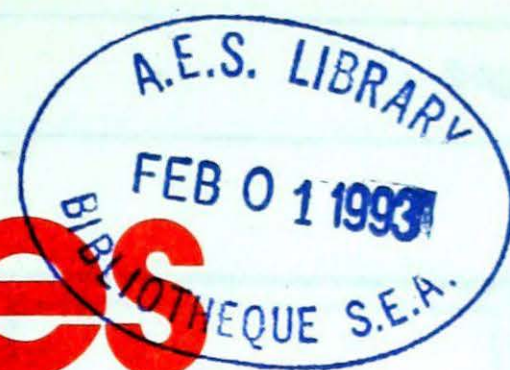




# Climatic Perspectives



Monthly Review

DECEMBER - 1992

Vol. 14

## CLIMATIC HIGHLIGHTS

Major snowstorms dominated this month's weather. The most unusual events took place along Canada's 'balmy' West coast. So far this season, the Greater Vancouver area has endured three major snowstorms, with accumulations between 50 and 90 centimetres. By month's end, Vancouver surpassed its average annual snowfall of 55 cm. Snowstorms also left their mark on Ontario and the Maritimes. Across the western half of the country, temperatures were bitterly cold. Saskatchewan's mean monthly temperatures were as much as 6°C below normal, as the Polar vortex - which normally resides in the Davis Strait - migrated southwest of its normal position. As a result, a cold trans-polar flow developed over the West.

During the first week of the month, the Atlantic provinces were pummelled by two winter storms. On the 3rd, Moncton, N.B. received 38 cm of snow, while more than 20 cm fell on Prince Edward Island. The next day, the low pressure system dumped as much as 25 cm of snow across Newfoundland.

On December 5, a second, more intense system buried the Cape Breton Highlands with 55 cm of snow. To the south, Sydney, N.S., received 26 cm and Charlottetown, P.E.I., received another 25 cm on top of the 24 cm, which fell on the 3rd.

Both storms disrupted highway travel and caused major power outages. On the 6th, the west coast of Newfoundland and the northern Peninsula were hard hit by strong winds and up to 35 cm of snow. In the wake of the storm, strong winds created blizzard conditions over the western parts of the Island, and along the south coast, winds gusting to 127 km/h disrupted ferry services.

Rain and hurricane-force winds pounded Vancouver Island on the 8th, while heavy snow fell at higher elevations on both the Island and along the north Pacific coast.

On December 10 and 11, a record-early winter storm dumped between 20 and 60 cm of snow on southern Ontario between London and Ottawa. Peterborough received 60 cm, but there were unofficial reports of amounts as high as 70 cm. In the Peterborough area, it was the second greatest snowfall since records began in 1866. The heavy, wet snow downed many trees, limbs and powerlines in the Toronto area. The city came to a grinding halt. For the first time in 20 years, hydro crews were called in from the outskirts of Toronto, as some residents endured neither heat nor power for two days. The Toronto City downtown observing site recorded a two day total of 30.8 cm of snow - the greatest snowfall since February 27-28, 1984.

During the week of the 14th, as much 40 cm of snow covered Greater Vancouver and the upper Fraser Valley. Portions of north Vancouver Island received as much as 60 cm. Over the holiday period, two snowstorms dumped more than 30 cm of snow on the Greater Vancouver area. Even balmy Victoria received 24 cm of snow near the end of the month, while residents of Port Hardy, on north Vancouver Island, experienced their first Christmas Day snowfall since 1961. In the wake of the heavy snowfalls, cold air spilled westwards across the Rockies, producing wind gusts in excess of 100 km/h in the coastal valleys of British Columbia. The resulting blowing and drifting snow restricted travel and caused a number of road closures.

Blizzard conditions developed on Christmas and Boxing Day across north-eastern Ontario, as a snowstorm moved across the region. Heavy snowsqualls developed to the lee of the Great Lakes, paralyzing south-central areas with 20 to 40 cm of snow.

On Christmas Day, parts of Newfoundland received 50 cm of snow, along with wind gusts in excess of 105 km/h, while the New Year was ushered in with 20 to 30 cm of snow across parts of New Brunswick, Prince Edward Island, and Cape Breton Island.

Arron Gergye



## Across the country

### Yukon

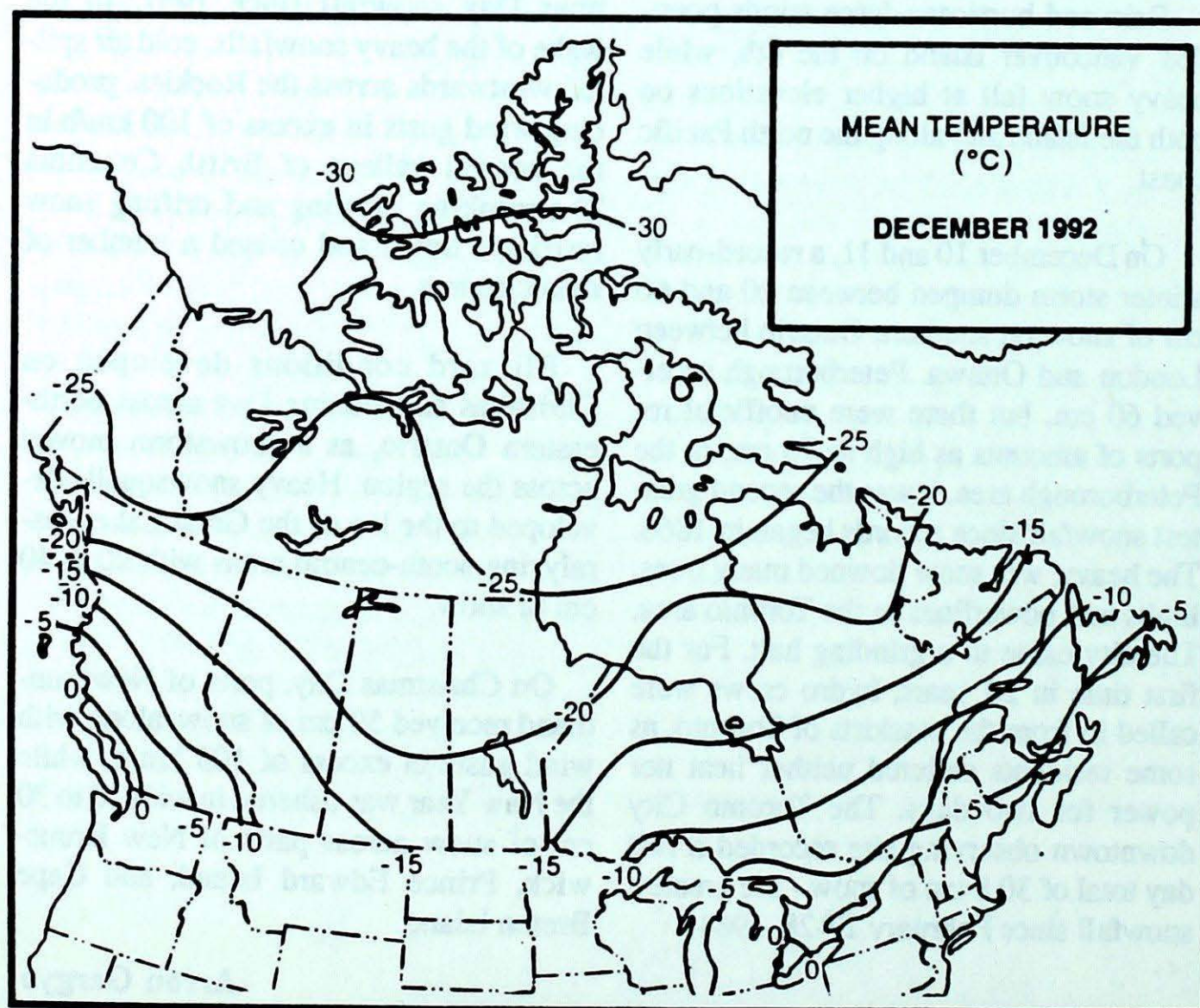
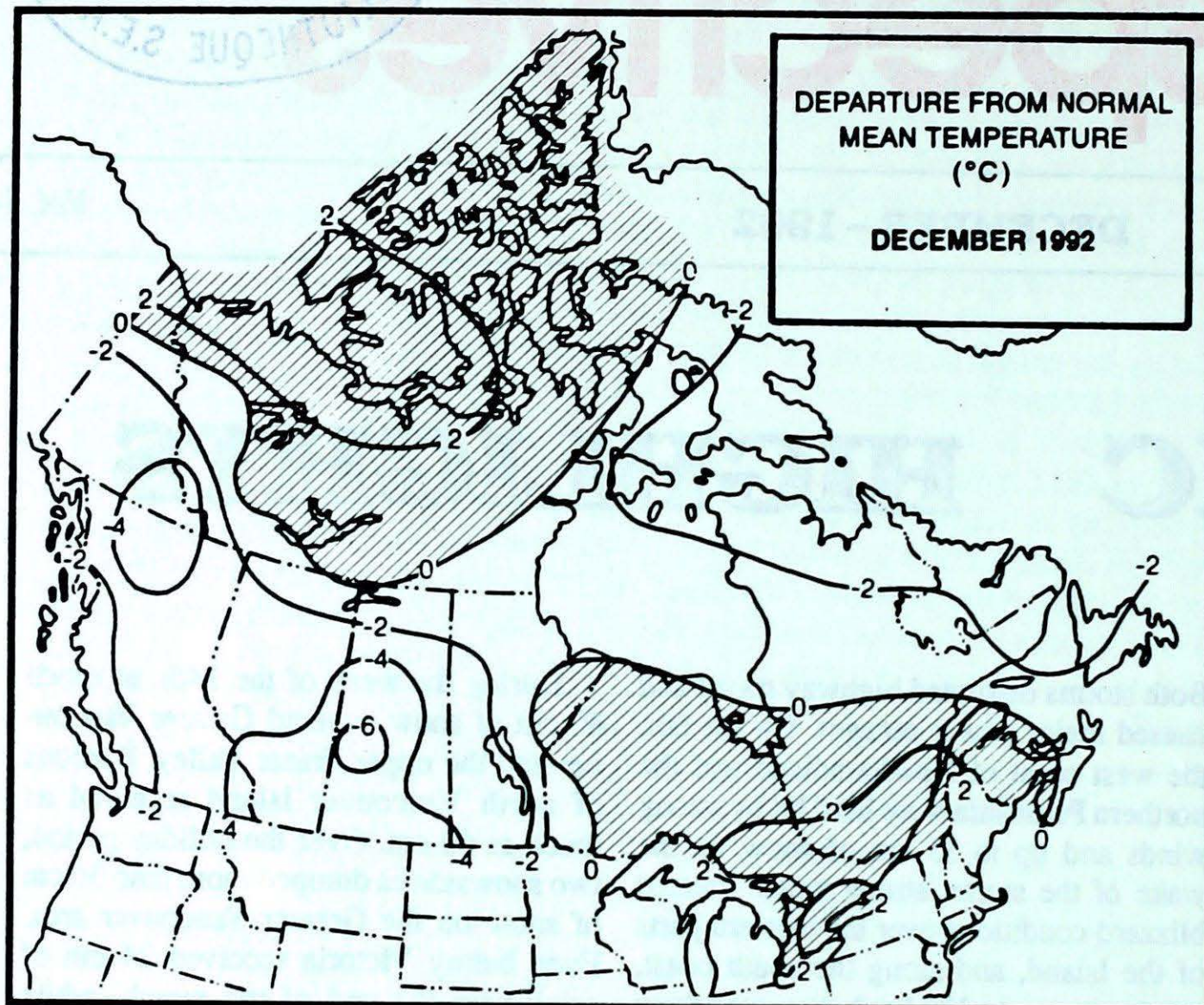
Even though it felt miserable, the statistics show that temperatures averaged near to above normal this month. At times, minimum temperatures dipped well into the minus thirties. Old Crow was the Territory cold spot, with a chilly  $-41^{\circ}\text{C}$ . Most locations had a few days with readings on the plus side, but two communities failed to reach the freezing mark even once during the month - Shingle Point and Old Crow.

Precipitation was light across the Yukon, with very little precipitation falling in the form of rain this month. Most stations received between 20 and 30 cm of snow. The greatest total accumulation, 84 cm, was at Blanchard River on the Yukon side of the coastal pass to Haines Alaska. On the other hand, the coastal passes in British Columbia were inundated with snow. Fraser Camp, in the White Pass, had 276 cm of snow, leaving 101 cm of snow on the ground at month's end.

The south-central Yukon around Whitehorse, and the Dawson area, received a little more snow than average. Shingle Point had over 150% of their normal snowfall, while the rest of the Territory recorded less than their normal monthly amount.

### Northwest Territories

The high Arctic was often clear and cold, but did experience the usual snowfalls. Baffin Island experienced numerous blizzards, due to low pressure systems moving into Davis Strait and Baffin Bay. Mild Atlantic air warmed up the southeastern Arctic to above freezing several times, but overall, temperatures averaged 4 to 5 degrees below normal. The western Arctic tended to be warmer, with Mold Bay averaging  $2^{\circ}\text{C}$  above normal. All areas reported a minimum temperature colder than  $-30^{\circ}\text{C}$  and, not surprisingly, Eureka reported the coldest reading, a chilling  $-41.8^{\circ}\text{C}$ . The weather along the Arctic coast varied with the passage of weather systems. Almost all regions had blizzards or near blizzard conditions at least once this month. East of Cambridge Bay, there was extensive low





cloud and fog during the first half of the month, but conditions cleared as the water froze and a solid ice cover developed.

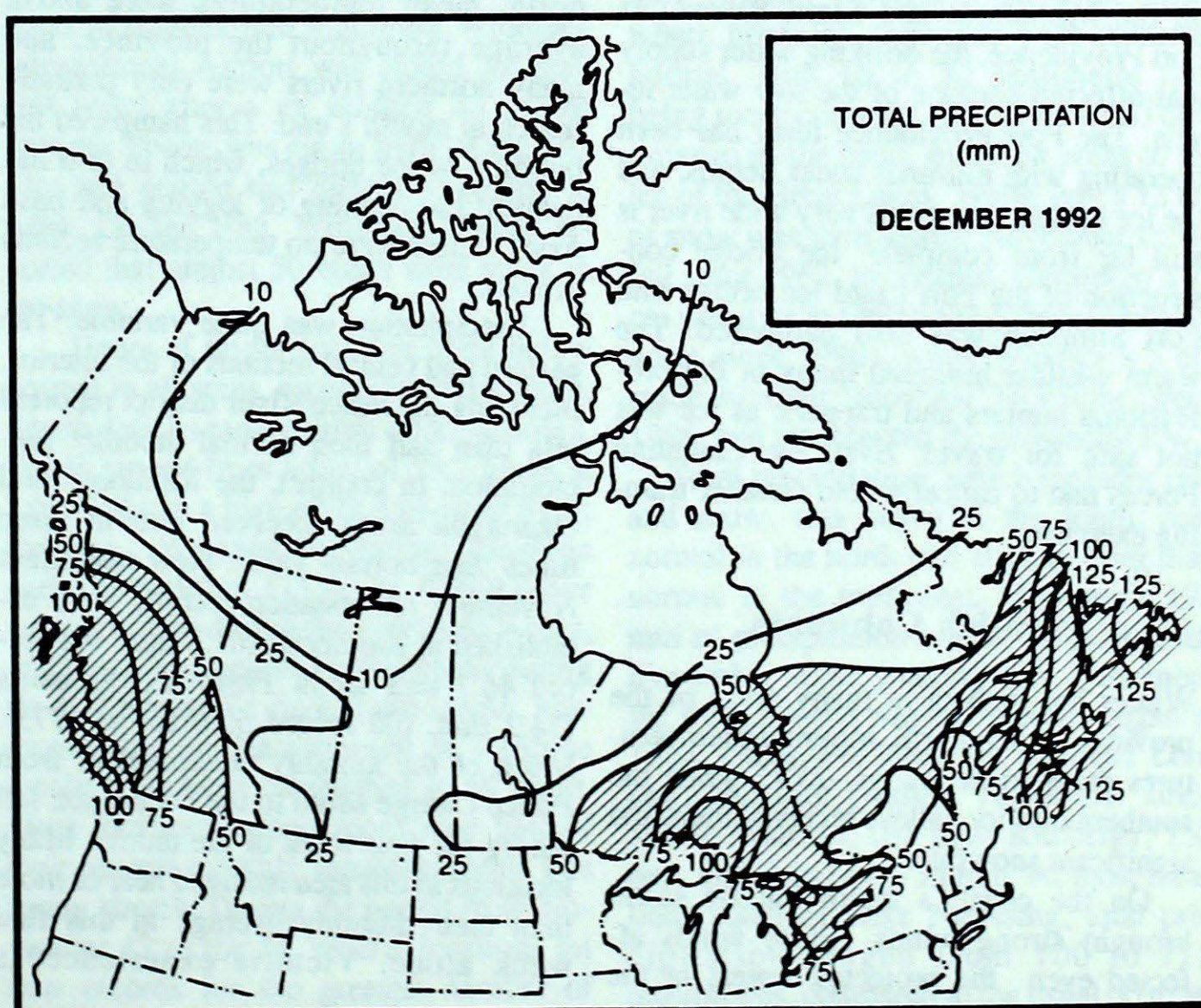
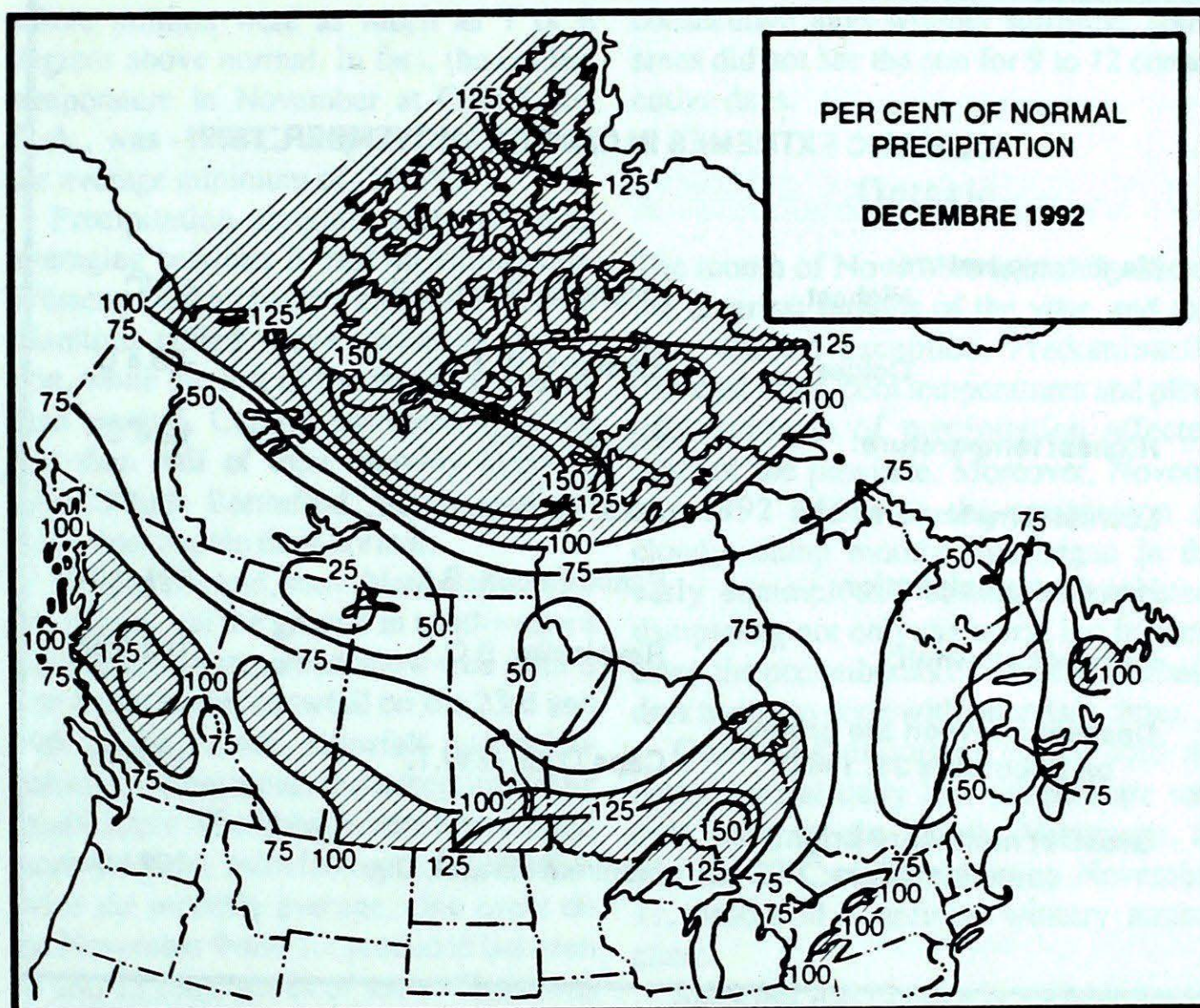
The sun failed to shine on Eureka, Mould Bay and Resolute Bay this month, but this should not be surprising, since the sun never rises at Eureka in November, and the maximum possible hours of bright sunshine at Mould Bay and Resolute Bay at this time of year are only 1 minute and 12 hours, respectively. The clouds cleared just long enough at Baker Lake to tally 15.3 hours of sunshine, while Coral Harbour enjoyed 46.4 hours of the golden rays.

Precipitation in the form of snow was close to normal in the Arctic Islands, ranging from 3.4 mm at Resolute to 4.3 mm at Eureka. Further south, amounts were variable. Hall Beach was close to normal, with 12.8 mm, but Coral Harbour was well below normal, with a tally of only 7.8 mm compared to a normal of 19.6 mm. Baker Lake received 25.1 mm, 5.8 mm more than normal.

The Keewatin district experienced typical November weather. Cold Arctic air dominated the region. Storms tracking through or near the region, resulted in many days of blizzard or near blizzard conditions. The south warmed to near freezing, when the warm sectors of these systems pushed northwards. Near Hudson Bay, fog, drizzle, snow and low status cloud was common. In the northern districts, temperatures dropped to minus forty several times.

In the Mackenzie district, above-normal temperatures were common. Northeast of Great Slave Lake, from Yellowknife to Lupin Mine and Contwoyto Lake, there was extensive low cloud and fog during the month, due to the low level moisture input of Great Slave Lake. Resupply flights into the Diamond exploration area were hampered. Although Yellowknife experienced its fifth warmest November on record, few new daily records were established. The coldest day was November 21, the day of their Santa Claus.

The unseasonably warm weather delayed the construction of ice roads in the Mackenzie Delta, although some drivers did risk the drive from Inuvik to Tukoyakuk. Above-normal temperatures also





### CLIMATIC EXTREMES IN CANADA - NOVEMBER, 1992

<b>Mean temperature:</b>			
Highest	Amphitrite Point, B.C.	4.9°C	
Coldest	Eureka, N.W.T.	-33.4°C	
<b>Highest temperature:</b>			
	Windsor, Ont.	12.8°C	
<b>Lowest temperature:</b>			
	Coral Harbour, N.W.T.	-46.8°C	
<b>Heaviest precipitation:</b>			
	Prince Rupert, B.C.	311.0 mm	
<b>Heaviest snowfall:</b>			
	Revelstoke, B.C.	162.0 cm	
<b>Deepest snow on the ground on December 31, 1992</b>			
	Cape Dyer, N.W.T.	108 cm	
<b>Greatest number of bright sunshine hours:</b>			
	Montreal Mirabel, Que.	102 hours	

resulted in lower than normal water levels on the Mackenzie and Liard Rivers. At Fort Providence, the drinking water supply was affected because of the low water levels. The Fort Providence ferry has been operating with minimal water depths, and the ice bridge across this very wide river is still far from complete. Ice bridge construction of the Fort Liard ice bridge into Fort Simpson was also hampered. The warm weather hindered many of the professional hunters and trappers, as ice was not safe for travel. Even the Canadian Forces had to cancel a cold weather training exercise.

#### British Columbia

Winter has arrived in many areas of the province. In the north, minimum temperatures dropped as low as -25°C, while the southern interior valleys received their first significant snowfalls.

On the coast, a major Pacific storm brought strong winds. These winds affected even the protected waters of the South Coast.

Although it was cold at times in the north, mean temperatures were above average throughout the province, and many northern rivers were only partially frozen at month's end. This hampered the building of ice bridges, which in turn has delayed the opening of logging and bush roads. There were no temperature records broken.

Precipitation was quite variable. The eastern and central sections of the interior, including the Peace River district reported less than half their normal monthly precipitation. In contrast, the Kamloops and Okanagan areas received two to three times their normal value. New maximum November precipitation records were established at Kamloops (61.3 mm, old record 46.7 mm set in 1959) and Kelowna (74.2 mm, old record 52.6 set in 1973). Much of the monthly precipitation, from Prince George south to the Okanagan, fell during the first week of the month. Many locations in this area received near or more than their monthly average in this first week alone. Victoria experienced a

thunderstorm on the 8th. Victoria, on average, gets only three thunderstorms per year. Small hail was recorded as well, an even rarer occurrence since, statistically, Victoria averages less than one day with hail per year.

Snowfalls varied appreciably around the province. The greatest snowfalls were in the mountain areas, stretching south-eastwards from Williams Lake. The southern interior valleys received their first significant snowfall of the year on November 20 and 21. Although snow began accumulating in the mountains in late October, most ski areas opened near month's end, which is only a little earlier than normal.

Vancouver's sunshine equalled the average of 69.3 hours, but hours of bright sunshine in the remainder of the province varied from just less than half to near normal. One low monthly sunshine record was broken this month. Cranbrook received only 40.1 hours of sunshine, breaking the old November record of 55.3 set in 1973.

November was a windy month, with numerous widespread gales occurring along the coast. A violent Pacific storm crossed the south and central coastal areas on the 20th and 21st. Winds at Solander Island, on the northwest coast of Vancouver Island, reached a maximum sustained speed of 148 km/h with gusts to 184 km/h. Cape Mudge, located at the northern end of Georgia Strait, reported a wind speed of 115 km/h. This storm resulted in major damage to a marina at Nanoose Bay, just north of Nanaimo, where 300 boats were torn away from their moorings, beached and damaged. Initial estimates of damage ran to \$4 million. This same storm caused major power outages in Victoria, where storm generated waves forced authorities to close many waterfront roadways.

#### Alberta

A stagnant weather pattern early in November maintained a persistent layer of cloud and extensive fog. This dull start set the tone for the month, as most locations had 20 to 50 percent less hours of bright sunshine than normal. The cloud cover kept temperatures near the freezing mark,



and thus temperatures averaged above normal.

Southern regions received their normal monthly precipitation total during the first week, but continued to accumulate more as weather systems continued to track through. Extensive fog and snow, with temperatures fluctuating near freezing, resulted in hazardous driving conditions.

Calgary was hit by an intense disturbance on November 8 and 9, dumping 24 cm of snow on the city, but by the end of the week, Chinook conditions developed and melted most of the mess. Another major low pressure system crossed central Alberta on the 21st and 22nd, pulling cold Arctic air southwards across the province. Snowfalls were heaviest through the central areas, with Edmonton receiving 17.2 cm. Strong northwest winds pushed cold Arctic air southwards, and produced blizzard conditions over the eastern half of the province. Arctic air covered the whole province by the morning of the 23rd, when the lowest readings this season were registered, with lows dropping down to the minus twenties across northern and central Alberta. High Level was the coldest at  $-24.6^{\circ}\text{C}$ .

This cold snap was short lived, however, as mild Pacific air flooded back within a few days. High Level recorded a new daily high of  $4^{\circ}\text{C}$  on the 27th, while southern Alberta had temperatures rebound to the 10 to 12 degree range. A Pacific cold front, moving east across the province on the 27th, produced freezing rain and rain in the Peace River district, rain through the central areas, and rain changing to snow in the south. Calgary received 10.4 mm of rain, while Lethbridge received 9.4 cm of snow. This allowed Calgary to set a new monthly rainfall record of 12.2 mm. Sunny skies and mild temperatures returned by the end of the month.

### Saskatchewan and Manitoba

November was cloudy and mild. All but the southeast corner of Manitoba reported above normal temperatures. Cloudy skies kept nighttime readings well above normal in all areas, especially in the northwest,

where minima were as much as 7 or 8 degrees above normal. In fact, the coldest temperature in November at Cree Lake, Sask., was  $-17.1^{\circ}\text{C}$ , only  $2^{\circ}\text{C}$  colder than the average minimum of  $-15.2^{\circ}\text{C}$ .

Precipitation amounts were variable, averaging between 10 and 40 millimetres. Western Saskatchewan and southeastern Manitoba tallied above normal precipitation, while the rest of the region was drier than normal. Central Manitoba received less than half of their monthly average, while North Battleford, Sask., received more than double their normal.

By month's end, snow blanketed the entire region, but the ground in southwestern Saskatchewan remained snow-free until a 4 to 8 centimetre snowfall on the 23rd and 24th of the month. Snowfall was below normal in most areas, the exception being southeastern Manitoba, where heavier and more frequent snowfalls gave more than twice the monthly average. One event on the November 9 and 10, produced between 15 and 25 centimetres of snow. There was very little wind to whip the snow into drifts, but those 15 to 25 centimetres caused significant inconvenience to residents of southeastern Manitoba. Winnipeg International Airport was closed for several hours after a jet skidded off of the runway. Power was cut in parts of the district and people had difficulty getting to work. On the 10th, Winnipeg Transit reported that almost 50 buses were stuck in the snow.

Hours of bright sunshine were below normal in all areas, especially in the south, where deficits ranged from 40 to 60 hours. Totals ranged from a low of 23.7 hours at Lynn Lake to a high of 71.5 hours at Swift Current. Average November sunshine varies from 90 to 117 hours. Cloud cover was persistent during the first three weeks, and if not for frequent sunny breaks during the last five or six days of the month, new records for the least amount of sunshine would have been established in all areas. Most locations tallied more than half of their normal monthly sunshine during this sunny stretch. During the period from November 12 to the 24, several locations set new records for the greatest number of

consecutive days without sunshine; some areas did not see the sun for 9 to 12 consecutive days.

### Ontario

The month of November is usually one of the dreariest months of the year, and this year was no exception. Predominantly overcast skies, cool temperatures and plentiful amounts of precipitation affected most of the province. Moreover, November 1992 added to the succession of cloudy, damp months that began in the early summer and continued unabated, dampening not only the spirit, but in some cases the pocketbooks of farmers and builders trying to cope with uncertain times.

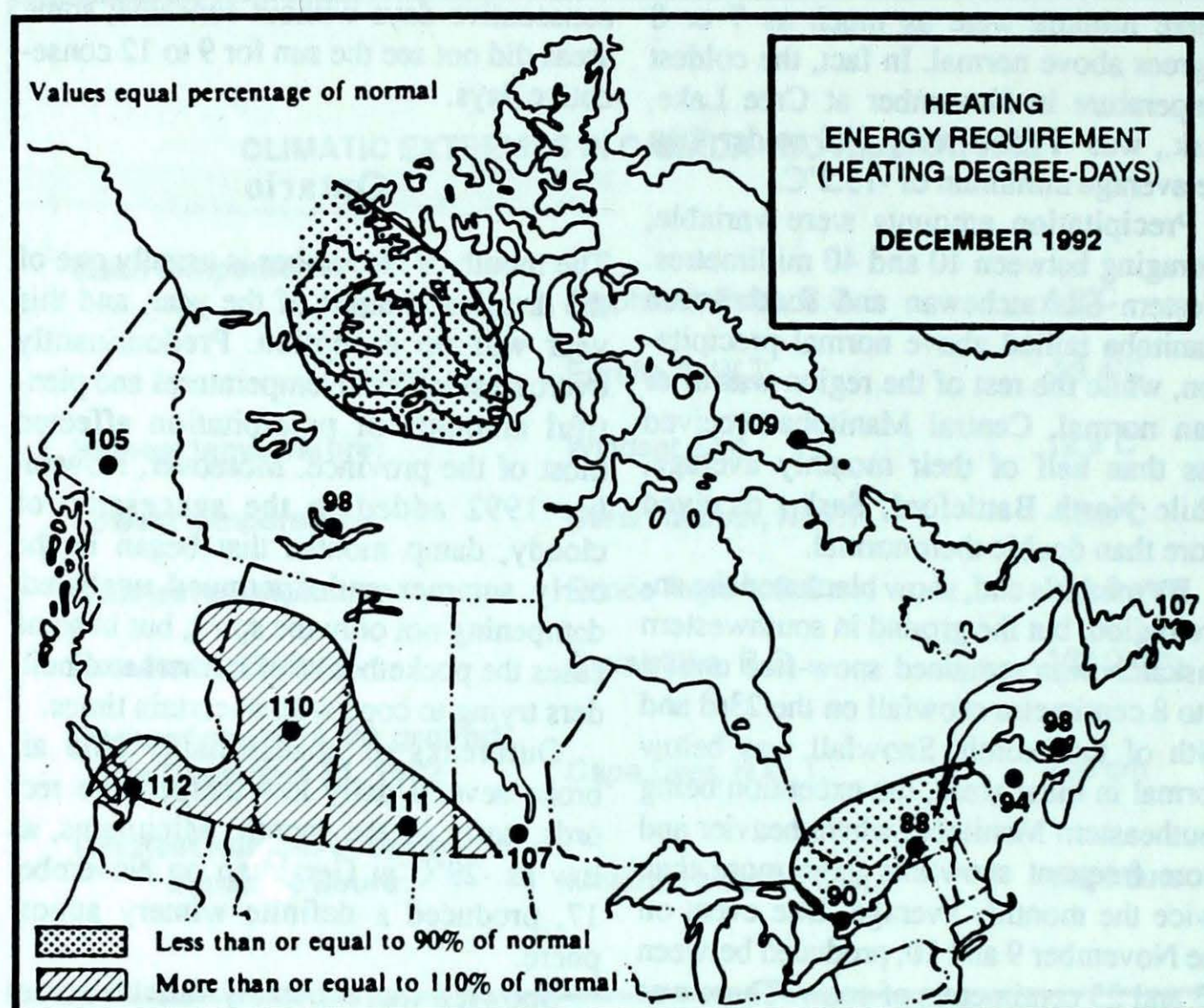
Outbreaks of unseasonably cold air broke several daily low temperature records, early in the month. Minimums, as low as  $-29^{\circ}\text{C}$  at Geraldton on November 17, produced a definite wintery atmosphere.

Snowfall was extremely variable across the province. The Manitoulin Island-Earlington areas received approximately half of their normal November snowfall. Elsewhere however, snowfalls were closer to normal, with 10 to 30 centimetre falls being more common, except 40 to 70 centimetres in the usual snowbelt areas to the lee of the Great Lakes. North Bay's 13 cm of snow was their lowest November snowfall since 1962. In contrast, Geraldton's 78 cm was tops in Ontario (but only their snowiest since 1990), while Windsor's 5 cm made this their "snowiest" November since 1986, and represented the provincial low.

Total precipitation, which includes rain and snow, was heavy in the south, near normal in the north and slightly drier than normal in the northwest. Muskoka's 197 mm of precipitation was twice their usual November total, making this November the wettest since weather records began in 1937. Other wet locations included London, 162 mm (wettest November since 1950); Wiarton, 161 mm; Kitchener, 158 mm; and Windsor, 133 mm. At most locations south of Lake Nipissing, total precipitation ranged from 100 to 125 millimetres, compared to the usual 60 to 90

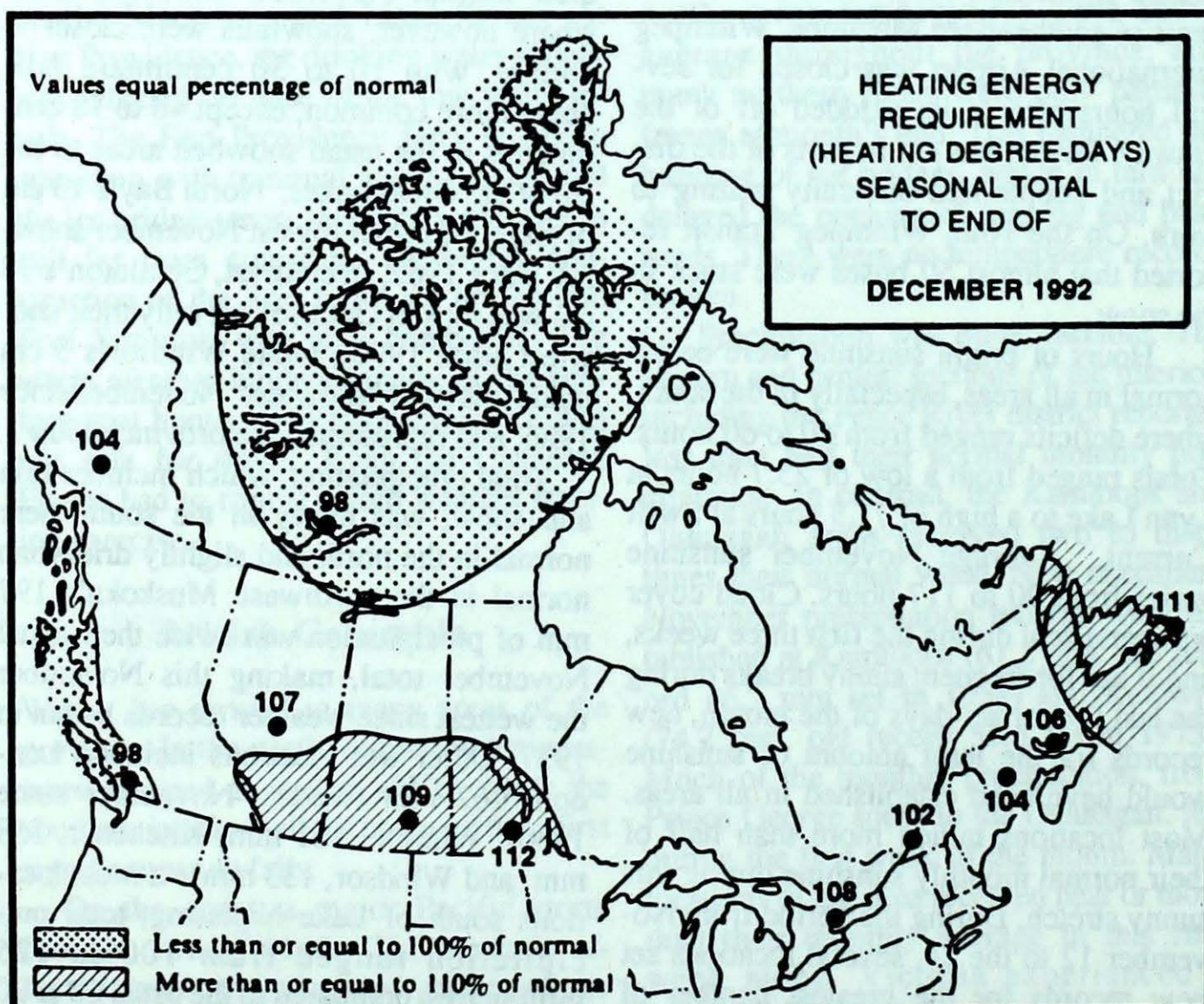
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### SEASONAL TOTAL OF HEATING DEGREE-DAYS TO END OF DECEMBER

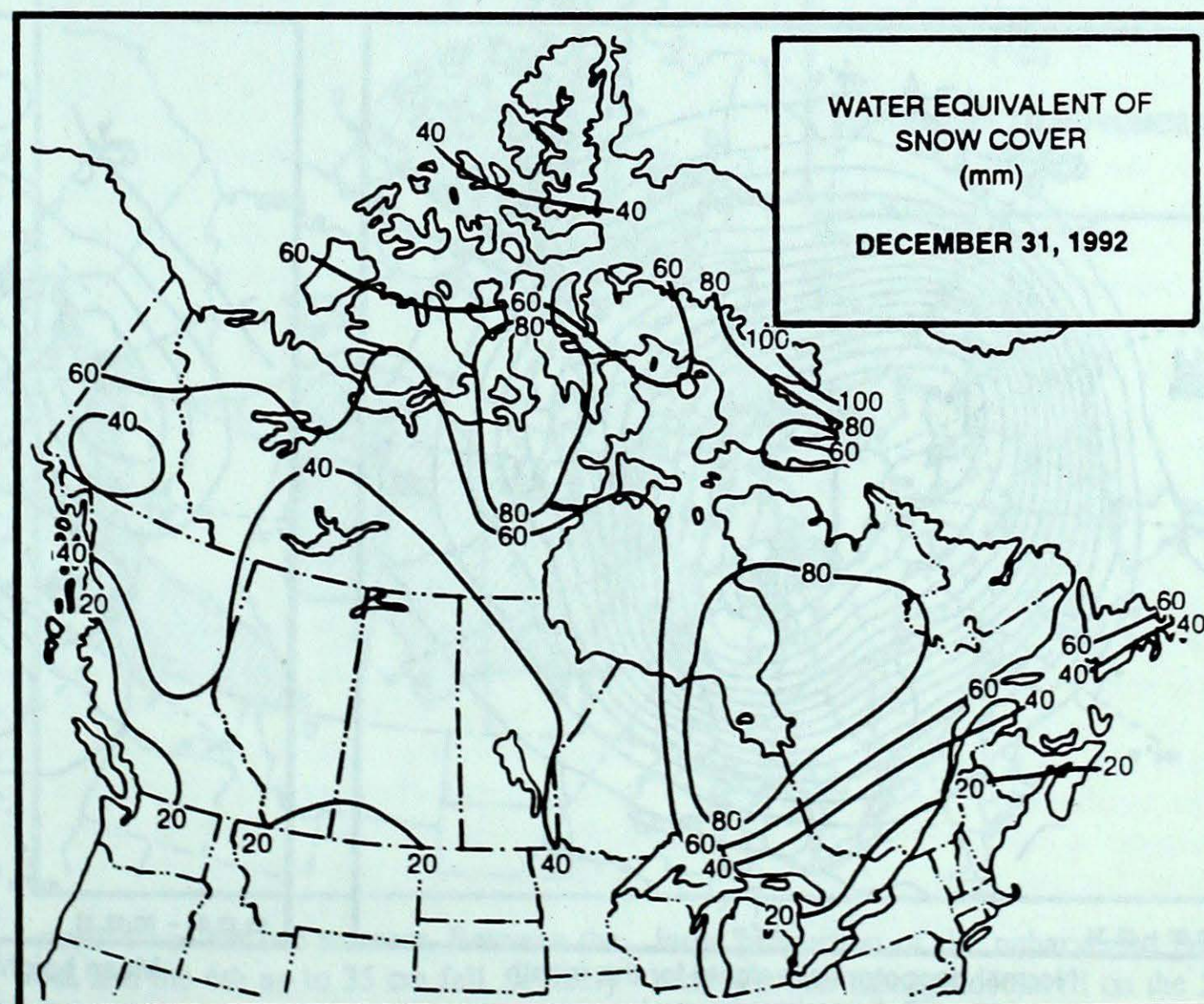
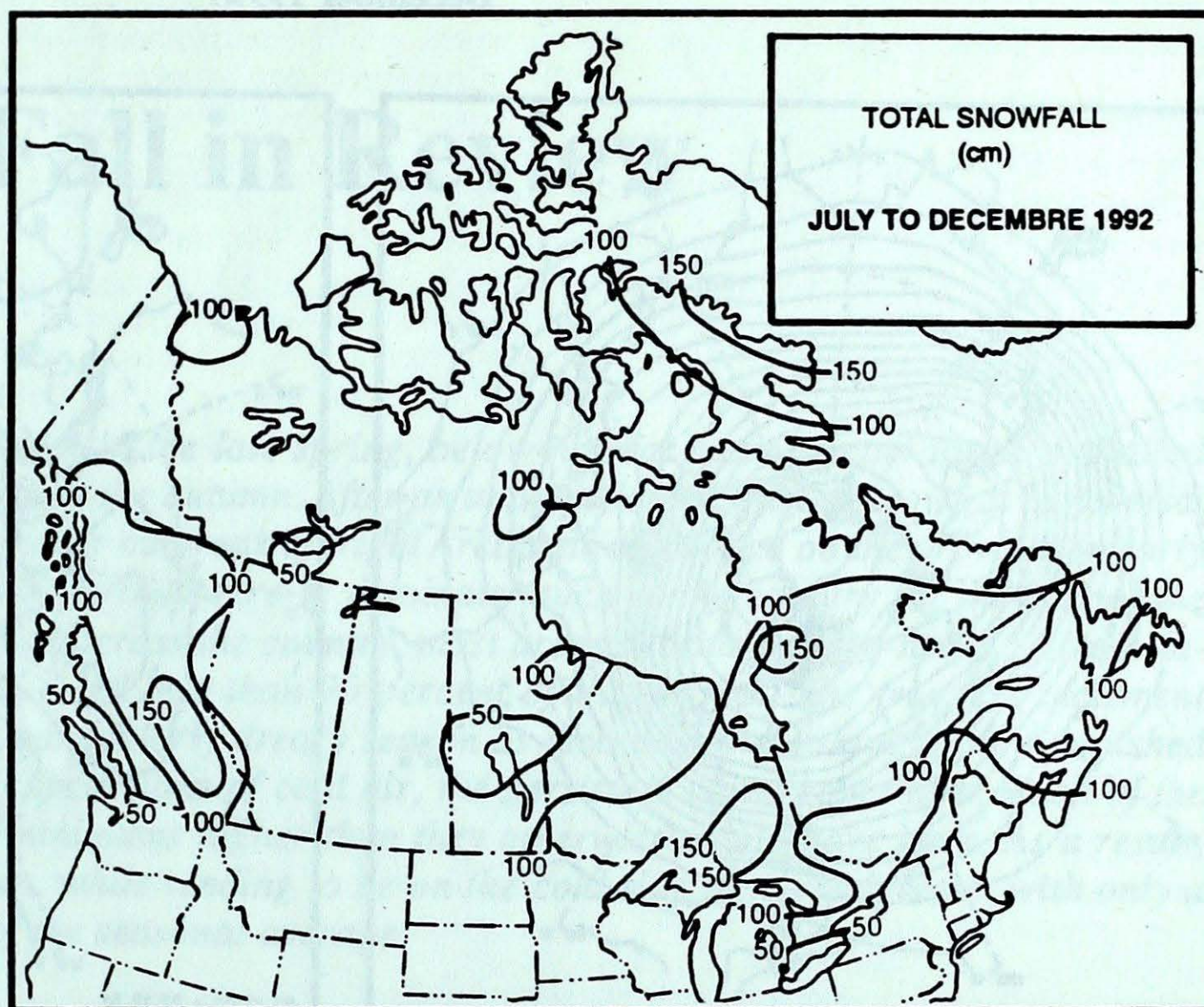
	1992	1991	NORMAL
<b>BRITISH COLUMBIA</b>			
Kamloops	1669	1438	1533
Penticton	1496	1328	1414
Port Hardy	1513	1435	1577
Vancouver	1188	1139	1218
Victoria	1271	1219	1280
<b>YUKON TERRITORY</b>			
Whitehorse	3151	2978	3025
<b>NORTHWEST TERRITORIES</b>			
Iqaluit	4220	3847	4010
Inuvik	4209	4384	4188
Yellowknife	3324	3638	3382
<b>ALBERTA</b>			
Calgary	2374	2027	2168
Edmonton Mun.	2352	2212	2197
Grande Prairie	2769	2529	2536
<b>SASKATCHEWAN</b>			
Estevan	2413	2247	2085
Regina	2469	2351	2257
Saskatoon	2627	2489	2352
<b>MANITOBA</b>			
Brandon	2680	2633	2337
Churchill	3730	3736	3534
Dauphin	2581	2557	2325
Winnipeg	2476	2407	2214
<b>ONTARIO</b>			
Kapuskasing	2573	2536	2468
London	1561	1489	1461
Ottawa	1769	1732	1721
Sudbury	2149	2066	2015
Thunder Bay	2311	2391	2176
Toronto	1547	1466	1459
Windsor	1303	1281	1274
<b>QUEBEC</b>			
Baie Comeau	2398	2370	2318
Montréal	1683	1676	1642
Québec	1949	1993	1942
Sept-Îles	2556	2498	2429
Sherbrooke	1982	1965	1981
Val d'Or	2498	2434	2361
<b>NEW BRUNSWICK</b>			
Fredericton	1807	1800	1739
Moncton	1800	1770	1708
<b>NOVA SCOTIA</b>			
Sydney	1639	1553	1510
Yarmouth	1604	1423	1454
<b>PRINCE EDWARD ISLAND</b>			
Charlottetown	1678	1610	1603
<b>NEWFOUNDLAND</b>			
Gander	2120	2053	1854
St. John's	1941	2728	1746



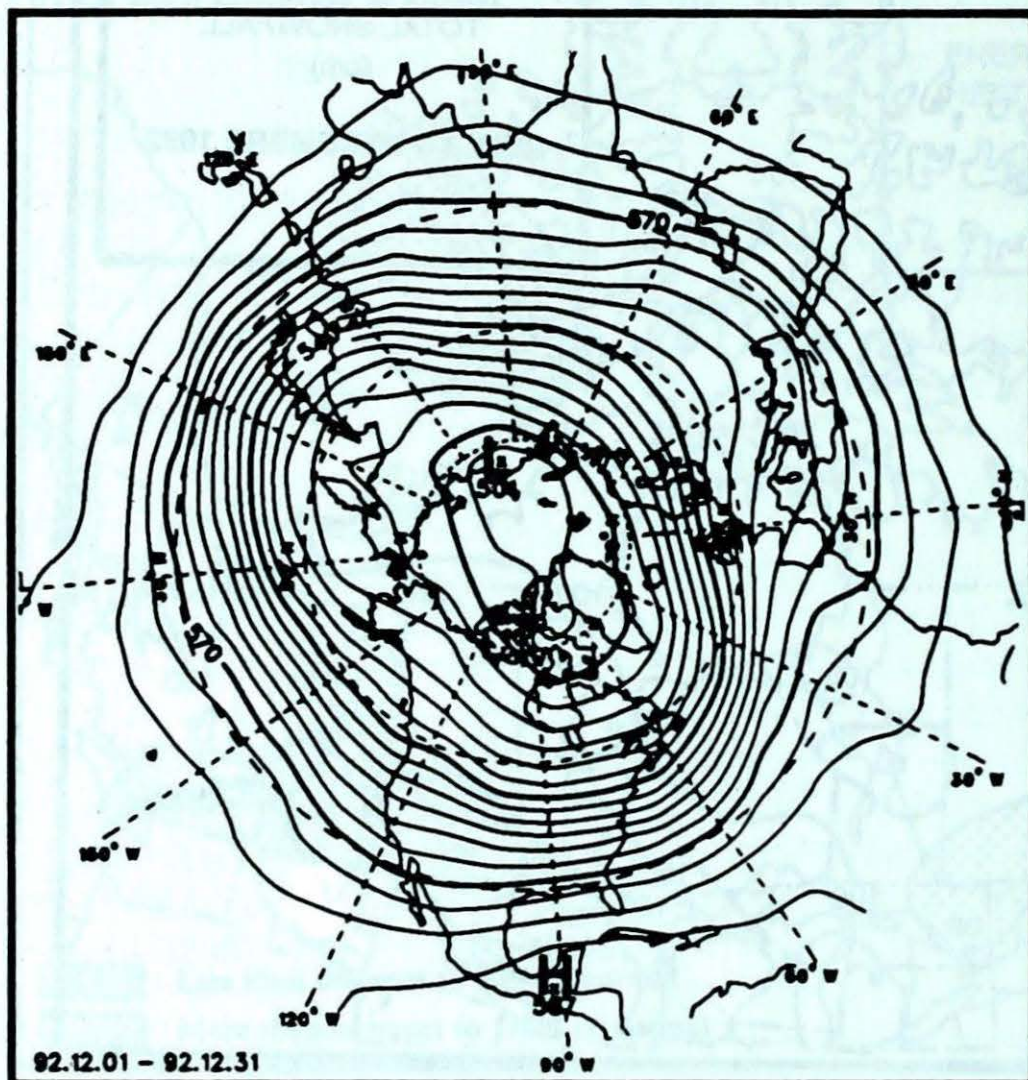


**SEASONAL SNOWFALL TOTALS (cm)  
TO END OF DECEMBER**

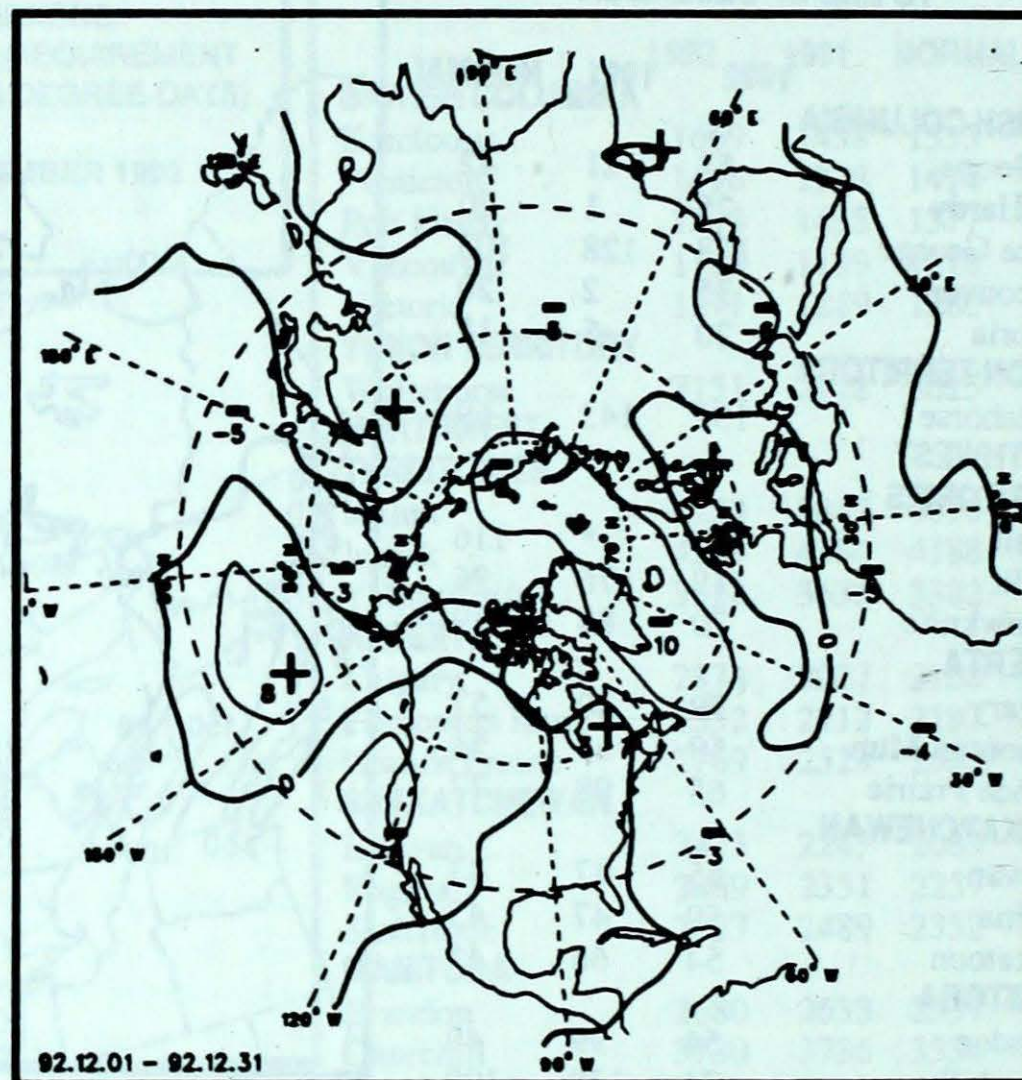
	1992	1991	NORMAL
<b>BRITISH COLUMBIA</b>			
Kamloops	58	21	42
Port Hardy	25	1	20
Prince George	178	128	103
Vancouver	35	2	20
Victoria	20	5	15
<b>YUKON TERRITORY</b>			
Whitehorse	135	143	69
<b>NORTHWEST TERRITORIES</b>			
Iqaluit	101	*	116
Inuvik	119	76	96
Yellowknife	70	88	79
<b>ALBERTA</b>			
Calgary	79	40	57
Edmonton Mun.	59	65	54
Grande Prairie	65	98	77
<b>SASKATCHEWAN</b>			
Estevan	55	47	43
Regina	59	47	45
Saskatoon	54	66	45
<b>MANITOBA</b>			
Brandon	54	99	49
Churchill	74	139	100
The Pas	64	119	72
Winnipeg	82	48	48
<b>ONTARIO</b>			
Kapuskasing	191	143	139
London	85	85	78
Ottawa	56	68	82
Sudbury	105	81	96
Thunder Bay	115	130	80
Toronto	49	52	47
Windsor	17	31	40
<b>QUEBEC</b>			
Baie Comeau	103	131	134
Montréal	22	55	82
Québec	60	71	124
Sept-Îles	126	146	151
Sherbrooke	36	94	112
Val d'or	106	99	129
<b>NEW BRUNSWICK</b>			
Fredericton	67	61	92
Moncton	120	107	97
<b>NOVA SCOTIA</b>			
Sydney	97	85	80
Yarmouth	30	56	52
<b>PRINCE EDWARD ISLAND</b>			
Charlottetown	131	124	97
<b>NEWFOUNDLAND</b>			
Gander	126	98	115
St. John's	80	120	91



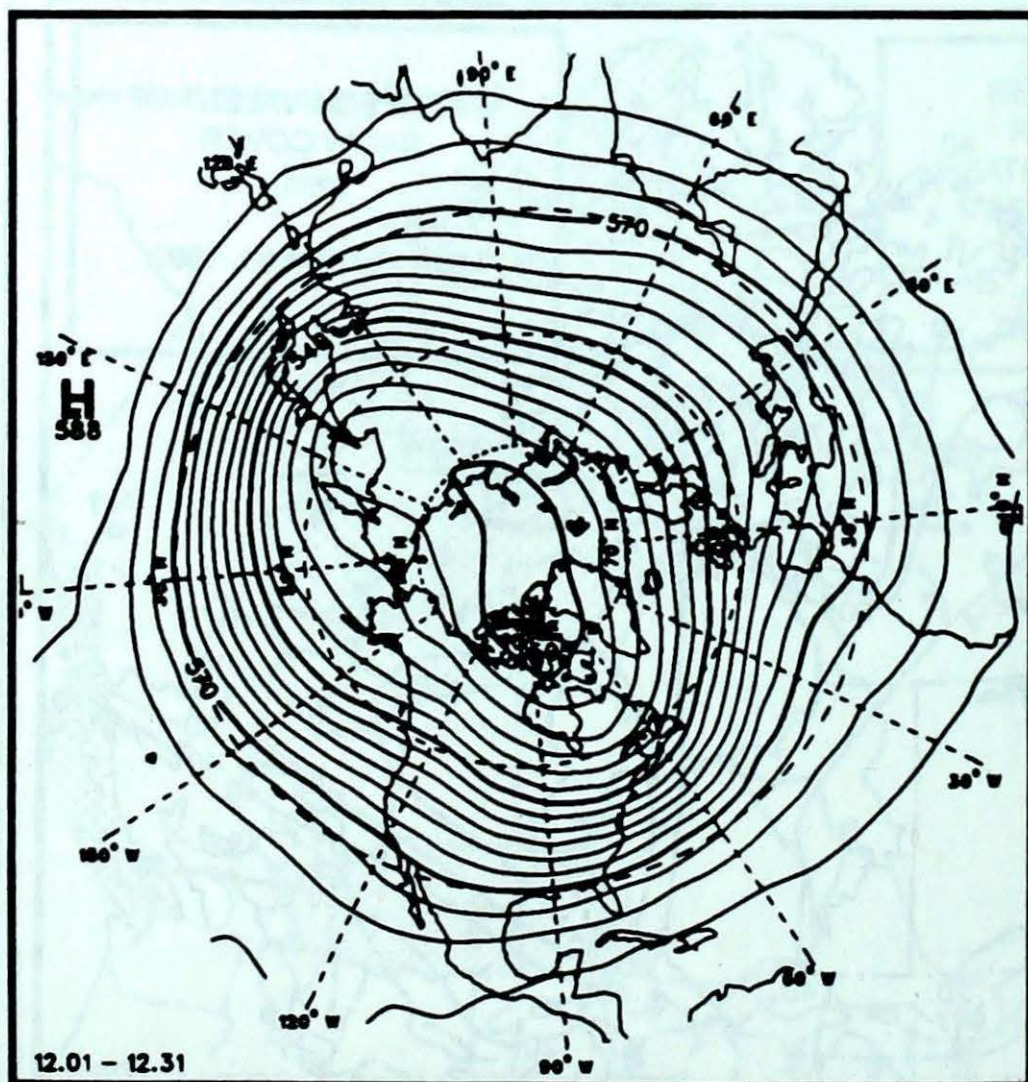


**50-kPa ATMOSPHERIC CIRCULATION****December 1992**

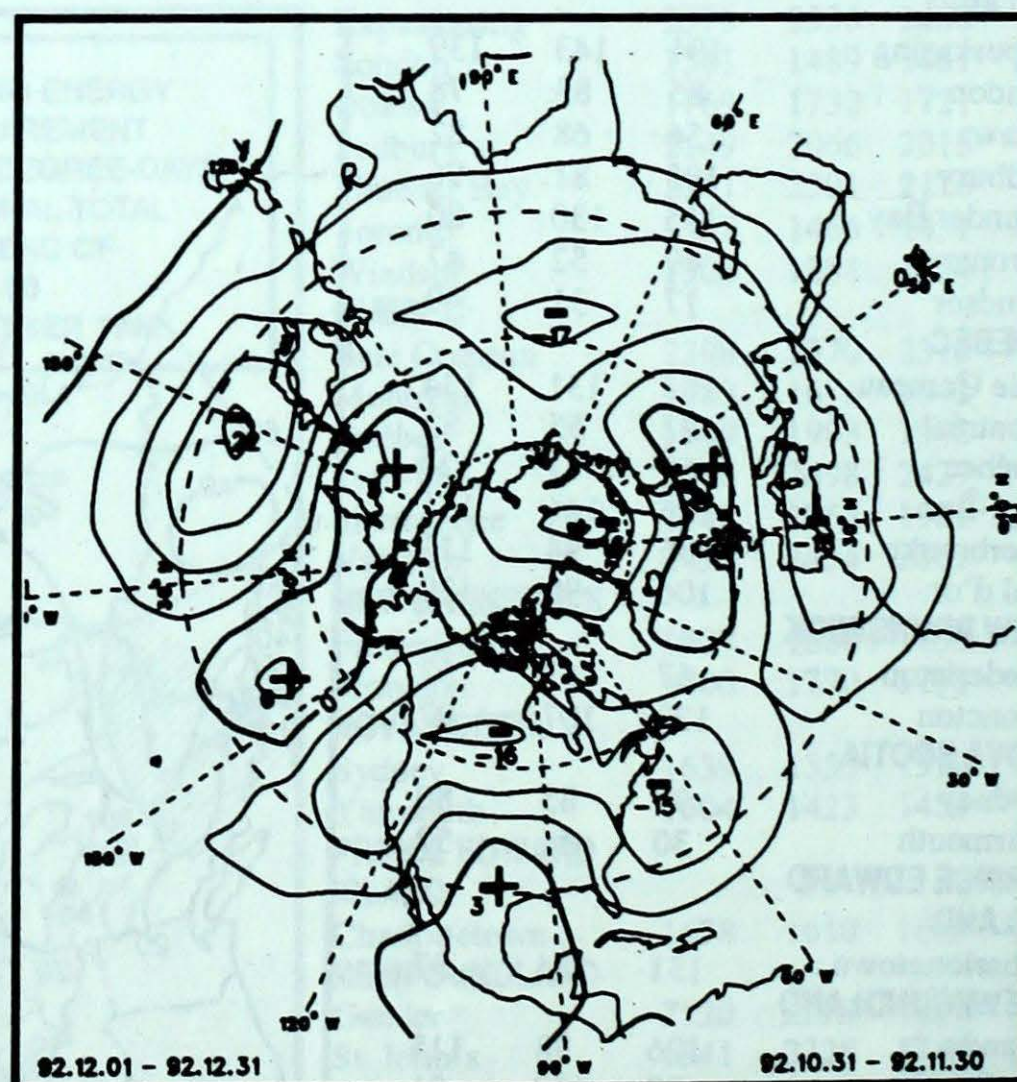
Mean geopotential heights  
- 5 decametre interval -



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 -



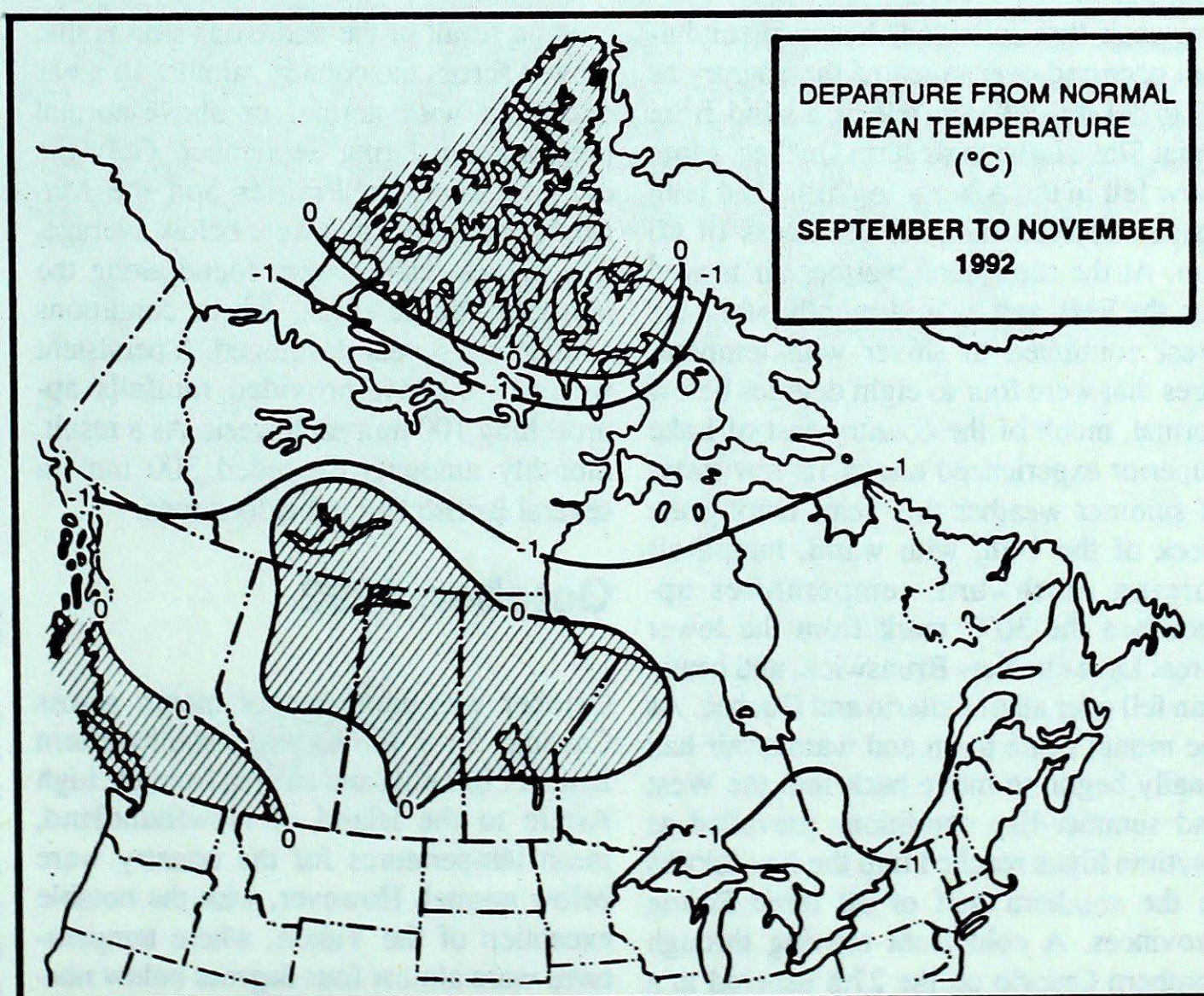
## Fall in Review

*Continuing the trend that had begun in the late spring, below-normal mean temperatures prevailed across most of the country throughout the autumn. After an unprecedented August snowfall in Alberta, a second major snowstorm and another outbreak of frigid Arctic air descended on the province in early September, fore-shadowing conditions that were to dominate much of the country for the rest of the fall. As a multitude of storms moved across the country, most areas received above-normal precipitation, and only a few locations received less than 90 percent of the normal. The frequent inclement conditions helped to make this a particularly dreary season as amounts of sunshine were diminished considerably. Despite the regular incursions of cold air, the persistent cloud cover over much of the nation frequently kept overnight minimums higher than they otherwise would have been. As a result, mean temperatures for the autumn, while tending to be on the cold side of normal, were, with only a few exceptions, within a degree of the seasonal average.*

### September, 1992

The cool and wet conditions that characterized the weather during the summer continued into September, but with a slight twist. The only areas that had experienced any significant spells of warmth during July and August were found in the extreme western portion of the country. In September this changed as the West endured some of the month's coldest weather. Average temperatures were two to four degrees below normal from Manitoba westward. In the lower Mackenzie Valley and the Yukon temperatures were as much as several degrees below normal. After a cold start, the eastern half of the country experienced relatively warm conditions during the latter half of the month. As a result, from Ontario eastward temperatures for the month averaged out to values within a degree or so of normal.

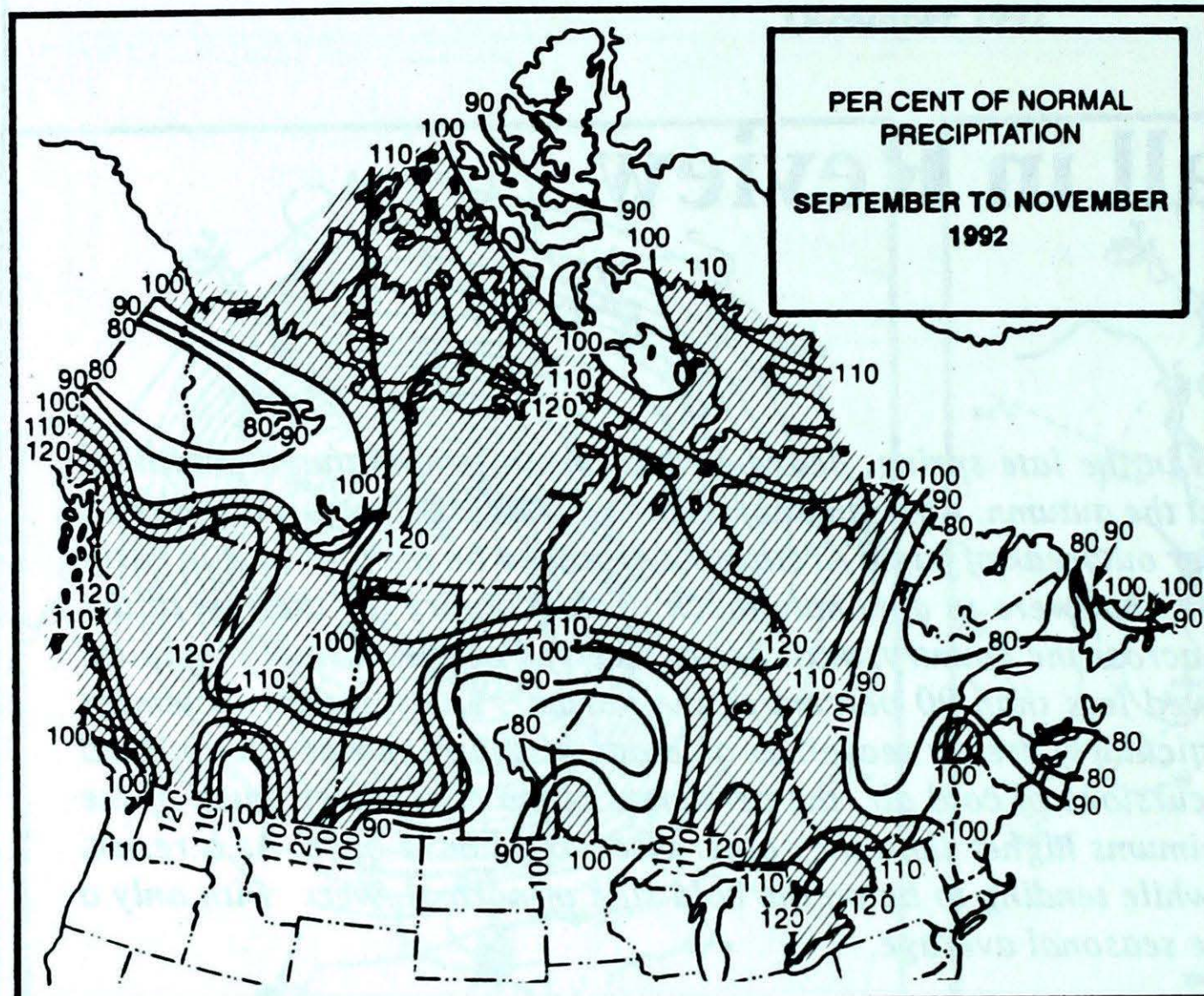
Frigid air that had moved into the Yukon during the latter half of August spilled southward by September. In advance of this cold outbreak, much of southern Alberta received its second major snow



storm since the late summer. Between the 4th and the 6th up to 35 cm fell, severely disrupting transportation and flattening a

large proportion of the unharvested grain crop. Further damage occurred on the 5th as a severe frost hit the province. During





the week that followed, heavy precipitation occurred over much of the country as 25 to 50 mm of rain fell in a band from Great Slave Lake to western Quebec. More snow fell in the Alberta foothills, and both coasts received rainfalls in excess of 60 mm. At the same time warmer air moved into the East, and by mid-month, while the West continued to shiver with temperatures that were four to eight degrees below normal, much of the country east of Lake Superior experienced one of its few tastes of summer weather this year. During the week of the 14th, with warm, humid air surging northward, temperatures approached the 30°C mark from the lower Great Lakes to New Brunswick, and heavy rain fell over all of Ontario and Quebec. As the month came to an end warmer air had finally begun to move back into the West and summer-like conditions prevailed as daytime highs reached into the low thirties in the southern half of all three Prairie Provinces. A cold front moving through southern Ontario on the 27th ushered in a slight cooling trend and produced heavy thunderstorms that dropped as much as 150 mm of rain in the Ottawa Valley.

As a result of the numerous storms that moved across the country, almost all areas ended up with normal or above-normal precipitation during September. Only the extreme southern Prairies and the Maritimes had totals that were below average. The highest values were found along the northern Pacific coast, where conditions similar to last year developed. A persistent westerly airflow provided rainfalls approaching 100 mm each week. As a result, monthly amounts exceeded 300 mm in several British Columbia locations.

## October, 1992

October was another cool month across Canada. Save for extreme southwestern British Columbia and an area from the high Arctic to the island of Newfoundland, mean temperatures for the country were below normal. However, with the notable exception of the Yukon, where temperatures were almost four degrees below normal, there were few areas of drastically cold conditions. Unlike September, precipitation was below normal in most areas.

Only the east and west coasts provinces and the southern third of Alberta received more than the usual share of moisture. Although many of these areas approached 200 mm of precipitation, the winner in this category was found along British Columbia's Pacific shore where the westerly flow once again contributed to totals of almost 400 mm. In comparison, much of central Alberta and Saskatchewan received only 10 mm, less than half the normal.

The warm temperatures that had ended the month of September persisted for the first few days of October. They were soon replaced by colder air. By mid-month all but the Atlantic provinces and the eastern Arctic were under its influence. Overnight lows plunged below -10°C from eastern British Columbia to northern Ontario and temperatures in the Yukon dropped to -31°C on the 17th. The territory's earliest minus-thirty value on record. In contrast, temperatures were more than 6°C above normal over Baffin Island, with daytime highs reaching 5°C at Iqualuit. Because of the cold air covering the country, much of the precipitation that fell during the mid-part of the month came in the form of snow. Record October snowfalls of 30 cm occurred in northern British Columbia, while 10 to 20 cm were common across the southern Prairies. Snowsquall advisories were issued to the lee of the Great Lakes. Very little of the snow that fell in the southern part of the country stayed for very long, as summer mounted a comeback attempt in the final third of the month. An influx of warmer air managed to raise daytime highs in the Prairies back into the mid-twenties and for a brief spell, into the upper teens in southern Ontario and southern Quebec.

The Atlantic provinces received some of the most spectacular weather this month as a series of storms moved through the area. Between the 6th and the 8th Newfoundland was savaged by a storm that dropped 80 mm of rain, 20 cm of snow, and produced 140 km/h winds that ripped down trees and utility poles and destroyed the island's only remaining drive-in theatre. Total damage from the storm exceeded 9 million dollars. On the 19th another storm, moving up the Atlantic coast,



was responsible for a 12-hour rainfall of almost 100 mm at Sydney, and several centimetres of snow at Halifax. The following day it moved over the west side of Newfoundland, where another 20 to 30 mm of rain fell, accompanied by winds of 120 km/h.

## November, 1992

Unlike the previous two autumn months, in November not all of the country had what could be characterized as a cool month. In the West temperatures for the month averaged above normal, as frequent incursions of frigid winter weather were more than offset by the regular appearance of warmer air masses. The most notable seasonal departure came in the Mackenzie Valley, where means were as much as six degrees above normal. Farther east, average temperatures were somewhat cooler, with means ranging from near normal in Ontario down to four degrees below normal in Newfoundland.

November was a wet month for much of the country. In British Columbia, persistent precipitation peppered the Pacific province. In excess of 250 mm were recorded in several coastal locations, while the Okana-

gan received almost 75 mm, three times the November normal. Precipitation totals dropped to 50 percent of the normal in the eastern Prairies, but rose again through most of eastern Canada. With more than 150 mm, several locations in southern Ontario recorded their wettest November in more than 40 years. In the Atlantic Provinces, totals were only fifty to seventy-five percent of normal, but as the long-term average for this area is generally in excess of 150 mm, actually amounts received were from 50 mm to 100 mm in most locations.

As the month began, mild air covered much of the Mackenzie Valley, with daytime highs reaching several degrees above the freezing mark. Farther east however the first in a series of disturbances moved across the Great Lakes on the 3rd, producing heavy snowfalls in northern Ontario and southeastern Manitoba. In the wake of this storm much colder air was drawn out of the central Arctic. Temperatures plunged well below zero and new record low temperatures were set as far east as Newfoundland. At the same time, a strong and persistent westerly airflow brought British Columbia most of its moisture for the month in just a few days, as 50 to 100

mm of rain was recorded in November's first week.

Frequent storms and the outbreaks of cold air that frequently followed continued to be the story for the rest of the month. After 15 to 25 cm snowfalls that brought Calgary and Winnipeg to a halt on the 9th and 10th, an intense area of low pressure moved through the Great Lakes on the 12th and 13th, dropping 35 cm of snow in northern Ontario and more than 50 mm of rain in the south. Hydro was disrupted as high winds, occasionally with hurricane-force gusts, ripped down trees and power lines. During the following week another 15 cm of snow contributed to blizzard conditions in parts of Alberta and Saskatchewan. Ten to 20 cm fell in Ontario, and 25 to 30 cm fell in the Maritimes.

Combined with the cold outbreaks following these storms, warm air moving northward in their advance helped to make November a topsy-turvy month for temperatures. In many areas, especially those in the West, extremely cold conditions were followed by temperatures substantially above normal. For example, just a few days after hitting a low of  $-25^{\circ}\text{C}$ , High Level Alberta set a new record high as the temperature on the 27th reached  $4^{\circ}\text{C}$ .

Malcolm Geast  
Canadian Climate Centre





## DECEMBER 1992

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	1.3	-1.9	8.8	-9.7	42.6	194	147.3	65	0	16	67	124	520.6
ALERT BAY	2.4	-1.5	9.5	-5.0	10.6	65	137.4	59	0	19	*	*	484.6
AMPHITRITE POINT	4.9	-0.6	11.2	-0.8	25.2	221	332.3	74	0	20	*	*	405.9
BLUE RIVER A	-10.4	-2.6	2.3	-25.2	150.4	138	76.4	63	34	14	31	104	*
CAPE SCOTT	4.4	-0.4	10.0	-3.0	8.6	72	305.7	83	0	22	*	*	423.0
CASTLEGAR A	-4.3	-2.3	4.2	-15.2	89.0	118	62.0	57	39	10	36	117	692.1
COMOX A	2.1	-1.6	9.6	-6.1	54.7	184	135.7	64	27	15	60	*	492.0
CRANBROOK A	-10.8	-4.2	4.5	-24.8	43.2	104	30.3	65	29	8	44	71	893.2
DEASE LAKE	-20.5	-4.5	1.7	-44.3	49.4	119	42.0	125	52	9	42	102	1195.2
FORT NELSON A	-24.0	-3.0	2.6	-44.3	10.7	40	7.8	36	33	4	54	*	1301.7
FORT ST JOHN A	-17.8	-4.6	4.9	-44.6	34.0	84	29.2	81	26	4	50	*	1111.5
HOPE A	-0.3	-1.9	9.3	-14.3	67.2	147	189.2	65	11	13	5	123	564.4
KAMLOOPS A	*7.4	-4.6	5.0	-21.9	55.5	185	38.9	120	17	13	38	78	786.3
KELOWNA A	-6.8	-3.7	6.7	-25.4	78.0	205	53.1	123	35	11	40	98	770.2
MACKENZIE A	-14.1	-3.4	3.1	-42.2	63.1	79	57.9	68	53	10	49	132	993.1
PENTICTON A	-4.2	-3.8	4.5	-14.1	30.5	132	22.3	71	7	10	44	113	689.5
PORT ALBERNI A	1.2	-1.4	8.8	-5.4	40.3	141	145.9	43	8	14	22	*	522.5
PORT HARDY A	2.2	-1.3	9.9	-4.3	24.4	157	189.8	69	0	17	52	116	489.9
PRINCE GEORGE A	-11.7	-3.8	3.3	-34.3	113.2	214	81.4	143	30	12	43	91	902.8
PRINCE RUPERT A	0.9	-0.5	9.7	-13.4	37.0	102	311.0	109	0	19	40	124	543.5
PRINCETON A	-9.4	-3.7	5.5	-28.9	40.4	90	31.1	59	28	10	64	*	*
REVELSTOKE A	-6.4	-2.2	5.5	-21.4	162.0	117	109.8	76	52	15	30	112	757.2
SANDSPIT A	2.9	-0.5	10.3	-8.5	6.6	39	123.2	69	0	17	59	147	469.6
SMITHERS A	-10.2	-2.6	5.8	-35.3	81.3	144	78.4	131	39	13	22	57	876.2
TERRACE A	-5.0	-1.6	4.7	-21.8	113.4	107	160.8	84	15	16	48	160	711.9
VANCOUVER INT'L A	1.9	-2.0	9.5	-10.6	35.0	200	117.8	65	10	13	60	126	499.1
VICTORIA INT'L A	3.0	-1.2	11.8	-4.7	19.8	151	80.7	51	14	15	66	126	464.9
WILLIAMS LAKE A	-10.9	-3.2	1.6	-30.9	92.5	187	76.7	186	66	13	36	74	895.7
YUKON TERRITORY													
DAWSON A	-28.5	*	-5.0	-46.3	36.6	*	18.0	*	*	*	*	*	*
MAYO A	-26.9	-2.7	1.0	-50.1	14.6	60	11.9	53	*	*	*	*	*
WATSON LAKE A	-29.7	-6.2	0.2	-52.9	31.2	67	20.9	57	44	7	4	13	1478.7
WHITEHORSE A	-18.7	-2.1	3.7	-45.1	32.1	133	16.1	80	16	6	25	109	1137.2
NORTHWEST TERRITORIES													
BAKER LAKE A	-27.4	0.8	-8.1	-40.1	12.7	146	12.5	152	66	4	3	46	1408.0
CAMBRIDGE BAY A	-26.2	3.8	-8.7	-39.8	10.0	159	6.4	119	44	2	0	*	1371.5
CLYDE A	-26.3	-1.9	-13.6	-38.2	15.0	190	12.4	159	48	3	0	*	1372.3
COPPERMINE A	-22.3	3.6	-6.2	-35.0	19.4	169	17.2	155	65	4	0	*	1248.8
CORAL HARBOUR A	-28.3	-2.8	-9.7	-46.8	12.6	117	12.6	124	16	4	0	0	1433.8
EUREKA	-33.4	1.4	-20.1	-41.6	2.6	104	2.6	108	10	2	0	*	1593.3
FORT SIMPSON A	-24.4	0.4	5.2	-40.9	11.7	49	7.3	39	33	2	20	69	1315.8
FORT SMITH A	-20.7	0.9	3.6	-39.2	16.7	67	6.5	29	22	6	40	144	1231.7
IQALUIT	-25.7	-3.9	-6.8	-39.7	24.2	98	20.2	91	19	5	9	43	1353.9
HALL BEACH A	-26.7	0.7	-10.9	-42.8	9.4	102	8.8	101	42	3	*	*	1385.7
HAY RIVER A	-21.4	-0.5	6.2	-36.0	7.8	30	5.4	22	16	3	*	*	1224.3
INUVIK A	-24.7	2.5	0.9	-41.2	22.0	106	19.1	110	49	4	0	*	1324.9
MOULD BAY A	-30.9	0.3	-14.6	-41.3	5.2	130	4.8	133	20	1	0	*	1516.0
NORMAN WELLS A	-26.8	-0.3	-7.5	-43.1	8.6	45	6.0	32	21	2	2	12	1386.9
POND INLET A	-26.7	*	-9.0	-37.2	7.8	*	7.6	*	21	2	0	*	1386.3
RESOLUTE A	-25.9	3.4	-14.4	-38.2	9.4	177	7.4	151	15	3	0	*	1360.5
YELLOWKNIFE A	-23.2	0.8	-2.2	-39.2	14.0	64	7.4	41	16	3	11	51	1277.2
ALBERTA													
BANFF	-13.7	-4.8	2.0	-36.0	25.0	56	13.6	36	18	4	*	*	982.8
CALGARY INT'L A	-11.8	-4.0	8.0	-35.6	22.2	107	14.0	88	10	5	94	96	923.6
COLD LAKE A	-19.9	-5.7	0.7	-44.4	29.6	112	24.6	99	25	8	65	86	1175.5
CORONATION A	-16.3	-4.5	2.5	-41.7	36.2	161	21.5	110	27	6	84	100	1062.0



DECEMBER 1992

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	Mean	Difference from Normal	Maximum	Minimum									
EDMONTON INT'L A	-15.5	-2.4	6.1	-38.0	26.4	102	23.5	107	11	11	89	114	1037.4
EDMONTON MUNICIPAL	-13.5	-3.1	5.3	-35.4	31.4	*	27.4	111	20	10	81	104	978.3
EDMONTON NAMAO A	-14.3	-2.5	4.7	-37.0	26.3	97	22.8	87	19	8	*	*	1001.3
EDSON A	-14.6	-1.7	5.0	-37.5	34.6	155	28.2	117	29	10	70	105	959.8
FORT CHIPEWYAN A	-20.8	-0.3	-2.0	-40.5	3.0	11	3.0	14	*	*	*	*	*
FORT MCMURRAY A	-20.9	-3.9	2.8	-42.2	10.4	35	7.8	31	17	3	82	132	1205.2
GRANDE PRAIRIE A	-17.7	-4.3	7.2	-46.5	41.6	121	31.2	97	32	8	64	*	1105.6
HIGH LEVEL A	-22.6	-1.3	2.6	-43.6	4.2	14	4.2	17	9	1	21	55	1258.9
JASPER	-13.3	-4.1	2.5	-31.8	21.6	66	16.8	51	18	9	46	*	969.0
LETHBRIDGE A	-10.8	-5.0	7.2	-36.4	23.8	93	19.6	89	11	9	89	99	892.3
MEDICINE HAT A	-11.4	-3.8	6.8	-36.3	14.5	76	13.3	82	11	4	93	107	908.8
PEACE RIVER A	-19.8	-4.5	5.5	-46.5	25.8	99	25.3	117	20	4	*	*	1173.5
RED DEER A	-14.4	-3.0	4.7	-39.8	28.5	133	25.3	125	20	7	*	*	1006.5
ROCKY MTN HOUSE A	-14.6	-5.5	6.4	-40.7	38.8	155	28.5	128	24	9	*	*	1012.7
SLAVE LAKE A	-18.3	-3.5	3.3	-42.5	32.7	104	23.7	72	17	7	57	98	1125.5
SUFFIELD A	-12.4	*	6.3	-34.2	15.3	*	13.6	*	11	6	92	*	943.4
WHITECOURT A	-15.3	-2.2	7.7	-38.2	47.3	171	30.9	116	17	10	*	*	958.5
SASKATCHEWAN	*	*	*	*	*	*	*	*	*	*	*	*	*
BROADVIEW	-17.6	-3.6	0.4	-37.7	29.8	141	*	*	19	10	79	83	1102.2
CREE LAKE	-23.0	-1.7	-1.4	-42.3	9.8	30	9.4	43	20	3	43	77	1270.6
ESTEVAN A	-15.4	-4.3	3.0	-36.3	23.4	119	15.4	79	14	6	92	89	1035.8
KINDERSLEY	-17.1	-4.3	-0.3	-40.4	15.3	74	13.3	69	22	6	58	*	1090.8
LA RONGE A	-21.8	-4.2	-1.0	-40.5	21.1	76	20.7	92	33	4	*	*	1232.8
MEADOW LAKE A	-21.9	*	0.8	-43.0	21.0	*	20.8	*	25	9	65	*	1237.5
MOOSE JAW A	-14.3	-3.6	3.5	-39.1	26.2	104	20.1	94	22	8	79	92	1000.2
NIPAWIN A	-21.0	*	-0.7	-40.8	25.0	*	19.6	*	31	5	85	*	1209.8
NORTH BATTLEFORD A	-20.3	-6.2	0.2	-44.2	21.7	95	18.8	90	20	7	*	*	1132.1
PRINCE ALBERT A	-20.8	-4.3	0.1	-41.8	23.6	99	21.0	96	22	3	69	97	1202.8
REGINA A	-16.3	-3.5	1.4	-39.6	36.7	176	26.3	157	16	9	73	86	1062.8
SASKATOON A	-19.7	-5.6	0.7	-42.9	23.4	109	18.2	91	22	5	*	*	1168.4
SWIFT CURRENT A	-14.6	-4.7	3.2	-39.7	26.2	127	22.4	113	17	7	77	90	1009.6
YORKTON A	-18.7	-4.1	-0.9	-40.4	30.8	129	25.6	113	30	8	*	*	1139.0
MANITOBA	*	*	*	*	*	*	*	*	*	*	*	*	*
BRANDON A	-18.3	-3.9	0.7	-37.1	28.3	144	27.6	145	27	10	95	*	1124.6
CHURCHILL A	-23.2	-1.0	-5.2	-36.2	18.6	82	10.2	49	10	4	51	92	1275.5
DAUPHIN A	-17.4	-3.1	5.8	-35.9	23.4	90	15.6	64	14	6	95	102	1095.5
GILLAM A	-22.9	0.6	-2.9	-39.2	33.2	104	16.0	51	18	7	*	*	1266.4

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	Mean	Difference from Normal	Maximum	Minimum									
ISLAND LAKE	-19.0	1.7	-2.5	-37.0	20.2	34	12.6	38	14	6	*	*	1149.5
LYNN LAKE A	-24.0	-2.2	-2.5	-41.1	16.0	48	13.4	53	25	4	18	29	1302.6
NORWAY HOUSE A	-20.6	*	-1.7	-38.8	31.4	*	21.4	*	24	7	*	*	1197.5
THE PAS A	-19.9	-2.3	0.7	-39.0	23.8	84	18.8	85	18	4	83	112	1176.4
THOMPSON A	-23.4	-1.4	-2.2	-40.7	18.9	43	16.2	50	18	6	63	93	1284.6
WINNIPEG INT'L A	-16.6	-2.6	0.5	-33.9	40.4	195	29.2	152	36	9	82	88	1070.7
ONTARIO	*	*	*	*	*	*	*	*	*	*	*	*	*
EARLTON A	-10.3	2.3	7.0	-33.7	52.7	98	51.5	91	21	13	*	*	877.3
GERALDTON A	-13.9	*	2.2	-36.3	76.4	*	77.0	*	50	19	*	*	987.9
GORE BAY A	-2.8	2.7	8.8	-17.5	49.6	85	42.0	56	15	10	*	*	647.4
HAMILTON A	-2.0	1.4	10.4	-13.5	42.0	122	82.4	106	*	11	*	*	618.5
KAPUSKASING A	-13.0	1.7	2.4	-33.2	77.8	146	100.3	188	63	17	*	*	961.6
KENORA A	-14.6	-0.5	-0.3	-32.8	55.7	181	40.6	130	50	13	*	*	1012.0
KINGSTON A	-2.9	2.1	6.6	-17.6	55.0	115	94.2	84	*	13	68	88	646.8
LONDON A	-1.7	1.8	10.6	-17.8	60.2	117	101.8	116	0	12	49	87	608.6
MOOSENEE	-15.3	0.7	2.2	-34.0	32.8	82	43.8	108	37	9	25	43	1031.7
MUSKOKA A	-4.7	2.4	7.6	-24.9	66.0	90	70.7	72	2	16	*	*	716.8
NORTH BAY A	-6.8	2.9	7.2	-25.4	54.4	89	43.2	57	19	14	58	75	768.0
OTTAWA INT'L A	-5.3	2.4	6.7	-20.6	40.0	71	51.7	64	7	9	*	*	721.9
PETAWAWA A	-6.0	2.4	10.1	-28.2	29.4	54	31.7	41	10	7	*	*	745.1
PETERBOROUGH A	-5.0	1.4	6.9	-27.2	81.6	211	90.0	112	20	13	*	*	712.9
PICKLE LAKE	-12.7	5.0	0.0	-34.0	34.8	85	24.2	66	29	11	*	*	1064.1
RED LAKE A	-16.4	-0.3	-1.0	-38.3	54.1	170	34.9	109	63	10	71	*	1070.4
ST CATHARINES A	-0.3	1.2	11.8	-12.3	39.6	138	92.4	116	0	11	68	*	567.0
SARNIA A	-0.4	2.2	10.8	-13.8	7.0	18	52.9	73	0	6	72	110	570.8
SAULT STE MARIE A	-4.5	2.2	6.8	-18.8	106.6	140	107.9	136	19	17	34	54	698.0
SIOUX LOOKOUT A	-14.6	0.5	0.0	-34.5	53.4	156	53.1	158	34	16	*	*	1007.5
SUDBURY A	-7.6	2.6	6.1	-26.2	80.6	141	70.7	109	52	15	42	49	794.6
THUNDER BAY A	-9.9	1.2	3.3	-27.2	76.8	166	57.1	137	51	12	61	66	863.9
TIMMINS A	-11.1	2.9	4.5	-31.6	81.1	114	76.0	119	65	18	*	*	916.4
TORONTO	0.4	*	9.0	-13.0	37.4	*	74.0	*	0	7	*	*	545.7
TORONTO INT'L A	-1.7	1.8	7.8	-14.9	35.0	108	56.5	87	*	9	*	*	609.0
TORONTO ISLAND A	0.2	*	7.0	-12.4	42.4	147	67.4	*	0	7	*	*	551.1
TRENTON A	-3.6	0.9	8.2	-21.6	64.5	139	90.1	109	8	15	*	*	670.2
WATERLOO WELLINGTON	-2.6	1.7	8.5	-16.4	42.6	114	73.8	95	0	13	*	*	639.5
WAWA A	-8.9	*	3.9	-29.3	134.6	*	129.2	*	80	19	*	*	834.1
WIARTON A	-1.5	2.2	10.2	-16.0	85.6	93	76.7	71	*	14	43	93	604.8
WINDSOR A	0.2	2.1	12.8	-10.9	11.0	38	58.6	81	0	6	*	*	553.1



## DECEMBER 1992

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	Mean	Difference from Normal	Maximum	Minimum									
QUEBEC													
BAGOTVILLE A	-9.6	2.5	7.8	-28.1	78.6	93	64.0	81	33	15	*	*	855.2
BAIE COMEAU A	-8.9	1.4	4.8	-27.2	65.2	85	50.8	49	21	12	59	70	834.7
BLANC SABLOU A	-11.1	-3.5	1.1	-28.7	103.0	123	103.2	69	16	24	83	*	903.1
GASPE A	-7.8	*	6.7	-22.3	65.2	*	49.1	*	17	10	77	*	800.9
INUKJUAQ A	-19.5	-1.6	-2.5	-32.3	14.6	63	13.4	60	13	4	*	*	1162.0
KUUJJUAQ A	-21.8	-3.4	7.0	-37.9	22.8	58	22.4	59	24	26	*	*	1235.0
KUUJJUARAPIK A	-17.0	-1.1	1.5	-38.3	41.4	99	34.5	82	17	10	26	51	1086.6
LA GRANDE IV A	-19.6	*	1.9	-41.4	49.0	*	49.6	*	45	14	32	*	1164.6
LA GRANDE RIVIERE A	-17.7	*	1.4	-35.6	53.2	*	58.4	*	61	13	*	*	*
MANIWAKI	-7.3	2.7	8.9	-28.9	56.6	98	50.4	70	18	12	59	85	785.6
MONT JOLI A	-7.1	1.2	6.7	-21.7	36.2	40	37.2	39	11	10	34	57	779.4
MONTREAL INT'L A	-4.2	2.7	10.2	-21.1	8.0	14	25.8	30	2	6	87	108	688.5
MONTREAL MIRABEL I/	5.6	*	9.2	-25.4	18.6	*	37.9	*	5	11	102	*	733.8
NATASHQUAN A	-11.3	-2.1	1.9	-27.9	61.2	91	59.0	54	23	13	74	84	907.2
QUEBEC A	-6.5	2.5	5.5	-24.7	38.8	45	48.4	43	17	11	76	100	760.1
ROBERVAL A	-9.4	3.3	7.4	-28.3	3.8	5	38.2	48	19	11	*	*	849.0
SCHEFFERVILLE A	-20.6	-1.6	0.5	-39.5	37.4	74	32.4	66	42	10	58	96	1196.7
SEPT-ILES A	-11.5	-0.5	3.0	-29.9	78.0	88	55.3	53	20	11	78	80	915.1
SHERBROOKE A	-5.4	3.2	6.6	-25.8	21.0	28	49.4	51	1	9	61	*	725.7
ST HUBERT A	-4.4	2.6	8.4	-22.4	11.2	*	38.0	38	0	9	74	*	695.8
VAL D'OR A	-11.5	1.7	6.4	-34.3	67.0	105	52.2	75	23	16	39	45	913.7
NEW BRUNSWICK													
CHARLO A	-7.8	0.9	5.8	-22.6	76.2	83	69.3	60	44	12	80	87	766.3
CHATHAM A	*	*	*	*	*	*	*	*	*	*	*	*	*
FREDERICTON A	-5.1	1.4	6.1	-22.7	53.6	77	82.4	70	19	11	74	*	717.1
MONCTON A	-5.1	0.3	7.2	-21.7	100.9	140	118.5	98	17	13	61	67	715.9
SAINT JOHN A	-4.0	0.8	9.4	-23.2	65.8	103	115.6	70	16	14	75	82	680.2

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	-2.4	-0.1	11.5	-18.5	57.6	94	85.0	71	6	12	*	*	631.6
HALIFAX INT'L A	-3.0	-0.1	11.0	-17.8	73.1	136	154.8	86	3	14	0	*	631.6
SABLE ISLAND	2.2	-0.4	11.8	-9.9	9.0	48	132.2	92	0	16	28	53	489.2
SHEARWATER A	-1.7	-0.2	10.5	-15.3	36.2	96	117.3	79	1	15	79	85	609.4
SYDNEY A	-2.2	-0.4	11.3	-14.8	76.7	117	131.1	80	12	14	54	81	626.4
YARMOUTH A	-0.8	-0.5	10.0	-13.4	25.4	58	100.0	70	5	11	76	122	561.4
PRINCE EDWARD ISLAND													
CHARLOTTETOWN A	-3.7	0.2	7.3	-17.5	101.0	139	124.8	97	21	17	*	*	672.7
NEWFOUNDLAND													
BONAVISTA	-2.8	-1.3	10.3	-12.4	55.0	141	81.8	85	30	10	*	*	645.0
BURCEO	-2.8	-1.0	8.3	-14.0	48.6	95	131.0	70	10	12	*	*	645.7
CARTWRIGHT	-11.7	-2.6	5.7	-30.5	64.1	95	65.5	87	58	13	52	86	920.5
CHURCHILL FALLS A	-19.0	-0.2	0.8	-38.2	37.6	61	29.7	41	61	10	69	83	1147.1
COMFORT COVE	-5.3	-1.2	8.6	-20.2	60.8	85	86.2	80	22	14	*	*	721.9
DANIELS HARBOUR	-6.5	-2.6	0.5	-20.5	63.4	91	83.8	92	16	18	32	107	738.7
DEER LAKE A	-7.0	-1.8	5.4	-25.2	117.8	136	130.0	116	50	17	*	*	774.8
GANDER INT'L A	-5.5	-1.7	9.0	-18.5	71.8	101	97.2	90	32	12	*	*	728.3
GOOSE A	-15.0	-2.0	3.2	-31.2	46.3	63	30.1	41	13	9	77	105	1019.6
MARY'S HARBOUR	-10.9	-3.8	4.2	-29.8	74.4	115	75.4	91	70	13	*	*	896.5
PORT AUX BASQUES	-3.4	-1.7	6.8	-14.7	90.8	168	148.6	96	14	22	54	*	660.6
ST ANTHONY	-9.0	-1.3	0.8	-28.2	145.2	232	142.6	130	70	16	*	*	834.7
ST JOHN'S A	-3.0	-1.5	11.0	-13.4	60.1	92	115.8	72	15	17	57	100	650.8
ST LAWRENCE	-2.0	-1.0	8.3	-16.6	35.7	109	117.0	94	12	15	*	*	610.4
STEPHENVILLE A	-4.6	-2.0	6.5	-17.3	90.6	112	136.3	119	29	18	*	*	700.5
WABUSH LAKE A	-18.5	0.1	1.3	-39.5	36.5	46	27.5	38	39	9	59	86	1131.4



## AGROCLIMATOLOGICAL STATIONS

DECEMBER 1992

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	1.2	-1.8	9.5	-11.0	23.0	140.9	54	0	12	56	2.8	2583.6
SUMMERLAND	-5.3	-4.2	7.0	-16.5	30.8	33.8	103	10	12	58	0.0	2491.0
ALBERTA												
BEAVERLODGE	-15.7	-4.1	6.0	-43.0	27.7	29.8	93	23	8	68	0.0	1348.5
LACOMBE	-14.7	-3.2	4.5	-40.5	29.5	24.3	131	24	9	83	0.0	1280.6
SASKATCHEWAN												
INDIAN HEAD	-16.6	-3.6	0.5	-40.0	37.7	26.3	122	30	11	**	0.0	1517.2
MELFORT	-19.0	-2.5	-1.5	-41.5	18.6	18.6	74	30	7	40	0.0	1289.5
REGINA	-16.8	-3.8	1.5	-40.0	32.0	31.5	174	18	12	**	0.0	1371.5
SCOTT	-14.6	-0.4	-2.0	-44.0	24.5	23.4	114	31	9	57	0.0	1283.0
SWIFT CURRENT	-13.8	-3.5	3.0	-41.0	26.1	18.5	115	15	6	78	0.0	1553.7
MANITOBA												
BRANDON	-17.8	-3.7	0.2	-36.6	28.8	28.8	143	22	10	**	0.0	1536.1
MORDEN	-15.6	-1.2	-1.0	-32.0	37.4	37.4	161	15	13	79	0.0	1688.5
GLENLEA	-17.0	-4.7	-1.0	-36.0	44.2	44.2	198	72	11	69	0.0	1530.3
ONTARIO												
DELHI	-1.0	1.9	11.0	-18.0	34.3	84.1	99	0	9	**	3.8	1984.6
ELORA	-2.8	2.4	6.5	-18.5	27.6	58.8	82	0	5	**	0.0	1674.3
GUELPH	-2.4	1.7	7.6	-20.0	28.6	64.9	91	0	10	52	0.0	1704.9
HARROW	0.3	2.0	11.5	-11.0	12.6	50.1	68	0	6	59	3.3	2202.4
KAPUSKASING	-12.6	2.1	2.5	-36.0	79.3	108.3	212	47	18	31	0.0	1192.6
OTTAWA	-4.7	2.8	7.5	-20.7	28.0	38.1	53	4	10	80	0.0	1872.8
SMITHFIELD	-2.4	2.1	7.9	-20.7	**	97.8	101	22	10	**	**	2162.2

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 POCATIERE	-5.9	2.3	9.0	-23.0	52.3	62.1	69	15	8	72	0.0	1602.1
L'ASSOMPTION	-5.0	3.4	9.0	-24.0	12.8	25.5	28	9	10	92	0.0	1817.1
NORMANDIN	-11.7	2.4	6.5	-31.4	**	**	*	4	5	58	0.0	1234.3
NEW BRUNSWICK												
FREDERICTON	-4.5	1.9	6.5	-23.0	31.6	66.2	54	13	10	74	0.1	1900.3
NOVA SCOTIA												
KENTVILLE	-1.8	0.6	11.5	-18.0	56.4	108.0	83	12	11	31	3.8	1927.5
NAPPAN	-2.7	1.3	10.0	-22.5	77.5	121.1	102	15	11	55	1.2	1613.5
PRINCE EDWARD ISLAND												
CHARLOTTETWN	**	**	**	**	**	**	**	***	***	**	**	**
NEWFOUNDLAND												
ST. JOHN'S WEST	-2.7	-1.3	11.0	-13.0	73.9	160.1	91	30	15	46	2.5	1166.1

Courtesy of Agriculture Canada



...continued from page 5

millimetres, resulting in the wettest November since 1985. Moreover, accumulated total precipitation to-date for 1992, reveals that across most of southern Ontario precipitation totals have already exceeded a normal year's supply. In London for example, 1162 mm has been recorded, compared to a normal annual total of 909 mm.

In the northern regions, 65 to 90 mm of precipitation fell this November, and although these totals are near normal, wetter pockets did exist, raising lake water levels. For example, Sault Ste. Marie recorded 133 mm (normal 86 mm) - the wettest in 5 years.

The main contrast appeared in north-western Ontario. Only 35 to 40 millimetres of precipitation was recorded, and although this area is traditionally known as the driest section of Ontario, these low totals are still only 60 to 90 percent of normal. In particular, Sioux Lookout's 31 mm was their driest November in 11 years.

The lack of sunshine was perhaps the most notable negative weather feature this month, with this month's meagre sunshine amounts 10 to 40 hours short of the paltry totals normally received in Ontario during November. Only November 1985 was cloudier by comparison. Wiarton recorded the least sun, with only 34 hours - the cloudiest month on the Bruce Peninsula in 5 years.

### Quebec

November was a relatively cold month over most of the province, with below normal precipitation, except in the southwest quadrant, and above normal hours of bright sunshine, especially over the eastern half of Quebec. No significant weather events were reported this month other than Blanc Sablon setting a new low monthly mean temperature record.

Precipitation ranged from more than 100 mm at Montreal (125 percent of normal), to 13.6 mm at Inukjuak (34 percent of normal).

Measurable amounts of snow were recorded over the entire province. Over southern Quebec, amounts ranged from 5.4 cm at Trois-Rivières to 45.4 cm at Sept-Îles. Over northern Quebec, amounts exceeded 35 cm over all of the district, except at Inukjuak (15.6 cm). Kuujuarapik and La Grande Rivière had the most, 71.7 and 79.0 centimetres, respectively. The final day of the month saw 30 cm of snow covering the ground at La Grande IV and 36 cm at La Grande Rivière.

Total hours of bright sunshine were above seasonal values east of a line from Quebec City to Kuujuaq, except for the Magdalen Islands, which recorded 70 percent of normal sunshine. West of that line, hours of sunshine decreased gradually to reach values that were less than half the average.

### Maritimes

The mean temperatures across the Maritimes were much cooler than normal this month, with Charlo, N.B., having the greatest negative departure at  $-3.4^{\circ}\text{C}$ . Luckily, winds were lighter than average, counteracting the chilling effect.

Precipitation was also on the light side of normal, with Moncton, N.B., being the driest area, receiving less than half their normal monthly allotment. Snowfall amounts throughout the region were very localized, with actual amounts varying significantly.

Hours of bright sunshine did show a pattern, in that most of New Brunswick was sunnier than normal, compared to the rest of the region. Halifax, Sable Island and Sydney were especially cloudy this month, tallying 30 hours less sunshine than average. Sydney in fact, established a new record low sunshine value for the month of November, 47.7 hours. The previous record was 47.8 hours set in 1966; records date back to 1948.

### Newfoundland

Record-breaking low temperatures and below-normal rainfall highlighted the

weather picture across Newfoundland during November. Snowfall was near normal across the region and hours of bright sunshine varied, but with well below-normal totals in western locations. Except for a brief mild spell during the middle of the month, below normal temperatures were common, with daily and monthly records established. Deer lake reported a minimum reading of  $-23.1^{\circ}\text{C}$  late in the month - a new monthly record. Mean monthly temperatures were generally 3 to 4 degrees below normal, with St. John's, Gander, Comfort Cove, Port-aux-Basques, and St. Anthony all establishing new record low mean temperatures. St. John's recorded  $-0.3^{\circ}\text{C}$  compared to a normal of  $3.4^{\circ}\text{C}$ .

Rainfall was light across much of the region, with monthly totals about 25 percent of normal in eastern locations (Gander 19.7 mm compared to a normal of 74.8 mm). During the middle of the month, a weather system gave 10 to 15 centimetres of snow to many areas, the only major snowfall this month. Monthly snowfall totals were in the 25 to 35 centimetre range, which is close to normal.

Sunshine was below normal in western locations and close to normal in eastern Newfoundland. Prevailing winds this month were west at 23 km/h, which is close to normal.

In Labrador, record-breaking low precipitation amounts, and above-normal sunshine was observed. Temperatures were below normal most of the month, with mean values about  $3^{\circ}\text{C}$  below normal (Goose Bay  $-7.5^{\circ}\text{C}$  compared to a normal of  $-3.8^{\circ}\text{C}$ ). Precipitation was light throughout the month, with totals approximately 25 percent of normal. Goose Bay reported only 15.5 cm of snow, a new record for November. Sunshine was frequent, especially during the latter half of the month, as a dry Arctic air mass brought fair but cold conditions to the region. Goose Bay recorded 111.1 hours of sunshine, which is about 45 hours above normal. Sunshine totals in western locations were closer to 60 hours, a little above normal.

Darlene Lavigne  
Canadian Climate Centre



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Climatic perspectives (Monthly review.



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YELLOW	25970	JAUNE
BLACK	25971	NOIR
BLUE	25972	BLEU
RL BLUE	25973	BLEU RL
GREY	25974	GRIS
GREEN	25975	VERT
TANGERINE	25977	TANGERINE
RED	25978	ROUGE
EX RED	25979	ROUGE EX

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