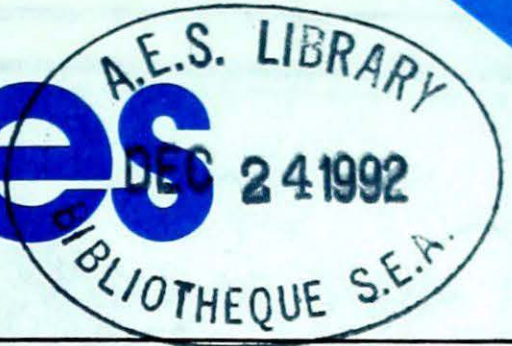


# Climatic Perspectives



December 14 to 20, 1992 A weekly review of Canadian climate and water

Vol. 14 No. 51



## Heavy snowfall wallops BC's South Coast

*Several Pacific storms affected the coast of British Columbia this week. In addition, an Arctic air mass gradually spread southwards, encompassing most of western Canada. The wintry combination produced generally cold, snowy weather across the Prairies and British Columbia.*

Snow started falling on north Vancouver Island during the middle of the week, and along the west coast of British Columbia late Friday evening. By the time the snow had tapered off, or changed to rain over the weekend, as much as 20 to 40 centimetres of snow briefly 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.

Snowfalls such as this are not all that unusual in Vancouver, especially in the higher elevations of the city. Since 1937, there have been 22 occurrence of snow events greater than 18 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, 1968, when 31.2 cm covered the ground. One consolation is that the snow cover usually does not last very long.

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

able excitement to skiers and resort operators, alike. Further north, the snow was accompanied by bitter cold, with readings dropping down to the mid-minus thirties later that week.

### Great Lake levels on the rise

November precipitation in the Great Lakes Basin was well above average, approximately 158 percent of the monthly normal. In fact, the water supply to Lakes Huron/Michigan and Lake Ontario this month 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 96%, 185%, 195% and 140% of their normal November precipitation, respectively. Since July, the lower Great Lakes received above average rainfalls every month except October.

As a result of the supply and outflow conditions, the level of Lake Superior declined less than it usually does in November, while the levels of the other Great Lakes all rose during the month rather than decline, as they would normally do this month. Lakes Huron and Erie are currently 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 forties. Even in the more southern regions, maximum read-

ings, on some days, failed to climb much higher than minus thirty. Blizzards plagued the Arctic coastline and the Keewatin, while the high Arctic remained clear and cold. Snow and blowing snow was reported on Baffin Island for a good part of the week. At Fort Providence, ice jams on the Mackenzie River disrupted ferry operations. It is hoped the ferry will be able to operate until the ice bridge is ready in January. Ice roads in the Mackenzie Delta are expected to open soon.

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

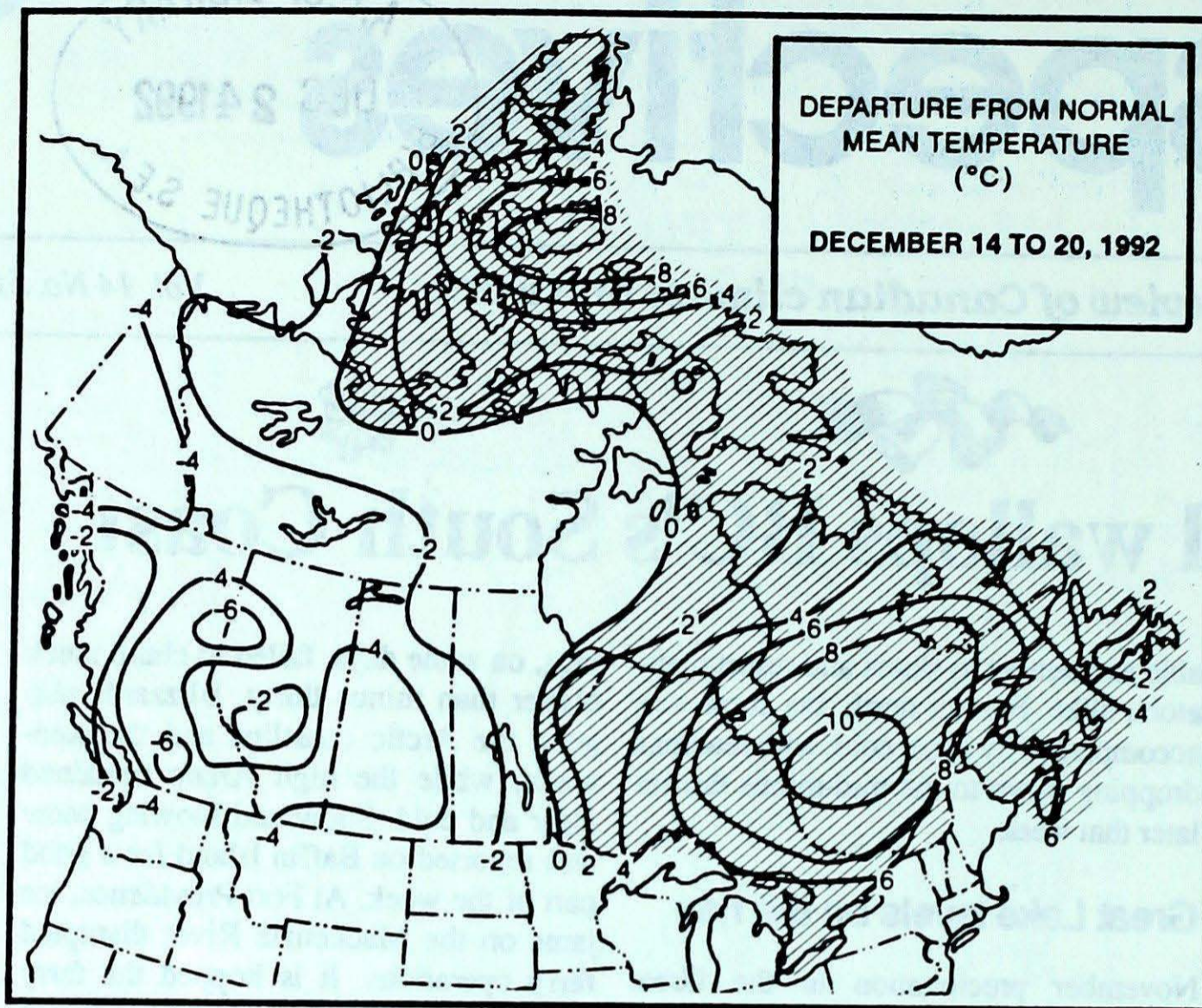
In Ontario, bands of lake-effect snow streamers dumped between 20 to 40 centimetres east of Georgian Bay. With the year almost over, it now looks like total hours of bright sunshine will be at or near record low values in southern Ontario.

Atlantic Canada was unsettled and wet, with many areas receiving 30 to 50 millimetres of precipitation. Daily record rainfalls were also reported along the west coast of Newfoundland, due to a strong onshore flow.

### A look ahead...

For the week of December 28, below normal temperatures are expected east of Manitoba and most of the Northwest Territories. Above normal readings are likely in the west. Unsettled weather will prevail across southern Ontario and Quebec.





DEPARTURE FROM NORMAL  
MEAN TEMPERATURE  
(°C)  
DECEMBER 14 TO 20, 1992

**Weekly normal temperatures (°C)**

	max.	min.
Whitehorse A	-11.8	-20.2
Iqaluit A	-18.7	-26.7
Yellowknife A	-19.8	-27.9
Vancouver Int'l A	6.8	1.5
Victoria Int'l A	7.4	1.8
Calgary Int'l A	-1.6	-13.4
Edmonton Int'l A	-7.2	-17.8
Regina A	-8.1	-17.9
Saskatoon A	-9.4	-18.9
Winnipeg Int'l A	-9.8	-19.0
Ottawa Int'l A	-4.8	-12.8
Toronto (Pearson Int'l A)	-0.4	-8.1
Montréal Int'l A	-4.1	-11.9
Québec A	-6.2	-14.7
Fredericton A	-2.7	-12.7
Saint John A	-1.2	-10.4
Halifax (Shearwater)	1.1	-6.6
Charlottetown A	-1.4	-8.9
Goose A	-10.5	-18.9
St John's A	0.9	-5.5

**Weekly temperature and precipitation extremes**

	Maximum temperature (°C)	Minimum temperature (°C)	Heaviest precipitation (mm)
British Columbia	Victoria Int'l A 10	Dease Lake -37	Port Hardy A 82
Yukon Territory	Teslin (aut) -2	Watson Lake A -45	Watson Lake A 4
Northwest Territories	Fort Smith A -1	Shepherd Bay A -45	Cape Dyer A 50
Alberta	Whitecourt A 8	Grande Prairie A -37	Grande Prairie A 13
Saskatchewan	Moose Jaw A 3	Meadow Lake A -36	Broadview 9
		Prince Albert A -36	
Manitoba	Dauphin A 0	Thompson A -36	Brandon A 5
Ontario	Windsor A 12	Armstrong (aut) -32	Kapuskasing A 38
Quebec	Montréal Int'l A 10	Kuujuuaq A -30	La Grande Rivière 34
New Brunswick	Saint John A 10	St-Léonard A -16	Saint John A 48
Nova Scotia	Sable Island 12	Amherst (aut) -8	Shearwater 54
Prince Edward Island	East Point (aut) 8	Charlottetown A -8	East Point (aut) 38
Newfoundland	Argentia A 12	Churchill Falls A -27	Stephenville A 54

Across The Country...

Highest Mean Temperature	Estevan Point (aut) (B.C.)	6
Lowest Mean Temperature	Alert (N.W.T.)	-33

92/12/14-92/12/20

CLIMATIC PERSPECTIVES  
VOLUME 14

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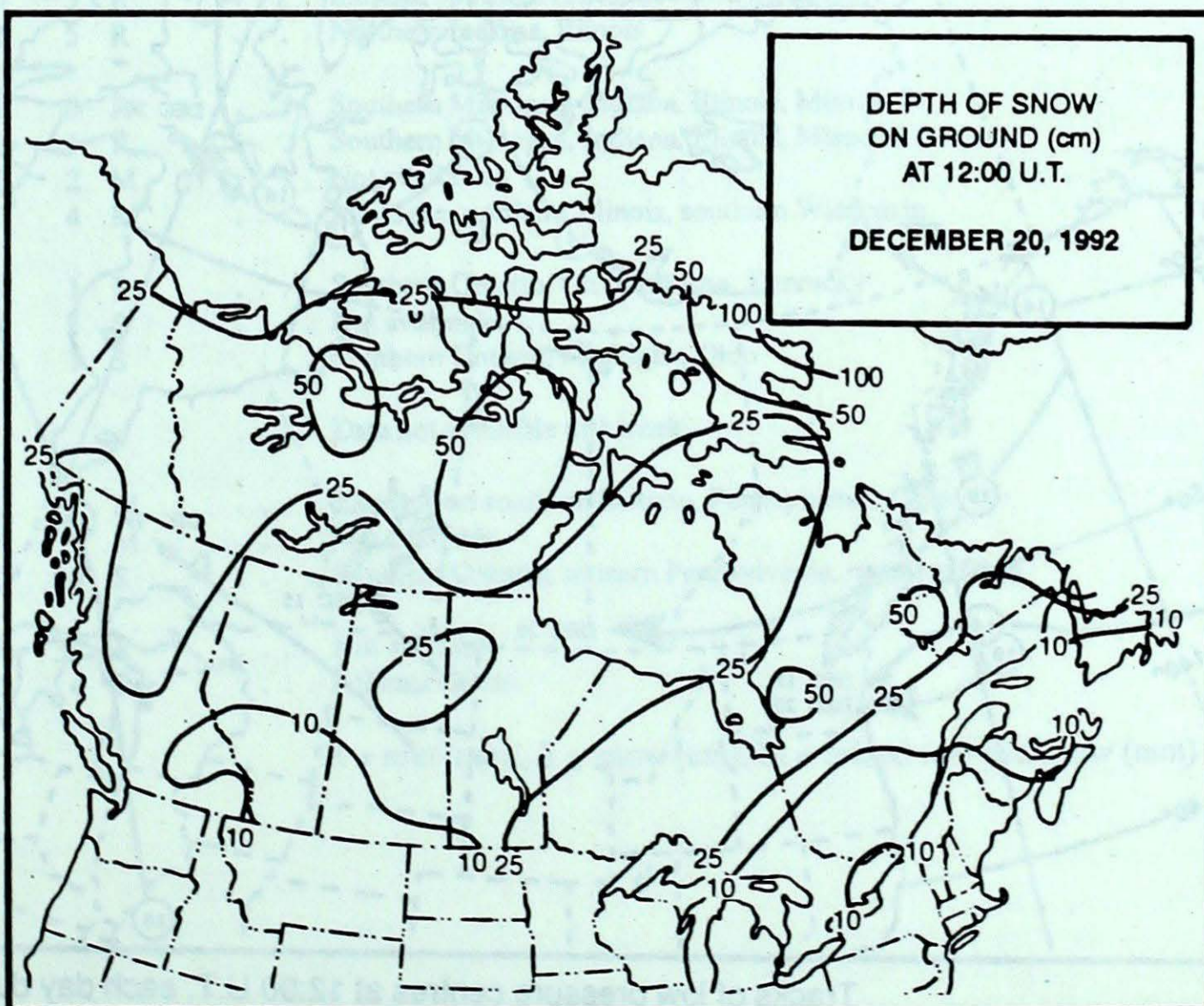
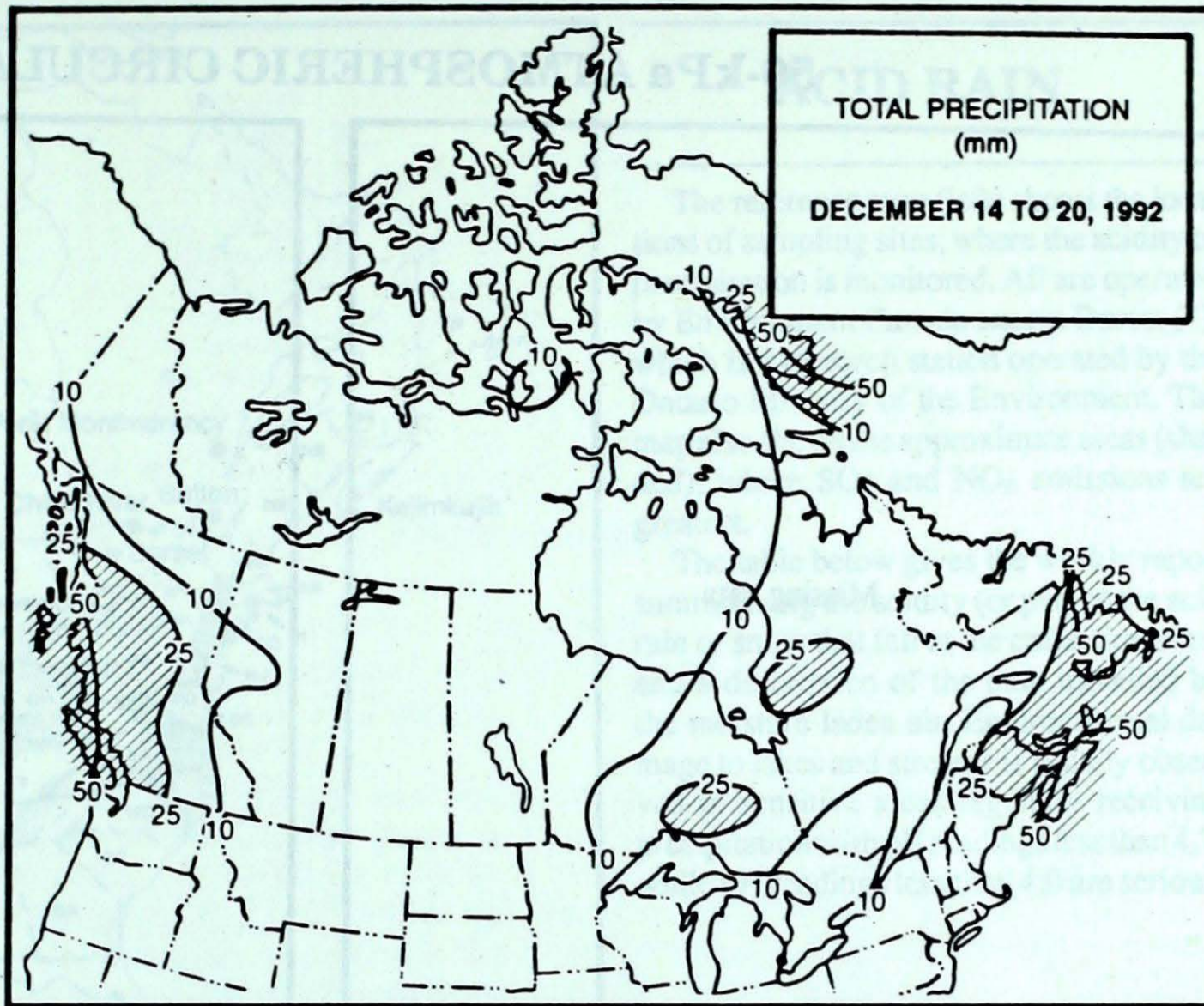
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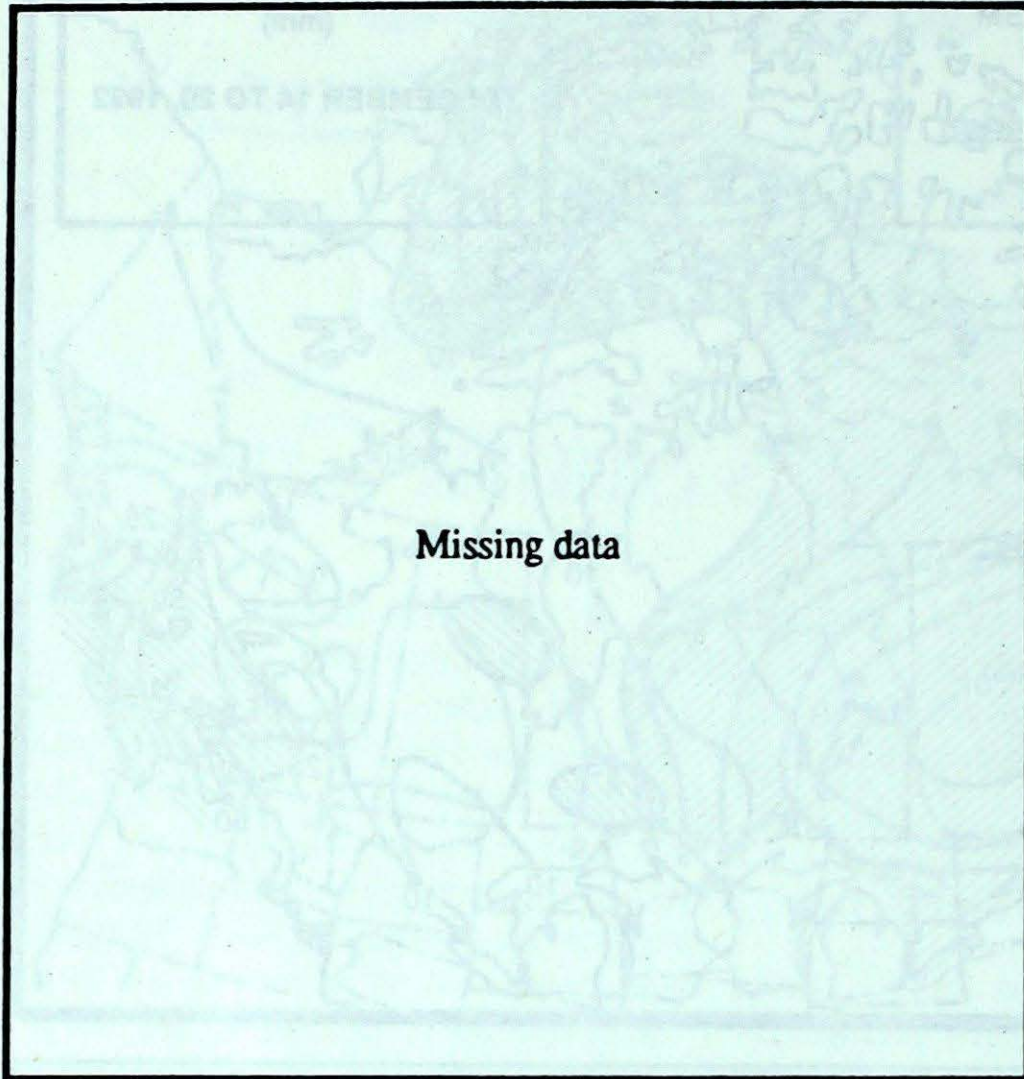
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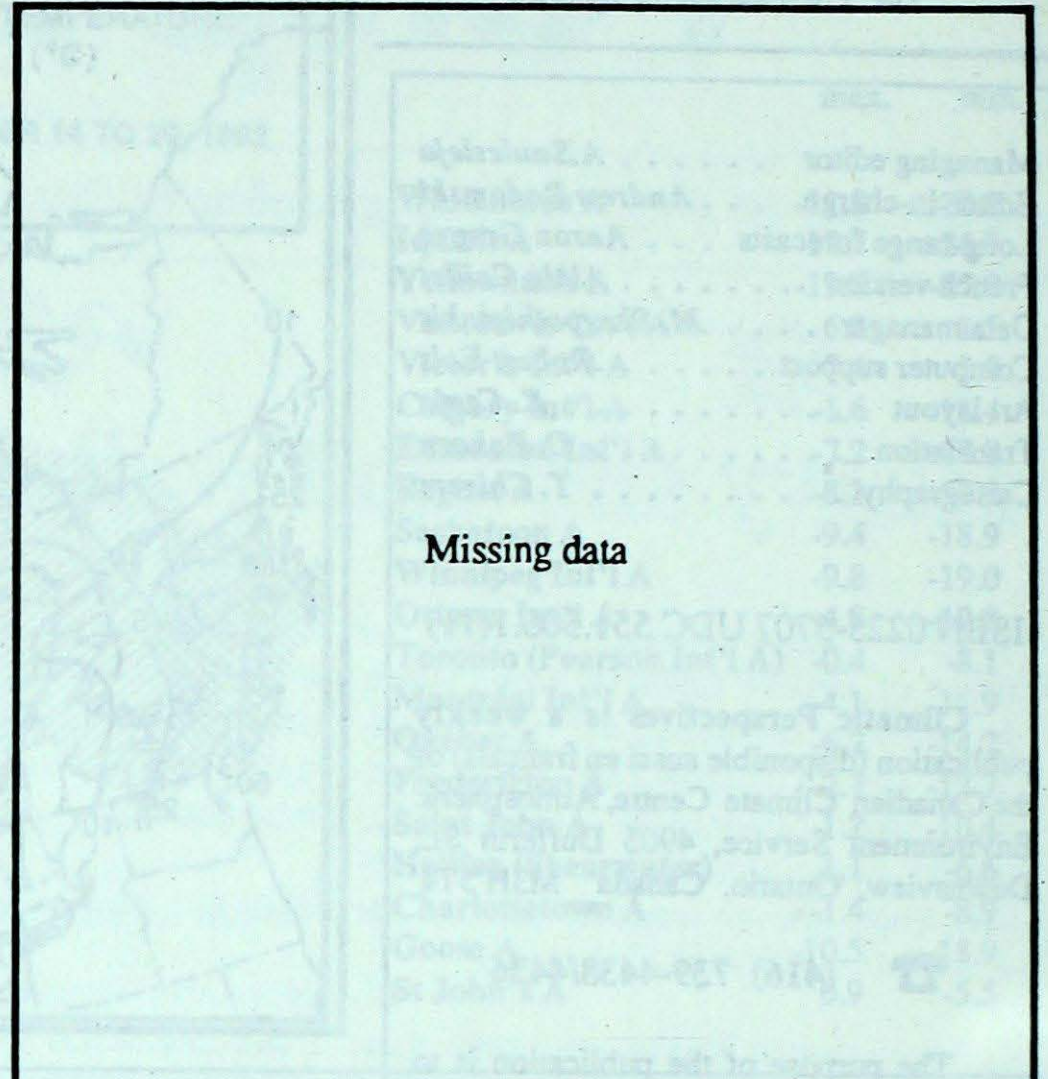
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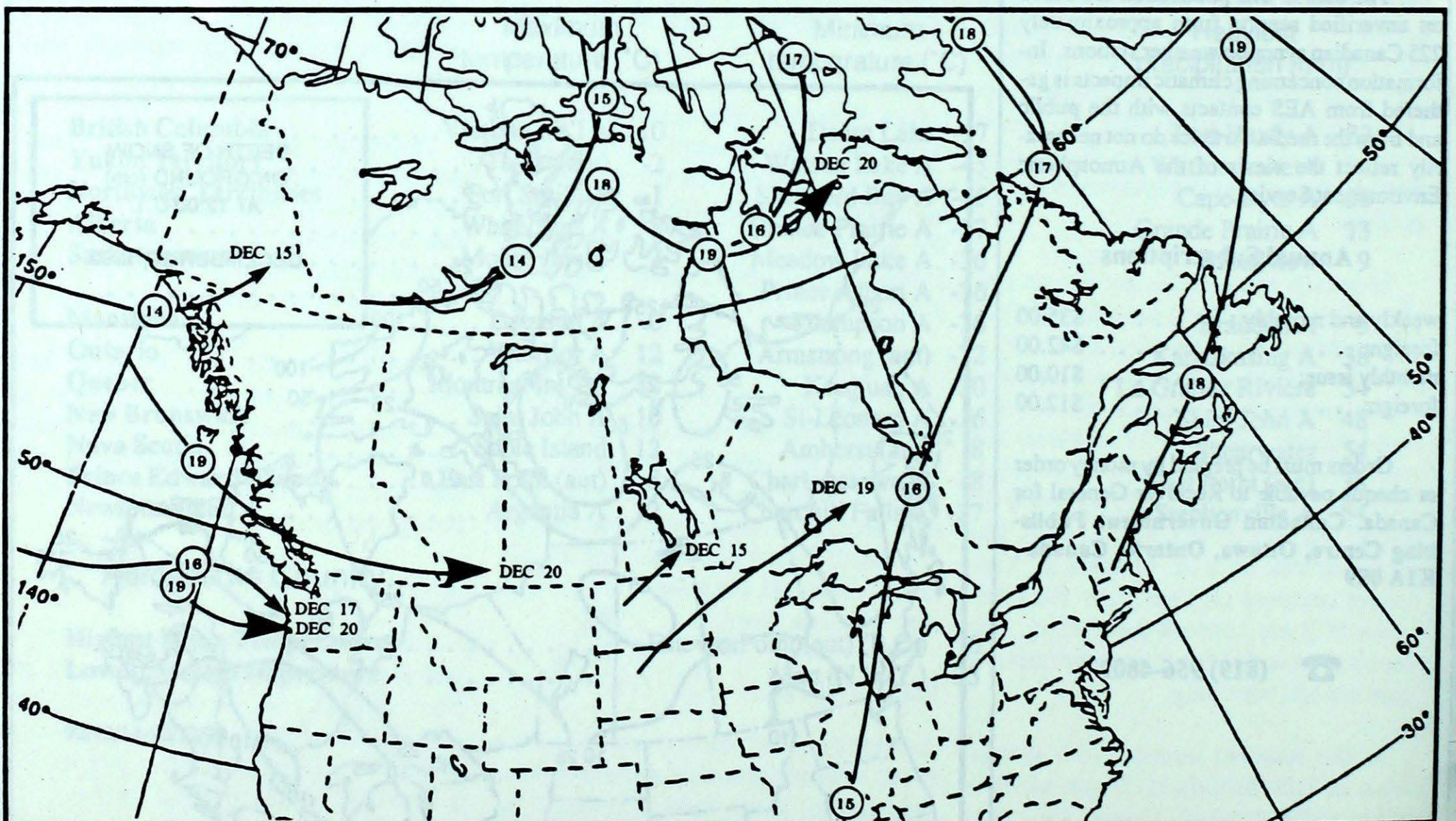
### 50-kPa ATMOSPHERIC CIRCULATION



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

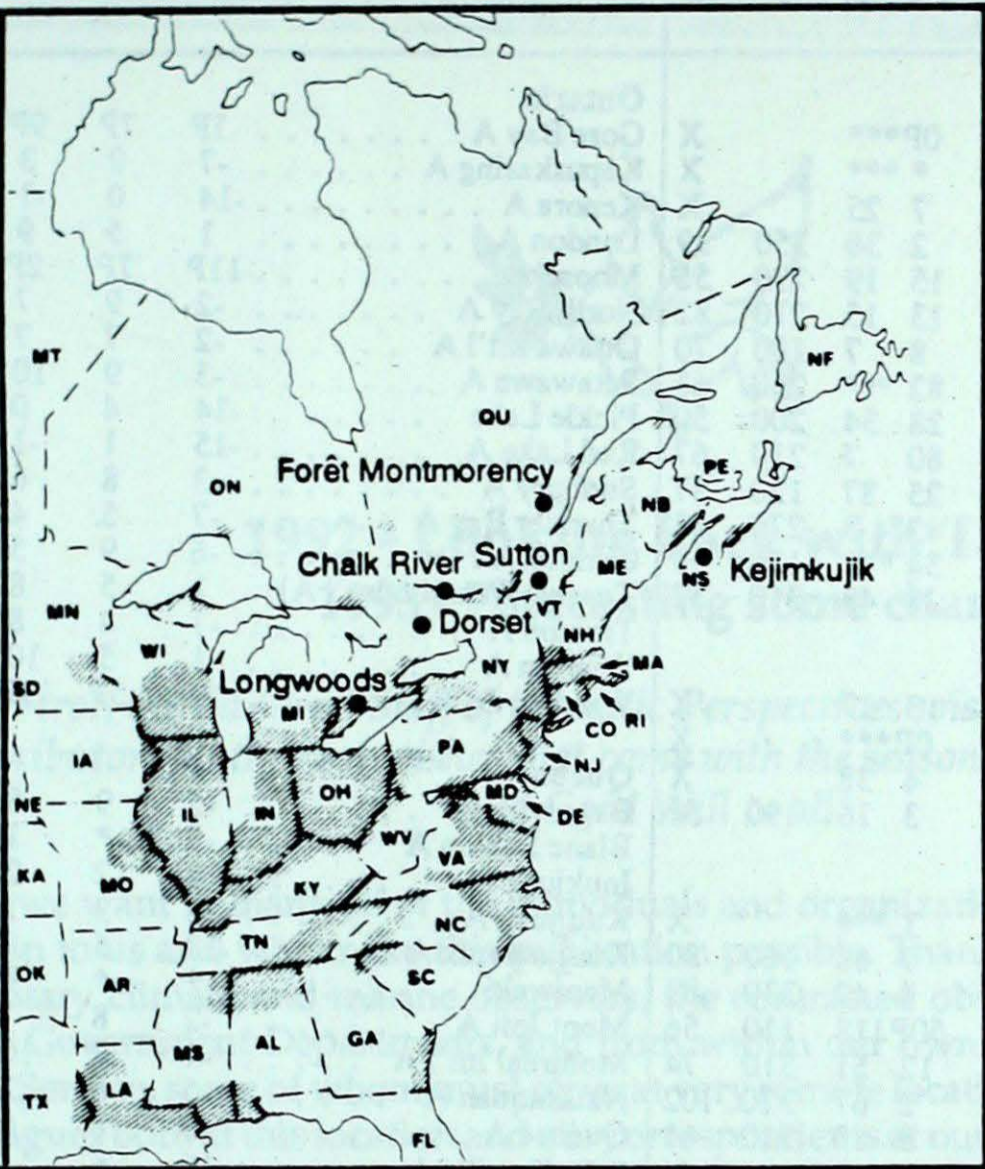


Mean geopotential height anomaly  
50-kPa level (10 decametre intervals)



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

- ALABAMA -- AL
- ARKANSAS -- AR
- CONNECTICUT -- CO
- DELAWARE -- DE
- FLORIDA -- FL
- GEORGIA -- GA
- ILLINOIS -- IL
- INDIANA -- IN
- IOWA -- IA
- KANSAS -- KA
- KENTUCKY -- KY
- LOUISIANA -- LA
- MAINE -- ME
- MANITOBA -- MT
- MARYLAND -- MD
- MASSACHUSETTS -- MA
- MICHIGAN -- MI
- MINNESOTA -- MN
- MISSISSIPPI -- MS
- MISSOURI -- MO
- NEBRASKA -- NE
- NEW BRUNSWICK -- NB
- NEWFOUNDLAND -- NF
- NEW HAMPSHIRE -- NH
- NEW JERSEY -- NJ
- NEW YORK -- NY
- NORTH CAROLINA -- NC
- NORTH DAKOTA -- ND
- NOVA SCOTIA -- NS
- OHIO -- OH
- OKLAHOMA -- OK
- ONTARIO -- ON
- PENNSYLVANIA -- PA
- PRINCE EDWARD ISLAND -- PE
- QUÉBEC -- QC
- RHODE ISLAND -- RI
- SOUTH CAROLINA -- SC
- SOUTH DAKOTA -- SD
- TENNESSEE -- TN
- TEXAS -- TX
- VERMONT -- VT
- VIRGINIA -- VA
- WEST VIRGINIA -- WV
- WISCONSIN -- WI



## 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
December 13 to 19, 1992				
Longwoods	16	4.0	3 R	... .. Indiana, southern Illinois, southern Missouri
	19	4.2	5 R	... .. Northern Indiana, Illinois
Dorset *	15	4.1	3 R	... .. Southern Michigan, Indiana, Illinois, Missouri
	16	3.6	1 R	... .. Southern Michigan, Indiana, Illinois, Missouri
	17	4.2	2 M	... .. Not available
	19	4.0	4 M	... .. Michigan, northern Illinois, southern Wisconsin
Chalk River	15	4.3	1 R	... .. Southern Ontario, Ohio, Indiana, Kentucky
	17	4.3	3 S	... .. Not available
	19	4.6	1 S	... .. Southern Ontario, Michigan, Ohio
Sutton				... .. Data not available this week
Montmorency	16	4.2	2 M	... .. Eastern and southern Ontario, Pennsylvania, Ohio
	17	4.4	5 M	... .. Not available
	19	4.2	20 S	... .. Southern Ontario, western Pennsylvania, northern Ohio
Kejimikujik	17	4.8	33 R	... .. Not available
	19	4.6	4 R	... .. Atlantic Ocean

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	
<b>British Columbia</b>									<b>Ontario</b>								
Blue River A	-10P	-4P	1P	-22P	0P***			X	Gore Bay A	1P	7P	9P	-7P	13P	5	200	83
Cape St James	*	*	*	*	****			X	Kapuskasing A	-7	9	3	-22	38	23	300	39
Cranbrook A	-12	-7	1	-23	7	25		X	Kenora A	-14	0	-1	-29	6	29		X
Fort Nelson A	-26	-4	-14	-34	2	30	350	39	London A	1	5	9	-7	11	***	230	63
Fort St John A	-20	-7	3	-34	15	19	220	56	Moosonee	-11P	7P	2P	-24P	14P	37	270	35
Kamloops A	-10	-7	2	-21	13	15	270	82	North Bay A	-2	9	7	-14	6	6	220	59
Penticton A	-4	-4	2	-14	8	7	180	70	Ottawa Int'l A	-2	7	7	-10	7	10	280	76
Port Hardy A	2	-1	6	-1	82	***	250	61	Petawawa A	-3	9	10	-15	6	3	240	54
Prince George A	-13	-4	0	-32	28	34	200	50	Pickle Lake	-14	4	0	-28	7	27		X
Prince Rupert A	1	-1	6	-5	80	7	210	67	Red Lake A	-15	1	-1	-30	5	40	190	35
Smithers A	-9	-1	6	-20	25	37	120	37	Sudbury A	-3	8	6	-14	8	10	220	65
Vancouver Int'l A	2	-2	9	-6	42	3	270	63	Thunder Bay A	-7	5	4	-20	16	4	280	50
Victoria Int'l A	3	-2	10	-1	34	***	130	59	Timmins A	-6	9	5	-21	21	22	270	41
Williams Lake A	-12	-4	2	-31	28	43	310	52	Toronto(Pearson Int'l A)	1	5	8	-13	2	3	270	57
<b>Yukon Territory</b>									Trenton A	-1	4	8	-11	8	22	280	70
Komakuk Beach A	-28	-3	-15	-36	3	17		X	Warton A	1	5	10	-8	11	3	280	50
Teslin (aut)	-25P	*	-2P	-37P	0P***			X	Windsor A	3P	5P	12P	-6P	8P***		230	80
Watson Lake A	-29	-5	-7	-45	4	38		X	<b>Québec</b>								
Whitehorse A	-22	-6	-6	-36	3	16	190	52	Bagotville A	-5	9	8	-19	23	13	290	63
<b>Northwest Territories</b>									Blanc Sablon A	-7	*	1	-17	25	17	010	67
Alert	-33	-3	-29	-38	1	***		X	Inukjuak A	-18	2	-2	-27	6	15		X
Baker Lake A	-29	-1	-8	-40	9	68	160	80	Kuujuuaq A	-18	3	1	-30	15	42	260	65
Cambridge Bay A	-26	4	-16	-35	4	49	330	89	Kuujuarapik A	-13	5	2	-23	15	21	310	48
Cape Dyer A	-19P	2P	-2P	-36P	50P	118	110	56	Maniwaki	*	*	9	*	*	6		X
Clyde A	-23	3	-13	-36	12	51	310	74	Mont Joli A	-2	8	7	-13	12	7	190	83
Coppermine A	-26	0	-21	-32	2	67	320	102	Montréal Int'l A	-1	7	10	-9	11	***	260	67
Coral Harbour A	-27	-2	-10	-39	8	19	310	61	Natashquan A	-5	6	2	-18	20	12	200	50
Eureka	-32	4	-20	-40	1	10		X	Québec A	-3	8	6	-11	23	5	280	61
Fort Smith A	-24	-2	-1	-33	1	21	310	46	Schefferville A	-16	6	1	-29	15	42	290	63
Hall Beach A	-24	3	-11	-40	6	43	160	59	Sept-Îles A	-5	8	3	-21	23	22	100	46
Inuvik A	-29	-1	-18	-39	2	51	340	41	Sherbrooke A	-2	8	7	-12	13	3	280	87
Iqaluit A	-22	1	-7	-33	10	20	340	74	Val-d'Or A	-6	9	7	-20	10	8	210	65
Mould Bay A	-32P	-1P	-24P	-41P	1P	21		X	<b>New Brunswick</b>								
Norman Wells A	-27	-1	-17	-38	4	23	310	43	Fredericton A	-1	7	6	-11	36	***	270	70
Resolute A	-20	9	-14	-34	1	13		X	Miscou Island (aut)	-1	4	5	-9	23	***		
Yellowknife A	-27	-3	-6	-36	2	19	301	63	Moncton A	0	6	7	-10	40	*	270	61
<b>Alberta</b>									Saint John A	0	6	10	-10	48	3	200	69
Calgary Int'l A	-12	-4	8	-26	6	5	260	69	<b>Nova Scotia</b>								
Cold Lake A	-19	-5	1	-34	3	18	040	33	Greenwood A	2	5	12	-5	34	3	270	74
Edmonton Namao A	-14	-3	5	-29	7	18	310	61	Shearwater A	3	6	11	-5	54	***	190	61
Fort McMurray A	-21	-5	2	-31	1	13	340	41	Sydney A	2	5	12	-4	33	***	230	65
High Level A	-24	-3	1	-36	1	13	360	43	Yarmouth A	3	4	10	-6	51	***	310	69
Jasper	*	*	2	*	*	10		X	<b>Prince Edward Island</b>								
Lethbridge A	-10	-4	7	-27	5	7	250	102	Charlottetown A	1	6	8	-8	21	11	160	65
Medicine Hat A	-10	-3	7	-24	1	3	250	56	East Point (auto)	2	*	8	-3	38	***		
Peace River A	-20	-5	5	-34	8	8	360	50	<b>Newfoundland</b>								
<b>Saskatchewan</b>									Cartwright	-7	3	6	-18	9	36	200	59
Cree Lake	-24	-4	-1	-34	4	21	210	69	Churchill Falls A	-14	6	1	-27	14	62	280	54
Estevan A	-14P	-2P	-3P	-29P	2P	4	320	48	Gander Int'l A	-2	3	9	-10	24	12	160	82
La Ronge A	-21	-5	-2	-33	3	29		X	Goose A	-10	4	3	-22	12	9	290	54
Regina A	-16	-3	-1	-31	5	17	330	43	St John's A	-1	1	11	-7	18	***	200	85
Saskatoon A	-20	-6	-3	-31	4	16	030	39	St Lawrence	0	2	9	-8	42	***		X
Swift Current A	-14	-4	2	-31	5	4	210	56	Wabush Lake A	-12	9	2	-26	11	36	180	65
Yorkton A	-19	-5	-2	-34	6	19	300	35	<b>Manitoba</b>								
Brandon A	-18	-3	-2	-30	5	13	050	43	Brandon A	-18	-3	-2	-30	5	13	050	43
Churchill A	-23	0	-6	-31	2	14	320	67	Churchill A	-23	0	-6	-31	2	14	320	67
Lynn Lake A	-24	-1	-6	-32	4	26	310	41	Lynn Lake A	-24	-1	-6	-32	4	26	310	41
The Pas A	-20	-2	-3	-31	4	17	340	43	The Pas A	-20	-2	-3	-31	4	17	340	43
Thompson A	-24	-2	-5	-36	3	21		X	Thompson A	-24	-2	-5	-36	3	21		X
Winnipeg Int'l A	-15	-1	-2	-30	5	29	170	56	Winnipeg Int'l A	-15	-1	-2	-30	5	29	170	56

92/12/14-92/12/20

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.



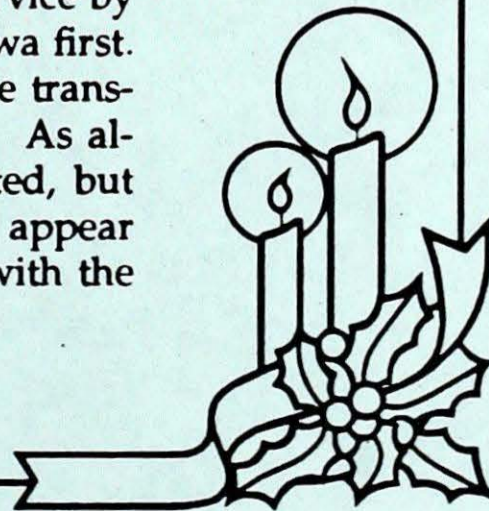
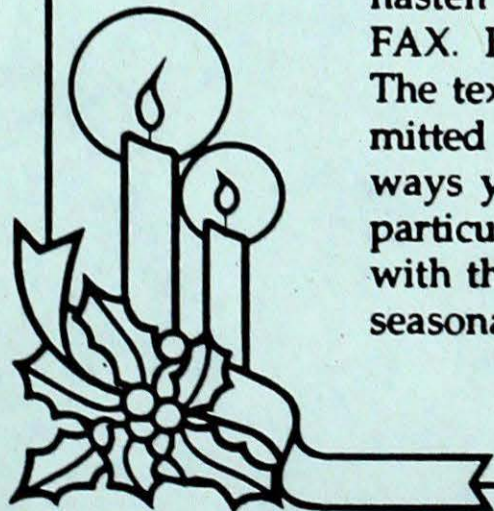
**1992 - Looking back with Thanks.  
1993 - Forecasting some changes.**

*First, the Editorial Staff of Climatic Perspectives wish our readers and contributors all the best wishes that come with the season - Peace, Comfort, Joy and Good Will to all!*

Next we want to thank all of the individuals and organizations who provide information to us and who make this publication possible. Thanks to the observers: the voluntary climate and marine observers, the contracted observers and those from other Government Departments, and from within our own Atmospheric Environment Service, some of whom must serve at very remote locations. Thanks also to our colleagues both at this location and our correspondents at our regional offices, who's input and contributions are much appreciated. Earl Coatta and Bob Tortorelli from Pacific Region, Jim Ross and Pat Kyle (Western), Brian Fehr and Rick Raddatz (Central), Bryan Smith and Sandy Radecki (Ontario), Roger Gauthier and Jacques Miron (Quebec), Keith Freeman, Frank Amirault, Charles MacLeod and George MacMillan (Atlantic). We also would like to thank Don Watt and the staff of the Yukon Weather Centre, Yellowknife and Iqaluit Weather Offices, and the staff stationed at the many B.C. weather offices who provide reports every week.

We also want to thank those in other federal government and provincial agencies, our United States Weather Service contacts, and those in the U.K., Europe and Australia, who always try to assist us. Finally, we want to thank Bruce Findlay, our past Managing Editor, for his diligent and thoughtful service. Many thanks, we could not have done this without you!

**Outlook for 1993:** Climatic Perspectives will be undergoing some changes, and experimentation in the coming year. We will be mailing out Climatic Perspectives directly from AES in Toronto to hasten its arrival by several days, and will commence service by FAX. Previously the publication was sent to DSS in Ottawa first. The text and tables of this issue and future issues will be transmitted to a number of computer bulletin board systems. As always your comments and suggestions will be appreciated, but particularly your contributions. The monthly forecast will appear with three classes, and we will continue to experiment with the seasonal outlook.



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