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Climatic Perspectives

June 21 to 27, 1993 **A weekly review of Canadian climate and water** *Vol. 15 No. 26*

A stormy, wet start to summer

Heavy rains fell during the first week of summer across most of Canada, producing severe weather and breaking many rainfall records.

The B.C. interior experienced another week of unsettled weather, with rain both at the beginning and end of the week. On the evening of June 26, in the Okanagan, an intense thunderstorm produced up to 25 mm of rainfall in less than an hour. Storms during the weekend brought a new record June rainfall of 148 mm to Prince George and a new 48-hour June rainfall record of 60.8 mm to Vanderhoof. Prince George reported over 7 cm of pea-sized hail on Sunday, and in Kamloops, lightning injured 3 golfers. The wet weather delayed haying, as well as construction and highway maintenance.

The southern and central foothills of Alberta received heavy downpours on the 21st, the result of widespread thunderstorms passing over southern Alberta. A complex, slow moving, low pressure system moved over central Alberta, dumping 30 to 50 millimetres of rain along the northern foothills on Tuesday and an additional 30 mm over the most northwestern and central regions on Wednesday. Occasional showers continued Thursday, bringing the four-day, cumulative rainfall figures of 90 mm to Edmonton, and 140 mm in the Swan Hills. Buffalo Head Hills had local flooding due to 170 mm of rain received over the same four-day period. Clear skies, experienced by most of the province on Friday and early Saturday, gave way to further rain in the northern regions late Saturday and the south-central regions on Sunday. Grande Prairie received a total of 109 mm rain during the week, which is 50 percent more than normal for the entire month of June.

Rains began Monday in northern Saskatchewan and progressed down to southern Saskatchewan and Manitoba by Tuesday. Visibility was reduced to under 6 km as smoke from very active northern Saskatchewan and Manitoba forest fires drifted across the south. As the week progressed, heavy precipitation extinguished the flames and saved many hectares of forest.

June 1993 continues to bring heavy rainfalls to southern Ontario. A total of 134 mm has fallen to-date this month in Toronto, making this the wettest June since 1967. This, however, is a long way from Toronto's record wet June, set in 1870, which saw 205.5 mm.

High winds and heavy precipitation affected the Maritimes during the first part of the week. Gusty northerly winds were reported on June 23. The areas most affected were between Moncton and Halifax, which experienced wind gusts in the 100 km/h range, causing numerous trees and power lines to be downed. The north coast of P.E.I., the northeast coast of Nova Scotia and the southeast coast of New Brunswick were hit with wind induced tidal storm surges in the 1.0 to 1.5 meter range, causing damage to some coastal installations and boats. Moncton received a two-day rainfall of 85 mm on June 22 and 23, which is only 8 mm less than their normal for the month. St. John's, Newfoundland, received 65 mm over the period of June 23 and 24.

Severe summer weather...

On Monday, June 21, the thunderstorms which had developed in the foothills of Alberta caused heavy downpours, hail and wind gusts approaching 100 km/h. Tornadoes were reported at Raven, Daysland and Tofield. On June 27, another tornado touched down east of Olds, Alberta.

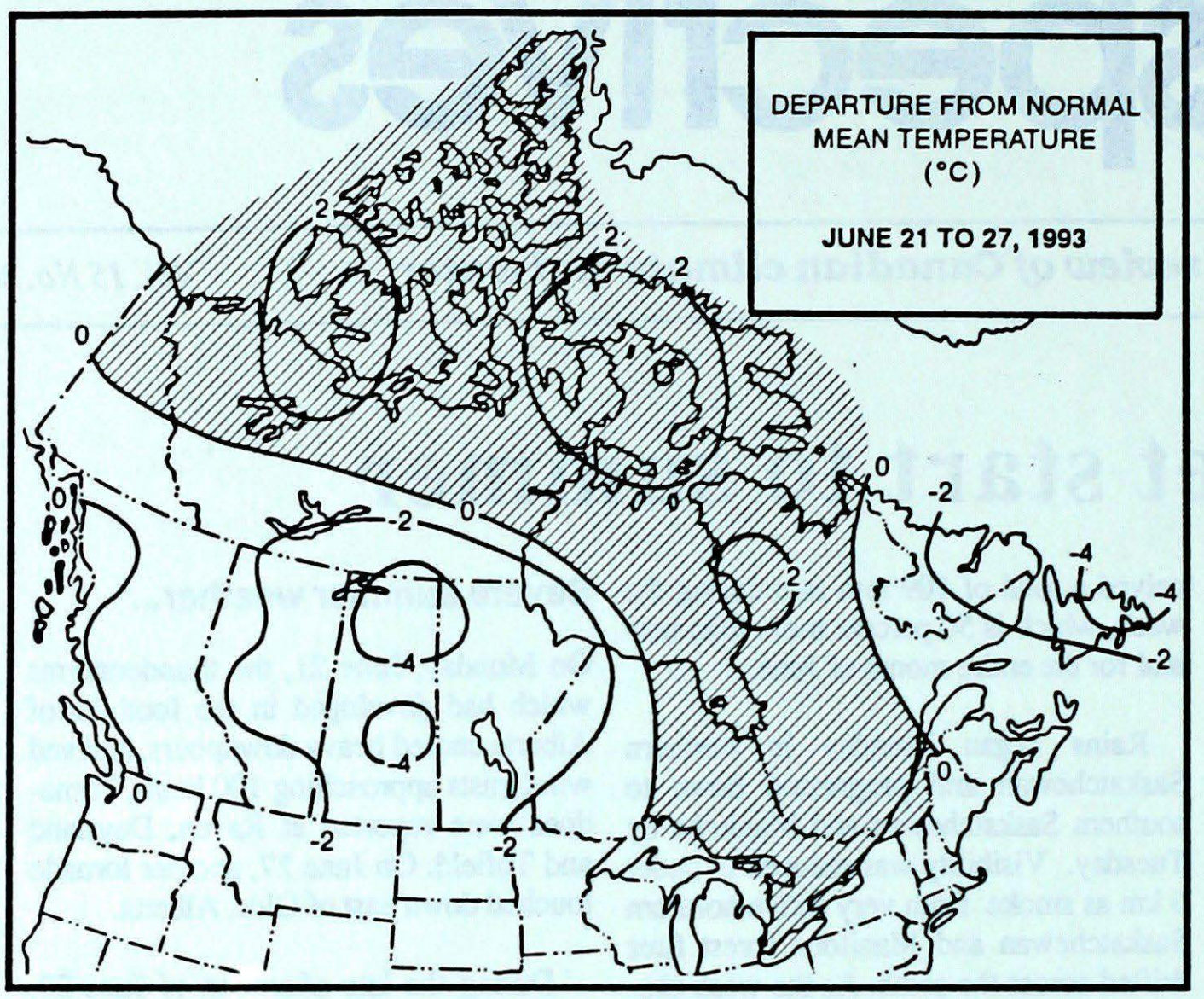
During the late afternoon of June 27, heavy thunderstorms produced hail and high winds across a large area of southern, central and eastern Ontario and also in southwestern Quebec. Golf ball sized hail was reported near the Ottawa and St. Lawrence Valleys. In the community of Prévost, north of Montreal, hail accumulated to a depth 15 cm. Near Maniwaki high winds downed trees and overturned camping trailers. In Ontario the same afternoon, there were numerous reports of torrential downpours and hail. A waterspout was sighted over Lake Erie.

Elsewhere...

In the eastern Arctic, the week began cloudy with more sunshine towards midweek. Clyde, situated on Baffin Island, was the only weather station in Canada to report fresh snow this week after receiving 8 cm on June 21.

A Look Ahead...

For the week of July 5, above-normal temperatures are expected over the Atlantic region, British Columbia, the Yukon, the Arctic Islands and the western half of the Mackenzie District. Thunderstorm activity is likely east of Saskatchewan.



Weekly normal temperatures (°C)

	max.	min.
Whitehorse A	18.6	6.3
Iqaluit A	8.5	1.7
Yellowknife A	19.3	10.1
Vancouver Int'l A	19.5	11.2
Victoria Int'l A	19.2	9.8
Calgary Int'l A	20.6	7.9
Edmonton Int'l A	21.0	8.0
Regina A	23.7	10.0
Saskatoon A	23.6	9.9
Winnipeg Int'l A	24.4	11.7
Ottawa Int'l A	24.6	13.5
Toronto (Pearson Int'l A)	24.8	12.5
Montréal Int'l A	24.7	14.5
Québec A	23.0	11.9
Fredericton A	23.9	11.4
Saint John A	20.6	9.7
Halifax (Shearwater)	19.9	10.8
Charlottetown A	21.1	11.5
Goose A	18.2	7.0
St John's A	17.7	7.8

Weekly temperature and precipitation extremes

	Maximum temperature (°C)		Minimum temperature (°C)		Heaviest precipitation (mm)	
British Columbia	Lytton	30	Puntzi Mountain (aut)	-1	Fort St. John	107
Yukon Territory	Whitehorse A	24	Komakuk Beach A	0	Whitehorse A	14
Northwest Territories	Norman Wells A	28	Clyde A	-3	Iqaluit A	8
Alberta	Medicine Hat A	33	Edson A	0	Grande Prairie A	110
Saskatchewan	Eastend Cypress (aut)	33	Nipawin A	2	Nipawin A	80
Manitoba	Winnipeg Int'l A	30	Churchill A	-1	The Pas A	80
Ontario	Thunder Bay A	31	Timmins A	3	Simcoe	56
Quebec	Val-d'Or	31	Border (aut)	0	Sherbrooke A	66
New Brunswick	Fredericton A	32	St-Léonard A	5	Moncton A	95
Nova Scotia	Greenwood A	32	Truro	4	Truro	30
Prince Edward Island	Charlottetown A	27	Charlottetown A	7	Charlottetown A	39
Newfoundland	Wabush Lake A	26	Wabush Lake A	0	St John's A	77

Across The Country...

Highest Mean Temperature	Windsor A (Ont.)	22
Lowest Mean Temperature	Clyde A (N.W.T.)	2

93/06/21-93/06/27

CLIMATIC PERSPECTIVES
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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.

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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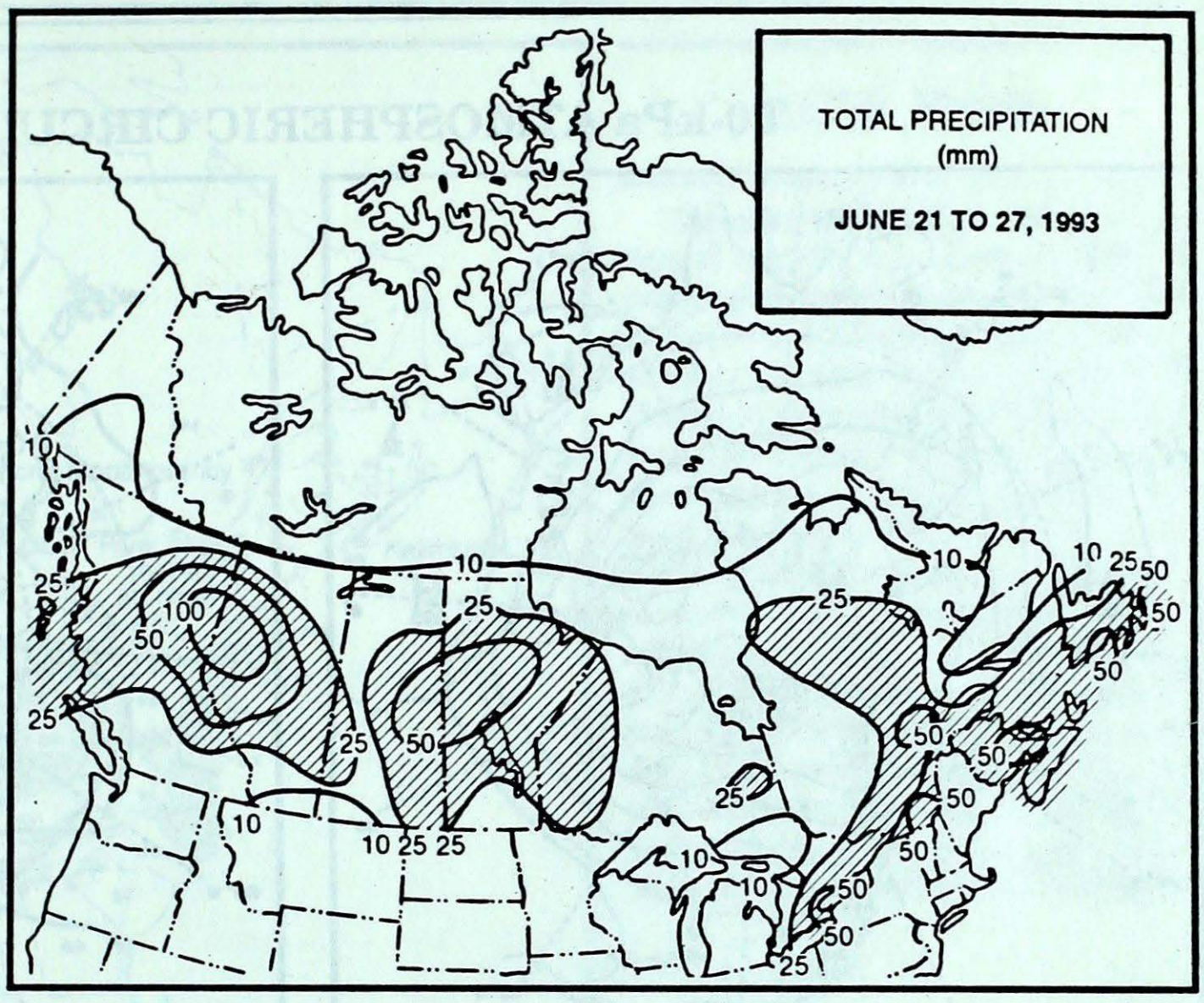
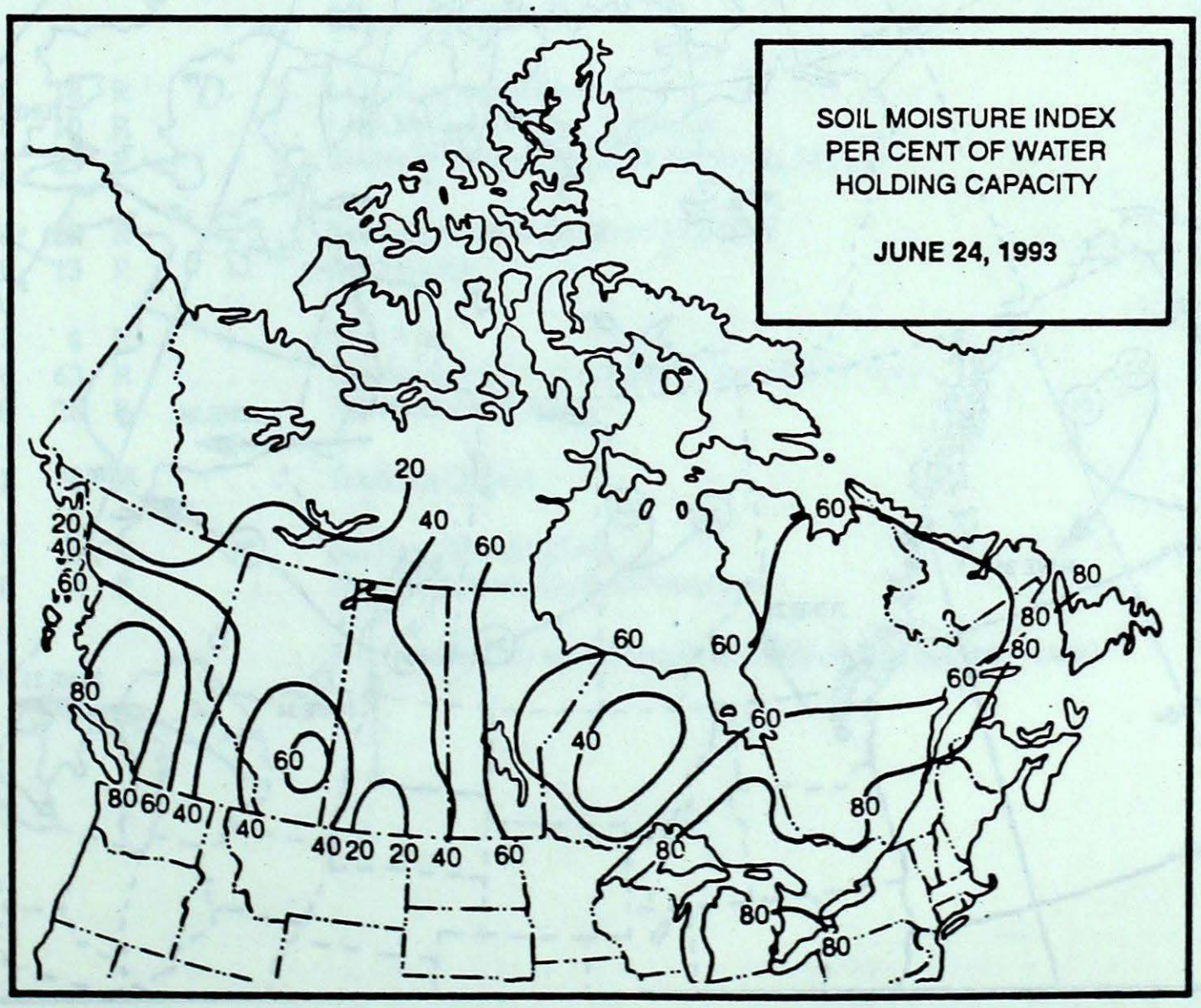
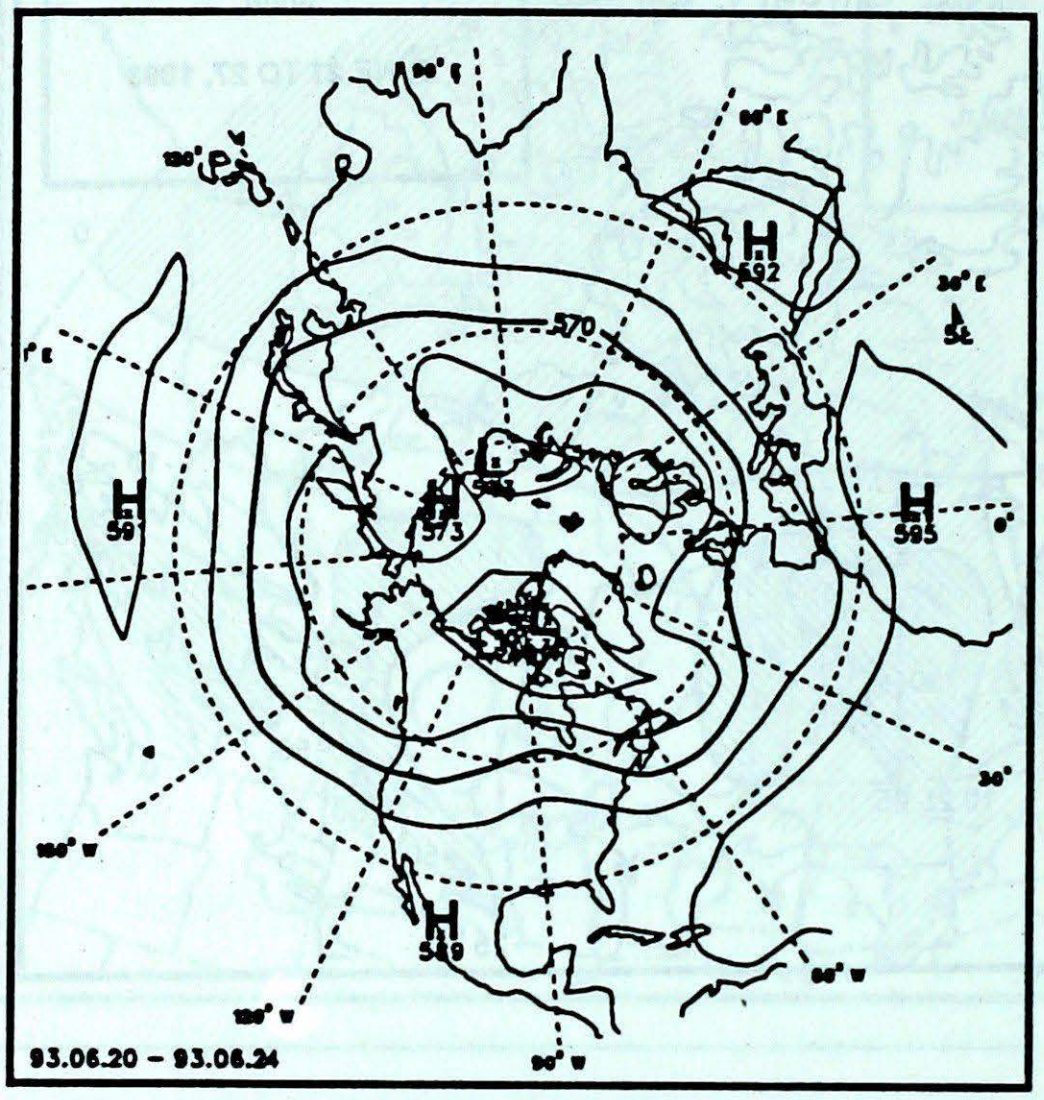
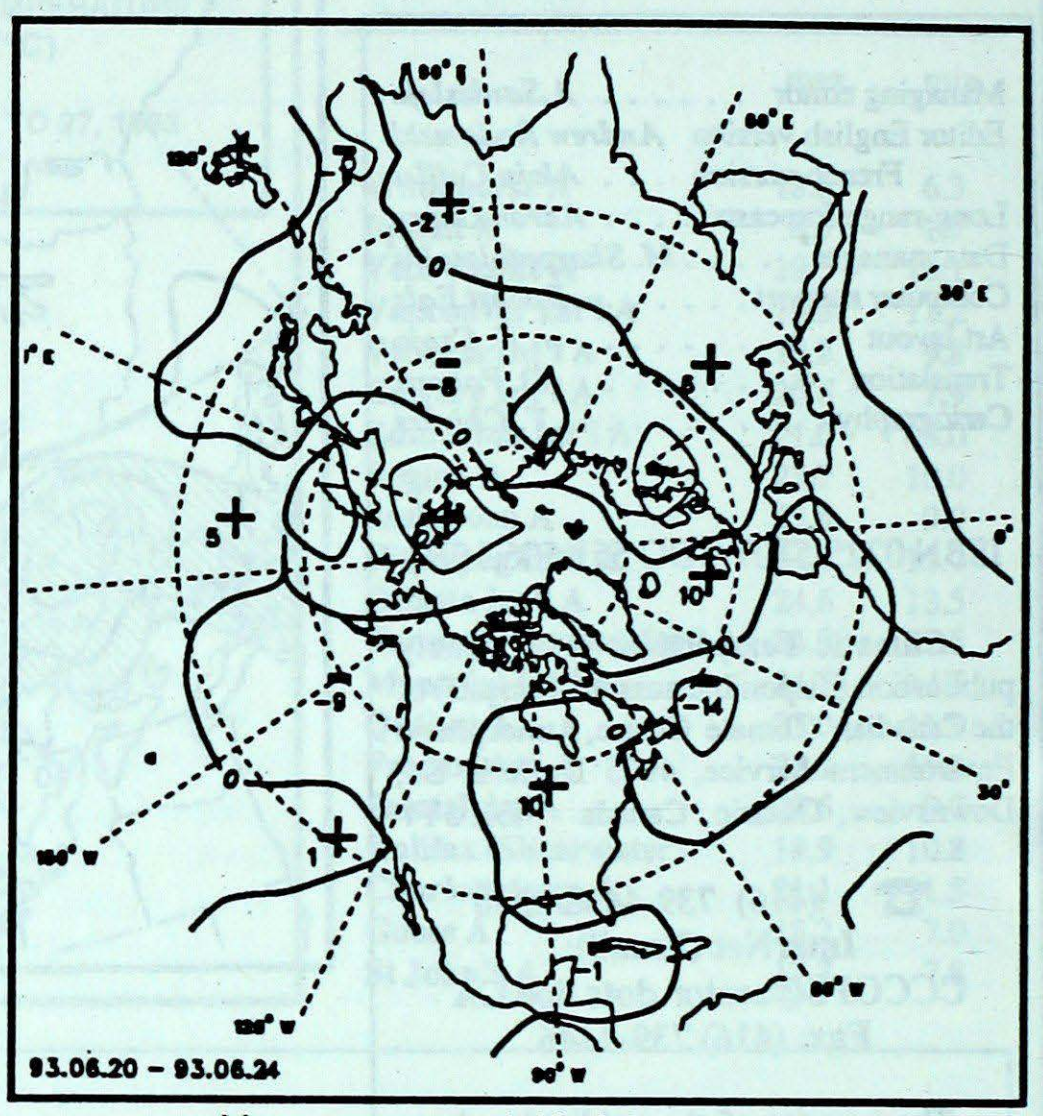




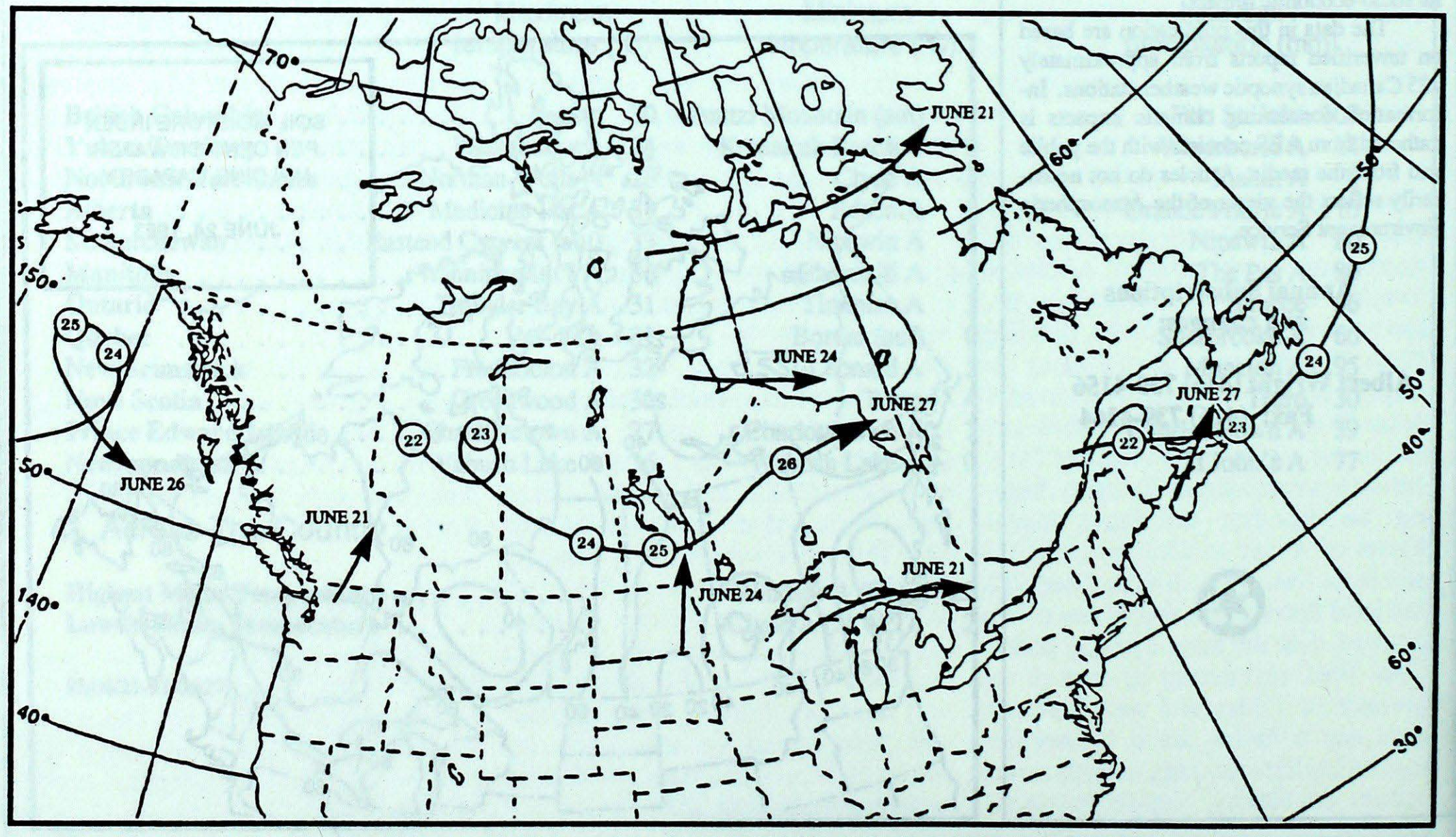
50-kPa ATMOSPHERIC CIRCULATION



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

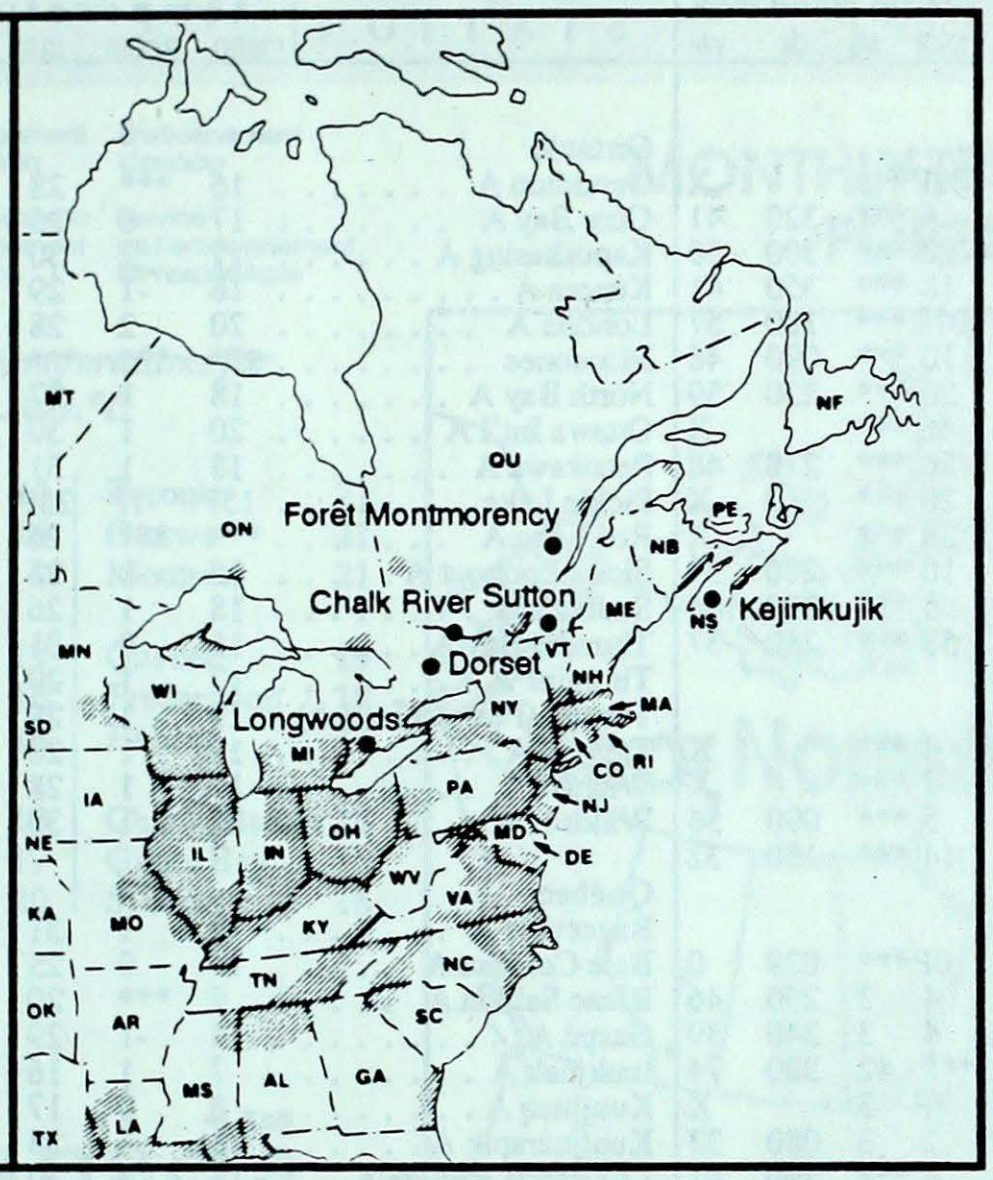


Mean geopotential height anomaly
50-kPa level (10 decametre intervals)



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

ALABAMA - AL
ARKANSAS - AR
CONNECTICUT - CO
DELAWARE - DE
FLORIDA - FL
GEORGIA - GA
ILLINOIS - IL
INDIANA - IN
IOWA - IA
KANSAS - KA
KENTUCKY - KY
LOUSIANA - LA
MAINE - ME
MANITOBA - ME
MARYLAND - MT
MASSACHUSETTS - MA
MICHIGAN - MI
MINNESOTA - MN
MISSISSIPI - MS
MISSOURI - MO
NEBRASKA - NE
NEW BRUNSWICK - NB
NEW FOUNDLAND - NF
NEW HAMPSHIRE - NH
NEW JERSEY - NJ
NEW YORK - NY
NORTH CAROLINA - NC
NORTH DAKOTA - ND
NOVA SCOTIA - NS
OHIO - OH
OKLAHOMA - OK
ONTARIO - ON
PENNSYLVANIA - PA
PRINCE EDWARD ISLAND - PE
QUÉBEC - QC
RHODE ISLAND - RI
SOUTH CAROLINA - SC
SOUTH DAKOTA - SD
TENNESSEE - TN
TEXAS - TX
VERMONT - VT
VIRGINIA - VA
WEST VIRGINIA - WV
WISCONSIN - WI



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 Environment and Energy. 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
					June 20 to 26, 1993
Longwoods					. . . . Data not available
Dorset *	20	4.4	18	R	. . . . Lake Huron, Michigan
	2	4.7	10	R	. . . . Lake Huron, southern Michigan
	25	4.3	25	R	. . . . Southern Ontario, southern Michigan, Indiana
Chalk River	20	4.6	22	R	. . . . Northern Ontario, northern Michigan
	25	4.1	13	R	. . . . Lake Huron
Sutton	20	3.7	8	R	. . . . New York
	21	4.4	63	R	. . . . Eastern and southern Ontario, western New York
	22	4.8	28	R	. . . . Nortwestern Quebec
Montmorency	21	4.7	2	R	. . . . Southern Quebec
Kejimkujik	21	3.7	5	R	. . . . Southern New England
	23	4.8	4	R	. . . . New Brunswick, Gulf St-Lawrence
					. . . . 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								
Blue River A	14P	0P	27P	7P	32P	***		X
Comox A	15	0	21	8	16	***	320	41
Cranbrook A	14	-2	27	5	22	***	300	50
Fort Nelson A	14	-1	25	4	18	***	350	41
Fort St John A	12P	-2P	22P	5P	107P	***	180	57
Kamloops A	18	-1	28	7	10	***	090	46
Penticton A	17	-1	28	7	20	***	230	59
Port Hardy A	12	0	17	7	46	***		X
Prince George A	14	0	22	6	56	***	270	48
Prince Rupert A	13	2	17	6	20	***		X
Smithers A	12	0	19	5	38	***		X
Vancouver Int'l A	16	1	23	11	10	***	280	39
Victoria Int'l A	15	1	24	9	5	***	290	44
Williams Lake A	12	-1	21	4	53	***	280	37
Yukon Territory								
Komakuk Beach A	5	1	16	0	4	***		X
Teslin (aut)	12	***	22	2	7	***		X
Watson Lake A	13	-1	21	3	5	***	090	56
Whitehorse A	12	-1	24	3	14	***	150	32
Northwest Territories								
Alert	3P	1P	7P	-2P	0P	***	029	0
Baker Lake A	8	1	21	-1	4	3	290	46
Cambridge Bay A	6	2	13	0	4	3	340	39
Cape Dyer A	***	***	***	***	***	42	320	74
Clyde A	2P	0P	9P	-3P	7P	3		X
Coppermine A	9	4	25	-1	2	3	080	33
Coral Harbour A	7	3	18	1	4	***	290	41
Eureka	5	1	10	1	6	3		X
Fort Smith A	13P	-2P	21P	2P	7P	***	150	50
Hall Beach A	5	2	10	-1	3	***	330	33
Inuvik A	12	0	24	2	3	***	290	43
Iqaluit A	7	2	12	1	8	***	320	56
Mould Bay A	***	***	8	***	***	***		X
Norman Wells A	16	1	28	7	7	***	210	65
Resolute A	4	2	8	-1	4	3	070	78
Yellowknife A	13	-2	21	6	1	***	160	54
Alberta								
Calgary Int'l A	14	0	26	2	9	***	330	85
Cold Lake A	13	-3	23	7	40	***	360	56
Edmonton Namao A	12	-3	23	5	54	***	270	67
Fort McMurray A	13	-2	21	5	21	***	130	54
Grande Prairie A	13	-2	22	6	110	***	270	65
High Level A	13P	-3P	22P	2P	9P	***	350	57
Lethbridge A	15P	-1P	30P	4P	1P	***	250	96
Medicine Hat A	17	-1	33	8	18	***	230	83
Peace River A	14	-1	24	6	63	***	350	57
Saskatchewan								
Cree Lake	11	-5	19	2	26	***	180	59
Estevan A	14	-4	30	4	30	***	260	83
La Ronge A	13	-3	23	5	35	***	200	50
Regina A	14	-3	31	4	40	***	310	76
Saskatoon A	13	-4	31	5	15	***	320	63
Swift Current A	14	-2	33	5	41	***	340	87
Yorkton A	13	-4	29	5	43	***	160	56
Manitoba								
Brandon A	14	-3	28	4	19	***	270	56
Churchill A	5	-3	17	-1	20	***	040	65
Lynn Lake A	12	-4	27	3	20	***	150	59
The Pas A	13	-3	26	5	80	***	150	61
Thompson A	11	-3	26	2	40	***	030	61
Winnipeg Int'l A	17	-1	30	8	17	***	160	70

STATION	temperature mean	anom	max	min	precip. ptot	st	wind max dir	vel
Ontario								
Geraldton A	16	***	28	5	21	***	190	59
Gore Bay A	17	0	25	9	8	***	170	39
Kapuskasing A	17	2	30	4	13	***	330	65
Kenora A	16	-1	29	6	36	***	220	52
London A	20	2	28	12	28	***	190	65
Moosonee	***	***	***	***	***	***		X
North Bay A	18	1	27	8	2	***	240	52
Ottawa Int'l A	20	1	30	11	26	***	330	50
Petawawa A	18	1	31	5	18	***	330	50
Pickle Lake	15P	-1P	28P	6P	18P	***	190	46
Red Lake A	***	***	26	***	***	***	200	59
Sioux Lookout A	16	-1	26	7	29	***	210	74
Sudbury A	18	1	26	8	6	***	230	69
Thunder Bay A	15	0	31	8	18	***	310	50
Timmins A	17	1	29	3	29	***	350	52
Toronto(Pearson Int'l A)	19	1	29	9	55	***	230	78
Trenton A	19	1	28	9	36	***	230	65
Wiarton A	17	1	28	7	11	***	240	41
Windsor A	22	1	30	14	12	***	290	61
Québec								
Bagotville A	18	1	31	6	59	***	260	67
Baie Comeau A	14	0	25	4	13	***	340	69
Blanc Sablon A	9	***	20	2	7	***	020	65
Gaspé A	14	-1	29	4	31	***	360	46
Inukjuak A	7	1	16	1	5	***		X
Kuujjuaq A	8	0	17	1	11	***	020	41
Kuujjuarapik A	11	3	28	1	29	***	110	67
La Grande Rivière A	16	3	30	3	14	***	230	56
Mont Joli A	15	-1	30	5	10	***	350	65
Montréal Int'l A	20	0	30	10	37	***	350	48
Natashquan A	12	0	20	3	5	***	010	46
Québec A	19	1	29	9	12	***	340	65
Schefferville A	9	-1	19	2	18	***	020	54
Sept-Îles A	13	-1	24	6	8	***	010	67
Sherbrooke A	17	1	28	5	66	***	270	78
Val-d'Or A	17	1	31	4	13	***	200	69
New Brunswick								
Fredericton A	18	0	32	8	42	***	340	76
Miscou Island (aut)	14	-1	23	8	9	***		X
Moncton A	16	-1	30	6	95	***	010	102
Saint John A	14	-1	22	7	39	***	340	61
St Leonard A	17	***	29	5	38	***	340	59
Nova Scotia								
Greenwood A	16	-1	32	5	24	***	350	65
Shearwater A	15	0	24	8	16	***	340	95
Sydney A	***	***	26	***	***	***	350	59
Yarmouth A	14	-1	20	7	6	***	340	70
Prince Edward Island								
Charlottetown A	15	-1	27	7	39	***	360	74
East Point (auto)	14	***	23	8	26	***		X
Newfoundland								
Cartwright	6	-4	17	1	8	***	330	69
Churchill Falls A	4P	-8P	7P	1P	19P	***		X
Gander Int'l A	8	-6	24	2	25	***	300	93
Goose A	10	-3	25	1	11	***	050	54
Stephenville A	12	-2	18	5	32	***	070	74
St John's A	8	-5	20	2	77	***	300	82
St Lawrence	10	1	20	5	39	***		X
Wabush Lake A	10	-2	26	0	37	***	030	46

93/06/21-93/06/27

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.

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