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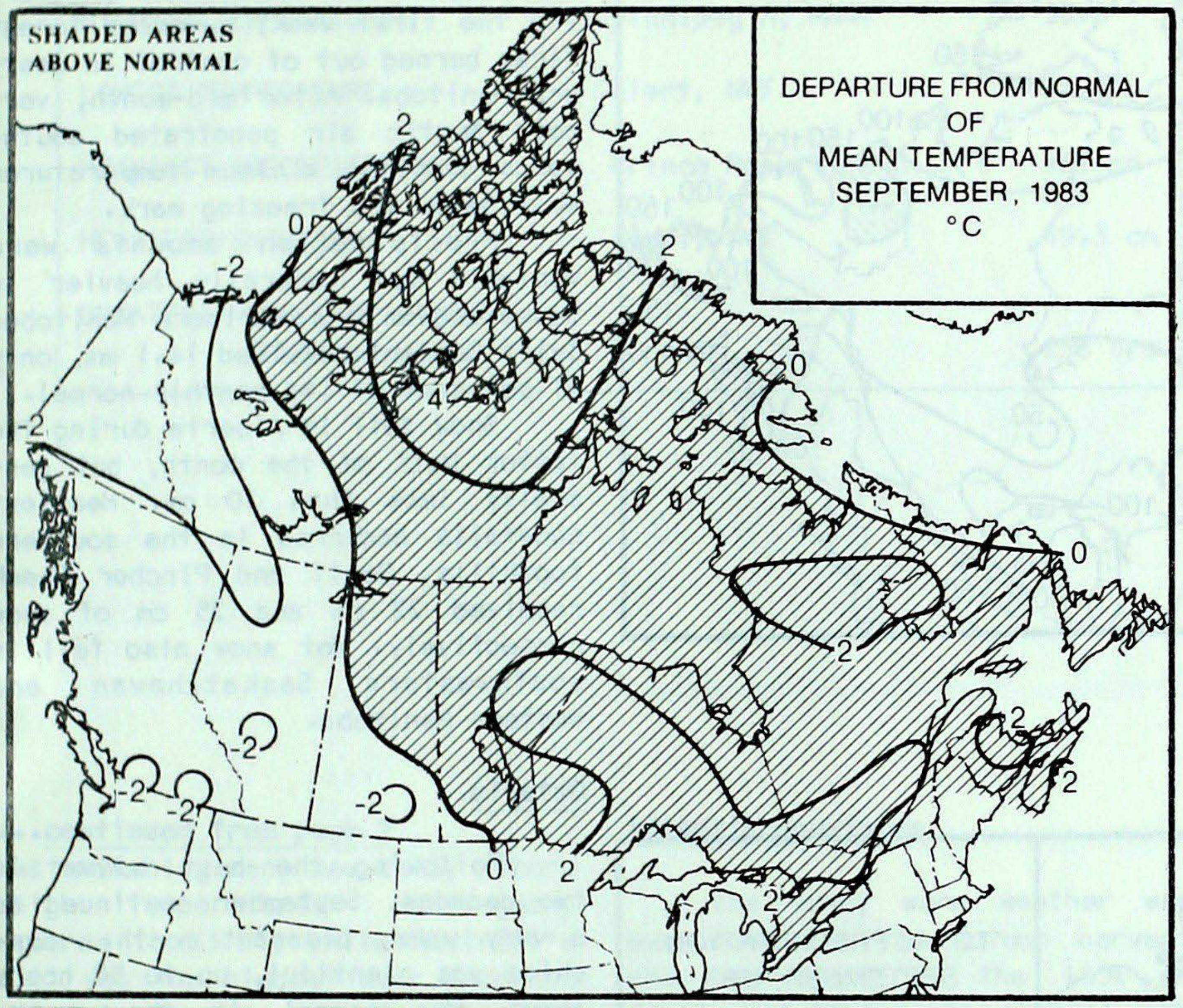
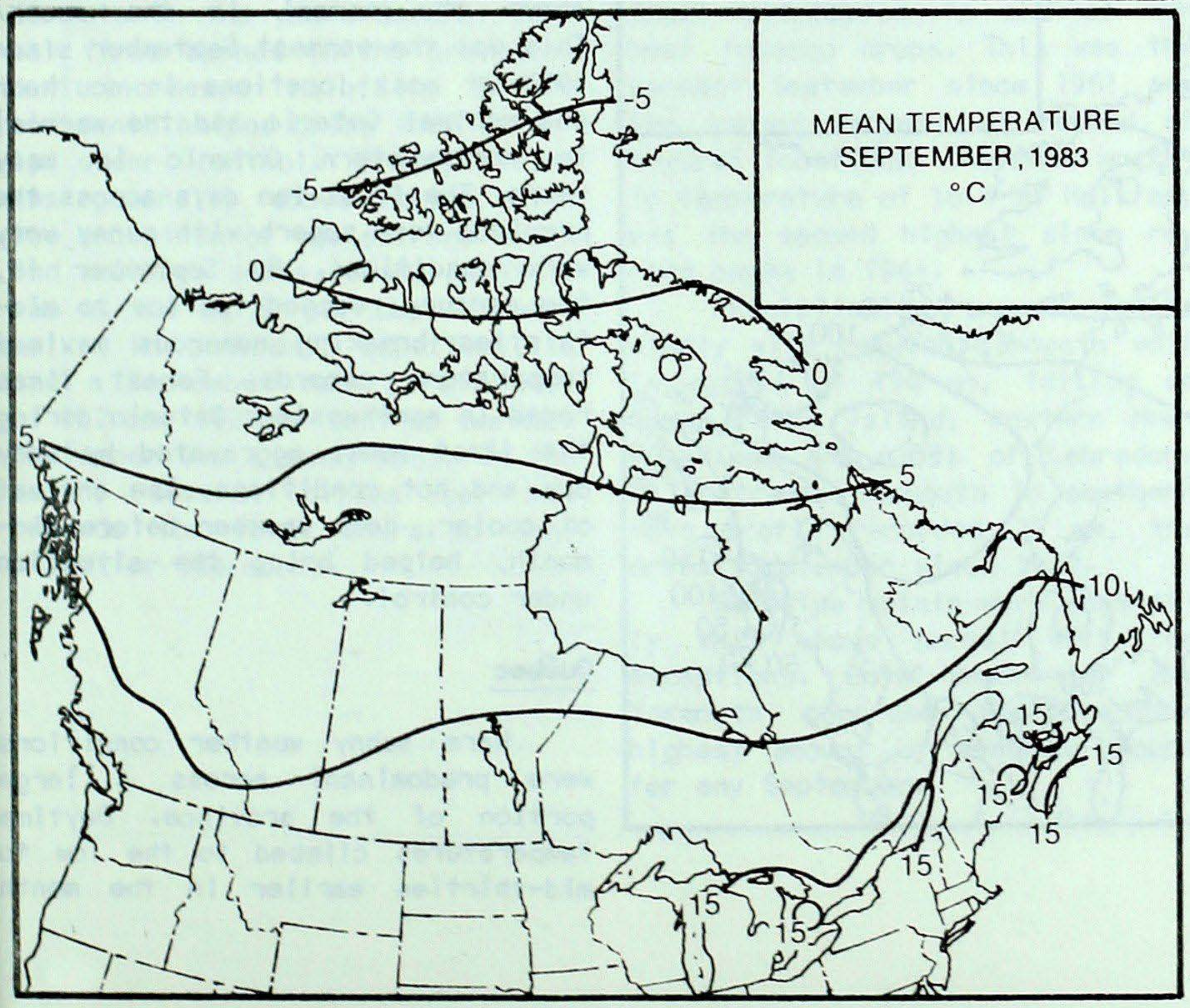




ACROSS THE COUNTRY

Yukon and Northwest Territories

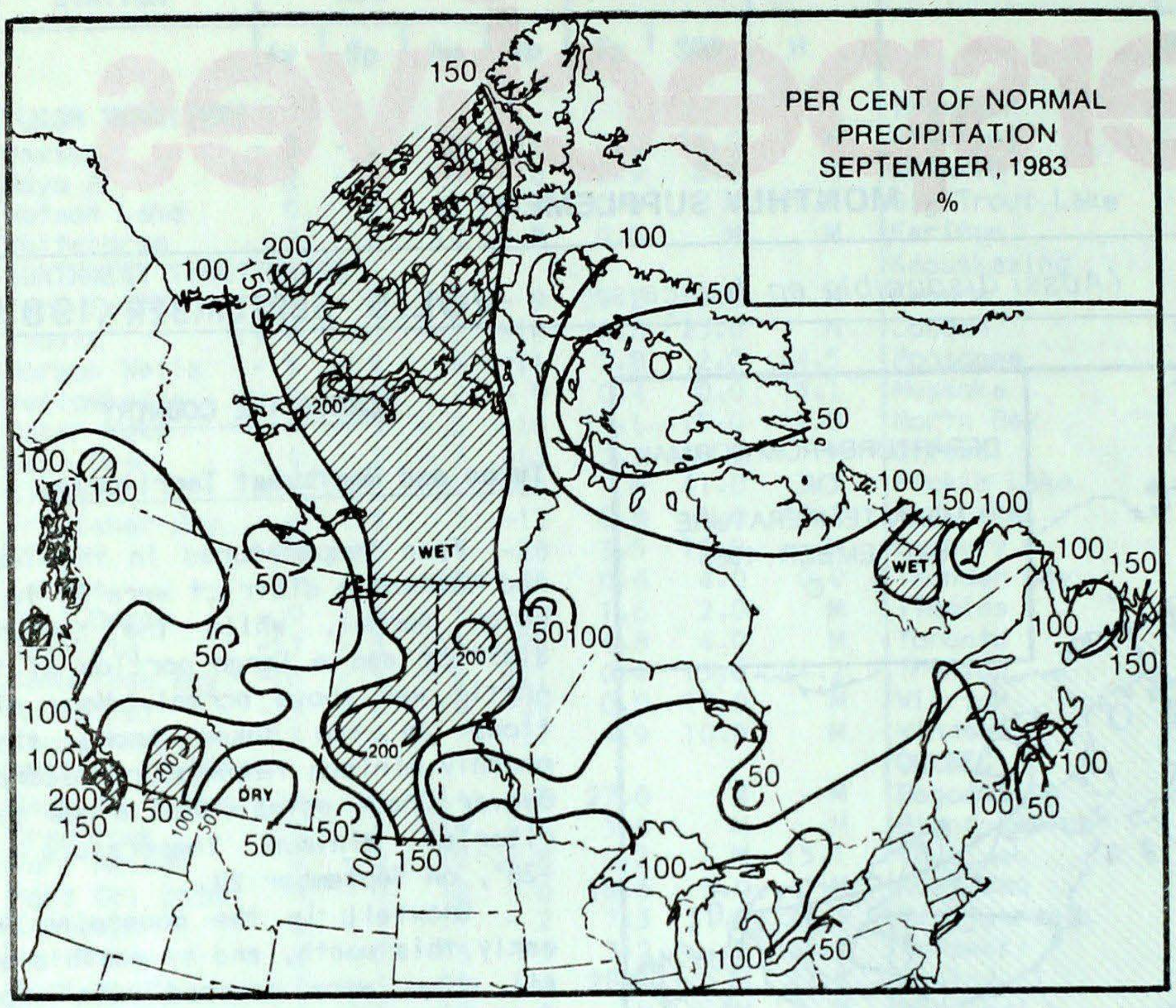
Mean temperatures in the Yukon and Mackenzie district were 2° to 4° below normal, while the Keewatin district and a large portion of the Arctic was above normal. Many stations in the Yukon broke their monthly minimum temperature records. Beaver Creek established a new territorial minimum temperature of -28°, on September 27.

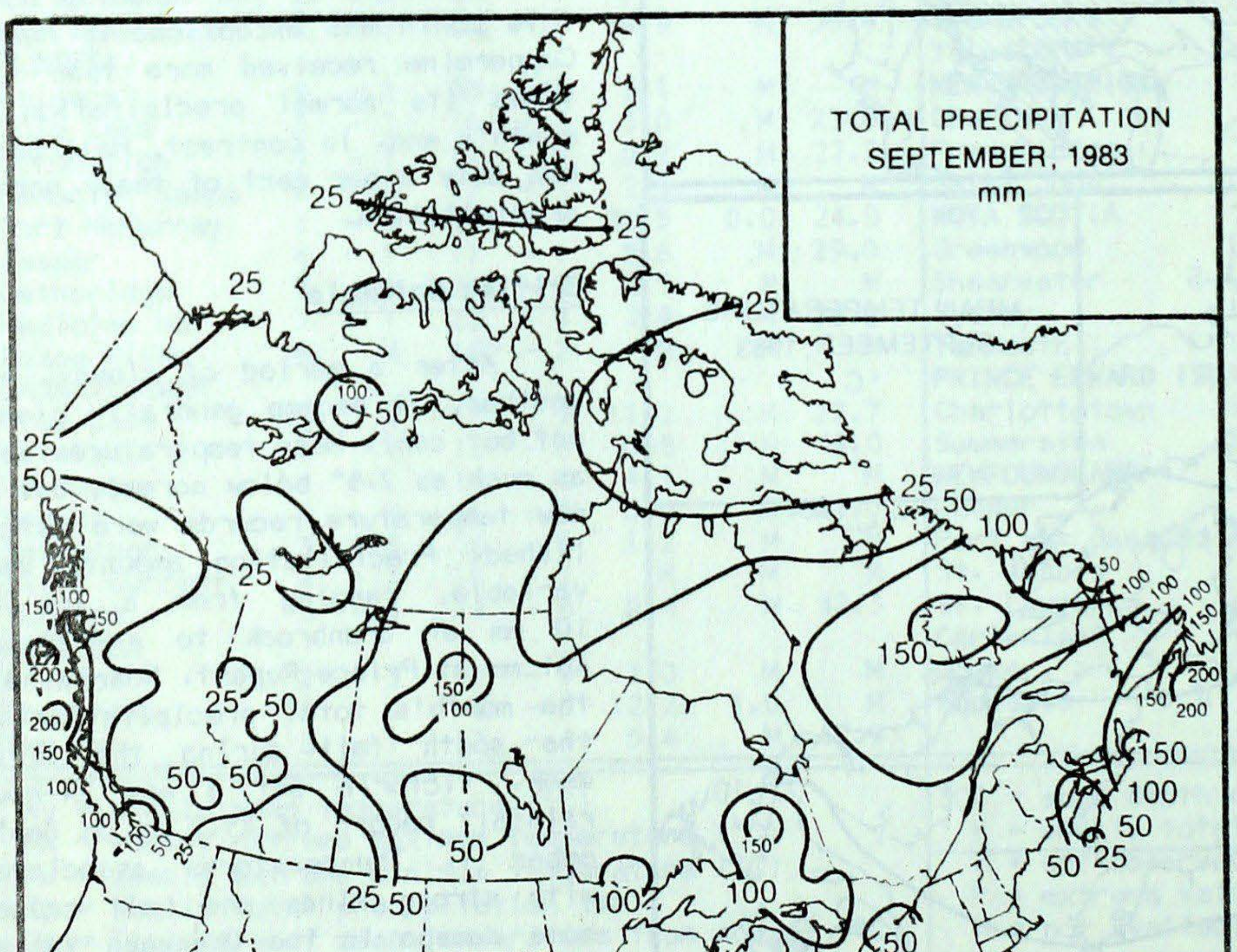
Snowfall in the mountains was early this month, and by month's end all areas were covered with snow. Whitehorse established a new September 24-hour precipitation record on the 4th, when 25 mm were recorded. The total precipitation across the central third of the Canadian north this month was exceptionally heavy. Coppermine received more than four times its normal precipitation by month's end. In contrast, Hall Beach had only 8 per cent of their normal precipitation.

British Columbia

After a period of cloudy, wet weather, it became generally pleasant but cool. Mean temperatures were as much as 2.5° below normal, but no new temperature records were established. Precipitation amounts were variable, ranging from a low of 10 mm at Cranbrook to a high of 461 mm at Prince Rupert. Nearly half the month's total precipitation in the south fell during the first week. Victoria set a new 24-hour rainfall record of 45.2 mm on September 1. Thunderstorms associated with strong winds and hail caused some damage in the Okanagan Valley early in the month. Strongest winds occurred on September 6, when gales swept the Queen Charlotte Islands. Wind speeds reached 140 km/h at Cape St James.

Canada





Prairies

Many locations across the south had record breaking temperatures early in the month, with daytime readings climbing into the mid to upper thirties. Winnipeg, on September 2, recorded a scorching 38.8°, the hotest day this year and a new September temperature record. During the first week, numerous forest fires burned out of control in eastern Manitoba. After mid-month, very cold Arctic air penetrated southwards dropping minimum temperatures well below the freezing mark.

Precipitation amounts were variable but generally heavier in Saskatchewan and northern Manitoba. Swift Current received 14.1 mm, only 41 per cent of its monthly normal.

Snow fell in Alberta during the latter half of the month, but generally less than 10 cm. Heaviest snowfalls occurred in the southern foothills. Banff and Pincher Creek received 22 cm and 25 cm of snow respectively. Wet snow also fell in southwestern Saskatchewan and western Manitoba.

Ontario

Following the best summer in two decades, September continued as a very warm, pleasant month. Sunshine was plentiful, up to 50 hours above the normal in the south. This was the warmest September since 1971 at most locations in southern and central Ontario and the warmest in northwestern Ontario in many years. The first ten days across the province were superb with sunny very warm conditions. By September 10, the mercury reached the low to mid-thirties breaking numerous maximum temperature records. Forest fires raged in northwestern Ontario during the first week, aggravated by very dry and hot conditions. The arrival of cooler, damp weather before mid-month, helped bring the situation under control.

Québec

Warm sunny weather conditions were predominant across a large portion of the province. Daytime temperatures climbed to the low to mid-thirties earlier in the month

CLIMATIC EXTREMES - JULY, 1983

MEAN TEMPERATURE:			
	WARMEST	Windsor, ONT	18.5°
	COLDEST	Alert, NWT	-8.2°
HIGHEST TEMPERATURE:		Winnipeg A, MAN.	38.8°
LOWEST TEMPERATURE:		Alert, NWT	-25.1°
HEAVIEST PRECIPITATION:		Prince Rupert, B.C.	461 mm
HEAVIEST SNOWFALL:		Alert, NWT	49.3 cm
GREATEST NUMBER OF BRIGHT SUNSHINE HOURS:		Toronto, ONT	238 hrs

...**continued from page 2**

establishing many new daily record high temperatures. Huntingdon, soared to 33.5°, while Montréal's 31° was the highest ever recorded so late in the year. Several forest fires burned in the province, but increased rainfalls before mid-month helped bring them quickly under control. Precipitation was generally above normal with the exception of the extreme north and southern areas, where rainfall was as low as 61 per cent of normal. In contrast, Schefferville had a September record rain fall of 152 mm, 182 per cent of normal. September was a sunny month in the south, several cities set new records for total hours of sunshine for the month.

Atlantic Provinces

The sunny warm weather was excellent for the Autumn harvest and, in addition, the lack of frost attributed to one of the best tobacco crops. This was the warmest September since 1961 and the second warmest on record at several locations. The mean monthly temperature of 16.4 at Halifax, was the second highest since record began in 1944.

Precipitation amount varied widely with heaviest amounts well in excess of 150 mm, falling on Cape Breton Island, eastern Newfoundland and parts of Labrador. In contrast, Yarmouth in southern Nova Scotia recorded 20 mm, the driest September since 1930.

Sunshine totals were generally well above normal with few exceptions. Both Shearwater and Yarmouth recorded their second highest amount of sunshine hours for any September.

CLIMATIC IMPACTS

Agriculture

September was ideal for harvesting in the Maritimes but the first half of the month was too wet in Newfoundland and harvesting was delayed. In southern Québec and Ontario, the dry and hot weather of this summer was blamed for lower yields especially the grain crop. There was more rain in September and that was beneficial for late maturing crops. In the Prairies, the harvest was almost completed by the third week of September with the exception of the Peace River district where wet weather conditions hampered the harvest.

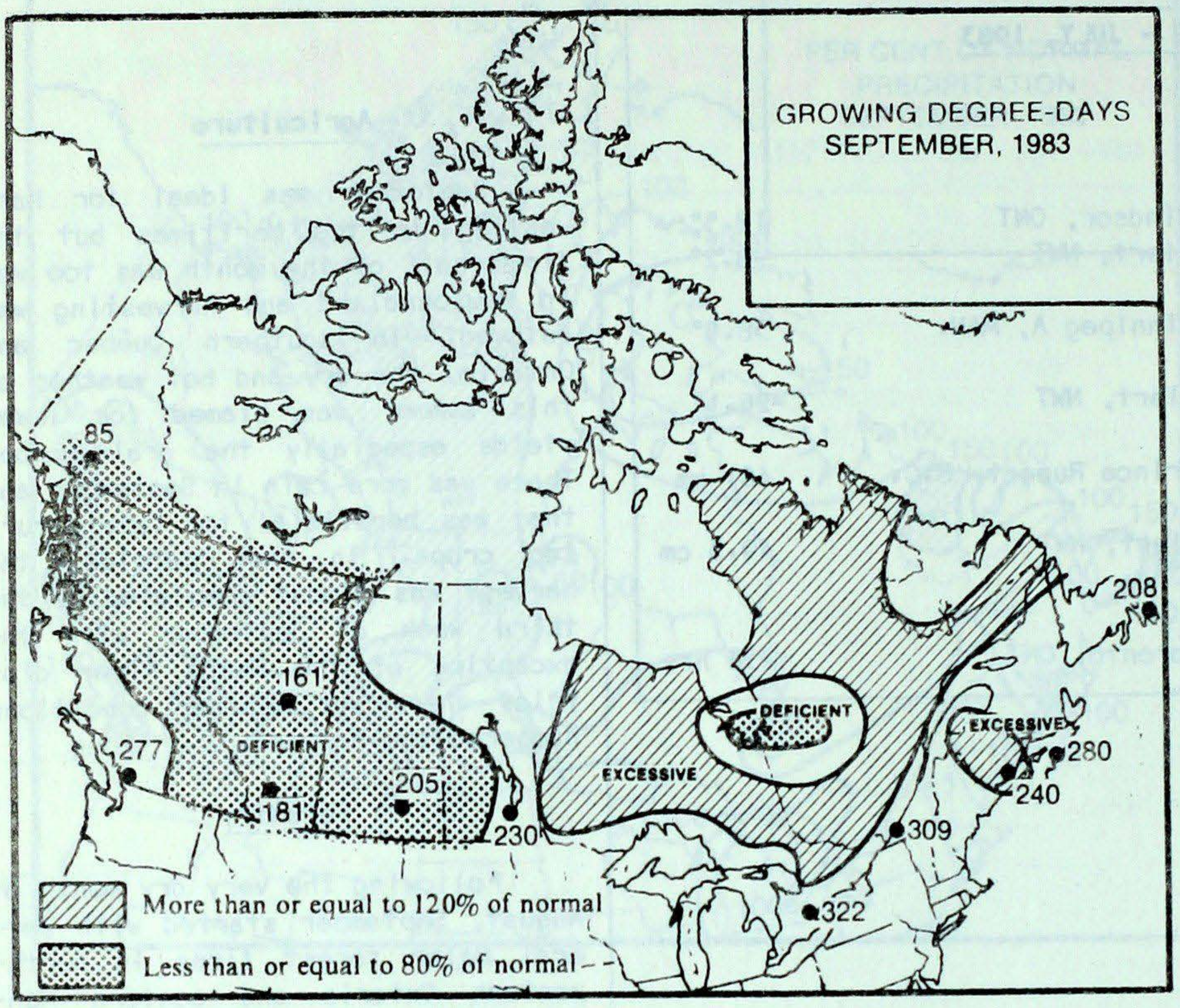
Forestry

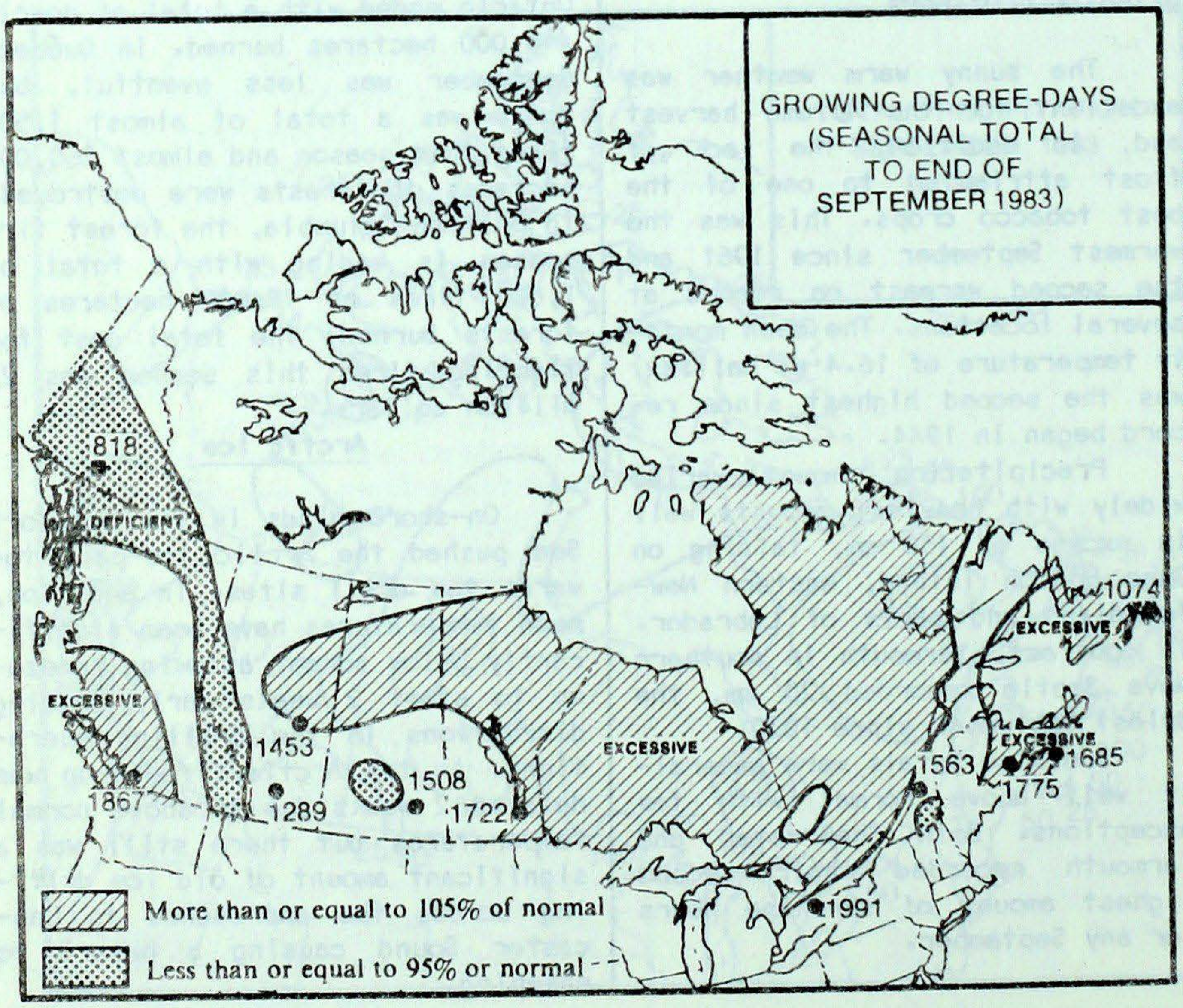
Following the very dry month of August, September started with several major forest fires in northwestern Ontario and eastern Manitoba. The most important one, Kenora-73 covered an area of 85,000 hectares. The forest fire season in Ontario ended with a total of nearly 444,000 hectares burned. In Québec, September was less eventful, but there was a total of almost 1,500 fires this season and almost 260,000 hectares of forests were destroyed. In British-Columbia, the forest fire season is ending with a total of 1,600 fires an 77,000 hectares of forests burned; the total cost for fighting fires this season was 23 million dollars.

Arctic Ice

On-shore winds in the Beaufort Sea pushed the Arctic ice-pack towards the drill sites. In addition, mean temperatures have been significantly below normal allowing freeze-up to start 2 weeks early causing disruptions in the drilling operations. In the Arctic, freeze-up was delayed 2 weeks due to above normal temperatures but there still was a significant amount of old ice drifting across the approaches to Lancaster Sound causing a hazard to shipping.

GROWING DEGREE-DAYS

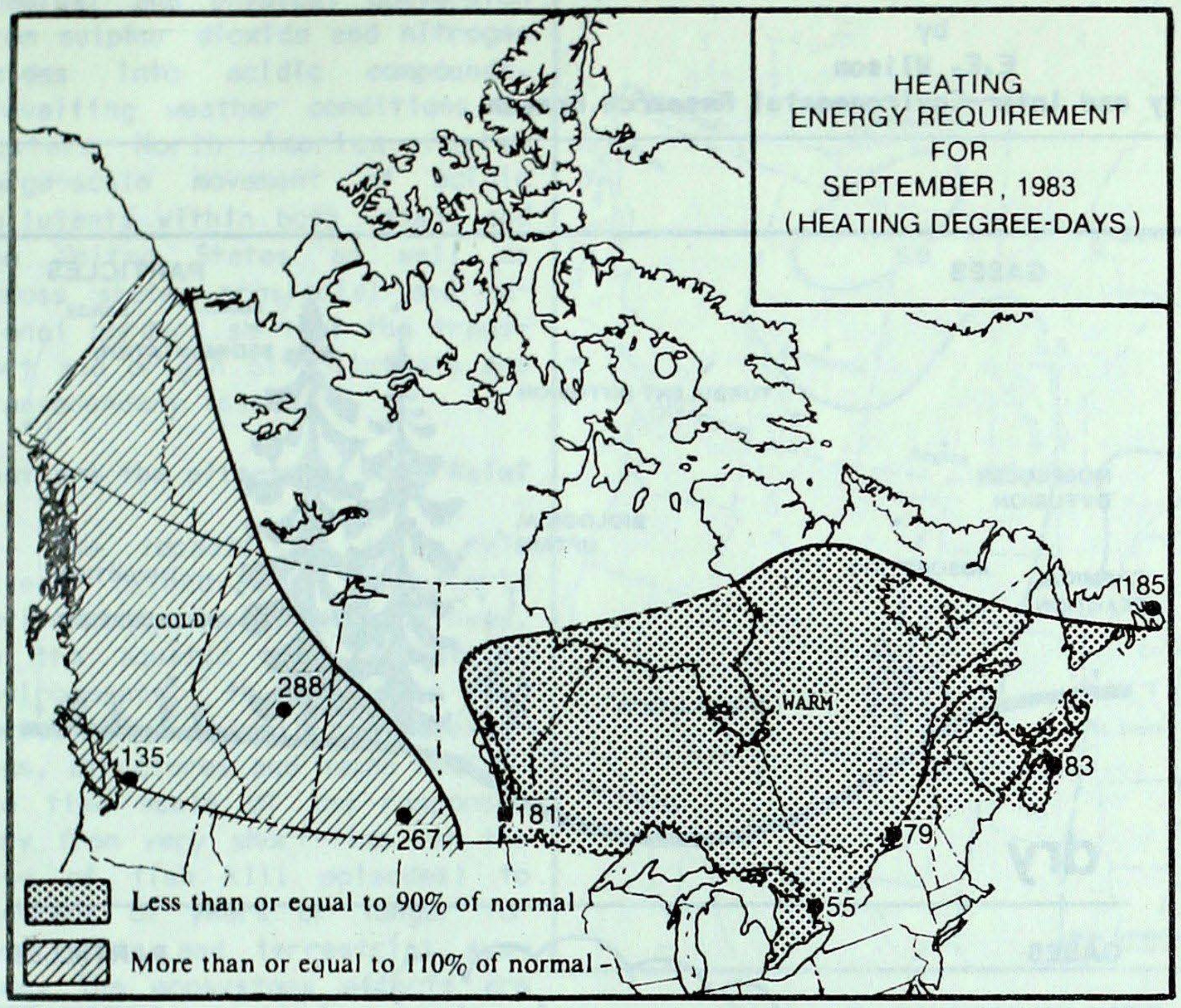


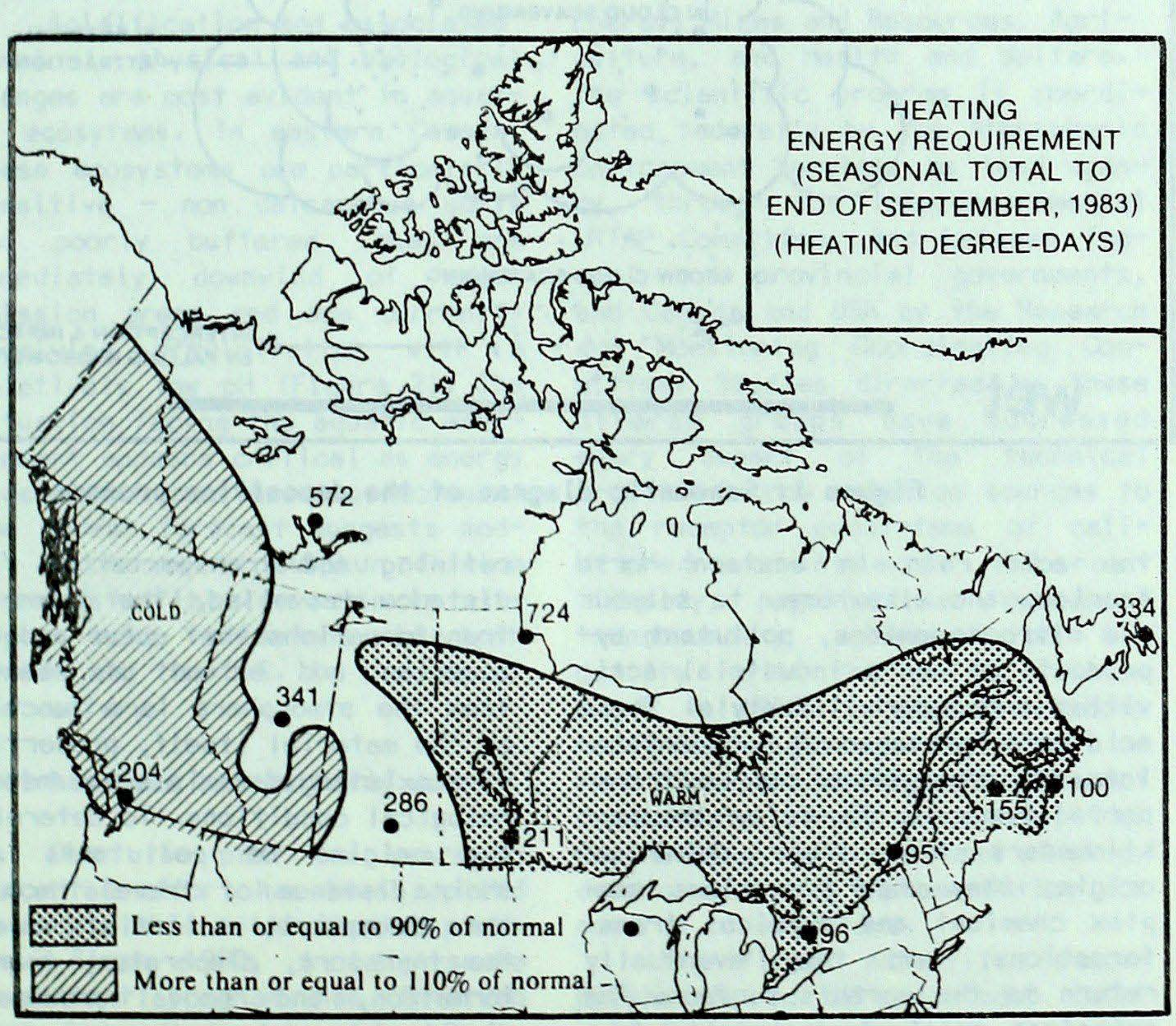


TOTAL TO END OF SEPTEMBER

	1983	1982	NORMAL
BRITISH COLUMBIA			
Kamloops	2080	2050	2051
Penticton	1891	1916	1959
Prince George	1139	1290	1122
Vancouver	1867	1696	1734
Victoria	1749	1570	1605
ALBERTA			
Calgary	1289	1186	1255
Edmonton Mun.	1453	1462	1284
Grande Prairie	1141	1127	1239
Lethbridge	1525	1529	1562
Peace River	1140	1048	1179
SASKATCHEWAN			
Estevan	1739	1488	1671
Prince Albert	1365	1218	1353
Regina	1508	1476	1543
Saskatoon	1541	1421	1519
Swift Current	1429	1244	1514
MANITOBA			
Brandon	1502	1411	1556
Dauphin	1434	1328	1493
Winnipeg	1722	1571	1654
ONTARIO			
London	1973	1909	1953
Muskoka	1771	1714	1612
North Bay	1644	1528	1604
Ottawa	2015	1890	1886
Thunder Bay	1453	1208	1323
Toronto	1991	1829	1963
Trenton	1974	1790	1947
Windsor	2297	2258	2262
QUEBEC			
Baie Comeau	1122	921	1096
Montréal	2014	1894	1955
Québec	1563	1554	1607
Sept-Iles	1038	804	970
Sherbrooke	1472	1465	1721
NEW BRUNSWICK			
Charlo	1449	1270	1394
Fredericton	1775	1594	1618
Moncton	1677	1389	1536
NOVA SCOTIA			
Halifax	1685	1385	1498
Sydney	1486	1268	1374
Yarmouth	1490	1378	1378
PRINCE EDWARD ISLAND			
Charlottetown	1656	1382	1455
NEWFOUNDLAND			
Gander	1275	1017	1144
St. John's	1074	975	1044
Stephenville	1392	1154	1174

ENERGY REQUIREMENT





SEASONAL TOTAL OF HEATING DEGREE-DAYS TO END OF SEPTEMBER

	1983	1982	NORMAL
BRITISH COLUMBIA			
Kamloops	175	120	136
Penticton	188	136	139
Prince George	511	396	482
Vancouver	204	195	190
Victoria	241	232	248
YUKON TERRITORY			
Whitehorse	733	574	608
NORTHWEST TERRITORIES			
Frobisher Bay	1099	1227	1121
Inuvik	876	727	837
Yellowknife	572	542	536
ALBERTA			
Calgary	368	389	383
Edmonton Mun.	341	322	344
Grande Prairie	466	448	410
SASKATCHEWAN			
Estevan	232	244	234.
Regina	286	282	273
Saskatoon	299	309	288
MANITOBA			
Brandon	246	317	265
Churchill	724	834	764
The Pas	289	368	351
Winnipeg	211	266	234
ONTARIO			
Kapuskasing	273	475	371
London	100	162	132
Ottawa	93	185	164
Sudbury	167	303	268
Thunder Bay	196	374	322
Toronto	96	154	123
Windsor	62	235	75
QUÉBEC			
Baie Comeau	362	532	437
Montréal	95	179	133
Québec	174	263	223
Sept-Iles	407	569	469
Sherbrooke	224	320	313
Val-d'Or	266	447	382
NEW BRUNSWICK			
Charlo	253	348	257
Fredericton	155	222	207
Moncton	164	237	215
NOVA SCOTIA			
Halifax	100	176	171
Sydney	192	239	212
Yarmouth	174	252	236
PRINCE EDWARD ISLAND			
Charlottetown	147	218	194
NEWFOUNDLAND			
Gander	328	366	346
St. John's	334	342	373

ACID RAIN

by
E.E. Wilson
Air Quality and Inter-Environmental Research Branch

Almost everyone has heard, at one time or another, about the phenomena known as acid rain. It is well-known as a major environmental concern in many regions of North America, northern Europe and other parts of the world. But what exactly is it, where does it come from, why is it a problem and what are scientists doing about it? These questions are answered, in part, as follows.

What is Acid Rain?

Acidic deposition, popularly described as "acid rain", actually occurs as a result of two fundamental and distinct processes. The process by which acids are deposited in rain or snow is called "wet deposition". Acidic precipitation deposited onto the surface by this process includes all forms of precipitation - rain, snow, sleet and hail. It is usually defined as being more acidic (i.e., having a lower pH) than "normal, clean" rain, which is slightly acidic at a pH of approximately 5.6. In the second process, known as "dry deposition", sulphate- and nitrate-containing particles, and gases such as sulphur dioxide of nitrogen are deposited or absorbed onto surfaces. These particles and gases can either be acidic or can be converted into acid forms after deposition.

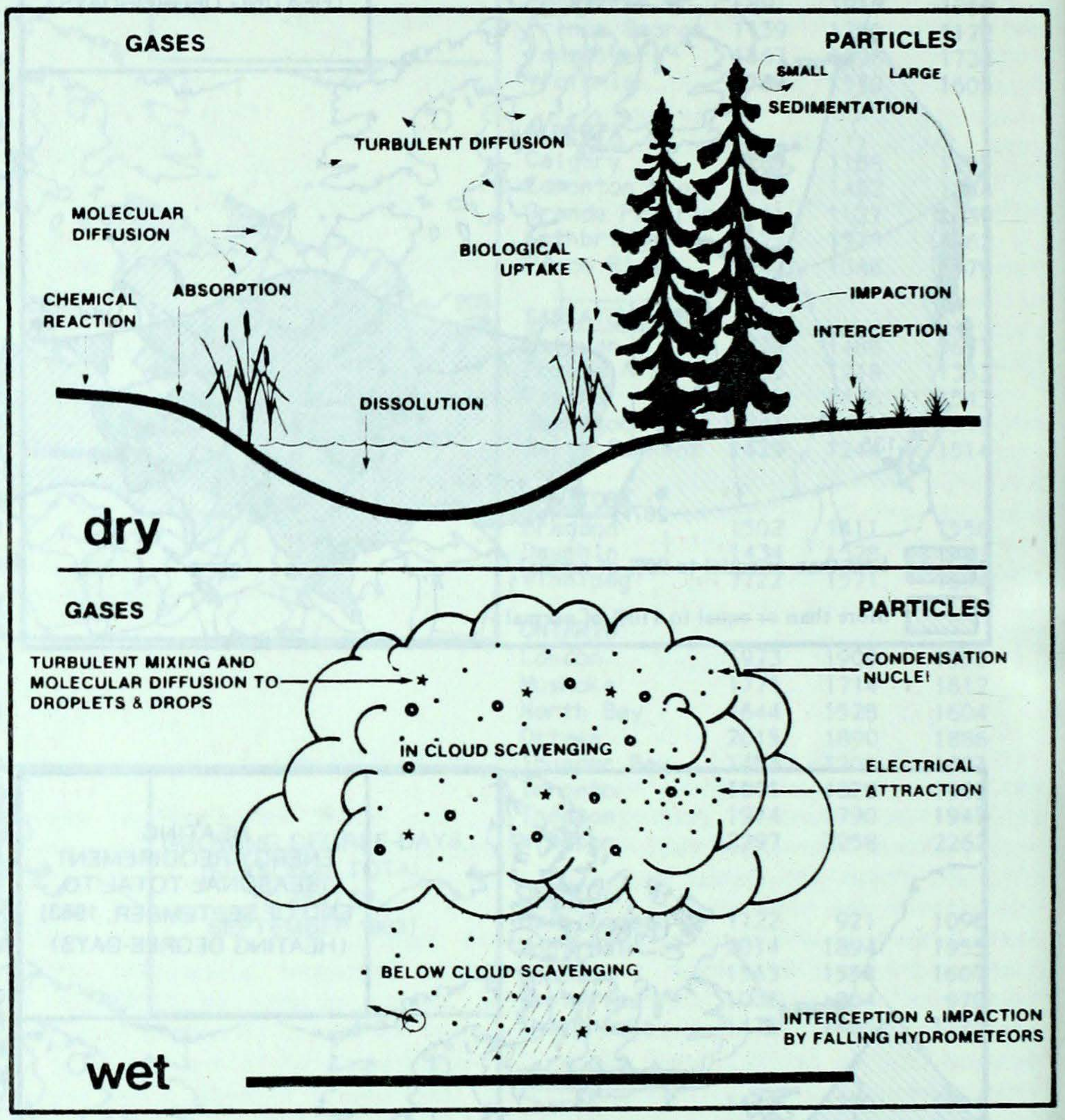


Figure 1: Schematic diagram of the deposition process

Atmospheric input often comprises a significant portion of the total input to an ecosystem. Wet and dry acidic deposition are both important on a regional basis in Canada, although in the Canadian Shield areas far removed from sources, wet deposition is relatively more important. Dry deposition provides a slower but more continuous impact. Figure 1 shows schematically several wet and dry deposition processes.

Where does the Acid Rain originate?

Research attributes most of the acid rain in eastern North America, and elsewhere, to sulphur and nitrogen oxides, pollutant by-products of man's industrial activities and modern lifestyle. These acid rain "precursors" once emitted into the atmosphere can be transported hundreds to a few thousand kilometers from their point of origin; they undergo various complex chemical and physical transformations, and they eventually return to the earth's surface. The emissions originate primarily from combustion of fossil fuels, including major processes such as power generation, ore smelting, petroleum refining and transportation. The distance travelled, the types of transformations that occur and the location and extent of removal from the atmosphere is a function of the material itself, properties of coexisting materials and meteorological conditions. To determine the origins of pollutants and their distance of travel through the atmosphere, scientists model the transport, dispersion, transformation, and removal processes of emissions released.

Long-range transport of air pollutants (LRTP) and acidic precipitation are closely related.

Prolonged transport of sulphur and nitrogen compounds allows time for chemical and physical conversion from sulphur dioxide and nitrogen oxides into acidic compounds. Prevailing weather conditions in eastern North America foster large-scale movement of acidic pollutants within both Canada and the United States as well as across state, provincial and national borders so that the transport and origin of pollutants are transboundary issues.

What are the effects of Acid Rain?

The impacts of acid rain extend beyond the atmospheric environment, the dominant pathway, to the aquatic and terrestrial environments, to fisheries and agriculture, as well as to buildings, structures and human health. The time scale of the responses vary from very short-time (in the case of fish kill episodes) to hundreds of years or longer for some soils and terrestrial systems. The ecosystems effects are subtle, difficult to measure, often cumulative and possibly irreversible.

Acidification and associated chemical, physical and biological changes are most evident in aquatic ecosytems. In eastern Canada, these ecosystems are particularly sensitive - non calcareous soils and poorly buffered lakes are immediately downwind of major emission areas and are currently receiving precipitation with a relatively low pH (Figure 2). The situation facing the aquatic environment appears critical as energy consumption continues to increase. One recent forecast suggests modest increases in sulphur dioxide and substantial increases in nitrogen oxide emissions in both Canada and the U.S. to the end of the century.

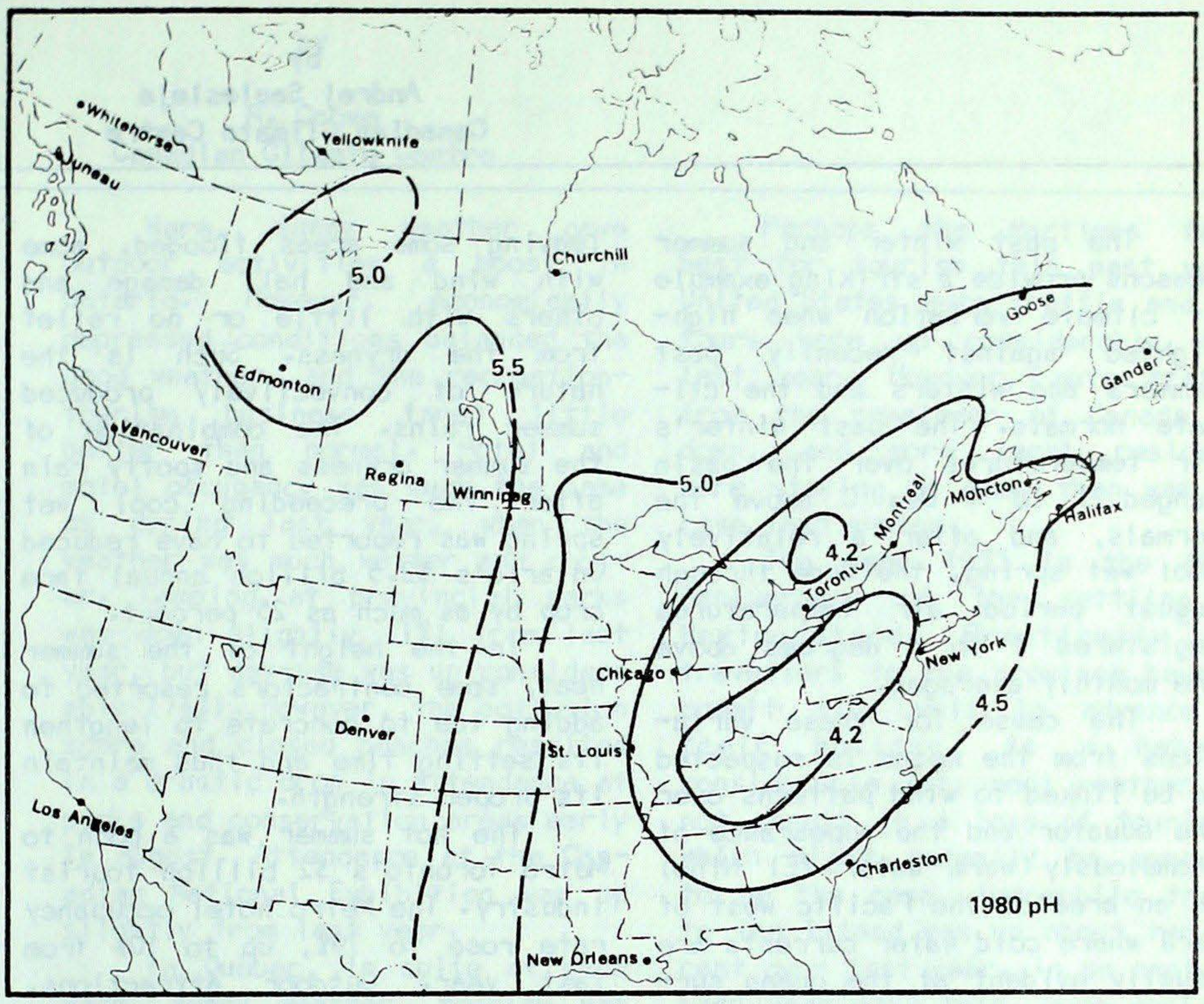


Figure 2: Mean annual pH in North America for the year 1980

What has been and is being done?

Over the past few years, a concerted effort has been applied to tackle this multi-faceted problem. Since 1980, a large-scale government program has involved five federal departments: Environment, Fisheries and Oceans, Energy, Mines and Resources, Agriculture, and Health and Welfare. The scientific program is coordinated federally by the Atmospheric Environment Service, as lead agency, through the Interdepartmental LRTAP Committee, and between federal and provincial governments, and Canada and USA by the Research and Monitoring Coordinating Committee. Studies directed by these diverse groups have addressed every aspect of the technical problem - from emission sources to the receptor ecosystems of calibrated watersheds. Internationally, negotiations towards a transboundary agreement on air quality with the United States began in 1980. Scientists of both countries have participated on Work Groups dealing with impact assessment, atmospheric modelling, engineering and costs, and strategy development and implementation for control of emissions.

Significant scientific accomplishments to date include: total emission inventories for both anthropogenic and natural sources; geological mapping of sensitive terrain; relationships between ecosystems loading and environmental consequences including effects on fisheries, surface water chemistry and wildlife; effects on forests and vegetation and the soils that support these systems, terrestrial wildlife and total land systems. The atmospheric program has provided extensive information on transport, transformation and deposition fields. One important result of the scientific programs has been the acceptance of a Canadian target level for wet sulphate deposition, set at 20 kg SO_4 ha^{-1} y^{-1}, which is required to protect moderately sensitive aquatic eccosystems.

This report has addressed only a small part of the questions posed. Acid rain represents a wide-ranging topic that can include all aspects of the problem of the long-range transport of air pollutants. Future articles will expand on some of the important problems and their resolution.

Reflections on The Mild Winter of 82-83 and Hot Summer of 83 - Impacts on the Great lakes Basin

by
Andrej Saulesleja
Canadian Climate Centre

The past winter and summer seasons provide a striking example of climate variation when highlighted against recently past summers and winters and the climate normals. The past winter's air temperatures over the basin ranged 3 to 4 Deg C above the normals, and after a relatively cool wet spring, the June through August period air temperatures registered 1 to 4 degrees above the monthly averages.

The cause for these variations from the means is suspected to be linked to wind patterns over the equator and the appearance of anomalously warm water (El Niño) in an area of the Pacific west of Peru where cold water currents are usually evident at the ocean surface. (See the May '83 supplement to Climatic Perspectives for more details on El Niño).

The past mild winter saved Southern Ontario towns and municipalities millions in snow removal expenses. However, although ski operators had plentiful natural or man-made snow, attendance was down because of a lack of snow in the populated areas.

Higher than normal winter air temperatures resulted in a much reduced ice cover over the Great Lakes. Lake Erie remained essentially ice free through the winter and ice over Georgian Bay and Lake Superior was reduced in extent. Great Lakes shipping benefitted from an extended season but thin ice along coastal areas and over smaller lakes proved hazardous for recreational pastimes.

In the past summer, the higher temperatures were accompanied by extended periods without significant precipitation. Areas of the Great lakes basin were in the midst of drought or near drought conditions in July and when the rains came, it was in locally heavy downpours from thunderstorms leaving some areas flooded, some with wind and hail damage and others with little or no relief from the dryness. Such is the nature of convectively produced summer rains. The combination of the summer dryness and spotty rain after the preceeding cool wet spring was reported to have reduced Ontario's $2.5 billion annual farm crop by as much as 25 percent.

In the height of the summer heat, some contractors resorted to adding ice to concrete to lengthen its setting time and thus maintain its proper strength.

The hot summer was a boon to Metro Toronto's $2 billion tourist industry. The Metro hotel occupancy rate rose to 79%, up to 10% from last year. Outdoor attractions, parks, baseball games and resorts benefited from increased attendance, but indoor shows, the art galleries, and the Ontario Science Centre had reduced attendance.

Water temperatures over Lake Ontario began to soar with the warm spell in June to levels never before seen since lake-wide surface temperature records began in 1968. Near the end of June Lake Ontario's mean surface temperature was at 21 Deg C almost 9 Deg C above normal. At the end of August, it remains 2-3 Deg C above normal but sunny and warm conditions over the rest of the basin have warmed other Lakes as well. In the month of August Lake Erie was 3-4 Deg C above average, lake Huron 3-5 above and Lake Superior 5-7 above.

Sultry air temperatures and sunny skies attracted many to the beaches to swim in unusually warm waters, but the combination of polution and naturally enhanced bacterial growth in warmer waters caused many beaches to be closed to swimming in July and August.

The Great Lakes may hold the key to weather conditions over the basin this fall and winter. Water temperatures of the lakes are considerably above normal, and as such the lakes represent a large and persistent source of moisture and heat energy to enhance the development of weather systems and storms. Barring unusual weather patterns in the coming months, the energy stored in the lakes should stack the deck of weather possibilities in favour of more frequent and perhaps more severe thunderstorm activity over or to the lee of lakes in fall and greater and more intense "lake effect snowfall" over snow belt areas this winter. The energy could also feed larger weather systems, increasing their intensity to produce higher winds and perhaps more precipitation during the fall and early winter. Higher water temperatures mean that greater evaporation from the lakes is likely and that water levels are likely to drop more in the fall and winter if the greater evaporation is not offset by increased precipitation.

But, however caused, the past seasons provide an example of the mean weather conditions and impacts one might expect towards the middle of the next century as a result of a warming of the climate from increased atmospheric carbon dioxide. The warming resulting from a doubled carbon dioxide concentration is estimated to be 3 to 4 Deg C in winter and near 3 Deg C in summer, making the past winter and summer perhaps typical of the seasons to come in the middle of the next century. We do not know all implications from such a warming climate but the past seasons provide some hints.

SUMMER RECREATION AND TOURISM - 1983

by

R. Crowe
Canadian Climate Centre

In spite of much sunny, warm weather this past summer, recreation and tourism patterns across Canada were for the most part close to normal.

In British Columbia, July was a bad month weatherwise, as generally cool, rainy weather affected outdoor activities. Many campsites and parks were wet. August fared better, as some sunny warm weather occurred, and outdoor activities were on the increase. Attendance at the Pacific National Exhibition in Vancouver was down drastically for the first few days of the fair due to some rainy days. However, record crowds during the last weekend raised total attendance to just under last year's value.

In spite of considerable heat and humidity, it was a good summer for tourism on the Prairies. Outdoor recreation fared well, but there were some problems with flooded compsites, particularly in the Peace River area of Alberta.

Warm, sunny weather gave outdoor activities a boost in Ontario. However, economically depressed conditions balanced the good weather, and the recreation-tourism business fared little better than normal. Hotel and motel occupancy was much the same as during last year, when the weather was much wetter and cooler. Camping at provincial parks was down slightly (1%) from last year, but day-use was up considerably (7½%). However, the pollution scare and closed beaches resulted in a drastic drop in attendance at parks and conservation areas early in August. Attendance at the Canadian National Exhibition was up slightly from last year.

In Québec, in spite of much warm, sunny weather, tourism was down slightly from last year due to the depressed economy and the high price of gas. More Québec residents left the province for American holidays than did last year.

Perhaps the Martimes fared best for tourism this past year. United States auto traffic and bus tours were up considerably from last year. However, auto traffic from the remainder of Canada was down, and more local residents were staying at home than was the case last summer.

The year 1983 is the 400th anniversary of the settling of Newfoundland. Practically all travellers to the province have to commit time well in advance of their holiday. As a result, considerable wet, cool weather did not result in a loss of tourists, which might normally be expected to be the case. Automobile travel to the island was up about two per cent over last year. In an anniversary year like this, more would be expected, but the depressed economy took its toll. Airline traffic was down slightly from last year, mostly due to a strike by Eastern Provincial Airlines.

GREAT LAKES SURFACE WATER TEMPERATURES

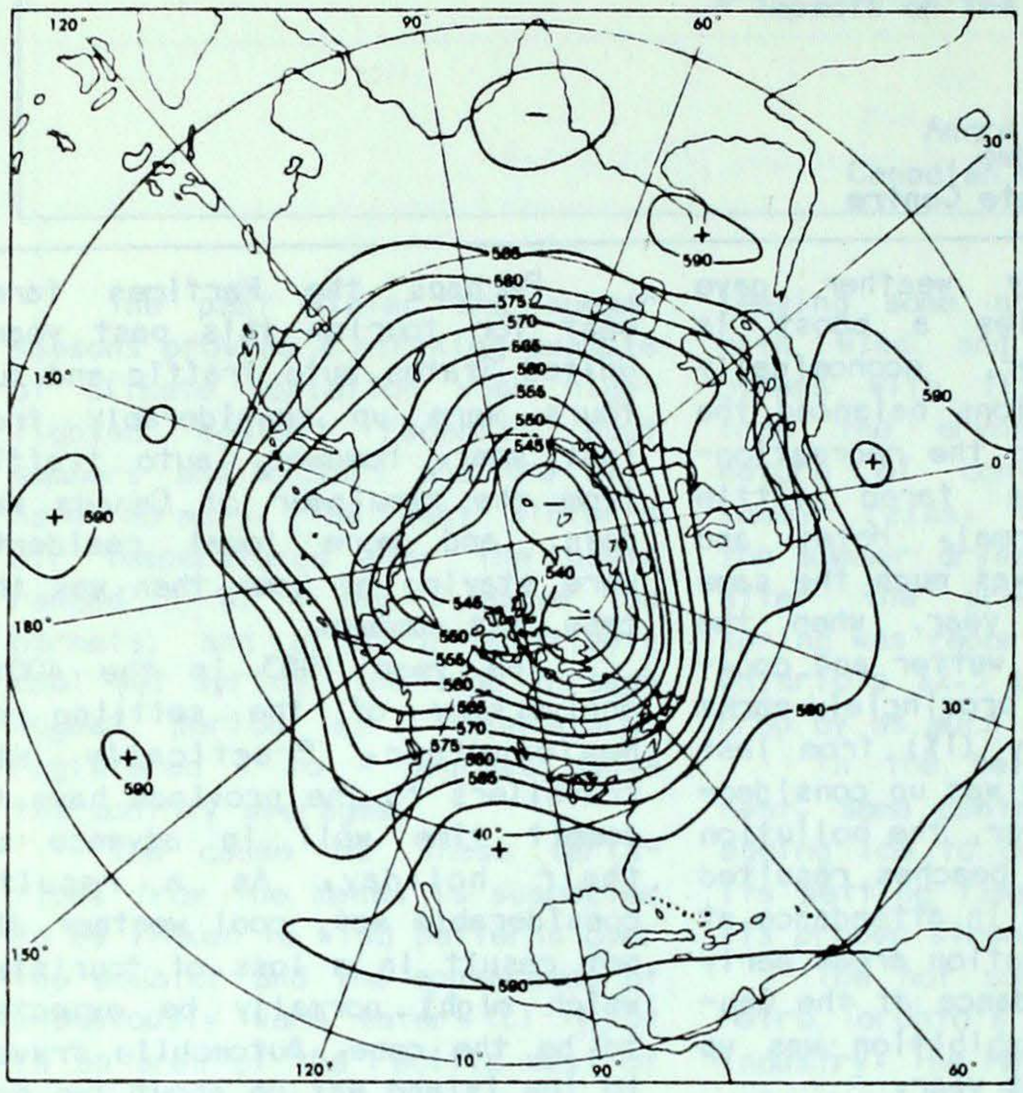
by

George Irbe
Canadian Climate Centre

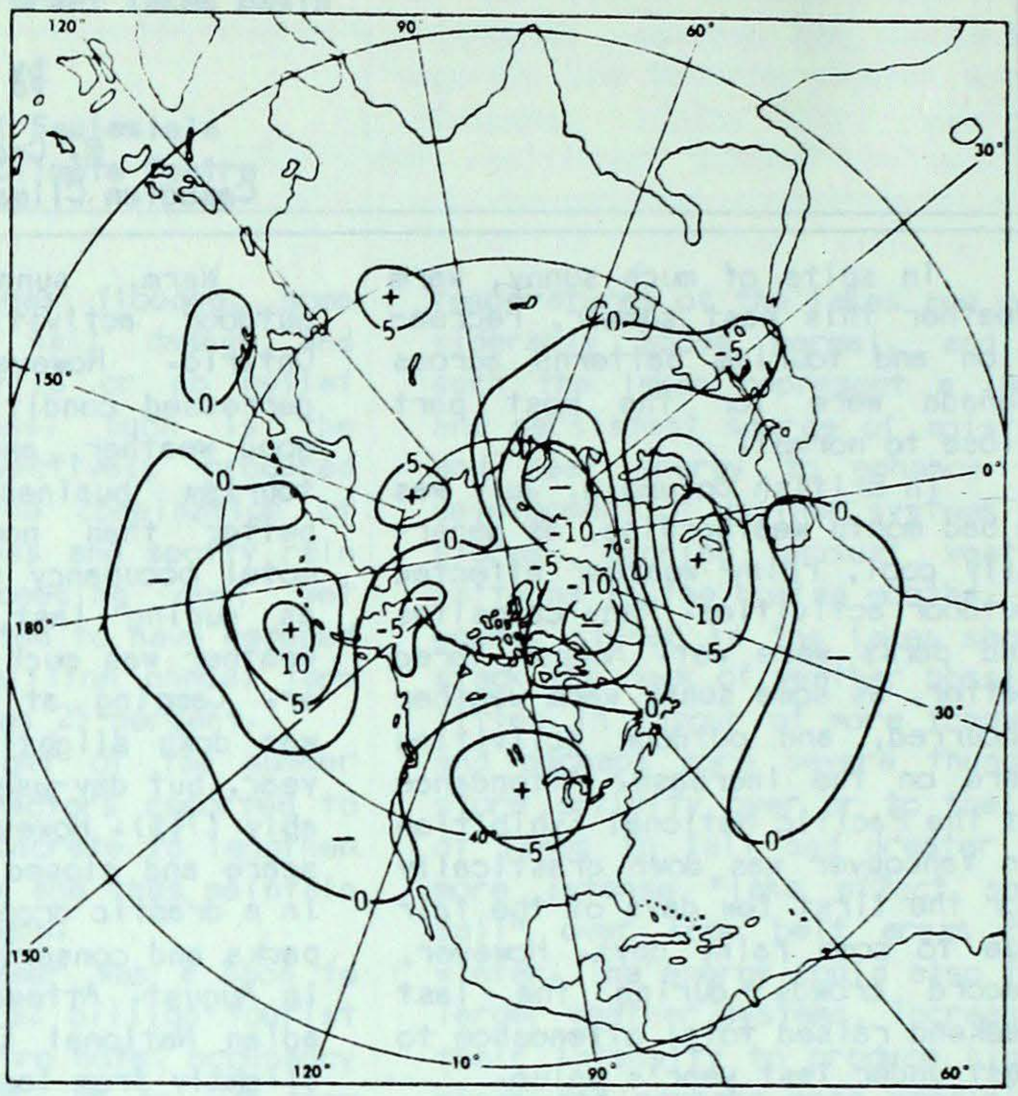
Consistently warm conditions, with only a few short cool spells, prevailed over the Great Lakes in July, August and the first week of September. Air temperatures averaged from 1°C above normal in the lower Great Lakes region, to 3°C above normal in the Lake Superior region. As a result, surface water temperatures in the Great Lakes also exceeded normal values by considerable margins. Peak temperatures, reached in the latter part of August were more than 4°C above normal. After the arrival of cooler weather in September water temperatures started to return to more normal values.

	Jul. Temp. Dep.	Aug. Temp. Dep.	Sept. Temp. Dep.
Lake Ontario	7(16.5 +0.4)	2(22.4 +3.3)	1(22.9 +4.7)
	14(20.5 +3.2)	16(23.6 +4.1)	8(21.8 +4.2)
	22(22.3 +4.3)	20(21.2 +2.9)	25(17.0 +1.9)
Lake Erie	7(19.4 -1.3)	7(24.9 +2.8)	25(19.4 +0.8)
	13(21.6 +0.3)	16(25.8 +3.7)	
	26(23.4 +1.8)	29(25.8 +4.3)	
Lake Huron	6(13.1 +0.3)	2(22.8 +3.5)	25(16.9 +1.8)
	12(16.1 +2.4)	20(22.2 +4.2)	
	26(20.0 +3.2)	31(21.8 +4.1)	
Georgian Bay	6(13.0 -1.2)	2(20.6 +3.4)	25(17.9 +3.2)
	12(15.7 0.0)	20(20.6 +2.5)	
	26(18.6 +1.3)	31(22.4 +4.7)	
Lake Superior	5(6.5 -0.1)	7(18.4 +7.2)	
	12(7.5 -0.2)	14(19.4 +7.2)	
	25(13.8 +4.0)	31(18.5 +4.9)	

50 kPa ATMOSPHERIC CIRCULATION



MEAN 50kPa HEIGHT (dam)
AUGUST 1983



MEAN 50kPa HEIGHT ANOMALY (dam)
AUGUST 1983

Commencing in this issue 50 kPa (kilopascal) Northern Hemisphere mean height and anomaly maps will be occasionally included on a trial basis. Some ongoing adjustments will be made in future and comments are invited.

The 50 kPa level of the atmosphere, on the average 5000 metres above sea level, is generally considered the steering flow for weather systems. At this level air movement is nearly parallel to the contour lines depicted on the mean height field map, with the wind speed being inversely proportional to the distance between contour lines. The wind flow is generally in a west to east direction but aligned in wave-like patterns around the hemisphere. These patterns called "waves", can vary considerably in amplitude, and they usually persist for much longer periods than do surface weather patterns. When the amplitude of these waves increases and becomes greater (meridional flow) and their eastward progression slows down or even stops, it is said that they have become quasi-stationary. If such is the case, strong surface temperature anomalies can occur over certain areas.

Near or above normal temperatures can usually be expected in areas where there is a southwesterly upper air flow, or in other words downstream from the trough position, and in the vicinity of the ridge as can be seen on the accompanying height field charts over central Canada. Below normal temperature can usually be expected where there is a northwesterly air flow, downstream from the ridge position, and in the vicinity of a trough as depicted over the Atlantic Provinces. Likewise, temperatures can usually be expected to be close to normal if the upper air flow is in a west to east direction (zonal) with no waves, or ones with a very weak amplitude.

Surface weather conditions are also affected by the 50 kPa upper air flow. Areas in the vicinity of a trough position, such as depicted along both the east and the west coasts will receive relatively more unsettled weather, while areas in the vicinity of a ridge position will receive relatively more stable, fair conditions as seen across the central part of the continent.

During the month of August, mean temperatures in central Canada were more than 4° above normal, while rainfall amounts were less than 50 per cent of normal in several regions. Both the Canadian west and east coasts had near or below-normal mean temperatures, but precipitation amounts especially in the Atlantic provinces, were heavy, as much as 200 per cent of normal.

The 50 kPa height anomaly map depicts the departure in decametres (dam) between the actual height fields and the normal conditions for the time of year.

There are many other factors which can influence weather conditions, for example, topographic features such as mountains, large bodies of water (Great Lakes) etc., but overall, the 50 kPa mean upper air flow relates well to the ensemble surface weather patterns which have occurred during the period.

Andy Radomski

SEPTEMBER 1983 SEPTEMBRE

STATION	Temperature °C / Température °C: Mean / Moyenne	Difference from Normal / Écart à la normale	Maximum / Maximale	Minimum / Minimale	Snowfall (cm) / Chute de neige (cm)	Total Precipitation (mm) / Précipitation totale (mm)	% of Normal Precipitation / % de précipitation normale	Snow on ground at end of month (cm) / Neige au sol à la fin du mois (cm)	No. of days with Precip. 1.0 or more (mm) / Nombre de jours de préc. 1.0 ou plus (mm)	Bright sunshine (hours) / Durée de l'insolation (heures)	Degree Days below 18°C / Degrés-jours au-dessous de 18°C	Mean Sea Level Pressure (kPa) / Pression au niveau moyen de la mer (kPa)	Mean Vapour Pressure (kPa) / Pression de vapeur moyenne (kPa)
BRITISH COLUMBIA COLOMBIE-BRITANNIQUE													
Abbotsford	13.0	-1.5	26.2	0.2	0.0	103.4	115	0	8	179	148.7	101.8	1.24
Alert Bay	11.0	-1.6	19.8	1.6	0.0	102.5	86	0	15		210.4	102.0	1.13
Blue River A													
Bull Harbour	11.8	-0.3	18.1	2.2	0.0	149.9	99	0	19			101.9	
Burns Lake													
Cape St. James	12.4	-0.5	17.4	6.9	0.0	157.8	126	0	18				
Cape Scott	12.5	-0.2	17.2	5.4	0.0	184.8	97	0	18		167.0	101.8	1.26
Castlegar A	12.6	-1.8	27.5	-2.1	0.0	20.6	57	0	4	205	162.7	101.8	
Comox A													
Cranbrook A	10.3	-2.0	26.1	-5.7	T	10.0	34	0	3	218	350.9	101.8	.69
Dease Lake	5.8	-1.3	17.5	-8.9	3.0	51.9	112	0	12	115	366.9	101.6	.69
Ethelda Bay													
Fort Nelson A	7.4	-1.3	24.2	-8.3	4.6	61.6	148	T	7	176	318.7	101.4	.73
Fort St. John A	8.0	-1.5	22.3	-7.8	8.5	48.7	124	0	8		300.8	101.5	.74
Hope A	13.5	-2.0	24.8	2.3	0.0	110.4	107	0	11	159	132.6	101.9	1.16
Kamloops A	13.2	-1.7	29.2	-2.9	0.0	46.8	219	0	8	176	144.1	101.7	.92
Kelowna A	11.7	-1.4	24.7	-4.8	0.0	35.6	87	0	5	195	188.1	101.8	.88
Langara	11.6	-0.5	16.0	5.9	0.6	236.7	141	0	23		191.8	101.6	1.20
Lytton	14.6	-1.9	27.3	-0.1	0.0	32.7	127	0	7	165	109.3	101.7	1.01
Mackenzie A	7.2	-1.9	20.4	-7.1	0.8	58.2	117	0	10	125	323.3		
McInnes Island	12.7	-0.2	18.4	6.4	0.0	315.0	154	0	17		160.8	101.8	1.29
Merry Island													
Penticton A	13.4	-1.3	25.6	-2.1	0.0	27.2	154	0	4	209	140.9	101.8	.92
Port Alberni A	13.3	-1.4	26.7	-2.1	0.0	51.0	56	0	8	187	143.4		
Port Hardy A	11.3	-0.5	19.1	1.3	0.0	118.9	87	0	16	151	200.0	101.9	1.12
Prince George A	8.2	-1.5	21.1	-7.5	T	36.8	46	0	7	166	293.5	101.8	.81
Prince Rupert A	10.6	-0.8	16.4	-0.5	0.0	461.1	198	0	22	104	217.4	101.7	1.18
Princeton A	10.4	-2.5	23.4	-6.7	0.0	31.6	174	0	4	184			
Quesnel A	9.5	-1.8	23.9	-8.4	0.0	44.6	98	0	12		256.3	101.8	.89
Revelstoke A	10.5	-1.7	21.0	-1.5	0.0	63.1	108	0	12	134	226.8	101.8	.97
Sandspit A	12.4	-0.5	20.6	6.2	0.0	179.9	200	0	16	124	165.2	101.7	1.20
Smithers A	8.2	-1.6	19.6	-4.8	0.0	46.0	91	0	13	128	294.6	101.7	.84
Stewart A													
Terrace A	10.5	-1.4	18.7	-1.4	0.0	109.2	111	0	12	107	224.8	101.7	.89
Vancouver Harbour	13.7	-0.9	21.7	5.1	0.0	91.4	116	0	7		128.4		
Vancouver Int'l A	13.5	-0.7	23.4	3.6	0.0	76.7	114	0	7	199	135.2	101.9	1.23
Victoria Gonzales Heights	13.7	-0.5	23.7	2.2	0.0	84.6	253	0	5	215	128.2		
Victoria Int'l A	13.1	-0.8	23.7	2.2	0.0	84.6	214	0	5	216	148.2	101.9	1.14
Victoria Marine	12.4	-0.6	20.8	3.1	0.0	60.0	97	0	6		167.2	101.9	1.15
Williams Lake A	8.9	-1.4	23.9	-6.5	0.6	39.1	129	0	8	170	273.6	101.8	.73

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YUKON TERRITORY TERRITOIRE DU YUKON													
Burwash A	1.7	-3.4	16.5	-22.3	9.9	25.0	105	0	5		485.5	101.3	.52
Dawson A	2.6	-2.8	15.5	-23.2	17.2	47.9	133	3	7		460.8	101.3	.57
Mayo A	4.0	-2.5	17.5	-14.9	1.2	23.8	79	0	7		418.2	101.3	.59
Watson Lake A	5.5	-2.1	19.0	-13.9	7.5	55.4	127	0	9	132	489.3	101.4	.66
Whitehorse A	4.7	-2.8	18.6	-19.4	4.8	50.4	166	T	7	139	401.0	101.4	.61
NORTHWEST TERRITORIES TERRITOIRES DU NORD-OUEST													
Alert	-8.2	-2.0	4.7	-25.1	49.3	23.9	86	10	6	99	786.9	101.6	.31
Baker Lake	5.2	2.9	13.0	-4.4	7.8	57.1	154	2	11	71	391.1	101.2	.74
Cambridge Bay A	4.0	4.7	13.2	-6.1	15.6	28.8	166	5	5	119	437.7	101.1	.70
Cape Dyer A	-0.1	1.3	7.4	-7.6	13.2	11.2	15	5	3		543.9	101.4	.42
Cape Parry A	1.0	0.3	0.0	-7.9	21.4	39.6	169	3	7		509.3	101.2	.59
Clyde	0.6	0.8	13.3	-8.8	27.6	26.4	75	21	5	184	522.8	101.6	.52
Coppermine	3.8	1.3	19.1	-3.5	0.8	103.3	430	0	10	60	426.8	101.0	.68
Coral Harbour A	2.3	1.4	13.0	-9.1	4.6	5.2	15	1	0	183	470.5	101.4	.59
Eureka	-5.0	-3.3	4.5	-18.2	14.0	18.6	194	2	5	71	689.7	101.4	.41
Fort Reliance	6.9	0.8	16.6	-2.7	2.0	46.7	155	T	12		331.6	101.1	.81
Fort Simpson A	4.8	-2.5	22.3	-20.6	14.8	20.4	65	6	4	161	384.9	101.3	.62
Fort Smith A	6.8	-0.7	21.2	-10.2	1.0	17.8	43	0	7	156	336.4	101.2	.72
Frobisher Bay A	1.9	-0.5	11.3	-4.6	12.5	14.2	31	T	7	168	484.2	101.3	.55
Hall Beach A	1.2	1.8	9.4	-5.5	0.4	2.3	8	0	1		505.6	101.6	.58
Hay River A	6.5	-1.6	23.1	-10.3	13.9	53.0	125	5	7		347.8	101.2	.73
Inuvik A	0.7	-2.4	17.1	-20.1	21.0	20.6	86	8	8	110	507.1	101.3	.55
Mould Bay A	-5.3	1.2	-0.5	-15.0	35.2	24.9	180	17	8	20	697.6	101.2	.40
Norman Wells A	4.1	-2.0	21.2	-15.7	8.5	25.6	87	5	6	134	415.4	101.3	.59
Pond Inlet A													
Resolute A	-1.2	3.9	6.2	-8.4	5.2	35.0	194	1	6	31	572.6	101.4	.53
Sachs Harbour A	-2.3	-0.3	7.5	-14.9	24.4	42.8	252	3	12	51	608.6	101.2	.50
Yellowknife A	5.4	-1.3	17.7	-9.7	17.4	35.8	117	5	7	151	376.1		
ALBERTA													
Banff	7.7	-1.6	22.0	-7.5	21.8	34.5	83						
Brooks	10.5	-1.4	32.5	-6.5	0.0	8.2	20	0		208			
Calgary Int'l A	9.9	-0.7	27.5	8.6	6.2	16.0	42	0	3	205	246.2	101.6	.61
Cold Lake A	8.7	-1.1	25.9	-6.3	T	58.8	131	0	5	153	280.5	101.4	.81
Coronation A	8.8	-1.7	31.0	-9.1	3.2	48.4	148	0	7	181	281.6	101.6	.73
Edmonton Int'l A	8.4	-1.4	26.4	-9.6	5.0	36.2	79	0	7	169	288.7	101.5	.80
Edmonton Municipal A	9.8	-1.2	24.1	-4.4	3.0	40.2	103	0	7	166	247.6	101.5	.81
Edmonton Namao A	9.0	-1.4	23.2	-6.4	1.0	41.6	100	0	10		268.7	101.5	.81

SEPTEMBER 1983 SEPTEMBRE

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Edson A	7.1	-1.4	24.2	-11.4	0.4	52.2	117	0	8	155	328.1	101.6	.74
Fort Chipewyan A	7.2	-0.6	21.5	-10.5	T	32.9	78						
Fort McMurray A	8.2	-0.8	22.8	-9.5	T	33.0	56	0	6	143	296.0	101.3	.83
Grande Prairie A	8.6	-1.2	24.4	-9.0	T	15.2	41	0	6	159	283.7	101.5	.70
Hign Level A	6.1	-2.0	22.0	-11.1	T	36.2	107	0	8	158	355.1	101.3	.69
Jasper	7.9	-1.9	22.5	-8.5	0.6	29.4	77	0	9	136	302.5	101.8	.70
Lethbridge A	11.5	-0.8	30.4	-3.8	0.2	17.0	46	0	5		202.3	101.5	.70
Medicine Hat A	11.4	-1.8	34.9	-3.0	0.2	18.8	58	0	4	217	195.7	101.5	.72
Peace River A	7.6	-1.5	21.2	-9.5	0.2	32.3	84	0	5		303.3	101.4	.77
Red Deer A	8.6	-1.5	27.4	-8.4	T	25.5	58	0	9		279.7	101.6	.73
Rocky Mountain House	7.7	-2.0	25.4	-9.6	1.4	58.1	117	0	11		309.3	101.6	.72
Slave Lake A	7.8	-1.2	20.4	-7.0	T	40.6	81	0	7	151	305.7	101.4	.79
Suffield A	11.6	-1.2	33.6	-5.7	T	9.4	27	0	3	211	205.3		
Whitecourt	7.7	-1.2	23.3	-8.3	T	40.8	118	0	12		288.5	101.6	.79
SASKATCHEWAN													
Broadview	10.1	-0.5	32.4	-8.5	20.2	44.3	90	1	6	163	245.0	101.4	.76
Collins Bay	7.2	1.2	23.0	-6.0	1.2	101.7	149	0	14	111	327.5	101.2	.83
Cree Lake	7.8	-0.1	24.4	-8.5	6.8	86.3	151	0	9	121	301.7	101.3	.81
Estevan A	11.8	-0.6	35.4	-5.1	4.2	67.0	154	0	8	190	269.0	101.5	.87
Hudson Bay	9.9	0.1	29.5	-5.9	0.0	57.6	110	0	6	164	248.6	101.2	.92
Kindersley KY	10.3	-1.2	34.4	-5.9	0.0	48.4	183	0	8		238.4	101.4	.79
La Ronge A	9.4	0.3	28.5	-3.2	T	90.7	154	0	12		267.9	101.2	.92
Meadow Lake	9.2	-1.0	29.0	-6.9	T	86.7	204	0	7	159	259.3	101.3	.83
Moose Jaw A	11.1	-1.4	36.7	-5.1	3.2	57.2	160	0	6	175	220.5	101.5	.77
Nipawin A	9.9		30.1	-8.1	T	59.8		0	8	174	244.1	101.2	.90
North Battleford A	9.4	-1.6	34.4	-5.0	0.0	81.9	319	0	7		262.0	101.4	.83
Prince Albert A	9.3	-0.6	30.1	-8.0	T	106.7	271	0	9	170	267.1	101.3	.86
Regina A	9.7	-2.0	33.4	-6.9	3.8	61.8	168	0	11	160	240.0	101.5	.81
Saskatoon A	10.2	-1.0	33.9	-5.4	T	65.2	205	0	8		240.5	101.4	.81
Swift Current A	10.2	-1.5	35.2	-8.0	3.2	14.1	41	0	5	188	245.1		
Wynyard	10.0	-0.9	30.8	-5.4	0.5	41.0	110	0	6	156	247.0	101.3	.81
Yorkton A	10.5	-0.4	31.6	-6.8	1.5	29.4	63	0	4	160	236.6	101.4	.85
MANITOBA													
Bissett	12.0	1.3	35.5	-1.1	T	52.0	77	0	9	159	192.9	101.2	1.00
Brandon A	11.5	0.1	33.6	-5.5	4.2	43.6	99	T	6		213.2	101.4	.90
Churchill A	5.9	0.5	18.1	-2.8	1.2	119.1	234	0	11	95	366.7	100.9	.83
Dauphin A	11.8	0.5	35.7	-6.4	2.3	33.4	57	0	6	152	209.6		.90
Gillam A	8.6	2.0	25.6	-2.4	0.2	92.0	180	0	11		282.4	100.9	.94
Gimli	12.9	1.2	36.5	-1.5	T	40.2	65	0	6	155	175.6	101.2	1.02
Island Lake	11.1	1.9	30.4	-1.8	1.6	96.8	161	0	11		217.0	101.0	1.02
Lynn Lake A	8.4	1.7	25.3	-4.7	T	164.3	226	0	12	123	289.8	101.1	.89
Norway House A	10.7		29.7	-2.4	0.4	85.4		0	10		227.6	101.0	.97
Pilot Mound	11.8	-0.1	36.1	-2.0	0.0	72.6	126	0	8		204.3	101.4	.95
Portage la Prairie A	12.8	0.4	37.8	0.4	T	53.4	107	0	11		178.3		
The Pas A	10.6	0.8	28.4	-3.4	T	96.0	168	0	10	156	228.8	101.1	1.00
Thompson A	8.9	2.0	28.0	-6.5	0.6	118.5	185	0	11	135	275.6	101.0	.90
Winnipeg Int'l A	12.9	0.5	38.8	-1.2	T	52.8	99	0	7	162	180.6	101.3	1.01
ONTARIO													
Atikokan	12.6	2.4	32.0	-4.2	T	105.8	132	0	9	159	180.2	101.4	1.14
Earlton A	13.6	2.5	30.3	-1.3	0.0	93.8	95	0	9		154.9	101.5	
Geraldton	11.9	2.6	30.5	-0.6	0.2	144.6	101	0	13		200.7	101.4	1.12
Gore Bay A	15.9	2.1	27.8	5.1	0.0	112.0	123	0	10		94.3	101.6	1.45
Hamilton	18.3	1.5	34.9	3.9	0.0	53.4	73	0	6	225			
Hamilton A	16.9	1.2	32.7	2.6	0.0	63.4	85	0	6		74.1		
Kapuskasing A	12.0	2.0	32.0	-0.1	0.0	169.3	179	0	15		193.5	101.4	1.17
Kenora A	13.2	1.6	34.6	-0.5	0.0	52.6	76	0	7		171.2	101.3	1.09
Kingston A	17.4	2.0	30.0	3.3	0.0	50.8	63	0	6	210	67.3	101.8	1.58
Lansdowne House	11.5	2.5	27.9	-0.2	0.6	64.4	80	0	14		209.6	101.1	1.05
London A	16.4	1.0	34.4	2.6	0.0	70.2	89	0	8	203	83.4	101.9	1.46
Moosonee	10.7	1.2	30.7	-3.0	0.0	75.3	94	0	14	119		101.2	1.11
Mount Forest	14.7	0.9	30.2	0.3	0.0	120.2	150	0	9	195	123.9	101.8	1.39
Muskoka A	14.7	1.5	31.8	0.7	0.0	141.3	138	0	5		134.1		
North Bay A	14.6	2.4	28.0	2.8	0.0	137.0	118	0	11	162	123.6	101.7	1.38
Ottawa Int'l A	17.1	2.8	33.1	4.0	0.0	58.4	74	0	10	234	76.4	101.7	1.37
Petawawa A	14.7	2.1	32.4	-3.2	T	64.5	78	0	8		99.8	101.7	1.34
Peterborough A	14.9	0.9	31.4	-0.2	T	48.1	66	0	6		113.4		
Pickle Lake	11.5	2.2	31.5	-1.7	1.2	63.4	73	0	11		214.3	101.2	1.02
Red Lake A	11.3	0.5	33.2	-1.8	0.8	74.3	119	0	10	155	216.6	101.2	1.02
St. Catharines A	17.7	0.7	33.3	3.4	0.0	72.7	89	0	7		65.1		
Sarnia A	17.1	0.6	34.4	2.6	0.0	70.2	112	0	7		75.1		
Sault Ste. Marie A	15.1	2.3	30.7	0.1	0.0	75.6	79	0	11	133	119.0	101.6	1.44
Simcoe	16.9	1.2	32.0	2.0	0.0	35.4	43	0	4		77.6	101.9	1.25
Sioux Lookout A	12.6	1.9	31.6	-0.6	1.0	74.8	92	0	10		180.7		1.12
Sudbury A	14.3	2.1	28.8	1.5	0.0	97.9	92	0	10	160	132.5	101.6	1.31
Thunder Bay A	13.1	2.0	31.4	-3.0	T	83.8	94	0	10	157	161.8	101.4	1.20
Timmins A	12.0	1.7	30.8	-1.8	0.2	116.8	127	0	15		191.0	101.5	1.24
Toronto	18.2	1.1	34.1	6.2	0.0	44.3	67	0	6	238	55.0		
Toronto Int'l A	16.7	1.2	34.2	2.9	0.0	54.9	86	0	6		82.4	101.8	1.39
Toronto Island A	17.7	1.3	33.4	6.6	0.0	38.7	56	0	6		60.3	101.8	1.48
Trenton A	16.7	1.4	30.7	2.6	0.0	43.2	59	0	6		78.0	101.7	1.48
Trout Lake (Big)													
Waterloo-Wellington A	15.2	0.4	32.0	-0.4	0.0	88.4	128	0	9		114.9		
Wawa A													
Wiarton A	16.2	2.0	31.4	2.8	0.0	128.4	136	0	8	195	92.5	101.7	1.37
Windsor A	18.5	1.1	34.0	3.2	0.0	64.4	96	0	5		51.7	101.8	1.47

SEPTEMBER 1983 SEPTEMBRE

STATION	Temperature °C *Température °C*												
	Mean *Moyenne*	Difference from Normal *Écart à la normale*	Maximum *Maximale*	Minimum *Minimale*	Snowfall (cm) *Chute de neige (cm)*	Total Precipitation (mm) *Précipitation totale (mm)*	% of Normal Precipitation *% de précipitation normale*	Snow on ground at end of month (cm) *Neige au sol à la fin du mois (cm)*	No. of days with Precip. 1.0 or more (mm) *Nombre de jours de préc. 1.0 ou plus (mm)*	Bright sunshine (hours) *Durée de l'insolation (heures)*	Degree Days below 18°C *Degrés-jours au-dessous de 18°C*	Mean Sea Level Pressure (kPa) *Pression au niveau moyen de la mer (kPa)*	Mean Vapour Pressure (kPa) *Pression de vapeur moyenne (kPa)*
QUEBEC													
Bagotville A	13.4	2.3	31.8	-1.1	0.0	107.6	108	0	12		156.5	101.5	1.18
Baie Comeau A	11.3	1.5	22.8	-0.5	T	106.7	103	0	12	138	201.1	101.4	1.17
Blanc Sablon													
Chibougamau A	10.4	1.6	25.7	-2.0	T	179.4	158	0	18	110	232.6	101.4	1.15
Kuujjuac A	6.1	0.7	22.2	-3.2	T	35.0	61	0	8	88	358.1	101.1	.69
Gaspe A	12.5	1.2	28.4	-1.0	0.0	68.6	97	0	10	158	173.8	101.4	1.19
Inukjuac A	7.0	2.0	18.0	0.7	0.8	80.4	136	0	13	84	330.7	100.8	.83
La Grande Riviere	8.4		21.8	0.1	0.0	136.4		0	11	75	287.5	101.0	.92
Maniwaki	14.5	2.4	31.2	-0.1	0.0	68.3	71	0	12	192	133.6	101.6	1.34
Matagami A	10.5	1.5	28.8	-3.6	0.0	162.1	169	0	17	116	233.4		
Mont Joli A	13.2	2.0	29.4	-0.2	0.0	80.3	96	0	9	144	151.9	101.4	1.20
Montreal Int'l A	17.1	2.3	31.8	2.8	0.0	76.9	87	0	6	221	79.4	101.6	1.44
Montreal Mirabel Int'l A	15.7		31.3	-0.5	0.0	44.0		0	5	229	107.8	101.7	1.32
Natashquan	10.9	1.7	21.5	-0.5	0.0	112.4	119	0	11	166	210.2	101.3	1.18
Nitchequon	8.4	2.1	20.6	0.3	1.0	134.4	136	0	18	88	289.6	101.2	.93
Kuujjuarapik A	8.8	1.7	21.2	-0.1	T	96.7	101	0	17	84	277.9	100.9	.92
Quebec A	15.0	2.4	31.0	1.1	0.0	87.1	73	0	11	188	122.4	101.6	1.26
Roberval A	13.9	2.7	31.8	1.0	0.0	116.5	128	0	12	167	142.9	101.4	1.24
Ste. Atathe des Monts	13.7	2.8	28.9	-1.0	0.0	67.6	65	0	8	203	148.8	101.7	1.29
St. Hubert A	16.6	2.2	32.3	0.8	0.0	74.7	83	0	7		95.0	101.6	1.38
Schefferville A	7.2	2.0	20.5	-1.5	T	152.0	182	0	16	105	325.1	101.2	.83
Sept-Iles A	10.6	1.3	23.4	0.0	0.0	99.8	89	0	15	125	221.3	101.4	1.12
Sherbrooke A	13.6	1.5	29.2	-2.4	0.0	79.1	78	0	9	207	146.8	101.8	1.30
Val d'Or A	12.6	2.2	29.5	-3.4	0.0	81.0	75	0	15	134	179.3	101.6	1.23
NEW BRUNSWICK NOUVEAU-BRUNSWICK													
Charlo A	13.1	1.7	30.9	1.0	0.0	57.1	63	0	10	167	157.8	101.5	1.21
Chatham A	14.9	1.9	32.5	1.5	0.0	89.0	104	0	10	179	119.3	101.5	1.31
Fredericton A	15.2	2.0	32.4	-0.7	0.0	52.0	60	0	7	200	112.0	101.6	1.34
Moncton A	14.9	1.9	29.9	1.6	0.0	36.5	48	0	7	199	110.8	101.6	1.39
Saint John A	14.6	1.9	28.0	3.1	0.0	64.8	58	0	5	214	108.3	101.7	1.31

STATION	Temperature °C *Température °C*												
	Mean *Moyenne*	Difference from Normal *Écart à la normale*	Maximum *Maximale*	Minimum *Minimale*	Snowfall (cm) *Chute de neige (cm)*	Total Precipitation (mm) *Précipitation totale (mm)*	% of Normal Precipitation *% de précipitation normale*	Snow on ground at end of month (cm) *Neige au sol à la fin du mois (cm)*	No. of days with Precip. 1.0 or more (mm) *Nombre de jours de préc. 1.0 ou plus (mm)*	Bright sunshine (hours) *Durée de l'insolation (heures)*	Degree Days below 18°C *Degrés-jours au-dessous de 18°C*	Mean Sea Level Pressure (kPa) *Pression au niveau moyen de la mer (kPa)*	Mean Vapour Pressure (kPa) *Pression de vapeur moyenne (kPa)*
NOVA SCOTIA NOUVELLE-ECOSSE													
Eddy Point	15.4	1.1	30.4	7.0	0.0	162.3	187	0	7	190	83.6	101.6	1.48
Greenwood A	14.9	1.1	31.1	0.8	0.0	34.6	41	0	3		91.2	101.7	1.36
Halifax Int'l A	15.9	2.1	29.0	5.1	0.0	82.7	88	0	4		83.4	101.7	1.37
Sable Island	16.2	0.5	22.2	4.0	0.0	81.4	88	0	7	157	58.9	101.7	1.62
Shearwater A	14.7	0.2	28.3	6.0	0.0	26.8	31	0	4	224	66.0	101.7	1.43
Sydney A	14.7	1.2	30.7	3.6	0.0	168.6	193	0	13	171	112.6	101.5	1.39
Truro	14.5	1.8	28.7	0.3	0.0	76.2	101	0	5	197	120.4	101.7	1.39
Yarmouth A	14.8	1.2	25.6	4.0	0.0	20.0	22	0	4	207	98.2	101.8	1.41
PRINCE EDWARD ISLAND ILE-DU-PRINCE-EDOUARD													
Charlottetown A	15.4	1.9	28.7	5.5	0.0	78.5	91	0	9		101.2	101.6	1.43
Summerside A	15.8	1.7	29.0	6.0	0.0	101.4	129	0	10	193	87.5	101.5	1.38
NEWFOUNDLAND TERRE-NEUVE													
Argentia A	12.7	0.2	22.3	5.8	0.0	123.8	148	0	13		156.2	101.6	1.30
Battle Harbour	8.2	-0.3	20.4	1.0	0.0	48.5	64	0	7		289.8	101.3	.93
Bonavista	11.9	0.2	23.6	4.0	0.0	125.0	145	0	13		185.1	101.5	1.19
Burgeo	12.6	1.0	19.0	5.3	0.0	119.7	100	0	16	129	160.4	101.5	1.26
Cartwright	7.9	-0.4	21.4	0.8	0.0	83.4	92	0	14	127	302.1	101.2	.88
Churchill Falls A	8.0	1.3	19.3	-2.6	T	147.6	156	0	19	99	301.0	101.3	.89
Comfort Cove	11.5	0.2	26.6	2.1	0.0	66.0	77	0	14		196.7	101.5	1.13
Daniel's Harbour	11.9	1.1	22.8	1.0	0.0	112.0	122	0	13	125	189.5	101.3	1.19
Deer Lake A	11.8	1.3	27.9	-0.7	0.0	81.1	91	0	13		192.2	101.5	1.19
Gander Int'l A	11.7	0.3	26.2	2.1	0.0	67.0	83	0	12	123	190.5	101.5	1.18
Goose A	9.3	0.2	22.5	-3.1	T	68.2	77	0	11	94	260.5	101.2	.94
Hopedale	6.4	-0.8	18.2	0.2	0.4	113.2	120	0	13		348.5	101.2	.77
Port-aux-Basques	13.0	1.7	21.8	5.0	0.0	102.0	88	0	13	150	158.0	101.6	1.31
St. Anthony	8.9	-0.7	24.3	1.0	0.0	96.2	117	0	12		267.3	101.3	1.00
St. John's A	11.9	0.3	23.6	2.4	0.0	189.9	163	0	13	112	185.9	101.5	1.17
St. Lawrence			23.0	3.0	0.0	219.9	181	0	10		151.4		
Stephenville A	13.4	1.5	25.0	3.8	0.0	116.8	112	0	14	129	142.0	101.4	1.24
Wabush Lake A	8.0	1.8	21.8	-0.8	T	124.1	132	0	17	95	302.8	101.2	.88

SEPTEMBER 1983 SEPTEMBRE

STATION	Temperature °C / Température °C: Mean / Moyenne	Temperature °C: Difference from Normal / Ecart à la normale	Temperature °C: Maximum / Maximale	Temperature °C: Minimum / Minimale	Snowfall (cm) / Chute de neige (cm)	Total Precipitation (mm) / Précipitation totale (mm)	% of Normal Precipitation / % de précipitation normale	Snow on ground at end of month (cm) / Neige au sol à la fin du mois (cm)	No. of days with Precip. 1.0 or more (mm) / Nombre de jours de préc. 1.0 ou plus (mm)	Bright sunshine (hours) / Durée de l'insolation (heures)	Degree Days above 5°C / Degrés-jours au-dessus de 5°C: This Month / Présent mois	Degree Days above 5°C: Since Jan. 1st / Depuis le 1er janv.	Mean Dew Point °C / Point de rosée moyen °C
AGROCLIMATOLOGICAL STATIONS AGROCLIMATOLOGIQUES													
BRITISH COLUMBIA COLOMBIE-BRITANNIQUE													
Agassiz	14.6	-0.9	25.5	5.0	0.0	86.4	82	0	12	173	271.8	2044.4	
Kamloops													
Sidney													
Summerland	13.1	4.1	25.5	0.5	0.0	37.4	213	0	3	211	242.0	1919.0	
ALBERTA													
Beaverlodge	8.2	-1.3	23.0	-7.0	T	26.0	62	0	7	170			
Ellerslie	8.6		25.0	-9.0	3.6	35.0		0	7	164	123.3	1339.2	
Fort Vermilion													
Lacombe													
Lethbridge													
Vauxhall													
Vegreville													
SASKATCHEWAN													
Indian Head	10.5	-6.9	32.0	-5.0	3.6	51.2	121	0	8				
Melfort	9.9	-0.5	30.5	-5.0	0.0	65.2	160	0	7	157	166.5	1491.5	
Regina	10.1	-1.1	34.0	-8.0	0.0	59.2	168	0	9		145.8	1551.3	
Saskatoon	9.9		34.0	-7.0	0.0	62.2		0	9	178	169.0	1586.5	
Scott	8.3	-2.1	27.0	-7.0	0.0	88.0	310	0	9	167	122.5	1421.2	
Swift Current South	11.0	-0.8	35.5	-8.5	2.5	10.9	37	0	4	148	190.6	1754.1	
MANITOBA													
Brandon	11.7	-0.1	34.5	-5.5	4.5	40.5	81	0	5	143	211.1	1703.1	
Glenlea	12.5	0.3	38.5	-1.0	0.0	58.8	117	0	10	158			
Morden	13.2	0.1	39.0	0.0	0.0	66.6	128	0	8	140	246.2	1931.3	
ONTARIO													
Delhi	17.0	1.1	32.0	1.0	0.0	50.8	63	0	6	229	367.3	2105.5	
Elora	15.1		31.2	-0.1	0.0	71.0		0	10	191	307.5	1832.5	
Guelph	15.5	0.5	32.6	-1.2	0.0	64.1	101	0	9	211	319.0	1883.0	
Harrow	18.6	1.1	33.0	2.0	0.0	54.2	82	0	4	246	726.2	2140.2	
Kapuskasing													
Merivale													
Ottawa	17.2	2.6	33.6	3.0	0.0	52.0	65	0	8	220	365.8	2038.8	
Smithfield	17.2	2.2	31.5	3.5	0.0	43.6	56	0	6		366.8	2009.5	
Vineland Station	18.1	1.1	33.4	4.4	0.0	59.2	79	0	9	219	394.3	2133.3	
Woodslee	17.7	0.6	31.0	2.0	0.0	102.8	154	0	5				
QUEBEC													
La Pocatiere	14.0	-1.4	32.0	0.5	0.0	79.8	84	0	9	192	281.4	1577.3	
L'Assomption	16.4	2.5	32.0	-0.5	0.0	63.5	72	0	7	206	347.2	1937.3	
Lavaltrie													
Lennoxville													
Normandin	12.9	2.5	32.0	-3.5	0.0	90.2	94	0	13	161			
St. Augustin													
Ste. Clothilde	16.6	2.4	32.0	-0.5	0.0	79.2	92	0	6	214	354.3	1984.4	
NEW BRUNSWICK NOUVEAU-BRUNSWICK													
Fredericton													
NOVA SCOTIA NOUVELLE-ECOSSE													
Kentville	16.3	2.0	31.0	2.5	0.0	36.8	43	0	4	225	340.3	1864.2	
Nappan	15.1	1.7	29.5	0.0	0.0	52.7	65	0	6	196	303.5	1665.0	
PRINCE EDWARD ISLAND ILE-DU-PRINCE EDOUARD													
Charlottetown	15.8	1.7	28.5	4.5	0.0	71.8	86	0	9	202	322.7	1693.5	
NEWFOUNDLAND TERRE-NEUVE													
St. John's West	12.3	0.7	25.9	3.5	0.0	166.4	156	0	15	118	220.4	1261.1	