# Climatic Canada Perspectives

Monthly Review

JUNE-1988

Vol. 10

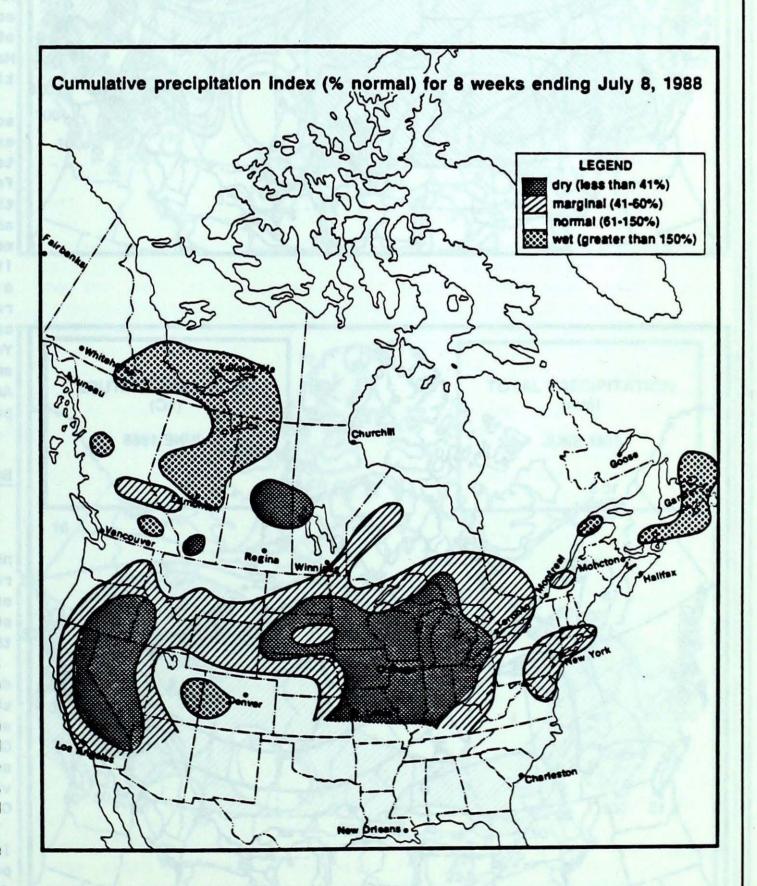
### CLIMATIC HIGHLIGHTS

P.Scholefield, Monitoring and Prediction Division

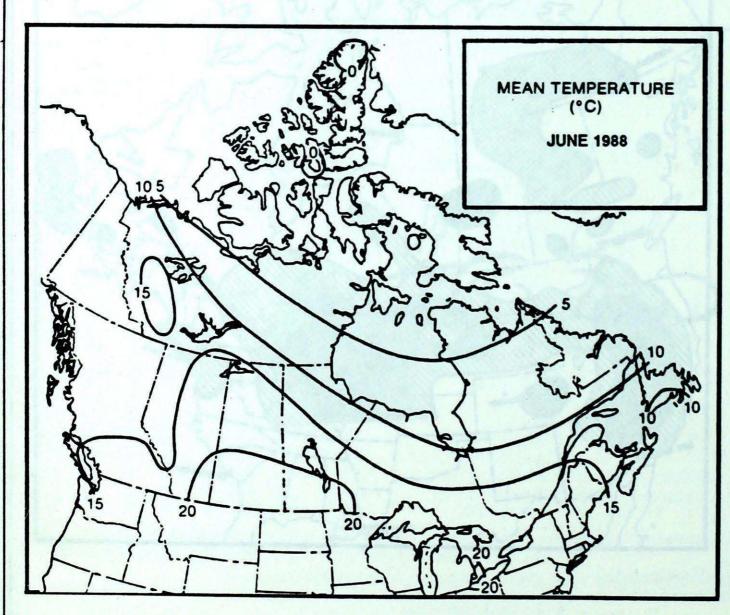
### Mid-West U.S.A. Drought Expands into Southwestern Ontario

Once again this month, lack precipitation dominated the national weather scene. Despite some substantial rainfalls on the Prairies, dryness persisted in the extreme south of Alberta, the southern half of Saskatchewan and extreme southeastern Manitoba. New drought concerns arose in southwestern Ontario. The accompanying map shows how the extensive dry area in the mid-western U.S.A. corn belt has begun to engulf southwestern Ontario.

For many locations southwest of Toronto, it was the driest June on record. In the city itself, it was the second driest June (also May-June period) since records began in 1840, with the driest occurring in 1949. Although the dry spell has not yet been as severe as the one on the Prairies, its impact on farming has been significant because crops planted in southwestern Ontario are dependent on a wetter and less variable precipitation regime than that which typifies the Prairies. New record low precipitation amounts for June were established over the basins of Lakes Michigan-Huron and Erie, while the previous (1912) record minimum was equalled over the Lake Ontario basin. All Great Lakes' water levels were below those of June, 1987.



# DEPARTURE FROM NORMAL OF MEAN TEMPERATURE (C°) JUNE 1988



## Across the country

### Yukon and Northwest Territories

June was abnormally warm over northern Mackenzie and northern Keewatin Districts, averaging as much as 4°C above normal. However, over most of the Yukon and the Northwest Territories, monthly temperatures averaged not far from normal. Record daily low temperatures were set in southern Yukon on June 1 and again during the third week of the month in the central Arctic. The highest temperatures occurred during the last ten days of the month over the northern Mackenzie District, where some stations reported the high twenties.

Southeastern Yukon and the southern Mackenzie District were exceptionally wet in June, with the total precipitation reaching two to four times normal values. Most of the rain fell during the third week and also toward the end of the month. Yellowknife's monthly precipitation total of 71.7 mm established a new record for June. The heavy rain caused a number of road closures due to washouts. Northern Yukon, northern Mackenzie District and most of the western and northern Archipelago reported below normal precipitation for the month.

### British Columbia

Temperatures averaged close to normal for the month and no new records were established. The highest temperatures occurred in the southeastern Interior valleys and the lowest along the North Coast.

Precipitation was very variable due to the convective nature of the showers. Above normal amounts fell over most stations in the Queen Charlottes and along the North Coast and also in many southern Interior valleys. It was quite dry in the Cariboo and Peace River districts.

The wet weather in the southern Interior was causing agricultural problems. A lush hay crop needed dry weather for harvesting, while cherry-splitting was reported in the Okanagan.

### Prairie Provinces

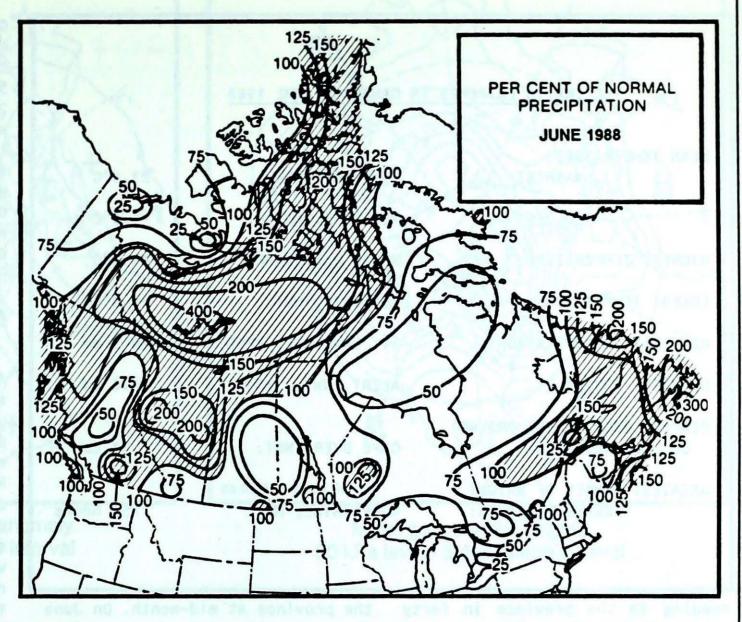
June was a record-breaking warm month across practically all of the Prairies. It was the warmest June ever over the southern agricultural parts of the three provinces with mean temperatures 4 to 7°C above normal. Most days of the month were above normal, but there was some cooling about mid-month. Recordbreaking heat struck southern Saskatchewan and southern Manitoba during the first week when the mercury soared into the forties. On the 5th, Regina and Moose Jaw levelled off at 41°C, but some climatological stations were as high as 44°C.

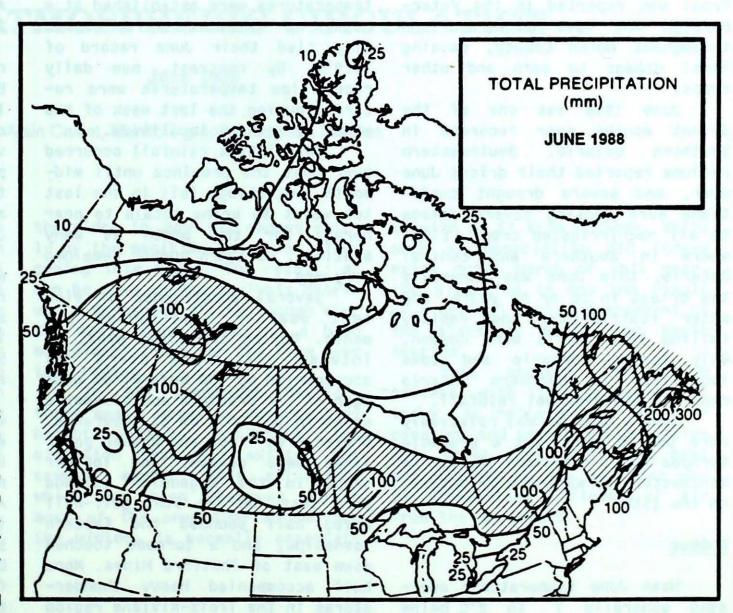
The dry weather of the previous few months continued for most of June, and the worsening drought in the southern agricultural areas was making headlines. Many stations in southern Saskatchewan and southern Alberta had less than half their normal June rainfall, and many stations that had near normal amounts reported most of this rainfall in short-duration bursts during heavy thunderstorms or toward the end of the month, too late for many farmers. The major exception was central and northern Alberta, where some places had twice their normal June rainfall, much of this occurring on June 28 and 29, when up to 200 mm of rain fall.

Numerous outbreaks of severe weather occurred across the southern Prairie Provinces during the month. Most noteworthy was the Camrose tornado on June 5th, which did at least \$3 million worth of damage.

### Ontario

Mean temperatures averaged near normal over most of southern and central Ontario, but northwestern parts of the province were very warm, with means averaging 2 to 4°C above normal, and the warmest June since at least 1976. Several stations in this part of the province recorded their warmest June ever. In spite of the fact that temperatures in southern Ontario averaged near normal, there were some exceptionally hot days and also some very cool ones. On June 25, the mercury soared to 40.2°C at Windsor, the highest





CLIMATIC EXTREMES	IN CANADA - JUNE 1988	
	THE OWNER OF THE PARTY OF THE P	
MEAN TEMPERATURE:		
WARMEST	ESTEVAN, SASK.	23.6°C
COLDEST	RESOLUTE, NWT.	-1.0°C
HIGHEST TEMPERATURE:	MOOSE JAW, SASK.	41.2°C
LOWEST TEMPERATURE:	RESOLUTE, NWT.	-9.3°C
HEAVIEST PRECIPITATION:	ST. LAWRENCE, NFLD.	341.3 mm
HEAVIEST SNOWFALL:	ALERT, NWT.	44.6 cm
DEEPEST SNOW ON THE GROUND		
ON JUNE 30, 1988:	CAPE DYER, NWT.	31 cm
GREATEST NUMBER OF BRIGHT		
SUNSHINE HOURS:	COPPERMINE, NWT.	456 hours

reading in the province in forty years. Three days later ground frost was reported in the Peterborough and Waterloo areas and throughout Huron County, causing local damage to corn and other crops.

June 1988 was one of the driest months ever recorded in Southern Ontario. Southwestern regions reported their driest June ever, and severe drought conditions were causing severe damage to all non-irrigated crops. Elsewhere in southern and central Ontario, this June was generally the driest in 30 or 40 years, and water restrictions and rapidly falling lake levels were common. Only eastern Ontario and some localities in northern Ontario reported above normal rainfall.

Severe weather was relatively rare during June, but a probable tornado did significant damage to Winchester, 40 km south of Ottawa, on the 25th.

### Québec

Mean June temperatures averaged generally 1 to 2°C below normal for the month. However, a hot spell occurred over most of

the province at mid-month. On June 15, new all time June maximum temperatures were established at a number of stations, while Quebec City tied their June record of 33.9°C. By contrast, new daily record low temperatures were recorded during the last week of the month at several localities.

Very little rainfall occurred over most the province until midmonth, but enough fell in the last two weeks to bring totals to near normal for the month at many stations. Northern Quebec remained very dry.

Several occurrences of violent weather highlighted the month. During the first week, an intense east-coast storm was accompanied by 100 km/h winds over much of the province and six-metre waves in the Gulf of St. Lawrence. Broken tree limbs and downed power lines were common, and lobster traps in the Magadalen Islands were lost. On the 5th, golf-ball sized hail pounded the Eastern Townships, and a tornado touched down east of Thetford Mines. More hail accompanied heavy thunderstorms in the Trois-Rivière region on the 12th, and at Notre-Dame on the 14th and

Gaspé on the 16th. On the 21st, a tornado caused \$3 million damage to the town of Saint-Bernard, about 50 km south of Quebec City. On the 22nd, a house was blown down by the wind at Coteau Station, while torrential rains triggered a land-slide which in turn caused a train derailment at Coteau Landing. Heavy downpours of rain, strong winds and hail also occurred in southern Quebec on the 25th.

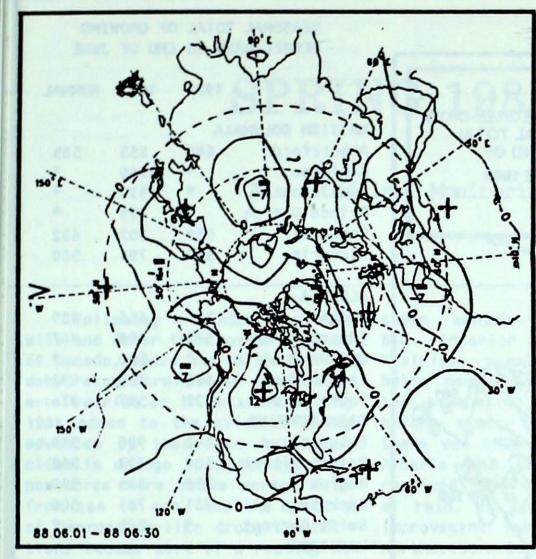
### **Atlantic Provinces**

It was cool this June in Atlantic Canada. Although a few stations reported near normal values, for most of the area, temperatures averaged 1 to 2°C below normal. At Moncton and Charlo, N.B., it was the second coldest June ever. Some frost was reported over New Brunswick early in the month. Although most of the month was cool, a brief warm spell occurred just after mid-month, with temperatures climbing into the low to mid-thirties at many localities. A number of record high temperatures for the day were established.

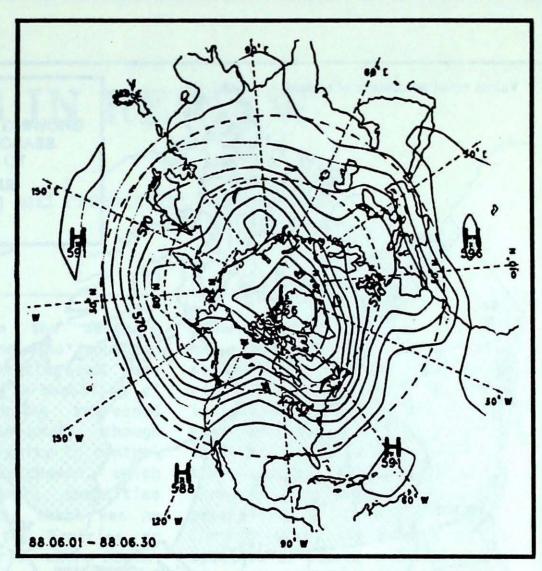
Precipitation was well-below normal in June over most of New Brunswick and western Prince Edward Island. Over most of the remainder of the Atlantic Provinces it was very wet. In Newfoundland, total precipitation amounts were two to three times normal at many stations. Gander had their wettest June on record with 165 mm.

Gander, reported 13.4 cm of snow on June 1st, a new daily record. At the same location, a monthly total of 22.2 cm pushed the 1987-88 seasonal accumulation to 595.2 cm, third heaviest snowfall amount since records began in 1937.

A number of heavy thunderstorms occurred over the Maritimes,
especially during the latter half
of the month. On the 26th, lightning struck a runway at Yarmonth
Airport, creating a hole and knocking out a number of lights. Over
50 mm of rain fell in the HalifaxDartmouth area on the 30th, causing
flooded basements and streets,
traffic chaos and power outages.



Mean geopotential height anomaly 50 kPa level - 5 decametre interval



Mean geopotential heights
50 kPa level - 5 decametre interval

# 50 kPa ATMOSPHERIC CIRCULATION

June 1988

Alain Caillet, Monitoring and Prediction Division

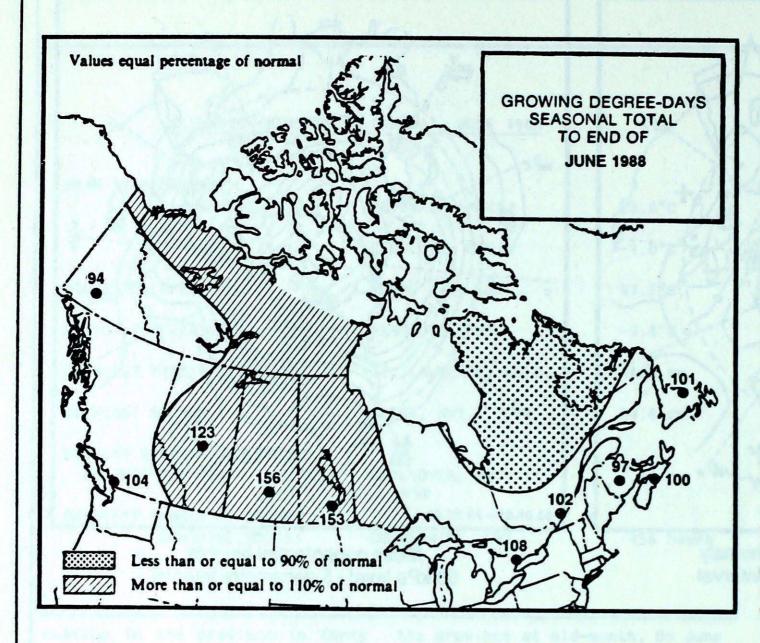
June, circulation the aloft saw a marked intensification of the ridge over west central North-America. At the end of the month, this planetary wave, which is normally located along a line from northern British Columbia through the Yukon to northern Alaska, had for three months been firmly stationed further to the east, over the Prairies. Its mean monthly height values have been above normal in every analysis since the beginning of the year.

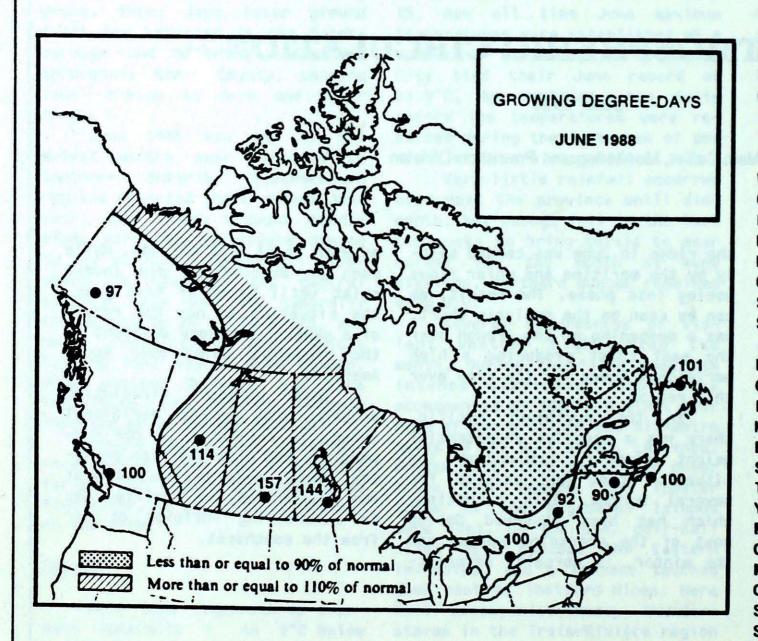
By comparison with the preceding month, intensification of the ridge in June was caused mainly by the maritime and polar flows coming into phase. The result, as can be seen on the analysis chart, was a deepening of the trough over the east coast producing a high meridional index for the flow over this region.

In the northeast Pacific, there was a negative geopotential height anomaly, prolonging the situation that had existed for several months. This situation, which had been observed during most of the preceding autumn and the winter, is normally associat-

ed with an El Nino episode. While such an association did indeed exist until March of this year, the situation is now the result of a general eastward movement of the planetary waves over North America.

This unusual circulation pattern, with its high meridional index, is reflected in the temperature and precipitation analyses, which show sweltering heat and drought on the Prairies due to unremitting influxes of air from the southwest.





# SEASONAL TOTAL OF GROWING DEGREE-DAYS TO END OF JUNE

	1988	1987	NORMAL
BRITISH COLUMB	IA		
Abbotsford	646	855	585
Kamloops	*	1060	
Penticton	*	973	*
Prince George	*	479	****
Vancouver Victoria	659	902	632
VICCUITA	569	791	580
ALBERTA			
Calgary	556	666	389
Edmonton Mun.	575	698	467
Grande Prairie	*	560	- *
Lethbridge	670	765	493
Peace River SASKATCHEWAN	422	547	376
Estevan	842	920	539
Prince Albert	564	703	368
Regina	798	825	510
Saskatoon	781	781	506
Swift Current	*	765	*
MANITOBA			
Brandon		766	to the
Churchill	26	60	14
Dauphin	600	765	407
Winnipeg		870	
ONTARIO			
London	684	896	618
Mount Forest	*	659	*
North Bay	Jon*	546	
Ottawa	684	790	646
Thunder Bay	377	539	300
Toronto	643	861	596
Trenton	624	828	599
Windsor QUEBEC	832	1033	759
Baie Comeau		301	*
Maniwaki	517	530	504
Montréal .	669	806	655
Quebec	513	540	504
Sept-Iles	212	244	232
Sherbrooke	471	534	474
NEW BRUNSWICK			
Charlo	371	418	377
Fredericton	480	521	494
Moncton	387	466	411
NOVA SCOTIA			
Sydney	325	310	310
Truro		413	
Yarmouth	*	463	* 3
PRINCE EDWARD I	SLAND 356	394	373
NEWFOUNDLAND	356	374	3/3
Gander	168	289	166
St. John's		246	
Stephenville	262	286	260

# SPRING 1988 IN REVIEW

Alain Caillet, Monitoring and Prediction Division

Following a winter that was mild and drier than normal in most of Canada, there was no relief for dehydrated farmland on the southern Prairies or in Ontario. Spring 1988 added to the evidence being advanced by those who hold that climatic change is underway: temperatures were above normal from from sea to sea, and the spectre of Depression-like drought conditions became more of a reality as a critical precipitation deficit made itself felt on the southern Prairies and in Ontario.

### Temperatures

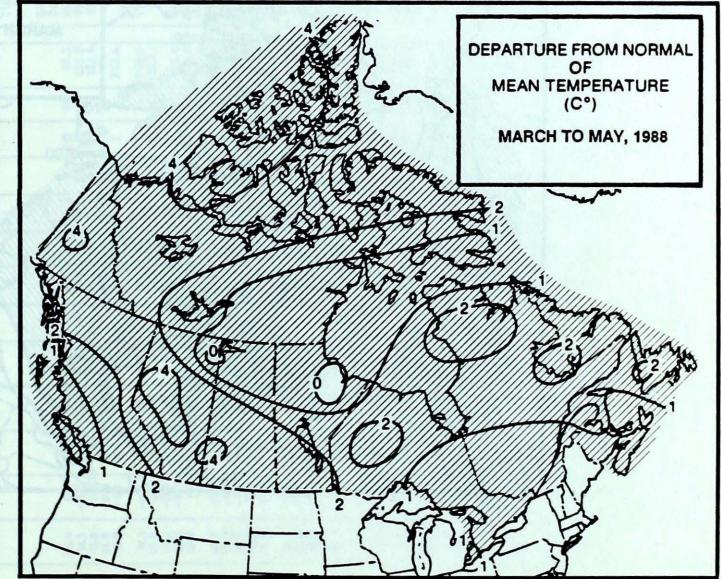
Beginning in early March, western Canada enjoyed very mild temperatures. This was especially the case in Alberta and the Yukon. temperature of almost 20°C was reached at Medicine Hat in Alberta, which was in its seventh consecutive month of above-normal temperatures. In April, the northwest experienced an early spring; Dawson (Yukon) reached 29°C, and summer seemed to have arrived in the B.C. interior and in Alberta, with temperatures reaching 30 and 27°C respectively. By mid-May, the temperature had already reached 34°C at Medicine Hat. In the central and eastern parts of the country, temperatures were much more variable. Despite mean positive anomalies, repeated influxes of cold air resulted in spring weather that was mild but capricious.

### Precipitation

The hydrological situation in western Canada started to become critical in early March. For over

seven months in the southern B.C. interior and the southern Prairies, precipitation had been below normal. The probability of the situation being redressed before summer was small, though there was some respite in central Alberta and Saskatchewan, which received appreciable quantities of rain. In April, there was no improvement for the Prairies or northwestern Ontario, where monthly accumulations were 25% below normal. Only southeastern Saskatchewan and the valleys of the southern B.C. interior received

generous precipitation. In late May, under the influence of a strong and almost stationary ridge in the west, dryness indices were still rising in the Prairies and southern Ontario, while British Columbia, Yukon and the Mackenzie District received three to five times their normal precipitation for the month. Further east, there were a few spectacular storms and precipitation was variable, but most stations in Quebec and the Atlantic provinces recorded more or less normal amounts.



### Impacts

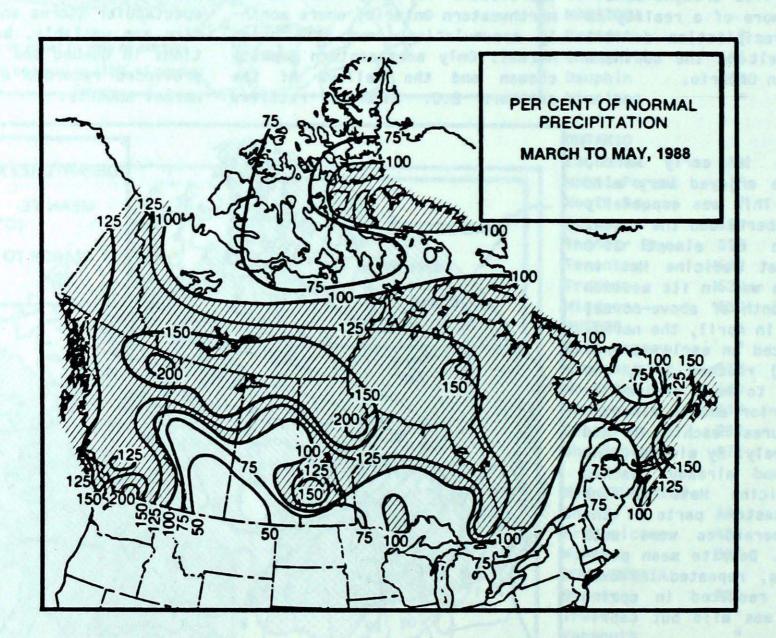
The remarkable spring weather had both direct and indirect effects on the economy and other aspects of Canadian life. The mild temperatures were perceived very differently from region to region and province to province. In the north and northwest, the early arrival of spring was cause for celebration. On the Prairies, despite low soil water reserves, people were happy because winter kill losses to winter wheat and last fall's rye crops were low, and because the spring seeding was coming along rapidly. In Ontario and Quebec, however, the mild weather brought an early end to maple syrup production, and ski resorts had to close early.

Soon, a large number of small rural communities and farms in western Canada were having to make arrangements to transport the water they needed; wind erosion was ravaging many farms, and forest fires were breaking out all over the place. By late May, the only hope for the crop on the Prairies was normal rainfall for the whole remaing part of the growing season.

Meanwhile, variable skies in Nova Scotia, often bringing ample precipitation, gave the province its best maple syrup harvest in many years, and in general, fewer brush fires were reported in the Maritimes.

There were two big storms, one affecting the Maritimes and one in Quebec. On the 18th and

19th of April, as 40 cm of snow fell along the North Shore at Sept-Iles, Quebec, freezing rain accumulated on the high- voltage power lines that supply almost the entire province, as well as some parts of the Maritimes and the United States. There was a spectacular, generalized power failure causing losses of several million dollars for industry and trade. On 2-4 May, Nova Scotia and Prince Edward Island were hit by a storm bringing high winds, up to 148 km/h on Cape Breton Island. Lobster fishermen on Pictou Island, Nova Scotia, lost 70% of their traps. There were reports of damage to buildings, uprooted trees and traffic accidents, though fortunately no lives were lost.



7毫1

	-				1	1	1	_	_	1-	1	1	JUNE	1988
STATION	upey	Difference from Normal	Maximum	Minimum	Snowfall (cm)	A of Normal Snowfall	Total Precipitation (mm)	Z of Normal Precipitation	Snow on ground at end of month (am)	No. of days with Precip 1.0 mm or more	Bright Sunshine (hours)	Z of Normal Bright Sunshine	Degree Days below 18 C	STAT
BRITISH COLUMBIA														YUKON
ABBOTSFORD ALERT BAY AMPHITRITE POINT BLUE RIVER BULL HARBOUR	14.9 11.5 11.9 14.5 10.2	0.2 -0.8 -0.5 0.8 -1.2	30.3 21.2 17.6 30.5 16.6	4.7 3.2 5.6 0.6 1.6	0.0 0.0 0.0 0.0 0.0		49.7 5.8 98.5 101.4 86.0	77 8 106 124 110	0 0 0 0 0	9 10 9 16 15	215 X X 167 X	99	99.3 195.3 182.9	BURWASH DAWSON MAYO WATSON L WHITEHOU
CAPE SCOTT CAPE ST.JAMES CASTLEGAR COMOX CRANBROOK	11.1 10.6 16.7 14.5 15.9	-0.4 0.0 -0.2 -0.5 1.8	15.8 13.0 33.8 25.3 30.3	4.8 4.2 5.0 3.7 4.1	0.0 0.0 0.0 0.0 0.0		99.1 114.2 60.4 40.9 43.1	96 155 96 116 89	0 0 0 0	13 15 11 7	142 191 X 250	79	208.5 223.1 106.0 77.9	NORTHW TERRITO
DEASE LAKE ETHELDA BAY FORT NELSON FORT ST.JOHN HOPE	10.0 10.3 14.3 13.5 15.4	-0.4 -1.0 -0.1 0.0 -0.4	24.2 18.2 27.4 24.2 31.0	-2.3 2.2 3.2 4.5 5.7	0.0 0.0 0.0 0.0		54.8 155.3 63.6 46.3 50.5	125 122 92 68 78	0 0 0 0	11 19 11 7	153 X 245 X 194	70 * 86	239.7 230.3 114.8 135.0 83.3	CAMBRID CAPE DYE CAPE PAR CLYDE COPPERM
KAMLOOPS KELOWNA LANGARA LYTTON MACKENZIE	18.4 16.6 10.3 18.2 12.0	0.4 0.7 0.2 0.1 -0.5	33.8 32.3 14.4 33.4 26.3	4.3 0.2 4.7 4.6 -2.0	0.0 0.0 0.0 0.0 0.0		30.8 49.0 110.2 27.6 55.4		0 0 0 0	7 9 20 7 8	253 214 X 249 234	98 78 92 93	41.3 68 9 230.1 43.1 180.9	CORAL HI EUREKA FORT REL FORT SIM FORT SMI
MCINNES ISLAND PENTICTON PORT ALBERNI PORT HARDY PRINCE GLORGE	11.6 17.7 13.5 11.0	-0.4 0.5 * -0.8 0.2	16.1 34.1 30.7 17.6 26.3	5.9 3.7 2.4 2.0 2.1	0.0 0.0 0.0 0.0		143.4 36.8 52.2 76.7 48.4	117 133 * 108 72	0 0 0 0	19 8 7 13	X 218 204 150 232	83 87 89	193.8 52.2 135.5 210.5 148.7	INUAIK HAT BEY HOT BEY
PRINCE RUPERT PRINCETON QUESNEL REVELSTOKE SANDSPIT	10.9 14.5 14.3 16.5	0.1 0.0 0.3 0.6 -0.3	18.6 32.4 29.5 30.0 18.5	1.2 0.5 2.8 2.2 4.4	0.0 0.0 0.0 0.0		88.0 37.0 26.1 88.5 96.8	67 139 41	0000	16 8 7 12 16	151 239 X 175 133	100 # 80 76	212.3 116.5 62.4 211.3	NORMAN POND INL RESOLUTI
SMITHERS TERRACE	11.1	-1.4 -1.5	27.8 25.5	-4.1 1.5	0.0		74.7		0	14	193	77	209.4	ALBERTA
VANCOUVER HARBOUR VANCOUVER INT'L VICTORIA GONZ. HTS	15.1 13.9	0.0	25.4 26.0	7.1	0.0		39.0 13.9	86	0	7 3	X 257 288	107	90.1	BANFF
VICTORIA INT'L VICTORIA MARINE WILLIAMS LAKE	13.7 12.0 13.6	-0.6 -0.5 0.6	26.7 22.1 30.6	4.4 3.3 1.1	0.0 0.0 0.0		29.2 29.1 21.8	100	0 0 0	6 5 7	271 X 237	105	127.9 184.7 4.9	CALGARY COLD LAN CORONAT EDMONTO EDMONTO EDSON FORT CHI

1988	,	1							"				
	Tem	peratur	e C				H		3	ore			
STATION	Mean	Dirference from Normal	Madmum	Minimum	Snowfall (cm)	Z of Normal Snowfall	Total Precipitation (mm)	2 of Normal Pracipitation	Snow on ground at end of month (am)	No. of days with Precip 1.0 mm or more	Bright Sunshine (hours)	Z of Normal Bright Sunshine	Degree Days below 18 C
YUKON TERRITORY	1100												
BURWASH DAWSON MAYO WATSON LAKE WHITEHORSE	14.4 14.4 12.7 11.9	1.5 1.0 0.0 -0.2	27.8 26.8 25.7 23.9	-1.0 0.9 1.0 -2.2	1.0 0.0 0.0 0.0		18.3 23.0 95.0 31.1	42 65 184 101	000	8 12 7	X X X 209	78	281.7 158.1 186.3
NORTHWEST TERRITORIES													
ALERT BAKER LAKE CAMBRIDGE BAY CAPE DYER CAPE PARRY	-0.9 4.8 3.6 0.2 3.9	0.2 0.7 2.1 0.0 2.3	5.6 19.0 21.8 10.8 16.2	-7.5 -2.3 -3.0 -6.0 -2.3	44.6 2.8 1.8 44.4 0.4	455 100 45 154 12	34.8 45.6 16.8 45.6 7.8	287 218 127 115 54	26 0 31	9 5 5 9 2	170 310 249 X	55 118 92	563.0 369.9 431.3 535.0 425.0
CLYDE COPPERMINE CORAL HARBOUR EUREKA FORT RELIANCE	1.6 6.9 2.1 2.0 9.9	1.0 3.1 0.0 0.2 0.3	15.5 24.9 12.5 8.3 26.3	-7.6 -2.9 -3.4 -3.0 -1.4	11.4 0.2 10.4 1.2 5.6	118 7 128 50 430	12.2 3.2 34.8 4.9 75.1	97 18 129 90 287	0000	5 1 6 1	225 456 264 279 X	86 147 93 68	493.2 331.3 477.3 479.3 246.6
FORT SIMPSON FORT SMITH IQALUIT HALL BEACH HAY RIVER	14.6 15.5 2.9 1.7 12.2	0.2 1.9 -0.5 1.7 0.3	31.1 28.8 14.5 9.9 28.6	0.3 1.2 -2.5 -2.6 -0.5	0.0 0.0 3.8 3.4 0.0	37 54	174.4 82.9 17.8 15.4 117.2	450 201 45 92 437	0 0 0	11 12 7 4 15	256 221 201 X X	91 73 114	107.5 88.4 453.0 489.8 178.3
INUVIK MOULD BAY NORMAN WELLS POND INLET RESOLUTE	12.9 2.1 15.7 2.9 -1.0	2.8 2.4 1.7 1.4 -0.4	27.3 9.3 28.7 13.5 8.9	-1.4 -6.3 4.1 1.5 -9.3	0.2 4.8 0.0 17.0 16.0	9 137 309 228	3.6 5.4 63.8 23.3 28.8	15 85 172 277 238	0 2 0 0	2 3 6 5 6	391 210 304 X 150	104 85 97 58	161.4 550.6 79.9 453.7 571.3
YELLOWKNIFE	13.1	0.2	24.9	1.7	0.0		71.7	426	0	6	298	75	148.7
ALBERTA									13				
BANFF	13.6	2.0	29.0	1.0	0.0		78.2	127	0	18	x		
CALGARY INT'L COLD LAKE CORONATION	16.3 16.5 17.6	2.8 2.0 3.2	29.6 29.1 32.0	4.9 0.4	0.0 0.0 0.0		84.6 146.0 89.6	94 203 155	0	11 12 8	268 244 314	100	70.5 61.4 53.2
EDMONTON INT'L EDMONTON MUNI. EDMONTON NAMAO EDSON FORT CHIPEWYAN	15.8 16./ 15.9 13.9 15.3	1.7 1.6 1.2 2.1 1.7	27.8 28.7 28.6 26.4 28.0	4.1 6.0 4.0 1.0 2.0	0.0 0.0 0.0 0.0 0.0		120.8 157.4 143.9 170.7 63.2	157 203 184 193 153	0 0 0 0	12 15 14 14	278 270 X 246 X	96 99 96	71.2 53.2 73.1 126.5

	Ten	peratu	re C						5	more					Ten	peratur	e C						2	o e			
FORT MCMURRAY SRANDE PRAIRIE	Medn	Ditference from Normal	Maximum	Minimum	Snowfall (cm)	Z of Normal Snowfall	Total Precipitation (mm)	Z of Normal Precipitation	Snow on ground at end of month (cm)	No. of days with Precip 1.0 mm or m	Bright Sunshine (hours)	2 of Normal Bright Sunshine	Degree Days below 18 C	STATION	Mean	Difference from Normal	Madmum	Minimum	Snowfall (cm)	Z of Normal Snowfall	Total Precipitation (mm)	% of Normal Precipitation	Snow on ground at end of month (am)	No. of days with Precip 1.0 mm or mo	Bright Sunshine (hours)	Z of Normal Bright Sunshine	Degree Days below 18 C
ORT MCMURRAY FRANDE PRAIRIE IIGH LEVEL ASPER ETHBRIDGE	15.9 14.1 14.2 13.9 18.8	1.9 0.4 0.6 1.5 3.4	27.9 27.1 27.1 29.1 34.3	4.0 2.0 1.9 3.0 4.3	0.0 0.0 0.0 0.0 0.0		99.1 157.6 78.6 56.4 45.9	154 225 147 102 58	0 0 0 0 0	15 14 6 8 5	212 268 226 224 319	77 * 74 * 112	74.3 119.5 115.8 127.6 38.1	THE PAS THOMPSON WINNIPEG INT'L	19.1 15.5 22.0	4.7 9.3 5.2	35.5 34.1 37.2	9.3 2.1 6.2	0.0 0.0 0.0		19.7 65.4 94.9	31 113 118	000	2 10 8	311 284 362	113 107 131	29 94 1
REDICINE HAT EACE RIVER LED DEER OCKY MTN HOUSE LAYE LAKE	20.7 13.6 15.4 14.3 14.2	4.1 -0.1 1.8 1.5 0.9	35.2 26.2 29.2 27.8 26.5	5.9 3.1 3.1 1.3 2.7	0.0 0.0 0.0 0.0 0.0		48.0 136.7 119.6 79.6 175.2	229 142 76	0 0 0 0	8 10 8 11 16	344 X X X 238	123	23.8 122.9 84.1 117.8 115.7	ATIKOKAN BIG TROUT LAKE EARLTON GERALDTON	16.9 14.2 14.6 14.6	2.4 2.2 -0.6	32.3 30.3 33.4 32.1	0.9 1.9 -0.6	0.0 0.0 0.0		95.8 34.8 60.3	101 52 67	0000	10 9	296 262 X	123	65 12 135
UFFIELD HITECOURT ASKATCHEWAN	20.2	1.8	34.0 25.9	6.7 2.3	0.0		64.0 141.6	97 154	0	8 16	335 X	117	26.4 110.0	GORE BAY  HAMILTON RBG HAMILTON KAPUSKASING	16.4 19.6 18.1 13.0	0.9 0.1 -1.1	31.0 36.5 35.0 32.2	7.3 5.5 -0.8	0.0 0.0 0.0 0.0		124.8 26.3 8.4 7.6 82.0	135 45 12 11 96	0000	13 6 4 3 9	341 X X		12 6
ROADVIEW DLLINS BAY REE LAKE STEVAN UDSON BAY	20.4 13.1 14.7 23.6	5.5 2.6 1.8 7.1	36.3 26.4 28.i 39.1	5.8 0.3 4.5 7.8	0.0 0.0 0.0 0.0		42.0 78.2 135.7 59.2	65 138 267 76	0 0 0	6 11 11 4	316 227 236 344	107 # 88 113	19.5 155.9 101.3 7.9	KENORA KINGSTON LANSDOWNE HOUSE LONDON MOOSONEE	21.1 16.3 15.1 18.1 9.8	5.0 -0.4 1.6 0.2 -2.1	34.0 30.4 28.9 38.2 32.3	9.9 3.4 2.9 5.2 -2.1	0.0 0.0 0.0 0.0 0.2	25	68.9 35.0 52.4 9.6 43.3	82 54 64 13	0 0 0 0	89 123:	x	102 134 88	10 5 24
NDERSLEY L RONGE EADOW LAKE DOSE JAW PAWIN	20.6 17.9 16.8 22.7 19.9	4.9 3.8 1.9 6.1	38.3 29.0 31.6 41.2 38.2	4.3 6.5 1.8 7.4 5.6	0.0 0.0 0.0 0.0		66.2 21.2 67.0 46.2 15.4	115 25 90 69	0000	7 6 10 4	X X 270 353 313	123	25.7 37.9 56.5 11.7 20.0	MUSKOKA  NORTH BAY OTTAWA INT'L PETAWAWA	15.2 14.9 17.6	-0.7 -0.8 -0.4	31.6 31.2 35.0	0.0 0.7 5.2	0.0 0.0 0.0		65.0 63.6 94.0	79 74 128	0 0	6 6 5	X 286 283	114	15 12 7
ORTH BATTLEFORD RINCE ALBERT EGINA ASKATOON OFFT CURRENT	19.5 19.3 22.6 21.2 20.8	4.1 4.7 6.7 5.5 5.7	37.8 38.8 40.6 40.6 38.0	5.3 2.5 6.3 4.5 6.8	0.0 0.0 0.0 0.0		94.4 24.1 44.4 23.4	156 34 55 39	0 0 0	7 7 6 4 5	325 335 X 362	124 118	26.1 33.0 10.9 18.5	PETERBOROUGH PICKLE LAKE RED LAKE ST. CATHARINES	15.7 17.0 16.5 19.1 18.3	-0.6 0.2 2.6 3.8 -0.7	36.4 34.4 34.0 34.5 34.6	1.1 0.3 3.1 3.4 6.3	0.0 0.0 0.0		63.6 41.2 119.4 78.2 18.6	93 27	000 00	13 10 3	298 X		100
ANIUM CITY WYARD PKTON	20.8 20.5	5.6 5.0	38.5 37.0	4.9 8.0	0.0		72.1 17.4 38.8	95 23 54	0	1	X 320 293	128 109 101	15.8 15.0	SARNIA SAULT STE. MARIE SIOUX LOOKOUT SUDBURY	18.6 15.2 18.8 15.7	0.5 0.6 3.6 -0.3	39.1 32.8 33.6 32.4	7.0 1.8 5.8 2.0	0.0 0.0 0.0		10.2 104.3 37.1	30 13 113 44	0 0	3 3 8 4	X	129 127 116 115	9:
ANITOBA														THUNDER BAY TIMMINS TORONTO	16.0 13.8 19.7	2.0 -0.8 0.6	34.8 31.5 35.3	2.3 -0.3 7.9	0.0		32.1 62.5 16.6	41 69 25	0	7 8 5	X	115	14:
ANDON URCHILL UPHIN LAM	21.3 7.1 20.6 13.4 20.5	5.2 0.9 4.8 3.1 4.7	37.0 27.3 36.8 28.4 36.7	8.2 -2.6 8.7 -0.6 5.5	0.0 0.0 0.0 0.0		39.0 18.3 28.3 41.9 51.0	50 42 32 136 55	0 0 0 0	4 46 7 6	276 303 X 354	118 111 120	12.9 306.i 14.3 145.1 16.2	TORONTO INT'L TORONTO ISLAND TRENTON WATERLOO-WELL WAWA	17.7 18.6 17.1 16.9 11.7	0.0 1.5 -0.7 -0.6	36.0 34.5 32.1 36.1 28.0	3.3 8.7 3.0 3.0 -0.1	0.0 0.0 0.0 0.0	•	25.0 13.9 50.4 8.8 90.2	37 20 79 11	0 0 0 0	6 2 8	X		6 3 7 8 33:
AND LAKE IN LAKE RWAY HOUSE OT MOUND RTAGE LA PRAIRIE	16.9 14.9 17.9 22.3	3.7 2.8	34.2 28.6 33.4	5.4 1.1 8.0	0.0 0.0 0.0	•		119 138	0	7 10 7	X 262	99	64.1 106.9 43.9	WIARTON WINDSOR	15.2 21.1	-0.4 1.4	31.0 40.2	1.0 6.5	0.0		66.7 27.2	99 30	0	3	334 X	115	111

181

													JUNE	1988													
STATION	Tem	Difference from Normal	Maximum	Minimum	Snowfall (cm)	Z of Normal Snowfall	Total Precipitation (mm)	X of Normal Precipitation	Snow on ground at end of month (cm)	No. of days with Precip 1.0 mm or more	Bright Sunshine (hours)	2 of Normal Bright Sunshine	Degree Days below 18 C	STATION	Ten	Difference from Normal	Maximum	Minimum	Snowfall (cm)	X of Normal Snowfall	Total Precipitation (mm)	Z of Normal Precipitation	Snow on ground at end of month (cm)	No. of days with Precip 1.0 mm or more	Bright Sunshine (hours)	Z of Normal Bright Sunshine	Degree Days below 18 C
QUEBEC														NOVA SCOTIA			38	**									100
BAGOTVILLE BAIE COMEAU BLANC SABLON CHIBOUGAMAU GASPE	14.1 11.4 7.3 11.5 11.3	-1.4 -1.3 0.3 -2.2 -2.3	34.8 24.4 13.8 30.2 29.9	-1.1 1.6 1.0 0.8 -1.2	0.0 0.0 0.4 0.4	400 100	93.4 111.4 113.8 90.2 90.0	103 131 121 83 153	0 0 0 0	10 10 15 14 11	184 113 227 160	* 97 *	135.2 197.7 198.6 201.8	GREENWOOD HALIFAX INT'L SABLE ISLAND SHEARWATER SYDNEY	14.7 13.4 11.1 12.7 12.4	-1.2 -1.4 0.1 -1.2 -0.8	33.7 32.3 17.6 26.9 32.7	2.3 3.2 4.5 4.3 2.6	0.0 0.0 0.0 0.0		73.6 87.9 142.6 138.2 100.1	102 98 152 164 121	0 0 0 0	11 13 14 12 13	X 0 145 206 161	88 93 71	123.1 147.7 206.6 160.1 173.4
INUKJUAK KUUJJUAQ KUUJJUARAPIK LA GRANDE RIVIERE MANIWAKI	4.9 4.9 5.8 9.5 14.7	0.5 -2.0 -0.7 * -1.2	20.4 18.7 24.0 26.0 33.0	-2.4 -1.8 -1.4 -2.4 1.4	1.6 6.6 3.3 3.6 0.0	43 183 68	13.0 27.0 30.7 43.4 59.5	37 53 54 8 66	0 0 0 0	4 8 5 6 7	250 139 241 290 264	129 77 128 * 106	392.9 389.9 366.9 255./ 129.9	PRINCE EDWARD	12.8	-0.6	24.6	3.9	0.0		114.0	140	0	10	229	108	156.0
MATAGAMI MONT JOLI MONTREAL INT'L MONTREAL M INT'L NATASHQUAN	10.1 13.3 17.2 15.8 9.9	-3.1 -1.0 -1.1 * -0.6	29.2 29.2 33.4 33.4 18.8	-3.4 0.3 4.6 0.6 3.3	0.0 0.0 0.0 0.0	•	121.6 126.4 72.0 87.6 93.4	201 87 *	0 0 0 0	17 12 5 6 11	225 180 257 202	94 74 103 # 88	237.6 152.1 74.3 101.4 235.2	CHARLOTTETOWN SUMMERSIDE NEWFOUNDLAND	12.6 13.3	-1.9 -1.6	30.7 28.8	2.0 2.9	0.0		95.4 46.2	119 62	0	16 13	T/3	71	171.9 151.5
QUEBEC ROBERVAL SCHEFFERVILLE SEPT-ILES SHERBROOKE	16.0 14.2 7.1 10.6 14.4	-0.4 -1.3 -1.5 -1.1 -1.1	33.9 32.8 22.0 24.9 32.6	3.0 2.9 -4.6 2.5 1.5	0.0 0.0 12.6 0.0 0.0	177	65.2 98.7 34.4 95.7 74.5	121 46 106	0 0 0 0	9 12 8 13 8	239 200 167 167 260	106 * 71 *	97.7 133.2 328.7 220.5 129.1	BATTLE HARBOUR BONAVISTA BURGEO CARTWRIGHT	8.3 10.1 8.9 6.9	1.7 0.5 0.7 1.5	24.5 24.9 15.6 24.4	-1.0 0.1 2.4 -0.1	1.0 8.2 0.0 4.6	111 683 184	154.8 185.2 248.3 183.7	182	0 0 0	17 16 15 19	X X * 99	55	291.8 239.3 275.4 334.7
STE AGATHE DES MONTS ST-HUBERT VAL D'OR NEW BRUNSWICK	14.5 17.2 13.0	-0.5 -1.0 -1.6	31.7 34.7 30.1	-1.0 1.9 -1.3	0.0		100.0 62.4 99.0	72	0	8 5 12	256 * 241	107	132.2 77.7 167.6	CHURCHILL FALLS COMFORT COVE DANIEL'S HARBOUR DEER LAKE GANDER INT'L	8.0 10.9 10.9 11.2 10.9	-1.8 -0.8 1.1 -0.5 -0.9	24.8 32.0 22.6 32.2 30.3	-1.7 -0.4 2.4 -0.2 -0.3	29.4 13.6 0.0 0.0 22.2	588 715 792	70.9 145.1 107.3 108.0 165.0	182 124 152	0000	9 15 14 12 14	172 X 144 X 142	91 75 77	299.9 216.5 208.3 206.4 217.9
CHARLO CHATHAM FREDERICTON MONCTON SAINT JOHN	12.7 14.1 15.1 13.4 13.1	-1.6 -1.6 -1.1 -1.6 -0.7	31.0 33.2 33.9 32.4 28.3	2.7 2.7 -0.1 0.8 0.7	0.0 0.0 0.0 0.0 0.0		89.0 81.2 48.9 72.9 74.9	99 57 81	0 0 0 0	9 12 7 11 13	175 202 * 188 214	74 88 83 105	168.6 144.0 114.2 153.0 152.6	GOOSE PORT-AUX-BASQUES ST ANTHONY ST JOHN'S ST LAWRENCE	9.2 8.6 6.6 11.7 9.7	-2.1 -0.4 -1.5 0.8 1.4	27.2 17.2 24.0 27.6 20.8	0.3 2.2 -0.6 0.9 2.1	3.0 0.0 11.7 0.6 0.0	81 30 *	126.0 131.1 126.0 177.5 341.3	127 126 207	0 0 0 0	14 16 18 14 15	138 145 182	73 * 97 *	264.0 271.9 324.7 197.7 249.7
STAHON				8				Assert March 1997						STEPHENVILLE WABUSH LAKE	10.9	-1.0 -1.6	22.6 23.7	2.4	0.0 4.2	•	107.3 47.8	124 53	0	14 11	144		208.3 311.3
	18			1				A MISSISSION OF				223	E.														

### AGROCLIMATOLOGICAL STATIONS

### JUNE 1988

	Ten	peratur	e C					month (cm)			Degree above	days 5 C		Tem	peratur	e C					h (cm)			Degree above	days 5 C
STATION	Mean	Difference from Normal	Maximum	Minimum	Snowfall (cm) Total Precipitation (mm)	% of Normal Precipitation	Snow on ground at end of mont	No. of days with Precip 1.0 mm or more	Bright Sunshine (hours)	This month	Since jan. ist	STATION	Mean	Dirference from Normal	Maximum	Winimum	Snowfall (cm)	Total Precipitation (mm)	2 of Normal Precipitation	Snow on ground at end of month	No. of days with Precip 1.0 mm or more	Sunshine (hours)	This month	Since Jan. ist	
																	- 20		15						
BRITISH																	401								
AGASSIZ	15.2	-0.4	30.0	5.5	0.0	61.7	77	0	12	194	3045	836.4	GUELPH HARROW	17.0	-0.4	36.2	0.5	0.0	11.3	16	0	•	307	358.8	688.
IDNEY UMMERLAND	14.4	0.1	27.0 33.0	13.0	0.0	37.1 46.8	153	0	7	272 230	281.5 377.1	673.9 858.3	KAPUSKASING	13.2	-0.9	38.0	0.5 5.0 -1.0	0.0	11.3 23.0 77.3	16 31 95	0	10	307 348 204	358.8 468.3 242.4	941. 408.
ALBERTA							15 3 E	34			L MU		OTTAWA SMITHFIELD	18.0	-0.1 0.7	35.3 32.3 35.4	5.1 3.3 6.0	0.0	97.0 52.6	121 85 149	0	7	283 N/A 309	388.7 390.0 422.8	748. 768. 753.
EAVERLODGE LLERSLIE	13.0	-0.1	26.0	3.0	0.0	102.0	149	0	12	253	247.5	503.3	VINELAND STATION	19.1	0.7	35.4	6.0	0.0	10.6	149	0	3	309	472.8	753.
ACOMBE ETHBRIDGE	15.5	1.8	28.5	1.5	0.0	110.8	137	0	8	302	312.5	585.8	QUEBEC				2.1								
EGREVILLE	17.1	2.9	31.5	3.5	0.0	139.3	190	0	11	N/A	364.1	669.8	L'ASSUMPTION LENNOXVILLE	15.3	-0.4	32.0 35.0	2.0	0.0	101.8 78.4	93	0	10	235 256	309.1 365.3	517. 701.
SASKATCHEWAN					Seller Seller		120		Š. 118	~^	3021	009.0	NORMANDIN ST. AUGUSTIN	13.4	-1.2	32.5	0.0	0.0	86.8	113	0	11	223	254.7	441.
NDIAN HEAD IELFORT	21.6 20.4	6.0	38.0	8.0 4.5 5.0	0.0	43.8 16.5	59	0	4	200	502.0	843.0	STE CLOTHILDE	17.0	-0.7	34.5	2.0	0.0	93.2	108	0	7	266	359.3	715.
REGINA SASKATOON SCOTT SWIFT CURRENT SOUTH	22.2 21.3 19.3 21.1	5.1 6.5 5.7 4.8 5.6	39.0 41.0 41.0 36.0 38.5	5.0 4.0 5.0 7.0	0.0 0.0 0.0 0.0 0.0	29.4 23.4 89.0 73.0	23 40 39 134 99	00000	36486	290 N/A 323 331 345	455.0 531.3 424.1 502.1	766.0 853.5 880.5 752.1 880.5	NEW BRUNSWICK FREDERICTON NOVA SCOTIA	15.4	-0.6	33.5	2.5	0.0	49.8	56	0	10	233	310.2	570.
MANITOBA BRANDON	22.3	6.0	39.0	5.6	0.0	18.0	22	0	8	N/A	519.4	894.4	NAPPAN	13.5	-1.2	29.5	0.0	0.0	73.2	93	0	13	188	256.8	464.:
IENLEA IORDEN	21.9 22.9	5.0 5.5	39.0 36.5 37.0	5.6 5.5 4.5	0.0 0.0 0.0	18.0 24.6 43.0	22 28 57	0	4 3	N/A 352 342	519.4 508.2 536.5	819.6 974.0	PRINCE EDWARD												
ONTARIO													CHARLOTTETOWN	13.4	-1.5	30.5	1.5	0.0	89.4	121	0	14	180	250.3	443.3
DELHI GLORA	18.3 16.5	0.0	34.0 35.2	4.0	0.0	14.8 22.8	81 26	0	\$	346 N/A	405.1 346.5	809.6 655.2	NEWFOUNDLAND ST. JOHN'S WEST	## P											
LIN LIN	20 k 10 k 20 k 10 k			82 -53 -33 -33 34	2 1 2 3 3 3							1 ±	MANUAL PROPERTY OF THE PROPERT	94 10 10 10 10		32.1 30.5 31.0									
Mark of the second seco												#4.1 #2.4 \$1.3 6.6		JUA -											