

# Climatic Perspectives

MONTHLY SUPPLEMENT INCLUDED

December 11 to 17, 1989

A weekly review of Canadian climate

Vol. 11 No. 51

## Bitter cold grips centre of Canada



While the western third of the country has enjoyed unusually mild weather for a number of weeks, bitterly-cold Arctic air continues to sweep southeastwards, dropping temperatures to record-low values.

### The Seaway

Attempts to keep the St. Lawrence portion open past the December 19 closing date are continuing, although the worst ice conditions in at least 20 years are being experienced. Fifteen down-bound ships still have to clear the St-Lambert Lock. Near Montréal, brash ice, sometimes a metre thick, has slowed ships to a crawl, and two ice-breakers have been called in. The Welland Canal has started to freeze, and there is plenty of ice. Problems are expected if the mercury drops any further.

### St. Lawrence Freeze-up

In the Gulf, ice growth has been accelerated by the very cold weather of the past few weeks. Ice-breakers are assisting in a number of areas. In the River between Montréal and Québec, some of the worst ice conditions since the early 70's are being experienced. Conditions are more reminiscent of a severe winter in mid-January. Ice-breakers are needed to break up ice-jams and get the ships through.

### Southern Prairies

A good portion of the snow that covered the southern agricultural districts a few weeks ago has gradually been lost. Farmers are worried that a lack of fresh snow will further deplete the much-needed soil moisture necessary for spring planting.

### Good Skiing

Some of the best early-season skiing conditions in recent years are being experienced in Ontario, Quebec and the mountain ski areas of Alberta, while in B.C., abnormally-mild weather has resulted in a lack of snow at lower elevations.

### Happy Holidays

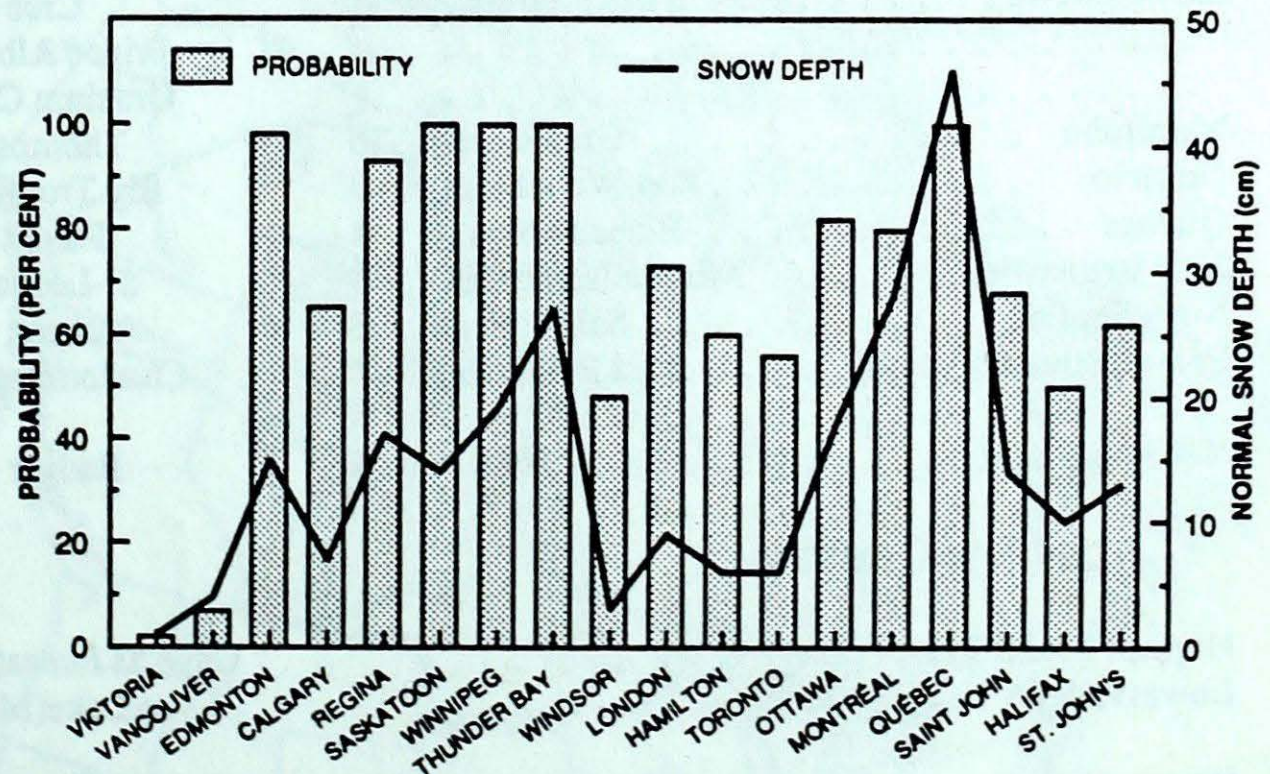
We would like to take this opportunity to wish all of our readers a Merry Christmas and a Happy New Year. As usual, *Climatic Perspectives* will not be published during the Christmas - New Year Holidays. All maps and tables for this period will appear in January 1990.

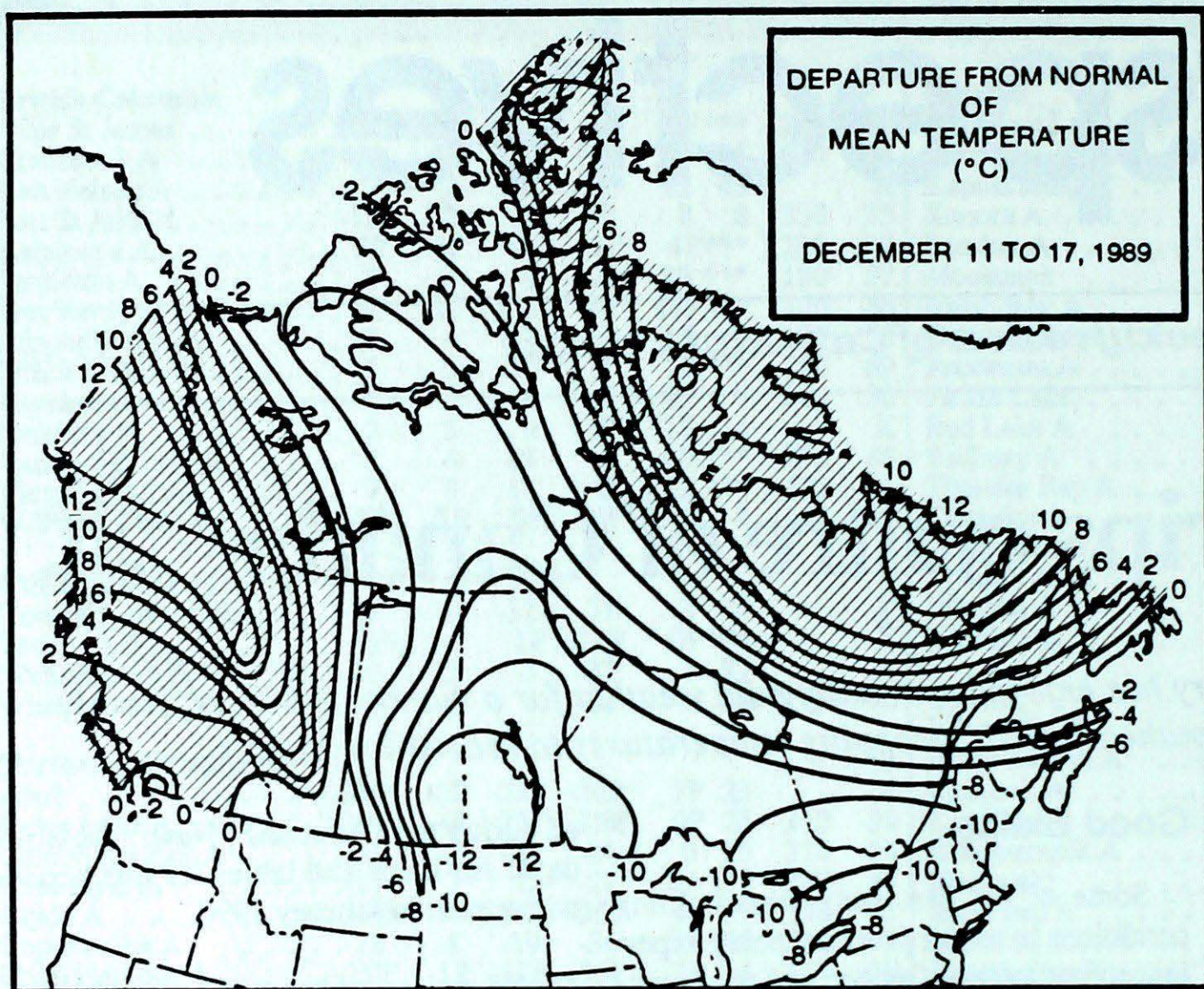
ed during the Christmas - New Year Holidays. All maps and tables for this period will appear in January 1990.

### Cold to continue in east...

For the week of December 25, above-normal temperatures are anticipated across the Yukon, the western half of the District of Mackenzie, British Columbia, Alberta, Saskatchewan, southern Manitoba and southern Ontario. Elsewhere, below-normal temperatures are expected to continue. The coldest readings are expected over the northeast.

PROBABILITY OF A WHITE CHRISTMAS AND NORMAL SNOW DEPTH AT YEAR'S END





**Weekly normal temperatures (°C)**

	max.	min.
Whitehorse A	-11.9	-20.1
Iqaluit A	-19.0	-26.9
Yellowknife A	-19.5	-27.5
Vancouver Int'l A	6.9	1.4
Victoria Int'l A	7.5	1.5
Calgary Int'l A	-0.7	-13.1
Edmonton Int'l A	-6.9	-18.5
Regina A	-7.4	-18.0
Saskatoon A	-8.9	-19.0
Winnipeg Int'l A	-9.5	-18.8
Ottawa Int'l A	-3.6	-11.6
Toronto Int'l A	0.4	-7.2
Montréal Int'l A	-2.8	-10.3
Québec A	-5.0	-13.3
Fredericton A	-1.7	-11.1
Saint John A	0.1	-9.0
Halifax (Shearwater)	2.2	-5.5
Charlottetown A	-0.2	-7.6
Goose A	-10.5	-18.6
St John's A	1.6	-4.7

**Weekly temperature and precipitation extremes**

	Maximum temperature (°C)	Minimum temperature (°C)	Heaviest precipitation (mm)
British Columbia	Sandspit A 12	Fort Nelson A -26	Prince Rupert A 20
Yukon Territory	Whitehorse A 8	Shingle Point A -33	Shingle Point A 3
Northwest Territories	Hay River A 0	Fort Reliance -43	Fort Smith A 20
Alberta	Grande Prairie A 8	Fort Chipewyan A -39	Cold Lake A 28
Saskatchewan	Swift Current A -1	Cree Lake -39	Swift Current A 13
		Prince Albert A -39	
		Uranium City A -39	
Manitoba	Gretna (aut) -16	Thompson A -44	Island Lake 2
Ontario	Port Weller (aut) 0	Big Trout Lake -40	Warton A 12
Québec	Blanc Sablon A 4	Parent (aut) -37	Schefferville A 35
New Brunswick	Miscou Island (aut) 0	St-Léonard A -24	Chatham A 21
Nova Scotia	Sable Island 6	Amherst (aut) -18	Yarmouth A 16
Prince Edward Island	East Point (aut) -1	Charlottetown A -17	Charlottetown A 14
			Summerside A 14
Newfoundland	Nain A 6	Badger (aut) -28	Nain A 69

**Across The Country...**

Highest Mean Temperature	Cape St James(BC) 8
Lowest Mean Temperature	Lynn Lake(MAN) -34

CLIMATIC PERSPECTIVES  
VOLUME 11

Managing Editor . . . . . *Alain Caillet*  
Editor-in-charge  
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French version . . . . . *Alain Caillet*  
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ISBN 0225-5707 UDC 551.506.1(71)

Climatic Perspectives is a weekly publication (disponible aussi en français) of the Canadian Climate Centre, Atmospheric Environment Service, 4905 Dufferin St., Downsview, Ontario, Canada M3H 5T4

☎ (416) 739-4438/4436

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

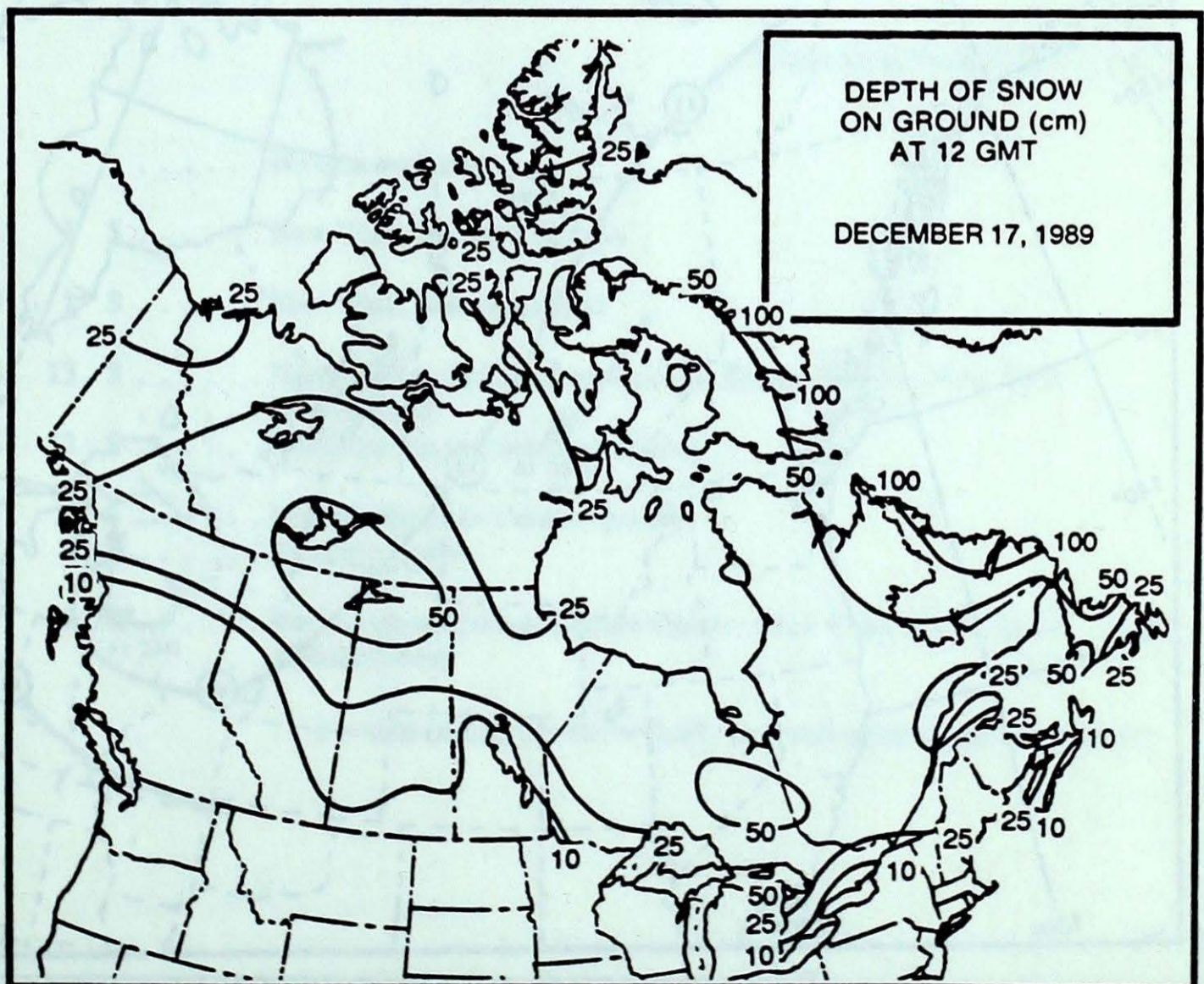
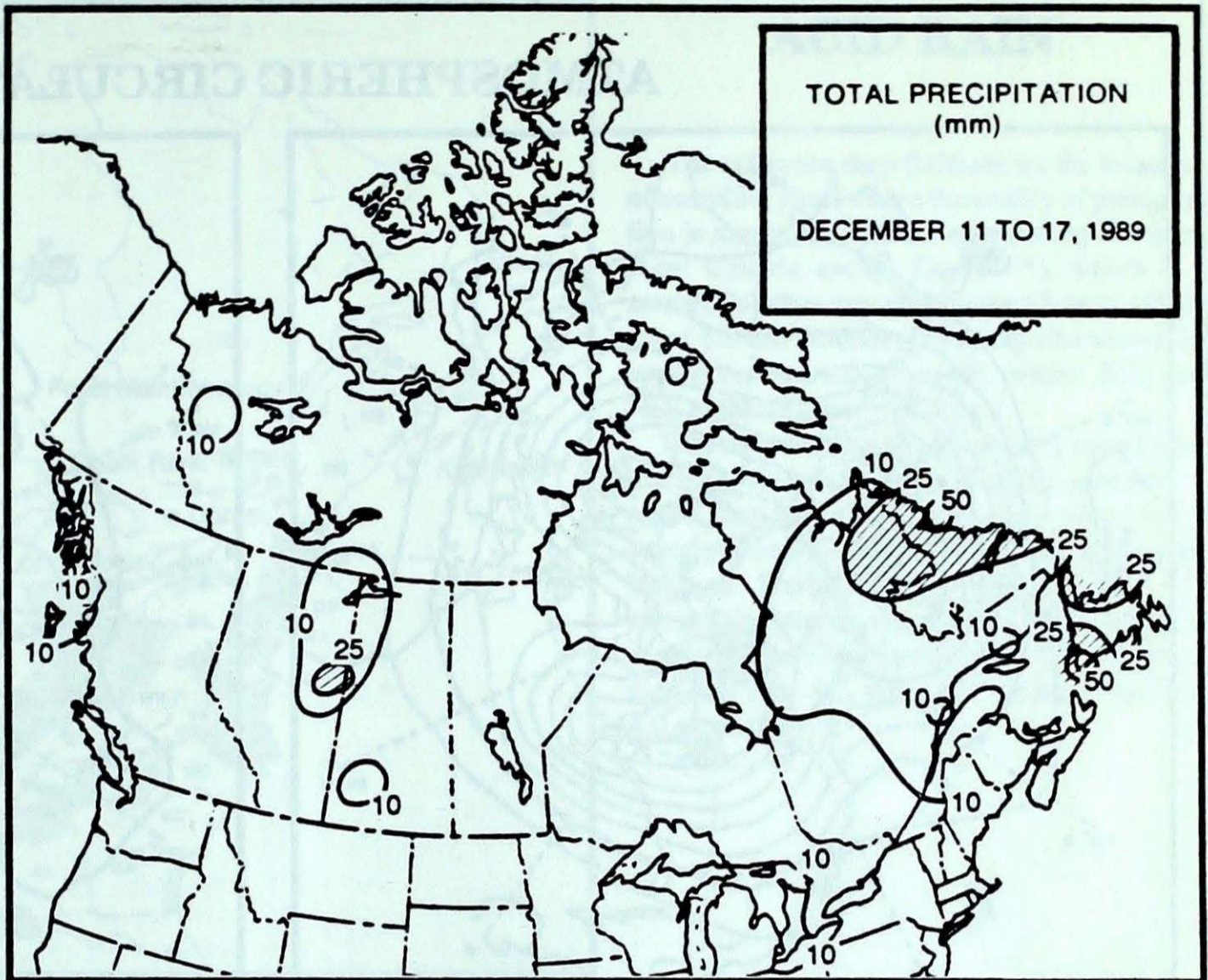
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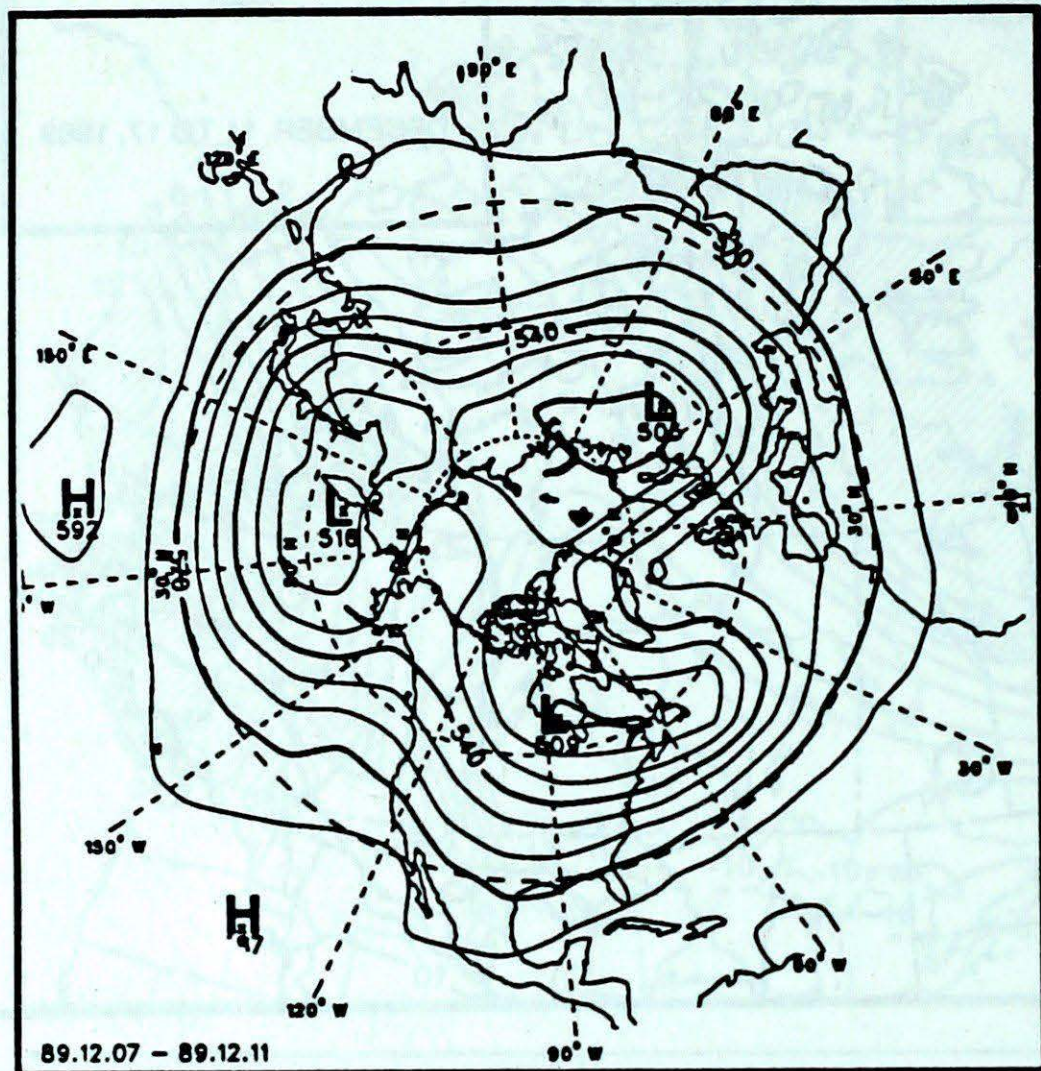
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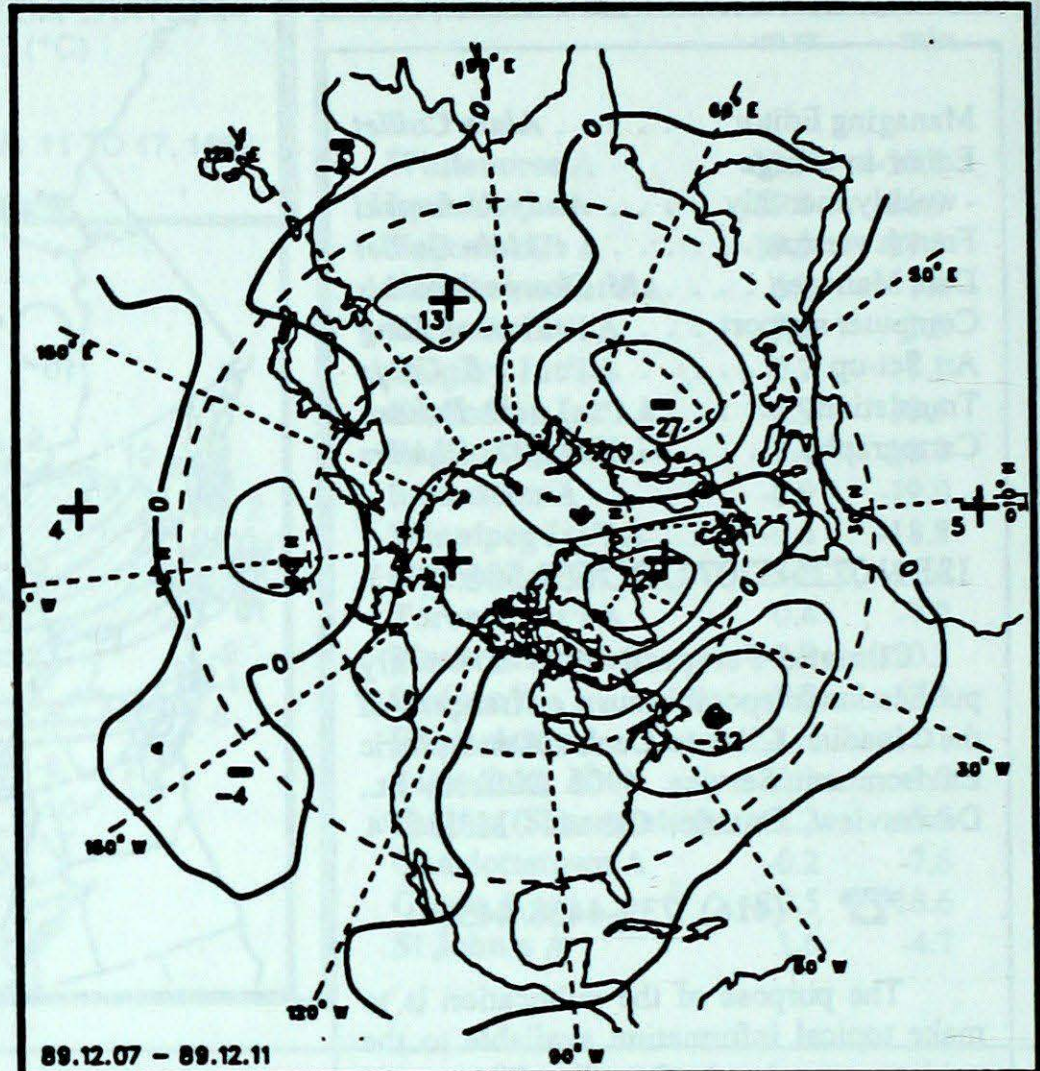
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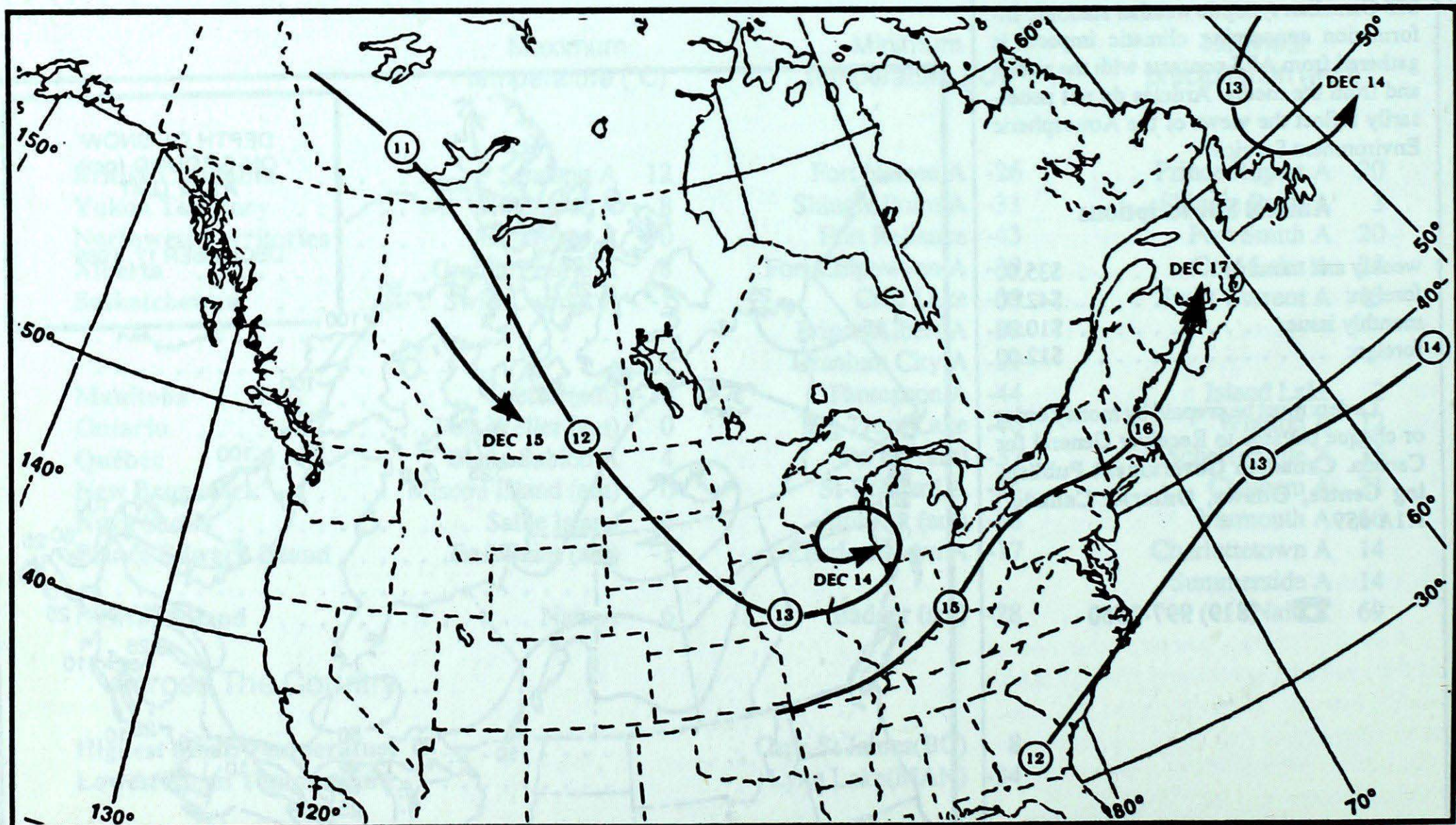
### ATMOSPHERIC CIRCULATION



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



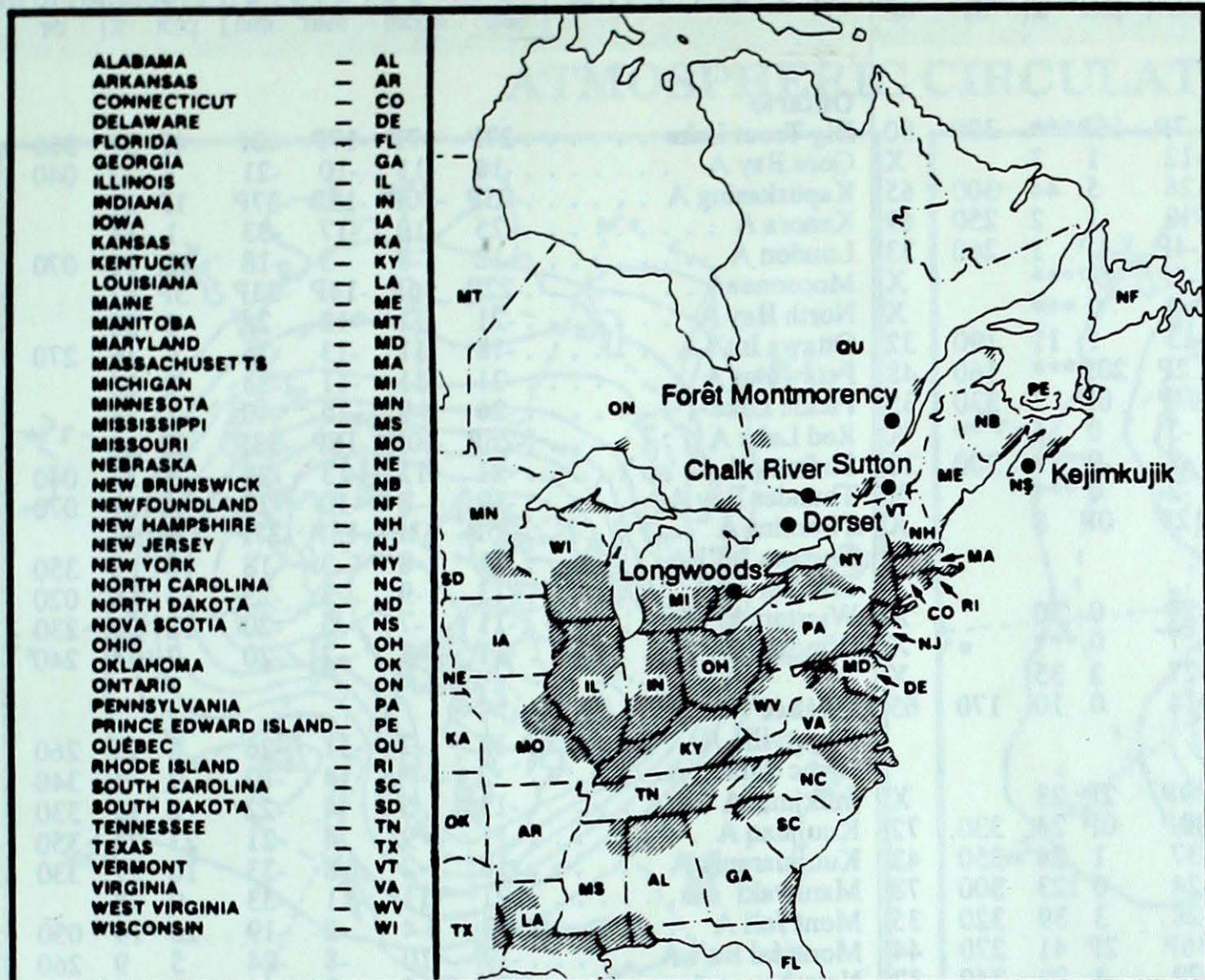
Mean geopotential height anomaly  
50-kPa level (10-decametre intervals)



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

ATMOSPHERIC ENVIRONMENT SERVICE LIBRARY

## 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<sub>2</sub> and NO<sub>x</sub> 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
------	-----	----	--------	------------------

From December 10 to 16, 1989

Longwoods				..... No data available
Dorset *	10	4.1	1 S	..... New York, Southern Ontario
Chalk River	10	3.9	1 S	..... New York, Eastern Ontario
Sutton	15	4.4	13 S	..... Northwestern and Southern Quebec, Eastern Ontario, New York, New England
	16	4.6	12 S	..... Northwestern and Southern Quebec
Montmorency	10	5.1	1 S	..... Northwestern and Central Quebec
	16	4.8	3 S	..... Northern Quebec
Kejimikujik	15	3.7	7 S	..... Northwestern Quebec, Eastern Ontario, New York, New England ..... Atlantic Ocean

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

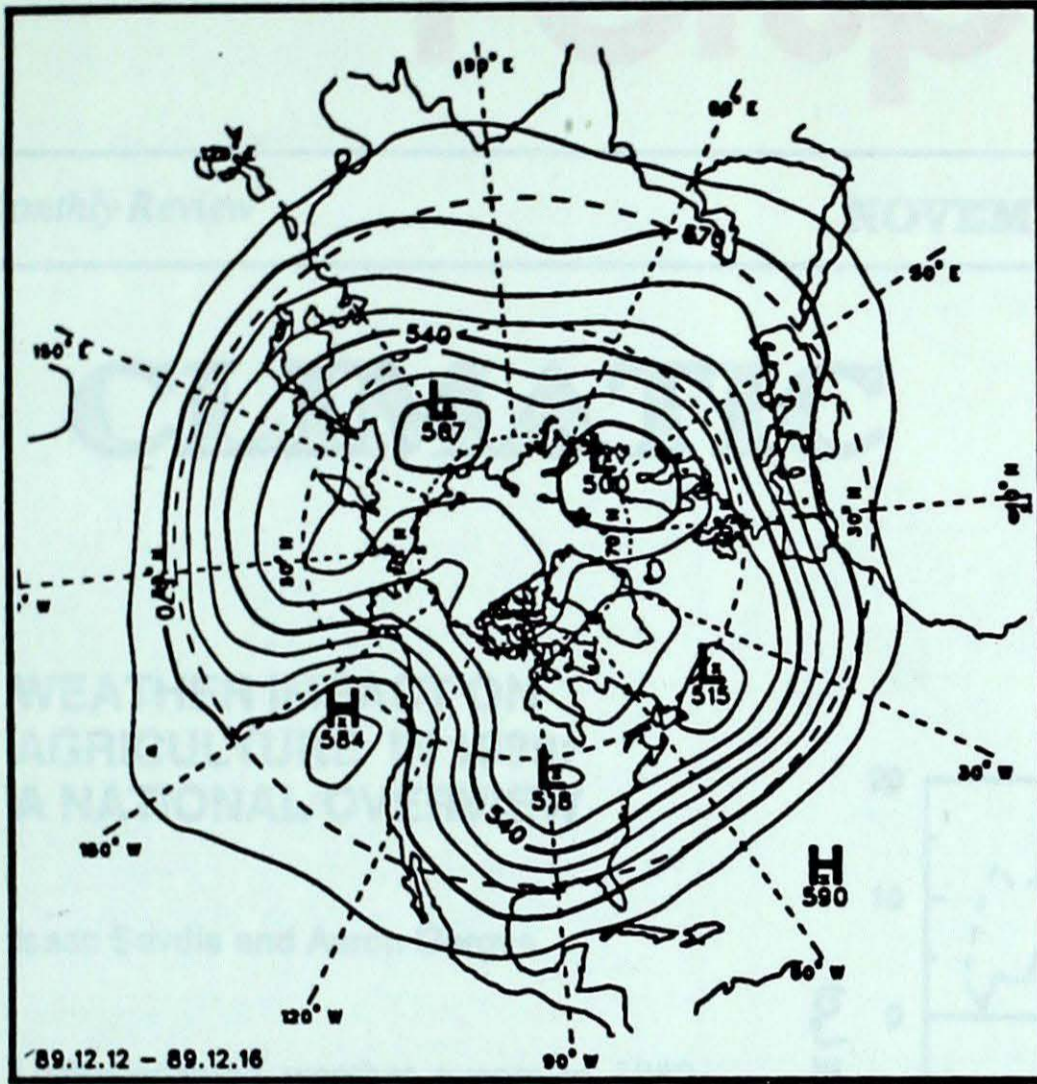
STATION	temperature				precip.		wind max		STATION	temperature				precip.		wind max									
	mean	anom	max	min	ptot	st	dir	vel		mean	anom	max	min	ptot	st	dir	vel								
<b>British Columbia</b>									<b>Ontario</b>																
Cape St James	8P	2P	11P	7P	16P***		300	80	Big Trout Lake	-27P	-7P	-17P	-40P	4P	37	300	32								
Cranbrook A	-6	-2	-2	-12	1	3		X	Gore Bay A	-16	-11	-10	-21	1	22	040	37								
Fort Nelson A	-9	12	10	-26	5	44	300	65	Kapuskasing A	-25P	-10P	-15P	-37P	1P	67		X								
Fort St John A	-5	8	8	-19	1	2	250	69	Kenora A	-25	-10	-17	-33	1	14		X								
Kamloops A	0P	2P	3P	-4P	1P	1	260	33	London A	-12	-8	-3	-18	12	11	070	41								
Penticton A	0P	0P	4P	-7P	0P***			X	Moosonee	-22P	-6P	-14P	-33P	5P	42		X								
Port Hardy A	6	2	8	-1	9	***		X	North Bay A	-21	-11	-12	-28	0	58		X								
Prince George A	-4	4	1	-15	1	11	190	32	Ottawa Int'l A	-18	-11	-13	-25	4	16	270	52								
Prince Rupert A	6P	4P	9P	2P	20P***		160	48	Petawawa A	-21	-11	-11	-33	0	26		X								
Revelstoke A	-2P	1P	2P	-7P	0P	7	330	35	Pickle Lake	-26	-9	-15	-40	1	38		X								
Smithers A	-1	6	2	-5	0	6		X	Red Lake A	-26P	-10P	-16P	-38P	2P	22		X								
Vancouver Int'l A	2	-2	7	-2	0	***	300	30	Sudbury A	-21	-11	-13	-28	1	37	040	35								
Victoria Int'l A	3	-1	9	-2	0	***		X	Thunder Bay A	-19	-8	-10	-28	4	21	070	43								
Williams Lake A	-4P	2P	4P	-12P	0P	8		X	Timmins A	-25P	-11P	-13P	-37P	1P	69		X								
<b>Yukon Territory</b>									<b>Toronto Int'l A</b>																
Komakuk Beach A	-22	2	-15	-28	0	30		X	Trenton A	-13	-9	-3	-23	3	6	020	46								
Teslin (aut)	-6	*	8	-17	0	***		X	Warton A	-11	-7	-5	-20	12	50	230	37								
Watson Lake A	-14	10	6	-27	2	35		X	Windsor A	-11	-8	-2	-20	7	4	240	41								
Whitehorse A	-3	13	8	-14	0	10	170	65	<b>Québec</b>																
<b>Northwest Territories</b>									<b>Bagotville A</b>																
Alert	-30P	1P	-23P	-39P	2P	23		X	Blanc Sablon A	-2	*	4	-12	7	4	340	78								
Baker Lake A	-32P	-4P	-22P	-38P	0P	24	330	72	Inukjuak A	-13	5	-4	-22	2	13	330	48								
Cambridge Bay A	-33	-3	-25	-37	1	24	350	43	Kuujuuaq A	-11	9	-4	-21	23	73	350	43								
Cape Dyer A	-11	10	0	-24	0	123	300	78	Kuujuuarapik A	-18	-2	-8	-33	10	27	330	39								
Clyde A	-20	5	-13	-28	3	39	320	35	Maniwaki	-21	-11	-11	-33	0	28		X								
Coppermine A	-30P	-1P	-20P	-36P	2P	41	270	44	Mont Joli A	-13	-4	-2	-19	20	19	050	59								
Coral Harbour A	-19	8	-9	-29	4	29	340	37	Montréal Int'l A	-17	-10	-8	-24	5	9	260	50								
Eureka	-32	4	-26	-39	0	20	310	67	Natashquan A	-5	6	3	-16	6	31	290	57								
Fort Smith A	-23	-2	-7	-39	20	58	150	56	Québec A	-18	-8	-8	-25	18	56	240	50								
Hall Beach A	-19P	9P	-10P	-27P	1P	33		X	Schefferville A	-13	8	-1	-26	35	69	350	61								
Inuvik A	-25	2	-20	-32	5	30	180	41	Sept-Îles A	-9P	3P	-1P	-20P	13P	15	290	48								
Iqaluit A	-16	7	-1	-25	0	21	340	59	Sherbrooke A	*	*	-32P		4P	53	260	37								
Mould Bay A	-32	-1	-25	-37	1	23	340	50	Val-d'Or A	-25	-11	-16	-32	0	35	320	33								
Norman Wells A	-21	5	-15	-39	11	19	290	41	<b>New Brunswick</b>																
Resolute A	-30	-1	-23	-38	0	28	050	52	Charlo A	-12	-3	-2	-18	11	30	270	59								
Yellowknife A	-26	-3	-10	-41	5	24	330	50	Chatham A	-12	-5	-2	-21	21	59	340	56								
<b>Alberta</b>									<b>Fredericton A</b>																
Calgary Int'l A	-5	2	5	-20	5	3	360	67	Moncton A	-13P	-7P	-3P	-20P	18P	50	240	67								
Cold Lake A	-16	-2	-1	-32	28	27	310	56	Saint John A	-13	-9	-1	-21	***	64	120	70								
Edmonton Namao A	-7	5	4	-27	8	6	330	56	<b>Nova Scotia</b>																
Fort McMurray A	-18	-2	-6	-38	20	44	100	41	Greenwood A	-8	-6	0	-13	13	40	270	74								
High Level A	-15	7	3	-38	4	35	340	61	Shearwater A	-8	-6	1	-14	10	9	290	65								
Jasper	-7	1	4	-22	1	15		X	Sydney A	-5	-3	0	-10	9	15	290	52								
Lethbridge A	-5	0	4	-28	6	6	260	85	Yarmouth A	-6	-6	1	-12	16	13	290	85								
Medicine Hat A	-9	-2	2	-28	16	14	300	46	<b>Prince Edward Island</b>																
Peace River A	-3P	12P	8P	-9P	0P	2		X	Charlottetown A	-11	-7	-2	-17	14	23	330	74								
<b>Saskatchewan</b>									<b>Summerside A</b>																
Cree Lake	-25	-4	-12	-39	7	35	200	46	Charlottetown A	-11	-7	-2	-16	14	45	280	70								
Estevan A	-24	-13	-13	-34	2	3	320	32	<b>Newfoundland</b>																
La Ronge A	-27	-9	-13	-35	1	19		X	Cartwright	-2	8	2	-12	36	124	320	80								
Regina A	-23	-10	-12	-33	3	6	140	35	Churchill Falls A	-11	10	1	-24	15	71	300	59								
Saskatoon A	-24P	-10P	-11P	-35P	4P	16	350	33	Gander Int'l A	-4P	0P	0P	-13P	33P	34	280	74								
Swift Current A	-16	-7	-1	-28	13	10	300	57	Goose A	-4	11	2	-17	20	82	210	61								
Yorkton A	-29	-14	-18	-38	1	13		X	Port Aux Basques	-3	-1	3	-8	53	82	290	85								
<b>Manitoba</b>									<b>St John's A</b>																
Brandon A	-27	-13	-19	-35	0	8	040	37	St Lawrence	-2P	-1P	3P	-7P	13P	10		X								
Churchill A	-30	-8	-18	-37	0	22	310	46	Wabush Lake A	-13	8	-3	-26	13	32	300	37								
Lynn Lake A	-34	-10	-21	-44	0	35		X	89/12/11-89/12/17																
The Pas A	-29	-12	-21	-37	0	8		X																	
Thompson A	-34	-11	-22	-44	0	40		X																	
Winnipeg Int'l A	-27	-13	-19	-36	1	6		X																	

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

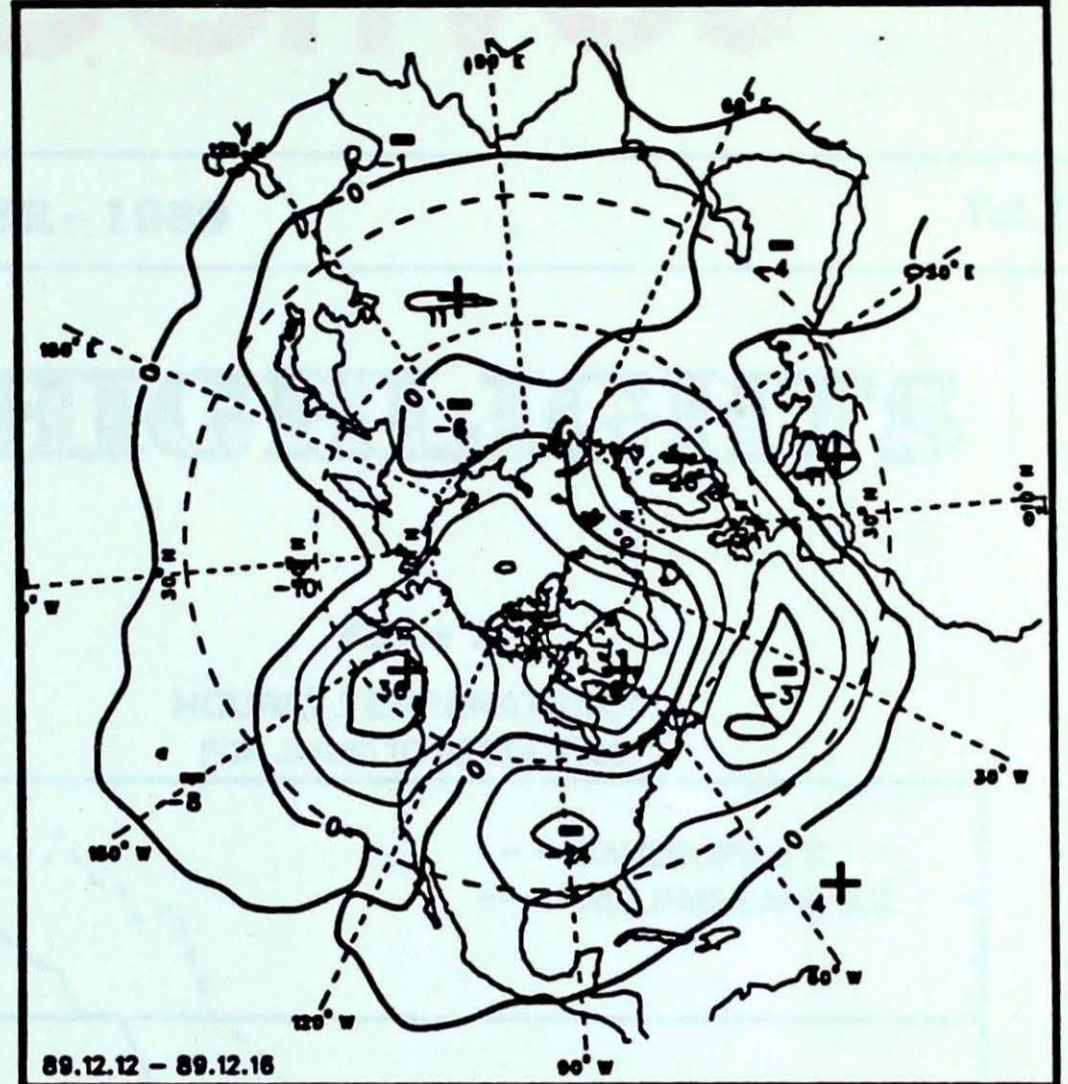
ptot = weekly precipitation total in mm  
 st = snow thickness on the ground in cm  
 dir = direction of max wind, deg. from north.  
 vel = wind speed in km/h

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

### ATMOSPHERIC CIRCULATION



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



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



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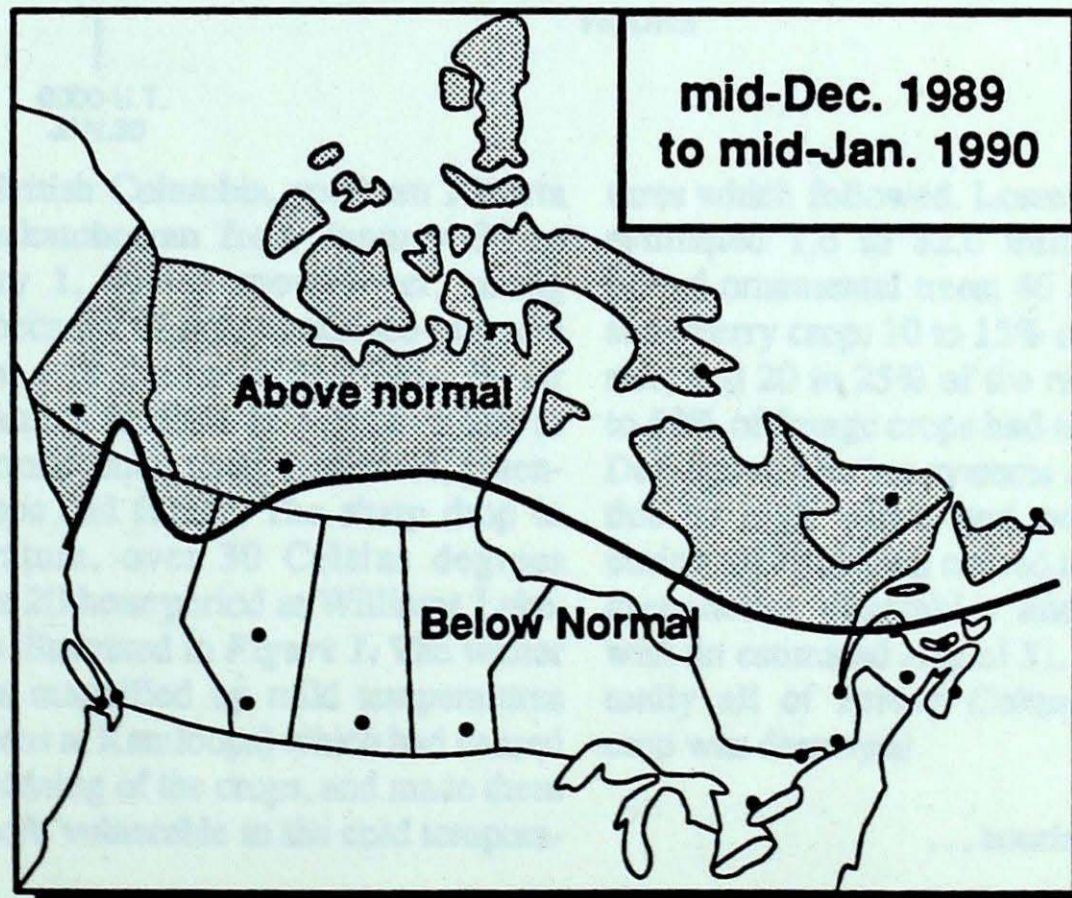
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### MONTHLY TEMPERATURE FORECAST

*Normal temperatures for  
mid-December to mid-January, °C*

Whitehorse	-19	Toronto	-5
Yellowknife	-26	Ottawa	-9
Iqaluit	-24	Montréal	-9
Vancouver	3	Québec	-11
Victoria	4	Fredericton	-8
Calgary	-10	Halifax	-3
Edmonton	-14	Charlottetown	-6
Regina	-15	Goose Bay	-15
Winnipeg	-17	St. John's	-3

**mid-Dec. 1989  
to mid-Jan. 1990**



Canada