LIMITED REPORT

Saskatoon SRC Climatological Reference Station Annual Summary 1995

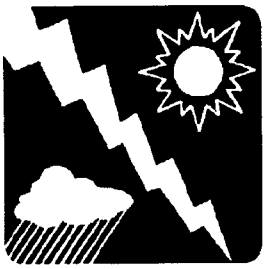
by

C.R. Beaulieu
V. Wittrock

Environment Technology Division

SRC Publication No. E-2900-1-E-96

February, 1996



SASKATOON SRC
CLIMATOLOGICAL REFERENCE STATION

ANNUAL SUMMARY, 1995

By

C.R. Beaulieu
V. Wittrock

Climatology Section

Environmental Technologies Division
Research and Technical Services Branch

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ACKNOWLEDGEMENTS

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Enquiries concerning the SRC Climatological Reference Station (CRS), its data, measurement programs and publications are most welcome. For further information contact:

Elaine Wheaton	Virginia Wittrock	Carol Beaulieu
Lead Scientist	Research Scientist	Technician
306-933-8179	306-933-8122	306-933-8182

Climatology Section
Fax 306-933-7817
E-mail Wheaton@src.sk.ca
Web Site Home Page - http://www.src.sk.ca

ERRATA

CORRECTION TO SOIL TEMPERATURES FOR 1994

Please note:

Please be advised that the soil temperatures given in the 1994 Annual Summary have been revised because of re-calibration of the data logger. In the 1995 report, the 1994 soil temperatures in the Monthly Summaries have been corrected and revised graphs for 1994 have been included.

Cover Photograph
Campbell-Stokes sunshine recorder at the SRC, Climate Reference Station, Saskatoon , 1993.

SUMMARY

Data concerning temperature, precipitation, soil temperature, wind speed and direction, bright sunshine, and solar radiation recorded at the SRC Climatological Reference Station (CRS), (59°09'N, 106°36'W, 497m asl) are presented for the year 1995 and compared with the long-term (*circa* 1900-1995) and standard-period (1961-1990) records.

A warm, late winter gave way to a very cool April. It was the coldest April since 1979 when the average temperature was -2.3°C. The temperatures recovered to seasonal averages in May with June warmer than usual. September was warmer than average but temperatures dropped below seasonal averages for the rest of the year. Over all, the annual average temperature was 0.4°C above the 30-year average. This can be partly attributed to the minimum temperature being 0.4°C above average for the year.

Saskatoon received 30.8 mm less precipitation than average for the year. The driest month was September with 0.8 mm of precipitation while August, rather than June, was the wettest with over twice the usual monthly amount. Hail occurred on July 27th causing minor damage at the climate station. Snow flurries were first noticed on September 19th but it was not until October 31st that snow remained on the ground.

Growing degree-days were near average despite the very cold April. Although much shorter than last year, the frost free season equalled the average of 119 days.

Bright sunshine was 7.1% below the 30-year average. Only three months, February, September and December, had bright sunshine values above the 30-year monthly averages. Smoke haze from northern forest fires was readily noted in the city from late May to late August and may have contributed to the low sunshine values for those months.

Gale force winds were recorded during May (causing minor damage), July, August (for four days) and early December (causing the first blizzard of the winter).

WEATHER EVENTS

Frost Free Season

Last Spring Frost	First Fall Frost	Length of Season
1995 May 22	September 19	119 days
1994 May 9	October 4	147 days
1993 May 17	September 14	119 days
30-year Average		
May 19	September 15	119 days

Extremes

Hottest day =August 5th at 36.0°C Coldest days = December 8th and 10th at -32.5°C

Rainiest Month	Rainiest Day	Heaviest Rainfall
August	August 9th	July 27th
75.6 mm	25.5 mm	7.4 mm between 1:00 and 2:00 pm

Tipping Bucket was used to officially record precipitation between May 1st and October 30th .

STATION HISTORY AND LOCATION

The first meteorological observations were taken at or near Saskatoon by the Royal Northwest Mounted Police in 1889 with only temperatures being recorded at the start. There is some disagreement in the early records as to the exact location of the weather observing point, but the majority of the evidence indicates 52°15'N and 106°20'W, elevation 480 m above sea level as the most probable location. This would place it at Clark's Crossing on the South Saskatchewan River, approximately 16 km northeast of the centre of the City of Saskatoon. At that time, there was a settlement at Clark's Crossing along with 10 to 15 families at Saskatoon on either side of the river.

Little is known about the very early observers; however, the records do show that Major T.H. Keenan took the observations from March 1892 until March 1895, and Mr. George Will was the observer from January 1897 until April 1897. It is thought that Thomas H. Copeland was involved in the observational program from 1895 to May 1, 1901, at which time it was taken over by Mr. Eby, Sr. Continuous observations were taken by the Ebys at a site on 8th Street until October 31, 1942, when the station was closed. Mr. Eby, Sr. took the observations until his death in 1921, at which time his daughter, Miss E.S. Eby, recorded the observations until April 1931 then by her brother, Mr. J.M. Eby continued the observations until the station was closed. The Eby station recorded temperature, precipitation and weather notes on fog, thunderstorms, winds and any unusual weather phenomena. Reports were made twice daily, morning and evening.

In 1916 a climatological station was established by the Physics Department of the University of Saskatchewan and continuous observations were kept twice daily until January 15, 1965. The long time observer at this site was Mr. Sidney Cox. The Saskatchewan Research Council took over the program in the fall of 1963 at the newly established Climatological Reference Station.

The location of the Saskatchewan Research Council's Climatological Reference Station is latitude 52°09'N and longitude 106°36'W and the elevation is 497 m asl[1].

The long-time observer (16 years) at this present site was Mr. Joe Calvert, who retired from the program in August, 1983. Ray Begrand succeeded Mr. Calvert until September 1988 when Virginia Wittrock became the primary observer. Carol Beaulieu became the primary observer in 1992.

In the summer of 1992, the CRS began to be converted to an automated system of data collection with the installation of a Campbell Scientific Data Logger and automatic sensors. The following manual data collection duties were turned over to Environment Canada: evaporation, bright sunshine (Campbell-Stokes), snow survey, snow cover, and manual temperature and precipitation programs. Manual temperature, precipitation and snow cover readings at the site are still possible in the event of total, extended power failure.

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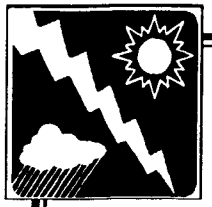
[1]From various sources including the *Physical Environment of Saskatoon, Canada* (E.A. Christiansen (ed.) 1970) and 1974 *Annual Meteorological Summary, Saskatoon, Saskatchewan,* (Environment Canada, Atmospheric Environment Service).



SASKATCHEWAN RESEARCH COUNCIL MONTHLY WEATHER SUMMARY

Latitude 52°09' N — SASKATOON — Longitude 106°36' W

	ANNUAL SUMMARY 1995	1995 VALUE	1994 VALUE	AVERAGES (1961 - 1990) EXTREME VALUES (1892-1994)
TEMPERATURE	Annual Average (°C)	2.3	2.6[2]	1.9
	Extreme Annual Maximum (°C)/Date	36.0/Aug 5	32.0/Sept18	41.0/June, 1988
	Annual Average Maximum (°C)	7.9	8.5[2]	7.8
	Extreme Annual Minimum (°C)/Date	-32.5/Dec 8 &10	-43.2/Feb13[3]	-50.0/Feb,1893
	Annual Average Minimum (°C)	-3.4	-3.3[2]	-3.8
	Days with Frost	199	184[4]	198
	Heating Degree-Days (18°C base)	5841.9	5619.7[3]	5684.3
	Growing Degree-Days (5°C base)	1657.7	1769.1[3]	1659.7
PRECIPITATION	Yearly total (mm)	329.4	347.0	360.2
	Greatest 24-h (mm)/Date	25.0/Aug 9	38.8/May17	99.4/June 1983
	Days with Precipitation	107[1]	101[3]	114
WIND	Average Speed (km/h)	13.9	14.1[2]	16.3
	Peak Gust Speed (km/h)/Date	89.3/Jul 29	81.0/July11[2]	151/Aug/1967/14[9]
SUNSHINE	Total Bright Sunshine (h)	2083.1	2192.2[5]	2399.4
	% Possible Bright Sunshine	46.7	49.2[5]	53.8
	Number of days with Bright Sun	303	319[6]	
	Total Global Radiation (MJ/m²)	4520.9	3980.6[7]	4391.9
	Total Diffuse Radiation (MJ/m²)	1758.4	1444.5[8]	1729.6

FOR YOUR INFORMATION

[1]Missing 5 days of data
[2]Missing 12 days data in February
[3]February 1-12 missing data supplied by AES, Saskatoon
[4]Confirmed with AES, Saskatoon
[5]Missing 4 days + 7 hours of data
[6]Missing 4 days of data
[7]Missing 8 days of data + 6 days of partial data
[8]Missing 6 days of partial data
[9]Information from AES Saskatoon

SASKATCHEWAN RESEARCH COUNCIL MONTHLY WEATHER SUMMARY

Latitude 52°09' N — SASKATOON — Longitude 106°36' W

JANUARY 1995

		1995 VALUE	1994 VALUE	AVERAGE OR EXTREME VALUE 1961 - 1990	EXTREME ALL YEARS
TEMPERATURE	Monthly Average (°C)	-13.8	-20.2	-17.6	
	Extreme Monthly Maximum (°C)/Date	6.0/30	-4.5/31	7.0/1986/11	10.0/1931/30
	Monthly Average Maximum (°C)	-10.0	-16.8	-12.4	
	Number of recording years			28	96
	Extreme Monthly Minimum (°C)/Date	-30.0/3	-34.5/8	-43.9/1966/22&1969/29	-48.9/1893/31
	Monthly Average Minimum (°C)	-17.6	-23.6	-22.7	
	Number of recording years			28	96
	Days with Frost	31	31	31	
	Heating Degree-Days (18°C base)	986.2	1171.3	1043.0	
	Growing Degree-Days (5°C base)	0.0	0.0	0.0	
PRECIPITATION	Monthly total (mm)	12.0	31.0	20.8	
	Greatest 24-h (mm)/Date	4.0/15	5.0/5&15	15.4/1989/30	30.5/1893 /23
	Number of recording years			28	96
	Days with Precipitation	9	17	11	
	Total Year - to - Date	12.0	31.0	20.8	
WIND	Average Speed (km/h)	11.0	13.2	15.7	
	Peak Gust Speed (km/h)/Date	44.2/2	66.6/31	111.0/1986/11	
SUNSHINE	Total Bright Sunshine (h)	70.4	48.6	104.9	
	% Possible Bright Sunshine	27.5	19.0	41.0	
	Number of days with Bright Sun	15	18		
	Total Global Radiation (MJ/m²)	115.0	n/a	129.9	
	Total Diffuse Radiation (MJ/m²)	67.5	77.26	71.4	
SOIL	Average Temperature (°C) 10 cm / 50 cm	-6.9/-1.8	-4.7/0.2	-8.3/-3.9	
	@ 0900 h 150cm / 300 cm	2.2/4.5	3.0/5.1	1.8/4.4	

FOR YOUR INFORMATION

You could not wish for a nicer January temperature-wise than the one we experienced this year. The average temperature was 5.2°C above normal with the last 3 days of January rising above 0°C. The warm month is also reflected in the below average heating degree-days. Like December, the lack of snow cover has contributed to low soil temperatures with frost occurring at the 150 cm level. Precipitation was well below the average at 13.0 mm but was varied with sleet/rain occurring on the last days of the month. We received more sunshine this year than last but are still well below the 30 year average. We may have been walking around outside without hats and scarves this January but in 1936 the temperature dropped to -18°C and didn't come above that for 49 consecutive nights. (Camden House Publishing, 1994)

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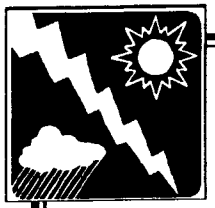


SASKATCHEWAN RESEARCH COUNCIL MONTHLY WEATHER SUMMARY

Latitude 52°09' N SASKATOON Longitude 106°36' W

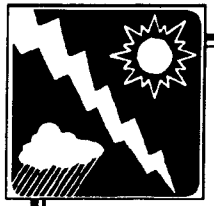
	FEBRUARY 1995	1995 VALUE	1994[2] VALUE	AVERAGE OR EXTREME VALUE 1961 - 1990	EXTREME ALL YEARS
TEMPERATURE	Monthly Average (°C)	-11.8	-20.8	-13.8	
	Extreme Monthly Maximum (°C)/Date	6.5/21	0.0	7.5/ 1988/26	12.8/1931/19
	Monthly Average Maximum (°C)	-7.0	-15.3	-9.0	
	Number of recording years			28	98
	Extreme Monthly Minimum (°C)/Date	-28.0/28	-43.2	-41.1/1972/6	-50.0 /1893/1
	Monthly Average Minimum (°C)	-16.7	-26.4	-18.3	
	Number of recording years			28	98
	Days with Frost	28	28	28	
	Heating Degree-Days (18°C base)	835.5	1073.8	878.0	
	Growing Degree-Days (5°C base)	0.0	0.0	0.0	
PRECIPITATION	Monthly total (mm)	13.0	12.0	14.5	
	Greatest 24-h (mm)/Date	5.0/25	3.2/23	14.2/1979/13	20.3/1918 /7
	Number of recording years			28	98
	Days with Precipitation	6[1]	10	10	
	Total Year - to - Date	25.0	43.0	35.3	
WIND	Average Speed (km/h)	14.8	16.9[3]	15.8	
	Peak Gust Speed (km/h)/Date	46.7/9	35.8[3]	106.0/1988/22	
SUNSHINE	Total Bright Sunshine (h)	140.1	91.9[4]	133.2	
	% Possible Bright Sunshine	51.1		48.6	
	Number of days with Bright Sun	26	20[4]		
	Total Global Radiation (MJ/m²)	226.9	68.7[5]	210.1	
	Total Diffuse Radiation (MJ/m²)	94.2	48.8[6]	105.3	
SOIL	Average Temperature (°C) @ 0900 h 10 cm / 50 cm	-6.6/-2.1	-5.2/-1.5[7]	-7.3/-4.1	
	150cm / 300 cm	1.5/3.4	1.7/3.5[7]	0.8/3.2	

FOR YOUR INFORMATION

February's temperatures were -2.0° warmer for both the monthly and maximum averages while the minimum average was 1.6° above the average for the month. Total precipitation for the month was close to the monthly average at 13.0 mm. We had 26 days of bright sunshine. This was reflected in the total hours being 2.5% above the average.

For February 1994, daily data is available after the 12th.

[1]5 days of missing data
[2]data supplied/confirmed by AES Saskatoon unless otherwise noted
[3]based on data from Feb. 12-28
[4]4 days of missing data
[5]8 days of missing data & 6 days of partial data
[6]6 days of partial data
[7]based on data from Feb. 11-28



SASKATCHEWAN RESEARCH COUNCIL MONTHLY WEATHER SUMMARY

Latitude 52°09' N **SASKATOON** Longitude 106°36' W

MARCH 1995

		1995 VALUE	1994[1] VALUE	AVERAGE OR EXTREME VALUE 1961 - 1990	EXTREME ALL YEARS
TEMPERATURE	Monthly Average (°C)	-5.4	-1.3	-7.1	
	Extreme Monthly Maximum (°C)/Date	13.0/11	17.0/31	15.0/1973/24&1981/16	22.8/1910/23
	Monthly Average Maximum (°C)	-0.8	3.2	-2.2	
	Number of recording years			28	98
	Extreme Monthly Minimum (°C)/Date	-32.5/6	-25.5/8	-38.9/1972/2	-43.3/1897/14
	Monthly Average Minimum (°C)	-10.1	-5.8	-12.1	
	Number of recording years			28	98
	Days with Frost	28	30	30	
	Heating Degree-Days (18°C base)	726.1	601.1	727.8	
	Growing Degree-Days (5°C base)	3.8	2.5	1.5	
PRECIPITATION	Monthly total (mm)	24.0	3.0	19.9	
	Greatest 24-h (mm)/Date	11.0/25	1.0	32.0/1967/30	32.0/1967/30
	Number of recording years			28	93
	Days with Precipitation	8	4	9	
	Total Year - to - Date	49.0	46.0	55.2	
WIND	Average Speed (km/h)	15.7	16.2	16.6	
	Peak Gust Speed (km/h)/Date	55.4/21	51.4/6	93.0/1959/18	
SUNSHINE	Total Bright Sunshine (h)	129.8	226.7	176.9	
	% Possible Bright Sunshine	35.5	61.9	48.3	
	Number of days with Bright Sun	23	30		
	Total Global Radiation (MJ/m²)	324.8	197.7	362.4	
	Total Diffuse Radiation (MJ/m²)	171.0	45.9	173.9	
SOIL	Average Temperature (°C) @ 0900 h 10 cm / 50 cm	-2.9/-0.8	-0.7/0.6	-3.1/-1.8	
	150cm / 300 cm	-1.0/2.5	1.2/2.8	0.4/2.4	

FOR YOUR INFORMATION

March came in like a lion and went out like a lion! Between the 24th and 27th CRS recorded 20 mm of precipitation , most of which was wet snow. After a very mild middle part of the month, temperatures dropped to well below 0°C for the last weeks. The average temperature was below last year's but still warmer then the long term average of -7.1°C. We did have 2 days less frost this month than usual. It was not a bright month with only 129.8 h of bright sunshine. Snow cover at the site had all but disappeared by the 22nd but was renewed by the snow storms of the last week. Gopher activity at the site was first noticed on the 13th and geese were observed on the river as early as the 10th.

[1] 4 hrs. of missing data

SRC

SASKATCHEWAN RESEARCH COUNCIL MONTHLY WEATHER SUMMARY

Latitude 52°09' N — SASKATOON — Longitude 106°36' W

APRIL 1995

		1995 VALUE	1994[1] VALUE	AVERAGE OR EXTREME VALUE 1961 - 1990	EXTREME ALL YEARS
TEMPERATURE	Monthly Average (°C)	1.1	5.5[2]	3.5	
	Extreme Monthly Maximum (°C)/Date	14.5/11&21	25.5/17	30.6/1977/26	33.0/1952/28
	Monthly Average Maximum (°C)	6.8	12.5	9.9	
	Number of recording years			28	98
	Extreme Monthly Minimum (°C)/Date	-19.5/3	-10.0/4	-27.8/1979/1	-28.3/1893/5&1954/2
	Monthly Average Minimum (°C)	-4.7	-1.5[2]	-2.0	
	Number of recording years			28	98
	Days with Frost	27	17	20	
	Heating Degree-Days (18°C base)	507.9	367.1	388.0	
	Growing Degree-Days (5°C base)	1.3	72.2	60.2	
PRECIPITATION	Monthly total (mm)	26	4.0	20.2	
	Greatest 24-h (mm)/Date	5/15	1.0/8,10,18,&23	24.6/1985/19	30.2/1955/19
	Number of recording years			28	98
	Days with Precipitation	12	4	7	
	Total Year - to - Date	75	50.0	75.4	
WIND	Average Speed (km/h)	15.2	12.2[2]	17.6	
	Peak Gust Speed (km/h)/Date	73.7/2	64.1/19	108.0/1959/06	
SUNSHINE	Total Bright Sunshine (h)	201.4	240.3	231.3	
	% Possible Bright Sunshine	48.5	57.9	56.0	
	Number of days with Bright Sun	27	29		
	Total Global Radiation (MJ/m²)	482.5	411.7	492.2	
	Total Diffuse Radiation (MJ/m²)	200.0	135.4[3]	178.5	
SOIL	Average Temperature (°C) 10 cm / 50 cm	2.3/1.7	4.5/3.1	3.1/2.5	
	@ 0900 h 150cm / 300 cm	1.6/2.3	2.3/2.6	1.2/2.2	

FOR YOUR INFORMATION

This month was the coldest April recorded at the site since 1979 when the average temperature was -2.3. We had only 2 frost free days that month which was reflected in 0.0 growing degree-days. This April we did not fare much better with 4 frost free days and 1.3 growing degree-days. Precipitation was above average for the month and came as snow, sleet, and rain; sometimes all at once. The cold temperatures are also reflected in the slow thawing of the soil causing spring flowers to be delayed.

We may think we had a cold month but in 1757 at York Factory, Manitoba the severity of the weather froze the beer stored in the cellars during April.

(Phillips 1988)

[1]data missing for April 1
[2]6 h of missing data
[3]1.5 of missing data

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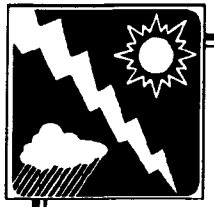

SASKATCHEWAN RESEARCH COUNCIL MONTHLY WEATHER SUMMARY

Latitude 52°09' N — SASKATOON — Longitude 106°36' W

MAY 1995

		1995 VALUE	1994 VALUE	AVERAGE OR EXTREME VALUE 1961 - 1990	EXTREME ALL YEARS
TEMPERATURE	Monthly Average (°C)	11.1	12.1	11.5	
	Extreme Monthly Maximum (°C)/Date	34.0/29	30.0/27	35.0/1988/30	37.2/1936/27
	Monthly Average Maximum (°C)	18.8	19.1	18.5	
	Number of recording years			28	98
	Extreme Monthly Minimum (°C)/Date	-3.5/4	-4.0/4	-10.0/1967/2	-19.8/1907/6
	Monthly Average Minimum (°C)	3.3	5.0	4.5	
	Number of recording years			28	98
	Days with Frost	7	4	6	
	Heating Degree-Days (18°C base)	239.8	187.0	193.1	
	Growing Degree-Days (5°C base)	179.4	221.2	209.9	
PRECIPITATION	Monthly total (mm)	15.4	102.4	43.9	
	Greatest 24-h (mm)/Date	6.2/15	38.8/17	39.9/1985/4	51.3/1909/30
	Number of recording years			28	98
	Days with Precipitation	10	13	9	
	Total Year - to - Date	90.4	152.4	119.3	
WIND	Average Speed (km/h)	13.5	15.9[2]	17.6	
	Peak Gust Speed (km/h)/Date	76.9/13	65.7/29[2]	132.0/1965/17	
SUNSHINE	Total Bright Sunshine (h)	274.7	249.3	284.6	
	% Possible Bright Sunshine	56.6	51.4	59.0	
	Number of days with Bright Sun	31	29		
	Total Global Radiation (MJ/m²)	667.2	604.4[2]	586.3	
	Total Diffuse Radiation (MJ/m²)	194.6[1]	173.1[2]	222.2	
SOIL	Average Temperature (°C) 10 cm / 50 cm	9.5/7.9	11.0/9.4	10.5/8.9	
	@ 0900 h 150cm / 300 cm	4.4/3.1	5.5/3.6	4.4/3.1	

FOR YOUR INFORMATION

Temperatures of May's last week soared to the low 30°s bringing the monthly average to near normal values. It was a dry, bright month with only 35% of the expected precipitation and all days receiving some bright sunshine. Frost occurred as late as the 22nd and hopefully it will be the last until fall. No hail fell this month unlike last year when on May 22nd Saskatoon received golf ball sized hail. The soil is slowly recovering from this year's cold spring conditions. Strong gale force winds of 76.9 km/h on the 13th lasted for 15 minutes causing minor damage in the city.

Approximate temperatures can be calculated without a thermometer by counting the number of times a cricket chirps in 8 seconds and adding 4 to that number. (Lalonde 1994)

[1]66.5 h of missing data
[2]45 minutes of missing data

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SASKATCHEWAN RESEARCH COUNCIL MONTHLY WEATHER SUMMARY

Latitude 52°09' N — SASKATOON — Longitude 106°36' W

JUNE 1995

		1995 VALUE	1994 VALUE	AVERAGE OR EXTREME VALUE 1961 - 1990	EXTREME ALL YEARS
TEMPERATURE	Monthly Average (°C)	18.0	16.1	15.9	
	Extreme Monthly Maximum (°C)/Date	32.5/13	30.0/23	41.0/1988/5	41.0/1988/5
	Monthly Average Maximum (°C)	25.1	22.0	22.6	
	Number of recording years			28	99
	Extreme Monthly Minimum (°C)/Date	2.5/8	2.0/16	-3.3/1967/6	-3.9/1903/9&1917/2
	Monthly Average Minimum (°C)	10.9	10.2	9.2	
	Number of recording years			28	99
	Days with Frost	0	0	0	
	Heating Degree-Days (18°C base)	48.1	69.8	77.9	
	Growing Degree-Days (5°C base)	389.8	332.7	338.8	
PRECIPITATION	Monthly total (mm)	31.6	60.8	63.6	
	Greatest 24-h (mm)/Date	9.0/15	16.8/29	99.4/1983/24	99.4/1983/24
	Number of recording years			28	99
	Days with Precipitation	9	13	12	
	Total Year - to - Date	122.0	213.2	182.9	
WIND	Average Speed (km/h)	13.5	15.2	17.0	
	Peak Gust Speed (km/h)/Date	60.6/16	79.7/29	117.0/1986/01	
SUNSHINE	Total Bright Sunshine (h)	254.3	213.7	299.3	
	% Possible Bright Sunshine	51.2	43.0	60.0	
	Number of days with Bright Sun	29	28		
	Total Global Radiation (MJ/m²)	651.1	594.8	638.7	
	Total Diffuse Radiation (MJ/m²)	250.7	211.9[1]	228.1	
SOIL	Average Temperature (°C) 10 cm / 50 cm	17.1/13.8	17.6/13.6	15.7/14.0	
	@ 0900 h 150cm / 300 cm	7.9/5.0	8.7/5.6	8.3/5.3	

FOR YOUR INFORMATION

June was a hot, dry month with the temperature 2.1°C above average. Although rainfall was 50% below what we usually receive for June, heavy runoff in the mountains caused high flow rates in the river. Even though it was hot, the bright sunshine levels were 8.8% below the monthly average. The warm month is also reflected in the lower than average heating degree-days and higher than average growing degree-days. Smoke from various northern forest fires was often noted in the city throughout June. There have been 523 fires so far this year, compared to 282 last year and the five-year average of 361. Almost $55 million has been spent; twice the budgeted amount for the whole year. (Sheane 1995)

[1]0.5 h of missing data

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SASKATCHEWAN RESEARCH COUNCIL MONTHLY WEATHER SUMMARY

Latitude 52°09' N **SASKATOON** Longitude 106°36' W

JULY 1995

		1995 VALUE	1994 VALUE	AVERAGE OR EXTREME VALUE 1961 - 1990	EXTREME ALL YEARS
TEMPERATURE	Monthly Average (°C)	18.1	18.0	18.4	
	Extreme Monthly Maximum (°C)/Date	35.0/26	31.5/28	38.5/1984/27	40.0/1919/17&1941/19
	Monthly Average Maximum (°C)	25.2	24.5	25.1	
	Number of recording years			28	99
	Extreme Monthly Minimum (°C)/Date	5.0/4	6.5/25	1.7/1967/2	-0.6/1918/25
	Monthly Average Minimum (°C)	11.0	11.6	11.6	
	Number of recording years			28	99
	Days with Frost	0	0	0	
	Heating Degree-Days (18°C base)	34.6	30.9	28.7	
	Growing Degree-Days (5°C base)	407.4	407.2	409.8	
PRECIPITATION	Monthly total (mm)	57.2	50.8	55.8	
	Greatest 24-h (mm)/Date	16.2/5	12.2/18	45.5/1968/29	79.2/1946/3
	Number of recording years			27	99
	Days with Precipitation	12	15	12	
	Total Year - to - Date	179.2	264.0	238.7	
WIND	Average Speed (km/h)	12.4	12.3	15.5	
	Peak Gust Speed (km/h)/Date	89.3/29	81.0/11	113.0/1955/05	
SUNSHINE	Total Bright Sunshine (h)	248.5	288.8	333.1	
	% Possible Bright Sunshine	49.6	57.6	66.5	
	Number of days with Bright Sun	31	31		
	Total Global Radiation (MJ/m²)	626.8	691.4	633.5	
	Total Diffuse Radiation (MJ/m²)	254.8	226.0	216.5	
SOIL	Average Temperature (°C) 10 cm / 50 cm	17.5/15.7	14.1/14.2	18.1/16.8	
	@ 0900 h 150cm / 300 cm	10.4/7.1	8.5/5.3	11.0/7.5	

FOR YOUR INFORMATION

July was an average month. The maximum, minimum and average temperatures were within 0.6°C of the 30 year averages. The percentage of possible bright sunshine was 8% below last year and 16.9 % below the 30 year average.

Rainfall was 1.4 mm greater than the monthly average. This did not reduce the deficit of the yearly total of 179.2 mm which currently is 59.5mm below average. The majority of the rain came in two down pours. The first occurred during the afternoon of 5th with 16.2 mm and the second on the 27th between 1 & 3 pm with 12.0 mm falling. Hail was reported in the area with this second rainfall.

Torrential rainfalls have played a part in Canadian history. In 1759 Montcalm was able to repulse an attack by Wolfe with the help of "the dreadfullest thunderstorm and fall of rain that can be conceived" The rainfall dampened all the gun powder and neither side could continue shooting.

(Phillips 1998)

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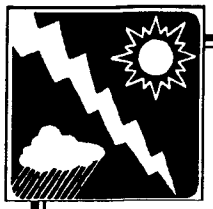


SASKATCHEWAN RESEARCH COUNCIL MONTHLY WEATHER SUMMARY

Latitude 52°09' N — SASKATOON — Longitude 106°36' W

AUGUST 1995

		1995 VALUE	1994 VALUE	AVERAGE OR EXTREME VALUE 1961 - 1990	EXTREME ALL YEARS
TEMPERATURE	Monthly Average (°C)	16.8	17.1	17.2	
	Extreme Monthly Maximum (°C)/Date	36.0/5	31.5/5	37.0/1984/10	37.8/1893/6&1949/6
	Monthly Average Maximum (°C)	22.9	24.1	24.3	
	Number of recording years			28	98
	Extreme Monthly Minimum (°C)/Date	6.0/11	3.0/31	-2.8/1976/28	-2.8/1976/28
	Monthly Average Minimum (°C)	10.6	10.1	10.1	
	Number of recording years			28	98
	Days with Frost	0	0	0	
	Heating Degree-Days (18°C base)	59.2	61.6	63.3	
	Growing Degree-Days (5°C base)	365.2	370.1	378.3	
PRECIPITATION	Monthly total (mm)	75.6	54.0	35.2	
	Greatest 24-h (mm)/Date	25.0/9	16.0/6	27.9/1989/25	73.7/1945/3
	Number of recording years			28	98
	Days with Precipitation	11	13	9	
	Total Year - to - Date	254.8	318.0	273.9	
WIND	Average Speed (km/h)	15.2	11.3	15.5	
	Peak Gust Speed (km/h)/Date	73.6/9	65.2/13	151/1967/14	
SUNSHINE	Total Bright Sunshine (h)	231.5	240.1	294.8	
	% Possible Bright Sunshine	51.1	53.0	65.0	
	Number of days with Bright Sun	28	30		
	Total Global Radiation (MJ/m²)	530.0	541.4	529.0	
	Total Diffuse Radiation (MJ/m²)	184.9	202.2	185.6	
SOIL	Average Temperature (°C) 10 cm / 50 cm	16.0/15.3	17.6/16.4	16.7/16.8	
	@ 0900 h 150cm / 300 cm	11.2/8.4	11.2/7.6	12.4/9.3	

FOR YOUR INFORMATION

August was a wet, windy month. We received more than twice the usual amount of rain. The greatest amount occurred on the 9th with 25.0 mm while the most intense downpour happened on the 29th with 3.6 mm being received in 15 minutes. We had 4 days of at least "force 7" or *"near "gale* " winds averaging between 55-64 km/h. On the 9th, *"gale winds"* at 73.6 km/h accompanied the wet weather. The rainy weather is reflected in the bright sunshine being 14% less than the average for August. This August weather is very similar to that experienced last year.

We may have had a lot of rain this August but there were no reports of farmers water-skiing on their wheat fields as there were in 1985 after 380 mm of rain fell on Parkman SK.

(Phillips 1988)

SASKATCHEWAN RESEARCH COUNCIL MONTHLY WEATHER SUMMARY

Latitude 52°09' N — SASKATOON — Longitude 106°36' W

SEPTEMBER 1995

		1995 VALUE	1994 VALUE	AVERAGE OR EXTREME VALUE 1961 - 1990	EXTREME ALL YEARS
TEMPERATURE	Monthly Average (°C)	12.8	14.2	11.3	
	Extreme Monthly Maximum (°C)/Date	30.5/3	32.0 /18	35.6 /1978 /4	35.6 /1978 /4
	Monthly Average Maximum (°C)	20.5	22.2	17.7	
	Number of recording years			28	96
	Extreme Monthly Minimum (°C)/Date	-5.5\20	1.0 /30	-7.8 /1978 /30	-11.1/1908/28
	Monthly Average Minimum (°C)	5.0	6.2	4.8	
	Number of recording years			28	96
	Days with Frost	4	0	4	
	Heating Degree-Days (18°C base)	160.2	112.9	199.6	
	Growing Degree-Days (5°C base)	242.1	288.6	196.2	
PRECIPITATION	Monthly total (mm)	0.8	1.6	32.8	
	Greatest 24-h (mm)/Date	0.4/17&18	0.8 /20	29.6/1980/3	44.2 /1931/12
	Number of recording years			28	96
	Days with Precipitation	2	3	9	
	Total Year - to - Date	255.6	319.6	306.7	
WIND	Average Speed (km/h)	12.6	13.7	16.7	
	Peak Gust Speed (km/h)/Date	64.1/12	55.3/11	148/1967/22	
SUNSHINE	Total Bright Sunshine (h)	255.7	222.3	188.9	
	% Possible Bright Sunshine	67.5	58.7	50.0	
	Number of days with Bright Sun	30	27		
	Total Global Radiation (MJ/m²)	447.2	398.0	351.8	
	Total Diffuse Radiation (MJ/m²)	106.9	124.2	127.6	
SOIL	Average Temperature (°C) 10 cm / 50 cm	12.5/13.5	13.5/14.4	11.2/13.3	
	@ 0900 h 150cm / 300 cm	11.3/9.0	12.1/9.8	11.9 /9.9	

FOR YOUR INFORMATION

September was a good harvest month as it was sunny and very dry. A trace of snow was observed in the early morning of the 19th. The average temperatures for the month were not as warm as last year but were still slightly warmer than the 30 year average.

The growing season ended on September 19th with our first fall frost. Our last spring frost was on May 22 making 119 continuous frost free days (right on the 30 year average).

Here at the SRC we do NOT predict the weather; we only record it. Why? The first chief of the English Weather Service made forecasts for a few years, then committed suicide. The first chief of the US Weather Bureau went mad after several years on the job. In 1906, then-chief W.L. Moore told a Senate committee that the US Weather Bureau had sent more men to insane asylums than any other branch of government. As recently as the 1960s, British law decreed you could be burned at the stake as a heretic if you were guilty of trying to predict the weather.(Phillips 1995b)

SASKATCHEWAN RESEARCH COUNCIL MONTHLY WEATHER SUMMARY

Latitude 52°09' N — SASKATOON — Longitude 106°36' W

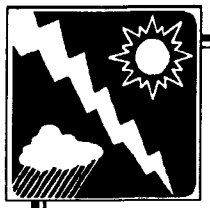
	OCTOBER 1995	1995 VALUE	1994 VALUE	AVERAGE OR EXTREME VALUE 1961 - 1990	EXTREME ALL YEARS
TEMPERATURE	Monthly Average (°C)	5.5	6.4	4.8	
	Extreme Monthly Maximum (°C)/Date	20.0/10&16	21.0/9	28.5 /1984 /8	32.2 /1943 /5
	Monthly Average Maximum (°C)	10.8	12.2	10.9	
	Number of recording years			28	96
	Extreme Monthly Minimum (°C)/Date	-11.0/31	-10.0/31	-19.5/1984/30&31	-25.6/1919/26
	Monthly Average Minimum (°C)	0.3	0.6	-1.3	
	Number of recording years			28	96
	Days with Frost	13	13	19	
	Heating Degree-Days (18°C base)	385.2	364.8	405.2	
	Growing Degree-Days (5°C base)	68.7	74.6	62.2	
PRECIPITATION	Monthly total (mm)	32.8	14.4	18.0	
	Greatest 24-h (mm)/Date	22.2/12	5.4/2	36.7/1984/16	36.7/1984 /16
	Number of recording years			28	96
	Days with Precipitation	10	8	6	
	Total Year - to - Date	288.4	334.0	324.7	
WIND	Average Speed (km/h)	13.2	15.6	17.1	
	Peak Gust Speed (km/h)/Date	65.9/16	62.6/30	138/1967/16	
SUNSHINE	Total Bright Sunshine (h)	116.3	146.5[1]	166.4	
	% Possible Bright Sunshine	35.3	44.5[1]	51	
	Number of days with Bright Sun	26	24		
	Total Global Radiation (MJ/m²)	223.2	228.5	239.1	
	Total Diffuse Radiation (MJ/m²)	107.7	87.7	92.6	
SOIL	Average Temperature (°C) 10 cm / 50 cm	6.4/9.3	6.6/9.9	4.5 /8.1	
	@ 0900 h 150cm / 300 cm	9.7/8.9	10.4/9.5	9.7/9.5	

FOR YOUR INFORMATION

October was wet with 82% above average precipitation. The 12th had 22.2mm of the 32.8mm total. There were 10 days with less than 1 h of bright sunshine placing this October well below last year's and the 30 year average. The average temperatures were slightly warmer than normal which was reflected in the lower number of frost days. The soil temperatures dipped below freezing on the 20th for the first time since the spring thaw. By the end of the month, frost had reached the 50cm level. Hallowe'en saw one of the first snow storms of the season accompanied by extreme minimum temperatures making unpleasant conditions for trick or treaters.

Statistics compiled for the "Canadian warmest summer" resulted in a 3rd place tie for 1995 with 1989 being the warmest and 1994 the second warmest on record. June & July were the warmest period in 101 years of record-keeping. June-July-August was the second warmest globally since 1866; 1995 may become the warmest year on record. (Phillips 1995 b)

[1] 7 h of missing data due to equipment maintenance



SASKATCHEWAN RESEARCH COUNCIL MONTHLY WEATHER SUMMARY

Latitude 52°09' N — SASKATOON — Longitude 106°36' W

NOVEMBER 1995

		1995 VALUE	1994 VALUE	AVERAGE OR EXTREME VALUE 1961 - 1990	EXTREME ALL YEARS
TEMPERATURE	Monthly Average (°C)	-9.2	-3.8	-6.1	
	Extreme Monthly Maximum (°C)/Date	9.5/18	8.5/15	19.4/1975 /4	21.7 /1903 /3
	Monthly Average Maximum (°C)	-5.4	1.2	-1.5	
	Number of recording years			29	97
	Extreme Monthly Minimum (°C)/Date	-26.5/11	-21.5/28	-33.5/1985/24	-39.4 /1893/30
	Monthly Average Minimum (°C)	-13.0	-8.8	-10.5	
	Number of recording years			29	97
	Days with Frost	30	30	29	
	Heating Degree-Days (18°C base)	817.6	654.8	692.0	
	Growing Degree-Days (5°C base)	0.0	0.0	2.8	
PRECIPITATION	Monthly total (mm)	19.0	5.0	14.9	
	Greatest 24-h (mm)/Date	6.0/9	2.0/26	19.3/1978/4	27.9/1938 /1
	Number of recording years			29	97
	Days with Precipitation	8	4	8	
	Total Year - to - Date	307.4	339.0	339.6	
WIND	Average Speed (km/h)	15.4	14.9	15.3	
	Peak Gust Speed (km/h)/Date	63.8/19	59.4/24	100.0/1976/17	
SUNSHINE	Total Bright Sunshine (h)	74.1	121.2	101.8	
	% Possible Bright Sunshine	28.2	46.1	39.0	
	Number of days with Bright Sun	17	26		
	Total Global Radiation (MJ/m²)	125.0	136.1	123.7	
	Total Diffuse Radiation (MJ/m²)	73.1	60.1	73.6	
SOIL	Average Temperature (°C) @ 0900 h 10 cm / 50 cm	-1.2/3.4	-1.1/4.2	-1.7/2.6	
	150cm / 300 cm	6.9/7.8	7.5/8.3	6.8/8.1	

FOR YOUR INFORMATION

November was a cool cloudy month. We received only 28.2 % of the possible sunshine; 10.8% lower than normal. We had 14 days of less than 1 h of bright sunshine. The unusual low temperatures were reflected in the high heating degree-days total for the month; 125.6° higher than normal.

Monthly precipitation total was considerably more than last year at 19 mm; 4.1 mm greater than the 30 year average. However, by November's end, the yearly precipitation level was still 32.2 mm below normal.

Snow fall is measured as its water equivalent(i.e. as if the snow was melted and poured into a rain gauge). One mm of melted snow will, on average, equal one cm of snow.

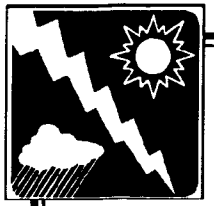
In 1987, villagers in Uganda murdered their local rainmaker, blaming him for hailstones and torrential rains. Earlier, he had threatened the people with hailstorms unless they showed him more respect.
(Phillips 1988)

SRC

SRC Publication No. E-2900-1-E-96

SRC Climatological Reference Station Annual Summary, 1995

February 1996



SASKATCHEWAN RESEARCH COUNCIL MONTHLY WEATHER SUMMARY

Latitude 52°09' N **SASKATOON** **Longitude 106°36' W**

	DECEMBER 1995	1995 VALUE	1994 VALUE	AVERAGE OR EXTREME VALUE 1961 - 1990	EXTREME ALL YEARS
TEMPERATURE	Monthly Average (°C)	-15.7	-12.4	-14.8	
	Extreme Monthly Maximum (°C)/Date	0.0/4	6.0/20	9.5/1987/7	13.3/1939 /5
	Monthly Average Maximum (°C)	-11.7	-7.5	-9.8	
	Number of recording years			29	97
	Extreme Monthly Minimum (°C)/Date	-32.5/8&10	-29.0/10	-42.2/ 1973/31	-43.9 / 1892/ 22
	Monthly Average Minimum (°C)	-19.7	-17.0	-19.3	
	Number of recording years			29	97
	Days with Frost	31	31	31	
	Heating Degree-Days (18°C base)	1041.5	924.6	987.7	
	Growing Degree-Days (5°C base)	0.0	0.0	0.0	
PRECIPITATION	Monthly total (mm)	22.0	8.0	20.6	
	Greatest 24-h (mm)/Date	6.0/13&31	2.0/7&28	14.5/1973/23	20.6/1936 /24
	Number of recording years			29	97
	Days with Precipitation	10	6	13	
	Total Year - to - Date	329.4	347.0	360.2	
WIND	Average Speed (km/h)	14.1	12.2	15.7	
	Peak Gust Speed (km/h)/Date	77.5/4	49.3/2	121/1955/12	
SUNSHINE	Total Bright Sunshine (h)	86.3	102.8	84.2	
	% Possible Bright Sunshine	36.1	43.0	35.0	
	Number of days with Bright Sun	20	27		
	Total Global Radiation (MJ/m²)	101.2	107.9	95.2	
	Total Diffuse Radiation (MJ/m²)	53.0	51.9	54.3	
SOIL	Average Temperature (°C) 10 cm / 50 cm	-8.9/-2.4	-6.0/-0.5	-6.6/-1.7	
	@ 0900 h 150cm / 300 cm	3.5/6.0	4.1/6.4	3.9/6.3	

FOR YOUR INFORMATION

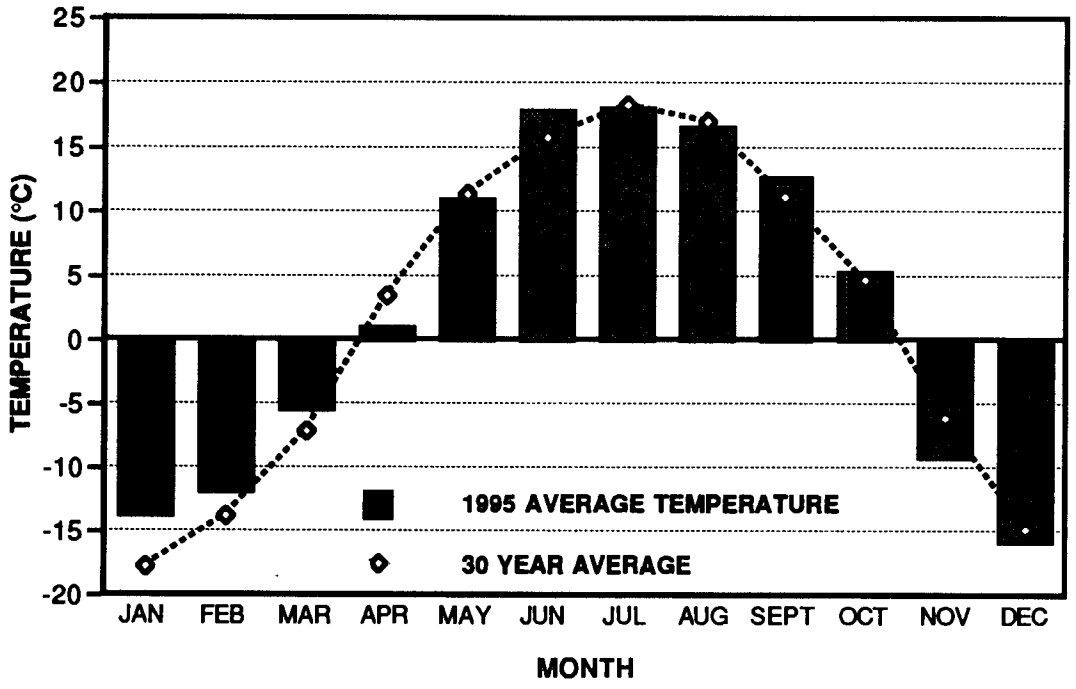
Temperatures for December were normal ranging between 0° and -32.5°C. The bright sunshine, although normal, was notable by its absence. We recorded 14 days with less than 1 h of sunshine. On the 4th, we experienced an early winter blizzard . The barometric pressure dropped to an extreme low of 923 Kpa by noon and in 2.5 hours, between 1130h and 1400h, the temperature dropped 12.3°C as the storm front moved over the city. Winds of 77 km/h whipped 3 cm of new snow into the air. Highways were close due to zero visibility. Monthly snow fall was just above average. The greatest snowfall in Canada for 1 month was 539.5 cm at Haines Apps, BC in Dec. 1959. While Earth averages only one-twentieth of its precipitation as snow, Canada receives more than one-third in the form of snow. (Camden House Publishing 1994).

SRC

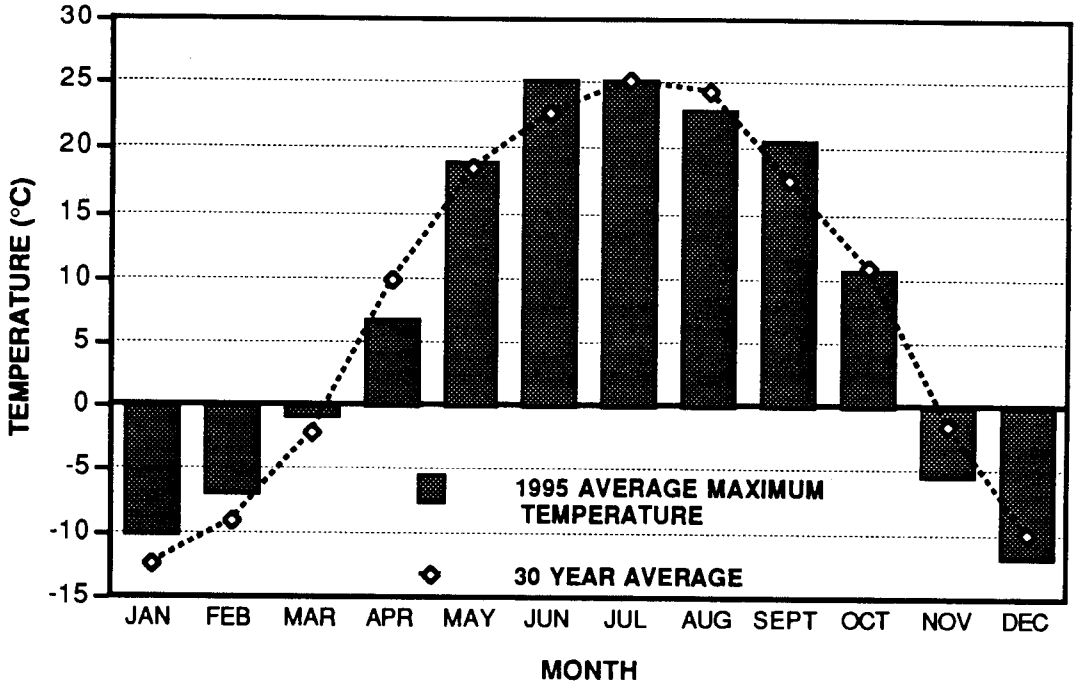
MONTHLY CLIMATE VALUES, 1995

MONTH	TEMP °C	AVG MAX TEMP °C	AVG MIN TEMP °C	GROWING DEGREE DAYS°C	HEATING DEGREE DAYS °C	PPT mm	CUMMULATIVE PPT mm
JANUARY	-13.8	-10.0	-17.6	0.0	986.2	12.0	12.0
FEBRUARY	-11.8	-7.0	-16.7	0.0	835.5	13.0	25.0
MARCH	-5.4	-0.8	-10.1	3.8	726.1	24.0	49.0
APRIL	1.1	6.8	-4.7	1.3	507.9	26.0	75.0
MAY	11.1	18.8	3.3	179.4	239.8	15.4	90.4
JUNE	18.0	25.1	10.9	389.8	48.1	31.6	122.0
JULY	18.1	25.2	11.0	407.4	34.6	57.2	179.2
AUGUST	16.8	22.9	10.6	365.2	59.2	75.6	254.8
SEPTEMBER	12.6	20.5	5.0	242.1	160.2	0.8	255.6
OCTOBER	5.5	10.8	0.3	68.7	385.2	32.8	288.4
NOVEMBER	-9.2	-5.4	-13.0	0.0	817.6	19.0	307.4
DECEMBER	-15.7	-11.7	-19.7	0.0	1041.5	22.0	329.4
TOTAL	27.5	95.2	-40.7	1657.7	5841.9	329.4	
AVERAGE	2.3	7.9	-3.4				

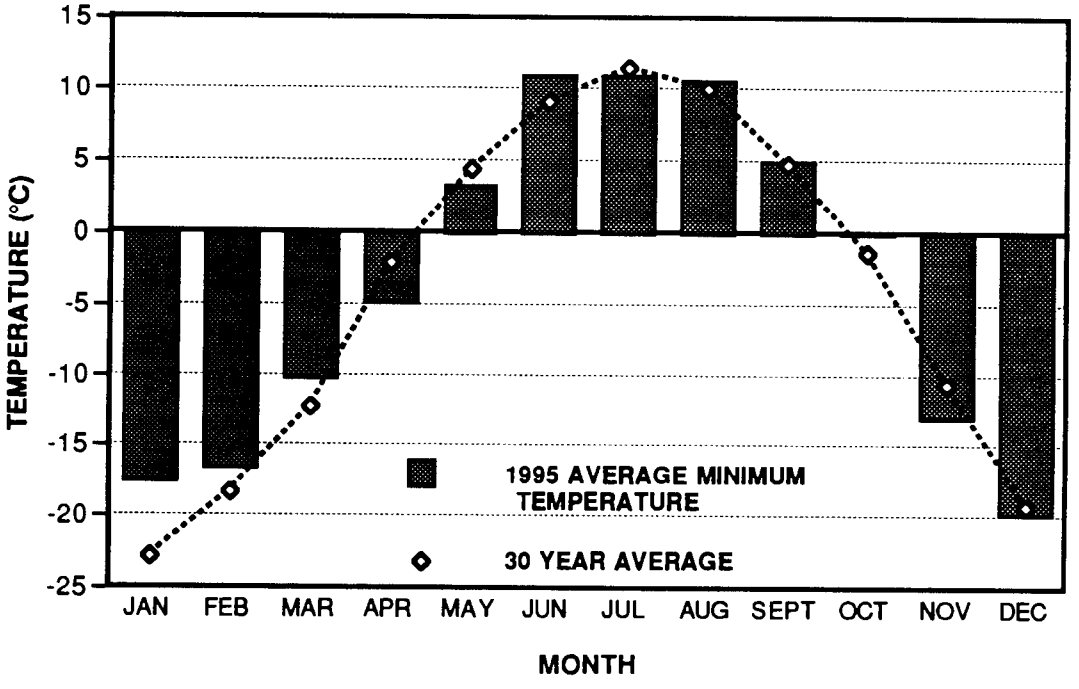
MONTHLY AVERAGE TEMPERATURES, 1995



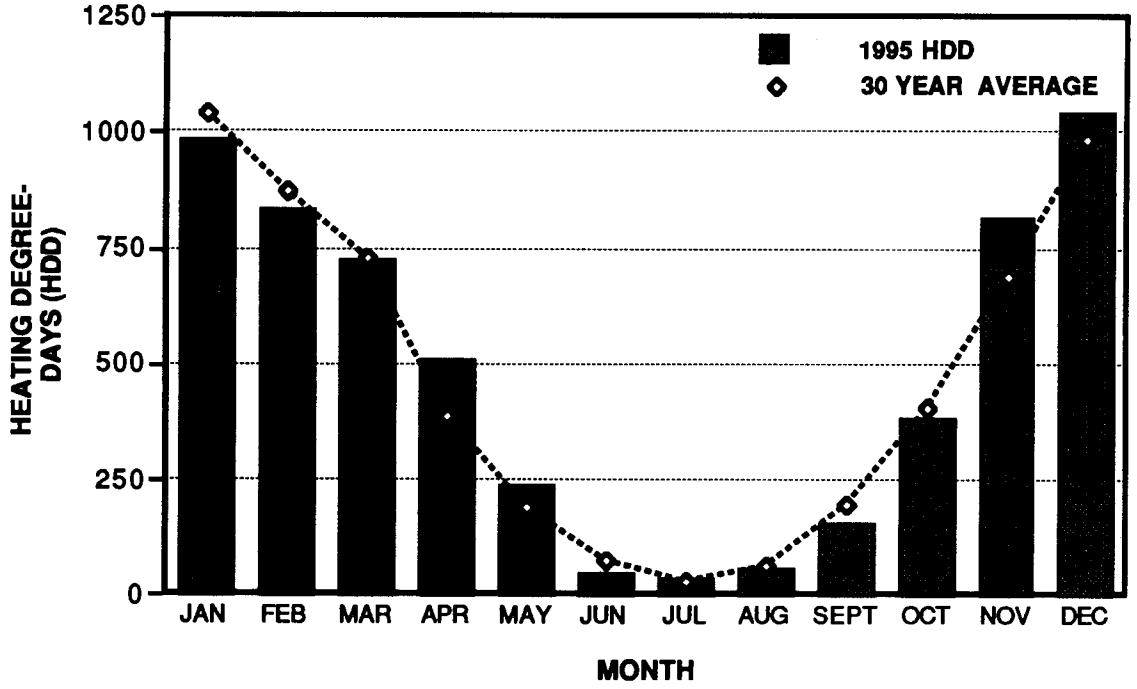
MONTHLY MAXIMUM TEMPERATURES, 1995



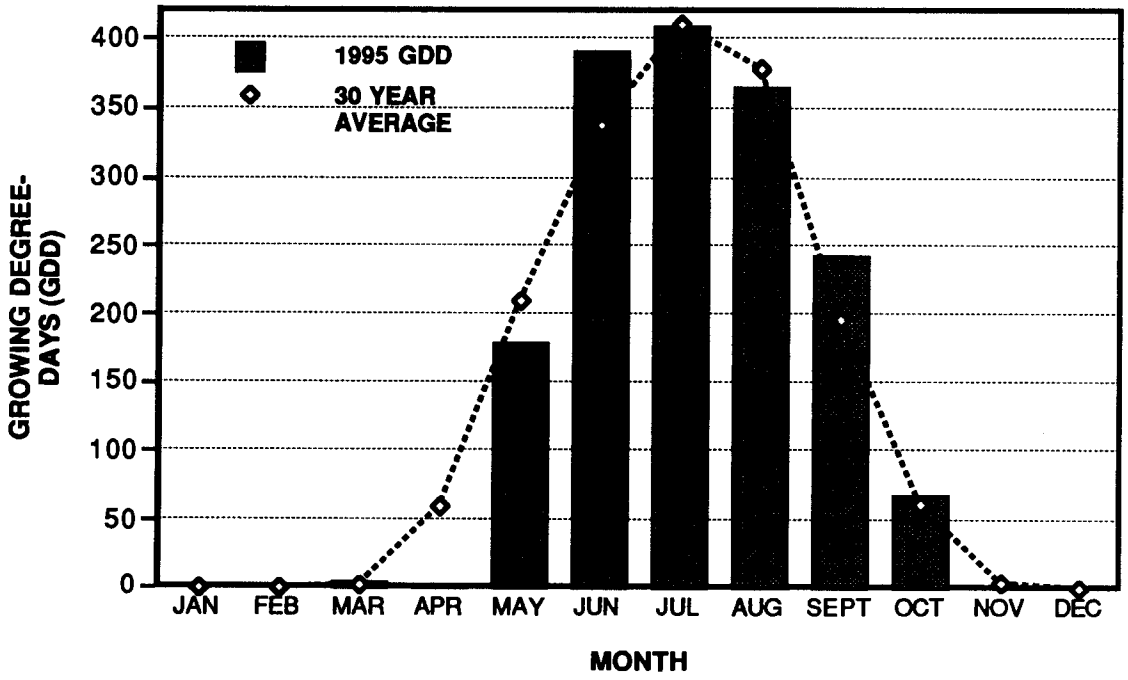
MONTHLY MINIMUM TEMPERATURES, 1995



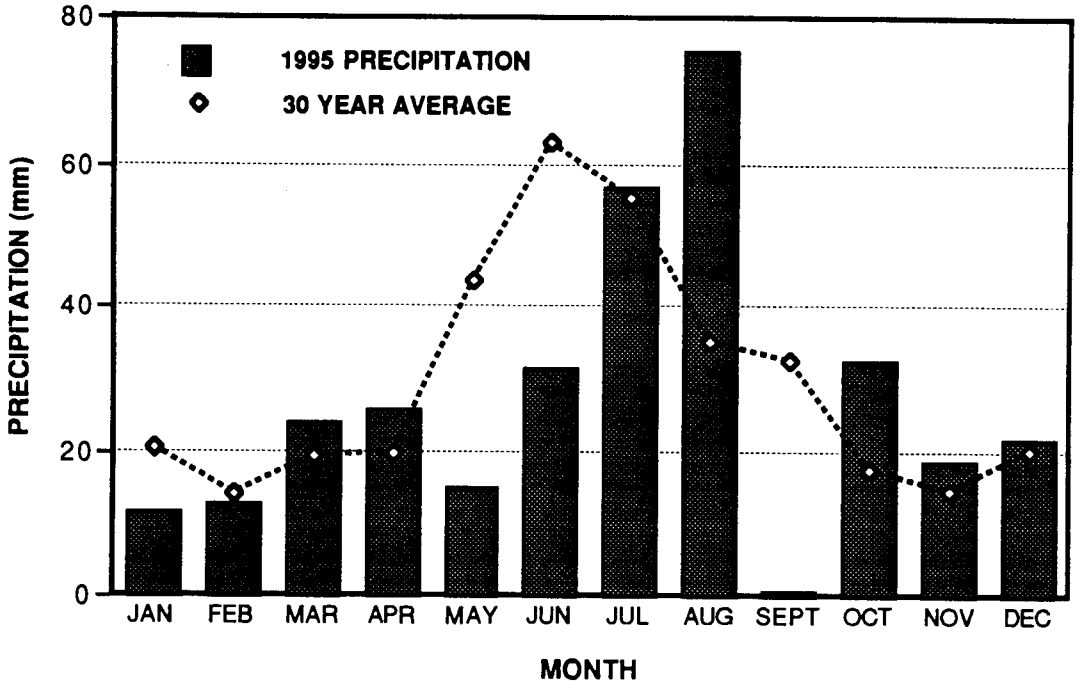
MONTHLY HEATING DEGREE-DAYS, 1995



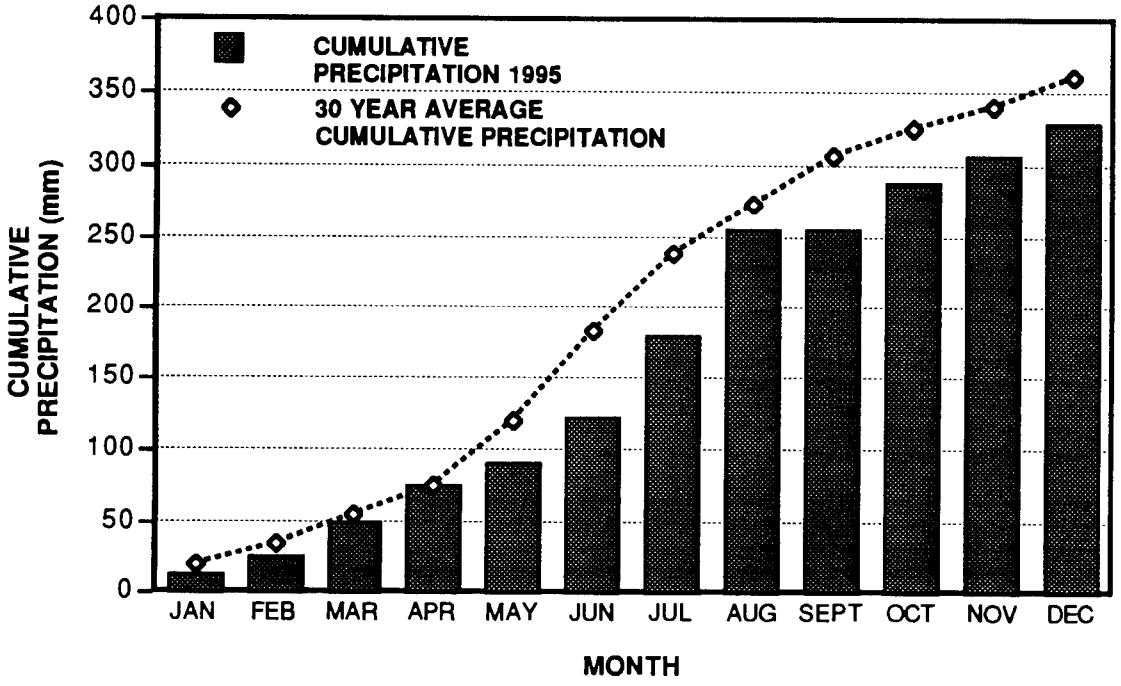
MONTHLY GROWING DEGREE-DAYS, 1995



MONTHLY PRECIPITATION, 1995



CUMULATIVE PRECIPITATION, 1995



GLOBAL SOLAR RADIATION, 1995

(MJ/m²)

DATE	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
1	1.9	1.8	12.5	14.0	12.0	15.1	21.7	18.7	20.3	11.3	6.4	2.0
2	4.3	4.6	10.6	11.2	21.0	21.9	17.9	20.0	19.9	7.8	5.4	3.9
3	3.7	8.0	12.7	20.6	15.4	26.1	24.1	23.0	19.4	11.2	8.5	5.8
4	4.9	6.8	10.1	16.0	27.0	26.7	26.4	23.1	19.5	6.3	8.1	1.5
5	6.0	6.6	12.6	16.4	26.5	14.9	12.3	25.3	7.6	5.5	2.3	4.3
6	2.3	8.1	11.9	17.6	17.9	9.7	18.4	19.5	17.9	8.2	1.8	3.7
7	2.2	3.9	12.8	19.2	12.9	15.6	17.6	16.9	19.5	8.5	3.5	2.6
8	2.4	7.0	15.4	20.6	23.7	27.8	24.5	4.5	16.1	11.7	3.3	4.6
9	2.4	6.5	12.8	21.6	26.4	23.5	25.4	3.3	18.6	11.8	3.0	5.0
10	2.5	7.3	13.5	20.8	25.5	24.3	24.0	11.2	18.1	9.2	7.7	3.4
11	1.8	9.3	11.6	20.5	25.2	28.7	15.6	9.8	15.6	6.8	4.6	1.8
12	2.2	7.0	9.1	19.5	28.6	23.8	27.1	17.8	17.0	0.9	3.6	2.2
13	1.8	9.3	6.5	16.7	23.4	25.0	22.6	2.2	17.9	9.8	6.7	1.7
14	2.7	11.3	5.3	3.0	27.1	25.1	25.4	23.3	16.1	6.6	5.9	2.0
15	3.2	10.0	6.2	4.6	15.9	26.4	25.3	21.4	10.1	9.2	4.9	2.8
16	2.6	4.9	4.3	8.5	27.6	27.8	22.9	19.3	11.1	7.6	2.6	2.4
17	2.3	7.2	2.7	20.9	28.1	23.6	25.8	13.4	8.0	4.9	4.9	3.4
18	2.5	8.4	12.9	13.7	13.0	9.3	5.9	15.2	10.0	1.8	4.7	4.7
19	3.1	8.4	4.5	21.8	18.8	27.3	24.0	22.5	11.6	10.2	1.3	2.2
20	3.6	8.5	13.7	19.8	23.7	25.1	17.2	23.7	15.7	7.6	5.4	2.6
21	2.4	8.8	11.4	21.1	8.7	27.9	21.2	19.1	16.4	9.8	4.6	1.8
22	2.5	10.3	12.2	15.4	15.6	12.4	17.9	21.3	16.1	7.7	3.9	4.0
23	4.1	10.7	7.2	24.0	18.5	17.1	8.9	13.4	16.3	9.7	1.9	1.7
24	2.6	6.1	7.5	15.6	17.4	27.1	14.9	19.0	14.8	6.0	2.1	1.8
25	5.9	6.5	2.2	15.4	12.9	22.9	19.5	21.7	14.7	7.8	2.5	2.8
26	7.4	12.1	7.7	24.1	26.6	23.8	26.3	12.8	14.6	4.4	3.1	5.5
27	5.4	12.6	11.9	10.3	29.3	5.3	19.1	15.4	10.6	3.0	3.0	5.2
28	7.5	15.0	19.2	8.5	28.4	14.6	27.5	15.2	12.9	2.2	3.6	3.8
29	7.4		19.3	11.3	25.0	28.0	15.0	16.8	7.5	3.4	1.8	4.9
30	6.4		14.9	9.8	27.9	24.3	11.1	20.7	13.3	8.4	3.9	5.5
31	5.1		9.6		17.2		21.3	20.5		3.9		1.6
TOTAL	115.0	226.9	324.8	482.5	667.2	651.1	626.8	530.0	447.2	223.2	125.0	101.2

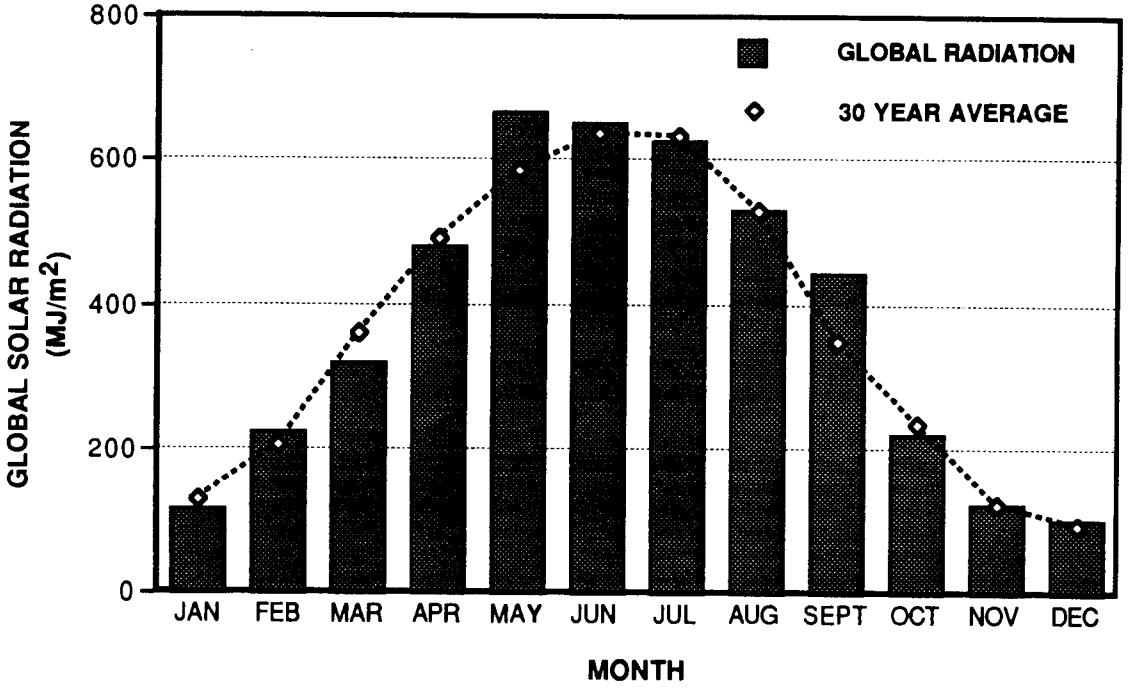
DIFFUSE SOLAR RADIATION, 1995

(MJ/m²)

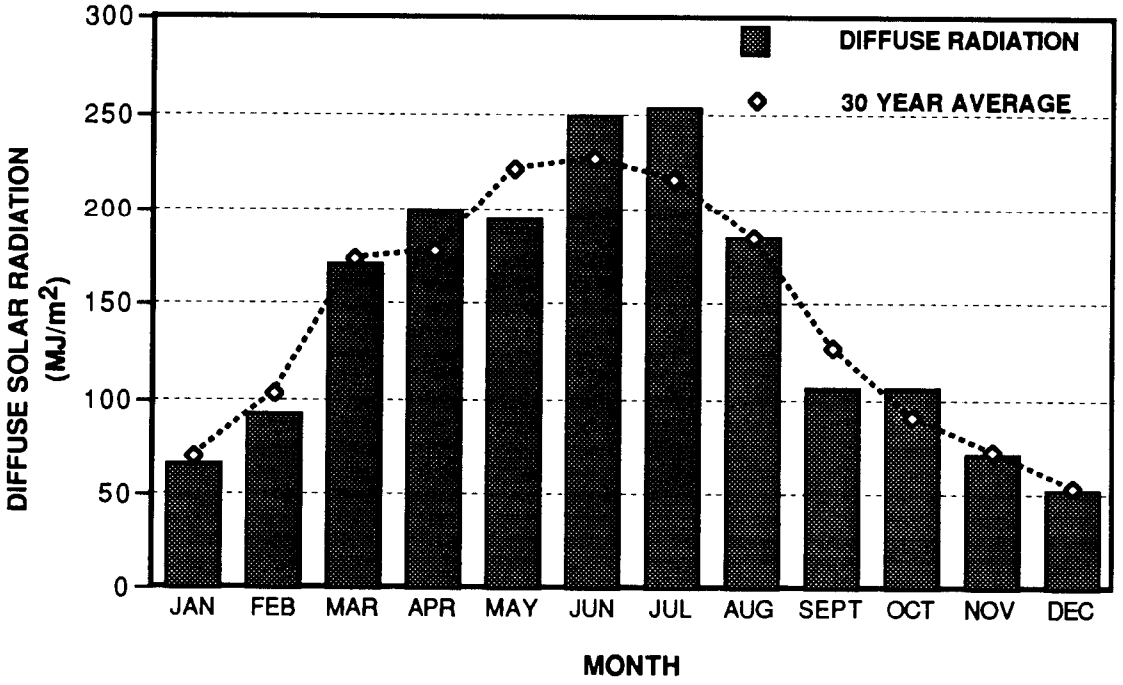
DATE	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
1	1.7	1.8	4.4	9.1	9.6	9.7	12.0	9.2	2.2	4.1	3.8	2.0
2	1.2	3.0	7.3	5.5	10.1	8.8	11.3	10.3	2.2	3.2	3.8	2.0
3	2.0	2.3	5.3	3.8	7.3	6.1	10.3	6.9	2.1	4.0	1.4	1.2
4	1.2	2.3	7.5	7.8	3.2	6.2	9.2	5.9	2.2	5.6	2.0	1.5
5	1.3	2.7	6.4	9.2	3.2	9.0	7.7	2.4	6.3	4.6	2.3	1.1
6	2.2	2.1	5.1	8.0	8.9	8.1	9.4	9.3	5.3	5.8	1.8	1.9
7	2.2	3.5	3.2	5.2	9.5	11.2	11.6	8.0	2.3	4.5	3.4	2.5
8	2.3	2.7	4.8	4.8	6.2	6.3	6.5	4.1	5.2	2.6	3.2	1.1
9	2.4	2.7	6.3	3.4	3.3	10.2	7.2	3.1	1.9	1.7	3.0	1.5
10	2.4	3.8	2.4	5.2	3.8	10.7	6.7	9.9	1.9	5.9	2.0	2.0
11	1.8	2.0	5.1	4.8	7.3	6.2	10.4	7.9	4.2	5.0	3.7	1.8
12	2.2	5.5	6.7	4.9	3.4	7.9	7.0	8.9	2.4	0.9	3.5	2.1
13	1.8	2.5	5.8	7.7	5.5*	9.4	10.3	2.2	2.4	2.2	1.7	1.7
14	2.5	2.7	5.0	2.8	0.0*	10.5	7.5	5.0	3.8	5.4	1.8	1.9
15	2.8	2.9	5.8	4.3	0.0*	6.1	7.1	5.8	6.7	4.4	2.9	2.4
16	2.6	4.3	4.1	7.8	2.2*	5.3	7.3	7.2	5.6	3.9	2.5	2.1
17	2.3	5.3	2.6	6.8	3.1	8.0	6.7	5.4	5.8	4.1	2.6	2.1
18	2.4	3.6	6.2	8.4	9.1	7.7	5.0	8.9	5.2	1.8	1.8	1.6
19	2.9	3.3	4.3	7.3	8.8	4.5	9.7	5.0	5.9	1.3	1.3	2.2
20	2.4	5.8	5.5	8.1	7.8	8.0	9.1	2.3	5.4	4.9	1.0	2.0
21	2.2	3.4	5.3	4.9	7.9	5.4	8.7	5.7	2.5	1.2	3.0	1.8
22	2.3	2.1	5.5	8.4	9.2	10.6	10.3	4.7	2.3	4.6	1.7	1.5
23	2.6	2.2	6.2	3.0	8.5	13.2	7.6	6.8	1.8	1.8	1.9	1.7
24	2.5	4.8	6.3	10.7	12.1	8.7	11.0	5.2	2.4	4.2	2.0	1.7
25	1.8	5.8	2.0	9.8	10.4	11.0	9.3	3.1	1.9	3.8	2.5	1.8
26	1.9	2.4	7.2	4.2	4.8	9.9	3.1	8.3	2.2	3.5	2.9	1.3
27	3.1	5.2	10.7	9.1	3.0	4.8	5.9	7.7	4.2	2.6	2.9	1.3
28	1.8	3.2	3.7	7.6	3.5	9.9	2.4	6.7	3.0	2.2	2.5	1.1
29	2.2		4.3	8.9	7.8	6.8	8.4	2.8	4.7	3.2	1.8	1.2
30	1.5		9.5	8.5	4.3	10.5	7.4	3.1	2.9	1.3	2.4	1.3
31	2.9		6.5		10.8		8.7	3.1		3.4		1.6
TOTAL	67.5	94.2	171.0	200.0	194.6*	250.7	254.8	184.9	106.9	107.7	73.1	53.0

*Partial Data set

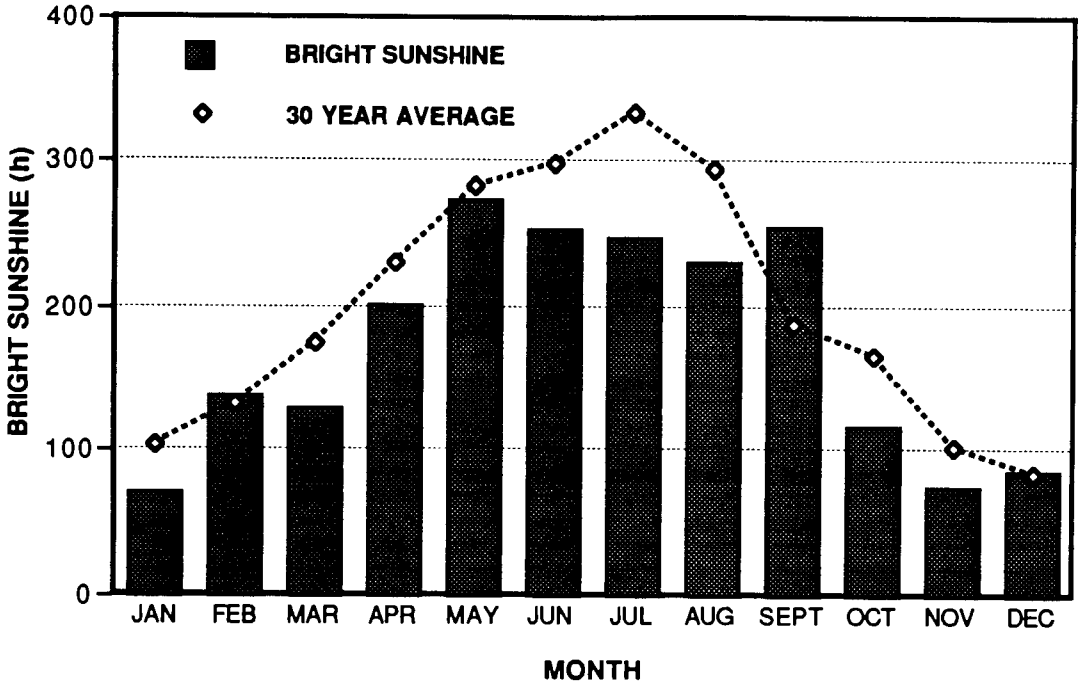
MONTHLY GLOBAL SOLAR RADIATION, 1995



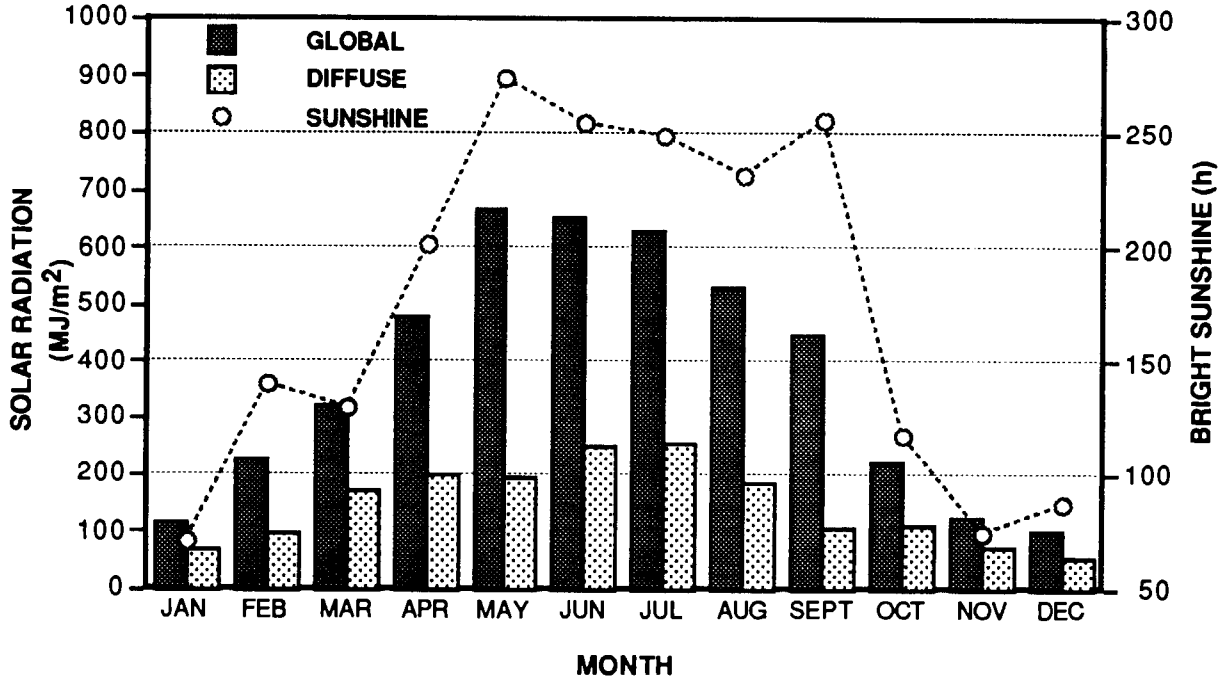
MONTHLY DIFFUSE SOLAR RADIATION, 1995



MONTHLY BRIGHT SUNSHINE, 1995



COMPARISON OF MONTHLY SOLAR RADIATION, 1995



SUNRISE 1995

(local time: in hours and minutes)

DATE	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
1	9:15	8:47	7:53	6:42	5:37	4:52	4:50	5:27	6:17	7:07	8:01	8:53
2	9:15	8:46	7:51	6:39	5:35	4:51	4:50	5:29	6:19	7:09	8:03	8:54
3	9:15	8:44	7:49	6:37	5:33	4:50	4:51	5:30	6:21	7:10	8:05	8:55
4	9:15	8:42	7:46	6:35	5:31	4:49	4:52	5:32	6:22	7:12	8:07	8:57
5	9:15	8:41	7:44	6:33	5:29	4:49	4:53	5:33	6:24	7:14	8:09	8:58
6	9:14	8:39	7:42	6:30	5:27	4:48	4:54	5:35	6:26	7:15	8:10	8:59
7	9:14	8:37	7:40	6:28	5:26	4:48	4:54	5:36	6:27	7:17	8:12	9:00
8	9:13	8:35	7:37	6:26	5:24	4:47	4:55	5:38	6:29	7:19	8:14	9:02
9	9:13	8:34	7:35	6:23	5:22	4:47	4:56	5:40	6:30	7:20	8:16	9:03
10	9:12	8:32	7:33	6:21	5:20	4:46	4:57	5:41	6:32	7:22	8:18	9:04
11	9:12	8:30	7:30	6:19	5:19	4:46	4:58	5:43	6:34	7:24	8:19	9:05
12	9:11	8:28	7:28	6:17	5:17	4:45	5:00	5:45	6:35	7:26	8:21	9:06
13	9:10	8:26	7:26	6:14	5:15	4:45	5:01	5:46	6:37	7:27	8:23	9:07
14	9:09	8:24	7:24	6:12	5:14	4:45	5:02	5:48	6:39	7:29	8:25	9:08
15	9:08	8:22	7:21	6:10	5:12	4:45	5:03	5:49	6:40	7:31	8:26	9:09
16	9:08	8:20	7:19	6:08	5:11	4:45	5:04	5:51	6:42	7:33	8:28	9:10
17	9:07	8:18	7:17	6:06	5:09	4:45	5:06	5:53	6:44	7:34	8:30	9:10
18	9:06	8:16	7:14	6:03	5:08	4:45	5:07	5:54	6:45	7:36	8:32	9:11
19	9:05	8:14	7:12	6:01	5:06	4:45	5:08	5:56	6:47	7:38	8:33	9:12
20	9:04	8:12	7:10	5:59	5:05	4:45	5:09	5:58	6:49	7:40	8:35	9:12
21	9:02	8:10	7:07	5:57	5:04	4:45	5:11	5:59	6:50	7:41	8:37	9:13
22	9:01	8:08	7:05	5:55	5:02	4:45	5:12	6:01	6:52	7:43	8:39	9:14
23	9:00	8:06	7:03	5:53	5:01	4:46	5:14	6:03	6:54	7:45	8:40	9:14
24	8:59	8:04	7:00	5:51	5:00	4:46	5:15	6:04	6:55	7:47	8:42	9:14
25	8:57	8:02	6:58	5:49	4:59	4:46	5:16	6:06	6:57	7:49	8:43	9:15
26	8:56	8:00	6:56	5:47	4:58	4:47	5:18	6:07	6:58	7:50	8:45	9:15
27	8:55	7:57	6:53	5:45	4:56	4:47	5:19	6:09	7:00	7:52	8:47	9:15
28	8:53	7:55	6:51	5:43	4:55	4:48	5:21	6:11	7:02	7:54	8:48	9:15
29	8:52		6:49	5:41	4:54	4:48	5:22	6:12	7:03	7:56	8:50	9:15
30	8:50		6:46	5:39	4:53	4:49	5:24	6:14	7:05	7:58	8:51	9:16
31	8:49		6:44		4:53		5:25	6:16		7:59		9:16

SUNSET 1995

(local time: in hours and minutes)

DATE	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
1	17:05	17:53	18:46	19:40	20:31	21:17	21:31	20:57	19:54	18:44	17:38	16:58
2	17:06	17:55	18:47	19:42	20:33	21:18	21:30	20:56	19:52	18:42	17:36	16:57
3	17:07	17:57	18:49	19:43	20:35	21:20	21:30	20:54	19:50	18:40	17:34	16:57
4	17:08	17:59	18:51	19:45	20:37	21:21	21:29	20:52	19:48	18:37	17:33	16:56
5	17:19	18:01	18:53	19:47	20:38	21:22	21:29	20:50	19:45	18:35	17:31	16:56
6	17:11	18:03	18:55	19:49	20:40	21:23	21:28	20:49	19:43	18:33	17:29	16:55
7	17:12	18:05	18:56	19:50	20:42	21:23	21:28	20:47	19:41	18:31	17:27	16:55
8	17:13	18:06	18:58	19:52	20:43	21:24	21:27	20:45	19:38	18:28	17:26	16:55
9	17:15	18:08	19:00	19:54	20:45	21:25	21:26	20:43	19:36	18:26	17:24	16:54
10	17:176	18:10	19:02	19:56	20:46	21:26	21:25	20:41	19:34	18:24	17:22	16:54
11	17:17	18:12	19:03	19:57	20:48	21:27	21:25	20:39	19:31	18:21	17:21	16:54
12	17:19	18:14	19:05	19:59	20:50	21:27	21:24	20:37	19:29	18:19	17:19	16:54
13	17:20	18:16	19:07	20:01	20:51	21:28	21:23	20:35	19:27	18:17	17:18	16:54
14	17:22	18:18	19:09	20:02	20:53	21:29	21:22	20:33	19:24	18:15	17:16	16:54
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27	17:44	18:42	19:31	20:25	21:11	21:31	21:05	20:06	18:54	17:48	17:01	17:00
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29	17:48		19:35	20:28	21:14	21:31	21:02	20:01	18:49	17:44	16:59	17:01
30	17:50		19:37	20:30	21:15	21:31	21:01	19:59	18:47	17:42	16:59	17:02
31	17:52		19:38		21:16		20:59	19:57		17:40		17:03

SUNRISE 1996

(local time: in hours and minutes)

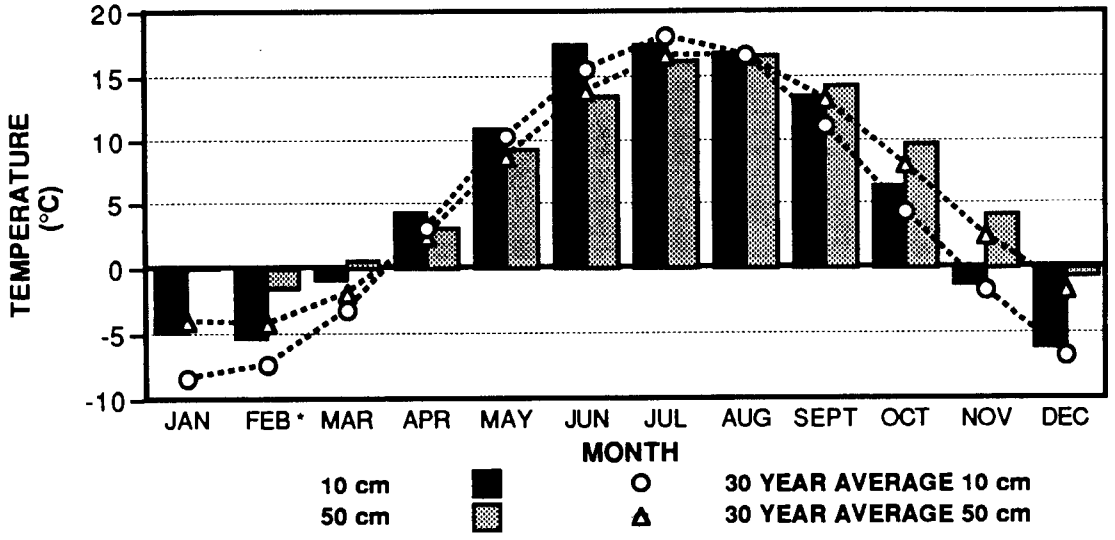
DATE	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
1	9:15	8:48	7:51	6:40	5:35	4:51	4:50	5:28	6:19	7:08	8:03	8:54
2	9:15	8:46	7:49	6:38	5:33	4:50	4:51	5:30	6:20	7:10	8:04	8:55
3	9:15	8:44	7:47	6:35	5:31	4:50	4:52	5:31	6:22	7:11	8:06	8:56
4	9:15	8:43	7:45	6:33	5:30	4:49	4:52	5:33	6:23	7:13	8:08	8:58
5	9:15	8:41	7:42	6:31	5:28	4:48	4:53	5:34	6:25	7:15	8:10	8:59
6	9:14	8:39	7:40	6:29	5:26	4:48	4:54	5:36	6:27	7:17	8:12	9:00
7	9:14	8:38	7:38	6:26	5:24	4:47	4:55	5:38	6:28	7:18	8:13	9:01
8	9:13	8:36	7:36	6:24	5:22	4:47	4:56	5:39	6:30	7:20	8:15	9:03
9	9:13	8:34	7:33	6:22	5:21	4:46	4:57	5:41	6:32	7:22	8:17	9:04
10	9:12	8:32	7:31	6:19	5:19	4:46	4:58	5:43	6:33	7:23	8:19	9:05
11	9:12	8:30	7:29	6:17	5:17	4:46	4:59	5:44	6:35	7:25	8:21	9:06
12	9:11	8:29	7:26	6:15	5:16	4:45	5:00	5:46	6:37	7:27	8:22	9:07
13	9:10	8:27	7:24	6:13	5:14	4:45	5:02	5:47	6:38	7:29	8:24	9:08
14	9:09	8:25	7:22	6:10	5:13	4:45	5:03	5:49	6:40	7:30	8:26	9:09
15	9:09	8:23	7:20	6:08	5:11	4:45	5:04	5:51	6:42	7:32	8:28	9:09
16	9:08	8:21	7:17	6:06	5:10	4:45	5:05	5:52	6:43	7:34	8:30	9:10
17	9:07	8:19	7:15	6:04	5:08	4:45	5:07	5:54	6:45	7:36	8:31	9:11
18	9:06	8:17	7:13	6:02	5:07	4:45	5:08	5:56	6:47	7:38	8:33	9:12
19	9:05	8:15	7:10	6:00	5:05	4:45	5:09	5:57	6:48	7:39	8:35	9:12
20	9:04	8:13	7:08	5:58	5:04	4:45	5:10	5:59	6:50	7:41	8:36	9:13
21	9:03	8:11	7:06	5:55	5:03	4:45	5:12	6:00	6:51	7:43	8:38	9:13
22	9:02	8:09	7:03	5:53	5:01	4:46	5:13	6:02	6:53	7:45	8:40	9:14
23	9:00	8:06	7:01	5:51	5:00	4:46	5:15	6:04	6:55	7:46	8:41	9:14
24	8:59	8:04	6:59	5:49	4:59	4:46	5:16	6:05	6:56	7:48	8:43	9:15
25	8:58	8:02	6:56	5:47	4:58	4:47	5:18	6:07	6:58	7:50	8:45	9:15
26	8:56	8:00	6:54	5:45	4:57	4:47	5:19	6:09	7:00	7:52	8:46	9:15
27	8:55	7:58	6:52	5:43	4:56	4:48	5:21	6:10	7:01	7:54	8:48	9:15
28	8:54	7:56	6:49	5:41	4:55	4:48	5:22	6:12	7:03	7:55	8:49	9:15
29	8:52	7:54	6:47	5:39	4:54	4:49	5:24	6:14	7:05	7:57	8:51	9:16
30	8:51		6:45	5:37	4:53	4:49	5:25	6:15	7:06	7:59	8:52	9:16
31	8:49		6:42		4:52		5:27	6:17		8:01		9:15

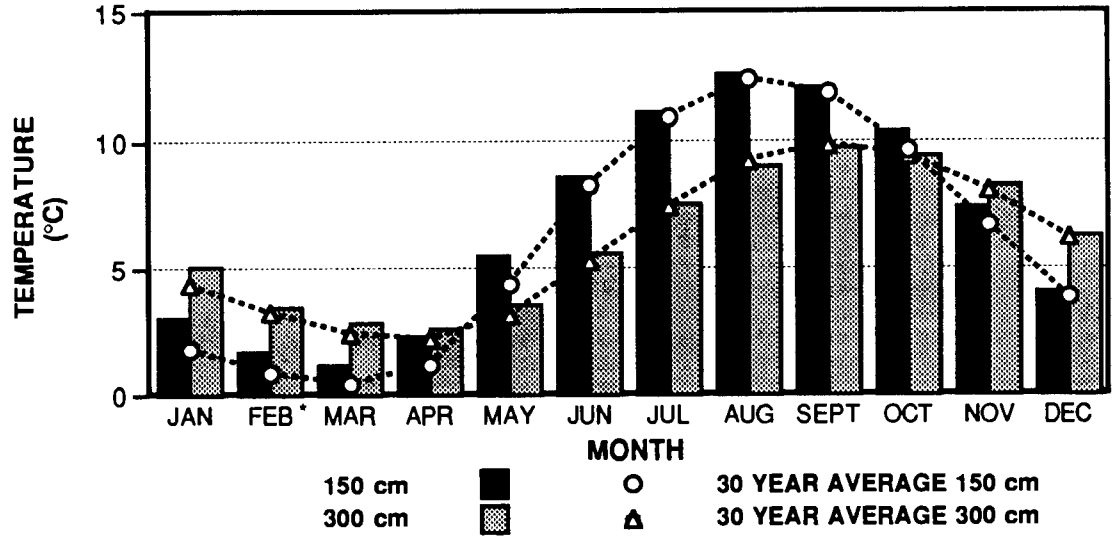
SUNSET 1996

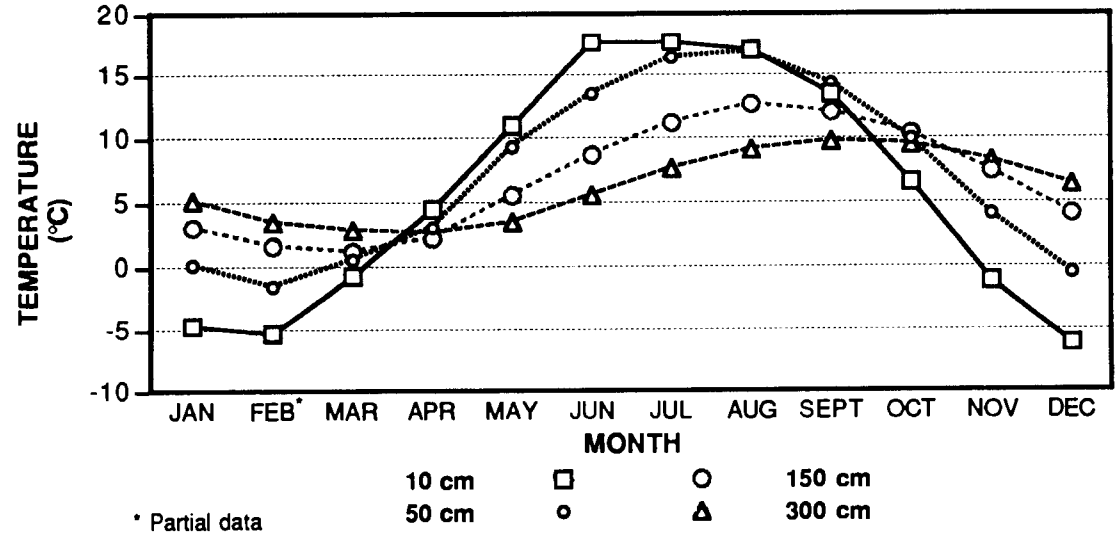
(local time: in hours and minutes)

DATE	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
1	17:04	17:53	18:47	19:41	20:33	21:18	21:30	20:56	19:53	18:43	17:37	16:57
2	17:05	17:55	18:49	19:43	20:34	21:19	21:30	20:54	19:50	18:40	17:35	16:57
3	17:07	17:57	18:51	19:45	20:36	21:20	21:29	20:53	19:48	18:38	17:33	16:56
4	17:08	17:59	18:52	19:47	20:38	21:21	21:29	20:51	19:46	18:36	17:31	16:56
5	17:09	18:00	18:54	19:48	20:39	21:22	21:28	20:49	19:43	18:33	17:29	16:55
6	17:10	18:02	18:56	19:50	20:41	21:23	21:28	20:47	19:41	18:31	17:28	16:55
7	17:11	18:04	18:58	19:52	20:43	21:24	21:27	20:45	19:39	18:29	17:26	16:55
8	17:13	18:06	18:59	19:53	20:44	21:25	21:26	20:43	19:37	18:27	17:24	16:54
9	17:14	18:08	19:01	19:55	20:46	21:26	21:26	20:42	19:34	18:24	17:23	16:54
10	17:16	18:10	19:03	19:57	20:48	21:26	21:25	20:40	19:32	18:22	17:21	16:54
11	17:17	18:12	19:05	19:59	20:49	21:27	21:24	20:38	19:29	18:20	17:20	16:54
12	17:19	18:14	19:07	20:00	20:51	21:28	21:23	20:36	19:27	18:18	17:18	16:54
13	17:20	18:15	19:08	20:02	20:52	21:28	21:22	20:34	19:25	18:15	17:17	16:54
14	17:22	18:17	19:10	20:04	20:54	21:29	21:21	20:32	19:22	18:13	17:15	16:54
15	17:23	18:19	19:12	20:05	21:55	21:29	21:20	20:30	19:20	18:11	17:14	16:54
16	17:25	18:21	19:14	20:07	20:57	21:30	21:19	20:28	19:18	18:09	17:12	16:54
17	17:26	18:23	19:15	20:09	20:59	21:30	21:18	20:26	19:15	18:07	17:11	16:55
18	17:28	18:25	19:17	20:11	21:00	21:31	21:17	20:23	19:13	18:05	17:10	16:55
19	17:30	18:27	19:19	20:12	21:01	21:31	21:15	20:21	19:11	18:02	17:09	16:55
20	17:31	18:29	19:21	20:14	21:03	21:31	21:14	20:19	19:08	18:00	17:07	16:56
21	17:33	18:30	19:22	20:16	21:04	21:31	21:13	20:17	19:06	17:58	17:06	16:56
22	17:35	18:32	19:24	20:17	21:06	21:31	21:11	20:15	19:04	17:56	17:05	16:57
23	17:37	18:34	19:26	20:19	21:07	21:32	21:10	20:13	19:01	17:54	17:04	16:57
24	17:38	18:36	19:27	20:21	21:08	21:32	21:09	20:11	18:59	17:52	17:03	16:58
25	17:40	18:38	19:29	20:23	21:10	21:32	21:07	20:08	18:57	17:50	17:02	16:59
26	17:42	18:40	19:31	20:24	21:11	21:31	21:06	20:06	18:54	17:48	17:01	17:00
27	17:44	18:41	19:33	20:26	21:12	21:31	21:04	20:04	18:52	17:46	17:00	17:00
28	17:46	18:43	19:34	20:38	21:14	21:31	21:03	20:02	18:50	17:44	17:00	17:01
29	17:47	18:45	19:36	20:39	21:15	21:31	21:01	19:59	18:47	17:42	16:59	17:02
30	17:49		19:38	20:31	21:16	21:31	20:59	19:57	18:45	17:40	16:58	17:03
31	17:51		19:40		21:17		20:58	19:55		17:38		17:04

MONTHLY SOIL TEMPERATURES, 1994 (Errata)

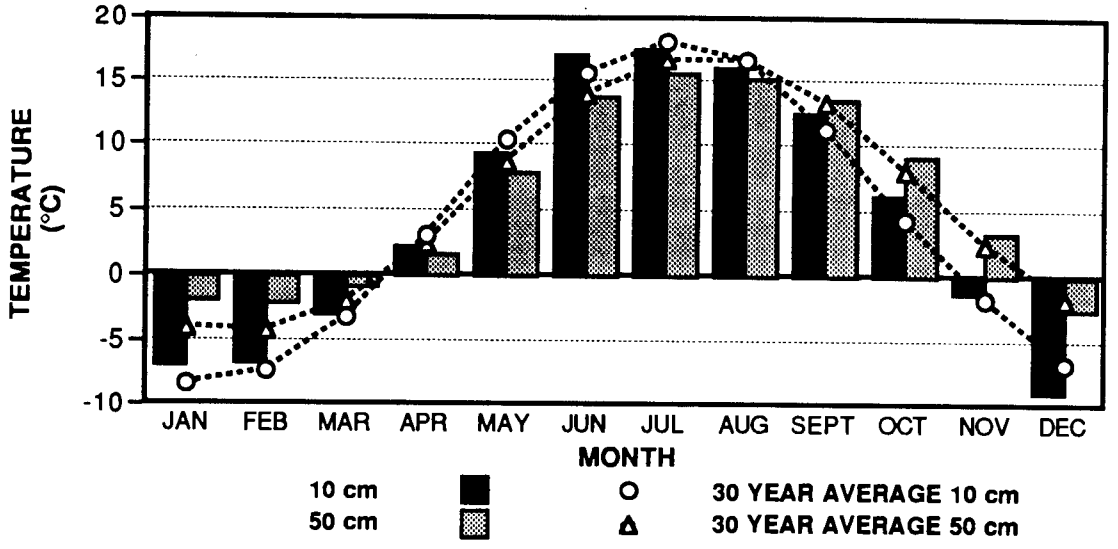


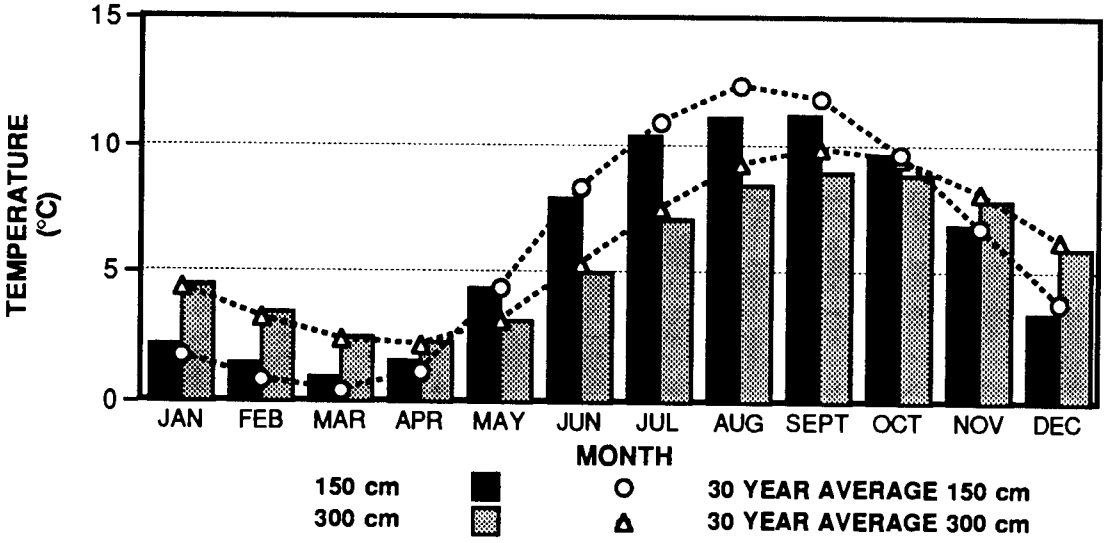


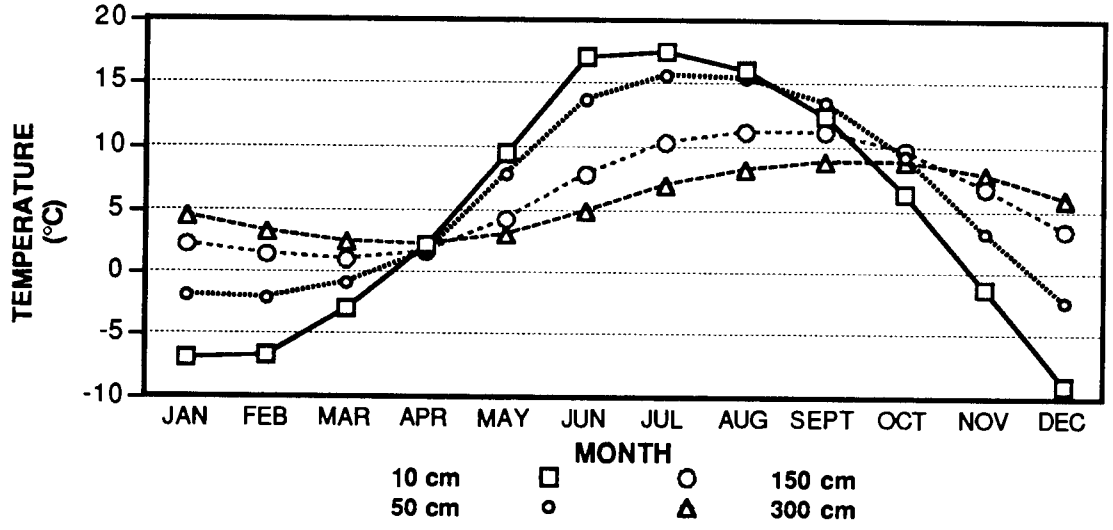


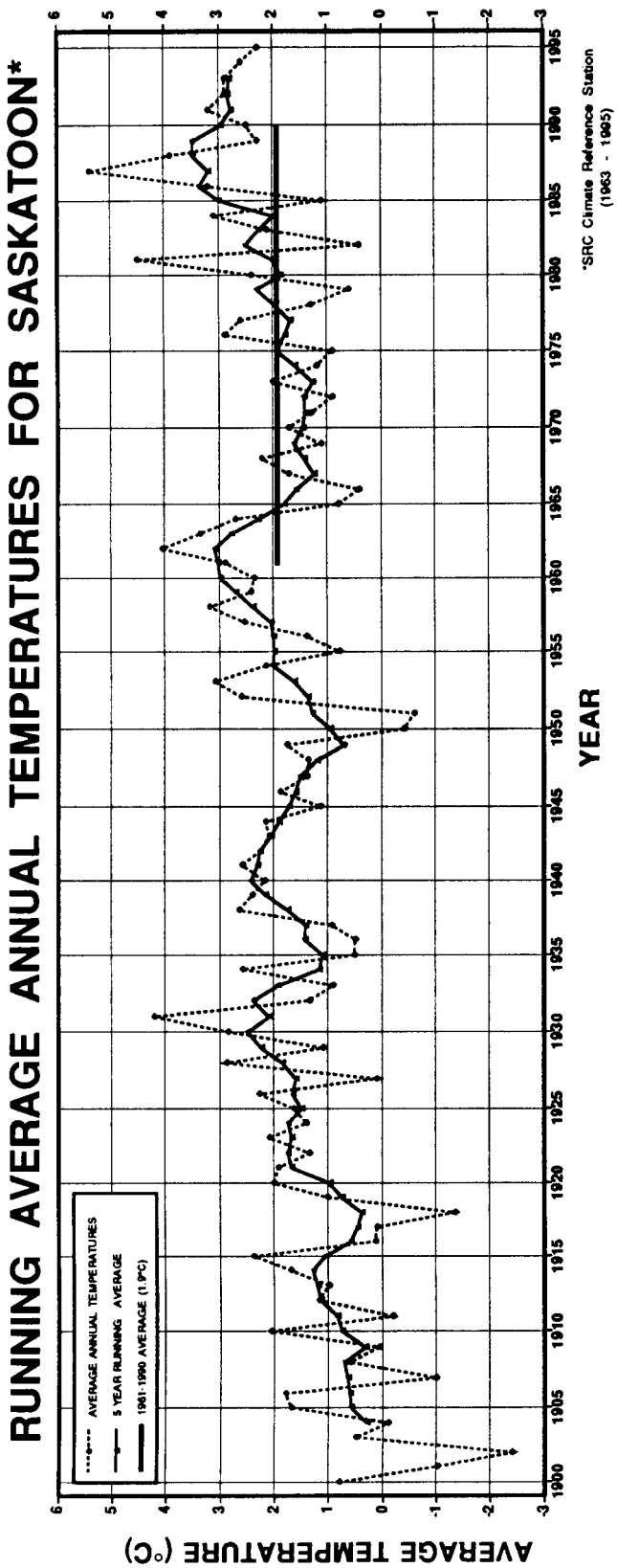
* Partial data

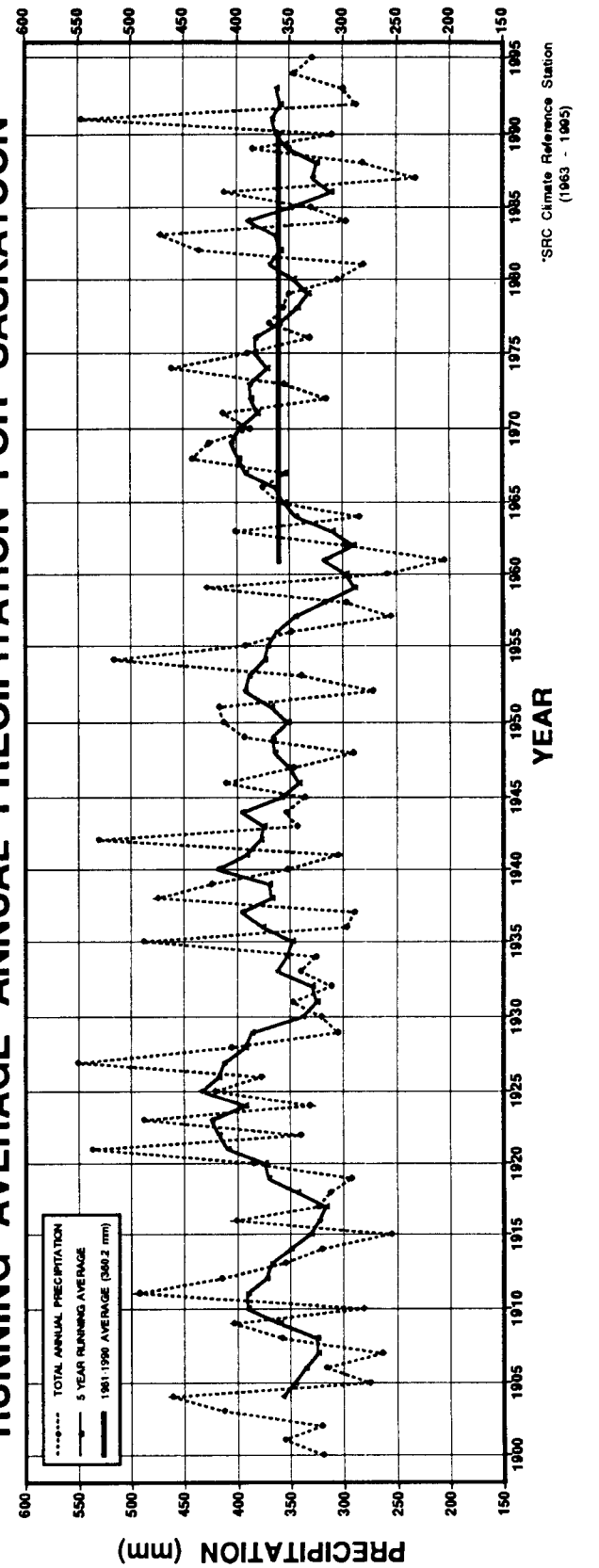
MONTHLY SOIL TEMPERATURES, 1995








RUNNING AVERAGE ANNUAL TEMPERATURES FOR SASKATOON*
AVERAGE ANNUAL TEMPERATURES
5 YEAR RUNNING AVERAGE
1961-1990 AVERAGE (1.9°C)
AVERAGE TEMPERATURE (°C)
YEAR
*SRC Climate Reference Station (1963 - 1995)


RUNNING AVERAGE ANNUAL PRECIPITATION FOR SASKATOON*
TOTAL ANNUAL PRECIPITATION
5 YEAR RUNNING AVERAGE
1961-1990 AVERAGE (340.2 mm)
PRECIPITATION (mm)
YEAR
*SRC Climate Reference Station (1963 - 1995)

GLOSSARY OF TERMS AND INSTRUMENTS USED AT SASKATOON SRC CRS

AVERAGE (Avg) VALUE (1961-1990) In climatology it is often useful to make spatial comparisons of particular element values over a common time period. At an interior continental site such as Saskatoon, a period of 30 years is required to produce statistically stable estimates of the more variable elements. To facilitate spatial comparisons, the World Meteorological Organization recommends the standard normal (average) period January 1st, 1961 to December 31st, 1990 for data analysis. Data derived from CRS conform to this standard, except where noted.

BRIGHT SUNSHINE is the unobstructed direct radiation from the sun, as opposed to the shading of a location by clouds or by other obstructions.

BRIGHT SUNSHINE - Number of Days is the total number of days when at least 0.1 of an hour of bright sunshine was recorded.

BRIGHT SUNSHINE - Percentage Possible refers to the ratio of measured bright sunshine hours to total possible daylight hours in a given period, expressed as a percentage.

BRIGHT SUNSHINE - Total is the sum of the daily bright sunshine values in hours and tenths of hours as measured by an automated sunshine recorder using voltaic cells.

DIFFUSE SOLAR RADIATION - Total is radiation reaching the earth's surface after having been scattered from the direct solar beam. The instrument used is an Eppley pyranometer with a shade ring (See GLOBAL SOLAR RADIATION - Total).

EXTREME is the highest or lowest value of a particular element recorded during the period in question.

EXTREME ALL YEARS Temporal comparisons at a point are also of value in some types of climatic studies. Therefore, it is desirable to produce the maximum length of reliable climatic record to carry out studies over a period of time. Data are drawn from the following data sets:

Saskatoon, SRC:1963 to 1995

Saskatoon, U. of S.:1916 to 1963

Saskatoon, City:1892 to 1915

Station locations, exposures and measurement procedures were subject to change during this time period. Data presented in this column are <u>not adjusted</u> and users are cautioned accordingly.

FROST is recorded on each occasion when the daily minimum temperature is equal to or less than 0°C.

GLOBAL SOLAR RADIATION - Total is the sum of the direct solar and diffuse radiation during the period in question. Measurements are carried out on a horizontal surface at the ground and integrated over the whole celestial dome, summing the diffuse and direct components of the solar beam. The temperature-compensated Eppley pyranometer is used. The standard metric unit of measurement is the megajoule per square metre (MJ/m^2). (To facilitate comparison with past years' data: 1.0 MJ/m^2 = 23.895 langleys). Comparison is provided with a provisional average based on 16 years of data (1975-1990).

GROWING DEGREE-DAY (GDD) is an index of the growing requirement in order for plant growth to proceed. The air temperature must exceed a critical value appropriate to the plant species in question. For many members of the grass family, including most commercial cereals grown on the prairies, a base temperature of 5.0°C has been established. On a specified day, the difference between the daily average temperature and the 5.0°C base temperature defines the number of growing degree-days. Mathematically:

GDD = (T - 5.0°C), for that day,

where T = daily mean temperature in °C

if T is equal to or less than 5.0°C, GDD = 0.

Daily GDD values are summed to provide totals for the appropriate month, growing season or year.

HEATING DEGREE-DAY (HDD) is an index of the heating requirement to achieve a stipulated comfort value in an indoor environment. For most purposes, a temperature of less than 18°C is considered uncomfortable and supplementary heating is required. On a specific day, the amount by which 18°C exceeds the daily average temperature defines the number of heating degree-days for that day. Mathematically:

HDD = (18°C - T), for that day,

where T = daily mean temperature in °C

if T is equal to or greater than 18°C, HDD = 0.

Monthly and annual values of HDD are obtained by summing daily values.

NUMBER OF RECORDING YEARS Due to missing observations, faulty instrument calibration, lost records, *etc.*, only partial data are available especially during the period 1892 - 1915. The number of years of useful record is therefore cited.

PRECIPITATION (Ppt) - **Total** is the sum of the daily recorded precipitation. The snowfall component of precipitation is recorded as an equivalent amount of liquid water. For particulars on precipitation measurement procedures and instruments, the reader is referred to the Atmospheric Environment Service publication *Manual of Climatological Observations*, 2nd Ed., January, 1978. The notation "T" in this column refers to a trace of precipitation (less than 0.2 mm water equivalent). As of August 7, 1993, total precipitation was measured using the Belfort weighing gauge for the winter season and the tipping bucket during frost-free period.

PRECIPITATION DAY is recorded on occasions when the amount of precipitation in a 24-hour period equals or exceeds 0.2 mm water. The so-called climatological day, beginning at 9 a.m. standard time on the date of reference and ending at 9 a.m. the next morning, was employed in record keeping up to January 1994. On February 1, 1994, after consultation with AES, record keeping was changed to the 24-hour period of 0000 hours - 2400 hours to conform to their reporting of climatological statistics. An asterisk (*) appearing in the average column denotes the occurrence of measurable precipitation on one or more occasions, and that the calculated 30-year average amounts to less than a trace.

SOIL TEMPERATURE under a short grass surface with normal accumulation, is measured according to procedures outlined in the AES publication "*Soil Temperature*" January 1, 1976. Depths below surface at which soil temperature measurements are made are: 5 cm, 10 cm, 20 cm, 50 cm, 100 cm, 150 cm and 300 cm. Only 10 cm, 50 cm 150 cm and 300 cm are reported in this report. Since soil temperature is affected by profile structure and water content, extrapolation of the measured data is difficult.

SUNRISE/SUNSET times have been included in this report. They have been calculated using the computer program "TONITE" by Leonard Abbey and compared against the sunrise/sunset tables in the "*Observer's Handbook*" (Bishop 1994, 1995).

TEMPERATURE - Average Annual is the average of the daily average temperatures in degrees Celsius (°C) for one year.

TEMPERATURE - Average Daily is defined as the arithmetic mean of the daily maximum temperature in degrees Celsius (°C) and the daily minimum temperature in degrees Celsius (°C) for the day in question.

TEMPERATURE - Average Maximum is the average of the daily maximum temperatures in degrees Celsius (°C) for one year for the particular month in question. For details concerning measurement procedures, the reader is referred to the AES publication, " *Manual of Climatological Observations*", 2nd ed., January, 1978.

TEMPERATURE - Average Minimum is the average of the daily minimum temperatures in degrees Celsius (°C) averaged over the appropriate time periods. Refer to TEMPERATURE-Average Maximum concerning measurement procedures.

TEMPERATURE - Average Monthly is the average of the daily average temperatures in degrees Celsius (°C) for the one month under consideration.

WIND SPEED - Average (Avg) is the average of the hourly wind speeds for the period in question measured in kilometres per hour (km/h). Average hourly wind speeds are obtained from a RM Young Wind Monitor anemometer at a height of 10 m.

WIND SPEED - Peak Gust refers to the highest instantaneous value recorded by the anemometer system for the period of reference, irrespective of direction and/or duration. Comparison is with published data for Saskatoon Airport.

BIBLIOGRAPHY

Abbey, L., 1992. *Tonite.* Version 3.7. Abbey Information Services, Atlanta, Georgia.

Bergsteinsson, J. L. and J. G. Calvert,1980. *Climatological Reference Station Annual Summary, 1979.* Saskatchewan Research Council Technical Report No. 102. Saskatoon, SK.

Bishop, R. L. (Ed.), 1994. *Observer's Handbook, 1995.* The Royal Astronomical Society of Canada, Toronto, ON.

Bishop, R. L. (Ed.), 1995. *Observer's Handbook, 1996.* The Royal Astronomical Society of Canada, Toronto, ON.

Camden House Publishing, 1994. *Weather 1995* (calendar). Camden House Publishing, Camden East, ON.

Christiansen, E.A. (Ed.), 1970. *Physical Environment of Saskatoon, Canada.* Saskatchewan Research Council in co-operation with National Research of Canada, Ottawa, ON.

Environment Canada, Atmospheric Environment Service (AES), 1971. *Daily Climatological Data, Saskatoon, Sk.* AES, Toronto, ON.

Environment Canada, Atmospheric Environment Service (AES), 1975. *1974 Annual Meteorological Summary.* AES, Saskatoon, SK.

Environment Canada, Atmospheric Environment Service (AES), 1978. *Manual of Climatological Observations*, 2nd ed. AES, Downsview, ON

Environment Canada, Atmospheric Environment Service (AES), 1976. *Soil Temperature.* AES, Downsview, ON.

Huschke, R.E. (Ed.), 1959. *Glossary of Meteorology.* American Meteorological Society, Boston.

Lalonde, S. B., 1994. *Never Sell Your Hen on a Rainy Day.* Duck Creek Publications, Kelvington, SK.

Phillips, D. W. (Ed.), 1988. *Canadian Weather Trivia Calendar, 1989.* Environment Canada, Downsview, ON.

Phillips, D.W., 1995a. *Summer 95..One for the Record.* Media Release, Nov. 3, 1995. Environment Canada, Downsview, ON.

Phillips, D.W., 1995b. *Weather Flashes.* Fifth House Publishers, Saskatoon, SK.

Sheane, Jo Lynn., 1995. *Firefighters Keep Fingers Crossed for Rain.* Star Phoenix, Saskatoon, SK., July 4, 1995.