



# Climatic Perspectives



September 21 to 27, 1992 **A weekly review of Canadian climate and water**

## Summer rainfalls push Great Lakes water levels upward

*The water levels on the Great Lakes usually begin their seasonal decline during the summer, and continue into the winter season. This has not been the case this year.*

Record high precipitation over the Great Lakes Basin in July caused all the Great Lakes to rise. The Basin received 145 percent of its usual July rainfall. The Lake Erie drainage basin, received 175 mm of rain, the highest amount ever recorded and more than twice the average.

Precipitation in August continued its above-normal trend, approximately 113 percent of normal. The overall water supply and outflow conditions on Lakes Ontario, Superior, Huron and Georgian Bay were such that the water levels remained relatively constant during the month. In contrast, the level of Lake Erie began its seasonal decline after rising considerably in July.

In September, rainfall continued its above normal trend, delaying the normal water level declines expected at this time of year. On average, the Basin has received 130 percent of its normal rainfall in September. Only Lake Ontario's water level declined due to the regulated higher outflow into the St. Lawrence River.

### Rain and wind buffets Ontario's cottage country

During the early morning hours of the 22nd, heavy thunderstorms rumbled across the Muskoka/Haliburton cottage

district north of Toronto, producing torrential downpours. The slow moving storms dropped between 100 and 150 millimetres of rain in a matter of hours, causing local flooding and sharp lake and river rises of 30 to 60 centimetres. The East River, north of Huntsville, rose by nearly three metres. Luckily, the water levels in many of the lakes were in the process of being lowered, as this is the seasonal draw-down period; but even so, currents in some of the connecting rivers and channels became unusually strong - a hazard to boaters.

On Sunday, September 27, in the wake of a cold frontal passage, gale-force winds picked up and blew across southern and central Ontario. The strong, gusty westerly winds, approaching 100 km/h, toppled trees and broke limbs and branches, which in turn knocked down power and phone lines, cutting-off many rural residents until the next day.

### Elsewhere...

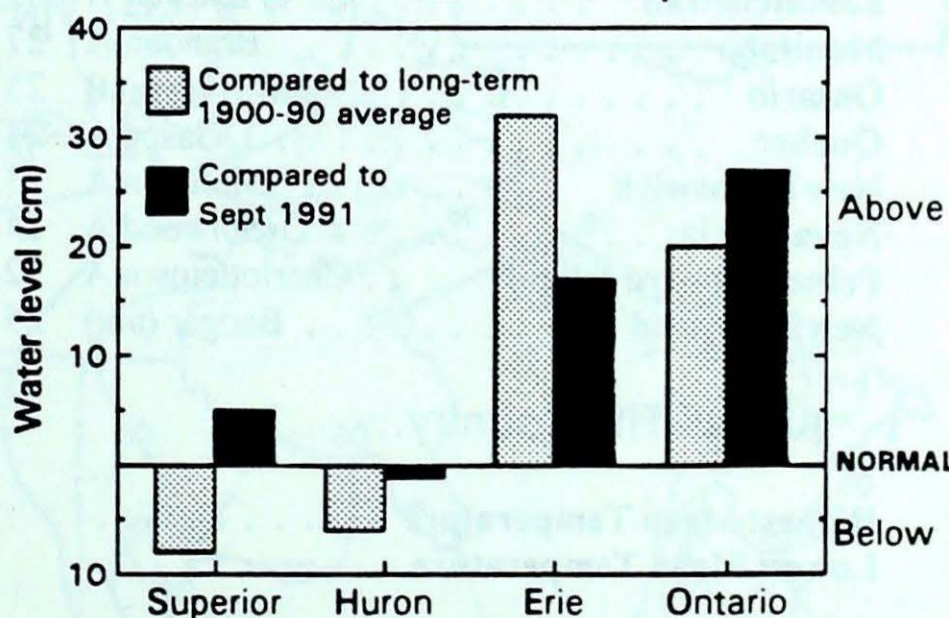
Snow and record cold encompassed the Yukon. Strong winds, snow and freezing rain af-

fecting Baffin Island. Heavy snow was reported in northern British Columbia and the Prairie provinces, while in the south temperatures briefly climbed into the thirties. Relatively pleasant autumn weather prevailed in Atlantic Canada.

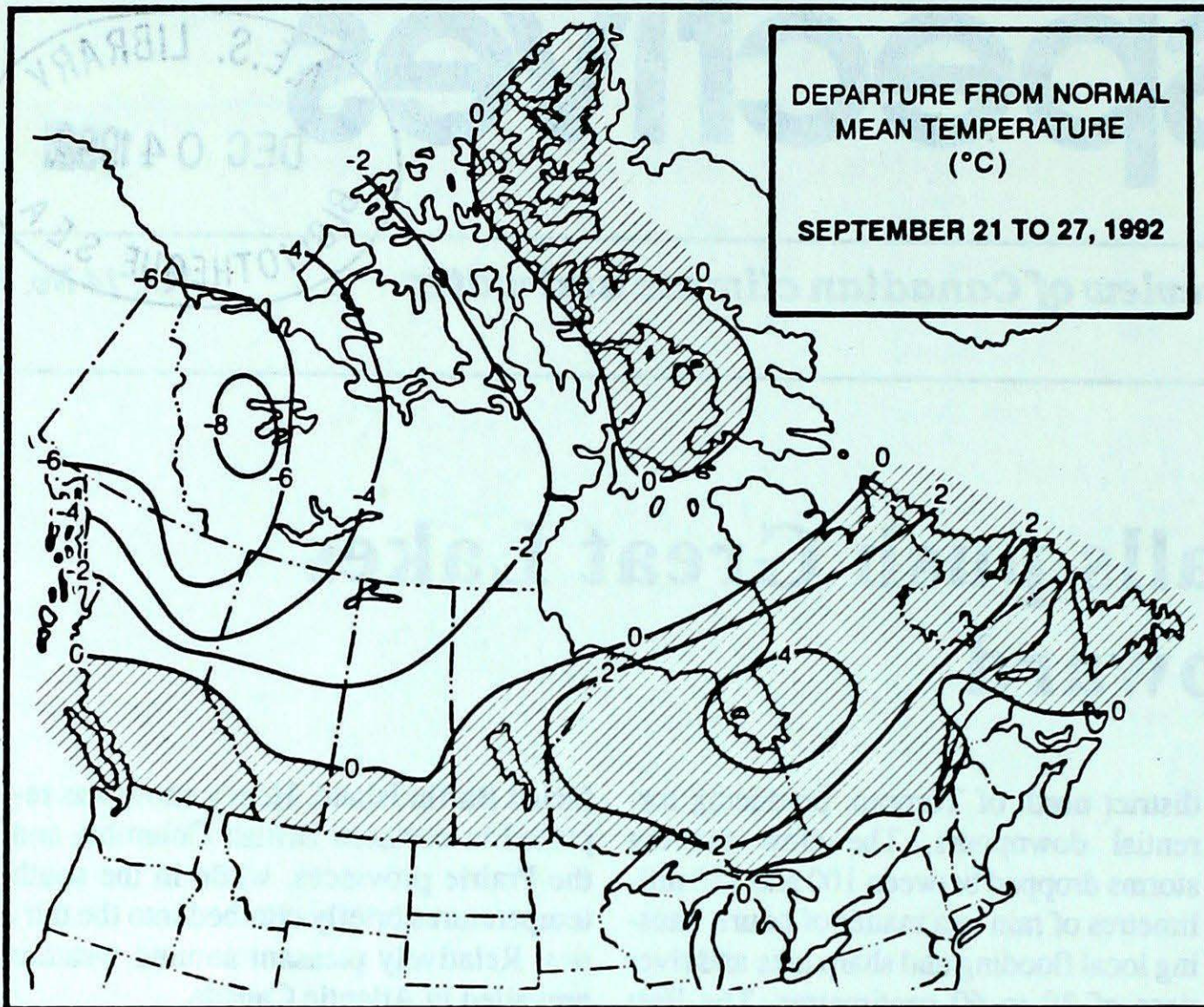
### A Look Ahead...

For the week of October 5, temperatures will be above normal across most of Canada. Near to below normal values are expected across the Atlantic region, the Yukon, the Mackenzie District of The Northwest Territories and British Columbia. Stormy weather is likely over the Maritimes.

Great Lakes water levels Sept 1992



Although Lake Superior is higher than a year ago, it together with Lake Huron have lower water levels than average. In contrast, Lakes Erie and Ontario are now considerably above both last year and the long-term average. The outflow of Lake Ontario can be regulated to reduce the risk of damage.



DEPARTURE FROM NORMAL  
MEAN TEMPERATURE  
(°C)  
SEPTEMBER 21 TO 27, 1992

**Weekly normal temperatures (°C)**

	max.	min.
Whitehorse A	10.5	1.3
Iqaluit A	2.6	-2.0
Yellowknife A	7.5	1.4
Vancouver Int'l A	17.2	9.1
Victoria Int'l A	18.0	8.0
Calgary Int'l A	15.9	2.5
Edmonton Int'l A	15.1	-2.0
Regina A	15.8	2.4
Saskatoon A	15.4	2.7
Winnipeg Int'l A	15.6	3.8
Ottawa Int'l A	17.5	7.3
Toronto (Pearson Int'l A)	19.2	8.1
Montréal Int'l A	18.0	8.0
Québec A	15.9	5.7
Fredericton A	18.0	5.8
Saint John A	16.3	6.8
Halifax (Shearwater)	17.7	9.4
Charlottetown A	16.8	8.3
Goose A	12.2	3.4
St John's A	14.8	6.9

**Weekly temperature and precipitation extremes**

	Maximum temperature (°C)	Minimum temperature (°C)	Heaviest precipitation (mm)
British Columbia	Penticton A 27	Fort Nelson A -10	Prince Rupert A 167
Yukon Territory	Watson Lake A 7	Beaver Creek -22	Sheldon Lake 26
Northwest Territories	Fort Smith 7	Alert -23	Cape Dyer A 47
Alberta	Medicine Hat A 30	High Level A -5	High Level A 33
Saskatchewan	Estevan A 33	Collins Bay -5	Cree Lake 29
Manitoba	Brandon A 27	Grand Rapids (aut) -6	Winnipeg Int'l A 37
Ontario	Armstrong (aut) 25	Lansdowne House -4	Petawawa A 66
Quebec	Gaspé A 24	Sherbrooke A -4	Baie Comeau A 52
New Brunswick	Moncton A 23	St-Léonard A -3	Saint John A 50
Nova Scotia	Greenwood A 24	Greenwood A -1	Western Head (aut) 28
Prince Edward Island	Charlottetown A 22	Charlottetown A 3	East Point (aut) 10
Newfoundland	Badger (aut) 25	Badger (aut) -3	St John's A 26

**Across The Country...**

Highest Mean Temperature	Abbotsford (B.C.) 15
Lowest Mean Temperature	Alert (N.W.T.) -15

92/09/21-92/09/27

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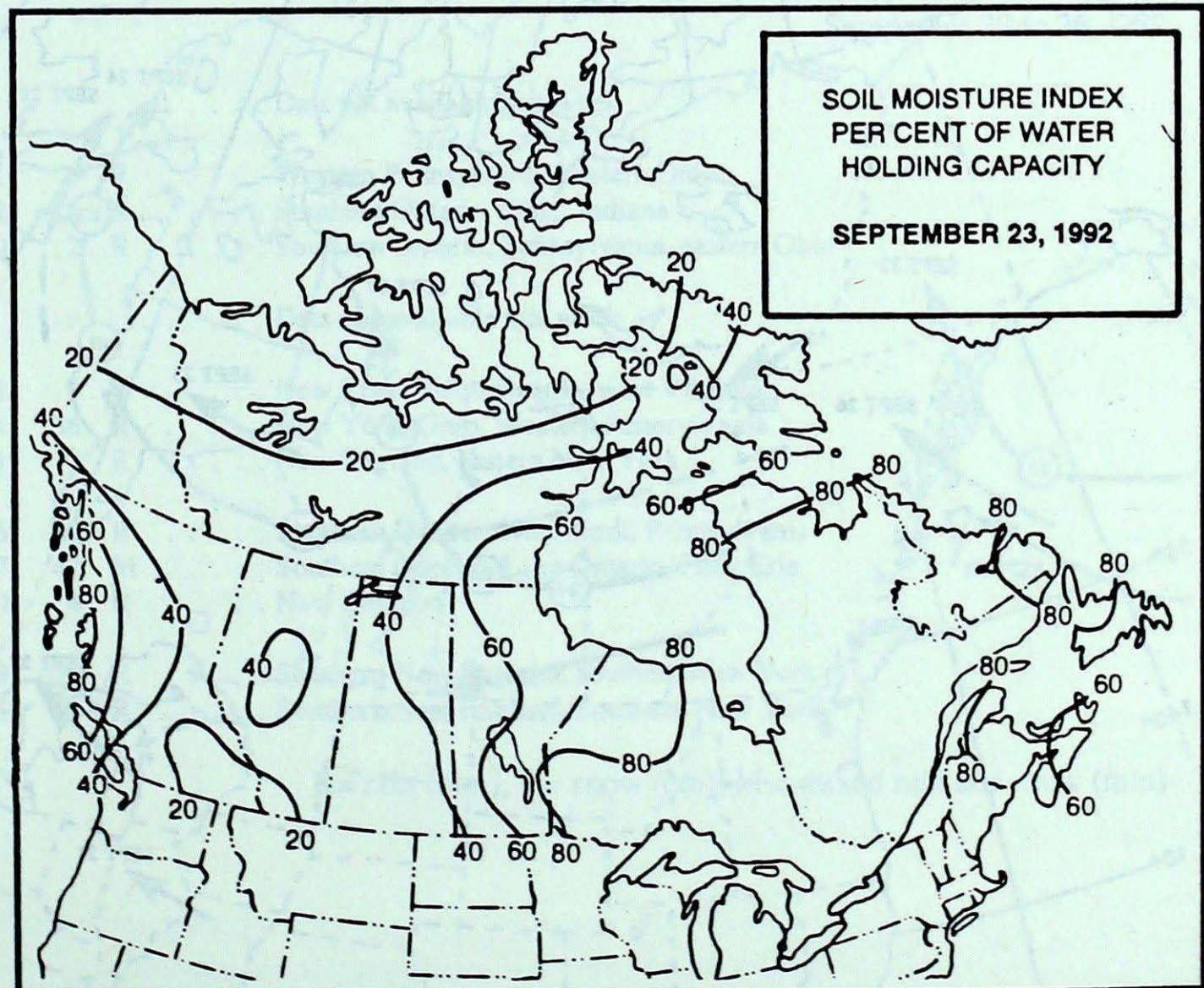
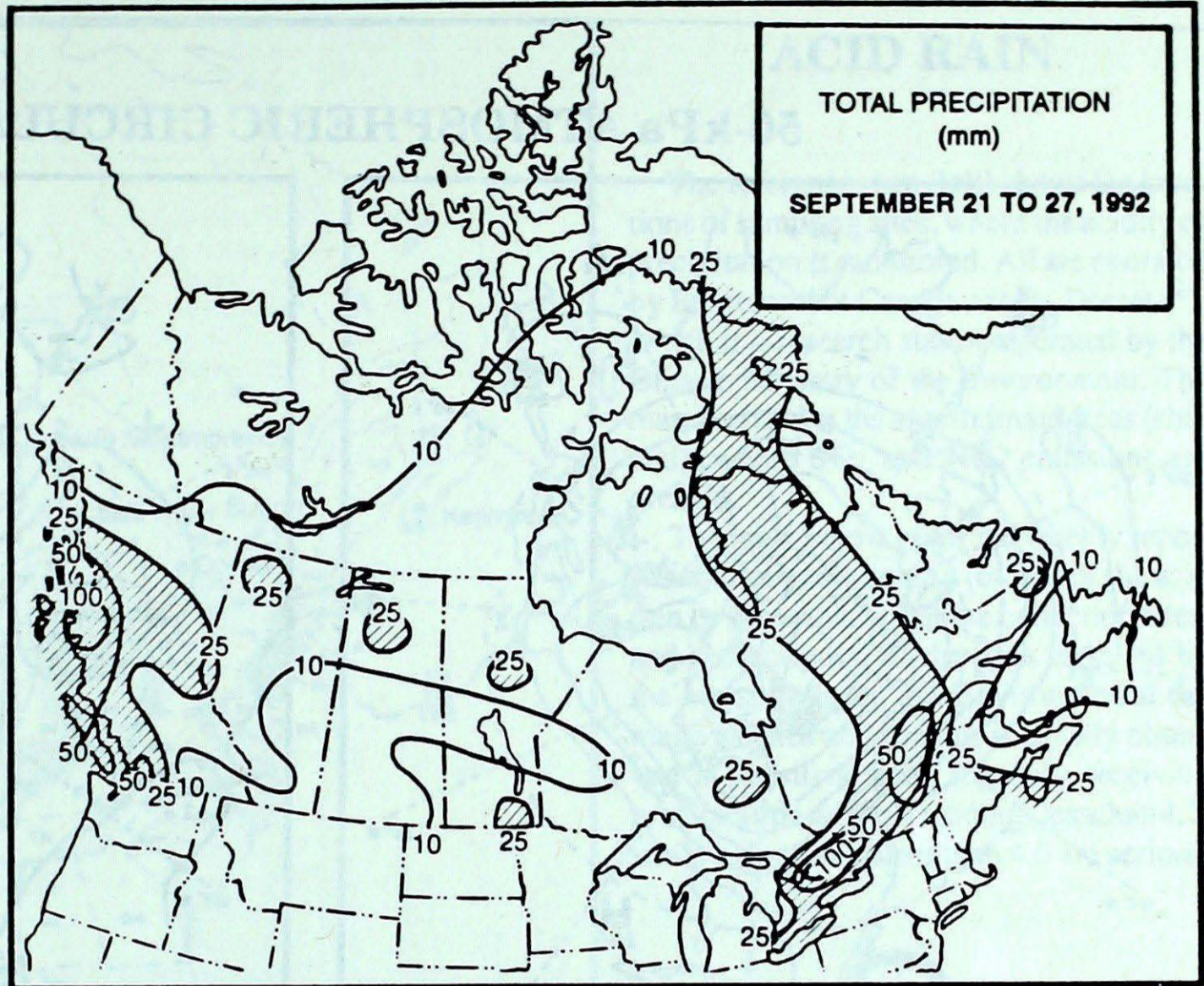
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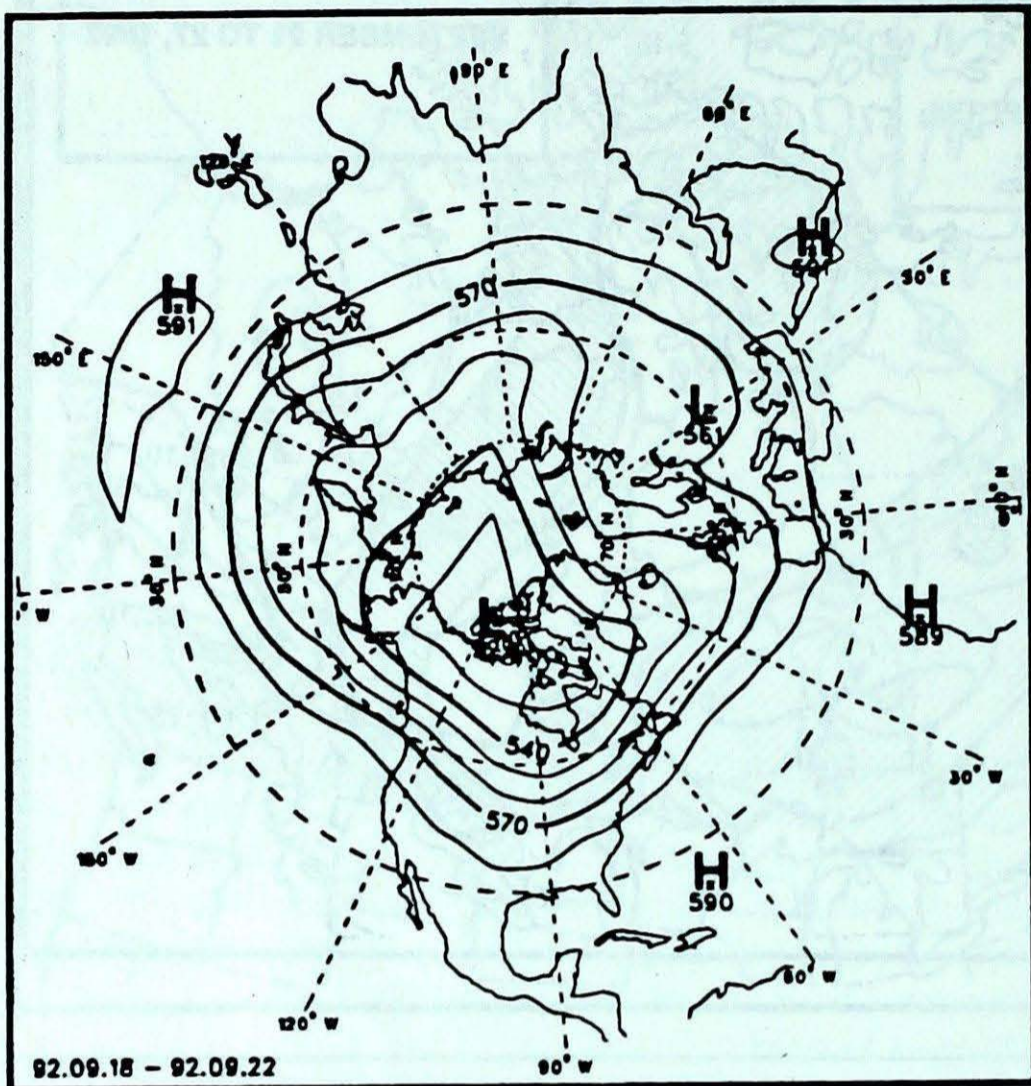
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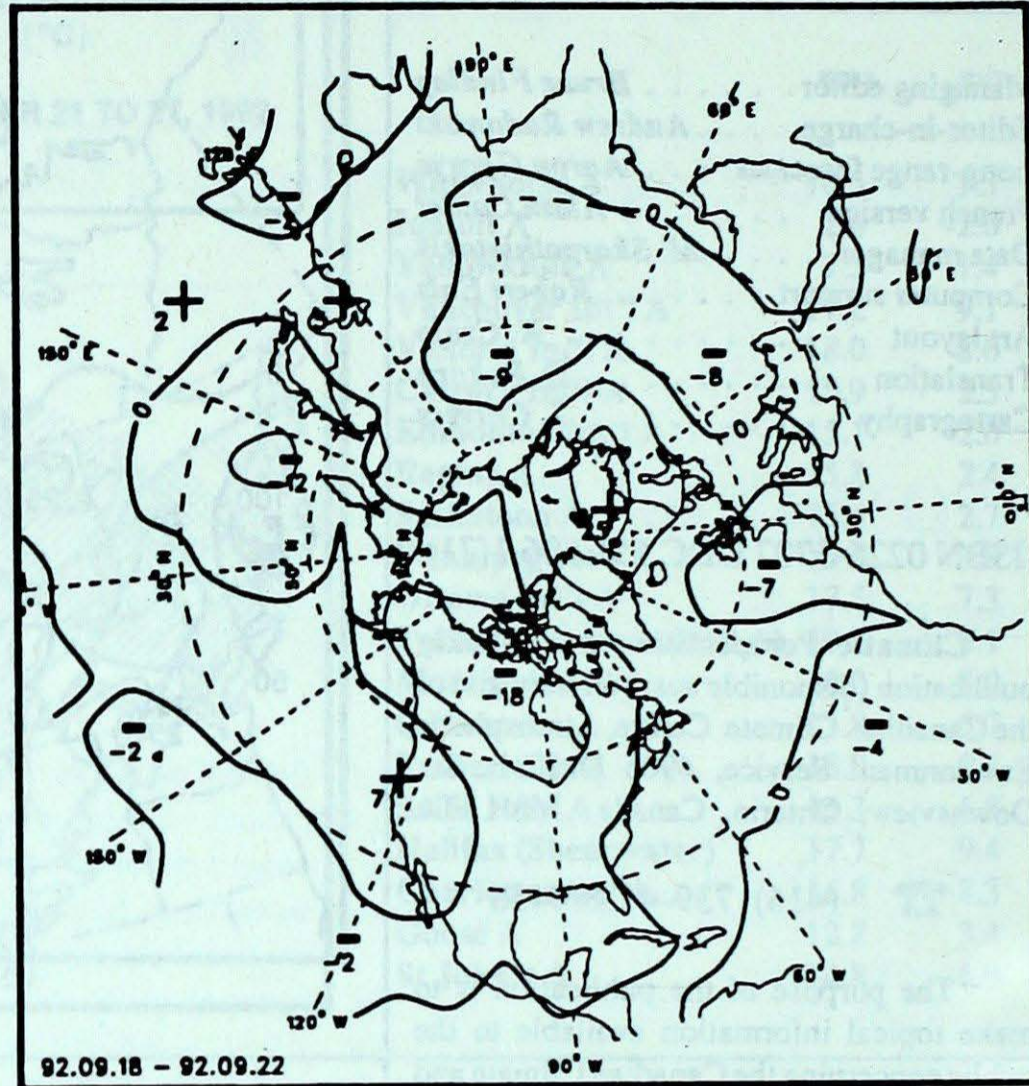
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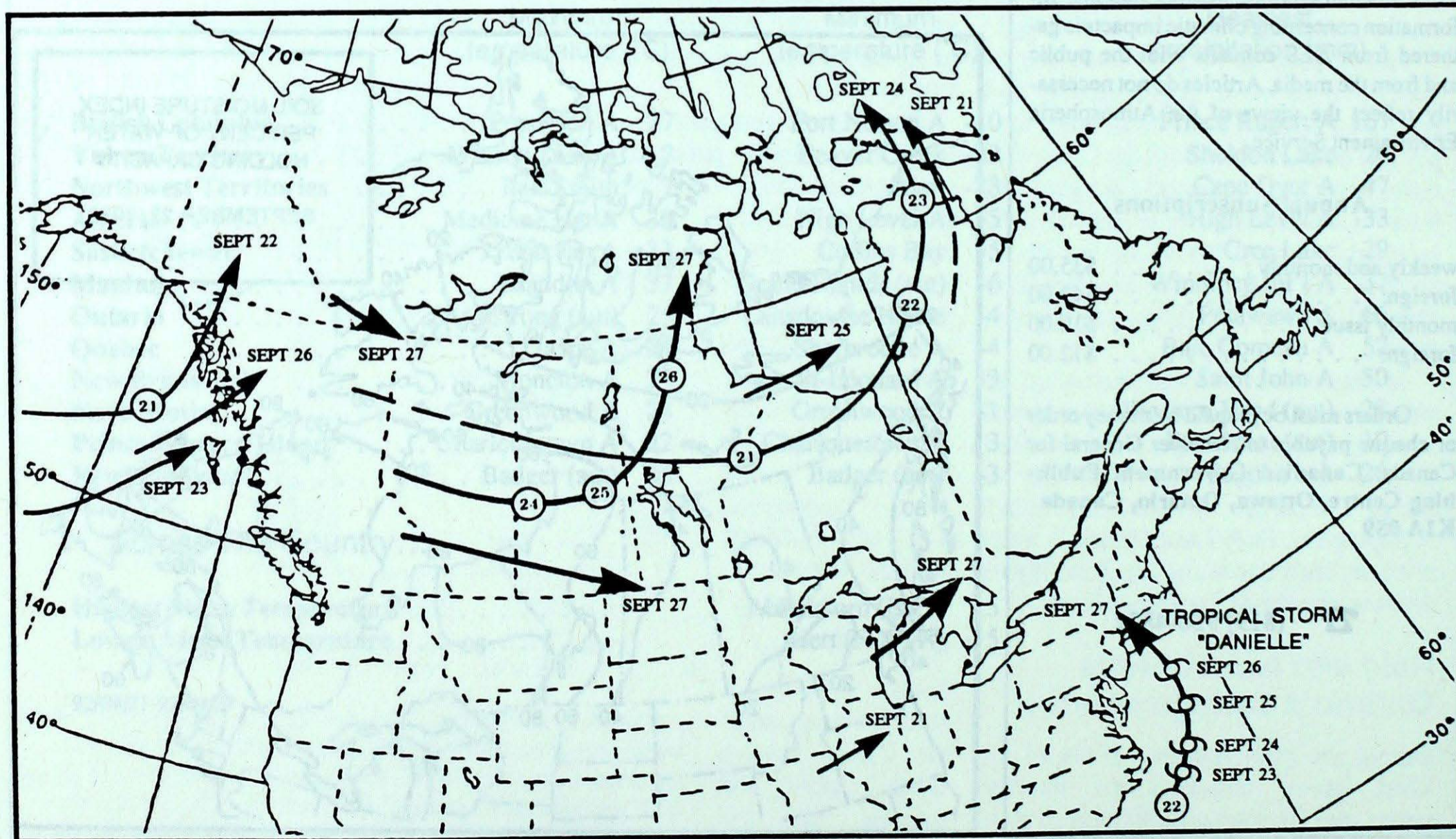
### 50-kPa ATMOSPHERIC CIRCULATION



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

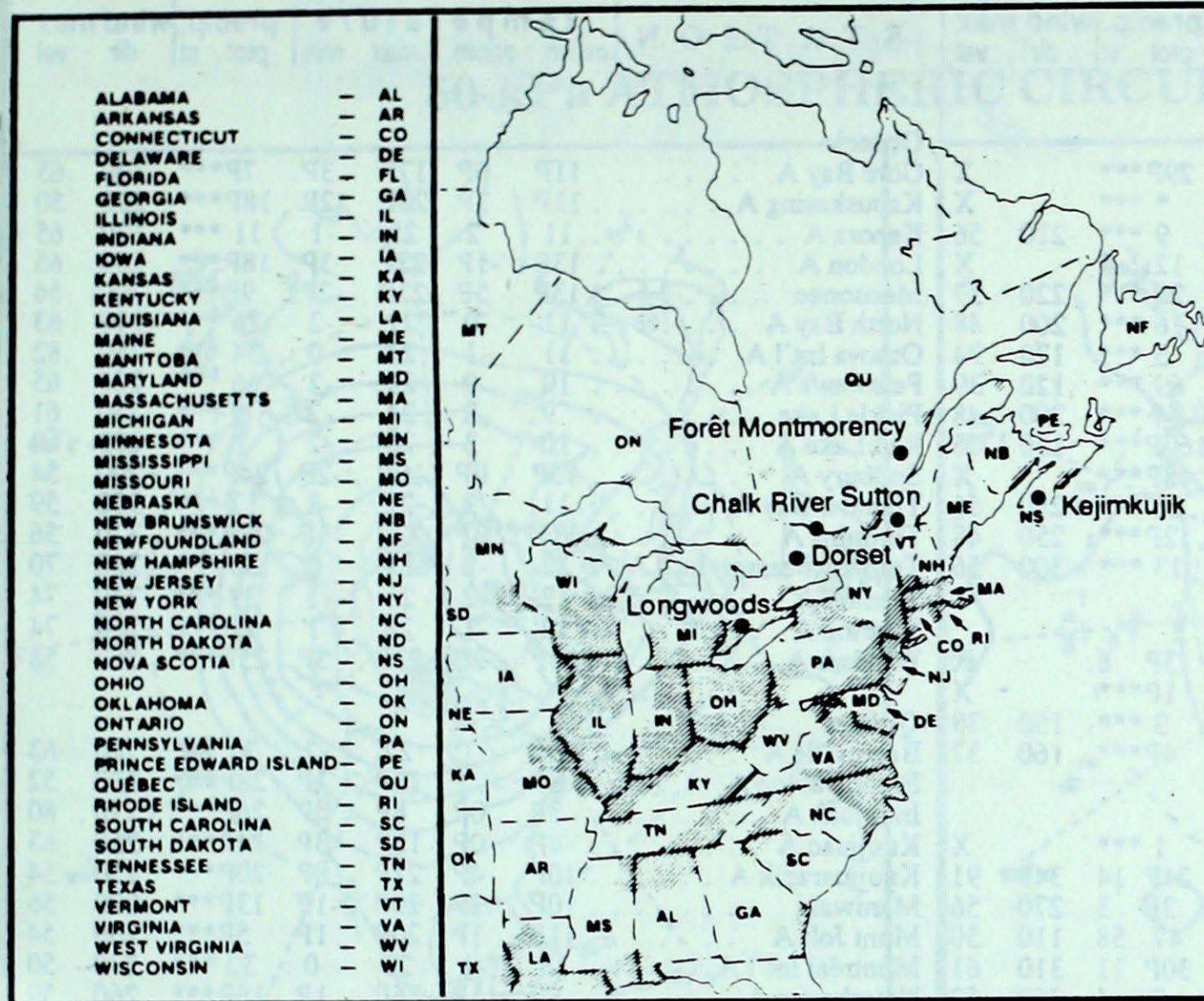


Mean geopotential height anomaly  
50-kPa level (10 decametre intervals)



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<sub>2</sub> and NO<sub>x</sub> 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 20 to 26, 1992

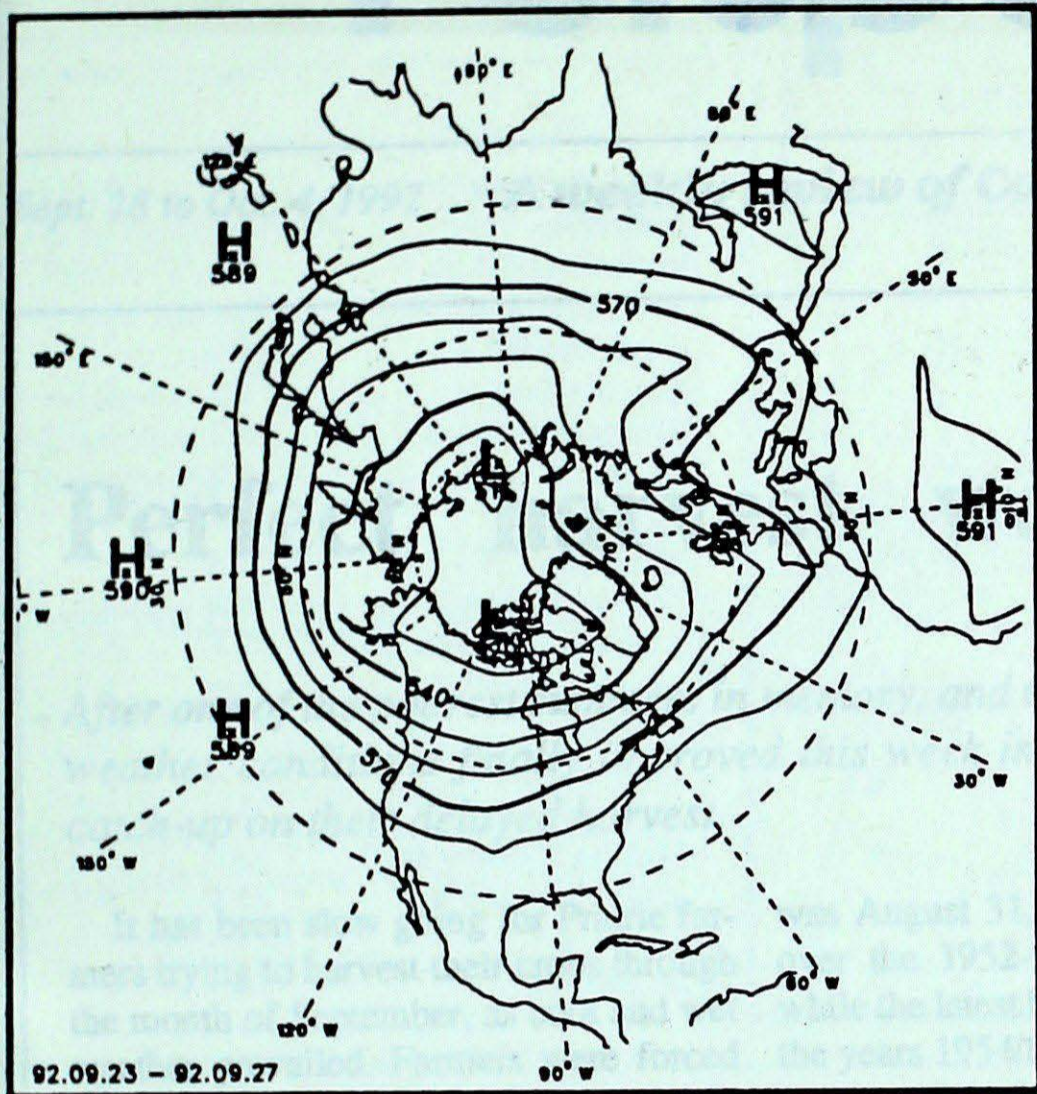
Longwoods					.....	Data not available this week
Dorset *	20	4.1	1 R	.....	Western Pennsylvania, eastern Ohio	
	21	4.3	28 R	.....	Southern Ontario, Ohio, Indiana	
	26	4.0	2 R	.....	Southern Ontario, Pennsylvania, eastern Ohio	
Chalk River					.....	Data not available this week
Sutton	21	3.8	9 R	.....	New York, Pennsylvania, west Virginia	
	22	4.4	36 R	.....	New York, Ohio, Western Pennsylvania	
	26	5.1	3 R	.....	New England, eastern New York	
Montmorency	21	4.6	19 R	.....	Southern Quebec, New York, Pennsylvania	
	22	4.7	42 M	.....	Southern Quebec, Lake Ontario, Lake Erie	
	26	5.0	4 R	.....	New England	
Kejimikujik	22	4.9	20 R	.....	Southern New England, southern New York	
	23	4.6	1 R	.....	Southern New England, Southern New York	

R= rain (mm), S = snow (cm), M = mixed rain and snow (mm)

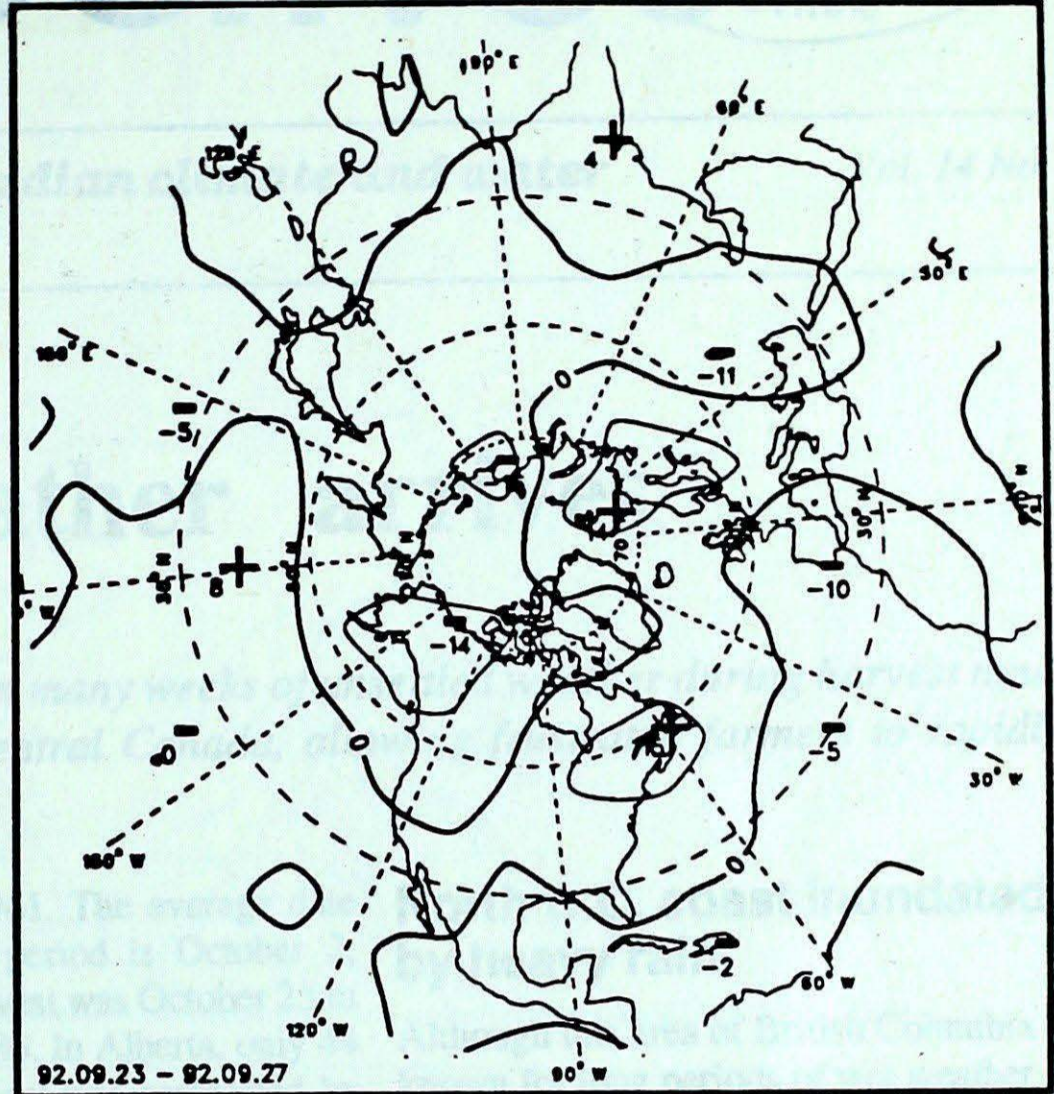
STATION	temperature				precip.		wind max		STATION	temperature				precip.		wind max	
	mean	anom	max	min	ptot	st	dir	vel		mean	anom	max	min	ptot	st	dir	vel
<b>British Columbia</b>									<b>Ontario</b>								
Blue River A	9P	-1P	23P	0P	29P***			X	Gore Bay A	11P	0P	17P	3P	7P***	300	65	
Cape St James	*	*	*	*	* **			X	Kapuskasing A	11P	3P	22P	-2P	18P***	200	50	
Cranbrook A	12	1	25	1	9 ***	210	56		Kenora A	11	2	25	-1	11 ***	170	65	
Fort Nelson A	-1	-8	7	-10	12 8		X	London A	13P	-1P	22P	3P	18P***	250	65		
Fort St John A	3	-6	17	-4	20 ***	220	37		Moosonee	13P	5P	23P	-2P	9P***	200	56	
Kamloops A	14	1	23	2	16 ***	200	48		North Bay A	11	0	21	-2	26 ***	190	63	
Penticton A	15	1	27	2	5 ***	170	74		Ottawa Int'l A	11	-1	22	0	34 ***	250	82	
Port Hardy A	12	1	19	2	69 ***	120	39		Petawawa A	10	0	20	-2	66 ***	200	65	
Prince George A	9	1	20	1	54 ***	200	48		Pickle Lake	9	3	24	-2	9 ***	250	61	
Prince Rupert A	10P	-1P	15P	4P	167P***	150	65		Red Lake A	10	3	23	-2	6 ***	280	69	
Smithers A	8P	-1P	17P	-1P	48P***		X	Sudbury A	10P	0P	19P	-2P	24P***	290	54		
Vancouver Int'l A	15	2	21	6	21 ***	280	56		Thunder Bay A	11	2	22	-3	7 ***	300	59	
Victoria Int'l A	15P	2P	22P	6P	12P***	250	48		Timmings A	11P	3P	22P	-1P	27P***	320	56	
Williams Lake A	10	1	21	-1	13 ***	300	56		Toronto(Pearson Int'l A)	12	-2	21	2	30 ***	260	70	
<b>Yukon Territory</b>									<b>Québec</b>								
Komakuk Beach A	-7P	-5P	-4P	-10P	3P 8		X	Bagotville A	10	1	22	-2	31 ***	280	63		
Teslin (aut)	1P	*	6P	-2P	1P***		X	Blanc Sablon A	8P	*	16P	1P	28P***	230	52		
Watson Lake A	1	-5	7	-5	3 ***	150	39		Inukjuak A	3P	0P	8P	0P	26P***	270	80	
Whitehorse A	-1P	-7P	6P	-4P	4P***	160	37		Kuujuuaq A	4P	0P	18P	-3P	14P***	250	63	
<b>Northwest Territories</b>									<b>New Brunswick</b>								
Alert	-15	-2	0	-23	1 ***		X	Fredericton A	11	-1	22	-2	11 ***	280	70		
Baker Lake A	-3P	-3P	3P	-8P	24P 14	340	91		Miscou Island (aut)	12	0	20	4	7 ***			
Cambridge Bay A	-5P	-2P	0P	-10P	2P 3	270	56		Moncton A	12	0	23	0	9 ***	270	52	
Cape Dyer A	-5	-1	1	-12	47 58	110	50		Saint John A	11	-1	21	0	50 ***	310	56	
Clyde A	-2P	0P	2P	-10P	30P 11	310	61		<b>Nova Scotia</b>								
Coppermine A	-7	-6	-2	-14	0 4	250	52		Greenwood A	12	-1	24	-1	16 ***	170	56	
Coral Harbour A	-1P	0P	2P	-6P	9P***	300	85		Shearwater A	13	-1	20	4	21 ***	210	54	
Eureka	-12P	1P	-6P	-19P	0P 3		X	Sydney A	13	0	24	2	7 ***	190	54		
Fort Smith A	2	-3	7	-2	12 3		X	Yarmouth A	13	0	20	3	27 ***	190	56		
Hall Beach A	-2	1	2	-6	14 6	320	83		<b>Prince Edward Island</b>								
Inuvik A	-6	-6	-2	-10	6 10	290	41		Charlottetown A	13	0	22	3	7 ***	180	46	
Iqaluit A	0P	0P	5P	-4P	21P 3	300	89		East Point (auto)	14P	*	22P	8P	10P***			
Mould Bay A	-12P	-2P	-7P	-17P	1P 5		X	<b>Newfoundland</b>									
Norman Wells A	-6	-10	-1	-12	2 10		X	Cartwright	9P	2P	20P	2P	9P***	220	50		
Resolute A	-8P	0P	-2P	-13P	7P 5	030	57		Churchill Falls A	8	5	21	0	21 ***	300	56	
Yellowknife A	-1P	-6P	3P	-6P	1P***	040	41		Gander Int'l A	12	2	22	2	1 ***	320	78	
<b>Alberta</b>									<b>92/09/21-92/09/27</b>								
Calgary Int'l A	10	1	25	-1	11 ***	250	67	Goose A	10	3	24	1	9 ***	210	65		
Cold Lake A	7	-1	26	-1	5 ***	290	46	St John's A	11	0	20	2	26 ***	270	54		
Edmonton Namao A	7P	-2P	25P	-3P	8P***	290	48	St Lawrence	12	1	23	2	4 ***		X		
Fort McMurray A	5	-3	20	-2	23 ***		X	Wabush Lake A	8	3	21	-1	20 ***	300	48		
High Level A	1	-6	8	-5	33 ***	360	32										
Jasper	*	*	23	*	* **		X										
Lethbridge A	12	0	28	0	11 ***	240	83										
Medicine Hat A	13	1	30	2	11 ***	250	56										
Peace River A	4	-4	19	-4	24 ***		X										
<b>Saskatchewan</b>																	
Cree Lake	2	-3	9	-4	29 3	320	65										
Estevan A	12	2	33	-5	9 ***	170	102										
La Ronge A	5	-2	19	-4	22 ***	310	46										
Regina A	11	2	32	-4	2 ***	360	70										
Saskatoon A	10	1	28	-2	0 ***	290	54										
Swift Current A	11	1	31	-3	2 ***	290	54										
Yorkton A	9	1	28	-4	11 5	310	74										
<b>Manitoba</b>																	
Brandon A	9	0	27	-5	10 ***	300	80										
Churchill A	2	-1	10	-2	21 ***	300	93										
Lynn Lake A	3	-2	9	-2	15 3	010	52										
The Pas A	8	0	26	-1	5 ***	310	82										
Thompson A	6P	1P	20P	-4P	34P***	010	74										
Winnipeg Int'l A	11	1	26	-3	37 ***	310	72										

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.

### 50-kPa 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

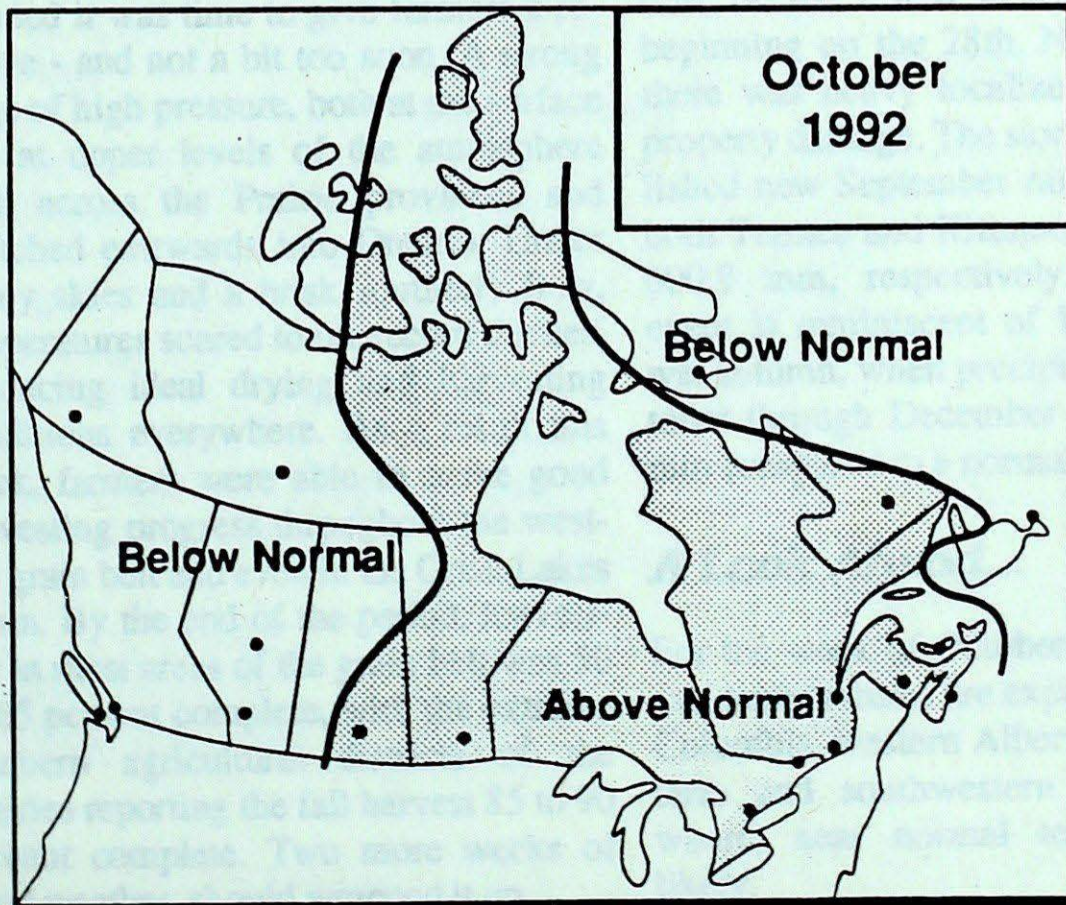
Atmospheric  
Environment  
Service

Service  
de l'environnement  
atmosphérique

### MONTHLY TEMPERATURE FORECAST

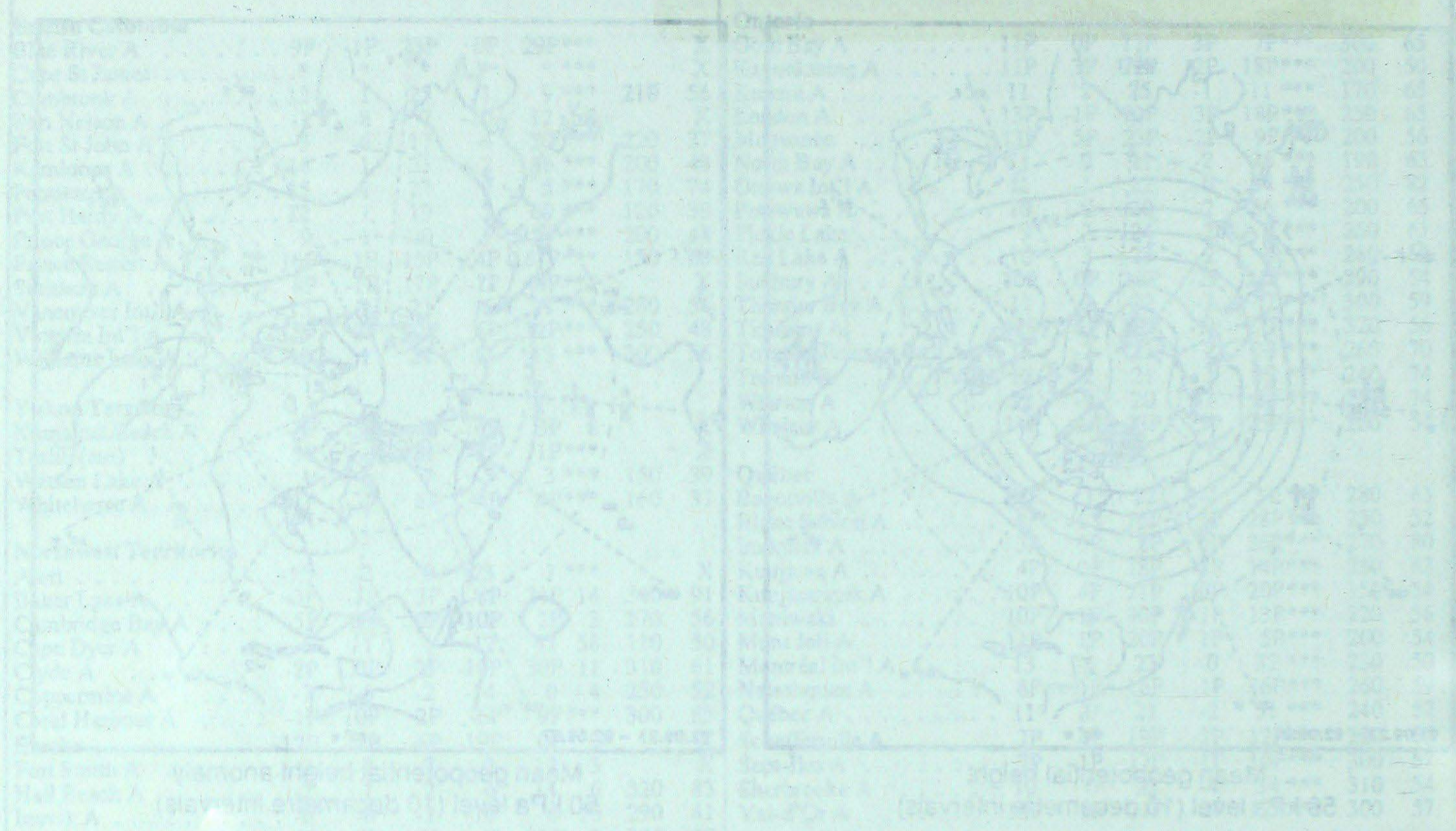
*Normal temperatures for  
the month of October, °C*

Whitehorse	1	Toronto	9
Yellowknife	-2	Ottawa	8
Iqaluit	-5	Montréal	9
Vancouver	10	Québec	7
Victoria	10	Fredericton	8
Calgary	6	Halifax	10
Edmonton	5	Charlottetown	8
Regina	5	Goose Bay	3
Winnipeg	6	St. John's	7



Canada

# 50-KPa ATMOSPHERIC CIRCULATION



Mean geopotential level (10 degree intervals) 50 KPa level (10 degree intervals)

Station	Mean geopotential level (10 degree intervals) 50 KPa level (10 degree intervals)
St. John's	1000
Halifax	1000
Moncton	1000
Quebec	1000
Ottawa	1000
Toronto	1000
Windsor	1000
Chicago	1000
St. Louis	1000
Denver	1000
Phoenix	1000
Los Angeles	1000
San Francisco	1000
Seattle	1000
Portland	1000
Vancouver	1000
Calgary	1000
Edmonton	1000
Winnipeg	1000
Saskatoon	1000
Regina	1000
Victoria	1000
Whitehorse	1000
Yellowknife	1000
Inuvik	1000
Resolute	1000
Alert	1000

## MONTHLY TEMPERATURE FORECAST

October 1985

Region	Temperature Forecast
Northwest Territories	Below Normal
Yukon	Below Normal
Northwest	Below Normal
Alberta	Below Normal
Saskatchewan	Below Normal
Manitoba	Below Normal
Ontario	Below Normal
Quebec	Below Normal
Atlantic	Below Normal
British Columbia	Below Normal
Alberta	Below Normal
Saskatchewan	Below Normal
Manitoba	Below Normal
Ontario	Below Normal
Quebec	Below Normal
Atlantic	Below Normal
British Columbia	Above Normal
Alberta	Above Normal
Saskatchewan	Above Normal
Manitoba	Above Normal
Ontario	Above Normal
Quebec	Above Normal
Atlantic	Above Normal

Canada