Environment Canada Environnement Canada

dian Climate Centre

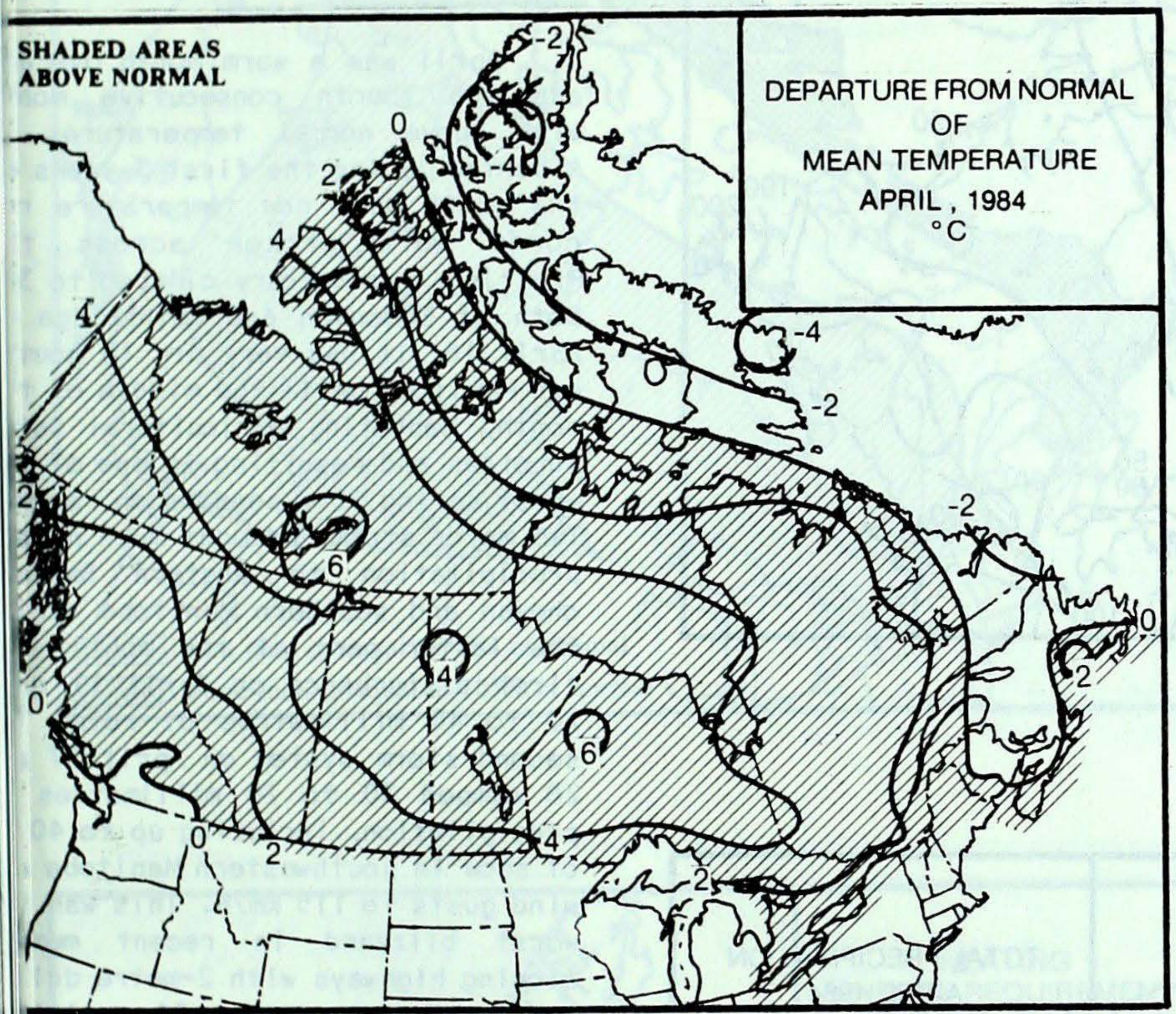
Climatic Perspectives

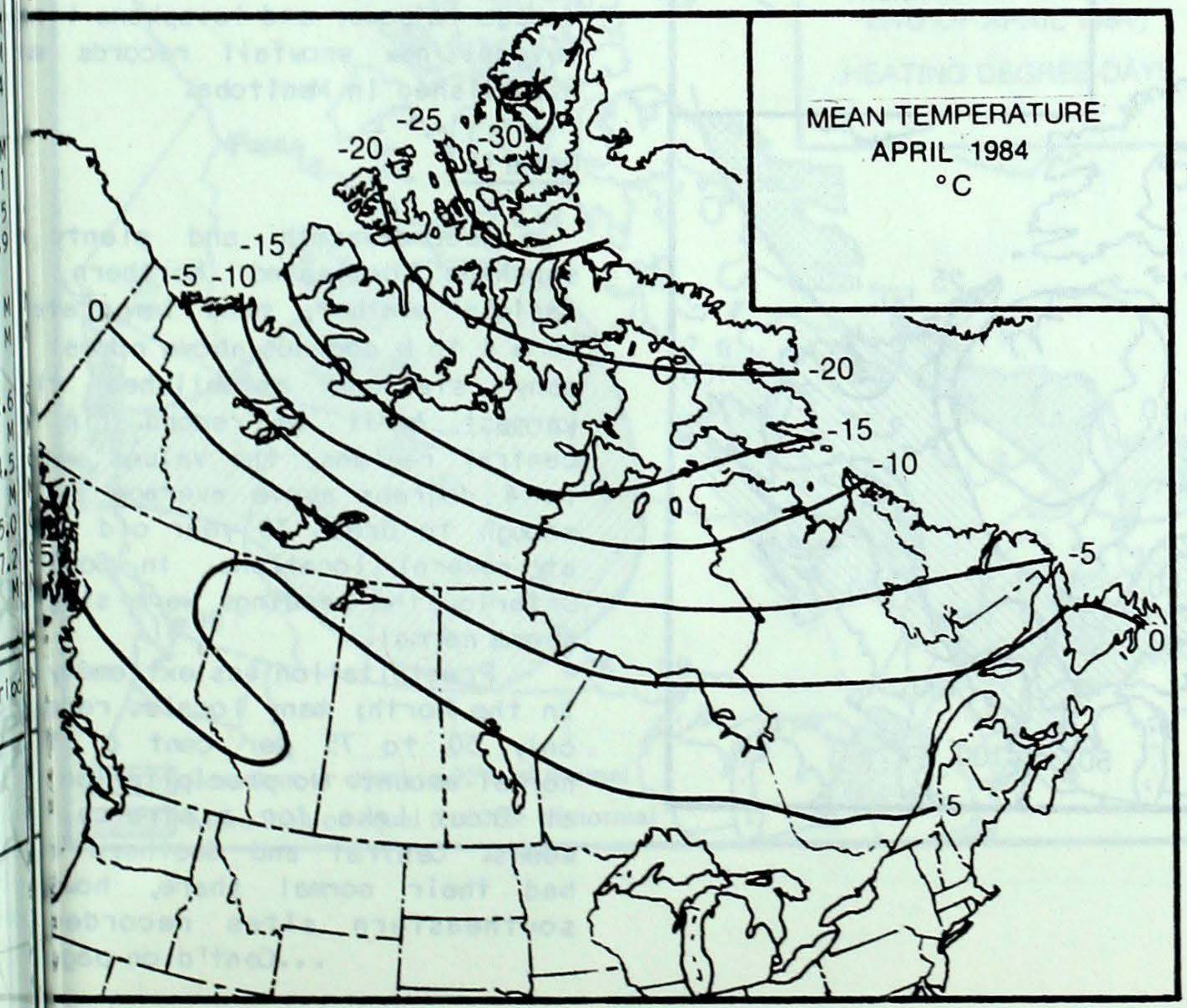
MONTHLY SUPPLEMENT

ISSN 0821-6762
UDC: 551.506.1(71)

(Aussi disponible en français)

VOL. 6 APRIL, 1984





ACROSS THE COUNTRY

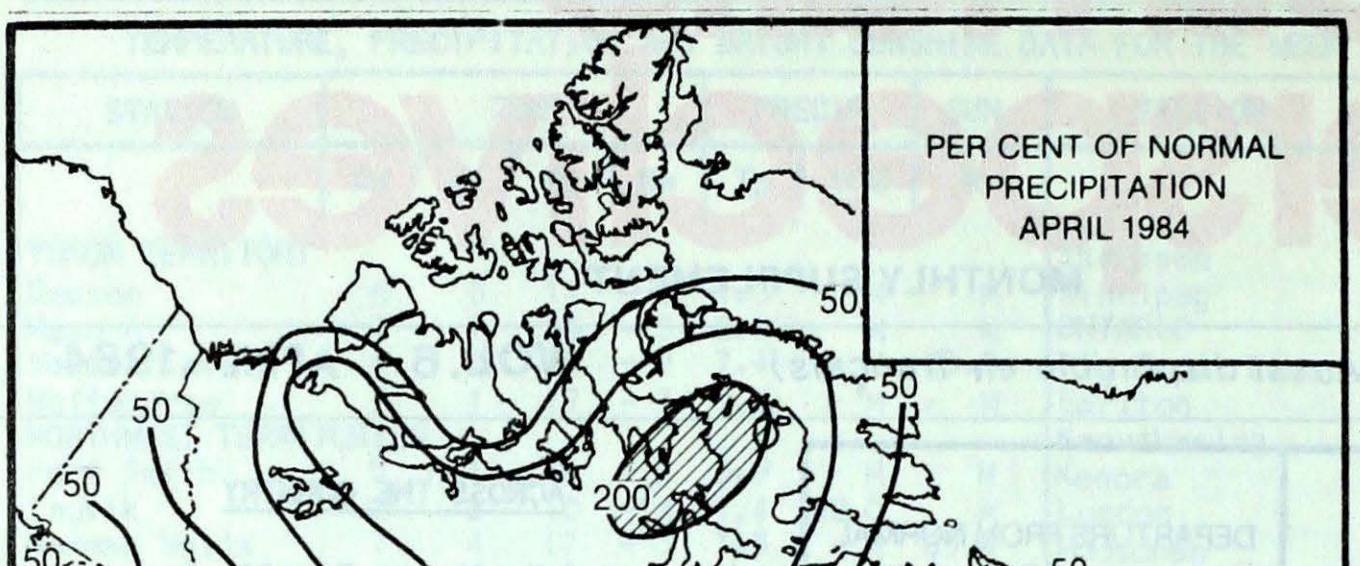
Yukon and Northwest Territories

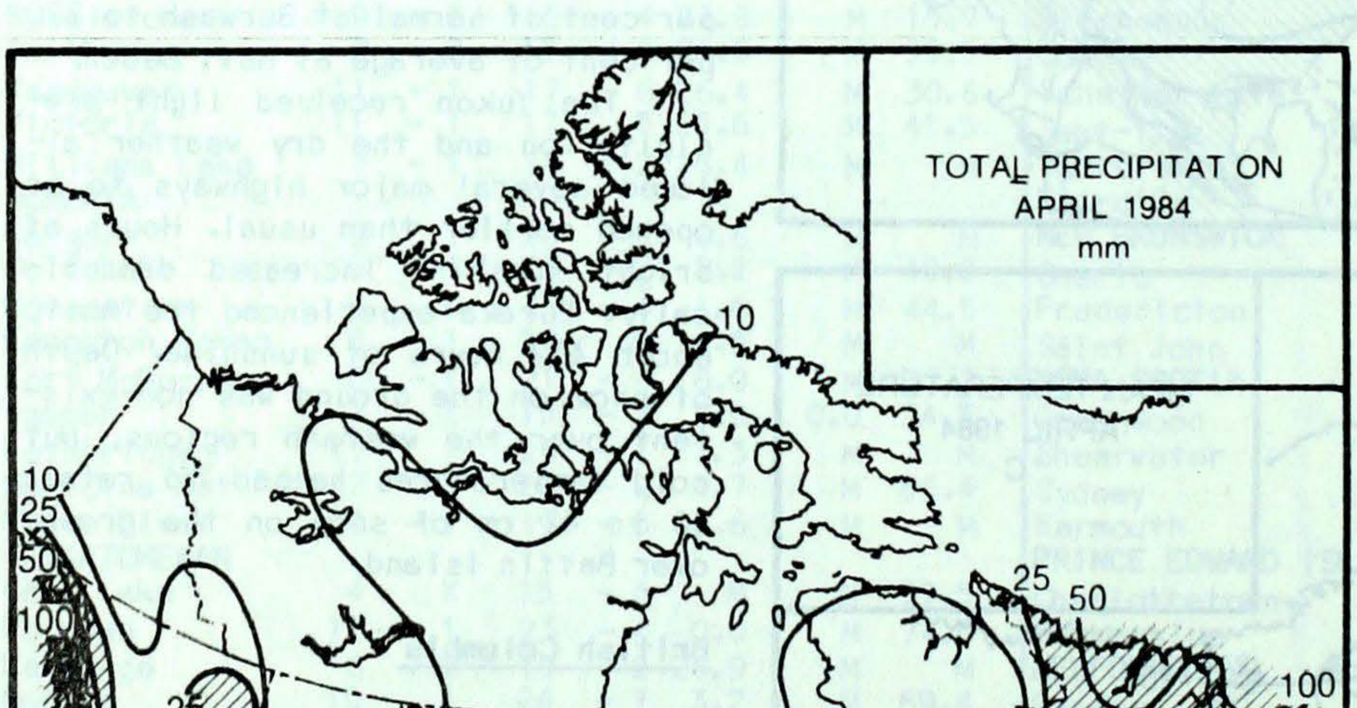
Spring warmth arrived early in the western Arctic. Mean temperatures were 2 to 5 degrees above normal in the Yukon and the Mackenzie District. Near the end of the month, daytime temperatures climbed to 20° at some locations in the Mackenzie Valley. In contrast, the eastern regions and the High Arctic continued to endure below-normal temperatures. Over Baffin Island, the temperatures have been below the long term average for many months now. With a mean value of -31.6°, Eureka was the coldest place in Canada this month. Precipitation was typically variable, ranging from 6 per cent of normal at Burwash to 220 per cent of average at Hall Beach.

The Yukon received light precipitation and the dry weather allowed several major highways to be opened earlier than usual. Hours of bright sunshine increased dramatically. Eureka experienced the most, about 432 hours of sunshine. Depth of snow on the ground was non-existent over the western regions, but cold temperatures helped to retain 30 to 42 cm of snow on the ground over Baffin Island.

British Columbia

The west coast and the southern interior were unsettled and cool, while in more northern districts mean temperatures and total hours of sunshine were above normal. Several communities along the coast and the southern interior received more than twice their normal monthly precipitation. In contrast Lytton set a new low monthly precipitation record of 3.7 mm, only 20 per cent of normal. On April 15, a small but very intense low pressure system rapidly approached the west coast associated with wind speeds well in excess of 100 km/h. The storm caused millions





of dollars worth of property damage both along the mid-coast and th central interior. Fishing boat capsized, houses were damaged an power and telephone lines were down ed. Several fires fanned by stron winds threatened populated areas i the central interior.

Prairie Provinces

April was a warm month overal and the fourth consecutive mont with above normal temperatures i Alberta. During the first 3 weeks o the month many new temperature re cords were broken across th Prairies. The mercury climbed to 30 both at Edmonton and Lethbridge o April 16. It was very dry in south ern Manitoba until the middle of th month, depleting agricultural wate supplies and resulting in one of th worst spring fire seasons on recor Two major storms brought much neede precipitation to eastern Saskat chewan and southern Manitoba durin the latter part of the month. Th first disturbance on April 11 gav 20 to 40 millimetres of rain. Th second storm system on April 27 ar 28 dumped 30 to 70 millimetres c precipitation, including up to 40 c of snow in southwestern Manitoba ar wind gusts to 115 km/h. This was th worst blizzard in recent memor closing highways with 2-metre drif and causing more than $6 - millic damage to power and telephone line Several new snowfall records wer established in Manitoba.

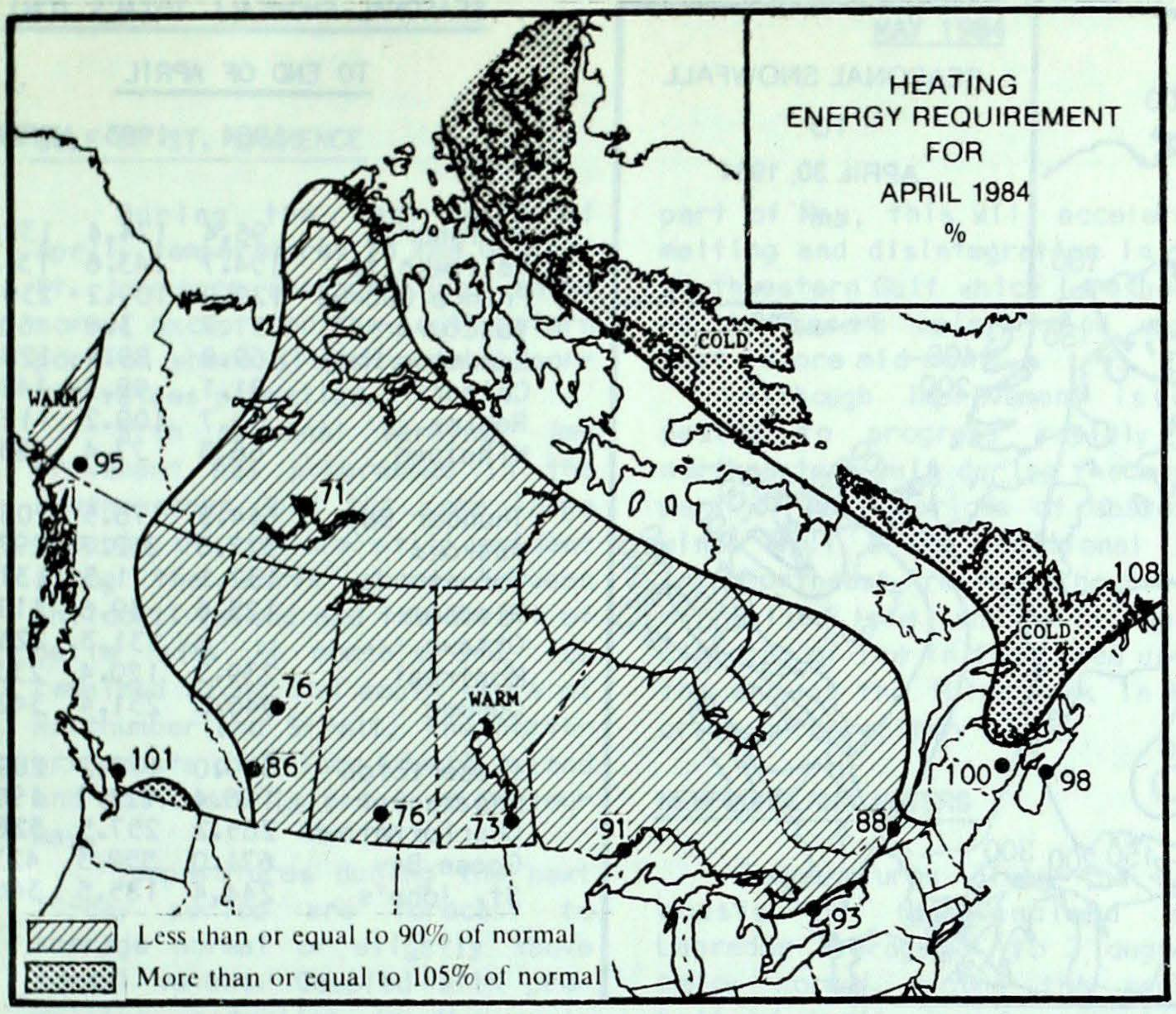
Ontario

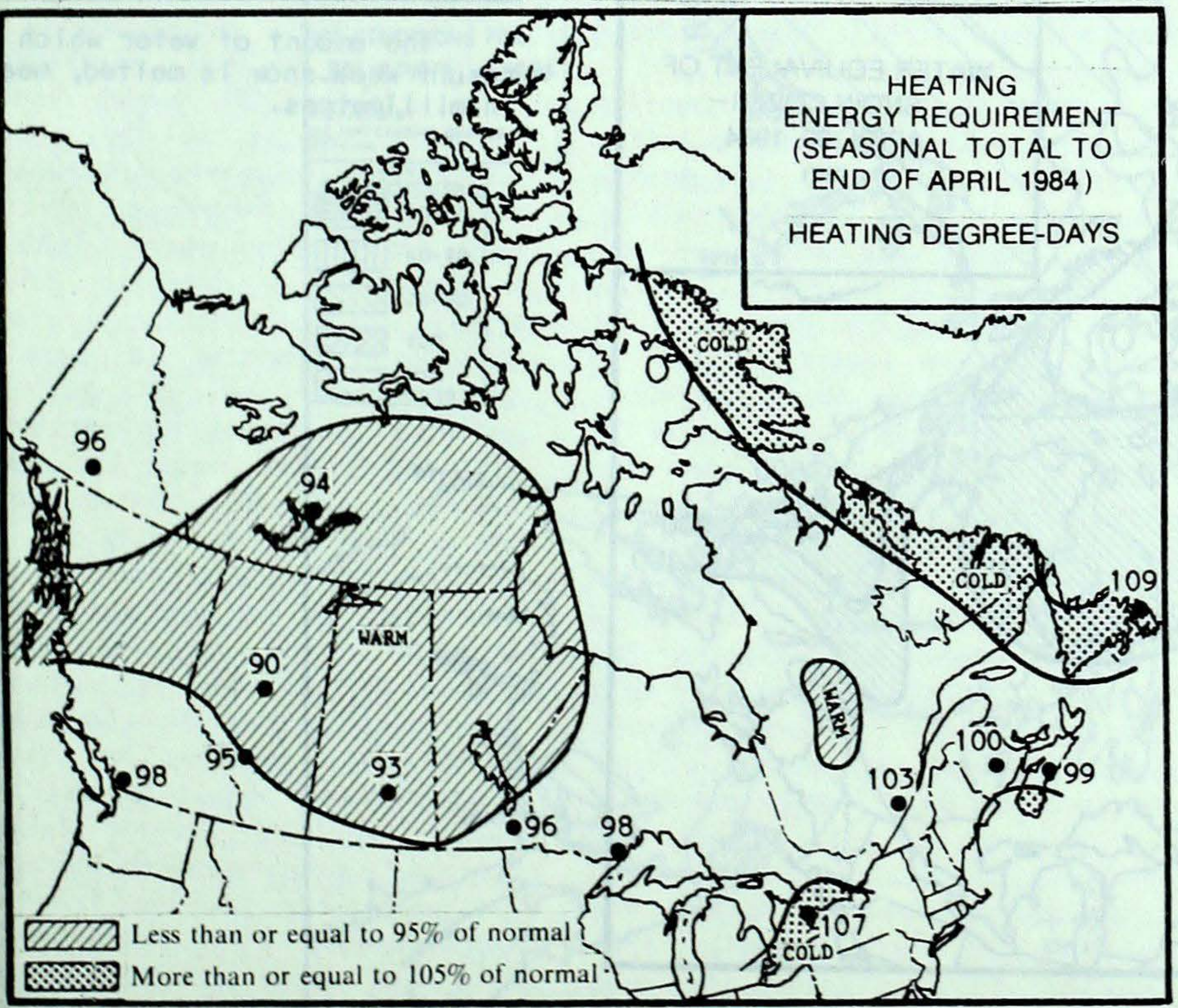
Record-warmth and plenty sunshine dominated Northern O tario's weather, mean temperatur were 4 to 6 degrees above normal a many stations established the warmest April on record. In t central regions, the values were to 4 degrees above average - hi enough to break 30 year old rec at several locations. In Southe Ontario, the readings were sligh above normal.

Precipitation was extremely In the North; many locales recei only 50 to 75 per cent of th normal amount. No precipitation f at Trout Lake for a stretch o weeks. Central and Southern ar had their normal share, howev southeastern sites recorded

...Cont'd on page

ENERGY REQUIREMENT

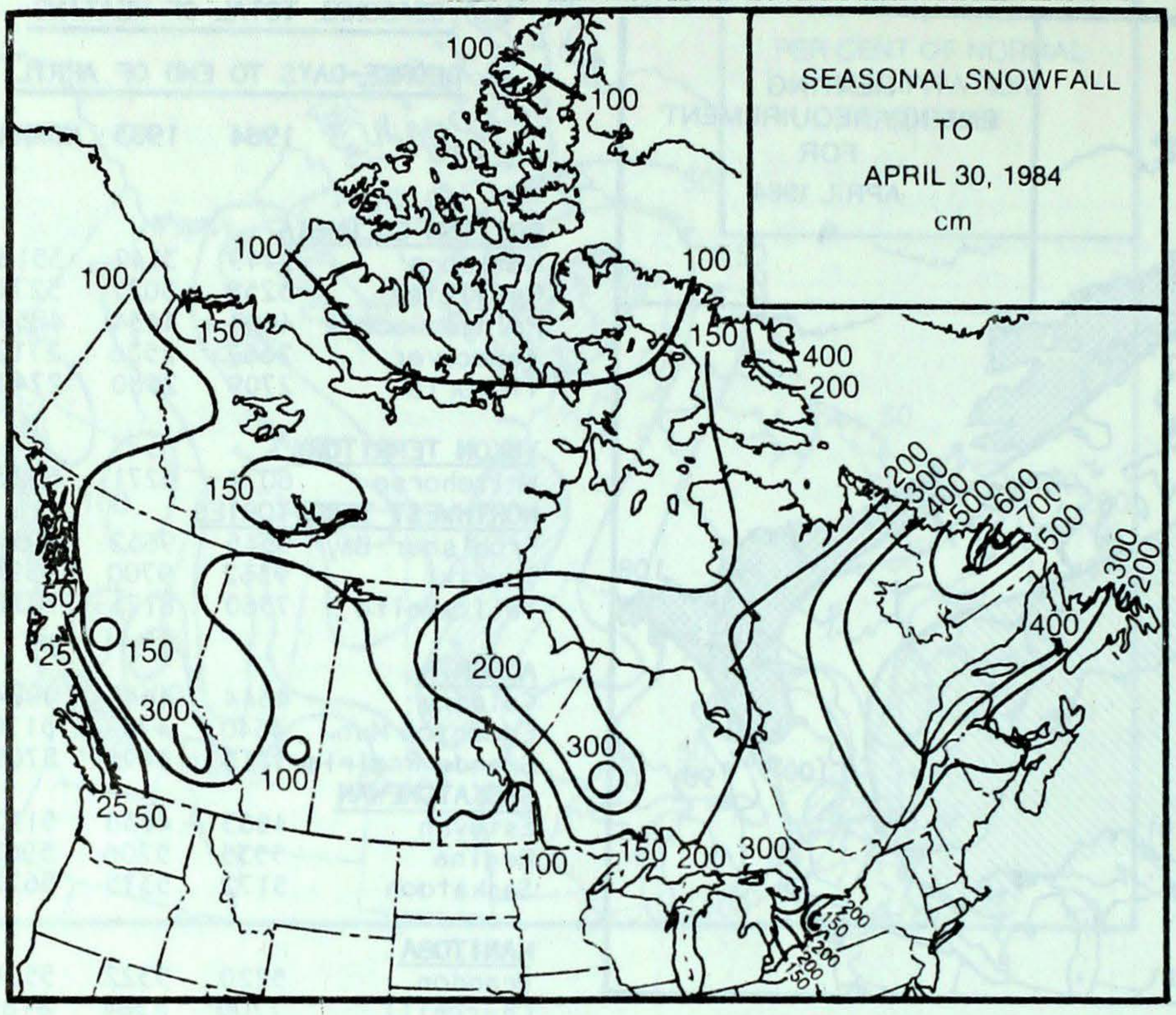




SEASONAL TOTAL OF HEATING DEGREE-DAYS TO END OF APRIL

	1984	1983	NORMAL
BRITISH COLUMBIA			
Kamloops	3449	3142	3518
Penticton	3258	3077	3271
Prince George	4604	4434	4859
Vancouver	2667	2536	2712
Victoria	2709	2580	2747
YUKON TERRITORY			
Whitehorse	6074	6271	6326
NORTHWEST TERRITORIES			
Frobisher Bay	9545	9652	8934
Inuvik	9362	9700	9394
Yellowknife	7360	8171	7870
ALBERTA			
Calgary	4644	4448	4884
Edmonton Mun.	4640	4749	5170
Grande Prairie	5113	4495	5709
SASKATCHEWAN			
Estevan	4863	4838	5133
Regina	5535	5206	5965
Saskatoon	5172	5375	5672
MANITOBA			
Brandon	5220	5322	5578
Churchill	7700	8384	8185
The Pas	5715	6221	6283
Winnipeg	5267	5096	5485
ONTARIO			
Kapuskasing	5822	5853	5903
London	3967	3475	3785
Ottawa	4410	4122	3385
Sudbury	5004	4752	5060
Thunder Bay	5165	4994	5253
Toronto	4034	3565	3783
Windsor	3613	3076	3372
QUEBEC			
Baie Comeau	5157	5250	5106
Montréal	4335	3969	4224
Quebec	4170	4499	4242
Sept-Iles	5690	5569	5605
Sherbrooke	4738	4450	4840
Val-d'Or	5614	5480	5718
NEW BRUNSWICK			
Charlo	4888	4839	4793
Fredericton	4342	4105	4342
Moncton	4330	4151	4332
NOVA SCOTIA			
Halifax	3632	3528	3673
Sydney	3974	3829	3961
Yarmouth	3486	3608	3771
PRINCE EDWARD ISLAND			
Charlottetown	3821	3946	3710
NEWFOUNDLAND			
Gander	4614	4453	4494
St. John's	4188	3703	3847

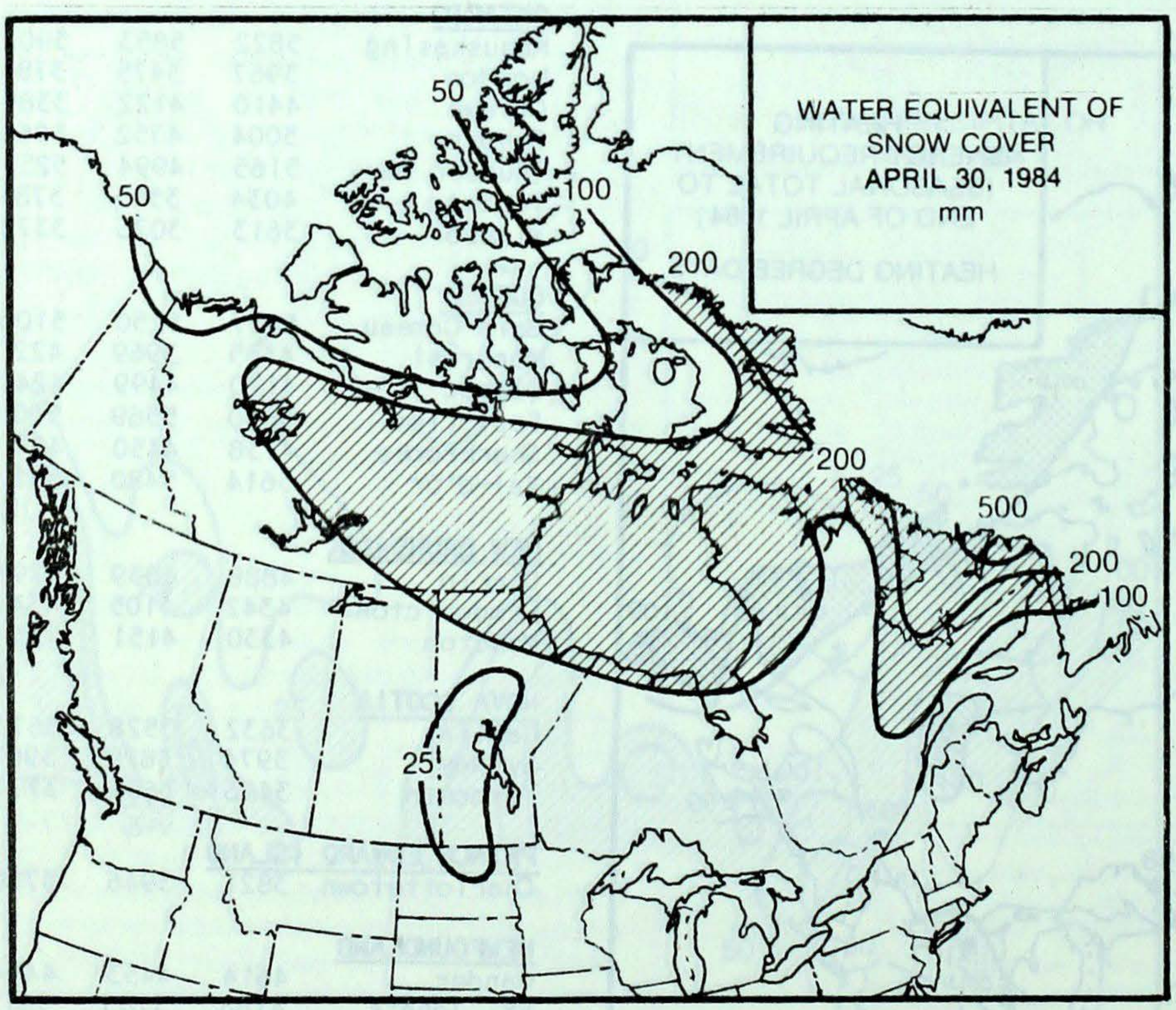
S N O W F A L L



SEASONAL SNOWFALL TOTALS (CM)

TO END OF APRIL

	1984	1983	NORMAL
Whitehorse	96.4	124.4	132.8
Yellowknife	154.7	143.6	131.5
Prince George	129.0	109.2	239.5
Vancouver	11.7	3.8	60.4
Edmonton Nam.	69.8	89.5	128.6
Calgary	81.1	98.3	142.2
Regina	66.7	109.2	112.5
Winnipeg	66.3	77.4	123.0
Thunder Bay	144.9	176.5	208.8
Muskoka	327.6	252.7	297.6
Toronto	132.1	71.5	131.1
Windsor	125.6	39.6	117.4
Ottawa	m	131.3	226.1
Montréal	239.3	120.4	233.4
Québec	340.8	251.4	342.5
Fredericton	309.0	179.2	289.3
Shearwater	196.4	123.7	196.8
Charlottetown	265.2	257.5	328.5
Goose Bay	671.0	558.3	423.1
St. John's	244.4	185.5	346.3



Snow Cover Water Equivalent

The amount of water which wou result when snow is melted, measur in millimetres.

ICE FORECAST FOR THE GULF OF ST. LAWRENCE AND NEWFOUNDLAND WATERS MAY 1984

GULF OF ST. LAWRENCE

During the last half of April, temperatures in the Gulf of St. Lawrence averaged just above normal except for the southwestern portion where slightly below normal values prevailed.

With seasonal warming, improvement has progressed in the southwestern Gulf but some large amounts of ice are still evident along the north shore between Anticosti Island and the Strait of Belle Isle. At month's end, ice remained along the south shore of Northumberland Strait, the northern coasts of Prince Edward Island and Anticosti Island, and Chaleur Bay.

Temperatures during the next 30-day period are forecast to average normal or slightly above normal values. Coupled with prevailing westerlies in the early part of May, this will accelerate melting and disintegration in the southwestern Gulf which is expected to become mainly open water just before mid-month.

Although improvement is expected to progress rapidly in northeastern Gulf during the early part of May, periods of easterly winds will drift additional ice into Northeast Arm from the Strait of Belle Isle and will delay clearing of ice in that area until the end of the third week in May or soon thereafter.

NEWFOUNDLAND WATERS

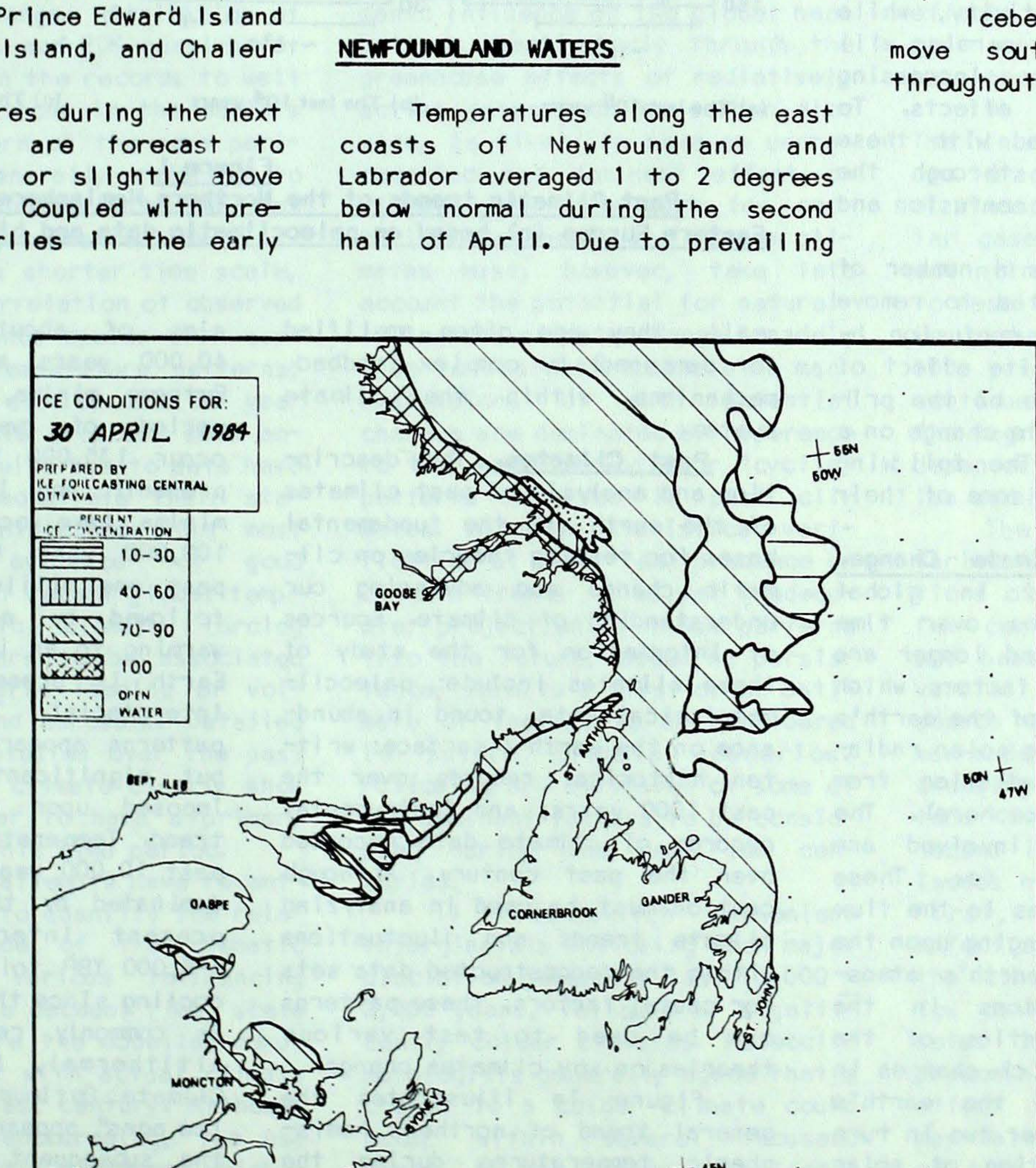
Temperatures along the east coasts of Newfoundland and Labrador averaged 1 to 2 degrees below normal during the second half of April. Due to prevailing northeasterly winds, the ice, at the end of April, was packed against the coast to as far south as Conception Bay.

Further northward retreat is anticipated during the second half of May, moving the ice edge just south of the Strait of Belle Isle at the beginning of June. It is also expected that periods of easterly winds after the first week in May will result in onshore ice congestions particularly for the coastal areas from Notre Dame Bay northward.

Icebergs will continue to move southward from the pack throughout the period.

Issued by:

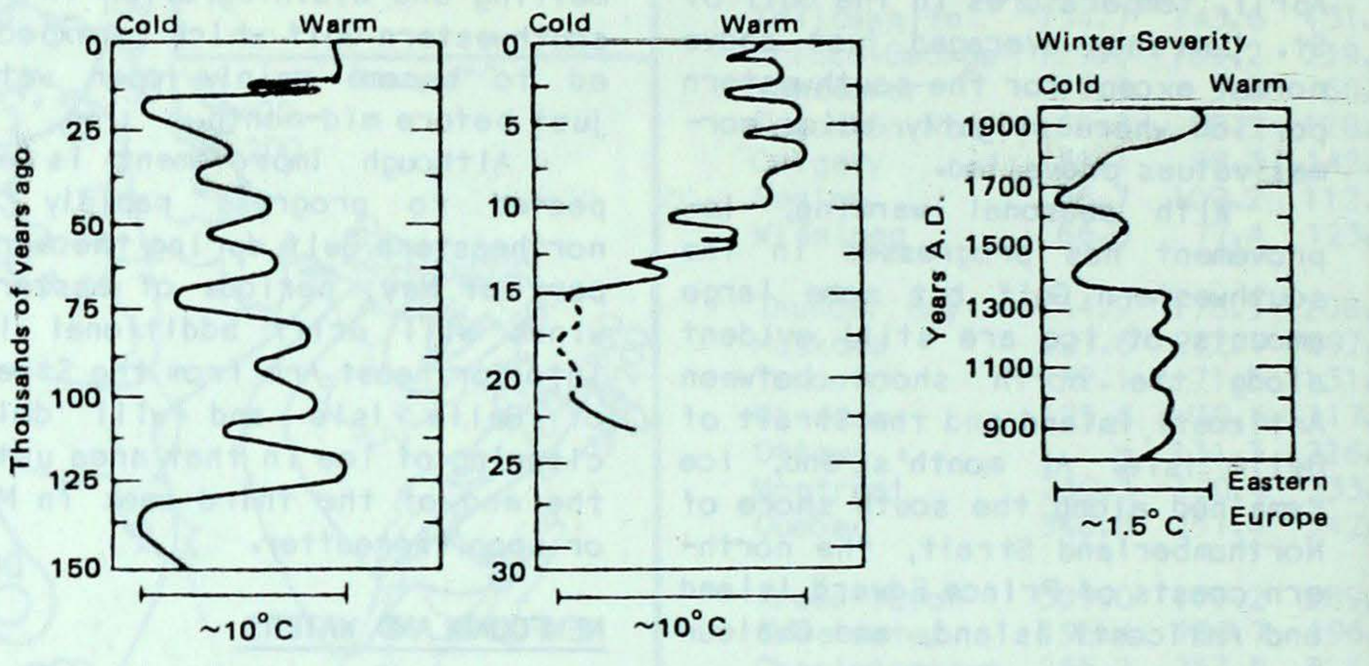
Ice Forecasting Central



ABOUT GLOBAL CLIMATE CHANGE AND VARIABILITY

by
H. Hengeveld
Canadian Climate Centre

Background. The past decade has witnessed an increasing interest, both within the scientific community and the media in the issue of climate change. Reports on results of research related to this issue, however, often imply major disagreements within the scientific community as to why and how climates change and how such changes affect society. Some postulate the imminent arrival of another ice age, others suggest future global cooling due to increased volcanic activity, while many believe a major warming will soon occur due to increasing global "greenhouse" effects. To the public, presented with these conflicting reports through the media, the result is confusion and skepticism.



(a) The last 10^5 years (b) The last 10^4 years (c) The last 10^3 years

Figure 1
Past Climatic trends of the Northern Hemisphere (a,b) and Eastern Europe (c) based on paleoclimatic data and historical records

In recent years a number of studies have attempted to remove some of the above confusion by examining the composite effect of what are believed to be the primary causes of climate change on a common time scale. The following paragraphs summarize some of their conclusions.

Causes of Climate Change. Significant changes in global climate of durations over time scales of decades and longer are largely related to factors which disturb the balance of the earth's heat budget (incoming solar radiation - outgoing radiation from earth and its atmosphere). The number of factors involved are actually relatively few. These relate to: a) changes in the flux of solar energy impinging upon the outer edge of the earth's atmosphere; b) alterations in the physical characteristics of the earth's surface; or c) changes in the composition of the earth's atmosphere. The latter two in turn affects the absorption of solar energy within the climate system and/or the emission of long wave infrared radiation to space. While the direct impact of these factors on the energy balance may be quite small, they are often amplified (or dampened) by complex feedback mechanisms within the climate system.

Past Climates. The description and analysis of past climates of the earth are the fundamental bases for testing theories on climatic change and advancing our understanding of climate. Sources of information for the study of these climates include: paleoclimatological data, found in abundance on the earth's surface; written historical records over the past 1000 years; and instrumental records of climate data recorded over the past century. Although caution must be used in analyzing climate trends and fluctuations within the reconstructed data sets for causal factors, these patterns can be used to test various theories on why climates change.

Figure 1a illustrates the general trend of northern hemispheric temperatures during the past 150,000 years as derived from paleoclimatological studies. Analyses of these trends suggest the presence of three dominant quasi-periodic cycles at frequencies of about 100,000 years, 40,000 years and 20,000 years. Extreme minima, corresponding to period of maximum glaciation, occur 135,000 YBP (years before present) and 18,000 YBP. These minima have occurred at regular 100,000 year intervals for the past one million years. Each is followed by a dramatic 8-10°C warming to an interglacial state. Earth is presently in such an interglacial. The 40K and 20K patterns appear as smaller scale but significant anomalies superimposed upon this large scale trend. Temperature trends for the past 10,000 years (Figure 1b) are dominated by the peaking of the present inter glacial about 6-8,000 YBP followed by a gradual cooling since then. This warm peak is commonly referred to as the Altithermal, Hypsithermal, or Climate Optimum. Several "little ice ages" appear superimposed upon the subsequent cooling trend at approximately 2500 years intervals, the latest occurring between 1430 AD and 1850 AD (Figure 1c). Today global average temperatures are believed to be about 1°C belo that of 1,000 years ago, 1.5°C below that of the Altithermal and 2.5°C cooler than the last Interglacial of 125K YBP.

Figure 2 provides a detailed and comparatively accurate reconstruction of global temperatures for the past century. Following several decades of cold temperatures early in the period, a pronounced warming is evident between 1920 and 1945. More recently, the 1950's and 1960's exhibit a cooling trend, followed by the recurrence of the warming trend during the 1970's. Total range of temperature variation over the 100 years period have not exceeded 0.6°C.

Many efforts have been made to explain the temperature variations discussed above on the basis of postulated theories on causes of climate change. Attribution of the 100K, 40K and 20K quasi-periodic cycles in the records to well defined variations in the earth's orbital pattern of the same periodicities, generally referred to as the Milankovitch mechanism, has gained wide acceptance. For fluctuations on a shorter time scale, efforts at correlation of observed solar irradiance cycles with quasi-periodic temperature patterns, particularly at 180 and 80 year intervals, have provided some encouraging results but to date have failed to demonstrate their statistical significance. The most substantial evidence for good correlation of recent global temperatures with climate forcing factors appears to be associated with atmospheric loading of volcanic dust and aerosols. Detailed correlation studies over the past 400 years of climate clearly show this parameter to have a primary role during this time period.

Several attempts have recently been made to quantify the relative magnitude of the climatic effects of various influencing factors over a decadal time, scale and to compare the modelled cumulative effect with actual climate data of the past century. Although results are encouraging, the use of significantly different weighting factors in the studies to achieve basically similar results underscore the fact that the forcing factors used are plausible, but not necessarily the only, explanation for recent climatic events.

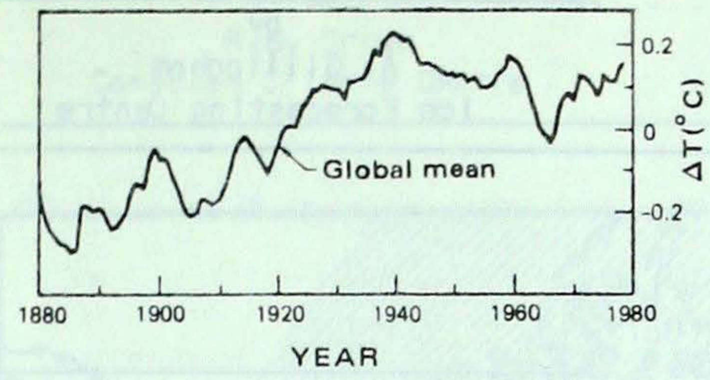


Figure 2
Mean Global Temperature Trends for the Past 100 Years

Future Climate. Anthropogenic influence on the global heat balance, particularly through the greenhouse effects of radiatively active gases such as carbon dioxide, is likely to have an unprecedented and dominent effect on climate over the next few centuries. Scenarios for future climates must, however, take into account the potential for naturally induced climate change in addition to that attributable to man. Discussions of such potential changes are dominated by reference to the quasi-periodic or "cyclic" patterns observed in past climates. Although statistical verification of their real presence in climate trends is as yet inadequate, projection of these patterns into the future, assuming persistence, permits a first order estimate of factors to be considered in future climate scenarios. Following are estimates of some of the dominant factors to be considered during the next few centuries:

1) Milankovitch mechanism: Interglacials following each major glaciation generally last 10,000 ± 2,000 years, followed by significantly colder climates. Paleoclimatologists generally agree that a change to a colder climate could occur within several thousand years. If the change is episodic rather than sinusoidal in nature, a finite although remote possibility exists that such an event could occur much sooner. It appears probable, however, that the present long term cooling trend will continue for at least the next few centuries at the rate of less than 0.1 °C/century.

2) Solar variations. 11 and 22 year cycles in sunspot behaviour appear unlikely to have substantial long term effects on global trends, both due to their short duration and small amplitudes. Apparent periodicities of 80 years and possibly 180 years may be more pronounced, as suggested in the isotopic data analysis of glacial ice cores. The amplitude of these effects appear not to exceed 0.3 °C.

3) Volcanic Aerosols. Volcanic activity and its influence on climate are generally assumed to be episodic in nature and largely unpredictable. The cooling effects of volcanic activity in past centuries is estimated to have been up to 0.4 °C.

4) Anthropogenic influence. The increasing greenhouse effect due to accumulating concentrations of atmospheric CO_2 and other similar gases such as freon, methane and nitrous oxide, appears likely to result in a 3°C ± 1.5 °C warming in global climate over the next 100 years. Warming will likely continue beyond this level, with the magnitude and duration highly dependent on future energy policies and hence very unpredictable.

The above comparison of the various primary factors in projections of the climate for the next few centuries is over-simplified and based on inadequate, controversial and often confusing research results. Furthermore, other man-made influences such as increasing atmospheric aerosols, and land and water use changes may become important. Two over-riding issues however, appear to emerge. First, the anthropogenic CO_2 effect appears likely to dominate the climate patterns of the next few centuries, with volcanic and solar influences modulating the predominating trend. Second, the effect of doubled CO_2 atmosphere may well be a short lived anomaly on time scales of millenia, with significant cooling occurring in several thousands of years or sooner.

ICE COVER - EASTERN CANADIAN WATERS
WINTER AND EARLY SPRING - 1983-84

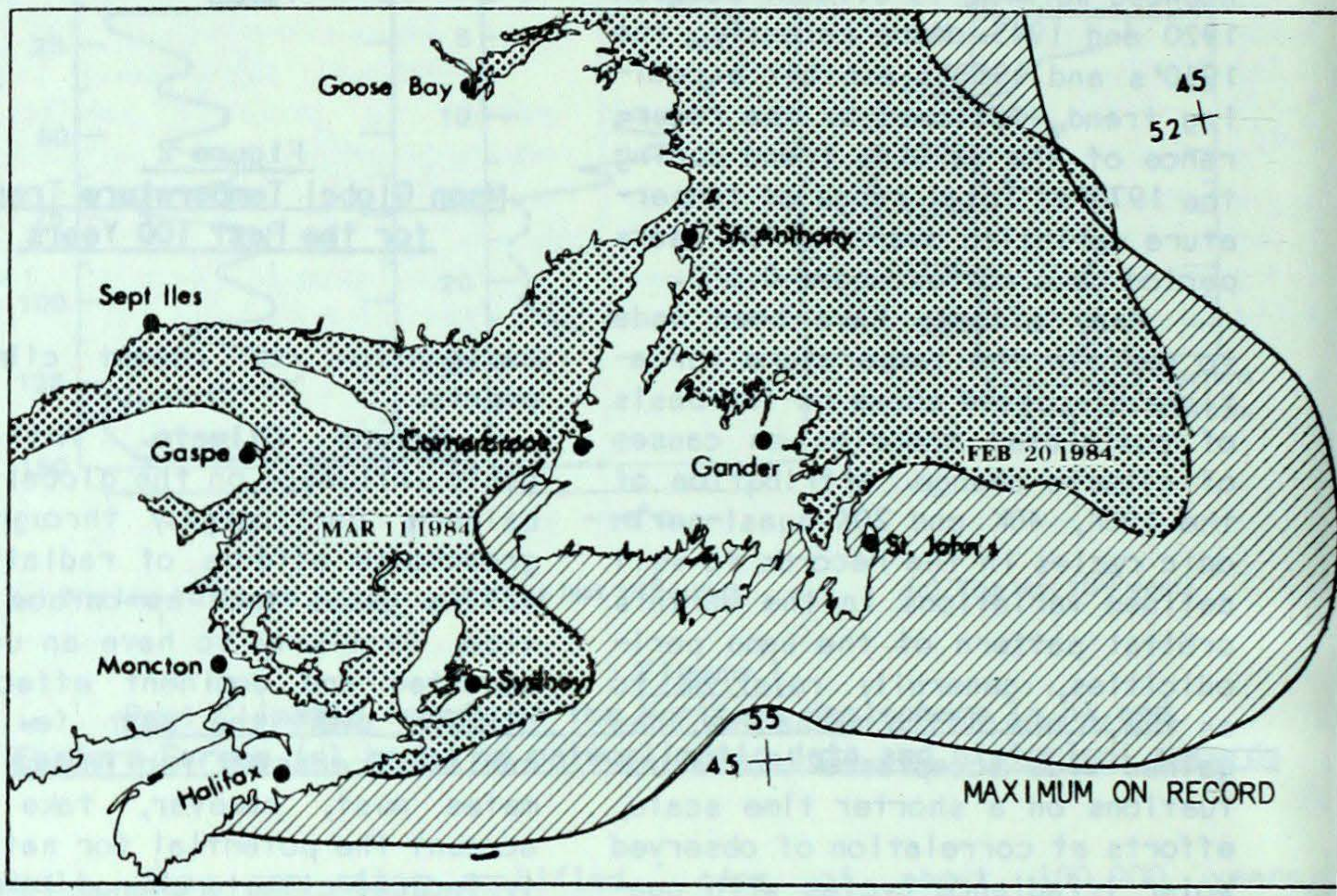
by
A. Gillingham
Ice Forecasting Centre

EAST NEWFOUNDLAND WATERS

At the beginning of April, 1984, the ice cover off eastern Newfoundland was more extensive than normal but somewhat less than the worst conditions on record.

Ice thickness and distribution off east Newfoundland during the winter and spring are determined not only by local weather conditions but, to a great extent, also by air temperatures along the coast from Hudson Strait southward during the late summer, fall and winter. Mean temperatures along the Labrador coast between August, 1983, and March, 1984, were below normal every month and reached the unusually low value of more than 7 degrees (C) below normal during February. Ice drift off Labrador during the fall and winter was southward. Even though temperatures off eastern Newfoundland were close to normal values during the fall and winter and the mean ice drift was eastward, the colder-than-normal conditions along the Labrador coast since last summer contributed significantly to an ice cover that was thicker and more extensive than normal off eastern Newfoundland by mid-winter.

As a result of the cold summer and early fall, ice began to form along the northern Labrador coast about 2 weeks earlier than normal and spread rapidly southward. By mid-December, new ice had appeared as far south as the Strait of Belle Isle which normally does not occur until the beginning of January. During the first week in January ice had spread southward into Notre Dame Bay which is close to a month earlier than normal. Primarily because of the very cold temperatures and southward drift along the Labrador coast during February, the pack reached its most southerly limit during the season off eastern Newfoundland on February 20.



Maximum ice cover off East Coast of Canada during winter of 1983-84 compared with maximum on record.

The prevailing eastward drift off Newfoundand pushed the pack much farther east than normal during the winter. That was good news for shipping interests since there were no extended periods of congestion along the route to and from Botwood as had occurred during the winter of 1982-83. Above-normal temperatures off east Newfoundland in February and March, coupled with a slow northward ice drift component during March, halted the steady southward movement of the pack.

Icebergs moving southward with pack ice along the Labrador coast in January and February were pushed eastward by the prevailing eastward drift. As a result, few icebergs were spotted in east Newfoundland waters or in the oil-drilling area during the first two months this year. A change in the mean windflow during March, however, has resulted in an increase in the number of icebergs in the drilling area and in the shipping lanes off eastern and southeastern Newfoundland sinc March.

GULF OF ST. LAWRENCE

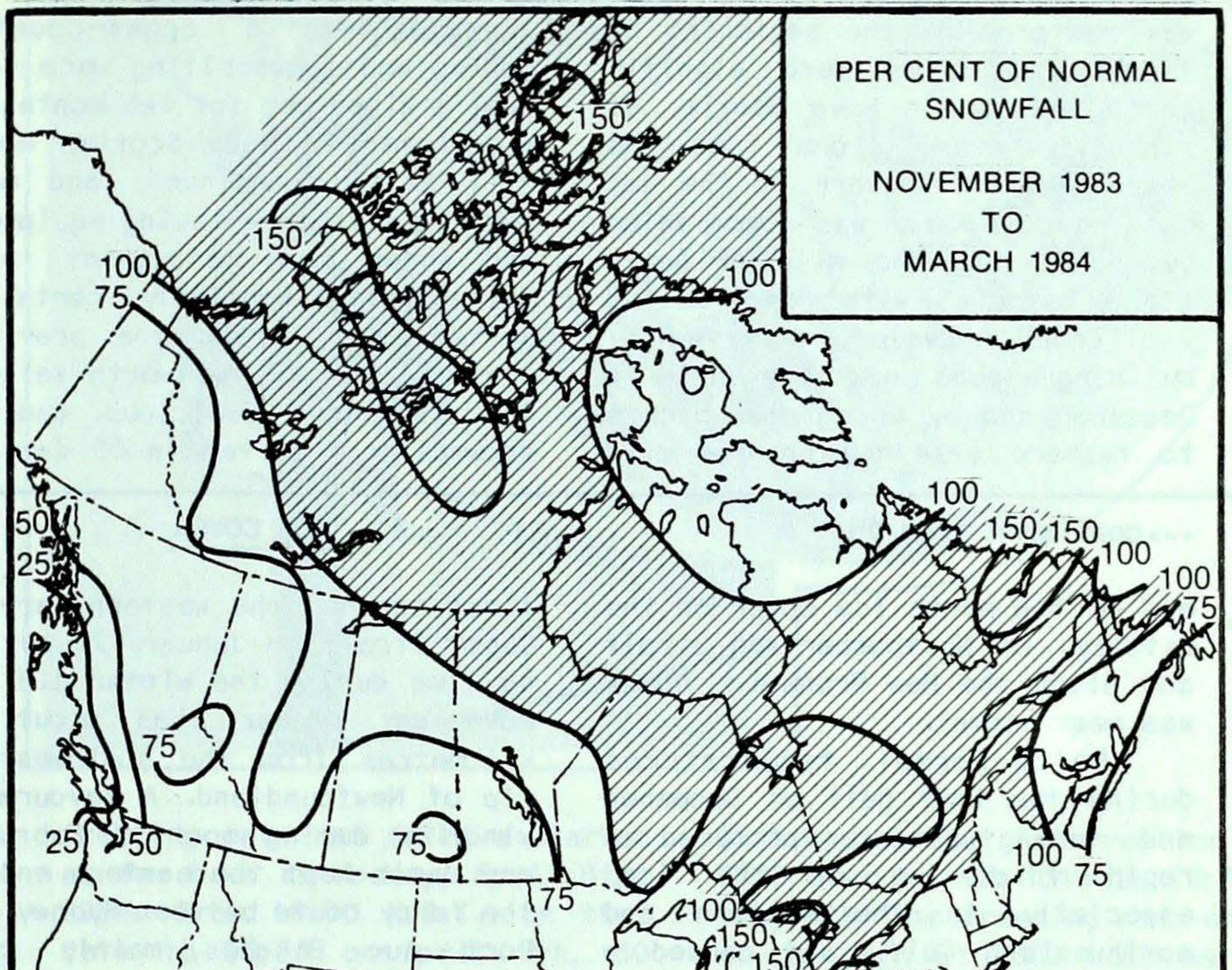
Temperatures during the fal and winter were near normal ove all of the Gulf except along th north shore where values wer between 1 and 2 degrees below th mean.

New ice began to form in th Estuary and along the north shor of the Gulf during the second wee of December which is about 2 week earlier than the mean date. By th

continued on page 10

THE 1983-84 WINTER RECREATION SEASON IN CANADA

by
R.B. Crowe
Canadian Climate Centre



Last winter was a good outdoor recreation season in most of Canada, and one of the best in years in some areas. Conditions for skiing and snowmobiling were particularly good in British Columbia, Ontario, Québec and New Brunswick.

British Columbia had the best skiing season in years, with high elevations enjoying less rain and more sunshine than usual. Along the coast ample snowcover on the coast ranges combined with sunny weather to give nearly perfect conditions through both the important Christmas-New Year's and the March spring-break periods. It was also a long season with the snow on the coastal mountains coming late in November or early in December and lasting through April. Normally, skiing ends by mid-April, but it continued at Whistler until Easter. Interior skiing was equally good all winter.

Over the western Prairies, conditions were not as good as in many areas of Canada. High level Rockies resorts, such as Sunshine, Marmot, Fortress Mountain and Lake Louise reported only a normal winter, but low level resorts suffered because of excessively cold weather in December when the snow cover was ample and later from repeated and prolonged thaws. The only good low-level skiing occurred during the first half of January. From mid-month to the end of the winter snow-making could not keep up with the continual thaws. Urban ski areas suffered most, as virtually all enthusiasts headed for the high-level Rockies resorts. Banff and Jasper reported snowfall at only 60 per cent of normal for the winter. Although the thaws were less severe and not so prolonged over the eastern Prairies, there was not enough natural snow this past winter for much cross-country skiing and snowmobiling. Only those resorts with snowmaking facilities did reasonably well.

Over Ontario and Québec this last winter was excellent. In many areas it was the best season in the last six years, and certainly, conditions this winter made up for the past three poor to marginal seasons. Ski resorts opened early, and cross-country skiing and snowmobiling got off to a good start in late November and early December. Winter sports were still enjoyed at the end of March and early April in some areas, so that it was one of the longest seasons in recent years. There were fewer disruptive storms than normal, so that access to and from resorts was excellent. A generally persistant snow cover in urban centres also gave a psychological boost to the industry. The weather was excellent during the high period from Christmas to New Year's. The only factor that prevented the season from being one of best-ever was a prolonged two or three-week February thaw. Attendance at resorts was building up gradually through January at both week-ends and the mid-week period, but this momentum was broken by the February thaw. The thaw also ruined the base for cross-country skiing and snowmobiling, but down-hill skiing continued uninterrupted due to snow-making until the natural base was restored in early March.

Conditions across the Atlantic Provinces this past winter varied from excellent in Northern New Brunswick to marginal and poor over the Island of Newfoundland. In the Campbellton-Edmundston area of New Brunswick, snow was abundant and with virtually no rain conditions were the best that winter sports enthusiasts can ever remember. Prince Edward Island and southern New Brunswick fared almost as well, but a ten to fifteen-day thaw around mid-February caused resorts without snow-making facilities to close temporarily until the natural base was restored by the beginning of March. Conditions were significantly poorer in Nova Scotia, as virtually every storm from the third week of January to the second week of March was accompanied by rain, fog and mild Atlantic air. Resorts with snow-making facilities, however, survived by building a good snow base early in December and by using cool nights to restore base during the mild régime. A Christmas Day storm added natural base, so that the Christmas-New Year's boom period was excellent for winter sports. Conditions were also excellent during the first half of the spring school break in March. Overall, while cross-country skiing and snowmobiling were virtually wiped out for two months at mid-winter in Nova Scotia, downhill skiing continued, and most resorts with snow-making equipment and under good management fared fairly well financially, certainly better than during the previous winter. In the Wentworth Valley, for instance, judicious use of snowmaking resulted in 85 days of reasonable to good skiing during the 100-day period from mid-December to the end of March. In western Newfoundland, skiing started late in the Corner Brook area, as the natural snow cover did not come until early January. In spite of the lack of snow-making equipment, it was a fair to good winter for snowmobiling and skiing across western and central Newfoundland. However, continual thaws and rain storms resulted in poor winter sports conditions over the eastern part of the Island, and particularly over the Avalon Peninsula.

...continued from 8B

ICE COVER

end of the month ice cover on the Estuary, on Northumberland Strait and along the New Brunswick coast was near normal.

Below-normal temperatures during the last half of December and during January produced a rapid thickening of the ice, especially in the western and northwestern Gulf, and caused a rapid eastward spread of the ice cover. By the fourth week of January the only open water in the Gulf was along the southern half of the west coast of Newfoundland.

Heavier ice from the Gulf first reached the western part of Cabot Strait on January 22 but at no time during the winter did ice move any closer than about 16 kilometres from the southwestern tip of Newfoundland. A favourable windflow during most of February and March kept the eastern end of the ferry route between Sydney and Port aux Basques mainly open water.

Ice first appeared in the approaches to Sydney during the second week of February but did not reach its maximum extent off eastern Cape Breton until March 11 (Figure 1). Although congestion developed near the entrance to Sydney harbour on several occasions during late February and March, the ice was loose enough at most times to pose no serious problems.

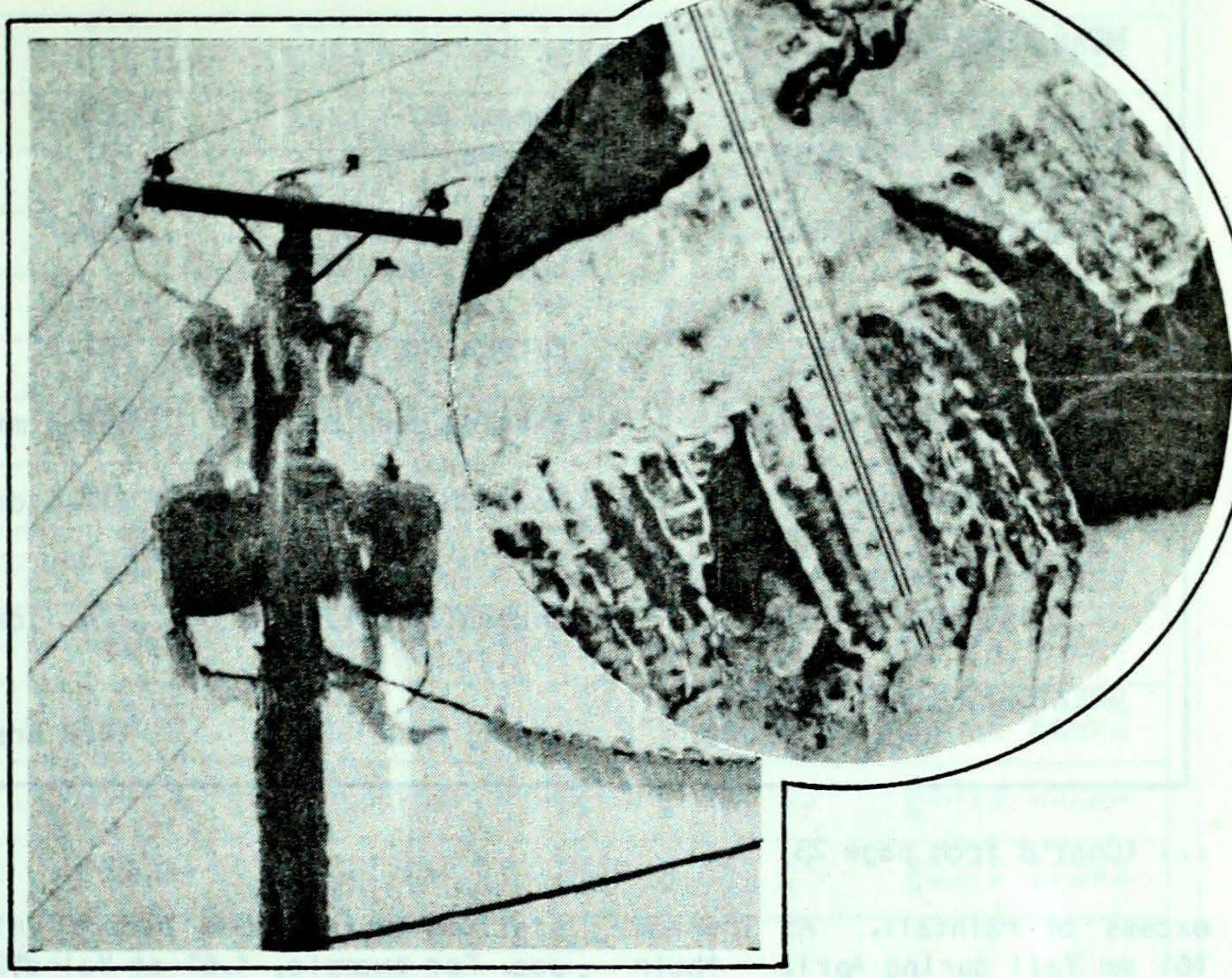
In general, heaviest ice conditions persisted during the late winter and early spring in the southwestern Gulf and east of the Gaspé Peninsula, creating difficulties for shipping in those areas. At the beginning of April, ice coverge in the Gulf was less than normal for that time of year.

Freezing degree-days from 01 Oct. to 02 Apr.

	This Season	Maximum	Minimum
Mont Joli	1202	1408 (1973-74)	1016 (1982-83)
Charlo	1170	1405 (1975-76)	1024 (1980-81)
Summerside	655	775 (1976-77)	531 (1982-83)
Stephenville	534	767 (1974-75)	345 (1980-81)
St. John's	362	642 (1974-75)	285 (1980-81)
Goose Bay	2124	2213 (1975-76)	1409 (1980-81)

Freezing degree-day is defined as the departure of the mean daily temperature from the base temperature of 0°C (one degree-day for each degree of departure below 0°C. For example -10°C yields 10 freezing degree-days).

Sleet Storm Paralyzes Newfoundland



On April 13, Newfoundland experienced the worst sleet storm in 25 years as heavy ice loads knocked down transmission lines leaving hundreds of thousands of residents in the cold and dark for days. The Avalon Peninsula was the hardes hit as people lined up to purchase essential food supplies and such items as kerosene oil and fuel for camp stoves and heaters. Parts of Belle Isle remained without electricity for nearly a weak.

The storm of 1958 has some similarity to the one we experienced recently. Both caused extensive damage and almost brought the City of St. John's to its knees. Climatologically both began near the end of the week.

Our records show that freezing rain and freezing drizzle started on February 27th, 1958 and continued sporatically to March 2nd, 1958. The bulk of precipitation occurred on February 27th and 28th - 17.5 mm. and 14.0 mm. respectively. 3.3. mm. fell on March 1st, with only a trace on March 2nd.

During our recent storm, which became most apparent on Friday evening, April 13th, 1984, freezing rain and drizzle started as far back as Monday, April 8th, 1984. From 18:50 N.S.T. on that date to 20:30 on April 9th, 30 mm. of precipitation fell. Freezing rain and drizzle started again near 0100 on the 12th and continued intermittently throughout the 12th and without interruption from 2100 hour on the 13th to 10:30 on the 15th. The freezing rain changed to rain at 2000 hour here at the airport but the temperature was so low that the freezing rain could have continued over most of the Avalon Peninsula.

Date	TEMPERATURE High	Low	PRECIPITATION mm.	Type
			17.5	
Feb. 27, 1958	0.6	-2.2	14.0	
Feb. 28, 1958	-0.6	-1.7	3.3	
March 1, 1958	-1.1	-2.8	Trace	
March 2, 1958	-0.6	-2.8	5.4	5.0" Freezing
April 8, 1984	8.0	-0.6	30.8	75% Freezing
April 9, 1984	1.4	-0.7	17.8	All liquid
April 10, 1984	2.8	0.8	1.6	50% liquid
April 11, 1984	6.5	-0.6	7.8	All Freezing
April 12, 1984	0.0	-1.0	7.0	80% Freezing
April 13, 1984	0.5	-0.6	61.0	Almost all liq-
April 14, 1984	1.0	0.0		uid at Airport
			10.7	Almost all liq-
April 15, 1984	1.0	-1.6		uid at Airport

By:

M.J. Willis
St. John's weather office

CLIMATIC EXTREMES - APRIL, 1984

MEAN TEMPERATURE:		
WARMEST	Comox, BC	10.5°
COLDEST	Eureka, NWT	-31.6°
HIGHEST TEMPERATURE:	Edmonton, ALTA Lethbridge, ALTA	29.7°
LOWEST TEMPERATURE:	Eureka, NWT	-41.2°
HEAVIEST PRECIPITATION:	Ethelda Bay, BC	339.8 mm
HEAVIEST SNOWFALL:	Moncton, NB	112.6 cm
DEEPEST SNOW ON THE GROUND ON APRIL 30, 1984:	Churchill Falls, NFLD	74 cm
GREATEST NUMBER OF BRIGHT SUNSHINE HOURS:	Alert, NWT	469 hrs

... (Cont'd from page 2B)

excess of rainfall. At Trenton 161 mm fell during April - their wettest since 1973.

Although a late April storm dropped up to 20 cm of snow in the North, snowfall was below normal across the entire Province. Hours of bright sunshine were excessive North of Lake Superior. The totals exceeded the normal by 100 hours at some locations; for example at Moosonee, 268 hours of sunshine surpassed the normal by 95 hours. A fierce wind storm struck Ontario on April 30. Hurricane-force winds caused extensive property damage, Wiarton recorded a peak gust of 126 km/h - the highest wind speed ever in the Bruce Peninsula in 26 years of records.

Québec

Northern Québec enjoyed pleasantly mild and dry weather. Mean temperatures were 3 to 6 degrees above normal and some stations established record values. For example, 4.6° at Val-d'Or broke the old record dating back to 1955. Over Southern Québec, the temperatures were near normal; however, near the end of the month daily values climbed into the record mid-twenties. A long string of warm days and cool nights provided ideal weather for maple sap production in the South. Precipitation was light across the North, three locations received the least amount on record for April. Along the St. Lawrence Valley, precipitation was about normal. Due to ample snow on the ground, spring skiing continued late into the month especially at southeastern resorts. Light precipitation fell during the last two weeks of April in the agricultural areas and farmers took advantage of the dry weather to start ploughing on well drained fields. Hours of bright sunshine were above normal almost everywhere; in the eastern regions, the values reached nearly 185 per cent of normal.

Atlantic Provinces

April was winter-like across Atlantic Canada. Fierce ice storm, heavy rain and snow and cool temperatures dominated the weather. Monthly temperatures were up to 7° degrees below normal in Labrador, and averaged slightly below normal in the Maritime Provinces. Precipitation was excessive throughout most of the Provinces. Several stations reported the second largest value for April. At Sydney, 204.1 mm was more than double the normal and the wettest April since record began in 1939. Storms crossing the East Coast deposited 30 to 45 cm of snow, southeastern New Brunswick received the most 112.6 cm - nearly four times the normal amount. April was rather dull, hours of bright sunshine were only 50 per cent of normal in parts of Nova Scotia. Sable Island experienced only 71 hours of sunshine, 64 hours below normal and the lowest April value since 1961. Storms battered the East Coast on numerous occasions. The worst ice storm in decades virtually paralyzed the Avalon Peninsula on April 13. Heavy ice accretion on utility line left some communities were without electricity and heat for over a week. An early April snow storm produced a mixture of snow, freezing rain, high winds and cold temperatures across the Maritimes. Schools and busineses were closed and there were widespread power outages. Moncton received nearly 92 cm of snow during this storm. Another fierce storm hit eastern Canada in mid-month. Heavy rains in the 40 to 70 mm range caused minor flooding. The Saint John River rose to flood stages near Frederictor submerging roads and fields under deep waters.

Canadian Climate Centre
Atmospheric Environment Service
4905 Dufferin Street
Downsview, Ontario
CANADA M3H 5T4 (416) 667-4711/4906

Annual subscription rate for weekly issues--- $35.00
Annual subscription rate for one issue per month including monthly supplement--- $10.00

EDITOR: A. Shabbar ASSISTANT EDITOR: A. Caillet STAFF WRITER: A. Radomski

Correspondents: T. Mullane, Ottawa; H. Wahl, Whitehorse; N. Penny, Vancouver; W. Prusak, Edmonton; F. Luciow, Winnipeg; B. Smith, Toronto; J. Miron, Montréal; F. Amirault, Halifax.

Subscription enquiries: Supply and Services Canada, Publishing Centre, Ottawa, Ontario, Canada, K1A 0S9

APRIL 1984

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	8.4	-.3	23.8	-1.0	0.0	0	127.0	124	0	17	140	86	287.3
ALERT BAY	7.4	0.0	15.7	1.3	1.0	91	117.6	141	0	20	MSG	MSG	313.2
BLUE RIVER A	4.3	.4	24.2	-8.7	7.0	78	66.0	145	0	15	114	68	MSG
BULL HARBOUR	6.9	.1	15.2	.4	TR	MSG	183.6	146	0	20	MSG	MSG	333.8
BURNS LAKE	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG
CAPE ST. JAMES	6.8	.3	13.6	1.0	1.0	40	112.7	106	0	20	142	MSG	337.0
CAPE SCOTT	6.8	-.4	12.1	1.1	.5	14	26.1	14	0	22	MSG	MSG	337.7
CASTLEGAR A	7.9	-.2	27.5	-4.0	4.0	48	62.8	143	0	12	165	96	303.9
COMOX A	10.5	2.5	18.2	.2	0.0	0	78.2	137	0	13	MSG	MSG	285.9
CRANBROOK A	5.8	0.0	25.0	-5.1	3.8	38	35.3	137	0	4	200	MSG	365.7
DEASE LAKE	2.2	1.9	13.8	-9.5	7.8	65	6.8	55	0	2	203	107	475.6
ETHELDA BAY	6.4	0.0	16.1	-2.7	0.0	0	339.8	141	0	20	MSG	MSG	347.4
FORT NELSON A	4.9	3.3	17.1	-6.0	9.0	56	25.5	153	0	6	194	MSG	392.7
FORT ST. JOHN A	5.7	2.8	24.8	-3.0	10.9	66	13.4	62	0	3	MSG	MSG	369.0
HOPE A	8.6	-.7	26.5	.5	.3	21	118.7	113	0	3	MSG	MSG	282.8
KAMLOOPS A	9.2	.1	29.2	-1.7	TR	MSG	20.4	196	0	5	169	85	266.6
KELOWNA A	7.4	-.1	27.2	-5.9	1.2	120	21.8	123	0	8	151	74	318.7
LANGARA	6.6	.8	13.8	1.1	1.4	30	124.4	103	0	18	MSG	MSG	342.2
LYTTON	9.4	.1	25.4	0.0	0.0	0	3.7	20	0	1	152	79	259.7
MACKENZIE A	3.9	1.5	22.6	-7.9	3.8	36	16.0	60	0	6	197	96	423.7
MCINNES ISLAND	7.5	.3	15.8	1.8	1.6	33	298.7	171	0	23	MSG	MSG	313.9
MERRY ISLAND	9.1	.2	15.8	3.5	0.0	0	78.6	144	0	12	176	MSG	267.8
PENTICTON A	8.1	-.5	23.5	-3.3	.2	100	24.2	113	0	5	171	81	295.9
PORT ALBERNI A	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG
PORT HARDY A	7.0	.4	15.3	-.2	2.8	215	135.8	126	0	18	162	113	330.9
PRINCE GEORGE A	5.0	.7	24.8	-6.0	1.9	19	19.8	72	0	8	181	89	388.5
PRINCE RUPERT A	6.0	.6	17.1	-2.4	4.6	63	179.3	94	0	18	145	108	360.0
PRINCETON A	5.4	-.8	24.9	-5.9	.2	6	12.4	84	0	6	155	MSG	MSG
QUESNEL A	6.3	.9	26.0	-6.0	TR	MSG	10.9	47	0	4	MSG	MSG	355.3
REVELSTOKE A	7.3	.9	21.1	-2.6	TR	MSG	50.2	85	0	14	149	83	319.1
SANDSPIT A	6.6	.6	12.0	-1.0	.9	43	212.8	252	0	20	163	105	334.4
SMITHERS A	4.7	.5	15.1	-5.1	1.4	20	13.5	77	0	4	177	100	399.7
STEWART A	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG
TERRACE A	6.2	.5	16.9	-2.3	2.2	18	84.8	138	0	9	164	111	353.3
VANCOUVER HARBOUR	9.1	-.2	16.9	2.2	0.0	0	163.0	179	0	19	MSG	MSG	266.3
VANCOUVER INT'L A	8.8	0.0	17.9	.9	0.0	0	124.3	209	0	13	166	92	282.3
VICTORIA GONZ. HTS	9.4	.3	18.3	3.1	0.0	0	20.9	69	0	8	215	106	258.1
VICTORIA INT'L A	8.3	-.1	19.3	.2	0.0	0	47.8	122	0	11	202	112	291.9
VICTORIA MARINE	8.1	.1	16.6	.6	TR	MSG	75.8	107	0	14	MSG	MSG	299.6
WILLIAMS LAKE A	4.5	.1	23.0	-6.1	12.7	131	14.7	68	0	3	162	78	392.0

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									
YUKON TERRITORY													
BURWASH A	.9	3.2	11.2	-15.7	1.0	8	1.0	6	0	0	MSG	MSG	539.9
DAWSON A	2.4	4.3	16.8	-9.1	11.4	123	13.3	141	0	5	MSG	MSG	470.6
MAYO A	3.4	3.8	16.8	-7.8	8.6	115	7.8	91	0	3	MSG	MSG	439.5
WATSON LAKE A	2.5	3.1	14.4	-12.2	3.6	26	13.8	91	TR	3	MSG	MSG	464.5
WHITEHORSE A	2.6	2.3	15.5	-8.1	1.4	13	1.4	15	0	0	256	112	463.0
NORTHWEST TERRITORIES													
ALERT	-27.1	-2.2	-14.0	-40.9	3.4	44	3.4	45	16	1	469	120	1352.8
BAKER LAKE	MSG	MSG	21.0	-6.0	28.2	207	MSG	169	MSG	MSG	198	85	322.5
CAMBRIDGE BAY	-18.8	3.1	-2.3	-36.0	2.4	30	2.4	33	37	1	256	102	1105.2
CAPE DYER A	-20.2	-4.8	-7.7	-38.7	32.6	64	20.7	46	61	6	MSG	MSG	1146.3
CAPE PARRY A	-14.0	4.7	1.0	-28.9	17.9	137	9.9	103	17	9	MSG	MSG	961.1
CLYDE	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG
COPPERMINE	-13.1	4.4	3.6	-34.5	21.6	212	15.7	143	20	4	174	81	871.7
CORAL HARBOUR A	-15.3	1.0	.6	-37.1	21.0	146	19.6	143	32	7	226	81	999.2
EUREKA	-31.6	-4.0	-14.7	-41.2	1.2	41	.4	15	12	0	432	122	1487.2
FORT RELIANCE	-3.4	6.2	15.0	-21.2	13.2	100	11.1	88	1	3	MSG	MSG	641.6
FORT SIMPSON A	2.7	5.2	19.0	-11.1	4.6	39	4.6	32	0	3	248	112	460.4
FORT SMITH A	4.6	6.8	21.4	-10.0	4.4	33	4.6	28	0	1	249	102	402.1
FROBISHER BAY A	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG
HALL BEACH A	-22.0	-1.1	-.9	-40.5	24.3	211	23.9	219	41	5	MSG	MSG	1200.7
HAY RIVER A	1.4	5.6	20.2	-14.5	TR	MSG	2.0	13	0	1	MSG	MSG	507.1
INUVIK A	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG
MOULD BAY A	-22.2	1.9	9.6	-37.2	6.2	107	1.6	32	28	1	326	114	1206.9
NORMAN WELLS A	-2.6	4.6	15.8	-15.2	6.0	39	6.9	45	0	1	213	90	618.3
POND INLET A	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG
RESOLUTE A	-25.2	-2.1	-11.9	-40.5	2.6	40	1.8	31	37	0	334	121	1296.5
SACHS HARBOUR A	-14.4	5.6	0.0	-30.3	3.2	65	2.1	47	15	0	166	63	970.0
YELLOWKNIFE A	-.4	6.5	13.8	-14.7	7.0	71	6.0	58	0	2	259	97	551.3
ALBERTA													
BANFF	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG
BROOKS	6.0	1.4	29.5	-9.0	1.2	9	25.3	100	0	MSG	MSG	MSG	MSG
CALGARY INT'L A	5.4	2.1	27.1	-8.1	1.0	4	15.5	48	0	2	212	104	378.2
COLD LAKE A	7.4	4.5	26.4	-5.2	TR	MSG	28.7	133	0	7	242	106	317.9
CORONATION A	5.9	2.9	27.9	-6.2	1.2	8	23.8	100	0	5	249	108	364.7
EDMONTON INT'L A	5.9	2.7	29.7	-8.4	.4	3	6.6	33	0	2	251	108	363.1
EDMONTON MUN. A	7.4	3.2	28.1	-4.0	0.0	0	10.9	50	0	2	264	116	319.1
EDMONTON NAMAO A	6.8	2.9	27.5	-5.0	TR	MSG	11.8	66	0	3	MSG	MSG	337.5
EDSON A	4.1	2.2	11.3	-3.1	8.6	58	13.7	52	0	6	188	92	416.2
FORT CHIPEWYAN A	3.8	5.1	22.0	-11.0	5.6	24	18.6	95	0	MSG	MSG	MSG	MSG

APRIL 1984

STATION	Temperature C Mean	Difference from Normal	Maximum	Minimum	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
FORT MCMURRAY A	7.1	5.0	27.2	-5.5	2.4	18	24.7	120	0	4	216	93	333.6
GRANDE PRAIRIE	5.5	2.8	28.3	-6.5	12.6	106	16.6	85	0	2	215	MSG	374.3
HIGH LEVEL A	5.3	4.5	27.2	-6.2	1.8	12	4.3	25	0	2	234	95	375.5
JASPER	3.9	.6	23.5	-7.1	15.0	138	27.4	121	0	6	176	MSG	423.1
LETHBRIDGE A	6.5	1.6	29.7	-7.6	15.1	55	34.7	81	0	6	MSG	MSG	346.4
MEDICINE HAT A	7.9	2.3	29.6	-7.7	5.2	28	17.8	59	0	8	246	122	305.0
PEACE RIVER A	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG
RED DEER A	5.1	2.0	26.7	-8.5	2.5	15	16.3	62	0	6	MSG	MSG	367.5
ROCKY MTN HOUSE	4.5	1.5	27.7	-7.5	2.4	8	6.9	20	0	1	MSG	MSG	405.7
SLAVE LAKE A	5.2	2.7	27.6	-6.4	TR	MSG	7.7	44	0	3	239	103	384.6
SUFFIELD A	7.8	2.6	29.1	-7.6	4.6	29	19.9	69	0	7	240	114	311.6
WHITECOURT	5.5	2.8	27.6	-5.6	2.6	15	12.7	47	0	3	MSG	MSG	376.1
SASKATCHEWAN													
BROADVIEW	5.9	3.4	21.6	-7.6	12.0	85	24.0	87	TR	5	220	106	363.7
COLLINS BAY	.2	4.1	20.8	-17.9	12.0	37	25.8	88	0	3	241	MSG	535.1
CREE LAKE	3.6	5.4	19.8	-10.6	5.0	27	14.5	67	0	3	382	159	432.8
ESTEVAN A	6.6	2.5	21.1	-6.3	17.5	108	28.3	76	0	6	237	113	341.4
HUDSON BAY	6.2	4.7	23.4	-5.7	16.8	93	65.0	241	0	9	228	MSG	353.1
KINDERSLEY KY	7.6	3.8	28.3	-7.6	4.6	42	14.6	68	0	4	MSG	MSG	311.5
LA RONGE A	5.8	5.4	23.6	-8.1	0.0	0	14.2	72	0	3	MSG	MSG	367.5
MEADOW LAKE	8.1	4.5	25.7	-9.8	0.0	0	17.4	79	0	7	254	MSG	332.7
MOOSE JAW A	7.2	3.0	23.2	-6.8	TR	MSG	3.0	10	0	1	264	121	324.3
NIPAWIN A	5.9	MSG	11.7	0.0	3.2	MSG	11.0	MSG	0	4	219	89	364.0
NORTH BATTLEFORD A	7.5	4.5	25.8	-6.8	3.6	33	27.1	128	0	6	MSG	MSG	314.1
PRINCE ALBERT A	6.8	4.9	23.8	-7.6	1.0	9	22.4	102	0	4	245	110	336.7
REGINA A	7.0	3.7	23.8	-6.2	TR	MSG	4.3	18	0	2	249	119	326.4
SASKATOON A	7.6	4.3	25.3	-6.4	6.8	72	18.2	86	0	4	MSG	MSG	313.5
SWIFT CURRENT A	6.7	3.2	25.6	-9.1	1.3	8	11.5	41	0	4	288	138	341.0
URANIUM CITY A	2.5	5.6	8.8	-3.9	8.0	47	7.7	43	0	2	MSG	MSG	464.8
WYNYARD	6.6	4.1	22.7	-5.1	.2	1	16.8	69	0	4	221	96	341.0
YORKTON	6.3	4.1	23.5	-5.3	7.8	60	32.4	146	0	8	232	104	351.0
MANITOBA													
BISSETT	7.0	5.2	23.2	-7.3	1.5	8	42.0	100	TR	8	224	98	330.7
BRANDON A	6.3	3.5	22.3	-9.8	37.0	327	95.0	282	13	6	MSG	MSG	352.1
CHURCHILL A	-4.6	5.5	18.7	-23.3	62.9	282	60.2	263	37	6	140	69	667.7
DAUPHIN A	6.4	4.1	24.2	-6.5	32.4	199	76.6	240	14	8	198	89	348.1
GILLAM A	.4	7.0	23.7	-16.0	41.0	107	33.2	89	35	5	MSG	MSG	530.6
GIMLI	5.4	4.0	19.8	-5.2	20.0	132	64.2	171	3	6	228	92	379.2
ISLAND LAKE	4.4	7.6	22.5	-7.9	51.4	186	37.1	90	21	5	MSG	MSG	408.2
LYNN LAKE A	1.9	5.4	22.2	-12.2	17.9	76	16.9	73	0	5	239	103	484.0
NORWAY HOUSE A	4.1	MSG	22.4	-7.6	27.0	MSG	46.0	MSG	20	8	MSG	MSG	417.0
PILOT MOUND	6.1	3.1	21.5	-7.7	35.4	223	64.0	155	4	7	MSG	MSG	341.4
PORTAGE LA PRAIRIE A	6.9	3.7	23.6	-6.8	34.1	302	56.5	133	14	7	MSG	MSG	332.2
THE PAS A	5.3	5.3	23.8	-7.7	27.2	140	36.0	131	6	4	220	97	387.2
THOMPSON A	2.1	5.8	24.3	-13.0	44.4	147	50.2	150	12	6	195	84	481.2
WINNIPEG INT'L A	7.2	3.8	23.5	-5.7	4.8	42	46.9	122	TR	6	233	106	323.9
ONTARIO													
ATIKOKAN	5.5	3.4	21.5	-9.6	16.0	76	31.4	68	1	4	250	121	376.3
EARLTON A	7.0	5.1	24.7	-9.3	7.4	38	46.0	92	0	7	MSG	MSG	357.9
GERALDTON	3.8	4.3	21.8	-15.9	20.0	129	38.0	88	1	4	MSG	MSG	426.4
GORE BAY A	6.3	2.6	22.2	-5.2	.4	4	42.9	66	0	7	MSG	MSG	351.3
HAMILTON	7.0	0.0	25.8	-1.8	TR	MSG	82.0	106	0	12	174	MSG	327.1
HAMILTON A	6.7	.6	24.5	-2.9	.4	6	73.6	93	0	10	MSG	MSG	340.3
KAPUSKASING A	5.5	5.0	26.2	-13.3	1.4	6	23.8	45	0	1	MSG	MSG	384.8
KENORA A	7.7	5.0	21.6	-3.7	1.8	9	30.2	72	TR	5	MSG	MSG	287.3
KINGSTON A	7.1	1.6	23.7	-3.4	0.0	0	155.2	222	0	12	151	75	325.6
LANSDOWNE HOUSE	3.5	5.8	22.2	-11.8	3.4	11	50.6	125	TR	4	MSG	MSG	436.5
LONDON A	7.5	1.1	23.7	-4.8	3.0	33	69.8	86	0	13	155	93	317.0
MOOSONEE	1.4	3.7	24.6	-23.3	TR	MSG	17.4	41	0	1	268	155	497.7
MOUNT FOREST	6.0	1.6	23.8	-4.9	7.2	52	55.8	77	0	12	179	96	358.3
MUSKOKA A	6.6	2.1	26.1	-6.1	2.4	20	58.8	80	0	12	MSG	MSG	336.5
NORTH BAY A	6.6	3.4	24.8	-6.4	11.4	69	60.1	96	0	9	194	99	342.7
OTTAWA INT'L A	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG
PETAWAWA A	6.5	2.3	24.5	-6.6	3.2	53	99.2	166	0	9	MSG	MSG	345.1
PETERBOROUGH A	6.9	.9	22.7	-5.6	.4	6	103.4	144	0	11	MSG	MSG	332.5
PICKLE LAKE	4.9	5.4	21.6	-7.4	1.8	6	22.6	52	0	2	MSG	MSG	392.3
RED LAKE A	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG
ST. CATHARINES A	7.5	.3	25.2	-3.0	1.4	42	65.9	88	0	8	MSG	MSG	315.7
SARNIA A	7.0	-.1	26.1	-3.5	TR	MSG	72.0	79	0	12	175	91	330.6
SAULT STE. MARIE A	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG
SIMCOE	7.6	.8	25.0	-3.0	1.6	34	87.2	98	0	13	MSG	MSG	312.3
SIOUX LOOKOUT A	6.4	5.0	21.3	-6.8	.6	2	26.7	59	0	2	MSG	MSG	347.6
SUDBURY A	6.3	3.6	25.5	-7.8	16.2	103	49.4	81	0	6	199	96	349.8
THUNDER BAY A	5.3	2.8	21.2	-6.8	3.8	23	26.5	52	2	3	249	116	381.3
TIMMINS A	5.5	4.5	26.1	-12.4	16.0	70	33.8	69	0	5	MSG	MSG	376.1
TORONTO	8.2	.6	23.1	-.2	TR	MSG	66.0	91	0	8	MSG	MSG	294.2
TORONTO INT'L A	7.2	1.0	25.3	-3.6	1.6	22	58.7	84	0	11	MSG	MSG	323.7
TORONTO ISLAND A	7.0	.8	19.7	-.2	TR	MSG	61.3	92	0	11	MSG	MSG	330.8
TRENTON A	7.5	1.1	21.3	-3.2	TR	MSG	161.0	212	0	12	MSG	MSG	315.0
TROUT LAKE	2.7	6.5	MSG	-10.7	.6	MSG	23.0	82	1	3	MSG	MSG	458.5
WATERLOO-WELL A	6.6	.6	23.5	-3.7	2.2	31	48.5	63	0	11	MSG	MSG	341.4
WAWA A	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG
WIARTON A	6.2	1.5	24.9	-4.6	11.4	106	67.9	99	0	9	211	109	355.4
WINDSOR A	8.3	.2	24.8	-1.1	TR	MSG	57.5	69	0	11	MSG	MSG	290.6

APRIL 1984

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	4.6	2.4	24.5	-9.7	9.6	48	32.5	68	0	5	MSG	MSG	403.3
BAIE COMEAU A	.3	-.1	13.1	-10.6	6.8	23	67.5	105	14	5	218	MSG	531.9
BLANC SABLON	-3.2	-2.3	9.2	-16.8	30.0	75	33.2	46	3	10	208	MSG	612.1
CHIBOUGAMAU A	2.7	3.8	19.6	-16.8	27.4	124	39.4	76	0	6	244	129	459.2
KUUJJUAQ A	-6.7	2.5	14.7	-34.1	4.2	19	2.8	12	35	1	172	87	740.6
GASPE A	.6	-.3	16.5	-15.0	32.6	85	96.5	117	1	8	190	MSG	486.7
INUKJUAK A	-7.0	3.9	7.0	-31.2	2.4	18	5.0	34	8	2	188	106	751.2
LA GRANDE RIVIERE	.2	MSG	19.1	-24.5	TR	MSG	4.2	MSG	0	2	0	MSG	555.4
MANIWAKI	6.5	2.9	22.5	-7.0	.6	5	93.8	156	0	9	201	105	345.8
MATAGAMI A	4.5	6.2	24.2	-15.0	8.2	35	25.3	63	0	5	261	142	411.1
MONT JOLI A	2.6	1.0	16.4	-8.3	12.0	43	39.0	70	0	7	195	127	501.1
MONTREAL INT'L A	7.1	1.4	23.4	-5.1	1.0	10	76.2	103	0	10	198	105	320.7
MONTREAL M INT'L A	6.1	MSG	22.7	-5.9	2.4	MSG	84.2	MSG	0	9	205	MSG	356.8
NATASHQUAN	-1.3	-.8	12.5	-15.4	20.4	68	56.2	74	TR	9	210	129	579.5
NITCHEQUON	-2.6	3.2	13.9	-30.9	17.0	58	18.8	51	5	4	257	138	616.5
KUUJJUARAPIK A	-1.8	5.0	21.9	-28.4	2.0	9	9.0	33	TR	1	275	149	593.3
QUEBEC A	4.1	.8	24.4	-7.6	5.8	36	42.6	59	0	8	193	112	418.1
ROBERVAL A	4.4	2.7	23.5	-10.3	8.2	37	48.5	103	0	5	231	MSG	405.8
STE AGATHE DES MONTS	5.1	2.9	20.5	-7.1	5.6	28	90.2	108	0	7	188	98	386.7
ST HUBERT A	6.7	1.0	23.9	-5.3	1.2	12	85.8	115	0	10	MSG	MSG	340.1
SCHEFFERVILLE A	-5.5	1.7	13.1	-31.5	7.5	18	7.0	15	36	3	254	MSG	703.9
SEPT-ILES A	.3	.3	11.7	-12.7	28.4	86	96.5	123	1	5	226	121	532.7
SHERBROOKE A	5.3	1.7	26.8	-8.9	3.8	16	74.1	100	0	10	184	MSG	381.5
VAL D'OR A	4.6	3.7	23.4	-10.3	25.6	119	66.2	130	0	7	229	124	402.3
NEW BRUNSWICK													
CHARLO A	2.0	.7	15.9	-8.0	23.2	68	102.0	124	7	11	196	121	481.7
CHATHAM A	2.1	-.9	23.2	-7.6	31.3	95	125.8	149	TR	12	161	94	479.3
FREDERICTON A	4.0	-.1	23.6	-6.3	14.3	67	115.5	145	0	9	151	MSG	417.7
MONCTON A	1.9	-1.1	21.1	-11.0	112.6	396	195.6	218	0	14	150	94	484.1
SAINT JOHN A	3.6	.4	19.1	-6.8	25.4	123	147.7	138	0	12	152	96	431.1
NOVA SCOTIA													
EDDY POINT	2.7	.2	15.3	-6.2	24.2	127	149.0	164	0	14	111	71	459.6
GREENWOOD A	4.5	-.1	21.7	-7.7	31.8	183	80.7	107	0	12	MSG	MSG	403.5
HALIFAX INT'L A	4.0	.7	20.1	-5.0	24.3	101	165.4	144	0	11	MSG	MSG	421.2
SABLE ISLAND	4.3	1.0	11.0	-.9	8.8	144	116.4	119	0	13	71	53	409.5
SHEARWATER A	3.7	-.3	22.3	-4.7	15.5	119	168.9	168	0	13	122	74	409.6
SYDNEY A	1.8	-.2	18.8	-11.4	28.8	113	204.1	200	0	14	93	59	487.6
TRURO	3.5	.6	19.6	-9.2	30.0	160	105.4	132	0	11	129	86	435.2
YARMOUTH A	5.0	.3	19.2	-5.0	12.6	194	148.3	154	0	10	156	87	397.2
PRINCE EDWARD ISLAND													
CHARLOTTETOWN A	2.2	-.1	16.8	-6.6	40.2	147	146.5	179	TR	13	MSG	MSG	474.6
SUMMERSIDE A	1.7	-.9	17.5	-6.0	45.2	188	108.3	144	0	11	159	98	488.7
NEWFOUND LAND													
ARGENTIA A	1.5	-.8	10.9	-8.6	10.2	111	99.7	129	0	12	MSG	MSG	505.0
BATTLE HARBOUR	-5.0	-2.7	12.0	-7.6	9.9	22	16.1	30	23	4	MSG	MSG	688.2
BONAVISTA	-.6	-1.2	8.0	-10.6	9.2	41	105.4	163	TR	11	MSG	MSG	558.5
BURGEO	2.1	.5	13.8	-9.1	2.4	10	84.2	67	0	6	126	90	477.4
CARTWRIGHT	-5.4	-2.8	15.3	-23.1	60.1	105	61.0	76	54	4	248	193	702.3
CHURCHILL FALLS A	-4.2	.8	15.6	-30.0	30.2	58	27.8	45	MSG	5	269	174	654.2
COMFORT COVE	-1.2	-2.1	12.6	-14.0	42.6	92	97.8	109	8	9	MSG	MSG	575.1
DANIEL'S HARBOUR	-.2	-.5	12.0	-14.2	10.6	37	34.8	67	0	6	226	169	545.5
DEER LAKE A	.3	-.5	18.8	-17.0	13.8	46	38.2	65	0	4	MSG	MSG	530.7
GANDER INT'L A	-.6	-1.5	13.6	-12.3	37.3	79	97.8	105	7	12	145	125	556.1
GOOSE A	-3.6	-1.9	19.7	-29.7	52.4	108	50.8	83	57	3	MSG	MSG	646.0
HOPEDALE	-6.9	-2.0	11.6	-28.2	25.0	54	25.0	46	72	4	MSG	MSG	746.8
PORT-AUX-BASQUES	2.7	1.9	15.6	-8.1	3.8	16	69.8	75	0	8	158	MSG	457.2
ST ANTHONY	-5.2	-3.3	MSG	-22.4	47.6	127	65.0	66	70	9	MSG	MSG	692.9
ST JOHN'S A	-.2	-1.4	9.9	-12.0	17.7	51	MSG	MSG	TR	20	83	72	547.6
ST LAWRENCE	MSG	MSG	MSG	MSG	1.2	6	134.2	119	0	15	MSG	MSG	476.0
STEPHENVILLE A	5.0	3.2	18.2	-10.1	12.5	57	53.2	89	0	5	191	146	449.1
WABUSH LAKE A	-3.4	2.2	16.7	-26.8	30.1	61	26.2	50	30	4	263	184	640.8

APRIL 1984 AVRIL

STATION	Temperature °C / *Température °C* — Mean / *Moyenne*	Difference from Normal / *Ecart 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 above 5°C / *Degrés-jours au-dessus de 5°C* — This Month / *Présent mois*	Since Jan. 1st / *Depuis le 1er janv.*	Mean Dew Point °C / *Point de rosée moyen °C*
AGROCLIMATOLOGICAL STATIONS AGROCLIMATOLOGIQUES													
BRITISH COLUMBIA COLOMBIE-BRITANNIQUE													
Agassiz	9.0	-0.5	24.0	-0.5	0.0	120.1	109	0	21	131	120.0	308.1	
Kamloops													
Sidney													
Summerland	7.9	-0.8	25.0	-1.0	0.0	21.2	108	0	6	175	92.0	138.0	
ALBERTA													
Beaverlodge	5.4	2.8	27.5	-5.5	8.6	8.0	35	0	2	215	39.4	40.1	
Ellerslie	6.0		28.5	-7.5	T	5.6		0	2	249	55.4	56.2	
Fort Vermilion													
Lacombe	5.3	2.2	29.0	-9.5	0.0	7.1	30	0	3		55.9	57.6	
Lethbridge	6.7	1.9	30.0	-6.5	9.0	27.3	66	0					
Vauxhall													
Vegreville	6.4	3.3	29.0	-8.5	0.0	15.2	109	0	4		70.5	70.5	
SASKATCHEWAN													
Indian Head	6.8	3.7	22.0	-7.5	0.4	6.0	21	0	3		89.5	89.5	
Melfort	6.7	5.4	23.0	-6.5	1.9	21.3	113	0	4	214	83.5	83.5	
Regina	8.2	5.2	23.0	-11.0	0.0	5.8	24	0	2		64.5	64.5	
Saskatoon	7.4		25.5	-6.0	6.2	15.6		0	3	247	98.0	98.0	
Scott	6.5	3.8	23.0	-8.0	0.0	14.4	60	0	5	244	73.9	73.9	
Swift Current South	7.0	3.0	25.5	-7.5	0.0	10.6	41	0	3	242	92.5	94.1	
MANITOBA													
Brandon	6.7	3.4	23.0	-12.0	35.9	72.1	196	12	6	213	74.5	77.0	
Glenlea	7.5	4.1	23.0	-7.0	4.7	40.7	109	0	6	220	99.0	99.0	
Morden	7.2	3.2	22.5	-5.5	8.8	84.0	209	T	6	202	92.3	92.8	
ONTARIO													
Delhi	7.7	1.0	24.0	-4.5	0.0	87.0	93	0	15	171	92.5	98.9	
Flora	6.4		23.4	-3.1	0.0	42.5		0	13	173	68.5	69.0	
Guelph	6.6	0.8	23.8	-5.1	0.0	56.8	70	0	13	165	71.5	74.0	
Harrow	7.9	0.0	23.0	-2.0	0.0	83.5	103	0	13	175	92.3	99.7	
Kapuskasing													
Merivale													
Ottawa	7.4	1.7	22.3	-3.7	T	113.0	175	0	9	188	84.5	84.5	
Smithfield	7.7	1.6	21.5	-3.0	0.0	149.8	184	0	11		85.5	87.7	
Vineland Station	6.3	-0.6	24.3	-2.0	T	67.6	93	0	8	174	55.8	63.6	
Woodslee													
QUEBEC													
La Pocatiere	1.9	-0.9	21.0	-9.5	3.0	39.4	62	T	4	187	18.6	18.6	
L'Assomption	6.2	1.2	23.0	-6.0	1.2	79.8	111	0	8	190	69.5	69.5	
Lavaltrie													
Lennoxville													
Normandin	2.9	2.4	23.0	-13.0	10.2	54.3	111	0	5	217	30.0	30.0	
St. Augustin													
Ste. Clothilde	7.2	1.5	22.5	-4.5	0.0	73.0	95	0	9	184	86.6	89.1	
NEW BRUNSWICK NOUVEAU-BRUNSWICK													
Fredericton													
NOVA SCOTIA NOUVELLE-ECOSSE													
Kentville													
Nappan	3.1	-0.2	19.5	-9.5	85.9	144.1	191	0	13	159	23.0	35.8	
PRINCE EDWARD ISLAND ILE-DU-PRINCE-EDOUARD													
Charlottetown	2.6	-0.2	16.5	-6.0	42.8	153.8	197	0	14		12.9	17.7	
NEWFOUNDLAND TERRE-NEUVE													
St. John's West	0.3	-1.3	9.0	-11.5	7.8	213.8	169	0	19	67	0.0	22.7	

ACID RAIN REPORT ISSUED BY ENVIRONMENT CANADA FOR MAY 6-MAY 12 1984

LONGWOODS NEAR LONDON ONTARIO

Air which passed over southwestern Ontario, Michigan and Illinois brought slightly acidic rain with a pH of 4.7 to Longwoods on May 8. On the next day May 9 the region received moderately acidic rain with a pH reading of 4.3. The air associated with this rainfall came from northern Ontario, Michigan and Wisconsin.

DORSET* MUSKOKA ONTARIO

On May 7 a small amount of strongly acidic rain with a pH of 3.7 fell in air that had passed over southern Ontario and the Ohio river valley. Air that had passed over the same regions brought a large amount of moderately acidic rain with pH 4.5 on May 8. This was followed on May 9 by moderately acidic rain with pH 4.5 in air from Sudbury, northern Ontario and Wisconsin. On May 12 Dorset received strongly acidic rain with a pH of 3.9 from Sudbury and northern Michigan.

CHALK RIVER OTTAWA ONTARIO

On May 8 Chalk River received a large amount of moderately acidic rain with a pH of 4.4. This occurred in air from southern Ontario and the Ohio river valley. On May 9 a small amount of slightly acidic rain of pH 4.8 fell in air from northern Ontario, Michigan and the Ohio valley produced strongly acidic rain with a pH reading of 3.8 on May 11. This was followed on May 12 with a small amount of moderately acidic rain of pH 4.5 from the Sudbury region and northern Michigan.

MONTMORENCY QUEBEC CITY QUEBEC

On May 8 Montmorency received a large amount of moderately acidic rain of pH 4.6 in air which passed over southern Quebec and New England. This was followed on the next day by a small amount of a moderately acidic mixture of rain and snow from southern Quebec, southern Ontario and the eastern United States. On May 11 strongly acidic rain with pH 4.2 fell in air from southern Quebec, Southern Ontario and Michigan. Strongly acidic rain with a pH of 4.1 fell on May 12. This occurred in air from the Sudbury region and northern Michigan.

KEJIMKUJIK SOUTHWESTERN NOVA SCOTIA

Two rainstorms occurred during the week of May 6-12. The first on May 8 was normal precipitation with a pH of 5.1 from New Brunswick, northern Quebec and northern New England. The second rainstorm was moderately acidic with a pH level of 4.4 in air from the Atlantic ocean and the eastern seaboard of the United States.

This report was prepared by Federal Long-Range Transport of Air Pollutants (LRTAP) Liaison Office. For further information, please contact Dr. H.C. Martin at (416) 667-4803.