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Climatic Perspectives

Monthly Review

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CLIMATIC HIGHLIGHTS

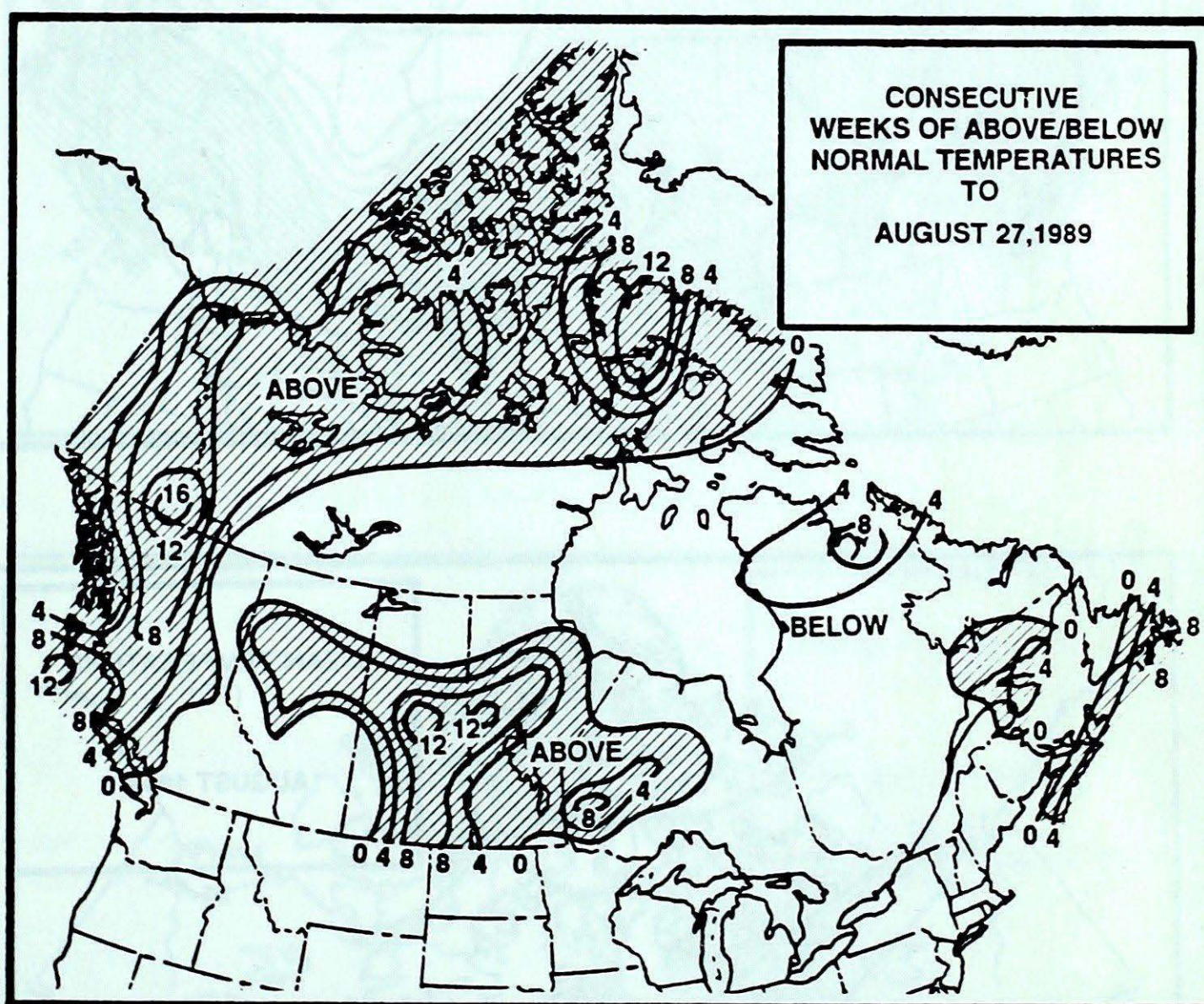
Record heat-wave in north-western Canada

The last summer of this decade will be remembered for record-high temperatures in the western portions of the Northwest Territories and the Yukon. During early June, a ridge of high pressure from the north Pacific Ocean moved over the Northwest Territories and controlled the air circulation over the Arctic, setting up a persistent flow of extremely warm air from the south.

Week after week, record-high temperatures were set along the coastal regions of the western Arctic as the mercury soared into the mid 30's. In July, daytime temperatures in some communities in the Arctic were equal to, or greater than those experienced in southern Canada. Norman Wells recorded its all-time high temperature of 34.9°C on July 14; a day later, the temperature reached an all-time high of 34.9°C at Coppermine. On July 16, Yellowknife experienced its all-time high temperature of 32.5°C. Both Fort Simpson and Fort Smith had a record 18 days this summer of temperatures 30°C or greater, compared to the long-term average of 3 days.

For 9 consecutive days, July 13-21, daily record-high values were established at Lynn Lake, Manitoba.

The hot and dry weather set the stage for the outbreak of disastrous forest fires in the northern areas of Manitoba and Saskatchewan. During mid-July, about 600 fires raged across northern Manitoba forcing

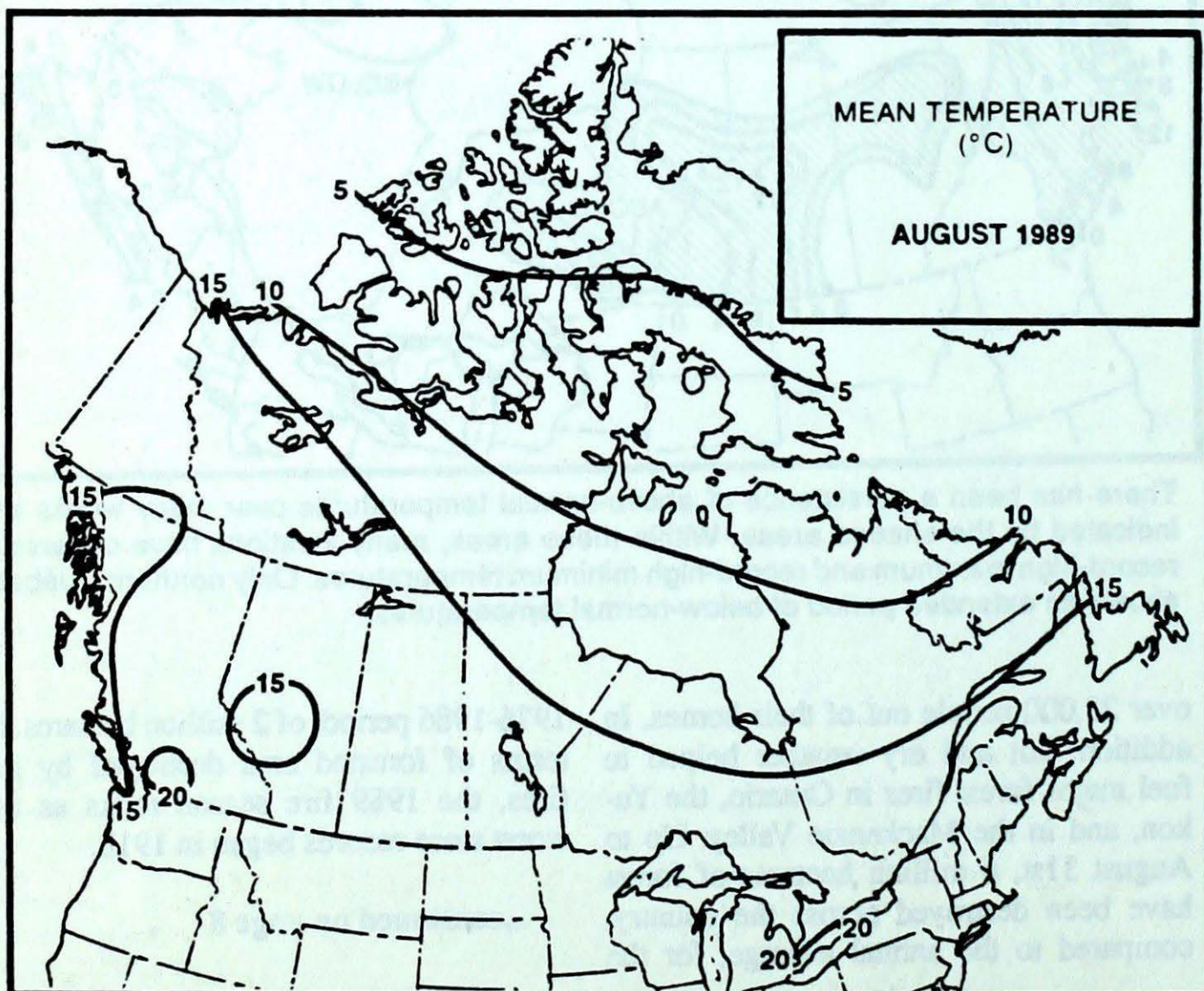
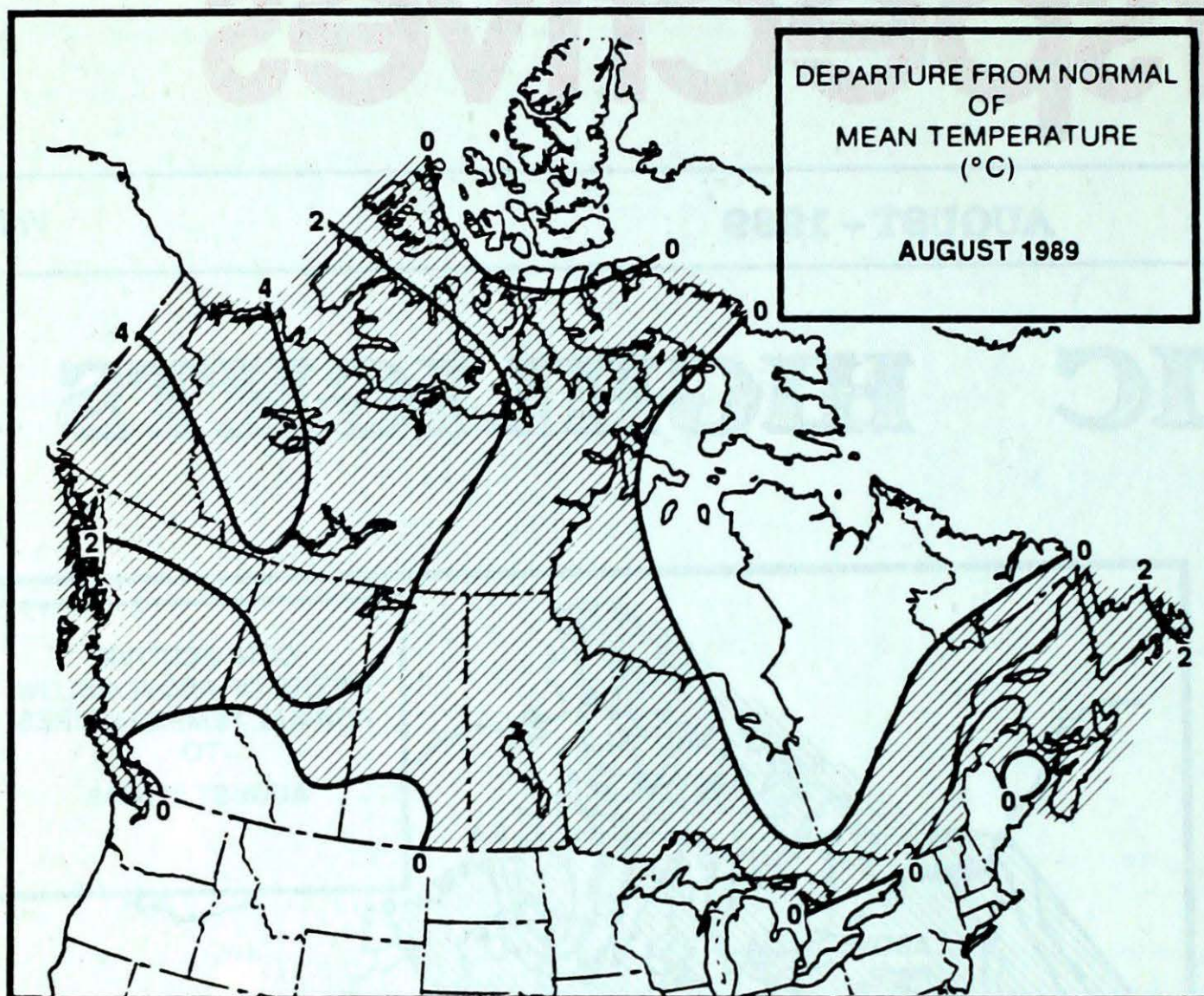


There has been a persistence of above-normal temperatures over many weeks as indicated by the shaded areas. Within these areas, many locations have observed record-high maximum and record-high minimum temperatures. Only northern Québec shows an extended period of below-normal temperatures.

over 23,000 people out of their homes. In addition, hot and dry weather helped to fuel major forest fires in Ontario, the Yukon, and in the Mackenzie Valley. Up to August 31st, 6 million hectares of forest have been destroyed across the country, compared to the annual average, for the

1976-1986 period, of 2 million hectares. In terms of forested area destroyed by the fires, the 1989 fire season ranks as the worst since records began in 1918.

...continued on page 8



Across the country

Yukon

The dominant high pressure ridge and abundant sunshine which contributed to above-normal temperatures, briefly gave way mid-month, but quickly returned. The greatest departure was a positive anomaly of 5.0 Celsius degrees along the Dempster Highway.

Below-normal precipitation was general, except around the southern lake system with 140% of normal, and around Beaver Creek with 120%.

The first 2 weeks saw all stations exceeding 30°C. Many monthly extremes fell during this period. At the end of the month, the first frost hit most areas.

Whitehorse typifies the glorious summer that has been enjoyed in the Yukon. The August mean temperature of 15.1°C was 2.6 Celsius degrees warmer than normal, and almost tied the 1957 record of 15.3°C. The sunshine total of 305.5 hours was 75 hours more than normal. The combined 4 months of May, June, July, and August, have tied the record mean temperature of 13.2°C set in 1958.

Northwest Territories

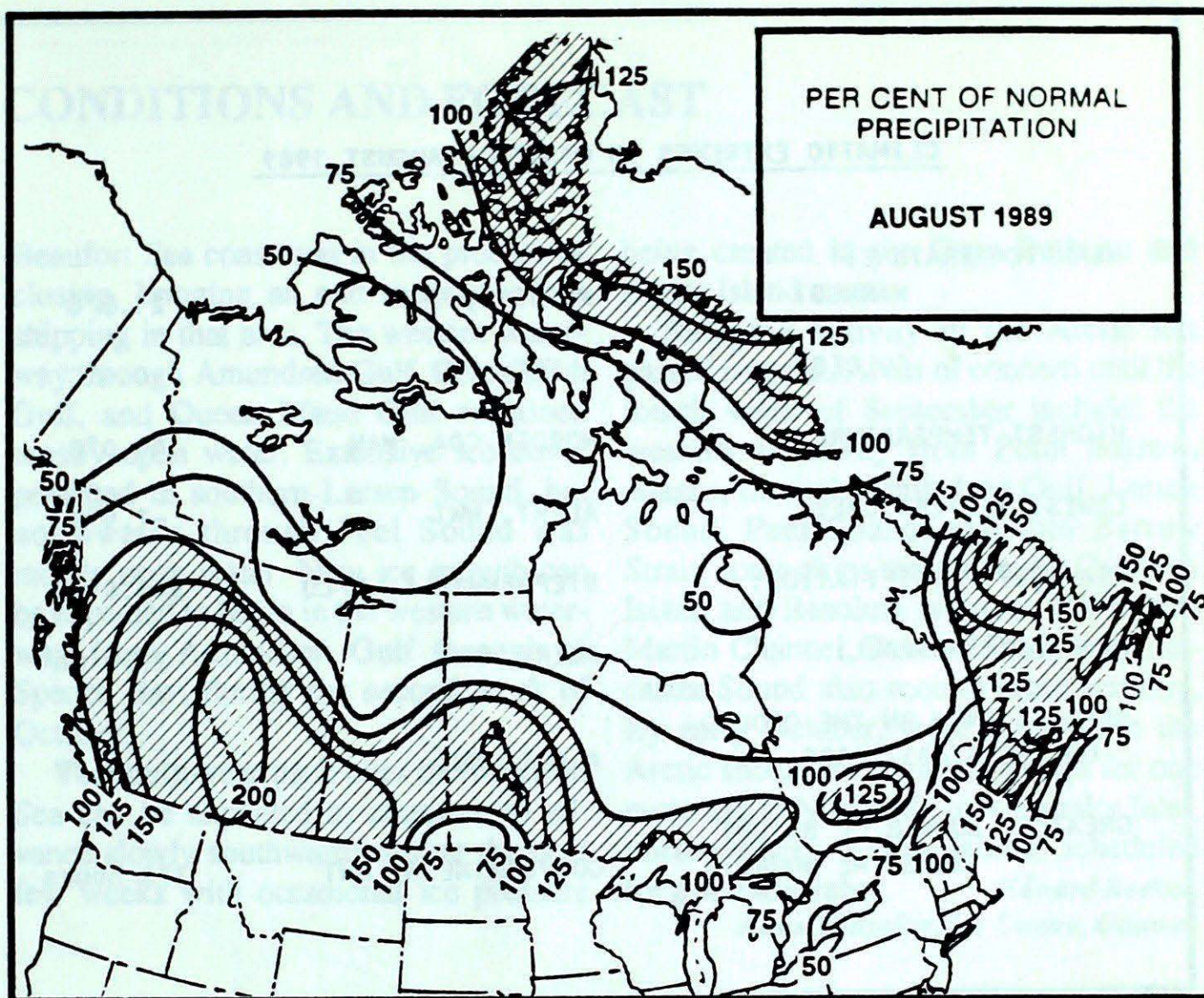
For the fifth consecutive month, temperatures have been above normal in the western Mackenzie District. The dominant high pressure ridges which have been responsible for record-high temperatures in the Yukon this month, also covered the western Territories. Inuvik recorded a monthly mean which was 4.8 Celsius degrees above normal. On the 13th, Fort Simpson was Canada's hot spot with 33.7°C. Temperatures in the eastern Arctic were near, to slightly below normal.

Except for the extreme eastern Arctic, most of the Territories received below normal precipitation. Across the Arctic, by month's end, there has been the odd snow-shower.

British Columbia

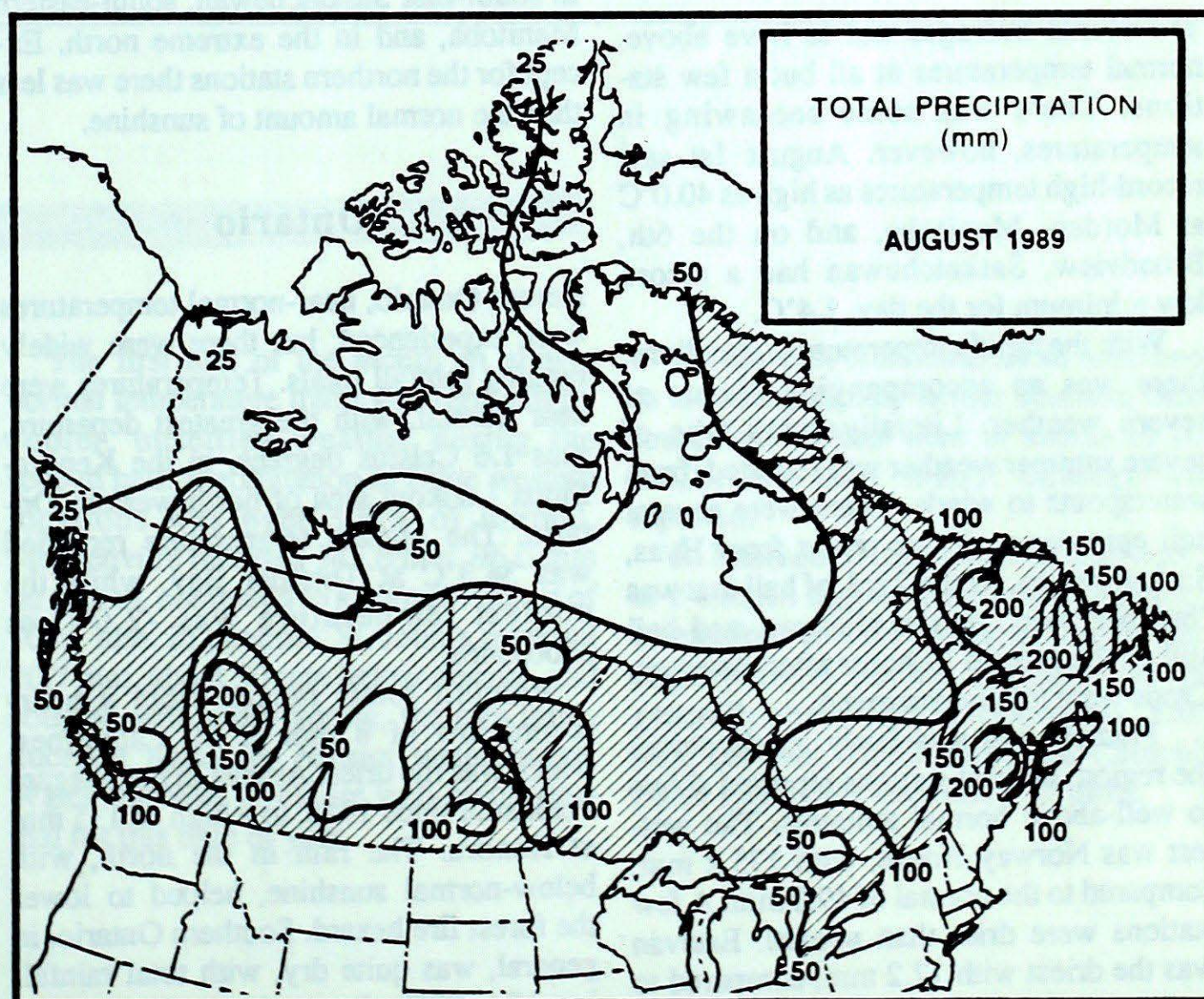
August saw a weather pattern similar to July, with a series of upper troughs on, or just offshore, tending to have the most effect in southern parts of the province. As in July, thunderstorms made frequent appearances. As a result, precipitation was well-above average in the southern and central interior, while temperatures and sunshine did not stray too far from average in most parts of the province. Cranbrook reported the only record with 85.2 mm of rain, 263% of normal, and a new August low sunshine record, of only 203.7 hours, 73% of normal.

Temperatures north of 55° latitude were 1.5 to 2.5 Celsius degrees above normal. The north coast was near 1.0 degree above normal, while the south coast and southern interior varied from 1.0 degree below to 0.5 degree above normal. Open coast regions, both north and south, reported near 50% of normal precipitation.



Alberta

With a few brief exceptions, temperatures during the first 3 weeks were generally near to, or above normal. The last week of the month was unsettled and considerably cooler than normal. Overall, for the month, central and extreme south and south-eastern regions were near average in temperature. The north was 1.0 to 2.5 Celsius degrees above normal. The highest temperature was 33.2°C on the 11th at Medicine Hat, and the coolest, 0.6°C on the 31st, at High Level. Northern regions were drier than normal, while the southern 2/3 of the province was wetter than normal. The wettest areas were through the Edson-Whitecourt-Grande Prairie regions with 186 to 212 mm of rain. Normal amounts for this area are between 60 and 90 mm. The mountain parks which normally average around 50 mm of rain, were also wetter than normal with 122 mm at Jasper, and 146 mm at Banff.



CLIMATIC EXTREMES IN CANADA - AUGUST 1989

MEAN TEMPERATURE:		
WARMEST	WINDSOR, ONT	21.5°C
COLDEST	ALERT, NWT	0.4°C
HIGHEST TEMPERATURE:	MORDEN CDA, MAN	40.0°C
LOWEST TEMPERATURE:	ALERT, NWT	-7.9°C
HEAVIEST PRECIPITATION:	STEPHENVILLE, NFLD	345.6 mm
HEAVIEST SNOWFALL:	ALERT, NWT	26.4 cm
DEEPEST SNOW ON THE GROUND ON AUGUST 31, 1989:	ALERT, NWT	4 cm
GREATEST NUMBER OF BRIGHT SUNSHINE HOURS:	COPPERMINE A, NWT	373 hours

Saskatchewan and Manitoba

The month averaged out to have above-normal temperatures at all but a few stations. There was some seesawing in temperatures, however. August 1st saw record-high temperatures as high as 40.0°C at Morden, Manitoba, and on the 6th, Broadview, Saskatchewan had a record low minimum for the day, 1.4°C.

With the rapid temperature fluctuations, there was an accompanying plague of severe weather. Literally every type of severe summer weather was reported, from waterspouts to winds. There were several hail episodes with one report from Hyas, Saskatchewan, on the 23rd, of hail that was "bumper deep" on the highway, and hail still on the ground 19 hours after the event. Crops were totally destroyed.

Precipitation was fairly ample across the region. Several stations reported above to well-above normal amounts. The wettest was Norway House, with 175.2 mm, compared to the normal of 49.0 mm. A few stations were drier than normal. Estevan was the driest with 17.2 mm, compared to

a normal of 52.8 mm. The driest areas were in south-east Saskatchewan, south-eastern Manitoba, and in the extreme north. Except for the northern stations there was less than the normal amount of sunshine.

Ontario

Across Ontario, near-normal temperatures were experienced, but there were widely ranging rainfall totals. Temperatures were near normal, with the greatest departure, plus 1.6 Celsius degrees, in the Kenora-Sioux Lookout area of north-western Ontario. The highest temperature recorded was 34.3°C at Thunder Bay, while the coolest temperature was -2.0°C at Moosonee.

Rainfall totals ranged from a near-record low of 8 mm at St. Catharines, which was the driest August in the Niagara Peninsula since 1948, to a high of 135 mm at Kenora. The rain in the north, with below-normal sunshine, helped to lower the forest fire hazard. Southern Ontario, in general, was quite dry, with total rainfall just 10 to 80% of normal.

South-western Ontario normally experiences more tornadoes than the rest of the country, but there were no major tornadoes reported during August.

Québec

Temperatures were slightly above normal in the south, and below normal in the north. Kuujuaq, on Ungava Bay, had the greatest departure, 1.8 Celsius degrees below normal.

Total precipitation amounts varied from only 53.2 mm, or 60% of normal in the National Capital Region, to 170.9 mm at Blanc Sablon, at the extreme eastern tip of the province. In the north, precipitation was below normal. Values ranged from 20 mm, 31% of normal, at Inukjuak to 88.2 mm, 94% of normal in the Fermont-Wabush area. Schefferville recorded 0.4 cm of snow.

Maritimes

August was a very variable month. Sunshine hours ranged from 43.9 hours below normal at Fredericton, to 79.9 hours above normal at Sable Island, Nova Scotia, where the total of 258.5 hours, broke the August 1966 record of 234.7 hours. Sydney, Nova Scotia recorded 280.3 hours, which was the second-highest total for August since records began in 1949.

It was generally dry, with the exception of some areas in New Brunswick where it was extremely wet. On the 5th, Fredericton received 148.6 mm of rain, setting an all-time record for the greatest rainfall in 24 hours, in the Fredericton area, and the monthly total of 233.4 mm was a record amount. In Nova Scotia and Prince Edward Island, rainfall was generally below normal, ranging from 44% of normal at Yarmouth, Nova Scotia, to 86% of normal at Summerside, P.E.I.

Mean temperatures were generally above normal, except slightly below around Fredericton and Saint John.

Hurricane Dean tracked south of Cape Breton, Nova Scotia early on the 8th. Although the mainland escaped the effects of

ICE CONDITIONS AND FORECAST

As of September 18th, new ice has been reported in the vicinity of Resolute, and in most areas further north. Ice growth in Baffin Bay can be expected to begin along northern coastlines during the second week of October, and by mid-month may cover northern Baffin Bay and along the Baffin coast as far south as Clyde. There is sufficient ice north of the approaches to Lancaster Sound to produce drift of loose old ice into the area throughout the next 30-day period. New ice can be expected to develop in Barrow Strait, and along the coastlines of Lancaster Sound, early in the last week of September.

In the western Arctic, at mid-September, the wide-open lead along the

Beaufort Sea coast was in the process of closing, bringing an end to trouble-free shipping in that area. The western waterway through Amundsen Gulf, Coronation Gulf, and Queen Maud Gulf remained mostly open water. Extensive ice cover persisted in southern Larsen Sound, but northwards through Peel Sound was mostly open water. New ice growth can be expected to begin in the western waterway from Amundsen Gulf through to Spence Bay, during the second week of October.

The multi-year pack over the Beaufort Sea can be expected to continue to advance slowly southwards during the next few weeks with occasional ice pressure

being created in the Cape Bathurst and Barter Island areas.

Shipping activity in the Arctic has passed its peak. Areas of concern until the fourth week of September include: the western waterway from Point Barrow, Alaska, through Amundsen Gulf, Larsen Sound, Peel Sound, and into Barrow Strait; some ships remain in the Cameron Island and Resolute areas, so the Byam-Martin Channel, Barrow Strait, and Lancaster Sound also require close scrutiny. By early October, most shipping in the Arctic should be complete except for one more trip to Nanisivik, in Admiralty Inlet, north-western Baffin Island, scheduled for mid-November.

*Edward Becker,
Alain Frappier, Ice Centre, Ottawa*

the storm, Louisbourg received 58.2 mm of rain during its passage. On the morning of the 15th, a tornado touched down at Carlisle, New Brunswick, with serious damage to a few properties.

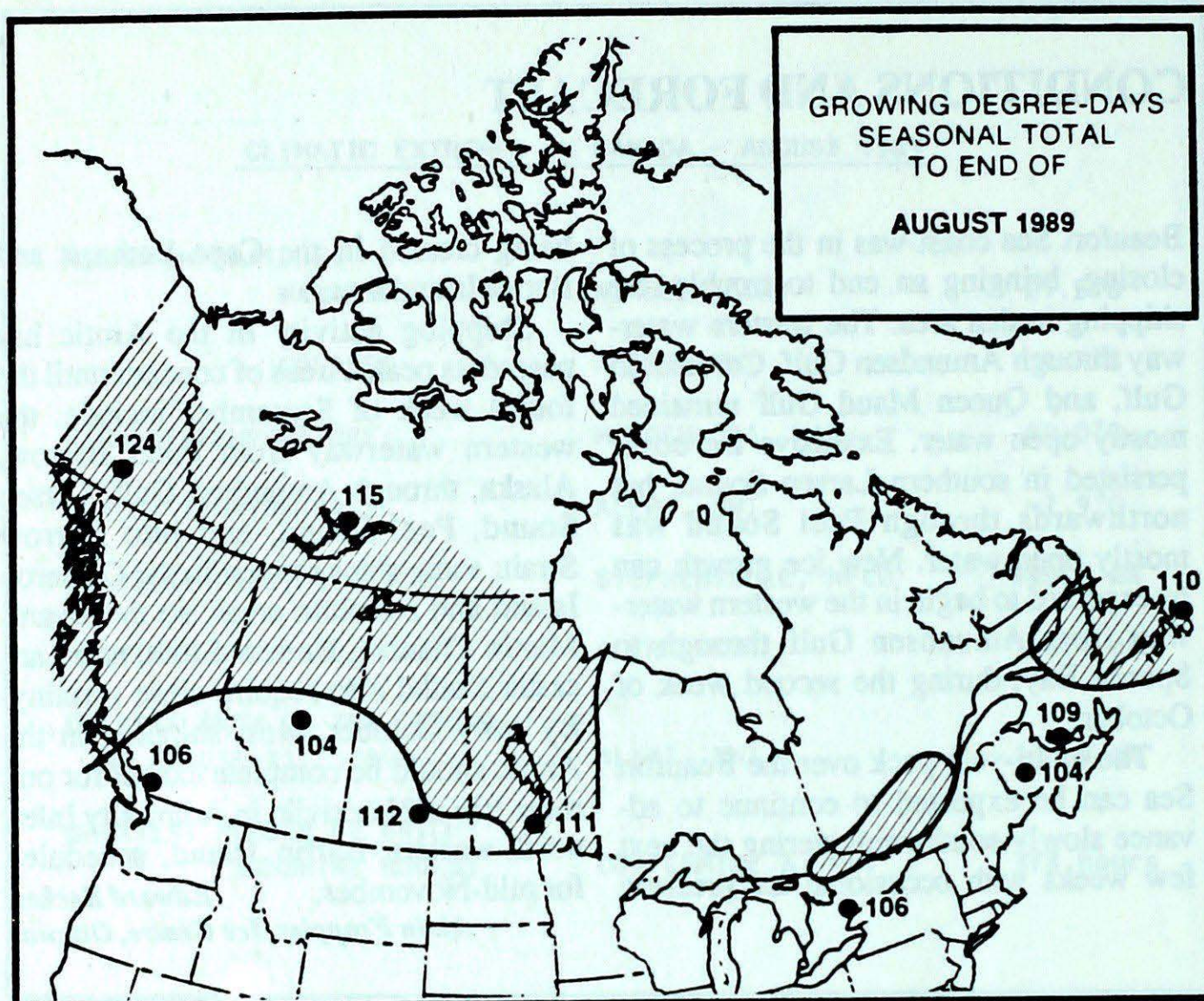
Newfoundland and Labrador

Above-normal temperatures prevailed across much of Newfoundland. Precipitation and sunshine were below normal on the Avalon Peninsula but well-above normal in western locations.

The first half of the month an above-normal temperature trend was replaced by cooler, unsettled weather during the second half. Precipitation in some western locations was over 300% of normal. Stephenville reported 345.6 mm, 96.0 mm on the 5th, compared to a normal August of 104.1 mm. In contrast, St. John's reported 70.7 mm, about 50 mm below normal, and coupled with a dry spring, the city introduced a bylaw to restrict water usage. Water reservoir levels are well-below normal for this time of year.

On the 8th, Hurricane Dean weakened as it tracked rapidly across southern Newfoundland. Winds were in excess of 100 km/h, but only minor damage was reported.

In Labrador, mean temperatures were 1 to 2 Celsius degrees below normal, except at extreme eastern locations which were slightly above normal. Precipitation was generally above normal: Goose Bay, 220.9 mm, (normal, 103.2 mm); and Churchill Falls, 133.6 mm, (normal, 95.0 mm).

SEASONAL TOTAL OF GROWING
DEGREE-DAYS TO END OF AUGUST

1989 1988 NORMAL

BRITISH COLUMBIA

Abbotsford	1431	1412	1309
Kamloops	1775	*	1694
Penticton	1705	*	1616
Prince George	975	*	870
Vancouver	1427	1441	1347
Victoria	1272	1262	1236

ALBERTA

Calgary	970	1213	905
Edmonton Mun.	1100	1292	1057
Grande Prairie	1009	*	927
Lethbridge	1101	1492	1091
Peace River	999	1048	869

SASKATCHEWAN

Estevan	1508	1793	1384
Prince Albert	1268	1301	1138
Regina	1464	1676	1308
Saskatoon	1358	1573	1266
Swift Current	*	*	*

MANITOBA

Brandon	1393	1475	1285
Churchill	523	366	401
Dauphin	1410	1439	1252
Winnipeg	1515	1565	1371

ONTARIO

London	1551	1724	1472
North Bay	1343	*	1232
Ottawa	1607	1706	1478
Thunder Bay	1136	1207	1110
Toronto	1570	1692	1482
Trenton	1572	1656	1536
Windsor	1802	2018	1776

QUÉBEC

Baie Comeau	939	*	927
Maniwaki	1405	1390	1280
Montréal	1683	1686	1599
Québec	1433	*	1337
Sept-Îles	902	832	833
Sherbrooke	1361	1342	1228

NEW BRUNSWICK

Charlo	1156	1157	1092
Fredericton	1409	1390	1362
Moncton	1317	1245	1241

NOVA SCOTIA

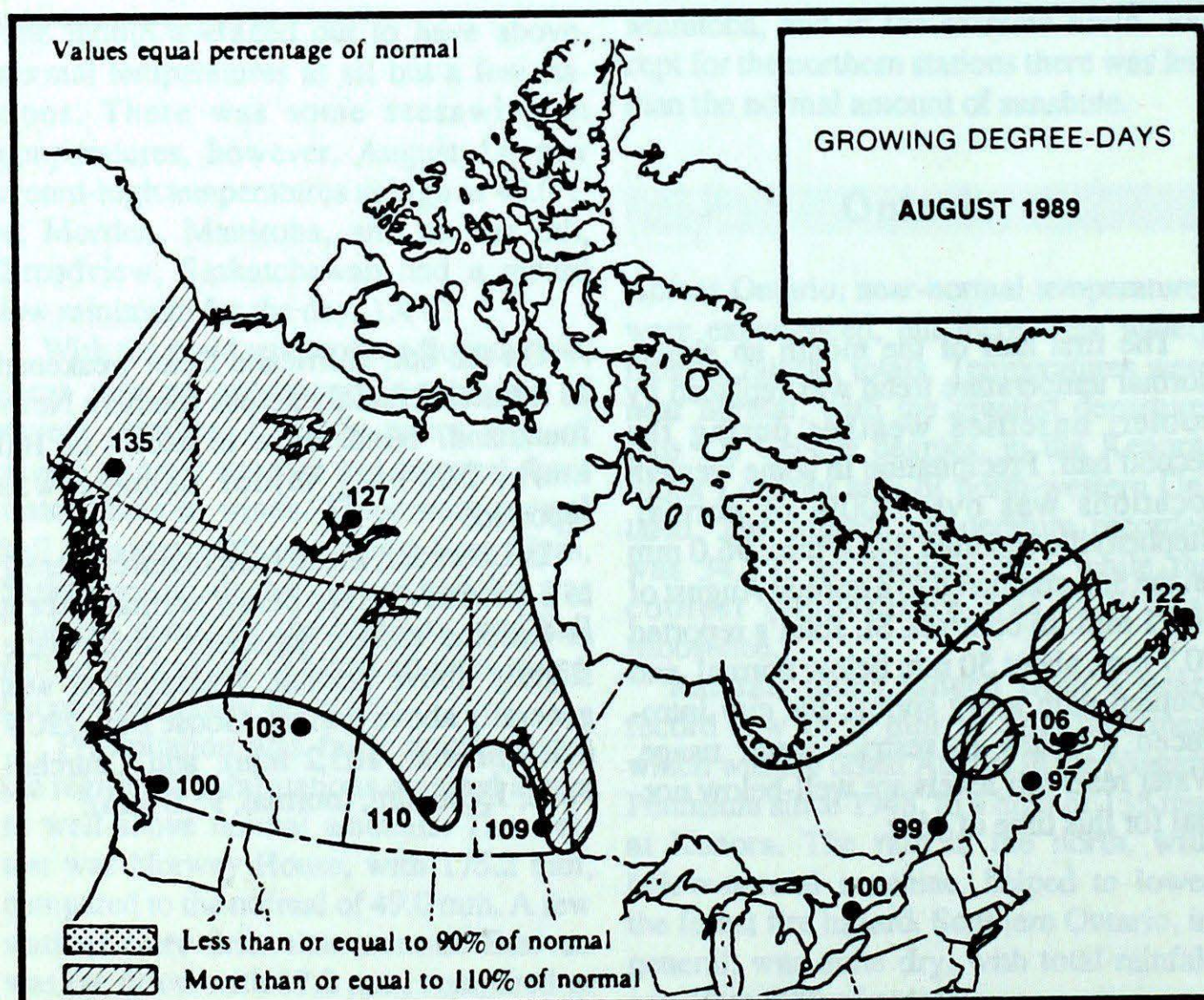
Sydney	1082	1124	1054
Yarmouth	1173	1099	1084

PRINCE EDWARD ISLAND

Charlottetown	1303	1197	1200
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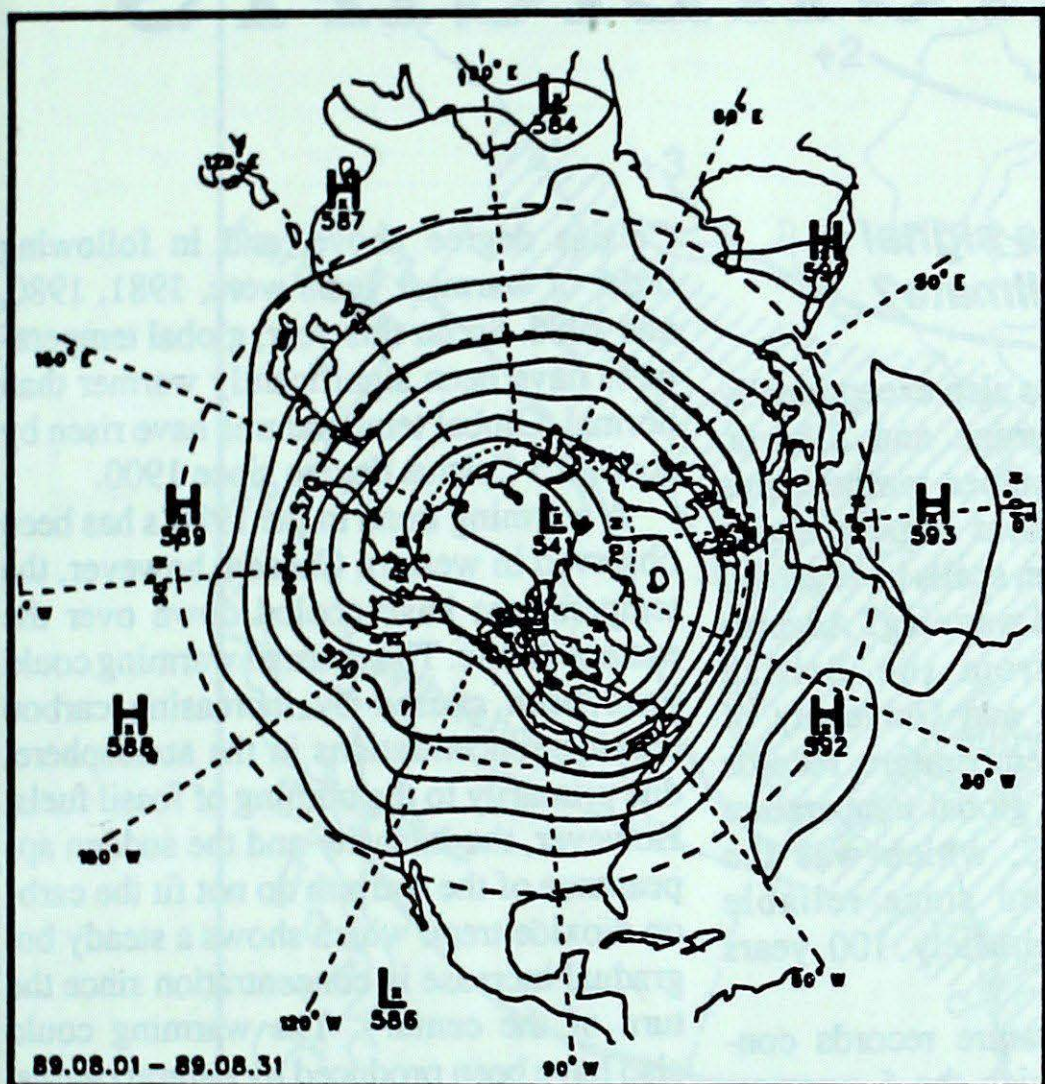
NEWFOUNDLAND

Gander	835	845	782
St. John's	803	*	729
Stephenville	1116	962	948

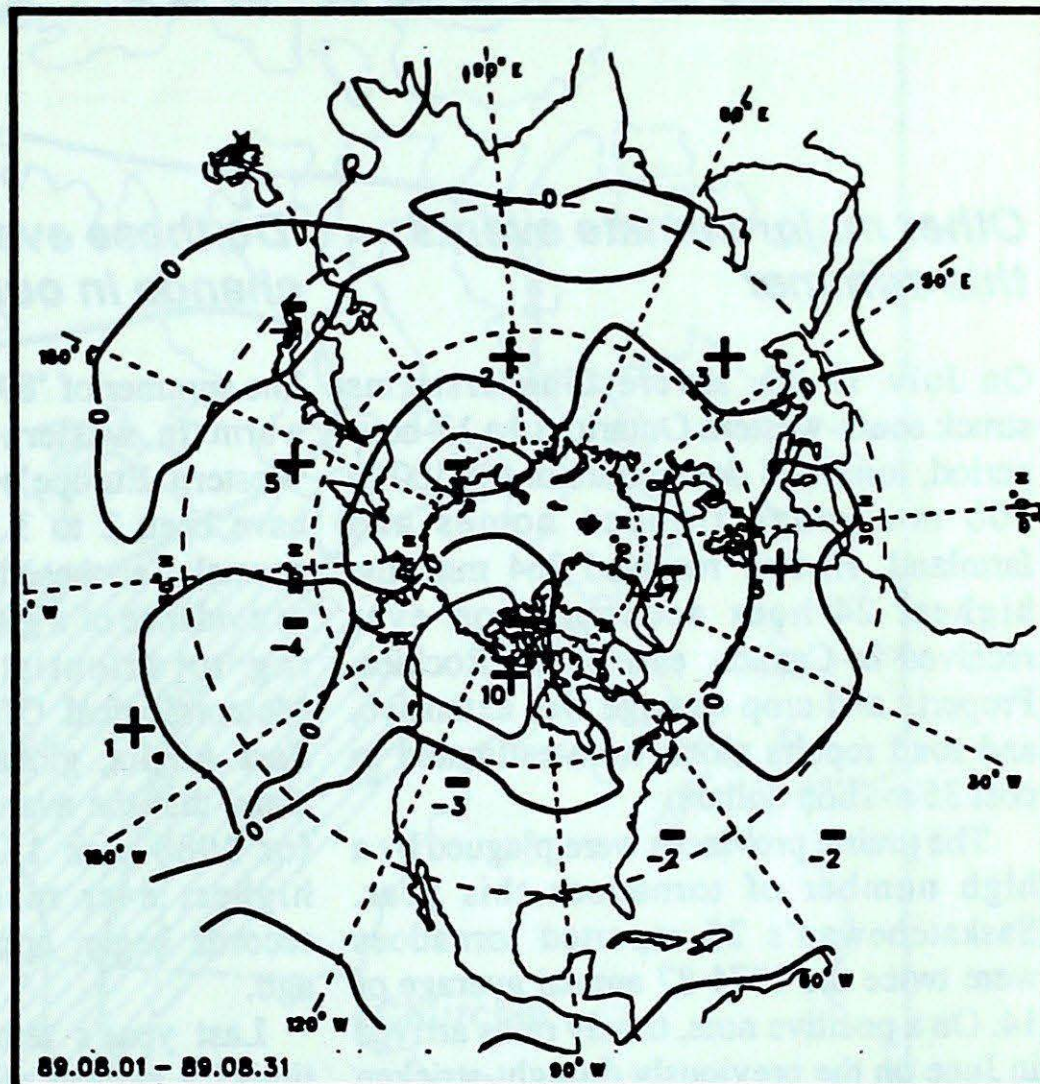


50-kPa ATMOSPHERIC CIRCULATION

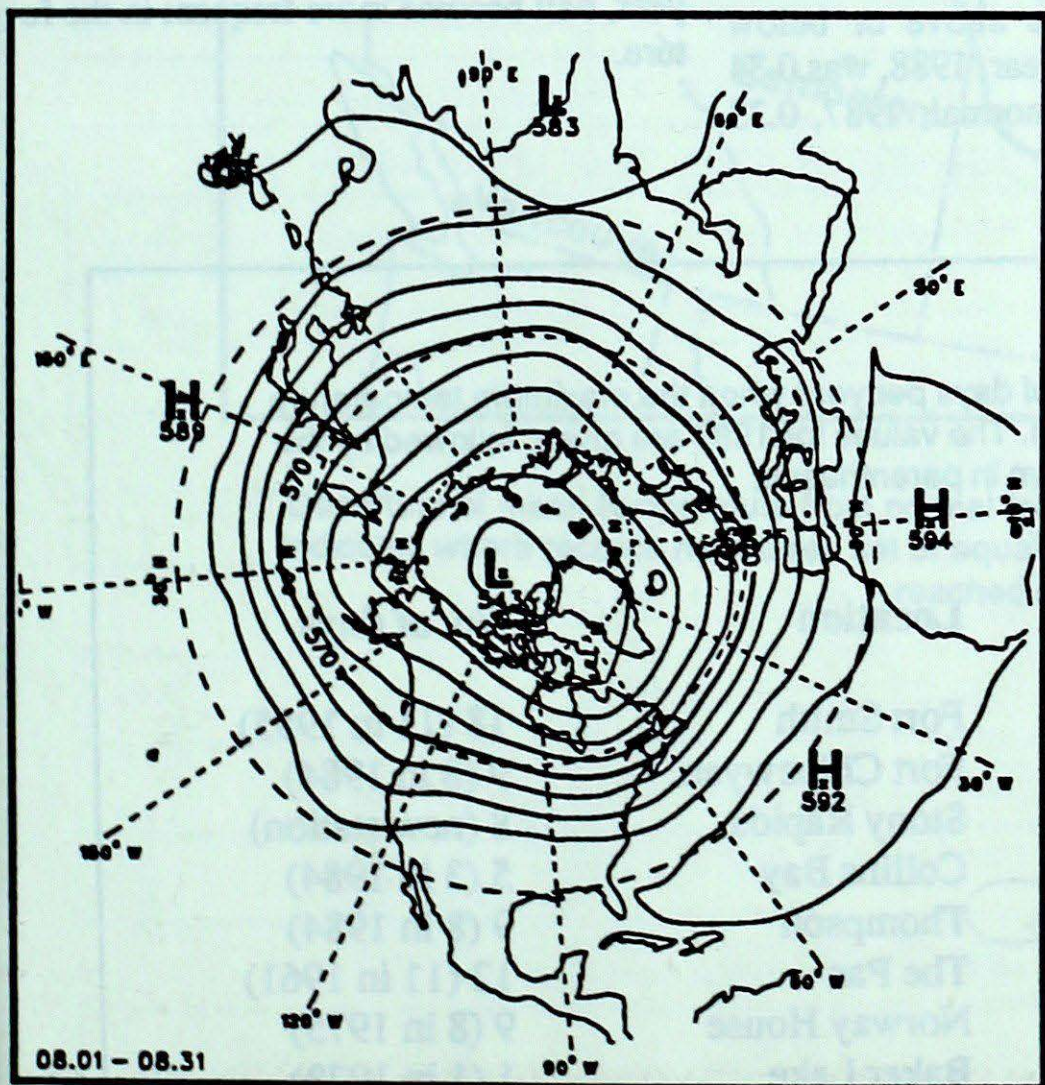
August 1989



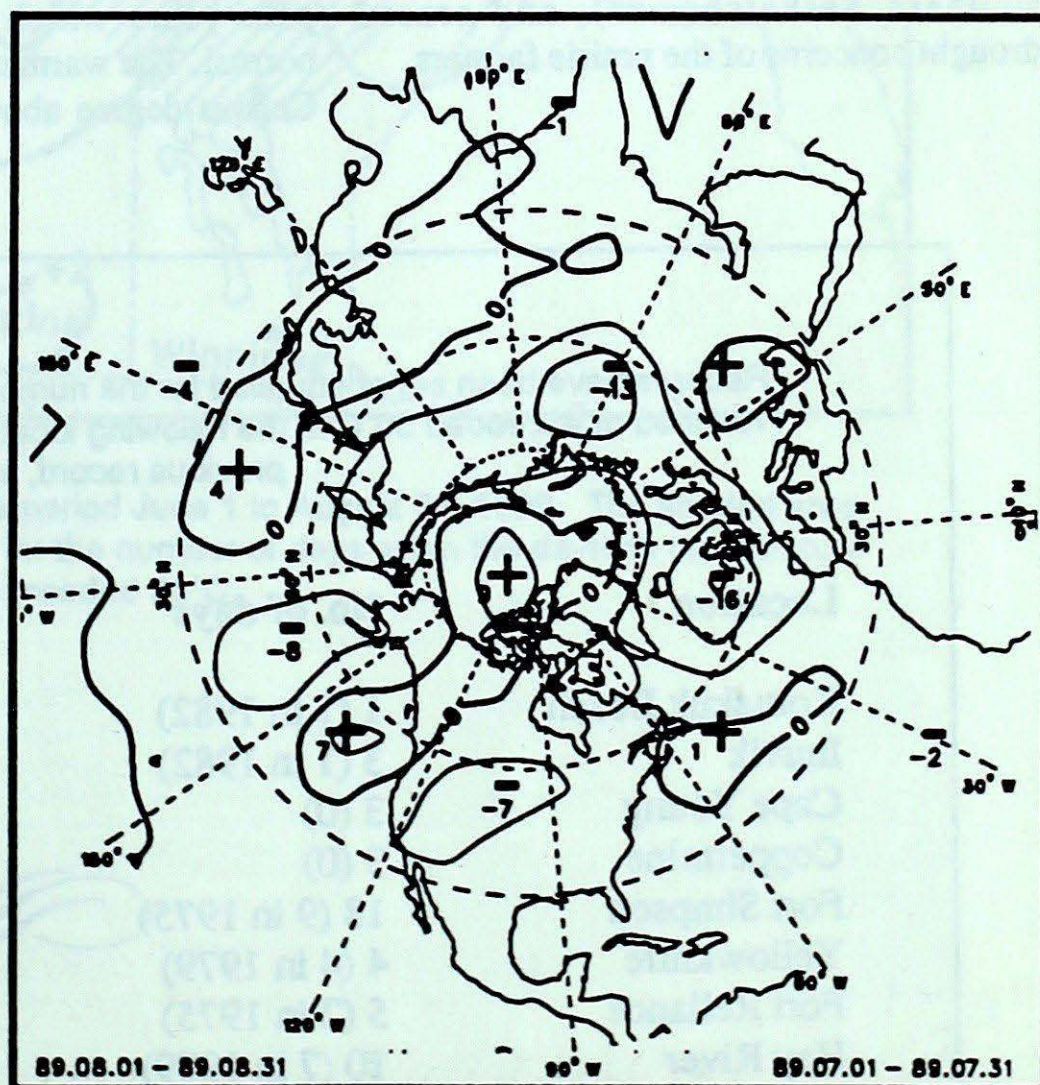
Mean geopotential heights
- 5 decametre interval -



Mean geopotential height anomaly
- 5 decametre interval -



Normal geopotential heights for the month
- 5 decametre interval -



Mean heights difference w/r to previous month
- 5 decametre interval -

CLIMATIC HIGHLIGHTS

Other major climate events this summer

On July 19-20, severe thunderstorms struck south-western Ontario. In a 17-hour period, torrential downpours in the 100 to 300 mm range flooded homes and farmland. Harrow received 264 mm, the highest 24-hour accumulation ever received in Canada, east of the Rockies. Property and crop damage was extensive, and road repairs alone were estimated to cost 35 million dollars.

The prairie provinces were plagued by a high number of tornadoes this year. Saskatchewan's 28 reported tornadoes were twice the 1974-87 annual average of 14. On a positive note, timely rains arrived in June on the previously drought-stricken regions of the Prairies. The rains fell where it was needed the most (central and southern Saskatchewan), and erased drought concerns of the prairie farmers.

Do these events signal a change in our climate?

The summer of '89 was also exceptionally warm in western Europe and Siberia. Western Europe's summer temperatures have been 2 to 3 Celsius degrees above normal. Can these warm spells be regarded as evidence of a global warming? According to scientists from the British Meteorological Office and University of East Anglia, global temperature records show that the average global temperature for 1988 was 15.3°C, which was the highest ever recorded since reliable records began approximately 100 years ago.

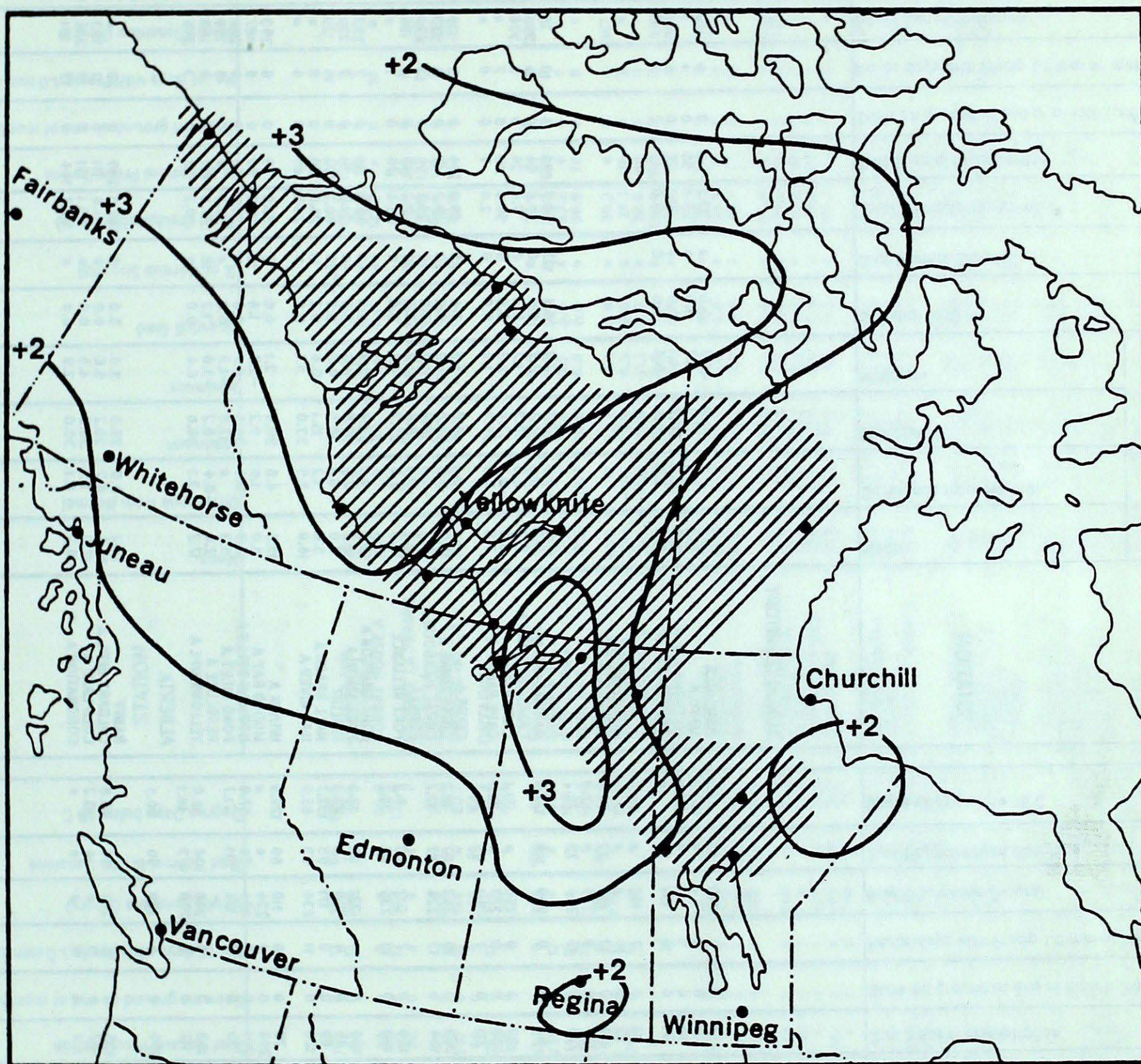
Last year's temperature records continued a pattern of which the 5 warmest years have all been in the 1980's. A reference period of 1950-1979 is used to compare years which are above or below normal. The warmest year, 1988, was 0.34 Celsius degree above normal; 1987, 0.33

Celsius degree above, and in following order of warmest years were, 1981, 1980, and 1986. So far this year, global temperatures have been significantly warmer than normal. Global temperatures have risen by about 0.5 Celsius degree since 1900.

A warming trend in the 1980's has been observed in western Canada, however, the temperatures have cooled down over the eastern Arctic. The unusual warming could have been caused by increasing carbon dioxide concentrations in the atmosphere, due primarily to the burning of fossil fuels. However, the intensity and the sudden appearance of the warmth do not fit the carbon dioxide trend which shows a steady but gradual increase in concentration since the turn of the century. The warming could also have been produced by natural causes. If the cause is carbon dioxide, then warm spells, such as the ones experienced this year, will become more frequent in the future.

Records have been set or equalled for the number of days per year when the maximum temperature reached or exceeded 30°C at the following locations. The values for 1989 are given, followed by the previous record, shown in parentheses.

Location	No. of days	Location	No. of days
Komakuk Beach	1 (1 in 1982)	Fort Smith	18 (11 in 1955)
Inuvik	3 (1 in 1982)	Fort Chipewyan	9 (8 in 1984)
Cape Young	3 (0)	Stony Rapids	8 (new station)
Coppermine	3 (0)	Collins Bay	5 (3 in 1984)
Fort Simpson	18 (9 in 1975)	Thompson	9 (8 in 1984)
Yellowknife	4 (4 in 1979)	The Pas	12 (11 in 1961)
Fort Reliance	5 (2 in 1975)	Norway House	9 (8 in 1975)
Hay River	10 (7 in 1979)	Baker Lake	1 (1 in 1973)



Departure of mean temperature from normal for the period June 1 to August 31, 1989. The shaded area indicates where records have been set or equalled for the number of days when the daytime temperature reached or exceeded 30°C.



AUGUST 1989

STATION	Temperature C				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
	Mean	Difference from Normal	Maximum	Minimum									
BRITISH COLUMBIA													
ABBOTSFORD A	16.9	0.0	28.6	8.4	0.0	*	85.7	153	0	7	232	95	85.7
ALERT BAY	14.5	0.2	22.1	7.8	0.0	*	47.5	71	0	9	*	*	108.2
AMPHITRITE POINT	14.4	0.1	19.1	11.0	0.0	*	52.3	46	0	9	*	*	112.6
BLUE RIVER A	15.4	-0.6	32.0	3.9	0.0	*	132.1	171	0	18	152	67	*
CAPE ST JAMES	14.8	1.0	19.9	10.5	0.0	*	32.1	41	0	7	196	*	98.6
CAPE SCOTT	14.1	0.6	18.0	10.1	0.0	*	61.7	95	0	14	*	*	120.9
CASTLEGAR A	18.5	-1.3	35.3	7.1	0.0	*	60.3	131	0	13	199	72	31.4
COMOX A	16.9	-0.1	25.8	9.7	0.0	*	53.2	120	0	9	235	*	43.3
CRANBROOK A	16.4	-1.1	32.0	5.6	0.0	*	85.2	226	0	15	204	73	78.7
DEASE LAKE	13.9	2.3	29.7	0.3	0.0	*	33.0	63	0	8	239	118	127.9
FORT NELSON A	17.0	2.2	31.8	1.7	0.0	*	66.8	109	0	9	254	*	72.1
FORT ST JOHN A	15.9	1.5	28.2	4.1	0.0	0	64.9	108	0	8	223	*	82.1
HOPE A	17.9	-0.5	28.5	8.2	0.0	*	106.0	211	0	7	211	95	24.6
KAMLOOPS A	19.4	-0.4	35.2	8.6	0.0	*	72.8	265	0	10	243	87	18.1
KELOWNA A	18.0	-0.1	34.5	6.0	0.0	*	52.8	164	0	13	224	87	32.7
LYTTON	20.5	-0.7	36.1	9.9	0.0	*	24.4	130	0	7	212	88	5.3
MACKENZIE A	15.6	1.8	29.1	3.5	0.0	*	85.2	160	0	19	235	98	77.7
PENTICTON A	19.3	-0.2	32.5	7.5	0.0	*	47.6	180	0	*	221	82	12.0
PORT ALBERNI A	17.6	0.0	30.2	5.5	0.0	*	19.8	46	0	4	210	*	32.3
PORT HARDY A	14.7	0.9	20.5	6.9	0.0	*	47.8	69	0	9	171	93	102.7
PRINCE GEORGE A	15.4	1.3	29.4	3.6	0.0	*	81.7	120	0	11	234	93	85.5
PRINCE RUPERT A	13.8	0.8	16.6	10.9	0.0	*	125.2	75	0	10	110	80	129.9
PRINCETON A	16.2	-0.9	33.5	5.4	0.0	*	65.9	258	0	9	234	*	*
REVELSTOKE A	17.0	-0.8	31.4	8.2	0.0	*	106.0	201	0	17	184	76	57.0
SANDSPIT A	15.8	1.1	22.7	9.2	0.0	*	27.2	55	0	7	176	101	71.7
SMITHERS A	16.0	1.9	27.5	4.5	0.0	*	45.2	103	0	9	249	106	62.0
TERRACE A	16.9	1.1	28.4	8.7	0.0	*	71.2	112	0	7	208	103	46.1
VANCOUVER INT'L A	17.2	0.1	25.6	10.3	0.0	*	63.1	154	0	6	229	90	30.5
VICTORIA INT'L A	15.5	-0.6	26.3	7.6	0.0	*	36.0	135	0	4	272	99	78.8
VICTORIA MARINE	14.2	0.1	22.2	7.2	0.0	*	27.9	87	0	3	*	*	118.2
WILLIAMS LAKE A	*	*	*	*	*	*	*	*	*	*	*	*	*

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	Mean	Difference from Normal	Maximum	Minimum									
YUKON TERRITORY													
DAWSON A	14.9	*	31.3	-0.7	0.0	*	22.2	*	0	*	*	*	*
MAYO A	16.1	3.5	31.3	1.7	0.0	*	23.6	56	0	*	*	*	*
WATSON LAKE A	14.0	0.9	30.7	4.1	0.0	*	32.1	76	0	6	306	134	69.7
WHITEHORSE A	15.1	2.6	30.6	-0.6	0.0	0	15.9	42	0	6	306	132	99.3
NORTHWEST TERRITORIES													
ALERT	0.4	-0.5	12.2	-7.9	26.4	127	30.7	108	4	10	78	98	544.6
BAKER LAKE A	9.8	0.1	24.4	0.7	0.0	0	23.8	64	0	4	286	136	253.3
CAMBRIDGE BAY A	8.8	2.3	18.3	1.2	0.0	0	7.4	26	0	3	306	174	285.5
CAPE DYER A	3.9	-0.7	13.0	-2.8	0.8	8	56.4	110	0	7	*	*	436.6
CAPE PARRY A	7.4	2.0	20.9	1.0	0.0	0	2.0	7	0	0	*	*	281.3
CLYDE A	4.1	0.1	15.0	-1.3	0.4	5	55.9	214	0	12	179	93	430.8
COPPERMINE A	12.3	3.6	29.0	1.0	0.0	0	18.0	47	0	5	373	195	179.3
CORAL HARBOUR A	7.3	-0.1	17.7	-1.2	0.0	0	24.2	54	0	9	239	106	*
EUREKA	3.2	-0.1	8.4	-1.8	0.8	30	17.2	148	0	4	196	82	459.1
FORT RELIANCE	15.3	2.4	29.2	4.7	0.0	*	68.4	170	0	7	*	*	110.6
FORT SIMPSON A	18.2	4.1	33.7	2.3	0.0	*	88.8	191	0	7	333	135	63.8
FORT SMITH A	16.7	2.5	32.8	2.8	0.0	*	21.8	51	0	7	229	*	86.8
IQUALUIT	7.0	0.1	16.5	0.6	0.8	200	60.2	102	0	16	129	80	342.7
HALL BEACH A	5.8	1.2	15.1	0.4	0.2	11	24.6	60	0	8	*	*	378.6
HAY RIVER A	16.9	2.5	33.0	5.1	0.0	*	24.5	65	0	4	*	*	33.0
INUVIK A	15.5	4.8	30.6	2.1	0.0	0	32.8	75	0	6	283	131	98.9
MOULD BAY A	3.0	1.6	9.2	-2.7	1.6	18	19.4	90	0	6	187	143	467.5
NORMAN WELLS A	17.3	3.9	30.5	6.7	0.0	*	25.2	43	0	4	294	124	69.2
POND INLET A	5.3	*	12.8	-1.8	0.0	*	22.3	*	0	6	229	*	392.8
RESOLUTE A	2.0	-0.4	8.2	-3.0	1.2	18	39.4	127	0	8	188	119	494.9
YELLOWKNIFE A	17.2	3.1	30.6	6.4	0.0	*	10.2	23	0	1	346	120	81.2
ALBERTA													
BANFF	13.2	-0.6	29.0	3.0	0.0	0	146.0	299	0	20	*	*	*
CALGARY INT'L A	15.4	0.2	29.2	5.6	0.0	*	61.6	111	0	12	183	65	92.2
COLD LAKE A	17.0	1.5	30.0	4.9	0.0	*	115.1	151	0	10	246	96	62.0
CORONATION A	16.2	0.1	30.0	2.9	0.0	*	74.2	144	0	13	181	63	82.5

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STATION	Temperature C				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
	Mean	Difference from Normal	Maximum	Minimum									
EDMONTON INT'L A	15.2	0.4	28.8	1.0	0.0	*	81.9	105	0	11	192	68	100.8
EDMONTON MUNICIPAL	16.5	0.3	29.6	2.6	0.0	*	48.8	63	0	12	209	75	77.0
EDMONTON NAMAQ A	15.7	0.1	28.6	1.2	0.0	*	58.8	80	0	9	*	*	90.0
EDSON A	13.8	0.4	25.6	2.0	0.0	0	188.2	217	0	17	158	64	132.6
FORT CHIPEWYAN A	16.8	2.5	32.0	3.0	0.0	*	40.0	80	0	*	*	*	*
FORT MCMURRAY A	17.4	2.6	31.3	2.2	0.0	*	27.9	36	0	9	248	100	59.9
GRANDE PRAIRIE A	15.7	0.9	27.5	2.7	0.0	0	185.9	307	0	16	196	*	80.7
HIGH LEVEL A	16.5	2.7	31.9	0.6	0.0	*	33.4	54	0	5	232	91	82.7
JASPER	13.9	-0.3	29.2	1.8	0.0	0	122.2	252	0	12	174	*	134.6
LETHBRIDGE A	16.9	-0.7	31.5	3.7	0.0	0	91.4	194	0	9	217	*	60.6
MEDICINE HAT A	18.3	-0.6	33.2	4.5	0.0	*	48.4	133	0	9	259	88	45.1
PEACE RIVER A	16.2	2.0	28.8	1.5	0.0	0	117.5	235	0	12	*	*	80.1
RED DEER A	14.7	-0.2	29.6	3.7	0.0	0	94.2	143	0	16	*	*	109.1
ROCKY MTN HOUSE A	13.9	-0.4	25.9	3.3	0.0	0	115.5	150	0	13	*	*	128.2
SLAVE LAKE A	16.1	2.1	28.8	3.6	0.0	*	128.7	178	0	11	197	80	77.8
SUFFIELD A	18.2	*	32.8	7.2	0.0	*	67.6	*	0	12	238	*	49.0
WHITECOURT A	14.7	0.8	26.5	2.0	0.0	*	212.3	240	0	17	*	*	112.7
SASKATCHEWAN													
BROADVIEW	17.8	1.5	37.8	1.3	0.0	*	58.6	100	0	9	247	83	60.7
COLLINS BAY	15.3	*	29.3	3.9	0.0	*	51.6	*	0	5	229	*	136.0
CREE LAKE	15.4	1.6	29.2	2.2	0.0	*	57.0	85	0	7	212	86	98.9
ESTEVAN A	19.4	0.8	38.6	3.0	0.0	*	17.2	33	0	4	267	86	36.4
KINDERSLEY	17.4	0.0	32.8	4.2	0.0	*	59.0	159	0	7	240	*	61.8
LA RONGE A	15.8	1.0	29.9	1.3	0.0	*	30.4	46	0	3	*	*	87.6
MEADOW LAKE A	16.3	*	30.9	3.3	0.0	*	50.0	*	0	7	223	*	78.2
MOOSE JAW A	19.4	0.8	38.7	7.1	0.0	*	46.3	115	0	6	293	98	31.2
NIPAWIN A	16.4	*	32.4	3.2	0.0	*	105.2	*	0	6	249	*	75.1
NORTH BATTLEFORD A	17.4	0.6	32.0	3.6	0.0	*	24.9	55	0	9	*	*	53.1
PRINCE ALBERT A	17.1	1.2	32.0	2.6	0.0	*	72.0	138	0	8	270	101	63.8
REGINA A	19.3	1.5	38.4	5.9	0.0	*	59.0	132	0	8	267	91	38.5
SASKATOON A	17.9	0.7	35.2	5.8	0.0	*	51.6	135	0	8	*	*	59.3
SWIFT CURRENT A	17.3	-0.2	35.5	6.0	0.0	*	75.9	177	0	8	256	86	62.6
WYNYARD	17.6	1.1	33.9	4.8	0.0	*	48.8	97	0	8	240	86	64.2
YORKTON A	17.3	0.4	33.6	0.3	0.0	*	74.5	122	0	5	274	96	69.0
MANITOBA													
BRANDON A	18.5	1.0	38.2	4.8	0.0	*	59.4	92	0	9	268	*	63.6
CHURCHILL A	11.5	0.2	28.7	2.5	0.0	*	58.6	101	0	9	225	97	202.0
DAUPHIN A	18.5	1.4	35.1	4.5	0.0	*	140.7	226	0	10	261	95	53.3
GILLAM A	13.6	0.5	27.0	0.5	0.0	0	42.0	51	0	9	*	*	134.1
GIMLI	17.8	*	32.2	4.5	0.0	*	50.3	*	0	6	256	97	53.1

STATION	Temperature C				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
	Mean	Difference from Normal	Maximum	Minimum									
ISLAND LAKE	16.6	1.1	30.4	3.9	0.0	*	108.6	139	0	9	*	*	78.0
LYNN LAKE A	14.6	1.1	29.3	3.8	0.0	*	51.2	66	0	7	210	90	126.3
NORWAY HOUSE A	16.5	*	30.1	1.4	0.0	*	175.2	*	0	10	*	*	78.0
PORTAGE LA PRAIRIE	19.2	0.8	36.8	4.8	0.0	*	44.0	54	0	9	*	*	46.1
THE PAS A	16.8	0.7	32.3	3.0	0.0	*	75.8	132	0	11	258	100	74.1
THOMPSON A	14.4	1.2	30.0	-1.7	0.0	0	96.4	110	0	8	226	99	126.3
WINNIPEG INT'L A	19.5	1.2	38.7	5.1	0.0	*	76.6	102	0	8	259	91	37.0
ONTARIO													
BIG TROUT LAKE	14.6	0.3	26.0	3.0	0.0	*	74.4	91	0	8	200	*	119.2
EARLTON A	16.0	-0.2	29.9	3.4	0.0	*	110.7	133	0	7	*	*	91.7
GERALDTON A	15.2	*	32.6	0.0	0.0	*	53.2	*	0	9	*	*	109.0
GORE BAY A	18.5	0.3	29.6	8.0	0.0	*	58.9	78	0	8	*	*	31.5
HAMILTON RBG	20.9	*	33.2	8.1	0.0	*	39.2	*	0	4	267	*	*
HAMILTON A	19.1	-0.9	29.9	6.3	0.0	*	26.1	36	0	3	*	*	19.7
KAPUSKASING A	15.1	-0.2	29.5	-1.1	0.0	*	78.0	84	0	11	*	*	108.6
KENORA A	19.2	1.6	33.5	8.9	0.0	*	135.4	158	0	12	*	*	*
KINGSTON A	19.3	-0.3	29.3	5.6	0.0	*	53.2	73	0	6	246	96	28.0
LONDON A	19.3	-0.2	30.7	8.2	0.0	*	55.8	69	0	7	218	89	16.9
MOOSONEE	13.2	-1.1	30.0	-2.0	0.0	*	56.6	71	0	11	163	76	160.0
MUSKOKA A	17.6	0.2	31.2	2.2	0.0	*	68.7	77	0	10	*	*	55.7
NORTH BAY A	17.2	0.2	29.9	5.2	0.0	*	80.6	82	0	8	223	95	55.5
OTTAWA INT'L A	19.4	0.2	30.4	7.5	0.0	*	53.2	60	0	9	247	102	25.3
PETAWAWA A	17.9	0.2	32.2	0.2	0.0	*	37.0	47	0	12	*	*	47.5
PETERBOROUGH A	17.9	-0.8	32.5	2.4	0.0	*	74.4	100	0	7	*	*	46.5
PICKLE LAKE	15.6	0.5	32.5	4.1	0.0	*	84.5	81	0	14	*	*	103.3
RED LAKE A	17.7	1.4	32.9	5.5	0.0	*	111.0	125	0	10	241	*	58.0
ST CATHARINES A	20.7	-0.2	32.0	7.3	0.0	*	8.2	11	0	2	*	*	14.4
SARNIA A	19.4	-1.1	32.7	8.2	0.0	*	29.2	58	0	6	271	109	33.7
SAULT STE MARIE A	16.6	-0.3	30.3	5.6	0.0	*	85.2	103	0	9	190	76	68.9
SIOUX LOOKOUT A	18.2	1.6	33.4	6.8	0.0	*	42.0	48	0	10	*	*	51.7
SUDBURY A	17.7	0.4	31.8	6.7	0.0	*	81.6	98	0	8	207	83	58.3
THUNDER BAY A	16.7	0.3	34.3	4.1	0.0	*	90.7	109	0	11	248	97	71.8
TIMMINS A	15.1	-0.4	29.3	1.4	0.0	*	101.7	114	0	11	*	*	112.3
TORONTO	21.2	*	33.2	10.2	0.0	*	48.6	*	0	6	*	*	8.9
TORONTO INT'L A	19.7	0.0	33.3	6.9	0.0	*	39.6	52	0	6	*	*	21.2
TORONTO ISLAND A	20.1	*	33.0	8.3	0.0	*	41.0	*	0	3	*	*	11.4
TRENTON A	19.1	-0.6	30.2	6.2	0.0	*	51.8	72	0	7	*	*	26.6
WATERLOO WELLINGTON	18.8	-0.1	31.4	4.5	0.0	*	19.0	24	0	3	*	*	29.2
WAWA A	14.2	*	28.7	2.5	0.0	*	108.8	*	0	9	*	*	122.5
WIARTON A	18.3	0.2	31.3	6.2	0.0	*	26.9	30	0	6	*	*	30.9
WINDSOR A	21.5	0.2	32.0	10.3	0.0	*	36.4	43	0	5	*	*	3.5

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	Mean	Difference from Normal	Maximum	Minimum									
QUÉBEC													
BAGOTVILLE A	17.2	06*	29.7	3.1	0.0	*	126.0	127	0	12	*	*	63.4
BAIE COMEAU A	14.6	0.0	24.7	1.4	0.0	*	64.4	68	0	9	214	106	106.5
BLANC SABLON A	12.3	0.5	21.6	3.0	0.0	*	170.9	154	0	17	100	*	174.5
CHIBOUGAMAU CHAPAIS	14.2	*	27.3	0.1	0.0	*	147.7	*	0	17	180	87	123.8
GASPE A	16.9	*	29.2	2.0	0.0	*	166.4	*	0	14	206	*	61.1
INUKJUAK A	8.2	-0.7	17.1	2.0	0.0	*	20.0	31	0	6	179	123	303.6
KUUJUAQ A	8.6	-1.8	20.6	0.3	0.0	0	38.2	60	0	11	141	85	284.0
KUUJUAUPIK A	*	*	*	*	*	*	*	*	*	*	*	*	*
LA GRANDE IV A	11.2	*	24.6	-2.5	0.0	*	55.0	*	0	9	207	*	211.9
LA GRANDE RIVIERE A	11.6	*	25.1	0.2	0.0	*	52.6	*	0	8	204	*	196.4
MANIWAKI	17.7	0.7	30.1	1.5	0.0	*	98.8	108	0	11	225	100	54.1
MATAGAMIA	13.8	*	28.1	-1.5	0.0	*	138.8	*	0	14	182	89	143.2
MONT JOLI A	17.3	1.3	28.7	5.7	0.0	*	101.8	129	0	10	206	84	45.7
MONTREAL INT'L A	19.4	-0.2	30.5	4.9	0.0	*	119.2	130	0	10	258	107	26.9
MONTREAL MIRABEL V	18.0	*	29.2	3.6	0.0	*	69.8	*	0	8	263	*	39.2
NATASHQUAN A	14.3	1.0	22.6	4.1	0.0	*	101.6	97	0	14	168	73	114.3
QUEBEC A	18.3	0.8	29.0	3.6	0.0	*	109.0	93	0	11	230	105	40.9
ROBERVAL A	17.6	1.2	29.1	4.8	0.0	*	124.8	127	0	10	211	*	49.5
SCHÉFFERVILLE A	9.7	-1.1	21.3	0.2	0.4	17	66.6	68	0	8	169	111	255.5
SEPT-ÎLES A	14.4	0.3	23.1	3.6	0.0	*	74.9	72	***	7	*	*	172.0
SHERBROOKE A	16.9	0.4	30.7	0.8	0.0	*	142.3	109	0	14	232	*	67.2
STE AGATHE DES MONT	16.7	0.4	28.2	1.8	0.0	*	82.2	77	0	12	228	96	71.4
ST HUBERT A	19.4	0.2	30.4	4.4	0.0	*	61.0	63	0	10	260	*	26.4
VAL D'OR A	15.5	0.0	28.9	-0.6	0.0	*	78.2	77	0	11	191	81	100.3
NEW BRUNSWICK													
CHARLO A	17.6	1.2	28.8	3.9	0.0	*	74.7	71	0	9	225	92	43.0
CHATHAM A	18.3	0.3	29.8	3.7	0.0	*	163.4	196	0	10	204	86	39.1
FREDERICTON A	17.8	-0.4	28.9	3.2	0.0	*	233.4	268	0	10	177	*	41.7
MONCTON A	17.8	0.2	29.2	2.3	0.0	*	34.0	43	0	8	245	107	44.9
SAINT JOHN A	16.4	-0.2	25.8	6.0	0.0	*	91.0	89	0	11	202	95	53.7

STATION	Temperature C				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
	Mean	Difference from Normal	Maximum	Minimum									
NOVA SCOTIA													
GREENWOOD A	19.2	0.9	31.3	5.1	0.0	*	61.5	68	0	9	*	*	29.5
HALIFAX INT'L A	18.4	0.3	28.6	6.2	0.0	*	60.4	54	0	4	*	*	33.4
SABLE ISLAND	18.4	0.8	24.0	9.9	0.0	*	67.4	58	0	6	259	144	21.4
SHEARWATER A	18.1	0.3	26.5	7.1	0.0	*	58.7	60	0	8	243	108	31.5
SYDNEY A	19.0	1.4	29.3	5.3	0.0	*	61.2	60	0	9	280	124	35.0
YARMOUTH A	17.0	0.6	24.5	8.6	0.0	*	43.2	44	0	8	233	111	45.5
PRINCE EDWARD ISLAND													
CHARLOTTETOWN A	18.5	0.7	27.6	6.5	0.0	*	68.6	78	0	13	*	*	37.8
SUMMERSIDE A	18.5	0.1	28.5	7.7	0.0	*	69.0	86	0	10	219	91	29.3
NEWFOUNDLAND													
BONAVISTA	17.3	2.3	26.3	7.0	0.0	*	88.0	106	0	12	*	*	52.0
BURGEO	15.2	0.5	25.2	4.1	0.0	*	172.3	117	0	14	0	0	99.1
CARTWRIGHT	11.6	-0.4	26.0	1.9	0.0	*	104.2	127	0	13	132	75	198.6
CHURCHILL FALLS A	11.1	-0.9	24.5	1.6	0.0	*	133.6	136	0	15	172	101	215.3
COMFORT COVE	16.5	1.2	28.5	5.4	0.0	*	163.5	155	0	17	*	*	72.5
DANIELS HARBOUR	15.6	1.1	24.4	3.8	0.0	*	226.0	197	0	18	129	71	75.9
DEER LAKE A	16.2	0.9	28.3	1.0	0.0	*	164.2	162	0	15	0	*	78.6
GANDER INT'L A	17.1	1.5	30.2	5.9	0.0	*	125.2	129	0	12	209	112	61.5
GOOSE A	13.0	-1.3	29.5	3.9	0.0	*	220.9	214	0	13	120	68	162.3
MARY'S HARBOUR	13.0	*	27.7	2.8	0.0	*	118.4	145	0	18	*	*	162.2
PORT AUX BASQUES	15.5	0.8	24.4	5.3	0.0	*	234.2	204	0	16	*	*	768.4
ST ANTHONY	13.1	1.0	25.4	0.6	0.0	*	212.2	155	0	16	0	*	138.2
ST JOHN'S A	17.3	2.0	28.3	6.5	0.0	*	70.7	58	0	11	226	122	51.9
ST LAWRENCE	15.8	1.9	24.6	5.5	0.0	*	111.0	78	0	10	*	*	65.6
STEPHENVILLE A	13.1	1.0	24.7	0.0	0.0	*	345.6	332	0	16	163	100	48.3
WABUSH LAKE A	12.0	0.2	25.4	0.4	0.0	*	88.2	94	0	12	196	103	189.1

AGROCLIMATOLOGICAL STATIONS

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STATION	Temperature C				Snowfall (cm)	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)	Degree days above 5 C	
	Mean	Difference from Normal	Maximum	Minimum							This month	Since Jan. 1st
BRITISH COLUMBIA												
AGASSIZ	17.6	-0.1	28.5	8.0	0.0	93.4	151	0	8	223	390.8	1680.0
KAMPOOPS	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
SIDNEY	16.2	-0.1	26.0	9.0	0.0	34.2	120	0	5	237	347.0	1441.3
SUMMERLAND	19.2	-0.8	33.0	8.5	0.0	38.0	139	0	14	231	440.7	1795.9
ALBERTA												
BEAVERLODGE	14.9	0.7	27.0	1.5	0.0	103.8	163	0	14	196	304.8	1127.8
ELLERSLIE	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
LACOMBE	15.0	0.1	28.5	3.0	0.0	77.1	113	0	12	188	308.9	1109.3
LETHBRIDGE	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
VEGREVILLE	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
SASKATCHEWAN												
INDIAN HEAD	18.9	1.5	37.0	4.0	0.0	53.4	96	0	5	22	423.7	1553.9
MELFORT	17.0	0.9	32.0	4.5	0.0	61.8	114	0	6	231	383.5	1331.5
REGINA	18.6	1.2	38.0	3.0	0.0	47.0	106	0	7	22	424.7	1524.5
SASKATOON	18.5	1.3	35.0	6.0	0.0	58.6	170	0	9	253	412.0	1452.5
SCOTT	17.0	1.0	31.0	2.0	0.0	42.7	92	0	9	247	366.2	996.8
SWIFT CURRENT	17.6	-0.1	35.0	6.0	0.0	72.2	189	0	10	220	390.5	1400.2
MANITOBA												
BRANDON	19.5	1.6	39.1	4.3	0.0	62.0	89	0	8	22	448.1	1618.3
GLENLEA	20.2	1.9	37.5	5.0	0.0	26.2	43	0	7	269	478.5	1758.0
MORDEN	19.4	0.4	40.0	4.0	0.0	67.8	95	0	6	241	446.5	1621.0
ONTARIO												
DELHI	19.6	-0.2	30.0	6.0	0.0	45.4	49	0	7	22	2.2	1691.7
ELORA	18.1	0.0	30.2	4.6	0.0	91.7	127	0	7	22	406.2	1473.5
GUELPH	18.8	0.0	31.5	4.8	0.0	32.4	40	0	3	226	427.2	1548.9
HARROW	21.2	0.0	30.0	9.0	0.0	72.0	91	0	6	254	502.0	1848.9
KAPUSKASING	14.8	-0.7	29.0	-2.0	0.0	91.3	102	0	9	206	305.8	1108.4
OTTAWA	19.6	0.2	30.6	6.0	0.0	52.1	62	0	8	247	452.4	1727.8
SMITHFIELD	19.9	0.6	30.6	7.1	0.0	91.7	121	0	9	22	462.4	1715.7
VINELAND	20.3	-0.5	31.5	8.3	0.0	30.4	35	0	7	231	474.3	1693.4
WOODSLIE	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2

STATION	Temperature C				Snowfall (cm)	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)	Degree days above 5 C	
	Mean	Difference from Normal	Maximum	Minimum							This month	Since Jan. 1st
QUÉBEC												
LA POCAIÈRE	18.7	1.4	29.0	0.3	0.0	33.6	34	0	7	248	423.7	1377.8
L'ASSOMPTION	19.5	0.7	30.5	3.5	0.0	64.6	68	0	10	22	2.2	1654.8
LENNOXVILLE	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
NORMANDIN	16.3	0.9	30.0	1.5	0.0	118.0	126	0	10	208	349.5	1234.6
STE. CLOTILDE	19.2	0.3	31.0	3.0	0.0	91.6	95	0	11	266	438.6	1680.4
NEW BRUNSWICK												
FREDERICTON	18.2	0.1	29.0	5.0	0.0	152.7	177	0	10	177	408.5	1469.5
NOVA SCOTIA												
KENTVILLE	19.7	1.3	30.5	6.0	0.0	51.3	52	0	7	254	2.2	1560.0
NAPPAN	18.1	0.7	27.5	2.0	0.0	56.2	62	0	8	227	407.5	1414.3
PRINCE EDWARD ISLAND												
CHARLOTTETOWN A	19.2	0.8	28.0	6.0	0.0	70.4	79	0	12	228	441.1	1424.2
NEWFOUNDLAND												
ST. JOHN'S WEST	17.6	2.1	27.5	5.0	0.0	73.7	64	0	10	219	391.5	1114.9