

Environment Canada
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VOL 6 ISS 11
CLIMATIC PERSPECTIVES

Climatic Perspectives

A WEEKLY REVIEW OF CANADIAN CLIMATE

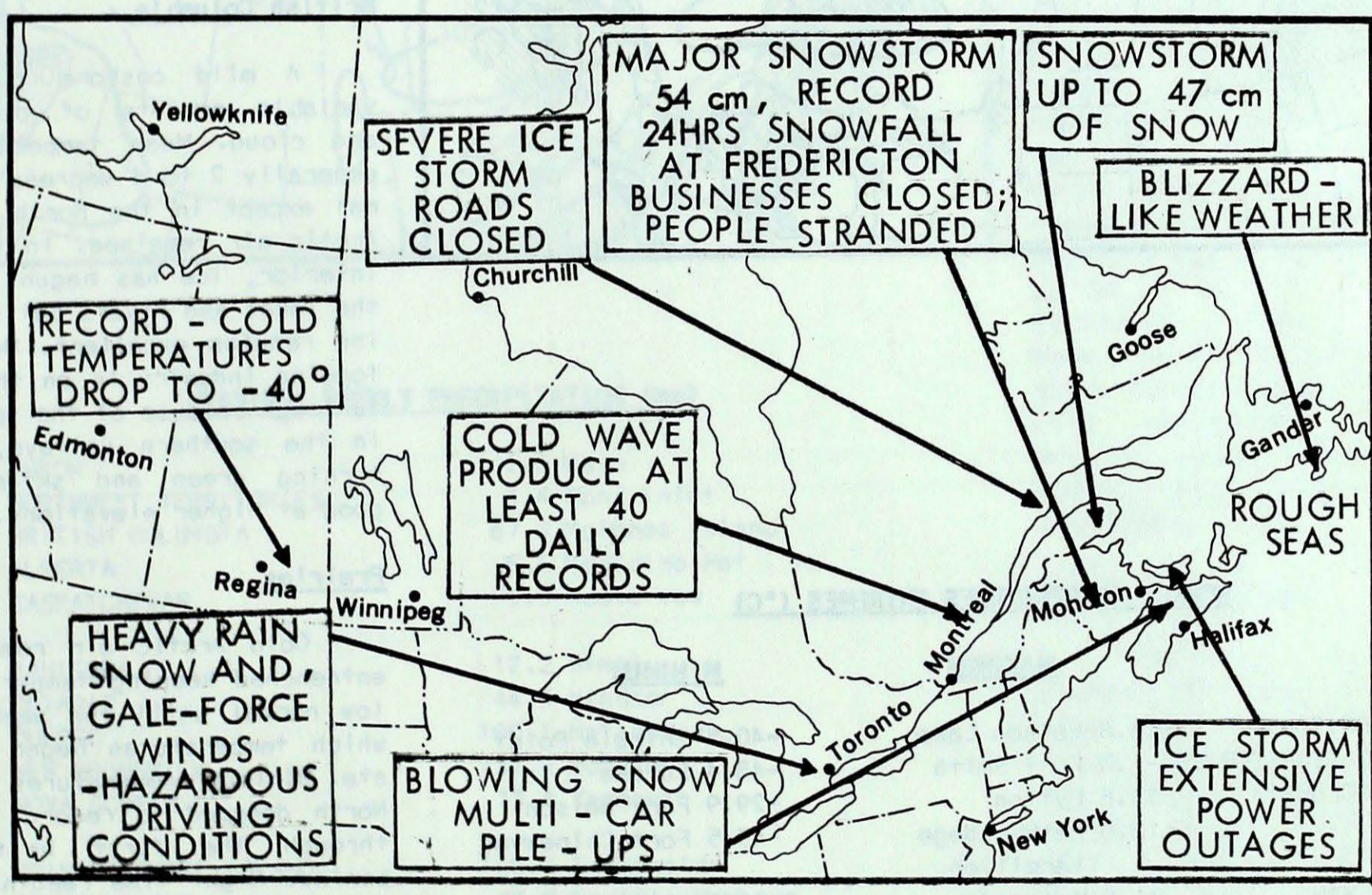
MARCH 23, 1984

(Also available in français)

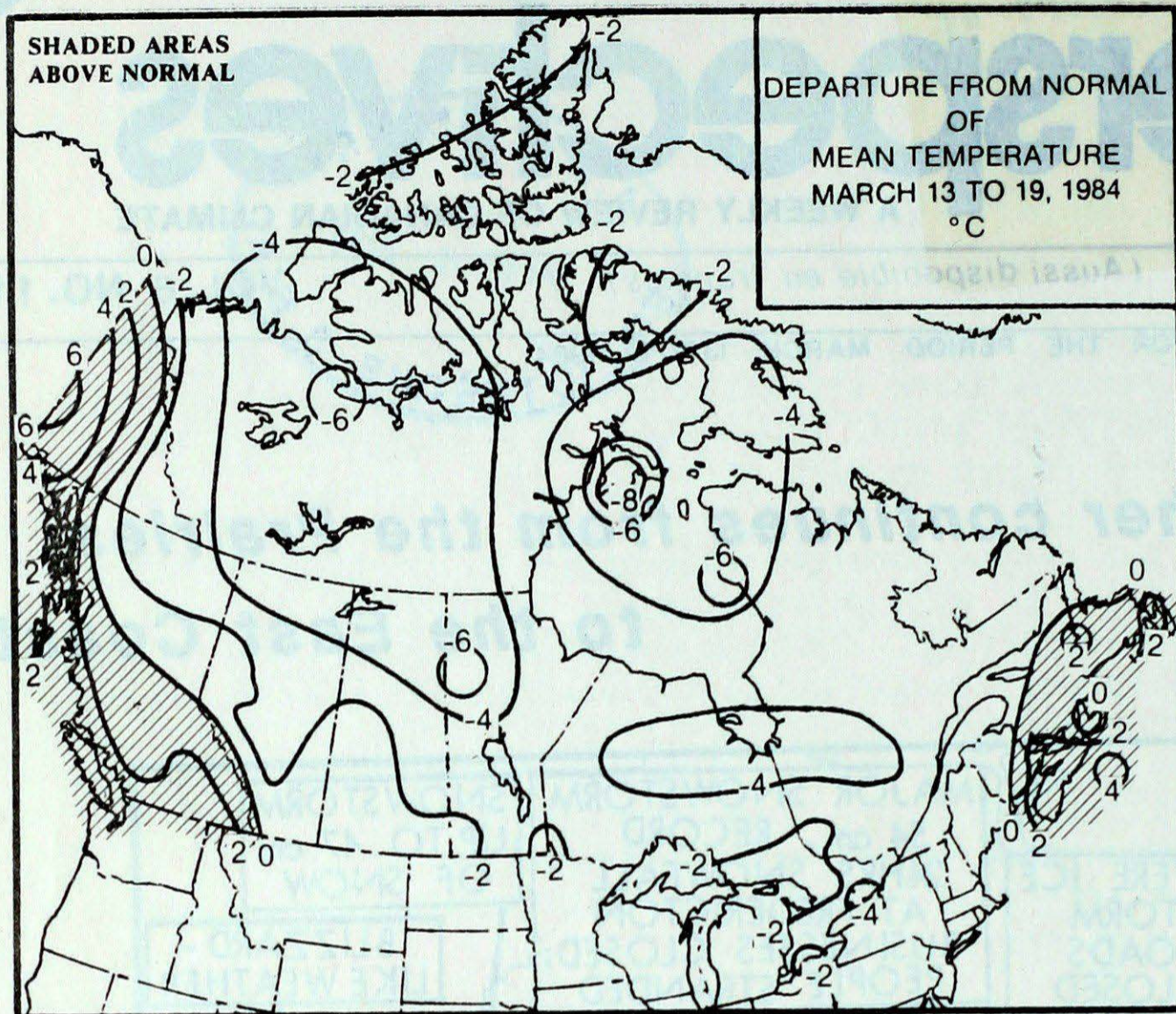
VOL. 6 NO. 11

FOR THE PERIOD MARCH 13 TO 19, 1984

• *Wintry weather continues from the Prairies to the East Coast*



- However, British Columbia enjoys spring
- *Summary of the '83-84 winter in Quebec*

**ACROSS THE COUNTRY...****Yukon and Northwest Territories**

After several weeks of balmy weather, the temperatures turned colder in the Yukon as frigid Arctic air swept westward from the Northwest Territories. However, the southwestern Yukon still averaged 5° above normal; on March 19, the readings climbed to 7° at Watson Lake. Most of the North received a fair amount of sunshine as the daylight hours became longer. Snowfall amounts were light, almost all stations received less than 10 mm of precipitation.

British Columbia

A mild onshore flow brought variable amounts of precipitation and cloud. Mean temperatures were generally 2 to 4 degrees above normal except in the North where cold Arctic air remained. In the central interior, ice has begun to melt on the lakes and rivers but spring skiing remains excellent. Most of the logging industry is on their annual furlough because of the spring thaw. In the southern valleys, grass is turning green and skiing remains good at higher elevations.

Prairies

Cold Arctic air remained well entrenched keeping temperatures below normal until the weekend after which temperatures began to moderate. Minimum temperatures across the North dropped to record low values through the first half of the period. Night time readings hovered between -30 and -45 degrees in the North and -25 to -30 degrees in central Districts. Skies were generally cloudy in the west but sunshine was more prevalent in the east. Snowfalls were less than 10 cm but heavier amounts fell in southern Manitoba.

Ontario

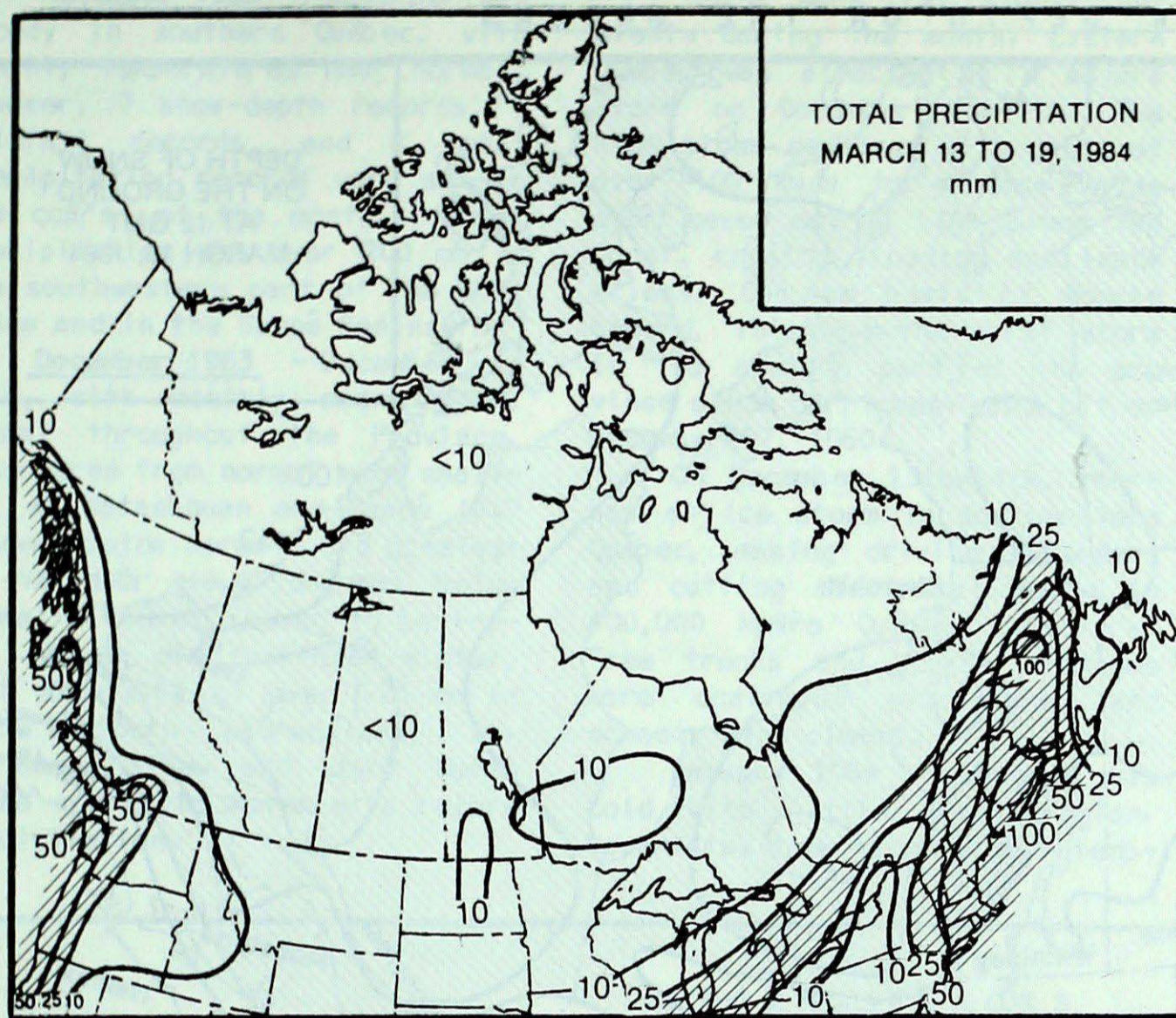
Gale-force winds, heavy rain and snow created yet another day of hazardous weather across the Province on March 16. Southwestern Ontario received the heaviest precipitation as 35.5 mm fell at Windsor

WEEKLY TEMPERATURES EXTREMES (°C)

	<u>MAXIMUM</u>	<u>MINIMUM</u>
YUKON TERRITORY	6.8 Watson Lake	-40.5 Shingle Point
NORTHWEST TERRITORIES	-1.0 Fort Smith	-48.4 Eureka
BRITISH COLUMBIA	15.6 Lytton	-29.9 Fort Nelson
ALBERTA	13.0 Lethbridge Vermilion	-43.5 Fort Chipewyan
SASKATCHEWAN	11.8 Moose Jaw	-45.0 Cree Lake
MANITOBA	3.0 Brandon	-42.8 Lynn Lake
ONTARIO	7.5 Britt	-39.9 Coburg
QUÉBEC	15.2 Sherbrooke	-38.9 Nitchequon
NEW BRUNSWICK	13.5 Moncton	-23.0 Chatham
NOVA SCOTIA	17.2 Greenwood	-20.4 Truro
PRINCE EDWARD ISLAND	13.8 Charlottetown	-19.0 Charlottetown
NEWFOUNDLAND	14.4 Deer Lake	-34.8 Wabush Lake

ACROSS THE NATION

Warmest mean temperature	8.5	Vancouver, BC
Coollest mean temperature	-37.4	Eureka, NWT



HEAVIEST WEEKLY PRECIPITATION (mm)

YUKON	2.8 Mayo
NORTHWEST TERRITORIES	4.4 Pond Inlet
BRITISH COLUMBIA	67.4 McInnes Island
ALBERTA	6.6 Medicine Hat
SASKATCHEWAN	5.9 Moose Jaw
MANITOBA	12.2 Gimli
ONTARIO	44.3 Windsor
QUÉBEC	100.1 Natashquan
NEW BRUNSWICK	131.9 Moncton
NOVA SCOTIA	73.4 Yarmouth
PRINCE EDWARD ISLAND	100.3 Summerside
NEWFOUNDLAND	43.8 Daniels Harbour

Historically this Week

March 13, 1968 A meteorological automatic reporting stations (MARS) was installed at Gonzales Observatory, Victoria, B.C. - the first such permanent installation in Canada. The unit automatically measures temperature, dew point temperature, wind and precipitation, and transmits the data to a meteorological teletype circuit every 15 minutes.

March 14 - 16, 1902 A severe blizzard swept the eastern provinces. The temperature at Winnipeg was near 10° on the 13th but, during the 14th-16th blizzard, 28 cm of snow fell, wind speeds exceeded 95 km/h for many hours and the temperature fell to -24° by the morning of the 16th.

during the storm. Afterwards, a vigorous cold front passage brought plummeting temperatures to the South. As a result, rain turned to wind-driven snow and wet roads transformed into virtual skating rinks.

Otherwise, the weather was dry but cold as winter maintained its icy grip on the Province. Depth of snow on the ground ranged from 88 cm at Pickle Lake to zero at London.

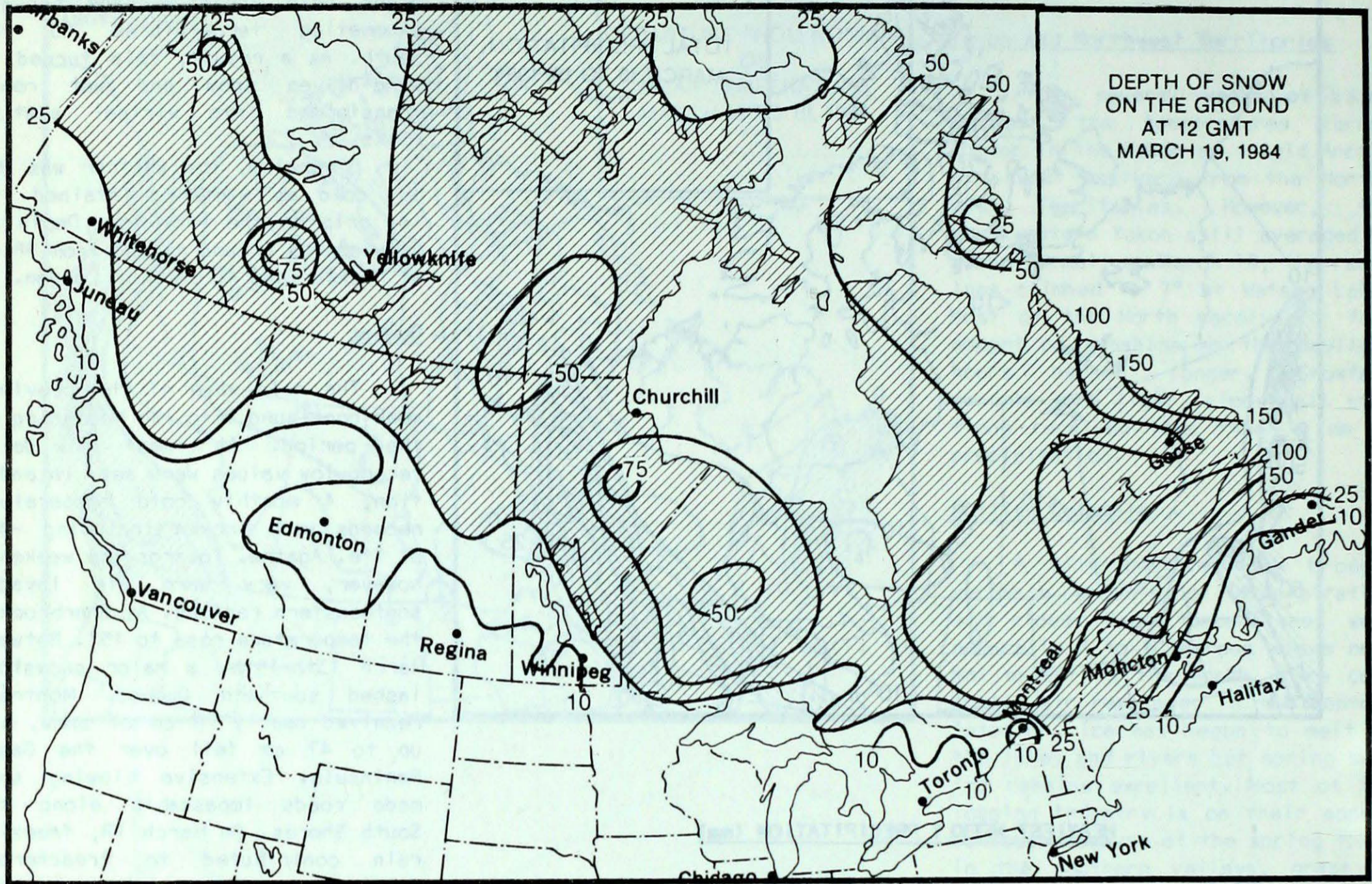
Québec

The cold wave of the previous week continued into the beginning of the period. At least 40 daily record-low values were set. In addition, 4 monthly cold temperature records were broken including -30° at Ste. Agathe. Towards the weekend, however, very warm air invaded southeastern regions. At Sherbrooke, the temperature rose to 15°. Between March 13th-15th, a major snowstorm lashed southern Québec. Montréal received nearly 10 cm of snow, but up to 47 cm fell over the Gaspé Peninsula. Extensive blowing snow made roads impassable along the South Shores. On March 18, freezing rain contributed to treacherous driving conditions in southern Québec; many highways were closed near Québec City.

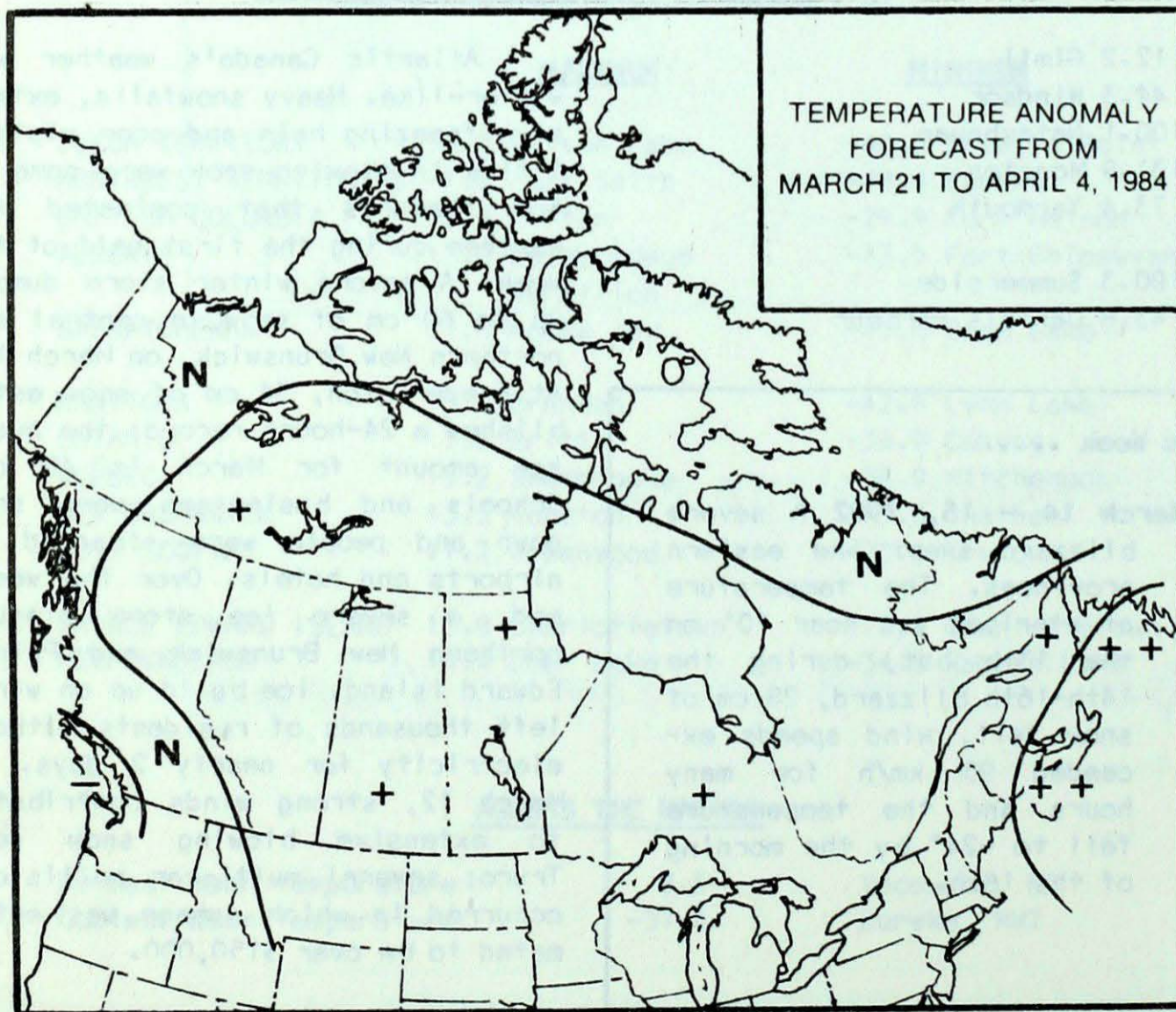
Atlantic Provinces

Atlantic Canada's weather was winter-like. Heavy snowfalls, extensive freezing rain and poor visibilities in blowing snow were some of the features that dominated the weather during the first half of the week. A severe winter storm dumped up to 60 cm of snow in central and northern New Brunswick, on March 14. At Fredericton, 54 cm of snow established a 24-hours record; the average amount for March is 49 cm. Schools and businesses were shut down and people were stranded at airports and hotels. Over the weekend, a severe ice storm plagued northern New Brunswick and Prince Edward Island. Ice build up on wires left thousands of residents without electricity for nearly 2 days. On March 12, strong winds contributed to extensive blowing snow near Truro; several multi-car collisions occurred in which damage was estimated to be over \$150,000.

SNOW DEPTH ON THE GROUND



TEMPERATURE ANOMALY FORECAST



Temperature Anomaly Forecast

The temperature anomaly forecast, for each of the 70 Canadian stations, is prepared by searching historical weather maps to find cases similar to the present one. The principle used is that a prediction for the next 15 days may be based on what is known to have actually happened during 15-day periods. After the five best cases are selected, the surface temperature anomalies are calculated. This results in five separate forecasts, which are averaged to provide the forecast depicted.

- ++ much above normal
- + above normal
- N normal
- below normal
- much below normal

Québec Weather Review - Winter 1983-84

November 1983 - November was cloudy in southern Québec, with monthly temperatures near normal; however, 7 snow-depth records, 5 rainfall records, and 8 total precipitation records were set in the course of the month. Total precipitation was over 200 mm in the southwestern part of the Province and in the Gaspé Peninsula.

December 1983 - December was cold, with monthly means below normal throughout the Province. Departures from normal were smallest at Natashquan and Gaspé (0.7 degrees below normal) and greatest at Val-d'Or (3.6 degrees below normal). Québec seemed to be trying for an old fashioned winter, with snowfalls of over 125 cm in the southern Laurentians, St. Lawrence Valley and Lower North Shore adding to November's record precipitation.

There were two significant events during the month. Eastern Québec was affected by a severe storm on December 6th-7th. The high tides combined with gusts of over 100 km/h to produce waves over seven metres high along the Coast, causing flooding and landslides. On the basis of damage caused, this was the worst storm in the eastern part of the province since Hurricane Donna hit on December 17, 1960.

On December 13th-14th, there was an ice storm in southwestern Québec, making driving hazardous and cutting electrical power to 400,000 Hydro Québec customers. Tree trunks and broken branches were scattered everywhere, and schools were closed.

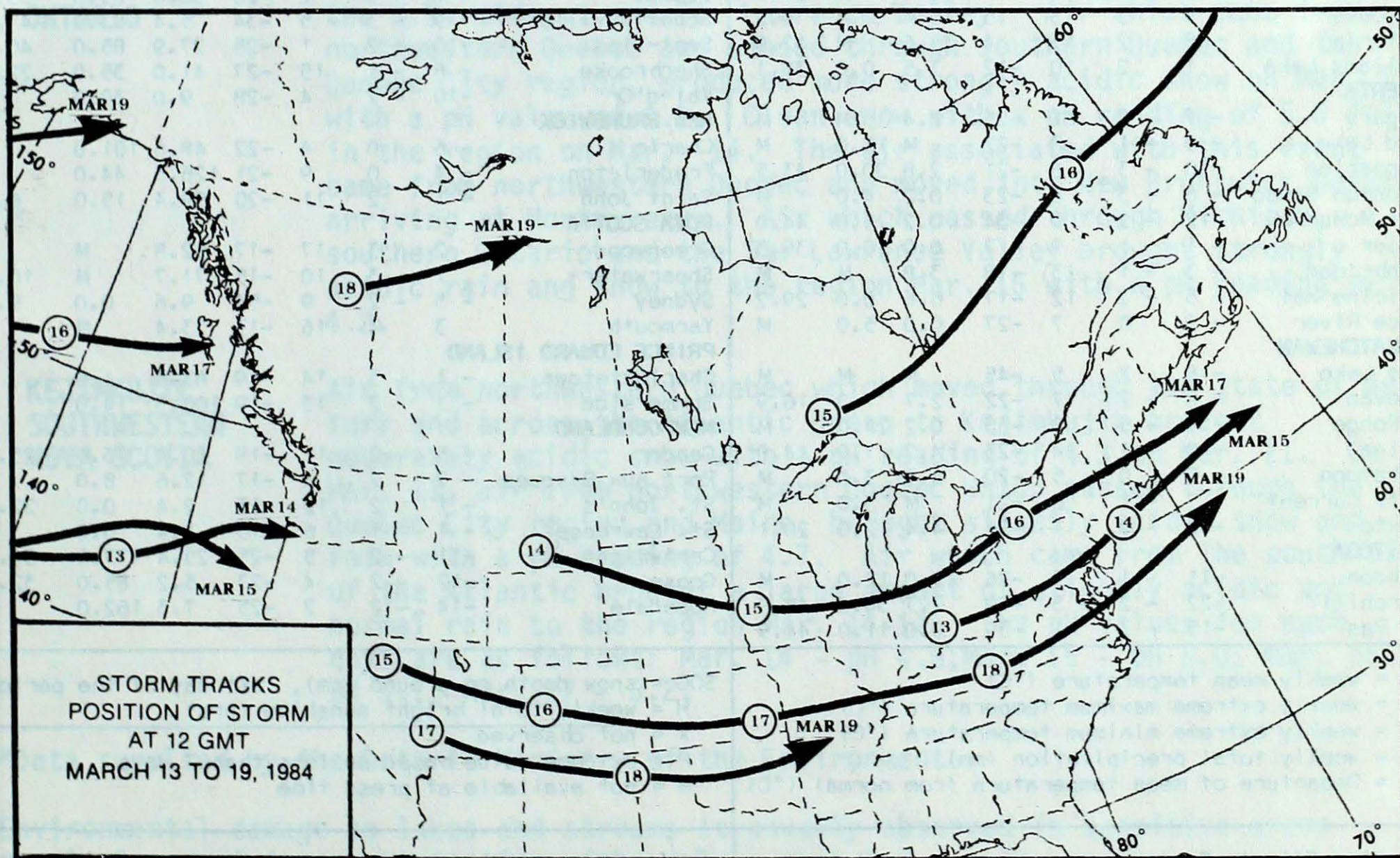
January 1984 - January was cold with little precipitation. Departures from monthly mean temp-

eratures were smallest at Sherbrooke (0.8 degrees below normal) and greatest over central Québec (over 5 degrees below normal). Except for the shores of Hudson's Bay, total precipitation was under 75 per cent of normal. Generally, snowfall in the south was only 25 to 50 cm.

February 1984 - February saw a mild spell beginning around the 10th, recalling the weather experienced in southern Québec in February 1981. There was little precipitation except on the 14th and 15th, when 20 to 30 cm fell. On the seven days between the 12th and the 18th, no fewer than 90 daily temperature records were broken at 21 stations, and two monthly maximum records were set.

Québec Region
Climatology

STORM TRACKS



TEMPERATURE, PRECIPITATION AND BRIGHT SUNSHINE DATA FOR THE WEEK ENDING 0600 GMT MARCH 20, 1984

STATION	TEMP				PRECIP		SUN	STATION	TEMP				PRECIP		SUN
	Av	Dp	Mx	Mn	Ip	SOG	H		Av	Dp	Mx	Mn	Ip	SOG	H
YUKON TERRITORY								Thompson	-19	-6	1	-42	1.2	26.0	35.0
Dawson	-8	7	0	-21	0.6	41.0	M	Winnipeg	-11	-2	1	-27	7.1	M	34.2
Mayo A	-8	4	-1	-19	2.8	35.0	M	ONTARIO							
Watson Lake	-14	-3	7	-29	1.6	42.0	34.1	Big Trout Lake	-18	-4	1	-37	0.8	62.0	M
Whitehorse	-3	5	6	-14	1.9	17.0	M	Earlton	-9	-2	5	-25	M	21.0	M
NORTHWEST TERRITORIES								Kapusking	-12	-3	6	-32	5.0	11.0	M
Fort Smith	-19	-4	-1	-41	2.4	39.0	M	Kenora	-9	-2	3	-24	10.4	27.0	M
Inuvik	-28	-3	-19	-41	M	60.0	M	London	-3	-2	7	-11	36.6	0.0	10.5
Norman Wells	-23	-3	-15	-32	1.2	18.0	53.9	Moosonee	-17	-5	3	-38	3.4	28.0	51.2
Yellowknife	-24	-5	-9	-42	4.2	19.0	43.1	Muskoka	-4	-1	7	-17	M	10.0	M
Baker Lake	-30	-4	-15	-41	M	52.0	31.1	North Bay	-7	-2	6	-22	24.8	17.0	30.0
Cape Dyer	-27	-3	-16	-38	4.3	46.0	M	Ottawa	-7	-3	2	-20	10.4	37.0	23.4
Clyde	-28	-2	-19	-35	3.8	84.0	31.8	Pickle Lake	-15	-4	5	-37	12.2	88.0	M
Frobisher Bay	-29	-5	-18	-38	0.0	19.0	55.3	Red Lake	-13	-4	4	-35	13.9	45.0	41.9
Alert	-33	0	-26	-42	0.8	15.0	11.8	Sudbury	-8	-2	7	-23	10.4	5.0	30.9
Eureka	-37	-2	-29	-48	0.0	15.0	M	Thunder Bay	-9	-3	3	-21	8.4	11.0	28.7
Hall Beach	-32	-1	-25	-39	M	25.0	M	Timmins	-11	-3	5	-28	3.4	48.0	M
Resolute	-33	-2	-26	-39	1.6	26.0	19.4	Toronto	-4	-3	3	-14	25.5	6.0	M
Cambridge Bay	-35	-6	-28	-41	0.2	28.0	46.4	Trenton	-5	-4	3	-15	13.6	3.0	M
Mould Bay	-33	-1	-26	-38	M	26.0	M	Warton	-5	-2	5	-14	37.4	5.0	20.6
Sachs Harbour	-33	-5	-26	-38	0.0	10.0	M	Windsor	-2	-3	7	-8	44.3	1.0	M
BRITISH COLUMBIA								QUEBEC							
Cape St. James	7	2	11	5	29.1	M	29.1	Bagotville	-12	-5	1	-31	16.2	69.0	M
Cranbrook	4	2	12	-2	2.8	M	21.2	Blanc-Sablon	-15	-9	5	-27	24.0	121.0	M
Fort Nelson	-14	-4	9	-30	1.0	36.0	39.6	Inukjuak	-27	-7	-10	-37	M	38.0	46.3
Fort St. John	-8	-1	8	-26	0.0	0.0	M	Kuujuuaq	-21	-3	-12	-32	4.0	57.0	36.3
Kamloops	7	4	15	-1	5.2	M	M	Kuujuuarapik	-19	-3	-1	-38	7.2	32.0	42.3
Penticton	6	3	14	0	14.0	M	M	Maniwaki	-8	-2	4	-24	26.2	26.0	31.9
Port Hardy	7	3	12	-1	31.0	M	27.9	Mont-Joli	-9	-3	-1	-21	25.8	34.0	M
Prince George	-1	1	12	-14	2.5	M	31.7	Montréal	-6	-4	2	-19	16.7	5.0	19.1
Prince Rupert	5	2	10	-3	47.7	M	21.6	Natashquan	-8	-1	3	-25	100.1	74.0	M
Revelstoke	5	3	10	1	8.8	0.0	13.1	Nitchequon	-19	-4	-3	-39	4.8	43.0	M
Smithers	1	2	10	-7	3.4	M	25.9	Québec	-8	-3	2	-26	38.0	85.0	33.3
Vancouver	9	3	13	5	15.4	M	9.2	Schefferville	-19	-3	-5	-34	5.4	83.0	47.3
Victoria	8	2	13	4	27.6	M	12.9	Sept-Îles	-10	-2	1	-25	27.9	85.0	40.0
Williams Lake	1	2	10	-12	1.5	0.0	39.1	Sherbrooke	-6	-1	15	-27	41.0	35.0	22.2
ALBERTA								Val-d'Or	-10	-2	4	-28	9.0	39.0	M
Calgary	-7	-2	11	-25	2.4	M	M	NEW BRUNSWICK							
Cold Lake	-9	-1	8	-22	M	15.0	M	Charlo	-6	0	4	-22	48.6	101.0	M
Coronation	-10	-3	6	-21	2.8	20.0	43.5	Fredericton	-4	0	9	-21	126.5	44.0	M
Edmonton Namao	-8	-3	8	-23	0.2	4.0	M	Saint John	-1	2	11	-20	99.4	15.0	6.0
Fort McMurray	-12	-2	9	-34	0.2	5.0	44.0	NOVA SCOTIA							
Jasper	-1	1	9	-17	0.0	0.0	39.3	Greenwood	2	3	17	-17	52.8	M	M
Lethbridge	-3	-1	13	-18	3.8	M	M	Shearwater	1	3	10	-15	71.7	M	10.6
Medicine Hat	-5	-2	12	-17	6.6	0.0	29.2	Sydney	-5	-2	9	-54	9.6	0.0	9.6
Peace River	-9	0	7	-27	0.0	5.0	M	Yarmouth	3	4	16	-13	73.4	M	M
SASKATCHEWAN								PRINCE EDWARD ISLAND							
Cree Lake	-18	X	5	-45	M	M	M	Charlottetown	-1	3	14	-19	63.5	1.0	M
Estevan	-8	-2	7	-22	2.7	7.0	16.9	Summerside	-1	2	13	-19	100.3	14.0	M
La Ronge	-13	-5	9	-33	0.2	27.0	M	NEWFOUNDLAND							
Regina	-10	-1	4	-23	4.2	7.0	14.8	Gander	-5	0	11	-19	10.4	16.0	25.0
Saskatoon	-9	0	5	-20	4.2	3.0	M	Port aux Basques	-2	2	4	-17	12.6	8.0	M
Swift Current	-7	-1	8	-21	M	3.0	M	St. John's	-1	2	12	-13	2.4	0.0	22.6
Yorkton	-12	-2	1	-26	4.4	12.0	20.1	St. Lawrence	-1	1	6	-15	1.4	0.0	M
MANITOBA								Cartwright	-11	-2	5	-25	25.4	177.0	34.6
Brandon	-11	-1	3	-26	12.0	12.0	M	Goose	-12	-2	4	-27	5.2	85.0	32.8
Churchill	-22	-2	-3	-39	2.7	34.0	45.9	Hopedale	-14	-2	2	-25	7.3	162.0	M
The Pas	-15	-3	1	-39	0.0	11.0	44.9								

Av = weekly mean temperature (°C)
 Mx = weekly extreme maximum temperature (°C)
 Mn = weekly extreme minimum temperature (°C)
 Tp = weekly total precipitation (mm)
 Dp = Departure of mean temperature from normal (°C)

SOG = snow depth on ground (cm), last day of the period
 H = weekly total bright sunshine (hrs)
 X = not observed
 P = extreme value based on less than 7 days
 M = not available at press time

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ACID RAIN REPORT ISSUED BY ENVIRONMENT CANADA FOR MAR. 11-17, 1984

**LONGWOODS
NEAR LONDON
ONTARIO**

Longwoods received normal snow on Mar. 13 with a pH reading of 6.0. This snow was produced in air which came from the south and passed over North Carolina, West Virginia and Ohio. On the next day Mar. 14 the region received strongly acidic rain which had a pH value of 3.4 and was produced in air which had passed over Wisconsin, Michigan and Ohio. Air from the U.S. midwest brought strongly acidic rain to Longwoods on Mar. 15 with a pH reading of 4.0.

**DORSET *
MUSKOKA
ONTARIO**

Air from the U.S. midwest and southern Ontario brought strongly acidic rain to Dorset on Mar. 15 and 16 with pH readings of 4.0 and 4.1 respectively.

**CHALK RIVER
OTTAWA VALLEY
ONTARIO**

Air which passed through Wisconsin, Michigan, Pennsylvania and New York brought strongly acidic snow to Chalk River on Mar. 13 with a pH reading of 3.5. On Mar. 15 the region received strongly acidic rain with a pH reading of 3.3. This rain was associated with air which had passed through the U.S. midwest, Ohio, Pennsylvania and New York. On the next day Mar. 16 air from the U.S. midwest and southern Ontario produced slightly acidic snow and rain with a pH reading of 4.7.

**MONTMORENCY
QUEBEC CITY
ONTARIO**

Montmorency received strongly acidic snow Mar. 11 with a pH reading of 3.9. This snow was produced in air which passed over the U.S. midwest and St. Lawrence Valley. Air which came from northwestern Quebec and passed through southern Quebec and the Quebec City region, produced more strongly acidic snow on Mar. 13 with a pH value of 4.1. Clean snow with a pH reading of 5.6 fell in the region on Mar. 14. The air associated with this event came from northwestern Quebec and moved into New Brunswick before arriving at Montmorency. Air which passed through Michigan, southern Ontario and the St. Lawrence Valley brought strongly acidic rain and snow to the region Mar. 16 with a pH reading of 4.2.

**KEJIMKUIK
SOUTHWESTERN
NOVA SCOTIA**

Air from northwestern Quebec which moved through the state of New York and across the Atlantic Ocean to Kejimkujik brought moderately acidic snow with a pH reading of 4.3 on Mar. 11. On Mar. 13, air from northwestern Quebec which passed through the Quebec City region and Maine, brought slightly acidic snow and rain with a pH reading of 4.7. Air which came from the south off of the Atlantic brought a large amount of slightly acidic and normal rain to the region Mar. 14-17. The pH values for each day are as follows: Mar. 14 - pH 4.8; Mar. 15 - pH 5.0; Mar. 16 - pH 5.1; Mar. 17 - 5.2.

*Data supplied by the Ontario Ministry of the Environment.

Environmental damage to lakes and streams is usually observed in sensitive areas regularly receiving precipitation with pH less than 4.7.

This report was prepared by the Federal Long Range Transport of Air Pollutants (LRTAP) Liaison Office. For further information, please contact Dr. H. C. Martin at (416)667-4803.