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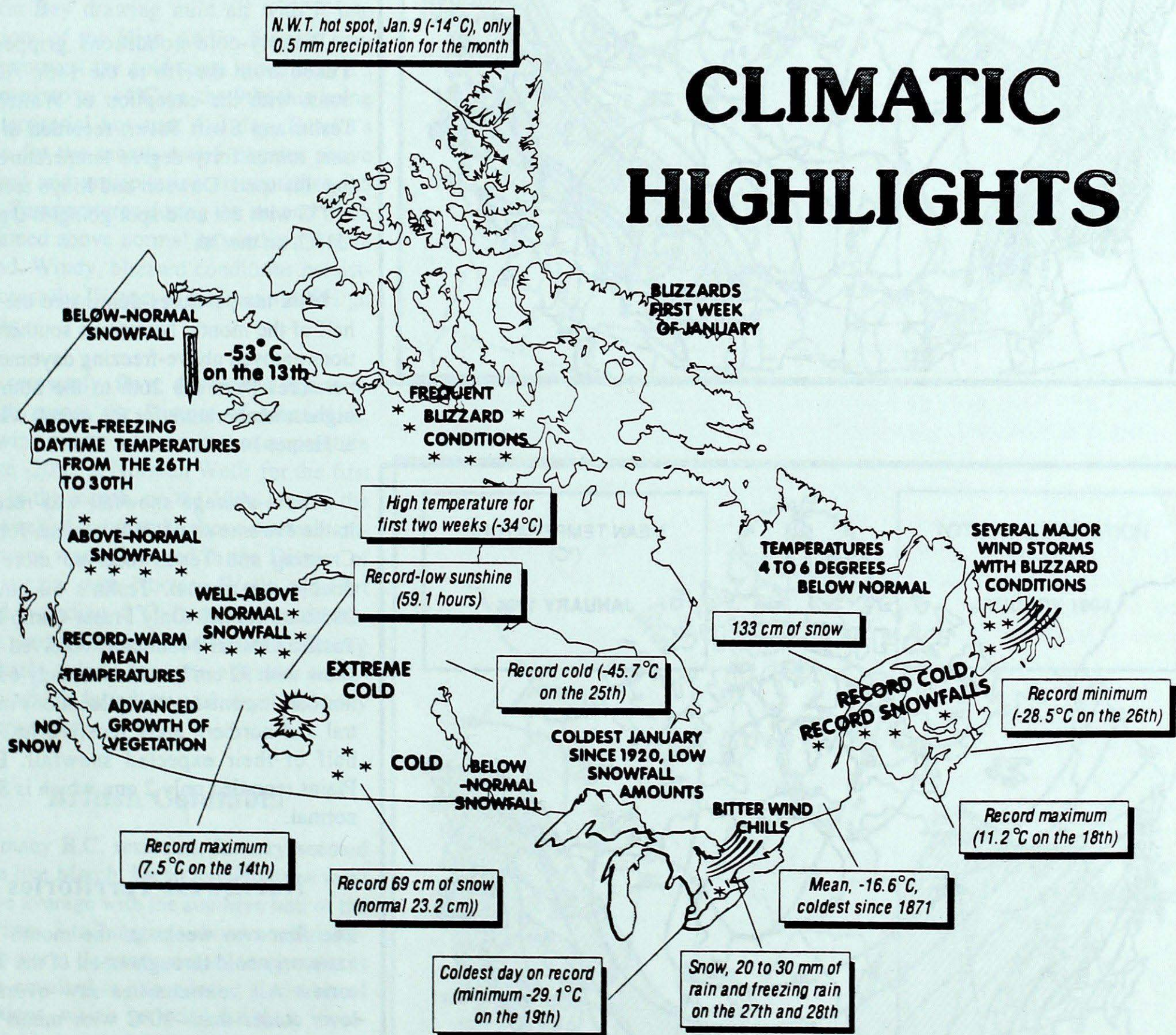
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Monthly Review

January 1994

Vol. 16

CLIMATIC HIGHLIGHTS



Across the country

Yukon

Above-average temperatures blessed the majority of Yukoners. South-central Yukon saw temperatures as much as 7 degrees above normal. The mild weather brought heavier snows to the south while the term "Arctic Desert" fit well for central and northern areas.

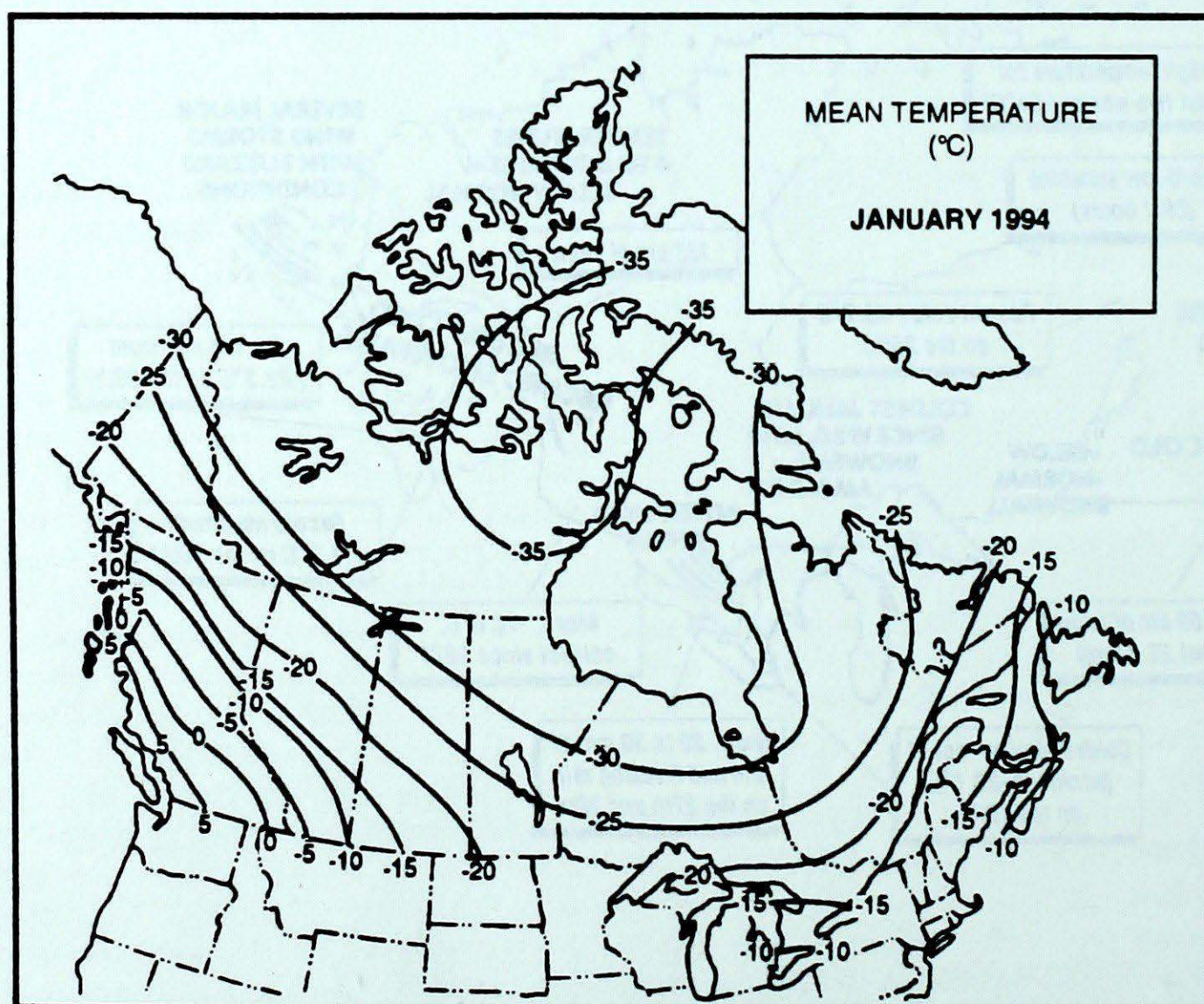
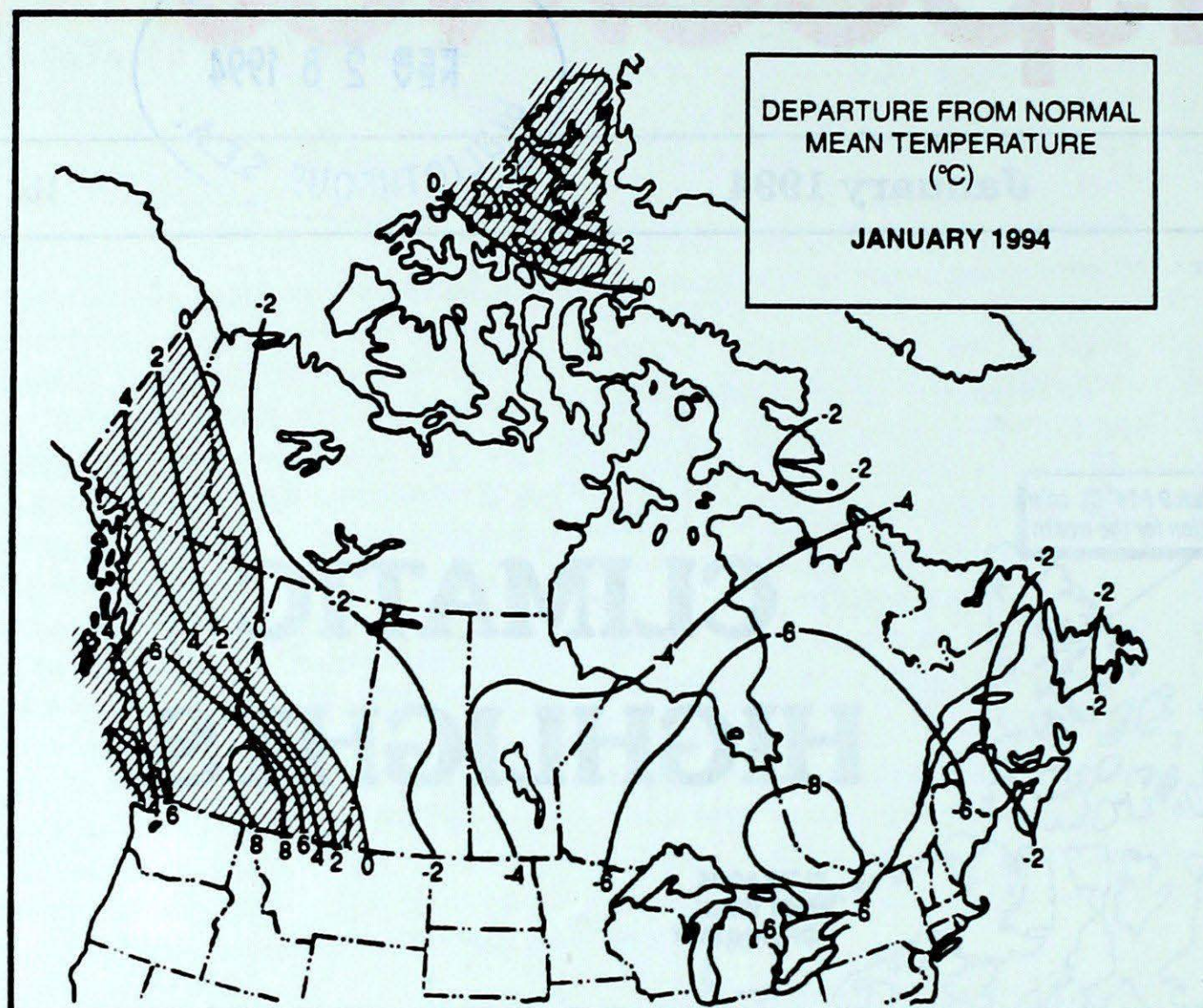
Bitterly-cold conditions gripped the Yukon from the 7th to the 14th. All stations, with the exception of Whitehorse, Teslin and Swift River, recorded at least one, minus forty degree temperature during this spell. Dawson and Mayo recorded -50°C with the cold spot going to Ogilvie, -51°C , on the 7th.

Mild temperatures dominated the latter half of the month. Numerous southern stations enjoyed above-freezing daytime temperatures from the 26th to the 30th. The highest temperature for the month was 6°C at Haines Junction on the 27th.

Above-average snowfall was recorded in the extreme south. Whitehorse, Johnson Crossing and Teslin received more than double the normal. Teslin's 82 cm was 295% of normal. Only Fraser Camp in the Pacific Coastal Mountains received more snow with 92 cm but this was only 61% of normal. In contrast, many locations in central and northern areas received less than half of their expected snowfall. Eagle Plains recorded only 2 cm, which is 8% of normal.

Northwest Territories

The first two weeks of the month were extremely cold throughout all of the Territories. All communities saw overnight lows colder than -30°C with minus 40's common in the District of Mackenzie. The coldest temperature was -53°C in Fort Good Hope on the 13th. The warmest temperature in Yellowknife during the first



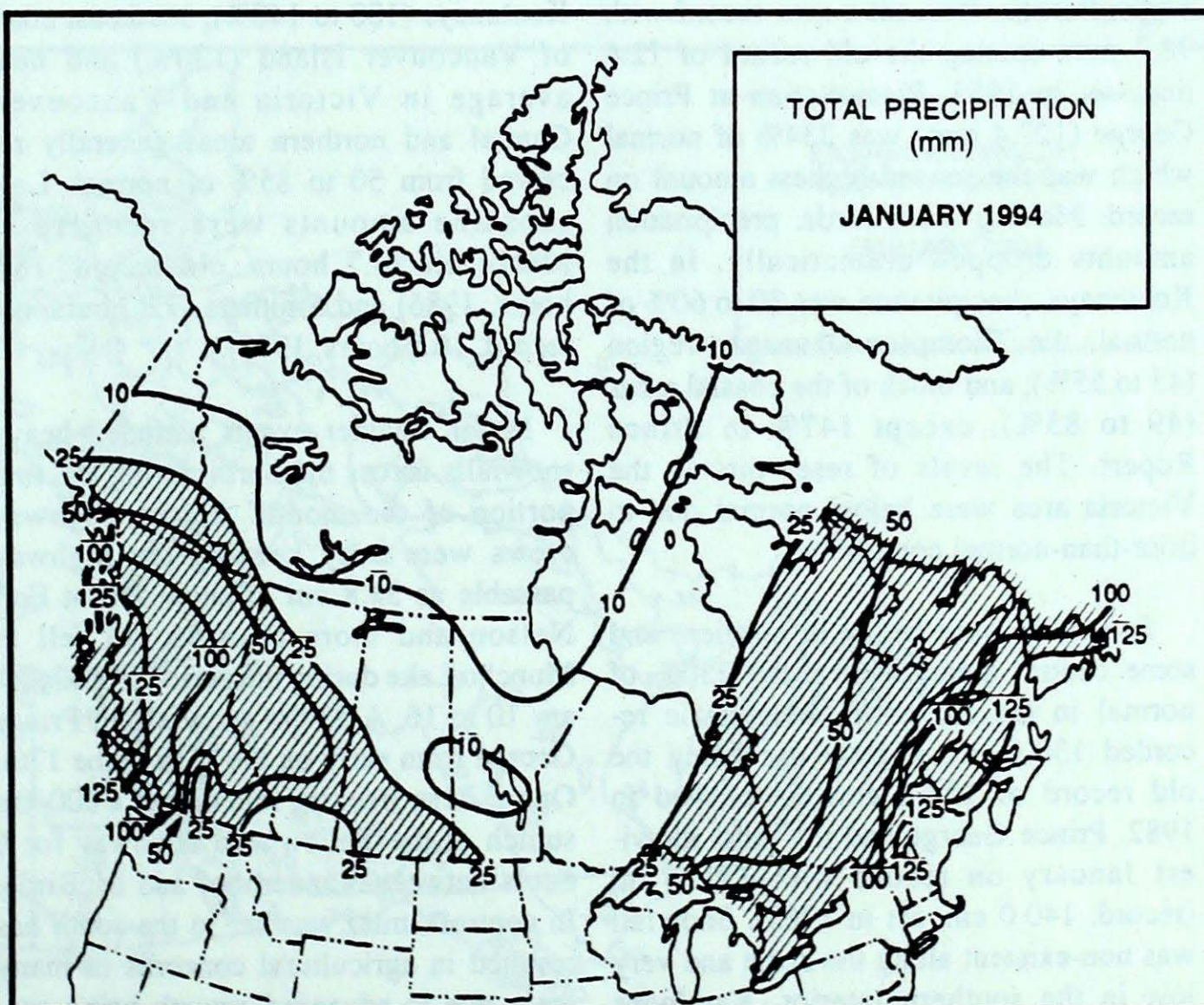
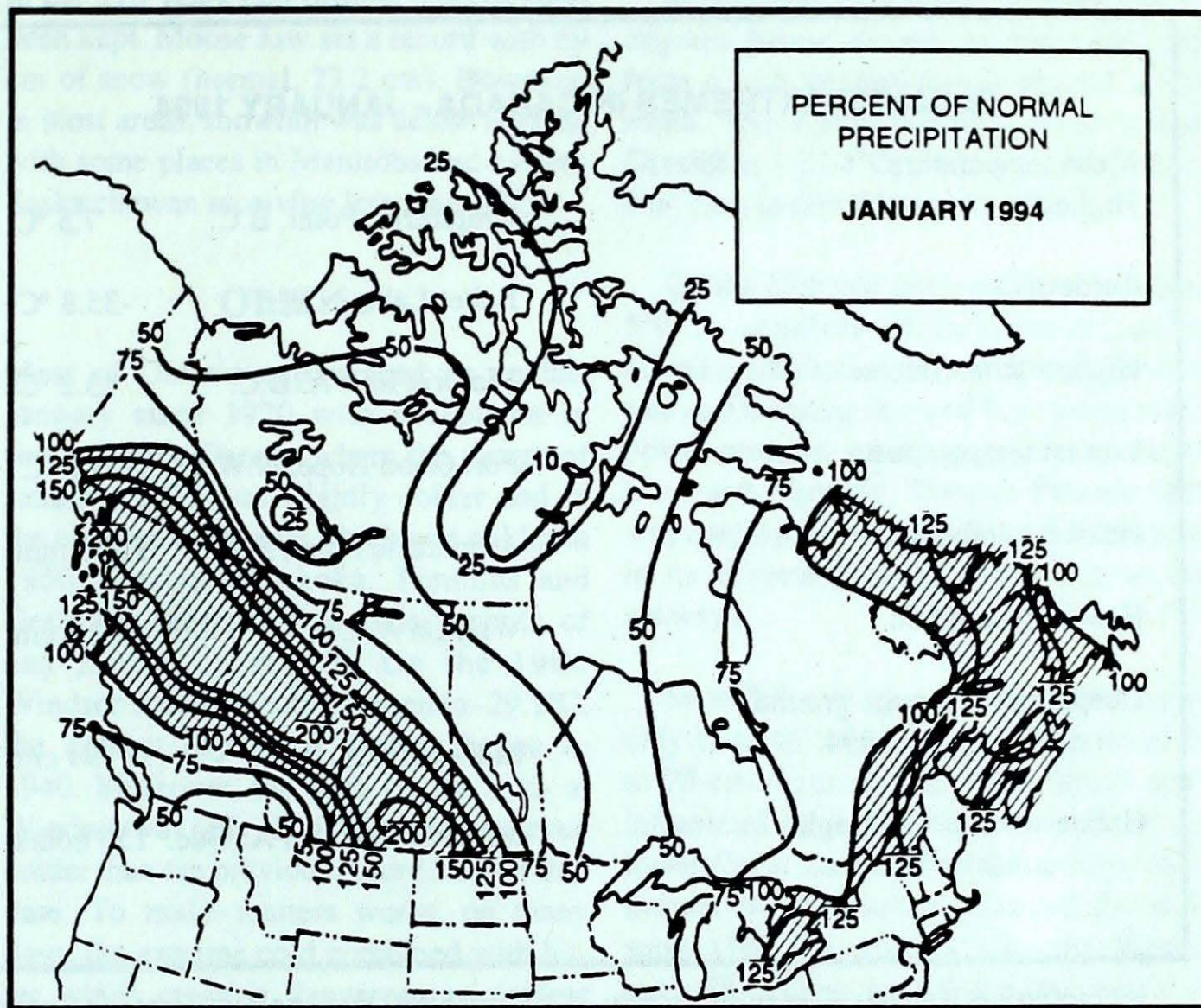
two weeks of January was -34°C , about 10 degrees below normal. A continuous northerly flow brought cold air southwards from the Polar Ice Cap.

A low pressure system that moved through Quebec and into the Labrador Sea brought some snow and strong winds to eastern Baffin Island during the first week, with blizzard conditions, at times, reaching as far west as Iqaluit. The low moved into Baffin Bay drawing mild air with it into portions of the High Arctic. Eureka, usually amongst the cold spots in the N.W.T., warmed up to -14°C on the 9th; this being the territorial hot spot that day. Eureka's mean for the month was 5 degrees above normal and precipitation amounted to 0.5 mm. Temperatures during the second week remained above normal in southern Baffin Island. Windy, blizzard conditions persisted across the District of Keewatin and High Arctic.

A westerly flow developed by mid-month across the District of Mackenzie, allowing milder air to raise the temperature above -20°C at Norman Wells for the first time in the month, on the 18th. During the last week of the month, above-normal temperatures were observed in the District of Mackenzie, with Norman Wells and Fort Liard recording -3°C . In the east, temperatures were normal or below normal. Strong northerly winds brought blizzard conditions which lasted several days, to many communities.

British Columbia

For many B.C. residents, January seemed more like March. Mean temperatures were above average with the southern half of the province, 3 to 7 degrees above normal. Record-warm January mean temperatures were equalled or exceeded at a number of locations, which included 6.6°C at Victoria, (old record, 6.3°C , 1981); Vancouver equalled the 1981 mean of 6.3°C ; and Castlegar, (1.6°C , old record, 1.0° , 1981).



CLIMATIC EXTREMES IN CANADA - JANUARY 1994

Mean temperature:		
Highest	Amphitrite Point, B.C.	7.5 °C
Coldest	Baker Lake, N.W.T.	-35.8 °C
Highest temperature:	Victoria Int'l A. B.C.	13.2 °C
Lowest temperature:	Fort Good Hope, N.W.T.	-53.0 °C
Heaviest precipitation:	Amphitrite Point, B.C.	330.3 mm
Heaviest snowfall:	Wiarton A, Ont.	161.6 cm
Deepest snow on the ground on January 31, 1994	Mackenzie A, B.C.	94 cm
Greatest number of bright sunshine hours:	Montréal Mirabel A, Que.	153 hours

Precipitation was heaviest in the northern half of B.C., with most locations receiving more than double their monthly totals. Fort St. John set a new record with 78.7 mm, erasing the old record of 72.4 mm, set in 1953. Precipitation at Prince George (127.4 mm) was 234% of normal which was the second-highest amount on record. Moving southwards, precipitation amounts dropped dramatically. In the Kootenays, precipitation was 30 to 60% of normal; the Thompson-Okanagan region (45 to 55%); and much of the coastal areas (49 to 85%), except 147% in Prince Rupert. The levels of reservoirs in the Victoria area were below normal due to drier-than-normal conditions.

Snowfalls were heavy in northern and some central areas, with about 250% of normal in the far north. Mackenzie recorded 138.4 cm, slightly exceeding the old record of 138.2 cm, established in 1982. Prince George had the third-snowiest January on record with 111.8 cm (record, 140.0 cm, set in 1965). Snowfall was non-existent along the coast and very low in the southern interior. Kamloops received only 7% of normal snowfall.

Sunshine was below average, or in some cases, well-below average in much of the province. The exceptions were the Kootenays (100 to 140%), southeast coast of Vancouver Island (130%) and near average in Victoria and Vancouver. Central and northern areas generally received from 50 to 85% of normal. Low sunshine amounts were recorded at Mackenzie (4.7 hours, old record, 16.8 hours, 1986) and Smithers (7.8 hours, old record, 16.5 hours, 1971).

Major weather events included heavy snowfalls across the north during the first portion of the month. Alaska Highway crews were busy keeping the highway passable as 34.8 cm of snow fell at Fort Nelson and more than 56 cm fell at Muncho Lake during the period from January 10 to 16. A 33-cm snowfall hit Prince George from early on the 15th to the 17th. On the 21st, freezing rain closed a 300-km stretch of the Yellowhead Highway for 6 hours between Vanderhoof and McBride. In contrast, mild weather in the south has resulted in agricultural concerns in many areas due to advanced growth being susceptible to frost damage.

Alberta

January was a month of some extreme temperature fluctuations and heavy snow accumulations in many areas. The year began with 3 to 8 cm of fresh snow and temperatures below normal as an arctic air mass took hold of central and northern regions. Meanwhile, westerly winds maintained temperatures near the zero mark in the south. By the 4th, the arctic air had pushed into southern regions producing high wind chills and reduced visibilities to all but the extreme north. Warm, moist Pacific air overriding the cold arctic air spawned daily snowfalls in central and northern areas. Temperatures moderated on the 7th as gusty westerly winds brought warm air aloft, to the surface. Record-minimum temperatures in the minus 40's were reported in the north on the 9th and 10th under clear skies. By the 11th, westerly winds restored chinook conditions to the south.

On the 12th, up to 30 cm of snow was reported in the foothills. Pacific air continued to stream across the Continental Divide and collided with the arctic air mass, giving central Albertans a real taste of winter. A brief respite from the cold occurred from the 20th to the 22nd, as a westerly flow allowed temperatures in the single digits to spread north and eastwards. On the 22nd, freezing rain and dense fog occurred along a line from Grande Prairie to St. Paul. Snow began to move into north-central Alberta on the 23rd, pushing the monthly snowfall amounts beyond or near to previous records at many locations. The last week of the month saw a moderating of temperatures. Fort McMurray's mean of -32°C for the first 3 weeks of January saw amelioration as the last few days of January had a mean of -10°C. A record-maximum temperature of 1.7°C was reported at High Level, on the 30th.

Numerous sites in central and northern areas broke their previous record for January snowfall, including the following (in centimetres): Whitecourt (101.9); Edson (102.8); Coronation (73.1); Cold

Lake (49.9) and Edmonton Int'l (80.4). The abundance of cloud and snow was responsible for a new monthly record of only 59.1 hours of sunshine at Edmonton Int'l.

Saskatchewan and Manitoba

January 1994 was cold. The mean monthly temperature was about 5 degrees below normal, making it one of the coldest January's in the last 10 years. There were numerous records broken by the prolonged cold spell. Manitoba experienced the coldest temperatures and for a longer duration than Saskatchewan, notably the southwest, where a few brief reprieves were provided by disturbances from the Pacific.

The coldest temperature was -45.7°C , on the 25th, in Thompson, Manitoba. There were many days in northern Manitoba and a few days in the south of both provinces when the mercury never rose above -30°C .

Snowfall was heaviest in southern Saskatchewan, with most areas receiving over 40 cm. Regina had 47 cm which is the most

in the 110 years that official records have been kept. Moose Jaw set a record with 69 cm of snow (normal, 23.2 cm). However, in most areas, snowfall was below normal, with some places in Manitoba and eastern Saskatchewan receiving less than 10 cm.

Ontario

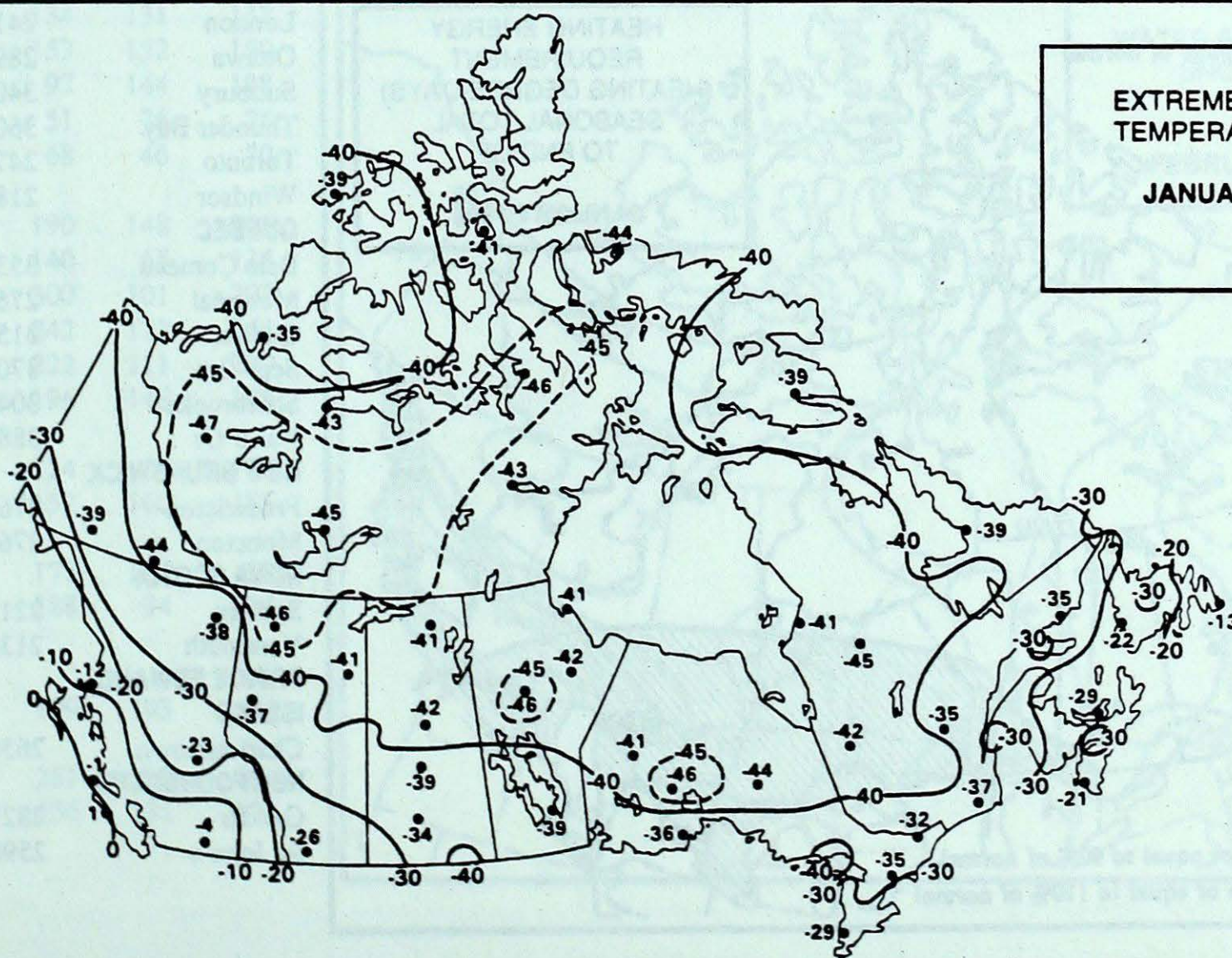
Most of Ontario experienced its coldest January since 1920 with exceptions in southwestern Ontario where the month of January, 1977 was slightly colder and in the extreme northwest which was colder in 1950. Ottawa, Muskoka, Timmins and Geraldton recorded the coldest month of any month on record. On the 19th, Windsor's temperature plunged to -29.1°C , the coldest day since records began in 1940. Moreover, the high on the 19th at Windsor was only -20.9°C which was even colder than the previous record low for that date. To make matters worse, on many days, the extreme cold combined with bitter winds creating dangerous equivalent wind chill temperatures as low as -45°C in the south and below -60°C in the north.

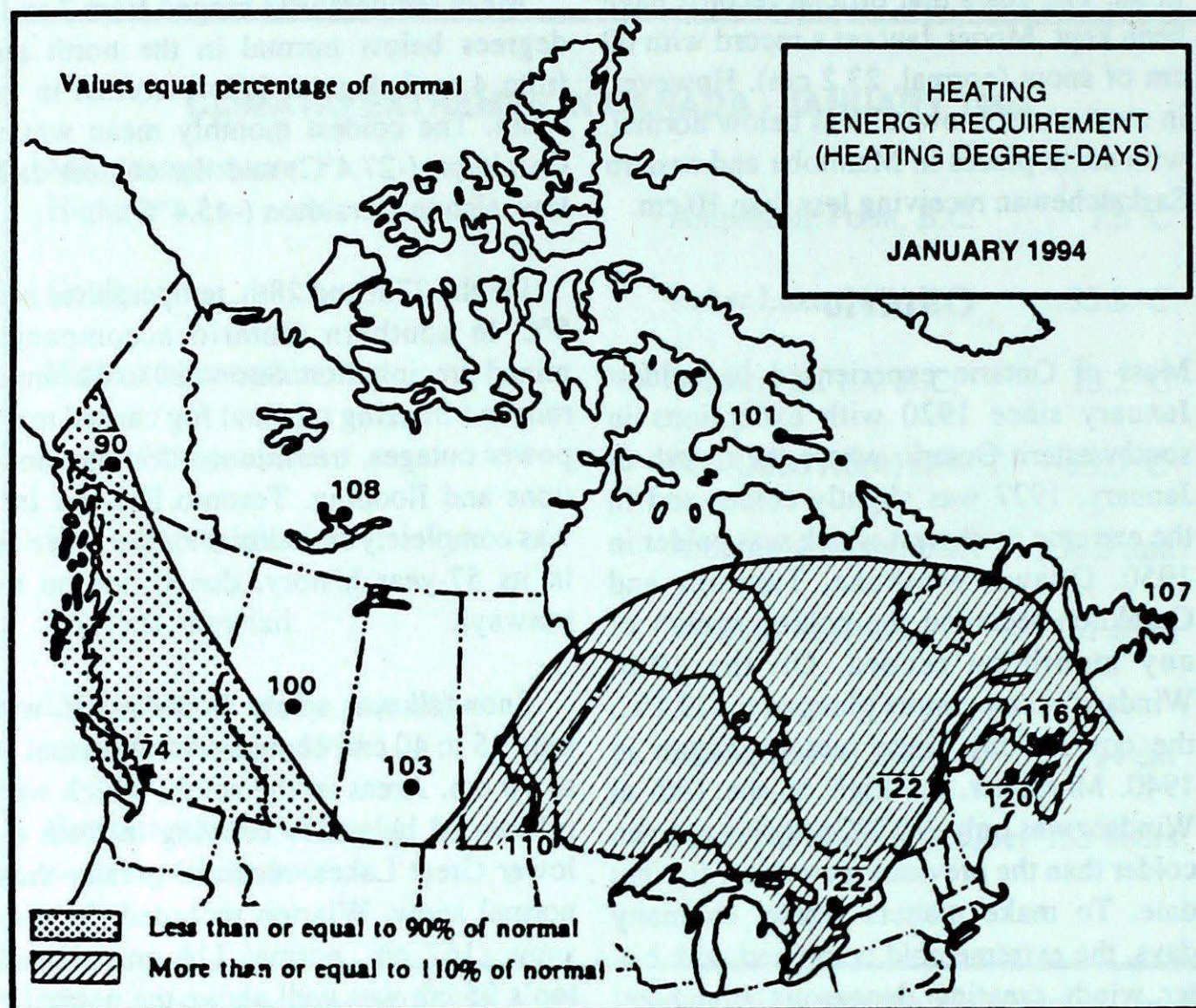
Mean temperatures ranged from 7 to 10 degrees below normal in the north and from 4 to 8 degrees below normal in the south. The coldest monthly mean was in Geraldton (-27.4°C) and the coldest daily low, also in Geraldton (-45.4°C).

On the 27th and 28th, temperatures near 5°C in southern Ontario accompanied mixed precipitation. Snow, 20 to 30 mm of rain and freezing rain and fog caused many power outages, treacherous driving conditions and flooding. Toronto Pearson Int'l was completely shut down for the first time in its 57-year history, due to ice on the runways.

Snowfall was sparse in the north, with only 15 to 40 cm, compared to the usual 30 to 70 cm. Areas in the south, which were influenced by winds blowing in from the lower Great Lakes, received greater-than-normal snow. Wiarton recorded the most snow (162 cm, normal 116 cm). Hamilton's 95 cm was well above the normal of 42 cm. Elsewhere in the province, snowfall totals were 110 to 150% of normal.

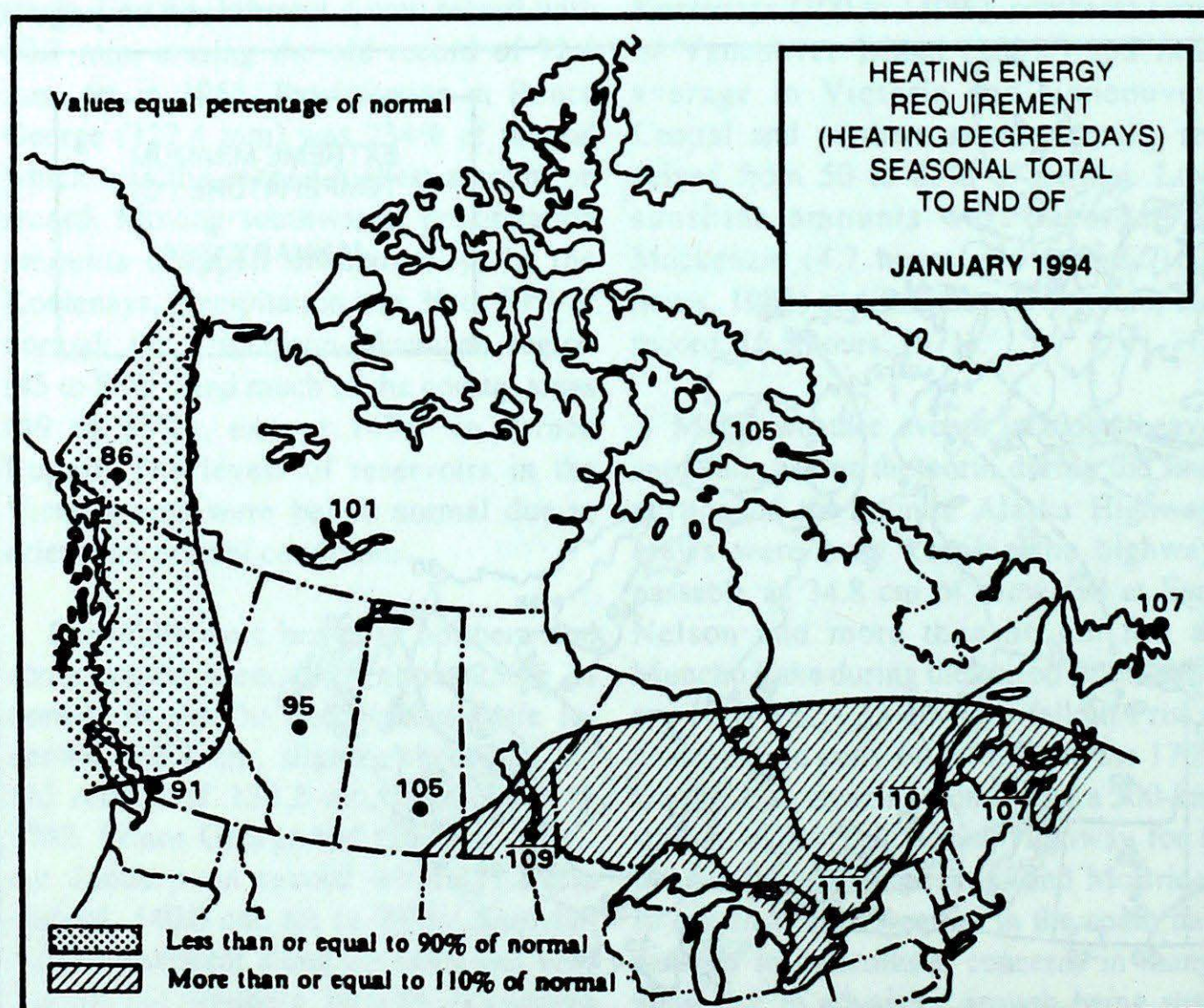
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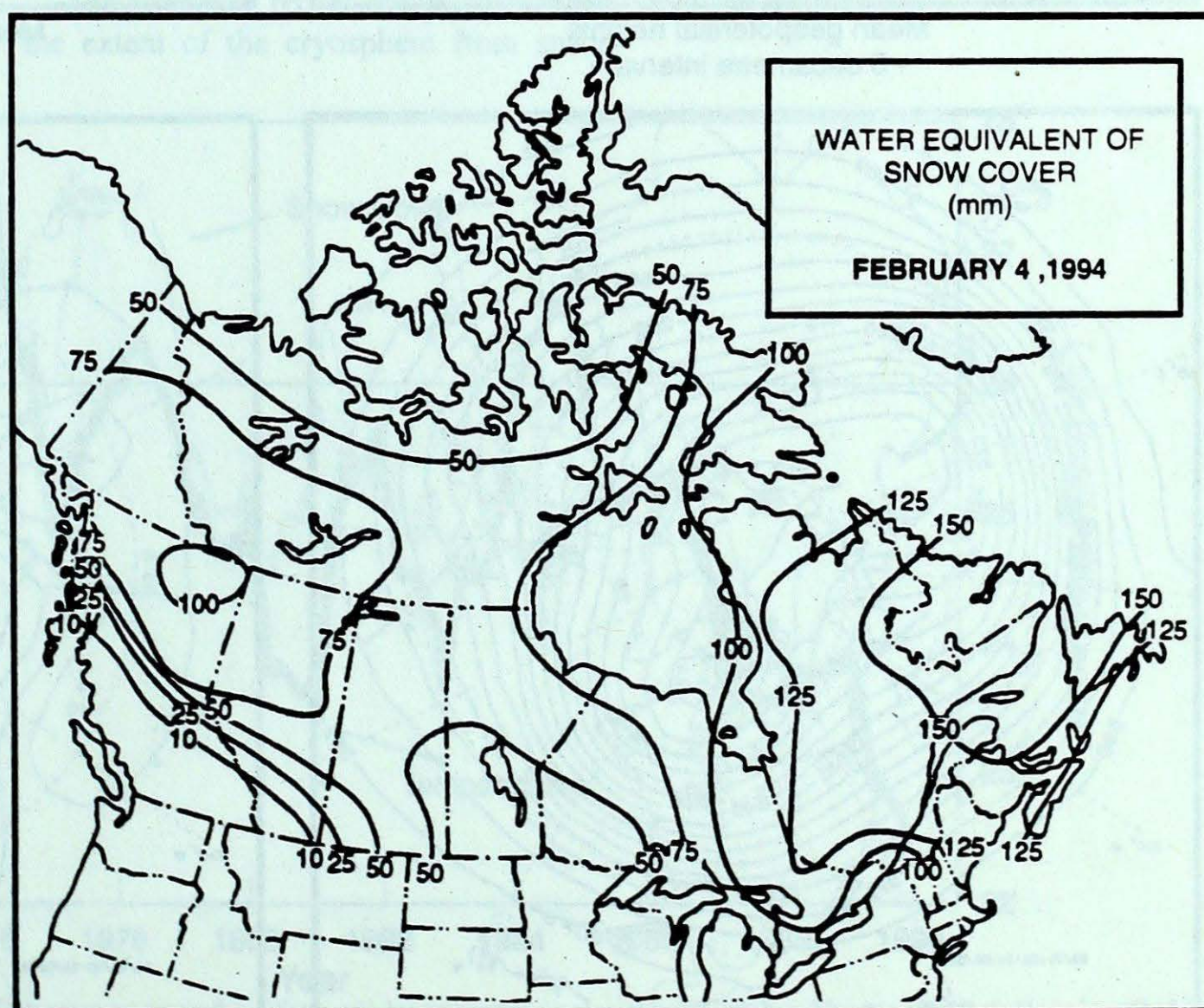
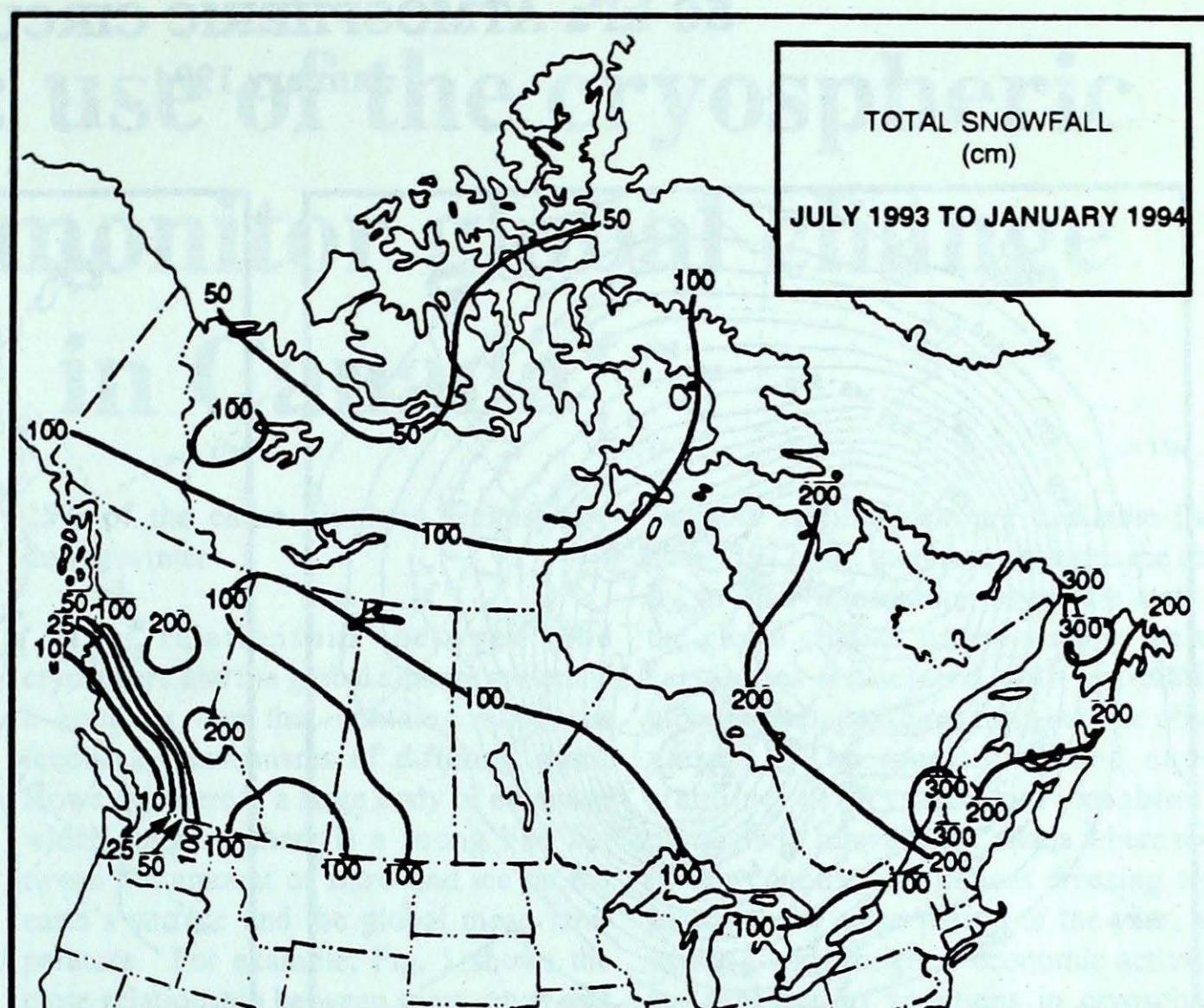
SEASONAL TOTAL OF HEATING DEGREE-DAYS TO END OF JANUARY

	1994	1993	NORMAL
BRITISH COLUMBIA			
Kamloops	2026	2577	2281
Penticton	1915	2211	2056
Port Hardy	2790	3344	3234
Vancouver	1546	1751	1698
Victoria	1604	1769	1745
YUKON TERRITORY			
Whitehorse	3647	4246	4224
NORTHWEST TERRITORIES			
Iqaluit	5644	5752	5362
Inuvik	5239	5468	5661
Yellowknife	4903	4565	4833
ALBERTA			
Calgary	2940	3281	3091
Edmonton Mun.	3057	3295	3218
Grande Prairie	3326	3868	3644
SASKATCHEWAN			
Estevan	3543	3474	3146
Regina	3532	3545	3370
Saskatoon	3699	3746	3506
MANITOBA			
Brandon	3868	3798	3506
Churchill	5340	4985	4943
Dauphin	4176	3894	3899
Winnipeg	3666	3555	3367
ONTARIO			
Kapuskasing	3995	3648	3602
London	2417	2244	2224
Ottawa	2893	2614	2617
Sudbury	3404	3072	2996
Thunder Bay	3607	3313	3210
Toronto	2475	2229	2225
Windsor	2189	1926	1983
QUEBEC			
Baie Comeau	3534	3437	3310
Montréal	2767	2523	2516
Québec	3152	2893	2856
Sept-Îles	3700	3653	3421
Sherbrooke	3040	2848	2900
Val-d'Or	3887	3592	3440
NEW BRUNSWICK			
Fredericton	2768	2660	2581
Moncton	2762	2672	2517
NOVA SCOTIA			
Sydney	2213	2414	2213
Yarmouth	2133	2283	2094
PRINCE EDWARD ISLAND			
Charlottetown	2630	2522	2381
NEWFOUNDLAND			
Gander	2827	2989	2603
St. John's	2598	2710	2424



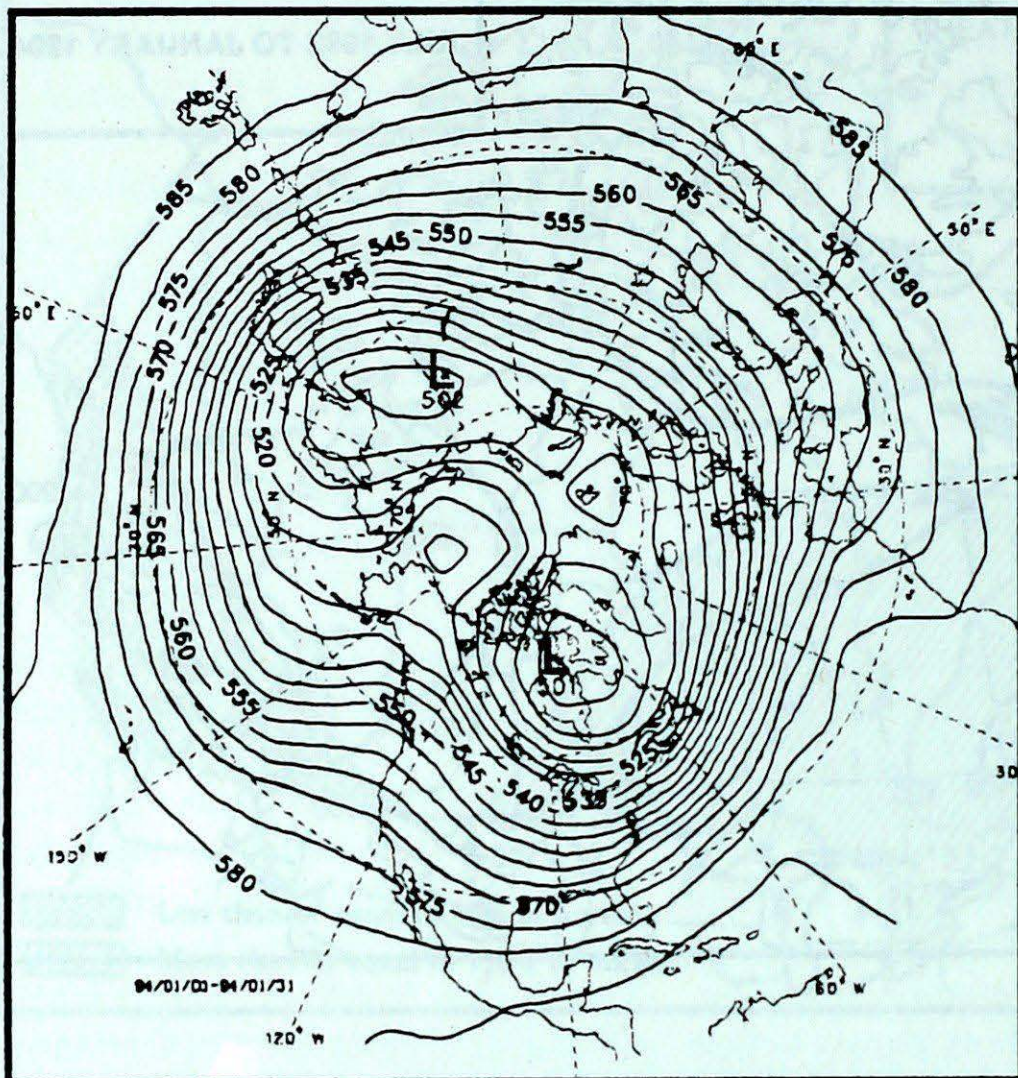
SEASONAL SNOWFALL TOTALS (cm) TO END OF JANUARY

	1994	1993	NORMAL
BRITISH COLUMBIA			
Kamloops	19	81	74
Port Hardy	2	37	49
Prince George	152	221	164
Vancouver	0	62	46
Victoria	0	27	35
YUKON TERRITORY			
Whitehorse	119	165	91
NORTHWEST TERRITORIES			
Iqaluit	118	127	144
Inuvik	87	151	117
Yellowknife	102	78	94
ALBERTA			
Calgary	46	88	77
Edmonton Mun.	112	62	78
Grande Prairie	134	79	115
SASKATCHEWAN			
Estevan	106	72	63
Regina	89	64	65
Saskatoon	*	58	65
MANITOBA			
Brandon	51	63	64
Churchill	*	100	117
The Pas	75	72	96
Winnipeg	63	100	72
ONTARIO			
Kapuskasing	160	223	193
London	58	85	133
Ottawa	134	131	132
Sudbury	153	152	150
Thunder Bay	97	144	128
Toronto	51	76	75
Windsor	68	46	70
QUEBEC			
Baie Comeau	190	148	203
Montréal	140	65	134
Québec	300	101	202
Sept-Îles	242	173	244
Sherbrooke	222	111	180
Val-d'or	196	148	188
NEW BRUNSWICK			
Fredericton	124	84	156
Moncton	152	160	175
NOVA SCOTIA			
Sydney	173	160	93
Yarmouth	188	94	114
PRINCE EDWARD ISLAND			
Charlottetown	199	193	174
NEWFOUNDLAND			
Gander	251	180	194
St. John's	156	131	172

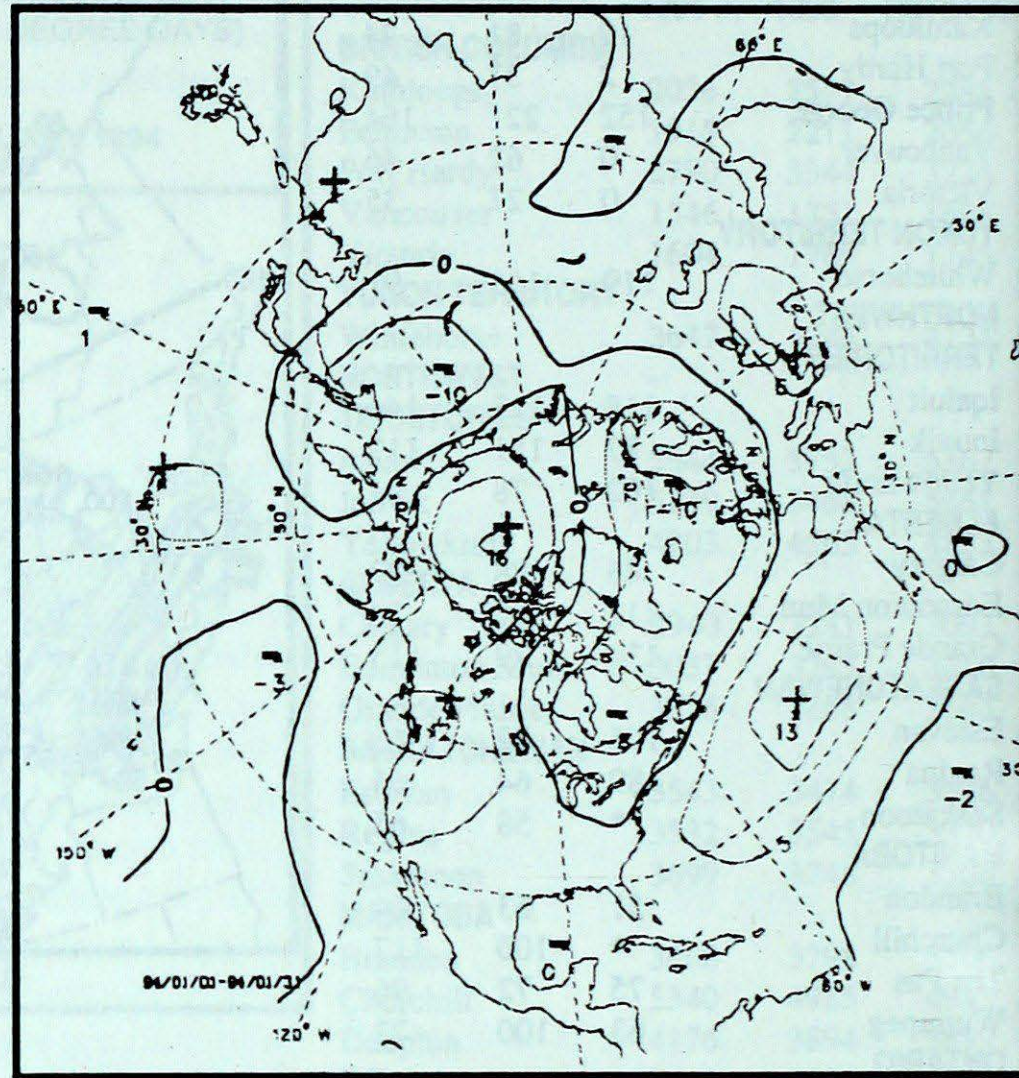


50-kPa ATMOSPHERIC CIRCULATION

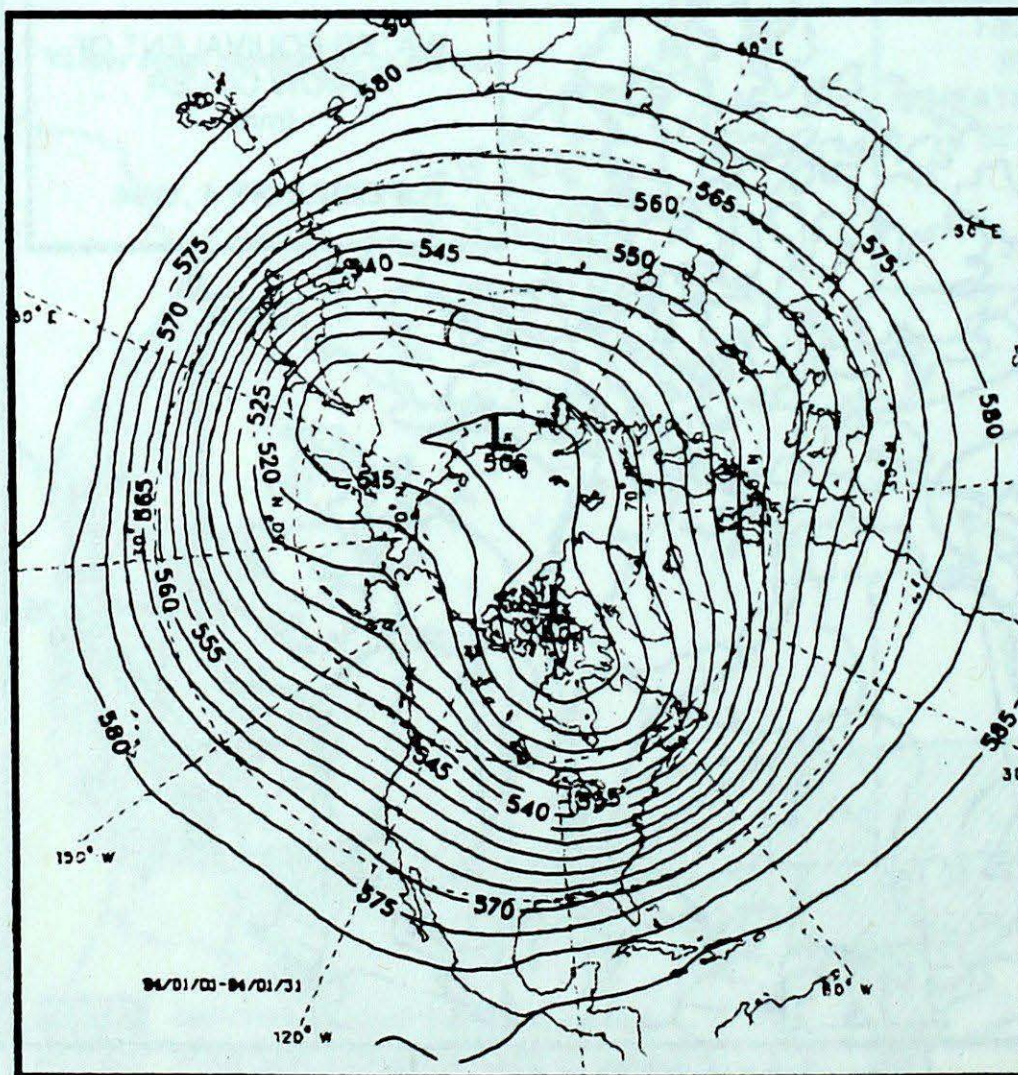
January 1994



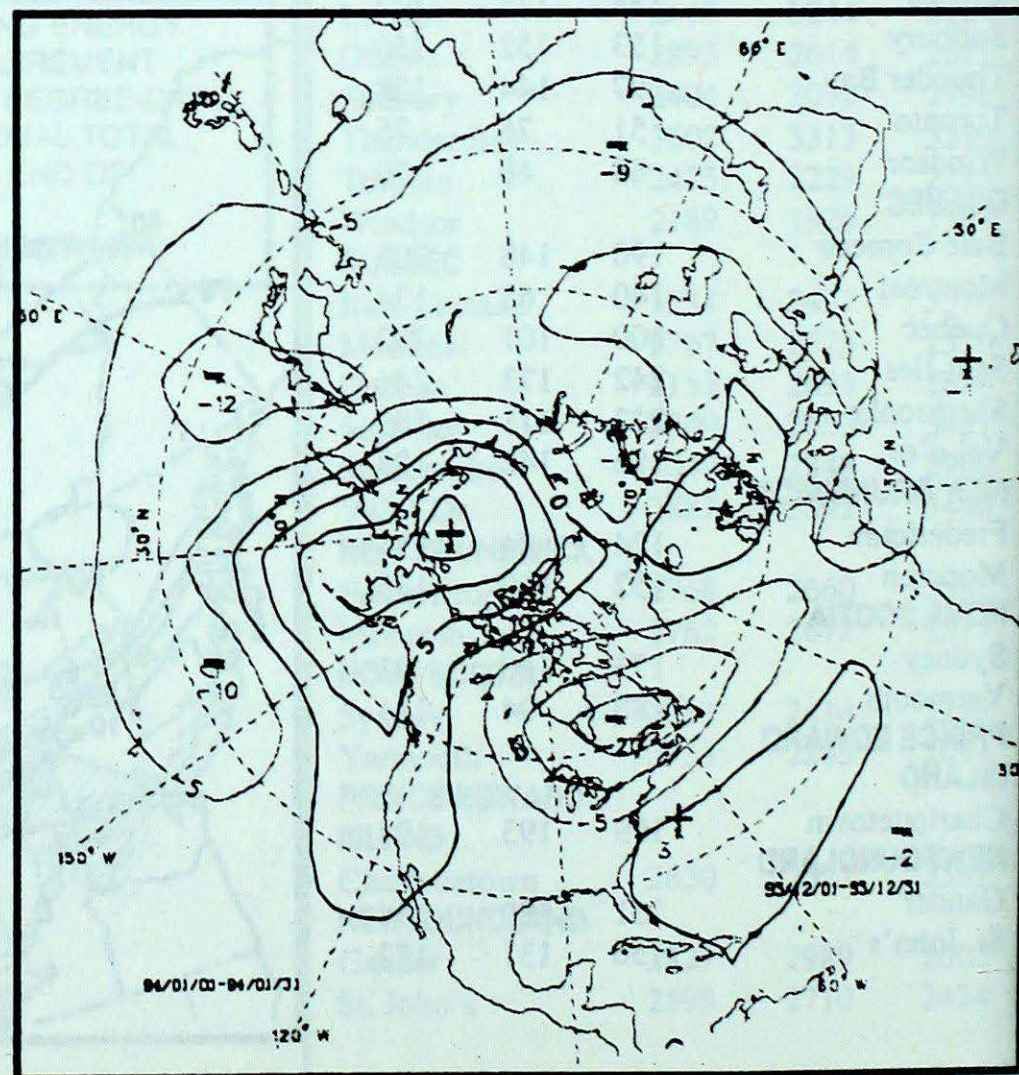
Mean geopotential heights
- 5 decametre interval -



Mean geopotential height anomaly
- 5 decametre interval -



Normal geopotential heights for the month
- 5 decametre interval -



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

CRYSYS: use of the cryospheric system to monitor global change in Canada

The term "cryosphere" traces its origins to the Greek word *kruos* for frost. It collectively describes the portions of the earth's surface where water is in a solid form such as sea-ice, snow cover, glaciers, ice caps and permafrost. The importance of the cryosphere in the global climate system is related to significant changes in energy transfers which occur when snow or ice cover a surface: the surface reflectivity goes up dramatically, reducing the amount of energy absorbed at the surface, and in the case of sea-ice, the transfer of heat from the ocean to the atmosphere is significantly reduced. These changes exert a considerable influence on the climate system considering that snow and ice can cover up to

25% of the entire Northern Hemisphere during winter.

The relationship between the cryosphere and the global climate system is a complex one that contains numerous feedback mechanisms of differing signs. However, there is a large body of evidence which suggests there is a strong link between the amount of snow and ice on the earth's surface and the global mean temperature. For example, Fig. 1 shows the close relationship between snow cover and air temperatures in the Northern Hemisphere noted by Robinson et al. (1991).

The relatively recent ability to monitor the extent of the cryosphere from space

(reliable satellite data are available from about 1972 on), therefore provides the ability to infer information about the state of the global climate system without the uncertainties associated with estimating global air temperatures from surface observations. The monitoring and understanding of cryospheric variables is particularly relevant in Canada where most of the country experiences freezing temperatures for some period of the year, and where a wide range of economic activities are sensitive to variations in cryospheric elements (e.g. agriculture, transportation, construction, mining, offshore oil exploration, recreation).

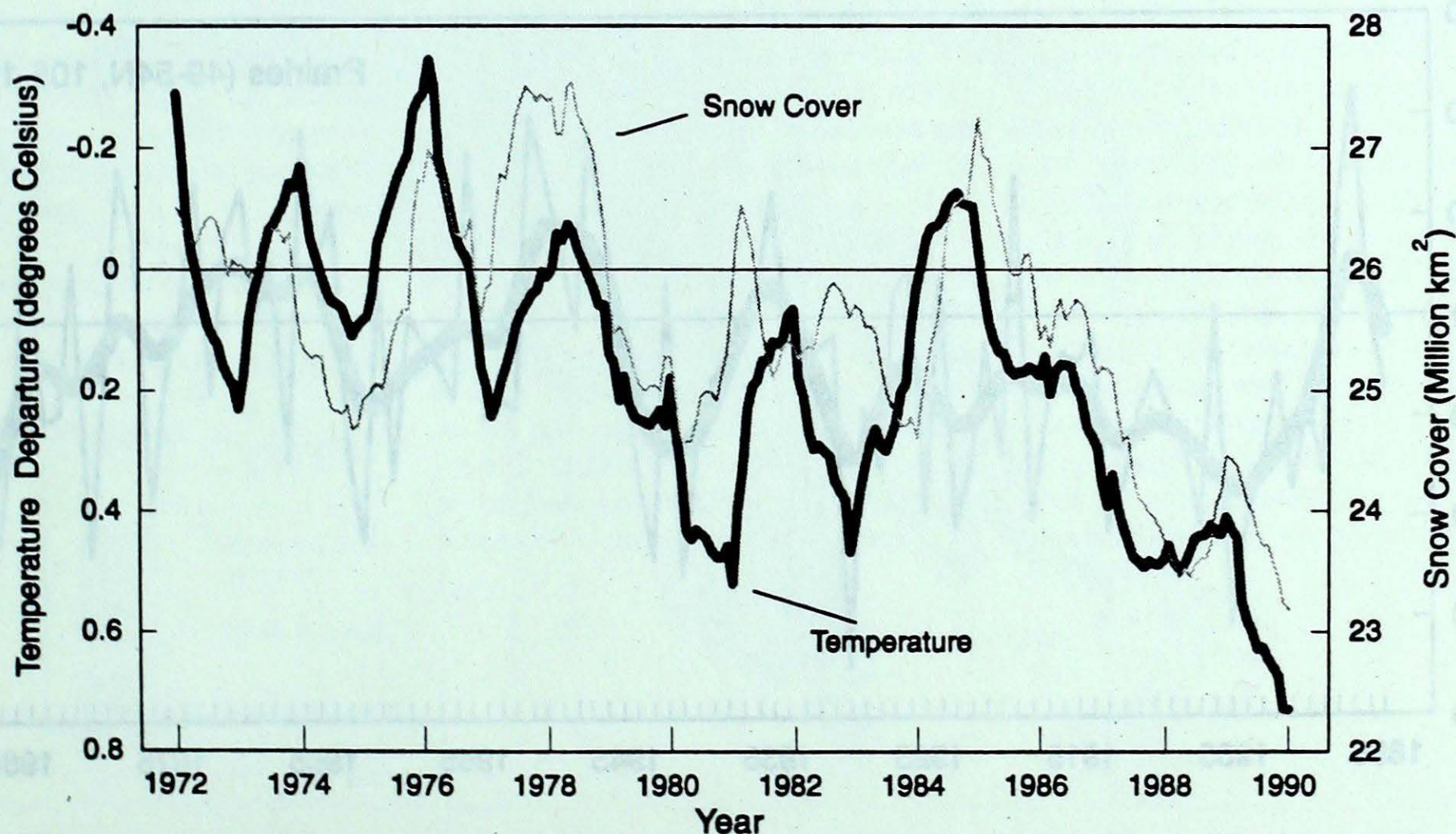


Figure 1: Twelve-month running means of snow cover and surface air temperature over the Northern Hemisphere following Robinson et al. (1991). Temperatures are expressed as departures from a 1951-70 reference period and are derived from the Jones et al. (1991) gridded data set. Snow cover data were supplied by Robinson (personal communication).

CRYSYS is a Canadian interdisciplinary research program within NASA's Earth Observing System (EOS) Program to monitor Earth systems from space. It is also a recognized research project within the federal government's Green Plan Global Warming Science Program. Two basic scientific goals of CRYSYS are: (1) to develop capabilities for monitoring and understanding regional and hemispheric variations in cryospheric variables; and (2) to improve understanding of the role of the cryosphere in the climate system, and in global change. CRYSYS was initiated by Canadian scientists in 1988 in response to NASA's request for research related to its new Earth Observing System Program. CRYSYS offered Canadian scientists opportunities to play a significant role in developing methods for extracting information on the cryosphere from conventional and remote sensing systems as part of EOS. CRYSYS provides Canadian scientists with a link to the data and information system of EOS (EOSDIS), and allows CRYSYS investigators access to the huge volumes of satellite data being ar-

chived under the EOS program. In 1993, the Atmospheric Environment Service took over the role of principal sponsoring agency for CRYSYS, and Dr. Barry Goodison assumed the role of principal investigator.

CRYSYS investigators use in-situ, airborne, and satellite data, as well as modeling in their research on the cryospheric variables of importance in Canada (snow, sea-ice, lake ice, glaciers, ice caps and permafrost). In the area of snow, Canadian scientists are making significant contributions in developing techniques for mapping snow cover and snow water-equivalent from active and passive satellite microwave data. In the area of permafrost, Canadian scientists are at the forefront of research to map and monitor the extent of permafrost from the new generation of radar-equipped satellites. Radar and other satellite data are also being used by Canadian glaciologists involved in CRYSYS to provide more accurate data on the areal extent, volume and mass balance of Canadian glaciers and ice caps. In the area of

sea-ice, research is focussed on extracting additional information from satellite data to better estimate the thickness and volume of sea-ice cover, and on modelling studies to better understand the natural variability in the sea-ice system. CRYSYS research activities also contribute to the objectives of other international research programs such as GEWEX and ACSYS, and to an improved ability to model the global climate system.

The research has significant operational applications in areas such as water resources planning (flood forecasting, hydroelectricity production), construction projects in permafrost areas, shipping in ice-infested waters, forest fire management, soil moisture recharge in agricultural regions, and in the provision of long-term climate forecasts.

Another objective of CRYSYS is to develop the ability to extend the satellite record back in time through the integration of conventional and remotely-sensed data. By extending the period of record of

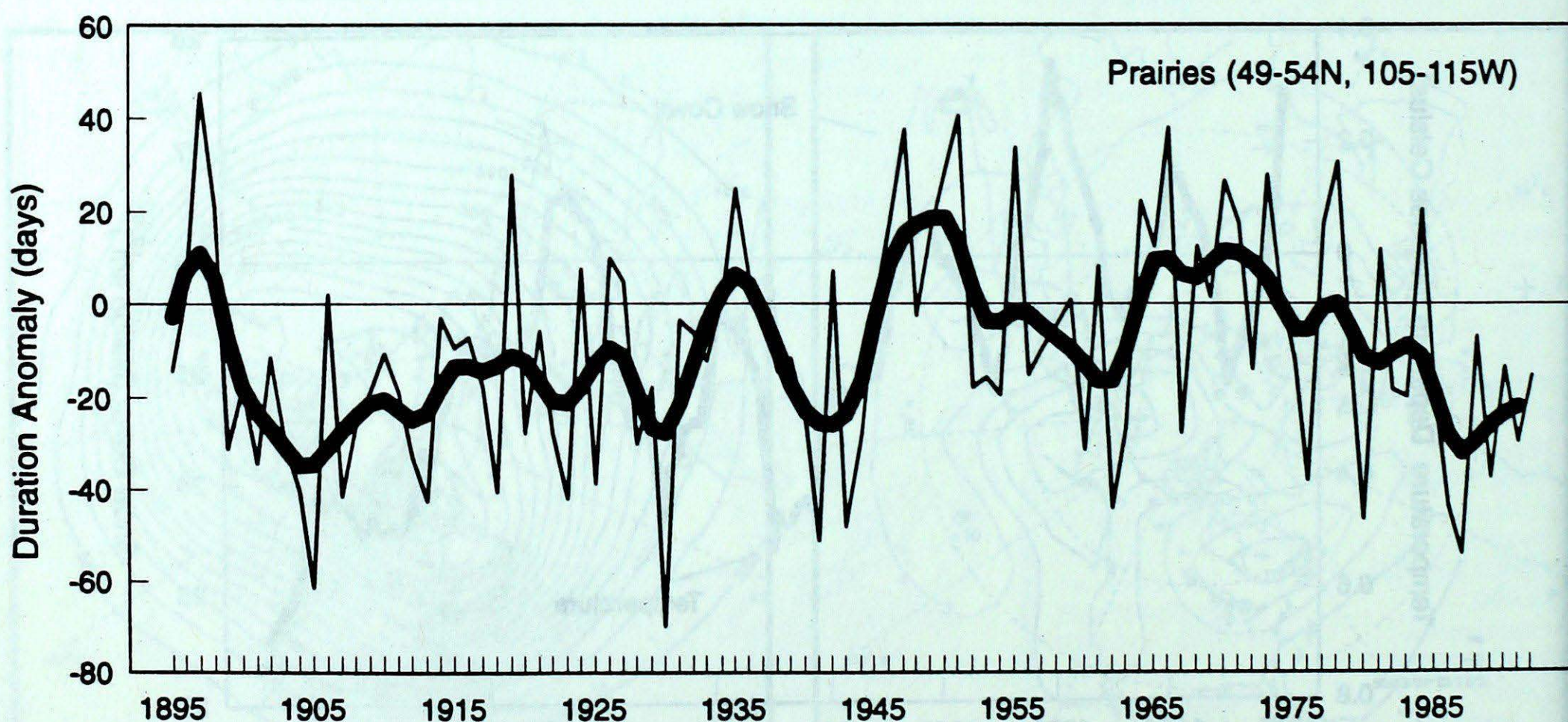


Figure 2: Observed variability in reconstructed annual snow cover duration over the Prairies. Snow cover was defined as days with more than 1 inch of snow on the ground, and is expressed as the departure from a 1961-80 reference period (regional average = 116 days). The heavy line is the result of passing a 9-term binomial filter.

cryospheric variables such as sea-ice and snow cover extent, one can start to gain a better idea of the natural variability in the system. Without some idea of how things vary over longer time periods, it is difficult to know whether changes observed over the recent period of satellite data reflect some new climatic state, or whether they are simply normal fluctuations of the system. This is clearly demonstrated in the following example using results from some recently completed CRYSYS snow cover research.

In the January 14, 1994 edition of "The Globe and Mail", an article appeared in which Dr. Tom Karl of the National Climatic Data Center in Asheville, N.C., suggested that a trend toward earlier spring melt in North America, observed over the last 20 years of satellite data, is related to global warming. Figure 2 presents a time-series plot of reconstructed snow cover duration over the Canadian Prairies for the last 100 years. Snow cover in this area was noted by Karl et al. (1993) as being especially sensitive to temperature change. The reconstructed data were developed using daily snowfall and maximum temperature in a calibrated melting degree-day model (Brown and Goodison, 1993). Over the pe-

riod of calibration (1955-89), the method was able to account for over 70% of the observed interannual variability in snow cover for the Prairies region. The data had to be reconstructed because observed daily snow depth data are only available in digital format from 1955 on. The plot clearly shows a long-term trend toward increasing snow cover reaching a peak in the early 1970's when satellite data coverage began. This was followed by a rapid decline in snow cover during the late-70's and 80's, although it appears this trend has recently ended. The U.S. Great Plains exhibit a similar long-term trend in snow cover (Hughes and Robinson, 1993). From Fig. 2 one can readily see that snow cover in the Prairies is characterized by large fluctuation from one year to the next, and there is some evidence of cyclical variation at roughly 15-20 year intervals. Seen in this longer-term context, the recent decrease in snow cover in the interior of North America does not appear "unnatural".

For further information on CRYSYS or any other material appearing in this article, please contact

Ross Brown at (514) 421-4772 or by e-mail at brownr@ncr.dots.doe.ca

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Will there be more storms in our future?

There has been much speculation in the past several years about the impact of global warming on storminess, particularly in light of the damage done by recent tropical cyclones. Questions have also been raised about whether Canada has experienced an increase in severe storms. In an attempt to answer these questions, a review of scientific literature was undertaken in the fall of 1993. The study focussed on two types of storms: tropical cyclones, extra-tropical cyclones (the predominant cause of winter storms in eastern Canada).

Although general circulation models (GCMs) have, as yet, far too coarse a resolution to simulate individual storms, they can provide information about how underlying conditions that affect storm development may respond to global warming. Among such factors that can affect tropical cyclone development are: sea-surface temperature, the temperature difference between air masses, the amount of water vapour in the air and atmospheric circulation patterns. Some researchers have used the prediction of warmer sea-surface temperatures to theorize that there will be an increase in the number and intensity of tropical cyclones. Others have predicted that the reduction in the vertical temperature gradient may limit the intensity of the cyclones that will develop. Thus, the scientific community is not yet able to come to a

conclusion on whether tropical cyclones will increase in frequency or intensity as the earth warms. Better understanding of cyclone climatology and its relationship to GCM outputs are necessary before any conclusions can be made.

Extra-tropical cyclones are essentially driven by baroclinicity and are influenced by the configuration of atmospheric circulation. Under global warming, the equator-to-pole temperature gradient is expected to weaken. Thus it would be expected that the number of storms would decrease. Evidence from the Canadian Climate Centre GCM simulation suggests that there could be a reduction in the total number of storms but that the number of intense storms may actually increase.

Analysis of Canadian temperatures clearly indicate that there has been a warming trend, albeit uneven, over the length of the instrumental record. So, has there been an increase in "storminess" in Canada as well? Analyses of data from the 1900's, done on hemispheric (Agee, 1991) and continental (Zishka and Smith, 1980) scales have revealed that the frequency of cyclonic and anticyclonic events tend to decrease during periods of cooling and increase during periods of warming. The decreases seem to be related to a reduction in the number of weak storms. It was also

noted that the intensity of storms tends to increase during the warmer periods.

However, it is difficult to determine a trend in "storminess" in Canada itself, due to a lack of organized data. The record of severe summer storms, for example, is less than 20 years long; too short to reveal any significant trend in activity. Work by Peter Lewis et al. (1988) analysing extreme maritime storms, based on wind speed, from 1957 to 1983, found that the average number of severe storms reached a minimum in 1966 and rose to a peak in 1974. The number of storms remained above average until the end of the record of study. Unfortunately, this study has not yet been updated to the end of the 1980's. A very preliminary examination of absolute station pressure from twelve stations in Ontario and the Maritimes from 1953 to 1992 did not appear to show any significant trend in frequencies and intensities of low pressure events but further analysis is underway.

Considering the importance of storms to Canada's economic activities, further study of this issue is warranted.

P. Kertland and W.C. Wong

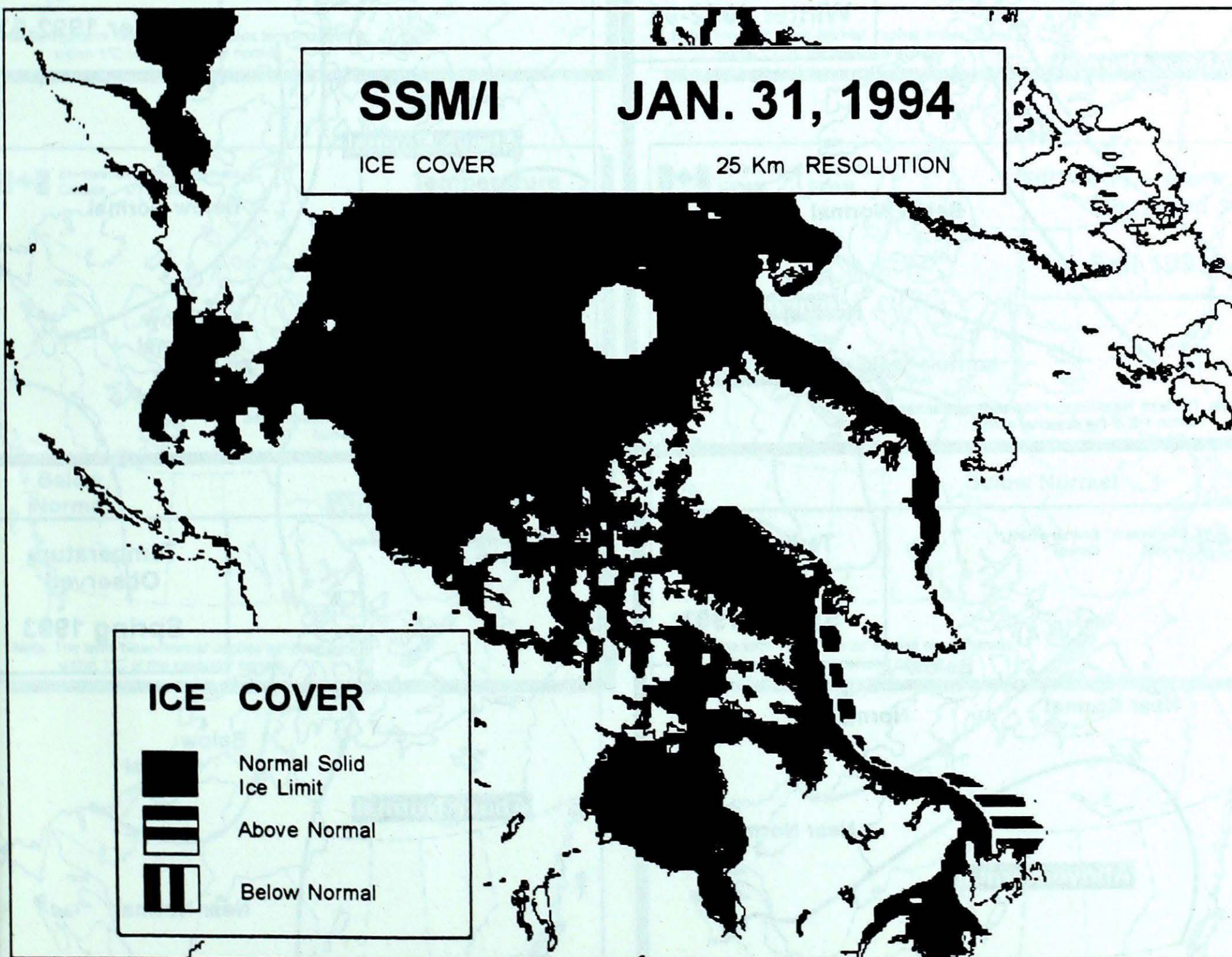
End of January Ice Image

The past several months of negative temperature anomalies experienced over the East Coast of Canada has continued the above-normal sea-ice cover in the area. The positive temperature anomalies for the

first 2 weeks of January had little effect on the ice cover. This slight warming in the area was immediately followed by temperatures that were up to 10 degrees colder than normal for the last half of January.

The outlook for February forecasts continuing below-normal temperatures for the East Coast.

Arvids Silis
Climate Processes and Observations
Research Division (Arctic)



Verification of The Seasonal Outlook

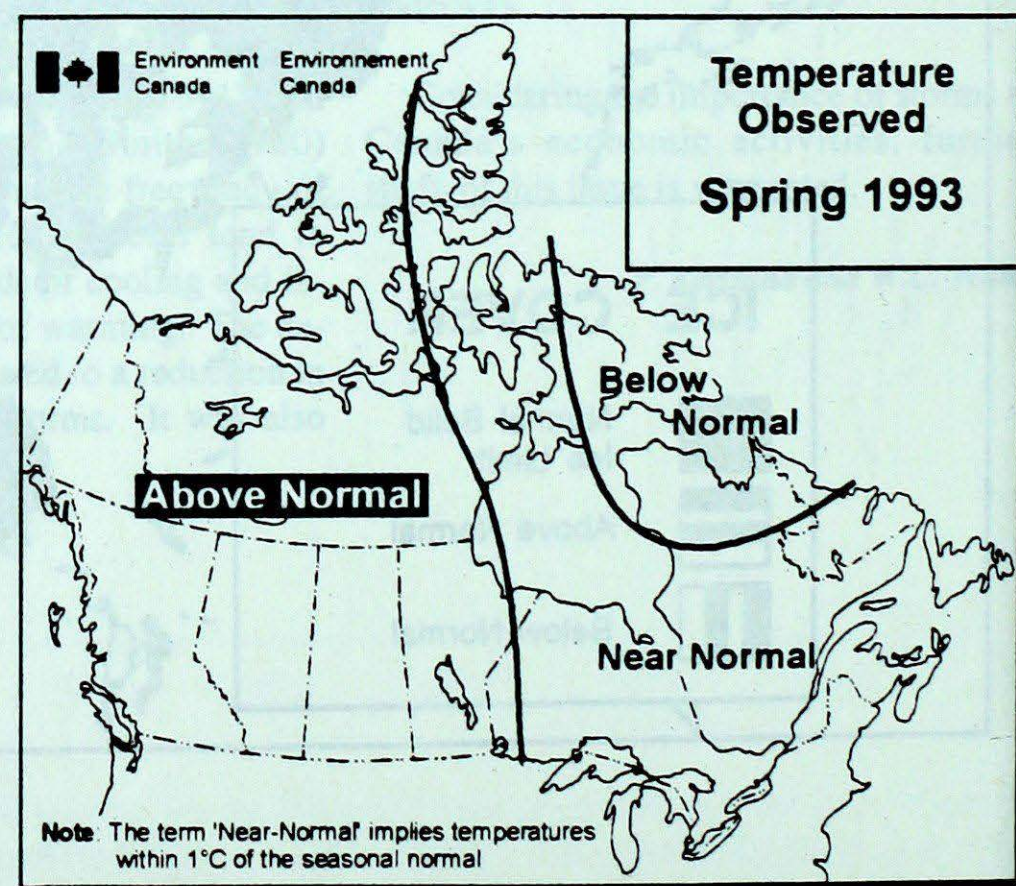
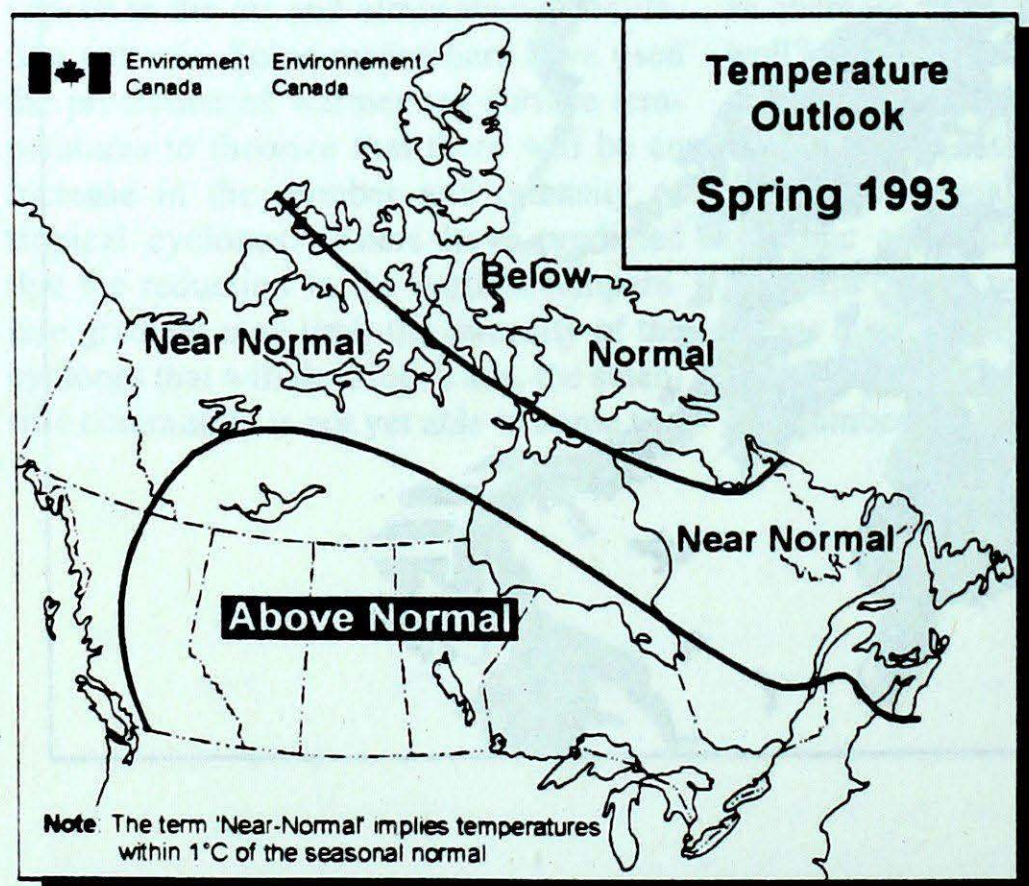
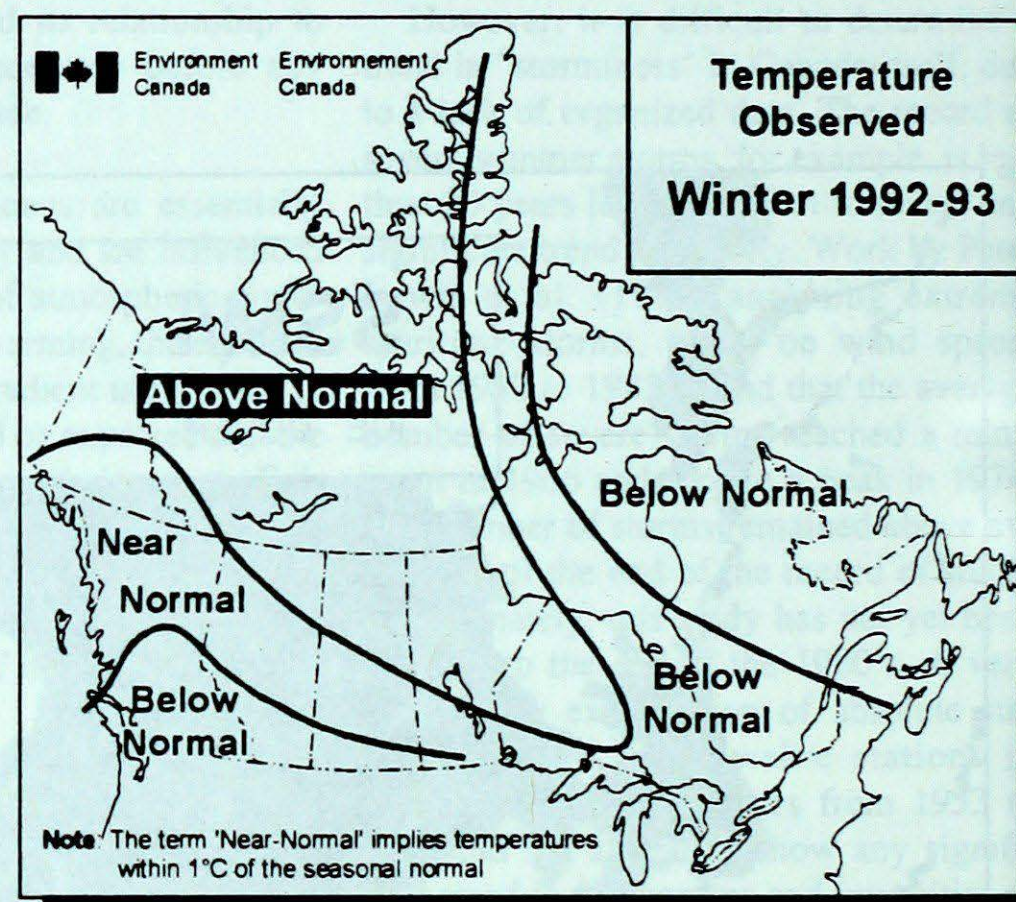
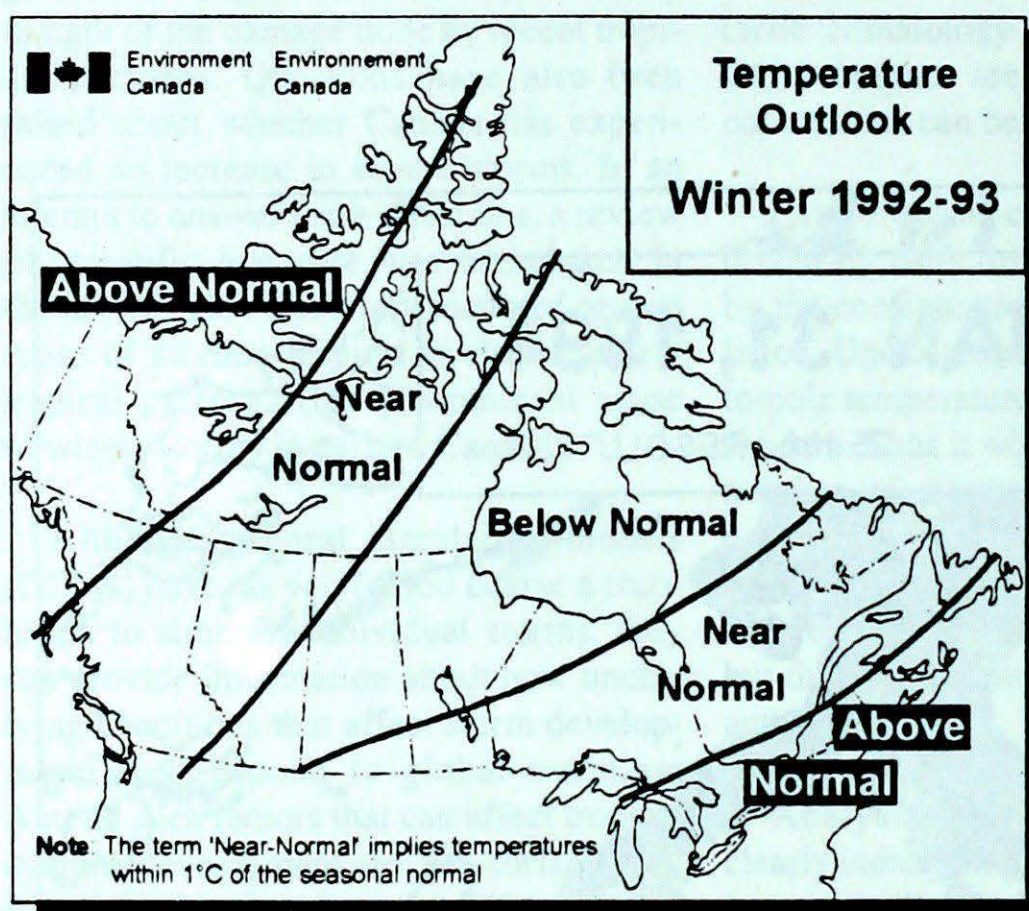
The winter of 1993/94 marks the beginning of the second year that we have been producing seasonal outlooks. The observed temperature anomalies, as well as the outlook that was issued for each season, are shown in three categories (classes): above, below and near normal. Near normal is defined to be within 1°C of the 30-year normal (1951-80) for that season.

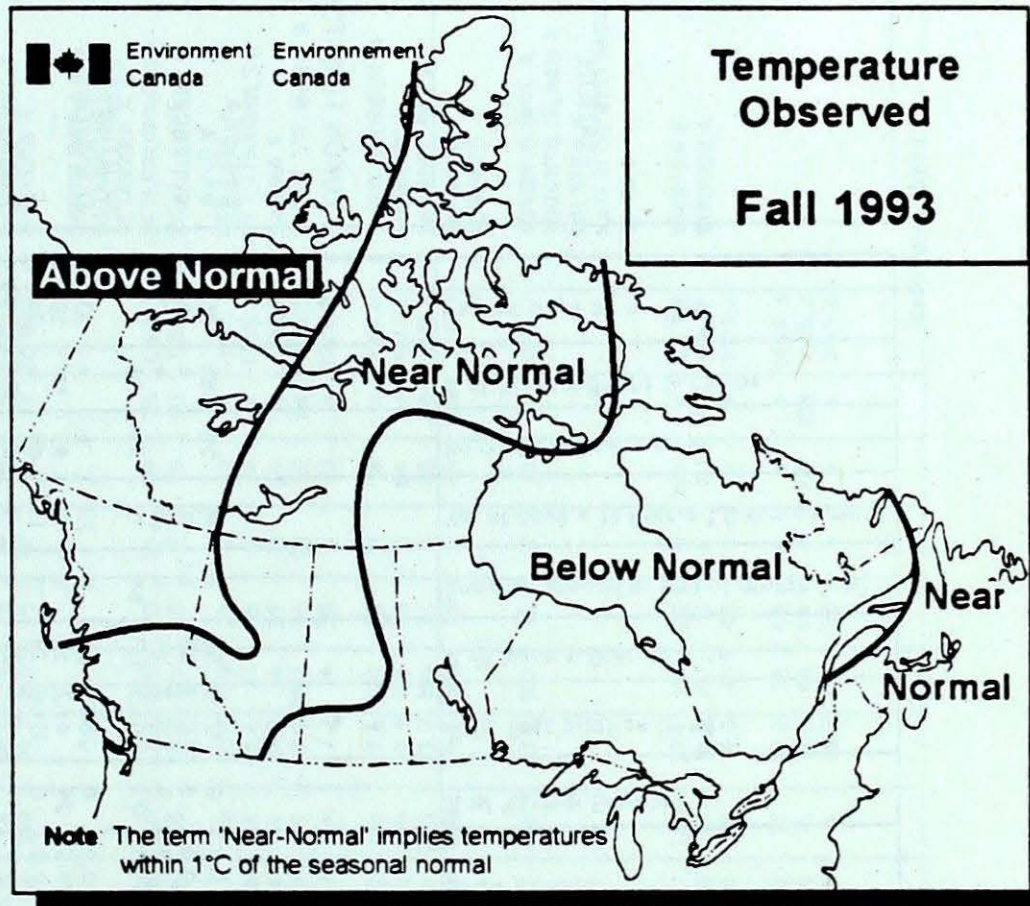
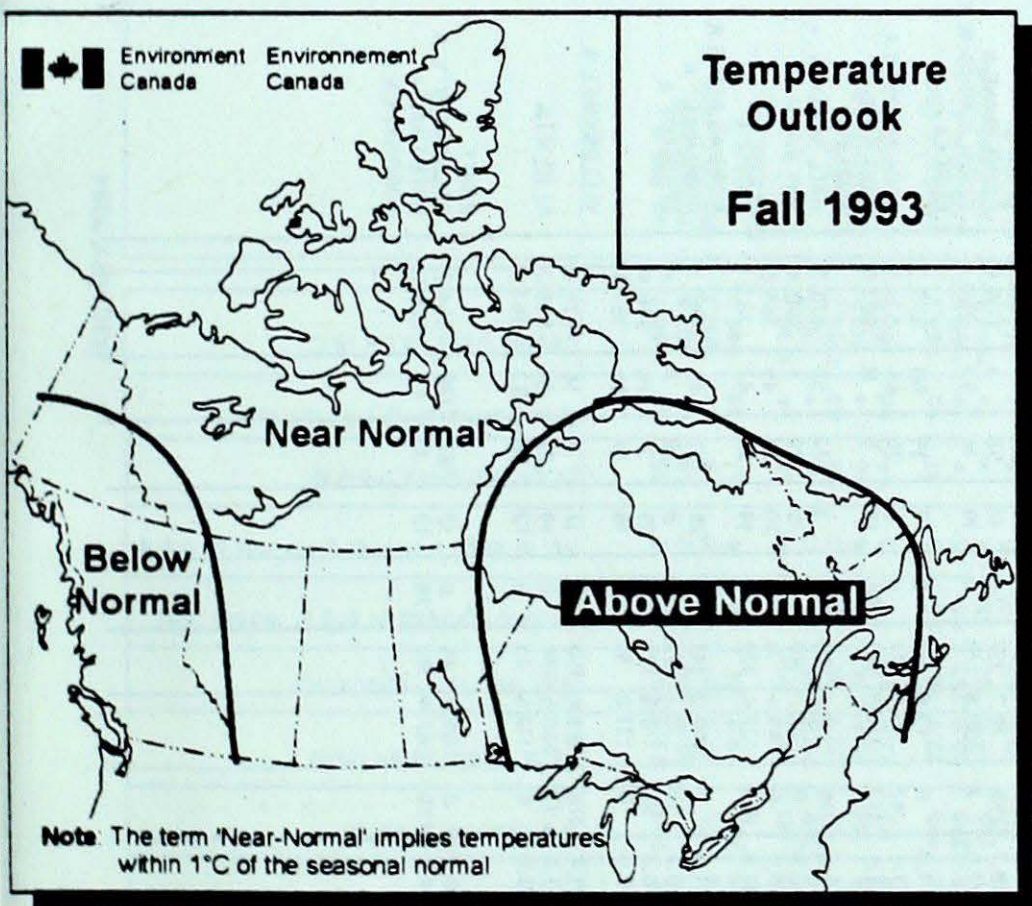
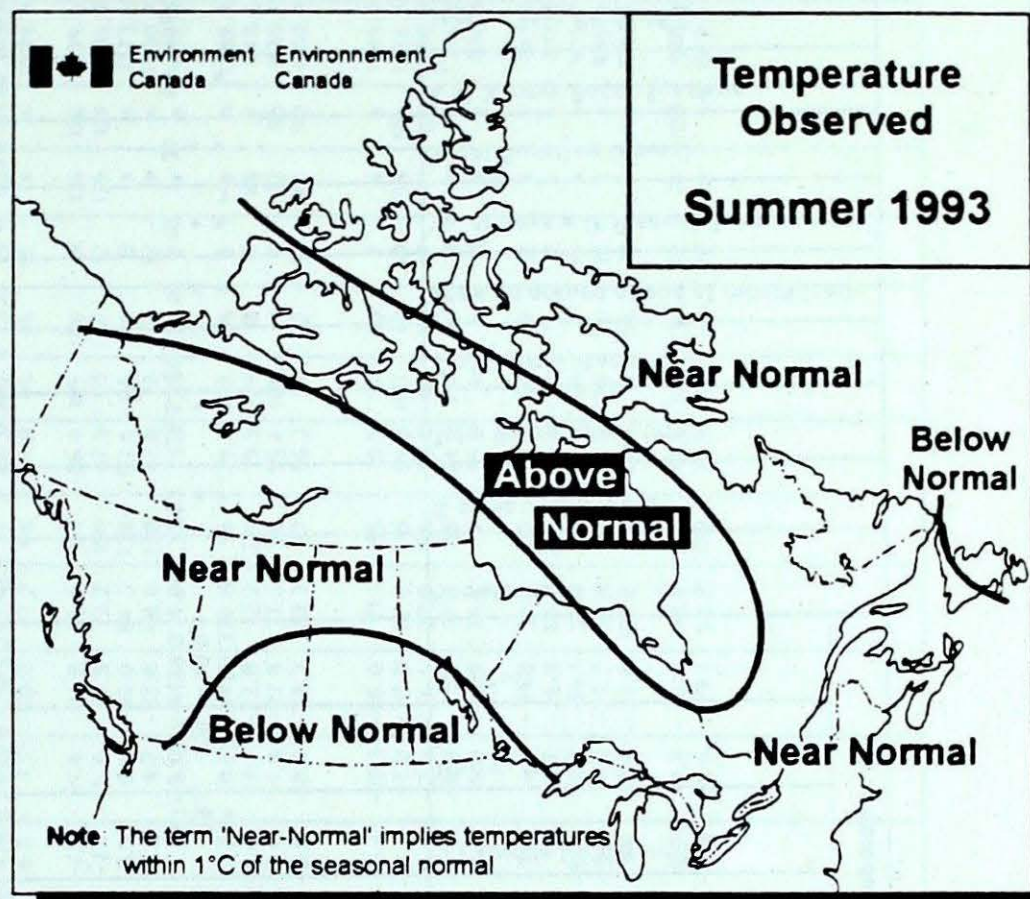
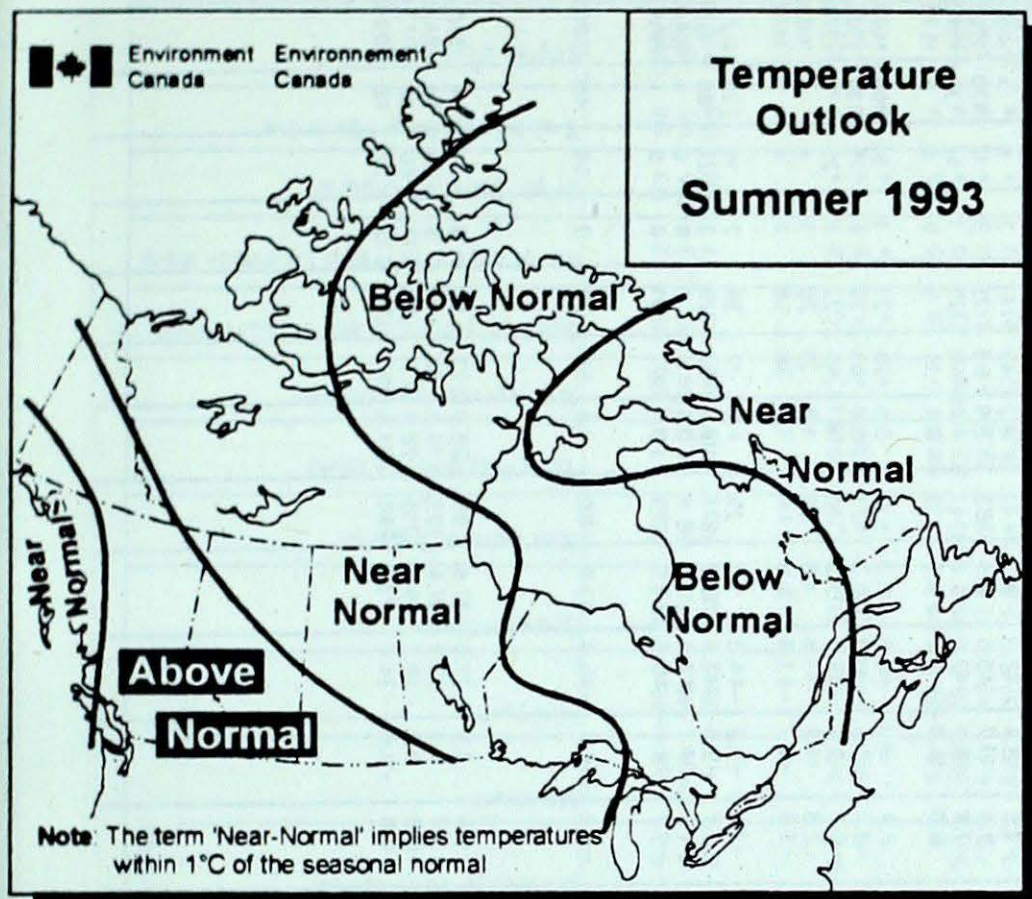
The maps shown may be different from those shown in the original Climatic Perspectives publication of the outlook. Various formats were tried before we settled on the 3-class temperature format, which now appears regularly in Climatic Perspectives.

Verification of the 30-day and seasonal outlooks, as shown, will be provided in

future editions of Climatic Perspectives. Rather than give a score or numerical indication of verification, we leave it up to our readers to decide how well we are doing.

We expect that the long-range outlooks will become more accurate we begin to use information from climate models, which employ sophisticated physical simulations of how the atmosphere works.





JANUARY 1994

STATION	Temperature C				Snowfall (cm)	% of Normal Snowfall	Total Precipitation (mm)	% of Normal Precipitation	Snow on ground at end of month (cm)	No. of days with Precip 1.0 mm or more	Bright Sunshine (hours)	% of Normal Bright Sunshine	Degree Days below 18 C
	Mean	Difference from Normal	Maximum	Minimum									
BRITISH COLUMBIA													
ABBOTSFORD A	6.3	4.7	12.5	-3.2	0.0	0	121.8	58	0	16	58	85	363.7
ALERT BAY	6.4	3.6	10.6	0.4	0.0	0	133.3	68	0	16	*	*	359.8
AMPHITRITE POINT	7.5	2.8	10.9	1.7	0.0	0	330.3	81	0	20	*	*	324.4
BLUF RIVER A	-3.0	8.4	3.6	-16.5	120.1	123	107.5	131	64	15	25	54	*
CAPE SCOTT	7.4	3.8	11.0	2.6	0.0	0	288.1	86	0	23	*	*	328.5
CASLEGAR A	1.6	6.0	7.1	-6.9	19.8	24	47.2	59	0	8	45	101	509.9
COMOX A	5.7	3.5	11.1	-1.8	0.0	0	151.0	78	0	13	49	*	381.9
CRANBROOK A	-0.7	9.8	9.2	-11.8	9.0	17	11.4	26	0	3	102	129	580.1
DEASE LAKE	-17.3	2.4	-1.0	-35.1	110.6	326	81.6	294	71	14	17	28	1095.7
FORT NELSON A	-21.5	2.3	3.5	-38.6	71.1	227	50.4	202	73	13	53	*	1224.3
FORT ST JOHN A	-18.1	0.4	2.3	-33.7	98.7	258	78.7	221	56	17	58	*	1119.9
HOPE A	6.3	6.7	12.4	-0.8	1.6	2	200.8	78	0	19	16	93	364.1
KAMLOOPS A	1.1	7.2	7.3	-7.6	1.8	6	13.6	43	0	7	39	68	523.3
KELOWNA A	0.9	7.4	7.9	-9.8	13.4	42	15.6	47	0	6	28	64	531.5
MACKENZIE A	-11.3	3.2	1.7	-26.6	138.4	172	114.8	177	94	18	5	8	907.0
PENTICTON A	2.6	5.3	7.7	-3.7	3.0	10	12.2	38	0	3	27	57	478.3
PORT ALBERNIA	5.4	4.6	11.8	-1.8	0.0	0	221.1	90	0	15	20	*	390.4
PORT HARDY A	6.2	3.8	10.8	-1.3	0.0	0	149.4	71	0	20	29	45	365.0
PRINCE GEORGE A	-5.6	6.5	4.9	-29.3	111.8	183	127.4	222	29	19	28	47	733.1
PRINCE RUPERT A	5.2	5.7	11.7	-2.0	1.0	2	340.3	147	0	24	22	45	398.1
PRINCETON A	-0.5	7.4	8.3	-12.0	30.2	55	30.2	55	9	8	38	*	*
REVELSTOKE A	0.4	8.2	6.2	-7.6	78.2	54	118.8	107	21	19	31	70	546.4
SANDSPIT A	6.2	4.2	11.0	0.9	0.0	0	131.0	91	0	16	37	65	367.4
SMITHERS A	-4.8	6.1	2.6	-23.5	101.4	178	83.4	150	52	17	8	14	675.9
TERRACE A	0.1	5.8	6.3	-9.3	83.8	72	160.5	104	0	19	27	51	559.2
VANCOUVER INT'L A	6.3	3.8	12.0	-3.3	0.0	0	112.5	73	0	13	56	103	361.9
VICTORIA INT'L A	6.6	3.5	13.2	-2.7	0.0	0	69.4	45	0	12	82	128	354.2
WILLIAMS LAKE A	-3.9	6.5	6.5	-22.9	64.6	130	62.4	142	28	13	31	44	679.9

STATION	Temperature C				Snowfall (cm)	% of Normal Snowfall	Total Precipitation (mm)	% of Normal Precipitation	Snow on ground at end of month (cm)	No. of days with Precip 1.0 mm or more	Bright Sunshine (hours)	% of Normal Bright Sunshine	Degree Days below 18 C
	Mean	Difference from Normal	Maximum	Minimum									
YUKON TERRITORY													
DAWSON A	-29.4	*	-7.7	-50.3	6.6	*	4.8	*	*	*	*	*	*
MAYO A	-27.1	1.9	0.9	-50.0	*	*	*	*	*	*	*	*	*
WHITEHORSE A	-17.0	3.7	2.7	-39.0	51.7	243	35.5	201	18	10	31	68	1084.9
NORTHWEST TERRITORIES													
BAKER LAKE A	-35.8	-2.8	-22.4	-43.5	0.2	2	0.2	3	27	0	33	92	1668.9
CAMBRIDGE BAY A	-34.8	-1.2	-21.3	-40.6	2.8	53	2.6	54	20	1	14	***	1636.0
CLYDE A	-30.0	-3.5	-18.4	-42.3	4.2	42	4.2	42	41	3	0	*	1486.6
COPPERMINE A	-30.5	-0.4	13.7	-43.5	7.6	83	5.9	63	22	3	17	420	1502.4
CORAL HARBOUR A	-32.1	-2.4	-18.4	-42.9	4.0	47	4.0	48	25	1	57	130	1548.3
FURFKA	-31.4	5.0	-14.0	-41.2	0.6	19	0.4	14	5	0	0	*	1530.6
FORT SIMPSON A	-30.7	-2.4	-4.1	-48.0	4.3	21	3.6	20	27	1	51	106	1499.3
FORT SMITH A	-30.5	-3.7	-10.5	-45.1	26.3	123	12.0	65	70	6	75	132	1502.0
IQUALUIT	-26.4	-0.8	-8.7	-38.8	19.2	70	18.1	69	22	7	25	70	1378.8
HALL BEACH A	33.8	-2.8	-14.9	-41.8	1.8	20	1.8	21	26	1	*	*	1605.0
HAY RIVER A	-29.7	-3.9	-8.2	-43.8	9.8	44	7.8	38	56	3	*	*	1478.7
INUVIK A	-31.1	-1.5	-9.0	-44.3	5.2	25	4.0	22	38	2	16	230	1523.3
NORMAN WELLS A	-31.1	-2.2	-2.9	-47.6	15.8	77	12.0	62	29	3	27	88	1521.1
POND INLET A	-35.1	*	-24.7	-43.8	0.6	*	0.6	*	7	0	0	*	1644.5
RESOLUTE A	-33.3	-1.2	-24.4	-40.8	1.0	29	0.9	27	21	0	0	*	1589.0
YELLOWKNIFE A	-33.0	-4.2	-14.4	-45.0	13.6	88	7.4	56	27	3	69	48	1580.4
ALBERTA													
BANFF	-5.6	5.9	7.5	-27.0	37.6	85	28.0	73	19	8	*	*	730.3
CALGARY INT'L A	-9.1	2.7	9.3	-23.9	21.4	103	10.6	65	4	5	96	94	842.3
COLD LAKE A	-19.8	-0.8	0.2	-38.7	49.9	210	28.9	131	40	12	46	50	1173.6
CORONATION A	-17.3	-0.8	-0.4	-34.7	73.1	290	41.6	193	34	12	57	48	1094.1

STATION	Temperature C				Snowfall (cm)	% of Normal Snowfall	Total Precipitation (mm)	% of Normal Precipitation	Snow on ground at end of month (cm)	No. of days with Precip 1.0 mm or more	Bright Sunshine (hours)	% of Normal Bright Sunshine	Degree Days below 18 C
	Mean	Difference from Normal	Maximum	Minimum									
EDMONTON INT'L A	-16.5	0.0	1.6	-34.0	80.4	280	73.9	303	38	13	59	60	1068.7
EDMONTON MUNICIPAL	-15.2	-0.2	1.9	-31.1	76.1	*	68.6	279	45	12	58	64	102.9
EDMONTON NAMAO A	-16.1	-0.5	1.2	-32.8	77.8	315	56.3	227	37	11	*	*	1057.1
EDSON A	-14.0	0.3	6.0	-33.0	102.8	286	79.8	314	40	14	57	69	994.2
FORT MCMURRAY A	-23.6	-1.8	-0.9	-41.2	37.1	141	20.3	89	37	10	48	54	1290.7
GRANDE PRAIRIE A	-18.1	-0.4	0.9	-37.6	102.0	268	90.8	268	45	21	44	*	1119.5
HIGH LEVEL A	-24.1	-0.9	1.7	-46.1	25.9	97	22.1	95	38	7	43	80	1306.2
JASPER	-8.2	4.6	5.7	-27.6	44.8	118	25.4	74	30	6	56	*	812.5
LETHBRIDGE A	-7.3	3.0	13.1	-26.2	23.6	83	13.8	58	1	5	64	68	782.4
MEDICINE HAT A	-12.5	0.1	6.8	-21.3	28.2	109	22.9	101	6	9	47	50	944.2
PEACE RIVER A	-19.7	0.7	3.4	-41.2	59.3	220	56.0	253	46	15	*	*	1168.0
RED DEER A	-14.5	1.0	1.1	-33.7	60.7	245	46.9	197	36	14	*	*	1007.4
ROCKY MTN HOUSE A	-13.5	-0.5	9.2	-32.5	58.1	191	49.8	180	39	15	*	*	977.6
SLAVE LAKE A	-17.6	-0.4	2.0	-39.0	76.6	231	55.2	208	35	19	40	48	1014.9
SUFFIELD A	-13.3	*	5.2	-29.5	35.8	*	26.7	*	9	9	58	*	968.2
WHITECOURT A	-15.4	1.2	2.7	-31.0	101.9	319	74.7	255	35	16	*	*	1036.3
SASKATCHEWAN													
BROADVIEW	-22.3	-2.6	5.5	-37.7	39.6	211	33.4	190	23	13	90	75	1248.3
ESTEVAN A	-20.5	-4.2	-3.0	-39.8	50.8	249	33.6	175	28	7	79	65	1192.0
KINDERSLEY	-18.4	-1.2	-2.0	-35.2	35.7	197	22.1	129	20	7	42	*	1127.3
LA RONGE A	-25.8	-3.1	-8.2	-42.1	18.6	84	13.4	77	38	7	*	*	1355.3
MEADOW LAKE A	-22.4	*	-2.6	-40.6	38.0	*	27.8	*	34	11	54	*	1251.8
MOOSE JAW A	-18.1	-2.3	2.7	-34.0	69.0	297	52.6	283	35	13	57	54	1119.5
NIPAWIN A	-24.8	*	-6.9	-39.1	11.2	*	7.2	*	30	3	73	*	1326.6
NORTH BATTLEFORD A	-20.1	-1.1	-3.0	-36.5	35.2	159	27.6	139	23	11	*	*	1181.0
PRINCE ALBERT A	-23.2	-1.7	-5.1	-39.2	28.3	155	20.9	126	25	9	64	67	1277.0
REGINA A	-19.9	-2.0	-5.1	-38.3	47.0	235	33.0	199	33	9	69	69	1174.1
SWIFT CURRENT A	-15.8	-1.1	4.7	-33.3	32.0	144	29.6	140	25	11	46	50	1042.1
YORKTON A	-22.9	-3.0	6.1	-39.2	26.2	108	23.8	105	35	12	75	70	1027.2
MANITOBA													
BRANDON A	-23.5	-3.8	-6.9	-37.4	27.1	128	21.4	110	20	9	104	*	1283.8
DAUPHIN A	-23.7	-4.2	-5.3	-39.1	25.0	97	14.0	57	17	4	111	93	1292.7
GILLIAM A	-31.1	-3.1	-14.6	-42.1	18.0	78	8.0	45	40	3	*	*	1522.7
ISLAND LAKE	-30.0	-5.2	-10.9	-42.4	14.8	37	12.0	55	44	4	*	*	1489.3
LYNN LAKE A	-31.2	-4.3	-13.9	-40.9	19.9	75	12.8	69	44	4	102	109	1524.2
NORWAY HOUSE A	-28.9	*	-10.1	-41.4	25.8	*	19.2	*	35	5	*	*	1455.8

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	Mean	Difference from Normal	Maximum	Minimum									
THE PAS A	-26.9	-4.2	-8.8	-40.0	10.7	46	7.0	39	18	2	113	110	1390.6
THOMPSON A	30.7	-4.1	-14.4	-45.7	17.2	68	9.3	49	37	3	136	145	1511.3
WINNIPEG INT'L A	-23.1	-3.8	-7.2	-35.3	20.8	88	14.0	66	17	7	131	108	1274.8
ONTARIO													
CARLTON A	-24.7	-8.4	-3.8	-39.6	41.3	72	35.7	63	50	8	*	*	1322.4
GERALDTON A	-27.4	*	-3.2	-45.4	23.8	*	21.4	*	24	6	*	*	1407.6
GORE BAY A	*	*	*	*	*	*	*	*	*	*	*	*	*
HAMILTON RBG	-10.0	*	5.5	-27.0	89.2	*	88.8	*	8	15	86	*	*
HAMILTON A	-11.7	-5.3	5.3	-28.0	95.2	242	83.8	119	23	10	*	*	920.4
KAPUSKASING A	-26.5	-7.9	-4.4	-42.5	37.6	68	32.8	61	51	9	*	*	1378.9
KENORA A	-23.6	-5.1	-8.4	-37.3	16.8	54	14.8	52	21	3	*	*	1291.0
KINGSTON A	-14.0	-6.3	6.0	-32.2	61.0	118	68.0	85	22	12	107	107	992.7
LONDON A	-11.5	-4.9	4.3	-29.1	42.4	77	84.5	112	13	13	58	81	913.7
MUSKOKA A	-17.0	-6.6	1.7	-40.0	77.2	96	84.8	99	45	16	*	*	1084.9
NORTH BAY A	-20.7	-7.7	-1.4	-37.8	75.6	127	66.4	105	60	9	116	120	1199.6
OT TAWA INT'L A	-18.0	-7.1	5.4	-32.5	75.2	150	67.6	111	57	12	125	127	1115.9
PETAWAWA A	-21.6	-8.5	0.0	-39.0	64.3	138	53.4	94	*	8	*	*	1223.5
PETERBOROUGH A	-15.9	-6.3	4.7	-37.6	48.6	138	42.8	77	22	12	*	*	1050.2
PICKLE LAKE	-27.3	-5.9	-9.0	-41.5	14.0	33	13.2	35	26	2	*	*	1402.8
RED LAKE A	-26.2	-5.2	-8.7	-39.2	29.8	96	19.6	68	44	6	146	*	1369.3
ST CATHARINES A	-9.1	-4.4	7.7	-23.8	72.2	219	75.5	129	8	17	69	*	840.2
SARNIA A	-10.4	-3.9	4.8	-27.9	27.6	96	55.4	105	1	9	72	85	830.7
SAULT STE MARIE A	-17.5	-6.8	-0.9	-36.2	62.7	82	56.2	70	22	12	84	110	1100.2
SIOUX LOOKOUT A	-25.5	-6.1	-10.1	-40.0	21.1	55	19.5	54	40	7	*	*	1349.2
SUDBURY A	-21.9	-8.2	-1.0	-38.0	62.0	115	59.3	103	42	10	106	105	1236.3
THUNDER BAY A	-22.0	-6.6	-3.6	-36.6	27.0	56	16.4	40	28	7	141	119	1239.0
TIMMINS A	-25.7	-8.4	-6.3	-41.0	37.0	56	24.5	44	61	9	*	*	1354.8
TORONTO	-10.0	*	5.0	-25.9	75.4	*	65.0	*	6	11	*	*	868.1
TORONTO INT'L A	-12.4	-5.7	4.5	-31.0	37.4	112	61.0	121	7	12	*	*	941.3
TORONTO ISLAND A	-10.1	*	3.7	-26.9	66.8	214	59.5	*	4	11	*	*	871.3
TRENTON A	-14.2	-6.6	5.7	-35.1	55.9	116	67.8	98	9	16	*	*	996.7
WATERLOO WELLINGTON	-13.2	-5.5	4.5	-29.2	56.8	141	81.8	136	20	15	*	*	968.6
WAWA A	-22.9	*	-2.2	-39.8	102.8	*	55.8	*	56	12	*	*	1267.2
WIARTON A	-13.3	6.2	2.9	-30.6	161.6	158	112.6	116	37	20	74	108	970.9
WINDSOR A	-9.2	-4.3	5.0	-29.1	53.8	178	79.8	145	4	11	*	*	843.4

JANUARY 1994

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	Mean	Difference from Normal	Maximum	Minimum									
QUEBEC													
BAGOTVILLE A	-22.9	-7.1	-1.8	-37.5	86.9	127	70.6	111	70	14	*	*	1267.4
BAIE COMEAU A	-19.7	-5.7	-0.8	-35.4	98.8	117	89.4	98	39	15	137	140	1169.1
CHIROUGAMAU CHAPAIS	-27.9	*	-11.0	-45.0	*	*	*	*	*	*	*	*	1472.4
GASPE A	-16.0	*	8.1	-35.2	107.4	*	93.2	*	50	10	137	*	1054.1
KUUJUAQ A	-29.0	-5.7	-6.2	-42.9	35.6	109	35.6	108	32	7	70	111	1458.3
KUUJUAUPIK A	-29.8	-7.3	-11.0	-40.7	24.4	91	23.8	92	18	9	99	138	1481.1
LA GRANDE IV A	-30.3	*	-12.9	-45.1	22.2	*	*	*	*	6	96	*	1497.2
LA GRANDE RIVIERE A	-30.5	*	-11.6	-40.4	7.0	*	7.0	*	56	3	104	*	1503.7
MANIWAKI	-20.6	-7.1	0.2	-36.0	*	*	71.7	130	*	20	*	*	1196.9
MONT JOLI A	-17.6	-6.0	0.7	-30.7	133.3	153	125.4	143	20	16	90	111	1102.5
MONTREAL INT'L A	-16.6	-6.4	8.1	-31.8	69.2	131	88.8	123	14	10	128	120	1071.7
MONTREAL MIRABEL I/	-18.5	*	7.6	-35.5	79.0	*	105.6	*	30	11	153	*	1132.0
QUEBEC A	-18.8	-6.7	4.9	-33.0	104.6	135	109.4	122	92	16	146	150	1142.8
ROBERVAL A	-23.5	-7.7	-1.6	-35.6	62.4	89	62.2	92	39	14	128	*	1285.4
SFPT-II FS A	-19.9	-5.9	-3.3	-36.3	123.8	133	85.0	89	37	16	13	12	1174.9
SHERBROOKE A	-17.8	-6.2	8.0	-37.1	150.2	241	127.4	173	55	*	111	*	1110.6
ST HUBERT A	-16.7	-6.6	8.3	-34.7	66.7	*	84.7	102	24	10	124	*	1074.0
VAL D'OR A	-25.8	-9.0	-6.1	-40.3	54.4	91	48.0	80	56	8	119	118	1357.5
NEW BRUNSWICK													
CHARLO A	-16.8	-4.1	6.3	-31.6	128.9	153	122.7	136	85	14	27	23	1073.9
CHATHAM A	*	*	*	*	*	*	*	*	*	*	*	*	*
FREDERICTON A	-14.8	-5.6	9.0	-31.0	88.1	138	128.7	125	5	9	*	*	1018.3
MONCTON A	-13.5	-5.4	9.2	-30.9	87.7	113	97.5	78	8	8	128	119	977.8
SAINT JOHN A	-12.4	-4.6	8.7	-27.7	84.6	111	149.3	100	4	11	140	132	942.8

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									
NOVA SCOTIA													
GREENWOOD A	-8.9	-3.9	11.4	-25.9	127.1	167	147.4	117	13	16	*	*	832.8
HALIFAX INT'L A	-9.3	-3.3	8.8	-28.5	59.5	94	130.3	85	4	14	*	*	845.4
SABIE ISLAND	-1.4	-1.5	10.6	-14.0	25.0	69	146.4	100	0	14	42	80	601.5
SHEARWATER A	-7.6	-3.5	9.1	-26.5	66.1	145	132.0	92	1	11	125	110	791.3
SYDNEY A	-8.8	-4.1	7.7	-26.2	79.6	107	139.9	94	10	15	125	145	831.0
YARMOUTH A	-5.8	-3.1	9.1	-21.3	113.6	183	160.8	114	0	22	59	83	736.9
PRINCE EDWARD ISLAND													
CHARLOTTETOWN A	-12.1	-5.0	7.3	-29.0	111.8	146	115.6	99	14	10	*	*	933.3
NEWFOUNDLAND													
BONAVISTA	-5.7	-1.4	8.1	-17.2	47.0	92	78.4	87	5	15	*	*	734.7
BURGEO	-6.7	-1.9	6.1	-21.4	92.1	161	182.6	119	8	23	*	*	771.7
CARTWRIGHT	-17.3	-4.1	2.0	-34.4	114.2	137	117.6	132	92	15	88	98	1093.7
COMFORT COVE	-9.3	-1.9	8.0	-20.7	44.8	55	61.0	64	24	12	*	*	824.0
DANIELS HARBOUR	-9.1	-2.2	9.5	-23.5	96.8	109	134.2	135	7	27	22	40	787.4
DEER LAKE A	-8.4	0.0	9.1	-22.5	140.1	162	136.0	145	27	23	*	*	830.1
GANDER INT'L A	-8.7	-2.5	6.6	-20.9	68.8	87	86.0	79	21	16	113	132	827.7
GOOSE A	-21.1	-4.7	1.6	-35.2	111.5	139	94.5	127	34	14	102	115	1212.3
MARY'S HARBOUR	-14.1	-3.8	4.2	-29.9	31.0	42	55.4	65	28	11	*	*	995.5
PORT AUX BASQUES	-6.8	-2.7	5.5	-22.0	136.8	186	175.4	131	53	26	32	*	785.8
ST ANTHONY	-12.6	-1.3	4.0	-30.7	78.1	136	73.1	76	54	16	*	*	918.4
ST JOHN'S A	-5.6	-1.7	10.4	-18.8	83.5	103	147.4	95	4	19	75	*	729.4
ST LAWRENCE	-5.2	-1.4	7.9	-18.2	59.6	117	143.8	121	10	24	*	*	720.4
STEPHENVILLE A	-7.6	-2.6	7.3	*	93.4	987	128.5	111	36	28	28	*	793.6
WABUSH LAKE A	-27.4	-5.1	-11.5	-42.5	49.3	*	41.0	63	60	11	89	*	1407.7

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	6.6	5.4	12.5	0.5	0.0	150.9	66	0	18	50	0.0	54.0
SUMMERLAND	2.5	5.9	6.5	-7.5	2.2	16.1	45	0	4	27	0.0	15.6
ALBERTA												
BEAVERLODGE	-15.8	0.1	3.0	-32.0	94.5	82.7	251	43	16	44	0.0	0.0
LACOMBE	-14.6	0.9	2.5	-34.0	55.0	56.3	262	23	15	53	0.0	0.0
SASKATCHEWAN												
INDIAN HEAD	-21.5	-3.6	-4.5	-37.0	39.3	32.9	157	52	8	**	0.0	0.0
MELFORT	-23.4	-2.5	-5.0	-37.0	11.3	11.3	60	38	5	54	0.0	0.0
REGINA	**	**	**	**	**	**	**	***	***	**	**	**
SCOTT	-19.4	-0.3	-2.0	-37.0	40.4	37.3	221	30	9	46	0.0	0.0
SWIFT CURRENT	-14.8	0.0	4.5	-33.0	28.7	28.2	171	25	6	46	0.0	0.0
MANITOBA												
BRANDON	-23.6	-4.3	-5.2	-38.8	26.0	26.0	122	17	10	**	0.0	0.0
MORDEN	-21.8	-2.1	-7.0	-34.0	19.4	19.4	76	12	7	124	0.0	0.0
GLENLEA	-24.5	-7.2	-7.0	-40.0	11.2	11.2	48	24	7	128	0.0	0.0
ONTARIO												
DELHI	-10.4	-4.4	6.0	-22.5	48.4	78.4	117	15	12	**	0.0	0.0
FLORA	-13.9	-5.7	3.4	-30.0	38.8	75.6	130	21	10	**	0.0	0.0
HARROW	-7.9	-3.1	5.0	-27.5	31.5	62.9	107	3	10	72	0.0	0.0
KAPUSKASING	-27.0	-8.4	-5.0	-45.0	32.6	31.4	65	32	9	108	0.0	0.0
OTTAWA	-17.5	-6.7	5.8	-32.2	67.6	80.3	145	19	14	125	0.0	0.0
SMITHFIELD	-13.3	-5.8	4.5	-31.8	70.1	90.6	110	17	12	**	0.0	0.0

Courtesy of Agriculture Canada

STATION	Temperature C				Snowfall (cm)	Total Precipitation (mm)	% of Normal Precipitation	Snow on ground at end of month (cm)	No. of days with Precip 1.0 mm or more	Bright Sunshine (hours)	Degree days above 5 C	
	Mean	Difference from Normal	Maximum	Minimum							This month	Since Jan. 1st
QUEBEC												
LA POCAIERE	-17.9	-6.6	3.0	-33.5	99.9	102.2	130	60	14	124	0.0	0.0
NORMANDIN	-26.6	-8.6	-9.1	-44.4	**	67.4	106	43	23	137	0.0	0.0
NEW BRUNSWICK												
FREDERICTON	-14.3	-5.2	9.0	-32.0	75.4	117.6	114	0	11	136	0.0	0.0
NOVA SCOTIA												
KENTVILLE	-8.8	-3.8	11.0	-28.0	111.1	161.0	119	25	20	74	0.0	0.8
NAPPAN	-11.1	-4.3	9.5	-33.5	77.7	124.4	109	10	10	109	0.0	0.0
PRINCE EDWARD ISLAND												
CHARLOTTE TOWN	**	**	**	**	**	**	**	***	***	**	**	**
NEWFOUNDLAND												
ST. JOHN'S WEST	-5.0	-1.2	10.0	-19.0	65.7	162.2	90	19	674	0	**	**

Courtesy of Agriculture Canada

...continued from page 5

Quebec

Quebec experienced the coldest January in history at all stations south of the 54th parallel, except for Sherbrooke (the second coldest), Sept-Îles (third coldest), Natashquan and Blanc Sablon. From Val-d'Or to Sept-Îles, at least 72 daily record-low minimum and record-low maximum temperatures were recorded. Montréal's mean of -16.6°C was the coldest since 1871, using the records at McGill. Hydro-Quebec estimated that the sale of electricity was in the neighbourhood of \$40 million more than normal.

In spite of the cold, precipitation was generally about 100 to 156% of normal, with 55 to 85 cm. Exceptions were Sherbrooke (150 cm), Québec (105 cm), Mont-Joli (133 cm), Gaspé (107 cm), Sept-Îles (124 cm) and Natashquan (126 cm). In contrast, La Grande Rivière received only 7 cm of snow. With the cold weather, sunshine totals across the province were 105 to 183% of normal.

A major storm on the 5th deposited 15 to 18 cm of snow on the North Shore and 20 to 30 cm in the Gaspé region. Winds gusted to 98 km/h at Cap-Chat. The ferry Camille Marcoux was stuck in ice for 12 hours near Matane. On the 6th, strong winds in the Gaspé region closed many businesses as winds of 113 km/h were recorded at Cap-Chat. On the 8th and 9th, another snowstorm added 31 cm of snow to Mont-Joli, to add to the 76 cm that had already been received from the 1st to the 9th. Three more snowstorms affected the region before the end of the month, each with accumulations of 15 to 30 cm.

Maritimes

Overall, January 1994 was the coldest January since 1920 in many locations. A number of locations which began recording after 1940, reported the coldest month on record. Records included Charlottetown, Prince Edward Island (mean, -12.1°C , old record, -11.9°C , February 1962) and Charlo, New Brunswick (mean,

-16.8°C , old record, -16.4°C , February 1993).

It was extremely cold on the 26th, with both CFB Shearwater and Halifax Int'l, Nova Scotia, recording new record-low minimum temperatures with readings of -26.5°C (previous record, -26.1°C , Jan. 31, 1951) and -28.5°C (previous record, -26.1°C , Feb. 4, 1971), respectively. It was so cold on the 26th that steam fog rising from Halifax Harbour turned the bridges spanning Halifax-Dartmouth to ice, causing havoc to commuters.

Despite the record-cold temperatures, some mild air did manage to find its way to the Maritimes. On the 18th, CFB Greenwood, Nova Scotia, reported a record-maximum temperature of 11.2°C , and Halifax Int'l recorded a record maximum of 8.8°C on the 29th.

Precipitation totals were generally above normal and ranged from 78% of normal at Moncton, New Brunswick, to 145% of normal at Charlo. Snowfall totals in New Brunswick and P.E.I. ranged from a record-high January total of 128.9 cm (153% of normal) at Charlo (previous record, 124.9 cm, 1969) to 103% of normal at Moncton. In Nova Scotia, snowfall ranged from 93% of normal at Halifax Int'l to 170% of normal at CFB Greenwood.

A number of storms crossed the Maritimes during the month. One such storm on the 18th brought heavy rain, snow and strong winds. Over 50 centimetres of snow fell in some areas of northern New Brunswick and up to 40 millimetres of rain fell in Nova Scotia. All modes of transportation were disrupted. Marine ferry services in all areas were halted or delayed. High winds in the Halifax-Dartmouth area broke windows, downed power lines and ripped the roof off a mobile home.

Newfoundland and Labrador

A changeable weather pattern prevailed across Newfoundland during the month.

Below-normal temperatures, frequent periods of snow or rain and strong gusty winds were common. Temperatures varied frequently with a maximum of 10.4°C at St. John's to minimums near -30°C in central and northern locations. Overall, mean temperatures were about 2 degrees below normal. Below-normal temperatures for the month resulted in significant ice growth along the coasts.

Precipitation was above normal in western locations. Deer Lake recorded 140 cm of snow (normal, 86 cm). Total hours of sunshine were above normal in central and eastern regions with Gander recording 112.5 hours, about 25 hours above normal. However, sunshine was around 50% of normal in western locations, where totals were near 25 hours.

Several major wind storms resulted in blizzard conditions during the month. Notably, on the 6th, Port-aux-Basques reported gusts to 120 km/h resulting in visibility near zero in snow and blowing snow. Schools closed, highway travel was at a standstill and the Marine Atlantic ferry from Nova Scotia took forty hours to cross, normally a six-hour sail.

In Labrador, below-normal temperatures dominated, with readings commonly 10 to 15 degrees below normal. Wabush Lake was the coldest at -42.5°C , on the 24th. During a brief respite from the cold, Mary's Harbour reported a reading of 4.2°C during mid-month. Overall, mean temperatures for the month were about 5 degrees below normal. Snowfall amounts varied, with locations in the west, below normal and in the east, above normal. Strong winds accompanied several cold Arctic outbreaks, resulting in bitterly cold conditions and schools were forced to close on several occasions. Happy-Valley (Goose Bay) residents experienced a water shortage as residents kept water running to prevent freeze-up.

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