Environment Canada Environnement Canada

Climatic Perspectives

Monthly review JANUARY Vol.10 1988

CLIMATIC HIGHLIGHTS

by
P. Scholefield, Monitoring and Prediction Division

Wildly Fluctuating Temperatures and Meagre Snowfalls

What is happening in our weather? The media from across the country have posed this question to us numerous times during this month.

The fluctuating weather regimes that typify the transitional autumn season usually settle down into a more persistent mid-winter pattern by January. This has certainly not been the case this year! With the exception of the east coast, the month started with an abrupt change from the mildness of December as a deep 50 kPa trough developed over Hudson Bay and a frigid Arctic air mass engulfed the country. However, starting on the 9th, an alternating series of mild and cold surges moved across the southern parts of the country from west to east causing some dramatic day to day changes in temperature. These fluctuations continued right up to the end of the month, when, maximum temperatures climbed above 10°C over the southern parts of Ontario and Quebec.

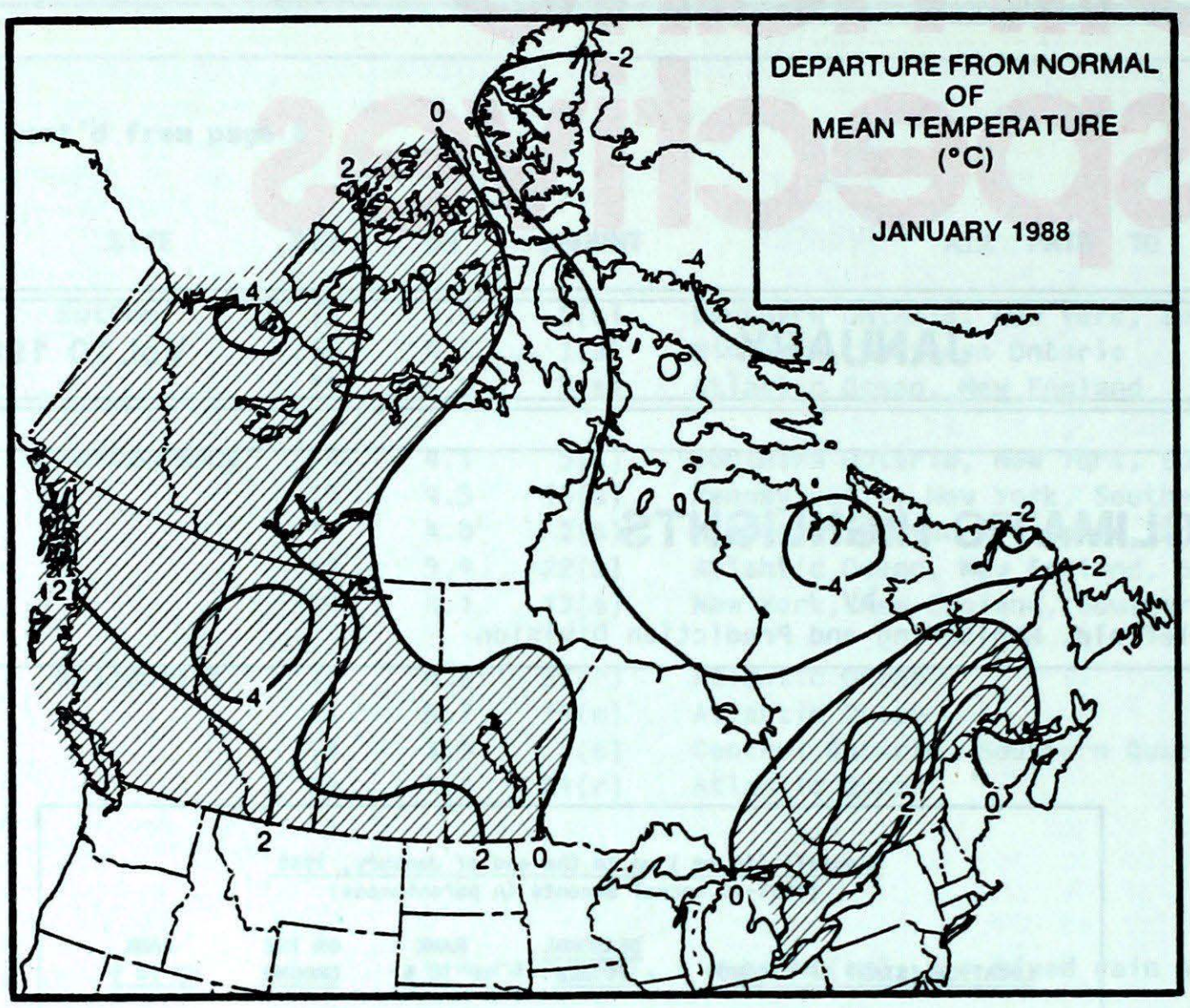
Most of the winter storms penetrated Canada along tracks through northern B.C., south of James Bay and along the east coast through the Gulf of St. Lawrence, leaving the rest of the country with much less snow than normal. Many parts of southern Canada had little or no snow on the ground at the end of the month (see accompanying tables).

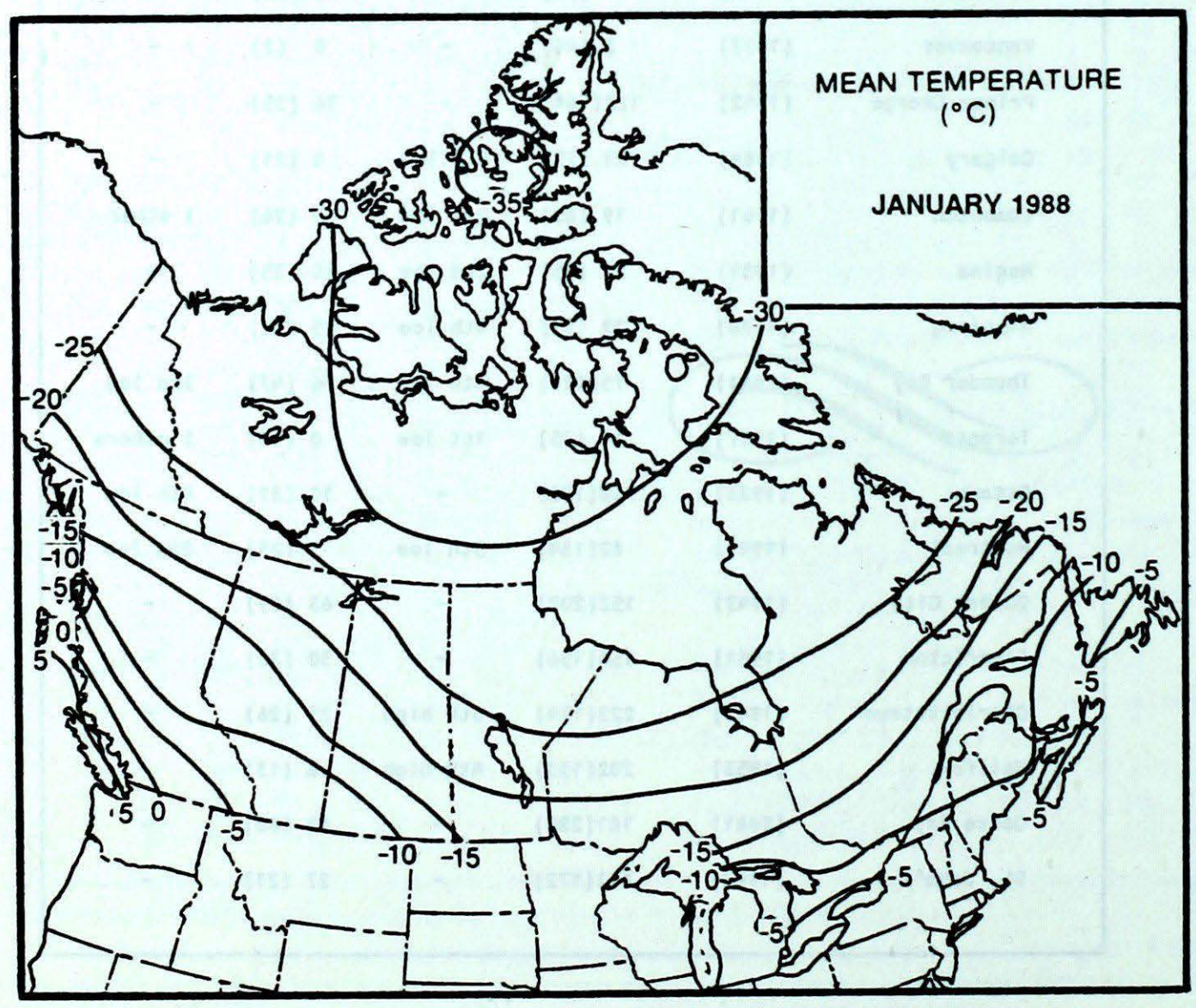
Snowfall (in cm) up to the end of January, 1988
(1951-80 normal amounts in parentheses)

LOCATION (START OF RECORD)		SEASONAL TOTALS	RANK UP TO 5	ON THE GROUND	RANK UP TO 5
Resolute Bay	(1947)	77 (58)	5th high	8 (26)	1st low
Iqaluit	(1946)	82(144)	4th low	23 (28)	-
Yellowknife	(1942)	132 (94)	-	37 (36)	-
Whitehorse	(1942)	70 (91)	-	25 (32)	-
Vancouver	(1937)	2 (46)	-	0 (2)	-
Prince George	(1942)	122(164)	-	36 (35)	-
Calgary	(1884)	21 (77)	4th low	4 (21)	-
Edmonton	(1961)	19 (82)	1st low	5 (26)	1 other
Regina	(1931)	27 (65)	2nd low	10 (25)	-
Winnipeg	(1938)	32 (72)	4th low	15 (32)	-
Thunder Bay	(1941)	75(128)	4th low	16 (47)	3rd low
Toronto	(1937)	24 (75)	1st low	0 (10)	3 others
Ottawa	(1938)	118(132)	-	10 (31)	4th low
Montreal	(1941)	82(134)	5th low	1 (25)	2nd low
Quebec City	(1943)	152(202)	-	63 (69)	-
Fredricton	(1951)	156(156)	-	30 (30)	-
Charlottetown	(1943)	223(174)	5th high	25 (26)	-
Halifax	(1953)	202(133)	4th high	8 (13)	-
Goose Bay	(1941)	181(239)	-	62 (80)	-
St. John's	(1942)	171(172)	-	27 (21)	-

Canada

TEMPERATURE





ACROSS THE COUNTRY

Yukon and Northwest Territories

The re-establishment of a strong arctic vortex near Baffin Island produced a bitterly cold January over the eastern half of the Arctic. The readings dropped below -40°C on many occasions in the Franklin District. Eureka recorded a minimum temperature of -52.6°C on January 31. In sharp contrast, the Yukon and the Mackenzie District continued to enjoy mild winter weather. Mean January temperatures were 2 to 4°C above normal in the Yukon, (Old Crow had a monthly reading that was more than 5°C above normal).

With the exception of the central portion of the Mackenzie District, precipitation was below normal throughout the Arctic. Central areas of the Yukon and most of Baffin Island received less than half their normal January share. A meagre 3 cm was only 6% of normal at Watson Lake.

British Columbia

Arctic air moved southward over the province to start the new year on a cool and dry note, but milder Pacific air brought rising temperatures and some precipitation later in the month. The northeast led the way again with readings 3 to 4°C above normal. The remainder of the province had temperatures that were 0.5 to 2°C above normal. Only Blue River and Princeton experienced slightly below normal values.

Above normal precipitation fell on the Queen Charlottes and the North Coast (Terrace 147%). Elsewhere in the north, precipitation ranged from 55 to 85% of normal, the south was generally dry with less than 25% of normal falling in a narrow band from central Chilcotin to Penticton. Williams Lake had only 9% of normal. Snowfall exceeded 150% of normal in the Peace River and nearby Rockies, but the values decreased rapidly in all directions with less than 75% of normal in the northwest.

PRECIPITATION

Hurricane force winds occurred on the North Coast on the 12th and 13th.

Prairie Provinces

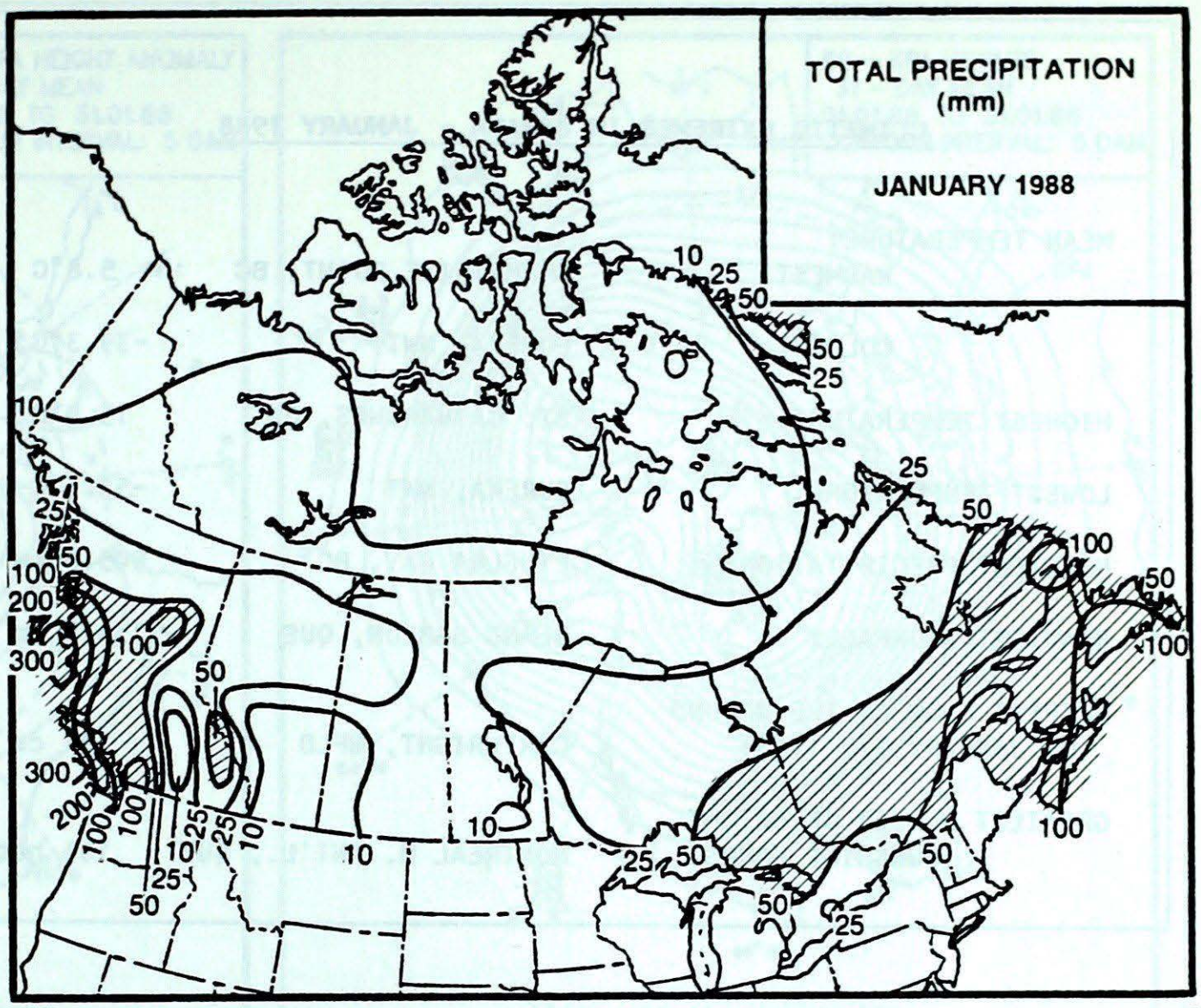
The new year came in with a vengeance, reversing the mild winter weather trend. During the middle of the month, however, the readings rebounded to above normal values and the mean January temperatures registered 1 to 5°C above the long-term average. The only exception was northern Manitoba and northeastern Saskatchewan where January was nearly 1°C colder than normal. The month was particularly mild in Alberta. On January 28, the mercury climbed to 14°C at Lethbridge. Gusty chinook winds were frequent across southwestern localities between January 14-15.

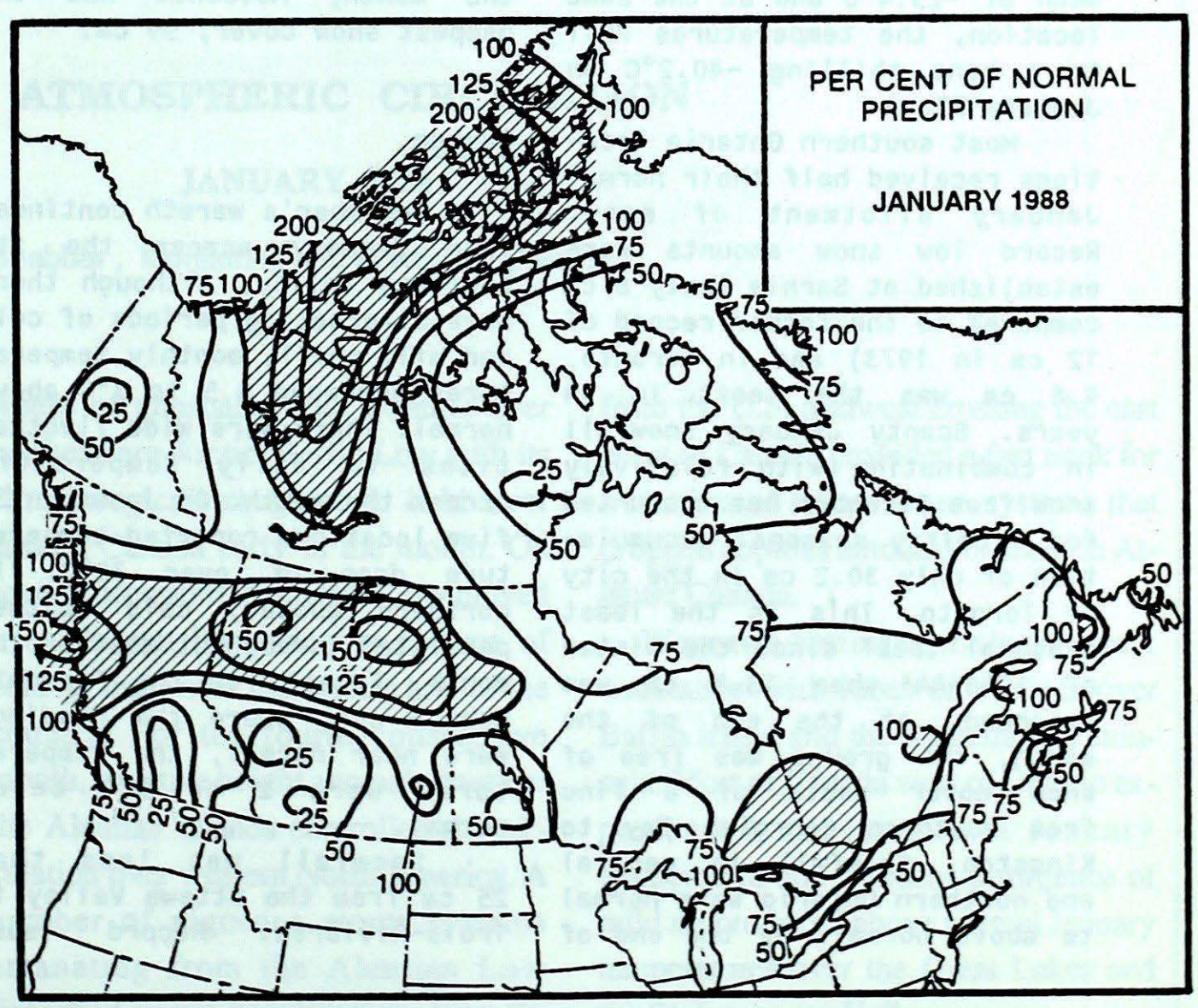
Except for northern Saskatchewan and northern Alberta, precipitation was less than 75% of normal throughout the Prairies. Snow cover improved somewhat over December, although extreme southern Saskatchewan had less than 5 cm. Southern Manitoba reported 9 to 13 cm. In Alberta, heaviest snowfall was over the Peace River-High Level-Fort McMurray regions where up to 50 cm fell. Heavy snowfall (about 30 cm) during January 28-29, temporarily closed the Columbia Icefield Highway between Banff and Jasper. Central Alberta had the least snowfall, Edmonton received about 5 cm of snow.

Ontario

January 1988 continued the remarkably mild and snow free winter season across southern Ontario, however cold temperatures and ample snowfall highlighted the weather in the northern and northwestern areas of the province. The temperatures in south and central Ontario were 1 to 2° above normal. A number of daily maximum readings were set, for example, the mercury soared to 15.4° on January 31 at St. Catharines.

In northern and northwestern Ontario, temperatures were much more winter-like. Province wide, Big Trout Lake experienced the coldest





EXTREMES

CLIMATIC EXTREMES IN CANADA - JANUARY 1988

MEAN TEMPERATURE:		
WARMEST	AMPHITRITE POINT, BC	5.8°C
COLDEST	EUREKA, NWT	-39.3°C
HIGHEST TEMPERATURE:	ST. CATHARINES, ONT	15.4°C
LOWEST TEMPERATURE:	EUREKA, NWT	-52.6°C
HEAVIEST PRECIPITATION:	ETHELDA BAY, BC	545.6 mm
HEAVIEST SNOWFALL:	BLANC SABLON, QUE	154.8 cm
DEEPEST SNOW ON THE GROUND ON JANUARY 31, 1988:	CARTWRIGHT, NFLD	111 cm
GREATEST NUMBER OF BRIGHT SUNSHINE HOURS:	MONTREAL M. INT'L., QUE	135 hours

mean of -25.4°C and at the same location, the temperatures fell to a bone chilling -40.2°C on January 23.

Most southern Ontario locations received half their normal January allotment of snow. Record low snow amounts were established 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. Scanty January snowfall in combination with relatively snow free December has accounted for a paltry seasonal accumulation of only 30.2 cm in the city of Toronto. This is the least seasonal total since the winter of 1943-44 when 13.4 cm was recorded. At the end of the month, the ground was free of snow cover south of a line from southern Georgian Bay to Kingston. Snowfall in central and northern Ontario were normal to above normal. By the end of the month, Moosonee had the deepest snow cover, 99 cm.

Quebec

December's warmth continued into January across the St. Lawrence Valley. Although there were alternating periods of cold and mild spell, monthly temperatures averaged 1.5 to 3°C above normal. There were wide fluctuations in daily temperature across the south. On January 13, five locations reported temperature drop of over 30°C. In northern Quebec, cold weather persisted throughout most of the month. Except for the Fermont-Wabush area where the readings were near normal, the temperatures were 2 to 5°C below normal.

Snowfall was less than 25 cm from the Ottawa Valley to Trois-Rivières. Record least January snowfall amount was reported at St. Hubert. However, in the mountainous areas over 100 cm fell. For example, 109.7 cm was a record at Matagami. Eastern Quebec had plenty of snowfall with Blanc Sablon receiving the most, 154.8 cm.

Hours of bright sunshine were above normal in southwestern and northern Quebec but remained below normal in the eastern areas of the province.

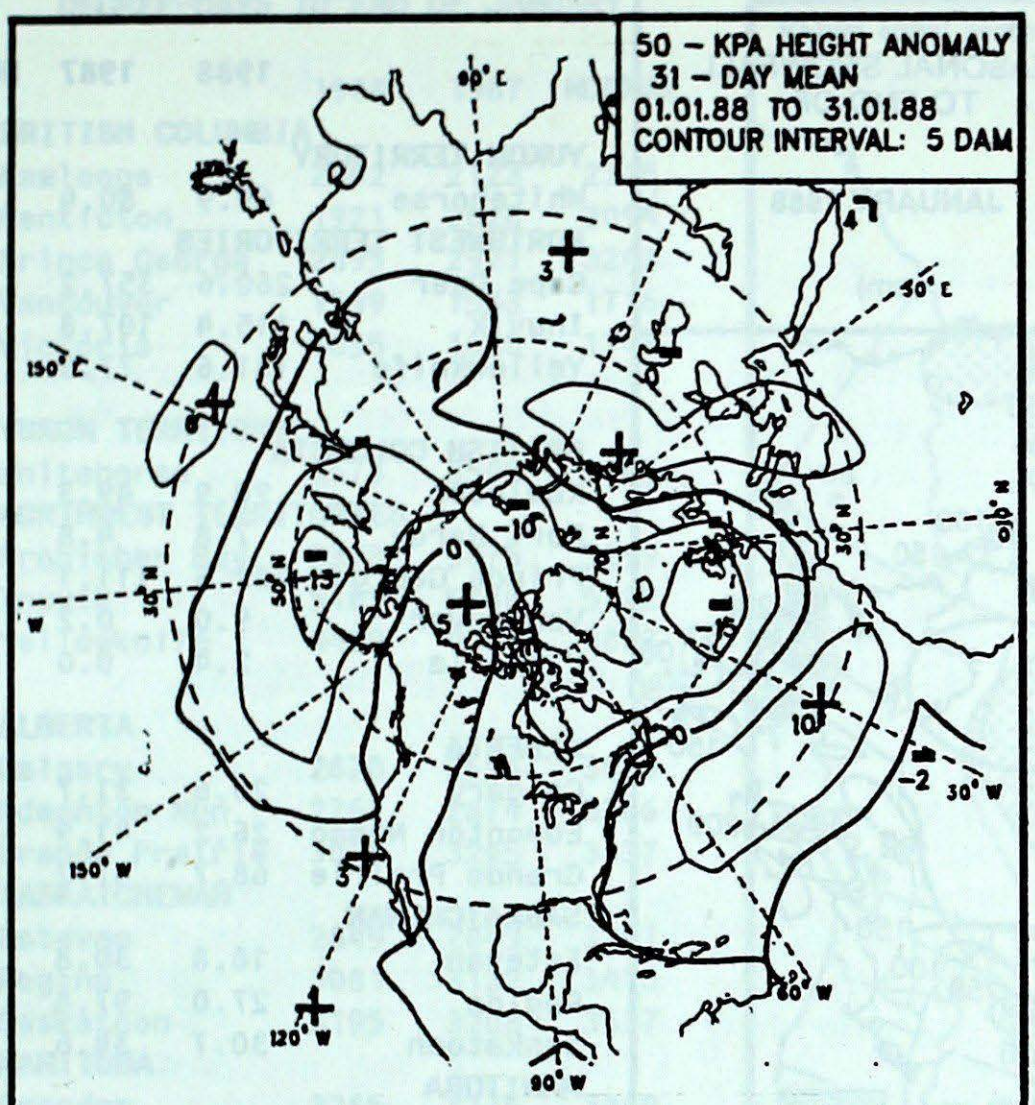
Atlantic Provinces

The weather was cold but generally sunny across most of the provinces. The temperatures were below the long-term average ranging from nearly 2°C below normal in Labrador to near normal in southwestern Nova Scotia. On the 14th, a daily record low temperature was established at Truro as the reading dropped from 2°C at midnight to -22°C the following morning. During a brief mild spell, the mercury climbed above 10°C at St. John's on January 26.

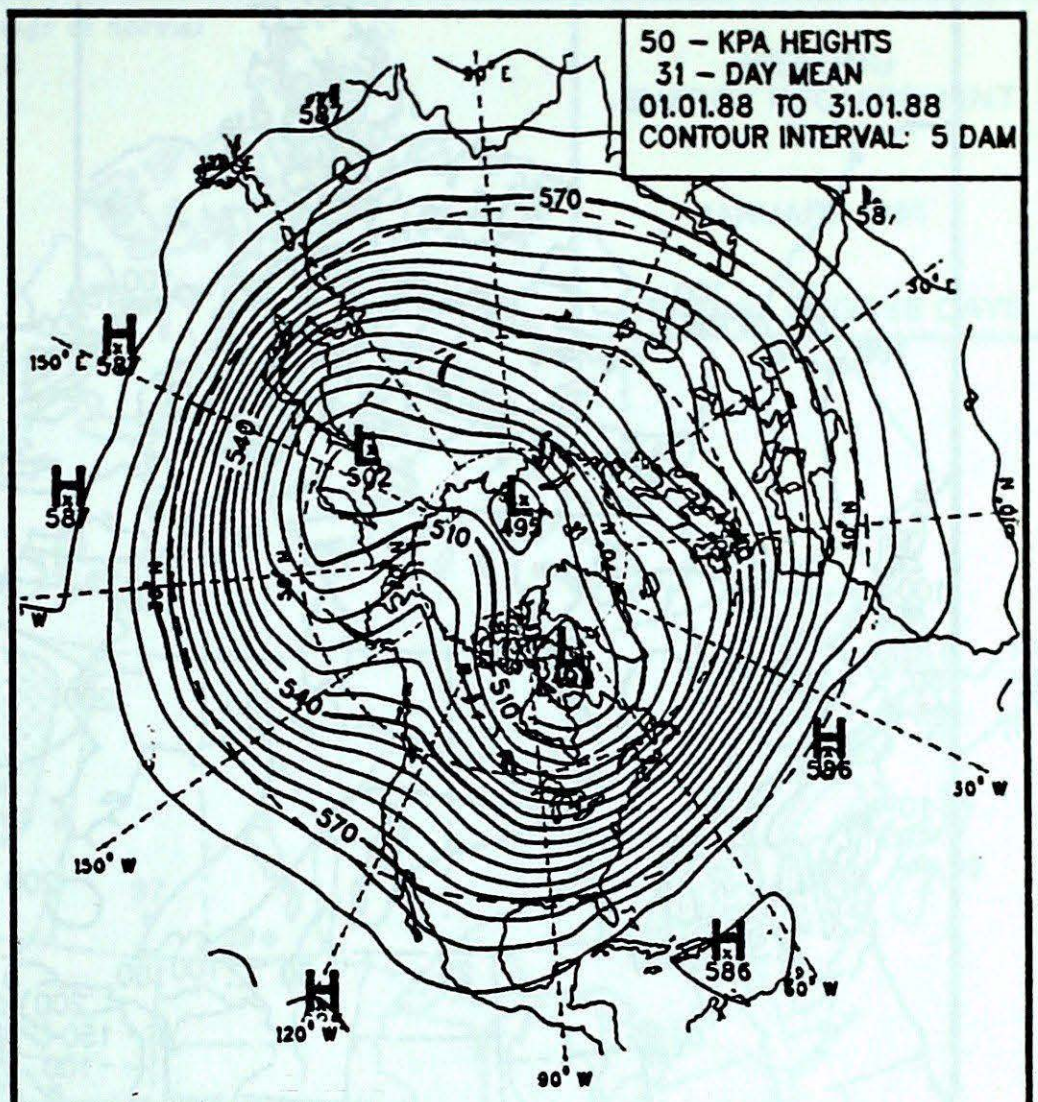
During the period January 14-15, bitter cold temperatures accompanied by strong winds produced extremely uncomfortable conditions. Heavy demand for electricity caused widespread power outages in several areas of New Brunswick, and in Nova Scotia a new 24-hour record for power consumption was set.

At least 3 major storms producing rain, snow and freezing rain crossed the east coast during January. However, precipitation remained below normal throughout the Maritimes. Snowfall was below normal, only northern New Brunswick and northern Labrador received above normal amounts. Nain, in northern Labrador, received a whopping 199 cm double the normal amount.

River runoff in all watersheds decreased from last month's value, and in Nova Scotia storage in six reservoirs decreased to 47% of the full rated capacity.



Mean geopotential height anomaly
50 kPa level (in decameter)



Mean geopotential heights
50 kPa level (in decameter)

50 kPa ATMOSPHERIC CIRCULATION

JANUARY 1988

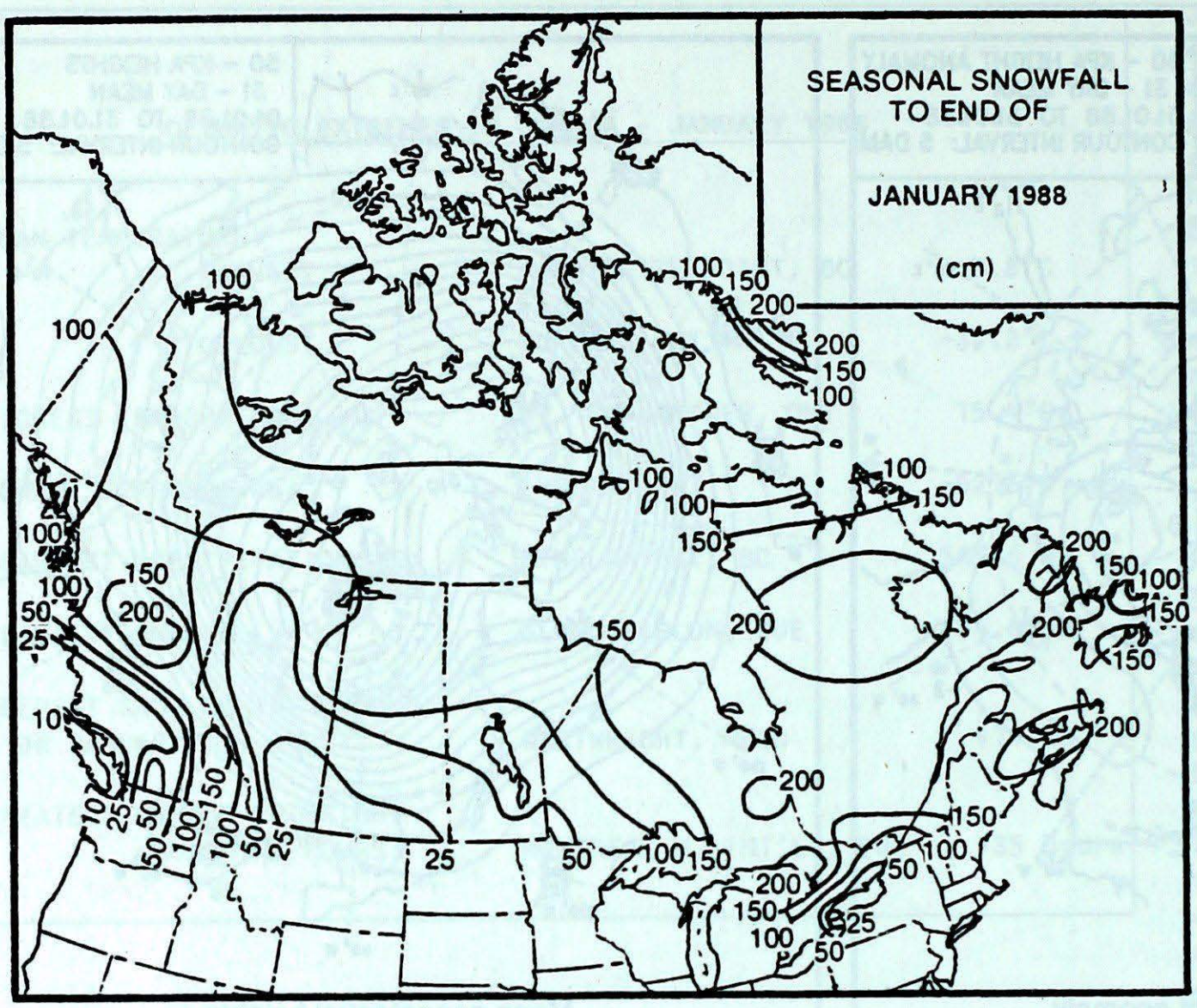
Amir Shabbar , Monitoring and Prediction Division

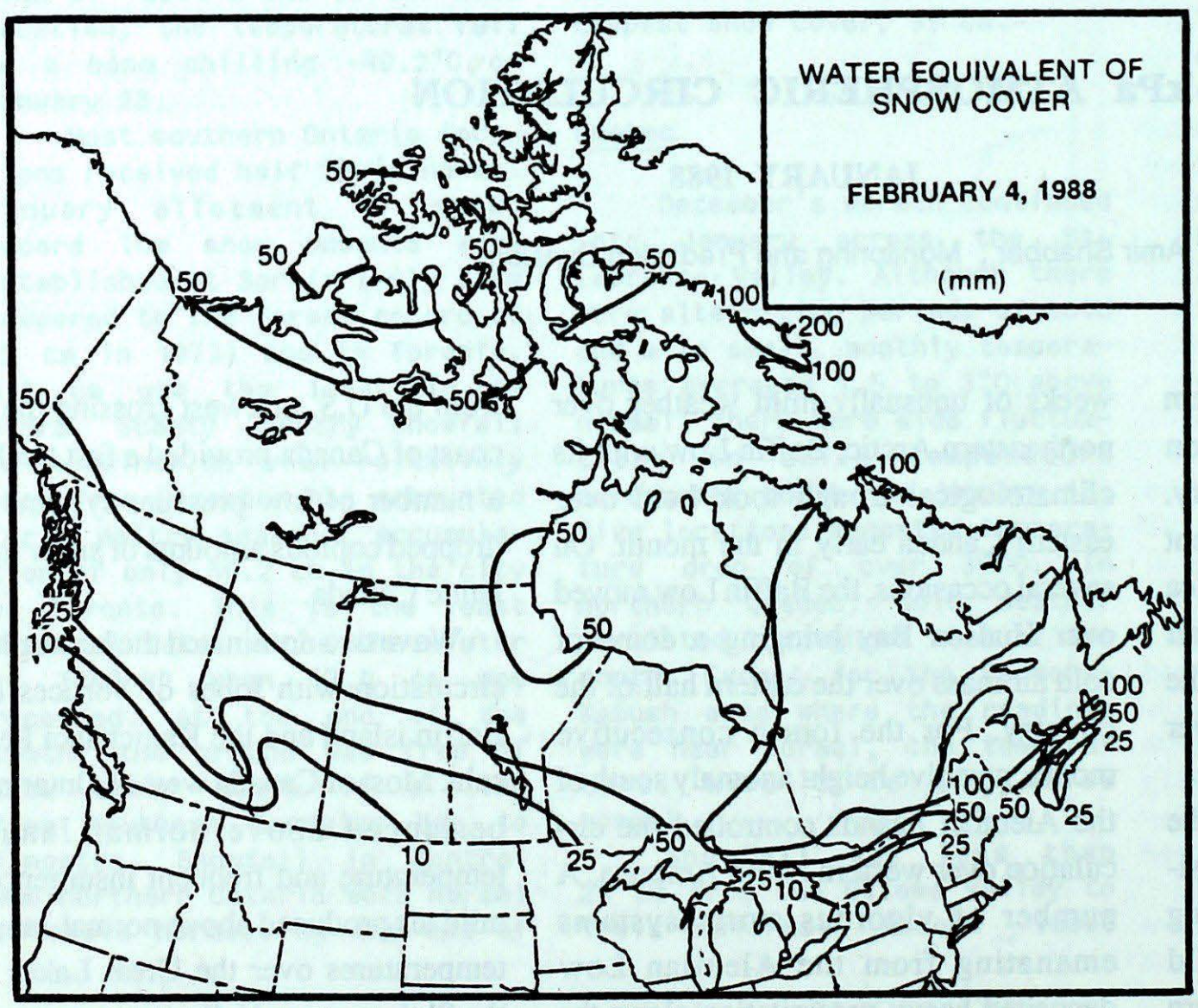
Highly transitory long wave pattern characterized the 50 kPa circulation across North America during January. During the first week, the establishment of a strong block over the Beaufort Sea triggered the deployment of very cold air over most of eastern Canada and the temperatures plummeted to -40°C over the central areas of the country.

However, towards the middle of the month the block and its associated positive anomaly weakened and a strong zonal flow pushed abnormally mild temperatures across most of the southern portions of the country. After many weeks of unusually mild weather over northeastern Arctic, Baffin Low with its climatological trough took hold over eastern Canada early in the month. On several occasions, the Baffin Low moved over Hudson Bay bringing a dome of cold air mass over the eastern half of the country. For the fourth consecutive month, negative height anomaly south of the Aleutian Islands controlled the circulation over western North America. A number of vigorous storm systems emanating from the Aleutian Low deposited heavy precipitation along the B.C. west coast. A strong ribbon of air from the U.S. midwest crossing the east coast of Canada provided a fast track for a number of low pressure systems that dropped copious amounts of snow in Atlantic Canada.

Wave two dominated the hemispheric circulation with lobes of vortices over Baffin island and the Kamchatka Peninsula. Most of Canada west of Ontario experienced above normal January temperature and frequent insurgence of mild air produced above normal January temperatures over the Great Lakes and the St. Lawrence Valley.

SNOWFALL



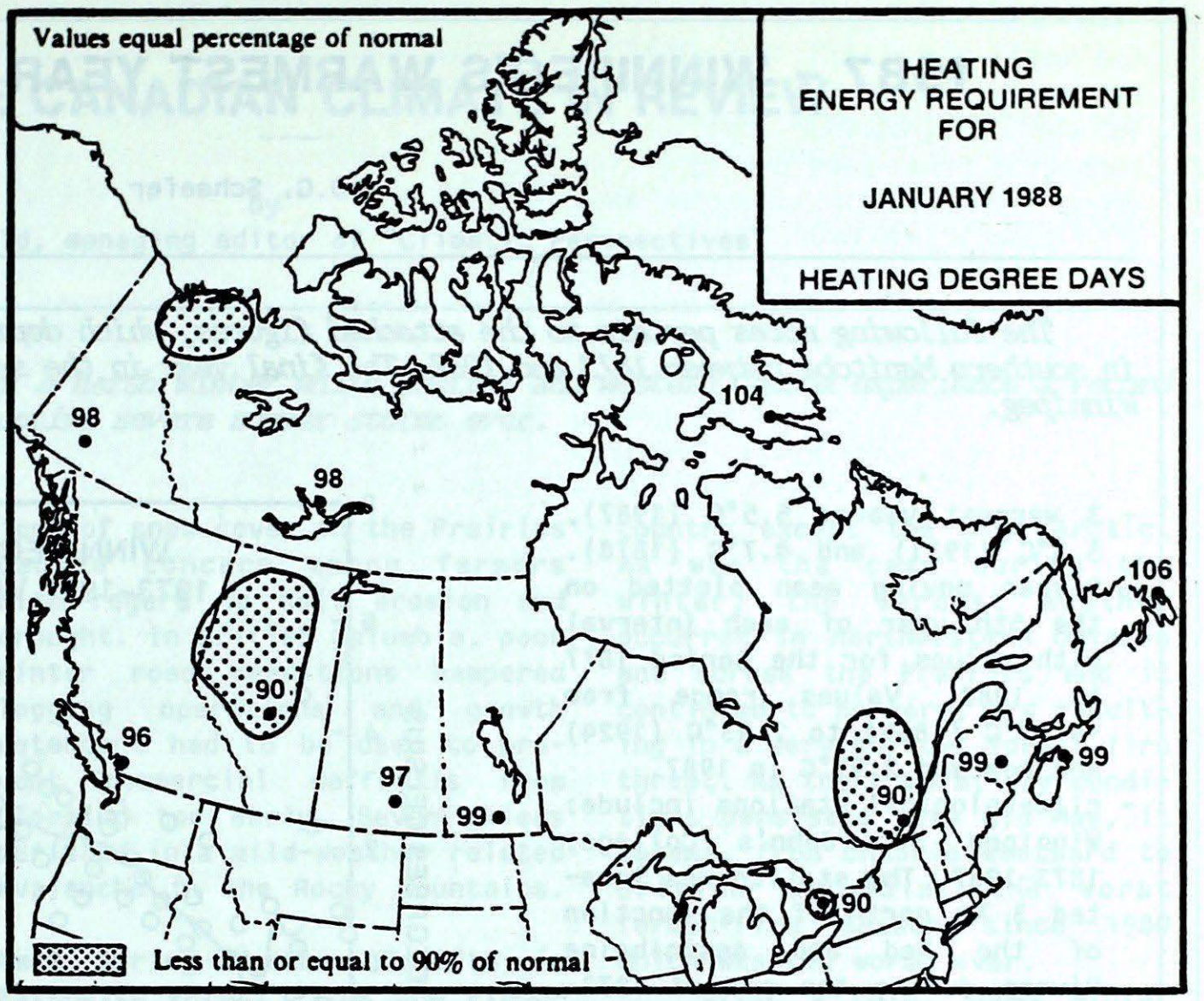


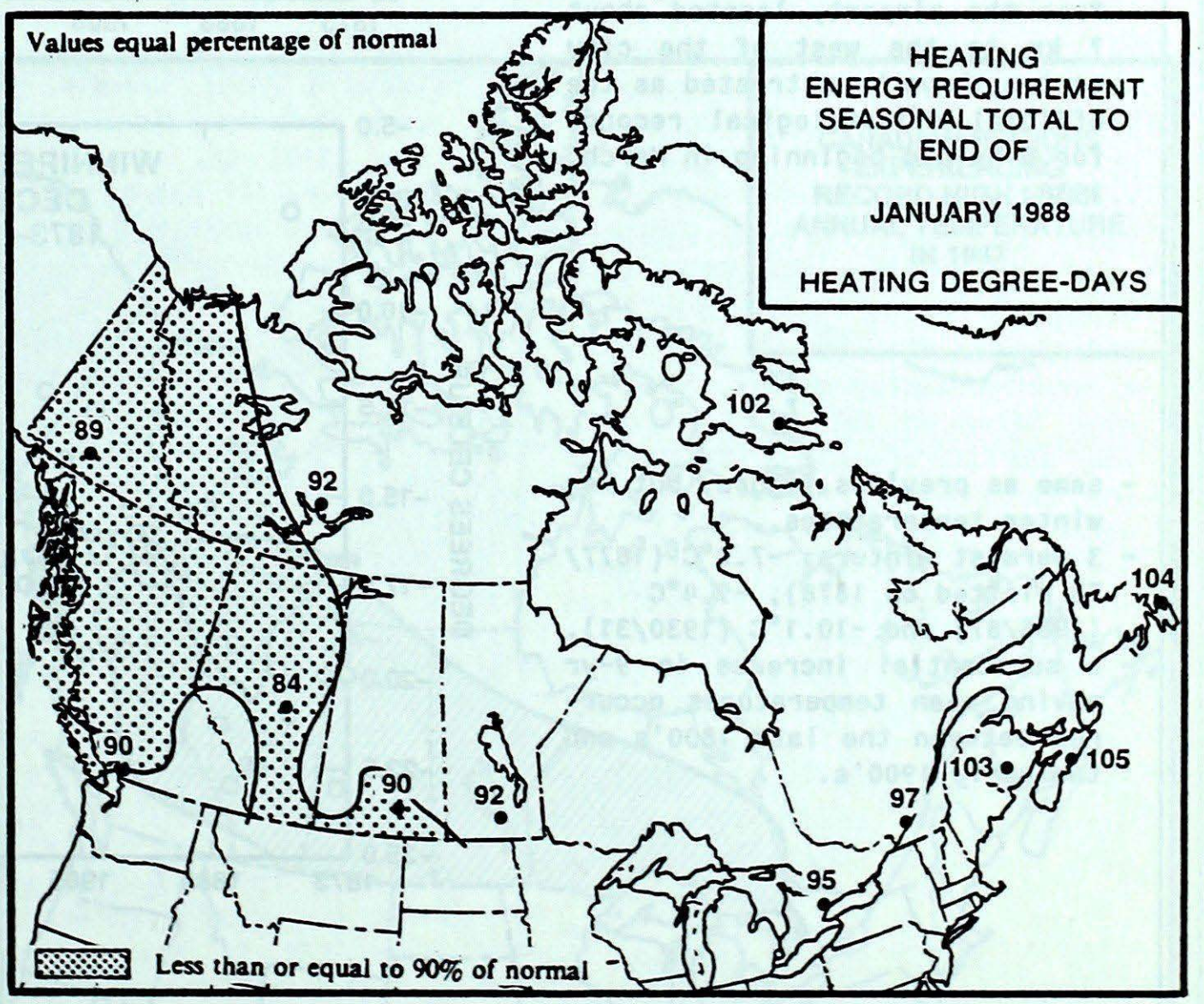
SEASONAL SNOWFALL TOTALS (CM)
TO END OF JANUARY

	1988	1987	NORMAL
YUKON TERRITORY			
Whitehorse	69.9	80.4	90.7
NORTHWEST TERRITORIES			
Cape Dyer	260.6	357.2	383.6
Inuvik	115.4	107.8	117.3
Yellowknife	131.6	77.8	94.2
BRITISH COLUMBIA			
Kamloops	20.9	49.3	74.0
Port Hardy	7.8	4.8	49.3
Prince George	121.6	111.1	164.0
Vancouver	9.0	0.2	46.0
Victoria	2.4	0.0	35.4
ALBERTA			
Calgary	20.6	31.7	77.3
Edmonton Namao	26.2	41.9	78.2
Grande Prairie	68.7	47.2	114.7
SASKATCHEWAN			
Estevan	18.8	30.8	63.1
Regina	27.0	97.8	65.0
Saskatoon	30.7	34.6	64.7
MANITOBA			
Brandon	31.7	31.5	64.0
Churchill	77.5	115.5	117.0
The Pas	82.9	77.9	95.6
Winnipeg	31.7	65.3	71.7
ONTARIO			
Kapuskasing	190.4	187.4	193.4
London	104.3	119.0	132.6
Ottawa	117.8	110.2	132.0
Sudbury	180.4	144.6	149.6
Thunder Bay	74.5	81.0	127.7
Toronto	24.0	87.2	74.8
Windsor	60.8	83.7	70.4
QUEBEC			
Baie Comeau	160.4	213.2	203.2
Montréal	81.8	135.9	134.4
Quebec	151.8	165.0	201.9
Sept-Iles	136.4	189.7	243.9
Sherbrooke	173.5	191.6	179.8
Val-d'Or	177.8	193.2	187.3
NEW BRUNSWICK			
Charlo	195.9	197.2	219.1
Fredericton	155.8	179.6	155.9
Moncton	227.7	*	174.6
NOVA SCOTIA			
Shearwater	134.4	124.1	92.9
Sydney	200.4	194.9	154.7
Yarmouth	112.4	139.8	114.2
PRINCE EDWARD ISLAND			
Charlottetown	222.7	158.7	173.8
NEWFOUNDLAND			
Gander	188.4	355.2	193.7
St. John's	171.0	246.9	172.1

SEASONAL TOTAL OF HEATING DEGREE-DAYS TO END OF JANUARY

	1988	1987	NORMAL
BRITISH COLUMBIA			
Kamloops	2042	2123	2315
Penticton	1921	2028	2094
Prince George	2895	2921	3243
Vancouver	1549	1583	1716
Victoria	1655	1688	1748
YUKON TERRITORY			
Whitehorse	3673	3595	4145
NORTHWEST TERRITORIES			
Frobisher Bay	5378	5875	5299
Inuvik	5169	5486	5722
Yellowknife	4429	4464	4823
ALBERTA			
Calgary	2670	2695	3079
Edmonton Mun	2762	2874	3306
Grande Prairie	3060	3245	3637
SASKATCHEWAN			
Estevan	2849	2849	3201
Regina	3081	3132	3416
Saskatoon	3195	3208	3537
MANITOBA			
Brandon	3265	3375	3469
Churchill	4769	4980	4901
The Pas	3661	3679	3842
Winnipeg	3096	3266	3372
ONTARIO			
Kapuskasing	3483	3585	3592
London	2132	2232	2240
Ottawa	2530	2616	2641
Sudbury	2862	2956	3044
Thunder Bay	3068	3127	3226
Toronto	2121	2228	2241
Windsor	1928	1934	2000
QUÉBEC			
Baie Comeau	3248	3516	3249
Montréal	2431	2578	2502
Quebec	2831	3002	2833
Sept-Iles	3331	3658	3376
Sherbrooke	2796	2942	2932
Val-d'Or	3349	3502	3457
NEW BRUNSWICK			
Charlo	2950	3251	2835
Fredericton	2682	2899	2596
Moncton	2594	2851	2523
NOVA SCOTIA			
Halifax	2179	2338	2084
Sydney	2317	2609	2216
Yarmouth	2120	2251	2069
PRINCE EDWARD ISLAND			
Charlottetown	2445	2704	2364
NEWFOUNDLAND			
Gander	2701	3017	2603
St. John's	2516	2811	2418





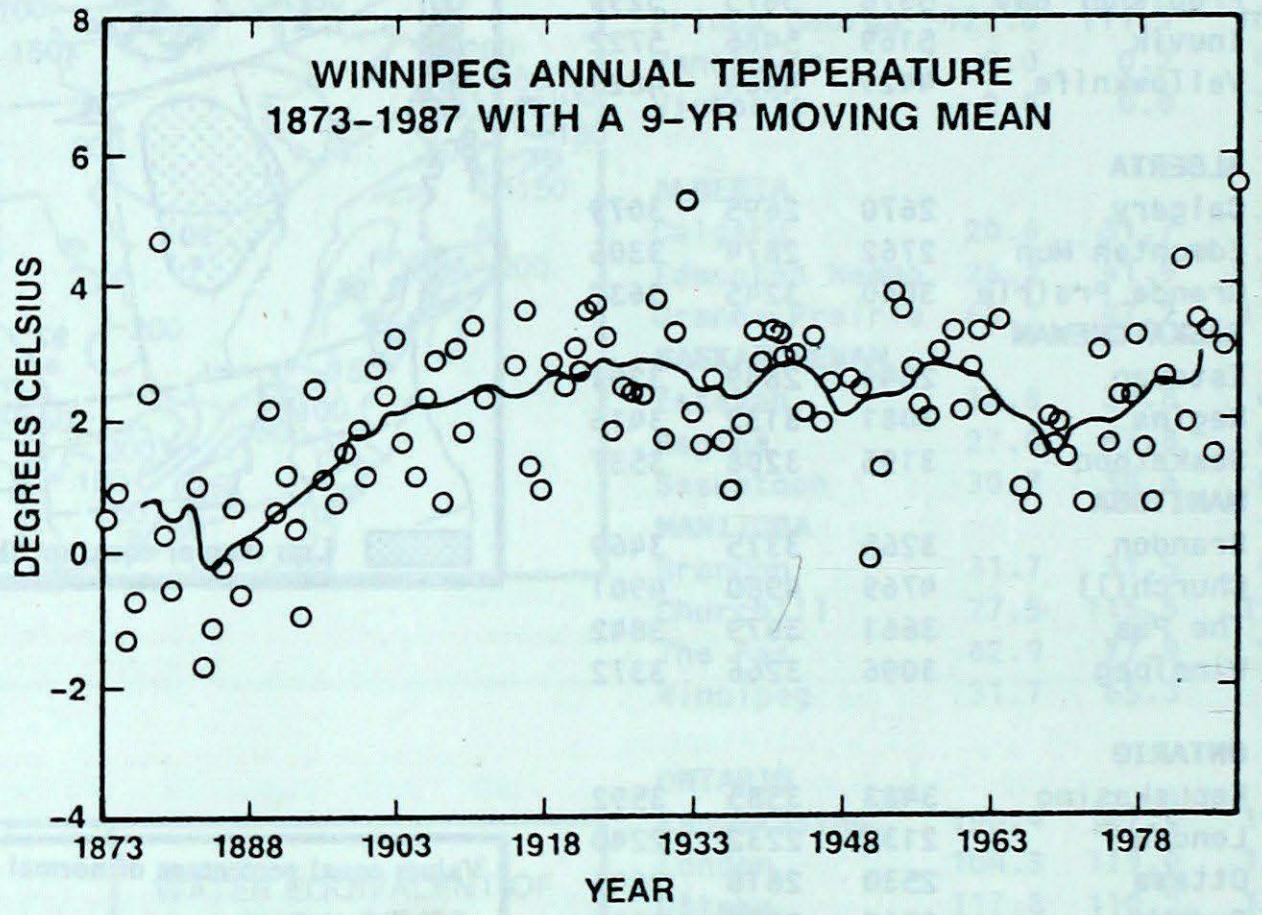
FEATURE

1987 - WINNIPEG'S WARMEST YEAR IN PERSPECTIVE

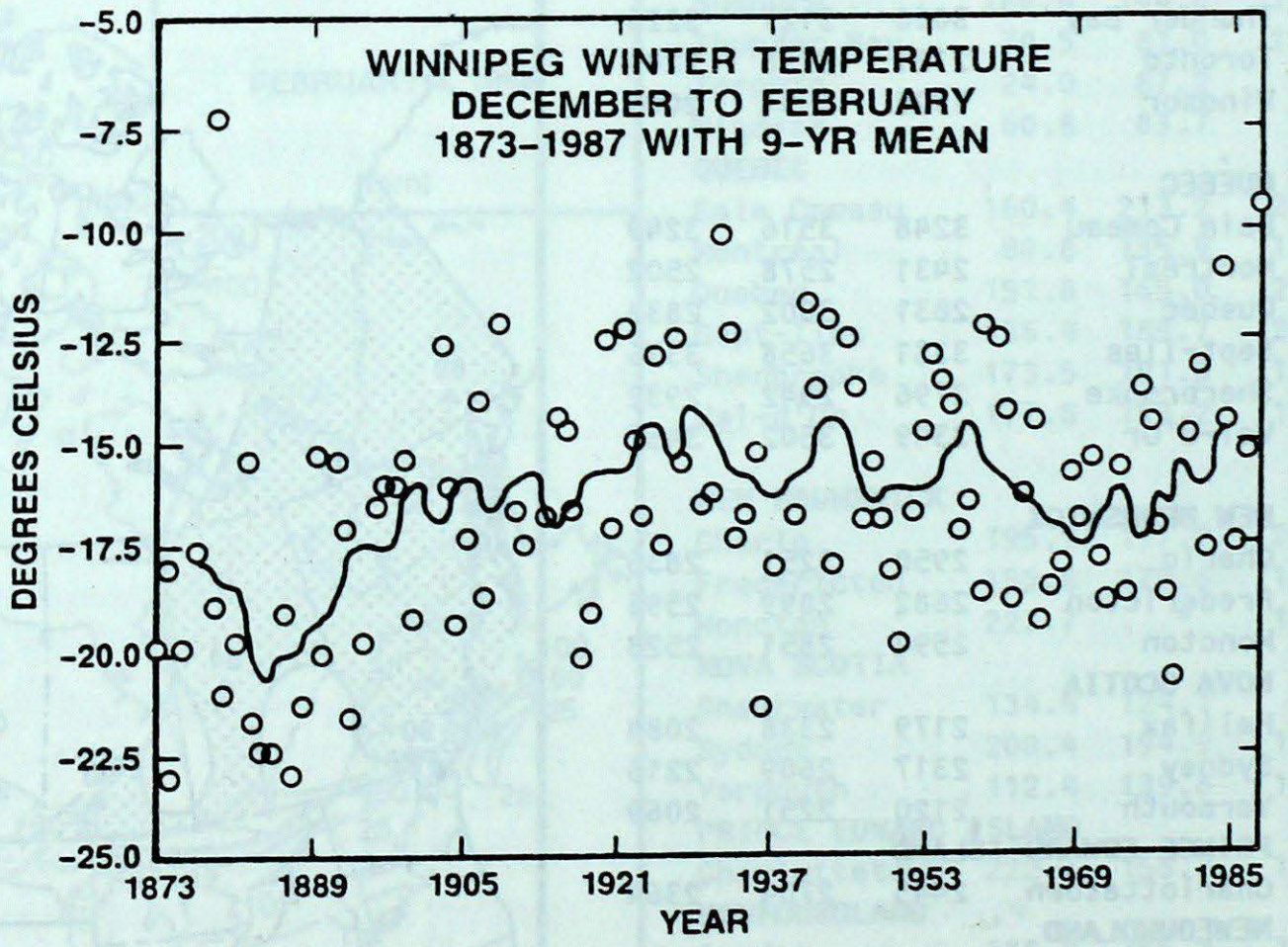
D.G. Schaefer

The following notes pertain to the attached figures, which depict aspects of temperature records taken in southern Manitoba between 1873 and 1987. The final year in the series was the warmest on record for Winnipeg.

- 3 warmest years: 5.5°C (1987), 5.3°C (1931) and 4.7°C (1878).
- 9-year moving mean plotted on the 5th year of each interval with values for the period 1877 to 1982. Values range from -0.19°C (1884) to 2.93°C (1924) and reached 2.91°C in 1987.
- climatological stations include: Winnipeg St. John's College, 1873-1937. The station was located 3 km north of the junction of the Red and Assiniboine Rivers during the period 1873-1932. In 1932 it was moved to the campus of the University of Manitoba about 8 km south of the city centre. Winnipeg Int'l Airport, 1938-1987. Observation from the airport, located about 7 km to the west of the city centre, have been treated as the official climatological records for Winnipeg beginning in March, 1938.



- same as previous figure, but for winter temperatures.
- 3 warmest winters: -7.2°C (1877/78 plotted on 1878), -9.4°C (1986/87) and -10.1°C (1930/31).
- a substantial increase in 9-yr moving mean temperatures occurred between the late 1800's and the early 1900's.



1987 - THE CANADIAN CLIMATE IN REVIEW

by
P.R. Scholefield, managing editor of "Climatic Perspectives"

Atlantic Canada struggles through a harsh winter while central and western Canada experience a record warm year with some of the most destructive severe summer storms ever.

Severe Winter in Atlantic Canada

A series of severe winter storms battered the Atlantic provinces in January causing major disruptions in air, sea and ground transportation, frequent closures of businesses and schools, and several widespread power outages. One of the worst storms occurred on the last day of the month and was responsible for at least 4 highway accident deaths in New Brunswick. Moncton became paralyzed under a 67.4 cm snowfall and Prince Edward Island became virtually isolated as air, land and sea transportation services were cancelled. Newfoundland took the brunt of winter storms in February as most areas received in excess of 100 cm of snow during the month. There were the usual school and business closures as snow drifts reached heights of 6 - 10 metres in some locations. A late-winter storm in mid March caused at least 8 deaths on the highways of New Brunswick where conditions were the worst in recent memory. The same storm produced flooding and power outages in St. John's Newfoundland and strong easterly winds piled up ice along the Atlantic coast, immobilizing ship traffic.

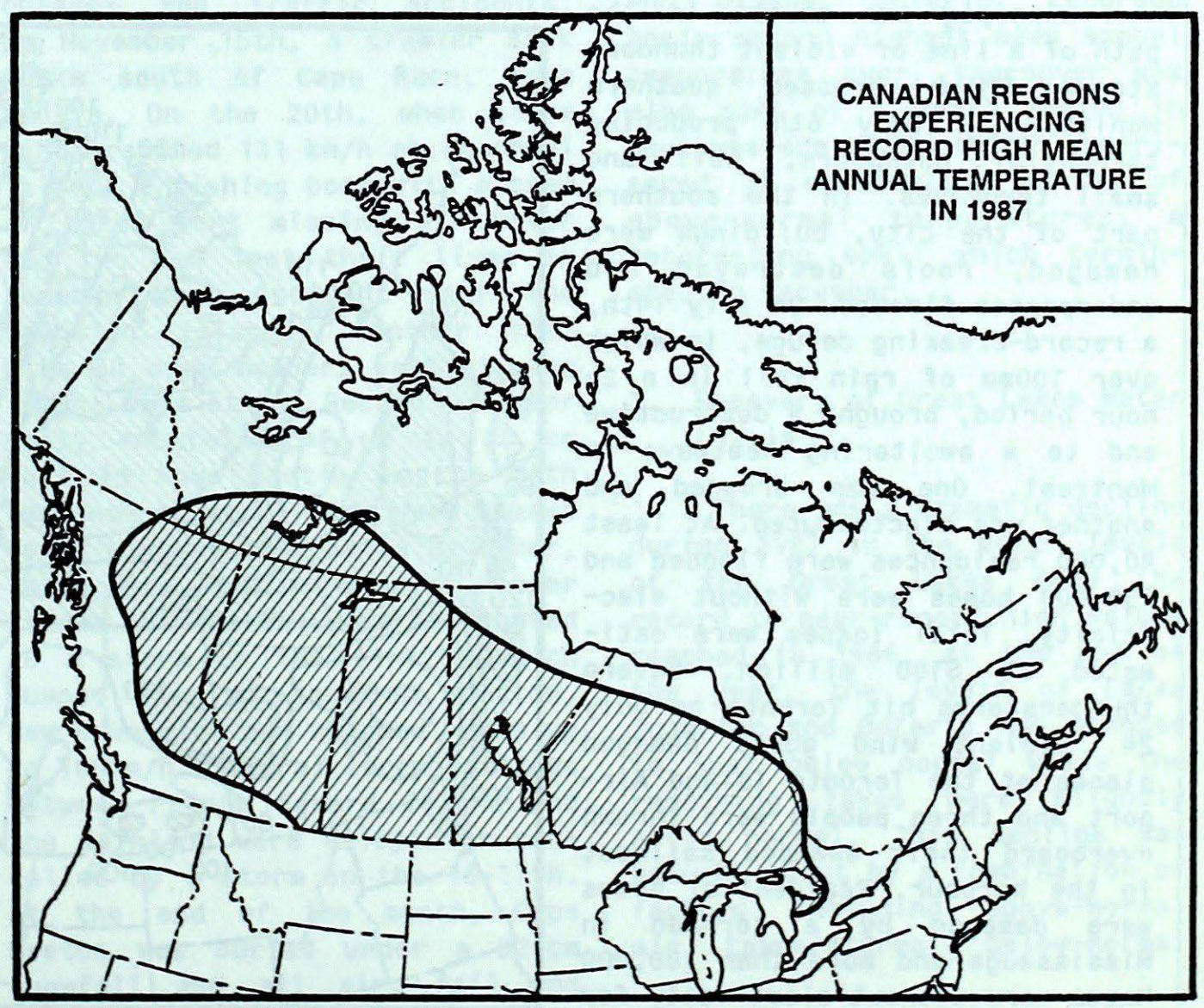
A Mild Winter Over Central and Western Canada

An extraordinary winter-long mild spell engulfed all of the country west of the St. Lawrence River Valley and produced some record mild temperatures across the Prairies. Benefits included reduced interior heating costs and pleasant weather for outdoor winter recreation. The associated lack of snow cover on the Prairies caused concern among farmers with regard to soil erosion and drought. In British Columbia, poor winter road conditions hampered logging operations and growth retardent had to be used to prevent commercial daffodils from blooming too early. Seven skiers perished in a mild-weather related avalanche in the Rocky Mountains.

Warm Spring Weather Results in Extensive Forest Fires and Flooding

Unusually warm April and May weather with some summer-like temperatures affected the whole country except the high Arctic. As was the case during the winter, the warmest weather occurred in northwestern Ontario and across the Prairies and it continued to be very, dry resulting in a very serious forest fire threat. As these warm, dry conditions persisted into mid May, it became, from Ontario westward to British Columbia, the worst forest-fire season since 1980 which was the worst ever.

After a cold, snowy winter in Atlantic Canada, the sudden spring warmth of early April combined with some heavy rains brought on some disastrous flooding. The flooding on the Saint



CANADIAN REGIONS EXPERIENCING RECORD HIGH MEAN ANNUAL TEMPERATURE IN 1987

FEATURE

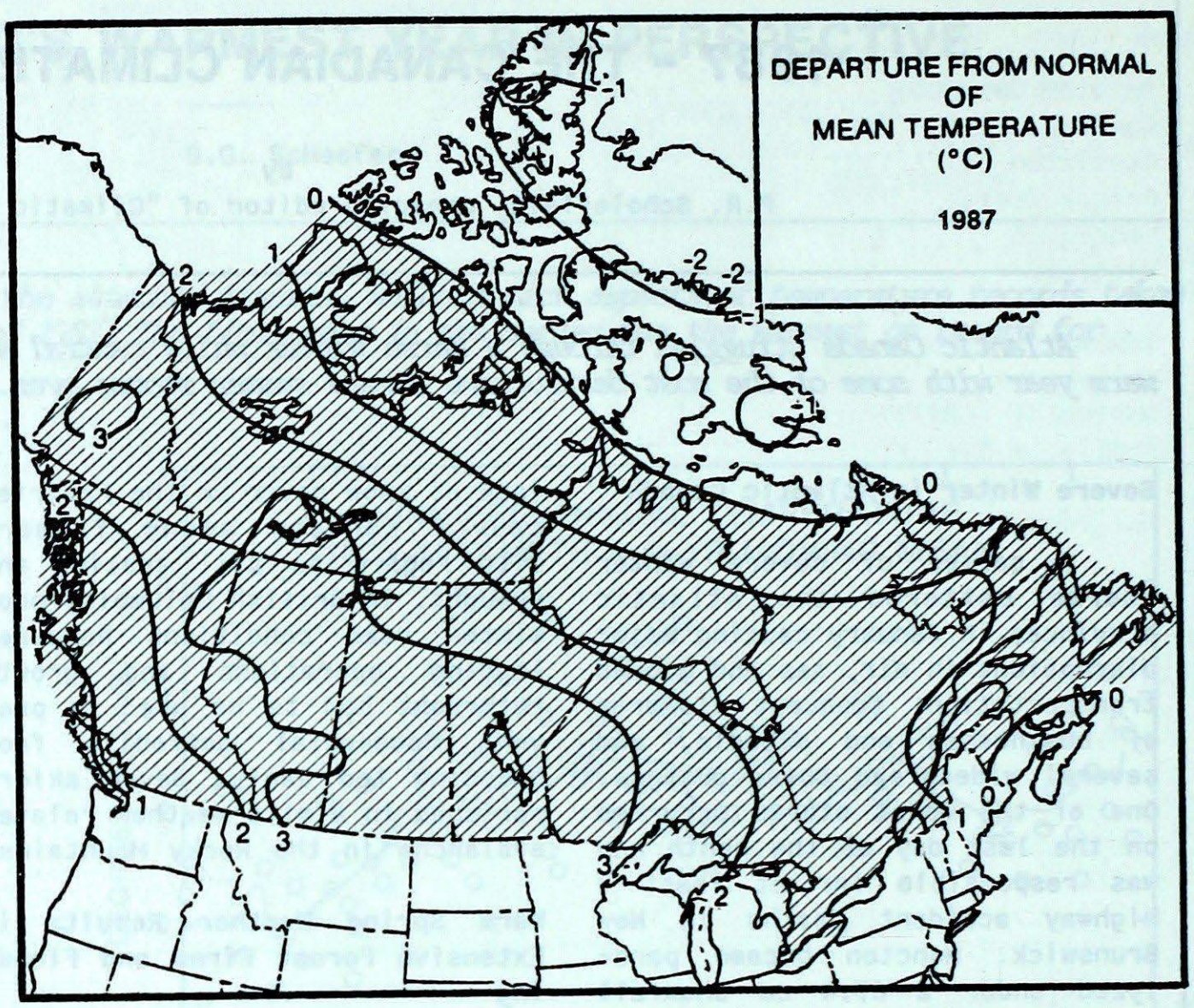
John River in New Brunswick was the worst since 1973. Thousands of residents had to flee their homes in the Perth-Andover area as the rampaging river sent chunks of ice through the streets, sweeping away the town's railway bridge. In southeastern Quebec, flooding forced the evacuation of 450 residents, 2,000 people were without electricity and ice destroyed three spans of a railway bridge over the Ste. Anne River. Property damage from these floods was estimated to be in the millions of dollars.

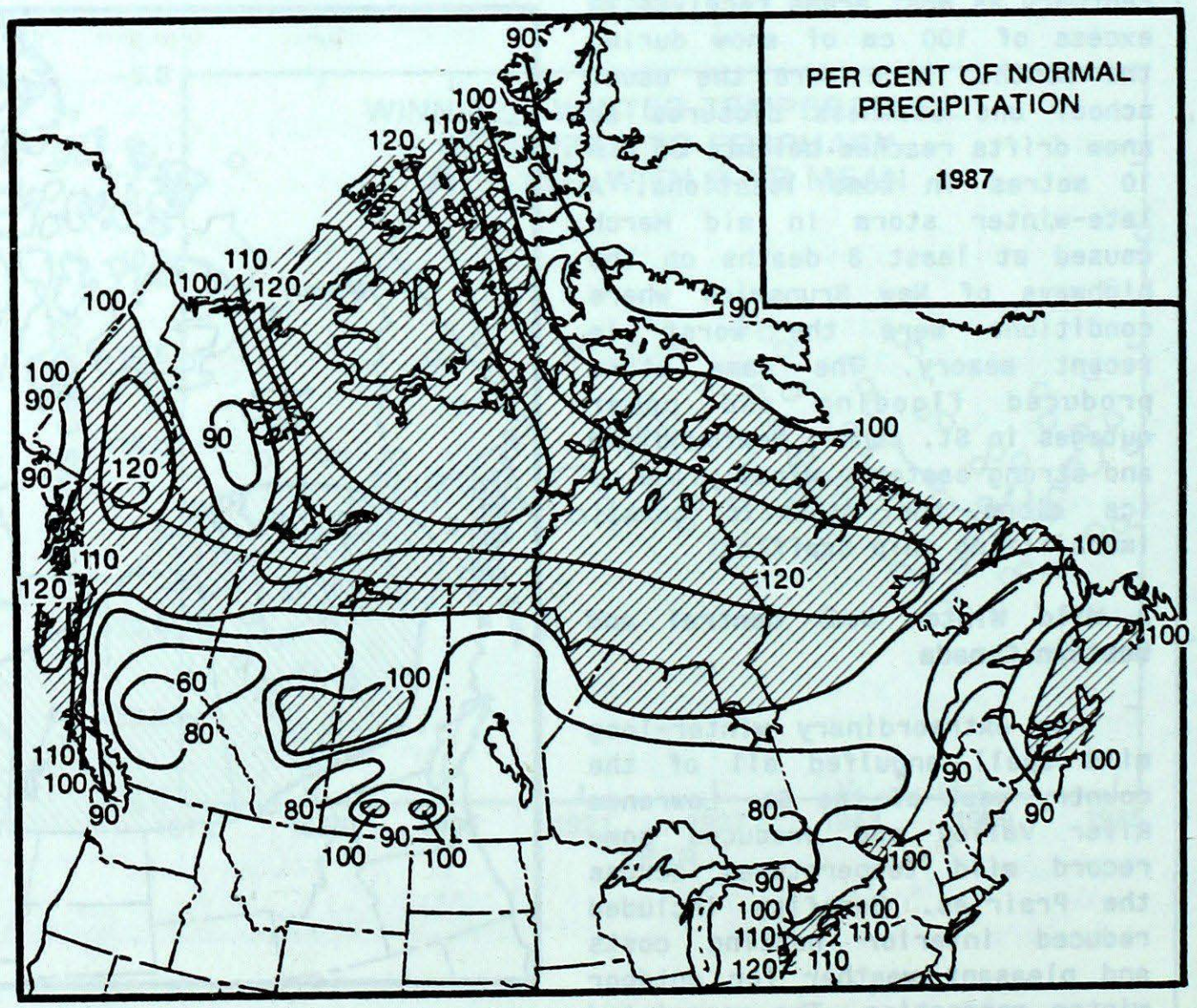
Freak May Snowstorm in Central Alberta

Numerous snowfalls near 20 cm occurred in central Alberta during a 48-hour period from May 18-20. It was Edmonton's second largest May snowfall. There were widespread electricity outages as the heavy wet snow toppled trees and weighted down hydro and telephone lines.

Severe Weather Disasters Strike Four of Canada's Largest Cities in July

Winnipeg was caught in the path of a line of violent thunderstorms which crossed southern Manitoba on July 6th producing torrential downpours, hail and small tornadoes. In the southern part of the city, buildings were damaged, roofs destroyed and underpasses flooded. On July 14th, a record-breaking deluge, in which over 100mm of rain fell in a 2-hour period, brought a destructive end to a sweltering heatwave in Montreal. One man drowned and another was electrocuted. At least 40,000 residences were flooded and 350,000 homes were without electricity. Total losses were estimated at $100 million. Severe thunderstorms hit Toronto on July 24. Violent wind gusts damaged planes at the Toronto Island Airport and three people were thrown overboard their swamped sailboat in the harbour. Residential homes were damaged by a tornado in Mississauga and more than 100,000 homes were without electricity for up to two days. In Edmonton on July 31, 27 people were killed in





Canada's second worst tornado disaster ever which was also the third worst natural disaster in the country's history. It was also the most costly disaster ever with damages estimated at $250 million.

Summer Drought on the East Coast

July was unusually warm and dry in Atlantic Canada, particlarly in Newfoundland where salmon rivers had to be closed to fisherman because of low water levels and high forest fire hazards shut down most forestry operations, affecting 1500 workers. August rains brought relief to Newfoundland, but it continued to be hot and dry in the Maritimes. The potatoe crop was under stress in Prince Edward Island and, in Nova Scotia, there was a ban on woods travel and on fishing in some rivers.

Severe Flooding Affects Prairie Provinces in Late July - Early August

Marengo, Saskatchewan and an area to the northeast of town received up to 152 mm of rain over a period of about two hours on the evening of July 28th. There was extensive flood damage to the town and some farms in the surrounding area suffered crop damage. Some of the worst flooding in recent memory occurred on the Smoky, Wapiti and Simonette Rivers near Grande Prairie, Alberta when in excess of 300mm of rain fell in a 3-day period, beginning on July 31st. Flood damage was estimated at $5 million. A large area of southern Manitoba was inundated with excessive rainfalls on August 14. More than 200 mm of rain fell in the districts near Killarney, causing extensive flood damage to the town and nearby farms.

Prolonged Southern B.C. Drought Delays Onset of Autumn Rainy Season

Warm, dry weather in June over southern B.C. set the stage for the development of serious drought conditions later in the summer. By the end of the month the forest fire hazard was serious and 2,000 hectares had been burned in a major fire near Penticton. July rains brought relief to some areas, however only scant precipitation fell over southern British Columbia from mid August until the rainy season finally arrived over one month late at the middle of November. Wells dried up on the south coast and Vancouver's mountain-fed water reservoirs became dangerously depleted. Lakes and water levels in the interior were so low that there was a serious threat of a disastrous winter kill of fish and water had to be transported to the ranges to feed livestock. The fishing industry was also threatened as low water levels in streams hampered salmon spawning.

Winter Comes on Strong Again in Atlantic Canada

Winter 1987/88 started off as a repeat of last winter as central and western Canada basked in pleasantly mild weather while the east coast was lashed by fierce storms. Several fatal accidents at sea were reported along with accounts of numerous power outages and traffic accidents. On November 15th, a trawler sank 400km south of Cape Race, Nova Scotia. On the 20th, when storm winds reached 131 km/h at St. Paul Island, a fishing boat with a crew of three went missing off Dover and two men lost their lives in another boat incident near the Magdalen Islands. Another boat with 34 crew members went missing in the same storm. Record November daily snowfalls of up to 28 cm fell in Nova Scotia on the 26th and snow-covered roads were blamed for 8 highway deaths. In December, there were four more major winter storms. Six deaths were attributed to a storm on the 11-12th which dumped 35cm of snow on Moncton, New Brunswick and whipped winds up to 100km/h. Several ferry sailings between Prince Edward Island and the mainland were delayed or cancelled by a storm on the 16-17th. At the end of the month, Cape Breton was buried under a 52-cm snowfall and all air, rail and road transportation came to a halt.

Extraordinary Climatological Events

1. Record High Mean Annual Temperatures

Mild weather in November and December, combined with the record period of above-normal temperatures earlier during the first half of the year, pushed the mean annual temperatures to an all-time record high value at many locations covering a vast area from the upper Great Lakes Basin west-northwestward to B.C. and the southern District of Mackenzie (see map on page 9B). A selection of the major centres where record mean annual temperatures were set or equalled (indicated by an *) are as follows:

Yellowknife	: -2.2°C
Prince George	: 6.7°C
Edmonton	: 6.2*
Calgary	: 6.7°C
Regina	: 5.7*
Saskatoon	: 5.1°C
Winnipeg	: 5.5°C
Kenora	: 5.4°C
Thunder Bay	: 4.7°C

Vancouver, B.C. and Toronto and Ottawa, Ontario, recorded their second highest mean annual temperature ever. Vancouver was also part of a small region in southwestern B.C. which experienced 16 consecutive months of above-normal temperatures, a record-long spell which terminated in December.

2. Recovery of Great Lakes Water Levels

There was a dramatic decline during 1987 in the water levels of the Great Lakes from the record to near-record high values reached in 1986. At the end of the year, the levels of Lakes Superior and Ontario had dropped to just below normal while the remaining lakes were slightly above normal. This decline was brought about by a combination of factors including above-normal air temperatures, below-normal

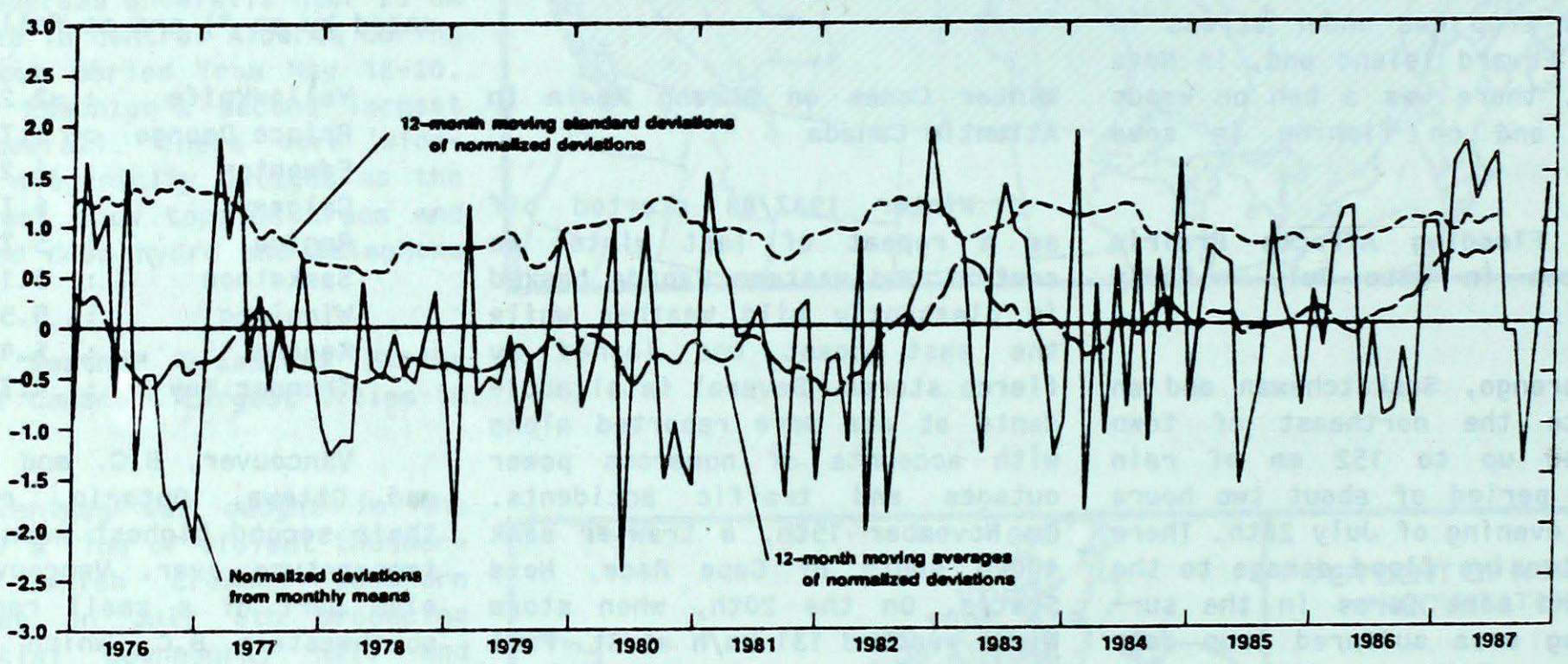
FEATURE

ice cover, below-normal precipitation and an exceptionally sunny late winter and spring. Also contributing to the high evaporation rate was the fact that most of the lakes attained new monthly mean record temperatures in June and July.

3. Annual Snowfall Records in New Brunswick

Despite abundant snowfalls throughout Atlantic Canada in 1987, only Moncton, New Brunswick set a new annual snowfall record which was 537.5 cm. In contrast, 250 km to the north-northwest at Charlo, only 232 cm fell which was a record low amount for the year.

TIME SERIES ANALYSIS OF STANDARDIZED DEPARTURES FROM MONTHLY MEAN TEMPERATURES AT TORONTO (BLOOR STREET)



JANUARY 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	2.6	1.0	12.9	-8.7	6.9	21	110.8	52	0	15	67	98	475.9
ALERT BAY	3.9	1.1	9.4	-4.2	4.6	13	170.0	87	1	17	X		437.0
AMPHITRITE POINT	5.8	1.1	11.1	-1.5			352.0	86	0	20	X		337.7
BLUE RIVER	-10.5	0.2	2.5	-30.4	72.1	73	62.2	73	58	13	63	135	MSG
BULL HARBOUR	4.3	1.1	10.2	-4.7	5.6	22	236.2	97	0	19	X		423.7
CAPE SCOTT	5.2	1.1	10.5	-1.7	7.6	33	286.4	93	0	19	X		397.9
CAPE ST.JAMES	5.5	1.6	9.0	-1.1	7.4	45	172.0	106		20	52	*	389.1
CASTLEGAR	-3.2	0.6	6.1	-12.3	37.3	44	47.4	56	10	8	54	120	656.2
COMOX	3.2	1.0	11.1	-6.3	0.4	0	136.5	70	0	13	X		458.6
CRANBROOK	-7.4	1.2	8.5	-26.2	19.1	39	18.7	38	3	3	90	*	852.3
DEASE LAKE													
ETHELDA BAY	2.7	0.8	8.7	-8.0	8.0	15	545.6	165	0	19	X		MSG
FORT NELSON	-20.0	3.8	5.8	-37.3	29.2	93	19.5	78	42	4	70	*	1128.7
FORT ST.JOHN	-14.3	3.4	4.6	-33.4	58.9	154	40.2	112	38	7	X		997.5
HOPE	0.3	0.7	9.1	-10.7	22.3	27	227.0	88	9	14	12	71	544.5
KAMLOOPS	-4.3	1.8	13.0	-20.1	6.2	19	4.8	15	0	1	50	86	691.5
KELOWNA	-4.5	0.6	7.3	-20.7	17.2	56	15.6	50	6	6	43	97	698.3
LANGARA	3.4	1.1	10.5	-4.2	2.2	7	215.7	136	1	23	X		453.2
LYTTON	-3.1	0.7	9.0	-16.9	15.0	26	42.7	55	2	8	63	101	651.2
MACKENZIE	-12.1	2.2	2.8	-40.5	130.8	162	106.0	120	105	15	33	59	930.2
MCINNES ISLAND	4.7	1.8	10.1	-4.8	13.9	38	302.2	108	4	20	X		411.6
PENTICTON	-1.6	1.1	8.1	-13.7	9.9	34	7.6	23	0	3	54	112	608.7
PORT ALBERNI	2.9	*	12.1	-4.0	3.2	*	266.8	*	0	14	33	*	467.5
PORT HARDY	3.7	1.3	9.3	-5.2	6.0	20	218.6	103	2	18	61	94	444.6
PRINCE GEORGE	-11.0	1.1	5.6	-37.9	66.2	108	50.8	88	36	11	47	79	899.5
PRINCE RUPERT	1.0	1.2	8.3	-10.7	29.5	59	261.4	114	8	20	56	116	527.3
PRINCETON	-8.1	-0.2	5.3	-28.5	29.0	52	22.1	40	31	6	77	*	MSG
QUESNEL	-9.6	1.5	8.0	-33.8	34.1	55	28.9	51	25	7	X		858.2
REVELSTOKE	-4.9	1.7	5.3	-17.9	86.7	59	77.2	63	37	13	32	72	710.2
SANDSPIT	3.8	1.8	9.7	-3.0	3.0	8	220.1	152	0	20	45	77	439.1
SMITHERS	-8.8	2.1	6.2	29.3	53.4	93	46.0	82	31	15	63	115	830.9
TERRACE	-4.7	1.2	4.6	-17.7	119.6	102	226.4	147	22	17	53	101	702.8
VANCOUVER HARBOUR	4.9	1.5	12.6	0.0	0.2	0	108.6	49	0	14	X		380.1
VANCOUVER INT'L	3.5	1.0	12.6	-6.5	3.0	11	93.6	60	0	14	67	125	451.1
VICTORIA GONZ. HTS	5.1	1.0	14.0	-2.9	0.0		52.2	47	0	8	85	124	389.3
VICTORIA INT'L	3.7	0.6	14.1	-5.1	1.4	7	88.3	57	0	10	75	117	444.6
VICTORIA MARINE	4.5	0.7	12.6	-2.2	0.5	4	127.2	56	0	15	X		418.5
WILLIAMS LAKE	-8.6	1.8	7.7	-29.3	8.8	17	3.8	8	2	2	62	89	824.5

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													
DAWSON	-27.3	*	-4.5	-43.5	18.9	*	18.9	*	52		X		
MAYO	-25.3	3.7	-1.3	-44.6	10.2	54	2.8	16	32	1	X		1341.6
WATSON LAKE	-23.2	3.5	1.4	-44.1	30.6	75	18.4	55	52	7	53	117	1276.4
WHITEHORSE	-18.5	2.2	2.0	-37.0	13.0	61	9.8	55	25	4			1128.2
NORTHWEST TERRITORIES													
ALERT	-32.3	-0.2	-16.7	-43.6	11.8	159	6.2	87	34	3	0		1559.0
BAKER LAKE	-34.2	-1.2	-18.2	-42.9	2.6	32	1.2	15	70	0	43	120	1619.9
CAMBRIDGE BAY	-32.4	1.2	-16.8	-41.3	2.8	52	2.4	50	25	1	10	909	1562.6
CAPE DYER	-26.4	-4.3	-14.7	-40.0	63.0	85	64.8	100	22	9	X		1376.4
CAPE PARRY	-24.4	4.4	-8.9	-36.3	9.2	93	7.3	102	11	3	X		1313.9
CLYDE	-30.5	-4.0	-20.4	-39.0	3.8	38	3.0	30	22	1	0		1503.4
COPPERMINE	-27.8	2.3	-8.1	-41.2	35.0	380	32.3	347	40	4	19	475	1419.1
CORAL HARBOUR	-32.0	-2.3	-16.4	-46.0	3.8	44	3.8	45	32	1	49	111	1550.7
EUREKA	-39.3	-2.9	-23.8	-52.6	3.6	112	3.6	124	13	1			1776.8
FORT RELIANCE	-29.8	-0.2	-9.7	-45.3	13.0	90	6.9	57	43	2	X		1480.4
FORT SIMPSON	-24.8	3.4	-5.3	-42.6	19.8	95	17.2	86	64	5	49	102	1327.4
FORT SMITH	-23.8	3.0	-7.2	-44.3	23.3	108	16.7	90	39	8	57	99	1313.3
IQALUIT	-28.2	-2.6	-13.9	-38.5	8.8	31	8.7	33	23	4	30	85	1430.9
HALL BEACH	-32.9	-1.9	-18.7	-44.2	2.6	29	2.6	29	30	0	X		1577.2
HAY RIVER	-24.0	1.8	-5.0	-43.3	21.2	94	20.2	97	28	9	X		1306.8
INUVIK	-26.6	3.0	-6.3	-42.1	8.0	39	5.5	30	43	2	15	205	1383.1
MOULD BAY	-30.7	2.8	-15.4	-46.8	9.2	278	7.4	274	17	2			1508.7
NORMAN WELLS	-26.1	2.8	-3.0	-40.0	22.6	109	16.8	86	20	6	30	101	1356.8
POND INLET	-33.7	-2.6	-18.2	-43.0	2.6	32	2.4	48	14	1	X		1601.9
RESOLUTE	-31.6	0.6	-21.0	-40.0	9.6	282	8.3	251	8	4	0		1536.7
YELLOWKNIFE	-27.4	1.4	-8.6	-46.8	21.3	137	17.5	131	37	4	68	154	1407.6
ALBERTA													
BANFF	-10.7	0.8	4.5	-34.0	26.0	58	24.6	64	29	5	X		
CALGARY INT'L	-8.5	3.3	10.4	-30.6	7.4	35	4.3	26	4	2	126	123	821.3
COLD LAKE	-17.5	1.5	3.0	-37.0	20.8	87	18.7	84	22	7	102	112	1102.2
CORONATION	-14.8	1.7	3.6	-34.6	10.8	42	7.1	33	12	4	128	107	1016.2
EDMONTON INT'L	-12.1	4.4	5.2	-30.5	5.6	19	5.9	24	5	2	111	113	931.5
EDMONTON MUNI.	-11.0	4.0	4.8	-29.6	4.6	16	5.2	21	2	2	111	123	900.2
EDMONTON NAMAO	-11.8	3.8	4.4	-30.7	10.0	40	6.5	26	2	2	X		925.4
EDSON	-12.1	3.3	7.4	-33.7	19.0	52	10.4	40	11	3	94	113	933.5
FORT CHIPEWYAN	-23.6	2.5	-4.0	-45.0	23.1	108	23.1	120	36		X		

JANUARY 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
FORT MCMURRAY	-19.4	2.4	1.2	-39.6	52.5	198	32.9	144	57	10	82	92	1160.6
GRANDE PRAIRIE	-13.6	4.1	6.1	-39.3	49.0	128	40.1	118	37	5	85	*	980.7
HIGH LEVEL	-20.4	4.2	2.3	-42.7	41.5	156	36.2	175	48	10	45	83	1192.3
JASPER	-11.1	1.7	4.0	-33.0	25.2	66	20.8	60	25	5	89	*	9014
LETHBRIDGE	-6.6	3.7	13.8	-27.9	9.8	34	8.0	33	1	1	119	124	762.5
MEDICINE HAT	-9.2	3.4	12.8	-29.3	5.8	22	5.6	24	1	3	133	143	841.3
PEACE RIVER	-14.8	5.6	5.6	-36.2	29.9	110	29.2	132	26	6	X		1018.9
RED DEER	-11.7	3.8	6.2	-34.9	8.2	33	7.7	32	7	3	X		923.3
ROCKY MTN HOUSE	-12.2	0.8	8.9	-33.1	7.4	24	2.8	10	2	1	X		937.5
SLAVE LAKE	-14.8	3.2	5.5	-42.0	30.8	93	28.2	102	27	7	79	94	1018.7
WHITECOURT	-12.7	3.9	6.2	-34.3	28.1	88	23.9	81	12	6	X		909.1
SASKATCHEWAN													
BROADVIEW	-16.3	2.6	4.9	-33.1	17.4	92	16.0	105	6	4	133	111	1063.3
COLLINS BAY	-26.9	-0.7	-9.2	-40.6	36.7	187	26.7	157	42	9	91	*	1392.0
CREE LAKE	-24.5	0.6	-6.0	-44.7	44.2	211	24.6	166	36	10	61	72	1316.6
ESTEVAN	-13.4	2.9	6.7	-32.0	15.4	75	10.6	55	3	3	132	108	972.3
HUDSON BAY	-21.1	0.2	-1.5	-41.1	22.6	89	14.2	72	24	7	88	*	1210.9
KINDERSLEY	-15.8	1.4	4.4	-34.5	12.2	67	8.2	47	12	3	X		1051.6
LA RONGE	-22.3	0.3	-3.7	-40.9	40.0	180	34.1	173	51	8	X		1248.7
MEADOW LAKE	-20.0	-0.5	1.9	-41.9	19.2	95	15.6	72	20	6	100	*	1177.4
MOOSE JAW	-13.4	2.4	7.6	-33.9	19.7	84	12.4	66	8	5	115	109	972.2
NIPAWIN	-20.6	*	-1.0	-38.5	27.5	*	16.3	*	30	7	100	*	1199.8
NORTH BATTLEFORD	-17.6	1.4	2.0	-35.3	12.6	57	8.9	44	12	4	X		1102.9
PRINCE ALBERT	-20.1	1.4	1.2	-40.0	18.2	100	14.5	87	24	5	98	102	1188.8
REGINA	-15.8	2.1	4.6	-36.4	17.4	87	11.6	69	10	4	101	101	1047.8
SASKATOON	-17.6	1.7	1.1	-35.6	15.9	79	12.6	70	13	7	X		1103.9
SWIFT CURRENT	-12.8	1.9	5.9	-34.1	13.9	62	13.3	63	4	3	107	116	954.6
WYNYARD	-18.0	1.0	4.7	-33.5	20.4	95	16.0	83	12	4	X 105	93	1116.3
YORKTON	-17.8	2.1	3.9	-33.4	18.7	77	14.3	62	14	8	106	98	1131.5
MANITOBA													
BRANDON	-17.7	2.0	2.7	-32.9	17.7	83	15.9	81	13	4	X		1098.5
CHURCHILL	-28.7	-1.2	-14.3	-38.6	14.6	86	11.0	71	20	4	117	145	1447.4
DAUPHIN	-18.4	1.1	2.2	-27.3	21.8	84	16.5	67	16	11	124	104	1127.4
GILLAM	-27.9	0.1	-14.4	-39.2	20.6	89	11.0	52	43	4	X		1417.9
GIMLI	-19.3	0.9	-1.4	-33.7	19.0	59	15.6	59	19	7	126	102	1158.3
ISLAND LAKE	-24.6	0.2	-7.9	-38.7	31.8	79	27.4	97	30	6	X		1321.9
LYNN LAKE	-27.3	-0.4	-10.5	-40.6	33.6	126	18.4	82	40	6	78	82	1404.8
NORWAY HOUSE	-24.0	*	-8.6	-39.1	25.4	*	20.6	*	31	9	X	*	1303.7
PORTAGE LA PRAIRIE	-17.1	1.2	3.0	-32.4	34.7	177	15.4	58	13		X		1089.4

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
THE PAS	-21.9	0.8	-6.5	-40.6	29.8	125	17.1	95	27	6	92	89	1239.1
THOMPSON	-26.4	0.2	-12.5	-38.3	31.7	125	26.9	123	29	9	89	94	1377.4
WINNIPEG INT'L	-18.2	1.1	1.0	-33.0	10.1	42	8.8	41	15	5	120	99	1123.7
ONTARIO													
ATIKOKAN	-18.9	-0.5	0.4	-37.8	35.0	77	25.2	81	28	7	95	87	1144.1
BIG TROUT LAKE	-25.4	-0.9	-7.4	-40.2	36.5	*	29.2	117	57	8	96	*	1345.7
EARLTON	-15.2	1.1	4.7	-35.6	49.5	86	60.7	107	39	11	X		1027.6
GERALDTON	-20.3	-0.3	1.7	-38.0	40.8	110	26.8	70	38	8	X		1186.6
GORE BAY	-8.3	1.8	6.4	-27.5	70.6	123	46.9	76	12	12	X		812.8
HAMILTON RBG	-4.3	0.7	14.2	-22.0	9.4	25	22.8	34	0	6	128	*	713.9
HAMILTON	-5.0	1.4	11.6	-21.3	24.4	61	28.5	45	0	9	X		713.9
KAPUSKASING	-18.7	-0.1	3.8	-35.8	65.6	118	57.7	107	78	11	X		1137.3
KENORA	-18.6	-0.1	-1.3	-34.4	24.0	76	24.1	85	35	7	X		1097.9
KINGSTON	-5.9	1.8	7.0	-26.5	20.8	40	25.4	36	0	10	92	91	740.1
LANSDOWNE HOUSE	-23.5	-0.8	-2.0	-41.1	32.6	90	28.3	94	39	7	X		1285.6
LONDON	-5.3	1.3	9.6	-19.6	21.6	39	34.5	45	0	9	90	127	721.0
MOOSONEE	-21.3	-0.9	2.8	-36.6	84.1	126	32.3	79	99	10	98	119	1220.1
MOUNT FOREST													
MUSKOKA	-9.5	0.9	7.1	-37.8	113.0	146	113.1	131	18	19	X		852.4
NORTH BAY	-10.8	2.2	5.5	-33.3	46.6	76	78.8	124	16	13	101	103	892.4
OTTAWA INT'L	-9.0	1.9	8.5	-29.4	23.4	46	36.8	60	10	10	115	*	835.9
PETAWAWA	-10.5	2.3	8.7	-36.8	37.0	79	48.4	103	16	10	X		883.5
PETERBOROUGH	-7.2	2.1	11.7	-28.6	27.9	79	41.2	93		10	X		780.7
PICKLE LAKE	-22.5	-1.1	-0.7	-38.6	44.0	104	36.3	95	50	8	X		1268.9
RED LAKE	-21.4	-0.4	-2.4	-39.2	20.8	66	16.7	58	38	6	119	*	1221.1
ST. CATHARINES	-3.2	1.1	15.4	-17.5	10.4	31	18.0	31	0	8	X		658.0
SARNIA	-4.7	1.0	9.8	-18.8	18.0	27	25.9	49	0	7	112	133	702.6
SAULT STE. MARIE	-10.3	-0.2	5.5	-28.4	91.0	119	77.4	104	14	15	98	128	879.2
SIMCOE											X		
SIOUX LOOKOUT											X		
SUDBURY	-12.2	1.5	4.1	-33.3	64.2	118	70.2	122	30	12	100	99	938.1
THUNDER BAY	-15.9	-0.5	3.3	-32.4	34.2	70	21.1	51	16	7	113	95	1050.8
TIMMINS	-17.2	0.1	5.1	-34.4	63.9	96	51.8	92	62	9	X		1092.7
TORONTO	-3.1	1.5	12.0	-21.9	13.4	36	30.0	49	0	6			654.2
TORONTO INT'L	-4.5	2.2	14.0	-23.7	4.8	14	21.5	42	0	6	X		698.8
TORONTO ISLAND	-3.3	-1.6	10.0	-21.3	6.4	20	32.0	57	0	8			659.4
TRENTON											X		
WATERLOO-WELL	-6.6	0.6	9.8	-22.9	22.8	56	43.9	78	0	9	X		761.1
WAWA	-14.8	*	4.0	-38.2	101.0	*	70.0	*	45	14		*	1017.7
WIARTON	-5.5	1.6	9.7	-22.6	108.5	106	68.6	70	2	17	58	85	749.6
WINDSOR	-4.5	0.4	9.9	-19.6	15.4	50	31.9	58	0	7	X		697.3

JANUARY 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	-13.3	2.5	5.2	-33.0	79.8	116	72.8	114	33	15	X		971.9
BAIE COMEAU	-12.2	1.5	1.8	-31.5	96.2	113	78.1	86	39	12	88	*	937.3
BLANC SABLON	-12.5	-2.1	0.1	-25.3	154.8	136	154.8	116	58	17	88	*	
CHIBOUGAMAU	-16.6	3.1	2.9	-38.4	74.4	95	65.3	90	65	17	76	87	1073.0
GASPE	-10.8	0.1	4.0	-25.9	116.0	123	126.2	119	60	9	86	*	893.5
INUKJUAK	-26.5	-2.0	-15.1	-39.3	5.4	54	5.4	55	36	3	92	176	1379.7
KUUJJUAQ	-28.2	-4.9	-10.1	-39.5	18.8	57	17.2	51	30	4	114	181	1444.3
KUUJJUARAPIK	-25.6	-3.1	-1.1	-43.2	29.2	108	25.4	98	26	6	94	131	1348.8
LA GRANDE RIVIERE	-24.4	*	-0.3	-39.9	36.6	*	30.8	*	47	9		*	1313.9
MANIWAKI	-11.2	2.3	7.2	-38.3	32.8	67	42.4	77	23	10	100	108	905.4
MATAGAMI	-18.6	1.5	4.2	-35.2	109.7	177	69.0	117	70	13	84	107	1134.0
MONT JOLI	-9.7	1.9	4.6	-27.4	89.2	102	87.0	99	32	16	74	90	858.8
MONTREAL INT'L	-8.1	2.1	10.8	-28.7	13.8	26	26.4	36	1	9	112	105	807.8
MONTREAL M INT'L	-10.8	*	9.4	-30.1	24.4	*	40.6	*	29	10	135	*	890.0
NATASHQUAN	-11.8	0.3	0.9	-30.1	94.8	137	78.8	86	41	12	80	73	922.7
QUEBEC	-11.6	0.5	2.8	-32.2	70.4	90	84.2	93	63	15	107	110	917.6
ROBERVAL	-12.6	3.2	6.1	-33.7	55.6	78	59.6	88	56	13	97	*	944.0
SCHEFFERVILLE	-26.5	-3.7	-1.4	-42.0	32.6	68	31.4	66	67	8	120	*	1368.5
SEPT-ILES	-13.2	0.8	1.4	-31.9	92.6	99	85.2	89	21	15	74	68	965.9
SHERBROOKE	-10.1	1.6	10.4	-31.4	48.0	77	53.2	74	29	12	96	*	871.3
STE AGATHE DES MONTS	-11.5	1.9	9.2	-33.4	69.4	84	71.6	76	58	17	103	107	915.5
ST-HUBERT	-8.1	2.0	8.7	-28.0	14.6	25	26.5	31	3	6			808.6
VAL D'OR	-15.1	1.7	5.0	-35.9	63.4	106	68.8	114	46	15	91	90	1027.9
NEW BRUNSWICK													
CHARLO	-12.0	-0.3	2.3	-27.3	119.3	142	48.0	46	84	11	111	94	929.7
CHATHAM	-10.0	-0.3	5.2	-26.4	70.0	105	79.2	80	42	11	117	102	869.6
FREDERICTON	-9.6	-0.4	6.0	-26.6	51.9	81	92.1	89	30	13	114	*	856.5
MONCTON	-8.4	-0.3	5.5	-26.8	45.9	58	60.5	48	13	10	125	116	818.2
SAINT JOHN	-8.1	-0.3	5.4	-29.4	42.4	55	95.7	64	12	12	127	119	808.4

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	-5.5	-0.5	11.5	-26.4	59.6	78	65.4	52	22	14	X		728.9
HALIFAX INT'L	-5.3	0.7	12.3	-23.8	49.8	78	109.8	71	8	9	*		720.5
SABLE ISLAND	-0.6	-0.7	11.6	-15.3	25.1	69	79.3	54	0	11	83	156	577.3
SHEARWATER	-4.2	-0.1	10.3	-21.5	38.7	84	105.3	73		9	129	113	688.5
SYDNEY	-5.7	-1.0	9.6	-18.4	67.1	90	118.5	79	6	11	105	122	734.7
YARMOUTH	-2.9	-0.2	9.4	-18.7	36.2	58	95.8	67	0	12	82	114	647.6
PRINCE EDWARD ISLAND													
CHARLOTTETOWN	-7.3	-0.2	7.3	-23.8	47.3	61	76.0	65	25	12	X		785.4
SUMMERSIDE	-7.2	0.0	4.6	-23.1	48.8	73	66.9	65	41	11	113	104	781.5
NEWFOUNDLAND													
BATTLE HARBOUR	-13.5	-3.9	0.6	-29.9	41.4	60	46.6	73	91	10	X		975.7
BONAVISTA	-4.8	-0.5	7.9	-19.2	26.2	51	40.2	44	15	5	X		707.6
BURGEO	-4.8	-0.7	6.4	-17.4	54.8	95	82.1	54	12	13	*		708.7
CARTWRIGHT	-14.6	-1.4	-1.0	-27.5	51.7	62	49.9	55	111	10	99	109	1011.6
CHURCHILL FALLS	-22.1	-1.8	-0.5	-35.7	56.4	65	50.0	58	95	11	113	113	1244.1
COMFORT COVE	-7.9	-1.5	4.6	-23.1	60.1	74	60.1	57	70	10	X		801.5
DANIEL'S HARBOUR	-7.1	-0.2	3.6	-21.9	51.3	57	44.3	44	7	11	8	14	778.1
DEER LAKE	-8.3	-0.2	5.5	-29.5	129.7	150	118.9	127	88	20	X		814.1
GANDER INT'L	-7.3	-1.1	6.4	-24.1	63.8	81	62.6	57	24	10	99	116	784.9
GOOSE	-18.4	-2.0	0.5	-31.4	100.1	125	78.2	105	62	13	93	105	1128.0
PORT-AUX-BASQUES	-4.4	-0.3	4.0	-18.4	101.8	138	126.6	95	24	21	52	*	671.6
ST ANTHONY	-11.0	0.3	0.5	-30.0	137.0	239	125.3	129	99	18	X		894.9
ST JOHN'S	-5.2	-1.3	10.2	-19.1	58.0	71	79.7	51	27	12	98	*	719.3
ST LAWRENCE	-4.3	-0.5	6.9	-15.5	73.3	144	112.3	95	27	16		*	
STEPHENVILLE	-5.5	-0.5	7.0	-18.8	94.3	99	105.0	91	40	23	41		728.3
WABUSH LAKE	-21.7	0.6	-0.4	-39.2	39.1	54	32.8	50	54	11	95		1232.0

AGROCLIMATOLOGICAL STATIONS — JANUARY 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	2.1	0.9	15.0	-8.0	8.1	143.2	62	1	16	45	7.0	7.0
KAMLOOPS												
SIDNEY	3.5	*	11.5	-3.5	0.0	77.5	*	0	10	65	5.3	5.3
SUMMERLAND	-2.3	0.9	8.5	-15.0	10.2	13.0	37	0	6	61	0.0	0.0
ALBERTA												
BEAVERLODGE	-12.0	3.9	6.0	-33.0	48.0	37.0	112	30	7	69	0.0	0.0
ELLERSLIE												
FORT VERMILLION												
LACOMBE	-12.0	3.5	5.5	-35.0	4.0	3.0	14		0	112	0.0	0.0
LETHBRIDGE												
VAUXHALL												
VEGREVILLE	-14.4	3.7	4.0	-33.0	4.5	1.2	7	3	4	N/A	0.0	0.0
SASKATCHEWAN												
INDIAN HEAD	-17.0	0.9	5.0	-36.0	27.2	20.2	96	17	5	N/A	0.0	0.0
MELFORT	-19.6	1.3	-1.0	-37.0	20.5	20.5	108	34	7	77	0.0	0.0
REGINA	*		1.5	-38.5	19.5	15.5	86	8	5	N/A	0.0	0.0
SASKATOON	-17.2	1.9	2.0	-37.0	14.6	14.6	65	8	6	108	0.0	0.0
SCOTT	-17.0	2.1	3.0	-38.0	15.3	11.6	69	9	5	106	0.0	0.0
SWIFT CURRENT SOUTH	-12.6	2.2	6.5	-33.5	7.5	6.5	39	2	2	105	0.0	0.0
MANITOBA												
BRANDON	-18.1	1.2	4.1	-34.8	15.4	15.4	72	13	3	N/A	0.0	0.0
GLENLEA	-19.0	0.7	0.0	-33.5	12.0	12.0	47	13	6	116	0.0	0.0
MORDEN	-16.2	1.1	4.0	-30.5	21.6	15.2	65	7	4	132	0.0	0.0
ONTARIO												
DELHI	-5.5	0.5	12.0	-22.0	17.0	50.1	75	0	11	103	4.0	4.0
ELORA	-7.2	1.0	8.3	-24.0	N/A	39.0	67	0	N/A	N/A	2.1	2.1

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
GUELPH	-6.6	0.6	10.1	-25.0	7.9	39.9	71	0	8	80	3.4	3.4
HARROW	-3.2	1.6	10.0	-18.5	3.6	21.2	30	0	4	118	4.0	4.0
KAPUSKASING	-19.3	0.7	3.5	-37.5	48.5	49.8	103	47	11	104	0.0	0.0
MERIVALE												
OTTAWA	-8.6	2.2	8.2	-29.2	22.6	35.7	65	7	20	115	0.0	0.0
SMITHFIELD	-5.5	2.0	11.9	-26.0	19.5	53.7	65	0	12	N/A	2.9	2.9
VINELAND STATION	-3.1	1.0	14.2	-12.0	8.8	22.4	35	0	9	107	8.7	8.7
WOODSLEE												
QUEBEC												
LA POCATIERE	-9.2	2.1	5.0	-27.5	42.3	45.2	57	30	6	114	0.0	0.0
L'ASSUMPTION	-10.1	1.8	6.5	-31.5	12.7	28.4	38	14	13	101	0.0	0.0
LENNOXVILLE												
NORMANDIN	-15.0	3.0	5.0	-37.0	43.2	43.8	69	30	10	94	0.0	0.0
ST. AUGUSTIN												
STE CLOTHILDE	-7.3	2.7	13.5	-28.0	10.8	20.4	29	0	6	111	2.0	2.8
NEW BRUNSWICK												
FREDERICTON	-9.3	-0.2	6.0	-27.5	42.4	81.7	79	14	11	114	0.0	0.0
NOVA SCOTIA												
KENTVILLE	-4.7	0.3	12.0	-22.0	47.6	70.9	52	29	10	82	1.0	1.0
NAPPAN	-7.2	-0.4	8.0	-27.5	32.3	54.9	48	4	9	112	0.0	0.0
PRINCE EDWARD ISLAND												
CHARLOTTETOWN	-6.6	0.0	8.5	-23.0	43.4	68.2	67	30	8	126	0.0	0.0
NEWFOUNDLAND												
ST. JOHN'S WEST	-4.3	-0.5	10.0	-19.0	62.0	108.1	60	42	13	89	0.0	0.0