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VOL 5 ISS 50  
CLIMATIC PERSPECTIVES

# Climatic Perspectives

A WEEKLY REVIEW OF CANADIAN CLIMATE

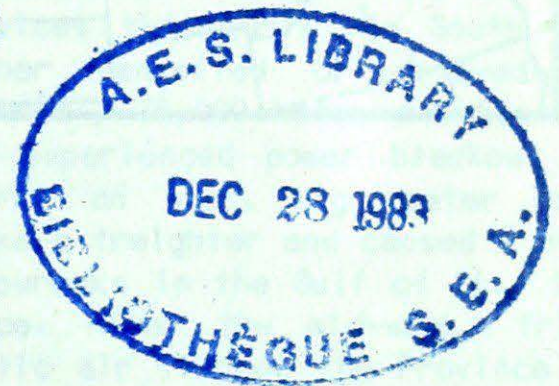
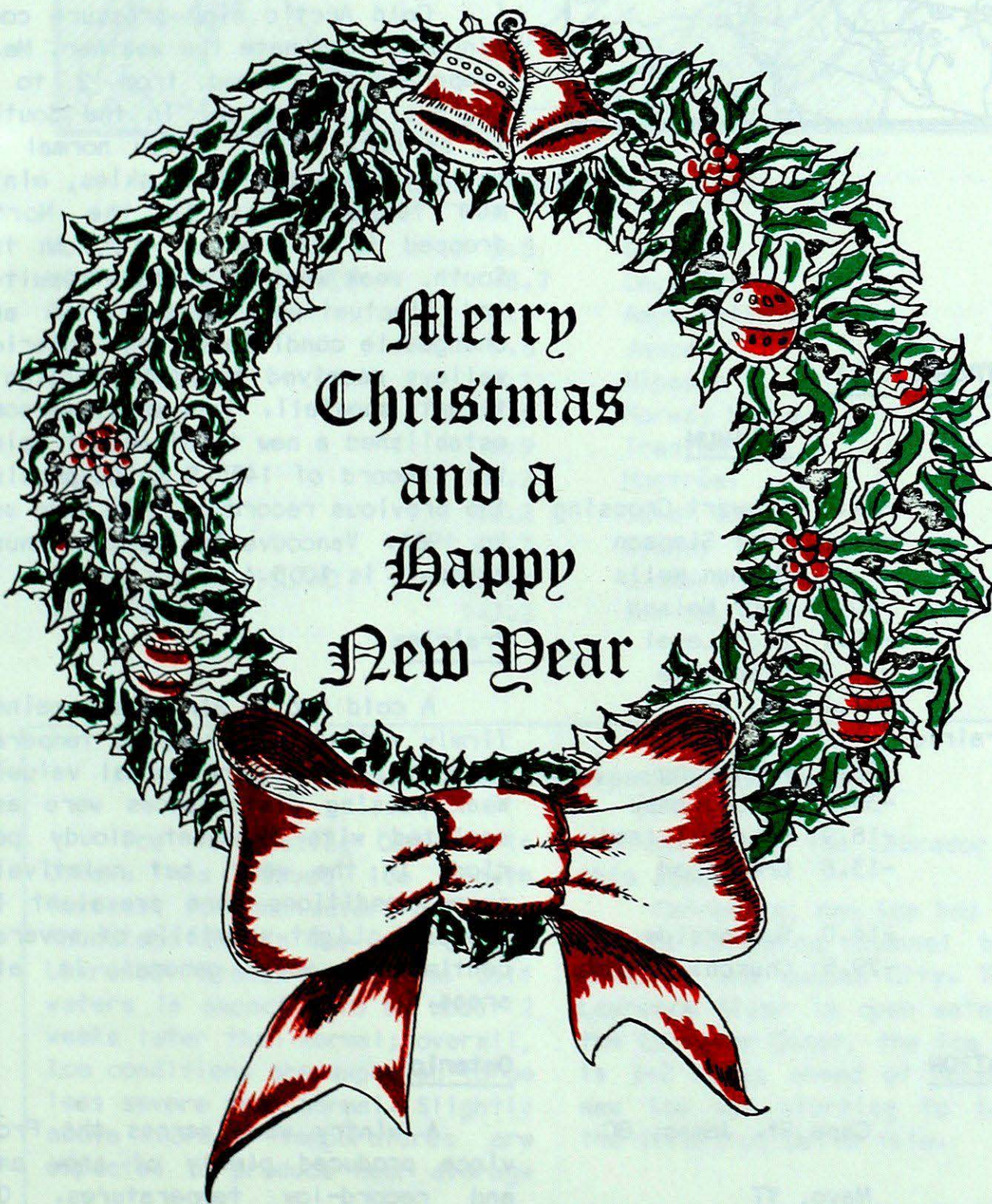
DECEMBER 16, 1983

(Aussi disponible en français)

VOL.5 NO.50

FOR THE PERIOD DECEMBER 6 TO 12, 1983

- ***Frigid weather keeps Santa cold Brrrr...***
- ***Winter storm whitens most of eastern Canada***



- **Dreaming of a White Christmas ?**

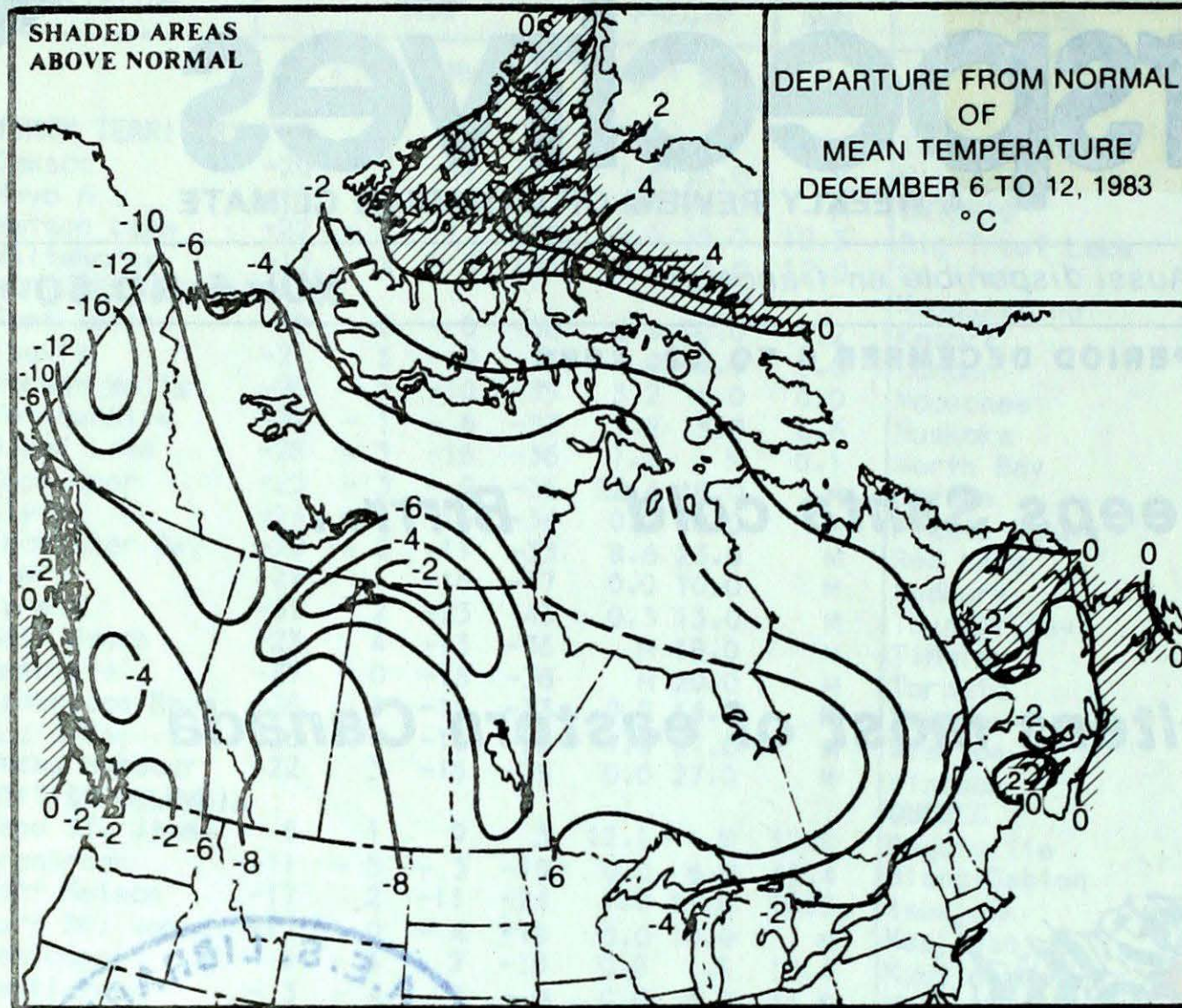
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NOTE: The data shown in this publication are based on unverified reports from approximately 225 Canadian synoptic stations.

Canada



**ACROSS THE COUNTRY...**



**Yukon and Northwest Territories**

The first major outbreak of the Arctic air this season produced bitterly cold temperatures in the Yukon and the Mackenzie District. The readings plummeted to near -50° in the central Yukon. Old Crow and Oglivie experienced minimums of -40 to -44 degrees, while at Stewart Crossing, the temperatures fell to a bone-chilling -49°. The extreme cold has accelerated freeze-up of large lakes in the Yukon. Once again this week, precipitation was light across the North; only Baffin Island had snowfall of 20 to 40 cm. A thin cover of snow (5 cm) remained on the ground at Whitehorse.

**British Columbia**

Cold Arctic high pressure continued to dominate the weather. Mean temperatures ranged from 2 to 6 degrees below normal in the South, to as much as 10° below normal in the North. Under clear skies, minimum temperatures in the North dropped to as low as -41°. In the South, weak weather systems resulted in fluctuating temperatures and changeable conditions. Many interior valleys received their first significant snowfall. Vancouver airport established a new total annual rainfall record of 1435.8 mm surpassing the previous record of 1435.0 mm set in 1981. Vancouver's normal annual rainfall is 1055.4 mm.

**Prairies**

A cold Arctic air mass remained firmly entrenched, keeping temperatures well below the normal values. Weak passing disturbances were associated with frequent cloudy periods in the west, but relatively sunny conditions were prevalent in the east. Light snowfalls of several centimetres were general in all areas.

**Ontario**

A wintry week across the Province produced plenty of snow and record-low temperatures. On December 6, a major winter storm swept into Ontario from Oklahoma and

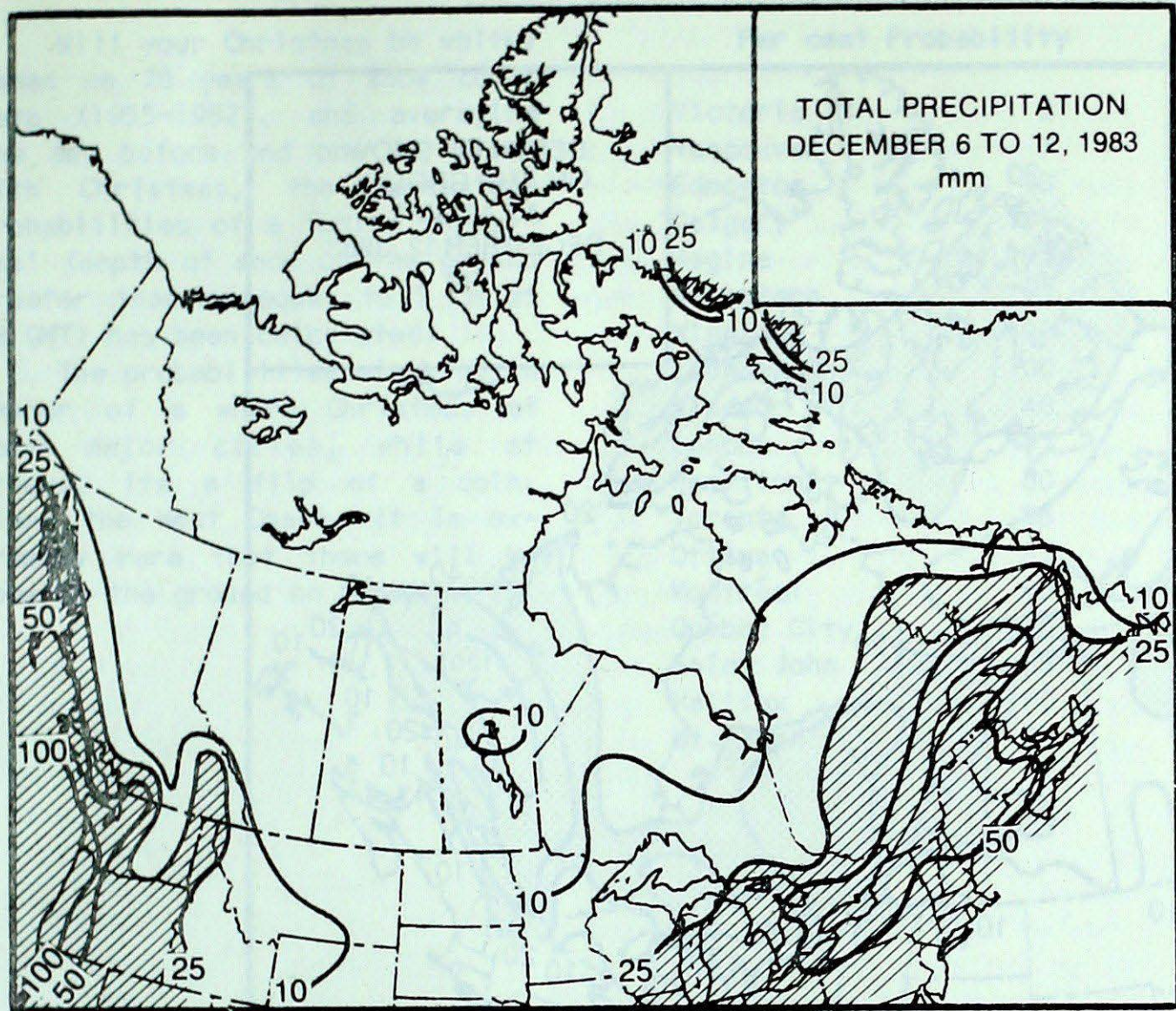
**WEEKLY TEMPERATURES EXTREMES (°C)**

	<u>MAXIMUM</u>		<u>MINIMUM</u>	
YUKON TERRITORY	-8.2	Burwash	-49.0	Stewart Crossing
NORTHWEST TERRITORIES	-7.7	Cape Dyer	-41.2	Fort Simpson Norman Wells
BRITISH COLUMBIA	18.3	Cape Scott	-40.7	Fort Nelson
ALBERTA	0.8	Lethbridge	-40.1	High Level
SASKATCHEWAN	-6.1	Estevan	-37.8	Cree Lake
MANITOBA	7.0	Dauphin	-41.1	Gillam
		Portage La Prairie		
ONTARIO	6.7	Windsor	-38.2	Armstrong
QUEBEC	16.8	Natashquan	-35.7	Chibougamau
NEW BRUNSWICK	12.7	Moncton	-18.9	Miscou Island
NOVA SCOTIA	13.7	Truro	-13.6	Greenwood
PRINCE EDWARD ISLAND	11.1	Summerside	-14.0	Summerside
NEWFOUNDLAND	9.8	St. John's	-29.5	Churchill Falls

**ACROSS THE NATION**

Warmest mean temperature	6.4	Cape St. James, BC
Coollest mean temperature	-41.0	Mayo, YT





**HEAVIEST WEEKLY PRECIPITATION (mm)**

YUKON	3.8	Burwash
NORTHWEST TERRITORIES	48.7	Cape Dyer
BRITISH COLUMBIA	108.5	Amphitrite Point
ALBERTA	9.8	Jasper
SASKATCHEWAN	8.1	Nipawin
MANITOBA	14.6	Norway House
ONTARIO	78.9	Trenton
QUEBEC	79.2	Montréal
NEW BRUNSWICK	54.2	Saint John
NOVA SCOTIA	63.3	Sydney
PRINCE EDWARD ISLAND	27.4	Summerside
NEWFOUNDLAND	143.2	St. Lawrence

**Near Normal Ice Growth Expected This Season**

Ice forecasting Central in Ottawa has issued ice growth forecast for the waters off Newfoundland and in the Gulf of St. Lawrence. Freeze-up in the Gulf waters is expected to be about 2 weeks later than normal; overall, ice conditions are expected to be less severe than normal. Slightly above normal temperatures are expected to produce near average

ice cover off the Labrador Coast this season.

Currently, new ice has formed in the shipping channel between Montréal and Québec City. The St. Lawrence River is open water. Off the Labrador Coast, the ice growth is 1-2 weeks ahead of normal and new ice was starting to form in the Strait of Belle Isle.

dumped 20 to 40 cm of snow. Drifting snow driven by strong winds severely restricted visibilities in many areas across central Ontario. In the North, falls were generally light and in the South, rain combined with snow created treacherous roads. Afterwards, frigid Arctic air covered the Great Lakes basin and the temperatures plunged to record-low values. In northern Ontario, overnight readings of -35 to -38 degrees were common.

Ample snow in the lee of the Great Lakes allowed almost all ski resorts to open for the season.

**Québec**

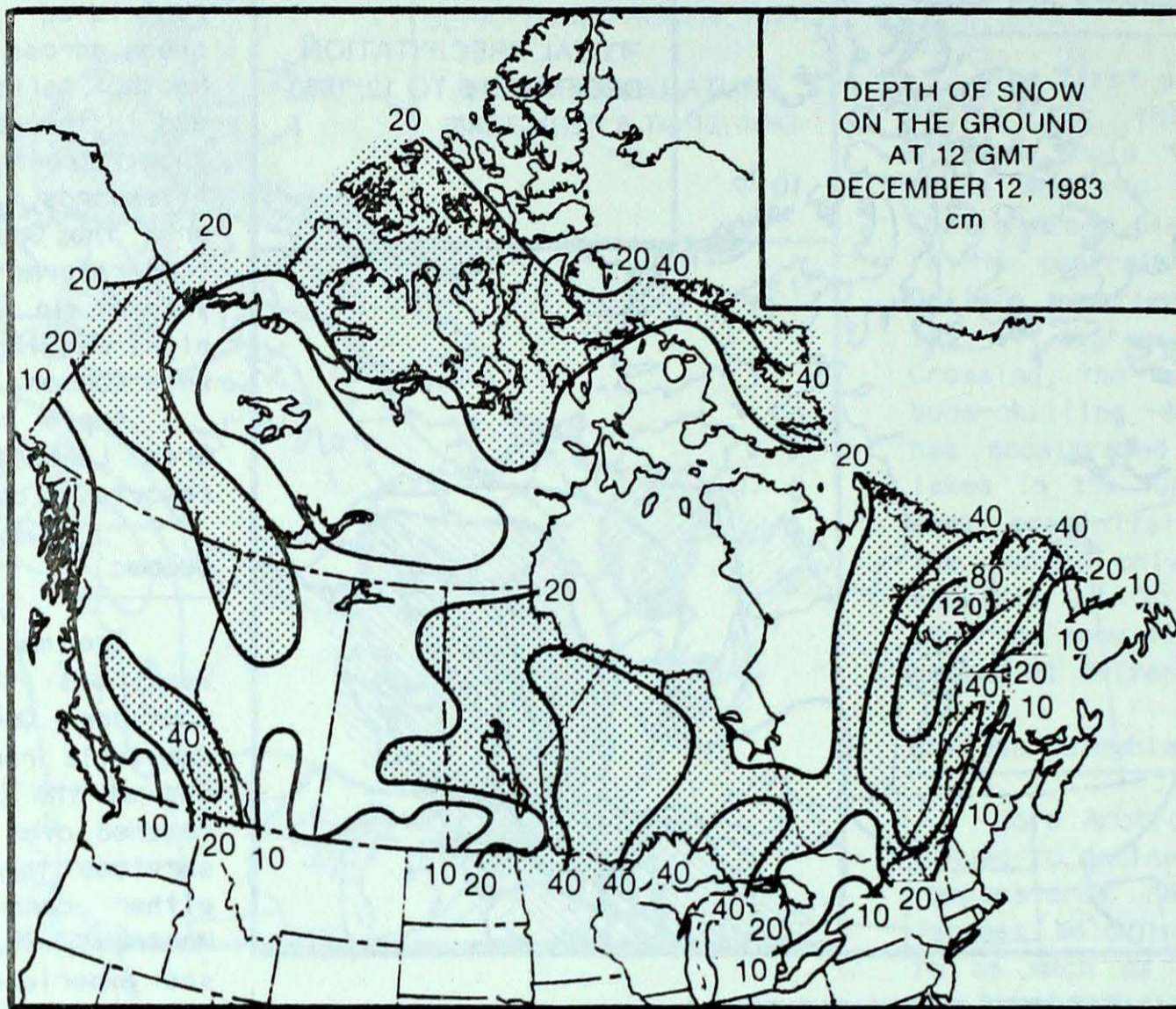
The main weather event of the week was the storm that struck southern Québec on December 6. Snowfalls ranged from 25 to 42 cm, and at the peak of the storm winds reached over 100 km/h. Air and rail services throughout the South were either cancelled or delayed. In Montréal, 75,000 homes and businesses experienced power blackout for nearly an hour. High water waves broke a freighter and caused 2 other shipwrecks in the Gulf of St. Lawrence. After the mid-week, frigid Arctic air flooded the Province and the temperatures dropped to -20 to -35 degrees.

**Atlantic Provinces**

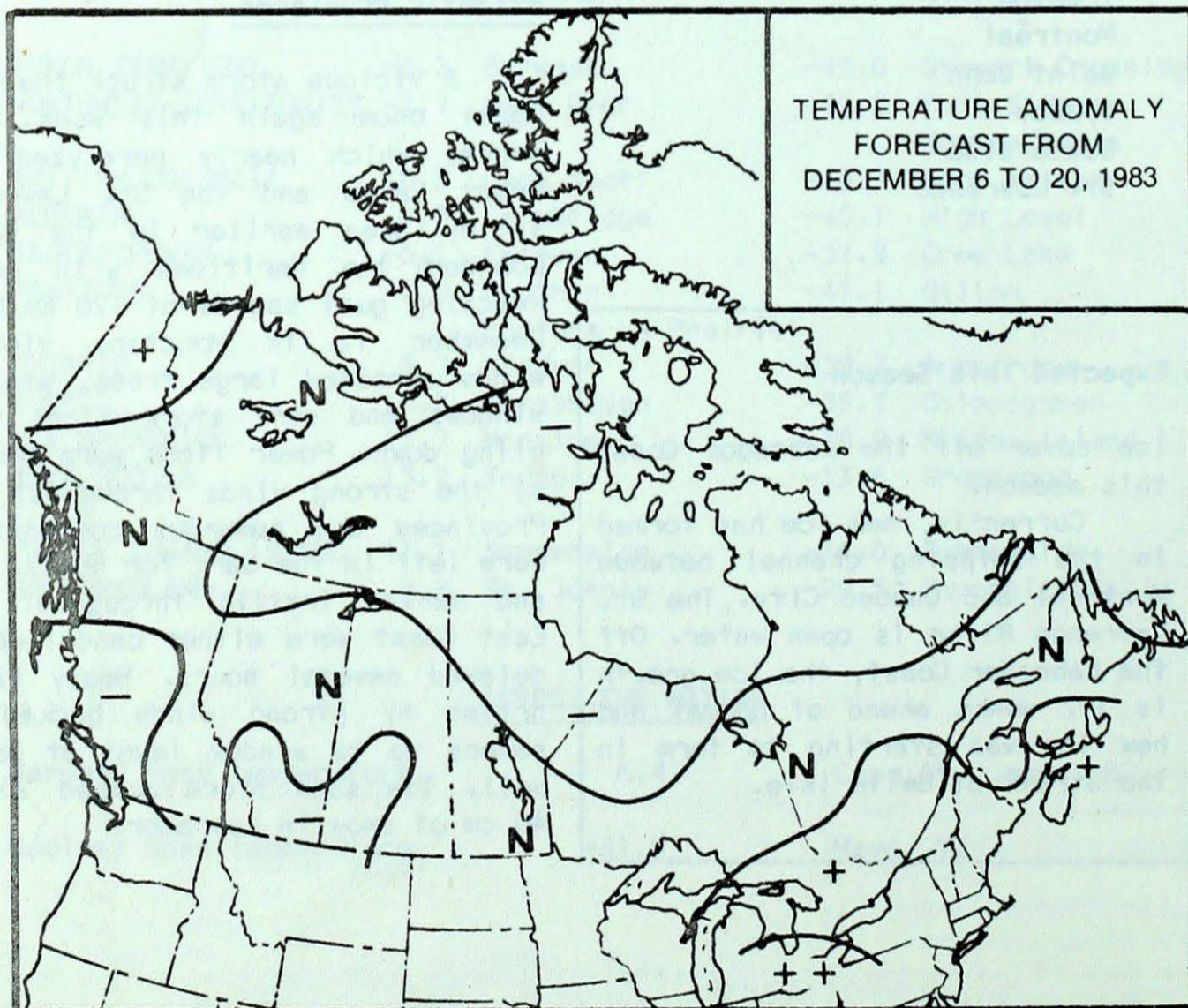
A vicious storm struck the East Coast once again this week. The storm, which nearly paralyzed the Great Lakes and the St. Lawrence Valley area earlier in the week, pounded the Maritimes with gales reaching gust speeds of 120 km/h on December 7. In Moncton, violent winds uprooted large trees, smashed windows and sent store signs tumbling down. Power lines were broken by the strong winds throughout the Provinces and numerous communities were left in the dark for hours. Air and marine traffic throughout the East Coast were either cancelled or delayed several hours. Heavy rains driven by strong winds backed up sewers up to window level at Campbell. The same storm dumped 25 to 40 cm of snow in Labrador.



## 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



**Probabilities of 'White Christmas' at Major Canadian Cities**

Will your Christmas be white? Based on 28 years of snow cover data (1955-1982), and averaging one day before and one day after with Christmas, the percentage probabilities of a 'white Christmas' (depth of snow on the ground greater than or equal to 2 cm at 12 GMT) has been calculated.

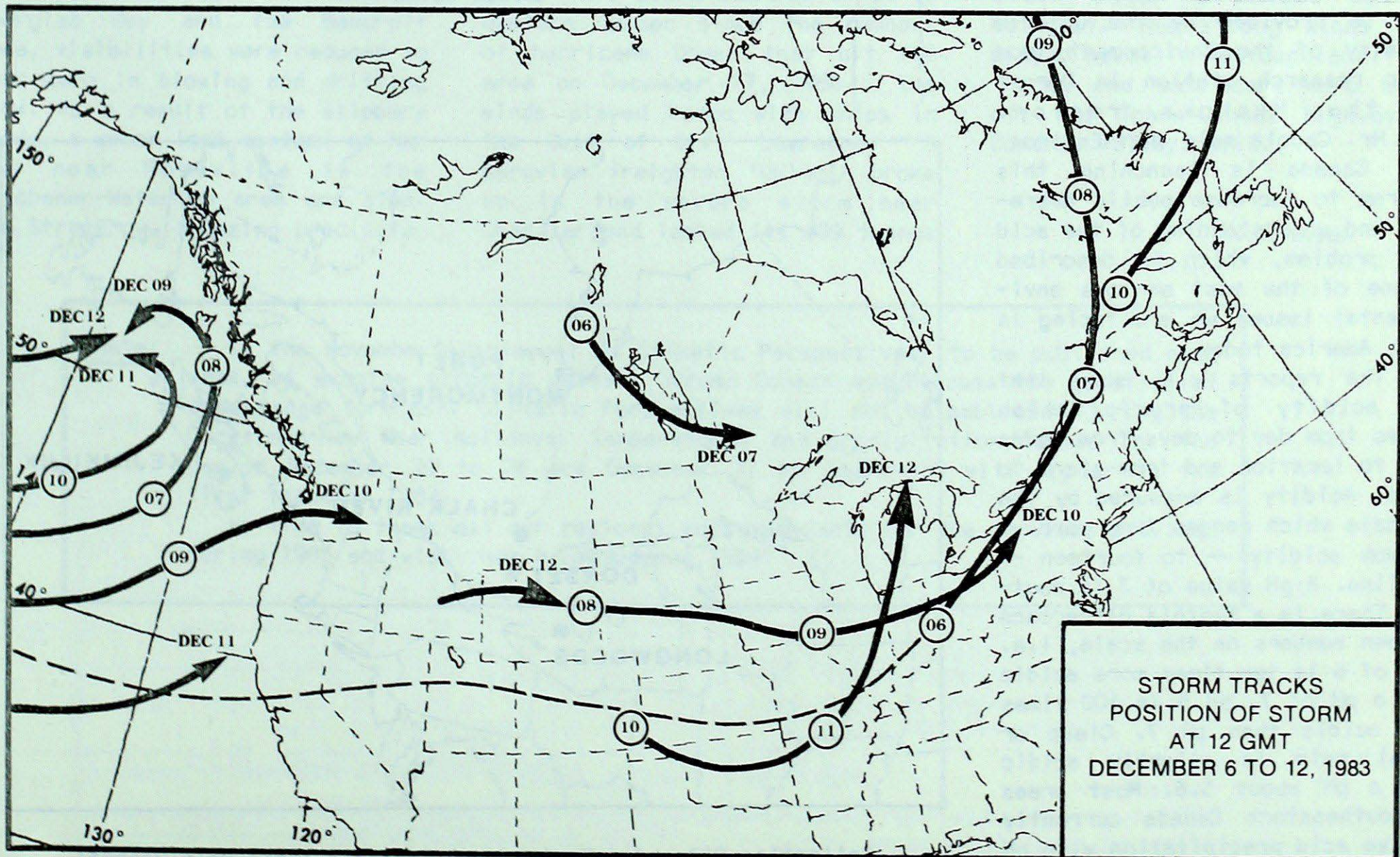
The probabilities stack up in favour of a white Christmas at many major cities, while at others, its a flip of a coin. Along the West Coast, it is extremely rare that there will be snow on the ground on December 25.

**Per cent Probability**

Victoria	2
Vancouver	7
Edmonton	98
Calgary	65
Regina	93
Saskatoon	100
Winnipeg	100
Thunder Bay	100
Windsor	48
London	73
Hamilton	60
Toronto	56
Ottawa	82
Montréal	80
Québec City	100
Saint John	68
Halifax	50
St. John's	62



**STORM TRACKS**





**Weekly Acid Rain Bulletin Issued by Environment Canada**

Beginning with the first issue in 1984, Climatic Perspectives will carry a new type of weather bulletin issued by Environment Canada: weekly acid rain or snow reports. Charles Caccia, Federal Minister of the Environment, announced the program in Ottawa on December 6.

These weekly reports, also to be issued to the wire services every Tuesday, will summarize the acidity or pH of the rain or snow that fell at five locations in eastern Canada during the preceding seven days. In addition, the bulletins will include a description of the movements of the weather systems that produced the rain or snow and will demonstrate how weather systems which have passed over areas of highest sulphur dioxide emissions end up creating precipitation of highest acidity.

Four of the collection sites are part of Environment Canada's air and precipitation monitoring network: Longwoods in southwestern Ontario, Chalk River in the Ottawa Valley, Forêt Montmorency near Québec City and Kejimikujik National Park in Nova Scotia. Data will also be provided by the Ontario Ministry of the Environment from their research station in Dorset in the Muskoka region.

Mr. Caccia said that Environment Canada is launching this program to increase public awareness and understanding of the acid rain problem, which he described as one of the most serious environmental issues we are facing in North America today.

The reports will show that the acidity of precipitation varies from day to day, from location to location and from storm to storm. Acidity is measured by the pH scale which ranges from zero -- maximum acidity -- to fourteen -- alkaline. A pH value of 7 is neutral. There is a tenfold difference between numbers on the scale, i.e. a pH of 6 is ten times more acidic than a pH of 7, pH 5 is 100 times more acidic than pH 7. Clean or normal rain is slightly acidic with a pH about 5.6. Most areas of southeastern Canada currently receive acid precipitation with pH values averaging between 4.2 and 4.5

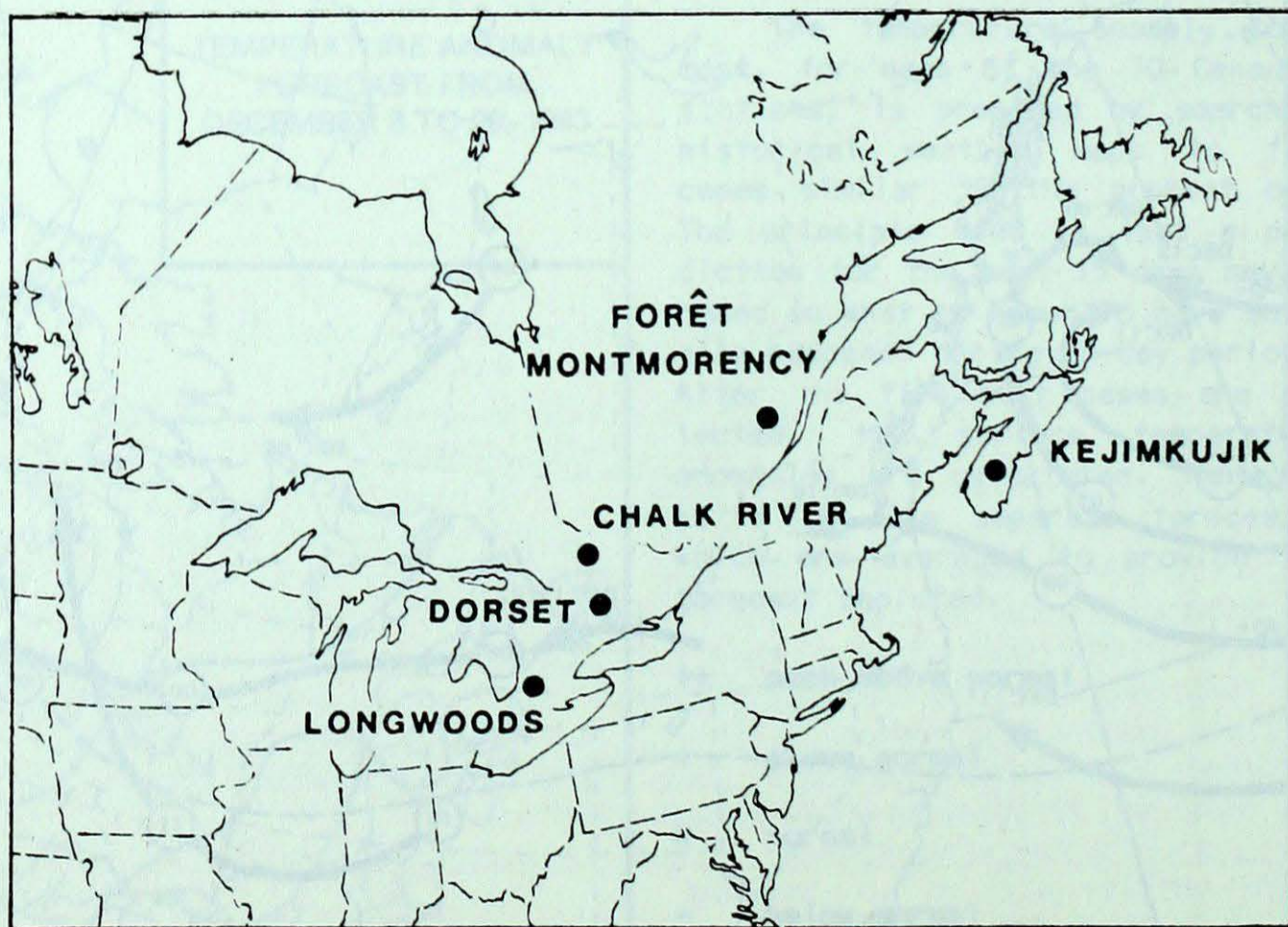
Environmental damage to aquatic life, vegetation and soil is observed in sensitive areas regularly receiving precipitation with pH values less than 4.7. The effects of acid rain are generally cumulative and no one event, even

though considered strongly acidic, can constitute immediate danger to human health or property.

For further information please contact Dr. Hans Martin.  
Telephone: (416) 667 4803

**pH SCALE**

a	11.0	Ammonia
l		
k	10.5	Milk of Magnesia
a		
l	8.3	Sea Water
l		
n	8.2	Baking Soda
e		
.....		
	7.0	Neutral-Distilled Water
.....		
	6.6	Milk
	5.6	Normal Rain
a.....		
c		
l	4.2-4.5	Average pH of rain in south - eastern Canada
a		
d		
c	2.2	Vinegar
l		
d	2.0	Lemon Juice
a		
l		
n		



Collection Sites for Environment Canada's 'Acid Rain Report'



### Major Winter Storm in Eastern Canada

- Shipwreck in the Gulf Waters -
- Cities snow clogged -
- Millions spent to clean up -
- several lives lost -

Heavy snow driven by gales reaching gust speeds of 120 km/h lashed eastern Canada from Ontario to Newfoundland on the 6th and 7th of December. An intense storm which grew as it swept up into Canada from the U.S. nearly paralyzed Ottawa with heavy snow, caused shipwreck in the Gulf of St. Lawrence, produced power blackouts from the Ottawa Valley to the East Coast and claimed at least 5 lives. In Ottawa, about 24 cm of snow and winds of 75 km/h kept the airport closed for many hours. Treacherous roads caused bottlenecks on major streets and contributed to at least 250 traffic accidents. A Renfrew woman died when the car in which she was a passenger slid into the path of a truck, and a 76-year old man died while shovelling snow outside his home. Statistically, this storm was the worst in 5 years in the Ottawa area, dumping the heaviest snow since January 21, 1979. It cost Ottawa about \$2 million to clean up. In southern Georgian Bay and the Bancroft area, visibilities were reduced to near zero in blowing and drifting snow. As a result of the slippery roads, a woman lost control of her car near Roseville in the Kitchener-Waterloo area and died. In Strathroy, freezing precipita-

tion iced up and snapped utility lines leaving about 4,000 homes without power.

The storm then moved eastward and pounded southern Québec by violent winds. In Montréal, 25 cm of snow increased the seasonal snowfall to 110 cm, which is more than the combined total for last winter. Most air and rail transportations were disrupted and many stores and schools were closed. Some 75,000 homes and businesses were without power for about an hour. Slippery roads were responsible for a fatal collision between a truck and two busses in which the truck driver was killed and 14 passengers were injured. About 20 families in the Matane-St. Anne des monts area had to be rescued from their shore line houses. Poor visibilities in the blowing snow contributed to a fatal accident near Roberval, the driver of a car died when his vehicle collided with a train. In property loss and public disruption, this storm was the worst in eastern Québec since the remnant of hurricane Donna that hit the area on December 17, 1960. The winds played havoc with ships in the Gulf of St. Lawrence. A Peruvian freighter 'Unisol' broke up in the severe storm near Chandler and leaked its 609 tonnes

of diesel fuel. Thirty five crew members were removed to safety by helicopter. An oil slick several square kilometres wide polluted the harbour possibly threatening aquatic life in the area. High water waves caused another tanker 'Irving Eskimo' to spill 1,000 barrels of Bunker C oil into the Gulf waters. Yet another vessel 'Allegra F' ran aground about 300 metres off Bale-Comeau. Later, high waters lifted it back to the sea. A small unmanned vessel overturned and sank near Les Escoumins during the storm. On December 7, the same storm struck the East Coast with fury. Deluges of rains and 100 km/h winds toppled utility poles and traffic signs. Communities throughout New Brunswick experienced power failure. Air and ferry services throughout the Maritimes came to a halt. In Beresford N.B., storm surges washed out about 500 metres of roads and damaged cottages. A 6-year old girl died when she was blown under a school bus at Bathurst. The strong winds also played havoc in Newfoundland. Two trucks and some cars were blown off the Trans-Canada Highway at Cordroy Valley, Nfld.

A. Shabbar

#### Note:

In the November supplement of Climatic Perspectives, to be published next week, we examine climatic pattern across Canada and discuss the question of long range forecast. Climatic Perspectives will not be published during the Christmas-New Year holidays. Temperatures and precipitation tables for the period December 20 to 26 and December 27 to January 2 will appear in the first issue of 1984.

We like to thank all our regional correspondants for the services provided during 1983 and wish them a prosperous 1984.



TEMPERATURE, PRECIPITATION AND BRIGHT SUNSHINE DATA FOR THE WEEK ENDING 0600 GMT DECEMBER 13, 1983

STATION	TEMP				PRECIP		SUN	STATION	TEMP				PRECIP		SUN
	Av	Dp	Mx	Mn	Tp	SOG	H		Av	Dp	Mx	Mn	Tp	SOG	H
<b>YUKON TERRITORY</b>								Thompson	-27	-5	-17	-39	3.8	29.0	10.7
Dawson	-39	-13	-23	-46	0.0	34.0	M	Winnipeg	-19	-7	-10	-28	3.0	6.0	17.6
Mayo A	-41	-18	-19	-48	0.0	23.0	M	<b>ONTARIO</b>							
Watson Lake	-32	-10	-12	-45	1.9	16.0	6.5	Big Trout Lake	-25	-7	-16	-36	4.9	45.0	M
Whitehorse	-26	-10	-10	-38	M	5.0	6.1	Earlton	-16	-6	-3	-32	M	18.0	M
<b>NORTHWEST TERRITORIES</b>								Kapuskasing	-22	-11	-10	-35	7.8	25.0	M
Fort Smith	-27	-7	-15	-38	M	11.0	0.4	Kenora	-18	-6	-8	-29	7.6	37.0	M
Inuvik	-31	-5	-22	-39	1.8	42.0	0.0	London	-3	-1	5	-14	62.0	10.0	8.6
Norman Wells	-33	-7	-22	-41	0.6	9.0	6.1	Moosonee	-21	-9	-9	-33	8.2	12.0	24.8
Yellowknife	-29	-7	-20	-38	1.4	5.0	5.2	Muskoka	-7	-2	2	-24	42.1	25.0	M
Baker Lake	-29	-5	-23	-37	1.6	20.0	0.0	North Bay	-12	-5	2	-22	18.1	11.0	4.4
Cape Dyer	-22	-1	-8	-35	48.7	130.0	M	Ottawa	-8	-3	1	-19	63.1	26.0	8.6
Clyde	-20	4	-12	-29	27.2	78.0	M	Pickle Lake	-22	-6	-11	-34	11.8	48.0	M
Frobisher Bay	-22	-2	-9	-31	2.0	26.0	7.9	Red Lake	-20	-7	-10	-36	6.9	47.0	22.6
Alert	-28	1	-21	-36	1.2	10.0	M	Sudbury	-13	-4	2	-23	24.3	13.0	10.9
Eureka	-35	0	-29	-39	M	13.0	M	Thunder Bay	-15	-5	-1	-27	21.3	14.0	24.6
Hall Beach	-28	-2	-15	-36	0.8	20.0	M	Timmins	-21	-9	-8	-34	21.6	28.0	M
Resolute	-25	2	-17	-34	M	20.0	M	Toronto	-3	-2	4	-14	42.4	5.0	M
Cambridge Bay	-26	1	-20	-39	1.8	17.0	0.0	Trenton	-5	-2	5	15	78.9	9.0	M
Mould Bay	-29	0	-24	-35	0.0	25.0	M	Warton	-4	-2	4	-11	52.8	26.0	6.5
Sachs Harbour	-28	-3	-22	-36	0.9	20.0	M	Windsor	-1	-1	7	-8	43.4	6.0	M
<b>BRITISH COLUMBIA</b>								<b>QUEBEC</b>							
Cape St. James	6	1	9	3	24.9	M	M	Bagotville	-12	-3	-1	-28	52.4	46.0	M
Cranbrook	-8	-1	0	-22	14.6	24.0	17.2	Blanc-Sablon	-7	1	3	-20	36.4	14.0	10.7
Fort Nelson	-29	-9	-14	-41	2.7	13.0	M	Inukjuak	-17	-3	-12	-26	3.0	15.0	10.8
Fort St. John	-22	-10	-6	-35	2.3	14.0	M	Kuujuuaq	-15	-1	-4	-25	8.0	12.0	12.5
Kamloops	-4	-2	1	-8	8.1	7.0	14.0	Kuujuuarapik	-15	-4	-7	-26	12.4	19.0	10.2
Penticton	0	-1	3	-8	12.9	15.0	M	Manawaki	-10	-2	1	-24	48.6	13.0	9.8
Port Hardy	3	-1	7	-5	50.5	M	11.6	Mont-Joli	-7	-2	2	-17	44.7	41.0	M
Prince George	-11	-5	0	-22	2.7	11.0	4.7	Montréal	-7	-2	2	-19	79.2	23.0	13.2
Prince Rupert	0	-3	6	-10	45.8	2.0	6.8	Natashquan	-3	3	17	-20	54.2	21.0	M
Revelstoke	-3	3	3	-9	49.4	49.0	6.2	Nitchequon	-18	-3	-8	-34	23.4	47.0	8.0
Smithers	-11	-5	-6	-17	7.6	11.0	2.6	Québec	-8	-3	1	-23	63.2	48.0	13.4
Vancouver	3	-1	9	-5	33.2	M	11.9	Schefferville	-18	-3	-4	-28	29.0	57.0	22.8
Victoria	4	-1	10	-4	40.5	M	10.6	Sept-Îles	-9	-2	3	-22	67.9	44.0	15.0
Williams Lake	-11	-6	-1	-21	4.7	28.0	M	Sherbrooke	-9	-3	2	-27	59.7	24.0	15.4
<b>ALBERTA</b>								Val-d'Or	-16	-6	-1	-31	28.8	20.0	5.4
Calgary	-15	-8	1	-24	4.6	7.0	19.8	<b>NEW BRUNSWICK</b>							
Cold Lake	-22	-9	-8	-34	3.8	19.0	20.0	Charlo	-8	-1	8	-19	40.7	M	13.0
Coronation	-20	-9	-9	-34	7.0	16.0	12.3	Fredericton	-2	2	12	-17	21.4	1.0	M
Edmonton Namao	-18	-7	-6	-30	4.2	15.0	M	Saint John	-4	-1	12	-16	54.2	4.0	19.7
Fort McMurray	-22	-6	-7	-35	2.9	13.0	15.8	<b>NOVA SCOTIA</b>							
Jasper	-15	-6	-2	-26	9.8	13.0	4.6	Greenwood	-2	-2	9	-14	16.8	M	M
Lethbridge	-14	-9	1	-23	8.4	9.0	M	Shearwater	0	-1	11	-12	25.6	M	25.6
Medicine Hat	-16	-9	-5	-26	6.5	14.0	17.3	Sydney	0	0	10	-9	63.3	0.0	25.1
Peace River	-23	-9	-7	-36	3.4	10.0	M	Yarmouth	1	-1	12	-11	13.9	M	M
<b>SASKATCHEWAN</b>								<b>PRINCE EDWARD ISLAND</b>							
Cree Lake	-24	X	-14	-38	3.8	8.0	15.8	Charlottetown	-3	-2	11	-13	25.5	0.0	M
Estevan	-16	-6	-6	-26	5.2	7.0	17.2	Summerside	-1	-2	11	-14	27.4	3.0	19.0
La Ronge	-23	-4	-13	-36	0.2	18.0	M	<b>NEWFOUNDLAND</b>							
Regina	-19	-7	-9	-32	7.3	14.0	15.2	Gander	-3	-1	5	-12	5.8	3.0	32.9
Saskatoon	-21	-8	-9	-33	3.8	M	M	Port aux Basques	0	0	8	-10	41.1	1.0	M
Swift Current	-17	-8	-7	-30	M	14.0	5.6	St. John's	0	0	10	-8	9.4	M	30.0
Yorkton	-21	-8	-9	-32	4.0	11.0	19.2	St. Lawrence	0	1	10	-9	23.8	M	M
<b>MANITOBA</b>								Cartwright	-9	-2	3	-20	8.6	42.0	17.0
Brandon	-19	-6	-10	-27	4.2	6.0	M	Goose	-12	-3	3	-25	12.5	60.0	20.1
Churchill	-25	-6	-16	-33	4.0	35.0	0.4	Hopedale	-10	-2	2	-22	7.3	39.0	M
The Pas	-23	-7	-14	-33	7.0	18.0	22.8								

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

Canadian Climate Centre  
Atmospheric Environment Service  
4905 Dufferin Street  
Downsview, Ontario  
CANADA M3H 5T4 (416) 667-4711/4906

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