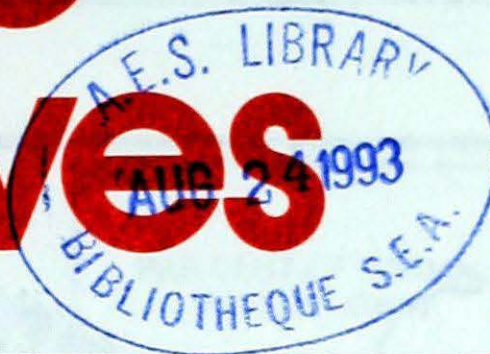




Environment
Canada

Environnement
Canada

Climatic Perspectives



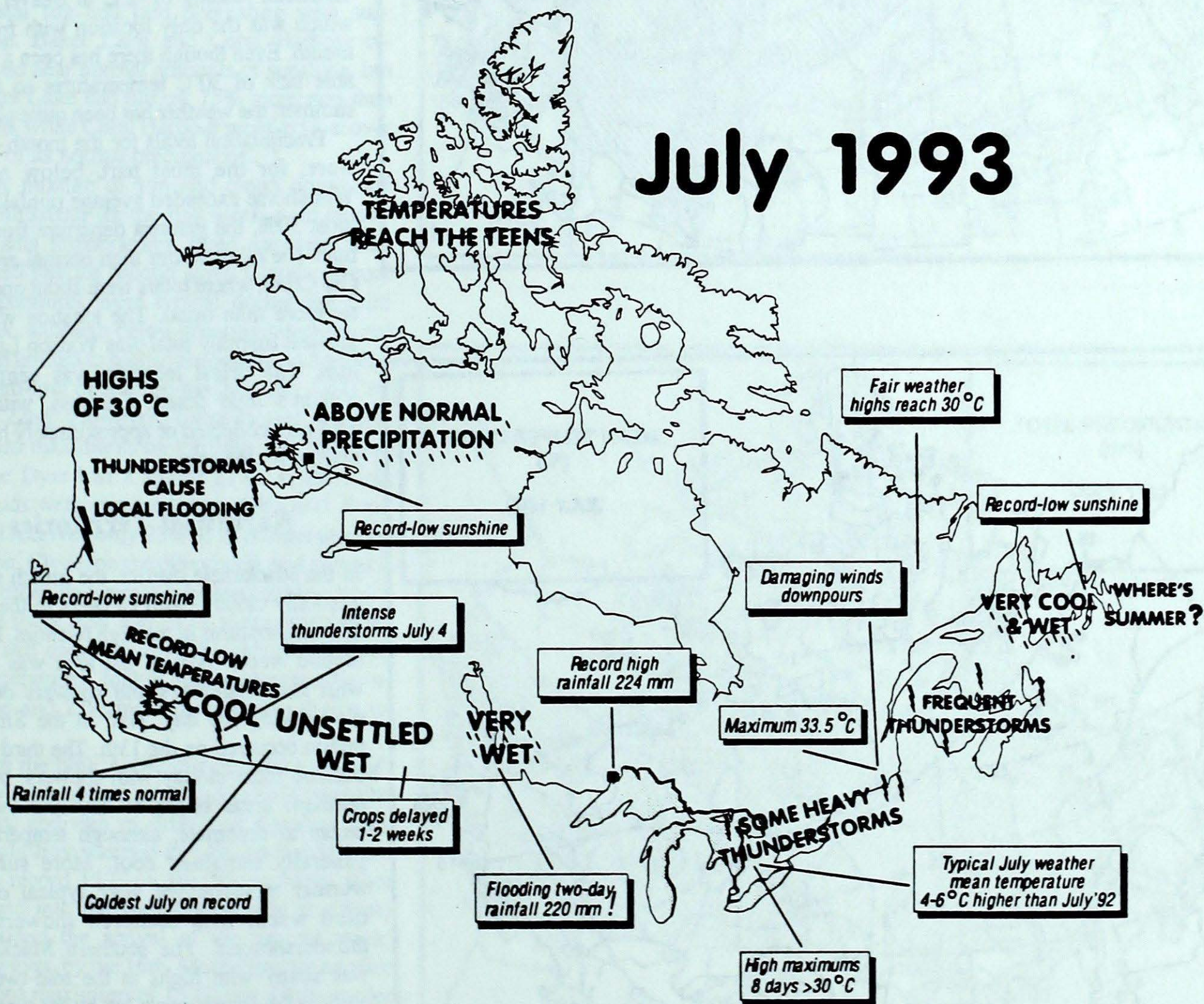
Monthly Review

July 1993

Vol. 15

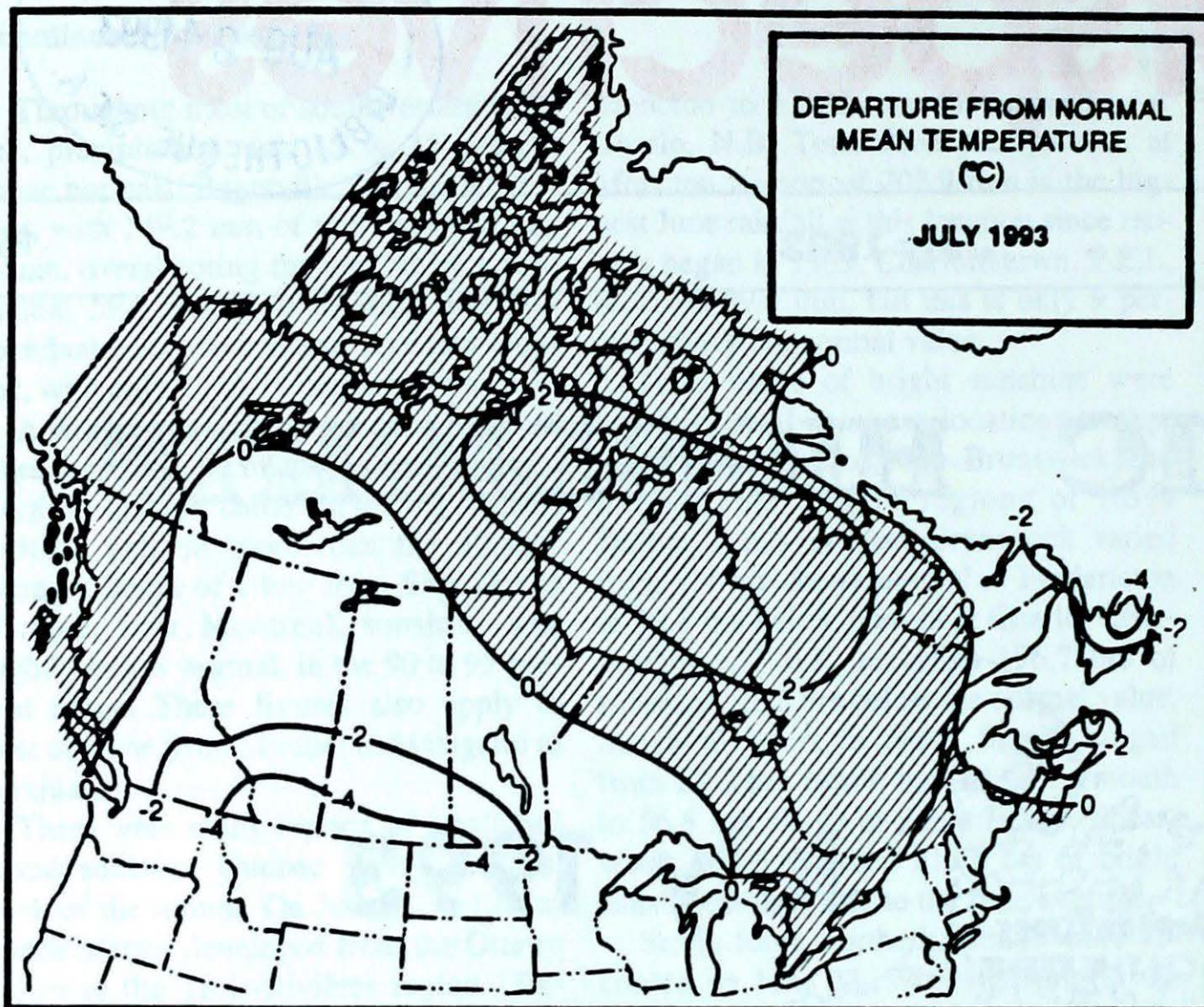
CLIMATIC HIGHLIGHTS

July 1993



Across the country

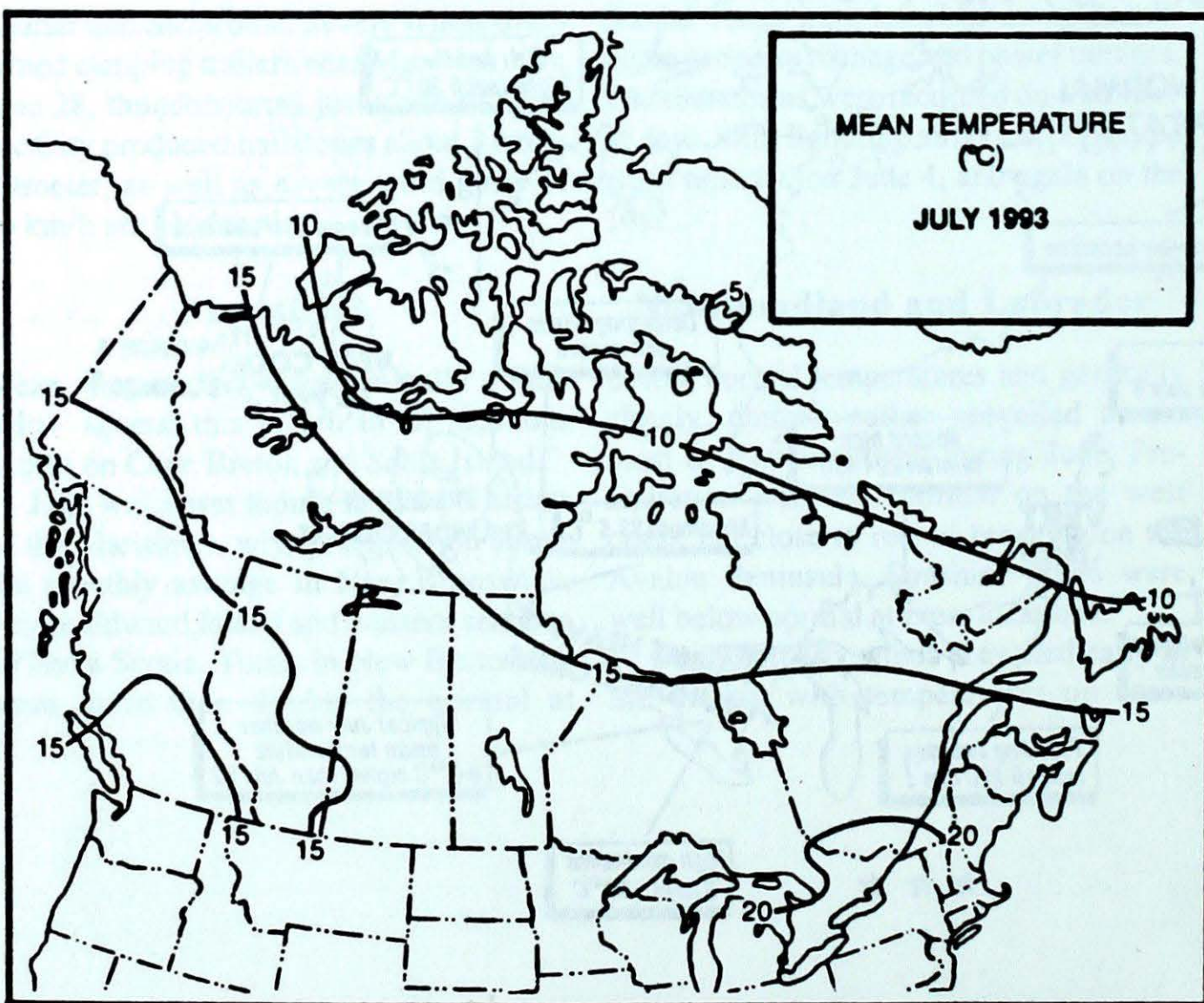
Yukon



Territory wide, temperatures were up to 2°C above normal, and precipitation was near or below average. Dawson City finally achieved a daily maximum of 30°C on July 14. This was also the warmest reading recorded during the month, and for that matter, the warmest reading of the year. Their 30°C reading was preceded seven days earlier with a daily maximum of just 15°C. The cold spot goes to both Burwash and Klondike, with daily minimums of just 1.0°C. There was an unofficial reading of -2°C at Beaver Creek, which was the only location with frost this month. Even though there has been a noticeable lack of 30°C temperatures so far this summer, the weather has been quite pleasant.

Precipitation totals for the month of July were, for the most part, below normal. Whitehorse exceeded average rainfall by almost 50%, the greatest departure from normal. The other wetter than normal area was Old Crow, where totals were about one quarter more than usual. The location with the greatest monthly total was Watson Lake, 62 mm. The driest location was centred in Yukon's little desert, Carcross, with only 13.4 mm collected or approximately half the normal for the area.

Northwest Territories



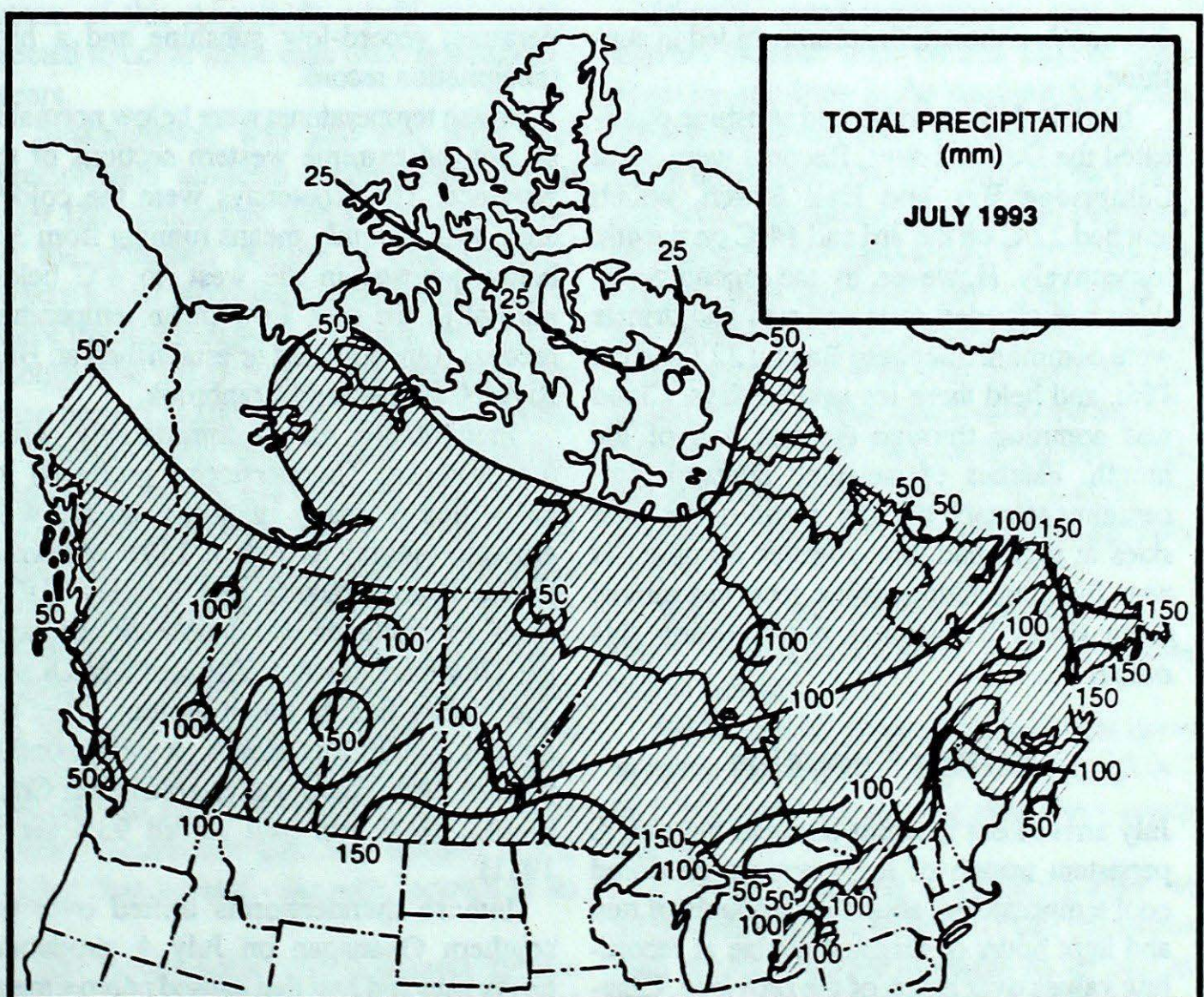
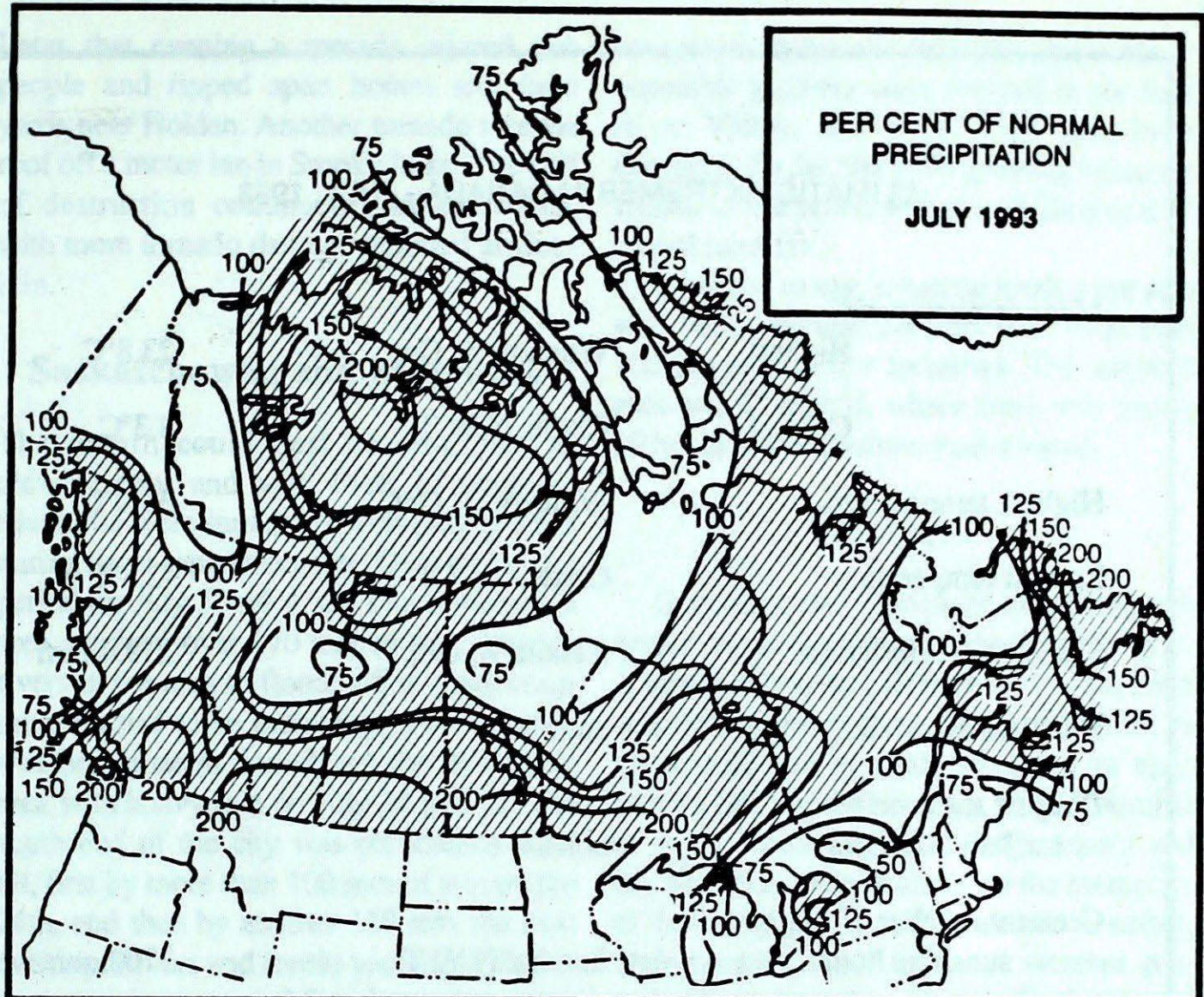
In the Mackenzie district, the month started generally cloudy, with showers in the north and temperatures in the high twenties. By the second week, most of the area was sunny with thundershowers and showers developing during the day. Hail in the Simpson region occurred on the 13th. The third week became more cloudy with showers, but the northern areas began to dry and the sun began to dominate, although temperatures generally remained cool. More sun and warmer temperatures were typical of the third week, with scattered showers and thundershowers. The southern Mackenzie was sunny with highs in the mid-twenties early in the fourth week, but by the weekend clouds and showers returned to most of the area. Yellowknife, this month, established a record-minimum 265.6 hours of bright sun-

shine and received almost twice its normal rainfall. In contrast, Fort Simpson received only 55% of its normal precipitation and had near normal sunshine.

In the Keewatin, sunny and warm weather was typical during the first week, although clouds and showers did catch the fringes of the district. Rankin Inlet began the month with its third straight day of record-warm weather. Cloud with rain and cooler temperatures ended the week before clearing began around the 11th. Some cloud passed by early in the third week, but skies cleared and temperatures climbed back into the mid-twenties, with a few records set at Rankin and Baker Lake. The month finished off with coastal fog and rain alternating with sunshine. Baker Lake and Coral Harbour received near normal amounts of sunshine, but Baker Lake had almost 75% more rain than usual, while Coral Harbour received just over half of its normal precipitation.

A mixture of sun and cloud dominated Baffin Island for the first week, with below-freezing temperatures. Gale warnings were posted into the second week. Cloud and cool temperatures were typical during the third week, although below-freezing temperatures were limited to higher elevations. Iqaluit set a record-low of zero on the 21st and 1.0°C on the 22nd. However, Cape Dorset set new record maximums on the 20th and 26th, and Cape Dyer had a record 21°C on the 23rd. Clouds were common at month's end. Pond Inlet received only 23% of its normal precipitation. Clyde, on the other hand, had almost 2 1/2 times its normal July precipitation and a little more than half of its average sunshine, but still ended the month with near-normal temperatures. Iqaluit had near-normal sunshine and 23% more precipitation than normal.

In the high Arctic, the month began with varying amounts of cloud, giving snow to Alert, and rain or drizzle at Resolute Bay. Mould Bay warmed to 14°C by the 5th, and to a record 15°C on the 7th, as sunny skies spread into the area. Cloud, rain or drizzle heralded the arrival of the second week. However, by the 16th, Mould Bay set another record maximum of 15°C, just a little cooler than Resolute Bay's record 16°C on the 15th. Clouds were common during the latter half of



CLIMATIC EXTREMES IN CANADA - JULY, 1993

Mean temperature:			
	Highest	Windsor A, Ont.	23.8°C
	Coldest	Clyde, N.W.T.	4.3°C
Highest temperature:		Windsor A, Ont.	34.0°C
Lowest temperature:		Clyde, N.W.T.	-2.8°C
Heaviest precipitation:		Kenora A, Ont.	259.4 mm
Heaviest snowfall:		none	
Deepest snow on the ground on July 31, 1993		none.	
Greatest number of bright sunshine hours:		Eureka, N.W.T.	370 hours

the month, although the month ended in sunshine.

In early July, warmth and sunshine dominated the Dewline sites. Records were set at Cambridge Bay and Hall Beach, which reached 22°C on the 3rd and 14°C on the 4th, respectively. However, by the second week, skies had clouded over and rain and drizzle were common. Shepherd Bay hit 22°C on the 15th, and held there for several days. Cloud was common through the last half of the month. Patches of sunshine allowed temperatures to reach the low twenties, but clear skies at night had temperatures dropping to near freezing. Coppermine received almost three times its normal precipitation this month.

British Columbia

July arrived but it seems summer did not. A persistent trough of low pressure produced cool temperatures, abundant amounts of rain and kept hours of bright sunshine at record-low values over much of the province. Cranbrook was the least fortunate location, establishing a new record-low mean tem-

perature, record-low sunshine and a high precipitation record.

Mean temperatures were below normal in all but the extreme western sections of the province. The Kootenays were the coldest area, with monthly means running from 3°C below average in the west, to 4°C below normal in the east. Low mean temperature records were equalled or established at: Blue River, Castlegar and Cranbrook.

Precipitation varied considerably across the province. Thunderstorms produced locally heavy rains in some areas, with amounts ranging as high as 150% of normal in the Peace, Parsnip and Bulkley Valley areas. Precipitation was double the normal in the Thompson district. The southern Okanagan Valley had as much as four times the normal rainfall this month. A new monthly precipitation record was established at Cranbrook, 101.6 mm (old record 93.5 set in 1981).

Intense thunderstorms drifted over the southern Okanagan on July 4, producing heavy rain and hail that caused approximately \$7 million damage to fruit crops. A thundershower produced more than 52 mm

of rain at White Rock (30 km south of Vancouver), in a 7-hour period on July 14, causing local flooding. Another thunderstorm event on July 20, dumped over 50 mm of rain in an 8-hour period on the northern Saanich Peninsula of Greater Victoria, breaking the all-time precipitation record for the month of July; some local flooding occurred, but the dry soil was able to absorb much of the moisture. Other areas of the province were not immune either; a thunderstorm caused local flooding along the Alaska highway on the 28th. On the 29th, Terrace received a daily record rainfall of 25.6 mm.

Sunshine was at an absolute minimum across the province, setting many new low sunshine records. The dullest area of the province was the south, where sunshine amounts hovered near 60% of normal. Areas around Hope and Cranbrook were closer to 55% of the long-term average. The Peace River district had only 70% of their normal sunshine, while the Charlottes saw only 60% of the average. The central interior had 80 to 85 percent of normal values, but this dimmed to 75% in the Thompson region and across Vancouver Island. Only the Terrace area received above-normal sunshine this month.

The following monthly low sunshine records were established: Abbotsford, 193.4 hours (old record 203.3 hours established in 1983); Castlegar, 186.0 (204.0, 1983); Cranbrook, 184.1 (254.4, 1983) Fort St. John, 216.2 (235.1, 1957); Germansen Landing, 184.8 (187.9, 1983); Port Alberni, 183.8 (184.9, 1983); Revelstoke, 179.0 (180.8, 1986); Vancouver, 200.9 (210.2, 1982); and Victoria, 244.6 (250.7, 1983).

Alberta

It was not the best of months for haying and camping. A persistent broad trough of low pressure lingered over Alberta for most of July, maintaining a cold, wet and unstable air mass over most of the province. The persistent cloud cover blocked out sunshine as well as providing a record or near-record number of days with measurable rainfall across the southern and western regions. The position of the jet stream has been well south of its normal location, allowing cool air to dominate across Alberta.

This was the coldest July on record for southern and western Alberta. Medicine Hat's mean monthly temperature of 15.9°C fell short of the old record, 16.5°C set in 1884. Calgary's 13.3°C tied their coldest July set in 1884. Banff (11.2°C) and Jasper (13.6°C) also broke their old records (11.8°C) in 1912 and (14.1°C) in 1921, respectively. Grande Prairie (14.3°C) broke the old record (14.8°C) set in 1933. Records were also established at Coronation (14.2°C), Edson (12.7°C), Lethbridge (14.4°C), Pincher Creek (12.4°C) and Red Deer (13.2°C). The cold air mass over the province during the month resulted in fifteen new daily minimum temperature records being set. The lowest record was set at Banff, -0.2°C on the 15th!

Warm air finally pushed into southern and eastern Alberta on the 28th and 29th. Temperatures rose to 30 degrees on the 29th in southern and eastern regions, marking the only 30°C day in July. Medicine Hat reached 34°C, while a new daily maximum was set at Cold Lake (31.0°C).

A series of disturbances moving inland from the Pacific during the month maintained a constant supply of moisture and instability. On Canada Day, a low pressure area from British Columbia, moving through the northern regions, gave some locales 35 to 40 millimetres of rain. Another system crossed southern Alberta on the 7th and 8th dumping up to 35 mm. Central areas received up to 50 mm from a system creeping through the region from the 19th to 21st. Another impulse of moisture, crossing the southern regions, gave a further 30 mm on July 25 and 26.

The main rain producer during the month was afternoon thundershowers that built up in the unstable air mass from daytime heating. Sunny mornings constantly gave way to afternoon clouds and thundershowers. The frequent thunderstorms spawned numerous funnel clouds and small hail. A small tornado was reported near Medicine Hat on the 24th.

Summer came to an abrupt end at the end of the month, as an advancing cold front helped to develop severe thunderstorms with large hail, heavy downpours and damaging winds. A small tornado and golf-ball size hail were reported near Pigeon Lake at 5 pm.

Later that evening a tornado injured two people and ripped apart homes and farm yards near Holden. Another tornado tore the roof off a motor inn in Smoky Lake. The trail of destruction continued northeastwards, with more tornado damage reported at Conklin.

Saskatchewan and Manitoba

The month could best be described as cloudy, cool and wet. Parts of southern Manitoba were inundated with precipitation during three separate events. Over a two-day period on July 3 and 4, the Duck Mountain area received over 170 mm of rain, causing rivers in the area to flood; a few small communities had to be evacuated. Two separate weather systems inundated the Winnipeg area with heavy rain on July 24 and 25. The south end of the city was particularly hard hit, first by more than 100 mm of rain on the 24th, and then by another 119 mm the next evening. Rivers and creeks rose to levels seldom seen in summer. Many basements were flooded, as the city storm sewer system could not handle the unusual amount of water. A storm of this magnitude would not be expected to occur more than once in a hundred years.

Saskatchewan was also wet, with total precipitation amounts ranging from 82 to over 180 millimetres. The wettest areas were in the southeast portion of that province, where actual precipitation exceeded by up to three times, the expected amount for July. La Ronge was the only location reporting less than normal precipitation, but only by 2 mm.

Temperatures were cooler than normal during the month, and this July ranks among one of the coldest on record, following the same pattern as the Summer of '92. Days with maximum temperatures of 30°C or more were rare, and occurred only at a few locations. Extreme maximums were mainly in the upper twenties. Ironically, the area where temperatures averaged near or above normal was across the north. Churchill had a mean temperature that was actually 0.4°C higher than normal - the only location to do so.

The cool weather put a damper on the agricultural sector. Most crops are 5 to 15 days behind schedule, and many farmers are

concerned about an early fall frost. Many vegetable growers were flooded in the Red River Valley, and some crops have been damaged. So far, the 1993 growing season is similar to last years, with the addition of near record rainfalls.

Needless to say, sunshine totals were also well-below normal. Deficits were more than 100 hours at a few locations. The sunniest spot was Churchill, where there was nearly 10 hours more sunshine than normal.

Ontario

Overall, it was a pleasant summer month across most of southern and central Ontario. A month when both farmers and vacationers were able to enjoy the best of both worlds, as the rainfall was not only adequate for agriculture, but also fell on only a small number of days. Sunshine, warm temperatures and dry weekends helped diminish the memories of last July's miserable summer weather. Unfortunately, cool and wet weather prevailed in northwestern Ontario for the second successive July as the inclement Prairie weather spilled over into this region.

Monthly mean temperatures were 1 to 2 degrees warmer than normal east of Lake Superior, resulting in the warmest July since 1988 in the south, and 1989 in the northeast. More remarkable though, was the stark contrast when compared to July 1992. The mean temperature this month was 4 to 6 degrees warmer than last year's July - an amazing turn around for a summer month in Ontario, where over 95% of the Julys exhibit a range of less than 2°C from one July to the next! In addition, July 1993 featured many daily-high temperatures above 30°C (8 in Toronto for example), compared to none during July 1992.

West of Lake Superior, however, July's mean temperatures were 1 to 2 degrees below normal.

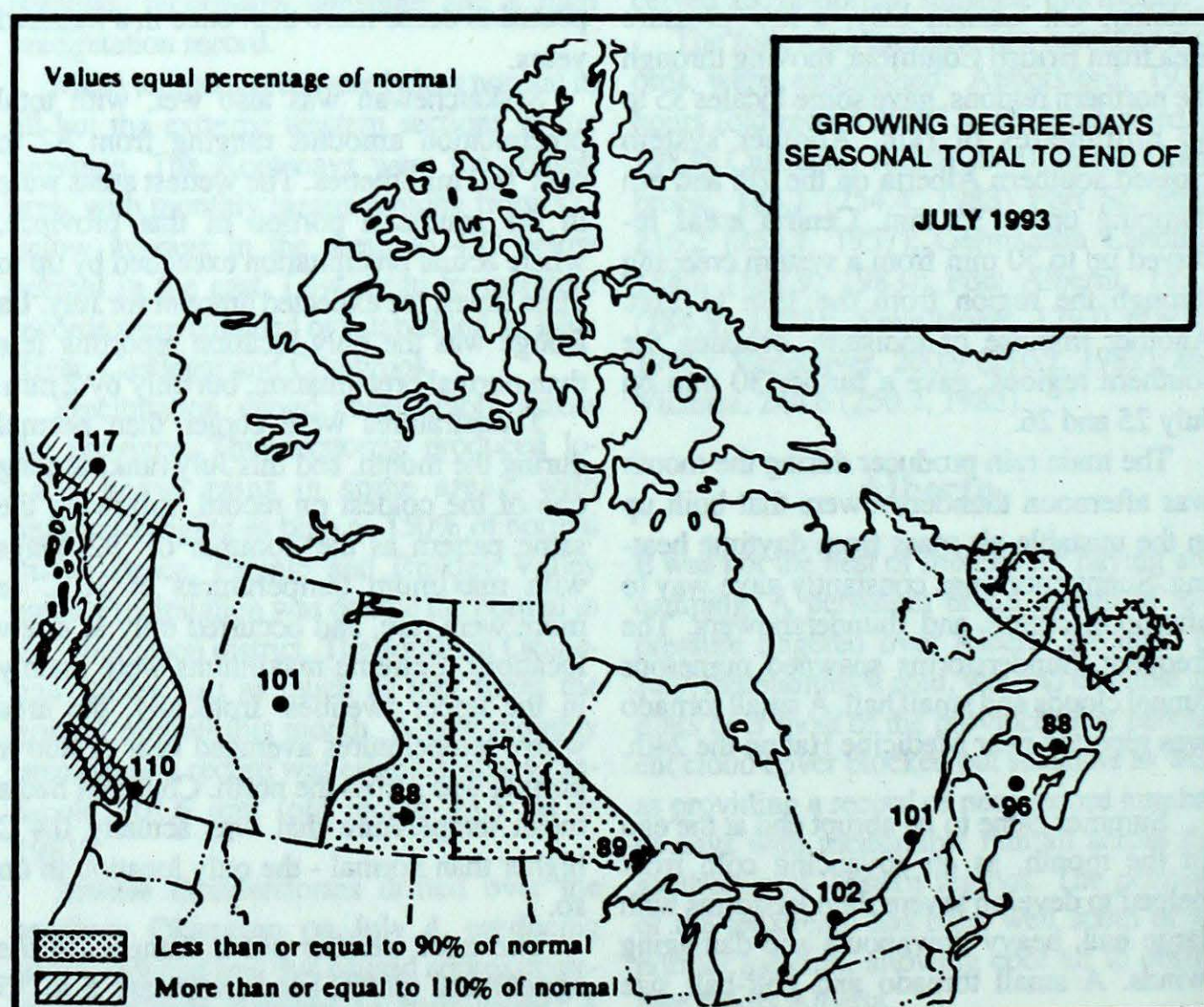
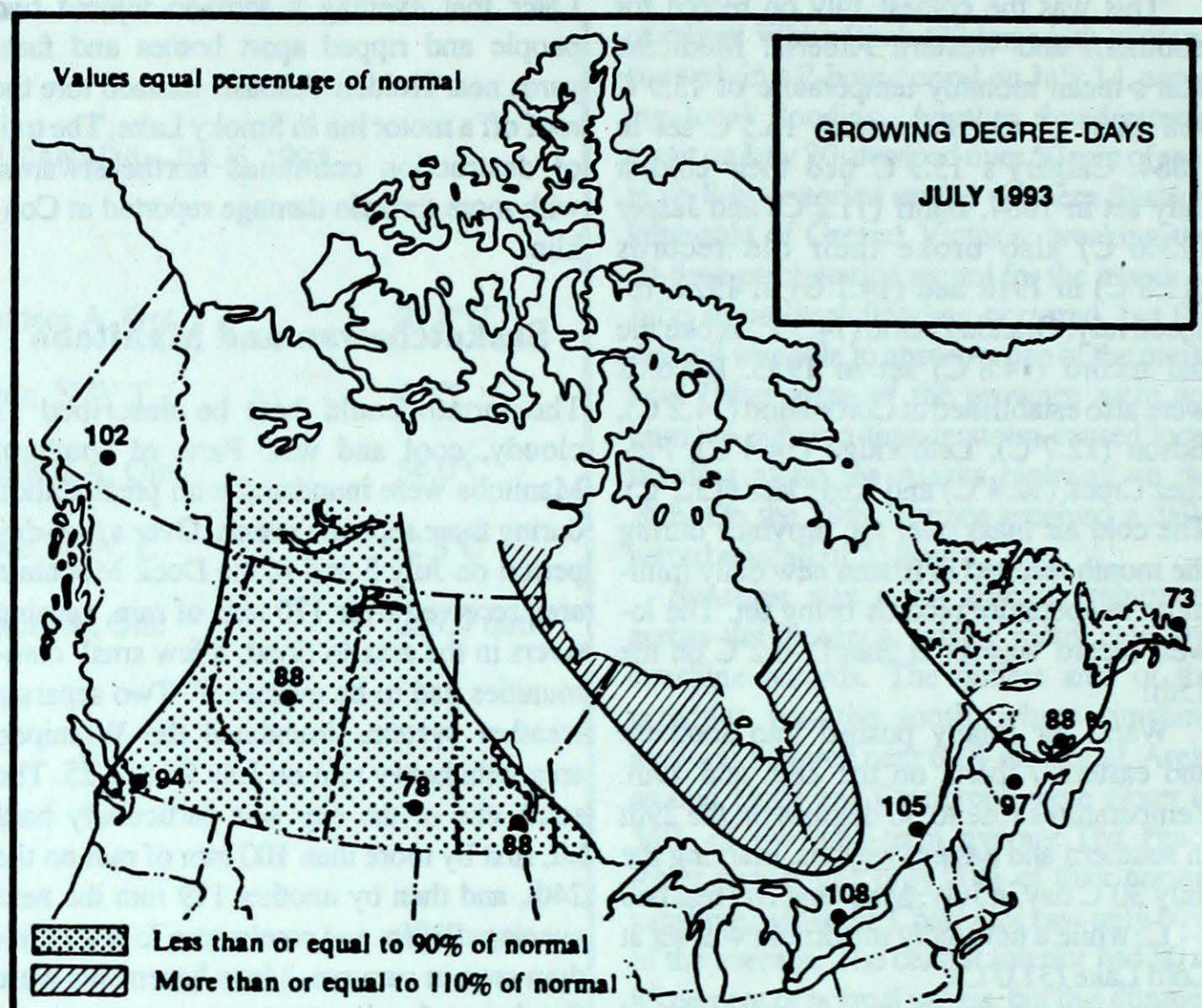
While rainfall totals did exceed the norm in many locales, the bulk of the rain fell in 2 or 3 major events, leaving most days sunny and dry.

Rainfall displayed a similar pattern to temperature, although in this case, the wetter than normal weather extended as far east as Timmins, and included isolated portions of southern Ontario from Muskoka to London.

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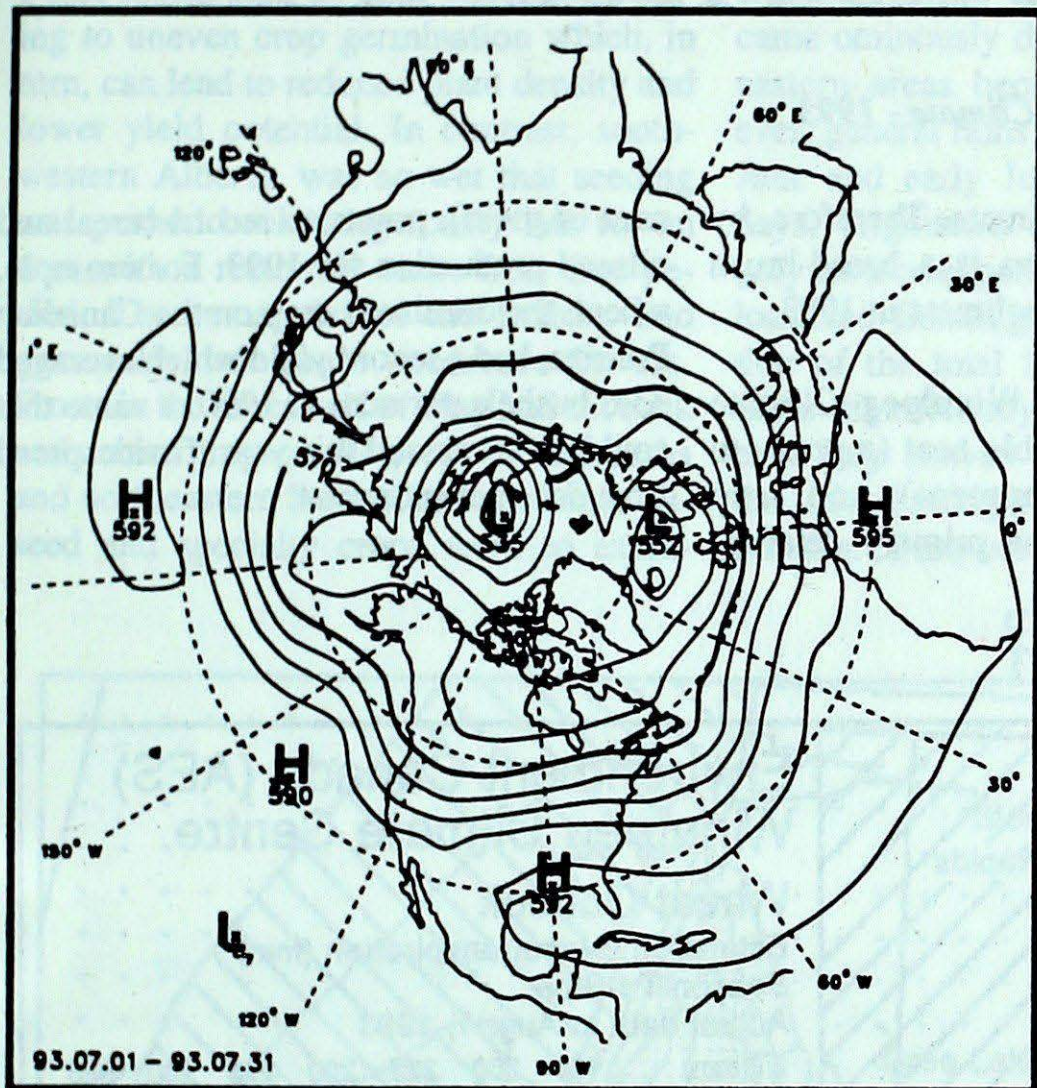
SEASONAL TOTAL OF GROWING
DEGREE-DAYS TO END OF JULY

	1993	1992	NORMAL
BRITISH COLUMBIA			
Abbotsford	1048	1293	910
Kamloops	1132	1472	1081
Penticton	1172	1381	1132
Prince George	848	750	689
Vancouver	1039	1260	940
Victoria	967	1091	864
ALBERTA			
Calgary	704	618	740
Edmonton Mun.	892	747	887
Grande Prairie	780	681	752
Lethbridge	853	734	927
Medicine Hat	939	801	1035
Peace River	803	653	734
SASKATCHEWAN			
Estevan	791	667	987
Prince Albert	760	544	826
Regina	826	701	934
Saskatoon	779	588	919
MANITOBA			
Brandon	766	625	920
Churchill	162	*	109
Winnipeg	756	680	876
ONTARIO			
London	1107	857	1077
North Bay	951	366	898
Ottawa	1149	1049	1102
Thunder Bay	642	532	719
Toronto	1103	1001	1078
Trenton	1088	976	1086
Windsor	1320	1184	1252
QUEBEC			
Baie Comeau	590	310	611
Maniwaki	925	812	925
Montréal	1139	1085	1128
Québec	1007	890	950
Sept-Îles	462	419	488
Sherbrooke	923	652	878
NEW BRUNSWICK			
Fredericton	859	797	892
Moncton	729	640	786
NOVA SCOTIA			
Sydney	710	599	710
Yarmouth	719	638	726
PRINCE EDWARD ISLAND			
Charlottetown	665	632	755
NEWFOUNDLAND			
Gander	231	225	367
St. John's	249	342	332
Stephenville	582	427	594

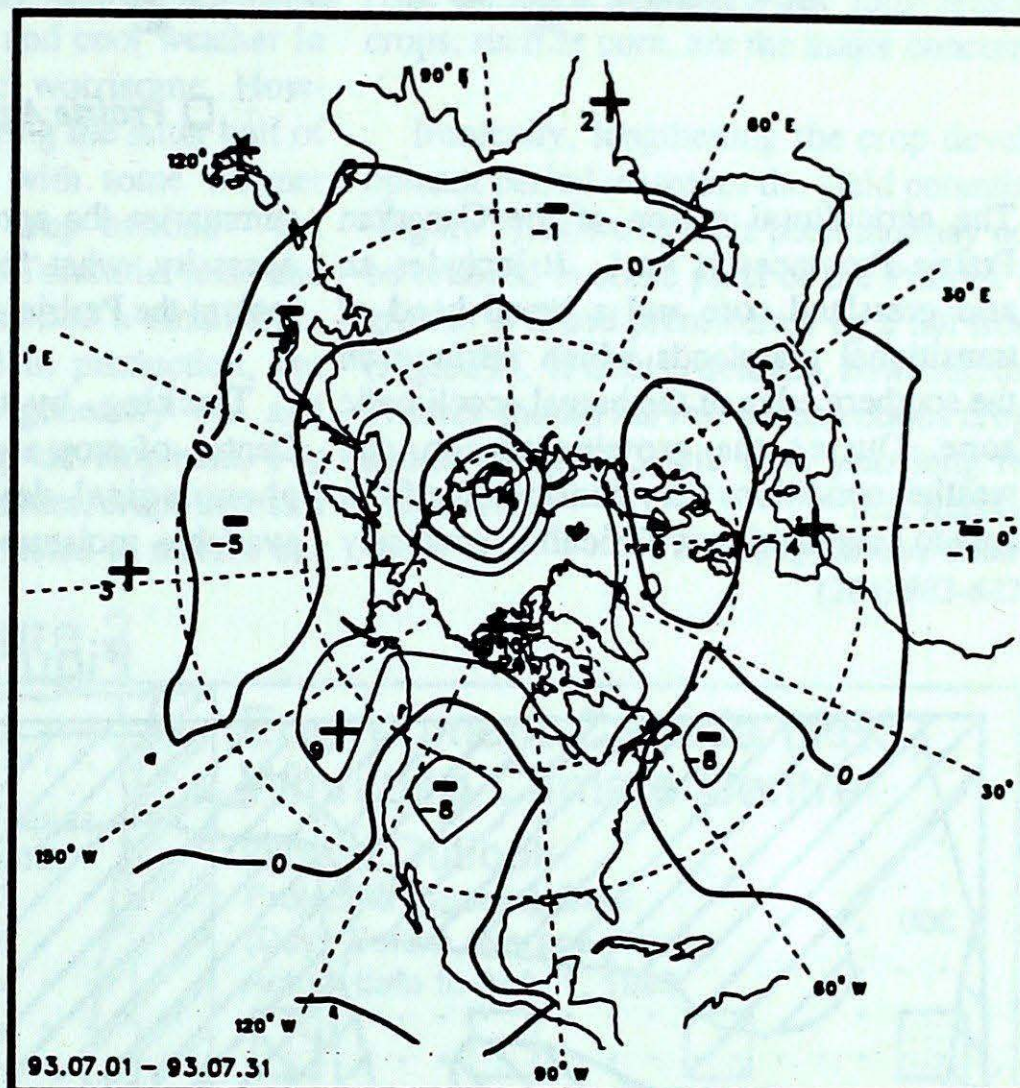


50-kPa ATMOSPHERIC CIRCULATION

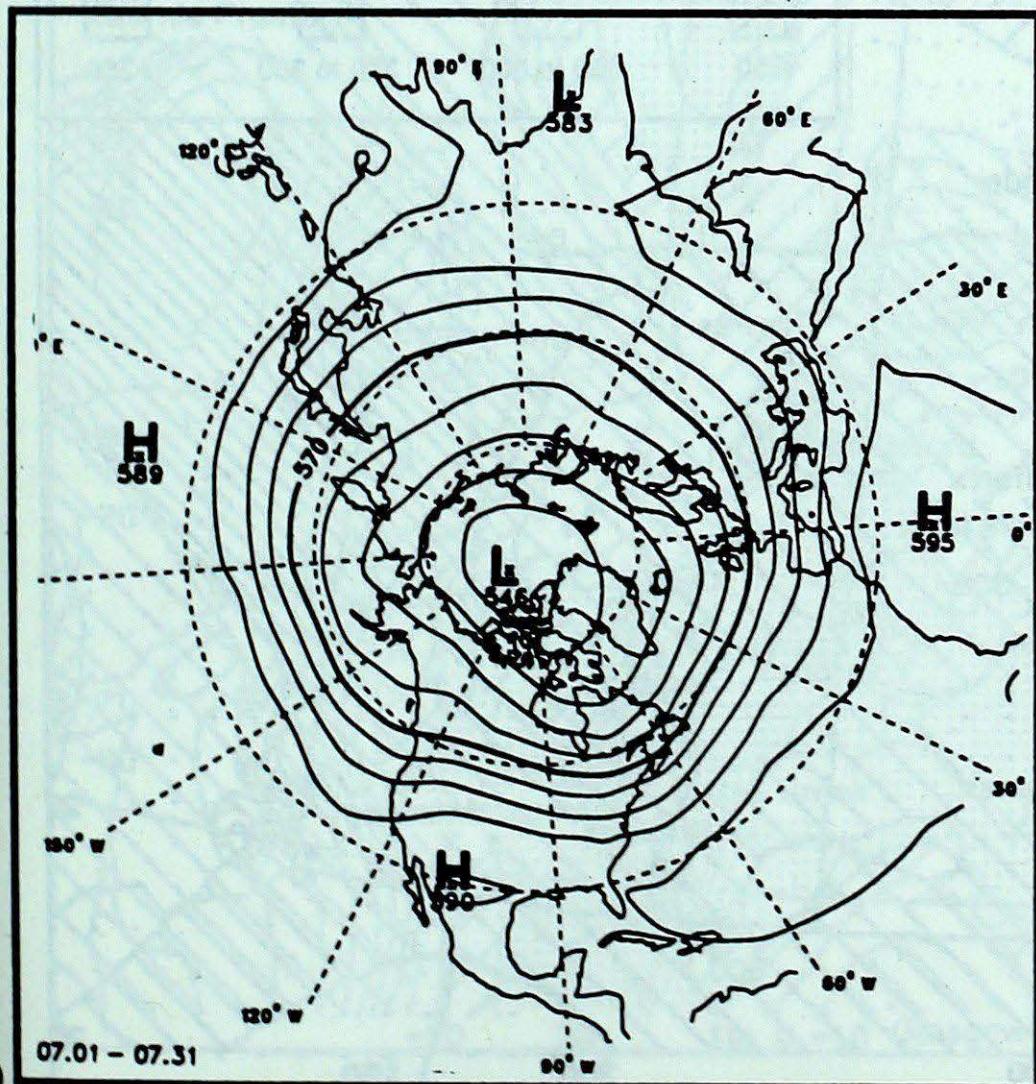
July 1993



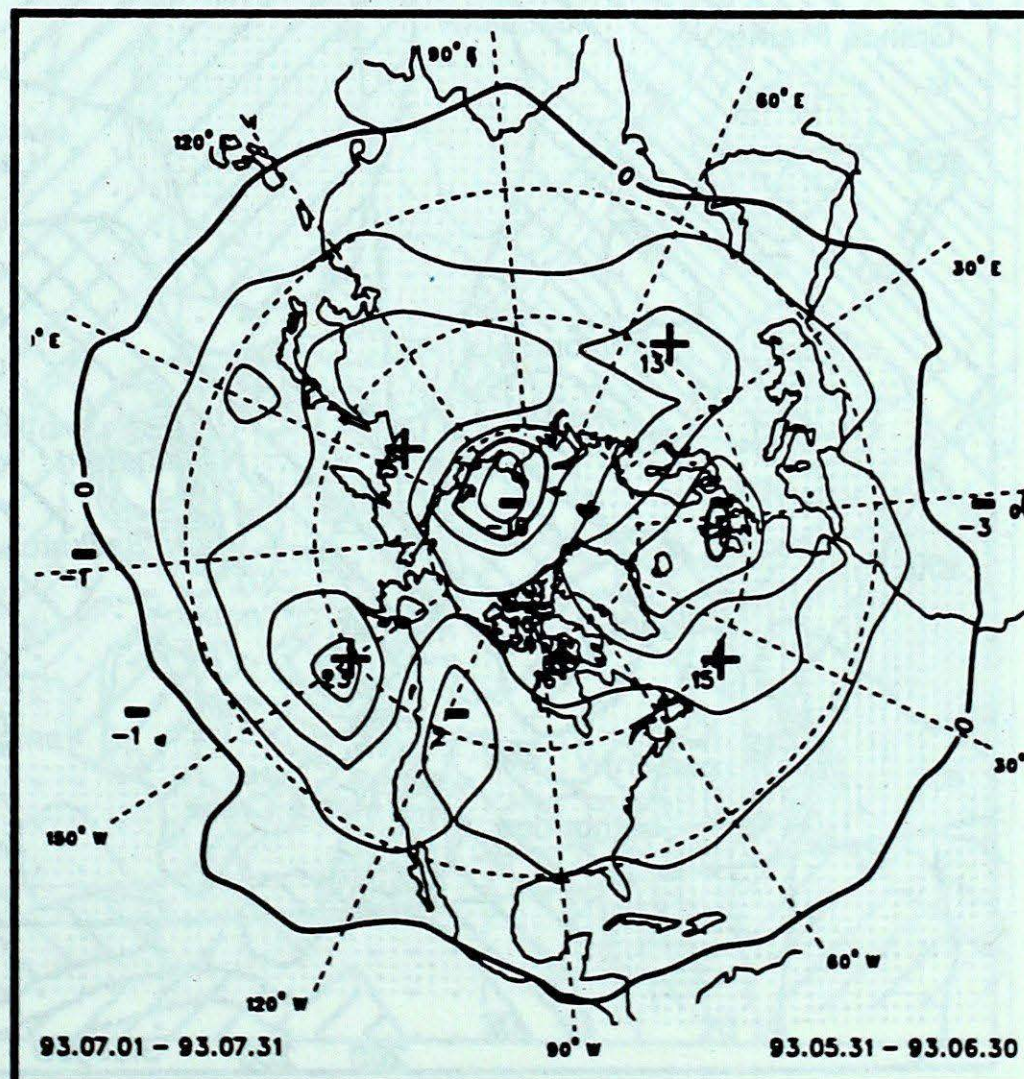
Mean geopotential heights
- 5 decametre interval -



Mean geopotential height anomaly
- 5 decametre interval -



Normal geopotential heights for the month
- 5 decametre interval -



Mean heights difference w/r to previous month
- 5 decametre interval -

Bumper crops at risk from frost

□ *Prairie Agro-Climate - 1993*

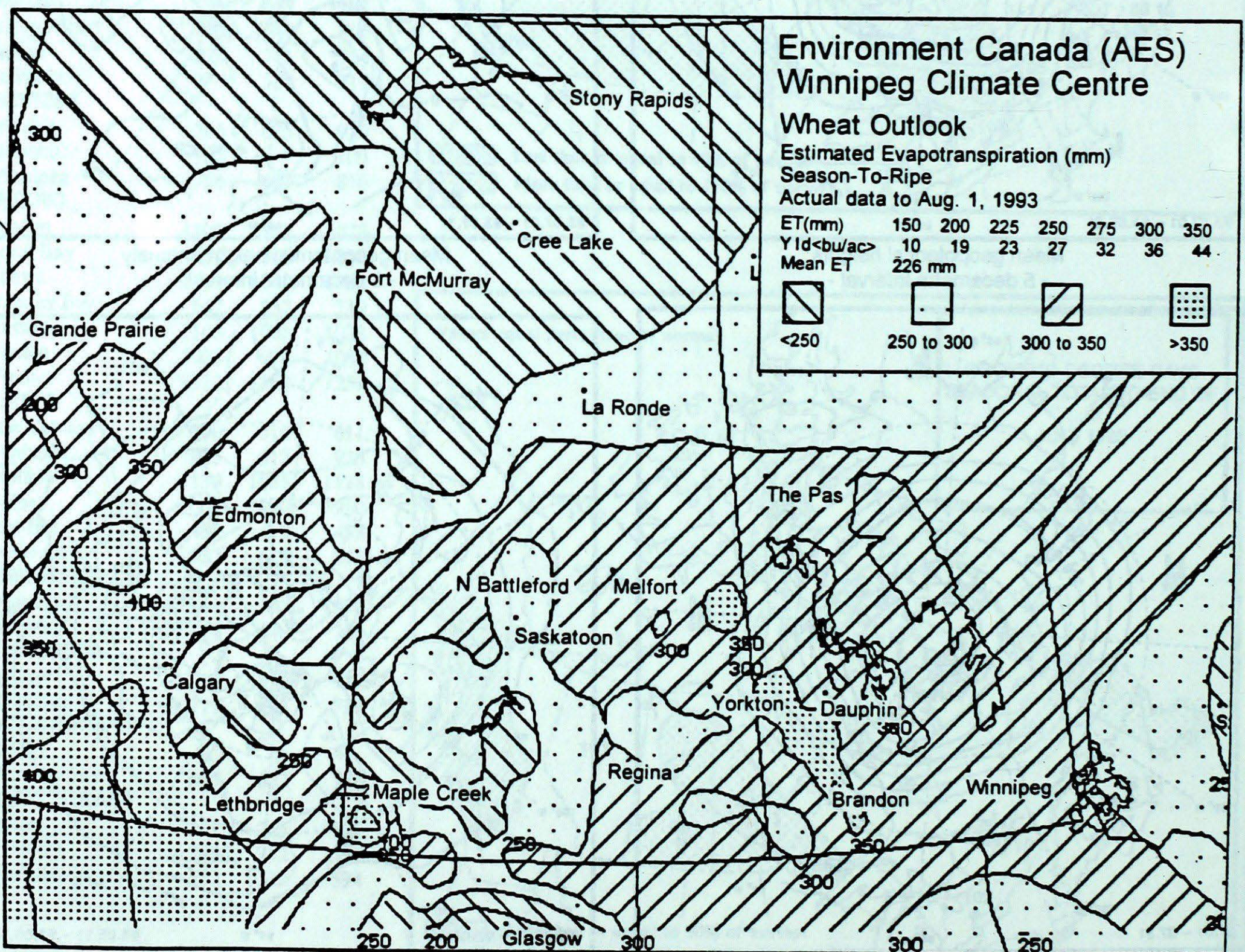
The agricultural region of the Canadian Prairie Provinces is vast. It includes an arid grassland core and a broad band of transitional grasslands which infringe on the southern edge of the boreal ecoclimatic zone. During the growing-season, the weather conditions vary considerably from area to area making it difficult to concisely

summarize the agroclimate. Therefore, by necessity, what follows is a broad-brush look at the Prairie agroclimate in 1993.

Tracking, by the Winnipeg Climate Centre, of crop available heat (a proxy to phenological development), and crop available moisture (the primary determi-

nant of yield), points to record cereal and oilseed production for 1993. For example, wheat, the dominant crop on the Canadian Prairies, had a record yield which averaged 33.6 bushels per acre in 1990, a value that could be surpassed this year if widespread frost does not intervene.

Figure 1



May 1993 gave variable soil moisture conditions to the Prairies. Southwestern Manitoba, southeastern Saskatchewan, northwestern Saskatchewan and Albert's Peace region had very dry conditions leading to uneven crop germination which, in turn, can lead to reduced plant density and lower yield potential. In contrast, southwestern Alberta, was so wet that seeding was pushed back dangerously late for an area with a relatively short frost free period. The remainder of the Prairies had generally adequate moisture levels. Frosts in the latter half of May had set back early emerging cereal crops in Manitoba and northeastern Saskatchewan. Some oilseed and specialty crops were so exten-

sively damaged by the frost that they had to be reseeded.

In the post-seeding period, the moisture situation across the western Prairies became ominously dry, and cool weather in eastern areas became worrisome. However, general rains during the latter half of June and early July, with some warmer days, brightened the crop outlook - but only for a brief period. Torrential rains and localized flooding drowned a small fraction of the total land in production, but more significantly, a generally wet and cool July slowed crop development. For the second straight summer, crops across a broad area are not expected to mature be-

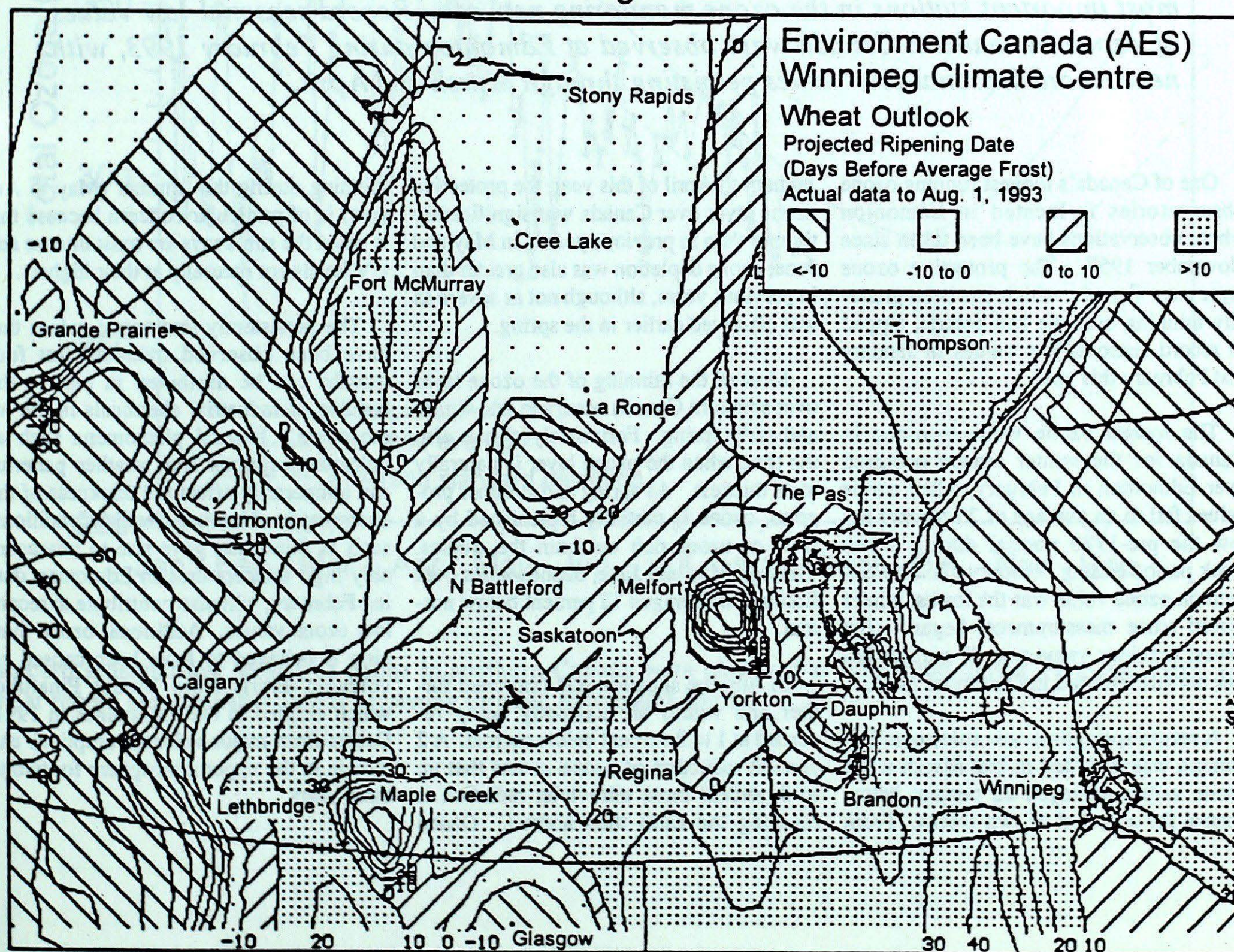
fore the mean date of the first fall frost. The northern portion of Saskatchewan's agricultural zone and northeastern and southwestern Alberta are particularly at risk while in Manitoba the long-season crops, such as corn, are the major concern.

Ironically, lengthening the crop development period increases the yield potential (Figure 1), however, this potential may not be realized in some parts of the Prairies if growth is ended prematurely by a fall frost (Figure 2). If frost is delayed, however, the Prairies should harvest a tremendous crop. Either way, 1993 will be a year long remembered.

R.L. Raddatz

Winnipeg Climate Centre
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Figure 2



NOTE: Grande Prairie and Edson Alberta recorded their first frost of the season on August 11 and 12.

Ozone watch

□ Stratospheric ozone depletion - Edmonton

The ozone layer is a naturally-produced chemical layer that surrounds the earth some 15 to 35 km above the surface. It serves as a shield against over exposure to the sun's ultraviolet rays. Edmonton has been measuring ozone since 1957 making it one of the most important stations in the ozone monitoring network. Record seasonal-low values of ozone in southern Canada were observed at Edmonton during February 1993, with near record seasonal-low values persisting through March and April.

One of Canada's longest running ozone observatories is located in Edmonton where observations have been taken since November 1957. The protective ozone layer over Canada, which has been gradually thinning over the last decade, dipped to record seasonal-low values in January and February this year.

The lowest ozone value recorded in Canada for the winter season occurred over Edmonton in February, when ozone values fell to an average of 25 percent below the pre-1980 normal during a two week period ending February 12. The Edmonton ozone value was the lowest winter record since measurements began. The lowest previous value was 21 percent below normal reported in December 1985.

A record springtime-low value over Edmonton was recorded in late March when ozone values averaged 22 percent below normal for a period of two weeks. From

January to April of this year, the protective ozone layer over Canada was significantly thinner than in previous years. In May and June, ozone depletion was also greater than in previous years, although not as severe as was observed earlier in the spring.

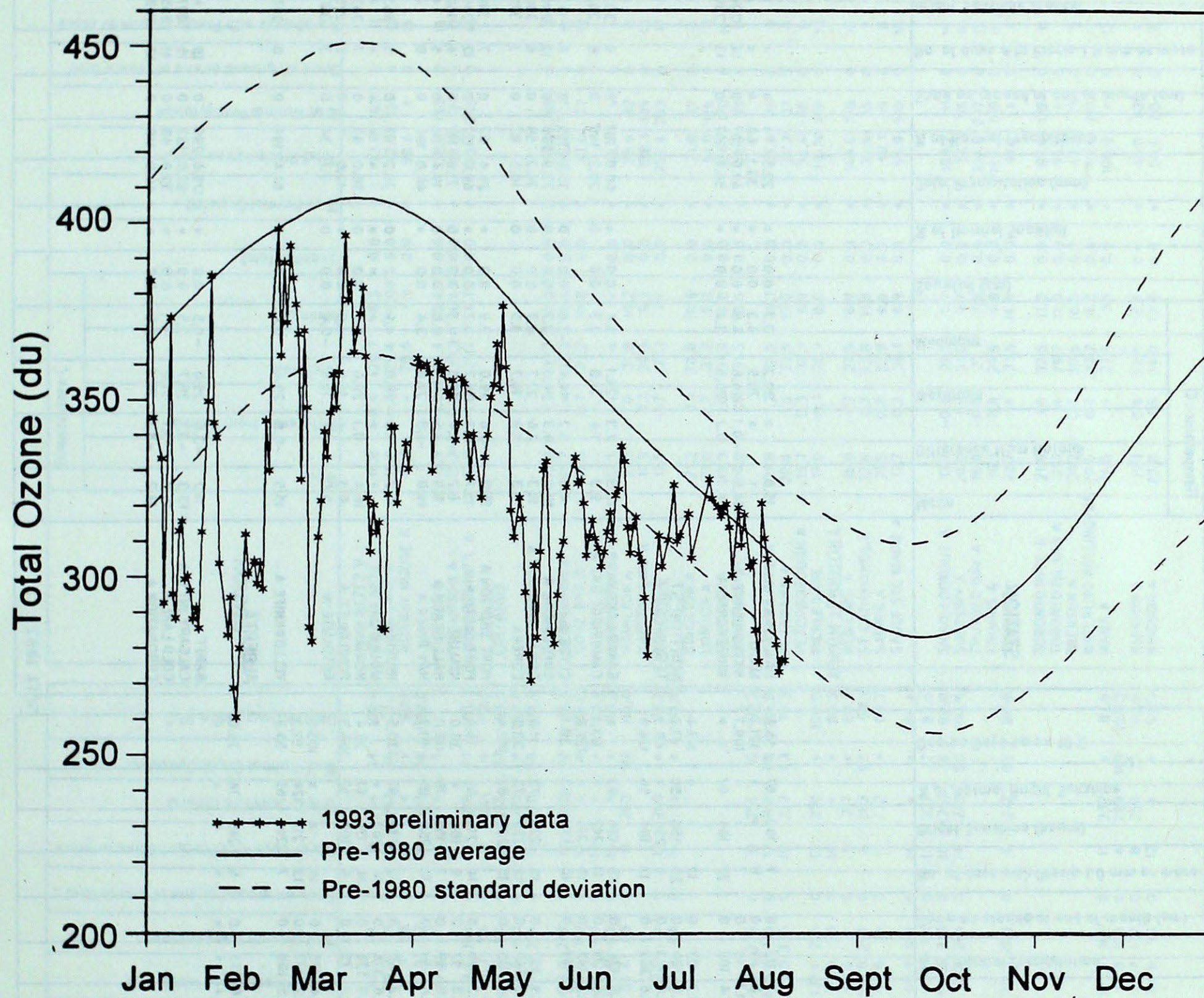
Most of the thinning of the ozone layer over southern Canada occurs in late winter and early spring. Fortunately, this is also the time when the ozone layer is naturally at its thickest. As spring and summer progress, ozone is partially replenished by a flow of ozone-rich air from the tropics. Through May and June, ozone values over Edmonton averaged 12 percent below normal.

In July the situation had improved further and values are currently being recorded at 1 to 2 percent below normal. A 2 percent reduction of ozone means that up to 3 percent more ultraviolet radiation is reaching the earth than normal. Ozone

thinning during the summer (May to August) is of particular concern because this is when the sun's rays are most intense and UV levels are naturally at their highest.

The persistently low ozone values that have been observed over the last four months can be attributed in part to the buildup of industrial chemicals in the atmosphere. Natural phenomena such as volcanic eruptions and weather patterns, can temporarily affect the thickness of the ozone layer. Unusual weather conditions, such as those that gave rise to unseasonably high temperatures in Edmonton during February, will also contribute to record low ozone values. Additional ozone thinning is believed to have been caused by volcanic debris from Mount Pinatubo, which erupted in the Philippines in 1991. Debris from major volcanic eruptions can remain in the upper atmosphere for two to three years.

Total Ozone Edmonton 1993



Record seasonal-low values of ozone in southern Canada were observed at Edmonton during February 1993, with near record seasonal-low values persisting through March and April.

JULY 1993

STATION	Temperature C				Snowfall (cm)	% of Normal Snowfall	Total Precipitation (mm)	% of Normal Precipitation	Snow on ground at end of month (cm)	No. of days with Precip 1.0 mm or more	Bright Sunshine (hours)	% of Normal Bright Sunshine	Degree Days below 18 C
	Mean	Difference from Normal	Maximum	Minimum									
BRITISH COLUMBIA													
ABBOTSFORD A	16.3	-0.7	25.0	7.8	0.0	*	46.3	112	0	7	193	67	55.6
ALERT BAY	14.1	0.1	20.0	7.6	0.0	*	25.8	49	0	8	*	*	121.2
AMPHITRITE POINT	14.5	0.6	19.5	10.4	0.0	*	51.1	70	0	7	*	*	109.7
BLUE RIVER A	14.6	-1.9	25.5	2.8	0.0	*	133.4	182	0	22	164	67	*
CAPE SCOTT	13.2	0.2	17.5	10.2	0.0	*	29.7	32	0	12	*	*	147.4
CASTLEGAR A	16.9	-3.2	31.8	7.5	0.0	*	53.6	136	0	20	186	59	47.2
COMOX A	16.5	-0.9	23.6	9.6	0.0	*	48.0	173	0	9	254	*	48.3
CRANBROOK A	14.1	-4.2	28.3	4.4	0.0	*	101.6	382	0	17	184	56	124.5
DEASE LAKE	12.8	0.3	22.2	1.1	0.0	0	68.8	124	0	15	186	93	*
FORT NELSON A	15.3	-1.3	26.7	3.8	0.0	*	59.8	71	0	11	242	*	83.1
FORT ST JOHN A	13.8	-1.8	23.5	5.1	0.0	*	109.2	142	0	15	216	*	129.8
HOPE A	16.9	-1.6	25.3	8.3	0.0	*	59.5	161	0	10	138	53	38.1
KAMLOOPS A	18.6	-2.2	29.4	8.7	0.0	*	57.9	257	0	15	229	73	11.0
KELOWNA A	17.3	-1.3	27.6	6.7	0.0	*	93.2	340	0	19	226	73	33.5
MACKENZIE A	14.7	0.0	25.0	2.7	0.0	*	70.4	115	0	15	235	87	101.4
PENTICTON A	18.1	-2.2	31.1	7.7	0.0	*	99.2	470	0	14	215	69	19.9
PORT ALBERNI A	16.9	-0.2	26.3	7.2	0.0	*	27.3	97	0	6	184	*	38.0
PORT HARDY A	14.2	0.6	20.7	8.4	0.0	*	30.8	59	0	7	155	78	119.0
PRINCE GEORGE A	15.0	-0.1	24.8	4.8	0.0	*	54.6	91	0	10	254	87	91.7
PRINCE RUPERT A	13.8	1.1	18.7	7.6	0.0	*	66.2	60	0	12	139	97	130.5
PRINCETON A	15.2	-2.6	27.0	5.4	0.0	*	84.6	376	0	14	203	*	*
REVELSTOKE A	17.3	-0.9	26.6	8.0	0.0	*	75.9	138	0	14	179	67	26.4
SANDSPIT A	14.7	0.7	20.7	10.1	0.0	*	32.2	75	0	6	106	57	106.3
SMITHERS A	14.6	-0.1	25.2	4.2	0.0	*	80.4	175	0	10	*	*	105.5
TERRACE A	16.3	0.2	26.3	8.2	0.0	*	83.2	147	0	13	217	124	57.2
VANCOUVER INT'L A	16.4	-0.9	23.0	10.2	0.0	*	34.5	108	0	7	201	65	50.9
VICTORIA INT'L A	15.6	-0.7	23.1	8.2	0.0	*	67.6	373	0	5	245	74	76.0
WILLIAMS LAKE A	*	*	*	*	*	*	*	*	*	*	*	*	*
YUKON TERRITORY													
DAWSON A	15.9	*	30.2	3.7	0.0	*	22.5	*	*	*	*	*	*
MAYO A	*	*	28.5	6.3	0.0	*	33.1	64	*	*	*	*	*
WATSON LAKE A	14.8	-0.1	26.6	4.8	0.0	*	62.0	107	0	14	224	85	116.1
WHITEHORSE A	14.3	0.2	26.6	3.9	0.0	*	56.7	167	0	13	238	95	113.5
NORTHWEST TERRITORIES													
BAKER LAKE A	13.3	2.3	26.1	3.4	0.0	*	68.8	181	0	9	303	101	146.9
CAMBRIDGE BAY A	9.3	1.4	21.8	3.3	0.0	0	29.2	148	0	8	262	86	267.8
CLYDE A	4.3	0.2	14.4	-2.8	0.0	0	35.4	155	0	8	143	55	424.1
COPPERMINE A	10.0	0.3	24.0	2.7	0.0	0	73.9	286	0	12	290	91	246.4
CORAL HARBOUR A	11.3	2.6	22.7	0.7	0.0	0	24.2	59	0	6	308	108	206.5
EUREKA	7.3	1.9	16.7	1.5	0.0	0	10.5	87	0	3	370	109	331.0
FORT SIMPSON A	16.0	-0.6	29.0	2.9	0.0	*	29.4	63	0	7	319	111	73.1
FORT SMITH A	15.7	-0.3	26.7	3.7	0.0	*	69.6	122	0	12	249	83	79.5
IQALUIT	6.2	-1.4	19.5	-0.3	0.0	0	71.0	112	0	4	160	79	366.0
HALL BEACH A	6.9	1.5	17.1	0.8	0.0	0	19.4	56	0	5	*	*	343.0
HAY RIVER A	14.0	-1.8	27.8	3.4	0.0	*	48.0	100	0	8	*	*	129.0
INUVIK A	15.2	1.6	28.0	4.9	0.0	0	29.2	87	0	5	363	107	95.4
MOULD BAY A	*	*	*	*	*	*	*	*	*	*	*	*	*
NORMAN WELLS A	16.4	0.1	29.6	6.2	0.0	0	30.0	53	0	7	263	91	67.9
POND INLET A	6.3	*	14.6	-1.0	0.0	*	12.6	*	0	3	275	*	365.8
RESOLUTE A	5.8	1.7	15.9	-0.4	0.0	0	7.7	34	0	3	331	121	376.9
YELLOWKNIFE A	15.5	-0.8	25.4	8.0	0.0	*	67.4	199	0	8	266	70	95.6
ALBERTA													
BANFF	11.2	-3.6	25.0	-0.5	0.0	*	125.6	296	0	18	*	*	209.6
CALGARY INT'L A	13.3	-3.1	28.7	2.5	0.0	*	87.0	133	0	15	227	71	148.0
COLD LAKE A	15.8	-1.1	31.0	4.1	0.0	*	39.6	46	0	11	235	75	81.3
CORONATION A	14.2	-3.1	28.1	3.9	0.0	*	69.0	110	0	13	268	80	134.6

JULY 1993

STATION	Temperature C				Snowfall (cm)	% of Normal Snowfall	Total Precipitation (mm)	% of Normal Precipitation	Snow on ground at end of month (cm)	No. of days with Precip 1.0 mm or more	Bright Sunshine (hours)	% of Normal Bright Sunshine	Degree Days below 18 C
	Mean	Difference from Normal	Maximum	Minimum									
EDMONTON INT'L A	14.6	-1.2	26.5	2.8	0.0	*	67.5	74	0	10	264	84	106.6
EDMONTON MUNICIPAL	15.7	-1.7	26.6	6.0	0.0	*	89.8	101	0	12	262	86	77.3
EDMONTON NAMAO A	15.1	-1.8	26.2	4.6	0.0	*	67.2	88	0	16	*	*	90.9
EDSON A	12.7	-1.8	24.0	2.5	0.0	*	77.8	72	0	18	185	66	162.6
FORT CHIPEWYAN A	15.7	-0.4	27.0	3.5	0.0	*	90.2	141	*	*	*	*	*
FORT MCMURRAY A	15.3	-1.1	26.3	4.3	0.0	*	78.6	104	0	16	218	77	85.7
GRANDE PRAIRIE A	14.3	-1.6	23.9	3.3	0.0	*	75.3	116	0	11	241	*	112.9
HIGH LEVEL A	15.1	-0.9	27.4	2.5	0.0	*	68.8	110	0	10	285	97	94.7
JASPER	13.6	-1.5	22.8	4.8	0.0	*	76.0	153	0	16	195	*	138.4
LETHBRIDGE A	14.4	-4.2	30.7	4.7	0.0	*	141.1	324	0	15	228	66	114.9
MEDICINE HAT A	15.9	-4.0	33.5	5.7	0.0	*	120.9	299	0	15	252	72	76.9
PEACE RIVER A	14.7	-1.0	23.9	3.5	0.0	*	86.0	142	0	12	*	*	107.8
RED DEER A	13.2	-2.9	26.6	2.4	0.0	*	98.4	127	0	13	*	*	148.9
ROCKY MTN HOUSE A	12.9	-2.4	26.4	3.0	0.0	*	108.0	116	0	16	*	*	159.2
SLAVE LAKE A	14.4	-0.9	23.1	3.8	0.0	*	84.4	88	0	11	263	90	115.4
SUFFIELD A	15.8	*	32.4	4.7	0.0	*	73.8	*	0	12	250	*	78.2
WHITCOURT A	14.1	-1.0	23.8	5.0	0.0	*	117.8	116	0	14	*	*	118.6
SASKATCHEWAN													
BROADVIEW	15.1	-2.6	28.2	4.6	0.0	*	121.4	236	0	8	254	76	92.2
CREE LAKE	14.8	-0.8	25.4	2.3	0.0	*	138.8	145	0	12	188	68	101.8
ESTEVAN A	15.8	-4.1	27.4	4.8	0.0	*	181.8	336	0	10	223	63	76.3
KINDERSLEY	15.1	-3.2	32.7	3.8	0.0	*	131.4	275	0	13	270	*	100.6
LA RONGE A	15.7	-0.9	31.5	3.9	0.0	*	82.0	90	0	14	*	*	86.5
MEADOW LAKE A	15.3	*	32.9	3.0	0.0	*	43.6	*	0	9	217	*	89.2
MOOSE JAW A	16.5	-3.2	30.6	5.3	0.0	*	158.0	296	0	8	282	82	63.1
NIPAWIN A	15.5	*	28.9	5.9	0.0	*	161.6	*	0	17	232	*	84.7
NORTH BATTLEFORD A	15.0	-3.1	30.1	4.0	0.0	*	93.3	143	0	14	*	*	100.4
PRINCE ALBERT A	15.7	-1.7	30.3	5.4	0.0	*	98.6	151	0	13	227	77	83.5
REGINA A	15.7	-3.2	29.1	4.8	0.0	*	166.7	313	0	10	261	76	80.0
SWIFT CURRENT A	15.0	-3.3	31.6	3.7	0.0	*	115.1	245	0	14	273	80	100.6
YORKTON A	15.5	-2.8	28.8	5.5	0.0	*	115.2	203	0	9	272	83	80.9
MANITOBA													
BRANDON A	15.4	-3.4	27.6	3.3	0.0	*	107.7	162	0	11	232	*	87.5
CHURCHILL A	12.2	0.4	28.9	-0.1	0.0	*	45.8	100	0	4	289	101	193.3
DAUPHIN A	16.3	-2.2	29.9	4.4	0.0	*	87.7	137	0	8	250	77	65.6
GILLAM A	15.3	0.4	30.4	4.7	0.0	*	84.0	90	0	12	*	*	99.3
ISLAND LAKE													
LYNN LAKE A	16.8	-0.4	28.7	6.5	0.0	*	93.8	92	0	11	*	*	58.1
NORWAY HOUSE A	15.0	-0.6	29.4	6.0	0.0	*	92.4	121	0	12	206	74	93.6
	16.2	*	28.6	6.1	0.0	*	98.4	*	0	14	*	*	64.8
THE PAS A	15.9	-1.8	29.4	5.4	0.0	*	128.5	183	0	14	206	68	79.8
THOMPSON A	15.3	0.0	29.1	4.4	0.0	*	68.8	71	0	12	202	80	90.2
WINNIPEG INT'L A	17.8	-1.8	27.7	6.7	0.0	*	193.4	255	0	16	220	70	37.9
ONTARIO													
EARLTON A	19.0	1.3	31.7	5.3	0.0	*	69.0	85	0	9	*	*	17.3
GERALDTON A	16.7	*	27.5	5.5	0.0	*	136.6	*	0	12	*	*	52.1
GORE BAY A	19.5	0.7	27.2	10.8	0.0	*	47.0	77	0	10	*	*	1.1
HAMILTON RBG	22.5	*	*	*	0.0	*	69.4	*	0	*	*	*	*
HAMILTON A	21.5	1.0	31.8	10.2	0.0	*	29.6	42	0	6	*	*	1.7
KAPUSKASING A	17.9	1.1	29.5	6.2	0.0	*	188.1	195	0	13	*	*	31.9
KENORA A	17.5	-1.7	27.1	7.7	0.0	*	259.4	283	0	17	*	*	36.5
KINGSTON A	21.2	1.1	30.8	10.9	0.0	*	21.8	37	0	4	284	101	0.0
LONDON A	21.0	0.7	31.2	9.3	0.0	*	91.0	126	0	8	250	91	4.5
MUSKOKA A	19.3	1.0	31.9	8.0	0.0	*	131.9	170	0	14	*	*	10.0
NORTH BAY A	19.9	1.6	31.5	8.5	0.0	*	38.0	37	0	8	287	105	9.3
OTTAWA INT'L A	21.8	1.2	32.5	12.1	0.0	*	65.6	76	0	9	*	*	0.4
PETAWAWA A	20.4	1.5	27.5	13.2	0.0	*	29.2	37	0	6	*	*	8.9
PETERBOROUGH A	19.7	0.3	30.1	6.9	0.0	*	50.4	66	0	6	*	*	6.7
PICKLE LAKE	17.0	-0.1	28.1	8.0	0.0	*	131.8	119	0	13	*	*	51.6
RED LAKE A	16.9	-1.3	27.5	6.9	0.0	*	148.6	168	0	15	196	*	46.9
ST CATHARINES A	22.4	0.7	33.8	11.9	0.0	*	35.6	55	0	7	308	*	1.3
SARNIA A	21.5	0.8	32.9	9.6	0.0	*	40.1	59	0	8	310	105	4.5
SAULT STE MARIE A	17.7	0.2	30.1	6.9	0.0	*	96.9	140	0	10	238	83	33.3
SIOUX LOOKOUT A	17.7	-0.6	27.7	6.7	0.0	*	104.2	111	0	14	*	*	28.1
SUDBURY A	20.0	1.3	31.0	9.7	0.0	*	55.2	66	0	10	280	97	6.7
THUNDER BAY A	16.8	-0.8	27.1	7.8	0.0	*	224.0	297	0	15	189	62	46.9
TIMMINS A	18.1	0.9	29.9	4.9	0.0	*	144.3	160	0	14	*	*	27.5
TORONTO	22.7	*	31.5	14.4	0.0	*	91.6	*	0	8	*	*	0.0
TORONTO INT'L A	21.6	1.0	32.5	11.0	0.0	*	87.4	122	0	8	*	*	0.6
TORONTO ISLAND A	21.1	*	29.7	11.0	0.0	*	96.2	*	0	7	*	*	0.0
TRENTON A	21.2	0.6	30.5	10.5	0.0	*	43.2	71	0	5	*	*	0.9
WATERLOO WELLINGTON	20.5	0.9	32.2	8.8	0.0	*	111.6	157	0	7	*	*	3.7
WAWA A	14.6	*	27.9	5.1	0.0	*	100.8	*	0	12	*	*	101.7
WIARTON A	19.1	0.6	33.4	8.7	0.0	*	46.8	62	0	9	310	105	15.2
WINDSOR A	23.8	1.6	34.0	13.8	0.0	*	56.6	68	0	8	*	*	0.0

Please note that the total precipitation for June 1993 at Churchill, Manitoba should be 36.6 mm.

JULY 1993

STATION	Temperature C				Snowfall (cm)	% of Normal Snowfall	Total Precipitation (mm)	% of Normal Precipitation	Snow on ground at end of month (cm)	No. of days with Precip 1.0 mm or more	Bright Sunshine (hours)	% of Normal Bright Sunshine	Degree Days below 18 C
	Mean	Difference from Normal	Maximum	Minimum									
QUEBEC													
BAGOTVILLE A	18.5	0.6	33.2	7.2	0.0	*	112.8	94	0	16	*	*	23.0
BAIE COMEAU A	15.4	-0.4	26.1	4.9	*	*	91.8	108	0	15	*	*	81.8
BLANC SABLON A	9.9	-1.4	19.1	2.0	0.0	*	*	*	*	13	104	*	*
CHIBOUGAMAU CHAPAIS	17.1	*	29.0	4.5	0.0	*	127.2	*	0	16	*	*	48.6
GASPE A	15.4	*	28.3	4.5	0.0	*	144.8	*	0	15	19	*	84.3
INUKJUAQ A	12.9	3.6	22.6	3.2	0.0	0	66.0	122	0	7	249	121	158.8
KUUJUAQ A	13.5	2.1	27.8	1.0	0.0	*	77.2	134	0	9	*	*	146.5
KUUJUAUPIK A	14.2	3.7	28.9	4.4	0.0	0	101.4	123	0	13	220	130	135.8
LA GRANDE IV A	15.7	*	27.5	5.8	0.0	*	77.2	*	0	10	198	*	75.8
LA GRANDE RIVIERE A	16.1	*	28.5	6.6	0.0	*	75.8	*	0	15	221	*	77.0
MANIWAKI	19.7	1.4	31.9	7.1	0.0	*	65.8	72	0	20	*	*	12.4
MONT JOLI A	16.6	-0.7	28.9	7.3	0.0	*	87.6	116	0	10	212	84	51.7
MONTREAL INT'L A	21.5	0.6	33.5	11.7	0.0	*	90.2	100	0	9	258	94	2.1
MONTREAL MIRABEL I/	20.4	*	32.5	9.4	*	*	92.6	*	0	7	245	*	5.4
NATASHQUAN A	13.0	-1.2	24.2	5.4	0.0	*	85.0	89	0	*	171	70	15.6
QUEBEC A	19.8	0.7	32.0	8.8	0.0	*	116.0	99	*	12	239	97	9.8
ROBERVAL A	18.6	0.7	32.6	9.9	0.0	*	92.2	77	0	18	220	*	22.0
SCHEFFERVILLE A	13.8	1.2	26.1	3.6	0.0	0	75.3	78	0	14	*	*	132.4
SEPT-ILES A	14.3	-0.9	24.9	4.9	0.0	*	180.2	186	0	18	177	73	113.1
SHERBROOKE A	18.7	0.9	32.4	7.4	0.0	*	85.2	71	0	12	247	*	20.3
ST HUBERT A	21.3	0.6	32.6	10.6	0.0	*	88.0	91	0	11	246	*	1.0
VAL D'OR A	18.4	1.3	29.6	6.1	0.0	*	140.2	138	0	15	218	84	33.5
NEW BRUNSWICK													
CHARLO A	16.7	-1.1	25.6	6.8	0.0	*	107.8	109	0	15	213	84	50.3
FREDERICTON A	18.8	-0.5	32.4	6.7	0.0	*	61.6	69	0	11	*	*	27.2
MONCTON A	17.1	-1.4	28.1	6.2	0.0	*	123.3	130	0	16	201	83	53.9
SAINT JOHN A	17.4	0.5	30.1	6.0	0.0	*	78.1	76	0	14	238	109	46.6
NOVA SCOTIA													
GREENWOOD A	18.9	-0.2	30.6	5.7	0.0	*	62.6	81	0	11	*	*	25.1
HALIFAX INT'L A	17.6	-0.6	30.3	8.4	0.0	*	129.6	138	0	14	*	*	45.6
SABLE ISLAND	14.6	-0.9	21.6	8.7	0.0	*	80.2	87	0	7	208	128	108.7
SHEARWATER A	17.0	-0.4	29.6	8.0	0.0	*	107.0	110	0	12	232	106	52.8
SYDNEY A	15.4	-2.3	26.8	7.5	0.0	*	104.3	128	0	11	202	83	89.3
YARMOUTH A	16.3	0.0	26.2	7.6	0.0	*	42.4	54	0	4	274	133	57.7
PRINCE EDWARD ISLAND													
CHARLOTTETOWN A	16.2	-2.1	26.8	6.4	0.0	*	89.8	107	0	16	*	*	72.9
NEWFOUNDLAND													
BONAVISTA	10.8	-3.9	24.1	1.5	0.0	*	154.6	254	0	14	*	*	222.8
BURGED	13.3	-0.2	22.7	5.5	0.0	*	212.4	152	0	14	*	*	144.0
CARTWRIGHT	9.6	-3.1	28.2	1.9	0.0	*	135.0	162	0	20	103	52	261.6
COMFORT COVE	10.9	-5.6	26.6	3.4	0.0	*	156.6	192	0	17	*	*	218.6
DANIELS HARBOUR	11.3	-3.1	23.2	2.0	0.0	*	114.0	128	0	14	133	65	208.4
DEER LAKE A	13.6	-2.8	26.6	4.0	0.0	*	86.0	109	0	15	*	*	131.2
GANDER INT'L A	12.0	-4.5	25.1	3.3	0.0	*	104.0	151	0	14	120	56	188.8
GOOSE A	13.9	-1.9	30.1	0.1	0.0	*	73.1	70	0	10	161	82	138.5
MARY'S HARBOUR	9.7	-0.5	26.9	3.0	0.0	*	223.2	328	0	18	*	*	257.9
PORT AUX BASQUES	13.0	-0.2	26.8	6.1	0.0	*	183.8	170	0	13	169	*	155.9
ST ANTHONY	8.9	-4.0	22.7	2.4	0.0	*	209.4	207	0	16	*	*	281.1
ST JOHN'S A	12.4	-3.1	25.4	3.0	0.0	*	140.4	186	0	10	113	*	177.8
ST LAWRENCE	12.2	0.1	22.7	4.9	0.0	*	87.9	89	0	10	*	*	141.0
STEPHENVILLE A	14.5	-1.5	23.7	6.6	0.0	*	145.8	152	0	15	153	*	114.2
WABUSH LAKE A	14.0	0.5	26.8	1.6	0.0	*	89.6	85	0	14	217	*	124.4

AGROCLIMATOLOGICAL STATIONS

JULY 1993

STATION	Temperature C				Snowfall (cm)	Total Precipitation (mm)	% of Normal Precipitation	Snow on ground at end of month (cm)	No. of days with Precip 1.0 mm or more	Bright Sunshine (hours)	Degree days above 5 C	
	Mean	Difference from Normal	Maximum	Minimum							This month	Since jan. 1st
BRITISH COLUMBIA												
AGASSIZ	16.8	-1.1	25.5	9.5	0.0	90.0	193	0	10	146	366.5	1346.2
SUMMERLAND	17.6	-3.3	29.5	8.5	0.0	86.7	391	0	13	208	389.3	1204.5
ALBERTA												
BEAVERLODGE	13.8	-1.4	23.5	3.0	0.0	79.4	124	0	17	219	271.5	796.0
LACOMBE	13.4	-2.7	26.0	1.0	0.0	100.2	139	0	12	247	252.9	718.1
SASKATCHEWAN												
INDIAN HEAD	15.9	-2.7	29.5	4.5	0.0	102.2	192	0	7	**	338.5	846.0
MELFORT	15.3	-2.1	29.0	5.0	0.0	157.5	245	0	14	237	141.0	763.5
REGINA	15.6	-3.0	28.0	2.5	0.0	149.7	284	0	8	**	322.8	818.8
SCOTT	14.4	-2.8	29.5	3.0	0.0	82.5	137	0	13	251	289.4	737.7
SWIFT CURRENT	15.1	-3.4	31.0	3.5	0.0	107.4	280	0	14	213	311.6	851.0
MANITOBA												
BRANDON	16.1	-3.1	28.8	3.5	0.0	103.0	148	0	13	**	345.1	869.2
MORDEN	17.2	-2.4	28.0	8.0	0.0	196.4	266	0	17	215	384.0	957.0
ONTARIO												
DELHI	21.7	1.0	33.0	8.0	0.0	37.4	53	0	7	**	517.3	1257.7
ELORA	20.2	1.1	31.7	9.8	0.0	135.1	185	0	8	**	472.4	1078.6
GUELPH	20.0	0.3	32.1	7.5	0.0	111.9	136	0	10	281	465.8	1072.5
HARROW	23.3	1.3	34.0	12.5	0.0	75.9	96	0	11	281	564.9	1391.4
OTTAWA	21.5	0.9	31.4	11.6	0.0	64.0	75	0	7	271	840.7	1213.7
SMITHFIELD	22.2	2.0	31.1	10.3	0.0	29.9	44	0	7	**	**	**

Courtesy of Agriculture Canada

STATION	Temperature C				Snowfall (cm)	Total Precipitation (mm)	% of Normal Precipitation	Snow on ground at end of month (cm)	No. of days with Precip 1.0 mm or more	Bright Sunshine (hours)	Degree days above 5 C	
	Mean	Difference from Normal	Maximum	Minimum							This month	Since Jan. 1st
QUEBEC												
LA POCAIERE	18.0	-0.7	32.0	7.0	0.0	69.4	73	0	9	257	403.0	929.0
L'ASSOMPTION	20.7	0.5	33.5	10.5	0.0	75.4	81	0	8	239	485.8	1148.3
NORMANDIN	17.8	0.9	31.4	5.7	0.0	71.0	62	0	20	226	382.1	789.7
NEW BRUNSWICK												
FREDERICTON	19.1	0.0	32.5	6.0	0.0	67.1	75	0	10	227	436.0	1020.5
NOVA SCOTIA												
KENTVILLE	18.4	-0.8	30.0	6.0	0.0	70.8	101	0	13	233	413.3	979.3
NAPPAN	17.5	-0.5	28.0	6.0	0.0	79.9	95	0	11	200	388.5	860.3
PRINCE EDWARD ISLAND												
CHARLOTTETWN	8.8	8.8	8.8	8.8	8.8	8.8	88	888	888	88	8.8	8.8
NEWFOUNDLAND												
ST. JOHN'S WEST	12.8	-2.8	25.5	3.0	0.0	121.1	164	0	8	101	241.2	495.3

Courtesy of Agriculture Canada

...continued from page 5

By far, the wettest locale was the Thunder Bay to Kenora district. Kenora's 259 mm, set a new record for most rain in any July since 1939, while Thunder Bay's 224 mm smashed their former record of 200 mm set in 1982. Other wet areas included: Kapuskasing, 188 mm - wettest July since 1968; Red Lake, 149 mm - wettest since 1974; and Muskoka, 132 mm - wettest July since 1985. The dry areas, generally south of Sudbury, and including eastern Ontario, southwestern Ontario and the Niagara Peninsula were led by Kingston, where only 22 mm of rain fell on just 4 days, making this their driest July since 1975. Other dry spots were: Petawawa, 29 mm - driest July since records began there in 1971; Hamilton, 30 mm - driest since 1968; St Catharines, 36 mm; and North Bay, 38 mm.

Regarding sunshine, southern Ontario enjoyed an abundance, while again, the north and especially the northwest suffered a deficiency. On the sunny side, Wiarton's 310 hours - 15 hours above normal - was Ontario's sunshine capital, while Thunder Bay's meagre 189 hours of sun represented a deficit of 115 hours, to attain the dubious distinction as the cloudiest July in 34 years of sunshine observations.

Quebec

Most of the province experienced above normal temperatures this month. In northwestern Quebec, this July was one of the hottest ever, with the mean monthly temperature exceeded by 2.5 to 4.0 degrees. At Kuujuaq, Inukjuak and Kuujuaq this was the second hottest July on record. La Grande Rivière set a new record for the second consecutive month with a mean temperature of 15.7°C. The highest temperature this month was 33.5°C, recorded at Dorval.

Precipitation was near to slightly below normal in the southwest and north-central districts. The wettest area was around Sept-Îles, where 180.2 mm, or almost twice the normal amount, turned golf courses into ponds. On July 20, heavy rains, with hail in the Montreal area caused some flooding. The Abitibi region, likewise, suffered from Mother Nature's work; it was drenched with 140.2 mm of rain, 66.8 mm of which fell in less than 6 hours during the night of July

28/29. Val d'Or received 66.8 mm of rain in less than 6 hours on the 29th, flooding many basements. On the same day, Rock Forest received 54.0 mm in 2 hours and Granby 51.3 mm in 45 minutes. On July 30, at Saguenay-Lac-St-Jean and in the Beauce and Sept-Îles areas, heavy rains, with some hail, flooded basements. The only region which received significantly less precipitation, 70 to 80 percent of the normal amount, was near Labrador.

Strong, damaging winds hit eastern sections of Montreal on July 3, La Sarre on July 5 and Lac du Fils on July 10.

All of central and southern Quebec received less sunshine than normal. Areas east of Sept-Îles received less than three quarters of their normal amount of sunshine.

Maritimes

July was generally sunny and warm during the first half of the month, while cloud, showers and cooler temperatures dominated most areas during the latter half.

Mean temperatures were generally below normal, particularly at Charlottetown, P.E.I. and Sydney, N.S. The exception was at Saint John, N.B., where the mean was one half a degree above normal.

Precipitation totals varied either side of normal, ranging from 50% below normal at Yarmouth, N.S., to 34% above normal at Halifax. Although Charlottetown reported only a few millimetres more rain than normal, a measurable amount of precipitation was recorded on 18 days this month, tying the July record for the most number of days with measurable precipitation first set in 1986.

Saint John and Yarmouth, N.S. reported 21 and 65 hours more sunshine than normal, respectively, while Sable Island had 36 hours more sunshine than normal, otherwise hours of bright sunshine were generally below normal in some areas of southern New Brunswick. The area with the least sunshine was near Charlottetown, where the total there was 65 hours less than normal - the lowest total in July since 1980.

Thunderstorms were frequent, with several damaging lightning strikes reported. A tornado was reported at McGivney, N.B., a small town 40 km north of Fredericton, on

July 12. There were no injuries and only some minor damage.

Newfoundland

Record-low amounts of bright sunshine and low temperatures, with above-normal rainfall dominated the weather scene across Newfoundland during July. Cool temperatures were common over eastern Newfoundland, with readings some days registering as much as 15°C below normal. Overall though, mean temperatures from eastern locations were 3 to 5 degrees below normal. Gander reported a July mean temperature of 12.0°C, a new record low. Across the western half of the Island, temperatures were 2 to 3 degrees below normal, while southern locations recorded near normal values.

Frequent northerly winds, produced a persistent cloud cover which resulted in record-low sunshine values in eastern Newfoundland. Gander and St. John's recorded 119.7 and 113.4 hours of bright sunshine, respectively, breaking records set in 1980. Extensive fog, rain or drizzle was also reported across the region. St. John's 140.4 mm of rain, was about 65 mm above normal, while western locations reported over 200 mm of precipitation. The cool, damp weather had a negative impact, as tourism operators reported reduced attendance, and the agriculture community reported poor growing conditions.

Labrador, in contrast, reported fair and seasonable July weather, with temperatures occasionally reaching 30°C. However, coastal districts reported frequent onshore winds, which produced cloudy conditions. Cartwright, along the coast, reported a mean temperature of 9.6°C, about 3°C below normal.

Rainfall varied across Labrador, with western locations recording nearly 80 mm of rain, which is approximately 20 mm below normal. In contrast, Mary's Harbour, further to the south, received 223.2 mm, or about three times the normal.

Hours of bright sunshine near the Labrador coast tallied approximately 100 hours, or about half the normal. However, Wabush Lake, in western Labrador, recorded 216.7 hours of sun, which is nearly 20 hours above normal.