



Climatic Perspectives

MONTHLY SUPPLEMENT INCLUDED

Archives Ref. 1

November 11 to 17, 1991 A weekly review of Canadian climate and water

Vol. 13 No 46

Pacific storms lash Canada's west coast

Most residents in British Columbia are conditioned to the stormy weather that can occur at this time of year, and this week was no exception.

A series of Pacific disturbances moved across Vancouver Island and the Queen Charlotte Islands this week, producing very strong winds and heavy rainfalls. The strong winds were even felt in the interior valleys of central B.C. Recorded rainfall amounts at Prince Rupert and Terrace were in the order of 153.8 and 163.2 millimetres, compared to a November average of 281.3 and 180.3 millimetres, respectively.

The most intense weather system affected northern Vancouver Island and the mainland on the morning of November 16, exactly one month after a previous storm produced winds in excess of 100 km/h in the interior valleys. At Port Hardy and Comox, situated on the east side of Vancouver Island, southeasterly winds gusted to 100 km/h. Winds of this magnitude are not unusual in this part of the country and can be expected to occur at least once every two years. Speeds on the outer west coast reached 150 km/h during this storm. On the lower mainland and in the central interior valleys wind velocities were not quite as high, but wind damage was still considerable. Although wind speeds at Vancouver were under 100 km/h, many trees were uprooted, power was knocked out and ferry crossings were cancelled. Hydro crews were kept busy

repairing downed power lines on Vancouver Island and in the Cariboo and central interior areas of the province, as thousands were without power. Some communities were without power for more than a day. At Vancouver, wind speeds of 100 km/h can be expected to occur once every two years, while higher speeds can be expected to occur once every four years.

Snow and winter cold in the Yukon

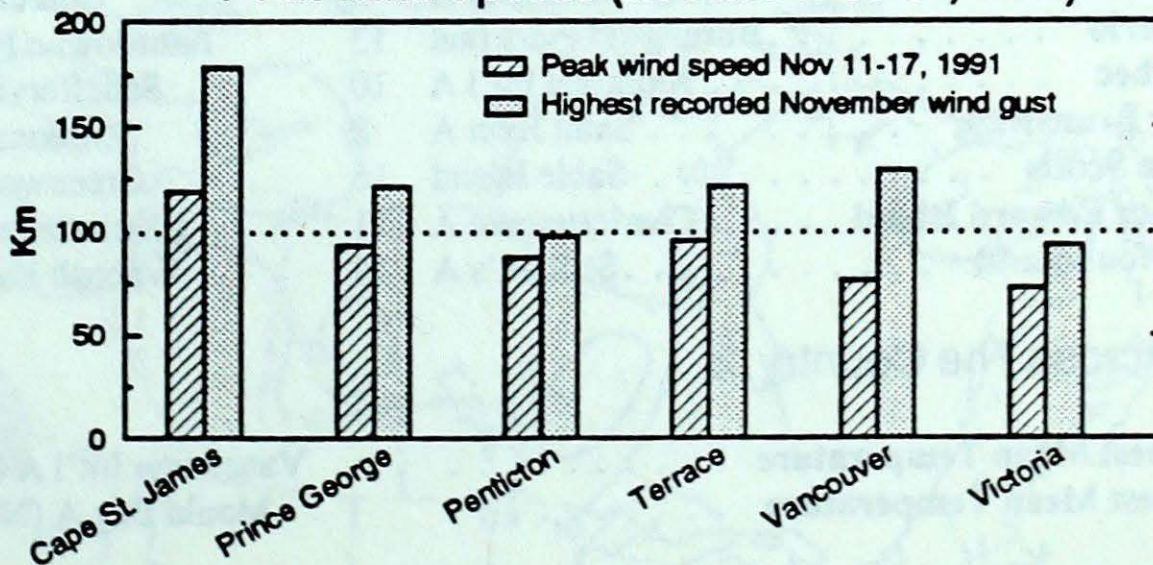
Weather systems tracking from the Pacific across the southern Yukon and northern B.C. produced snowfalls that are well above average for mid-November. The city of Whitehorse has now received more than double their normal November snowfall of 23.8 cm. Snow slides south of Whitehorse closed the Klondike Highway.

Swift River on the Alaska highway received the most snow, 45 cm. Near record low minimum temperatures in the minus forties were registered in the northern Yukon. In contrast in the eastern Arctic, near record warm weather was observed on Baffin Island this week, where temperatures actually climbed to near freezing, but where the depth of snow on the ground at Cape Dyer has risen to 171 cm.

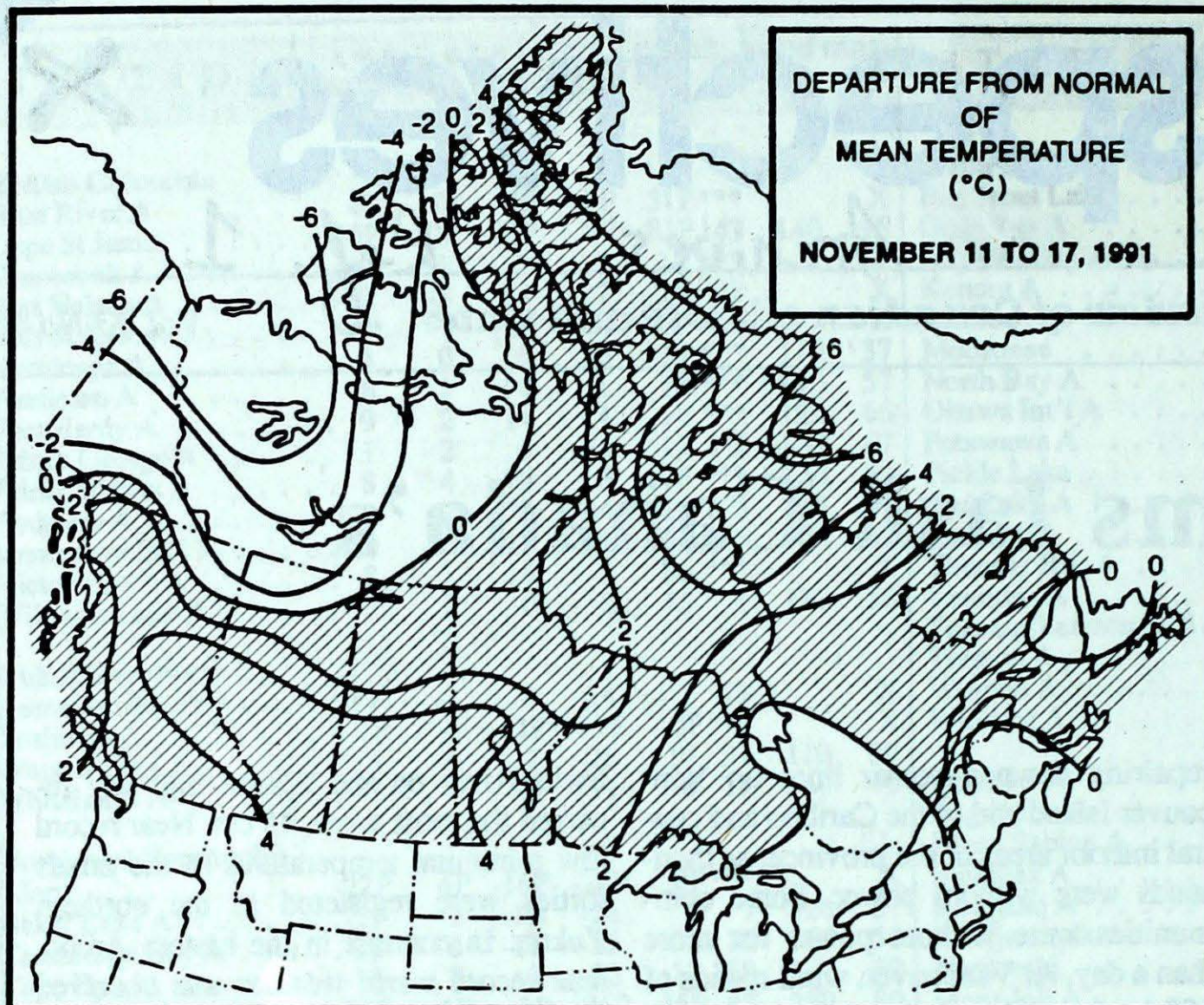
A look ahead ...

Last week a centrally located ridge of high pressure moved westward. As a result, for the week of November 25, we can expect below normal temperatures in the Yukon, northern B.C., southeastern Ontario, Quebec, Labrador and the Atlantic provinces. Elsewhere in Canada, readings are forecast to be slightly above normal.

Peak Wind Speeds (November 11-17, 1991)



This week's damaging winds in B.C. were below the November maximum values.



Weekly normal temperatures (°C)

	max.	min.
Whitehorse A	-5.5	-12.5
Iqaluit A	-8.5	-16.4
Yellowknife A	-8.2	-16.3
Vancouver Int'l A	8.8	2.7
Victoria Int'l A	9.2	2.5
Calgary Int'l A	2.4	-9.1
Edmonton Int'l A	0.9	-9.9
Regina A	0.8	-9.0
Saskatoon A	-0.4	-9.0
Winnipeg Int'l A	0.5	-7.0
Ottawa Int'l A	5.3	-2.0
Toronto (Pearson Int'l A)	7.8	-0.4
Montréal Int'l A	5.6	-1.1
Québec A	3.4	-3.2
Fredericton A	5.6	-2.8
Saint John A	5.8	-1.7
Halifax (Shearwater)	7.7	1.1
Charlottetown A	6.0	-0.5
Goose A	-0.4	-7.3
St John's A	6.0	0.2

Weekly temperature and precipitation extremes

	Maximum temperature (°C)	Minimum temperature (°C)	Heaviest precipitation (mm)
British Columbia	Comox A 17	Fort Nelson A -20	Terrace A 163
.	Victoria Int'l A 17		
Yukon Territory	Watson Lake A 0	Shingle Point A -33	Watson Lake A 18
Northwest Territories	Fort Smith A 2	Mould Bay A -42	Yellowknife A 14
Alberta	Lethbridge A 15	High Level A -22	Fort McMurray A 14
Saskatchewan	Estevan A 14	Collins Bay -26	Saskatoon A 5
Manitoba	Portage La Prairie A 9	Churchill A -25	Island Lake 9
Ontario	Burlington Piers (aut 13	Lansdowne House -25	Ottawa Int'l A 26
Québec	Montréal Int'l A 10	Schefferville A -20	Gaspé A 46
New Brunswick	Saint John A 8	St-Léonard A -9	Moncton A 69
Nova Scotia	Sable Island 16	Greenwood A -1	Sydney A 105
Prince Edward Island	Charlottetown A 11	Charlottetown A 0	Charlottetown A 79
Newfoundland	St John's A 14	Wabush Lake A -19	Argentia A 126

Across The Country...

Highest Mean Temperature	Vancouver Int'l A (BC) 8
Lowest Mean Temperature	Mould Bay A (NWT) -35

**CLIMATIC PERSPECTIVES
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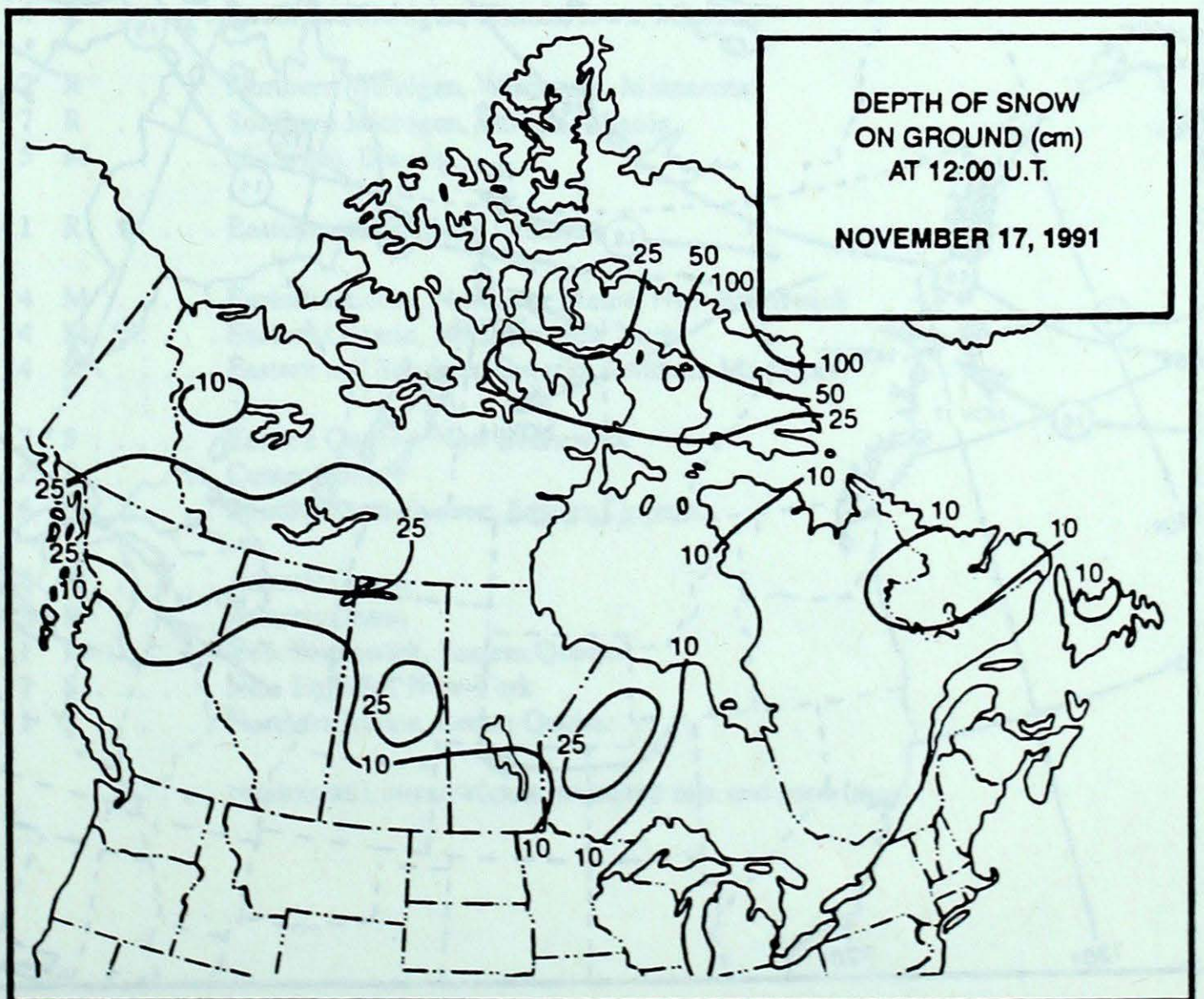
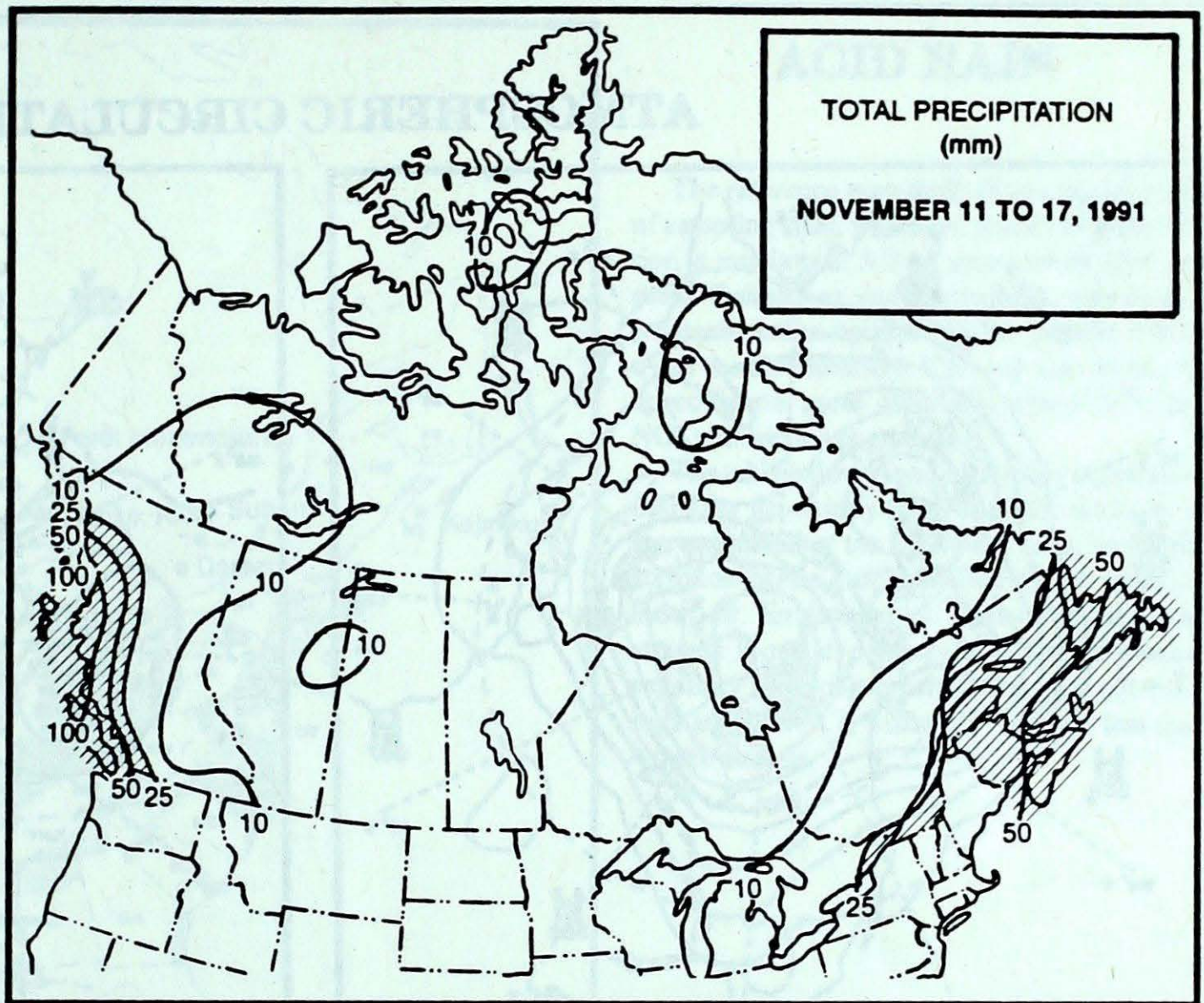
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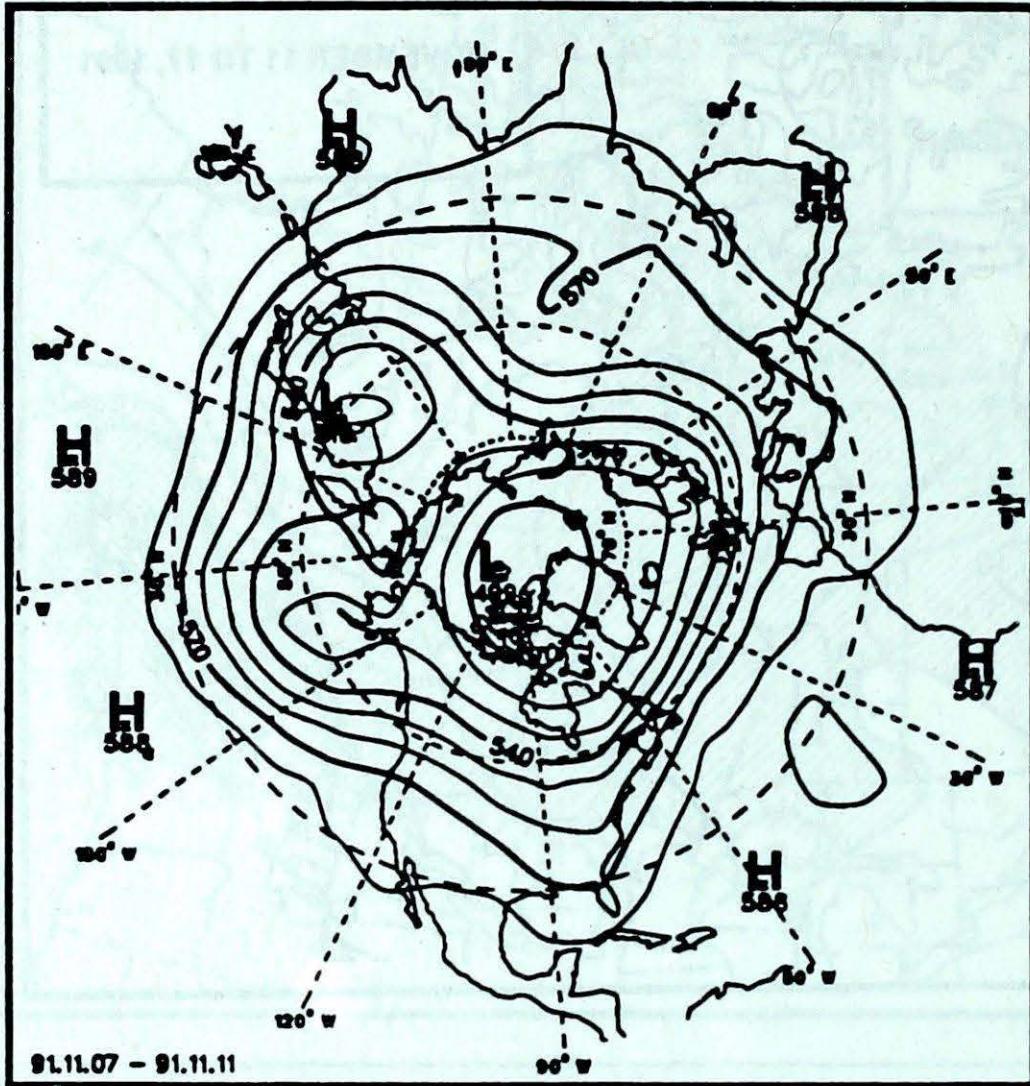
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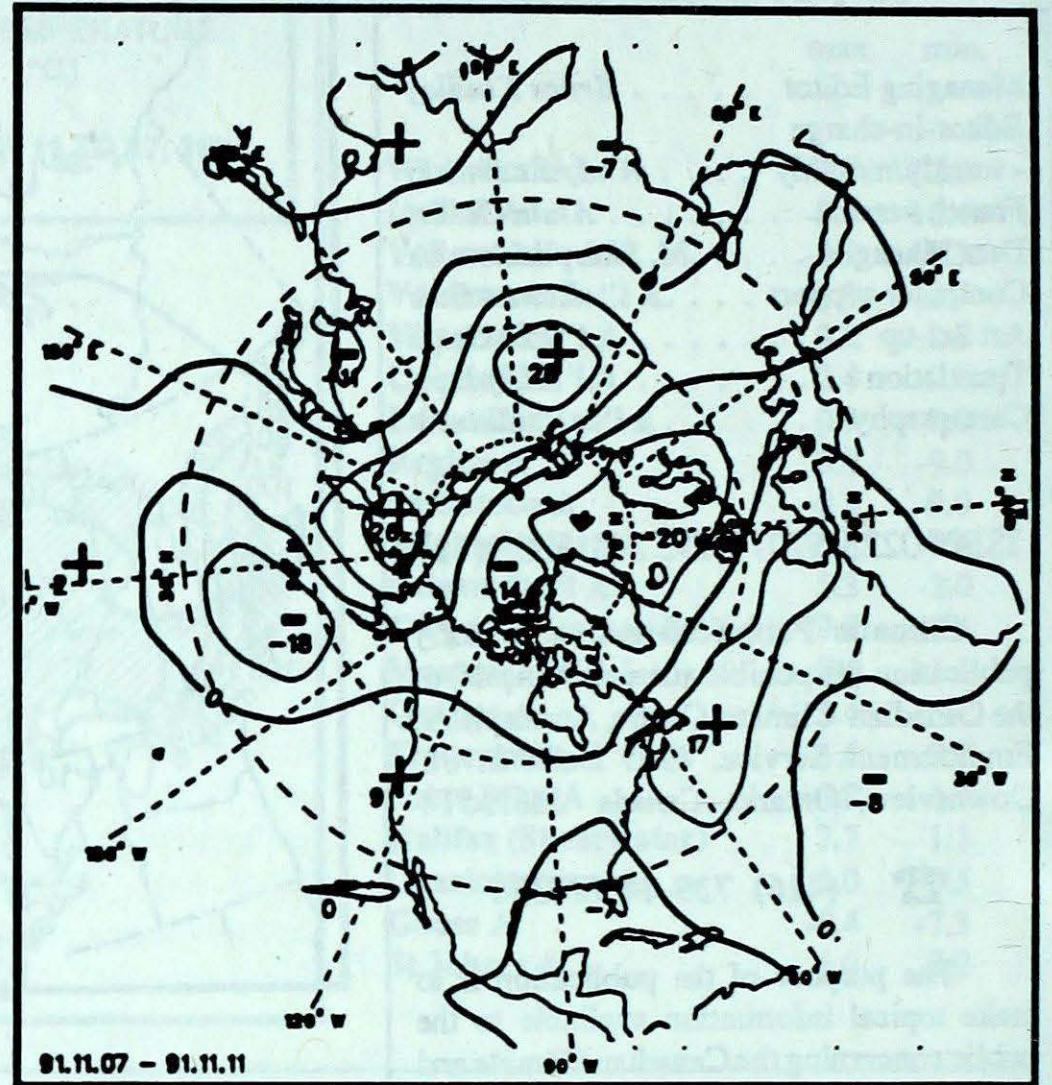
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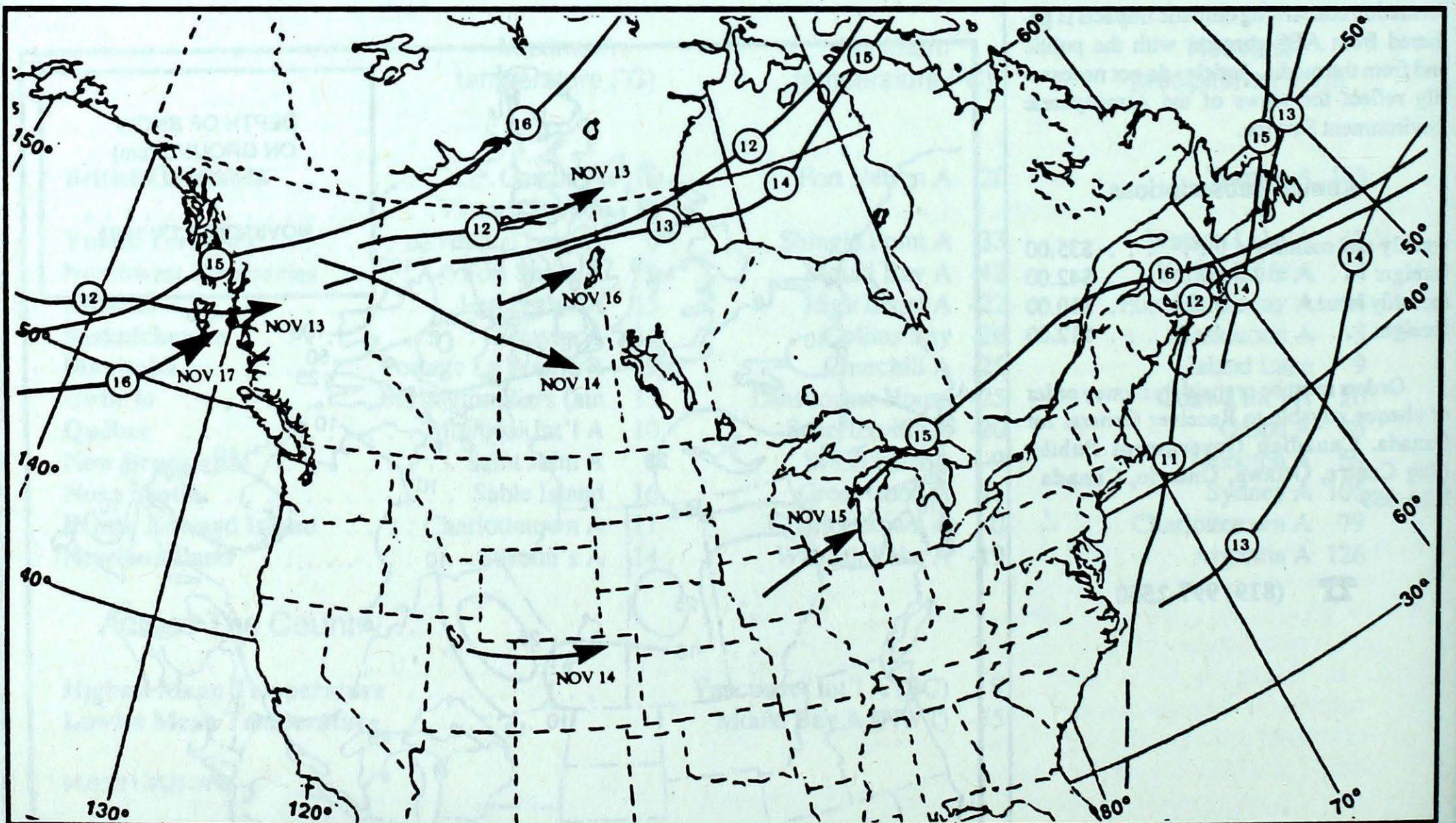
ATMOSPHERIC CIRCULATION



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



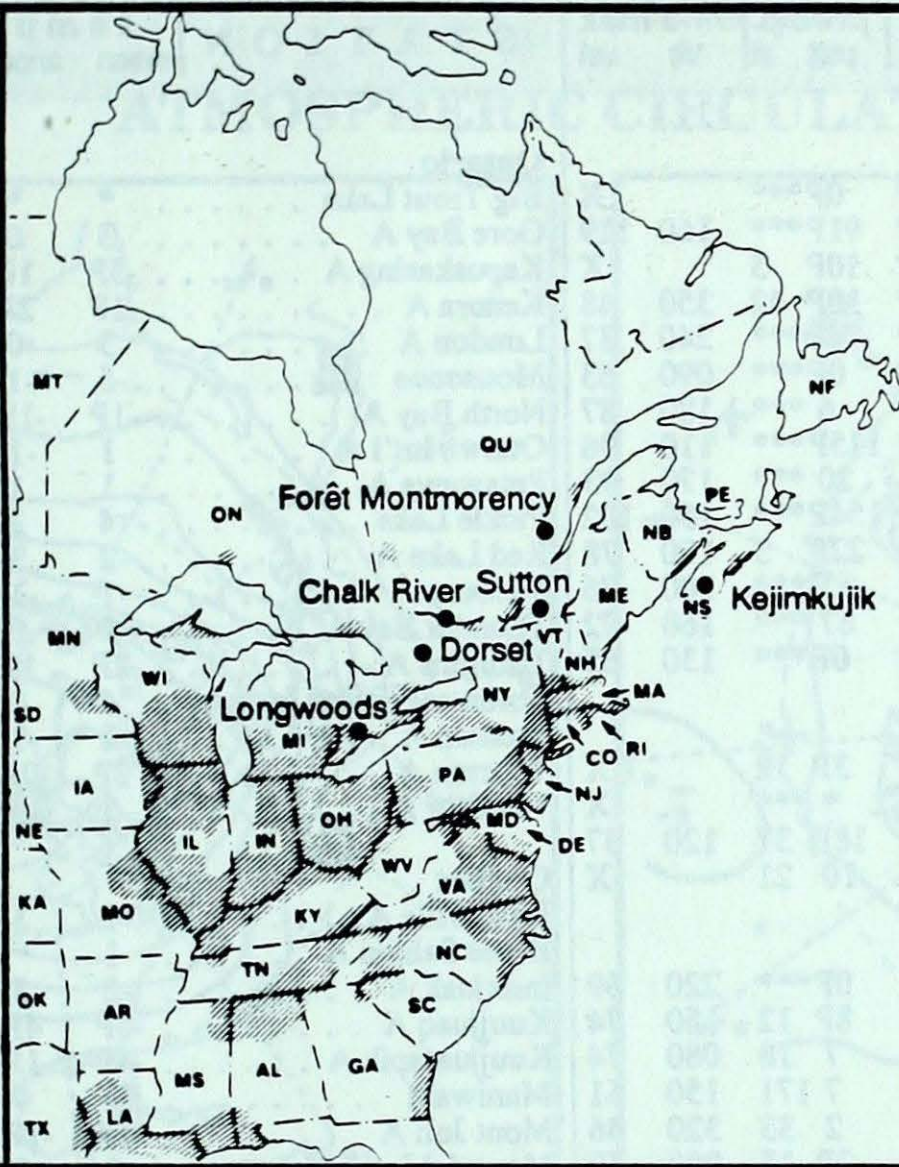
Mean geopotential height anomaly
50-kPa level (10-decametre intervals)



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

ACID RAIN

- 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 — QU
- RHODE ISLAND — RI
- SOUTH CAROLINA — SC
- SOUTH DAKOTA — SD
- TENNESSEE — TN
- TEXAS — TX
- VERMONT — VT
- VIRGINIA — VA
- WEST VIRGINIA — WV
- WISCONSIN — WI



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 10 to 16, 1991

Longwoods	14	4.1	8 R Indiana, Southern Illinois, Southern Missouri
	15	4.1	4 R	..... Southern Michigan, Illinois, Iowa, Missouri
Dorset*	13	3.8	2 R	..... Northern Michigan, Wisconsin, Minnesota
	14	4.1	7 R	..... Southern Michigan, Indiana, Illinois
	15	4.4	5 M	..... Michigan, Illinois
Chalk River	13	4.1	1 R	..... Eastern and Southern Ontario
Sutton	11	5.1	4 M	..... Eastern Quebec, Northern, Maine, New Brunswick
	13	4.0	4 M	..... Eastern Ontario, Northern New York
	15	4.2	14 R	..... Eastern and Southern Ontario, Southern Michigan
Montmorency	11	5.4	3 S	..... Eastern Quebec, New Brunswick
	13	4.7	2 S	..... Center Quebec
	15	4.9	6 M	..... Southwestern Quebec, Eastern Ontario
Kejimkujik	10	4.8	48 R	..... Atlantic Ocean
	11	4.9	23 R	..... Atlantic Ocean
	13	4.3	1 R	..... New Brunswick, Eastern Quebec
	15	4.1	7 S	..... New England, New York
	16	4.8	1 S	..... Northern Maine, Center Quebec

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

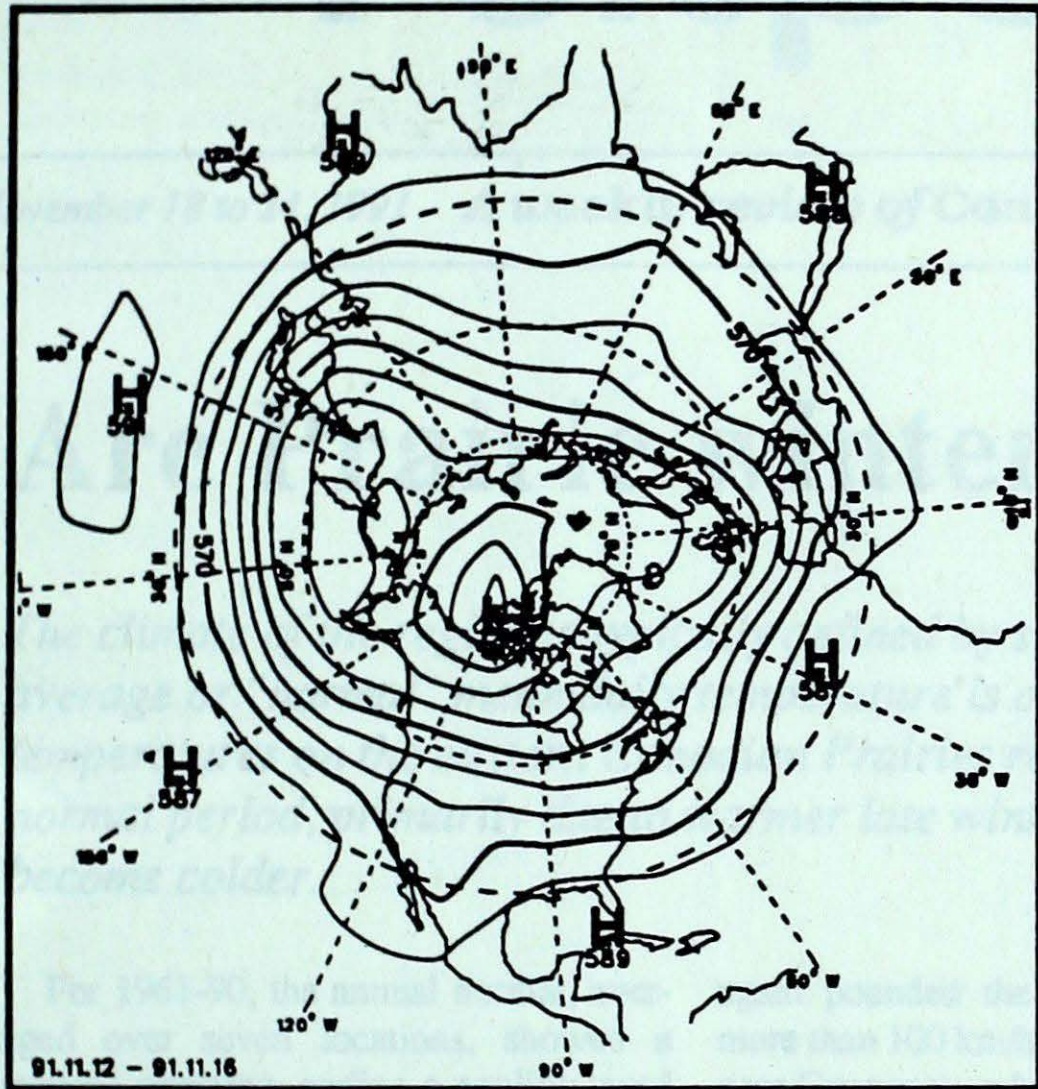
STATION	temperature				precip. ptot	wind max dir	max vel		STATION	temperature				precip. ptot	wind max dir	max vel	
	mean	anom	max	min						st	st	st	st				
British Columbia								Ontario									
Blue River A	0P	1P	3P	-4P	0P***		X	Big Trout Lake	*	*	6	*	* 25	210	46		
Cape St James	8P	1P	12P	6P	91P***	160	119	Gore Bay A	3	0	8	-5	10 ***	270	48		
Cranbrook A	2P	2P	11P	-7P	10P 5		X	Kapuskasing A	-3P	1P	5P	-16P	2P 1	330	50		
Fort Nelson A	-15P	-3P	-8P	-20P	10P 42	350	48	Kenora A	-1P	2P	7P	-7P	2P 11	180	41		
Fort St John A	-7P	0P	8P	-18P	6P***	240	37	London A	3	0	11	-5	15 ***	220	57		
Kamloops A	5P	3P	14P	-4P	0P***	090	63	Moosonee	-5	-1	6	-18	2 1	280	37		
Penticton A	5	2	12	-3	6 ***	180	87	North Bay A	-1P	-1P	7P	-11P	19P 1	020	39		
Port Hardy A	7P	2P	14P	0P	115P***	110	96	Ottawa Int'l A	1	-1	10	-7	26 1	330	41		
Prince George A	3	6	11	-4	20 ***	170	93	Petawawa A	1	1	7	-10	17 ***	310	52		
Prince Rupert A	7P	3P	13P	0P	154P***	150	102	Pickle Lake	-4	3	5	-16	3 17	330	37		
Smithers A	2P	4P	8P	-4P	22P 3	190	78	Red Lake A	-2	3	5	-9	5 6	180	37		
Vancouver Int'l A	8	2	16	1	55 ***	100	76	Sudbury A	-1	-1	5	-9	7 ***	330	37		
Victoria Int'l A	8	2	17	-1	67 ***	160	72	Thunder Bay A	-2	0	9	-11	2 8		X		
Williams Lake A	2P	4P	9P	-7P	0P***	130	65	Timmins A	-2P	1P	6P	-11P	5P 5	310	52		
Yukon Territory								Toronto (Pearson Int'l A)									
Komakuk Beach A	-21P	-4P	-9P	-31P	3P 12		X	Trenton A	2	-1	10	-7	19 ***	240	50		
Teslin (aut)	*	*	-3	*	* ***		X	Warton A	3P	0P	10P	-6P	23P***	210	50		
Watson Lake A	-12P	2P	0P	-29P	18P 37	120	37	Windsor A	5	-1	12	-2	12 ***	220	43		
Whitehorse A	-13	-4	-5	-23	10 21		X	Québec									
Northwest Territories								Bagotville A									
Alert	-17P	10P	-8P	-27P	0P***	220	69	Blanc Sablon A	-1	*	3	-6	16 1	050	72		
Baker Lake A	-18P	0P	-6P	-30P	8P 12	150	74	Inukjuak A	-2	5	1	-6	6 5	220	59		
Cambridge Bay A	-24	-1	-18	-31	7 18	080	74	Kuujuuaq A	-5P	4P	1P	-13P	2P 4		X		
Cape Dyer A	-9	5	-3	-21	7 171	150	61	Kuujuuarapik A	-4P	1P	3P	-10P	2P 4	130	48		
Clyde A	-13	4	-2	-26	2 33	320	46	Maniwaki	0	0	8	-10	13 ***	330	37		
Coppermine A	-23P	-6P	-15P	-31P	2P 18	080	59	Mont Joli A	-1P	-1P	4P	-8P	18P 1	050	83		
Coral Harbour A	-10	5	-3	-23	6 17	060	48	Montréal Int'l A	2	0	10	-7	19 ***	040	63		
Eureka	-17P	14P	-9P	-28P	2P 15		X	Natashquan A	-1	0	3	-6	21 8	050	33		
Fort Smith A	-12P	-2P	2P	-26P	6P 28	150	50	Québec A	0	0	4	-4	14 ***		X		
Hall Beach A	-16P	4P	-4P	-28P	2P 14	320	46	Schefferville A	-8P	1P	0P	-20P	3P 14	150	32		
Inuvik A	-28	-8	-18	-37	1 20		X	Sept-Îles A	-1P	1P	3P	-5P	25P 6	340	39		
Iqaluit A	-4	8	0	-17	7 19	140	59	Sherbrooke A	0P	0P	8P	-6P	29P 1	320	46		
Mould Bay A	-35P	-8P	-17P	-42P	0P 14		X	Val-d'Or A	-3	0	4	-16	9 3	340	50		
Norman Wells A	-26P	-8P	-16P	-35P	12P 5	300	74	New Brunswick									
Resolute A	-22P	2P	-13P	-36P	13P 12	130	67	Chatham A	*	*	*	*	* ***		X		
Yellowknife A	-18	-6	-3	-33	14 36	100	56	Fredericton A	1P	0P	6P	-4P	40P***	040	83		
Alberta								Miscou Island (aut)									
Calgary Int'l A	2	6	11	-9	0 1		X	Moncton A	2P	0P	7P	-2P	69P 1	050	87		
Cold Lake A	-1	5	8	-10	0 1		X	Saint John A	2P	0P	8P	-2P	47P 1	330	65		
Edmonton Namao A	1	6	8	-8	1 3	270	43	Nova Scotia									
Fort McMurray A	-3	4	7	-15	14 6	250	54	Greenwood A	5	1	12	-1	67 1	070	69		
High Level A	-13P	-4P	2P	-22P	12P 21	360	52	Shearwater A	5	1	14	0	78 ***	310	56		
Jasper	1	6	8	-8	12 2		X	Sydney A	5	1	10	1	105 ***	350	85		
Lethbridge A	5	6	15	-8	0 ***		X	Yarmouth A	5P	0P	14P	0P	52P 2	070	59		
Medicine Hat A	4P	5P	14P	-7P	0P***		X	Prince Edward Island									
Peace River A	-4P	4P	7P	-15P	9P 6	290	67	Charlottetown A	5P	2P	11P	0P	79P 1	060	69		
Saskatchewan								East Point (auto)									
Cree Lake	-6	0	4	-19	4 20	200	57	6P	*	10P	3P	0P***					
Estevan A	3	5	14	-6	0 ***		X	Newfoundland									
La Ronge A	-3P	4P	7P	-14P	3P 35	290	44	Cartwright	-1	1	2	-9	18 10	030	43		
Regina A	1	5	11	-9	0 ***		X	Churchill Falls A	-7	0	-2	-15	8 7	330	35		
Saskatoon A	-1	4	5	-11	5 7	180	46	Gander Int'l A	1	-1	4	-3	59 1	090	56		
Swift Current A	2P	5P	12P	-7P	0P***		X	Goose A	-4P	0P	1P	-12P	8P 12		X		
Yorkton A	0P	5P	7P	-7P	0P 1		X	Port Aux Basques	*	*	8	*	* ***	080	104		
Manitoba								St John's A									
Brandon A	-3P	2P	5P	-11P	0P 7		X	5	2	14	0	98 ***	090	69			
Churchill A	-11	0	-1	-25	6 23	350	54	St Lawrence	5	1	10	1	93 ***		X		
Lynn Lake A	-8P	1P	1P	-22P	2P 21	290	39	Wabush Lake A	-7P	1P	0P	-19P	4P 7		X		
The Pas A	-1	5	6	-8	1 23	300	48	91/11/11-91/11/17									
Thompson A	-7P	2P	3P	-21P	1P 22		X										
Winnipeg Int'l A	-1	2	6	-6	5 1	170	80										

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

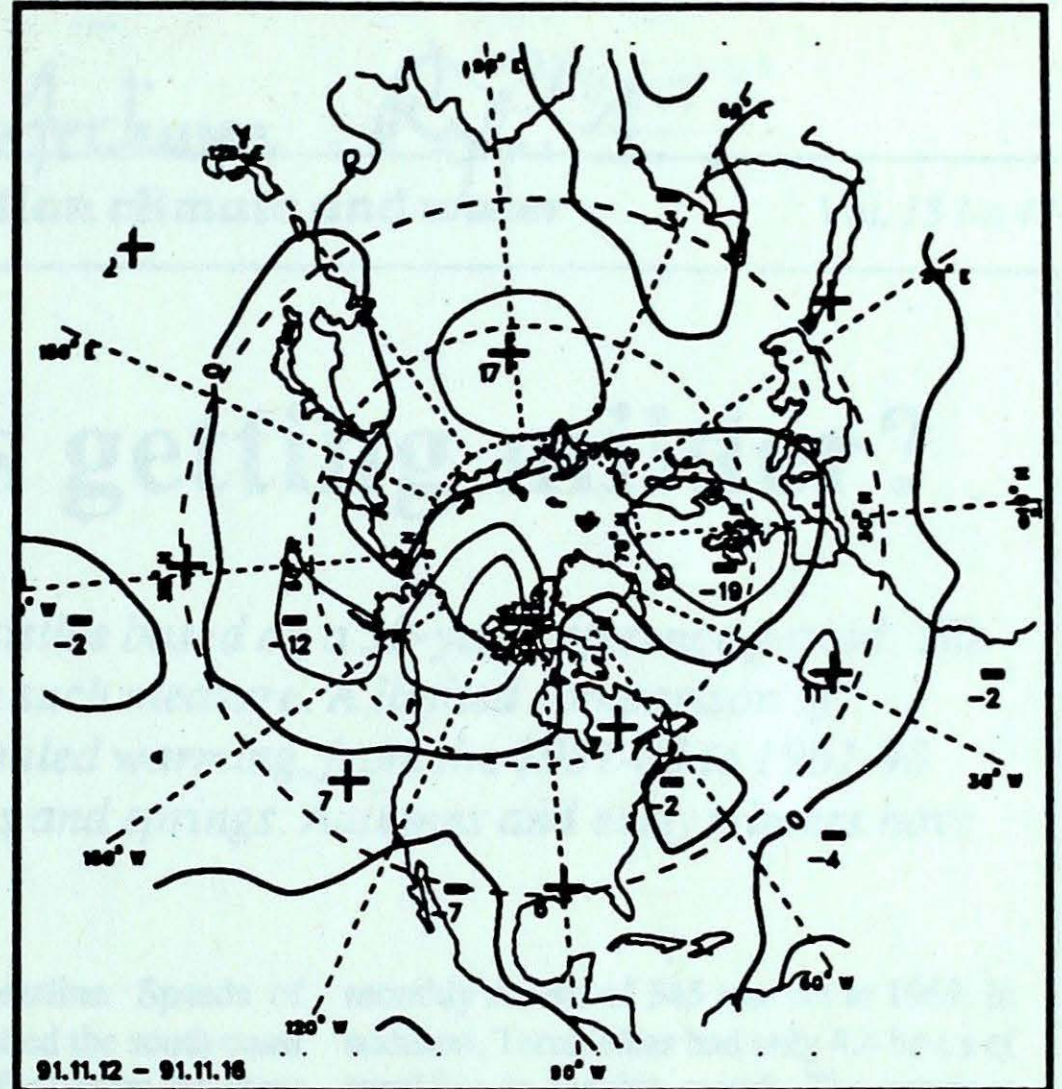
ptot = weekly precipitation total in mm
 st = snow thickness on the ground in cm
 dir = direction of max wind, deg. from north.
 vel = wind speed in km/h

— 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)



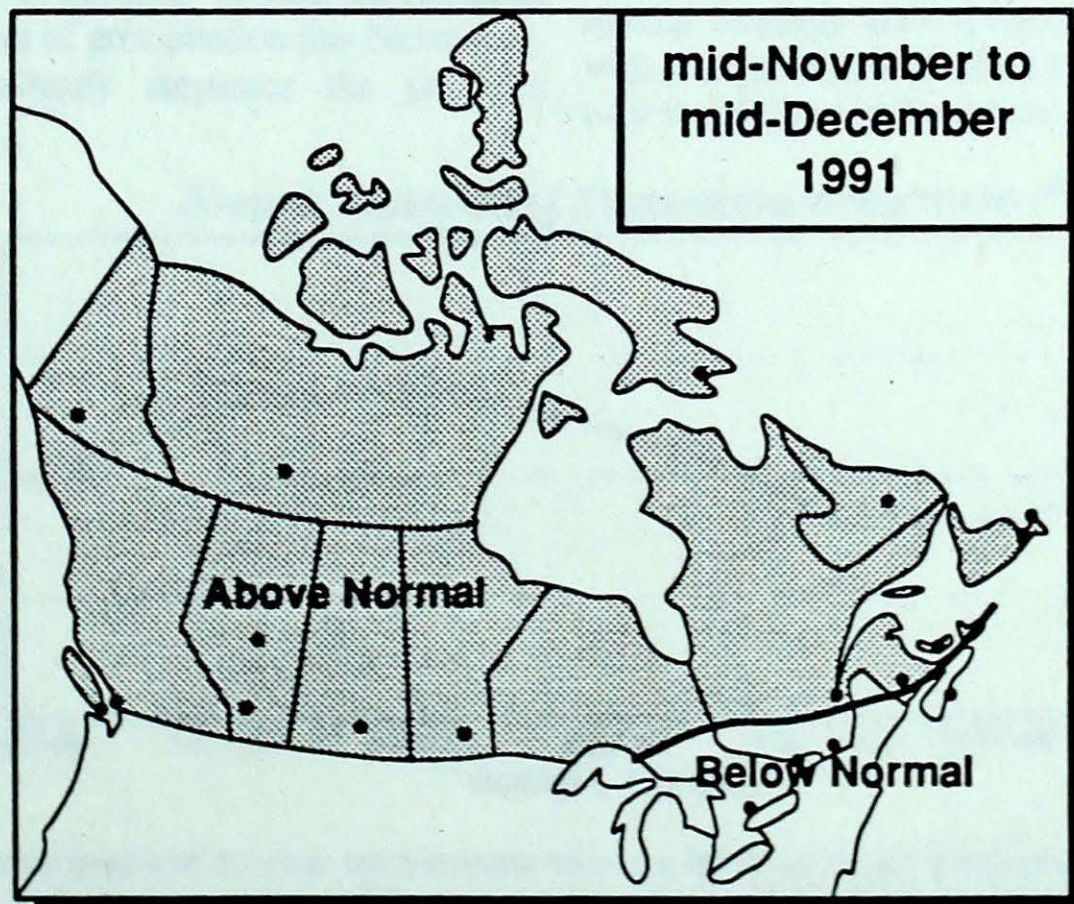
Environment Canada / Environnement Canada

Atmospheric Environment Service / Service de l'environnement atmosphérique

MONTHLY TEMPERATURE FORECAST

Normal temperatures for
mid-November to mid-December, °C

Whitehorse	-13	Toronto	0
Yellowknife	-19	Ottawa	-3
Iqaluit	-17	Montreal	-2
Vancouver	5	Quebec	-5
Victoria	5	Fredericton	-3
Calgary	-5	Halifax	2
Edmonton	-8	Charlottetown	-1
Regina	-9	Goose Bay	-8
Winnipeg	-9	St. John's	1



Canada

