Environment Canada | Environnement Canada

dian Climate Centre

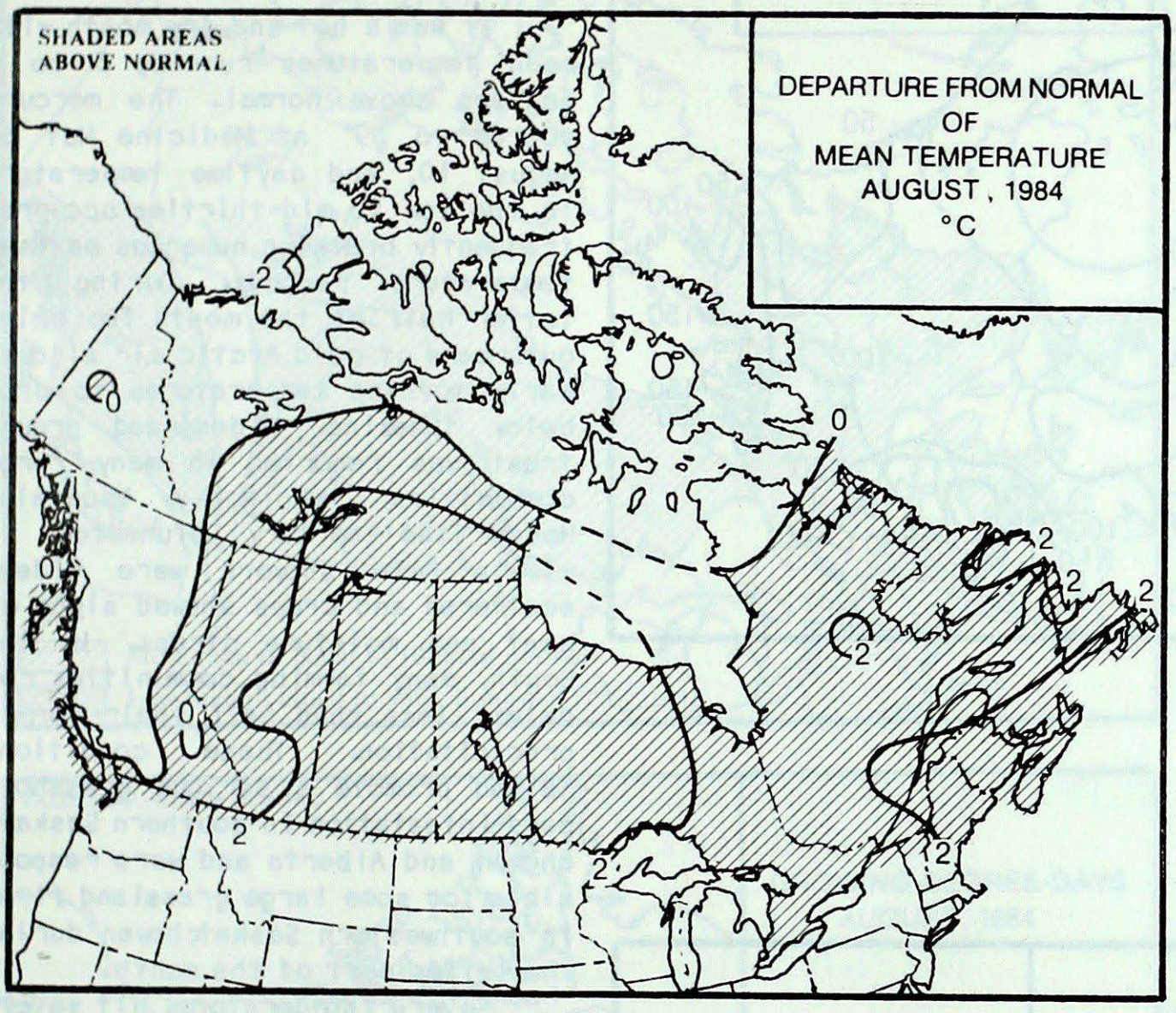
Climatic Perspectives

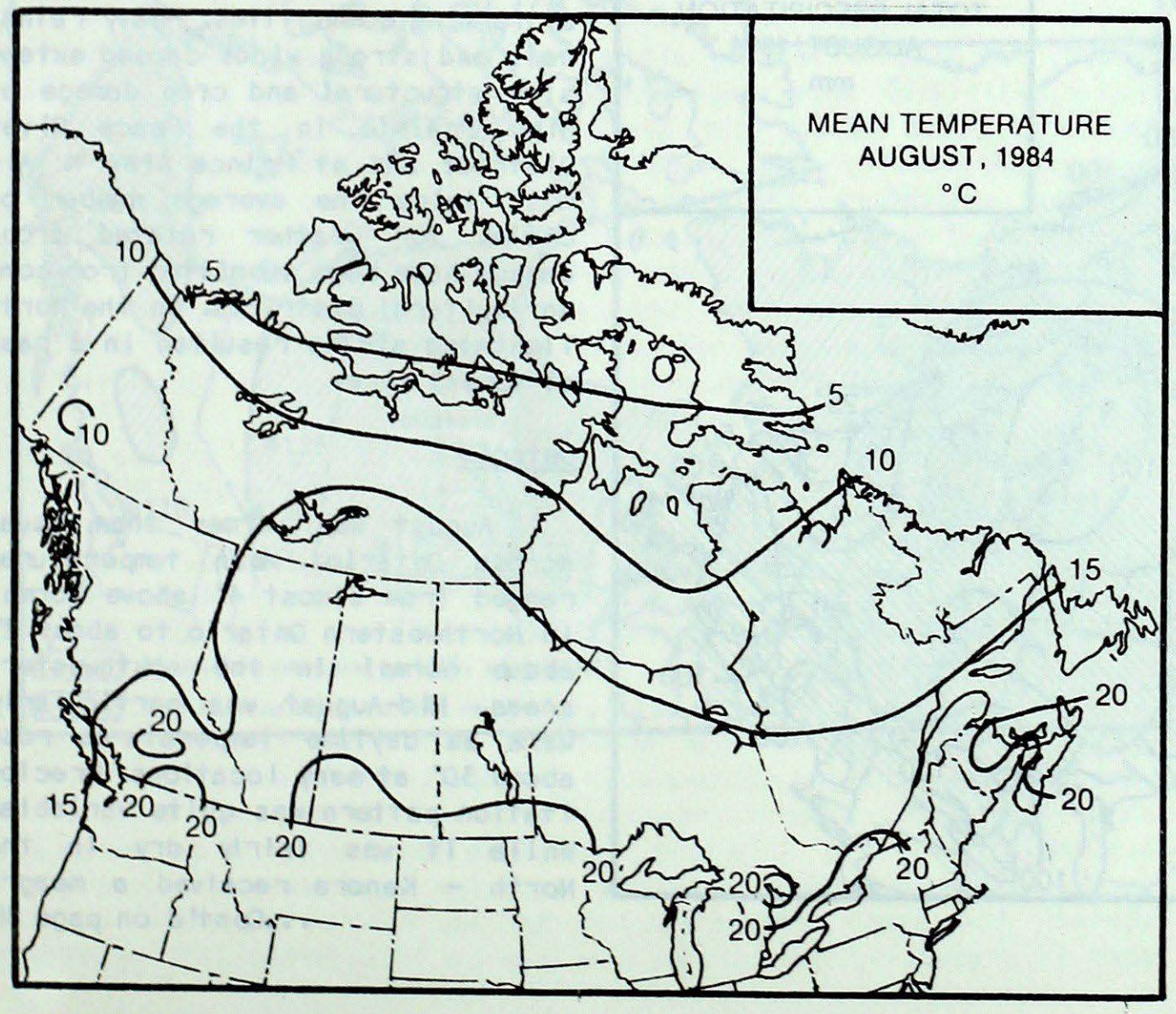
MONTHLY SUPPLEMENT

ISSN 0821-6762
UDC: 551.506.1(71)

(Aussi disponible en français)

VOL.6 AUGUST ,1984





ACROSS THE COUNTRY

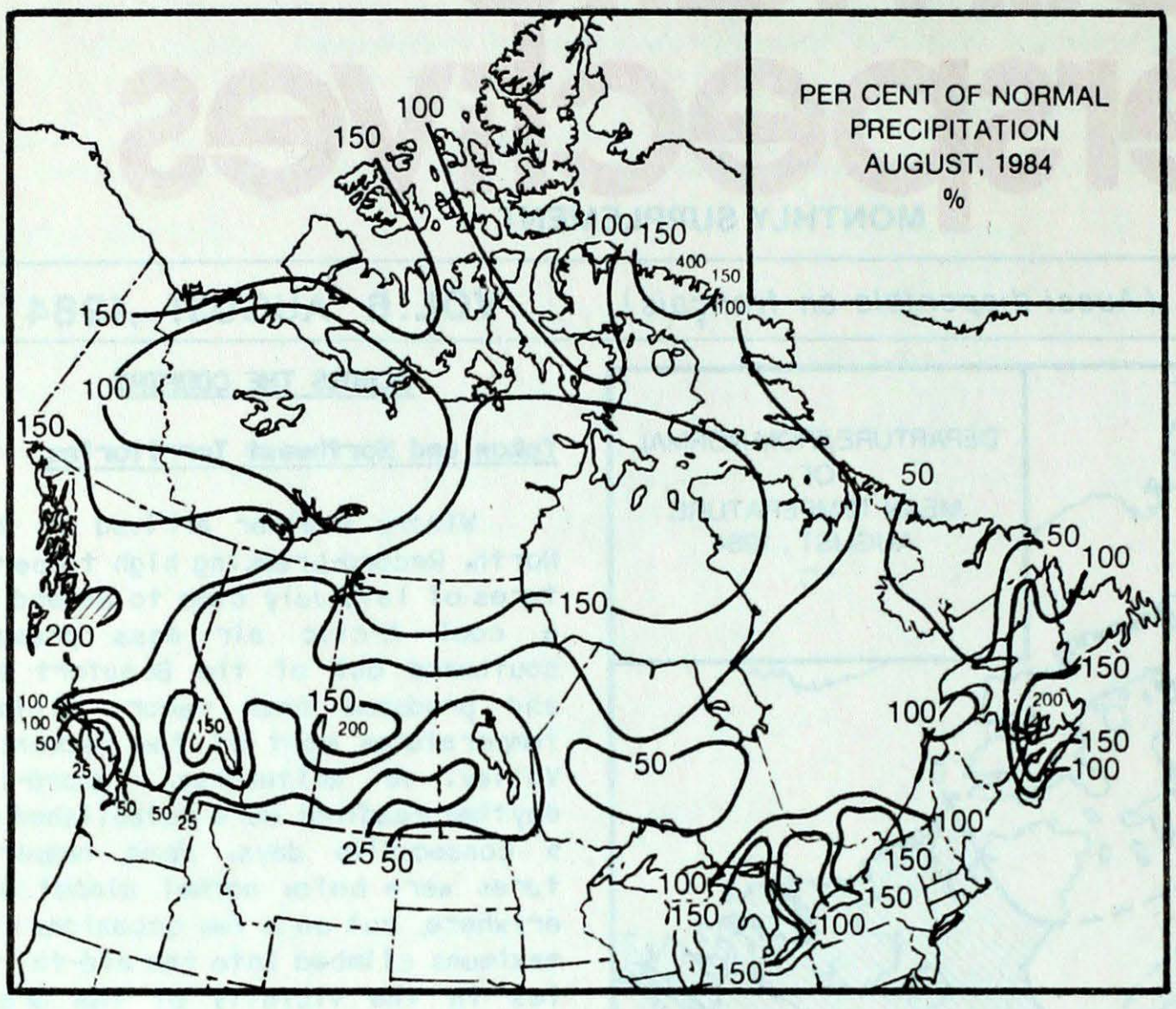
Yukon and Northwest Territories

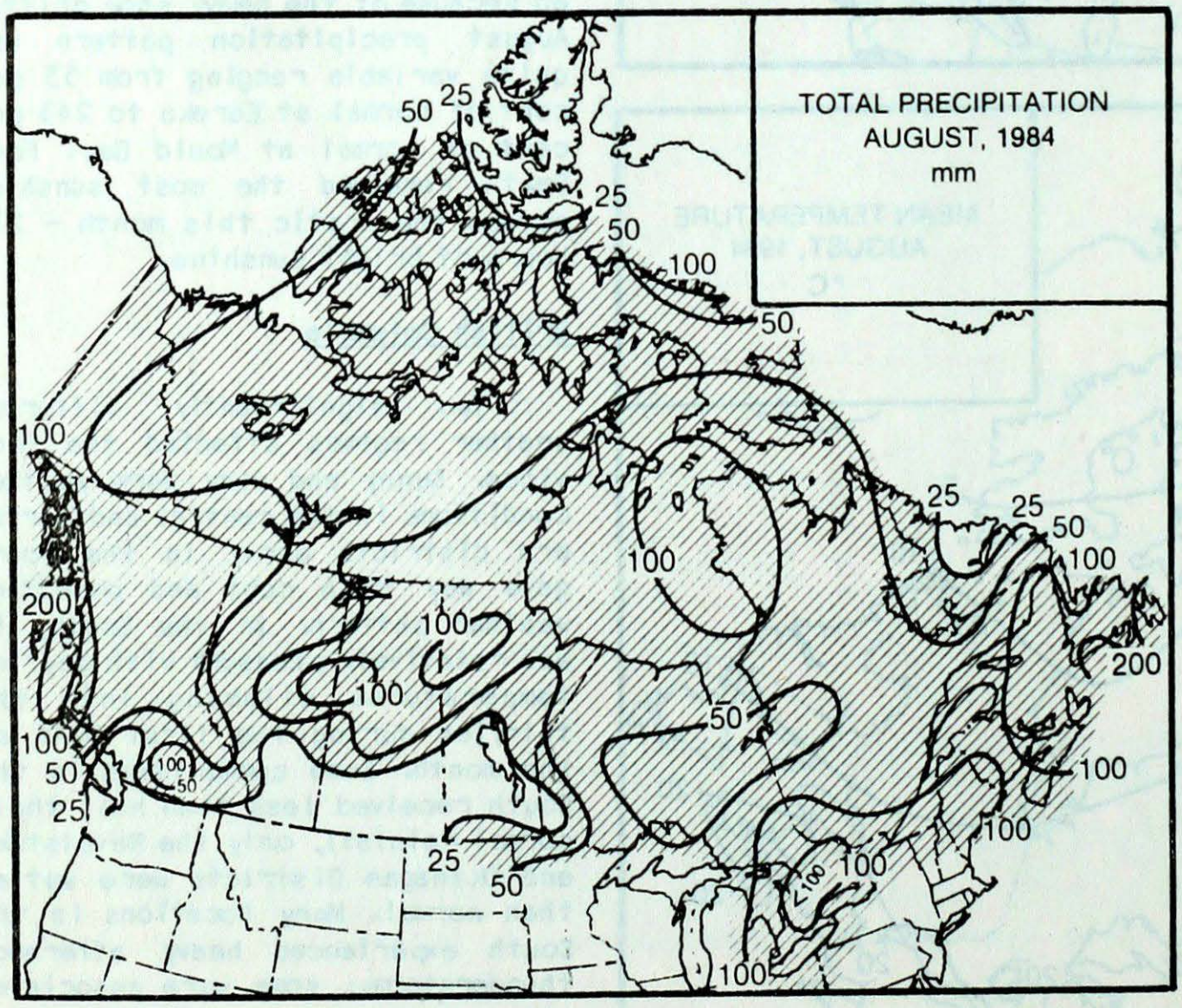
Wintry weather arrived in the North. Record-breaking high temperatures of late July came to an end as a cool Arctic air mass pressed southward out of the Beaufort Sea and produced near record minimum temperatures east of the Mackenzie Valley. At Whitehorse, record-low daytime readings were established on 5 consecutive days. Mean temperatures were below normal almost everywhere, but on a few occasions the maximums climbed into the mid-thirties in the vicinity of the Great Slave Lake. A major snow storm tracked out of the Aluetian Islands and dumped the first seasonal snow fall over the Yukon. The winds combined with snow produced treacherous roads and the Taylor Highway from Dawson towards Alaska was closed because of the heavy snow drifts. August precipitation pattern was quite variable ranging from 53 per cent of normal at Eureka to 243 per cent of normal at Mould Bay. Fort Smith received the most sunshine across the Arctic this month - 270 hours of bright sunshine.

British Columbia

Two significantly different weather regimes affected the Province. Sunny and very warm weather conditions in the central and northern districts early in the month gave way to a cool and unsettled weather pattern. In the South, it was relatively pleasant with daytime temperatures climbing into the thirties during the first half of the month. Some communities in the South received less than half their normal rainfall, only the Revelstoke and Okanagan Districts were wetter than normal. Many locations in the South experienced heavy afternoon thunderstorms; some were associated with heavy downpours and strong winds. Many forest fires were

Canada





started by lightning but the situation remained under control. Harvest operations progressed well in the South but cool and wet weather conditions in more northern farming communities slowed crop growth and delayed early harvest.

Prairie Provinces

It was a hot and dry month with mean temperatures running 3 to 4 degrees above normal. The mercury soared to 39° at Medicine Hat on August 10, and daytime temperature in the low to mid-thirties occurred frequently breaking numerous maximum temperature records. During the latter half of the month two brief outbreaks of cold Arctic air allowed early morning temperatures to drop below freezing. Widespread ground frost was reported in many rural communities; at Rocky Mountains House the mercury plummeted to -3.6°. Rain showers were widely scattered and crops showed signs of heat and moisture stress. In the South, many farming communities received less than half their normal precipitation. These conditions helped promote a serious grasshoppers infestation in southern Saskatchewan and Alberta and were responsible for some large grassland fires in southwestern Saskatchewan during the latter part of the month.

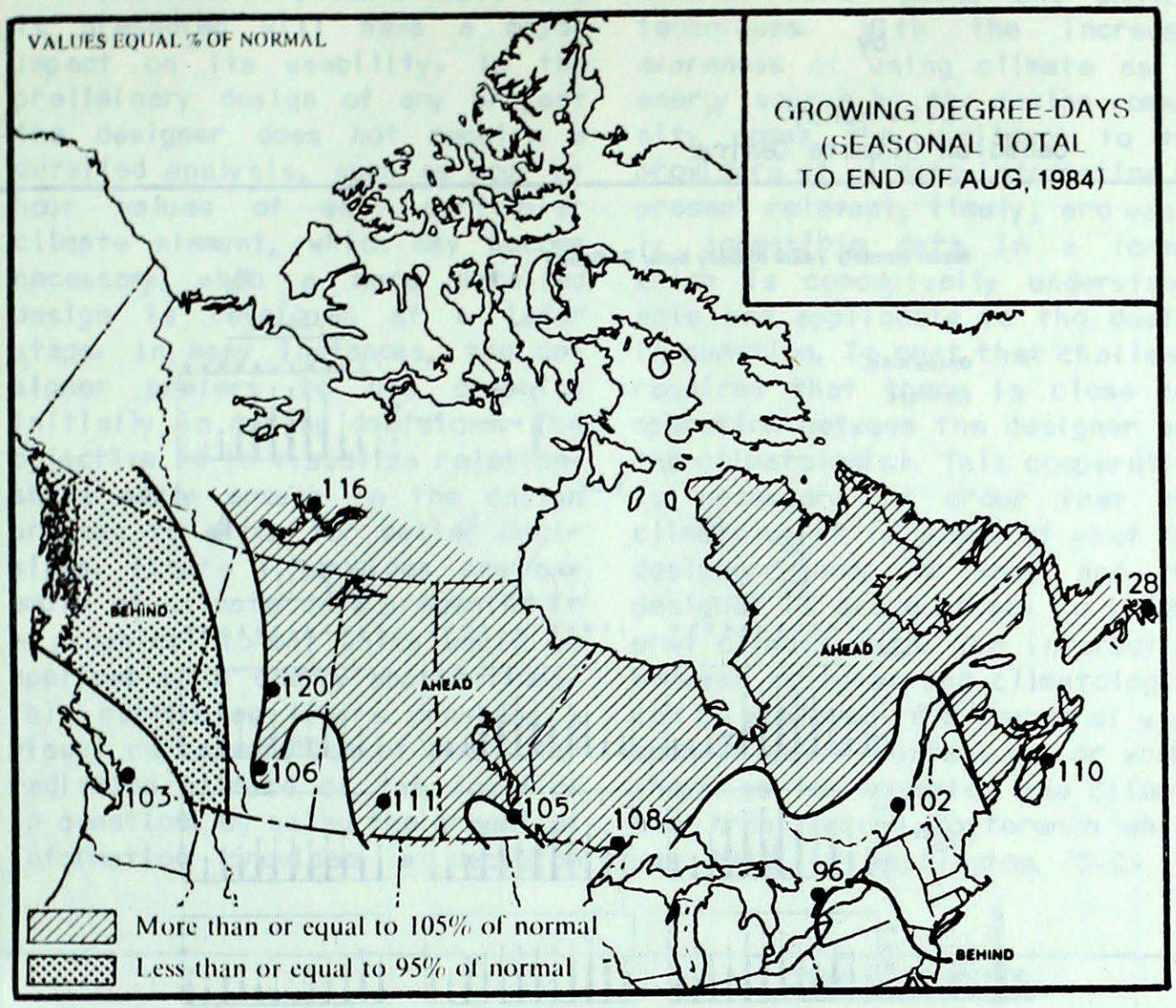
Severe thunderstorms hit several farming communities. Heavy rains, hail and strong winds caused extensive structural and crop damage at High Prairie in the Peace River District and at Prince Albert. Almost twice the average number of claims for weather related crops damage have been submitted from some agricultural districts. In the North lightning strike resulted in a rash of forest fire.

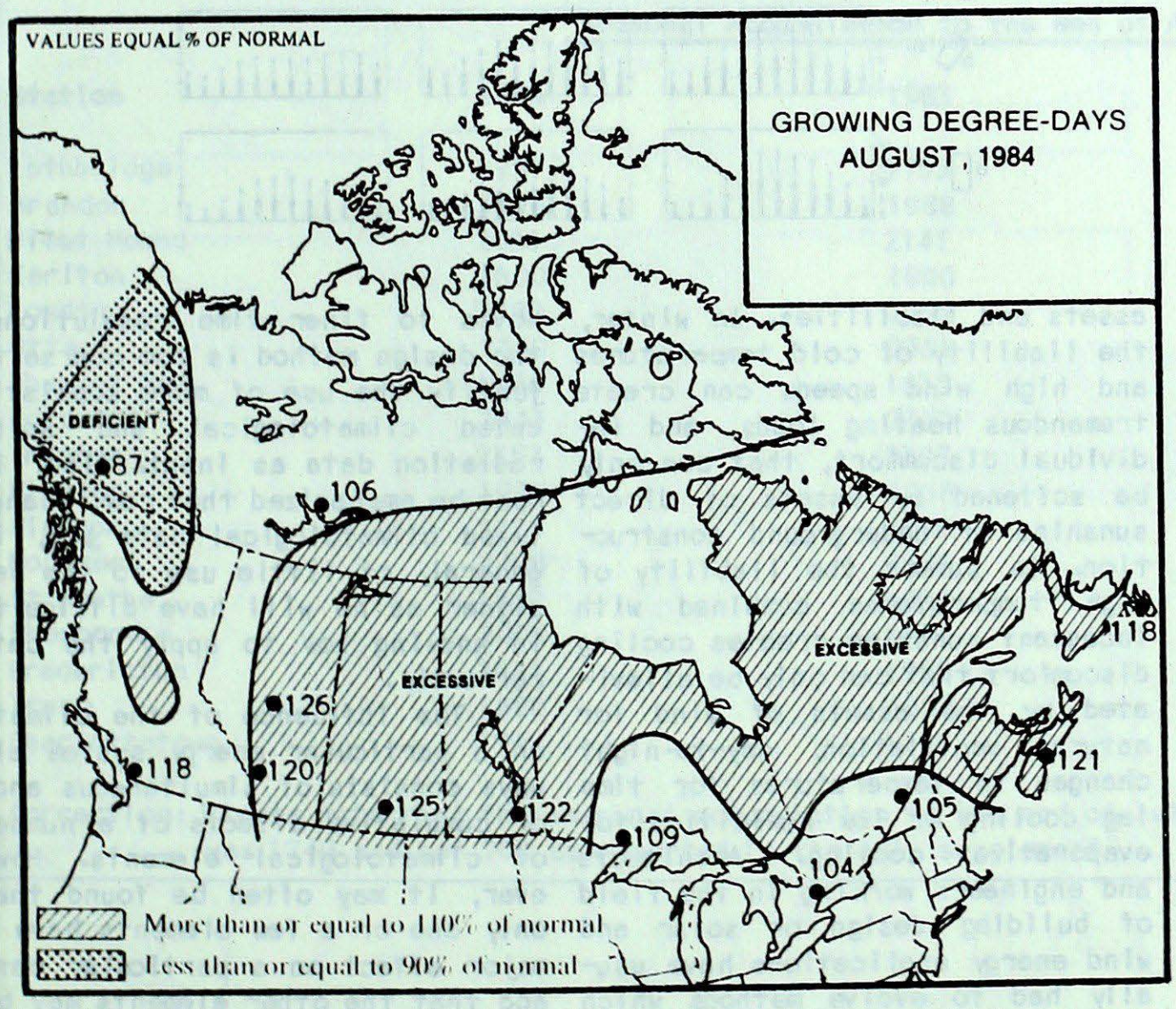
Ontario

August was warmer than usual across Ontario. Mean temperatures ranged from almost 4° above normal in Northwestern Ontario to about 2° above normal in the southwestern areas. Mid-August was particularly warm as daytime temperatures rose above 30° at many locations. Precipitation pattern was quite variable. While it was fairly dry in the North - Kenora received a meagre

...Cont'd on page 8B

GROWING DEGREE-DAYS





	TOTAL TO END OF AUGUST		
	1984	1983	NORMAL
BRITISH COLUMBIA			
Kamloops	1839	1750	1846
Penticton	1695	1634	1756
Prince George	985	1023	1049
Vancouver	1577	1545	1511
Victoria	1424	1444	1393
ALBERTA			
Calgary	1219	1161	1143
Edmonton Mun.	1449	1313	1200
Grande Prairie	1060	1085	1150
Lethbridge	1477	1335	1422
Peace River	1085	1029	
SASKATCHEWAN			
Estevan	1756	1503	1540
Prince Albert	1387	1203	1266
Regina	1598	1306	1432
Saskatoon	1558	1363	1309
Swift Current	1485	1235	1398
MANITOBA			
Brandon	1519	1291	1446
Dauphin	1485	1261	1383
Winnipeg	1596	1414	1518
ONTARIO			
London	1712	1520	1600
Muskoka	1509	1362	1387
North Bay	1400	1268	1443
Ottawa	1767	1544	1762
Thunder Bay	1318	1197	1203
Toronto	1686	1532	1749
Trenton	1655	1501	1735
Windsor	1991	1782	2015
QUÉBEC			
Baie Comeau	976	839	1006
Montréal	1796	1537	1752
Québec	1550	1316	1460
Sept-Iles	950	1038	877
Sherbrooke	1404	1208	1555
NEW BRUNSWICK			
Charlo	1331	1096	1256
Fredericton	1562	1343	1457
Moncton	1461	1254	1351
NOVA SCOTIA			
Halifax	1429	1237	1305
Sydney	1384	1087	1196
Yarmouth	1291	1110	1191
PRINCE EDWARD ISLAND			
Charlottetown	1460	1223	1280
NEWFOUNDLAND			
Gander	1164	954	1020
St. John's	1158	755	907
Stephenville	1255	1042	1022

X = Season Ended

The Need For Climate Data In Energy Decisions

by

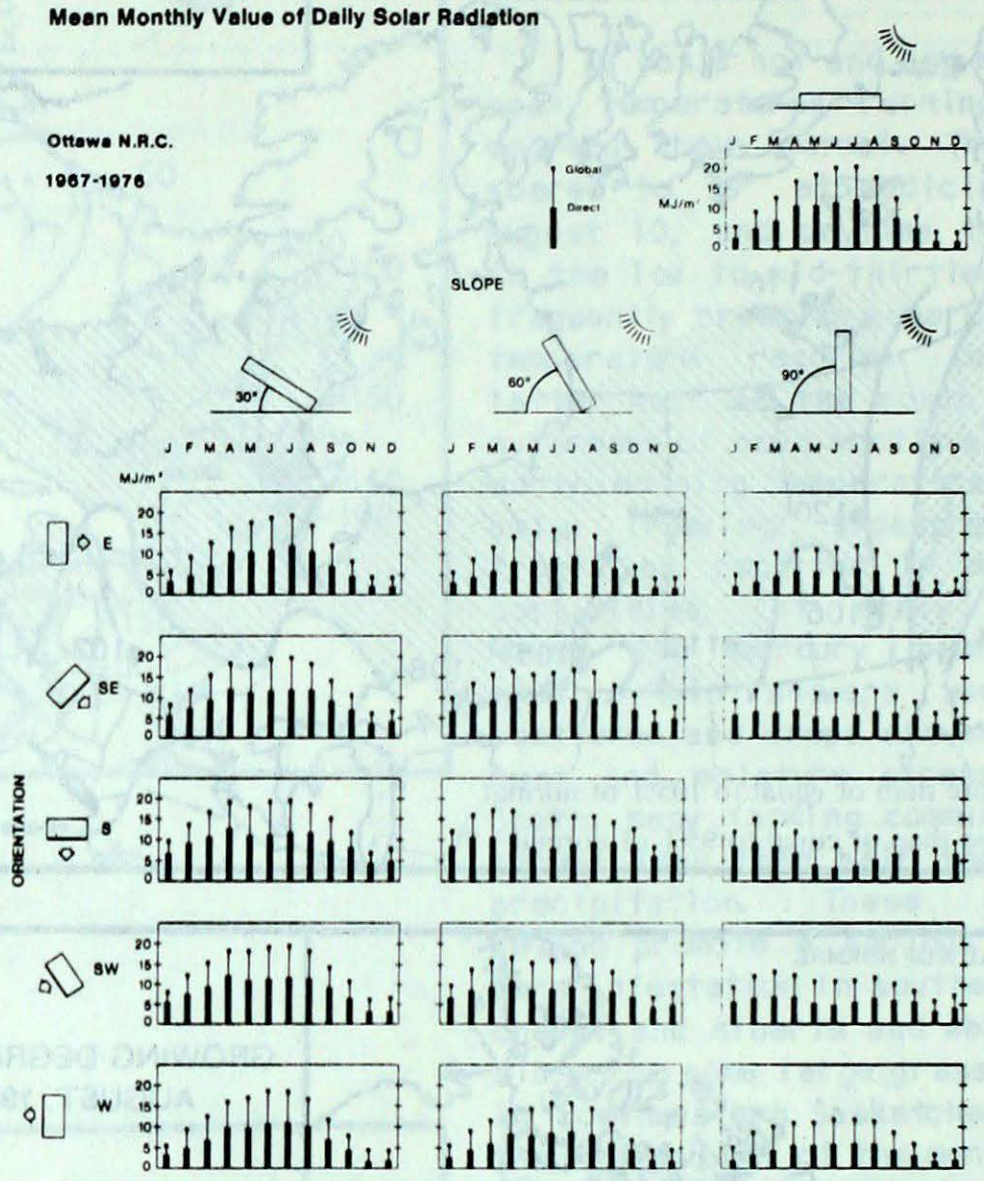
D.C. McKay
Canadian Climate Centre

It goes without saying that the consumption of energy is related to the energy system, i.e. the climate within which we dwell. Energy keeps us warm, at work, well fed and well travelled. The energy problems which face us today require close attention to climatic features so that industry, technology and urbanization can use them to positive advantage in our quest for quality of life.

The use of climate in design is not new. Down through the ages human civilizations have designed and constructed their shelters to cope with and to utilize climate. For example, consider the Middle Eastern, court yard, townhouse as found in most of the urban areas typically in Baghdad. Houses of this type have been in existence for over 4,000 years. The combination of shaded court yard, covered open terrace, cool rooms and flat roof open to the clear, cold night sky, together with the absence of openings in the external walls, provides a finely graded and cooled environment adaptly suited to this essentially desert climate. In contrast consider the shelter of the Eskimo who must survive in a harsh extremely cold climate. The igloo is ideal for these conditions, its aerodynamic shape offers low resistance to wind and a higher surface resistance to heatflow.

With the introduction of cheap energy the use of artifical means to maintain human comfort weakened the apparent need for climate control and the use of climate in design fell into disuse. However, in the few years which have passed since the "energy crisis" of the early 1970's a resurgence of the concept of design with climate has been rekindled. In the continuing interest of human comfort and energy conservation designers have again become cognative of the nuances of the climate in which they build. As noted by Loftness (1982), the climate surrounding a project site can be seen as a series of assets and liabilities. In winter, the liability of cold temperatures and high wind speeds can create tremendous heating loads, and individual discomfort, that can only be softened by assets of direct sunshine or underground construction. In summer the liability of high temperatures combined with incessant sunshine creates cooling discomfort that can only be alleviated by the assets of wind for natural ventilation, day-to-night changes in temperatures for time lag cooling or low humidities for evaporative cooling. Architects and engineers working in the field of building design or solar and wind energy applications have usually had to evolve methods which make use of simplistic meteorological inputs for several reasons; availability of the data and the form or format in which it is presented; the rapid escalation of cost in processing the data as one moves to finer time resolutions; the design method is too coarse to justify the use of more sophisticated climatological and solar radiation data as input. Also, it must be emphasized that raw, unanalyzed climatological data are, in general, of little use to the designer as he will have difficulty in knowing how to apply the data correctly.

The influence of the climate on a particular energy system always consists of simultaneous and/or cumulative effects of a number of climatological elements. However, it may often be found that only one or a few elements have a major effect on a particular case and that the other elements may be ignored. The climatologist and the architect or engineer must work in close cooperation to determine what are the important climatic elements and how the raw climatological data can be transformed into applicable



information.

The form in which climate data is presented will have a major impact on its usability. In the preliminary design of any project the designer does not require a detailed analysis, such as hour by hour values of each particular climate element, which may become necessary when a more detailed design is developed at a later stage. In many instances, the designer prefers to use graphics initially in making decisions. The objective is to visualize relationships early enough in the design process to allow for better decisions. Figure 1 provides one example of climate data presented in a graphical format which would be applicable for energy applications. This particular figure provides a visual representation of the solar radiation climate of the location in question. By using the graphical information provided a decision could be made as to, orientation to enhance solar gains and shading techniques. With the increased awareness of using climate as an energy source by the design community comes the challenge to the providers of climate information to present relevant, timely, and easily accessible data in a format which is conceptually understandable and applicable to the design in question. To meet that challenge requires that there is close cooperation between the designer and the climatologist. This cooperation is necessary in order that the climatologist is aware of what the designer needs to know and the designer is aware of how to interpret climate data. The interaction between designer and climatologist can be achieved in a number of ways such as joint conferences or workshops as for example, the Climate and Architecture Conference which was held in Washington, D.C. in 1979. This conference brought together architects and climatologists to discuss and identify climate information needed by various professionals and to recommend methods of graphic display for that information which would be most useful to designers. The publication of documents such as Climate/Energy Graphics (Loftness, 1982) which provides a useful set of exercises to improve the use of climatic data in building design is another mechanism for educating the designers to the use of climate data.

REFERENCES

Loftness, V., 1982: Climate/Energy Graphics: Report to the World Climate Programme WCP-30. World Meteorological Organization, Geneva, Switzerland.

CORN HEAT UNITS

Seasonal Accumulation to the end of August

Station	1984	1983	Per cent of Normal
Lethbridge	1791	1733	115
Brandon	1976	1988	100
Pilot Mound	2051	2141	106
Earlton	1800	1808	116
London	2389	2336	100
Ottawa	2379	2351	100
Thunder Bay	1766	1835	118
Toronto	2343	2332	99
Trenton	2357	2307	96
Wiarton	1975	2058	98
Windsor	2725	2736	100
Montréal	2498	2379	100
St Agathe	1869	1824	82
Sherbrocke	2003	1851	106
Fredericton	2074	1958	104
Truro	1882	1658	116
Charlottetown	1961	1765	107

Correction: Please note that the seasonal accumulation to the end of July at Wiarton was 1240 and not 908 as reported in the July supplement.

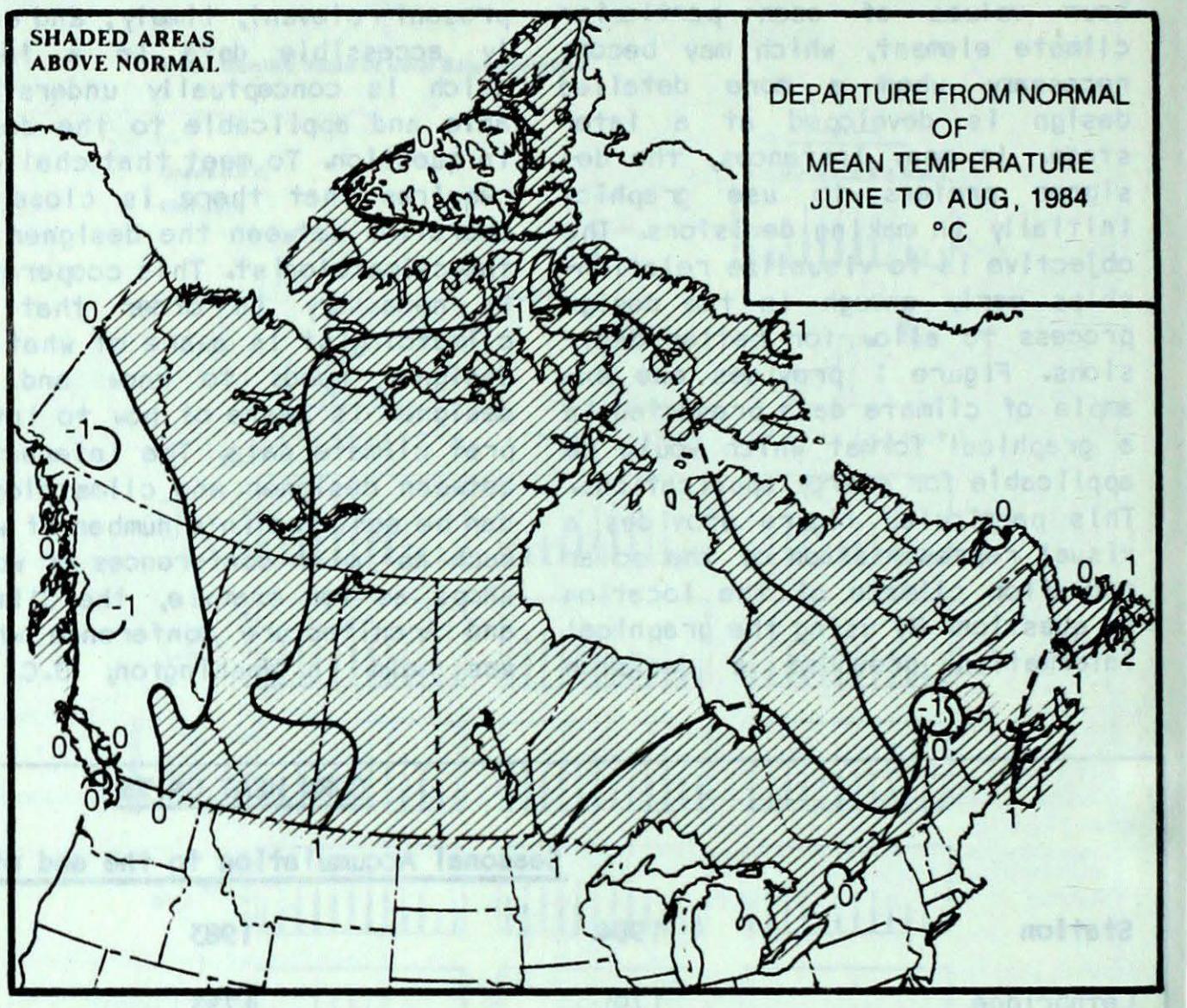
Summer of 1984 - A Climatic Review

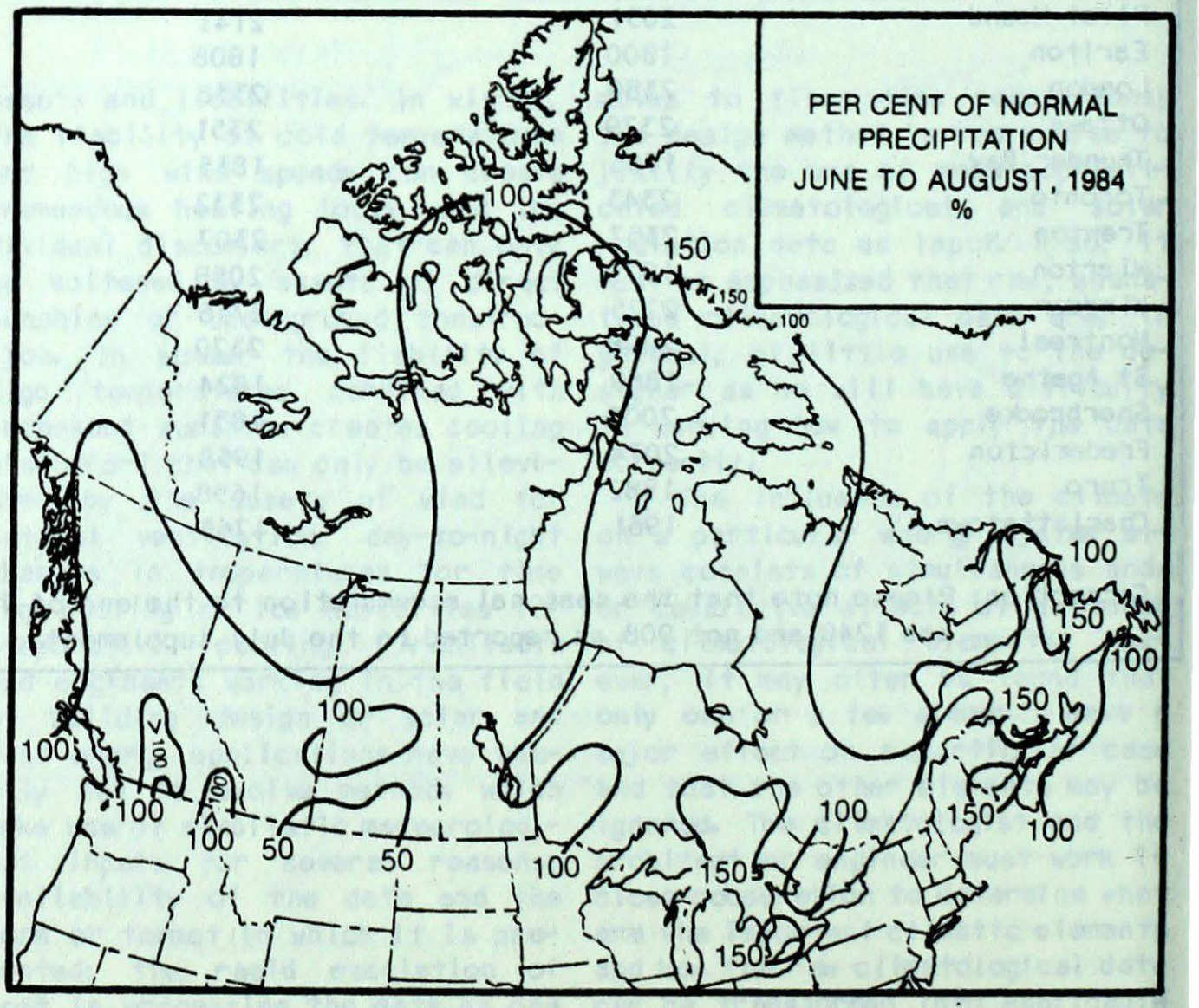
by
A. Shabbar
Canadian Climate Centre

The summer of 1984 offered most Canadian near normal temperatures and almost perfect vacation weather. On the Prairies, however, the weather had its greatest impact on the agriculture. Record-breaking heat and very little rain dried up farmlands, and crops in southern Saskatchewan and southern Alberta suffered irreparable damage. Unusually high number of destructive storms lashed southern Ontario, but on a positive note the forest fire season could be described as the quietest in many years across the country.

Mean June through August temperatures were about 2° above normal on the southern Prairies and in Northwestern Ontario. Elsewhere, the readings were close to normal.

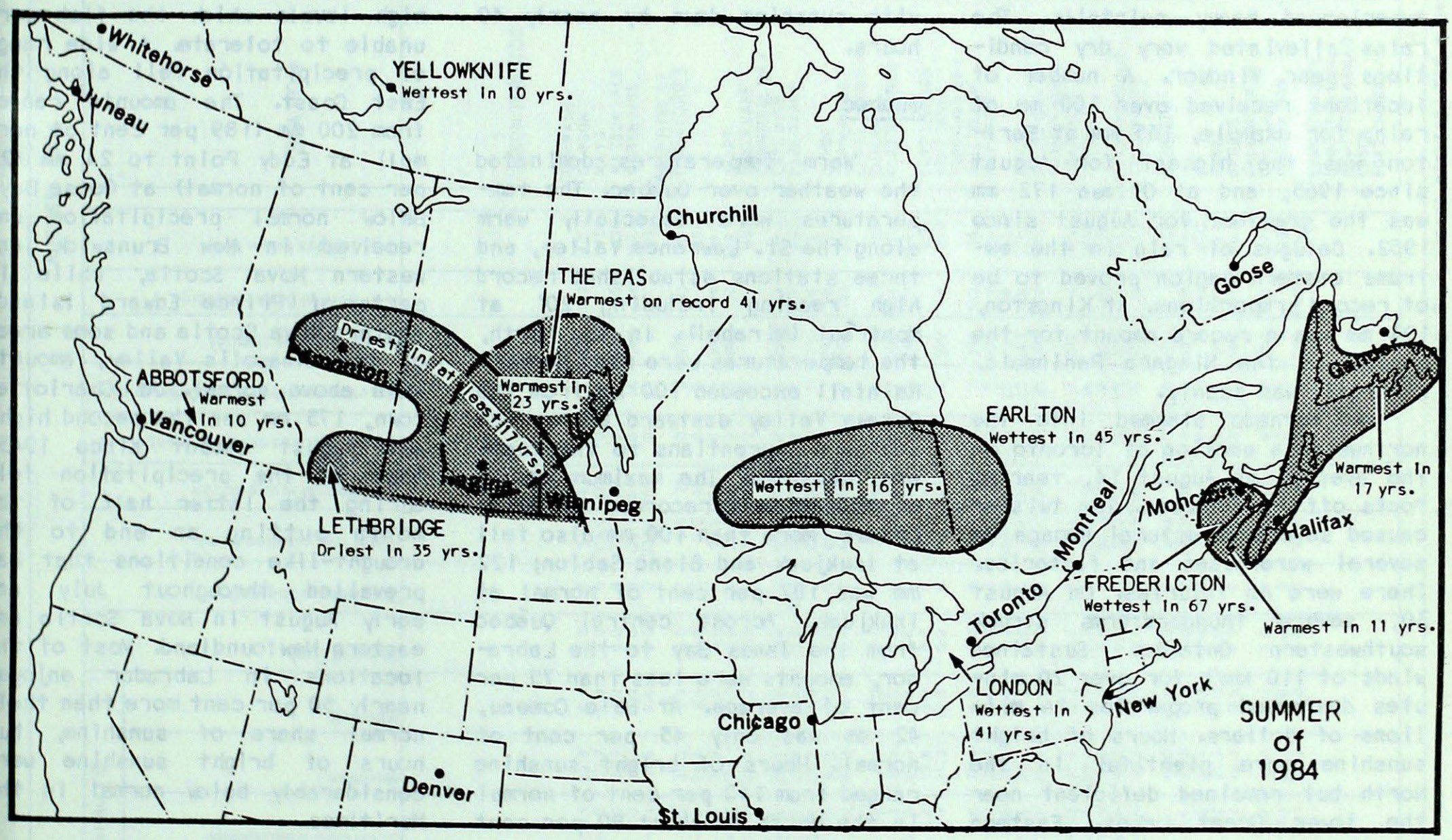
After many months of cool weather, warm temperatures covered the Northwest Territories during June and July. The readings were especially warm in the Mackenzie Valley where typically maximums reached into the low thirties. Summer was extremely short in the Yukon, only the last two weeks of July were warm. A major snow storm during mid-August brought an abrupt end to the summer in the Yukon. Cool and damp weather plagued British Columbia throughout June but July provided pleasantly warm temperatures. Storms were deflected northwards leaving much of the southern regions dry, Victoria City had no measurable rainfall during July. The Prairies suffered one of its severest drought in recent history. The relentless heat (temperatures in the high thirties) and the lack of sufficient rain left much of southern Alberta and southern Saskatchewan extremely dry. Areas south of a line from Brandon through Saskatoon to Calgary were the hardest hit. Some crops on non-irrigated lands past the point of recovery. Owing to the below-normal spring runoff from the mountains, the stream flow in the





rivers was far below normal. Added to the drought problem, there was a severe grasshopper infestation. The insects devoured thousands of square kilometres of crops. Major reduction in crop yield was expected. During mid-summer, lightning strikes helped ignited numerous grassland fires in southern Saskatchewan. The warm and dry weather also hastened harvest work across the Prairies. Cutting and swathing were finished about 2 to 3 weeks ahead of normal in some areas. Southern Manitoba had quite a few severe weather. Destructive winds and damaging hail caused extensive property damage.

From Manitoba to the Gulf of St. Lawrence, the temperatures were near normal. The right combination of the warmth and rain proved beneficial to crops. Ontario grape growers produced a bumper crop this year. During July southern Ontario was very dry but crop reviving rains came in August. There was unusually high number of severe weather across the lower Great Lakes. During a heavy downpour during mid- June, more than 75 mm of rain fell in less than 6 hours at Hamilton; a few days later an additional 87 mm fell at the same location. On July 15, tornadoes carved wide paths of destruction from Ralpton to Blue Sea Lake near Ottawa. The village of Blue Sea Lake was the hardest hit as many homes were reduced to rubble and 1 person was killed. Another tornado slammed into Toronto on August 14. The twister caused severe structural damage to several warehouses and factories. In Atlantic Canada, June was rather cool and wet; however, a warm spell coincided with the visit of the Tall Ships to Halifax. And there was a rare snowfall on Cape Breton on June 4. Very dry weather brought drought-like conditions to Nova Scotia and Newfoundland in July. Eastern Newfoundland was very dry, a meagre 41 mm at St. John's was only 55 per cent of normal. The dry weather depleted soil moisture reserves and crops exhibited moisture stress. Dry weather also contributed to below average river levels. August's heat increased the sale of air conditioners as people sought relief from the uncomfortable weather. Warm weather also claimed an estimated 106,000 trouts in Lake George in the Yarmouth County. The fish couldn't tolerate record-high water temperatures. Crop saving rains arrived in Newfoundland during August, and the warm July and August weather contributed to one of the best corn crop in Nova Scotia.



CLIMATIC EXTREMES - AUGUST, 1984

MEAN TEMPERATURE:		
WARMEST	Eddy Point, NS	23.3°
COLDEST	Mould Bay, NWT	0.2°
HIGHEST TEMPERATURE:	Medicine Hat, Alt	39.0°
LOWEST TEMPERATURE:	Alert, NWT	- 8.6°
HEAVIEST PRECIPITATION:	McInnes Island, BC	267.0 mm
HEAVIEST SNOWFALL:	Mould Bay, NWT	22.8 cm
DEEPEST SNOW ON THE GROUND ON AUGUST 31, 1984:	Alert, NWT	10 cm
GREATEST NUMBER OF BRIGHT SUNSHINE HOURS:	Estevan, Sask	350 hrs

... (Cont'd from page 2B)

23 mm - the south of the Province experienced heavy rainfalls. The rains alleviated very dry conditions near Windsor. A number of locations received over 100 mm of rain; for example, 165 mm at Earlton was the highest for August since 1965, and at Ottawa 172 mm was the greatest for August since 1952. Deluges of rain in the extreme eastern region proved to be of record proportions. At Kingston, 194 mm was a record amount for the month. In the Niagara Peninsula, rainfall was scanty.

A tornado slammed into the northwestern section of Toronto on the evening of August 14, tearing roofs off many houses. The twister caused severe structural damage to several warehouses and factories. There were no injuries. On August 30, severe thunderstorms struck southwestern Ontario. Sustained winds of 110 km/h for over 20 minutes destroyed properties in millions of dollars. Hours of bright sunshine were plentiful in the North but remained deficient near the lower Great Lakes. Eastern Ontario was considerably cloudy with sunshine down by nearly 40 hours.

Québec

Warm temperatures dominated the weather over Québec. The temperatures were especially warm along the St. Lawrence Valley, and three stations established record high reading including 20° at Montréal (Mirabel). In the North, the temperatures were near normal. Rainfall exceeded 100 mm from the Ottawa Valley eastward across the southern Laurentians to the Eastern Townships. The maximum amount of 172 mm was recorded at Hull-Ottawa. More than 100 mm also fell at Inukjuak and Blanc Sablon; 122 mm was 187 per cent of normal at Inukjuak. Across central Québec from the James Bay to the Labrador, amounts were less than 75 per cent of average. At Baie Comeau, 42 mm was only 45 per cent of normal. Hours of bright sunshine ranged from 140 per cent of normal in the North to about 80 per cent of normal in the eastern areas.

Altantic Provinces

Altantic Canada experienced very warm but dull weather during August. Only Newfoundland had above normal hours of bright sunshine. At least 9 stations in the Maritimes recorded record-high mean temperatures; at Sable Island, 20.1° was the warmest August reading since 1917. Many other locations broke old records dating back several decades. The warm, humid weather during the early part of the month caused an increase in the sale of air conditioners as people sought relief from the uncomfortable weather. Warm weather was also blamed for the death of an estimated 106,000 Brock Trout in Lake George in the Yarmouth County, the water temperature in this lake rose to record-high levels which the fish were unable to tolerate. A wide range of precipitation fell along the East Coast. The amounts ranged from 200 mm (189 per cent of normal) at Eddy Point to 24 mm (23 per cent of normal) at Goose Bay. Below normal precipitation was received in New Brunswick and western Nova Scotia, while in parts of Prince Edward Island, eastern Nova Scotia and some areas of the Annapolis Valley, amounts were above normal. At Charlottetown, 173 mm was the second highest August amount since 1943. Most of the precipitation fell during the latter half of the month putting an end to the drought-like conditions that had prevailed throughout July and early August in Nova Scotia and eastern Newfoundland. Most of the locations in Labrador enjoyed nearly 50 per cent more than their normal share of sunshine, but hours of bright sunshine were considerably below normal in the Maritimes.

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Annual subscription rate for weekly issues--- $35.00
Annual subscription rate for one issue per month including monthly supplement--- $10.00

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AUGUST 1984

STATION	Temperature C Mean	Difference from Normal	Maximum	Minimum	Snowfall (cm)	% of Normal Snowfall	Total Precipitation (mm)	% of Normal Precipitation	Snow on ground at end of month (cm)	No. of days with Precip 1.0 mm or more	Bright Sunshine (hours)	% of Normal Bright Sunshine	Degree Days below 18 C
BRITISH COLUMBIA													
ABBOTSFORD	17.0	0.1	29.8	6.3	0.0	0	51.4	92	0	4	263	107	42.9
ALERT BAY	12.3	-2.0	21.2	6.8	0.0	0	114.0	171	0	21	X		MSG
BLUE RIVER	15.9	0.3	32.9	2.2	0.0	0	73.0	98	0	12	191	85	MSG
CAPE ST. JAMES	13.8	0.0	19.1	7.9	0.0	0	120.7	154	0	18	143	*	132.0
CAPE SCOTT	13.6	-0.1	17.6	9.4	0.0	0	200.1	188	0	20	X		MSG
CASTLEGAR	20.2	0.5	36.2	3.2	0.0	0	9.5	21	0	3	278	101	15.6
COMOX	16.6	-0.4	24.6	8.1	0.0	0	9.0	20	0	3	X		MSG
CRANBROOK	18.3	0.9	33.2	3.0	0.0	0	19.6	60	0	4	319	*	34.0
DEASE LAKE	11.4	-0.2	29.1	-1.1	0.8	*	59.5	113	0	15	165	82	204.5
ETHELDA BAY	13.5	-0.2	20.8	4.3	0.0	0	254.9	150	0	19	X		MSG
FORT NELSON	14.6	-0.2	30.6	1.0	TR	0	96.5	158	0	16	228	*	128.9
FORT ST. JOHN	14.8	0.4	27.9	0.5	3.8	475	60.8	101	0	7	X		MSG
HOPE	18.0	-0.4	30.2	8.9	0.0	0	113.1	225	0	7	231	104	23.3
KAMLOOPS	20.7	0.9	35.5	5.1	0.0	0	26.4	96	0	7	270	96	15.6
KELOWNA	19.0	1.2	35.3	3.1	0.0	0	47.8	155	0	7	263	101	23.3
LANGARA	13.4	0.2	17.9	9.2	0.0	0	171.1	166	0	19	X		MSG
LYTTON	21.1	0.2	34.6	8.6	0.0	0	8.8	52	0	2	250	104	10.2
MACKENZIE	13.6	-0.2	29.0	0.6	0.0	0	34.0	144	0	13	243	101	144.6
MCINNES ISLAND	14.5	0.2	19.6	9.2	0.0	0	267.0	178	0	23	X		MSG
MERRY ISLAND	18.0	0.3	24.3	13.0	0.0	0	18.7	42	0	4	222	*	16.0
PENTICTON	20.3	0.8	35.9	4.0	0.0	0	30.1	114	0	7	277	102	14.1
PORT ALBERNI	16.5	-1.1	29.7	4.9	0.0	0	7.2	17	0	3	210	*	56.4
PORT HARDY	13.8	0.0	20.4	7.0	0.0	0	100.7	146	0	20	121	66	131.2
PRINCE GEORGE	14.5	0.4	28.5	0.7	0.0	0	71.4	105	0	13	242	96	113.2
PRINCE RUPERT	13.6	0.5	20.3	6.4	0.0	0	251.0	158	0	21	105	76	136.7
PRINCETON	17.3	0.2	35.5	2.2	0.0	0	19.8	78	0	7	272	*	MSG
QUESNEL	16.1	0.5	30.3	2.7	0.0	0	67.4	105	0	14	X		MSG
REVELSTOKE	17.7	0.1	31.2	5.4	0.0	0	84.6	200	0	8	220	91	43.7
SANDSPIT	14.3	-0.4	18.7	8.0	0.0	0	90.7	183	0	18	126	72	113.6
SMITHERS	13.4	-0.7	27.7	2.7	0.0	0	70.8	162	0	14	174	75	143.2
STEWART	MSG		MSG	MSG	MSG		MSG		MSG	MSG	MSG		MSG
TERRACE	14.4	-1.4	25.0	7.1	0.0	0	140.9	222	0	15	137	68	113.2
VANCOUVER HARBOUR	17.8	0.6	27.2	11.1	0.0	0	25.5	47	0	1	X		MSG
VANCOUVER INT'L	17.3	0.2	27.0	10.0	0.0	0	15.7	38	0	4	261	102	26.6
VICTORIA GONZ. HTS	15.5	0.2	22.3	9.5	0.0	0	8.8	42	0	2	308	107	76.0
VICTORIA INT'L	16.3	0.2	27.1	6.2	0.0	0	7.6	28	0	2	292	107	57.5
VICTORIA MARINE	14.3	0.1	23.2	5.9	0.0	0	19.1	72	0	5	X		MSG
WILLIAMS LAKE	15.1	0.1	29.9	-1.0	0.0	0	46.7	110	0	9	246	88	96.3

STATION	Temperature C Mean	Difference from Normal	Maximum	Minimum	Snowfall (cm)	% of Normal Snowfall	Total Precipitation (mm)	% of Normal Precipitation	Snow on ground at end of month (cm)	No. of days with Precip 1.0 mm or more	Bright Sunshine (hours)	% of Normal Bright Sunshine	Degree Days below 18 C
YUKON TERRITORY													
BURWASH	9.9	-0.5	27.9	-3.8	18.4	680	56.0	146	5	9	X		246.3
DAWSON	10.7	-1.1	28.1	-4.0	9.4	400	31.8	58	0	8	X		224.3
MAYO	12.8	0.2	29.0	-1.8	8.4	400	41.8	101	0	8	X		170.4
WATSON LAKE	13.0	-0.1	31.4	0.5	TR	0	51.2	122	0	11	232	102	165.6
WHITEHORSE	11.8	-0.7	30.2	-1.8	4.6	575	65.9	174	0	12	246	106	196.9
NORTHWEST TERRITORIES													
ALERT	0.7	-0.2	11.0	-8.6	21.6	104	20.8	73	10	5	302	146	535.4
BAKER LAKE	9.5	-0.2	22.3	0.3	0.0	0	64.9	174	0	9	182		264.3
CAMBRIDGE BAY	6.2	-0.3	13.7	-1.0	TR	0	36.8	131	0	10	MSG		364.6
CAPE DYER	3.5	-1.1	12.4	-2.8	9.2	87	26.3	51	0	6	X		450.0
CAPE PARRY	4.4	-1.0	17.8	-3.0	3.0	187	27.2	98	TR	7	X		423.6
CLYDE	2.9	-1.1	11.5	-1.4	10.4	156	116.4	446	0	16	88	46	467.3
COPPERMINE	8.5	-0.2	24.2	0.4	TR	0	33.5	87	0	5	165	86	293.5
CORAL HARBOUR	6.7	-0.7	17.1	-1.7	0.0	0	97.8	220	0	11	190	84	350.3
EUREKA	2.3	-1.0	9.5	-5.2	6.6	244	6.1	53	TR	2	238	99	485.5
FORT RELIANCE	15.3	2.4	27.3	4.0	0.0	0	35.6	89	0	6	X		100.2
FORT SIMPSON	14.3	0.4	35.4	0.2	15.2	*	63.3	142	0	9	254	103	134.6
FORT SMITH	16.5	2.3	33.1	-2.8	0.0	0	57.4	135	0	5	270	103	99.1
FROBISHER BAY	6.0	-0.9	14.5	-0.9	1.2	200	79.6	135	0	15	139	86	372.4
HALL BEACH	4.5	-0.1	12.9	-1.0	0.0	0	38.6	95	0	6	X		421.1
HAY RIVER	15.5	1.1	31.9	1.4	0.0	0	59.5	158	0	9	X		104.9
INUVIK	9.4	-1.3	27.5	-5.9	11.2	339	68.2	156	0	14	156	72	267.0
MOULD BAY	0.2	-1.2	4.5	-4.6	22.8	253	52.2	243	TR	9	21	16	551.3
NORMAN WELLS	12.9	-0.5	28.8	-1.8	16.3	*	43.7	75	2	9	206	87	173.9
POND INLET	MSG		MSG	MSG	MSG		MSG		MSG	MSG	X		MSG
RESOLUTE	1.0	-1.4	9.6	-5.0	22.0	328	25.4	82	0	5	169	106	524.9
SACHS HARBOUR	1.4	-2.4	10.9	-5.0	4.4	88	38.8	169	0	9	105	55	515.4
YELLOWKNIFE	15.6	1.5	30.9	0.3	0.0	0	28.2	64	0	7	289	100	104.1
ALBERTA													
BANFF	14.9	1.1	28.5	0.5	0.0	0	73.0	149	0	MSG	X		MSG
BROOKS	19.0	1.6	35.5	0.0	0.0	0	14.5	31	0	MSG	X		MSG
CALGARY INT'L	17.4	2.2	31.4	0.5	0.0	0	16.4	30	0	2	305	108	50.2
COLD LAKE	17.7	2.2	31.2	0.6	0.0	0	36.2	48	0	8	241	95	56.7
CORONATION	17.7	1.6	33.9	0.6	0.0	0	40.4	78	0	11	303	106	48.2
EDMONTON INT'L	17.0	2.2	31.8	0.7	0.0	0	30.5	39	0	7	272	96	62.9
EDMONTON MUN.	18.4	2.2	32.7	3.4	0.0	0	23.0	30	0	6	292	105	45.7
EDMONTON NAMAO	17.2	1.6	31.4	1.6	0.0	0	32.4	44	0	5	X		59.9
EDSON	14.9	1.7	30.6	0.2	0.0	0	26.8	29	0	8	234	95	104.5
FORT CHIPEWYAN	17.6	3.1	34.0	3.0	0.0	0	42.2	87	0	MSG	X		MSG

X = Not observed * = normal missing MSG = data missing

AUGUST 1984

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FORT MCMURRAY	16.9	2.1	32.6	0.6	0.2	*	105.5	138	0	11	258	104	77.3
GRANDE PRAIRIE	15.1	0.3	30.1	3.5	0.0	0	58.4	97	0	11	263	*	105.8
HIGH LEVEL	15.4	1.4	32.5	1.5	TR	0	45.2	78	0	11	245	96	112.6
JASPER	14.9	0.7	31.3	0.0	0.0	0	51.6	106	0	10	223	*	109.0
LETHBRIDGE	19.6	2.0	35.5	2.8	0.0	0	22.5	48	0	6	MSG		27.2
MEDICINE HAT	20.9	2.0	39.0	3.4	0.0	0	5.9	16	0	2	332	111	23.1
PEACE RIVER	15.2	1.0	31.7	-1.1	0.0	0	26.6	53	0	7	X		90.7
RED DEER	16.4	1.5	31.7	-1.7	0.0	0	21.9	33	0	6	X		69.3
ROCKY MTN HOUSE	17.0	2.7	31.2	-3.6	0.0	0	31.9	41	0	9	X		91.1
SLAVE LAKE	15.5	1.1	31.3	0.1	0.0	0	55.1	77	0	10	271	111	98.0
SUFFIELD	20.3	1.9	36.5	2.3	0.0	0	12.4	31	0	3	327	107	29.1
WHITECOURT	15.5	1.6	30.1	0.1	0.0	0	94.8	107	0	14	X		97.6
SASKATCHEWAN													
BROADVIEW	19.9	3.5	35.5	-1.0	0.0	0	8.0	13	0	2	321	108	40.5
COLLINS BAY	16.2	3.6	31.4	0.5	0.0	0	45.0	67	0	10	224	*	92.8
CREE LAKE	16.8	2.4	32.2	2.5	0.0	0	80.0	132	0	9	238	96	75.5
ESTEVAN	22.2	3.6	36.1	5.5	0.0	0	29.4	56	0	5	350	113	16.6
HUDSON BAY	18.7	2.9	31.9	0.2	0.0	0	23.6	40	0	6	309	*	46.5
KINDERSLEY	20.3	2.9	37.4	2.2	0.0	0	11.8	32	0	2	X		29.9
LA RONGE	17.9	2.7	33.0	0.7	0.0	0	59.4	95	0	7	X		58.4
MEADOW LAKE	17.1	1.4	31.3	-2.0	0.0	0	58.3	80	0	9	265	*	58.4
MOOSE JAW	21.7	3.1	37.1	3.6	0.0	0	9.1	20	0	4	319	107	20.9
NIPAWIN	19.0	*	33.6	1.6	0.0	0	48.3	*	0	6	319	121	40.0
NORTH BATTLEFORD	19.3	2.5	34.6	3.1	0.0	0	97.3	214	0	7	X		34.7
PRINCE ALBERT	18.3	2.9	34.6	0.2	0.0	0	70.2	135	0	6	304	113	48.0
REGINA	21.0	3.2	36.1	5.1	0.0	0	22.4	50	0	4	319	108	28.0
SASKATOON	20.6	3.4	37.7	3.5	0.0	0	7.9	21	0	4	X		31.6
SWIFT CURRENT	20.1	2.6	36.2	1.6	0.0	0	19.8	46	0	5	318	107	34.9
URANIUM CITY	17.1	2.5	32.6	2.7	0.0	0	75.0	158	0	7	X		71.4
WYNYARD	19.9	3.1	34.4	-1.4	0.0	0	11.0	20	0	3	311	111	40.6
YORKTON	19.8	2.9	36.4	1.0	0.0	0	19.8	33	0	4	306	108	40.6
MANITOBA													
BISSETT	19.9	3.2	33.7	3.0	0.0	0	27.0	35	0	5	288	116	23.6
BRANDON	20.1	2.6	36.1	1.3	0.0	0	26.0	40	0	4	X		31.9
CHURCHILL	14.5	3.2	32.2	3.8	0.0	0	67.9	116	0	6	308	133	121.0
DAUPHIN	19.8	2.7	35.7	2.5	0.0	0	14.5	23	0	3	304	111	32.5
GILLAM	16.1	2.3	32.0	1.2	0.0	0	38.2	63	0	9	X		82.3
GIMLI	20.2	3.1	35.0	3.8	0.0	0	18.2	32	0	7	304	115	27.3
ISLAND LAKE	19.3	3.0	31.2	2.9	0.0	0	52.6	85	0	8	X		46.5
LYNN LAKE	16.9	2.8	22.6	11.1	0.0	0	109.7	188	0	9	229	98	82.6
NORWAY HOUSE	18.6	*	31.6	1.5	0.0	0	47.6	*	0	8	X		43.6
PILOT MOUND	20.7	3.1	36.7	4.6	0.0	0	43.0	67	0	5	X		25.4

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PORTAGE LA PRAIRIE	21.0	2.6	36.7	5.2	0.0	0	31.1	38	0	5	X		18.7
THE PAS	19.3	3.2	32.2	1.2	0.0	0	15.2	26	0	7	291	113	38.3
THOMPSON	16.8	2.9	33.4	-1.4	0.0	0	68.6	95	0	10	261	114	75.1
WINNIPEG INT'L	21.0	2.7	36.5	5.9	0.0	0	21.6	29	0	5	312	110	19.5
ONTARIO													
ATIKOKAN	19.0	3.2	32.8	2.9	0.0	0	67.2	69	0	9	262	108	35.1
EARLTON	17.5	1.3	30.0	3.8	0.0	0	165.1	198	0	12	X		54.0
GERALDTON	17.4	2.8	30.9	1.6	0.0	0	92.6	139	0	8	X		61.5
GORE BAY	19.5	1.3	27.3	15.1	0.0	0	79.2	105	0	9	X		14.9
HAMILTON RBG	21.9	1.1	31.1	10.0	0.0	0	81.2	100	0	11	237	93	2.4
HAMILTON	21.0	1.0	29.5	9.6	0.0	0	62.0	77	0	6	X		6.9
KAPUSKASING	17.2	1.9	30.4	0.3	0.0	0	45.1	49	0	8	X		66.9
KENORA	21.4	3.8	34.9	6.8	0.0	0	23.1	27	0	4	X		17.2
KINGSTON	20.5	1.1	29.5	7.8	0.0	0	194.0	255	0	15	208	82	14.6
LANSDOWNE HOUSE	18.3	3.6	31.4	5.5	0.0	0	66.1	75	0	12	X		MSG
LONDON	21.0	1.5	29.5	9.6	0.0	0	62.0	77	0	6	217	88	6.9
MOOSONEE	15.3	1.0	30.5	0.0	0.0	0	43.6	55	0	8	243	113	111.6
MOUNT FOREST	18.5	1.0	28.5	4.0	0.0	0	41.2	48	0	5	MSG		34.4
MUSKOKA	19.0	1.6	28.4	3.0	0.0	0	80.1	90	0	13	X		33.4
NORTH BAY	17.9	0.9	27.8	6.3	0.0	0	102.6	104	0	11	192	82	46.3
OTTAWA INT'L	20.3	1.6	32.6	8.4	0.0	0	172.1	195	0	11	209	86	14.2
PETAWAWA	19.0	1.4	31.3	3.3	0.0	0	66.0	83	0	8	X		34.6
PETERBOROUGH	19.2	1.1	30.0	3.7	0.0	0	112.8	152	0	11	X		31.1
PICKLE LAKE	18.9	3.8	23.6	3.9	0.0	0	42.6	41	0	10	X		47.6
RED LAKE	19.5	3.3	33.7	2.2	0.0	0	61.3	79	0	8	286	*	40.9
ST. CATHARINES	22.0	1.0	31.2	9.4	0.0	0	49.0	61	0	9	X		3.4
SARNIA	21.2	0.9	30.8	9.0	0.0	0	176.1	343	0	8	255	102	6.6
SAULT STE. MARIE	18.3	1.4	28.9	4.0	0.0	0	65.4	79	0	8	243	93	29.5
SIMCOE	20.7	1.0	30.0	8.0	0.0	0	83.4	128	0	9	X		11.2
SIOUX LOOKOUT	19.9	3.3	32.0	6.5	0.0	0	60.2	68	0	8	X		33.1
SUDBURY	18.5	1.2	30.1	7.3	0.0	0	143.2	173	0	11	240	96	34.9
THUNDER BAY	18.0	1.6	30.9	5.1	0.0	0	86.5	104	0	9	259	101	35.5
TIMMINS	17.2	1.7	30.2	0.4	0.0	0	49.8	56	0	11	X		60.3
TORONTO	22.3	1.1	30.8	11.4	0.0	0	56.9	78	0	9	MSG		1.5
TORONTO INT'L	21.1	1.4	32.0	7.4	0.0	0	63.8	83	0	9	X		9.9
TORONTO ISLAND	22.1	2.0	30.9	12.4	0.0	0	42.4	60	0	10	X		1.9
TRENTON	20.5	0.8	30.0	8.0	0.0	0	81.0	113	0	10	X		14.1
TROUT LAKE	17.6	3.3	30.7	3.1	0.0	0	85.8	105	0	9	246	*	69.5
WATERLOO-WELL	19.7	0.8	28.9	5.6	0.0	0	114.6	129	0	9	X		25.4
WAWA	16.0	*	26.0	3.0	0.0	0	75.0	*	0	6	X		71.9
WIARTON	20.6	2.5	28.4	6.1	0.0	0	146.0	168	0	12	249	98	25.8
WINDSOR	22.4	1.1	32.1	10.5	0.0	0	106.1	126	0	9	X		1.4

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QUEBEC													
BAGOTVILLE	18.2	1.8	30.8	3.2	0.0	0	78.3	79	0	11	X		37.3
BAIE COMEAU	15.3	0.7	25.1	4.3	0.0	0	42.4	45	0	7	205	*	85.5
BLANC SABLON	13.1	1.3	23.0	1.8	0.0	0	113.6	105	0	10	158	*	154.3
CHIBOUGAMAU	16.3	2.3	30.0	3.2	0.0	0	63.6	54	0	8	229	111	72.9
KUUJJUAQ	11.2	0.8	30.3	1.0	0.0	0	71.4	112	0	12	137	82	212.4
GASPE	17.5	1.5	29.0	6.4	0.0	0	74.2	85	0	10	212	*	44.0
INUKJUAK	8.9	0.0	20.5	4.0	0.0	0	121.8	187	0	14	144	99	282.3
LA GRANDE RIVIERE	12.5	*	30.3	0.5	0.0	0	72.2	*	0	11	244	*	176.2
MANIWAKI	18.3	1.3	30.3	2.6	0.0	0	161.2	177	0	8	183	83	40.2
MATAGAMI	16.0	2.0	31.6	0.7	0.0	0	55.5	52	0	12	252	124	61.8
MONT JOLI	17.2	1.2	27.5	7.7	0.0	0	82.4	104	0	9	197	81	51.7
MONTREAL INT'L	21.1	1.5	31.5	7.4	0.0	0	112.4	122	0	10	229	95	14.4
MONTREAL M INT'L	19.9	*	30.7	5.8	0.0	0	126.6	*	0	10	223	*	22.6
NATASHQUAN	15.0	1.7	23.9	6.7	0.0	0	50.4	48	0	6	206	89	91.4
NITCHEQUON	14.0	2.2	26.9	3.5	0.0	0	75.2	67	0	12	222	122	128.4
KUUJJUARAPIK	11.3	1.4	30.4	3.0	0.0	0	89.9	96	0	9	185	111	195.1
QUEBEC	19.9	2.4	30.9	7.0	0.0	0	79.4	68	0	7	220	100	14.7
ROBERVAL	18.6	2.2	32.2	5.6	0.0	0	87.2	88	0	14	233	*	39.8
STE AGATHE DES MONTS	18.2	2.4	28.0	4.9	0.0	0	161.1	142	0	13	202	85	42.5
ST HUBERT	20.6	1.4	32.1	6.4	0.0	0	108.9	113	0	11	X		15.7
SCHEFFERVILLE	12.2	1.4	28.0	0.5	0.0	0	61.4	63	0	13	209	*	179.2
SEPT-ILES	15.5	1.4	26.4	5.4	0.0	0	87.2	84	0	10	206	92	80.3
SHERBROOKE	18.4	1.9	29.2	1.5	0.0	0	111.3	92	0	9	228	*	45.0
VAL D'OR	16.3	1.3	30.2	0.1	0.0	0	97.3	97	0	9	226	96	73.3
NEW BRUNSWICK													
CHARLO	19.4	3.3	30.3	7.2	0.0	0	93.9	87	0	11	228	94	23.4
CHATHAM	20.3	2.3	32.7	7.1	MSG		44.0	53	0	7	209	88	17.5
FREDERICTON	20.3	2.1	33.4	6.8	0.0	0	110.9	127	0	9	202	*	14.0
MONCTON	19.7	2.1	31.0	6.9	0.0	0	64.6	82	0	8	232	101	15.2
SAINT JOHN	18.9	2.3	29.3	8.4	0.0	0	56.5	55	0	8	173	81	19.0

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NOVA SCOTIA													
EDDY POINT	20.5	2.4	27.9	7.7	0.0	0	200.6	189	0	9	212	94	7.2
GREENWOOD	20.5	2.2	32.8	6.3	0.0	0	149.3	166	0	9	X		17.0
HALIFAX INT'L	20.6	2.5	32.5	10.0	0.0	0	96.7	87	0	11	X		9.6
SABLE ISLAND	20.1	2.5	27.0	7.9	0.0	0	75.2	65	0	9	198	111	7.3
SHEARWATER	20.1	2.3	29.3	10.0	0.0	0	102.5	105	0	9	219	97	6.4
SYDNEY	20.0	2.4	30.2	10.0	0.0	0	183.9	182	0	11	202	89	8.1
TRURO	19.9	2.3	30.7	4.2	0.0	0	145.0	151	0	9	204	96	21.1
YARMOUTH	18.6	2.2	27.0	9.6	0.0	0	84.6	87	0	7	225	107	22.9
PRINCE EDWARD ISLAND													
CHARLOTTETOWN	20.3	2.5	29.9	9.6	0.0	0	172.7	196	0	12	X		10.1
SUMMERSIDE	20.5	2.1	30.9	11.6	0.0	0	188.3	236	0	9	229	95	5.6
NEWFOUNDLAND													
ARGENTIA	16.6	1.3	24.0	9.5	0.0	0	153.0	159	0	8	X		51.9
BATTLE HARBOUR	13.5	2.3	28.7	0.7	0.0	0	71.5	35	0	7	X		139.6
BONAVISTA	16.3	1.3	26.7	8.0	0.0	0	118.3	143	0	12	X		69.9
BURGEO	16.8	1.9	22.1	5.5	0.0	0	202.4	137	0	11	149	90	34.7
CARTWRIGHT	13.6	1.6	28.8	2.2	0.0	0	32.2	39	0	7	274	157	140.3
CHURCHILL FALLS	13.5	1.1	29.7	1.4	0.0	0	39.2	41	0	7	242	142	143.7
COMFORT COVE	16.3	0.7	28.4	7.0	0.0	0	150.0	140	0	15	X		74.4
DANIEL'S HARBOUR	17.4	2.9	25.7	5.7	0.0	0	97.6	35	0	10	190	106	MSG
DEER LAKE	17.0	2.0	32.1	0.1	0.0	0	91.5	89	0	11	X		57.4
GANDER INT'L	16.6	1.0	28.6	6.1	0.0	0	181.3	187	0	12	196	105	63.3
GOOSE	16.4	2.1	33.1	2.7	0.0	0	23.6	23	0	6	263	149	75.7
HOPEDALE	MSG		MSG	MSG	MSG		MSG		MSG	MSG	X		MSG
PORT-AUX-BASQUES	17.0	2.3	24.5	6.1	0.0	0	167.0	145	0	15	170	*	31.9
ST ANTHONY	13.1	0.5	25.3	3.0	0.0	0	97.9	74	0	7	X		151.7
ST JOHN'S	17.3	2.0	28.6	7.0	0.0	0	204.3	168	0	11	219	118	51.0
ST LAWRENCE	17.2	3.1	24.4	8.8	0.0	0	129.1	106	0	12	X		35.4
STEPHENVILLE	17.8	1.7	25.9	4.0	0.0	0	133.3	128	0	10	187	100	33.1
WABUSH LAKE	13.2	1.4	26.9	1.7	0.0	0	53.6	57	0	12	228	120	147.6

X = Not observed * = normal missing MSG = data missing

AUGUST 1984 AOÛT

STATION	Temperature °C Température °C: Mean Moyenne	Difference from Normal Ecart à la normale	Maximum Maximale	Minimum Minimale	Snowfall (cm) Chute de neige (cm)	Total Precipitation (mm) Précipitation totale (mm)	% of Normal Precipitation % de précipitation normale	Snow on ground at end of month (cm) Neige au sol à la fin du mois (cm)	No. of days with Precip. 1.0 or more (mm) Nombre de jours de préc. 1.0 ou plus (mm)	Bright sunshine (hours) Durée de l'insolation (heures)	Degree Days above 5°C Degrés-jours au-dessus de 5°C: This Month Présent mois	Degree Days above 5°C Degrés-jours au-dessus de 5°C: Since Jan 1st Depuis le 1er janv.	Mean Dew Point °C Point de rosée moyen °C
AGROCLIMATOLOGICAL STATIONS AGROCLIMATOLOGIQUES													
BRITISH COLUMBIA COLOMBIE-BRITANNIQUE													
Agassiz	17.7	0.0	30.0	8.0	0.0	72.6	117	0	7	245	393.8	1605.7	
Kamloops													
Sidney													
Summerland	20.0	0.0	34.0	6.0	0.0	53.6	196	0	8	286	460.5	1607.5	
ALBERTA													
Beaverlodge	15.2	1.0	29.5	-2.5	0.0	35.3	55	0	8	253	316.3	1010.5	
Ellerslie	17.0	2.1	31.5	-0.5	0.0	28.2	42	0	8	277	370.0	1170.4	
Fort Vermilion													
Lacombe	16.2	1.3	30.0	-1.5	0.0	61.5	90	0	9		343.3	1099.5	
Lethbridge													
Vauxhall													
Vegreville	17.0	1.9	33.5	-3.0	0.0	17.5	23	0	5		371.7	1193.9	
SASKATCHEWAN													
Indian Head	21.0	3.6	35.0	1.0	0.0	17.6	31	0	5		500.0	1472.0	
Melfort	19.5	3.4	34.0	0.0	0.0	15.3	28	0	5	306	453.5	1399.0	
Regina	20.1	2.7	35.0	1.0	0.0	12.8	29	0	6		473.3	1453.3	
Saskatoon	20.3	3.1	37.0	-0.5	0.0	9.6	27	0	3	335	479.5	1544.5	
Scott	18.2	2.2	35.5	1.0	0.0	41.8	90	0	10	303	410.8	1295.0	
Swift Current	20.5	2.8	28.2		0.0	17.9	47	0	6	293	481.2	1496.1	
MANITOBA													
Brandon	20.5	2.6	36.5	2.0	0.0	21.6	31	0	3	300	444.9	1492.8	
Glenlea	20.5	2.2	36.5	3.0	0.0	40.1	66	0	6	303	471.0	1511.8	
Morden	21.8	2.8	37.0	5.0	0.0	25.8	36	0	4	279	521.5	1675.2	
ONTARIO													
Delhi	20.7	0.9	30.5	2.5	0.0	85.2	92	0	9	233	487.3	1647.5	
Elora	19.5	1.4	29.0	5.0	0.0	56.3	78	0	10		443.5	1437.0	
Guelph													
Harrow	22.1	0.9	30.5	8.5	0.0	70.9	90	0	10	261	527.0	1819.7	
Kapuskasing													
Merivale													
Ottawa	21.1	1.7	32.9	7.7	0.0	196.2	232	0	11	217	499.4	1683.5	
Smithfield	20.6	1.3	30.0	8.0	0.0	62.2	82	0	12		484.0	1619.8	
Vineland Station	21.8	1.0	30.0	12.0	0.0	111.0	129	0	10	216	522.0	1685.9	
Woodslee													
QUEBEC													
La Pocatiere	18.9	1.6	31.0	5.0	0.0	77.4	79	0	11	226	431.6	1318.2	
L'Assomption	20.6	1.8	32.0	5.0	0.0	63.5	67	0	11	218	489.6	1600.3	
Lavaltrie													
Lennoxville													
Normandin	17.6	2.2	31.0	1.5	0.0	61.6	66	0	12	209	390.0	1197.0	
St. Augustin													
Ste. Clothilde	21.4	2.5	32.0	8.0	0.0	74.1	77	0	8	240	508.3	1725.8	
NEW BRUNSWICK NOUVEAU-BRUNSWICK													
Fredericton													
NOVA SCOTIA NOUVELLE-ECOSSE													
Kentville	21.0	2.6	32.5	8.0	0.0	143.8	147	0	9	213	495.9	1596.3	
Nappan	19.8	2.4	29.5	7.5	0.0	108.7	118	0	11	224	459.8	1376.3	
PRINCE EDWARD ISLAND ILE-DU-PRINCE-EDOUARD													
Charlottetown	20.4	2.0	30.0	7.5	0.0	153.6	173	0	10	227	478.3	1395.9	
NEWFOUNDLAND TERRE-NEUVE													
ST. John's West	17.4	1.9	28.0	8.0	0.0	147.2	128	0	12	208	385.9	1122.1	