Environment Canada Environnement Canada

Climatic Perspectives

September 18 to 24, 1989 **A weekly review of Canadian climate** *Vol. 11 No 39*

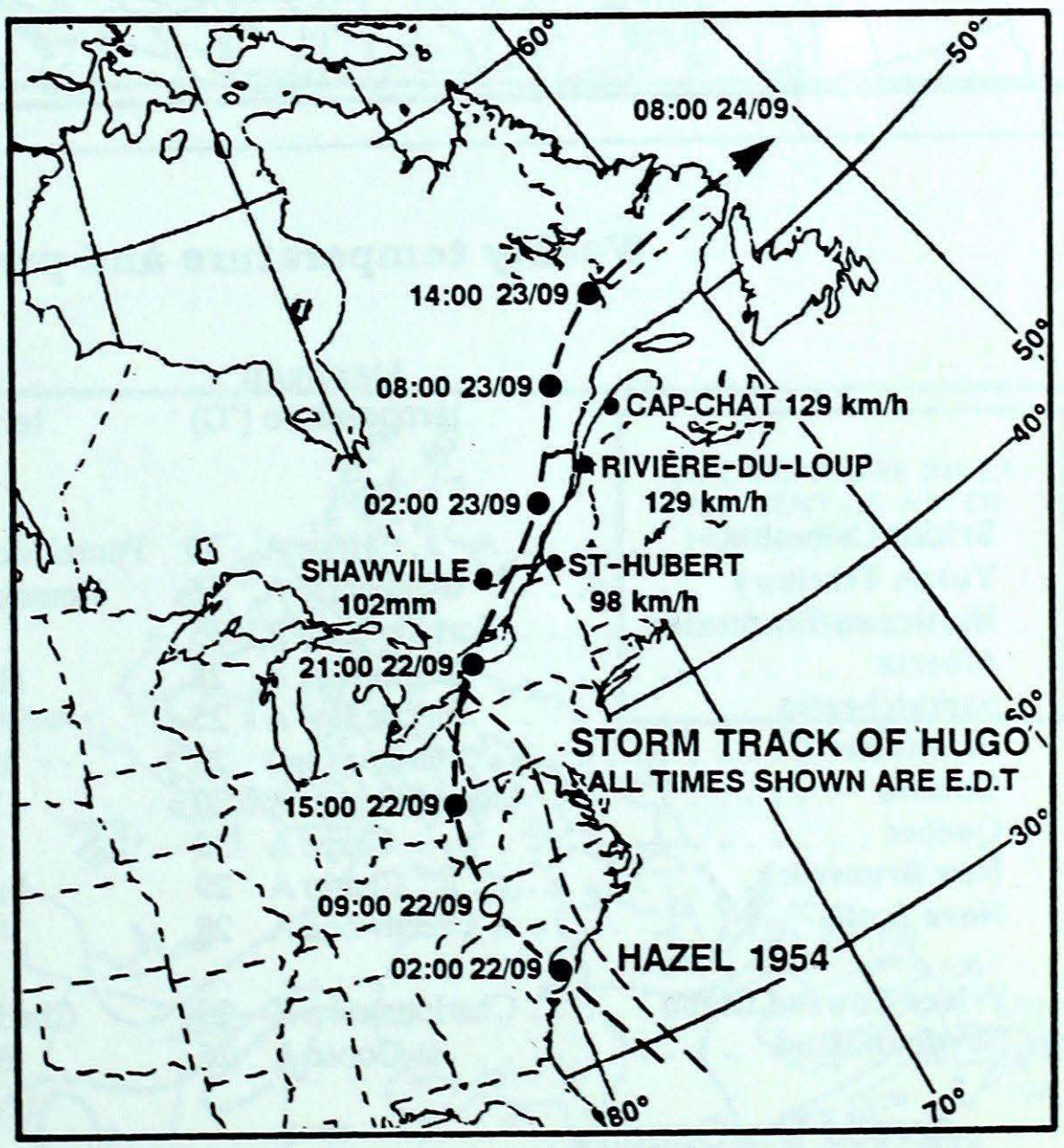
Remnants of hurricane Hugo race across eastern Canada

Almost 35 years after hurricane Hazel ravaged southern Ontario, hurricane Hugo struck the coast of South Carolina during the early morning hours of September 22. This tropical storm then headed in a northerly direction towards the lower Great Lakes, following almost exactly the same track as Hazel did on that fateful Friday of October 15, 1954. Although both storms had become extratropical by the time they reached southern Ontario, unlike Hazel, Hugo had lost more of its furry.

Bands of rain associated with Hugo reached southern Ontario during the afternoon of the 22nd, and spread rapidly eastwards into the province of Québec by evening. As the centre of the low pressure system advanced, both precipitation and wind velocity increased, with the winds shifting to northerly gales in its wake. The storm phased with a frontal disturbance moving through northern Ontario, which allowed unseasonably cold Arctic air to spill across much of eastern Canada by the end of the period. As a result, the first full day of autumn in Ontario was cold and blustery.

The storm produced heavy rain, but because of its rapid eastward motion, the precipitation was short-lived, with the bulk of the rain falling within a 12-hour period. As a result, any flooding was minor in nature. Heaviest precipitation fell in a band from the Niagara Peninsula eastwards to the Ottawa Valley and across southern Quebec. Up to 70 mm of rain fell in southern and eastern Ontario. In Quebec, amounts ranged between 50 and 100 millimetres. In 1954, 200 mm of rain was recorded just northwest of Toronto in a 48-hour period from hurricane Hazel.

Winds associated with this latest storm were more of a problem in Quebec and Atlantic Canada than in Ontario. At Moncton Airport, a gust of 124 Km/h on September 23 was the highest peak wind speed ever recorded during the month in 35 years of records. The previous record was 100 Km/h set on September 27, 1964. At Cap Chat on the Gaspe, wind gusts reached 129 Km/h, while at Summerside, P.E.I., southwesterly winds were clocked as high as 96 Km/h. For the most part wind damage was minor, but there were some power outages in Quebec and ferry crossings were disrupted in the Maritimes.



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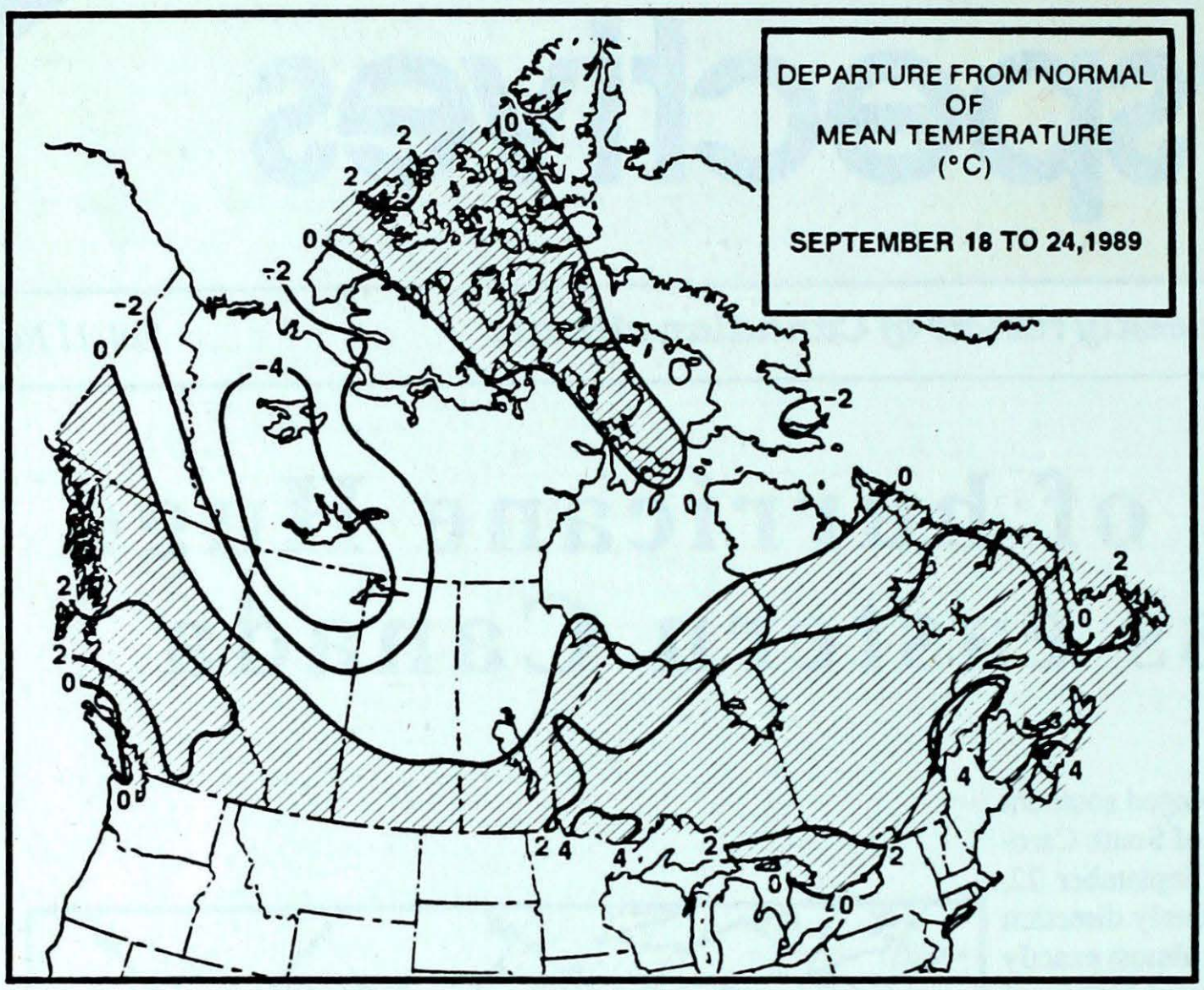

Weekly normal temperature (°C)

	max	min
Whitehorse A	11.4	1.9
Iqaluit A	3.6	-1.2
Yellowknife A	9.0	2.7
Vancouver Int'l A	17.4	9.4
Victoria Int'l A	18.3	8.3
Calgary Int'l A	16.2	3.0
Edmonton Int'l A	15.7	2.3
Regina A	16.4	3.1
Saskatoon A	16.0	3.4
Winnipeg Int'l A	16.4	4.8
Ottawa Int'l A	18.2	7.8
Toronto Int'l A	19.8	8.8
Montréal Int'l A	18.7	8.5
Québec A	17.0	6.2
Fredericton A	18.7	6.0
Saint John A	16.9	6.9
Halifax	18.1	9.5
Charlottetown A	17.2	8.4
Goose A	13.0	3.5
St John's A	14.9	6.8

Weekly temperature and precipitation extremes

	Maximum temperature (°C)		Minimum temperature (°C)		Heaviest precipitation (mm)	
British Columbia	Hope A	30	Puntzi Mountain (aut)	-3	Prince Rupert A	122
Yukon Territory	Whitehorse A	16	Komakuk Beach A	-11	Watson Lake A	26
Northwest Territories	Fort Simpson A	13	Alert	-20	Rankin Inlet A	34
Alberta	Lethbridge A	28	High Level A	-8	Fort Chipewyan A	16
Saskatchewan	Moose Jaw A	25	Cree Lake	-6	Swift Current A	20
Manitoba	Gretna (aut)	28	Thompson A	-6	Island Lake	28
Ontario	Sioux Lookout A	30	Wawa A	-4	Petawawa	68
Québec	Gaspe A	30	Kuujjuaq A	-3	Maniwaki	81
New Brunswick	Charlo A	29	St-Léonard A	-1	Fredericton A	27
Nova Scotia	Greenwood A	28	Sydney A	3	Sable Island	54
			Truro	3		
Prince Edward Island	Charlottetown A	26	Charlottetown A	3	Summerside A	37
Newfoundland	Goose A	26	Badger (aut)	-3	Goose A	65

Across The Country...

Highest Mean Temperature	Hope A(BC)	18
Lowest Mean Temperature	Alert(NWT)	-12

89/09/18-89/09/24

CLIMATIC PERSPECTIVES
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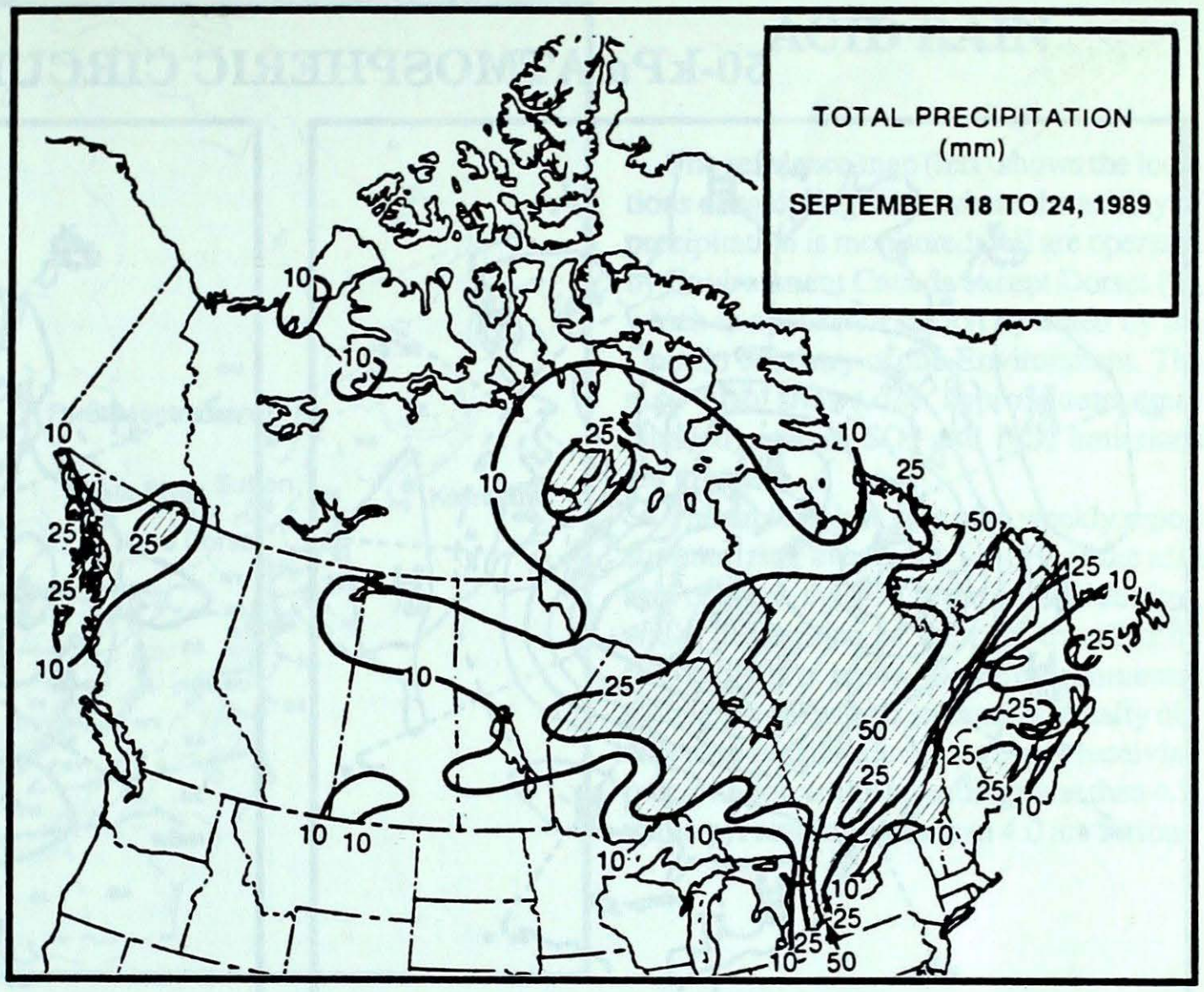
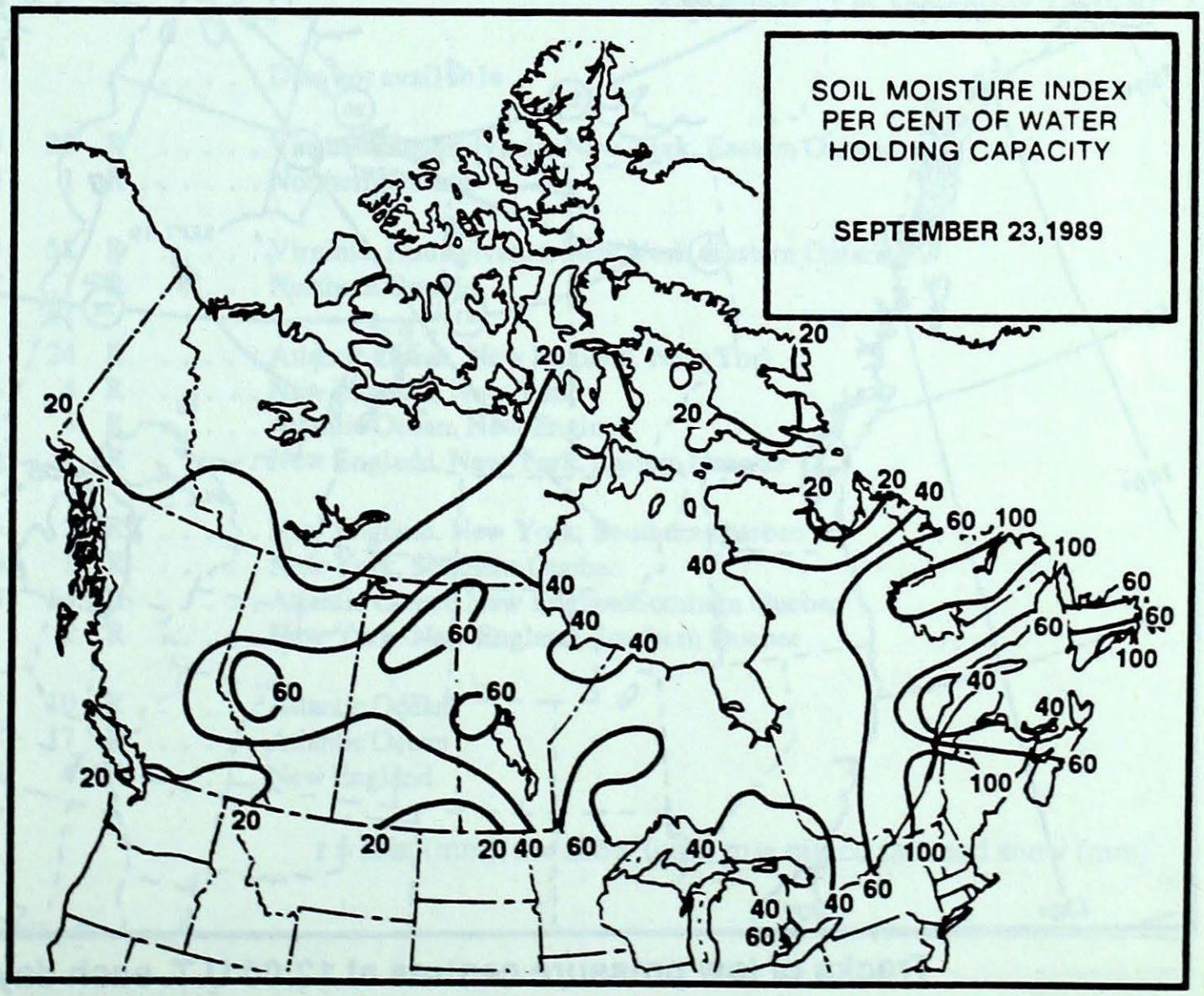
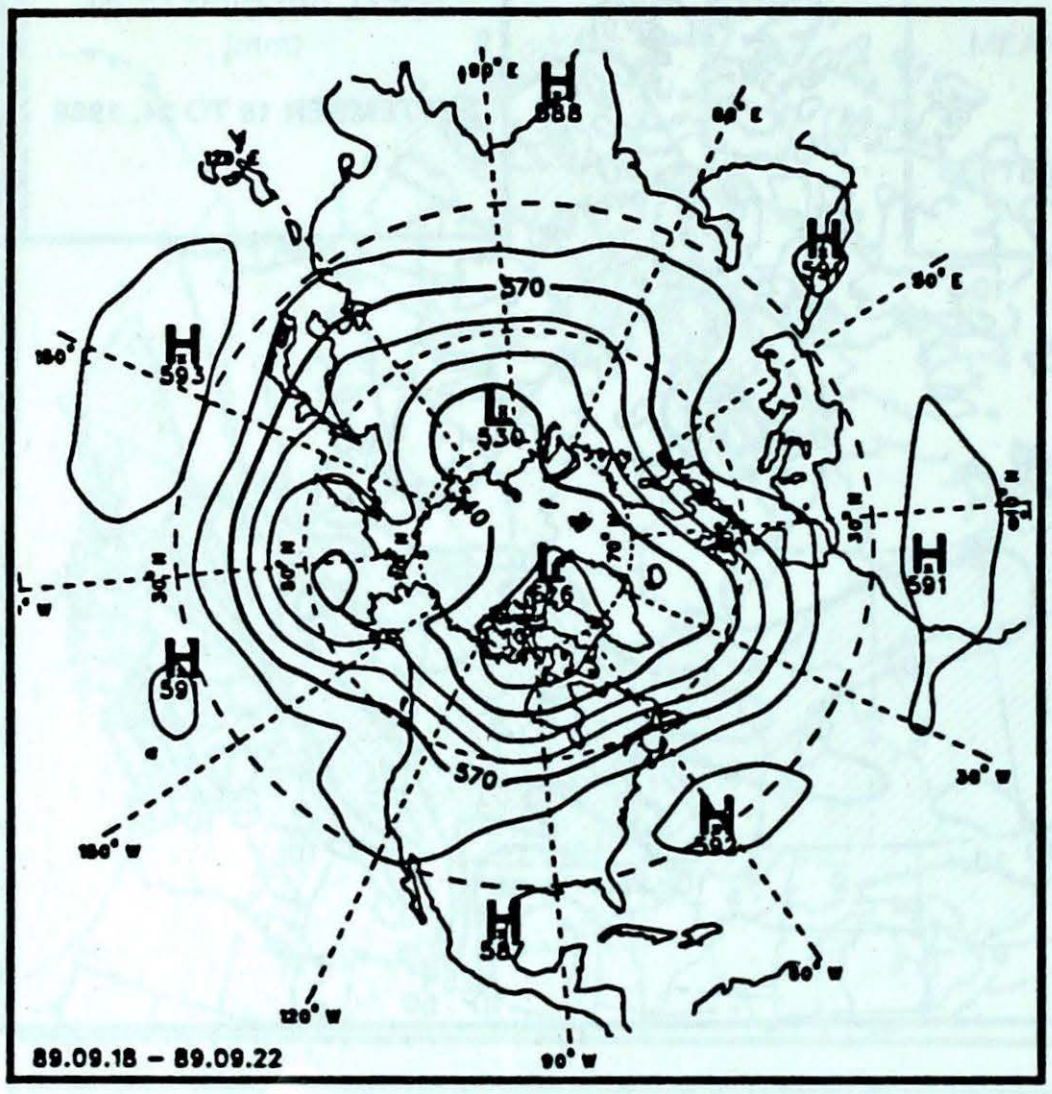
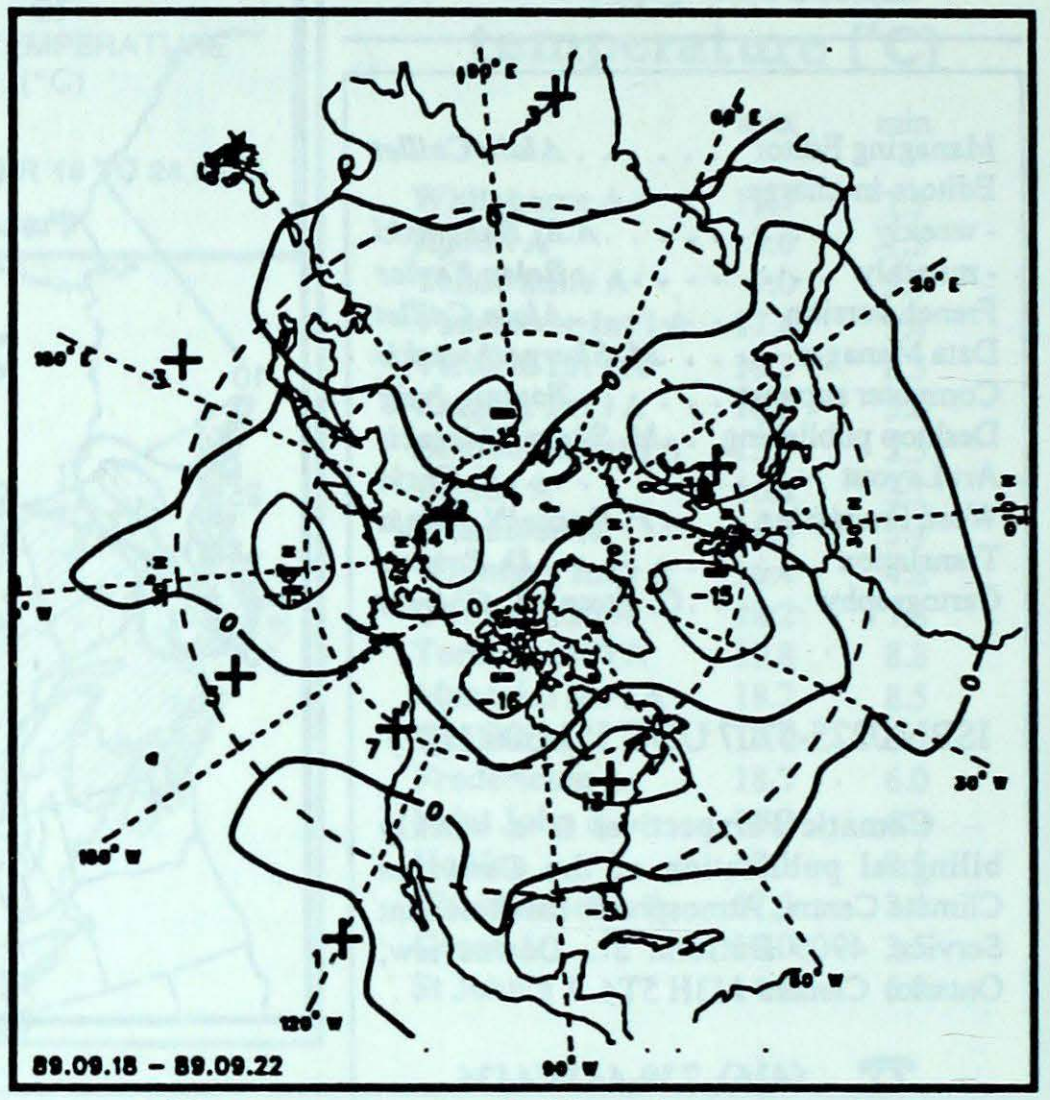




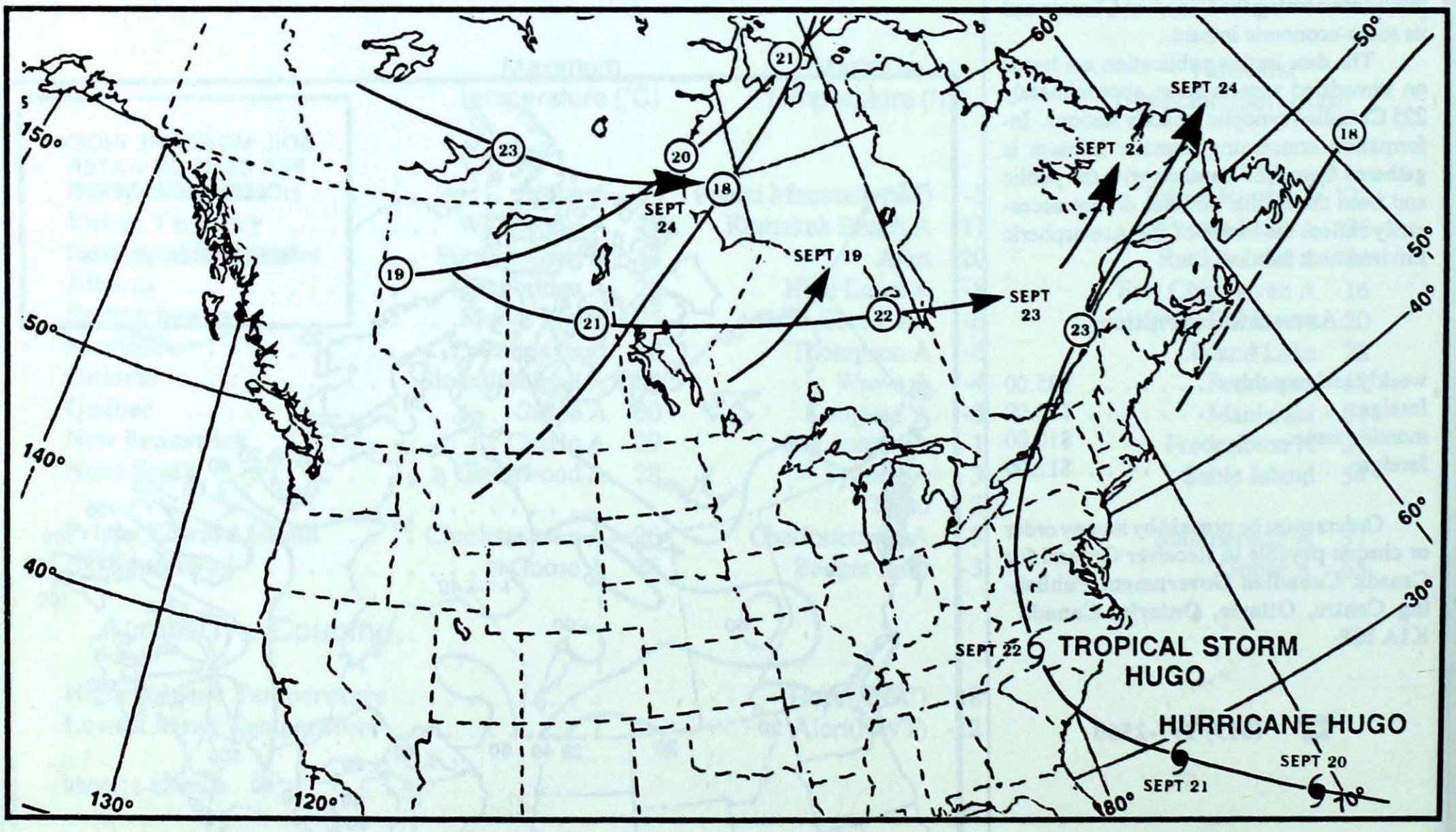
50-kPa ATMOSPHERIC CIRCULATION



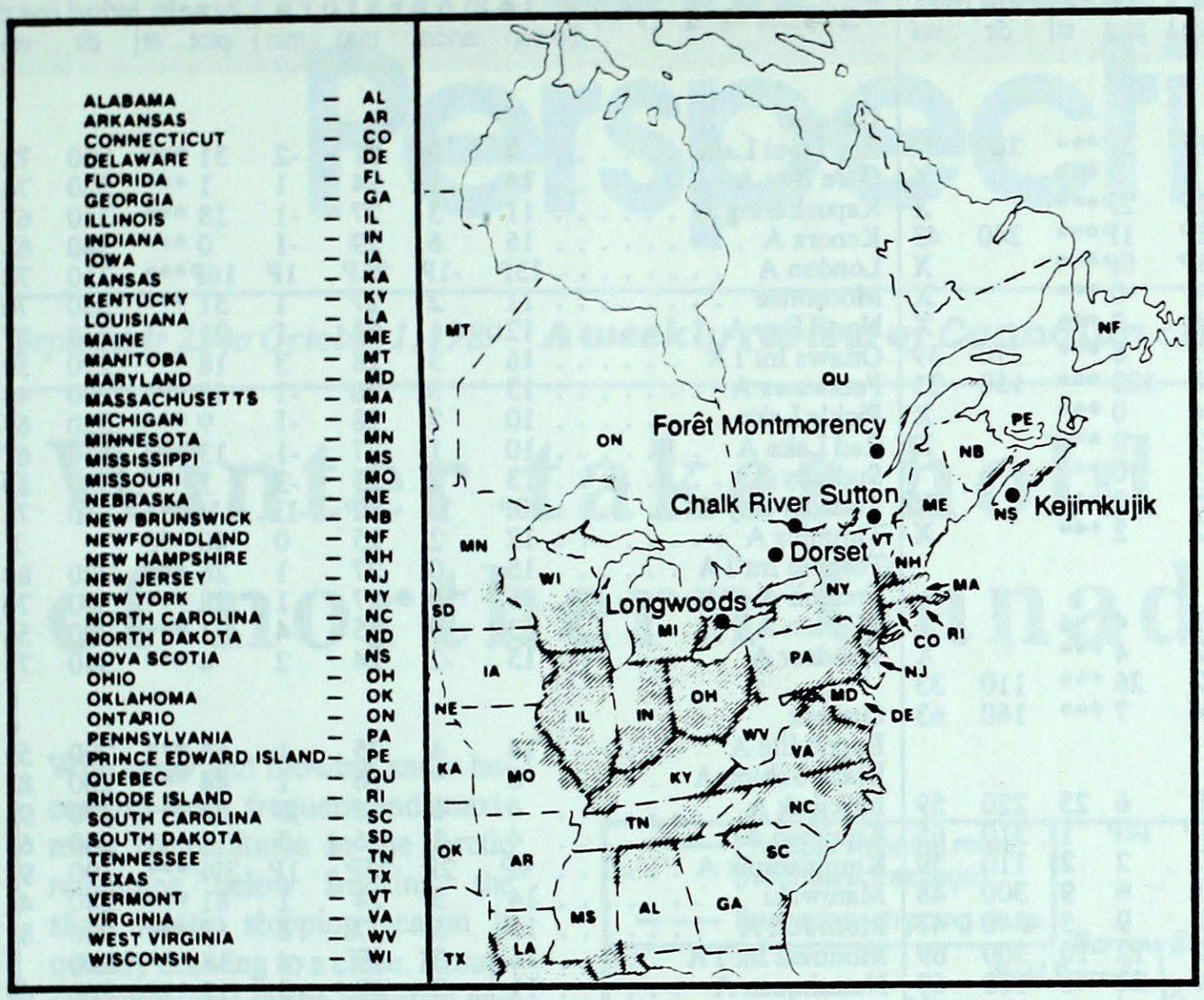
Mean geopotential height
50-kPa level (10 decametre intervals)



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.



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_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.

SITE	day	pH	amount		AIR PATH TO SITE
					September 17 to September 23, 1989
Longwoods					. . . . . Data not available
Dorset *	22	4.3	30	R	. . . . . Virginia, Pennsylvania, New York, Eastern Ontario
	23	4.5	1	R	. . . . . Northern Ontario
Chalk River	22	4.3	52	R	. . . . . Virginia, Pennsylvania, New York, Eastern Ontario
	23	4.7	1	R	. . . . . Northern Ontario
Sutton	19	5.1	24	R	. . . . . Atlantic Ocean, New England, New York
	20	4.5	4	R	. . . . . New England, New York
	22	4.1	4	R	. . . . . Atlantic Ocean, New England
	23	3.8	7	R	. . . . . New England, New York, Eastern Ontario
Montmorency	19	4.6	2	R	. . . . . New England, New York, Southern Quebec
	20	5.0	1	R	. . . . . New York, Southern Quebec
	22	4.4	64	R	. . . . . Atlantic Ocean, New EnglandSouthern Quebec
	23	4.1	2	R	. . . . . New York, New England, Southern Quebec
Kejimkujik	17	4.7	10	R	. . . . . Atlantic Ocean
	20	4.8	17	R	. . . . . Atlantic Ocean
	23	4.5	4	R	. . . . . New England

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

STATION	temperature mean	anom	max	min	precip. ptot	st	wind max dir	vel
British Columbia								
Cape St James	15P	2P	20P	11P	1P***		280	54
Cranbrook A	87	77	24	1	0 ***			X
Fort Nelson A	6P	-2P	18P	-2P	2P***			X
Fort St John A	9P	0P	21P	-2P	1P***		240	43
Kamloops A	15P	1P	26P	3P	0P***			X
Penticton A	15	1	29	4	0 ***			X
Port Hardy A	11	0	17	6	2 ***			X
Prince George A	12	3	23	1	8 ***		270	39
Prince Rupert A	13	2	18	8	122 ***		150	33
Revelstoke A	12	1	21	4	0 ***			X
Smithers A	12	3	22	2	9 ***			X
Vancouver Int'l A	14	1	23	7	0 ***			
Victoria Int'l A	14	1	26	5	0 ***			X
Williams Lake A	12	2	25	-2	2 ***			X
Yukon Territory								
Komakuk Beach A	-3	-3	1	-11	4	4		X
Teslin (aut)	7	*	14	-2	4 ***			X
Watson Lake A	6	-1	15	-2	26 ***		110	33
Whitehorse A	8	1	16	-4	7 ***		160	63
Northwest Territories								
Alert	-12	0	-6	-20	6	25	220	59
Baker Lake A	0P	-1P	5P	-4P	14P	1	310	65
Cambridge Bay A	-3	-1	1	-7	2	2	110	59
Cape Dyer A	-3	0	2	-11	6	9	300	48
Clyde A	-3	-1	6	-10	9	5	340	41
Coppermine A	-3	-2	2	-9	12	10	300	69
Coral Harbour A	0	0	3	-4	21	1	120	69
Eureka	-12	-1	-4	-20	2	4	300	46
Fort Smith A	2	-5	10	-8	9	***	160	57
Hall Beach A	-3P	-1P	2P	-8P	7P	7	100	57
Inuvik A	-2	-4	3	-7	8	5		X
Iqaluit A	-1	-2	6	-6	5	1	140	65
Mould Bay A	-6	2	-2	-10	3	5	050	56
Norman Wells A	1	-4	10	-4	1	***	310	63
Resolute A	-6	0	-1	-15	9	24	110	63
Yellowknife A	2	-4	7	-5	9	***	150	57
Alberta								
Calgary Int'l A	12	2	24	2	0 ***		160	52
Cold Lake A	8	-1	21	-3	1 ***		330	56
Edmonton Namao A	10	1	22	0	0 ***		150	48
Fort McMurray A	5	-3	23	-5	11 ***		310	39
High Level A	3	-5	18	-8	7 ***		340	41
Jasper	10	2	24	-4	1 ***			X
Lethbridge A	13	2	28	3	2 ***		280	56
Medicine Hat A	13	1	27	4	7 ***		200	46
Peace River A	8P	-1P	20P	0P	4P***		330	43
Saskatchewan								
Cree Lake	3	-3	16	-6	10 ***		200	54
Estevan A	11	0	23	-3	1 ***		310	67
La Ronge A	7P	-1P	19P	-3P	3P***		290	52
Regina A	10	0	23	0	8 ***		320	65
Saskatoon A	10	0	22	-2	0 ***		320	56
Swift Current A	10	0	23	1	20 ***		300	56
Yorkton A	9P	0P	21P	-4P	10P***		320	57
Manitoba								
Brandon A	10	0	22	-6	3 ***		310	76
Churchill A	4P	-1P	10P	-3P	7P***		300	78
Lynn Lake A	5	-1	14	-3	16 ***		320	61
The Pas A	7	-2	16	-2	4 ***		310	70
Thompson A	4	-2	12	-6	12 ***		240	54
Winnipeg Int'l A	11	1	24	-5	5 ***		340	63

STATION	temperature mean	anom	max	min	precip. ptot	st	wind max dir	vel
Ontario								
Big Trout Lake	7	0	21	-2	31 ***		330	72
Gore Bay A	14	1	24	1	1 ***		320	74
Kapuskasing A	11	3	27	-1	18 ***		310	67
Kenora A	16	6	29	-1	0 ***		340	63
London A	13P	-1P	26P	1P	16P***		310	78
Moosonee	11	2	27	1	51 ***		350	76
North Bay A	12	1	23	-1	21	1	330	67
Ottawa Int'l A	16	3	28	3	18 ***		290	59
Petawawa A	13	3	26	-1	68 ***		290	48
Pickle Lake	10	2	28	-1	9 ***		320	67
Red Lake A	10	1	27	-1	13 ***		350	67
Sudbury A	13	2	25	-3	1 ***		330	80
Thunder Bay A	10P	1P	25P	-1P	11P***		350	78
Timmins A	12	2	25	0	40	78		X
Toronto Int'l A	15	0	27	1	26 ***		320	80
Trenton A	15	0	27	1	28 ***		300	70
Wiarton A	13	0	25	4	1 ***		290	56
Windsor A	15	-2	24	2	4 ***		340	78
Québec								
Bagotville A	14	4	25	1	55 ***		290	59
Blanc Sablon A	8	*	16	1	44 ***		200	82
Inukjuak A	4	0	8	0	24 ***		170	93
Kuujjuaq A	4	-1	16	-3	9	1	280	63
Kuujjuarapik A	9P	2P	26P	1P	39P***		190	93
Maniwaki	14	3	24	1	81 ***		240	48
Mont Joli A	15	5	27	4	10 ***		200	83
Montréal Int'l A	16	3	29	4	18 ***		240	
Natashquan A	11	3	19	3	12 ***		260	65
Québec A	15	3	24	3	37 ***		240	72
Schefferville A	6	2	22	-3	53	8	240	82
Sept-Îles A	11	2	21	1	59 ***		300	74
Sherbrooke A	15	4	28	-1	28 ***		180	70
Val-d'Or A	12	3	24	0	26 ***		300	70
New Brunswick								
Charlo A	13	3	29	1	13 ***		280	72
Chatham A	14P	2P	27P	1P	10P***		220	85
Fredericton A	14	2	25	1	27 ***		200	78
Moncton A	15P	3P	26P	2P	16P***		270	74
Saint John A	14	2	23	4	27 ***		200	82
Nova Scotia								
Greenwood A	17P	4P	28P	7P	11P***		210	80
Shearwater A	17	3	25	7	7 ***		210	61
Sydney A	16	3	26	3	3 ***		270	50
Yarmouth A	15	2	22	6	2 ***		180	63
Prince Edward Island								
Charlottetown A	15	3	26	3	16 ***		270	70
Summerside A	16P	3P	25P	5P	37P***		210	96
Newfoundland								
Cartwright	9	2	25	0	47 ***		310	87
Churchill Falls A	8	5	23	-2	51	1	350	6
Gander Int'l A	14P	4P	26P	1P	4P***		210	106
Goose A	11P	3P	26P	2P	65P***		040	70
Port Aux Basques	13	2	18	7	36 ***		210	48
St John's A	13	2	25	4	6 ***		270	78
St Lawrence	13	2	22	2	22 ***			X
Wabush Lake A	8	2	22	-2	34 ***		360	61

89/09/18-89/09/24

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.