Environment Canada　Environnement Canada

Climatic Perspectives

June 21 to 27, 1988　*A weekly review of Canadian climate*　*Vol. 10 No. 26*

THE CHANGING ATMOSPHERE
L'ATMOSPHÈRE EN ÉVOLUTION

Implications for Global Security
Implications pour la sécurité du globe

Environment Canada　Environnement Canada

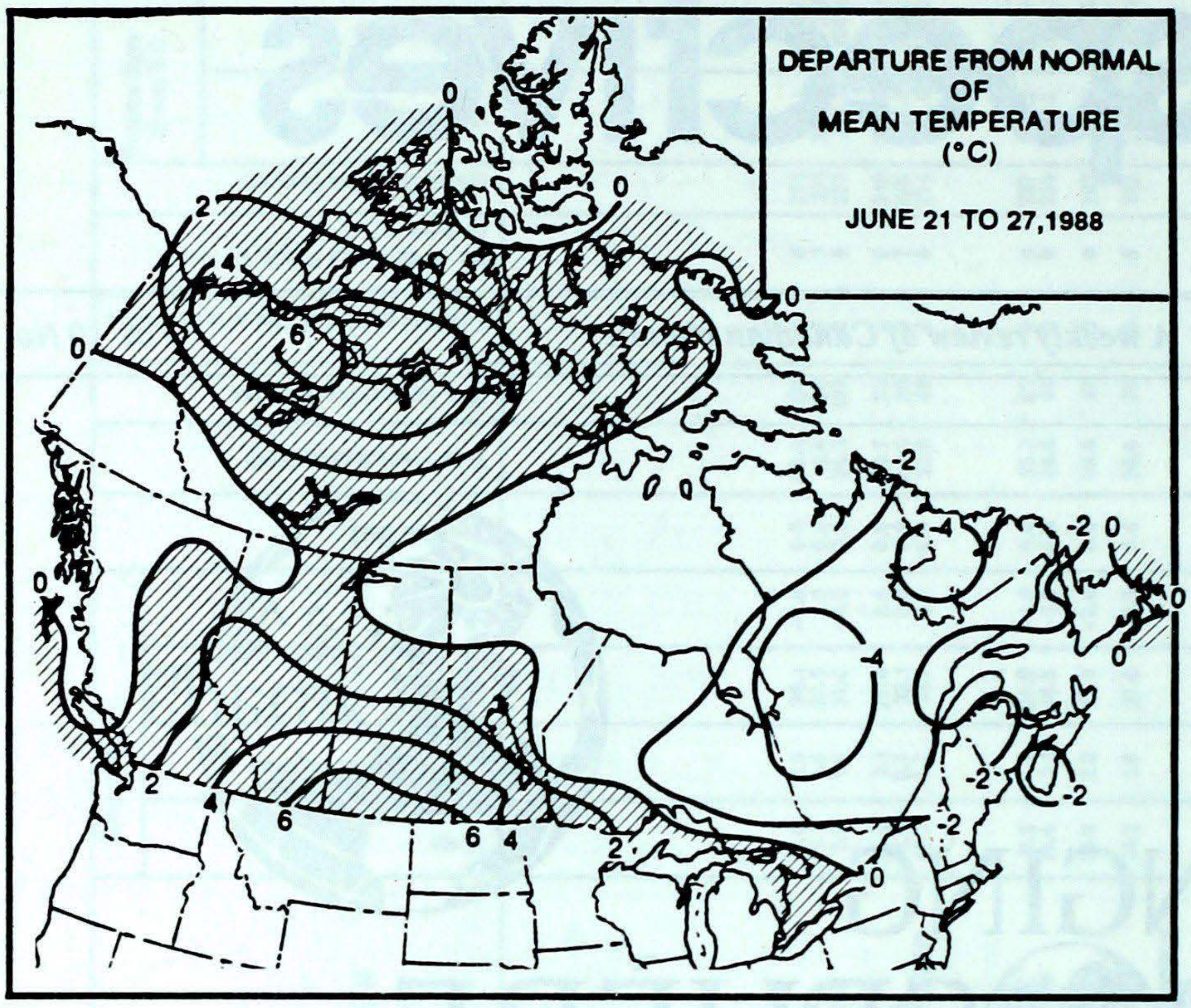
Canada

Some 300 scientists, economists, environmentalists, legal experts and policy-makers from several countries on six continents met in Toronto from June 27 - 30, to discuss issues that could affect the future of humanity. These included climate change, acid rain, depletion of the ozone layer and Arctic haze. In fact, many at the conference see Global Change itself as the major challenge and are pressing for political action to adapt to or slow down chemical alterations to the atmosphere. See page 3 for more details.

- **Severe weather strikes southern Quebec**
- **Prairies and Ontario in dire need of rain**

– Spotty heavy downpours of little help

Canada


DEPARTURE FROM NORMAL OF MEAN TEMPERATURE (°C)

JUNE 21 TO 27,1988

Weekly Temperature Extreme (°C)

	MAXIMUM		MINIMUM	
BRITISH COLUMBIA	LYTTON	32	DEASE LAKE	−2
YUKON TERRITORY	SHINGLE POINT A	25	SWIFT RIVER	−2
NORTHWEST TERRITORIES	NORMAN WELLS	29	CAPE DYER	−5
ALBERTA	MEDICINE HAT	35	BANFF	2
SASKATCHEWAN	MOOSE JAW	39	COLLINS BAY	1
MANITOBA	PORTAGE LA PRAIRIE	36	CHURCHILL	−1
ONTARIO	WINDSOR	40	MOOSONEE	−2
QUEBEC	MONTREAL INT'L	28	KUUJJUAQ	−1
NEW BRUNSWICK	CHATHAM	29	CHARLO	4
NOVA SCOTIA	GREENWOOD	31	SHELBURNE	4
PRINCE EDWARD ISLAND	SUMMERSIDE	27	SUMMERSIDE	1
NEWFOUNDLAND	ST JOHN'S	26	DEER LAKE	0

ACROSS THE NATION

WARMEST MEAN TEMPERATURE	25	ESTEVAN	SASK
COOLEST MEAN TEMPERATURE	−1	BROUGHTON ISLAND	NWT

ACROSS THE COUNTRY . . .

Yukon and Northwest Territories

The first week of summer saw temperatures in the Yukon unseasonably cool, as a cold atmospheric low settled over the Gulf of Alaska. Rainfalls were spotty, but in some areas substantial. Variable amounts of cloud and fluctuating temperatures were common in the western and central Arctic. The Mackenzie District experienced a sunny warm weekend. Fog and cloud plagued the coastal Arctic. It was more or less fair over southern Baffin Island, but cool as most of June has been to-date. At Iqaluit, light snow welcomed travellers on a Midnight-Sun Tour charter flight from Toronto on the 25th.

British Columbia

Weather-wise, it was a mixed week, but for the most part seasonally pleasant. Sky conditions were variable. Afternoon showers were common in many parts of the interior, with the rain helping keep forest fires to a minimum. A lush hay crop needs dry weather for harvesting.

Prairies Provinces

Alberta was sunny, with steadily increasing temperatures through the period. Afternoon showers and thundershowers were common, especially in the central regions. The weekend saw a number of new or tied maximum temperature records. Late on the evening of the 27th, heavy thunderstorms with frequent lightning rolled across the province, dumping between 5 and 30 millimetres of rain. Crops in central Alberta have adequate moisture, but in the south it continues to be very dry.

In Saskatchewan and Manitoba some shower and thundershower activity was evident in a number of areas, but there were no sustained rainfalls sufficient enough to provide any meaningful relief to the deepening drought. For many crops, rainfall at this time will be too late, because of depleted soil moisture and continuing high temperatures, climbing to the mid-to high thirties. In contrast, freezing temperatures were evident in northeast due to a northwesterly circulation.

Ontario

It was a week of marked temperature contrasts. Daytime readings ranged from the thirties at the beginning of the week and on the 25th to the teens and low twenties for the remainder of the period. In fact in cottage country it was down right cold at times. On June 25, Windsor hit 40.2C, the highest temperature in Ontario since August 25, 1948. A band of heavy showers crossed the province during the middle of the week and again during the weekend, bringing some relief from the dry conditions. Severe thunderstorms, with frequent lightning and heavy downpours moved through cottage country Saturday morning. Wind damage and torrential rainfalls were also reported in eastern Ontario. Lightning strikes ignited new fires in the north. The forest fire situation is critical, and this is possibly the worst forest fire season since 1917, with over 200 blazes. Parched agricultural regions received minimal amounts of rain. Note: Vol.10 No.25. The June 14, temperature at Toronto was the warmest since July 15, 1983.

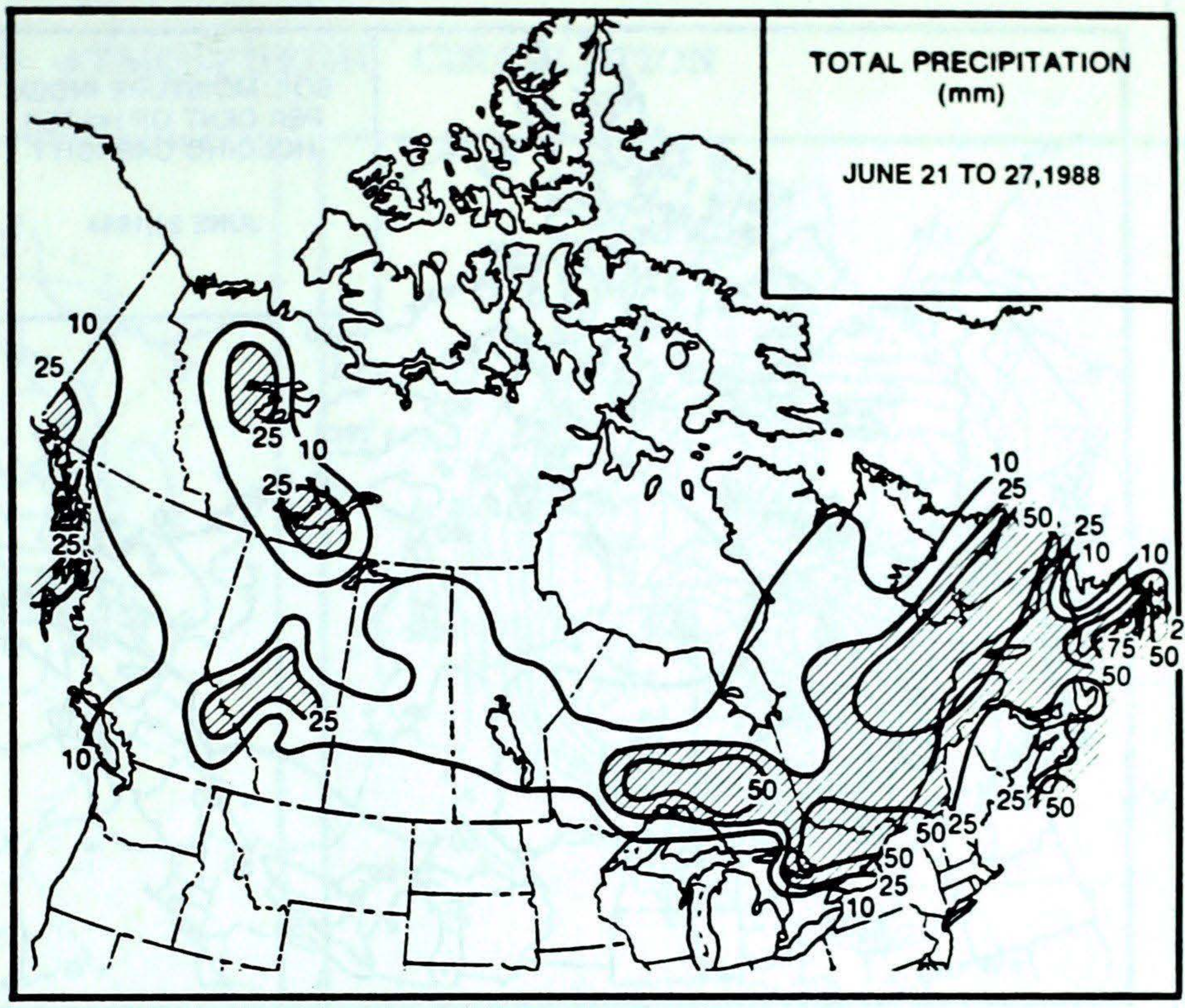
Quebec

Southern Quebec received significant amounts of rain on June 22 and 25, accompanied by heavy thunderstorms, hail and strong winds. On the 21st, a tornado caused nearly $3 million damage in the town of Saint-Bernard, approximately 50 km south of Quebec City. Early in the evening on the 22nd, a house was blown down by the wind at Coteau Station, and torrential rains triggered a landslide causing a train derailment at Coteau Landing. On the 25th, wind gusts reached 90 km/h at Huntingdon, south of Montreal, with heavy rain and hail. Hail also fell at Notre-Dame du Laus, southeast of Maniwaki. The hot, dry weather at the start of the week came to an end, and many daily minimum temperature records were broken between June 22 and 26. Precipitation totalling more than 60 mm was quite common.

Atlantic Provinces

In the Maritimes, it was mainly cloudy and wet, although there was some sun during the middle of the week. The rain helped bring a major forest fire under control in New Brunswick. Thunderstorms caused power disruptions in parts of Nova Scotia on the 23rd. Lightning struck and created a hole in a runway at Yarmouth Airport.

A series of disturbances produced a mixed bag of weather in Newfoundland. Temperatures over the weekend dropped to near freezing in the northern areas. Rainfalls were substantial across the south. It was also an unsettled week across Labrador, with snow even accompanying the rain. Temperatures were well below normal.

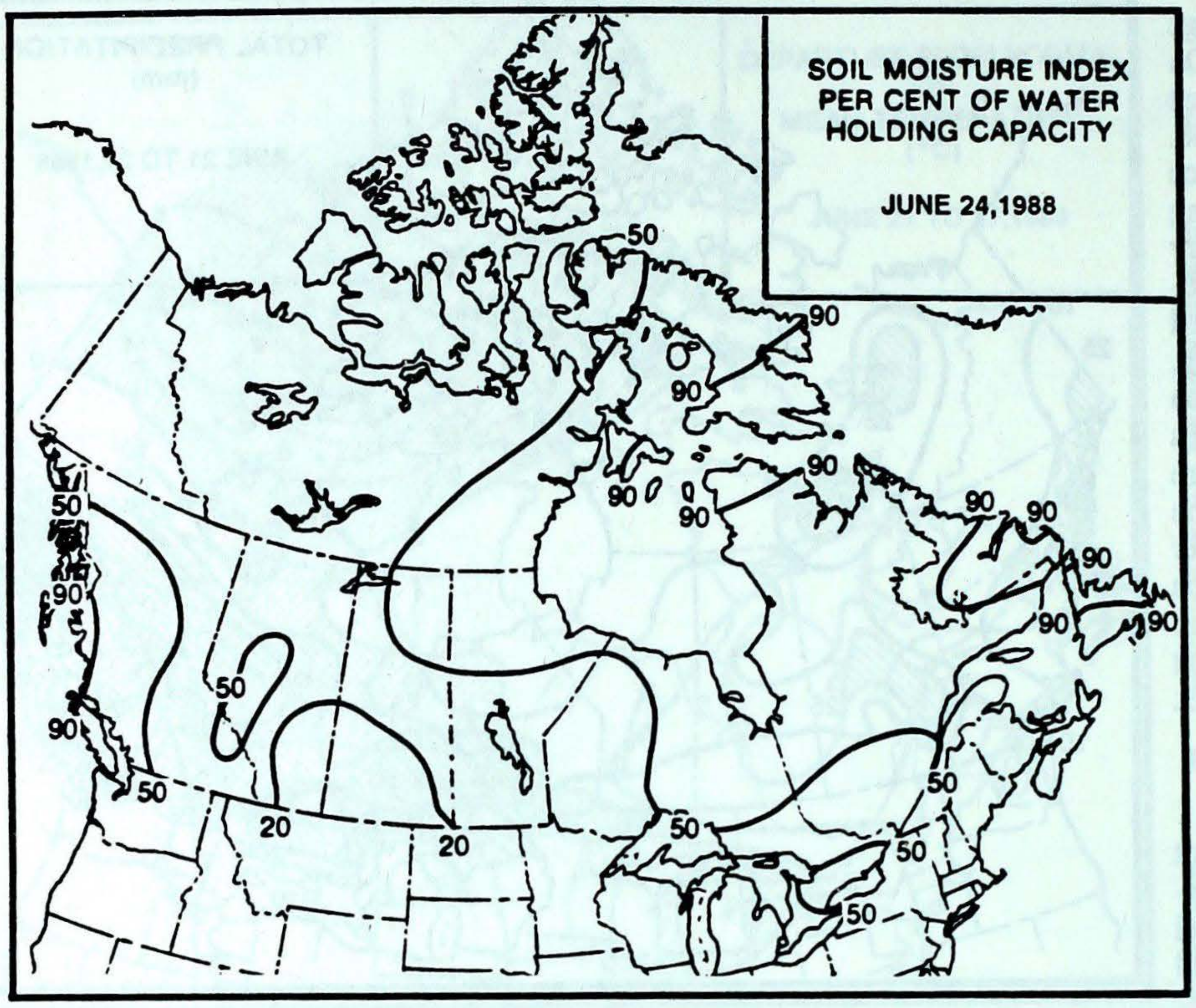


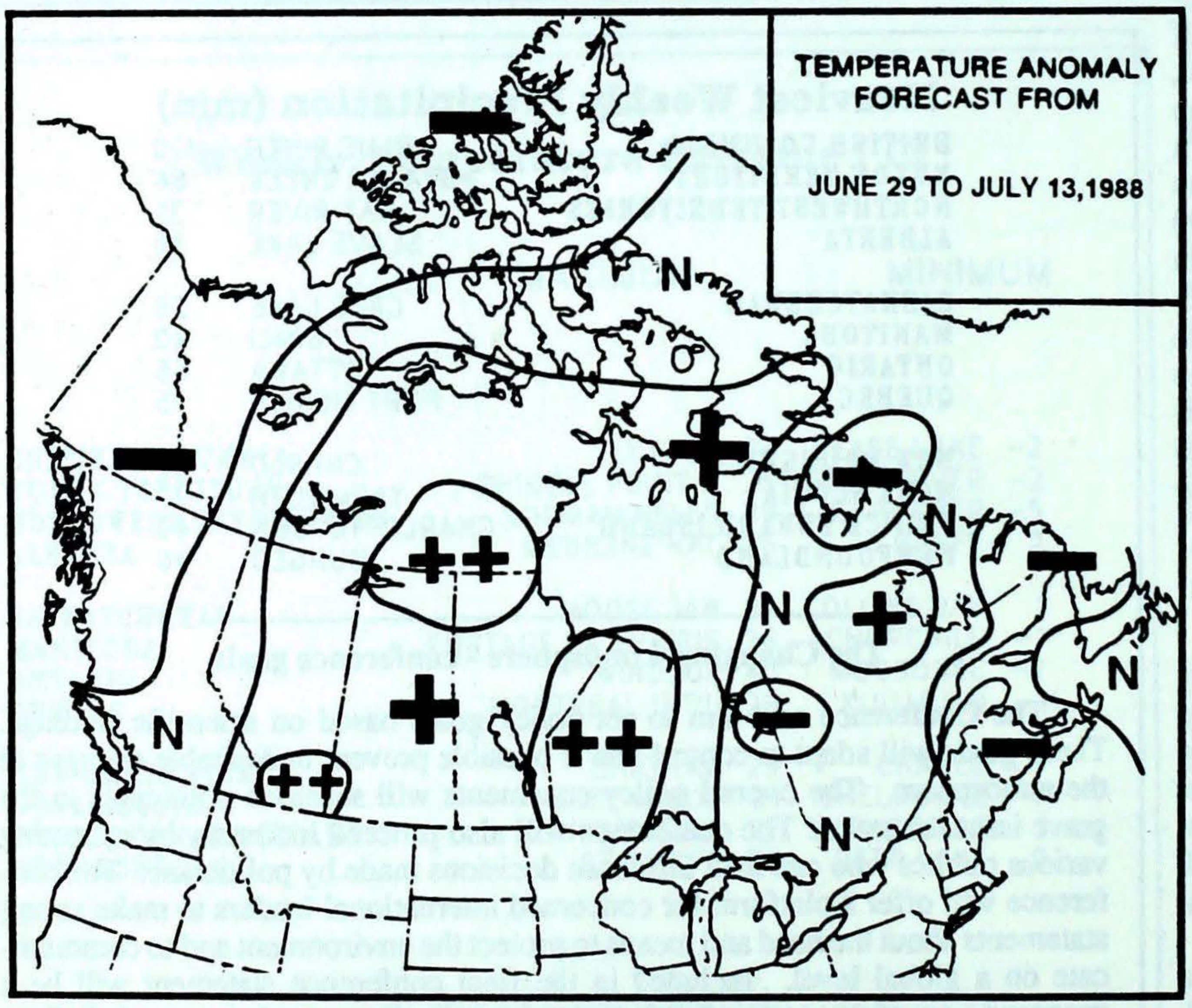
Heaviest Weekly Precipitation (mm)

BRITISH COLUMBIA	BLUE RIVER	470
YUKON TERRITORY	BEAVER CREEK	64
NORTHWEST TERRITORIES	HAY RIVER	35
ALBERTA	SLAVE LAKE	56
SASKATCHEWAN	CREE LAKE	28
MANITOBA	GIMLI	20
ONTARIO	OTTAWA	66
QUEBEC	PORT MENIER	75
NEW BRUNSWICK	CHARLO	43
NOVA SCOTIA	YARMOUTH	77
PRINCE EDWARD ISLAND	CHARLOTTETOWN	49
NEWFOUNDLAND	BURGEO	96

The Changing Atmosphere - conference goals

The Conference will aim to set policy goals based on scientific findings. These goals will adapt to control and if possible prevent undesirable changes in the atmosphere. The overall policy statements will sensitize politicians to the grave issues at stake. The conference will also proceed indirectly by educating various publics who can then influence decisions made by politicians. The conference will offer a platform for concerned international leaders to make strong statements about the need and means to protect the environment and to communicate on a global level. Included in the final conference statement will be a proposed Law of the Atmosphere. Despite the enormous environmental challenges, the conference will take the view that there are viable solutions to many of the problems now confronting humanity. Following the Brundtland Commission, Canada will encourage a mood of optimism in the face of adversity. The very fact that an environmental conference of this scope is being held here, indicates that the issues are seen as realistic and manageable.





+ +	**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.

CLIMATIC PERSPECTIVES VOLUME 10

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Unsolicited articles are welcome but should be at maximum about 1500 words in length. They will be subject to editorial change without notice due to publishing time constraints. The contents may be reprinted freely with proper credit.

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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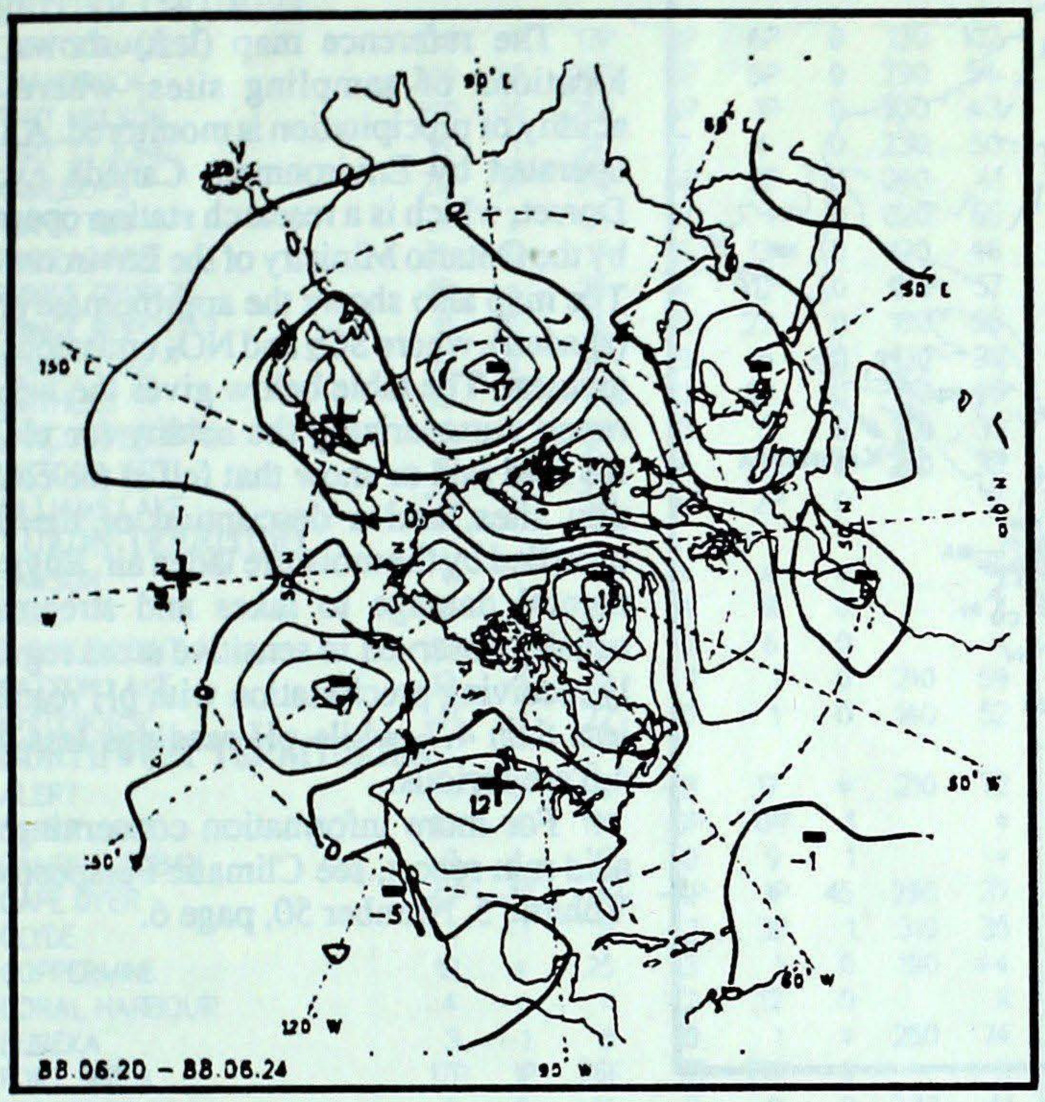
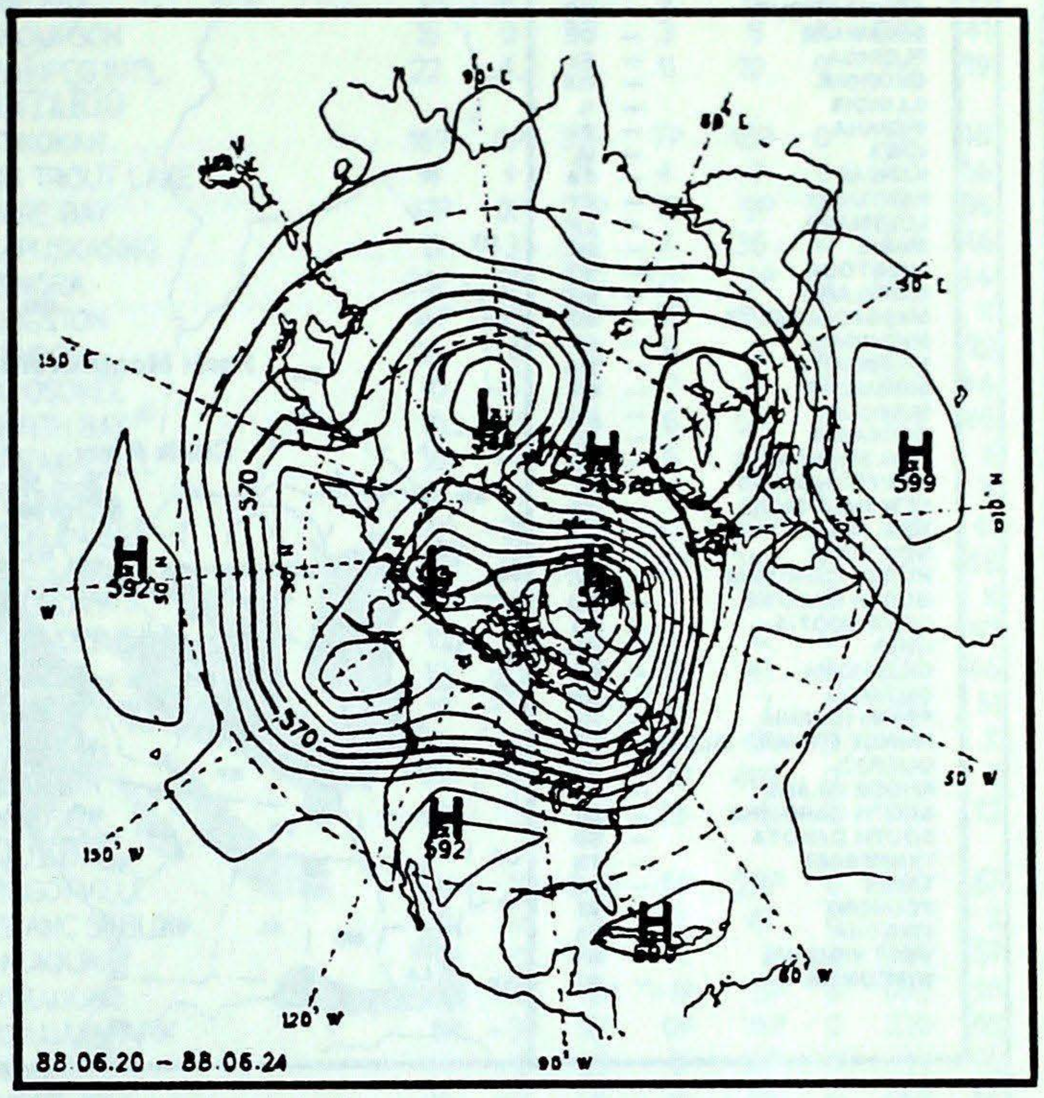
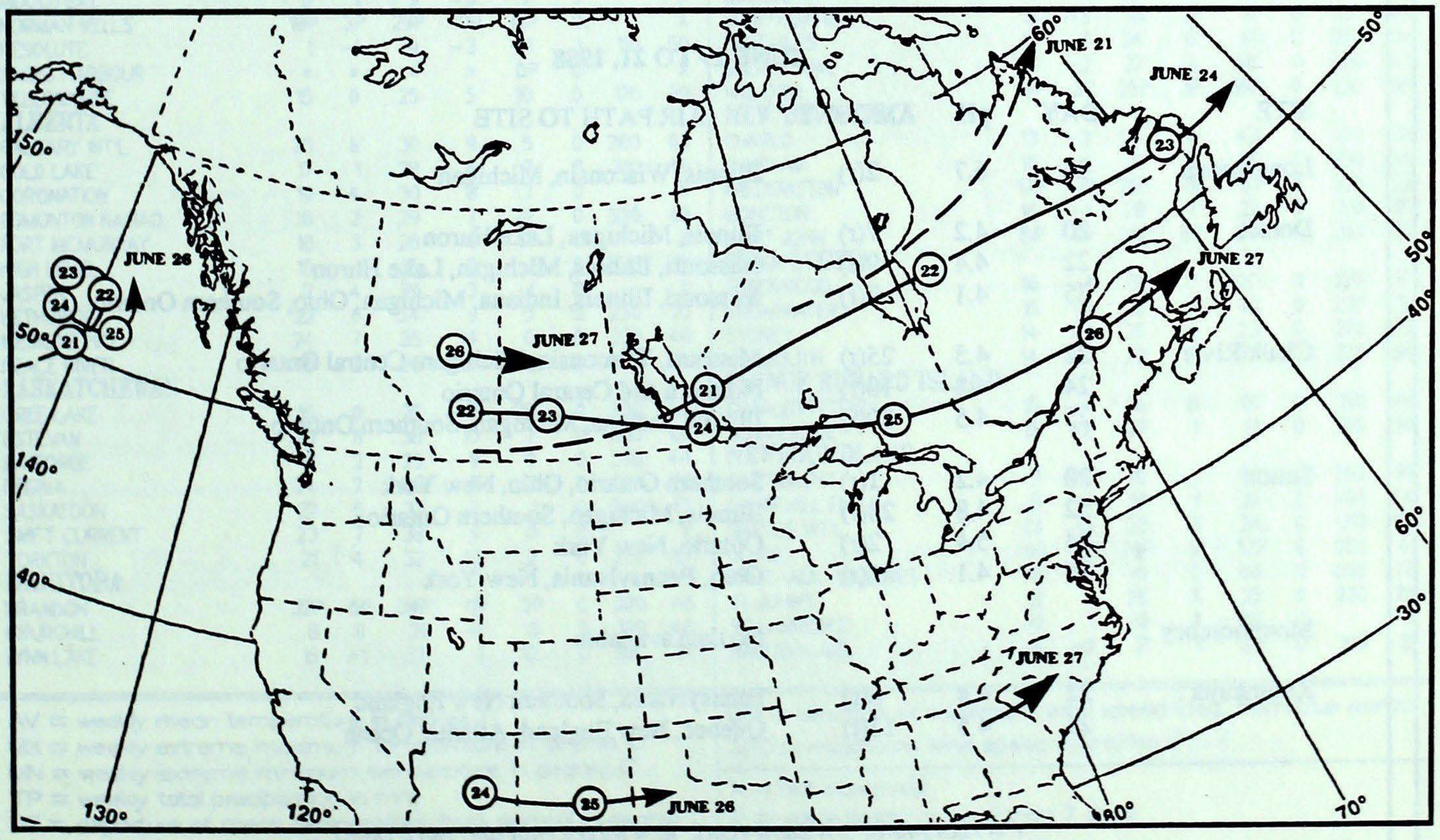
50 kPa ATMOSPHERIC CIRCULATION



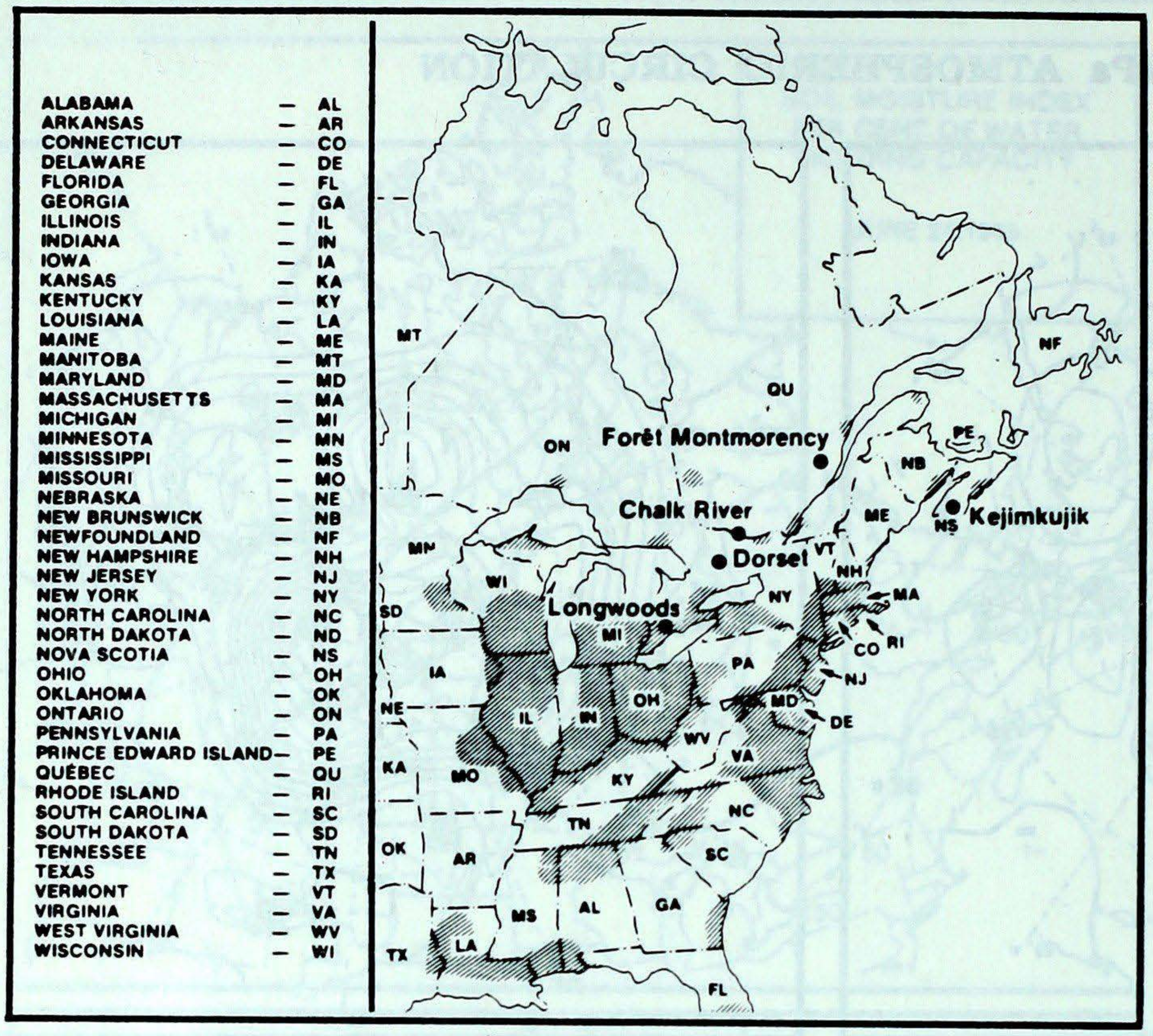
Mean geopotential height anomaly 50 kPa level (5 decameter intervals)



Mean geopotential height 50 kPa level (5 decameter intervals)



Storm track - Position of storm at 12 GMT during the period: June 21 to 27, 1988



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 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.

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

JUNE 19 TO 21, 1988

SITE	DAY	pH	AMOUNT	AIR PATH TO SITE
Longwoods	22	6.7	2(r)	Illinois, Wisconsin, Michigan
Dorset	20	4.2	7(r)	Illinois, Michigan, Lake Huron
	22	4.4	9(r)	Missouri, Illinois, Michigan, Lake Huron
	25	4.1	7(r)	Missouri, Illinois, Indiana, Michigan, Ohio, Southern Ontario
Chalk River	22	4.5	25(r)	Missouri, Wisconsin, Michigan, Central Ontario
	24	4.2	10(r)	Northern and Central Ontario
	25	4.5	39(r)	Illinois, Indiana, Michigan, Southern Ontario
Sutton	20	4.2	1(r)	Southern Ontario, Ohio, New York
	22	4.8	28(r)	Illinois, Michigan, Southern Ontario
	24	5.4	2(r)	Ontario, New York
	25	4.1	41(r)	Ohio, Pennsylvania, New York
Montmorency				No data available
Kejimkujik	22	4.4	8(r)	Pennsylvania, Southern New England
	25	4.5	13(r)	Quebec, New England, Atlantic Ocean

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

STATISTICS FOR THE WEEK ENDING 0600 GMT June 28, 1988

STATION	TEMPERATURE				PRECIP.		WIND MX	
	AV	DP	MX	MN	TP	SOG	DIR	SPD
BRITISH COLUMBIA								
CAPE ST.JAMES	12P	1P	17P	8P	6P	0	130	102
CRANBROOK	20P	5P	29P	11P	5P	0	290	54
FORT NELSON	15P	0P	25P	5P	1P	0	260	43
FORT ST.JOHN	15	1	24	7	4	0	230	50
KAMLOOPS	21P	2P	31P	9P	2P	0	240	41
PENTICTON	21	3	31	8	1	0	020	50
PORT HARDY	12	0	17	6	13	0	120	46
PRINCE GEORGE	15	*	25	4	12	0	210	57
PRINCE RUPERT	11	0	16	5	23	0	180	56
REVELSTOKE	19	2	28	9	16	0	130	39
SMITHERS	12	−1	21	2	22	0	150	46
VANCOUVER INT'L	16	1	25	8	2	0	140	35
VICTORIA INT'L	15	1	23	6	0	0	240	35
WILLIAMS LAKE	17P	*	31P	5P	2P	0		X
YUKON TERRITORY								
DAWSON	*	*	*	*	*	*		*
MAYO	14	0	23	4	8	0		X
SHINGLE POINT A	10	3	25	2	6	0		*
WATSON LAKE	13	−1	22	1	1	0	210	59
WHITEHORSE	11	−1	22	0	1	0	140	52
NORTHWEST TERRITORIES								
ALERT	1	0	6	−3	17	*	210	72
BAKER LAKE	8P	1P	19P	0P	0P	1		*
CAMBRIDGE BAY	9	4	22	0	9	1		*
CAPE DYER	0P	−1P	4P	−5P	1P	45	290	37
CLYDE	1	−1	8	−2	3P	1	310	35
COPPERMINE	12	*	25	3	1	0	190	44
CORAL HARBOUR	4	−1	11	−2	12	0		X
EUREKA	3	−1	8	0	1	*	260	74
FORT SMITH	17P	1P	26P	7P	27P	0		X
FROBISHER BAY	3	−2	10	−2	9	0	330	41
HALL BEACH	3	1	9	−1	1	1	350	37
INUVIK	16P	5P	27P	5P	0P	0		X
MOULD BAY	3	1	9	−3	2	3		X
NORMAN WELLS	18P	3P	29P	10P	32P	0		X
RESOLUTE	1	−1	9	−3	1	1	110	50
SACHS HARBOUR	*	*	*	*	0P	0		X
YELLOWKNIFE	15	0	25	5	10	0	170	39
ALBERTA								
CALGARY INT'L	20	6	30	9	5	0	280	63
COLD LAKE	17	1	28	6	7	0	310	46
CORONATION	19	4	30	8	7	0		*
EDMONTON NAMAO	18	2	29	7	29	0	320	48
FORT MCMURRAY	18	3	28	6	7P	0		X
HIGH LEVEL	15	−1	25	3	1	0	330	37
JASPER	17	4	29	3	1	0		X
LETHBRIDGE	22	6	34	9	5	0	230	70
MEDICINE HAT	24	7	35	14	0	0	250	48
PEACE RIVER	16	2	26	6	3	0	280	54
SASKATCHEWAN								
CREE LAKE	16	0	25	7	28	0	300	54
ESTEVAN	25	8	38	10	7	0	300	80
LA RONGE	17	2	25	9	9	0	320	44
REGINA	24	7	36	7	2	0	290	78
SASKATOON	22	5	37	7	1	0	300	67
SWIFT CURRENT	23	7	38	9	0	0		X
YORKTON	21	4	32	10	2	0	320	67
MANITOBA								
BRANDON	22P	5P	34P	11P	2P	0	020	46
CHURCHILL	8	0	21	−1	0	0	120	44
LYNN LAKE	15	−1	27	1	12	0	300	39

STATION	TEMPERATURE				PRECIP.		WIND MX	
	AV	DP	MX	MN	TP	SOG	DIR	SPD
THE PAS	17	*	26	9	19	0	110	61
THOMPSON	15	0	28	3	8	0	020	41
WINNIPEG INT'L	22	4	34	11	10	0	300	89
ONTARIO								
ATIKOKAN	16P	0P	32P	7P	18P	0	310	48
BIG TROUT LAKE	14	*	25	4	7	0	360	56
GORE BAY	17P	0P	27P	7P	9P	0	290	96
KAPUSKASING	12	−3	22	4	36	0	320	46
KENORA	20P	2P	33P	12P	6P	0	030	44
KINGSTON	16P	−2P	26P	6P	20	0		X
LONDON	20	1	38	8	3	0	270	72
MOOSONEE	10	−4	18	−2	20	0	320	44
NORTH BAY	15	−1	29	6	54	0	270	65
OTTAWA INT'L	18	−1	29	6	66	0		X
PETAWAWA	16	−1	29	1	53	0		X
PICKLE LAKE	14P	−2P	25P	4P	49P	0	290	41
RED LAKE	17P	0P	30P	6P	26P	0	320	48
SUDBURY	16	−1	28	7	34	0		X
THUNDER BAY	15	0	26	4	12	0	310	57
TIMMINS	13	−3	27	3	41	0	330	46
TORONTO INT'L	19	1	36	8	7	0	280	61
TRENTON	18	0	30	6	31	0		X
WIARTON	16P	0P	28P	7P	48P	0		X
WINDSOR	23	3	40	13	5	0	250	72
QUEBEC								
BAGOTVILLE	13P	−3P	24P	5P	28P	0	290	67
BLANC SABLON	8	*	14	2	47	0		X
INUKJUAK	7	0	14	1	3	0	050	57
KUUJJUAQ	7P	−1P	19P	−1P	11P	0	090	56
KUUJJUARAPIK	5P	−3P	18P	0P	16P	0	320	65
MANIWAKI	14	−3	27	2	30	0	130	48
MONT JOLI	14	−2	26	8	61	0	140	67
MONTREAL INT'L	17	−2	28	7	36	0	150	56
NATASHQUAN	9	−3	17	3	48	0	330	57
QUEBEC	16	−1	28	5	31	0	290	52
SCHEFFERVILLE	8	−3	18	0	4	0	180	44
SEPT-ILES	12	−2	24	6	61	0	080	74
SHERBROOKE	14	−2	27	2	48	0	290	43
VAL D'OR	13P	−3P	25P	3P	39P	0	330	50
NEW BRUNSWICK								
CHARLO	13	−3	24	4	43	0	290	59
CHATHAM	16	−1	29	5	18	0	230	54
FREDERICTON	17P	−1P	28P	7P	17P	0	300	52
MONCTON	16	−1	28	7	22	0	210	59
SAINT JOHN	15P	0P	26P	8P	31P	0	200	59
NOVA SCOTIA								
GREENWOOD	16	−1	31	7	30	0	220	57
SHEARWATER	15	−1	25	9	40	0	220	57
SYDNEY	14	−1	26	5	23	0	270	72
YARMOUTH	14	−1	23	8	77	0	220	56
PRINCE EDWARD ISLAND								
CHARLOTTETOWN	15	−1	26	8	49	0	150	46
SUMMERSIDE	15	−2	27	1	18	0	220	59
NEWFOUNDLAND								
CARTWRIGHT	7	−3	19	1	69	0	350	59
CHURCHILL FALLS	8	−4	18	1	24	0	020	44
GANDER INT'L	13	−1	23	3	24	0	210	83
GOOSE	9P	−4P	20P	1P	57P	0	050	41
PORT-AUX-BASQUES	9	−1	15	2	66	0	090	78
ST JOHN'S	12	0	26	3	25	0	220	78
ST LAWRENCE	10	1	20	2	84	0		X
WABUSH LAKE	8	−3	17	1	20	0	160	31

AV = weekly mean temperature in degree C
MX = weekly extreme maximum temperature in degree C
MN = weekly extreme minimum temperature in degree C
TP = weekly total precipitation in mm
DP = departure of mean temperature from normal in degree C
SOG = snow depth on ground in cm, last day of the period

DIR = direction of maximum wind speed (deg. from true north)
SPD = maximum wind speed in km/hour

X = not observed
P = value based on less than 7 days
* = missing