



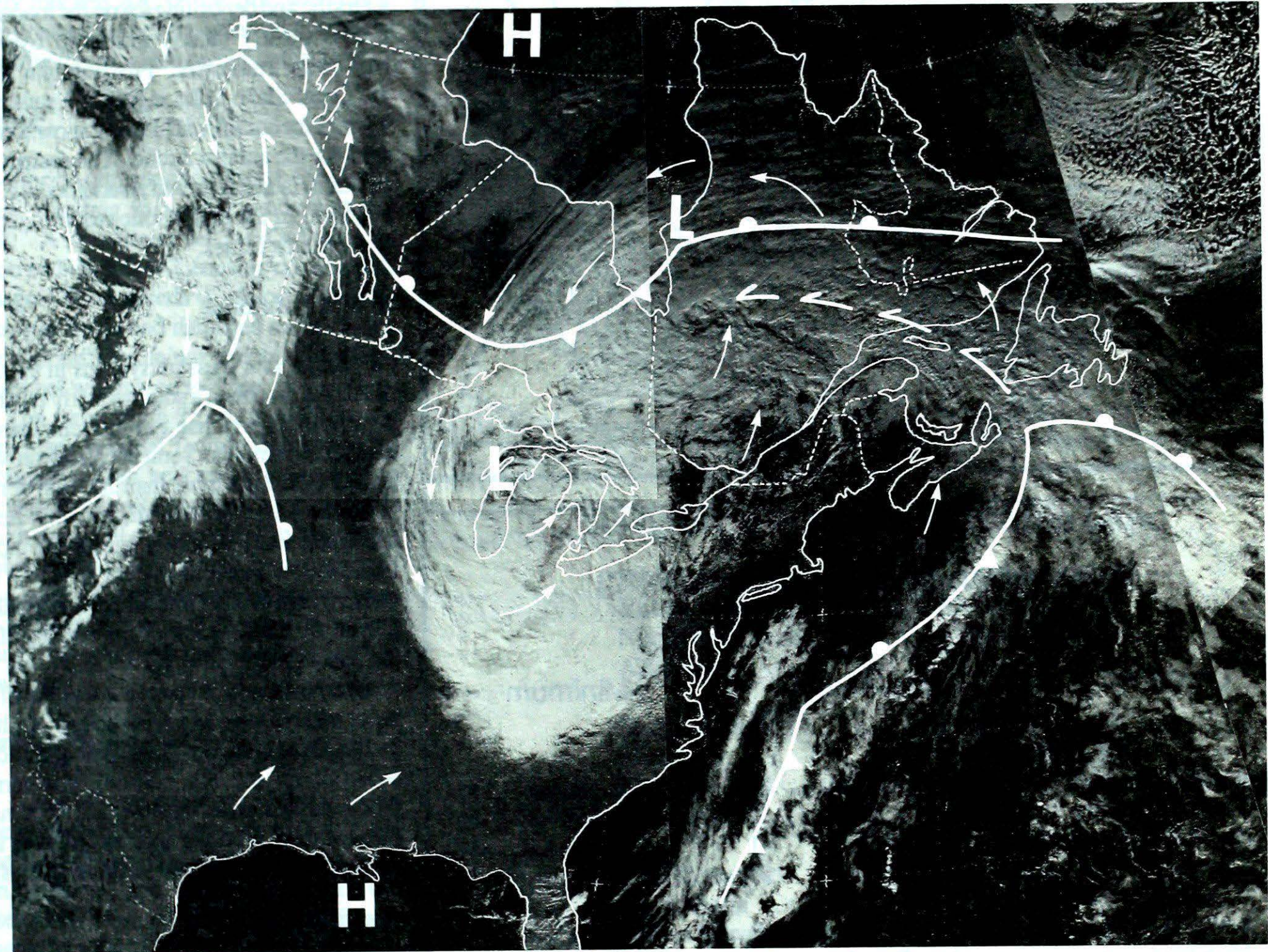
Climatic Perspectives



November 1 to 7, 1988

A weekly review of the Canadian climate

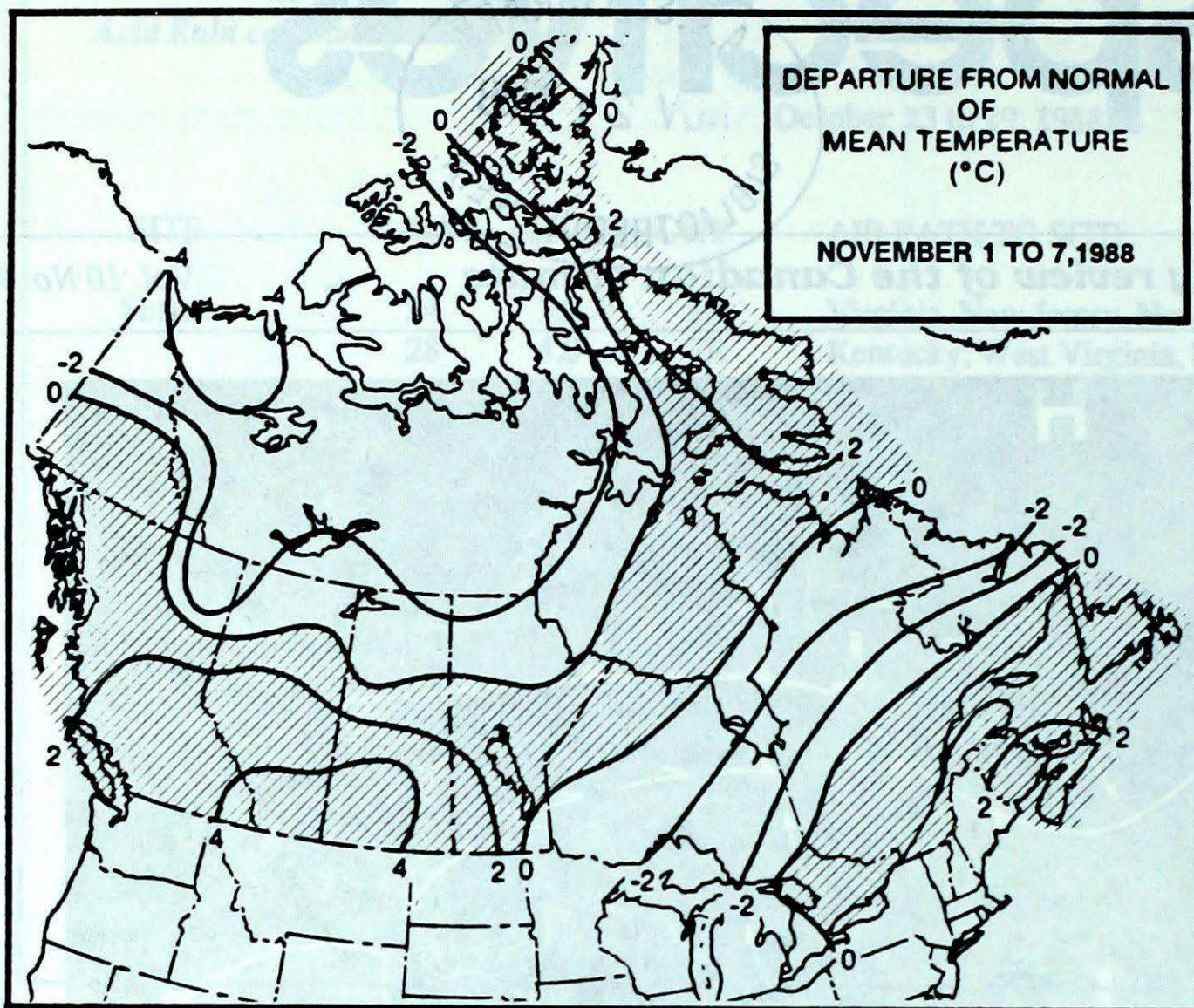
Vol. 10 No. 45



This NOAA-11 satellite photo of November 6, 1988 shows the nearly stationary solid cloud deck, covering the Great Lakes Basin during the weekend, and also gives a good idea of the unsettled and cloudy weather condition experienced throughout the rest of the country this week. Note the increasing darkness over the Arctic regions as the polar night gradually sets in.

● Major storms lash eastern Canada

- Heavy snowfalls in northern Ontario and western Quebec
- Record rainfalls cause flooding along the Atlantic coast



ACROSS THE COUNTRY...

Yukon and Northwest Territories

Significant snowfalls of up to 15 cm occurred in the southern Yukon. Large open lakes are still responsible for the formation of low cloud and fog in the valleys, hampering air traffic and depositing ice on the roadways. It was mostly cloudy and cold over the Northwest Territories. Freezing rain fell in the Great Slave Lake region. Weather advisories for occasional blowing snow were issued for the eastern Arctic. The eastern part of Baffin Island received an additional 23 cm of snow. In the high Arctic readings dipped to the minus forties.

British Columbia

Major low pressure systems in the Gulf of Alaska produced a southwesterly on-shore flow, which gave rise to mild temperatures and heavy rainfalls. Some locations on Vancouver Island got more than 200 mm of rain. With the arctic front in the vicinity, heavy snowfalls were reported across the north. Fort Nelson received 38 cm of snow this week, which in itself surpasses the normal for the month. Heavy snow on the evening of the 3rd created difficulty for travellers on the Alaska Highway. Although a number of interior valleys were in a rain shadow, ski hills in the Okanagan got their first significant snowfall on the 6th. Strong downdrafts produced by thunderstorms in the Kootenays early Sunday morning took down trees and powerlines and damaged small structures.

Prairie Provinces

It was a week of variable skies and contrasting temperatures as a number of weather systems tracked eastwards. In the south temperatures managed to reach the mid-teens, while in the north, where daily low temperature records were broken, the mercury remained below the freezing mark. Parts of the north received as much as 40 cm of snow. The weekend saw a mixture of rain and snow fall in the agricultural districts, but for the most part they remained snow-free.

Ontario

Major storms moved across the province, the most notable being over the

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)	10
.	Sable Island (NS)	
Coollest Mean Temperature	Eureka (NWT)	-29

weekend. While daily maximum temperature records were broken in the south on November 5, new one day record monthly rainfall totals of more than 50 mm were established for Sault Ste. Marie and Wawa. In addition, bands of off-lake snow streamers dumped from 20 to 30 centimetres along the north shore of Lake Superior on November 6. Temperatures in the Niagara fruit belt briefly touched 20C on the 5th, which is in sharp contrast to the record low temperatures set across the province earlier in the week.

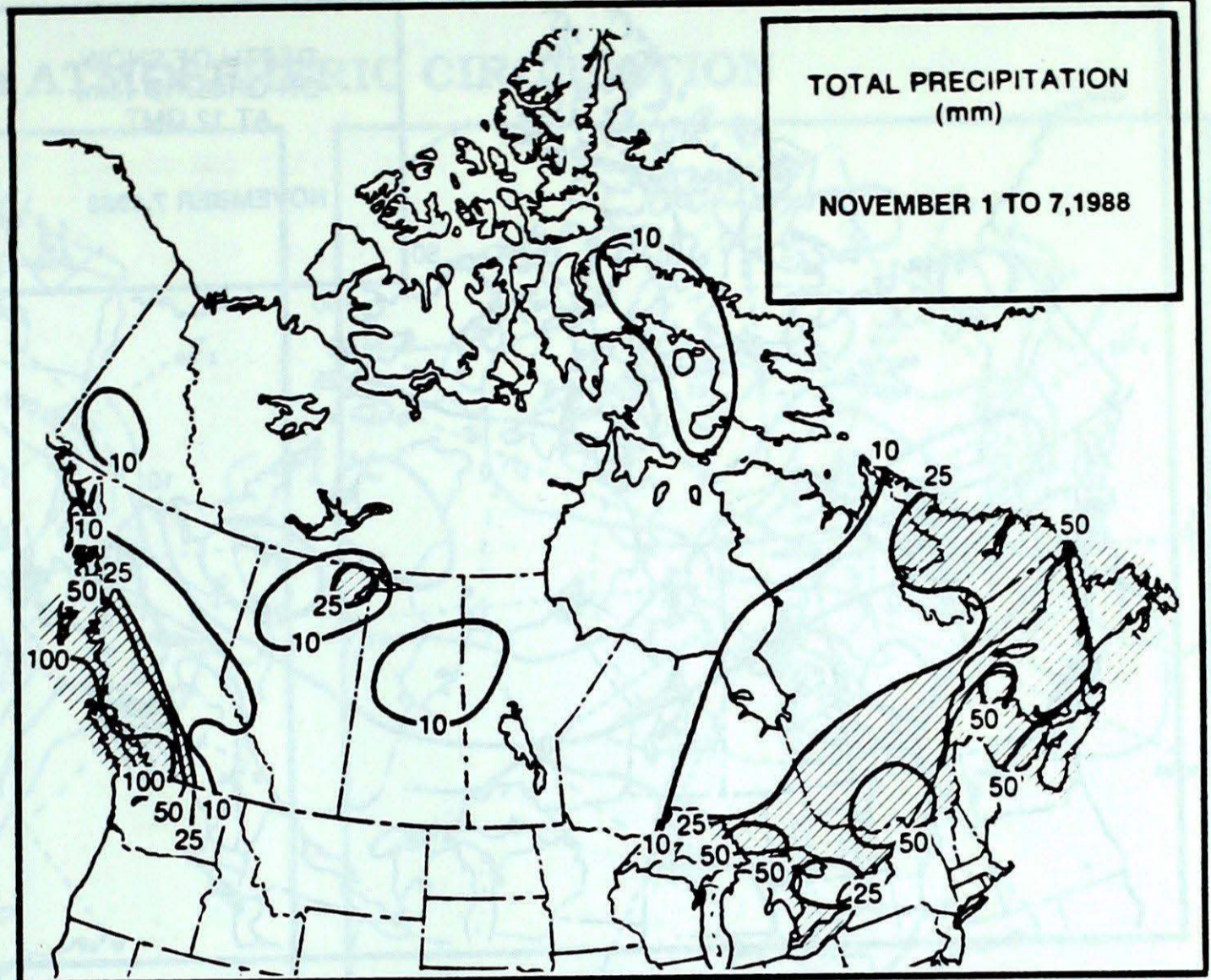
Quebec

Storms approached from the Great Lakes, resulting in a very windy and wet week. A windstorm hit the Quebec City region on November 2, causing considerable damage. Wind speeds of almost 100 km/h broke tree limbs and damaged roofs. Some buildings suffered minor structural damage, one school was forced to close.

The same day a 75 cm snowfall in the Laurentians, north of Trois Rivières stranded 35 hunters. Two helicopters were used to evacuate those suffering from exposure. Although snow fell over much of southwestern Quebec early in the period, heavy rainfalls and a surge of record warm air accompanying another slow-moving weather system during the weekend quickly depleted the snow cover.

Maritime Provinces

It was stormy week as an intense storm battered the region. Although rainfall totals of between 50 and 60 millimetres were common, parts of Cape Breton Island received closer to 100 mm of rain. Ingonish Beach, situated on the Cape Breton Highlands, recorded 140 mm of rain in a 24-hour period, ending on the morning of the 3rd. This established a new all-time 24-hour precipitation record, with records dating back to 1950. All roads in the area of the Wreck Cove hydroelectric site, providing access to Cape Breton Highland Park, were washed out. Prince Edward Island missed out on the heavy rainfalls. Strong winds gusting in excess of 100 km/h were reported along the coast of Nova Scotia. Wind-whipped seas created havoc for Maritime ferry operations as a number of crossings were cancelled or delayed. One ferry spent more than 6 hours riding out the storm in Northumberland Strait



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

before it was able to dock. There were many reports of power outages caused by fallen tree limbs in parts of Nova Scotia and New Brunswick. There were accidents and two deaths attributed to the storm.

Newfoundland

The week began fair but deteriorated as an intense storm approached Wednesday evening. Along the south coast rainfalls ranged from 40 to 60 millimetres. Burgeo and Port-aux-Basques reported gusts to 110 km/h. There was widespread flooding due to

this storm, particularly in the St. John's area. Ferry services to the mainland were temporarily cut off and there were power interruptions. Fair weather briefly followed this weather disturbance, when another system over the weekend brought additional rain to the Island.

In Labrador, the weather pattern was similar but precipitation was in the form of snow. The first system left behind 15 to 20 centimetres of snow during the middle of the week. The second storm over the weekend produced a mixture of snow and freezing rain and milder temperatures.

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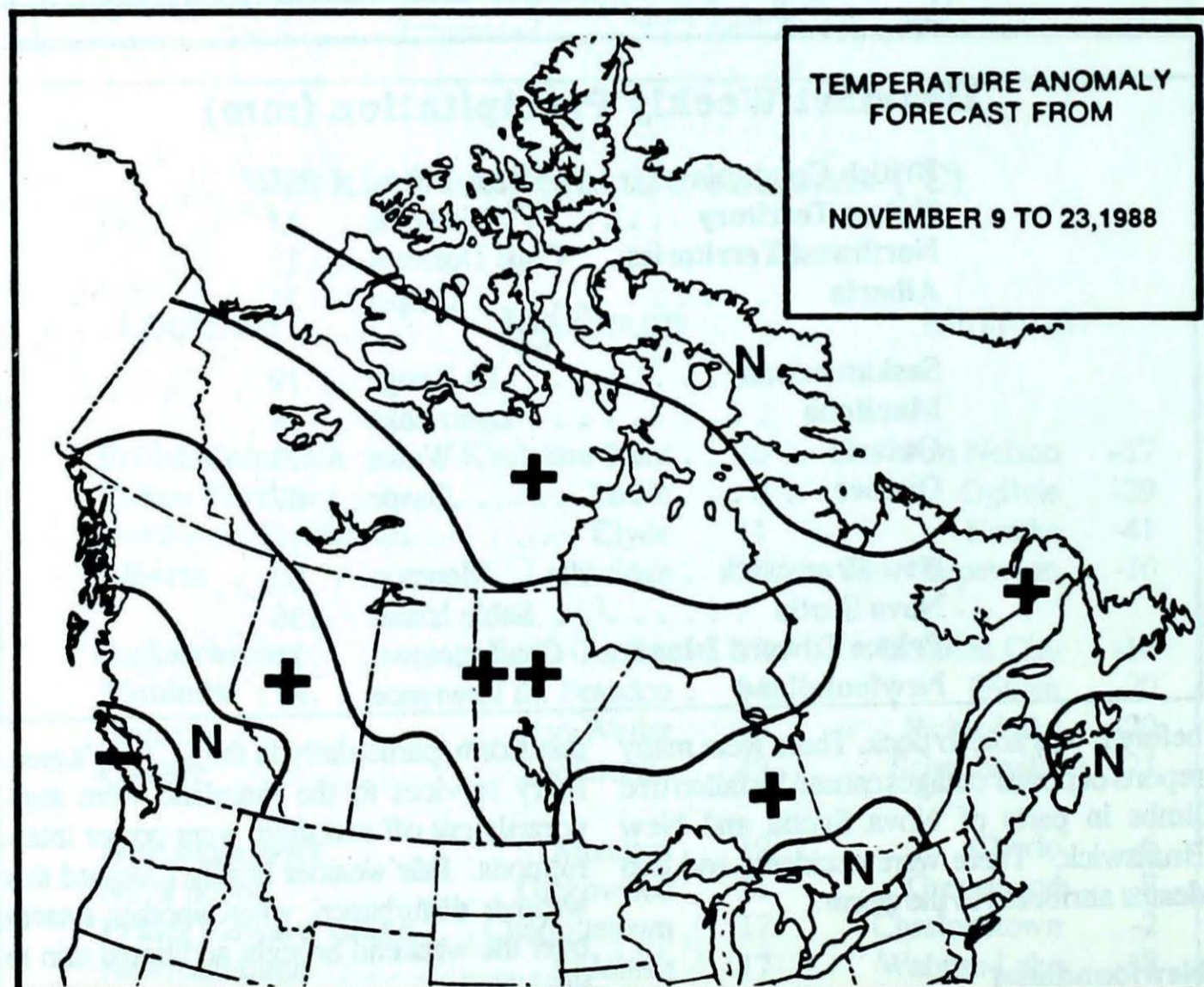
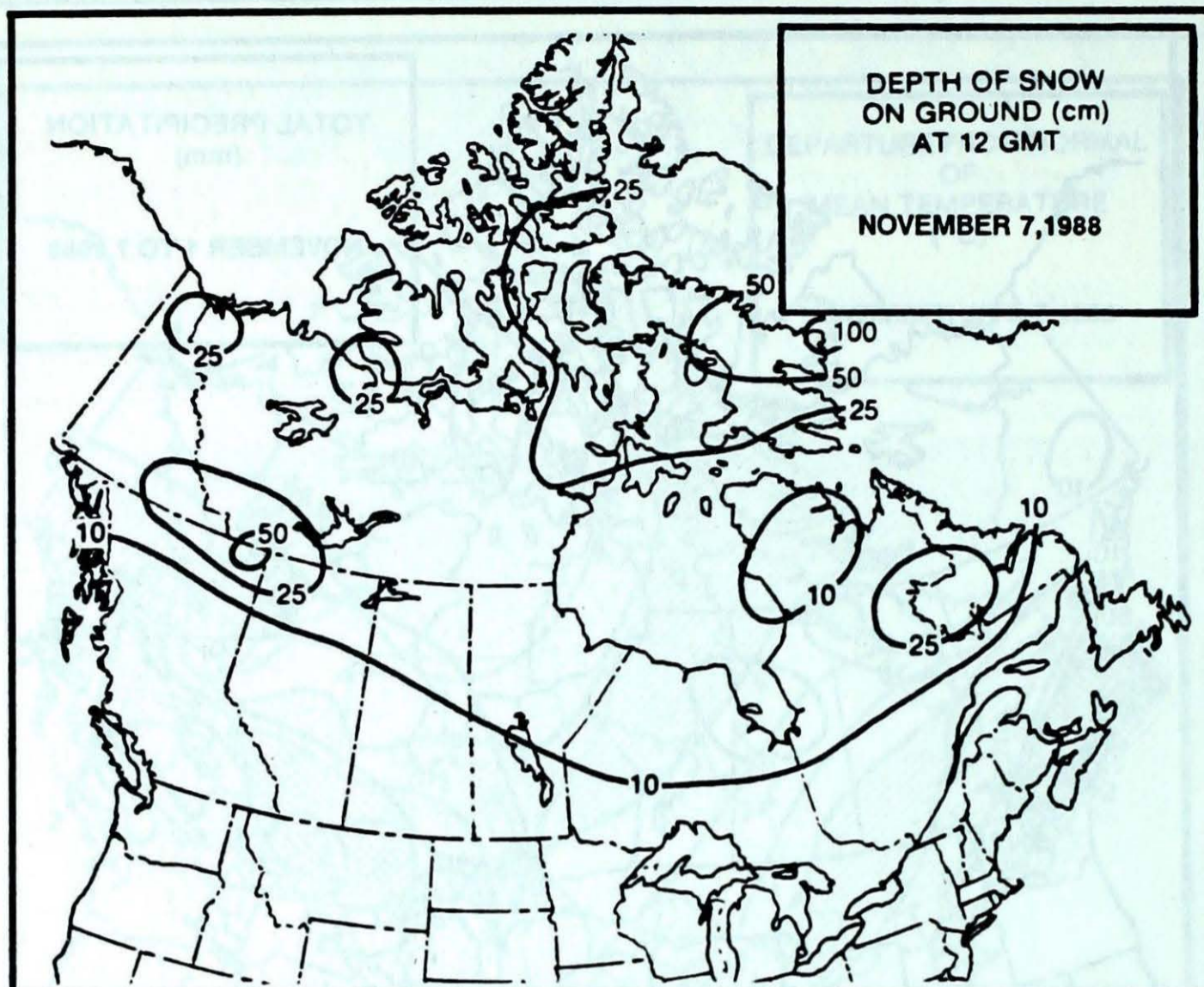
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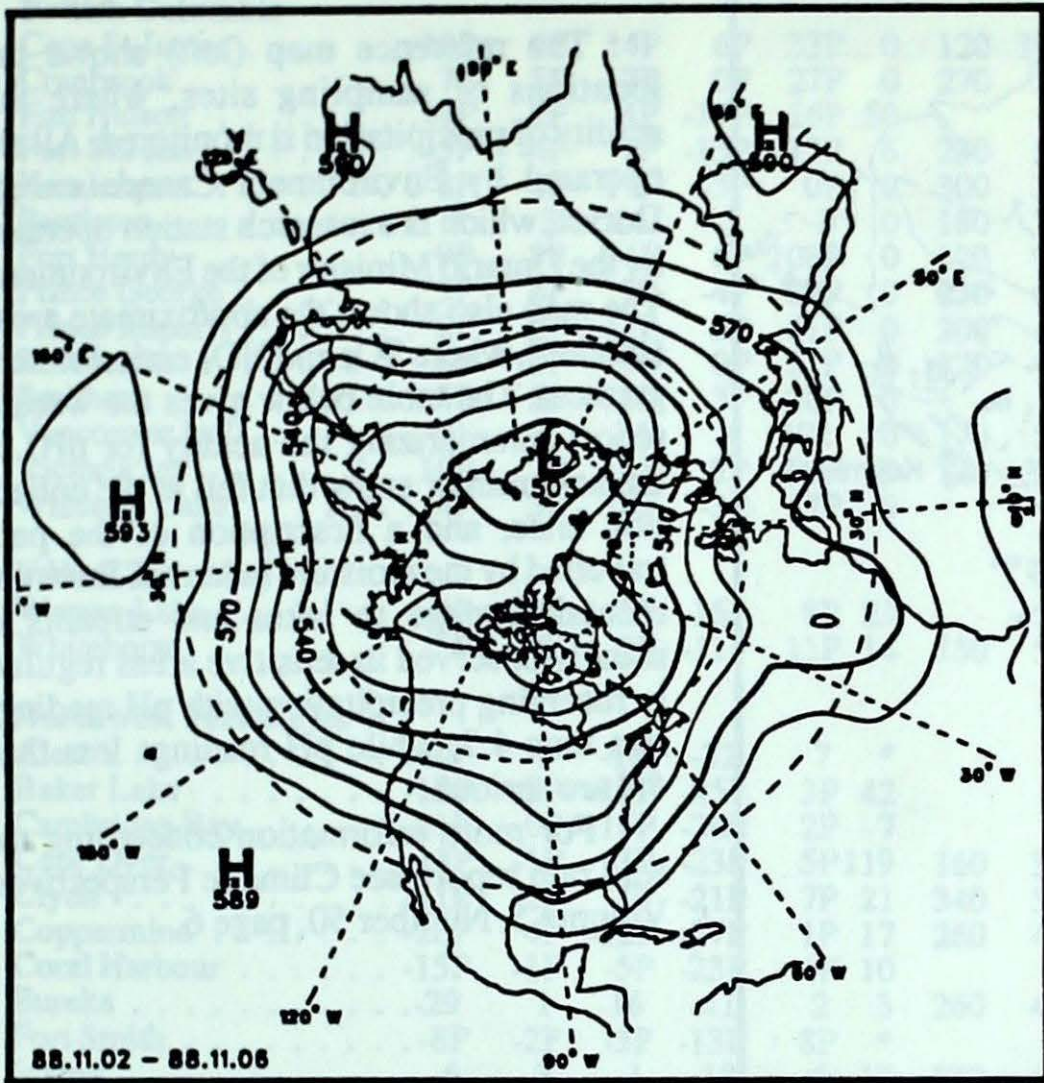
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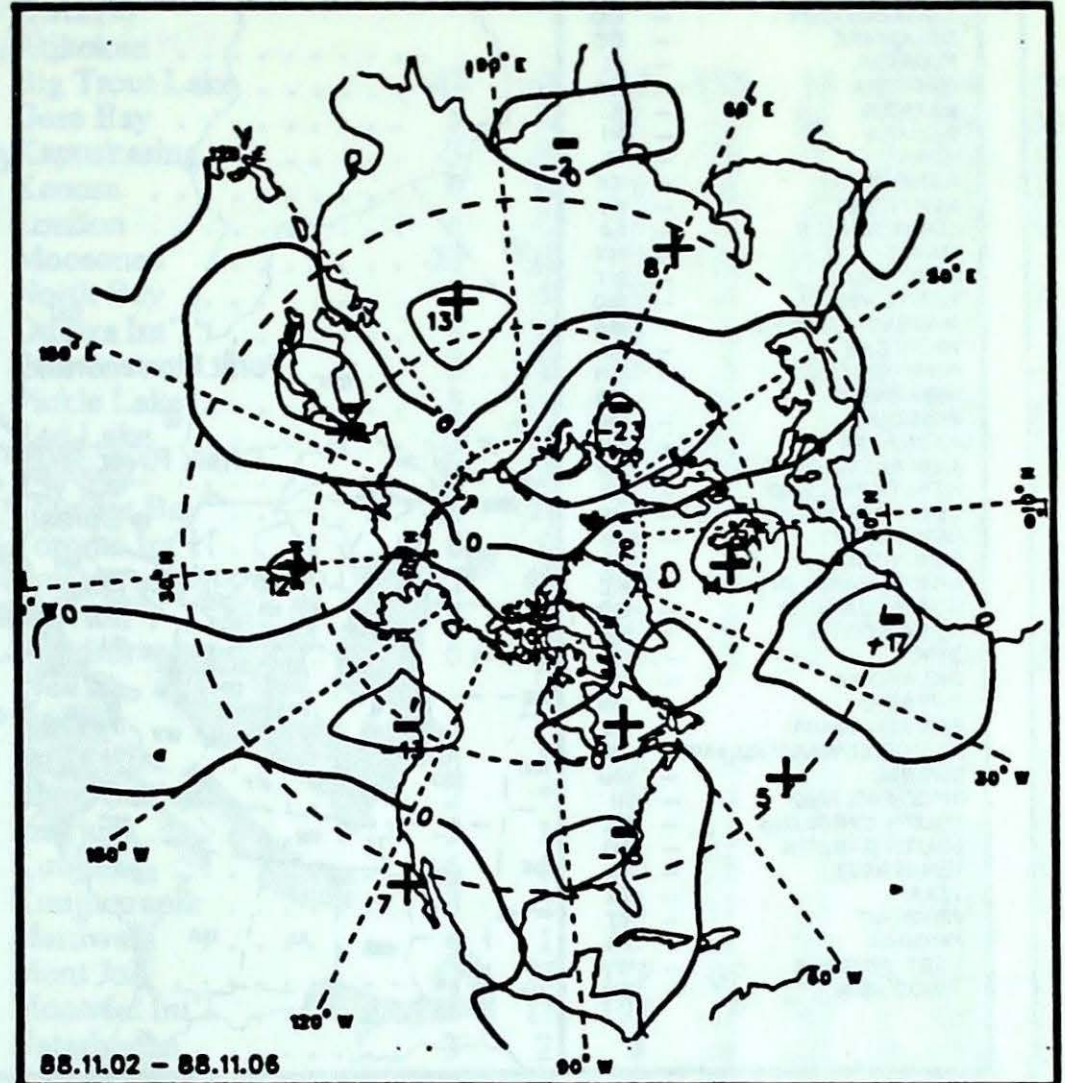
++ much above normal
 + above normal
 N normal
 - below normal
 -- much below normal

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.

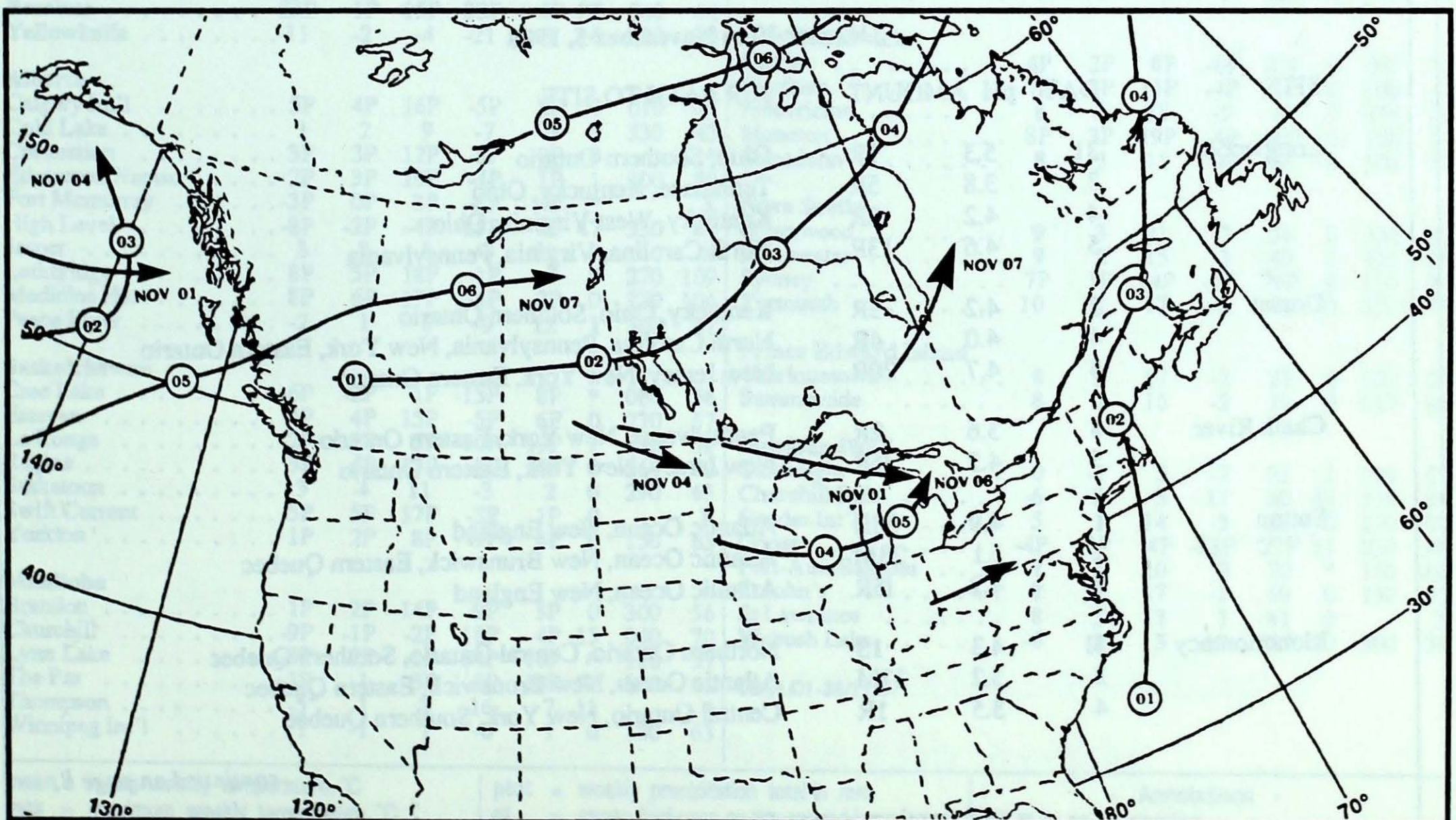
50 kPa ATMOSPHERIC CIRCULATION



Mean geopotential height
50 kPa level (5 decameter intervals)



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

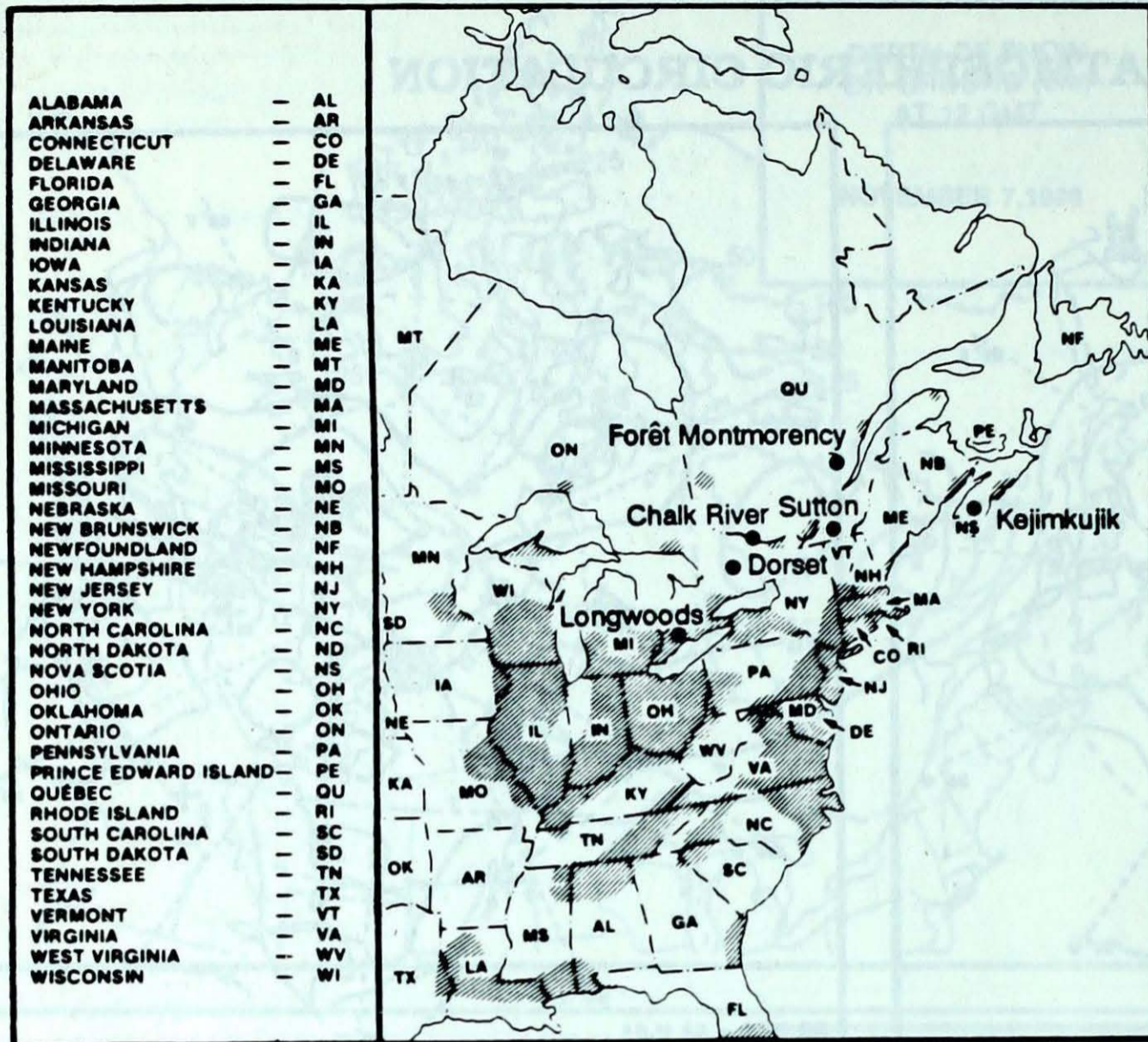


Storm track - Position of storm at 12 GMT each day during the period.

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 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.

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



October 30 to November 5, 1988

SITE	DAY	pH	AMOUNT	AIR PATH TO SITE
Longwoods	31	5.3	1R	Ohio, Southern Ontario
	3	3.8	5R	Tennessee, Kentucky, Ohio
	4	4.2	8R	Kentucky, West Virginia, Ohio
	5	4.6	13R	North Carolina, Virginia, Pennsylvania
Dorset	3	4.2	3R	Kentucky, Ohio, Southern Ontario
	4	4.0	4R	North Carolina, Pennsylvania, New York, Eastern Ontario
	5	4.7	20R	New Jersey, New York, Eastern Ontario
Chalk River	4	3.6	2R	Pennsylvania, New York, Eastern Ontario
	5	4.2	16R	New Jersey, New York, Eastern Ontario
Sutton	1	4.9	38R	Atlantic Ocean, New England
	2	5.1	23M	Atlantic Ocean, New Brunswick, Eastern Quebec
	5	4.2	15R	Atlantic Ocean, New England
Montmorency	31	4.3	1S	Northern Ontario, Central Ontario, Southern Quebec
	2	5.2	37M	Atlantic Ocean, New Brunswick, Eastern Quebec
	4	3.5	1R	Central Ontario, New York, Southern Quebec

continued on page 8.

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	
	moy	anom	max	min			dir	vit		moy	anom	max	min			dir	vit
British Columbia									Ontario								
Cape St James	10P	2P	14P	6P	33P	0	120	102	Atikokan					*			
Cranbrook	7P	5P	17P	0P	27P	0	270	56	Big Trout Lake	-4P	0	3P	-15P	1P	2	170	57
Fort Nelson	-9P	-2P	-4P	-17P	16P	50		*	Gore Bay	5	0	13	-3	64	0	080	50
Fort St John	-5P	-4P	7P	-13P	13P	6	230	56	Kapuskasing	-3	-2	4	-15	18	9	040	46
Kamloops	8P	4P	17P	-3P	0P	0	300	37	Kenora	0	0	8	-8	0	2	170	50
Penticton	8	3	16	-3	3	0	180	70	London	6	0	15	-2	31	1	190	57
Port Hardy	9P	3P	14P	6P	108P	0	120	93	Moosonee	-3P	-3P	3P	-16P	31P	4		*
Prince George	3P	4P	9P	-4P	27P	0	230	61	North Bay	3	0	13	-8	18	0	110	70
Prince Rupert	8P	2P	11P	5P	61P	0	200	46	Ottawa Int'l	5	0	17	-3	51	0		X
Revelstoke	6P	3P	9P	0P	61P	0	320	46	Petawawa	5	2	15	-3	22	0		X
Smithers	4P	3P	10P	-3P	20P	0		*	Pickle Lake	-5	-3	4	-20	1	10	170	48
Vancouver Int'l	10	2	14	4	102	0	170	52	Red Lake	-2P	-1P	5P	-11P	1P	3	190	59
Victoria Int'l	10P	2P	16P	2P	60P	0	130	50	Sudbury	3P	0P	12P	-8P	41P	0		X
Williams Lake	4P	3P	10P	-3P	17P	0		X	Thunder Bay	-1P	-2P	7P	-10P	5P	2	020	61
Yukon Territory									Toronto Int'l								
Watson Lake	-8P	0P	-3P	-15P	8P	23		*	Trenton	7P	1P	17P	-1P	13P	0		X
Whitehorse	-5P	0P	-2P	-11P	11P	14	150	52	Warton	5	0	15	-3	18	0		X
Northwest Territories									Windsor								
Alert	-28	-3	-18	-32	7	*		*	Québec								
Baker Lake	-19P	-3P	-12P	-25P	3P	42		*	Bagotville	3	1	8	-4	40	0	090	59
Cambridge Bay	-21P	0P	-16P	-26P	2P	7		*	Blanc Sablon	2	*	9	-6	33	0		X
Cape Dyer	-13P	-1P	-3P	-23P	5P	119	160	33	Inukjuak	-3	1	1	-11	5	4	250	59
Clyde	-11P	2P	-1P	-21P	7P	21	340	50	Kuujuuaq	-6	-1	0	-13	8	4	280	67
Coppermine	-20P	4P	-12P	-27P	1P	17	260	46	Kuujuuarapik	-3	-2	2	-11	13	7	120	59
Coral Harbour	-15P	-1P	-5P	-23P	4P	10		X	Maniwaki	4	1	15	-3	53	0	330	54
Eureka	-29	1	-16	-41	2	3	260	46	Mont Joli	4P	2P	11P	0P	23P	0	140	67
Fort Smith	-8P	-2P	-3P	-13P	8P	*		X	Montréal Int'l	6P	1P	19P	-1P	76P	0	020	67
Iqaluit	-6	3	-1	-18	6	17	330	63	Natashquan	3	2	8	-6	25	0	090	80
Hall Beach	-21	-3	-13	-28	3P	30	300	70	Québec	4	2	14	-3	40	0	060	96
Inuvik	-21P	-5P	-13P	-29P	3P	27		X	Schefferville	-8	-3	3	-21	23	23	290	61
Mould Bay	-27	-4	-24	-32	2P	15		X	Sept-Iles	2	1	6	-5	45	0	080	69
Norman Wells	-17P	-3P	-13P	-21P	3P	10		X	Sherbrooke	5	1	19	-7	41	0	110	63
Resolute	-23P	-1P	-15P	-33P	4P	27	040	44	Val D'or	1	1	9	-6	28	0	340	52
Yellowknife	-11	-2	-4	-21	3	6	030	39	New Brunswick								
Alberta									Charlo	4P	2P	8P	-6P	29P	0	090	93
Calgary Int'l	5P	4P	16P	-5P	2P	0	010	57	Chatham	7P	3P	15P	-4P	46P	0	090	44
Cold Lake	1	2	9	-7	7P	*	330	43	Fredericton	8	3	18	-5	49	0	080	59
Coronation	3P	3P	12P	-5P	0P	0		*	Moncton	8P	3P	19P	-4P	60P	0	250	59
Edmonton Namao	2P	3P	10P	-4P	1P	1	300	59	Saint John	8	3	15	-4	56	0	100	81
Fort McMurray	-3P	0P	3P	-8P	4P	*		X	Nova Scotia								
High Level	-8P	-2P	-4P	-15P	8P	47	350	44	Greenwood	9	3	21	-7	54	0	130	85
Jasper	3	3	8	-3	21	0		X	Shearwater	9	2	15	-3	49	0	130	89
Lethbridge	8P	5P	18P	-1P	0	0	270	109	Sydney	7P	1P	14P	-4P	76P	0	130	94
Medicine Hat	8P	6P	17P	-4P	2P	0	270	104	Yarmouth	10	2	17	-2	48	0	120	74
Peace River	-2	1	6	-9	12	1	300	41	Prince Edward Island								
Saskatchewan									Charlottetown	8	2	17	-2	21	0	120	78
Cree Lake	-6P	-2P	1P	-15P	8P	*	080	56	Summerside	8	2	16	-2	19	0	010	69
Estevan	4P	4P	15P	-5P	6P	0	270	57	Newfoundland								
La Ronge	-2P	2P	5P	-10P	19P	1	120	59	Cartwright	0	-1	5	-7	21	1	320	52
Regina	3P	4P	13P	-3P	4P	0	260	72	Churchill Falls	-6	-2	3	-17	30	44	320	56
Saskatoon	3	4	11	-3	2	0	290	65	Gander Int'l	5	1	14	-3	33	0	270	93
Swift Current	5P	5P	17P	-3P	1P	0		X	Goose	-4P	-3P	4P	-13P	27P	11	030	48
Yorkton	1P	2P	8P	-9P	4P	0	150	63	Port-Aux-Basques	7	1	10	0	70	*	100	104
Manitoba									St John's	7	2	17	-1	69	0	150	91
Brandon	1P	2P	14P	-9P	3P	0	300	56	St Lawrence	8	3	13	1	81	0		X
Churchill	-9P	-1P	-2P	-18P	4P	13	040	70	Wabush Lake	-6	-2	3	-18	21P	20	300	39
Lynn Lake	-8P	-2P	-1P	-14P	18P	*	120	37	88/11/01-88/11/07								
The Pas	-1P	1	3P	-8P	10P	11	140	61									
Thompson	-5	1	3	-16	7	11		*									
Winnipeg Int'l	1	1	7	-6	1	0	180	63									

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.

Acid Rain continued from page 6

October 30 to November 5, 1988

SITE	DAY	pH	AMOUNT	AIR PATH TO SITE
	5	4.4	14R	Atlantic Ocean, Maine
Kejimikujik	1	5.1	39R	Atlantic Ocean
	2	5.3	26R	Atlantic Ocean
	3	4.4	2R	Pennsylvania, New Jersey, Atlantic Ocean
	5	5.1	5R	Atlantic Ocean

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

