Sum</i>					1006.00						

Table 2: VMC Meteorological Monthly Data Comparisons For 1997

<u>Site</u>							<u>Wind Speed:</u>		<u>Wind Direction:</u>	
<u>Month</u>	<u>Air Temp</u>	<u>H2O Temp</u>	<u>Barom Press</u>	<u>Rel Humd</u>	<u>Precip</u>	<u>Pyranom</u>	<u>Max</u>	<u>Mean Resultant</u>	<u>Mean Resultant</u>	<u>StDev</u>
	<i>degrees C</i>		<i>mb</i>				<i>m/second</i>			
ColchReef										
<u>Jan</u>										
Mean	-5.88		1011.11	71.18		47.783		8.55	206.40	8.62
Max	9.81		1039	100.7		523.7	23.2	21.05	359.20	76.20
Min	-21.15		983	29.6		0	0.83	0.08	0.46	1.64
N	31	31	31	31		31	31	31	31	31
Sum										
<u>Feb</u>										
Mean	-3.34		1016.35	72.20		80.449		7.18	176.82	7.17
Max	10.36		1039	102		672.3	21.5	19.25	359.80	72.60
Min	-17.96		989	36.15		0	0.76	0.13	0.01	1.21
N	28	28	28	28		28	28	28	28	28
Sum										
<u>Mar</u>										
Mean	-1.75		1012.42	69.54		117.18		7.24	194.13	7.14
Max	12.54		1037	102.2		760	23.6	21.01	359.90	75.50
Min	-14.83		987	32.44		0	0.55	0.09	0.04	0.86
N	31	31	31	31		31	31	31	31	31
Sum										
<u>Apr</u>										
Mean	4.86		1009.07	65.75		143.91		5.77	186.97	7.12
Max	19.61		1024	102.6		892	17.7	15.04	359.90	72.90
Min	-9.57		993	20.77		0	0.29	0.02	0.11	0.27
N	29	29	29	29		29	29	29	29	29
Sum										
<u>May</u>										
Mean	9.86	5.45	1007.72	67.58		166.91		5.98	223.07	7.26
Max	20.94	14	1026	100.8		905	16.5	14.88	360.00	73.30
Min	2.61	1.86	988	27.34		0	0.3	0.06	0.16	0.76
N	29	29	29	29		29	29	29	29	29
Sum										

<u>Site</u>							<u>Wind Speed:</u>		<u>Wind Direction:</u>	
<u>Month</u>	<u>Air Temp</u>	<u>H2O Temp</u>	<u>Barom Press</u>	<u>Rel Humd</u>	<u>Precip</u>	<u>Pyranom</u>	<u>Max</u>	<u>Mean Resultant</u>	<u>Mean Resultant</u>	<u>StDev</u>
	<i>degrees C</i>		<i>mb</i>	<i>%</i>	<i>mm</i>	<i>watts/m²</i>	<i>m/second</i>		<i>degrees</i>	
ColchReef										
<u>Jun</u>										
Mean	18.63	16.3	1010.48	71.47		227.1		4.72	215.77	7.20
Max	29.84	20.2	1020	102.5		953	19.7	15.03	359.90	71.00
Min	10.47	10.1	994	26.26		0	0	0.00	0.00	0.00
N	30	30	30	30		30	30	30	30	30
Sum										
<u>Jul</u>										
Mean	20.52	20	1010.31	73.39		198.31		5.11	215.47	7.04
Max	29.33	24	1022	102.3		883	17.5	13.31	359.90	74.00
Min	13.45	10.9	994	32.14		0	0.27	0.01	0.28	0.97
N	31	31	31	31		31	31	31	31	31
Sum										
<u>Aug</u>										
Mean	19.72	20.8	1011.50	76.62		172.18		4.73	189.63	7.84
Max	30.29	23.3	1022	100.3		810	19.5	15.70	359.90	76.50
Min	13.77	19.0	998	34.94		0	0.28	0.04	0.21	0.92
N	31	31	31	31		31	31	31	31	31
Sum										
<u>Sep</u>										
Mean	16.37	18.0	1010.24	80.15		115.92		6.31	214.43	6.47
Max	25.23	22.2	1020	101		692.7	17.6	13.45	360.00	60.60
Min	7.55	13.3	980	38.95		0	0.47	0.13	0.32	0.95
N	26	26	26	26		26	26	26	26	26
Sum										
<u>Oct</u>										
Mean	9.25	12.5	1014.51	73.52		94.519		5.94	201.04	7.93
Max	22.84	14.4	1027	99.1		535	16.1	14.28	359.80	78.40
Min	0.217	10.2	991	31.21		0	0.57	0.04	0.11	0.93
N	29	29	29	29		29	29	29	29	29
Sum										

<u>Site</u>							<u>Wind Speed:</u>		<u>Wind Direction:</u>	
<u>Month</u>	<u>Air Temp</u>	<u>H2O Temp</u>	<u>Barom Press</u>	<u>Rel Humd</u>	<u>Precip</u>	<u>Pyranom</u>	<u>Max</u>	<u>Mean Resultant</u>	<u>Mean Resultant</u>	<u>StDev</u>
	degrees C		mb	%	mm	watts/m ²	m/second		degrees	
ColchReef										
<u>Nov</u>										
Mean	3.35	8.7	1009.59	77.92		48.386		6.82	204.74	7.89
Max	16.55	10.7	1029	102.1		411.5	20.0	18.53	360.00	73.30
Min	-6.87	6.43	985	42.9		0	0.7	0.10	0.24	1.36
N	27	27	27	27		27	27	27	27	27
Sum										
<u>Dec</u>										
Mean	-1.31	2.04	1007.32	78.35		33.49		6.69	189.64	8.26
Max	6.722	6.65	1029	101.8		382.7	25.1	17.10	359.80	62.92
Min	-16.87	-1	980	40.44		0	0.83	0.32	0.02	1.97
N	31	31	31	31		31	31	31	31	31
Sum										
<hr/>										
LYE145										
<u>Jan</u>										
Mean	-8.65			79.07	0.05	39.405		3.89	222.75	22.16
Max	9.1			99.65	3.302	480.22		354.42	10.00	69.00
Min	-26.5			20.75	0	0.698		0.65	2.88	0.00
N	31			31	31	31		31	31	31
Sum					38.61					
<u>Feb</u>										
Mean	-4.48			76.41	0.06	76.289		3.32	219.62	22.34
Max	12.5			99.55	3.81	653.33		360.00	7.90	72.00
Min	-19.6			30.15	0	0		0.13	0.90	0.00
N	28			28	28	28		28	28	28
Sum					40.89					
<u>Mar</u>										
Mean	-3.79			75.36	0.09	103.53		3.39	221.78	24.11
Max	13.6			99.95	6.35	804.1		356.94	8.65	80.00
Min	-18.2			27.75	0	0.698		0.15	2.88	0.00
N	31			31	31	31		31	31	31
Sum					64.52					

<u>Site</u>							<u>Wind Speed:</u>		<u>Wind Direction:</u>	
<u>Month</u>	<u>Air Temp</u>	<u>H2O Temp</u>	<u>Barom Press</u>	<u>Rel Humd</u>	<u>Precip</u>	<u>Pyranom</u>	<u>Max</u>	<u>Mean Resultant</u>	<u>Mean Resultant</u>	<u>StDev</u>
	degrees C		mb	%	mm	watts/m ²	m/second		degrees	
LYE145										
<u>Apr</u>										
Mean	3.42			64.40	0.13	191.98		2.87	217.80	26.72
Max	19.65			99.65	9.388	907.4		359.28	9.75	78.62
Min	-13.65			21.2	0	0.698		0.53	0.90	4.52
N	30			30	30	30		30	30	30
					96.26					
<u>May</u>										
Mean	8.16			69.67	0.34	173.49		3.30	217.33	24.13
Max	21.25			99.65	21.25	1020.5		358.92	21.25	62.73
Min	-1.7			6.45	0	0		0.38	0.00	0.00
N	31			31	31	31		31	31	31
Sum					250.2					
<u>Jun</u>										
Mean	16.62			69.68	0.08	236.17		2.23	184.46	30.76
Max	26.8			100	20.07	949.28		359.82	17.85	74.47
Min	6.45			17.85	0	0		0.48	0.90	4.89
N	30			30	30	30		30	30	30
Sum					57.98					
<u>Jul</u>										
Mean	17.10			76.58	0.17	227.32		2.02	205.02	31.05
Max	26.55			100	17.78	996.74		359.28	5.08	70.92
Min	7.95			40.35	0	0		0.60	3.96	0.00
N	31			31	31	31		31	31	31
Sum					125.5					
<u>Aug</u>										
Mean	15.78			80.57	0.23	182.67		2.03	187.80	30.87
Max	26.45			100	16.8	850.86		359.28	16.50	69.21
Min	8.11			16.5	0	0		0.53	0.90	5.87
N	31			31	31	31		31	31	
Sum					166.1					

<u>Site</u>						<u>Wind Speed:</u>	<u>Wind Direction:</u>			
<u>Month</u>	<u>Air Temp</u>	<u>H2O Temp</u>	<u>Barom Press</u>	<u>Rel Humd</u>	<u>Precip</u>	<u>Pyranom</u>	<u>Max</u>	<u>Mean Resultant</u>	<u>Mean Resultant</u>	<u>StDev</u>
	degrees C		mb	%	mm	watts/m ²	m/second		degrees	
PMRC AQ										
<u>Feb</u>										
Mean	-3.72		951.39	61.19	1.63			2.34	197.88	27.39
Max	13.9		978	90.1	6.9			6.70	360.00	69.20
Min	-21.1		930	20.4	0			0.20	0.00	12.50
N	20		20	20	20			20	20	20
Sum					32.5					
<u>Mar</u>										
Mean	-0.26		960.34	59.78	2.34			2.30	196.75	27.68
Max	13.7		978	99.1	2.5			5.80	360.00	69.40
Min	-14.7		938	20	0			0.10	0.00	7.50
N	16		16	16	16			16	16	16
Sum					37.5					
<u>Apr</u>										
Mean	4.05			47.16	2.60			2.27	195.94	27.47
Max	19.7			98.2	4.8			6.60	360.00	77.60
Min	-13.6			20.2	0			0.20	0.00	7.50
N	30		30	30	30			30	30	30
Sum					78					
<u>May</u>										
Mean	7.69			60.69	4.10			2.59	224.11	28.29
Max	17.4			97.7	8.6			7.30	360.00	81.20
Min	-1.8			20.8	0			0.10	0.00	8.30
N	26		26	26	26			26	26	26
Sum					106.7					
<u>Jun</u>										
Mean	18.34		947.88	55.46	2.20			1.54	183.13	33.65
Max	28.1		957	90.5	9.4			6.40	359.00	80.60
Min	6.2		933	24.3	0			0.00	1.00	2.70
N	28		28	28	28			28	28	28
Sum					61.6					

<i>Site</i>							<i>Wind Speed:</i>		<i>Wind Direction:</i>	
<i>Month</i>	<i>Air Temp</i>	<i>H2O Temp</i>	<i>Barom Press</i>	<i>Rel Humd</i>	<i>Precip</i>	<i>Pyranom</i>	<i>Max</i>	<i>Mean Resultant</i>	<i>Mean Resultant</i>	<i>StDev</i>
	<i>degrees C</i>		<i>mb</i>	<i>%</i>	<i>mm</i>	<i>watts/m²</i>	<i>m/second</i>		<i>degrees</i>	
PMRC AQ										
<u>Jul</u>										
<i>Mean</i>	18.25		948.11	65.08	3.51			1.47	180.20	33.53
<i>Max</i>	27.6		958	99.6	9.7			3.90	360.00	82.60
<i>Min</i>	9.1		932	21.4	0			0.00	0.00	4.10
<i>N</i>	31		31	31	31			31	31	31
<i>Sum</i>					108.7					
<u>Aug</u>										
<i>Mean</i>	16.90		949.12	69.16	3.41			1.40	171.12	33.91
<i>Max</i>	27.7		958	99.6	7.4			4.60	360.00	83.40
<i>Min</i>	9.2		940	34.3	0			0.10	0.00	3.80
<i>N</i>	31		31	31	31			31	31	31
<i>Sum</i>					105.8					
<u>Sep</u>										
<i>Mean</i>	12.81		948.06	75.48	3.63			1.61	175.81	36.06
<i>Max</i>	23.6		957	96.1	6.9			4.70	360.00	78.90
<i>Min</i>	1.4		930	20.3	0			0.10	0.00	4.70
<i>N</i>	30		30	30	30			30	30	30
<i>Sum</i>					108.8					
<u>Oct</u>										
<i>Mean</i>	7.32		950.66	61.50	1.97			1.72	183.66	31.38
<i>Max</i>	23.1		962	98.8	4.6			5.90	360.00	72.90
<i>Min</i>	-4.5		930	20.8	0			0.10	0.00	6.40
<i>N</i>	31		31	31	31			31	31	31
<i>Sum</i>					61					
<u>Nov</u>										
<i>Mean</i>	0.33		946.46	72.18	3.17			1.82	201.59	29.65
<i>Max</i>	15.6		964	96.4	6.9			5.90	360.00	81.10
<i>Min</i>	-11.8		930	35	0			0.00	0.00	7.00
<i>N</i>	29		29	29	29			29	29	29
<i>Sum</i>					92					

<u>Site</u>							<u>Wind Speed:</u>		<u>Wind Direction:</u>	
<u>Month</u>	<u>Air Temp</u>	<u>H2O Temp</u>	<u>Barom Press</u>	<u>Rel Humd</u>	<u>Precip</u>	<u>Pyranom</u>	<u>Max</u>	<u>Mean Resultant</u>	<u>Mean Resultant</u>	<u>StDev</u>
	degrees C		mb	%	mm	watts/m ²	m/second			
PMRC AQ										
<u>Jul</u>										
Mean	18.25		948.11	65.08	3.51			1.47	180.20	33.53
Max	27.6		958	99.6	9.7			3.90	360.00	82.60
Min	9.1		932	21.4	0			0.00	0.00	4.10
N	31		31	31	31			31	31	31
Sum					108.7					
<u>Aug</u>										
Mean	16.90		949.12	69.16	3.41			1.40	171.12	33.91
Max	27.7		958	99.6	7.4			4.60	360.00	83.40
Min	9.2		940	34.3	0			0.10	0.00	3.80
N	31		31	31	31			31	31	31
Sum					105.8					
<u>Sep</u>										
Mean	12.81		948.06	75.48	3.63			1.61	175.81	36.06
Max	23.6		957	96.1	6.9			4.70	360.00	78.90
Min	1.4		930	20.3	0			0.10	0.00	4.70
N	30		30	30	30			30	30	30
Sum					108.8					
<u>Oct</u>										
Mean	7.32		950.66	61.50	1.97			1.72	183.66	31.38
Max	23.1		962	98.8	4.6			5.90	360.00	72.90
Min	-4.5		930	20.8	0			0.10	0.00	6.40
N	31		31	31	31			31	31	31
Sum					61					
<u>Nov</u>										
Mean	0.33		946.46	72.18	3.17			1.82	201.59	29.65
Max	15.6		964	96.4	6.9			5.90	360.00	81.10
Min	-11.8		930	35	0			0.00	0.00	7.00
N	29		29	29	29			29	29	29
Sum					92					

<u>Site</u>							<u>Wind Speed:</u>		<u>Wind Direction:</u>	
<u>Month</u>	<u>Air Temp</u>	<u>H2O Temp</u>	<u>Barom Press</u>	<u>Rel Humd</u>	<u>Precip</u>	<u>Pyranom</u>	<u>Max</u>	<u>Mean Resultant</u>	<u>Mean Resultant</u>	<u>StDev</u>
	degrees C		mb	%	mm	watts/m ²	m/second		degrees	
PMRC AQ										
<u>Dec</u>										
Mean	-4.28		943.47	73.07	1.94			1.74	192.65	
Max	7.2		961	98.6	4.3			6.00	360.00	80.60
Min	-21.6		930	27.7	0			0.10	1.00	9.00
N	31		31	31	31			31	31	31
Sum					60.1					
<hr/>										
West2900										
<u>Jan</u>										
Mean	-10.88			87.70		17.715		1.04	215.05	
Max	8.35			101.5		234.9	12.1	8.50	360.00	80.20
Min	-30.01			20.44		0	0	0.00	0.00	0.00
N	31			31	31	31	31	31	31	31
Sum										
<u>Feb</u>										
Mean	-7.05			84.29		30.734		0.75	242.62	
Max	11.11			101.4		528	8.64	6.08	360.00	80.60
Min	-24.19			25.45		0	0	0.00	0.00	0.00
N	27			27	27	27	27	27	27	27
Sum										
<u>Mar</u>										
Mean	-5.83			81.49		72.658		0.98	227.22	39.10
Max	12.73			101.9		802	9.13	5.10	360.00	
Min	-21.12			21.77		0	0.22	0.01	0.28	2.43
N	30			30	30	30	30	30	30	30
Sum										
<u>Apr</u>										
Mean	0.41			66.89		150.47		0.81	207.60	39.00
Max	15.63			101.9		1086	6.54	4.48	359.90	80.30
Min	-18.14			20.26		0	0	0.00	0.00	0.00
N	30			30	30	30	30	30	30	30
Sum										

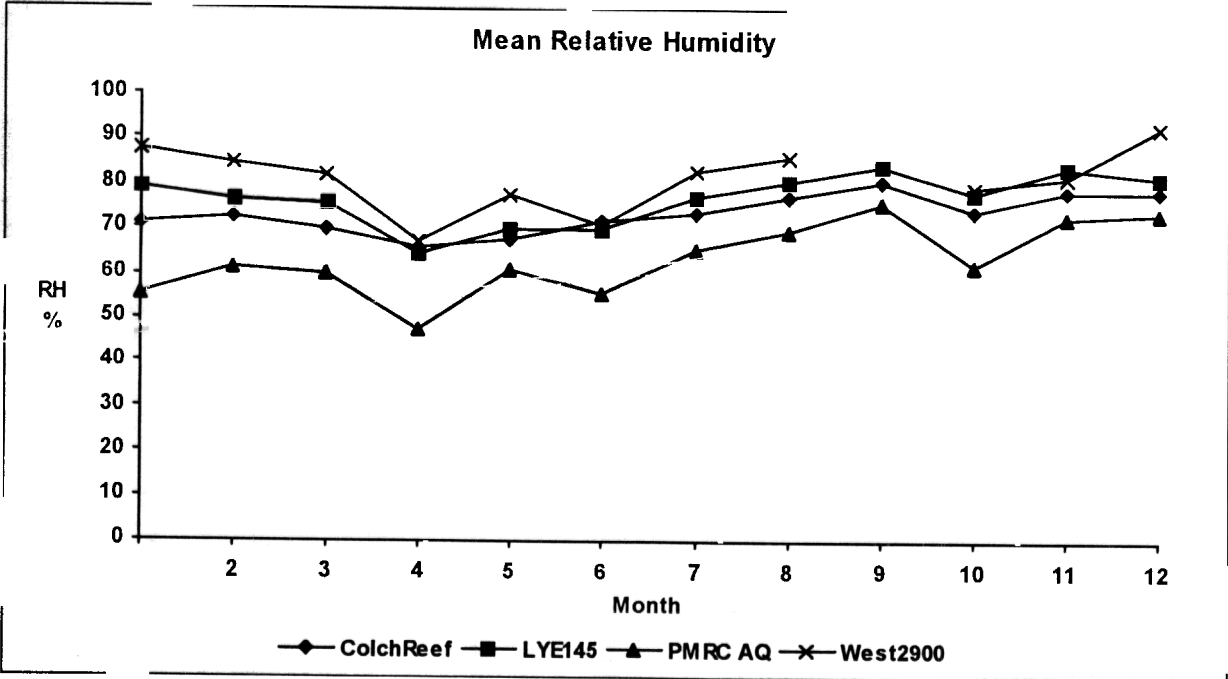
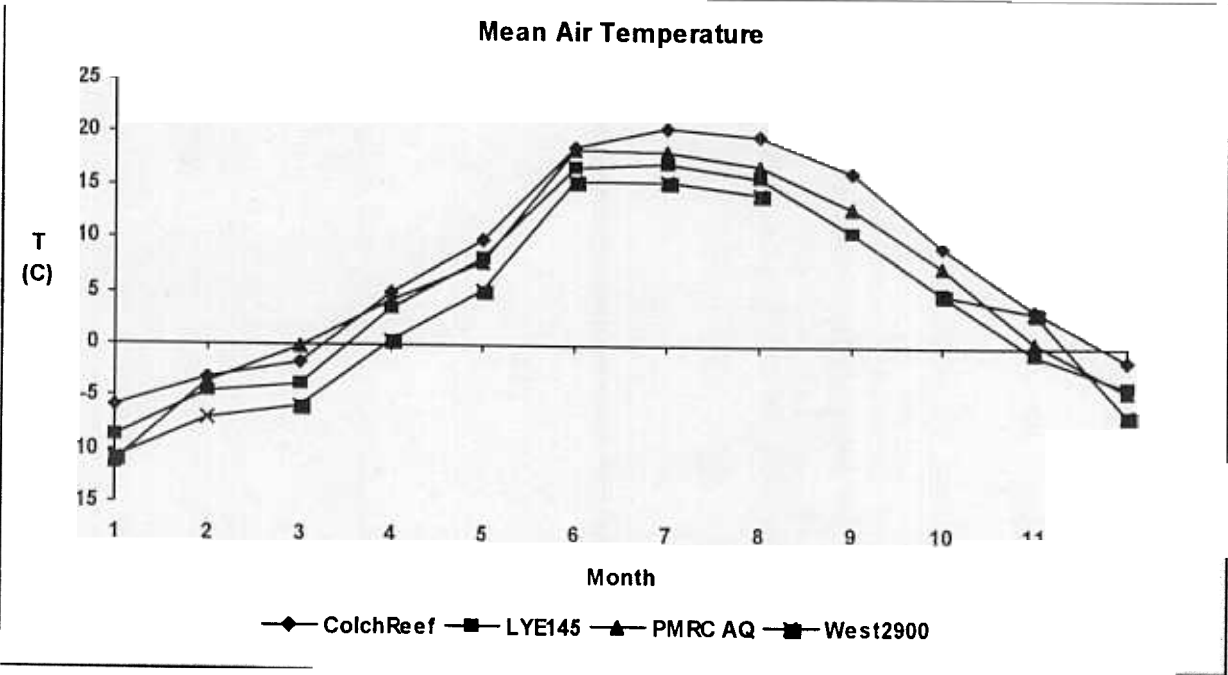
<i>Site</i>							<u><i>Wind Speed:</i></u>		<u><i>Wind Direction:</i></u>	
<u><i>Month</i></u>	<i>Air Temp</i>	<i>H2O Temp</i>	<i>Barom Press</i>	<i>Rel Humd</i>	<i>Precip</i>	<i>Pyranom</i>	<i>Max</i>	<i>Resultant</i>	<i>Resultant</i>	<i>StDev</i>
	<i>degrees C</i>		<i>mb</i>	<i>%</i>	<i>mm</i>	<i>watts/m²</i>				
West2900										
<u>May</u>										
Mean	5.03			77.34		115.35		1.00	234.79	37.03
Max	20.45			101.9		1071	10.3	7.26	359.80	80.60
Min	-5.44			20.11		0	0	0.00	0.00	0.00
N	31			31	31	31	31	31	31	31
Sum										
<u>Jun</u>										
Mean	15.26			70.65	4.11	200.34		0.70	204.50	32.42
Max	26.82			101.5	6.4	1110	4.07	2.68	359.50	80.70
Min	0.79			24.26	0	0	0.15	0.00	0.11	1.07
N	30			30	30	30	30	30	30	30
Sum					61.6					
<u>Jul</u>										
Mean	15.38			82.62	4.57	159.32		0.53	195.41	32.12
Max	26.24			101.9	7.1	1140	3.44	2.12	359.70	80.80
Min	6.07			41.21	0	0	0	0.00	0.00	0.00
N	31			31	31	31	31	31	31	31
Sum					141.7					
<u>Aug</u>										
Mean	14.22			85.91	5.13	124.31		0.56	188.45	31.44
Max	25.01			102.1	7	1077	4.53	2.69	359.90	80.00
Min	7.52			48.37	0	0	0.18	0.01	0.01	0.00
N	28			28	28	28	28	28	28	28
Sum					143.7					
<u>Oct</u>										
Mean	4.82			79.04		48.938		0.74	194.32	36.90
Max	20.93			102.5		1124	8.32	5.49	360.00	80.70
Min	-8.65			20.96	0	0	0.15	0.00	0.01	1.43
N	27			27	27	27	27	27	27	27
Sum										

<u>Site</u>							<u>Wind Speed:</u>		<u>Wind Direction:</u>	
<u>Month</u>	<u>Air Temp</u>	<u>H2O Temp</u>	<u>Barom Press</u>	<u>Rel Humd</u>	<u>Precip</u>	<u>Pyranom</u>	<u>Max</u>	<u>Mean Resultant</u>	<u>Mean Resultant</u>	<u>StDev</u>
	<i>degrees C</i>		<i>mb</i>	<i>%</i>	<i>mm</i>	<i>watts/m²</i>	<i>m/second</i>		<i>degrees</i>	
West2900										
<u>Nov</u>										
Mean	3.13			81.43		43.855		0.77	142.65	29.21
Max	9.05			103.2		905	4.95	4.09	360.00	78.30
Min	-1.21			41.74	0	0	0	0.00	0.00	0.00
N	6			6	6	6	6	6	6	6
Sum										
<u>Dec</u>										
Mean	-6.53			92.56		5.6079		0.58	164.90	26.46
Max	3.687			103.1		253	8.64	6.20	359.90	77.70
Min	-25.25			26.68	0	0	0	0.00	0.00	0.00
N	29			29	29	29	29	29	29	29
Sum										

Table 3. PMRC Meteorological Data

Month	Monthly						Long Term Average							
	Precipitation (inches)		Air Temperature (F)			Cum GDD		Precipitation (inches)		Air Temperature (F)			Cum GDD	
	Mean	Sum	Absolute			32F	50F	Mean	Sum	Absolute			32F	50F
			Mean	Max	Min					Mean	Max	Min		
January	0.03	0.58	11.71	42.98	-33.16	3.15	0.00	0.10	2.99	19.41	62.78	-24.52	39.52	2.76
February	0.07	1.30	25.31	57.02	-5.98	38.79	0.00	0.07	1.85	21.94	60.28	-19.12	72.41	3.65
March	0.09	1.50	31.53	56.66	5.54	99.97	1.98	0.09	2.66	30.63	77.90	-9.58	180.33	8.39
April	0.10	3.12	39.30	67.46	7.52	361.15	14.31	0.13	3.91	41.02	73.76	7.52	458.37	30.58
May	0.16	4.27	45.85	63.32	28.76	720.43	29.25	0.14	4.10	53.73	83.89	28.76	1129.18	199.53
June	0.09	2.46	65.01	82.58	43.16	1822.29	501.11	0.12	3.54	62.09	89.24	20.84	2017.24	560.21
July	0.14	4.35	64.86	81.68	48.38	2848.65	969.47	0.15	4.80	65.68	89.78	44.42	3125.99	1082.16
August	0.14	4.23	62.42	81.86	48.56	3808.05	1370.87	0.12	3.71	63.78	84.74	28.94	4104.53	1514.96
September	0.15	4.35	55.06	74.48	34.52	4505.19	1565.09	0.16	4.81	57.06	89.01	4.28	4860.82	1786.66
October	0.08	2.44	45.17	73.58	23.90	4917.12	1639.79	0.12	3.58	45.02	73.58	22.04	5265.52	1826.36
November	0.13	3.68	32.60	60.08	10.76	5042.67	1645.37	0.10	2.98	34.95	66.56	0.68	5426.36	1834.65
December	0.08	2.40	24.30	44.96	-6.88	5057.16	1645.37	0.07	2.23	26.37	62.20	-22.72	5481.54	1834.90

Figure 1: Meteorological Variables Summarized By Month At VMC Sites



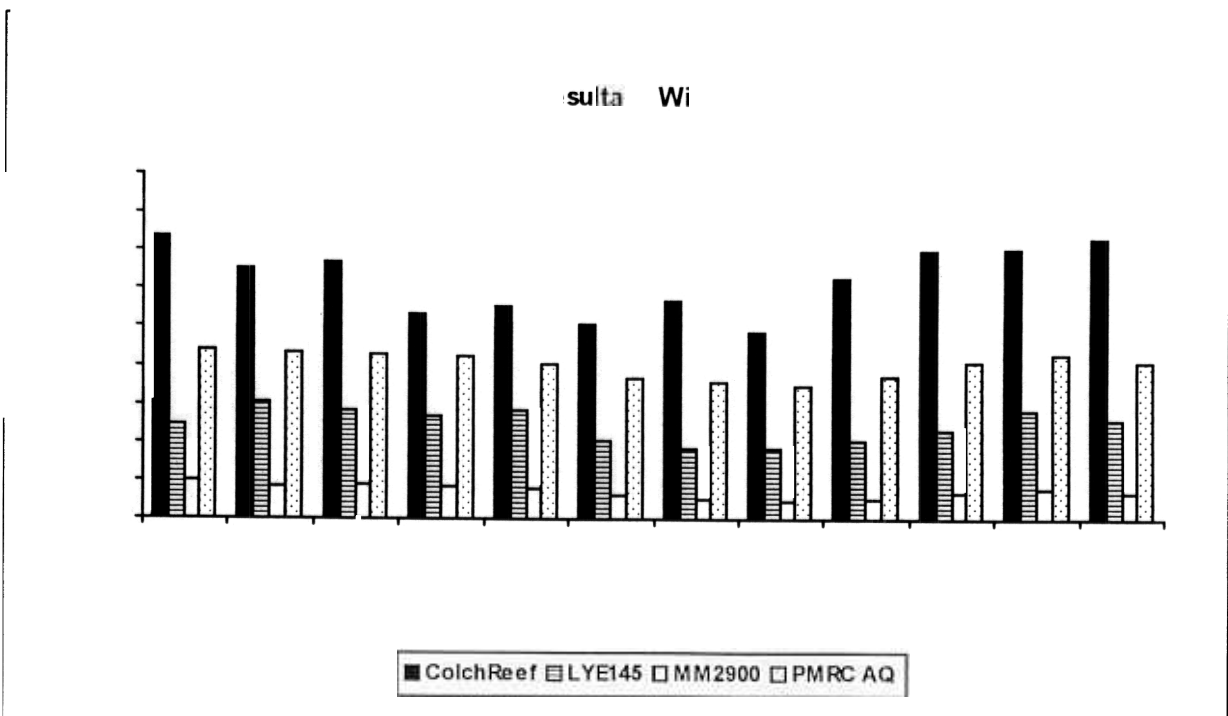
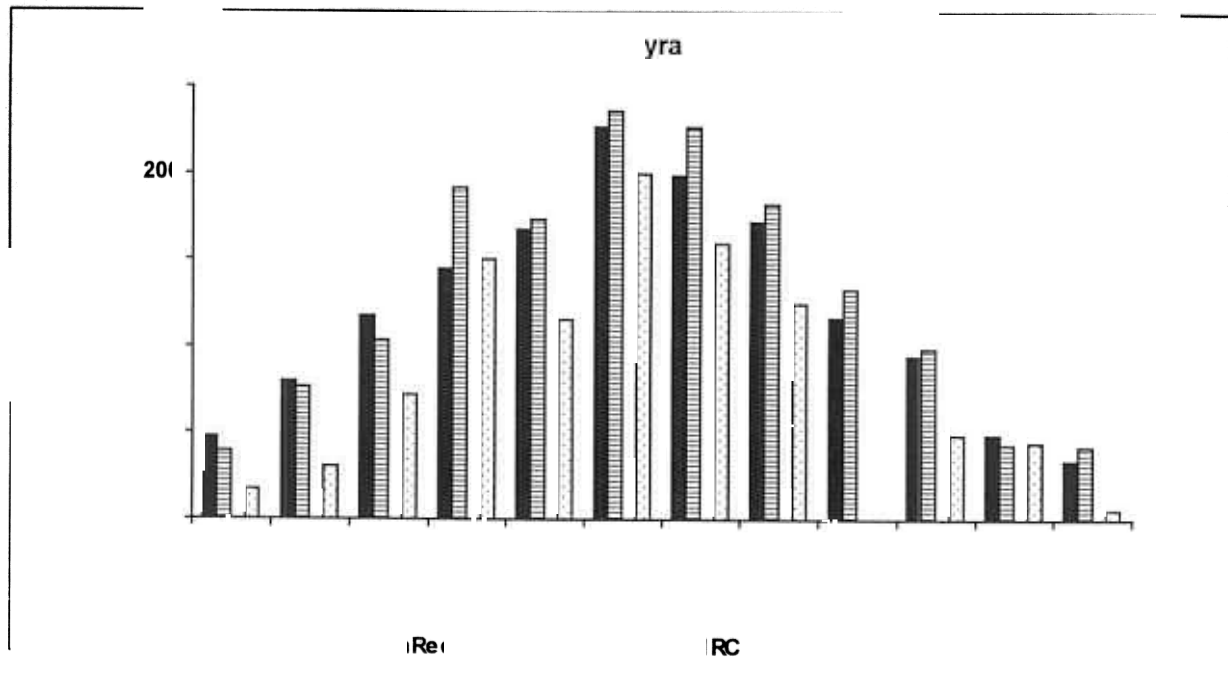


Figure 1: Meteorological Variables Summarized By Month At VMC Sites

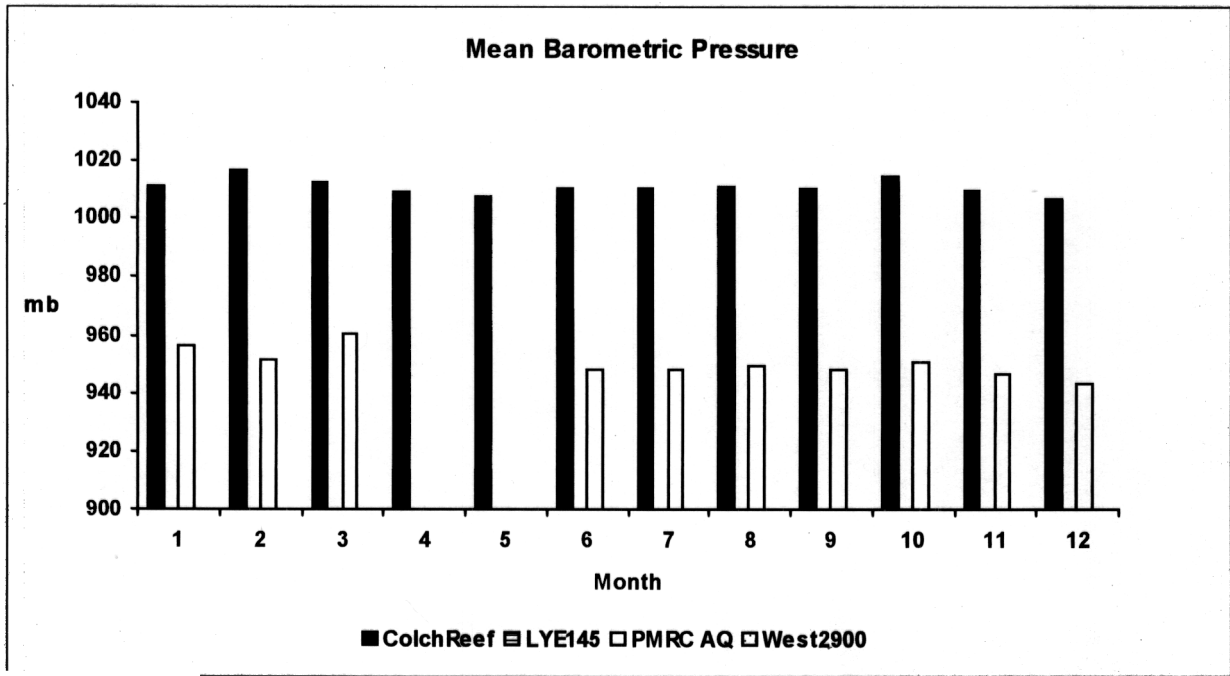


Figure 2: Meteorological Variables Summarized By Month On Individual Sites

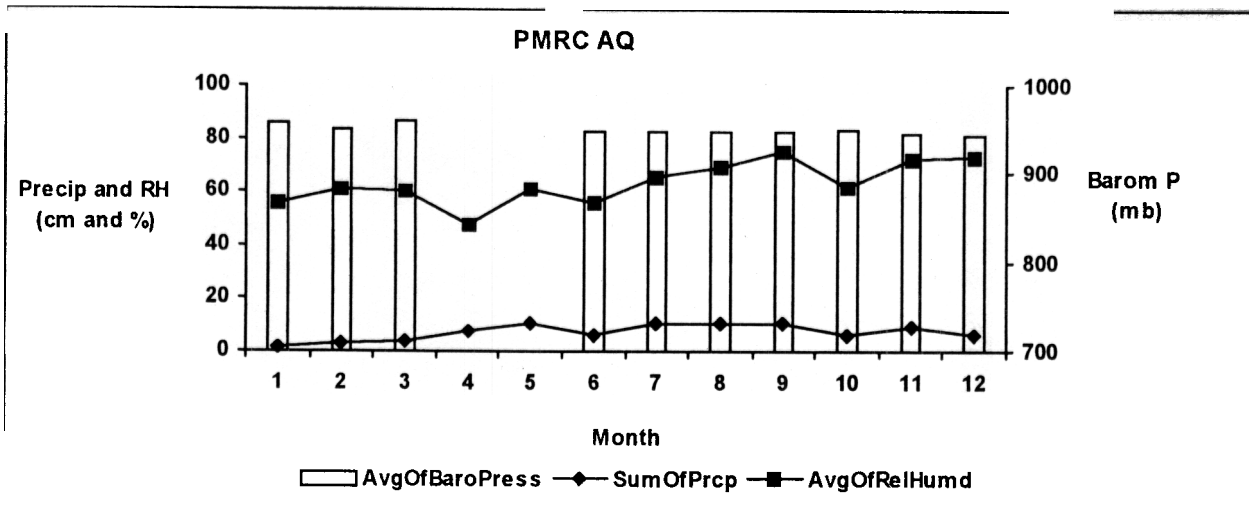
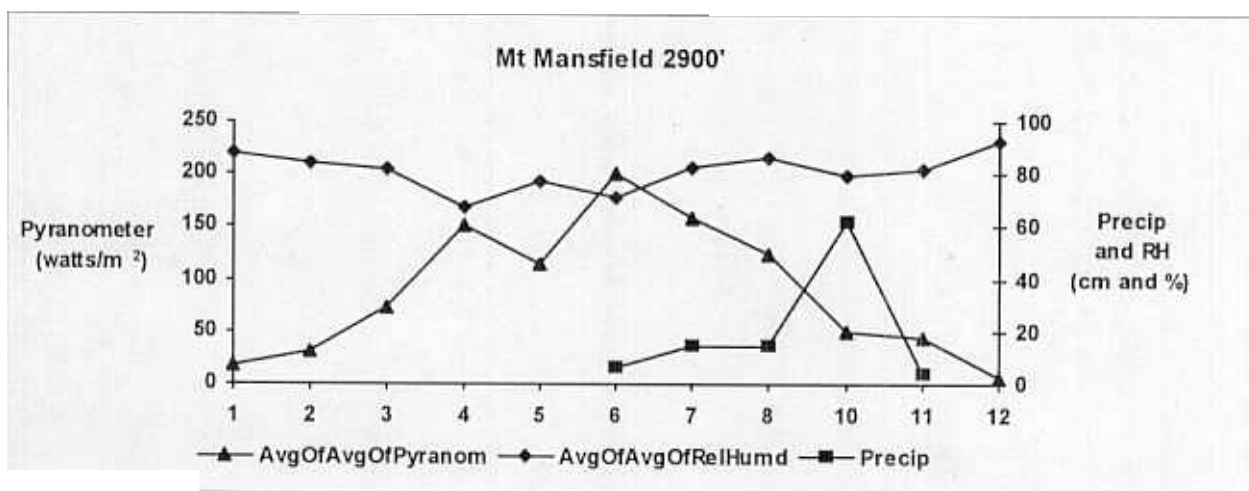
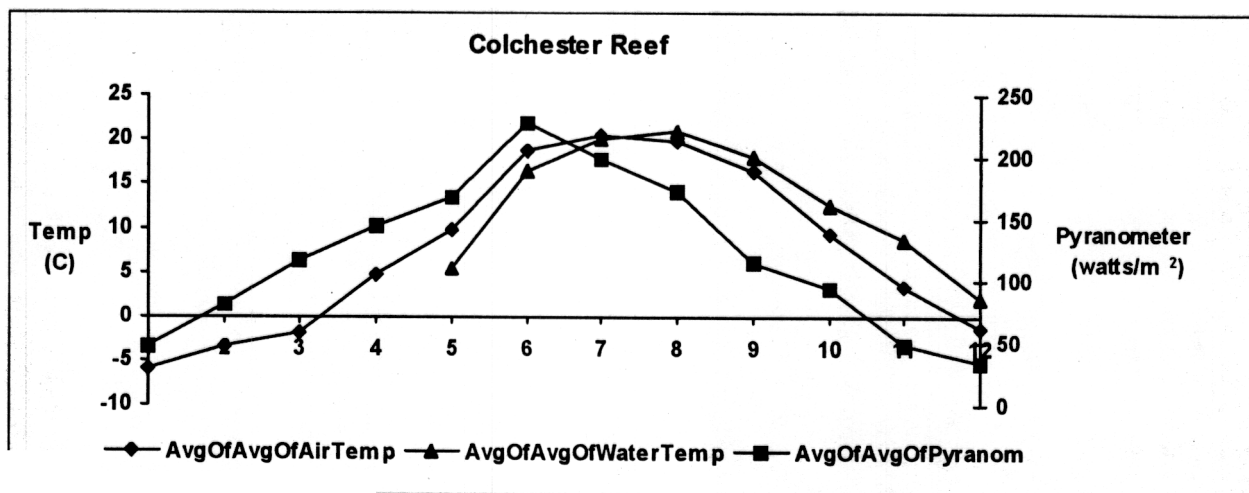
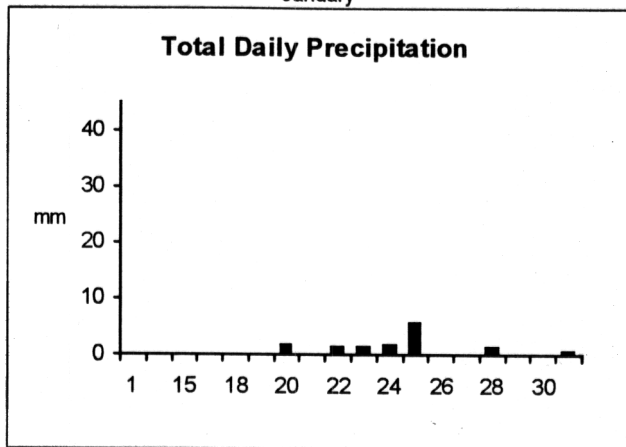
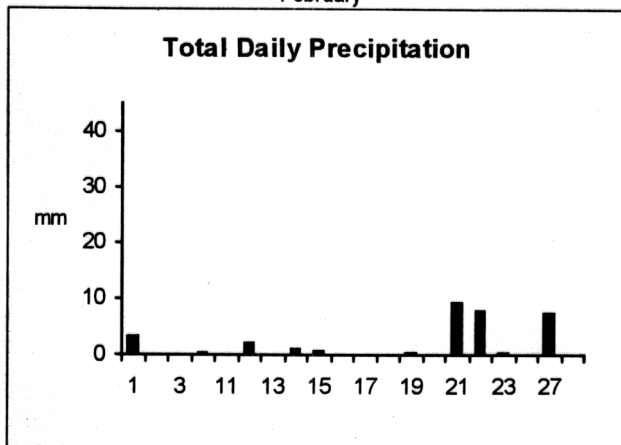


Figure 3:
PMRC AQ Total Daily Precipitation - 1997

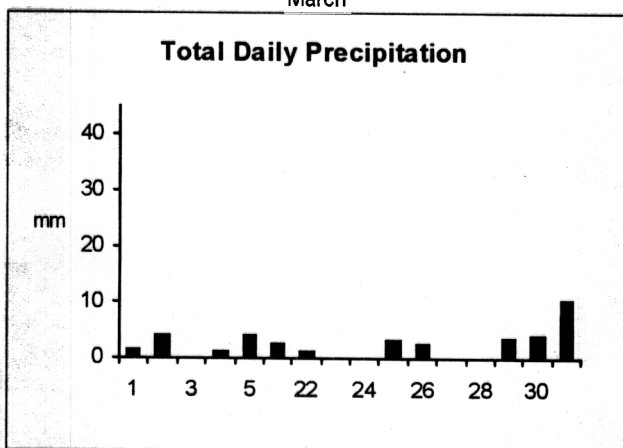
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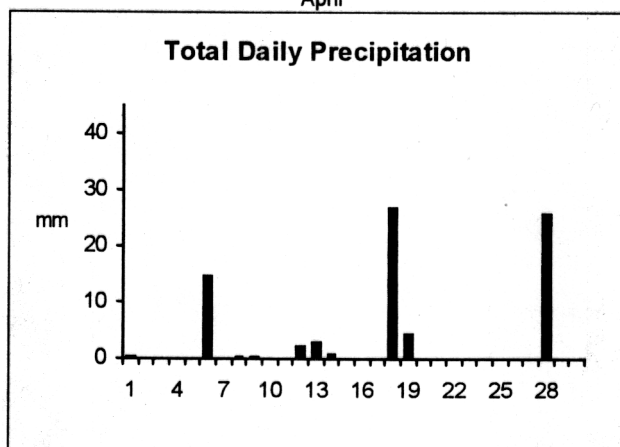
February



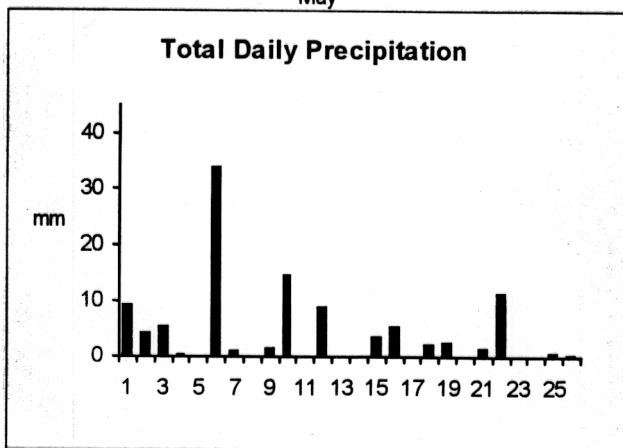
March



April



May



June

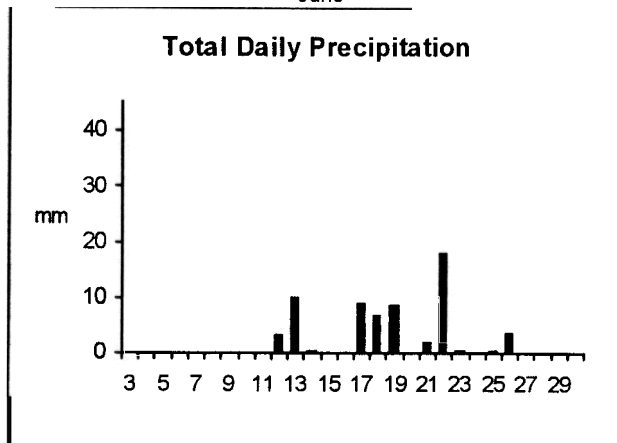
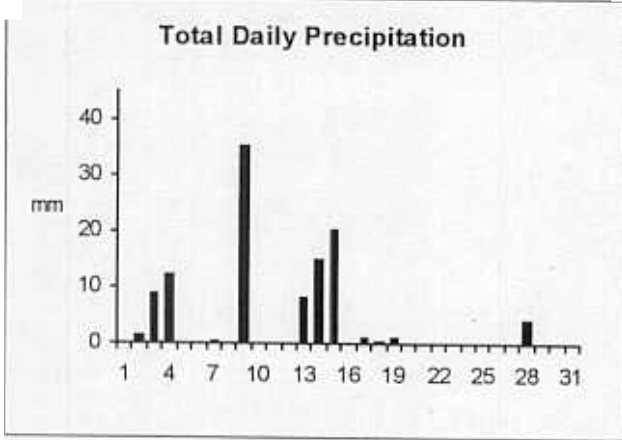
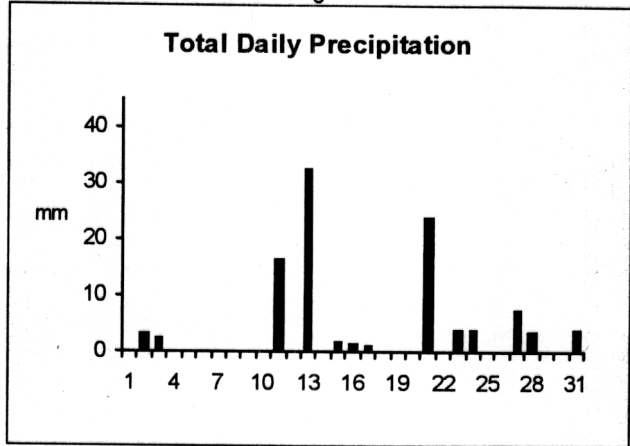


Figure 3:
PMRC AQ Total Daily Precipitation - 1997

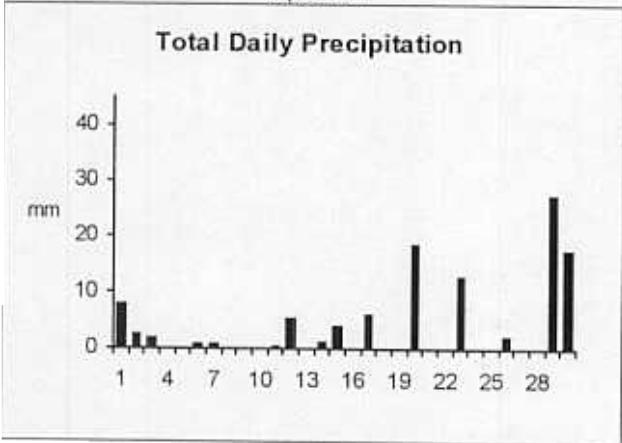
July



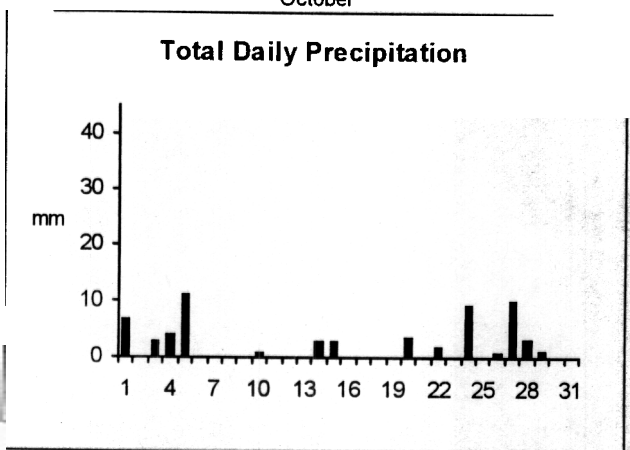
August



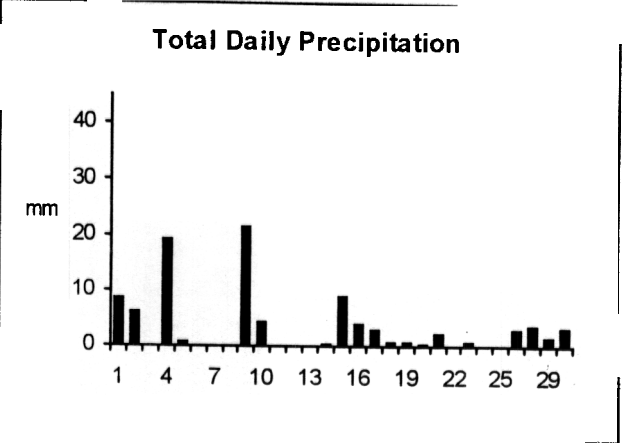
September



October



November



December

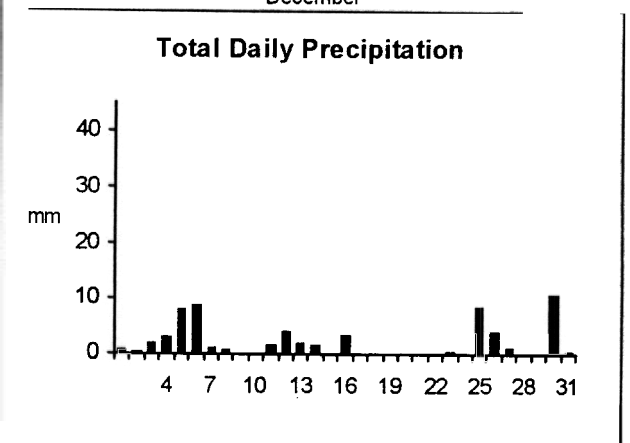


Figure 4:
PMRC AQ Daily Temperature - 1997

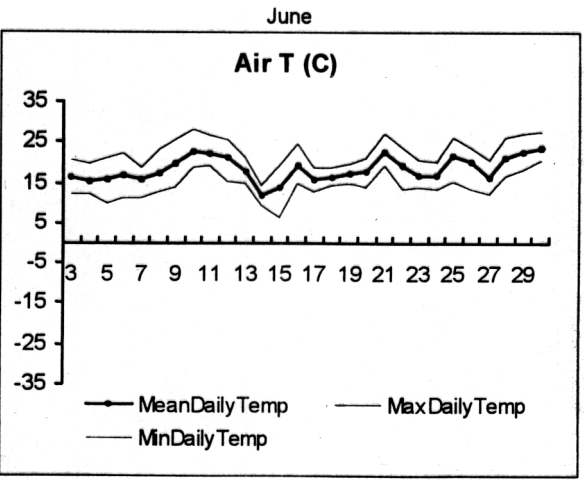
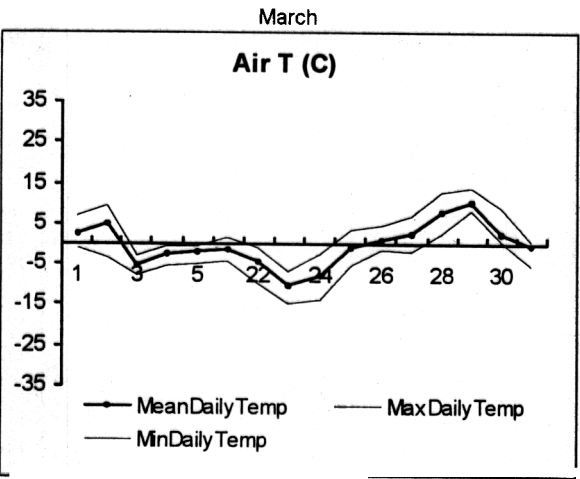
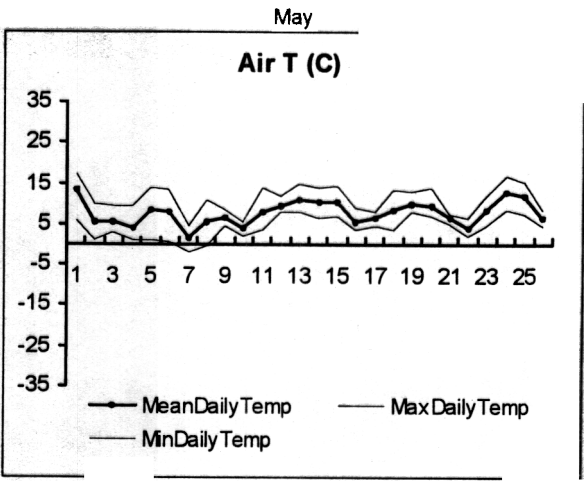
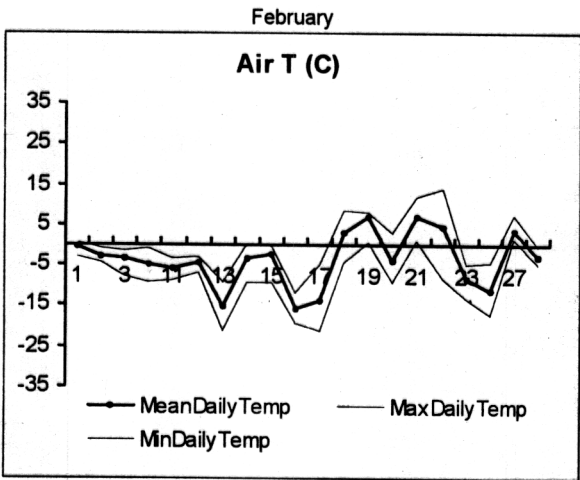
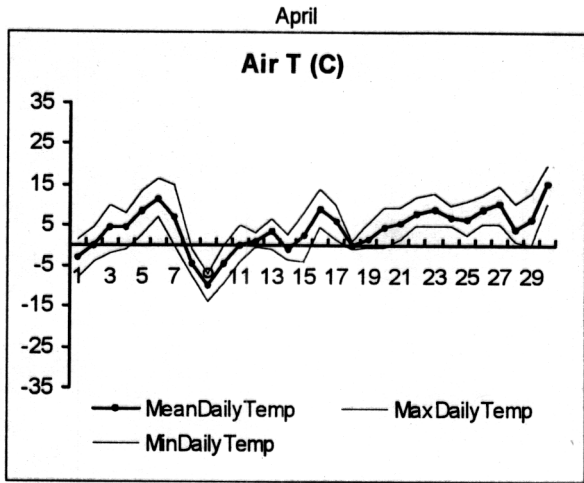
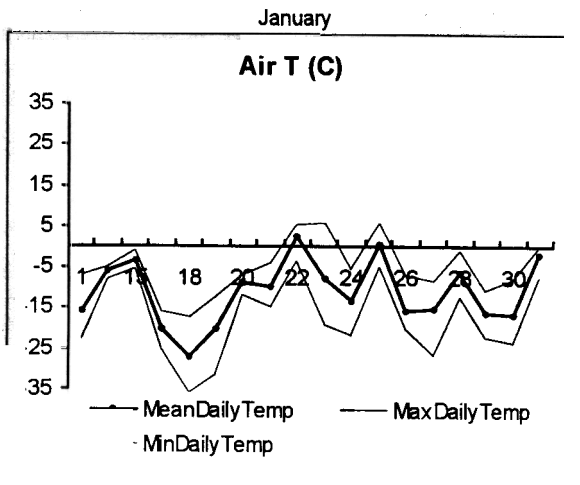
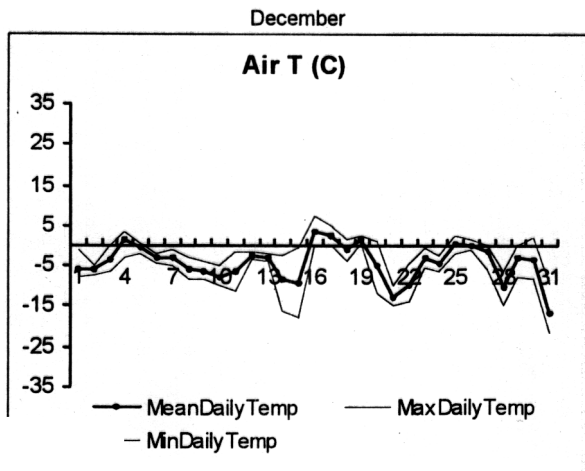
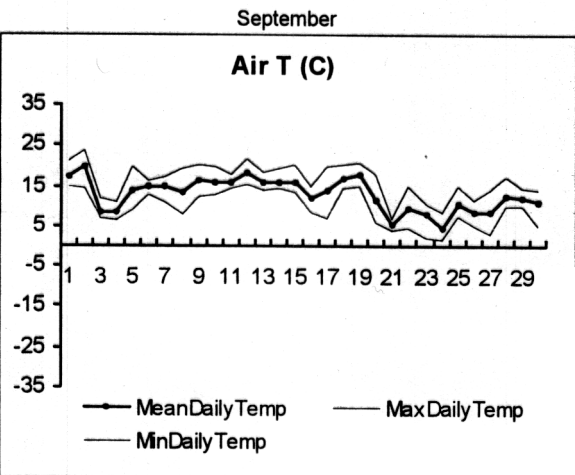
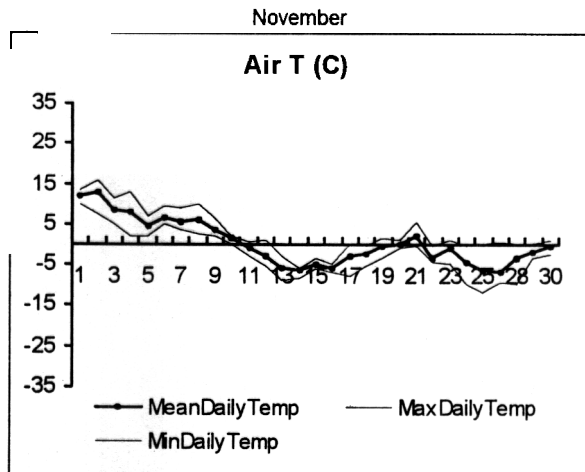
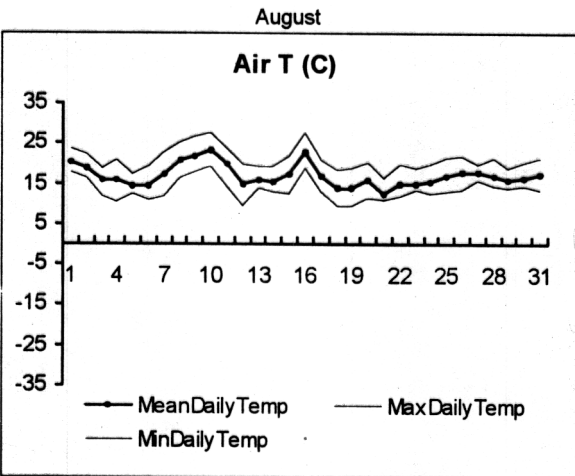
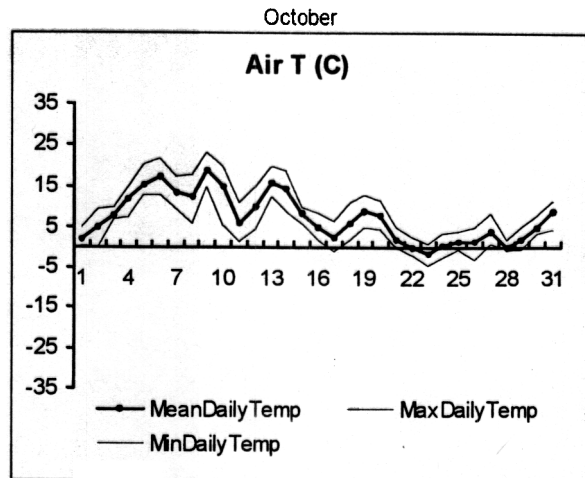
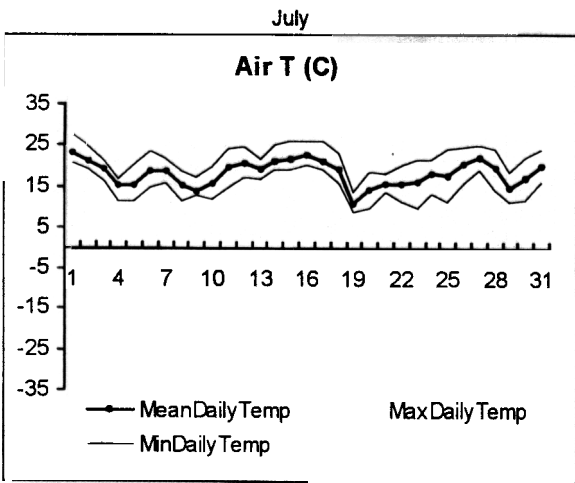


Figure 4:
PMRC AQ Daily Temperature - 1997



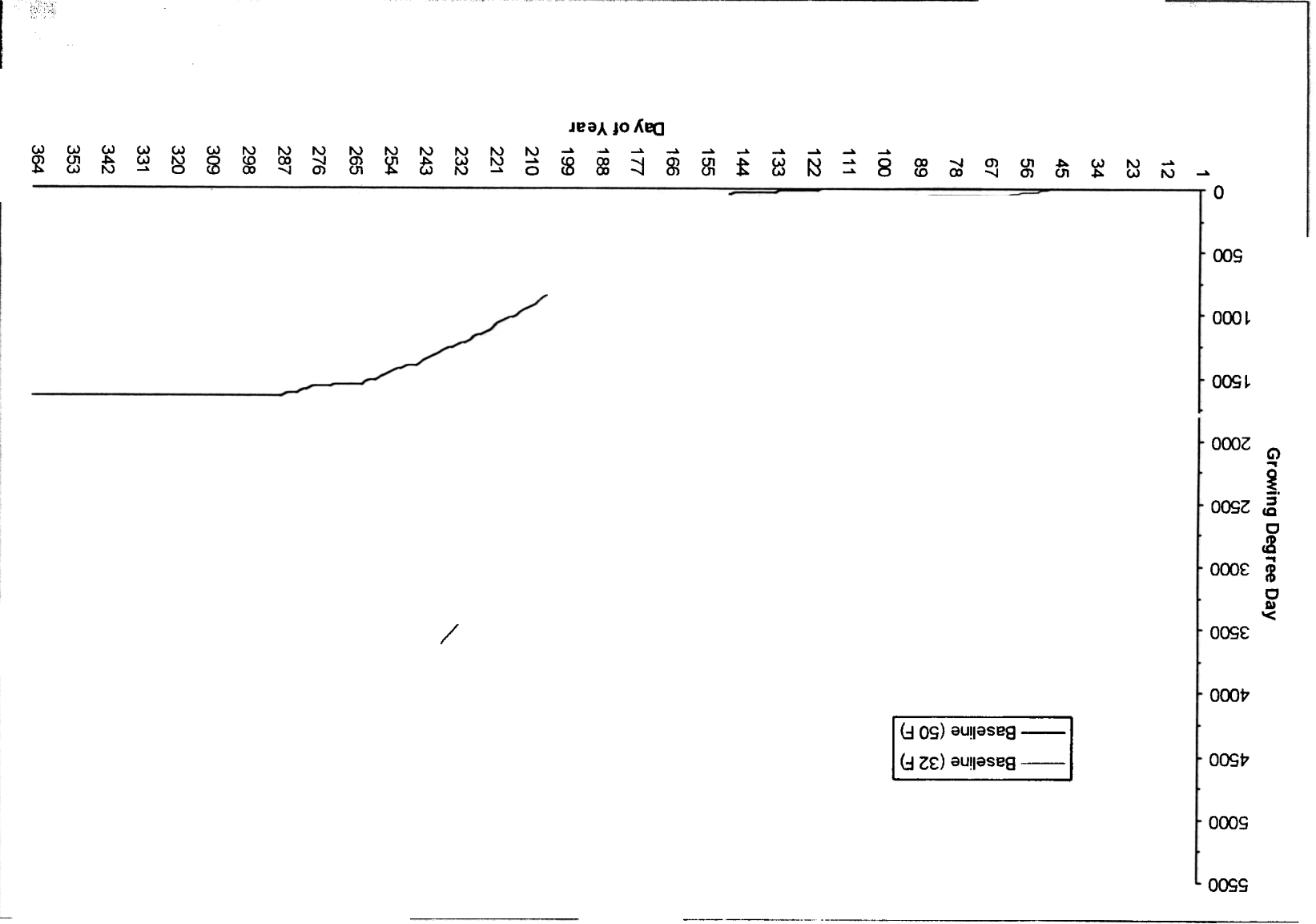


Figure 5: PMRC AQ Cumulative Growing Degree Days