Environment Canada Environnement Canada

Climatic Perspectives

Monthly Review **MARCH – 1988** Vol. 10

CLIMATIC HIGHLIGHTS

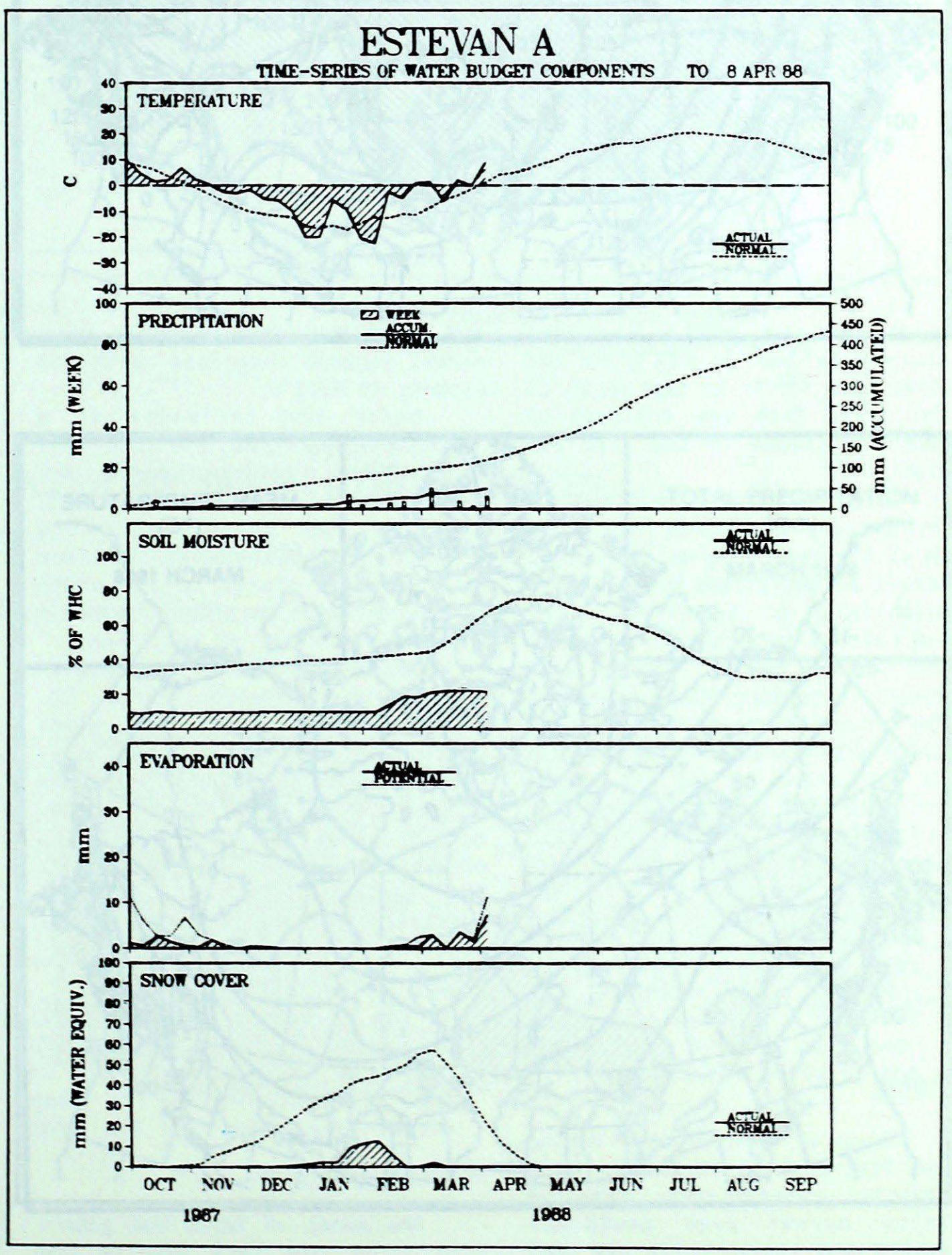
P.Scholefield, Monitoring and Prediction Division

Some Relief, but Drought Concerns Continue in the West

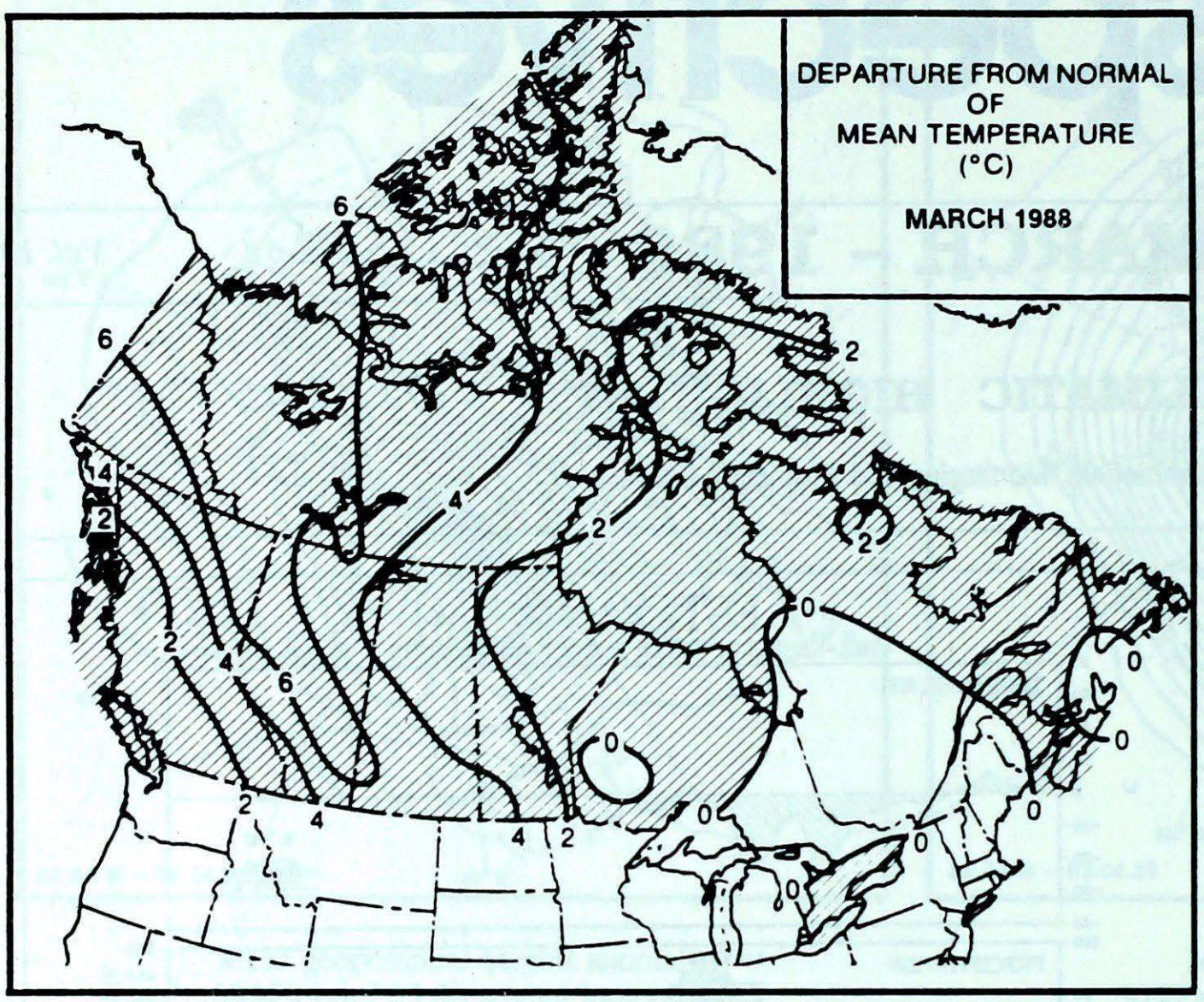
Significant amounts of precipitation fell across the drought-parched areas of western Canada during the month of March. A major storm at the end of the month was particularly welcomed by Prairie farmers. Monthly precipitations totals rose to well above-normal values over the central parts of Alberta and Saskatchewan. The map on page 3B shows the areal extent of this wetter region where above-normal precipitation reached as high as 303% at Prince Albert. This map also shows the areas in the southern Prairies and southern interior of B.C. valleys that again, for 7th and 8th consecutive months respectively, have had below-normal precipitation amounts.

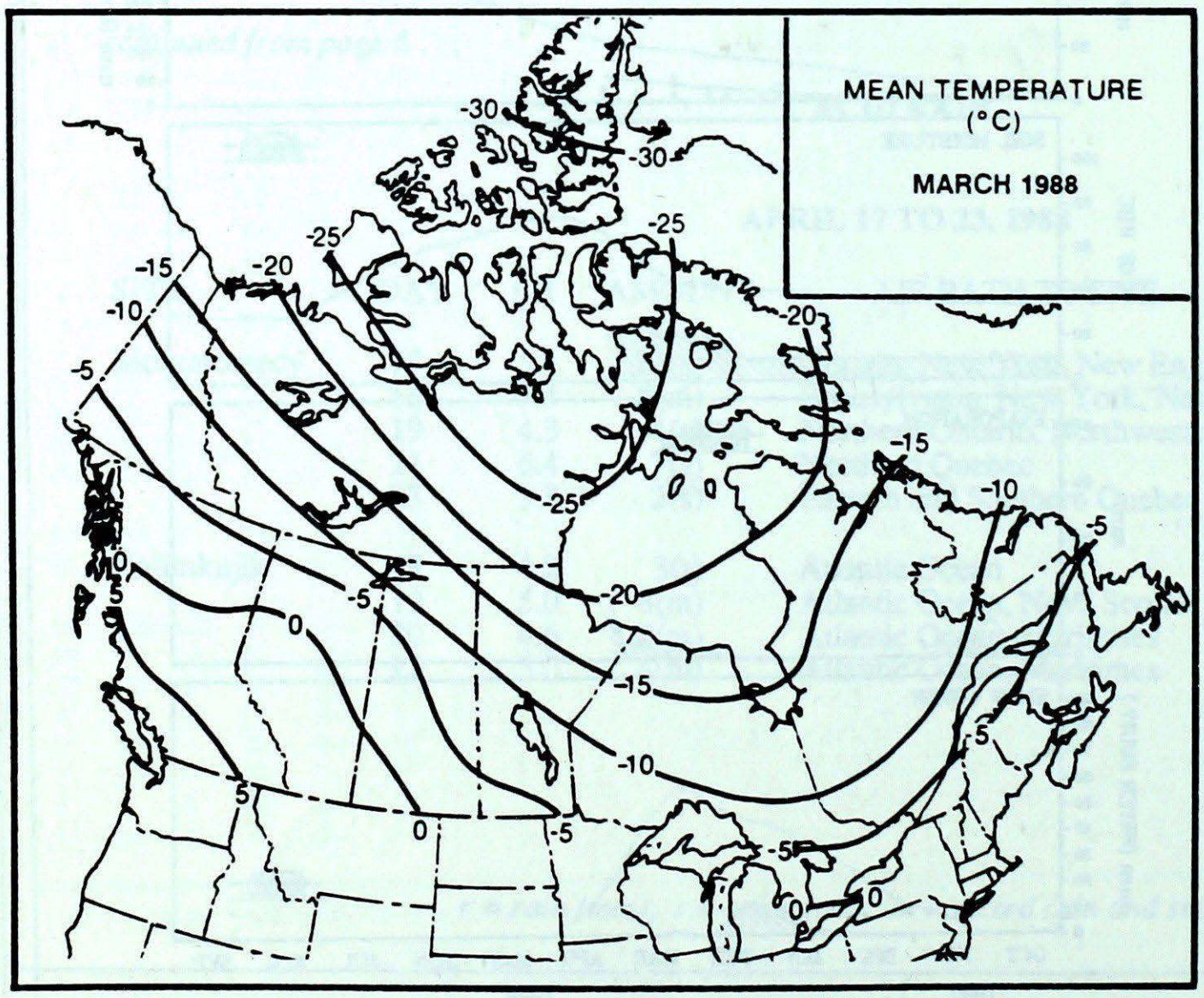
The accompanying water budget time series graph for Estevan, Saskatchewan demonstrates the severity of the drought conditions. Note particularly the depressed value of the water-holding capacity (WHC) curve. Since November, Estevan has received only 37 mm of precipitation, which is only 40% of normal. Climate statistics for the region show that in only 12 years out of the past 50 has there been enough April, May and June precipitation for a recovery to normal amounts. On the benefit side, there was very little winter kill of winter wheat and fall rye crops, and spring seeding is off

...continued page 10, Highlights



Canada





ACROSS THE COUNTRY

Yukon and Northwest Territories

March was a mild month across the Territories, particularly the Yukon, with above normal temperatures lasting practically the whole month. Pacific air invaded from the west during the first week, pushing temperatures as high as 6 to 8°C in the central Yukon which broke several daily records. Thoughts of spring though were quickly dissipated as blizzard conditions and temperatures of -40°C returned to the west, then moved across the District of Keewatin.

Later in the month, temperatures returned to more seasonable values. Even Baffin Island experienced some pleasant sunny weather after a several bouts with strong winds and blowing snow.

Precipitation was variable but mean amounts were generally below normal except over the southeast half of Baffin Island. The heaviest snowfalls, reaching 20-30 cm, occurred over a period of 7 days in the Yukon at the middle of the month.

British Columbia

March was a typical spring month with variable temperatures, precipitation and sunshine. Mean temperatures were generally above normal. Not only were there several daily maximum records set but also record mean monthly maximum values above 6°C occurred at Fort Nelson and Fort St. John.

A series of weather systems from the Pacific brought generous amounts of precipitation to coastal regions with accumulations exceeding 200% in some places. On the other hand, below-normal precipitation in the southern interior intensified the drought situation which has persisted since last fall. The situation improved somewhat as 5 to 20 mm of rain finally fell at the end of the month.

Record low amonts of sunshine occurred at Lytton, Williams Lake and Prince George with values of 77, 64 and 73% of normal respectively. Due to the lack of snow, some low

altitude ski areas closed earlier than usual.

Prairie Provinces

March was yet another mild month, in Alberta which recorded its 7th consecutive month with above-normal temperatures. It was also pleasantly mild in Saskatchewan and Manitoba where, in the north and northeast respectively, it was quite a contrast from the previous month.

The temperature anomalies were highest in the west where they reached +9°C in the Grand Prairie and Peace River districts of Alberta. There were numerous daily maximum records established between March 8 to 20 when temperatures rose above the 15°C level. Medicine Hat recorded the highest temperature of the month (19.8°C) on the 19th.

However, outbreaks of Arctic air at the beginning and end of the month were enough to remind people that winter was not yet over as temperatures plunged briefly below -10°C.

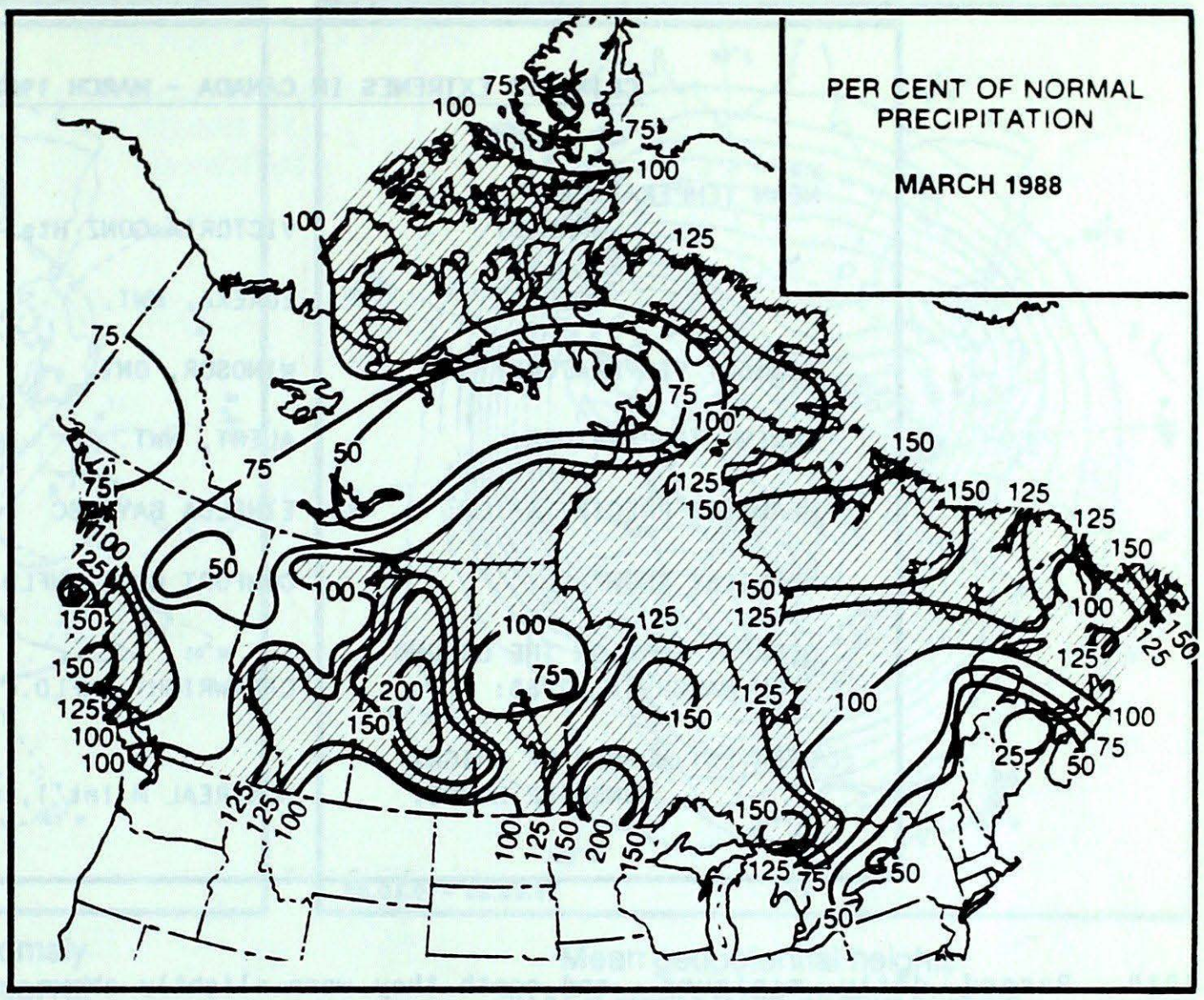
Concern over the lack of precipitation at the beginning of the month were eventually alleviated by a return to more normal amounts. Starting in the second week of the month, several spring storms dumped 10 to 25 cm of snow, or rain and snow mixed in the agricultural regions.

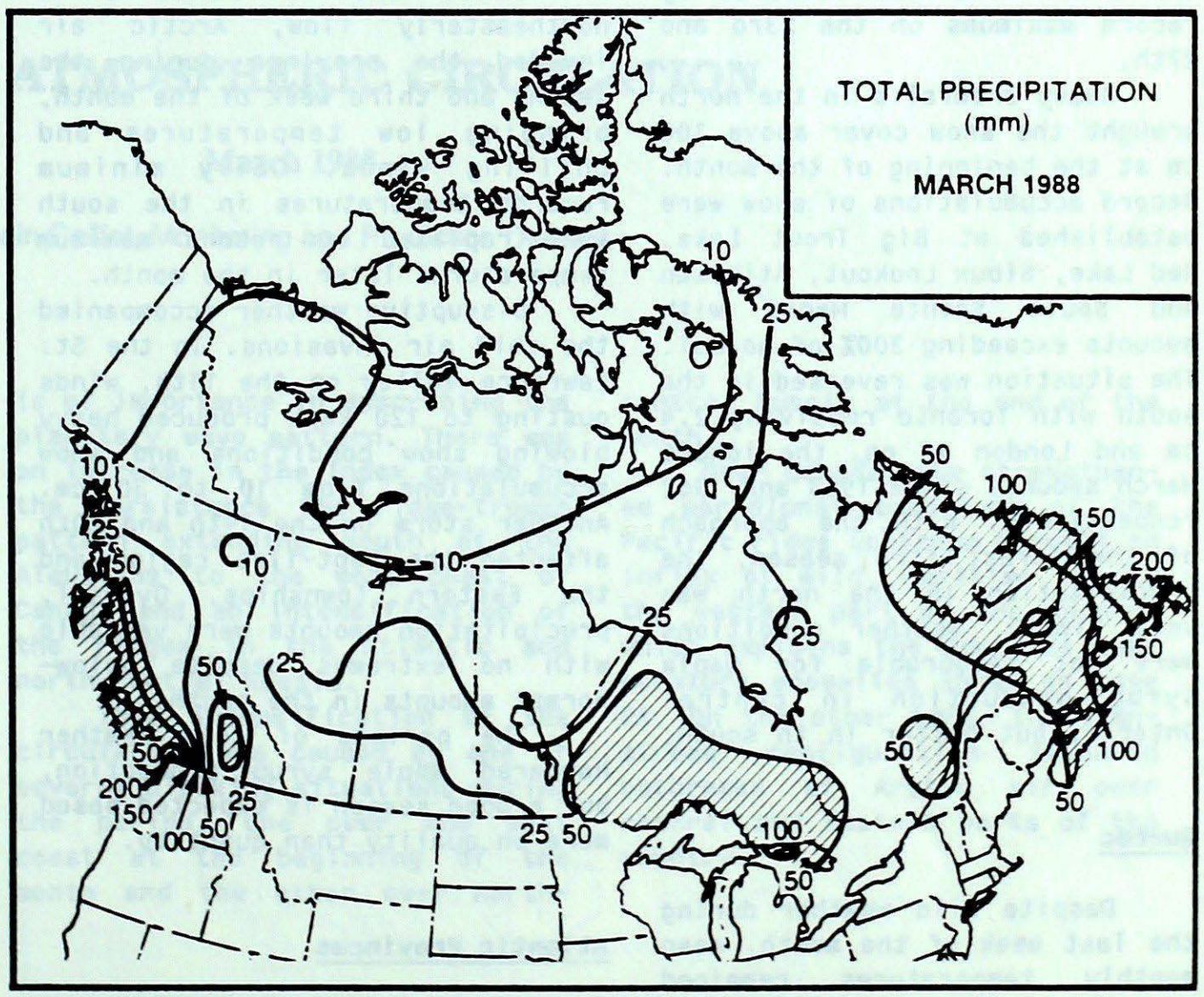
In Alberta, the storm of the 25-27th was accompanied by strong winds and blizzard conditions, forcing the closure of highways. For Edmonton, where the data goes back to 1880, it was the third driest month and for the winter season the driest ever and third mildest.

Ontario

The temperature regime was rather variable across the province, fluctuating between spring-like and wintry values, resulting in overall monthly means near normal. The precipitation pattern followed that of snowfall, very little in the south and lots up north.

Despite near-normal mean temperatures, Ontario experienced some of the coldest March weather since





CLIMATIC EXTREMES IN CANADA - MARCH 1988

MEAN TEMPERATURE:		
WARMEST	VICTORIA GONZ Hts. B.C.	7.6°C
COLDEST	EUREKA, NWT.	-32.4°C
HIGHEST TEMPERATURE:	WINDSOR, ONT.	21.7°C
LOWEST TEMPERATURE:	ALERT, NWT.	-45.4°C
HEAVIEST PRECIPITATION:	ETHELDA BAY, BC	406.3 mm
HEAVIEST SNOWFALL:	COMFORT COVE, NFLD.	186.8 cm
DEEPEST SNOW ON THE GROUND ON MARCH 31, 1988:	CARTWRIGHT, NFLD.	175 cm
GREATEST NUMBER OF BRIGHT SUNSHINE HOURS:	MONTREAL M Int'l, QUE.	244 hours

1984. Record daily minimums plunged as low as -21°C in the north and -10°C in the south on the 21st. This was followed by record maximums on the 23rd and 27th.

Heavy snowfalls in the north brought the snow cover above 100 cm at the beginning of the month. Record accumulations of snow were established at Big Trout Lake, Red Lake, Sioux Lookout, Atikokan and Sault Sainte Marie with amounts exceeding 300% of normal. The situation was reversed in the south with Toronto receiving 2.4 cm and London 16 cm, the lowest March amounts since 1953 and 1962 respectively. With the approach of the forest fire season, the precipitation in the north was very timely. Weather conditions were not favourable for maple syrup production in central Ontario, but better in th south.

Quebec

Despite mild weather during the last week of the month, mean monthly temperatures remained below normal over southwest Quebec and elsewhere in the east and north they were slightly above normal except Kuujjuaq with an anomaly of +3.2°C.

Under the influence of a northeasterly flow, Arctic air invaded the province during the second and third week of the month, bringing low temperatures and chilling winds. Daily minimum records temperatures in the south were replaced by record maximum temperatures later in the month.

Disruptive weather accompanied the cold air invasions. In the St. Lawrence Valley on the 11th, winds gusting to 120 km/h produced heavy blowing snow conditions and snow accumulations from 10 to 30 cm. Another storm on the 19th and 20th affected the Sept-Iles region and the Eastern townships. Overall, precipitation amounts were variable with no extremes despite below-normal amounts in the south.

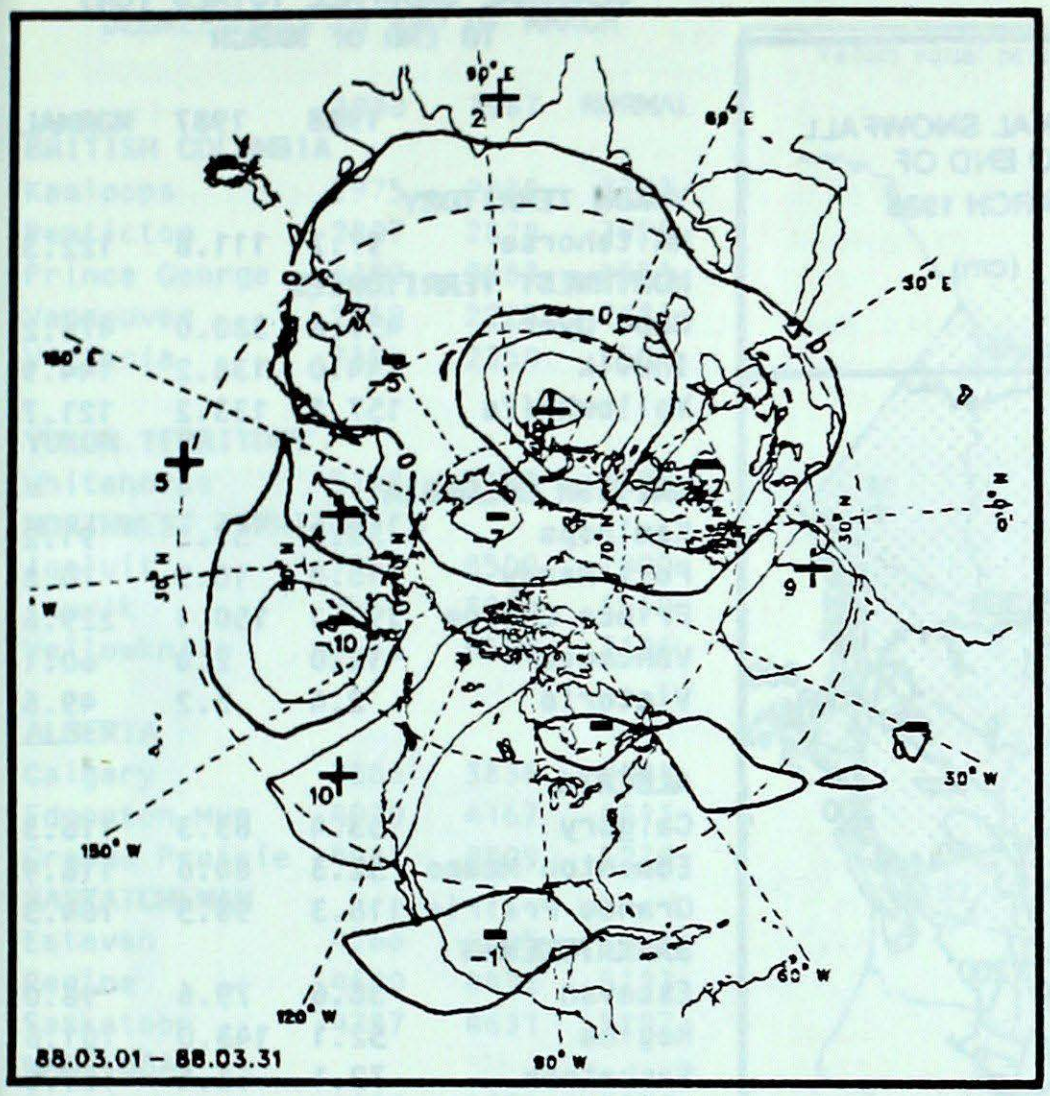
The periods of cold weather hampered maple syrup production, but a good season is expected based more on quality than quantity.

Atlantic Provinces

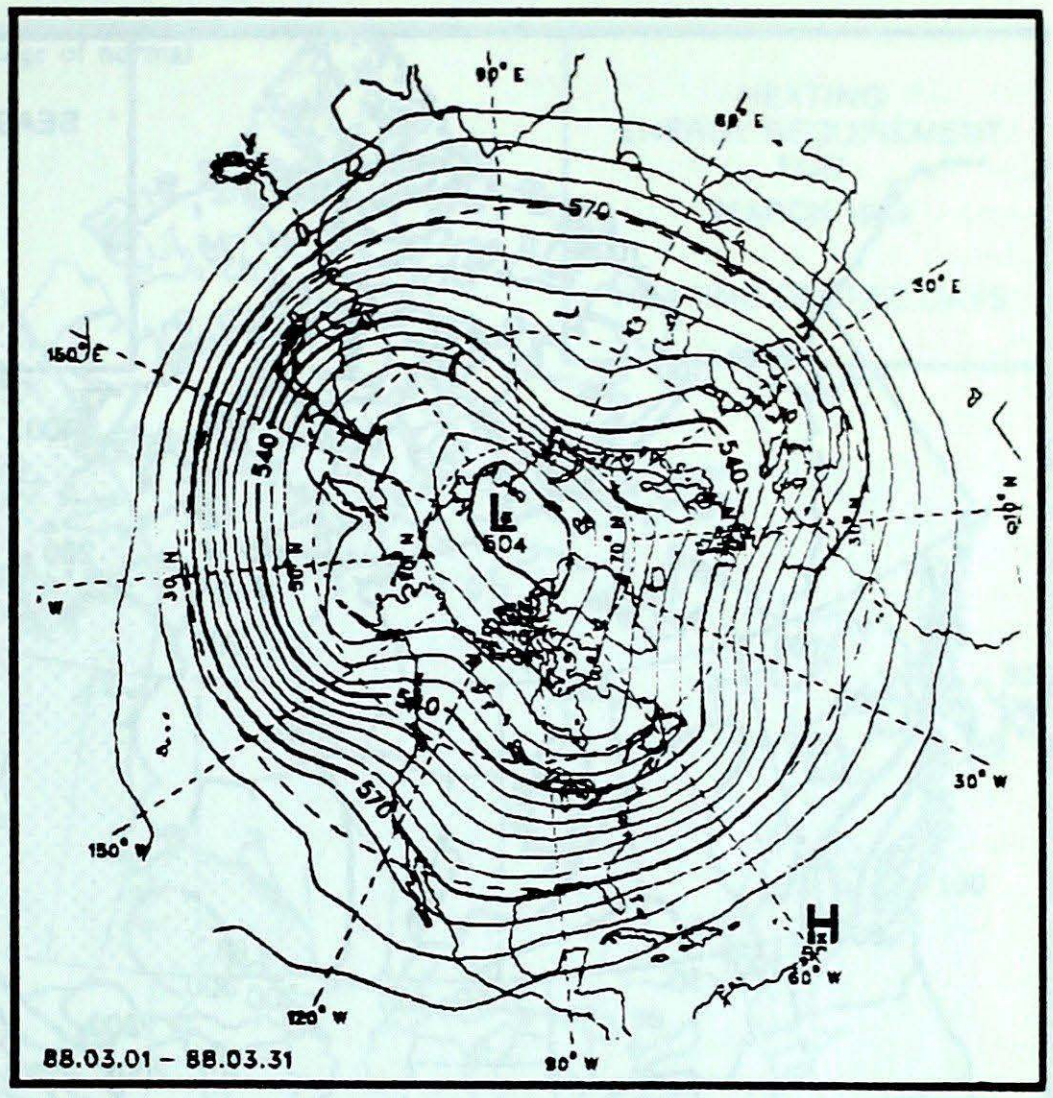
The month of March was generally sunny and very dry in the Maritimes, stormy and snowy in Newfoundland and Labrador. During the month, frequent storms from the Atlantic brushed by the Maritimes but battered Newfoundland and Labrador. Extremely variable temperatures, sometimes as low as -20°C and as high as +15°C, averaged to near normal for the month.

The dearth of precipitation caused new low record amounts for March in New Brunswick at Chatham (23.4 mm) and Moncton (22.3 mm) and at CFB Summerside (32.2 mm) PEI which replaced the previous records set in 1938, 1947 and 1947 respectively. On the other hand, Gander received 60 cm of snow on the 8th and 9th which upped the monthly accumulation to a record 170.6 cm.

Winds which accompanied the storm, affected all the Atlantic provinces and on several occasions windspeeds exceeded 100 km/h. On March 8, a fishing boat with 8 crewman aboard sank during the storm, just east of Nova Scotia.



Mean geopotential height anomaly
50 kPa level - 5 decametre interval



Mean geopotential heights
50 kPa level - 5 decametre interval

50 kPa ATMOSPHERIC CIRCULATION

March 1988

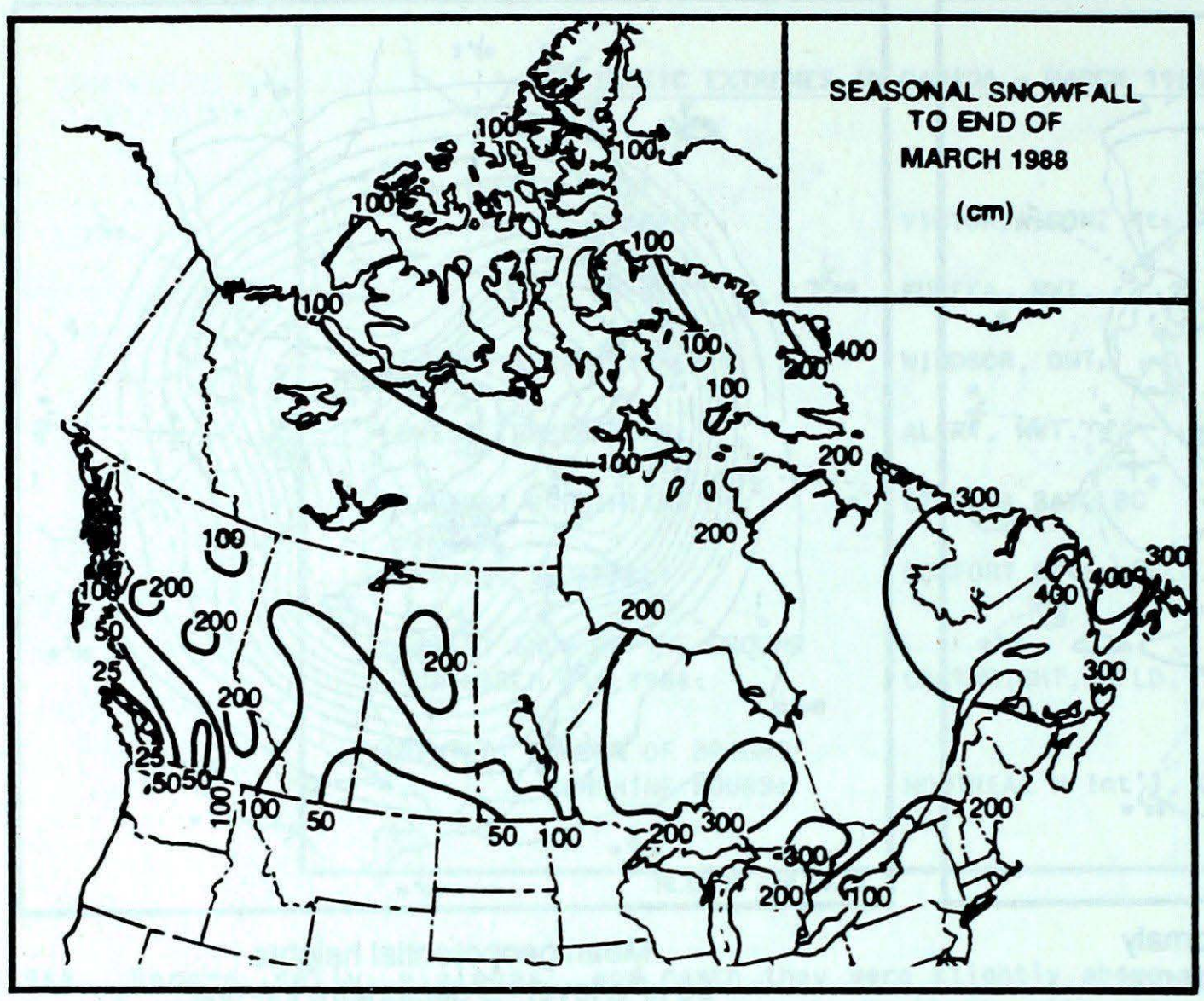
Alain Caillet, Monitoring and Prediction Division

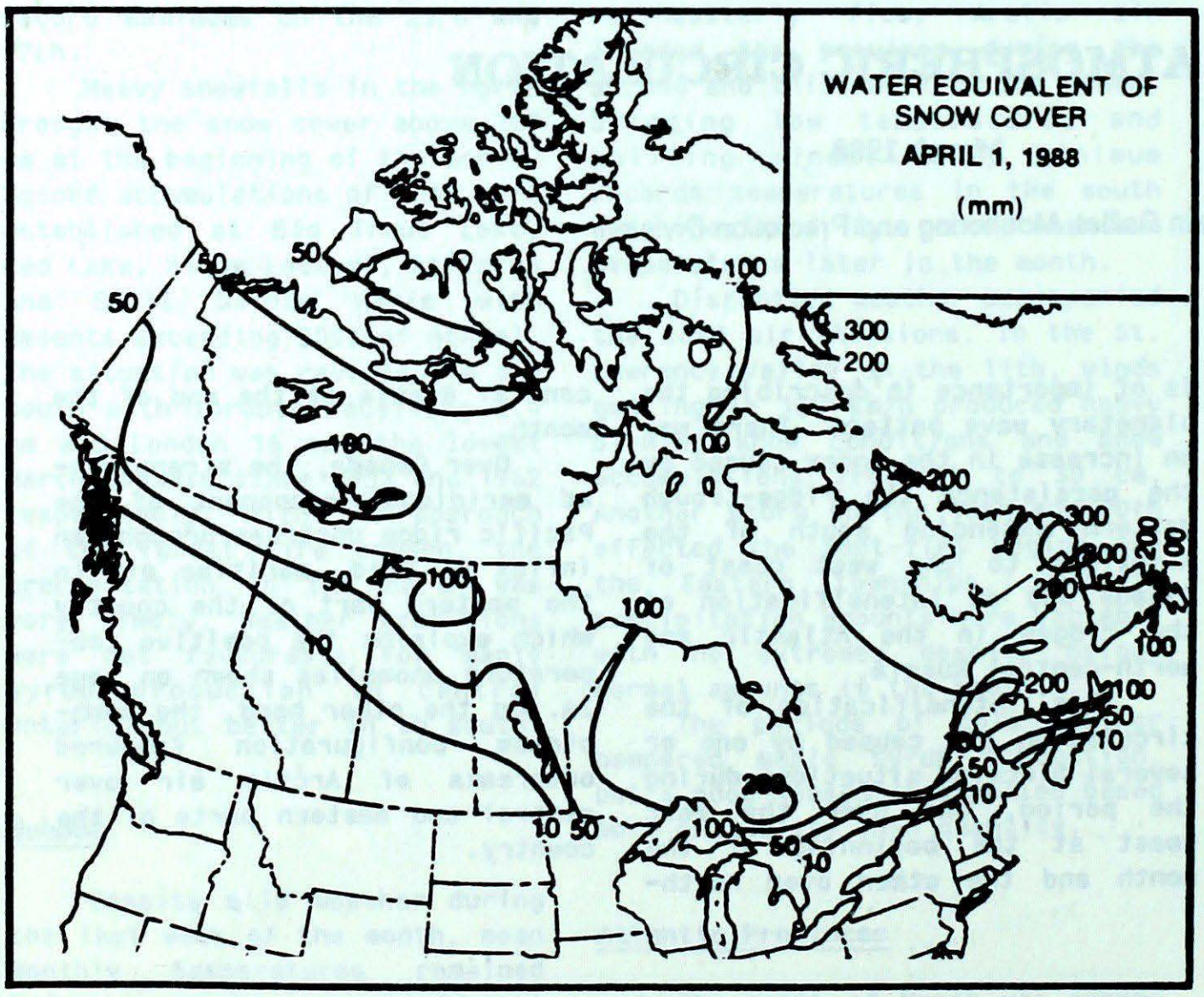
At this time of year, the evolution of the upper level 50-kPa flow reflects the seasonal warming of the atmosphere with height rises over North America and Canada in particular except along the west coast. The centre of the height rises over Hudson Bay is related to a northward retreat of the Arctic vortex to the north pole from its position further southward last month.

Again this month, the meridional index (a measure of north-south displacement of air masses) is of importance in describing the planetary wave pattern. There was an increase in the index caused by the persistence the ridge-trough pattern extending south of the Aleutians to the west coast of Canada and an intensification of the ridges in the Atlantic and north-central Russia.

This intensification of the circulation was caused by one or several blocking situations during the period, one over the west coast at the beginning of the month and the other over north-central Russia at the end of the month.

Over Canada, the strengthened meridional component of the Pacific ridge upstream brought an influx of mild, maritime air to the western part of the country which explains the positive temperature anomalies shown on page 2A. On the other hand, the downstream configuration favoured outbreaks of Arctic air over central and eastern parts of the country.



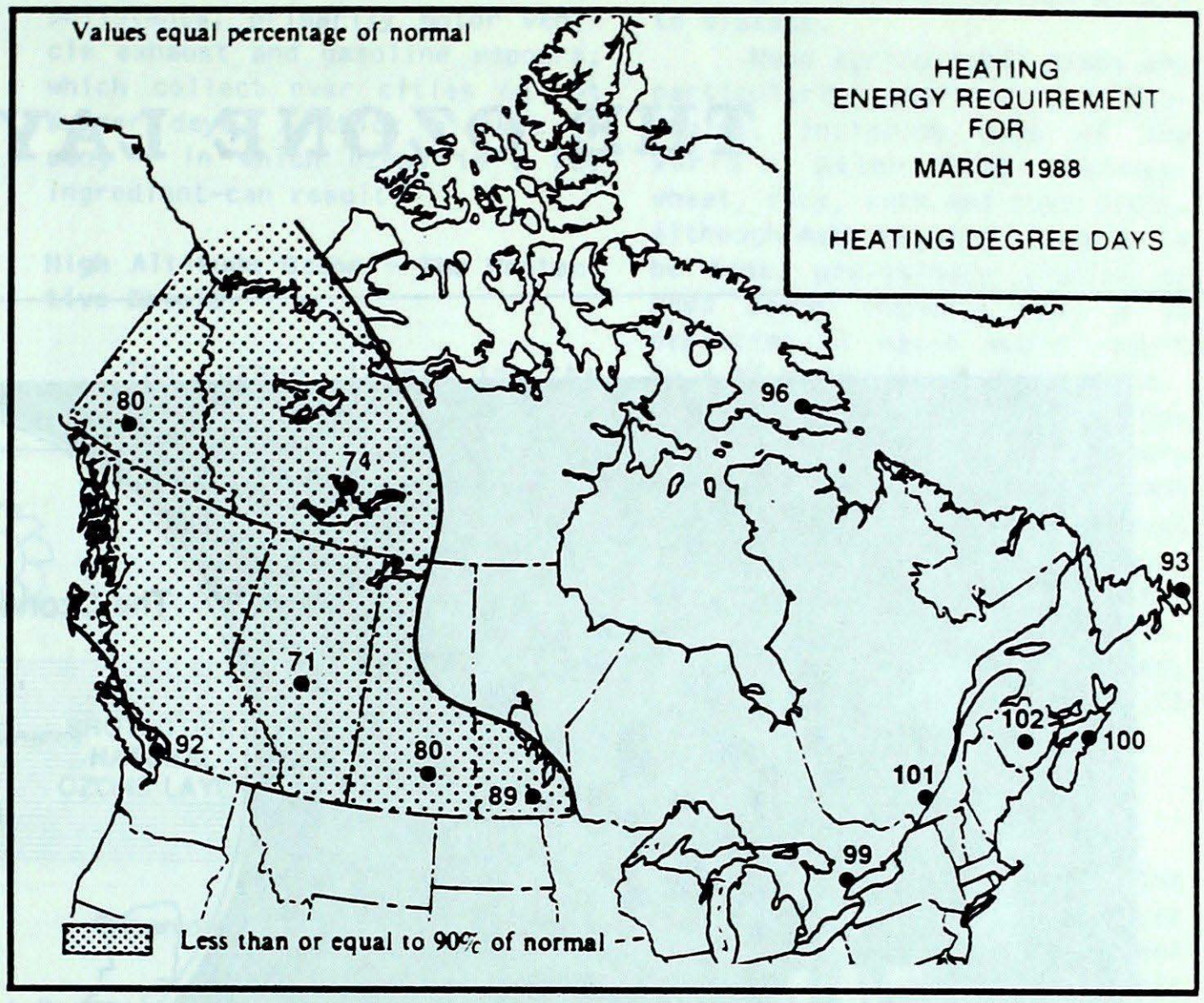


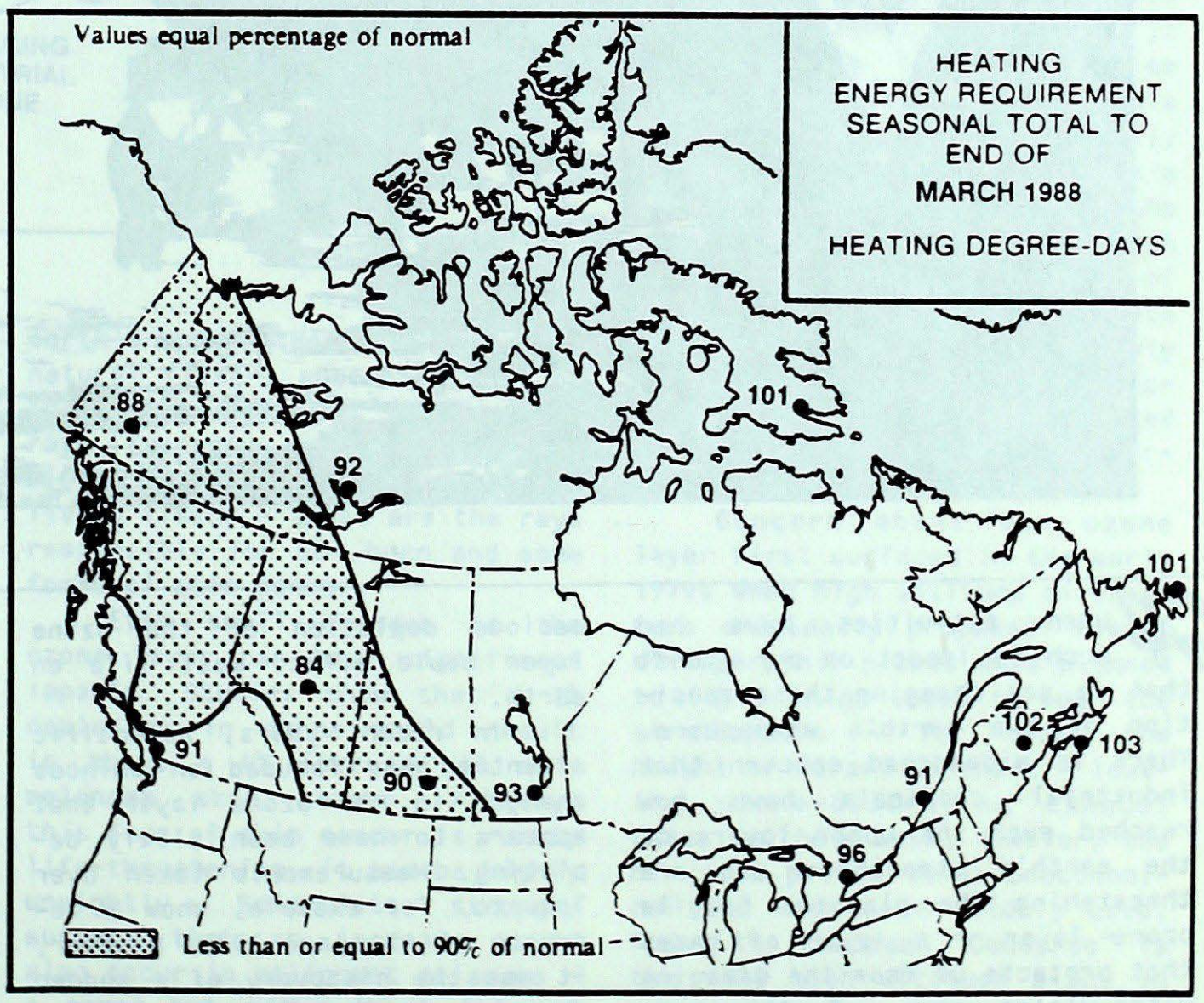
SEASONAL SNOWFALL TOTALS (CM)
TO END OF MARCH

	1988	1987	NORMAL
YUKON TERRITORY			
Whitehorse	97.7	111.8	122.3
NORTHWEST TERRITORIES			
Cape Dyer	457.8	380.0	476.2
Inuvik	144.0	138.2	144.9
Yellowknife	157.2	133.2	121.7
BRITISH COLUMBIA			
Kamloops	33.3	57.3	91.2
Port Hardy	13.4	10.9	70.8
Prince George	191.1	150.1	229.6
Vancouver	12.0	2.0	60.1
Victoria	2.4	5.2	49.6
ALBERTA			
Calgary	53.4	63.3	116.3
Edmonton Namao	52.3	80.6	116.9
Grande Prairie	118.3	96.5	164.3
SASKATCHEWAN			
Estevan	38.6	79.6	98.0
Regina	52.1	143.0	101.6
Saskatoon	72.1	68.4	101.6
MANITOBA			
Brandon	59.8	103.9	103.5
Churchill	111.3	170.5	150.2
The Pas	134.2	127.6	144.6
Winnipeg	64.9	120.1	111.7
ONTARIO			
Kapuskasing	313.2	249.5	284.8
London	183.3	167.8	199.4
Ottawa	203.8	164.6	217.9
Sudbury	321.0	228.5	229.3
Thunder Bay	116.3	112.4	192.6
Toronto	78.4	119.0	123.7
Windsor	114.4	119.7	113.2
QUEBEC			
Baie Comeau	333.0	227.8	336.9
Montréal	165.6	199.0	223.7
Quebec	291.4	202.6	326.3
Sept-Iles	286.2	210.5	387.9
Sherbrooke	248.9	261.2	289.3
Val-d'Or	277.0	268.6	285.1
NEW BRUNSWICK			
Charlo	356.0	248.7	368.6
Fredericton	252.0	303.1	267.8
Moncton	361.7	*	310.6
NOVA SCOTIA			
Shearwater	190.0	197.8	183.8
Sydney	286.2	349.9	287.2
Yarmouth	159.6	232.8	200.9
PRINCE EDWARD ISLAND			
Charlottetown	365.7	295.9	301.2
NEWFOUNDLAND			
Gander	484.6	492.0	342.2
St. John's	240.7	430.1	311.7

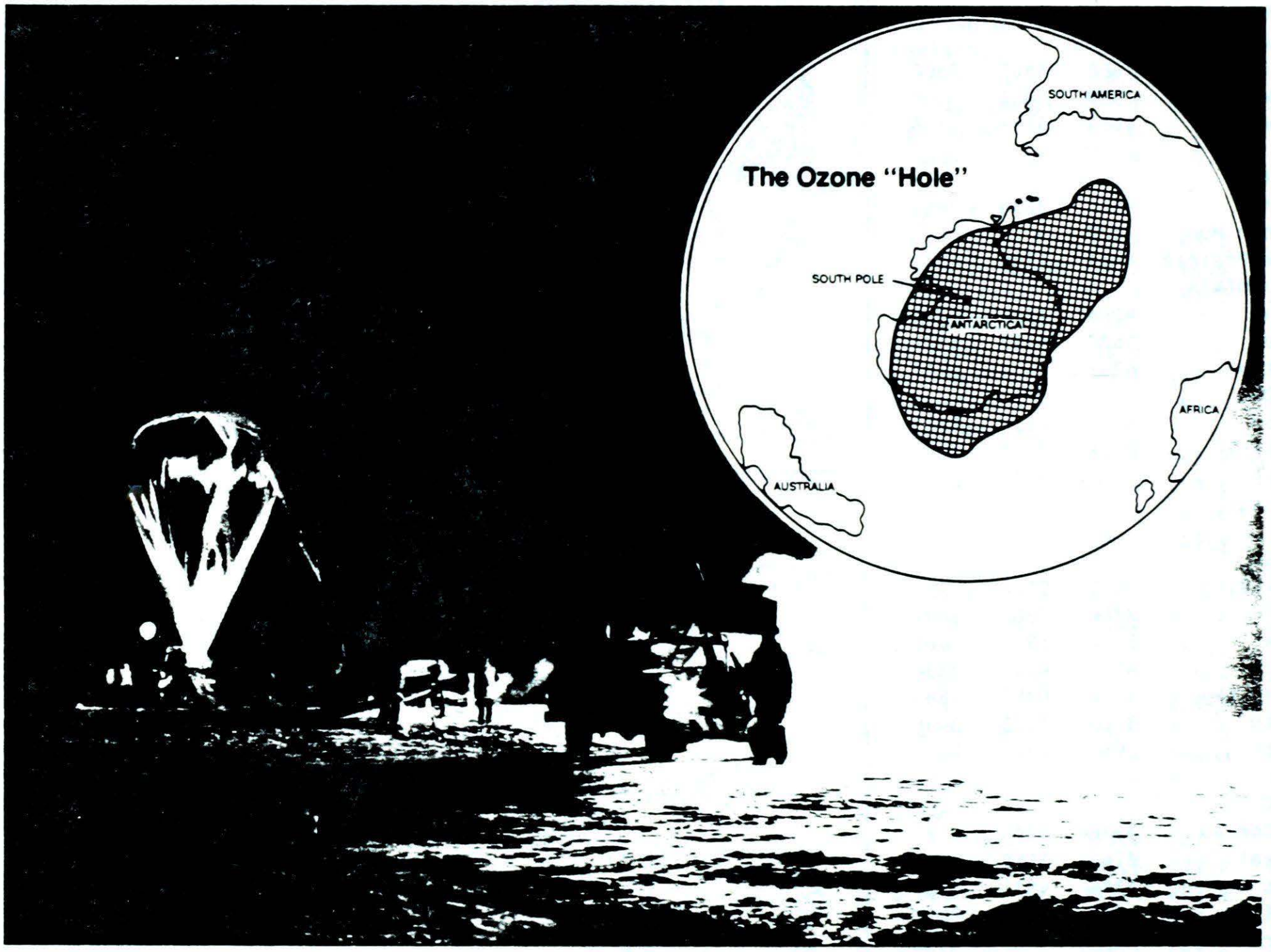
SEASONAL TOTAL OF HEATING DEGREE-DAYS TO END OF MARCH

	1988	1987	NORMAL
BRITISH COLUMBIA			
Kamloops	2975	2880	3323
Penticton	2807	2824	3029
Prince George	4140	3983	4551
Vancouver	2269	2223	2481
Victoria	2394	2354	2501
YUKON TERRITORY			
Whitehorse	5148	5158	5833
NORTHWEST TERRITORIES			
Iqaluit	7858	8509	7800
Inuvik	7569	8011	8569
Yellowknife	6653	6558	7196
ALBERTA			
Calgary	3886	3836	4484
Edmonton Mun	4029	4167	4811
Grande Prairie	4413	4809	5279
SASKATCHEWAN			
Estevan	4266	4045	4795
Regina	4600	4432	5123
Saskatoon	4787	4631	5297
MANITOBA			
Brandon	4901	4828	5232
Churchill	7266	7201	7349
The Pas	*	5292	5845
Winnipeg	4763	4647	5136
ONTARIO			
Kapuskasing	5402	5200	5403
London	3366	3380	3491
Ottawa	3944	3922	4060
Sudbury	4501	4368	4634
Thunder Bay	4718	4455	4844
Toronto	3369	3393	3494
Windsor	3051	2937	3123
QUÉBEC			
Baie Comeau	4918	4993	4933
Montréal	3784	3959	3900
Quebec	4346	4433	4336
Sept-Iles	4998	5143	5007
Sherbrooke	4271	4409	4436
Val-d'Or	5179	5116	5198
NEW BRUNSWICK			
Charlo	4490	4673	4364
Fredericton	4055	4270	3968
Moncton	3954	4282	3895
NOVA SCOTIA			
Halifax	*	3612	3301
Sydney	3611	3994	3511
Yarmouth	3248	3464	3210
PRINCE EDWARD ISLAND			
Charlottetown	3827	4154	3733
NEWFOUNDLAND			
Gander	4043	4375	3969
St. John's	3737	4122	3688





THE OZONE LAYER



Human activities have had such an impact on our planet that we are changing the composition of the earth's atmosphere. There is widespread concern that industrial chemicals have now reached even the upper layers of the earth's atmosphere and are threatening the planet's fragile ozone layer - a layer of gases that protects us from the damaging ultra-violet rays of the sun. Exposure to ultra-violet can cause skin cancer, reduce crop yields and damage aquatic life. Indeed, serious depletion of the ozone layer could affect most life on earth.

In recent years, scientific attention has focused on ominous changes in the ozone layer that appears to have been slowly depleting. Measurements taken over Toronto, for example, show a decrease of 4% since 1975. However, it was the discovery of a sudden unexplained "hole" in the ozone over Antarctic that galvanized scientific interest. Here the ozone layer has been observed to thin dramatically during the spring over an area the size of the continental United States. Environment Canada scientists are currently studying the Arctic to determine if a similar thinning may be developing there.

Scientists do not fully understand these changes in the ozone layer but they are concerned that they could indicate a serious weakening in the earth's protective shield. Although some changes in the ozone layer could be due to natural conditions,

increasing evidence now points to chemical contamination from our industrialized society as the root cause.

What is Ozone?

Ozone (O_3) is a pungent-smelling slightly bluish gas, which is a close chemical cousin to oxygen (O_2). The ozone in our atmosphere is spread so thinly that its bluish color would never be noticed. However, one can occasionally catch a whiff of this gas after a thunderstorm. Lightning can literally split apart the air molecules, which re-combine to form a trail of ozone, leaving that sharp "clean" odour which soon dissipates after a storm.

About 90% of the earth's ozone occurs in a natural layer far above the surface of the globe, in a frigid region of the atmosphere known as the stratosphere. Some natural ozone can also be found near the earth's surface, however most ground-level ozone is formed as a result of human activities. Ironically, ozone near the ground is a serious pollutant, damaging human health and agricultural crops in, or near, large urban areas. Ground-level ozone is formed from air pollutants, primarily motor vehicle exhaust and gasoline vapours, which collect over cities on hot summer days. A thick blanket of smog - in which ozone is a key ingredient-can result.

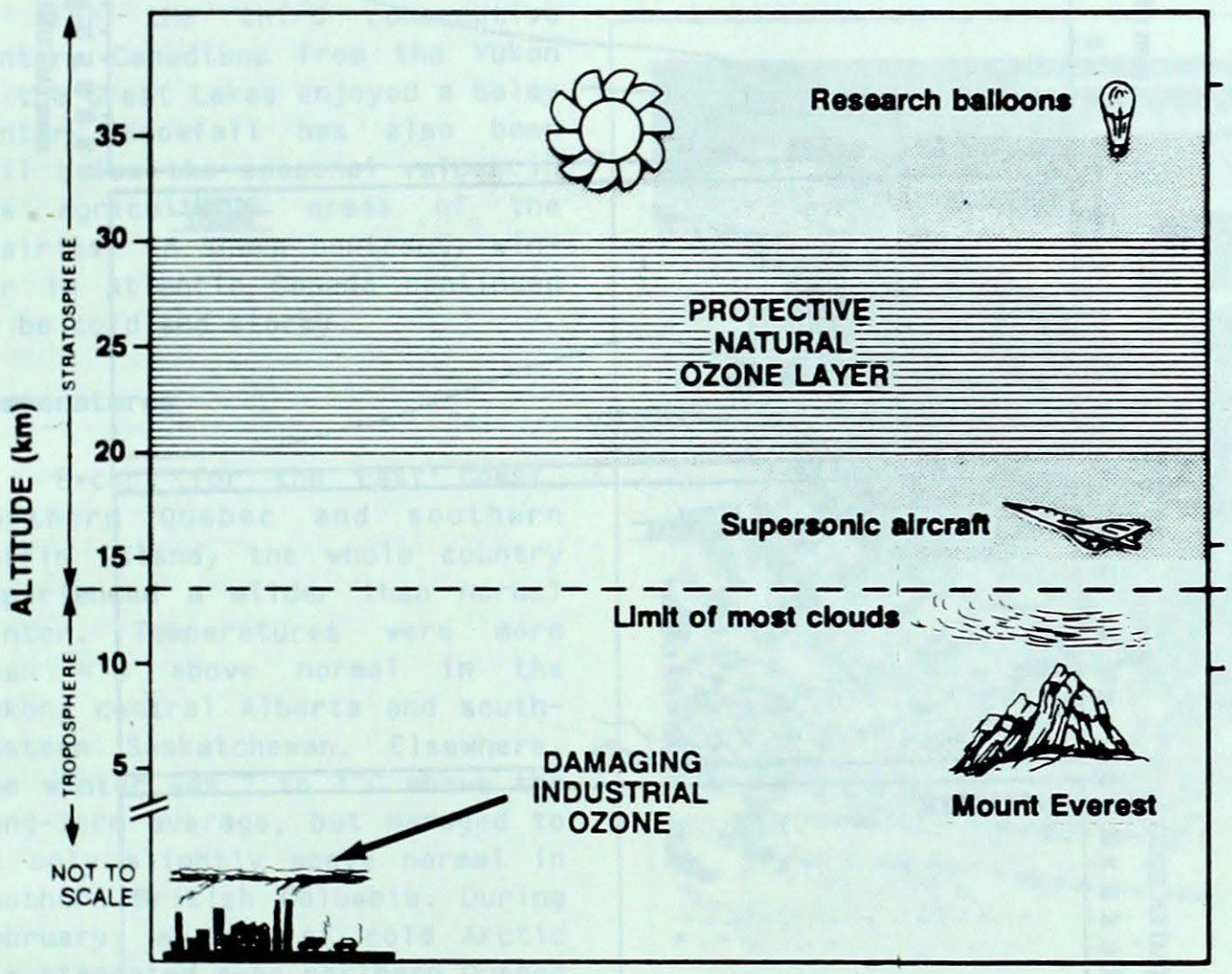
High Altitude Ozone - The Protective Shield

The ozone layer in the earth's upper atmosphere acts as a natural filter, absorbing most of the sun's damaging ultra-violet rays. Excessive exposure to ultra-violet can cause serious damage to living tissue - these are the rays responsible for sun burn and some forms of skin cancer.

Even small changes in the ozone layer can have significant impacts. Studies show that a 1% depletion in ozone would result in about a 4% increase in non-melanoma skin cancer. Although this form of skin cancer is rarely life-threatening, it can be highly unsightly. Scientists strongly suspect that an increase would also occur in malignant melanoma - a rarer but often fatal form of skin cancer. Ultra-violet can also cause skin and eye aging and suppress the human immune system, leading to greater susceptibility to disease.

Many agricultural crops are particularly sensitive to ultra-violet, including most of the world's major food sources: wheat, rice, corn and soya beans. Although much research remains to be done, preliminary studies on soya beans indicate that a 1% depletion of ozone would result in a 1% reduction in crop yield.

Aquatic life near the ocean's surface is also very susceptible to ultra-violet, and excessive exposure could disrupt fish production in the world's oceans. Even industrial materials, such as plastics and paints, have been shown to be affected, becoming yellow and brittle with lengthy exposure.



Threats to the Ozone Shield

Most of the ozone in the stratosphere is found in a layer about 20 km thick, lying between 15 km and 35 km above the earth's surface. Here, in these frigid heights, the ozone is spread so thinly that if it were compressed to ground-level pressure, it would form a layer only 3 mm thick. Ozone is a very unstable substance which can be readily destroyed by contact with certain industrial pollutants. Even the upper atmosphere isn't far enough away to escape the effects of human activities. Air pollutants reach the stratosphere by slowly moving up from the lower atmosphere, or by being injected directly from high altitude aircraft and space vehicles.

Concern about the ozone layer first surfaced in the early 1970s when high altitude aircraft were originally proposed. Fleets of supersonic planes were planned to fly at high speed through the stratosphere - far above the height of normal aircraft - leaving ozone-destroying exhaust fumes in their wake. However, the new jets proved to be uneconomical and were never widely used. Today the European "Concorde" is the only high altitude plane in regular service. (Other vehicles travelling through the stratosphere, such as space craft and new military aircraft, do not

Ozone, continued from page 9

pose a problem at present, as they have not yet come into heavy use.)

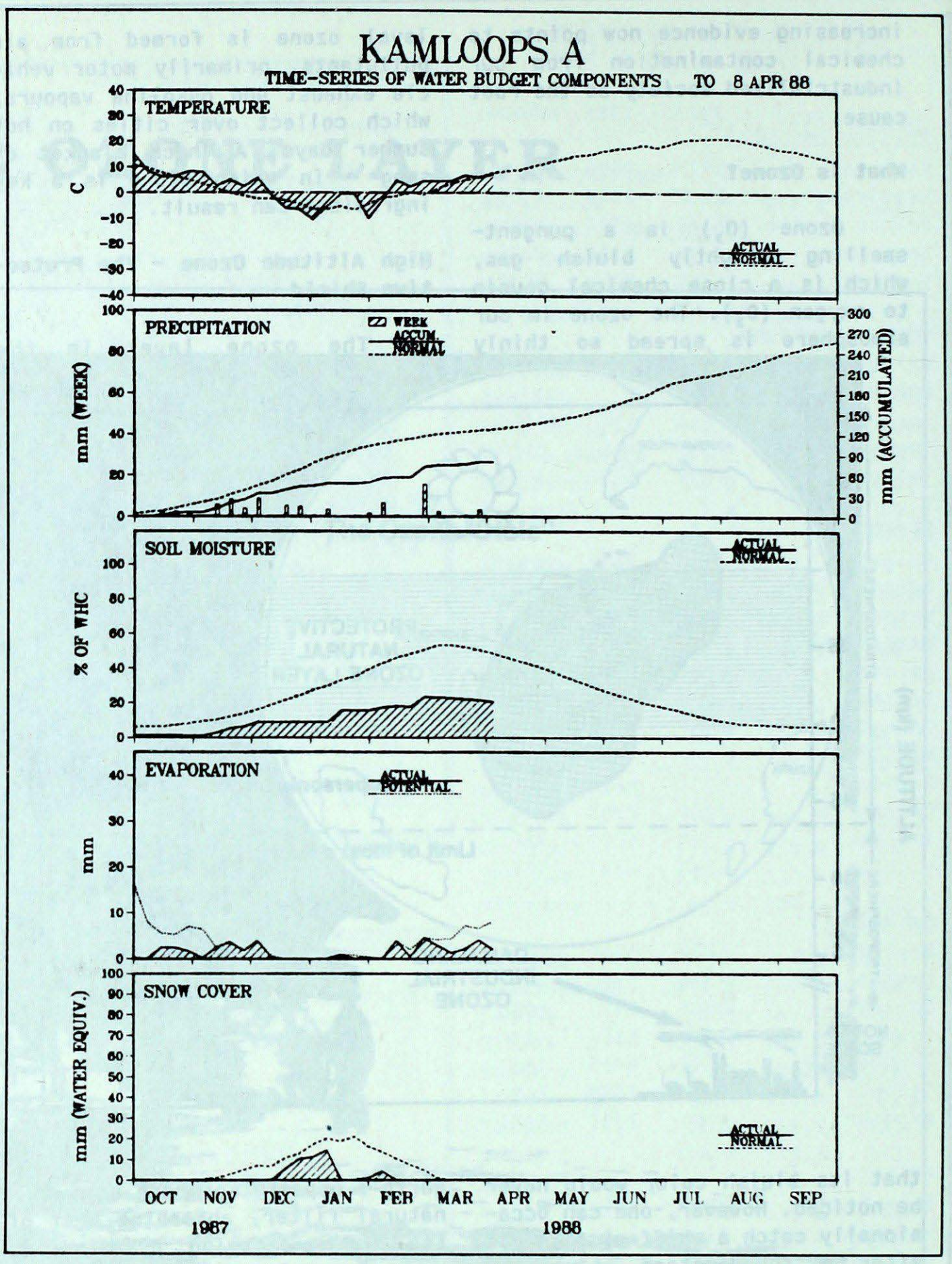
In the mid-1970s, attention had switched from advanced high-tech aircraft to the ordinary aerosol spray can. By this time, spray cans had become a tremendously popular item - used by millions on a daily basis to dispense products such as hair sprays and deodorants. The products in these spray cans were mixed with propellants and stored under pressure. When the can was used, the propellant helped to force out the contents.

Industrial chemicals, known as "CFCs" ("chlorofluorocarbons") were used as the propellant. CFCs are a stable non-toxic group of chemicals which were considered to be environmentally safe. Unfortunately, the effects of CFCs were considered only for the lower atmosphere.

During the 1970s, the use of spray cans released literally thousands of tons of CFCs directly into the lower atmosphere, where they began their slow movement up into the stratosphere. Although CFCs are very stable in the lower atmosphere, scientists are concerned that once they reach the upper stratosphere, these chemicals will be broken apart by the intense ultra-violet light above the ozone layer. One of the substances that is produced in this break down process is chlorine. Chlorine has a voracious appetite for ozone - a single molecule is capable of destroying thousands of molecules of ozone.

In the late seventies, steps were taken to reduce the use of CFCs in spray cans. In 1976, Canadian industry agreed to cut this use by half. In fact, this objective was surpassed, partly because of a widespread consumer boycott. In 1980, Canada banned the major propellant uses - in hair sprays, antiperspirants and deodorants. This action reduced the use of CFCs in spray cans by 86%, and resulted in an overall national reduction of 45%. Similar bans were undertaken in the U.S.A. and Nordic countries in the late 1970s and early 1980s. Europe followed suit with less restrictive regulations. These actions caused a sharp drop in the global release of CFCs.

(Editor: *This text, from a fact sheet of the Atmospheric Environment Service, will be continued in the next monthly issue.)*



Highlights, continued from page 1

to a particularly early start due to the dryness of the soil.

In southern B.C., low precipitation amounts in the interior valleys combined with another year of low snowpacks in the mountains has created a serious drought problem. An irrigation bulletin for the Okanagan has reported water reservoirs at only 10% of their capacity. The severity of this drought is clearly demonstrated by the accompanying water budget time series for Kamloops.

WINTER 1987-88 IN REVIEW

Amir Shabbar, Monitoring and Prediction Division

Fairly mild and snow free winters are getting to be the norm in western Canada but harsh winter weather continues to plague Atlantic Canada.

For the third consecutive winter, Canadians from the Yukon to the Great Lakes enjoyed a balmy winter. Snowfall has also been well below the seasonal values in the agricultural areas of the Prairies. In sharp contrast, winter in Atlantic Canada continued to be cold and stormy.

Nearly 40 cm of snow accompanied by 100 km/h caused whiteouts at Gander on March 18. Snowfall of over 121 cm during March increased the snow depth to almost 100 cm.

Temperatures

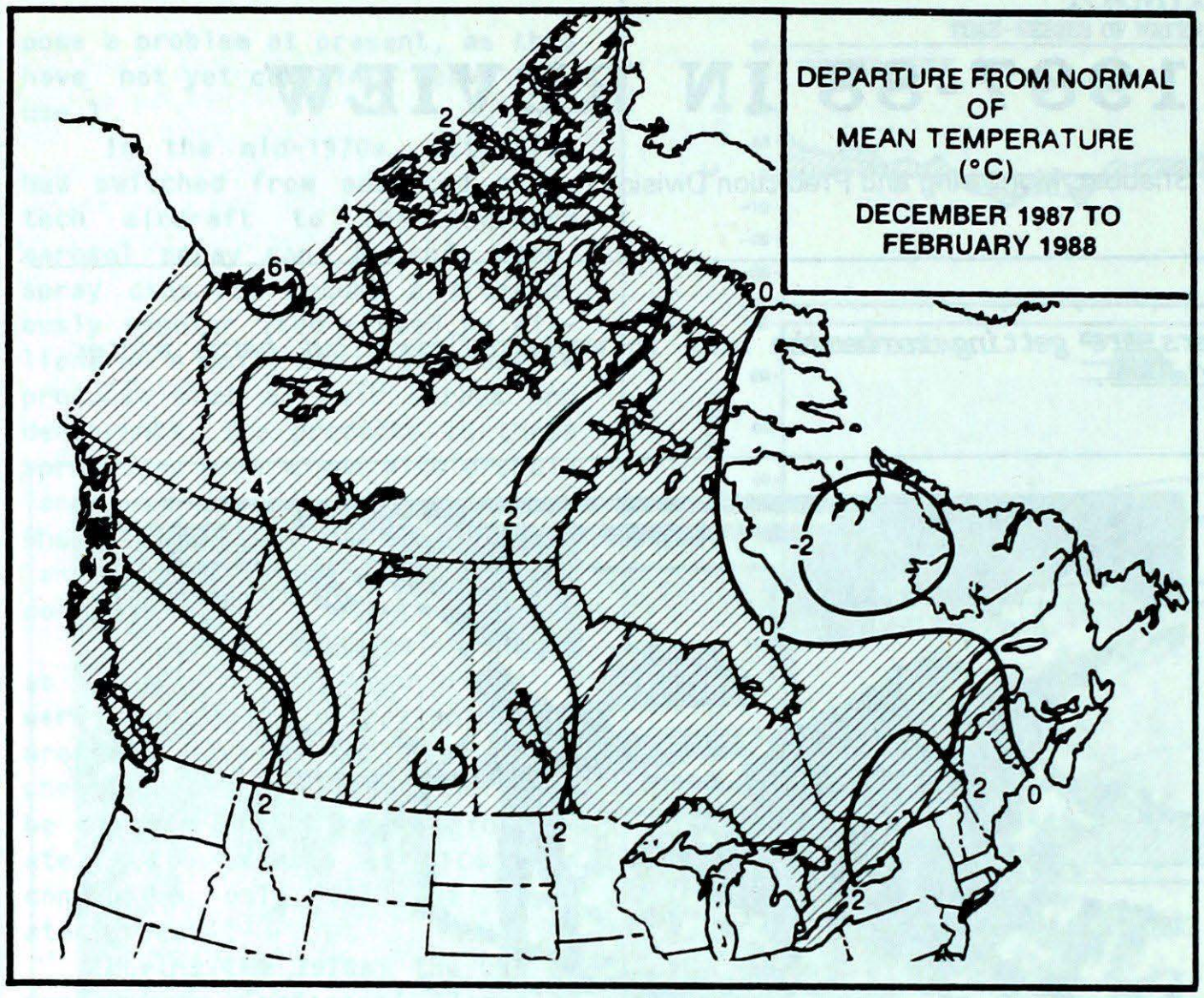
Except for the East Coast, northern Quebec and southern Baffin Island, the whole country experienced a milder than normal winter. Temperatures were more than 4°C above normal in the Yukon, central Alberta and south-eastern Saskatchewan. Elsewhere, the winter was 2 to 3°C above the long-term average, but managed to be only slightly above normal in southern British Columbia. During February, a dome of cold Arctic air stagnated over northern Quebec and the temperatures dropped to a bone-chilling -43°C in northern and central Quebec. Eureka set a daily record low temperature for January 31, -52.6°C.

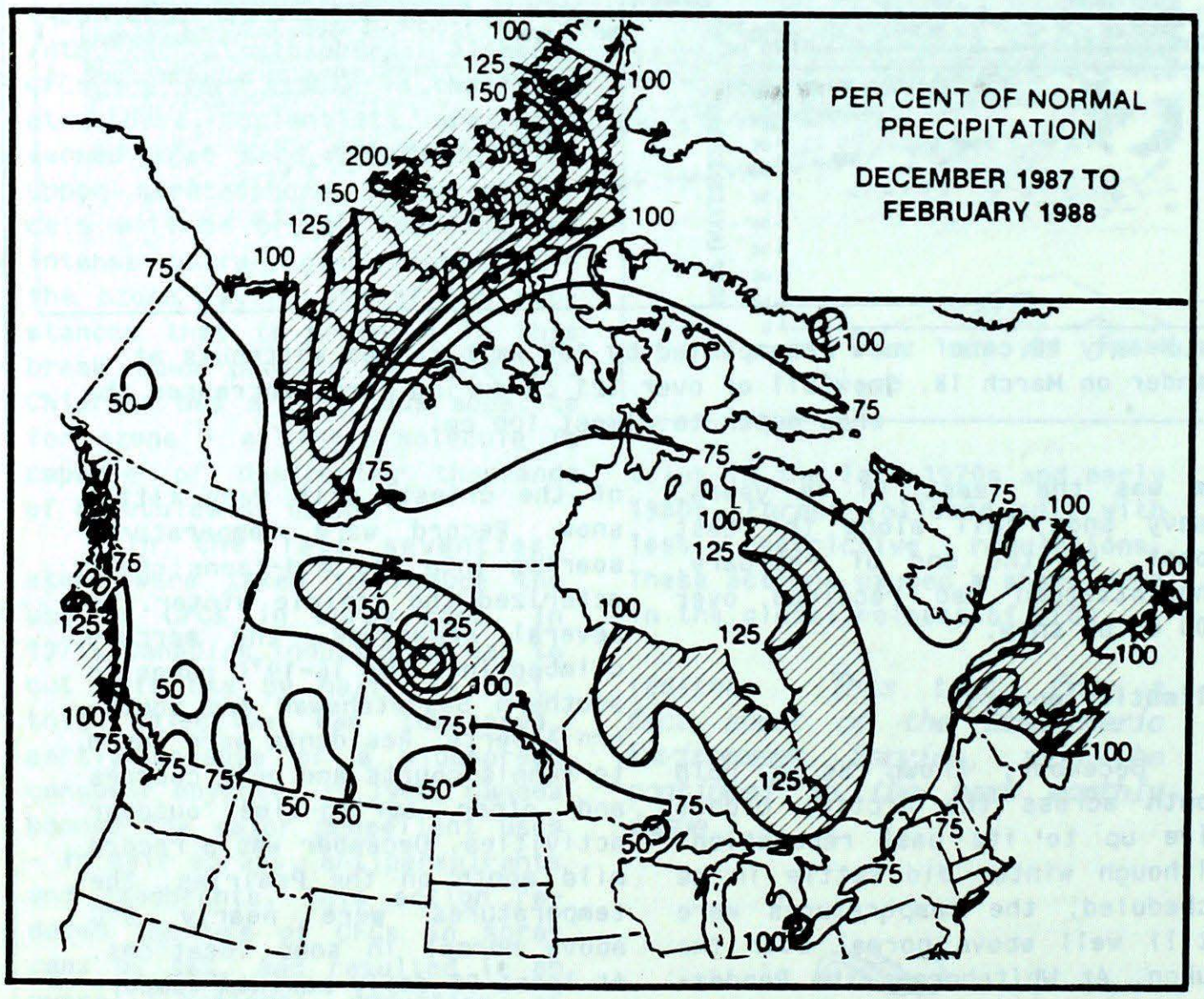
Precipitation

Once again, winter was drier than normal throughout most of southern Canada. Precipitation was less than half of normal over most of the grain growing areas of the Prairies and the Yukon. The northern Prairies and the High Arctic had more than 150% of normal. Near normal precipitation fell elsewhere. By the end of January, snowfall was well below normal across the southern Prairies and over the Great Lakes basin. Record-low January snow amounts were recorded at Sarnia (only 8 cm compared to the former record of 12 cm in 1973) and in Toronto, 4.8 cm was the least in 44 years. Heavy snow fell along the East Coast. By the end of February, Charlottetown had received over 300 cm of snow.

Climatic Impacts

December, known as a cold month across the Arctic, didn't live up to its past reputation. Although winter did settle in as scheduled, the temperatures were still well above normal over the Yukon. At Whitehorse, the Rendez-Vous week in February was the second warmest in 20 years as daytime highs reached above the freezing mark and it was also one of the driest, with very little snow. Record warm temperatures soaring into the mid-teens characterized the Prairie winter. On several occasions, the mercury climbed into the 16-19°C range in southern Saskatchewan and southern Alberta. Residents were lured to tennis courts and golf courses and other spring-time outdoor activities. December was a record mild month on the Prairies, the temperatures were nearly 9°C above normal in some locations. At least 90 daily maximum temperature records were set, including a reading of 9°C at Edmonton on December 25 which established the mildest Christmas Day since





observations began in 1880. December's warmth pushed the mean 1987 temperature to an all-time record high value at many places in a vast area from the Great Lakes to British Columbia, and into the Yukon and the District of Mackenzie. The annual mean of 5.5°C at Winnipeg topped the highest reading set in 1931.

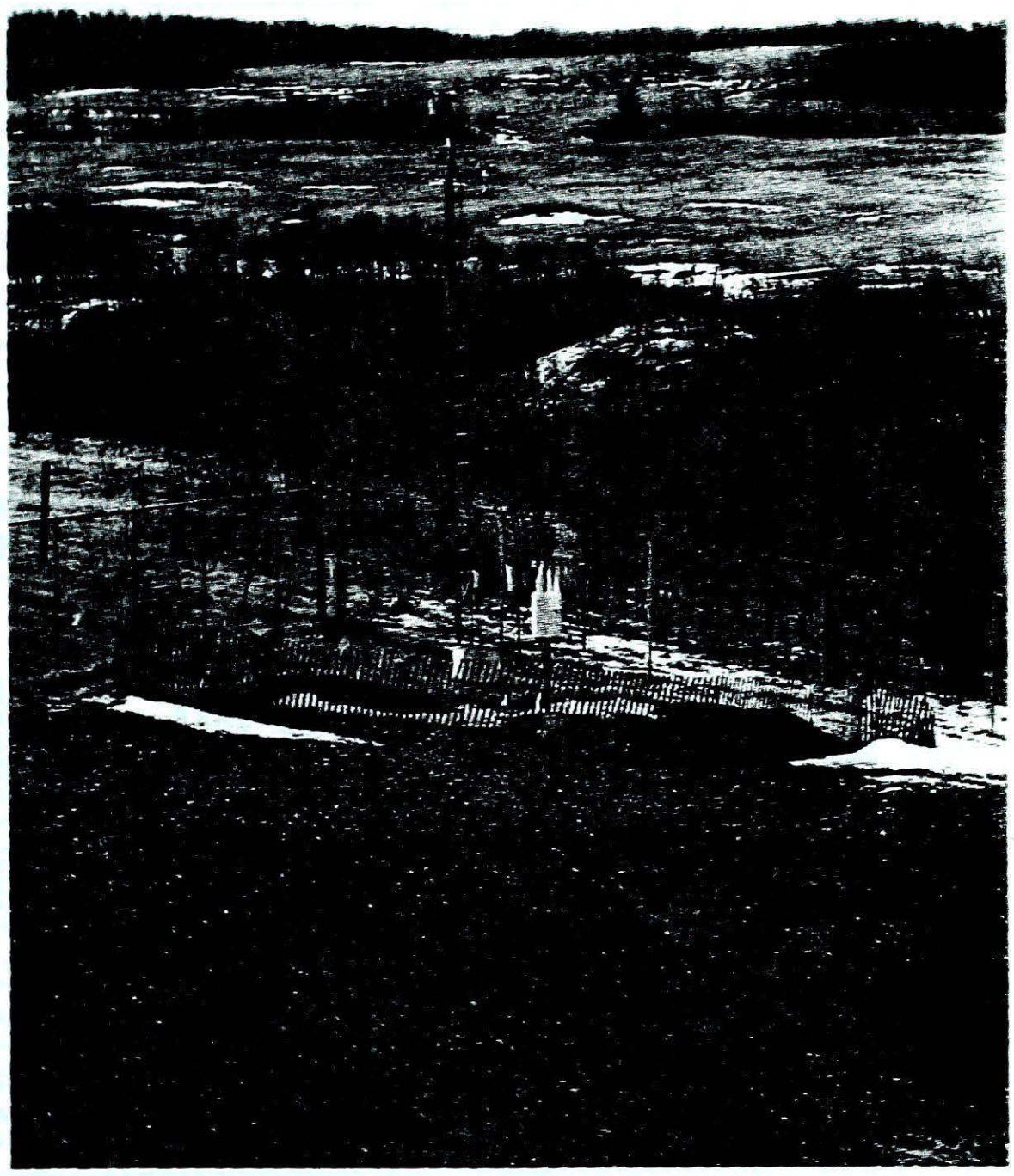
Below normal snowfall, however, was the main story from the Prairies. Southern Saskatchewan and southern Alberta were particularly dry receiving no more than one half their normal winter allotment. Estevan's meager 1.8 mm of precipitation in December was only 9% of normal. Most dug outs in southern Saskatchewan were dry and for the first time since the drought of the 1930s, Old Wives Lake, southwest of Moose Jaw dried up. Lack of snow cover added to the agricultural problems when strong winds blew away precious top soil off many southwestern Prairie farms. Owing to the lack of adequate snow cover, cattle ranchers realized a substantial saving in animal feed costs, since their cattle could graze on the snow-free range land.

During the 15th Olympic Winter Games in Calgary, the weather was spring-like. Both the participants and the spectators enjoyed the balmy weather while the temperatures rose to near 20°C. Strong winds hampered ski jumping events at the Winter Olympics. For nearly a week, peak sustained winds exceeded 40 km/h. The winds were much stronger on the slopes of Mount Allen where, on some days, downhill skiing was postponed. Precipitation was also below normal in the southern B.C. interior where the dry spell was described as the worst in 60 years.

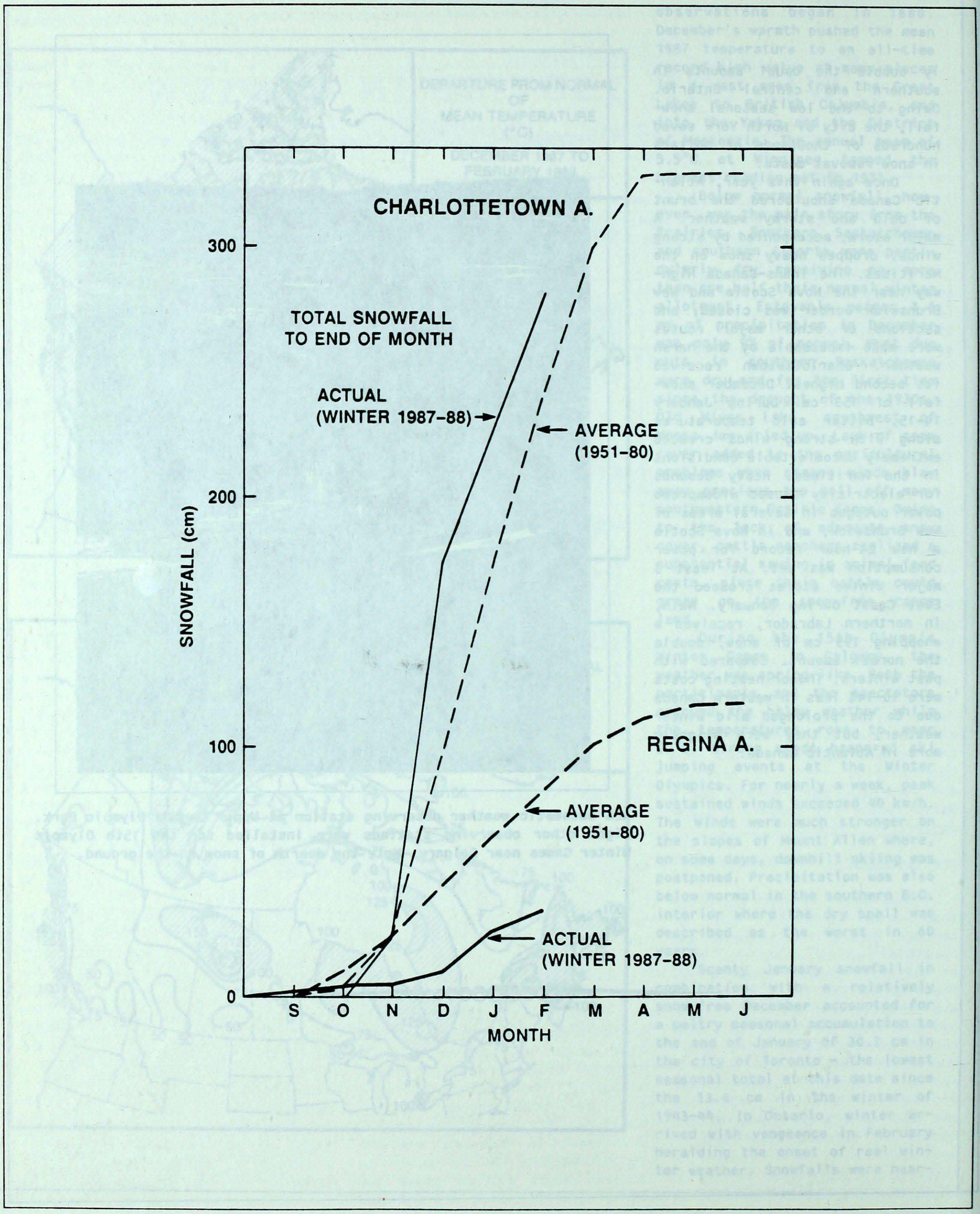
Scanty January snowfall in combination with a relatively snow-free December accounted for a paltry seasonal accumulation to the end of January of 30.2 cm in the city of Toronto - the lowest seasonal total at this date since the 13.4 cm in the winter of 1943-44. In Ontario, winter arrived with vengeance in February heralding the onset of real winter weather. Snowfalls were near-

ly double the usual amounts in southern and central Ontario. Owing to the low seasonal snowfall, the city of North York saved hundreds of thousands of dollars in snow removal costs.

Once again this year, Atlantic Canada shouldered the brunt of cold and stormy weather. A major storm, accompanied by strong winds, dropped heavy snow on the Maritimes. The Trans-Canada Highway near the Nova Scotia and New Brunswick border was closed, and sections of other major routes were made impassable by the harsh weather. Charlottetown received its second highest December snowfall of 153 cm. During January 14-15, bitter cold temperatures along with strong winds created extremely uncomfortable conditions in the Maritimes. Heavy demands for electricity caused widespread power outages in several areas of New Brunswick, and in Nova Scotia a new 24-hour record for power consumption was set. At least 3 major winter storms crossed the East Coast during January. Nain, in northern Labrador, received a whopping 199 cm of snow, double the normal amount. Compared with past winters, indoor heating costs were 10-14% less in western Canada due to the prolonged mild winter weather, but they were slightly more in Atlantic Canada.



AES automatic weather observing station at Upper Canada Olympic Park. Eight other observing stations were installed for the 15th Olympic Winter Games near Calgary. Note the dearth of snow on the ground.


CHARLOTTETOWN A.
TOTAL SNOWFALL
TO END OF MONTH
ACTUAL
(WINTER 1987-88)
AVERAGE
(1951-80)
REGINA A.
AVERAGE
(1951-80)
ACTUAL
(WINTER 1987-88)
SNOWFALL (cm)
300
200
100
0
S
O
N
D
J
F
M
A
M
J
MONTH

MARCH 1988

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
BRITISH COLUMBIA													
ABBOTSFORD	6.9	1.3	18.9	-2.0	0.0		154.7	111	0	14	89	79	344.7
ALERT BAY	6.1	0.9	14.2	0.0	0.0		223.2	182	0	21	X		369.9
AMPHITRITE POINT	6.9	0.7	13.0	0.7	0.0		354.8	103	0	19	X		342.8
BLUE RIVER	1.3	2.8	12.1	-11.6	36.1	97	75.8	136	32	16	88	91	a
BULL HARBOUR	5.7	0.8	18.7	-1.8			268.5	160	0	22	X		381.0
CAPE SCOTT	6.3	0.9	13.2	0.8	8.0	68	304.8	129	0	23	X		364.6
CAPE ST.JAMES	6.1	1.2	11.5	0.3	7.4	80	151.8	116	0	22	128	a	366.8
CASTLEGAR	4.7	2.0	16.0	-4.5	8.4	30	69.8	120	0	13	111	90	411.1
COMOX	6.4	1.4	13.4	-1.0	0.0		99.6	89	0	12	X		359.8
CRANBROOK	3.1	3.0	14.9	-6.6	11.6	61	22.3	133	0	6	148	a	461.9
DEASE LAKE	-2.2	5.2	7.3	-17.2	39.8	149	21.0	94	53	5	106	79	627.9
ETHELDA BAY	5.1	0.9	13.6	-2.7	0.0		406.3	144	0	25	X		397.2
FORT NELSON	-3.1	6.7	9.6	-19.4	8.8	29	7.6	31	26	2	147	a	651.8
FORT ST.JOHN	0.6	7.2	12.6	-11.2	18.6	56	18.6	62		3	X		540.2
HOPE	5.6	0.0	19.2	-1.1	0.0		322.5	218	0	19	85	84	354.7
KAMLOOPS	5.2	1.7	18.2	-5.5			7.0	72	0	2	125	85	396.0
KELOWNA	4.3	2.0	16.2	-7.8	1.8	31	18.2	97	0	7	117	87	425.8
LANGARA	5.1	1.3	11.5	0.5	8.0	45	269.7	203	0	23	X		398.1
LYTTON	6.0	0.9	18.2	-4.5	0.2	2	26.0	91	0	7	112	77	355.3
MACKENZIE	-0.1	4.6	9.6	-14.9	45.6	107	42.6	79	67	13	108	86	559.4
MCINNES ISLAND	6.2	1.2	13.9	1.2	2.6	17	324.7	148	6	22	X		364.8
PENTICTON	5.2	1.3	15.5	-6.3	1.1	25	19.2	110	0	8	118	84	389.1
PORT ALBERNI	6.1	a	18.7	-5.2	11.0	a	231.2	a	0	15	102	a	368.9
PORT HARDY	5.5	1.1	14.4	-1.8	0.4	3	277.2	195	0	21	106	104	387.1
PRINCE GEORGE	1.1	2.9	10.0	-9.1	21.2	70	35.2	95	0	11	100	72	524.1
PRINCE RUPERT	5.0	2.0	12.0	-3.8	7.6	29	243.2	121	0	24	84	89	402.0
PRINCETON	3.0	2.0	16.4	-8.0	12.4	94	27.0	142	0	10	131	a	a
QUESNEL	2.5	2.9	12.0	-8.0	8.8	47	35.9	121	0	8	X		479.6
REVELSTOKE	2.7	2.0	9.3	-6.8	14.0	44	76.0	86	0	15	85	83	474.0
SANDSPIT	5.6	1.7	12.6	-0.8	1.2	10	167.6	168	0	20	107	88	384.3
SMITHERS	-0.3	1.0	13.4	-9.4	5.5	24	7.8	30	0	3	112	91	492.2
TERRACE	3.1	1.6	10.8	-3.0	32.8	74	108.4	130	0	16	87	80	462.6
VANCOUVER HARBOUR	7.4	1.3	14.5	1.0			184.7	120	0	15	X		329.5
VANCOUVER INT'L	6.8	1.0	13.6	-1.6	0.0		138.2	136	0	13	114	88	
VICTORIA GONZ. HTS	7.6	0.9	15.1	1.8	1.6	32	106.8	227	0	13	128	84	319.0
VICTORIA INT'L	6.4	0.7	13.9	-1.8	0.0		122.6	170	0	13	126	87	360.2
VICTORIA MARINE	6.5	0.6	14.5	-0.3			214.9	187	0	17	X		354.5
WILLIAMS LAKE	1.2	2.2	12.0	-9.5	17.2	78	19.8	88	6	10	104	64	520.6

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
YUKON TERRITORY													
BURWASH											X		
DAWSON	-8.1	6.8	8.0	-32.0	34.6	285	34.6	329			X		
MAYO	-5.5	6.2	7.3	-22.1	5.2	48	2.8	27	20	2	X		725.2
WATSON LAKE	-6.0	5.3	6.3	-25.7	33.6	120	20.0	86	58	5	109	80	743.6
WHITEHORSE	-3.0	5.2	7.0	-16.6	10.6	64	8.6	63	30	3	129	84	650.1
NORTHWEST TERRITORIES													
ALERT	-30.2	3.0	-2.4	-45.4	11.2	155	4.7	69	37	2	74	111	1493.2
BAKER LAKE	-25.6	2.3	-13.8	-37.6	22.4	269	8.5	111	79	4			1350.9
CAMBRIDGE BAY	-26.8	4.5	-14.5	-38.0	6.4	118	1.4	29	33	0	186	100	1388.5
CAPE DYER	-19.3	3.6	-9.5	-30.1	42.4	123	40.4	137	70	4	X		1157.2
CAPE PARRY	-20.0	7.6	-0.6	-33.0	8.8	83	5.0	81	11	1	X		1177.4
CLYDE	-24.4	2.0	-10.3	-37.3	20.0	333	10.4	173	25	1	207	128	1313.3
COPPERMINE	-21.6	5.5	-1.8	-37.1	14.9	143	11.0	172	54	4	148	91	1228.2
CORAL HARBOUR	-22.1	3.1	-8.0	-37.0	3.9	36	3.9	36	30	2	195	98	1240.9
EUREKA	-32.4	5.0	-12.2	-48.2	0.4	16	0.2	9	14	0	80	67	1562.6
FORT RELIANCE	-16.3	5.6	-0.8	-37.0	10.5	84	3.1	30	46	1	X		1062.7
FORT SIMPSON	-8.9	6.0	8.3	-26.1	19.1	90	17.7	81	60	7	174	108	825.1
FORT SMITH	-8.6	6.2	5.3	-25.6	9.0	56	6.6	45	35	3	166	93	824.0
IQALUIT	-21.0	1.7	-6.0	-36.8	32.0	126	27.5	118	49	7	165	93	1207.8
HALL BEACH	-27.7	1.8	-14.6	-38.7	2.6	21	2.6	22	34	0	X		1414.6
HAY RIVER	-10.5	5.8	5.3	-24.4	10.2	53	10.2	55	50	5	X		880.2
INUVIK	-19.7	5.3	2.6	-38.4	15.6	104	11.3	94	43	4	a		1168.1
MOULD BAY	-27.2	5.6	-10.3	-42.0	4.4	146	2.4	100	13	1	85	77	1400.8
NORMAN WELLS	-13.7	6.1	7.0	-30.1	14.8	108	11.8	91	9	6	199	117	984.8
POND INLET											X		
RESOLUTE	-28.6	2.8	-9.7	-41.2	9.1	293	8.1	270	13	3	172	117	1444.5
YELLOWKNIFE	-12.9	6.0	1.5	-27.8	7.4	51	5.2	41	36	2	183	93	953.6
ALBERTA													
BANFF	0.4	3.8	11.5	-12.5	26.8	108	21.8	104	0	9	X		
CALGARY INT'L	0.9	4.9	16.1	-13.5	24.2	121	19.8	122		5	185	114	529.5
COLD LAKE	-1.9	5.7	10.7	-17.3	28.9	137	36.3	180	10	4	140	81	615.0
CORONATION	-0.2	6.9	16.4	-16.1	24.4	104	27.9	134	11	5	158	86	563.4
EDMONTON INT'L	1.4	8.1	16.2	-11.0	7.2	38	6.6	41	0	2	169	98	515.7
EDMONTON MUNI.	2.3	7.3	16.5	-9.7	7.8	41	7.4	40	0	1	171	102	487.5
EDMONTON NAMAO	1.7	7.3	15.7	-10.8	7.9	45	6.1	33		2	X		505.5
EDSON	0.7	6.9	14.8	-13.0	26.2	80	29.2	125		6	152	98	538.3
FORT CHIPEWYAN	-9.5	4.6	6.0	-26.5	19.2	116	19.2	124	50		X		

MARCH 1988

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									
FORT MCMURRAY	-4.0	5.2	10.4	-21.2	23.5	97	18.2	87	28	6	134	81	682.0
GRANDE PRAIRIE	0.9	8.1	13.7	-11.6	8.4	36	8.9	42		3	163	a	529.6
HIGH LEVEL	-6.4	5.4	7.5	-21.0	24.4	116	23.7	146	39	3	132	75	755.7
JASPER	1.6	4.3	13.0	-10 5	19.4	131	24.0	150		7	139	a	510.4
LETHBRIDGE	2.5	4.6	17.2	-12.4	19.4	73	19.4	80	0	4	167	100	481.5
MEDICINE HAT	2.6	5.4	19.8	-12.1	7.5	40	13.9	75	0	6	162	99	479.3
PEACE RIVER	0.6	9.1	12.6	-10.3	12.3	60	12.3	71	0	5	X		538.3
RED DEER	0.8	7.0	16.7	-10.8	31.8	157	32.0	164	7	4	X		554.9
ROCKY MTN HOUSE	-0.6	4.0	15.9	-18.5	68.2	226	38 7	144	2	5	X		576.2
SLAVE LAKE	0.2	7.1	12.2	-11.6	8.0	28	20.0	94	0	5	152	90	552.1
SUFFIELD													
WHITECOURT	1.4	7.3	15.0	-9.2	17.9	70	22.5	93		8	X		513.3
SASKATCHEWAN													
BROADVIEW	-4.1	4.5	15.0	-20.6	27.6	155	30.8	185	3	7	175	100	685.8
COLLINS BAY	-12.6	3.1	4.4	-31.2	30.6	110	20.2	88	42	4	180	a	947.9
CREE LAKE	-10.0	3.6	5.9	-32.4	39.0	184	26.2	167	41	3	158	88	867.4
ESTEVAN	-1.2	4.7	17.9	-18.3	8.0	46	12.4	64	0	4	184	99	592.9
HUDSON BAY	-7.7	2.0	9.4	-27.8	78.2	232	61.0	214	42	7	150	a	797.4
KINDERSLEY	-0.4	6.2	13.6	-14.0	16.2	110	14.0	95	0	4	X		569.0
LA RONGE	-8.7	2.0	9.5	-27.7	50.5	230	48.3	313	62	0	X		829.1
MEADOW LAKE	-6.6	1.0	6.9	-23.4	41.6	229	43.0	219	32	8	115	a	761.0
MOOSE JAW	-1.3	4.3	16.3	-18.7	16.0	86	16.8	96		5	171	102	597.4
NIPAWIN	-8.4	a	4.5	-26.8	60.2	a	44.2	a	36	9	126	a	818.1
NORTH BATTLEFORD	-3.7	4.9	9.1	-24.1	20.0	95	24.7	119	4	4	X		677.3
PRINCE ALBERT	-6.8	3.5	6.9	-26.4	56.1	284	58.2	303	33	7	122	73	767.6
REGINA	-2.4	5.4	15.5	-20.9	16.3	89	22.4	125		6	160	102	632.1
SASKATOON	-3.8	4.8	8.9	-20.5	30.8	166	34.4	186	6	6	X		675.2
SWIFT CURRENT	-0.7	5.0	16.5	-15.8	17.7	83	17.6	87	4	4	186	118	577.4
											X		
WYNYARD	-5.9	2.9	7.1	-27.4	50.2	201	48.7	196	13	8	144	77	740.7
YORKTON	-5.8	3.8	11.7	-22.1	7.1	27	41.4	158	5	8	161	97	702.0
MANITOBA													
BRANDON	-4.6	4.1	14.0	-19.2	19.8	100	20.9	104	7	6	X		698.6
CHURCHILL	-19.9	0.5	-2.2	-34.1	22.2	119	19.6	108	32	6	198	104	1175.2
DAUPHIN	-5.9	2.6	12.8	-23.6	30.4	125	37.3	152	13	8	190	107	739.4
GILLAM	-15.4	1.8	2.1	-32.8	24.8	79	19.0	64	66	5	X		1035.5
GIMLI	-6.6	2.4	9.0	-19.9	37.6	160	37.8	147	16	7	194	99	762.5
ISLAND LAKE	-11.4	1.3	9.9	-29.2	21.6	38	18.4	38	39	4	X		909.4
LYNN LAKE	-12.9	2.4	6.8	-31.1	33.0	132	18.3	84	46	4	201	107	958.8
NORWAY HOUSE	-10.7	a	-3.9	-19.1	24.4	a	20.0	a	13	5	a		915.4
PORTAGE LA PRAIRIE	-3.8	3.6	11.9	-16.6	23.7	135	26.5	97	0	8	X		675.0

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									
THE PAS	-8.7	2.5	7.7	-27.6	27.8	98	18.5	78	11	3	175	100	828 7
THOMPSON	-12.4	2.5	10.7	-31.2	18.2	62	17.0	58	15	5	203	104	965.4
WINNIPEG INT'L	-4.5	3.7	10.9	-17.8	22.2	105	24.2	106	1	5	187	106	697.9
ONTARIO													
ATIKOKAN	-6.9	0.9	6.4	-30.3	92.0	277	81.0	220	40	15	128	74	772.8
BIG TROUT LAKE	-13.0	1.5	9.2	-33.8	61.8	a	54.2	250	98	6	191	a	960.5
EARLTON	-8 0	-0.4	10.7	-32.9	23.9	53	50.5	87	9	11	X		810.7
GERALDTON	-10.3	0.7	7.2	-36.2	61.8	158	65.2	170	58	11	X		875.1
GORE BAY	-4.9	-0.6	9.0	-26.5	56.1	179	101.3	188	4	15	X		710.9
HAMILTON RBG	0.7	0.3	20.3	-14.2	2.9	14	40.7	54	0	7	172	a	
HAMILTON	-0.5	0.3	9.3	-13.9	7.8	38	37.4	52	0	9	X		57.7
KAPUSKASING	-10.3	-0.9	10.1	-32.0	62.8	132	74.2	133	63	14	X		877.4
KENORA	-6.5	0.6	7.2	-20.5	57.4	195	67.2	223	40	9	X		759.4
KINGSTON	-1.6	0.0	16.0	-19.0	5.2	16	38.0	52	0	8	176	123	608.7
LANSDOWNE HOUSE	-11.4	1.2	8.0	-33.6	47.6	160	46.0	159	5	6	X		912.6
LONDON	-0.4	0.5	18.4	-14.4	15.7	56	49.3	65	0	11	138	114	570.2
MOOSONEE	-12.0	0.3	10.3	-33.4	38 0	114	41.2	109	70	11	138	93	931.0
MUSKOKA	-4.8	-1.0	13.3	-26.7	25.7	69	46.5	70	5	11	X		692.9
NORTH BAY	-6.3	-1.0	10.1	-25.9	38.0	98	64.1	104	20	10	154	103	753.4
OTTAWA INT'L	-3.3	-0.3	16.6	-19.6	6.0	16	27.4	40	0	7	207	a	659.4
PETAWAWA	-5.5	-0.9	13.7	-27.1	20.4	68	42.2	83	1	9	X		728.8
PETERBOROUGH	-2.0	0.5	15.8	-19.9	3.8	16	35.0	55	0	3	X		618.9
PICKLE LAKE	-10.4	0.3	9.6	-32.6	59.8	155	53.6	127	71	9	X		885.5
RED LAKE	-9.2	-0.3	9.9	-30.4	75.4	314	63.6	243	74	10	144	a	843.5
ST. CATHARINES	1.1	0.4	21.0	-10.7	6.6	36	39.6	56	0	6	X		523.3
SARNIA	0.4	-0.2	18.8	-13.4	16.8	76	34.6	55	0	138			547.3
SAULT STE. MARIE	-5.6	-0.5	10.6	-27.6	75.8	250	85.9	142	23	15	141	93	731.6
											X		
SIOUX LOOKOUT	-8.7	-0.4	6.1	-30.1	95.8	297	98.2	280	75	15	X		828.7
SUDBURY	-6.6	-0.6	8.5	-25.9	48.0	137	95.6	173	20	13	146	95	763.0
THUNDER BAY	-4.8	1.5	7.8	-25.4	30.2	88	53.9	119		7	150	86	705.9
TIMMINS	-9.3	-0.9	12.5	-34.7	72.9	135	81.5	138	67	14	X		559.4
TORONTO	0.9	0.2	17.7	-14.9	6.2	25	26.8	38	0	6			530.3
TORONTO INT'L	-0.8	0.2	19.0	-16.4	2.4	10	23.6	38	0	4	X		580.5
TORONTO ISLAND	0.8	0.7	10.5	-14.0	6.0	28	30.2	50	0	7			532.7
TRENTON	-1.0	0.0	15.5	-17.6	6.0	22	46.3	64	0	5	X		588 5
WATERLOO-WELL	-1.8	0.0	16.8	-17.1	7.2	29	37.0	51	0	8	X		614.0
WAWA	-8.3	a	8.2	-33.2	65.6	a	82.2	a	36	11		a	814.6
WIARTON	-3.0	-0.2	5.9	-21.4	20.2	47	45.2	69	0	13	147	106	651.1
WINDSOR	2.1	0.9	21.7	-8.8	7.0	35	31.6	44	0	8	X		494.1

MARCH 1988

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
QUEBEC													
BAGOTVILLE	-7.5	-1.0	10.0	-25.4	33.8	70	41.2	79	10	8	X		790.7
BAIE COMEAU	-6.4	0.0	9.6	-24.0	32.0	52	43.7	64	34	7	187	a	756.8
BLANC SABLON	a		6.6	-15.4	34.1	41	55.3	60	3	17	99	a	
CHIBOUGAMAU	-11.6	-0.8	7.6	-30.8	41.4	93	44.4	98	64	11	165	104	916.8
GASPE	-3.8	1.3	11.0	-20.4	26.2	29	35.0	33	23	9	162	a	659.9
INUKJUAK	-19.3	1.3	-1.7	-35.3	37.8	420	35.8	397	58	7	166	103	1155.8
KUUJJUAQ	-14.5	3.2	2.9	-34.6	47.0	175	46.4	178	49	10	144	87	1014.2
KUUJJUARAPIK			4.1	-35.8	19.2	95	22.2	105	32	7	116	68	1093.3
LA GRANDE RIVIERE	-15.2	a	5.9	-33.8	31.8	a	27.4	a	40	6	164	a	1028.2
MANIWAKI	-6.3	-1.2	13.7	-27.7	15.8	46	43.4	84	4	10	191	131	752.6
MATAGAMI	-11.5	0.1	10.8	-18.4	59.4	111	67.8	157	45	10	160	104	916.8
MONT JOLI	-5.2	-0.2	8.7	-19.7	19.6	31	33.2	46	4	7	157	120	717.3
MONTREAL INT'L	-2.8	-0.3	16.3	-18.2	14.2	39	26.4	35	0	6	205	132	642.9
MONTREAL M INT'L	-5.1	a	11.8	-22.0	9.5	a	22.4	a	5	7	244	a	715.1
NATASHQUAN	-6.1	0.1	3.8	-19.5	58.6	102	118.0	146	32	15	123	86	746.2
QUEBEC	-5.4	-0.9	8.2	-20.8	15.0	27	52.4	63	70	8	181	129	723.2
ROBERVAL	-7.4	-0.5	8.9	-24.0	19.6	33	50.2	82	25	6	182	a	778.8
SCHEFFERVILLE	-13.4	1.7	4.8	-39.6	66.0	157	65.4	157	73	14	132	a	972.6
SEPT--ILES	-6.3	0.3	5.8	-22.6	48.2	68	74.6	90	17	10	144	93	752.4
SHERBROOKE	-5.1	-0.8	16.9	-24.1	16.6	31	33.5	45	1	8	159	a	715.3
STE AGATHE DES MONTS	-6.4	-0.7	12.3	-26.3	23.4	35	35.6	37	44	12	197	129	754.9
ST-HUBERT	-3.0	-0.6	16.8	-18.0	8.3	21	26.0	32	0	6			651.7
VAL D'OR	-9.4	-1.1	8.8	-30.6	30.2	63	43.4	73	28	10	175	112	850.0
NEW BRUNSWICK													
CHARLO	-4.8	0.4	10.5	-21.1	23.7	31	38.6	42	35	7	203	137	706.7
CHATHAM	-2.3	1.0	14.9	-19.5	9.8	14	23.4	24		6	195	133	630.4
FREDERICTON	-2.6	-0.2	14.6	-20.2	11.6	23	36.3	42		8	183	a	638.8
MONCTON	-2.7	0.2	15.0	-17.2	13.9	20	22.3	19		8	170	123	631.9
SAINT JOHN	-1.8	0.7	15.8	-15.6	8.8	17	38.9	34	0	7	182	126	612.2

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
NOVA SCOTIA													
GREENWOOD	-0.2	0.7	19.3	-14.2	22.4	46	37.2	44	0	9	X		564.8
HALIFAX INT'L	-1.5	0.1	12.4	-16.1	41.8	91	78.9	61	0	11	a		602.4
SABLE ISLAND	0.5	-0.2	8.8	-9.0	11.4	40	121.8	104	0	12	92	78	542.8
SHEARWATER	-0.8	0.0	12.2	-12.6	34.0	87	96.2	82	0	10	150	101	581.8
SYDNEY	-3.0	-0.5	10.0	-19.9	54.2	84	140.6	107		13	109	86	650.8
YARMOUTH	0.2	-0.1	12.9	-12.8	15.6	47			0	8	158	115	551.8
PRINCE EDWARD ISLAND													
CHARLOTTETOWN	-3.4	-0.3	11.6	-18.4	62.6	101	70.8	74	10	12	X		664.4
SUMMERSIDE	-2.7	0.1	12.6	-17.9	26.7	48	32.2	38	12	11	150	105	642.9
NEWFOUNDLAND													
BATTLE HARBOUR	-6.2	-0.2	7.2	-20.0	59.1	a	101.5	150	129	18	X		749.2
BONAVISTA	-1.5	1.2	11.8	-10.7	76.2	194	165.2	189		15	X		605.8
	-2.6	-0.5	6.9	-11.4	46.4	97	134.1	107	4	17	0		638.3
CARTWRIGHT	-7.4	0.7	6.2	-26.4	92.4	107	113.0	121	175	16	89	71	790.3
CHURCHILL FALLS	-11.9	0.7	6.7	-32.3	81.4	126	86.2	131	105	14	149	108	928.8
COMFORT COVE	-3.5	0.1	13.9	-15.5	186.8	271	198.2	191	58	17	X		664.4
DANIEL'S HARBOUR	-2.9	1.6	12.1	-15.9	20.4	33	22.8	30	0	1	73	63	647.5
DEER LAKE	-3.1	1.7	13.6	-18.3	57.2	105	60.0	87	22	18	X		648.6
GANDER INT'L	-3.0	0.5	13.0	-13.7	170.6	235	201.6	183	24	14	108	103	651.0
GOOSE	-8.5	0.1	10.3	-26.2	84.1	112	90.2	124	63	11	137	105	819.3
PORT-AUX-BASQUES	-3.1	-0.4	8.1	-11.0	54.1	105	187.3	178	2	17	100	a	652.7
ST ANTHONY											X		
ST JOHN'S	-1.6	0.7	14.5	-12.2	38.4	59	171.8	130		18	111	117	606.5
ST LAWRENCE	-1.7	-0.1	11.0	-11.7	76.7	173	194.3	152		19	X		
STEPHENVILLE	-2.6	0.2	12.1	-13.1	38.6	65	89.2	109	2	16	96	91	636.0
WABUSH LAKE	-11.8	2.0	4.6	-31.4	65.1	109	57.6	101	54	13	131	a	925.8

AGROCLIMATOLOGICAL STATIONS — MARCH 1988

STATION	Temperature C				Snowfall (cm)	Total Precipitation (mm)	% of Normal Precipitation	Snow on ground at end of month (cm)	No. of days with Precip 1.0 mm or more	Bright Sunshine (hours)	Degree days above 5 C	
	Mean	Difference from Normal	Maximum	Minimum							This month	Since jan. 1st
BRITISH COLUMBIA												
AGASSIZ	7.0	0.9	19.0	-1.0	0.0	241.4	164	0	19	98	76.3	120.8
SIDNEY	6.4	*	14.0	-2.0	0.0	115.8	*	0	13	114	50.6	83.1
SUMMERLAND	5.3	1.6	16.0	-4.0	0.0	18.8	127	0	9	132	34.6	42.1
ALBERTA												
BEAVERLODGE	1.0	7.1	14.0	-9.0	12.0	10.0	41	0	3	153	3.7	5.0
ELLERSLIE												
LACOMBE	0.8	6.8	17.5	-13.5	14.0	13.5	71	0	1	183	3.1	4.6
LETHBRIDGE												
VEGREVILLE	0.3	8.4	16.0	-22.5	19.8	24.4	195	12	4	N/A	2.8	3.8
SASKATCHEWAN												
INDIAN HEAD												
MELFORT	-7.5	2.7	5.5	-27.0	42.6	43.8	244	9	7	93	0.0	0.0
REGINA	-3.0	5.2	15.0	-22.0	14.4	22.1	137	TR	6	N/A	0.3	0.3
SASKATOON	-3.9	4.6	10.0	-21.5	37.0	38.0	170	3	7	138	0.0	0.0
SCOTT	-1.6	7.3	11.0	-16.0	13.3	20.0	105	0	4	158	0.0	0.0
SWIFT CURRENT SOUTH	-0.2	4.5	16.5	-15.5	11.4	10.3	67	0	5	156		
MANITOBA												
BRANDON	-3.9	4.5	15.1	-19.8	16.8	3.0	13	0	4	N/A	0.3	0.3
GLENLEA	-5.0	4.0	11.5	-18.0	22.7	25.3	106	2	4	176	0.0	0.0
MORDEN	-2.8	3.9	13.0	-16.0	17.4	16.8	59	0	5	188	1.0	1.0
ONTARIO												
DELHI	0.0	0.3	22.0	-16.5	10.0	54.1	64	0	12	151	19.8	23.8
ELORA	-2.5	0.2	16.0	-19.8	0.0	38.9	52	0		N/A	8.4	10.5
GUELPH	-1.4	0.5	16.1	-19.3	9.0	39.7	63	0	9	144	12.1	15.5
HARROW	2.1	0.9	19.0	-8.5	0.0	30.1	40	0	6	140	25.1	29.1
KAPUSKASING	-11.0	-1.4	9.0	-36.0	45.4	48.7	90	57	14	120	0.0	0.0
OTTAWA	-3.5	-0.6	16.0	-20.3	5.6	26.5	45	TR	5	207	7.7	8.6
SMITHFIELD	-0.9	-0.5	16.1	-18.5	4.6	48.9	58	0	4	N/A	11.6	14.5
VINELAND STATION	-1.4	-2.1	20.6	-10.2	5.4	38.8	55	0	9	157	21.4	30.1
QUEBEC												
LA POCATIERE	-5.3	-0.9	11.0	-18.5	14.5	24.0	36	48	7	184	0.0	0.0
L'ASSUMPTION	-4.6	-0.9	13.5	-23.5	6.5	20.6	30	1	10	190	3.3	3.3
LENNOXVILLE												
NORMANDIN	-9.5	-0.8	7.0	-34.0	23.4	44.6	75	38	5	191	0.0	0.0
ST. AUGUSTIN												
STE CLOTHILDE	-2.4	-0.1	16.5	-20.0	15.4	26.4	36	0	10	186	11.6	16.7
NEW BRUNSWICK												
FREDERICTON	-2.3	0.2	14.5	-22.5	9.2	34.9	43	0	6	183	8.3	8.3
NOVA SCOTIA												
KENTVILLE	-0.4	0.6	17.5	-14.5	40.0	46.7	47	0	10	152	16.6	18.6
NAPPAN	-1.2	0.9	17.5	-16.0	18.8	20.7	23	0	6	163	14.3	14.3
PRINCE EDWARD ISLAND												
CHARLOTTETOWN	-3.0	-0.3	11.0	-18.0	47.4	64.4	76	TR	7	137	3.0	3.0
NEWFOUNDLAND												
ST. JOHN'S WEST	-0.5	1.5	14.0	-12.5	37.5	223.7	146	0	17	106	4.1	5.9

Correction to the saisonal total of heatind degree-days to the end of December 1987

	1987	1986	NORMAL
BRITISH COLUMBIA			
Kamloops	1330	1542	1573
Penticton	1298	1456	1445
Prince George	1965	2236	2317
Vancouver	1084	1173	1234
Victoria	1199	1264	1277
YUKON TERRITORY			
Whitehorse	2557	2757	3002
NORTHWEST TERRITORIES			
Iqaluit	3958	4442	3930
Inuvik	3821	4173	4216
Yellowknife	3015	3332	3378
ALBERTA			
Calgary	1840	2107	2181
Edmonton Mun	1849	2177	2288
Grande Prairie	2069	2441	2541
SASKATCHEWAN			
Estevan	1860	2082	2152
Regina	2021	2298	2325
Saskatoon	2082	2356	2399
MANITOBA			
Brandon	2153	2467	2338
Churchill	3338	3746	3487
The Pas	2413	2700	2589
Winnipeg	1986	2321	2247
ONTARIO			
Kapuskasing	2365	2612	2483
London	1426	1515	1499
Ottawa	1718	1777	1746
Sudbury	1945	2084	2057
Thunder Bay	2037	2246	2201
Toronto	1442	1529	1486
Windsor	1243	1272	1312
QUÉBEC			
Baie Comeau	2339	2573	2277
Montréal	1652	1740	1637
Quebec	1961	2094	1910
Sept-Iles	2386	2667	2387
Sherbrooke	1955	2049	2014
Val-d'Or	2336	2534	2378
NEW BRUNSWICK			
Charlo	2045	2332	1929
Fredericton	1842	2021	1763
Moncton	1796	2000	1717
NOVA SCOTIA			
Halifax	1508	1633	1407
Sydney	1589	1884	1513
Yarmouth	1496	1596	1428
PRINCE EDWARD ISLAND			
Charlottetown	1671	1895	1597
NEWFOUNDLAND			
Gander	1913	2207	1856
St. John's	1802	2087	1744