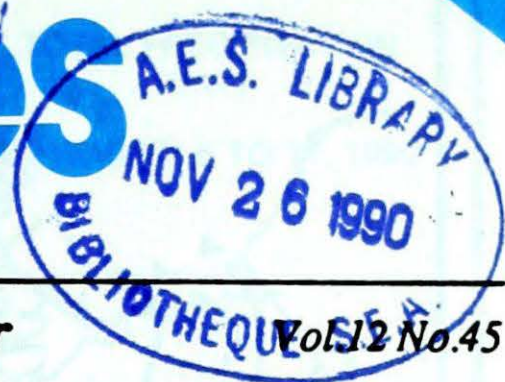




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Climatic Perspectives



November 5 to 11, 1990 A weekly review of Canadian climate and water

Record rainfalls cause major floods in B.C.

A series of frontal disturbances brought torrential rainfalls to the B.C. coast, beginning on November 8. Hardest hit areas were the eastern half of the Fraser Valley and northern Vancouver Island, where total rainfall amounts, in four days, ranged between 150 and 350 mm, especially on the west side of the mountains. Flooding and resultant washouts and mud slides were further aggravated by melting snow, attributed to higher freezing levels. Preliminary damage estimates place destruction in the tens of millions of dollars.

By the end of the period, Squamish, north of Vancouver received 310 mm of rain. Hope and Chilliwack, in the Fraser Valley, received 337 and 195 millimetres of rain, respectively. Gold River on the west coast of Vancouver Island recorded 314 mm in the same 4-day period. The greatest one-day rainfall was recorded at Hope, 173.1 mm on the 9th, followed closely by Squamish, 164.4 mm and Gold River's 143.8 mm, both on the 10th. The same stations had two-day rainfall totals of 304 mm, 233 mm and 233 mm, respectively. Hope's one and two-day rainfall amounts have a statistical chance of reoccurring less than once in every 100 years.

Snow and freezing rain hit Ontario

Winter took aim at Ontario on November 5, with heavy snow in northern and central regions, and freezing rain in a band from just north of Lake Ontario to

Georgian Bay. North Bay and Sudbury received 20 to 30 centimetres of snow. Gore Bay was buried under 37 cm of the white stuff, setting a new mark for the greatest one-day November snowfall.

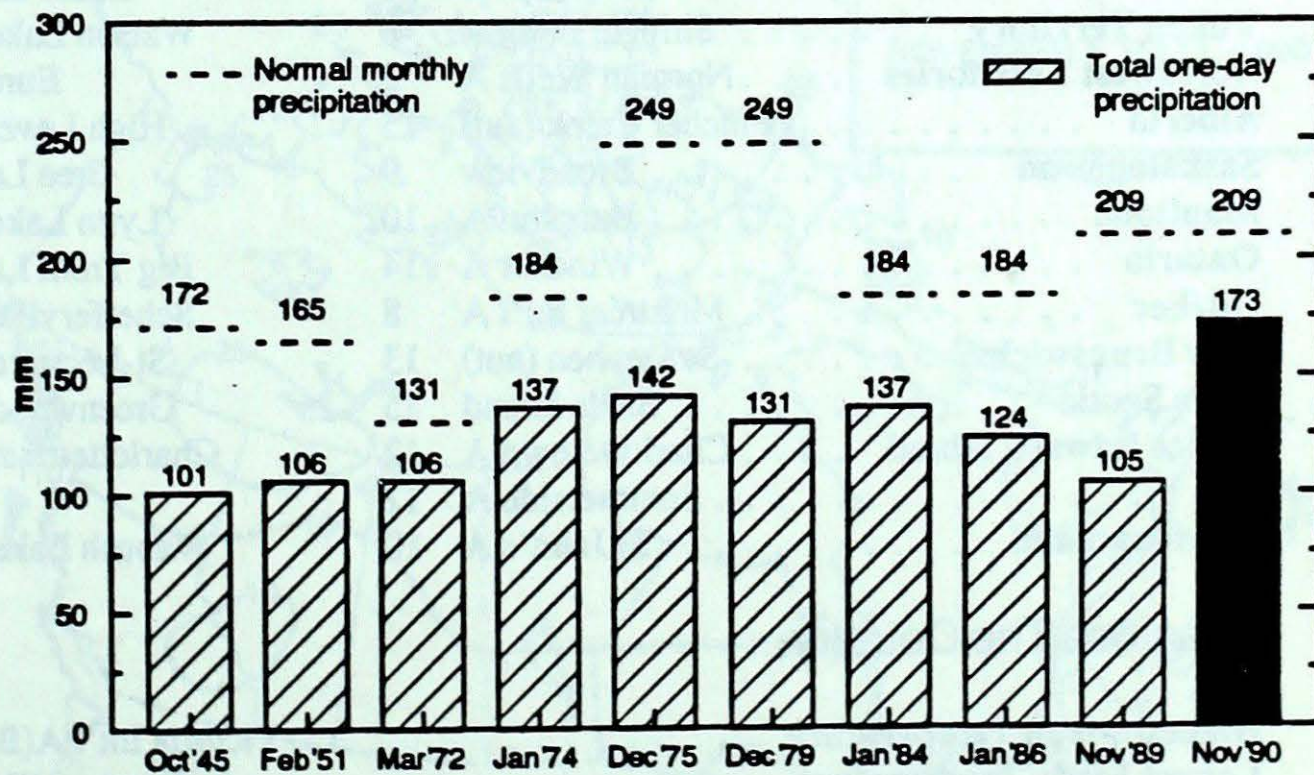
Further to the south, 1 to 2 centimetres of ice accumulated after several hours of freezing rain. Damage to trees and power lines was considerable. Orchards near Georgian Bay were severely hit, as iceladen trees snapped due to the weight. In some areas power was off for 2 days. Although freezing rain does occur north of Toronto on average once each November (Muskoka, Mount Forest) an occurrence so early in the month is unusual. At Mus-

koka, this freezing rain storm appears to be the earliest since an ice storm hit late in October 1962.

Warm weather for the East...

For the week of November 19, above-normal temperatures are expected across Manitoba, Ontario, Quebec and the Atlantic region. Across southern Ontario and the Atlantic provinces, temperatures will be 5 to 7 degrees above normal. Elsewhere, temperatures will be near to below normal. The Arctic Islands will experience temperatures of about 3 to 5 degrees below normal.

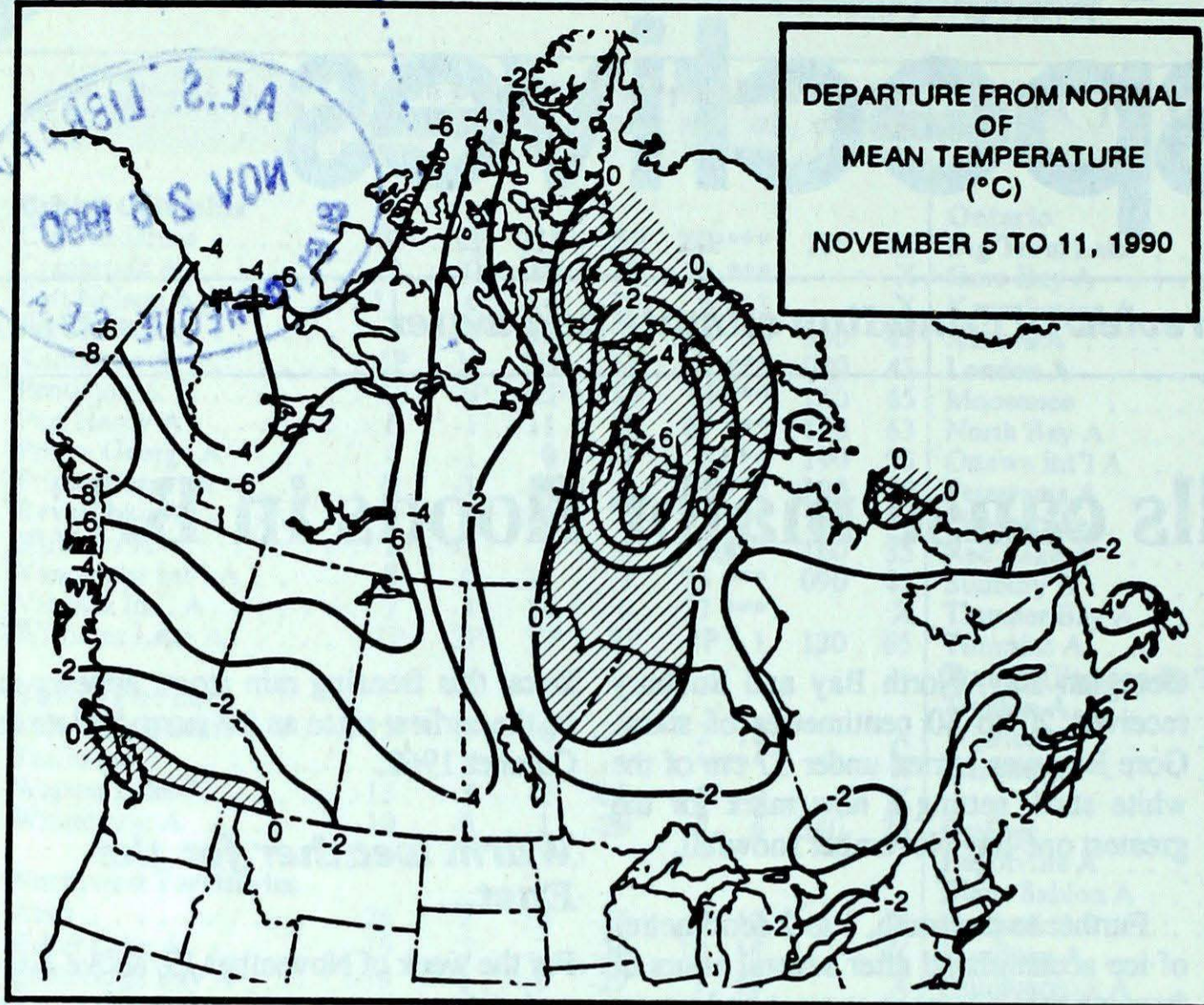
Top ten greatest one-day rainfall amounts at Hope, B.C.



The November 9, rainfall amount surpassed all previous one-day rainfalls at Hope by a significant margin.

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Weekly normal temperatures (°C)

	max.	min.
Whitehorse A	-3.3	-9.8
Iqaluit A	-7.9	-15.1
Yellowknife A	-7.1	-14.3
Vancouver Int'l A	10.3	4.1
Victoria Int'l A	10.5	3.7
Calgary Int'l A	5.8	-6.4
Edmonton Int'l A	2.3	-8.7
Regina A	3.4	-7.9
Saskatoon A	2.1	-7.4
Winnipeg Int'l A	2.8	-5.9
Ottawa Int'l A	6.2	-1.0
Toronto (Pearson Int'l A)	8.2	0.3
Montréal Int'l A	6.9	0.2
Québec A	5.0	-1.9
Fredericton A	7.6	-1.6
Saint John A	7.5	-0.2
Halifax (Shearwater)	9.0	2.4
Charlottetown A	7.4	0.7
Goose A	1.6	-5.5
St John's A	7.6	1.5

Weekly temperature and precipitation extremes

	Maximum temperature (°C)	Minimum temperature (°C)	Heaviest precipitation (mm)
British Columbia	Kamloops A 20	Dease Lake -26	Hope A 376
Yukon Territory	Shingle Point A 0	Watson Lake A -33	Watson Lake A 12
Northwest Territories	Norman Wells A 1	Eureka -40	Coral Harbour A 25
Alberta	Pincher Creek (aut) 15	High Level A -27	Edson A 27
Saskatchewan	Broadview 9	Cree Lake -30	La Ronge A 4
Manitoba	Dauphin A 10	Lynn Lake A -22	Gillam A 15
Ontario	Windsor A 14	Big Trout Lake -15	Gore Bay A 72
Québec	Montréal Int'l A 8	Schefferville A -21	Sept-iles A 64
New Brunswick	St Stephen (aut) 13	St-Léonard A -8	St-Léonard A 63
Nova Scotia	Sable Island 15	Greenwood A -3	Sydney A 51
Prince Edward Island	Charlottetown A 12	Charlottetown A -3	Summerside A 51
	Summerside A 12		
Newfoundland	St John's A 10	Wabush Lake A -20	Port Aux Basques 51

Across The Country...

Highest Mean Temperature	Victoria Int'l A(BC) 8
Lowest Mean Temperature	Eureka(NWT) -33

90/11/05-90/11/11

CLIMATIC PERSPECTIVES
VOLUME 12

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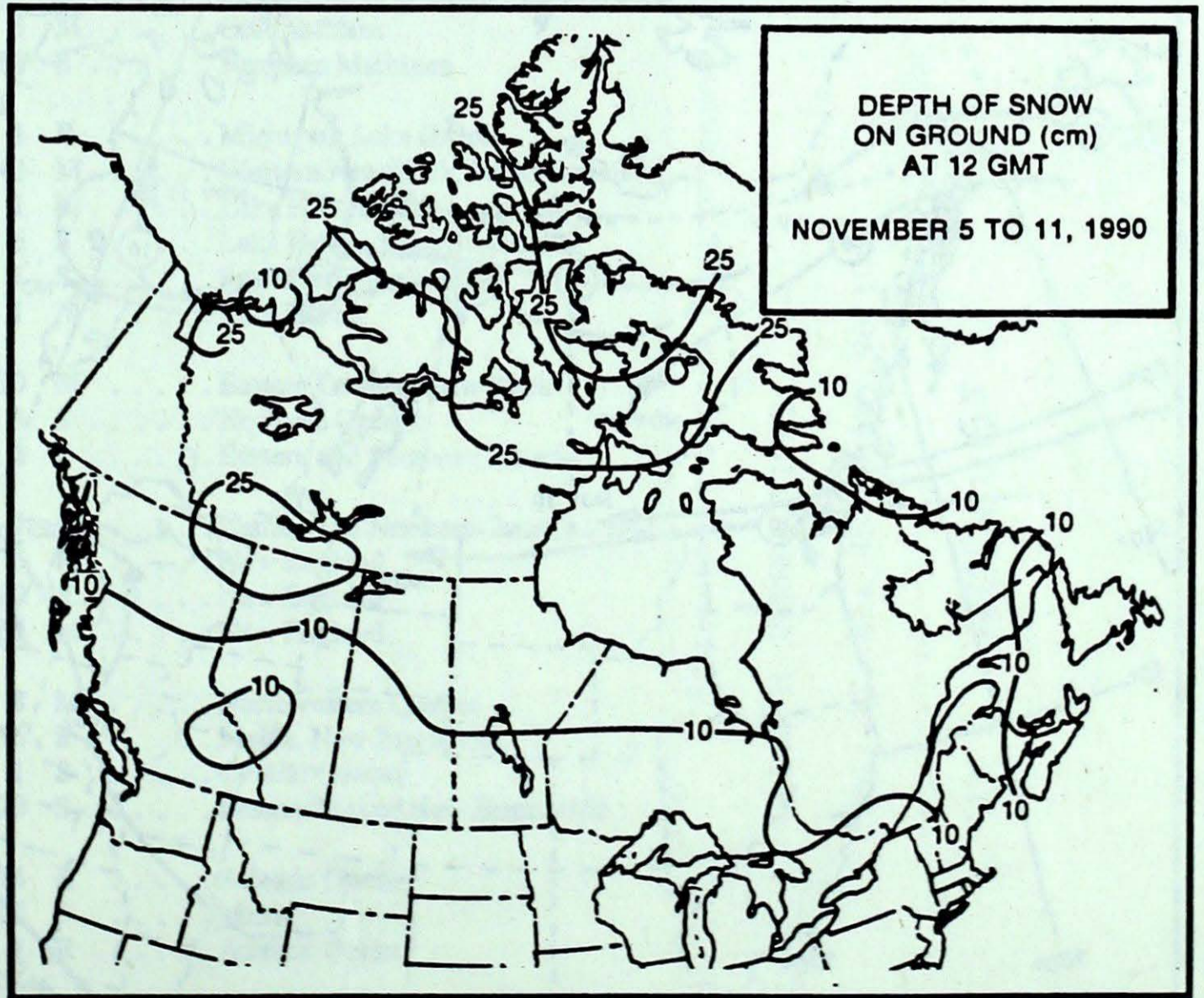
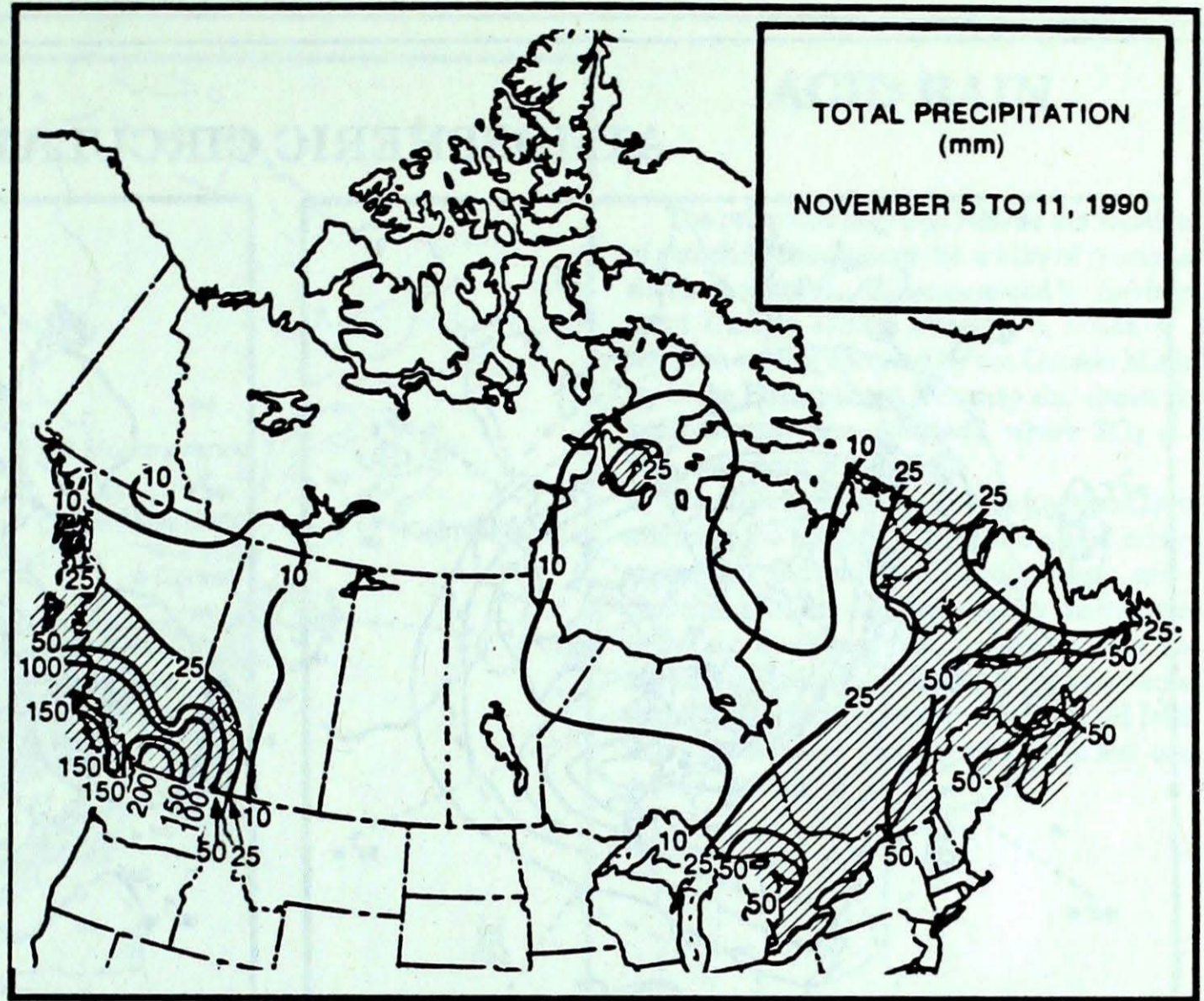
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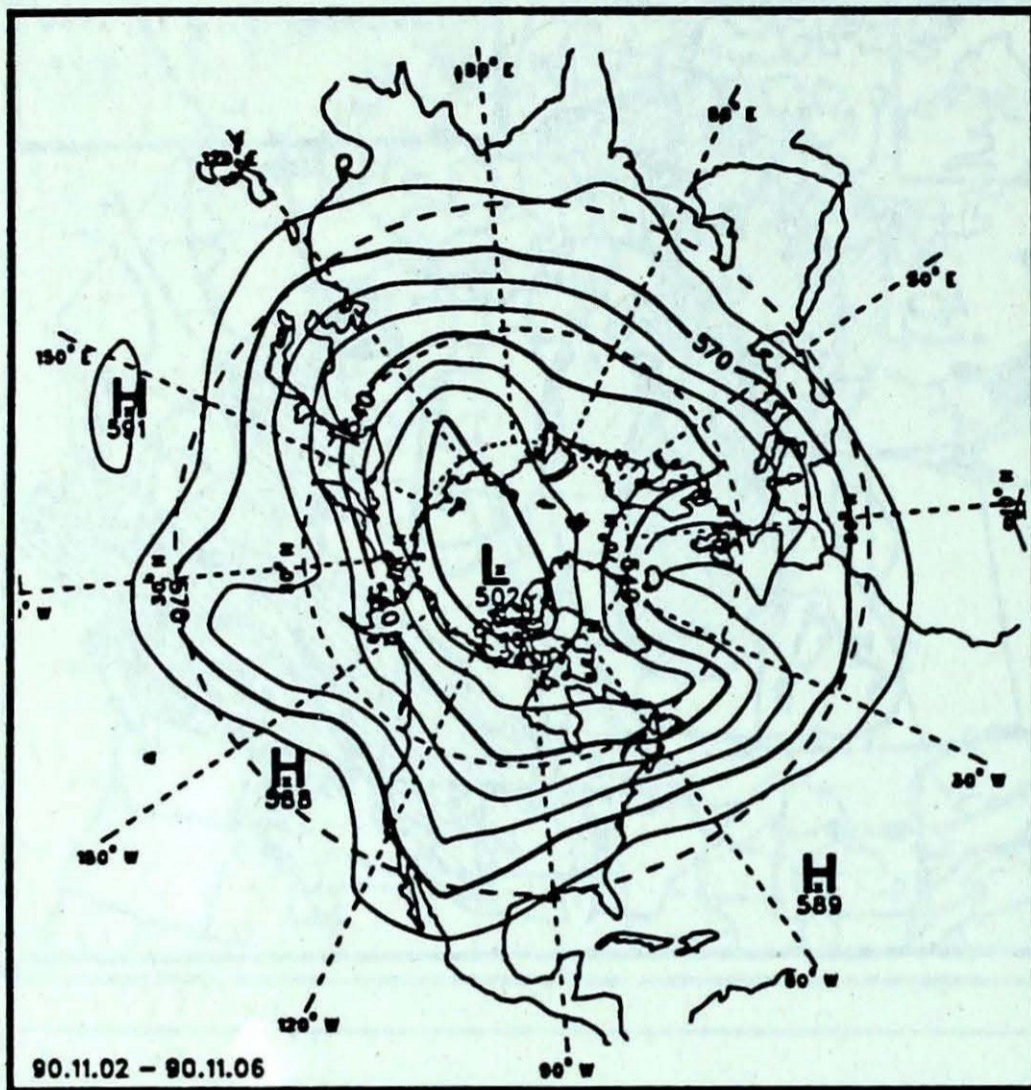
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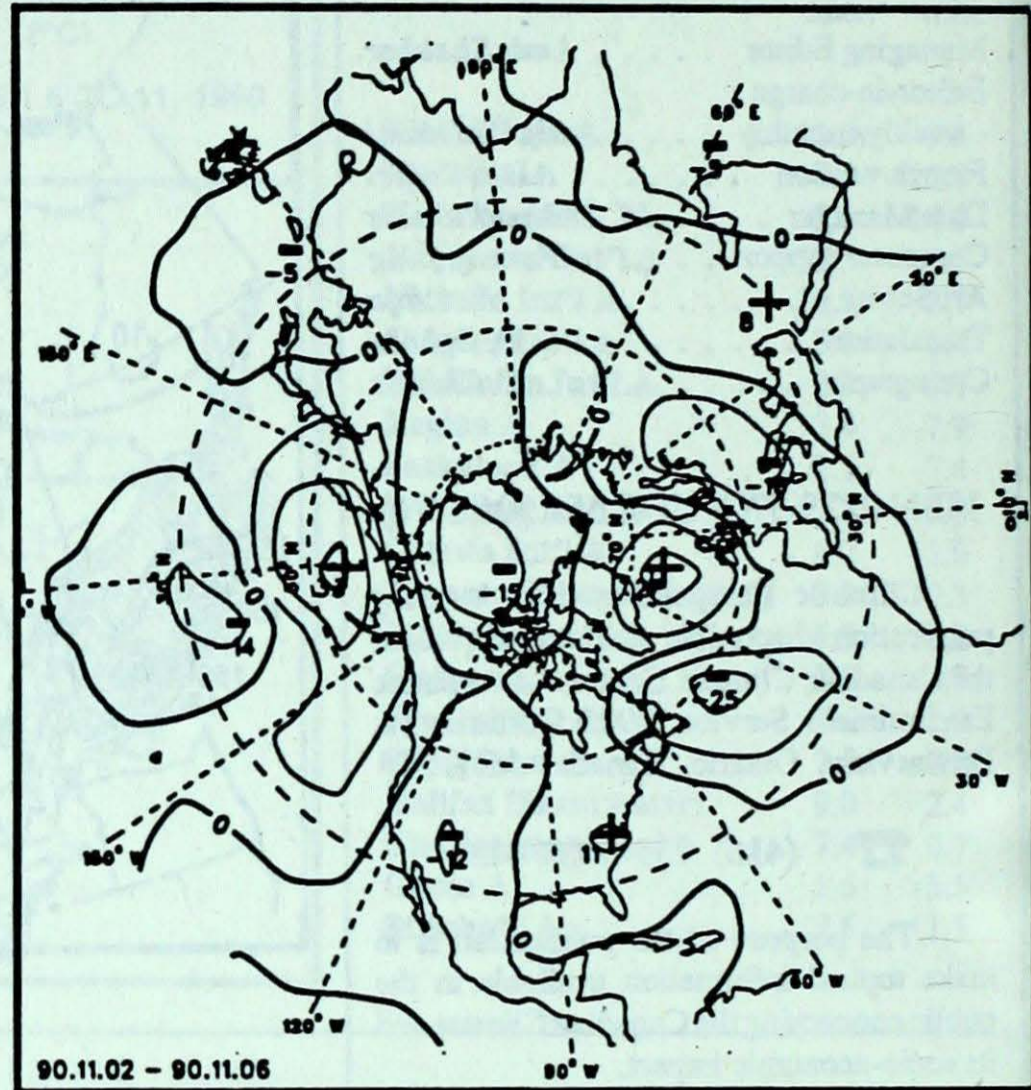
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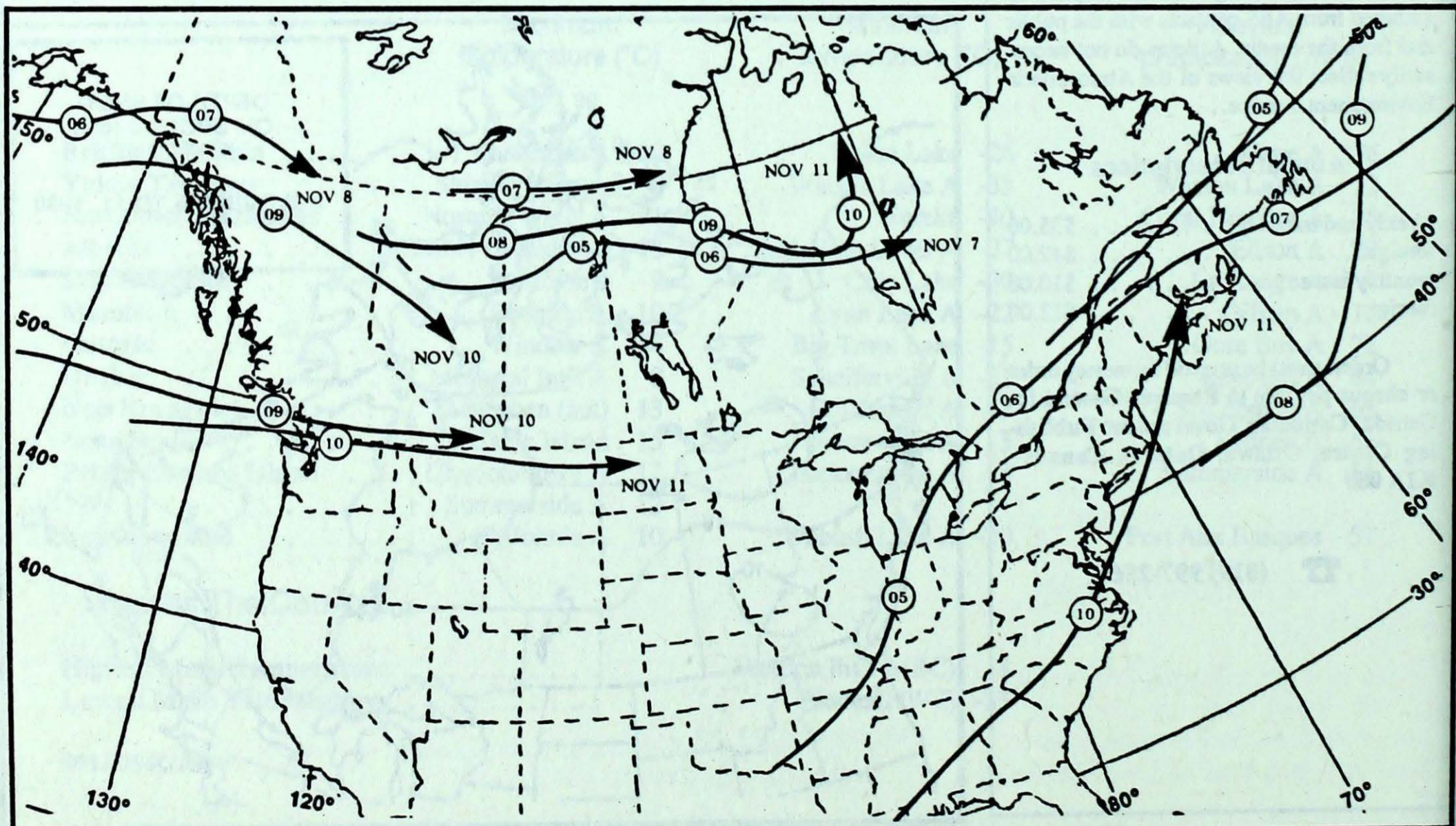
ATMOSPHERIC CIRCULATION



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



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

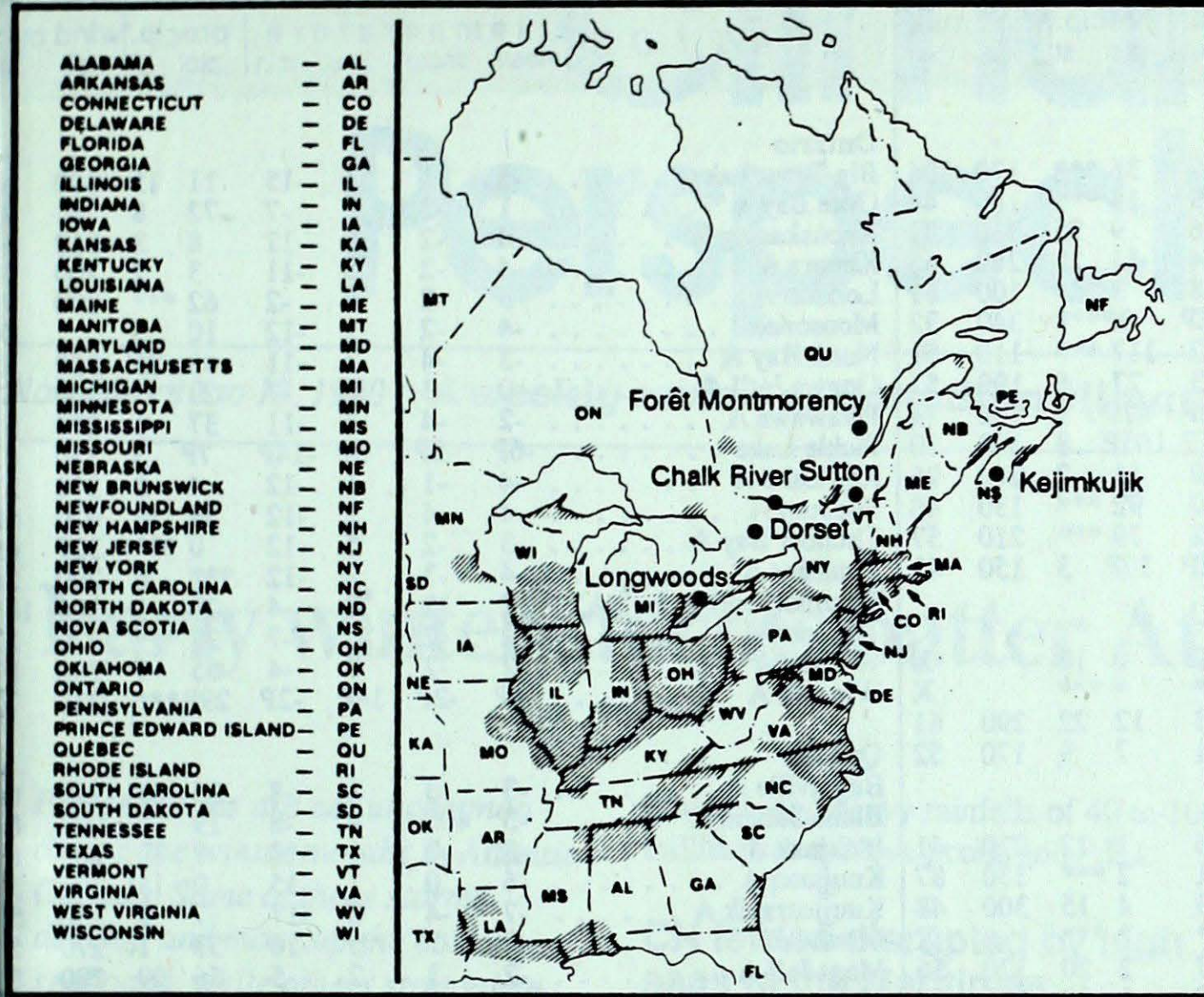


Tracks of low pressure centres at 12:00 U.T. each day during the period.

ACID RAIN

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
Longwoods	4	4.5	10 R	Michigan, Wisconsin
	5	3.9	33 R	Eastern Ohio, Western Pennsylvania
	9	4.1	5 M	Ohio, Indiana
	10	5.7	3 S	Northern Michigan
Dorset*	4	4.1	1 R	Michigan, Lake Huron
	5	4.3	42 M	Western New York, Pennsylvania
	6	5.0	1 M	Lake Huron, Lake Superior
	7	4.6	5 S	Lake Huron, Lake Superior
	9	4.1	1 S	Southern Ontario, Ohio
	10	4.4	1 M	Lake Huron
Chalk River	5	4.2	30 M	Eastern Ontario, New York
	7	4.4	3 S	Northern Ontario
	9	4.1	2 S	Eastern and Southern Ontario
Sutton	4	3.9	7 R	Eastern and Northern Ontario
	5	4.2	6 R	New England
	6	4.4	10 R	New England
	10	5.0	61 M	New England
Montmorency	4	4.2	8 M	Northwestern Quebec
	5	4.4	16 S	Maine, New Brunswick
	7	5.2	1 S	Central Quebec
	10	5.0	20 S	Eastern Maine, New Brunswick
Kejimikujik	6	3.9	14 R	Atlantic Ocean
	7	4.9	17 S	Maine
	10	4.7	1 R	Atlantic Ocean

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

November 4 to 10 1990

Environment Canada Environnement

CLIMATIC PERSPECTIVES

Vol: 12 No: 45 Date: 901105

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DTM ARCHIVES

STATION	temperature				precip.		wind max		STATION	temperature				precip.		wind max	
	mean	anom	max	min	ptot	st	dir	vel		mean	anom	max	min	ptot	st	dir	vel
British Columbia									Ontario								
Cape St James	6	-2	10	2	36	***	170	104	Big Trout Lake	-5	1	1	-15	11	15	300	63
Cranbrook A	3	2	13	-9	14	***	180	44	Gore Bay A	1	-3	5	-7	72	8	280	80
Fort Nelson A	-16	-7	-4	-26	9	25	330	33	Kapuskasing A	-4	-2	2	-11	8	3	310	61
Fort St John A	-11	-8	6	-24	11	20	260	65	Kenora A	-4	-2	3	-11	3	2	200	46
Kamloops A	3	0	20	-8	3	***	100	61	London A	3	-2	8	-2	62	***	290	78
Penticton A	4P	-1P	17P	-2P	0P	***	340	32	Moosonee	-4	-2	2	-12	10	3	X	
Port Hardy A	6	0	12	2	117	***	110	59	North Bay A	-3	-4	3	-11	48	25	350	65
Prince George A	-4	-4	6	-13	27	6	190	57	Ottawa Int'l A	0	-3	8	-7	29	***	300	67
Prince Rupert A	3P	-2P	9P	-2P	62P	1	140	74	Petawawa A	-2	-4	6	-11	37	1	270	57
Revelstoke A	2P	-1P	7P	-1P	105P	8	170	50	Pickle Lake	-6P	-2P	3P	-14P	7P	3	330	41
Smithers A	-3	-3	6	-10	11	2	240	96	Red Lake A	-4	-1	1	-12	4	3	310	57
Vancouver Int'l A	8	1	15	0	92	***	130	46	Sudbury A	-4	-4	2	-12	34	18	020	59
Victoria Int'l A	8	1	16	-2	79	***	210	57	Thunder Bay A	-3	-2	5	-12	0	***	320	63
Williams Lake A	-2P	-1P	6P	-12P	19P	3	150	41	Timmins A	-4	-3	2	-12	***	6	290	56
Yukon Territory									Toronto (Pearson Int'l A)								
Komakuk Beach A	-21	-5	-4	-29	0	18		X	Trenton A	2	-2	10	-7	28	***	270	87
Teslin (aut)	*	*	-1	*	*	***		X	Warton A	2	-2	7	-4	55	1	280	82
Watson Lake A	-17	-6	-3	-33	12	22	290	61	Windsor A	4P	-2P	14P	-2P	29P	***	220	72
Whitehorse A	-17	-10	0	-31	7	9	170	52	Québec								
Northwest Territories									Bagotville A								
Alert	-30	-4	-23	-36	1	12	220	41	Blanc Sablon A	-3	400	4	-8	19	2	090	80
Baker Lake A	-19	0	-8	-31	2	***	350	87	Inukjuak A	-8	-3	-1	-18	7	10	200	63
Cambridge Bay A	-25	-3	-8	-33	4	15	300	48	Kuujuuaq A	-6	0	1	-15	9	15	290	52
Cape Dyer A	*	*	*	*	*	***		X	Kuujuuarapik A	-7	-4	0	-17	7	8	130	57
Clyde A	-18	-3	-10	-27	2	20	320	56	Maniwaki	-2	-3	5	-10	33	1	270	52
Coppermine A	-23	-9	-4	-32	1	19	350	57	Mont Joli A	-2	-3	2	-5	56	29	280	83
Coral Harbour A	-8	8	-4	-23	25	33	050	85	Montréal Int'l A	1	-3	8	-7	50	1	250	67
Eureka	-33P	-2P	-24P	-40P	1P	11		X	Natashquan A	-2P	-2P	5P	-14P	31P	***	090	83
Fort Smith A	-16	-7	-2	-32	7	29	160	35	Québec A	-2	-3	5	-9	56	28	290	67
Hall Beach A	-15	6	-5	-26	8	19	170	56	Schefferville A	-10	-3	-2	-21	31	33	350	56
Inuvik A	-22	-5	0	-36	18	33	310	44	Sept-Îles A	-4P	-3P	7P	-13P	64P	16	300	70
Iqaluit A	-14	-2	-4	-23	3	8	120	50	Sherbrooke A	-1	-3	4	-5	60	15	260	57
Mould Bay A	-31	-6	-20	-39	1	25		X	Val-d'Or A	-6	-4	2	-17	37	22	320	69
Norman Wells A	-18	-3	1	-36	7	10	300	46	New Brunswick								
Resolute A	-24	-1	-12	-35	1	27	110	54	Charlo A	-1	-3	4	-6	35	12	050	74
Yellowknife A	-17	-7	-5	-28	2	15	100	52	Chatham A	-1	-3	8	-6	56	7	250	87
Alberta									Fredericton A								
Calgary Int'l A	-4	-3	6	-13	1	1	260	82	Moncton A	0	-3	12	-7	53	***	260	96
Cold Lake A	-8	-4	8	-17	3	2	270	69	Saint John A	1P	-3P	12P	-5P	37P	***	090	80
Edmonton Namao A	-5	-2	10	-14	9	3	300	82	Nova Scotia								
Fort McMurray A	-12	-7	6	-27	6	4	270	82	Greenwood A	4	-2	14	-3	25	***	260	104
High Level A	-15	-7	-2	-27	19	30	320	37	Shearwater A	4	-2	13	-3	21	***	100	89
Jasper	-3	-2	4	-14	12	9		X	Sydney A	4	-1	12	-1	51	***	140	96
Lethbridge A	0	-1	13	-13	1	***	240	104	Yarmouth A	5	-1	12	-1	27	***	130	89
Medicine Hat A	-2	-3	10	-16	1	1	220	52	Prince Edward Island								
Peace River A	-10	-5	5	-21	8	3	260	56	Charlottetown A	2	-2	12	-3	35	***	220	89
Saskatchewan									Summerside A								
Cree Lake	-14	-7	0	-30	4	14	240	56	2	-3	12	-3	51	***	250	93	
Estevan A	-5	-4	8	-17	0	***	220	63	Newfoundland								
La Ronge A	-11	-5	2	-24	4	12	300	57	Cartwright	-2P	-1P	2P	-6P	16P	16	350	70
Regina A	-5	-3	5	-17	1	***	330	56	Churchill Falls A	-8	-3	-1	-17	35	22	310	56
Saskatoon A	-9	-6	3	-20	0	4	310	50	Gander Int'l A	-1	-4	7	-6	22	1	120	69
Swift Current A	-4	-3	6	-16	4	1	220	63	Goose A	-4	-2	3	-11	15	10	340	67
Yorkton A	-7	-4	7	-16	3	1	310	59	Port Aux Basques	1	-3	7	-3	51	1	310	96
Manitoba									St John's A								
Brandon A	-5	-3	9	-15	0	***	270	56	1	-4	10	-3	24	5	150	80	
Churchill A	-9	0	0	-20	9	23	320	89	St Lawrence	2	-3	10	-4	29	***	X	
Lynn Lake A	-11P	-2P	1P	-22P	7P	17	340	56	Wabush Lake A	-9	-4	0	-20	22	10	010	44
The Pas A	-9	-5	2	-18	3	14	150	56	90/11/05-90/11/11								
Thompson A	-9	0	2	-21	8	29	280	46									
Winnipeg Int'l A	-5	-3	5	-15	0	***	280	54									

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.