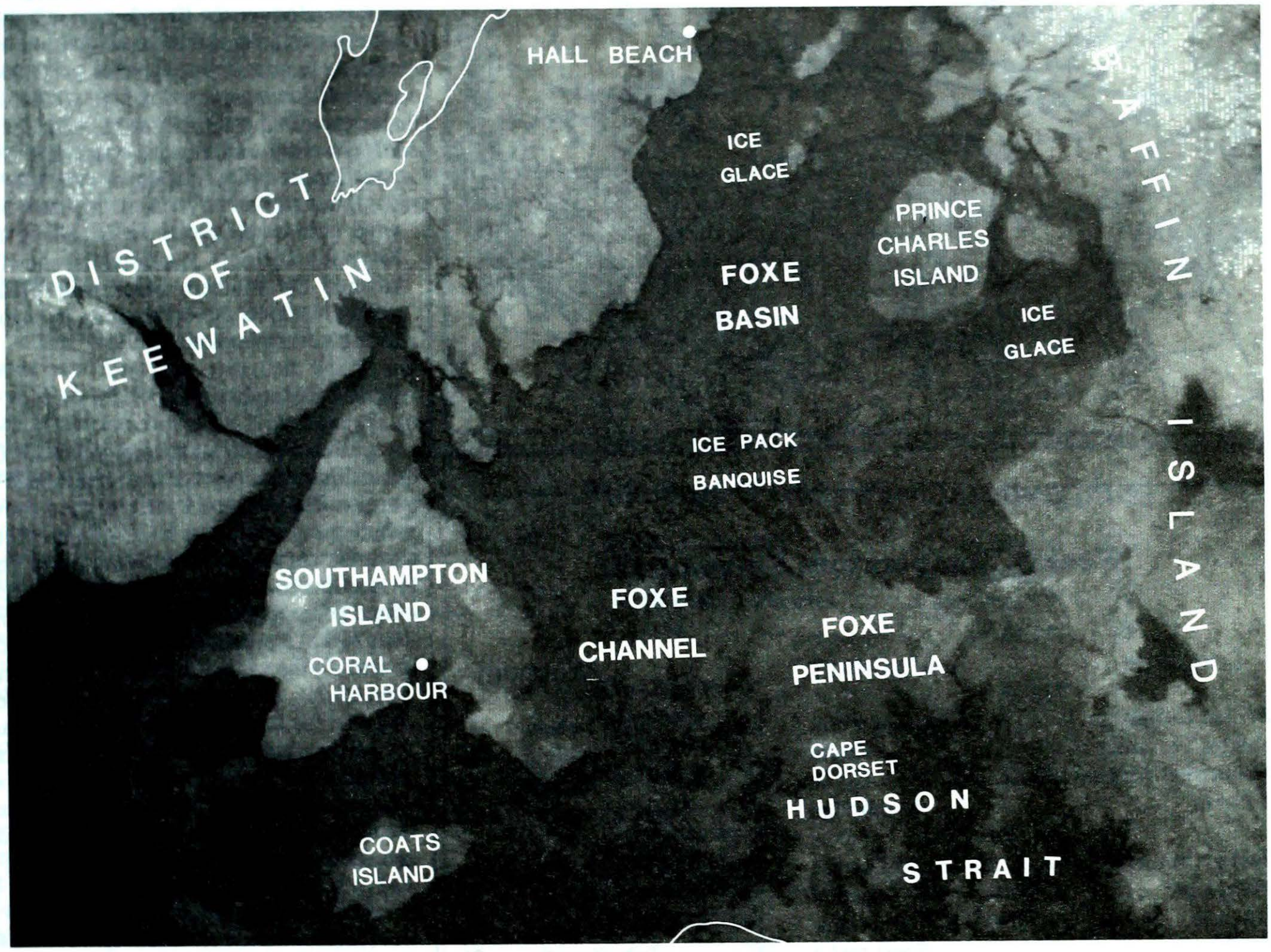
Environment Canada Environnement Canada

Climatic Perspectives

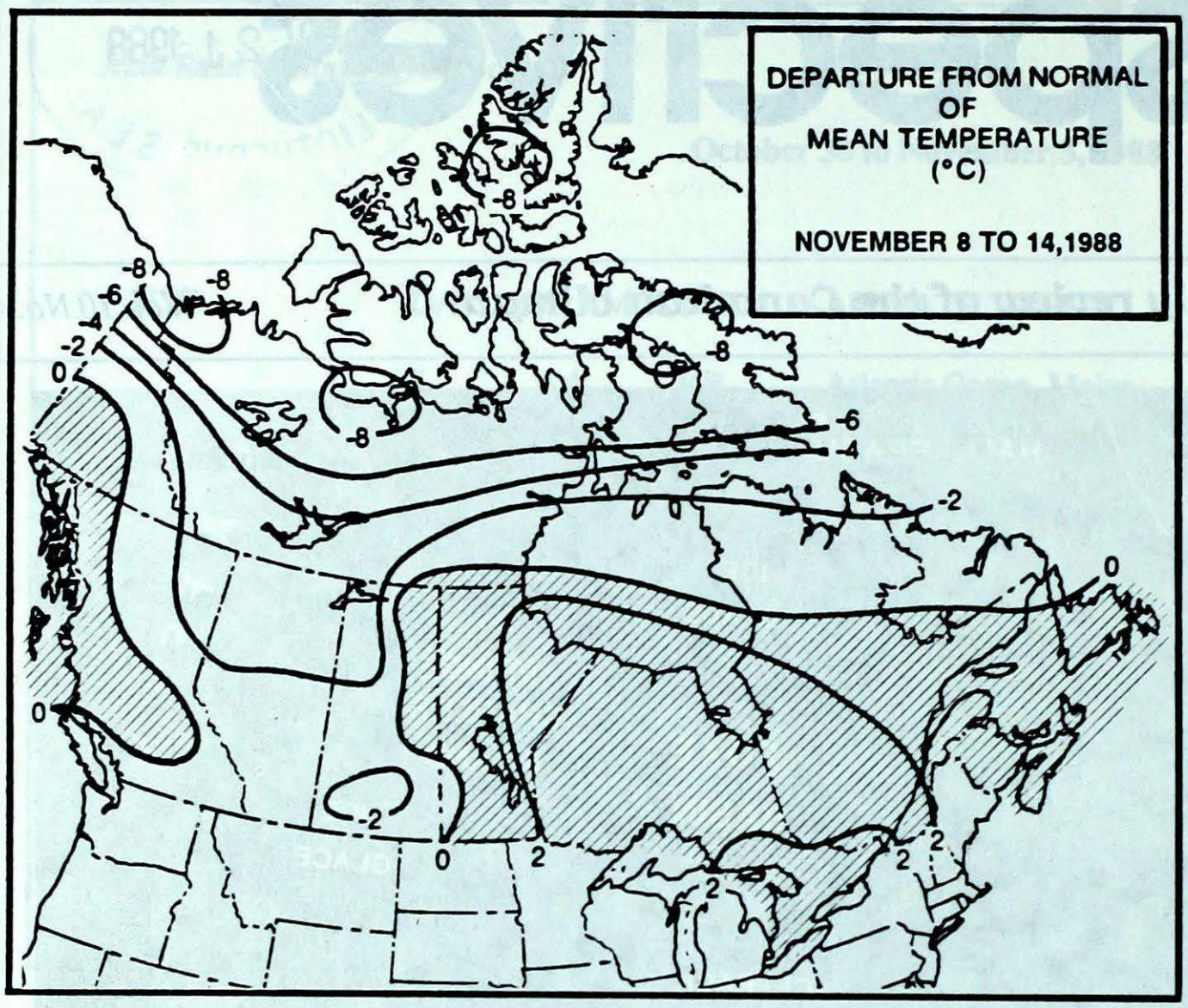
November 8 to 14, 1988 **A weekly review of the Canadian climate** *Vol. 10 No. 46*



This NOAA-10 satellite photograph of November 12, 1988, shows freeze-up progressing in the eastern Arctic. New ice began forming in Foxe Basin and Channel by the end of October. The ice, swirled by the wind and ocean currents, is now spreading southwards into Hudson Strait. Due to the nature of infrared photography, the cold Arctic terrain (lighter shading) and the ice-covered water (darker grey) contrast well.

- **Another major storm crosses the Great Lakes en route towards Newfoundland**
- **Abnormally cold in the Arctic**

Canada



Weekly Temperature Extreme (°C)

Location	Maximum		Minimum	
British Columbia	Kindakun Point	20	Fort Nelson	-17
Yukon Territory	Teslin	0	Ogilvie	-29
Northwest Territories	Clyde	-1	Eureka	-41
Alberta	Lethbridge	18	Fort Chipewyan	-16
Saskatchewan	Swift Current	17	Uranium City	-18
Manitoba	Brandon	14	Gillam	-20
Ontario	Port Weller	18	Pickle Lake	-20
Québec	Sherbrooke	19	Schefferville	-21
New Brunswick	Moncton	19	Charlo	-6
Nova Scotia	Greenwood	21	Greenwood	-7
Prince Edward Island	Charlottetown	17	Charlottetown	-2
Newfoundland	St John's	17	Wabush Lake	-18
Across The Country...				
Warmest Mean Temperature			Estevan Point (BC) Sable Island (NS)	10
Coolest Mean Temperature			Eureka (NWT)	-29

88/11/01-88/11/07

ACROSS THE COUNTRY . . .

Yukon and Northwest Territories

Persistent Pacific storms in the Gulf of Alaska produced snow and kept temperatures below freezing in the southern Yukon. Further to the north it was bitterly cold. Daily minimum temperature records, as low as minus forty in the Beaufort, were broken after the middle of the week. Brisk northeasterly winds, at times gusting to 60 km/h, created blowing snow and high wind chills along the Dempster Highway. Road crews are currently building ice roads and constructing ice bridges; some of them will be ready for use shortly. Blowing snow and wind chill advisories were issued for the Keewatin District. A substantial snowfall covered the southern Mackenzie Valley, giving residents the opportunity to engage in outdoor winter activities.

British Columbia

With Pacific storms approaching the coastline, weatherwise it was a mixed up week. The Arctic air mass sagged southward across northern B.C., giving wintry weather conditions. South of the cold front it was much milder and the interior valleys fared better, but for the most part, sunshine was still at a premium, especially along the coast. In the central interior, the combination of rain, snow and temperatures hovering near the freezing mark resulted in a rash of traffic accidents due to icy roads. Higher elevations of the southern valleys have become snow covered, permitting some cross-country skiing, but it will be another few weeks before downhill slopes are ready.

Prairie Provinces

November is normally one of the gloomiest months on the prairies, and this week was no exception. Although there has been some sunshine, cloudy skies predominated. There have been significant snowfalls north of the Manitoba Lakes virtually every day. Snow depths in excess of 50 cm were common across the north by the end of the period.

In Alberta, a shallow layer of Arctic air gave predominantly cloudy skies. Except in the extreme south, where the mercury reached 10°C early in the period, temperatures remained below freezing. Light snowfalls were reported in most districts. The Peace River District received the most.

Ontario

It was another dull, wet and blustery week, with little sunshine, as frontal disturbances moved across the region. On November 10, an intense storm tracked out of the American mid-west, resulting in a particularly stormy period. A sharp cold front triggered thunderstorms and produced storm-force winds in its wake. In the Lake Simcoe area, winds gusted to almost 100 km/h, knocking down power lines, trees and damaging outdoor structures and sheds. In addition, the strong winds collapsed the walls of a nearly completed industrial mall under construction. While the bulk of the precipitation missed northwestern Ontario, there were heavy snowfalls in northern Ontario, but mostly rain in the south.

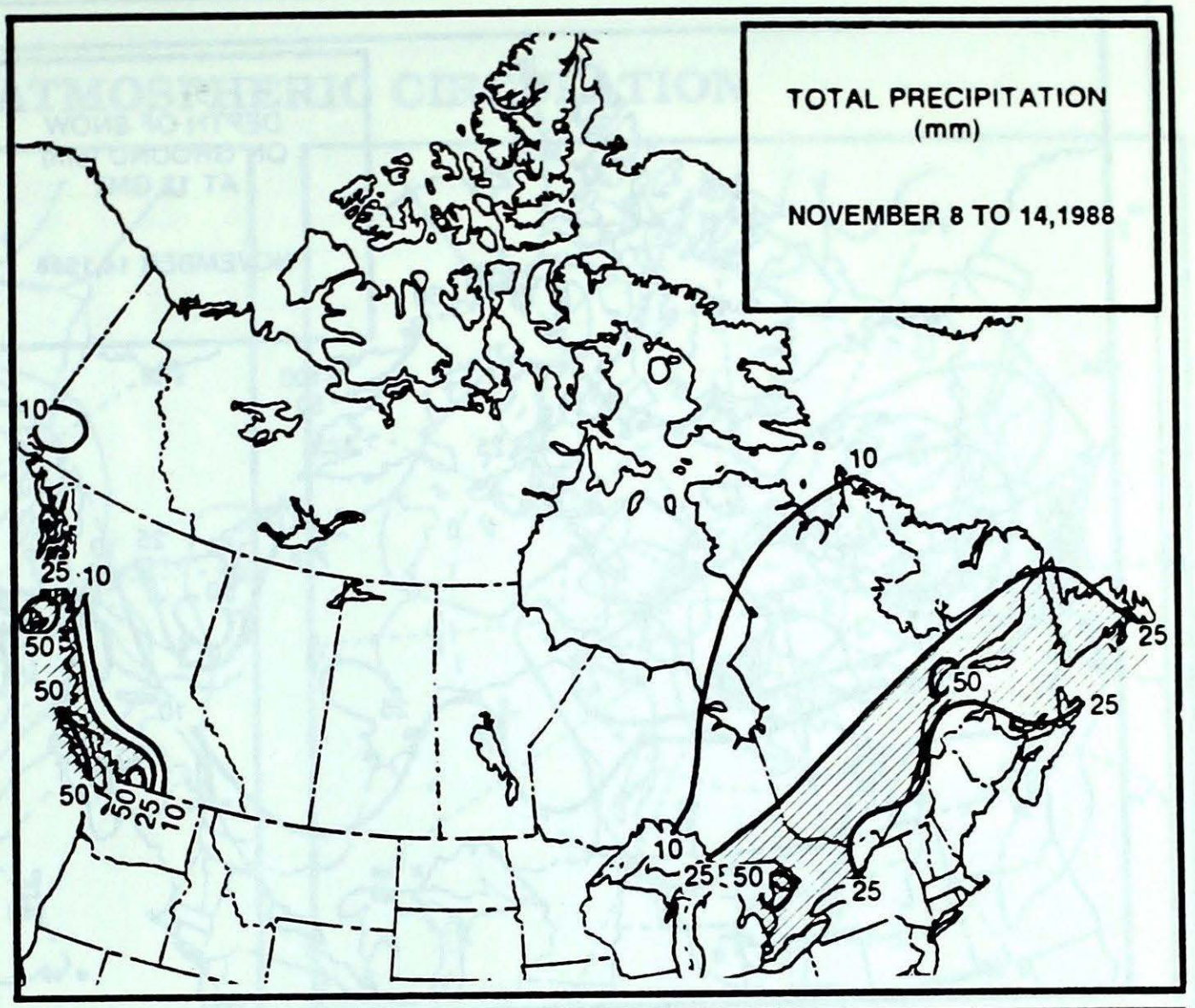
Quebec

The weather pattern was much the same as in Ontario - unsettled, windy and wet. Two weather systems produced a mixture of rain and snow. On November 10, an intense low pressure system crossing the region gave wind gusts in excess of 95 km/h. A second disturbance during the weekend provided additional snow. The Laurentians and communities near the north shore received anywhere up to 30 cm of snow. A snowfall in the Quebec City region on the 13th caused numerous traffic accidents and mishaps, including the death of five persons.

Atlantic Provinces

In the Maritimes, the period was mainly cloudy, with some sun and cooler temperatures occurring over the weekend. It was not nearly as wet as in previous weeks, but several centimetres of snow did fall in the higher elevations of western New Brunswick.

In Newfoundland, the week started out mild and wet, but by the 9th lower temperatures resulted in 2 to 5 centimetres of snow covering the northern portions of the Island. An intense disturbance affecting the Great Lakes moved across southern Labrador over the weekend, bringing milder air and rain and strong winds. Wind gusts reached up to 100 km/h at Port aux Basques, causing ferry delays to the mainland. In Labrador, snow was the predominant form of precipitation, with falls ranging from 10 to 20 centimetres. It got progressively colder during the course of the period.



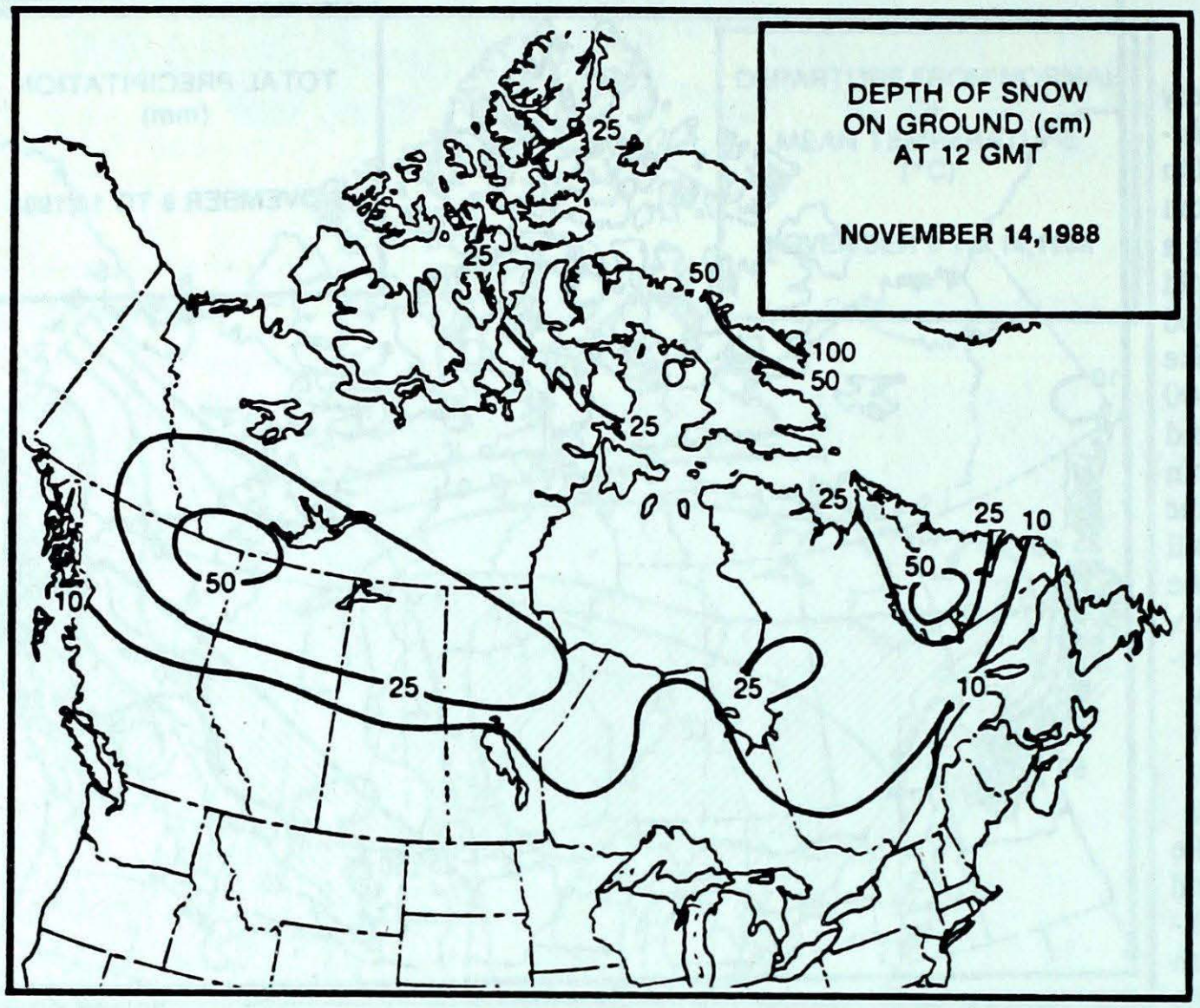
Heaviest Weekly Precipitation (mm)

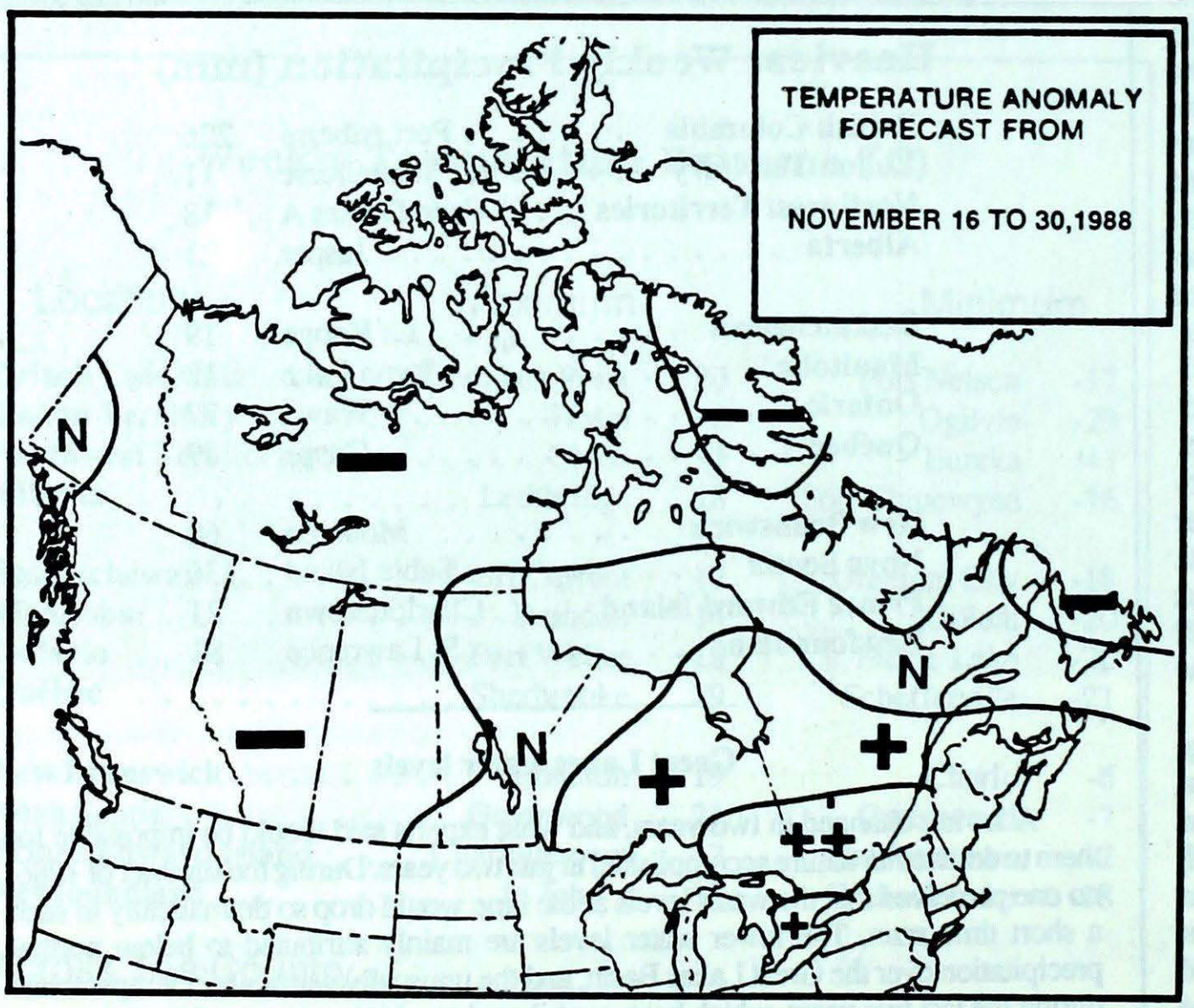
British Columbia	Port Alberni	226
Yukon Territory	Whitehorse	11
Northwest Territories	Cape Dorset A	18
Alberta	Jasper	21
Saskatchewan	La Ronge	19
Manitoba	Lynn Lake	18
Ontario	Wawa	77
Québec	Gaspe	87
New Brunswick	Moncton	60
Nova Scotia	Sable Island	136
Prince Edward Island	Charlottetown	21
Newfoundland	St Lawrence	81

Great Lakes water levels

A lot has changed in two years, and what experts said would be impossible for them to do, mother nature accomplished in just two years. During the summer of 1986, no one perceived that the water levels at the time would drop so dramatically in such a short time span. The lower water levels are mainly attributed to below normal precipitation over the Great Lakes Basin, and the unusually warm water temperatures during the last two years, which have contributed to a higher evaporation rate.

Compared to the long term average (1900-1987), water levels as of November 1988 were as follows: Lake Superior (12 cm below), Lake Huron (9 cm below), Lake St. Clair (7 cm above), Lake Erie (3 cm above), Lake Ontario (5 cm below). Compared to 1987 & 1986, Great Lake water levels have changed by: Lake Superior (-5 cm & -38 cm), Lake Huron (-37 cm & -107 cm), Lake St. Clair (-36 cm & -96 cm), Lake Erie (-40 cm & -88 cm), Lake Ontario (+6 cm & -58 cm).





+ +	much above normal
+	above normal
N	normal
-	below normal
- -	much below normal

Temperature Anomaly Forecast

This forecast is prepared by searching historical weather maps to find cases similar to the present. The historical outcome during the 15 days subsequent to the chosen analogues is assumed to be a forecast for the next 15 days from now.

CLIMATIC PERSPECTIVES VOLUME 10

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The purpose of the publication is to make topical information available to the public concerning the Canadian Climate and its socio-economic impact.

Unsolicited articles are welcome but should be at maximum about 1500 words in length. They will be subject to editorial change without notice due to publishing time constraints. The contents may be reprinted freely with proper credit.

The data in this publication are based on unverified reports from approximately 225 Canadian synoptic weather stations. Information concerning climatic impacts is gathered from AES contacts with the public and from the media. Articles do not necessarily reflect the views of the Atmospheric Environment Service.

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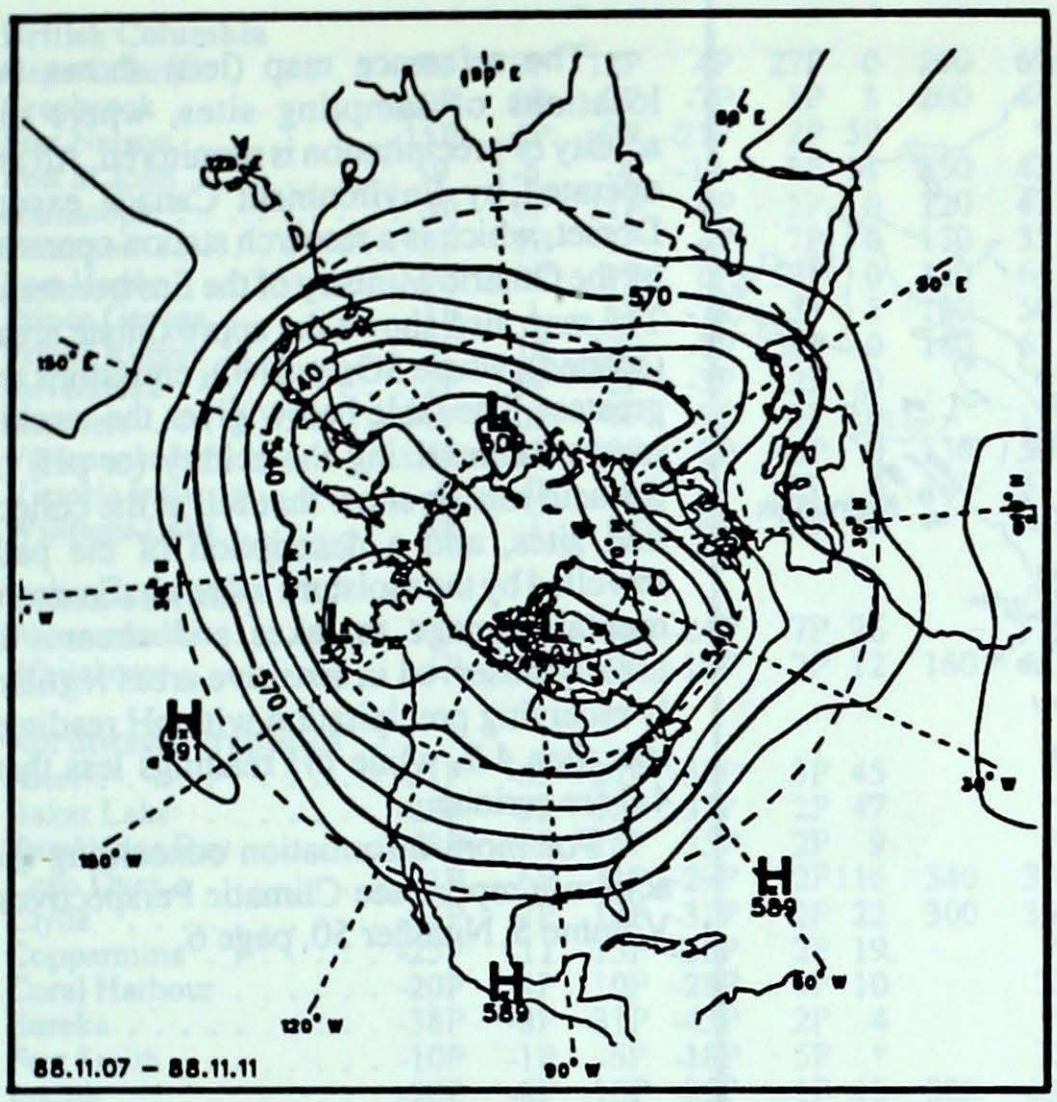
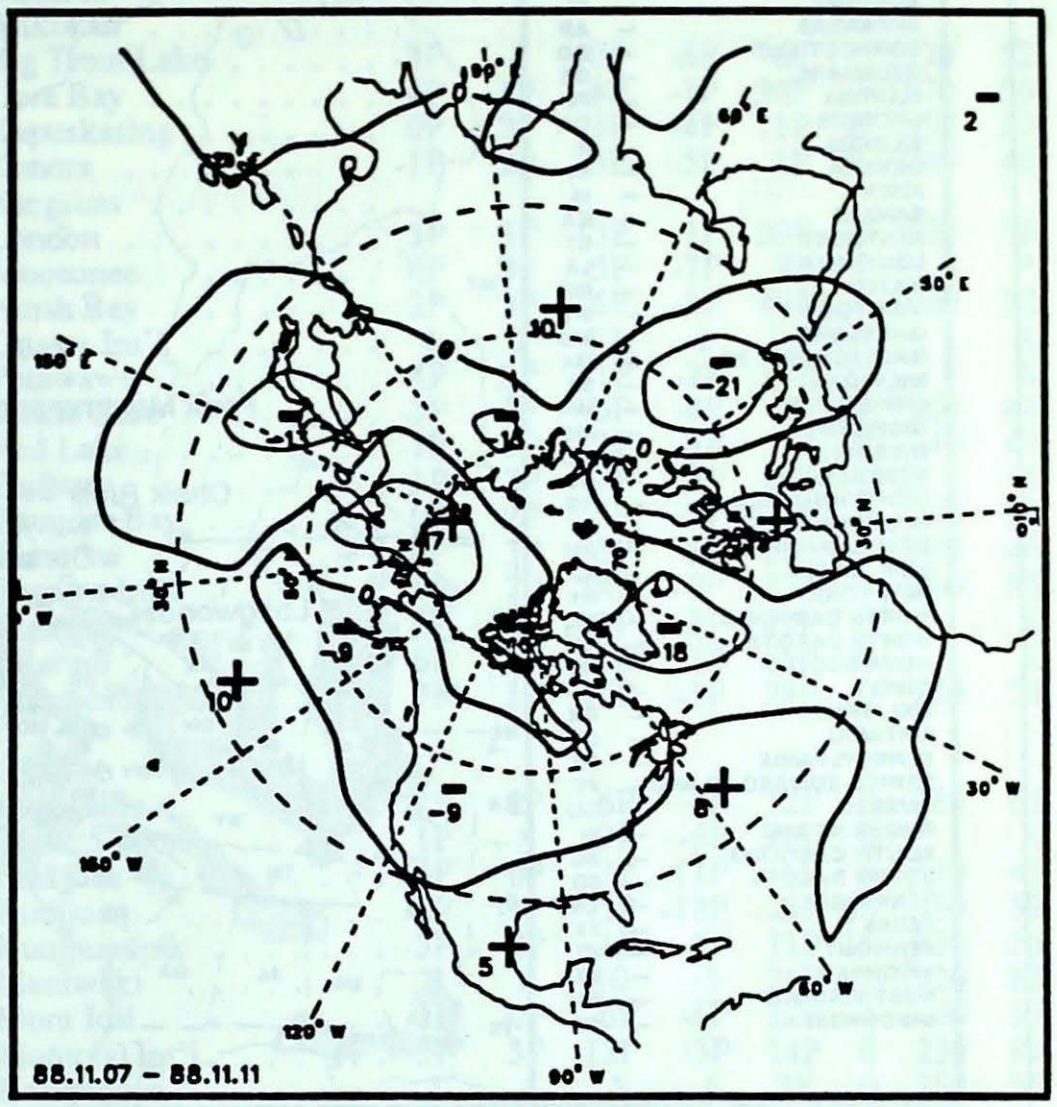
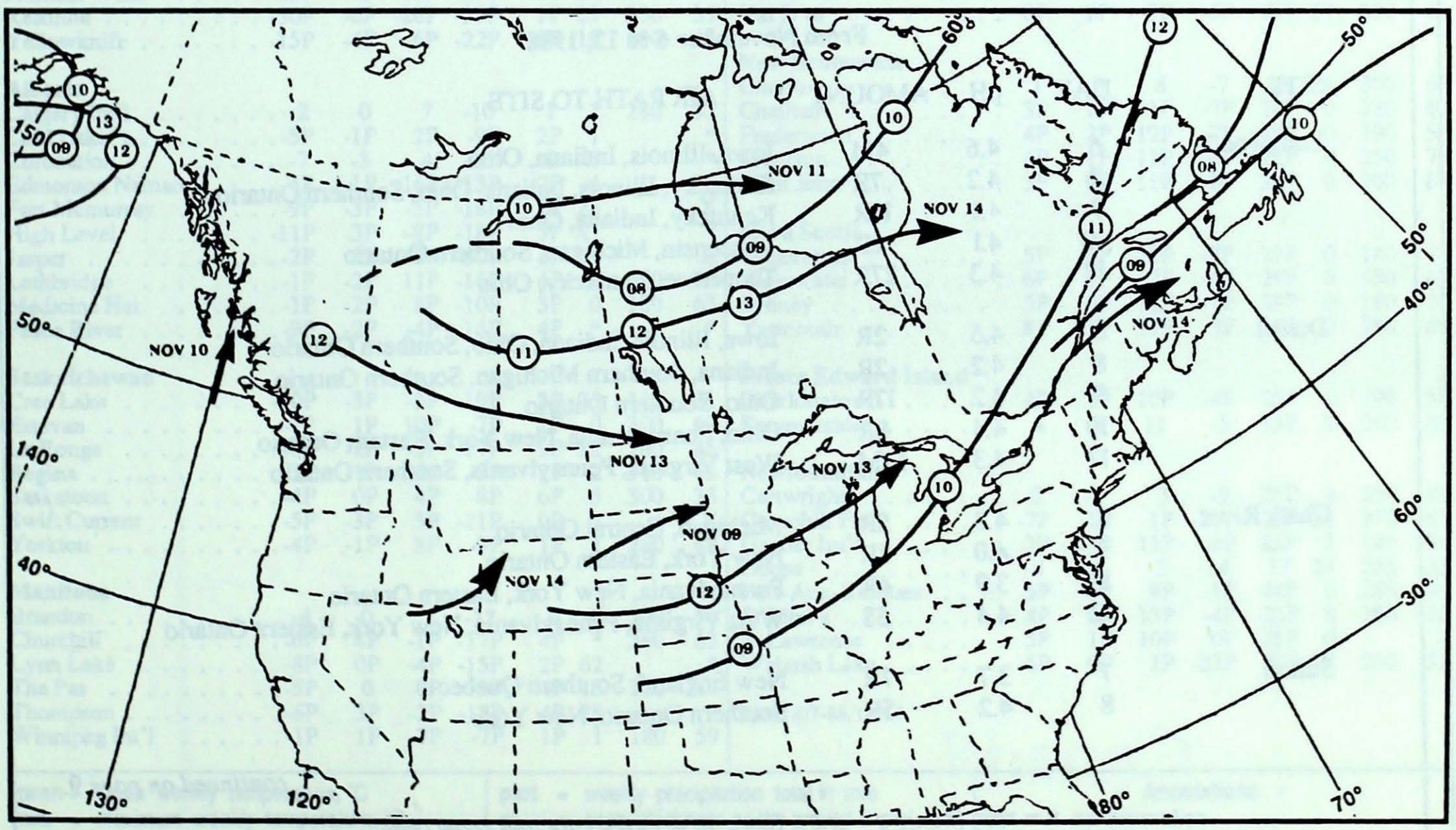
50 kPa ATMOSPHERIC CIRCULATION



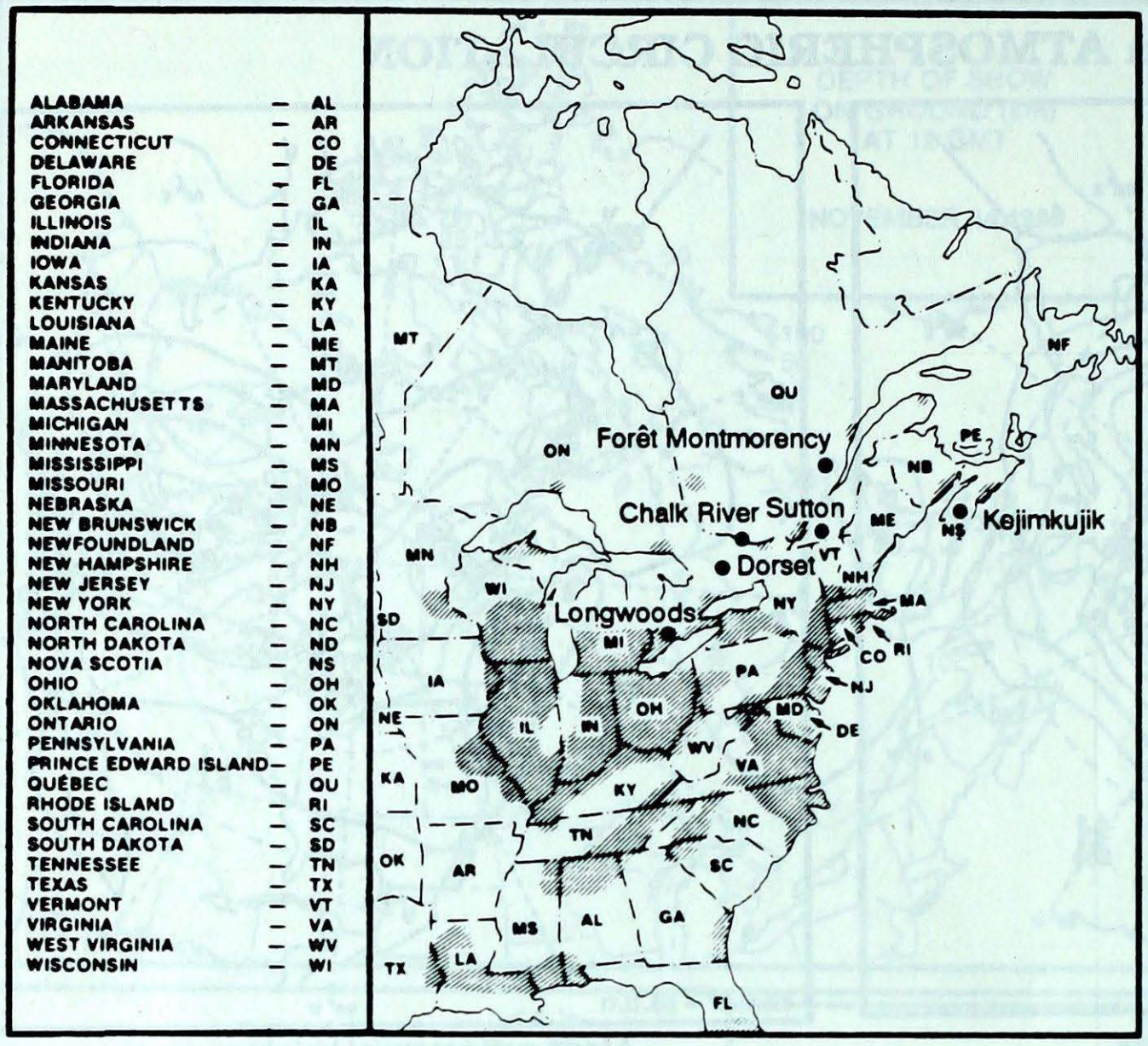
Mean geopotentiial height
50 kPa level (5 decameter intervals)



Mean geopotential height anomaly
50 kPa level (5 decameter intervals)



Storm track - Position of storm at 12 GMT each day during the period.



ACID RAIN REPORT

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_2 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.

For more information concerning the acid rain report, see Climatic Perspectives, Volume 5, Number 50, page 6.

From November 6 to 12, 1988

SITE	DAY	pH	AMOUNT	AIR PATH TO SITE
Longwoods	6	4.6	4M	Iowa, Illinois, Indiana, Ohio
	7	4.2	7R	Kentucky, Illinois, Indiana, Ohio, Southern Ontario
	9	4.1	10R	Kentucky, Indiana, Ohio
	10	4.1	2R	Wisconsin, Michigan, Southern Ontario
	12	4.3	27R	Tennessee, Kentucky, Ohio
Dorset	6	4.5	2R	Iowa, Illinois, Indiana, Ohio, Southern Ontario
	8	4.2	2R	Indiana, Southern Michigan, Southern Ontario
	9	4.2	17R	Ohio, Southern Ontario
	10	4.4	8R	Ohio, Pennsylvania, New York, Eastern Ontario
	12	4.3	11M	West Virginia, Pennsylvania, Southern Ontario
Chalk River	8	4.3	5R	Michigan, Central Ontario
	9	4.0	8R	New York, Eastern Ontario
	10	3.9	4R	Pennsylvania, New York, Eastern Ontario
	12	4.4	5S	West Virginia, Pennsylvania, New York, Eastern Ontario
Sutton	7	3.7	7R	New England, Southern Quebec
	8	4.2	5R	Southern Ontario, New York

continued on page 9.

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

STATION	temperature moy	anom	max	min	precip. ptot	st	wind max dir	vit
British Columbia								
Cape St.James	7P	0P	12P	4P	27P	0	290	69
Cranbrook	0P	0P	7P	-7P	1P	3	200	44
Fort Nelson	-15P	-4P	-9P	-21P	2P	50		*
Fort St.John	-9	-5	-4	-14	3P	11	350	43
Kamloops	3P	0P	11P	-4P	1P	0	120	41
Penticton	3P	-1P	7P	-4P	7P	0	170	35
Port Hardy	5P	0P	9P	0P	58P	0	110	61
Prince George	-1P	1	6P	-7P	3P	1	180	50
Prince Rupert	5P	1P	12P	-7P	36P	0	180	61
Revelstoke	2P	0P	6P	-3P	12P	0		*
Smithers	-1P	0P	4P	-7P	9P	0		*
Vancouver Int'l	6P	0P	12P	0P	46P	0	130	50
Victoria Int'l	6	0	11	-1	23	0	140	61
Williams Lake	0P	1	6P	-8P	2P	0		X
Yukon Territory								
Watson Lake	-13P	-1P	-8P	-24P	7P	26		*
Whitehorse	-6P	2P	0P	-16P	2P	12	160	61
Northwest Territories								
Alert	-31P	-6P	-27P	-35P	3P	45		*
Baker Lake	-23P	-5P	-12P	-33P	2P	47		*
Cambridge Bay	-28P	-6P	-16P	-35P	2P	9		*
Cape Dyer	-21P	-6P	-11P	-29P	2P	116	340	33
Clyde	-24P	-7P	-13P	-31P	2P	22	300	33
Coppermine	-25P	-11	-15P	-35P	2P	19		*
Coral Harbour	-20P	-4P	-10P	-28P	1P	10		X
Eureka	-38P	-8P	-31P	-43P	2P	4		*
Fort Smith	-10P	-1P	-5P	-18P	5P	*		X
Iqaluit	-20P	-8P	-10P	-25P	1P	15	320	43
Hall Beach	-26P	-6P	-18P	-32P	3P	30	290	57
Inuvik	-29P	-10P	-17P	-40P	2P	26		X
Mould Bay	-29P	-3P	-22P	-36P	2P	15		X
Norman Wells	-23P	-7P	-16P	-29P	8P	10		X
Resolute	-30P	-6P	-26P	-35P	1P	27	330	35
Yellowknife	-15P	-4P	-6P	-22P	8P	19	180	48
Alberta								
Calgary Int'l	-2	0	7	-10	1	1	280	57
Cold Lake	-5P	-1P	2P	-9P	2P	1		*
Coronation	-7	-3	4	-15	0	0		*
Edmonton Namao	-4P	-1P	16P	-13P	2P	4		*
Fort Mcmurray	-9P	-3P	-5P	-18P	1P	23		X
High Level	-11P	-3P	-8P	-18P	5P	41		*
Jasper	-2P	1P	5P	-10P	1P	1		X
Lethbridge	-1P	-2P	11P	-16P	4P	0	280	74
Medicine Hat	-1P	-2P	8P	-10P	3P	0	180	65
Peace River	-9P	-2P	-4P	-16P	4P	*		*
Saskatchewan								
Cree Lake	-10P	-3P	-5P	-19P	3P	25	110	31
Estevan	-1P	1P	10P	-7P	1P	0	300	69
La Ronge	-8P	-2P	-3P	-17P	9P	12	200	46
Regina	-3P	-1P	6P	-9P	2P	2	310	43
Saskatoon	-4P	0P	4P	-8P	6P	5	300	33
Swift Current	-5P	-3P	5P	-11P	0P	2		X
Yorkton	-4P	-1P	8P	-9P	1P	1	280	48
Manitoba								
Brandon	-4	0	7	-12	4	0	300	56
Churchill	-6P	4P	-1P	-17P	4P	*	360	63
Lynn Lake	-8P	0P	-4P	-15P	2P	62		*
The Pas	-5P	0	0P	-9P	4P	15	320	44
Thompson	-6P	3P	-2P	-12P	4P	28		*
Winnipeg Int'l	-1P	1P	7P	-7P	1P	1	180	59

STATION	temperature moy	anom	max	min	precip. ptot	st	wind max dir	vit
Ontario								
Atikokan						*		
Big Trout Lake	-3P	4	0P	-6P	6P	*	320	52
Gore Bay	4P	1P	8P	-1P	36P	0	270	56
Kapuskasing	0P	3P	3P	-4P	11P	8	350	50
Kenora	-1P	2P	3P	-5P	1P	6	240	46
Kingston								
London	5P	1P	13P	1P	39P	0	250	78
Moosonee	0P	3P	5P	-7P	9P	2		*
North Bay	2P	2P	6P	-2P	49P	7	080	52
Ottawa Int'l	4	2	12	-2	15	0		X
Petawawa	4P	3P	11P	-2P	35P	0		X
Pickle Lake	-3P	3P	0P	-8P	3P	16	260	44
Red Lake	-1P	3P	2P	-4P	1P	9	240	44
Sudbury	1P	2P	7P	-5P	26P	3		X
Thunder Bay	0P	2P	5P	-7P	7P	0	270	39
Timmins	0P	3P	5P	-5P	21P	5	340	46
Toronto Int'l	6P	2P	14P	0P	27P	0	260	85
Trenton	6P	2P	13P	-2P	29P	0		X
Wiarton	6P	2P	9P	3P	65P	0		X
Windsor	7P	1P	15P	-1P	28P	0	250	72
Québec								
Bagotville	2P	2P	6P	-4P	12P	0	280	61
Blanc Sablon	1P	*	7P	-6P	20P	0		X
Inukjuak	-6P	0P	-3P	-11P	6P	6	110	41
Kuujjuaq	-8P	-1P	-1P	-18P	23P	20	350	59
Kuujjuarapik	-3P	2P	1P	-9P	11P	15	330	56
Maniwaki	3	2	10	-3	26P	0	220	83
Mont Joli	1P	0P	6P	-6P	12P	1	160	57
Montréal Int'l	5P	3P	12P	-3P	14P	0	230	91
Natashquan	1	1	8	-6	38	0	280	65
Québec	2	1	10	-4	36	1	240	85
Schefferville	-8P	0P	-1P	-25P	14P	19	350	39
Sept-Iles	0	1	9	-10	52	10	300	63
Sherbrooke	3P	2P	12P	-4P	21P	0	250	61
Val D'or	0P	2P	5P	-5P	33P	17	330	56
New Brunswick								
Charlo	1	0	8	-7	18	6	300	67
Chatham	3P	2P	11P	-7P	24P	0	280	67
Fredericton	4P	2P	12P	-7P	19P	0	190	57
Moncton	4P	1P	11P	-8P	11P	0	250	76
Saint John	3P	0P	11P	-6P	20P	0	200	63
Nova Scotia								
Greenwood	5P	1P	13P	-7P	19P	0	140	78
Shearwater	6P	1P	12P	-4P	29P	0	180	65
Sydney	5P	0P	11P	-1P	28P	0	180	70
Yarmouth	8P	2P	13P	3P	14P	0	260	65
Prince Edward Island								
Charlottetown	4P	1P	10P	-4P	25P	0	190	54
Summerside	4	0	11	-5	13P	0	260	69
Newfoundland								
Cartwright	-2	-1	3	-9	25P	1	350	81
Churchill Falls	-7P	-1P	1P	-20P	21P	51	310	65
Gander Int'l	2P	-1P	11P	-6P	25P	1	140	76
Goose	-4	-1	3	-14	17	24	250	35
Port-Aux-Basques	5P	1P	9P	-1P	48P	0	280	98
St John's	4P	0P	13P	-4P	23P	0	160	83
St Lawrence	5P	1P	10P	0P	35P	0		X
Wabush Lake	-6P	0P	1P	-23P	20P	22	280	52

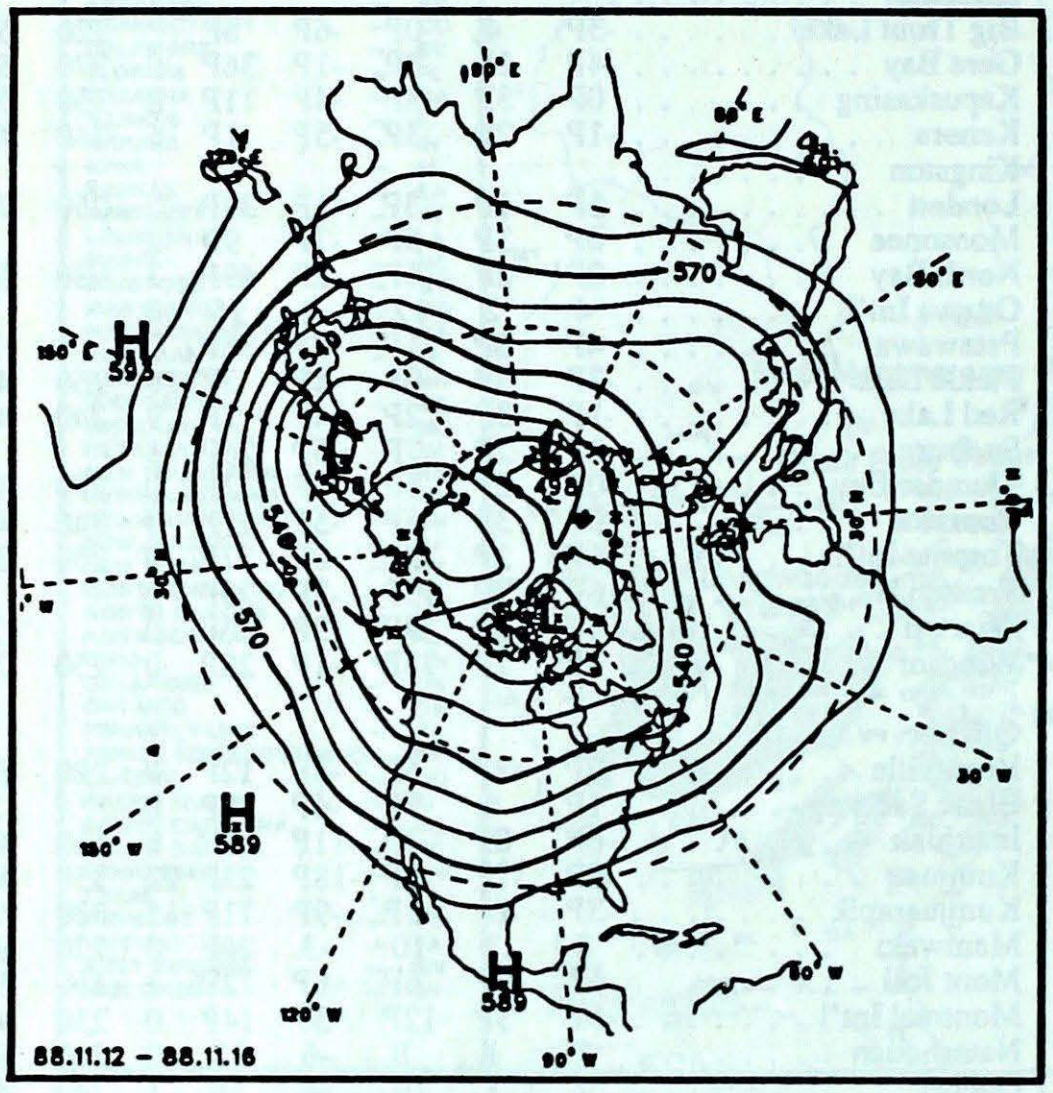
88/11/07-88/11/14

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

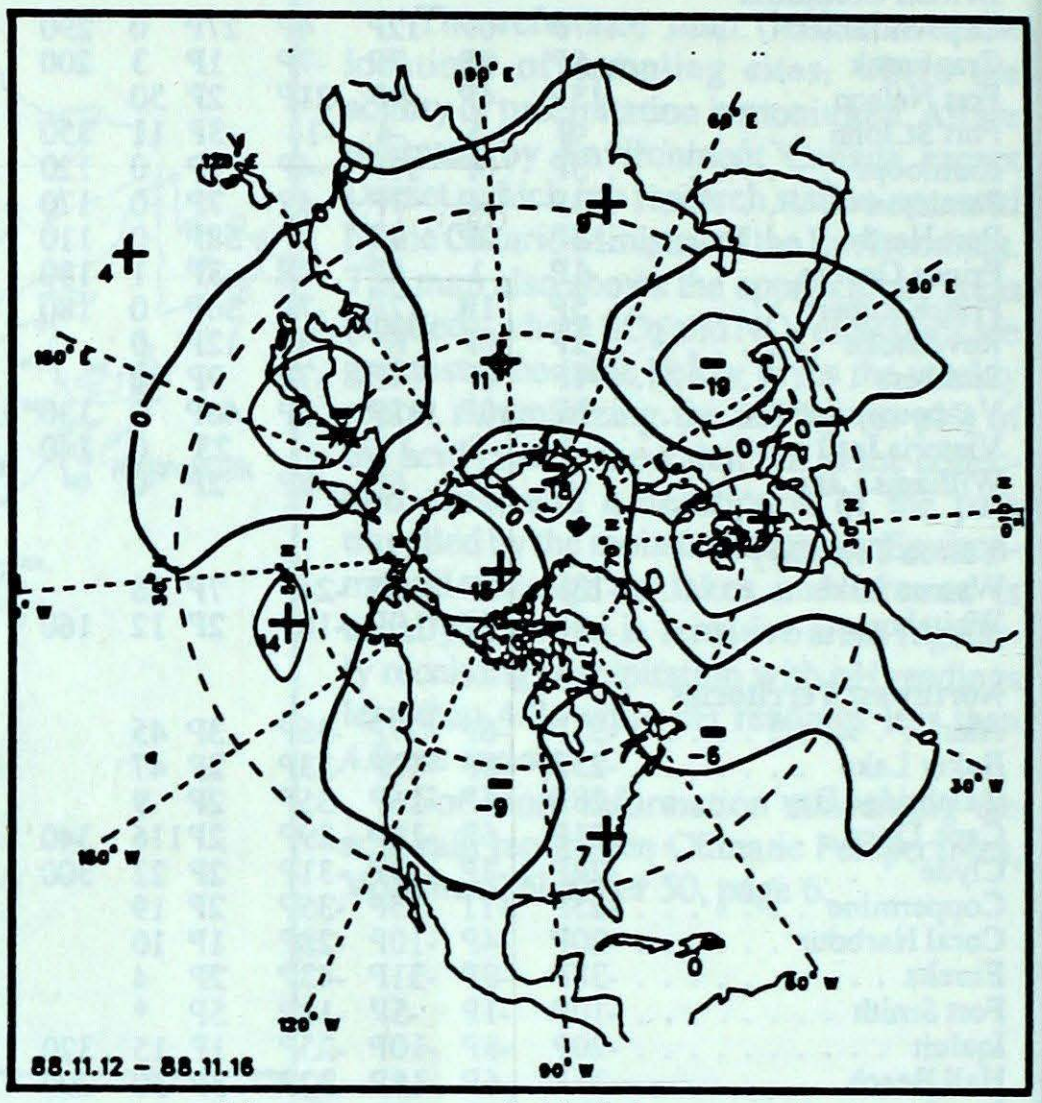
ptot = weekly precipitation total in mm
st = snow thickness on the ground in cm
dir = direction of max wind, deg. from north.
vit = wind speed in km/h

- Annotations -
X = no observation
P = less than 7 days of data.
***** = missing data when going to printing.

50 kPa ATMOSPHERIC CIRCULATION



Mean geopotentiial height
50 kPa level (5 decameter intervals)



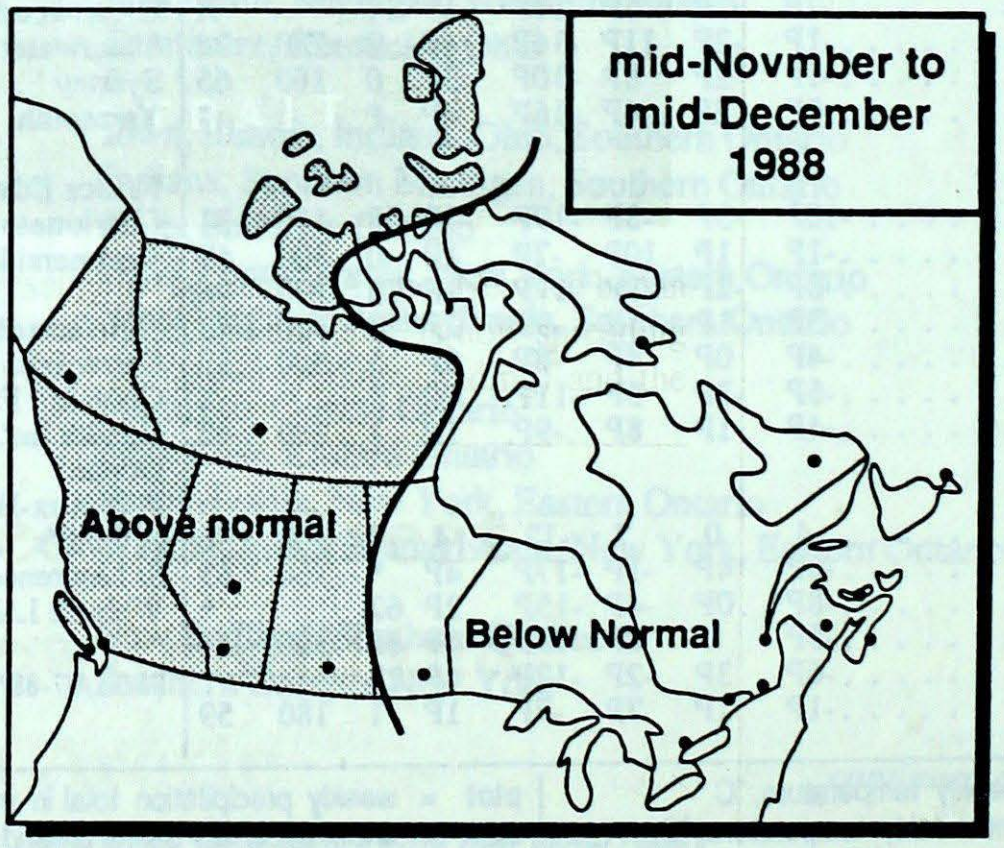
Mean geopotential height anomaly
50 kPa level (5 decameter intervals)

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



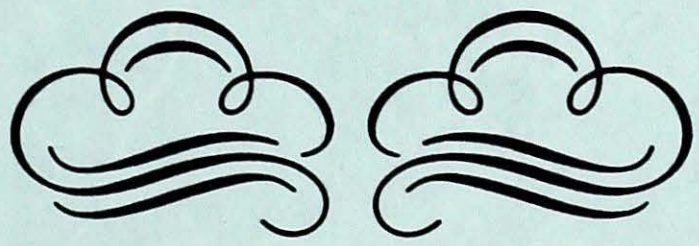
Canada

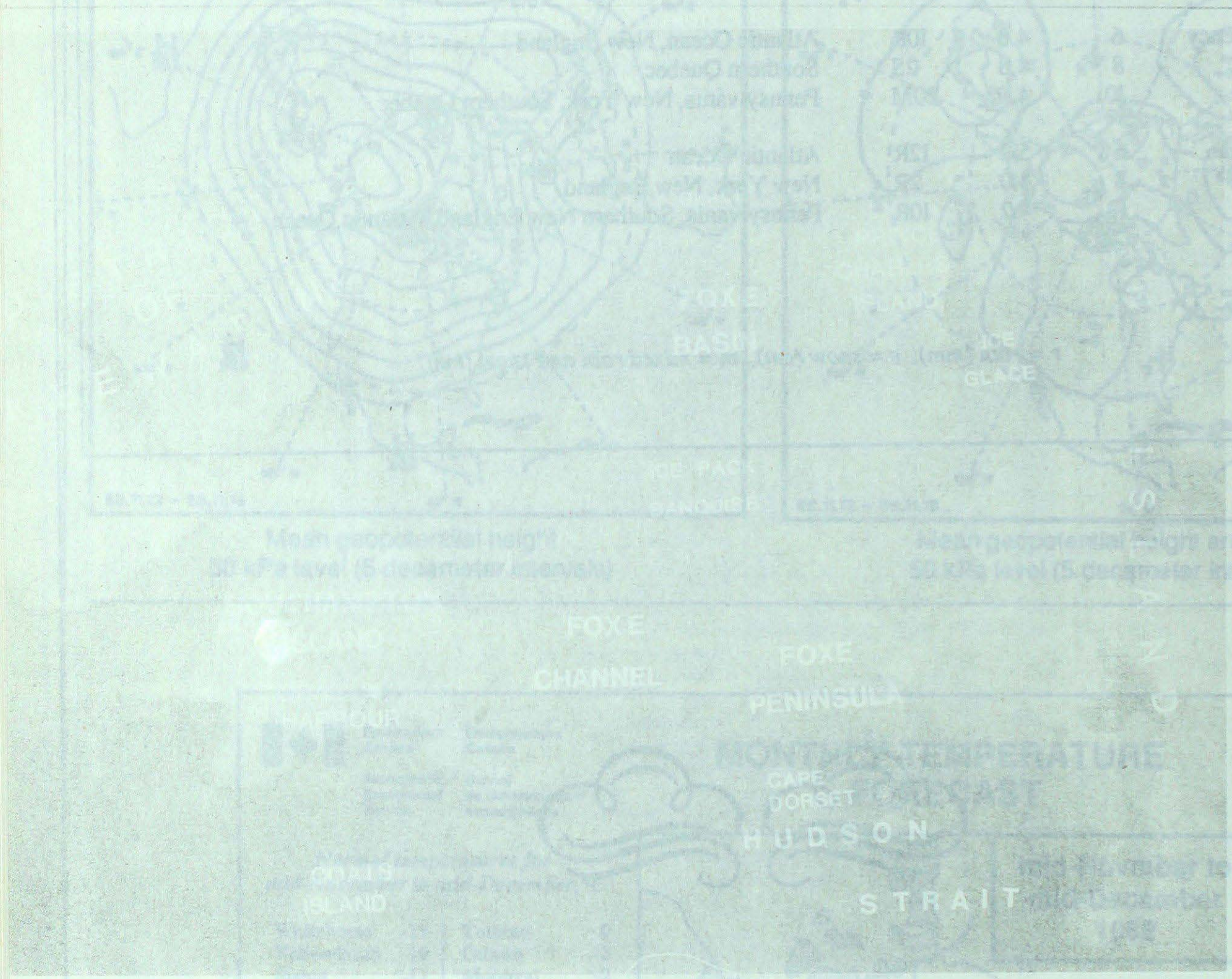
Acid Rain continued from page 6

From November 6 to 12, 1988

SITE	DAY	pH	AMOUNT	AIR PATH TO SITE
	9	3.8	1R	Pennsylvania, New York
Montmorency	6	4.6	10R	Atlantic Ocean, New England
	8	4.8	2S	Southern Quebec
	10	4.0	20M	Pennsylvania, New York, Southern Quebec
Kejimkujik	6	5.2	12R	Atlantic Ocean
	8	4.0	2R	New York, New England
	10	4.2	10R	Pennsylvania, Southern New England, Atlantic Ocean

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





s NOAA-10 satellite photograph of November 12, 1988, shows freeze-up progressing in the eastern Arctic. New ice began g in Foxe Basin and Channel by the end of October. The ice, swirled by the wind and ocean currents, is now spreading ards into Hudson Strait. Due to the nature of infrared photography, the cold Arctic terrain (lighter shading) and the ered water (darker grey) contrast well.

- Another major storm crosses the Great Lakes en route towards Newfoundland
- Abnormally cold in the Arctic