A Climatological Assessment of Major 20th Century Drought Years in the Grand River Basin

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Original Draft:	February, 2000
Final Report:	September, 2000
Prepared for:	Grand River Conservation Authority
Under Contract to:	Atmospheric Science Division Meteorological Service of Canada Environment Canada-Ontario Region
Funded by:	Climate Change Action Fund, Natural Resources Canada
	Contract No. KM452-9-6909

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Acknowledgements

The author wishes to thank the Grand River Conservation Authority for initiating this climate proposal and Natural Resources Canada for their financial support of the project through the Climate Change Action Fund. I would also like to extend special thanks to Dwight Boyd and Lorrie Minshall of the Grand River Conservation Authority, as well as Heather Auld of the Meteorological Service of Canada - Ontario Region for their support of the project, and review of the final manuscript. Finally, I wish to thank Malcolm Geast of the Meteorological Service of Canada - Ontario Region for his insightful review of the document.

Executive Summary

Drought conditions experienced over southern Ontario from mid-1997 through 1999 have heightened concerns with many municipalities and conservation authorities over the future of water resources. The issue is of particular significance to the Grand River Basin which supplies water to a population of over 750,000. The question has been raised as to whether the on-going drought conditions are more serious than those experienced in southern Ontario during the 1930s and early 1960s. This report attempts to answer this question by examining 20th century temperature and precipitation records of climatological stations in the immediate vicinity of the basin, focusing on the key drought years experienced from 1930-1939, 1961-1966 and 1997-1999.

An assessment of departures from normal of annual precipitation and mean temperature determined an initial cursory assessment of drought severity. Based on these results, it was concluded that the drought conditions of 1931, 1998 and 1999 were likely more severe than those experienced during other drought years of the 1930s, 1960s and 1990s. The Cumulative Precipitation Index was then computed for basin stations during the specified drought period years. Based only on these calculated values, it was determined that the early 1930s would be ranked as the most serious drought years.

In order to perform a more thorough drought severity comparison, a water budget model (Johnstone and Louie; 1984) was used to calculate monthly components of the water budget during the drought years. This procedure used a modified Thornthwaite and Mather (1955) approach, with an additional snowmelt model added. Model results of station water deficits and surpluses were compared to MacIver and Whitewood's (1992) long-term normals for the stations. Important observations from the water budget results included:

- All stations exhibited serious drought conditions in 1930, 1933, 1934, 1936, 1963 as well as 1998 and 1999.

- With the exception of Mount Forest, 1998 appears to rank as the most serious drought year since at least 1920, the start year of most model runs.

- At Mount Forest, the pattern of drought differed markedly from the stations in the central and southern parts of the basin. Water deficits and surpluses were most extreme at Mount Forest in 1930 and 1931, with 1998 ranked third.

- Water deficits and surpluses can show significant interannual variability. Even the dry 1930s were characterized by a "wet" year, 1937, where all stations reported lower-than-normal water deficits and near-normal to above-normal water surpluses.

- During the drought periods of the 1930s, 1960s and 1990s, all stations recorded significantly lower-than-normal precipitation during the April-October period. However, precipitation during January-March and November-December varied above and below normal.

- The 1930s and 1990s displayed above-normal mean annual and April-October temperatures. However, during the 1930s, mean temperatures fluctuated from above to below normal during January-March and November-December, while remaining well above normal during the same periods in 1998 and 1999. In contrast to this, the serious 1963 drought year recorded below-normal mean annual temperatures, with temperatures varying above and below-normal during the selected monthly periods.

These results, combined with a statistical analysis of the temperature and precipitation data, allowed us to conclude several important observations concerning the nature of droughts:

- Although drought years are normally characterized by below-normal annual precipitation, seasonal precipitation may be significantly above normal. For example, all stations reported above-normal summer precipitation during 1964.

- Although annual mean temperatures are usually above normal during a drought year, below-average values also occur. For example, the serious 1963 drought year recorded cooler-than-normal temperatures at all stations.

- Not all droughts are characterized by winters with low snowpack.

- Serious drought years do not necessarily correlate well with the years of driest springs and driest summers. Similarly the occurrence of warmer-than-normal summer maximum or summer mean temperatures is not a predictor for drought.

- Major one-day rainfall events can occur during serious drought years. In recent years, however, the occurrence of these events has been rare.

From these results, we can see that it is difficult to use any specific pattern in seasonal precipitation, or in seasonal and annual temperatures, as a predictor for significant drought years.

Finally, the drought analyses concluded by examining the role that climate variability cycles such as El Niño/La Niña (ENSO) and the North Atlantic Oscillation (NAO) may play during significant drought years. The data was first analysed on the entire 1910-1999 station dataset, and then on a recent subset of the data, 1970-1999.

Some interesting observations were made with the ENSO analyses. At all of the stations selected to represent the Grand River Basin,

- El Niño winters have been warmer than normal for the 1910-1999 analysis period, as well as the recent 1970-1999 period.

- El Niño winters since 1970 have been drier, as well as warmer, than normal.

- El Niño summers since 1970 have been warmer than normal.

- El Niño or neutral (non-ENSO) years are more likely to represent the extremes in above and below-normal annual and seasonal precipitation distributions for the 1910-1999 period.

- Since 1970, La Niña years are more likely to represent the extreme below-normal "tails" of the annual precipitation distributions, while El Niño and neutral years dominate the extreme above-normal values. Depending on the season, the distribution of seasonal precipitation extremes varies between El Niño, La Niña and non-ENSO years.

- Since 1970, if annual precipitation departs from normal by more than 10 percent, it is most likely to be below normal, i.e. a "drier" year.

These observations are of particular importance when considering drought. However, these results are only seasonal and consequently, no conclusions can be made on how an El Niño/La Niña event would affect an entire drought year.

In the NAO analyses of the precipitation and mean temperature data, a few trends have been identified, but these are primarily for the smaller data subset, 1970-1999. The most important of these 1970-1999 results included:

- Summer precipitation has been below normal at two of nine stations in recent high NAO index years.

- At eight of nine stations, autumn precipitation has been above normal during recent low NAO index years, while winter precipitation has been below normal during these years.

- At all stations, the autumn mean temperatures display a trend towards lower-than-normal values in low NAO index years. With the exception of Georgetown, the same trend is observed annually and during the winter.

- A strong trend towards below-normal summer mean temperatures is observed at all stations during non-NAO index years.

- Summer mean temperatures have been above normal at all stations in recent high NAO index years.

- A few stations have also observed a warmer-than-normal winter mean temperature trend during recent high NAO index years.

- The winter seasons from 1970-1999 display a tendency to have precipitation 10 percent and more below normal during low NAO index years.

The recent summer precipitation and mean temperature results for high NAO index years are a promising find in this study. However, the findings still do not support a definitive link between the NAO and southern Ontario drought periods. The results are even less promising in the combined ENSO-NAO analyses. Consequently, no definitive statements can be made linking ENSO or NAO events to significant drought years.

Climate change scenarios suggest that southern Ontario may experience more frequent and more intense droughts during the 21st century. This will only place additional stress on the water resources system that is already faced by the increasing demands of expansive population growth. Immediate concerns lie with the potential for the drought of recent years to extend into the year 2000 and beyond. It is yet to be determined whether or not this drought will outrank that of the 1930s in eventual duration and severity.

1.0 Introduction

Designated as a Canadian Heritage River in 1994, the Grand River is part of the largest river basin in southern Ontario. The Grand River Basin encompasses an area of 679,000 hectares (6734 square kilometres) while supporting a population of over 750,000. The Grand stretches 290 kilometres from its headwaters northeast of Dundalk to empty into Lake Erie at Dunnville. Elevations range from 200 metres at the Lake Erie shore to more than 500 metres in its northern regions. The Grand and its tributaries serve as a source of drinking water to many municipalities within the basin, as well as provide essential water resources to industries and agriculture. Thus, when the balance of nature shifts from years of abundant moisture to hot and dry conditions, the impact of these climate changes on the Grand River becomes a major issue.

Drought conditions from mid-1997 through 1999 in southern Ontario have raised considerable concern with the Grand River Conservation Authority over the future of water resources in the Grand River watershed. Demand for water in the basin is already under the stress of strong regional urban and economic growth. The recent drought has only added to the strain on the system. However, this drought is certainly not the first, nor will it be the last, to impact on the area. In the 20th century, serious drought conditions were also experienced during the 1930s and 1960s. Droughts of shorter duration occurred throughout the decades as well. Drought is a recurring feature in the normal climate cycle and future droughts can be anticipated.

In order to gain a better perspective on the severity of the drought of the late 1990s, an analysis of climatological data is performed for the three major drought periods of the 1930s, 1960s and 1990s. The first section of the report outlines the available climate data that is provided to the Grand River Conservation Authority, as well as that used in our analyses. Next, the general concept of drought is examined and an overview of the serious drought conditions of the 1930s, 1960s and 1990s is given. The remainder of the report focuses on the analyses. Temperature and precipitation data is examined for the drought periods. A water budget model is used to provide output of the water balance over the basin during the droughts. An assessment of climate variability cycles and their possible connections to droughts in southern Ontario is made. Finally, future climate change and its link to drought potential is discussed.

2.0 Daily and Hourly Meteorological/Climate Data Files

2.1 Daily Precipitation, Daily Maximum/Minimum Temperatures and Daily Freezing Rain Flag Data

2.1.1 Datafile Preparation

Daily climate data was requested for the years 1930 to 1959 for all available climate stations within and near the Grand River Basin in southern Ontario. The requested data included total daily precipitation amounts, divided into total rainfall and snowfall amounts, as well as daily maximum and minimum temperatures, and days with freezing rain. Although the freezing rain flag was included, its use is considered to be somewhat limited. For climate stations where only one daily observation is taken, it is very likely that not all freezing rain events are flagged.

The above requested data was extracted from Environment Canada's National Climate Data Archive, and consists of numeric values and one-character flags. (All data is from a quality-controlled archive.) The datafiles have been written in the standard archive format (4 digit year) or 233 character (ASCII) format and are provided on the CD accompanying this report. The filenames are *xxxxxxx.txt*, where *xxxxxxx* is the station's climate identification number. A list of the provided climate stations, with their period of record, is given in Table 1. When available, station data prior to 1930 was included as well. Additional station data was also provided to update the Grand River Conservation Authority's existing datasets to 1999.

All applicable flags are also included for the temperature and precipitation parameters. These flags are used to indicate special information regarding the data. They include:

A	Precipitation amount accumulated over more than one day; previous value's flag was C or L
C	Precipitation occurred; amount is uncertain; recorded value is 0
E	Estimated
F	Precipitation amount accumulated over more than day and estimated
L	Precipitation may or may not have occurred; amount is unknown; recorded value is 0
M	Missing
T	A trace of precipitation occurred; recorded value is zero

Therefore, the format for a data record is as follows:

```
                                        Data repeated
|  Stn id      |Year |Mo|Elem|S|Value  |F|  ............31 times
```

where the fields are defined as follows:

Abbreviation	Length	Field	Data Type
Stn ID	7	Station Identification	Alphanumeric
Year	4	Year of data	Numeric
Mo	2	Month of data (i.e. 01=Jan., etc.)	Numeric
Elem	3	Element Number	Numeric
S	1	Sign of Data	'–' = negative ' ' = positive
Value	5	Data Value	Numeric
Flag	1	Data Flag	Alphanumeric

where elements include:

001 = Daily Maximum Temperature	(Units: 0.1° C)
002 = Daily Minimum Temperature	(Units: 0.1° C)
010 = Daily Total Rainfall	(Units: 0.1 mm)
011 = Daily Total Snowfall	(Units: 0.1 cm)
012 = Daily Total Precipitation	(Units: 0.1 mm)
015 = Day with Freezing Rain	(1=Yes, 0=No)

All values for an element over the period of a record are given before values for the next element are specified.

2.1.2 Climate Stations Provided

TABLE 1

Climate Stations Providing Daily Precipitation, Temperature and Freezing Rain Data

Stat Id#		Station Name	Latitude (Degs)	Longitude (Degs)	Elevation (m)	Start Yr	Mo	Dy	End Yr	Mo	Dy
6110270		ANGUS	44.32	79.87	191	1930	2	1	1965	2	28
6110661		BEETON	44.10	79.78	233	1916	11	1	1970	1	31
6110662		BEETON ASSAGI	44.12	79.77	221	1975	3	1	1976	11	30
6110663		BEETON GRAHAM	44.08	79.78	229	1971	9	1	1984	12	31
6110667		BEETON WATSON	44.07	79.85	252	1968	4	1	1971	7	31
6110827		BORDEN A	44.27	79.93	227	1966	9	1	1970	3	31
6110HK7		BORDEN STP	44.30	79.90	201	1985	12	1	1992	9	30

Stat Id#		Station Name	Latitude (Degs)	Longitude (Degs)	Elevation (m)	Start Yr	Mo	Dy	End Yr	Mo	Dy
6111143		CAMP BORDEN	44.27	79.90	221	1960	1	1	1966	8	31
6111145		CAMP BORDEN A	44.32	79.90	233	1926	5	1	1928	2	29
6111145		CAMP BORDEN A	44.32	79.90	233	1934	1	1	1945	10	31
6112171		DURHAM	44.17	80.83	384	1882	6	1	1901	10	31
6112171		DURHAM	44.17	80.83	384	1927	9	1	1928	12	31
6112171		DURHAM	44.17	80.83	384	1935	9	1	1937	7	31
6112171		DURHAM	44.22	80.80	384	1947	11	1	1966	9	30
6112171		DURHAM	44.22	80.80	384	1967	4	1	1967	4	30
6112171		DURHAM	44.22	80.80	384	1968	5	1	1986	8	11
6112171		DURHAM	44.18	80.82	384	1986	8	11	1999	7	31
6112350		EUGENIA	44.33	80.55	274	1916	5	1	1969	1	31
6113480		HOLSTEIN	44.05	80.77	407	1953	2	1	1956	4	30
6113480		HOLSTEIN	44.05	80.77	407	1957	1	1	1963	2	28
6113480		HOLSTEIN	44.05	80.77	407	1964	1	1	1965	8	31
6113480		HOLSTEIN	44.05	80.77	407	1966	3	1	1966	4	30
6113510		HOPEVILLE	44.10	80.60	480	1947	11	1	1964	10	31
6121603		CLIFFORD	43.97	81.12	366	1970	6	1	1972	5	31
6129235		WALKERTON	44.12	81.13	244	1902	8	1	1904	2	29
6129235		WALKERTON	44.13	81.15	244	1915	7	15	1971	12	31
6131081		CALEDONIA	43.08	79.95	206	1931	1	1	1966	11	30
6131982		DELHI CDA	42.87	80.55	232	1934	6	1	1999	7	31
6131983		DELHI CS	42.87	80.55	232	1997	6	1	1999	8	31
6133120		HAGERSVILLE	42.97	80.07	221	1948	4	1	1999	8	31
6133121		HAGERSVILLE 2	42.93	80.08	213	1956	7	1	1966	11	30
6133121		HAGERSVILLE 2	42.93	80.08	213	1968	4	1	1968	6	30
6133121		HAGERSVILLE 2	42.93	80.08	213	1969	1	1	1984	10	31
6133855		JARVIS	42.88	80.12	215	1954	5	1	1956	5	31
6134257		KOHLER	42.90	79.87	206	1949	5	1	1967	8	31
6136643		PORT DOVER	42.78	80.22	186	1874	1	1	1924	12	31
6136643		PORT DOVER	42.78	80.22	186	1926	1	1	1930	6	30

Stat Id#		Station Name	Latitude (Degs)	Longitude (Degs)	Elevation (m)	Start Yr	Mo	Dy	End Yr	Mo	Dy
6136643		PORT DOVER	42.78	80.22	186	1931	3	1	1948	12	31
6136643		PORT DOVER	42.78	80.22	186	1950	1	1	1983	12	31
6137730		SIMCOE	42.85	80.27	241	1962	1	1	1986	12	16
6137732		SIMCOE (AUT)	42.85	80.27	241	1992	12	1	1999	9	30
6137735		SIMCOE	42.85	80.35	223	1866	3	1	1874	3	31
6137735		SIMCOE	42.85	80.35	223	1877	1	1	1888	2	29
6137735		SIMCOE	42.87	80.33	223	1920	7	1	1942	12	31
6137735		SIMCOE	42.87	80.33	223	1944	10	1	1961	7	31
6140437		AYR	43.28	80.45	290	1956	5	1	1961	7	31
6140941		BRANTFORD	43.13	80.27	206	1876	1	1	1878	6	30
6140941		BRANTFORD	43.13	80.27	206	1881	4	1	1889	5	31
6140941		BRANTFORD	43.13	80.27	206	1890	1	1	1915	8	31
6140941		BRANTFORD	43.13	80.27	206	1918	1	1	1920	3	31
6140941		BRANTFORD	43.13	80.27	206	1921	8	1	1926	12	31
6140941		BRANTFORD	43.13	80.27	206	1931	2	1	1957	1	31
6140941		BRANTFORD	43.13	80.27	206	1958	3	1	1963	6	30
6140948		BRANTFORD BRANT PARK	43.15	80.30	213	1972	11	1	1973	11	30
6140951		BRANTFORD MORELL	43.15	80.28	198	1959	5	1	1964	10	31
6140954		BRANTFORD MOE	43.13	80.23	196	1960	6	1	1999	9	30
6141095		CAMBRIDGE GALT MOE	43.38	80.37	268	1879	9	1	1898	6	30
6141095		CAMBRIDGE GALT MOE	43.38	80.37	268	1899	1	1	1899	2	28
6141095		CAMBRIDGE GALT MOE	43.38	80.37	268	1904	1	1	1904	7	31
6141095		CAMBRIDGE GALT MOE	43.38	80.37	268	1940	5	1	1940	6	30
6141095		CAMBRIDGE GALT MOE	43.33	80.32	268	1948	4	1	1966	3	31
6141095		CAMBRIDGE GALT MOE	43.33	80.32	268	1968	9	1	1970	6	30
6141095		CAMBRIDGE GALT MOE	43.33	80.32	268	1971	9	1	1994	2	28
6141602		CLIFFORD	43.97	80.97	373	1950	8	1	1967	7	31
6142065		DOON	43.40	80.45	312	1948	5	1	1953	12	31
6142400		FERGUS SHAND DAM	43.73	80.33	418	1939	10	1	1999	8	31
6142402		FERGUS MOE	43.70	80.38	396	1962	11	1	1983	2	28
6142402		FERGUS MOE	43.70	80.38	396	1985	2	1	1999	8	31

Stat Id#		Station Name	Latitude (Degs)	Longitude (Degs)	Elevation (m)	Start Yr	Mo	Dy	End Yr	Mo	Dy
6142627		FULLARTON	43.38	81.20	335	1956	10	1	1967	7	31
6142803		GLEN ALLAN	43.68	80.72	404	1955	8	1	1957	12	31
6142803		GLEN ALLAN	43.68	80.72	404	1958	8	1	1999	4	30
6142990		GRAND VALLEY	43.88	80.35	470	1910	3	1	1917	11	30
6142990		GRAND VALLEY	43.88	80.35	470	1934	5	1	1939	11	30
6142991		GRAND VALLEY WPCP	43.88	80.33	465	1974	5	1	1994	12	31
6143069		GUELPH ARBORETUM	43.55	80.27	328	1975	7	1	1997	8	31
6143083		GUELPH OAC	43.55	80.27	334	1881	5	1	1893	12	31
6143083		GUELPH OAC	43.55	80.27	334	1899	1	1	1962	5	31
6143083		GUELPH OAC	43.52	80.23	334	1962	6	1	1973	11	30
6143090		GUELPH TURFGRASS CS	43.55	80.22	325	1995	10	1	1999	09	30
6144232		KITCHENER	43.45	80.52	343	1914	10	1	1940	12	31
6144232		KITCHENER	43.47	80.45	343	1941	1	1	1956	12	31
6144232		KITCHENER	43.43	80.50	343	1957	1	1	1977	12	31
6144240		KITCHENER CITY ENG 1	43.45	80.48	320	1954	9	1	1961	9	30
6144241		KITCHENER CITY ENG 2	43.45	80.48	320	1961	7	1	1961	9	30
6144245		KITCHENER OWRC	43.40	80.43	282	1962	6	1	1975	6	30
6144475		LONDON A	43.03	81.15	278	1940	7	1	1999	7	31
6144481		LONDON LAMBETH A	42.98	81.22	246	1930	9	1	1941	3	31
6144505		LONDON SOUTH	42.98	81.20	246	1883	3	1	1932	1	31
6145267		MONTICELLO	43.98	80.42	482	1954	10	1	1962	11	30
6145267		MONTICELLO	43.97	80.40	482	1962	12	1	1995	8	31
6145495		MORRISTON	43.47	80.12	305	1948	4	1	1966	7	31
6145502		MOUNT FOREST	43.97	80.75	404	1996	8	1	1999	8	31
6145503		MOUNT FOREST	43.97	80.73	415	1891	10	1	1898	12	31
6145503		MOUNT FOREST	43.95	80.75	415	1915	7	1	1948	12	31
6145503		MOUNT FOREST	43.98	80.75	415	1962	1	1	1986	10	31
6146240		PARIS	43.20	80.42	267	1870	5	1	1870	9	30

Stat Id#		Station Name	Latitude (Degs)	Longitude (Degs)	Elevation (m)	Start Yr	Mo	Dy	End Yr	Mo	Dy
6146240		PARIS	43.20	80.42	267	1884	3	1	1927	12	31
6146240		PARIS	43.20	80.42	267	1929	1	1	1945	10	31
6146240		PARIS	43.18	80.45	267	1967	8	1	1967	10	31
6146711		PRESTON	43.40	80.42	291	1953	5	1	1996	6	30
6146714		PRESTON WPCP	43.38	80.35	273	1970	10	1	1997	2	28
6146939		REDICKVILLE	44.23	80.22	526	1944	10	1	1985	1	31
6148100		STRATFORD	43.42	80.97	363	1865	1	1	1874	3	31
6148100		STRATFORD	43.38	81.00	363	1877	1	1	1888	12	31
6148100		STRATFORD	43.38	81.00	363	1894	1	1	1912	6	30
6148100		STRATFORD	43.38	81.00	363	1913	8	1	1913	12	31
6148100		STRATFORD	43.38	81.00	363	1915	8	1	1959	8	31
6148105		STRATFORD MOE	43.37	81.00	354	1959	10	1	1999	8	31
6149380		WATERLOO FIRE HALL	43.47	80.52	317	1973	9	1	1973	10	31
6149380		WATERLOO FIRE HALL	43.47	80.52	317	1974	5	1	1974	10	31
6149386		WATERLOO WPCP	43.48	80.52	328	1962	9	1	1977	10	31
6149386		WATERLOO WPCP	43.48	80.52	328	1979	4	1	1999	7	31
6149387		WATERLOO WELLINGTON A	43.45	80.38	314 (317 after 5/1985)	1970	3	1	1999	10	31
6149625		WOODSTOCK	43.12	80.75	282	1870	2	1	1959	1	31
6149625		WOODSTOCK	43.13	80.77	282	1959	2	1	1999	9	30
6152661		GALT OSMOND	43.33	80.17	270	1965	6	1	1973	1	31
6152661		GALT OSMOND	43.35	80.17	270	1973	2	1	1978	3	31
6152691		GEORGETOWN	43.63	79.92	274	1882	3	1	1958	4	30
6152691		GEORGETOWN	43.65	79.95	274	1958	5	1	1966	10	31
6152695		GEORGETOWN WPCP/WWTP	43.63	79.88	221	1962	8	1	1999	9	30
6153192		HAMILTON	43.25	79.95	92	1866	1	1	1874	3	31
6153192		HAMILTON	43.25	79.95	92	1876	1	1	1888	4	30
6153192		HAMILTON	43.27	79.90	92	1897	9	1	1904	5	31
6153192		HAMILTON	43.27	79.90	92	1905	1	1	1906	3	31
6153192		HAMILTON	43.27	79.90	92	1906	10	1	1929	12	31

Stat Id#		Station Name	Latitude (Degs)	Longitude (Degs)	Elevation (m)	Start Yr	Mo	Dy	End Yr	Mo	Dy
6153192		HAMILTON	43.27	79.90	92	1938	5	1	1958	8	31
6153194		HAMILTON A	43.17	79.33	237	1959	11	1	1999	10	31
6153300		HAMILTON RBG	43.28	79.88	102	1950	4	1	1997	10	31
6158350		TORONTO	43.63	79.40	113	1850	1	1	1999	8	31
6158733		TORONTO INT'L A	43.63	79.63	173	1937	11	1	1999	10	31

2.1.3 Missing Daily Climate Station Data

Tables of missing climate station data have been prepared for the daily temperature and precipitation parameters, as well as the freezing rain flag (see Appendix A). In an analysis of climate data involving sums and averages, certain rules, as described by the Canadian Climate Centre, would be used. These rules were used to decide what months of data should be considered missing. In the case of daily temperature, a month of data was considered to be missing if more than five daily observations were missing (or if more than three consecutive daily values were missing). A month of precipitation data was deemed to be missing when any daily values were missing, or if there were more than four consecutive days with an “C”, “F”, or “L” flag. A month of data for the freezing rain flag was considered to be missing only if all daily values were not available. The tables are meant to be a quick reference guide only, and the actual datasets should always be checked to determine the exact amount of data missing in any given month.

2.2 Hourly Meteorological Data

Hourly temperature and rainfall data was also requested for the period 1930-1959. However, this data is only available from the National Climate Archive after 1953 and for a limited number of stations. Hourly data before this period is available from microfiche, and extensive effort would be required to either provide paper copies of the original daily observation sheets or computer entry of the data.

Hourly dry bulb temperatures and hourly rainfall amounts were therefore extracted from the Climate Data Archive to update the Grand River Conservation Authority’s existing datasets. The data consists of numeric values and one-character flags. (All data is from a quality-controlled archive.) It is written in the standard archive format (4 digit year) or 186 character (ASCII) format and is also provided on the CD accompanying this report. The filenames provided are *station_hrl.txt*, where *station* is one of the names that is listed in Table 2. The climate stations providing data for each of the files is also given in the table.

TABLE 2
Climate Stations Providing Hourly Rainfall and Dry Bulb Temperature Data

STATION Name in Filename	**Climate Stations Providing Hourly Data - Name and Climate ID Number**
toronto_intl	Toronto Int’l Airport 6158733
hamilton	Hamilton Airport 6153194
mt_forest	Mount Forest 6145503 and 6145504
simcoe	Simcoe 6137730 Simcoe (AUT) 6137732
waterloo	Waterloo Wellington Airport 6149387

All applicable flags are also included for the rainfall. The flags are used to indicate special information regarding the data.

H Freezing
I Unadjusted
J Freezing and unadjusted

Therefore, the format for a data record is as follows:

```
                                               Data repeated
|  Stn id      |Year|Mo|Dy|Elem|S|Value  |F|  ............24 times
```

where the fields are defined as follows:

Abbreviation	Length	Field	Data Type
Stn ID	7	Station Identification	Alphanumeric
Year	4	Year of data	Numeric
Mo	2	Month of data (i.e. 01=Jan., etc.)	Numeric
Dy	2	Day of data	Numeric
Elem	3	Element Number	Numeric
S	1	Sign of Data	'–' = negative ' ' = positive
Value	5	Data Value	Numeric
Flag	1	Data Flag	Alphanumeric

where elements include:

078 = Dry Bulb Temperature	(Units: 0.1° C)
123 = Hourly Rainfall	(Units: 0.1 mm)

All values for an element over the period of a record are given before values for the next element are specified. (In the case of the *mt_forest* and *simcoe* files, temperature data is given for each of the two stations in each file, followed by the hourly rainfall data for each of the two stations in each file.)

3.0 Defining Drought

The term drought has always been difficult to define. Its meanings often differ between individuals, depending on how the water shortages impact on their lives. A general definition for drought is:

> "A prolonged period of abnormally dry weather producing a moisture shortage that affects crops and forests, and reduces water resources to a degree, thus creating serious environmental, economic or social problems." (Koshida, 1992).

The one aspect which is thus universal to all definitions is the lack of moisture that is basic in a drought.

Three basic types of droughts can be defined, which may occur either separately or simultaneously. A ***meteorological drought*** is defined in terms of a significant precipitation departure from normal over a prolonged period. Three months of precipitation shortfall is normally considered to be the shortest period that can be identified as a drought. ***Agricultural droughts*** link the characteristics of meteorological droughts to the impacts on livestock and crop growth. A ***hydrological drought*** is concerned with the effects of precipitation deficiencies on regional water resources. As a longer period of time is required before these are observed, a hydrological drought normally lags the occurrence of meteorological and agricultural droughts.

All droughts differ in three important aspects: intensity, duration and spatial coverage. In an attempt to compare the severity of droughts, various drought indices have been developed (see Section 6.0). However, no universal drought index has yet to be created. Defining specific onset and termination dates of droughts has also proven to be difficult. Droughts develop slowly and can persist for seasons or years. Finally, the area covered by different droughts can vary substantially. The largest areas affected by drought in the 20th century occurred during 1934, when southern Canada and more than 65% of the United States experienced extreme drought. This contrasts with other years when drought was observed on a smaller regional scale.

4.0 A Descriptive Overview of the 1930s, 1960s and 1990s Droughts

The term "Dirty Thirties" is often used to describe the widespread drought conditions that afflicted large areas of the U.S. and Canada during the 1930s. Southern Ontario was one of the regions hard hit by the dry 1930s. Although the majority of the years during this decade observed drought conditions, 1933, 1934 and 1936 were considered to be the most devastating for agricultural crop losses. This was particularly true in 1936 when the deadliest heat wave in southern Ontario's history was recorded. Mid-July temperatures soared to the 40°C mark in several locations, setting maximum temperature records that remain unbroken to this day. It was reported that the heat was responsible for more than 550 deaths in Ontario. Over 225 of these casualties were in Toronto alone. The majority of the victims were the elderly, ill and very young who succumbed to heat prostration. Some of the deaths were attributed to heart attacks suffered by those who tried to escape the heat by entering the cold waters of Lake Ontario. Agriculture was particularly hard hit. Crops wilted and production was reduced by 25 percent. The intensity of the heat was such that fruit literally baked on the trees in the Niagara Peninsula.

Although of a shorter duration, drought experienced in the 1960s also seriously impacted water resources. This was especially true in 1963 and 1964. When wells in farming communities dried up, tank cars and trucks were used to supplement water supply for human and livestock use. Crops suffered, with soybean and corn production drastically cut. In the spring and autumn, 1964, Great Lakes water levels fell to extreme lows. The economic impact from this alone was estimated to exceed $100 million, with the majority sustained by the shipping industry.

Above-normal temperatures made weather headlines over southern Ontario during 1998 and 1999. The duration of the warmer weather is particularly evident from Toronto's Pearson Airport weather records. As of February, 2000, average monthly mean temperatures at this site have been above normal since November, 1997. These warm temperatures are part of a global warming trend, where the 1990s were the warmest decade dating back to 1860. In contrast to the above-normal temperatures, however, precipitation over southern Ontario was below normal in 1998 and 1999.

The consequences of the recent temperature and precipitation trends have had a tremendous impact on southern Ontario water resources. By the end of 1999, water levels in all the Great Lakes had fallen below the 80-year average. Lower-than-normal precipitation, reduced streamflow runoff and increased evaporation due to warmer temperatures have also resulted in a record rate of their emptying. Inland river, lake and well water levels have been significantly affected as well. During 1998, the Grand River Conservation Authority reported that the summer natural flows at Cambridge on the Grand River would have dropped to their lowest values in 60 years. The natural river flow neglects additions by upstream multi-purpose reservoirs which heavily augmented flows in the Grand River in 1998 (GRCA 1998).

5.0 Data Analyses

5.1 Stations Selected and Data Preparation

Stations within, and just outside, the Grand River Basin boundaries were chosen for the data analyses. Station data was selected to include all available data for the period September, 1909 to August, 1999. However, due to the length of record being analysed, more than one station often had to represent the analysed site, or supplement missing data from the main analysis station (see Table 3). Data gaps were also filled by assessing information from nearby climate stations, selected from Table 1. Using Canadian Climate Centre rules, a month of precipitation data is considered to be missing in any sum/average data analyses if any daily precipitation value within the month is missing. The annual precipitation total is also considered to be missing if any monthly value within the year is missing. Therefore, the filling of missing precipitation data values was a necessary step in providing as much monthly/annual data as possible. Examples of this procedure included the use of precipitation data from Cambridge-Galt MOE to fill data missing from the Kitchener site, and the use of Fergus MOE precipitation data to fill missing values from Fergus Shand Dam. No attempt was made to fill longer data gaps if no additional climate station data was in the immediate vicinity: for example, climate data from the month of September, 1959 in Stratford was left as missing. A similar procedure was used to complete temperature data wherever possible.

Table 3 lists the main climate stations used in the analyses. An additional station, Proton, is also given, but is only used in the water budget calculations of this report. Figure 1 displays the location of these stations.

Figure 1
Location of Main Climate Stations Used in the Data Analyses

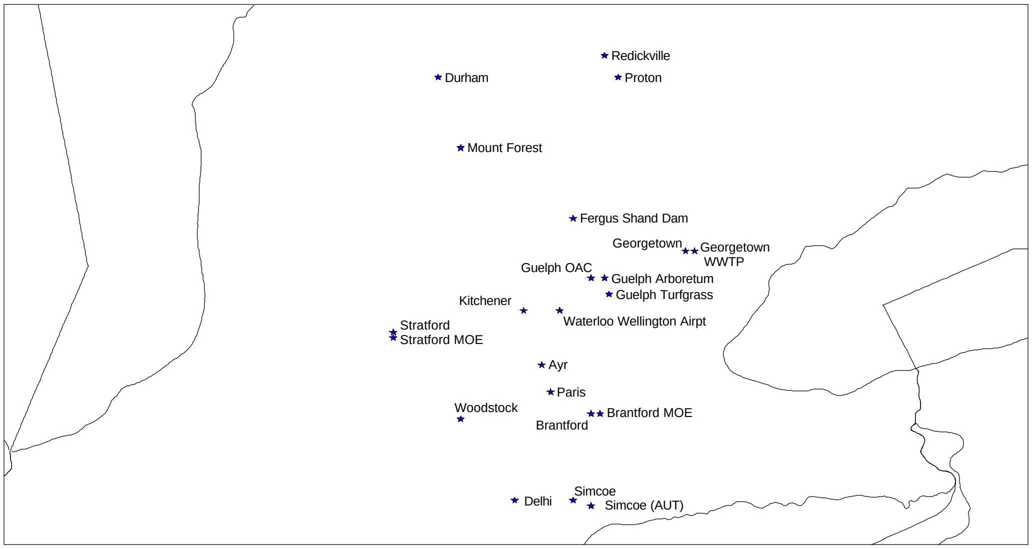

TABLE 3

Climate Stations Used in the Data Analyses

Station Name(s) in Report Charts/Tables (*Analysis Years*)	**Primary Stations Included in Data Analysis**	**Stat Id#**	**Latitude (Degrees)**	**Longitude (Degrees)**	**Data Years**
BRANTFORD	Brantford	6140941	43.1	80.3	1909-1915
(1910-1999)					1921-1926
					1931-1956
					1959-1961
	Paris	6146240	43.2	80.4	1915-1921
					1927-1931
	Ayr	6140437	43.3	80.5	1956-1959
	Brantford MOE	6140954	43.1	80.2	1962-1999
DELHI/SIMCOE	Simcoe	6137735	42.9	80.3	1920-1934
(1921-1999)	Delhi CDA	6131982	42.9	80.6	1934-1997
	Simcoe (AUT)	6137732	42.9	80.3	1997-1999
FERGUS SHAND DAM	Fergus Shand Dam	6142400	43.7	80.3	1939-1999
(1940-1999)					
GEORGETOWN	Georgetown	6152691	43.6	79.9	1909-1966
(1910-1999)	Georgetown WPCP/WWTP	6152695	43.6	79.9	1978-1999
GUELPH	Guelph OAC	6143083	43.6	80.3	1909-1973
(1910-1999)	Guelph Arboretum	6143069	43.6	80.2	1975-1997
	Guelph Turfgrass CS	6143090	43.5	80.2	1997-1999
KITCHENER/	Kitchener	6144232	43.5	80.5	1914-1971
WATERLOO-WELLINGTON	Waterloo Wellington Airport	6149387	43.5	80.4	1972-1999
(1915-1999)					
MOUNT FOREST/	Mount Forest	6145503	44.0	80.8	1915-1948
REDICKVILLE/DURHAM					1962-1979
(1916-1999)	Redickville	6146939	44.2	80.2	1948-1961
					1979-1986
	Durham	6112171	44.2	80.8	1986-1996
	Mount Forest	6145502	44.0	80.8	1996-1999
STRATFORD	Stratford	6148100	43.4	81.0	1909-1959
(1910-1999)	Stratford MOE	6148105	43.4	81.0	1959-1999
WOODSTOCK	Woodstock	6149625	43.1	80.8	1909-1999
(1910-1999)					
PROTON	Proton	6116750	44.2	80.5	1970-1999
(1970-1999)					

(Note that the “analysis year” referred to in the above table represents the hydrological year September to August. For example, the year 1939 refers to September, 1938 to August, 1939 inclusive. The “data year” is the normal January to December year. The terms “analysis” and “data” years used in this report will follow this convention.)

5.2 Annual Data Time Series

Time series of annual temperatures, total precipitation and rain/snow data are provided in Appendix B for the nine main analysis stations. The years plotted on these charts are analysis years, as described in Section 5.1. All graphs include the 1961-1990 normal values for comparison purposes. The only exception is Georgetown’s temperature graph. Due to significant gaps in temperature data, no normals are calculated for this period. The Mount Forest/Redickville/Durham composite charts show two normals. A Durham station normal was plotted for the period from 1987-1996 when Durham climate data was analysed. A Mount Forest normal represents the remaining years when Mount Forest and Redickville data were available. As there was no significant difference between the two station normals, Mount Forest’s value was used in the analyses. The Delhi/Simcoe 1961-1990 normals were also found to be very similar, so that the Delhi normal which was plotted represents both stations well. As described in Section 5.1, efforts were made to complete both temperature and precipitation datasets. However, as the gaps in the data plots show, a significant number of missing years of the parameters still exist.

The graphs show considerable interannual variability in the values. Although the figures are self-explanatory, two features of particular importance should be discussed. In 1937, precipitation amounts were well above normal at all stations, except Kitchener. This 1937 value has been, in fact, the highest annual value recorded at Brantford since 1910, the start year of the analysis. Although Kitchener’s 1937 precipitation was well below normal, it was still considerably higher than values in the three years previous to this, showing a similar trend to that of the other stations. Secondly, annual precipitation at Mount Forest was much below normal from the mid-1920s into the 1930s. The rain/snow graph shows that the annual snowfall showed little change from normal during these years, while the rainfall dipped significantly. Rainfall amounts in 1931, for example, were actually less than the total annual snowfall, a phenomenon that we would not expect, and certainly do not observe at any other station or in any other year.

To remove interannual variability from the data, a 10-year moving means analysis was performed on annual mean temperatures and total precipitation. The results are also displayed in Appendix B. Several decadal trends in the data are now apparent. An upward trend in mean temperatures is observed from the early 1930s into the late 1930s. Temperatures then shifted downward into the early 1940s, before displaying an upward trend again into the early to late 1950s. The trend then reversed with cooling into the 1960s through early 1980s, interrupted by only a slight brief warming trend during the 1970s. Warming started to dominate again during the 1980s and continued into the 1990s. The trend at Mount Forest is, however, somewhat different. After warming in the 1930s, a prolonged cooling trend developed into the 1960s. This was followed by a gradual warming into the 1970s, and then a more significant warming from the 1980s into the 1990s. Total precipitation showed a general downward shift through the 1930s, trending back to normal or above normal through the 1940s and 1950s. Precipitation again dipped downward through the 1960s. A steady increase in annual precipitation through the 1970s into the 1980s is apparent, before showing a decline again during the 1990s. (The apparent upward trend in precipitation during the 1990s at Delhi and Guelph reflects the fact that both of these stations are missing 1997-1999 data. Similarly, the trend analysis for Fergus Shand Dam should be viewed with caution due to large annual data gaps.)

5.3 Annual and Seasonal Data Departures from 1961-1990 Normal during the Drought Years

Annual and seasonal temperature and precipitation departures from 1961-1990 normal were calculated for the main analysis stations for the drought period analysis years. The years included in this analysis and in the remainder of the report are:

1930-1939
1961-1966
and
1997-1999

The seasons referred to in our analyses include the following months:

Autumn:	September-November
Winter:	December-February
Spring:	March-May
Summer:	June-August

for the analysis year that is described in Section 5.1.

Tabular results of the departures from normal calculations are included in Appendix C. Graphical plots of the results are given in Appendix D. Some of the more interesting observations include:

Annual Precipitation

- With the exception of 1932, 1935, 1937 and 1997, drought years were characterized by below-normal to well-below-normal precipitation at all stations.

- Each of the 1932 and 1935 years showed precipitation variability from above to below normal at the stations.

- In 1937 and 1997, all stations observed well-above-normal precipitation values.

- Considerable variability was observed in the year recording the maximum precipitation departure from normal. For those stations with precipitation data for the three drought periods, the years of lowest precipitation values included 1931, 1936 and 1999. No 1997-1999 precipitation data was available for Simcoe or Guelph. Both of these stations recorded their lowest precipitation for the remaining drought years during 1962.

Seasonal Precipitation

- Although the majority of the seasons observed below-normal precipitation during the serious drought periods, there were seasons when precipitation was above normal.

- In 1930, Delhi's winter precipitation was over 96 percent above normal.

- All stations reported above-normal summer precipitation during 1964.

- The winter of 1999 recorded above-normal precipitation amounts at Waterloo-Wellington, Mount Forest and Stratford.

Annual Mean Temperature

- Although most of the years during the 1930s recorded above-normal mean temperatures, some years did have below-normal values. The serious 1934 drought year observed below-normal temperatures at all stations except Delhi. Although 1936 is noted for its summer heat wave, annual mean temperatures were actually just below normal at all stations except Stratford, which was just marginally above.

- Temperatures during the 1961-1966 period varied from above to below normal. In 1963, however, the mean temperatures were below normal.

- All stations with available data had mean temperatures that were well above normal during 1998 and 1999.

- The years of warmest annual mean temperatures were observed in either 1932, 1998 or 1999.

Seasonal Mean Temperature

- Temperatures varied from above to below normal during the autumn and spring drought periods, although the most significant departures were above normal.

- The winter season showed the strongest temperature departures from normal, as well as strong pattern reversals during drought periods.

- Winters from 1930-1933 were warmer than normal, shifted to below normal for three years, and then reversed the trend to warmer than normal through to 1939.

- The winter season during the 1960s showed below-normal temperatures through 1964, with the coldest temperatures during the serious drought year, 1963. Temperatures then climbed above normal again during 1965 and 1966.

- The 1930 summers were almost entirely warmer than normal.

- With the exception of Kitchener/Waterloo, stations observed cooler-than-normal mean temperatures in the summer of 1964.

- Above-normal temperatures were observed in the winter season of 1997 and during all seasons of 1998 and 1999, except in the 1998 autumn.

Annual Maximum Temperature

- Maximum temperatures were almost all above normal during the 1930s.

- Maximum temperatures varied above and below normal during the drought period of the 1960s, with the serious drought year, 1963, cooler than normal at all stations.

- Both 1998 and 1999 had warmer-than-normal maximum temperatures.

Seasonal Maximum Temperature

- Temperatures varied from above to below normal during the autumn and spring drought periods, although the most significant departures were above normal.

- The 1963 drought year was characterized by temperatures just below normal in the autumn, but just above normal during the spring.

- All stations recorded below-normal maximum temperatures during the autumn of 1998. The remaining seasons showed warmer-than-normal temperatures in 1998 and 1999.

- The winter season showed the largest temperatures departures from normal, with trends similar to those observed above for the mean temperatures.

- During the 1930s, the summer maximum temperatures were again almost entirely above normal, but showed a significantly higher departure from normal than the means (i.e. the minimum temperatures were below normal during the summer months, but their departures from normal were less than those observed in the maxima).

- The 1933, 1934, and 1936 years showed the greatest above-normal summer maximum temperature departures from normal.

- In contrast, the cooler-than-normal temperatures of the 1960s showed less of a departure from normal than the means.

- Both the summer maximum and summer mean temperatures of 1998 and 1999 displayed similar above-normal departures.

In addition to these observations, we can also attempt to make an assessment of the severity of the drought years based simply on the precipitation departure from normal data. This procedure would rank the top six drought years as shown in Table 4.

TABLE 4

Drought Severity Based on Annual Precipitation Departure from Normal

Drought Severity Ranking	Drought Analysis Year	Annual Precipitation % Departure from Normal (Maximum 9-station average)
1	1962	-27.0
2	1931	-26.7
3	1936	-26.1
4	1999	-23.9
5	1934/1998	-21.6

The years 1937 and 1997 would be classified as “wet” years with annual precipitation exceeding normal.

However, the occurrence of drought is also strongly dependent on temperature: warmer temperatures give higher evaporation. A ranking of the years with warmest mean temperatures yields the top six drought years as shown in Table 5.

TABLE 5

Drought Severity Based on Annual Mean Temperature Departure from Normal

Drought Severity Ranking	Drought Analysis Year	Annual Mean Temperature Departure from Normal (°C) (Maximum 8-station average)
1	1998	+1.9
2	1932/1999	+1.8
3	1933	+1.3
4	1931	+0.9
5	1937	+0.7

The years 1931, 1998 and 1999 are common to both tables. Based only on these results, we might expect that the drought conditions of 1931 and of recent years were more severe than those experienced during other drought years of the 1930s and 1960s. However, it would still be difficult to assign a number one ranking to any of these years. At best, we can consider this to be a cursory assessment of the potential severity of the droughts. These values represent only annual departures from normal. The pattern of temperature and precipitation distribution during the year is essential in determining drought conditions. An assessment of the monthly water budget is needed and will be addressed in Section 7.0. This should allow a more thorough comparison of the severity of the drought periods.

5.4 Climate Statistics of the Drought Years

Although southern Ontario has endured drought in other years during the 20th century, the droughts of the 1930s, 1960s and recent 1990s were considered to be the most serious and prolonged. In an attempt to put each of these periods in perspective, tables of climate statistics are presented in Appendix E. Precipitation and temperature data was analysed for selected stations and for the period of record specified in each of the tables.
To account for the differences in climate normal values between Mount Forest and Durham, an adjustment factor was applied to the Durham data for the 1987-1996 period. The precipitation data was simply multiplied by the ratio of the Mount Forest to Durham normal. The temperature data was adjusted by the difference in the normal means between the two stations. Some of the more interesting observations from these tables are summarized below.

Maximum Temperature and Date of Occurrence/Extreme Maximum Temperature
With the exception of Kitchener, all stations with temperature data available during the 1930s recorded their extreme maximum temperatures in July, 1936. Several other years during the 1930s also experienced higher maximum temperatures than those of the drought years of the 1960s or recent 1990s. Fergus Shand Dam recorded its highest maximum temperature in 1988: another year noted for drought conditions over southern Ontario.

Number of Times Maximum Temperature Equaled or Exceeded 30°/35°/40° Celsius
The number of occurrences of maximum temperatures equaling or exceeding 30°C was greatest at all stations during the drought period of the 1930s. During the drought years of the 1960s, temperatures equaled or exceeded 35°C only once, during 1966 at Georgetown. Similarly, the recent drought years observed temperatures equaling or exceeding 35°C on just three occasions during 1999. Temperatures equaled or exceeded 40°C on five dates in July, 1936 at Brantford, and on three dates at Delhi.

Maximum Number of Days between Precipitation Events
The longest period of consecutive days having less than 0.2 mm of precipitation per day was 34 days at Georgetown in summer, 1936. The most consistent and longest dry period sustained by all stations occurred in October, 1964 and lasted between 21 to 27 days. With the exception of Delhi, the infamous 1936 heat wave occurred in the midst of that year's longest dry spell. Prolonged dry periods do not always occur during the summer months in drought analysis years. In 1999, for example, the lengthiest dry periods occurred in March and late-April.

Rankings of Driest Years

Considerable variability in station rankings was normally observed during each drought year. Even the dry 1930s experienced a wet year, 1937. This is the number one ranked wet year for Brantford, and ranks in the top seven wettest years for four other stations. Three stations ranked their driest years in either 1998 or 1999. At the other stations, the number one rated dry years occurred in 1931, 1936 and 1962. Only Guelph did not report either its 1st or 2nd ranked dry years during the drought years. However, no analysis was possible for Guelph during the recent dry years, due to significant amounts of missing precipitation data. For the remaining three stations located within the Grand River Basin, the ratings were all in the top eight during 1998 and 1999.

Rankings of Years with Least Snowfall

As was observed with the dry year rankings, there is considerable variability in the least snow rankings. Although Mount Forest reported its 5th wettest year in 1937, it was also the year that the station reported the least snowfall. The 1938 year ranked 2nd for least snow, but was the 26th driest year. Delhi is the only other station to receive a number one least snowfall ranking during a drought year: 1964. In contrast, the 1930 year at Delhi is ranked as the year with the most snowfall, with another drought year, 1939, ranked 2nd. Similarly, at Brantford, the 2nd and 3rd ranked most snowfall years occurred in 1965 and 1930, respectively.

Rankings of Years with Driest Springs

The drought year, 1962, recorded the driest springs at Delhi and Guelph. As with the other precipitation rankings, ratings varied substantially between stations during the drought years. However, 1962 was perhaps the most consistent year with no ranking lower than 11th.

Rankings of Years with Driest Summers

Four stations had number one rankings during either 1934 or 1936. No stations reported number one ratings during the 1960s or 1990s. In fact, during the 1999 year, only Woodstock had a ranking within the top ten dry summers.

Rankings of Years with Highest Average Annual Mean Temperature

Despite the summer heat wave in 1936, this year’s mean temperature ranked towards the cooler values. The 1932, 1998 and 1999 years recorded the warmest annual mean temperatures, with rankings generally in the top five, and the lowest rating of 11th at Georgetown in 1999. In contrast, the 1961-1966 period had mean temperatures ranking towards the cooler values.

Rankings of Years with Highest Average Summer Maximum Temperature

In contrast to the annual rankings, 1932 has no ranking warmer than 30th. Although 1936 experienced an intense heat wave in July, the summer ranked from 3rd to 16th for highest average summer maximum temperature. Both Simcoe and Mount Forest experienced their warmest values in 1933. Both the 1933 and 1936 years ranked consistently warm with no rating cooler than 16th. The 1961-1966 summer period had maximum temperatures ranking towards the cooler values. In 1999, Woodstock's 8th rating was the only ranking in the top ten in either 1998 or 1999.

Rankings of Years with Highest Average Summer Mean Temperature

Stratford was the only station to have a top rating in this category during a drought analysis year, 1933. As was observed with the summer maximum temperatures, the 1961-1966 summer mean temperatures ranked towards the cooler values and 1932 also had no ranking warmer than 30th.

6.0 Cumulative Precipitation Index Calculations

In an attempt to quantify or rank drought conditions, numerous drought indices have been developed. These indices have proven to be effective tools in the detection and subsequent monitoring and analysis of drought. An in-depth description of drought indices is provided in Mather (1985) and Hayes (1999). The Palmer meteorological drought severity index (PDSI) and Palmer hydrological drought index (PHDI) are two of the best known and most widely used indices. Both indices are routinely calculated in Canada and the United States to provide information on crop and hydrological moisture. A newer index, the Standardized Precipitation Index, is also being used by the U.S. National Drought Mitigation Center to quantify drought in the United States. The cumulative precipitation index (CPI) is another simple and reliable index that can be calculated on a regular basis for use by water supply managers. Precipitation data is used solely in the CPI calculation. Consequently, in this report, this index was chosen to be computed for the analysis stations during the drought period years.

Under non-drought conditions, the CPI compares an eight week accumulation of daily precipitation values with normal totals for the same period. The resulting ratio is expressed as a percentage. If this percentage is 60 percent or greater, the CPI calculations continue, with the first week dropped from the computations and a new week added to the end. However, using Mather's (1985) convention, drought warning conditions are reached when at least eight weeks of accumulated precipitation is less than 60 percent of normal precipitation, while drought emergency conditions are reached when the precipitation falls below 40 percent of normal over at least an eight week period. If either of these conditions occur, the calculation of the index changes. The original period is not removed from the calculations, and the cumulative interval is then extended beyond eight weeks by adding a new one week period at the end. Computations persist, at additional one week intervals, until the computed percentage is again above the 60 percent threshold, i.e. enough precipitation has fallen to raise the cumulative precipitation for the entire period of accumulation to at least 60 percent. The computation then returns to the normal eight week accumulation until drought warning conditions are again reached.

Cumulative precipitation computations were performed for the nine analysis stations listed in Table 6. The weekly station normals were calculated using all available data during the station analysis years. Results for all drought warning conditions during the drought period years are presented in Appendix F. Table F-1 in Appendix F can be used to assist in identifying the weeks listed in the CPI tables. The CPI calculations are also displayed graphically in Appendix G.

Periods of a minimum of 17 weeks for which the CPI values were at drought or emergency warning level are given in Table 6. All of the prolonged drought periods spanned part or whole summer seasons. The most extensive periods occurred during the early 1930s with Mount Forest reporting CPI values below 60 percent for a 38-month period from 1930 to 1933. Based on the CPI values alone, the early 1930s would have to be ranked as the most serious drought years. However, as was noted in Section 5.3, we will still need to consider the complete water budget. This will be discussed in the next section.

TABLE 6

Prolonged Periods for which Cumulative Precipitation Index is Less than 60% of Normal (Minimum 17-week duration)

Station	**Start Week**	**End Week**
Brantford	Jun 15 - Jun 21, 1930	Mar 23 - Mar 29, 1931
	Apr 27 - May 3, 1933	Nov 3 - Nov 9, 1933
	Apr 20 - Apr 26, 1936	Sep 29 - Oct 5, 1936
	Jun 8 - Jun 14, 1998	May 25 - May 31, 1999
Delhi/Simcoe	Jun 15 - Jun 21, 1930	Feb 9 - Feb 15, 1931
	Jan 19 - Jan 25, 1962	Jul 27 - Aug 2, 1962
	Sep 8 - Sep 14, 1963	Apr 20 - Apr 26, 1964
	Aug 24 - Aug 31, 1964	Apr 13 - Apr 19, 1965
Fergus Shand Dam	None	None
Georgetown	Jun 22 - Jun 28, 1930	Jun 15 - Jun 21, 1931
	Jul 20 - Jul 26, 1931	Apr 27 - May 3, 1932
	Feb 16 - Feb 22, 1934	Dec 29, 1934 - Jan 4, 1935
	Jul 20 - Jul 26, 1935	Dec 29, 1935 - Jan 4, 1936
	Jun 8 - Jun 14, 1936	Dec 22 - Dec 28, 1936
	Aug 10 - Aug 16, 1939	May 4 - May 10, 1940
	Jul 6 - Jul 12, 1998	Dec 22 - Dec 28, 1998
Guelph	None	None
Kitchener/ Waterloo-Wellington	Jun 22 - Jun 28, 1930	Feb 9 - Feb 15, 1931
	Jan 12 - Jan 18, 1934	Jul 6 - Jul 12, 1935
	Jul 20 - Jul 26, 1935	Jun 8 - Jun 14, 1936
	Jul 6 - Jul 12, 1937	Jan 19 - Jan 25, 1938
	Jun 29 - Jul 5, 1998	Dec 22 - Dec 28, 1998
Mount Forest/Redickville	Feb 9 - Feb 15, 1930	Apr 20 - Apr 26, 1933
	Feb 9 - Feb 15, 1934	Nov 10 - Nov 16, 1934
	Jul 6 - Jul 12, 1960	Feb 16 - Feb 22, 1961
Stratford	Aug 10 - Aug 16, 1939	Jan 19 - Jan 25, 1940
Woodstock	Jun 8 - Jun 14, 1930	Jun 22 - Jun 28, 1931
	Apr 20 - Apr 26, 1933	Oct 13 - Oct 19, 1933

7.0 Water Budget Calculations

7.1 Introduction

Our analysis of the southern Ontario drought periods has focused on the meteorological parameters of daily mean temperature and total daily precipitation at selected stations. However, in an attempt to simulate the moisture conditions over southern Ontario during the drought periods, it is important to model the water balance during these years. Evaporation is an essential part of this balance. Evaporation pan data is not available from the basin’s meteorological data network prior to 1959. The scarcity of this data past 1959 also necessitates its calculation through a model. In the water budget model that we use, temperature and precipitation are used as input to the water balance in determining evapotranspiration, moisture deficits and surpluses. An analysis of the computed station water budgets will allow us to better understand the relative severity of the droughts.

7.2 The Water Budget Model

The water budget procedure used in our calculations is a modified Thornthwaite and Mather (1955) approach, with an additional snowmelt model added. The model, which has been used by the Canadian Climate Centre, is described by Johnstone and Louie (1984). The meteorological input data to the model consists of daily values of mean temperature and total precipitation. The only additional input parameters required are station latitude, as well as an estimate of the station’s soil water holding capacity. Despite the minimal meteorological data requirements, the model requires complete annual datasets of these variables.

For each model year run, the monthly components of the water budget are output, based on the accumulated daily computations during the period. The monthly water budget components include:

TEMPERATURE: The mean monthly temperature is computed from the input mean daily values.

PRECIPITATION: Total monthly precipitation (rain and snowfall water equivalent) is a summation of the input total daily precipitation values.

RAIN: Total monthly rainfall is computed from the daily rainfall values. The daily precipitation is considered to be rainfall if the mean daily temperature is above -1°C.

SNOW: Total monthly snowfall is computed from the daily snowfall values. The daily precipitation is considered to be all snow if the mean daily temperature is less than or equal to -1°C. These daily snow values are then added to the snowpack or snow storage variable, which is the SNOW term displayed in the water budget output.

SNOW MELT: Total monthly snowmelt is the sum of the daily snowmelt values, calculated only if there is snow on the ground, and the mean daily temperature is greater than 0°C.

POTENTIAL EVAPOTRANSPIRATION (PE):

Total monthly potential evapotranspiration is the sum of the computed daily values. Potential evapotranspiration is defined as the amount of moisture that would be lost to the atmosphere through evaporation and plant transpiration, given optimum moisture conditions or soil continuously at its water holding capacity. To determine daily values of this term, the model uses the empirical formula developed by Thornthwaite:

$$PE = ADJ * 0.553(10T_d/I)^A$$

where ADJ is an adjustment factor that uses the station latitude to correct for day length;
T_d is the daily mean temperature;
I and A are Thornthwaite parameters.

ACTUAL EVAPOTRANSPIRATION (AE):

Total monthly actual evapotranspiration is the sum of the computed daily values. Actual evapotranspiration is defined as the amount of moisture actually being lost to the atmosphere through evaporation and plant transpiration.

When the total available water from rainfall and snowmelt equals or exceeds the potential evapotranspiration for the period, the actual evapotranspiration equals the potential evapotranspiration. Any excess available water is then used to recharge the soil storage.

However, when the demands for water are such that the potential evapotranspiration exceeds the total available water from rainfall and snowmelt, water must then be withdrawn from the soil storage. The actual evapotranspiration in this case is the sum of the rainfall, snowmelt and moisture withdrawn from the soil.

MOISTURE SURPLUS:

When the actual evapotranspiration equals the potential evapotranspiration, and the soil storage is restored to its water holding capacity, any excess water is the moisture surplus. This surplus water is effectively runoff that cannot be recovered by the model for future use.

MOISTURE DEFICIT:

If evaporative demands are still not satisfied after water has been withdrawn from the soil storage, a moisture deficit is created. This term is then the difference between the potential evapotranspiration and the actual evapotranspiration.

SOIL MOISTURE STORAGE:

If soil moisture must be withdrawn in an attempt to meet evaporative demands, the withdrawn amount is taken from the existing soil moisture storage. However, when rainfall and snowmelt are sufficient to meet the water requirements, excess water will be added to the soil storage until the soil's water holding capacity is attained.

Soil water holding capacities that may be used in this model include:
280 mm - clay soils
200 mm - clay/loam soils
150 mm - sand/loam soils
100 mm - sandy soils

The 100 mm water holding capacity is used in our model runs so that comparisons may be made with normal water budget profiles that are based on this value (see Section 7.3). In the two soil layers assumed in the model, the upper layer has a maximum water retention of 100 mm, while the lower layer has 60 percent of this capacity, or 60 mm.

It should be remembered that certain computational errors are introduced to the water balance components due to various assumptions made in the model. As a result, the model output values, in particular those of surplus and deficit, should always be used qualitatively as a predictor of trends, rather than quantitatively.

7.3 Water Budget Normals

Using the above-described water budget model, MacIver and Whitewood (1992) prepared profiles of the average water budget for Canadian stations, using available data for the period 1968-1988. A soil-holding capacity of 100 mm (sandy soils) was assumed for all stations, giving a standard reference for station profiles. Available data during the twenty-one year period was used to calculate long-term averages of mean monthly temperature and precipitation. These parameters were then used as input to the water balance model. This procedure maintained consistency in the month to month changes in water deficiency and surplus occurring throughout the year.

Eight station profiles were selected from their work. These are presented in Appendix H. Seven of these stations corresponded to stations used in this report's drought period analysis. An additional station, Proton, was also available for the recent drought years. This station is located north and east of Mount Forest and at a slightly higher elevation, 480 metres compared to 414 metres. Proton is used as an extra station to represent the northern/headwater region of the basin. As Guelph and Georgetown climate stations closed and reopened as new stations during the 1968-1988 period, no normals were available. The remaining eight profiles will be used as the normals against which select drought period water budgets computed in this report can be compared.

7.4 Water Budget for Southern Ontario Drought Years

The above-described water budget model was used to compute the water budget for our selected analysis stations over years that included the drought periods. The model runs on a standard "January-December" year, and not the hydrological year that has been referred to in other sections of this report. Although every effort was made to complete missing daily mean temperature and precipitation values, especially during the drought period years, significant data gaps longer than one week could not be filled and consequently the model was not run for the station affected during these years. For the recent 1999 year, quality-control archived climatological data was available only through August at the time of the water budget runs, so the 1999 water budget is incomplete. (Exceptions to this are Brantford's, Guelph's and Kitchener/Waterloo's water budgets. Please see applicable comments in the footnote of Table 8.)

Where possible, the water budget model was run from the year 1920. Years before 1920 were not included, as data gaps in both temperature and precipitation became more frequent prior to the 1920s. The model was run with at least one year lead time before results were included in this report. This led to the exclusion of some water budget model runs during drought years. Some important examples of this include:

- Significant gaps in both the precipitation and temperature records for Georgetown resulted in the model not being run for this station during the drought periods.

- The model could not be run for Simcoe during the 1997-1999 drought years. No precipitation data is available from the automated Simcoe station.

- Kitchener had a missing month of precipitation data in 1931, a missing month of temperature data in 1937, and two monthly gaps in both precipitation and temperature data during each of 1938 and 1939. Consequently the model was run for 1930 and then “restarted” with 1932 data to give results for 1933-1936.

- Mount Forest had large gaps in the 1933 precipitation data. The model was run for 1930-1932 and then “restarted” with 1934 data to give results for 1935-1939. One month of temperature data and another month of precipitation data was missing during 1961. The model was run starting in 1962, giving results for 1963-1966.

- Woodstock had a significant number of missing daily precipitation values in 1961 and 1962. In 1963, the entire month of precipitation data was missing in June. As a result, only water budget results for 1965 and 1966 were computed, using 1964 as the model start year.

Available drought period tabular output from the water budget model for selected analysis stations is provided in Appendix I. This output is for the stations and model year runs listed in Table 7.

A summary of station water deficits and surpluses for drought period data years is provided in Table 8. MacIver and Whitewood’s (1992) long-term normals are included in this table for comparison with the observed drought year values. Based on the water balance output, the 1930, 1933, 1934, 1936, 1963, 1998 and 1999 drought years were chosen as being the most serious during their respective drought periods. Consequently, water budgets for these years were plotted for the available stations. The years 1931 and 1932 were also plotted for Mount Forest, as these were identified as serious drought years for this station. The results are displayed in Appendix J, and may be compared to MacIver and Whitewood’s (1992) normals in Appendix H.

TABLE 7

Drought Years of Water Budget Model Output
(Based on Available Station Data)

Station	Drought Years of Water Budget Model Output
Brantford	1930-1939; 1961-1966; 1997-1999
Delhi/Simcoe*	1930-1939; 1961-1966
Fergus Shand Dam	1997-1999
Guelph	1930-1939; 1961-1966; 1997-1999
Kitchener/Waterloo	1930, 1933-1936; 1961-1966; 1997-1999
Mount Forest/Redickville	1930-1932, 1935-1939; 1963-1966; 1997-1999
Proton	1997-1999
Stratford	1930-1939; 1961-1966; 1997-1999
Woodstock	1930-1939; 1997-1999

* 1997-1999 water budget model output not available due to missing station data within period

TABLE 8

Annual Water Deficit (*Water Surplus*) Values (mm) as Output from the Water Budget Model for Drought Period Years

STATION	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1961	1962	1963	1964	1965	1966	1997	1998	1999 (toAug)	Norm (1968-88)
Brantford	212.6	54.6	23.3	254.8	223.6	103.6	256.6	18.5	202.0	144.4	103.5	22.2	208.2	45.1	105.0	107.4	35.1	329.7	102.6	83.7
	354.9	*182.5*	*404.2*	*268.2*	*259.4*	*239.5*	*377.2*	*442.8*	*225.5*	*338.0*	*149.8*	*231.4*	*143.8*	*225.2*	*386.1*	*329.4*	*294.4*	*211.1*	_81.3*_	*370.5*
Delhi/Simcoe	224.9	43.0	88.1	297.5	274.4	57.7	234.7	24.1	64.5	155.0	38.2	150.9	128.9	49.7	74.3	120.5	N/A	N/A	N/A	75.3
	423.2	*238.3*	*357.7*	*282.5*	*246.1*	*254.1*	*380.1*	*535.1*	*277.1*	*424.1*	*333.3*	*207.2*	*163.6*	*277.8*	*486.3*	*399.1*				*482.3*
Fergus Shand Dam											N/A	N/A	N/A	N/A	N/A	N/A	70.1	199.6	37.0	64.6
																	342.3	*172.3*	*171.5*	*427.4*
Guelph	138.5	79.5	1.2	174.4	138.0	67.7	175.3	2.0	24.8	195.4	39.0	88.4	141.6	16.0	61.2	120.2	101.6	299.0	59.6	N/A
	301.0	*231.2*	*356.8*	*211.9*	*318.0*	*198.3*	*343.3*	*337.8*	*196.3*	*297.4*	*209.0*	*174.6*	*173.9*	*232.9*	*441.9*	*295.8*	*260.7*	*183.7*	_131.8*_	
Kitchener/Waterloo	172.3	N/A	N/A	193.8	234.5	96.3	176.0	N/A	N/A	N/A	63.5	55.1	182.3	8.5	114.2	99.1	70.4	241.4	94.7	51.5
	288.4			*281.2*	*171.7*	*111.6*	*279.0*				*213.3*	*235.1*	*165.9*	*261.7*	*462.9*	*312.1*	*326.2*	*233.3*	_187.1*_	*417.9*
Mt. Forest/Redickville	303.6	293.6	100.7	N/A	N/A	65.7	107.0	23.8	55.9	75.0	N/A	N/A	46.9	8.3	32.1	10.7	0.0	161.1	16.8	53.6
	193.8	*109.9*	*276.4*			*494.2*	*559.6*	*373.9*	*354.9*	*316.4*			*237.4*	*309.4*	538.5	*342.1*	*607.3*	*272.1*	*295.4*	*450.4*
Proton																	0.0	58.0	30.5	37.2
																	625.5	*291.6*	*312.8*	*530.1*
Stratford	138.1	0.0	17.6	156.8	179.8	42.8	194.5	51.0	123.9	140.1	34.1	37.3	98.7	40.9	38.7	39.9	16.4	211.3	150.3	57.6
	428.6	*472.8*	*468.7*	*295.5*	*377.0*	*374.4*	*454.8*	*394.9*	*260.0*	*323.9*	266.1	*223.6*	*250.0*	*419.4*	*513.9*	*439.1*	*456.6*	*294.7*	*263.3*	*525.9*
Woodstock	204.4	68.4	1.4	232.9	162.5	65.2	89.7	50.0	133.8	143.8	N/A	N/A	N/A	N/A	N/A	N/A	1.0	297.3	181.0	63.3
	215.0	*132.5*	*317.3*	*282.4*	*379.3*	*323.4*	*424.3*	*483.8*	*255.2*	*366.9*							*399.8*	*233.0*	*158.7*	*434.3*

* Missing daily temperature and precipitation data during 1997-1999 for Brantford, Guelph and Waterloo-Wellington was made available in August, 2000. Consequently, the complete 1998 and 1999 water budget output for these three stations is presented in Appendices I and J. The above table records water deficit and water surplus values through August, 1999. For each of these stations, the 1999 water deficit for the year is the same value as that listed above. The 1999 annual water surplus values are 177.7 mm for Brantford, 222.1 mm for Guelph and 187.1 mm for Waterloo-Wellington.

7.4.1 The 1930s

Water budget computations were available for stations that represented all sections of the basin. The year 1930 was marked by very high water deficits, as well as water surpluses that were below to well below normal. This was followed by two years of lower-than-normal water deficits. Surpluses generally fell to lower levels in 1931, but then recovered substantially during 1932. During 1933 and 1934, deficits increased sharply to levels higher than those experienced in 1930, and surpluses fell below normal. Surpluses remained generally similar in 1935, but water deficits improved to below or just above normal. The next year, 1936, saw the “see-saw” battle continue as deficits rose again to the highest in the decade, although surpluses rose significantly as well.

The exception to this was Mount Forest where the drought pattern differed. The 1930 and 1931 deficit values were not only the highest of the decade, but also were significantly larger than those of the serious 1998 drought year. Although deficits lowered considerably by 1932, they still remained much higher than normal. Surpluses in 1930 and 1931 reached extremely low values, well below those of the 1998 drought year. Although surplus recovered somewhat in 1932, it was still significantly below normal and below the higher values experienced in the later years of the 1930s. In fact, these first three years of the 1930s were undoubtedly the worst of the decade for Mount Forest. No computations were available for 1933 and 1934. However, the following two years showed a trend similar to the other stations in deficits, with lower deficits rising to higher values in 1936. The 1936 values still remained well below those of the early 1930s. Surpluses however were actually higher than normal, in contrast to the other stations.

The 1937 year saw a return to wetter conditions at all stations, as was evidenced in the analysis of basin precipitation in Section 5.3. Deficits were lower than normal, while moisture surpluses were greater than normal. However, conditions worsened again in 1938 in Brantford, Stratford and Woodstock with significantly high water deficits and low surpluses. The pattern does not appear to be consistent though. Mount Forest’s water deficit was higher than that of 1937, but was only somewhat above normal, and well below the seriously low values of the early 1930s. Guelph’s 1938 water deficit, if compared to other station normals, is likely still less than normal, while Delhi/Simcoe are also less than normal. The 1938 water surpluses are in agreement at all stations, as they register lower than 1937 values and are well-below-normal values.

In 1939, water surpluses increased across the central and southern portions of the basin, with perhaps a small downward trend in the headwaters. Brantford’s water deficit condition improved somewhat from 1938, but was still well above normal. The water deficit conditions worsened again at the remaining stations, but with the exception of Guelph, remained below the values of the earlier 1930s. Guelph’s water deficit in 1939 was actually the highest of the decade. Drought conditions finally ended in 1940.

During the most serious drought years, moisture deficits were normally observed for a three or four month period, spanning June into September. The longest periods of moisture deficit were observed at Mount Forest: from June through November, 1930 and

June through October, 1931. Moisture surpluses were generally observed from January through April, but with some years showing surpluses again through November and December. During the extremely low surplus year of 1931 at Mount Forest, April recorded nearly all the moisture surplus.

Mean temperatures at all stations during the April-October period were above normal during the serious drought years. However, the remaining two periods showed considerable fluctuations above and below normal during these years. The largest temperature departures from normal were also recorded during the January-March and November-December periods. The April-October drought periods recorded significantly lower-than-normal precipitation at all stations. One notable exception to this occurred at Mount Forest in 1936, where precipitation values were actually just above normal for April-October. Precipitation during the January-March and November-December periods showed considerable variability above and below normal during the serious drought years.

7.4.2 The 1960s

The years 1961 and 1962 experienced much lower-than-normal surpluses with deficit conditions varying above and below normal through the basin**.** The year 1963 saw the maximum water deficits during the 1961-1966 period, as well as the lowest surpluses. Although these deficits were still below those encountered in the 1930s, it is interesting to note that the surpluses were actually lower than those of the worst years of the 1930s.

Moisture conditions improved considerably in 1964. Water deficits fell significantly below normal. Surpluses increased as well, but still remained well below normal. Surpluses returned to normal or above normal in 1965, but fell somewhat below normal again in 1966. Deficits rose significantly above normal again during 1965 and 1966, with the exception of Stratford that remained somewhat below-normal levels. However, these values were all below the maxima attained during 1963. The year 1967 saw a return to non-drought conditions.

Mount Forest, however, was the one exception to the above pattern. Deficits throughout the 1961-1966 period remained lower than normal, and certainly well below those experienced in the 1930s. Surpluses were below normal, except in 1965, but were still much higher than the extreme lows recorded in 1930 and 1931.

During 1963, moisture surplus at the stations was generally limited to the months of February through May. Deficit conditions persisted from July through October. Only Brantford’s surplus period was shifted to the period from January through April, with the deficit conditions starting earlier in June and lasting through October. However, the maximum runoff was still observed in March when it would normally be expected.

Mean temperatures at all stations were below normal during the most serious drought year 1963, with the January-March period showing the largest departures from normal. The only exception to this was Kitchener’s April-October above-normal temperatures. All stations recorded well-below-normal precipitation in each of the three periods in 1963:

January-March, April-October and November-December. (Only Mount Forest's November-December precipitation was just below normal.)

7.4.3 The Recent 1990s

In 1997, moisture conditions at Mount Forest and Woodstock showed abundant surplus with virtually no water deficit. At Fergus Shand Dam and Kitchener/Waterloo, water deficits were somewhat higher than normal while the surplus was lower than normal. Similarly, surplus was below normal at Brantford, Kitchener/Waterloo and Stratford, although the annual water deficit was minimal. These figures are all in sharp contrast to the drought conditions experienced in 1998. It appears evident from the model data that 1998 has been the most serious drought year in the three drought periods of analysis for Brantford, Guelph, Stratford and Woodstock. Deficit conditions at Kitchener/Waterloo were similar to those experienced during 1934, with only somewhat higher water surplus. Although we have no record from Fergus Shand Dam as it was not built until after the dry 1930s, the 1998 water balance also shows an occurrence of serious drought conditions. The model output from Mount Forest shows similar conditions in 1998, but its ranking when compared to the drought years of the 1930s differs markedly from the other stations. Mount Forest's water deficits and surpluses were at their most extreme during 1930 and 1931, with 1998 ranking a somewhat distant third compared to these years. In addition, water deficits in the first eight months of 1999 improved more significantly than at any of the other stations.

In our discussion of the droughts of the 1930s and 1960s, we recognized that the drought pattern at Mount Forest differed from the other stations in the basin/near-basin central and southern stations. Although Mount Forest is located on the northwestern basin boundary, we are assuming that it is representative of the climate of the Grand River's headwaters, as no other stations are available for analysis during this period. Although we have no other climate station in the northern basin for our analysis of the 1930s, we can use Proton's data to analyse the recent drought. Proton's water budget follows a very similar pattern to that of Mount Forest in deficit and surplus trends. However, one major difference is that the 1998 water deficit is much less severe than Mount Forest's. Orography and the effects of Lake Huron and Georgian Bay are substantial influences on the climate in the headwaters of the Grand River Basin. This makes it particularly difficult to accurately assess the moisture conditions over this important region.

Not only were serious moisture deficits observed during 1998 but they also extended over a longer period than those experienced during the 1930s and 1960s. Deficits were reported at all stations from June through October, 1998. This five-month annual deficit period was exceeded only by the drought deficits at Mount Forest from June through November, 1930.

Moisture surplus over most of the basin was also limited to the first three or four months of 1998. Mount Forest and Proton both saw the return of some surplus in December, 1998. Surplus conditions improved somewhat in early 1999, with most stations reporting a surplus for one month longer than in 1998. However, both Mount Forest and Proton reported their maximum surplus in March, one month earlier than is normally expected in the headwater region and when central and southern stations normally experience their highest runoff values.

Mean temperatures at all stations were significantly above normal during 1998 with the January-March period showing the largest departures from normal. All annual precipitation amounts were well below normal. The April-October period observed significantly lower-than-normal precipitation at all stations. Precipitation during November and December was well below normal, except near normal at Mount Forest. The remaining January-March period showed significantly higher-than-normal precipitation at Brantford, Kitchener/Waterloo, Mount Forest and Woodstock, with remaining stations near normal.

7.4.4 Summary of Water Budget Results

Some of the more important observations of the water budget results are summarized as follows:

- All stations exhibited serious drought conditions in 1930, 1933, 1934, 1936, 1963 as well as 1998 and 1999.

- With the exception of Mount Forest, 1998 appears to rank as the most serious drought year since at least 1920.

- At Mount Forest, water deficits and surpluses were most extreme in 1930 and 1931, with 1998 ranked third.

- Water deficits and surpluses can show significant variability from year to year. Even the dry 1930s were characterized by a “wet” year, 1937, where all stations reported lower-than-normal water deficits and near-normal to above-normal water surpluses.

- With the exception of the 1930 drought deficits in Mount Forest, the longest period of deficit was observed in 1998. All stations reported deficits from June through October, 1998. Mount Forest’s deficit period stretched from June through November, 1930.

- The lowest surplus values of the drought periods were observed in 1963, with the exception of Mount Forest’s seriously low values of 1930 and 1931.

- The most serious drought years of the 1930s were characterized by above-normal mean temperatures during April-October. Temperatures varied from above to below normal during the January-March and November-December periods of the 1930s, with the largest temperature departures from normal also observed during these periods.

- The 1963 drought year observed below-normal mean temperatures with the January-March period having the largest departures from normal.

- Mean temperatures at all stations were well above normal during 1998, with the January-March period showing the largest departures from normal. For the available months in 1999, mean temperatures were also significantly warmer than normal.

- During the drought periods of the 1930s, 1960s and 1990s, all stations recorded significantly lower-than-normal precipitation during the April-October period. Precipitation during the January-March and November-December periods fluctuated above and below-normal values.

8.0 Significant Rainfall Events during the Drought Periods

Although one does not normally associate high rainfall events with drought years, precipitation records show that they do indeed occur and at a higher frequency than one might expect. An investigation of station precipitation data over the entire period of record revealed numerous occasions during the drought years of the 1930s and 1960s when one-day rainfall amounts exceeded 30 mm. The events have been rare and less extreme during the recent drought years. Some notable examples of these one-day rainfall events are included in Table 9.

The 103.4 mm reported at Guelph in 1938 is the extreme one-day rainfall amount for Guelph stations, dating back to 1881. Although weather maps were not examined, the temperature data suggests that a strong cold front crossed the region on this date. Kitchener reported 51.3 mm during this event, with Brantford, Woodstock and Stratford recording values ranging from 30-35 mm. To put this event in perspective, Guelph reported two-day rainfall amounts of 151.2 mm as a result of Hurricane Hazel in October, 1954. A one-day rainfall record is certainly not what one might expect to happen during a drought.

Finally, it is interesting to note that in 1938, Guelph reported 282 mm, or 32 percent of its total annual rainfall, on only five dates. Three of these events, occurring on July 31, August 10 and August 31, accounted for 184 mm of the total. The high summer rainfall events allowed the water budget model to reduce Guelph's water deficits to zero in August. However, the high runoff that would likely be associated with such events cannot be adequately handled by a simple water budget model. This is especially true if the rainfall was observed over a relatively short period, rather than distributed over the entire twenty-four hours.

TABLE 9

Significant One-Day Rainfall Events During Drought Years

Station	24-Hour Rainfall Amount (mm)	Date Observed
Brantford	64.5	Aug 17, 1932
	51.6	Sep 12, 1934
Brantford MOE	60.2	Jul 27, 1966
Delhi CDA	55.9	Sep 7, 1934
	43.2	Aug 1, 1964
	65.0	Aug 2, 1964
Georgetown WWTP	58.4	Nov 9, 1962
	60.2	Jul 12, 1964
	68.1	Jul 17, 1965
Guelph OAC	59.7	Jun 1, 1936
	63.5	Feb 5, 1938
	103.4	Aug 10, 1938
Kitchener	50.3	Jun 2, 1936
	66.0	Sep 27, 1936
	51.3	Aug 10, 1938
Mount Forest	57.4	Jul 20, 1963
	61.2	Aug 3, 1964
	54.0	Jun 12, 1999
Stratford	63.0	Jul 18, 1931
	74.9	Jun 2, 1936
	71.4	Aug 11, 1964
Stratford MOE	40.2	Dec 6, 1998
Woodstock	51.6	Sep 7, 1934
	40.1	Aug 1, 1964
	62.7	Aug 2, 1964

9.0 Climate Variability Cycles and Links to Southern Ontario Drought Periods

9.1 El Niño/La Niña and the Southern Oscillation

9.1.1 Introduction

El Niño to continue wreaking havoc into summer
Scientists: Brace for a severe El Niño winter
La Niña s winter arrival may bring a Florida freeze
National Weather Service: La Niña to bring another weird winter

Media headlines such as these have been capturing the public's attention since the mid-1990s. With such exposure and hype, El Niño and La Niña have become part of the general public's weather vocabulary. Over the past several years, we have tended to brand El Niño and La Niña as the "culprits" behind many severe global weather events. In many cases, they appear to deserve their reputation. Scientists, for example, consider El Niño to be the dominant weather force behind the occurrence of severe drought conditions in Indonesia, as well as flooding during the same seasons in California. La Niña, on the other hand, has often been linked to an increased threat of hurricanes on the east coast of the United States, as well as generally colder-than-normal winters over North America. Given the potential links of El Niño and La Niña to such extreme weather events, it has sometimes become too convenient to blame these phenomena for ANY unusual weather that occurs worldwide. Nevertheless, in many cases valid links appear to have been discovered. This leads us to question whether or not El Niño or La Niña may have played significant roles in the southern Ontario drought periods of the 1930s, 1960s and 1990s. However, before attempting to investigate this issue, some general background information and definitions of these weather phenomena will be given.

9.1.2 Definitions of El Niño, La Niña and the Southern Oscillation

El Niño is characterized by a warming of the surface waters in the eastern and central equatorial Pacific Ocean, accompanied as well by a large scale weakening of the trade winds. In normal years, these winds move westward, carrying warmer equatorial waters westwards and producing upwelling of cold deep ocean waters along the South American coast. During El Niño years, a slackening, and sometimes complete reversal, of the trade winds results in warmer-than-normal water temperatures off the western South American coast. La Niña, on the other hand, represents the reverse phenomenon to El Niño. Cold eastern and central equatorial Pacific sea surface temperature anomalies are experienced during these events, as a result of a strengthening of the low level easterly winds.

Both El Niño and La Niña events are also accompanied by a variation from normal in tropical sea level pressure between the eastern and western hemispheres. Historically, the scientific community has tended to use the five-month running mean of the sea level pressure difference between Tahiti and Darwin, the Southern Oscillation Index, or SOI, as a defining index for El Niño/La Niña years. A negative index, characterizing El Niño, is related to falling sea level pressures in the eastern Pacific and rising pressures in the west. Conversely, during a La Niña event, the index is positive and the pressure anomalies are reversed. However, station pressure at Tahiti shows considerable variability. As a result, scientists in recent years have moved towards using changes in the equatorial Pacific sea surface temperatures as the primary means of classification for El Niño/La Niña years.

El Niño events occur at irregular intervals, approximately every 2 to 7 years. They typically last about 12-18 months. La Niña events are of similar duration and tend to occur every 4 to 5 years. In the northern hemisphere, both events have their strongest influence during the winter season. Both the intensity and duration of the El Niño/ Southern Oscillation (ENSO) events are important in determining the pattern and duration of associated severe weather occurrences.

Scientists studying El Niños and La Niñas have linked the phenomena and their resulting changes in atmospheric flow patterns to various global severe weather events, particularly in the tropics. El Niños are linked to heavy rainfall and flooding in parts of South America, unpredictable monsoon rains in India and Indonesia, as well as severe drought conditions in Australia, Africa and Indonesia. In the United States, flooding in California and parts of the midwestern United States is often experienced during El Niño years. The southern half of the United States can experience cooler-than-normal winters, while winters in the northern half are generally warmer than normal. It is also believed that El Niño conditions suppress the development of major storms and hurricanes in the Atlantic, while increasing the number of tropical storms in the Pacific. La Niña tends to have the opposite effects to El Niño, reversing the above patterns of precipitation and temperature anomalies.

In Canada, the effects of El Niño/La Niña appear to be more variable and less predictable. As the ENSO influence is strongest in the winter, the climate analyses conducted by Shabbar et al. (1996, 1997) concentrate primarily on this season. In general, somewhat drier-than-normal winters are experienced during El Niño from south/central British Columbia eastward into northern Ontario. No significant impact on the El Niño winter precipitation patterns is observed in the Atlantic region, southern Ontario and the northern Arctic. Warmer-than-normal temperatures are generally experienced during the El Niño winter seasons through the western provinces, northwestern Ontario and then eastward to the Labrador coast. Slight, but not statistically significant, warming has been associated with southern Ontario El Niño winters. In contrast, an increase in snowfall has been observed during La Niña winters from central British Columbia into the St. Lawrence valley. La Niña winters are also generally colder than normal, with the strongest effects appearing to stretch from the Yukon southeastward into northwestern Ontario. No statistically significant cooling was found in southern Ontario during the La Niña winter season.

Since the 1970s, both El Niño and La Niña events have become stronger, more persistent and more frequent. The 1997-98 El Niño is classified as the strongest El Niño on record in over a century, surpassing the previous record setting event in 1982-83. La Niña events of 1973-74 closely rival those of 1988-89, 1955-56 and the more recent 1998-99 for the strongest levels reached during the 20th century. The winter of 1999-2000 continues to be in a La Niña phase. The extensive research that has been undertaken in this field has led scientists to conclude that the next significant El Niño may be expected to begin in late 2002. If indeed a link could be found between El Niño/La Niña events and drought periods in southern Ontario, the forecasting of future El Niño/La Niña phenomena would prove to be extremely valuable in the forewarning of upcoming drought events.

9.1.3 Classification of El Niño/La Niña and Drought Analysis Years

Given the importance of the potential link between El Niño/La Niña and drought, an analysis of the southern Ontario drought period temperature and precipitation records was undertaken for significant ENSO years within the 20th century. The first step in this procedure was to identify strong to moderate ENSO events during this period. Events prior to 1950 were based on the SOI remaining in the lower 25 percent (El Niño) or upper 25 percent (La Niña) of the distribution for five months or longer (Shabbar et. al, 1996; Rasmusson, 1984; Ropelewski and Jones, 1987). Some modification to the resulting years was then performed, based on the SOI indices calculated by the U.S. National Centers for Environmental Prediction and provided on the University of Washington website: <http://tao.atmos.washington.edu/pacs/additional_analyses/soi.html>.
ENSO events since the start of 1950 were compiled using a classification that is based on tropical Pacific sea surface temperatures and provided on the National Oceanic and Atmospheric Administration (NOAA) website: <http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/ensostuff/ensoyears.html>.

The resulting 24 El Niño years and 17 La Niña years are listed in Table 10. The ENSO year is defined as starting in the fall of the previous year. For example, the ENSO year of 1997-1998 is defined as occurring from October, 1997 through March, 1998. The corresponding drought period analysis years are also highlighted within this table. It should be noted that the cited literature indicated considerable differences in the significant La Niña events that occurred from 1900 to 1910. For example, STORMFAX (1998) lists 1903-1904, 1906-1907 and 1908-1909 as La Niña years during this decade, while the work of Shabbar (1996) uses Ropelewski and Jones' (1987) La Niña events of 1904-1905 and 1909-1910. Due to the uncertainty involved in correctly identifying these early La Niña years, the ENSO drought analyses described in Section 9.1.4 were performed only for the period 1910-1999.

Seven drought period years are identified from the table; four are classified as El Niño events while the remaining three are listed as major La Niña events. Clearly, no preferred occurrence of drought period years is evident from the table, with years such as 1963 not even classified with major ENSO years. The drought of the past few summers, as well as the 1965 and 1966 drought period analysis years, actually "see-saw" between El Niño and

TABLE 10

Years of Onset of Strong or Moderate El Niño and La Niña Events in the 20th century
Corresponding Drought Period Analysis Years are Highlighted

El Niño Years	La Niña Years
1900 - 1901	1903 - 1904
1902 - 1903	1906 - 1907
1905 - 1906	1908 - 1909
1911 - 1912	1916 - 1917
1914 - 1915	1924 - 1925
1918 -1919	1928 - 1929
1923 - 1924	**1938 - 1939** **
1925 - 1926	1950 - 1951
1930 - 1931 **	1954 - 1955
1932 - 1933 **	1955 - 1956
1939 - 1940	**1964 - 1965** **
1941 - 1942	1970 - 1971
1951 - 1952	1973 - 1974
1953 - 1954	1975 - 1976
1957 - 1958	1988 - 1989
1965 - 1966 **	1995 -1996
1969 - 1970	**1998 - 1999** **
1972 - 1973	
1976 - 1977	
1982 - 1983	
1986 - 1987	
1991 - 1992	
1994 - 1995	
1997 - 1998 **	

Note: The 1997-1998 El Niño was the strongest on record.

La Niña events.

9.1.4 Precipitation and Mean Temperature Station Analyses

Although Table 10 would suggest that there is no clear correlation between ENSO and major drought years in southern Ontario, it does not rule out that a link could exist between ENSO events and below-normal annual and/or seasonal precipitation. To investigate this possibility, an analysis was performed on the nine selected basin/near-basin stations using all available data from the analysis years 1910-1999. Climate archive rules were again followed for calculating average annual and seasonal precipitation amounts. Average precipitation amounts were calculated for each station for all years during the analysis period, and these values were considered to be the "normal" for the precipitation analysis. Averages for the major El Niño and La Niña years, as selected from Table 10, were also calculated. An additional calculation was made for "neutral" years, or years that were classified as non-major ENSO events. Precipitation departures from normal were then computed for all, ENSO and neutral years. The average precipitation amounts were also computed for each station for 1930-1939, 1961-1966 and 1998-1999 and displayed in the tables for comparison purposes with the ENSO average values. (The average for 1998-1999 did not include the analysis year 1997, as 1997 was characterized primarily by above-normal precipitation amounts for the stations.) Finally an average of all the available station amounts and percentages below-normal were computed for each classification. Annual and seasonal precipitation results of the above procedure are given in Tables K-1 to K-5 in Appendix K.

There is a trend towards higher-than-normal annual precipitation at Fergus Shand Dam during La Niña years. Autumn precipitation at Delhi/Simcoe tends to be lower than normal during El Niño years, and above-normal during La Niña years. During El Niño winters, Mount Forest and Fergus Shand Dam tend to observe below-normal precipitation. In contrast, there is a trend for above-normal winter precipitation at Mount Forest during La Niña years. No detectable influence of the ENSO or neutral years on precipitation departure from normal is shown during the spring season for any of the stations. During the La Niña summer seasons, Brantford, Delhi/Simcoe and Stratford stations record below-normal precipitation. Georgetown shows a similar trend for below-normal summer precipitation, but during El Niño years. Aside from the above observations, the remaining annual and seasonal individual and combined station data show little ENSO impact on precipitation departures from normal.

The same procedure is repeated for mean temperatures using all available data from the analysis years 1910-1999. In this case, an analysis is performed to determine if a link could exist in southern Ontario between ENSO events and above-normal annual and/or seasonal mean temperatures. As is the case with precipitation, climate archive rules are used in determining average annual and seasonal mean temperatures. Results of the analysis are presented in Tables K-6 to K-10 in Appendix K. Annually, there is a trend for Georgetown to observe warmer-than-normal mean temperatures during El Niño years. During La Niña years, annual temperatures at Fergus Shand Dam display a tendency to warmer-than-normal conditions, with the reverse pattern observed at Guelph. In the autumn, Georgetown mean temperatures tend to be cooler than normal during La Niña years. At all stations, El Niño winters tend to be warmer than normal. As with precipitation, no influence of the ENSO or neutral years on mean temperature departure from normal is detected during the spring season for any of the stations. The summer season at Guelph and Stratford shows a trend towards just below-normal mean temperatures during La Niña years. However, the remaining stations show little ENSO impact on mean temperature departures from normal during the summer.

As was mentioned previously, ENSO events have become stronger and more frequent since the 1970s. Consequently, the above precipitation and mean temperature analyses were repeated on a subset of the larger dataset, including only the years 1970-1999. Results of these analyses are presented in Tables K-11 to K-20 in Appendix K. Brantford, Delhi/Simcoe and Stratford have lower-than-normal precipitation during El Niño years. However, data from remaining stations shows little or no trend, and consequently the station average shows only a weaker tendency towards lower-than-normal precipitation during El Niño years. During La Niña years, Mount Forest observes below-normal precipitation, while Brantford and Woodstock exhibit strong trends towards recording greater-than-normal precipitation during neutral years. In El Niño autumns, Brantford, Delhi/Simcoe, Kitchener/Waterloo, Stratford and Woodstock tend to have below-normal precipitation, with the combined nine station average still reflecting this trend. La Niña autumns in Delhi/Simcoe and Guelph give above-normal precipitation, but no consistent pattern is observed for the remaining stations, or for the overall station average. There is an above-normal precipitation trend during non-ENSO autumns at Woodstock. During recent El Niño winters, all stations have observed lower-than-normal precipitation. In contrast at Mount Forest, all six recent La Niña winters have recorded higher-than-normal precipitation. However, no significant La Niña impact is observed at the remaining stations during the winter. During El Niño springs, Brantford, Delhi/Simcoe and Mount Forest/Redickville tend to have lower-than-normal precipitation. This pattern is actually weakly negated at four of the remaining stations. As a result, no El Niño signal is observed for the overall station averages. During the summer season, recent La Niña years at Brantford, Delhi/Simcoe, Kitchener/Waterloo and Stratford have recorded below-normal precipitation, with the trend for all stations to still have below-normal precipitation.

During the 1970-1999 analysis period, mean annual temperatures at Georgetown, Kitchener and Stratford have been warmer than normal during El Niño years, but colder than normal at Georgetown and Brantford during non-ENSO years. During recent La Niña autumns, there is a trend towards warmer-than-normal mean temperatures at Guelph. Mean winter temperatures at all stations have been warmer than normal during recent El Niño years. In contrast, mean winter temperatures have been colder than normal at Mount Forest during La Niña years since 1970. Mean spring temperatures have been above normal at Kitchener during recent El Niño years. During recent La Niña springs at Fergus Shand Dam, mean temperatures have tended to be colder than normal. El Niño summers since 1970 have been warmer than normal at all of the stations. In contrast, non-

ENSO mean summer temperatures at Mount Forest have been below normal. No La Niña signal is observed during this season at any of the stations.

All of the above analyses have considered simply whether precipitation and mean temperature are above or below normal during ENSO and neutral years. Extreme events, such as droughts, are concerned with the amount by which the precipitation and temperature actually deviate from normal annually and during the individual seasons. Consequently, an additional distribution analysis was performed on the station data for the major ENSO and neutral years during the extended 1910-1999 period, as well as on the smaller subset of data from 1970-1999. Precipitation was classified into twenty-three categories. These ranged from 100 percent below normal to 100 percent above normal at 10 percent intervals, with an additional above-normal category for values equaling or exceeding 110 percent. The zero-percent distribution included precipitation less than 10 percent from the period normal. Mean temperatures were placed into eleven classes, from 5°C below normal to 5°C above normal. The zero-degree distribution included mean temperature departures less than 1°C from the period normal. A relative percent frequency of occurrence of each of the categories was computed for each of the selections. Results from the stations were then averaged for each data period to give an equivalent “all-station” result for the major ENSO years, as well as neutral years. The station average annual and seasonal results for precipitation and mean temperature are displayed graphically in Appendix L.

In examining the results, we are concerned primarily with those categories other than the zero-percent and zero-degree distributions. Therefore the following discussion will concentrate on the remaining class distributions. For the 1910-1999 period, the annual, autumn and spring distributions show no significant trend outside the “tails”. El Niño winters tend to be drier, showing a higher frequency of occurrence of precipitation that is greater than 10 percent below, rather than above, normal. In summer, both El Niño and La Niña years have a much higher frequency of occurrence of precipitation which is greater than 10 percent below, rather than above, normal: 54 percent below versus 34 percent above for El Niño years, and 61 percent below versus 29 percent above for La Niña years. Annually and seasonally, El Niño and neutral years are more likely to represent the extreme “tails” of the above-normal precipitation distributions, as well as the annual, spring and summer extremes of the below-normal precipitation distributions. The autumn and winter below-normal precipitation extremes are relatively evenly distributed between El Niño, La Niña and neutral years.

The annual and autumn mean temperature distributions for the 1910-1999 analysis period show a high frequency of occurrence of mean temperatures that are 1°C, but less than 2°C, colder than normal during El Niño, La Niña and neutral years. Autumn mean temperatures 2-4°C colder than normal are observed primarily in El Niño and neutral years, but mean temperatures 2-4°C warmer than normal are only observed during neutral years. The most dominant winter distribution occurs during La Niña years with mean temperatures that are 1°C, but less than 2°C, colder than normal. In contrast, only a small percentage of above-normal winter mean temperatures are observed during La Niña years.

In spring, temperatures that depart from normal by at least 1§C are more likely to be below normal during any kind of year. The summer distribution shows a high occurrence frequency of mean temperatures that are 1§C, but less than 2§C, colder than normal, especially during La Niña and neutral years. The extreme "tails" of the mean temperature distributions are represented primarily by El Niño or neutral years during autumn, winter and spring. The annual and summer extremes are relatively evenly distributed between El Niño, La Niña and neutral years.

The results of the 1970-1999 analyses are shown in Appendix L. Annually, if precipitation departs from the normal by more than 10 percent, it is likely to be drier than normal. A similar pattern is observed in the El Niño autumn precipitation distribution. El Niño winters show a higher frequency of occurrence of precipitation that is greater than 10 percent below, rather than above, normal. A higher number of La Niña summers have precipitation which is greater than 10 percent below, rather than above, normal: 71 percent below versus 17 percent above. No trends are observed in the spring distribution. Annually and during the autumn and spring, La Niña years are more likely to represent the below-normal "tails" of the distributions, while El Niño and La Niña years dominate these extremes during the winter and summer. Above-normal winter and spring "tails" are distributed between La Niña and non-ENSO years, while El Niño and non-ENSO years dominate the annual, autumn and summer extremes.

The annual mean temperature distribution for the 1970-1999 analysis period, as for the 1910-1999 period, shows a high frequency of occurrence of mean temperatures that are 1§C, but less than 2§C, colder than normal during any kind of year. Similarly, the autumn distribution shows a high frequency of occurrence of mean temperatures in this same category, but La Niña years also show the same high frequency of mean temperatures that are warmer by 1§C, but less than 2§C, from normal. In La Niña winters, springs and summers, temperatures that depart from normal by at least 1§C are more likely to be below normal. The summer distribution shows that no recent year has had mean temperatures that have been warmer than normal by more than 2§C. However mean temperatures up to 4§C colder than normal have been observed. The below-normal "tails" of the annual and seasonal mean temperature distributions occur during El Niño and neutral years, except during spring when La Niña dominates. Spring and winter above-normal extremes are dominated by El Niño and neutral years, while the majority of above-normal summer temperatures occur during El Niño years. There is no dominance in the above-normal "tails" annually or during the autumn.

9.1.5 Summary of El Niño/La Niña Results

In an attempt to determine if any significant links exist during ENSO years for precipitation and mean temperature departures from normal in southern Ontario, a few interesting results have emerged. Although observations are included for the 1970-1999 period, they should be viewed with some caution due to the small number of ENSO years represented. At all of our selected stations,

- El Niño winters since 1970 have observed lower-than-normal precipitation.

- El Niño winters have been warmer than normal for the 1910-1999 analysis period, as well as the recent 1970-1999 period.
- El Niño summers since 1970 have been warmer than normal.

Another interesting observation is that Mount Forest has recorded higher-than-normal precipitation in all of the recent six La Niña winters. The station also observed a significant above-normal La Niña winter precipitation trend during the entire 1910-1999 period.

Results of the distribution analyses lead us to the following conclusions:

- El Niño or neutral years are more likely to represent the extreme above and below-values or "tails" of the annual and seasonal precipitation distributions for the 1910-1999 period. Only the autumn and winter below-normal precipitation extremes are relatively evenly distributed between El Niño, La Niña and neutral years.

- Since 1970, La Niña years are more likely to represent the below-normal "tails" of the annual precipitation distributions, while El Niño and neutral years dominate the above-normal "tails". Depending on the season, the distribution of seasonal precipitation extremes varies between El Niño, La Niña and non-ENSO years.

- Since 1970, if annual precipitation departs from normal by more than 10 percent during the year, it is most likely to be below normal.

- From 1910-1999, both above and below-normal "tails" of the mean temperature distributions are represented primarily by El Niño or neutral years during autumn, winter and spring. The annual and summer extremes are relatively evenly distributed between the years.

- Since 1970, the extreme cooler-than-normal "tails" of the mean temperature distribution have been El Niño or neutral years annually and in all seasons except spring when La Niña dominates. The above-normal extremes during spring and winter are in El Niño and neutral years, while no pattern is observed annually, or during the autumn and summer.

- Since 1970, no summer mean temperature has been warmer than normal by more than 2§C, although mean temperatures have been colder than normal by up to 4§C.

The observations that El Niño summers are warmer than normal and that winters since 1970 have been warmer and drier than normal are of particular importance when considering drought. Warmer summer temperatures bring higher evaporation rates, while warmer and drier winters and less snowfall could mean less spring runoff. However, the extreme warmer "tails" of the mean temperature distributions showed no clear patterns annually or in most seasons. As the main ENSO results are seasonal, no definitive statement can be made on how an El Niño/La Niña event would affect an entire drought year.

9.2 North Atlantic Oscillation

9.2.1 Definition of the North Atlantic Oscillation

A perhaps less well-known, but just as important, climate teleconnection pattern is the North Atlantic Oscillation or NAO. It is associated with changes in the surface westerly winds across the North Atlantic into Europe. An index defining the NAO is based on the difference in atmospheric pressure between the higher latitudes of Iceland and the lower latitudes of the Azores. Stronger-than-normal westerlies and higher-than-normal north-south pressure differences characterize a positive index, while the reverse is true for negative indices.

The NAO exists throughout the year but, like ENSO, is most prevalent in the winter. However, considerable variability is exhibited by the NAO, both interannually and interseasonally. Significant interdecadal variability is also apparent. For example, the NAO had a persistent negative phase from the mid-1950s to 1979. A sharp reversal in the pattern occurred in 1979, and the positive phase of the NAO then prevailed through to 1995. In recent years, the NAO has exhibited a more variable nature, oscillating interannually between phases.

Strong positive values of the NAO index have been linked to above-normal temperatures across the eastern United States and northern Europe, with Greenland and occasionally southern Europe and the Middle East experiencing colder-than-normal conditions. Precipitation patterns are also affected in these areas, with above-normal precipitation experienced over northern Europe and Scandinavia, and lower-than-normal precipitation across southern and central Europe. A reversal in precipitation and temperature anomalies is observed when the NAO index enters its strong negative phase.

Although much of the scientific literature focuses on the effects of NAO on the weather over the eastern United States and Europe, the NAO could indeed have a significant impact on southern Ontario’s weather. This might be especially true during years of low NAO winter indices when Atlantic atmospheric circulation blocking patterns are established. As with ENSO, we are interested in knowing whether or not the NAO can be related to drought conditions over southern Ontario.

9.2.2 Classification of North Atlantic Oscillation Index and Drought Analysis Years

An analysis of the southern Ontario drought period mean temperature and precipitation records was undertaken for significant NAO years within the period 1910-1999. The first step in this procedure was to identify years within the 20th century that exhibited winters from December through March with higher (+) and lower-than-normal (-) NAO indices. For years up to 1984, the NAO classifications of Rogers (1984) were used. Significant NAO years after 1984 were determined from the NOAA website for teleconnection indices: <http://nic.fb4.noaa.gov/data/cddb/cddb/tele_index.nh>. The resulting 41 positive NAO years and 28 negative NAO years are listed in Table 11. The NAO year is defined as starting in December of the previous year. For example, the positive NAO year of 1999 is defined as having a higher-than-normal positive NAO index from December, 1998 through March, 1999. The corresponding drought period analysis years are also highlighted within this table.

Twelve drought period years are identified from the table; six are classified as + NAO index events while the remaining six are listed as having a Ä NAO index. As with the ENSO analysis, no preferred occurrence of drought period years is evident from the tables, with years such as 1998 not even classified with the major NAO years.

9.2.3 Precipitation and Mean Temperature Station Analyses

Although Table 11 would suggest that there is no clear link between NAO and major drought years in southern Ontario, it does not rule out that a connection could exist between NAO events and below-normal annual and/or seasonal precipitation. To investigate this possibility, an analysis was performed on the nine selected basin/near-basin stations using all available data from the analysis years 1910-1999.

The same procedure that was described for the ENSO analysis in Section 9.1.4 was also used for the NAO computations. Annual and seasonal precipitation and mean temperature calculations were made for years of high and low NAO winter indices, as selected from Table 11, as well as for the remaining “neutral” years, or years that were classified as non-NAO. Results of this analysis are given in Tables M-1 to M-10 in Appendix M.

Only two NAO signals are detected in the annual and seasonal station precipitation data for 1910-1999. During low NAO index years, annual precipitation at Fergus Shand Dam tends to be above normal. Winter precipitation at Delhi/Simcoe is greater than average during high NAO index years.

Annually, mean temperatures are colder than normal at Fergus Shand Dam, Guelph, Mount Forest, Stratford and Woodstock during low NAO index years. This trend is also apparent during the autumn at Guelph, Mount Forest and Woodstock, during the winter at Fergus Shand Dam, Mount Forest and Stratford, as well as during the spring at Fergus Shand Dam. Summer mean temperatures have been warmer than normal at Fergus Shand Dam during high NAO index years, but below normal at this station, as well as Mount Forest, during neutral (non-NAO) years.

The above analyses were repeated for the recent subset of the precipitation data, 1970-1999, and the results are presented in Tables M-11 to M-15 in Appendix M. A pattern of above-normal annual precipitation during low NAO index years is observed at Kitchener, Mount Forest and Stratford. A similar trend is observed in the autumn at all stations except Guelph. In the winter, this pattern appears to be reversed for all stations except Stratford, with precipitation below normal during the low NAO index years. In contrast, winter precipitation at Delhi/Simcoe and Guelph has been above normal during recent high NAO index years. During high NAO index years, Guelph’s spring precipitation shows an above-normal trend, while Georgetown’s and Mount Forest’s summer precipitation are below normal. In contrast, summer precipitation at Georgetown during

TABLE 11

Winters of High NAO (+) and Low NAO (–) Indices
in the 20th Century
(Winter: Dec-Mar; 1999 for example is Dec 1998 - Mar 1999)

Corresponding Drought Period Analysis Years are Highlighted

+ NAO Winter Index Years	- NAO Winter Index Years
1903 and 1904	1900 through 1902
1906 through 1910	1912
1915 and 1916	1917 and 1918
1920	1926
1922 and 1923	1929
1925	**1932 ****
1928	**1936 ****
1930 and 1931 **	1940 and 1941
1934 **	1947
1937 **	1955 and 1956
1943 and 1944	1959 and 1960
1949	**1963 through 1966 ****
1952	1968 and 1969
1954	1977 through 1979
1957	1987
1961 **	1996
1973 through 1976	
1981	
1983 and 1984	
1988 through 1995	
1999 **	

Note: The NAO was a record high in 1989, and a record low in 1969.

low NAO index years tends to be above normal. However, some caution should be used in the interpretation of the low NAO index results as the sample size is only four or five years of data.

As with the ENSO analysis of Section 9.1.4, the mean temperature and precipitation data were classed into distribution categories for high and low NAO index years, as well as neutral years. Our discussion of the results will again focus on all categories, except the near-normal zero-distribution. Graphs of these results are displayed in Appendix N.

No significant patterns emerge from the annual and seasonal precipitation distributions for the 1910-1999 period.

The annual, autumn and summer mean temperature distributions for the 1910-1999 analysis period show a higher frequency of occurrence of mean temperatures that are 1, but less than 2, degrees colder than normal during any kind of year. During winters of low NAO index, mean temperatures are generally colder than normal, although the warmer extremes occur during the low NAO index years as well. A similar, but weaker, pattern is observed during the spring.

During low NAO index years from 1970-1999, if winter precipitation departs from the normal by 10 percent or more, it is likely to be drier than normal. A similar, but weaker, trend is observed during high NAO index autumns. In addition, autumn precipitation is higher than normal during low NAO index years, while spring precipitation during low NAO index years never deviates from normal by less than 10 percent. Caution is again advised in interpreting the low NAO index results due to the low sampling size. No pattern emerges from the recent annual and summer distributions.

A somewhat higher frequency of occurrence of mean temperatures that are 1§C, but less than 2§C, colder than normal during any kind of year is apparent from the 1970-1999 annual and autumn mean temperature distribution graphs. During recent low NAO index winters and summers, as well as during neutral summers, mean temperatures that depart from normal by at least 1§C have been almost always below normal. No clear pattern is detected in the spring mean temperature distribution.

9.2.4 Summary of North Atlantic Oscillation Results

In the analyses of the precipitation and mean temperature data over southern Ontario, a few trends have been identified. These are primarily in the smaller data subset, 1970-1999, where low NAO index results are based on a very small sampling size. The most important of these 1970-1999 results included:

- Summer precipitation has been below normal at two stations, Georgetown and Mount Forest, in recent high NAO index years.

- At eight of nine stations, autumn precipitation has been above normal during recent low NAO index years, while winter precipitation has been below normal during these years.

- At all stations, the autumn mean temperatures display a trend towards lower-than-normal values in low NAO index years. With the exception of Georgetown, the same trend is observed annually and during the winter.

- A strong trend towards below-normal summer mean temperatures is observed at all stations during non-NAO index years.

- Summer mean temperatures have been above normal at all stations in recent high NAO index years.

- A few stations have also observed a warmer-than-normal winter mean temperature trend during recent high NAO index years.

The distribution analyses revealed that:

- Since 1970, if winter precipitation departs from normal by more than 10 percent during a low NAO index year, it is most likely to be below normal.

- Annual and autumn mean temperature distributions for 1970-1999 show that for any NAO or neutral year, mean temperatures that are at least 1§C colder than normal are more likely than mean temperatures warmer by 1§C or more. This is also apparent in the 1910-1999 summer mean temperature distributions.

- During recent low NAO index winters and summers, as well as during neutral summers, mean temperatures that depart from normal by at least 1§C have been almost always below normal.

The recent summer precipitation and mean temperature results for high NAO index years are a promising find in this study. However, the findings still do not support a definitive link between the NAO and southern Ontario drought periods.

9.3 ENSO, North Atlantic Oscillation and Southern Ontario Drought Years

The above analyses considered major ENSO and NAO years separately in an attempt to determine if there is a link between their occurrence and that of precipitation and temperature anomalies. In an attempt to determine if perhaps there is an effect on these fields when a major ENSO and NAO year occur at the same time, a table combining these years was produced. Table 12 lists four classes of years during the 20th century:

- El Niño and high NAO winter index years
- El Niño and low NAO winter index years
- La Niña and high NAO winter index years

- La Niña and low NAO winter index years.

Any drought analysis years that occurred simultaneously were highlighted. The grouping of the years in this manner produced small datasets: eight, six, four and six years respectively. Only one drought analysis year fell into each category. No obvious connection between drought periods and these combined years is apparent.

TABLE 12

Years of Strong or Moderate El Niño and La Niña events that Correspond to
Winters of High NAO (+) and Low NAO (–) Indices
in the 20th Century (1910-1999)
(Winter: Dec-Mar; 1999 for example is Dec 1998 - Mar 1999)

Corresponding Drought Period Analysis Years are Highlighted

El Niño Years and + NAO Winter Index Years	El Niño Years and - NAO Winter Index Years	La Niña Years and + NAO Winter Index Years	La Niña Years and - NAO Winter Index Years
1915	1912	1925	1917
1931 **	1926	1974	1929
1952	1940	1976	1955
1954	**1966 ****	**1999 ****	1956
1973	1977		**1965 ****
1983	1987		1996
1992			
1995			

9.4 Other Climate Teleconnection Patterns

The El Niño-Southern Oscillation (ENSO) and North Atlantic Oscillation (NAO) are two of the major sources of interannual variability in the atmospheric circulation. However, other oscillations have also been identified that could influence the weather over southern Ontario. The Pacific/North American (PNA) anomaly is linked to a strong negative pressure anomaly to the south of the Aleutians, a positive anomaly over the northwestern United States and southwestern Canada, as well as a weaker negative anomaly over the southeastern United States. The reverse of this phenomenon may also occur. The Pacific Decadal Oscillation (PDO) is another teleconnection pattern that was only recently identified in 1996. The index defining this oscillation is based upon sea surface temperatures in the Pacific Ocean, north of 20N. During the warm index phase of the PDO, these temperatures are cooler than normal in the central North Pacific. Surface pressure anomalies during this phase include an intensification of the "Aleutian Low" pressure cell, as well as anomalously high sea level pressures over western North America and the subtropical Pacific. The cold index phase of the PDO is characterized by a reversal of these sea surface temperature and pressure patterns. Additional upcoming work on southern Ontario drought periods will examine the potential link of the PDO to such extreme events.

Longer time scale climate variations including interdecadal changes are considered to be related primarily to solar energy variations. The driving forces behind such changes appear to be linked to the 11 and 22-year sunspot cycles, as well as the 18.6-year lunar tidal cycle. However, work in this area has been inconclusive and no satisfactory explanation that these cycles may correlate with weather or climate has been found.

10.0 Future Climate Change and Drought

Change has been, and will continue to be, an integral part of the earth's climate system. However, in recent decades, concern has developed over how human activities may be significantly contributing to climate change. A significant increase in the atmospheric concentrations of carbon dioxide (CO_2) over the past century is directly attributed to man's activities. This increase is linked to increased atmospheric warming and a subsequent rise in mean global temperatures. In an attempt to determine the possible impact of increased CO_2 on our climate, scientists have developed general circulation models (GCMs) to simulate future climatic conditions. Although it is difficult to project future concentrations of carbon dioxide, scientists have concluded that a doubled-CO_2 scenario is possible by the year 2050. The GCMs are commonly run under these conditions. Based on their output, climate predictions for southern Ontario include the following:

- An average warming of 2°C to 5°C is possible by the latter part of the 21st century, with a slightly greater increase in winter than in summer.
- Annual precipitation may increase. However, any increased precipitation will likely be offset by higher evapotranspiration as a result of warmer temperatures.
- Despite an increase in annual precipitation, the number of precipitation events may actually decrease, while their intensity increases. An increase in short duration extreme rainfall events would increase the risk of rapid flooding, as much of the precipitation would be lost as surface runoff.
- Winter precipitation will likely increase, but less will fall in the form of snow.
- Spring melts and runoffs are expected to occur earlier in the year.
- Water supply from both surface and groundwater sources is expected to decrease.
- Water demand is expected to increase during the summer months.
- Growing seasons will be longer but drought could become more frequent and possibly more severe.
- Higher water temperatures, reduced runoff and stream discharge would lead to a reduction in water quality.
- Average Great Lakes' water levels could decline to record low levels by late in the 21st century.

The GCM output was used by Sanderson et al. (1990b) in a regional hydrologic model to determine the impact of future climate change on water resources in the Grand River Basin. Under the $2xCO_2$ climate scenarios, they estimated that streamflow will decrease by 16 percent while the summer moisture deficit may double in the basin by the latter half of the 21st century.

Despite what appear to be quite dire predictions for water supply and demand over southern Ontario in the next 100 years, it should be remembered that considerable uncertainty in climate prediction still exists. Although all GCMs agree on global warming during the 21st century, the models are not always consistent in their predictions. It is still not known, for example, at what rate future climate changes will occur. Exact predictions of future regional climates are especially difficult to determine. This is particularly true in southern Ontario. The Great Lakes have a major impact on climate in this region, but their effects are not yet included in GCMs. Nevertheless, significant climate changes over southern Ontario seem likely over the next century. Whether or not they will include an increase in the severity and occurrence of drought is yet to be determined.

11.0 Conclusions

Although drought is a recurring phenomenon in nature, not all droughts are of the same intensity and duration. In the 20th century, the droughts of the 1930s, 1960s and the late 1990s have all had a serious impact on water resources in the Grand River Basin in southern Ontario. The "Dirty Thirties" are particularly well-known for the hardships that were endured in many parts of Canada and the U.S. as a result of the intense drought conditions. Could drought conditions of recent years be even more severe than those of the infamous 1930s and 1960s?

A comparison of the three drought periods was undertaken by analysing 20th century precipitation and mean temperature data from climatological stations within and near the Grand River Basin. Climate statistics of these parameters, as well as precipitation and mean temperature departures from normal and Cumulative Precipitation Indices, were calculated. Water budget model runs were also performed.

As a result of the analyses, several interesting conclusions were made concerning the nature of droughts. Although droughts are normally characterized by below-normal annual precipitation, seasonal precipitation can be significantly above normal. For example, all stations reported above-normal summer precipitation during 1964. Considerable interannual variability in moisture conditions can occur during drought years. This was particularly apparent when the drought conditions of 1936 were sharply reversed during the "wet" year of 1937, and then returned during 1938 and 1939. Although annual mean temperatures are usually above normal during a drought year, below-average values also occur. For example, the serious 1963 drought year recorded cooler-than-normal mean temperatures at all stations. Considerable variability exists in seasonal mean temperature departure from normal, although summer mean temperatures are usually warmer than average.

An examination of the mean temperature and precipitation statistics yielded several observations. Very dry winters, as well as those with near-record snowfalls, occur during droughts. Serious drought years do not necessarily correlate well with the years of driest springs and driest summers. Similarly the occurrence of warmer-than-normal average summer maximum or summer mean temperatures is not a predictor for drought. Above-normal annual mean temperatures are also not reliable indicators. The 1936 drought year had stations ranking in the top twenty for cooler-than-normal annual mean temperatures. From these results, we can see that it is difficult to use any specific pattern in seasonal precipitation, or in seasonal and annual mean temperatures, as a predictor for significant drought years.

In assessing the combined precipitation and mean temperature departures from normal, it was concluded that the drought conditions of 1931, 1998 and 1999 were likely more severe than those experienced during other drought years of the 1930s, 1960s and 1990s. Water deficit and surplus output from the water budget model runs established 1998 as the number one hydrological drought year at the basin stations since at least 1920. There was however one notable exception to this. At Mount Forest, water deficits and surpluses were most extreme in 1930 and 1931, with 1998 ranked third. Other years in which all stations reported serious drought conditions included 1933, 1934, 1936, 1963 and 1999. The 1963 drought year is noteworthy in that it observed the lowest surplus values of all the drought years, with the exception of Mount Forest's 1930 and 1931 values.

Perhaps the most surprising discovery was that major one-day rainfall events happen during drought years. Numerous examples of their occurrences were found in the records during the 1930s and 1960s. In recent years, such events have been rare. However, as the bulk of the precipitation is lost as runoff, especially if the rainfall is observed over a relatively short period, there is little improvement in the ongoing drought conditions.

The report also examined the possible links between climate variability cycles, such as ENSO and NAO, and the drought years of the 1930s, 1960s and 1990s. Although some interesting observations were made with the ENSO and NAO analyses, especially in the recent decades since 1970, no definitive statement could be made linking these events with significant drought episodes. The results were even less promising in the combined ENSO-NAO analyses, where no connections to drought periods could be detected.

Climate change scenarios from GCMs suggest that southern Ontario may experience more frequent and more intense droughts during the next century. With increasing demands also expected on water resources, this would only add to the stress on the system. However, immediate concerns lie with the potential for the drought of recent years to extend into the year 2000 and beyond. This study ended at the completion of the 1999 hydrological year. Temperatures in the autumn and early winter of the 2000 hydrological year have persisted above normal over the basin. Precipitation during this period was near normal to just below normal. Climate research continues to work towards finding reliable predictors to use in long-range drought forecasting, but as of yet, none have been found. Whether or not this recent drought will outrank that of the 1930s in eventual duration and severity is yet to be determined.

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Appendix A

Tables of Missing Climate Station Data

MISSING CLIMATE STATION DATA…CLIMATE ARCHIVE RULES

The table displays the number of months that data is considered missing in each given year.
*** means that data is considered missing for the given year.

																TOTAL DAILY RAINFALL																				
																YEAR																				
CLIMATE ID	**STATION**	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964
6110270	Angus	1	1	0	2	4	2	3	2	3	5	0	2	1	0	2	0	0	2	2	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	3
6110661	Beeton	0	0	0	0	0	1	1	0	1	0	1	3	0	0	1	0	0	2	0	0	0	0	0	1	1	1	0	0	2	1	1	1	8	5	2
6110662	Beeton Assagi	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6110663	Beeton Graham	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6110667	Beeton Watson	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6110827	Borden A	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6111143	Camp Borden	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0	1	1	2	4
6111145	Camp Borden A	***	***	***	***	0	1	1	0	4	4	2	5	1	2	0	3	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6112171	Durham	***	***	***	***	***	10	4	7	***	***	***	***	***	***	***	***	***	10	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
6112350	Eugenia	0	0	0	0	0	2	1	1	0	5	0	1	0	0	0	0	0	0	1	1	4	9	7	11	10	5	0	1	0	0	0	0	0	0	0
6113480	Holstein	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	2	3	7	8	2	3	7	***	***	8	10	11
6113510	Hopeville	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	10	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2
6110HK7	Borden	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6121603	Clifford	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6129235	Walkerton	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6131081	Caledonia	***	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	1	1	0	4
6131982	Delhi CDA	***	***	***	***	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0
6131983	Delhi CS	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6133120	Hagersville	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	3	1	0	0	0	0	0	0	0	0	1	0	0	2	5	3	1
6133121	Hagersville 2	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	7	0	0	0	2	0	0	1	0
6133855	Jarvis	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	6	4	10	***	***	***	***	***	***	***	***
6134257	Kohler	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	5	0	2	1	0	2	1	0	1	3	0	1	1	1	4	4
6136643	Port Dover	6	2	0	0	1	0	0	1	1	0	0	0	2	0	0	0	0	1	1	***	1	1	1	0	0	0	0	1	3	0	0	5	6	3	4
6137730	Simcoe	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0	0	0
6137732	Simcoe (AUT)	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6137735	Simcoe	0	0	0	1	0	0	0	0	0	0	0	0	1	***	10	0	0	0	0	0	0	0	0	1	0	1	0	0	1	1	0	6	***	***	***
6140437	Ayr	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	4	0	1	0	1	7	***	***	***
6140941	Brantford	***	1	0	0	0	0	0	0	0	0	0	0	0	0	***	0	0	0	0	0	0	0	2	1	0	2	0	11	2	0	0	3	5	10	***
6140948	Brantford Brant Park	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6140951	Brantford Morell	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	4	0	0	0	1	2
6140954	Brantford MOE	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	5	1	0	0	0
6141095	Cambridge-Galt MOE	***	***	***	***	***	***	***	***	***	***	10	***	***	***	***	***	***	11	4	1	2	3	1	1	1	0	0	0	0	0	0	1	2	7	3
6141602	Clifford	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	7	0	0	0	0	0	0	0	0	0	0	5	9	6	***
6142065	Doon	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	6	3	3	2	0	5	***	***	***	***	***	***	***	***	***	***	***
6142400	Fergus Shand Dam	***	***	***	***	***	***	***	***	***	9	0	0	0	0	0	0	0	0	0	1	1	2	0	0	0	0	1	0	0	0	0	2	2	3	2
6142402	Fergus MOE	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	11	8	10
6142627	Fullarton	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	10	2	1	0	2	5	5	6	4
6142803	Glen Allan	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	8	4	6	7	0	0	0	0	0	0
6142990	Grand Valley	***	***	***	***	4	0	1	1	1	5	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6142991	Grand Valley STP	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6143069	Guelph Arboretum	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6143083	Guelph OAC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6143090	Guelph Turfgrass CS	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6144232	Kitchener	0	0	0	0	1	1	0	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0
6144240	Kitchener City Eng 1	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	10	5	***	***	***	***	***	11	***	***	***
6144241	Kitchener City Eng 2	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	9	***	***	***
6144245	Kitchener ORWC	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	6	1	1
6144475	London A	***	***	***	***	***	***	***	***	***	***	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6144481	London Lambeth A	9	***	4	0	0	0	1	0	0	0	0	9	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6144505	London South	0	0	11	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6145267	Monticello	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	9	1	3	3	1	0	0	1	8	0	0
6145495	Morriston	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	3	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
6145502	Mount Forest	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6145503	Mount Forest	3	0	0	4	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	***	***	***	***	***	***	***	***	***	***	***	***	***	0	0	0
6146240	Paris	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6146711	Preston	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	5	0	0	0	0	0	0	0	0	0	0	0
6146714	Preston WPCP	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6146939	Redickville	***	***	***	***	***	***	***	***	***	***	***	***	***	***	10	2	0	1	0	2	1	1	1	1	0	2	1	0	1	2	2	2	10	***	8
6148100	Stratford	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	***	***	***	***	***
6148105	Stratford MOE	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	10	0	0	0	0	0
6149380	Waterloo Fire Hall	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6149386	Waterloo WPCP	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	9	3	6
6149387	Waterloo Wellington	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6149625	Woodstock	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	4	1	0	2	3	2	0
6150243	Alton	0	0	0	0	0	1	***	***	***	***	***	***	***	***	***	***	***	0	0	2	2	0	4	5	4	8	***	***	***	10	***	8	6	6	***
6152661	Galt Osmond	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6152691	Georgetown	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	4	1	0	0	0	0	0	0	1	1	2	2	6	3	2	2	5	5	2
6152695	Georgetown WPCP	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	8	2	0
6153192	Hamilton	***	***	***	***	***	***	***	***	5	0	0	0	1	0	0	0	0	0	1	0	0	2	0	4	3	4	4	5	4	***	***	***	***	***	***
6153194	Hamilton A	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	11	0	5	5	5	4
6153300	Hamilton RGB	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6158350	Toronto	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6158733	Toronto Pearson Int'l A	***	***	***	***	***	***	***	10	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

MISSING CLIMATE STATION DATA…CLIMATE ARCHIVE RULES

The table displays the number of months that data is considered missing in each given year.
*** means that data is considered missing for the given year.

															TOTAL DAILY RAINFALL																					
																	YEAR																			
CLIMATE ID	**STATION**	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
6110270	Angus	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6110661	Beeton	0	3	0	0	0	11	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6110662	Beeton Assagi	***	***	***	***	***	***	***	***	***	***	3	1	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6110663	Beeton Graham	***	***	***	***	***	***	8	1	0	1	0	2	0	1	0	1	1	0	0	0	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6110667	Beeton Watson	***	***	***	4	0	0	5	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6110827	Borden A	***	9	0	0	0	9	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6111143	Camp Borden	1	4	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6111145	Camp Borden A	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6112171	Durham	1	4	11	6	3	0	1	2	1	0	0	3	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	5
6112350	Eugenia	0	0	0	0	11	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6113480	Holstein	11	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6113510	Hopeville	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6110HK7	Borden	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	11	0	0	0	0	1	1	8	***	***	***	***	***	***	***
6121603	Clifford	***	***	***	***	***	7	5	9	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6129235	Walkerton	0	0	0	0	0	0	0	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6131081	Caledonia	6	9	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6131982	Delhi CDA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	***	***
6131983	Delhi CS	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6133120	Hagersville	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
6133121	Hagersville 2	0	3	***	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6133855	Jarvis	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6134257	Kohler	7	7	8	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6136643	Port Dover	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6137730	Simcoe	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	5	3	1	0	0	0	5	***	***	***	***	***	***	***	***	***	***	***	***	***
6137735	Simcoe	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6137732	Simcoe (AUT)	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6140437	Ayr	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6140941	Brantford	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6140948	Brantford Brant Park	***	***	***	***	***	***	***	11	1	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6140951	Brantford Morell	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6140954	Brantford MOE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2	0	1	1	0	0	5
6141095	Cambridge-Galt MOE	5	10	***	9	0	6	10	0	1	0	0	1	4	0	0	0	0	1	0	0	0	1	0	0	1	1	1	0	0	11	***	***	***	***	***
6141602	Clifford	***	***	11	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6142065	Doon	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6142400	Fergus Shand Dam	1	1	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	4
6142402	Fergus MOE	0	0	0	1	1	1	0	0	0	0	0	1	0	4	1	1	0	4	10	***	1	0	0	4	0	8	0	5	0	0	1	0	0	0	4
6142627	Fullarton	5	3	9	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6142803	Glen Allan	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	1	0	8
6142990	Grand Valley	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6142991	Grand Valley STP	***	***	***	***	***	***	***	***	***	4	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	0	0	***	***	***	***	***
6143069	Guelph Arboretum	***	***	***	***	***	***	***	***	***	***	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	7	***	10	***	***
6143083	Guelph OAC	0	0	0	0	0	0	0	0	1	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6143090	Guelph Turfgrass CS	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6144232	Kitchener	0	0	0	0	0	0	0	0	0	0	0	0	0	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6144240	Kitchener City Eng 1	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6144241	Kitchener City Eng 2	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6144245	Kitchener ORWC	1	2	3	2	1	0	0	0	1	2	6	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6144475	London A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	5
6144481	London Lambeth A	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6144505	London South	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6145267	Monticello	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	5	8	***	***	***	***
6145495	Morriston	2	5	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6145502	Mount Forest	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	7	2	0	4
6145503	Mount Forest	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	7	5	1	3	1	0	6	***	***	***	***	***	***	***	***	***	***	***	***	***
6146240	Paris	***	***	10	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6146711	Preston	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	6	***	***	***
6146714	Preston WPCP	***	***	***	***	***	10	1	0	0	0	0	0	0	0	0	2	0	3	0	0	2	1	0	0	1	2	0	0	0	0	3	5	11	***	***
6146939	Redickville	1	2	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	11	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6148100	Stratford	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6148105	Stratford MOE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	3	0	1	0	5
6149380	Waterloo Fire Hall	***	***	***	***	***	***	***	***	10	6	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6149386	Waterloo WPCP	2	2	4	3	0	0	1	0	1	0	0	0	2	***	3	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	5
6149387	Waterloo Wellington	***	***	***	***	***	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	2
6149625	Woodstock	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
6150243	Alton	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6152661	Galt Osmond	5	0	0	0	0	0	0	0	0	0	0	0	0	9	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6152691	Georgetown	1	4	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6152695	Georgetown WPCP	1	0	0	0	0	0	0	0	0	0	0	0	1	6	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	5
6153192	Hamilton	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6153194	Hamilton A	0	1	1	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	2
6153300	Hamilton RGB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	4	***	***
6158350	Toronto	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	4
6158733	Toronto Pearson Int'l A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2

MISSING CLIMATE STATION DATA…CLIMATE ARCHIVE RULES

The table displays the number of months that data is considered missing in each given year.
*** means that data is considered missing for the given year.

																TOTAL DAILY SNOWFALL																				
																			YEAR																	
CLIMATE ID	STATION	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964
6110270	Angus	1	1	0	0	4	2	3	2	2	5	0	2	0	0	1	0	0	2	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	2
6110661	Beeton	0	0	0	0	0	0	1	0	1	0	1	2	0	0	0	0	0	2	0	0	0	0	0	1	1	1	0	0	2	0	1	1	5	4	1
6110662	Beeton Assagi	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6110663	Beeton Graham	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6110667	Beeton Watson	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6110827	Borden A	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6111143	Camp Borden	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	1	0	0	0	3
6111145	Camp Borden A	***	***	***	***	5	2	1	4	7	6	2	3	1	1	0	2	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6112171	Durham	***	***	***	***	***	10	4	8	***	***	***	***	***	***	***	***	***	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
6112350	Eugenia	0	0	0	0	0	2	1	1	0	5	0	1	0	1	0	0	0	0	1	0	4	8	6	11	10	4	0	1	0	0	0	0	0	0	0
6113480	Holstein	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	2	2	6	8	2	2	7	***	***	4	10	8
6113510	Hopeville	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	10	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	2
6110HK7	Borden	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6121603	Clifford	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6129235	Walkerton	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6131081	Caledonia	***	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	1
6131982	Delhi CDA	***	***	***	***	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0
6131983	Delhi CS	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6133120	Hagersville	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	3	1	0	0	0	0	0	0	0	0	1	0	0	0	5	0	0
6133121	Hagersville 2	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	7	0	0	0	0	0	0	0	0
6133855	Jarvis	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	6	2	10	***	***	***	***	***	***	***	***
6134257	Kohler	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	5	0	2	1	0	1	1	0	1	2	0	1	0	0	2	3
6136643	Port Dover	6	2	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0	1	4	***	1	1	1	0	0	0	0	1	1	1	0	1	5	2	3
6137730	Simcoe	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0	0	0
6137735	Simcoe	0	0	0	0	0	0	0	0	0	0	0	0	1	***	10	0	0	0	0	0	0	0	0	1	0	1	0	0	0	1	0	5	***	***	***
6137732	Simcoe (AUT)	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6140437	Ayr	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	4	0	1	0	0	7	***	***	***
6140941	Brantford	***	1	0	0	0	0	0	0	0	0	0	0	0	0	***	0	0	0	0	0	0	0	2	1	0	1	0	11	2	1	1	2	5	10	***
6140948	Brantford Brant Park	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6140951	Brantford Morell	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	4	0	0	0	0	2
6140954	Brantford MOE	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	5	0	1	1	0
6141095	Cambridge-Galt MOE	***	***	***	***	***	***	***	***	***	***	10	***	***	***	***	***	***	11	5	5	4	3	1	1	1	0	0	0	0	0	0	0	4	5	2
6141602	Clifford	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	7	0	0	0	0	0	0	0	0	0	1	5	9	6	***
6142065	Doon	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	5	3	3	1	0	2	***	***	***	***	***	***	***	***	***	***	***
6142400	Fergus Shand Dam	***	***	***	***	***	***	***	***	***	9	0	0	0	0	0	0	0	0	0	1	1	2	0	0	0	0	1	0	0	1	0	0	2	4	2
6142402	Fergus MOE	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	6	9
6142627	Fullarton	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	10	2	1	0	2	4	4	4	3
6142803	Glen Allan	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	8	4	6	7	0	0	0	0	0	0
6142990	Grand Valley	***	***	***	***	4	0	0	1	1	5	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6142991	Grand Valley STP	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6143069	Guelph Arboretum	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6143083	Guelph OAC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6143090	Guelph Turfgrass CS	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6144232	Kitchener	0	1	0	0	1	0	0	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
6144240	Kitchener City Eng 1	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	10	5	***	***	***	***	***	9	***	***	***
6144241	Kitchener City Eng 2	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	9	***	***	***
6144245	Kitchener ORWC	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	6	0	0
6144475	London A	***	***	***	***	***	***	***	***	***	***	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6144481	London Lambeth A	8	***	4	0	0	0	1	0	0	0	0	9	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6144505	London South	0	0	11	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6145267	Monticello	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	9	2	3	3	1	0	0	0	6	0	0
6145495	Morriston	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6145502	Mount Forest	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6145503	Mount Forest	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	***	***	***	***	***	***	***	***	***	***	***	***	***	0	0	0
6146240	Paris	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6146711	Preston	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	5	0	0	0	0	0	0	0	0	0	0	0
6146714	Preston WPCP	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6146939	Redickville	***	***	***	***	***	***	***	***	***	***	***	***	***	***	10	2	0	1	0	2	1	1	1	1	0	2	1	0	1	1	1	1	9	***	9
6148100	Stratford	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	***	***	***	***	***
6148105	Stratford MOE	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	10	0	0	0	0	0
6149380	Waterloo Fire Hall	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6149386	Waterloo WPCP	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	9	2	5
6149387	Waterloo Wellington	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6149625	Woodstock	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	4	1	0	1	0	1	0
6150243	Alton	0	0	0	0	0	1	***	***	***	***	***	***	***	***	***	***	***	0	0	2	2	0	4	5	4	7	***	***	***	10	***	7	6	4	***
6152661	Galt Osmond	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6152691	Georgetown	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	4	1	0	0	0	0	0	0	0	0	2	2	6	2	2	1	4	4	0
6152695	Georgetown WPCP	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	8	1	0
6153192	Hamilton	***	***	***	***	***	***	***	***	5	0	0	0	1	0	0	0	0	0	0	0	0	2	0	4	3	3	2	5	4	***	***	***	***	***	***
6153194	Hamilton A	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	11	0	3	3	6	4
6153300	Hamilton RGB	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6158350	Toronto	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6158733	Toronto Pearson Int'l A	***	***	***	***	***	***	***	10	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

MISSING CLIMATE STATION DATA…CLIMATE ARCHIVE RULES

The table displays the number of months that data is considered missing in each given year.
*** means that data is considered missing for the given year.

																TOTAL DAILY SNOWFALL																				
																		YEAR																		
CLIMATE ID	**STATION**	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
6110270	Angus	11	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6110661	Beeton	0	0	0	0	0	11	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6110662	Beeton Assagi	***	***	***	***	***	***	***	***	***	***	3	1	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6110663	Beeton Graham	***	***	***	***	***	***	8	1	0	1	0	1	0	0	0	0	0	0	0	0	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6110667	Beeton Watson	***	***	***	4	0	0	5	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6110827	Borden A	***	9	0	0	0	9	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6111143	Camp Borden	1	5	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6111145	Camp Borden A	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6112171	Durham	1	5	11	6	3	0	1	2	0	0	0	2	0	1	0	1	0	0	0	0	1	0	0	0	0	0	0	0	1	0	4	0	0	0	5
6112350	Eugenia	0	0	0	0	11	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6113480	Holstein	8	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6113510	Hopeville	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6110HK7	Borden	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	11	0	0	0	0	1	0	8	***	***	***	***	***	***	***
6121603	Clifford	***	***	***	***	***	7	5	9	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6129235	Walkerton	0	0	0	0	0	0	0	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6131081	Caledonia	0	2	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6131982	Delhi CDA	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	10	***	***
6131983	Delhi CS	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6133120	Hagersville	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
6133121	Hagersville 2	0	1	***	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6133855	Jarvis	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6134257	Kohler	5	3	6	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6136643	Port Dover	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6137730	Simcoe	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	5	3	1	0	0	0	5	***	***	***	***	***	***	***	***	***	***	***	***	***
6137735	Simcoe	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6137732	Simcoe (AUT)	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6140437	Ayr	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6140941	Brantford	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6140948	Brantford Brant Park	***	***	***	***	***	***	***	11	1	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6140951	Brantford Morell	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6140954	Brantford MOE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2	0	1	1	0	0	6
6141095	Cambridge-Galt MOE	3	9	***	9	0	6	9	0	1	0	0	1	4	0	0	0	0	0	0	0	1	0	0	0	1	1	1	0	2	***	***	***	***	***	***
6141602	Clifford	11	10	11	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6142065	Doon	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6142400	Fergus Shand Dam	0	2	1	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	4
6142402	Fergus MOE	0	0	0	1	1	1	0	0	0	0	0	1	0	4	1	1	0	4	10	***	1	0	0	4	0	8	0	5	0	0	1	0	0	0	4
6142627	Fullarton	5	5	8	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6142803	Glen Allan	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	1	0	8
6142990	Grand Valley	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6142991	Grand Valley STP	***	***	***	***	***	***	***	***	***	4	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	***	***	***	***	***
6143069	Guelph Arboretum	***	***	***	***	***	***	***	***	***	***	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	4	6	***	9	***	***
6143083	Guelph OAC	0	0	0	0	0	0	0	0	1	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6143090	Guelph Turfgrass CS	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6144232	Kitchener	0	0	0	0	0	0	0	0	0	0	0	0	0	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6144240	Kitchener City Eng 1	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6144241	Kitchener City Eng 2	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6144245	Kitchener ORWC	0	2	3	1	0	0	0	0	1	2	6	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6144475	London A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	5
6144481	London Lambeth A	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6144505	London South	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6145267	Monticello	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	4	8	***	***	***	***
6145495	Morriston	0	5	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6145502	Mount Forest	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	7	2	0	4
6145503	Mount Forest	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	7	4	1	3	1	0	6	***	***	***	***	***	***	***	***	***	***	***	***	***
6146240	Paris	***	***	9	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6146711	Preston	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	6	***	***	***
6146714	Preston WPCP	***	***	***	***	***	10	1	0	0	0	0	0	0	0	0	2	0	2	0	0	2	0	0	0	1	2	0	0	0	0	3	4	11	***	***
6146939	Redickville	1	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	11	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6148100	Stratford	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6148105	Stratford MOE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	3	0	1	0	5
6149380	Waterloo Fire Hall	***	***	***	***	***	***	***	***	10	6	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6149386	Waterloo WPCP	0	1	2	2	0	0	1	0	1	0	0	0	2	***	3	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	5
6149387	Waterloo Wellington	***	***	***	***	***	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	2
6149625	Woodstock	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
6150243	Alton	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6152661	Galt Osmond	5	1	0	0	0	0	0	0	0	0	0	0	0	9	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6152691	Georgetown	0	2	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6152695	Georgetown WPCP	0	0	0	0	0	0	0	0	0	0	0	0	1	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	5
6153192	Hamilton	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6153194	Hamilton A	1	0	1	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	2
6153300	Hamilton RGB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	4	***	***
6158350	Toronto	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	4
6158733	Toronto Pearson Int'l A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2

MISSING CLIMATE STATION DATA…CLIMATE ARCHIVE RULES

The table displays the number of months that data is considered missing in each given year.

*** means that data is considered missing for the given year.

															TOTAL DAILY PRECIPITATION																					
																		YEAR																		
CLIMATE ID		1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964
6110270	Angus	1	1	0	2	4	2	3	2	3	5	0	2	1	0	2	0	0	2	2	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	5
6110661	Beeton	0	0	0	0	0	1	1	0	1	0	1	3	0	0	1	0	0	2	0	0	0	0	0	1	1	1	0	0	2	1	2	1	8	5	2
6110662	Beeton Assagi	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6110663	Beeton Graham	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6110667	Beeton Watson	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6110827	Borden A	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6111143	Camp Borden	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	1	1	1	2	4
6111145	Camp Borden A	***	***	***	***	5	2	1	4	7	6	2	5	1	2	0	3	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6112171	Durham	***	***	***	***	***	10	4	8	***	***	***	***	***	***	***	***	***	10	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1
6112350	Eugenia	0	0	0	0	0	2	1	1	0	5	0	1	0	1	0	0	0	0	1	1	4	9	7	11	10	5	0	1	0	0	0	0	0	0	0
6113480	Holstein	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	2	3	7	8	2	3	7	***	***	8	10	11
6113510	Hopeville	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	10	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	2
6110HK7	Borden	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6121603	Clifford	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6129235	Walkerton	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6131081	Caledonia	***	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	1	1	0	4
6131982	Delhi CDA	***	***	***	***	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0
6131983	Delhi CS	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6133120	Hagersville	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	3	1	0	0	0	0	0	0	0	0	1	0	0	2	6	3	1
6133121	Hagersville 2	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	7	0	0	0	2	0	0	1	0
6133855	Jarvis	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	6	4	10	***	***	***	***	***	***	***	***
6134257	Kohler	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	5	0	2	1	0	2	1	0	1	3	0	1	1	1	4	5
6136643	Port Dover	6	2	0	0	1	0	0	1	1	0	0	0	3	0	0	0	0	1	4	***	1	1	1	0	0	0	0	1	3	1	0	5	6	3	4
6137730	Simcoe	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0	0	0
6137732	Simcoe (AUT)	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6137735	Simcoe	0	0	0	1	0	0	0	0	0	0	0	0	1	***	10	0	0	0	0	0	0	0	0	1	0	1	0	0	1	1	0	6	***	***	***
6140437	Ayr	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	4	0	1	0	1	7	***	***	***
6140941	Brantford	***	1	0	0	0	0	0	0	0	0	0	0	0	0	***	0	0	0	0	0	0	0	2	1	0	2	0	11	2	1	1	4	6	10	***
6140948	Brantford Brant Park	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6140951	Brantford Morell	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	4	0	0	0	1	2
6140954	Brantford MOE	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	5	1	1	1	0
6141095	Cambridge-Galt MOE	***	***	***	***	***	***	***	***	***	***	10	***	***	***	***	***	***	11	5	5	4	3	1	1	1	0	0	0	0	0	0	1	4	7	3
6141602	Clifford	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	7	0	0	0	0	0	0	0	0	0	1	5	9	6	***
6142065	Doon	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	5	3	2	1	0	5	***	***	***	***	***	***	***	***	***	***	***
6142400	Fergus Shand Dam	***	***	***	***	***	***	***	***	***	9	0	0	0	0	0	0	0	0	0	1	1	2	0	0	0	0	1	0	0	1	0	2	3	4	2
6142402	Fergus MOE	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	8	10
6142627	Fullarton	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	10	2	1	0	2	5	6	6	4
6142803	Glen Allan	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	8	4	6	7	0	0	0	0	0	0
6142990	Grand Valley	***	***	***	***	4	0	1	1	1	5	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6142991	Grand Valley STP	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6143069	Guelph Arboretum	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6143083	Guelph OAC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6143090	Guelph Turfgrass CS	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6144232	Kitchener	0	1	0	0	1	1	0	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0
6144240	Kitchener City Eng 1	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	10	5	***	***	***	***	***	11	***	***	***
6144241	Kitchener City Eng 2	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	9	***	***	***
6144245	Kitchener ORWC	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	7	1	1
6144475	London A	***	***	***	***	***	***	***	***	***	***	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6144481	London Lambeth A	9	***	4	0	0	0	1	0	0	0	0	9	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6144505	London South	0	0	11	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6145267	Monticello	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	9	2	3	3	1	0	0	1	8	0	0
6145495	Morriston	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	3	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
6145502	Mount Forest	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6145503	Mount Forest	3	0	0	4	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	***	***	***	***	***	***	***	***	***	***	***	***	***	0	0	0
6146240	Paris	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6146711	Preston	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	5	0	0	0	0	0	0	0	0	0	0	0
6146714	Preston WPCP	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6146939	Redickville	***	***	***	***	***	***	***	***	***	***	***	***	***	***	10	2	0	1	0	2	1	1	1	1	0	1	1	0	1	2	2	2	10	***	9
6148100	Stratford	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	***	***	***	***	***
6148105	Stratford MOE	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	10	0	0	0	0	0
6149380	Waterloo Fire Hall	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6149386	Waterloo WPCP	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	10	3	6
6149387	Waterloo Wellington	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6149625	Woodstock	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	4	1	0	3	3	2	0
6150243	Alton	0	0	0	0	0	1	***	***	***	***	***	***	***	***	***	***	***	0	0	2	2	0	4	5	4	8	***	***	***	10	***	8	7	5	***
6152661	Galt Osmond	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6152691	Georgetown	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	4	1	0	0	0	0	0	0	1	1	2	2	6	3	2	2	5	5	2
6152695	Georgetown WPCP	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	8	2	0
6153192	Hamilton	***	***	***	***	***	***	***	***	5	0	0	0	1	0	0	0	0	0	1	0	0	2	0	4	3	4	4	5	4	***	***	***	***	***	***
6153194	Hamilton A	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	11	0	6	6	6	5
6153300	Hamilton RGB	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6158350	Toronto	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6158733	Toronto Pearson Int'l A	***	***	***	***	***	***	***	10	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

MISSING CLIMATE STATION DATA…CLIMATE ARCHIVE RULES

The table displays the number of months that data is considered missing in each given year.
*** means that data is considered missing for the given year.

															TOTAL DAILY PRECIPITATION																					
																		YEAR																		
CLIMATE ID	**STATION**	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
6110270	Angus	11	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6110661	Beeton	0	3	0	0	0	11	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6110662	Beeton Assagi	***	***	***	***	***	***	***	***	***	***	3	1	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6110663	Beeton Graham	***	***	***	***	***	***	8	1	0	1	0	2	0	1	0	1	1	0	0	0	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6110667	Beeton Watson	***	***	***	4	0	0	5	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6110827	Borden A	***	9	0	0	0	9	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6111143	Camp Borden	1	5	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6111145	Camp Borden A	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6112171	Durham	1	5	11	6	3	0	1	2	1	0	0	3	0	2	0	1	0	0	0	0	1	0	0	0	0	0	0	0	1	0	4	0	0	0	5
6112350	Eugenia	0	0	0	0	11	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6113480	Holstein	11	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6113510	Hopeville	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6110HK7	Borden	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	11	0	0	0	0	1	1	8	***	***	***	***	***	***	***
6121603	Clifford	***	***	***	***	***	7	5	9	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6129235	Walkerton	0	0	0	0	0	0	0	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6131081	Caledonia	6	9	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6131982	Delhi CDA	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	10	***	***
6131983	Delhi CS	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6133120	Hagersville	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
6133121	Hagersville 2	0	3	***	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6133855	Jarvis	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6134257	Kohler	7	7	8	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6136643	Port Dover	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6137730	Simcoe	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	5	3	1	0	0	0	5	***	***	***	***	***	***	***	***	***	***	***	***	***
6137732	Simcoe (AUT)	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6137735	Simcoe	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6140437	Ayr	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6140941	Brantford	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6140948	Brantford Brant Park	***	***	***	***	***	***	***	11	1	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6140951	Brantford Morell	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6140954	Brantford MOE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2	0	1	1	0	0	6
6141095	Cambridge-Galt MOE	4	10	***	9	0	6	10	0	1	0	0	1	4	0	0	0	0	1	0	0	1	1	0	0	1	1	1	0	2	***	***	***	***	***	***
6141602	Clifford	***	***	11	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6142065	Doon	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6142400	Fergus Shand Dam	1	3	1	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	4
6142402	Fergus MOE	0	0	0	1	1	1	0	0	0	0	0	1	0	4	1	1	0	4	10	***	1	0	0	4	0	8	0	5	0	0	1	0	0	0	4
6142627	Fullarton	6	5	9	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6142803	Glen Allan	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	1	0	8
6142990	Grand Valley	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6142991	Grand Valley STP	***	***	***	***	***	***	***	***	***	4	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	0	0	***	***	***	***	***
6143069	Guelph Arboretum	***	***	***	***	***	***	***	***	***	***	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	4	7	***	10	***	***
6143083	Guelph OAC	0	0	0	0	0	0	0	0	1	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6143090	Guelph Turfgrass CS	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6144232	Kitchener	0	0	0	0	0	0	0	0	0	0	0	0	0	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6144240	Kitchener City Eng 1	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6144241	Kitchener City Eng 2	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6144245	Kitchener ORWC	1	2	3	2	1	0	0	0	1	2	6	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6144475	London A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	1	5
6144481	London Lambeth A	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6144505	London South	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6145267	Monticello	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	5	8	***	***	***	***
6145495	Morriston	2	5	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6145502	Mount Forest	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	8	2	0	4
6145503	Mount Forest	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	7	5	1	3	1	0	6	***	***	***	***	***	***	***	***	***	***	***	***	***
6146240	Paris	***	***	10	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6146711	Preston	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	6	***	***	***
6146714	Preston WPCP	***	***	***	***	***	10	1	0	0	0	0	0	0	0	0	2	0	3	0	0	2	1	0	0	1	2	0	0	0	0	3	5	11	***	***
6146939	Redickville	1	2	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	11	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6148100	Stratford	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6148105	Stratford MOE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	3	0	1	0	5
6149380	Waterloo Fire Hall	***	***	***	***	***	***	***	***	10	6	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6149386	Waterloo WPCP	2	3	4	3	0	0	1	0	1	0	0	0	2	***	3	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	5
6149387	Waterloo Wellington	***	***	***	***	***	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2	2	0	2
6149625	Woodstock	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
6150243	Alton	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6152661	Galt Osmond	5	1	0	0	0	0	0	0	0	0	0	0	0	9	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6152691	Georgetown	1	4	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6152695	Georgetown WPCP	1	0	0	0	0	0	0	0	0	0	0	0	1	6	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	5
6153192	Hamilton	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6153194	Hamilton A	1	1	1	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	2
6153300	Hamilton RGB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	4	***	***
6158350	Toronto	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	4
6158733	Toronto Pearson Int'l A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2

MISSING CLIMATE STATION DATA…CLIMATE ARCHIVE RULES

The table displays the number of months that data is considered missing in each given year.

*** means that data is considered missing for the given year.

																DAILY MAX TEMPERATURE																				
																		YEAR																		
CLIMATE ID	**STATION**	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
6110270	Angus	1	1	0	0	0	3	3	3	6	3	0	2	0	0	1	0	0	1	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	5
6110661	Beeton	0	0	0	0	0	0	0	0	0	0	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3	0	0	0	0
6110662	Beeton Assagi	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6110663	Beeton Graham	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6110667	Beeton Watson	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6110827	Borden A	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6111143	Camp Borden	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	1	0	0	0	0
6111145	Camp Borden A	***	***	***	***	6	0	0	1	3	5	2	4	0	1	0	2	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6112171	Durham	***	***	***	***	***	8	0	7	***	***	***	***	***	***	***	***	***	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6112350	Eugenia	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	9	***	***	***	***	***	***	***	***
6113480	Holstein	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	2	2	7	8	3	6	9	***	***	2	10	8
6113510	Hopeville	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6110HK7	Borden	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6121603	Clifford	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6129235	Walkerton	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6131081	Caledonia	***	1	7	4	5	7	10	6	3	2	2	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	2	0
6131982	Delhi CDA	***	***	***	***	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
6131983	Delhi CS	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6133120	Hagersville	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6133121	Hagersville 2	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	7	0	0	0	3	0	0	0	0
6133855	Jarvis	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	5	1	8	***	***	***	***	***	***	***	***
6134257	Kohler	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	5	0	1	3	0	4	5	1	0	2	1	2	3	1	2	5
6136643	Port Dover	6	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	***	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
6137730	Simcoe	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0	0	0
6137732	Simcoe (AUT)	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6137735	Simcoe	0	0	0	0	0	0	0	0	0	0	0	0	2	***	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	***	***	***
6140437	Ayr	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	4	1	2	0	1	7	***	***	***
6140941	Brantford	***	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	5	1	0	0	5	10	***
6140948	Brantford Brant Park	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6140951	Brantford Morell	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6140954	Brantford MOE	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	7	0	0	0	0
6141095	Cambridge-Galt MOE	***	***	***	***	***	***	***	***	***	***	11	***	***	***	***	***	***	11	5	0	0	2	2	2	0	0	0	0	0	0	0	1	2	2	1
6141602	Clifford	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6142065	Doon	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6142400	Fergus Shand Dam	***	***	***	***	***	***	***	***	***	9	0	0	2	0	2	0	0	0	1	1	1	2	0	0	0	0	2	0	0	0	1	0	1	0	0
6142402	Fergus MOE	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6142627	Fullarton	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	10	1	0	0	2	0	0	0
6142803	Glen Allan	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	7	0	0	0	0	0	0
6142990	Grand Valley	***	***	***	***	4	0	0	1	1	5	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6142991	Grand Valley STP	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6143069	Guelph Arboretum	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6143083	Guelph OAC	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6143090	Guelph Turfgrass CS	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6144232	Kitchener	0	0	0	0	0	0	0	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6144240	Kitchener City Eng 1	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6144241	Kitchener City Eng 2	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6144245	Kitchener ORWC	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6144475	London A	***	***	***	***	***	***	***	***	***	***	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6144481	London Lambeth A	9	***	4	0	0	0	0	0	0	0	0	9	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6144505	London South	0	0	11	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6145267	Monticello	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	9	2	2	3	4	0	0	0	0	1	0
6145495	Morriston	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6145502	Mount Forest	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6145503	Mount Forest	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	***	***	***	***	***	***	***	***	***	***	***	***	***	0	0	0
6146240	Paris	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6146711	Preston	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	6	0	0	0	0	0	0	0	0	0	0	0
6146714	Preston WPCP	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6146939	Redickville	***	***	***	***	***	***	***	***	***	***	***	***	***	***	10	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	4	11	7
6148100	Stratford	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	***	***	***	***	***
6148105	Stratford MOE	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	10	0	0	0	0	0
6149380	Waterloo Fire Hall	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6149386	Waterloo WPCP	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6149387	Waterloo Wellington	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6149625	Woodstock	0	0	0	0	0	0	0	0	0	0	1	1	2	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	4	1	0	0	0	0	0
6150243	Alton	0	0	0	0	0	2	***	***	***	***	***	***	***	***	***	***	***	1	0	2	3	0	1	1	5	8	***	***	***	10	***	6	0	1	11
6152661	Galt Osmond	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6152691	Georgetown	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	1	3	0	0	0	0	0	0	0	0	0	2	2	5	1	1	3	0	0	0
6152695	Georgetown WPCP	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6153192	Hamilton	***	***	***	***	***	***	***	***	5	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	5	***	***	***	***	***	***
6153194	Hamilton A	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	11	0	4	0	3	0
6153330	Hamilton RGB	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6158350	Toronto	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6158733	Toronto Pearson Int'l A	***	***	***	***	***	***	***	10	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

MISSING CLIMATE STATION DATA…CLIMATE ARCHIVE RULES

The table displays the number of months that data is considered missing in each given year.
*** means that data is considered missing for the given year.

																DAILY MAX TEMPERATURE																				
																		YEAR																		
CLIMATE ID	**STATION**	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
6110270	Angus	11	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6110661	Beeton	0	0	0	0	0	11	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6110662	Beeton Assagi	***	***	***	***	***	***	***	***	***	***	3	1	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6110663	Beeton Graham	***	***	***	***	***	***	***	***	***	***	***	***	6	1	1	2	1	2	1	3	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6110667	Beeton Watson	***	***	***	4	0	0	5	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6110827	Borden A	***	9	0	0	0	9	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6111143	Camp Borden	4	4	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6111145	Camp Borden A	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6112171	Durham	1	3	11	7	3	0	2	2	0	1	0	1	0	3	3	5	2	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	5
6112350	Eugenia	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6113480	Holstein	8	11	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6113510	Hopeville	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6110HK7	Borden	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	11	0	0	0	0	1	0	8	***	***	***	***	***	***	***
6121603	Clifford	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6129235	Walkerton	0	0	0	0	0	0	0	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6131081	Caledonia	4	2	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6131982	Delhi CDA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	***	***
6131983	Delhi CS	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6133120	Hagersville	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	9	0	0	0	0	0	0	0	0	0	0	0	0	0	4
6133121	Hagersville 2	0	1	***	10	0	0	0	0	0	0	0	1	0	1	0	0	1	0	0	2	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6133855	Jarvis	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6134257	Kohler	4	5	9	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6136643	Port Dover	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6137730	Simcoe	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	1	1	0	0	0	5	***	***	***	***	***	***	***	***	***	***	***	***	***
6137732	Simcoe (AUT)	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	9	10	5	1	0	2	5
6137735	Simcoe	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6140437	Ayr	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6140941	Brantford	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6140948	Brantford Brant Park	***	***	***	***	***	***	***	11	1	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6140951	Brantford Morell	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6140954	Brantford MOE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	3	1	11	0	0	9	2	1	5
6141095	Cambridge-Galt MOE	2	9	***	9	0	6	9	0	1	1	3	1	4	4	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	11	***	***	***	***	***
6141602	Clifford	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6142065	Doon	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6142400	Fergus Shand Dam	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
6142402	Fergus MOE	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	8	2	0	0	1	0	0	4
6142627	Fullarton	0	0	6	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6142803	Glen Allan	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	8
6142990	Grand Valley	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6142991	Grand Valley STP	***	***	***	***	***	***	***	***	***	9	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	***	***	***	***	***
6143069	Guelph Arboretum	***	***	***	***	***	***	***	***	***	***	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	***	9	***	***
6143083	Guelph OAC	0	0	0	0	0	0	0	0	1	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6143090	Guelph Turfgrass CS	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6144232	Kitchener	0	0	0	0	0	0	0	0	0	0	0	0	0	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6144240	Kitchener City Eng 1	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6144241	Kitchener City Eng 2	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6144245	Kitchener ORWC	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6144475	London A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
6144481	London Lambeth A	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6144505	London South	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6145267	Monticello	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	5	11	***	***	***	***
6145495	Morriston	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6145502	Mount Forest	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	7	0	0	4
6145503	Mount Forest	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	3	***	***	***	***	***	***	***	***	***	***	***	***	***
6146240	Paris	***	***	10	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6146711	Preston	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	6	***	***	***
6146714	Preston WPCP	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6146939	Redickville	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	11	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6148100	Stratford	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6148105	Stratford MOE	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	4
6149380	Waterloo Fire Hall	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6149386	Waterloo WPCP	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6149387	Waterloo Wellington	***	***	***	***	***	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2
6149625	Woodstock	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
6150243	Alton	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6152661	Galt Osmond	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6152691	Georgetown	0	2	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6152695	Georgetown WPCP	***	***	***	***	***	***	***	***	***	***	***	***	***	***	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	5
6153192	Hamilton	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6153194	Hamilton A	0	1	3	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
6153300	Hamilton RGB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	***	***
6158350	Toronto	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
6158733	Toronto Pearson Int'l A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2

MISSING CLIMATE STATION DATA…CLIMATE ARCHIVE RULES

The table displays the number of months that data is considered missing in each given year.

*** means that data is considered missing for the given year.

																		DAILY MIN TEMPERATURE																		
																		YEAR																		
CLIMATE ID	**STATION**	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964
6110270	Angus	1	1	0	0	0	3	3	3	4	4	0	2	0	0	1	0	0	1	1	0	2	0	0	1	0	0	2	0	0	0	0	0	0	0	5
6110661	Beeton	0	0	0	0	2	0	0	0	0	0	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0
6110662	Beeton Assagi	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6110663	Beeton Graham	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6110667	Beeton Watson	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6110827	Borden A	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6111143	Camp Borden	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	1	0	3	0	0
6111145	Camp Borden A	***	***	***	***	5	0	0	1	3	3	2	3	0	0	0	3	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6112171	Durham	***	***	***	***	***	8	0	7	***	***	***	***	***	***	***	***	***	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6112350	Eugenia	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	9	***	***	***	***	***	***	***	***
6113480	Holstein	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	2	2	7	8	3	5	9	***	***	1	10	8
6113510	Hopeville	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6110HK7	Borden	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6121603	Clifford	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6129235	Walkerton	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6131081	Caledonia	***	1	6	5	7	6	11	3	3	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
6131982	Delhi CDA	***	***	***	***	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6131983	Delhi CS	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6133120	Hagersville	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6133121	Hagersville 2	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	7	0	0	2	1	0	0	0	0
6133855	Jarvis	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	5	1	8	***	***	***	***	***	***	***	***
6134257	Kohler	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	5	7	1	3	0	5	6	1	0	1	1	1	3	1	2	2
6136643	Port Dover	8	4	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	1	0	***	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6137730	Simcoe	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0	0	0
6137732	Simcoe (AUT)	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6137735	Simcoe	0	0	0	0	0	0	0	0	0	0	0	0	1	***	10	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	5	***	***	***
6140437	Ayr	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	5	1	2	0	1	7	***	***	***
6140941	Brantford	***	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	3	5	0	0	4	11	***
6140948	Brantford Brant Park	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6140951	Brantford Morell	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6140954	Brantford MOE	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	7	0	0	0	0
6141095	Cambridge-Galt MOE	***	***	***	***	***	***	***	***	***	***	11	***	***	***	***	***	***	11	5	0	0	6	3	9	1	0	0	0	0	0	0	0	2	4	1
6141602	Clifford	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6142065	Doon	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6142400	Fergus Shand Dam	***	***	***	***	***	***	***	***	***	9	0	1	1	0	0	0	0	0	1	1	1	2	0	0	0	0	2	1	0	0	0	0	1	0	0
6142402	Fergus MOE	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6142627	Fullarton	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	10	1	0	0	2	0	0	0
6142803	Glen Allan	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	7	0	0	0	0	0	0
6142990	Grand Valley	***	***	***	***	4	2	1	1	1	4	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6142991	Grand Valley STP	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6143069	Guelph Arboretum	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6143083	Guelph OAC	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6143090	Guelph Turfgrass CS	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6144232	Kitchener	0	0	0	0	0	0	0	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6144240	Kitchener City Eng 1	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6144241	Kitchener City Eng 2	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6144245	Kitchener ORWC	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6144475	London A	***	***	***	***	***	***	***	***	***	***	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6144481	London Lambeth A	9	***	4	0	0	0	0	0	0	0	0	9	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6144505	London South	0	0	11	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6145267	Monticello	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	9	1	2	4	4	0	0	0	0	0	0
6145495	Morriston	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6145502	Mount Forest	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6145503	Mount Forest	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	***	***	***	***	***	***	***	***	***	***	***	***	***	0	0	0
6146240	Paris	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6146711	Preston	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	6	0	0	0	0	0	0	0	0	0	0	0
6146714	Preston WPCP	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6146939	Redickville	***	***	***	***	***	***	***	***	***	***	***	***	***	***	10	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	4	***	7
6148100	Stratford	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	***	***	***	***	***
6148105	Stratford MOE	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	10	0	0	0	0	0
6149380	Waterloo Fire Hall	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6149386	Waterloo WPCP	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6149387	Waterloo Wellington	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6149625	Woodstock	0	0	0	0	0	0	0	0	0	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	4	1	0	0	0	0	0
6150243	Alton	0	0	0	0	0	3	***	***	***	***	***	***	***	***	***	***	***	1	4	3	4	0	2	1	1	5	***	***	***	10	***	6	0	1	11
6152661	Galt Osmond	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6152691	Georgetown	0	0	0	0	0	0	0	0	0	0	1	0	0	2	0	1	3	0	0	0	0	0	0	0	0	0	2	2	5	1	1	2	0	0	0
6152695	Georgetown WPCP	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6153192	Hamilton	***	***	***	***	***	***	***	***	5	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	5	***	***	***	***	***	***
6153194	Hamilton A	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	11	0	0	0	3	0
6153300	Hamilton RGB	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6158350	Toronto	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6158733	Toronto Pearson Int'l A	***	***	***	***	***	***	***	10	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

MISSING CLIMATE STATION DATA…CLIMATE ARCHIVE RULES

The table displays the number of months that data is considered missing in each given year.

*** means that data is considered missing for the given year.

																DAILY MIN TEMPERATURE																				
																		YEAR																		
CLIMATE ID	**STATION**	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
6110270	Angus	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6110661	Beeton	0	0	0	0	0	11	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6110662	Beeton Assagi	***	***	***	***	***	***	***	***	***	***	3	1	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6110663	Beeton Graham	***	***	***	***	***	***	***	***	***	***	***	***	6	1	3	2	1	2	1	3	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6110667	Beeton Watson	***	***	***	4	0	0	5	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6110827	Borden A	***	9	0	0	0	9	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6111143	Camp Borden	0	4	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6111145	Camp Borden A	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6112171	Durham	1	4	11	8	3	1	2	2	0	2	0	1	0	3	3	5	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
6112350	Eugenia	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6113480	Holstein	8	11	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6113510	Hopeville	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6110HK7	Borden	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	11	0	0	0	0	1	0	8	***	***	***	***	***	***	***
6121603	Clifford	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6129235	Walkerton	0	0	0	0	0	0	0	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6131081	Caledonia	3	5	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6131982	Delhi CDA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	***	***
6131983	Delhi CS	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6133120	Hagersville	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	9	0	0	0	0	0	0	0	0	0	0	0	0	0	4
6133121	Hagersville 2	2	1	***	10	0	0	0	0	0	0	0	1	0	1	0	0	1	0	1	2	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6133855	Jarvis	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6134257	Kohler	4	5	8	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6136643	Port Dover	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6137730	Simcoe	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	1	1	0	0	0	5	***	***	***	***	***	***	***	***	***	***	***	***	***
6137732	Simcoe (AUT)	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	9	10	4	1	0	3	5
6137735	Simcoe	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6140437	Ayr	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6140941	Brantford	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6140948	Brantford Brant Park	***	***	***	***	***	***	***	11	2	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6140951	Brantford Morell	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6140954	Brantford MOE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	1	0	0	5
6141095	Cambridge-Galt MOE	1	9	***	9	0	6	9	0	1	0	0	1	4	4	6	3	1	0	0	0	0	0	0	0	0	0	1	0	0	11	***	***	***	***	***
6141602	Clifford	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6142065	Doon	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6142400	Fergus Shand Dam	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
6142402	Fergus MOE	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	8	2	0	0	0	0	0	4
6142627	Fullarton	0	0	6	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6142803	Glen Allan	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	8
6142990	Grand Valley	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6142991	Grand Valley STP	***	***	***	***	***	***	***	***	***	9	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	***	***	***	***	***
6143069	Guelph Arboretum	***	***	***	***	***	***	***	***	***	***	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	***	9	***	***
6143083	Guelph OAC	0	0	0	0	0	0	0	0	1	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6143090	Guelph Turfgrass CS	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6144232	Kitchener	0	0	0	0	0	0	0	0	0	0	0	0	0	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6144240	Kitchener City Eng 1	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6144241	Kitchener City Eng 2	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6144245	Kitchener ORWC	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6144475	London A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
6144481	London Lambeth A	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6144505	London South	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6145267	Monticello	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	5	11	***	***	***	***
6145495	Morriston	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6145502	Mount Forest	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	7	0	0	4
6145503	Mount Forest	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	3	***	***	***	***	***	***	***	***	***	***	***	***	***
6146240	Paris	***	***	10	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6146711	Preston	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	6	***	***	***
6146714	Preston WPCP	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6146939	Redickville	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	11	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6148100	Stratford	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6148105	Stratford MOE	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	4
6149380	Waterloo Fire Hall	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6149386	Waterloo WPCP	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6149387	Waterloo Wellington	***	***	***	***	***	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2
6149625	Woodstock	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
6150243	Alton	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6152661	Galt Osmond	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6152691	Georgetown	0	2	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6152695	Georgetown WPCP	***	***	***	***	***	***	***	***	***	***	***	***	***	***	6	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	5
6153192	Hamilton	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6153194	Hamilton A	0	0	2	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
6153300	Hamilton RGB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	***	***
6158350	Toronto	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
6158733	Toronto Pearson Int'l A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2

MISSING CLIMATE STATION DATA…CLIMATE ARCHIVE RULES

The table displays the number of months that data is considered missing in each given year.

*** means that data is considered missing for the given year.

															FREEZING RAIN FLAG																					
																	YEAR																			
CLIMATE ID	**STATION**	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964
6110270	Angus	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6110661	Beeton	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6110662	Beeton Assagi	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6110663	Beeton Graham	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6110667	Beeton Watson	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6110827	Borden A	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6111143	Camp Borden	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6111145	Camp Borden A	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6112171	Durham	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6112350	Eugenia	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6113480	Holstein	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6113510	Hopeville	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6110HK7	Borden	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6121603	Clifford	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6129235	Walkerton	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6131081	Caledonia	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6131982	Delhi CDA	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6131983	Delhi CS	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6133120	Hagersville	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6133121	Hagersville 2	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6133855	Jarvis	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6134257	Kohler	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6136643	Port Dover	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6137730	Simcoe	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0	0	0
6137732	Simcoe (AUT)	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6137735	Simcoe	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6140437	Ayr	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6140941	Brantford	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6140948	Brantford Brant Park	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6140951	Brantford Morell	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6140954	Brantford MOE	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6141095	Cambridge-Galt MOE	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6141602	Clifford	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6142065	Doon	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6142400	Fergus Shand Dam	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6142402	Fergus MOE	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6142627	Fullarton	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6142803	Glen Allan	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6142990	Grand Valley	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6142991	Grand Valley STP	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6143069	Guelph Arboretum	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6143083	Guelph OAC	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6143090	Guelph Turfgrass CS	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6144232	Kitchener	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6144240	Kitchener City Eng 1	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6144241	Kitchener City Eng 2	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6144245	Kitchener ORWC	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6144475	London A	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0	0	0	0	0	0	0	0	0	0
6144481	London Lambeth A	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6144505	London South	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6145267	Monticello	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6145495	Morriston	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6145502	Mount Forest	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6145503	Mount Forest	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0	0	0
6146240	Paris	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6146711	Preston	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6146714	Preston WPCP	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6146939	Redickville	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6148100	Stratford	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6148105	Stratford MOE	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6149380	Waterloo Fire Hall	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6149386	Waterloo WPCP	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6149387	Waterloo Wellington	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6149625	Woodstock	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6150243	Alton	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6152661	Galt Osmond	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6152691	Georgetown	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6152695	Georgetown WPCP	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6153192	Hamilton	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6153194	Hamilton A	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6153300	Hamilton RGB	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	6	0	0	0
6158350	Toronto	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0	0	0	0	0	0	0	0	0	0
6158733	Toronto Pearson Int'l A	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0	0	0	0	0	0	0	0	0	0

MISSING CLIMATE STATION DATA…CLIMATE ARCHIVE RULES
The table displays the number of months that data is considered missing in each given year.
*** means that data is considered missing for the given year.

															FREEZING RAIN FLAG																					
																	YEAR																			
CLIMATE ID	**STATION**	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
6110270	Angus	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6110661	Beeton	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6110662	Beeton Assagi	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6110663	Beeton Graham	***	***	***	***	***	***	***	***	***	***	***	***	0	0	0	0	0	0	0	0	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6110667	Beeton Watson	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6110827	Borden A	***	8	0	0	0	9	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6111143	Camp Borden	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6111145	Camp Borden A	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6112171	Durham	***	***	***	***	***	***	***	***	***	***	***	***	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
6112350	Eugenia	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6113480	Holstein	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6113510	Hopeville	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6110HK7	Borden	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	11	0	0	0	0	1	0	8	***	***	***	***	***	***	***
6121603	Clifford	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6129235	Walkerton	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6131081	Caledonia	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6131982	Delhi CDA	***	***	***	***	***	***	***	***	***	***	11	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	***	***
6131983	Delhi CS	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	6	3	4
6133120	Hagersville	***	***	***	***	***	***	***	***	***	***	***	***	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
6133121	Hagersville 2	***	***	***	***	***	***	***	***	***	***	***	***	0	0	0	0	0	0	0	2	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6133855	Jarvis	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6134257	Kohler	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6136643	Port Dover	***	***	***	***	***	***	***	***	***	***	***	***	0	0	0	0	0	0	0	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6137730	Simcoe	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	***	***	***	***	***	***	***	***	***	***	***	***	***
6137732	Simcoe (AUT)	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6137735	Simcoe	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6140437	Ayr	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6140941	Brantford	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6140948	Brantford Brant Park	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6140951	Brantford Morell	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6140954	Brantford MOE	***	***	***	***	***	***	***	***	***	***	***	***	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	1	0	0	5
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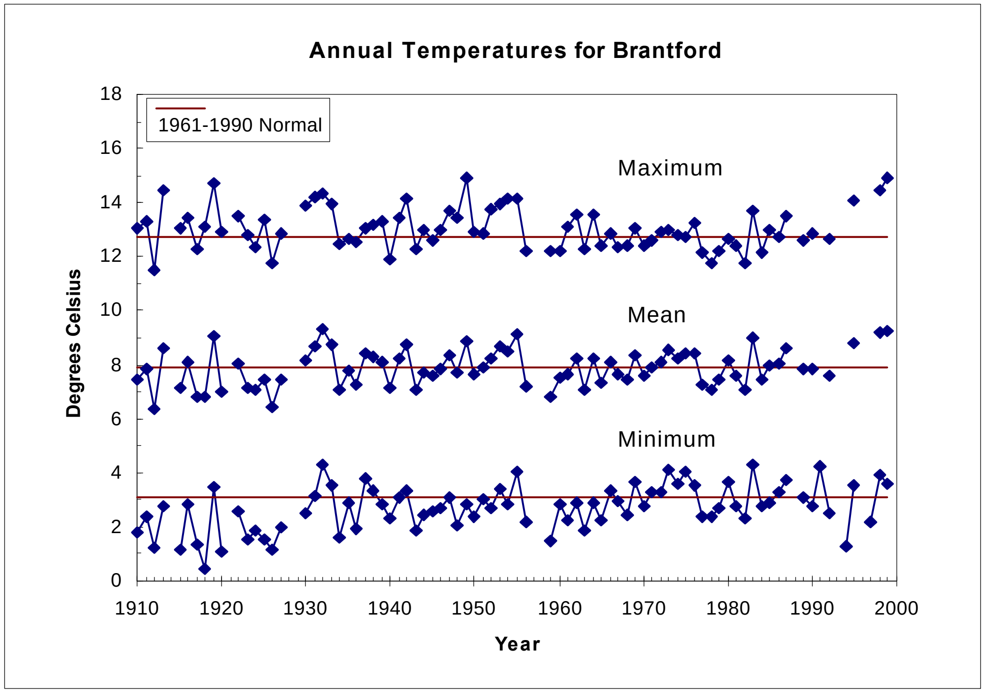
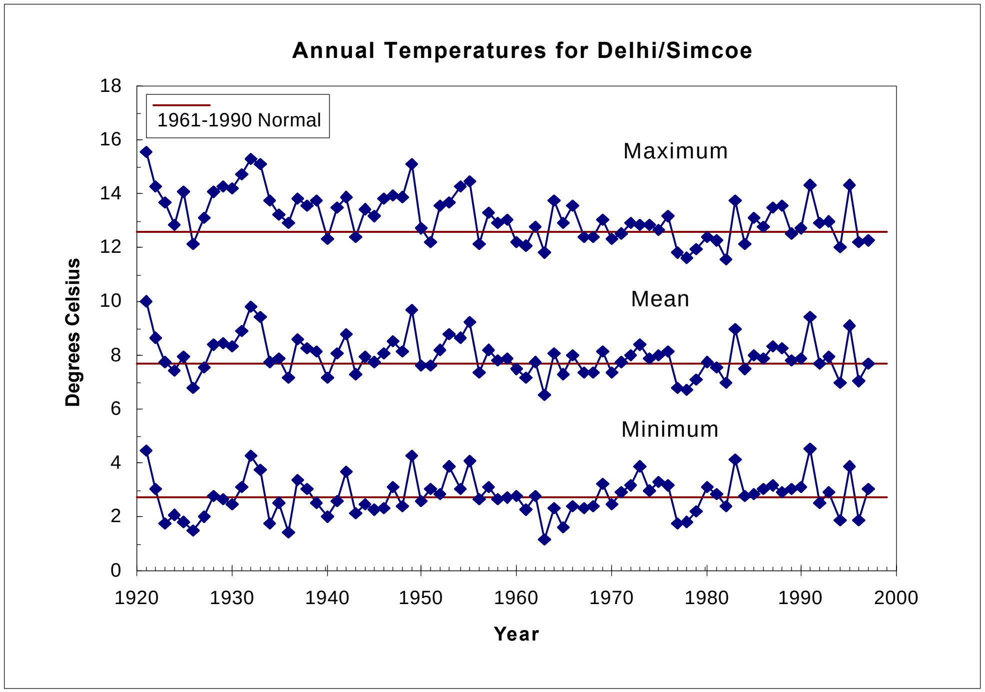
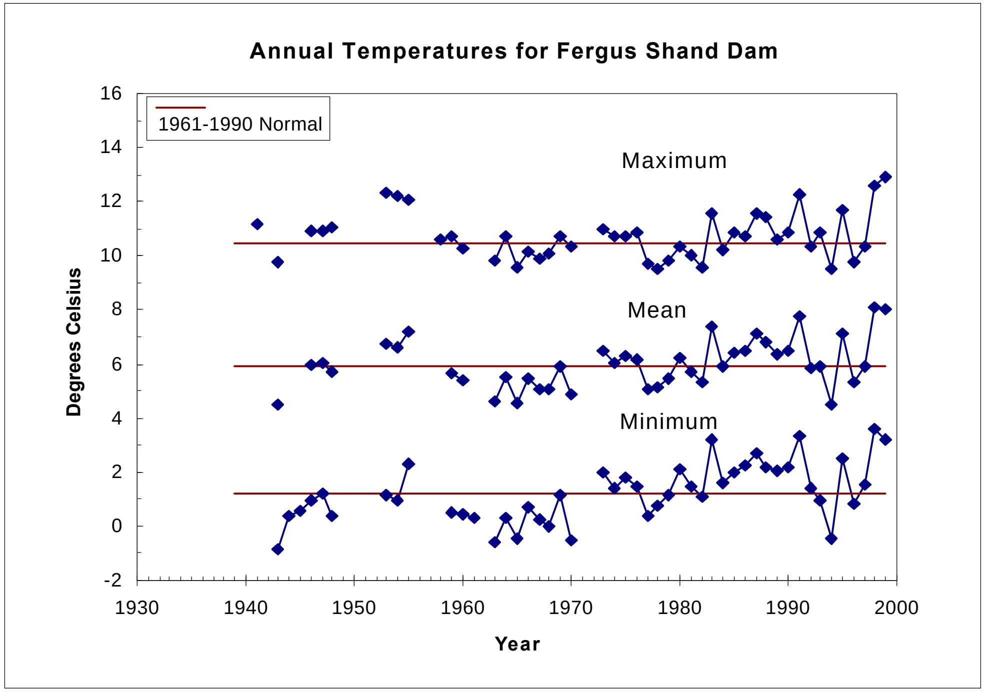
6141602	Clifford	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6142065	Doon	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6142400	Fergus Shand Dam	***	***	***	***	***	***	***	***	***	***	***	***	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
6142402	Fergus MOE	***	***	***	***	***	***	***	***	***	***	***	***	0	4	0	0	0	4	10	***	1	0	0	4	0	8	0	5	0	0	0	0	0	0	4
6142627	Fullarton	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6142803	Glen Allan	***	***	***	***	***	***	***	***	***	***	***	***	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	8
6142990	Grand Valley	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6142991	Grand Valley STP	***	***	***	***	***	***	***	***	***	***	***	***	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	***	***	***	***	***
6143069	Guelph Arboretum	***	***	***	***	***	***	***	***	***	***	***	***	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	***	9	***	***
6143083	Guelph OAC	***	***	***	***	***	***	***	11	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6143090	Guelph Turfgrass CS	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	10	1	***	***	***	***
6144232	Kitchener	***	***	***	***	***	***	***	***	***	***	***	***	0	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6144240	Kitchener City Eng 1	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6144241	Kitchener City Eng 2	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6144245	Kitchener ORWC	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6144475	London A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
6144481	London Lambeth A	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6144505	London South	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6145267	Monticello	***	***	***	***	***	***	***	***	***	***	***	***	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	3	5	***	***	***	***
6145495	Morriston	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6145502	Mount Forest	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	7	0	0	4
6145503	Mount Forest	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	***	***	***	***	***	***	***	***	***	***	***	***	***
6146240	Paris	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6146711	Preston	***	***	***	***	***	***	***	***	***	***	***	***	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	6	***	***	***
6146714	Preston WPCP	***	***	***	***	***	***	***	***	***	***	***	***	0	0	0	2	0	1	0	0	0	0	0	0	0	2	0	0	0	0	1	3	11	***	***
6146939	Redickville	***	***	***	***	***	***	***	***	***	***	***	***	0	0	0	0	0	0	0	0	11	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6148100	Stratford	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6148105	Stratford MOE	***	***	***	***	***	***	***	***	***	***	***	***	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	4
6149380	Waterloo Fire Hall	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6149386	Waterloo WPCP	***	***	***	***	***	***	***	***	***	***	***	***	2	***	3	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	5
6149387	Waterloo Wellington	***	***	***	***	***	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2
6149625	Woodstock	***	***	***	***	***	***	***	***	***	***	***	***	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
6150243	Alton	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6152661	Galt Osmond	***	***	***	***	***	***	***	***	***	***	***	***	0	9	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6152691	Georgetown	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6152695	Georgetown WPCP	***	***	***	***	***	***	***	***	***	***	***	***	1	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
6153192	Hamilton	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6153194	Hamilton A	***	***	***	***	***	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
6153300	Hamilton RGB	0	0	***	***	***	***	***	***	***	***	***	***	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	***	***
6158350	Toronto	0	0	0	0	7	***	***	***	***	***	***	***	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
6158733	Toronto Pearson Int'l A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2

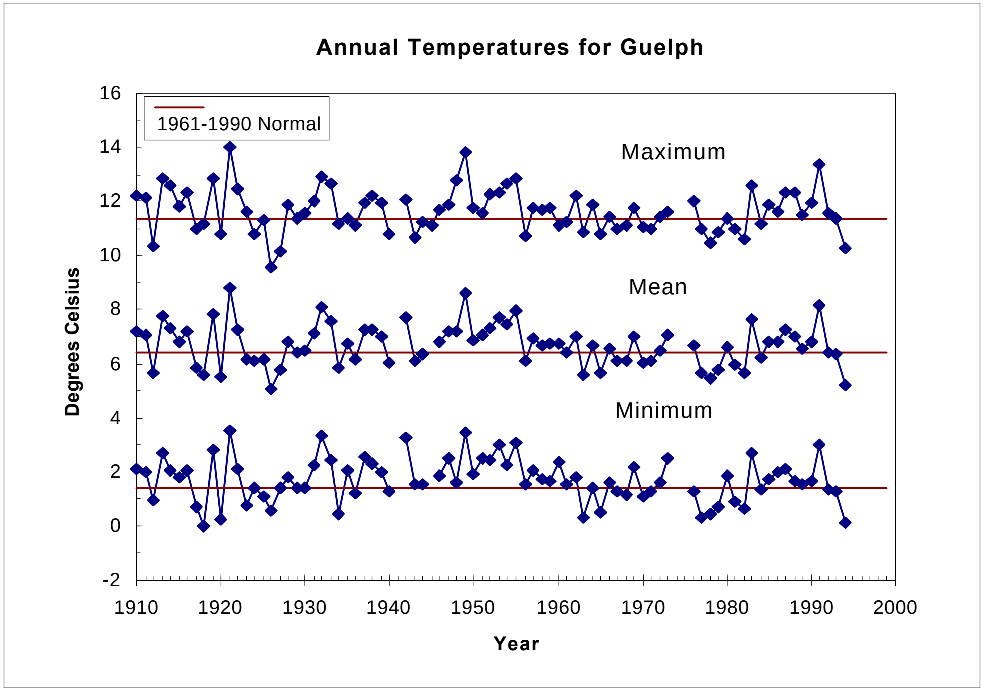
Appendix B

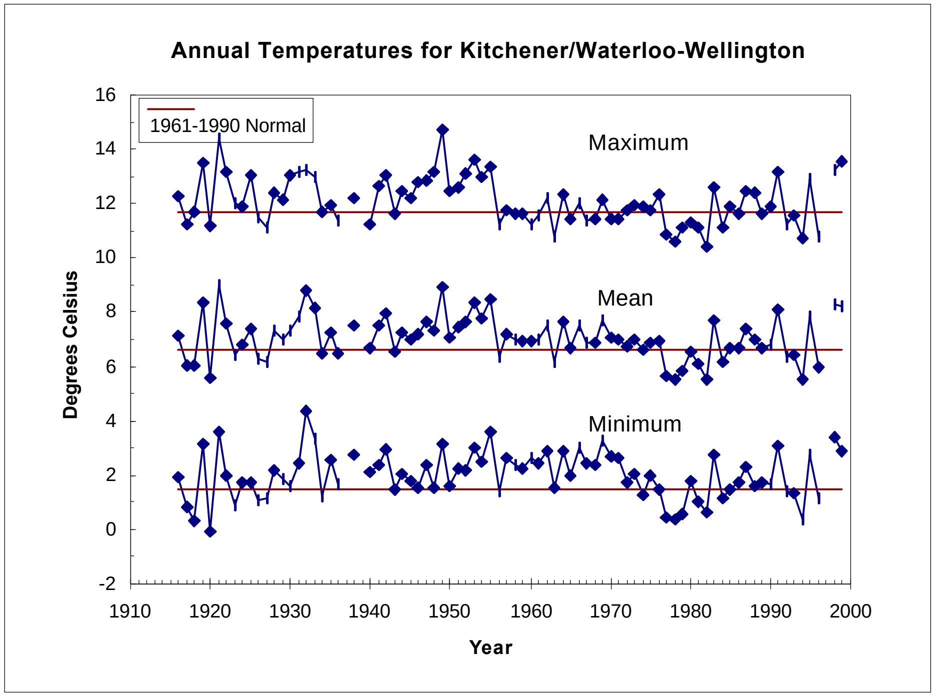
Time Series of Annual Temperatures, Total Precipitation and Rain/Snow


Annual Temperatures for Brantford
1961-1990 Normal
Maximum
Mean
Minimum
Degrees Celsius
0
2
4
6
8
10
12
14
16
18
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000
Year

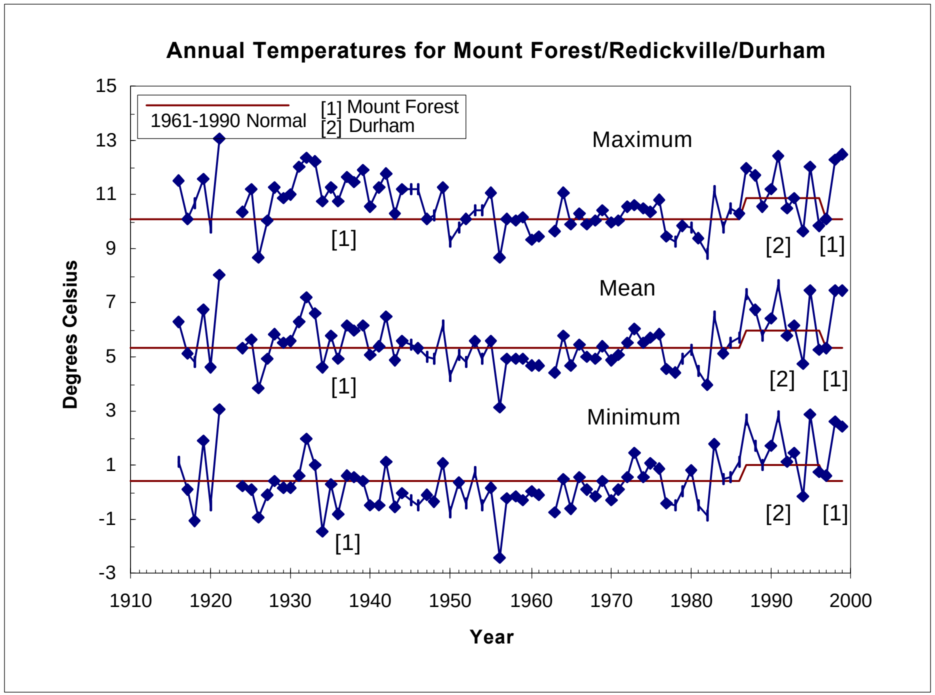

Annual Temperatures for Delhi/Simcoe
1961-1990 Normal
Maximum
Mean
Minimum
Degrees Celsius
0
2
4
6
8
10
12
14
16
18
1920
1930
1940
1950
1960
1970
1980
1990
2000
Year


Annual Temperatures for Fergus Shand Dam
1961-1990 Normal
Maximum
Mean
Minimum
Degrees Celsius
-2
0
2
4
6
8
10
12
14
16
1930
1940
1950
1960
1970
1980
1990
2000
Year

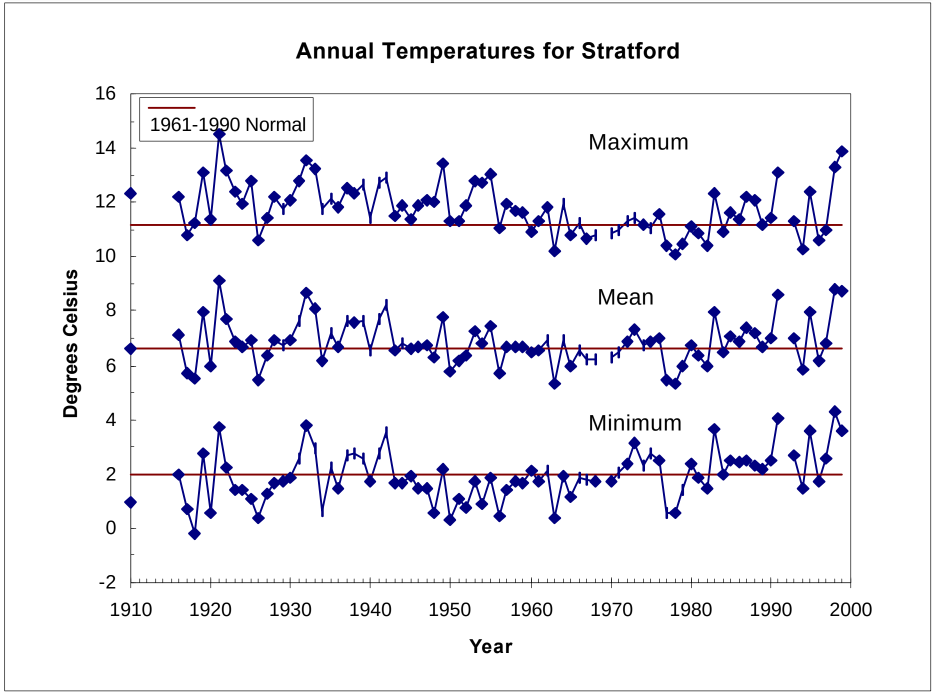

Annual Temperatures for Guelph
1961-1990 Normal
Maximum
Mean
Minimum
Degrees Celsius
-2
0
2
4
6
8
10
12
14
16
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000
Year



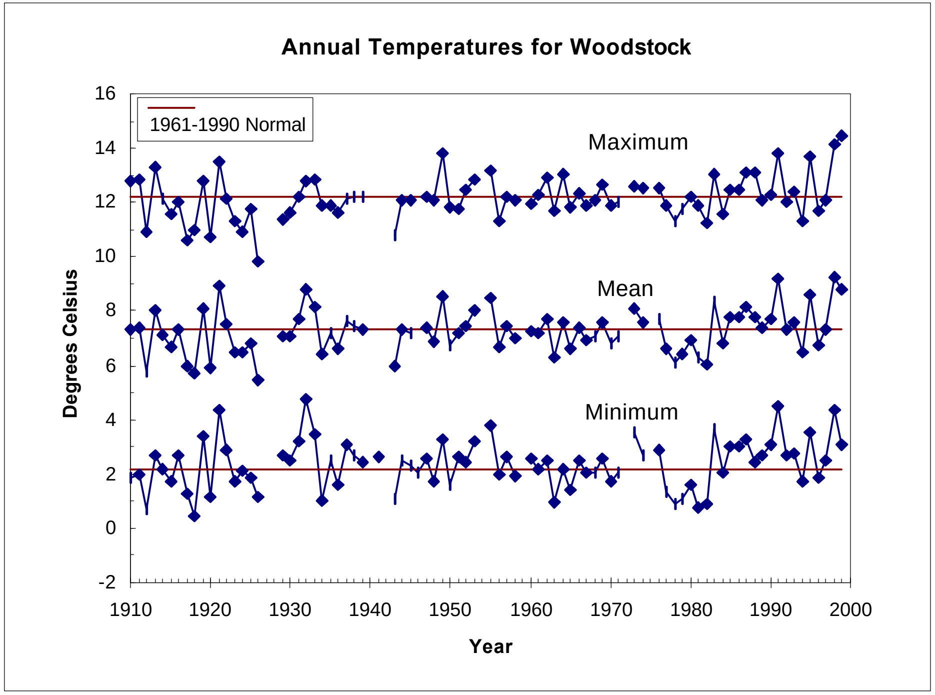
Annual Temperatures for Kitchener/Waterloo-Wellington



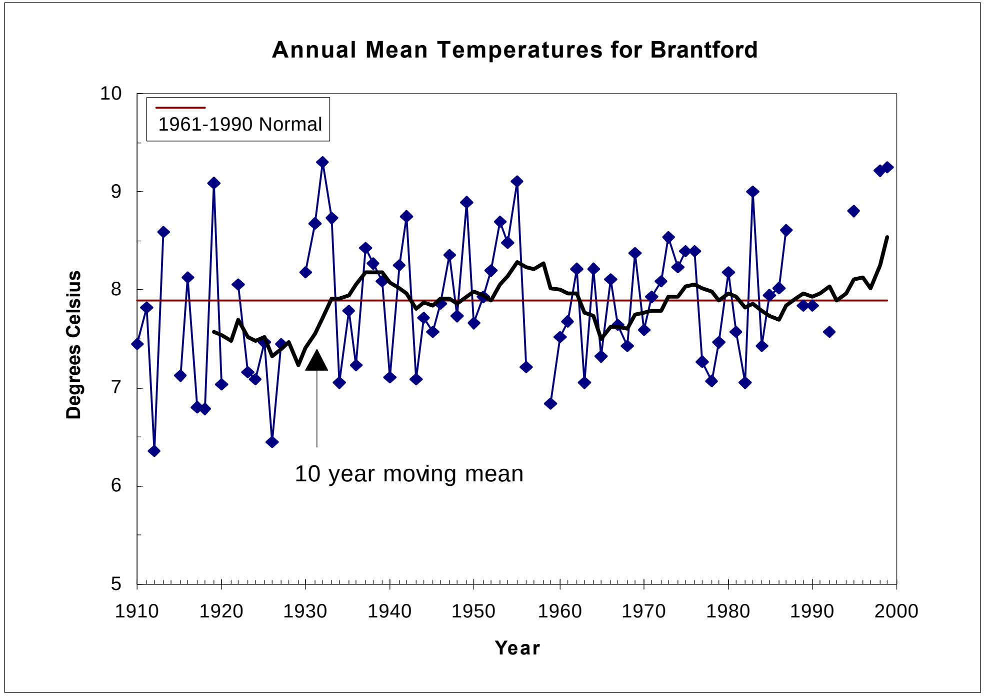
Annual Temperatures for Mount Forest/Redickville/Durham

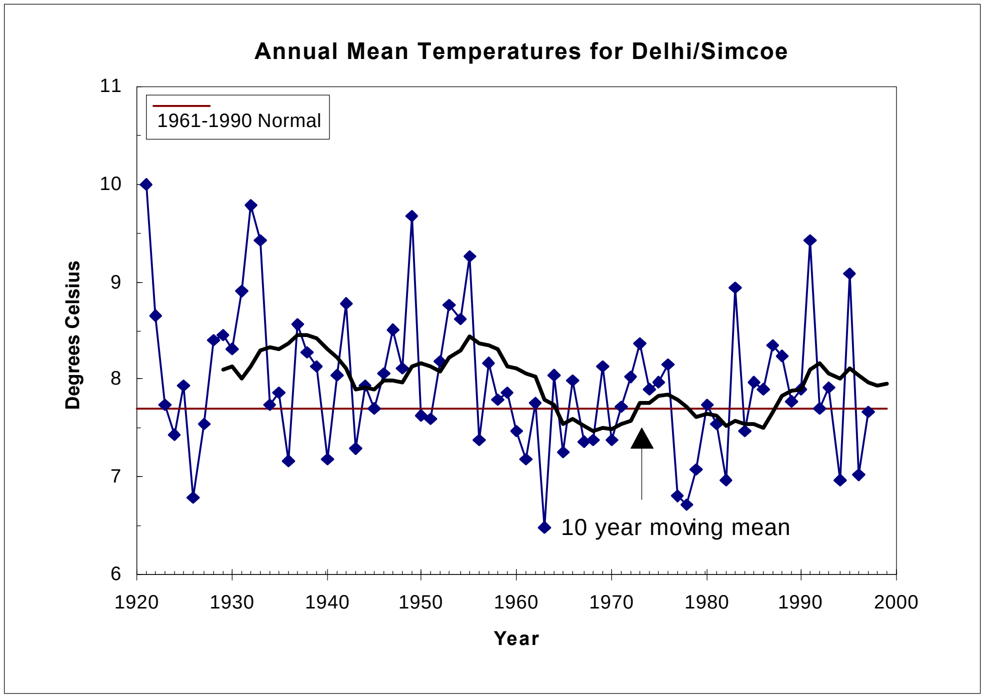


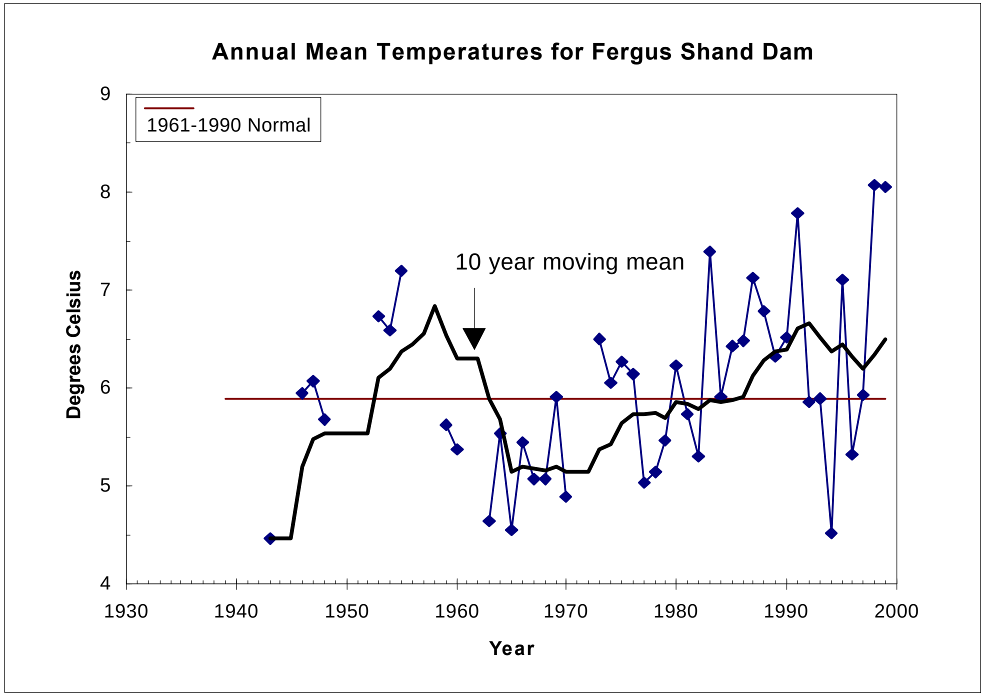
Annual Temperatures for Stratford

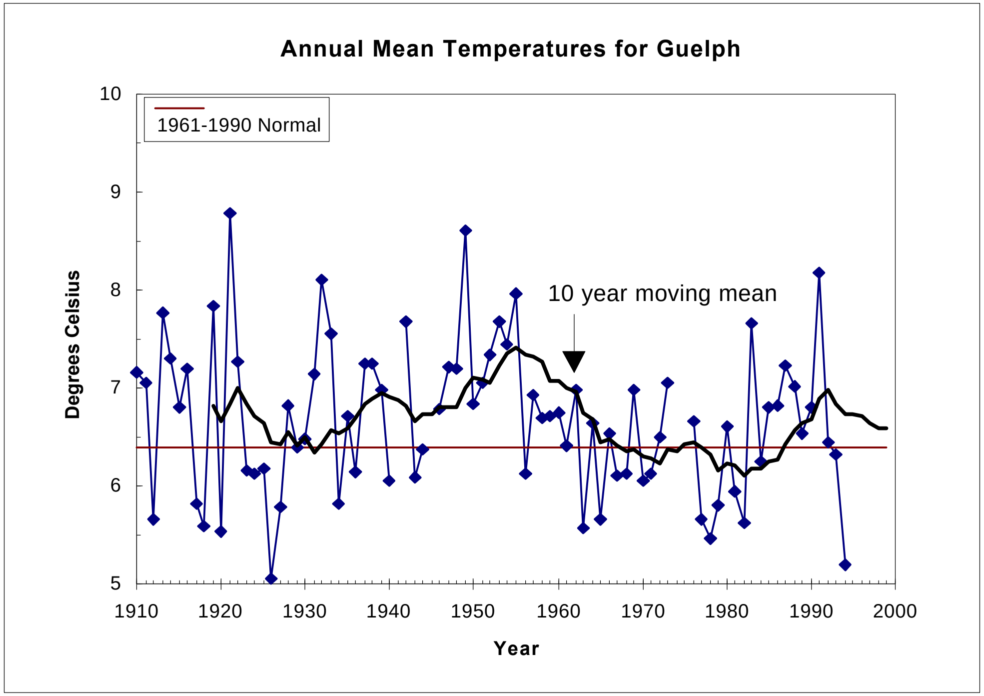


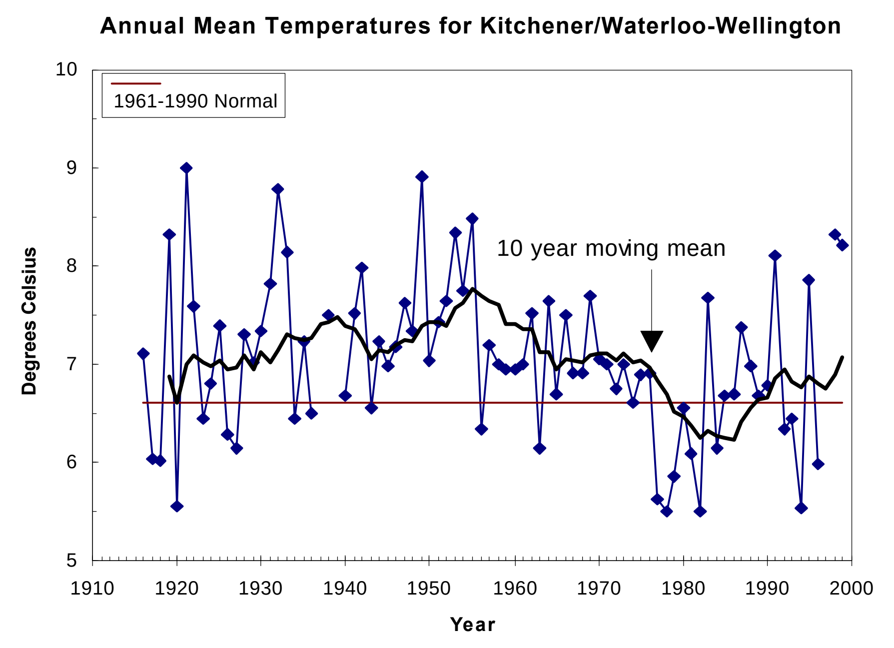
Annual Temperatures for Woodstock

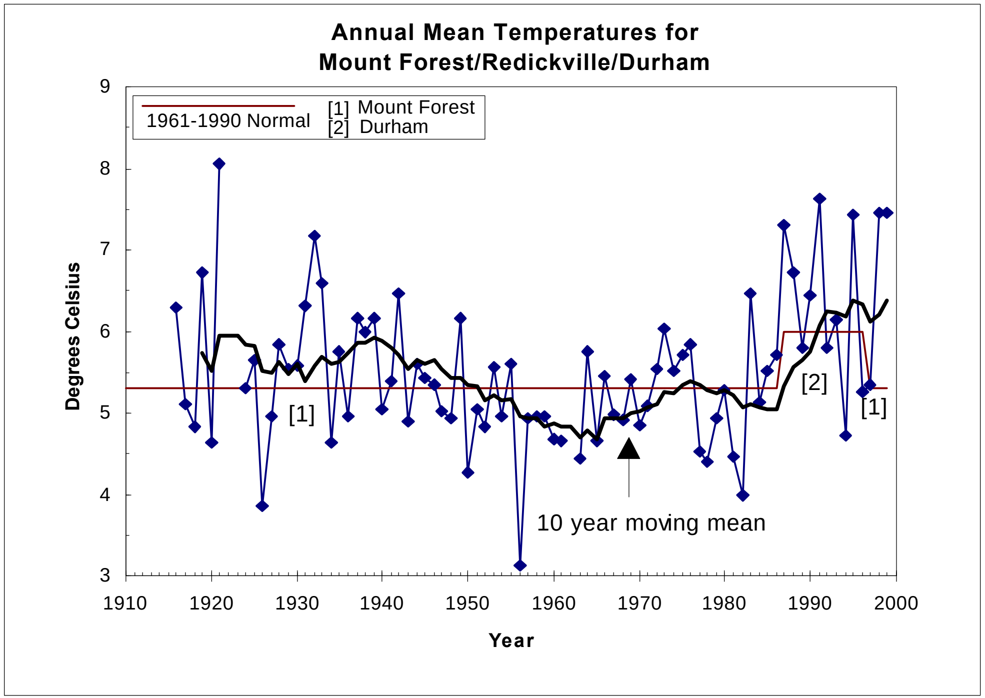

Annual Mean Temperatures for Brantford
1961-1990 Normal
10 year moving mean
Degrees Celsius
Year
10
9
8
7
6
5
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000

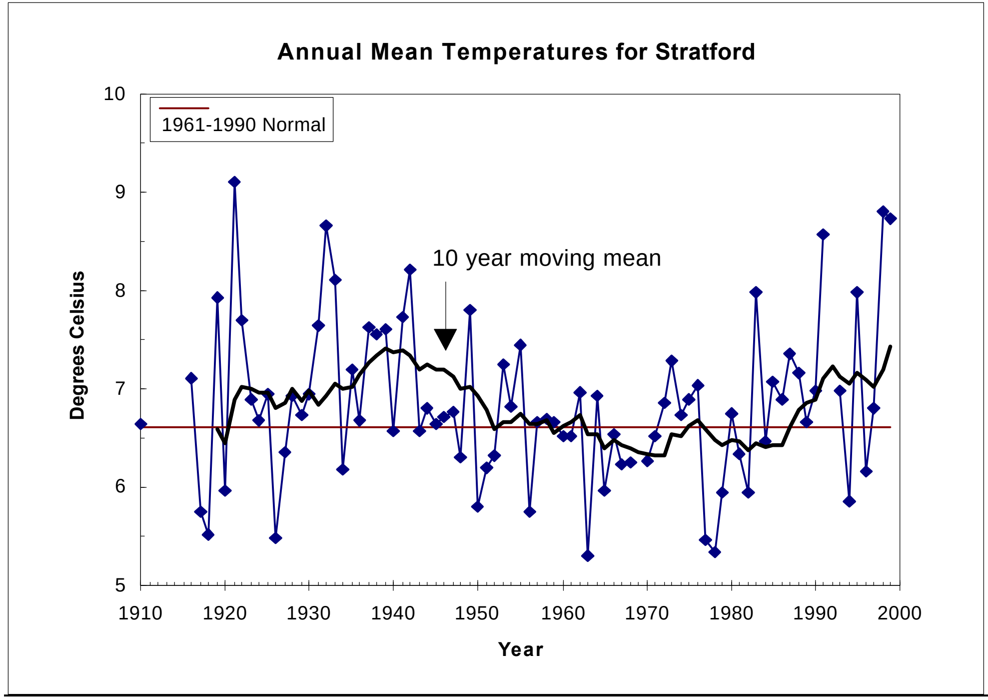

Annual Mean Temperatures for Delhi/Simcoe
1961-1990 Normal
10 year moving mean
Degrees Celsius
Year
11
10
9
8
7
6
1920
1930
1940
1950
1960
1970
1980
1990
2000

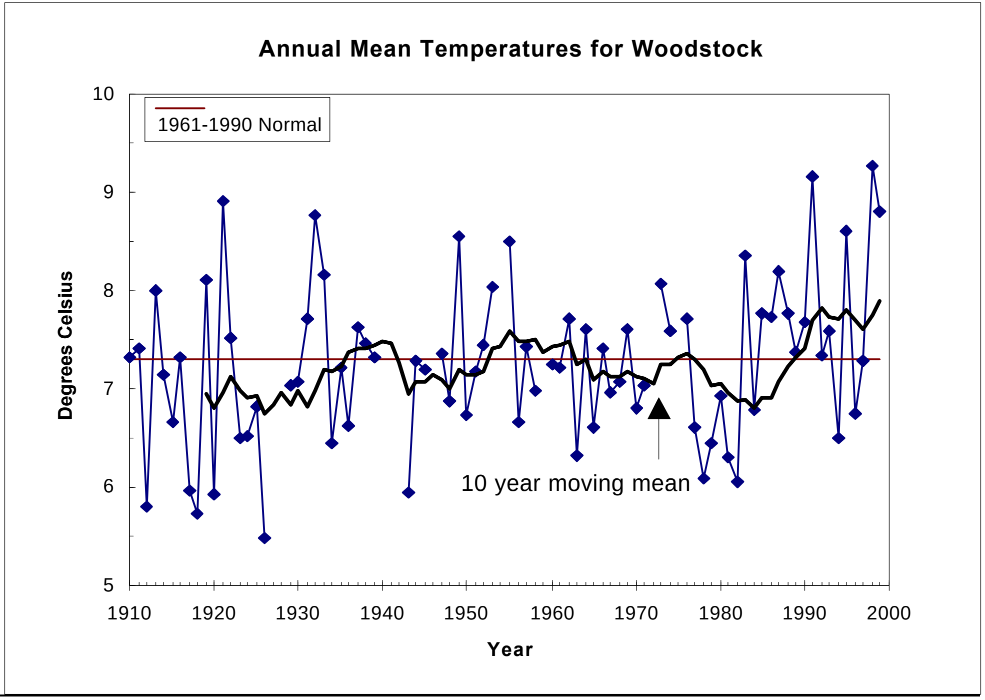

Annual Mean Temperatures for Fergus Shand Dam
1961-1990 Normal
10 year moving mean
Degrees Celsius
Year
9
8
7
6
5
4
1930
1940
1950
1960
1970
1980
1990
2000

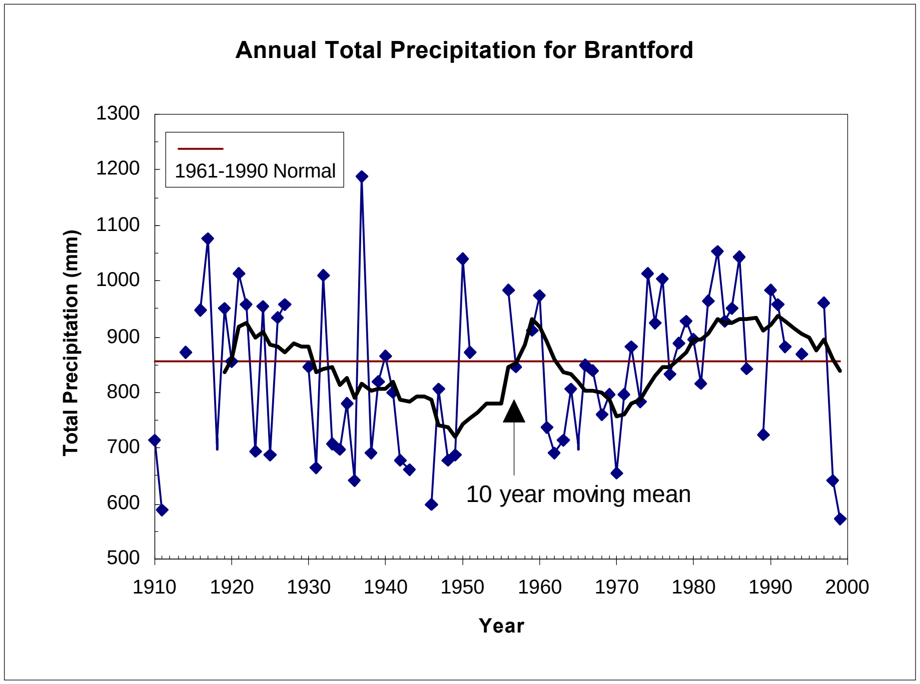

Annual Mean Temperatures for Guelph
1961-1990 Normal
10 year moving mean
Degrees Celsius
Year
10
9
8
7
6
5
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000

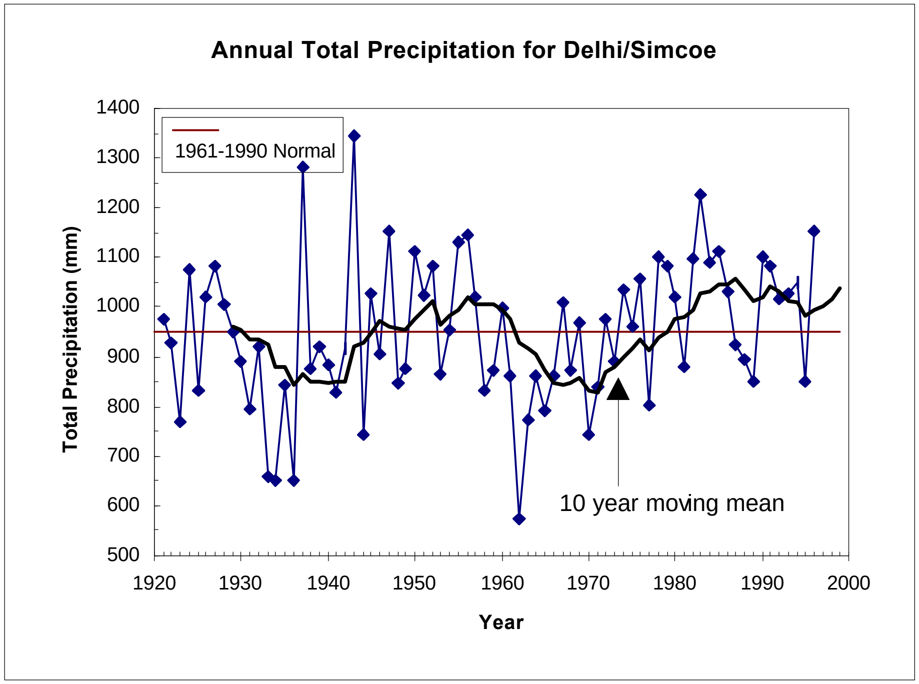

Annual Mean Temperatures for Kitchener/Waterloo-Wellington
1961-1990 Normal
10 year moving mean
Degrees Celsius
10
9
8
7
6
5
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000
Year

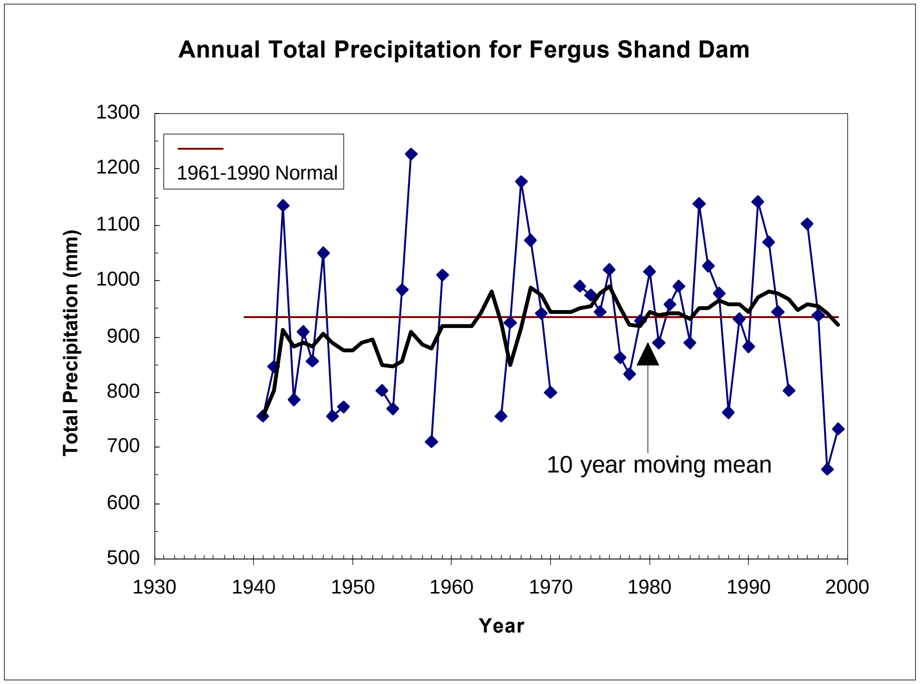

Annual Mean Temperatures for Mount Forest/Redickville/Durham
1961-1990 Normal
[1] Mount Forest
[2] Durham
[1]
[2]
[1]
10 year moving mean
Degrees Celsius
9
8
7
6
5
4
3
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000
Year

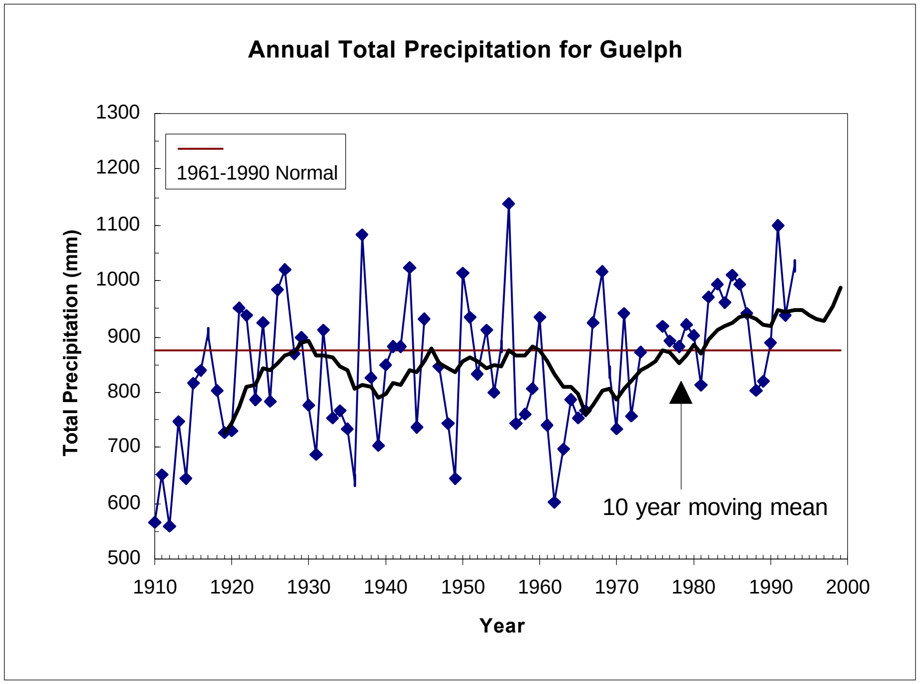

Annual Mean Temperatures for Stratford
1961-1990 Normal
10 year moving mean
Degrees Celsius
10
9
8
7
6
5
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000
Year

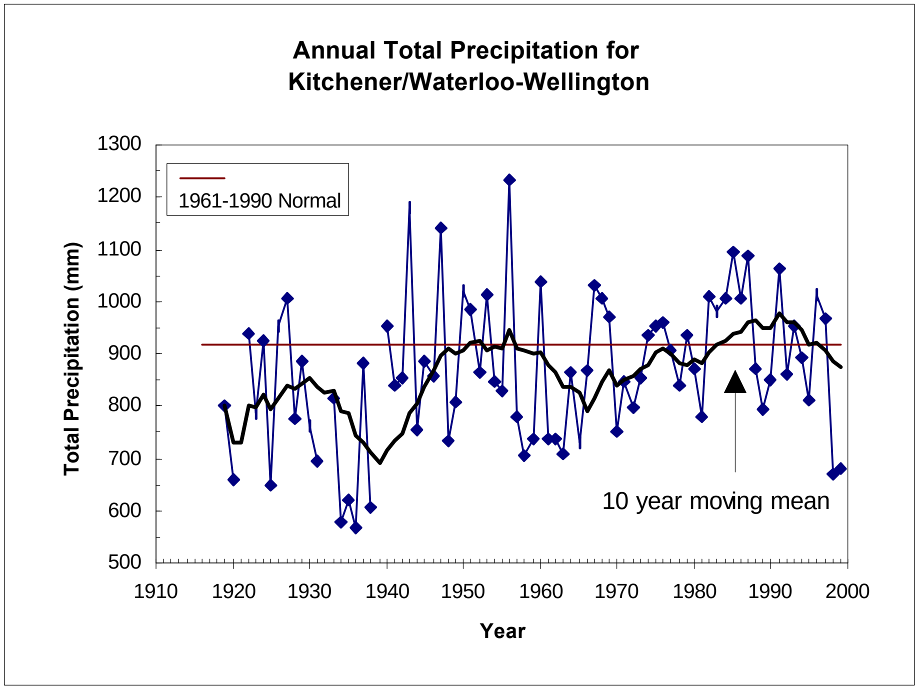

Annual Mean Temperatures for Woodstock
1961-1990 Normal
10 year moving mean
Degrees Celsius
10
9
8
7
6
5
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000
Year

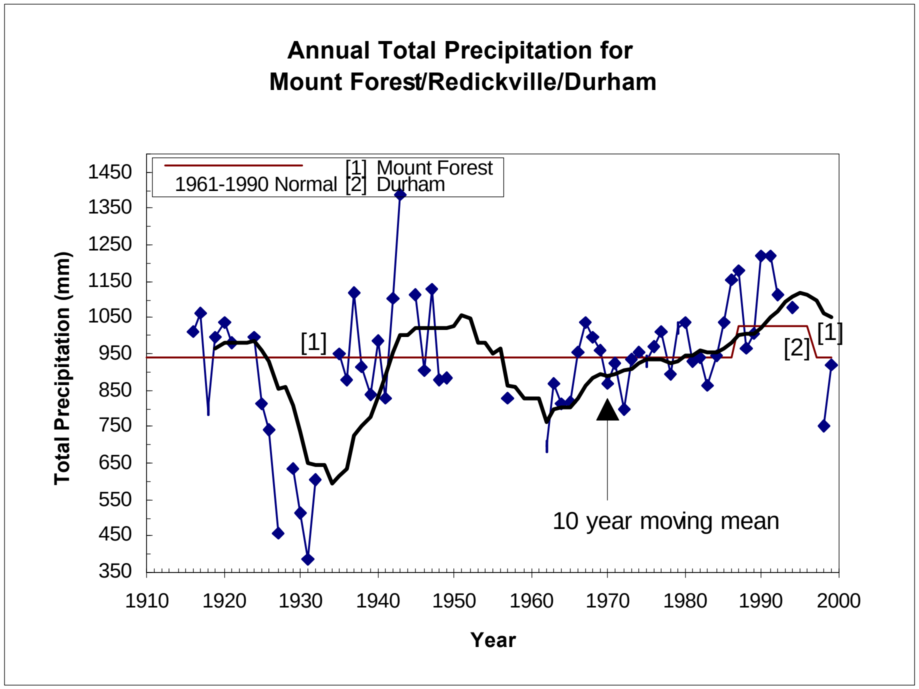

Annual Total Precipitation for Brantford
1961-1990 Normal
10 year moving mean
Total Precipitation (mm)
Year
500
600
700
800
900
1000
1100
1200
1300
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000

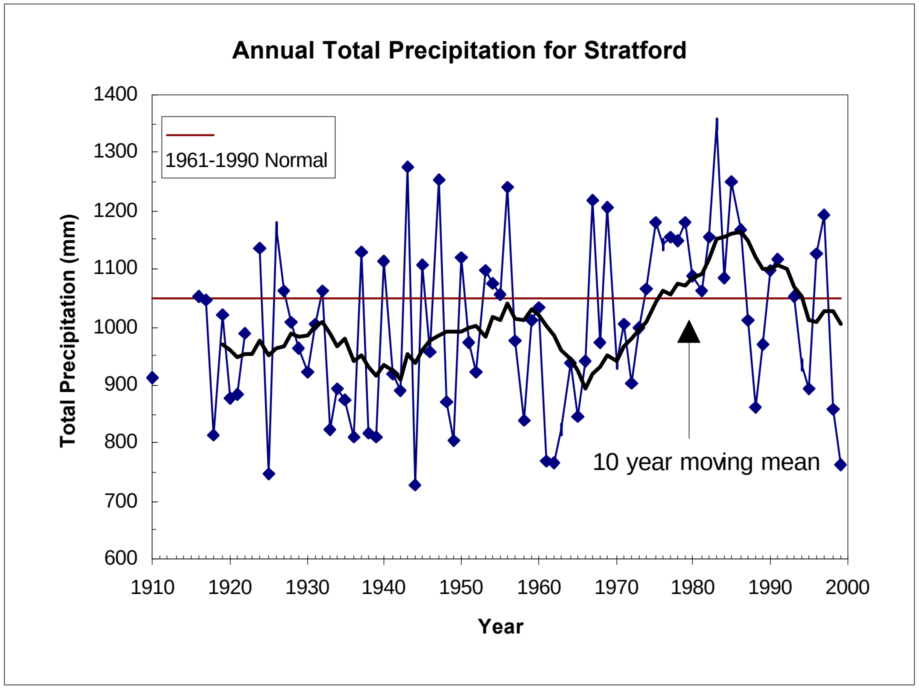

Annual Total Precipitation for Delhi/Simcoe
1961-1990 Normal
10 year moving mean
Total Precipitation (mm)
Year
500
600
700
800
900
1000
1100
1200
1300
1400
1920
1930
1940
1950
1960
1970
1980
1990
2000

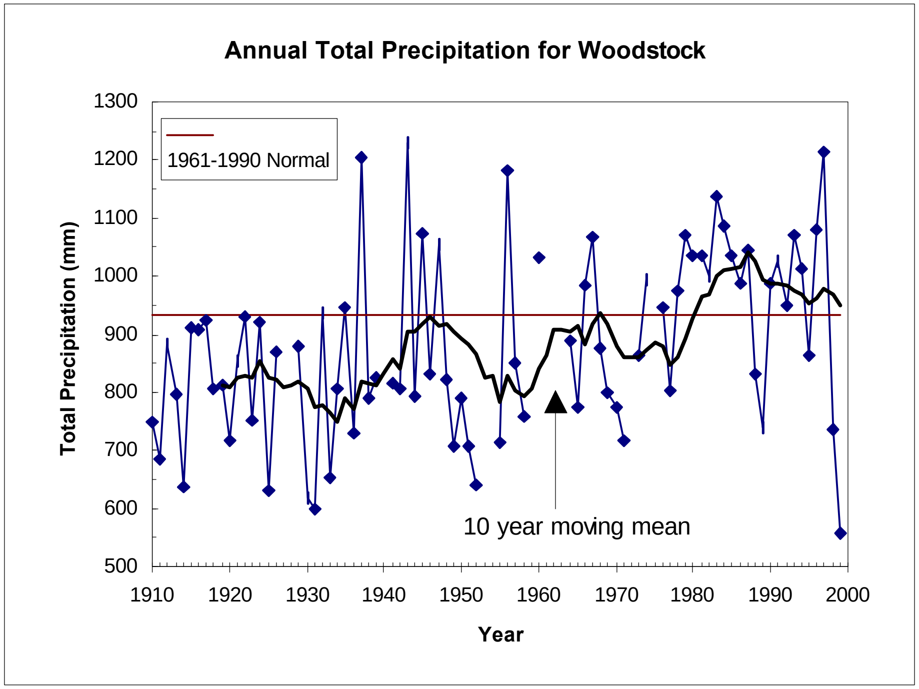

Annual Total Precipitation for Fergus Shand Dam
1961-1990 Normal
10 year moving mean
Total Precipitation (mm)
Year
500
600
700
800
900
1000
1100
1200
1300
1930
1940
1950
1960
1970
1980
1990
2000

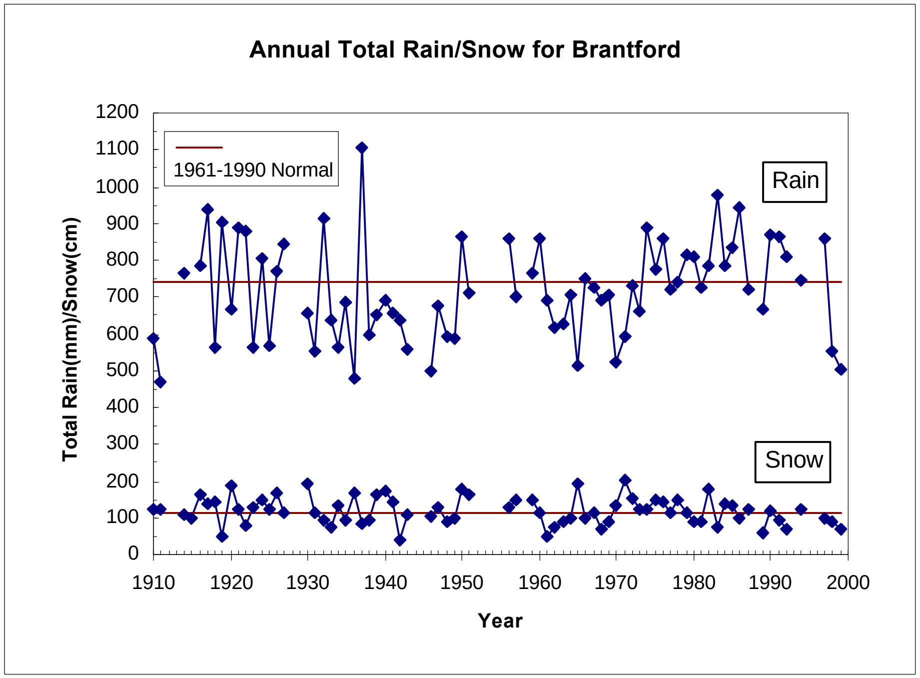

Annual Total Precipitation for Guelph
1961-1990 Normal
10 year moving mean
Total Precipitation (mm)
Year
500
600
700
800
900
1000
1100
1200
1300
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000

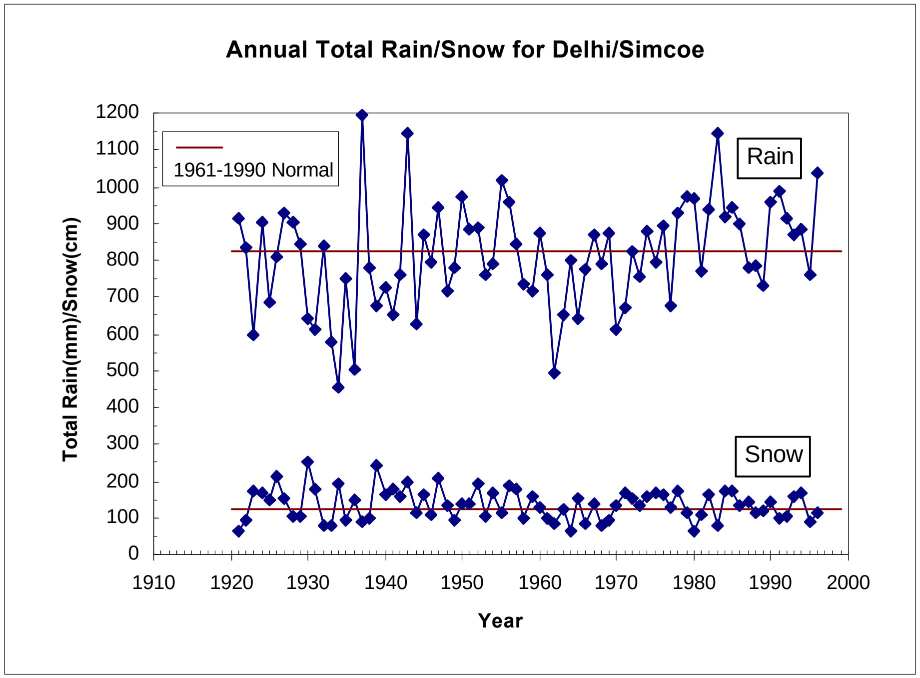

Annual Total Precipitation for Kitchener/Waterloo-Wellington

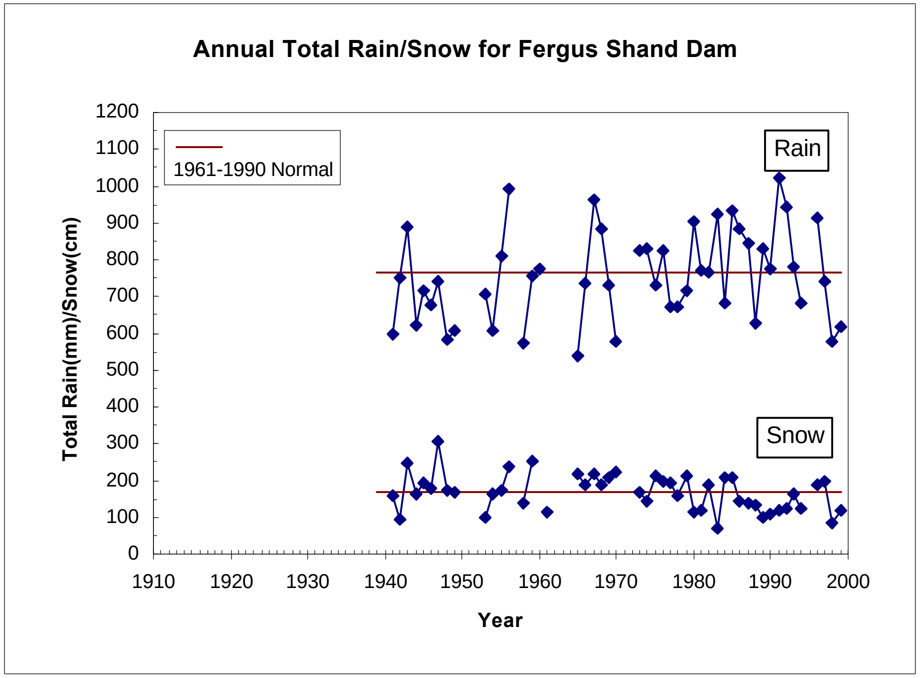

Annual Total Precipitation for Mount Forest/Redickville/Durham

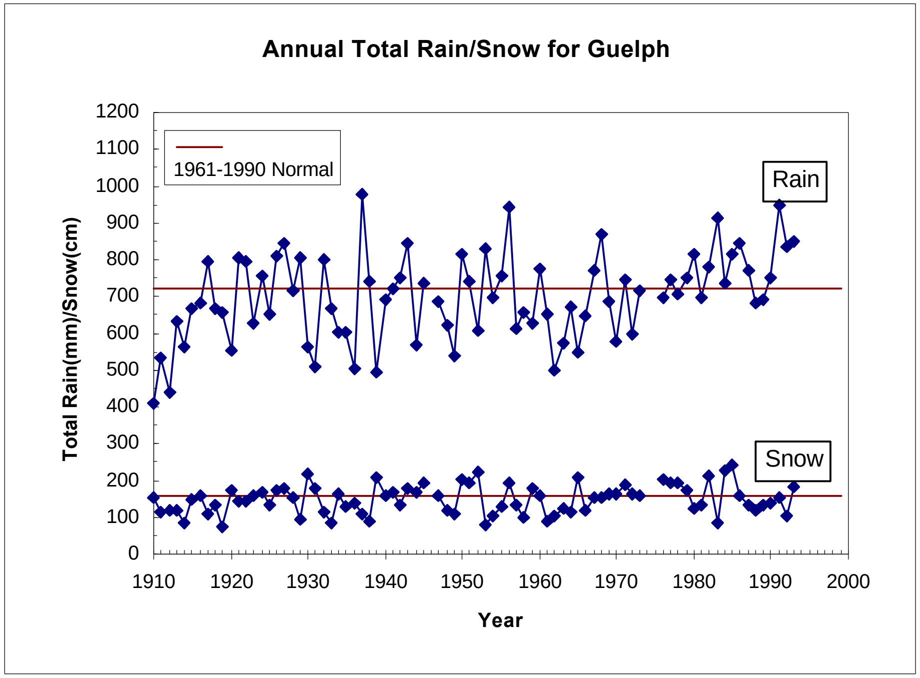

Annual Total Precipitation for Stratford

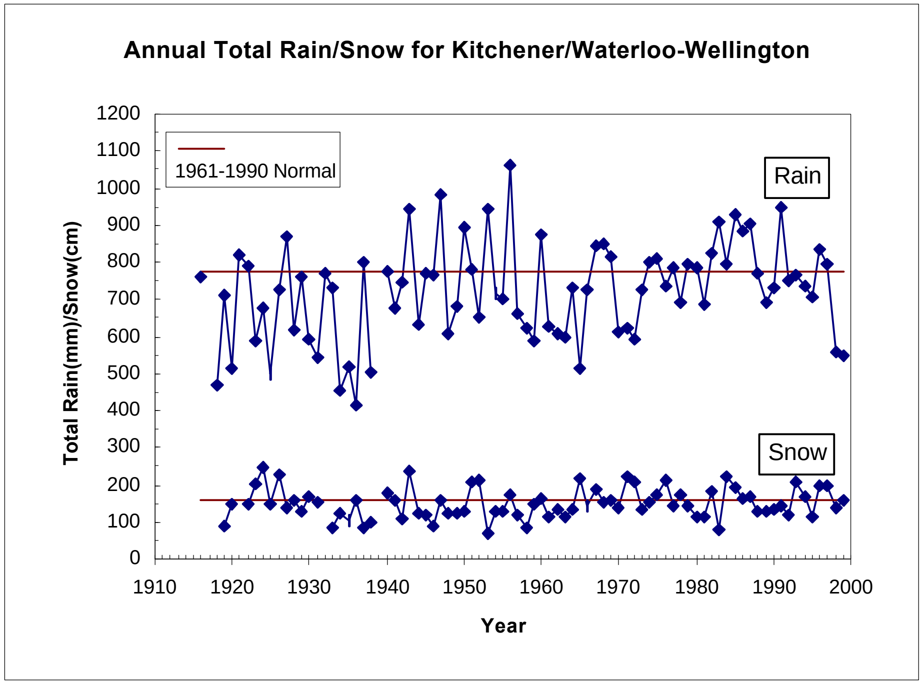

Annual Total Precipitation for Woodstock


Annual Total Rain/Snow for Brantford
1961-1990 Normal
Rain
Snow
Total Rain(mm)/Snow(cm)
Year
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000

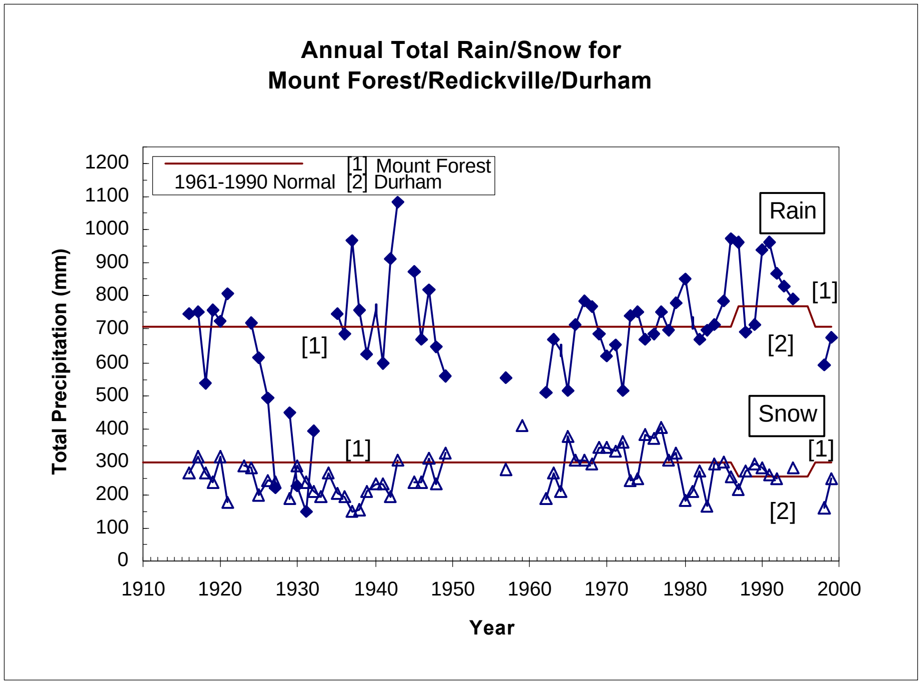

Annual Total Rain/Snow for Delhi/Simcoe
1961-1990 Normal
Rain
Snow
Total Rain(mm)/Snow(cm)
Year
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000


Annual Total Rain/Snow for Fergus Shand Dam
1961-1990 Normal
Rain
Snow
Total Rain(mm)/Snow(cm)
Year
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000

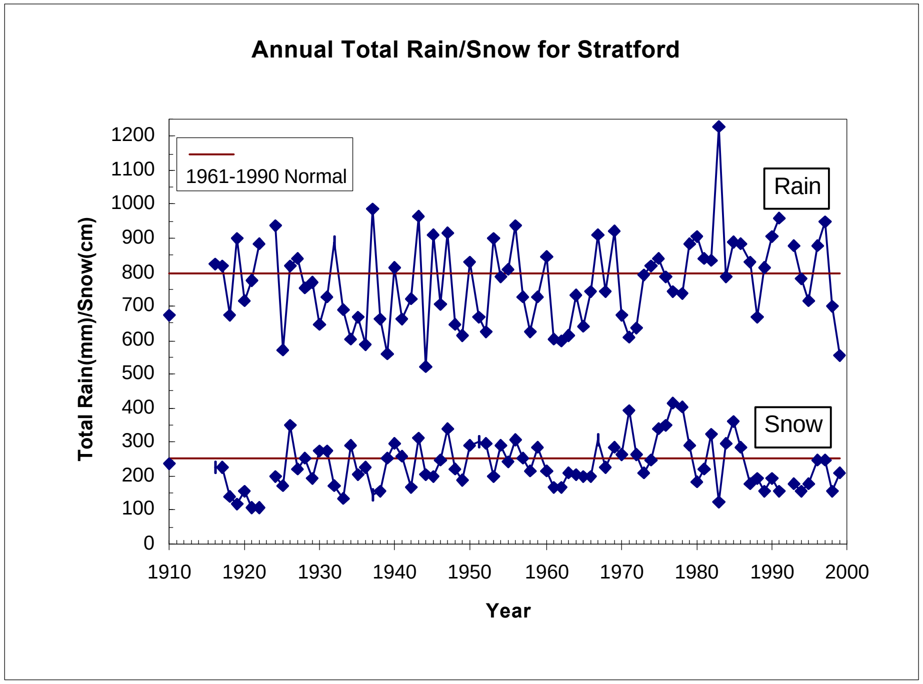

Annual Total Rain/Snow for Guelph
1961-1990 Normal
Rain
Snow
Total Rain(mm)/Snow(cm)
Year
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000



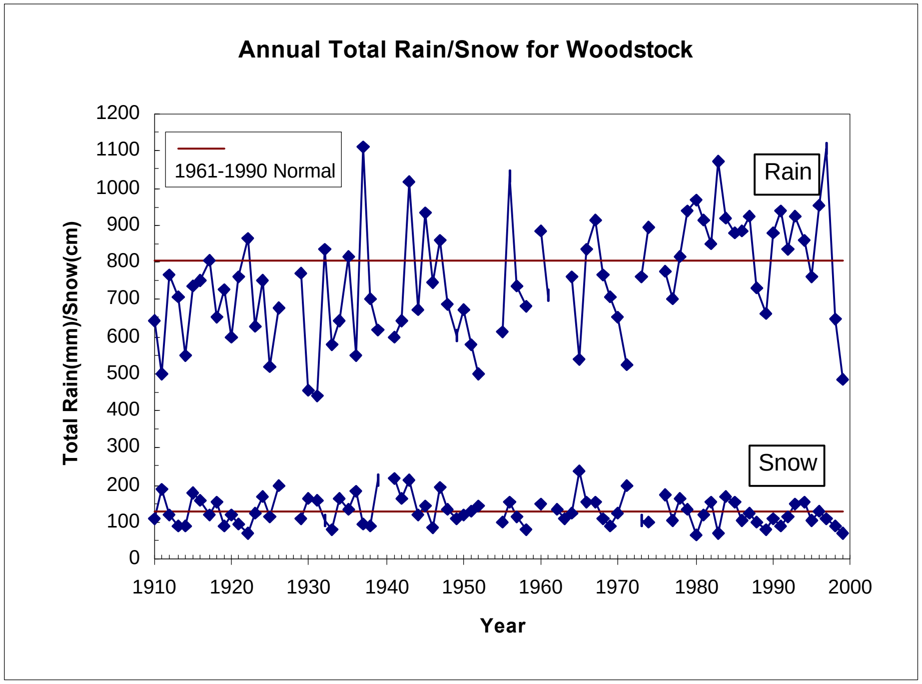
Annual Total Rain/Snow for Kitchener/Waterloo-Wellington



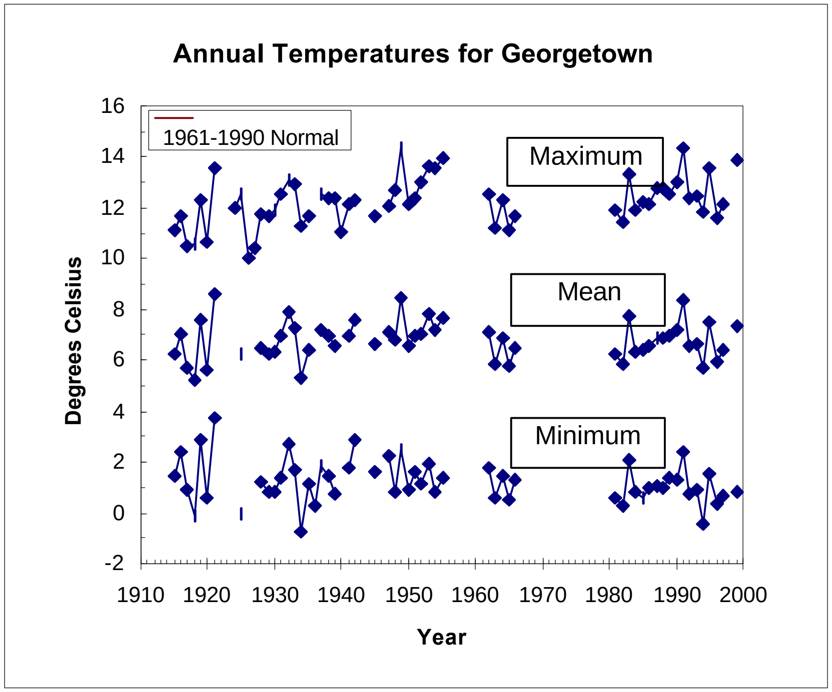
Annual Total Rain/Snow for
Mount Forest/Redickville/Durham

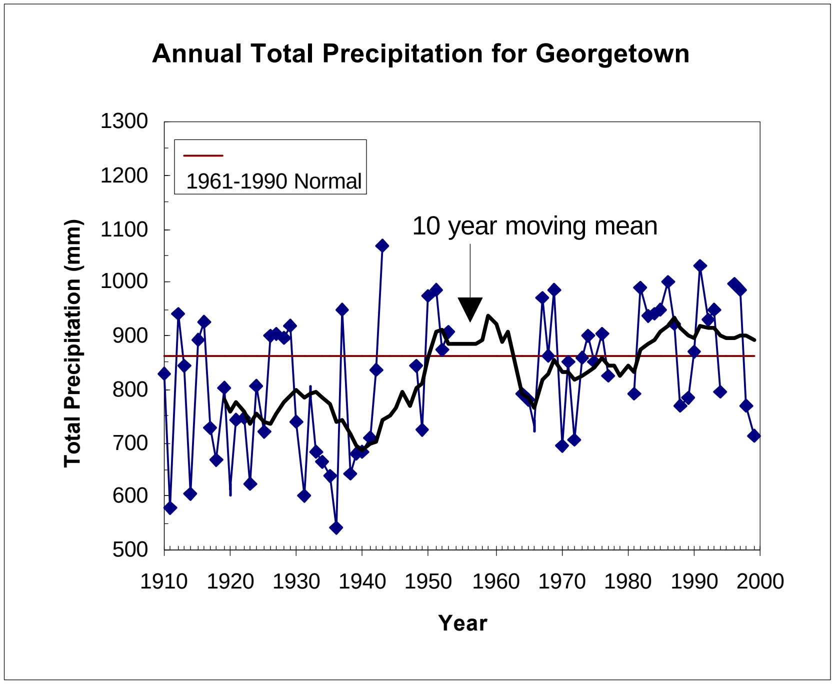


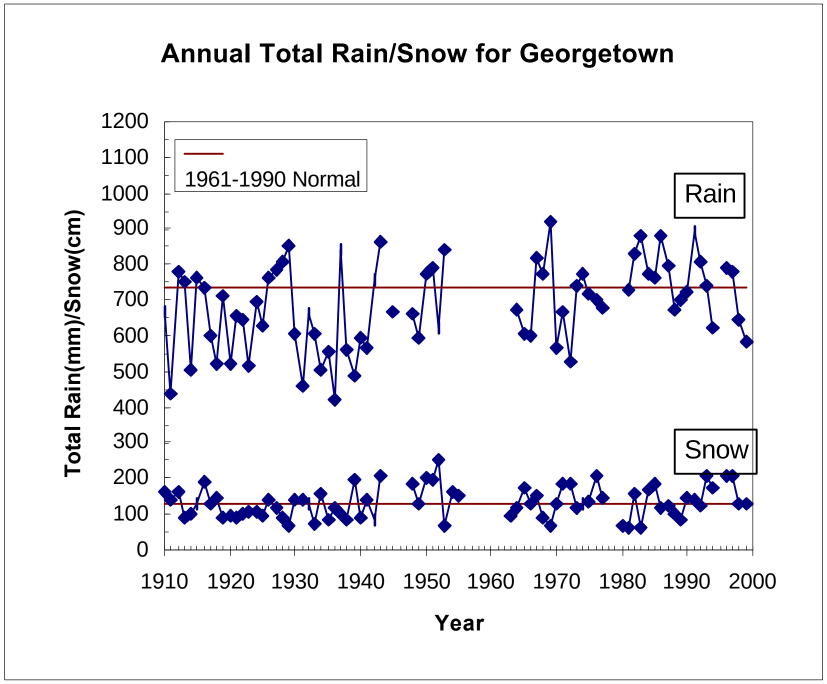
Annual Total Rain/Snow for Stratford



Annual Total Rain/Snow for Woodstock


Annual Temperatures for Georgetown
1961-1990 Normal
Maximum
Mean
Minimum
Degrees Celsius
16
14
12
10
8
6
4
2
0
-2
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000
Year


Annual Total Precipitation for Georgetown
1961-1990 Normal
10 year moving mean
Total Precipitation (mm)
1300
1200
1100
1000
900
800
700
600
500
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000
Year


Annual Total Rain/Snow for Georgetown
1961-1990 Normal
Rain
Snow
Total Rain(mm)/Snow(cm)
1200
1100
1000
900
800
700
600
500
400
300
200
100
0
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000
Year

Appendix C

Tables of Annual and Seasonal Precipitation, Mean and Maximum Temperature Departures from Normal

TABLE C-1

Annual Precipitation Percent Departure from 1961-1990 Normal during Drought Period Analysis Years

STATION	**1930**	**1931**	**1932**	**1933**	**1934**	**1935**	**1936**	**1937**	**1938**	**1939**	**1961**	**1962**	**1963**	**1964**	**1965**	**1966**	**1997**	**1998**	**1999**
Brantford	-1.2	-22.1	18.1	-17.2	-18.3	-8.7	-24.8	39.2	-19.3	-4.1	-13.6	-19.0	-16.5	-5.8	-17.1	-0.8	12.4	-24.9	-32.9
Delhi/Simcoe	-6.3	-16.6	-3.2	-30.6	-31.7	-11.4	-31.5	34.9	-8.0	-3.4	-9.3	-39.6	-18.6	-9.6	-16.8	-9.6	N/A	N/A	N/A
Fergus Shand Dam											N/A	N/A	N/A	N/A	-19.1	-1.2	0.4	-29.2	-21.6
Georgetown	-14.1	-30.5	-8.1	-20.9	-23.1	-26.0	-37.3	9.7	-25.6	-21.1	N/A	N/A	N/A	-8.3	-9.8	-15.3	14.1	-10.8	-17.4
Guelph	-11.0	-21.2	4.5	-13.8	-12.4	-16.2	-26.6	23.9	-5.3	-19.5	-15.3	-31.1	-20.3	-10.1	-13.9	-12.4	N/A	N/A	N/A
Kitchener/Waterloo	-16.8	-24.4	N/A	-11.0	-37.0	-32.2	-37.9	-3.9	-33.9	N/A	-19.6	-19.4	-22.6	-5.7	-20.5	-5.2	5.7	-26.9	-25.8
Mt. Forest/Redickville	-45.3	-58.9	-35.6	N/A	N/A	1.5	-6.2	19.2	-2.5	-10.5	N/A	-25.8	-7.5	-13.4	-12.7	1.6	N/A	-20.0	-1.8
Stratford	-12.2	-4.3	1.1	-21.7	-15.0	-16.7	-22.7	7.6	-22.2	-22.7	-26.8	-27.0	-21.6	-10.6	-19.6	-10.4	13.5	-18.4	-27.4
Woodstock	-33.8	-35.6	0.7	-29.8	-13.5	1.6	-21.8	29.4	-15.2	-11.4	N/A	N/A	N/A	-4.7	-16.8	5.6	30.2	-21.1	-40.4
AVERAGE	-17.6	-26.7	-3.2	-20.7	-21.6	-13.5	-26.1	20.0	-16.5	-13.3	-16.9	-27.0	-17.9	-8.5	-16.3	-5.3	12.7	-21.6	-23.9

TABLE C-2

Autumn Precipitation Percent Departure from 1961-1990 Normal during Drought Period Analysis Years
(Autumn - September/October/November)

STATION	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1961	1962	1963	1964	1965	1966	1997	1998	1999
Brantford	-7.1	-52.3	14.8	10.5	-0.4	3.4	-18.0	11.4	-27.5	-43.4	-44.0	-43.5	23.0	-55.4	-60.2	13.7	15.6	-21.6	-60.6
Delhi/Simcoe	-31.2	-56.3	-12.7	-14.7	-19.7	-4.4	-19.2	4.0	-26.7	-27.7	-48.7	-42.5	-6.3	-59.8	-67.4	12.1	N/A	N/A	N/A
Fergus Shand Dam											-49.4	N/A	7.8	-45.5	-62.7	38.2	-7.7	-35.3	-50.8
Georgetown	-20.5	-65.1	-14.7	0.7	-20.2	-26.3	-28.9	-23.5	-36.1	-33.9	-35.7	-46.6	31.5	-46.9	-52.2	11.4	25.1	-39.2	-51.6
Guelph	-19.9	-40.7	-7.3	1.6	-17.7	-5.9	-13.5	10.8	-25.8	-29.1	-36.1	-39.9	-2.3	-49.3	-49.1	24.5	N/A	N/A	N/A
Kitchener/Waterloo	-22.5	-42.2	-20.9	-11.9	-16.2	-37.4	-38.4	5.2	-66.6	-99	-36.1	-37.1	-8.9	-58.8	-61.1	21.3	14.4	-36.2	-54.4
Mt. Forest/Redickville	-39.2	-66.0	-54.3	7.4	N/A	2.3	5.7	16.7	-13.7	-29.8	-48.3	-37.7	4.3	-37.5	-44.4	22.8	0.0	-20.2	-33.2
Stratford	-26.8	-32.7	-17.6	-7.3	3.7	-21.7	-3.2	1.7	-29.2	-48.2	-30.9	-30.2	-19.2	-56.0	-59.2	-3.1	35.1	-15.6	-46.0
Woodstock	-43.7	-56.1	-4.5	-6.5	4.4	42.0	-1.9	23.0	-19.6	-43.1	-37.5	N/A	16	-72.3	-60.5	4.0	53.9	-16.4	-61.8
AVERAGE	-26.4	-51.4	-14.7	-2.5	-9.4	-6.0	-14.7	6.2	-30.6	-36.5	-40.8	-39.6	5.1	-53.5	-57.4	16.1	19.5	-26.3	-51.2

TABLE C-3

Winter Precipitation Percent Departure from 1961-1990 Normal during Drought Period Analysis Years
(Winter - December/January/February)

STATION	**1930**	**1931**	**1932**	**1933**	**1934**	**1935**	**1936**	**1937**	**1938**	**1939**	**1961**	**1962**	**1963**	**1964**	**1965**	**1966**	**1997**	**1998**	**1999**
Brantford	54.2	-35.7	50.4	-2.5	-14.1	9.5	9.5	71.5	13.9	40.3	-31.8	-2.0	-45.0	-25.1	43.7	3.1	30.8	-8.9	-37.0
Delhi/Simcoe	96.4	-6.8	26.0	-26.7	-11.2	-4.6	-18.1	82.5	17.2	45.9	-36.1	-22.5	-40.2	-47.4	20.9	-3.0	N/A	N/A	N/A
Fergus Shand Dam											-53.7	N/A	N/A	N/A	43.3	-3.8	40.4	-22.0	7.0
Georgetown	32.0	-43.5	46.0	-21.9	-21.1	-15.7	-39.2	47.7	-10.6	-4.5	-50.2	N/A	-47.8	-18.5	43.1	-13.9	65.3	16.1	28.6
Guelph	25.7	-32.1	24.7	1.4	20.7	-11.2	-21.5	75.2	1.4	5.6	-48.8	-16.3	-45.8	-31.5	45.9	-4.5	N/A	N/A	N/A
Kitchener/Waterloo	24.8	-38.3	N/A	1.9	-13.0	-28.9	-2.5	44.4	-6.5	-17.1	-39.0	5.5	-35.3	-17.0	50.3	12.5	48.4	-4.3	22.2
Mt. Forest/Redickville	-6.7	-33.2	-20.6	-17.3	-22.2	20.8	2.6	67.3	22.1	11.9	-19.6	2.9	-33.8	-22.9	38.7	-3.1	N/A	-6.7	47.8
Stratford	6.7	-31.2	12.4	-40.5	-11.5	-17.8	-20.1	-2.2	-23.5	-6.7	-55.3	-27.2	-28.9	-22.8	10.3	-7.4	18.1	-17.5	9.8
Woodstock	7.3	-40.1	11.2	-27.1	-12.9	4.2	-14.8	71.1	8.7	44.7	N/A	N/A	-38.1	-14.1	50.8	11.9	55.4	-0.7	-5.5
AVERAGE	30.1	-32.6	21.4	-16.6	-10.7	-5.5	-13.0	57.2	2.8	15.0	-41.8	-9.9	-39.4	-24.9	38.6	-0.9	43.1	-6.3	10.4

TABLE C-4

Spring Precipitation Percent Departure from 1961-1990 Normal during Drought Period Analysis Years
(Spring - March/April/May)

STATION	**1930**	**1931**	**1932**	**1933**	**1934**	**1935**	**1936**	**1937**	**1938**	**1939**	**1961**	**1962**	**1963**	**1964**	**1965**	**1966**	**1997**	**1998**	**1999**
Brantford	-0.6	-14.1	5.0	-24.0	-11.7	-23.5	-20.3	54.4	-21.9	2.4	15.1	-46.0	-4.7	22.2	-24.5	-2.5	5.2	-16.5	-22.8
Delhi/Simcoe	-32.2	-18.3	-1.9	-19.8	-30.3	-27.7	-32.6	44.9	-14.2	-7.8	26.8	-58.8	-10.6	8.9	-0.3	-22.6	N/A	N/A	N/A
Fergus Shand Dam											16.9	N/A	-6.1	12.6	-24.3	-10.5	5.8	-25.0	-37.4
Georgetown	-3.3	-10.2	-26.7	-12.3	-6.3	-43.9	-33.5	6.4	-27.6	-6.5	N/A	N/A	-14.4	12.4	-28.5	-20.4	4.8	13.1	-28.6
Guelph	-10.3	4.3	-3.5	-22.7	-21.2	-38.2	-28.2	5.3	-20.3	-11.9	7.1	-53.7	5.1	10.2	-15.7	-28.7	N/A	N/A	N/A
Kitchener/Waterloo	-20.6	-26.9	-24.5	0.6	-61.3	-59.5	-51.2	-22.0	-46.5	-13.0	-8.1	-48.0	-5.9	5.5	-23.3	-21.6	-7.0	-14.7	-47.0
Mt. Forest/Redickville	-56.9	-61.8	-47.1	N/A	-64.6	-0.8	12.8	2.7	3.4	-17.1	N/A	-36.8	1.8	-3.4	-0.7	-9.0	7.4	-19.9	-15.5
Stratford	3.4	-6.4	10.3	-9.2	-20.5	-31.1	-29.6	31.5	-13.7	-21.8	-15.3	-49.1	-16.1	-13.5	-9.2	-20.4	-0.6	-15.1	-43.6
Woodstock	-40.9	-33.6	-8.7	-35.8	-1.3	-14.2	-23.2	56.4	-12.6	-6.0	-0.7	N/A	-1.7	-4.2	-12.9	2.0	13.8	-18.5	-37.0
AVERAGE	-20.2	-20.9	-12.1	-17.6	-27.1	-29.9	-25.7	22.4	-19.2	-10.2	6.0	-48.7	-5.8	5.6	-15.5	-14.8	4.2	-13.8	-33.1

TABLE C-5

Summer Precipitation Percent Departure from 1961-1990 Normal during Drought Period Analysis Years
(Summer - June/July/August)

STATION	**1930**	**1931**	**1932**	**1933**	**1934**	**1935**	**1936**	**1937**	**1938**	**1939**	**1961**	**1962**	**1963**	**1964**	**1965**	**1966**	**1997**	**1998**	**1999**
Brantford	-38.7	9.7	7.9	-48.4	-44.1	-21.1	-61.5	27.0	-34.8	-7.0	3.6	14.9	-42.5	31.1	-16.6	-16.1	1.5	-47.5	-12.5
Delhi/Simcoe	-41.7	18.5	-19.2	-61.5	-63.1	-8.4	-54.8	17.0	-3.3	-15.5	19.1	-32.1	-21.3	57.3	-11.6	-25.1	N/A	N/A	N/A
Fergus Shand Dam											N/A	-32.0	-31.4	27.8	-21.0	-29.8	-27.8	-32.3	-2.1
Georgetown	-51.3	-4.5	-27.4	-47.3	-40.5	-19.0	-46.6	15.1	-25.5	-33.3	17.2	N/A	N/A	18.9	5.2	-37.3	-27.0	-23.5	-10.9
Guelph	-30.0	-16.1	7.3	-31.9	-24.4	-11.3	-41.3	14.1	21.1	-35.1	9.7	-15.1	-39.4	24.9	-23.2	-39.0	N/A	N/A	N/A
Kitchener/Waterloo	-38.1	4.3	3.5	-29.1	-52.9	-6.9	-51.8	-31.7	-12.9	N/A	-0.2	3.0	-40.3	42.0	-31.5	-28.6	-22.5	-44.7	-16.1
Mt. Forest/Redickville	-73.4	-70.2	-18.2	N/A	-54.9	-13.2	-42.6	-3.6	-16.2	-3.2	29.6	-27.7	-6.3	11.3	-32.3	-7.7	32.2	-31.0	2.0
Stratford	-31.3	60.0	1.1	-28.4	-35.1	3.4	-41.4	3.3	-20.7	-13.0	-0.5	-2.8	-21.1	57.0	-18.3	-13.0	-3.2	-25.5	-33.6
Woodstock	-48.7	-15.3	5.5	-48.1	-40.2	-23.7	-43.7	-17.7	-30.9	-28.0	23.5	-6.6	N/A	63.0	-29.6	5.7	4.2	-42.4	-49.1
AVERAGE	-44.1	-1.7	-5.0	-42.1	-44.4	-12.5	-48.0	2.9	-15.4	-19.3	12.8	-12.3	-28.9	37.0	-19.9	-21.2	-6.1	-35.3	-17.5

TABLE C-6

Annual Mean Temperature Departure (Degrees Celsius) from 1961-1990 Normal during Drought Period Analysis Years

STATION	**1930**	**1931**	**1932**	**1933**	**1934**	**1935**	**1936**	**1937**	**1938**	**1939**	**1961**	**1962**	**1963**	**1964**	**1965**	**1966**	**1997**	**1998**	**1999**
Brantford	0.3	0.8	1.4	0.8	-0.9	-0.1	-0.7	0.5	0.4	0.2	-0.2	0.3	-0.9	0.3	-0.6	0.2	N/A	1.3	1.4
Delhi/Simcoe	0.6	1.2	2.1	1.7	0.0	0.2	-0.5	0.9	0.6	0.4	-0.5	0.1	-1.2	0.3	-0.4	0.3	0.0	N/A	N/A
Fergus Shand Dam											N/A	N/A	-1.3	-0.4	-1.3	-0.5	0.0	2.2	2.2
Guelph	0.1	0.7	1.7	1.2	-0.6	0.3	-0.3	0.9	0.9	0.6	0.0	0.6	-0.8	0.3	-0.7	0.1	N/A	N/A	N/A
Kitchener/Waterloo	0.7	1.2	2.2	1.6	-0.2	0.6	-0.1	N/A	0.9	N/A	0.4	0.9	-0.5	1.0	0.1	0.9	N/A	1.7	1.6
Mt. Forest/Redickville	0.3	1.0	1.9	1.3	-0.7	0.5	-0.3	0.9	0.7	0.9	-0.6	N/A	-0.9	0.5	-0.7	0.1	0.1	2.2	2.2
Stratford	0.4	1.1	2.1	1.5	-0.4	0.6	0.1	1.0	1.0	1.0	-0.1	0.4	-1.3	0.3	-0.6	-0.1	0.2	2.2	2.1
Woodstock	-0.2	0.4	1.5	0.9	-0.9	-0.1	-0.7	0.3	0.2	0.0	-0.1	0.4	-1.0	0.3	-0.7	0.1	0.0	2.0	1.5
AVERAGE	0.3	0.9	1.8	1.3	-0.5	0.3	-0.4	0.7	0.6	0.5	-0.2	0.5	-1.0	0.3	-0.6	0.2	0.1	1.9	1.8

TABLE C-7

Autumn Mean Temperature Departure (Degrees Celsius) from 1961-1990 Normal during Drought Period Analysis Years (Autumn - September/October/November)

STATION	**1930**	**1931**	**1932**	**1933**	**1934**	**1935**	**1936**	**1937**	**1938**	**1939**	**1961**	**1962**	**1963**	**1964**	**1965**	**1966**	**1997**	**1998**	**1999**
Brantford	-0.4	0.5	2.6	-0.6	-0.9	0.8	-0.6	-0.9	-1.3	-0.1	0.8	1.6	-0.4	1.3	-0.2	0.0	N/A	-1.2	1.2
Delhi/Simcoe	0.1	0.8	3.2	0.4	0.0	1.3	-0.5	-0.4	-0.9	0.2	0.9	1.3	-0.5	1.1	0.0	0.2	-0.6	-0.8	N/A
Fergus Shand Dam											0.4	1.8	-0.8	1.3	-0.9	-1.3	-0.4	-0.2	1.9
Guelph	-0.5	0.3	2.9	-0.5	-0.5	1.3	0.0	-0.4	-0.4	0.7	1.3	2.2	-0.5	1.5	-0.4	-0.3	N/A	N/A	N/A
Kitchener/Waterloo	0.5	1.4	3.4	0.5	-0.2	1.4	0.2	-0.2	-0.6	N/A	1.9	2.7	0.3	2.7	0.9	0.7	N/A	-0.3	1.6
Mt. Forest/Redickville	-0.6	0.6	2.9	-0.3	-0.9	1.0	-0.3	-0.7	-1.2	0.7	0.3	1.7	-0.4	1.7	-0.3	-0.4	-0.6	-0.4	1.6
Stratford	-0.4	0.7	3.3	-0.1	-0.4	1.2	0.1	-0.4	-1.0	0.9	0.9	1.7	-0.3	1.4	-0.2	-0.1	-0.4	-0.3	1.9
Woodstock	-0.6	0.4	2.8	-0.6	-0.8	0.8	-0.6	-0.9	-1.4	-0.1	1.0	1.9	-0.2	1.4	-0.2	0.1	-0.5	-0.2	1.6
AVERAGE	-0.3	0.7	3.0	-0.2	-0.5	1.1	-0.3	-0.6	-1.0	0.4	1.0	1.9	-0.3	1.5	-0.2	-0.2	-0.5	-0.5	1.6

TABLE C-8

Winter Mean Temperature Departure (Degrees Celsius) from 1961-1990 Normal during Drought Period Analysis Years
(Winter - December/January/February)

STATION	**1930**	**1931**	**1932**	**1933**	**1934**	**1935**	**1936**	**1937**	**1938**	**1939**	**1961**	**1962**	**1963**	**1964**	**1965**	**1966**	**1997**	**1998**	**1999**
Brantford	0.0	1.1	4.4	2.8	-2.4	-1.3	-2.8	2.7	0.6	0.6	-1.1	-0.8	-2.6	-0.1	0.3	1.2	N/A	3.0	2.0
Delhi/Simcoe	1.2	2.0	5.7	3.6	-1.1	-0.6	-2.5	3.2	0.7	1.1	-1.3	-1.2	-3.4	-0.2	0.4	0.9	2.2	4.0	2.4
Fergus Shand Dam											N/A	N/A	-3.0	-1.4	-0.3	0.6	2.1	4.5	3.4
Guelph	0.4	1.3	5.5	3.0	-2.1	-0.5	-2.1	3.1	0.8	1.0	-0.6	-0.8	-2.6	-0.6	0.0	1.1	N/A	N/A	N/A
Kitchener/Waterloo	0.5	1.7	5.4	3.1	-1.6	-0.1	-1.9	3.5	0.9	0.0	-0.3	-0.9	-2.9	0.1	0.4	1.7	1.8	3.7	2.5
Mt. Forest/Redickville	0.6	1.3	5.0	2.9	-1.7	-0.4	-2.0	3.2	0.7	1.2	-1.0	N/A	-2.7	-0.2	0.4	1.4	2.0	4.3	3.1
Stratford	0.5	1.6	5.2	2.7	-2.2	-0.4	-2.4	2.9	0.9	1.3	-0.7	-0.8	-3.8	-0.3	0.4	0.9	2.3	4.5	3.3
Woodstock	-0.1	1.1	5.2	2.8	-2.2	-0.8	-2.7	2.6	0.3	0.8	-0.5	-0.7	-3.0	-0.3	0.3	1.0	2.0	4.2	2.5
AVERAGE	0.4	1.4	5.2	3.0	-1.9	-0.6	-2.3	3.0	0.7	0.8	-0.8	-0.9	-3.0	-0.4	0.2	1.1	2.1	4.0	2.7

TABLE C-9

Spring Mean Temperature Departure (Degrees Celsius) from 1961-1990 Normal during Drought Period Analysis Years
(Spring - March/April/May)

STATION	**1930**	**1931**	**1932**	**1933**	**1934**	**1935**	**1936**	**1937**	**1938**	**1939**	**1961**	**1962**	**1963**	**1964**	**1965**	**1966**	**1997**	**1998**	**1999**
Brantford	0.3	0.4	-1.6	0.1	-1.0	-0.8	-0.1	-0.9	0.8	-0.7	-0.9	1.0	0.1	0.6	-1.1	-0.9	-1.8	2.5	0.9
Delhi/Simcoe	0.5	0.9	-1.0	0.8	-0.2	-0.7	0.0	-0.4	1.3	-0.5	-1.2	0.7	-0.3	0.6	-1.1	-0.7	-1.3	2.4	1.0
Fergus Shand Dam											-1.1	0.8	-0.5	-0.2	-2.0	-1.5	-1.7	3.3	2.0
Guelph	-0.2	0.3	-1.5	0.6	-0.7	-0.3	0.1	-0.7	1.4	-0.7	-1.1	1.4	0.0	0.5	-1.4	-1.0	N/A	N/A	N/A
Kitchener/Waterloo	0.5	0.3	-0.7	0.7	-0.3	0.0	0.3	N/A	1.5	-1.3	-0.8	1.6	0.3	0.9	-0.5	-0.5	N/A	2.6	1.1
Mt. Forest/Redickville	0.1	0.6	-1.2	0.8	-0.9	-0.1	0.4	-0.8	1.4	0.0	-1.7	1.4	-0.1	0.8	-1.0	-1.1	-1.5	3.3	2.1
Stratford	0.2	0.4	-1.0	0.7	-0.8	-0.2	0.8	-0.6	1.8	-0.1	-0.9	0.9	-0.4	0.6	-1.3	-1.6	-1.3	3.2	1.6
Woodstock	-0.4	-0.3	-1.8	-0.1	-1.3	-0.9	-0.2	-1.1	0.8	-1.0	-0.8	1.2	0.0	0.6	-1.2	-1.0	-1.4	2.8	0.8
AVERAGE	0.1	0.4	-1.2	0.5	-0.7	-0.4	0.2	-0.8	1.3	-0.6	-1.1	1.1	-0.1	0.5	-1.2	-1.0	-1.5	2.9	1.3

TABLE C-10

Summer Mean Temperature Departure (Degrees Celsius) from 1961-1990 Normal during Drought Period Analysis Years
(Summer - June/July/August)

STATION	**1930**	**1931**	**1932**	**1933**	**1934**	**1935**	**1936**	**1937**	**1938**	**1939**	**1961**	**1962**	**1963**	**1964**	**1965**	**1966**	**1997**	**1998**	**1999**
Brantford	1.0	1.0	0.0	0.9	0.6	0.6	0.7	0.9	1.2	0.7	0.0	-0.8	-0.6	-0.6	-1.6	0.3	-0.8	0.8	1.1
Delhi/Simcoe	0.7	1.0	0.3	1.9	1.3	0.5	0.8	1.0	1.2	0.8	-0.6	-0.7	-0.7	-0.2	-1.1	0.6	-0.5	N/A	N/A
Fergus Shand Dam											0.8	0.4	0.3	-0.1	-1.2	1.3	1.1	2.0	2.3
Guelph	0.6	1.0	-0.1	1.5	0.9	0.7	1.0	1.3	1.6	1.2	0.3	-0.5	-0.3	-0.5	-1.4	0.7	-0.6	N/A	N/A
Kitchener/Waterloo	1.5	1.5	0.7	1.9	1.4	1.3	1.1	1.5	1.7	N/A	0.8	0.3	0.5	0.4	-0.4	1.8	-0.2	0.8	1.3
Mt. Forest/Redickville	1.0	1.6	0.8	1.8	0.9	1.4	0.5	1.8	2.0	1.7	-0.2	-0.1	-0.3	-0.5	-1.6	0.7	0.4	1.4	2.0
Stratford	1.0	1.4	0.7	2.6	1.6	1.7	1.7	2.1	2.1	1.9	0.2	-0.5	-0.7	-0.5	-1.5	0.4	0.0	1.3	1.7
Woodstock	0.2	0.6	-0.2	1.5	0.9	0.6	0.9	0.9	1.0	0.5	0.1	-0.6	-0.6	-0.4	-1.5	0.5	0.0	1.1	1.2
AVERAGE	0.9	1.2	0.3	1.7	1.1	1.0	1.0	1.3	1.5	1.1	0.2	-0.3	-0.3	-0.3	-1.3	0.8	-0.1	1.2	1.6

TABLE C-11

Annual Maximum Temperature Departure (Degrees Celsius) from 1961-1990 Normal during Drought Period Analysis Years

STATION	**1930**	**1931**	**1932**	**1933**	**1934**	**1935**	**1936**	**1937**	**1938**	**1939**	**1961**	**1962**	**1963**	**1964**	**1965**	**1966**	**1997**	**1998**	**1999**
Brantford	1.2	1.5	1.6	1.3	-0.2	0.0	-0.1	0.4	0.5	0.6	0.4	0.9	-0.4	0.8	-0.3	0.2	N/A	1.8	2.2
Delhi/Simcoe	1.6	2.1	2.7	2.5	1.2	0.6	0.3	1.2	0.9	1.1	-0.5	0.2	-0.8	1.1	0.3	1.0	-0.3	N/A	N/A
Fergus Shand Dam											N/A	N/A	-0.6	0.2	-0.9	-0.3	-0.2	2.1	2.4
Guelph	0.2	0.6	1.5	1.3	-0.2	0.0	-0.3	0.6	0.8	0.6	-0.1	0.8	-0.6	0.5	-0.6	0.1	N/A	N/A	N/A
Kitchener/Waterloo	1.4	1.5	1.5	1.3	0.0	0.2	-0.3	N/A	0.5	N/A	-0.1	0.5	-0.9	0.7	-0.3	0.3	N/A	1.6	1.9
Mt. Forest/Redickville	0.9	1.9	2.3	2.1	0.6	1.1	0.6	1.6	1.3	1.8	-0.7	N/A	-0.5	0.9	-0.2	0.2	0.0	2.2	2.4
Stratford	0.9	1.6	2.4	2.1	0.5	1.0	0.7	1.3	1.1	1.4	0.1	0.7	-1.0	0.8	-0.4	0.0	-0.2	2.1	2.7
Woodstock	-0.6	0.0	0.6	0.6	-0.3	-0.3	-0.6	0.0	0.0	0.0	0.1	0.7	-0.5	0.8	-0.4	0.2	-0.1	2.0	2.3
AVERAGE	0.8	1.3	1.8	1.6	0.2	0.4	0.0	0.8	0.7	0.9	-0.1	0.6	-0.7	0.7	-0.4	0.2	-0.2	1.9	2.3

TABLE C-12

Autumn Maximum Temperature Departure (Degrees Celsius) from 1961-1990 Normal during Drought Period Analysis Years
(Autumn - September/October/November)

STATION	**1930**	**1931**	**1932**	**1933**	**1934**	**1935**	**1936**	**1937**	**1938**	**1939**	**1961**	**1962**	**1963**	**1964**	**1965**	**1966**	**1997**	**1998**	**1999**
Brantford	0.4	1.8	3.6	-0.2	-0.4	0.8	-0.1	-0.7	-1.1	0.9	2.2	3.0	-0.6	2.6	0.6	-0.3	N/A	-0.6	2.5
Delhi/Simcoe	0.9	2.5	4.6	1.2	1.3	1.7	0.4	0.6	-0.4	1.9	1.9	1.7	-0.3	2.7	1.4	0.5	-0.7	-1.0	N/A
Fergus Shand Dam											1.7	2.8	-0.4	2.5	-0.2	-1.2	-0.8	-0.2	2.4
Guelph	-0.6	0.7	3.1	-0.3	-0.2	0.9	-0.1	-0.2	-0.6	1.1	1.8	2.5	-0.5	2.7	0.2	-0.7	N/A	N/A	N/A
Kitchener/Waterloo	1.0	2.7	3.2	0.0	-0.5	1.0	-0.1	-0.4	-1.1	N/A	1.8	2.4	-0.6	2.9	0.7	-0.1	N/A	-0.3	2.4
Mt. Forest/Redickville	0.2	2.0	4.1	0.7	0.1	1.6	0.7	0.3	-0.5	2.3	1.2	2.2	-0.3	2.7	0.5	-0.4	-0.9	-0.4	2.0
Stratford	0.4	2.1	4.4	0.8	0.8	1.6	0.7	0.4	-0.6	2.0	1.9	2.5	-0.1	2.8	0.5	-0.2	-0.8	-0.3	2.8
Woodstock	-1.3	0.4	2.1	-1.2	-0.4	0.4	-0.6	-1.0	-1.6	0.6	1.7	2.3	-0.3	2.7	0.6	-0.2	-0.9	-0.4	2.6
AVERAGE	0.1	1.7	3.6	0.2	0.1	1.1	0.1	-0.1	-0.8	1.4	1.8	2.4	-0.4	2.7	0.5	-0.3	-0.8	-0.5	2.5

TABLE C-13

Winter Maximum Temperature Departure (Degrees Celsius) from 1961-1990 Normal during Drought Period Analysis Years
(Winter - December/January/February)

STATION	**1930**	**1931**	**1932**	**1933**	**1934**	**1935**	**1936**	**1937**	**1938**	**1939**	**1961**	**1962**	**1963**	**1964**	**1965**	**1966**	**1997**	**1998**	**1999**
Brantford	0.4	1.2	3.9	2.9	-2.5	-1.4	-3.1	2.4	0.0	0.7	0.1	-0.5	-2.1	0.2	0.5	0.9	N/A	3.3	3.1
Delhi/Simcoe	2.0	3.0	6.2	4.8	-0.2	0.3	-2.2	3.7	1.0	1.7	-0.9	-1.6	-3.0	0.4	0.9	1.5	2.3	3.3	2.6
Fergus Shand Dam											N/A	N/A	-2.3	-0.8	-0.1	0.7	2.1	3.9	3.5
Guelph	0.6	1.1	4.9	2.8	-1.5	-0.4	-2.4	3.3	0.9	1.1	-0.1	-0.4	-2.4	-0.5	0.1	1.0	N/A	N/A	N/A
Kitchener/Waterloo	0.5	2.1	4.5	3.0	-1.2	-0.3	-2.6	3.1	0.1	-1.3	-0.3	-1.2	-3.3	-0.2	0.1	1.1	1.8	3.0	2.6
Mt. Forest/Redickville	0.8	2.1	5.0	3.2	-0.6	0.3	-1.4	3.5	1.0	1.9	-0.9	N/A	-2.3	0.4	0.5	1.3	2.1	3.8	3.1
Stratford	0.8	2.0	5.2	3.4	-1.4	0.1	-2.1	3.5	1.0	1.6	-0.2	-0.8	-3.5	0.1	0.4	0.8	2.1	3.7	3.4
Woodstock	-0.5	0.7	4.1	2.6	-1.9	-0.8	-3.0	2.4	0.1	0.7	-0.1	-0.8	-2.4	0.1	0.4	1.0	2.0	3.4	3.2
AVERAGE	0.7	1.7	4.8	3.2	-1.3	-0.3	-2.4	3.1	0.6	0.9	-0.4	-0.9	-2.7	-0.1	0.3	1.0	2.1	3.5	3.1

TABLE C-14

Spring Maximum Temperature Departure (Degrees Celsius) from 1961-1990 Normal during Drought Period Analysis Years
(Spring - March/April/May)

STATION	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1961	1962	1963	1964	1965	1966	1997	1998	1999
Brantford	1.0	1.1	-1.7	-0.1	-0.4	-0.5	0.0	-1.5	1.1	-0.8	-0.8	1.3	0.7	0.9	-1.3	-1.1	-1.4	3.1	1.7
Delhi/Simcoe	1.3	1.5	-0.8	0.9	0.9	0.0	0.3	-0.6	1.5	-0.4	-2.0	0.7	0.0	1.1	-0.9	0.0	-1.3	1.9	0.8
Fergus Shand Dam											-1.5	1.1	0.3	0.2	-1.7	-1.7	-1.8	3.5	2.5
Guelph	-0.7	-0.2	-2.0	-0.1	-0.9	-0.9	-0.7	-1.8	1.3	-1.4	-2.0	1.2	0.3	0.2	-1.9	-1.6	N/A	N/A	N/A
Kitchener/Waterloo	0.9	0.1	-1.5	-0.1	0.0	-0.4	-0.2	N/A	1.7	-2.7	-1.7	1.1	0.4	0.5	-1.1	-1.1	N/A	2.8	1.5
Mt. Forest/Redickville	0.3	0.9	-1.3	0.6	0.0	0.5	0.5	-0.7	1.9	0.3	-2.3	1.5	0.3	0.8	-1.0	-1.4	-1.8	3.4	2.4
Stratford	0.6	0.7	-0.8	0.5	0.0	0.3	1.0	-0.6	2.0	0.1	-1.3	1.4	0.1	0.7	-1.3	-1.5	-1.7	3.4	2.4
Woodstock	-0.9	-0.9	-2.8	-1.2	-1.1	-1.1	-0.6	-2.0	0.9	-1.7	-1.4	1.4	0.5	0.7	-1.4	-1.3	-1.5	3.2	1.6
AVERAGE	0.3	0.5	-1.6	0.1	-0.2	-0.3	0.0	-1.2	1.5	-1.0	-1.6	1.2	0.3	0.6	-1.3	-1.2	-1.6	3.1	1.9

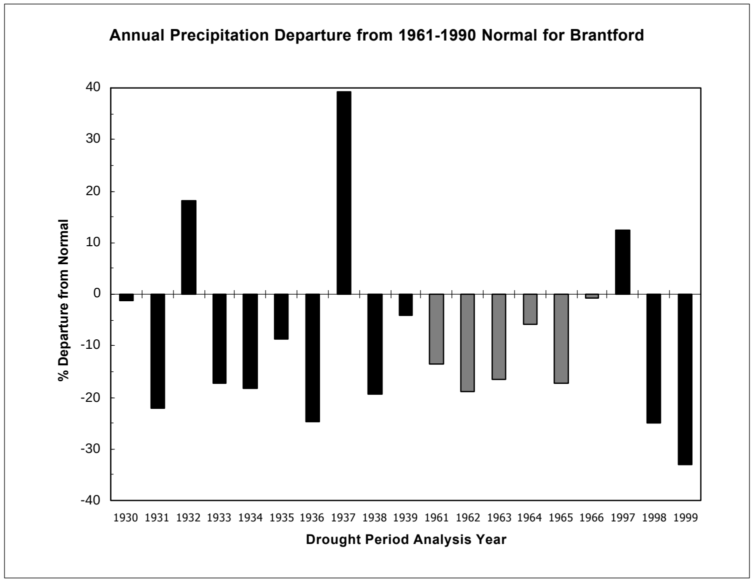
TABLE C-15

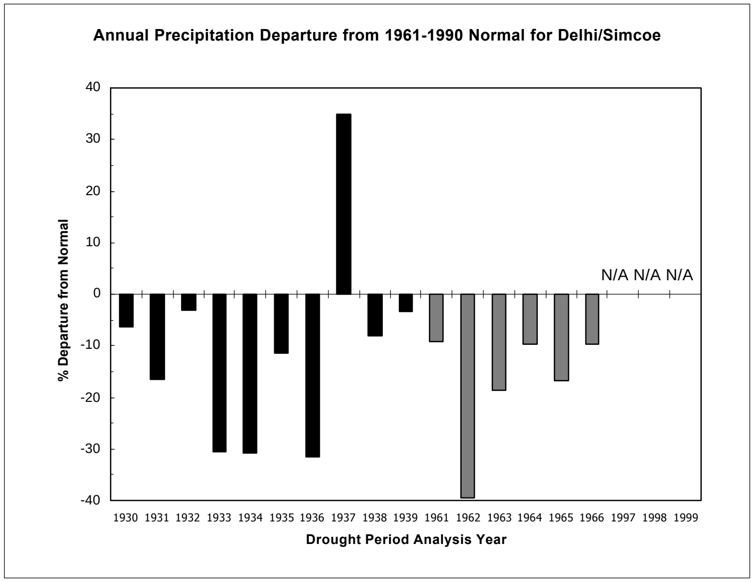
Summer Maximum Temperature Departure (Degrees Celsius) from 1961-1990 Normal during Drought Period Analysis Years
(Summer - June/July/August)

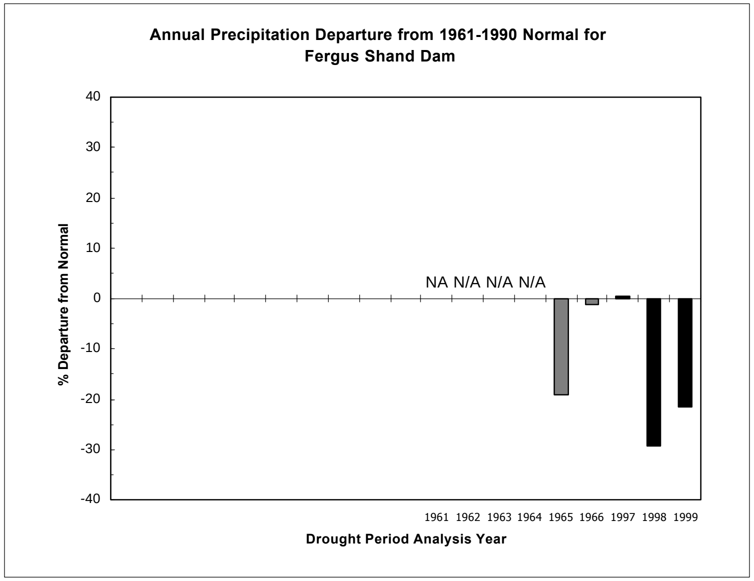
STATION	**1930**	**1931**	**1932**	**1933**	**1934**	**1935**	**1936**	**1937**	**1938**	**1939**	**1961**	**1962**	**1963**	**1964**	**1965**	**1966**	**1997**	**1998**	**1999**
Brantford	2.8	1.9	0.6	2.4	2.3	0.9	2.6	1.1	1.8	1.6	0.2	-0.5	0.2	-0.4	-1.1	1.0	-0.5	1.1	1.4
Delhi/Simcoe	2.0	1.3	0.7	3.1	2.4	0.4	2.7	0.9	1.5	1.3	-1.2	-0.3	-0.1	0.3	-0.3	1.8	-1.7	N/A	N/A
Fergus Shand Dam											-0.2	-0.2	-0.4	-1.2	-1.8	0.8	-0.2	1.1	1.2
Guelph	1.2	0.7	-0.2	2.4	1.5	0.1	1.7	0.8	1.3	1.3	-0.4	-0.3	0.1	-0.6	-1.1	1.3	-0.7	N/A	N/A
Kitchener/Waterloo	3.2	1.1	0.0	2.3	1.8	0.7	1.8	1.1	1.3	N/A	-0.2	-0.3	0.0	-0.4	-0.7	1.4	-0.4	0.8	1.2
Mt. Forest/Redickville	2.1	2.4	1.1	3.6	2.6	1.8	2.5	2.8	2.8	2.4	-0.8	0.2	0.1	-0.4	-1.1	1.1	0.2	1.7	1.7
Stratford	1.8	1.7	0.8	3.7	2.9	2.0	3.2	2.2	2.3	2.3	0.3	-0.3	-0.1	-0.3	-1.1	1.2	-0.2	1.7	2.3
Woodstock	0.2	-0.4	-1.2	2.1	1.9	0.1	1.8	0.2	0.6	0.3	-0.1	-0.2	0.0	-0.4	-1.2	1.0	-0.2	1.3	1.6
AVERAGE	1.9	1.2	0.3	2.8	2.2	0.9	2.3	1.3	1.7	1.5	-0.3	-0.2	0.0	-0.4	-1.0	1.2	-0.5	1.3	1.5

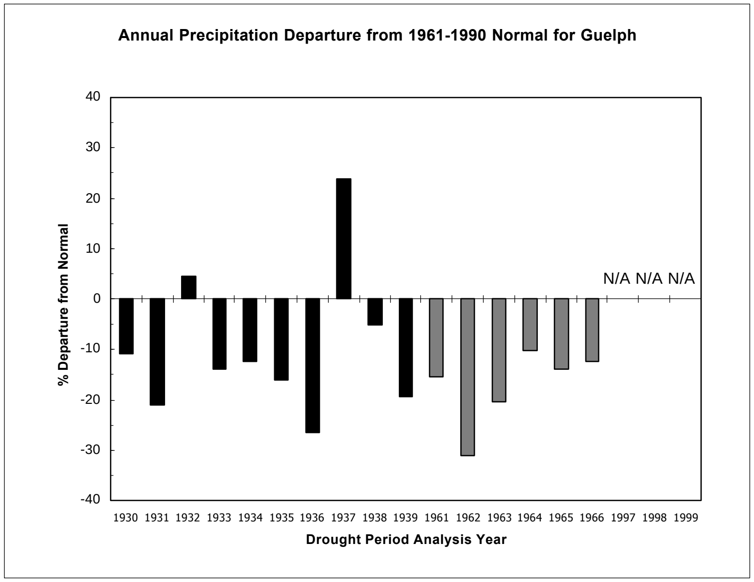
Appendix D

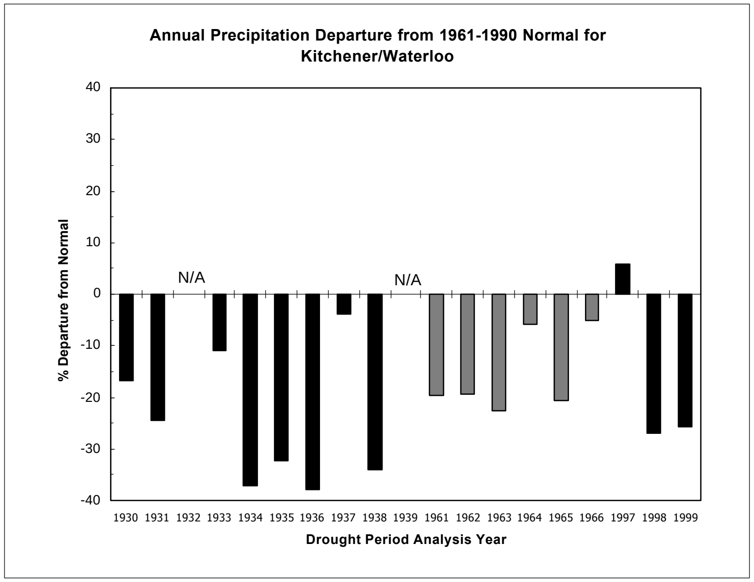
Graphs of Annual and Seasonal Precipitation, Mean and Maximum Temperature Departures from Normal

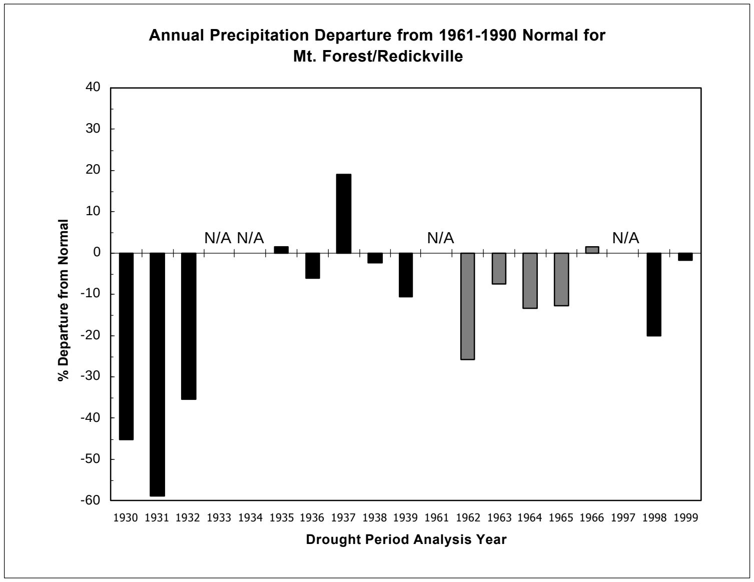

Annual Precipitation Departure from 1961-1990 Normal for Brantford

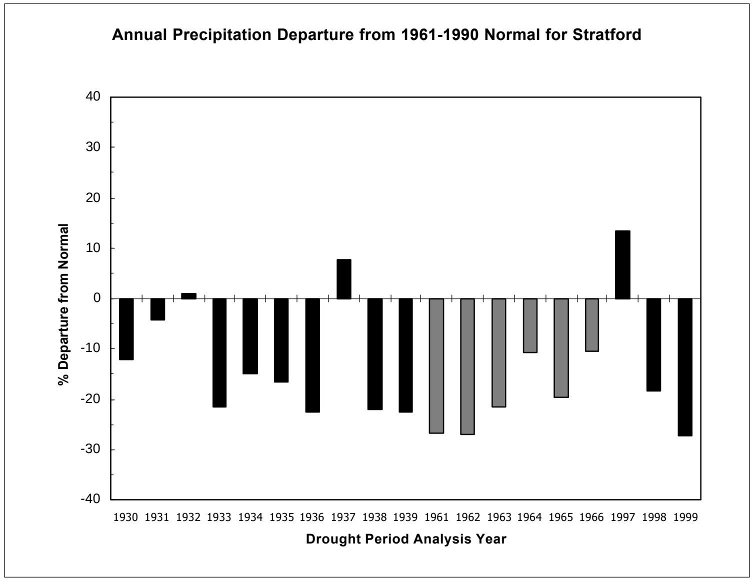

Annual Precipitation Departure from 1961-1990 Normal for Delhi/Simcoe

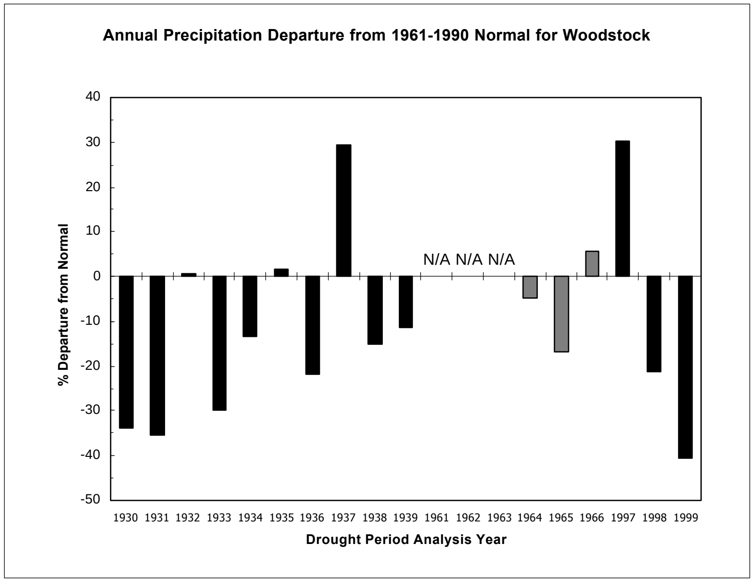

Annual Precipitation Departure from 1961-1990 Normal for Fergus Shand Dam

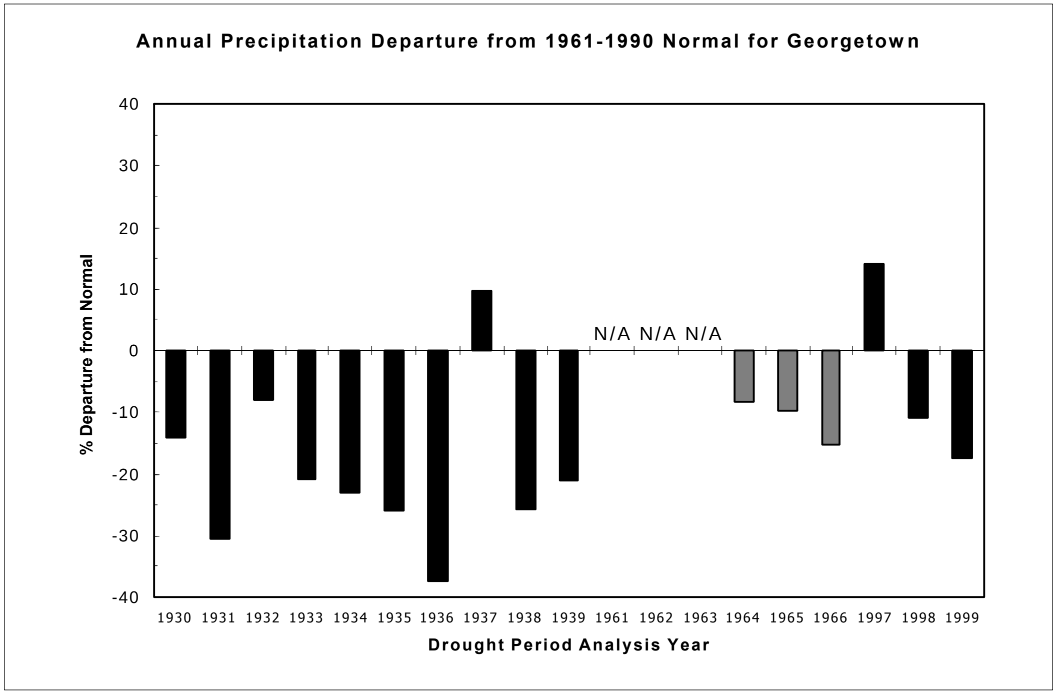

Annual Precipitation Departure from 1961-1990 Normal for Guelph

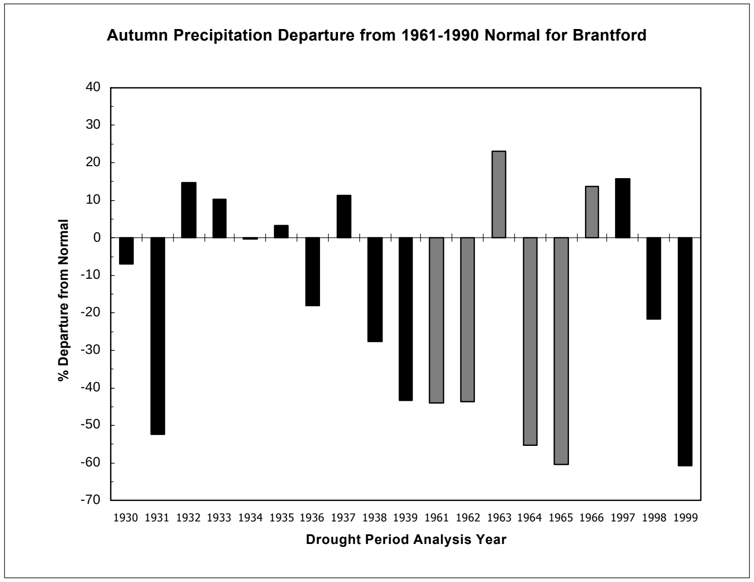

Annual Precipitation Departure from 1961-1990 Normal for Kitchener/Waterloo


Annual Precipitation Departure from 1961-1990 Normal for Mt. Forest/Redickville

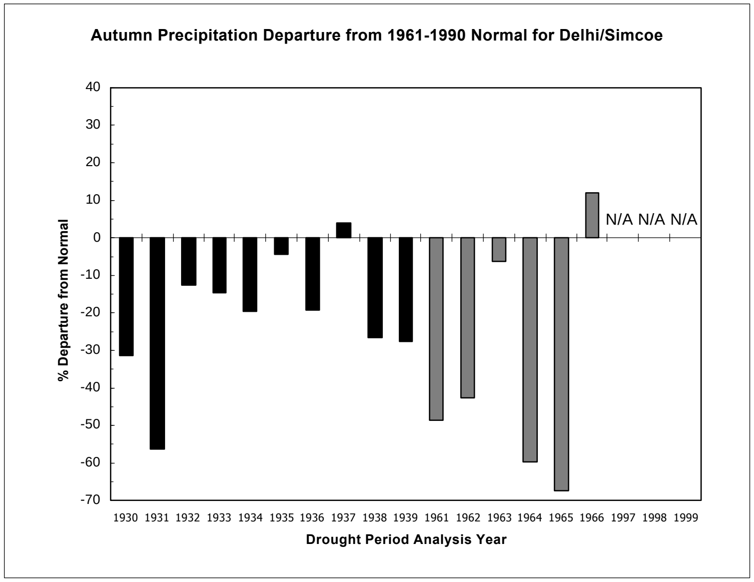

Annual Precipitation Departure from 1961-1990 Normal for Stratford


Annual Precipitation Departure from 1961-1990 Normal for Woodstock

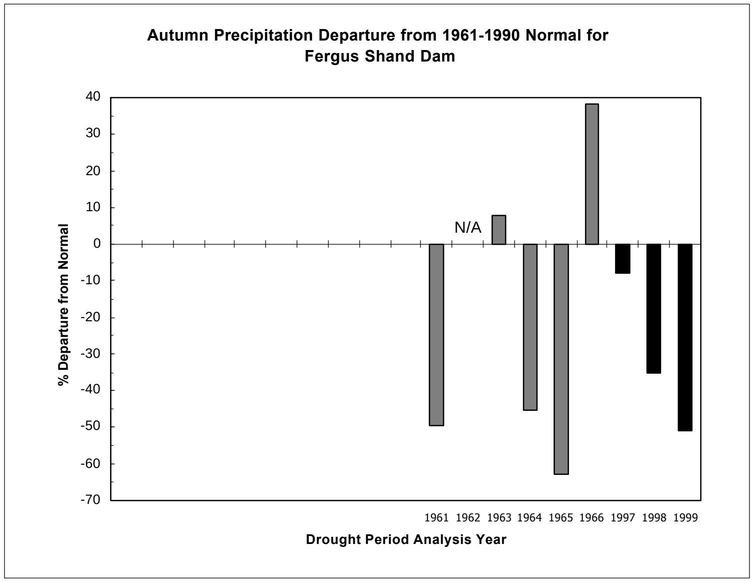

Annual Precipitation Departure from 1961-1990 Normal for Georgetown
40
30
20
10
0
-10
-20
-30
-40
% Departure from Normal
N/A N/A N/A
1930 1931 1932 1933 1934 1935 1936 1937 1938 1939 1961 1962 1963 1964 1965 1966 1997 1998 1999
Drought Period Analysis Year



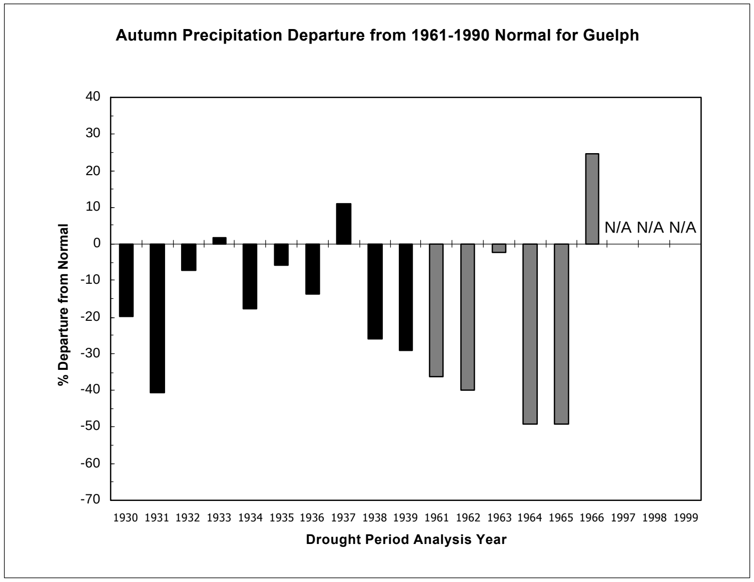
Autumn Precipitation Departure from 1961-1990 Normal for Brantford



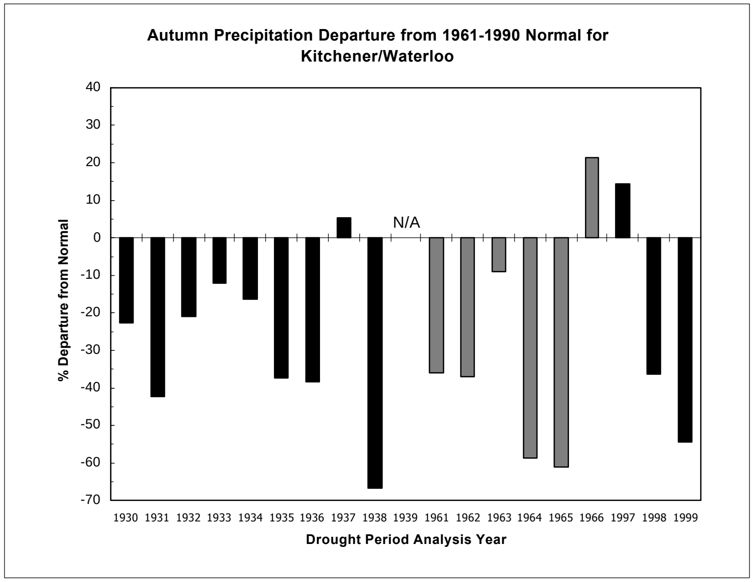
Autumn Precipitation Departure from 1961-1990 Normal for Delhi/Simcoe

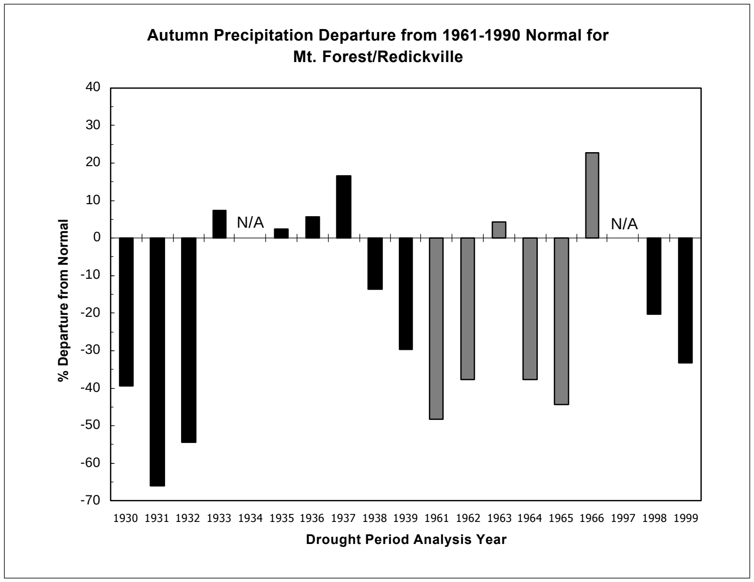


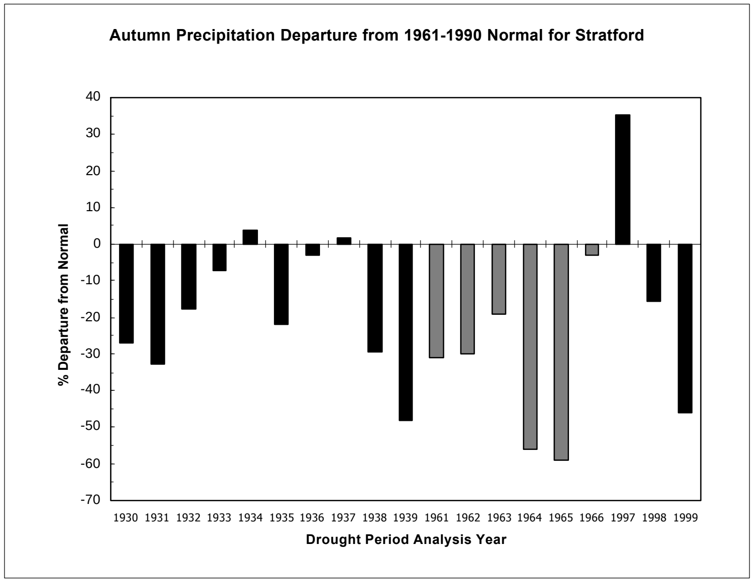
Autumn Precipitation Departure from 1961-1990 Normal for Fergus Shand Dam

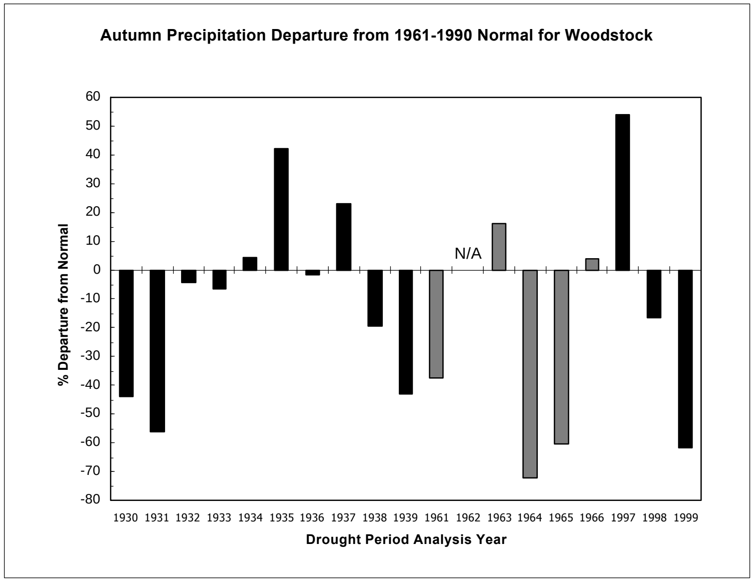


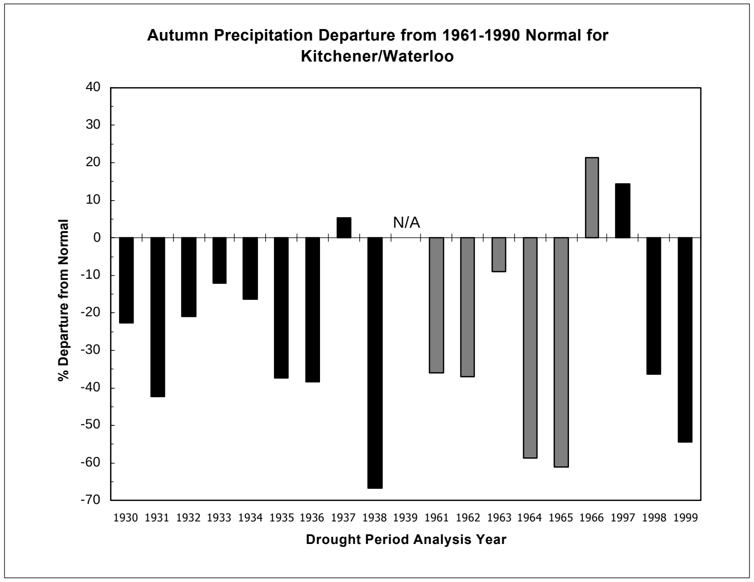
Autumn Precipitation Departure from 1961-1990 Normal for Guelph

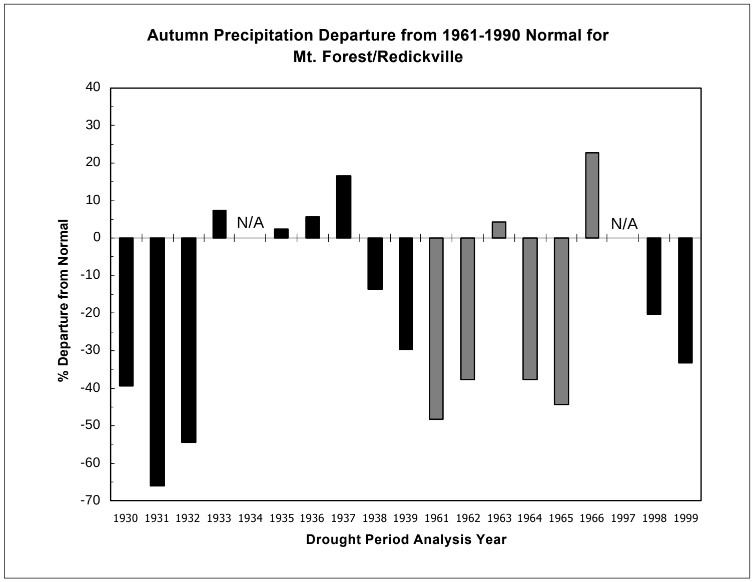

Autumn Precipitation Departure from 1961-1990 Normal for Kitchener/Waterloo

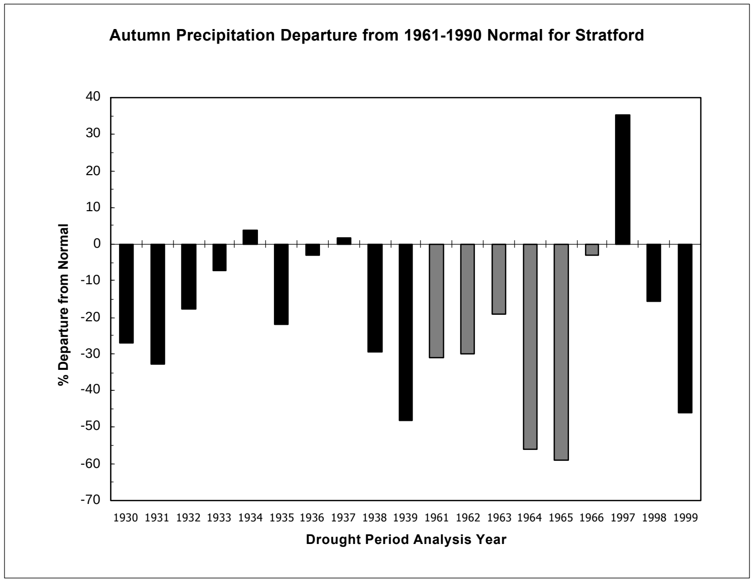

Autumn Precipitation Departure from 1961-1990 Normal for Mt. Forest/Redickville

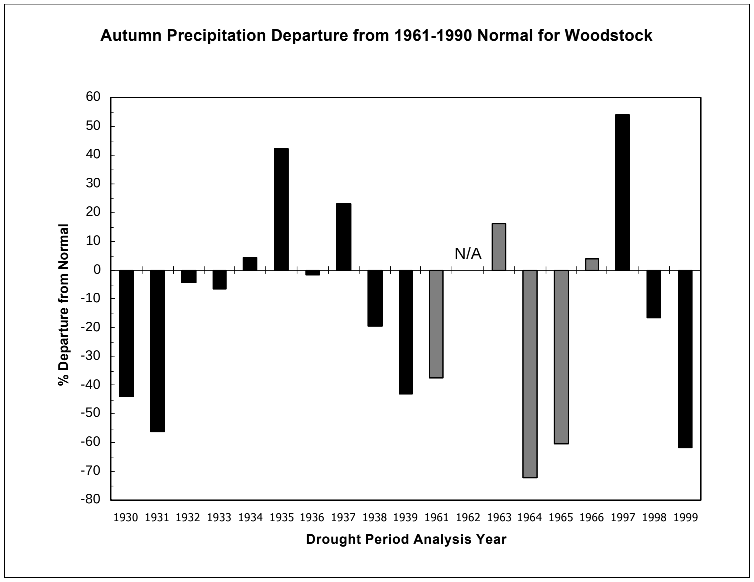

Autumn Precipitation Departure from 1961-1990 Normal for Stratford

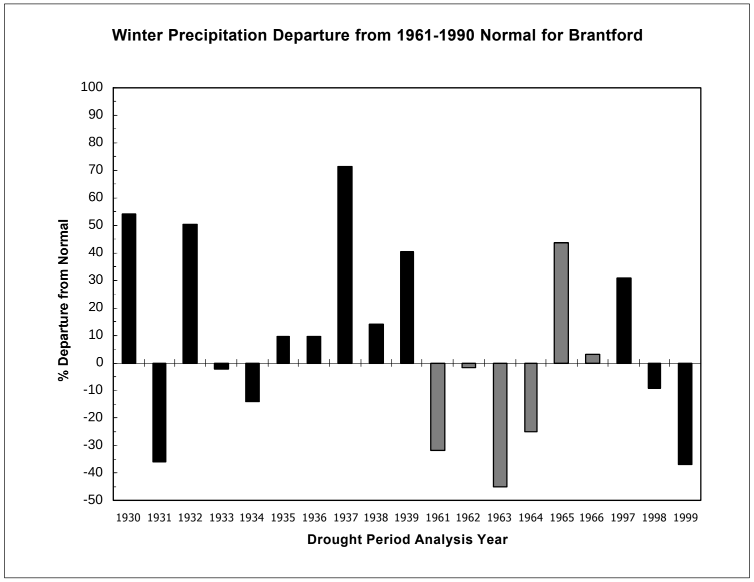

Autumn Precipitation Departure from 1961-1990 Normal for Woodstock

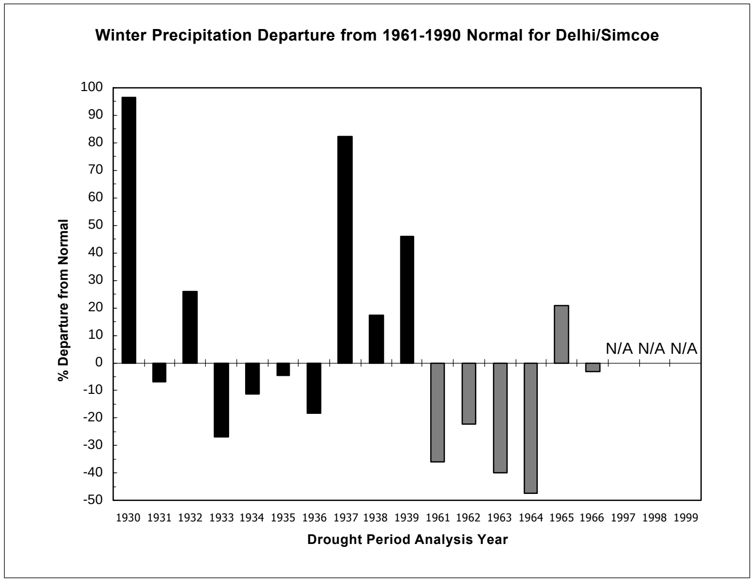

Autumn Precipitation Departure from 1961-1990 Normal for Kitchener/Waterloo

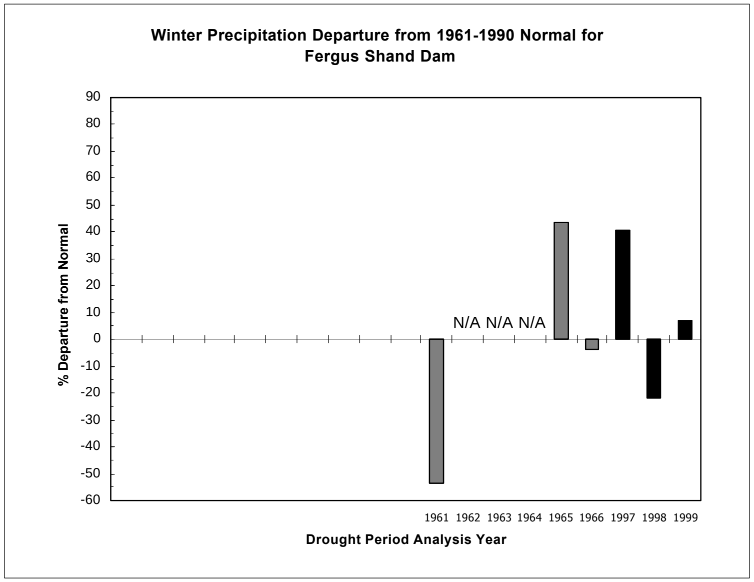

Autumn Precipitation Departure from 1961-1990 Normal for Mt. Forest/Redickville

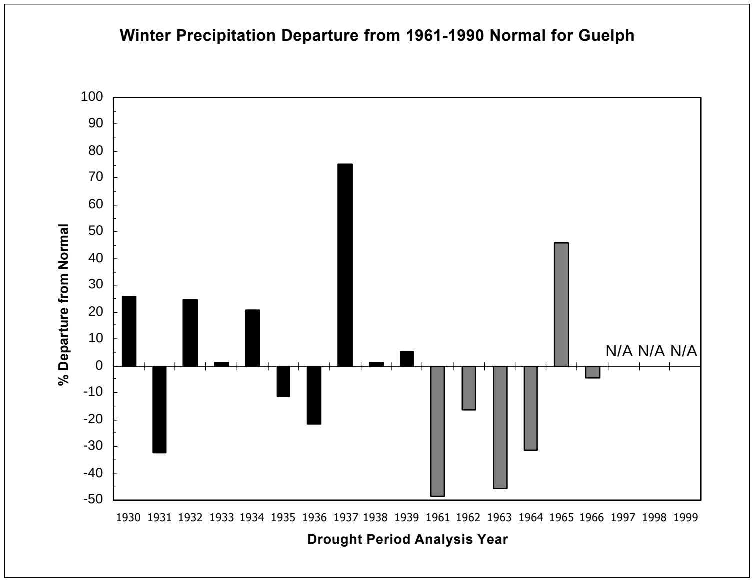

Autumn Precipitation Departure from 1961-1990 Normal for Stratford

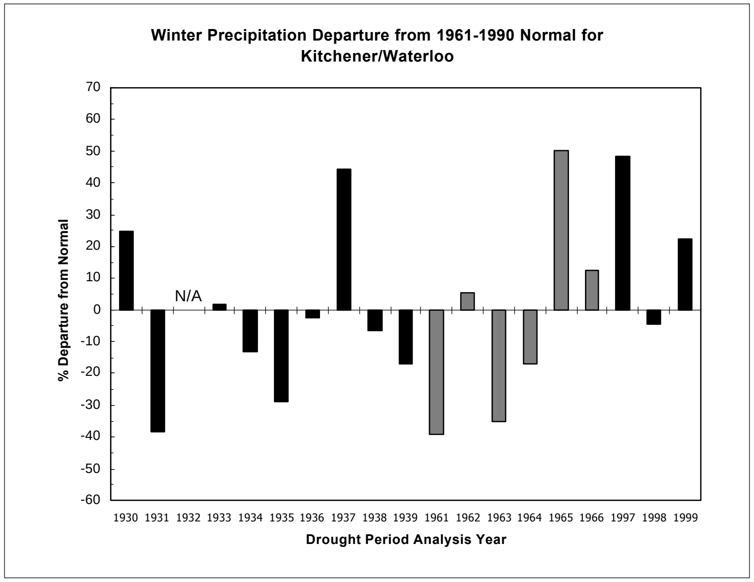

Autumn Precipitation Departure from 1961-1990 Normal for Woodstock

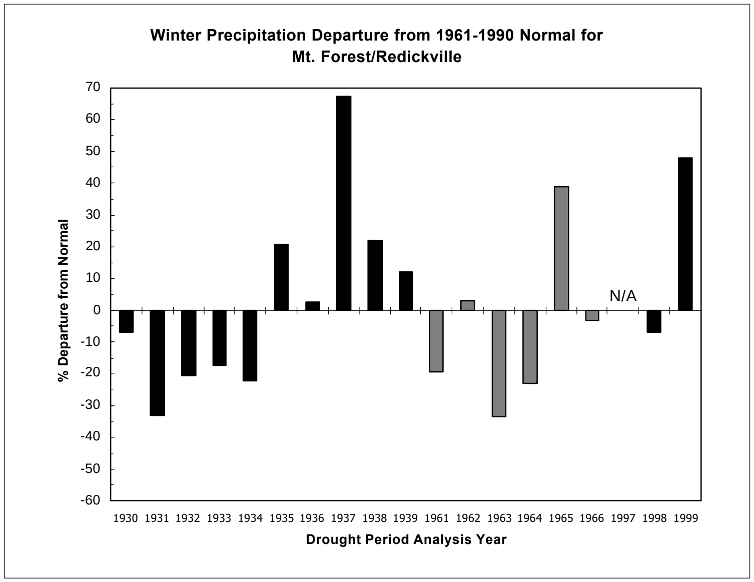

Winter Precipitation Departure from 1961-1990 Normal for Brantford
% Departure from Normal
100
90
80
70
60
50
40
30
20
10
0
-10
-20
-30
-40
-50
1930 1931 1932 1933 1934 1935 1936 1937 1938 1939 1961 1962 1963 1964 1965 1966 1997 1998 1999
Drought Period Analysis Year

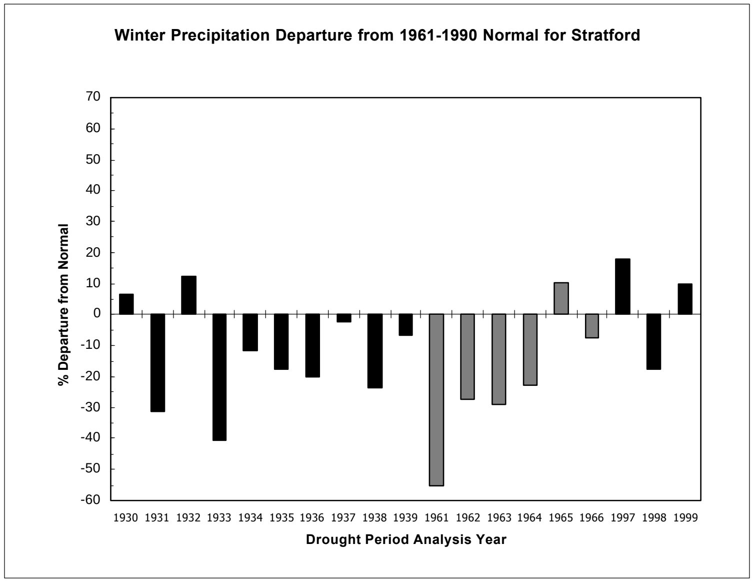

Winter Precipitation Departure from 1961-1990 Normal for Delhi/Simcoe
% Departure from Normal
100
90
80
70
60
50
40
30
20
10
0
-10
-20
-30
-40
-50
N/A N/A N/A
1930 1931 1932 1933 1934 1935 1936 1937 1938 1939 1961 1962 1963 1964 1965 1966 1997 1998 1999
Drought Period Analysis Year

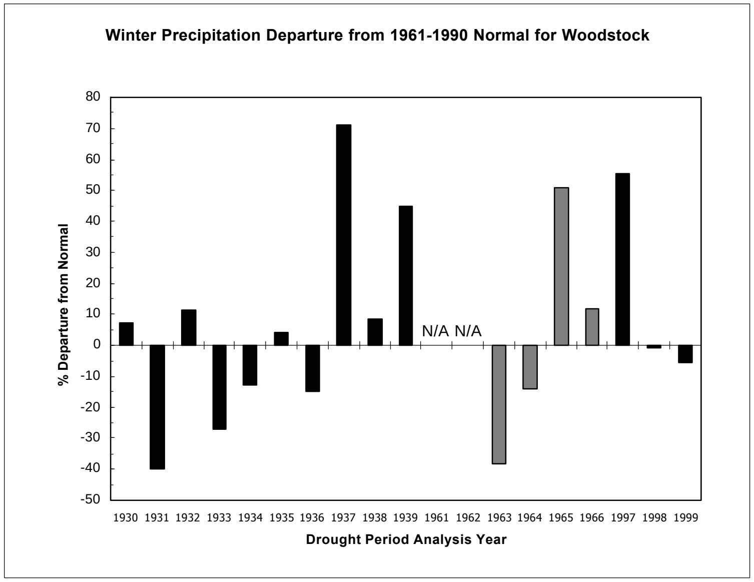

Winter Precipitation Departure from 1961-1990 Normal for Fergus Shand Dam
% Departure from Normal
90
80
70
60
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
N/A N/A N/A
1961 1962 1963 1964 1965 1966 1997 1998 1999
Drought Period Analysis Year

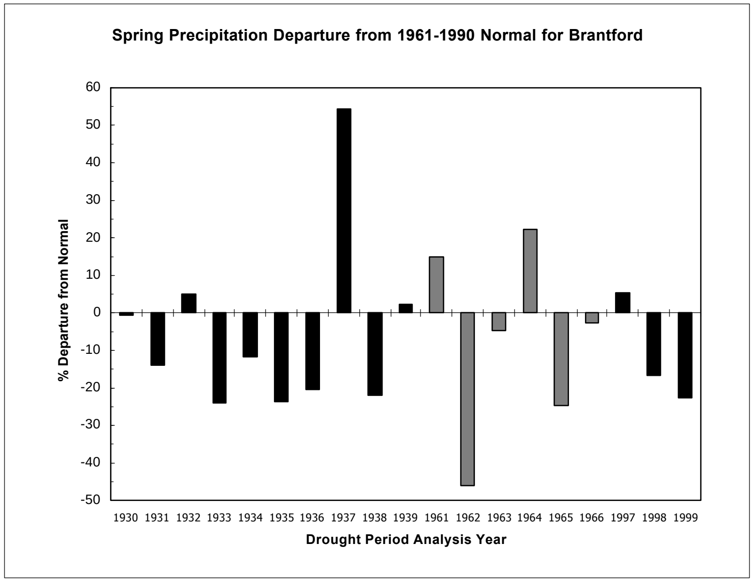

Winter Precipitation Departure from 1961-1990 Normal for Guelph
% Departure from Normal
100
90
80
70
60
50
40
30
20
10
0
-10
-20
-30
-40
-50
N/A N/A N/A
1930 1931 1932 1933 1934 1935 1936 1937 1938 1939 1961 1962 1963 1964 1965 1966 1997 1998 1999
Drought Period Analysis Year

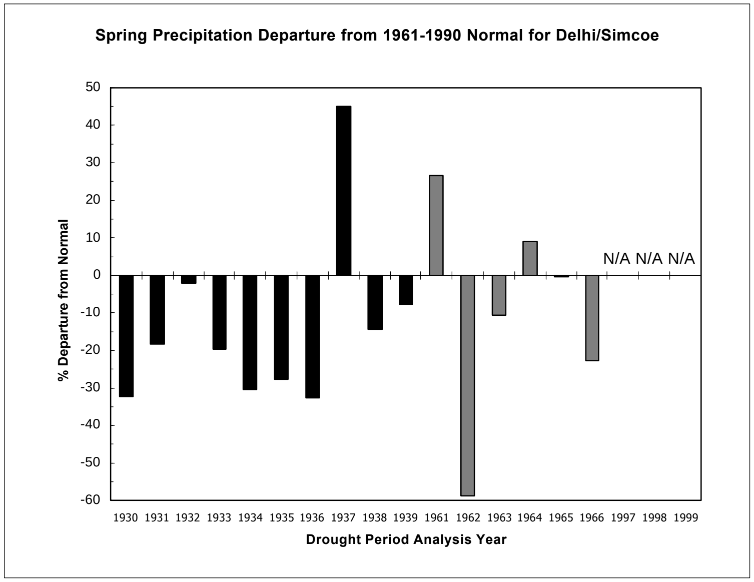

Winter Precipitation Departure from 1961-1990 Normal for Kitchener/Waterloo

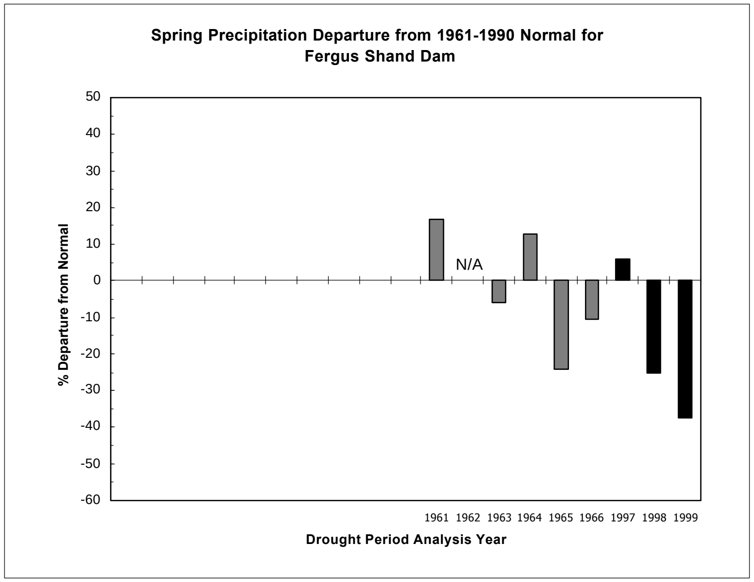

Winter Precipitation Departure from 1961-1990 Normal for Mt. Forest/Redickville

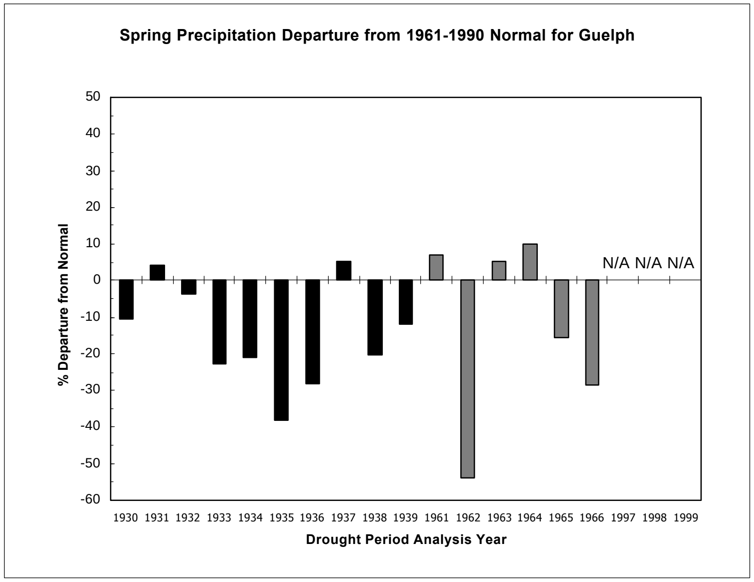

Winter Precipitation Departure from 1961-1990 Normal for Stratford

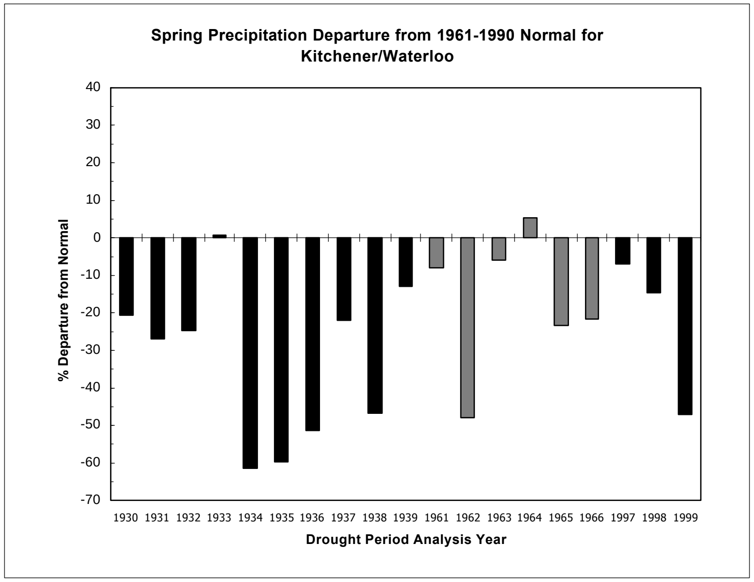

Winter Precipitation Departure from 1961-1990 Normal for Woodstock

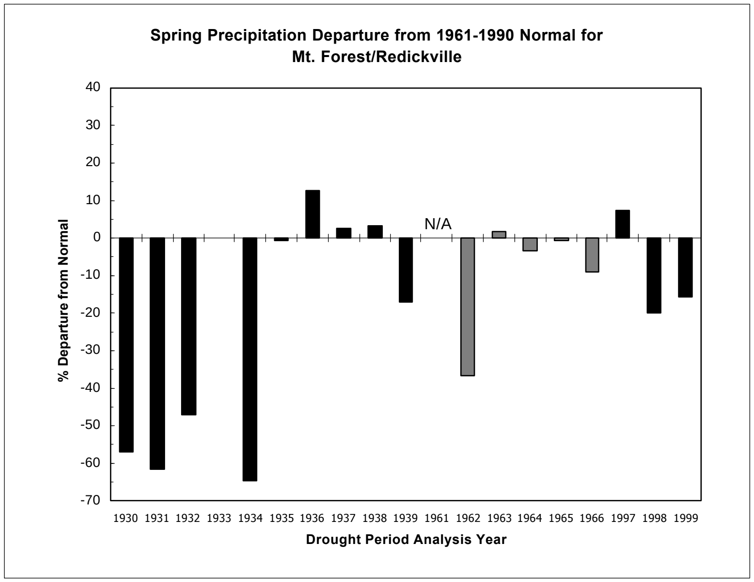

Spring Precipitation Departure from 1961-1990 Normal for Brantford

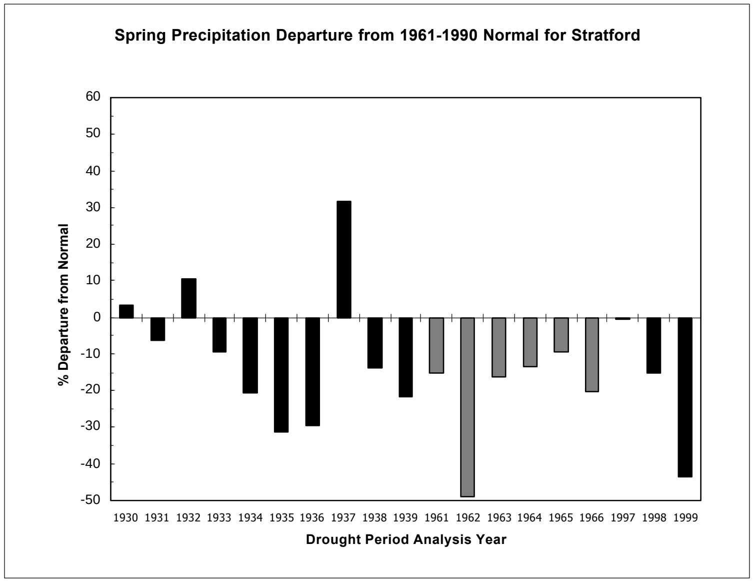

Spring Precipitation Departure from 1961-1990 Normal for Delhi/Simcoe

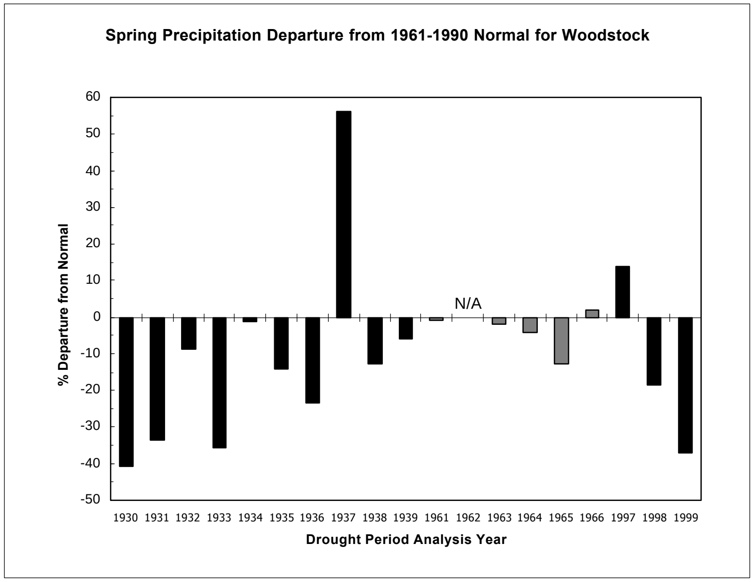

Spring Precipitation Departure from 1961-1990 Normal for Fergus Shand Dam


Spring Precipitation Departure from 1961-1990 Normal for Guelph

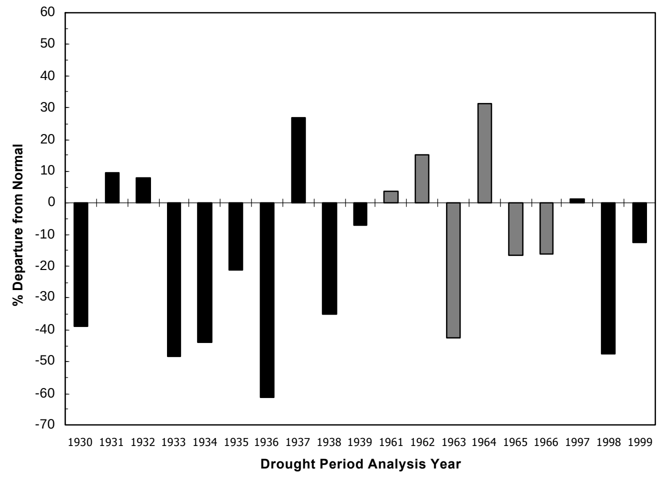

Spring Precipitation Departure from 1961-1990 Normal for Kitchener/Waterloo


Spring Precipitation Departure from 1961-1990 Normal for Mt. Forest/Redickville

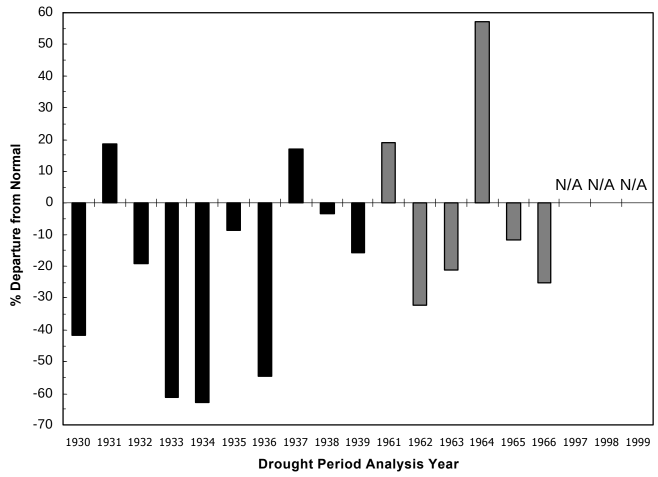

Spring Precipitation Departure from 1961-1990 Normal for Stratford


Spring Precipitation Departure from 1961-1990 Normal for Woodstock

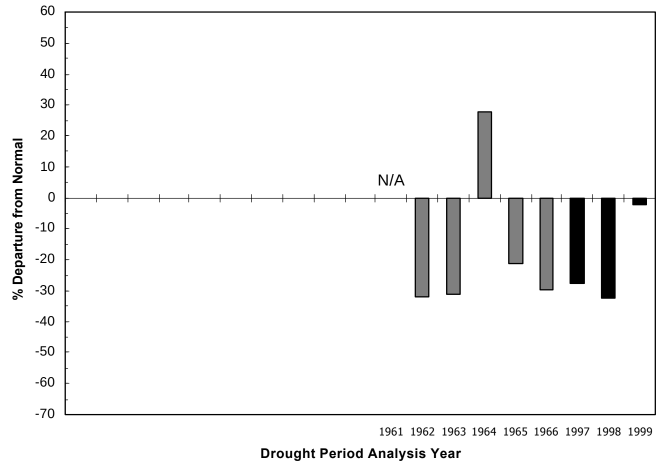
Summer Precipitation Departure from 1961-1990 Normal for Brantford



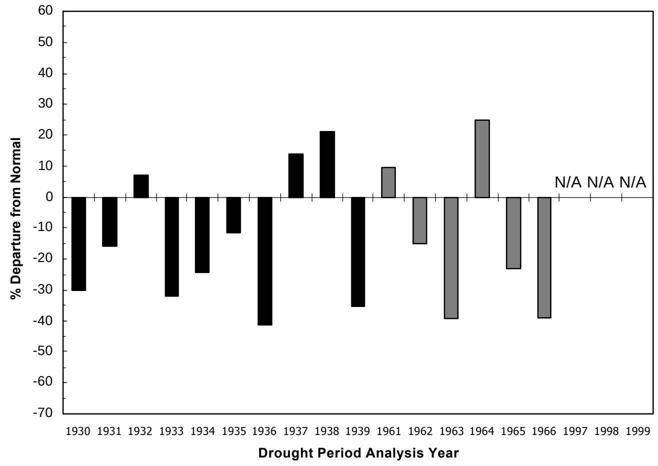
Summer Precipitation Departure from 1961-1990 Normal for Delhi/Simcoe

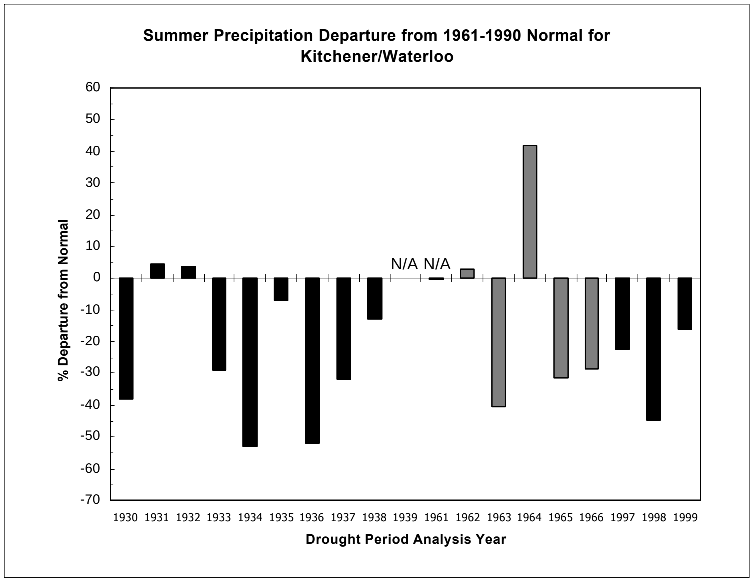


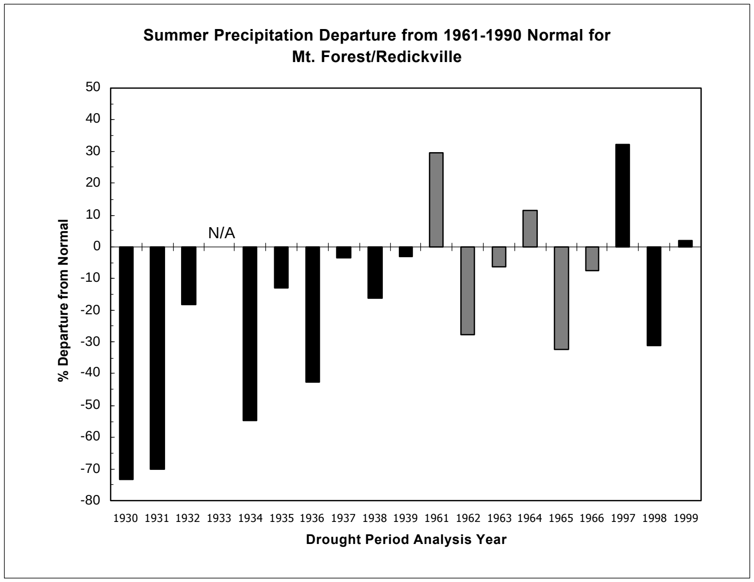
Summer Precipitation Departure from 1961-1990 Normal for Fergus Shand Dam

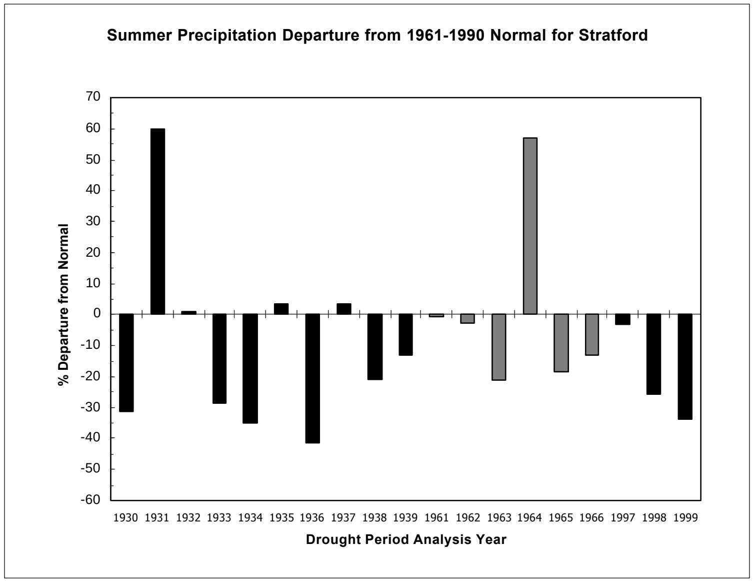


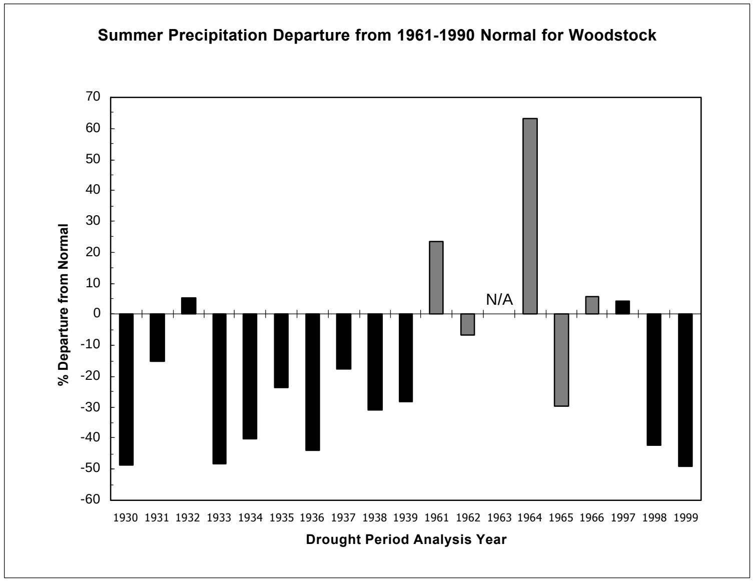
Summer Precipitation Departure from 1961-1990 Normal for Guelph

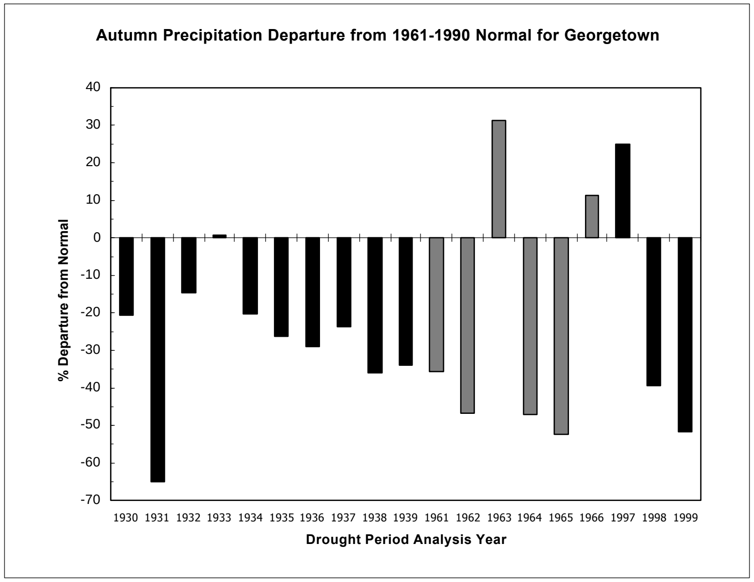


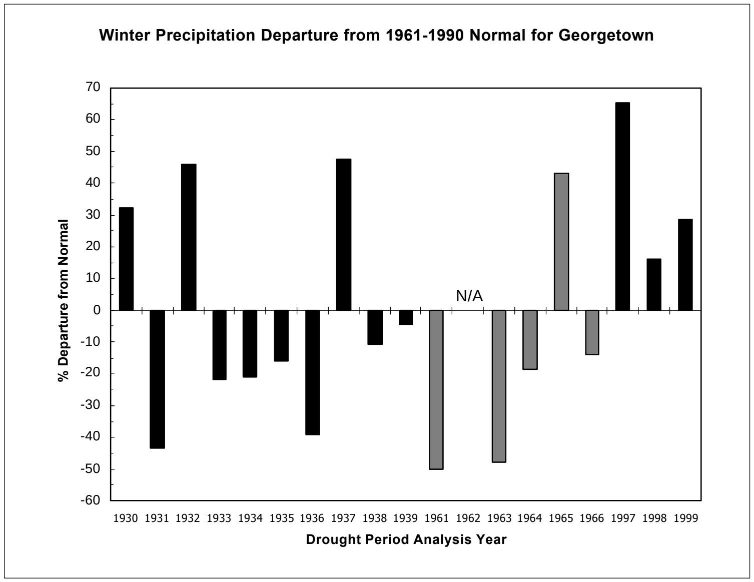

Summer Precipitation Departure from 1961-1990 Normal for Kitchener/Waterloo

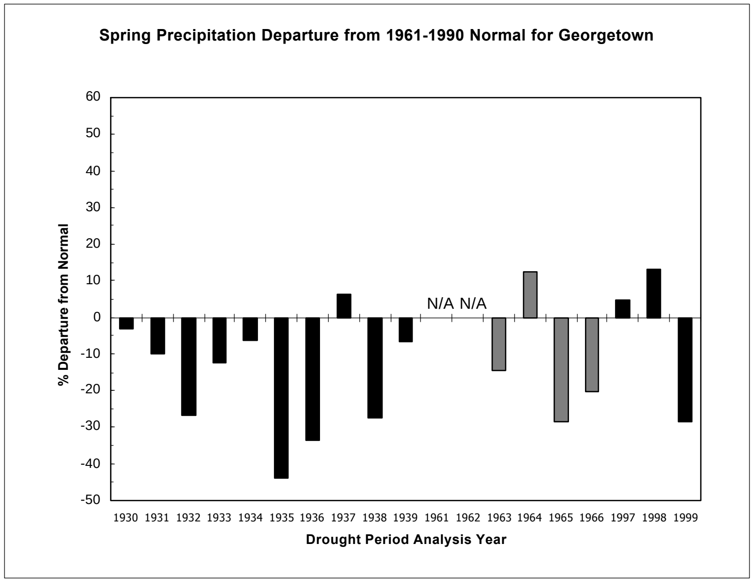

Summer Precipitation Departure from 1961-1990 Normal for Mt. Forest/Redickville

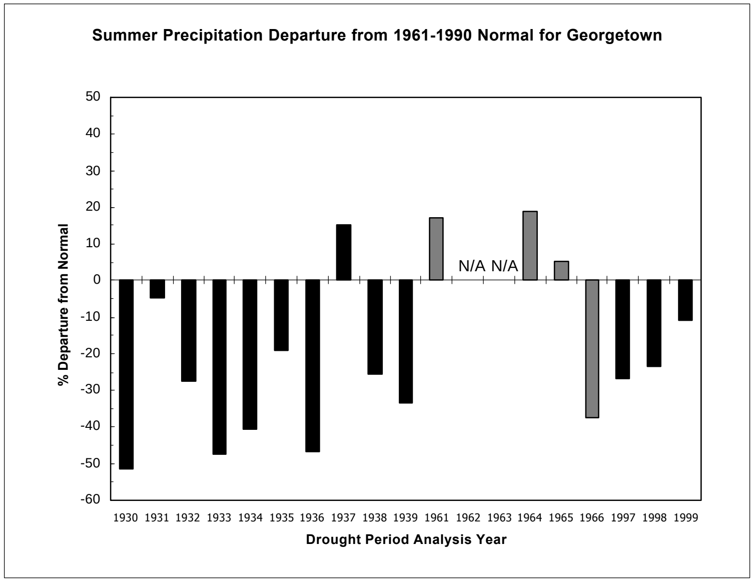

Summer Precipitation Departure from 1961-1990 Normal for Stratford

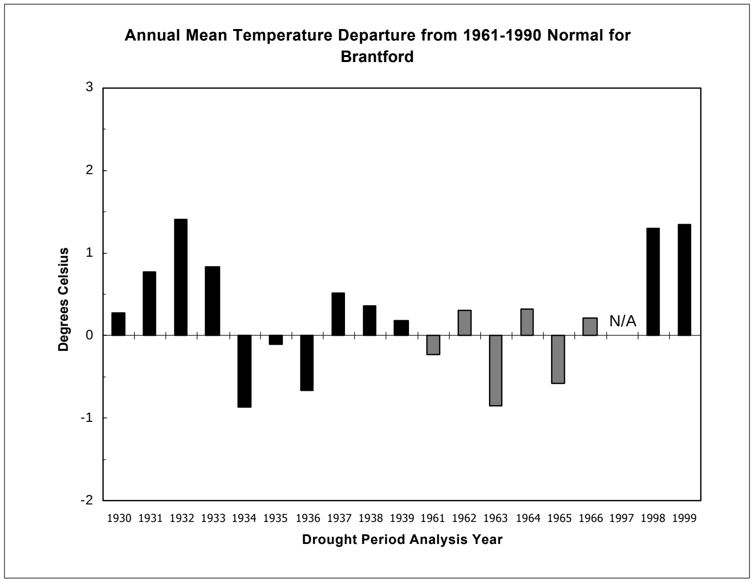

Summer Precipitation Departure from 1961-1990 Normal for Woodstock

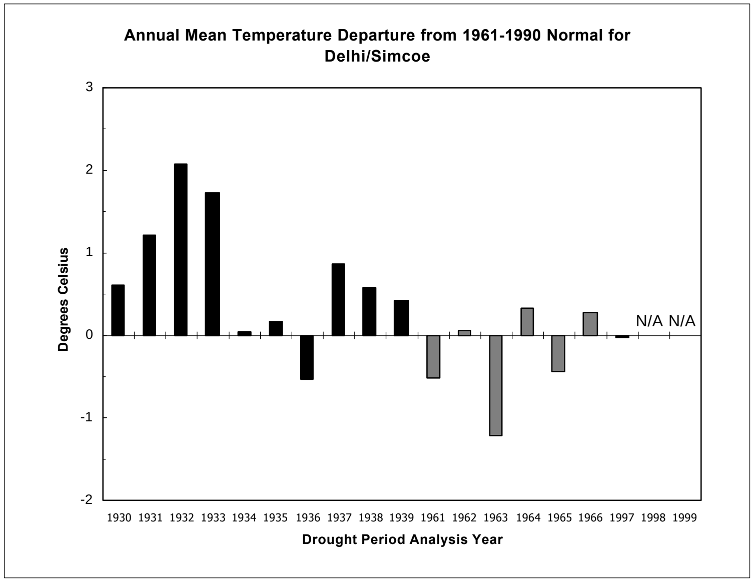

Autumn Precipitation Departure from 1961-1990 Normal for Georgetown

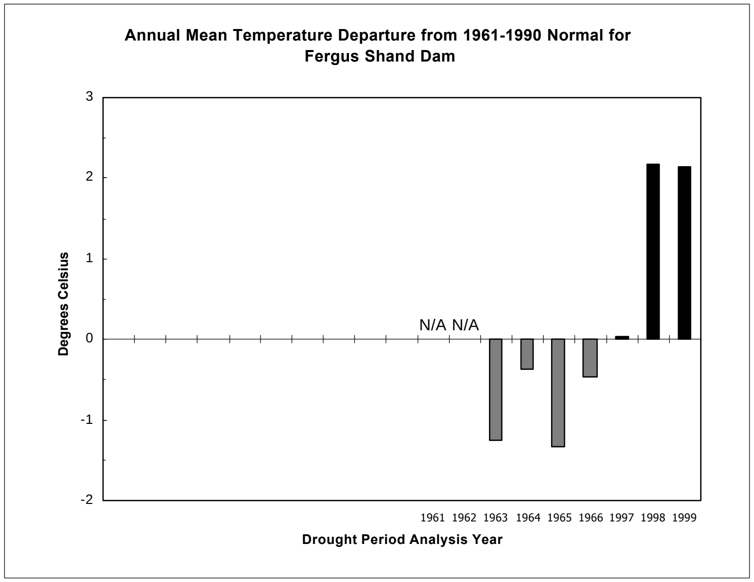

Winter Precipitation Departure from 1961-1990 Normal for Georgetown

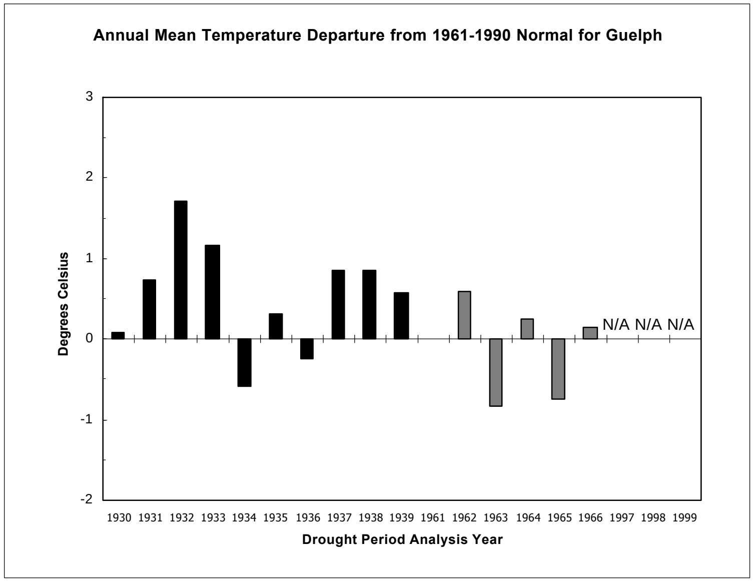

Spring Precipitation Departure from 1961-1990 Normal for Georgetown

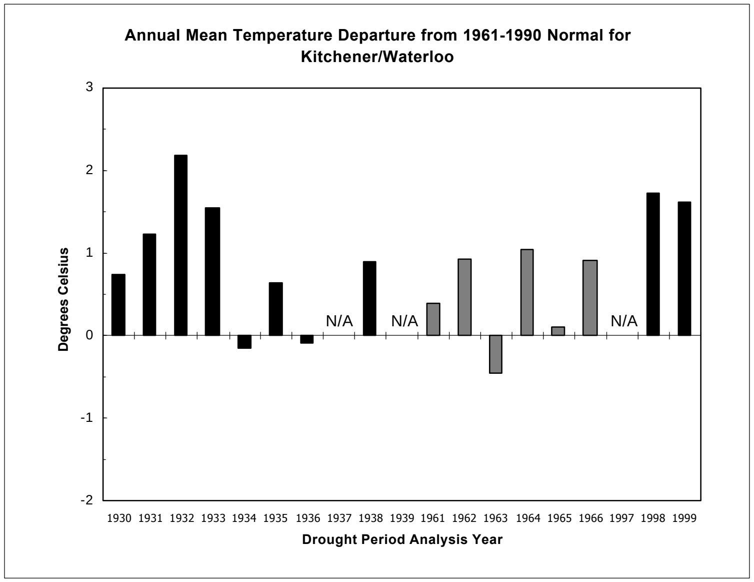

Summer Precipitation Departure from 1961-1990 Normal for Georgetown

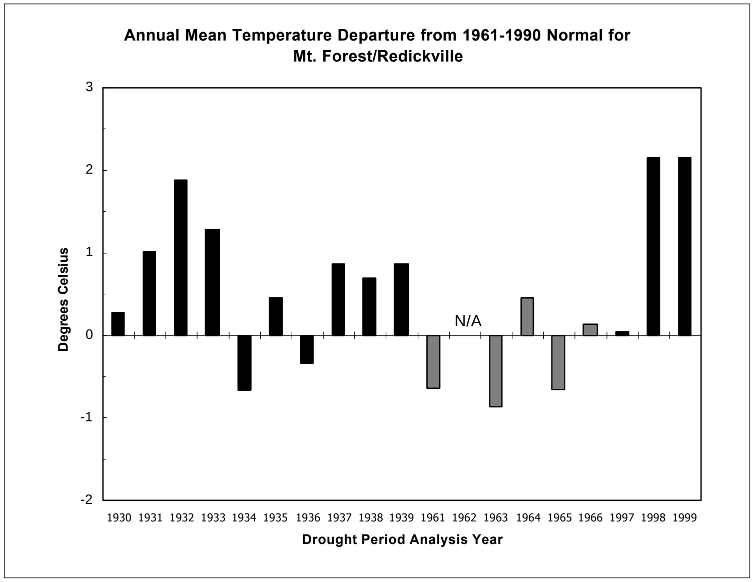

Annual Mean Temperature Departure from 1961-1990 Normal for Brantford
Degrees Celsius
3
2
1
0
-1
-2
N/A
1930 1931 1932 1933 1934 1935 1936 1937 1938 1939 1961 1962 1963 1964 1965 1966 1997 1998 1999
Drought Period Analysis Year

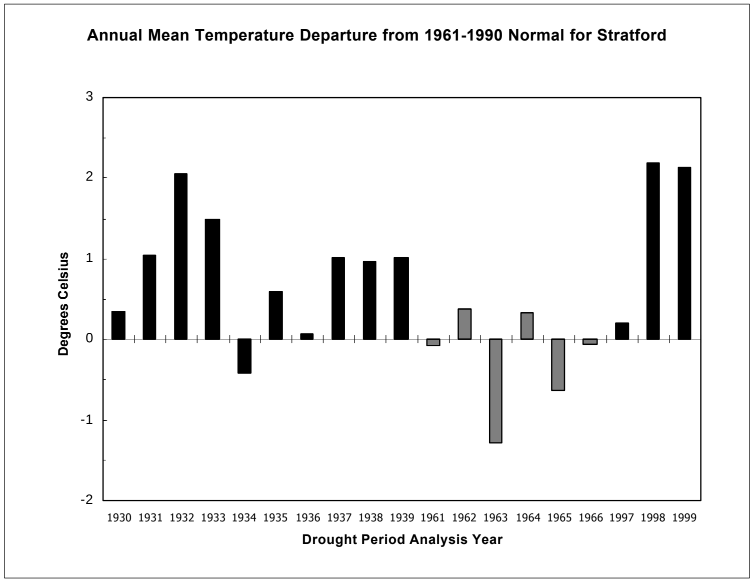

Annual Mean Temperature Departure from 1961-1990 Normal for Delhi/Simcoe
Degrees Celsius
3
2
1
0
-1
-2
N/A N/A
1930 1931 1932 1933 1934 1935 1936 1937 1938 1939 1961 1962 1963 1964 1965 1966 1997 1998 1999
Drought Period Analysis Year

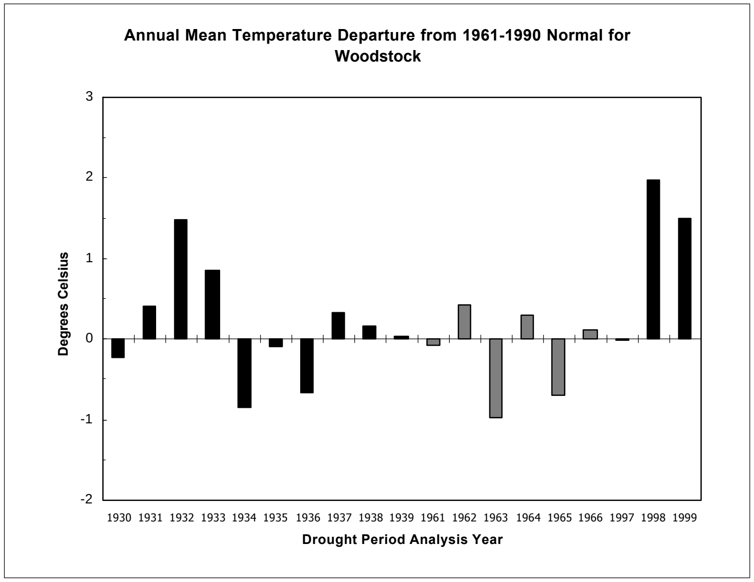

Annual Mean Temperature Departure from 1961-1990 Normal for Fergus Shand Dam
Degrees Celsius
3
2
1
0
-1
-2
N/A N/A
1961 1962 1963 1964 1965 1966 1997 1998 1999
Drought Period Analysis Year

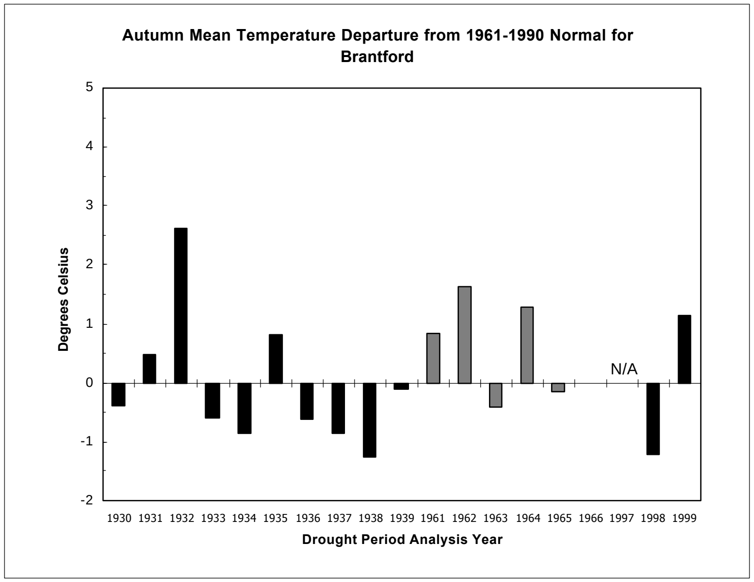

Annual Mean Temperature Departure from 1961-1990 Normal for Guelph
Degrees Celsius
3
2
1
0
-1
-2
N/A N/A N/A
1930 1931 1932 1933 1934 1935 1936 1937 1938 1939 1961 1962 1963 1964 1965 1966 1997 1998 1999
Drought Period Analysis Year

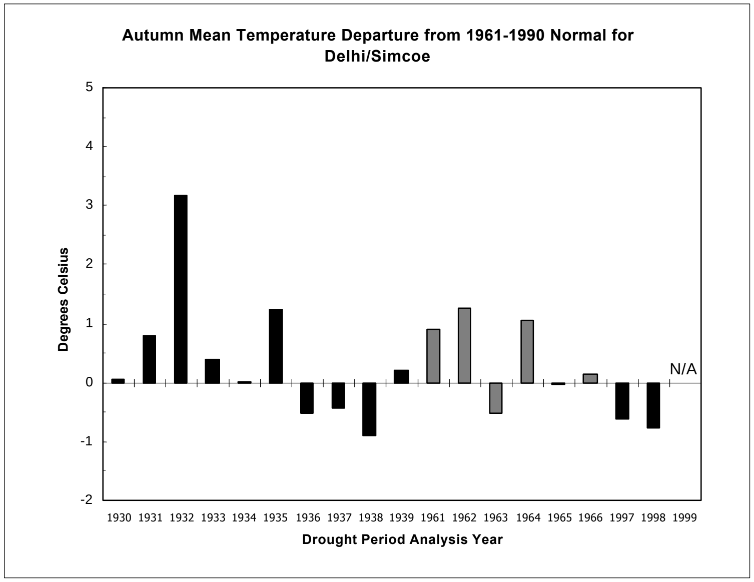

Annual Mean Temperature Departure from 1961-1990 Normal for Kitchener/Waterloo

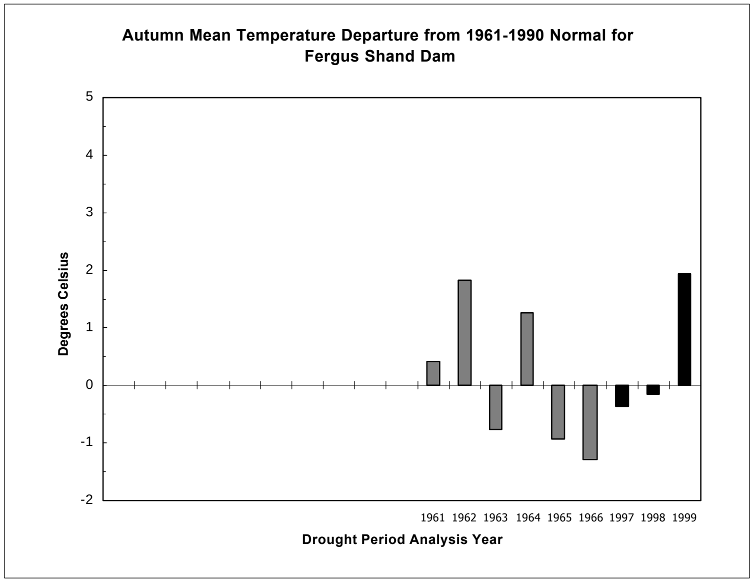

Annual Mean Temperature Departure from 1961-1990 Normal for Mt. Forest/Redickville

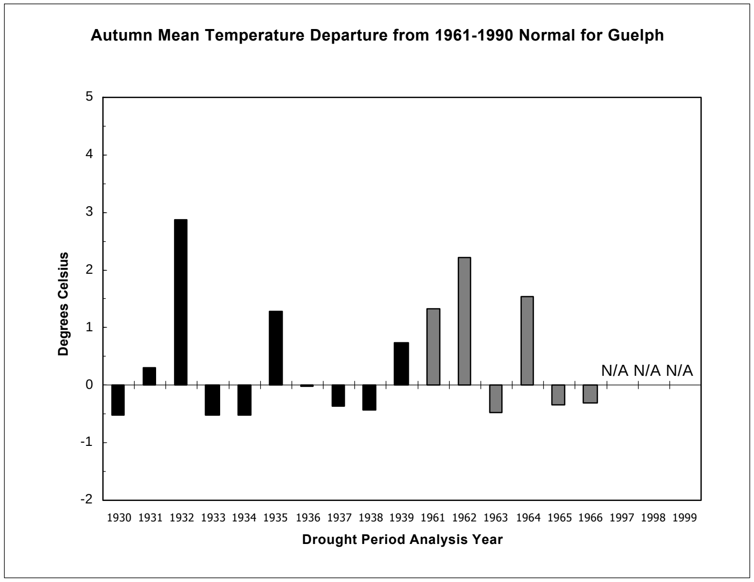

Annual Mean Temperature Departure from 1961-1990 Normal for Stratford

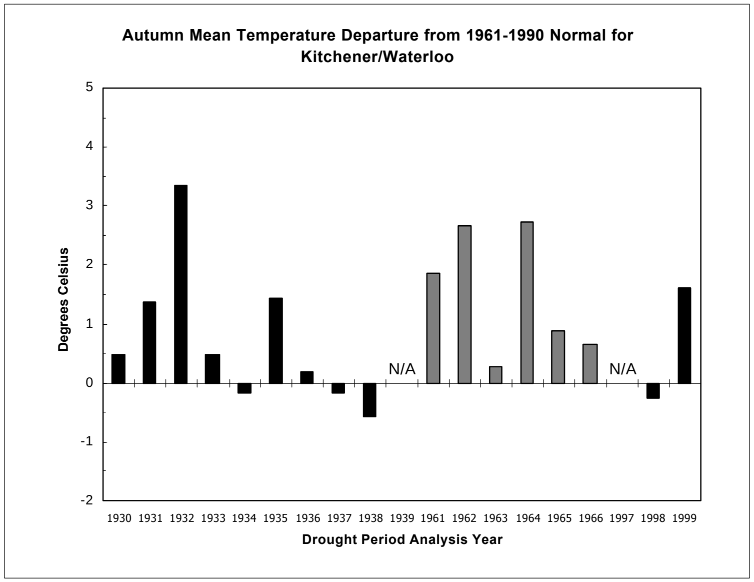

Annual Mean Temperature Departure from 1961-1990 Normal for Woodstock

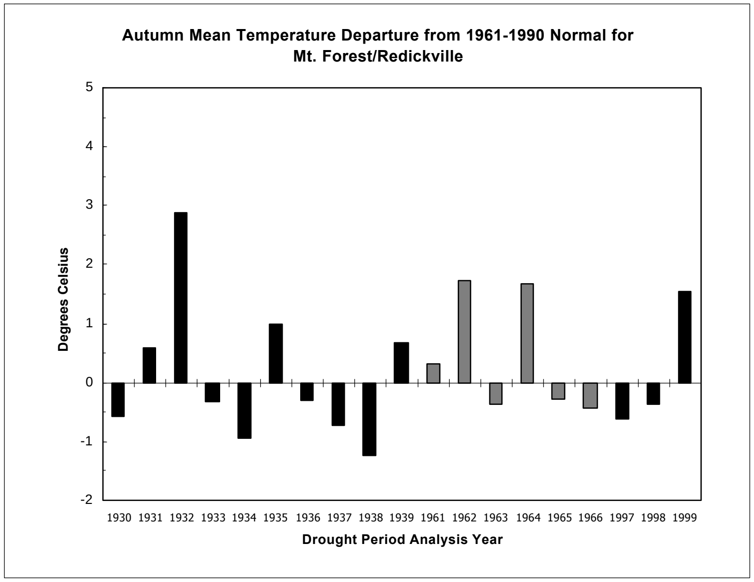

Autumn Mean Temperature Departure from 1961-1990 Normal for Brantford
Degrees Celsius
5
4
3
2
1
0
-1
-2
N/A
1930 1931 1932 1933 1934 1935 1936 1937 1938 1939 1961 1962 1963 1964 1965 1966 1997 1998 1999
Drought Period Analysis Year

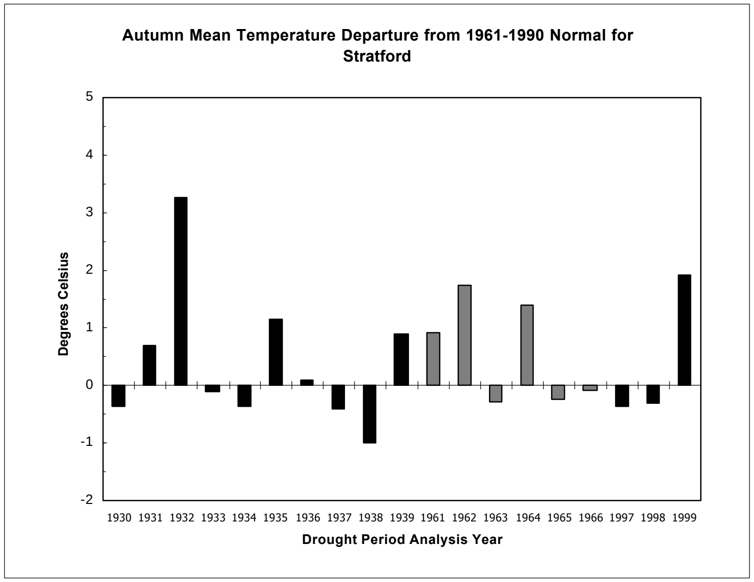

Autumn Mean Temperature Departure from 1961-1990 Normal for Delhi/Simcoe
Degrees Celsius
5
4
3
2
1
0
-1
-2
N/A
1930 1931 1932 1933 1934 1935 1936 1937 1938 1939 1961 1962 1963 1964 1965 1966 1997 1998 1999
Drought Period Analysis Year

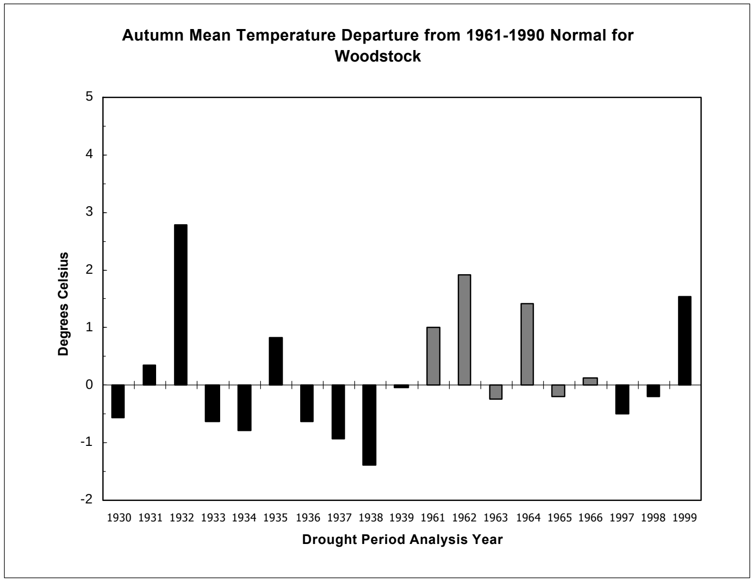

Autumn Mean Temperature Departure from 1961-1990 Normal for Fergus Shand Dam
Degrees Celsius
5
4
3
2
1
0
-1
-2
1961 1962 1963 1964 1965 1966 1997 1998 1999
Drought Period Analysis Year

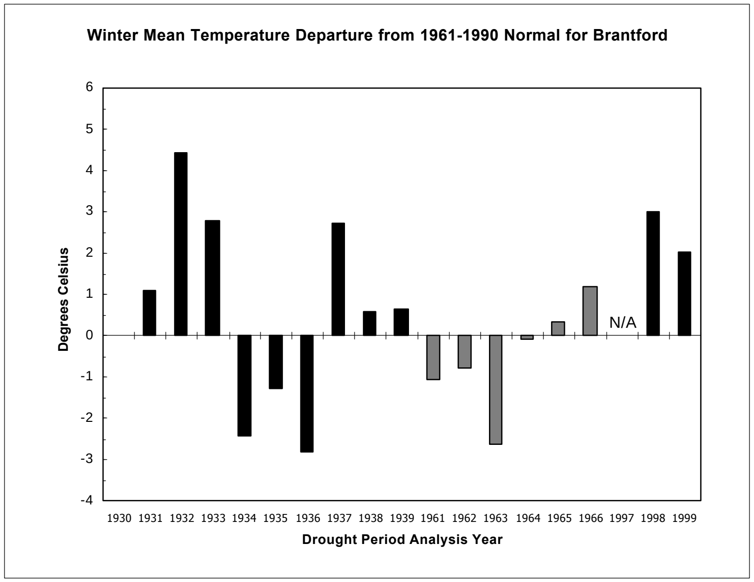

Autumn Mean Temperature Departure from 1961-1990 Normal for Guelph
Degrees Celsius
5
4
3
2
1
0
-1
-2
N/A N/A N/A
1930 1931 1932 1933 1934 1935 1936 1937 1938 1939 1961 1962 1963 1964 1965 1966 1997 1998 1999
Drought Period Analysis Year


Autumn Mean Temperature Departure from 1961-1990 Normal for Kitchener/Waterloo

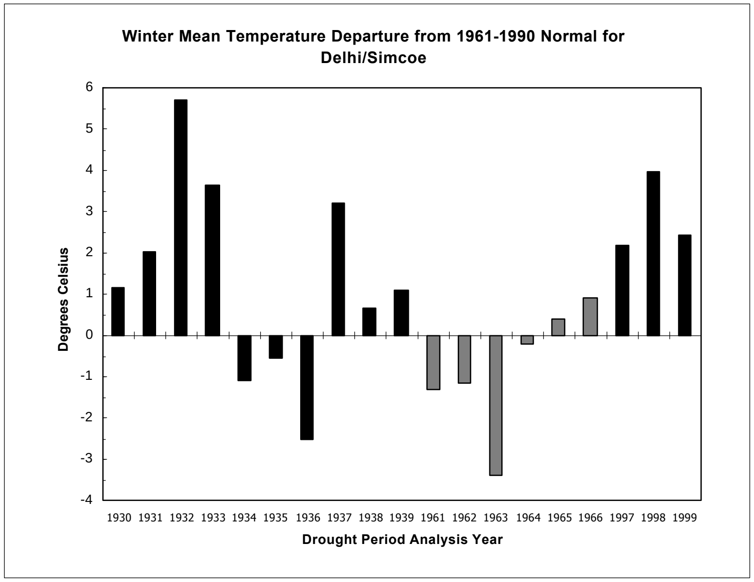

Autumn Mean Temperature Departure from 1961-1990 Normal for Mt. Forest/Redickville


Autumn Mean Temperature Departure from 1961-1990 Normal for Stratford

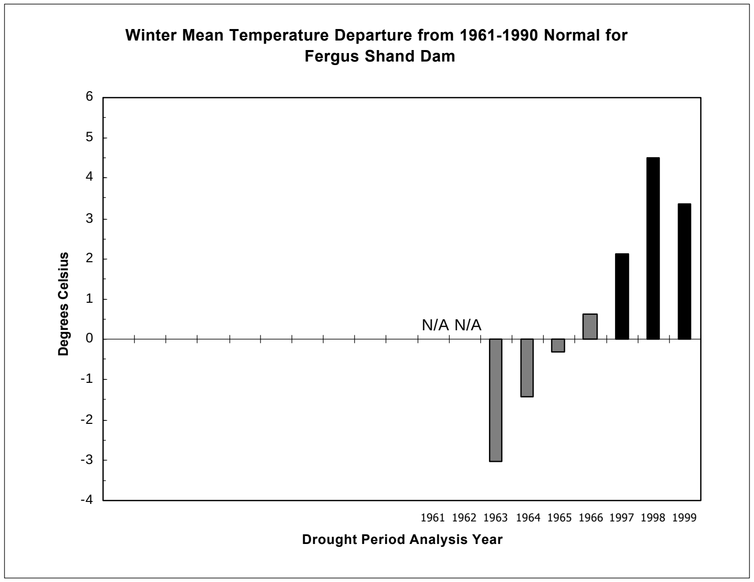

Autumn Mean Temperature Departure from 1961-1990 Normal for Woodstock



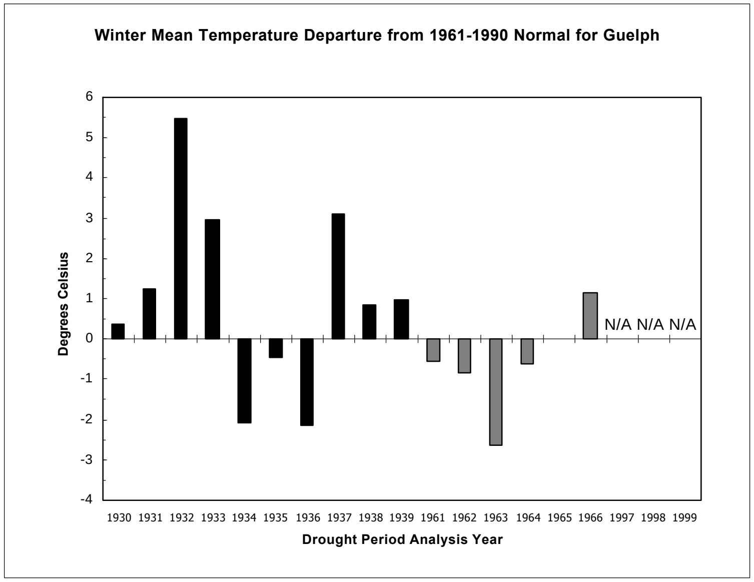
Winter Mean Temperature Departure from 1961-1990 Normal for Brantford



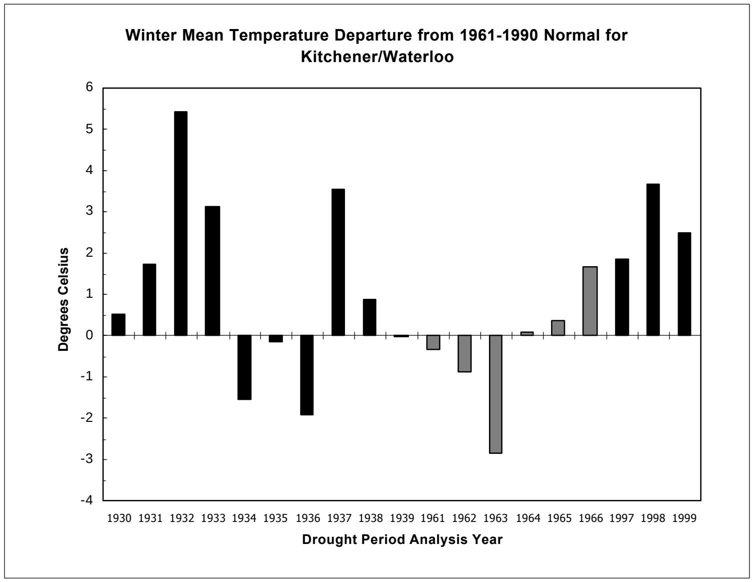
Winter Mean Temperature Departure from 1961-1990 Normal for Delhi/Simcoe

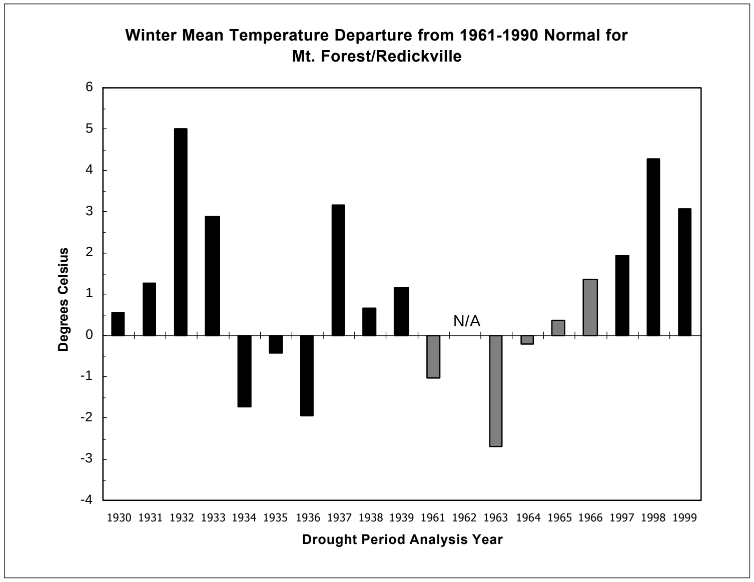


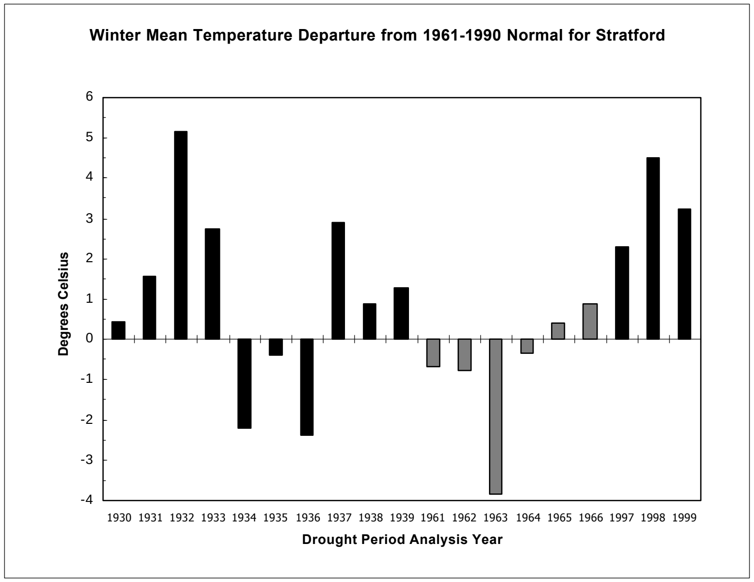
Winter Mean Temperature Departure from 1961-1990 Normal for Fergus Shand Dam

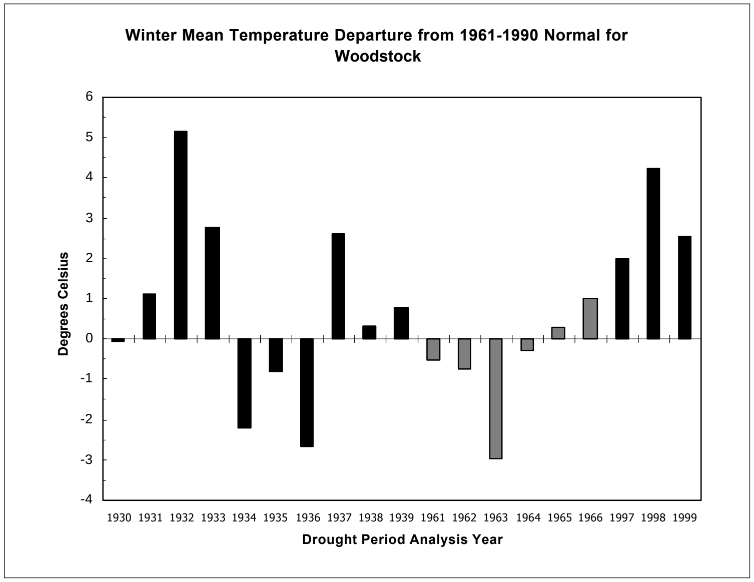


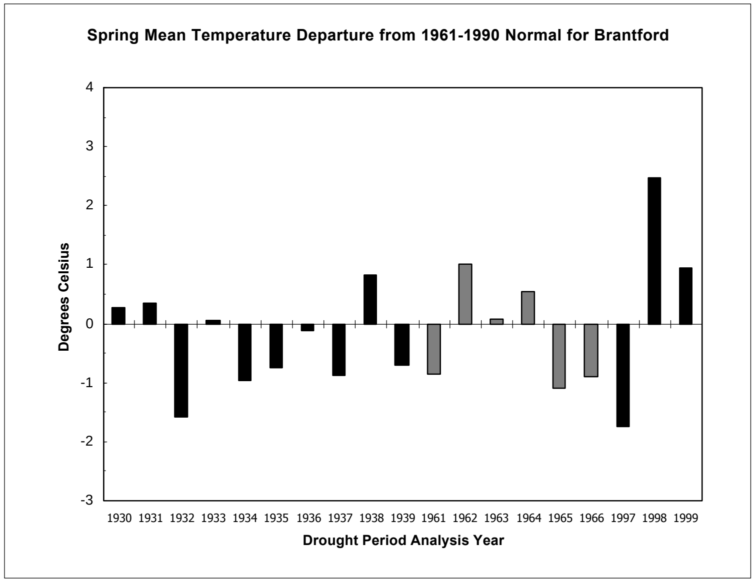
Winter Mean Temperature Departure from 1961-1990 Normal for Guelph

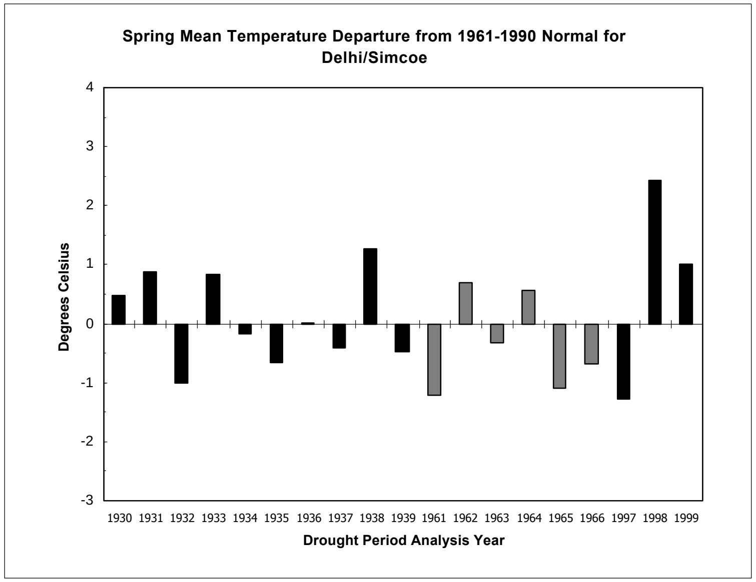

Winter Mean Temperature Departure from 1961-1990 Normal for Kitchener/Waterloo
Degrees Celsius
6
5
4
3
2
1
0
-1
-2
-3
-4
1930 1931 1932 1933 1934 1935 1936 1937 1938 1939 1961 1962 1963 1964 1965 1966 1997 1998 1999
Drought Period Analysis Year

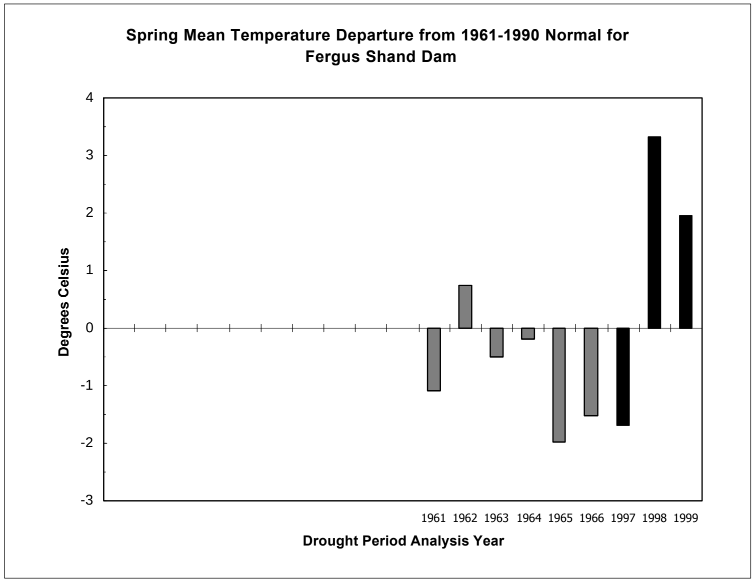

Winter Mean Temperature Departure from 1961-1990 Normal for Mt. Forest/Redickville
Degrees Celsius
6
5
4
3
2
1
0
-1
-2
-3
-4
N/A
1930 1931 1932 1933 1934 1935 1936 1937 1938 1939 1961 1962 1963 1964 1965 1966 1997 1998 1999
Drought Period Analysis Year

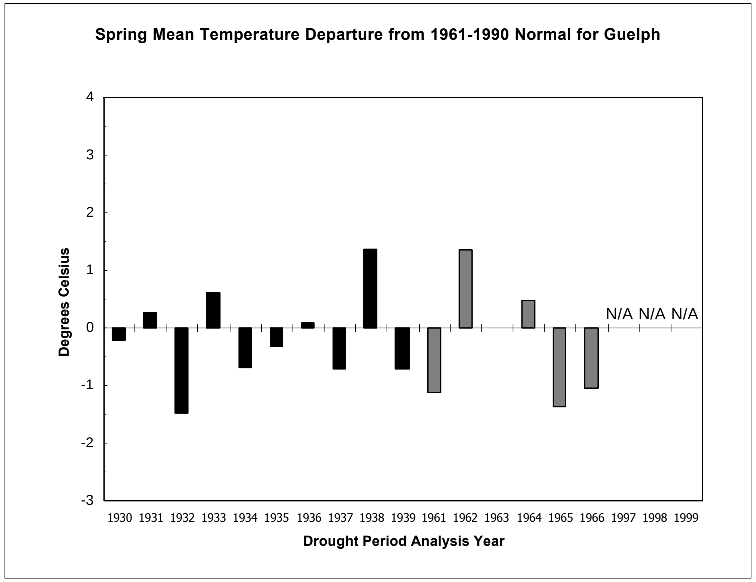

Winter Mean Temperature Departure from 1961-1990 Normal for Stratford
Degrees Celsius
6
5
4
3
2
1
0
-1
-2
-3
-4
1930 1931 1932 1933 1934 1935 1936 1937 1938 1939 1961 1962 1963 1964 1965 1966 1997 1998 1999
Drought Period Analysis Year

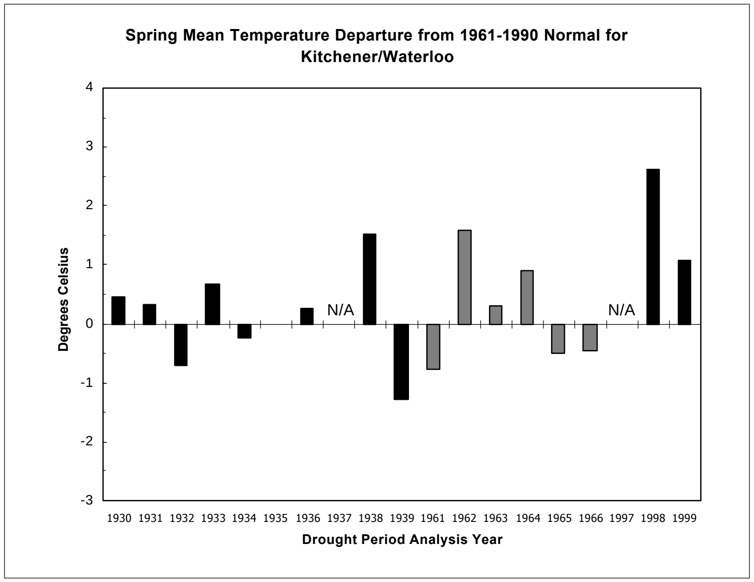

Winter Mean Temperature Departure from 1961-1990 Normal for Woodstock
Degrees Celsius
6
5
4
3
2
1
0
-1
-2
-3
-4
1930 1931 1932 1933 1934 1935 1936 1937 1938 1939 1961 1962 1963 1964 1965 1966 1997 1998 1999
Drought Period Analysis Year


Spring Mean Temperature Departure from 1961-1990 Normal for Brantford

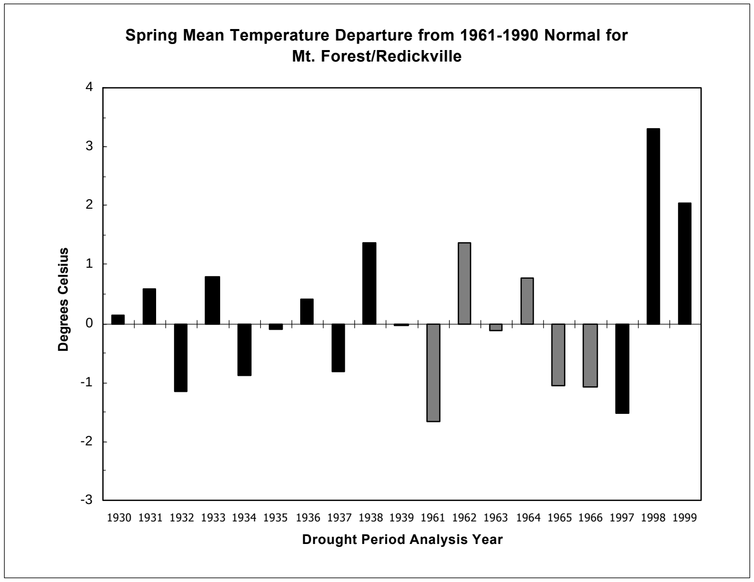

Spring Mean Temperature Departure from 1961-1990 Normal for Delhi/Simcoe


Spring Mean Temperature Departure from 1961-1990 Normal for Fergus Shand Dam

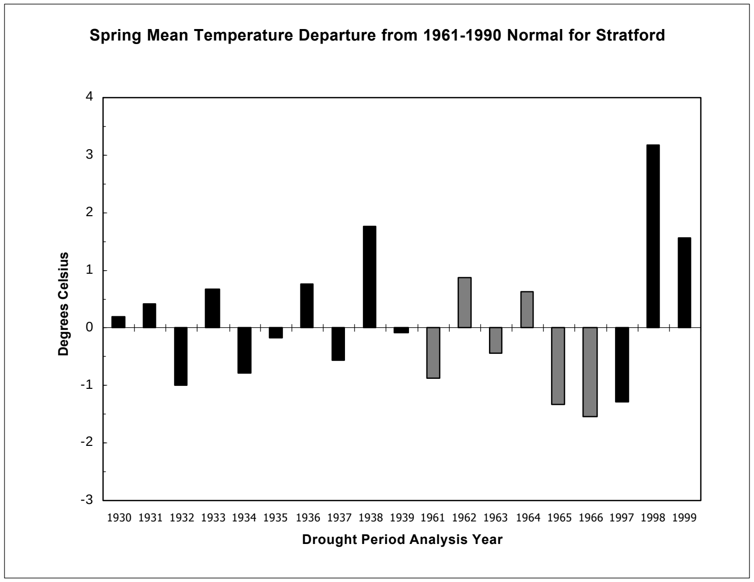

Spring Mean Temperature Departure from 1961-1990 Normal for Guelph



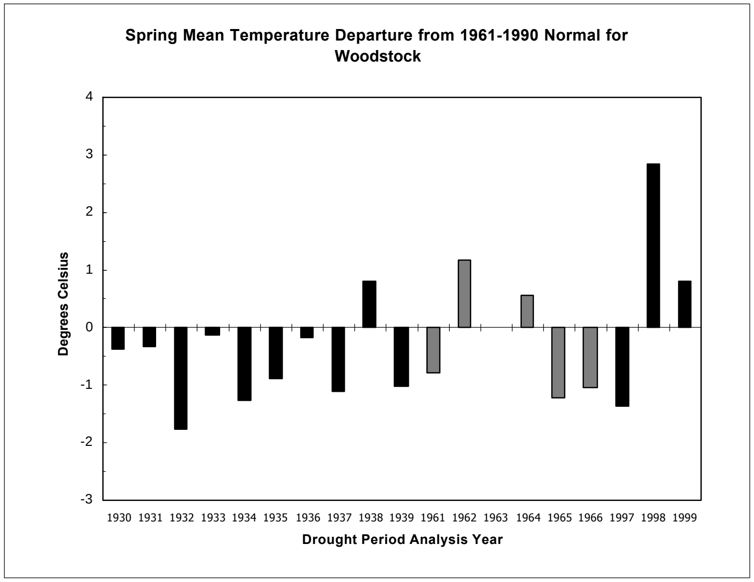
Spring Mean Temperature Departure from 1961-1990 Normal for Kitchener/Waterloo



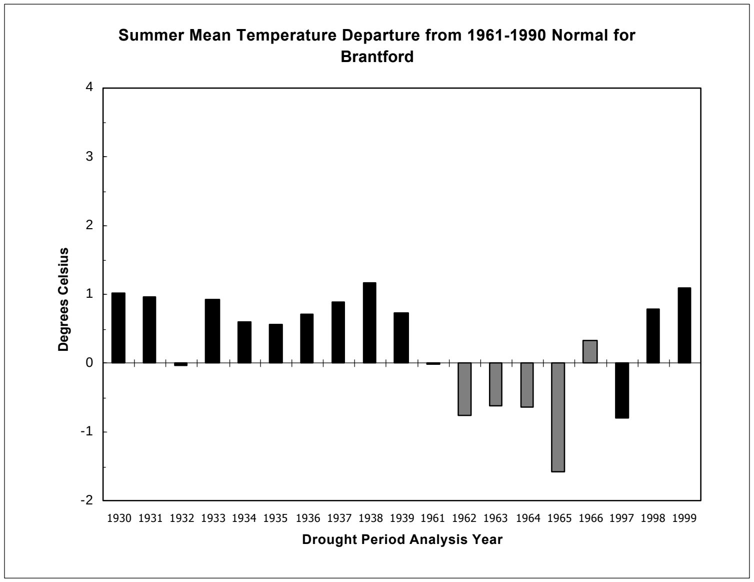
Spring Mean Temperature Departure from 1961-1990 Normal for Mt. Forest/Redickville

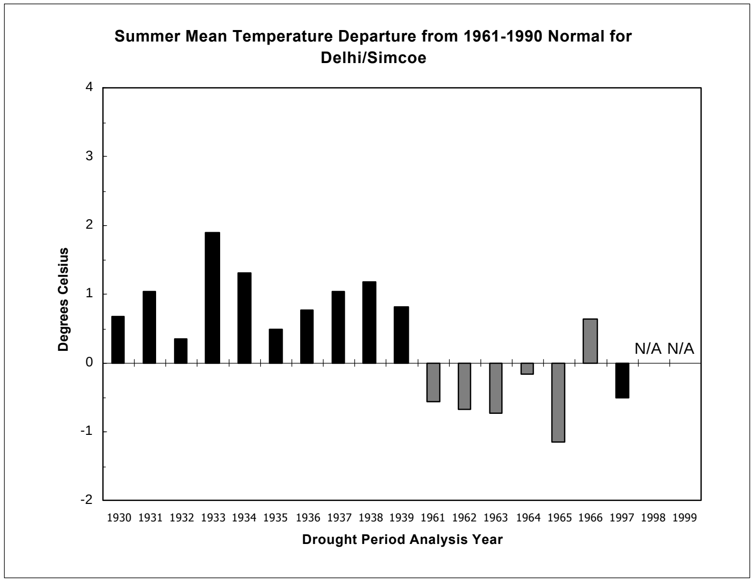


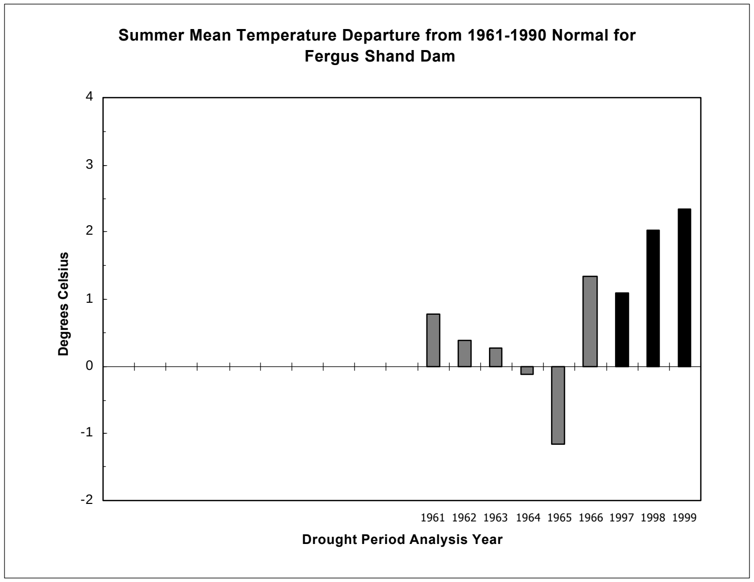
Spring Mean Temperature Departure from 1961-1990 Normal for Stratford

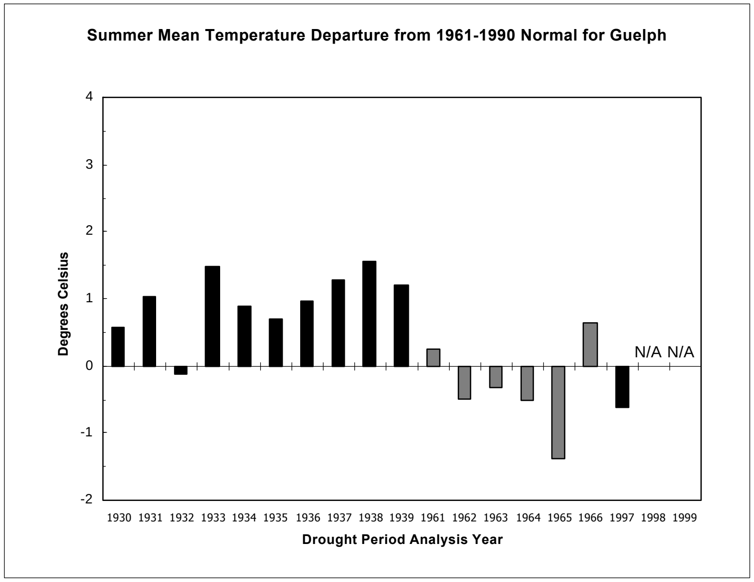


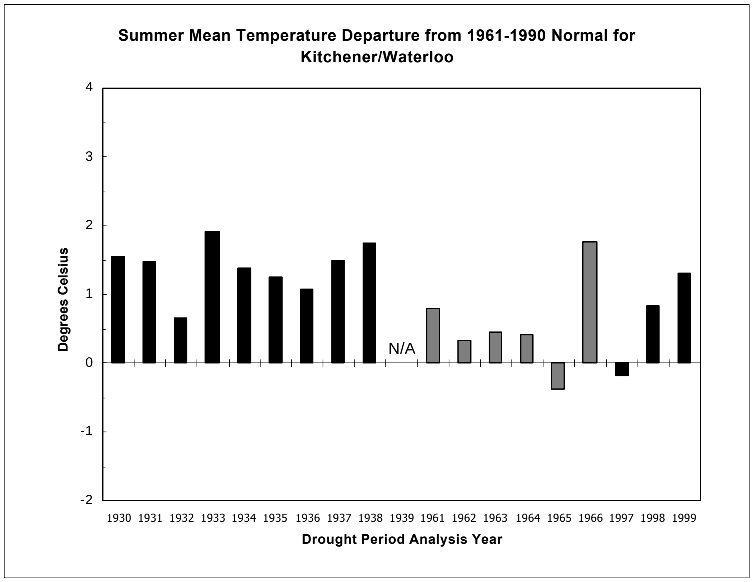
Spring Mean Temperature Departure from 1961-1990 Normal for Woodstock

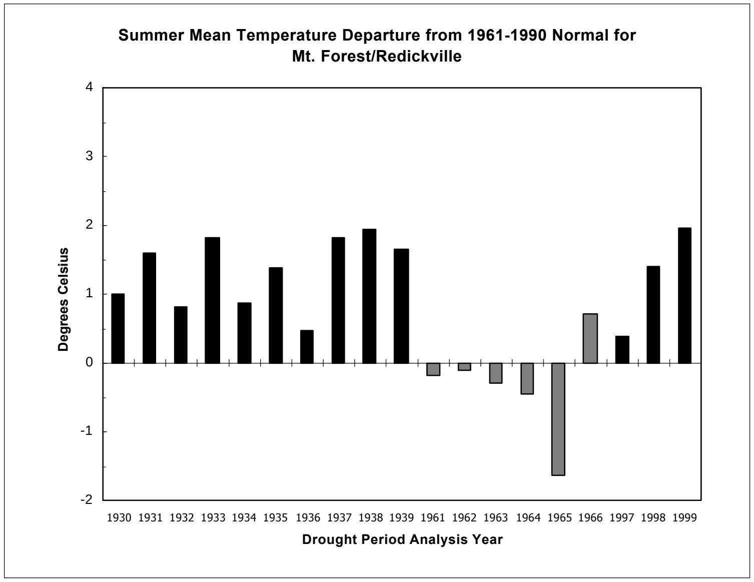

Summer Mean Temperature Departure from 1961-1990 Normal for Brantford
Degrees Celsius
4
3
2
1
0
-1
-2
1930 1931 1932 1933 1934 1935 1936 1937 1938 1939 1961 1962 1963 1964 1965 1966 1997 1998 1999
Drought Period Analysis Year

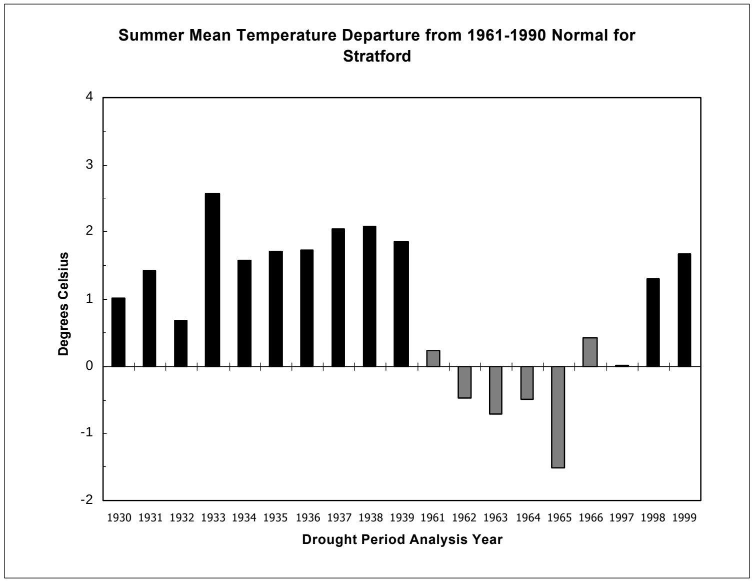

Summer Mean Temperature Departure from 1961-1990 Normal for Delhi/Simcoe
Degrees Celsius
4
3
2
1
0
-1
-2
N/A N/A
1930 1931 1932 1933 1934 1935 1936 1937 1938 1939 1961 1962 1963 1964 1965 1966 1997 1998 1999
Drought Period Analysis Year

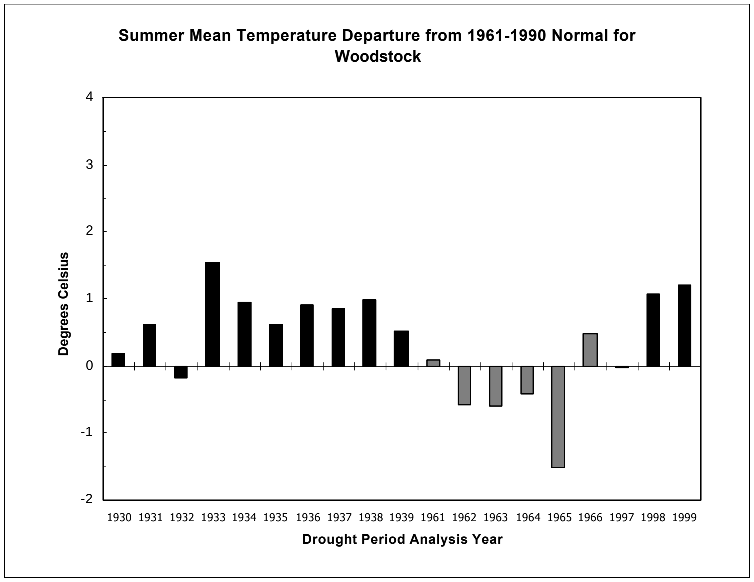

Summer Mean Temperature Departure from 1961-1990 Normal for Fergus Shand Dam
Degrees Celsius
4
3
2
1
0
-1
-2
1961 1962 1963 1964 1965 1966 1997 1998 1999
Drought Period Analysis Year

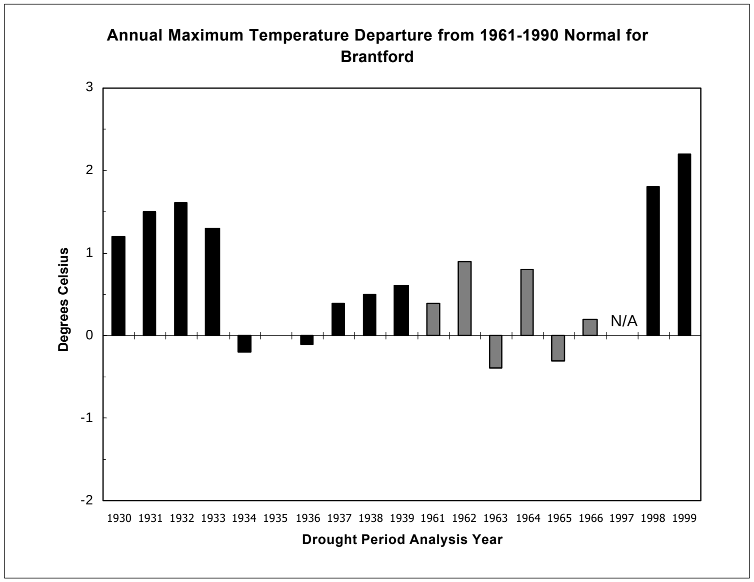

Summer Mean Temperature Departure from 1961-1990 Normal for Guelph
Degrees Celsius
4
3
2
1
0
-1
-2
N/A N/A
1930 1931 1932 1933 1934 1935 1936 1937 1938 1939 1961 1962 1963 1964 1965 1966 1997 1998 1999
Drought Period Analysis Year

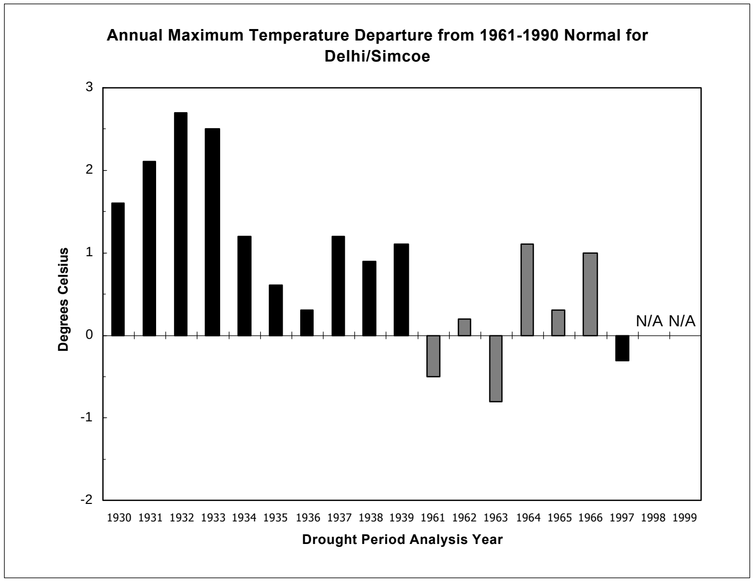

Summer Mean Temperature Departure from 1961-1990 Normal for Kitchener/Waterloo

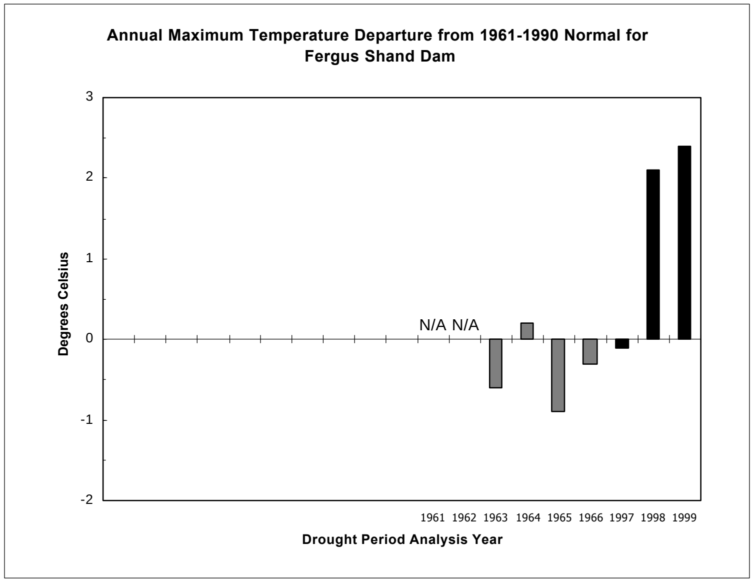

Summer Mean Temperature Departure from 1961-1990 Normal for Mt. Forest/Redickville

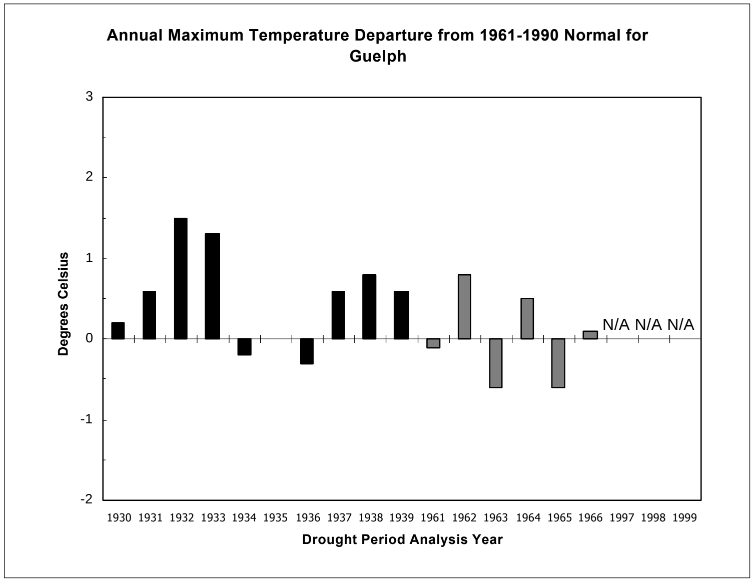

Summer Mean Temperature Departure from 1961-1990 Normal for Stratford

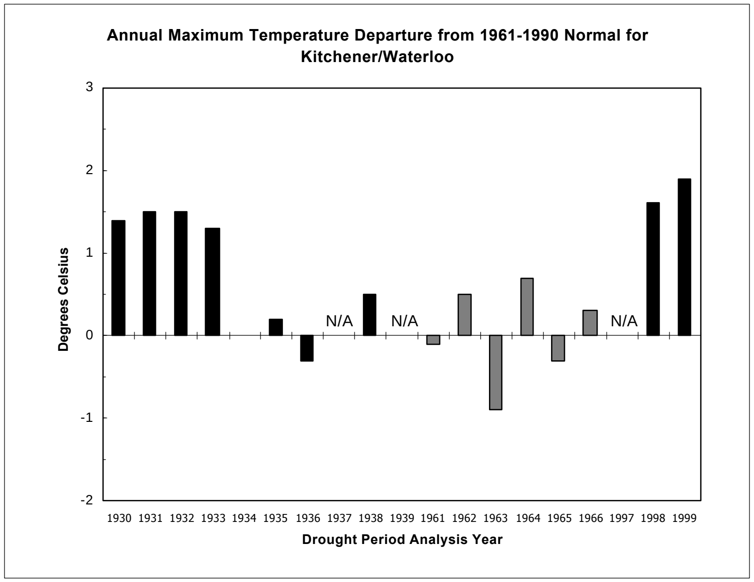

Summer Mean Temperature Departure from 1961-1990 Normal for Woodstock


Annual Maximum Temperature Departure from 1961-1990 Normal for Brantford
3
2
1
0
-1
-2
Degrees Celsius
N/A
1930 1931 1932 1933 1934 1935 1936 1937 1938 1939 1961 1962 1963 1964 1965 1966 1997 1998 1999
Drought Period Analysis Year

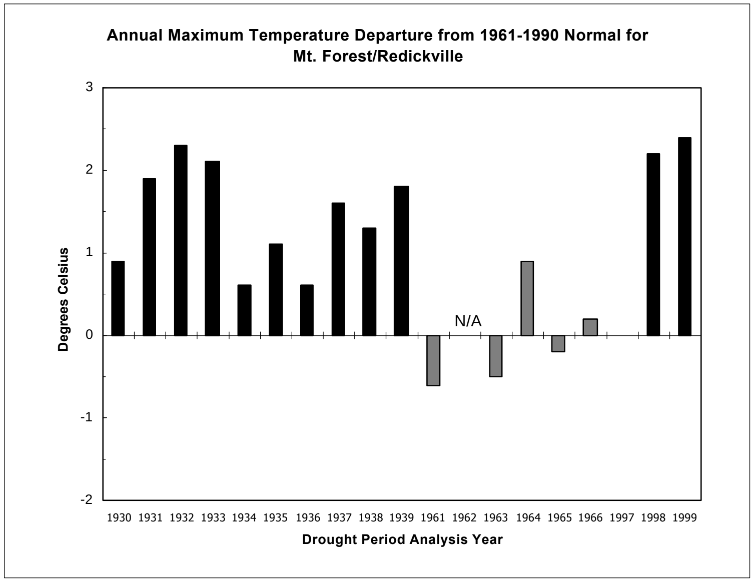

Annual Maximum Temperature Departure from 1961-1990 Normal for Delhi/Simcoe
3
2
1
0
-1
-2
Degrees Celsius
N/A N/A
1930 1931 1932 1933 1934 1935 1936 1937 1938 1939 1961 1962 1963 1964 1965 1966 1997 1998 1999
Drought Period Analysis Year


Annual Maximum Temperature Departure from 1961-1990 Normal for Fergus Shand Dam
3
2
1
0
-1
-2
Degrees Celsius
N/A N/A
1961 1962 1963 1964 1965 1966 1997 1998 1999
Drought Period Analysis Year

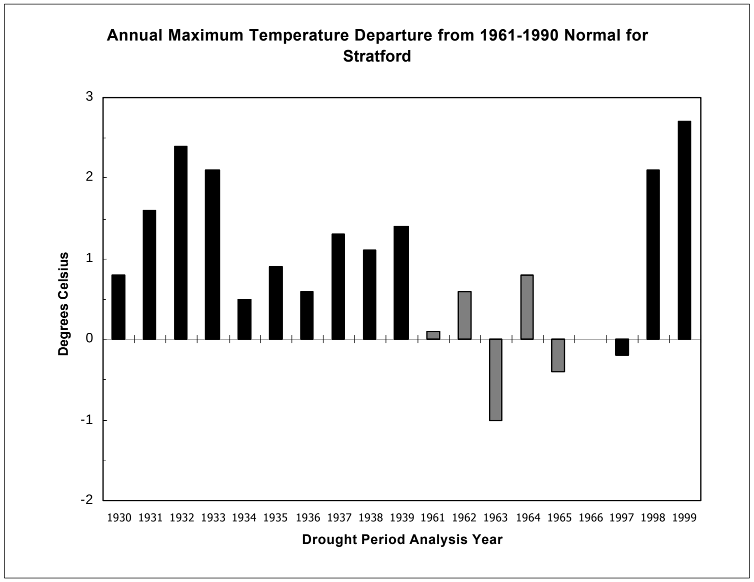

Annual Maximum Temperature Departure from 1961-1990 Normal for Guelph
3
2
1
0
-1
-2
Degrees Celsius
N/A N/A N/A
1930 1931 1932 1933 1934 1935 1936 1937 1938 1939 1961 1962 1963 1964 1965 1966 1997 1998 1999
Drought Period Analysis Year



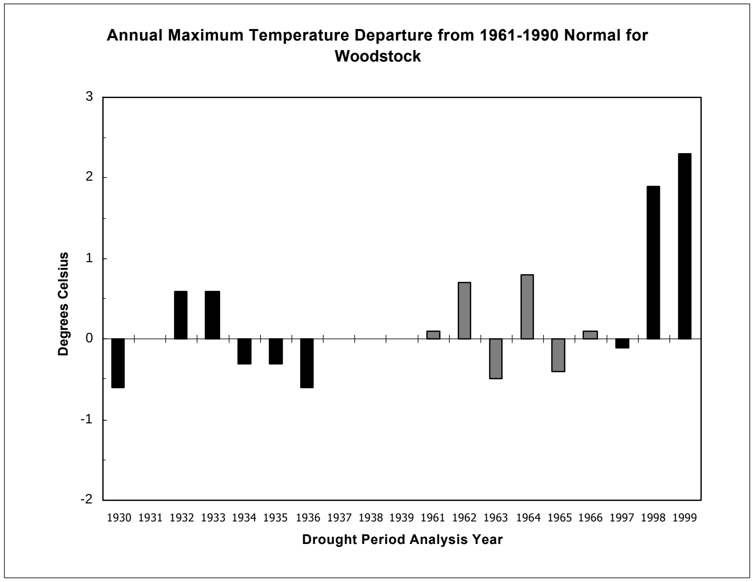
Annual Maximum Temperature Departure from 1961-1990 Normal for Kitchener/Waterloo



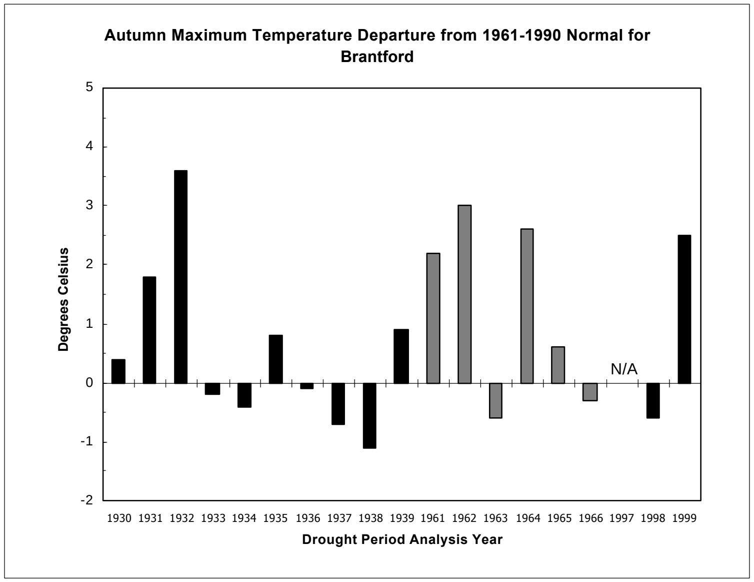
Annual Maximum Temperature Departure from 1961-1990 Normal for Mt. Forest/Redickville

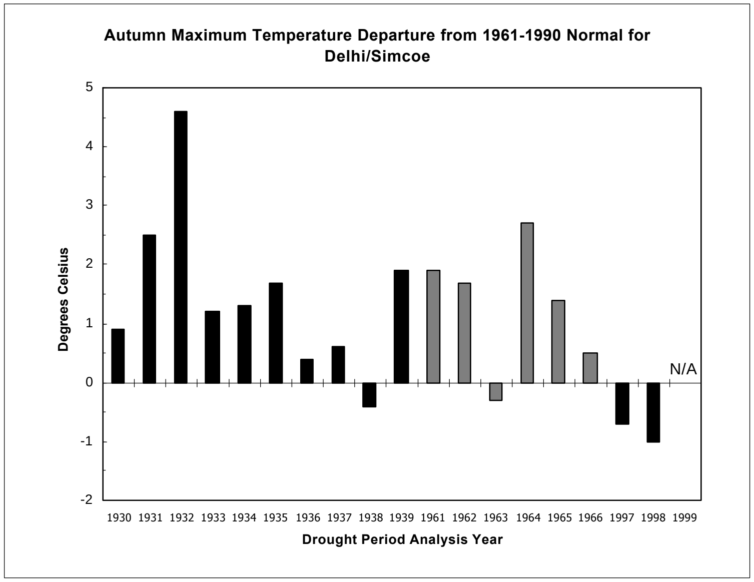


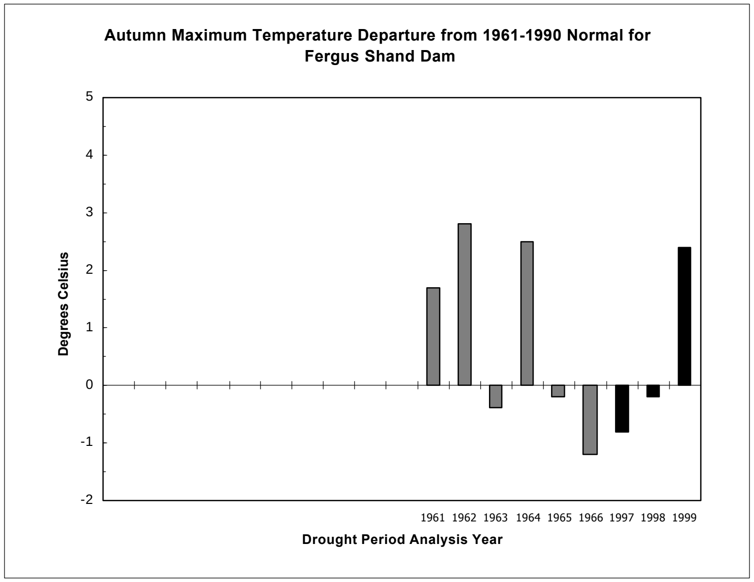
Annual Maximum Temperature Departure from 1961-1990 Normal for Stratford

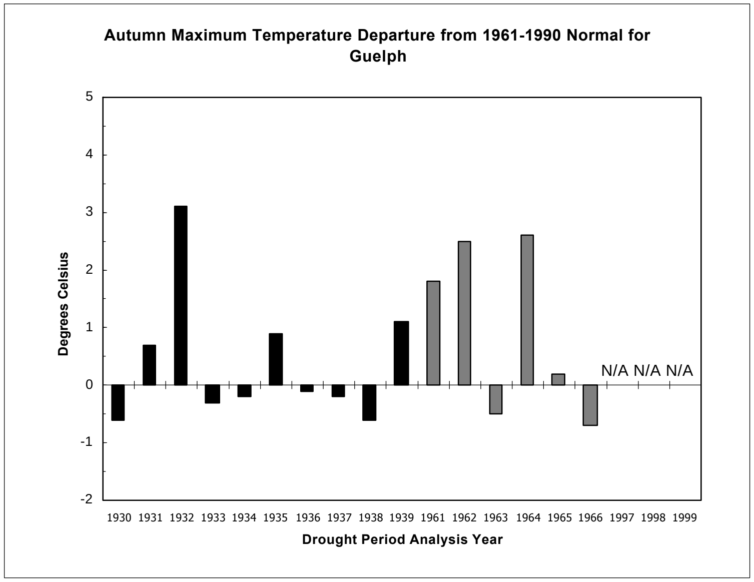


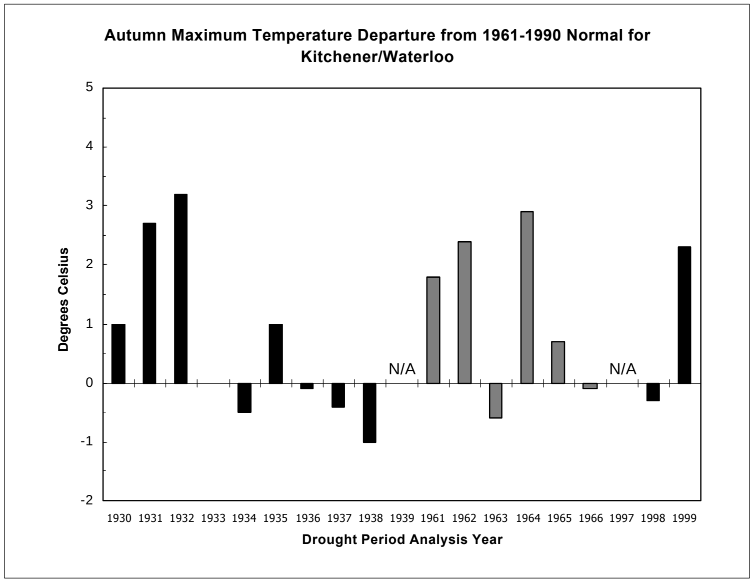
Annual Maximum Temperature Departure from 1961-1990 Normal for Woodstock


Autumn Maximum Temperature Departure from 1961-1990 Normal for Brantford

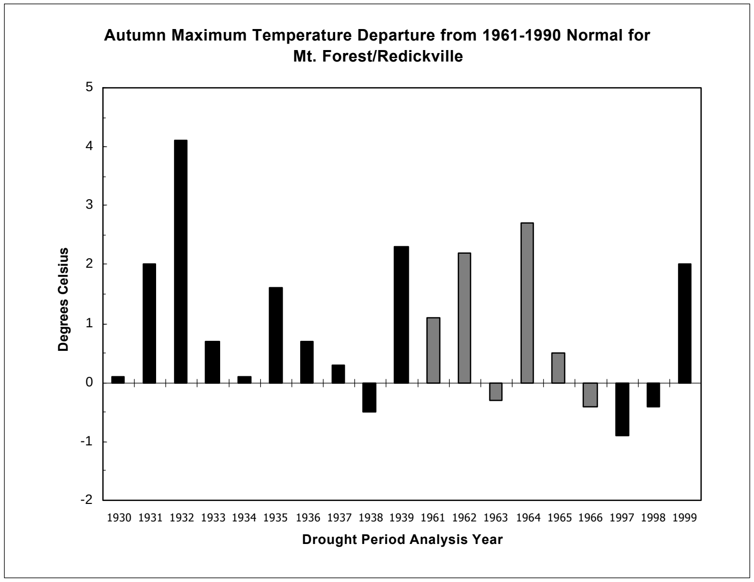

Autumn Maximum Temperature Departure from 1961-1990 Normal for Delhi/Simcoe


Autumn Maximum Temperature Departure from 1961-1990 Normal for Fergus Shand Dam

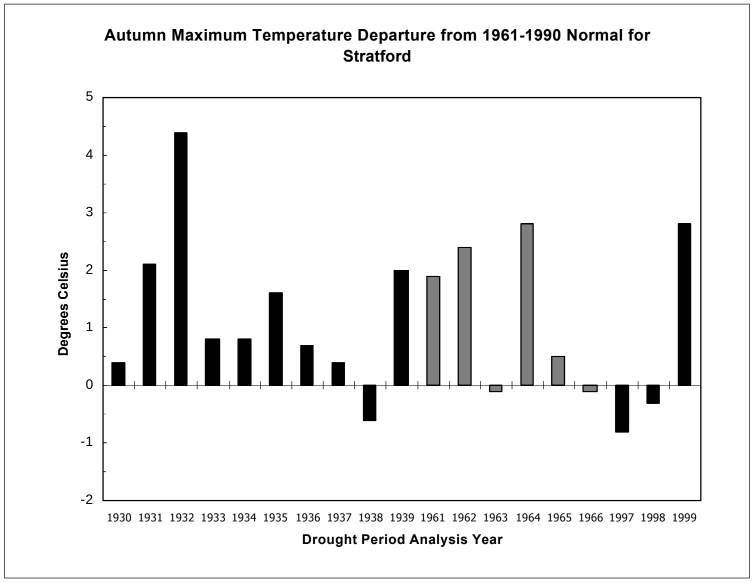

Autumn Maximum Temperature Departure from 1961-1990 Normal for Guelph



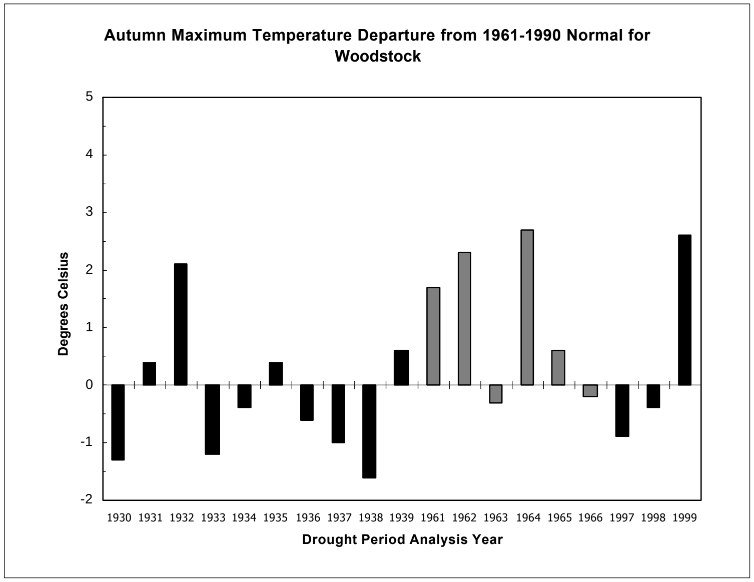
Autumn Maximum Temperature Departure from 1961-1990 Normal for Kitchener/Waterloo



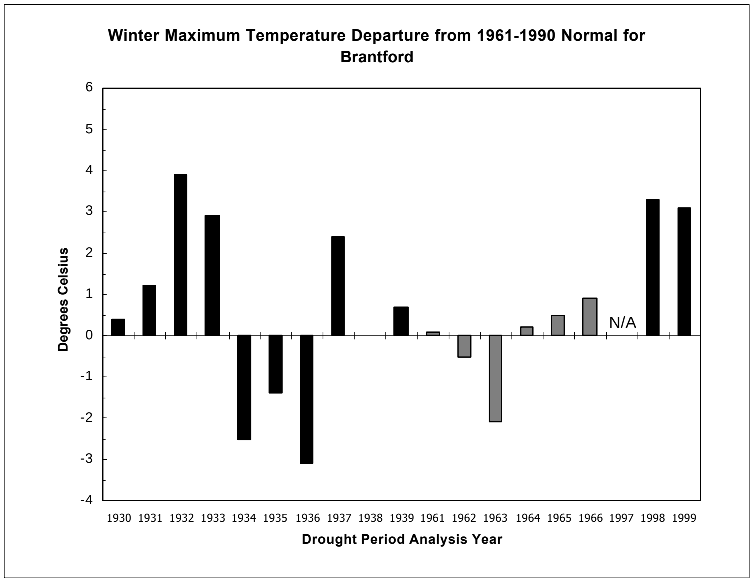
Autumn Maximum Temperature Departure from 1961-1990 Normal for Mt. Forest/Redickville



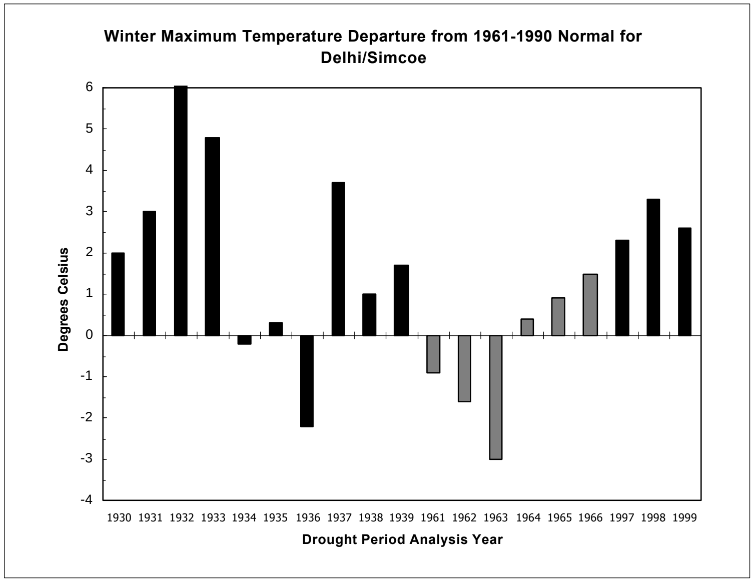
Autumn Maximum Temperature Departure from 1961-1990 Normal for Stratford



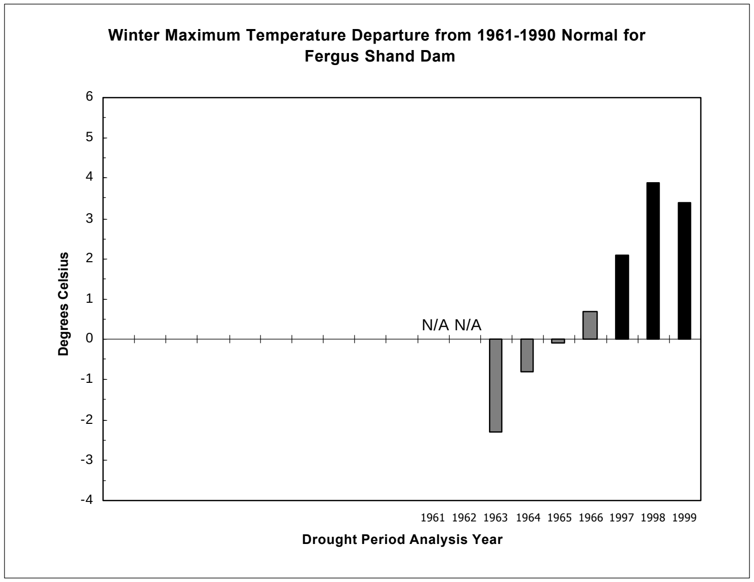
Autumn Maximum Temperature Departure from 1961-1990 Normal for Woodstock



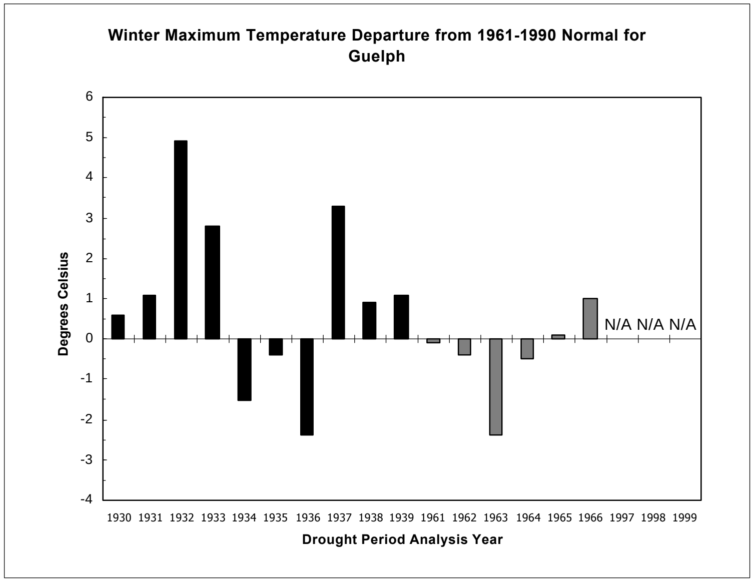
Winter Maximum Temperature Departure from 1961-1990 Normal for Brantford



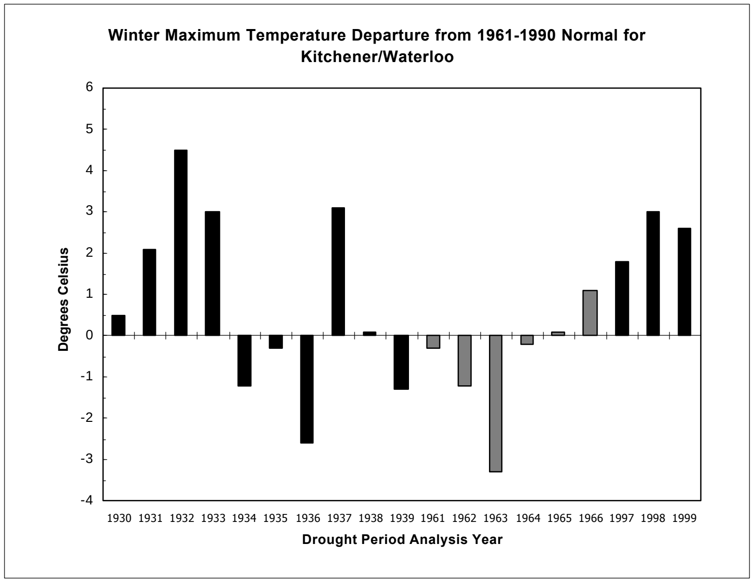
Winter Maximum Temperature Departure from 1961-1990 Normal for Delhi/Simcoe

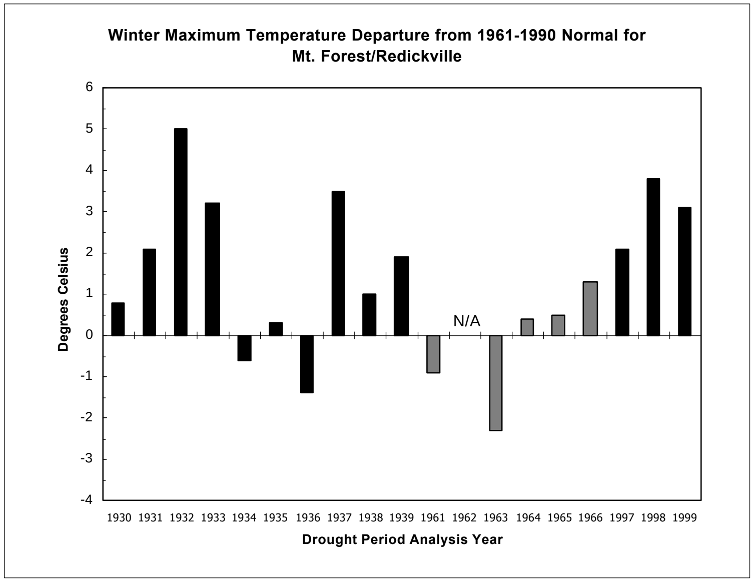


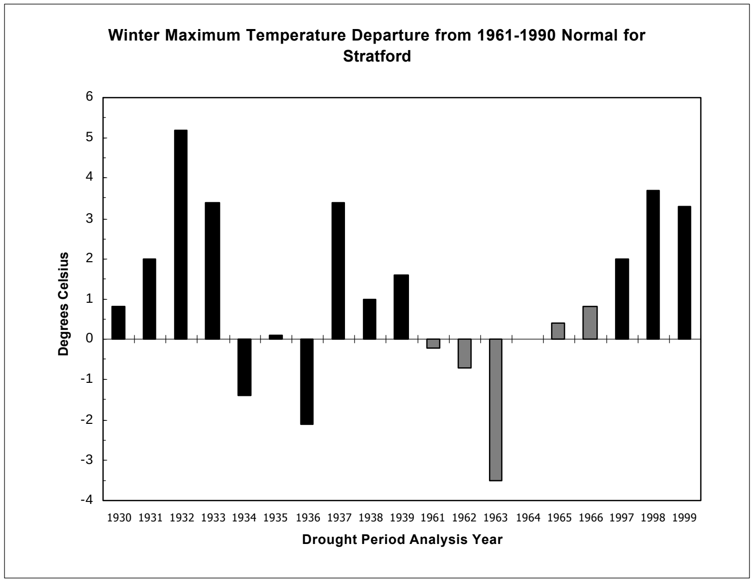
Winter Maximum Temperature Departure from 1961-1990 Normal for Fergus Shand Dam

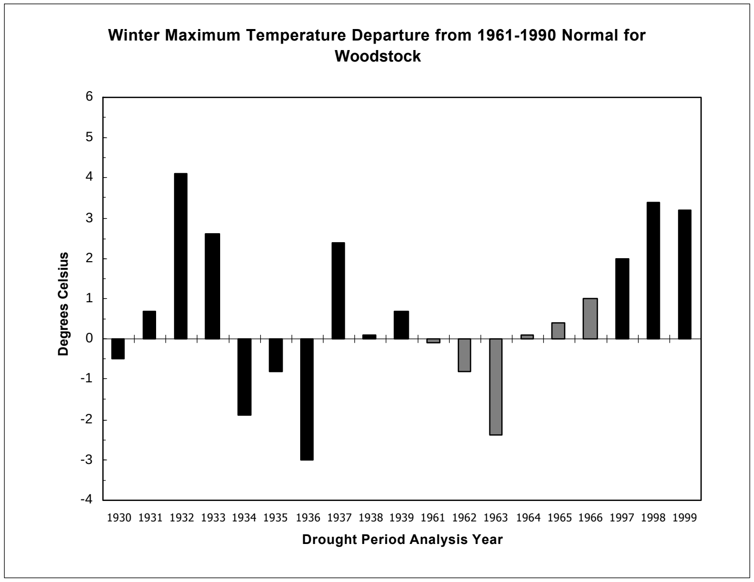


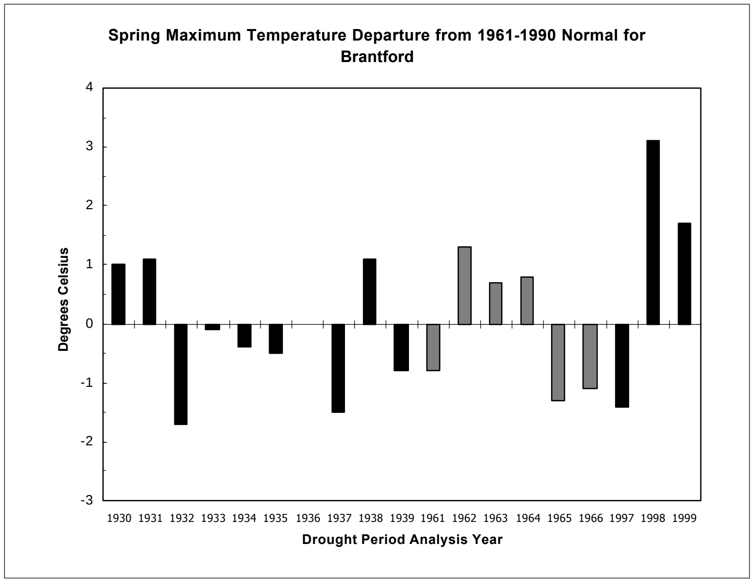
Winter Maximum Temperature Departure from 1961-1990 Normal for Guelph

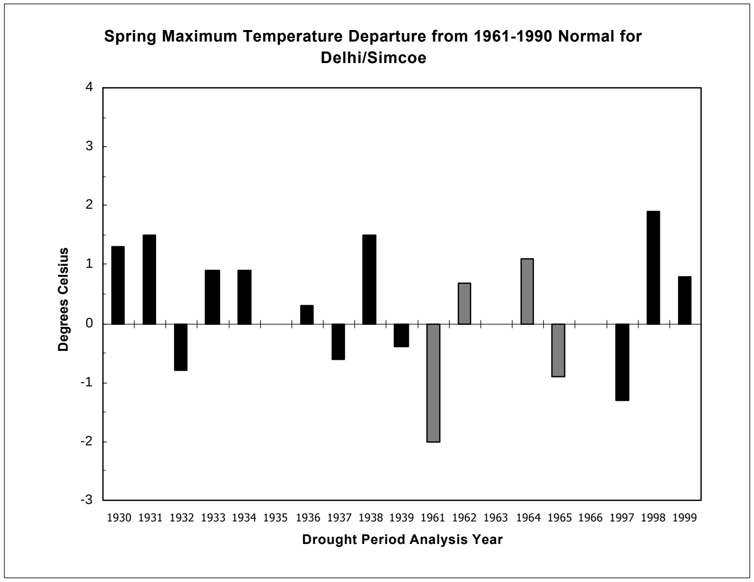

Winter Maximum Temperature Departure from 1961-1990 Normal for Kitchener/Waterloo

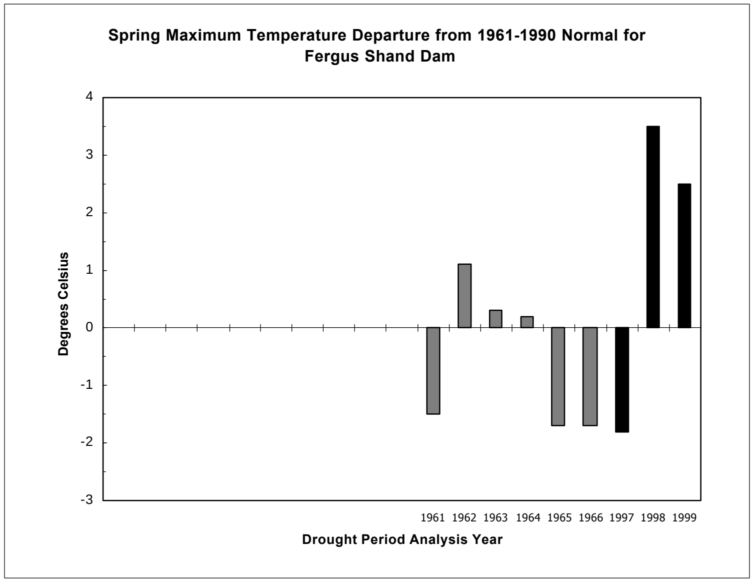

Winter Maximum Temperature Departure from 1961-1990 Normal for Mt. Forest/Redickville

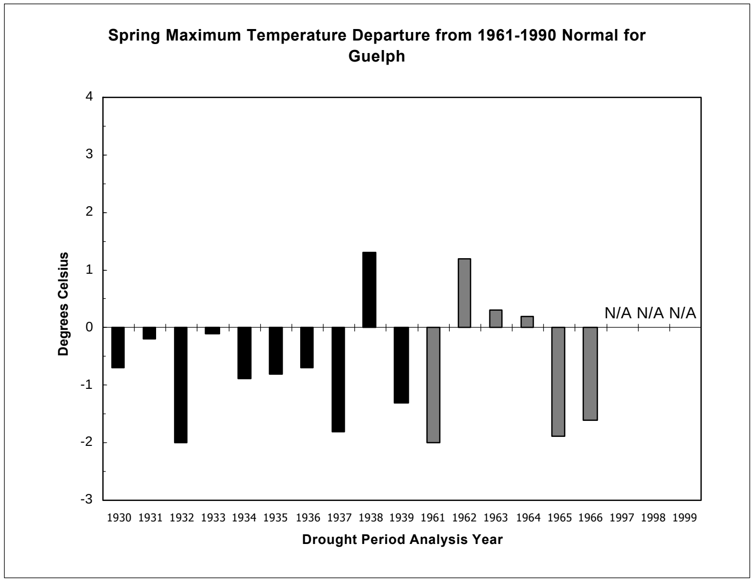

Winter Maximum Temperature Departure from 1961-1990 Normal for Stratford

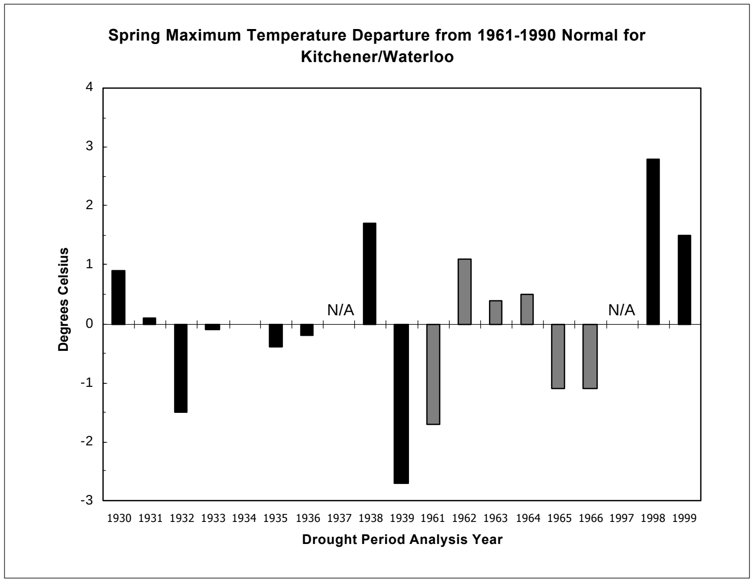

Winter Maximum Temperature Departure from 1961-1990 Normal for Woodstock

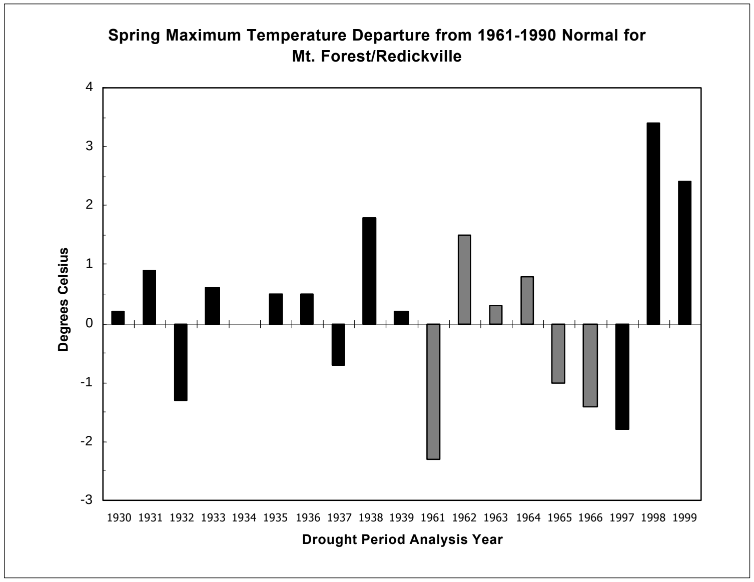

Spring Maximum Temperature Departure from 1961-1990 Normal for Brantford

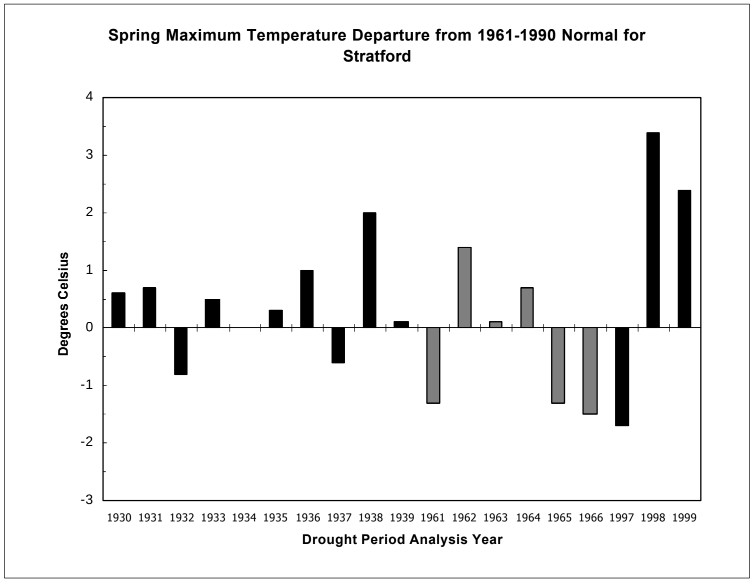

Spring Maximum Temperature Departure from 1961-1990 Normal for Delhi/Simcoe

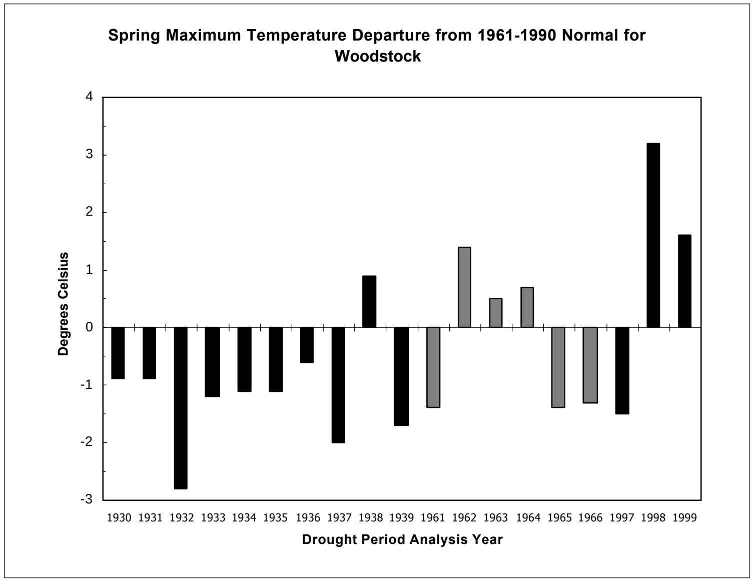

Spring Maximum Temperature Departure from 1961-1990 Normal for Fergus Shand Dam

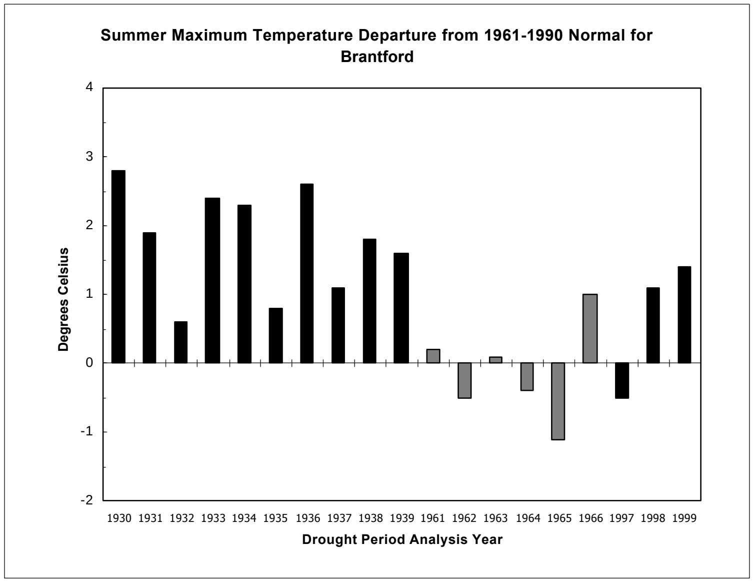

Spring Maximum Temperature Departure from 1961-1990 Normal for Guelph


Spring Maximum Temperature Departure from 1961-1990 Normal for Kitchener/Waterloo

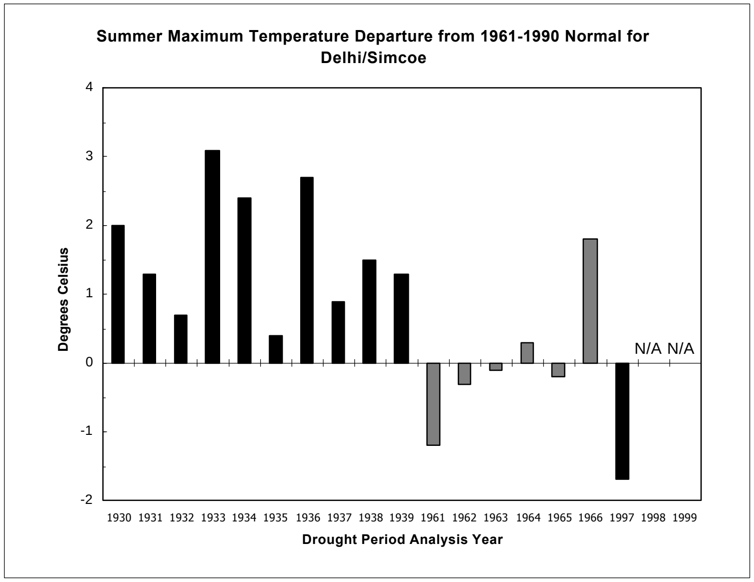

Spring Maximum Temperature Departure from 1961-1990 Normal for Mt. Forest/Redickville


Spring Maximum Temperature Departure from 1961-1990 Normal for Stratford

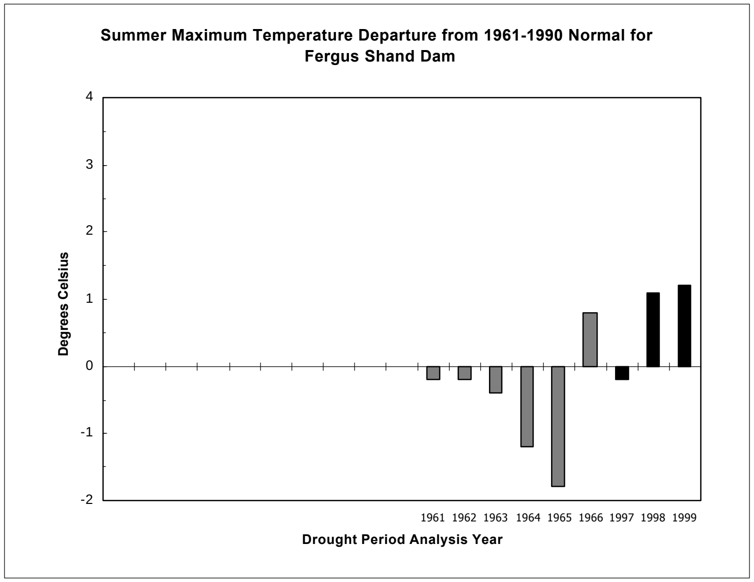

Spring Maximum Temperature Departure from 1961-1990 Normal for Woodstock



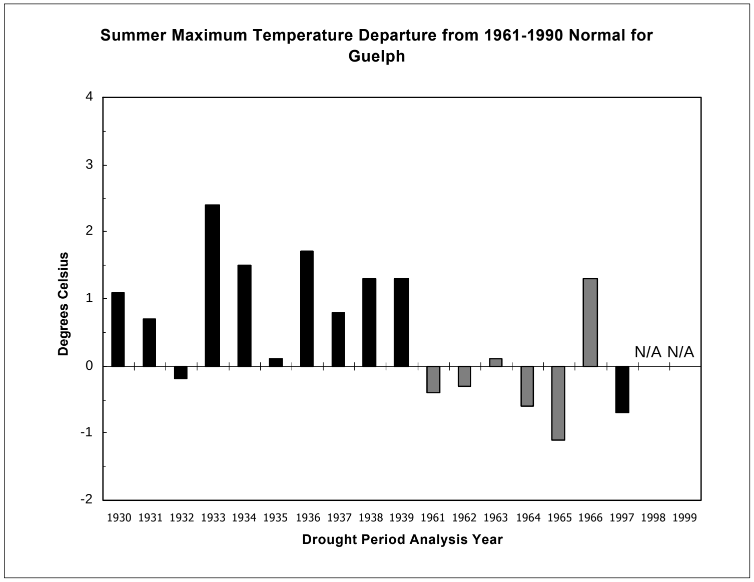
Summer Maximum Temperature Departure from 1961-1990 Normal for Brantford



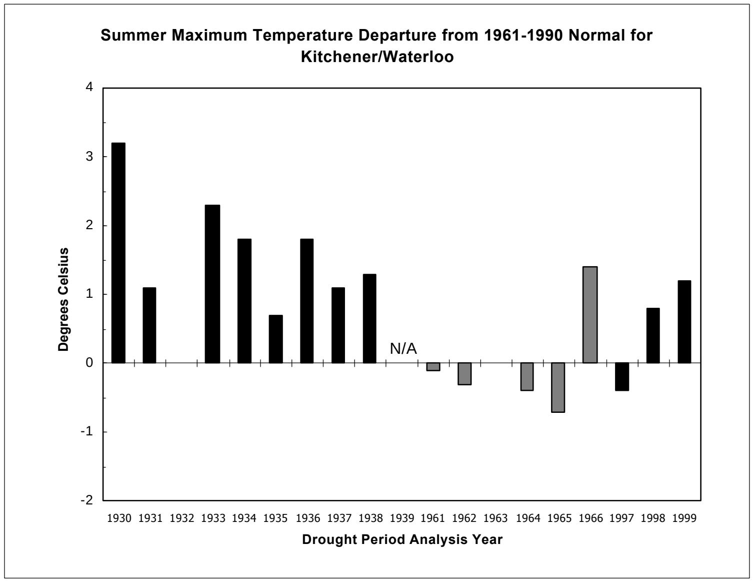
Summer Maximum Temperature Departure from 1961-1990 Normal for Delhi/Simcoe

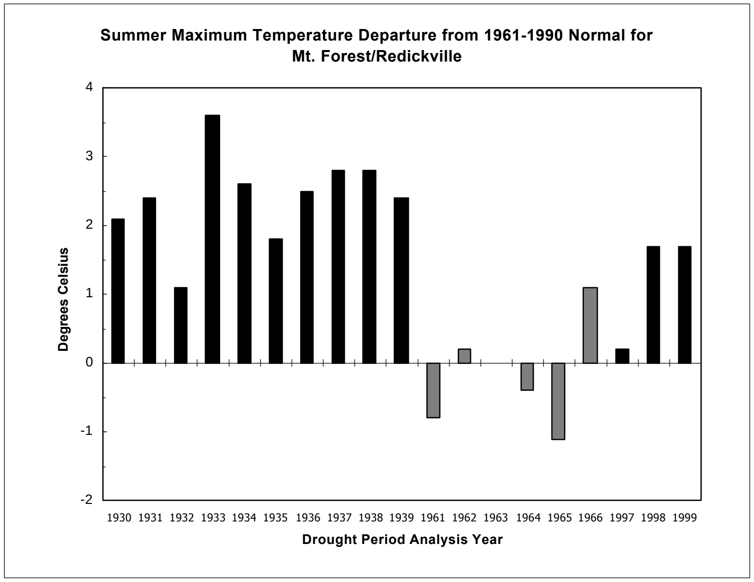


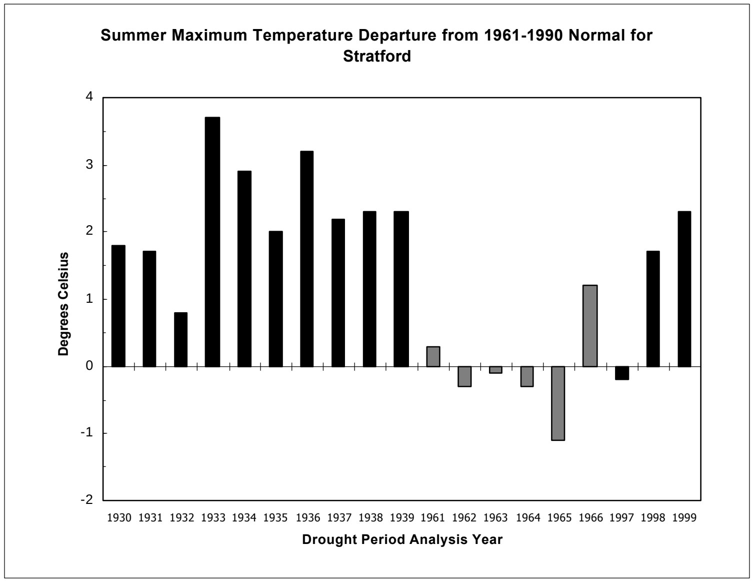
Summer Maximum Temperature Departure from 1961-1990 Normal for Fergus Shand Dam

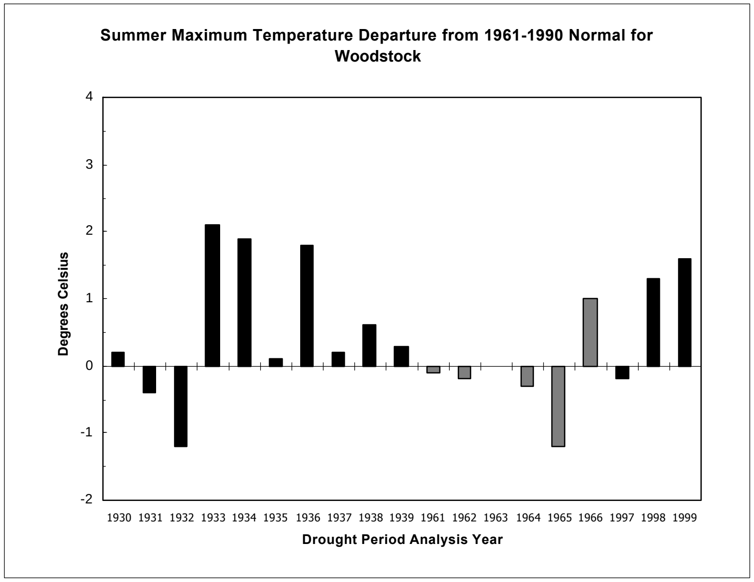


Summer Maximum Temperature Departure from 1961-1990 Normal for Guelph


Summer Maximum Temperature Departure from 1961-1990 Normal for Kitchener/Waterloo


Summer Maximum Temperature Departure from 1961-1990 Normal for Mt. Forest/Redickville


Summer Maximum Temperature Departure from 1961-1990 Normal for Stratford


Summer Maximum Temperature Departure from 1961-1990 Normal for Woodstock

Appendix E

Tables of Climate Statistics for the Drought Years

TABLE E-1

Maximum Temperature (Degrees Celsius) and Date of Occurrence in Drought Period Analysis Years and Extreme Temperature (Degrees Celsius) and Date Recorded over Available Data Years

STATION ***(Data Years)***	**1930**	**1931**	**1932**	**1933**	**1934**	**1935**	**1936**	**1937**	**1938**	**1939**	**1961**	**1962**	**1963**	**1964**	**1965**	**1966**	**1997**	**1998**	**1999**	**EXTREME**
Brantford	36.1	39.4	35.0	37.8	37.2	35.6	40.6	35.0	35.0	35.0	32.2	32.8	34.4	33.9	32.2	34.4	33.0	33.0	35.0	40.6*
(1910-1999)	(Aug 4)	(Jul 1)	(Sep 12)	(Jul 23)	(Jul 25)	(Jul 19)	(Jul 13)	(Jul 9)	(Jul 8)	(Jul 7)	(Sep 8)	(May 17)	(Jul 1)	(Jun 30)	(Aug 15)	(Jul 3)	(Jun 24)	(Jul 15)	(Jul 30)	(Jul 13/36)
Delhi/Simcoe	34.4	37.2	36.1	37.8	35.6	33.9	40.6	33.3	32.2	34.4	31.7	32.2	33.3	34.4	32.2	35.6	31.1	32.2	35.4	40.6
(1921-1999)	(Aug 8)	(Jul 2)	(Aug 31)	(Jul 23)	(Jul 25)	(Jul 19)	(Jul 9)	(Jul 8)	(Sep 3)	(Jul 7)	(Sep 1)	(Jul 7)	(Jul 1)	(Jun 30)	(Aug 15)	(Jul 3)	(Jun 24)	(Jul 15)	(Jul 30)	(Jul 9/36)
Fergus Shand Dam	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	31.1	31.1	32.2	31.1	30.6	32.2	30.0	32.5	31.5	35.5
(1939-1999)											(Sep 7)	(Sep 8)	(Jul 1)	(Jul 28)	(Aug 6)	(Jul 2)	(Jun 24)	(Jul 15)	(Jul 30)	(Jul 6/ 88)
Georgetown	35.0	37.8	35.0	36.1	35.6	33.3	39.4	33.9	35.0	36.1	32.2	32.8	34.4	33.3	32.8	35.6	32.5	33.0	33.0	39.4
(1910-1999)	(Jul 28)	(Jul 2)	(Sep 11)	(Jul 31)	(Jun 2)	(Jul 20)	(Jul 13)	(Jul 10)	(Jul 8)	(Jul 28)	(Sep 8)	(Jul 8)	(Jul 1)	(Jul 28)	(Aug 6)	(Jul 2)	(Jul 14)	(Jul 15)	(Jul 24)	(Jul 13/36)
Guelph	33.3	36.1	33.9	35.6	33.9	32.2	38.3	32.2	32.8	32.8	31.1	31.1	33.3	32.8	32.2	33.9	30.6	31.2#	31.8#	38.3**
(1910-1999)	(Aug 9)	(Jul 1)	(Sep 11)	(Jul 31)	(Jul 25)	(Jul 19)	(Jul 13)	(Aug 6)	(Aug 3)	(Jul 28)	(Sep 8)	(Jul 7)	(Jul 1)	(Jul 28)	(Aug 6)	(Jul 2)	(Jul 14)	(Jul 15)	(Jul 23)	(Jul 13/36)
Kitchener/Waterloo	36.1	35.0	33.3	34.4	33.9	33.3	37.2	32.2	32.8	32.8	30.6	31.7	32.8	32.8	32.2	33.9	31.6	33.2	33.4	38.3***
(1915-1999)	(Jul 28)	(Jul 2)	(Sep 11)	(Jul 23)	(Jun 28)	(Jul 19)	(Jul 13)	(Jul 10)	(Jul 8)	(Jul 28)	(Sep 8)	(Jul 8)	(Jul 1)	(Jul 28)	(Aug 6)	(Jul 2)	(Jun 24)	(Jul 15)	(Jul 5)	(Jul 27/41)
Mt. Forest/Redickville	32.8	36.1	35.6	36.1	35.0	32.8	36.7	33.9	32.8	32.8	32.2	30.0	31.1	31.1	31.7	31.7	30.0	33.0	31.0	36.7****
(1915-1999)	((Aug 8)	(Jul 1)	(Sep 12)	(Jul 23)	(Jul 24)	(Jul 20)	(Jul 11)	(Sep 15)	(Aug 15)	(Jul 7)	(Sep 8)	(Jul 8)	(Jul 1)	(Jul 28)	(Aug 6)	(Jul 2)	(Jul 14)	(Jun 25)	(Jul 30)	(Jul 11/36)
Stratford	33.9	35.6	36.1	36.1	35.0	33.9	38.9	33.3	33.3	33.3	31.7	31.1	32.2	34.4	31.7	32.2	32.0	33.0	34.0	38.9*****
(1910-1999)	(Sep 3)	(Jul 1)	(Sep 12)	(Jul 31)	(Jul 24)	(Jul 19)	(Jul 13)	(Jul 9)	(Sep 3)	(Jul 28)	(Sep 8)	(Jul 8)	(Jul 1)	(Jun 30)	(Aug 6)	(Jul 3)	(Jun 24)	(Jun 21)	(Jul 4)	(Jul 13/36)
Woodstock	33.3	34.4	32.8	36.1	36.1	33.3	38.9	32.2	31.7	33.3	31.7	31.7	33.3	33.9	32.2	34.4	32.5	33.0	34.0	38.9
(1910-1999)	(Aug 4)	(Jul 2)	(Sep 11)	(Jul 23)	(Jul 25)	(Jul 19)	(Jul 9)	(Jul 9)	(Sep 3)	(Jul 7)	(Jun 29)	(May 19)	(Jul 1)	(Jun 30)	(Aug 15)	(Jul 3)	(Jun 24)	(Jul 15)	(Jul 31)	(Jul 9/36)

* Extreme temperature of 40.6 degrees C also occurred July 8, 9 of 1936

** Extreme temperature of 38.3 degrees C also occurred August 6, 1918

*** Extreme temperature of 38.3 degrees C also occurred August 6, 7 of 1918

**** Extreme temperature of 36.7 degrees C also occurred July 10, 1936

***** Extreme temperature of 38.9 degrees C also occurred July 8, 9, 10, 11, 12 of 1936

\# Based on all available data….significant number of daily summer maximum temperatures missing.

TABLE E-2

Number of Times Maximum Temperature Equaled or Exceeded 30/35/40 Degrees Celsius in Drought Period Analysis Years

STATION	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1961	1962	1963	1964	1965	1966	1997	1998	1999
Brantford	42/ 4/0	33/ 3/0	21/ 2/0	32/ 8/0	44/ 6/0	25/ 1/0	43/10/5	25/ 1/0	33/ 1/0	25/ 1/0	11/ 0/0	16/ 0/0	16/0/0	21/ 0/0	9/ 0/0	26/ 0/0	10/ 0/0	21/ 0/0	29/ 1/0
Delhi/Simcoe	36/ 0/0	30/ 2/0	22/ 3/0	37/ 9/0	38/ 4/0	20/ 0/0	33/ 7/3	18/ 0/0	28/ 0/0	15/ 0/0	5/ 0/0	13/ 0/0	14/0/0	25/ 0/0	5/ 0/0	22/ 2/0	4/0/0	9/0/0	17/2/0
Fergus Shand Dam	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2/ 0/0	3/ 0/0	4/ 0/0	2/ 0/0	2/ 0/0	8/ 0/0	1/ 0/0	9/ 0/0	14/ 0/0
Georgetown	29/ 2/0	18/ 3/0	14/ 1/0	25/ 2/0	25/ 3/0	16/ 0/0	32/ 7/0	28/ 0/0	30/ 1/0	23/ 2/0	3/ 0/0	16/ 0/0	16/0/0	16/ 0/0	8/ 0/0	27/ 1/0	12/ 0/0	14/ 0/0	16/ 0/0
Guelph	19/ 0/0	10/ 2/0	9/ 0/0	19/ 2/0	23/ 0/0	13/ 0/0	21/ 6/0	13/ 0/0	15/ 0/0	13/ 0/0	5/ 0/0	12/ 0/0	13/0/0	13/ 0/0	5/ 0/0	17/ 0/0	2/ 0/0	3/ 0/0*	9/ 0/0*
Kitchener/Waterloo	35/ 2/0	19/ 1/0	12/ 0/0	23/ 0/0	24/ 0/0	15/ 0/0	22/ 7/0	13/ 0/0	19/ 0/0	17/ 0/0	6/ 0/0	11/ 0/0	14/0/0	19/ 0/0	6/ 0/0	18/ 0/0	4/ 0/0	12/ 0/0	17/ 0/0
Mt. Forest/Redickville	13/ 0/0	15/ 1/0	12/ 1/0	17/ 3/0	18/ 1/0	14/ 0/0	19/ 6/0	23/ 0/0	15/ 0/0	15/ 0/0	2/ 0/0	2/ 0/0	2/ 0/0	5/ 0/0	2/ 0/0	5/ 0/0	2/ 0/0	11/ 0/0	13/ 0/0
Stratford	18/ 0/0	15/ 1/0	16/ 1/0	24/ 4/0	30/ 2/0	20/ 0/0	31/ 8/0	24/ 0/0	22/ 0/0	15/ 0/0	4/ 0/0	7/ 0/0	10/0/0	17/ 0/0	3/ 0/0	7/ 0/0	3/ 0/0	16/ 0/0	25/ 0/0
Woodstock	20/ 0/0	11/ 0/0	9/ 0/0	23/ 3/0	34/ 3/0	15/ 0/0	27/ 6/0	11/ 0/0	10/ 0/0	8/ 0/0	9/ 0/0	12/ 0/0	14/0/0	19/ 0/0	8/ 0/0	15/ 0/0	7/ 0/0	18/ 0/0	27/ 0/0

* Based on all available data….significant number of daily summer maximum temperatures missing.

TABLE E-3

Maximum Number of Days between Precipitation Events* and Dates of Occurrence**
in Drought Period Analysis Years for Specified Climate Stations

STATION	**1930**	**1931**	**1932**	**1933**	**1934**	**1935**	**1936**	**1937**	**1938**	**1939**
Brantford	10 (9/ 1- 9/10)	15 (2/21- 3/ 7)	14 (5/12- 5/25)	17 (7/ 3- 7/19)	18 (5/22- 6/ 8)	17 (5/10- 5/26)	19 (7/ 3- 7/21)	10 (7/27- 8/ 5)	17 (6/14- 6/30)	15 (4/23- 5/ 7)
Delhi/Simcoe	16 (8/ 5- 8/20)	13 (9/ 3- 9/15)	14 (6/ 5- 6/18)	13 (2/22- 3/ 6)	17 (7/14-7/30)	17 (5/10- 5/26)	18 (7/27- 8/13)	8 (7/16- 7/23)	13 (10/23-11/ 4)	12 (4/26- 5/ 7)
Fergus Shand Dam	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Georgetown	25 (7/14- 8/ 7)	15 (4/11- 4/25)	19 (6/ 6- 6/24)	26 (12/24- 1/18)	18 (5/23- 6/ 9)	17 (5/10- 5/26)	34 (6/19- 7/22)	12 (7/12- 7/23)	12 (11/16-11/27)	17 (4/22- 5/ 8)
Guelph	15 (9/14- 9/28)	13 (2/21- 3/ 5)	16 (4/14- 4/29)	17 (6/ 8- 6/24)	18 (5/22- 6/ 8)	17 (5/10- 5/26)	22 (6/30- 7/21)	10 (11/ 3-11/12)	12 (10/24-11/ 4)	16 (4/22- 5/ 7)
Kitchener/Waterloo	15 (8/ 9- 8/23)	15 (2/21- 3/ 7)	26 (2/12- 3/ 8)	19 (12/31- 1/18)	19 (5/22- 6/ 9)	17 (5/10- 5/26)	24 (6/28- 7/21)	12 (10/14-10/25)	19 (11/ 9-11/27)	16 (4/23- 5/ 8)
Mt. Forest/Redickville	18 (9/19-10/ 6)	18 (4/ 3- 4/20)	19 (6/ 6- 6/24)	12 (11/23-12/ 4)	18 (5/23- 6/ 9)	17 (5/11- 5/27)	24 (6/29- 7/22)	8 (7/29- 8 / 5)	8 (7/ 2- 7/ 9)	16 (4/22- 5/ 7)
Stratford	13 (8/11- 8/23)	14 (11/ 7-11/20)	16 (6/ 5- 6/20)	13 (6/13- 6/25)	18 (5/23- 6/ 9)	17 (5/11- 5/27)	19 (7/ 4- 7/22)	11 (7/27- 8/ 6)	12 (6/12- 6/23)	16 (4/22- 5/ 7)
Woodstock	9 (9/ 1- 9/ 9)	14 (9/ 2- 9/15)	13 (6/ 6- 6/18)	10 (11/24-12/ 3)	17 (5/23- 6/ 8)	17 (5/10- 5/26)	12 (6/30- 7/11)	8 (12/11-12/18)	9 (12/22-12/30)	16 (4/22- 5/ 7)

* Daily Precipitation of 0.2 mm or more (i.e. greater than a “Trace”)
** Dates of Last Occurrence, if occurred more than once

TABLE E-3
(cont d)
Maximum Number of Days between Precipitation Events * and Dates of Occurrence
in Drought Period Analysis Years for Specified Climate Stations

STATION	1961	1962	1963	1964	1965	1966	1997	1998	1999
Brantford	17	17	16	27	13	20	9	12	16
	(1/ 4- 1/20)	(9/26-10/12)	(6/28- 7/13)	(10/ 4-10/30)	(6/ 3- 6/15)	(6/16- 7/ 5)	(9/30-10/ 8)	(5/12- 5/23)	(3/ 6- 3/21)
Delhi/Simcoe	17	16	24	22	9	20	10	N/A	N/A
	(1/ 4- 1/20)	(9/27-10/12)	(6/20- 7/13)	(10/ 4-10/25)	(7/23- 7/31)	(7/ 7- 7/26)	(9/29-10/ 8)		
Fergus Shand Dam	16	14	30	27	10	17	13	12	14
	(1/ 9- 1/24)	(5/ 9- 5/22)	(6/14- 7/13)	(10/ 4-10/30)	(9/ 9- 9/18)	(6/16- 7/ 2)	(7/28- 8/ 9)	(1/30- 2/10)	(3/ 7- 3/20)
Georgetown	25	15	24	24	14	17	13	12	30
	(9/ 1- 9/25)	(3/22- 4/ 5)	(6/20- 7/13)	(10/ 7-10/30)	(6/ 3- 6/16)	(6/16- 7/ 2)	(7/29- 8/10)	(5/12- 5/23)	(3/ 7- 4/ 5)
Guelph	17	14	14	27	11	20	12	9	13
	(1/ 4- 1/20)	(6/24- 7/ 7)	(6/29- 7/12)	(10/ 4-10/30)	(6/ 6- 6/16)	(6/16- 7/ 5)	(7/29- 8/ 9)	(8/ 8- 8/16)	(4/23- 5/ 5)
Kitchener/Waterloo	13	18	15	27	13	17	9	11	12
	(1/ 8- 1/20)	(6/24- 7/11)	(1/ 4- 1/18)	(10/ 4-10/30)	(6/ 3- 6/15)	(6/16- 7/ 2)	(10/10-10/18)	(1/31- 2/10)	(4/24- 5/ 5)
Mt. Forest/Redickville	15	16	15	21	9	17	7	14	13
	(1/ 9- 1/23)	(9/27-10/12)	(6/29- 7/13)	(10/ 4-10/24)	(7/23- 7/31)	(6/16- 7/ 2)	(8/ 3- 8/ 9)	(4/17- 4/30)	(4/23- 5/ 5)
Stratford	12	16	14	27	13	20	12	12	14
	(1/ 9- 1/20)	(3/20- 4/ 4)	(6/29- 7/12)	(10/ 4-10/30)	(6/ 3- 6/15)	(7/ 4- 7/23)	(7/15- 7/26)	(7/23- 8/ 30)	(3/ 7- 3/20)
Woodstock	16	17	13	27	13	19	10	12	14
	(9/ 1- 9/16)	(9/26-10/12)	(4/ 4- 4/16)	(10/ 4-10/30)	(6/ 3- 6/15)	(7/ 7- 7/25)	(9/29-10/ 8)	(5/12- 5/23)	(3/ 7- 3/20)

* Daily Precipitation of 0.2 mm or greater (i.e. greater than a “Trace”)

** Dates of Last Occurrence, if occurred more than once

TABLE E-4

Ranking of Drought Period Analysis Years for Driest Year (1 = driest) and Total Precipitation (mm) within each Year

STATION *(Data Years)*	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1961	1962	1963	1964	1965	1966	1997	1998	1999	#1 RANKED
Brantford	37	8	67	18	16	25	5	74	13	33	23	14	20	30	19	39	61	4	1	1999
(1910-1999)	(844.5)	(665.8)	(1009.2)	(707.9)	(698.7)	(780.0)	(642.8)	(1189.4)	(689.6)	(819.4)	(738.4)	(692.3)	(713.3)	(805.4)	(708.6)	(847.5)	(960.7)	(642.3)	(573.9)	(573.9)
Delhi/Simcoe	31	10	36	4	2	16	3	75	27	35	22	1	8	21	9	20	N/A	N/A	N/A	1962
(1921-1999)	(891.4)	(793.3)	(921.3)	(660.2)	(650.3)	(842.8)	(651.7)	(1283.3)	(875.7)	(918.8)	(862.8)	(574.4)	(774.1)	(860.6)	(792.1)	(860.3)				(574.4)
Fergus Shand Dam	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5	22	25	1	3	1998
(1939-1999)															(757.3)	(925.2)	(939.5)	(662.8)	(734.0)	(662.8)
Georgetown	22	3	31	12	9	7	1	61	8	11	N/A	N/A	N/A	30	27	21	66	25	17	1936
(1910-1999)	(741.1)	(600.3)	(793.7)	(682.4)	(664.1)	(639.1)	(541.5)	(947.3)	(642.3)	(680.8)				(791.5)	(778.7)	(730.9)	(984.8)	(769.6)	(713.1)	(541.5)
Guelph	26	8	55	21	24	13	4	79	37	10	16	3	9	29	20	25	N/A	N/A	N/A	1912
(1910-1999)	(777.7)	(689.1)	(913.1)	(753.0)	(765.3)	(732.5)	(641.2)	(1082.9)	(827.5)	(703.4)	(740.0)	(602.3)	(696.5)	(785.5)	(752.4)	(765.6)				(558.4)
Kitchener/Waterloo	19	9	N/A	29	2	4	1	45	3	N/A	15	16	11	40	12	42	59	7	8	1936
(1915-1999)	(763.3)	(693.7)		(816.5)	(577.8)	(621.6)	(569.0)	(881.2)	(605.7)		(737.1)	(738.7)	(709.4)	(864.5)	(729.0)	(869.4)	(969.0)	(670.7)	(680.1)	(569.0)
Mt. Forest/Redickville	3	1	4	N/A	N/A	35	21	59	26	16	N/A	6	19	11	13	36	N/A	8	28	1931
(1915-1999)	(513.5)	(385.7)	(604.6)			(952.9)	(879.9)	(1118.7)	(915.0)	(839.5)		(695.9)	(867.8)	(813.0)	(819.3)	(953.0)		(750.6)	(921.4)	(385.7)
Stratford	27	42	53	11	22	18	8	66	10	7	5	4	12	31	14	32	76	15	3	1944
(1910-1999)	(922.3)	(1005.9)	(1062.1)	(822.1)	(892.5)	(875.5)	(811.9)	(1130.2)	(817.3)	(811.6)	(769.4)	(767.3)	(823.9)	(939.3)	(844.3)	(941.5)	(1192.2)	(857.3)	(762.5)	(728.7)
Woodstock	3	2	51	7	30	53	14	77	22	34	N/A	N/A	N/A	45	21	56	78	15	1	1999
(1910-1999)	(616.8)	(600.3)	(938.1)	(653.8)	(806.6)	(947.1)	(729.0)	(1205.7)	(790.1)	(825.5)				(887.9)	(775.0)	(984.5)	(1213.4)	(735.3)	(555.8)	(555.8)

Rankings based on the following number of available analysis years for each station:

Brantford	74	Kitchener/Waterloo	78
Delhi/Simcoe	76	Mt. Forest/Redickville	63
Fergus Shand Dam	47	Stratford	83
Georgetown	72	Woodstock	79
Guelph	81		

TABLE E-5
Ranking of Drought Period Analysis Years for Year with Least Snowfall (1 = least) and Total Snowfall (cm) within each Year

STATION ***(Data Years)***	**1930**	**1931**	**1932**	**1933**	**1934**	**1935**	**1936**	**1937**	**1938**	**1939**	**1961**	**1962**	**1963**	**1964**	**1965**	**1966**	**1997**	**1998**	**1999**	**#1 RANKED**
Brantford	73	34	22	8	51	19	67	12	20	66	3	9	16	24	74	25	26	18	6	1942
(1910-1999)	(190.2)	(113.3)	(95.0)	(72.4)	(134.1)	(91.4)	(165.9)	(82.4)	(92.2)	(165.2)	(49.2)	(73.2)	(88.3)	(97.6)	(193.3)	(98.7)	(99.0)	(89.0)	(69.8)	(39.3)
Delhi/Simcoe	76	68	5	6	71	12	45	10	16	75	19	8	32	1	46	9	N/A	N/A	N/A	1964
(1921-1999)	(251.3)	(180.0)	(80.2)	(80.8)	(194.2)	(91.8)	(150.0)	(89.1)	(96.5)	(242.4)	(101.1)	(82.0)	(121.3)	(62.2)	(150.8)	(82.5)				(62.2)
Fergus Shand Dam	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	8	N/A	N/A	N/A	43	30	36	2	9	1983
(1939-1999)											(112.1)				(217.2)	(189.1)	(199.2)	(86.2)	(117.4)	(68.1)
Georgetown	44	49	42	7	56	11	30	24	9	69	N/A	N/A	20	28	62	41	72	34	40	1983
(1910-1999)	(138.2)	(141.0)	(131.1)	(74.7)	(159.6)	(86.9)	(119.6)	(103.5)	(84.1)	(194.4)			(96.9)	(117.9)	(175.5)	(130.7)	(206.7)	(126.4)	(129.9)	(58.9)
Guelph	78	65	16	5	54	27	35	14	6	76	7	10	24	17	75	21	N/A	N/A	N/A	1919
(1910-1999)	(215.0)	(178.1)	(114.9)	(86.3)	(162.7)	(128.8)	(136.0)	(106.9)	(88.9)	(209.2)	(89.6)	(103.8)	(121.3)	(114.9)	(206.8)	(119.5)				(71.9)
Kitchener/Waterloo	57	44	N/A	4	21	9	48	3	8	N/A	12	30	13	31	73	37	66	33	49	1953
(1915-1999)	(169.7)	(151.6)		(84.3)	(124.4)	(104.9)	(156.6)	(82.2)	(99.8)		(112.1)	(132.3)	(113.0)	(133.9)	(216.0)	(143.5)	(197.0)	(137.3)	(158.0)	(68.3)
Mt. Forest/Redickville	39	24	15	9	35	13	11	1	2	17	N/A	7	34	16	64	47	N/A	3	28	1937
(1915-1999)	(288.3)	(239.0)	(211.5)	(191.5)	(267.0)	(206.3)	(195.9)	(150.0)	(156.6)	(212.7)		(186.3)	(265.9)	(211.9)	(377.7)	(302.3)		(159.4)	(246.2)	(150.0)
Stratford	60	59	17	5	66	34	45	7	9	55	14	16	37	32	31	30	49	13	36	1922
(1910-1999)	(276.9)	(276.8)	(171.8)	(133.0)	(291.6)	(207.0)	(226.7)	(145.2)	(155.3)	(252.6)	(164.9)	(166.7)	(209.3)	(205.2)	(201.0)	(200.2)	(245.2)	(157.8)	(208.9)	(108.3)
Woodstock	66	64	25	6	68	50	73	16	13	78	N/A	49	30	45	81	57	29	14	4	1980
(1910-1999)	(162.5)	(160.2)	(104.8)	(78.1)	(164.7)	(134.0)	(180.7)	(93.2)	(89.7)	(210.0)		(132.9)	(108.7)	(125.2)	(236.8)	(151.6)	(108.6)	(90.0)	(71.0)	(66.3)

Rankings based on the following number of available analysis years for each station:

Brantford	75	Kitchener/Waterloo	78
Delhi/Simcoe	76	Mt. Forest/Redickville	67
Fergus Shand Dam	48	Stratford	83
Georgetown	76	Woodstock	79
Guelph	81		

TABLE E-6

Ranking of Drought Period Analysis Years for Driest Spring…March/April/May (1 = driest) and Total Precipitation (mm) within each Spring

STATION ***(Data Years)***	**1930**	**1931**	**1932**	**1933**	**1934**	**1935**	**1936**	**1937**	**1938**	**1939**	**1961**	**1962**	**1963**	**1964**	**1965**	**1966**	**1997**	**1998**	**1999**	**#1 RANKED**
Brantford	44	27	52	16	31	17	22	80	20	47	59	3	38	65	14T	40	53	25	19	1915
(1910-1999)	(209.1)	(180.8)	(220.9)	(159.8)	(185.7)	(161.0)	(167.7)	(324.8)	(164.3)	(215.4)	(242.2)	(113.6)	(200.6)	(257.1)	(158.8)	(205.2)	(221.4)	(175.6)	(162.5)	(80.2)
Delhi/Simcoe	8	22	38	18	9	13	6	73	27	33	59	1	30	47	40	17	N/A	N/A	N/A	1962
(1921-1999)	(164.5)	(198.2)	(238.0)	(194.6)	(169.2)	(175.3)	(163.5)	(351.5)	(208.2)	(223.6)	(307.6)	(99.9)	(216.9)	(264.2)	(241.9)	(187.7)				(99.9)
Fergus Shand Dam	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	36	N/A	20	34	12	17	26	11	3	1958
(1939-1999)											(254.8)		(204.5)	(245.3)	(165.0)	(195.1)	(230.5)	(163.4)	(136.4)	(93.8)
Georgetown	37	27	15	23	32	4	8	44	14	31	N/A	N/A	21	49	13	19	42	50	12	1915
(1910-1999)	(190.8)	(177.2)	(144.7)	(173.0)	(184.9)	(110.6)	(131.3)	(210.0)	(142.9)	(184.5)			(168.8)	(221.8)	(141.0)	(157.0)	(206.7)	(223.1)	(140.9)	(84.2)
Guelph	31	42	39	18	19	8	14	44	20	29	51	1	43	55	23	13	N/A	N/A	N/A	1962
(1910-1999)	(185.5)	(215.7)	(199.7)	(159.9)	(163.1)	(127.9)	(148.6)	(217.9)	(164.8)	(182.2)	(221.5)	(95.7)	(217.4)	(228.1)	(174.5)	(147.6)				(95.7)
Kitchener/Waterloo	25	16	19	49	2	3	6	21	10	32	38	7	42	56	20	23	41	29	8	1958
(1915-1999)	(176.0)	(162.1)	(167.4)	(223.0)	(85.7)	(89.8)	(108.1)	(172.8)	(118.5)	(192.9)	(203.6)	(115.3)	(208.6)	(233.8)	(169.9)	(173.8)	(206.1)	(189.0)	(117.4)	(83.2)
Mt. Forest/Redickville	6	4	7	N/A	3	40	53	43	44	24	N/A	11	42	36	41	30	47	21	26	1926
(1915-1999)	(93.7)	(83.1)	(115.2)		(77.1)	(215.9)	(245.4)	(223.4)	(225.0)	(180.4)		(137.6)	(221.6)	(210.1)	(216.0)	(198.0)	(233.6)	(174.4)	(183.8)	(63.4)
Stratford	46	36	55	33	18	8	10	72	26	16	23	2	22	27	32	19	42	24	3	1958
(1910-1999)	(238.3)	(215.7)	(254.2)	(209.3)	(183.1)	(158.7)	(162.2)	(303.0)	(198.8)	(180.1)	(195.1)	(117.2)	(193.4)	(199.2)	(209.1)	(183.5)	(229.1)	(195.6)	(130.0)	(106.3)
Woodstock	8	14	38	11	51	30	22	85	32	44	52	N/A	50	45	31	57	66	26	9	1958
(1910-1999)	(132.6)	(148.9)	(204.9)	(144.0)	(221.5)	(192.6)	(172.4)	(351.0)	(196.2)	(211.0)	(222.8)		(220.6)	(215.0)	(195.4)	(228.8)	(255.3)	(182.9)	(141.4)	(73.0)

Rankings based on the following number of available analysis years for each station:

T: tied ranking

Brantford	83	Guelph	82	Woodstock	87
Delhi/Simcoe	76	Kitchener/Waterloo	84		
Fergus Shand Dam	57	Mt. Forest/Redickville	79		
Georgetown	79	Stratford	87		

TABLE E-7

Ranking of Drought Period Analysis Years for Driest Summer…June/July/August (1 = driest) and Total Precipitation (mm) within each Summer

STATION ***(Data Years)***	**1930**	**1931**	**1932**	**1933**	**1934**	**1935**	**1936**	**1937**	**1938**	**1939**	**1961**	**1962**	**1963**	**1964**	**1965**	**1966**	**1997**	**1998**	**1999**	**#1 RANKED**
Brantford	12	58	55	5	7	24	1	73	14	42	51	63	8	77	29	31	49	6	38	1936
(1910-1999)	(145.8)	(260.9)	(256.7)	(122.7)	(133.1)	(187.6)	(91.7)	(302.1)	(155.1)	(221.3)	(246.4)	(273.3)	(136.9)	(311.8)	(198.3)	(199.6)	(241.5)	(124.8)	(208.2)	(91.7)
Delhi/Simcoe	4	65	20	2	1	32	3	60	38	23	66	8	16	76	28	14	N/A	N/A	N/A	1934
(1921-1999)	(142.2)	(289.0)	(197.0)	(93.9)	(89.9)	(223.3)	(110.3)	(285.2)	(235.7)	(206.1)	(290.4)	(165.5)	(191.8)	(383.6)	(215.6)	(182.5)				(89.9)
Fergus Shand Dam	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	13	14	48	21	15	16	12	33	1954
(1939-1999)												(176.5)	(178.0)	(331.4)	(204.9)	(182.1)	(187.4)	(175.6)	(253.9)	(139.0)
Georgetown	2	54	17	3	6	31	4	66	20	11	67	N/A	N/A	69	63	7	18	26	42	1911
(1910-1999)	(121.1)	(237.4)	(180.4)	(131.0)	(147.8)	(201.4)	(132.7)	(285.9)	(185.2)	(165.8)	(291.3)			(295.4)	(261.4)	(155.8)	(181.5)	(190.0)	(221.3)	(95.5)
Guelph	18	28	56	17	22	35	1	64	67	10	59	31	5	69	23	7	N/A	N/A	N/A	1936
(1910-1999)	(176.3)	(211.2)	(270.0)	(171.3)	(190.3)	(223.3)	(147.8)	(287.1)	(304.8)	(163.3)	(276.2)	(213.8)	(152.6)	(314.3)	(193.2)	(153.5)				(147.8)
Kitchener/Waterloo	14	62	60	21	1	49	4	17	42	N/A	55	59	12	78	18	22	25	8	35	1934
(1915-1999)	(162.9)	(274.5)	(272.3)	(186.7)	(123.9)	(245.1)	(126.9)	(179.7)	(229.2)		(262.8)	(271.0)	(157.1)	(373.7)	(180.3)	(188.0)	(204.1)	(145.6)	(220.8)	(123.9)
Mt. Forest/Redickville	2	3	31	N/A	5	34	8	44	33	45	72	18	41	59	12	39	73	14	53	1927
(1915-1999)	(66.6)	(74.6)	(204.8)		(113.0)	(217.5)	(143.8)	(241.5)	(209.8)	(242.6)	(324.7)	(181.0)	(234.6)	(278.7)	(169.5)	(231.3)	(331.2)	(172.8)	(255.6)	(56.1)
Stratford	14	84	54	20	10	56	5	55	27	36	53	51	26	83	29	37	50	24	12	1944
(1910-1999)	(173.4)	(403.9)	(255.2)	(180.7)	(163.8)	(261.1)	(148.0)	(260.8)	(200.3)	(219.8)	(251.2)	(245.4)	(199.1)	(396.4)	(206.4)	(219.8)	(244.3)	(188.1)	(167.7)	(125.9)
Woodstock	5	39	59	7	16	30	12	34	24	27	75	47	N/A	87	25	60	58	14	4	1969
(1910-1999)	(137.7)	(227.5)	(283.4)	(139.5)	(160.5)	(204.9)	(151.1)	(221.1)	(185.7)	(193.4)	(331.8)	(250.9)		(437.8)	(189.1)	(283.8)	(279.8)	(154.8)	(136.8)	(114.0)

Rankings based on the following number of available analysis years for each station:

Brantford	87	Kitchener/Waterloo	84
Delhi/Simcoe	76	Mt. Forest/Redickville	79
Fergus Shand Dam	56	Stratford	86
Georgetown	84	Woodstock	87
Guelph	83		

TABLE E-8

Ranking of Drought Period Analysis Years for Highest Average Annual Mean Temperature (1 = Hottest) and Average Mean Temperature (Degrees Celsius) for each Year

STATION ***(Data Years)***	**1930**	**1931**	**1932**	**1933**	**1934**	**1935**	**1936**	**1937**	**1938**	**1939**	**1961**	**1962**	**1963**	**1964**	**1965**	**1966**	**1997**	**1998**	**1999**	**#1 RANKED**
Brantford	28	12	1	10	72	43	62	17	22	33	46	26	70	25	60	31	N/A	3	2	1932
(1910-1999)	(8.2)	(8.7)	(9.3)	(8.7)	(7.0)	(7.8)	(7.2)	(8.4)	(8.3)	(8.1)	(7.7)	(8.2)	(7.1)	(8.2)	(7.3)	(8.1)	(0.0)	(9.2)	(9.3)	(9.3)
Delhi/Simcoe	20	9	2	5	48	42	69	14	21	27	68	46	77	30	66	33	53	N/A	N/A	1921
(1921-1999)	(8.3)	(8.9)	(9.8)	(9.4)	(7.7)	(7.9)	(7.2)	(8.6)	(8.3)	(8.1)	(7.2)	(7.8)	(6.5)	(8.0)	(7.3)	(8.0)	(7.7)			(10.0)
Fergus Shand Dam	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	41	30	42	32	22	1	2	1998
(1939-1999)													(4.6)	(5.5)	(4.6)	(5.4)	(5.9)	(8.1)	(8.0)	(8.1)
Georgetown	41	22	4	12	53	37	N/A	15	24	31	N/A	16	47	26	49	36	39	N/A	11	1921
(1910-1999)	(6.4)	(7.0)	(7.9)	(7.3)	(5.3)	(6.4)		(7.2)	(6.9)	(6.6)		(7.2)	(5.9)	(6.9)	(5.8)	(6.5)	(6.4)		(7.4)	(8.6)
Guelph	49	23	4	11	69	40	58	17	16	29	51	28	77	44	73	47	N/A	N/A	N/A	1921
(1910-1999)	(6.5)	(7.1)	(8.1)	(7.6)	(5.8)	(6.7)	(6.1)	(7.3)	(7.3)	(7.0)	(6.4)	(7.0)	(5.6)	(6.7)	(5.7)	(6.5)				(8.8)
Kitchener/Waterloo	29	13	3	9	63	31	62	N/A	24	N/A	42	21	69	18	54	23	N/A	7	8	1921
(1915-1999)	(7.3)	(7.8)	(8.8)	(8.1)	(6.5)	(7.2)	(6.5)		(7.5)		(7.0)	(7.5)	(6.2)	(7.6)	(6.7)	(7.5)		(8.3)	(8.2)	(9.0)
Mt. Forest/Redickville	30	12	4	9	71	22	55	15	19	14	68	N/A	75	23	69	37	42	3	2	1921
(1915-1999)	(5.6)	(6.3)	(7.2)	(6.6)	(4.6)	(5.8)	(5.0)	(6.2)	(6.0)	(6.2)	(4.7)		(4.4)	(5.7)	(4.7)	(5.4)	(5.3)	(7.5)	(7.5)	(8.1)
Stratford	30	14	4	7	69	22	48	15	17	16	57	29	83	33	72	56	40	2	3	1921
(1910-1999)	(6.9)	(7.7)	(8.7)	(8.1)	(6.2)	(7.2)	(6.7)	(7.6)	(7.6)	(7.6)	(6.5)	(7.0)	(5.3)	(6.9)	(6.0)	(6.5)	(6.8)	(8.8)	(8.7)	(9.1)
Woodstock	48	20	5	11	69	44	63	23	29	37	43	19	71	25	64	32	41	1	4	1998
(1910-1999)	(7.1)	(7.7)	(8.8)	(8.2)	(6.4)	(7.2)	(6.6)	(7.6)	(7.5)	(7.3)	(7.2)	(7.7)	(6.3)	(7.6)	(6.6)	(7.4)	(7.3)	(9.3)	(8.8)	(9.3)

Rankings based on the following number of available analysis years for each station:

Brantford	78	Kitchener/Waterloo	81
Delhi/Simcoe	77	Mt. Forest/Redickville	81
Fergus Shand Dam	44	Stratford	83
Georgetown	54	Woodstock	80
Guelph	81		

TABLE E-9

Ranking of Drought Period Analysis Years for Highest Average Summer (June/July/August) Maximum Temperature (1 = Hottest) and Average Maximum Temperature (Degrees Celsius) for each Summer

STATION ***(Data Years)***	**1930**	**1931**	**1932**	**1933**	**1934**	**1935**	**1936**	**1937**	**1938**	**1939**	**1961**	**1962**	**1963**	**1964**	**1965**	**1966**	**1997**	**1998**	**1999**	**#1 RANKED**
Brantford	3	13	41	7	8	36	5	31	15	19	47	71	48	69	80	34	72	28	21	1919
(1910-1999)	(28.4)	(27.5)	(26.2)	(28.0)	(27.9)	(26.4)	(28.2)	(26.7)	(27.4)	(27.2)	(25.8)	(25.1)	(25.7)	(25.2)	(24.5)	(26.6)	(25.1)	(26.7)	(27.0)	(29.4)
Delhi/Simcoe	9	19	31	1	5	37	3	26	14	20	71	59	53	41	57	13	76	N/A	N/A	1933
(1921-1999)	(27.6)	(26.9)	(26.3)	(28.7)	(28.0)	(26.0)	(28.3)	(26.5)	(27.1)	(26.9)	(24.4)	(25.3)	(25.5)	(25.9)	(25.4)	(27.4)	(23.9)			(28.7)
Fergus Shand Dam	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	34	37	40	52	55	17	36	13	12	1955
(1939-1999)											(23.5)	(23.5)	(23.3)	(22.5)	(21.9)	(24.5)	(23.5)	(24.8)	(24.9)	(26.7)
Georgetown	17	21	42	6	13	35	9	12	5	10	63	43	44	53	64	16	38	23	24	1949
(1910-1999)	(26.1)	(25.9)	(25.1)	(27.0)	(26.5)	(25.4)	(26.8)	(26.6)	(27.0)	(26.8)	(23.6)	(25.1)	(25.0)	(24.3)	(23.6)	(26.2)	(25.3)	(25.8)	(25.7)	(28.3)
Guelph	21	30	52	4	15	46	12	27	16	17	61	55	44	67	76	19	69	N/A	N/A	1949
(1910-1999)	(25.5)	(25.1)	(24.2)	(26.8)	(25.9)	(24.5)	(26.1)	(25.2)	(25.7)	(25.7)	(24.0)	(24.1)	(24.5)	(23.8)	(23.3)	(25.7)	(23.7)			(27.7)
Kitchener/Waterloo	4	34	57	13	18	39	16	35	27	N/A	60	65	54	72	75	26	70	36	32	1949
(1915-1999)	(27.9)	(25.8)	(24.7)	(27.0)	(26.5)	(25.4)	(26.5)	(25.8)	(26.0)		(24.6)	(24.4)	(24.7)	(24.3)	(24.0)	(26.1)	(24.3)	(25.5)	(25.9)	(29.1)
Mt. Forest/Redickville	16	12	30	1	8	19	10	4	5	11	73	50	58	65	78	31	52	22	21	1933
(1915-1999)	(25.1)	(25.4)	(24.1)	(26.6)	(25.6)	(24.8)	(25.5)	(25.8)	(25.8)	(25.4)	(22.2)	(23.2)	(23.0)	(22.6)	(21.9)	(24.1)	(23.2)	(24.7)	(24.7)	(26.6)
Stratford	23	27	40	2	6	19	5	17	12	13	51	70	67	71	83	34	68	26	16	1921
(1910-1999)	(25.8)	(25.7)	(24.8)	(27.7)	(26.9)	(26.0)	(27.2)	(26.2)	(26.3)	(26.3)	(24.3)	(23.7)	(23.9)	(23.7)	(22.9)	(25.2)	(23.8)	(25.7)	(26.3)	(27.7)
Woodstock	34	58	76	4	6	37	7	33	23	30	46	52	40	55	75	15	50	11	8	1949
(1910-1999)	(25.3)	(24.7)	(23.9)	(27.2)	(27.0)	(25.2)	(26.9)	(25.3)	(25.7)	(25.4)	(25.0)	(24.9)	(25.1)	(24.8)	(23.9)	(26.1)	(24.9)	(26.4)	(26.7)	(27.3)

Rankings based on the following number of available analysis years for each station:

Brantford	83	Kitchener/Waterloo	84
Delhi/Simcoe	77	Mt. Forest/Redickville	83
Fergus Shand Dam	56	Stratford	86
Georgetown	69	Woodstock	88
Guelph	83		

TABLE E-10

Ranking of Drought Period Analysis Years for Highest Average Summer (June/July/August) Mean Temperature (1 = Hottest) and Average Mean Temperature (Degrees Celsius) for each Summer

STATION ***(Data Years)***	**1930**	**1931**	**1932**	**1933**	**1934**	**1935**	**1936**	**1937**	**1938**	**1939**	**1961**	**1962**	**1963**	**1964**	**1965**	**1966**	**1997**	**1998**	**1999**	**#1 RANKED**
Brantford	11	13	44	15	22	25	21	17	8	20	43	70	64	65	82	32	71	18	9	1955
(1910-1999)	(20.9)	(20.9)	(19.9)	(20.8)	(20.5)	(20.5)	(20.6)	(20.8)	(21.1)	(20.6)	(19.9)	(19.1)	(19.3)	(19.3)	(18.3)	(20.2)	(19.1)	(20.7)	(21.0)	(22.0)
Delhi/Simcoe	23	15	36	4	9	30	21	16	12	20	63	66	67	54	75	24	59	N/A	N/A	1949
(1921-1999)	(20.2)	(20.5)	(19.8)	(21.4)	(20.8)	(20.0)	(20.3)	(20.5)	(20.7)	(20.3)	(18.9)	(18.8)	(18.8)	(19.3)	(18.4)	(20.1)	(19.0)			(21.8)
Fergus Shand Dam	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	35	42	47	53	56	23	29	12	9	1955
(1939-1999)											(18.0)	(17.6)	(17.5)	(17.1)	(16.0)	(18.5)	(18.3)	(19.2)	(19.5)	(20.8)
Georgetown	29	19	43	18	32	27	26	10	9	16	44	36	39	52	63	17	54	25	38	1949
(1910-1999)	(18.8)	(19.3)	(18.4)	(19.3)	(18.7)	(18.9)	(18.9)	(19.7)	(19.7)	(19.5)	(18.4)	(18.6)	(18.5)	(18.1)	(17.1)	(19.5)	(18.0)	(19.0)	(18.5)	(21.2)
Guelph	33	20	58	9	24	27	21	16	7	17	41	68	64	69	81	29	73	N/A	N/A	1955
(1910-1999)	(18.9)	(19.3)	(18.2)	(19.8)	(19.2)	(19.0)	(19.3)	(19.6)	(19.8)	(19.5)	(18.6)	(17.8)	(18.0)	(17.8)	(16.9)	(18.9)	(17.7)			(21.2)
Kitchener/Waterloo	17	20	43	8	23	26	30	19	13	N/A	38	55	49	51	73	12	70	37	25	1955
(1915-1999)	(20.0)	(20.0)	(19.2)	(20.4)	(19.9)	(19.8)	(19.6)	(20.0)	(20.2)		(19.3)	(18.8)	(19.0)	(18.9)	(18.1)	(20.3)	(18.3)	(19.3)	(19.8)	(21.7)
Mt. Forest/Redickville	24	14	30	8	28	20	39	7	6	13	59	58	62	66	82	33	42	19	5	1921
(1915-1999)	(18.0)	(18.6)	(17.8)	(18.8)	(17.9)	(18.4)	(17.5)	(18.8)	(18.9)	(18.7)	(16.8)	(16.9)	(16.7)	(16.5)	(15.4)	(17.7)	(17.4)	(18.4)	(19.0)	(19.6)
Stratford	28	20	32	1	17	11	10	6	4	8	50	71	75	72	85	43	53	24	13	1933
(1910-1999)	(19.4)	(19.8)	(19.1)	(21.0)	(20.0)	(20.1)	(20.1)	(20.5)	(20.5)	(20.2)	(18.6)	(17.9)	(17.7)	(17.9)	(16.9)	(18.8)	(18.4)	(19.7)	(20.1)	(21.0)
Woodstock	38	26	50	4	17	25	18	19	14	29	42	65	68	57	84	33	45	12	9	1995
(1910-1999)	(19.3)	(19.7)	(18.9)	(20.6)	(20.0)	(19.7)	(20.0)	(19.9)	(20.1)	(19.6)	(19.2)	(18.5)	(18.5)	(18.7)	(17.6)	(19.6)	(19.1)	(20.2)	(20.3)	(21.4)

Rankings based on the following number of available analysis years for each station:

Brantford	83	Kitchener/Waterloo	84
Delhi/Simcoe	77	Mt. Forest/Redickville	83
Fergus Shand Dam	56	Stratford	86
Georgetown	67	Woodstock	87
Guelph	83		

Appendix F

Tables of Station Cumulative Precipitation Index Computations

TABLE F-1

Dates Corresponding to Week Number in Cumulative Period Index Calculations

Week #s	Start Date	End Date	Week #s	Start Date	End Date
1	Sep 1 -	Sep 7	27	Mar 2 -	Mar 8
2	Sep 8 -	Sep 14	28	Mar 9 -	Mar 15
3	Sep 15 -	Sep 21	29	Mar 16 -	Mar 22
4	Sep 22 -	Sep 28	30	Mar 23 -	Mar 29
5	Sep 29 -	Oct 5	31	Mar 30 -	Apr 5
6	Oct 6 -	Oct 12	32	Apr 6 -	Apr 12
7	Oct 13 -	Oct 19	33	Apr 13 -	Apr 19
8	Oct 20 -	Oct 26	34	Apr 20 -	Apr 26
9	Oct 27 -	Nov 2	35	Apr 27 -	May 3
10	Nov 3 -	Nov 9	36	May 4 -	May 10
11	Nov 10 -	Nov 16	37	May 11 -	May 17
12	Nov 17 -	Nov 23	38	May 18 -	May 24
13	Nov 24 -	Nov 30	39	May 25 -	May 31
14	Dec 1 -	Dec 7	40	Jun 1 -	Jun 7
15	Dec 8 -	Dec 14	41	Jun 8 -	Jun 14
16	Dec 15 -	Dec 21	42	Jun 15 -	Jun 21
17	Dec 22 -	Dec 28	43	Jun 22 -	Jun 28
18	Dec 29 -	Jan 4	44	Jun 29 -	Jul 5
19	Jan 5 -	Jan 11	45	Jul 6 -	Jul 12
20	Jan 12 -	Jan 18	46	Jul 13 -	Jul 17
21	Jan 19 -	Jan 25	47	Jul 20 -	Jul 26
22	Jan 26 -	Feb 1	48	Jul 27 -	Aug 2
23	Feb 2 -	Feb 8	49	Aug 3 -	Aug 9
24	Feb 9 -	Feb 15	50	Aug 10 -	Aug 16
25	Feb 16 -	Feb 22	51	Aug 17 -	Aug 23
26	Feb 23 -	Mar 1	52	Aug 24 -	Aug 31

TABLE F-2

BRANTFORD’s Cumulative Precipitation Computations

Occurrences of Accumulated Precipitation (mm) Less than 60% of Normal for same Period.

YEAR is analysis year of start week of accumulation.

Year	Week #s	Act l (mm)	Norm(mm)	% of Norm		Year	Week #s	Act l(mm)	Norm(mm)	% of Norm
1930	42-49	83.9	158.8	52.8		1933	35- 2	169.5	354.4	47.8
	42-50	85.7	175.5	48.8			35- 3	169.5	376.9	45.0
	42-51	90.8	192.4	47.2			35- 4	204.1	396.8	51.4
	42-52	111.6	210.3	53.1			35- 5	206.9	413.1	50.1
	42- 1	111.6	223.9	49.8			35- 6	210.8	426.1	49.5
	42- 2	115.7	243.5	47.5			35- 7	229.1	441.7	51.9
	42- 3	122.9	266.1	46.2			35- 8	260.1	458.7	56.7
	42- 4	147.3	285.9	51.5			35- 9	260.1	474.1	54.9
	42- 5	150.1	302.2	49.7			35-10	286.3	493.3	58.0
	42- 6	158.5	315.3	50.3		1934	33-40	52.4	131.5	39.8
	42- 7	167.6	330.9	50.7			33-41	72.2	144.3	50.0
	42- 8	169.7	347.9	48.8		1934	42-49	89.9	158.8	56.6
	42- 9	178.1	363.3	49.0			42-50	92.7	175.5	52.8
	42-10	181.7	382.5	47.5			42-51	112.0	192.4	58.2
	42-11	183.2	400.7	45.7			42-52	113.3	210.3	53.9
	42-12	184.7	414.9	44.5		1935	11-18	73.7	132.3	55.7
	42-13	218.4	432.8	50.5		1935	27-34	73.4	127.4	57.6
	42-14	229.1	451.7	50.7		1935	30-37	69.8	133.9	52.1
	42-15	238.2	468.5	50.9			30-38	69.8	148.9	46.9
	42-16	240.7	486.8	49.5		1935	43-50	86.4	154.5	55.9
	42-17	249.0	502.7	49.5			43-51	97.8	171.5	57.0
	42-18	251.6	514.8	48.9			43-52	100.6	189.4	53.1
	42-19	269.1	526.4	51.1			43- 1	113.3	203.0	55.8
	42-20	274.2	536.3	51.1			43- 2	122.6	222.6	55.1
	42-21	288.1	550.5	52.3			43- 3	144.2	245.2	58.8
	42-22	305.3	565.7	54.0		1935	52- 7	81.8	138.5	59.1
	42-23	310.4	577.6	53.7		1936	32-39	62.3	125.7	49.6
	42-24	316.8	588.5	53.8		1936	34-41	75.7	127.1	59.6
	42-25	335.7	601.7	55.8			34-42	81.0	148.0	54.7
	42-26	335.7	614.7	54.6			34-43	84.0	169.3	49.6
	42-27	358.6	629.1	57.0			34-44	85.5	182.9	46.7
	42-28	363.7	642.9	56.6			34-45	85.5	197.0	43.4
	42-29	368.0	661.0	55.7			34-46	85.5	213.6	40.0
	42-30	404.0	674.5	59.9			34-47	100.2	233.1	43.0
1933	35-42	79.0	131.8	59.9			34-48	100.5	262.7	38.3
	35-43	86.9	153.1	56.8			34-49	107.1	285.9	37.5
	35-44	96.3	166.7	57.8			34-50	107.1	302.5	35.4
	35-45	96.3	180.8	53.3			34-51	118.3	319.5	37.0
	35-46	96.3	197.4	48.8			34-52	128.8	337.4	38.2
	35-47	102.6	216.9	47.3			34- 1	149.4	351.0	42.6
	35-48	114.3	246.5	46.4			34- 2	176.3	370.6	47.6
	35-49	141.8	269.7	52.6			34- 3	192.8	393.2	49.0
	35-50	144.3	286.3	50.4			34- 4	217.9	413.0	52.8
	35-51	157.8	303.3	52.0			34- 5	253.9	429.3	59.2
	35-52	159.8	321.2	49.8		1937	10-17	78.3	139.5	56.2
	35- 1	163.9	334.8	49.0		1938	8-15	53.4	137.6	38.8

TABLE F-2 (cont d)

BRANTFORD’s Cumulative Precipitation Computations
Occurrences of Accumulated Precipitation (mm) Less than 60% of Normal for same Period.
YEAR is analysis year of start week of accumulation.

Year	Week #s	Act l (mm)	Norm(mm)	% of Norm		Year	Week #s	Act l(mm)	Norm(mm)	% of Norm
1938	8-16	68.2	155.9	43.8		1961	14-22	77.4	132.9	58.2
	8-17	70.7	171.9	41.1			14-23	80.4	144.8	55.5
	8-18	89.7	183.9	48.8			14-24	81.9	155.7	52.6
	8-19	89.7	195.5	45.9		1961	19-26	56.2	99.9	56.2
	8-20	113.9	205.4	55.5		1961	51- 6	73.9	139.8	52.9
	8-21	125.0	219.6	56.9			51- 7	86.1	155.4	55.4
	8-22	132.6	234.9	56.5		1962	2- 9	54.4	139.3	39.0
1938	36-43	78.2	137.1	57.0			2-10	60.0	158.5	37.9
	36-44	81.0	150.7	53.7			2-11	93.8	176.8	53.1
	36-45	97.5	164.9	59.1		1962	15-22	60.2	114.0	52.8
	36-46	105.4	181.4	58.1			15-23	67.1	125.8	53.3
	36-47	119.4	201.0	59.4		1962	26-33	57.7	124.2	46.5
1938	42-49	82.1	158.8	51.7			26-34	62.3	140.4	44.4
1938	51- 6	65.2	139.8	46.6			26-35	78.0	156.4	49.9
1939	1- 8	72.8	137.5	52.9			26-36	86.2	172.4	50.0
	1- 9	72.8	152.9	47.6			26-37	86.2	193.2	44.6
	1-10	79.4	172.1	46.1			26-38	123.5	208.2	59.3
	1-11	95.4	190.4	50.1		1963	11-18	74.7	132.3	56.5
	1-12	121.6	204.6	59.4			11-19	74.7	143.9	51.9
	1-13	126.7	222.4	57.0			11-20	76.0	153.8	49.4
	1-14	141.9	241.4	58.8			11-21	92.3	168.0	55.0
1939	34-41	65.9	127.1	51.9			11-22	93.6	183.3	51.1
	34-42	85.4	148.0	57.7			11-23	95.0	195.1	48.7
1939	49- 4	88.5	150.2	58.9			11-24	101.6	206.0	49.3
	49- 5	93.1	166.5	55.9			11-25	107.9	219.2	49.2
	49- 6	93.1	179.6	51.8			11-26	118.6	232.3	51.1
	49- 7	99.2	195.2	50.8			11-27	135.1	246.7	54.8
	49- 8	102.8	212.2	48.4			11-28	141.2	260.4	54.2
	49- 9	102.8	227.6	45.2			11-29	158.7	278.5	57.0
	49-10	109.4	246.8	44.3			11-30	175.0	292.0	59.9
	49-11	125.4	265.1	47.3			11-31	178.3	315.3	56.6
	49-12	151.6	279.3	54.3			11-32	178.6	326.2	54.8
	49-13	156.7	297.1	52.7		1963	36-43	73.1	137.1	53.3
	49-14	171.9	316.1	54.4			36-44	73.1	150.7	48.5
	49-15	192.4	332.8	57.8			36-45	73.1	164.9	44.3
	49-16	198.8	351.1	56.6			36-46	99.0	181.4	54.6
1940	11-18	52.5	132.3	39.7			36-47	115.3	201.0	57.4
	11-19	65.7	143.9	45.7		1963	49- 4	58.5	150.2	38.9
	11-20	86.8	153.8	56.4			49- 5	61.1	166.5	36.7
	11-21	97.6	168.0	58.1			49- 6	73.0	179.6	40.6
	11-22	100.4	183.3	54.8			49- 7	75.8	195.2	38.8
	11-23	108.0	195.1	55.4		1964	2- 9	48.6	139.3	34.9
1960	50- 5	66.2	143.4	46.2			2-10	67.4	158.5	42.5
1960	52- 7	67.5	138.5	48.7			2-11	67.4	176.8	38.1
1961	2- 9	79.1	139.3	56.8			2-12	86.3	191.0	45.2
1961	14-21	69.0	117.7	58.6			2-13	99.3	208.9	47.6

TABLE F-2 (cont d)

BRANTFORD’s Cumulative Precipitation Computations
Occurrences of Accumulated Precipitation (mm) Less than 60% of Normal for same Period.
YEAR is analysis year of start week of accumulation.

Year	Week #s	Act l (mm)	Norm(mm)	% of Norm		Year	Week #s	Act l(mm)	Norm(mm)	% of Norm
1964	2-14	101.2	227.8	44.4		1998	41-52	119.6	223.1	53.6
	2-15	110.9	244.5	45.4			41- 1	132.6	236.7	56.0
	2-16	126.2	262.8	48.0			41- 2	133.0	256.3	51.9
	2-17	129.5	278.8	46.5			41- 3	135.4	278.9	48.6
	2-18	142.2	290.9	48.9			41- 4	139.2	298.7	46.6
	2-19	150.7	302.5	49.8			41- 5	144.4	315.0	45.8
	2-20	156.8	312.3	50.2			41- 6	155.4	328.1	47.4
	2-21	186.8	326.5	57.2			41- 7	157.8	343.7	45.9
	2-22	192.5	341.8	56.3			41- 8	158.8	360.7	44.0
1964	52- 7	74.3	138.5	53.7			41- 9	159.4	376.1	42.4
	52- 8	74.3	155.5	47.8			41-10	163.0	395.3	41.2
	52- 9	87.8	170.9	51.4			41-11	191.2	413.5	46.2
	52-10	106.6	190.1	56.1			41-12	191.2	427.7	44.7
	52-11	106.6	208.3	51.2			41-13	207.8	445.6	46.6
	52-12	125.5	222.6	56.4			41-14	221.2	464.5	47.6
	52-13	138.5	240.4	57.6			41-15	221.2	481.2	46.0
	52-14	140.4	259.4	54.1			41-16	239.6	499.5	48.0
	52-15	150.1	276.1	54.4			41-17	239.6	515.5	46.5
	52-16	165.4	294.4	56.2			41-18	265.1	527.6	50.4
	52-17	168.7	310.3	54.4			41-19	276.1	539.2	51.2
	52-18	181.4	322.4	56.3			41-20	278.6	549.1	50.7
	52-19	189.9	334.0	56.9			41-21	294.0	563.3	52.2
	52-20	196.0	343.9	57.0			41-22	294.0	578.5	50.8
1965	31-38	77.8	135.4	57.4			41-23	298.0	590.4	50.5
	31-39	87.7	149.0	58.9			41-24	300.0	601.3	49.9
	31-40	97.6	165.7	58.9			41-25	304.0	614.5	49.5
	31-41	97.6	178.5	54.7			41-26	322.8	627.5	51.4
	31-42	106.3	199.4	53.3			41-27	338.8	641.9	52.8
	31-43	118.0	220.7	53.5			41-28	338.8	655.7	51.7
1966	39-46	72.3	129.6	55.8			41-29	339.6	673.8	50.4
	39-47	73.8	149.1	49.5			41-30	339.6	687.2	49.4
1998	9-16	81.5	138.9	58.7			41-31	352.6	710.5	49.6
1998	32-39	73.0	125.7	58.2			41-32	360.0	721.4	49.9
	32-40	78.2	142.4	54.9			41-33	381.0	738.7	51.6
1998	35-42	60.2	131.8	45.7			41-34	415.6	754.9	55.1
1998	35-43	72.8	153.1	47.6			41-35	415.6	770.9	53.9
	35-44	98.0	166.7	58.8			41-36	422.6	786.9	53.7
1998	41-48	88.2	148.4	59.4			41-37	422.6	807.7	52.3
	41-49	96.4	171.6	56.2			41-38	469.1	822.7	57.0
	41-50	106.4	188.3	56.5			41-39	485.3	836.2	58.0
	41-51	115.6	205.2	56.3						

TABLE F-3

DELHI/SIMCOE's Cumulative Precipitation Computations

Occurrences of Accumulated Precipitation (mm) Less than 60% of Normal for same Period.

YEAR is analysis year of start week of accumulation.

Year	Week #s	Act l (mm)	Norm(mm)	% of Norm		Year	Week #s	Act l(mm)	Norm(mm)	% of Norm
1930	30-37	86.2	152.1	56.7		1933	40-10	202.4	435.8	46.5
1930	32-39	70.1	142.0	49.4			40-11	253.9	456.5	55.6
	32-40	76.5	161.0	47.5			40-12	277.5	475.8	58.3
1930	42-49	82.6	158.4	52.2		1934	31-38	87.3	150.7	57.9
	42-50	82.6	178.0	46.4			31-39	87.3	167.9	52.0
	42-51	87.7	193.0	45.4			31-40	87.3	186.9	46.7
	42-52	98.2	212.7	46.2			31-41	94.6	199.0	47.5
	42- 1	100.0	230.7	43.4			31-42	119.3	221.7	53.8
	42- 2	100.0	248.6	40.2			31-43	122.4	243.5	50.3
	42- 3	109.9	271.3	40.5			31-44	128.2	254.7	50.3
	42- 4	129.1	292.4	44.2			31-45	131.3	267.5	49.1
	42- 5	130.4	310.8	42.0			31-46	133.3	288.7	46.2
	42- 6	135.2	327.8	41.3			31-47	133.3	303.8	43.9
	42- 7	146.4	343.8	42.6			31-48	148.0	335.9	44.1
	42- 8	146.4	362.1	40.4			31-49	158.7	357.4	44.4
	42- 9	169.9	381.5	44.5			31-50	160.7	377.0	42.6
	42-10	172.5	404.7	42.6			31-51	177.2	392.0	45.2
	42-11	173.8	425.4	40.9			31-52	177.2	411.7	43.0
	42-12	175.8	444.7	39.5		1935	4-11	91.4	154.1	59.3
	42-13	210.9	465.7	45.3		1935	11-18	92.8	155.4	59.7
	42-14	234.0	488.5	47.9		1935	26-33	88.0	147.9	59.5
	42-15	238.9	508.0	47.0			26-34	88.0	166.2	53.0
	42-16	246.4	525.4	46.9		1935	30-37	78.9	152.1	51.9
	42-17	267.4	545.7	49.0			30-38	78.9	166.3	47.4
	42-18	271.3	560.1	48.4		1936	31-38	86.5	150.7	57.4
	42-19	310.7	573.4	54.2			31-39	90.3	167.9	53.8
	42-20	319.6	584.5	54.7		1936	34-41	71.7	137.0	52.3
	42-21	339.7	601.2	56.5			34-42	82.4	159.7	51.6
	42-22	347.4	618.7	56.2			34-43	93.5	181.5	51.5
	42-23	358.9	631.2	56.9			34-44	99.9	192.7	51.9
	42-24	378.0	644.0	58.7			34-45	102.2	205.6	49.7
1933	40-47	67.5	135.9	49.7			34-46	102.2	226.7	45.1
	40-48	67.5	168.0	40.2			34-47	113.1	241.8	46.8
	40-49	87.8	189.4	46.4			34-48	113.1	273.9	41.3
	40-50	89.9	209.1	43.0			34-49	113.1	295.4	38.3
	40-51	91.9	224.1	41.0			34-50	113.4	315.1	36.0
	40-52	93.9	243.8	38.5			34-51	143.4	330.1	43.5
	40- 1	94.7	261.8	36.2			34-52	149.5	349.7	42.8
	40- 2	96.5	279.7	34.5			34- 1	183.6	367.7	49.9
	40- 3	97.0	302.3	32.1			34- 2	200.9	385.7	52.1
	40- 4	118.3	323.5	36.6			34- 3	208.5	408.3	51.1
	40- 5	121.9	341.8	35.7			34- 4	253.7	429.4	59.1
	40- 6	145.5	358.9	40.5		1937	25-32	74.7	138.4	54.0
	40- 7	162.3	374.9	43.3		1937	51- 6	83.1	149.8	55.5
	40- 8	183.9	393.2	46.8			51- 7	91.5	165.7	55.2
	40- 9	183.9	412.6	44.6		1938	8-15	65.9	164.2	40.1

TABLE F-3 (cont d)

DELHI/SIMCOE’s Cumulative Precipitation Computations
Occurrences of Accumulated Precipitation (mm) Less than 60% of Normal for same Period.
YEAR is analysis year of start week of accumulation.

Year	Week #s	Act l (mm)	Norm(mm)	% of Norm		Year	Week #s	Act l(mm)	Norm(mm)	% of Norm
1938	8-16	86.9	181.6	47.8		1960	51-11	129.5	247.4	52.4
	8-17	90.5	202.0	44.8			51-12	143.7	266.7	53.9
	8-18	95.3	216.3	44.1			51-13	153.8	287.6	53.5
	8-19	96.6	229.6	42.1		1961	8-15	88.3	164.2	53.8
	8-20	113.1	240.7	47.0			8-16	101.0	181.6	55.6
	8-21	123.8	257.4	48.1		1961	11-18	63.6	155.4	40.9
	8-22	148.2	274.9	53.9			11-19	63.6	168.7	37.7
1938	39-46	76.0	138.0	55.1			11-20	63.6	179.8	35.4
1939	3-10	62.0	156.0	39.7			11-21	71.2	196.5	36.2
	3-11	81.0	176.7	45.8			11-22	78.7	214.0	36.8
	3-12	113.1	196.1	57.7			11-23	93.9	226.5	41.5
	3-13	119.4	217.0	55.0			11-24	106.6	239.3	44.6
	3-14	139.7	239.9	58.2			11-25	124.7	252.6	49.4
	3-15	144.0	259.3	55.5			11-26	144.8	267.2	54.2
	3-16	159.0	276.8	57.5		1962	1- 8	64.4	149.5	43.1
	3-17	176.8	297.1	59.5			1- 9	67.7	168.8	40.1
1939	34-41	57.7	137.0	42.1			1-10	74.1	192.0	38.6
	34-42	68.1	159.7	42.7			1-11	119.1	212.7	56.0
	34-43	80.8	181.5	44.5		1962	6-13	90.2	154.9	58.2
	34-44	99.4	192.7	51.6		1962	15-22	74.6	130.2	57.3
	34-45	110.8	205.6	53.9			15-23	77.1	142.7	54.1
	34-46	121.7	226.7	53.7			15-24	89.8	155.5	57.8
	34-47	122.5	241.8	50.7		1962	21-28	67.3	123.6	54.5
1939	49- 4	88.6	155.5	57.0			21-29	69.3	143.2	48.4
	49- 5	91.4	173.9	52.6			21-30	70.8	158.8	44.6
	49- 6	93.4	190.9	48.9			21-31	74.1	184.7	40.1
	49- 7	101.2	206.9	48.9			21-32	95.5	197.9	48.3
	49- 8	110.4	225.3	49.0			21-33	110.0	220.7	49.8
	49- 9	110.4	244.6	45.1			21-34	116.6	239.0	48.8
	49-10	120.8	267.8	45.1			21-35	137.5	256.9	53.5
	49-11	139.8	288.5	48.5			21-36	150.5	275.2	54.7
	49-12	171.9	307.8	55.8			21-37	151.0	295.3	51.1
	49-13	178.2	328.8	54.2			21-38	155.8	309.5	50.4
	49-14	198.5	351.7	56.5			21-39	160.1	326.7	49.0
	49-15	202.8	371.1	54.7			21-40	170.5	345.6	49.3
	49-16	217.8	388.5	56.1			21-41	182.8	357.8	51.1
	49-17	235.6	408.8	57.6			21-42	209.0	380.4	54.9
	49-18	252.2	423.2	59.6			21-43	217.8	402.2	54.2
	49-19	260.3	436.5	59.6			21-44	221.1	413.4	53.5
1960	48- 3	81.2	166.5	48.8			21-45	239.2	426.3	56.1
	48- 4	95.9	187.6	51.1			21-46	239.5	447.5	53.5
1960	51- 6	34.2	149.8	22.8			21-47	273.1	462.6	59.0
	51- 7	34.2	165.7	20.6			21-48	273.1	494.6	55.2
	51- 8	61.9	184.1	33.6		1962	46- 1	90.7	162.1	55.9
	51- 9	76.9	203.4	37.8			46- 2	96.5	180.1	53.6
	51-10	97.5	226.7	43.0			46- 3	96.5	202.7	47.6

TABLE F-3 (cont d)

DELHI/SIMCOE's Cumulative Precipitation Computations
Occurrences of Accumulated Precipitation (mm) Less than 60% of Normal for same Period.
YEAR is analysis year of start week of accumulation.

Year	Week #s	Act l (mm)	Norm(mm)	% of Norm		Year	Week #s	Act l(mm)	Norm(mm)	% of Norm
1963	11-18	88.0	155.4	56.6		1964	2-34	352.37	592.8	59.4
	11-19	88.0	168.7	52.2		1964	52- 7	53.1	150.7	35.2
	11-20	88.0	179.8	48.9			52- 8	55.1	169.1	32.6
	11-21	108.3	196.5	55.1			52- 9	69.0	188.4	36.6
	11-22	117.9	214.0	55.1			52-10	88.1	211.6	41.6
	11-23	118.2	226.5	52.2			52-11	89.7	232.3	38.6
	11-24	125.7	239.3	52.5			52-12	115.1	251.7	45.7
	11-25	135.8	252.6	53.8			52-13	124.0	272.6	45.5
	11-26	140.9	267.2	52.7			52-14	124.0	295.5	42.0
	11-27	162.0	286.8	56.5			52-15	146.9	314.9	46.7
	11-28	170.6	303.4	56.2			52-16	157.1	332.4	47.3
	11-29	188.6	323.0	58.4			52-17	159.6	352.7	45.3
1963	37-44	62.8	138.2	45.4			52-18	167.3	367.1	45.6
	37-45	62.8	151.1	41.6			52-19	174.6	380.3	45.9
	37-46	96.3	172.3	55.9			52-20	174.6	391.4	44.6
	37-47	97.1	187.3	51.8			52-21	201.0	408.2	49.2
1963	49- 4	92.2	155.5	59.3			52-22	206.6	425.7	48.5
	49- 5	96.3	173.9	55.4			52-23	219.3	438.1	50.1
1963	52- 7	47.8	150.7	31.7			52-24	224.3	450.9	49.7
1964	2- 9	37.3	150.8	24.7			52-25	225.6	464.3	48.6
	2-10	56.4	174.0	32.4			52-26	229.97	478.9	48.0
	2-11	58.0	194.7	29.8			52-27	263.47	498.4	52.9
	2-12	83.4	214.0	39.0			52-28	280.27	515.0	54.4
	2-13	92.3	235.0	39.3			52-29	280.57	534.6	52.5
	2-14	92.3	257.9	35.8			52-30	315.37	550.2	57.3
	2-15	115.2	277.3	41.6			52-31	344.37	576.1	59.8
	2-16	125.4	294.7	42.6			52-32	347.97	589.3	59.1
	2-17	127.9	315.0	40.6			52-33	360.87	612.2	59.0
	2-18	135.6	329.4	41.2		1965	33-40	79.6	147.7	53.9
	2-19	142.9	342.7	41.7			33-41	79.6	159.9	49.8
	2-20	142.9	353.8	40.4			33-42	99.7	182.5	54.6
	2-21	169.3	370.5	45.7			33-43	106.8	204.3	52.3
	2-22	174.9	388.0	45.1			33-44	118.5	215.5	55.0
	2-23	187.6	400.5	46.8			33-45	132.8	228.4	58.1
	2-24	192.6	413.3	46.6		1966	42-49	84.8	158.4	53.6
	2-25	193.9	426.6	45.5			42-50	103.0	178.0	57.9
	2-26	198.27	441.3	44.9			42-51	104.8	193.0	54.3
	2-27	231.77	460.8	50.3			42-52	107.6	212.7	50.6
	2-28	248.57	477.4	52.1			42- 1	133.6	230.7	57.9
	2-29	248.87	497.0	50.1			42- 2	134.4	248.6	54.1
	2-30	283.67	512.6	55.3		1997	NO DATA			
	2-31	312.67	538.5	58.1		1998	NO DATA			
	2-32	316.27	551.7	57.3		1999	NO DATA			
	2-33	329.17	574.6	57.3						

TABLE F-4

FERGUS SHAND DAM’s Cumulative Precipitation Computations

Occurrences of Accumulated Precipitation (mm) Less than 60% of Normal for same Period.

YEAR is analysis year of start week of accumulation.

Year	Week #s	Act l (mm)	Norm(mm)	% of Norm		Year	Week #s	Act l(mm)	Norm(mm)	% of Norm
1960	47- 2	83.6	164.2	50.9		1966	42-52	89.4	219.8	40.7
	47- 3	100.2	188.1	53.3			3-10	66.9	156.0	42.9
1960	50- 5	32.1	164.6	19.5			4-11	66.6	151.7	43.9
	50- 6	40.2	180.3	22.3		1966	42- 1	132.5	237.5	55.8
	50- 7	41.0	196.8	20.8			42- 2	132.5	258.9	51.2
	50- 8	64.6	217.8	29.7			42- 3	147.5	282.8	52.2
	50- 9	85.6	235.6	36.3			42- 4	157.1	301.1	52.2
	50-10	108.5	253.8	42.8			42- 5	177.2	321.0	55.2
	50-11	160.1	273.8	58.5			42- 6	198.2	336.7	58.9
1961	10-17	80.3	148.3	54.2		1997	52- 7	78.8	157.5	50.0
	10-18	85.4	161.9	52.7			52- 8	94.0	178.6	52.6
	10-19	94.3	177.6	53.1			52- 9	112.6	196.4	57.3
	10-20	94.3	188.4	50.0		1998	10-17	62.2	148.3	42.0
	10-21	95.1	205.3	46.3			10-18	81.8	161.9	50.5
	10-22	101.0	222.9	45.3		1998	20-27	64.4	115.1	56.0
	10-23	104.8	234.4	44.7		1998	30-37	79.2	136.0	58.3
	10-24	114.7	248.4	46.2			30-38	84.6	150.8	56.1
	10-25	146.1	262.6	55.6			30-39	99.4	168.8	58.9
	10-26	155.5	277.2	56.1			30-40	101.6	186.7	54.4
1962	48- 3	102.3	171.1	59.8			30-41	118.8	205.4	57.8
1963	37-44	72.9	152.6	47.8			30-42	121.0	232.5	52.0
	37-45	72.9	164.1	44.4			30-43	145.8	252.9	57.7
1963	40-47	78.9	148.2	53.2			30-44	157.8	267.1	59.1
	40-48	95.1	171.4	55.5		1998	40-47	82.0	148.2	55.3
	40-49	113.0	193.0	58.6			40-48	84.0	171.4	49.0
1963	51- 6	57.6	158.6	36.3		1998	50- 5	62.0	164.6	37.7
	51- 7	73.6	175.0	42.1			50- 6	65.0	180.3	36.1
1964	2- 9	64.8	154.5	41.9			50- 7	65.8	196.8	33.4
	2-10	70.7	172.7	40.9			50- 8	72.6	217.8	33.3
	2-11	76.8	192.7	39.9			50- 9	129.8	235.6	55.1
1964	52- 7	58.1	157.5	36.9			50-10	135.4	253.8	53.4
	52- 8	58.1	178.6	32.5			50-11	145.2	273.8	53.0
	52- 9	78.0	196.4	39.7			50-12	152.6	293.0	52.1
	52-10	83.9	214.6	39.1			50-13	161.4	310.4	52.0
	52-11	90.0	234.6	38.4			50-14	171.6	330.8	51.9
	52-12	142.9	253.8	56.3			50-15	174.0	349.3	49.8
	52-13	145.7	271.2	53.7			50-16	174.6	365.2	47.8
1965	9-16	84.9	147.4	57.6			50-17	192.0	383.8	50.0
	34-41	76.6	135.3	56.6			50-18	211.6	397.5	53.2
	34-42	79.6	162.5	49.0		1999	22-29	67.6	120.1	56.3
	34-43	93.3	182.9	51.0			22-30	67.6	134.9	50.1
1966	42-49	45.1	156.4	28.8			22-31	74.4	158.7	46.9
	42-50	67.3	178.2	37.8			22-32	90.2	170.9	52.8
	42-51	84.8	195.6	43.4			22-33	97.0	190.1	51.0

***Note: The analysis years 1961, 1962, 1963 and 1964 have missing daily precipitation values The CPI is not calculated during the missing value periods.

TABLE F-4 (cont d)

FERGUS SHAND DAM’s Cumulative Precipitation Computations
Occurrences of Accumulated Precipitation (mm) Less than 60% of Normal for same Period.
YEAR is analysis year of start week of accumulation.

Year	Week #s	Act l (mm)	Norm(mm)	% of Norm		Year	Week #s	Act l(mm)	Norm(mm)	% of Norm
1999	28-35	55.4	131.4	42.2		1999	28-38	100.0	183.6	54.5
	28-36	62.6	147.4	42.5			29-36	62.6	135.9	46.1
	28-37	62.8	168.7	37.2			30-37	62.2	140.5	44.3

TABLE F-5

GEORGETOWN's Cumulative Precipitation Computations
Occurrences of Accumulated Precipitation (mm) Less than 60% of Normal for same Period.
YEAR is analysis year of start week of accumulation.

Year	Week #s	Act l (mm)	Norm(mm)	% of Norm		Year	Week #s	Act l(mm)	Norm(mm)	% of Norm
1930	1- 8	80.5	137.0	58.7		1930	43-41	481.2	827.4	58.2
1930	34-41	66.6	117.2	56.8			43-42	487.8	847.6	57.6
	34-42	78.5	137.5	57.1		1931	47- 2	94.0	163.4	57.5
1930	43-50	81.3	155.8	52.2			47- 3	102.3	183.0	55.9
	43-51	96.5	175.0	55.2		1931	47- 4	108.7	201.4	54.0
	43-52	96.5	201.0	48.0			47- 5	108.7	220.0	49.4
	43- 1	99.8	216.5	46.1			47- 6	113.0	232.2	48.7
	43- 2	110.0	236.6	46.5			47- 7	120.7	248.1	48.7
	43- 3	118.3	256.2	46.2			47- 8	122.0	264.7	46.1
	43- 4	124.7	274.7	45.4			47- 9	130.6	282.2	46.3
	43- 5	124.7	293.3	42.5			47-10	131.9	301.9	43.7
	43- 6	129.0	305.5	42.2			47-11	133.2	319.3	41.7
	43- 7	136.7	321.3	42.5			47-12	133.2	336.9	39.5
	43- 8	138.0	338.0	40.8			47-13	161.4	353.0	45.7
	43- 9	146.6	355.3	41.7			47-14	170.6	371.3	46.0
	43-10	147.9	375.2	39.4			47-15	178.2	385.8	46.2
	43-11	149.2	392.6	38.0			47-16	180.7	402.6	44.9
	43-12	149.2	410.2	36.4			47-17	182.0	419.2	43.4
	43-13	177.4	426.3	41.6			47-18	188.4	430.7	43.7
	43-14	186.6	444.5	42.0			47-19	213.8	443.9	48.2
	43-15	194.2	459.1	42.3			47-20	217.6	452.9	48.1
	43-16	196.7	475.9	41.3			47-21	232.8	466.3	49.9
	43-17	198.0	492.5	40.2			47-22	238.7	481.8	49.5
	43-18	204.4	504.0	40.6			47-23	246.3	493.7	49.9
	43-19	229.8	517.2	44.4			47-24	251.9	507.6	49.6
	43-20	233.6	526.3	44.4			47-25	266.2	520.0	51.2
	43-21	248.8	539.6	46.1			47-26	266.2	533.5	49.9
	43-22	254.7	555.1	45.9			47-27	301.8	548.5	55.0
	43-23	262.3	567.0	46.3			47-28	301.8	562.7	53.6
	43-24	267.9	580.8	46.1			47-29	305.6	577.9	52.9
	43-25	282.2	593.3	47.6			47-30	349.6	588.8	59.4
	43-26	282.2	606.8	46.5			47-31	352.1	611.1	57.6
	43-27	317.8	621.8	51.1			47-32	368.6	621.0	59.4
	43-28	317.8	636.0	50.0			47-33	368.6	636.9	57.9
	43-29	321.6	651.2	49.4			47-34	386.9	650.1	59.5
	43-30	365.6	662.1	55.2			47-35	387.7	664.8	58.3
	43-31	368.1	684.3	53.8		1932	35-42	74.2	124.3	59.7
	43-32	384.6	694.2	55.4			35-43	76.2	148.9	51.2
	43-33	384.6	710.1	54.2		1932	41-48	81.9	148.3	55.2
	43-34	402.9	723.3	55.7		1933	12-19	51.6	124.6	41.4
	43-35	403.7	738.1	54.7			12-20	51.6	133.6	38.6
	43-36	423.8	752.9	56.3		1933	39-46	77.8	135.2	57.5
	43-37	436.7	771.2	56.6		1933	41-48	52.6	148.3	35.5
	43-38	445.4	785.6	56.7			41-49	65.8	165.5	39.8
	43-39	459.4	799.9	57.4			41-50	81.0	187.4	43.2
	43-40	481.2	816.1	59.0			41-51	96.2	206.5	46.6

TABLE F-5 (cont d)

GEORGETOWN’s Cumulative Precipitation Computations
Occurrences of Accumulated Precipitation (mm) Less than 60% of Normal for same Period.
YEAR is analysis year of start week of accumulation.

Year	Week #s	Act l (mm)	Norm(mm)	% of Norm		Year	Week #s	Act l(mm)	Norm(mm)	% of Norm
1933	41-52	96.2	232.5	41.4		1935	47- 2	80.4	163.4	49.2
	41- 1	97.0	248.0	39.1			47- 3	89.8	183.0	49.1
	41- 2	106.1	268.2	39.6			47- 4	104.5	201.4	51.9
	41- 3	112.8	287.8	39.2			47- 5	108.1	220.0	49.1
	41- 4	127.1	306.2	41.5			47- 6	113.7	232.2	49.0
	41- 5	136.2	324.8	41.9			47- 7	113.7	248.1	45.8
	41- 6	144.6	337.0	42.9			47- 8	137.6	264.7	52.0
1933	41- 7	155.8	352.9	44.2			47- 9	142.6	282.1	50.6
1933	41- 8	177.9	369.5	48.1			47-10	176.4	301.9	58.4
	41- 9	177.9	386.9	46.0			47-11	177.4	319.3	55.6
	41-10	212.5	406.7	52.3			47-12	193.9	336.9	57.6
	41-11	228.5	424.1	53.9			47-13	205.6	353.0	58.3
	41-12	237.4	441.7	53.8			47-14	220.3	371.26	59.3
1934	19-26	47.8	102.8	46.5			47-15	221.6	385.8	57.4
1934	33-40	61.5	121.8	50.5			47-16	230.5	402.6	57.3
	33-41	73.7	133.1	55.4			47-17	233.0	419.2	55.6
1934	43-50	59.2	155.8	38.0			47-18	235.5	430.7	54.7
	43-51	70.1	175.0	40.1		1936	16-23	64.1	107.9	59.4
	43-52	78.2	201.0	38.9		1936	20-27	62.52	104.6	59.8
	43- 1	90.1	216.5	41.6		1936	41-48	36.5	148.3	24.6
	43- 2	123.8	236.6	52.3			41-49	36.5	165.5	22.1
	43- 3	133.2	256.2	52.0			41-50	36.5	187.4	19.5
	43- 4	147.9	274.7	53.8			41-51	43.4	206.5	21.0
	43- 5	151.5	293.3	51.7			41-52	70.5	232.5	30.3
	43- 6	157.1	305.5	51.4			41- 1	82.7	248.0	33.3
	43- 7	157.1	321.3	48.9			41- 2	95.4	268.2	35.6
	43- 8	181.0	338.0	53.6			41- 3	99.2	287.8	34.5
	43- 9	186.0	355.3	52.3			41- 4	136.7	306.2	44.6
	43-10	219.8	375.2	58.6			41- 5	155.4	324.8	47.8
	43-11	220.8	392.6	56.2			41- 6	177.7	337.0	52.7
	43-12	237.3	410.2	57.9			41- 7	188.4	352.9	53.4
	43-13	249.0	426.3	58.4			41- 8	207.7	369.5	56.2
	43-14	263.7	444.5	59.3			41- 9	226.5	386.9	58.6
	43-15	265.0	459.1	57.7			41-10	226.5	406.7	55.7
	43-16	273.9	475.9	57.6			41-11	232.6	424.1	54.8
	43-17	276.4	492.5	56.1			41-12	234.7	441.7	53.1
	43-18	278.9	504.0	55.3			41-13	247.9	457.8	54.2
1935	25-32	66.7	113.4	58.8			41-14	262.9	476.1	55.2
	25-33	71.0	129.3	54.9			41-15	262.9	490.6	53.6
	25-34	71.0	142.5	49.8			41-16	283.2	507.4	55.8
	25-35	87.1	157.2	55.4			41-17	306.6	524.1	58.5
	25-36	102.3	172.1	59.5		1938	6-13	71.7	133.0	53.9
	25-37	102.3	190.4	53.7			6-14	79.2	151.2	52.4
	25-38	102.3	204.8	50.0			6-15	79.2	165.8	47.8
	25-39	126.6	219.1	57.8			6-16	92.6	182.6	50.7

TABLE F-5 (cont d)

GEORGETOWN’s Cumulative Precipitation Computations
Occurrences of Accumulated Precipitation (mm) Less than 60% of Normal for same Period.
YEAR is analysis year of start week of accumulation.

Year	Week #s	Act l (mm)	Norm(mm)	% of Norm		Year	Week #s	Act l(mm)	Norm(mm)	% of Norm
1938	6-17	95.9	199.2	48.1		1939	50-17	156.5	358.5	43.7
	6-18	107.4	210.7	51.0			50-18	163.7	370.0	44.2
	6-19	107.4	223.9	48.0			50-19	170.1	383.2	44.4
	6-20	129.8	232.9	55.7			50-20	182.8	392.2	46.6
	6-21	139.0	246.3	56.4			50-21	193.0	405.6	47.6
	6-22	145.4	261.8	55.5			50-22	214.1	421.1	50.8
1938	26-33	66.0	116.9	56.5			50-23	235.4	433.0	54.4
	26-34	67.0	130.0	51.5			50-24	237.9	446.9	53.2
	26-35	82.3	144.8	56.8			50-25	274.3	459.3	59.7
	26-36	92.7	159.6	58.1			29-36	64.0	116.9	54.7
	26-37	96.5	177.9	54.2		1961	INC DATA			
1938	39-46	57.1	135.2	42.2		1962	INC DATA			
	39-47	69.2	149.6	46.3		1963	13-20	69.5	116.0	59.9
1939	5-12	61.6	135.5	45.5		1963	15-22	46.2	110.6	41.8
	5-13	69.3	151.6	45.7			15-23	47.5	122.4	38.8
	5-14	80.0	169.8	47.1			15-24	55.5	136.3	40.7
	5-15	87.2	184.4	47.3			15-25	56.3	148.8	37.8
	5-16	95.6	201.2	47.5			15-26	58.8	162.3	36.2
1939	5-17	105.8	217.8	48.6			15-27	61.3	177.3	34.6
	5-18	113.0	229.3	49.3			15-28	75.3	191.5	39.3
	5-19	119.4	242.5	49.2			15-29	90.3	206.7	43.7
	5-20	132.1	251.5	52.5			15-30	106.8	217.6	49.1
	5-21	142.3	264.9	53.7		1963	15-31	106.8	239.8	44.5
	5-22	163.4	280.4	58.3			15-32	107.6	249.7	43.1
1939	34-41	54.8	117.2	46.8			15-33	124.5	265.6	46.9
	34-42	57.3	137.5	41.7			15-34	128.3	278.8	46.0
	34-43	78.6	162.0	48.5			15-35	152.7	293.6	52.0
	34-44	106.0	177.0	59.9			15-36	181.6	308.4	58.9
1939	45-52	96.4	161.5	59.7		1963	38-45	66.3	129.1	51.4
1939	47- 2	96.1	163.4	58.8		1963	41-48	62.9	148.3	42.4
1939	50- 5	60.1	159.3	37.7			41-49	65.7	165.5	39.7
	50- 6	60.1	171.5	35.0		1964	4-11	43.7	136.4	32.0
	50- 7	68.4	187.4	36.5			4-12	73.9	153.9	48.0
	50- 8	72.2	204.0	35.4			4-13	83.3	170.0	49.0
	50- 9	72.2	221.4	32.6			4-14	88.9	188.3	47.2
	50-10	77.6	241.2	32.2			4-15	108.3	202.9	53.4
	50-11	97.8	258.6	37.8			4-16	121.0	219.6	55.1
	50-12	112.3	276.2	40.7			4-17	129.1	236.3	54.6
	50-13	120.0	292.3	41.1			4-18	141.8	247.8	57.2
	50-14	130.7	310.6	42.1		1964	52- 7	72.9	146.4	49.8
	50-15	137.9	325.1	42.4			52- 8	72.9	163.0	44.7
	50-16	146.3	341.9	42.8			52- 9	88.1	180.4	48.8

***Note: The CPI was not calculated during the analysis years 1961and 1962, due to missing daily precipitation values. CPI computations during the analysis year 1963 do not include week 52 which has missing daily precipitation values.

TABLE F-5 (cont d)

GEORGETOWN’s Cumulative Precipitation Computations

Occurrences of Accumulated Precipitation (mm) Less than 60% of Normal for same Period.

YEAR is analysis year of start week of accumulation.

Year	Week #s	Act l (mm)	Norm(mm)	% of Norm		Year	Week #s	Act l(mm)	Norm(mm)	% of Norm
1964	52-10	98.3	200.2	49.1		1998	45-52	82.5	161.5	51.1
	52-11	104.9	217.6	48.2			45- 1	102.0	177.0	57.6
	52-12	135.1	235.2	57.4			45- 2	106.0	197.2	53.8
	52-13	144.5	251.3	57.5			45- 3	108.8	216.8	50.2
	52-14	150.1	269.6	55.7			45- 4	114.2	235.2	48.6
	52-15	169.5	284.1	59.7			45- 5	124.8	253.8	49.2
1965	35-42	55.0	124.3	44.3			45- 6	140.6	266.0	52.9
1965	49- 4	87.4	157.9	55.3			45- 7	148.8	281.9	52.8
	49- 5	93.8	176.6	53.1			45- 8	148.8	298.5	49.9
	49- 6	96.8	188.7	51.3			45- 9	149.6	315.9	47.4
	49- 7	97.1	204.6	47.5			45-10	152.2	335.7	45.3
	49- 8	120.0	221.3	54.2			45-11	183.4	353.1	51.9
	49- 9	128.1	238.6	53.7			45-12	184.8	370.7	49.9
	49-10	129.4	258.4	50.1		1998	45-13	194.8	386.8	50.4
	49-11	134.5	275.9	48.8			45-14	239.6	405.0	59.2
	49-12	147.5	293.4	50.3			45-15	239.6	419.6	57.1
	49-13	159.2	309.5	51.4			45-16	249.5	436.4	57.2
	49-14	172.7	327.8	52.7			45-17	249.5	453.0	55.1
	49-15	186.4	342.4	54.5		1999	24-31	55.9	117.4	47.6
	49-16	196.6	359.1	54.8			24-32	65.6	127.3	51.5
1966	39-46	72.1	135.2	53.3			24-33	85.6	143.2	59.8
	39-47	73.7	149.6	49.3		1999	28-35	52.5	116.3	45.1
	39-48	97.9	178.7	54.8			28-36	56.7	131.1	43.2
	39-49	112.4	195.9	57.4			28-37	56.7	149.5	37.9
1988	44-51	87.8	150.4	58.4			28-38	91.7	163.9	56.0
	44-52	89.8	176.4	50.9						

TABLE F-6

GUELPH’s Cumulative Precipitation Computations

Occurrences of Accumulated Precipitation (mm) Less than 60% of Normal for same Period.

YEAR is analysis year of start week of accumulation.

Year	Week #s	Act l (mm)	Norm(mm)	% of Norm		Year	Week #s	Act l(mm)	Norm(mm)	% of Norm
1930	43-50	73.2	158.4	46.2		1938	50- 8	100.3	202.5	49.5
	43-51	75.3	175.7	42.9			50- 9	107.7	220.1	48.9
1930	46- 1	83.2	158.5	52.5			50-10	136.1	238.4	57.1
	46- 2	90.6	176.4	51.4			50-11	136.6	258.0	53.0
	46- 3	90.6	197.4	45.9		1935	50-12	157.4	275.3	57.2
	46- 4	90.6	215.8	42.0			50-13	174.0	292.6	59.5
	46- 5	103.8	233.7	44.4			50-14	177.0	313.1	56.5
	46- 6	108.8	247.4	44.0			50-15	177.0	329.8	53.7
	46- 7	109.3	262.8	41.6			50-16	198.3	344.4	57.6
1931	2- 9	75.2	140.8	53.4		1936	12-19	58.1	127.8	45.5
	2-10	84.4	159.1	53.1			12-20	58.1	137.7	42.2
	2-11	85.2	178.8	47.7			12-21	78.4	150.6	52.1
	2-12	87.5	196.1	44.6			12-22	93.7	167.1	56.1
1931	24-31	69.7	120.4	57.9			12-23	101.3	176.9	57.3
1933	41-48	45.2	152.3	29.7		1936	41-48	37.0	152.3	24.3
	41-49	61.7	172.1	35.8			41-49	37.0	172.1	21.5
	41-50	79.0	194.2	40.7			41-50	37.5	194.2	19.3
	41-51	114.6	211.5	54.2			41-51	56.6	211.5	26.8
	41-52	114.6	236.7	48.4			41-52	72.9	236.7	30.8
	41- 1	117.1	251.4	46.6			41- 1	104.8	251.4	41.7
	41- 2	128.8	269.3	47.8			41- 2	126.7	269.3	47.1
	41- 3	135.1	290.3	46.5			41- 3	130.7	290.3	45.0
	41- 4	156.6	308.7	50.7			41- 4	181.2	308.7	58.7
	41- 5	165.0	326.6	50.5		1938	6-13	82.5	138.1	59.7
	41- 6	168.8	340.3	49.6			6-14	91.4	158.7	57.6
	41- 7	185.6	355.7	52.2			6-15	92.2	175.4	52.6
	41- 8	220.1	374.7	58.8			6-16	96.8	190.0	51.0
	41- 9	224.7	392.2	57.3			6-17	96.8	207.4	46.7
	41-10	234.8	410.5	57.2			6-18	101.9	218.4	46.7
	41-11	253.8	430.1	59.0			6-19	104.4	231.4	45.1
1934	33-40	60.3	124.9	48.3			6-20	129.0	241.3	53.5
	33-41	71.9	140.0	51.4			6-21	135.9	254.2	53.5
1934	36-43	73.1	136.2	53.7			6-22	139.9	270.7	51.7
	36-44	74.4	151.6	49.1		1938	39-46	61.5	146.4	42.0
	36-45	85.3	171.0	49.9			39-47	74.9	159.5	47.0
1935	26-33	71.2	123.8	57.5		1939	4-11	78.6	139.9	56.2
	26-34	75.0	137.3	54.6		1939	6-13	68.7	138.1	49.7
1935	29-36	68.7	124.6	55.1			6-14	84.8	158.7	53.4
	29-37	68.7	142.9	48.1			6-15	89.7	175.4	51.2
	29-38	68.7	158.3	43.4			6-16	99.9	190.0	52.6
	29-39	102.0	173.9	58.6		1939	35-42	76.0	129.5	58.7
1935	47- 2	82.4	153.3	53.8			35-43	82.1	151.7	54.1
	47- 3	98.7	174.3	56.6		1939	41-48	78.4	152.3	51.5
1935	50- 5	74.9	154.4	48.5			41-49	99.5	172.1	57.8
	50- 6	74.9	168.2	44.5			41-50	114.7	194.2	59.1
	50- 7	74.9	183.6	40.8			41-51	121.1	211.5	57.3

TABLE F-6 (cont d)

GUELPH’s Cumulative Precipitation Computations

Occurrences of Accumulated Precipitation (mm) Less than 60% of Normal for same Period.

YEAR is analysis year of start week of accumulation.

Year	Week #s	Act l (mm)	Norm(mm)	% of Norm		Year	Week #s	Act l(mm)	Norm(mm)	% of Norm
1939	41-52	125.2	236.7	52.9		1963	11-29	167.0	282.9	59.0
	41- 1	144.7	251.4	57.6		1963	37-44	62.0	137.5	45.1
	41- 2	149.3	269.3	55.4			37-45	62.0	156.9	39.5
	41- 3	150.6	290.3	51.9			40-47	63.8	143.9	44.4
	41- 4	165.3	308.7	53.6		1963	40-48	97.4	167.0	58.3
	41- 5	172.4	326.6	52.8			40-49	105.3	186.8	56.4
	41- 6	201.0	340.3	59.1		1963	51- 6	57.4	146.1	39.3
	41- 7	203.8	355.7	57.3			51- 7	74.2	161.5	45.9
1960	50- 5	51.9	154.4	33.6		1964	2- 9	61.7	140.8	43.8
	50- 6	88.0	168.2	52.3			2-10	67.5	159.1	42.4
	50- 7	90.1	183.6	49.1			2-11	72.1	178.8	40.3
	50- 8	117.0	202.5	57.8			2-12	107.1	196.1	54.6
	50- 9	129.2	220.1	58.7			2-13	114.3	213.3	53.6
1961	11-18	79.3	134.5	59.0			2-14	117.1	233.9	50.1
	11-19	79.3	147.5	53.8			2-15	129.6	250.5	51.7
	11-20	79.3	157.4	50.4			2-16	136.5	265.2	51.5
	11-21	82.6	170.3	48.5			2-17	147.9	282.6	52.3
	11-22	87.7	186.7	47.0			2-18	163.4	293.6	55.7
	11-23	95.4	196.5	48.5			2-19	181.2	306.6	59.1
	11-24	106.4	211.1	50.4			2-20	182.2	316.5	57.6
	11-25	132.3	222.4	59.5		1964	52- 7	71.3	144.3	49.4
1962	1- 8	68.2	138.0	49.4			52- 8	71.3	163.2	43.7
	1- 9	85.0	155.5	54.7			52- 9	88.3	180.7	48.9
	1-10	90.6	173.8	52.1			52-10	94.1	199.0	47.3
	1-11	115.7	193.5	59.8			52-11	98.7	218.7	45.1
1962	23-30	63.7	109.2	58.3			52-12	133.7	236.0	56.7
	23-31	67.3	130.2	51.7			52-13	140.9	253.2	55.6
1962	26-33	70.8	123.8	57.2			52-14	143.7	273.8	52.5
	26-34	77.9	137.3	56.8			52-15	156.2	290.5	53.8
	26-35	87.6	152.8	57.3			52-16	163.1	305.1	53.5
	26-36	89.6	166.9	53.7			52-17	174.5	322.5	54.1
	26-37	89.6	185.2	48.4			52-18	190.0	333.5	57.0
	26-38	106.1	200.5	52.9			52-19	207.8	346.5	60.0
	26-39	111.2	216.2	51.4			52-20	208.8	356.4	58.6
	26-40	116.3	230.9	50.4		1965	35-42	65.6	129.5	50.7
1963	11-18	78.1	134.5	58.1		1965	48- 3	92.6	161.1	57.5
	11-19	81.4	147.5	55.2			48- 4	101.3	179.6	56.4
	11-20	81.9	157.4	52.0		1966	38-45	77.4	138.6	55.9
	11-21	94.9	170.3	55.7			38-46	77.4	161.7	47.9
	11-22	99.0	186.7	53.0			38-47	86.3	174.9	49.4
	11-23	101.1	196.5	51.4			38-48	113.0	198.0	57.1
	11-24	110.8	211.1	52.5			38-49	119.6	217.8	54.9
	11-25	113.6	222.4	51.1		1966	45-52	94.8	163.2	58.1
	11-26	118.5	235.1	50.4		1997	NO DATA			
	11-27	135.0	249.8	54.0		1998	NO DATA			
	11-28	147.5	264.6	55.7		1999	NO DATA			

TABLE F-7

KITCHENER/WATERLOO-WELLINGTON’s Cumulative Precipitation Computations
Occurrences of Accumulated Precipitation (mm) Less than 60% of Normal for same Period.
YEAR is analysis year of start week of accumulation.

Year	Week #s	Act l (mm)	Norm(mm)	% of Norm		Year	Week #s	Act l(mm)	Norm(mm)	% of Norm
1930	1- 8	71.7	137.8	52.0		1933	34-48	139.7	276.8	50.5
1930	43-50	96.8	166.2	58.3			34-49	165.4	299.9	55.2
	43-51	96.8	181.0	53.5			34-50	192.1	321.1	59.8
	43-52	118.2	205.8	57.5		1933	52- 7	66.0	145.2	45.4
	43- 1	118.2	220.2	53.7			52- 8	76.7	162.5	47.2
	43- 2	140.6	239.8	58.6		1934	20-27	39.3	107.5	36.6
	43- 3	148.2	260.8	56.8			20-28	52.0	121.9	42.7
	43- 4	156.6	278.1	56.3			20-29	64.7	139.0	46.5
	43- 5	156.6	295.7	53.0			20-30	90.1	151.0	59.7
	43- 6	164.0	310.6	52.8			20-31	99.0	175.4	56.5
	43- 7	174.9	326.3	53.6			20-32	101.0	186.8	54.1
	43- 8	180.2	343.5	52.5			20-33	106.9	204.7	52.2
	43- 9	193.7	359.4	53.9			20-34	108.2	220.1	49.2
	43-10	193.7	378.0	51.3			20-35	108.2	234.4	46.2
	43-11	194.5	399.5	48.7			20-36	109.5	250.5	43.7
	43-12	196.3	418.4	46.9			20-37	121.4	270.2	44.9
	43-13	258.6	435.2	59.4			20-38	125.0	287.0	43.6
	43-14	271.6	455.7	59.6			20-39	125.0	302.1	41.4
	43-15	282.2	472.4	59.7			20-40	125.0	317.0	39.4
	43-16	285.5	487.8	58.5			20-41	135.1	335.6	40.3
	43-17	288.8	507.2	56.9			20-42	154.1	359.6	42.9
	43-18	293.9	519.4	56.6			20-43	160.5	380.9	42.1
	43-19	302.0	532.9	56.7			20-44	170.7	394.4	43.3
	43-20	318.1	543.1	58.6			20-45	205.5	413.0	49.8
	43-21	329.1	557.2	59.1			20-46	208.0	437.7	47.5
	43-22	338.8	573.1	59.1			20-47	209.8	452.0	46.4
	43-23	346.4	584.4	59.3			20-48	224.0	481.5	46.5
	43-24	354.3	597.7	59.3			20-49	232.9	504.6	46.2
1931	26-33	61.4	126.6	48.5			20-50	238.2	525.7	45.3
1932	21-28	57.2	111.8	51.2			20-51	244.6	540.6	45.3
	21-29	75.0	128.9	58.2			20-52	248.9	565.3	44.0
	21-30	79.6	140.8	56.5			20- 1	274.7	579.8	47.4
	21-31	88.5	165.2	53.6			20- 2	304.9	599.3	50.9
1932	26-33	56.6	126.6	44.7			20- 3	332.6	620.4	53.6
	26-34	56.6	142.0	39.9			20- 4	343.5	637.7	53.9
	26-35	65.2	156.3	41.7			20- 5	346.8	655.3	52.9
	26-36	102.1	172.4	59.2			20- 6	356.5	670.2	53.2
	26-37	108.2	192.1	56.3			20- 7	356.5	685.8	52.0
	26-38	108.2	209.0	51.8			20- 8	363.6	703.1	51.7
1933	34-41	77.6	131.0	59.3			20- 9	366.1	719.0	50.9
	34-42	77.6	154.9	50.1			20-10	385.9	737.6	52.3
	34-43	83.2	176.2	47.2			20-11	385.9	759.1	50.8
	34-44	93.7	189.7	49.4			20-12	388.9	778.0	50.0
	34-45	93.7	208.3	45.0			20-13	401.1	794.7	50.5
	34-46	97.8	233.0	42.0			20-14	402.4	815.3	49.4
	34-47	139.7	247.3	56.5			20-15	402.4	832.0	48.4

TABLE F-7 (cont d)

KITCHENER/WATERLOO-WELLINGTON’s Cumulative Precipitation Computations
Occurrences of Accumulated Precipitation (mm) Less than 60% of Normal for same Period.
YEAR is analysis year of start week of accumulation.

Year	Week #s	Act l (mm)	Norm(mm)	% of Norm		Year	Week #s	Act l(mm)	Norm(mm)	% of Norm
1934	20-16	412.5	847.3	48.7		1935	47-18	206.6	441.3	46.8
	20-17	422.7	866.8	48.8			47-19	242.1	454.8	53.2
	20-18	430.3	879.0	49.0			47-20	262.4	464.9	56.4
	20-19	465.8	892.5	52.2			47-21	267.4	479.0	55.8
	20-20	486.1	902.6	53.9			47-22	267.4	495.0	54.0
	20-21	491.1	916.7	53.6			47-23	282.7	506.3	55.8
	20-22	491.1	932.7	52.7			47-24	285.2	519.6	54.9
	20-23	506.4	944.0	53.6			47-25	305.5	532.9	57.3
1934	20-24	508.9	957.3	53.2			47-26	311.9	546.7	57.1
	20-25	529.2	970.6	54.5			47-27	314.2	562.3	55.9
	20-26	535.6	984.4	54.4			47-28	319.5	576.7	55.4
	20-27	537.9	1000.0	53.8			47-29	320.8	593.8	54.0
	20-28	543.2	1014.4	53.6			47-30	323.3	605.8	53.4
	20-29	544.5	1031.5	52.8			47-31	323.3	630.2	51.3
	20-30	547.0	1043.5	52.4			47-32	325.1	641.6	50.7
	20-31	547.0	1067.9	51.2			47-33	328.1	659.5	49.8
	20-32	548.8	1079.3	50.9			47-34	328.1	674.9	48.6
	20-33	551.8	1097.2	50.3			47-35	372.0	689.2	54.0
	20-34	551.8	1112.6	49.6			47-36	383.2	705.3	54.3
	20-35	595.7	1126.9	52.9			47-37	383.2	725.0	52.9
	20-36	606.9	1143.0	53.1			47-38	383.2	741.9	51.7
	20-37	606.9	1162.7	52.2			47-39	401.7	757.0	53.1
	20-38	606.9	1179.6	51.5			47-40	439.4	771.8	56.9
	20-39	625.4	1194.6	52.4			47-41	444.0	790.4	56.2
	20-40	663.1	1209.5	54.8		1936	38-45	74.2	142.8	52.0
	20-41	667.7	1228.1	54.4			38-46	74.2	167.5	44.3
	20-42	738.3	1252.1	59.0			38-47	89.7	181.8	49.3
	20-43	762.9	1273.4	59.9			38-48	96.1	211.3	45.5
	20-44	766.7	1286.9	59.6			38-49	96.1	234.4	41.0
	20-45	779.2	1305.5	59.7			38-50	98.9	255.6	38.7
1935	47- 2	81.2	161.6	50.2			38-51	120.7	270.4	44.6
	47- 3	108.9	182.7	59.6			38-52	135.8	295.2	46.0
	47- 4	119.8	200.0	59.9			38- 1	153.6	309.6	49.6
	47- 5	123.1	217.6	56.6			38- 2	177.5	329.2	53.9
	47- 6	132.8	232.5	57.1			38- 3	187.7	350.2	53.6
	47- 7	132.8	248.1	53.5		1937	7-14	76.0	145.1	52.4
	47- 8	139.9	265.4	52.7			7-15	78.5	161.8	48.5
	47- 9	142.4	281.3	50.6			7-16	95.1	177.2	53.7
	47-10	162.2	299.9	54.1		1937	26-33	66.7	126.6	52.7
	47-11	162.2	321.4	50.5		1937	43-50	93.6	166.2	56.3
	47-12	165.2	340.3	48.6		1937	45-52	85.2	171.0	49.8
	47-13	177.4	357.0	49.7			45- 1	85.2	185.4	46.0
	47-14	178.7	377.6	47.3			45- 2	104.3	205.0	50.9
	47-15	178.7	394.3	45.3			45- 3	108.1	226.0	47.8
	47-16	188.8	409.6	46.1			45- 4	114.5	243.3	47.1
	47-17	199.0	429.1	46.4			45- 5	117.0	260.9	44.9

TABLE F-7 (cont d)

KITCHENER/WATERLOO-WELLINGTON's Cumulative Precipitation Computations
Occurrences of Accumulated Precipitation (mm) Less than 60% of Normal for same Period.
YEAR is analysis year of start week of accumulation.

Year	Week #s	Act l (mm)	Norm(mm)	% of Norm		Year	Week #s	Act l(mm)	Norm(mm)	% of Norm
1937	45- 6	123.3	275.8	44.7		1998	31-38	76.0	136.1	55.9
	45- 7	139.3	291.5	47.8		1998	34-41	61.0	131.0	46.6
	45- 8	140.1	308.8	45.4			34-42	71.4	154.9	46.1
	45- 9	140.1	324.6	43.2			34-43	92.6	176.2	52.6
	45-10	152.8	343.2	44.5		1998	44-51	86.4	159.7	54.1
	45-11	152.8	364.7	41.9			44-52	93.0	184.4	50.4
	45-12	152.8	383.6	39.8			44- 1	101.6	198.9	51.1
	45-13	166.3	400.4	41.5			44- 2	105.1	218.4	48.1
	45-14	174.3	420.9	41.4		1998	44- 3	106.5	239.5	44.5
	45-15	178.9	437.6	40.9			44- 4	127.9	256.8	49.8
	45-16	186.5	453.0	41.2			44- 5	136.1	274.4	49.6
	45-17	187.3	472.4	39.7			44- 6	147.3	289.3	50.9
	45-18	194.9	484.6	40.2			44- 7	153.1	304.9	50.2
	45-19	200.0	498.1	40.2			44- 8	154.1	322.2	47.8
	45-20	232.9	508.3	45.8			44- 9	154.5	338.1	45.7
	45-21	248.1	522.4	47.5			44-10	157.1	356.7	44.1
1965	47- 6	111.4	232.5	47.9			44-11	188.7	378.2	49.9
	47- 7	111.4	248.1	44.9			44-12	190.3	397.1	47.9
	47- 8	128.7	265.4	48.5			44-13	203.9	413.8	49.3
	47- 9	137.1	281.3	48.7			44-14	248.7	434.4	57.3
	47-10	138.9	299.9	46.3			44-15	248.7	451.1	55.1
	47-11	147.3	321.4	45.8			44-16	269.5	466.4	57.8
	47-12	163.1	340.3	47.9			44-17	271.1	485.9	55.8
	47-13	175.0	357.0	49.0		1999	24-31	62.4	123.9	50.4
	47-14	185.1	377.6	49.0			24-32	76.4	135.2	56.5
	47-15	203.6	394.3	51.6			24-33	86.2	153.2	56.3
	47-16	215.5	409.6	52.6		1999	28-35	49.2	126.9	38.8
1966	39-46	80.8	150.7	53.6			28-36	53.6	143.0	37.5
	39-47	85.1	165.0	51.6			28-37	53.6	162.6	33.0
	39-48	116.6	194.5	60.0			28-38	84.4	179.5	47.0
	39-49	126.0	217.6	57.9			28-39	92.0	194.6	47.3
1997	52- 7	75.2	145.2	51.8			28-40	121.0	209.5	57.8
1998	10-17	81.6	147.8	55.2						

***Note: The analysis years 1932 and 1939 have missing daily precipitation values The CPI is not calculated during the missing value periods.

TABLE F-8

MT. FOREST/REDICKVILLE's Cumulative Precipitation Computations
Occurrences of Accumulated Precipitation (mm) Less than 60% of Normal for same Period.
YEAR is analysis year of start week of accumulation.

Year	Week #s	Act l (mm)	Norm(mm)	% of Norm
1930	1- 8	76.3	167.9	45.5
	1- 9	86.5	183.7	47.1
	1-10	95.6	199.5	47.9
	1-11	99.4	221.4	44.9
	1-12	115.4	243.2	47.5
1930	18-25	69.5	120.8	57.5
1930	20-27	69.1	119.1	58.0
	20-28	76.7	133.0	57.7
	20-29	83.9	152.3	55.1
1930	24-31	70.7	125.6	56.3
	24-32	75.0	138.5	54.2
	24-33	77.0	156.2	49.3
	24-34	77.0	171.4	44.9
	24-35	91.2	184.2	49.5
	24-36	96.3	203.0	47.5
	24-37	100.6	220.0	45.7
	24-38	106.9	237.2	45.1
	24-39	107.7	254.2	42.4
	24-40	107.7	268.6	40.1
	24-41	112.3	289.2	38.8
	24-42	119.4	312.7	38.2
	24-43	139.7	334.2	41.8
	24-44	146.2	348.8	41.9
	24-45	158.2	361.8	43.7
	24-46	167.9	381.3	44.0
	24-47	169.2	396.2	42.7
	24-48	171.5	417.1	41.1
	24-49	171.5	440.2	39.0
	24-50	172.5	463.8	37.2
	24-51	172.5	480.8	35.9
	24-52	174.3	510.3	34.2
	24- 1	176.1	529.6	33.3
	24- 2	185.3	551.8	33.6
	24- 3	195.5	575.5	34.0
	24- 4	200.1	597.2	33.5
	24- 5	202.9	615.5	33.0
	24- 6	202.9	635.3	31.9
	24- 7	210.8	657.3	32.1
	24- 8	222.0	678.1	32.7
	24- 9	224.0	693.9	32.3
	24-10	230.6	709.7	32.5
	24-11	230.6	731.7	31.5
	24-12	230.6	753.4	30.6
	24-13	263.8	772.3	34.2
	24-14	289.5	792.2	36.5
	24-15	292.3	811.8	36.0
1930	24-16	300.7	829.2	36.3
	24-17	307.8	847.4	36.3
	24-18	320.6	863.9	37.1
	24-19	327.0	880.8	37.1
	24-20	341.7	893.5	38.2
	24-21	379.3	909.4	41.7
	24-22	387.2	926.5	41.8
	24-23	392.3	940.4	41.7
	24-24	397.2	954.9	41.6
	24-25	402.3	968.1	41.6
	24-26	402.3	984.3	40.9
	24-27	412.2	999.9	41.2
	24-28	436.4	1013.7	43.1
	24-29	440.9	1033.1	42.7
	24-30	442.7	1045.5	42.3
	24-31	446.5	1066.0	41.9
	24-32	446.5	1078.9	41.4
	24-33	446.5	1096.6	40.7
	24-34	462.6	1111.8	41.6
	24-35	473.0	1124.6	42.1
	24-36	478.0	1143.4	41.8
	24-37	480.6	1160.4	41.4
	24-38	481.4	1177.6	40.9
	24-39	485.4	1194.6	40.6
	24-40	486.9	1209.0	40.3
	24-41	490.4	1229.6	39.9
	24-42	490.7	1253.1	39.2
	24-43	494.0	1274.6	38.8
	24-44	495.5	1289.2	38.4
	24-45	498.6	1302.2	38.3
	24-46	505.2	1321.7	38.2
	24-47	510.5	1336.6	38.2
	24-48	514.8	1357.5	37.9
	24-49	552.1	1380.6	40.0
	24-50	553.4	1404.2	39.4
	24-51	553.4	1421.2	38.9
	24-52	560.0	1450.7	38.6
	24- 1	563.0	1470.0	38.3
	24- 2	566.8	1492.2	38.0
	24- 3	581.0	1515.9	38.3
	24- 4	606.4	1537.6	39.4
	24- 5	608.4	1555.9	39.1
	24- 6	621.1	1575.7	39.4
	24- 7	637.9	1597.7	39.9
	24- 8	639.9	1618.5	39.5
	24- 9	648.3	1634.3	39.7

TABLE F-8 (cont d)

MT. FOREST/REDICKVILLE’s Cumulative Precipitation Computations
Occurrences of Accumulated Precipitation (mm) Less than 60% of Normal for same Period.
YEAR is analysis year of start week of accumulation.

Year	Week #s	Act l (mm)	Norm(mm)	% of Norm		Year	Week #s	Act l(mm)	Norm(mm)	% of Norm
1930	24-10	648.3	1650.1	39.3		1930	24- 4	1260.9	2478.0	50.9
	24-11	659.7	1672.1	39.5			24- 5	1268.0	2496.3	50.8
	24-12	677.0	1693.8	40.0			24- 6	1289.0	2516.1	51.2
	24-13	680.1	1712.7	39.7			24- 7	1304.0	2538.1	51.4
	24-14	706.3	1732.6	40.8			24- 8	1310.9	2558.9	51.2
	24-15	727.6	1752.2	41.5			24- 9	1384.1	2574.7	53.8
	24-16	731.4	1769.6	41.3			24-10	1390.2	2590.5	53.7
	24-17	735.0	1787.8	41.1			24-11	1431.8	2612.5	54.8
	24-18	743.9	1804.3	41.2			24-12	1441.5	2634.2	54.7
	24-19	747.0	1821.2	41.0			24-13	1441.5	2653.1	54.3
	24-20	760.5	1833.9	41.5			24-14	1473.2	2673.0	55.1
	24-21	772.6	1849.8	41.8			24-15	1484.3	2692.6	55.1
	24-22	792.4	1866.9	42.4			24-16	1488.9	2710.0	54.9
	24-23	798.2	1880.8	42.4			24-17	1513.1	2728.2	55.5
	24-24	824.8	1895.3	43.5			24-18	1521.0	2744.7	55.4
	24-25	835.2	1908.5	43.8			24-19	1539.5	2761.6	55.8
	24-26	839.0	1924.7	43.6			24-20	1542.1	2774.3	55.6
	24-27	851.7	1940.3	43.9			24-21	1545.1	2790.2	55.4
	24-28	865.7	1954.1	44.3			24-22	1552.2	2807.3	55.3
	24-29	896.2	1973.5	45.4			24-23	1583.0	2821.2	56.1
	24-30	907.9	1985.9	45.7			24-24	1597.7	2835.7	56.3
	24-31	914.3	2006.4	45.6			24-25	1606.1	2848.9	56.4
	24-32	923.9	2019.3	45.8			24-26	1612.9	2865.1	56.3
	24-33	932.8	2037.0	45.8			24-27	1621.2	2880.7	56.3
	24-34	932.8	2052.2	45.5			24-28	1650.7	2894.5	57.0
	24-35	933.3	2065.0	45.2			24-29	1665.4	2913.9	57.2
	24-36	942.4	2083.8	45.2			24-30	1677.0	2926.3	57.3
	24-37	945.0	2100.8	45.0			24-31	1681.6	2946.8	57.1
	24-38	945.0	2118.0	44.6			24-32	1695.0	2959.7	57.3
	24-39	954.2	2135.0	44.7			24-33	1704.6	2977.4	57.3
	24-40	964.9	2149.4	44.9			24-34	1704.6	2992.6	57.0
	24-41	964.9	2170.0	44.5		1934	21-28	66.8	120.2	55.6
	24-42	964.9	2193.4	44.0			21-29	72.1	139.6	51.7
	24-43	966.7	2215.0	43.6		1934	24-31	57.8	125.6	46.0
	24-44	982.8	2229.6	44.1			24-32	65.9	138.5	47.6
	24-45	989.6	2242.6	44.1			24-33	74.8	156.2	47.9
	24-46	991.9	2262.1	43.9			24-34	82.9	171.4	48.4
	24-47	1023.9	2277.0	45.0			24-35	82.9	184.2	45.0
	24-48	1032.5	2297.9	44.9			24-36	82.9	203.0	40.8
	24-49	1107.1	2321.0	47.7			24-37	93.6	220.0	42.6
	24-50	1107.9	2344.6	47.3			24-38	96.1	237.2	40.5
	24-51	1137.9	2361.6	48.2			24-39	96.1	254.2	37.8
	24-52	1159.0	2391.1	48.5			24-40	96.1	268.6	35.8
	24- 1	1194.6	2410.4	49.6			24-41	113.9	289.2	39.4
	24- 2	1211.1	2432.6	49.8			24-42	124.3	312.7	39.8
	24- 3	1235.0	2456.3	50.3			24-43	128.1	334.2	38.3

TABLE F-8 (cont d)

MT. FOREST/REDICKVILLE’s Cumulative Precipitation Computations
Occurrences of Accumulated Precipitation (mm) Less than 60% of Normal for same Period.
YEAR is analysis year of start week of accumulation.

Year	Week #s	Act l (mm)	Norm(mm)	% of Norm		Year	Week #s	Act l(mm)	Norm(mm)	% of Norm
1934	24-44	128.1	348.8	36.7		1939	52-10	112.7	228.9	49.2
	24-45	149.2	361.8	41.2			52-11	130.5	250.8	52.0
	24-46	154.5	381.3	40.5			52-12	143.5	272.6	52.6
	24-47	166.4	396.2	42.0			52-13	153.1	291.5	52.5
	24-48	190.1	417.1	45.6			52-14	173.9	311.4	55.8
	24-49	200.0	440.2	45.4			52-15	181.8	331.0	54.9
	24-50	202.5	463.8	43.7			52-16	199.4	348.4	57.2
	24-51	202.5	480.8	42.1		1962	24-31	75.3	125.6	59.9
	24-52	209.1	510.3	41.0		1962	26-33	69.0	128.4	53.7
	24- 1	228.1	529.6	43.1			26-34	75.6	143.7	52.6
	24- 2	254.1	551.8	46.1		1962	29-36	75.8	129.6	58.5
	24- 3	261.2	575.5	45.4			29-37	75.8	146.6	51.7
	24- 4	280.5	597.2	47.0		1962	39-46	80.1	144.12	55.6
	24- 5	284.8	615.5	46.3		1963	12-19	87.0	149.1	58.4
	24- 6	300.3	635.3	47.3			12-20	93.2	161.8	57.6
	24- 7	300.6	657.3	45.7		1963	18-25	69.9	120.8	57.9
	24- 8	333.6	678.1	49.2			18-26	72.8	137.0	53.15
	24- 9	376.3	693.9	54.2		1963	37-44	79.1	145.8	54.3
	24-10	406.1	709.7	57.2			37-45	79.1	158.9	49.8
	24-11	429.0	731.7	58.6		1963	51- 6	67.3	171.5	39.2
1935	44-51	70.7	146.6	48.2			51- 7	75.7	193.5	39.1
	44-52	82.8	176.0	47.0		1964	2- 9	79.3	164.4	48.3
	44- 1	92.2	195.3	47.2			2-10	84.1	180.2	46.7
	44- 2	103.1	217.6	47.4			2-11	102.9	202.1	50.9
	44- 3	124.0	241.2	51.4		1964	22-29	70.3	123.7	56.8
	44- 4	144.0	263.0	54.8		1964	52- 7	89.5	176.5	50.7
1936	38-45	71.3	141.9	50.3			52- 8	90.8	197.3	46.0
	38-46	71.3	161.4	44.2			52- 9	117.6	213.1	55.2
	38-47	79.5	176.3	45.1			52-10	122.4	228.9	53.5
	38-48	81.8	197.1	41.5			52-11	141.2	250.8	56.3
	38-49	82.3	220.3	37.4			37-44	54.7	145.8	37.5
	38-50	82.3	243.8	33.8		1965	37-45	82.9	158.9	52.2
	38-51	112.3	260.9	43.1			37-46	94.9	178.4	53.2
	38-52	156.4	290.3	53.9			37-47	105.3	193.3	54.5
1939	4-11	72.7	156.2	46.5			37-48	114.2	214.1	53.3
	4-12	85.7	178.0	48.2		1966	42-49	40.8	151.0	27.0
	4-13	95.3	196.9	48.4			42-50	83.2	174.6	47.7
	4-14	116.1	216.8	53.6		1998	10-17	85.2	153.5	55.5
	4-15	124.0	236.3	52.5		1998	30-37	70.8	127.3	55.6
	4-16	141.6	253.7	55.8			30-38	75.2	144.5	52.1
1939	36-43	89.3	150.1	59.5			30-39	86.6	161.6	53.6
1939	52- 7	89.2	176.5	50.6			30-40	91.2	175.9	51.8
	52- 8	103.5	197.3	52.5			30-41	107.8	196.5	54.9
	52- 9	103.5	213.1	48.6			30-42	116.0	220.0	52.7

***Note: The analysis years 1933, 1934, 1961 and 1997 have missing daily precipitation values The CPI is not calculated during the missing value periods.

TABLE F-8 (cont d)

MT. FOREST/REDICKVILLE’s Cumulative Precipitation Computations
Occurrences of Accumulated Precipitation (mm) Less than 60% of Normal for same Period.
YEAR is analysis year of start week of accumulation.

Year	Week #s	Act l (mm)	Norm(mm)	% of Norm		Year	Week #s	Act l(mm)	Norm(mm)	% of Norm
1998	30-43	127.2	241.6	52.7		1998	50- 8	129.2	237.9	54.3
	30-44	140.4	256.1	54.8		1999	3-10	71.0	157.9	45.0
1998	40-47	82.4	142.0	58.0			3-11	104.4	179.9	58.0
	40-48	92.0	162.9	56.5			3-12	108.0	201.6	53.6
1998	50- 5	98.2	175.3	56.0		1999	28-35	71.4	124.7	57.3
	50- 6	101.2	195.1	51.9			28-36	76.8	143.5	53.5
	50- 7	105.2	217.1	48.5			28-37	93.6	160.5	58.3

TABLE F-9

STRATFORD's Cumulative Precipitation Computations

Occurrences of Accumulated Precipitation (mm) Less than 60% of Normal for same Period.

YEAR is analysis year of start week of accumulation.

Year	Week #s	Act l (mm)	Norm(mm)	% of Norm		Year	Week #s	Act l(mm)	Norm(mm)	% of Norm
1930	1- 8	84.0	168.0	50.0		1935	27-34	77.1	142.1	54.2
1930	43-50	78.0	159.5	48.9		1935	30-37	75.2	146.3	51.4
	43-51	78.0	175.7	44.4			30-38	75.2	158.8	47.4
	43-52	95.3	198.9	47.9			30-39	103.6	176.3	58.8
	43- 1	96.6	220.6	43.8		1935	47- 2	100.1	169.1	59.2
	43- 2	111.1	243.5	45.6			47- 3	107.2	192.5	55.7
	43- 3	118.0	266.9	44.2			47- 4	123.5	215.7	57.3
	43- 4	131.9	290.1	45.5			47- 5	128.1	235.5	54.4
	43- 5	134.4	309.9	43.4			47- 6	141.6	254.7	55.6
	43- 6	141.8	329.1	43.1			47- 7	141.6	271.7	52.1
	43- 7	173.1	346.1	50.0			47- 8	171.3	292.5	58.6
	43- 8	192.1	366.9	52.4		1936	12-19	111.2	198.3	56.1
	43- 9	203.3	384.9	52.8			12-20	127.8	215.2	59.4
	43-10	218.8	407.9	53.6		1936	41-48	39.3	155.9	25.2
	43-11	218.8	430.6	50.8			41-49	40.1	173.6	23.1
	43-12	220.6	455.0	48.5			41-50	45.2	195.6	23.1
	43-13	286.7	477.9	60.0			41-51	48.7	211.8	23.0
1931	15-22	110.4	185.9	59.4			41-52	64.2	235.0	27.3
1931	26-33	79.8	143.7	55.5			41- 1	71.6	256.7	27.9
1933	12-19	98.4	198.3	49.6			41- 2	104.7	279.5	37.5
	12-20	100.5	215.2	46.7			41- 3	117.9	303.0	38.9
	12-21	122.5	236.0	51.9			41- 4	178.9	326.1	54.9
	12-22	126.8	259.5	48.9			41- 5	206.9	346.0	59.8
	12-23	157.2	278.9	56.4		1937	10-17	116.1	197.4	58.8
	12-24	157.2	297.6	52.8		1938	8-15	93.1	184.3	50.5
	12-25	167.3	312.8	53.5			8-16	108.3	209.4	51.7
	12-26	176.2	330.2	53.4			8-17	109.1	236.2	46.2
	12-27	180.0	347.0	51.9			8-18	121.7	256.9	47.4
	12-28	203.3	363.1	56.0			8-19	128.8	282.8	45.6
	12-29	219.0	381.3	57.4			8-20	147.9	299.6	49.4
	12-30	229.2	397.0	57.7			8-21	157.1	320.4	49.0
1933	36-43	52.8	142.6	37.0			8-22	171.6	344.0	49.9
	36-44	70.8	156.2	45.3		1938	39-46	87.0	145.5	59.8
	36-45	74.6	173.1	43.1			39-47	90.1	160.4	56.2
	36-46	91.4	197.6	46.3		1938	42-49	77.6	158.1	49.1
	36-47	109.0	212.5	51.3		1938	51- 6	83.8	169.5	49.4
	36-48	109.0	243.0	44.9		1939	1- 8	84.0	168.0	50.0
	36-49	131.9	260.7	50.6			1- 9	84.0	186.1	45.2
	36-50	166.2	282.7	58.8			1-10	92.9	209.0	44.4
1934	32-39	80.6	135.5	59.5			1-11	110.5	231.7	47.7
	32-40	80.6	153.0	52.7			1-12	127.0	256.2	49.6
1934	43-50	86.4	159.5	54.2			1-13	147.3	279.0	52.8
	43-51	94.8	175.7	54.0			1-14	165.1	305.3	54.1
	43-52	96.1	198.9	48.3			1-15	173.0	331.6	52.2
	43- 1	113.7	220.6	51.6			1-16	187.0	356.7	52.4
1934	52- 7	97.2	170.4	57.0			1-17	213.4	383.4	55.7

TABLE F-9 (cont d)

STRATFORD’s Cumulative Precipitation Computations
Occurrences of Accumulated Precipitation (mm) Less than 60% of Normal for same Period.
YEAR is analysis year of start week of accumulation.

Year	Week #s	Act l (mm)	Norm(mm)	% of Norm		Year	Week #s	Act l(mm)	Norm(mm)	% of Norm
1939	1-18	236.9	404.1	58.6		1961	12-33	256.7	456.5	56.2
	1-19	250.4	430.0	58.2			12-34	278.6	472.4	59.0
	1-20	260.6	446.9	58.3		1962	16-23	88.9	179.0	49.7
1939	50- 5	90.6	172.4	52.6			16-24	109.7	197.7	55.5
	50- 6	90.6	191.5	47.3		1962	23-30	66.9	137.5	48.7
	50- 7	104.3	208.6	50.0			23-31	69.2	162.6	42.6
	50- 8	115.4	229.3	50.3			23-32	94.4	175.6	53.8
	50- 9	115.4	247.4	46.6			23-33	103.6	197.0	52.6
	50-10	124.3	270.4	46.0			23-34	112.2	212.8	52.7
	50-11	141.9	293.0	48.4		1962	30-37	85.6	146.3	58.5
	50-12	158.4	317.5	49.9			30-38	94.5	158.8	59.5
	50-13	178.7	340.3	52.5			30-39	105.7	176.3	60.0
	50-14	196.5	366.7	53.6			30-40	113.3	193.8	58.5
	50-15	204.4	392.9	52.0		1962	50- 5	97.3	172.4	56.5
	50-16	218.4	418.0	52.3			50- 6	97.3	191.5	50.8
	50-17	244.8	444.8	55.0			50- 7	102.6	208.6	49.2
	50-18	268.3	465.5	57.6			50- 8	130.5	229.3	56.9
	50-19	281.8	491.4	57.4		1963	16-23	81.6	178.0	45.6
	50-20	292.0	508.2	57.5			16-24	95.3	197.7	48.2
	50-21	313.6	529.0	59.3			16-25	102.9	213.0	48.3
1960	44-51	92.3	156.3	59.1			16-26	110.5	230.3	48.0
	44-52	96.9	179.5	54.0			16-27	126.8	247.1	51.3
	44- 1	97.4	201.2	48.4			16-28	133.5	263.3	50.7
	44- 2	115.2	224.1	51.4			16-29	144.7	281.5	51.4
	44- 3	123.8	247.5	50.0			16-30	173.7	297.1	58.5
	44- 4	127.1	270.7	47.0			16-31	175.5	322.3	54.5
	44- 5	160.6	290.5	55.3			16-32	175.5	335.3	52.3
	44- 6	160.6	309.7	51.9			16-33	207.1	356.7	58.1
	44- 7	168.5	326.7	51.6			16-34	212.2	372.5	57.0
	44- 8	192.4	347.5	55.4			16-35	225.2	388.2	58.0
	44- 9	207.6	365.6	56.8		1963	38-45	67.9	133.6	50.8
	44-10	230.8	388.5	59.4		1963	49- 4	89.6	170.3	52.6
1961	12-19	93.1	198.3	46.9			49- 5	94.4	190.1	49.7
	12-20	93.1	215.2	43.3			49- 6	103.5	209.3	49.5
	12-21	99.7	236.0	42.3			49- 7	114.9	226.3	50.8
	12-22	109.6	259.5	42.2		1964	2- 9	54.7	164.4	33.3
	12-23	119.3	278.9	42.8			2-10	60.5	187.3	32.3
	12-24	129.5	297.6	43.5			2-11	70.8	210.0	33.7
	12-25	140.4	312.8	44.9			2-12	114.7	234.5	48.9
	12-26	154.1	330.2	46.7			2-13	117.8	257.3	45.8
	12-27	169.8	347.0	48.9			2-14	129.3	283.6	45.6
	12-28	185.8	363.1	51.2			2-15	154.6	309.9	49.9
	12-29	194.2	381.3	50.9			2-16	195.9	334.9	58.5
	12-30	207.2	397.0	52.2			2-17	213.2	361.7	58.9
	12-31	215.1	422.2	51.0		1964	19-26	93.87	157.8	59.5
	12-32	224.7	435.2	51.6		1964	37-44	73.3	139.6	52.5

TABLE F-9 (cont d)

STRATFORD’s Cumulative Precipitation Computations

Occurrences of Accumulated Precipitation (mm) Less than 60% of Normal for same Period.

YEAR is analysis year of start week of accumulation.

Year	Week #s	Act l (mm)	Norm(mm)	% of Norm		Year	Week #s	Act l(mm)	Norm(mm)	% of Norm
1964	52- 7	92.9	170.4	54.5		1998	46- 1	97.4	170.7	57.1
	52- 8	92.9	191.2	48.6			46- 2	115.0	193.5	59.4
	52- 9	111.2	209.3	53.1		1998	49- 4	96.0	170.3	56.4
	52-10	117.0	232.2	50.4		1998	51- 6	57.0	169.5	33.6
	52-11	127.3	254.9	50.0			51- 7	62.2	186.6	33.3
1965	6-13	62.2	168.0	37.0			51- 8	94.7	207.3	45.7
	6-14	76.5	194.31	39.4			51- 9	134.8	225.4	59.8
	6-15	100.6	220.6	45.6			51-10	140.0	248.4	56.4
	6-16	113.7	245.6	46.3			51-11	160.3	271.0	59.1
	6-17	145.0	272.4	53.2		1999	22-29	85.2	145.4	58.6
	6-18	150.9	293.1	51.5			22-30	85.2	161.0	52.9
	6-19	172.5	319.0	54.1			22-31	86.0	186.2	46.2
	6-20	177.3	335.9	52.8			22-32	99.8	199.2	50.1
1966	39-46	73.7	145.5	50.6			22-33	112.4	220.6	51.0
	39-47	92.0	160.4	57.4			22-34	133.6	236.4	56.5
1966	42-49	91.4	158.1	57.8			22-35	133.6	252.1	53.0
1998	20-27	74.1	148.7	49.8			22-36	137.4	268.7	51.2
1998	30-37	76.8	146.3	52.5			22-37	139.4	291.6	47.8
	30-38	79.8	158.8	50.3			22-38	151.8	304.1	49.9
	30-39	100.9	176.3	57.2			22-39	184.2	321.7	57.3
	30-40	103.7	193.8	53.5			22-40	195.3	339.2	57.6
	30-41	115.7	209.3	55.3			22-41	208.4	354.7	58.8
	30-42	128.1	229.9	55.7			22-42	209.0	375.3	55.7
	30-43	134.1	249.3	53.8		1999	45-52	97.2	165.9	58.6

TABLE F-10

WOODSTOCK's Cumulative Precipitation Computations
Occurrences of Accumulated Precipitation (mm) Less than 60% of Normal for same Period.
YEAR is analysis year of start week of accumulation.

Year	Week #s	Act I (mm)	Norm(mm)	% of Norm		Year	Week #s	Act I(mm)	Norm(mm)	% of Norm
1930	1- 8	48.2	145.5	33.1		1930	41-30	406.0	747.3	54.3
	1- 9	88.3	162.8	54.2			41-31	413.6	769.9	53.7
	1-10	90.4	182.0	49.7			41-32	421.7	783.8	53.8
	1-11	113.7	200.0	56.9			41-33	421.7	803.8	52.5
	1-12	130.0	219.0	59.4			41-34	452.6	820.2	55.2
	1-13	137.2	239.2	57.4			41-35	459.7	835.2	55.0
1930	27-34	73.1	137.8	53.1			41-36	473.4	852.0	55.6
	27-35	78.0	152.7	51.1			41-37	480.8	872.1	55.1
	27-36	79.5	169.6	46.9			41-38	488.1	886.1	55.1
	27-37	99.9	189.6	52.7			41-39	505.1	902.4	56.0
1930	32-39	78.3	132.6	59.1			41-40	546.2	919.6	59.4
	32-40	83.7	149.8	55.9			41-41	547.7	937.1	58.5
1930	41-48	100.4	170.2	59.0			41-42	558.7	961.7	58.1
	41-49	108.1	194.6	55.6			41-43	571.7	984.9	58.1
	41-50	110.7	211.5	52.3		1932	26-33	75.43	133.8	56.4
	41-51	120.1	230.2	52.2			26-34	77.43	150.2	51.6
	41-52	132.3	251.9	52.5			26-35	85.53	165.1	51.8
	41- 1	133.6	266.1	50.2			12-19	72.6	136.0	53.4
	41- 2	133.6	284.5	47.0		1933	32-39	79.0	132.6	59.6
	41- 3	139.7	308.9	45.2		1933	34-41	57.9	133.3	43.4
	41- 4	160.3	328.4	48.8			34-42	58.4	157.9	37.0
	41- 5	160.8	345.9	46.5			34-43	62.4	181.1	34.5
	41- 6	172.6	361.4	47.8			34-44	86.1	196.7	43.8
	41- 7	183.5	378.8	48.4			34-45	87.4	211.7	41.3
	41- 8	186.0	397.4	46.8			34-46	95.3	234.1	40.7
	41- 9	200.6	414.7	48.4			34-47	106.0	249.2	42.5
	41-10	206.6	433.9	47.6			34-48	130.9	286.0	45.8
	41-11	207.6	451.9	45.9			34-49	149.9	310.4	48.3
	41-12	207.9	470.9	44.2			34-50	161.6	327.3	49.4
	41-13	239.4	491.1	48.8			34-51	181.2	346.1	52.4
	41-14	248.8	512.3	48.6			34-52	181.2	367.7	49.3
	41-15	257.0	529.5	48.5			34- 1	182.5	381.9	47.8
	41-16	262.3	545.7	48.1			34- 2	187.8	400.3	46.9
	41-17	268.2	564.1	47.6			34- 3	198.3	424.7	46.7
	41-18	270.8	576.1	47.0			34- 4	228.3	444.2	51.4
	41-19	281.3	587.9	47.9			34- 5	237.2	461.7	51.4
	41-20	289.0	598.3	48.3			34- 6	264.1	477.2	55.3
	41-21	309.0	613.4	50.4			34- 7	280.9	494.7	56.8
	41-22	324.9	632.0	51.4		1934	34-41	76.7	133.3	57.5
	41-23	332.0	640.3	51.9		1934	36-43	88.5	149.7	59.1
	41-24	337.7	654.8	51.6			36-44	97.3	165.3	58.9
	41-25	356.2	670.0	53.2			36-45	107.3	180.3	59.5
	41-26	356.2	682.4	52.2			36-46	112.1	202.7	55.3
	41-27	368.0	697.7	52.8			36-47	114.7	217.9	52.7
	41-28	375.2	712.6	52.7		1934	43-50	94.6	169.4	55.8
	41-29	383.6	731.7	52.4			43-51	108.6	188.2	57.7

TABLE F-10 (cont d)

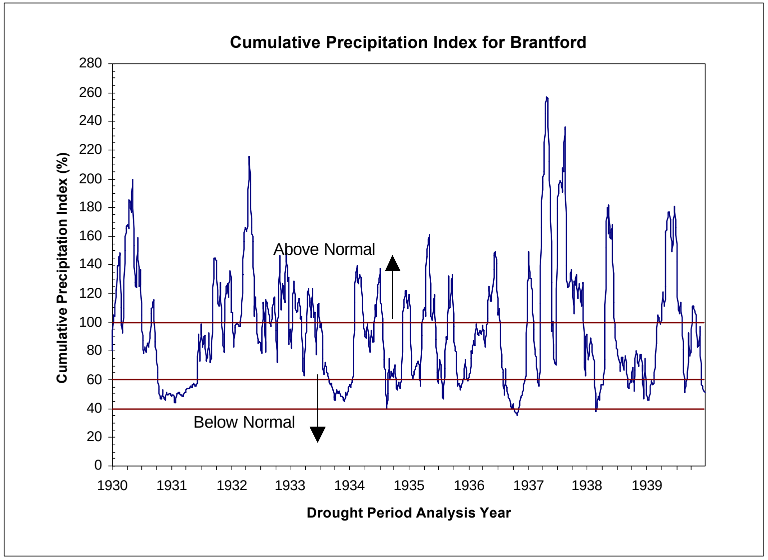
WOODSTOCK’s Cumulative Precipitation Computations
Occurrences of Accumulated Precipitation (mm) Less than 60% of Normal for same Period.
YEAR is analysis year of start week of accumulation.

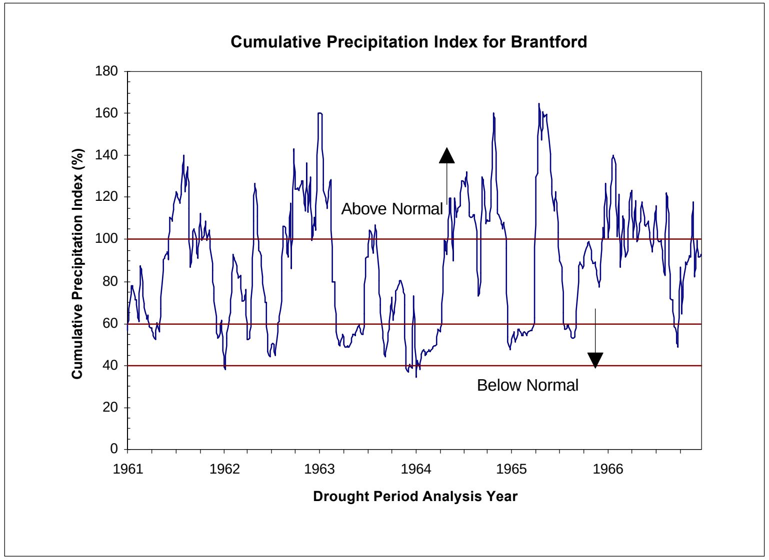
Year	Week #s	Act l (mm)	Norm(mm)	% of Norm		Year	Week #s	Act l(mm)	Norm(mm)	% of Norm
1934	43-52	109.9	209.9	52.4		1939	1-13	138.7	239.2	58.0
1935	30-37	82.3	140.3	58.7		1939	45-52	92.5	171.1	54.1
	30-38	82.3	154.3	53.3			45- 1	97.3	185.3	52.5
1935	43-50	87.9	169.4	51.9			45- 2	121.1	203.7	59.5
	43-51	104.2	188.2	55.4			45- 3	122.4	228.0	53.7
	43-52	107.3	209.9	51.1			45- 4	134.8	247.6	54.5
	43- 1	118.3	224.1	52.8			45- 5	143.2	265.1	54.0
	43- 2	143.0	242.4	59.0		1940	7-14	76.6	150.9	50.8
1935	43- 3	159.5	266.8	59.8			7-15	81.9	168.1	48.7
1936	36-43	75.3	149.7	50.3			7-16	92.7	184.3	50.3
	36-44	78.1	165.3	47.3			7-17	93.8	202.7	46.3
	36-45	78.6	180.3	43.6			7-18	118.0	214.7	55.0
	36-46	78.6	202.7	38.8			7-19	122.1	226.5	53.9
	36-47	99.3	217.9	45.6		1960	47- 2	85.3	166.2	51.3
	36-48	100.6	254.6	39.5			47- 3	87.3	190.6	45.8
	36-49	127.5	279.0	45.7		1960	50- 5	66.5	151.3	43.9
	36-50	130.3	296.0	44.0		1960	52- 7	69.8	148.6	47.0
	36-51	141.6	314.7	45.0			52- 8	89.5	167.1	53.6
	36-52	158.3	336.4	47.1			52- 9	108.2	184.5	58.7
	36- 1	198.4	350.6	56.6		1961	10-17	87.2	149.4	58.4
1936	43-50	101.3	169.4	59.8			10-18	93.6	161.4	58.0
1938	8-15	63.1	150.7	41.9		1961	10-19	94.4	173.2	54.5
	8-16	72.8	166.9	43.6			10-20	94.4	183.6	51.4
	8-17	72.8	185.2	39.3		1963	11-18	80.4	142.2	56.5
	8-18	81.1	197.3	41.1			11-19	81.5	154.0	52.9
	8-19	84.5	209.1	40.4			11-20	81.5	164.3	49.6
	8-20	106.6	219.4	48.6			11-21	100.6	179.5	56.1
	8-21	118.3	234.6	50.4			11-22	109.2	198.1	55.1
	8-22	131.2	253.2	51.8			11-23	110.5	206.4	53.6
1938	41-48	93.4	170.2	54.9			11-24	122.0	220.8	55.3
	41-49	98.7	194.6	50.7			11-25	130.9	236.1	55.5
1938	51- 6	58.6	149.9	39.1			11-26	136.5	248.5	54.9
1939	1- 8	71.2	145.5	49.0			11-27	151.5	263.7	57.5
	1- 9	71.2	162.8	43.7			11-28	165.5	278.6	59.4
	1-10	81.1	182.0	44.6		1963	36-43	81.7	149.7	54.6
	1-11	106.0	200.0	53.0		1998	45-51	588.6	69.0	55.1
	1-12	127.5	219.0	58.2			45-52	615.2	90.7	56.4

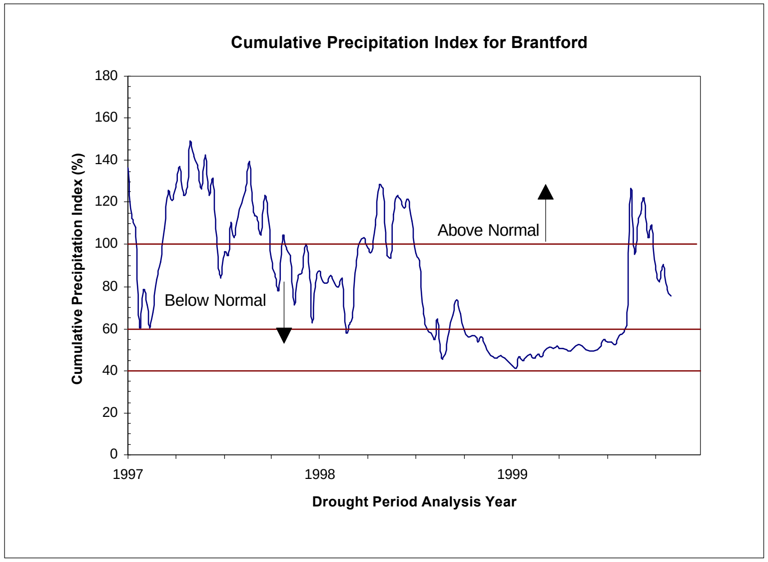
***Note: The analysis years 1961, 1962 and 1963 have missing daily precipitation values. The CPI is not calculated during the missing value periods.

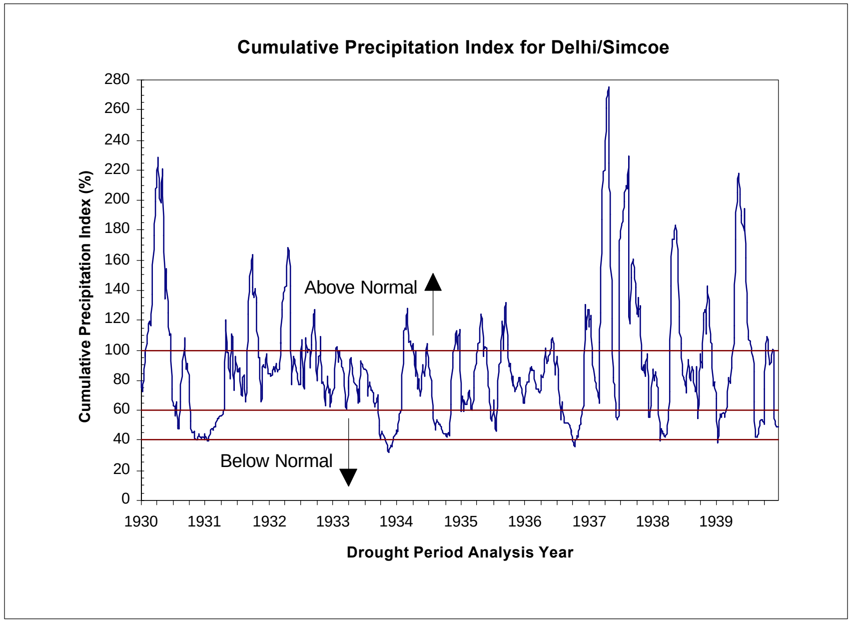
Appendix G

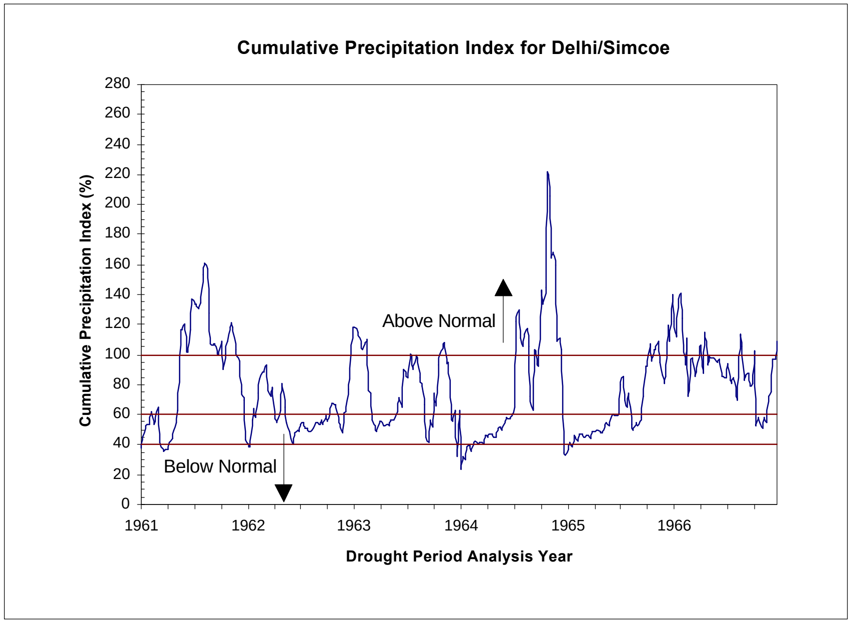
Graphs of Station Cumulative Precipitation Index Computations

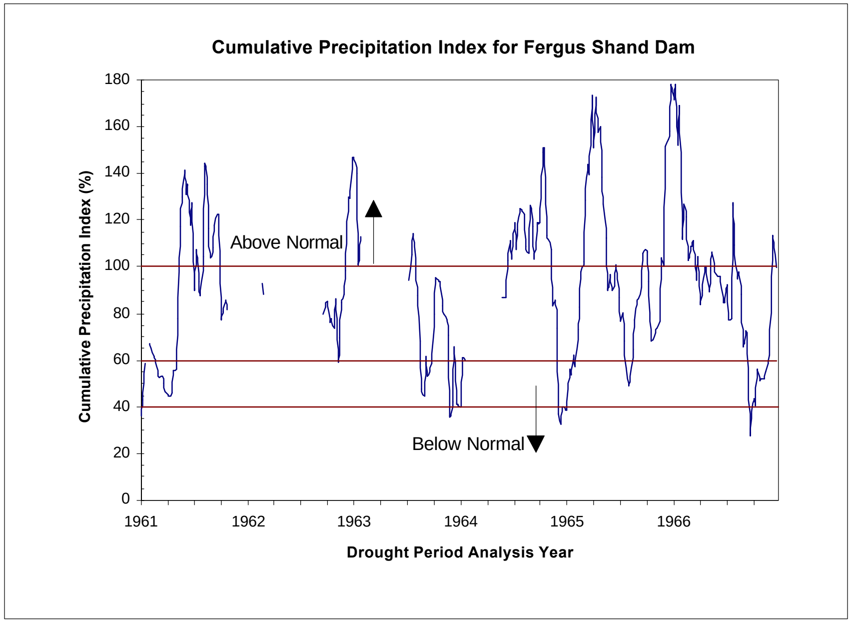

Cumulative Precipitation Index for Brantford
Cumulative Precipitation Index (%)
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
Above Normal
Below Normal
1930
1931
1932
1933
1934
1935
1936
1937
1938
1939
Drought Period Analysis Year

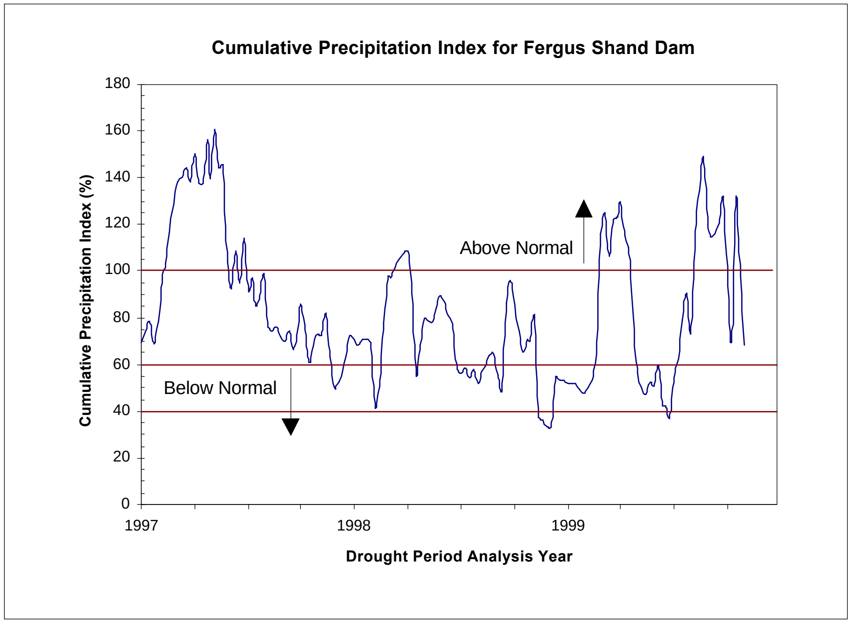

Cumulative Precipitation Index for Brantford
Cumulative Precipitation Index (%)
180
160
140
120
100
80
60
40
20
0
Above Normal
Below Normal
1961
1962
1963
1964
1965
1966
Drought Period Analysis Year


Cumulative Precipitation Index for Brantford
Cumulative Precipitation Index (%)
180
160
140
120
100
80
60
40
20
0
Above Normal
Below Normal
1997
1998
1999
Drought Period Analysis Year


Cumulative Precipitation Index for Delhi/Simcoe
Cumulative Precipitation Index (%)
0
20
40
60
80
100
120
140
160
180
200
220
240
260
280
Above Normal
Below Normal
1930
1931
1932
1933
1934
1935
1936
1937
1938
1939
Drought Period Analysis Year


Cumulative Precipitation Index for Delhi/Simcoe
Cumulative Precipitation Index (%)
0
20
40
60
80
100
120
140
160
180
200
220
240
260
280
Above Normal
Below Normal
1961
1962
1963
1964
1965
1966
Drought Period Analysis Year


Cumulative Precipitation Index for Fergus Shand Dam
Cumulative Precipitation Index (%)
180
160
140
120
100
80
60
40
20
0
1961
1962
1963
1964
1965
1966
Drought Period Analysis Year
Above Normal
Below Normal


Cumulative Precipitation Index for Fergus Shand Dam
Cumulative Precipitation Index (%)
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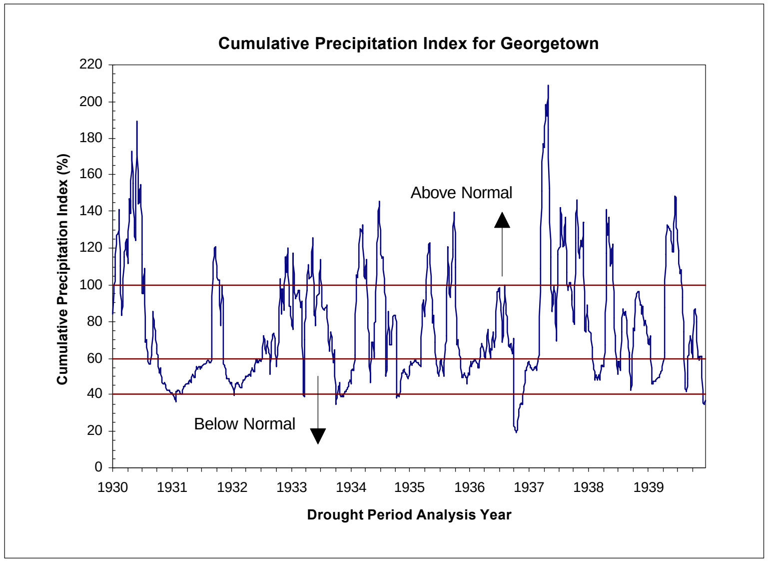
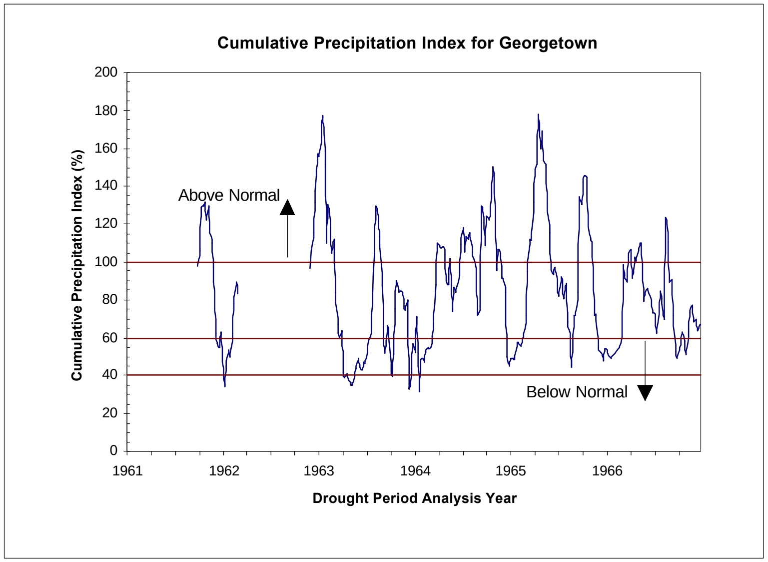
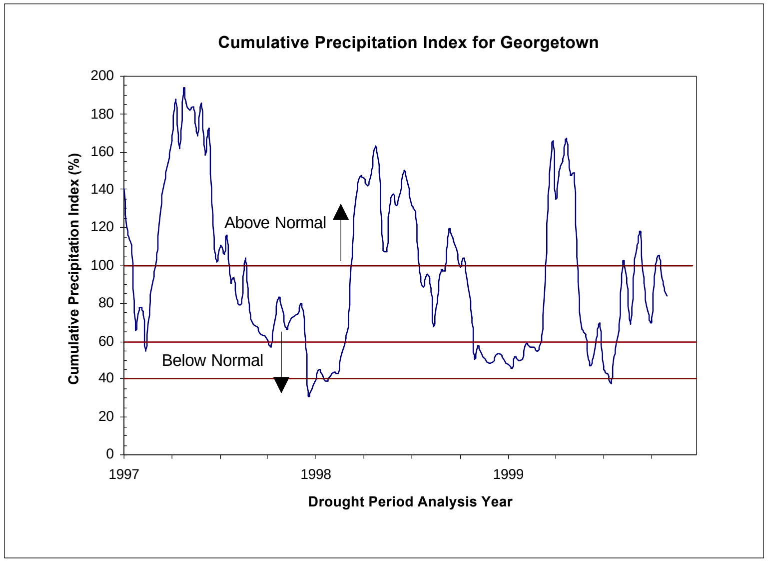
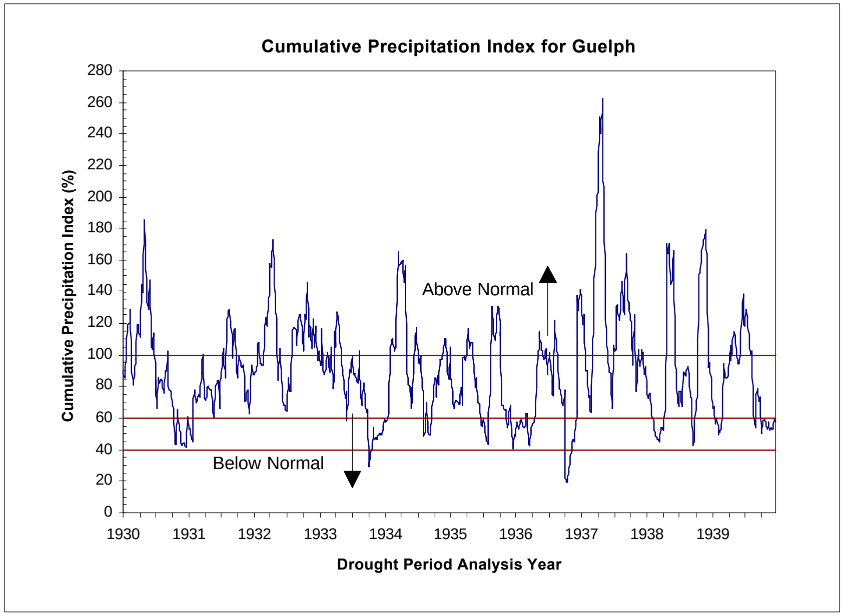
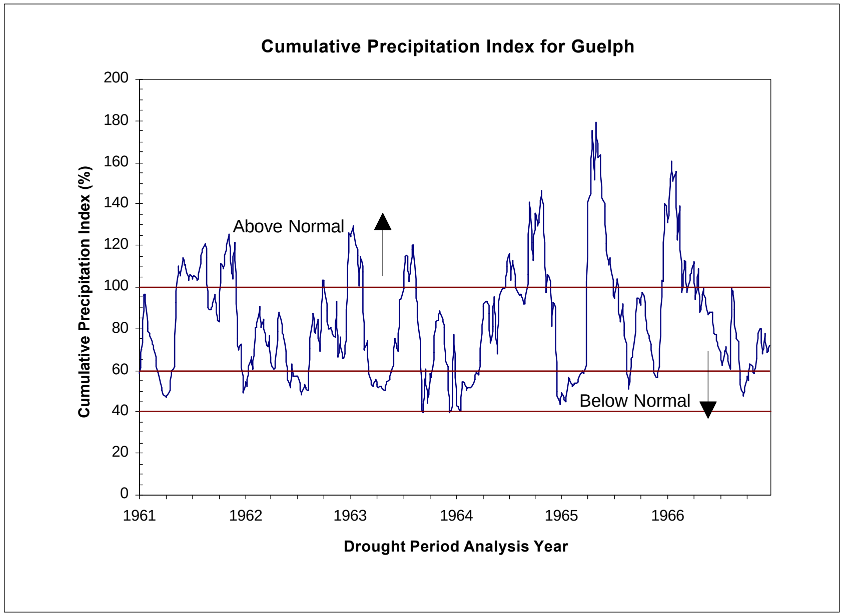
160
140
120
100
80
60
40
20
0
1997
1998
1999
Drought Period Analysis Year
Above Normal
Below Normal

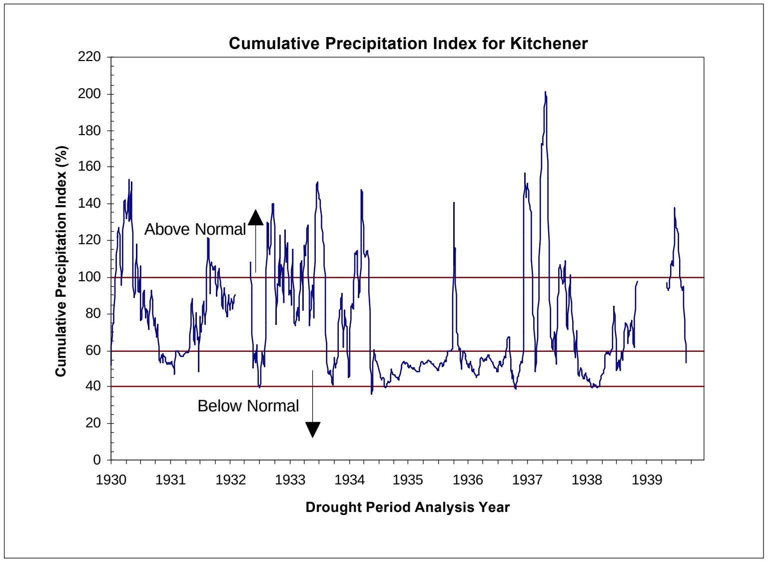

Cumulative Precipitation Index for Georgetown
Cumulative Precipitation Index (%)
220
200
180
160
140
120
100
80
60
40
20
0
Above Normal
Below Normal
1930
1931
1932
1933
1934
1935
1936
1937
1938
1939
Drought Period Analysis Year


Cumulative Precipitation Index for Georgetown
Cumulative Precipitation Index (%)
200
180
160
140
120
100
80
60
40
20
0
Above Normal
Below Normal
1961
1962
1963
1964
1965
1966
Drought Period Analysis Year

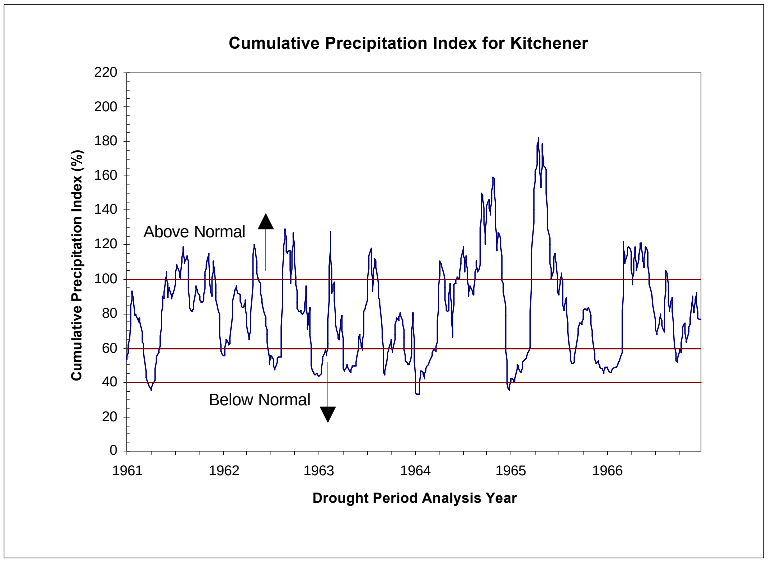

Cumulative Precipitation Index for Georgetown
Cumulative Precipitation Index (%)
200
180
160
140
120
100
80
60
40
20
0
Above Normal
Below Normal
1997
1998
1999
Drought Period Analysis Year


Cumulative Precipitation Index for Guelph
Cumulative Precipitation Index (%)
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
1930
1931
1932
1933
1934
1935
1936
1937
1938
1939
Drought Period Analysis Year
Above Normal
Below Normal

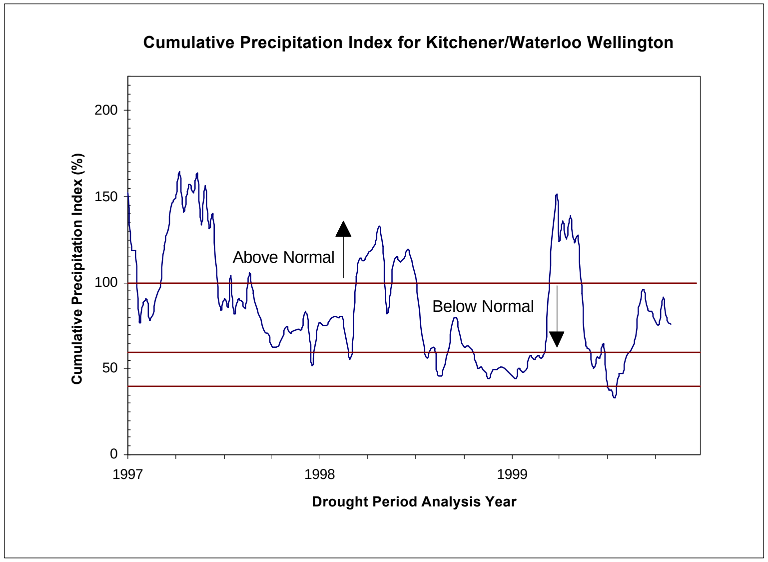

Cumulative Precipitation Index for Guelph
Cumulative Precipitation Index (%)
200
180
160
140
120
100
80
60
40
20
0
1961
1962
1963
1964
1965
1966
Drought Period Analysis Year
Above Normal
Below Normal



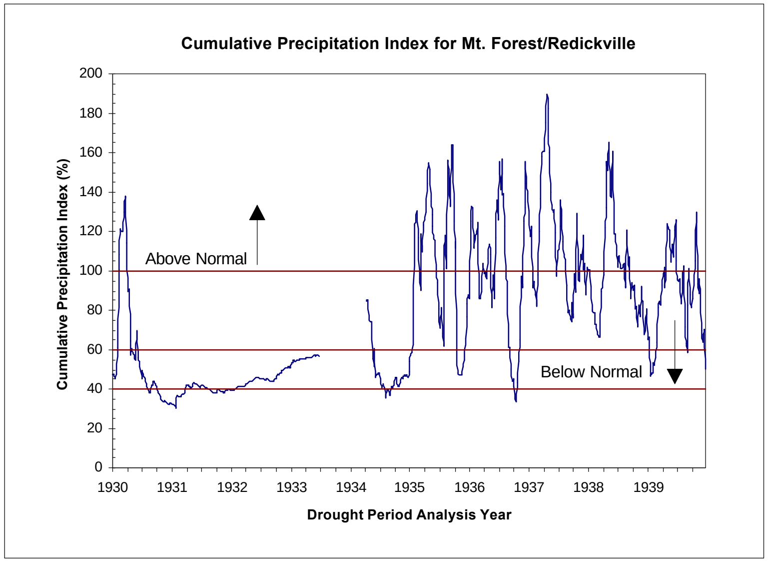
Cumulative Precipitation Index for Kitchener

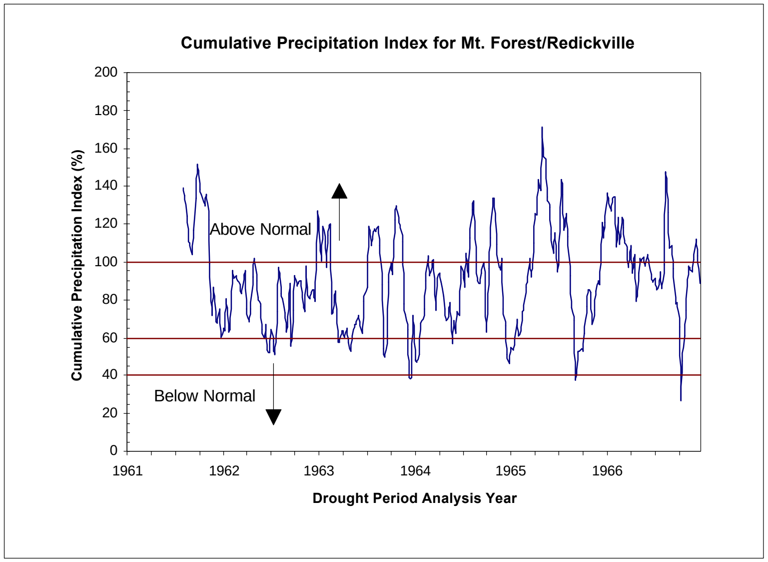


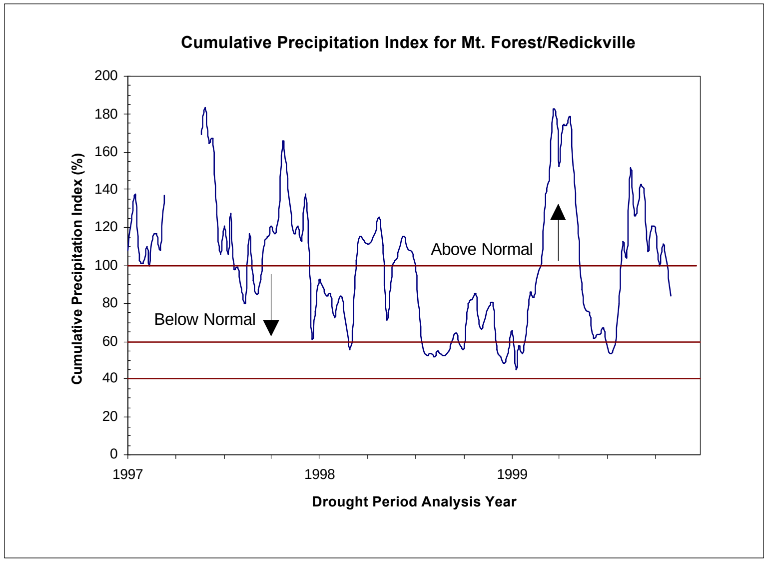
Cumulative Precipitation Index for Kitchener

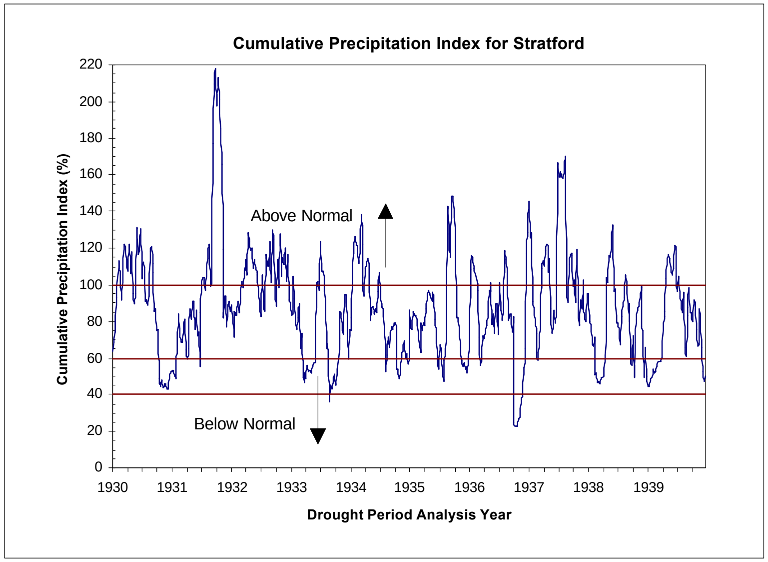


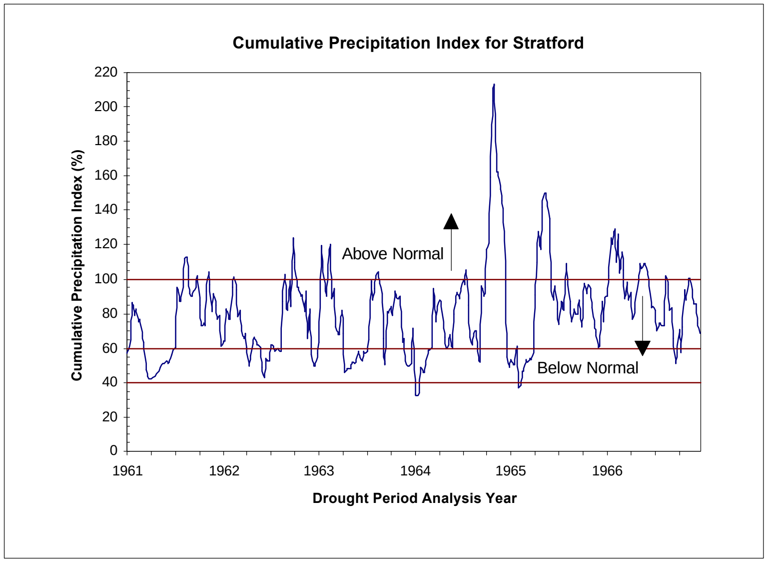
Cumulative Precipitation Index for Kitchener/Waterloo Wellington

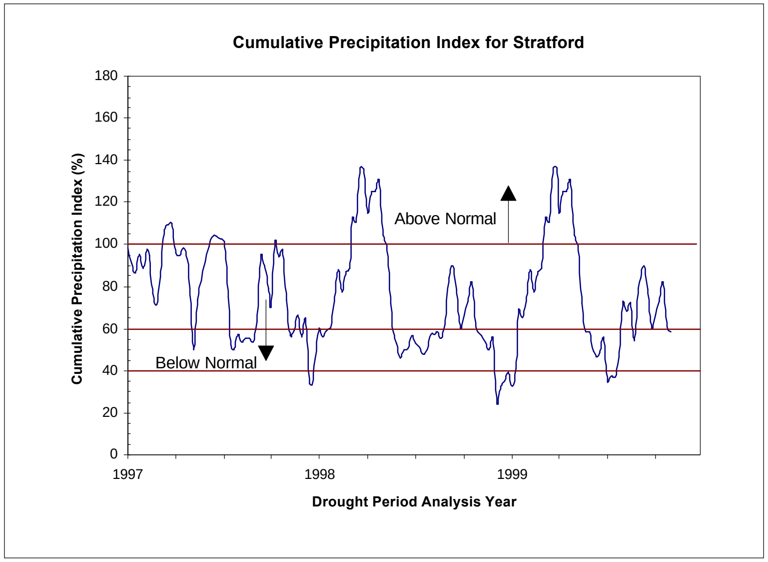

Cumulative Precipitation Index for Mt. Forest/Redickville
Cumulative Precipitation Index (%)
200
180
160
140
120
100
80
60
40
20
0
Above Normal
Below Normal
1930
1931
1932
1933
1934
1935
1936
1937
1938
1939
Drought Period Analysis Year

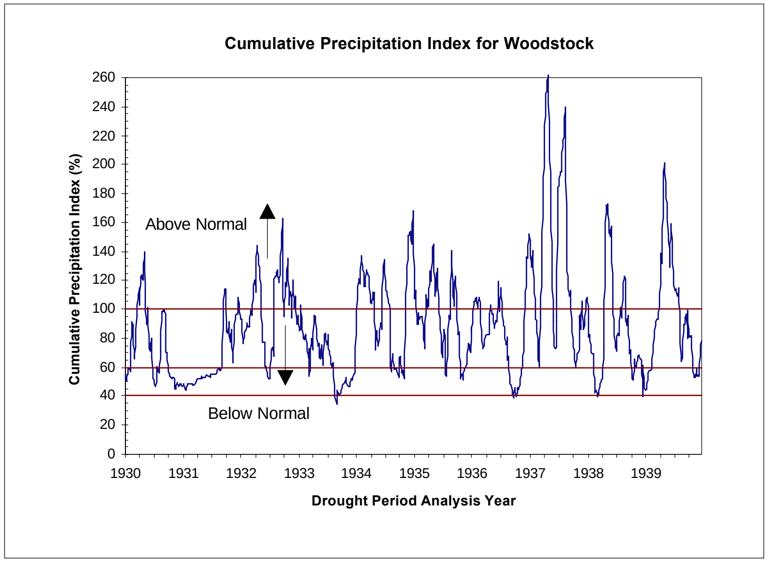

Cumulative Precipitation Index for Mt. Forest/Redickville
Cumulative Precipitation Index (%)
200
180
160
140
120
100
80
60
40
20
0
Above Normal
Below Normal
1961
1962
1963
1964
1965
1966
Drought Period Analysis Year


Cumulative Precipitation Index for Mt. Forest/Redickville
Cumulative Precipitation Index (%)
200
180
160
140
120
100
80
60
40
20
0
Above Normal
Below Normal
1997
1998
1999
Drought Period Analysis Year

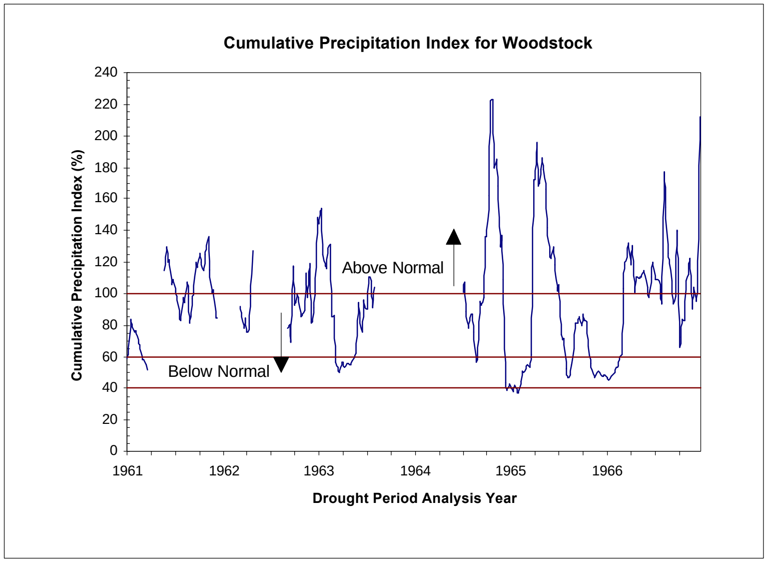

Cumulative Precipitation Index for Stratford
Cumulative Precipitation Index (%)
220
200
180
160
140
120
100
80
60
40
20
0
Above Normal
Below Normal
1930
1931
1932
1933
1934
1935
1936
1937
1938
1939
Drought Period Analysis Year


Cumulative Precipitation Index for Stratford
Cumulative Precipitation Index (%)
220
200
180
160
140
120
100
80
60
40
20
0
Above Normal
Below Normal
1961
1962
1963
1964
1965
1966
Drought Period Analysis Year

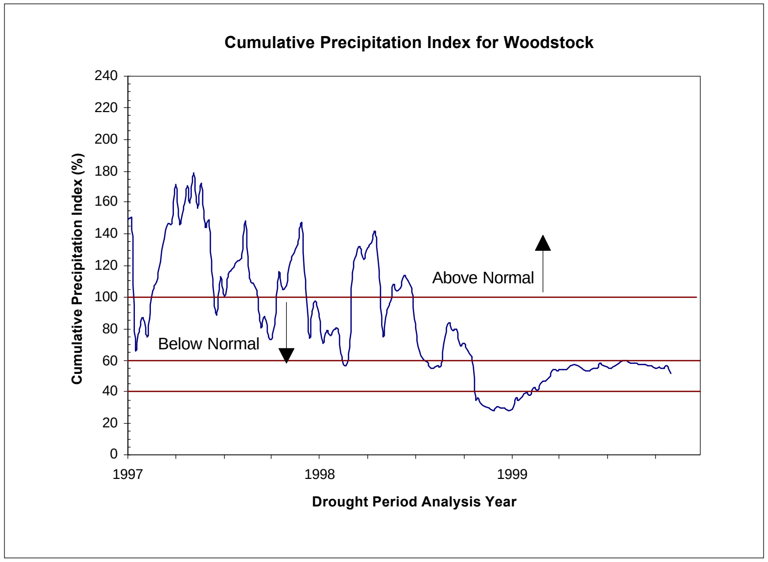

Cumulative Precipitation Index for Stratford
Cumulative Precipitation Index (%)
180
160
140
120
100
80
60
40
20
0
Above Normal
Below Normal
1997
1998
1999
Drought Period Analysis Year



Cumulative Precipitation Index for Woodstock
Cumulative Precipitation Index (%)
0
20
40
60
80
100
120
140
160
180
200
220
240
260
Above Normal
Below Normal
1930
1931
1932
1933
1934
1935
1936
1937
1938
1939
Drought Period Analysis Year



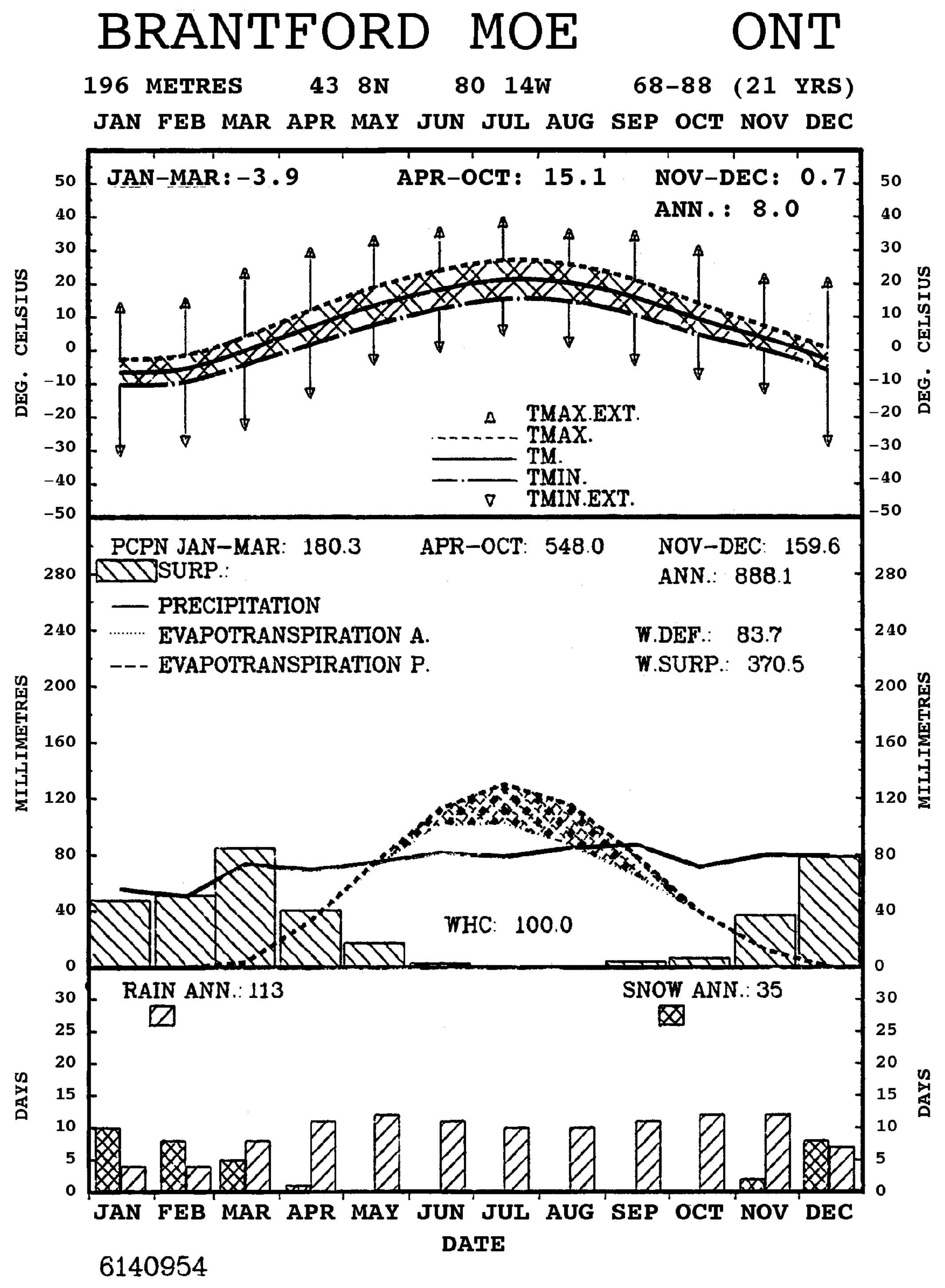
Cumulative Precipitation Index for Woodstock
Cumulative Precipitation Index (%)
0
20
40
60
80
100
120
140
160
180
200
220
240
Above Normal
Below Normal
1961
1962
1963
1964
1965
1966
Drought Period Analysis Year

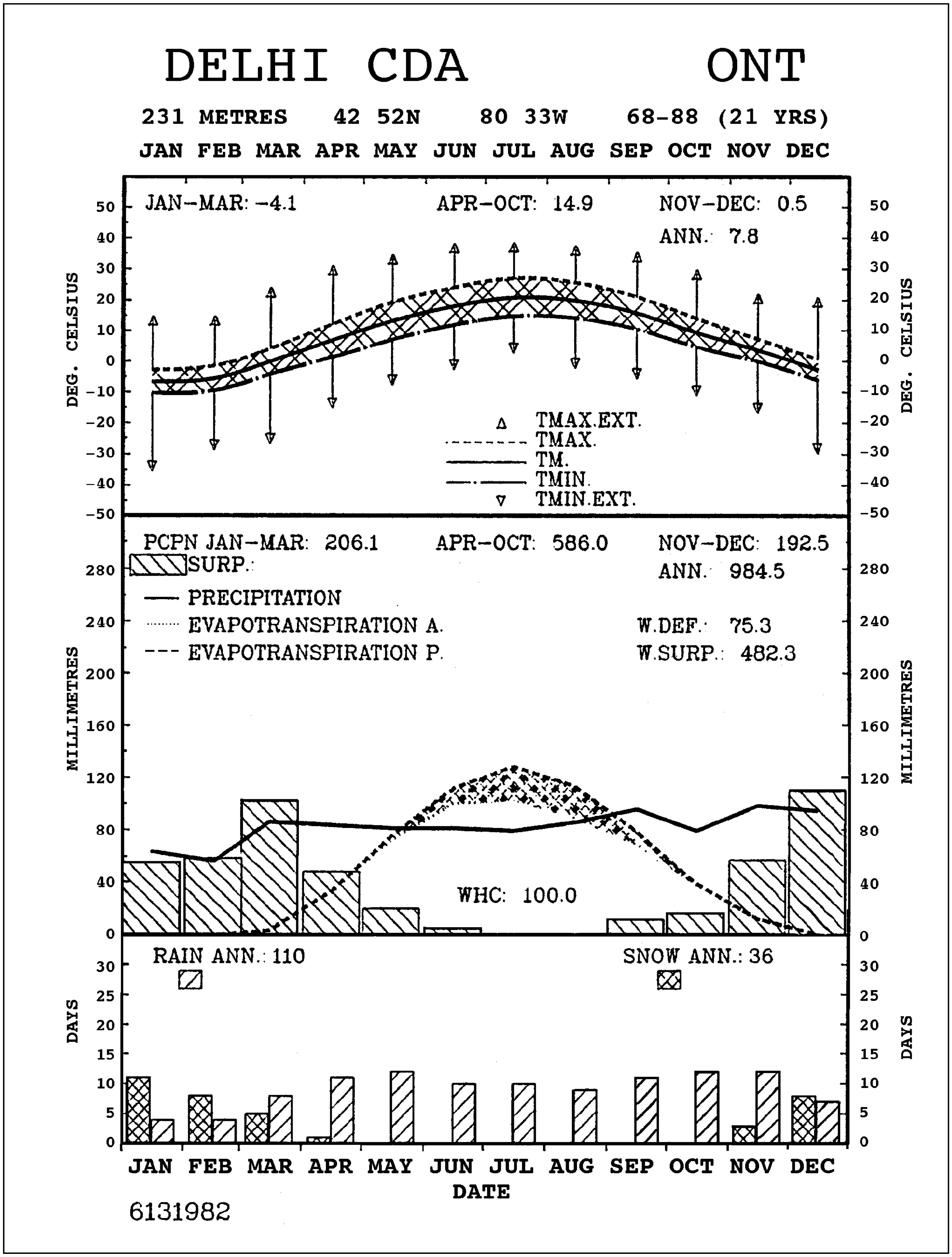


Cumulative Precipitation Index for Woodstock
Cumulative Precipitation Index (%)
0
20
40
60
80
100
120
140
160
180
200
220
240
Above Normal
Below Normal
1997
1998
1999
Drought Period Analysis Year

Appendix H

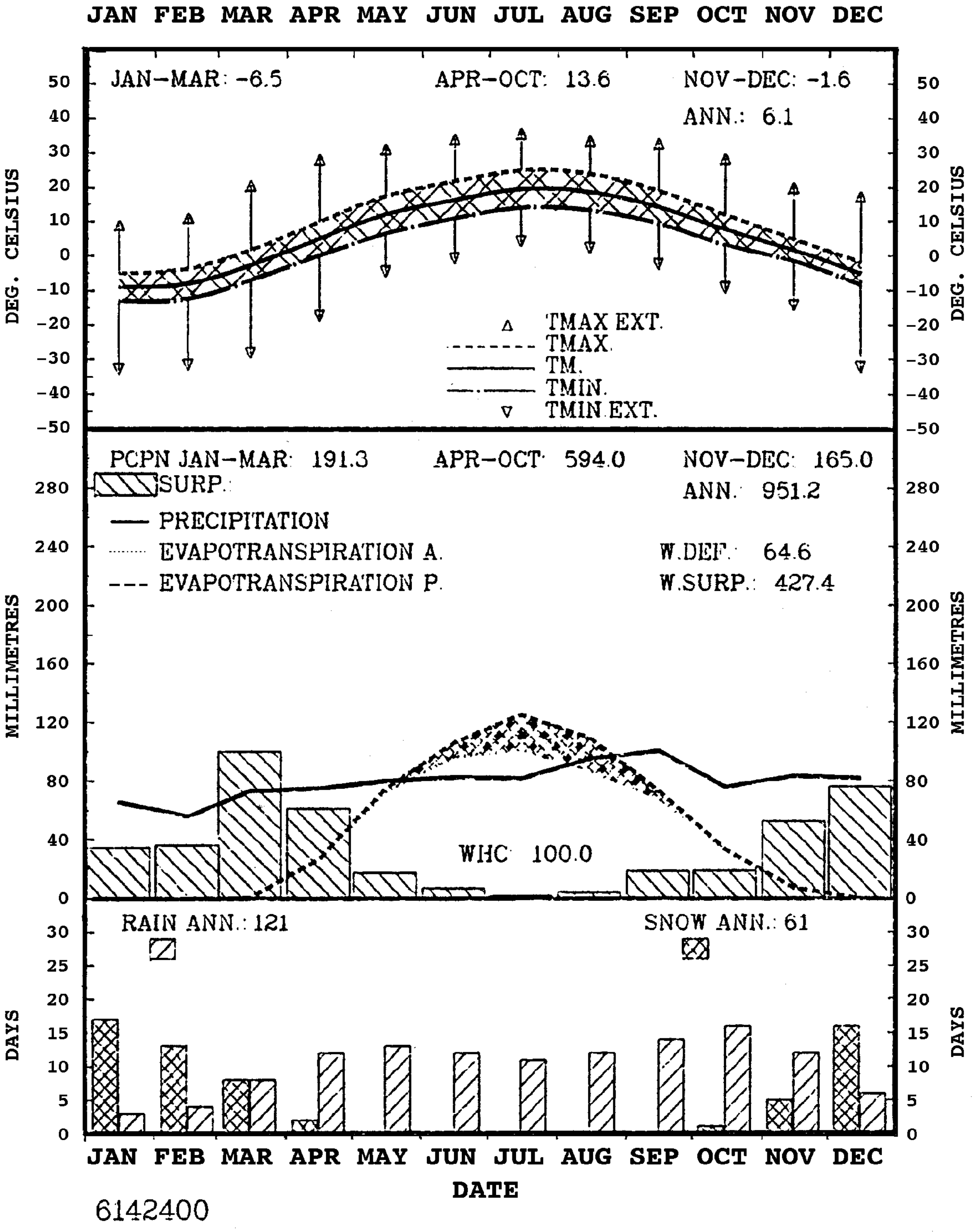
Water Budget Normal Profiles for Southern Ontario Stations

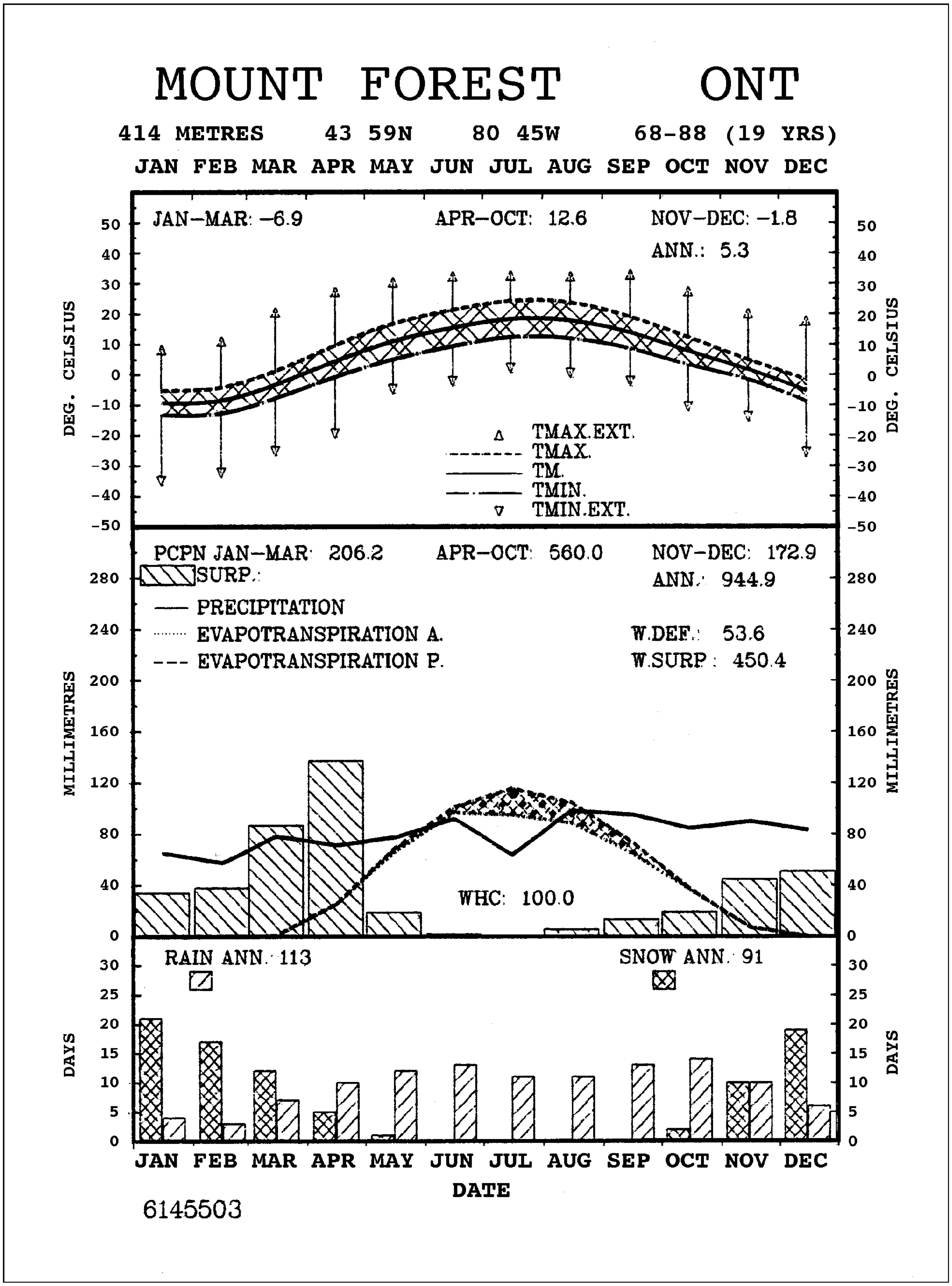

BRANTFORD MOE ONT
196 METRES 43 8N 80 14W 68-88 (21 YRS)
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
JAN-MAR: -3.9
APR-OCT: 15.1
NOV-DEC: 0.7
ANN.: 8.0
TMAX.EXT.
TMAX.
TM.
TMIN.
TMIN.EXT.
DEG. CELSIUS
50
40
30
20
10
0
-10
-20
-30
-40
-50
PCPN JAN-MAR: 180.3
APR-OCT: 548.0
NOV-DEC: 159.6
ANN.: 888.1
SURP.:
PRECIPITATION
EVAPOTRANSPIRATION A.
EVAPOTRANSPIRATION P.
W.DEF.: 83.7
W.SURP.: 370.5
WHC: 100.0
MILLIMETRES
280
240
200
160
120
80
40
0
RAIN ANN.: 113
SNOW ANN.: 35
DAYS
30
25
20
15
10
5
0
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
DATE
6140954

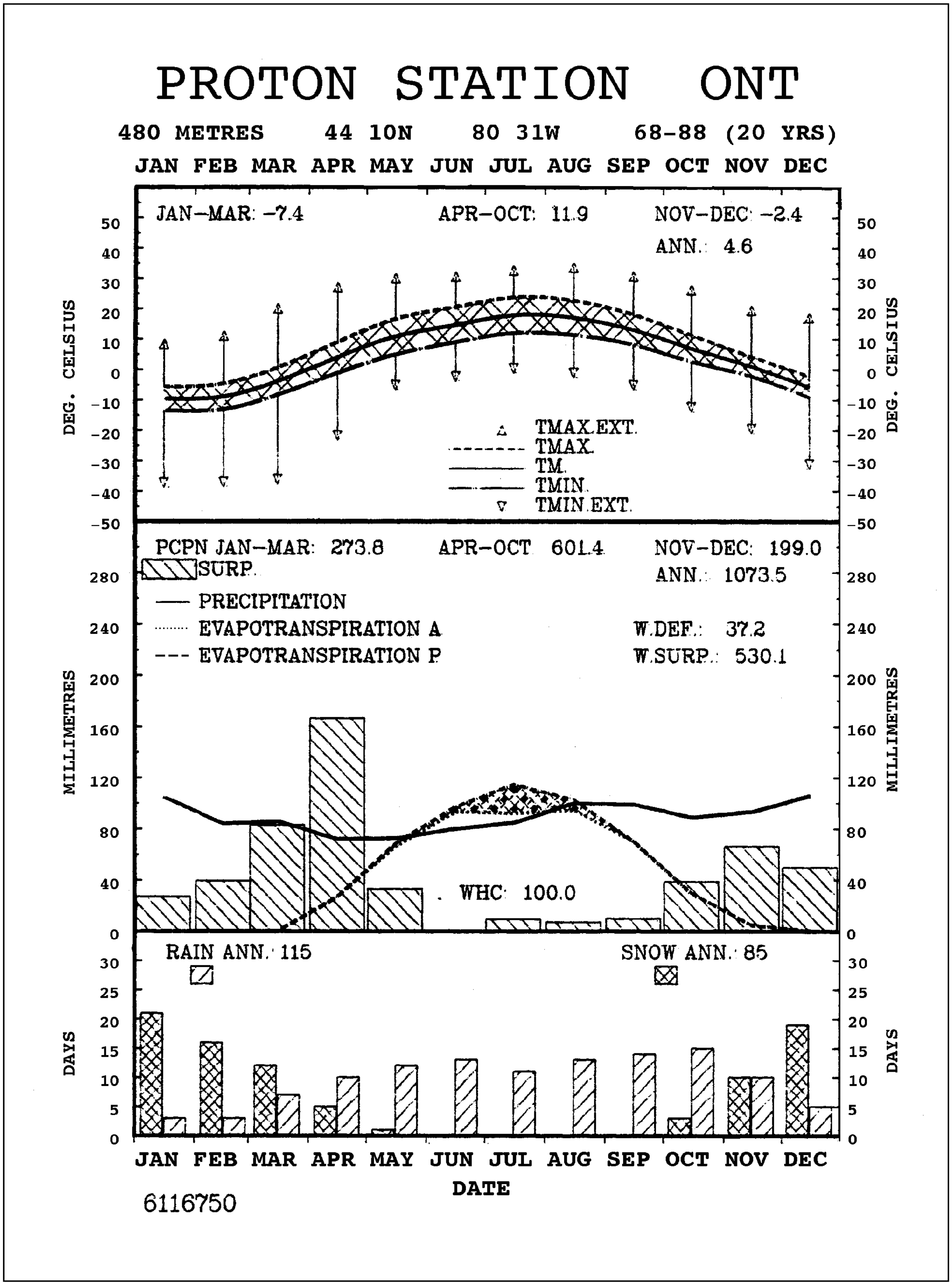

DELHI CDA ONT
231 METRES 42 52N 80 33W 68-88 (21 YRS)
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
JAN-MAR: -4.1
APR-OCT: 14.9
NOV-DEC: 0.5
ANN.: 7.8
DEG. CELSIUS
50 40 30 20 10 0 -10 -20 -30 -40 -50
TMAX.EXT.
TMAX.
TM.
TMIN.
TMIN.EXT.
PCPN JAN-MAR: 206.1
APR-OCT: 586.0
NOV-DEC: 192.5
ANN.: 984.5
SURP.:
PRECIPITATION
EVAPOTRANSPIRATION A.
EVAPOTRANSPIRATION P.
W.DEF.: 75.3
W.SURP.: 482.3
MILLIMETRES
280 240 200 160 120 80 40 0
WHC: 100.0
RAIN ANN.: 110
SNOW ANN.: 36
DAYS
30 25 20 15 10 5 0
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
DATE
6131982

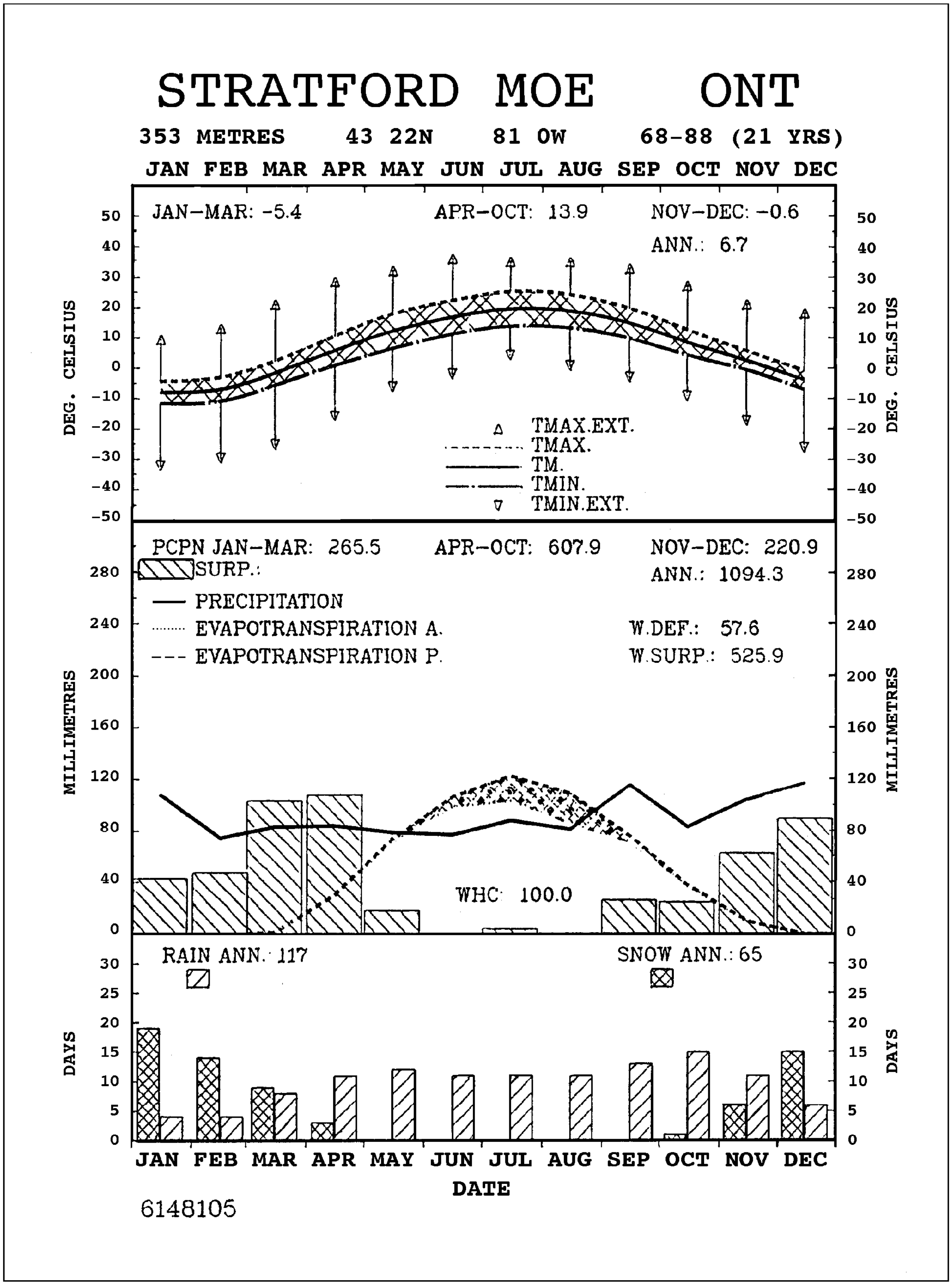
FERGUS SHAND DAM ONT

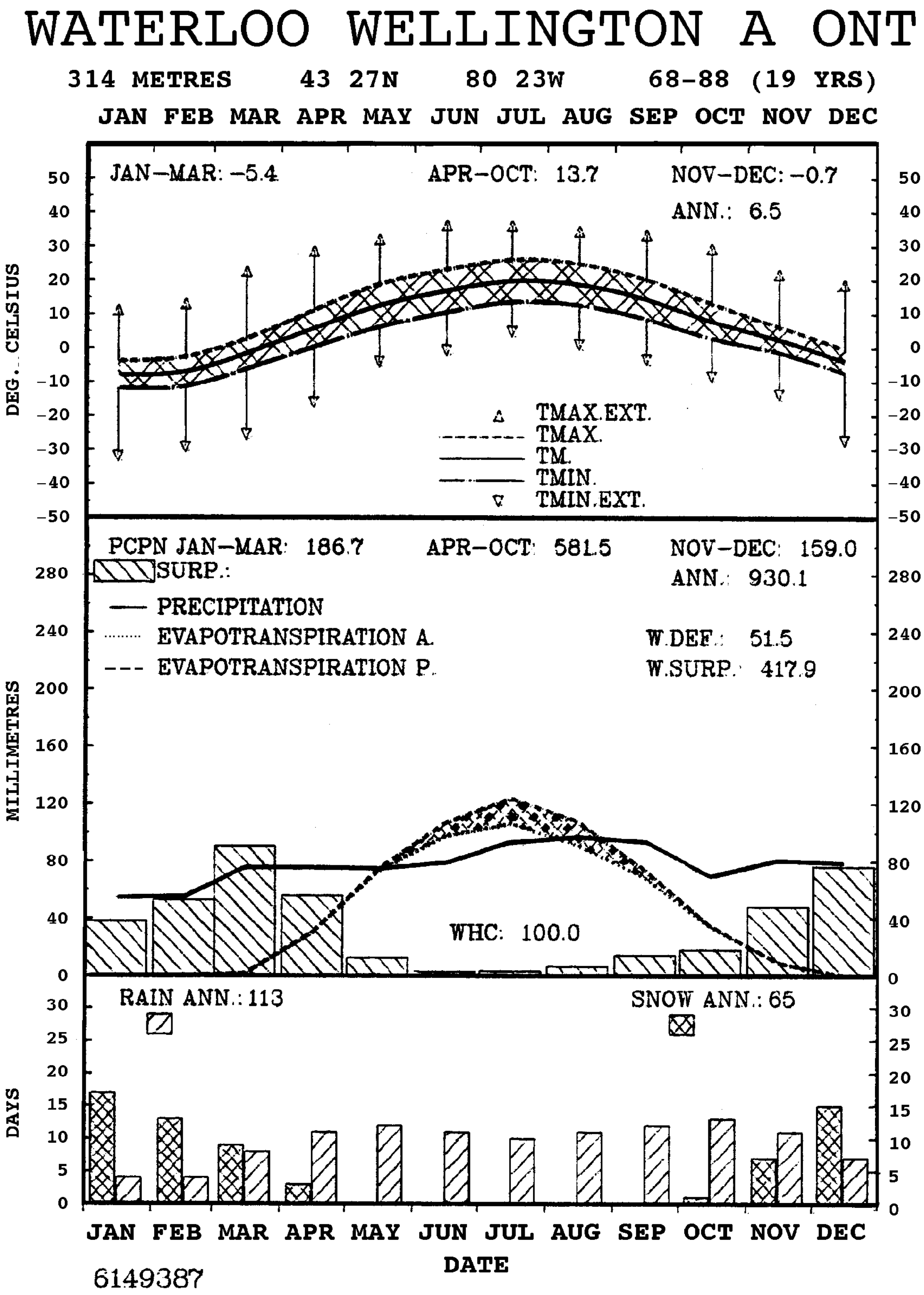
417 METRES 43 44N 80 20W 68-88 (21 YRS)

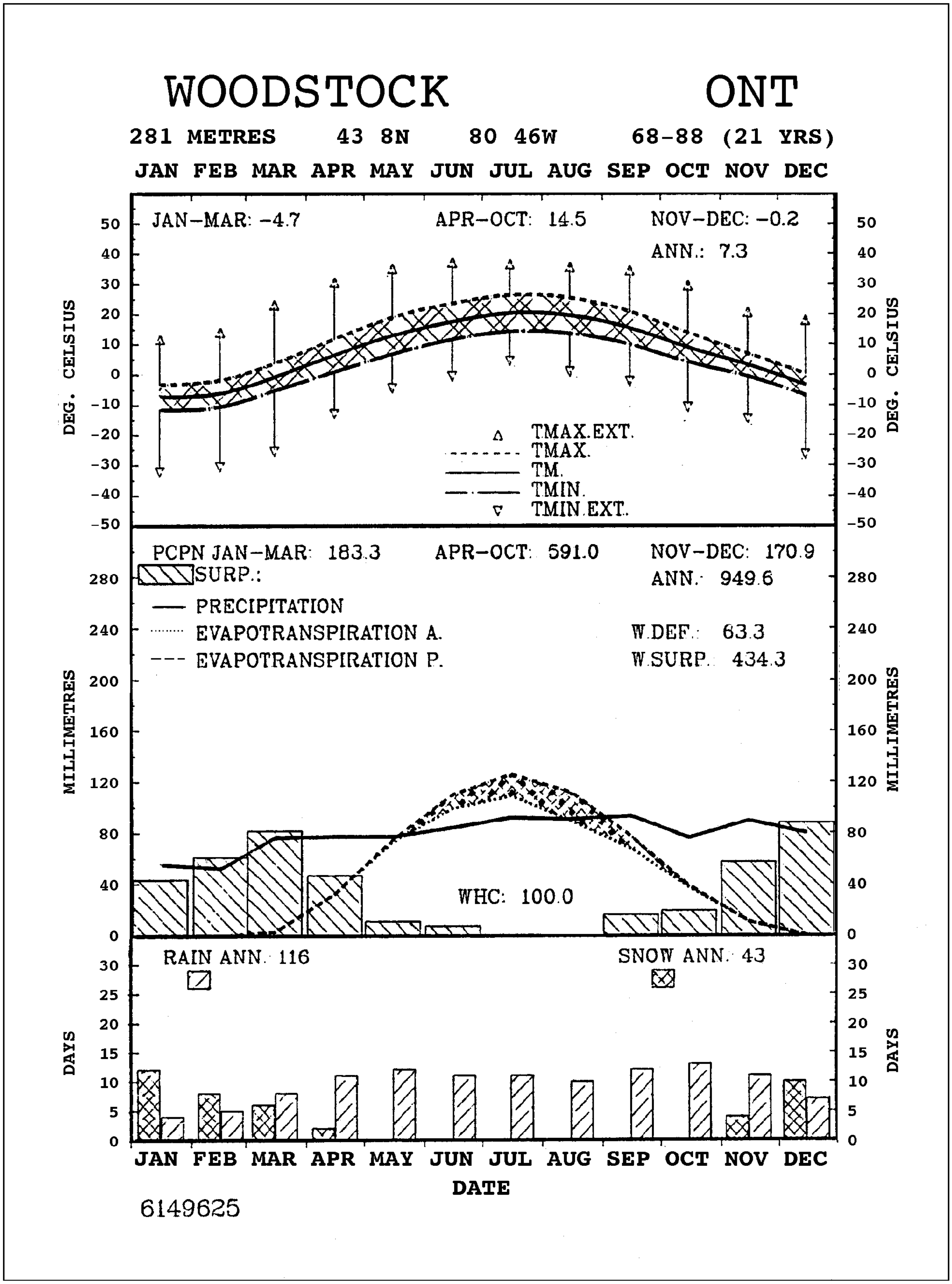



MOUNT FOREST ONT
414 METRES 43 59N 80 45W 68-88 (19 YRS)
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
JAN–MAR: –6.9
APR–OCT: 12.6
NOV–DEC: –1.8
ANN.: 5.3
DEG. CELSIUS
50
40
30
20
10
0
-10
-20
-30
-40
-50
TMAX.EXT.
TMAX.
TM.
TMIN.
TMIN.EXT.
PCPN JAN–MAR 206.2
APR–OCT 560.0
NOV–DEC: 172.9
ANN.: 944.9
SURP.:
PRECIPITATION
EVAPOTRANSPIRATION A.
EVAPOTRANSPIRATION P.
W.DEF.: 53.6
W.SURP.: 450.4
WHC: 100.0
MILLIMETRES
280
240
200
160
120
80
40
0
RAIN ANN. 113
SNOW ANN. 91
DAYS
30
25
20
15
10
5
0
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
DATE
6145503


PROTON STATION ONT
480 METRES 44 10N 80 31W 68-88 (20 YRS)
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
JAN-MAR: -7.4
APR-OCT: 11.9
NOV-DEC: -2.4
ANN.: 4.6
TMAX.EXT.
TMAX.
TM.
TMIN.
TMIN.EXT.
DEG. CELSIUS
50 40 30 20 10 0 -10 -20 -30 -40 -50
PCPN JAN-MAR: 273.8
APR-OCT 601.4
NOV-DEC: 199.0
ANN.: 1073.5
SURP.
PRECIPITATION
EVAPOTRANSPIRATION A
EVAPOTRANSPIRATION P
W.DEF.: 37.2
W.SURP.: 530.1
WHC: 100.0
MILLIMETRES
280 240 200 160 120 80 40 0
RAIN ANN.: 115
SNOW ANN.: 85
DAYS
30 25 20 15 10 5 0
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
DATE
6116750


STRATFORD MOE ONT
353 METRES 43 22N 81 0W 68-88 (21 YRS)
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
JAN–MAR: -5.4
APR–OCT: 13.9
NOV–DEC: -0.6
ANN.: 6.7
DEG. CELSIUS
50
40
30
20
10
0
-10
-20
-30
-40
-50
TMAX.EXT.
TMAX.
TM.
TMIN.
TMIN.EXT.
PCPN JAN–MAR: 265.5
APR–OCT: 607.9
NOV–DEC: 220.9
ANN.: 1094.3
SURP.:
PRECIPITATION
EVAPOTRANSPIRATION A.
EVAPOTRANSPIRATION P.
W.DEF.: 57.6
W.SURP.: 525.9
MILLIMETRES
280
240
200
160
120
80
40
0
WHC: 100.0
RAIN ANN.: 117
SNOW ANN.: 65
DAYS
30
25
20
15
10
5
0
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
DATE
6148105


WATERLOO WELLINGTON A ONT
314 METRES 43 27N 80 23W 68-88 (19 YRS)
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
JAN–MAR: –5.4
APR–OCT: 13.7
NOV–DEC: –0.7
ANN.: 6.5
DEG. CELSIUS
50 40 30 20 10 0 –10 –20 –30 –40 –50
TMAX.EXT.
TMAX.
TM.
TMIN.
TMIN.EXT.
PCPN JAN–MAR: 186.7
APR–OCT: 581.5
NOV–DEC: 159.0
ANN.: 930.1
SURP.:
PRECIPITATION
EVAPOTRANSPIRATION A.
EVAPOTRANSPIRATION P.
W.DEF.: 51.5
W.SURP.: 417.9
WHC: 100.0
MILLIMETRES
280 240 200 160 120 80 40 0
RAIN ANN.: 113
SNOW ANN.: 65
DAYS
30 25 20 15 10 5 0
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
DATE
6149387


WOODSTOCK ONT
281 METRES 43 8N 80 46W 68-88 (21 YRS)
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
JAN-MAR: -4.7
APR-OCT: 14.5
NOV-DEC: -0.2
ANN.: 7.3
DEG. CELSIUS
50 40 30 20 10 0 -10 -20 -30 -40 -50
Δ TMAX.EXT.
TMAX.
TM.
TMIN.
∇ TMIN.EXT.
PCPN JAN-MAR: 183.3
APR-OCT: 591.0
NOV-DEC: 170.9
ANN.: 949.6
SURP.:
PRECIPITATION
EVAPOTRANSPIRATION A.
EVAPOTRANSPIRATION P.
W.DEF.: 63.3
W.SURP.: 434.3
MILLIMETRES
280 240 200 160 120 80 40 0
WHC: 100.0
RAIN ANN.: 116
SNOW ANN.: 43
DAYS
30 25 20 15 10 5 0
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
DATE
6149625

Appendix I

Selected Water Budget Output for Southern Ontario Stations During Drought Years

```
 Brantford, Ontario       WATER BUDGET VALUES FOR THE PERIOD 1930-1939
                          (Model Run from YEAR 1929)

 YR  MO  TEMP(C)  PCPN  RAIN  MELT   PE    AE   DEF   SURP  SNOW  SOIL  ACC P

1930- 1   -6.0   131.0  67.9  65.8   1.6   1.6    .0 132.1  50.4 100.0  384.6
1930- 2   -3.3    79.1  30.6  89.8   5.3   5.3    .0 115.0   9.1 100.0  463.7
1930- 3    -.3    94.8  38.5  29.6   3.3   3.3    .0  64.8  35.8 100.0  558.5
1930- 4    6.9    41.7  35.1  42.4  34.4  34.4    .0  43.0    .0 100.0  600.2
1930- 5   14.3    72.6  72.6    .0  84.2  84.2    .0    .0    .0  88.4  672.8
1930- 6   19.8    84.2  84.2    .0 123.0 123.0    .0    .0    .0  49.6  757.0
1930- 7   21.9    25.3  25.3    .0 139.4  74.9 -64.5    .0    .0    .0  782.3
1930- 8   21.0    36.3  36.3    .0 124.0  36.3 -87.7    .0    .0    .0  818.6
1930- 9   17.5    38.2  38.2    .0  88.2  38.2 -50.0    .0    .0    .0  856.8
1930-10    8.9    28.3  26.8   1.5  38.7  28.3 -10.4    .0    .0    .0   28.3
1930-11    4.5    40.3  31.5   8.8  18.6  18.6    .0    .0    .0  21.7   68.6
1930-12   -2.7    33.2  17.2   5.3   1.7   1.7    .0    .0  10.7  42.4  101.8

1931- 1   -4.7    52.4  16.5  11.9    .2    .2    .0    .0  34.7  70.7  154.2
1931- 2   -3.3    31.7  25.3  36.6    .8    .8    .0  31.8   4.6 100.0  185.9
1931- 3     .5    68.3  63.2   9.7   5.8   5.8    .0  67.1    .0 100.0  254.2
1931- 4    7.0    59.9  59.9    .0  33.7  33.7    .0  26.2    .0 100.0  314.1
1931- 5   13.7    52.6  52.6    .0  80.8  80.8    .0    .0    .0  71.8  366.7
1931- 6   18.7    52.8  52.8    .0 115.6 115.6    .0    .0    .0   8.9  419.5
1931- 7   23.4   143.0 143.0    .0 150.3 144.1  -6.2    .0    .0   7.8  562.5
1931- 8   20.5    65.1  65.1    .0 120.8  72.4 -48.4    .0    .0    .6  627.6
1931- 9   18.8   123.3 123.3    .0  95.5  95.5    .0    .0    .0  28.3  750.9
1931-10   11.4    62.2  62.2    .0  49.7  49.7    .0    .0    .0  40.9   62.2
1931-11    7.2    71.7  71.7    .0  25.7  25.7    .0    .0    .0  86.8  133.9
1931-12     .2    75.7  64.3  11.4   5.2   5.2    .0  57.4    .0 100.0  209.6

1932- 1    1.1   132.3 132.3    .0   6.5   6.5    .0 125.8    .0 100.0  341.9
1932- 2   -2.1    66.4  45.4  21.0   2.8   2.8    .0  63.6    .0 100.0  408.3
1932- 3   -2.2    69.9  35.5  34.4   4.5   4.5    .0  65.4    .0 100.0  478.2
1932- 4    4.8    49.2  31.4  17.8  24.2  24.2    .0  25.0    .0 100.0  527.4
1932- 5   13.0   101.8 101.8    .0  76.3  76.3    .0  25.5    .0 100.0  629.2
1932- 6   19.2    31.1  31.1    .0 118.4 118.4    .0    .0    .0  12.7  660.3
1932- 7   20.1    97.0  97.0    .0 126.5 103.2 -23.3    .0    .0   6.4  757.3
1932- 8   20.4   128.6 128.6    .0 119.2 119.2    .0    .0    .0  15.9  885.9
1932- 9   16.2    99.8  99.8    .0  81.0  81.0    .0    .0    .0  34.7  985.7
1932-10   10.0    50.7  50.7    .0  43.2  43.2    .0    .0    .0  42.2   50.7
1932-11    1.3    97.0  63.7  26.4   9.6   9.6    .0  22.7   6.9 100.0  147.7
1932-12   -2.3    74.7  62.0  19.6   5.4   5.4    .0  76.2    .0 100.0  222.4

1933- 1     .3    37.4  37.4    .0   4.5   4.5    .0  32.9    .0 100.0  259.8
1933- 2   -3.4    65.8  33.3  32.5   1.7   1.7    .0  64.1    .0 100.0  325.6
1933- 3    -.8    64.6  64.6    .0   2.5   2.5    .0  62.1    .0 100.0  390.2
1933- 4    7.3    58.9  58.9    .0  35.2  35.2    .0  23.7    .0 100.0  449.1
1933- 5   13.8    36.3  36.3    .0  81.4  81.4    .0    .0    .0  54.9  485.4
1933- 6   20.4    55.9  55.9    .0 127.3 110.8 -16.5    .0    .0    .0  541.3
1933- 7   22.2     9.6   9.6    .0 141.9   9.6-132.3    .0    .0    .0  550.9
1933- 8   19.9    57.2  57.2    .0 116.2  57.2 -59.0    .0    .0    .0  608.1
1933- 9   18.1    44.3  44.3    .0  91.3  44.3 -47.0    .0    .0    .0  652.4
1933-10    8.8    56.0  56.0    .0  37.5  37.5    .0    .0    .0  18.5   56.0
1933-11     .0   122.9  84.9  38.0   7.5   7.5    .0  33.8    .0 100.0  178.9
1933-12   -4.4    65.1  29.5  24.4   2.3   2.3    .0  51.6  11.2 100.0  244.0
```

```
1934- 1   -3.5    51.0  48.5  11.2   2.5   2.5    .0  57.2   2.5 100.0  295.0
1934- 2  -13.2    40.6    .0    .0    .0    .0    .0    .0  43.1 100.0  335.6
1934- 3   -2.7    84.8  22.6  74.6   3.9   3.9    .0  93.4  30.7 100.0  420.4
1934- 4    5.2    90.7  90.7  30.7  24.7  24.7    .0  96.6    .0 100.0  511.1
1934- 5   14.7    10.2  10.2    .0  87.1  87.1    .0    .0    .0  23.1  521.3
1934- 6   20.6    73.2  73.2    .0 128.1  94.4 -33.8    .0    .0   1.9  594.5
1934- 7   22.5    17.0  17.0    .0 143.7  18.9-124.8    .0    .0    .0  611.5
1934- 8   18.5    42.9  42.9    .0 107.9  42.9 -65.0    .0    .0    .0  654.4
1934- 9   17.6   142.1 142.1    .0  88.5  88.5    .0    .0    .0  53.6  796.5
1934-10    9.0    29.6  29.6    .0  38.4  37.4   -.9    .0    .0  45.8   29.6
1934-11    5.3    59.9  59.9    .0  18.7  18.7    .0    .0    .0  87.0   89.5
1934-12   -4.7    40.3  21.7   4.1    .6    .6    .0  12.2  14.5 100.0  129.8

1935- 1   -6.7    91.6  66.8  23.6   1.5   1.5    .0  88.9  15.7 100.0  221.4
1935- 2   -6.3    67.9  25.9  17.1    .5    .5    .0  42.6  40.6 100.0  289.3
1935- 3    1.5    60.4  38.3  62.7  11.6  11.6    .0  89.4    .0 100.0  349.7
1935- 4    5.8    31.5  31.5    .0  28.4  28.4    .0   3.1    .0 100.0  381.2
1935- 5   10.6    69.1  69.1    .0  60.6  60.6    .0   8.5    .0 100.0  450.3
1935- 6   17.6    98.9  98.9    .0 107.5 107.5    .0    .0    .0  91.4  549.2
1935- 7   23.4    44.5  44.5    .0 150.6 135.9 -14.7    .0    .0    .0  593.7
1935- 8   20.4    44.2  44.2    .0 120.3  44.2 -76.1    .0    .0    .0  637.9
1935- 9   14.8    61.9  61.9    .0  72.8  61.9 -10.9    .0    .0    .0  699.8
1935-10    9.5    37.9  37.9    .0  39.8  37.9  -1.9    .0    .0    .0   37.9
1935-11    3.3    83.8  82.5    .8  13.1  13.1    .0    .0    .5  70.2  121.7
1935-12   -5.6    48.8  30.4   7.4   1.1   1.1    .0   7.0  11.5 100.0  170.5

1936- 1   -6.5    65.8  27.9  22.6    .4    .4    .0  50.1  26.8 100.0  236.3
1936- 2  -10.6    77.6  43.4  32.5   1.0   1.0    .0  74.9  28.5 100.0  313.9
1936- 3     .4    91.7  69.1  51.1   8.6   8.6    .0 111.7    .0 100.0  405.6
1936- 4    3.9    60.2  57.7   2.5  20.3  20.3    .0  39.9    .0 100.0  465.8
1936- 5   15.4    23.4  23.4    .0  91.5  91.5    .0    .0    .0  31.9  489.2
1936- 6   18.9    47.9  47.9    .0 116.4  79.8 -36.7    .0    .0    .0  537.1
1936- 7   22.4    15.5  15.5    .0 143.5  15.5-128.0    .0    .0    .0  552.6
1936- 8   20.6    28.3  28.3    .0 121.2  28.3 -92.9    .0    .0    .0  580.9
1936- 9   17.0    89.1  89.1    .0  85.3  85.3    .0    .0    .0   3.8  670.0
1936-10    9.3   102.5 102.5    .0  40.9  40.9    .0    .0    .0  65.4  102.5
1936-11     .6    57.9  47.8   2.5  10.3  10.3    .0   5.4   7.6 100.0  160.4
1936-12    -.8    91.8  58.2  41.2   4.2   4.2    .0  95.2    .0 100.0  252.2

1937- 1   -1.6   152.0 133.4   6.0   3.4   3.4    .0 135.9  12.6 100.0  404.2
1937- 2   -3.1    69.2  56.9  22.3   2.3   2.3    .0  76.9   2.6 100.0  473.4
1937- 3   -2.1    39.9  15.0  23.9   1.4   1.4    .0  37.5   3.6 100.0  513.3
1937- 4    5.8   216.3 216.3   3.6  27.4  27.4    .0 192.5    .0 100.0  729.6
1937- 5   13.8    68.6  68.6    .0  81.1  81.1    .0    .0    .0  87.5  798.2
1937- 6   18.5   104.9 104.9    .0 113.7 113.7    .0    .0    .0  78.7  903.1
1937- 7   21.9    60.6  60.6    .0 139.6 139.3   -.3    .0    .0    .0  963.7
1937- 8   22.0   136.6 136.6    .0 130.4 130.4    .0    .0    .0   6.2 1100.3
1937- 9   15.1    54.4  54.4    .0  74.8  56.5 -18.2    .0    .0   4.1 1154.7
1937-10    7.8    71.6  71.6    .0  32.7  32.7    .0    .0    .0  43.0   71.6
1937-11    2.9    36.3  35.5    .8  12.1  12.1    .0    .0    .0  67.2  107.9
1937-12   -3.6    35.1   3.8  23.7    .7    .7    .0    .0   7.6  94.0  143.0
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1938- 1   -6.2    54.3  18.7  21.9    .4    .4    .0  34.2  21.3 100.0  197.3
1938- 2   -2.3   118.5  88.4  39.3   2.4   2.4    .0 125.3  12.0 100.0  315.8
1938- 3    2.5    65.4  38.3  39.1  19.9  19.9    .0  57.5    .0 100.0  381.2
1938- 4    7.7    49.6  45.8   3.8  41.1  41.1    .0   8.5    .0 100.0  430.8
1938- 5   12.4    49.3  49.3    .0  71.7  71.7    .0    .0    .0  77.6  480.1
1938- 6   18.3    34.5  34.5    .0 112.4 112.1   -.3    .0    .0    .0  514.6
1938- 7   22.4    41.2  41.2    .0 142.7  41.2-101.5    .0    .0    .0  555.8
1938- 8   22.6    79.4  79.4    .0 134.3  79.4 -54.9    .0    .0    .0  635.2
1938- 9   14.6    58.5  58.5    .0  71.4  58.5 -12.9    .0    .0    .0  693.7
1938-10   10.8    14.3  14.3    .0  46.7  14.3 -32.4    .0    .0    .0   14.3
1938-11    3.7    53.9  42.4  11.5  17.4  17.4    .0    .0    .0  36.5   68.2
1938-12   -2.4    79.0  34.5   2.5   2.8   2.8    .0    .0  42.0  70.7  147.2

1939- 1   -4.9    69.1  11.9  58.0   2.2   2.2    .0  38.5  41.2 100.0  216.3
1939- 2   -4.6   107.9  62.2  25.3    .5    .5    .0  87.0  61.6 100.0  324.2
1939- 3   -1.8    89.4  66.6  84.4   4.2   4.2    .0 146.8    .0 100.0  413.6
1939- 4    5.0    91.9  91.9    .0  26.2  26.2    .0  65.7    .0 100.0  505.5
1939- 5   14.9    34.1  34.1    .0  88.6  88.6    .0    .0    .0  45.5  539.6
1939- 6   18.9    92.5  92.5    .0 116.5 110.7  -5.8    .0    .0  27.3  632.1
1939- 7   21.5    90.1  90.1    .0 136.4 111.2 -25.2    .0    .0   6.2  722.2
1939- 8   21.6    38.7  38.7    .0 127.3  44.9 -82.4    .0    .0    .0  760.9
1939- 9   16.8    53.4  53.4    .0  84.4  53.4 -31.0    .0    .0    .0  814.3
1939-10    9.7    57.4  57.4    .0  41.6  41.6    .0    .0    .0  15.8   57.4
1939-11    1.8    17.5  17.5    .0   7.2   7.2    .0    .0    .0  26.0   74.9
1939-12    -.7    33.9  21.6    .0   5.4   5.4    .0    .0  12.3  42.2  108.8
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Brantford, Ontario WATER BUDGET VALUES FOR THE PERIOD 1961-1966
(Model Run from YEAR 1959)

YR MO	TEMP(C)	PCPN	RAIN	MELT	PE	AE	DEF	SURP	SNOW	SOIL	ACC P
1961- 1	-7.3	14.6	.0	6.6	.1	.1	.0	.0	22.5	38.9	122.1
1961- 2	-3.1	47.0	41.7	27.8	3.8	3.8	.0	4.6	.0	100.0	169.1
1961- 3	.9	56.5	41.7	14.8	8.8	8.8	.0	47.7	.0	100.0	225.6
1961- 4	4.6	116.6	116.6	.0	21.7	21.7	.0	94.9	.0	100.0	342.2
1961- 5	11.4	69.1	69.1	.0	66.5	66.5	.0	2.6	.0	100.0	411.3
1961- 6	17.9	59.2	59.2	.0	109.9	109.9	.0	.0	.0	49.3	470.5
1961- 7	21.1	73.6	73.6	.0	134.2	122.9	-11.3	.0	.0	.0	544.1
1961- 8	20.3	113.6	113.6	.0	119.2	113.6	-5.6	.0	.0	.0	657.7
1961- 9	19.1	41.1	41.1	.0	97.9	41.1	-56.8	.0	.0	.0	698.8
1961-10	11.7	21.9	21.9	.0	51.7	21.9	-29.8	.0	.0	.0	21.9
1961-11	3.8	63.6	63.6	.0	14.4	14.4	.0	.0	.0	49.2	85.5
1961-12	-2.4	50.3	46.5	3.0	2.4	2.4	.0	.0	.8	96.3	135.8
1962- 1	-6.7	51.6	25.9	5.2	.1	.1	.0	27.3	21.3	100.0	187.4
1962- 2	-6.8	76.9	14.3	24.9	.7	.7	.0	38.5	59.0	100.0	264.3
1962- 3	.1	12.9	12.9	59.0	9.2	9.2	.0	62.7	.0	100.0	277.2
1962- 4	7.0	40.2	39.7	.5	36.4	36.4	.0	3.8	.0	100.0	317.4
1962- 5	16.1	60.5	60.5	.0	97.3	97.3	.0	.0	.0	63.2	377.9
1962- 6	18.1	75.8	75.8	.0	111.5	111.5	.0	.0	.0	27.4	453.7
1962- 7	19.6	125.3	125.3	.0	123.6	123.6	.0	.0	.0	29.2	579.0
1962- 8	19.7	72.2	72.2	.0	115.3	93.2	-22.2	.0	.0	8.2	651.2
1962- 9	14.4	123.5	123.5	.0	71.4	71.4	.0	.0	.0	60.3	774.7
1962-10	10.7	101.9	101.9	.0	47.8	47.8	.0	14.4	.0	100.0	101.9
1962-11	3.2	50.1	50.1	.0	10.8	10.8	.0	39.3	.0	100.0	152.0
1962-12	-4.6	61.2	38.6	9.1	2.3	2.3	.0	45.4	13.5	100.0	213.2
1963- 1	-8.5	19.4	.0	10.0	.2	.2	.0	9.8	23.0	100.0	232.6
1963- 2	-8.8	19.7	.3	6.0	.1	.1	.0	6.2	36.4	100.0	252.3
1963- 3	1.1	63.0	39.6	59.8	12.9	12.9	.0	86.5	.0	100.0	315.3
1963- 4	7.6	78.6	78.6	.0	37.3	37.3	.0	41.3	.0	100.0	393.9
1963- 5	11.7	59.0	59.0	.0	68.1	68.1	.0	.0	.0	90.9	452.9
1963- 6	18.5	14.1	14.1	.0	114.2	105.0	-9.2	.0	.0	.0	467.0
1963- 7	21.1	94.3	94.3	.0	134.3	94.3	-40.0	.0	.0	.0	561.3
1963- 8	18.4	28.5	28.5	.0	107.4	28.5	-78.9	.0	.0	.0	589.8
1963- 9	13.7	35.1	35.1	.0	67.4	35.1	-32.3	.0	.0	.0	624.9
1963-10	13.3	11.2	11.2	.0	59.0	11.2	-47.8	.0	.0	.0	11.2
1963-11	6.4	53.5	53.5	.0	22.7	22.7	.0	.0	.0	30.8	64.7
1963-12	-6.3	30.2	3.6	1.9	.4	.4	.0	.0	24.7	35.9	94.9
1964- 1	-3.3	63.0	35.9	46.1	2.3	2.3	.0	15.6	5.7	100.0	157.9
1964- 2	-4.6	43.5	9.7	8.0	.6	.6	.0	17.1	31.5	100.0	201.4
1964- 3	.3	89.3	58.0	60.2	7.1	7.1	.0	111.1	2.6	100.0	290.7
1964- 4	6.5	113.1	108.5	7.2	34.3	34.3	.0	81.4	.0	100.0	403.8
1964- 5	14.8	54.7	54.7	.0	88.2	88.2	.0	.0	.0	66.5	458.5
1964- 6	18.5	45.3	45.3	.0	114.8	111.8	-3.0	.0	.0	.0	503.8
1964- 7	21.8	100.7	100.7	.0	139.3	100.7	-38.6	.0	.0	.0	604.5
1964- 8	17.5	165.8	165.8	.0	101.0	101.0	.0	.0	.0	64.8	770.3
1964- 9	15.5	30.3	30.3	.0	77.3	77.3	.0	.0	.0	17.8	800.6
1964-10	8.5	31.2	31.2	.0	36.2	32.7	-3.5	.0	.0	16.3	31.2
1964-11	5.0	27.7	27.7	.0	20.2	20.2	.0	.0	.0	23.9	58.9
1964-12	-2.2	78.0	38.3	39.7	3.7	3.7	.0	.0	.0	98.2	136.9

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1965- 1   -5.8    95.9  38.7  37.4   1.3   1.3    .0  72.9  19.8 100.0  232.8
1965- 2   -4.8    88.4  40.1  26.9   1.9   1.9    .0  65.1  41.2 100.0  321.2
1965- 3   -2.3    71.1  41.9  43.5   1.8   1.8    .0  83.6  26.9 100.0  392.3
1965- 4    4.2    60.8  54.2  33.5  21.6  21.6    .0  66.1    .0 100.0  453.1
1965- 5   14.9    26.9  26.9    .0  88.7  88.7    .0    .0    .0  38.2  480.0
1965- 6   17.4    30.3  30.3    .0 106.9  68.5 -38.4    .0    .0    .0  510.3
1965- 7   18.6    86.8  86.8    .0 116.3  86.8 -29.5    .0    .0    .0  597.1
1965- 8   19.0    81.2  81.2    .0 111.3  81.2 -30.1    .0    .0    .0  678.3
1965- 9   17.0    78.6  78.6    .0  85.6  78.6  -7.0    .0    .0    .0  756.9
1965-10    8.4    97.7  97.7    .0  36.0  36.0    .0    .0    .0  61.7   97.7
1965-11    4.0    78.3  78.3    .0  14.4  14.4    .0  25.6    .0 100.0  176.0
1965-12     .7    79.1  74.0   5.1   6.3   6.3    .0  72.8    .0 100.0  255.1

1966- 1   -7.0    60.4   2.5    .0    .7    .7    .0   1.8  57.9 100.0  315.5
1966- 2   -4.0    48.6  30.1  58.0   1.7   1.7    .0  86.4  18.4 100.0  364.1
1966- 3    1.3    78.2  76.2  20.4  10.1  10.1    .0  86.5    .0 100.0  442.3
1966- 4    5.5    91.9  91.9    .0  26.5  26.5    .0  65.4    .0 100.0  534.2
1966- 5   10.7    35.1  35.1    .0  62.6  62.6    .0    .0    .0  72.5  569.3
1966- 6   18.9    63.6  63.6    .0 117.1 117.1    .0    .0    .0  19.0  632.9
1966- 7   21.9    70.4  70.4    .0 140.1  89.4 -50.8    .0    .0    .0  703.3
1966- 8   20.0    65.6  65.6    .0 116.9  65.6 -51.3    .0    .0    .0  768.9
1966- 9   14.8    95.7  95.7    .0  73.5  73.5    .0    .0    .0  22.2  864.6
1966-10    9.3    31.7  31.7    .0  40.0  34.8  -5.3    .0    .0  19.1   31.7
1966-11    4.6   111.0 109.2   1.0  17.3  17.3    .0  12.1    .8 100.0  142.7
1966-12   -1.9   103.9  76.6   5.8   5.2   5.2    .0  77.2  22.3 100.0  246.6
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 Brantford, Ontario      WATER BUDGET VALUES FOR THE PERIOD 1997-1999 *
                         (Model Run from YEAR 1992)

 YR  MO  TEMP(C)  PCPN  RAIN  MELT   PE    AE   DEF   SURP  SNOW  SOIL  ACC P

1997- 1   -6.6    66.2   5.0  11.9   1.5   1.5    .0  15.3  58.0 100.0  256.8
1997- 2   -3.1    84.8  45.8  87.9   3.1   3.1    .0 130.6   9.1 100.0  341.6
1997- 3    -.1    76.0  43.2  41.9   7.1   7.1    .0  78.0    .0 100.0  417.6
1997- 4    5.5    45.0  45.0    .0  28.3  28.3    .0  16.7    .0 100.0  462.6
1997- 5    9.6   100.4 100.4    .0  54.9  54.9    .0  45.5    .0 100.0  563.0
1997- 6   19.3    77.2  77.2    .0 120.1 120.1    .0    .0    .0  57.1  640.2
1997- 7   19.7    87.9  87.9    .0 124.7 122.9  -1.8    .0    .0  22.1  728.1
1997- 8   18.4    76.4  76.4    .0 107.3  87.8 -19.5    .0    .0  10.7  804.5
1997- 9   15.1    58.6  58.6    .0  75.4  61.6 -13.8    .0    .0   7.7  863.1
1997-10    9.0    57.1  57.1    .0  39.9  39.9    .0    .0    .0  25.0   57.1
1997-11    1.7    60.0  37.0  23.0   8.6   8.6    .0    .0    .0  76.3  117.1
1997-12   -1.3    34.4  19.4  14.0   1.4   1.4    .0   8.3   1.0 100.0  151.5

1998- 1   -2.9    88.8  62.8   3.3   2.9   2.9    .0  63.2  23.7 100.0  240.3
1998- 2    -.5    43.0  40.8  25.9   3.1   3.1    .0  63.6    .0 100.0  283.3
1998- 3    2.3    92.8  61.8  31.0  18.8  18.8    .0  74.0    .0 100.0  376.1
1998- 4    8.5    52.6  52.6    .0  42.3  42.3    .0  10.3    .0 100.0  428.7
1998- 5   16.9    30.2  30.2    .0 102.8 102.8    .0    .0    .0  27.4  458.9
1998- 6   18.9    46.6  46.6    .0 118.2  74.0 -44.3    .0    .0    .0  505.5
1998- 7   21.3    46.8  46.8    .0 135.8  46.8 -89.0    .0    .0    .0  552.3
1998- 8   21.8    31.4  31.4    .0 129.1  31.4 -97.7    .0    .0    .0  583.7
1998- 9   18.1    24.8  24.8    .0  91.8  24.8 -67.0    .0    .0    .0  608.5
1998-10   10.7    15.0  15.0    .0  46.7  15.0 -31.7    .0    .0    .0   15.0
1998-11    4.3    48.4  48.4    .0  14.6  14.6    .0    .0    .0  33.8   63.4
1998-12     .2    31.8  31.8    .0   8.7   8.7    .0    .0    .0  56.9   95.2

1999- 1   -6.7    53.4  12.4  32.4    .9    .9    .0    .8   8.6 100.0  148.6
1999- 2   -1.9    28.8  27.8   9.6   2.2   2.2    .0  35.2    .0 100.0  177.4
1999- 3    -.2    26.4  14.4  12.0   9.3   9.3    .0  17.1    .0 100.0  203.8
1999- 4    7.7    66.4  66.4    .0  38.2  38.2    .0  28.2    .0 100.0  270.2
1999- 5   14.9    69.7  69.7    .0  89.6  89.6    .0    .0    .0  80.1  339.9
1999- 6   19.9    84.0  84.0    .0 124.2 124.2    .0    .0    .0  39.9  423.9
1999- 7   23.4    88.4  88.4    .0 150.6 128.3 -22.3    .0    .0    .0  512.3
1999- 8   19.8    35.8  35.8    .0 116.1  35.8 -80.3    .0    .0    .0  548.1
1999- 9   17.3   154.5 154.5    .0  87.6  87.6    .0    .0    .0  66.9  702.6
1999-10    8.6    69.8  69.8    .0  36.6  36.6    .0    .1    .0 100.0   69.8
1999-11    5.3    86.0  86.0    .0  19.9  19.9    .0  66.1    .0 100.0  155.8
1999-12    -.9    40.9  29.1   6.8   5.7   5.7    .0  30.2   5.0 100.0  196.7
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*   Model runs were made in September, 2000 with Brantford climate data that had been updated/corrected by the GRCA for missing temperature and precipitation values during the 1990s.

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Delhi D/Simcoe, Ontario  WATER BUDGET VALUES FOR THE PERIOD 1930-1939
                            (Model Run from YEAR 1921)

 YR  MO  TEMP(C)  PCPN  RAIN  MELT   PE    AE   DEF   SURP  SNOW  SOIL  ACC P

1930- 1   -5.6   148.4  91.0  98.0   2.5   2.5    .0 186.5  49.3 100.0  439.3
1930- 2   -1.8   116.9  65.8  94.8   7.1   7.1    .0 153.5   5.6 100.0  556.2
1930- 3     .0    82.4  56.7  13.9   5.5   5.5    .0  65.2  17.4 100.0  638.6
1930- 4    6.6    33.6  33.6  17.4  32.9  32.9    .0  18.0    .0 100.0  672.2
1930- 5   14.3    48.5  48.5    .0  85.0  85.0    .0    .0    .0  63.5  720.7
1930- 6   19.4    99.6  99.6    .0 120.1 120.1    .0    .0    .0  43.0  820.3
1930- 7   21.1    24.5  24.5    .0 134.2  67.5 -66.8    .0    .0    .0  844.8
1930- 8   20.1    18.1  18.1    .0 118.1  18.1-100.0    .0    .0    .0  862.9
1930- 9   17.5    30.9  30.9    .0  88.6  30.9 -57.7    .0    .0    .0  893.8
1930-10    9.3    40.8  40.8    .0  41.2  40.8   -.4    .0    .0    .0   40.8
1930-11    4.8    41.0  39.7   1.3  20.5  20.5    .0    .0    .0  20.5   81.8
1930-12   -2.3    59.1  21.1  17.2   2.4   2.4    .0    .0  20.8  56.4  140.9

1931- 1   -3.7    77.4   8.9  27.1    .6    .6    .0    .0  62.2  91.9  218.3
1931- 2   -2.4    56.9  45.4  52.5   1.2   1.2    .0  88.5  21.2 100.0  275.2
1931- 3     .3    80.7  76.8  25.1   4.6   4.6    .0  97.4    .0 100.0  355.9
1931- 4    7.8    71.0  71.0    .0  39.0  39.0    .0  32.0    .0 100.0  426.9
1931- 5   14.1    46.5  46.5    .0  83.7  83.7    .0    .0    .0  62.8  473.4
1931- 6   18.3    64.1  64.1    .0 112.6 112.6    .0    .0    .0  14.3  537.5
1931- 7   22.9   158.3 158.3    .0 147.1 147.1    .0    .0    .0  25.5  695.8
1931- 8   20.5    66.6  66.6    .0 120.4  89.4 -31.0    .0    .0   2.6  762.4
1931- 9   18.9    84.0  84.0    .0  96.6  84.5 -12.0    .0    .0   2.1  846.4
1931-10   12.0    64.3  64.3    .0  53.5  53.5    .0    .0    .0  12.9   64.3
1931-11    7.8    76.6  76.6    .0  29.0  29.0    .0    .0    .0  60.5  140.9
1931-12    1.1    66.9  63.9   3.0   7.0   7.0    .0  20.4    .0 100.0  207.8

1932- 1    2.1   132.5 113.4  19.1   9.5   9.5    .0 123.0    .0 100.0  340.3
1932- 2    -.8    60.7  35.1  25.6   4.2   4.2    .0  56.5    .0 100.0  401.0
1932- 3   -1.6    78.5  35.4  43.1   5.9   5.9    .0  72.6    .0 100.0  479.5
1932- 4    5.3    59.7  50.8   8.9  27.2  27.2    .0  32.5    .0 100.0  539.2
1932- 5   13.0   101.1 101.1    .0  76.8  76.8    .0  24.3    .0 100.0  640.3
1932- 6   18.5    27.7  27.7    .0 114.2 114.2    .0    .0    .0  13.5  668.0
1932- 7   20.3   105.0 105.0    .0 128.6 110.3 -18.3    .0    .0   8.2  773.0
1932- 8   20.8    64.3  64.3    .0 122.2  72.2 -50.0    .0    .0    .3  837.3
1932- 9   16.6    64.0  64.0    .0  83.9  64.1 -19.8    .0    .0    .2  901.3
1932-10   11.4    51.4  51.4    .0  50.5  50.5    .0    .0    .0   1.1   51.4
1932-11    2.3   104.3 101.8   2.5  11.6  11.6    .0    .0    .0  93.8  155.7
1932-12   -1.4    61.9  54.4   7.5   6.9   6.9    .0  48.8    .0 100.0  217.6

1933- 1     .8    48.7  48.7    .0   6.3   6.3    .0  42.4    .0 100.0  266.3
1933- 2   -2.9    41.4  17.0  24.4   2.3   2.3    .0  39.1    .0 100.0  307.7
1933- 3    -.1    68.3  48.0  20.3   4.3   4.3    .0  64.0    .0 100.0  376.0
1933- 4    7.6    63.7  63.7    .0  37.3  37.3    .0  26.4    .0 100.0  439.7
1933- 5   14.7    62.6  62.6    .0  87.6  87.6    .0    .0    .0  75.0  502.3
1933- 6   20.4    41.4  41.4    .0 127.8 116.4 -11.4    .0    .0    .0  543.7
1933- 7   22.8    26.1  26.1    .0 146.0  26.1-119.9    .0    .0    .0  569.8
1933- 8   21.0    26.4  26.4    .0 124.0  26.4 -97.6    .0    .0    .0  596.2
1933- 9   18.7    26.4  26.4    .0  95.0  26.4 -68.6    .0    .0    .0  622.6
1933-10    9.6    63.6  63.6    .0  42.3  42.3    .0    .0    .0  21.3   63.6
1933-11     .9   117.0  58.3  58.7   9.0   9.0    .0  29.3    .0 100.0  180.6
1933-12   -3.1    84.8  51.8  33.0   3.5   3.5    .0  81.3    .0 100.0  265.4
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1934- 1   -2.5    63.7  38.5  19.1   2.8   2.8    .0  54.8   6.1 100.0  329.1
1934- 2  -12.2    35.7    .0    .0    .0    .0    .0    .0  41.8 100.0  364.8
1934- 3   -2.0    81.9  25.6  85.9   5.0   5.0    .0 106.5  12.2 100.0  446.7
1934- 4    6.1    75.7  75.7  12.2  30.1  30.1    .0  57.8    .0 100.0  522.4
1934- 5   14.9    11.6  11.6    .0  88.8  88.8    .0    .0    .0  22.8  534.0
1934- 6   21.0    35.1  35.1    .0 131.1  57.9 -73.2    .0    .0    .0  569.1
1934- 7   22.6    11.4  11.4    .0 145.0  11.4-133.6    .0    .0    .0  580.5
1934- 8   18.9    43.4  43.4    .0 110.9  43.4 -67.5    .0    .0    .0  623.9
1934- 9   17.7   145.8 145.8    .0  89.1  89.1    .0    .0    .0  56.7  769.7
1934-10    9.8    41.1  41.1    .0  42.8  42.7   -.1    .0    .0  55.0   41.1
1934-11    5.9    59.4  59.4    .0  21.2  21.2    .0    .0    .0  93.2  100.5
1934-12   -5.0    62.1  30.7   4.1   1.0   1.0    .0  27.0  27.3 100.0  162.6

1935- 1   -5.6    65.7  45.6  39.8   2.2   2.2    .0  83.2   7.6 100.0  228.3
1935- 2   -5.6    70.1  29.9  24.1    .7    .7    .0  53.3  23.7 100.0  298.4
1935- 3    2.2    56.7  43.4  37.0  14.5  14.5    .0  65.9    .0 100.0  355.1
1935- 4    5.6    37.6  37.6    .0  27.6  27.6    .0  10.0    .0 100.0  392.7
1935- 5    9.9    81.0  81.0    .0  57.0  57.0    .0  24.0    .0 100.0  473.7
1935- 6   17.3    93.3  93.3    .0 106.2 106.2    .0    .0    .0  87.1  567.0
1935- 7   22.7    62.0  62.0    .0 145.5 145.5    .0    .0    .0   3.6  629.0
1935- 8   20.0    68.0  68.0    .0 118.1  71.0 -47.0    .0    .0    .6  697.0
1935- 9   14.7    64.0  64.0    .0  72.7  64.1  -8.6    .0    .0    .5  761.0
1935-10    9.2    36.9  36.9    .0  39.0  36.9  -2.1    .0    .0    .5   36.9
1935-11    3.8   107.2 107.2    .0  15.1  15.1    .0    .0    .0  92.6  144.1
1935-12   -5.6    40.4  10.4  16.0   1.3   1.3    .0  17.7  14.0 100.0  184.5

1936- 1   -6.5    67.9   6.1  23.8    .5    .5    .0  29.4  52.0 100.0  252.4
1936- 2  -10.0    61.5  31.0  34.9   1.1   1.1    .0  64.8  47.6 100.0  313.9
1936- 3    1.0    85.4  70.9  62.1  10.7  10.7    .0 122.3    .0 100.0  399.3
1936- 4    3.8    61.0  57.2   3.8  20.8  20.8    .0  40.2    .0 100.0  460.3
1936- 5   14.7    17.1  17.1    .0  87.4  87.4    .0    .0    .0  29.7  477.4
1936- 6   18.5    60.7  60.7    .0 114.0  87.1 -26.9    .0    .0   3.3  538.1
1936- 7   21.8    13.2  13.2    .0 139.7  16.5-123.2    .0    .0    .0  551.3
1936- 8   20.6    36.4  36.4    .0 121.0  36.4 -84.6    .0    .0    .0  587.7
1936- 9   16.6   120.2 120.2    .0  84.0  84.0    .0    .0    .0  36.2  707.9
1936-10    9.9    71.6  71.6    .0  44.4  44.4    .0    .0    .0  63.5   71.6
1936-11    1.3    76.3  55.9    .0  11.0  11.0    .0   8.3  20.4 100.0  147.9
1936-12    -.7   100.4  72.4  48.4   5.7   5.7    .0 115.1    .0 100.0  248.3

1937- 1   -1.5   206.7  97.5  82.5   4.0   4.0    .0 176.0  26.7 100.0  455.0
1937- 2   -2.6    71.4  53.6  38.2   3.8   3.8    .0  88.0   6.3 100.0  526.4
1937- 3   -1.8    24.2  14.0  16.5   1.9   1.9    .0  28.6    .0 100.0  550.6
1937- 4    6.2   251.3 251.3    .0  30.1  30.1    .0 221.2    .0 100.0  801.9
1937- 5   13.9    76.0  76.0    .0  82.1  82.1    .0    .0    .0  93.9  877.9
1937- 6   18.9    94.4  94.4    .0 116.5 116.5    .0    .0    .0  71.7  972.3
1937- 7   21.2   100.8 100.8    .0 134.9 134.9    .0    .0    .0  37.7 1073.1
1937- 8   21.6    90.0  90.0    .0 127.7 113.7 -14.0    .0    .0  14.0 1163.1
1937- 9   15.0    61.8  61.8    .0  75.0  64.9 -10.1    .0    .0  10.9 1224.9
1937-10    8.3    86.6  86.6    .0  36.2  36.2    .0    .0    .0  61.3   86.6
1937-11    3.2    40.4  40.4    .0  13.8  13.8    .0    .0    .0  87.9  127.0
1937-12   -4.2    44.7  10.9  23.0    .4    .4    .0  21.3  10.8 100.0  171.7
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1938- 1   -6.4    56.7  14.8  20.4    .5    .5    .0  34.7  32.4 100.0  228.4
1938- 2   -1.9   141.6 103.0  61.2   3.0   3.0    .0 161.2   9.7 100.0  370.0
1938- 3    2.7    75.0  56.0  28.7  19.6  19.6    .0  65.2    .0 100.0  445.0
1938- 4    7.6    57.5  47.3  10.2  41.5  41.5    .0  16.0    .0 100.0  502.5
1938- 5   13.1    75.7  75.7    .0  77.2  77.2    .0    .0    .0  98.5  578.2
1938- 6   18.2    42.7  42.7    .0 112.4 112.4    .0    .0    .0  28.8  620.9
1938- 7   21.9   122.6 122.6    .0 139.7 130.8  -8.9    .0    .0  20.6  743.5
1938- 8   21.9    70.4  70.4    .0 130.3  91.0 -39.4    .0    .0    .0  813.9
1938- 9   14.7    96.8  96.8    .0  72.7  72.7    .0    .0    .0  24.1  910.7
1938-10   11.1    21.8  21.8    .0  48.9  32.7 -16.2    .0    .0  13.2   21.8
1938-11    4.0    67.8  50.1  17.7  19.4  19.4    .0    .0    .0  61.6   89.6
1938-12   -2.0    74.0  25.7   5.0   3.2   3.2    .0    .0  43.3  89.1  163.6

1939- 1   -5.0    70.2  19.5  48.4   2.6   2.6    .0  54.4  45.5 100.0  233.8
1939- 2   -4.2   158.5  71.6  55.9   1.4   1.4    .0 126.1  76.5 100.0  392.3
1939- 3   -1.3    94.7  67.3 103.9   5.9   5.9    .0 165.4    .0 100.0  487.0
1939- 4    5.0   104.8 102.2   2.6  26.6  26.6    .0  78.2    .0 100.0  591.8
1939- 5   14.5    24.1  24.1    .0  86.7  86.7    .0    .0    .0  37.4  615.9
1939- 6   19.1    57.8  57.8    .0 118.2  95.2 -23.0    .0    .0    .0  673.7
1939- 7   21.0   103.6 103.6    .0 133.5 103.6 -29.9    .0    .0    .0  777.3
1939- 8   20.9    44.7  44.7    .0 123.3  44.7 -78.6    .0    .0    .0  822.0
1939- 9   17.1    62.5  62.5    .0  86.0  62.5 -23.5    .0    .0    .0  884.5
1939-10   10.3    86.8  86.8    .0  45.5  45.5    .0    .0    .0  41.3   86.8
1939-11    1.8    26.3  26.3    .0   7.2   7.2    .0    .0    .0  60.4  113.1
1939-12    -.3    41.0  34.2   1.8   5.9   5.9    .0    .0   5.0  90.4  154.1
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   Delhi D/Simcoe, Ontario  WATER BUDGET VALUES FOR THE PERIOD 1961-1966
                              (Model Run from YEAR 1921)

  YR  MO  TEMP(C)  PCPN  RAIN  MELT   PE    AE    DEF   SURP  SNOW  SOIL  ACC P

 1961- 1   -8.4    20.1    .0  13.0    .3    .3    .0    .0  50.2  69.8  181.2
 1961- 2   -4.2    66.1  37.7  78.6   3.3   3.3    .0  82.8    .0 100.0  247.3
 1961- 3     .8    83.2  61.3  21.9   8.8   8.8    .0  74.4    .0 100.0  330.5
 1961- 4    4.1   146.9 146.9    .0  20.3  20.3    .0 126.6    .0 100.0  477.4
 1961- 5   11.0    77.5  77.5    .0  63.7  63.7    .0  13.8    .0 100.0  554.9
 1961- 6   17.0    90.8  90.8    .0 104.1 104.1    .0    .0    .0  86.7  645.7
 1961- 7   20.2    52.0  52.0    .0 127.2 127.2    .0    .0    .0  11.5  697.7
 1961- 8   19.7   147.6 147.6    .0 115.0 115.0    .0    .0    .0  44.0  845.3
 1961- 9   18.5    58.1  58.1    .0  94.4  84.7  -9.6    .0    .0  17.4  903.4
 1961-10   11.3     9.6   9.6    .0  49.9  21.3 -28.6    .0    .0   5.7    9.6
 1961-11    3.2    80.6  73.0   7.6  13.2  13.2    .0    .0    .0  73.2   90.2
 1961-12   -3.0    64.8  57.7   7.1   2.3   2.3    .0  35.7    .0 100.0  155.0

 1962- 1   -7.1    52.3  22.4  16.4    .4    .4    .0  38.4  13.5 100.0  207.3
 1962- 2   -7.4    43.6    .0  13.5    .4    .4    .0  13.1  43.6 100.0  250.9
 1962- 3    -.6    10.6  10.6  43.6   7.4   7.4    .0  46.8    .0 100.0  261.5
 1962- 4    6.4    66.4  66.4    .0  34.7  34.7    .0  31.7    .0 100.0  327.9
 1962- 5   15.7    22.9  22.9    .0  95.1  95.1    .0    .0    .0  27.8  350.8
 1962- 6   18.1    61.0  61.0    .0 111.2  84.3 -26.9    .0    .0   4.6  411.8
 1962- 7   19.3    52.0  52.0    .0 121.6  56.6 -65.0    .0    .0    .0  463.8
 1962- 8   19.1    52.5  52.5    .0 111.5  52.5 -59.0    .0    .0    .0  516.3
 1962- 9   14.1    78.1  78.1    .0  70.0  70.0    .0    .0    .0   8.1  594.4
 1962-10   10.7   104.2  73.2  31.0  48.7  48.7    .0    .0    .0  63.5  104.2
 1962-11    2.8    59.1  59.1    .0   9.6   9.6    .0  13.1    .0 100.0  163.3
 1962-12   -5.5    71.1  58.1   8.0   2.0   2.0    .0  64.1   5.0 100.0  234.4

 1963- 1   -9.8    27.9    .0   5.0    .1    .1    .0   4.9  27.9 100.0  262.3
 1963- 2   -9.5    25.0    .0   5.6    .1    .1    .0   5.5  47.3 100.0  287.3
 1963- 3     .5    71.0  54.3  64.0  12.0  12.0    .0 106.3    .0 100.0  358.3
 1963- 4    6.7    77.3  77.3    .0  33.1  33.1    .0  44.2    .0 100.0  435.6
 1963- 5   11.3    68.6  68.6    .0  65.9  65.9    .0   2.7    .0 100.0  504.2
 1963- 6   18.0    27.7  27.7    .0 110.7 110.7    .0    .0    .0  17.0  531.9
 1963- 7   20.6   100.4 100.4    .0 130.7 109.0 -21.7    .0    .0   8.4  632.3
 1963- 8   17.8    63.7  63.7    .0 103.2  69.2 -34.0    .0    .0   2.9  696.0
 1963- 9   13.4    32.3  32.3    .0  65.9  33.9 -32.0    .0    .0   1.3  728.3
 1963-10   12.7    14.4  14.4    .0  56.5  15.3 -41.2    .0    .0    .4   14.4
 1963-11    6.2    57.0  57.0    .0  22.3  22.3    .0    .0    .0  35.1   71.4
 1963-12   -6.6    35.6  16.5    .0    .7    .7    .0    .0  19.1  50.9  107.0

 1964- 1   -3.4    47.0  30.7  29.8   2.5   2.5    .0   9.0   5.6 100.0  154.0
 1964- 2   -4.9    26.5  12.7   5.6    .5    .5    .0  17.8  13.8 100.0  180.5
 1964- 3    -.1    85.4  74.7  23.7   6.9   6.9    .0  91.5    .8 100.0  265.9
 1964- 4    6.5   112.4 112.4    .8  34.8  34.8    .0  78.4    .0 100.0  378.3
 1964- 5   14.4    66.4  66.4    .0  85.5  85.5    .0    .0    .0  80.9  444.7
 1964- 6   18.4    39.1  39.1    .0 113.8 113.8    .0    .0    .0   6.3  483.8
 1964- 7   22.1    86.0  86.0    .0 141.3  91.8 -49.6    .0    .0    .5  569.8
 1964- 8   17.5   258.5 258.5    .0 100.9 100.9    .0  58.0    .0 100.0  828.3
 1964- 9   15.8    19.5  19.5    .0  79.3  79.3    .0    .0    .0  40.2  847.8
 1964-10    8.2    34.6  34.6    .0  34.9  34.8   -.1    .0    .0  40.0   34.6
 1964-11    5.1    29.8  24.7   5.1  21.5  21.5    .0    .0    .0  48.3   64.4
 1964-12   -2.3    79.5  44.2  35.3   4.7   4.7    .0  23.1    .0 100.0  143.9
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1965- 1   -5.8    95.6  43.8  24.3   1.1   1.1    .0  67.0  27.5 100.0  239.5
1965- 2   -4.9    75.6  21.8  58.0   2.3   2.3    .0  77.4  23.3 100.0  315.1
1965- 3   -2.6   128.9  93.2  26.6   1.2   1.2    .0 118.6  32.4 100.0  444.0
1965- 4    3.8    79.2  70.3  41.3  21.3  21.3    .0  90.3    .0 100.0  523.2
1965- 5   14.8    33.8  33.8    .0  88.1  88.1    .0    .0    .0  45.7  557.0
1965- 6   17.9    41.2  41.2    .0 110.1  86.9 -23.2    .0    .0    .0  598.2
1965- 7   18.3    83.3  83.3    .0 114.3  83.3 -31.0    .0    .0    .0  681.5
1965- 8   19.0    91.1  91.1    .0 111.2  91.1 -20.1    .0    .0    .0  772.6
1965- 9   16.9    95.7  95.7    .0  85.3  85.3    .0    .0    .0  10.4  868.3
1965-10    8.8   116.6 116.6    .0  38.0  38.0    .0    .0    .0  89.0  116.6
1965-11    3.9    76.7  56.4  20.3  14.3  14.3    .0  51.3    .0 100.0  193.3
1965-12     .0    87.0  79.9   7.1   5.3   5.3    .0  81.7    .0 100.0  280.3

1966- 1   -7.4    55.1  14.5    .0   1.0   1.0    .0  13.5  40.6 100.0  335.4
1966- 2   -4.5    59.0  48.8  50.8   2.0   2.0    .0  97.6    .0 100.0  394.4
1966- 3    1.9    73.7  63.8   1.5  13.9  13.9    .0  51.4   8.4 100.0  468.1
1966- 4    5.0    82.8  82.8   8.4  24.7  24.7    .0  66.5    .0 100.0  550.9
1966- 5   10.6    31.2  31.2    .0  61.7  61.7    .0    .0    .0  69.5  582.1
1966- 6   19.0    89.2  89.2    .0 117.6 117.6    .0    .0    .0  41.1  671.3
1966- 7   21.9    43.9  43.9    .0 139.8  85.0 -54.8    .0    .0    .0  715.2
1966- 8   19.7    49.4  49.4    .0 115.1  49.4 -65.7    .0    .0    .0  764.6
1966- 9   14.3   119.5 119.5    .0  71.3  71.3    .0    .0    .0  48.2  884.1
1966-10    9.1    42.0  42.0    .0  39.3  39.3    .0    .0    .0  50.9   42.0
1966-11    4.1   148.5 139.9   6.1  16.6  16.6    .0  80.3   2.5 100.0  190.5
1966-12   -2.6   130.4  92.2   2.5   4.9   4.9    .0  89.8  38.2 100.0  320.9
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Fergus Shand Dam, Ontario  WATER BUDGET VALUES FOR THE PERIOD 1997-1999
                           (Model Run from Year 1980)

 YR  MO  TEMP(C)  PCPN  RAIN  MELT   PE    AE    DEF   SURP  SNOW  SOIL  ACC P

1997- 1   -8.3    87.6  21.8  17.8   1.0   1.0    .0  38.6  64.6 100.0  307.0
1997- 2   -5.1    89.2  62.2  44.9   1.5   1.5    .0 105.5  46.7 100.0  396.2
1997- 3   -3.3   100.8  52.4  95.1   3.9   3.9    .0 143.6    .0 100.0  497.0
1997- 4    4.3    34.7  32.3   2.4  26.2  26.2    .0   8.5    .0 100.0  531.7
1997- 5    8.0    95.0  95.0    .0  48.9  48.9    .0  46.1    .0 100.0  626.7
1997- 6   18.9    50.8  50.8    .0 120.1 120.1    .0    .0    .0  30.7  677.5
1997- 7   19.0    66.8  66.8    .0 122.3  95.2 -27.1    .0    .0   2.3  744.3
1997- 8   17.1    69.8  69.8    .0 102.1  71.0 -31.0    .0    .0   1.1  814.1
1997- 9   14.4    62.0  62.0    .0  74.2  62.2 -12.0    .0    .0    .8  876.1
1997-10    8.3    38.2  38.0    .2  38.9  38.2   -.7    .0    .0    .8   38.2
1997-11     .9    64.4  53.0  11.4   8.3   8.3    .0    .0    .0  57.0  102.6
1997-12   -2.6    32.6  11.6  11.6    .5    .5    .0    .0   9.4  79.7  135.2

1998- 1   -4.0   107.2  58.4  22.8   2.0   2.0    .0  58.8  35.4 100.0  242.4
1998- 2   -1.8    19.4  18.6  36.2   1.5   1.5    .0  53.3    .0 100.0  261.8
1998- 3     .4    76.4  57.4  19.0  16.2  16.2    .0  60.2    .0 100.0  338.2
1998- 4    7.4    38.6  38.6    .0  39.7  39.7    .0    .0    .0  98.9  376.8
1998- 5   16.3    48.4  48.4    .0 101.8 101.8    .0    .0    .0  45.5  425.2
1998- 6   17.6    56.6  56.6    .0 111.6  98.3 -13.3    .0    .0   3.8  481.8
1998- 7   20.0    27.4  27.4    .0 129.2  31.2 -98.1    .0    .0    .0  509.2
1998- 8   20.2    91.6  91.6    .0 121.2  91.6 -29.6    .0    .0    .0  600.8
1998- 9   17.0    51.6  51.6    .0  87.8  51.6 -36.2    .0    .0    .0  652.4
1998-10    9.8    22.6  22.6    .0  45.0  22.6 -22.4    .0    .0    .0   22.6
1998-11    3.1    51.1  51.1    .0  11.5  11.5    .0    .0    .0  39.6   73.7
1998-12   -1.1    56.2  42.8    .0   7.3   7.3    .0    .0  13.4  75.0  129.9

1999- 1   -7.5   113.2  31.2  28.7    .8    .8    .0  34.1  66.7 100.0  243.1
1999- 2   -3.3    49.0  40.4  45.5   1.3   1.3    .0  84.6  29.8 100.0  292.1
1999- 3   -1.5    12.0    .6  41.2   7.2   7.2    .0  34.6    .0 100.0  304.1
1999- 4    6.9    54.8  54.8    .0  36.6  36.6    .0  18.2    .0 100.0  358.9
1999- 5   14.6    69.6  69.6    .0  90.7  90.7    .0    .0    .0  78.9  428.5
1999- 6   18.9   105.7 105.7    .0 120.4 120.4    .0    .0    .0  64.2  534.2
1999- 7   21.5    77.8  77.8    .0 139.3 139.3    .0    .0    .0   2.7  612.0
1999- 8   18.3    70.4  70.4    .0 109.1  72.1 -37.0    .0    .0    .9  682.4
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  Guelph, Ontario          WATER BUDGET VALUES FOR THE PERIOD 1930-1939
                           (Model Run from YEAR 1920)

 YR  MO  TEMP(C)  PCPN  RAIN  MELT    PE    AE   DEF   SURP  SNOW  SOIL  ACC P

1930- 1   -7.1    79.1  32.4  48.3   1.3   1.3    .0  79.3  51.3 100.0  306.9
1930- 2   -4.9    87.9  30.2 105.2   5.2   5.2    .0 130.2   3.8 100.0  394.8
1930- 3   -2.7    73.0   7.6  50.4   1.8   1.8    .0  56.2  18.8 100.0  467.8
1930- 4    5.1    45.4  45.4  18.8  28.8  28.8    .0  35.3    .0 100.0  513.2
1930- 5   12.9    67.1  67.1    .0  78.5  78.5    .0    .0    .0  88.6  580.3
1930- 6   18.0    70.3  70.3    .0 113.9 113.9    .0    .0    .0  45.0  650.6
1930- 7   19.5    40.6  40.6    .0 125.3  85.6 -39.7    .0    .0    .0  691.2
1930- 8   19.2    65.4  65.4    .0 114.4  65.4 -49.0    .0    .0    .0  756.6
1930- 9   15.4    34.1  34.1    .0  78.9  34.1 -44.8    .0    .0    .0  790.7
1930-10    8.3    42.4  41.1   1.3  38.5  38.5    .0    .0    .0   3.9   42.4
1930-11    2.9    61.8   5.9   6.4  17.7  12.6  -5.0    .0  49.5   3.5  104.2
1930-12   -4.4    45.4  13.7  48.1   1.2   1.2    .0    .0  33.1  64.1  149.6

1931- 1   -6.2    50.8  12.7    .0    .0    .0    .0    .0  71.2  76.8  200.4
1931- 2   -4.7    27.7  20.1  13.9    .3    .3    .0  10.6  64.8 100.0  228.1
1931- 3   -1.5    58.3  34.7  85.4   3.0   3.0    .0 117.0   3.1 100.0  286.4
1931- 4    5.7    62.1  62.1   3.1  30.2  30.2    .0  35.0    .0 100.0  348.5
1931- 5   12.5    95.3  95.3    .0  76.7  76.7    .0  18.6    .0 100.0  443.8
1931- 6   17.4    49.2  49.2    .0 110.0 110.0    .0    .0    .0  39.2  493.0
1931- 7   21.8    91.5  91.5    .0 141.0 123.9 -17.2    .0    .0   6.8  584.5
1931- 8   18.9    70.5  70.5    .0 112.6  75.3 -37.3    .0    .0   2.0  655.0
1931- 9   17.6    65.2  65.2    .0  91.1  66.1 -25.0    .0    .0   1.2  720.2
1931-10   10.3    68.7  68.7    .0  47.3  47.3    .0    .0    .0  22.5   68.7
1931-11    5.9    82.1  80.8   1.3  23.4  23.4    .0    .0    .0  81.2  150.8
1931-12   -1.0    72.7  61.2  11.5   3.9   3.9    .0  50.0    .0 100.0  223.5

1932- 1     .2   115.4  76.5  31.8   4.9   4.9    .0 103.4   7.1 100.0  338.9
1932- 2   -2.0    39.3  25.7  20.7   3.8   3.8    .0  42.6    .0 100.0  378.2
1932- 3   -3.5    54.6    .0  50.1   3.2   3.2    .0  46.9   4.5 100.0  432.8
1932- 4    3.4    36.4  17.8  23.1  21.6  21.6    .0  19.3    .0 100.0  469.2
1932- 5   11.8   108.7 108.7    .0  72.6  72.6    .0  36.1    .0 100.0  577.9
1932- 6   17.2    40.1  40.1    .0 108.4 108.4    .0    .0    .0  31.7  618.0
1932- 7   18.3   142.9 142.9    .0 117.4 117.4    .0    .0    .0  57.2  760.9
1932- 8   19.1    87.0  87.0    .0 113.6 112.4  -1.2    .0    .0  31.8  847.9
1932- 9   14.5   104.7 104.7    .0  74.4  74.4    .0    .0    .0  62.2  952.6
1932-10    8.9    56.4  56.4    .0  40.8  40.8    .0    .0    .0  77.8   56.4
1932-11     .2    75.7  70.6   5.1   7.1   7.1    .0  46.5    .0 100.0  132.1
1932-12   -2.9    82.9  44.9  21.5   4.4   4.4    .0  62.0  16.5 100.0  215.0

1933- 1   -1.3    51.5  45.9  21.6   2.6   2.6    .0  64.9    .5 100.0  266.5
1933- 2   -5.8    50.6  10.7  21.0    .8    .8    .0  30.8  19.4 100.0  317.1
1933- 3   -2.1    56.2  43.0  32.6   1.4   1.4    .0  74.2    .0 100.0  373.3
1933- 4    6.6    56.2  56.2    .0  34.9  34.9    .0  21.3    .0 100.0  429.5
1933- 5   13.3    47.5  47.5    .0  82.3  82.3    .0    .0    .0  65.2  477.0
1933- 6   19.1    79.0  79.0    .0 121.3 121.3    .0    .0    .0  22.9  556.0
1933- 7   21.1    15.3  15.3    .0 136.2  38.2 -98.1    .0    .0    .0  571.3
1933- 8   19.3    77.0  77.0    .0 114.8  77.0 -37.8    .0    .0    .0  648.3
1933- 9   17.1    49.6  49.6    .0  88.1  49.6 -38.5    .0    .0    .0  697.9
1933-10    7.8    55.9  55.9    .0  36.5  36.5    .0    .0    .0  19.4   55.9
1933-11   -1.2    86.3  27.9  45.6   6.1   6.1    .0    .0  12.8  86.8  142.2
1933-12   -5.8    79.5  17.0  18.1   1.2   1.2    .0  20.7  57.2 100.0  221.7
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1934- 1   -4.9   114.3  42.3  13.0    .3    .3    .0  55.0 116.1 100.0  336.0
1934- 2  -14.6    26.3    .0    .0    .0    .0    .0    .0 142.4 100.0  362.3
1934- 3   -4.1    60.7  20.1  69.3   2.4   2.4    .0  87.0 113.7 100.0  423.0
1934- 4    4.3    85.6  85.6 113.7  23.3  23.3    .0 176.0    .0 100.0  508.6
1934- 5   13.6    16.8  16.8    .0  84.0  84.0    .0    .0    .0  32.8  525.4
1934- 6   19.3    56.3  56.3    .0 122.5  89.1 -33.4    .0    .0    .0  581.7
1934- 7   20.9    55.7  55.7    .0 134.8  55.7 -79.1    .0    .0    .0  637.4
1934- 8   17.4    78.3  78.3    .0 103.8  78.3 -25.5    .0    .0    .0  715.7
1934- 9   16.6   110.8 110.8    .0  85.3  85.3    .0    .0    .0  25.5  826.5
1934-10    8.0    42.2  42.2    .0  36.4  36.4    .0    .0    .0  31.2   42.2
1934-11    4.5    66.3  66.3    .0  17.8  17.8    .0    .0    .0  79.8  108.5
1934-12   -5.4    46.8   3.0    .0    .8    .8    .0    .0  43.8  81.9  155.3

1935- 1   -7.4    68.9  38.4  49.7   1.3   1.3    .0  68.7  24.6 100.0  224.2
1935- 2   -7.6    46.3   7.7  11.8    .4    .4    .0  19.1  51.4 100.0  270.5
1935- 3     .6    47.3  26.0  72.7  10.6  10.6    .0  88.1    .0 100.0  317.8
1935- 4    4.9    23.4  23.4    .0  26.8  26.8    .0    .0    .0  96.6  341.2
1935- 5    9.4    57.2  57.2    .0  57.4  57.4    .0    .0    .0  96.4  398.4
1935- 6   16.2   116.7 116.7    .0 101.4 101.4    .0  11.7    .0 100.0  515.1
1935- 7   21.9    73.7  73.7    .0 141.5 141.5    .0    .0    .0  32.2  588.8
1935- 8   19.1    32.9  32.9    .0 114.3  65.1 -49.2    .0    .0    .0  621.7
1935- 9   13.7    51.3  51.3    .0  69.8  51.3 -18.5    .0    .0    .0  673.0
1935-10    9.1    45.4  45.4    .0  40.9  40.9    .0    .0    .0   4.5   45.4
1935-11    2.4   104.9 104.9    .0  11.9  11.9    .0    .0    .0  97.5  150.3
1935-12   -6.7    34.2   8.1   5.8    .6    .6    .0  10.7  20.3 100.0  184.5

1936- 1   -7.6    39.2   1.3   6.3    .1    .1    .0   7.4  51.9 100.0  223.7
1936- 2  -11.3    57.1  15.2  13.8    .5    .5    .0  28.5  80.0 100.0  280.8
1936- 3    -.5    59.0  36.1 102.9   8.1   8.1    .0 130.9    .0 100.0  339.8
1936- 4    2.3    76.3  74.5   1.8  16.2  16.2    .0  60.1    .0 100.0  416.1
1936- 5   14.2    26.0  26.0    .0  87.3  87.3    .0    .0    .0  38.7  442.1
1936- 6   17.5    93.1  93.1    .0 110.2 104.1  -6.1    .0    .0  27.7  535.2
1936- 7   20.9    18.8  18.8    .0 135.2  46.5 -88.7    .0    .0    .0  554.0
1936- 8   19.5    35.9  35.9    .0 116.4  35.9 -80.5    .0    .0    .0  589.9
1936- 9   16.0   129.4 129.4    .0  82.6  82.6    .0    .0    .0  46.8  719.3
1936-10    8.3    70.4  70.4    .0  38.5  38.5    .0    .0    .0  78.7   70.4
1936-11    -.2    58.5  34.3    .0   9.6   9.6    .0   3.5  24.2 100.0  128.9
1936-12   -2.0    92.0  62.8  53.4   3.3   3.3    .0 112.9    .0 100.0  220.9

1937- 1   -2.8   148.4  90.5   9.1   2.1   2.1    .0  97.6  48.8 100.0  369.3
1937- 2   -4.8    79.2  43.5  39.0   1.2   1.2    .0  81.3  45.4 100.0  448.5
1937- 3   -4.0    35.3  11.0   9.6    .3    .3    .0  20.3  60.1 100.0  483.8
1937- 4    5.2   105.6 105.6  60.1  27.1  27.1    .0 138.6    .0 100.0  589.4
1937- 5   12.6    77.0  77.0    .0  77.6  77.6    .0    .0    .0  99.4  666.4
1937- 6   17.5    95.0  95.0    .0 110.4 110.4    .0    .0    .0  84.0  761.4
1937- 7   20.3   103.6 103.6    .0 130.8 130.8    .0    .0    .0  56.8  865.0
1937- 8   21.0    88.5  88.5    .0 125.9 123.9  -2.0    .0    .0  21.4  953.5
1937- 9   14.1    74.2  74.2    .0  72.4  72.4    .0    .0    .0  23.2 1027.7
1937-10    7.3    54.1  54.1    .0  33.1  33.1    .0    .0    .0  44.2   54.1
1937-11    2.6    44.6  43.3   1.3  12.9  12.9    .0    .0    .0  75.9   98.7
1937-12   -5.2    14.3   8.1   2.3    .0    .0    .0    .0   3.9  86.3  113.0
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1938- 1   -7.5    43.1   8.4   7.2    .2    .2    .0   1.6  31.4 100.0  156.1
1938- 2   -3.8   127.6  98.1  38.9   1.9   1.9    .0 135.0  22.1 100.0  283.7
1938- 3    1.3    56.4  39.7  38.8  18.8  18.8    .0  59.7    .0 100.0  340.1
1938- 4    7.0    35.4  34.1   1.3  40.5  40.5    .0    .0    .0  94.9  375.5
1938- 5   11.8    73.0  73.0    .0  72.3  72.3    .0    .0    .0  95.6  448.5
1938- 6   17.3    43.6  43.6    .0 108.8 108.8    .0    .0    .0  30.4  492.1
1938- 7   21.0    85.2  85.2    .0 135.6 110.8 -24.8    .0    .0   4.9  577.3
1938- 8   21.3   176.0 176.0    .0 128.3 128.3    .0    .0    .0  52.6  753.3
1938- 9   13.7    87.6  87.6    .0  69.9  69.9    .0    .0    .0  70.3  840.9
1938-10   10.3    24.1  24.1    .0  47.3  47.3    .0    .0    .0  47.1   24.1
1938-11    3.4    53.5  39.6   2.5  18.3  18.3    .0    .0  11.4  70.9   77.6
1938-12   -2.9    69.2  14.6  16.5   2.7   2.7    .0    .0  49.5  99.4  146.8

1939- 1   -7.2    53.1   4.8  36.2   1.0   1.0    .0  39.4  61.6 100.0  199.9
1939- 2   -6.0    70.4    .0  10.0    .3    .3    .0   9.7 122.0 100.0  270.3
1939- 3   -3.8    53.5  28.9  70.3   2.8   2.8    .0  96.4  76.3 100.0  323.8
1939- 4    3.9    99.9  68.1 108.1  24.3  24.3    .0 151.9    .0 100.0  423.7
1939- 5   13.6    28.8  28.8    .0  84.3  84.3    .0    .0    .0  44.5  452.5
1939- 6   17.6    86.6  86.6    .0 110.8 104.5  -6.2    .0    .0  26.6  539.1
1939- 7   20.1    25.6  25.6    .0 129.5  52.2 -77.3    .0    .0    .0  564.7
1939- 8   20.9    51.1  51.1    .0 125.4  51.1 -74.3    .0    .0    .0  615.8
1939- 9   16.0    44.7  44.7    .0  82.3  44.7 -37.6    .0    .0    .0  660.5
1939-10    9.0    58.0  58.0    .0  41.4  41.4    .0    .0    .0  16.6   58.0
1939-11    1.0    18.0  18.0    .0   6.2   6.2    .0    .0    .0  28.5   76.0
1939-12   -2.0    37.0  30.7    .0   3.9   3.9    .0    .0   6.3  55.3  113.0
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 Guelph, Ontario           WATER BUDGET VALUES FOR THE PERIOD 1961-1966
                           (Model Run from YEAR 1920)

 YR  MO  TEMP(C)  PCPN  RAIN  MELT   PE    AE    DEF   SURP  SNOW  SOIL  ACC P

1961- 1   -9.5    14.0    .0    .0    .0    .0    .0    .0  34.5  82.8  173.6
1961- 2   -4.0    57.5  35.8  56.2   2.7   2.7    .0  72.0    .0 100.0  231.1
1961- 3    -.7    73.4  54.4  19.0   5.8   5.8    .0  67.6    .0 100.0  304.5
1961- 4    3.3    79.3  75.5   3.8  17.9  17.9    .0  61.4    .0 100.0  383.8
1961- 5   10.0    68.8  68.8    .0  60.8  60.8    .0   8.0    .0 100.0  452.6
1961- 6   16.6    61.2  61.2    .0 104.5 104.5    .0    .0    .0  56.7  513.8
1961- 7   19.7    75.2  75.2    .0 126.9 124.0  -2.9    .0    .0   7.9  589.0
1961- 8   19.4   139.8 139.8    .0 115.6 115.6    .0    .0    .0  32.1  728.8
1961- 9   18.5    56.0  56.0    .0  96.1  77.5 -18.7    .0    .0  10.6  784.8
1961-10   10.9    29.0  29.0    .0  50.1  32.7 -17.4    .0    .0   6.9   29.0
1961-11    2.5    55.1  55.1    .0  11.9  11.9    .0    .0    .0  50.0   84.1
1961-12   -4.0    60.7  42.7   6.1   2.0   2.0    .0    .0  11.9  96.9  144.8

1962- 1   -8.9    42.4    .0    .0    .0    .0    .0    .0  54.3  96.9  187.2
1962- 2   -8.6    49.6    .0  15.7    .5    .5    .0  12.1  88.1 100.0  236.8
1962- 3   -1.3    14.1  14.1  88.1   6.0   6.0    .0  96.3    .0 100.0  250.9
1962- 4    6.2    57.7  57.7    .0  34.8  34.8    .0  22.9    .0 100.0  308.6
1962- 5   15.1    23.9  23.9    .0  93.8  93.8    .0    .0    .0  30.1  332.5
1962- 6   16.9    85.5  85.5    .0 106.5  96.1 -10.5    .0    .0  19.6  418.0
1962- 7   18.0    77.4  77.4    .0 115.5  89.8 -25.7    .0    .0   7.2  495.4
1962- 8   18.6    50.9  50.9    .0 110.2  58.0 -52.2    .0    .0    .1  546.3
1962- 9   13.1    68.1  68.1    .0  66.8  66.8    .0    .0    .0   1.3  614.4
1962-10    9.1   108.9 108.9    .0  42.6  42.6    .0    .0    .0  67.7  108.9
1962-11    1.7    50.7  50.7    .0   6.9   6.9    .0  11.5    .0 100.0  159.6
1962-12   -5.9    56.1  30.1   4.3   2.6   2.6    .0  31.8  21.7 100.0  215.7

1963- 1  -10.3    21.7    .0    .0    .0    .0    .0    .0  43.4 100.0  237.4
1963- 2  -10.7    21.0    .0   2.3    .0    .0    .0   2.3  62.1 100.0  258.4
1963- 3    -.9    72.4  29.7 104.8  10.6  10.6    .0 123.9    .0 100.0  330.8
1963- 4    6.2    68.8  68.8    .0  33.1  33.1    .0  35.7    .0 100.0  399.6
1963- 5   10.5    76.2  76.2    .0  64.2  64.2    .0  12.0    .0 100.0  475.8
1963- 6   17.4    16.2  16.2    .0 109.6 109.6    .0    .0    .0   6.6  492.0
1963- 7   19.7    81.2  81.2    .0 126.8  86.2 -40.6    .0    .0   1.6  573.2
1963- 8   16.9    55.2  55.2    .0 100.0  56.4 -43.6    .0    .0    .4  628.4
1963- 9   12.7    47.2  47.2    .0  64.6  47.3 -17.3    .0    .0    .3  675.6
1963-10   12.3    16.5  16.5    .0  56.8  16.7 -40.1    .0    .0    .1   16.5
1963-11    4.9    54.4  54.4    .0  19.3  19.3    .0    .0    .0  35.2   70.9
1963-12   -8.5    33.9   4.6   2.8    .3    .3    .0    .0  26.5  42.2  104.8

1964- 1   -5.6    70.1  31.0  47.7   1.3   1.3    .0  19.6  17.9 100.0  174.9
1964- 2   -6.7    21.0    .0   9.3    .2    .2    .0   9.1  29.6 100.0  195.9
1964- 3   -1.6    83.4  46.7  61.9   4.6   4.6    .0 104.0   4.4 100.0  279.3
1964- 4    5.2    89.9  74.9  19.4  31.1  31.1    .0  63.2    .0 100.0  369.2
1964- 5   13.6    54.8  54.8    .0  83.7  83.7    .0    .0    .0  71.1  424.0
1964- 6   16.8    70.4  70.4    .0 105.8 105.8    .0    .0    .0  35.7  494.4
1964- 7   20.6    93.2  93.2    .0 132.8 116.8 -16.0    .0    .0  12.1  587.6
1964- 8   16.1   150.7 150.7    .0  94.8  94.8    .0    .0    .0  68.0  738.3
1964- 9   13.9    23.7  23.7    .0  70.9  70.9    .0    .0    .0  20.8  762.0
1964-10    7.2    56.8  56.8    .0  32.3  32.3    .0    .0    .0  45.3   56.8
1964-11    3.2    38.1  18.3  19.8  17.1  17.1    .0    .0    .0  66.2   94.9
1964-12   -3.7    73.8  46.8  27.0   3.0   3.0    .0  37.0    .0 100.0  168.7
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1965- 1   -8.3    94.5  21.1  21.2    .6    .6    .0  41.7  52.2 100.0  263.2
1965- 2   -6.9    97.8  12.5  40.7   1.3   1.3    .0  51.9  96.8 100.0  361.0
1965- 3   -4.2    58.7  11.0  38.5   1.3   1.3    .0  48.2 106.0 100.0  419.7
1965- 4    2.4    65.8  50.1 121.7  17.0  17.0    .0 154.7    .0 100.0  485.5
1965- 5   13.6    50.0  50.0    .0  83.9  83.9    .0    .0    .0  66.1  535.5
1965- 6   16.2    48.4  48.4    .0 101.8 101.8    .0    .0    .0  12.7  583.9
1965- 7   16.8    86.0  86.0    .0 106.9  90.4 -16.5    .0    .0   8.3  669.9
1965- 8   17.8    58.8  58.8    .0 106.2  65.3 -40.9    .0    .0   1.7  728.7
1965- 9   15.5    76.0  76.0    .0  79.9  76.1  -3.8    .0    .0   1.6  804.7
1965-10    6.9   126.0 120.7   5.3  32.0  32.0    .0    .0    .0  95.6  126.0
1965-11    1.9    88.3  85.8    .5  10.0  10.0    .0  72.0   2.0 100.0  214.3
1965-12   -1.6    74.8  49.6  27.2   3.4   3.4    .0  73.4    .0 100.0  289.1

1966- 1   -8.4    57.1   6.6    .0    .1    .1    .0   6.5  50.5 100.0  346.2
1966- 2   -5.4    42.3  29.5  36.9   1.1   1.1    .0  65.2  26.4 100.0  388.5
1966- 3    -.2    62.7  45.5  33.7   7.4   7.4    .0  71.8   9.9 100.0  451.2
1966- 4    3.9    41.0  39.7  11.2  21.6  21.6    .0  29.3    .0 100.0  492.2
1966- 5    9.1    43.9  43.9    .0  55.6  55.6    .0    .0    .0  88.3  536.1
1966- 6   17.9    58.7  58.7    .0 112.9 112.9    .0    .0    .0  34.1  594.8
1966- 7   20.7    23.8  23.8    .0 133.7  57.9 -75.8    .0    .0    .0  618.6
1966- 8   18.3    71.0  71.0    .0 108.9  71.0 -37.9    .0    .0    .0  689.6
1966- 9   13.3    61.6  61.6    .0  68.1  61.6  -6.5    .0    .0    .0  751.2
1966-10    7.7    41.4  41.4    .0  35.0  35.0    .0    .0    .0   6.4   41.4
1966-11    3.4   158.7 149.1   3.8  15.0  15.0    .0  44.4   5.8 100.0  200.1
1966-12   -3.9    98.3  71.4  11.4   4.2   4.2    .0  78.6  21.3 100.0  298.4
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  Guelph, Ontario            WATER BUDGET VALUES FOR THE PERIOD 1997-1999
                             (Model Run from YEAR 1953)

  YR  MO  TEMP(C)  PCPN  RAIN  MELT   PE    AE    DEF   SURP  SNOW  SOIL  ACC P

 1997- 1    -6.0    45.0  13.2  19.3   1.9   1.9    .0  30.6  12.5 100.0  168.3
 1997- 2    -3.4    86.7  55.2  44.0   3.0   3.0    .0  96.2    .0 100.0  255.0
 1997- 3    -1.1   117.3  52.3  61.9   7.0   7.0    .0 107.2   3.1 100.0  372.3
 1997- 4     5.7    19.4  16.0   6.5  34.5  34.5    .0    .0    .0  88.0  391.7
 1997- 5     7.9    86.9  86.9    .0  48.2  48.2    .0  26.7    .0 100.0  478.6
 1997- 6    18.1    46.3  46.3    .0 114.9 114.9    .0    .0    .0  31.4  524.9
 1997- 7    18.3    69.2  69.2    .0 117.5  94.5 -23.1    .0    .0   6.1  594.1
 1997- 8    16.6    69.9  69.9    .0  98.6  72.8 -25.8    .0    .0   3.2  664.0
 1997- 9    15.7    68.9  68.9    .0  81.1  69.5 -11.6    .0    .0   2.5  732.9
 1997-10    10.6     8.2   8.2    .0  51.1  10.0 -41.1    .0    .0    .7    8.2
 1997-11     1.6    78.3  61.5  16.8  10.4  10.4    .0    .0    .0  68.6   86.5
 1997-12    -2.1    40.9  12.2   8.4   1.4   1.4    .0    .0  20.3  87.8  127.4

 1998- 1    -3.5    83.5  43.4  26.4   2.6   2.6    .0  55.0  34.0 100.0  210.9
 1998- 2     -.6    26.6   6.2  54.4   5.6   5.6    .0  55.0    .0 100.0  237.5
 1998- 3     1.6    94.4  51.2  43.2  20.7  20.7    .0  73.7    .0 100.0  331.9
 1998- 4     9.9    37.5  37.5    .0  53.6  53.6    .0    .0    .0  83.9  369.4
 1998- 5    17.7    38.1  38.1    .0 110.8 110.8    .0    .0    .0  11.2  407.5
 1998- 6    19.0    94.5  94.5    .0 120.7  99.4 -21.3    .0    .0   6.3  502.0
 1998- 7    20.4    37.8  37.8    .0 131.6  44.1 -87.5    .0    .0    .0  539.8
 1998- 8    22.4    47.9  47.9    .0 134.5  47.9 -86.6    .0    .0    .0  587.7
 1998- 9    18.9    24.5  24.5    .0  98.1  24.5 -73.6    .0    .0    .0  612.2
 1998-10    11.3    22.1  22.1    .0  52.1  22.1 -30.0    .0    .0    .0   22.1
 1998-11     3.2    47.4  47.4    .0  12.8  12.8    .0    .0    .0  34.6   69.5
 1998-12      .8    50.1  44.0   3.2  11.1  11.1    .0    .0   2.9  70.7  119.6

 1999- 1    -7.1    98.4  29.7  56.6   1.7   1.7    .0  55.3  15.0 100.0  218.0
 1999- 2    -3.2    47.2  30.3  31.9   2.3   2.3    .0  59.9    .0 100.0  265.2
 1999- 3     -.3    29.7   2.4  27.3  13.1  13.1    .0  16.6    .0 100.0  294.9
 1999- 4     8.1    43.4  37.3   6.1  43.8  43.8    .0    .0    .0  99.6  338.3
 1999- 5    16.0    61.8  61.8    .0  99.6  99.6    .0    .0    .0  61.8  400.1
 1999- 6    19.4    94.8  94.8    .0 123.3 123.3    .0    .0    .0  33.3  494.9
 1999- 7    21.8   108.1 108.1    .0 141.2 126.5 -14.7    .0    .0  14.9  603.0
 1999- 8    18.5    50.6  50.6    .0 110.3  65.5 -44.9    .0    .0    .1  653.6
 1999- 9    17.2   152.1 152.1    .0  89.5  89.5    .0    .0    .0  62.6  805.7
 1999-10     8.3    76.6  76.6    .0  37.7  37.7    .0   1.5    .0 100.0   76.6
 1999-11     4.7    71.7  66.6   2.3  20.7  20.7    .0  48.2   2.8 100.0  148.3
 1999-12    -2.0    55.8  42.6   3.3   5.3   5.3    .0  40.6  12.7 100.0  204.1
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* Model runs were made in September, 2000 with Guelph climate data that had been updated/corrected by the GRCA for missing temperature and precipitation values during the 1990s.

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 Kitchener, Ontario       WATER BUDGET VALUES FOR THE YEAR 1930
                          (Model Run from YEAR 1921)

 YR  MO  TEMP(C)  PCPN  RAIN  MELT   PE    AE   DEF   SURP  SNOW  SOIL  ACC P

1930- 1   -7.2   103.6  72.0  48.2   1.2   1.2    .0 119.0  42.3 100.0  338.3
1930- 2   -4.1    68.7  33.0  74.2   6.3   6.3    .0 100.9   3.8 100.0  407.0
1930- 3   -1.6    62.1  28.7  25.5   2.9   2.9    .0  51.3  11.7 100.0  469.1
1930- 4    6.0    37.4  37.4  11.7  31.9  31.9    .0  17.2    .0 100.0  506.5
1930- 5   13.9    76.5  76.5    .0  84.7  84.7    .0    .0    .0  91.8  583.0
1930- 6   19.3    82.9  82.9    .0 121.9 121.9    .0    .0    .0  52.9  665.9
1930- 7   20.9    33.2  33.2    .0 134.2  86.1 -48.1    .0    .0    .0  699.1
1930- 8   19.9    46.8  46.8    .0 118.5  46.8 -71.7    .0    .0    .0  745.9
1930- 9   16.8    38.4  38.4    .0  85.8  38.4 -47.4    .0    .0    .0  784.3
1930-10    8.7    34.6  34.6    .0  39.7  34.6  -5.1    .0    .0    .0   34.6
1930-11    3.6    67.4  40.7    .0  18.6  18.6    .0    .0  26.7  22.1  102.0
1930-12   -3.6    34.0  17.3  36.1   1.4   1.4    .0    .0   7.3  74.1  136.0

 Kitchener, Ontario       WATER BUDGET VALUES FOR THE PERIOD 1933-1936
                          (Model Run from YEAR 1932)

 YR  MO  TEMP(C)  PCPN  RAIN  MELT   PE    AE   DEF   SURP  SNOW  SOIL  ACC P

1933- 1   -1.0    37.2  37.2    .0   2.6   2.6    .0  34.6    .0 100.0  256.9
1933- 2   -4.9    46.0  26.7  19.3   1.3   1.3    .0  44.7    .0 100.0  302.9
1933- 3   -2.0    49.4  27.9  21.5   1.1   1.1    .0  48.3    .0 100.0  352.3
1933- 4    6.9   133.9 133.9    .0  35.8  35.8    .0  98.1    .0 100.0  486.2
1933- 5   13.9    39.7  39.7    .0  85.1  85.1    .0    .0    .0  54.6  525.9
1933- 6   20.0    45.8  45.8    .0 126.5 100.4 -26.1    .0    .0    .0  571.7
1933- 7   21.8    49.6  49.6    .0 140.1  49.6 -90.5    .0    .0    .0  621.3
1933- 8   19.5    91.3  91.3    .0 116.0  91.3 -24.7    .0    .0    .0  712.6
1933- 9   17.2    35.8  35.8    .0  88.3  35.8 -52.5    .0    .0    .0  748.4
1933-10    7.8    77.7  77.7    .0  35.7  35.7    .0    .0    .0  42.0   77.7
1933-11    -.5    90.2  50.8  39.4   6.6   6.6    .0  25.6    .0 100.0  167.9
1933-12   -5.0    62.3  25.5   6.3   1.9   1.9    .0  29.9  30.5 100.0  230.2

1934- 1   -4.5    90.8  47.7  21.7    .5    .5    .0  68.9  51.9 100.0  321.0
1934- 2  -13.2    11.4    .0    .0    .0    .0    .0    .0  63.3 100.0  332.4
1934- 3   -3.7    50.8  12.7  54.4   1.7   1.7    .0  65.4  47.0 100.0  383.2
1934- 4    5.3    18.1  18.1  47.0  27.7  27.7    .0  37.4    .0 100.0  401.3
1934- 5   14.5    16.8  16.8    .0  88.5  88.5    .0    .0    .0  28.3  418.1
1934- 6   20.3    35.5  35.5    .0 128.3  63.8 -64.5    .0    .0    .0  453.6
1934- 7   21.4    59.9  59.9    .0 137.7  59.9 -77.8    .0    .0    .0  513.5
1934- 8   18.0    28.5  28.5    .0 106.8  28.5 -78.3    .0    .0    .0  542.0
1934- 9   16.7    97.9  97.9    .0  85.2  85.2    .0    .0    .0  12.7  639.9
1934-10    8.2    19.3  19.3    .0  36.9  23.0 -13.9    .0    .0   9.0   19.3
1934-11    4.4    35.0  35.0    .0  16.9  16.9    .0    .0    .0  27.1   54.3
1934-12   -4.9    21.6   1.3    .0    .5    .5    .0    .0  20.3  27.9   75.9
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1935- 1   -7.1    68.4  35.5  32.9   1.3   1.3    .0    .0  20.3  95.0  144.3
1935- 2   -6.5    44.5   5.1  12.8    .4    .4    .0  12.4  46.9 100.0  188.8
1935- 3    1.6    11.4  10.1  48.2  12.3  12.3    .0  46.0    .0 100.0  200.2
1935- 4    5.0    48.7  48.7    .0  26.4  26.4    .0  22.3    .0 100.0  248.9
1935- 5   10.2    29.7  29.7    .0  61.5  61.5    .0    .0    .0  68.2  278.6
1935- 6   17.1   141.3 141.3    .0 106.7 106.7    .0   2.8    .0 100.0  419.9
1935- 7   22.5    73.2  73.2    .0 145.2 145.2    .0    .0    .0  28.0  493.1
1935- 8   19.8    30.6  30.6    .0 117.8  58.6 -59.2    .0    .0    .0  523.7
1935- 9   13.8    44.0  44.0    .0  69.3  44.0 -25.3    .0    .0    .0  567.7
1935-10    8.7    26.5  26.5    .0  38.3  26.5 -11.8    .0    .0    .0   26.5
1935-11    3.0    79.2  79.2    .0  13.6  13.6    .0    .0    .0  65.6  105.7
1935-12   -6.1    73.7  44.9  18.6    .9    .9    .0  28.1  10.2 100.0  179.4

1936- 1   -7.0    53.4   8.9  11.3    .3    .3    .0  20.0  43.4 100.0  232.8
1936- 2  -10.9    48.3   1.3  16.8    .5    .5    .0  17.5  73.6 100.0  281.1
1936- 3     .3    42.0  26.7  88.9   9.7   9.7    .0 105.9    .0 100.0  323.1
1936- 4    3.0    25.4  21.5   3.9  17.9  17.9    .0   7.5    .0 100.0  348.5
1936- 5   14.2    49.6  49.6    .0  86.6  86.6    .0    .0    .0  63.0  398.1
1936- 6   17.3    65.3  65.3    .0 108.2 108.2    .0    .0    .0  20.1  463.4
1936- 7   21.4    21.9  21.9    .0 137.8  42.0 -95.8    .0    .0    .0  485.3
1936- 8   20.1    39.7  39.7    .0 119.9  39.7 -80.2    .0    .0    .0  525.0
1936- 9   16.2   123.0 123.0    .0  83.2  83.2    .0    .0    .0  39.8  648.0
1936-10    8.4    85.5  85.5    .0  38.4  38.4    .0    .0    .0  86.9   85.5
1936-11    -.2    47.2  31.1    .0   9.1   9.1    .0   8.9  16.1 100.0  132.7
1936-12   -1.3   107.1  88.4  34.8   4.0   4.0    .0 119.2    .0 100.0  239.8
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 Kitchener, Ontario       WATER BUDGET VALUES FOR THE PERIOD 1961-1966
                           (Model Run from YEAR 1940)

 YR  MO  TEMP(C)  PCPN  RAIN  MELT    PE    AE   DEF  SURP  SNOW  SOIL  ACC P

1961- 1   -8.8    16.1   4.6  10.0    .2    .2    .0    .0  31.2  93.9  186.2
1961- 2   -3.7    67.7  45.8  53.1   3.5   3.5    .0  89.3    .0 100.0  253.9
1961- 3    -.2    47.5  26.7  20.8   6.7   6.7    .0  40.8    .0 100.0  301.4
1961- 4    3.8    89.9  89.4    .5  19.8  19.8    .0  70.1    .0 100.0  391.3
1961- 5   11.0    66.2  66.2    .0  66.3  66.3    .0    .0    .0  99.9  457.5
1961- 6   17.7    66.5  66.5    .0 110.9 110.9    .0    .0    .0  55.5  524.0
1961- 7   20.3    80.5  80.5    .0 130.0 126.3  -3.7    .0    .0   9.7  604.5
1961- 8   20.0   115.8 115.8    .0 118.8 116.3  -2.5    .0    .0   9.2  720.3
1961- 9   18.8    65.8  65.8    .0  97.6  70.7 -26.9    .0    .0   4.3  786.1
1961-10   11.3    18.8  18.8    .0  51.6  21.2 -30.4    .0    .0   2.0   18.8
1961-11    2.8    68.3  68.3    .0  12.4  12.4    .0    .0    .0  57.8   87.1
1961-12   -3.8    67.3  42.1  15.3   2.1   2.1    .0  13.1   9.9 100.0  154.4

1962- 1   -8.7    54.6  10.2    .0    .0    .0    .0  10.2  54.3 100.0  209.0
1962- 2   -8.2    77.6  12.0  12.8    .4    .4    .0  24.4 107.1 100.0  286.6
1962- 3   -1.1    18.0  17.7 107.4   6.5   6.5    .0 118.6    .0 100.0  304.6
1962- 4    6.8    59.7  59.7    .0  37.6  37.6    .0  22.1    .0 100.0  364.3
1962- 5   15.9    37.6  37.6    .0  98.3  98.3    .0    .0    .0  39.3  401.9
1962- 6   18.0   134.2 134.2    .0 112.7 112.7    .0    .0    .0  60.8  536.1
1962- 7   19.3    64.3  64.3    .0 123.3 123.3    .0    .0    .0   1.8  600.4
1962- 8   19.3    72.5  72.5    .0 114.1  73.7 -40.4    .0    .0    .5  672.9
1962- 9   14.0    56.6  56.6    .0  71.4  56.7 -14.7    .0    .0    .4  729.5
1962-10    9.8    97.2  89.6   7.6  45.5  45.5    .0    .0    .0  52.1   97.2
1962-11    1.9    67.6  67.6    .0   7.4   7.4    .0  12.2    .0 100.0  164.8
1962-12   -5.8    79.8  44.4   5.6   2.4   2.4    .0  47.6  29.8 100.0  244.6

1963- 1  -10.6    21.6    .0    .0    .0    .0    .0    .0  51.4 100.0  266.2
1963- 2  -10.2    20.9    .0   2.3    .0    .0    .0   2.3  70.0 100.0  287.1
1963- 3    -.3    65.1  50.3  84.8  11.4  11.4    .0 123.7    .0 100.0  352.2
1963- 4    6.7    62.0  62.0    .0  34.9  34.9    .0  27.1    .0 100.0  414.2
1963- 5   11.4    81.5  81.5    .0  68.7  68.7    .0  12.8    .0 100.0  495.7
1963- 6   18.2    27.1  27.1    .0 114.5 114.5    .0    .0    .0  12.6  522.8
1963- 7   20.8    77.2  77.2    .0 133.5  89.1 -44.5    .0    .0    .8  600.0
1963- 8   17.9    52.8  52.8    .0 106.0  53.5 -52.5    .0    .0    .1  652.8
1963- 9   13.9    30.8  30.8    .0  70.5  30.9 -39.6    .0    .0    .0  683.6
1963-10   14.0    18.8  18.8    .0  64.5  18.8 -45.7    .0    .0    .0   18.8
1963-11    5.3    50.5  50.5    .0  20.3  20.3    .0    .0    .0  30.2   69.3
1963-12   -7.4    54.2   6.6   2.8    .4    .4    .0    .0  44.8  39.2  123.5

1964- 1   -4.7    78.3  39.4  59.4   1.7   1.7    .0  36.3  24.3 100.0  201.8
1964- 2   -5.8    24.4    .0  11.0    .3    .3    .0  10.7  37.7 100.0  226.2
1964- 3    -.9    84.6  48.1  70.4   5.4   5.4    .0 113.1   3.8 100.0  310.8
1964- 4    5.9    89.7  88.9   4.6  33.6  33.6    .0  59.9    .0 100.0  400.5
1964- 5   14.5    59.5  59.5    .0  88.5  88.5    .0    .0    .0  71.0  460.0
1964- 6   17.9    93.2  93.2    .0 112.5 112.5    .0    .0    .0  51.7  553.2
1964- 7   21.8    87.4  87.4    .0 140.3 133.0  -7.3    .0    .0   6.1  640.6
1964- 8   17.1   193.1 193.1    .0 100.6 100.6    .0    .0    .0  98.6  833.7
1964- 9   15.1    24.9  24.9    .0  77.0  77.0    .0    .0    .0  46.4  858.6
1964-10    8.3    31.8  31.8    .0  37.1  35.9  -1.2    .0    .0  42.4   31.8
1964-11    4.1    37.9  26.7  11.2  20.1  20.1    .0    .0    .0  60.2   69.7
1964-12   -3.4    84.2  57.9  26.3   2.6   2.6    .0  41.7    .0 100.0  153.9
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1965- 1   -7.3   107.0  21.9  22.7    .8    .8    .0  43.8  62.4 100.0  260.9
1965- 2   -6.2    93.0  12.1  44.5   1.4   1.4    .0  55.2  98.8 100.0  353.9
1965- 3   -3.1    48.5  20.1  53.2   1.8   1.8    .0  71.5  74.1 100.0  402.4
1965- 4    3.7    75.7  67.1  82.7  21.0  21.0    .0 128.8    .0 100.0  478.1
1965- 5   14.8    45.7  45.7    .0  90.3  90.3    .0    .0    .0  55.4  523.8
1965- 6   17.5    24.7  24.7    .0 109.5  80.1 -29.4    .0    .0    .0  548.5
1965- 7   18.2    85.9  85.9    .0 115.7  85.9 -29.8    .0    .0    .0  634.4
1965- 8   18.8    69.7  69.7    .0 111.6  69.7 -41.9    .0    .0    .0  704.1
1965- 9   16.5    71.7  71.7    .0  84.8  71.7 -13.1    .0    .0    .0  775.8
1965-10    7.7   124.9 124.9    .0  34.4  34.4    .0    .0    .0  90.5  124.9
1965-11    2.7    98.2  91.4    .0  11.9  11.9    .0  69.9   6.8 100.0  223.1
1965-12   -1.0    90.9  77.2  20.5   4.0   4.0    .0  93.7    .0 100.0  314.0

1966- 1   -7.5    55.3   6.6    .0    .3    .3    .0   6.3  48.7 100.0  369.3
1966- 2   -4.5    66.6  32.8  55.0   1.8   1.8    .0  86.0  27.5 100.0  435.9
1966- 3     .6    72.5  59.3  40.7   9.8   9.8    .0  90.2    .0 100.0  508.4
1966- 4    4.9    46.1  46.1    .0  25.2  25.2    .0  20.9    .0 100.0  554.5
1966- 5   10.0    55.2  55.2    .0  60.5  60.5    .0    .0    .0  94.7  609.7
1966- 6   19.1    67.8  67.8    .0 120.4 120.4    .0    .0    .0  42.1  677.5
1966- 7   22.2    29.2  29.2    .0 143.1  71.3 -71.8    .0    .0    .0  706.7
1966- 8   19.6    91.0  91.0    .0 116.5  91.0 -25.5    .0    .0    .0  797.7
1966- 9   14.3    70.8  70.8    .0  72.6  70.8  -1.8    .0    .0    .0  868.5
1966-10    8.4    39.9  39.9    .0  37.7  37.7    .0    .0    .0   2.2   39.9
1966-11    3.8   145.8 140.0    .0  15.4  15.4    .0  26.8   5.8 100.0  185.7
1966-12   -3.5   119.2  68.9  17.5   4.5   4.5    .0  81.9  38.6 100.0  304.9
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 Kitchener, Ontario       WATER BUDGET VALUES FOR THE PERIOD 1997-1999 *
                          (Model Run from YEAR 1940)

 YR  MO  TEMP(C)  PCPN  RAIN  MELT   PE    AE   DEF   SURP  SNOW  SOIL  ACC P

1997- 1   -7.1    89.2  23.9  22.7   1.9   1.9    .0  44.8  52.0 100.0  316.5
1997- 2   -4.0    87.5  53.8  73.8   2.5   2.5    .0 125.1  11.9 100.0  404.0
1997- 3   -2.0   111.7  46.6  74.8   5.4   5.4    .0 116.0   2.2 100.0  515.7
1997- 4    4.9    25.5  25.5   2.2  27.2  27.2    .0    .5    .0 100.0  541.2
1997- 5    8.7    88.6  88.6    .0  51.4  51.4    .0  37.2    .0 100.0  629.8
1997- 6   18.7    71.7  71.7    .0 117.5 117.5    .0    .0    .0  54.2  701.5
1997- 7   19.2    47.8  47.8    .0 122.7 102.0 -20.7    .0    .0    .0  749.3
1997- 8   17.1    84.6  84.6    .0 100.7  84.6 -16.1    .0    .0    .0  833.9
1997- 9   14.3    39.0  39.0    .0  72.6  39.0 -33.6    .0    .0    .0  872.9
1997-10    8.7    51.7  51.7    .0  40.0  40.0    .0    .0    .0  11.7   51.7
1997-11    1.2    64.4  49.0  15.4   8.1   8.1    .0    .0    .0  68.0  116.1
1997-12   -2.3    42.8  20.0  15.5    .9    .9    .0   2.6   7.3 100.0  158.9

1998- 1   -3.1   105.8  67.5   7.3   3.0   3.0    .0  71.8  38.3 100.0  264.7
1998- 2   -1.5    32.4  32.2  38.5   2.3   2.3    .0  68.4    .0 100.0  297.1
1998- 3     .8    95.4  65.8  29.6  16.7  16.7    .0  78.7    .0 100.0  392.5
1998- 4    7.6    53.8  53.8    .0  39.4  39.4    .0  14.4    .0 100.0  446.3
1998- 5   16.1    39.8  39.8    .0  98.7  98.7    .0    .0    .0  41.1  486.1
1998- 6   17.9    75.0  75.0    .0 112.6 100.7 -11.9    .0    .0  15.3  561.1
1998- 7   19.9    30.4  30.4    .0 127.2  45.7 -81.5    .0    .0    .0  591.5
1998- 8   20.3    40.2  40.2    .0 120.7  40.2 -80.5    .0    .0    .0  631.7
1998- 9   16.8    42.5  42.5    .0  85.7  42.5 -43.2    .0    .0    .0  674.2
1998-10    9.7    19.0  19.0    .0  43.3  19.0 -24.3    .0    .0    .0   19.0
1998-11    3.3    49.4  49.0    .4  12.2  12.2    .0    .0    .0  37.2   68.4
1998-12    -.5    72.8  63.6   2.0   8.5   8.5    .0    .0   7.2  94.3  141.2

1999- 1   -7.5   117.6  36.0  45.3   1.3   1.3    .0  74.2  43.5 100.0  258.8
1999- 2   -2.7    40.6  31.6  52.5   2.5   2.5    .0  81.7    .0 100.0  299.4
1999- 3   -1.1    27.4   2.0  25.4   7.9   7.9    .0  19.5    .0 100.0  326.8
1999- 4    6.9    47.2  47.2    .0  35.5  35.5    .0  11.7    .0 100.0  374.0
1999- 5   14.3    42.8  42.8    .0  87.0  87.0    .0    .0    .0  55.8  416.8
1999- 6   19.1    86.0  86.0    .0 120.2 117.8  -2.4    .0    .0  23.9  502.8
1999- 7   22.4    71.0  71.0    .0 144.5  94.9 -49.6    .0    .0    .0  573.8
1999- 8   18.1    63.8  63.8    .0 106.5  63.8 -42.7    .0    .0    .0  637.6
1999- 9   16.0   115.6 115.6    .0  81.6  81.6    .0    .0    .0  34.0  753.2
1999-10    7.7    67.0  67.0    .0  34.0  34.0    .0    .0    .0  67.0   67.0
1999-11    4.5    70.6  68.8    .0  18.5  18.5    .0  17.3   1.8 100.0  137.6
1999-12   -2.1    61.8  48.8   2.4   5.0   5.0    .0  46.2  12.4 100.0  199.4
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* Model runs were made in August, 2000 with Waterloo-Wellington climate archive data that had been updated/corrected for the months of:

January	1997
March	1997
September	1996
October	1996
July	1993

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Mount Forest, Ontario    WATER BUDGET VALUES FOR THE PERIOD 1930-1932
                           (Model Run from YEAR 1929)

 YR  MO  TEMP(C)  PCPN  RAIN  MELT   PE    AE   DEF   SURP  SNOW  SOIL  ACC P

1930- 1   -8.1    50.5   4.4  33.0   1.0   1.0    .0    .0 170.1  68.2  280.1
1930- 2   -5.9    26.7   7.6 143.5   6.0   6.0    .0 113.2  45.8 100.0  306.8
1930- 3   -3.6    54.4   5.6  34.3   1.5   1.5    .0  38.4  60.3 100.0  361.2
1930- 4    4.2     8.6   2.0  66.9  26.7  26.7    .0  42.2    .0 100.0  369.8
1930- 5   12.1    30.7  30.7    .0  77.3  77.3    .0    .0    .0  53.4  400.5
1930- 6   17.8    33.5  33.5    .0 115.1  86.9 -28.2    .0    .0    .0  434.0
1930- 7   18.5    30.3  30.3    .0 121.2  30.3 -90.9    .0    .0    .0  464.3
1930- 8   17.8     2.8   2.8    .0 108.6   2.8-105.8    .0    .0    .0  467.1
1930- 9   15.4    27.8  27.8    .0  81.4  27.8 -53.6    .0    .0    .0  494.9
1930-10    7.5    21.9  16.8   5.1  37.1  21.9 -15.2    .0    .0    .0   21.9
1930-11    2.1    39.8   1.5   5.1  16.5   6.6  -9.9    .0  33.2    .0   61.7
1930-12   -5.3    50.4   8.1  30.8    .9    .9    .0    .0  44.7  38.0  112.1

1931- 1   -7.1    73.0    .0    .0    .0    .0    .0    .0 117.7  38.0  185.1
1931- 2   -6.3    15.1   2.1  10.8    .4    .4    .0    .0 119.9  50.5  200.2
1931- 3   -3.1    42.9  19.0  32.5   1.4   1.4    .0    .6 111.3 100.0  243.1
1931- 4    5.0    27.0  27.0 111.3  29.0  29.0    .0 109.3    .0 100.0  270.1
1931- 5   11.9    13.2  13.2    .0  76.7  76.7    .0    .0    .0  36.5  283.3
1931- 6   16.7     8.6   8.6    .0 108.3  45.1 -63.2    .0    .0    .0  291.9
1931- 7   20.7    19.3  19.3    .0 136.2  19.3-116.9    .0    .0    .0  311.2
1931- 8   18.4    46.7  46.7    .0 112.4  46.7 -65.7    .0    .0    .0  357.9
1931- 9   16.5    46.4  46.4    .0  87.7  46.4 -41.3    .0    .0    .0  404.3
1931-10    9.7    40.4  40.4    .0  46.9  40.4  -6.5    .0    .0    .0   40.4
1931-11    5.5    33.3  31.3   2.0  23.9  23.9    .0    .0    .0   9.4   73.7
1931-12   -2.2    54.9   6.4  46.5   3.2   3.2    .0    .0   2.0  59.1  128.6

1932- 1    -.7    49.8  18.8  15.0   3.7   3.7    .0    .0  18.0  89.2  178.4
1932- 2   -4.9    59.3  13.2  42.2   1.6   1.6    .0  43.1  21.9 100.0  237.7
1932- 3   -5.0    69.4   4.3  40.8   1.7   1.7    .0  43.4  46.2 100.0  307.1
1932- 4    2.3    25.4   3.5  68.1  18.7  18.7    .0  52.9    .0 100.0  332.5
1932- 5   11.4    20.9  20.9    .0  73.7  73.7    .0    .0    .0  47.2  353.4
1932- 6   16.8    16.3  16.3    .0 108.9  63.5 -45.4    .0    .0    .0  369.7
1932- 7   17.9    62.0  62.0    .0 117.3  62.0 -55.3    .0    .0    .0  431.7
1932- 8   18.9   126.5 126.5    .0 114.8 114.8    .0    .0    .0  11.7  558.2
1932- 9   14.0   101.9 101.9    .0  74.7  74.7    .0    .0    .0  38.9  660.1
1932-10    8.9    92.7  92.7    .0  43.1  43.1    .0    .0    .0  88.5   92.7
1932-11    -.7    87.9  56.6   4.8   7.4   7.4    .0  42.4  26.5 100.0  180.6
1932-12   -3.9    79.5  45.2  52.9   3.5   3.5    .0  94.6   7.9 100.0  260.1
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 Mount Forest, Ontario    WATER BUDGET VALUES FOR THE PERIOD 1935-1939
                           (Model Run from YEAR 1934)

 YR  MO  TEMP(C)  PCPN  RAIN  MELT   PE    AE   DEF   SURP  SNOW  SOIL  ACC P

1935- 1   -8.7   133.3  60.6  32.3    .9    .9    .0  92.0  89.0 100.0  379.5
1935- 2   -8.7    64.3  13.7  27.9   1.0   1.0    .0  40.5 111.7 100.0  443.8
1935- 3    -.4    79.5  36.6 154.6   8.0   8.0    .0 183.2    .0 100.0  523.3
1935- 4    4.0    43.2  38.6   4.6  23.5  23.5    .0  19.7    .0 100.0  566.5
1935- 5    8.1    93.2  93.2    .0  51.3  51.3    .0  41.9    .0 100.0  659.7
1935- 6   15.9   134.7 134.7    .0 101.7 101.7    .0  33.0    .0 100.0  794.4
1935- 7   21.0    53.9  53.9    .0 136.9 136.9    .0    .0    .0  17.0  848.3
1935- 8   18.4    28.9  28.9    .0 111.6  45.9 -65.7    .0    .0    .0  877.2
1935- 9   12.9    69.0  69.0    .0  67.3  67.3    .0    .0    .0   1.7  946.2
1935-10    7.7    81.6  81.6    .0  35.5  35.5    .0    .0    .0  47.8   81.6
1935-11    1.7   127.4 112.6  10.7  10.8  10.8    .0  60.3   4.1 100.0  209.0
1935-12   -7.4    58.8  14.5   9.3    .2    .2    .0  23.6  39.1 100.0  267.8

1936- 1   -8.6    88.6    .8    .0    .0    .0    .0    .8 126.9 100.0  356.4
1936- 2  -12.6    60.2  16.3   9.2    .3    .3    .0  25.1 161.6 100.0  416.6
1936- 3   -2.2    65.7  48.1 129.5   5.5   5.5    .0 172.2  49.7 100.0  482.3
1936- 4    2.1   120.7  77.3  93.1  16.4  16.4    .0 154.0    .0 100.0  603.0
1936- 5   13.1    64.1  64.1    .0  82.7  82.7    .0    .0    .0  81.4  667.1
1936- 6   15.8    58.7  58.7    .0 101.5 101.5    .0    .0    .0  38.7  725.8
1936- 7   18.5    10.5  10.5    .0 121.1  49.2 -71.9    .0    .0    .0  736.3
1936- 8   18.1    74.6  74.6    .0 109.7  74.6 -35.1    .0    .0    .0  810.9
1936- 9   15.7   151.4 151.4    .0  82.6  82.6    .0    .0    .0  68.8  962.3
1936-10    7.2    91.5  77.0  14.5  35.8  35.8    .0  24.5    .0 100.0   91.5
1936-11   -2.0    64.0  38.4   5.4   7.0   7.0    .0  36.8  20.2 100.0  155.5
1936-12   -3.4   134.4  65.3  83.4   2.5   2.5    .0 146.2   5.9 100.0  289.9

1937- 1   -4.1    97.1  48.0  27.2    .9    .9    .0  74.3  27.8 100.0  387.0
1937- 2   -5.5   115.4  22.6  38.0   1.4   1.4    .0  59.2  82.6 100.0  502.4
1937- 3   -5.9    47.3    .0   4.6    .1    .1    .0   4.5 125.3 100.0  549.7
1937- 4    3.9   110.7 105.6 130.4  22.6  22.6    .0 213.4    .0 100.0  660.4
1937- 5   11.6    65.4  65.4    .0  73.2  73.2    .0    .0    .0  92.2  725.8
1937- 6   16.6    54.3  54.3    .0 106.8 106.8    .0    .0    .0  39.7  780.1
1937- 7   19.4    67.5  67.5    .0 126.9 106.8 -20.1    .0    .0    .4  847.6
1937- 8   20.4   119.7 119.7    .0 123.4 119.7  -3.7    .0    .0    .4  967.3
1937- 9   13.0    96.4  96.4    .0  68.0  68.0    .0    .0    .0  28.8 1063.7
1937-10    6.1    74.3  74.3    .0  28.9  28.9    .0    .0    .0  74.1   74.3
1937-11     .4    56.4  50.5   5.9   8.0   8.0    .0  22.5    .0 100.0  130.7
1937-12   -6.3    67.0    .0    .0    .0    .0    .0    .0  67.0 100.0  197.7

1938- 1   -8.8    81.1   7.6   2.3    .0    .0    .0   9.9 138.2 100.0  278.8
1938- 2   -5.5   105.0  58.2  12.5    .4    .4    .0  70.3 172.5 100.0  383.8
1938- 3    -.8    88.2  54.6 206.1  15.0  15.0    .0 245.8    .0 100.0  472.0
1938- 4    6.0    54.3  29.0  25.3  39.0  39.0    .0  15.3    .0 100.0  526.3
1938- 5   10.9    82.5  82.5    .0  68.9  68.9    .0  13.6    .0 100.0  608.8
1938- 6   16.4    93.1  93.1    .0 105.6 105.6    .0    .0    .0  87.5  701.9
1938- 7   20.1    65.7  65.7    .0 131.0 131.0    .0    .0    .0  22.2  767.6
1938- 8   20.4    51.0  51.0    .0 123.5  73.2 -50.3    .0    .0    .0  818.6
1938- 9   12.4   102.9 102.9    .0  64.5  64.5    .0    .0    .0  38.4  921.5
1938-10   10.1    32.0  32.0    .0  47.5  41.9  -5.6    .0    .0  28.4   32.0
1938-11    2.7    49.6  34.9   5.1  17.9  17.9    .0    .0   9.6  50.6   81.6
1938-12   -3.8    85.1   9.1  24.6   1.2   1.2    .0    .0  61.0  83.0  166.7
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1939- 1   -8.3    62.9  16.0  29.9    .9    .9    .0  28.0  78.0 100.0  229.6
1939- 2   -7.0    84.0    .0    .0    .0    .0    .0    .0 162.0 100.0  313.6
1939- 3   -4.5    61.9  38.6  69.4   2.8   2.8    .0 105.2 115.9 100.0  375.5
1939- 4    3.5    74.3  69.8 120.4  23.1  23.1    .0 167.1    .0 100.0  449.8
1939- 5   12.9    44.2  44.2    .0  82.1  82.1    .0    .0    .0  62.1  494.0
1939- 6   17.5    90.8  90.8    .0 112.5 112.5    .0    .0    .0  40.5  584.8
1939- 7   19.0    53.3  53.3    .0 123.7  93.8 -29.9    .0    .0    .0  638.1
1939- 8   19.6    98.5  98.5    .0 118.3  98.5 -19.8    .0    .0    .0  736.6
1939- 9   14.1    48.8  48.8    .0  74.1  48.8 -25.3    .0    .0    .0  785.4
1939-10    8.1    74.4  74.4    .0  38.5  38.5    .0    .0    .0  35.9   74.4
1939-11     .1    50.5  50.5    .0   4.1   4.1    .0    .0    .0  82.4  124.9
1939-12   -2.4    79.4  32.6   4.1   3.0   3.0    .0  16.1  42.7 100.0  204.3
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  Mount Forest, Ontario    WATER BUDGET VALUES FOR THE PERIOD 1963-1966
                          (Model run from YEAR 1961)

 YR  MO  TEMP(C)  PCPN  RAIN  MELT   PE    AE   DEF   SURP  SNOW  SOIL  ACC P

1963- 1  -11.6    43.9    .5    .0    .0    .0    .0    .5  91.0 100.0  285.9
1963- 2  -12.3    21.8    .0   2.3    .0    .0    .0   2.2 110.5 100.0  307.7
1963- 3   -2.8    63.4  19.3 154.6   7.7   7.7    .0 166.3    .0 100.0  371.1
1963- 4    5.0    64.3  64.3    .0  29.0  29.0    .0  35.3    .0 100.0  435.4
1963- 5    9.5    93.9  93.9    .0  60.8  60.8    .0  33.1    .0 100.0  529.3
1963- 6   16.2    38.1  38.1    .0 105.0 105.0    .0    .0    .0  33.1  567.4
1963- 7   18.3    95.0  95.0    .0 119.7 108.6 -11.1    .0    .0  19.5  662.4
1963- 8   15.7   101.5 101.5    .0  95.6  95.6    .0    .0    .0  25.4  763.9
1963- 9   12.0    49.2  49.2    .0  63.7  55.3  -8.3    .0    .0  19.2  813.1
1963-10   12.0    17.1  17.1    .0  57.6  30.1 -27.5    .0    .0   6.3   17.1
1963-11    4.2    98.0  93.6   3.6  19.2  19.2    .0    .0    .8  84.3  115.1
1963-12   -9.4    67.2   4.8  10.3    .3    .3    .0    .0  52.9  99.1  182.3

1964- 1   -5.9    67.5  27.5  30.7    .9    .9    .0  56.3  62.2 100.0  249.8
1964- 2   -7.9    25.2   5.3    .0    .0    .0    .0   5.3  82.1 100.0  275.0
1964- 3   -2.9    62.6  22.4  86.9   3.7   3.7    .0 105.6  35.4 100.0  337.6
1964- 4    4.9    74.8  72.3  37.9  32.6  32.6    .0  77.6    .0 100.0  412.4
1964- 5   12.3    72.7  72.7    .0  78.4  78.4    .0    .0    .0  94.3  485.1
1964- 6   15.3    63.0  63.0    .0  99.1  99.1    .0    .0    .0  58.2  548.1
1964- 7   19.2    59.7  59.7    .0 126.2 117.9  -8.3    .0    .0    .0  607.8
1964- 8   15.2   156.0 156.0    .0  92.2  92.2    .0    .0    .0  63.8  763.8
1964- 9   12.7    37.8  37.8    .0  67.5  67.5    .0    .0    .0  34.1  801.6
1964-10    6.3    46.8  45.5   1.3  30.5  30.5    .0    .0    .0  50.4   46.8
1964-11    3.2    61.7  30.6  26.2  19.1  19.1    .0    .0   4.9  88.2  108.5
1964-12   -4.5    74.7  37.7  40.9   2.2   2.2    .0  64.6   1.0 100.0  183.2

1965- 1   -8.9   107.5  35.5   7.9    .9    .9    .0  42.5  65.1 100.0  290.7
1965- 2   -8.0   105.3  23.6  37.7   1.4   1.4    .0  60.0 109.1 100.0  396.0
1965- 3   -5.1    50.7   1.3  35.6   1.4   1.4    .0  35.4 122.9 100.0  446.7
1965- 4    1.6    70.2  57.2 135.9  16.0  16.0    .0 177.1    .0 100.0  516.9
1965- 5   12.4    95.1  95.1    .0  79.3  79.3    .0  15.8    .0 100.0  612.0
1965- 6   14.7    14.6  14.6    .0  95.0  95.0    .0    .0    .0  19.6  626.6
1965- 7   15.4    69.5  69.5    .0 100.8  79.7 -21.1    .0    .0   9.4  696.1
1965- 8   16.1    85.4  85.4    .0  98.5  87.4 -11.0    .0    .0   7.3  781.5
1965- 9   14.5   105.4 105.4    .0  76.6  76.6    .0    .0    .0  36.2  886.9
1965-10    6.1   109.4 105.8   3.6  30.8  30.8    .0  14.7    .0 100.0  109.4
1965-11    1.3   108.1  74.1  30.0   9.5   9.5    .0  94.6   4.0 100.0  217.5
1965-12   -2.6    97.4  57.7  43.7   3.0   3.0    .0  98.4    .0 100.0  314.9

1966- 1   -9.5    57.7   2.1    .0    .0    .0    .0   2.1  55.6 100.0  372.6
1966- 2   -6.3    45.7  29.0  46.1   1.7   1.7    .0  73.4  26.2 100.0  418.3
1966- 3   -1.4    76.1  54.0  35.6   7.1   7.1    .0  82.5  12.7 100.0  494.4
1966- 4    2.9    63.5  35.4  40.8  19.7  19.7    .0  56.5    .0 100.0  557.9
1966- 5    7.4    58.4  58.4    .0  48.0  48.0    .0  10.4    .0 100.0  616.3
1966- 6   16.4   106.4 106.4    .0 106.1 106.1    .0    .3    .0 100.0  722.7
1966- 7   19.2    15.1  15.1    .0 125.8 115.1 -10.7    .0    .0    .0  737.8
1966- 8   17.6   109.8 109.8    .0 107.2 107.2    .0    .0    .0   2.6  847.6
1966- 9   12.1   100.0 100.0    .0  64.5  64.5    .0    .0    .0  38.1  947.6
1966-10    6.8    50.7  50.7    .0  33.2  33.2    .0    .0    .0  55.6   50.7
1966-11    2.5   118.6 115.3    .3  13.2  13.2    .0  58.1   3.0 100.0  169.3
1966-12   -5.3    94.9  45.3  17.2   3.7   3.7    .0  58.8  35.4 100.0  264.2
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 Mount Forest, Ontario    WATER BUDGET VALUES FOR THE PERIOD 1997-1999
                          (Model Run from YEAR 1988)

 YR  MO  TEMP(C)  PCPN  RAIN  MELT   PE    AE   DEF   SURP  SNOW  SOIL  ACC P

1997- 1   -8.5   182.4  30.0  29.6   1.1   1.1    .0  58.5 147.6 100.0  460.2
1997- 2   -5.8   117.0  42.8  29.8   1.0   1.0    .0  71.6 192.0 100.0  577.2
1997- 3   -3.6   104.2  44.4  84.1   3.6   3.6    .0 124.9 167.7 100.0  681.4
1997- 4    3.7    42.4  31.8 178.3  24.3  24.3    .0 185.8    .0 100.0  723.8
1997- 5    7.3    87.0  87.0    .0  45.0  45.0    .0  42.0    .0 100.0  810.8
1997- 6   18.1    83.8  83.8    .0 115.5 115.5    .0    .0    .0  68.3  894.6
1997- 7   18.0    93.2  93.2    .0 116.4 116.4    .0    .0    .0  45.1  987.8
1997- 8   16.2   154.2 154.2    .0  96.7  96.7    .0   2.6    .0 100.0 1142.0
1997- 9   13.9    81.4  81.4    .0  71.8  71.8    .0   9.6    .0 100.0 1223.4
1997-10    7.6    61.0  60.0   1.0  36.5  36.5    .0  24.5    .0 100.0   61.0
1997-11     .4    67.6  46.4  21.2   7.2   7.2    .0  60.4    .0 100.0  128.6
1997-12   -3.4    42.4  13.8  14.0    .3    .3    .0  27.4  14.6 100.0  171.0

1998- 1   -3.9   123.6  85.8  14.6   2.2   2.2    .0  98.2  37.8 100.0  294.6
1998- 2   -2.4    27.4  26.2  39.0   1.5   1.5    .0  63.7    .0 100.0  322.0
1998- 3     .1    99.2  69.2  30.0  16.4  16.4    .0  82.8    .0 100.0  421.2
1998- 4    6.4    38.4  38.4    .0  34.9  34.9    .0   3.5    .0 100.0  459.6
1998- 5   15.4    36.8  36.8    .0  96.6  96.6    .0    .0    .0  40.2  496.4
1998- 6   16.8    50.4  50.4    .0 107.5  88.7 -18.8    .0    .0   2.0  546.8
1998- 7   18.8    41.6  41.6    .0 122.0  43.6 -78.5    .0    .0    .0  588.4
1998- 8   19.6    80.8  80.8    .0 118.2  80.8 -37.4    .0    .0    .0  669.2
1998- 9   15.8    71.8  71.8    .0  82.1  71.8 -10.3    .0    .0    .0  741.0
1998-10    9.0    25.8  25.8    .0  41.9  25.8 -16.1    .0    .0    .0   25.8
1998-11    2.9    78.0  74.6   3.4  11.5  11.5    .0    .0    .0  66.5  103.8
1998-12   -1.4    94.2  61.8   2.4   6.8   6.8    .0  23.9  30.0 100.0  198.0

1999- 1   -8.2   152.6  29.8  31.6   1.0   1.0    .0  60.4 121.2 100.0  350.6
1999- 2   -3.8    59.6  29.2  45.5   1.4   1.4    .0  73.3 106.1 100.0  410.2
1999- 3   -2.2    30.8   8.6 128.3   6.3   6.3    .0 130.6    .0 100.0  441.0
1999- 4    6.5    58.8  58.8    .0  34.9  34.9    .0  23.9    .0 100.0  499.8
1999- 5   13.9    94.2  94.2    .0  87.0  87.0    .0   7.2    .0 100.0  594.0
1999- 6   18.5   105.6 105.6    .0 118.3 118.3    .0    .0    .0  87.3  699.6
1999- 7   21.0    81.0  81.0    .0 136.6 136.6    .0    .0    .0  31.7  780.6
1999- 8   17.5    69.0  69.0    .0 104.6  87.8 -16.8    .0    .0  12.9  849.6
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 Proton, Ontario          WATER BUDGET VALUES FOR THE PERIOD 1997-1999
                          (Model Run from YEAR 1988)

 YR  MO  TEMP(C)  PCPN  RAIN  MELT   PE    AE   DEF   SURP  SNOW  SOIL  ACC P

1997- 1   -9.1   174.3  24.4  28.8   1.0   1.0    .0  52.3 157.6 100.0  473.5
1997- 2   -6.8   112.8  20.2  19.8    .8    .8    .0  39.2 230.4 100.0  586.3
1997- 3   -5.1   107.6  43.0  63.4   3.0   3.0    .0 103.4 231.6 100.0  693.9
1997- 4    2.9    41.0  24.4 248.2  23.0  23.0    .0 249.6    .0 100.0  734.9
1997- 5    6.7   111.1 111.1    .0  45.1  45.1    .0  66.0    .0 100.0  846.0
1997- 6   17.1    78.0  78.0    .0 112.8 112.8    .0    .0    .0  65.2  924.0
1997- 7   16.8   106.6 106.6    .0 112.3 112.3    .0    .0    .0  59.5 1030.6
1997- 8   15.0   118.8 118.8    .0  93.2  93.2    .0    .0    .0  85.1 1149.4
1997- 9   12.9   110.0 110.0    .0  69.7  69.7    .0  25.4    .0 100.0 1259.4
1997-10    6.9    56.6  35.8  20.8  36.0  36.0    .0  20.6    .0 100.0   56.6
1997-11    -.1    62.0  37.8  24.2   7.1   7.1    .0  54.9    .0 100.0  118.6
1997-12   -4.0    38.8   1.5  13.0    .4    .4    .0  14.1  24.3 100.0  157.4

1998- 1   -4.9   141.0  77.6  24.3   1.9   1.9    .0 100.0  63.4 100.0  298.4
1998- 2   -3.4    23.0  20.9  29.2   1.2   1.2    .0  49.0  36.3 100.0  321.4
1998- 3   -1.0   113.4  67.4  82.3  15.2  15.2    .0 134.4    .0 100.0  434.8
1998- 4    5.5    37.2  37.2    .0  33.0  33.0    .0   4.2    .0 100.0  472.0
1998- 5   14.2    68.4  68.4    .0  92.5  92.5    .0    .0    .0  75.9  540.4
1998- 6   15.7    91.3  91.3    .0 103.7 103.7    .0    .0    .0  63.5  631.7
1998- 7   17.4    36.3  36.3    .0 115.8  99.8 -16.0    .0    .0    .0  668.0
1998- 8   17.9    77.0  77.0    .0 110.5  77.0 -33.5    .0    .0    .0  745.0
1998- 9   14.4    81.6  81.6    .0  77.6  77.6    .0    .0    .0   4.0  826.6
1998-10    8.1    31.2  31.2    .0  40.4  31.8  -8.5    .0    .0   3.4   31.2
1998-11    2.0    78.2  77.4    .8   9.6   9.6    .0    .0    .0  72.0  109.4
1998-12   -2.1   111.9  38.4    .0   6.3   6.3    .0   4.0  73.5 100.0  221.3

1999- 1   -8.7   157.4  39.4  28.7   1.0   1.0    .0  67.1 162.8 100.0  378.7
1999- 2   -5.0    56.2  33.3  32.8   1.2   1.2    .0  64.8 152.9 100.0  434.9
1999- 3   -3.3    33.0   8.8 117.6   5.9   5.9    .0 120.6  59.5 100.0  467.9
1999- 4    5.5    32.2  32.2  59.5  32.6  32.6    .0  59.1    .0 100.0  500.1
1999- 5   12.6    84.0  84.0    .0  82.8  82.8    .0   1.2    .0 100.0  584.1
1999- 6   17.4    99.1  99.1    .0 114.0 114.0    .0    .0    .0  85.1  683.2
1999- 7   19.7    43.9  43.9    .0 130.4 129.0  -1.4    .0    .0    .0  727.1
1999- 8   16.3    71.6  71.6    .0 100.7  71.6 -29.1    .0    .0    .0  798.7
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Stratford, Ontario   WATER BUDGET VALUES FOR THE PERIOD 1930-1939
(Model Run from YEAR 1920)

YR MO	TEMP(C)	PCPN	RAIN	MELT	PE	AE	DEF	SURP	SNOW	SOIL	ACC P
1930- 1	-7.7	128.6	41.2	34.6	.9	.9	.0	74.9	158.4	100.0	403.4
1930- 2	-4.1	75.7	35.6	174.5	6.6	6.6	.0	203.5	24.0	100.0	479.1
1930- 3	-2.4	103.6	35.0	42.8	2.3	2.3	.0	75.5	49.7	100.0	582.7
1930- 4	5.7	48.6	33.3	65.0	31.8	31.8	.0	66.5	.0	100.0	631.3
1930- 5	13.5	86.1	86.1	.0	82.2	82.2	.0	3.9	.0	100.0	717.4
1930- 6	18.3	102.7	102.7	.0	115.6	115.6	.0	.0	.0	87.1	820.1
1930- 7	20.2	23.4	23.4	.0	129.6	110.5	-19.1	.0	.0	.0	843.5
1930- 8	19.8	47.3	47.3	.0	117.8	47.3	-70.5	.0	.0	.0	890.8
1930- 9	16.8	38.1	38.1	.0	86.6	38.1	-48.5	.0	.0	.0	928.9
1930-10	8.6	69.9	69.9	.0	39.8	39.8	.0	.0	.0	30.1	69.9
1930-11	3.1	83.4	9.7	7.6	16.9	16.9	.0	.0	66.1	30.6	153.3
1930-12	-3.9	59.2	34.3	40.4	1.0	1.0	.0	4.3	50.6	100.0	212.5
1931- 1	-5.7	79.6	.0	.0	.0	.0	.0	.0	130.2	100.0	292.1
1931- 2	-4.1	56.1	20.3	14.4	.4	.4	.0	34.3	151.6	100.0	348.2
1931- 3	-1.5	64.8	14.7	55.8	1.9	1.9	.0	68.6	145.9	100.0	413.0
1931- 4	6.3	88.4	88.4	145.9	33.0	33.0	.0	201.4	.0	100.0	501.4
1931- 5	12.8	62.5	62.5	.0	78.1	78.1	.0	.0	.0	84.4	563.9
1931- 6	17.8	91.4	91.4	.0	112.1	112.1	.0	.0	.0	63.8	655.3
1931- 7	22.0	223.9	223.9	.0	142.0	142.0	.0	45.7	.0	100.0	879.2
1931- 8	19.8	88.6	88.6	.0	117.9	117.9	.0	.0	.0	70.7	967.8
1931- 9	18.5	87.4	87.4	.0	95.5	95.5	.0	.0	.0	62.6	1055.2
1931-10	11.3	66.7	66.7	.0	51.8	51.8	.0	.0	.0	77.4	66.7
1931-11	6.6	80.2	75.1	5.1	25.5	25.5	.0	32.1	.0	100.0	146.9
1931-12	-.4	103.5	68.1	27.0	4.4	4.4	.0	90.7	8.4	100.0	250.4
1932- 1	.2	132.8	101.1	35.6	5.0	5.0	.0	131.7	4.5	100.0	383.2
1932- 2	-2.9	80.1	34.8	49.8	2.6	2.6	.0	82.0	.0	100.0	463.3
1932- 3	-3.3	85.9	16.4	50.8	3.5	3.5	.0	63.7	18.7	100.0	549.2
1932- 4	3.9	49.5	22.8	45.4	23.4	23.4	.0	44.8	.0	100.0	598.7
1932- 5	12.8	120.8	120.8	.0	78.6	78.6	.0	42.2	.0	100.0	719.5
1932- 6	18.4	52.5	52.5	.0	116.1	116.1	.0	.0	.0	36.4	772.0
1932- 7	18.8	109.4	109.4	.0	120.3	116.0	-4.3	.0	.0	29.8	881.4
1932- 8	20.1	93.3	93.3	.0	119.7	106.4	-13.3	.0	.0	16.7	974.7
1932- 9	16.0	113.4	113.4	.0	82.3	82.3	.0	.0	.0	47.8	1088.1
1932-10	9.9	60.2	60.2	.0	45.3	45.3	.0	.0	.0	62.7	60.2
1932-11	.2	89.9	62.2	15.7	8.2	8.2	.0	32.3	12.0	100.0	150.1
1932-12	-3.0	84.5	25.7	50.5	4.2	4.2	.0	72.0	20.3	100.0	234.6
1933- 1	-1.0	32.2	30.9	21.6	2.9	2.9	.0	49.6	.0	100.0	266.8
1933- 2	-6.1	51.9	21.5	7.0	.5	.5	.0	28.0	23.4	100.0	318.7
1933- 3	-2.2	69.5	53.3	33.4	1.1	1.1	.0	85.6	6.2	100.0	388.2
1933- 4	6.6	72.4	72.4	6.2	34.6	34.6	.0	44.0	.0	100.0	460.6
1933- 5	13.9	67.4	67.4	.0	85.3	85.3	.0	.0	.0	82.1	528.0
1933- 6	20.7	31.5	31.5	.0	131.6	113.6	-18.0	.0	.0	.0	559.5
1933- 7	22.5	46.0	46.0	.0	145.0	46.0	-99.0	.0	.0	.0	605.5
1933- 8	19.8	103.2	103.2	.0	118.3	103.2	-15.1	.0	.0	.0	708.7
1933- 9	17.6	65.9	65.9	.0	90.6	65.9	-24.7	.0	.0	.0	774.6
1933-10	8.7	62.4	59.9	2.5	40.0	40.0	.0	.0	.0	22.4	62.4
1933-11	-1.0	166.6	90.4	46.3	6.2	6.2	.0	52.9	29.9	100.0	229.0
1933-12	-5.3	80.3	6.6	29.9	1.1	1.1	.0	35.4	73.7	100.0	309.3

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1934- 1   -5.0   128.5  34.9  13.7    .3    .3    .0  48.3 153.6 100.0  437.8
1934- 2  -14.6    41.9    .0    .0    .0    .0    .0    .0 195.5 100.0  479.7
1934- 3   -4.7    73.3  23.8  43.8   1.5   1.5    .0  66.1 201.2 100.0  553.0
1934- 4    4.4    85.5  79.1 207.6  24.1  24.1    .0 262.6    .0 100.0  638.5
1934- 5   14.2    24.3  24.3    .0  87.0  87.0    .0    .0    .0  37.3  662.8
1934- 6   20.3    70.2  70.2    .0 128.3 106.4 -22.0    .0    .0   1.2  733.0
1934- 7   21.5    52.8  52.8    .0 138.7  54.0 -84.7    .0    .0    .0  785.8
1934- 8   18.2    40.8  40.8    .0 108.5  40.8 -67.7    .0    .0    .0  826.6
1934- 9   17.1    82.4  82.4    .0  87.8  82.4  -5.4    .0    .0    .0  909.0
1934-10    8.6    58.7  58.7    .0  39.2  39.2    .0    .0    .0  19.5   58.7
1934-11    4.2    81.7  81.7    .0  16.5  16.5    .0    .0    .0  84.7  140.4
1934-12   -5.4    68.8   6.1    .0    .4    .4    .0    .0  62.7  90.4  209.2

1935- 1   -7.5    94.2  31.3  49.5   1.3   1.3    .0  69.9  76.1 100.0  303.4
1935- 2   -6.7    69.9  14.0  14.4    .5    .5    .0  27.9 117.6 100.0  373.3
1935- 3     .9    59.4  32.2 144.8  11.1  11.1    .0 166.0    .0 100.0  432.7
1935- 4    4.9    43.2  34.8   8.4  26.9  26.9    .0  16.3    .0 100.0  475.9
1935- 5    9.9    56.1  56.1    .0  60.3  60.3    .0    .0    .0  95.8  532.0
1935- 6   17.0   133.1 133.1    .0 106.9 106.9    .0  22.0    .0 100.0  665.1
1935- 7   23.1    69.9  69.9    .0 149.4 149.4    .0    .0    .0  20.5  735.0
1935- 8   20.3    58.1  58.1    .0 121.4  78.6 -42.8    .0    .0    .0  793.1
1935- 9   14.5    76.8  76.8    .0  73.7  73.7    .0    .0    .0   3.1  869.9
1935-10    9.5    58.9  58.9    .0  42.4  42.4    .0    .0    .0  19.5   58.9
1935-11    2.8   139.7 130.8   7.6  12.3  12.3    .0  45.6   1.3 100.0  198.6
1935-12   -6.4    58.4  12.7  14.3    .4    .4    .0  26.7  32.7 100.0  257.0

1936- 1   -7.9    87.9    .0    .0    .0    .0    .0    .0 120.6 100.0  344.9
1936- 2  -11.4    69.8    .0  17.8    .6    .6    .0  17.2 172.6 100.0  414.7
1936- 3    -.3    50.0  22.1 200.5   9.4   9.4    .0 213.2    .0 100.0  464.7
1936- 4    3.2    92.4  82.2  10.2  19.3  19.3    .0  73.1    .0 100.0  557.1
1936- 5   15.3    30.0  30.0    .0  94.5  94.5    .0    .0    .0  35.5  587.1
1936- 6   17.9    99.5  99.5    .0 112.5 107.2  -5.3    .0    .0  27.8  686.6
1936- 7   21.9    23.6  23.6    .0 141.8  51.4 -90.4    .0    .0    .0  710.2
1936- 8   20.7    24.9  24.9    .0 123.7  24.9 -98.8    .0    .0    .0  735.1
1936- 9   17.0   114.7 114.7    .0  87.6  87.6    .0    .0    .0  27.1  849.8
1936-10    8.7   108.8 108.8    .0  40.5  40.5    .0    .0    .0  95.4  108.8
1936-11    -.5    65.8  33.8   7.1   8.5   8.5    .0  27.8  24.9 100.0  174.6
1936-12   -2.1   101.6  61.0  65.5   3.0   3.0    .0 123.5    .0 100.0  276.2

1937- 1   -3.2   124.5  57.3  14.6   1.2   1.2    .0  70.6  52.6 100.0  400.7
1937- 2   -4.4    51.0  10.2  53.2   1.8   1.8    .0  61.6  40.2 100.0  451.7
1937- 3   -3.5    55.5  10.2  18.6    .6    .6    .0  28.3  66.9 100.0  507.2
1937- 4    4.9   192.9 192.9  66.9  25.4  25.4    .0 234.4    .0 100.0  700.1
1937- 5   13.1    54.6  54.6    .0  80.3  80.3    .0    .0    .0  74.3  754.7
1937- 6   18.1    76.5  76.5    .0 113.8 113.8    .0    .0    .0  37.0  831.2
1937- 7   21.4    89.4  89.4    .0 138.0 119.4 -18.6    .0    .0   7.0  920.6
1937- 8   22.0    94.9  94.9    .0 131.6  99.2 -32.4    .0    .0   2.7 1015.5
1937- 9   14.9    81.1  81.1    .0  76.6  76.6    .0    .0    .0   7.2 1096.6
1937-10    7.1    74.8  74.8    .0  32.2  32.2    .0    .0    .0  49.8   74.8
1937-11    1.5    45.5  40.4   5.1  10.8  10.8    .0    .0    .0  84.5  120.3
1937-12   -4.9    46.4  15.2    .0    .0    .0    .0    .0  31.2  99.7  166.7
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1938- 1   -7.1    60.0   6.9  11.1    .3    .3    .0  17.5  73.2 100.0  226.7
1938- 2   -3.8   110.4  54.8  35.1   1.0   1.0    .0  88.9  93.6 100.0  337.1
1938- 3    1.6    75.5  42.0 127.1  19.5  19.5    .0 149.7    .0 100.0  412.6
1938- 4    7.5    41.4  37.6   3.8  43.6  43.6    .0    .0    .0  97.8  454.0
1938- 5   12.4    81.9  81.9    .0  75.8  75.8    .0   3.9    .0 100.0  535.9
1938- 6   17.6    56.7  56.7    .0 110.9 110.9    .0    .0    .0  45.8  592.6
1938- 7   21.6    71.0  71.0    .0 139.4 116.8 -22.6    .0    .0    .0  663.6
1938- 8   22.3    72.6  72.6    .0 133.8  72.6 -61.2    .0    .0    .0  736.2
1938- 9   14.4    58.6  58.6    .0  73.1  58.6 -14.5    .0    .0    .0  794.8
1938-10   11.1    25.4  25.4    .0  51.0  25.4 -25.6    .0    .0    .0   25.4
1938-11    3.6    63.3  35.8   7.2  19.1  19.1    .0    .0  20.3  23.9   88.7
1938-12   -3.0    81.3  18.8  21.6   1.7   1.7    .0    .0  61.2  62.6  170.0

1939- 1   -6.0    79.0  12.2  54.6   1.6   1.6    .0  27.8  73.4 100.0  249.0
1939- 2   -5.4   104.1  44.4  12.2    .3    .3    .0  56.2 121.0 100.0  353.1
1939- 3   -2.7    64.1  42.6 113.1   4.6   4.6    .0 151.1  29.4 100.0  417.2
1939- 4    4.2    84.8  77.9  36.3  25.5  25.5    .0  88.8    .0 100.0  502.0
1939- 5   14.5    31.2  31.2    .0  89.7  89.7    .0    .0    .0  41.5  533.2
1939- 6   18.7   108.2 108.2    .0 118.0 115.0  -3.0    .0    .0  34.7  641.4
1939- 7   20.9    51.1  51.1    .0 134.8  85.8 -49.0    .0    .0    .0  692.5
1939- 8   21.2    60.5  60.5    .0 126.8  60.5 -66.3    .0    .0    .0  753.0
1939- 9   16.2    61.8  61.8    .0  83.6  61.8 -21.8    .0    .0    .0  814.8
1939-10    9.4    81.8  81.8    .0  43.3  43.3    .0    .0    .0  38.5   81.8
1939-11    1.7    29.8  29.8    .0   7.6   7.6    .0    .0    .0  60.7  111.6
1939-12   -1.7    74.1  26.4   5.1   4.0   4.0    .0    .0  42.6  88.3  185.7
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Stratford, Ontario WATER BUDGET VALUES FOR THE PERIOD 1961-1966
(Model Run from YEAR 1920)

YR MO	TEMP(C)	PCPN	RAIN	MELT	PE	AE	DEF	SURP	SNOW	SOIL	ACC P
1961- 1	-9.4	32.3	3.8	12.5	.3	.3	.0	16.0	61.8	100.0	240.5
1961- 2	-4.1	44.5	20.8	76.1	2.6	2.6	.0	94.3	9.4	100.0	285.0
1961- 3	-.2	54.4	48.7	15.1	7.6	7.6	.0	56.2	.0	100.0	339.4
1961- 4	3.6	85.6	80.5	5.1	19.4	19.4	.0	66.2	.0	100.0	425.0
1961- 5	10.2	55.1	55.1	.0	61.6	61.6	.0	.0	.0	93.5	480.1
1961- 6	16.8	83.4	83.4	.0	105.0	105.0	.0	.0	.0	72.0	563.5
1961- 7	19.9	73.9	73.9	.0	127.3	127.3	.0	.0	.0	18.6	637.4
1961- 8	19.4	93.9	93.9	.0	115.1	100.4	-14.6	.0	.0	12.0	731.3
1961- 9	18.1	69.7	69.7	.0	94.1	74.6	-19.5	.0	.0	7.1	801.0
1961-10	11.0	59.6	59.6	.0	50.1	50.1	.0	.0	.0	16.7	59.6
1961-11	2.6	69.2	69.2	.0	12.6	12.6	.0	.0	.0	73.3	128.8
1961-12	-3.8	91.3	47.7	14.9	2.4	2.4	.0	33.4	28.7	100.0	220.1
1962- 1	-8.6	59.5	8.6	2.3	.0	.0	.0	10.9	77.3	100.0	279.6
1962- 2	-8.3	55.4	.8	10.6	.2	.2	.0	11.2	121.3	100.0	335.0
1962- 3	-2.1	11.5	10.7	122.1	5.0	5.0	.0	127.8	.0	100.0	346.5
1962- 4	6.2	58.2	58.2	.0	35.8	35.8	.0	22.4	.0	100.0	404.7
1962- 5	14.8	47.5	47.5	.0	91.4	91.4	.0	.0	.0	56.1	452.2
1962- 6	17.0	94.6	94.6	.0	106.8	106.0	-.8	.0	.0	44.7	546.8
1962- 7	18.2	84.6	84.6	.0	116.1	108.1	-8.0	.0	.0	21.3	631.4
1962- 8	18.6	66.2	66.2	.0	110.4	81.9	-28.5	.0	.0	5.6	697.6
1962- 9	13.5	74.3	74.3	.0	68.9	68.9	.0	.0	.0	11.0	771.9
1962-10	9.8	94.5	94.5	.0	45.8	45.8	.0	.0	.0	59.7	94.5
1962-11	2.3	61.0	61.0	.0	8.9	8.9	.0	11.8	.0	100.0	155.5
1962-12	-6.6	129.3	39.6	2.3	2.4	2.4	.0	39.5	87.4	100.0	284.8
1963- 1	-11.9	36.5	.0	.0	.0	.0	.0	.0	123.9	100.0	321.3
1963- 2	-11.3	35.8	.0	2.3	.0	.0	.0	2.3	157.4	100.0	357.1
1963- 3	-1.4	63.2	31.1	189.5	9.2	9.2	.0	211.5	.0	100.0	420.3
1963- 4	5.9	51.5	51.5	.0	31.3	31.3	.0	20.2	.0	100.0	471.8
1963- 5	10.4	78.7	78.7	.0	62.7	62.7	.0	16.0	.0	100.0	550.5
1963- 6	16.9	52.1	52.1	.0	106.1	106.1	.0	.0	.0	46.0	602.6
1963- 7	19.6	93.6	93.6	.0	125.3	117.9	-7.4	.0	.0	21.7	696.2
1963- 8	16.7	53.4	53.4	.0	98.4	69.7	-28.7	.0	.0	5.4	749.6
1963- 9	12.8	37.2	37.2	.0	65.1	39.7	-25.4	.0	.0	2.9	786.8
1963-10	12.7	19.4	19.4	.0	58.5	21.3	-37.2	.0	.0	1.0	19.4
1963-11	5.1	68.4	67.1	.0	19.6	19.6	.0	.0	1.3	48.5	87.8
1963-12	-7.9	97.9	7.9	12.8	.6	.6	.0	.0	78.5	68.7	185.7
1964- 1	-5.0	76.9	19.6	49.0	1.4	1.4	.0	35.9	86.8	100.0	262.6
1964- 2	-6.4	43.9	8.0	8.0	.2	.2	.0	15.8	114.7	100.0	306.5
1964- 3	-1.2	76.8	41.2	138.8	5.2	5.2	.0	174.8	11.5	100.0	383.3
1964- 4	5.7	78.2	56.4	33.3	33.5	33.5	.0	56.2	.0	100.0	461.5
1964- 5	13.6	44.2	44.2	.0	82.9	82.9	.0	.0	.0	61.3	505.7
1964- 6	16.9	43.3	43.3	.0	106.5	104.6	-1.9	.0	.0	.0	549.0
1964- 7	20.6	93.1	93.1	.0	132.1	93.1	-39.0	.0	.0	.0	642.1
1964- 8	16.3	260.0	260.0	.0	96.0	96.0	.0	64.0	.0	100.0	902.1
1964- 9	14.3	42.5	42.5	.0	73.2	73.2	.0	.0	.0	69.3	944.6
1964-10	7.2	40.6	40.6	.0	32.4	32.4	.0	.0	.0	77.5	40.6
1964-11	4.2	33.0	19.5	10.2	20.5	20.5	.0	.0	3.3	86.7	73.6
1964-12	-3.3	85.9	51.4	37.8	3.2	3.2	.0	72.7	.0	100.0	159.5
1965- 1	-7.5	90.8	25.4	15.3	.9	.9	.0	39.8	50.1	100.0	250.3
1965- 2	-6.3	136.0	82.6	38.4	1.1	1.1	.0	119.9	65.1	100.0	386.3
1965- 3	-3.8	55.7	19.5	47.0	1.6	1.6	.0	64.9	54.3	100.0	442.0
1965- 4	2.4	62.3	44.5	72.1	17.7	17.7	.0	98.9	.0	100.0	504.3
1965- 5	13.7	91.1	91.1	.0	83.9	83.9	.0	7.2	.0	100.0	595.4
1965- 6	16.3	30.7	30.7	.0	101.8	101.8	.0	.0	.0	28.9	626.1
1965- 7	16.7	73.5	73.5	.0	106.4	89.3	-17.0	.0	.0	13.1	699.6
1965- 8	17.7	102.2	102.2	.0	105.2	102.9	-2.4	.0	.0	12.4	801.8
1965- 9	15.9	57.5	57.5	.0	81.8	62.5	-19.3	.0	.0	7.4	859.3

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1965-10    7.5    94.8  94.8    .0  33.8  33.8    .0    .0    .0  68.4   94.8
1965-11    2.7   123.4 106.9    .0  12.1  12.1    .0  63.2  16.5 100.0  218.2
1965-12   -1.7   107.4  94.0  29.9   3.9   3.9    .0 120.0    .0 100.0  325.6

1966- 1   -8.5    78.4   5.6    .0    .1    .1    .0   5.5  72.8 100.0  404.0
1966- 2   -5.5    76.7  25.9  39.4   1.2   1.2    .0  64.1  84.2 100.0  480.7
1966- 3    -.4    81.5  57.9  95.5   8.1   8.1    .0 145.2  12.3 100.0  562.2
1966- 4    3.6    57.4  45.9  23.8  19.7  19.7    .0  50.0    .0 100.0  619.6
1966- 5    8.4    44.6  44.6    .0  51.1  51.1    .0    .0    .0  93.5  664.2
1966- 6   17.4    73.2  73.2    .0 109.5 109.5    .0    .0    .0  57.2  737.4
1966- 7   20.6    35.3  35.3    .0 132.4  92.5 -39.9    .0    .0    .0  772.7
1966- 8   18.6   111.3 111.3    .0 110.0 110.0    .0    .0    .0   1.3  884.0
1966- 9   13.3    73.2  73.2    .0  67.9  67.9    .0    .0    .0   6.6  957.2
1966-10    7.8    44.8  44.8    .0  35.4  35.4    .0    .0    .0  16.0   44.8
1966-11    3.5   165.5 157.1    .0  15.0  15.0    .0  58.0   8.4 100.0  210.3
1966-12   -3.8   174.7  78.2  41.7   3.6   3.6    .0 116.3  63.2 100.0  385.0
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 Stratford, Ontario         WATER BUDGET VALUES FOR THE PERIOD 1997-1999
                            (Model Run from YEAR 1920)

 YR  MO  TEMP(C)  PCPN  RAIN  MELT   PE    AE   DEF   SURP  SNOW  SOIL  ACC P

1997- 1   -7.0   103.2  21.6  25.0   1.7   1.7    .0  44.9  78.9 100.0  385.7
1997- 2   -3.5    98.1  61.6  68.0   2.4   2.4    .0 127.3  47.3 100.0  483.8
1997- 3    -.8    89.4  60.4  76.3   7.0   7.0    .0 129.8    .0 100.0  573.2
1997- 4    4.9    42.0  42.0    .0  27.8  27.8    .0  14.2    .0 100.0  615.2
1997- 5    8.3    97.7  97.7    .0  49.3  49.3    .0  48.4    .0 100.0  712.9
1997- 6   18.8    55.7  55.7    .0 118.8 118.8    .0    .0    .0  36.9  768.6
1997- 7   19.3    81.1  81.1    .0 123.6 107.3 -16.4    .0    .0  10.7  849.7
1997- 8   17.2   107.5 107.5    .0 101.5 101.5    .0    .0    .0  16.8  957.2
1997- 9   15.1    86.3  86.3    .0  77.3  77.3    .0    .0    .0  25.8 1043.5
1997-10    8.9    76.8  76.8    .0  41.1  41.1    .0    .0    .0  61.5   76.8
1997-11    1.5    76.8  61.8  15.0   9.3   9.3    .0  29.0    .0 100.0  153.6
1997-12   -1.8    87.9  33.0  30.8    .8    .8    .0  63.0  24.1 100.0  241.5

1998- 1   -2.3   123.0  87.7  24.7   3.3   3.3    .0 109.2  34.7 100.0  364.5
1998- 2    -.7    22.8  21.6  35.9   3.2   3.2    .0  54.3    .0 100.0  387.3
1998- 3    1.3   109.9  61.3  48.6  19.3  19.3    .0  90.6    .0 100.0  497.2
1998- 4    7.6    35.7  35.7    .0  40.0  40.0    .0    .0    .0  95.7  532.9
1998- 5   16.8    50.0  50.0    .0 104.3 104.3    .0    .0    .0  41.4  582.9
1998- 6   18.3    60.2  60.2    .0 115.6  98.4 -17.1    .0    .0   3.2  643.1
1998- 7   20.2    52.9  52.9    .0 130.1  56.1 -74.0    .0    .0    .0  696.0
1998- 8   20.6    75.0  75.0    .0 123.1  75.0 -48.1    .0    .0    .0  771.0
1998- 9   17.7    29.2  29.2    .0  90.9  29.2 -61.7    .0    .0    .0  800.2
1998-10   10.4    37.0  37.0    .0  47.4  37.0 -10.4    .0    .0    .0   37.0
1998-11    4.1    87.5  87.5    .0  15.0  15.0    .0    .0    .0  72.5  124.5
1998-12    -.1   110.2  72.5   4.5   8.9   8.9    .0  40.6  33.2 100.0  234.7

1999- 1   -6.7   148.6  30.0  44.5   1.3   1.3    .0  73.2 107.3 100.0  383.3
1999- 2   -2.1    52.3  40.1  92.1   2.9   2.9    .0 129.3  27.4 100.0  435.6
1999- 3   -1.4    31.0   8.0  50.4   7.0   7.0    .0  51.3    .0 100.0  466.6
1999- 4    7.5    48.4  48.4    .0  38.9  38.9    .0   9.5    .0 100.0  515.0
1999- 5   14.9    50.6  50.6    .0  91.4  91.4    .0    .0    .0  59.2  565.6
1999- 6   19.6    62.1  62.1    .0 124.1 121.3  -2.8    .0    .0    .0  627.7
1999- 7   22.3    52.8  52.8    .0 144.0  52.8 -91.2    .0    .0    .0  680.5
1999- 8   18.4    52.8  52.8    .0 109.1  52.8 -56.3    .0    .0    .0  733.3
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 Woodstock, Ontario       WATER BUDGET VALUES FOR THE PERIOD 1930-1939
                          (Model Run from YEAR 1920)

 YR  MO  TEMP(C)  PCPN  RAIN  MELT   PE    AE   DEF   SURP  SNOW  SOIL  ACC P

1930- 1   -7.4    91.6  41.9  55.2   1.7   1.7    .0  78.1  33.8 100.0  257.1
1930- 2   -3.9    65.3  27.9  66.4   6.3   6.3    .0  88.0   4.8 100.0  322.4
1930- 3   -1.7    53.0  17.8  34.1   3.0   3.0    .0  48.9   5.9 100.0  375.4
1930- 4    6.0    24.7  22.2   8.4  31.2  31.2    .0    .0    .0  99.4  400.1
1930- 5   13.3    54.9  54.9    .0  79.9  79.9    .0    .0    .0  74.4  455.0
1930- 6   18.1    96.5  96.5    .0 113.0 113.0    .0    .0    .0  57.9  551.5
1930- 7   20.1     9.3   9.3    .0 128.3  67.2 -61.2    .0    .0    .0  560.8
1930- 8   19.7    31.9  31.9    .0 116.7  31.9 -84.8    .0    .0    .0  592.7
1930- 9   16.6    28.0  28.0    .0  84.5  28.0 -56.5    .0    .0    .0  620.7
1930-10    8.4    36.5  36.5    .0  38.4  36.5  -1.9    .0    .0    .0   36.5
1930-11    3.8    42.6  18.8  16.9  18.6  18.6    .0    .0   6.9  17.1   79.1
1930-12   -3.4    30.4  16.6  15.0   1.6   1.6    .0    .0   5.7  47.1  109.5

1931- 1   -5.4    54.3  12.0   2.3    .0    .0    .0    .0  45.7  61.4  163.8
1931- 2   -4.1    32.1  22.6  11.1    .3    .3    .0    .0  44.1  94.8  195.9
1931- 3   -1.1    50.1  31.1  63.1   3.0   3.0    .0  86.0    .0 100.0  246.0
1931- 4    6.2    51.4  51.4    .0  31.5  31.5    .0  19.9    .0 100.0  297.4
1931- 5   12.6    47.4  47.4    .0  76.1  76.1    .0    .0    .0  71.3  344.8
1931- 6   17.8    66.6  66.6    .0 110.8 110.8    .0    .0    .0  27.1  411.4
1931- 7   21.9   107.1 107.1    .0 140.5 122.2 -18.3    .0    .0  12.0  518.5
1931- 8   19.6    53.8  53.8    .0 115.9  65.8 -50.1    .0    .0    .0  572.3
1931- 9   18.0   108.9 108.9    .0  92.4  92.4    .0    .0    .0  16.5  681.2
1931-10   11.1    60.0  60.0    .0  50.6  50.6    .0    .0    .0  25.9   60.0
1931-11    6.9    63.9  61.9   2.0  26.2  26.2    .0    .0    .0  63.6  123.9
1931-12     .0    68.3  58.4   9.9   5.3   5.3    .0  26.6    .0 100.0  192.2

1932- 1    1.2    92.1  88.3   2.5   7.3   7.3    .0  83.5   1.3 100.0  284.3
1932- 2   -2.1    56.1  27.9  29.5   3.1   3.1    .0  54.3    .0 100.0  340.4
1932- 3   -3.0    40.8  14.3  26.5   3.8   3.8    .0  37.0    .0 100.0  381.2
1932- 4    4.3    41.2  23.9  17.3  24.2  24.2    .0  17.0    .0 100.0  422.4
1932- 5   12.2   123.4 123.4    .0  73.8  73.8    .0  49.6    .0 100.0  545.8
1932- 6   18.3    54.9  54.9    .0 114.5 114.5    .0    .0    .0  40.4  600.7
1932- 7   19.0   136.9 136.9    .0 120.9 120.9    .0    .0    .0  56.4  737.6
1932- 8   19.5    91.6  91.6    .0 114.9 113.5  -1.4    .0    .0  34.5  829.2
1932- 9   15.5   100.3 100.3    .0  78.7  78.7    .0    .0    .0  56.1  929.5
1932-10    9.7    57.8  57.8    .0  43.6  43.6    .0    .0    .0  70.3   57.8
1932-11     .6    69.9  49.5  20.4   8.9   8.9    .0  31.3    .0 100.0  127.7
1932-12   -2.9    62.6  41.4   8.5   5.3   5.3    .0  44.6  12.7 100.0  190.3

1933- 1    -.2    35.6  33.5  14.5   4.1   4.1    .0  43.9    .3 100.0  225.9
1933- 2   -4.9    44.1  29.4  15.0    .9    .9    .0  43.5    .0 100.0  270.0
1933- 3   -1.8    60.9  44.5  16.4   1.5   1.5    .0  59.4    .0 100.0  330.9
1933- 4    6.5    46.8  46.8    .0  33.2  33.2    .0  13.6    .0 100.0  377.7
1933- 5   13.6    36.3  36.3    .0  82.7  82.7    .0    .0    .0  53.6  414.0
1933- 6   19.8    31.9  31.9    .0 124.9  85.5 -39.4    .0    .0    .0  445.9
1933- 7   22.0    40.3  40.3    .0 141.6  40.3-101.3    .0    .0    .0  486.2
1933- 8   20.1    67.3  67.3    .0 119.3  67.3 -52.0    .0    .0    .0  553.5
1933- 9   17.7    50.4  50.4    .0  90.6  50.4 -40.2    .0    .0    .0  603.9
1933-10    8.4    80.3  80.3    .0  37.9  37.9    .0    .0    .0  42.4   80.3
1933-11    -.8   123.9  75.0  48.9   6.1   6.1    .0  60.3    .0 100.0  204.2
1933-12   -4.9    87.3  52.0  11.3   1.7   1.7    .0  61.7  24.0 100.0  291.5
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1934- 1   -4.0    57.3  34.1  24.1    .5    .5    .0  57.7  23.0 100.0  348.8
1934- 2  -13.9    25.4    .0    .0    .0    .0    .0    .0  48.4 100.0  374.2
1934- 3   -3.6    79.3  48.5  61.7   3.9   3.9    .0 106.3  17.6 100.0  453.5
1934- 4    4.5   106.1 103.6  20.1  23.5  23.5    .0 100.2    .0 100.0  559.6
1934- 5   14.0    36.1  36.1    .0  84.5  84.5    .0    .0    .0  51.6  595.7
1934- 6   20.0    52.4  52.4    .0 125.8 104.0 -21.8    .0    .0    .0  648.1
1934- 7   22.0    37.4  37.4    .0 141.4  37.4-104.0    .0    .0    .0  685.5
1934- 8   18.2    70.7  70.7    .0 107.4  70.7 -36.7    .0    .0    .0  756.2
1934- 9   17.0   203.9 203.9    .0  86.5  86.5    .0  17.4    .0 100.0  960.1
1934-10    8.5    54.1  54.1    .0  37.9  37.9    .0  16.2    .0 100.0   54.1
1934-11    4.7    88.3  88.3    .0  17.8  17.8    .0  70.5    .0 100.0  142.4
1934-12   -5.2    46.0   6.3   5.0    .3    .3    .0  11.0  34.7 100.0  188.4

1935- 1   -6.8    85.7  53.5  38.8   1.3   1.3    .0  91.0  28.1 100.0  274.1
1935- 2   -6.7    71.6  26.6  20.4    .6    .6    .0  46.4  52.7 100.0  345.7
1935- 3    1.3    75.5  53.2  75.0  12.0  12.0    .0 116.2    .0 100.0  421.2
1935- 4    5.0    39.5  39.0    .5  26.4  26.4    .0  13.1    .0 100.0  460.7
1935- 5    9.7    77.6  77.6    .0  57.9  57.9    .0  19.7    .0 100.0  538.3
1935- 6   16.9   107.5 107.5    .0 104.7 104.7    .0   2.8    .0 100.0  645.8
1935- 7   22.4    52.6  52.6    .0 144.0 144.0    .0    .0    .0   8.6  698.4
1935- 8   20.0    44.8  44.8    .0 118.6  53.4 -65.2    .0    .0    .0  743.2
1935- 9   14.2    74.3  74.3    .0  71.7  71.7    .0    .0    .0   2.6  817.5
1935-10    8.8    57.5  57.5    .0  38.6  38.6    .0    .0    .0  21.4   57.5
1935-11    2.7   107.4 102.0   1.3  12.2  12.2    .0  12.5   4.1 100.0  164.9
1935-12   -6.1    40.6  11.4  11.0    .7    .7    .0  21.7  22.3 100.0  205.5

1936- 1   -7.3    65.6  18.4  12.8    .3    .3    .0  30.9  56.7 100.0  271.1
1936- 2  -11.0    60.1  17.5  22.0    .7    .7    .0  38.8  77.4 100.0  331.2
1936- 3     .2    52.7  39.6  90.5   9.5   9.5    .0 120.5    .0 100.0  383.9
1936- 4    3.4   100.3  83.0  17.3  20.4  20.4    .0  79.9    .0 100.0  484.2
1936- 5   14.4    19.4  19.4    .0  87.1  87.1    .0    .0    .0  32.3  503.6
1936- 6   17.7    70.9  70.9    .0 110.2  92.0 -18.1    .0    .0  11.2  574.5
1936- 7   22.0    22.5  22.5    .0 141.4  33.7-107.8    .0    .0    .0  597.0
1936- 8   20.4    57.7  57.7    .0 121.5  57.7 -63.8    .0    .0    .0  654.7
1936- 9   16.5   141.0 141.0    .0  84.4  84.4    .0    .0    .0  56.6  795.7
1936-10    8.5    84.8  84.8    .0  39.3  39.3    .0   2.1    .0 100.0   84.8
1936-11    -.2    74.0  48.7   2.0   8.8   8.8    .0  41.9  23.3 100.0  158.8
1936-12   -1.9    90.7  71.3  42.7   3.8   3.8    .0 110.2    .0 100.0  249.5

1937- 1   -2.6   173.9 139.2   2.1   1.9   1.9    .0 139.4  32.6 100.0  423.4
1937- 2   -3.9    69.2  53.9  38.8   2.7   2.7    .0  90.0   9.1 100.0  492.6
1937- 3   -2.9    37.2  19.9  25.5    .9    .9    .0  44.5    .9 100.0  529.8
1937- 4    5.1   231.7 231.7    .9  26.0  26.0    .0 206.6    .0 100.0  761.5
1937- 5   13.1    82.1  82.1    .0  78.8  78.8    .0   3.3    .0 100.0  843.6
1937- 6   17.9   100.0 100.0    .0 111.7 111.7    .0    .0    .0  88.3  943.6
1937- 7   20.7    41.6  41.6    .0 132.7 129.9  -2.8    .0    .0    .0  985.2
1937- 8   21.3    79.5  79.5    .0 126.7  79.5 -47.2    .0    .0    .0 1064.7
1937- 9   14.3    88.6  88.6    .0  72.6  72.6    .0    .0    .0  16.0 1153.3
1937-10    7.1    69.0  69.0    .0  31.4  31.4    .0    .0    .0  53.6   69.0
1937-11    2.1    38.5  37.0   1.5  11.3  11.3    .0    .0    .0  80.8  107.5
1937-12   -4.7    32.2   8.1   3.3    .1    .1    .0    .0  20.8  92.1  139.7
```

```
1938- 1   -7.2    54.6  14.7   9.5    .2    .2    .0  16.2  51.2 100.0  194.3
1938- 2   -3.4   125.3  86.8  72.6   2.2   2.2    .0 157.2  17.1 100.0  319.6
1938- 3    1.8    59.5  36.3  40.3  17.9  17.9    .0  58.7    .0 100.0  379.1
1938- 4    7.1    50.4  38.5  11.9  40.4  40.4    .0  10.0    .0 100.0  429.5
1938- 5   12.2    86.3  86.3    .0  73.2  73.2    .0  13.1    .0 100.0  515.8
1938- 6   17.6    82.2  82.2    .0 109.8 109.8    .0    .0    .0  72.4  598.0
1938- 7   21.0    50.4  50.4    .0 134.5 122.8 -11.7    .0    .0    .0  648.4
1938- 8   21.7    53.1  53.1    .0 129.7  53.1 -76.6    .0    .0    .0  701.5
1938- 9   14.0    50.7  50.7    .0  70.3  50.7 -19.6    .0    .0    .0  752.2
1938-10   10.3    20.5  20.5    .0  46.4  20.5 -25.9    .0    .0    .0   20.5
1938-11    3.2    67.5  48.7   9.9  17.2  17.2    .0    .0   8.9  41.4   88.0
1938-12   -3.3    68.0  18.9  11.2   2.2   2.2    .0    .0  46.8  69.4  156.0

1939- 1   -5.6    96.4  28.7  50.9   1.5   1.5    .0  47.4  63.6 100.0  252.4
1939- 2   -5.1   118.0  70.4  21.0    .5    .5    .0  90.9  90.2 100.0  370.4
1939- 3   -2.7    59.0  39.4 105.6   4.1   4.1    .0 140.9   4.2 100.0  429.4
1939- 4    4.4   108.8 108.8   4.2  25.3  25.3    .0  87.7    .0 100.0  538.2
1939- 5   13.9    43.2  43.2    .0  84.5  84.5    .0    .0    .0  58.7  581.4
1939- 6   18.2    99.9  99.9    .0 113.4 113.1   -.3    .0    .0  45.5  681.3
1939- 7   19.9    56.3  56.3    .0 127.2 101.8 -25.3    .0    .0    .0  737.6
1939- 8   20.8    37.2  37.2    .0 123.7  37.2 -86.5    .0    .0    .0  774.8
1939- 9   16.1    50.7  50.7    .0  82.4  50.7 -31.7    .0    .0    .0  825.5
1939-10    9.1    97.9  97.9    .0  40.9  40.9    .0    .0    .0  57.0   97.9
1939-11    1.7    24.9  24.9    .0   7.4   7.4    .0    .0    .0  74.5  122.8
1939-12   -1.1    32.0  24.2    .3   5.0   5.0    .0    .0   7.5  94.0  154.8
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 Woodstock, Ontario      WATER BUDGET VALUES FOR THE PERIOD 1997-1999
                         (Model Run from YEAR 1920)

 YR  MO  TEMP(C)  PCPN  RAIN  MELT   PE    AE   DEF   SURP  SNOW  SOIL  ACC P

1997- 1   -6.5    84.2  26.6   6.4   1.7   1.7    .0  31.2  55.3 100.0  308.4
1997- 2   -3.1   111.0  74.6  84.2   2.9   2.9    .0 155.9   7.5 100.0  419.4
1997- 3     .0    92.2  43.4  56.3   8.3   8.3    .0  91.4    .0 100.0  511.6
1997- 4    5.4    41.1  41.1    .0  28.9  28.9    .0  12.2    .0 100.0  552.7
1997- 5    9.1   122.0 122.0    .0  53.3  53.3    .0  68.7    .0 100.0  674.7
1997- 6   19.3    80.6  80.6    .0 121.0 121.0    .0    .0    .0  59.6  755.3
1997- 7   20.0    66.8  66.8    .0 127.4 126.4  -1.0    .0    .0    .0  822.1
1997- 8   18.0   132.4 132.4    .0 105.9 105.9    .0    .0    .0  26.5  954.5
1997- 9   15.7    86.4  86.4    .0  79.8  79.8    .0    .0    .0  33.1 1040.9
1997-10    9.4    57.8  57.8    .0  43.1  43.1    .0    .0    .0  47.8   57.8
1997-11    1.9    59.6  54.8   4.8   9.9   9.9    .0    .0    .0  97.4  117.4
1997-12   -1.0    48.2  25.4  18.8   1.3   1.3    .0  40.4   4.0 100.0  165.6

1998- 1   -2.0   115.4  82.2   7.0   3.6   3.6    .0  85.6  30.2 100.0  281.0
1998- 2    -.4    30.2  28.2  32.2   3.4   3.4    .0  57.1    .0 100.0  311.2
1998- 3    1.9    94.3  53.8  40.5  20.1  20.1    .0  74.2    .0 100.0  405.5
1998- 4    8.0    57.4  57.4    .0  41.3  41.3    .0  16.1    .0 100.0  462.9
1998- 5   17.2    31.2  31.2    .0 106.1 106.1    .0    .0    .0  25.1  494.1
1998- 6   18.9    74.2  74.2    .0 118.6  92.8 -25.8    .0    .0   6.5  568.3
1998- 7   20.7    47.2  47.2    .0 132.2  53.7 -78.4    .0    .0    .0  615.5
1998- 8   21.0    33.4  33.4    .0 125.1  33.4 -91.7    .0    .0    .0  648.9
1998- 9   17.7    15.4  15.4    .0  90.5  15.4 -75.1    .0    .0    .0  664.3
1998-10   10.4    20.3  20.3    .0  46.6  20.3 -26.3    .0    .0    .0   20.3
1998-11    4.1    57.5  57.5    .0  15.0  15.0    .0    .0    .0  42.5   77.8
1998-12     .2    52.2  41.6   5.0   8.9   8.9    .0    .0   5.6  80.2  130.0

1999- 1   -6.7    84.1  28.7  39.3   1.1   1.1    .0  47.1  21.7 100.0  214.1
1999- 2   -2.1    48.1  24.1  35.4   2.8   2.8    .0  56.7  10.3 100.0  262.2
1999- 3   -1.3    19.0   9.8  19.5   6.6   6.6    .0  22.7    .0 100.0  281.2
1999- 4    7.6    70.8  70.8    .0  38.6  38.6    .0  32.2    .0 100.0  352.0
1999- 5   14.8    51.6  51.6    .0  89.8  89.8    .0    .0    .0  61.8  403.6
1999- 6   19.7    44.2  44.2    .0 124.0 106.0 -18.0    .0    .0    .0  447.8
1999- 7   22.4    43.0  43.0    .0 144.4  43.0-101.4    .0    .0    .0  490.8
1999- 8   18.9    49.6  49.6    .0 111.2  49.6 -61.6    .0    .0    .0  540.4
```
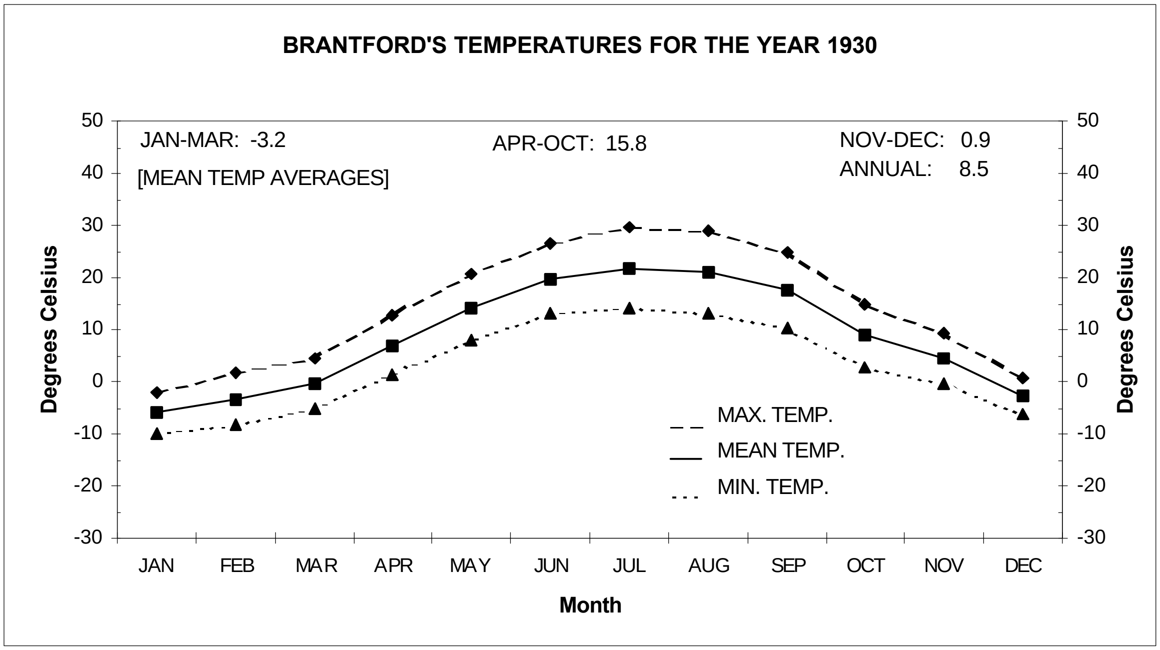
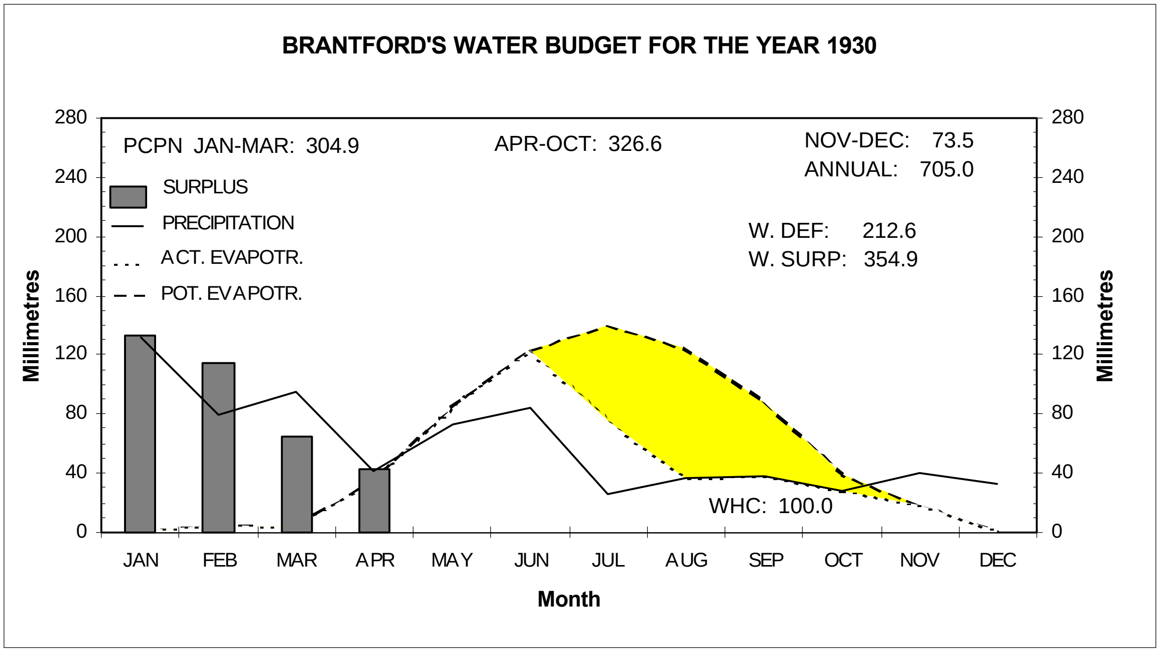
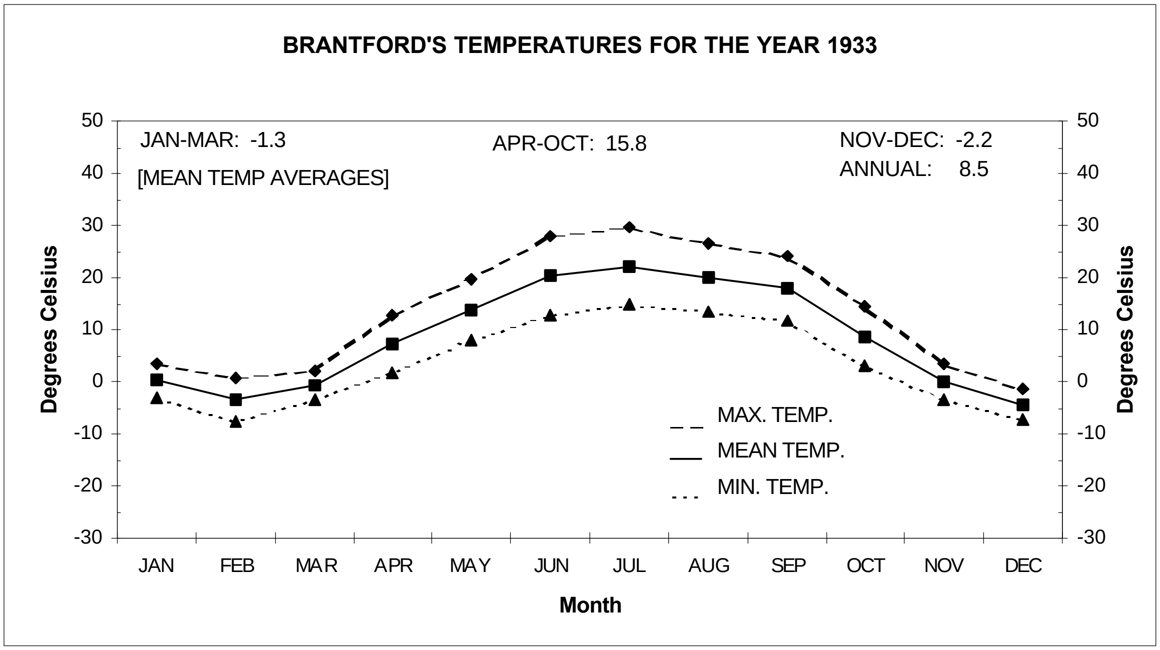

Appendix J

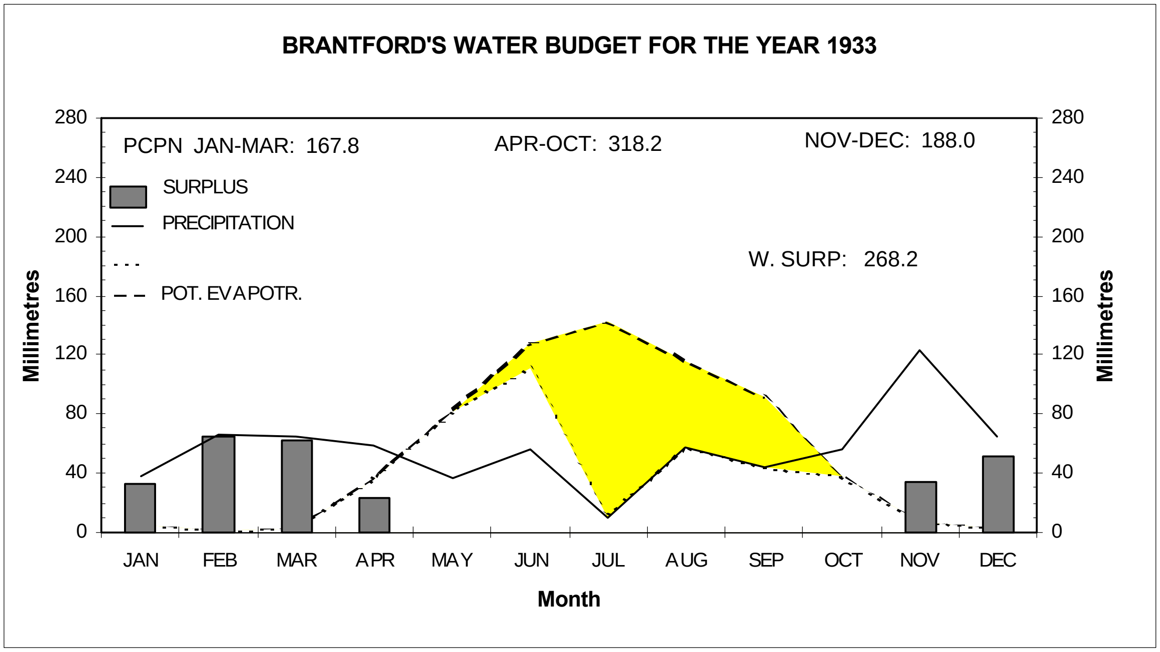
Selected Water Budget Profiles for Southern Ontario Stations During Drought Years


BRANTFORD'S TEMPERATURES FOR THE YEAR 1930
JAN-MAR: -3.2
[MEAN TEMP AVERAGES]
APR-OCT: 15.8
NOV-DEC: 0.9
ANNUAL: 8.5
MAX. TEMP.
MEAN TEMP.
MIN. TEMP.
Degrees Celsius
50
40
30
20
10
0
-10
-20
-30
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Month

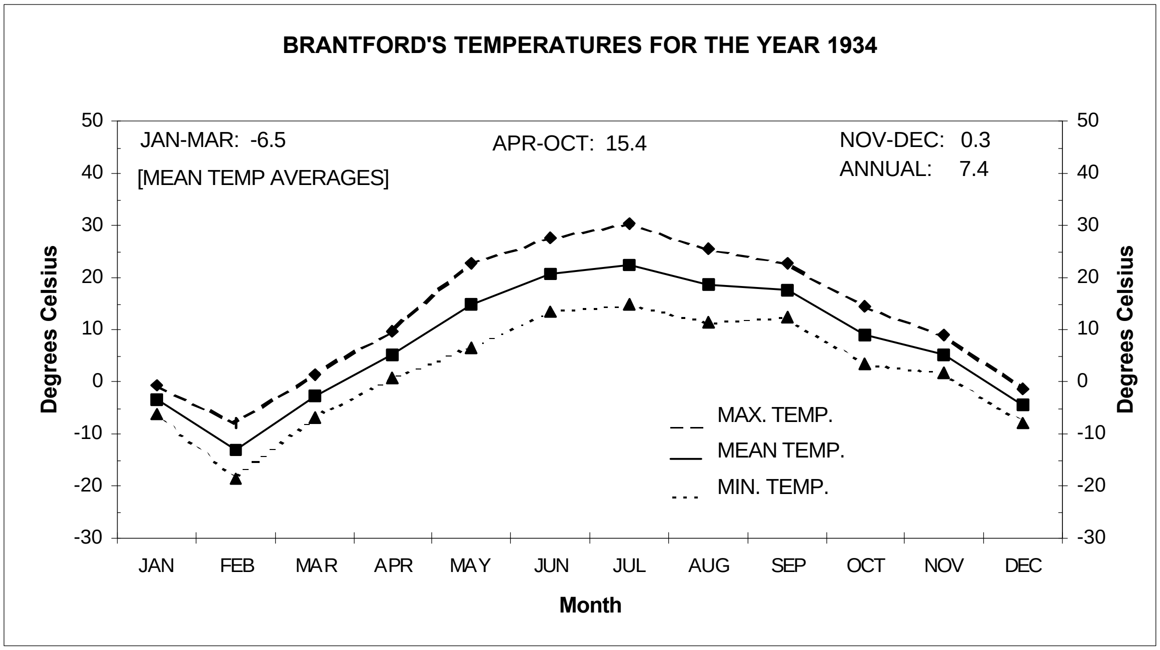

BRANTFORD'S WATER BUDGET FOR THE YEAR 1930
PCPN JAN-MAR: 304.9
APR-OCT: 326.6
NOV-DEC: 73.5
ANNUAL: 705.0
SURPLUS
PRECIPITATION
ACT. EVAPOTR.
POT. EVAPOTR.
W. DEF: 212.6
W. SURP: 354.9
WHC: 100.0
Millimetres
280
240
200
160
120
80
40
0
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Month

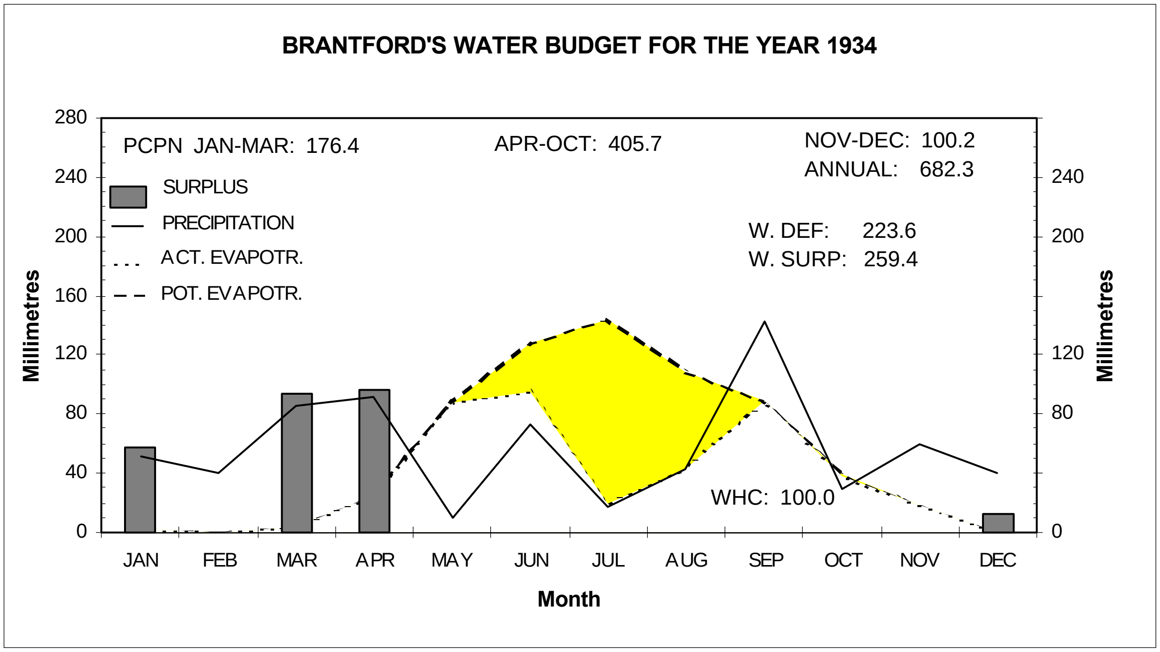


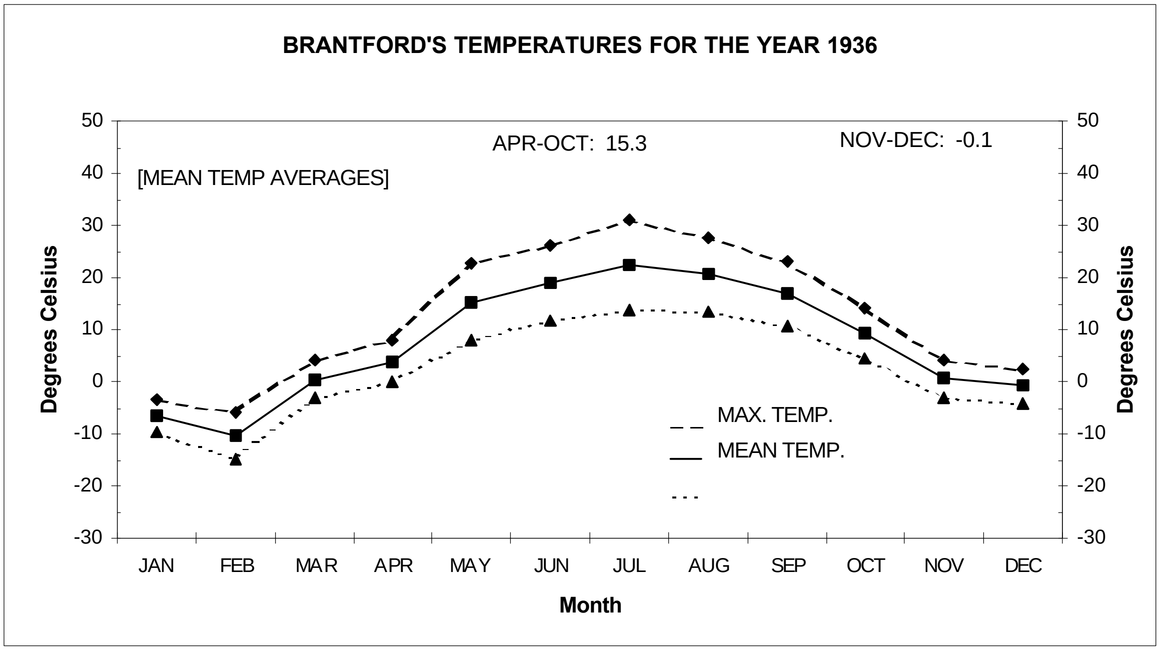
BRANTFORD'S TEMPERATURES FOR THE YEAR 1933

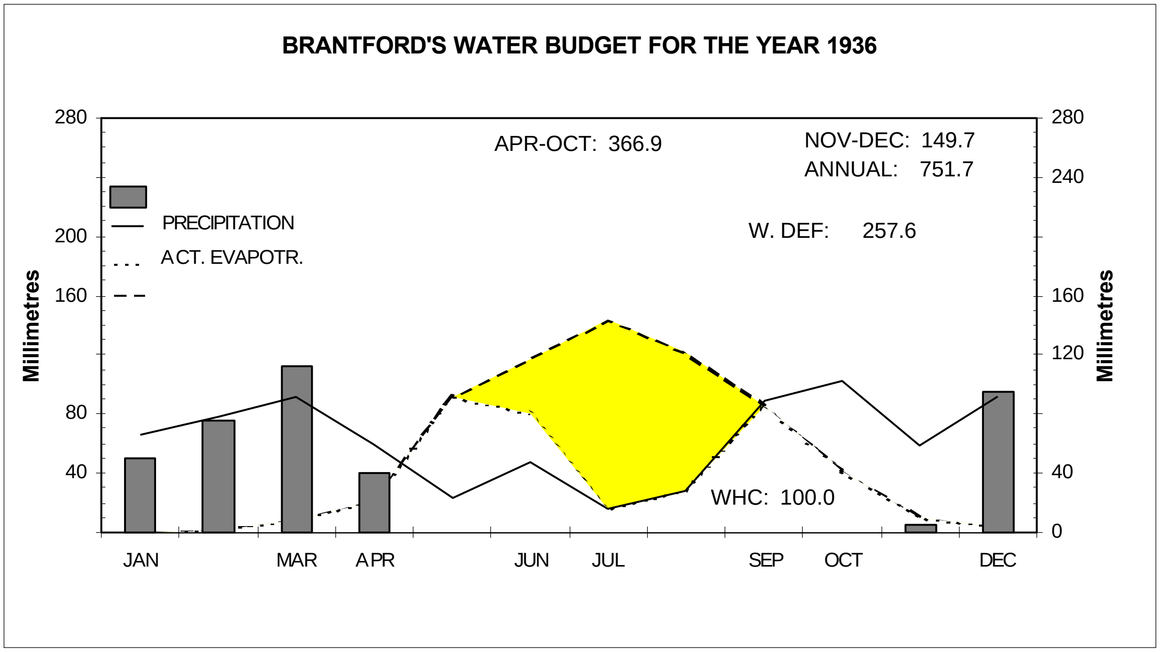


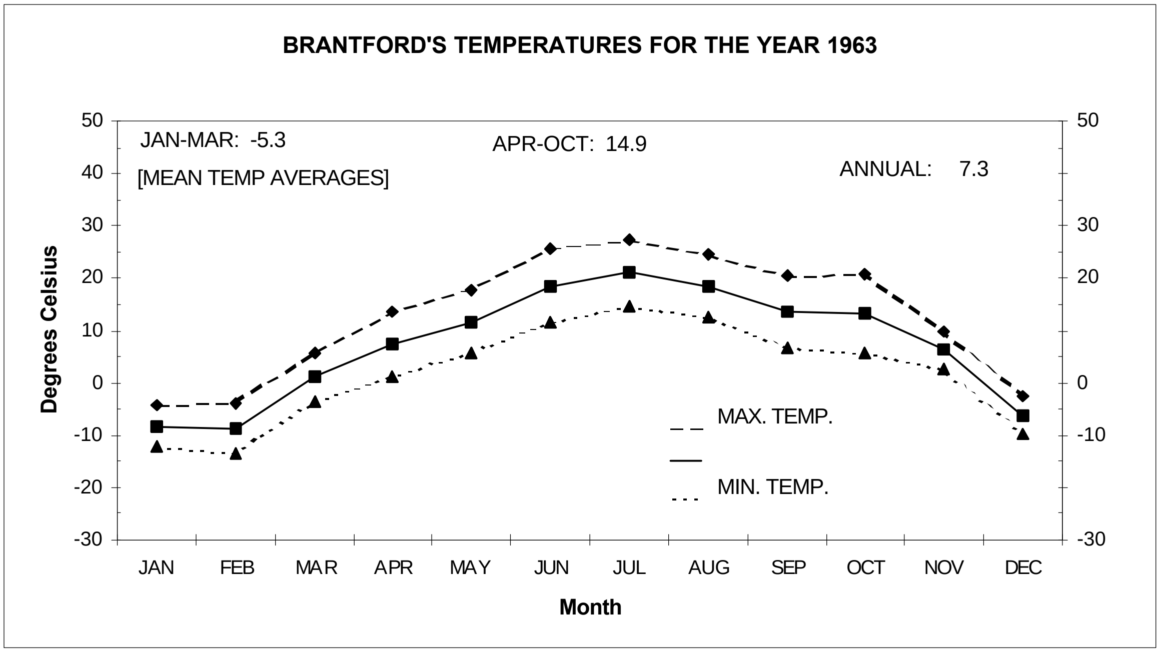
BRANTFORD'S WATER BUDGET FOR THE YEAR 1933


BRANTFORD'S TEMPERATURES FOR THE YEAR 1934
JAN-MAR: -6.5
[MEAN TEMP AVERAGES]
APR-OCT: 15.4
NOV-DEC: 0.3
ANNUAL: 7.4
MAX. TEMP.
MEAN TEMP.
MIN. TEMP.
Degrees Celsius
50
40
30
20
10
0
-10
-20
-30
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Month

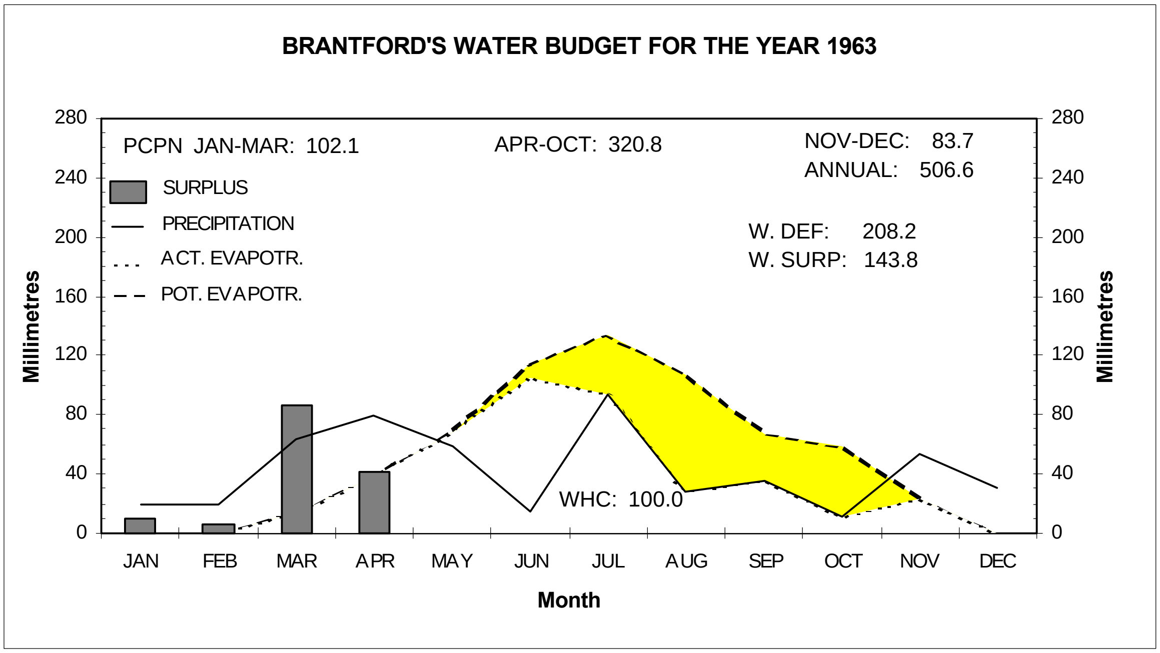

BRANTFORD'S WATER BUDGET FOR THE YEAR 1934
PCPN JAN-MAR: 176.4
APR-OCT: 405.7
NOV-DEC: 100.2
ANNUAL: 682.3
SURPLUS
PRECIPITATION
ACT. EVAPOTR.
POT. EVAPOTR.
W. DEF: 223.6
W. SURP: 259.4
WHC: 100.0
Millimetres
280
240
200
160
120
80
40
0
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Month


BRANTFORD'S TEMPERATURES FOR THE YEAR 1936
APR-OCT: 15.3
NOV-DEC: -0.1
[MEAN TEMP AVERAGES]
MAX. TEMP.
MEAN TEMP.
Degrees Celsius
50
40
30
20
10
0
-10
-20
-30
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Month

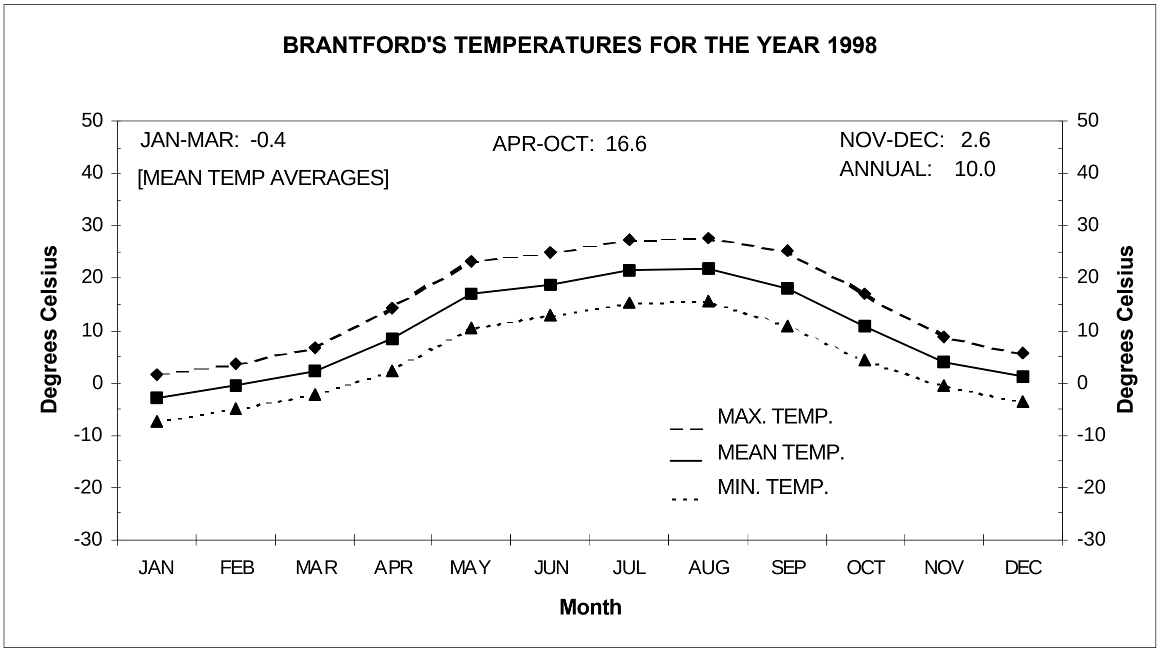

BRANTFORD'S WATER BUDGET FOR THE YEAR 1936
APR-OCT: 366.9
NOV-DEC: 149.7
ANNUAL: 751.7
PRECIPITATION
ACT. EVAPOTR.
W. DEF: 257.6
WHC: 100.0
Millimetres
280
240
200
160
120
80
40
0
JAN
MAR
APR
JUN
JUL
SEP
OCT
DEC

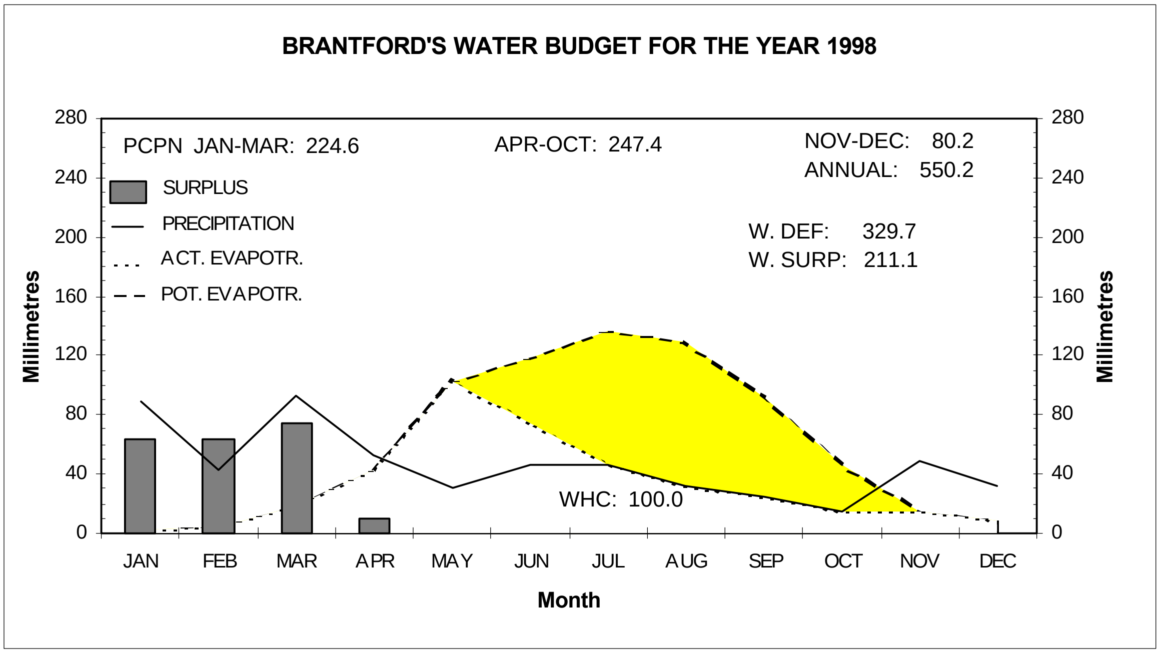


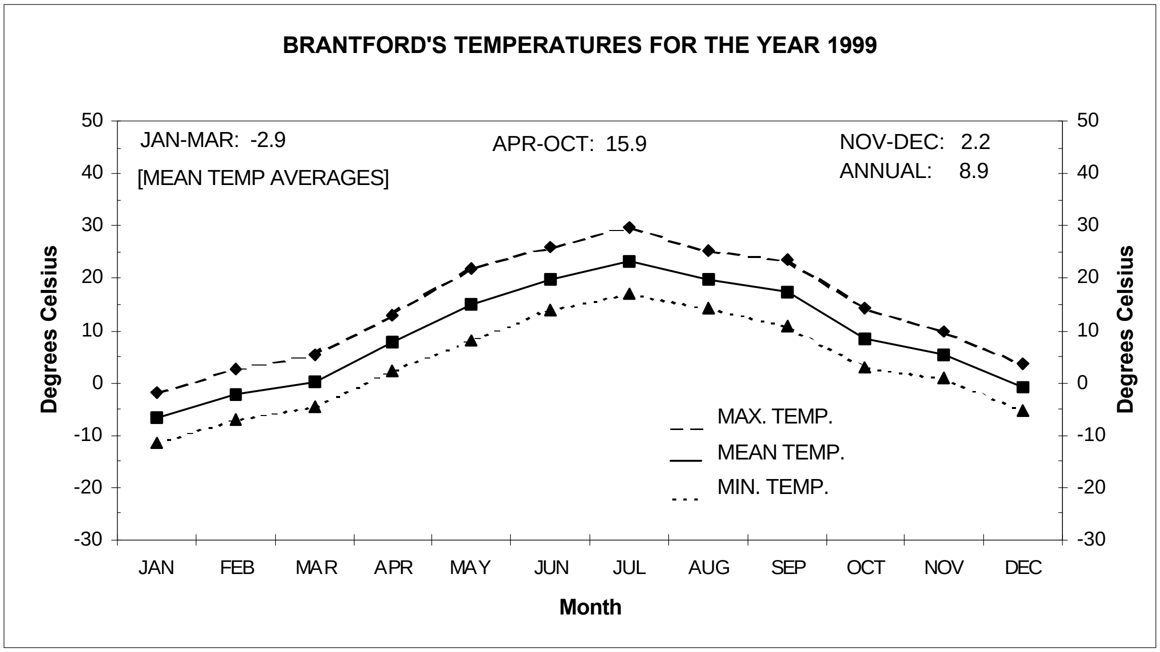
BRANTFORD'S TEMPERATURES FOR THE YEAR 1963
JAN-MAR: -5.3
[MEAN TEMP AVERAGES]
APR-OCT: 14.9
ANNUAL: 7.3
MAX. TEMP.
MIN. TEMP.
Degrees Celsius
50
40
30
20
10
0
-10
-20
-30
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Month

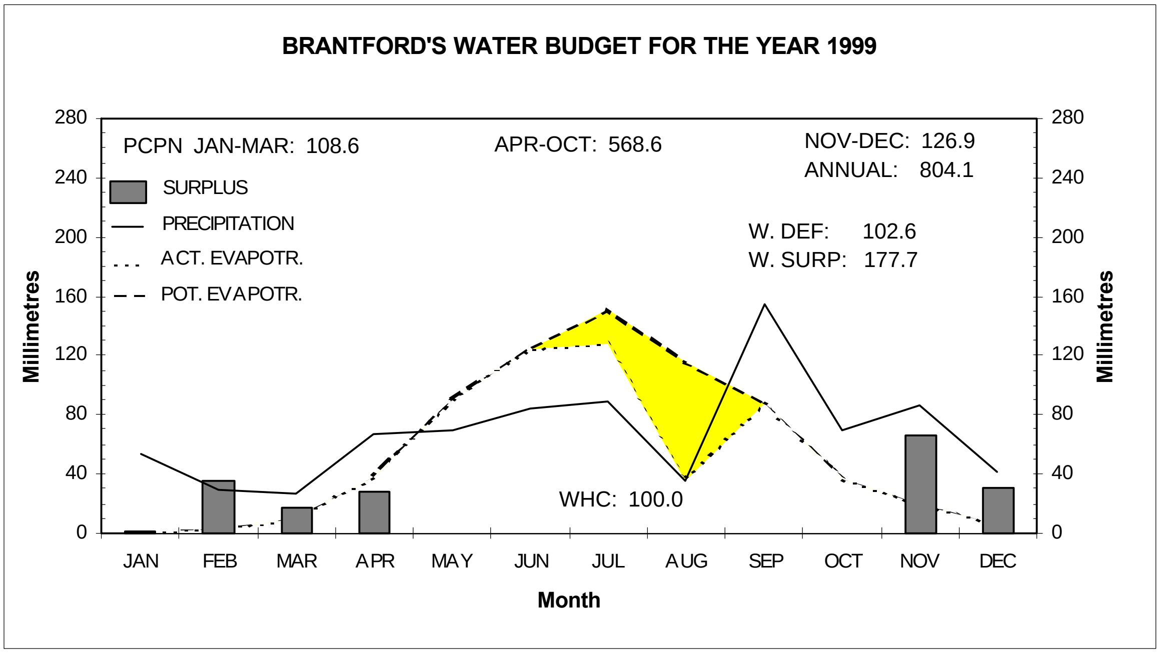


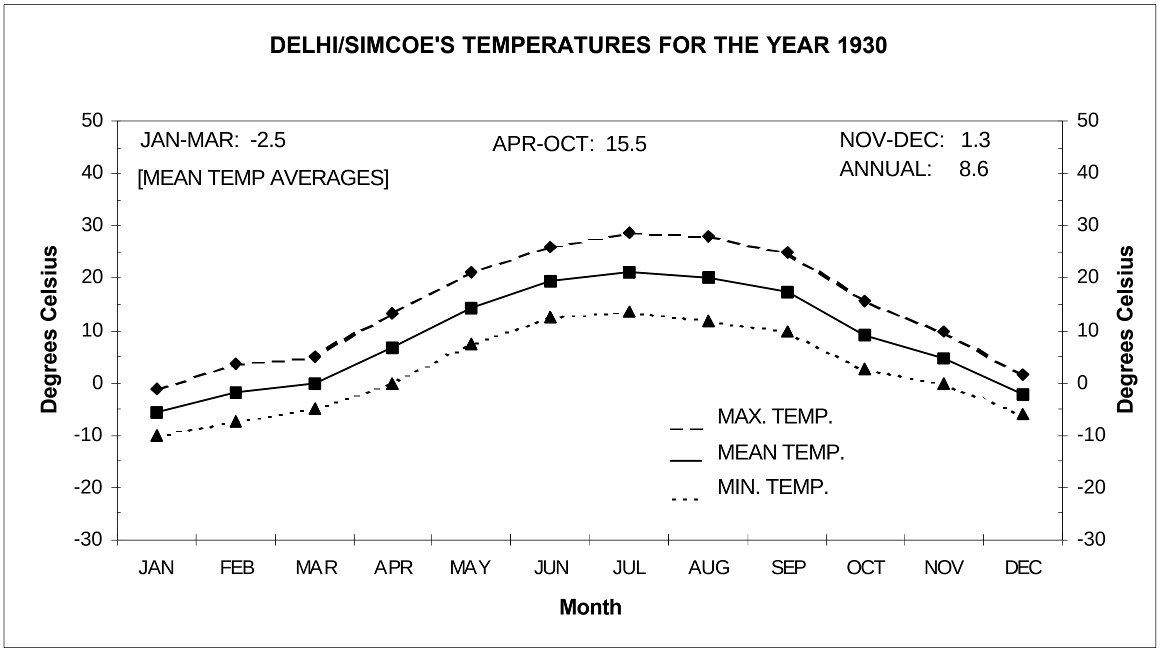
BRANTFORD'S WATER BUDGET FOR THE YEAR 1963
PCPN JAN-MAR: 102.1
APR-OCT: 320.8
NOV-DEC: 83.7
ANNUAL: 506.6
SURPLUS
PRECIPITATION
ACT. EVAPOTR.
POT. EVAPOTR.
W. DEF: 208.2
W. SURP: 143.8
WHC: 100.0
Millimetres
280
240
200
160
120
80
40
0
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Month


BRANTFORD'S TEMPERATURES FOR THE YEAR 1998

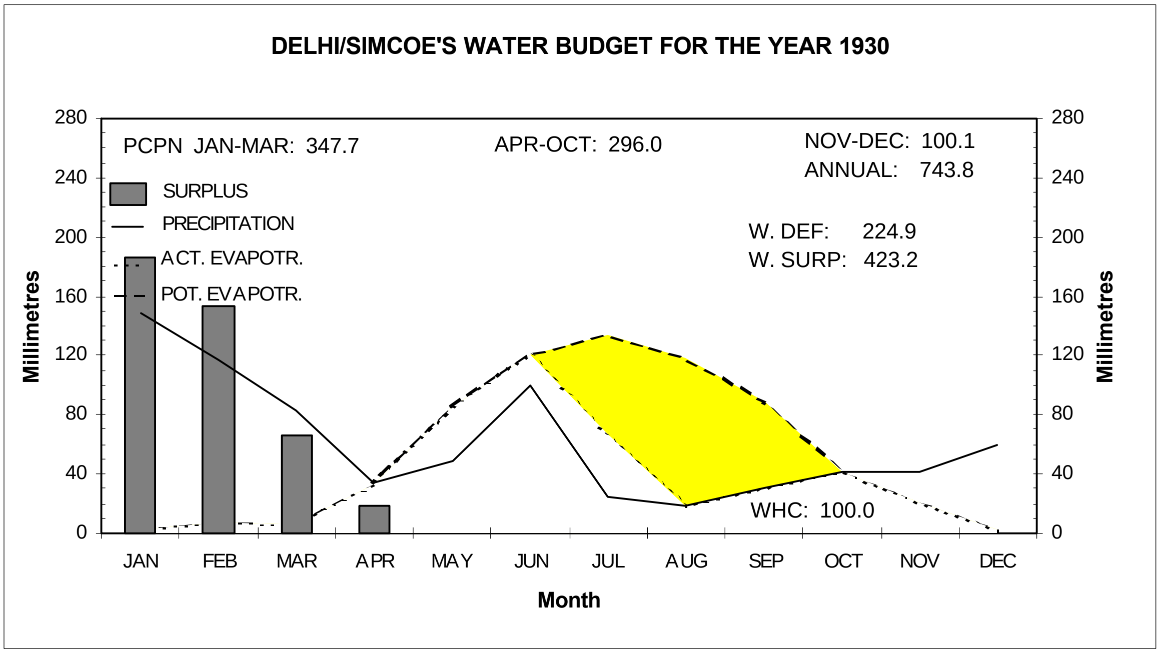

BRANTFORD'S WATER BUDGET FOR THE YEAR 1998


BRANTFORD'S TEMPERATURES FOR THE YEAR 1999
JAN-MAR: -2.9
[MEAN TEMP AVERAGES]
APR-OCT: 15.9
NOV-DEC: 2.2
ANNUAL: 8.9
MAX. TEMP.
MEAN TEMP.
MIN. TEMP.
Degrees Celsius
50
40
30
20
10
0
-10
-20
-30
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Month

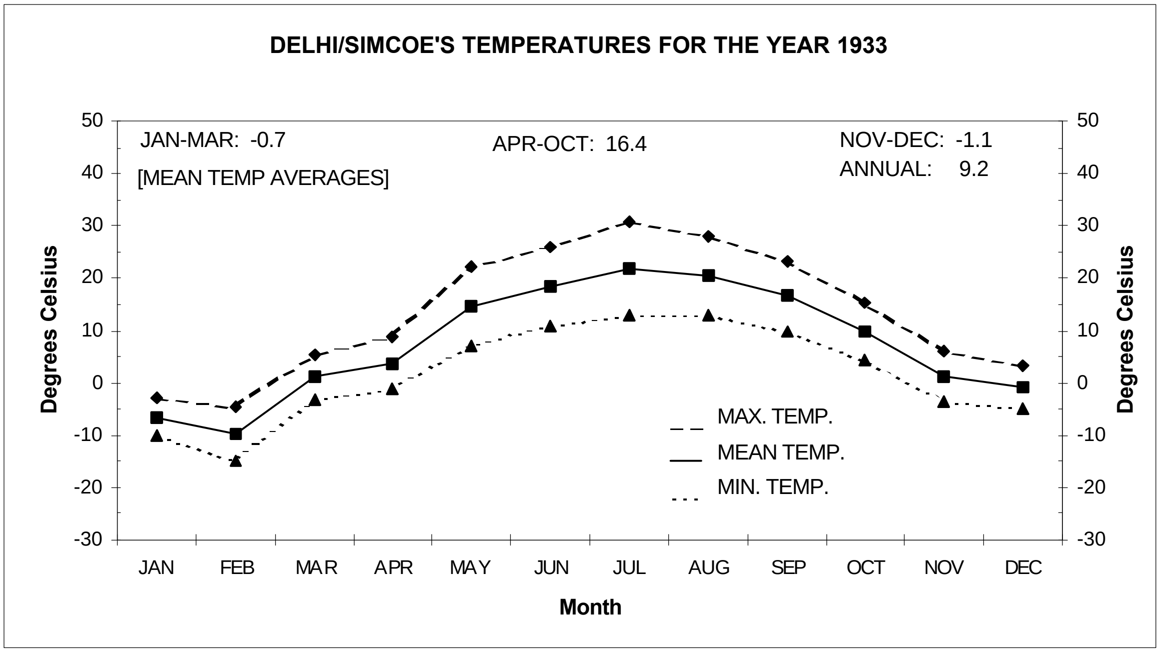

BRANTFORD'S WATER BUDGET FOR THE YEAR 1999
PCPN JAN-MAR: 108.6
APR-OCT: 568.6
NOV-DEC: 126.9
ANNUAL: 804.1
SURPLUS
PRECIPITATION
ACT. EVAPOTR.
POT. EVAPOTR.
W. DEF: 102.6
W. SURP: 177.7
WHC: 100.0
Millimetres
280
240
200
160
120
80
40
0
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Month

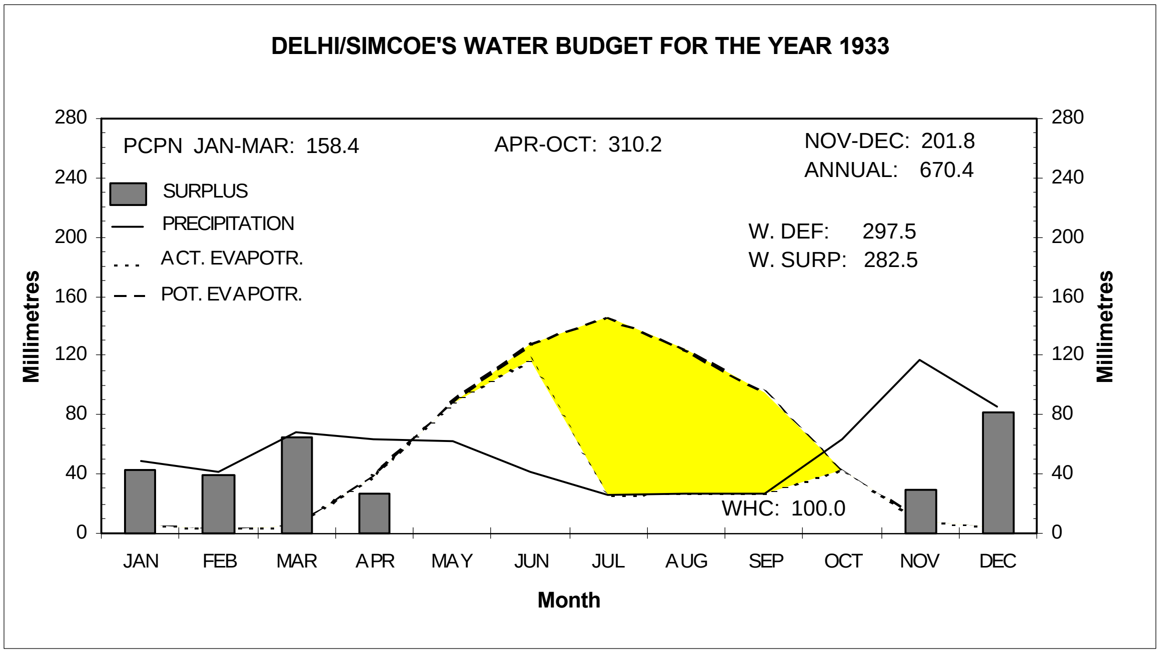


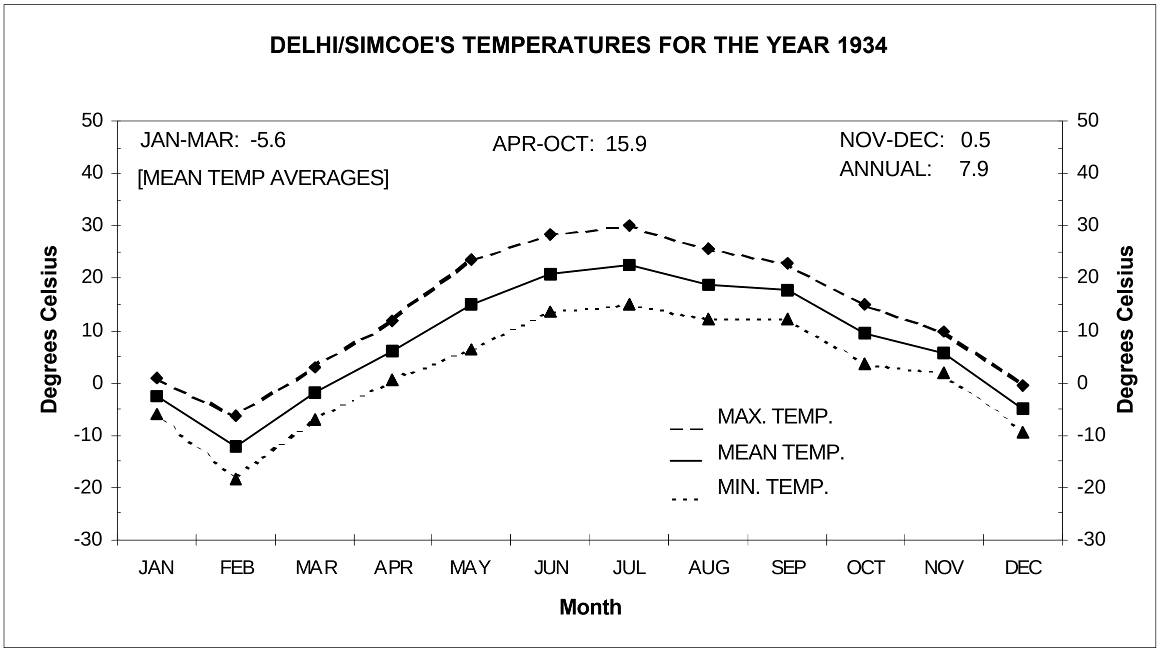
DELHI/SIMCOE'S TEMPERATURES FOR THE YEAR 1930
JAN-MAR: -2.5
[MEAN TEMP AVERAGES]
APR-OCT: 15.5
NOV-DEC: 1.3
ANNUAL: 8.6
MAX. TEMP.
MEAN TEMP.
MIN. TEMP.
Degrees Celsius
50
40
30
20
10
0
-10
-20
-30
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Month

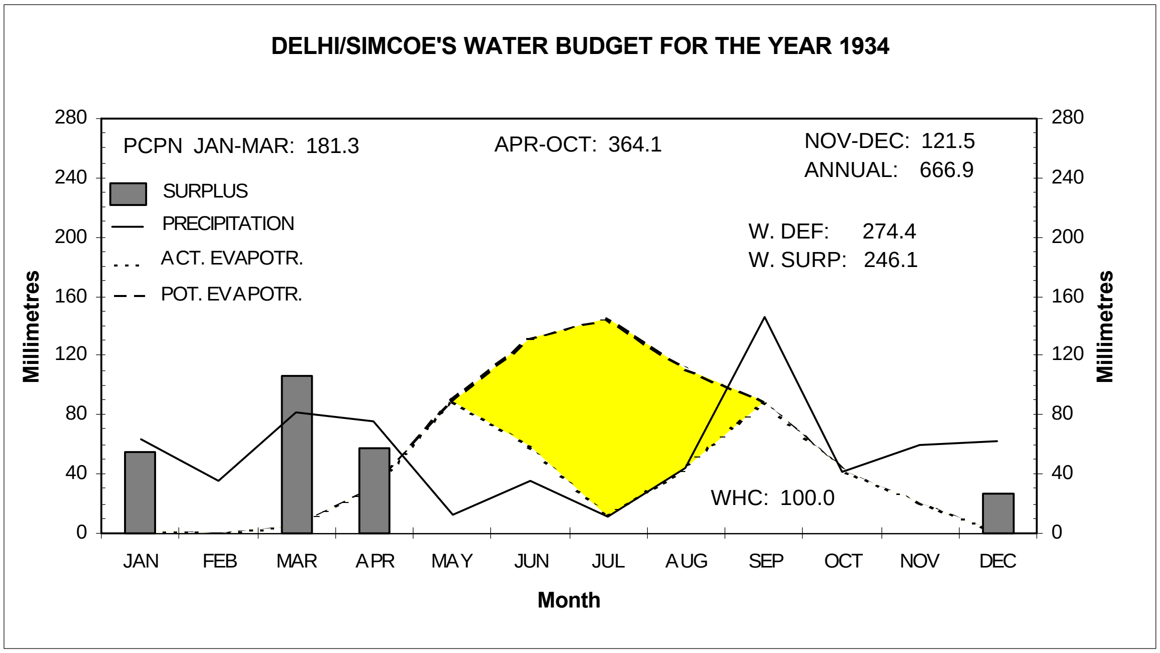


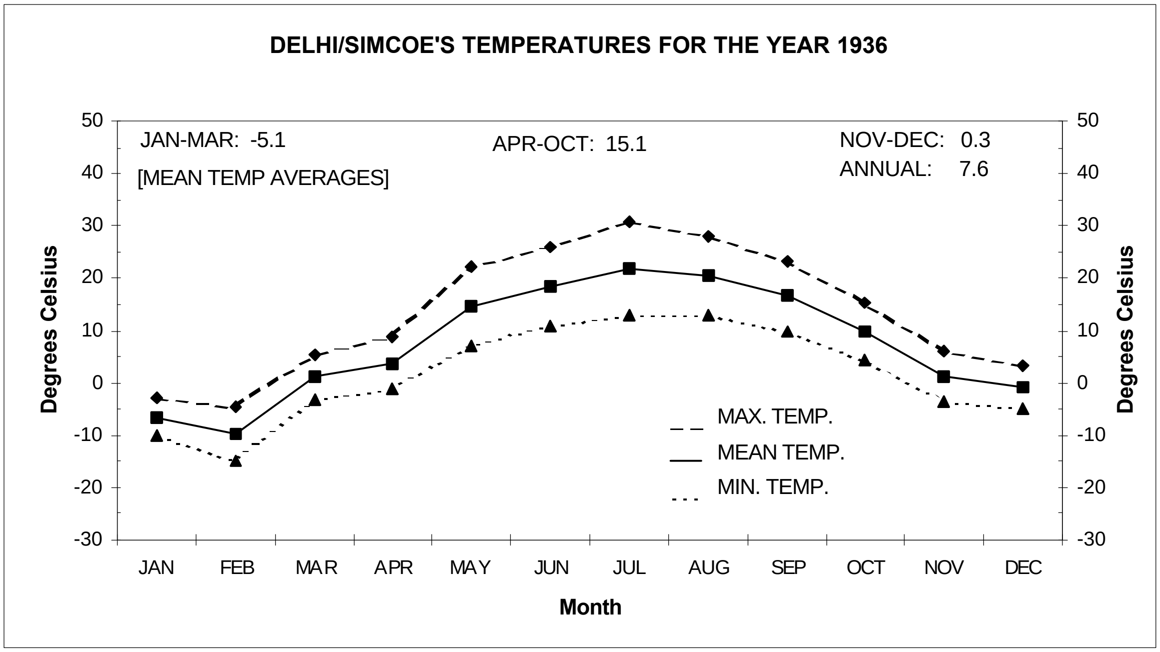
DELHI/SIMCOE'S WATER BUDGET FOR THE YEAR 1930
PCPN JAN-MAR: 347.7
APR-OCT: 296.0
NOV-DEC: 100.1
ANNUAL: 743.8
SURPLUS
PRECIPITATION
ACT. EVAPOTR.
POT. EVAPOTR.
W. DEF: 224.9
W. SURP: 423.2
WHC: 100.0
Millimetres
280
240
200
160
120
80
40
0
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Month

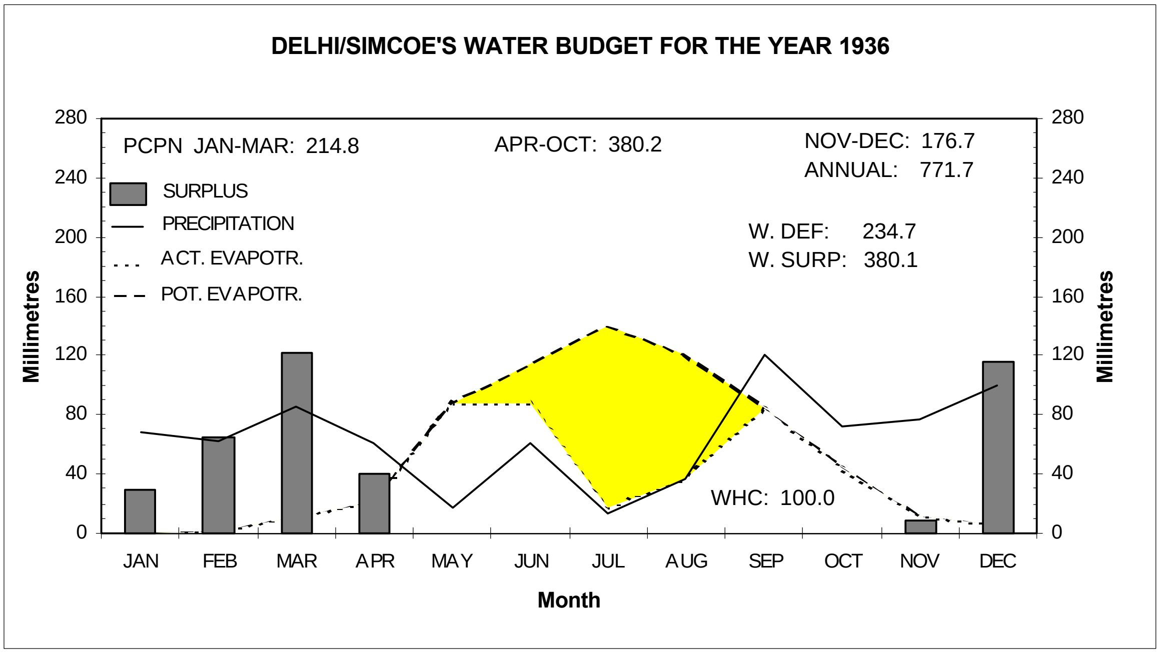

DELHI/SIMCOE'S TEMPERATURES FOR THE YEAR 1933
JAN-MAR: -0.7
[MEAN TEMP AVERAGES]
APR-OCT: 16.4
NOV-DEC: -1.1
ANNUAL: 9.2
Degrees Celsius
50
40
30
20
10
0
-10
-20
-30
MAX. TEMP.
MEAN TEMP.
MIN. TEMP.
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Month

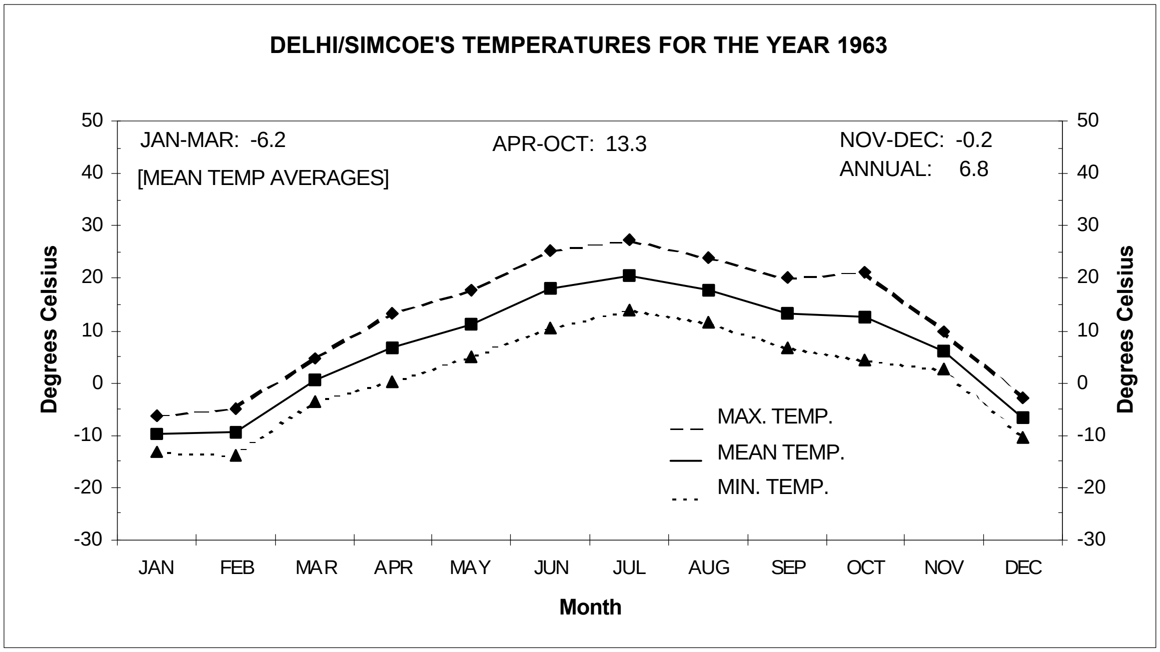

DELHI/SIMCOE'S WATER BUDGET FOR THE YEAR 1933
PCPN JAN-MAR: 158.4
APR-OCT: 310.2
NOV-DEC: 201.8
ANNUAL: 670.4
SURPLUS
PRECIPITATION
ACT. EVAPOTR.
POT. EVAPOTR.
W. DEF: 297.5
W. SURP: 282.5
WHC: 100.0
Millimetres
280
240
200
160
120
80
40
0
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Month


DELHI/SIMCOE'S TEMPERATURES FOR THE YEAR 1934
JAN-MAR: -5.6
[MEAN TEMP AVERAGES]
APR-OCT: 15.9
NOV-DEC: 0.5
ANNUAL: 7.9
MAX. TEMP.
MEAN TEMP.
MIN. TEMP.
Degrees Celsius
50
40
30
20
10
0
-10
-20
-30
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Month

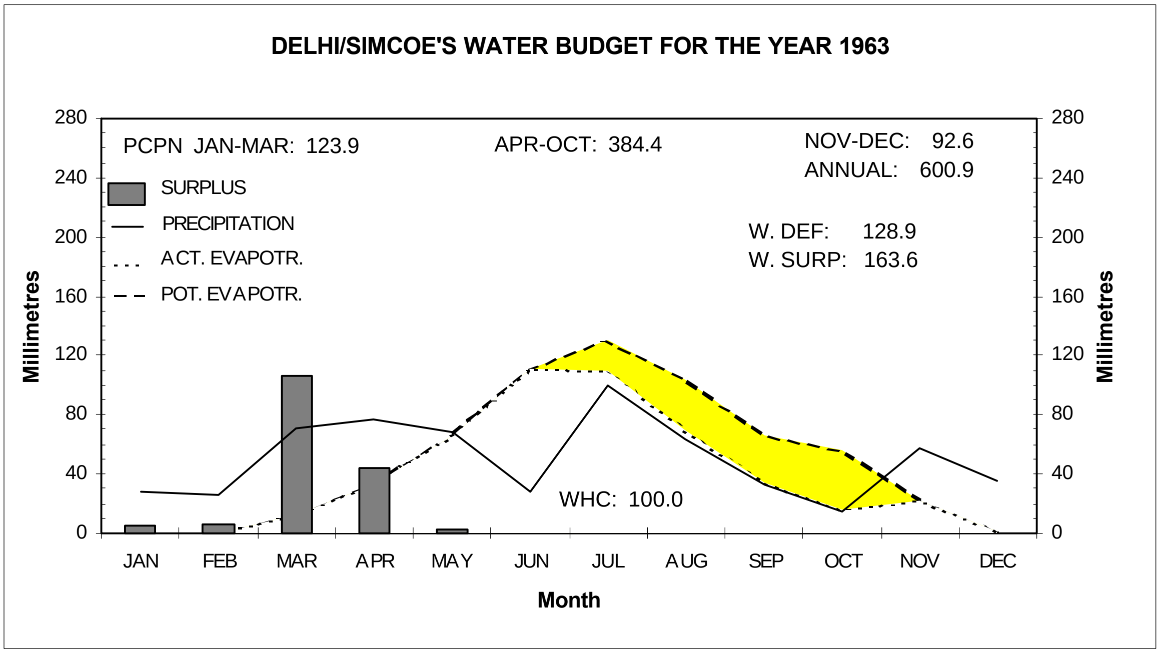

DELHI/SIMCOE'S WATER BUDGET FOR THE YEAR 1934
PCPN JAN-MAR: 181.3
APR-OCT: 364.1
NOV-DEC: 121.5
ANNUAL: 666.9
SURPLUS
PRECIPITATION
ACT. EVAPOTR.
POT. EVAPOTR.
W. DEF: 274.4
W. SURP: 246.1
WHC: 100.0
Millimetres
280
240
200
160
120
80
40
0
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Month


DELHI/SIMCOE'S TEMPERATURES FOR THE YEAR 1936
JAN-MAR: -5.1
[MEAN TEMP AVERAGES]
APR-OCT: 15.1
NOV-DEC: 0.3
ANNUAL: 7.6
MAX. TEMP.
MEAN TEMP.
MIN. TEMP.
Degrees Celsius
50
40
30
20
10
0
-10
-20
-30
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Month

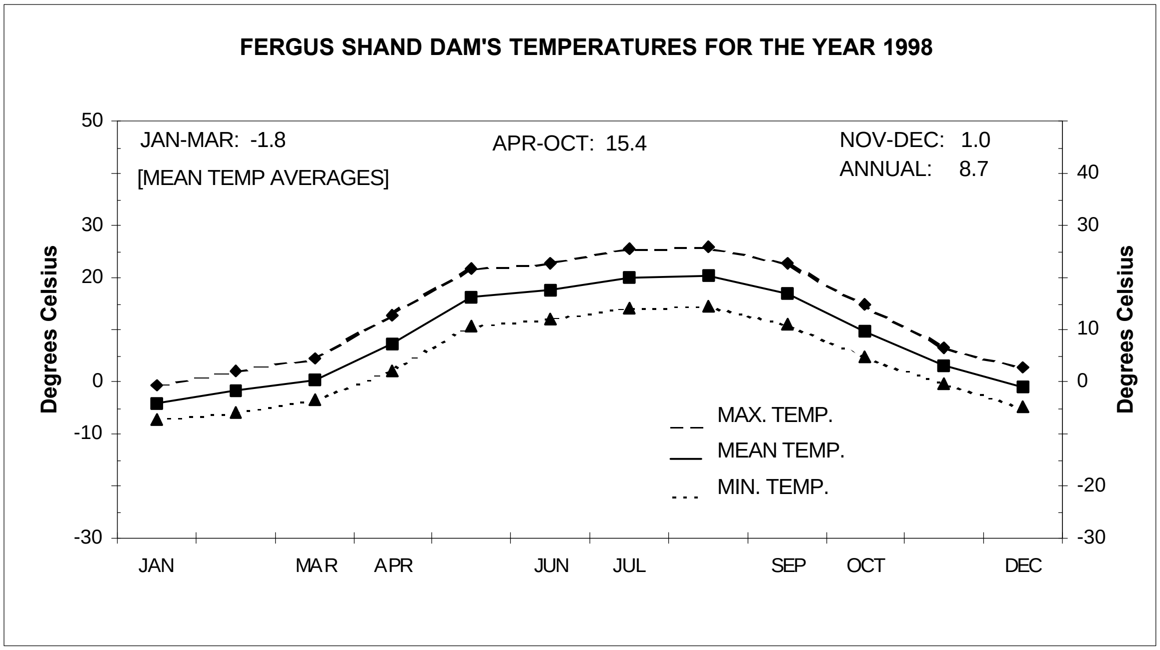

DELHI/SIMCOE'S WATER BUDGET FOR THE YEAR 1936
PCPN JAN-MAR: 214.8
APR-OCT: 380.2
NOV-DEC: 176.7
ANNUAL: 771.7
SURPLUS
PRECIPITATION
ACT. EVAPOTR.
POT. EVAPOTR.
W. DEF: 234.7
W. SURP: 380.1
WHC: 100.0
Millimetres
280
240
200
160
120
80
40
0
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Month

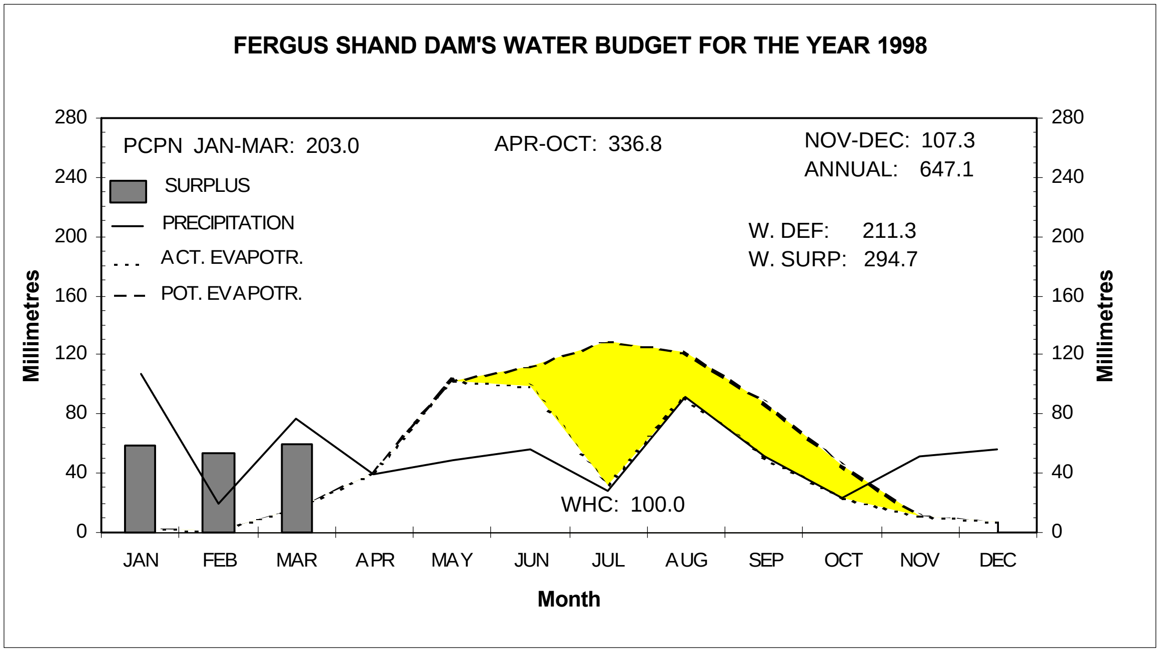


DELHI/SIMCOE'S TEMPERATURES FOR THE YEAR 1963

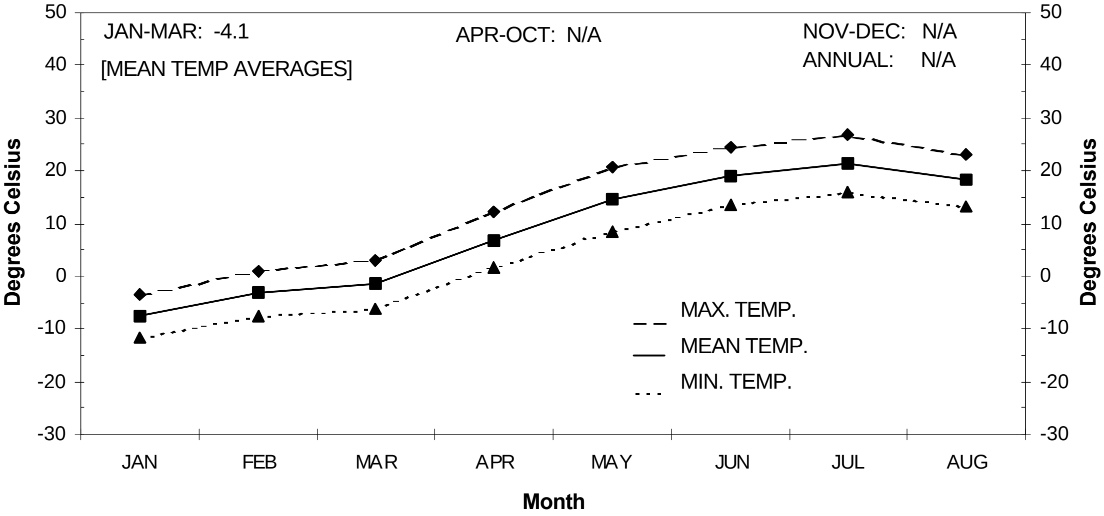


DELHI/SIMCOE'S WATER BUDGET FOR THE YEAR 1963

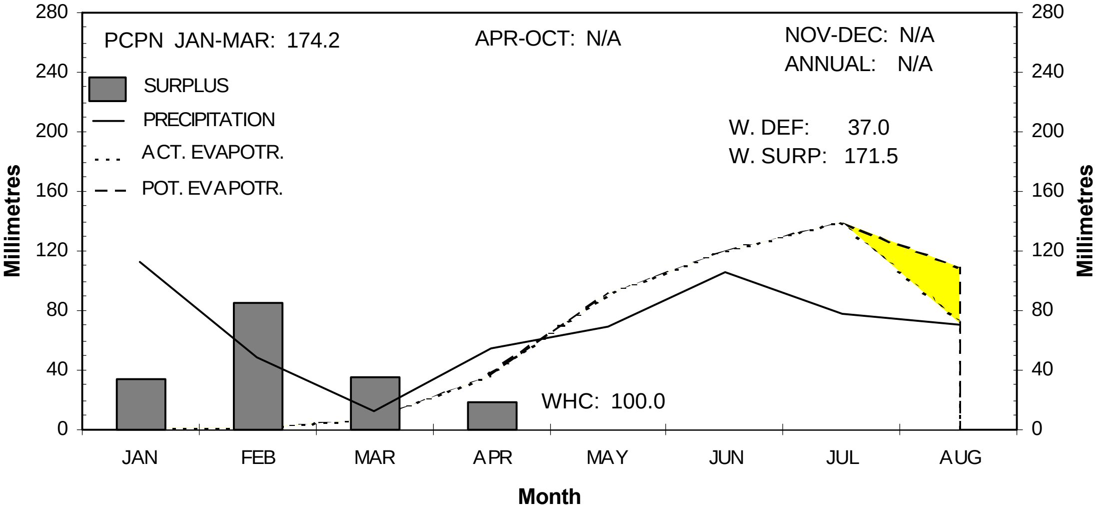

FERGUS SHAND DAM'S TEMPERATURES FOR THE YEAR 1998

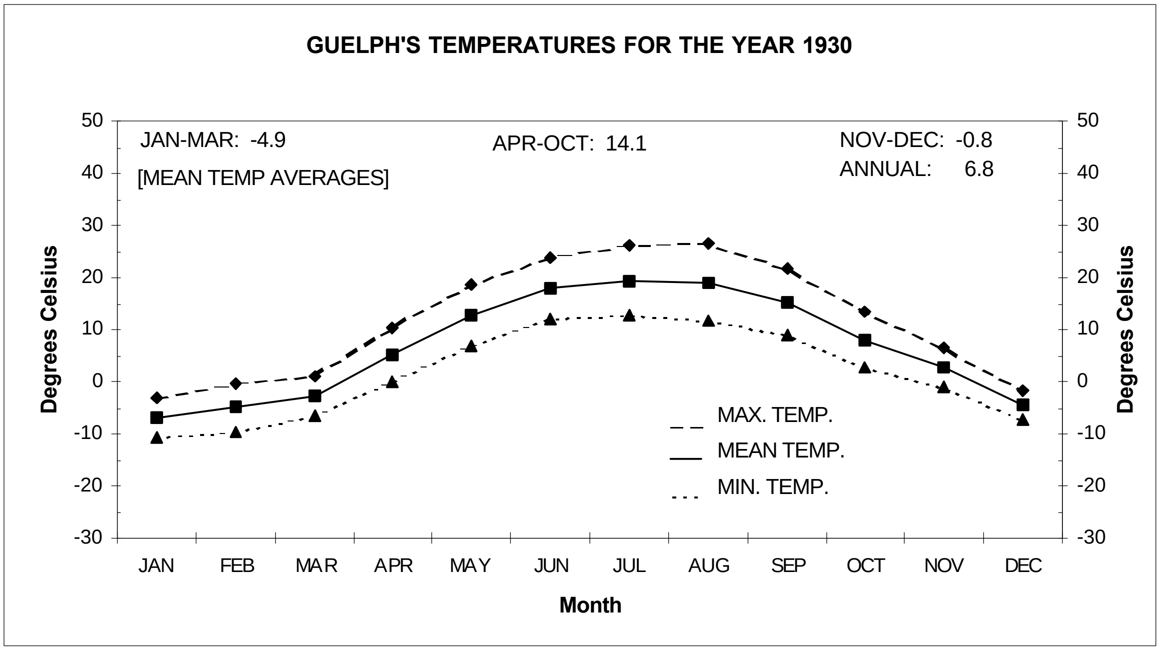

FERGUS SHAND DAM'S WATER BUDGET FOR THE YEAR 1998

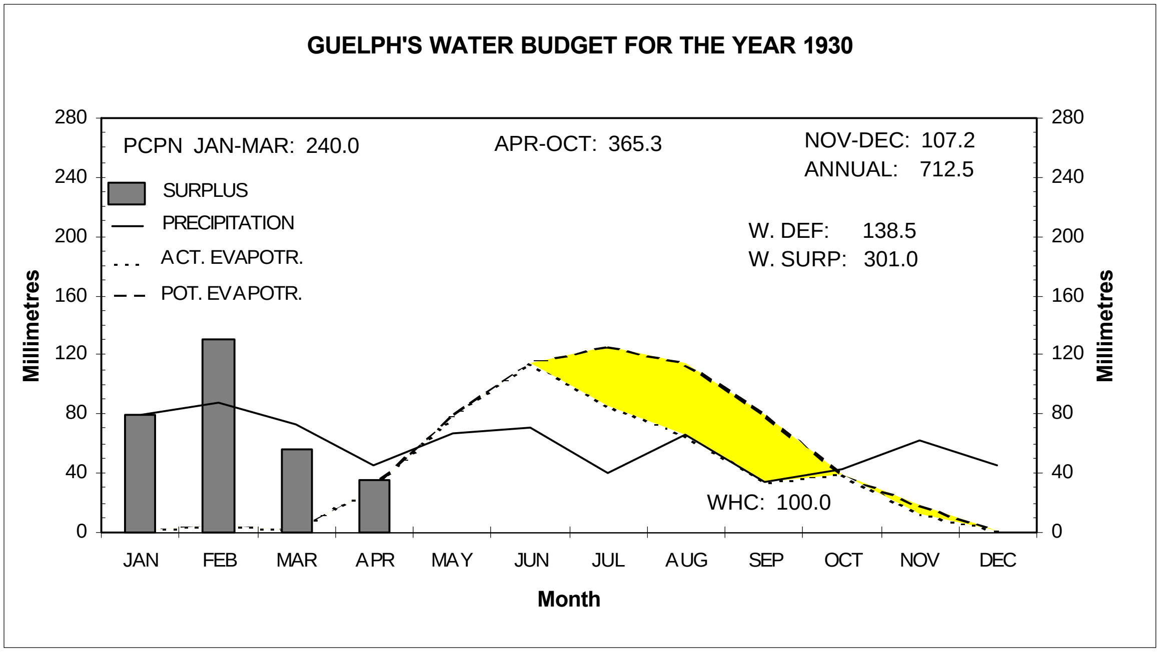
FERGUS SHAND DAM'S TEMPERATURES FOR THE YEAR 1999: THROUGH AUGUST

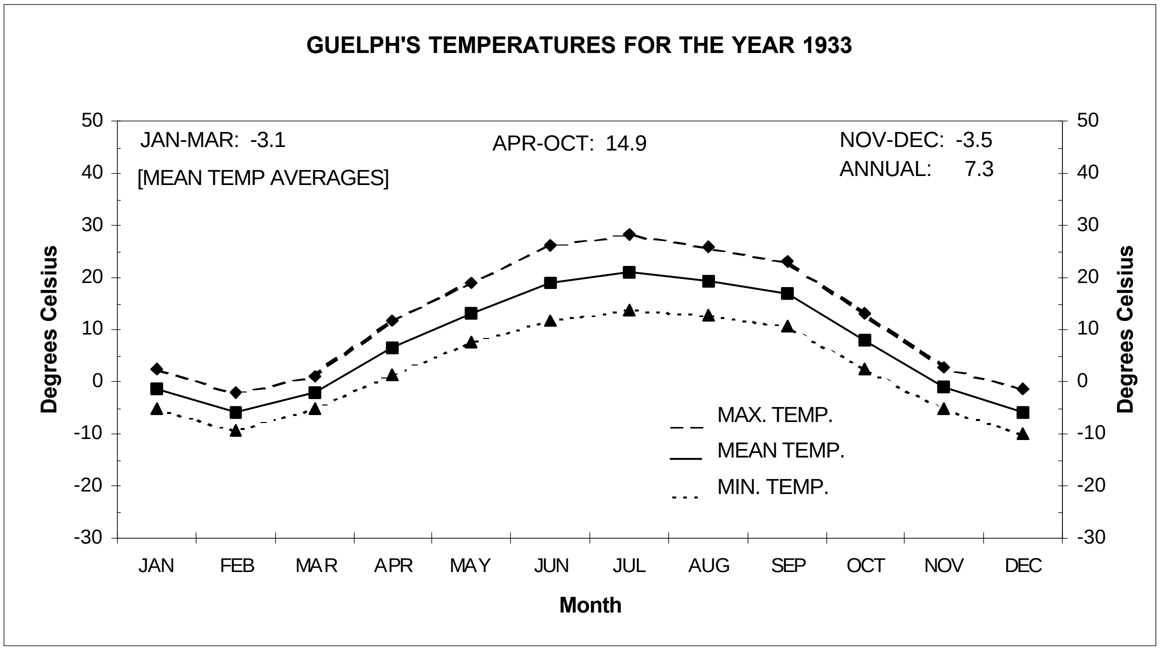


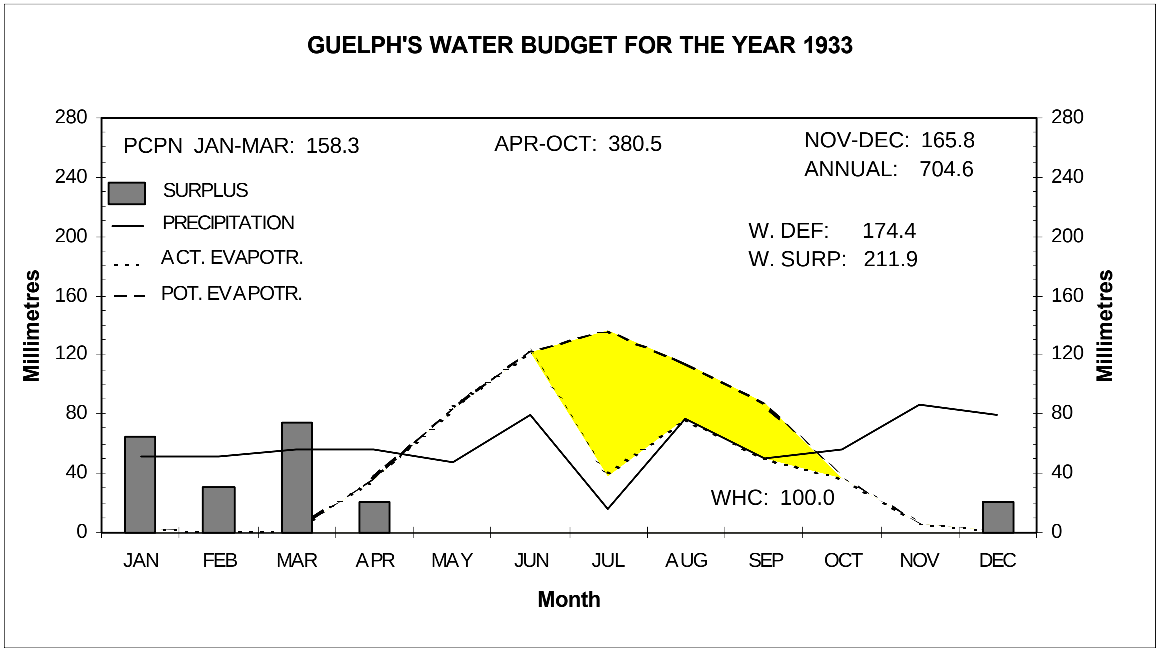
FERGUS SHAND DAM'S WATER BUDGET FOR THE YEAR 1999: THROUGH AUGUST

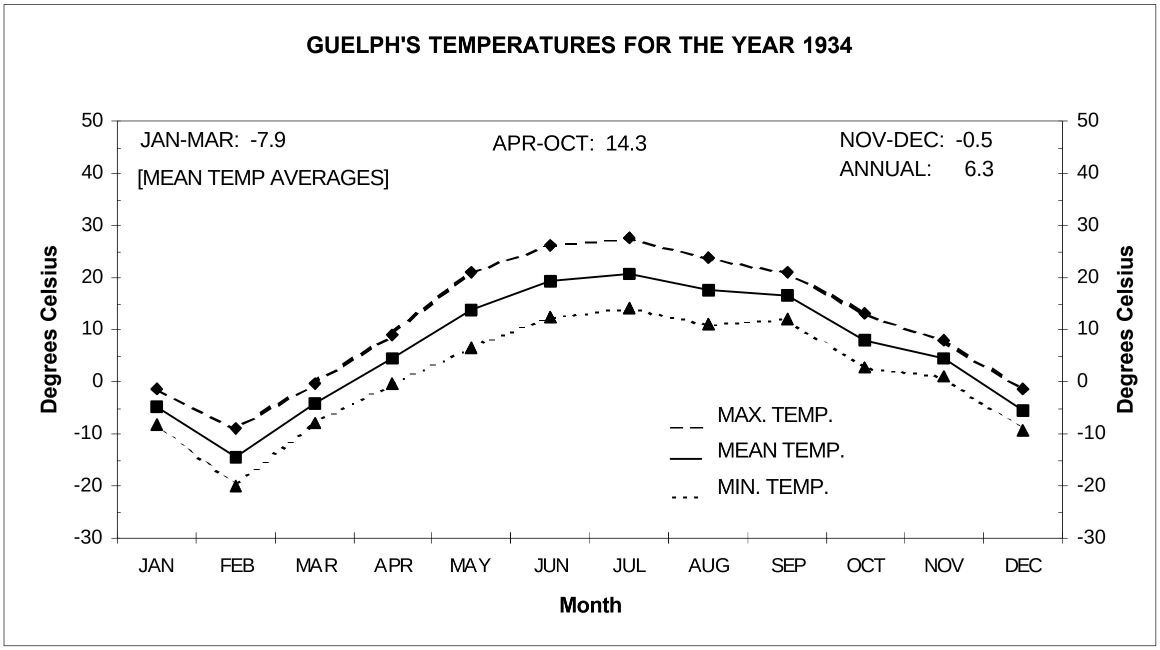


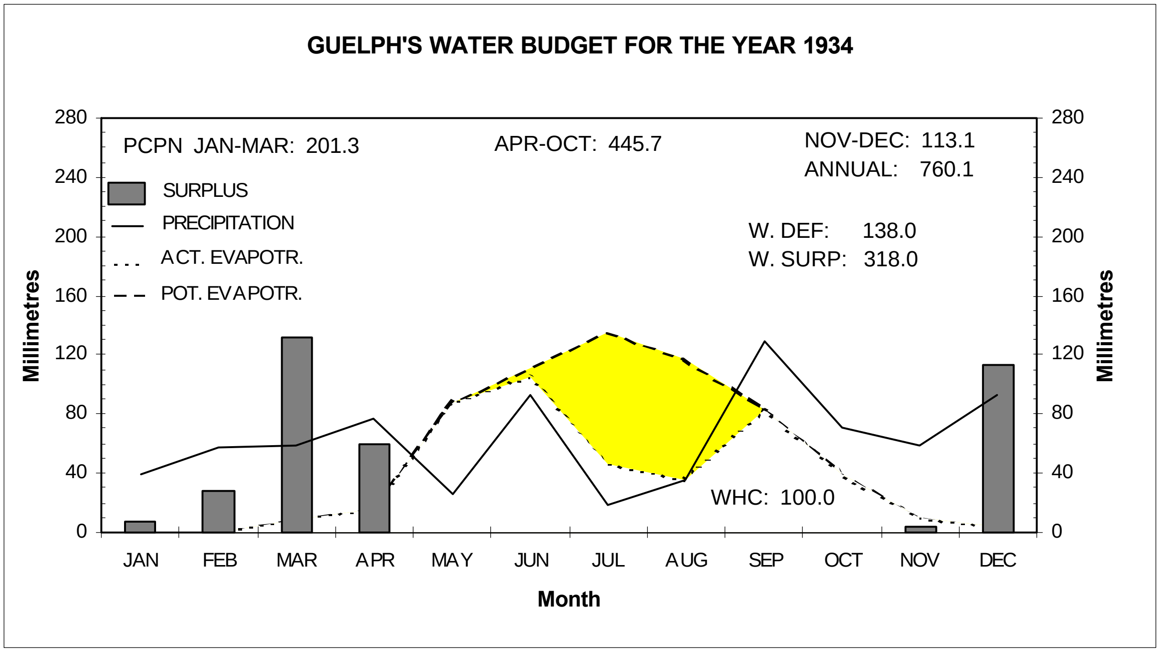

GUELPH'S TEMPERATURES FOR THE YEAR 1930
JAN-MAR: -4.9
[MEAN TEMP AVERAGES]
APR-OCT: 14.1
NOV-DEC: -0.8
ANNUAL: 6.8
MAX. TEMP.
MEAN TEMP.
MIN. TEMP.
Degrees Celsius
50
40
30
20
10
0
-10
-20
-30
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Month

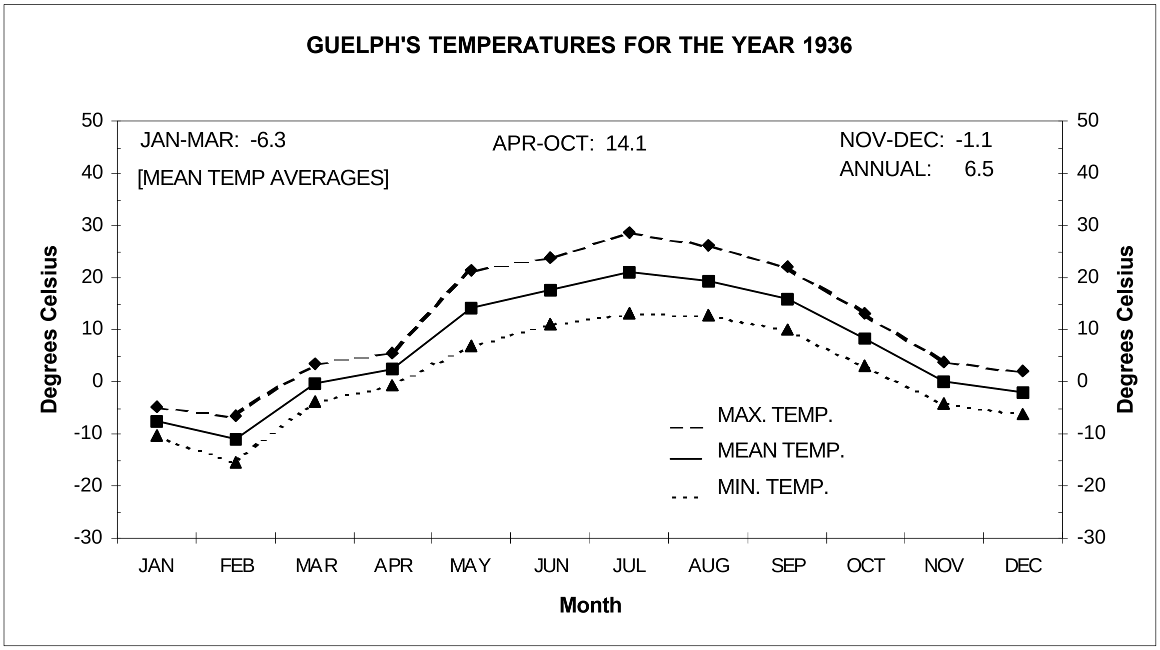

GUELPH'S WATER BUDGET FOR THE YEAR 1930
PCPN JAN-MAR: 240.0
APR-OCT: 365.3
NOV-DEC: 107.2
ANNUAL: 712.5
SURPLUS
PRECIPITATION
ACT. EVAPOTR.
POT. EVAPOTR.
W. DEF: 138.5
W. SURP: 301.0
WHC: 100.0
Millimetres
280
240
200
160
120
80
40
0
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Month

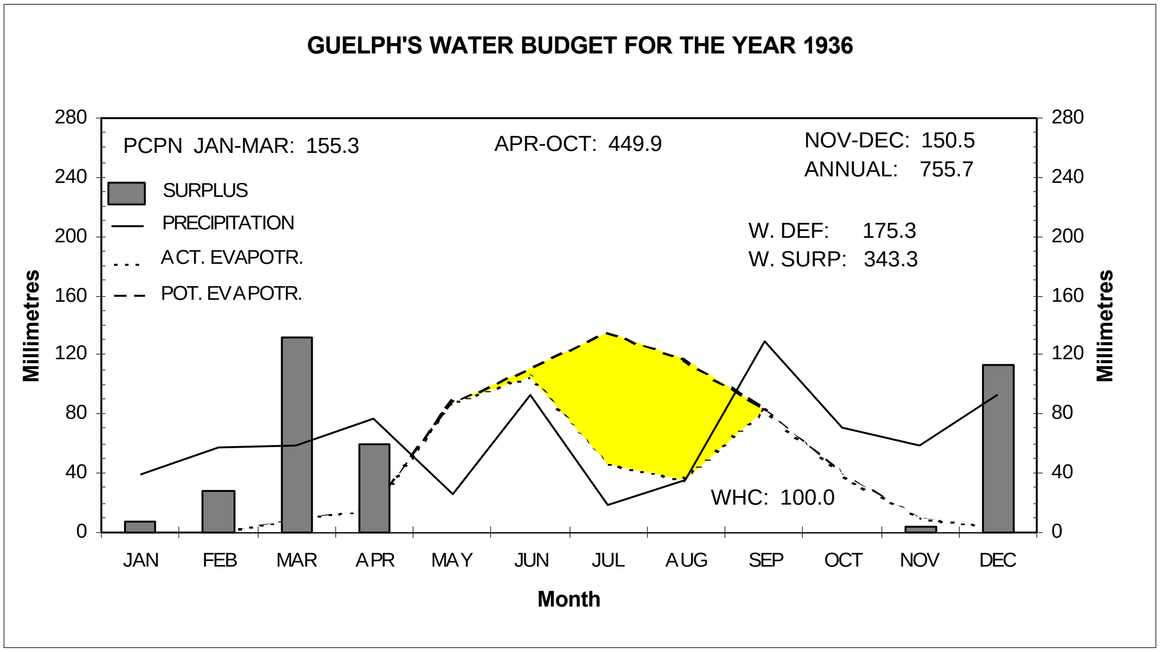

GUELPH'S TEMPERATURES FOR THE YEAR 1933
JAN-MAR: -3.1
[MEAN TEMP AVERAGES]
APR-OCT: 14.9
NOV-DEC: -3.5
ANNUAL: 7.3
MAX. TEMP.
MEAN TEMP.
MIN. TEMP.
Degrees Celsius
50
40
30
20
10
0
-10
-20
-30
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Month

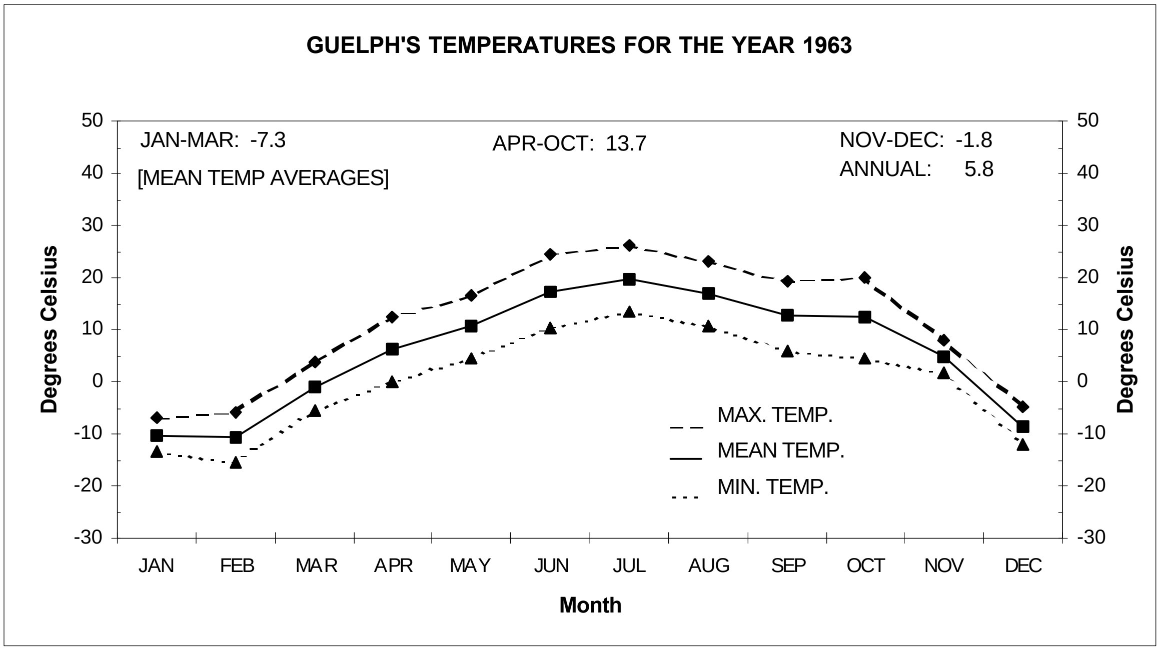

GUELPH'S WATER BUDGET FOR THE YEAR 1933
PCPN JAN-MAR: 158.3
APR-OCT: 380.5
NOV-DEC: 165.8
ANNUAL: 704.6
SURPLUS
PRECIPITATION
ACT. EVAPOTR.
POT. EVAPOTR.
W. DEF: 174.4
W. SURP: 211.9
WHC: 100.0
Millimetres
280
240
200
160
120
80
40
0
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Month

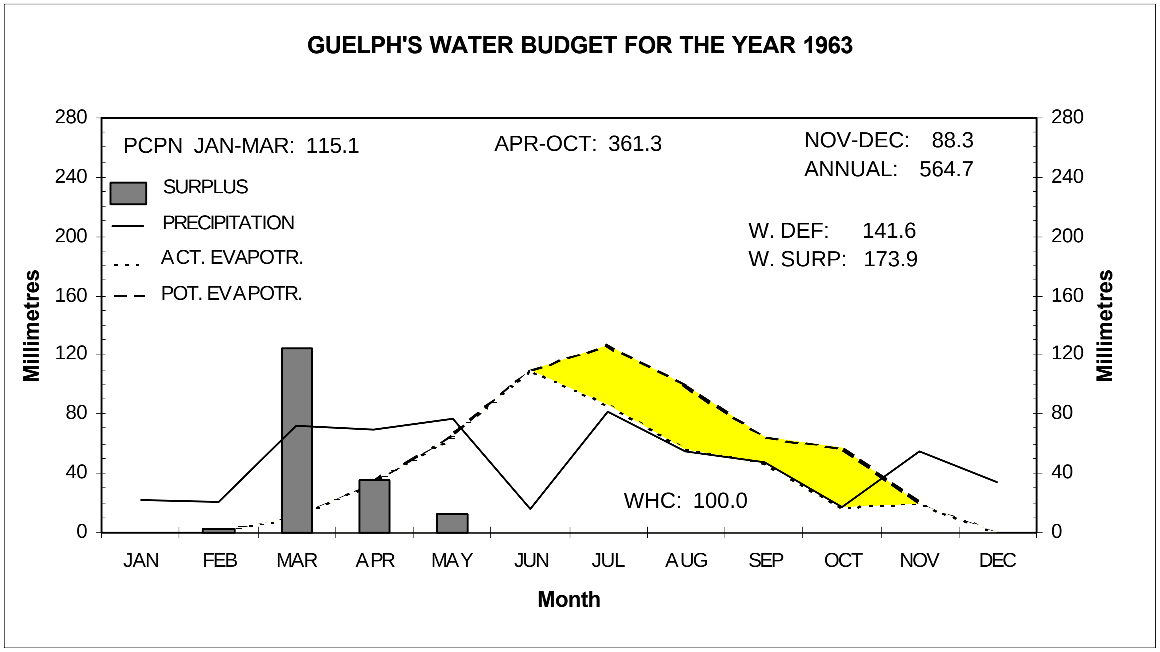

GUELPH'S TEMPERATURES FOR THE YEAR 1934
JAN-MAR: -7.9
[MEAN TEMP AVERAGES]
APR-OCT: 14.3
NOV-DEC: -0.5
ANNUAL: 6.3
MAX. TEMP.
MEAN TEMP.
MIN. TEMP.
Degrees Celsius
50
40
30
20
10
0
-10
-20
-30
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Month

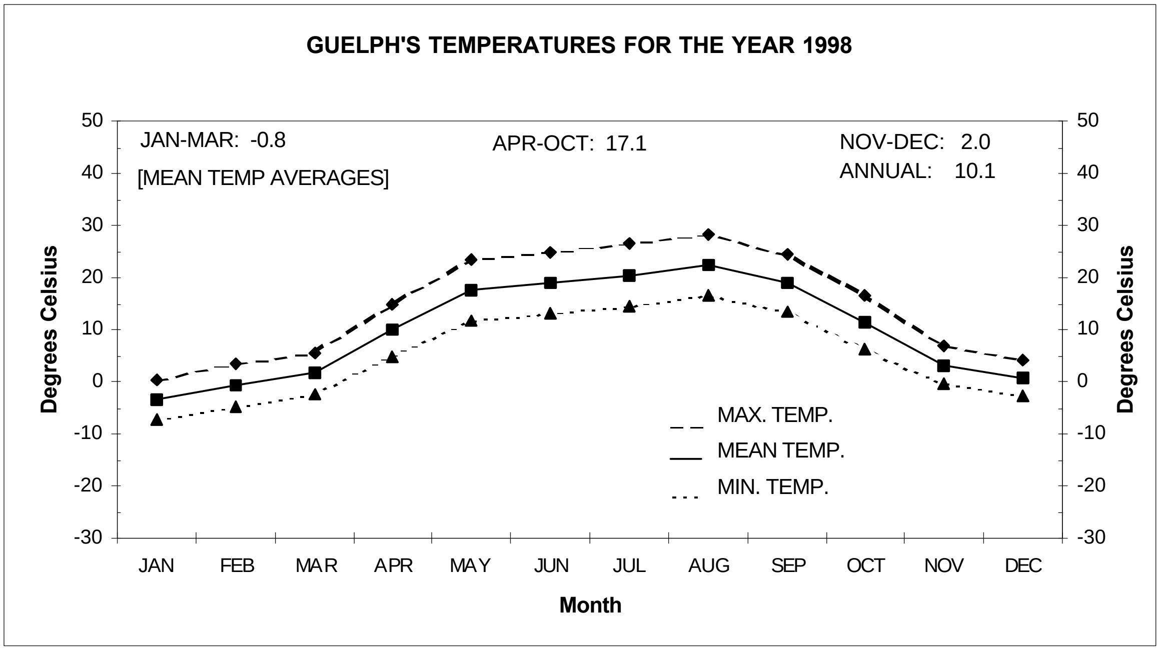

GUELPH'S WATER BUDGET FOR THE YEAR 1934
PCPN JAN-MAR: 201.3
APR-OCT: 445.7
NOV-DEC: 113.1
ANNUAL: 760.1
SURPLUS
PRECIPITATION
ACT. EVAPOTR.
POT. EVAPOTR.
W. DEF: 138.0
W. SURP: 318.0
WHC: 100.0
Millimetres
280
240
200
160
120
80
40
0
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Month

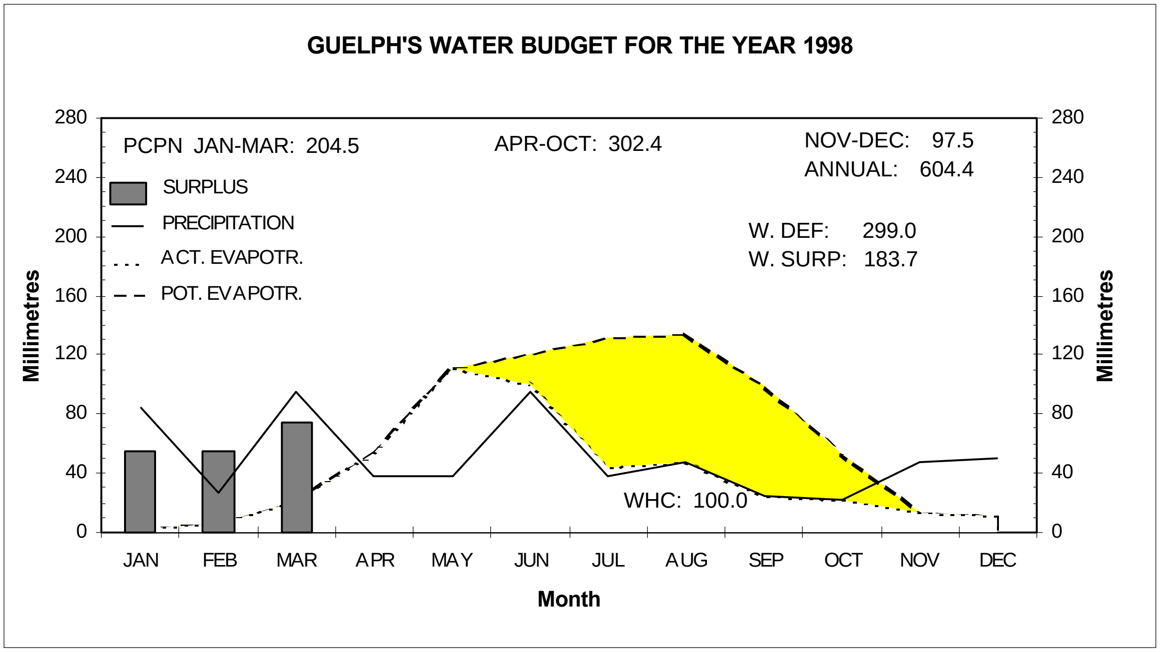

GUELPH'S TEMPERATURES FOR THE YEAR 1936
JAN-MAR: -6.3
[MEAN TEMP AVERAGES]
APR-OCT: 14.1
NOV-DEC: -1.1
ANNUAL: 6.5
MAX. TEMP.
MEAN TEMP.
MIN. TEMP.
Degrees Celsius
50
40
30
20
10
0
-10
-20
-30
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Month

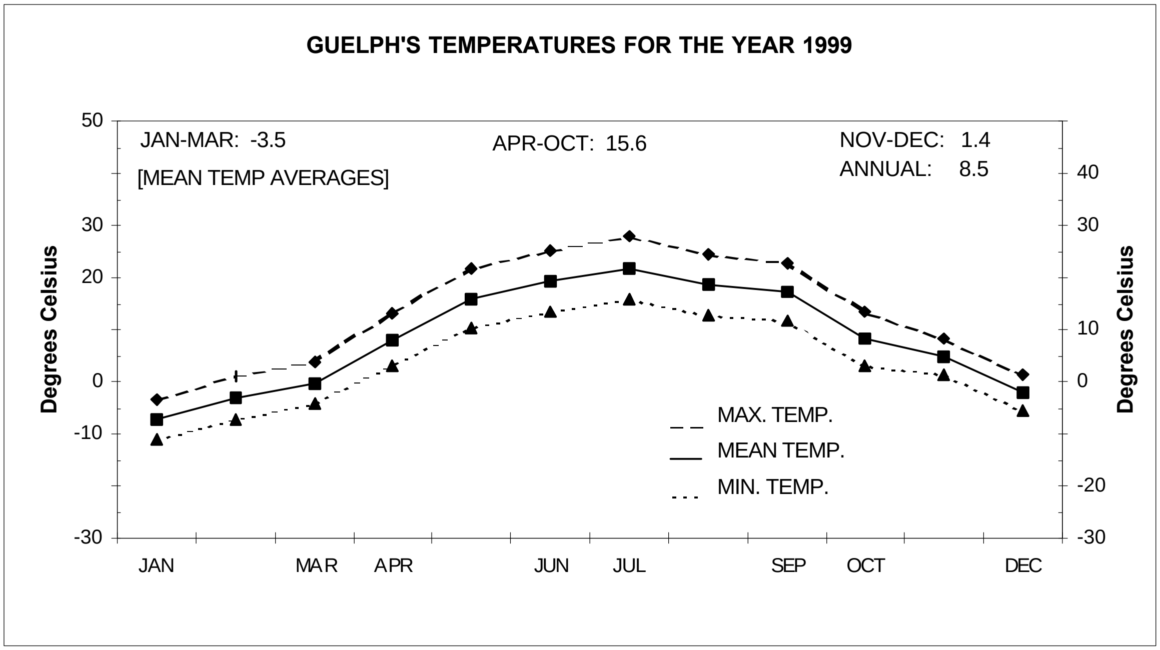

GUELPH'S WATER BUDGET FOR THE YEAR 1936
PCPN JAN-MAR: 155.3
APR-OCT: 449.9
NOV-DEC: 150.5
ANNUAL: 755.7
SURPLUS
PRECIPITATION
ACT. EVAPOTR.
POT. EVAPOTR.
W. DEF: 175.3
W. SURP: 343.3
WHC: 100.0
Millimetres
280
240
200
160
120
80
40
0
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Month

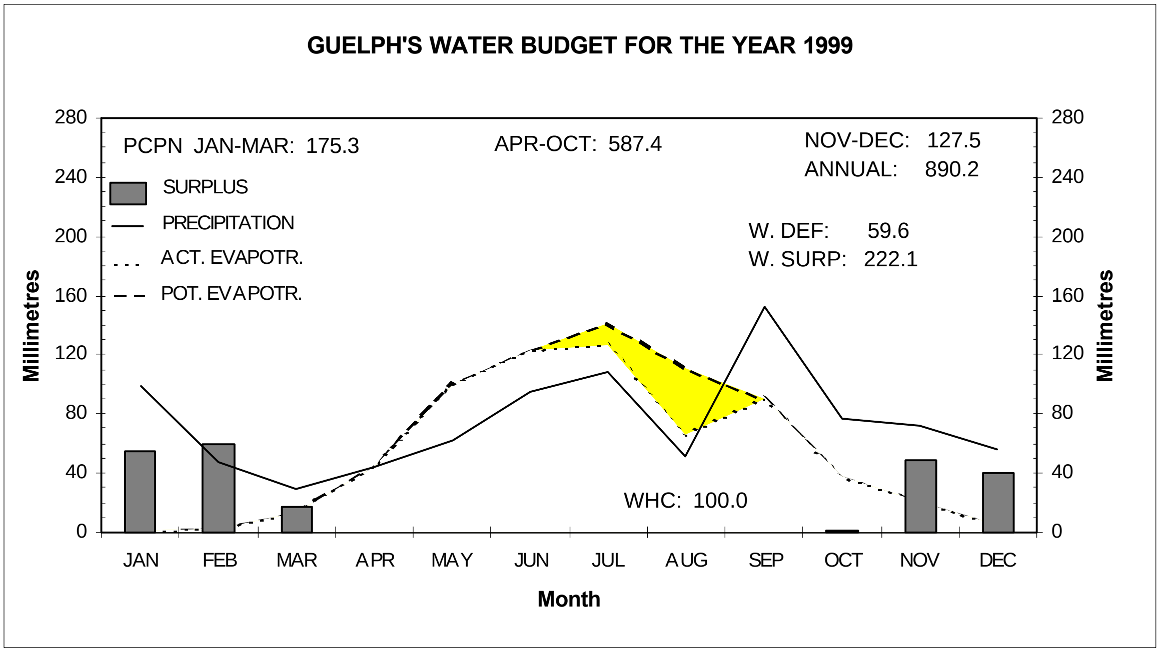

GUELPH'S TEMPERATURES FOR THE YEAR 1963
JAN-MAR: -7.3
[MEAN TEMP AVERAGES]
APR-OCT: 13.7
NOV-DEC: -1.8
ANNUAL: 5.8
MAX. TEMP.
MEAN TEMP.
MIN. TEMP.
Degrees Celsius
50
40
30
20
10
0
-10
-20
-30
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Month

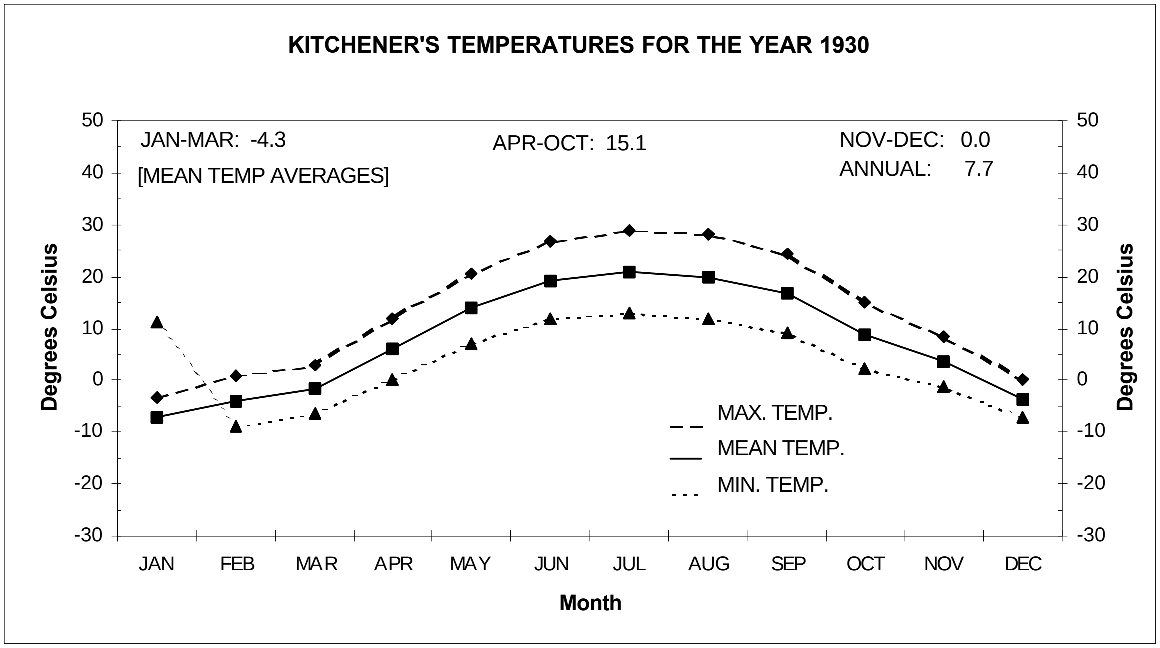

GUELPH'S WATER BUDGET FOR THE YEAR 1963
PCPN JAN-MAR: 115.1
APR-OCT: 361.3
NOV-DEC: 88.3
ANNUAL: 564.7
SURPLUS
PRECIPITATION
ACT. EVAPOTR.
POT. EVAPOTR.
W. DEF: 141.6
W. SURP: 173.9
WHC: 100.0
Millimetres
280
240
200
160
120
80
40
0
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Month

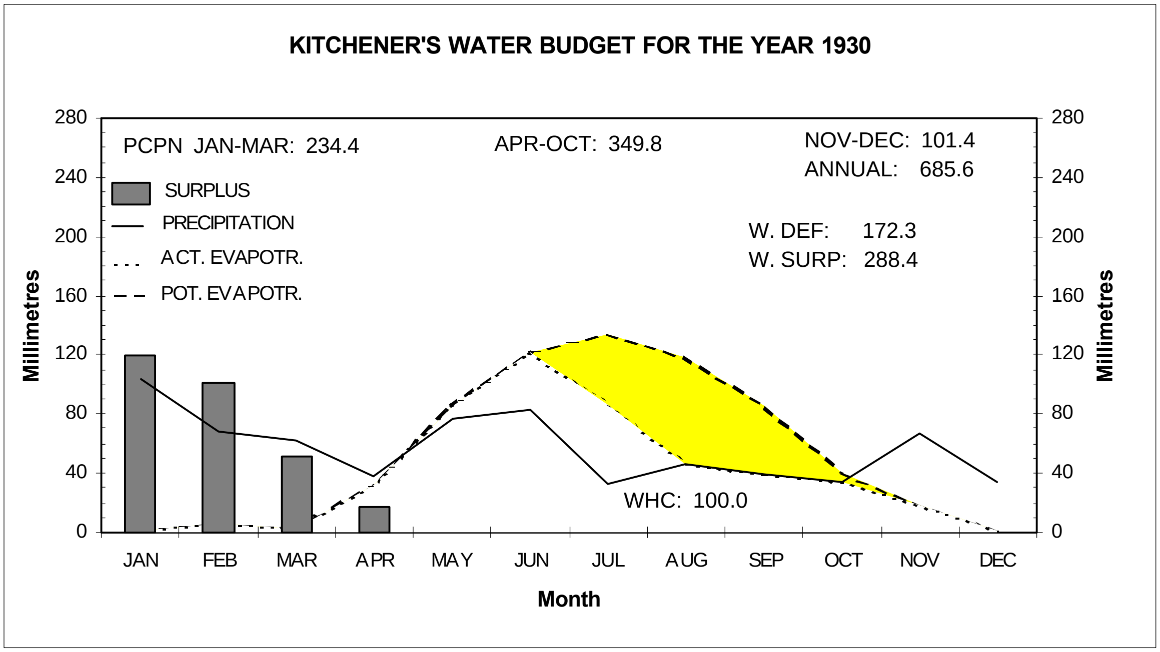

GUELPH'S TEMPERATURES FOR THE YEAR 1998
JAN-MAR: -0.8
[MEAN TEMP AVERAGES]
APR-OCT: 17.1
NOV-DEC: 2.0
ANNUAL: 10.1
MAX. TEMP.
MEAN TEMP.
MIN. TEMP.
Degrees Celsius
50
40
30
20
10
0
-10
-20
-30
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Month

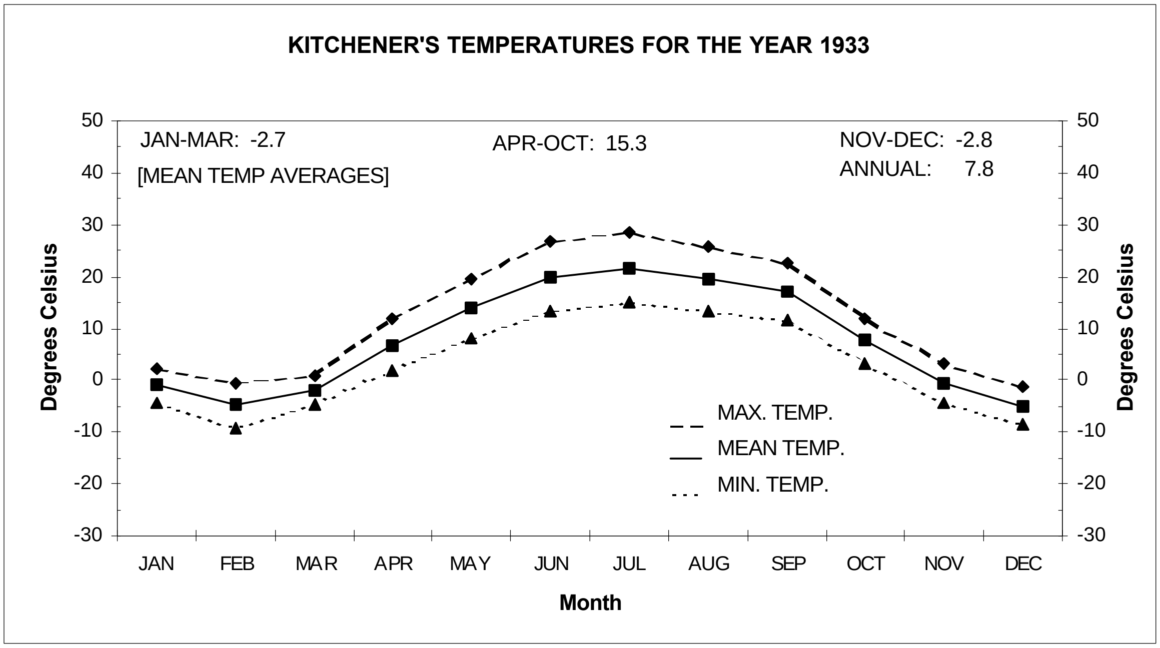

GUELPH'S WATER BUDGET FOR THE YEAR 1998
PCPN JAN-MAR: 204.5
APR-OCT: 302.4
NOV-DEC: 97.5
ANNUAL: 604.4
SURPLUS
PRECIPITATION
ACT. EVAPOTR.
POT. EVAPOTR.
W. DEF: 299.0
W. SURP: 183.7
WHC: 100.0
Millimetres
280
240
200
160
120
80
40
0
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Month

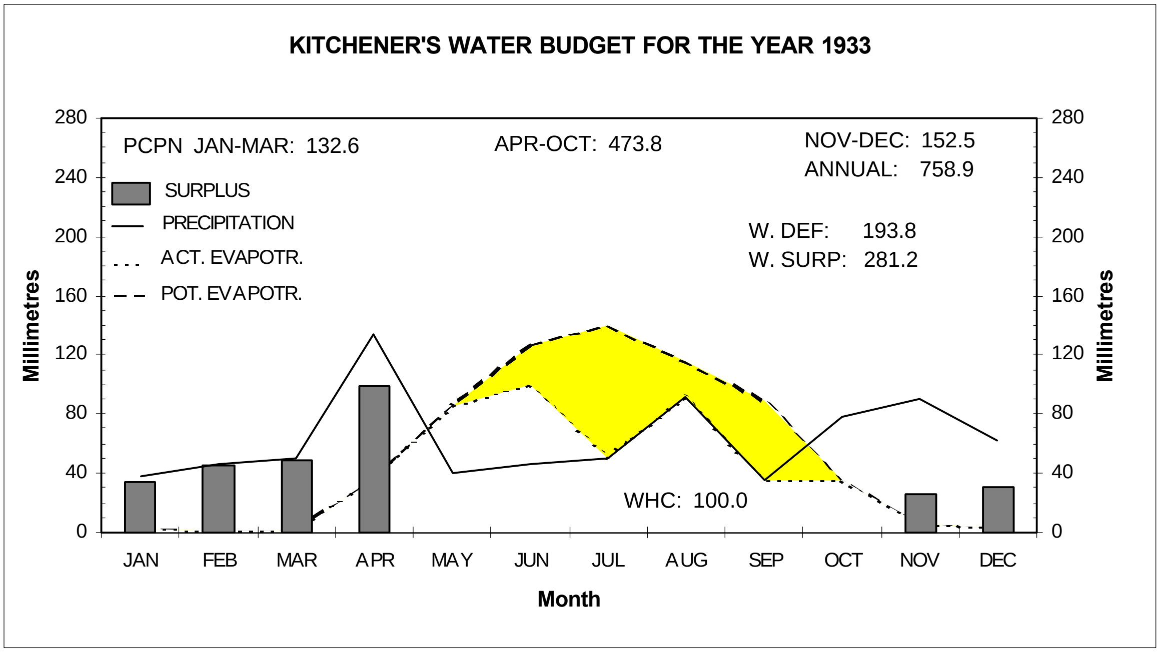

GUELPH'S TEMPERATURES FOR THE YEAR 1999
JAN-MAR: -3.5
[MEAN TEMP AVERAGES]
APR-OCT: 15.6
NOV-DEC: 1.4
ANNUAL: 8.5
Degrees Celsius
50
30
20
0
-10
-30
40
30
10
0
-20
-30
MAX. TEMP.
MEAN TEMP.
MIN. TEMP.
JAN
MAR
APR
JUN
JUL
SEP
OCT
DEC

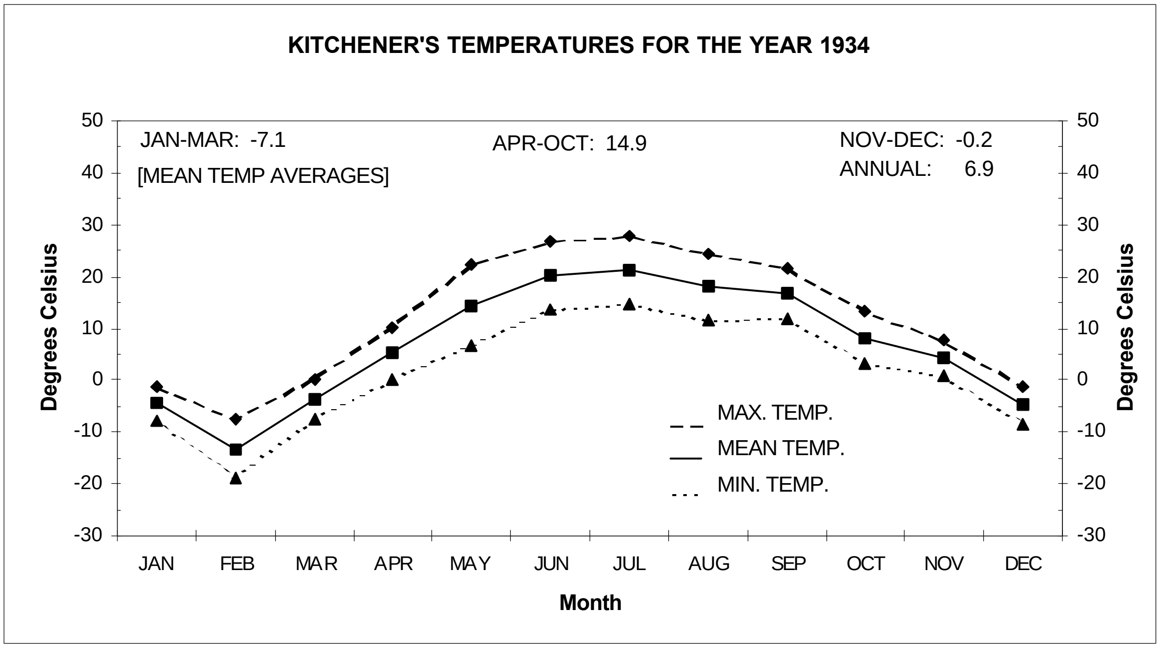

GUELPH'S WATER BUDGET FOR THE YEAR 1999
PCPN JAN-MAR: 175.3
APR-OCT: 587.4
NOV-DEC: 127.5
ANNUAL: 890.2
SURPLUS
PRECIPITATION
ACT. EVAPOTR.
POT. EVAPOTR.
W. DEF: 59.6
W. SURP: 222.1
WHC: 100.0
Millimetres
280
240
200
160
120
80
40
0
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Month

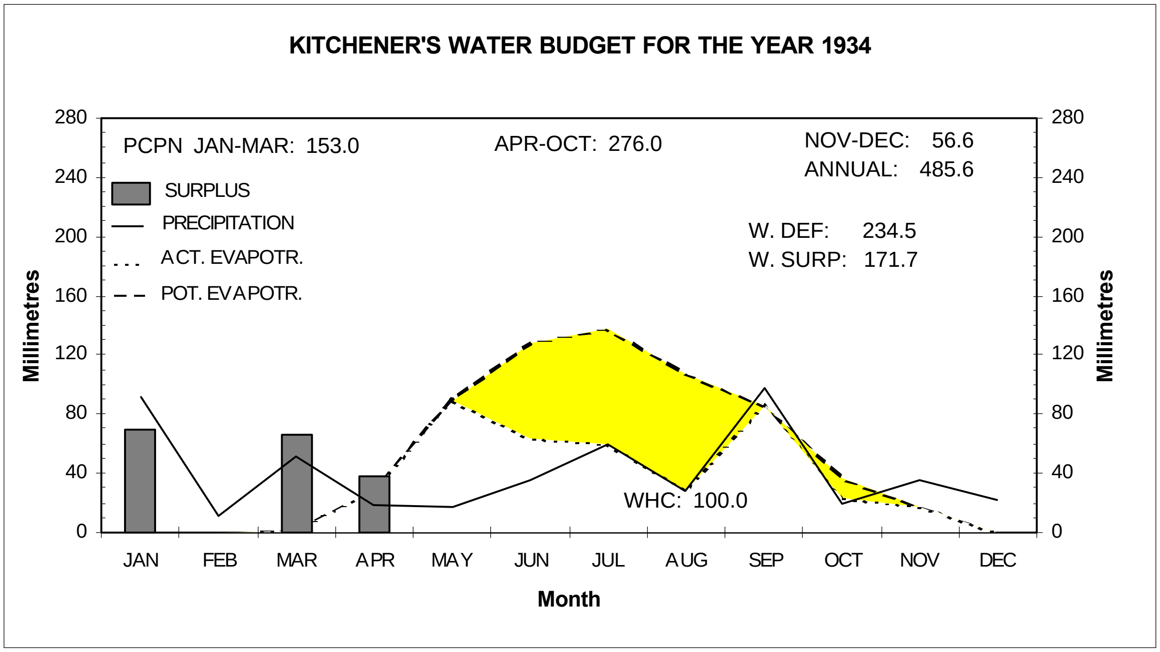

KITCHENER'S TEMPERATURES FOR THE YEAR 1930
JAN-MAR: -4.3
[MEAN TEMP AVERAGES]
APR-OCT: 15.1
NOV-DEC: 0.0
ANNUAL: 7.7
MAX. TEMP.
MEAN TEMP.
MIN. TEMP.
Degrees Celsius
50
40
30
20
10
0
-10
-20
-30
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Month

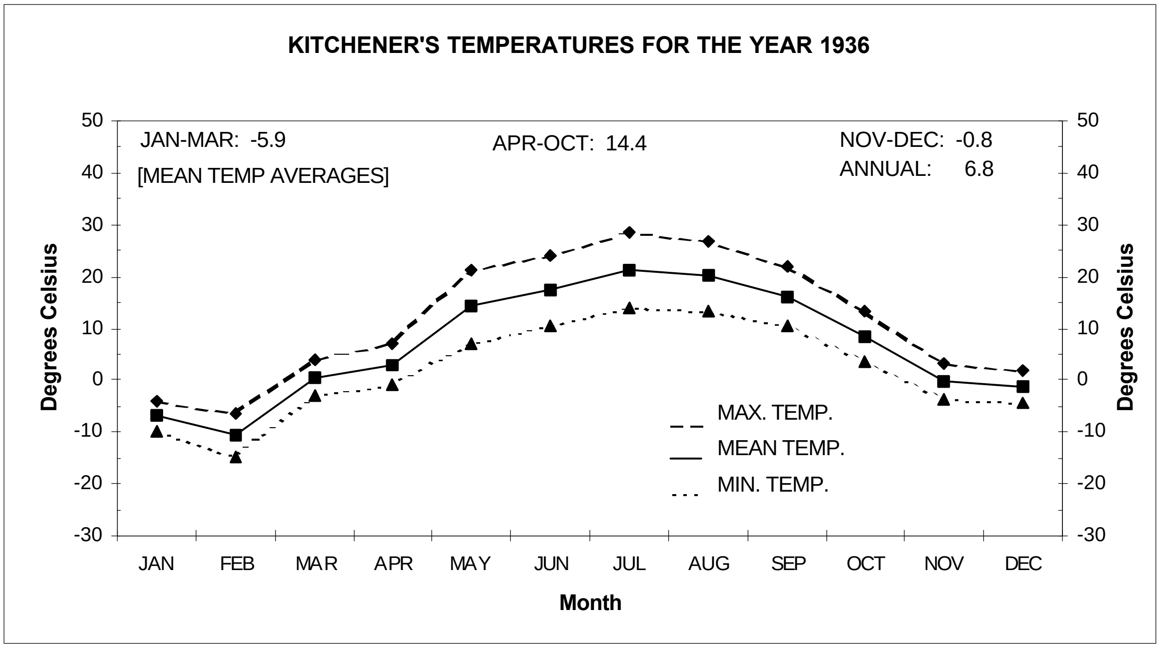

KITCHENER'S WATER BUDGET FOR THE YEAR 1930
PCPN JAN-MAR: 234.4
APR-OCT: 349.8
NOV-DEC: 101.4
ANNUAL: 685.6
SURPLUS
PRECIPITATION
ACT. EVAPOTR.
POT. EVAPOTR.
W. DEF: 172.3
W. SURP: 288.4
WHC: 100.0
Millimetres
280
240
200
160
120
80
40
0
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Month


KITCHENER'S TEMPERATURES FOR THE YEAR 1933
JAN-MAR: -2.7
[MEAN TEMP AVERAGES]
APR-OCT: 15.3
NOV-DEC: -2.8
ANNUAL: 7.8
MAX. TEMP.
MEAN TEMP.
MIN. TEMP.
Degrees Celsius
50
40
30
20
10
0
-10
-20
-30
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Month

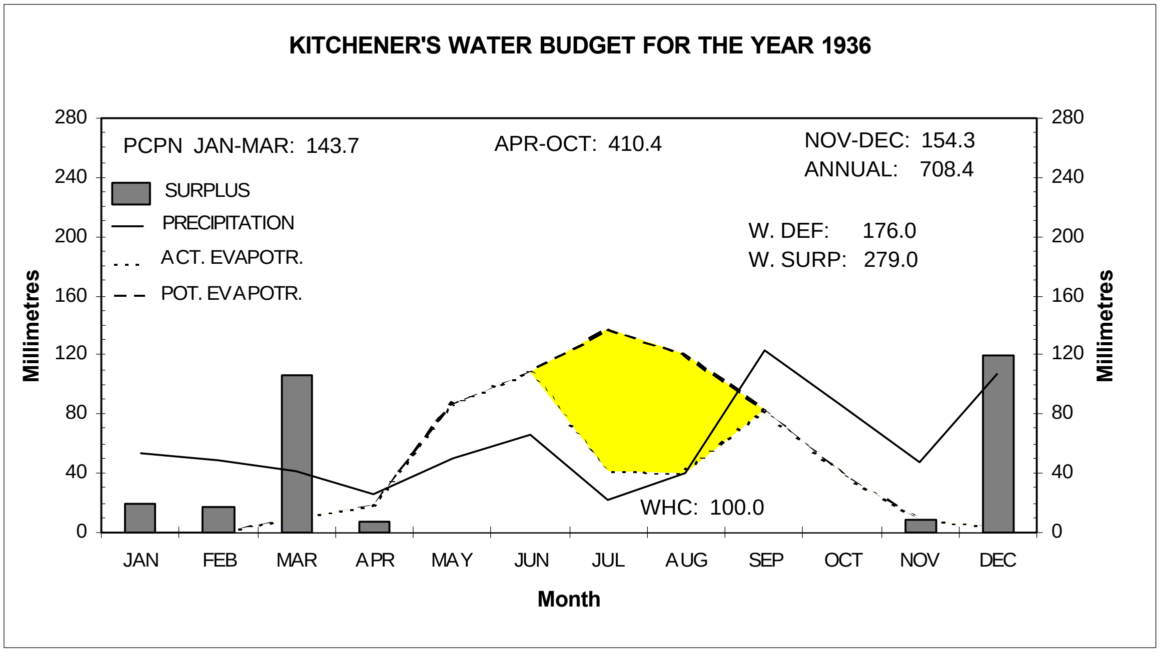

KITCHENER'S WATER BUDGET FOR THE YEAR 1933
PCPN JAN-MAR: 132.6
APR-OCT: 473.8
NOV-DEC: 152.5
ANNUAL: 758.9
SURPLUS
PRECIPITATION
ACT. EVAPOTR.
POT. EVAPOTR.
W. DEF: 193.8
W. SURP: 281.2
WHC: 100.0
Millimetres
280
240
200
160
120
80
40
0
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Month


KITCHENER'S TEMPERATURES FOR THE YEAR 1934
JAN-MAR: -7.1
[MEAN TEMP AVERAGES]
APR-OCT: 14.9
NOV-DEC: -0.2
ANNUAL: 6.9
MAX. TEMP.
MEAN TEMP.
MIN. TEMP.
Degrees Celsius
50
40
30
20
10
0
-10
-20
-30
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Month

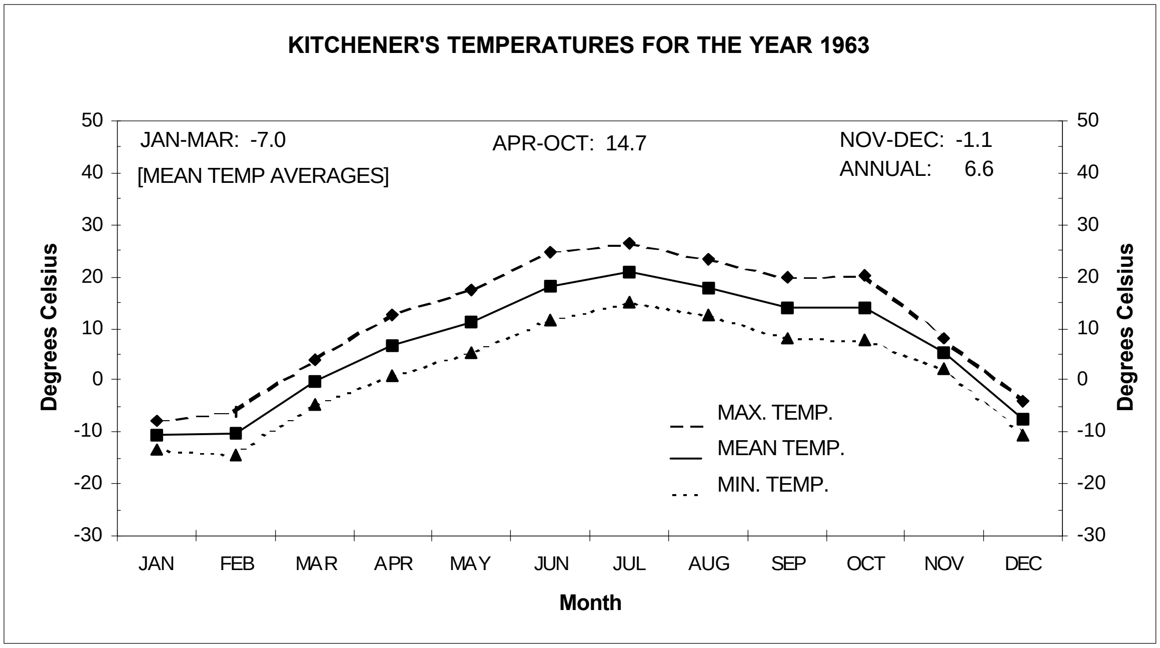

KITCHENER'S WATER BUDGET FOR THE YEAR 1934
PCPN JAN-MAR: 153.0
APR-OCT: 276.0
NOV-DEC: 56.6
ANNUAL: 485.6
SURPLUS
PRECIPITATION
ACT. EVAPOTR.
POT. EVAPOTR.
W. DEF: 234.5
W. SURP: 171.7
WHC: 100.0
Millimetres
280
240
200
160
120
80
40
0
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Month

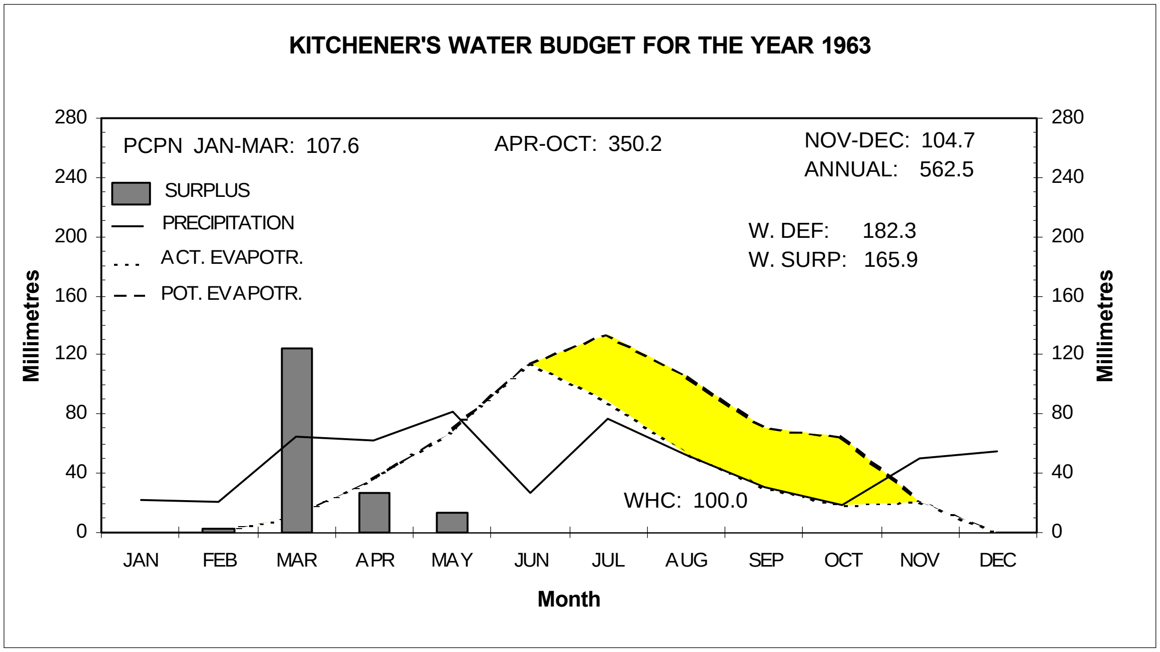


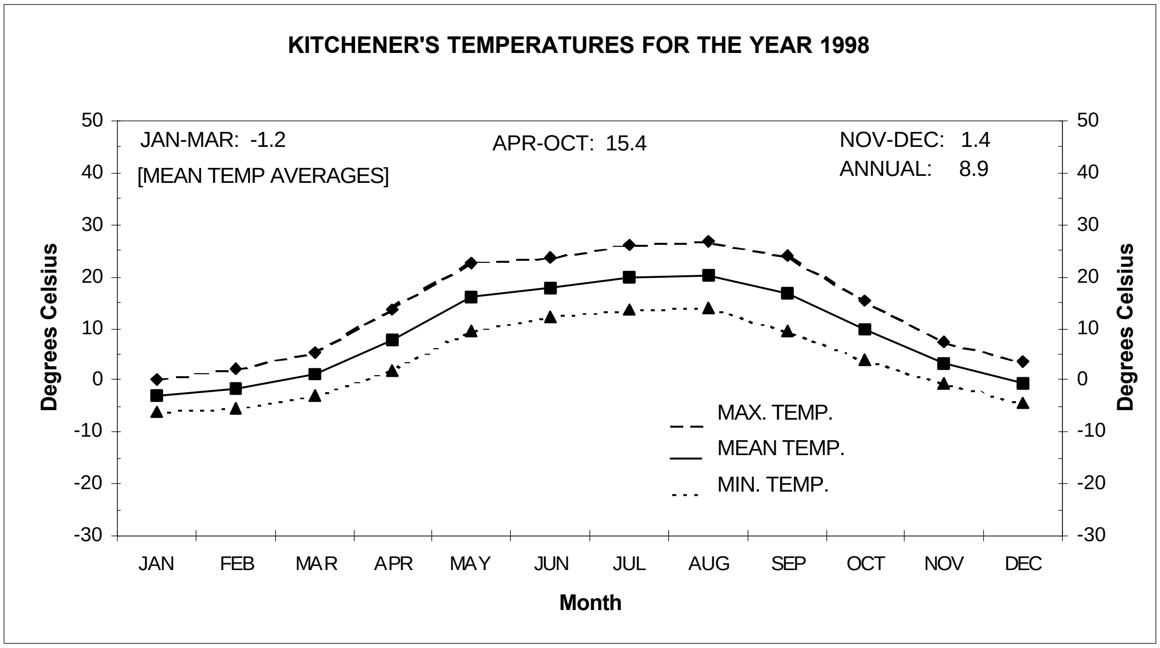
KITCHENER'S TEMPERATURES FOR THE YEAR 1936



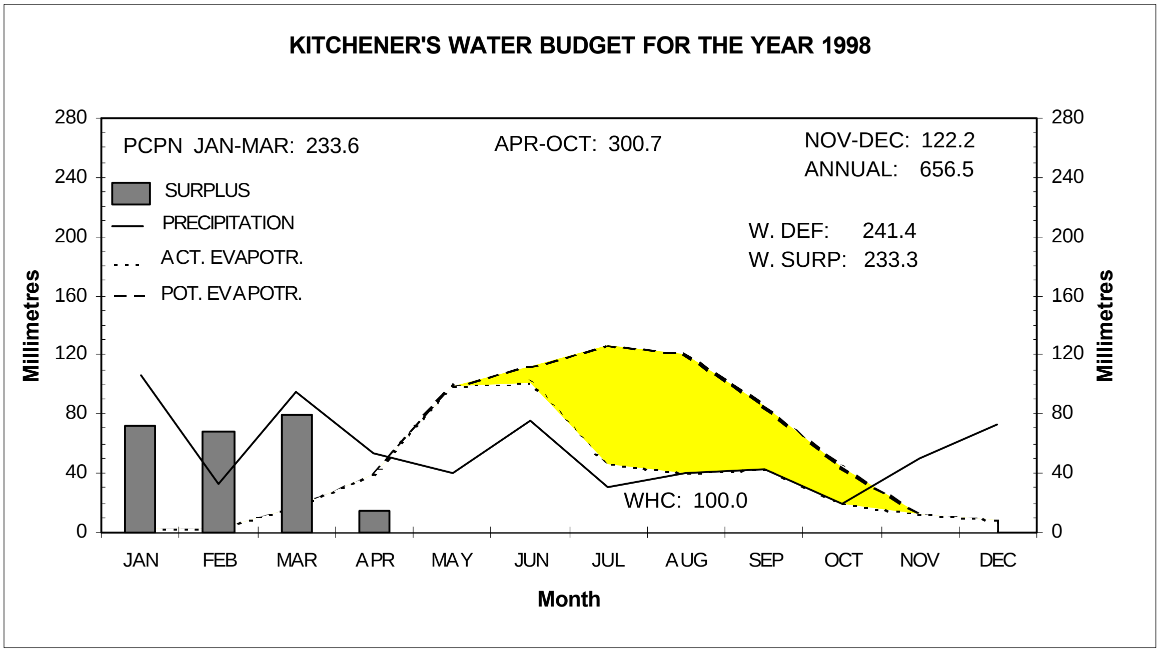
KITCHENER'S WATER BUDGET FOR THE YEAR 1936


KITCHENER'S TEMPERATURES FOR THE YEAR 1963
JAN-MAR: -7.0
[MEAN TEMP AVERAGES]
APR-OCT: 14.7
NOV-DEC: -1.1
ANNUAL: 6.6
MAX. TEMP.
MEAN TEMP.
MIN. TEMP.
Degrees Celsius
50
40
30
20
10
0
-10
-20
-30
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Month


KITCHENER'S WATER BUDGET FOR THE YEAR 1963
PCPN JAN-MAR: 107.6
APR-OCT: 350.2
NOV-DEC: 104.7
ANNUAL: 562.5
SURPLUS
PRECIPITATION
ACT. EVAPOTR.
POT. EVAPOTR.
W. DEF: 182.3
W. SURP: 165.9
WHC: 100.0
Millimetres
280
240
200
160
120
80
40
0
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Month

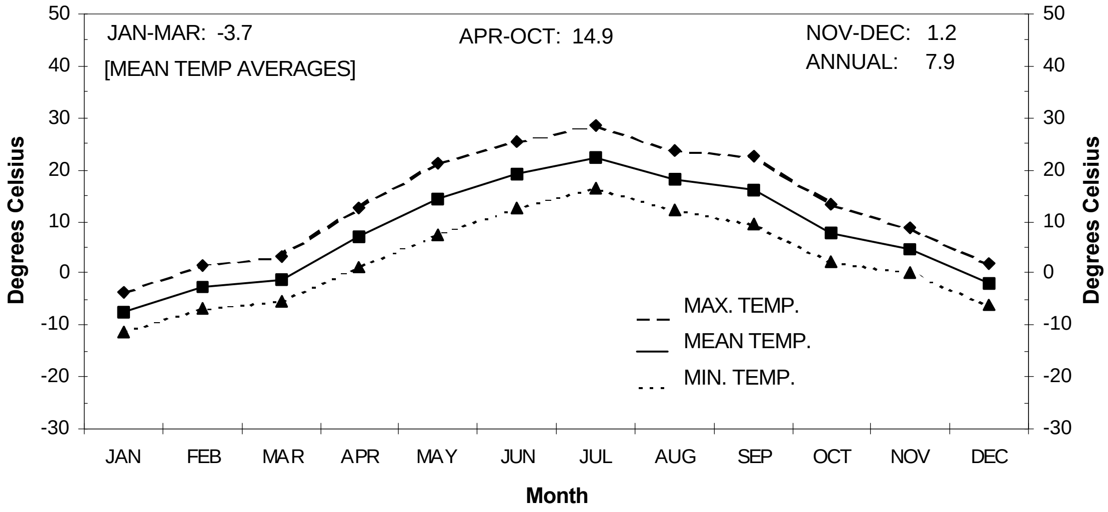


KITCHENER'S TEMPERATURES FOR THE YEAR 1998

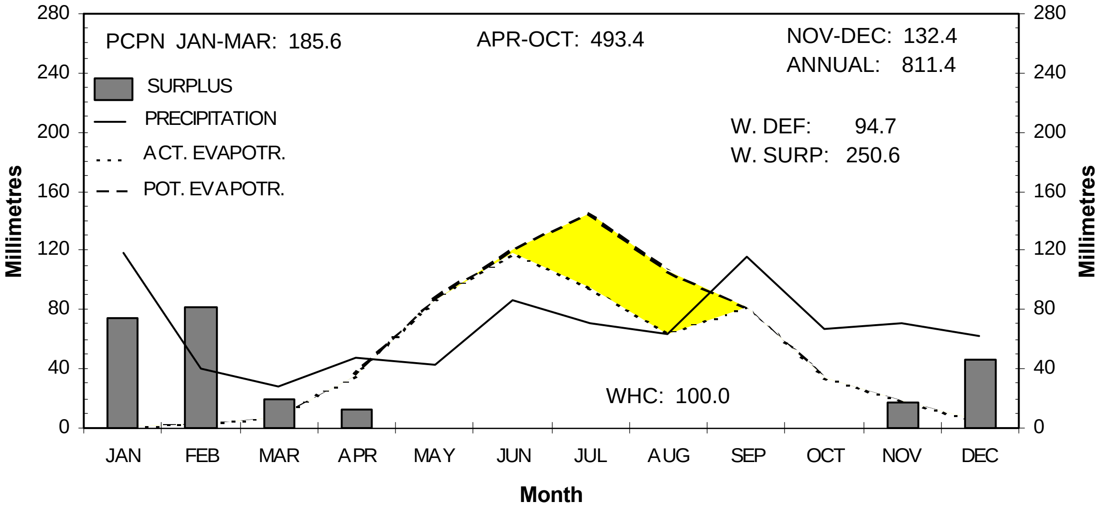


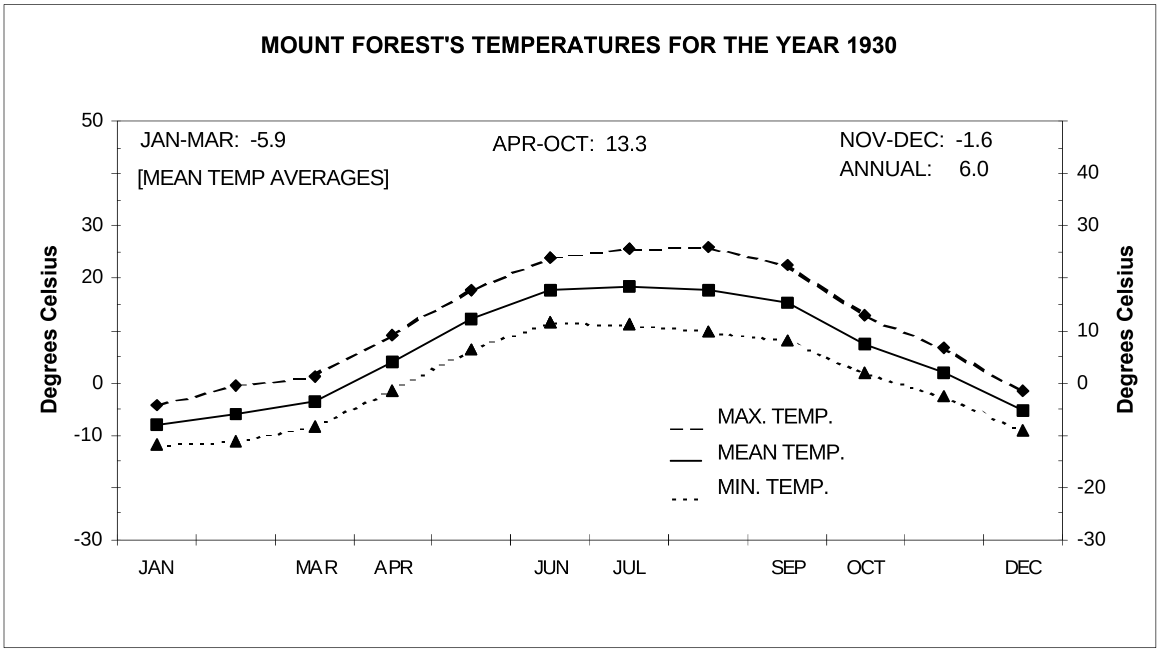
KITCHENER'S WATER BUDGET FOR THE YEAR 1998

KITCHENER'S TEMPERATURES FOR THE YEAR 1999

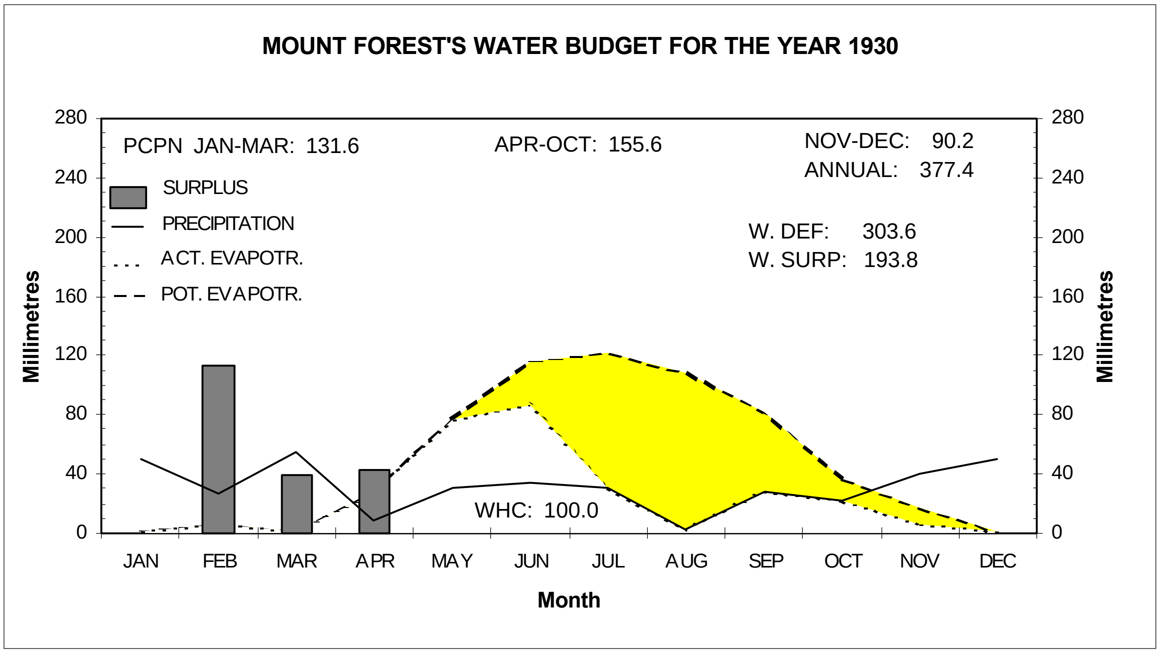


KITCHENER'S WATER BUDGET FOR THE YEAR 1999

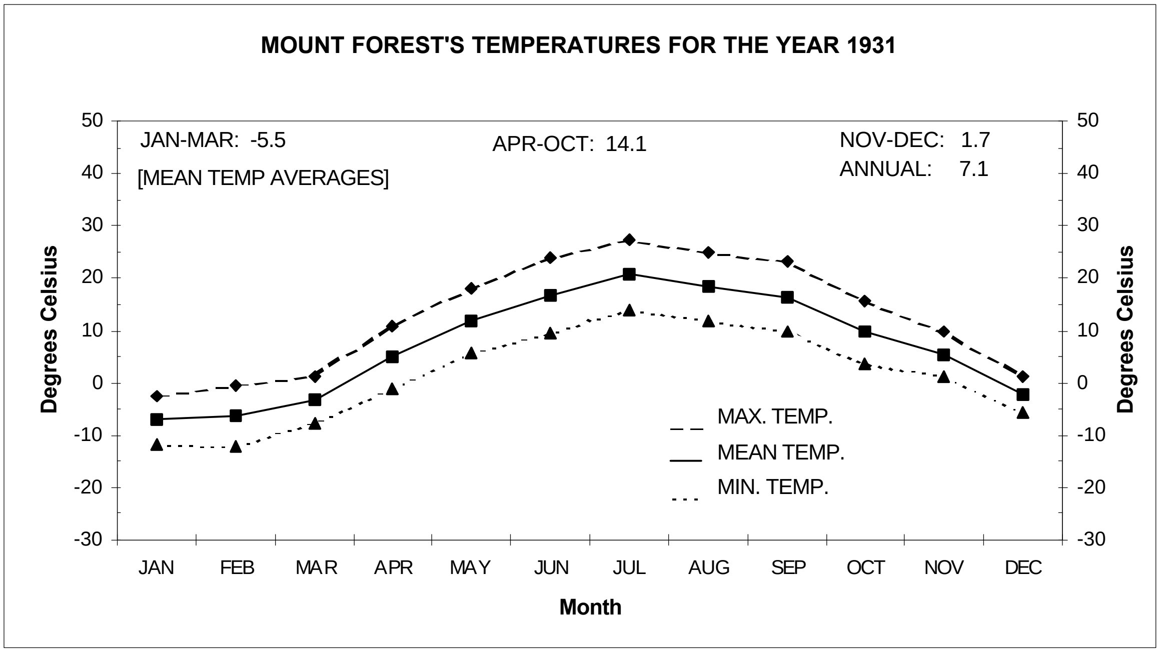


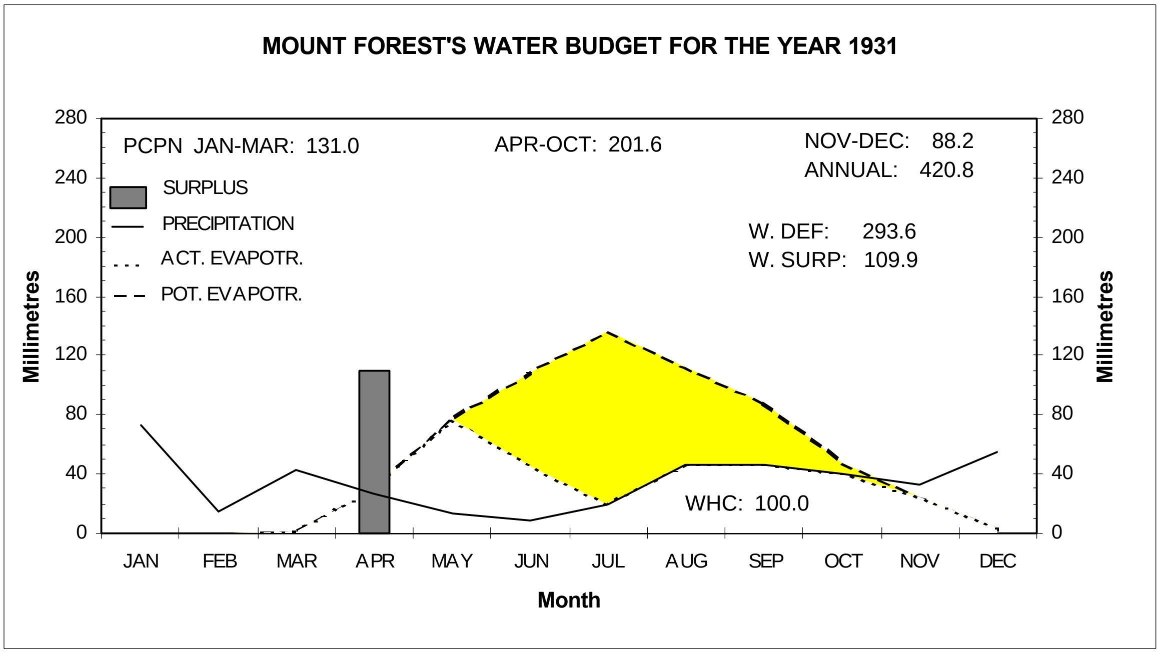


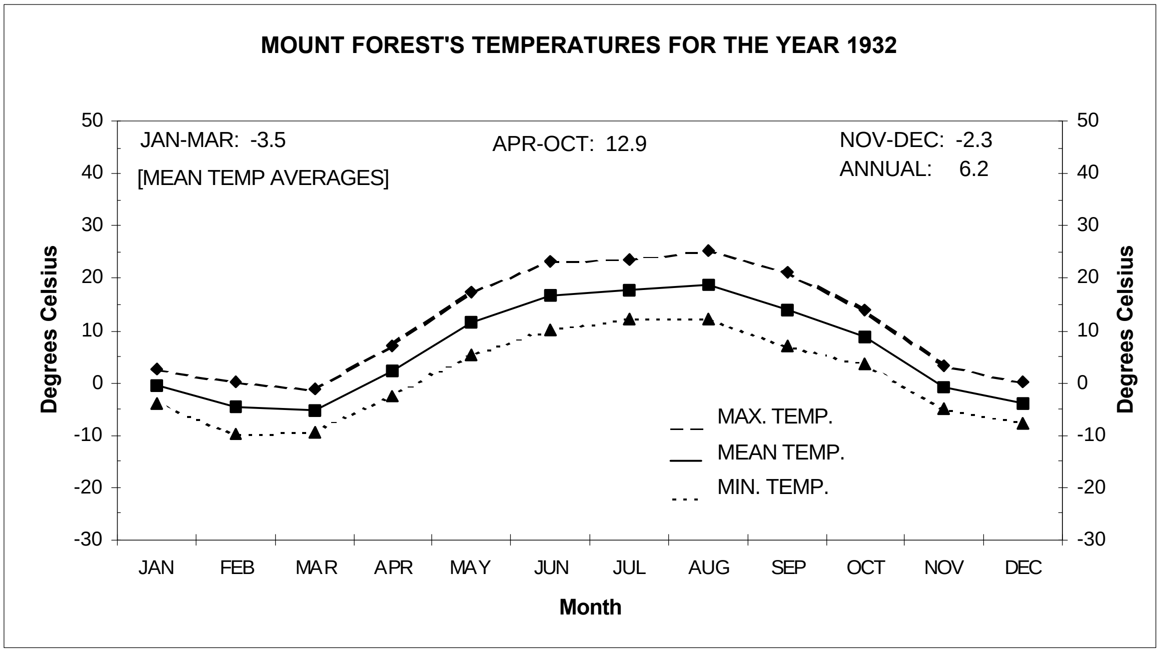
MOUNT FOREST'S TEMPERATURES FOR THE YEAR 1930

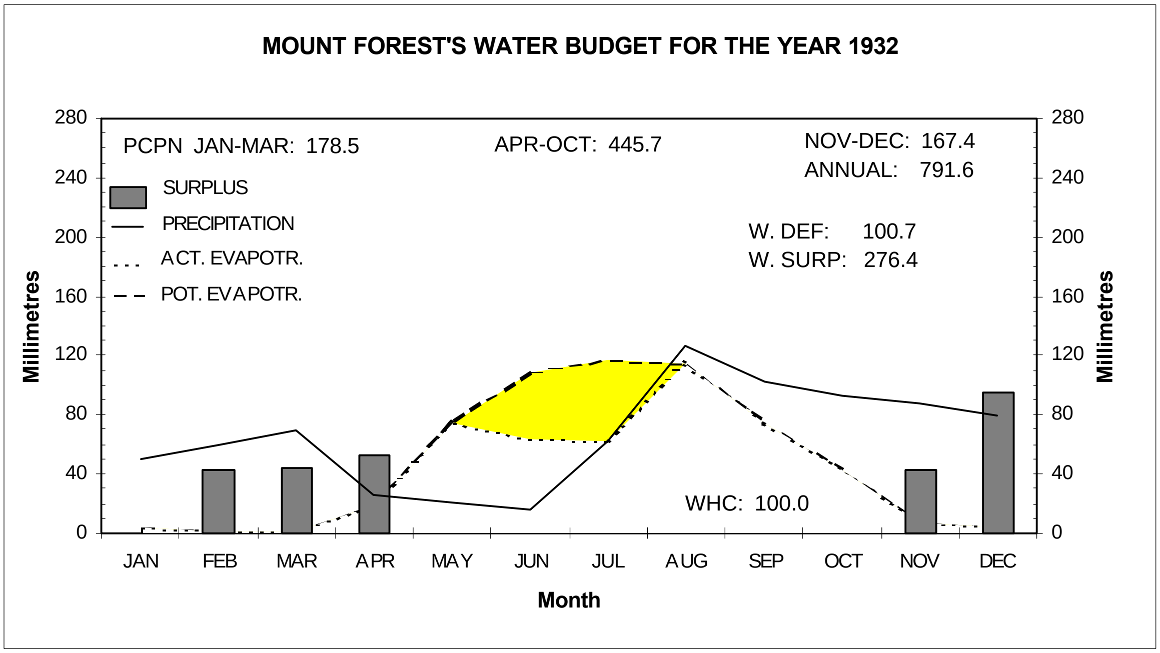


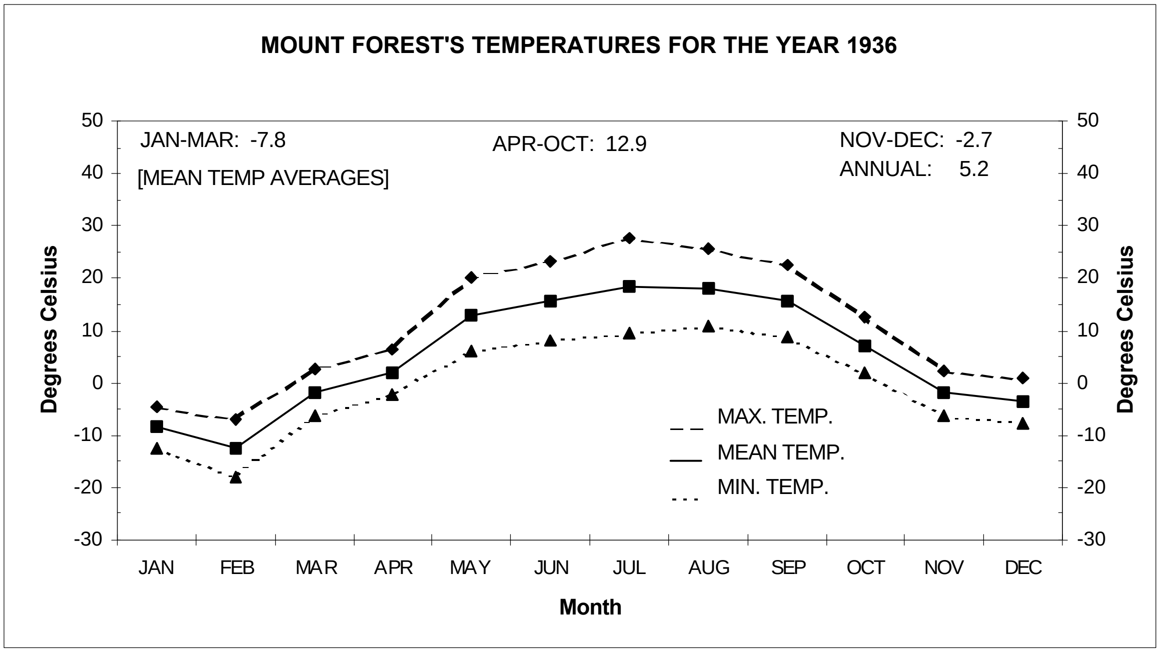
MOUNT FOREST'S WATER BUDGET FOR THE YEAR 1930

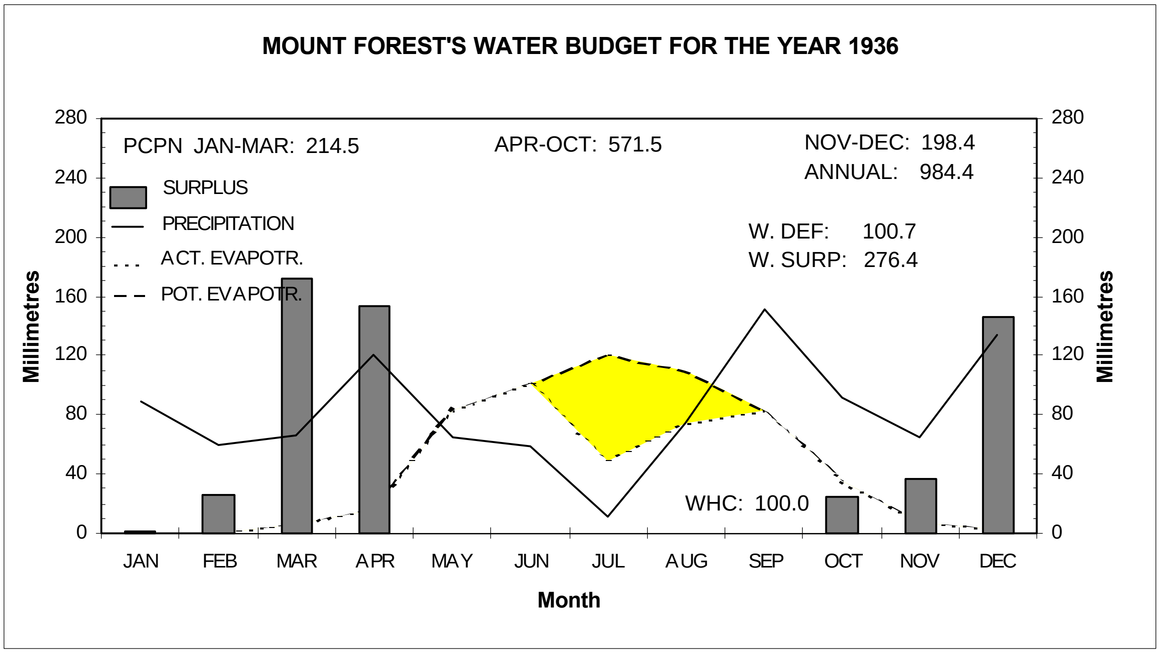

MOUNT FOREST'S TEMPERATURES FOR THE YEAR 1931
JAN-MAR: -5.5
[MEAN TEMP AVERAGES]
APR-OCT: 14.1
NOV-DEC: 1.7
ANNUAL: 7.1
MAX. TEMP.
MEAN TEMP.
MIN. TEMP.
Degrees Celsius
50
40
30
20
10
0
-10
-20
-30
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Month

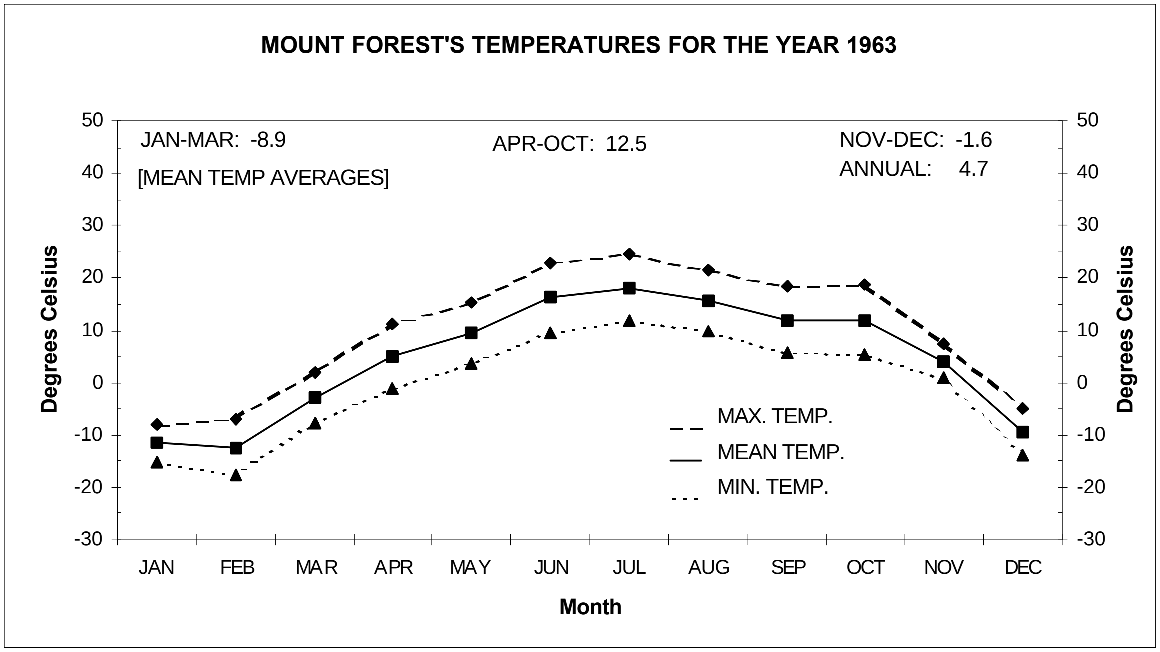

MOUNT FOREST'S WATER BUDGET FOR THE YEAR 1931
PCPN JAN-MAR: 131.0
APR-OCT: 201.6
NOV-DEC: 88.2
ANNUAL: 420.8
SURPLUS
PRECIPITATION
ACT. EVAPOTR.
POT. EVAPOTR.
W. DEF: 293.6
W. SURP: 109.9
WHC: 100.0
Millimetres
280
240
200
160
120
80
40
0
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Month

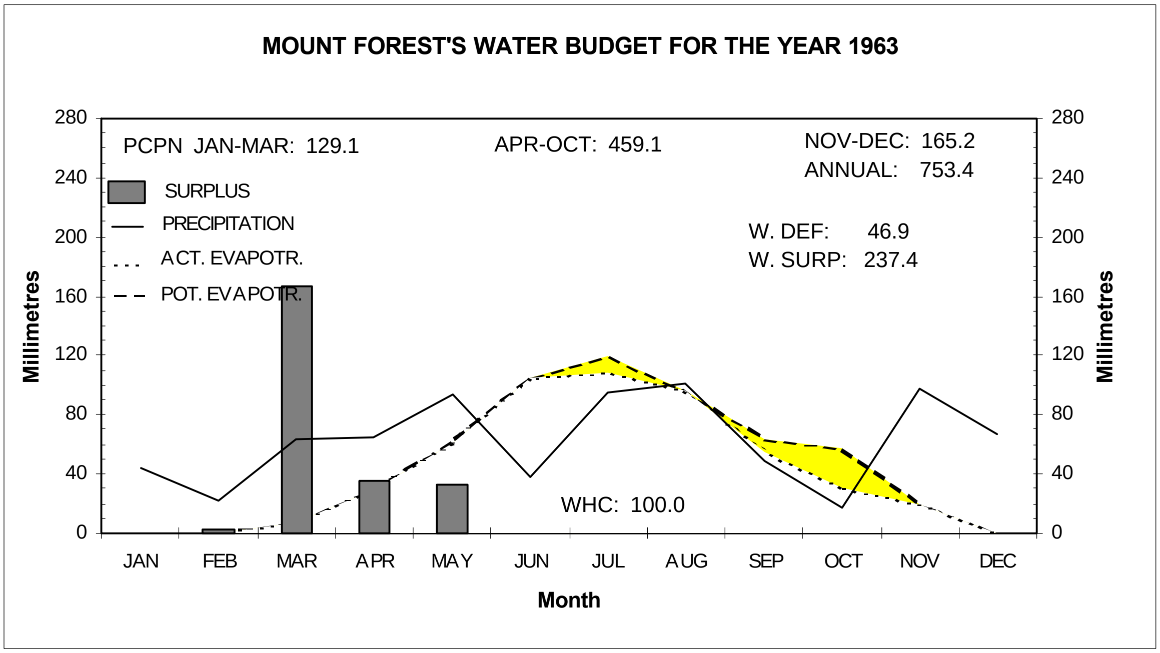

MOUNT FOREST'S TEMPERATURES FOR THE YEAR 1932
JAN-MAR: -3.5
[MEAN TEMP AVERAGES]
APR-OCT: 12.9
NOV-DEC: -2.3
ANNUAL: 6.2
MAX. TEMP.
MEAN TEMP.
MIN. TEMP.
Degrees Celsius
50
40
30
20
10
0
-10
-20
-30
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Month

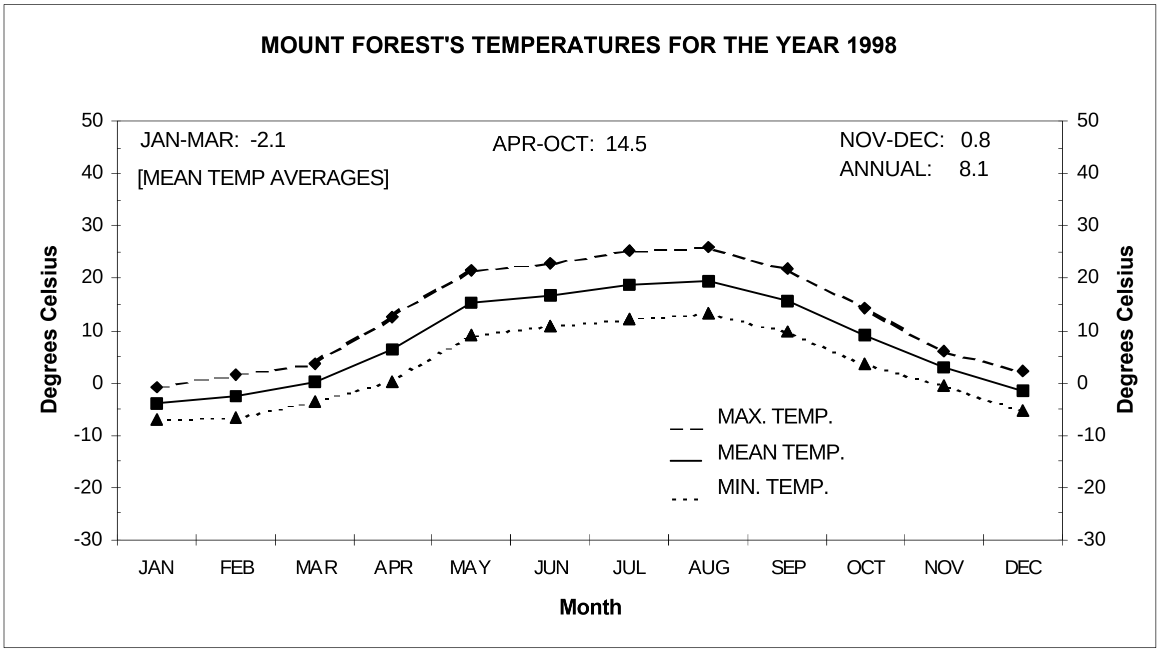

MOUNT FOREST'S WATER BUDGET FOR THE YEAR 1932
PCPN JAN-MAR: 178.5
APR-OCT: 445.7
NOV-DEC: 167.4
ANNUAL: 791.6
SURPLUS
PRECIPITATION
ACT. EVAPOTR.
POT. EVAPOTR.
W. DEF: 100.7
W. SURP: 276.4
WHC: 100.0
Millimetres
280
240
200
160
120
80
40
0
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Month

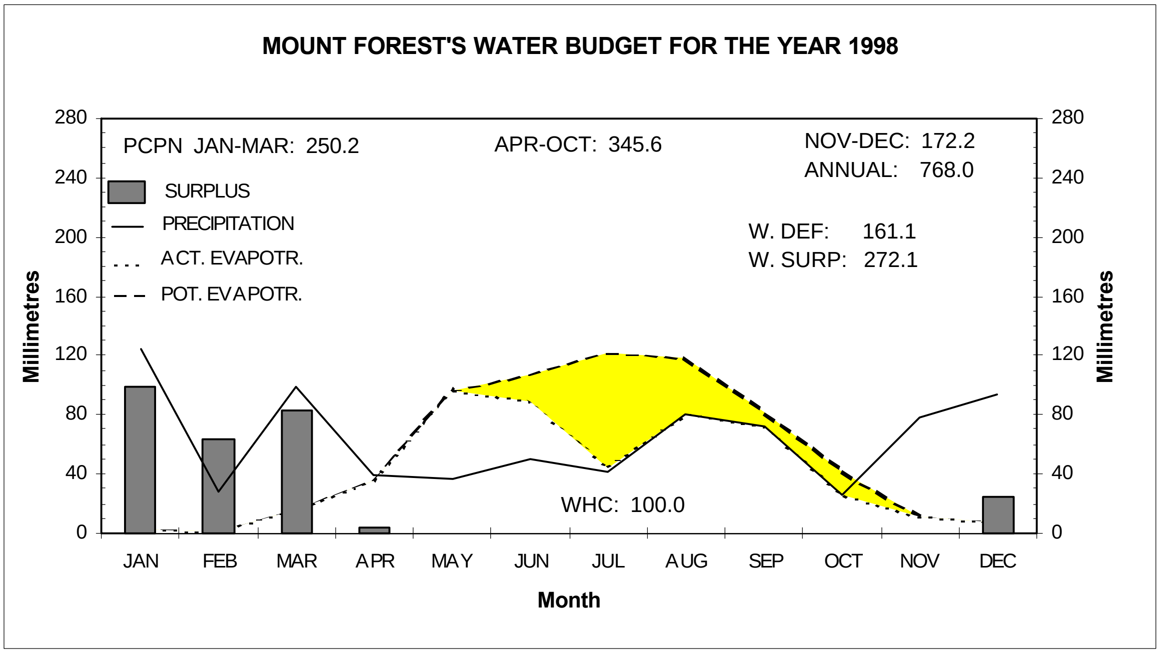

MOUNT FOREST'S TEMPERATURES FOR THE YEAR 1936

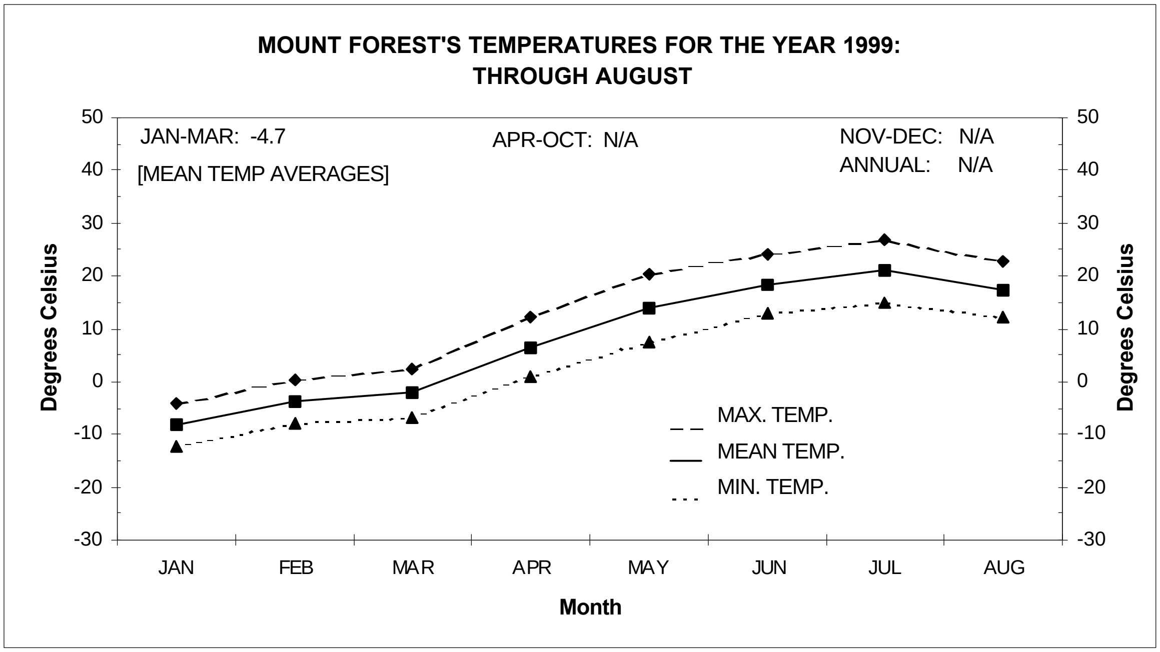

MOUNT FOREST'S WATER BUDGET FOR THE YEAR 1936

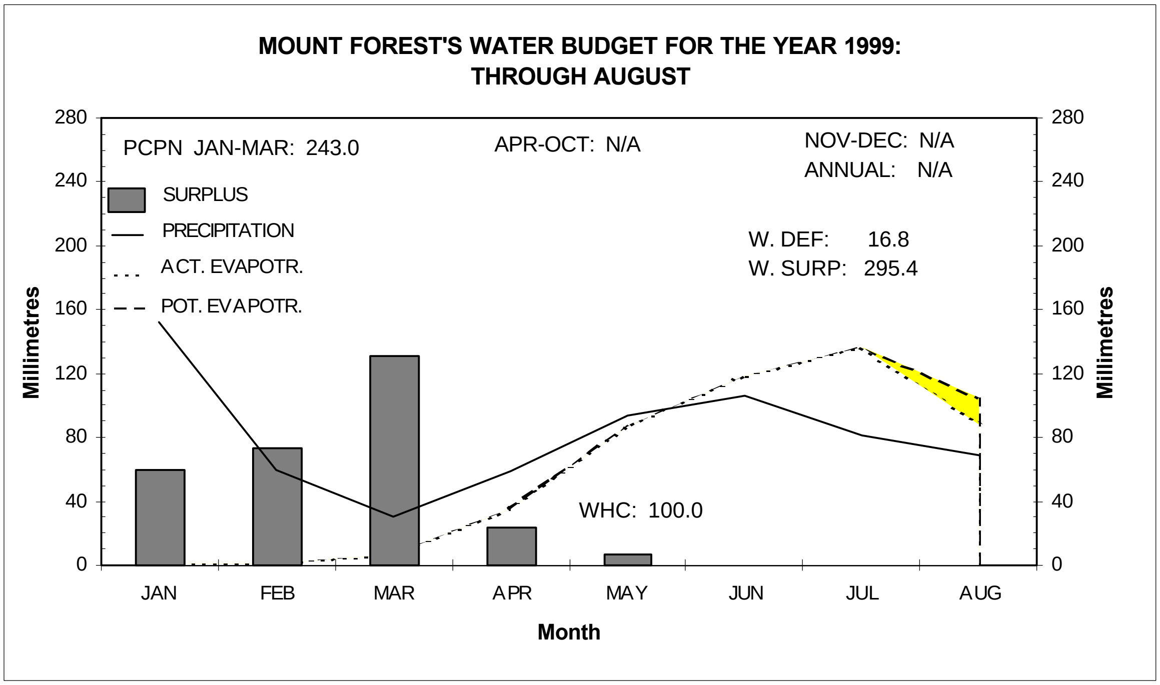

MOUNT FOREST'S TEMPERATURES FOR THE YEAR 1963
JAN-MAR: -8.9
[MEAN TEMP AVERAGES]
APR-OCT: 12.5
NOV-DEC: -1.6
ANNUAL: 4.7
MAX. TEMP.
MEAN TEMP.
MIN. TEMP.
Degrees Celsius
50
40
30
20
10
0
-10
-20
-30
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Month

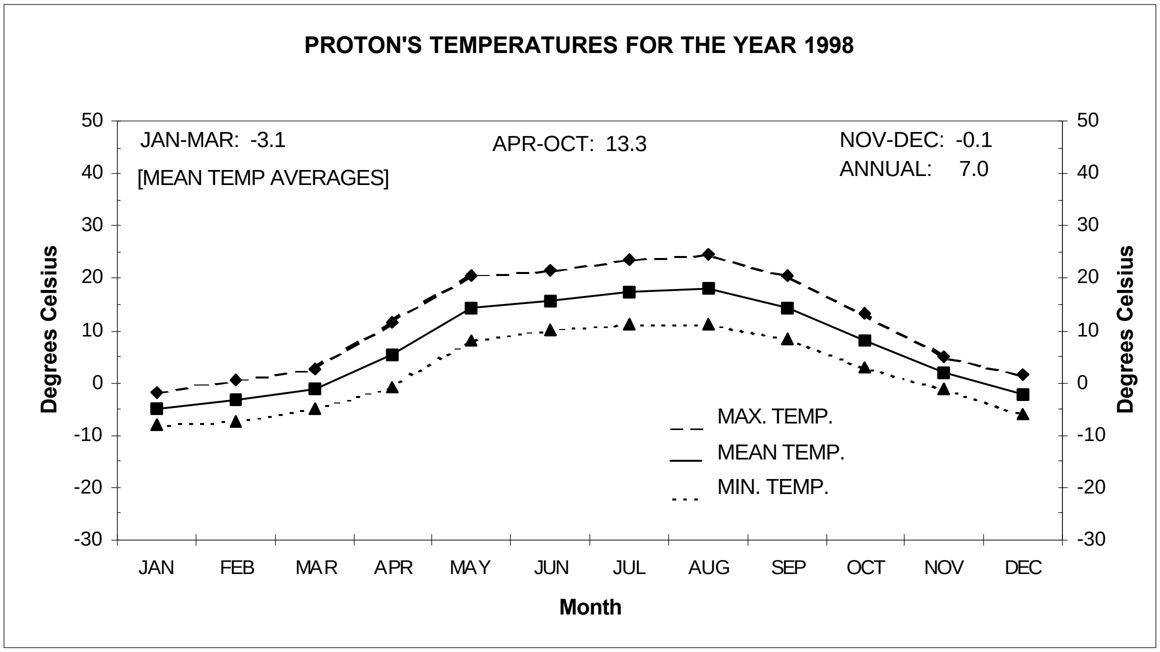

MOUNT FOREST'S WATER BUDGET FOR THE YEAR 1963
PCPN JAN-MAR: 129.1
APR-OCT: 459.1
NOV-DEC: 165.2
ANNUAL: 753.4
SURPLUS
PRECIPITATION
ACT. EVAPOTR.
POT. EVAPOTR.
W. DEF: 46.9
W. SURP: 237.4
WHC: 100.0
Millimetres
280
240
200
160
120
80
40
0
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Month

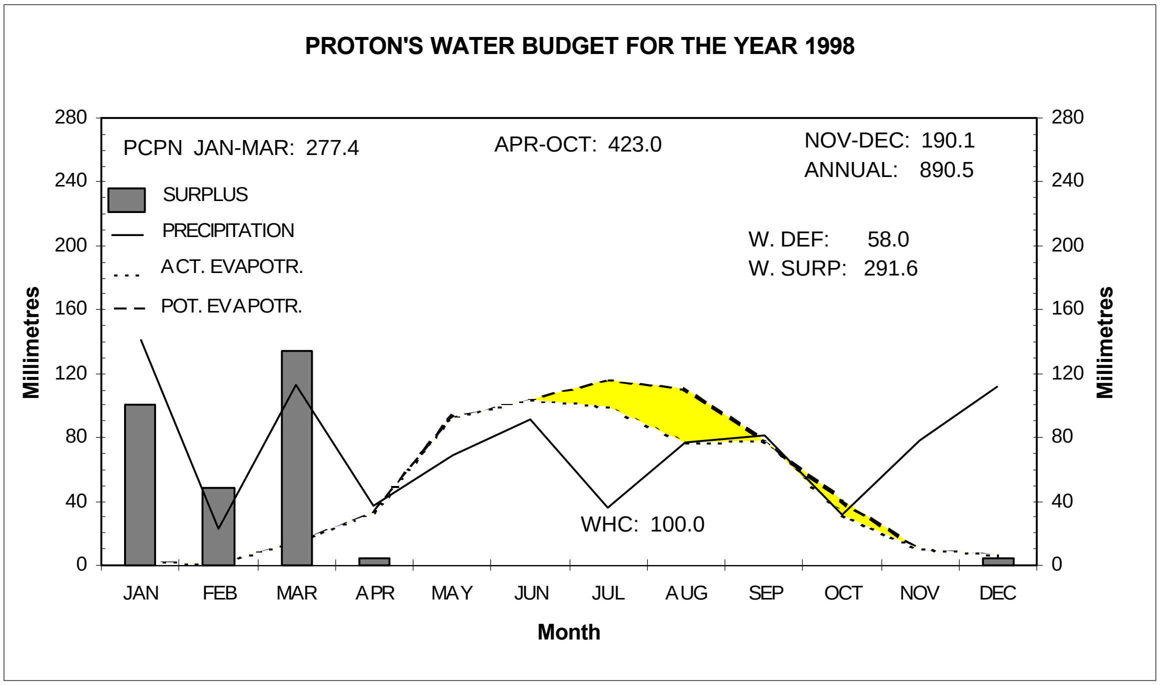

MOUNT FOREST'S TEMPERATURES FOR THE YEAR 1998
JAN-MAR: -2.1
[MEAN TEMP AVERAGES]
APR-OCT: 14.5
NOV-DEC: 0.8
ANNUAL: 8.1
MAX. TEMP.
MEAN TEMP.
MIN. TEMP.
Degrees Celsius
50
40
30
20
10
0
-10
-20
-30
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Month

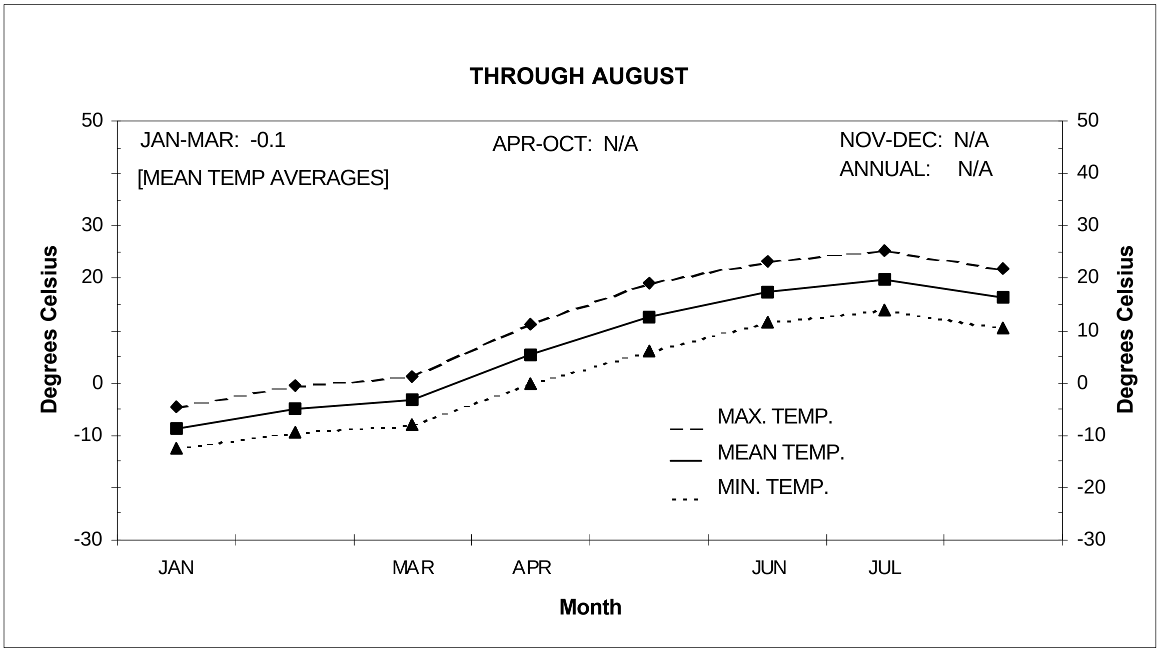

MOUNT FOREST'S WATER BUDGET FOR THE YEAR 1998
PCPN JAN-MAR: 250.2
APR-OCT: 345.6
NOV-DEC: 172.2
ANNUAL: 768.0
SURPLUS
PRECIPITATION
ACT. EVAPOTR.
POT. EVAPOTR.
W. DEF: 161.1
W. SURP: 272.1
WHC: 100.0
Millimetres
280
240
200
160
120
80
40
0
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Month

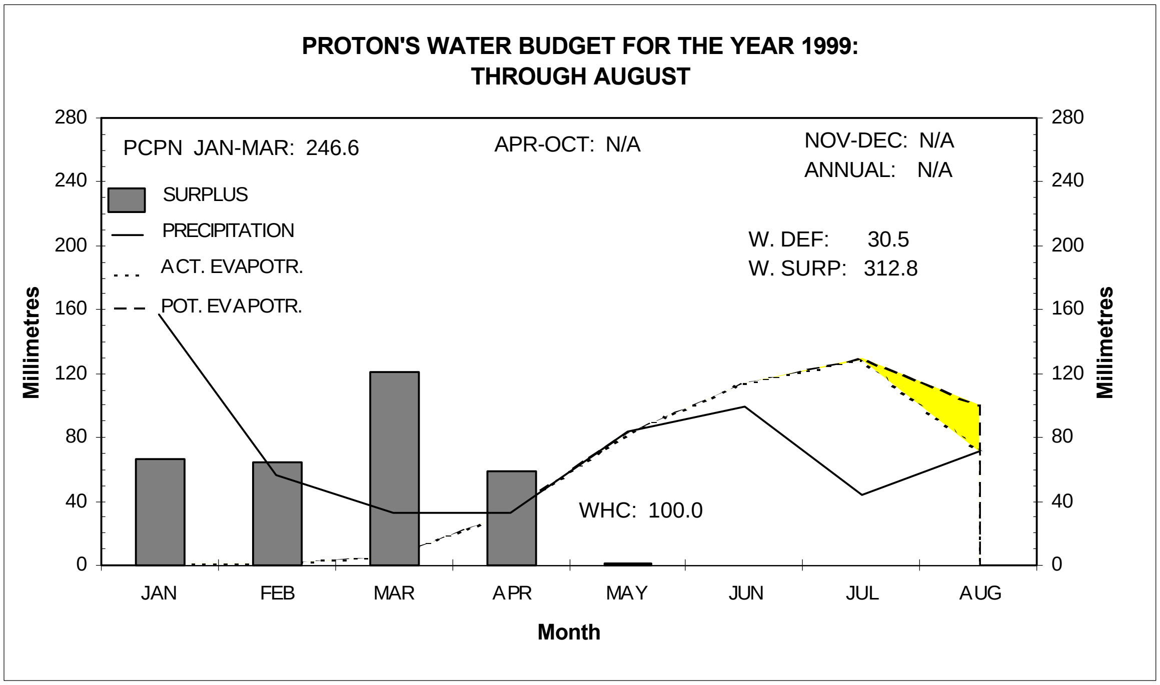

MOUNT FOREST'S TEMPERATURES FOR THE YEAR 1999: THROUGH AUGUST

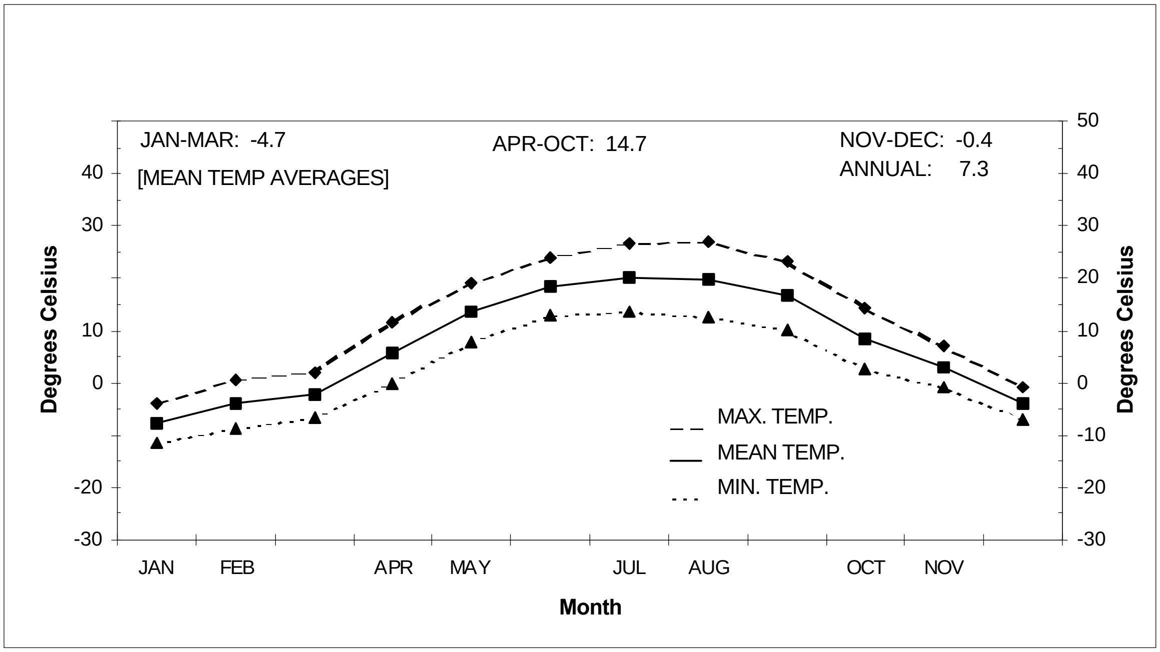

MOUNT FOREST'S WATER BUDGET FOR THE YEAR 1999: THROUGH AUGUST

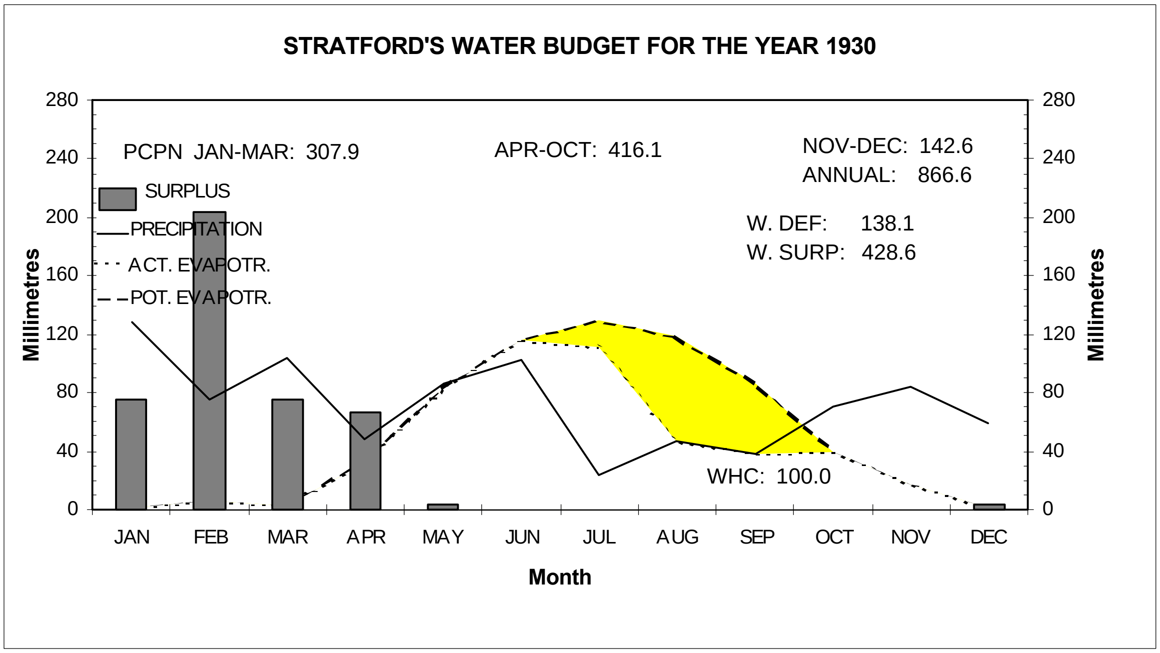

PROTON'S TEMPERATURES FOR THE YEAR 1998
JAN-MAR: -3.1
[MEAN TEMP AVERAGES]
APR-OCT: 13.3
NOV-DEC: -0.1
ANNUAL: 7.0
MAX. TEMP.
MEAN TEMP.
MIN. TEMP.
Degrees Celsius
50
40
30
20
10
0
-10
-20
-30
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Month

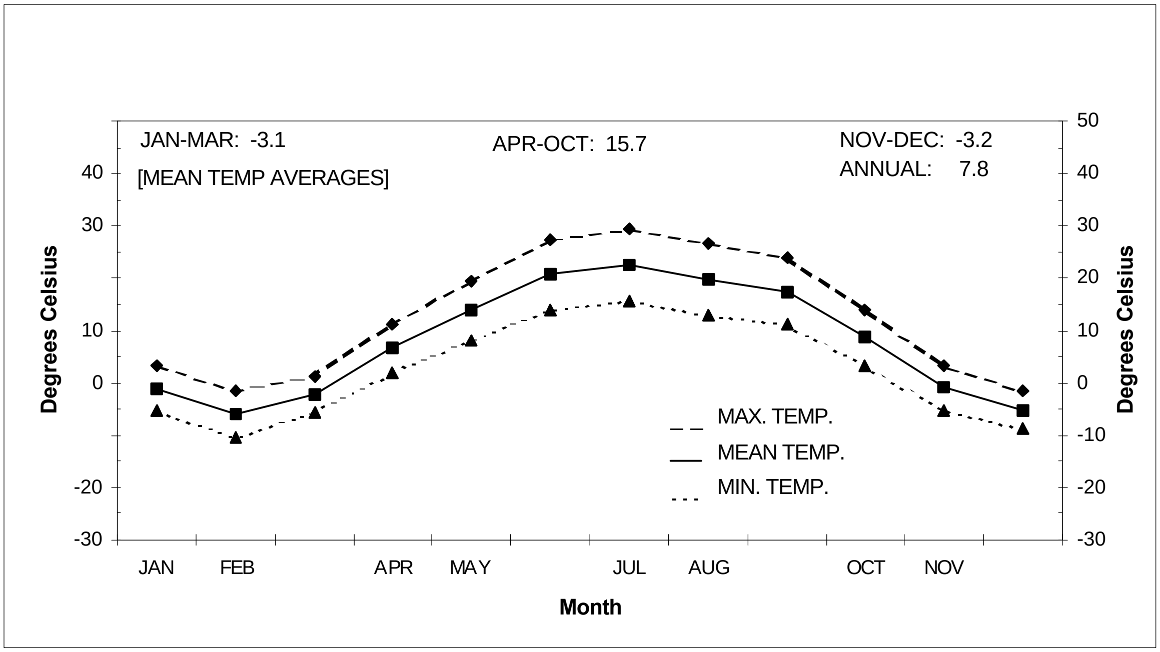

PROTON'S WATER BUDGET FOR THE YEAR 1998
PCPN JAN-MAR: 277.4
APR-OCT: 423.0
NOV-DEC: 190.1
ANNUAL: 890.5
SURPLUS
PRECIPITATION
ACT. EVAPOTR.
POT. EVAPOTR.
W. DEF: 58.0
W. SURP: 291.6
WHC: 100.0
Millimetres
280
240
200
160
120
80
40
0
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Month

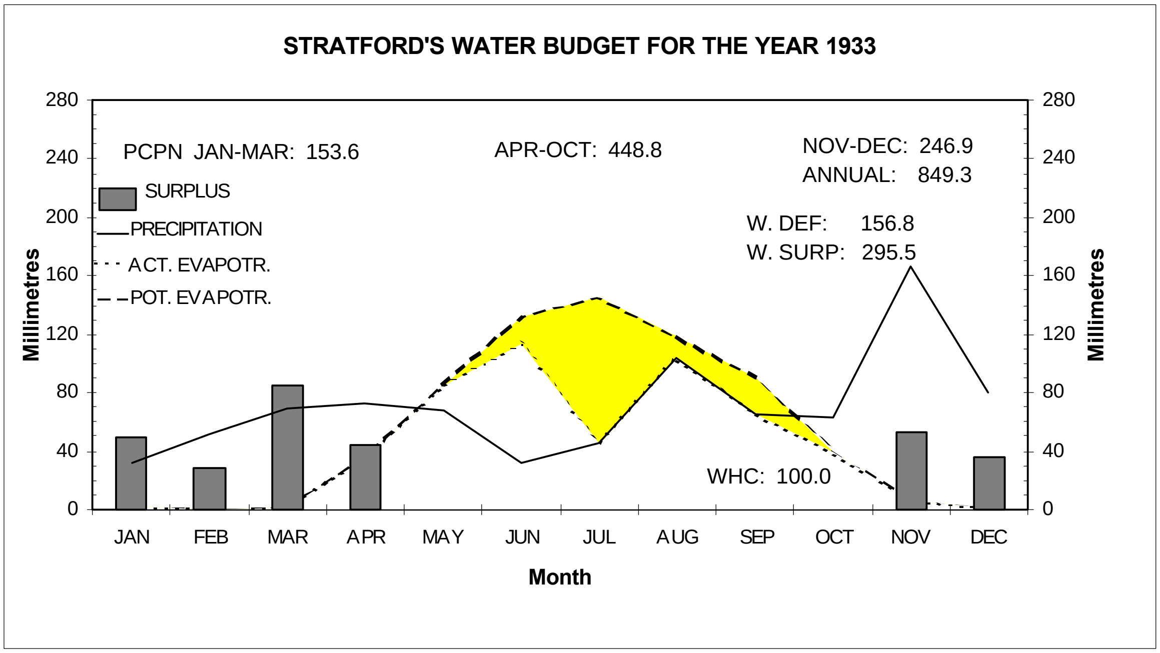

THROUGH AUGUST
JAN-MAR: -0.1
[MEAN TEMP AVERAGES]
APR-OCT: N/A
NOV-DEC: N/A
ANNUAL: N/A
Degrees Celsius
50
40
30
20
10
0
-10
-20
-30
MAX. TEMP.
MEAN TEMP.
MIN. TEMP.
JAN
MAR
APR
JUN
JUL
Month

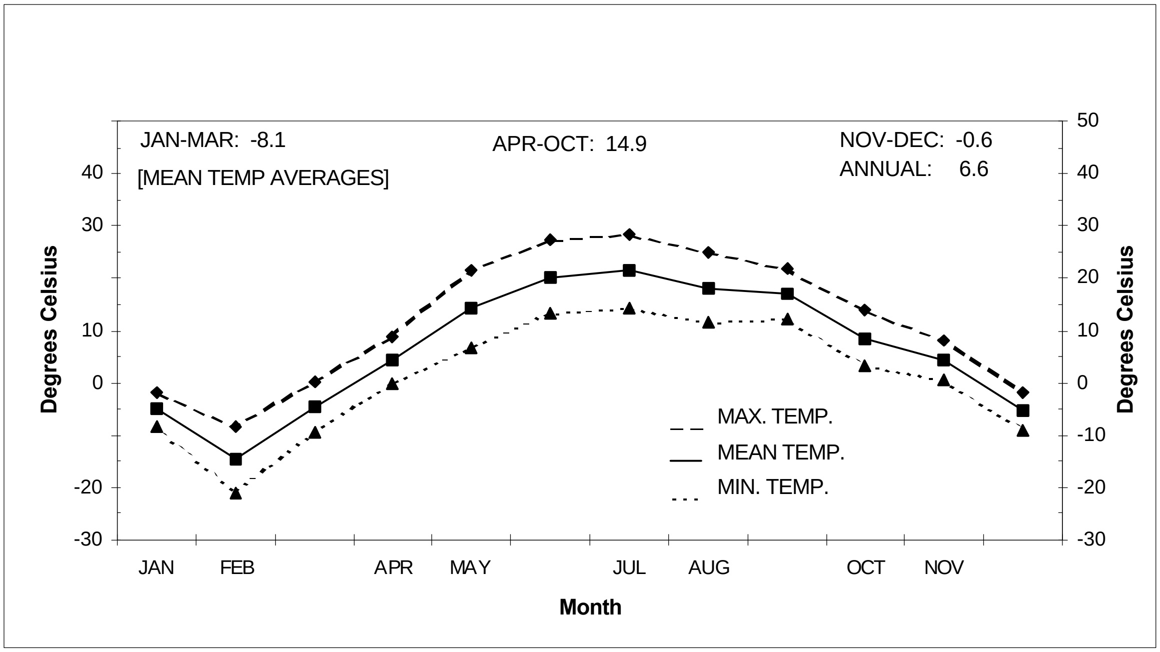

PROTON'S WATER BUDGET FOR THE YEAR 1999:
THROUGH AUGUST
PCPN JAN-MAR: 246.6
APR-OCT: N/A
NOV-DEC: N/A
ANNUAL: N/A
SURPLUS
PRECIPITATION
ACT. EVAPOTR.
POT. EVAPOTR.
W. DEF: 30.5
W. SURP: 312.8
WHC: 100.0
Millimetres
280
240
200
160
120
80
40
0
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
Month

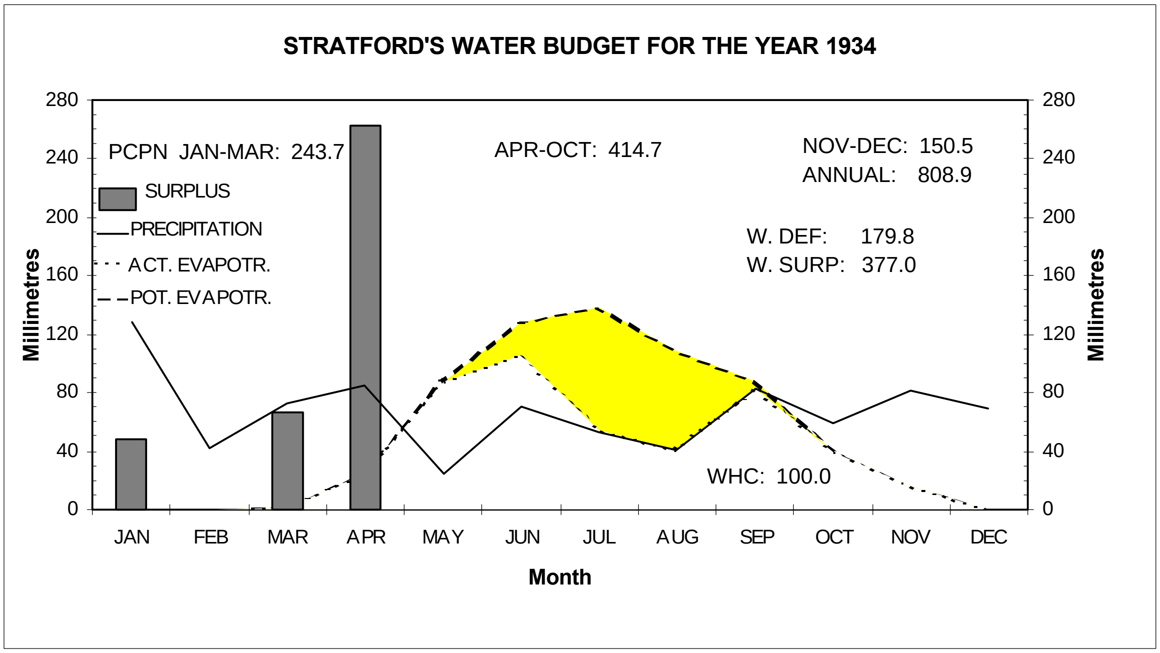


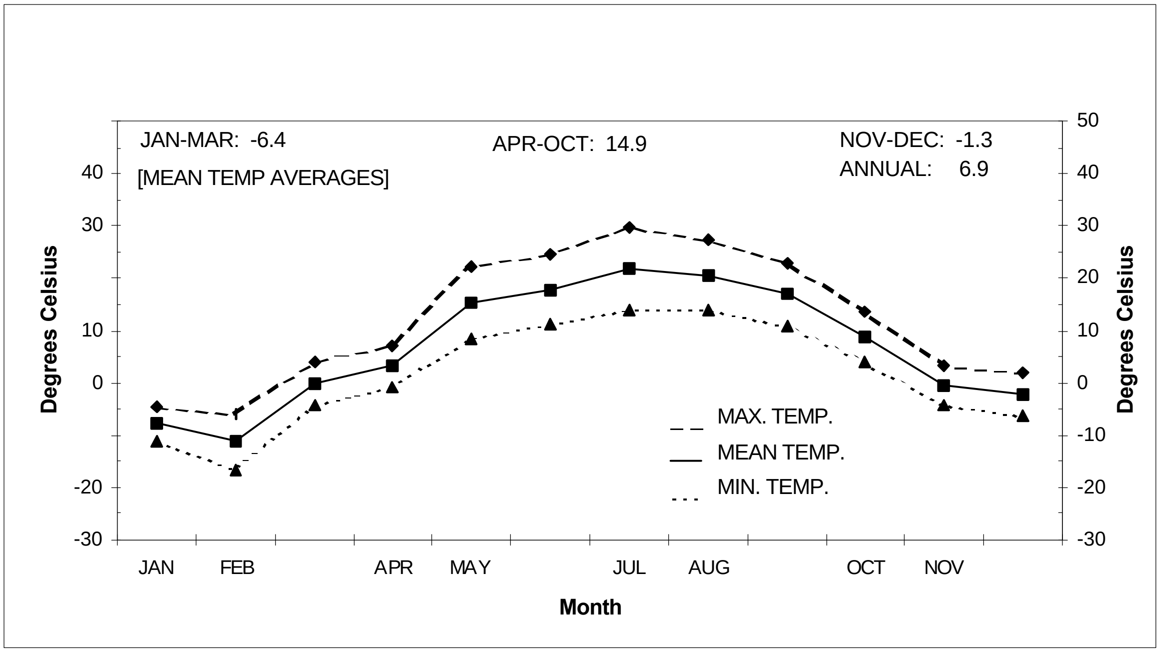

STRATFORD'S WATER BUDGET FOR THE YEAR 1930

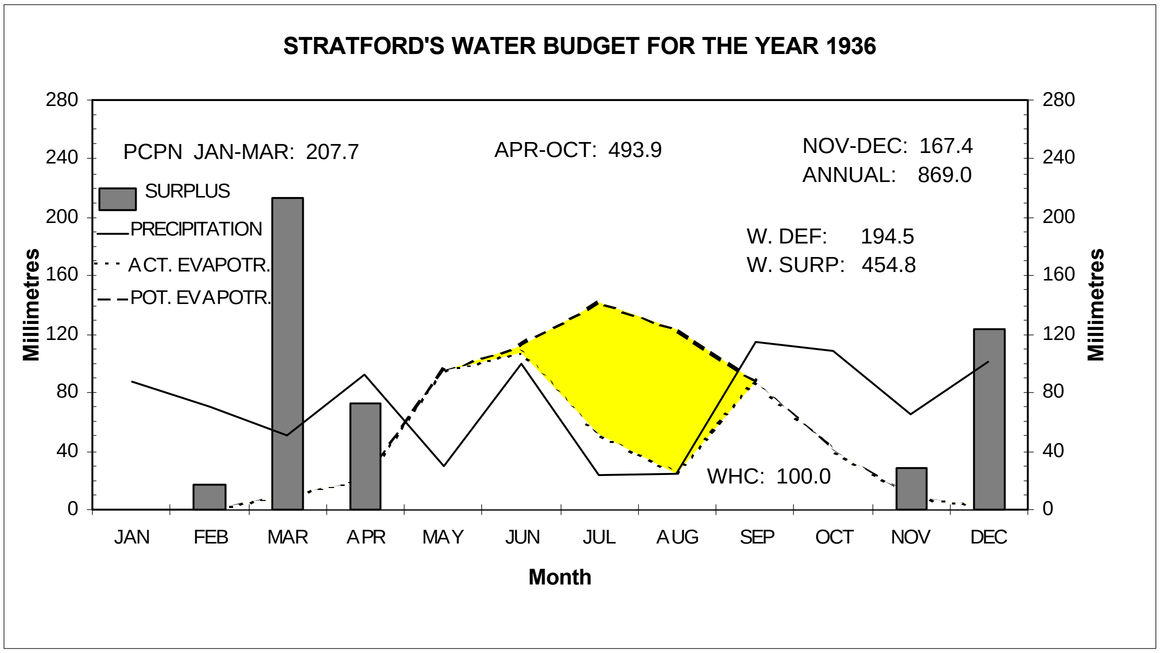


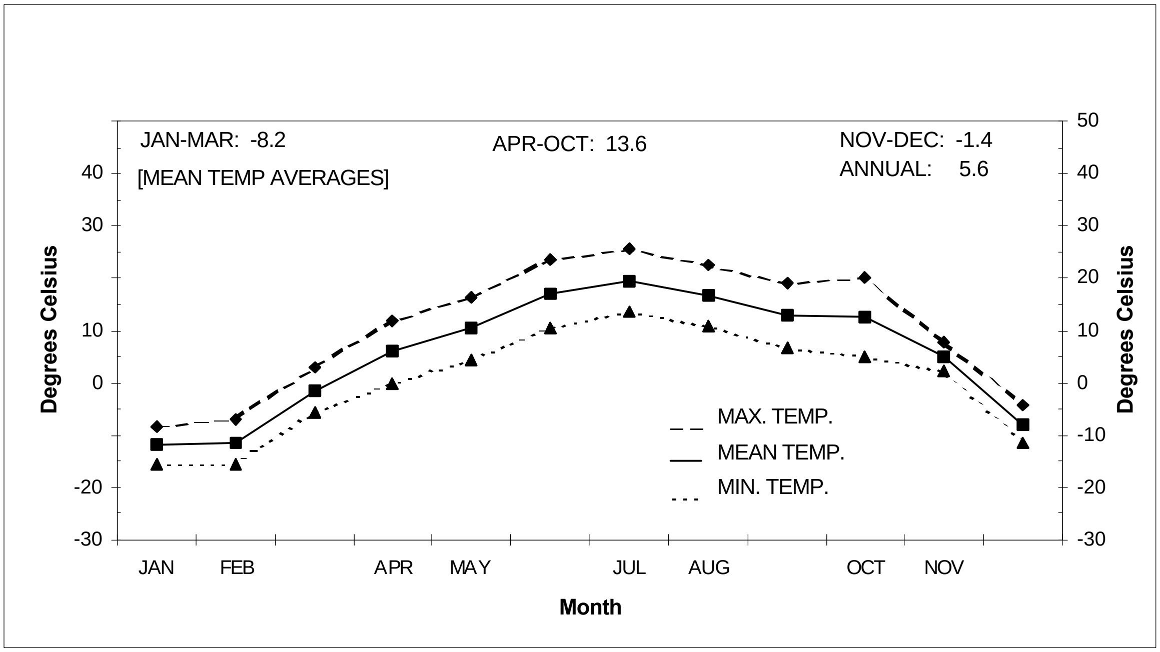

STRATFORD'S WATER BUDGET FOR THE YEAR 1933

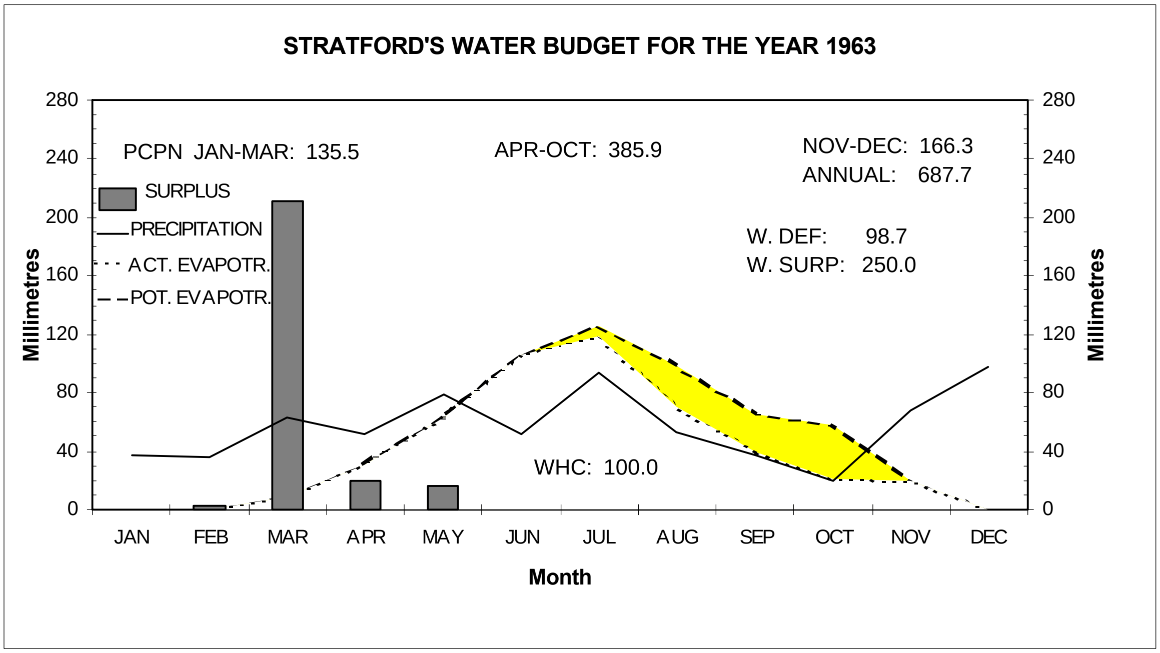

JAN-MAR: -8.1
[MEAN TEMP AVERAGES]
APR-OCT: 14.9
NOV-DEC: -0.6
ANNUAL: 6.6
MAX. TEMP.
MEAN TEMP.
MIN. TEMP.
Degrees Celsius
40
30
10
0
-20
-30
50
20
-10
JAN
FEB
APR
MAY
JUL
AUG
OCT
NOV
Month

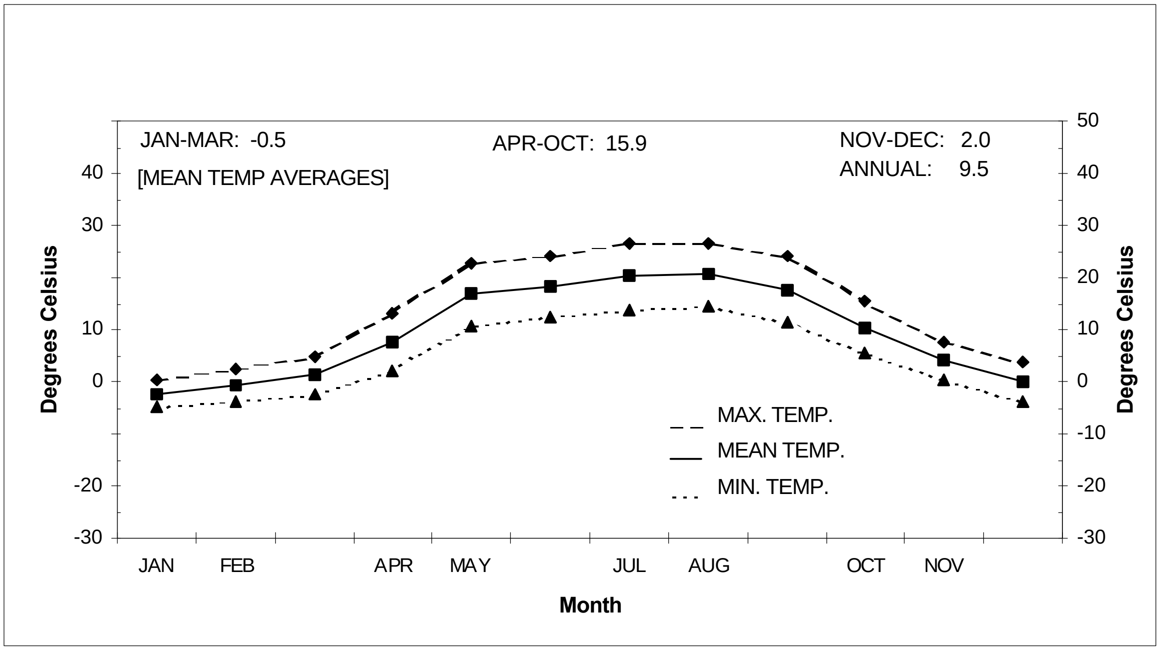

STRATFORD'S WATER BUDGET FOR THE YEAR 1934
PCPN JAN-MAR: 243.7
APR-OCT: 414.7
NOV-DEC: 150.5
ANNUAL: 808.9
SURPLUS
PRECIPITATION
ACT. EVAPOTR.
POT. EVAPOTR.
W. DEF: 179.8
W. SURP: 377.0
WHC: 100.0
Millimetres
280
240
200
160
120
80
40
0
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Month

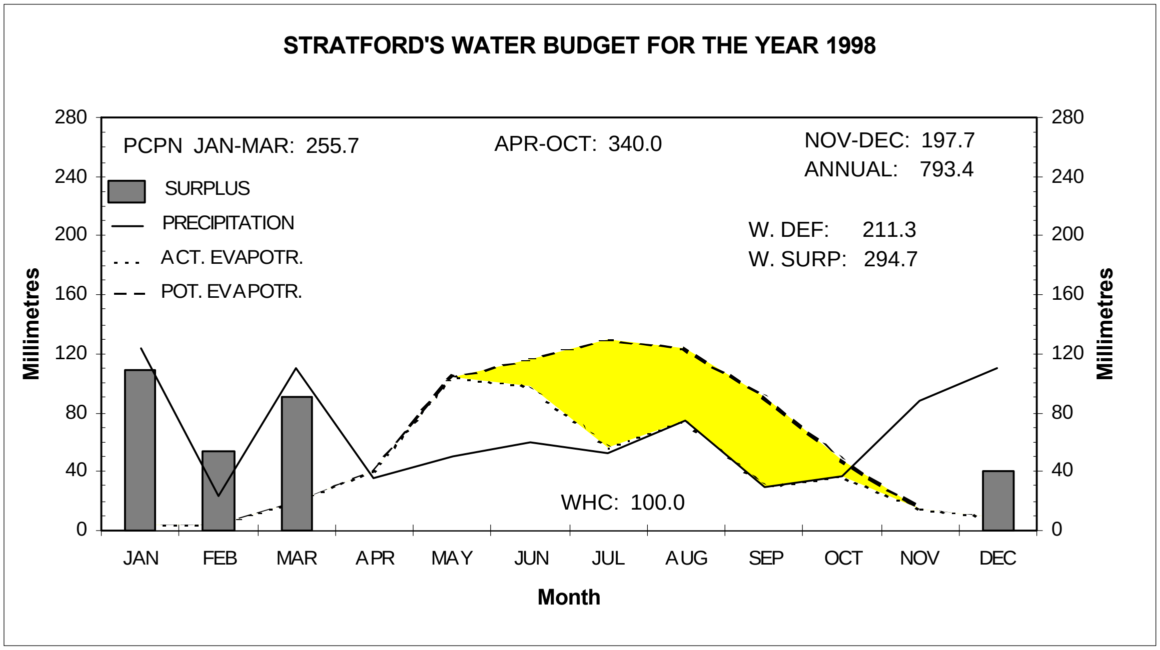

JAN-MAR: -6.4
[MEAN TEMP AVERAGES]
APR-OCT: 14.9
NOV-DEC: -1.3
ANNUAL: 6.9
MAX. TEMP.
MEAN TEMP.
MIN. TEMP.
Degrees Celsius
Month
JAN
FEB
APR
MAY
JUL
AUG
OCT
NOV
40
30
10
0
-20
-30
50
20
-10

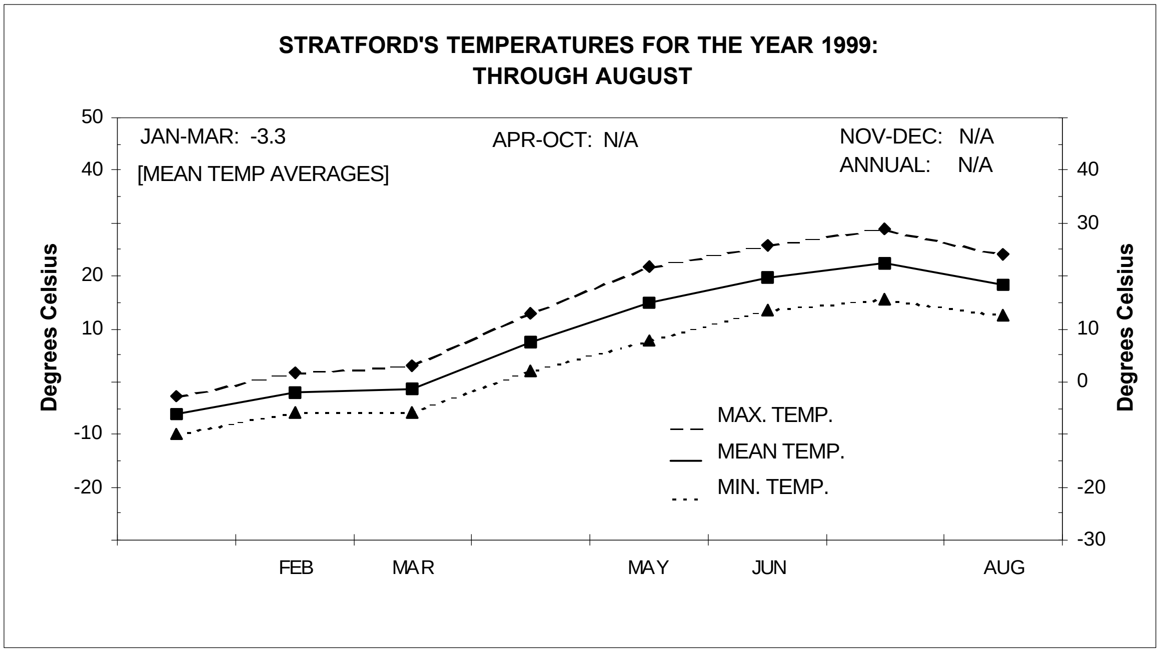

STRATFORD'S WATER BUDGET FOR THE YEAR 1936
PCPN JAN-MAR: 207.7
APR-OCT: 493.9
NOV-DEC: 167.4
ANNUAL: 869.0
SURPLUS
PRECIPITATION
ACT. EVAPOTR.
POT. EVAPOTR.
W. DEF: 194.5
W. SURP: 454.8
WHC: 100.0
Millimetres
Month
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
280
240
200
160
120
80
40
0

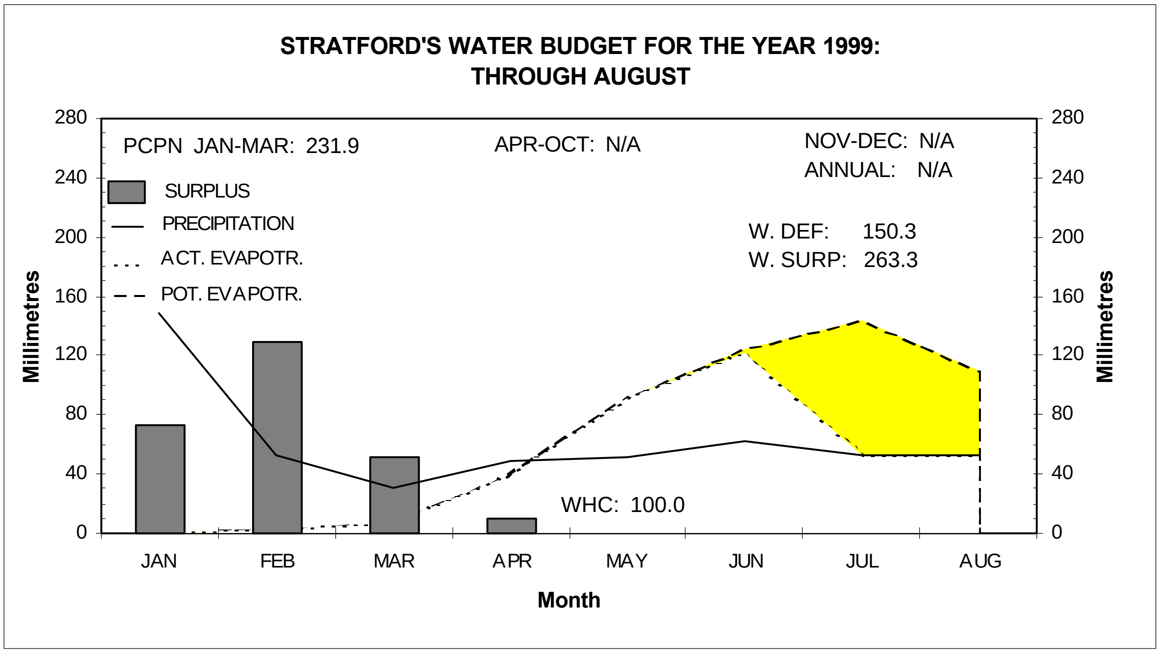

JAN-MAR: -8.2
[MEAN TEMP AVERAGES]
APR-OCT: 13.6
NOV-DEC: -1.4
ANNUAL: 5.6
MAX. TEMP.
MEAN TEMP.
MIN. TEMP.
Degrees Celsius
50
40
30
20
10
0
-10
-20
-30
JAN
FEB
APR
MAY
JUL
AUG
OCT
NOV
Month


STRATFORD'S WATER BUDGET FOR THE YEAR 1963
PCPN JAN-MAR: 135.5
APR-OCT: 385.9
NOV-DEC: 166.3
ANNUAL: 687.7
SURPLUS
PRECIPITATION
ACT. EVAPOTR.
POT. EVAPOTR.
W. DEF: 98.7
W. SURP: 250.0
WHC: 100.0
Millimetres
280
240
200
160
120
80
40
0
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Month

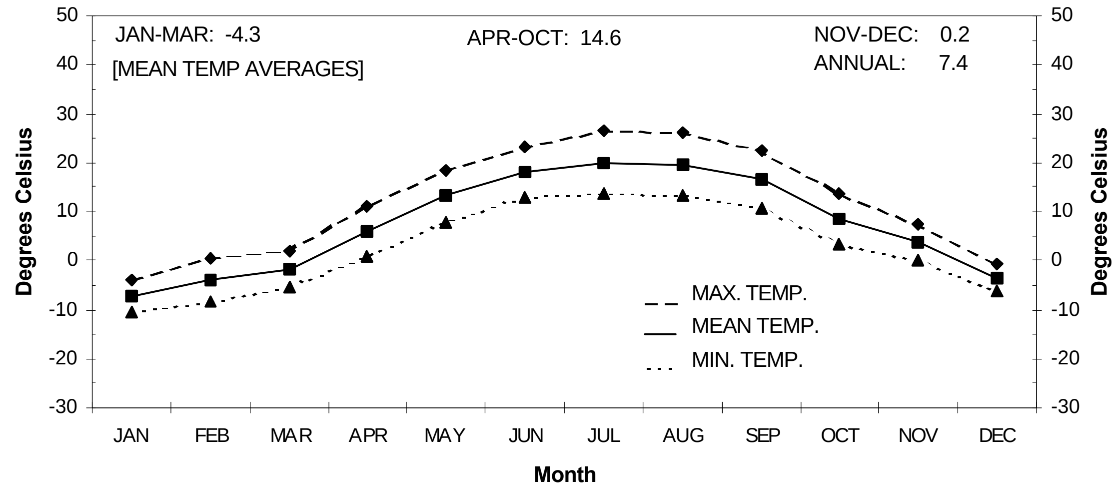

JAN-MAR: -0.5
[MEAN TEMP AVERAGES]
APR-OCT: 15.9
NOV-DEC: 2.0
ANNUAL: 9.5
Degrees Celsius
50
40
30
20
10
0
-10
-20
-30
MAX. TEMP.
MEAN TEMP.
MIN. TEMP.
JAN
FEB
APR
MAY
JUL
AUG
OCT
NOV
Month


STRATFORD'S WATER BUDGET FOR THE YEAR 1998
PCPN JAN-MAR: 255.7
APR-OCT: 340.0
NOV-DEC: 197.7
ANNUAL: 793.4
SURPLUS
PRECIPITATION
ACT. EVAPOTR.
POT. EVAPOTR.
W. DEF: 211.3
W. SURP: 294.7
WHC: 100.0
Millimetres
280
240
200
160
120
80
40
0
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Month

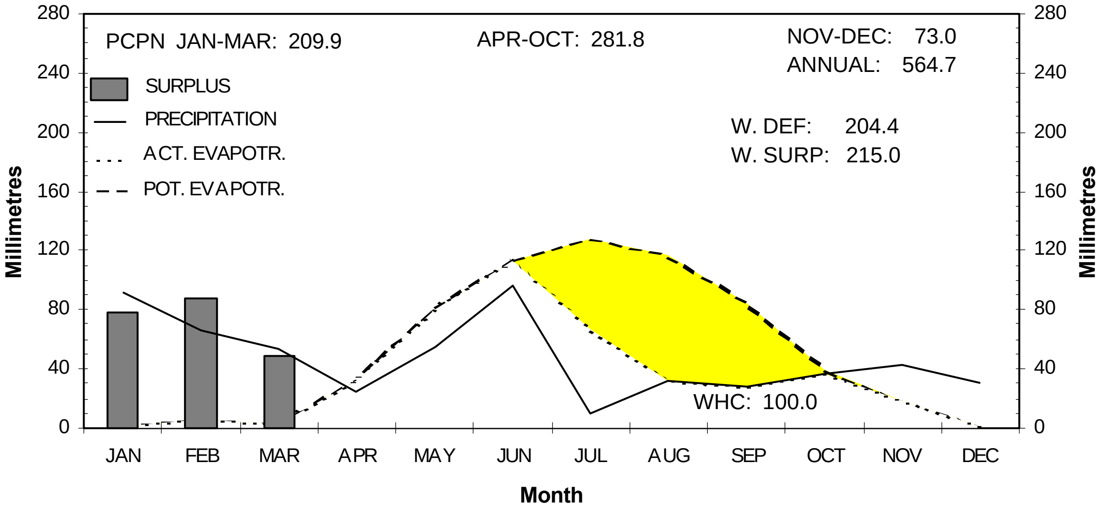

STRATFORD'S TEMPERATURES FOR THE YEAR 1999:
THROUGH AUGUST
JAN-MAR: -3.3
[MEAN TEMP AVERAGES]
APR-OCT: N/A
NOV-DEC: N/A
ANNUAL: N/A
Degrees Celsius
50
40
20
10
-10
-20
40
30
10
0
-20
-30
MAX. TEMP.
MEAN TEMP.
MIN. TEMP.
FEB
MAR
MAY
JUN
AUG

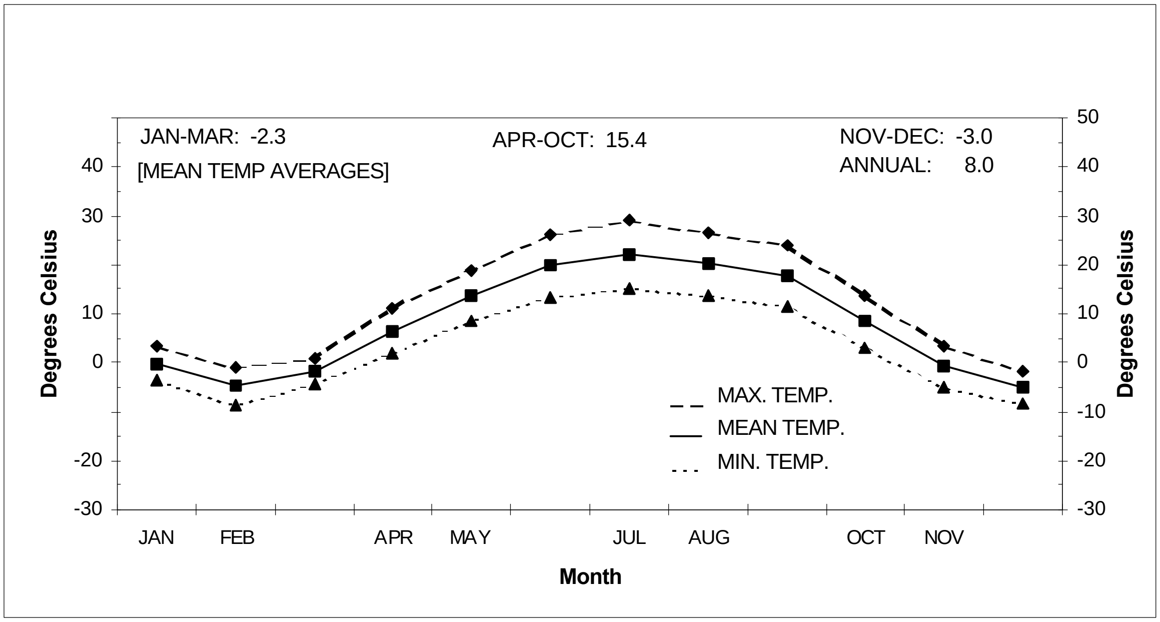

STRATFORD'S WATER BUDGET FOR THE YEAR 1999:
THROUGH AUGUST
PCPN JAN-MAR: 231.9
APR-OCT: N/A
NOV-DEC: N/A
ANNUAL: N/A
SURPLUS
PRECIPITATION
ACT. EVAPOTR.
POT. EVAPOTR.
W. DEF: 150.3
W. SURP: 263.3
WHC: 100.0
Millimetres
280
240
200
160
120
80
40
0
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
Month

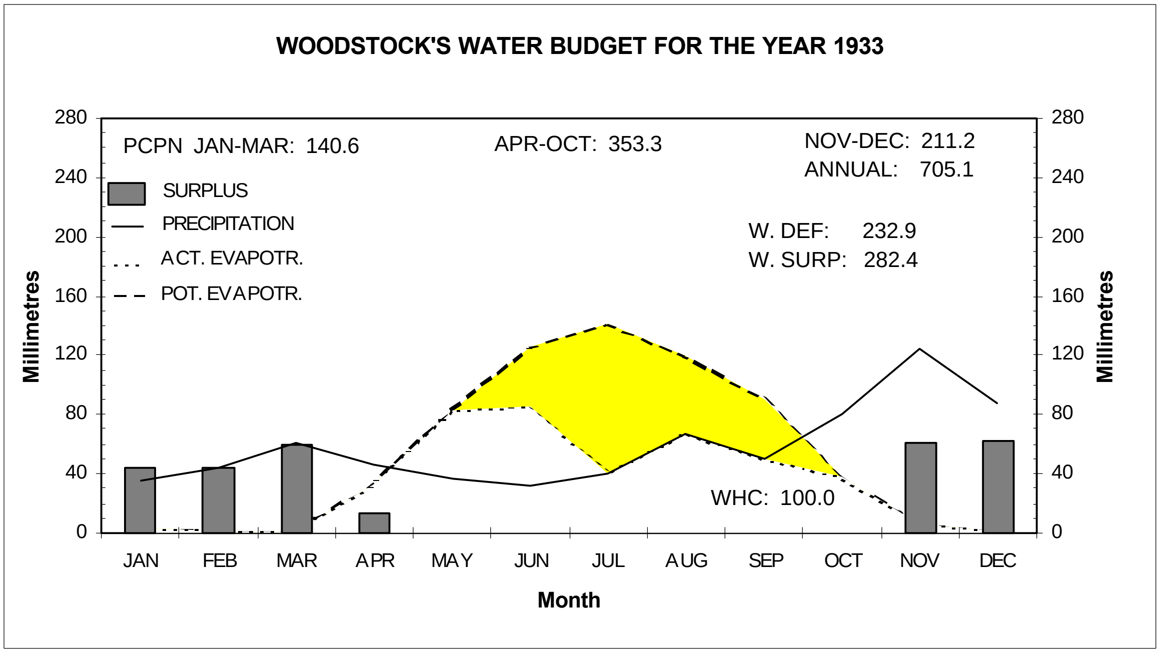
WOODSTOCK'S TEMPERATURES FOR THE YEAR 1930

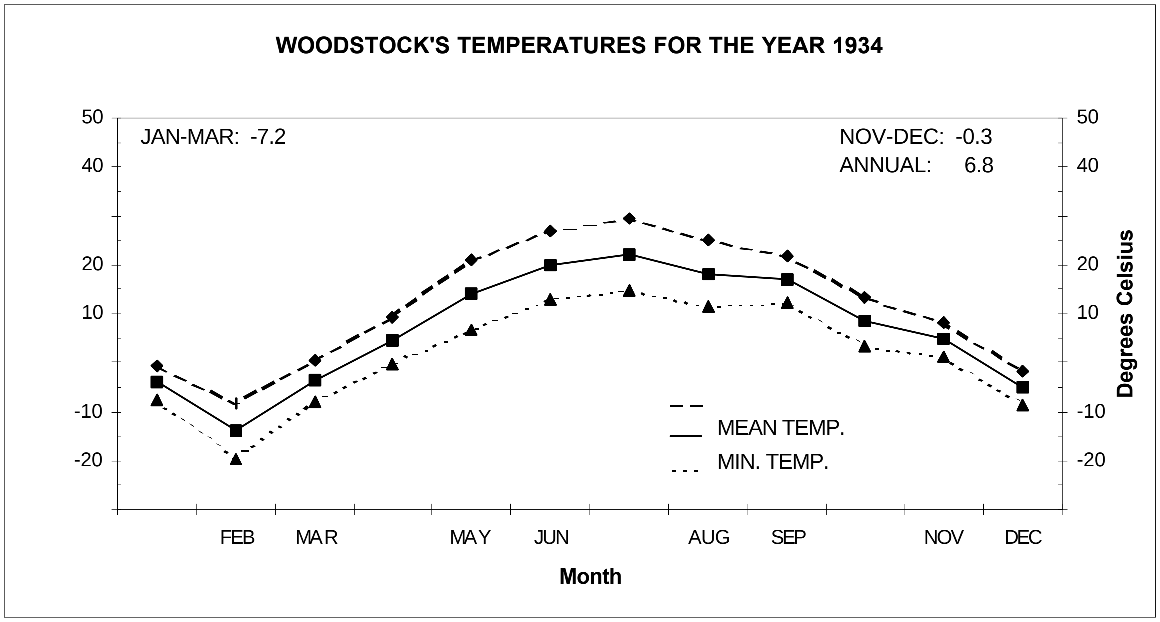


WOODSTOCK'S WATER BUDGET FOR THE YEAR 1930

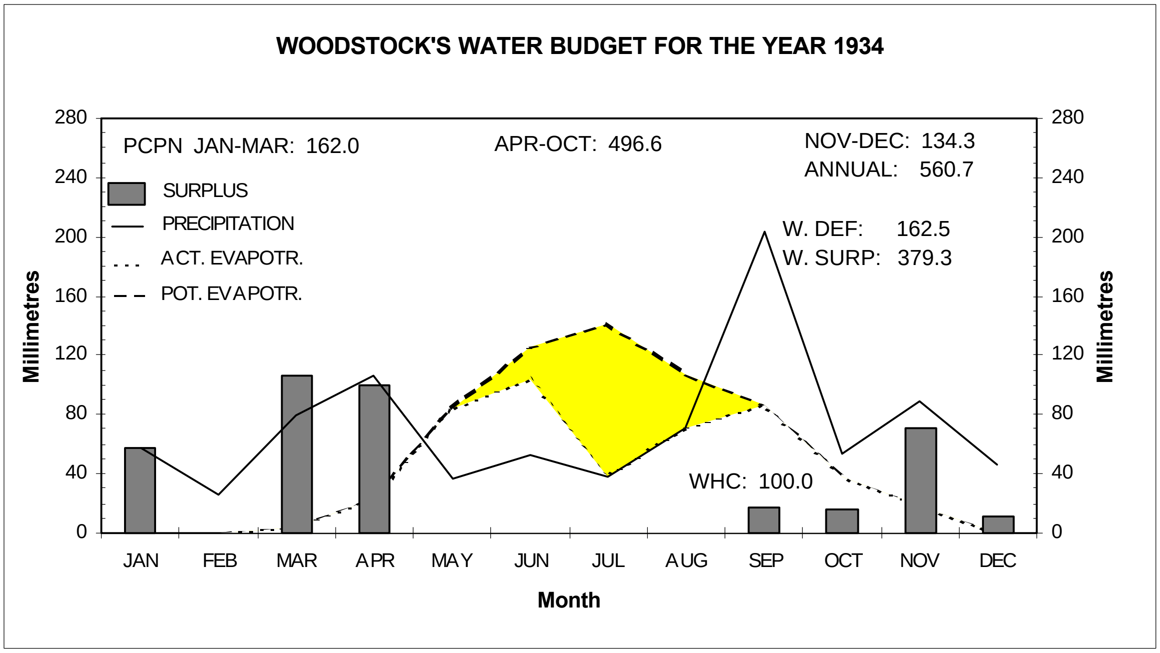




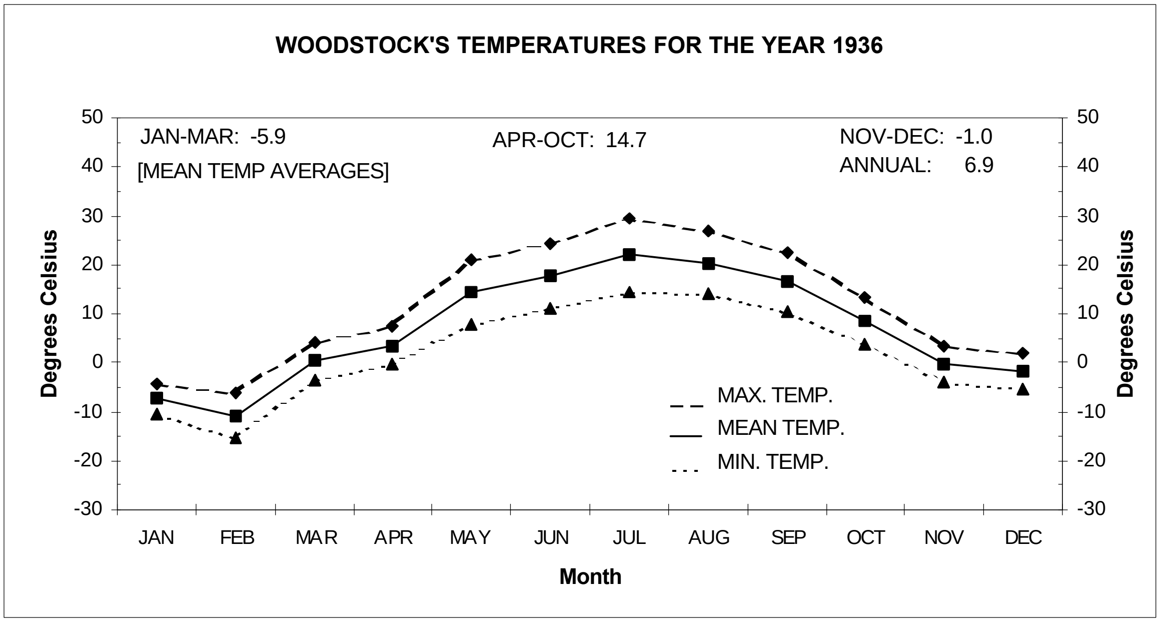

WOODSTOCK'S WATER BUDGET FOR THE YEAR 1933

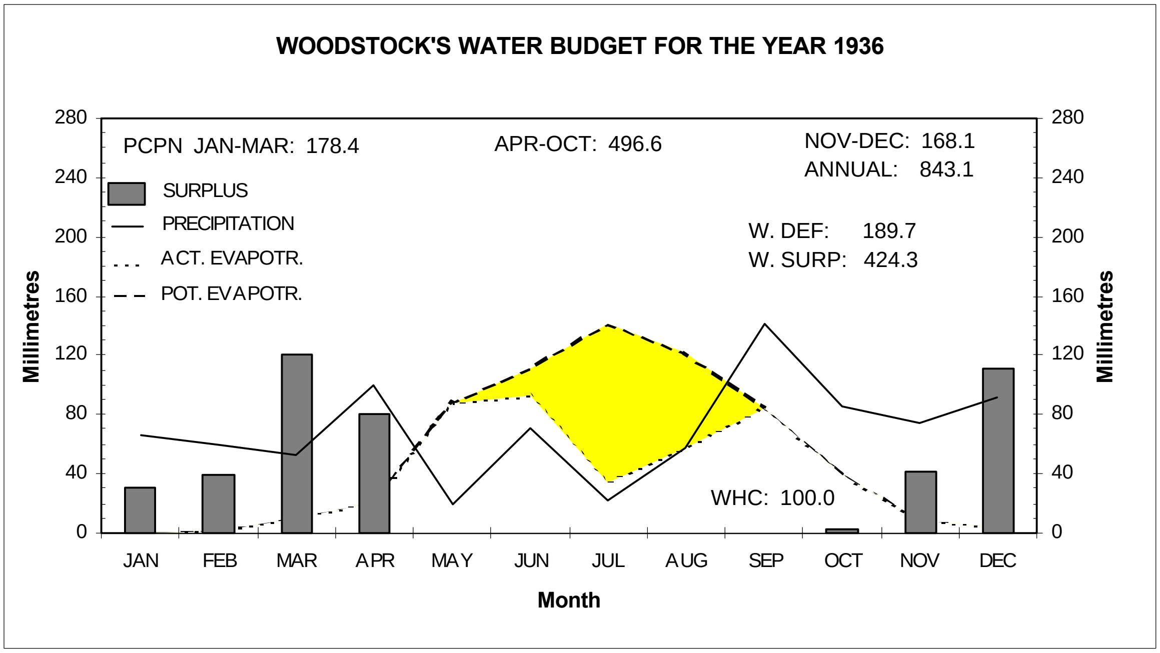


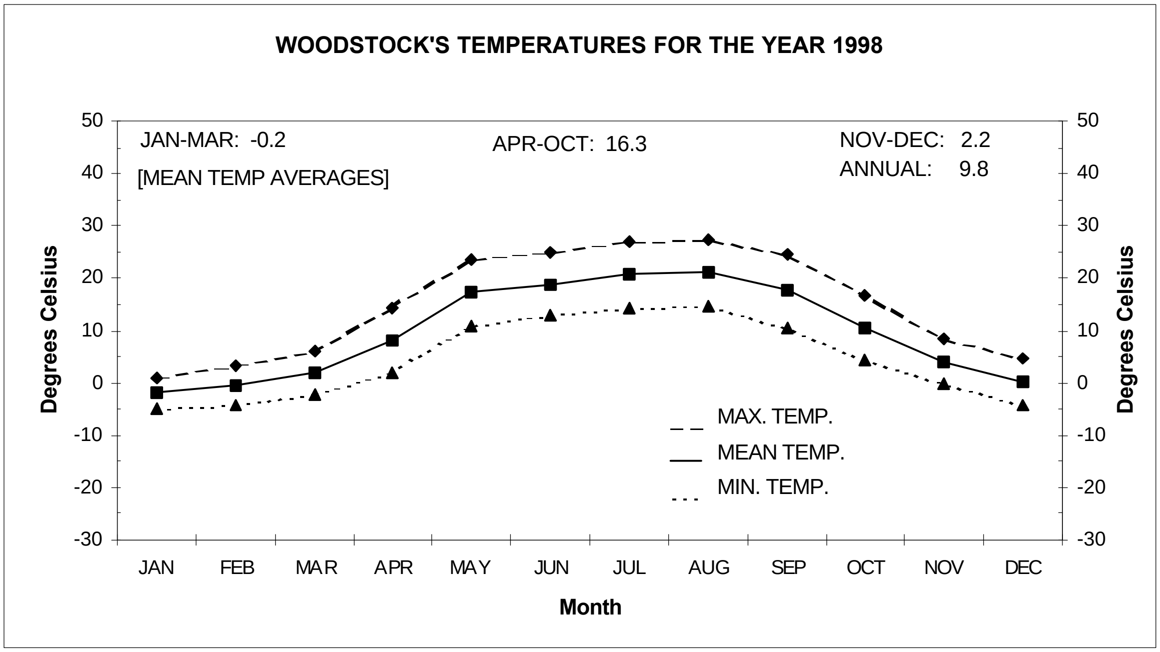
WOODSTOCK'S TEMPERATURES FOR THE YEAR 1934

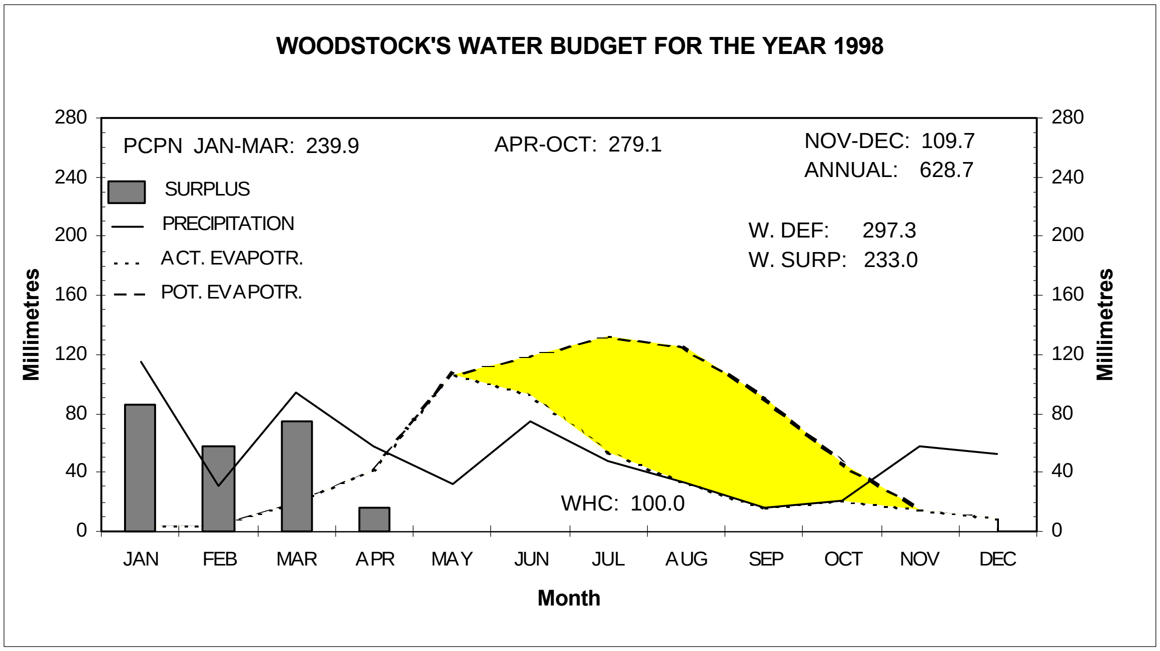


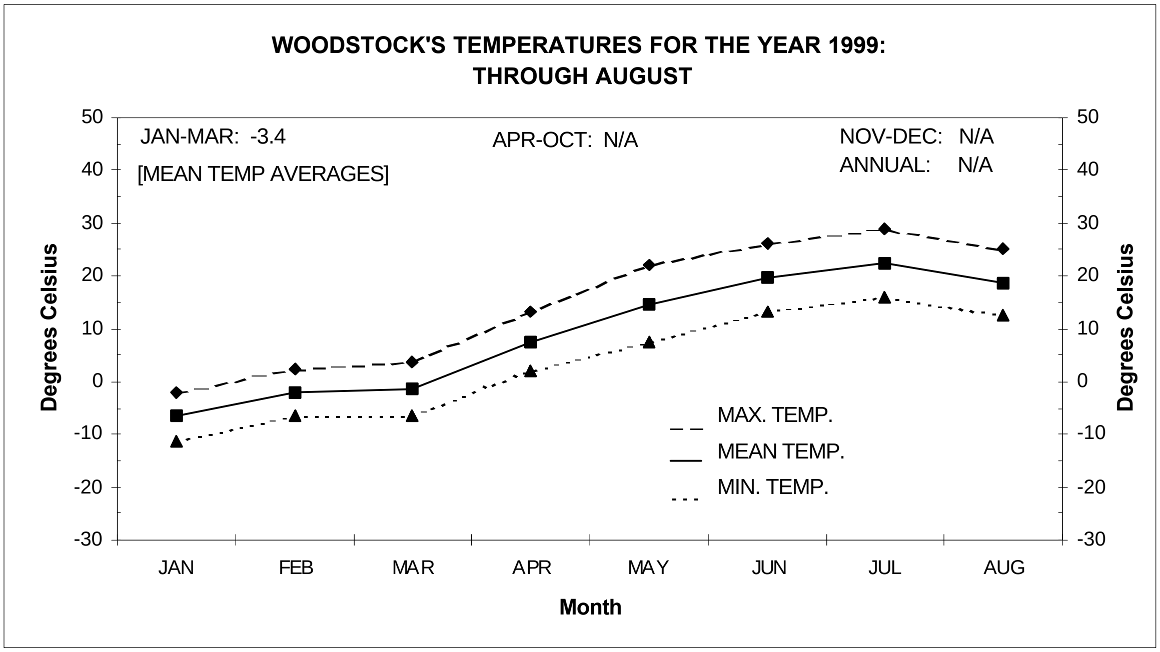
WOODSTOCK'S WATER BUDGET FOR THE YEAR 1934

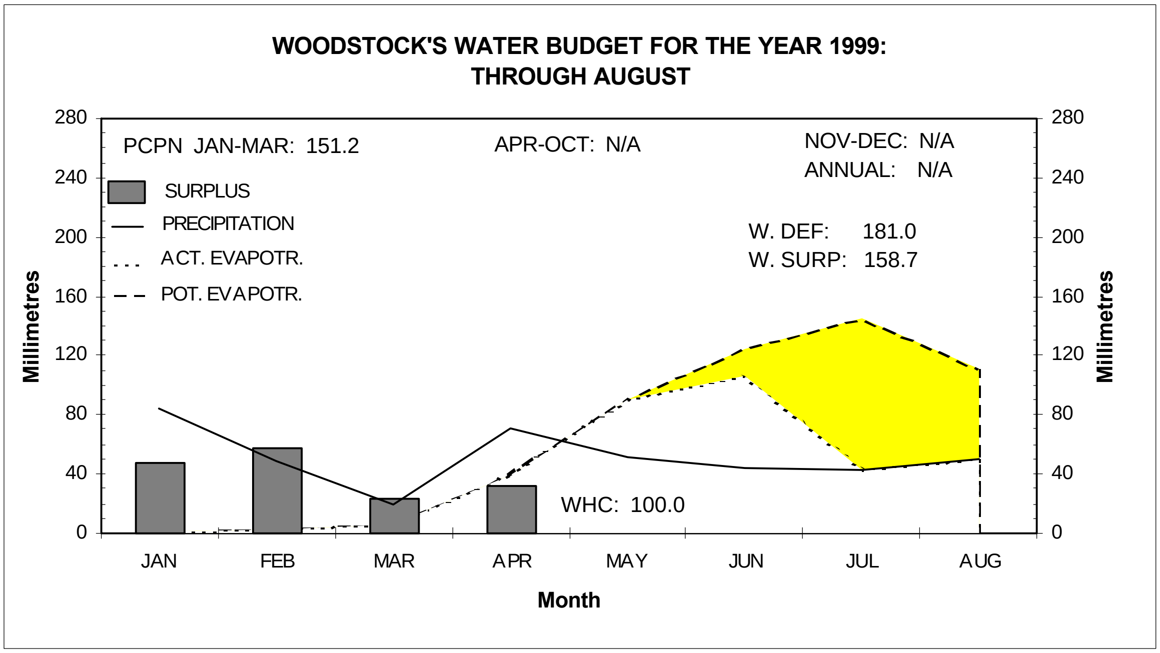

WOODSTOCK'S TEMPERATURES FOR THE YEAR 1936
JAN-MAR: -5.9
[MEAN TEMP AVERAGES]
APR-OCT: 14.7
NOV-DEC: -1.0
ANNUAL: 6.9
MAX. TEMP.
MEAN TEMP.
MIN. TEMP.
Degrees Celsius
50
40
30
20
10
0
-10
-20
-30
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Month


WOODSTOCK'S WATER BUDGET FOR THE YEAR 1936
PCPN JAN-MAR: 178.4
APR-OCT: 496.6
NOV-DEC: 168.1
ANNUAL: 843.1
SURPLUS
PRECIPITATION
ACT. EVAPOTR.
POT. EVAPOTR.
W. DEF: 189.7
W. SURP: 424.3
WHC: 100.0
Millimetres
280
240
200
160
120
80
40
0
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Month


WOODSTOCK'S TEMPERATURES FOR THE YEAR 1998
JAN-MAR: -0.2
[MEAN TEMP AVERAGES]
APR-OCT: 16.3
NOV-DEC: 2.2
ANNUAL: 9.8
MAX. TEMP.
MEAN TEMP.
MIN. TEMP.
Degrees Celsius
50
40
30
20
10
0
-10
-20
-30
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Month


WOODSTOCK'S WATER BUDGET FOR THE YEAR 1998
PCPN JAN-MAR: 239.9
APR-OCT: 279.1
NOV-DEC: 109.7
ANNUAL: 628.7
SURPLUS
PRECIPITATION
ACT. EVAPOTR.
POT. EVAPOTR.
W. DEF: 297.3
W. SURP: 233.0
WHC: 100.0
Millimetres
280
240
200
160
120
80
40
0
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Month


WOODSTOCK'S TEMPERATURES FOR THE YEAR 1999: THROUGH AUGUST


WOODSTOCK'S WATER BUDGET FOR THE YEAR 1999: THROUGH AUGUST

Appendix K

Tables of Annual and Seasonal Precipitation and Mean Temperature ENSO Results

TABLE K-1

Average Annual Precipitation (mm) and Percent of Years with Precipitation Less than Average
for All/El Niño/La Niña and Neutral (Non-ENSO) Analysis Years (1910-1999)

STATION	**All Avg (# yrs)**	**% yrs <Avg**	**Niño Avg (# yrs)**	**% yrs <Avg**	**Niña Avg (# yrs)**	**% yrs <Avg**	**Neut Avg (# yrs)**	**% yrs <Avg**	**1930-39 Avg**	**1961-66 Avg**	**1998-99 Avg**
Brantford	838.7 (74)	47.3	820.1 (15)	46.7	842.1 (11)	54.5	843.7 (48)	45.8	804.7	750.9	608.1
Delhi/Simcoe	949.6 (76)	50.0	913.8 (17)	64.7	977.5 (12)	41.7	955.5 (47)	46.8	848.9	787.4	N/A
Fergus Shand Dam	924.5 (47)	44.7	873.3 (11)	54.5	965.7 (8)	25.0	932.8 (28)	46.4	N/A	841.2	698.4
Georgetown	820.5 (72)	47.2	816.1 (18)	44.4	830.6 (12)	50.0	819.5 (42)	47.6	693.3	767.0	741.3
Guelph	845.8 (81)	50.6	826.9 (19)	52.6	879.2 (11)	36.4	845.6 (51)	52.9	788.6	723.7	N/A
Kitchener/Waterloo	867.6 (78)	52.6	852.8 (19)	63.2	878.6 (12)	50.0	870.7 (47)	48.9	691.1	774.7	675.4
Mt. Forest/Redickville	919.7 (63)	41.3	906.1 (14)	35.7	886.4 (10)	40.0	933.1 (39)	43.6	776.2	829.8	836.0
Stratford	1003.7 (83)	48.2	1007.4 (18)	50.0	981.9 (14)	50.0	1008.4 (51)	47.1	915.1	847.6	809.9
Woodstock	880.4 (79)	54.4	842.9 (19)	63.2	834.0 (14)	64.3	910.0 (46)	47.8	811.3	882.5	645.5
AVERAGE	894.5	48.5	873.3	52.8	897.3	45.8	902.1	47.4	791.2	800.5	716.4

TABLE K-2

Average Autumn (Sep/Oct/Nov) Precipitation (mm) and Percent of Years with Precipitation Less than Average
for All/El Niño/La Niña and Neutral (Non-ENSO) Analysis Years (1910-1999)

STATION	**All Avg (# yrs)**	**% yrs <Avg**	**Niño Avg (# yrs)**	**% yrs <Avg**	**Niña Avg (# yrs)**	**% yrs <Avg**	**Neut Avg (# yrs)**	**% yrs <Avg**	**1930-39 Avg**	**1961-66 Avg**	**1998-99 Avg**
Brantford	210.8 (84)	45.2	198.7 (19)	57.9	211.2 (13)	38.5	215.1 (52)	42.3	199.7	161.8	131.9
Delhi/Simcoe	244.8 (76)	55.3	222.6 (17)	70.6	266.0 (12)	33.3	247.4 (47)	55.3	203.9	166.4	N/A
Fergus Shand Dam	245.4 (53)	47.2	246.5 (12)	58.3	257.7 (10)	40.0	241.0 (31)	45.2	N/A	197.7	145.0
Georgetown	209.3 (88)	52.3	210.7 (21)	52.4	213.1 (14)	42.9	207.8 (53)	54.7	169.6	178.3	126.7
Guelph	213.6 (84)	50.0	208.9 (20)	60.0	229.4 (12)	41.7	211.8 (52)	48.1	198.7	174.0	N/A
Kitchener/Waterloo	219.6 (82)	51.2	213.1 (19)	52.6	225.0 (13)	38.5	220.6 (50)	54.0	175.3	169.9	133
Mt. Forest/Redickville	253.3 (78)	46.2	263.9 (18)	38.9	236.8 (13)	61.5	253.9 (47)	44.7	213.0	201.3	192.8
Stratford	263.5 (87)	50.6	261.5 (20)	50.0	250.1 (14)	50.0	267.7 (53)	50.9	232.8	190.2	196.8
Woodstock	230.3 (87)	48.3	212.2 (21)	61.9	208.4 (14)	50.0	243.5 (52)	42.3	218	170.5	148.5
AVERAGE	232.3	49.6	226.5	55.8	233.1	44.0	234.3	48.6	201.4	178.9	153.5

TABLE K-3

Average Winter (Dec/Jan/Feb) Precipitation (mm) and Percent of Years with Precipitation Less than Average
for All/El Niño/La Niña and Neutral (Non-ENSO) Analysis Years (1910-1999)

STATION	**All Avg (# yrs)**	**% yrs <Avg**	**Niño Avg (# yrs)**	**% yrs <Avg**	**Niña Avg (# yrs)**	**% yrs <Avg**	**Neut Avg (# yrs)**	**% yrs <Avg**	**1930-39 Avg**	**1961-66 Avg**	**1998-99 Avg**
Brantford	186.2 (81)	54.3	175.2 (18)	66.7	194.7 (12)	41.7	188.0 (51)	52.9	218.4	165.1	140.6
Delhi/Simcoe	222.3 (76)	51.3	215.8 (17)	58.8	232.7 (12)	41.7	222.0 (47)	51.1	249.0	163.0	N/A
Fergus Shand Dam	201.8 (57)	52.6	177.8 (14)	71.4	215.6 (10)	40.0	207.8 (33)	48.5	N/A	194.4	188.8
Georgetown	179.0 (80)	55.0	167.3 19	63.2	189.8 13	46.2	180.7 48	54.2	179.8	153.1	227.0
Guelph	176.8 (82)	52.4	164.9 (19)	63.2	178.0 (11)	45.5	180.9 (52)	50.0	198.8	151.7	N/A
Kitchener/Waterloo	188.6 (82)	56.1	178.6 (20)	55.0	202.7 (13)	38.5	189.0 (49)	61.2	181.7	181.8	206.0
Mt. Forest/Redickville	222.8 (75)	53.3	200.6 (16)	75.0	247.0 (11)	18.2	224.6 (48)	54.2	212.4	194.2	249.9
Stratford	261.2 (84)	52.4	249.2 (19)	57.9	269.4 (14)	50.0	263.3 (51)	51.0	245.3	221.4	272.4
Woodstock	187.5 (85)	55.3	171.2 (21)	61.9	187.0 (14)	64.3	194.4 (50)	50.0	205.3	200.2	189.1
AVERAGE	202.9	53.6	188.9	63.7	213.0	42.9	205.6	52.6	211.3	180.6	210.5

TABLE K-4

Average Spring (Mar/Apr/May) Precipitation (mm) and Percent of Years with Precipitation Less than Average
for All/El Niño/La Niña and Neutral (Non-ENSO) Analysis Years (1910-1999)

STATION	**All Avg (# yrs)**	**% yrs <Avg**	**Niño Avg (# yrs)**	**% yrs <Avg**	**Niña Avg (# yrs)**	**% yrs <Avg**	**Neut Avg (# yrs)**	**% yrs <Avg**	**1930-39 Avg**	**1961-66 Avg**	**1998-99 Avg**
Brantford	210.2 (83)	54.2	210.2 (20)	60.0	221.1 (12)	41.7	207.6 (51)	54.9	199.0	196.2	169.1
Delhi/Simcoe	243.1 (76)	52.6	228.7 (17)	58.8	259.1 (12)	41.7	244.2 (47)	53.2	208.7	219.7	N/A
Fergus Shand Dam	230.2 (57)	43.9	229.0 (13)	46.2	257.9 (9)	33.3	223.5 (35)	45.7	N/A	212.9	149.9
Georgetown	206.4 (79)	50.6	215.9 (19)	47.4	215.8 (13)	46.2	200 (47)	53.2	165.0	172.1	182.0
Guelph	209.1 (82)	50.0	209.9 (19)	47.4	227.1 (11)	45.5	205.1 (52)	51.9	176.5	180.8	N/A
Kitchener/Waterloo	213.2 (84)	52.4	214.5 (20)	45.0	219.4 (14)	57.1	211.0 (50)	54.0	149.6	184.2	153.2
Mt. Forest/Redickville	221.9 (79)	53.2	203.0 (17)	64.7	233.3 (14)	50.0	225.2 (48)	50.0	162.1	196.7	179.1
Stratford	237.7 (87)	50.6	238.3 (20)	50.0	250.4 (14)	42.9	234.1 (53)	52.8	210.3	182.9	162.8
Woodstock	215.4 (87)	51.7	200.6 (20)	60.0	213.5 (14)	57.1	221.5 (53)	47.2	197.5	216.5	162.1
AVERAGE	220.8	51.0	216.7	53.3	233.1	46.2	219.1	51.4	183.6	195.8	165.5

TABLE K-5

Average Summer (Jun/Jul/Aug) Precipitation (mm) and Percent of Years with Precipitation Less than Average for All/El Niño/La Niña and Neutral (Non-ENSO) Analysis Years (1910-1999)

STATION	All Avg (# yrs)	% yrs <Avg	Niño Avg (# yrs)	% yrs <Avg	Niña Avg (# yrs)	% yrs <Avg	Neut Avg (# yrs)	% yrs <Avg	1930-39 Avg	1961-66 Avg	1998-99 Avg
Brantford	230.7 (87)	49.4	237.4 (20)	50.0	233.2 (14)	78.6	227.5 (53)	41.5	187.7	227.7	166.5
Delhi/Simcoe	239.4 (76)	51.3	246.7 (17)	47.1	219.7 (12)	75.0	241.8 (47)	46.8	187.3	238.2	N/A
Fergus Shand Dam	246.7 (56)	57.1	235.3 (14)	57.1	246.9 (8)	50.0	251.3 34	58.8	N/A	214.6	214.7
Georgetown	231.0 (84)	56.0	221.1 (20)	70.0	239 (14)	42.9	232.7 (50)	54.0	178.9	251	205.6
Guelph	243.5 (83)	53.0	240.4 (19)	52.6	246.7 (11)	54.5	244.0 (53)	52.8	214.5	217.3	N/A
Kitchener/Waterloo	245.7 (84)	58.3	260.2 (20)	55.0	223.1 (13)	69.2	245.7 (51)	56.9	200.1	238.8	183.2
Mt. Forest/Redickville	230.3 (79)	48.1	236.0 (18)	44.4	231.3 (14)	42.9	227.9 (47)	51.1	168.2	236.6	214.2
Stratford	242.8 (86)	57.0	268.5 (19)	63.2	211.9 (14)	78.6	241.8 (53)	49.1	226.7	253.1	177.9
Woodstock	244.7 (87)	51.7	249.5 (20)	50.0	225.1 (14)	64.3	248.1 (53)	49.1	190.5	298.7	145.8
AVERAGE	239.4	53.6	243.9	54.4	230.8	61.8	240.1	51.1	194.2	241.8	186.9

TABLE K-6

Average Annual Mean Temperature (Degrees Celsius) and Percent of Years with Mean Temperature Greater than Average for All/El Niño/La Niña and Neutral (Non-ENSO) Analysis Years (1910-1999)

STATION	All Avg (# yrs)	% yrs >Avg	Niño Avg (# yrs)	% yrs >Avg	Niña Avg (# yrs)	% yrs >Avg	Neut Avg (# yrs)	% yrs >Avg	1930-39 Avg	1961-66 Avg	1998-99 Avg
Brantford	7.9 (78)	48.7	8.0 (20)	60.0	8.0 (12)	58.3	7.8 (46)	41.3	8.2	7.8	9.2
Delhi/Simcoe	8.0 (77)	45.5	8.1 (17)	58.8	7.9 (12)	33.3	7.9 (48)	43.7	8.4	7.4	N/A
Fergus Shand Dam	6.0 (44)	45.5	6.4 (10)	60.0	6.2 (7)	71.4	5.8 (27)	33.3	N/A	5.0	8.1
Georgetown	6.8 (54)	50.0	7.1 (12)	75.0	6.6 (10)	40.0	6.7 (32)	43.7	6.8	6.4	7.4
Guelph	6.7 (81)	51.9	6.7 (19)	57.9	6.5 (11)	27.3	6.7 (51)	54.9	6.9	6.3	N/A
Kitchener/Waterloo	7.1 (81)	43.2	7.3 (19)	57.9	7.0 (13)	30.8	7.0 (49)	40.8	7.5	7.1	8.3
Mt. Forest/Redickville	5.4 (81)	48.1	5.7 (19)	52.6	5.3 (14)	50.0	5.3 (48)	45.8	5.9	5.0	7.5
Stratford	6.9 (83)	43.4	7.1 (18)	50.0	6.7 (14)	35.7	6.8 (51)	43.1	7.4	6.4	8.8
Woodstock	7.3 (80)	51.2	7.4 (18)	61.1	7.2 (14)	42.9	7.2 (48)	50.0	7.4	7.1	9.0
AVERAGE	6.9	47.5	7.1	59.3	6.8	43.3	6.8	44.1	7.3	6.5	8.3

TABLE K-7

Average Autumn (Sep/Oct/Nov) Mean Temperature (Degrees Celsius) and Percent of Years with Mean Temperature Greater than Average for All/El Niño/La Niña and Neutral (Non-ENSO) Analysis Years (1910-1999)

STATION	**All Avg (# yrs)**	**% yrs >Avg**	**Niño Avg (# yrs)**	**% yrs >Avg**	**Niña Avg (# yrs)**	**% yrs >Avg**	**Neut Avg (# yrs)**	**% yrs >Avg**	**1930-39 Avg**	**1961-66 Avg**	**1998-99 Avg**
Brantford	9.7 (87)	42.5	9.3 (21)	33.3	9.9 (13)	46.2	9.7 (53)	45.3	9.7	10.3	9.8
Delhi/Simcoe	9.8 (78)	43.6	9.6 (18)	38.9	10.0 (12)	50.0	9.9 (48)	43.7	10.1	10.2	8.9
Fergus Shand Dam	8.0 (54)	46.3	7.8 (11)	45.5	8.4 (10)	50.0	8.0 (33)	45.5	N/A	8.1	8.9
Georgetown	8.6 (69)	46.4	8.4 (17)	35.3	8.4 (11)	27.3	8.7 (41)	56.1	8.4	9.1	8.9
Guelph	8.7 (85)	43.5	8.4 (20)	35.0	8.7 (12)	41.7	8.8 (53)	47.2	8.7	9.1	N/A
Kitchener/Waterloo	8.9 (82)	46.3	8.6 (19)	42.1	9.0 (13)	61.5	8.9 (50)	44.0	9.0	9.8	9.0
Mt. Forest/Redickville	7.6 (83)	42.2	7.4 (19)	36.8	7.7 (14)	50.0	7.6 (50)	42.0	7.8	8.1	8.3
Stratford	8.8 (87)	47.1	8.6 (20)	45.0	8.9 (14)	42.9	8.9 53	49.1	9.2	9.4	9.6
Woodstock	9.1 (87)	44.8	8.9 (20)	40.0	9.3 (14)	42.9	9.2 (53)	47.2	9.1	9.9	9.9
AVERAGE	8.8	44.8	8.5	39.1	8.9	45.8	8.9	46.7	9.0	9.3	9.2

TABLE K-8

Average Winter (Dec/Jan/Feb) Mean Temperature (Degrees Celsius) and Percent of Years with Mean Temperature Greater than Average for All/El Niño/La Niña and Neutral (Non-ENSO) Analysis Years (1910-1999)

STATION	**All Avg (# yrs)**	**% yrs >Avg**	**Niño Avg (# yrs)**	**% yrs >Avg**	**Niña Avg (# yrs)**	**% yrs >Avg**	**Neut Avg (# yrs)**	**% yrs >Avg**	**1930-39 Avg**	**1961-66 Avg**	**1998-99 Avg**
Brantford	-4.6 (85)	51.8	-3.9 (20)	70.0	-4.5 (13)	61.5	-4.8 (52)	42.3	-4.0	-5.1	-2.1
Delhi/Simcoe	-4.2 (79)	53.2	-3.6 (18)	77.8	-4.2 (13)	38.5	-4.4 48	47.9	-3.5	-5.6	-1.6
Fergus Shand Dam	-7.0 (55)	49.1	-6.3 (14)	71.4	-6.9 (10)	30.0	-7.3 31	45.2	N/A	-8.3	-3.4
Georgetown	-5.7 (68)	55.9	-4.6 (16)	81.2	-5.8 (11)	45.5	-6.1 41	48.8	-5.7	-7.1	-3.1
Guelph	-5.9 (83)	55.4	-5.3 (20)	75.0	-6.0 (11)	45.5	-6.1 52	50.0	-5.3	-6.9	N/A
Kitchener/Waterloo	-5.6 (85)	54.1	-4.7 (20)	80.0	-5.7 (14)	35.7	-5.8 (51)	49.0	-4.8	-6.3	-2.9
Mt. Forest/Redickville	-7.2 (83)	50.6	-6.4 (19)	73.7	-7.3 (14)	35.7	-7.5 (50)	46.0	-6.4	-7.9	-3.8
Stratford	-5.8 (84)	51.2	-5.1 (19)	73.7	-5.8 (14)	28.6	-6.0 (51)	49.0	-5.1	-6.8	-2.2
Woodstock	-5.1 (87)	52.9	-4.4 (21)	71.4	-5.1 (14)	50.0	-5.4 (52)	46.2	-4.7	-5.9	-2.0
AVERAGE	-5.7	52.7	-4.9	74.9	-5.7	41.2	-5.9	47.2	-4.9	-6.7	-2.6

TABLE K-9

Average Spring (Mar/Apr/May) Mean Temperature (Degrees Celsius) and Percent of Years with Mean Temperature Greater than Average for All/El Niño/La Niña and Neutral (Non-ENSO) Analysis Years (1910-1999)

STATION	All Avg (# yrs)	% yrs >Avg	Niño Avg (# yrs)	% yrs >Avg	Niña Avg (# yrs)	% yrs >Avg	Neut Avg (# yrs)	% yrs >Avg	1930-39 Avg	1961-66 Avg	1998-99 Avg
Brantford	6.5 (85)	50.6	6.6 (21)	52.4	6.4 (13)	46.2	6.5 (51)	51.0	6.3	6.5	8.4
Delhi/Simcoe	6.6 (79)	51.9	6.8 (18)	61.1	6.4 (13)	38.5	6.5 (48)	52.1	6.6	6.2	8.2
Fergus Shand Dam	4.5 (57)	47.4	5.0 (13)	53.8	4.3 (9)	44.4	4.4 (35)	45.7	N/A	3.9	7.3
Georgetown	5.3 (63)	50.8	5.2 (13)	46.2	5.0 (10)	40.0	5.4 (40)	55.0	5.0	5.2	5.7
Guelph	5.3 (84)	50.0	5.3 (20)	50.0	4.9 (11)	36.4	5.4 (53)	52.8	5.1	5.0	N/A
Kitchener/Waterloo	5.7 (83)	49.4	5.9 (20)	55.0	5.4 (14)	42.9	5.7 (49)	49.0	5.7	5.8	7.4
Mt. Forest/Redickville	3.9 (84)	50.0	4.1 (19)	52.6	3.6 (14)	50.0	3.9 (51)	49.0	4.0	3.7	6.7
Stratford	5.4 (87)	48.3	5.5 (20)	50.0	5.1 (14)	42.9	5.5 (53)	49.1	5.5	5.0	7.8
Woodstock	5.9 (86)	48.8	6.0 (19)	57.9	5.7 (14)	42.9	5.9 (53)	47.2	5.6	6.0	8.0
AVERAGE	5.5	49.7	5.6	53.2	5.2	42.7	5.5	50.1	5.5	5.3	7.4

TABLE K-10

Average Summer (Jun/Jul/Aug) Mean Temperature (Degrees Celsius) and Percent of Years with Mean Temperature Greater than Average for All/El Niño/La Niña and Neutral (Non-ENSO) Analysis Years (1910-1999)

STATION	**All Avg (# yrs)**	**% yrs >Avg**	**Niño Avg (# yrs)**	**% yrs >Avg**	**Niña Avg (# yrs)**	**% yrs >Avg**	**Neut Avg (# yrs)**	**% yrs >Avg**	**1930-39 Avg**	**1961-66 Avg**	**1998-99 Avg**
Brantford	20.0 (83)	48.2	20.0 (20)	60.0	19.9 (13)	38.5	19.9 (50)	46.0	20.6	19.4	20.8
Delhi/Simcoe	19.8 (77)	48.1	19.9 (17)	58.8	19.7 (12)	41.7	19.7 (48)	45.8	20.5	19.1	N/A
Fergus Shand Dam	18.4 (56)	50.0	18.4 (14)	57.1	18.6 (7)	57.1	18.3 (35)	45.7	N/A	17.5	19.4
Georgetown	18.7 (67)	47.8	18.7 (16)	50.0	18.5 (11)	36.4	18.7 (40)	50.0	19.1	18.4	18.8
Guelph	18.6 (83)	47.0	18.6 (19)	52.6	18.5 (11)	27.3	18.7 (53)	49.1	19.3	18.0	N/A
Kitchener/Waterloo	19.2 (84)	48.8	19.3 (20)	65.0	19.1 (13)	38.5	19.1 (51)	45.1	19.9	19.1	19.6
Mt. Forest/Redickville	17.4 (83)	47.0	17.7 (19)	57.9	17.3 (14)	42.9	17.4 (50)	44.0	18.3	16.7	18.7
Stratford	18.9 (86)	43.0	19.0 (19)	52.6	18.7 (14)	28.6	18.9 (53)	43.4	20.1	18.0	19.9
Woodstock	19.2 (87)	48.3	19.2 (19)	57.9	19.1 (14)	42.9	19.2 (54)	46.3	19.8	18.7	20.2
AVERAGE	18.9	47.6	19.0	56.9	18.8	39.3	18.9	46.2	19.7	18.3	19.6

TABLE K-11

Average Annual Precipitation (mm) and Percent of Years with Precipitation Less than Average for All/El Niño/La Niña and Neutral (Non-ENSO) Analysis Years (1970-1999)

STATION	**All Avg (# yrs)**	**% yrs <Avg**	**Niño Avg (# yrs)**	**% yrs <Avg**	**Niña Avg (# yrs)**	**% yrs <Avg**	**Neut Avg (# yrs)**	**% yrs <Avg**	**1930-39 Avg**	**1961-66 Avg**	**1998-99 Avg**
Brantford	876.7 (26)	38.5	813.8 (7)	71.4	822.3 (5)	60.0	927.5 (14)	14.3	804.7	750.9	608.1
Delhi/Simcoe	996.2 (27)	40.7	921.7 (7)	71.4	987.1 (5)	40.0	1033.9 (15)	26.7	848.9	787.4	N/A
Fergus Shand Dam	933.5 (27)	44.4	908.0 (7)	42.9	951.7 (5)	40.0	939.4 (15)	46.7	N/A	841.2	698.4
Georgetown	874.0 (26)	50.0	849.0 (7)	57.1	859.0 (6)	50.0	894.4 (13)	46.2	693.3	767.0	741.3
Guelph	912.5 (22)	45.5	895.0 (6)	50.0	892.4 (3)	33.3	925.2 (13)	46.2	788.6	723.7	N/A
Kitchener/Waterloo	901.7 (30)	50.0	865.6 (8)	62.5	871.7 (6)	50.0	930.9 (16)	43.7	691.1	774.7	675.4
Mt. Forest/Redickville	961.7 (26)	57.7	931.7 (7)	57.1	938.6 (5)	80.0	984.9 (14)	50.0	776.2	829.8	836.0
Stratford	1059.9 (29)	41.4	1028.5 (7)	71.4	1011.3 (6)	50.0	1091.9 (16)	25.0	915.1	847.6	809.9
Woodstock	949.3 (28)	35.7	896.8 (8)	62.5	839.3 (6)	66.7	1026.3 (14)	7.1	811.3	882.5	645.5
AVERAGE	940.6	44.9	901.1	60.7	908.2	52.2	972.7	34.0	791.2	800.5	716.4

TABLE K-12

Average Autumn (Sep/Oct/Nov) Precipitation (mm) and Percent of Years with Precipitation Less than Average for All/El Niño/La Niña and Neutral (Non-ENSO) Analysis Years (1970-1999)

STATION	**All Avg (# yrs)**	**% yrs <Avg**	**Niño Avg (# yrs)**	**% yrs <Avg**	**Niña Avg (# yrs)**	**% yrs <Avg**	**Neut Avg (# yrs)**	**% yrs <Avg**	**1930-39 Avg**	**1961-66 Avg**	**1998-99 Avg**
Brantford	232.0 (30)	50.0	199.0 (8)	75.0	236.1 (6)	33.3	247.0 (16)	43.7	199.7	161.8	131.9
Delhi/Simcoe	277.0 (27)	51.9	238.5 (7)	71.4	301.9 (5)	20.0	286.7 (15)	53.3	203.9	166.4	N/A
Fergus Shand Dam	253.4 (29)	55.2	245.6 (8)	62.5	247.9 (6)	66.7	259.7 (15)	46.7	N/A	197.7	145.0
Georgetown	230.0 (30)	43.3	218.9 (8)	62.5	226.6 (6)	33.3	236.8 (16)	37.5	169.6	178.3	126.7
Guelph	242.4 (25)	52.0	240.5 (7)	57.1	247.7 (4)	25.0	241.9 (14)	57.1	198.7	174.0	N/A
Kitchener/Waterloo	234.2 (30)	50.0	212.4 (8)	75.0	232.8 (6)	33.3	245.6 (16)	43.7	175.3	169.9	133.0
Mt. Forest/Redickville	280.0 (29)	48.3	287.2 (8)	50.0	239.2 (5)	60.0	289.2 (16)	43.7	213.0	201.3	192.8
Stratford	289.5 (30)	46.7	267.5 (8)	75.0	275.0 (6)	33.3	305.9 (16)	37.5	232.8	190.2	196.8
Woodstock	258.0 (29)	44.8	223.0 (8)	75.0	221.9 (6)	50.0	291.1 (15)	26.7	218.0	170.5	148.5
AVERAGE	255.2	49.1	237.0	67.1	247.7	39.4	267.1	43.3	201.4	178.9	153.5

TABLE K-13

Average Winter (Dec/Jan/Feb) Precipitation (mm) and Percent of Years with Precipitation Less than Average for All/El Niño/La Niña and Neutral (Non-ENSO) Analysis Years (1970-1999)

STATION	All Avg (# yrs)	% yrs <Avg	Niño Avg (# yrs)	% yrs <Avg	Niña Avg (# yrs)	% yrs <Avg	Neut Avg (# yrs)	% yrs <Avg	1930-39 Avg	1961-66 Avg	1998-99 Avg
Brantford	183.3 (29)	51.7	168.3 (14)	71.4	197.0 (10)	40.0	193.5 (41)	41.5	218.4	165.1	140.6
Delhi/Simcoe	217.4 (27)	48.1	205.5 (15)	66.7	231.6 (10)	40.0	224.8 (42)	47.6	249.0	163.0	N/A
Fergus Shand Dam	195.5 (30)	60.0	177.8 (14)	64.3	215.6 (10)	40.0	207.8 (33)	45.5	N/A	194.4	188.8
Georgetown	196.5 (29)	48.3	165.5 (14)	78.6	199.9 (10)	40.0	189.5 (36)	58.3	179.8	153.1	227.0
Guelph	184.7 (22)	45.5	167.0 (14)	64.3	190.4 (8)	37.5	189.2 (40)	50.0	198.8	151.7	N/A
Kitchener/Waterloo	188.8 (30)	53.3	163.8 (16)	62.5	205.2 (11)	36.4	192.5 (42)	59.5	181.7	181.8	206.0
Mt. Forest/Redickville	211.4 (28)	53.6	177.0 (7)	85.7	249.4 (6)	0.0	212.3 (15)	60.0	212.4	194.2	249.9
Stratford	282.3 (29)	51.7	244.3 (15)	86.7	286.7 (11)	54.5	270.7 (43)	55.8	245.3	221.4	272.4
Woodstock	193.1 (29)	48.3	168.9 (16)	75.0	196.9 (11)	63.6	207.0 (39)	41.0	205.3	200.2	189.1
AVERAGE	205.9	51.2	181.2	72.9	217.3	34.4	213.3	47.2	211.3	180.6	210.5

TABLE K-14

Average Spring (Mar/Apr/May) Precipitation (mm) and Percent of Years with Precipitation Less than Average
for All/El Niño/La Niña and Neutral (Non-ENSO) Analysis Years (1970-1999)

STATION	**All Avg (# yrs)**	**% yrs <Avg**	**Niño Avg (# yrs)**	**% yrs <Avg**	**Niña Avg (# yrs)**	**% yrs <Avg**	**Neut Avg (# yrs)**	**% yrs <Avg**	**1930-39 Avg**	**1961-66 Avg**	**1998-99 Avg**
Brantford	217.7 (27)	55.6	209.4 (8)	75.0	208.6 (5)	60.0	225.7 (14)	42.9	199.0	196.2	169.1
Delhi/Simcoe	248.0 (27)	51.9	227.7 (7)	71.4	251.3 (5)	40.0	256.4 (15)	46.7	208.7	219.7	N/A
Fergus Shand Dam	229.4 (28)	46.4	228.4 (7)	42.9	251.8 (5)	40.0	222.8 (16)	50.0	N/A	212.9	149.9
Georgetown	212.9 (26)	50.0	220.0 (7)	42.9	206.8 (6)	50.0	211.8 (13)	53.8	165.0	172.1	182.0
Guelph	220.9 (22)	59.1	218.0 (6)	50.0	213.7 (3)	33.3	223.8 (13)	69.2	176.5	180.8	N/A
Kitchener/Waterloo	222.1 (30)	50.0	223.4 (8)	62.5	216.0 (6)	50.0	223.7 (16)	43.7	149.6	184.2	153.2
Mt. Forest/Redickville	226.7 (28)	50.0	197.4 (7)	71.4	247.6 (6)	33.3	231.9 (15)	46.7	162.1	196.7	179.1
Stratford	243.7 (30)	50.0	248.3 (8)	37.5	242.5 (6)	50.0	241.8 (16)	56.2	210.3	182.9	162.8
Woodstock	231.8 (30)	50.0	229.5 (8)	62.5	215.1 (6)	50.0	239.2 (16)	43.7	197.5	216.5	162.1
AVERAGE	228.1	51.4	222.5	57.3	228.2	45.2	230.8	50.3	183.6	195.8	165.5

TABLE K-15

Average Summer (Jun/Jul/Aug) Precipitation (mm) and Percent of Years with Precipitation Less than Average
for All/El Niño/La Niña and Neutral (Non-ENSO) Analysis Years (1970-1999)

STATION	All Avg (# yrs)	% yrs <Avg	Niño Avg (# yrs)	% yrs <Avg	Niña Avg (# yrs)	% yrs <Avg	Neut Avg (# yrs)	% yrs <Avg	1930-39 Avg	1961-66 Avg	1998-99 Avg
Brantford	241.9 (30)	46.7	232.0 (8)	50.0	212.0 (6)	83.3	258.1 (16)	31.2	187.7	227.7	166.5
Delhi/Simcoe	253.7 (27)	55.6	257.5 (7)	57.1	216.4 (5)	80.0	264.4 (15)	46.7	187.3	238.2	N/A
Fergus Shand Dam	257.9 (29)	48.3	252.2 (8)	50.0	251.7 (5)	60.0	262.7 (16)	43.7	N/A	214.6	214.7
Georgetown	238.2 (28)	57.1	229.1 (7)	57.1	220.6 (6)	66.7	249.5 (15)	53.3	178.9	251.0	205.6
Guelph	257.8 (23)	56.5	263.1 (6)	50.0	245.3 (3)	66.7	258.1 (14)	57.1	214.5	217.3	N/A
Kitchener/Waterloo	256.6 (30)	56.7	268.7 (8)	50.0	209.6 (6)	83.3	268.3 (16)	50.0	200.1	238.8	183.2
Mt. Forest/Redickville	256.9 (30)	60.0	269.2 (8)	50.0	230.1 (6)	66.7	260.7 (16)	62.5	168.2	236.6	214.2
Stratford	246.3 (30)	63.3	271.6 (8)	62.5	194.9 (6)	83.3	252.9 (16)	56.2	226.7	253.1	177.9
Woodstock	264.7 (30)	43.3	278.3 (8)	50.0	217.7 (6)	50.0	275.5 (16)	37.5	190.5	298.7	145.8
AVERAGE	252.7	54.2	258.0	53.0	222.0	71.1	261.1	48.7	194.2	241.8	186.9

TABLE K-16

Average Annual Mean Temperature (Degrees Celsius) and Percent of Years with Mean Temperature Greater than Average for All/El Niño/La Niña and Neutral (Non-ENSO) Analysis Years (1970-1999)

STATION	All Avg (# yrs)	% yrs >Avg	Niño Avg (# yrs)	% yrs >Avg	Niña Avg (# yrs)	% yrs >Avg	Neut Avg (# yrs)	% yrs >Avg	1930-39 Avg	1961-66 Avg	1998-99 Avg
Brantford	8.1 (24)	45.8	8.3 (8)	62.5	8.3 (5)	60.0	7.7 (11)	27.3	8.2	7.8	9.2
Delhi/Simcoe	7.8 (28)	50.0	8.1 (7)	57.1	7.7 (5)	40.0	7.7 (16)	50.0	8.4	7.4	N/A
Fergus Shand Dam	6.2 (28)	50.0	6.5 (8)	62.5	6.4 (5)	40.0	6.0 (15)	46.7	N/A	5.0	8.1
Georgetown	6.8 (18)	44.4	7.2 (4)	75.0	6.8 (3)	66.7	6.6 (11)	27.3	6.8	6.4	7.4
Guelph	6.5 (23)	52.2	6.7 (6)	50.0	6.4 (3)	66.7	6.4 (14)	50.0	6.9	6.3	N/A
Kitchener/Waterloo	6.7 (29)	48.3	7.2 (8)	75.0	6.9 (6)	50.0	6.4 (15)	33.3	7.5	7.1	8.3
Mt. Forest/Redickville	5.5 (30)	50.0	5.9 (8)	62.5	5.6 (6)	50.0	5.2 (16)	43.7	5.9	5.0	7.5
Stratford	6.9 (29)	44.8	7.3 (7)	71.4	7.0 (6)	33.3	6.7 (16)	37.5	7.4	6.4	8.8
Woodstock	7.5 (28)	50.0	7.9 (8)	62.5	7.5 (6)	50.0	7.2 (14)	42.9	7.4	7.1	9.0
AVERAGE	6.9	48.4	7.2	64.3	7.0	50.7	6.7	39.9	7.3	6.5	8.3

TABLE K-17

Average Autumn (Sep/Oct/Nov) Mean Temperature (Degrees Celsius) and Percent of Years with Mean Temperature Greater than Average for All/El Niño/La Niña and Neutral (Non-ENSO) Analysis Years (1970-1999)

STATION	**All Avg (# yrs)**	**% yrs >Avg**	**Niño Avg (# yrs)**	**% yrs >Avg**	**Niña Avg (# yrs)**	**% yrs >Avg**	**Neut Avg (# yrs)**	**% yrs >Avg**	**1930-39 Avg**	**1961-66 Avg**	**1998-99 Avg**
Brantford	9.7 (28)	46.4	9.2 (8)	37.5	10.3 (6)	66.7	9.6 (14)	42.9	9.7	10.3	9.8
Delhi/Simcoe	9.5 (29)	44.8	9.2 (8)	50.0	10.1 (5)	60.0	9.5 (16)	37.5	10.1	10.2	8.9
Fergus Shand Dam	7.9 (29)	48.3	7.6 (8)	37.5	8.6 (6)	66.7	7.8 (15)	46.7	N/A	8.1	8.9
Georgetown	8.2 (20)	45.0	8.4 (5)	60.0	8.5 (3)	33.3	8.1 (12)	41.7	8.4	9.1	8.9
Guelph	8.3 (25)	56.0	8.0 (7)	57.1	9.0 (4)	75.0	8.3 (14)	50.0	8.7	9.1	N/A
Kitchener/Waterloo	8.4 (29)	41.4	8.1 (8)	37.5	9.1 (6)	66.7	8.2 (15)	33.3	9.0	9.8	9.0
Mt. Forest/Redickville	7.5 (30)	50.0	7.3 (8)	50.0	8.1 (6)	66.7	7.3 (16)	43.7	7.8	8.1	8.3
Stratford	8.7 (30)	46.7	8.4 (8)	50.0	9.4 (6)	66.7	8.5 (16)	37.5	9.2	9.4	9.6
Woodstock	9.2 (29)	48.3	9.0 (8)	50.0	9.8 (6)	66.7	9.0 (15)	40.0	9.1	9.9	9.9
AVERAGE	8.6	47.4	8.4	47.7	9.2	63.1	8.5	41.5	9.0	9.3	9.2

TABLE K-18

Average Winter (Dec/Jan/Feb) Mean Temperature (Degrees Celsius) and Percent of Years with Mean Temperature Greater than Average for All/El Niño/La Niña and Neutral (Non-ENSO) Analysis Years (1970-1999)

STATION	All Avg (# yrs)	% yrs >Avg	Niño Avg (# yrs)	% yrs >Avg	Niña Avg (# yrs)	% yrs >Avg	Neut Avg (# yrs)	% yrs >Avg	1930-39 Avg	1961-66 Avg	1998-99 Avg
Brantford	-4.5 (28)	53.6	-3.8 (8)	75.0	-4.2 (6)	50.0	-5.0 (14)	42.9	-4.0	-5.1	-2.1
Delhi/Simcoe	-4.4 (30)	53.3	-3.8 (8)	75.0	-4.3 (6)	50.0	-4.7 (16)	43.7	-3.5	-5.6	-1.6
Fergus Shand Dam	-6.7 (30)	56.7	-6.1 (8)	75.0	-6.6 (6)	33.3	-7.0 (16)	56.2	N/A	-8.3	-3.4
Georgetown	-5.1 (20)	50.0	-3.5 (5)	100.0	-5.0 (3)	66.7	-5.8 (12)	25.0	-5.7	-7.1	-3.1
Guelph	-6.2 (24)	54.2	-5.7 (7)	71.4	-6.1 (3)	33.3	-6.5 (14)	50.0	-5.3	-6.9	N/A
Kitchener/Waterloo	-5.8 (30)	56.7	-5.1 (8)	75.0	-5.7 (6)	33.3	-6.2 (16)	56.2	-4.8	-6.3	-2.9
Mt. Forest/Redickville	-7.1 (30)	50.0	-6.4 (8)	75.0	-7.0 (6)	16.7	-7.6 (16)	50.0	-6.4	-7.9	-3.8
Stratford	-5.5 (29)	55.2	-5.0 (7)	71.4	-5.4 (6)	33.3	-5.8 (16)	56.2	-5.1	-6.8	-2.2
Woodstock	-5.0 (29)	51.7	-4.3 (8)	75.0	-4.8 (6)	33.3	-5.5 (15)	46.7	-4.7	-5.9	-2.0
AVERAGE	-5.6	53.5	-4.8	77.0	-5.5	38.9	-6.0	47.4	-4.9	-6.7	-2.6

TABLE K-19

Average Spring (Mar/Apr/May) Mean Temperature (Degrees Celsius) and Percent of Years with Mean Temperature Greater than Average for All/El Niño/La Niña and Neutral (Non-ENSO) Analysis Years (1970-1999)

STATION	All Avg (# yrs)	% yrs >Avg	Niño Avg (# yrs)	% yrs >Avg	Niña Avg (# yrs)	% yrs >Avg	Neut Avg (# yrs)	% yrs >Avg	1930-39 Avg	1961-66 Avg	1998-99 Avg
Brantford	6.9 (27)	44.4	7.5 (8)	50.0	6.5 (5)	40.0	6.6 (14)	42.9	6.3	6.5	8.4
Delhi/Simcoe	6.7 (30)	46.7	7.4 (8)	62.5	6.0 (6)	33.3	6.6 (16)	43.7	6.6	6.2	8.2
Fergus Shand Dam	5.0 (29)	41.4	5.7 (8)	50.0	4.5 (5)	20.0	4.8 (16)	43.7	N/A	3.9	7.3
Georgetown	5.5 (18)	44.4	5.5 (4)	25.0	4.8 (3)	33.3	5.7 (11)	54.5	5.0	5.2	5.7
Guelph	5.5 (24)	37.5	5.9 (7)	42.9	4.6 (3)	33.3	5.4 (14)	35.7	5.1	5.0	N/A
Kitchener/Waterloo	5.7 (29)	44.8	6.5 (8)	75.0	5.1 (6)	33.3	5.5 (15)	33.3	5.7	5.8	7.4
Mt. Forest/Redickville	4.3 (30)	40.0	5.1 (8)	50.0	3.7 (6)	33.3	4.1 (16)	37.5	4.0	3.7	6.7
Stratford	5.7 (30)	36.7	6.4 (8)	50.0	5.1 (6)	33.3	5.5 (16)	31.2	5.5	5.0	7.8
Woodstock	6.3 (30)	36.7	7.1 (8)	50.0	5.7 (6)	33.3	6.1 (16)	31.2	5.6	6.0	8.0
AVERAGE	5.7	41.4	6.4	50.6	5.1	32.6	5.6	39.3	5.5	5.3	7.4

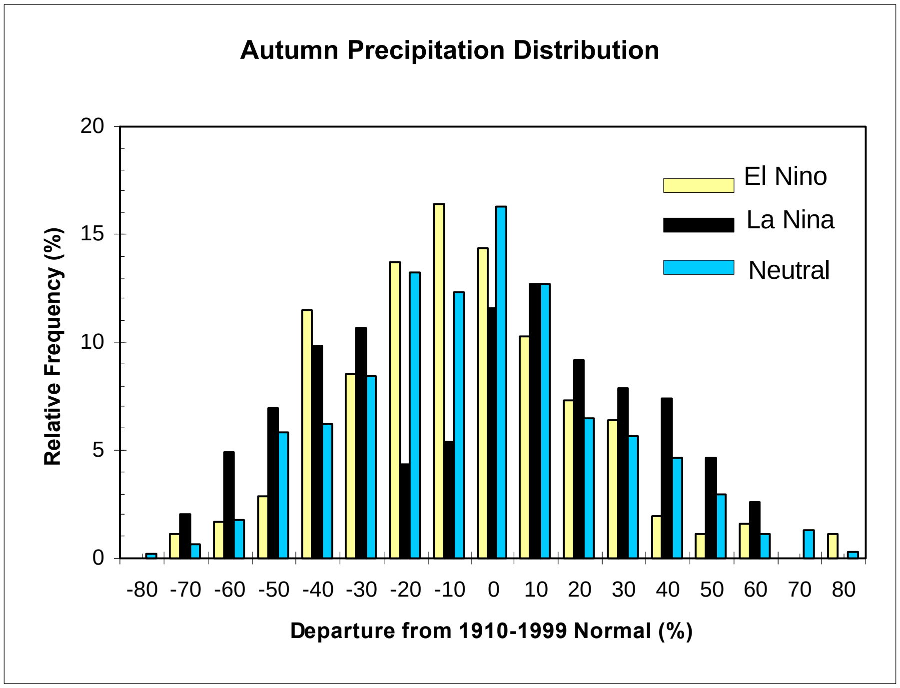
TABLE K-20

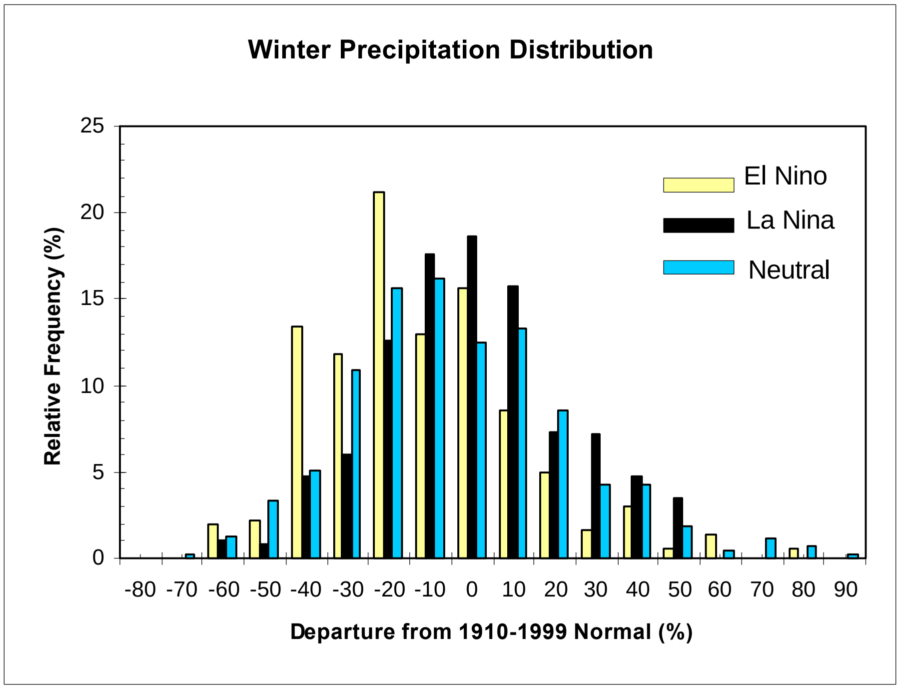
Average Summer (Jun/Jul/Aug) Mean Temperature (Degrees Celsius) and Percent of Years with Mean Temperature Greater than Average for All/El Niño/La Niña and Neutral (Non-ENSO) Analysis Years (1970-1999)

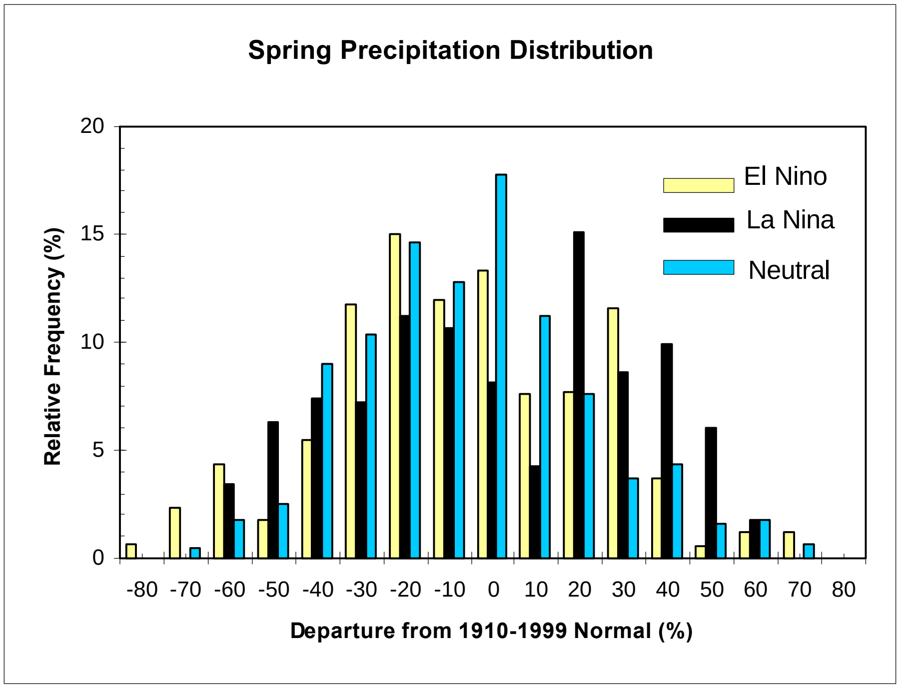
STATION	All Avg (# yrs)	% yrs >Avg	Niño Avg (# yrs)	% yrs >Avg	Niña Avg (# yrs)	% yrs >Avg	Neut Avg (# yrs)	% yrs >Avg	1930-39 Avg	1961-66 Avg	1998-99 Avg
Brantford	20.0 (27)	51.9	20.3 (8)	75.0	20.1 (5)	40.0	19.8 (14)	42.9	20.6	19.4	20.8
Delhi/Simcoe	19.7 (28)	50.0	20.1 (7)	71.4	19.7 (5)	40.0	19.5 (16)	43.7	20.5	19.1	N/A
Fergus Shand Dam	18.5 (29)	48.3	18.8 (8)	62.5	18.7 (5)	60.0	18.4 (16)	37.5	N/A	17.5	19.4
Georgetown	18.5 (20)	60.0	18.7 (5)	80.0	18.8 (3)	66.7	18.4 (12)	50.0	19.1	18.4	18.8
Guelph	18.4 (24)	41.7	18.7 (6)	66.7	18.4 (3)	33.3	18.3 (15)	33.3	19.3	18.0	N/A
Kitchener/Waterloo	18.7 (30)	53.3	19.1 (8)	75.0	19.0 (6)	66.7	18.4 (16)	37.5	19.9	19.1	19.6
Mt. Forest/Redickville	17.5 (30)	43.3	17.9 (8)	75.0	17.7 (6)	50.0	17.2 (16)	25.0	18.3	16.7	18.7
Stratford	18.7 (30)	50.0	19.0 (8)	75.0	18.8 (6)	50.0	18.4 (16)	37.5	20.1	18.0	19.9
Woodstock	19.4 (30)	50.0	19.8 (8)	75.0	19.5 (6)	50.0	19.1 (16)	37.5	19.8	18.7	20.2
AVERAGE	18.8	49.8	19.1	72.8	19.0	50.7	18.6	38.3	19.7	18.3	19.6

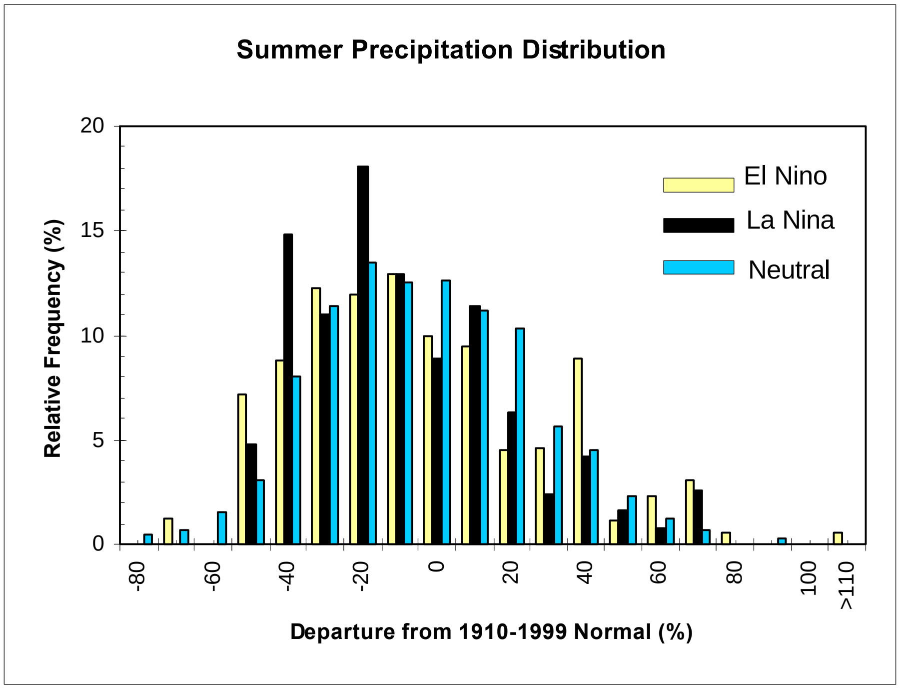
Appendix L

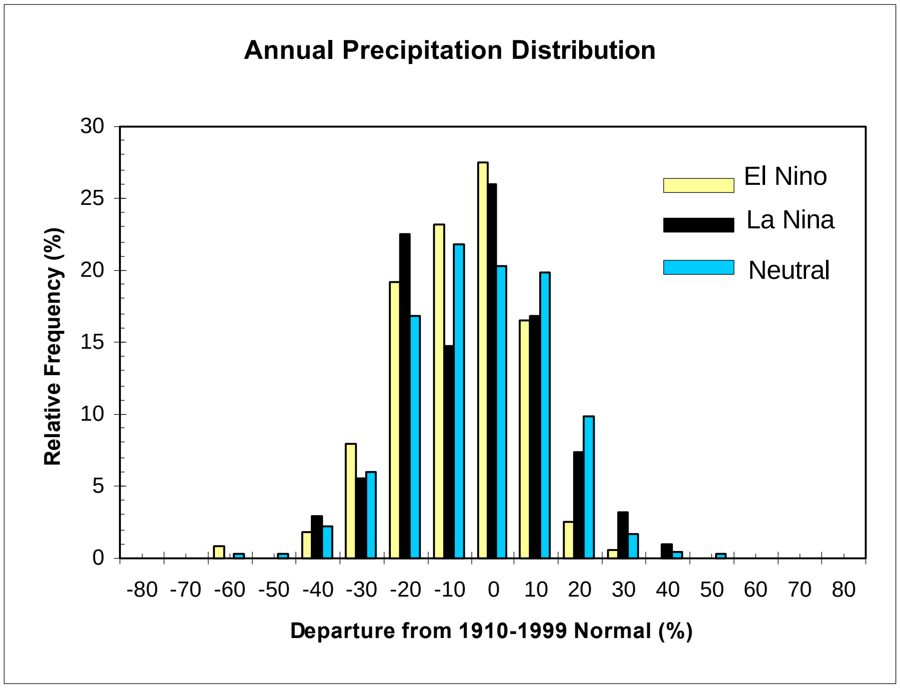
Graphs of Annual and Seasonal Precipitation and Mean Temperature ENSO Results

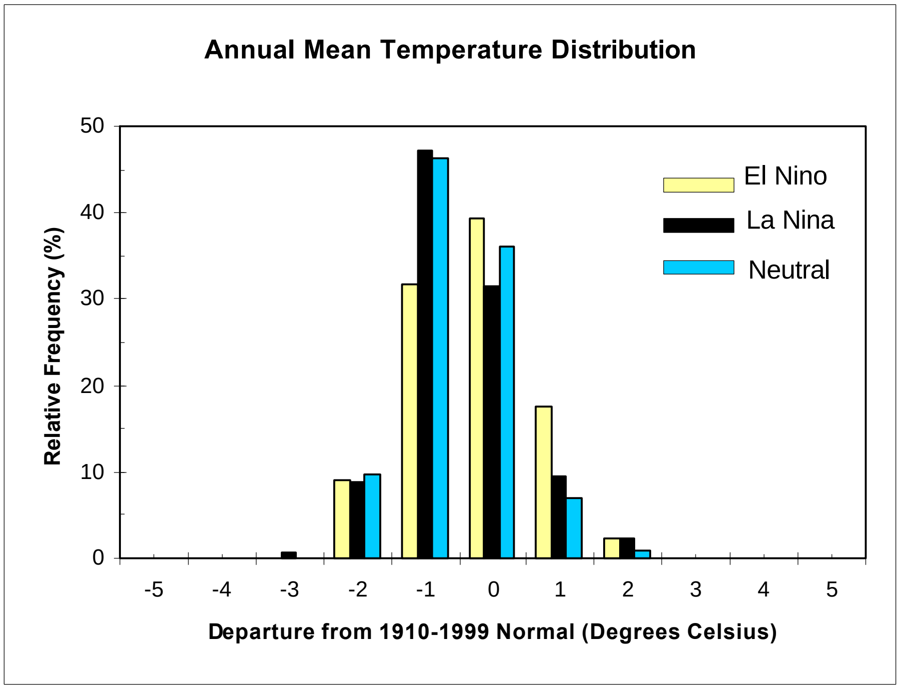

Autumn Precipitation Distribution
20
15
10
5
0
Relative Frequency (%)
El Nino
La Nina
Neutral
-80 -70 -60 -50 -40 -30 -20 -10 0 10 20 30 40 50 60 70 80
Departure from 1910-1999 Normal (%)

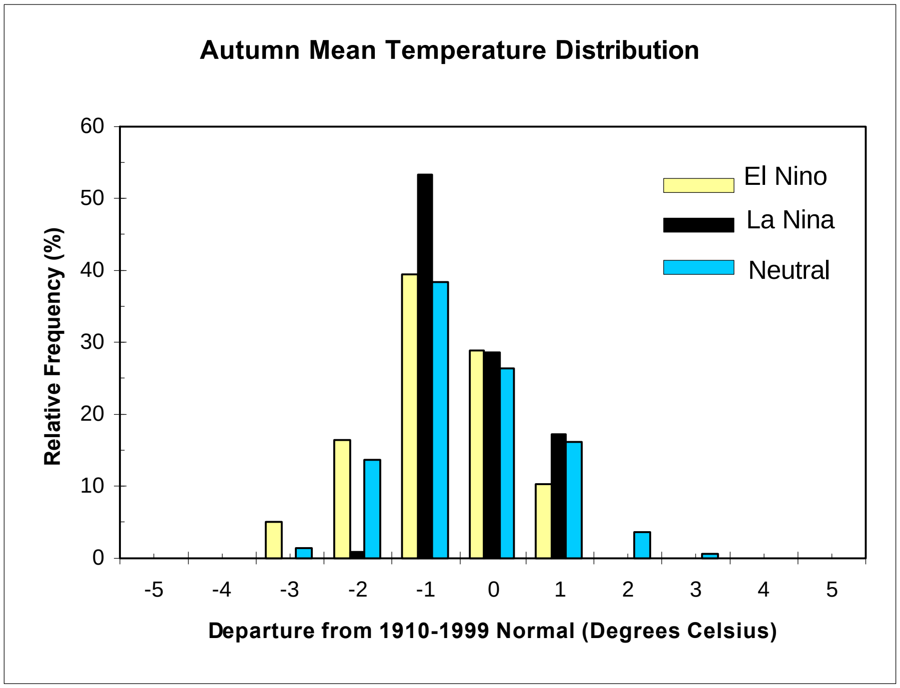

Winter Precipitation Distribution
25
20
15
10
5
0
Relative Frequency (%)
El Nino
La Nina
Neutral
-80 -70 -60 -50 -40 -30 -20 -10 0 10 20 30 40 50 60 70 80 90
Departure from 1910-1999 Normal (%)

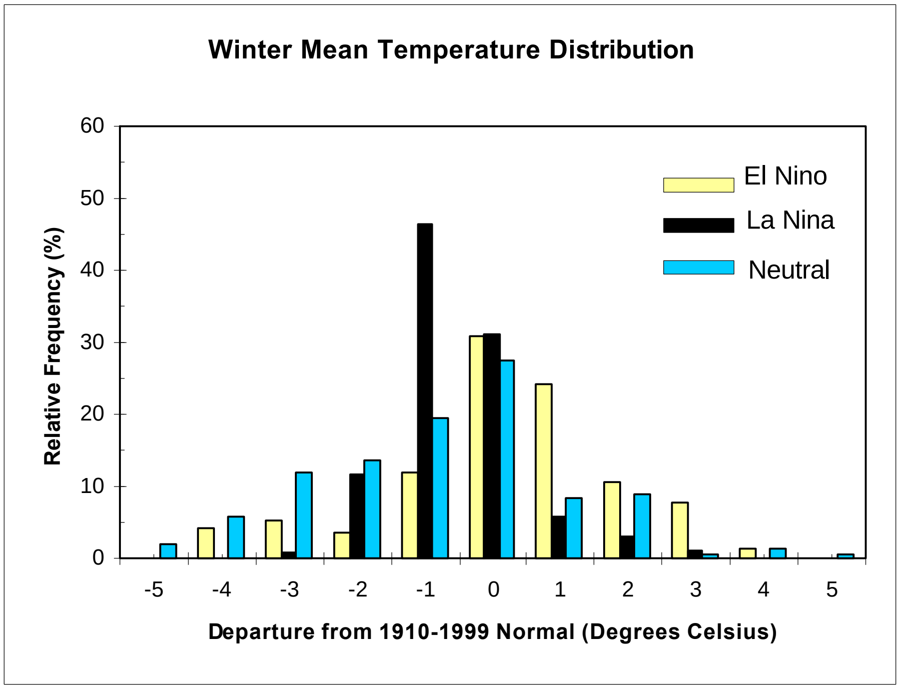

Spring Precipitation Distribution
Relative Frequency (%)
20
15
10
5
0
-80
-70
-60
-50
-40
-30
-20
-10
0
10
20
30
40
50
60
70
80
Departure from 1910-1999 Normal (%)
El Nino
La Nina
Neutral

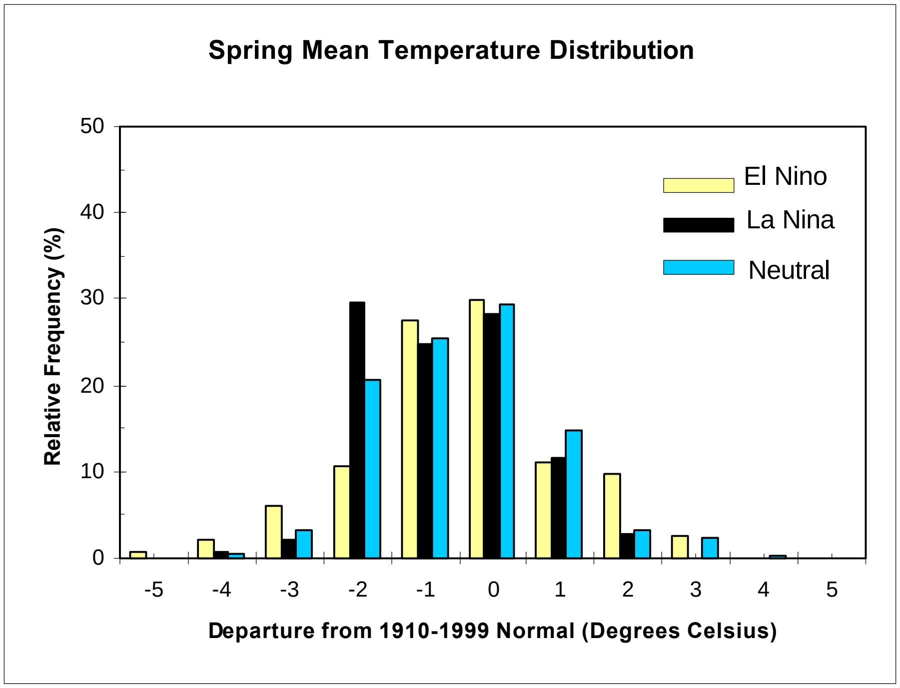

Summer Precipitation Distribution
Relative Frequency (%)
20
15
10
5
0
-80
-60
-40
-20
0
20
40
60
80
100
>110
Departure from 1910-1999 Normal (%)
El Nino
La Nina
Neutral

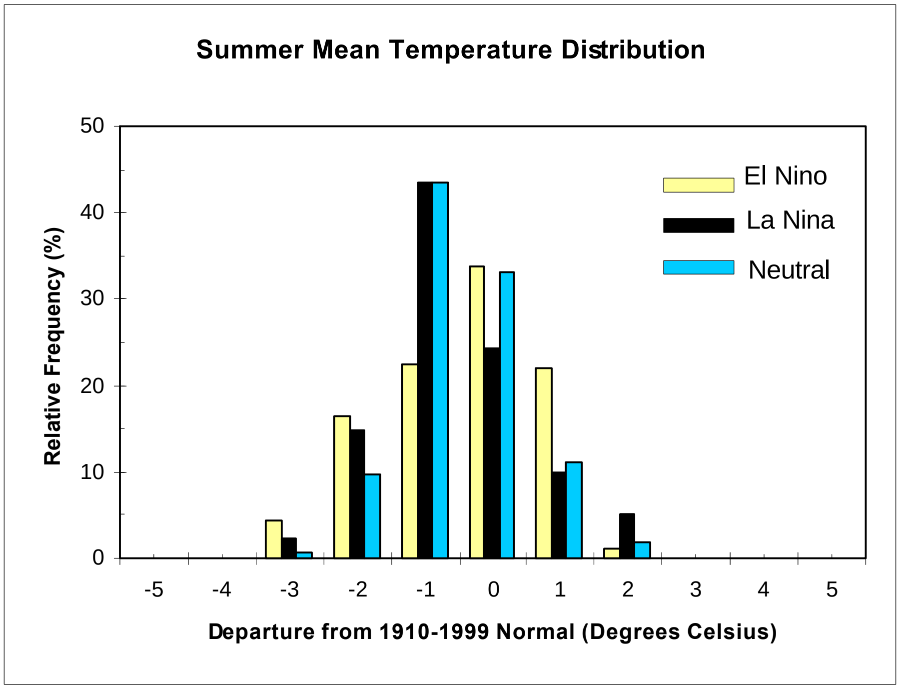

Annual Precipitation Distribution
Relative Frequency (%)
0
5
10
15
20
25
30
-80
-70
-60
-50
-40
-30
-20
-10
0
10
20
30
40
50
60
70
80
Departure from 1910-1999 Normal (%)
El Nino
La Nina
Neutral

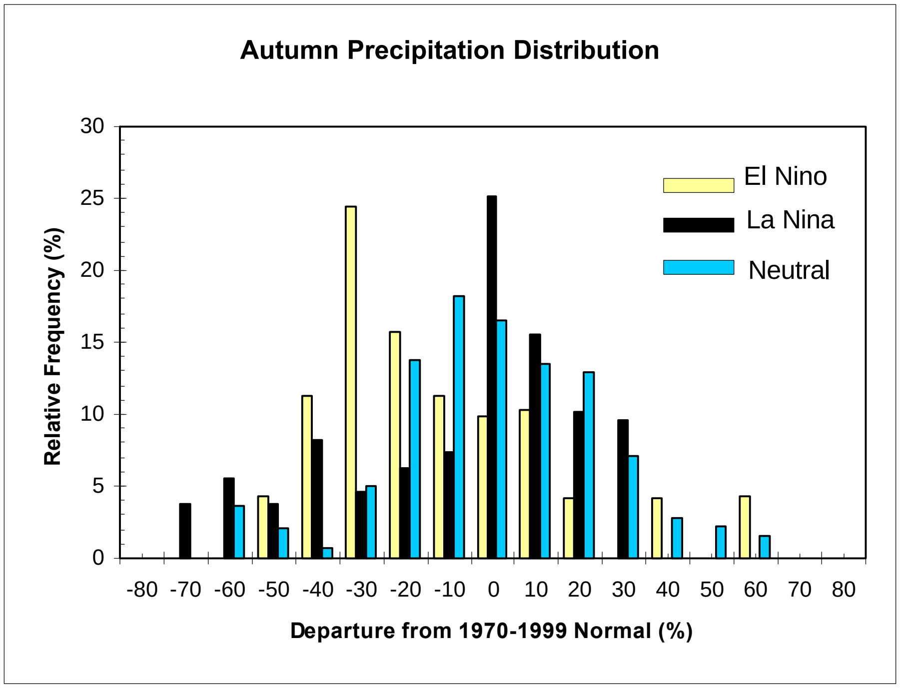

Annual Mean Temperature Distribution
Relative Frequency (%)
0
10
20
30
40
50
-5
-4
-3
-2
-1
0
1
2
3
4
5
Departure from 1910-1999 Normal (Degrees Celsius)
El Nino
La Nina
Neutral

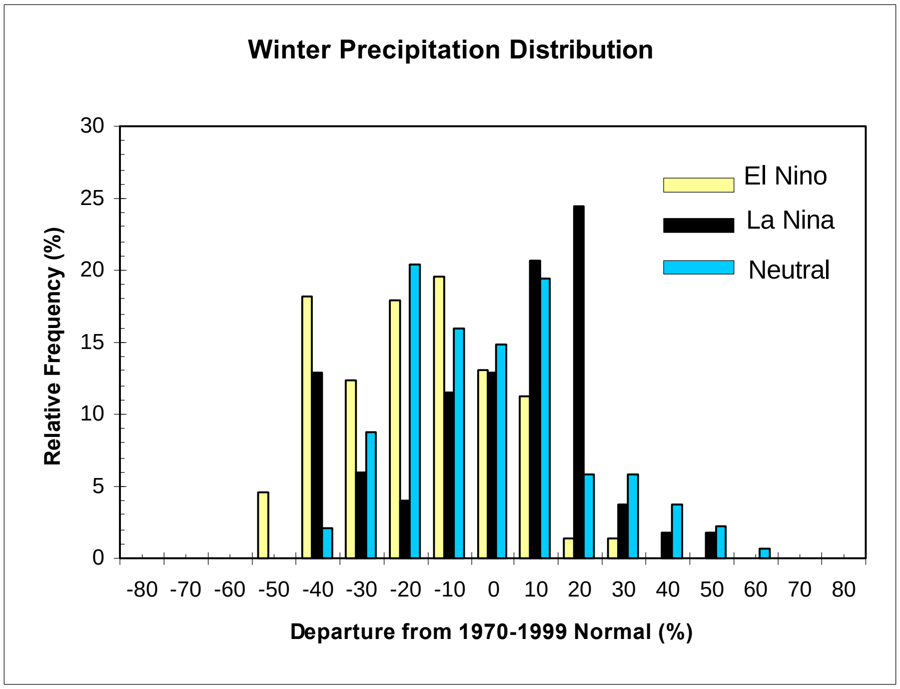

Autumn Mean Temperature Distribution
Relative Frequency (%)
60
50
40
30
20
10
0
-5
-4
-3
-2
-1
0
1
2
3
4
5
Departure from 1910-1999 Normal (Degrees Celsius)
El Nino
La Nina
Neutral

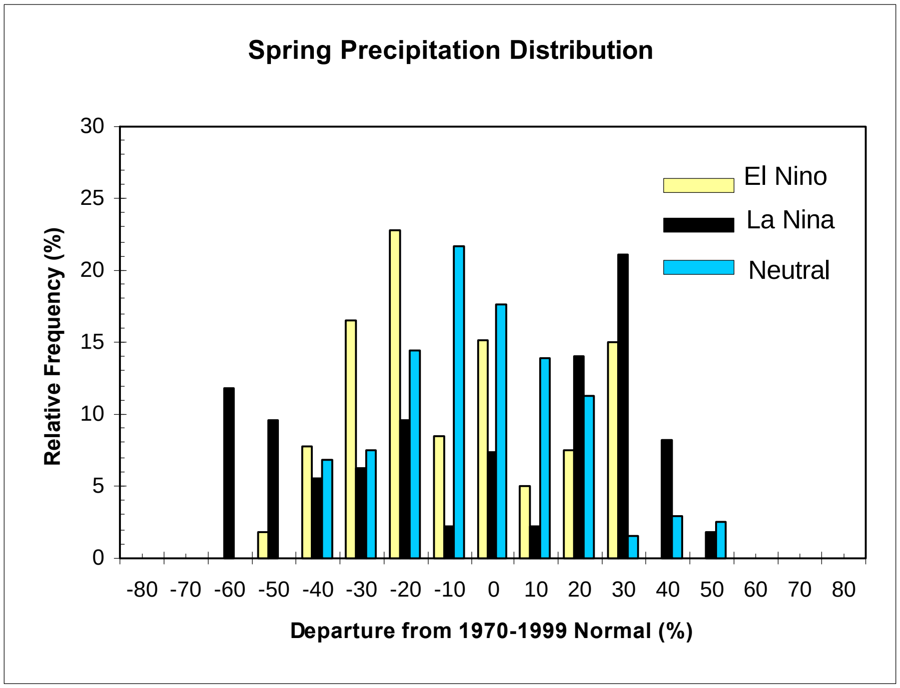

Winter Mean Temperature Distribution
Relative Frequency (%)
60
50
40
30
20
10
0
-5
-4
-3
-2
-1
0
1
2
3
4
5
Departure from 1910-1999 Normal (Degrees Celsius)
El Nino
La Nina
Neutral

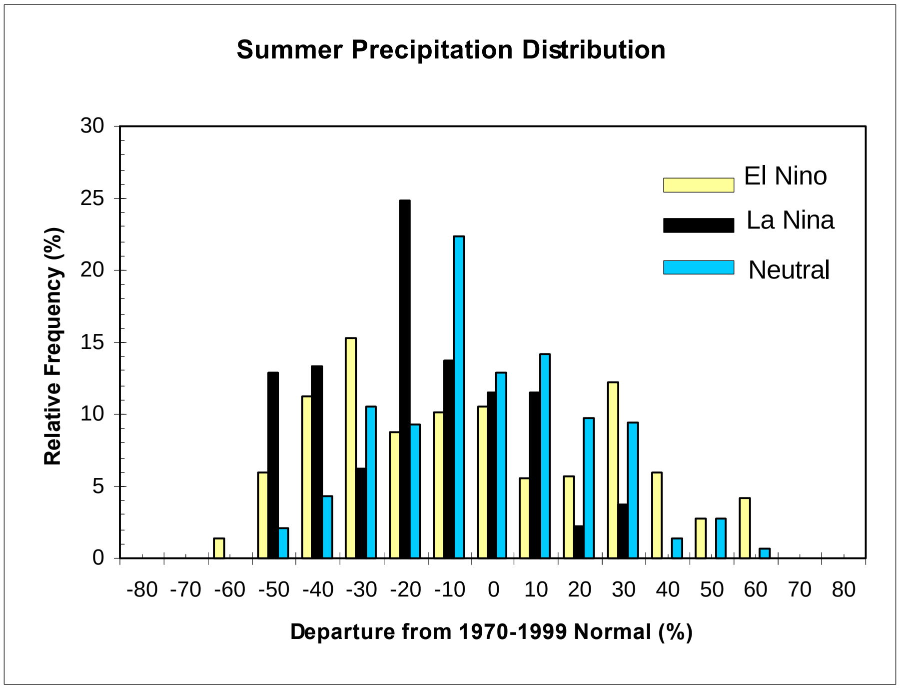

Spring Mean Temperature Distribution
Relative Frequency (%)
50
40
30
20
10
0
-5
-4
-3
-2
-1
0
1
2
3
4
5
Departure from 1910-1999 Normal (Degrees Celsius)
El Nino
La Nina
Neutral

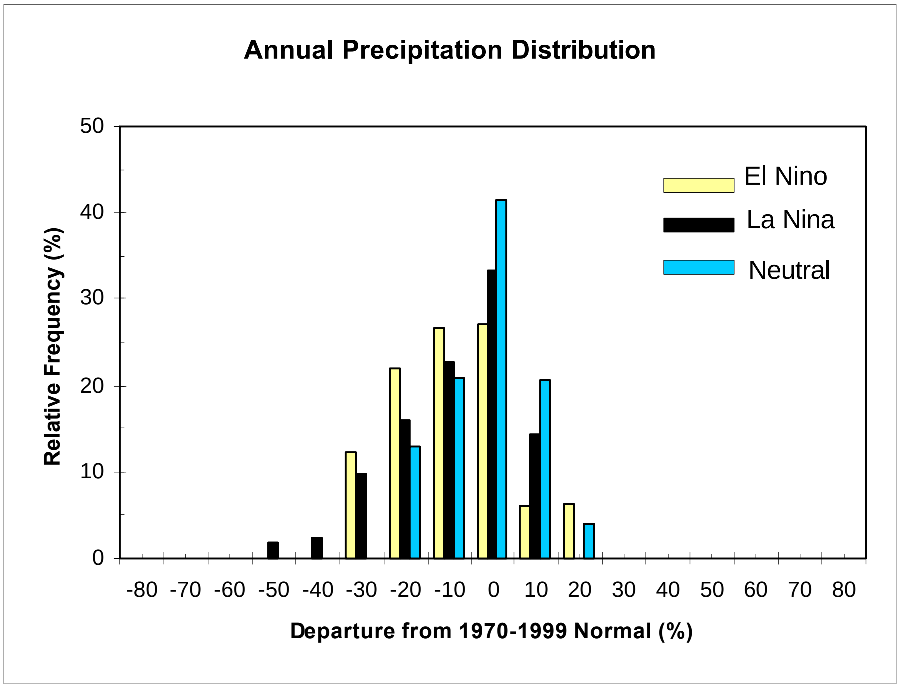

Summer Mean Temperature Distribution
Relative Frequency (%)
50
40
30
20
10
0
-5
-4
-3
-2
-1
0
1
2
3
4
5
Departure from 1910-1999 Normal (Degrees Celsius)
El Nino
La Nina
Neutral

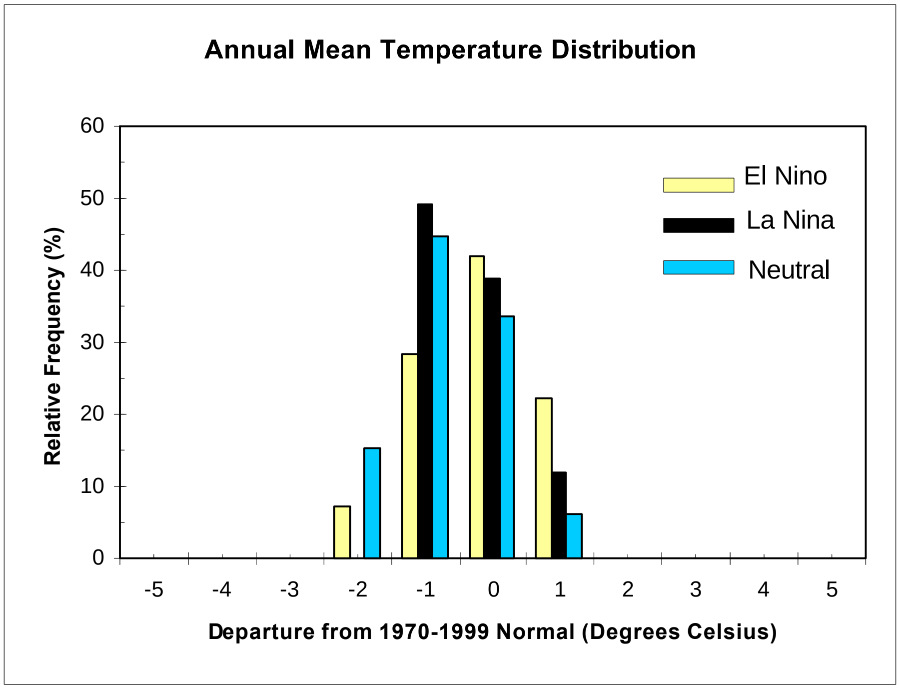

Autumn Precipitation Distribution
Relative Frequency (%)
30
25
20
15
10
5
0
-80 -70 -60 -50 -40 -30 -20 -10 0 10 20 30 40 50 60 70 80
Departure from 1970-1999 Normal (%)
El Nino
La Nina
Neutral

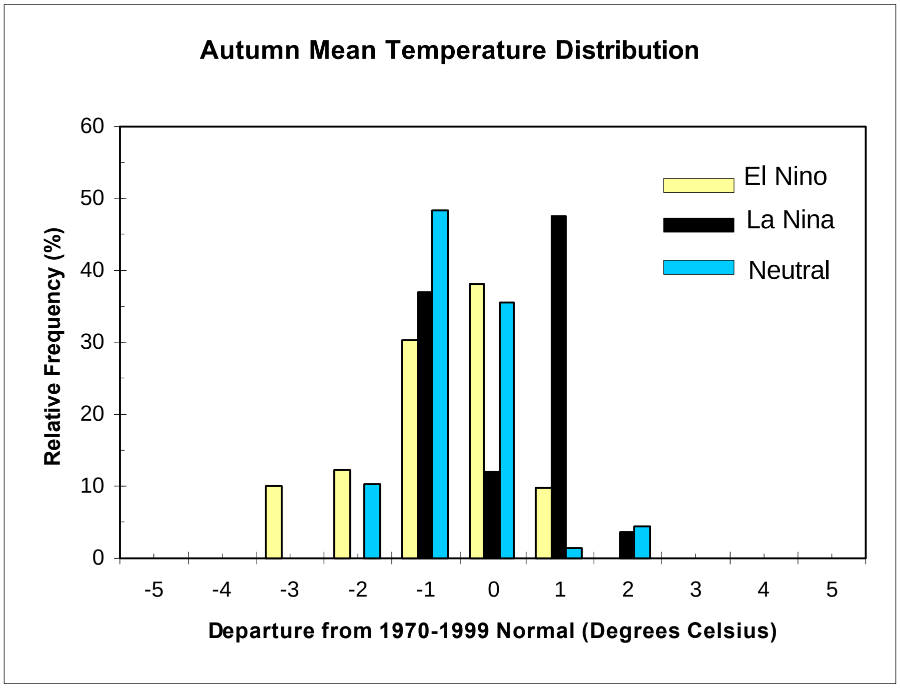

Winter Precipitation Distribution
Relative Frequency (%)
30
25
20
15
10
5
0
-80 -70 -60 -50 -40 -30 -20 -10 0 10 20 30 40 50 60 70 80
Departure from 1970-1999 Normal (%)
El Nino
La Nina
Neutral

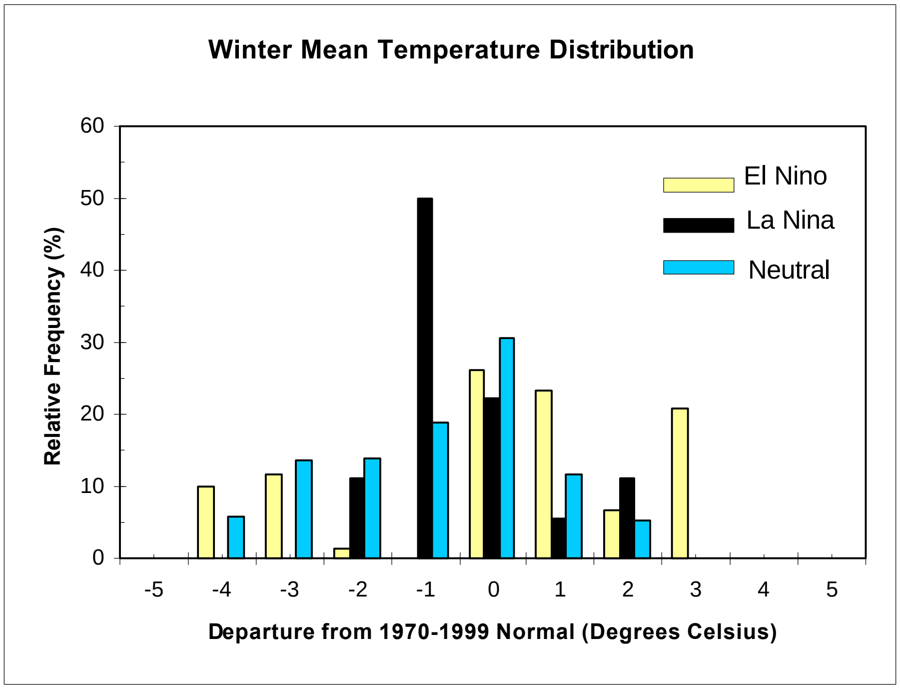

Spring Precipitation Distribution
Relative Frequency (%)
0
5
10
15
20
25
30
-80
-70
-60
-50
-40
-30
-20
-10
0
10
20
30
40
50
60
70
80
Departure from 1970-1999 Normal (%)
El Nino
La Nina
Neutral

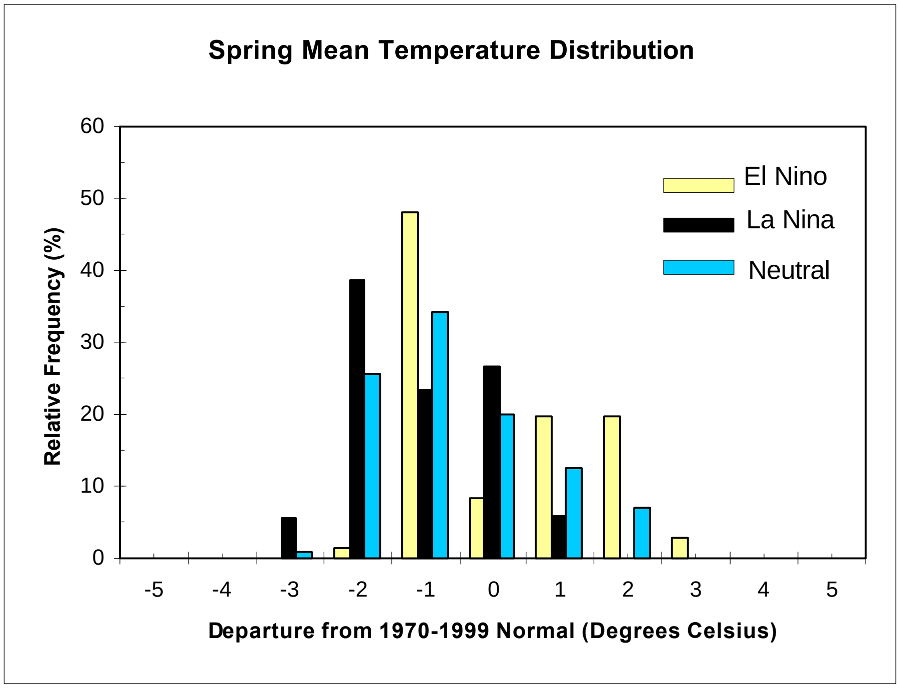

Summer Precipitation Distribution
Relative Frequency (%)
0
5
10
15
20
25
30
-80
-70
-60
-50
-40
-30
-20
-10
0
10
20
30
40
50
60
70
80
Departure from 1970-1999 Normal (%)
El Nino
La Nina
Neutral

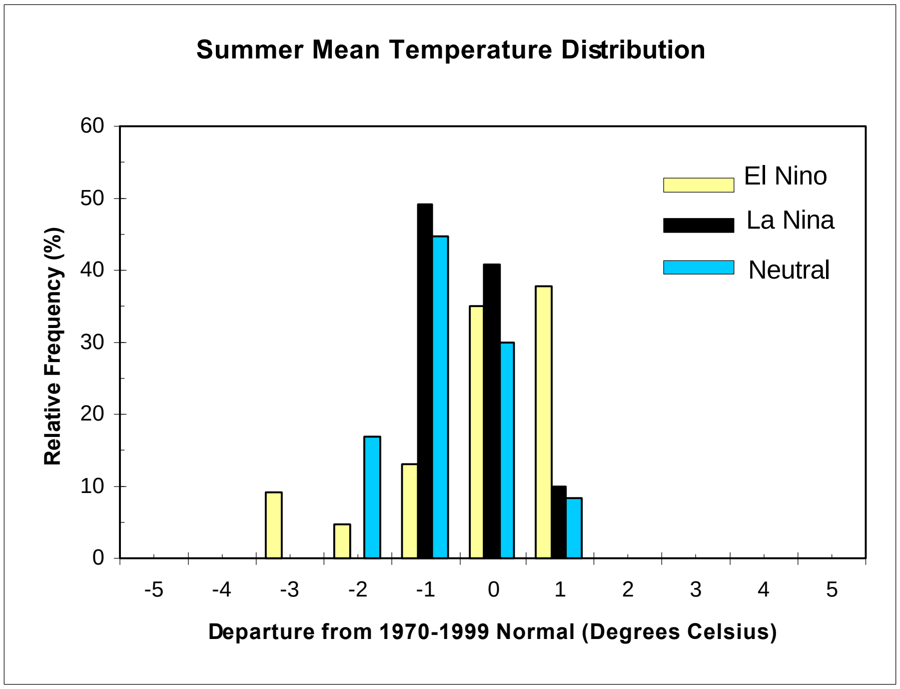

Annual Precipitation Distribution
El Nino
La Nina
Neutral
Relative Frequency (%)
0
10
20
30
40
50
-80
-70
-60
-50
-40
-30
-20
-10
0
10
20
30
40
50
60
70
80
Departure from 1970-1999 Normal (%)


Annual Mean Temperature Distribution
El Nino
La Nina
Neutral
Relative Frequency (%)
0
10
20
30
40
50
60
-5
-4
-3
-2
-1
0
1
2
3
4
5
Departure from 1970-1999 Normal (Degrees Celsius)


Autumn Mean Temperature Distribution
60
50
40
30
20
10
0
Relative Frequency (%)
El Nino
La Nina
Neutral
-5
-4
-3
-2
-1
0
1
2
3
4
5
Departure from 1970-1999 Normal (Degrees Celsius)


Winter Mean Temperature Distribution
60
50
40
30
20
10
0
Relative Frequency (%)
El Nino
La Nina
Neutral
-5
-4
-3
-2
-1
0
1
2
3
4
5
Departure from 1970-1999 Normal (Degrees Celsius)


Spring Mean Temperature Distribution
Relative Frequency (%)
0
10
20
30
40
50
60
-5
-4
-3
-2
-1
0
1
2
3
4
5
Departure from 1970-1999 Normal (Degrees Celsius)
El Nino
La Nina
Neutral


Summer Mean Temperature Distribution
Relative Frequency (%)
0
10
20
30
40
50
60
-5
-4
-3
-2
-1
0
1
2
3
4
5
Departure from 1970-1999 Normal (Degrees Celsius)
El Nino
La Nina
Neutral

Appendix M

Tables of Annual and Seasonal Precipitation and Mean Temperature NAO Results

TABLE M-1

Average Annual Precipitation (mm) and Percent of Years with Precipitation Less than Average
for All/High NAO (+) Winter Index/Low NAO (–) Winter Index and Neutral (Non-NAO) Index Analysis Years (1910-1999)

STATION	**All Avg (# yrs)**	**% yrs <Avg**	**+NAOAvg (# yrs)**	**% yrs <Avg**	**-NAO Avg (# yrs)**	**% yrs <Avg**	**Neut Avg (# yrs)**	**% yrs <Avg**	**1930-39 Avg**	**1961-66 Avg**	**1998-99 Avg**
Brantford	838.7 (74)	47.3	840.8 (27)	44.4	849.3 (21)	47.6	827.9 (26)	50.0	804.7	750.9	608.1
Delhi/Simcoe	949.6 (76)	50.0	968.4 (30)	46.7	943.2 (22)	54.5	932.0 (24)	50.0	848.9	787.4	N/A
Fergus Shand Dam	924.5 (47)	44.7	917.4 (19)	47.4	958.7 (14)	28.6	899.9 (14)	57.1	N/A	841.2	698.4
Georgetown	820.5 (72)	47.2	829.9 (30)	43.3	810.8 (17)	52.9	815.9 (25)	48.0	693.3	767.0	741.3
Guelph	845.8 (81)	50.6	843.1 (30)	60.0	855.2 (24)	41.7	840.4 (27)	48.1	788.6	723.7	N/A
Kitchener/Waterloo	867.6 (78)	52.6	841.9 (32)	62.5	909.9 (21)	38.1	864.9 (25)	52.0	691.1	774.7	675.4
Mt. Forest/Redickville	919.7 (63)	41.3	933.8 (23)	30.4	898.9 (19)	52.6	923.0 (21)	42.9	776.2	829.8	836.0
Stratford	1003.7 (83)	48.2	989.2 (32)	53.1	1034.7 (24)	37.5	993.4 (27)	51.9	915.1	847.6	809.9
Woodstock	880.4 (79)	54.4	875.9 (31)	51.6	914.6 (22)	45.5	856.9 (26)	65.4	811.3	882.5	645.5
AVERAGE	894.5	48.5	893.4	48.8	908.4	44.3	883.8	51.7	791.2	800.5	716.4

TABLE M-2

Average Autumn (Sep/Oct/Nov) Precipitation (mm) and Percent of Years with Precipitation Less than Average for All/High NAO (+) Winter Index/Low NAO (–) Winter Index and Neutral (Non-NAO) Index Analysis Years (1910-1999)

STATION	**All Avg (# yrs)**	**% yrs <Avg**	**+NAOAvg (# yrs)**	**% yrs <Avg**	**-NAO Avg (# yrs)**	**% yrs <Avg**	**Neut Avg (# yrs)**	**% yrs <Avg**	**1930-39 Avg**	**1961-66 Avg**	**1998-99 Avg**
Brantford	210.8 (84)	45.2	204.2 (33)	51.5	218.9 (24)	41.7	211.6 (27)	40.7	199.7	161.8	131.9
Delhi/Simcoe	244.8 (76)	55.3	235.2 (30)	60.0	253.4 (22)	50.0	248.9 (24)	54.2	203.9	166.4	N/A
Fergus Shand Dam	245.4 (53)	47.2	234.8 (21)	57.1	276.3 (16)	31.2	228.4 (16)	50.0	N/A	197.7	145.0
Georgetown	209.3 (88)	52.3	196.0 (34)	61.8	230.8 (24)	37.5	207.2 (30)	53.3	169.6	178.3	126.7
Guelph	213.6 (84)	50.0	206.2 (33)	57.6	231.8 (24)	33.3	206.6 (27)	55.6	198.7	174.0	N/A
Kitchener/Waterloo	219.6 (82)	51.2	207.5 (33)	63.6	234.7 (24)	33.3	220.9 (25)	52.0	175.3	169.9	133.0
Mt. Forest/Redickville	253.3 (78)	46.2	250.1 (30)	53.3	257.2 (23)	43.5	253.6 (25)	40.0	213.0	201.3	192.8
Stratford	263.5 (87)	50.6	251.2 (34)	67.6	279.6 (25)	32.0	263.9 (28)	46.4	232.8	190.2	196.8
Woodstock	230.3 (87)	48.3	219.1 (34)	52.9	245.2 (24)	33.3	231.2 (29)	55.2	218.0	170.5	148.5
AVERAGE	232.3	49.6	222.7	58.4	247.6	37.3	230.3	49.7	201.4	178.9	153.5

TABLE M-3

Average Winter (Dec/Jan/Feb) Precipitation (mm) and Percent of Years with Precipitation Less than Average
for All/High NAO (+) Winter Index/Low NAO (–) Winter Index and Neutral (Non-NAO) Index Analysis Years (1910-1999)

STATION	All Avg (# yrs)	% yrs <Avg	+NAOAvg (# yrs)	% yrs <Avg	-NAO Avg (# yrs)	% yrs <Avg	Neut Avg (# yrs)	% yrs <Avg	1930-39 Avg	1961-66 Avg	1998-99 Avg
Brantford	186.2 (81)	54.3	185.9 (32)	50.0	182.9 (22)	54.5	189.2 (27)	59.3	218.4	165.1	140.6
Delhi/Simcoe	222.3 (76)	51.3	236.4 (30)	30.0	204.9 (22)	59.1	220.8 (24)	70.8	249.0	163.0	N/A
Fergus Shand Dam	201.8 (57)	52.6	195.1 (23)	52.2	208.9 (16)	50.0	203.9 (18)	55.6	N/A	194.4	188.8
Georgetown	179.0 (80)	55.0	187.3 (33)	39.4	165.1 (21)	71.4	179.6 (26)	61.5	179.8	153.1	227.0
Guelph	176.8 (82)	52.4	185.2 (30)	40.0	167.3 (24)	66.7	175.8 (28)	53.6	198.8	151.7	N/A
Kitchener/Waterloo	188.6 (82)	56.1	191.0 (33)	51.5	188.8 (22)	50.0	185.5 (27)	66.7	181.7	181.8	206.0
Mt. Forest/Redickville	222.8 (75)	53.3	223.7 (31)	54.8	217.0 (21)	57.1	226.8 (23)	47.8	212.4	194.2	249.9
Stratford	261.2 (84)	52.4	259.3 (32)	53.1	263.1 (25)	52.0	261.5 (27)	51.9	245.3	221.4	272.4
Woodstock	187.5 (85)	55.3	188.9 (33)	51.5	188.9 (24)	58.3	184.6 (28)	57.1	205.3	200.2	189.1
AVERAGE	202.9	53.6	205.9	47.0	198.6	57.7	203.1	58.2	211.3	180.6	210.5

TABLE M-4

Average Spring (Mar/Apr/May) Precipitation (mm) and Percent of Years with Precipitation Less than Average
for All/High NAO (+) Winter Index/Low NAO (–) Winter Index and Neutral (Non-NAO) Index Analysis Years (1910-1999)

STATION	**All Avg (# yrs)**	**% yrs <Avg**	**+NAOAvg (# yrs)**	**% yrs <Avg**	**-NAO Avg (# yrs)**	**% yrs <Avg**	**Neut Avg (# yrs)**	**% yrs <Avg**	**1930-39 Avg**	**1961-66 Avg**	**1998-99 Avg**
Brantford	210.2 (83)	54.2	217.2 (31)	54.8	213.0 (22)	54.5	200.9 (30)	53.3	199.0	196.2	169.1
Delhi/Simcoe	243.1 (76)	52.6	243.1 (30)	53.3	252.6 (22)	50.0	234.4 (24)	54.2	208.7	219.7	N/A
Fergus Shand Dam	230.2 (57)	43.9	232.7 (22)	45.5	230.5 (18)	44.4	226.6 (17)	41.2	N/A	212.9	149.9
Georgetown	206.4 (79)	50.6	212.7 (32)	43.7	190.6 (21)	61.9	211.5 (26)	50.0	165.0	172.1	182.0
Guelph	209.1 (82)	50.0	213.1 (30)	43.3	209.0 (24)	54.2	205.0 (28)	53.6	176.5	180.8	N/A
Kitchener/Waterloo	213.2 (84)	52.4	213.1 (34)	47.1	218.3 (23)	56.5	209.1 (27)	55.6	149.6	184.2	153.2
Mt. Forest/Redickville	221.9 (79)	53.2	224.6 (29)	48.3	224.2 (24)	58.3	216.6 (26)	53.8	162.1	196.7	179.1
Stratford	237.7 (87)	50.6	239.0 (34)	50.0	246.5 (25)	48.0	228.2 (28)	53.6	210.3	182.9	162.8
Woodstock	215.4 (87)	51.7	213.4 (34)	50.0	226.3 (25)	44.0	208.2 (28)	60.7	197.5	216.5	162.1
AVERAGE	220.8	51.0	223.2	48.4	223.4	52.4	215.6	52.9	183.6	195.8	165.5

TABLE M-5

Average Summer (Jun/Jul/Aug) Precipitation (mm) and Percent of Years with Precipitation Less than Average
for All/High NAO (+) Winter Index/Low NAO (–) Winter Index and Neutral (Non-NAO) Index Analysis Years (1910-1999)

STATION	**All Avg (# yrs)**	**% yrs <Avg**	**+NAOAvg (# yrs)**	**% yrs <Avg**	**-NAO Avg (# yrs)**	**% yrs <Avg**	**Neut Avg (# yrs)**	**% yrs <Avg**	**1930-39 Avg**	**1961-66 Avg**	**1998-99 Avg**
Brantford	230.7 (87)	49.4	235.0 (32)	46.9	239.7 (25)	52.0	218.6 (30)	50.0	187.7	227.7	166.5
Delhi/Simcoe	239.4 (76)	51.3	253.7 (30)	43.3	232.4 (22)	59.1	228.0 (24)	54.2	187.3	238.2	N/A
Fergus Shand Dam	246.7 (56)	57.1	242.0 (22)	54.5	243.3 (18)	55.6	256.9 (16)	62.5	N/A	214.6	214.7
Georgetown	231.0 (84)	56.0	227.0 (34)	55.9	251.6 (21)	47.6	220.9 (29)	62.1	178.9	251.0	205.6
Guelph	243.5 (83)	53.0	237.9 (31)	51.6	247.1 (24)	50.0	246.8 (28)	57.1	214.5	217.3	N/A
Kitchener/Waterloo	245.7 (84)	58.3	238.8 (34)	67.6	250.8 (24)	45.8	250.0 (26)	57.7	200.1	238.8	183.2
Mt. Forest/Redickville	230.3 (79)	48.1	220.5 (31)	48.4	242.2 (22)	45.5	232.0 (26)	50.0	168.2	236.6	214.2
Stratford	242.8 (86)	57.0	244.1 (34)	52.9	248.5 (24)	62.5	236.4 (28)	57.1	226.7	253.1	177.9
Woodstock	244.7 (87)	51.7	254.0 (35)	48.6	252.8 (23)	47.8	227.1 (29)	58.6	190.5	298.7	145.8
AVERAGE	239.4	53.6	239.2	52.2	245.4	51.8	235.2	56.6	194.2	241.8	186.9

TABLE M-6

Average Annual Mean Temperature (Degrees Celsius) and Percent of Years with Mean Temperature Greater than Average for All/High NAO (+) Winter Index/Low NAO (–) Winter Index and Neutral (Non-NAO) Index Analysis Years (1910-1999)

STATION	All Avg (# yrs)	% yrs >Avg	+NAOAvg (# yrs)	% yrs >Avg	-NAO Avg (# yrs)	% yrs >Avg	Neut Avg (# yrs)	% yrs >Avg	1930-39 Avg	1961-66 Avg	1998-99 Avg
Brantford	7.9 (78)	48.7	8.0 (29)	51.7	7.6 (23)	34.8	8.0 (26)	57.7	8.2	7.8	9.2
Delhi/Simcoe	8.0 (77)	45.5	8.2 (30)	53.3	7.7 (22)	40.9	8.0 (25)	40.0	8.4	7.4	N/A
Fergus Shand Dam	6.0 (44)	45.5	6.3 (18)	66.7	5.6 (15)	20.0	6.1 (11)	45.5	N/A	5.0	8.1
Georgetown	6.8 (54)	50.0	6.8 (24)	54.2	6.5 (13)	46.2	7.0 (17)	47.1	6.8	6.4	7.4
Guelph	6.7 (81)	51.9	6.7 (31)	51.6	6.3 (23)	30.4	6.9 (27)	70.4	6.9	6.3	N/A
Kitchener/Waterloo	7.1 (81)	43.2	7.0 (32)	46.9	6.8 (24)	33.3	7.3 (25)	48.0	7.5	7.1	8.3
Mt. Forest/Redickville	5.4 (81)	48.1	5.6 (31)	61.3	5.0 (24)	29.2	5.6 (26)	50.0	5.9	5.0	7.5
Stratford	6.9 (83)	43.4	7.0 (33)	57.6	6.4 (23)	21.7	7.0 (27)	44.4	7.4	6.4	8.8
Woodstock	7.3 (80)	51.2	7.4 (32)	65.6	6.9 (22)	31.8	7.4 (26)	50.0	7.4	7.1	9.0
AVERAGE	6.9	47.5	7.0	56.5	6.5	32.0	7.0	50.3	7.3	6.5	8.3

TABLE M-7

Average Autumn (Sep/Oct/Nov) Mean Temperature (Degrees Celsius) and Percent of Years with Mean Temperature Greater than Average for All/High NAO (+) Winter Index/Low NAO (–) Winter Index and Neutral (Non-NAO) Index Analysis Years (1910-1999)

STATION	All Avg (# yrs)	% yrs >Avg	+NAOAvg (# yrs)	% yrs >Avg	-NAO Avg (# yrs)	% yrs >Avg	Neut Avg (# yrs)	% yrs >Avg	1930-39 Avg	1961-66 Avg	1998-99 Avg
Brantford	9.7 (87)	42.5	9.7 (34)	47.1	9.4 (24)	29.2	9.8 (29)	48.3	9.7	10.3	9.8
Delhi/Simcoe	9.8 (78)	43.6	9.8 (30)	43.3	9.7 (22)	45.5	9.9 (26)	42.3	10.1	10.2	8.9
Fergus Shand Dam	8.0 (54)	46.3	8.1 (21)	52.4	7.7 (17)	35.3	8.2 (16)	50.0	N/A	8.1	8.9
Georgetown	8.6 (69)	46.4	8.6 (29)	51.7	8.4 (18)	33.3	8.7 (22)	50.0	8.4	9.1	8.9
Guelph	8.7 (85)	43.5	8.6 (33)	51.5	8.4 (24)	29.2	8.9 (28)	46.4	8.7	9.1	N/A
Kitchener/Waterloo	8.9 (82)	46.3	8.7 (33)	42.4	8.8 (24)	45.8	9.1 (25)	52.0	9.0	9.8	9.0
Mt. Forest/Redickville	7.6 (83)	42.2	7.6 (32)	50.0	7.3 (24)	29.2	7.8 (27)	44.4	7.8	8.1	8.3
Stratford	8.8 (87)	47.1	8.9 (34)	52.9	8.6 (25)	36.0	9.0 (28)	50.0	9.2	9.4	9.6
Woodstock	9.1 (87)	44.8	9.2 (33)	51.5	8.9 (24)	33.3	9.2 (30)	46.7	9.1	9.9	9.9
AVERAGE	8.8	44.8	8.8	49.2	8.6	35.2	9.0	47.8	9.0	9.3	9.2

TABLE M-8

Average Winter (Dec/Jan/Feb) Mean Temperature (Degrees Celsius) and Percent of Years with Mean Temperature Greater than Average for All/High NAO (+) Winter Index/Low NAO (–) Winter Index and Neutral (Non-NAO) Index Analysis Years (1910-1999)

STATION	**All Avg (# yrs)**	**% yrs >Avg**	**+NAOAvg (# yrs)**	**% yrs >Avg**	**-NAO Avg (# yrs)**	**% yrs >Avg**	**Neut Avg (# yrs)**	**% yrs >Avg**	**1930-39 Avg**	**1961-66 Avg**	**1998-99 Avg**
Brantford	-4.6 (85)	51.8	-4.4 (33)	57.6	-5.3 (24)	37.5	-4.2 (28)	57.1	-4.0	-5.1	-2.1
Delhi/Simcoe	-4.2 (79)	53.2	-3.7 (31)	67.7	-4.9 (22)	36.4	-4.1 (26)	50.0	-3.5	-5.6	-1.6
Fergus Shand Dam	-7.0 (55)	49.1	-6.3 (21)	66.7	-8.0 (17)	23.5	-6.8 (17)	52.9	N/A	-8.3	-3.4
Georgetown	-5.7 (68)	55.9	-5.6 (29)	62.1	-6.3 (18)	44.4	-5.3 (21)	57.1	-5.7	-7.1	-3.1
Guelph	-5.9 (83)	55.4	-5.7 (32)	62.5	-6.6 (24)	37.5	-5.5 (27)	63.0	-5.3	-6.9	N/A
Kitchener/Waterloo	-5.6 (85)	54.1	-5.4 (34)	61.8	-6.2 (24)	41.7	-5.3 (27)	55.6	-4.8	-6.3	-2.9
Mt. Forest/Redickville	-7.2 (83)	50.6	-7.0 (33)	63.6	-7.9 (24)	29.2	-6.8 (26)	53.8	-6.4	-7.9	-3.8
Stratford	-5.8 (84)	51.2	-5.4 (33)	60.6	-6.7 (24)	29.2	-5.4 (27)	59.3	-5.1	-6.8	-2.2
Woodstock	-5.1 (87)	52.9	-4.9 (34)	61.8	-5.8 (24)	33.3	-4.8 (29)	58.6	-4.7	-5.9	-2.0
AVERAGE	-5.7	52.7	-5.4	62.7	-6.4	34.7	-5.3	56.4	-4.9	-6.7	-2.6

TABLE M-9

Average Spring (Mar/Apr/May) Mean Temperature (Degrees Celsius) and Percent of Years with Mean Temperature Greater than Average for All/High NAO (+) Winter Index/Low NAO (–) Winter Index and Neutral (Non-NAO) Index Analysis Years (1910-1999)

STATION	All Avg (# yrs)	% yrs >Avg	+NAOAvg (# yrs)	% yrs >Avg	-NAO Avg (# yrs)	% yrs >Avg	Neut Avg (# yrs)	% yrs >Avg	1930-39 Avg	1961-66 Avg	1998-99 Avg
Brantford	6.5 (85)	50.6	6.4 (32)	40.6	6.3 (24)	50.0	6.8 (29)	62.1	6.3	6.5	8.4
Delhi/Simcoe	6.6 (79)	51.9	6.5 (31)	48.4	6.3 (22)	45.5	6.8 (26)	61.5	6.6	6.2	8.2
Fergus Shand Dam	4.5 (57)	47.4	4.6 (22)	50.0	4.0 (18)	27.8	4.9 (17)	64.7	N/A	3.9	7.3
Georgetown	5.3 (63)	50.8	5.2 (28)	39.3	5.0 (17)	52.9	5.8 (18)	66.7	5.0	5.2	5.7
Guelph	5.3 (84)	50.0	5.2 (32)	40.6	5.0 (24)	45.8	5.7 (28)	64.3	5.1	5.0	N/A
Kitchener/Waterloo	5.7 (83)	49.4	5.5 (33)	39.4	5.6 (24)	45.8	6.1 (26)	65.4	5.7	5.8	7.4
Mt. Forest/Redickville	3.9 (84)	50.0	3.8 (33)	45.5	3.5 (24)	41.7	4.3 (27)	63.0	4.0	3.7	6.7
Stratford	5.4 (87)	48.3	5.4 (34)	44.1	5.0 (25)	44.0	5.8 (28)	57.1	5.5	5.0	7.8
Woodstock	5.9 (86)	48.8	5.9 (34)	44.1	5.6 (24)	50.0	6.1 (28)	53.6	5.6	6.0	8.0
AVERAGE	5.5	49.7	5.4	43.6	5.1	44.8	5.8	62.0	5.5	5.3	7.4

TABLE M-10

Average Summer (Jun/Jul/Aug) Mean Temperature (Degrees Celsius) and Percent of Years with Mean Temperature Greater than Average for All/High NAO (+) Winter Index/Low NAO (–) Winter Index and Neutral (Non-NAO) Index Analysis Years (1910-1999)

STATION	**All Avg (# yrs)**	**% yrs >Avg**	**+NAOAvg (# yrs)**	**% yrs >Avg**	**-NAO Avg (# yrs)**	**% yrs >Avg**	**Neut Avg (# yrs)**	**% yrs >Avg**	**1930-39 Avg**	**1961-66 Avg**	**1998-99 Avg**
Brantford	20.0 (83)	48.2	20.2 (31)	64.5	19.8 (24)	41.7	19.8 (28)	35.7	20.6	19.4	20.8
Delhi/Simcoe	19.8 (77)	48.1	20.1 (30)	63.3	19.7 (22)	45.5	19.4 (25)	32.0	20.5	19.1	N/A
Fergus Shand Dam	18.4 (56)	50.0	18.8 (23)	69.6	18.2 (17)	47.1	17.9 (16)	25.0	N/A	17.5	19.4
Georgetown	18.7 (67)	47.8	18.9 (27)	63.0	18.7 (17)	35.3	18.4 (23)	39.1	19.1	18.4	18.8
Guelph	18.6 (83)	47.0	18.9 (31)	54.8	18.5 (23)	34.8	18.5 (29)	48.3	19.3	18.0	N/A
Kitchener/Waterloo	19.2 (84)	48.8	19.3 (34)	52.9	19.2 (24)	41.7	19.0 (26)	50.0	19.9	19.1	19.6
Mt. Forest/Redickville	17.4 (83)	47.0	17.8 (32)	65.6	17.1 (24)	41.7	17.2 (27)	29.6	18.3	16.7	18.7
Stratford	18.9 (86)	43.0	19.2 (34)	55.9	18.6 (24)	33.3	18.7 (28)	35.7	20.1	18.0	19.9
Woodstock	19.2 (87)	48.3	19.4 (35)	60.0	19.0 (24)	37.5	19.0 (28)	42.9	19.8	18.7	20.2
AVERAGE	18.9	47.6	19.2	61.1	18.8	39.8	18.7	37.6	19.7	18.3	19.6

TABLE M-11

Average Annual Precipitation (mm) and Percent of Years with Precipitation Less than Average
for All/High NAO (+) Winter Index/Low NAO (–) Winter Index and Neutral (Non-NAO) Index Analysis Years (1970-1999)

STATION	**All Avg (# yrs)**	**% yrs <Avg**	**+NAOAvg (# yrs)**	**% yrs <Avg**	**-NAO Avg (# yrs)**	**% yrs <Avg**	**Neut Avg (# yrs)**	**% yrs <Avg**	**1930-39 Avg**	**1961-66 Avg**	**1998-99 Avg**
Brantford	876.7 (26)	38.5	885.3 (13)	38.5	873.3 (4)	50.0	865.7 (9)	33.3	804.7	750.9	608.1
Delhi/Simcoe	996.2 (27)	40.7	1000.8 (15)	40.0	1013.1 (5)	40.0	974.2 (7)	42.9	848.9	787.4	N/A
Fergus Shand Dam	933.5 (27)	44.4	931.0 (15)	46.7	940.5 (5)	60.0	934.1 (7)	28.6	N/A	841.2	698.4
Georgetown	874.0 (26)	50.0	868.8 (15)	53.3	915.7 (3)	33.3	868.1 (8)	50.0	693.3	767.0	741.3
Guelph	912.5 (22)	45.5	921.1 (11)	45.5	908.5 (4)	50.0	901.2 (7)	42.9	788.6	723.7	N/A
Kitchener/Waterloo	901.7 (30)	50.0	890.4 (16)	56.2	956.5 (5)	20.0	891.2 (9)	55.6	691.1	774.7	675.4
Mt. Forest/Redickville	961.7 (26)	57.7	963.9 (14)	64.3	1000.3 (4)	25.0	938.4 (8)	62.5	776.2	829.8	836.0
Stratford	1059.9 (29)	41.4	1037.8 (15)	46.7	1123.0 (5)	20.0	1061.9 (9)	44.4	915.1	847.6	809.9
Woodstock	949.3 (28)	35.7	940.4 (15)	40.0	994.4 (5)	20.0	937.6 (8)	37.5	811.3	882.5	645.5
AVERAGE	940.6	44.9	937.7	47.9	969.5	35.4	930.3	44.2	791.2	800.5	716.4

TABLE M-12

Average Autumn (Sep/Oct/Nov) Precipitation (mm) and Percent of Years with Precipitation Less than Average
for All/High NAO (+) Winter Index/Low NAO (–) Winter Index and Neutral (Non-NAO) Index Analysis Years (1970-1999)

STATION	All Avg (# yrs)	% yrs <Avg	+NAOAvg (# yrs)	% yrs <Avg	-NAO Avg (# yrs)	% yrs <Avg	Neut Avg (# yrs)	% yrs <Avg	1930-39 Avg	1961-66 Avg	1998-99 Avg
Brantford	232.0 (30)	50.0	220.2 (16)	68.7	269.4 (5)	20.0	232.2 (9)	33.3	199.7	161.8	131.9
Delhi/Simcoe	277.0 (27)	51.9	264.1 (15)	66.7	326.0 (5)	20.0	269.7 (7)	42.9	203.9	166.4	N/A
Fergus Shand Dam	253.4 (29)	55.2	243.3 (16)	62.5	309.1 (5)	20.0	238.8 (8)	62.5	N/A	197.7	145.0
Georgetown	230.0 (30)	43.3	217.3 (16)	50.0	285.6 (5)	20.0	221.6 (9)	44.4	169.6	178.3	126.7
Guelph	242.4 (25)	52.0	239.3 (14)	57.1	294.2 (4)	50.0	219.1 (7)	42.9	198.7	174.0	N/A
Kitchener/Waterloo	234.2 (30)	50.0	220.3 (16)	62.5	286.5 (5)	20.0	229.8 (9)	44.4	175.3	169.9	133.0
Mt. Forest/Redickville	280.0 (29)	48.3	274.8 (16)	56.2	326.6 (4)	0.0	268.5 (9)	55.6	213.0	201.3	192.8
Stratford	289.5 (30)	46.7	267.6 (16)	56.2	354.7 (5)	20.0	292.4 (9)	44.4	232.8	190.2	196.8
Woodstock	258.0 (29)	44.8	242.9 (15)	46.7	308.4 (5)	20.0	255.1 (9)	55.6	218.0	170.5	148.5
AVERAGE	255.2	49.1	243.3	58.5	306.7	21.1	247.5	47.3	201.4	178.9	153.5

TABLE M-13

Average Winter (Dec/Jan/Feb) Precipitation (mm) and Percent of Years with Precipitation Less than Average
for All/High NAO (+) Winter Index/Low NAO (–) Winter Index and Neutral (Non-NAO) Index Analysis Years (1970-1999)

STATION	**All Avg (# yrs)**	**% yrs <Avg**	**+NAOAvg (# yrs)**	**% yrs <Avg**	**-NAO Avg (# yrs)**	**% yrs <Avg**	**Neut Avg (# yrs)**	**% yrs <Avg**	**1930-39 Avg**	**1961-66 Avg**	**1998-99 Avg**
Brantford	183.3 (29)	51.7	184.1 (15)	46.7	174.8 (5)	80.0	186.8 (9)	44.4	218.4	165.1	140.6
Delhi/Simcoe	217.4 (27)	48.1	231.5 (15)	26.7	197.8 (5)	80.0	201.1 (7)	71.4	249.0	163.0	N/A
Fergus Shand Dam	195.5 (30)	60.0	194.1 (16)	56.2	171.3 (5)	80.0	211.5 (9)	55.6	N/A	194.4	188.8
Georgetown	196.5 (29)	48.3	201.7 (16)	43.7	163.8 (4)	75.0	201.9 (9)	44.4	179.8	153.1	227.0
Guelph	184.7 (22)	45.5	196.4 (11)	27.3	162.3 (4)	75.0	179.2 (7)	57.1	198.8	151.7	N/A
Kitchener/Waterloo	188.8 (30)	53.3	191.8 (16)	43.7	167.8 (5)	80.0	195.0 (9)	55.6	181.7	181.8	206.0
Mt. Forest/Redickville	211.4 (28)	53.6	220.2 (15)	40.0	184.7 (5)	80.0	211.6 (8)	62.5	212.4	194.2	249.9
Stratford	282.3 (29)	51.7	272.8 (15)	66.7	292.2 (5)	40.0	292.5 (9)	33.3	245.3	221.4	272.4
Woodstock	193.1 (29)	48.3	198.6 (16)	37.5	170.0 (5)	80.0	196.7 (8)	50.0	205.3	200.2	189.1
AVERAGE	205.9	51.2	210.1	43.2	187.2	74.4	208.5	52.7	211.3	180.6	210.5

TABLE M-14

Average Spring (Mar/Apr/May) Precipitation (mm) and Percent of Years with Precipitation Less than Average
for All/High NAO (+) Winter Index/Low NAO (–) Winter Index and Neutral (Non-NAO) Index Analysis Years (1970-1999)

STATION	**All Avg (# yrs)**	**% yrs <Avg**	**+NAOAvg (# yrs)**	**% yrs <Avg**	**-NAO Avg (# yrs)**	**% yrs <Avg**	**Neut Avg (# yrs)**	**% yrs <Avg**	**1930-39 Avg**	**1961-66 Avg**	**1998-99 Avg**
Brantford	217.7 (27)	55.6	233.9 (14)	42.9	194.3 (4)	75.0	202.9 (9)	66.7	199.0	196.2	169.1
Delhi/Simcoe	248.0 (27)	51.9	244.7 (15)	53.3	254.5 (5)	60.0	250.4 (7)	42.9	208.7	219.7	N/A
Fergus Shand Dam	229.4 (28)	46.4	234.6 (15)	46.7	222.2 (5)	60.0	224.1 (8)	37.5	N/A	212.9	149.9
Georgetown	212.9 (26)	50.0	227.8 (15)	40.0	197.1 (3)	66.7	190.8 (8)	62.5	165.0	172.1	182.0
Guelph	220.9 (22)	59.1	237.1 (11)	36.4	205.6 (4)	75.0	204.0 (7)	85.7	176.5	180.8	N/A
Kitchener/Waterloo	222.1 (30)	50.0	229.5 (16)	43.7	230.7 (5)	60.0	204.1 (9)	55.6	149.6	184.2	153.2
Mt. Forest/Redickville	226.7 (28)	50.0	241.0 (14)	42.9	230.5 (5)	60.0	202.2 (9)	55.6	162.1	196.7	179.1
Stratford	243.7 (30)	50.0	248.7 (16)	50.0	243.2 (5)	60.0	235.0 (9)	44.4	210.3	182.9	162.8
Woodstock	231.8 (30)	50.0	235.0 (16)	43.7	244.1 (5)	60.0	219.3 (9)	55.6	197.5	216.5	162.1
AVERAGE	228.1	51.4	236.9	44.4	224.7	64.1	214.8	56.3	183.6	195.8	165.5

TABLE M-15

Average Summer (Jun/Jul/Aug) Precipitation (mm) and Percent of Years with Precipitation Less than Average
for All/High NAO (+) Winter Index/Low NAO (–) Winter Index and Neutral (Non-NAO) Index Analysis Years (1970-1999)

STATION	**All Avg (# yrs)**	**% yrs <Avg**	**+NAOAvg (# yrs)**	**% yrs <Avg**	**-NAO Avg (# yrs)**	**% yrs <Avg**	**Neut Avg (# yrs)**	**% yrs <Avg**	**1930-39 Avg**	**1961-66 Avg**	**1998-99 Avg**
Brantford	241.9 (30)	46.7	240.6 (16)	50.0	242.6 (5)	40.0	243.8 (9)	44.4	187.7	227.7	166.5
Delhi/Simcoe	253.7 (27)	55.6	260.4 (15)	53.3	234.7 (5)	60.0	253.0 (7)	57.1	187.3	238.2	N/A
Fergus Shand Dam	257.9 (29)	48.3	254.7 (16)	50.0	237.9 (5)	40.0	276.8 (8)	50.0	N/A	214.6	214.7
Georgetown	238.2 (28)	57.1	223.2 (15)	73.3	250.4 (4)	25.0	257.8 (9)	44.4	178.9	251.0	205.6
Guelph	257.8 (23)	56.5	237.6 (12)	66.7	246.3 (4)	50.0	298.8 (7)	42.9	214.5	217.3	N/A
Kitchener/Waterloo	256.6 (30)	56.7	248.8 (16)	62.5	271.6 (5)	40.0	262.3 (9)	55.6	200.1	238.8	183.2
Mt. Forest/Redickville	256.9 (30)	60.0	237.9 (16)	75.0	298.5 (5)	40.0	267.4 (9)	44.4	168.2	236.6	214.2
Stratford	246.3 (30)	63.3	252.9 (16)	56.2	232.9 (5)	80.0	241.9 (9)	66.7	226.7	253.1	177.9
Woodstock	264.7 (30)	43.3	268.3 (16)	43.7	271.9 (5)	40.0	254.2 (9)	44.4	190.5	298.7	145.8
AVERAGE	252.7	54.2	247.2	59.0	254.1	46.1	261.8	50.0	194.2	241.8	186.9

TABLE M-16

Average Annual Mean Temperature (Degrees Celsius) and Percent of Years with Mean Temperature Greater than Average for All/High NAO (+) Winter Index/Low NAO (–) Winter Index and Neutral (Non-NAO) Index Analysis Years (1970-1999)

STATION	**All Avg (# yrs)**	**% yrs >Avg**	**+NAOAvg (# yrs)**	**% yrs >Avg**	**-NAO Avg (# yrs)**	**% yrs >Avg**	**Neut Avg (# yrs)**	**% yrs >Avg**	**1930-39 Avg**	**1961-66 Avg**	**1998-99 Avg**
Brantford	8.1 (24)	45.8	8.2 (12)	58.3	7.6 (4)	25.0	8.0 (8)	37.5	8.2	7.8	9.2
Delhi/Simcoe	7.8 (28)	50.0	8.1 (15)	66.7	7.2 (5)	20.0	7.7 (8)	37.5	8.4	7.4	N/A
Fergus Shand Dam	6.2 (28)	50.0	6.4 (16)	56.2	5.6 (5)	20.0	6.2 (7)	57.1	N/A	5.0	8.1
Georgetown	6.8 (18)	44.4	7.0 (12)	58.3	6.4 (2)	50.0	6.3 (4)	0.0	6.8	6.4	7.4
Guelph	6.5 (23)	52.2	6.7 (12)	58.3	6.0 (4)	25.0	6.4 (7)	57.1	6.9	6.3	N/A
Kitchener/Waterloo	6.7 (29)	48.3	6.9 (16)	56.2	6.1 (5)	20.0	6.8 (8)	50.0	7.5	7.1	8.3
Mt. Forest/Redickville	5.5 (30)	50.0	5.7 (16)	62.5	5.0 (5)	20.0	5.4 (9)	44.4	5.9	5.0	7.5
Stratford	6.9 (29)	44.8	7.2 (15)	66.7	6.1 (5)	20.0	6.9 (9)	22.2	7.4	6.4	8.8
Woodstock	7.5 (28)	50.0	7.7 (15)	66.7	6.8 (5)	20.0	7.4 (8)	37.5	7.4	7.1	9.0
AVERAGE	6.9	48.4	7.1	61.1	6.3	24.4	6.8	38.2	7.3	6.5	8.3

TABLE M-17

Average Autumn (Sep/Oct/Nov) Mean Temperature (Degrees Celsius) and Percent of Years with Mean Temperature Greater than Average for All/High NAO (+) Winter Index/Low NAO (–) Winter Index and Neutral (Non-NAO) Index Analysis Years (1970-1999)

STATION	**All Avg (# yrs)**	**% yrs >Avg**	**+NAOAvg (# yrs)**	**% yrs >Avg**	**-NAO Avg (# yrs)**	**% yrs >Avg**	**Neut Avg (# yrs)**	**% yrs >Avg**	**1930-39 Avg**	**1961-66 Avg**	**1998-99 Avg**
Brantford	9.7 (28)	46.4	9.7 (15)	46.7	9.0 (5)	20.0	10.0 (8)	62.5	9.7	10.3	9.8
Delhi/Simcoe	9.5 (29)	44.8	9.5 (15)	46.7	8.9 (5)	20.0	9.8 (9)	55.6	10.1	10.2	8.9
Fergus Shand Dam	7.9 (29)	48.3	8.1 (16)	56.2	7.2 (5)	20.0	8.0 (8)	50.0	N/A	8.1	8.9
Georgetown	8.2 (20)	45.0	8.4 (12)	58.3	7.5 (2)	0.0	8.1 (6)	33.3	8.4	9.1	8.9
Guelph	8.3 (25)	56.0	8.3 (14)	50.0	7.6 (4)	25.0	8.9 (7)	85.7	8.7	9.1	N/A
Kitchener/Waterloo	8.4 (29)	41.4	8.3 (16)	43.7	7.6 (5)	20.0	9.0 (8)	50.0	9.0	9.8	9.0
Mt. Forest/Redickville	7.5 (30)	50.0	7.5 (16)	50.0	6.8 (5)	20.0	7.7 (9)	66.7	7.8	8.1	8.3
Stratford	8.7 (30)	46.7	8.8 (16)	50.0	7.8 (5)	0.0	9.1 (9)	66.7	9.2	9.4	9.6
Woodstock	9.2 (29)	48.3	9.3 (15)	53.3	8.5 (5)	20.0	9.4 (9)	55.6	9.1	9.9	9.9
AVERAGE	8.6	47.4	8.6	50.6	7.9	16.1	8.9	58.4	9.0	9.3	9.2

TABLE M-18

Average Winter (Dec/Jan/Feb) Mean Temperature (Degrees Celsius) and Percent of Years with Mean Temperature Greater than Average for All/High NAO (+) Winter Index/Low NAO (–) Winter Index and Neutral (Non-NAO) Index Analysis Years (1970-1999)

STATION	**All Avg (# yrs)**	**% yrs >Avg**	**+NAOAvg (# yrs)**	**% yrs >Avg**	**-NAO Avg (# yrs)**	**% yrs >Avg**	**Neut Avg (# yrs)**	**% yrs >Avg**	**1930-39 Avg**	**1961-66 Avg**	**1998-99 Avg**
Brantford	-4.5 (28)	53.6	-3.9 (15)	66.7	-6.1 (5)	20.0	-4.6 (8)	50.0	-4.0	-5.1	-2.1
Delhi/Simcoe	-4.4 (30)	53.3	-3.8 (16)	75.0	-6.4 (5)	20.0	-4.4 (9)	33.3	-3.5	-5.6	-1.6
Fergus Shand Dam	-6.7 (30)	56.7	-6.1 (16)	68.7	-8.4 (5)	20.0	-6.7 (9)	55.6	N/A	-8.3	-3.4
Georgetown	-5.1 (20)	50.0	-5.0 (12)	58.3	-5.6 (2)	50.0	-5.0 (6)	33.3	-5.7	-7.1	-3.1
Guelph	-6.2 (24)	54.2	-5.5 (13)	69.2	-7.8 (4)	25.0	-6.5 (7)	42.9	-5.3	-6.9	N/A
Kitchener/Waterloo	-5.8 (30)	56.7	-5.3 (16)	68.7	-7.5 (5)	20.0	-5.7 (9)	55.6	-4.8	-6.3	-2.9
Mt. Forest/Redickville	-7.1 (30)	50.0	-6.7 (16)	62.5	-8.7 (5)	20.0	-7.1 (9)	44.4	-6.4	-7.9	-3.8
Stratford	-5.5 (29)	55.2	-4.9 (15)	66.7	-7.6 (5)	20.0	-5.5 (9)	55.6	-5.1	-6.8	-2.2
Woodstock	-5.0 (29)	51.7	-4.4 (16)	68.7	-6.9 (5)	20.0	-5.1 (8)	37.5	-4.7	-5.9	-2.0
AVERAGE	-5.6	53.5	-5.1	67.2	-7.2	23.9	-5.6	45.3	-4.9	-6.7	-2.6

TABLE M-19

Average Spring (Mar/Apr/May) Mean Temperature (Degrees Celsius) and Percent of Years with Mean Temperature Greater than Average for All/High NAO (+) Winter Index/Low NAO (–) Winter Index and Neutral (Non-NAO) Index Analysis Years (1970-1999)

STATION	All Avg (# yrs)	% yrs >Avg	+NAOAvg (# yrs)	% yrs >Avg	-NAO Avg (# yrs)	% yrs >Avg	Neut Avg (# yrs)	% yrs >Avg	1930-39 Avg	1961-66 Avg	1998-99 Avg
Brantford	6.9 (27)	44.4	6.7 (14)	42.9	7.5 (4)	75.0	6.7 (9)	33.3	6.3	6.5	8.4
Delhi/Simcoe	6.7 (30)	46.7	6.7 (16)	50.0	6.7 (5)	60.0	6.7 (9)	33.3	6.6	6.2	8.2
Fergus Shand Dam	5.0 (29)	41.4	4.9 (16)	37.5	5.2 (5)	60.0	5.1 (8)	37.5	N/A	3.9	7.3
Georgetown	5.5 (18)	44.4	5.6 (12)	41.7	5.4 (2)	50.0	5.6 (4)	50.0	5.0	5.2	5.7
Guelph	5.5 (24)	37.5	5.4 (13)	38.5	6.0 (4)	50.0	5.3 (7)	28.6	5.1	5.0	N/A
Kitchener/Waterloo	5.7 (29)	44.8	5.6 (16)	43.7	5.7 (5)	40.0	5.8 (8)	50.0	5.7	5.8	7.4
Mt. Forest/Redickville	4.3 (30)	40.0	4.2 (16)	37.5	4.6 (5)	60.0	4.1 (9)	33.3	4.0	3.7	6.7
Stratford	5.7 (30)	36.7	5.7 (16)	37.5	5.7 (5)	40.0	5.6 (9)	33.3	5.5	5.0	7.8
Woodstock	6.3 (30)	36.7	6.3 (16)	37.5	6.4 (5)	40.0	6.2 (9)	33.3	5.6	6.0	8.0
AVERAGE	5.7	41.4	5.7	40.7	5.9	52.8	5.7	37.0	5.5	5.3	7.4

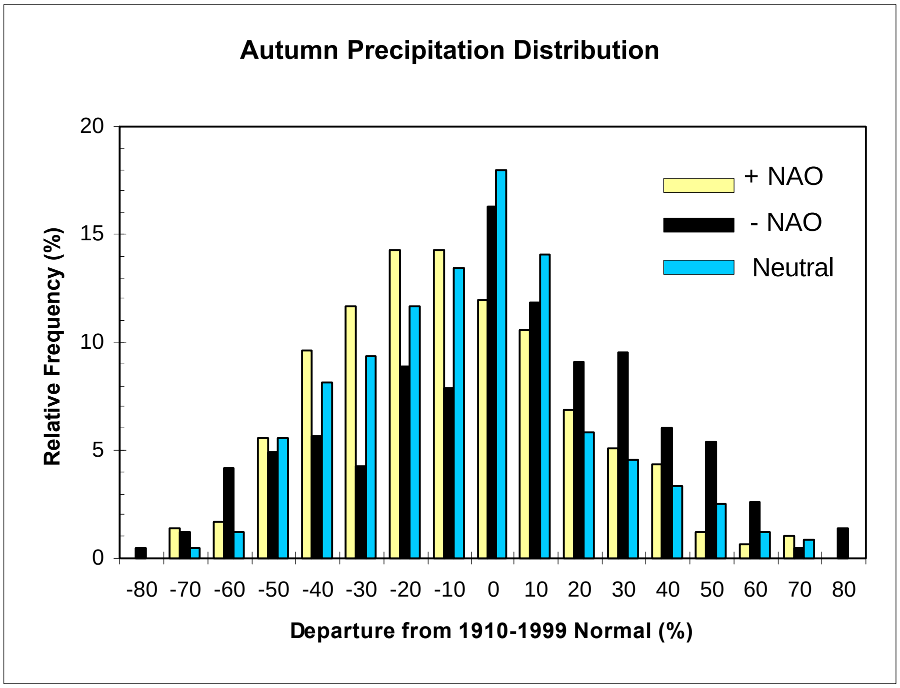
TABLE M-20

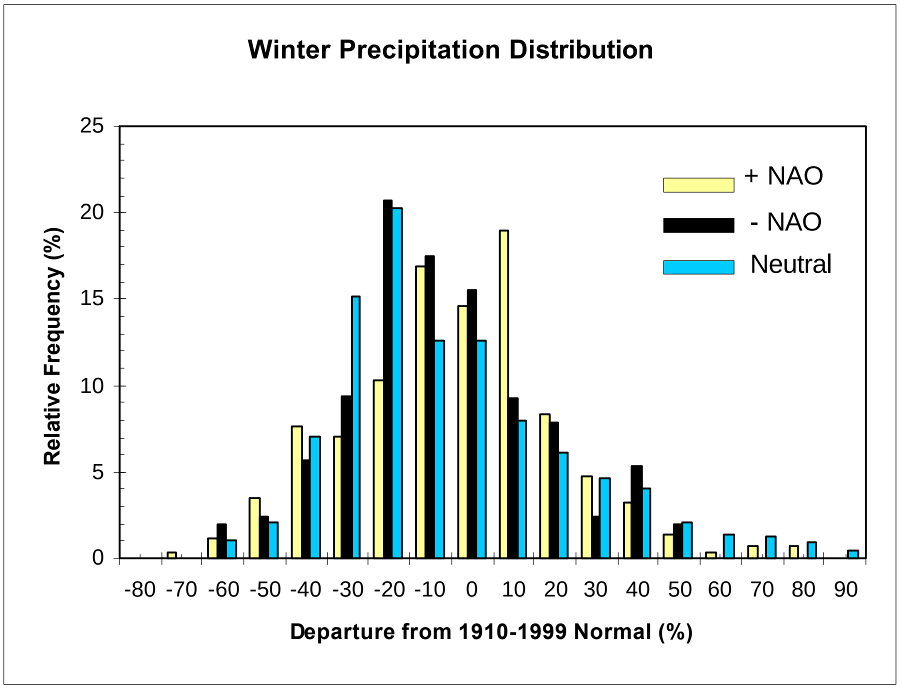
Average Summer (Jun/Jul/Aug) Mean Temperature (Degrees Celsius) and Percent of Years with Mean Temperature Greater than Average for All/High NAO (+) Winter Index/Low NAO (–) Winter Index and Neutral (Non-NAO) Index Analysis Years (1970-1999)

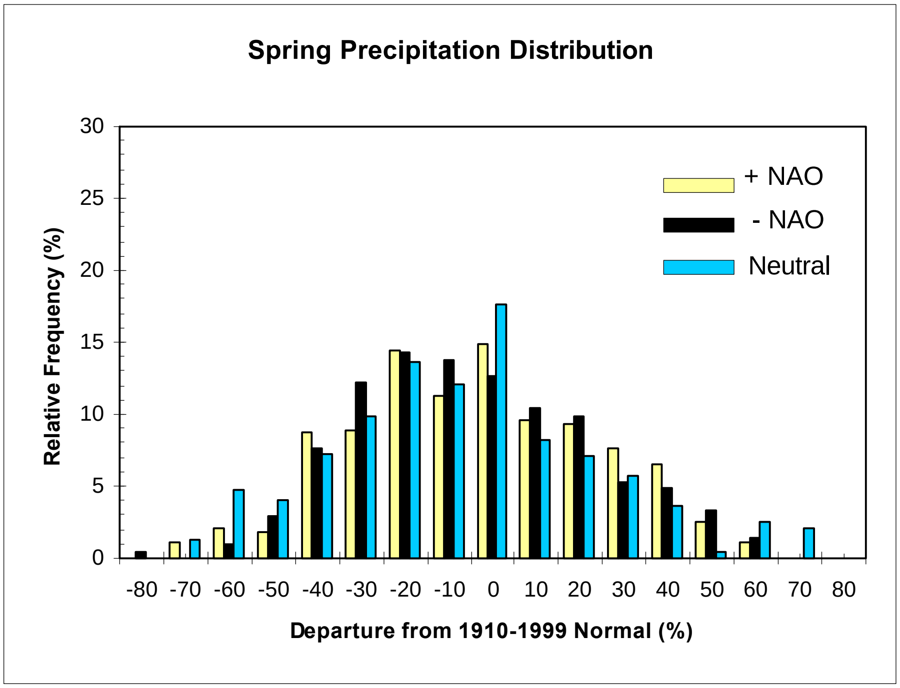
STATION	**All Avg (# yrs)**	**% yrs >Avg**	**+NAOAvg (# yrs)**	**% yrs >Avg**	**-NAO Avg (# yrs)**	**% yrs >Avg**	**Neut Avg (# yrs)**	**% yrs >Avg**	**1930-39 Avg**	**1961-66 Avg**	**1998-99 Avg**
Brantford	20.0 (27)	51.9	20.2 (14)	64.3	20.1 (4)	50.0	19.6 (9)	33.3	20.6	19.4	20.8
Delhi/Simcoe	19.7 (28)	50.0	20.0 (15)	73.3	19.6 (5)	40.0	19.2 (8)	12.5	20.5	19.1	N/A
Fergus Shand Dam	18.5 (29)	48.3	18.8 (16)	68.7	18.5 (5)	40.0	18.0 (8)	12.5	N/A	17.5	19.4
Georgetown	18.5 (20)	60.0	18.9 (12)	83.3	18.5 (2)	50.0	17.7 (6)	16.7	19.1	18.4	18.8
Guelph	18.4 (24)	41.7	18.8 (12)	66.7	18.4 (4)	25.0	17.8 (8)	12.5	19.3	18.0	N/A
Kitchener/Waterloo	18.7 (30)	53.3	19.0 (16)	68.7	18.4 (5)	40.0	18.3 (9)	33.3	19.9	19.1	19.6
Mt. Forest/Redickville	17.5 (30)	43.3	17.8 (16)	56.2	17.3 (5)	40.0	16.9 (9)	22.2	18.3	16.7	18.7
Stratford	18.7 (30)	50.0	19.0 (16)	68.7	18.4 (5)	40.0	18.2 (9)	22.2	20.1	18.0	19.9
Woodstock	19.4 (30)	50.0	19.7 (16)	68.7	19.2 (5)	40.0	18.9 (9)	22.2	19.8	18.7	20.2
AVERAGE	18.8	49.8	19.1	68.8	18.7	40.6	18.3	20.8	19.7	18.3	19.6

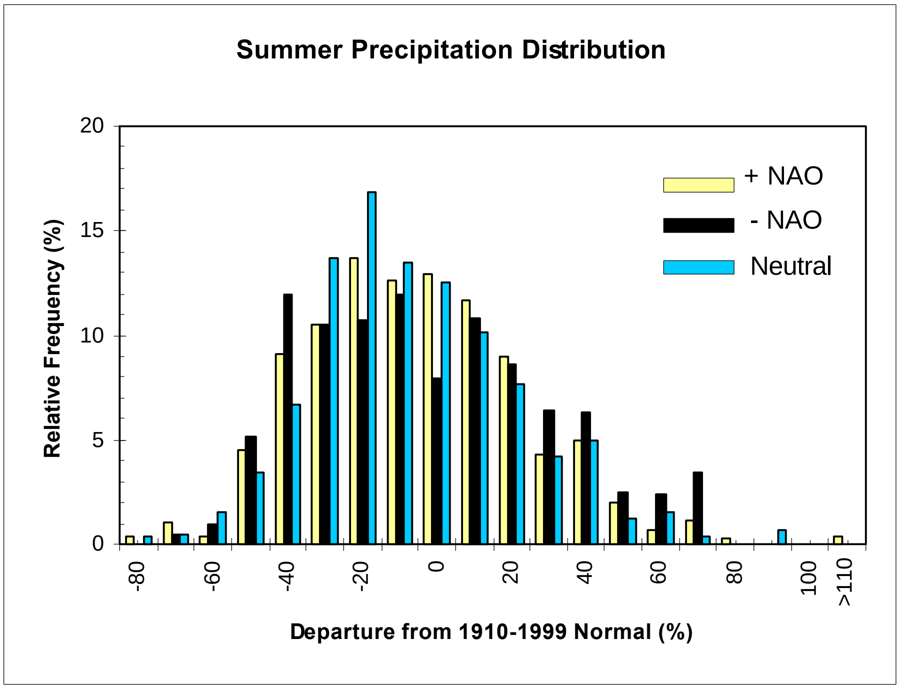
Appendix N

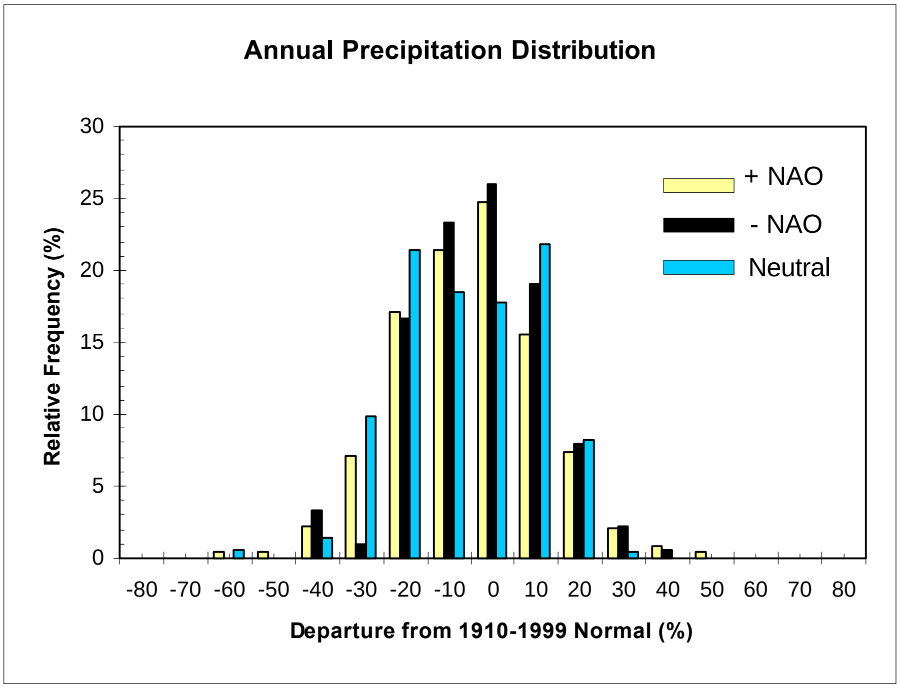
Graphs of Annual and Seasonal Precipitation and Mean Temperature NAO Results

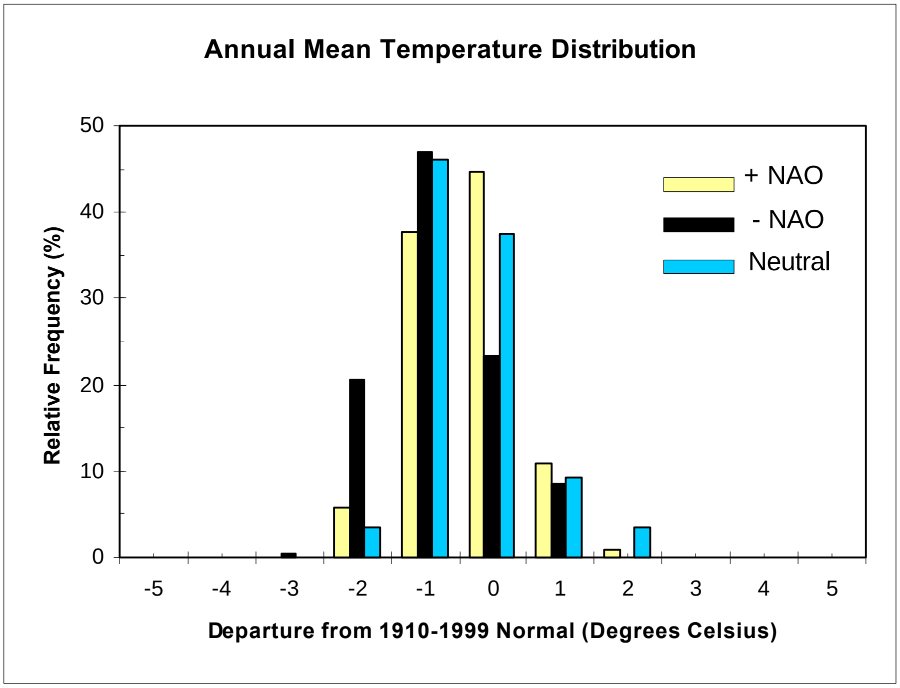

Autumn Precipitation Distribution
Relative Frequency (%)
0
5
10
15
20
-80
-70
-60
-50
-40
-30
-20
-10
0
10
20
30
40
50
60
70
80
Departure from 1910-1999 Normal (%)
+ NAO
- NAO
Neutral

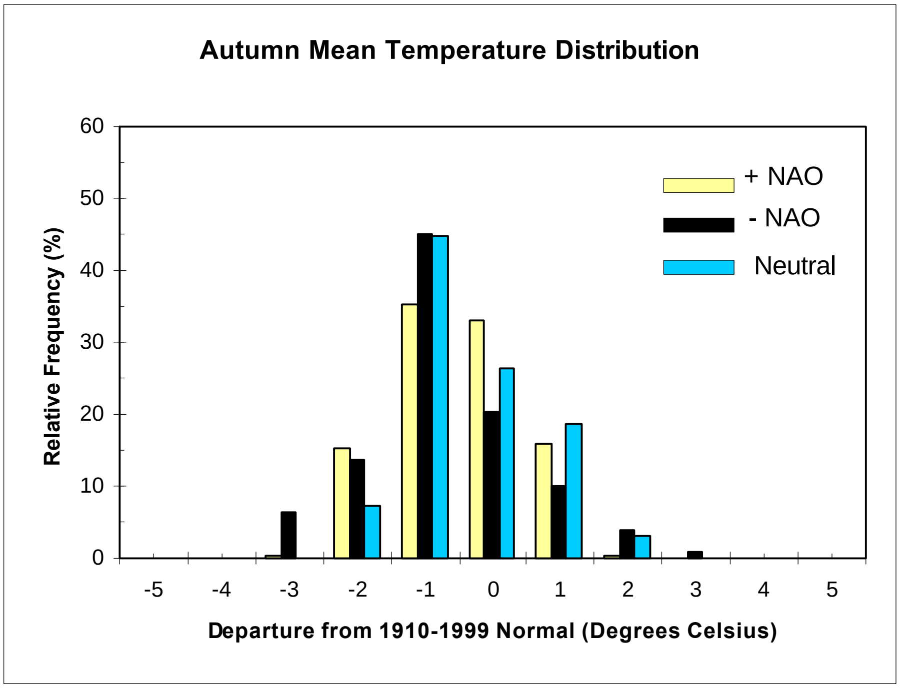

Winter Precipitation Distribution
Relative Frequency (%)
0
5
10
15
20
25
-80
-70
-60
-50
-40
-30
-20
-10
0
10
20
30
40
50
60
70
80
90
Departure from 1910-1999 Normal (%)
+ NAO
- NAO
Neutral


Spring Precipitation Distribution
Relative Frequency (%)
30
25
20
15
10
5
0
+ NAO
- NAO
Neutral
-80
-70
-60
-50
-40
-30
-20
-10
0
10
20
30
40
50
60
70
80
Departure from 1910-1999 Normal (%)

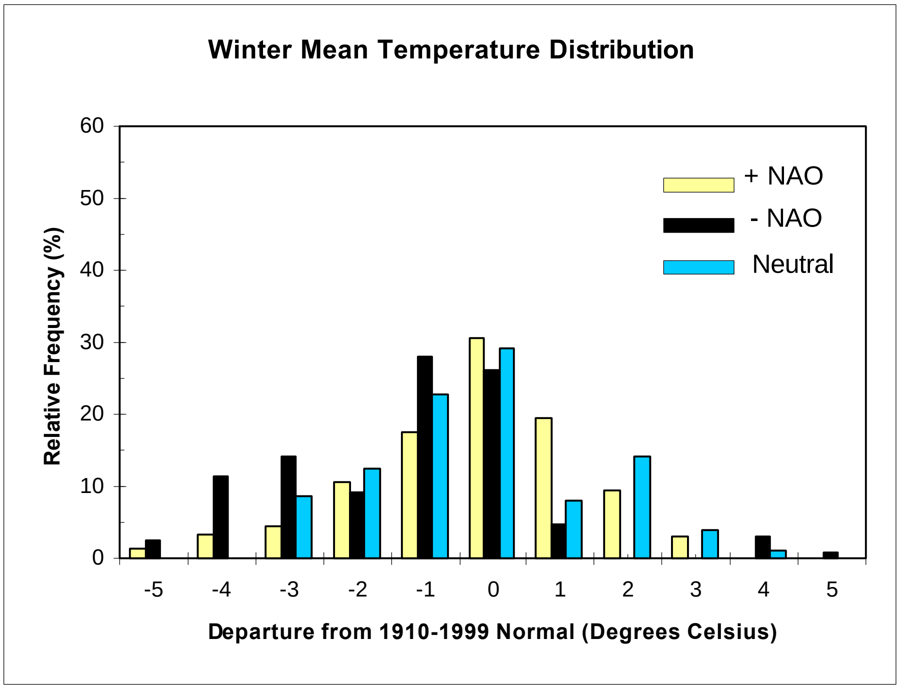

Summer Precipitation Distribution
Relative Frequency (%)
20
15
10
5
0
+ NAO
- NAO
Neutral
-80
-60
-40
-20
0
20
40
60
80
100
>110
Departure from 1910-1999 Normal (%)


Annual Precipitation Distribution
Relative Frequency (%)
30
25
20
15
10
5
0
+ NAO
- NAO
Neutral
-80 -70 -60 -50 -40 -30 -20 -10 0 10 20 30 40 50 60 70 80
Departure from 1910-1999 Normal (%)

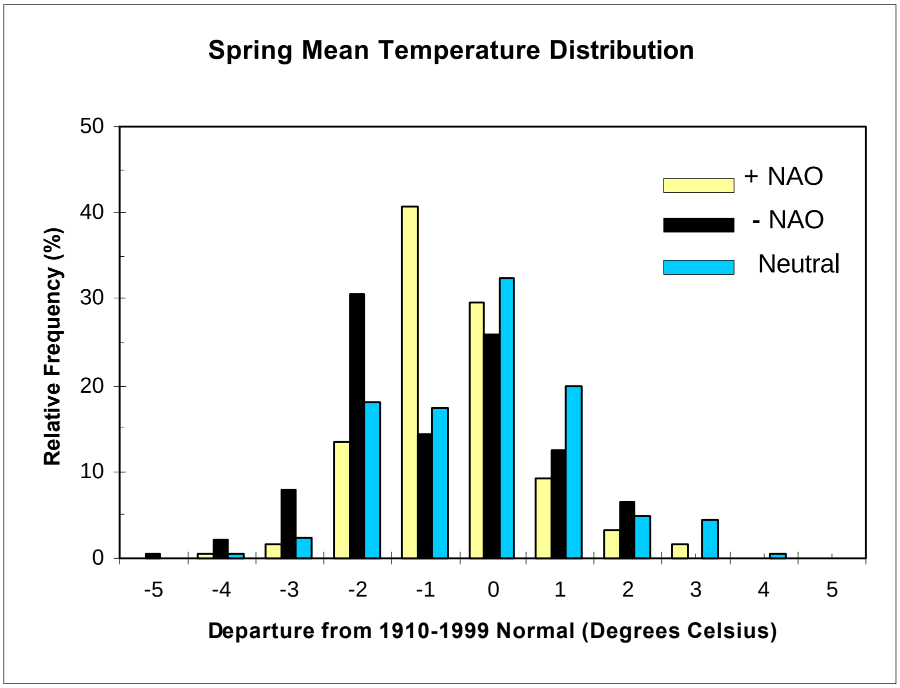

Annual Mean Temperature Distribution
Relative Frequency (%)
50
40
30
20
10
0
+ NAO
- NAO
Neutral
-5 -4 -3 -2 -1 0 1 2 3 4 5
Departure from 1910-1999 Normal (Degrees Celsius)

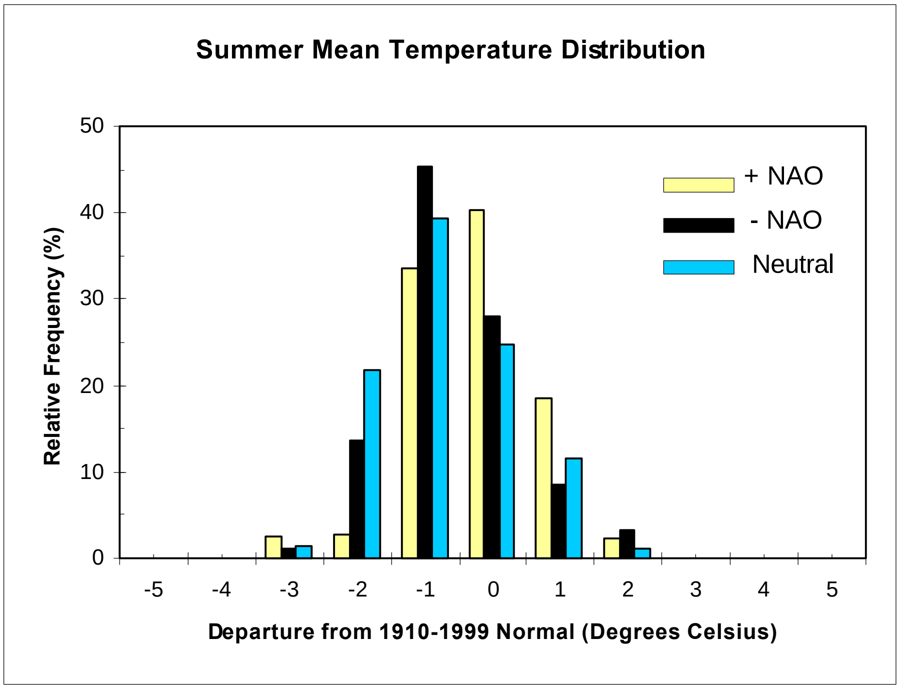


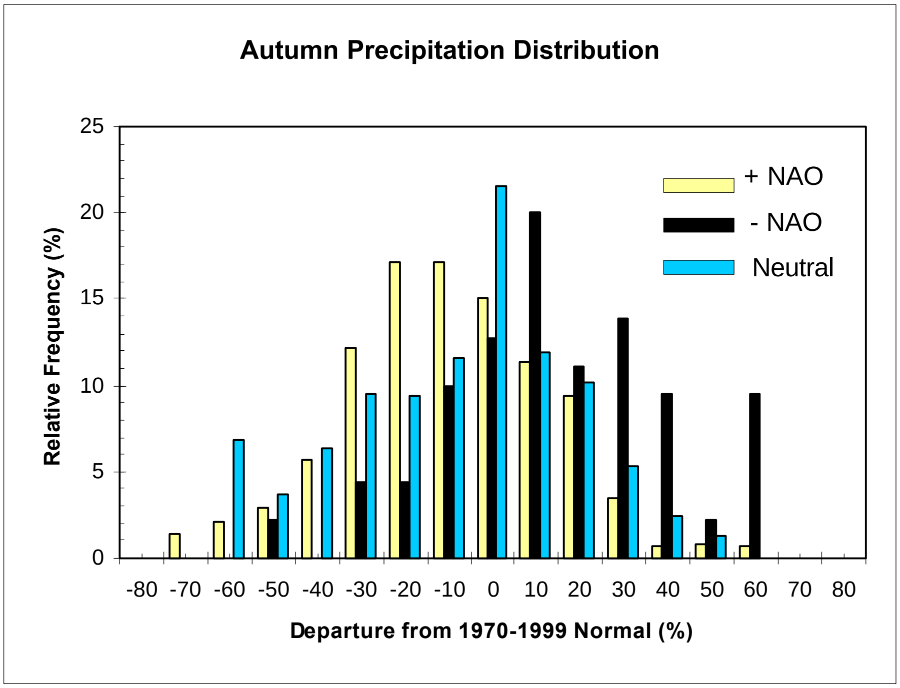
Autumn Mean Temperature Distribution

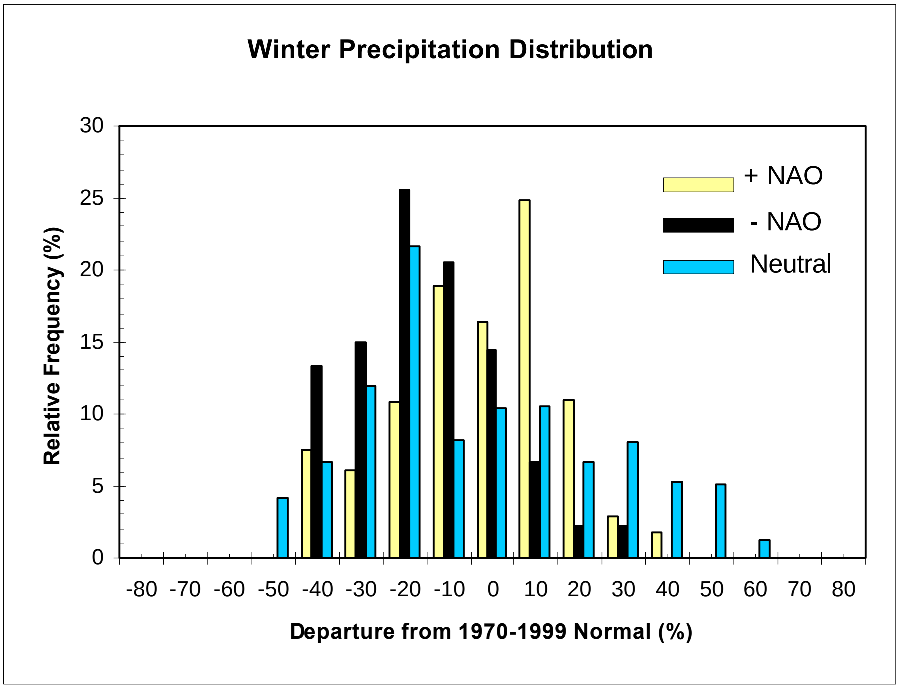


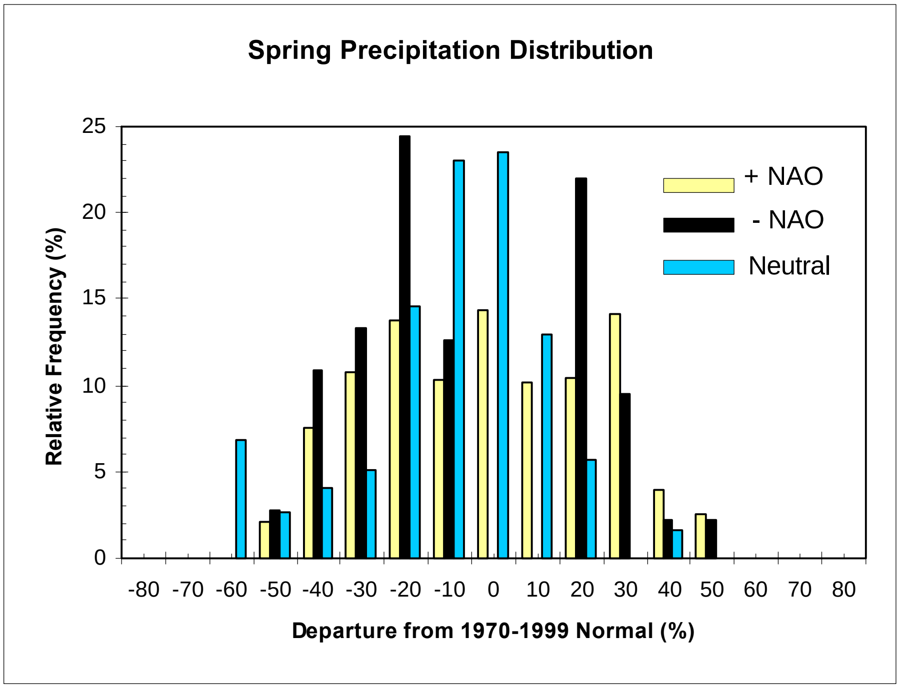
Winter Mean Temperature Distribution

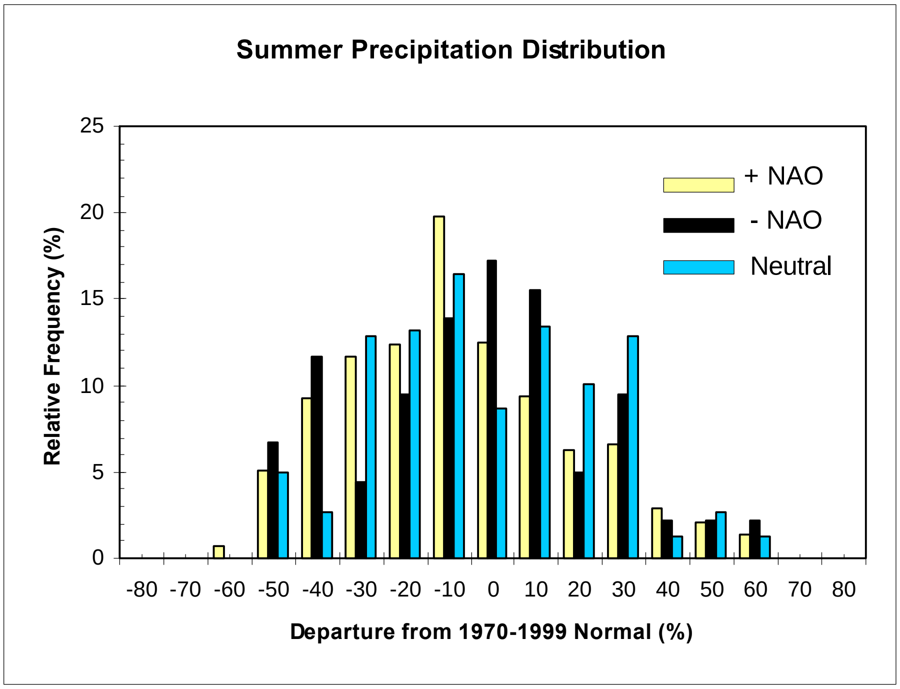

Spring Mean Temperature Distribution
Relative Frequency (%)
50
40
30
20
10
0
-5
-4
-3
-2
-1
0
1
2
3
4
5
Departure from 1910-1999 Normal (Degrees Celsius)
+ NAO
- NAO
Neutral

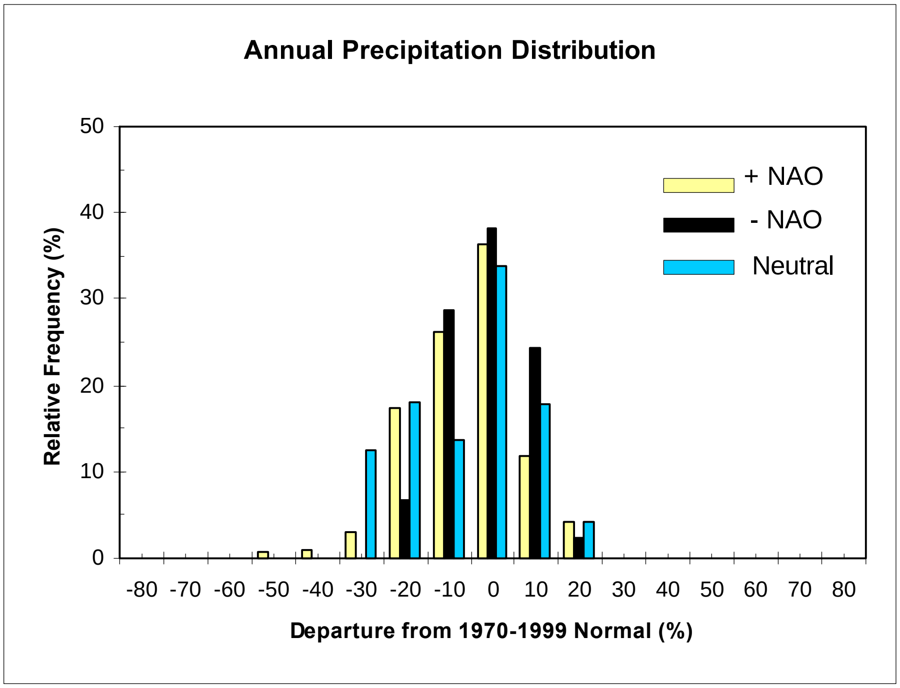

Summer Mean Temperature Distribution
Relative Frequency (%)
50
40
30
20
10
0
-5
-4
-3
-2
-1
0
1
2
3
4
5
Departure from 1910-1999 Normal (Degrees Celsius)
+ NAO
- NAO
Neutral

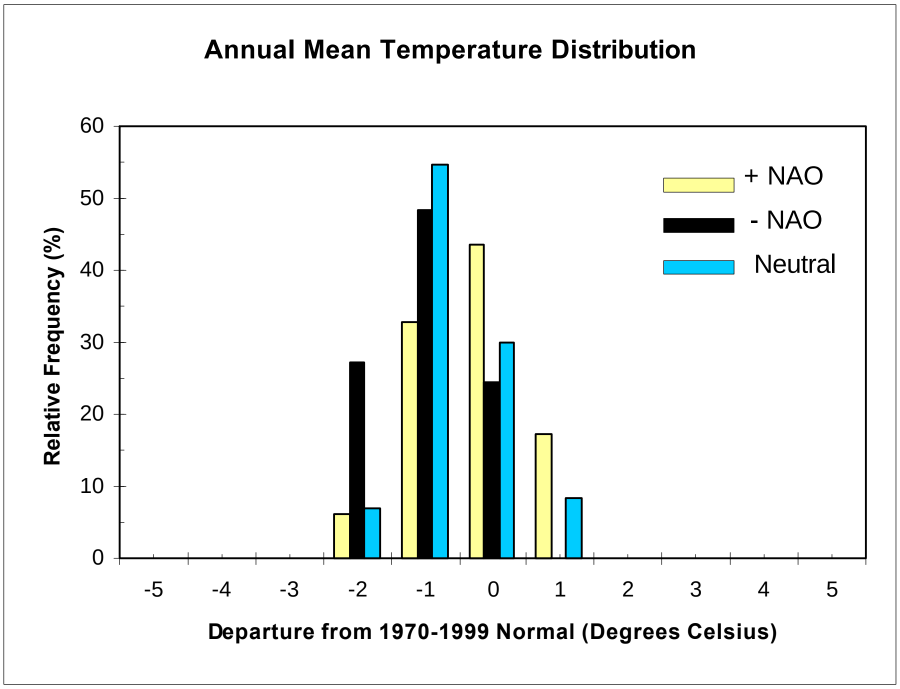

Autumn Precipitation Distribution
Relative Frequency (%)
0
5
10
15
20
25
+ NAO
- NAO
Neutral
-80 -70 -60 -50 -40 -30 -20 -10 0 10 20 30 40 50 60 70 80
Departure from 1970-1999 Normal (%)

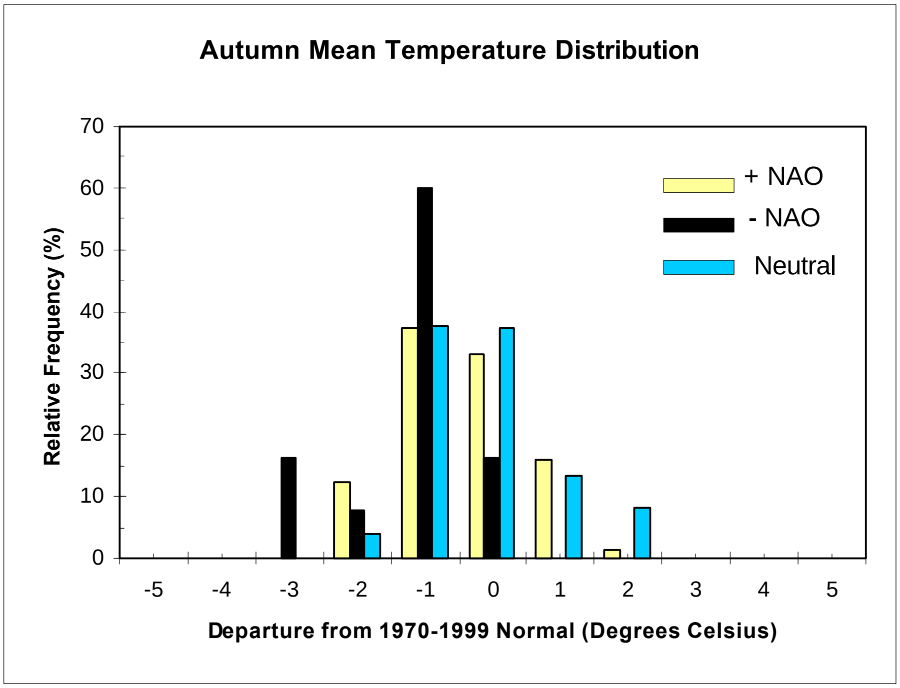

Winter Precipitation Distribution
Relative Frequency (%)
0
5
10
15
20
25
30
+ NAO
- NAO
Neutral
-80 -70 -60 -50 -40 -30 -20 -10 0 10 20 30 40 50 60 70 80
Departure from 1970-1999 Normal (%)

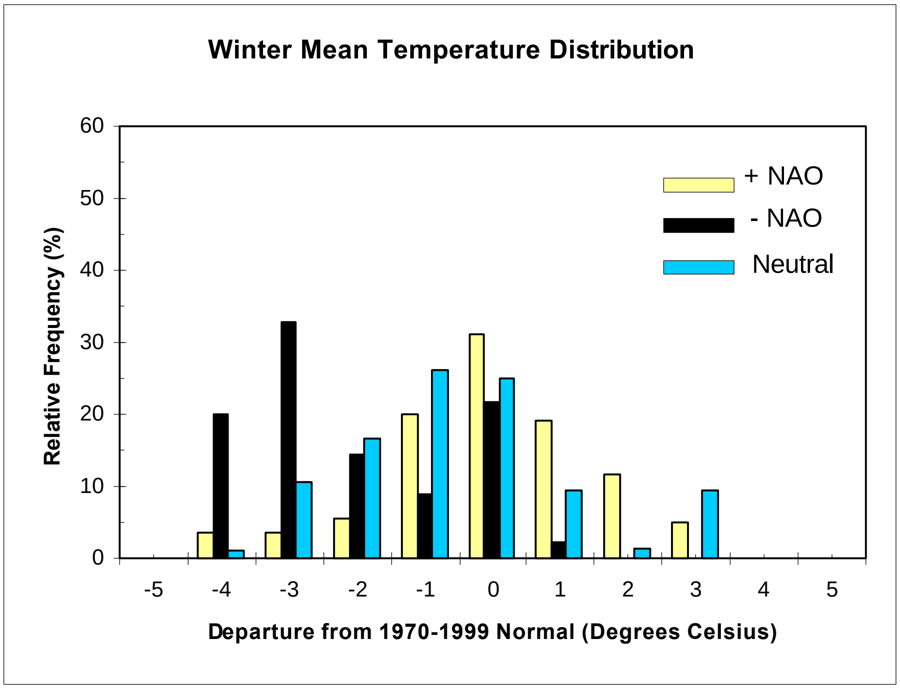

Spring Precipitation Distribution
Relative Frequency (%)
25
20
15
10
5
0
-80
-70
-60
-50
-40
-30
-20
-10
0
10
20
30
40
50
60
70
80
Departure from 1970-1999 Normal (%)
+ NAO
- NAO
Neutral

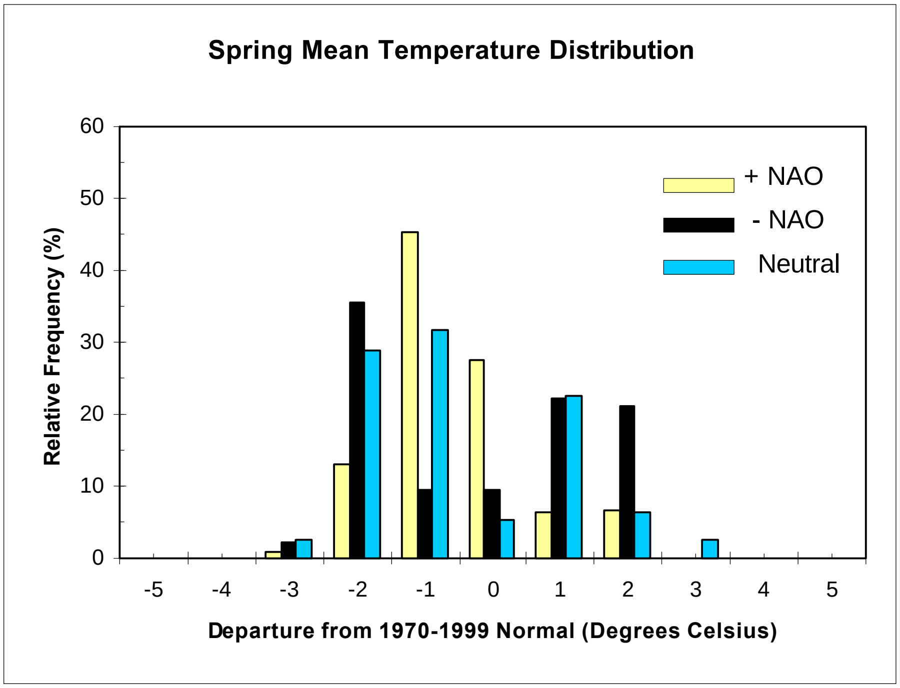

Summer Precipitation Distribution
Relative Frequency (%)
25
20
15
10
5
0
-80
-70
-60
-50
-40
-30
-20
-10
0
10
20
30
40
50
60
70
80
Departure from 1970-1999 Normal (%)
+ NAO
- NAO
Neutral

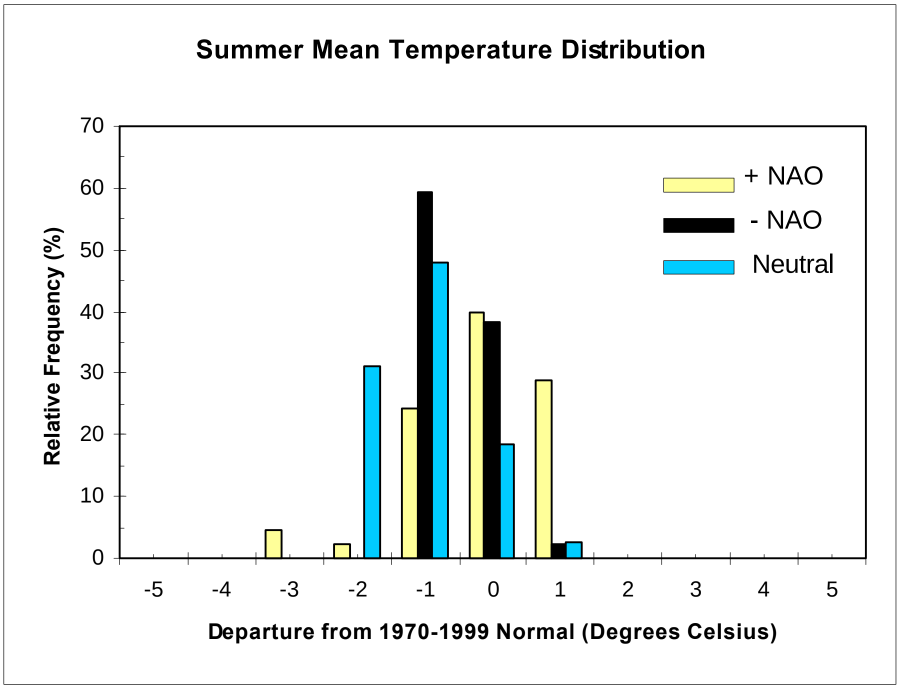

Annual Precipitation Distribution
Relative Frequency (%)
0
10
20
30
40
50
+ NAO
- NAO
Neutral
-80
-70
-60
-50
-40
-30
-20
-10
0
10
20
30
40
50
60
70
80
Departure from 1970-1999 Normal (%)


Annual Mean Temperature Distribution
Relative Frequency (%)
0
10
20
30
40
50
60
+ NAO
- NAO
Neutral
-5
-4
-3
-2
-1
0
1
2
3
4
5
Departure from 1970-1999 Normal (Degrees Celsius)


Autumn Mean Temperature Distribution
Relative Frequency (%)
70
60
50
40
30
20
10
0
+ NAO
- NAO
Neutral
-5
-4
-3
-2
-1
0
1
2
3
4
5
Departure from 1970-1999 Normal (Degrees Celsius)


Winter Mean Temperature Distribution
Relative Frequency (%)
60
50
40
30
20
10
0
+ NAO
- NAO
Neutral
-5
-4
-3
-2
-1
0
1
2
3
4
5
Departure from 1970-1999 Normal (Degrees Celsius)


Spring Mean Temperature Distribution
Relative Frequency (%)
60
50
40
30
20
10
0
-5
-4
-3
-2
-1
0
1
2
3
4
5
Departure from 1970-1999 Normal (Degrees Celsius)
+ NAO
- NAO
Neutral


Summer Mean Temperature Distribution
Relative Frequency (%)
70
60
50
40
30
20
10
0
-5
-4
-3
-2
-1
0
1
2
3
4
5
Departure from 1970-1999 Normal (Degrees Celsius)
+ NAO
- NAO
Neutral