

Climatic Perspectives

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December 7 to 13, 1992 A weekly review of Canadian climate and water

Vol. 14 No. 50

Record snowfall covers southern Ontario

Two weather systems, one moving eastwards across the American plains, the other originating in the American southwest, combined into a complex storm near the Eastern Seaboard on December 11, and pushed heavy precipitation northwards into the lower Great Lakes Basin.

A record early winter snowfall buried southern Ontario on December 10 and 11, dumping between 20 and 60 centimetres of snow between London and Ottawa. The hardest hit area was the region 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. Trenton 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, 1902, 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 30.8 cm of snow, making this the greatest snowfall since February 27 - 28, 1984, when 36.4 cm was measured in downtown Toronto. On January 23, 1966, 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 1944, when 58.4 and 57.2 centimetres fell, respectively.

What made this week's snowfall so eventful was the thick blanket of heavy, wet snow that stuck so uniformly to everything. Countless large trees, limbs and powerlines across the city were brought down by the weight of the snow. On Friday morning, the most populated area of the country was at a near standstill. Most schools and many businesses were closed. Travel became a nightmare, especially at Canada's busiest airport. For the first time in twenty years hydro emergency crews were called in from outside the city, as some residents were still without heat or power two days after the storm.

Elsewhere...

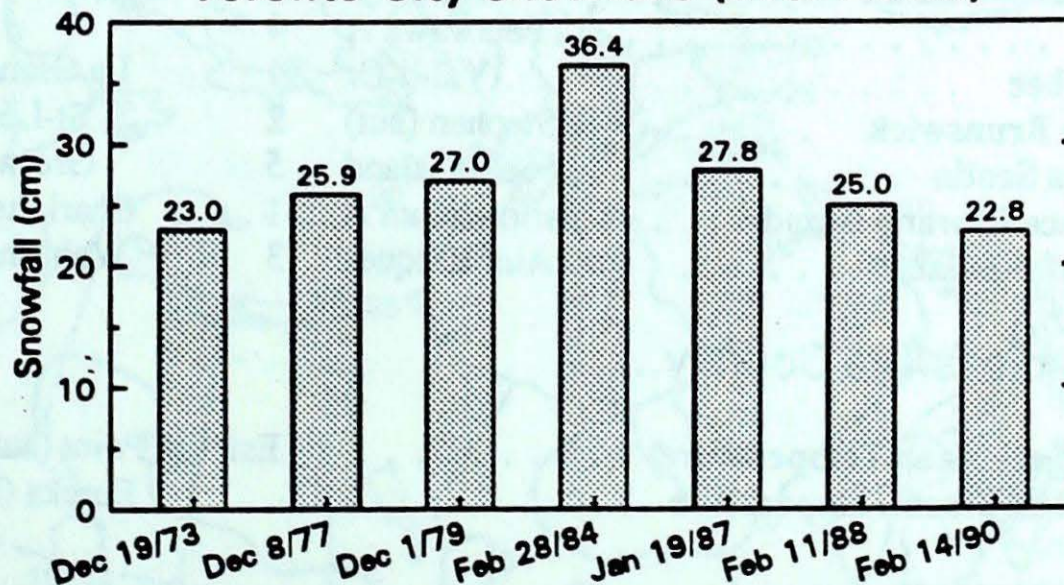
Rain and hurricane-force winds pounded Vancouver Island on the 8th, while heavy snow fell at higher elevations both on the Island and along the north Pacific coast.

Between 10 and 20 centimetres of snow fell on some parts of the Prairies this week. Gusty chinook winds developed along the Alberta foothills. It was a cloudy, cold week in the Maritimes, with generally light snowfalls. In Newfoundland and Labrador, strong winds and blowing snow, from a major storm that hit the Island last weekend, gradually weakened. A subsequent northerly flow, produced cold temperatures and more settled weather for the remainder of the week.

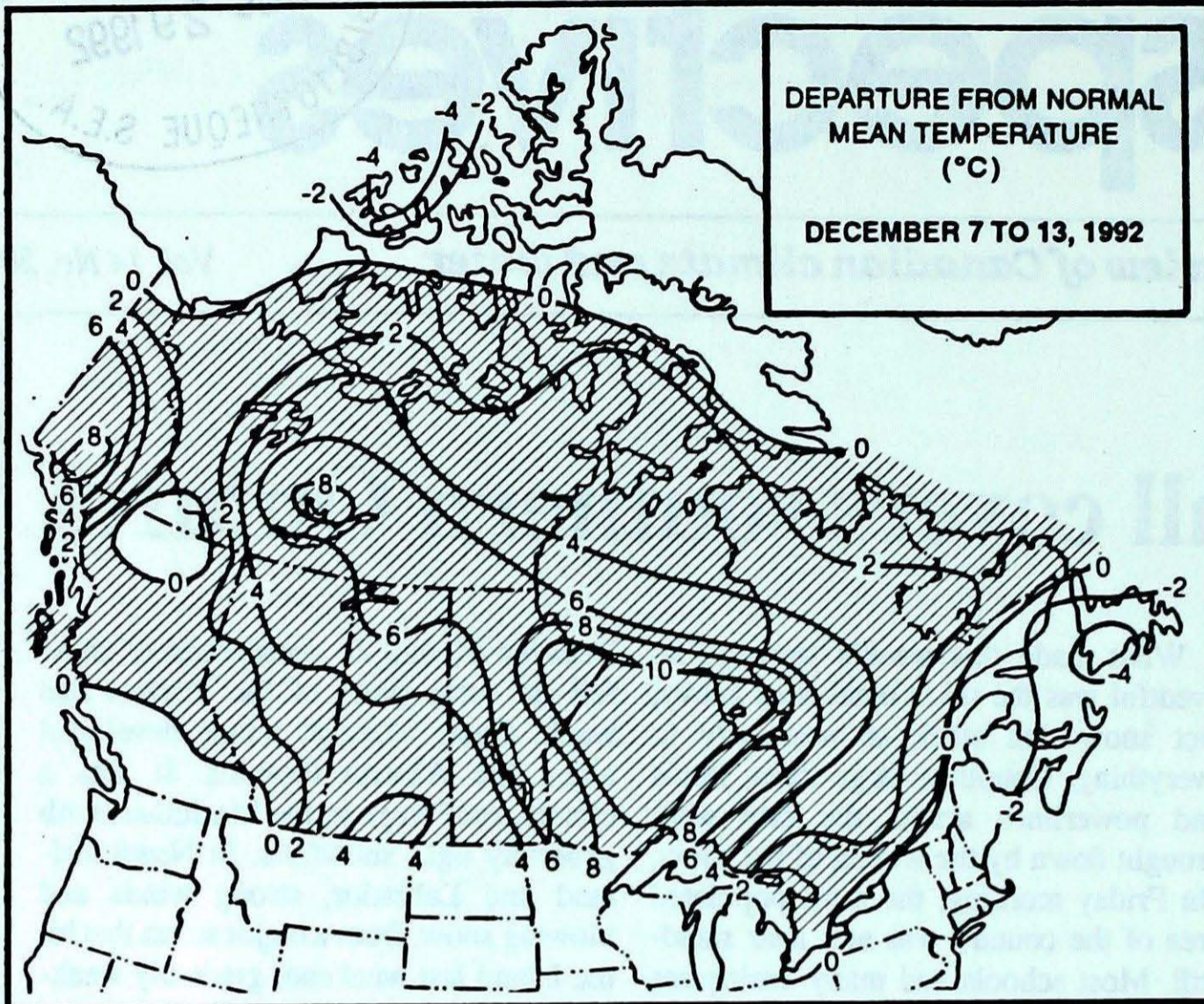
A Look Ahead...

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

Toronto City snowfalls (over 20cm)



The above is a sampling of recent snowfall events equal to more than 20 cm. In addition, Toronto City had at least nine snowfalls, between 1964 and 1973, which deposited 20 cm or more of snow. For more information contact Ontario Region (416) 973 8772.



Weekly normal temperatures (°C)

	max.	min.
Whitehorse A	-13.0	-20.8
Iqaluit A	-18.0	-25.5
Yellowknife A	-20.0	-28.0
Vancouver Int'l A	6.7	1.1
Victoria Int'l A	7.2	1.1
Calgary Int'l A	-1.3	-14.0
Edmonton Int'l A	-7.6	-19.0
Regina A	-7.9	-18.4
Saskatoon A	-9.2	-19.3
Winnipeg Int'l A	-9.8	-18.6
Ottawa Int'l A	-2.5	-10.0
Toronto (Pearson Int'l A)	1.2	-5.8
Montréal Int'l A	-1.7	-8.7
Québec A	-3.6	-11.3
Fredericton A	-0.3	-9.5
Saint John A	1.3	-7.7
Halifax (Shearwater)	3.6	-3.9
Charlottetown A	1.3	-6.0
Goose A	-8.1	-16.2
St John's A	2.6	-3.6

Weekly temperature and precipitation extremes

	Maximum temperature (°C)	Minimum temperature (°C)	Heaviest precipitation (mm)
British Columbia	Estevan Point (aut) 11	Fort Nelson A -33	Prince Rupert A 103
Yukon Territory	Blanchard 1	Ogilvie -38	Blanchard 34
Northwest Territories	Alert 0	Eureka -41	Cape Young A 11
Alberta	Grande Prairie A 7	High Level A -29	Slave Lake A 10
Saskatchewan	Moose Jaw A 4	Cree Lake -29	La Ronge A 11
Manitoba	Dauphin A -1	Lynn Lake A -29	Winnipeg Int'l A 12
Ontario	Ottawa Int'l A 4	Timmins A -24	Trenton A 49
	Petawawa A 4		
Quebec	Val-d'Or 4	La Grande IV A -31	La Grande Rivière 9
New Brunswick	St Stephen (aut) 2	St-Léonard A -21	Moncton A 2
Nova Scotia	Sable Island 5	Greenwood A -16	Yarmouth A 4
Prince Edward Island	Charlottetown A 1	Charlottetown A -10	East Point (aut) 6
Newfoundland	Port Aux Basques 3	Wabush Lake A -31	Cartwright 12

Across The Country...

Highest Mean Temperature	Estevan Point (aut) (B.C.)	6
Lowest Mean Temperature	Eureka (N.W.T.)	-36

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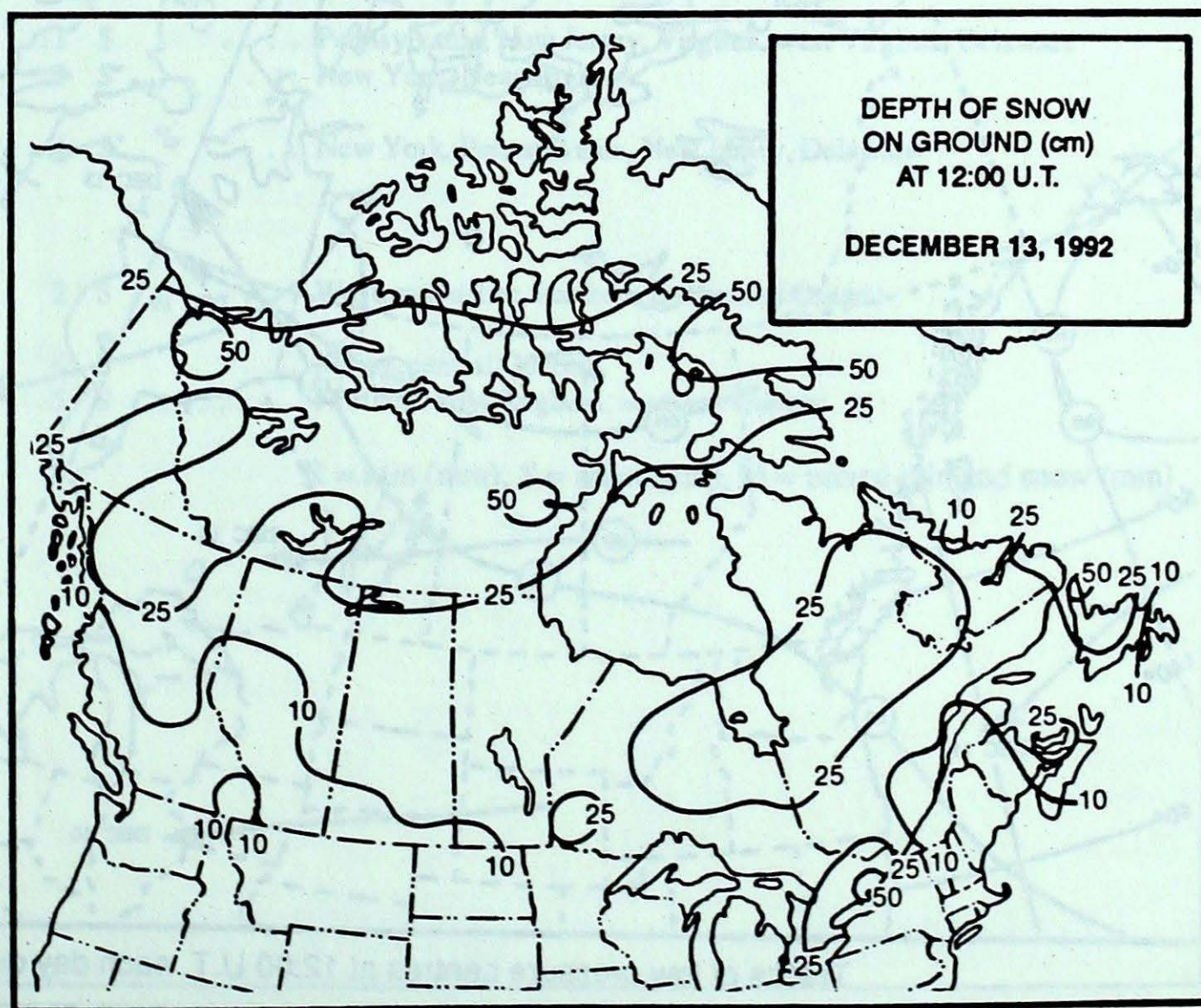
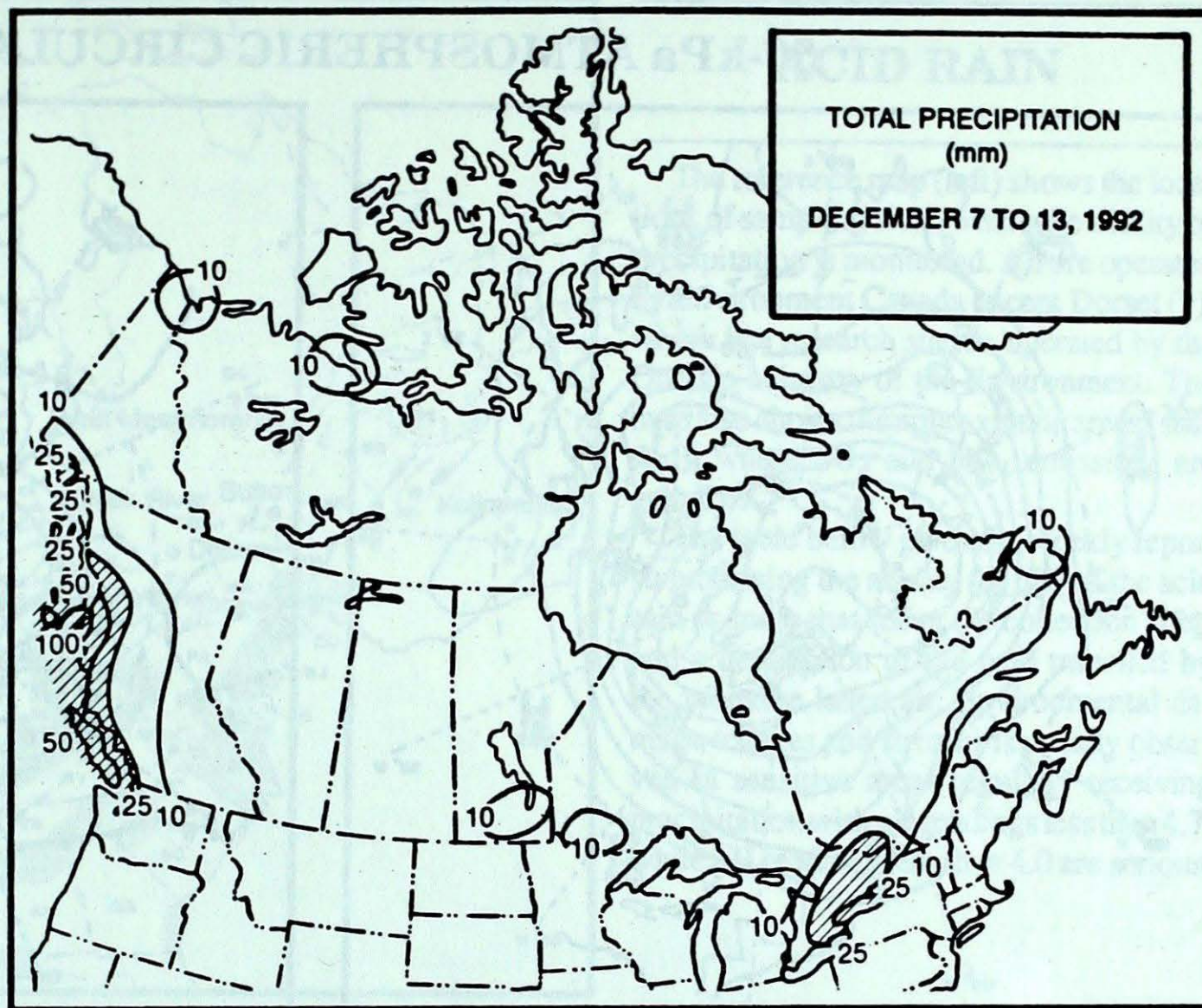
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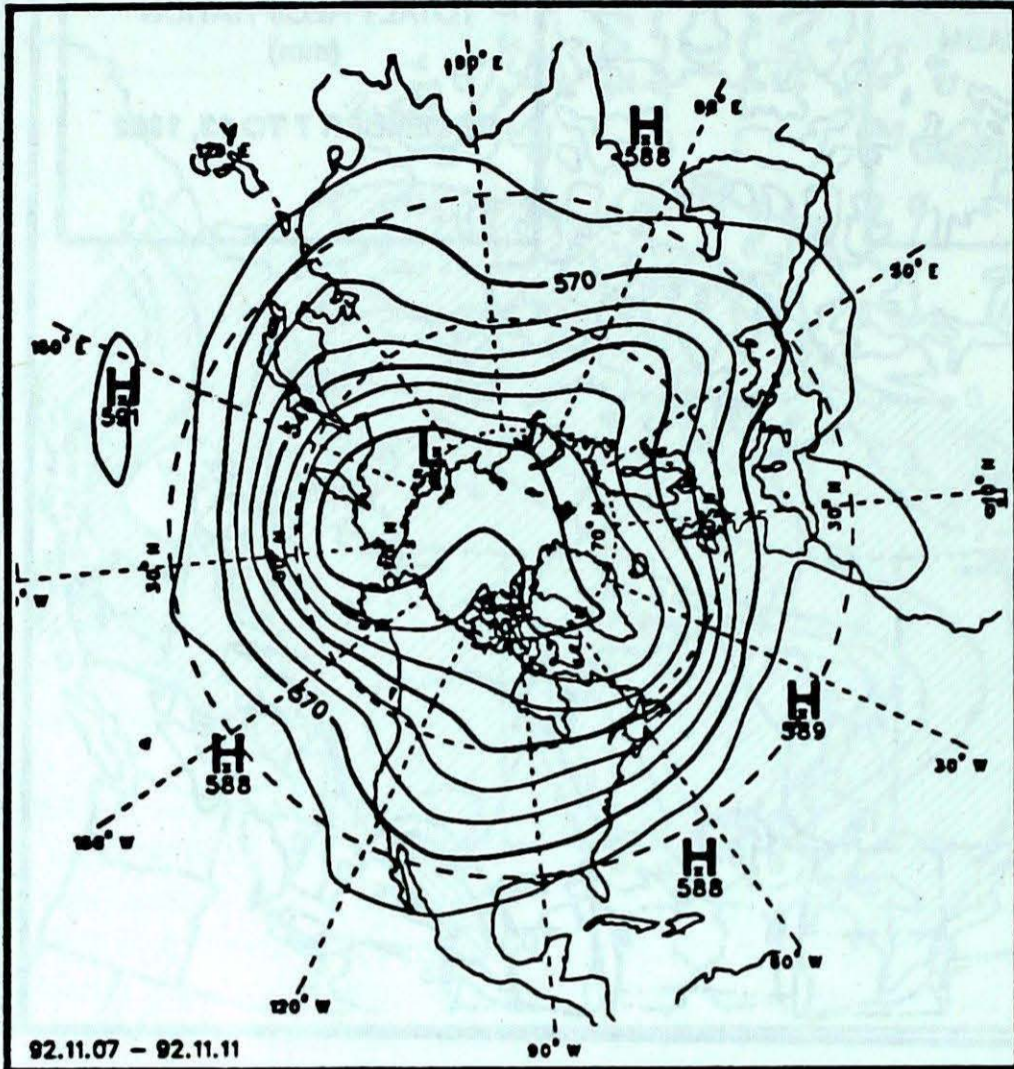
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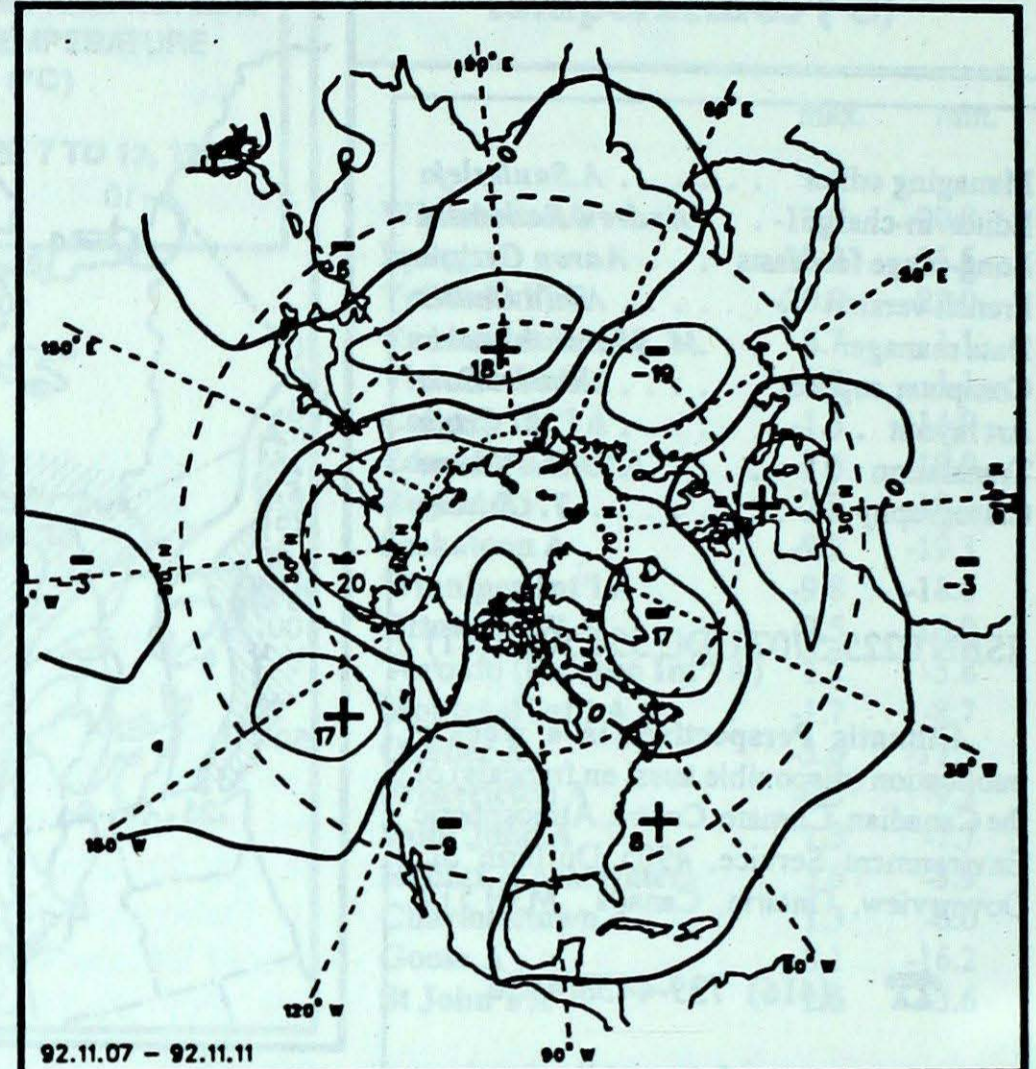
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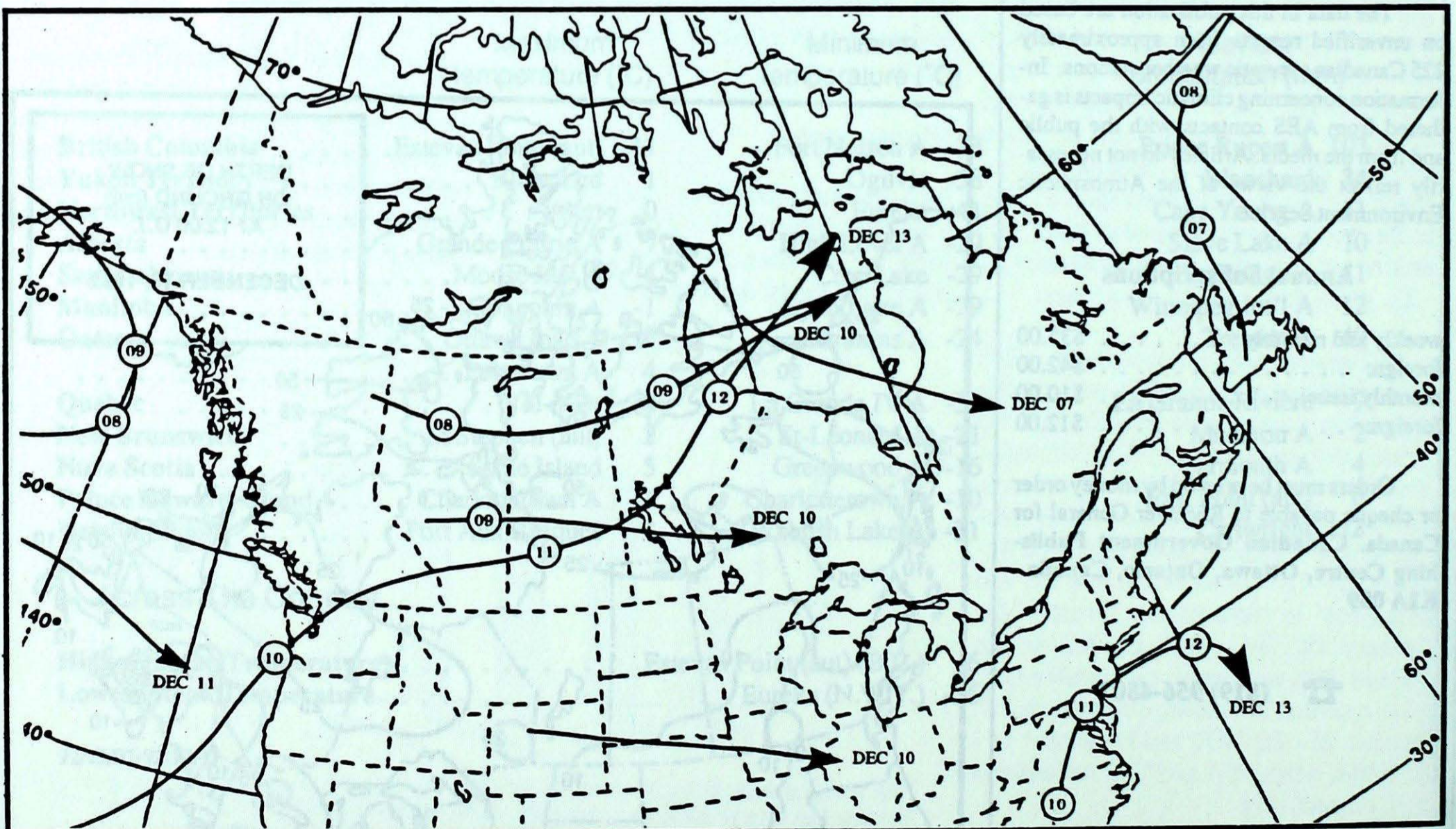
50-kPa ATMOSPHERIC CIRCULATION



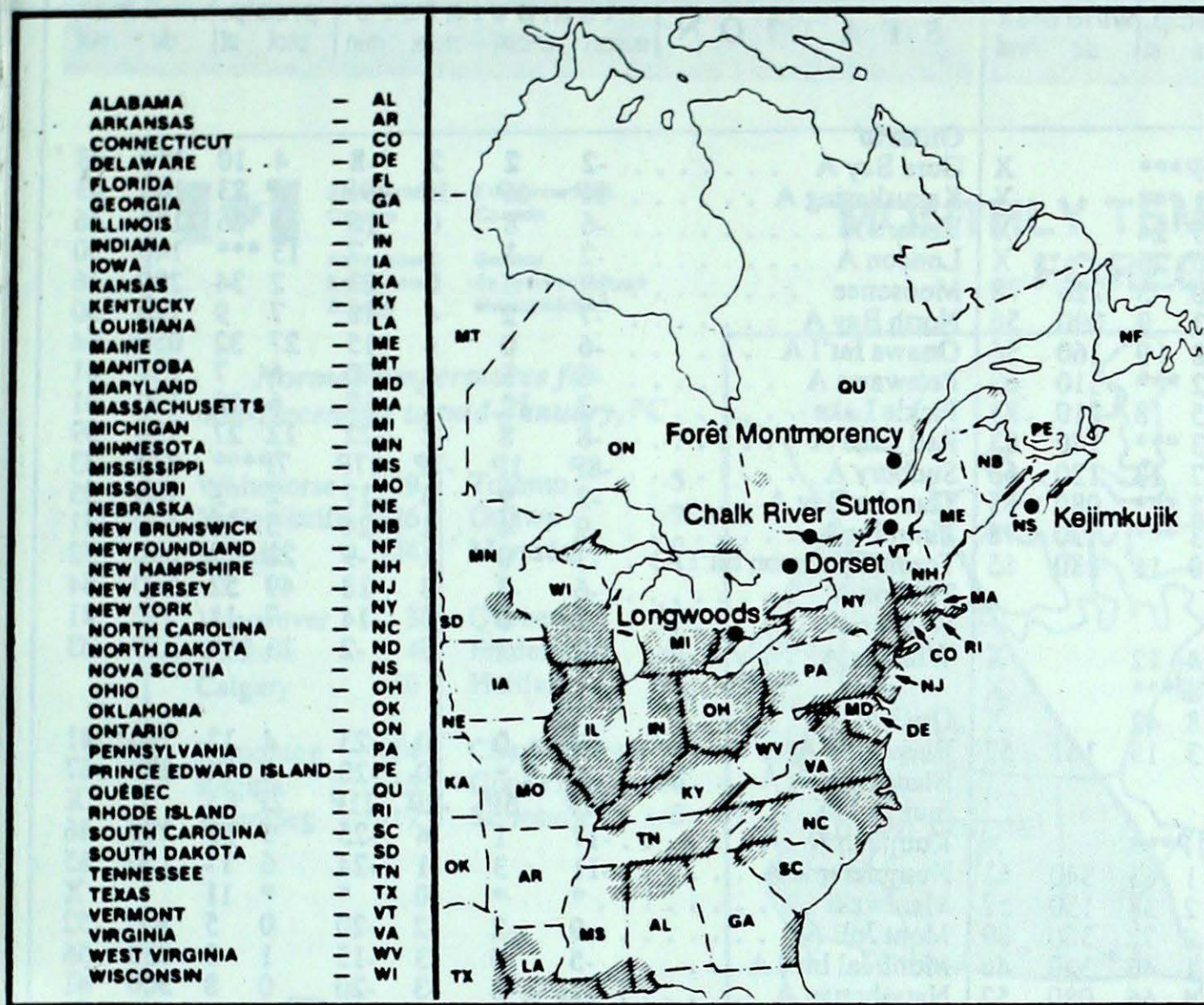
Mean geopotential height
50-kPa level (10 decametre intervals)



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 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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December 6 to 12, 1992

Longwoods				Data not available this week
Dorset *	10	4.8	11 S Pennsylvania, New Jersey, Virginia, west Virginia, Delaware
	11	5.1	3 S New York, New England
Chalk River	10	4.8	4 S New York, Pennsylvania, New Jersey, Delaware
Sutton				
Montmorency	06	4.6	2 S Western Quebec, northern and central Ontario
Kejimikujik	06	4.4	4 S Maine, central Quebec
	07	4.0	5 S Northern New England, southern Quebec

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

STATION	temperature				precip. ptot	st	wind max		STATION	temperature				precip. ptot	st	wind max	
	mean	anom	max	min			dir	vel		mean	anom	max	min			dir	vel
British Columbia								Ontario									
Blue River A	-9P	-1P	-4P	-18P	0P***			X	Gore Bay A	-2	2	2	-8	4	10	150	48
Cape St James	*	*	*	*	***			X	Kapusking A	-9P	5P	-1P	-19P	4P	23	160	43
Cranbrook A	-8	-1	3	-18	15	24		X	Kenora A	-6	8	0	-16	6	26	180	46
Fort Nelson A	-23	-2	-14	-33	0	25		X	London A	-2	1	1	-7	13	***	140	50
Fort St John A	-10	3	5	-22	0	5	220	78	Moosonee	-10	5	0	-23	2	34	290	46
Kamloops A	-4	-1	2	-12	13	9	090	56	North Bay A	-7	2	4	-18	7	9	120	50
Penticton A	-2	-1	2	-8	8	9	160	56	Ottawa Int'l A	-6	0	4	-15	27	32	050	54
Port Hardy A	3	-1	8	-3	62	***	110	69	Petawawa A	-6	3	4	-20	6	7	130	41
Prince George A	-6	1	2	-16	15	8	210	83	Pickle Lake	-7	12	-1	-17	6	18	170	41
Prince Rupert A	3	1	10	-5	103	***	140	83	Red Lake A	-8	8	-2	-22	12	27	130	39
Smithers A	-6	0	6	-14	17	13	120	56	Sudbury A	-8P	1P	-1P	-17P	7P***		310	33
Vancouver Int'l A	4	-1	7	-3	42	***	080	65	Thunder Bay A	-2	9	3	-17	2	3	180	35
Victoria Int'l A	5	1	8	-1	23	***	130	78	Timmins A	-9	4	1	-24	3	25	150	41
Williams Lake A	-6	1	0	-15	10	16	130	65	Toronto(Pearson Int'l A)	-3	0	1	-9	28	25	090	52
Yukon Territory								Québec									
Komakuk Beach A	-26	-2	-19	-34	4	12		X	Bagotville A	-10	0	0	-23	4	12	290	41
Teslin (aut)	-13P	*	-2P	-20P	0P***			X	Blanc Sablon A	-9	*	0	-20	6	14	290	67
Watson Lake A	-24	-1	-15	-33	8	42		X	Inukjuak A	-11P	5P	-2P	-21P	2P	15		X
Whitehorse A	-9	9	-2	-13	3	15	161	57	Kuujuuaq A	-17	1	-4	-25	5	33	270	46
Northwest Territories								New Brunswick									
Alert	-22P	8P	0P	-34P	1P***			X	Fredericton A	-6	-2	1	-19	1	7	300	59
Baker Lake A	-25	3	-17	-32	1	63	340	61	Miscou Island (aut)	-4P	0P	0P	-8P	0P***			
Cambridge Bay A	-27	2	-19	-37	2	38	150	57	Moncton A	-7	-3	1	-18	2	30	040	52
Cape Dyer A	-21	-1	-12	-31	0	72	300	89	Saint John A	-6	-3	1	-16	1	21	030	59
Clyde A	-27	-2	-20	-34	1	46	320	46	Nova Scotia								
Coppermine A	-22	8	-14	-31	4	66	080	52	Greenwood A	-5	-4	3	-16	4	17	040	65
Coral Harbour A	-22	4	-13	-34	4	15	080	52	Shearwater A	-4	-4	3	-12	2	12	040	54
Eureka	-36	-1	-25	-41	1	10		X	Sydney A	-3	-2	3	-8	2	11	270	67
Fort Smith A	-16	6	-3	-24	4	26	160	44	Yarmouth A	-2	-3	4	-11	4	4	310	70
Hall Beach A	-25	3	-14	-35	2	39	310	41	Prince Edward Island								
Inuvik A	-27	1	-21	-37	7	53		X	Charlottetown A	-4	-2	1	-10	3	38	060	46
Iqaluit A	-24	-2	-13	-32	8	12	350	74	East Point (auto)	-4P	*	1P	-7P	6P***			
Mould Bay A	-35	-5	-28	-41	1	21		X	Newfoundland								
Norman Wells A	-27	0	-21	-37	3	18	300	44	Cartwright	-8	1	-1	-17	12	32	300	52
Resolute A	-28	1	-19	-36	1	13		X	Churchill Falls A	-16	3	-6	-30	2	49	300	37
Yellowknife A	-15	9	-5	-23	5	19	150	50	Gander Int'l A	-5	-3	-1	-10	2	22	250	89
Alberta								92/12/07-92/12/13									
Calgary Int'l A	-6	2	7	-17	1	3	270	72	Goose A	-12	0	-3	-24	4	9	340	54
Cold Lake A	-15P	0P	-5P	-23P	5P	16		X	St John's A	-3	-2	1	-7	5	9	250	95
Edmonton Namao A	-9	4	2	-15	8	16		X	St Lawrence	-3	-2	1	-8	3	6		X
Fort McMurray A	-15	3	-2	-22	1	12	110	32	Wabush Lake A	-18P	0P	-4P	-31P	1P	32	300	37
High Level A	-17	6	-5	-29	1	14		X									
Jasper	*	*	0	*	*	7		X									
Lethbridge A	-4	1	5	-16	1	3	250	82									
Medicine Hat A	-5	3	5	-17	1	3	220	57									
Peace River A	-13	3	5	-23	0	3	220	52									
Saskatchewan																	
Cree Lake	-16	9	-8	-29	1	21	200	56									
Estevan A	-8	3	3	-18	0	3	310	52									
La Ronge A	-16	4	-9	-25	11	28		X									
Regina A	-8	5	1	-20	2	12	130	44									
Saskatoon A	-13	2	-5	-21	2	14	120	39									
Swift Current A	-6	4	2	-13	1	3	170	57									
Yorkton A	-11	4	-1	-21	1	11	150	41									
Manitoba																	
Brandon A	-12	3	-4	-22	3	***	140	35									
Churchill A	-15	7	-5	-25	9	22	330	65									
Lynn Lake A	-20	5	-13	-29	7	24		X									
The Pas A	-14	4	-8	-22	7	18	120	44									
Thompson A	-18	5	-7	-28	11	24		X									
Winnipeg Int'l A	-11	4	-3	-19	12	20	170	57									

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.



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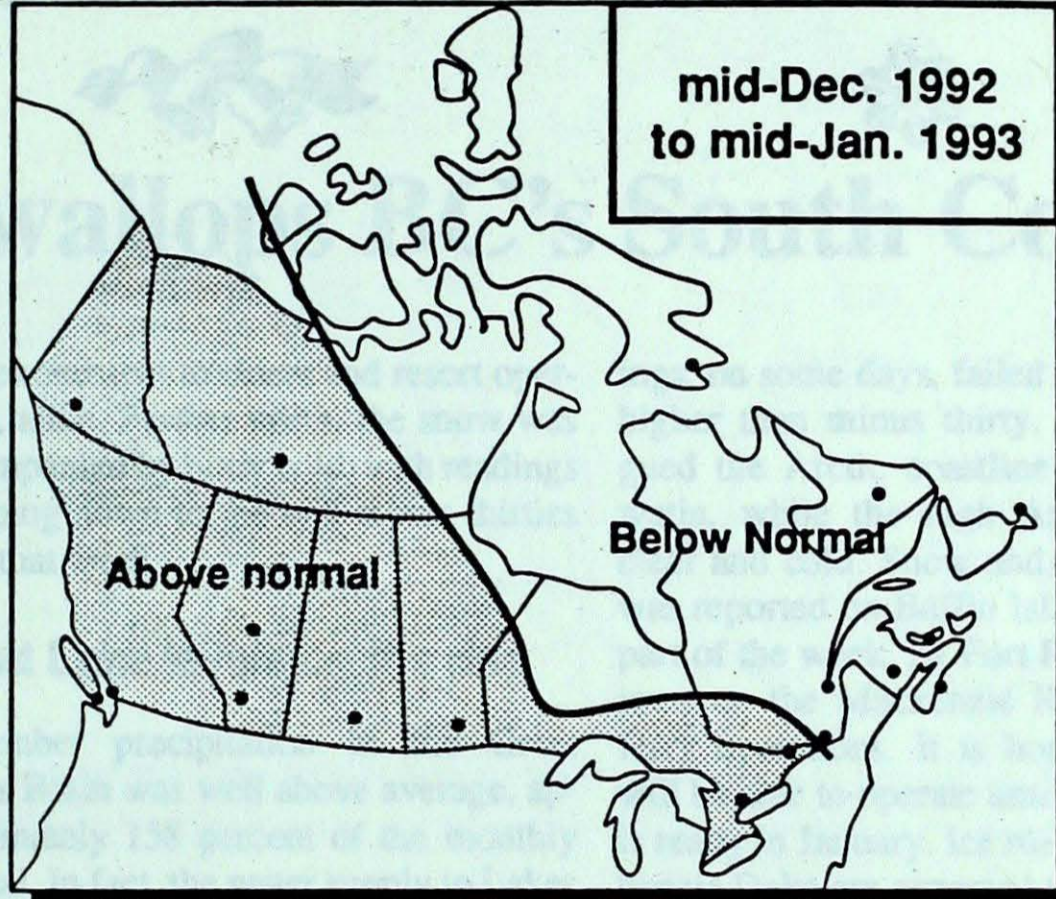
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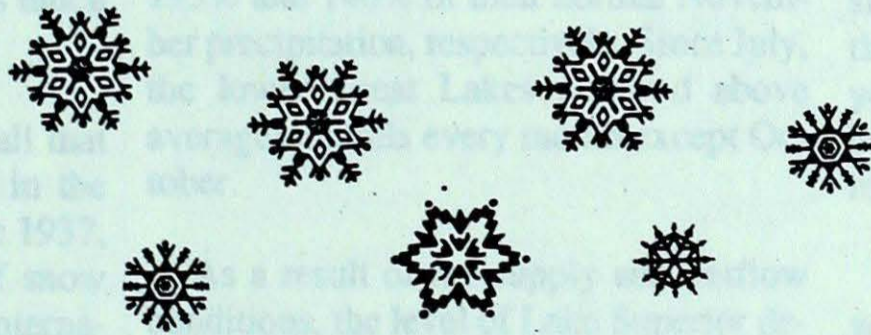
MONTHLY TEMPERATURE FORECAST

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



Canada



time the snow had tapered off, or changed to rain over the weekend, as much as 70 to 40 centimetres of snow briskly covered the Greater Vancouver area and the upper Fraser Valley, making this the worst snowfall event of the season. Portions of north Vancouver Island received as much as 60 cm.

Events such as this are not all that unusual in Vancouver, especially in the higher elevations of the city. Since 1937, there have been 22 occurrences of snow events greater than 15 cm at the International Airport, which is located near sea level. The most recent were on January 7, 1991 and December 30, 1990, when 19 and 30 centimetres fell, respectively. The worst snowstorm ever reported at Vancouver occurred on December 30, 1965, when 31.2 cm covered the ground. One consideration is that the snow cover usually does not last very long.

In the northern interior, after several years of light snowfalls, 20 cm of snow fell over the weekend. This result is near normal winter weather brought consider-

able snow was very close to the previous record high, established in the mid-eighties.

According to preliminary reports, the Lakes Superior, Michigan/Huron, Erie and Ontario basins received 90%, 100%, 150% and 140% of their normal November precipitation, respectively. In July, the Lake Superior basin received 100% of its normal precipitation, while the levels of the other Great Lakes all rose during the month, with that decline, as they would normally do this month. Lakes Huron and Erie were 13 and 41 centimetres higher than they were one year ago.

Elsewhere...

A bitterly cold air mass covered Canada's north, with minimum temperatures dropping to the minus fifties. Even in the more southern regions, minimum read-

ings were in the minus thirties. Even the Prairies got a true taste of winter, as temperatures plunged to new record low values. Light snowfalls were reported in a number of districts.

In Ontario, bursts of late-after snow showers dumped between 20 to 40 centimetres east of Georgian Bay. With the snow almost over, a new heavy fall was of light snowfall will be at or near record low values in southern Ontario.

Atlantic Canada was smothered but wet, with many areas receiving 30 to 50 centimetres of precipitation. Daily record minima were also reported along the west coast of Newfoundland, where a snowstorm blew.

A look ahead...

For the week of December 13, heavy snow and temperatures are expected east of Manitoba and most of the Northwest Territories. Above normal readings are likely in the west. Trends of weather will prevail across southern Ontario and Quebec.