

Climatic Perspectives

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Nov. 30 to Dec. 6, 1992

A weekly review of Canadian climate and water

Vol. 14 No. 49

Snowstorms bury Atlantic Canada

Two winter storms hit Atlantic Canada during the period, giving some sections of the east coast just over two thirds of their normal December snowfall during the first six days of the month. Snowfall accumulations for the week were as high as 62 cm.

The first storm hit on December 3, providing the Maritimes with a mixture of snow, freezing rain and rain. The hardest hit area was southeastern New Brunswick; Moncton received 38 cm of snow. More than 20 cm fell on Prince Edward Island, while lesser amounts were reported in Nova Scotia. Blowing snow, whiteouts and near blizzard conditions disrupted transportation in many areas. Winds gusting as high as 111 km/h were clocked off the north shore of Cape Breton Island.

As the weather system moved across Newfoundland a day later, it left 15 to 25 centimetres of fresh snow covering the ground, but on the Avalon Peninsula and along the south coast of the Island, the snow eventually changed to a mixture of freezing rain and rain.

On Saturday, December 5, a second more intense weather system approached Atlantic Canada. By the time it was over late on Sunday more than 55 cm of snow buried the Cape Breton Highlands. Further to the south, Sydney and Halifax, N.S., recorded 26 and 18 centimetres of snow, respectively. Charlottetown received 25 cm on top of the 24 cm that already fell a day or two earlier. High winds, gusting to 117 km/h, whipped the snow around, closing highways and cancelling ferry services to Prince Edward

Island late on Saturday and all day Sunday. Power was knocked out to thousands of homes in all three Maritime provinces.

Although all areas of Newfoundland received the snow on Sunday, the west coast of the Island and the Northern Peninsula were particularly hard hit by strong winds and a heavy 35 cm snowfall. As the intense low pressure system began moving away on December 6, westerly winds increased in strength and created blizzard conditions over the western portion of the Island, bringing most outdoor activity and transportation to a standstill. Along the south coast, wind gusts reaching 127 km/h disrupted ferry services between Nova Scotia and Newfoundland.

Elsewhere...

In the Yukon and the Northwest Territories above-normal temperatures continued to keep winter at bay, as vigorous storms in the Gulf of Alaska pumped relatively mild Pacific air inland. Cloudy skies were common as far east as Hudson Bay. The weather pattern over Baffin Island was changeable - a mixture of sun, cloud and some light snowfalls. Snow depths on the Island range between 50 and 70 centimetres along the eastern shore.

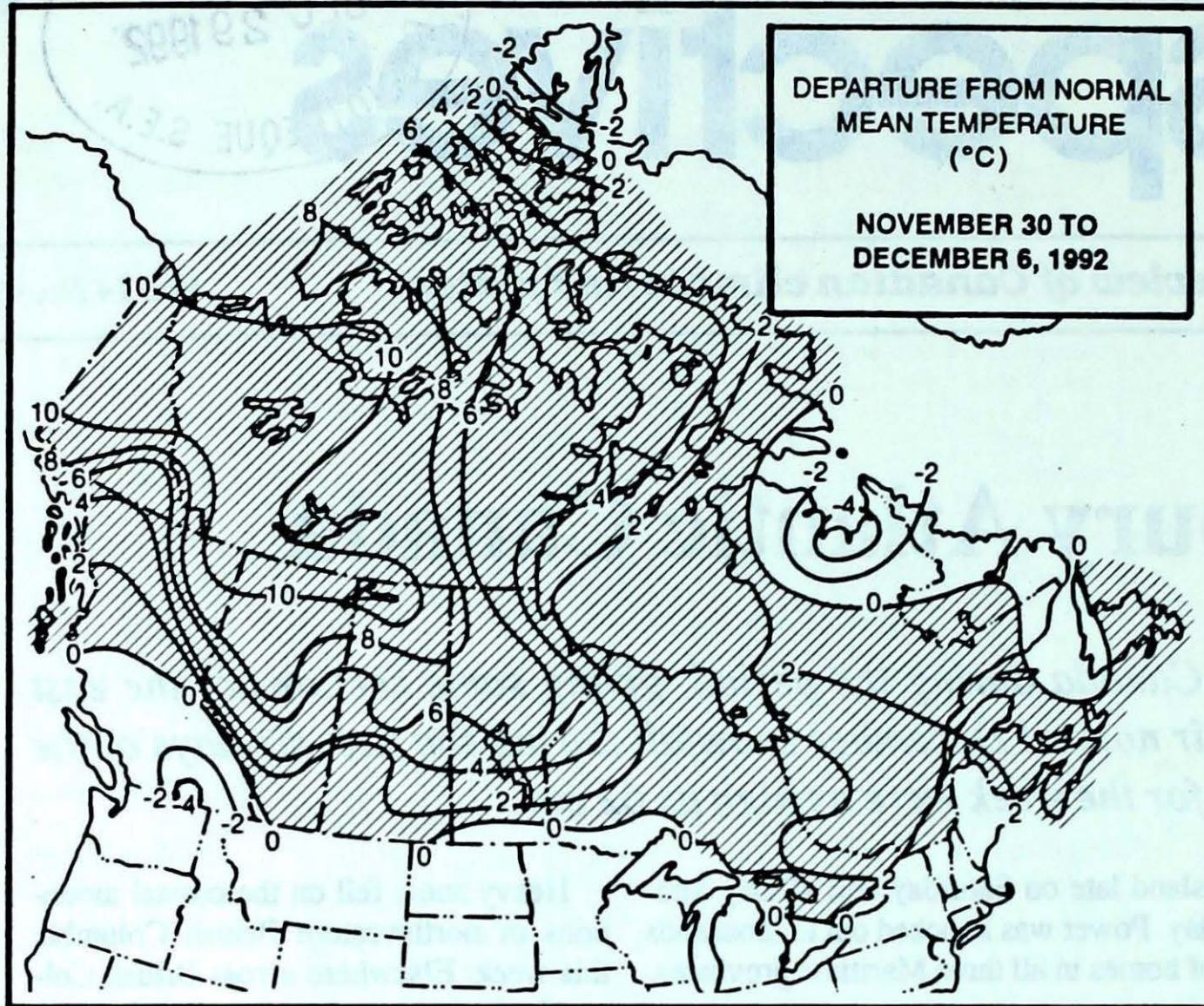
Heavy snow fell on the coastal mountains of northwestern British Columbia this week. Elsewhere across British Columbia, higher pressures produced a relatively tranquil period with variable weather conditions. Much the same can be said for the prairie provinces, but sunshine was more common in Alberta than Manitoba. Temperatures fluctuated, with daytime readings managing to climb above freezing.

The ski season has begun in Ontario, with 10 to 20 centimetres of lake-effect snow falling east of Georgian Bay. Freezing temperatures have produced a thin ice cover on many of the smaller lakes in cottage country, a pattern which is close to average for this time of the year.

East coast storms produced heavy snow along the north shore of the Gulf of St. Lawrence. Some ski resorts are open in the Laurentians, with a 55 cm snow base.

A Look Ahead...

For the week of December 14, above-normal temperatures are expected east of Manitoba. Elsewhere, near normal temperatures are likely. Storms are possible in the Atlantic region, and unsettled weather will occur over British Columbia and the Prairies.



DEPARTURE FROM NORMAL
MEAN TEMPERATURE
(°C)

NOVEMBER 30 TO
DECEMBER 6, 1992

**Weekly normal
temperatures (°C)**

	max.	min.
Whitehorse A	-12.5	-20.0
Iqaluit A	-15.3	-24.1
Yellowknife A	-18.1	-25.7
Vancouver Int'l A	7.2	2.0
Victoria Int'l A	7.8	1.8
Calgary Int'l A	-1.3	-13.0
Edmonton Int'l A	-6.6	-17.4
Regina A	-5.1	-15.8
Saskatoon A	-6.9	-16.6
Winnipeg Int'l A	-6.4	-15.3
Ottawa Int'l A	-0.6	-8.5
Toronto (Pearson Int'l A)	2.6	-5.4
Montréal Int'l A	0.0	-7.7
Québec A	-2.2	-9.6
Fredericton A	0.7	-8.6
Saint John A	1.7	-6.6
Halifax (Shearwater)	4.3	-2.9
Charlottetown A	2.0	-4.8
Goose A	-5.3	-13.8
St John's A	3.0	-3.0

Weekly temperature and precipitation extremes

	Maximum temperature (°C)	Minimum temperature (°C)	Heaviest precipitation (mm)
British Columbia	Victoria Int'l A 11	Dease Lake A -26	Hope A 34
Yukon Territory	Komakuk Beach A 8	Shingle Point A -28	Shingle Point A 9
Northwest Territories	Hay River A 6	Eureka -39	Coppermine A 13
Alberta	Calgary Int'l A 8	Banff (aut) -23	Cold Lake A 5
Saskatchewan	Moose Jaw 4	Nipawin A -28	Prince Albert A 9
Manitoba	Dauphin A 6	Churchill A -29	Gillam A 7
Ontario	Trenton A 5	Armstrong (aut) -30	Warton A 24
Quebec	Montréal Int'l A 6	La Grande IV A -34	Blanc Sablon A 34
	Sherbrooke A 6		
New Brunswick	Fredericton A 5	St-Léonard A -13	Moncton A 46
	St Stephen (aut) 5		
Nova Scotia	Sable Island 11	Amherst (aut) -9	Sydney A 37
Prince Edward Island	East Point (aut) 5	Charlottetown A -7	Charlottetown A 50
Newfoundland	Argentia A 7	Wabush Lake A -31	St Anthony 60

Across The Country...

Highest Mean Temperature	Langara (B.C.) 6
Lowest Mean Temperature	Eureka (N.W.T.) -35

CLIMATIC PERSPECTIVES
VOLUME 14

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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.

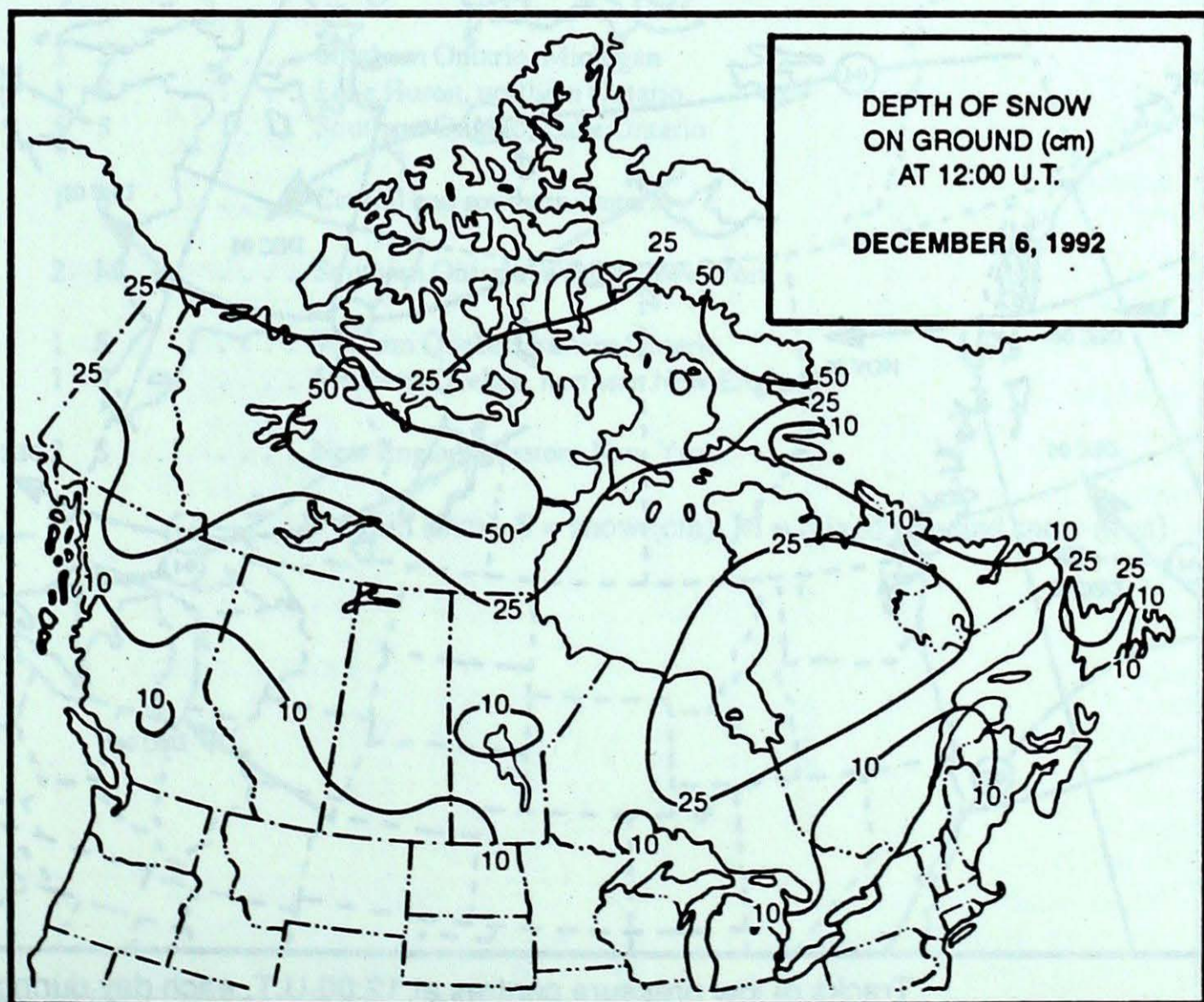
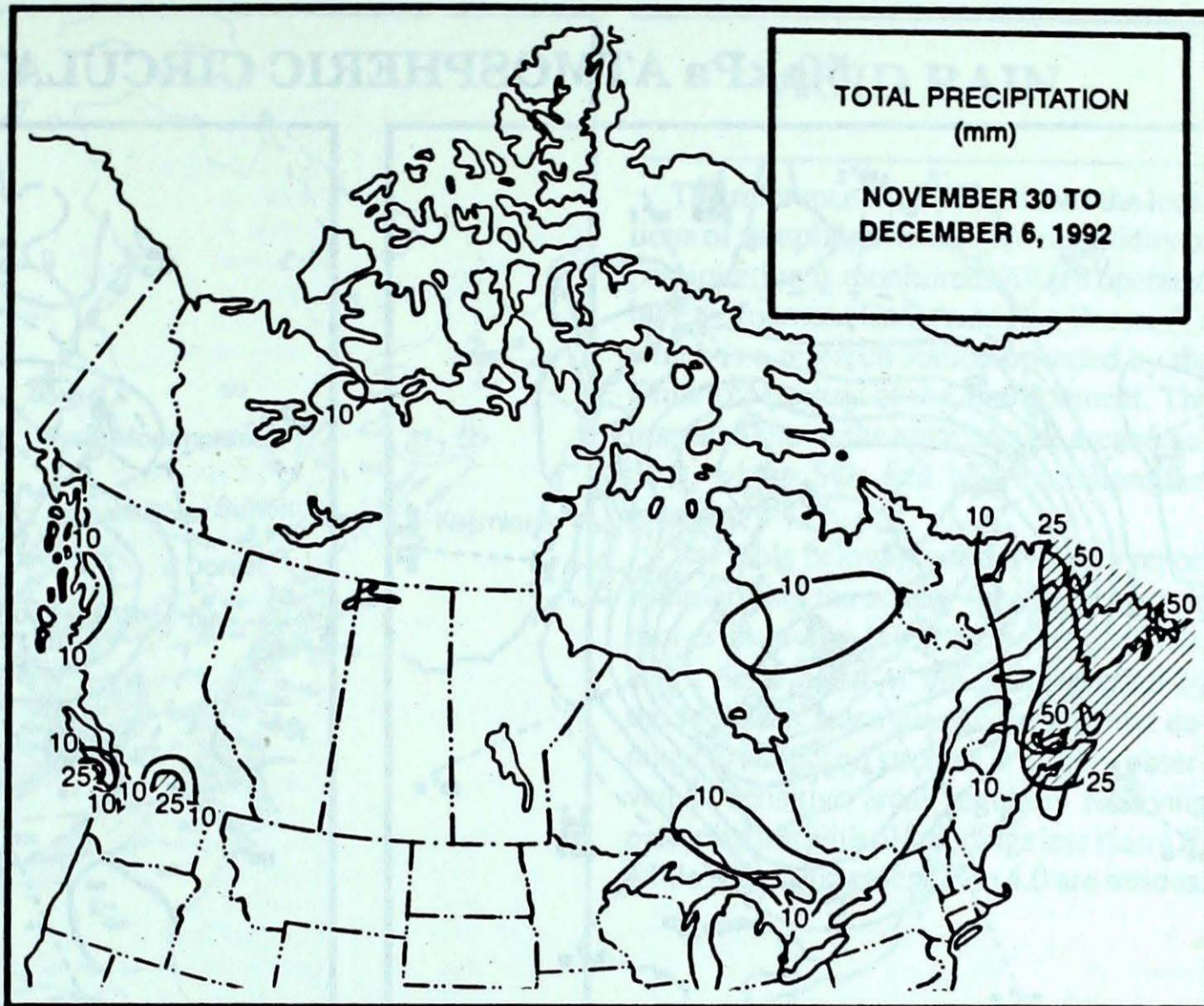
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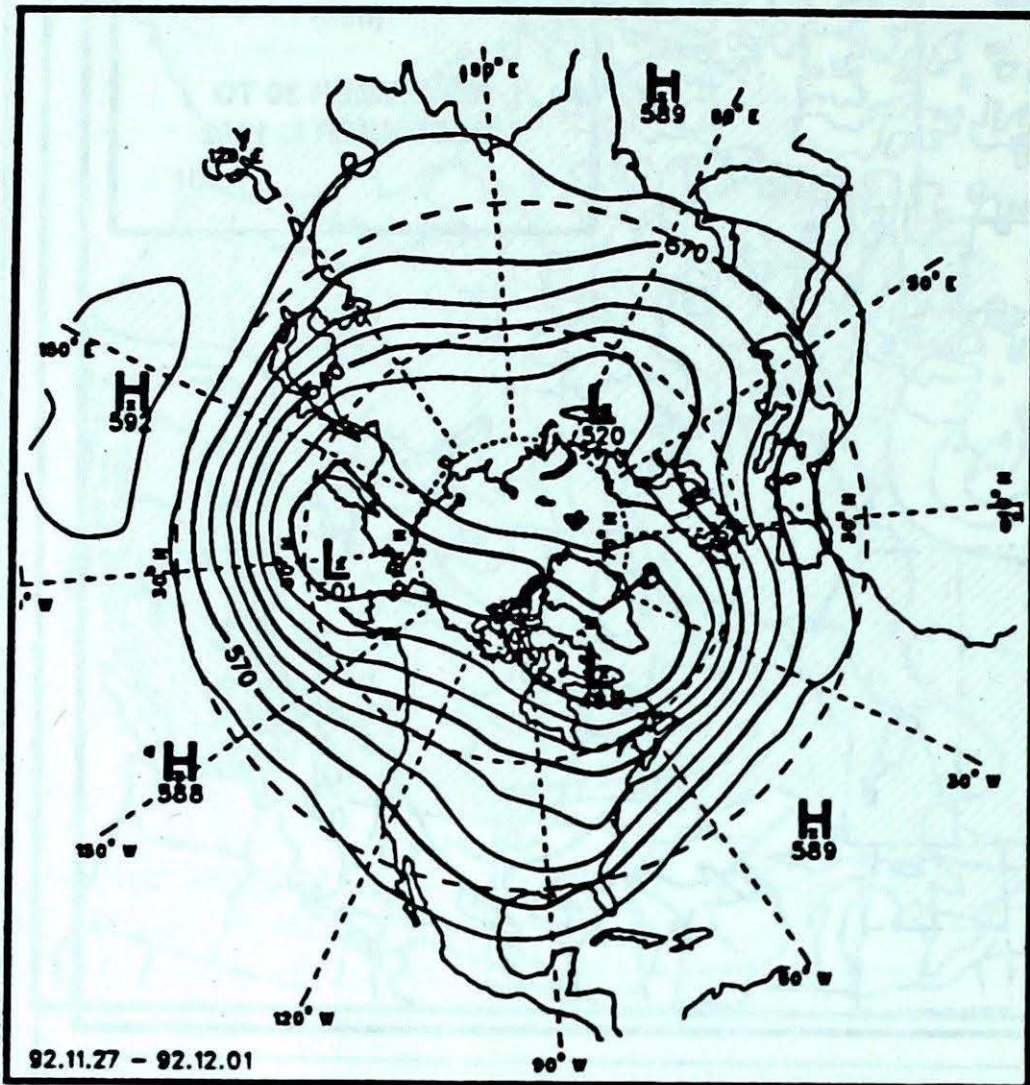
weekly and monthly : \$35.00
foreign: \$42.00
monthly issue: \$10.00
foreign: \$12.00

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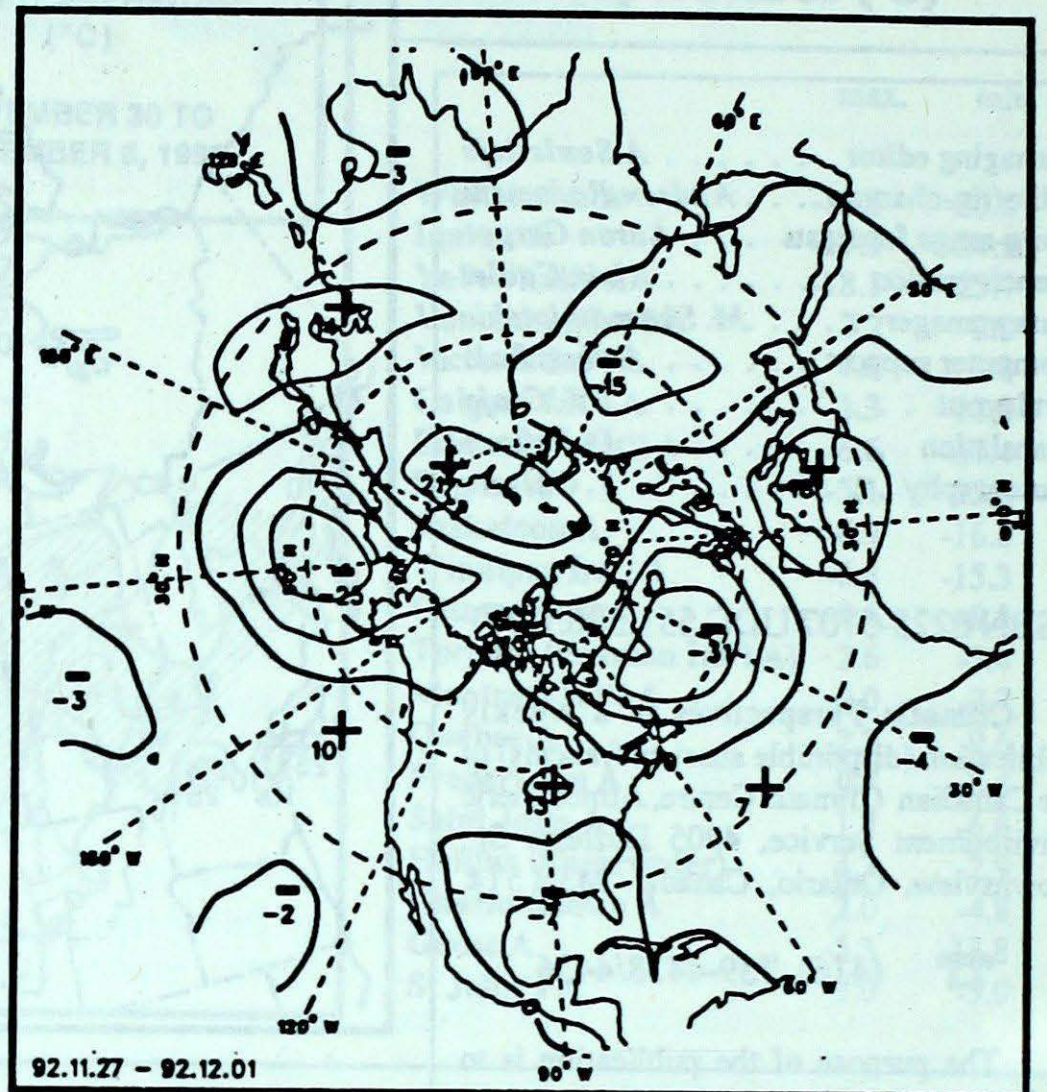
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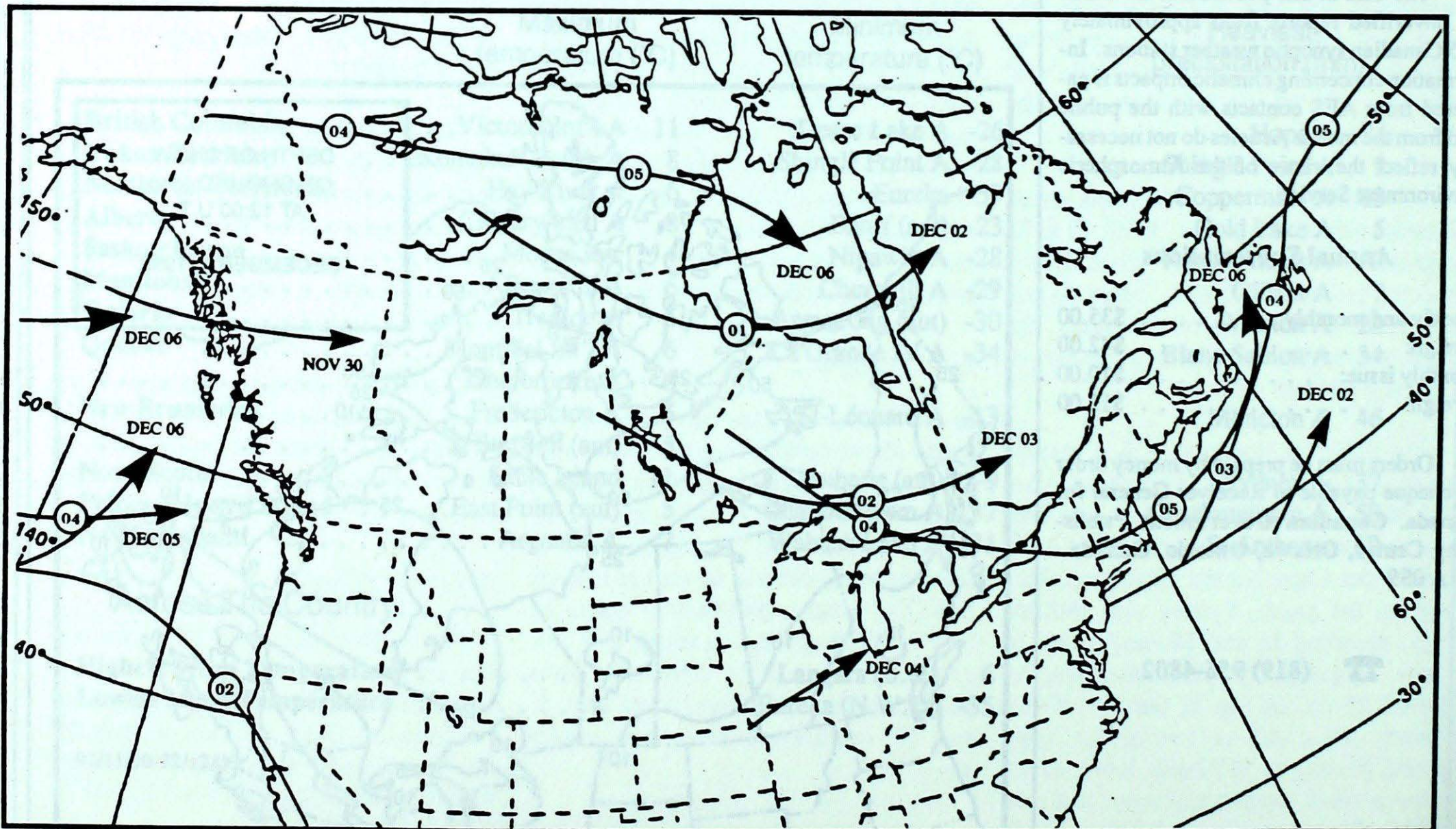
50-kPa ATMOSPHERIC CIRCULATION



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



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

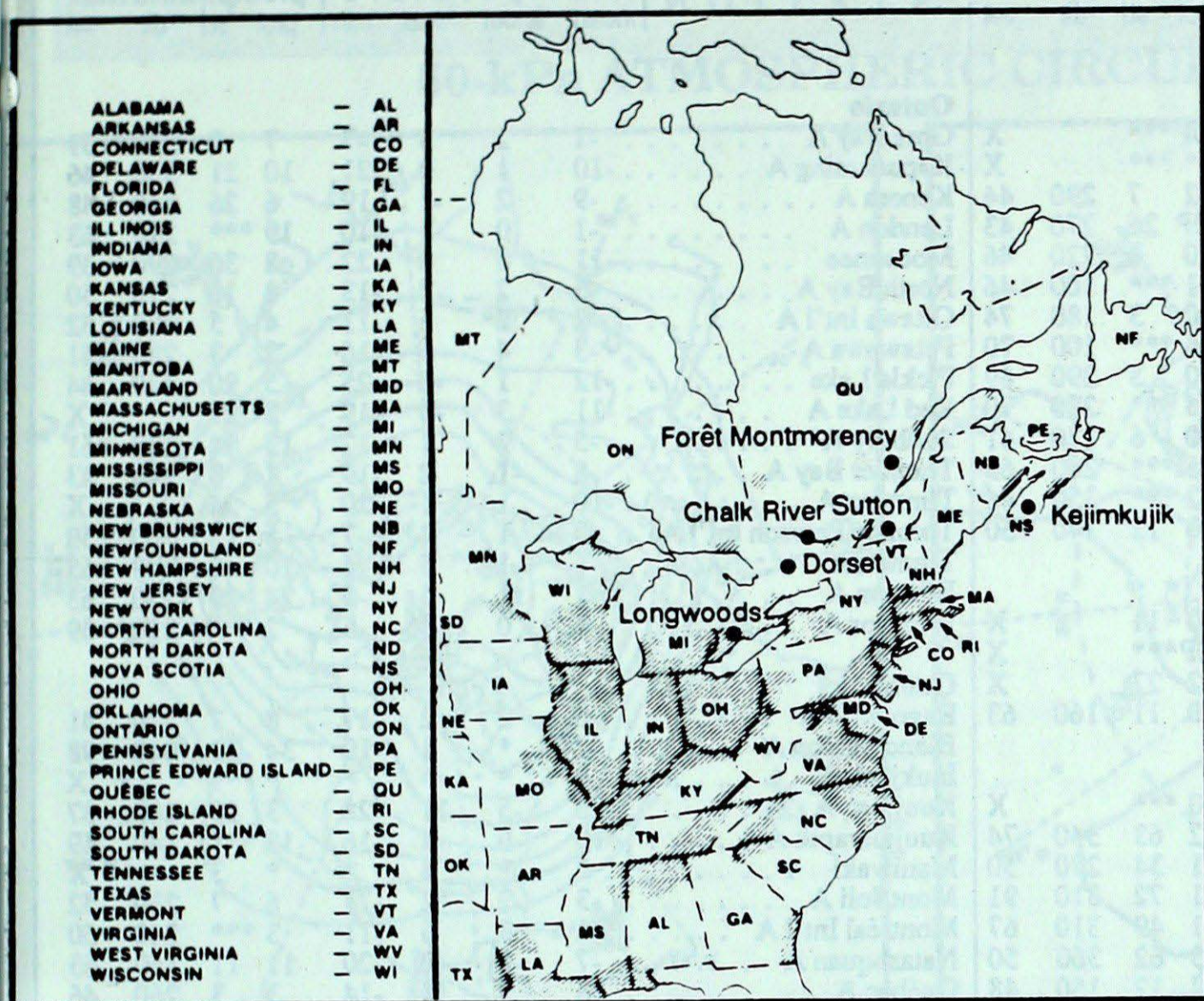


Tracks of low pressure centres at 12:00 U.T. each day during the period.

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 SO₂ 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
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November 29 to December 5, 1992

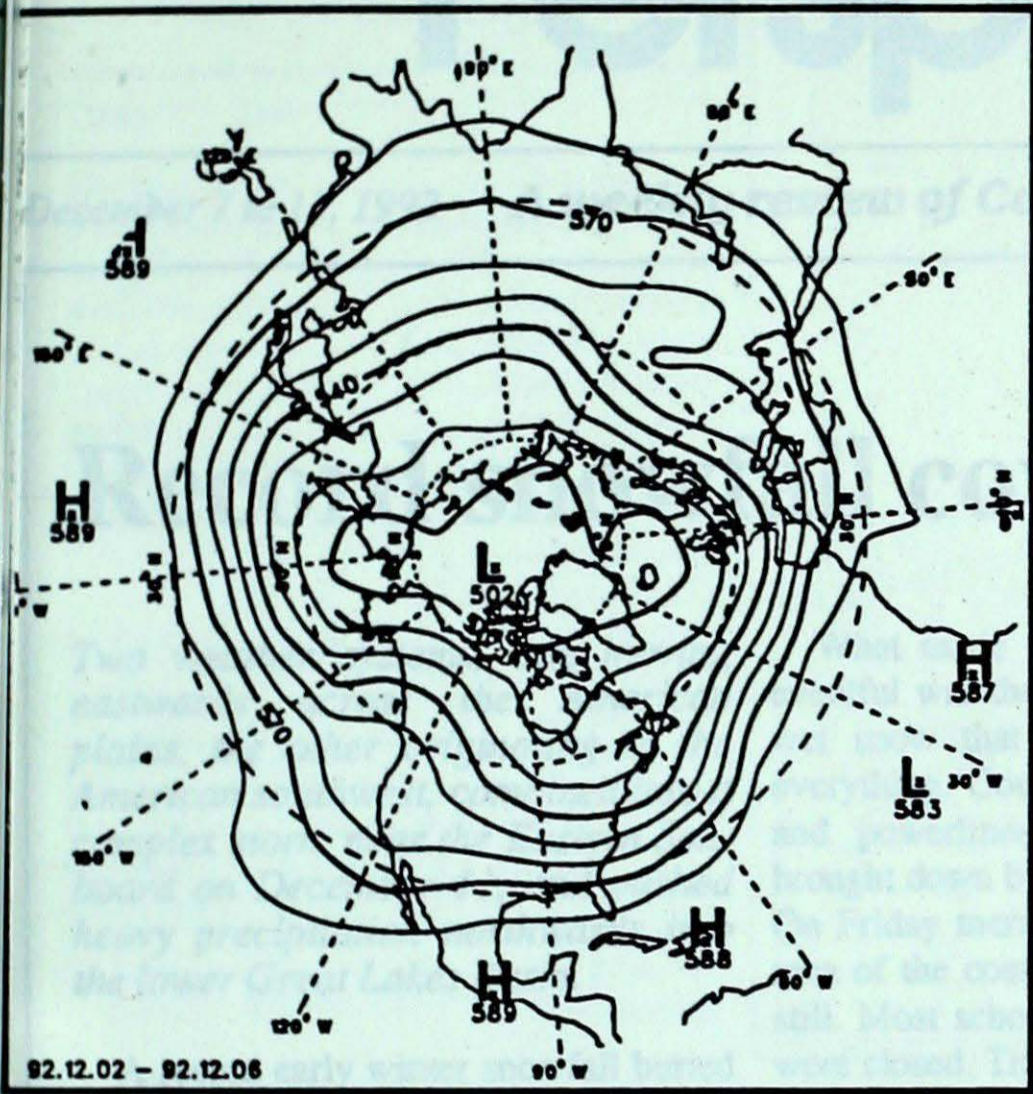
Longwoods	04	4.3	3 S Southern Michigan, Indiana, Western Ohio
Dorset *	02	4.1	3 S Southern Ontario, Michigan
	03	4.5	1 S Lake Huron, northern Ontario
	04	4.3	5 S Southern Ontario, Lake Ontario
Chalk River	02	4.3	1 S Central and southern Ontario
Sutton	01	4.1	2 M Southern Ontario, western New York
Montmorency	01	4.1	1 S Western Quebec, eastern Ontario
	03	4.1	1 S Southern Quebec, northern New England
Kejimikujik	04	4.6	2 S New England, eastern New York

R = rain (mm), S = snow (cm), M = mixed rain and snow (mm)

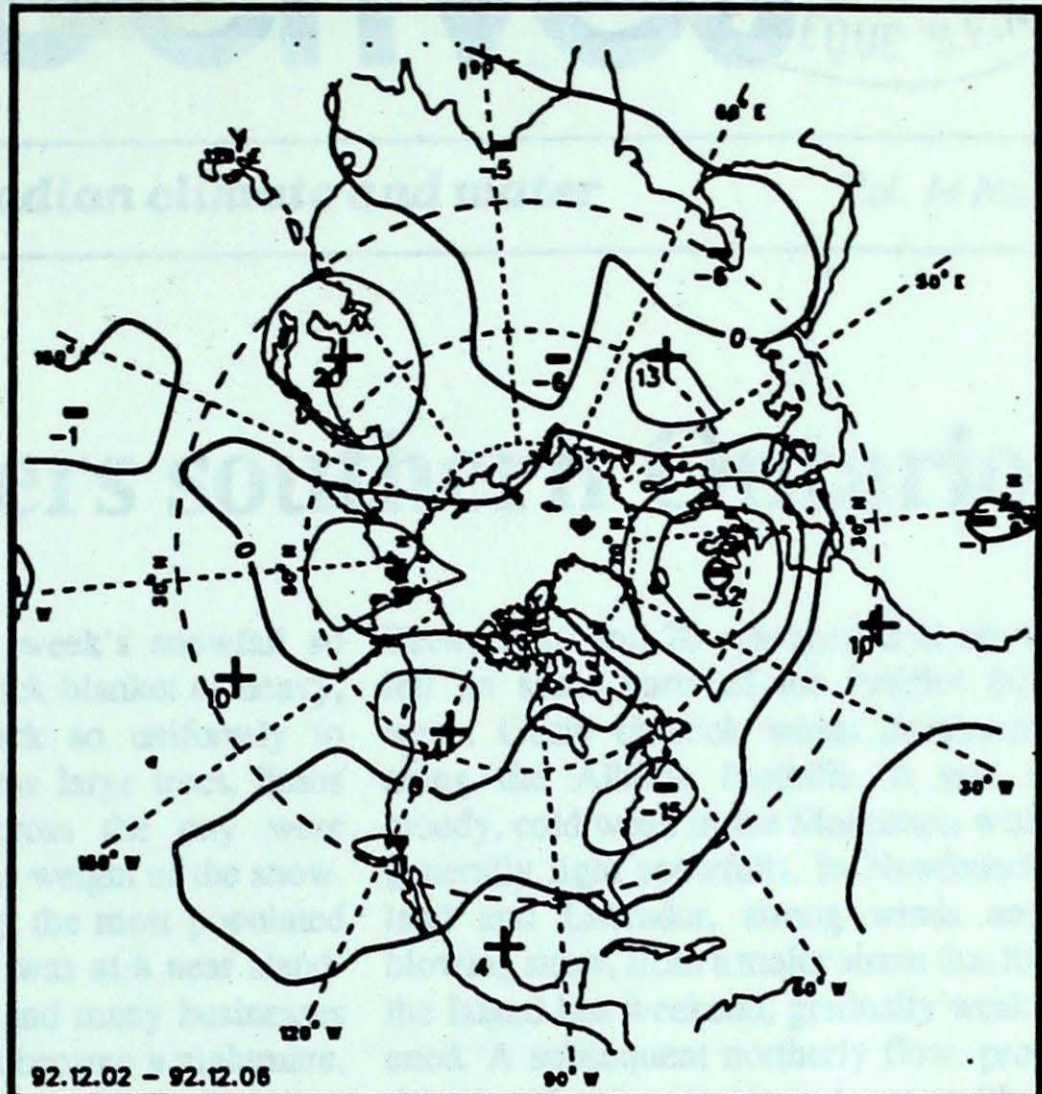
STATION	temperature				precip.		wind max		STATION	temperature				precip.		wind max	
	mean	anom	max	min	ptot	st	dir	vel		mean	anom	max	min	ptot	st	dir	vel
British Columbia								Ontario									
Blue River A	-11P	-4P	0P	-22P	0P***			X	Gore Bay A	-1	2	3	-7	7	7	320	59
Cape St James	*	*	*	*	* **			X	Kapuskasing A	-10	1	0	-21	10	21	330	46
Cranbrook A	*	*	3	*	2 7	290	44		Kenora A	-9	2	-1	-19	6	26	340	48
Fort Nelson A	-8P	11P	3P	-21P	0P 26	270	43		London A	-1	0	3	-10	19	***	290	63
Fort St John A	-4	9	4	-12	0 6	220	46		Moosonee	-11	0	0	-22	8	36	290	39
Kamloops A	-4	-3	8	-11	1 ***	100	46		North Bay A	-5	2	2	-13	8	10	270	50
Penticton A	-3	-4	2	-12	0 3	180	74		Ottawa Int'l A	-2	2	5	-13	4	5	290	52
Port Hardy A	3	-1	9	-3	6 ***	100	70		Petawawa A	-3	4	5	-16	2	3	280	41
Prince George A	-7	0	4	-14	0 3	290	69		Pickle Lake	-12	1	-6	-25	5	20	330	44
Prince Rupert A	3	2	8	-5	16 ***	280	70		Red Lake A	-11	3	-3	-19	3	27		X
Smithers A	-5	1	4	-11	0 6	170	41		Sudbury A	-5	2	1	-12	13	14	320	61
Vancouver Int'l A	3	-2	8	-5	6 ***	280	69		Thunder Bay A	-8	-1	2	-19	1	3	340	43
Victoria Int'l A	3	-2	11	-4	2 ***	150	46		Timmins A	-10	1	1	-20	5	24		X
Williams Lake A	-7	0	2	-17	0 12	140	50		Toronto(Pearson Int'l A)	0	1	4	-7	5	3	300	59
Yukon Territory								Québec									
Komakuk Beach A	-16	7	8	-27	0 11		X		Bagotville A	-6	2	2	-17	8	7	270	41
Teslin (aut)	-8P	*	3P	-19P	0P***		X		Blanc Sablon A	-7	*	1	-19	34	12	040	98
Watson Lake A	-18	4	0	-28	2 27		X		Inukjuak A	*	*	*	*	* **			X
Whitehorse A	-6	10	4	-19	0 11	160	63		Kuujuuaq A	-20	-5	-11	-28	3	29	240	37
Northwest Territories								New Brunswick									
Alert	-24	4	0	-35	0 ***		X		Fredericton A	-2	2	5	-10	15	14	310	65
Baker Lake A	-22	4	-11	-33	2 63	340	74		Miscou Island (aut)	-1P	2P	3P	-7P	3P***			
Cambridge Bay A	-20	9	-9	-30	1 34	270	50		Moncton A	-3	1	5	-10	46	42	320	82
Cape Dyer A	-19	2	-9	-27	1 72	310	91		Saint John A	-1	2	5	-10	29	29	010	69
Clyde A	-23	0	-15	-31	1 49	310	67		Nova Scotia								
Coppermine A	-14	11	-6	-26	13 62	360	50		Greenwood A	1	1	6	-7	20	22	350	78
Coral Harbour A	-20	4	-12	-32	2 12	150	48		Shearwater A	1	0	7	-6	24	21	060	67
Eureka	-35P	-2P	-29P	-39P	1P 10		X		Sydney A	0	0	5	-6	37	20	300	69
Fort Smith A	-9	10	4	-16	1 16	200	56		Yarmouth A	3	1	9	-5	15	8	330	74
Hall Beach A	-20	7	-12	-30	1 38	330	41		Prince Edward Island								
Inuvik A	-15	11	1	-35	3 48	220	35		Charlottetown A	-1	0	5	-7	50	42	360	65
Iqaluit A	-21	-1	-16	-27	1 9	310	54		East Point (auto)	0P	*	5P	-6P	15P***			
Mould Bay A	-23	7	-15	-29	3 22		X		Newfoundland								
Norman Wells A	-16	9	-7	-27	1 17	320	83		Cartwright	-7	-1	0	-17	22	3	340	93
Resolute A	-20	8	-16	-29	2 13		X		Churchill Falls A	-13	2	-3	-30	8	46	320	32
Yellowknife A	-13	9	-2	-20	1 17	300	69		Gander Int'l A	-2	0	4	-9	40	25	230	93
Alberta								92/11/30-92/12/06									
Calgary Int'l A	-3	4	8	-14	0 ***	270	80		Goose A	-9	0	-2	-21	11	11	340	61
Cold Lake A	-9	3	1	-21	5 11	300	50		St John's A	1	1	5	-3	52	6	250	100
Edmonton Namao A	-4	6	5	-12	0 8	270	70		St Lawrence	2	2	6	-1	32	4		X
Fort McMurray A	-8	7	3	-21	1 11		X		Wabush Lake A	-13	1	-4	-31	9	36		X
High Level A	-11	11	3	-22	0 13	300	46										
Jasper	*	*	2	*	* 7		X										
Lethbridge A	-4	1	5	-13	0 3	250	106										
Medicine Hat A	-5	1	5	-13	0 ***	240	80										
Peace River A	-6	8	6	-16	1 ***	260	50										
Saskatchewan																	
Cree Lake	-11	10	-1	-24	1 19	310	50										
Estevan A	-10	-1	4	-21	1 3	290	85										
La Ronge A	-11	5	0	-26	1 19		X										
Regina A	-9	1	3	-23	8 10	300	76										
Saskatoon A	-11	1	1	-25	4 13	300	57										
Swift Current A	-8	0	4	-17	0 4	300	78										
Yorkton A	-10	2	0	-21	2 10	320	37										
Manitoba																	
Brandon A	-10	2	3	-24	2 8	320	52										
Churchill A	-17	2	-5	-29	4 23	300	76										
Lynn Lake A	-13	8	-1	-29	1 20	320	56										
The Pas A	-9	5	1	-24	0 10	320	44										
Thompson A	-12	7	-2	-24	2 12	310	44										
Winnipeg Int'l A	-10	1	1	-20	2 21	180	54										

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)

The heaviest snow was recorded in the east of Toronto. Peterborough received 60 cm of snow during the two-day storm, but there are unofficial reports of snowfall amounts as high as 70 cm. Toronto and Kingston received 45.5 and 39.4 centimetres, respectively. In the Peterborough area, this is the second greatest snowfall since records began in 1866: a storm on January 21 - 22, 1969, dumped 73.6 cm of snow.

In Toronto itself, the two-day snowfall ranged between 30 and 50 centimetres, depending whether you lived in the west or east side of the metropolis. Officially, the "Toronto City" downtown observation site recorded 30.3 cm of snow, making this the greatest snowfall since February 27 - 28, 1954, when 36.4 cm was measured in downtown Toronto. On January 23, 1946, 39.9 cm fell on the ground. The two greatest snowfall events ever recorded in Toronto occurred on December 25 - 26, 1872 and December 11 - 12, 1946, when 58.4 and 57.7 centimetres fell, respectively.

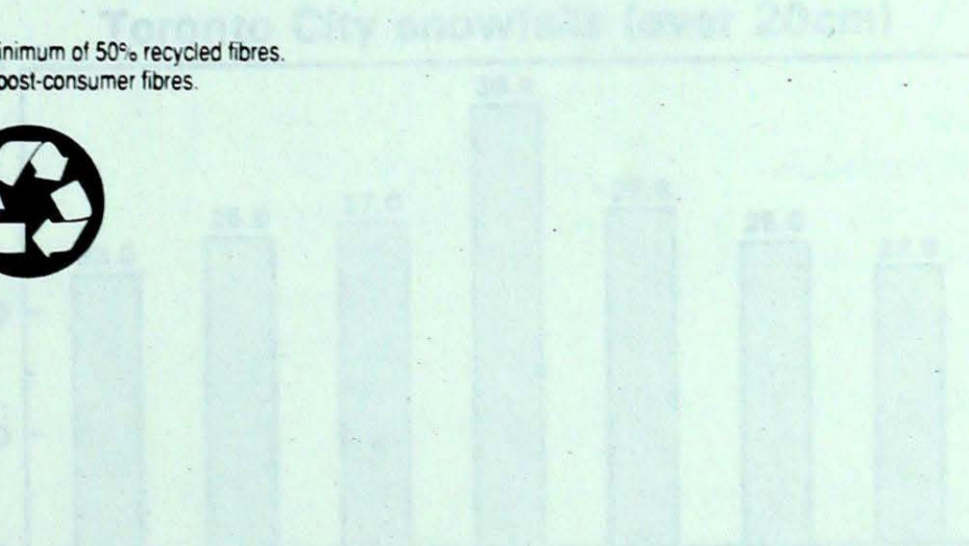
without heat or power two days after the storm.

Elsewhere...

Rain and hurricane-force winds pounded Vancouver Island on the 3rd, while heavy snow fell at higher elevations both on the island and along the north Pacific coast.

For the week of December 21, above-normal temperatures are expected for the eastern half of Quebec and the Atlantic provinces. Below-normal values are likely for British Columbia and much western Alberta. Elsewhere, near normal readings are expected.

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This chart is a sample of mean annual snowfall amounts in Toronto. In addition to Toronto City, the chart shows snowfalls in other parts of the Greater Toronto Area, which depend on the amount of snow. For more information, contact: Ontario Region (905) 873-8772.