~~NB 98901~~
0498901
0498901

✓ A F=1 N.B.

TORNADO PROJECT SUMMARY SHEET

1. DATE AND TIME August 14, 1989 ~~morning~~ ~2000 ADT

2. LOCATION OR PATH (attach map) Carlisle, New Brunswick.

3. PATH LENGTH ☐ NOT KNOWN ☐ <1 mi; ☐ 1-4 mi; ☐ 5-10 mi; ☐ 11-50 mi; ☐ LENGTH IF >50 mi

4. PATH WIDTH 10 → 5 wide 5. TORNADO PART OF SQUALL LINE? ☐ YES; ☐ NO; ☐ UNKNOWN:

6. ANY UNUSUAL COLORATION? ☐ YES; ☐ NO; ☐ UNKNOWN

7. ANY UNUSUAL SOUND? ☐ YES; ☐ NO; ☐ UNKNOWN

8. IF ANSWER TO 6 OR 7 YES, ELABORATE;

9. LIST ANY ASSOCIATED PHENOMENA
(Such as hail, vivid lightning heavy rain, no rain, etc.)

10. TOTAL DAMAGE ESTIMATE $ 20,000 11. TOTAL DEATHS

12. TOTAL INJURED 13. TOTAL HOMELESS

14. LIST ALL REFERENCES

15. SUMMARIZE REMARKS PERTAINING TO (a) FUNNEL; (b) INTERESTING OR CAPRICIOUS EVENTS.

→ "serious damage to a few properties.".

a) multiple funnels

b) Large shed moved off its foundations, trees broken and uprooted

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5132000

L.D. 19624450 150 ~~200~~ 0
5133500

TO MAED
FILE NO. 8810-45
AUG 22 1989
FOLIO NO. 892594
FILE OUT TO

TORNADO AT CARLISLE, NEW BRUNSWICK

AUGUST 14, 1989

prepared by

John Dublin

Scientific Services Unit

Fredericton, N.B.

August 17, 1989

TORNADO AT CARLISLE, NEW BRUNSWICK

AUGUST 14, 1989

On the evening of August 14, 1989, thunderstorms were reported over much of New Brunswick. Reports of a tornado were broadcast on television that evening and on radio the following morning.

On the morning of August 15th., I drove to Carlisle, N.B., a small community 12 km east northeast of Hartland, N.B. as the crow flies, where the heaviest damage was reported. The farm of Mr. and Mrs. Earl Pratt took the brunt of the damage. The tornado first touched down in the hamlet of Mainstream, N.B., which is about 3 km to the southwest of Carlisle, where a small barn or large shed was moved off its foundations. There were reports of damage to trees in the woods between Mainstream and Carlisle.

Mr. Pratt stated that the tornado struck at about 8:00 p.m. of August 14, 1989, and appeared to move in from the southwest, which is consistent with the report of damage from Mainstream. Mrs. Pratt, who remained in the farmhouse during the event, stated that the sky turned very black prior to the event and then she heard a very loud roar. This is characteristic of tornadoes, confirming that it was not just a severe downdraft that caused the damage.

Mr. Pratt, who is 86 years old, led me up a very steep road behind his house to the location where the tornado first touched down, and accompanied me along a second road which nearly paralleled the swath through the bush. The first sign of damage

where the tornado touched down on the Pratt property is shown in photo 1. Photos 2 through 4 were taken further along the swath and photo 5 shows the scene looking back up track of the tornado from the field at the bottom of the hill. At its widest, the swath was 8 to 10 m wide.

Photos 6 and 7 show what was left of the barn. The boards in the front right of photo 7 were picked up by Mr. Pratt and others from as far away as the road. A small building built against the barn disappeared completely but the 12 storm windows stored inside this building were virtually untouched with only 2 of the 24 panes of glass broken. On the left hand side of photo 6 the track of the tornado can be seen through the field of oats. There were two trees, 15 to 20 cm in diameter, snapped off at a height of about 5 m above ground level in the tree line across the road in picture 6. Unfortunately the damage does not show up very well in the photo. Because these trees were well separated, this was the first evidence that there were probably at least two funnels touched down. Across the stream which runs parallel to the road in photo 6 there was evidence of two swaths through the brush although damage was not nearly as severe as in the swath cut through the trees on the Pratt farm. A few poplars were broken off a metre or two above ground level and alders were bent over. The small house in photo 10 had the porch totally ripped off and the sheet metal roofing was bent back on one corner of the roof.

Photos 11 and 12 show grooves made in the ground as a portion of the barn was dragged over the ground by the tornado.

This groove was 5 to 10 cm deep and was about 4 to 5 m long and showed pronounced curvature. This is definite evidence of rotation and confirms that the it was not just a downdraft from a cumulonimbus cloud but definitely a tornado that caused the damage. The large spruce tree that is shown uprooted in photo 13 was well to the right of the track of the tornado that cut the swath through the trees and destroyed the barn and the other outbuildings. It was almost at the edge of the field of oats about 8 metres from the road. Photo 14 shows a small circular area of oats about 4 m in diameter just to the left of the tree that was flattened. A small branch of the spruce tree is shown on the right hand side. Around the perimeter of this circle the oats were bent in a clockwise fashion, again showing evidence of rotation, as if a funnel touched down very briefly. This supports the supposition that more than one funnel was involved. The large spruce was probably uprooted ~~by the~~ by a second funnel which touched down briefly and did not do any more damage until it reached the trees beyond the road and the stream.

A few hundred metres to the right of the track of the funnel that hit the small house in photo 10 there were a number of trees, mostly poplars and birches, that were broken off and bent over. Evidence of this is seen in the extreme left and the right of photo 15. This indicates that there was probably a third funnel that touched down very briefly.

In conclusion, there is no doubt that the damage in Carlisle, N.B. was caused by a tornado. The roar heard when the tornado

passed, the evidence of rotation, the random orientation of the trees that were broken off and the way the debris of the barn and other outbuilings was scattered all support the supposition that it was a tornado that hit the Pratt farm. The distibution of the damage in the hamlet of Carlisle indicates that there were two and possibly three funnels that touched down. Damage was reported from Mainstream to Carlisle, a distance of three or more kilometres. The bulk of the damage occurred on the Pratt farm and total damage was estimated to be in the range of $15,000.-20,000.

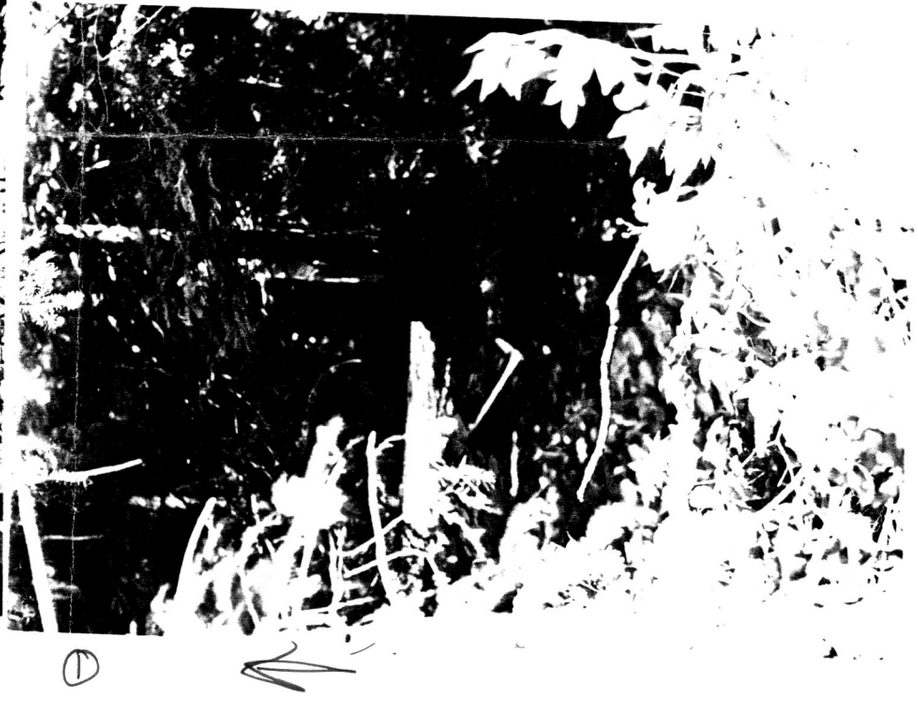

6


3


5


2


4


1

Environment Canada Environnement Canada

Climatic Perspectives

MONTHLY SUPPLEMENT INCLUDED

September 11 to 17, 1989 **A weekly review of Canadian climate** *Vol. 11 No 38*

Brief return to summer in Manitoba and Atlantic Canada

A disturbance crossing central Manitoba over the weekend pumped mild air northwards, allowing temperatures in the south to surge upwards into the record mid-thirties. At Brandon, the thermometer registered 34.8°C on the 17th. Thirty degree temperatures were also experienced at Dauphin, Estevan and Portage La Prairie, all on the same day. The warm summer-like weather was a boon to farmers trying to harvest their crops before the winter snow.

In Nova Scotia, under mostly sunny skies, temperatures also managed to nudge thirty degrees. In fact, due to a strong southerly flow, mild weather was common to most of Atlantic Canada at the start of the period, with daytime readings generally hovering up around the mid-twenties. A new daily maximum temperature record of 30.9°C was set at Greenwood on the 11th. In addition, a couple of daily temperature records were established in Newfoundland. St. John's maximum temperature reached 25.7°C.

Autumn harvest report

Nova Scotia: the McIntosh apple harvest is about to begin. Cool nights in late August and September have resulted in early colour development, with maturity not quite as advanced.

Ontario: soyabean and corn maturity advancing rapidly. Corn harvest has begun in some areas, white bean and final hay harvest is under way.

Manitoba: harvesting in full swing with wheat 93%, oats 70%, barley 95%, flax 55% and canola 80% complete.

Saskatchewan: harvest has recommenced after several weeks of unsettled weather. Most progress has been made with the barley and canola.

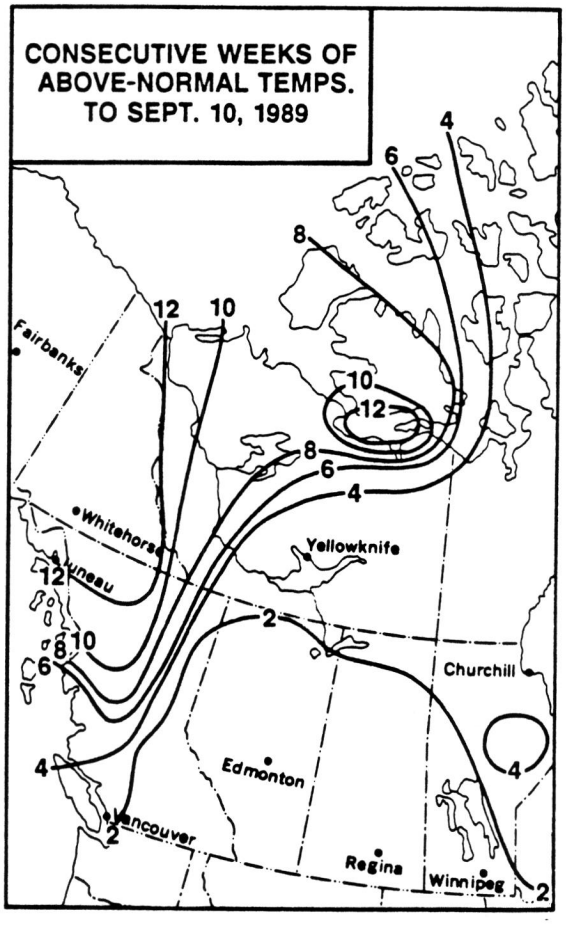
Alberta: harvest back in full swing after a lengthy period of precipitation, which has lowered the quality of the crops. Grain harvesting is less than half complete.

British Columbia: the Okanagan apple harvest is well under way. Size, colour and quality of the apples is considered good, although last winter's cold spell did damage many trees: the hard freeze damaged the buds and thus affected most of the apricot crop and the commercial viability of the peach crop. Grape harvest has just started, for the most part earlier than previous years. Most of the third hay cut has been baled.

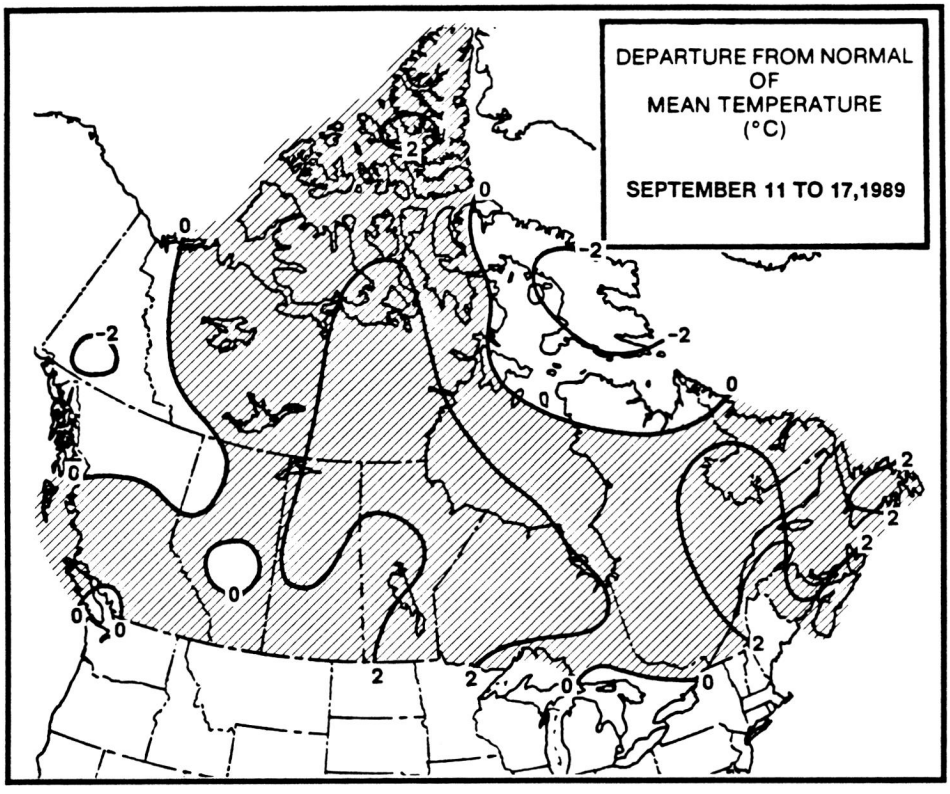
Summer-like temperatures in early autumn

A strong ridge of high pressure extending from the Yukon through the Prairies and Ontario to Québec will bring unseasonably warm temperatures throughout most of Canada for the five-day period starting September 24. Warm temperatures are expected to return to northwestern Canada, where a prolonged warm spell of 12 consecutive weeks was briefly interrupted in mid-September. A flow of cold air from the north will push colder than normal temperatures over the northeastern Arctic Islands, Labrador and northern Newfoundland. — *prepared Sept. 20, 1989*

A. Shabbar, Canadian Climate Centre



Canada



Weekly normal temperature (°C)

	max	min
Whitehorse A	13.6	3.8
Iqaluit A	5.3	0.2
Yellowknife A	10.8	4.2
Vancouver Int'l A	18.7	10.2
Victoria Int'l A	19.4	8.9
Calgary Int'l A	17.2	4.0
Edmonton Int'l A	16.3	3.0
Regina A	18.9	5.0
Saskatoon A	18.1	5.0
Winnipeg Int'l A	18.6	6.4
Ottawa Int'l A	19.4	8.9
Toronto Int'l A	21.4	9.5
Montréal Int'l A	19.5	9.5
Québec A	17.8	6.8
Fredericton A	19.3	6.4
Saint John A	17.3	7.3
Halifax	18.7	10.0
Charlottetown A	17.9	8.8
Goose A	13.5	4.6
St John's A	15.6	7.6

Weekly temperature and precipitation extremes

	Maximum temperature (°C)		Minimum temperature (°C)		Heaviest precipitation (mm)	
British Columbia	Port Alberni A	30	Dease Lake	-8	Fort St John A	17
Yukon Territory	Watson Lake A	22	Faro (aut)	-9	Komakuk Beach A	21
Northwest Territories	Fort Simpson A	26	Alert	-16	Inuvik A	32
Alberta	Medicine Hat A	29	Banff (aut)	-3	Jasper	30
Saskatchewan	Estevan A	33	Eastend Cypress (aut)	-5	Buffalo Narrows A	37
Manitoba	Brandon A	35	Grand Rapids (aut)	-2	Pilot Mound	26
Ontario	Kenora A	29	Upsala (aut)	-2	Simcoe	32
Québec	Montréal Int'l A	24	Kuujjuaq A	-3	La Grande Iv A	42
New Brunswick	Saint John A	27	Fredericton A	3	Saint John A	41
Nova Scotia	Greenwood A	31	Truro	4	Inverness (aut)	98
Prince Edward Island	Charlottetown A	25	Summerside A	7	Charlottetown A	34
Newfoundland	St John's A	27	Nain A	0	St Lawrence	101

Across The Country...

Highest Mean Temperature	Sable Island(NS)	19
Lowest Mean Temperature	Alert(NWT)	-9

89/09/11-89/09/17

CLIMATIC PERSPECTIVES
VOLUME 11

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The purpose of the publication is to make topical information available to the public concerning the Canadian Climate and its socio-economic impact.

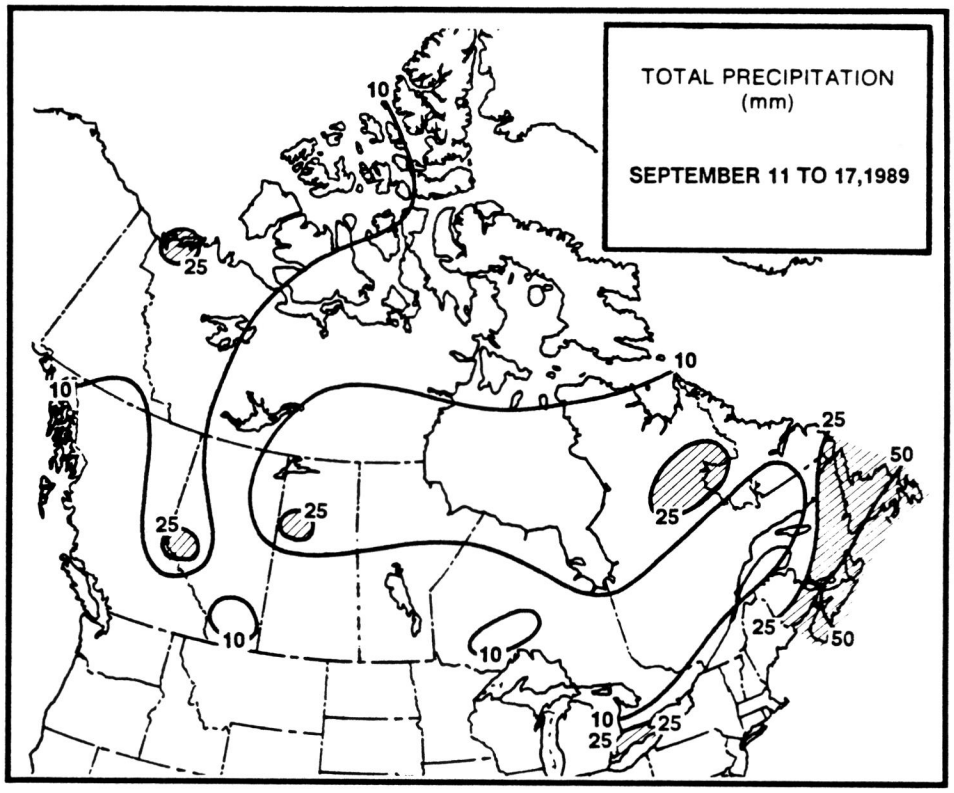
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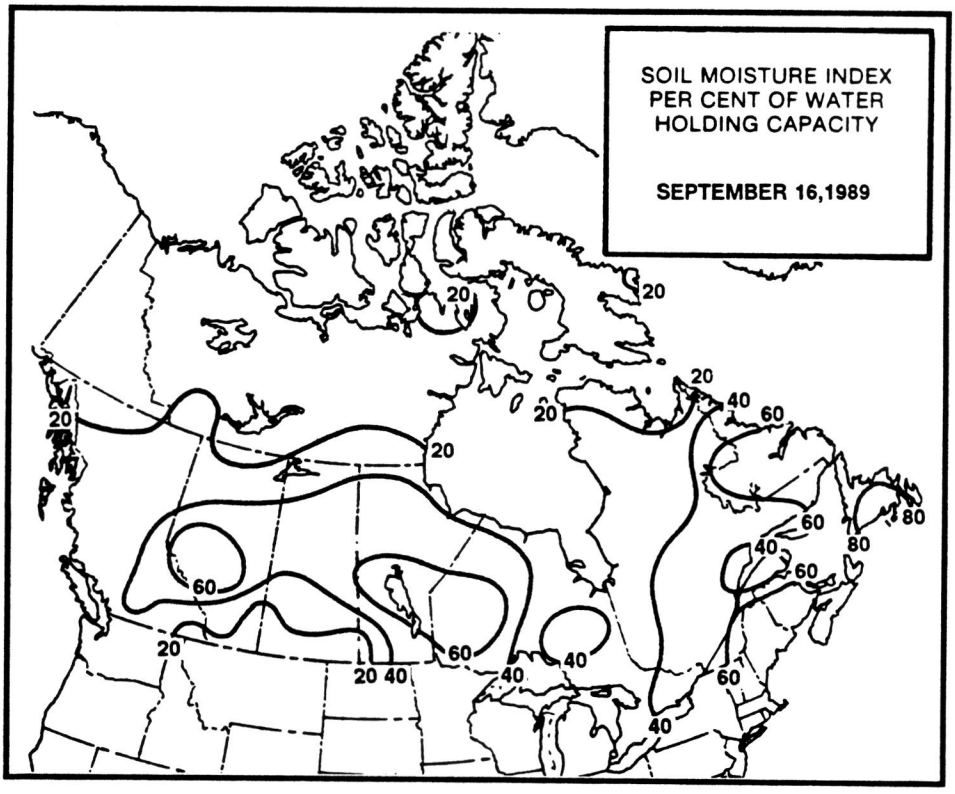
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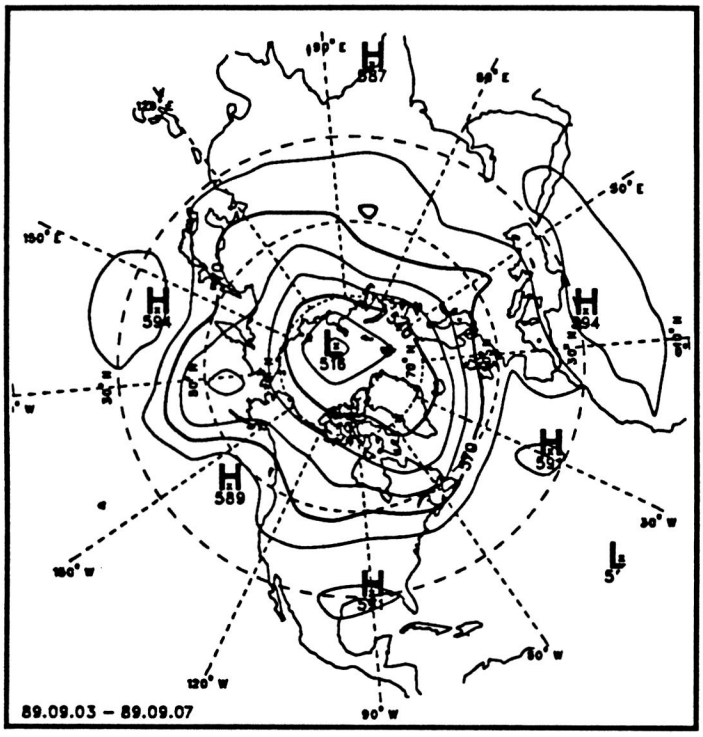
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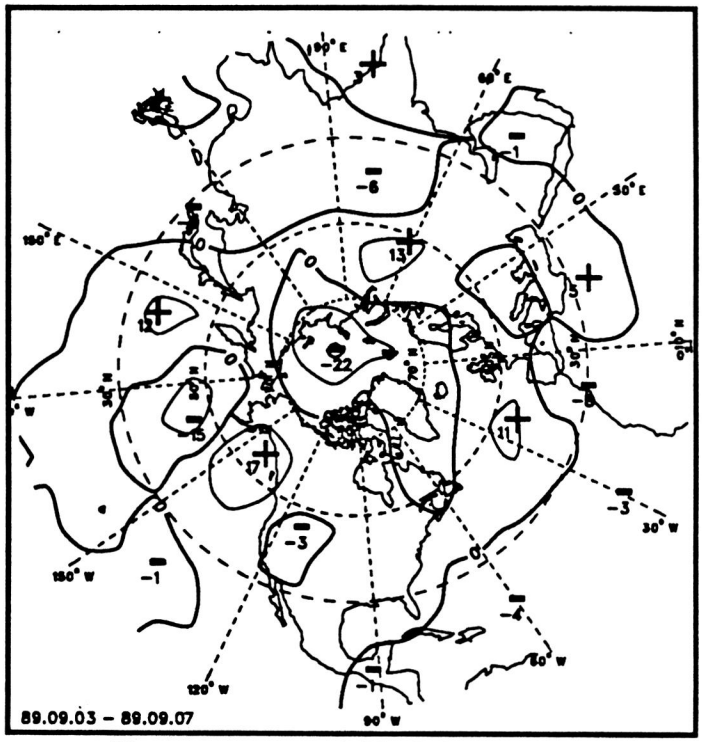




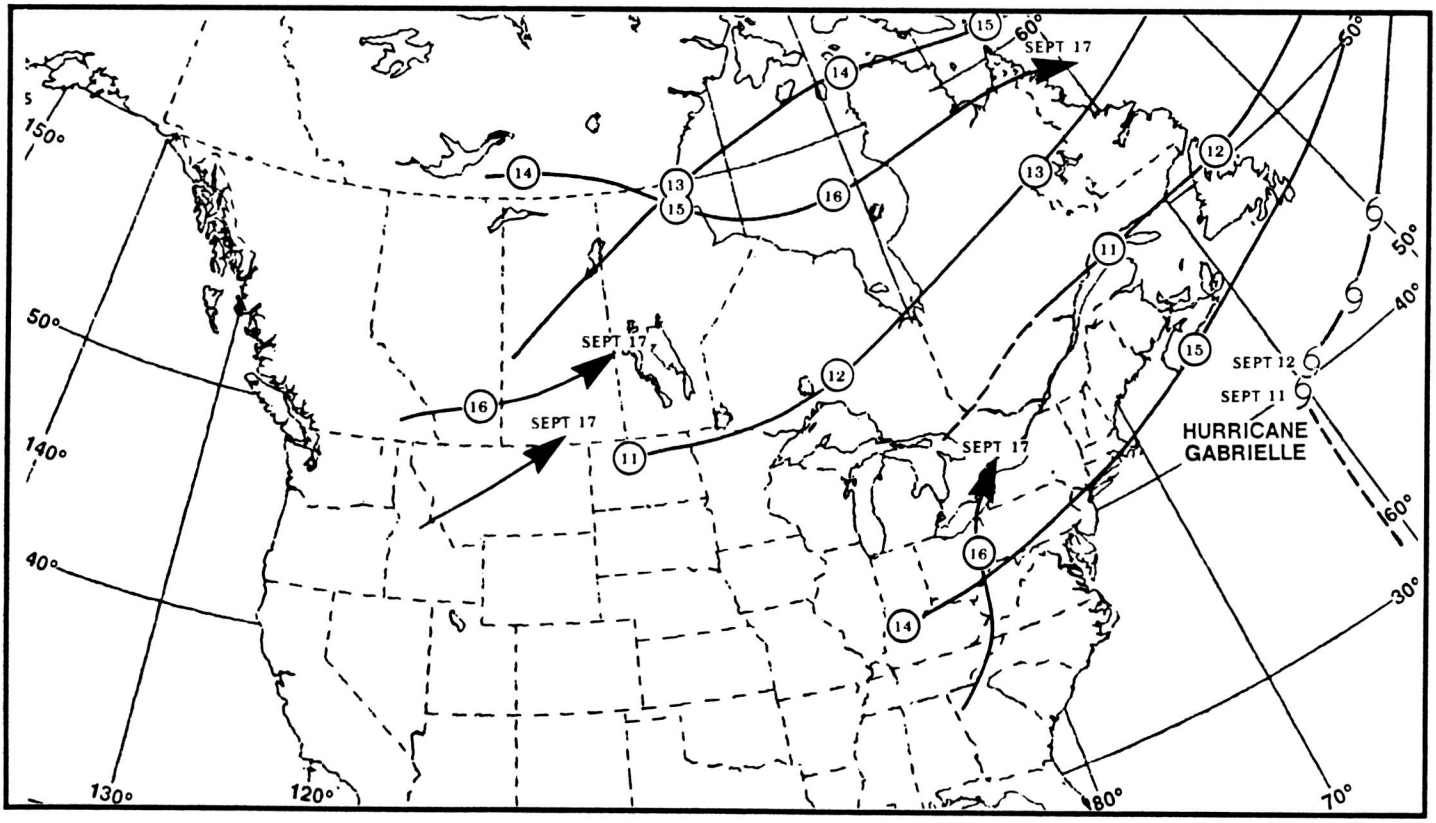
50-kPa ATMOSPHERIC CIRCULATION



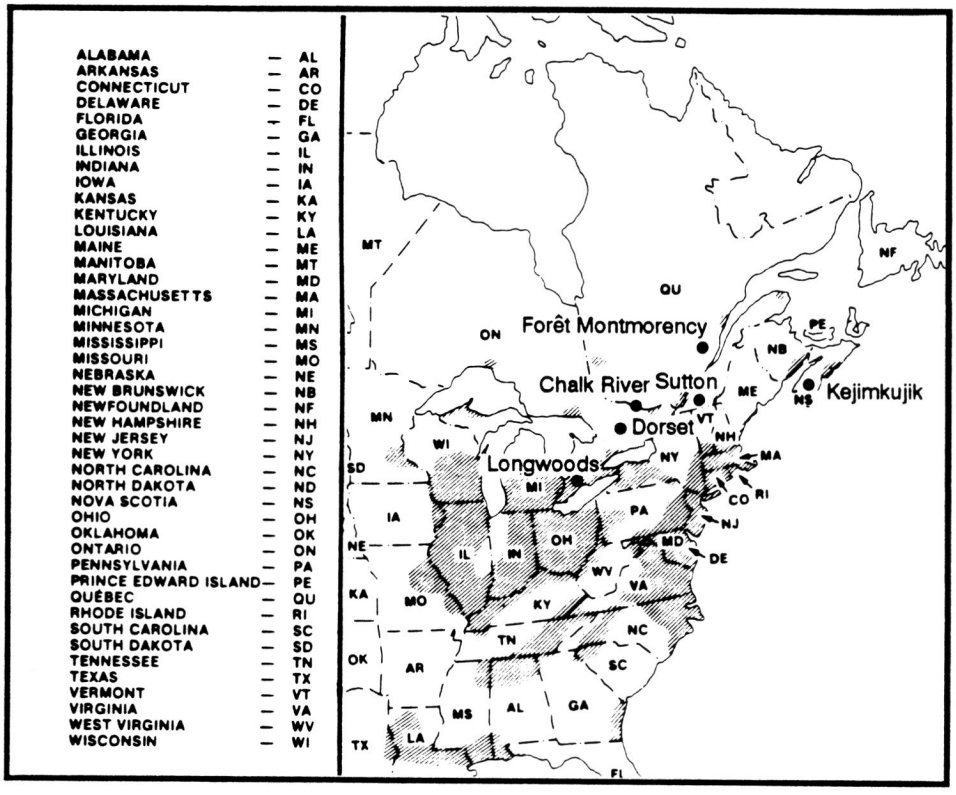
Mean geopotential height
50-kPa level (10 decametre intervals)



Mean geopotential height anomaly
50-kPa level (10 decametre intervals)



Tracks of low pressure centres at 12:00 U.T. each day during the period.



ACID RAIN

The reference map (left) shows the locations of sampling sites, where the acidity of precipitation is monitored. All are operated by Environment Canada except Dorset (*), which is a research station operated by the Ontario Ministry of the Environment. The map also shows the approximate areas (shaded), where SO_2 and NO_x emissions are greatest.

The table below gives the weekly report summarizing the acidity (or pH) of the acid rain or snow that fell at the collection sites, and a description of the path travelled by the moisture laden air. Environmental damage to lakes and streams is usually observed in sensitive areas regularly receiving precipitation with pH readings less than 4.7, while pH readings less than 4.0 are serious.

SITE	day	pH	amount		AIR PATH TO SITE
					September 10 to September 16, 1989
Longwoods	14	4.1	4	R	. . . . . Ohio, Southern Ontario
	16	3.8	6	R	. . . . . Pennsylvania, New York, Southern Ontario
Dorset *	13	4.3	4	R	. . . . . Central Ontario
	16	4.7	3	R	. . . . . New York, Eastern Ontario
Chalk River	13	4.3	3	R	. . . . . Central Ontario
	16	4.3	2	R	. . . . . New York, Eastern Ontario
Sutton	13	3.9	7	R	. . . . . Northwestern and Southern Québec
	14	4.6	25	R	. . . . . New York, Southern Québec
	16	4.1	4	R	. . . . . New England
Montmorency	16	4.1	2	R	. . . . . New England, Southern Québec
Kejimkujik	14	4.2	25	R	. . . . . Atlantic Ocean
	15	5.4	15	R	. . . . . Atlantic Ocean
	16	4.9	14	R	. . . . . Atlantic Ocean

r = rain (mm), s = snow (cm), m = mixed rain and snow (mm)

STATION	temperature mean	anom	max	min	precip. ptot	st	wind max dir	vel
British Columbia								
Cape St James	14P	1P	20P	10P	2P***		300	59
Cranbrook A	13	1	26	-1	0 ***		190	56
Fort Nelson A	9	-1	25	-3	13 ***		340	33
Fort St John A	10	-1	23	0	17	1	340	52
Kamloops A	16	1	28	6	4 ***		280	37
Penticton A	16P	1P	28P	4P	0P***		180	33
Port Hardy A	12P	0P	18P	7P	7P***		330	41
Prince George A	11P	1P	25P	-1P	0P***		030	33
Prince Rupert A	11	0	16	3	5 ***			X
Revelstoke A	13	1	21	3	6 ***		330	39
Smithers A	11	0	24	3	7 ***			X
Vancouver Int'l A	15	1	23	9	1 ***		300	3
Victoria Int'l A	14	0	24	5	0 ***			X
Williams Lake A	12P	1P	25P	1P	0P***			X
Yukon Territory								
Komakuk Beach A	2	0	8	-3	21	2		X
Teslin (aut)	8P	*	19P	-5P	10P***			X
Watson Lake A	8	-1	22	-4	3 ***			X
Whitehorse A	6	-3	18	-6	11 ***		340	46
Northwest Territories								
Alert	-9	1	-4	-16	0	16	190	85
Baker Lake A	5	2	10	-1	3 ***		330	61
Cambridge Bay A	2	2	6	-2	4	2	320	61
Cape Dyer A	-5	-4	2	-13	8	4	300	56
Clyde A	0P	-1P	4P	-6P	0P***			X
Coppermine A	4	1	16	-5	5	1	320	50
Coral Harbour A	1	-1	6	-5	6 ***		260	50
Eureka	-6	2	0	-12	4	3	110	56
Fort Smith A	9	1	22	0	5 ***		310	43
Hall Beach A	0	0	3	-4	3 ***		200	43
Inuvik A	5	0	17	-2	32 ***		320	59
Iqaluit A	0P	-3P	4P	-4P	7P	1	140	44
Mould Bay A	-4	2	1	-10	12	6	250	50
Norman Wells A	8	0	20	-1	19 ***		310	50
Resolute A	-4	0	-1	-10	23	20	100	44
Yellowknife A	9	2	17	1	6 ***		320	46
Alberta								
Calgary Int'l A	11	0	25	-1	6 ***		330	43
Cold Lake A	11	1	24	-2	1 ***		320	46
Edmonton Namao A	11	0	24	0	7 ***		330	44
Fort McMurray A	10	0	23	-2	13 ***		210	32
High Level A	9	-1	25	-3	2 ***		320	56
Jasper	10	0	25	-1	30 ***			X
Lethbridge A	14	1	28	-3	15 ***		260	72
Medicine Hat A	13	0	29	-3	8 ***		250	59
Peace River A	9	-1	23	-1	4 ***		360	37
Saskatchewan								
Cree Lake	10	2	19	-1	18 ***		320	48
Estevan A	14	2	33	-4	1 ***		180	52
La Ronge A	10	1	20	0	5 ***		300	48
Regina A	13	1	29	-1	0 ***		200	61
Saskatoon A	13P	1P	26P	-2P	0P***		220	56
Swift Current A	13	1	27	-2	3 ***		210	43
Yorkton A	13	1	26	-1	0 ***		140	52
Manitoba								
Brandon A	15P	3P	35P	1P	6P***		180	59
Churchill A	8	2	16	0	12 ***		330	59
Lynn Lake A	9	2	18	-1	12 ***		260	48
The Pas A	10	0	18	2	3 ***		240	54
Thompson A	9P	1P	18P	-1P	16P***		220	46
Winnipeg Int'l A	15	2	32	2	3 ***		180	63

STATION	temperature mean	anom	max	min	precip. ptot	st	wind max dir	vel
Ontario								
Big Trout Lake	10	2	20	2	5 ***		330	56
Gore Bay A	13	0	22	5	0 ***		280	41
Kapuskasing A	12	3	23	1	7 ***		250	50
Kenora A	15P	3P	29P	6P	6P***		170	50
London A	15	-1	25	6	10 ***		040	33
Moosonee	11	2	24	3	21 ***		220	37
North Bay A	12	0	21	4	0 ***		230	46
Ottawa Int'l A	15	0	25	6	9 ***		300	37
Petawawa A	13	0	26	2	6 ***			X
Pickle Lake	11	1	23	2	1 ***		220	50
Red Lake A	13	2	27	1	0 ***		150	46
Sudbury A	12	0	22	2	0 ***		230	56
Thunder Bay A	11	0	23	1	7 ***		340	43
Timmins A	11	1	23	-2	2 ***		250	52
Toronto Int'l A	15	-1	24	6	6 ***		080	39
Trenton A	15	-1	23	8	21 ***			X
Wiarton A	13	-2	21	4	6 ***			X
Windsor A	16	-2	26	9	30 ***		040	43
Québec								
Bagotville A	13	2	23	5	0 ***		280	33
Blanc Sablon A	11P	*	18P	4P	26P***		050	37
Inukjuak A	5	0	10	1	28 ***		200	46
Kuujjuaq A	5	0	14	-3	10 ***		210	65
Kuujjuarapik A	8	1	17	4	7 ***		150	59
Maniwaki	13	2	23	5	10 ***			X
Mont Joli A	14	3	21	7	0 ***		240	37
Montréal Int'l A	16	1	24	9	23 ***			
Natashquan A	11	2	18	5	5 ***		270	48
Québec A	15	3	22	7	12 ***		260	32
Schefferville A	7	2	14	0	27 ***		340	57
Sept-Îles A	12	3	20	4	0 ***		280	48
Sherbrooke A	14	2	21	5	37 ***			X
Val-d'Or A	12	2	22	2	0 ***		210	57
New Brunswick								
Charlo A	15	4	22	7	2 ***			X
Chatham A	14	2	25	5	13 ***		290	33
Fredericton A	14	1	25	3	9 ***		360	32
Moncton A	14P	1P	25P	7P	***P***		020	54
Saint John A	15	2	27	6	41 ***		360	52
Nova Scotia								
Greenwood A	16	2	31	7	74 ***		020	46
Shearwater A	17	3	26	9	70 ***		220	52
Sydney A	15	2	26	8	48 ***		020	44
Yarmouth A	16	2	27	7	33 ***		360	48
Prince Edward Island								
Charlottetown A	15	1	25	8	34 ***		020	48
Summerside A	14	0	24	7	24 ***		360	50
Newfoundland								
Cartwright	9	0	18	4	13 ***		350	56
Churchill Falls A	9	3	17	2	11 ***		310	5
Gander Int'l A	13	1	24	4	97 ***		320	48
Goose A	11	2	19	5	8 ***		310	56
Port Aux Basques	11P	0P	20P	6P	37P***		040	48
St John's A	15	4	27	6	52 ***		030	48
St Lawrence	14	3	21	7	101 ***			X
Wabush Lake A	9	3	17	2	9 ***		310	56

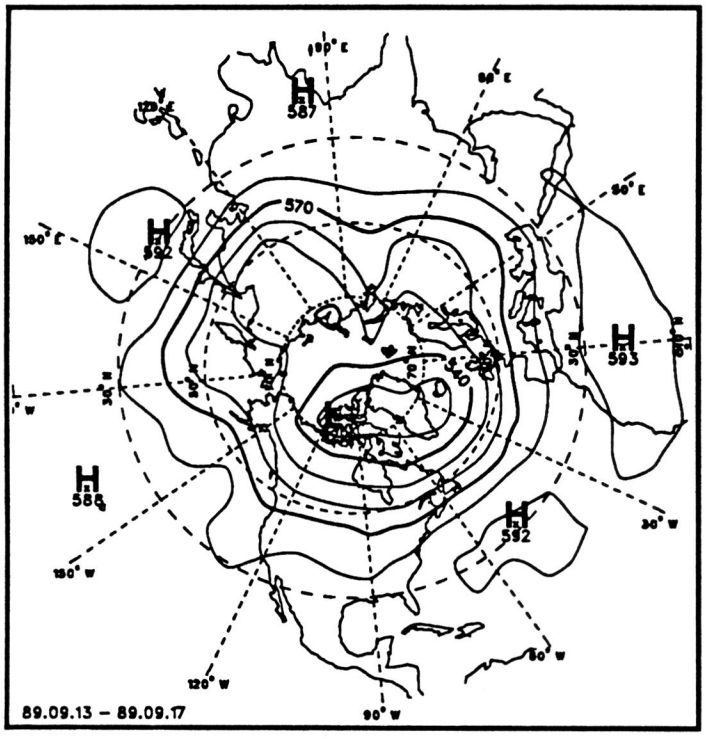
89/09/11-89/09/17

mean = mean weekly temperature, °C
max = maximum weekly temperature, °C
min = minimum weekly temperature, °C
anom = mean temperature anomaly, °C

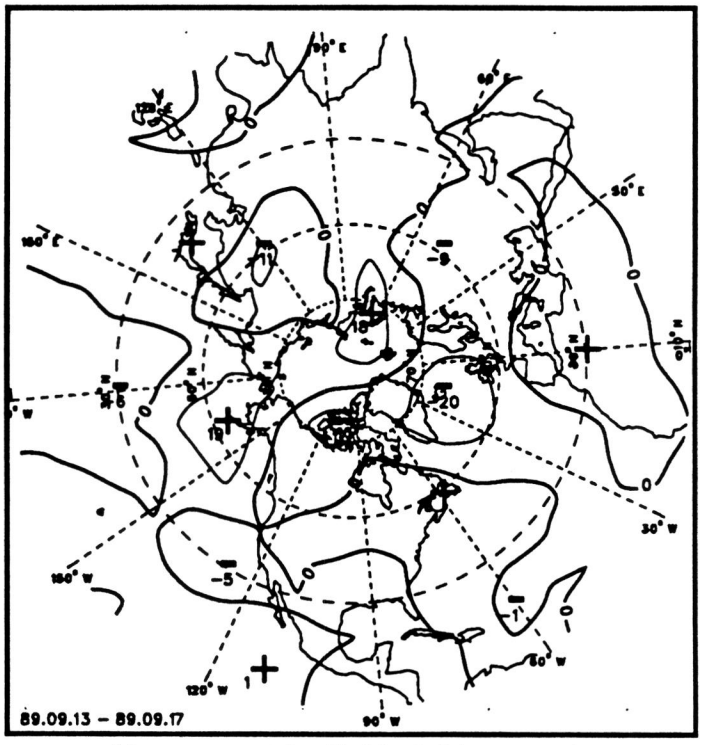
ptot = weekly precipitation total in mm
st = snow thickness on the ground in cm
dir = direction of max wind, deg. from north.
vel = wind speed in km/h

— Annotations —
X = no observation
P = less than 7 days of data
***** = missing data when going to printing.

50-kPa ATMOSPHERIC CIRCULATION



Mean geopotential height
50 kPa level (10 decametre intervals)



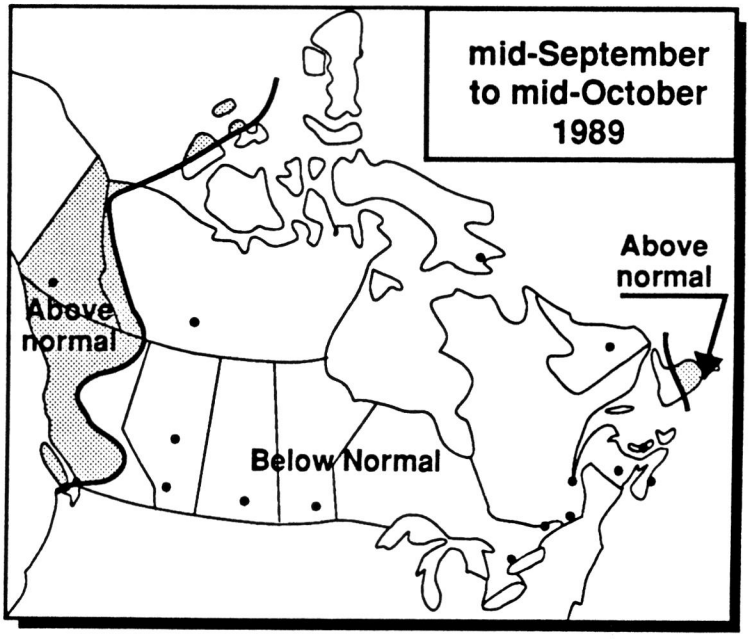
Mean geopotential height anomaly
50 kPa level (10 decametre intervals)

Environment Canada / Environnement Canada
Atmospheric Environment Service / Service de l'environnement atmosphérique

MONTHLY TEMPERATURE FORECAST

Normal temperatures from mid-September to mid-October, °C

Whitehorse	4	Toronto	12
Yellowknife	3	Ottawa	11
Iqaluit	-1	Montreal	12
Vancouver	12	Québec	10
Victoria	12	Fredericton	10
Calgary	8	Halifax	12
Edmonton	8	Charlottetown	11
Regina	8	Goose Bay	6
Winnipeg	9	St. John's	9



Canada

Environment Canada Environnement Canada

Climatic Perspectives

Monthly Review **AUGUST – 1989** *Vol. 11*

CLIMATIC HIGHLIGHTS

Record heat-wave in north-western Canada

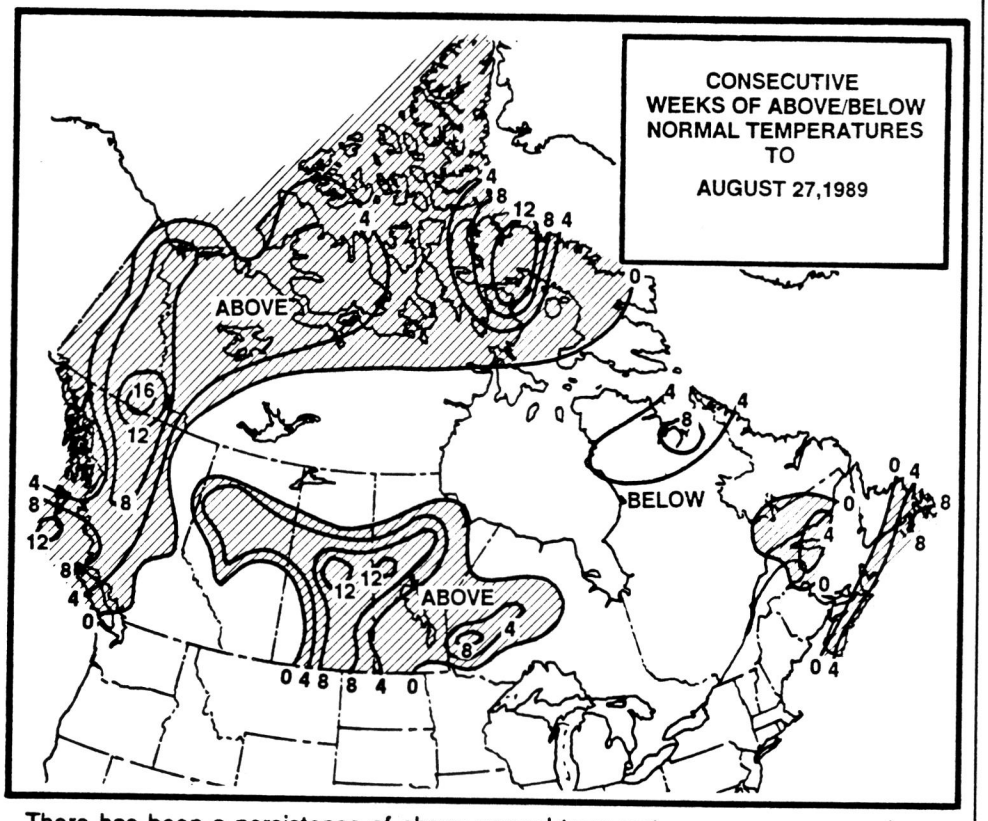
The last summer of this decade will be remembered for record-high temperatures in the western portions of the Northwest Territories and the Yukon. During early June, a ridge of high pressure from the north Pacific Ocean moved over the Northwest Territories and controlled the air circulation over the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

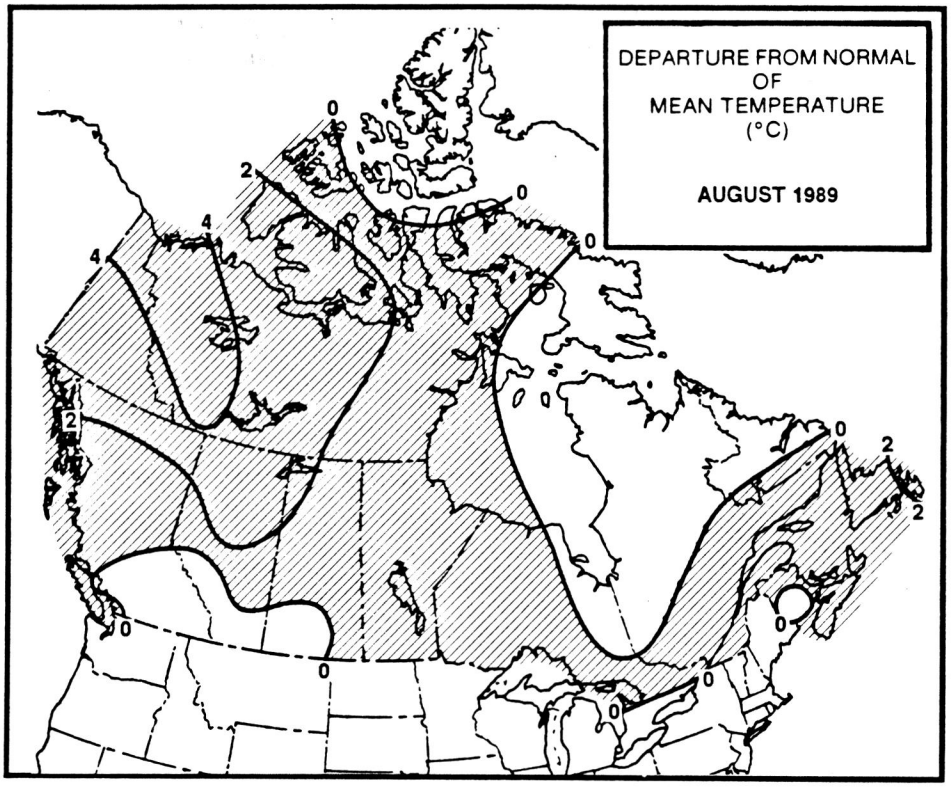
The hot and dry weather set the stage for the outbreak of disastrous forest fires in the northern areas of Manitoba and Saskatchewan. During mid-July, about 600 fires raged across northern Manitoba forcing over 23,000 people out of their homes. In addition, hot and dry weather helped to fuel major forest 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.

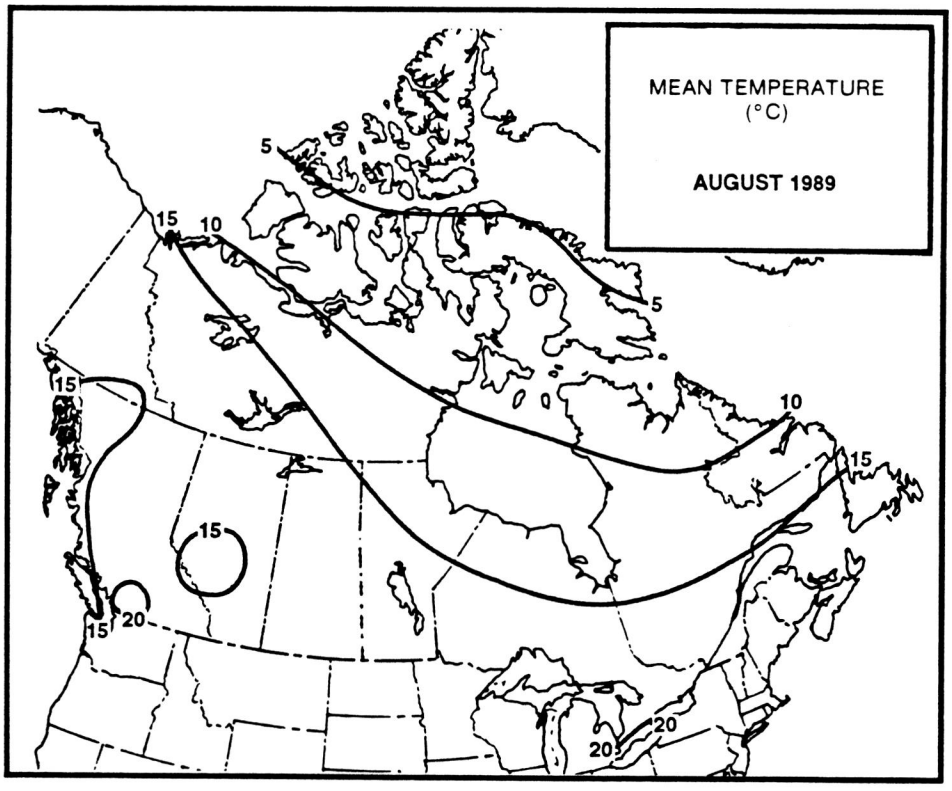
...continued on page 8



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.

Canada





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

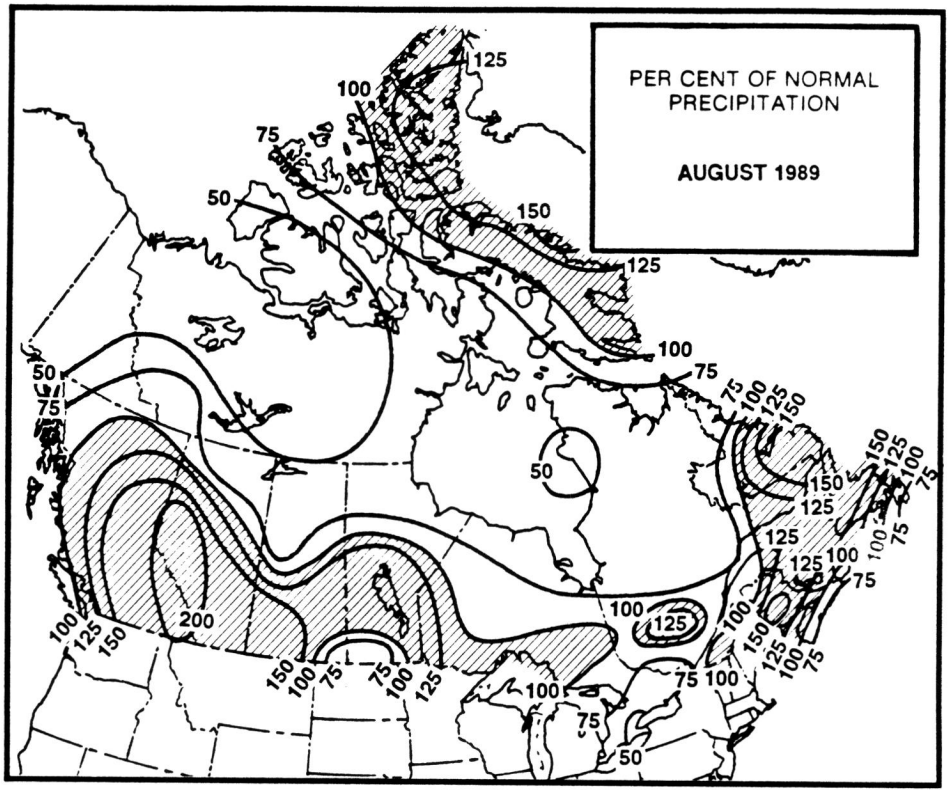
For the fifth consecutive month, temperatures have been above normal in the western Mackenzie District. The dominant high pressure ridges which have been responsible for record-high temperatures in the Yukon this month, also covered the western Territories. Inuvik recorded a monthly mean which was 4.8 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

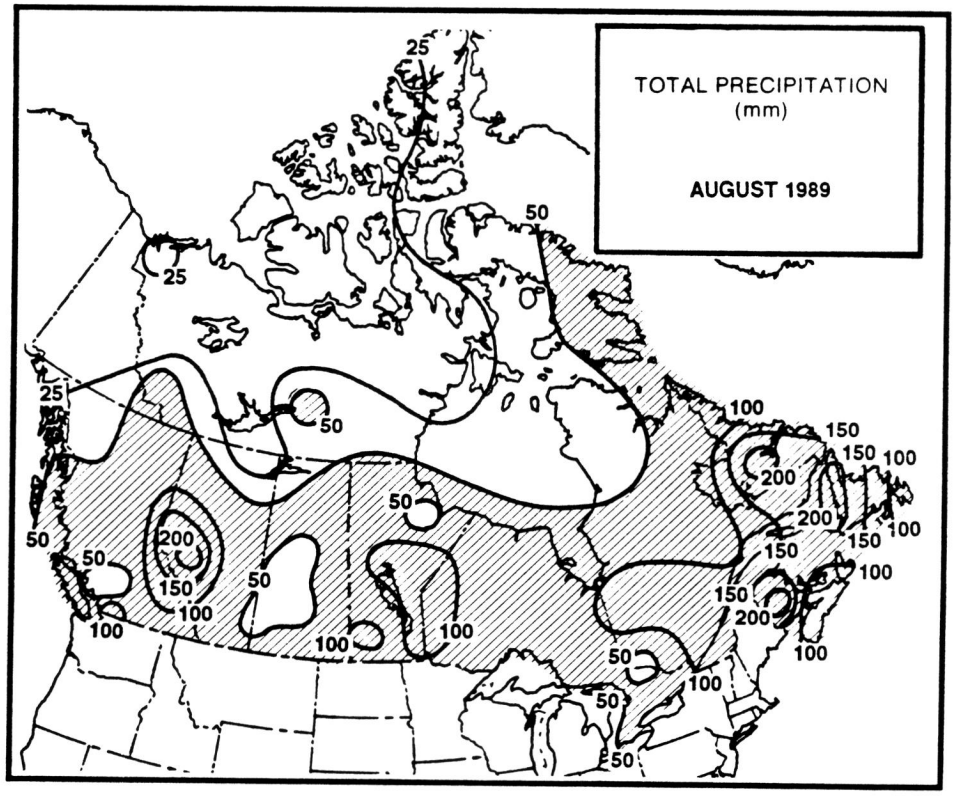
August saw a weather pattern similar to July, with a series of upper troughs on, or just offshore, tending to have the most effect in southern parts of the province. As in July, thunderstorms made frequent appearances. As a result, precipitation was well-above average in the southern and central interior, 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. Kuujuak, 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.

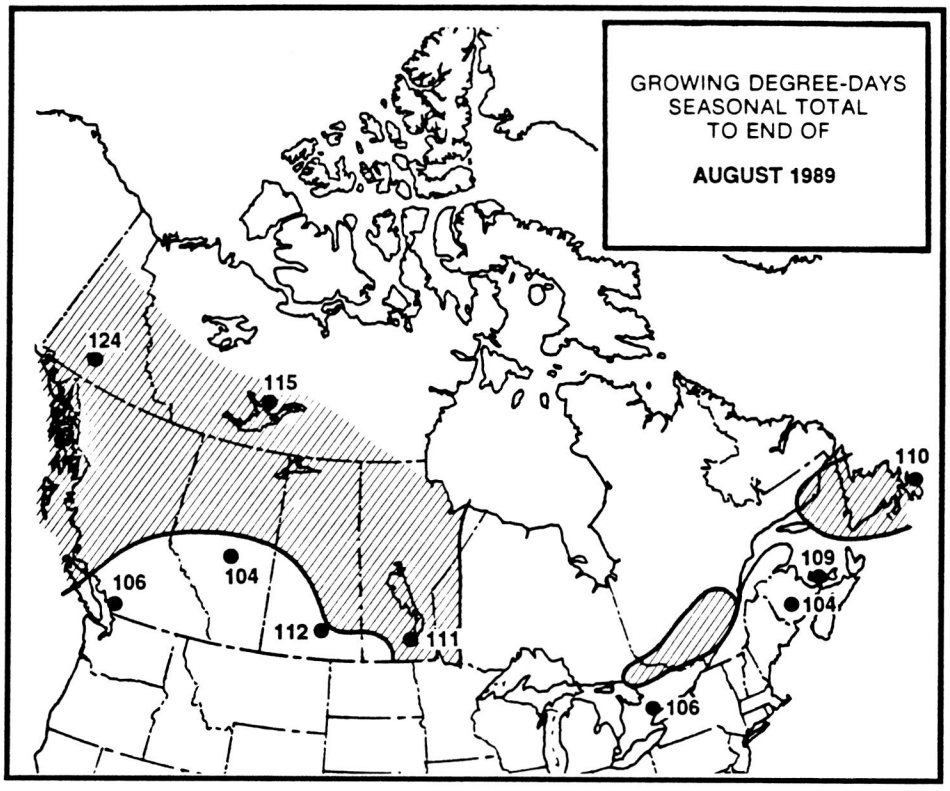
Newfoundland and Labrador

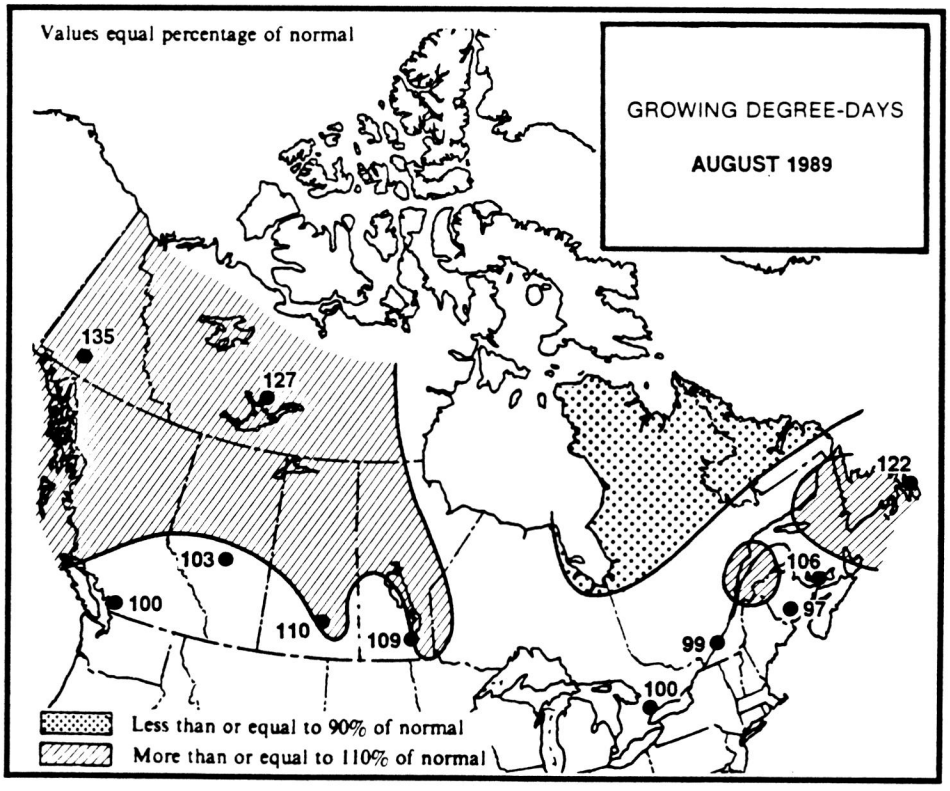
Above-normal temperatures prevailed across much of Newfoundland. Precipitation and sunshine were below normal on the Avalon Peninsula but well-above normal in western locations.

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).



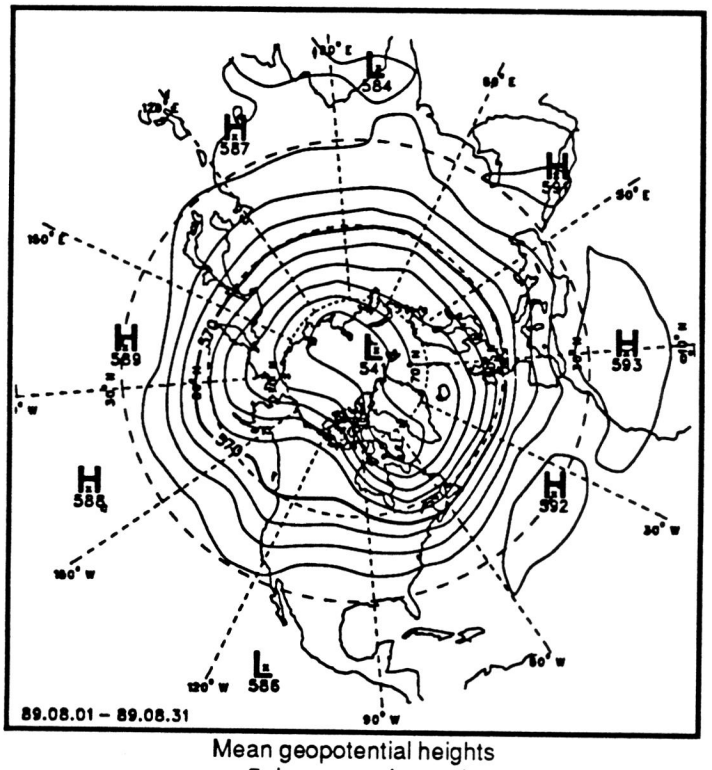


SEASONAL TOTAL OF GROWING DEGREE-DAYS TO END OF AUGUST

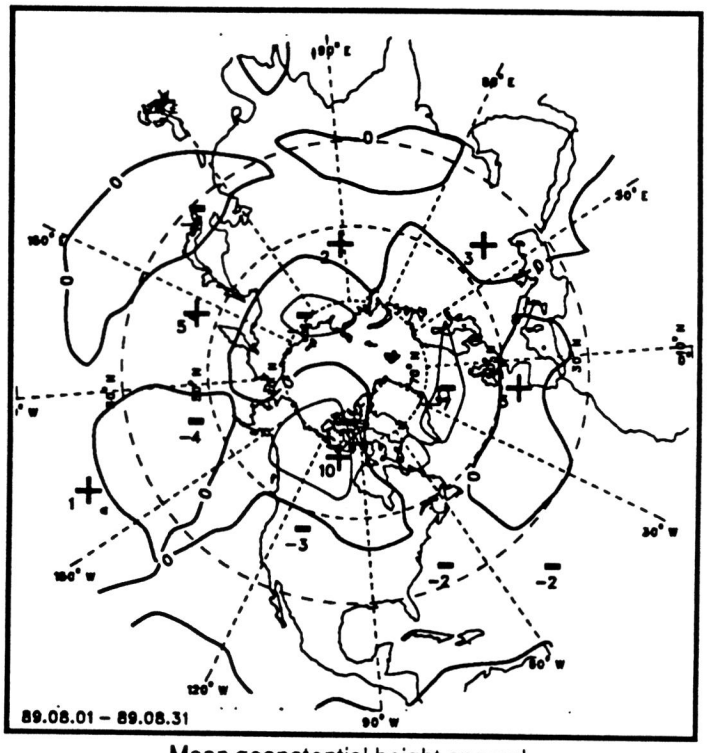
	1989	1988	NORMAL
BRITISH COLUMBIA			
Abbotsford	1431	1412	1309
Kamloops	1775	*	1694
Penticton	1705	*	1616
Prince George	975	*	870
Vancouver	1427	1441	1347
Victoria	1272	1262	1236
ALBERTA			
Calgary	970	1213	905
Edmonton Mun.	1100	1292	1057
Grande Prairie	1009	*	927
Lethbridge	1101	1492	1091
Peace River	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
QUEBEC			
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
NEWFOUNDLAND			
Gander	835	845	782
St. John's	803	*	729
Stephenville	1116	962	948

50-kPa ATMOSPHERIC CIRCULATION

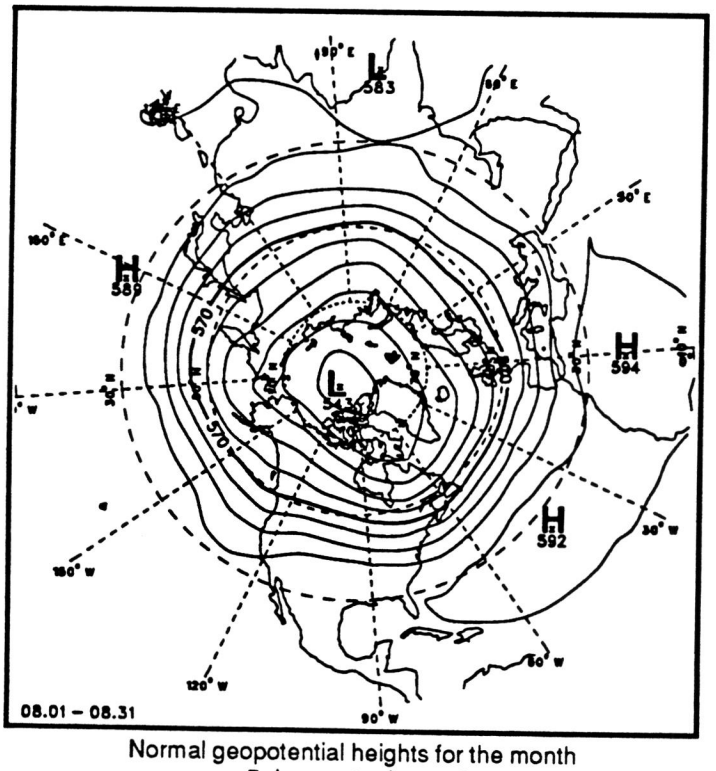
August 1989



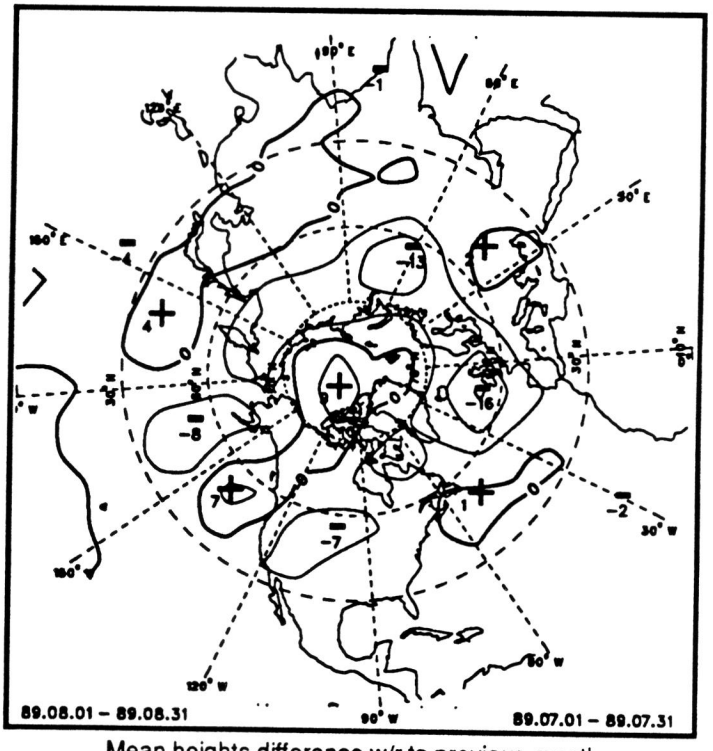
Mean geopotential heights
- 5 decametre interval -



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?

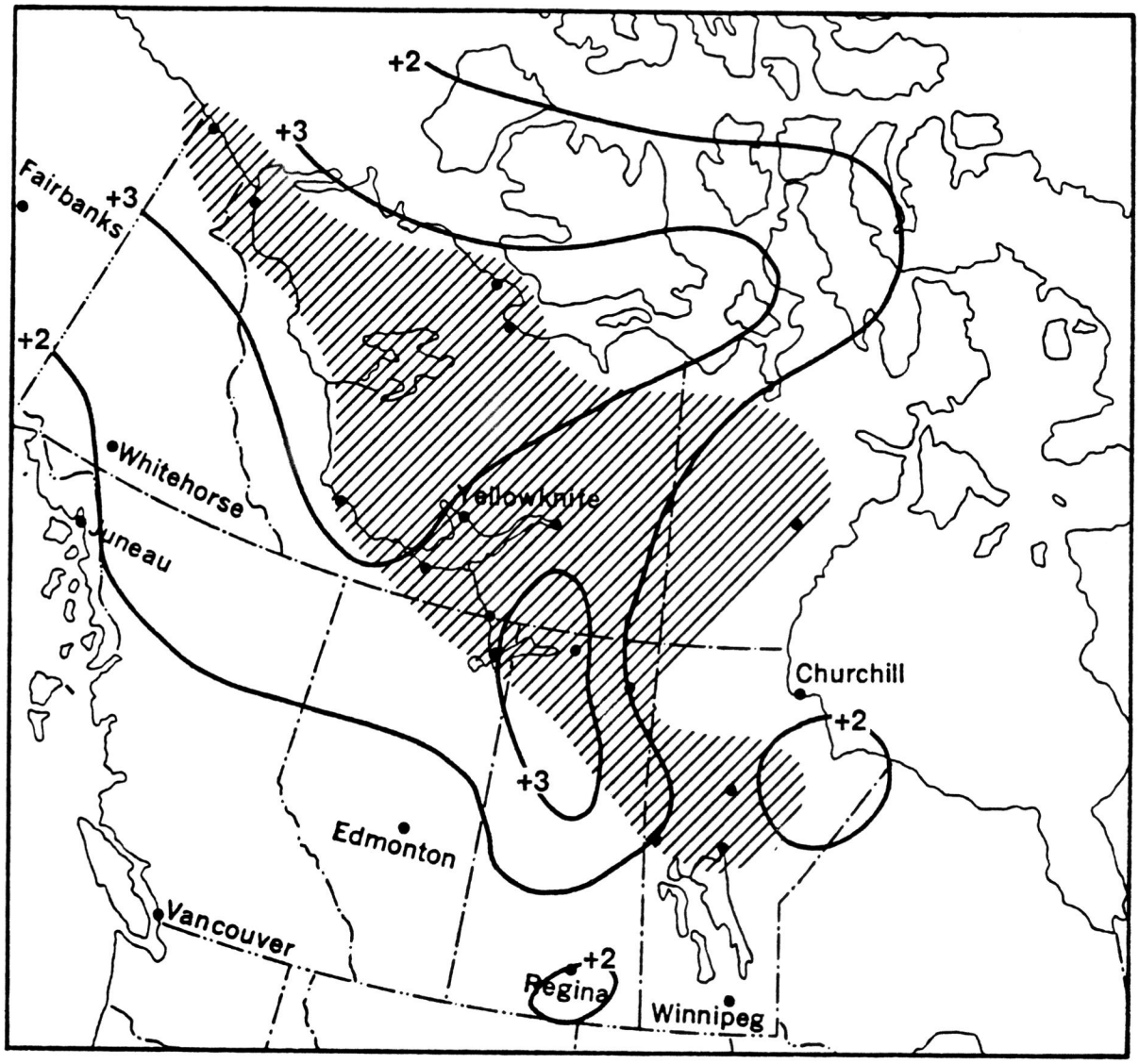
The summer of '89 was also exceptionally warm in western Europe and Siberia. Western Europe's summer temperatures have been 2 to 3 Celsius degrees above normal. Can these warm spells be regarded as evidence of a global warming? According to scientists from the British Meteorological Office and University 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	55	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	8.9	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	*	*	*	*	*	*	*	*	*	*	*	*	*

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									
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	38	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	5	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
IQALUIT	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

AUGUST 1989

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	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 NAMAO 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	5	*	*	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

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	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	*	*	30.8
WINDSOR A	21.5	0.2	32.0	10.3	0.0	*	36.4	43	0	5	*	*	3.5

AUGUST 1989

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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
KUUJJUAQ A	8.6	-1.8	20.6	0.3	0.0	0	38.2	60	0	11	141	85	284.0
KUUJJUARAPIK 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
MATAGAMI A	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 I/	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
SCHEFFERVILLE A	9.7	-1.1	21.3	0.2	0.4	17	66.6	68	0	8	169	111	255.5
SEPT-ILES 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	*	142.9	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

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	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

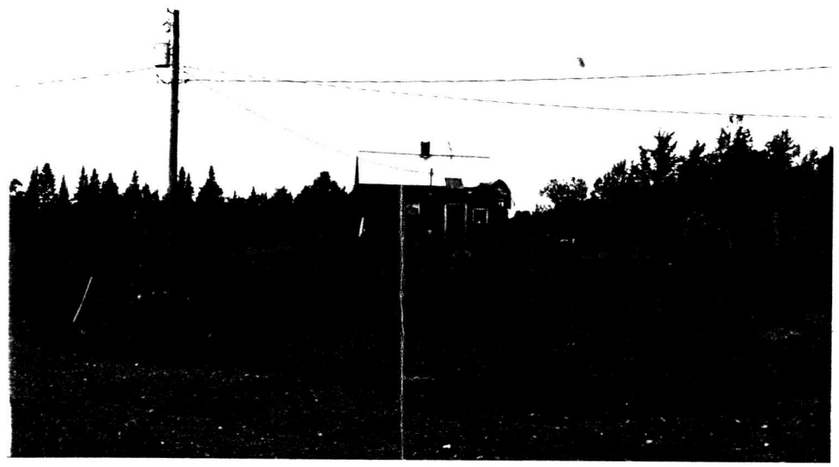
AGROCLIMATOLOGICAL STATIONS

AUGUST 1989

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
KAMPLOOPS	**	**	**	**	**	**	**	***	***	**	**	**
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	**	**	**	**	**	**	**	***	***	**	**	**
LACOMBE	15.0	0.1	28.5	3.0	0.0	77.1	113	0	12	188	308.9	1109.3
LETHBRIDGE	**	**	**	**	**	**	**	***	***	**	**	**
VEGREVILLE	**	**	**	**	**	**	**	***	***	**	**	**
SASKATCHWAN												
INDIAN HEAD	18.9	1.5	37.0	4.0	0.0	53.4	96	0	5	**	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	**	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	**	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	**	**	1691.7
ELORA	18.1	0.0	30.2	4.6	0.0	91.7	127	0	7	**	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	**	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	**	**	**	**	**	**	**	***	***	**	**	**

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 POCATIERE	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	**	**	1654.8
LENNOXVILLE	**	**	**	**	**	**	**	***	***	**	**	**
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	**	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


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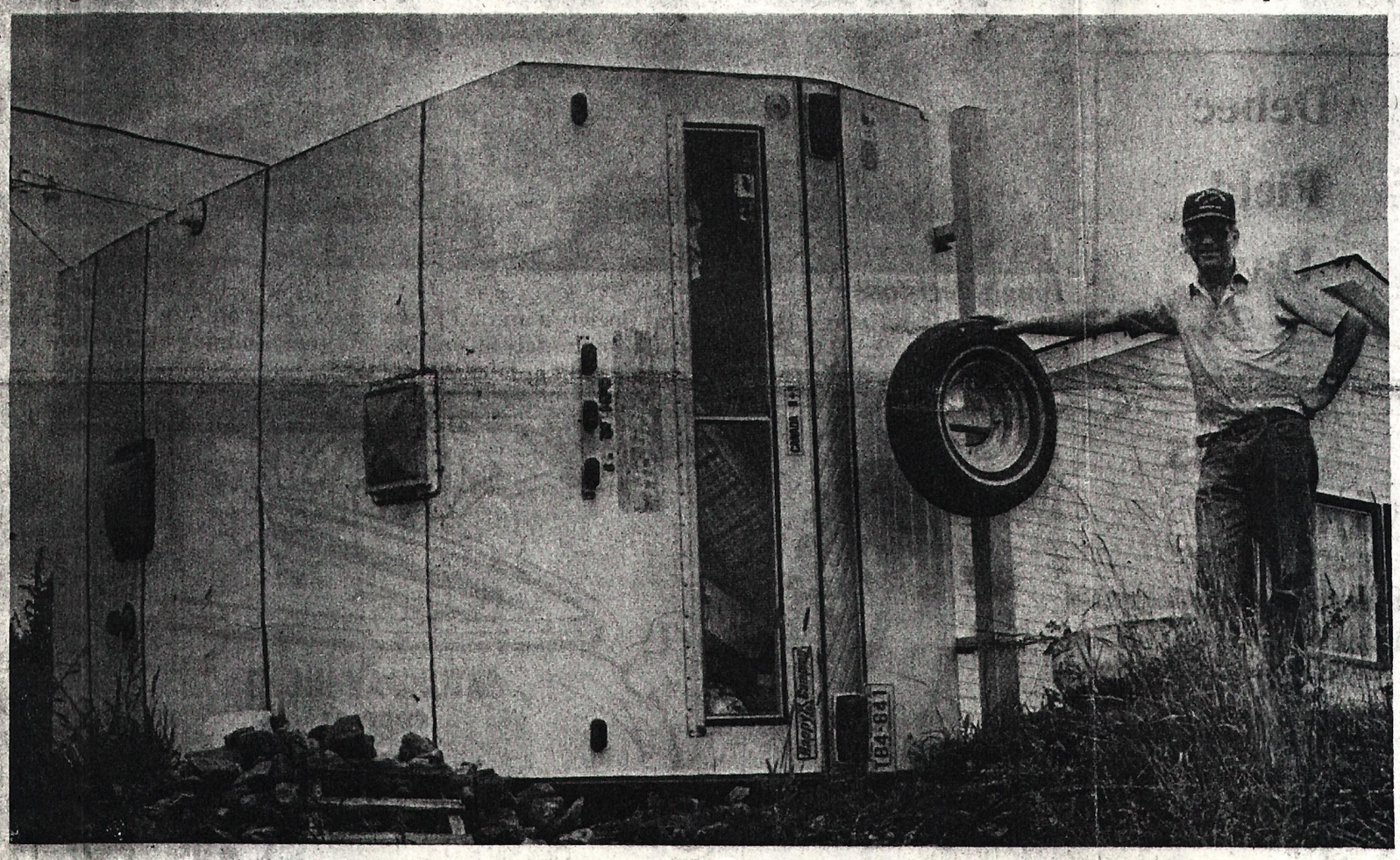
VOL. 25 NO. 33
WEDNESDAY, AUGUST 16, 1989

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Levelled

The twister that touched down in Carlisle Sunday evening made short work of Earl Pratt's barn. Pratt's grandson Ross Craig was one of many who helped clear the flattened field of oats of debris from the barn. (Brian Atkinson photos)



Twisted trailer

"It lasted less than 10 seconds," LLoyd Parsons said, but that was time enough for the twister that ripped across his Carlisle property to destroy his porch, twist his satellite dish in its moorings, and flip his trailer over.

Storm vents fury in Carlisle

When the sky turns black before the sun goes down, you know trouble is coming your way.

Ann Hathaway of Carlisle, near Hartland, watched the sky darken Monday night just before the "worst storm" she has ever seen came through.

"The sky got blacker and blacker, and then it looked like a black cloud was going right up the road," Hathaway said. "And you could hear a roaring noise."

It began at around 8:15 p.m. and within a few minutes Earl Pratt's barn was destroyed, much of it scattered into a neighboring field, a field of oats was flattened, a grainery was ruined, Lloyd Parsons' travel trailer was upended, his porch roof was hurled 500 yards and numerous trees snapped off or were ripped up by the roots.

The force of the storm was evidenced when a six-foot piece of lumber from the barn was driven a foot and a half into the ground by the wind and left standing alone in the field like a solitary fencepost.

The first thing Parsons thought of when he heard the sound of his porch roof being carried off was that "an airplane had crashed."

Neighbors on the scene agreed it had to be a twister to cause such a large amount of damage so quickly. Parsons said the storm was over in a few seconds. It will take a lot longer to clean up and repair the damage it left in its wake.