Environment Canada Environnement Canada

dian Climate Centre

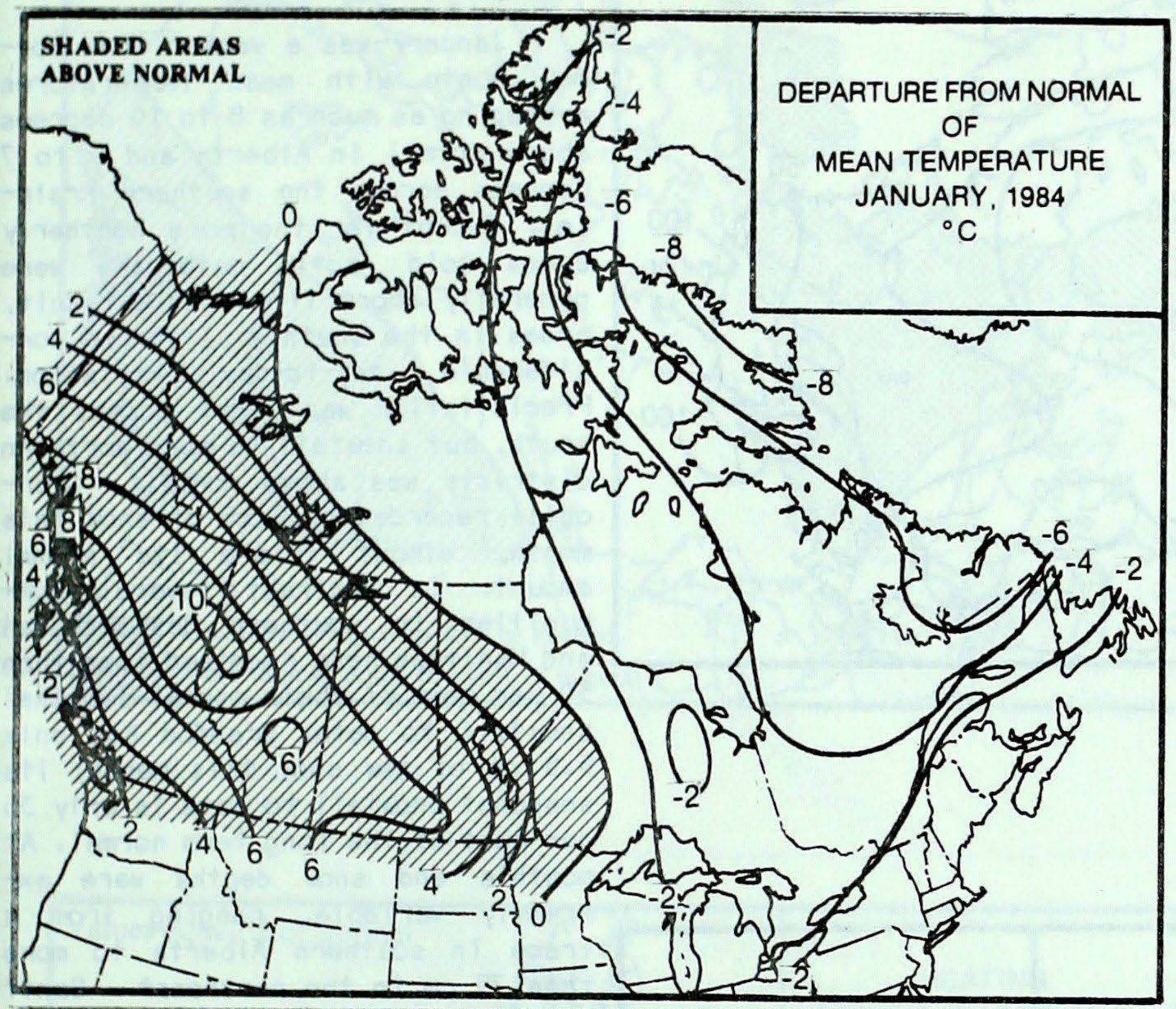
Climatic Perspectives

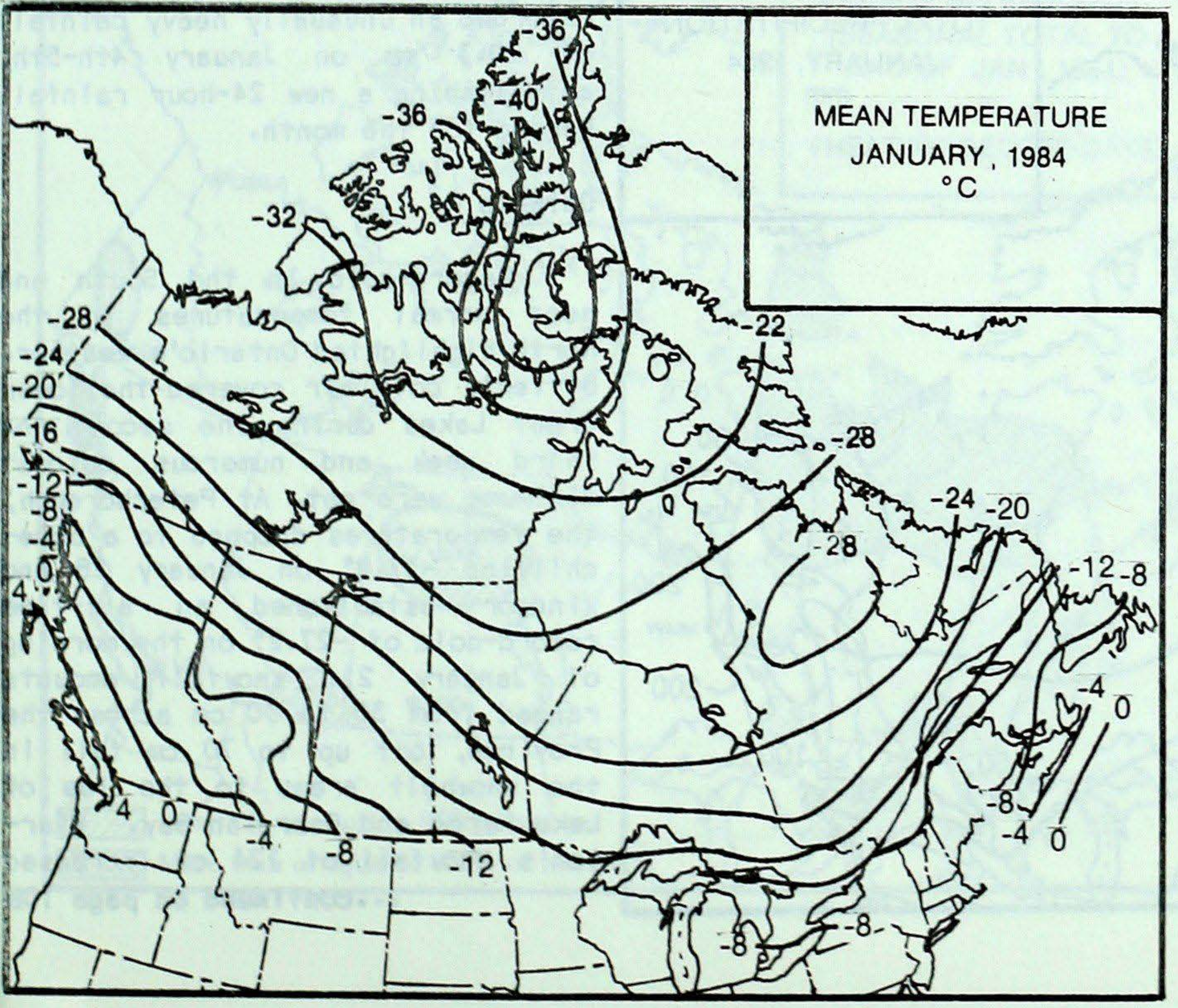
MONTHLY SUPPLEMENT

ISSN 0821-6762
UDC: 551.506.1(71)

(Aussi disponible en français)

VOL. 6 JANUARY, 1984





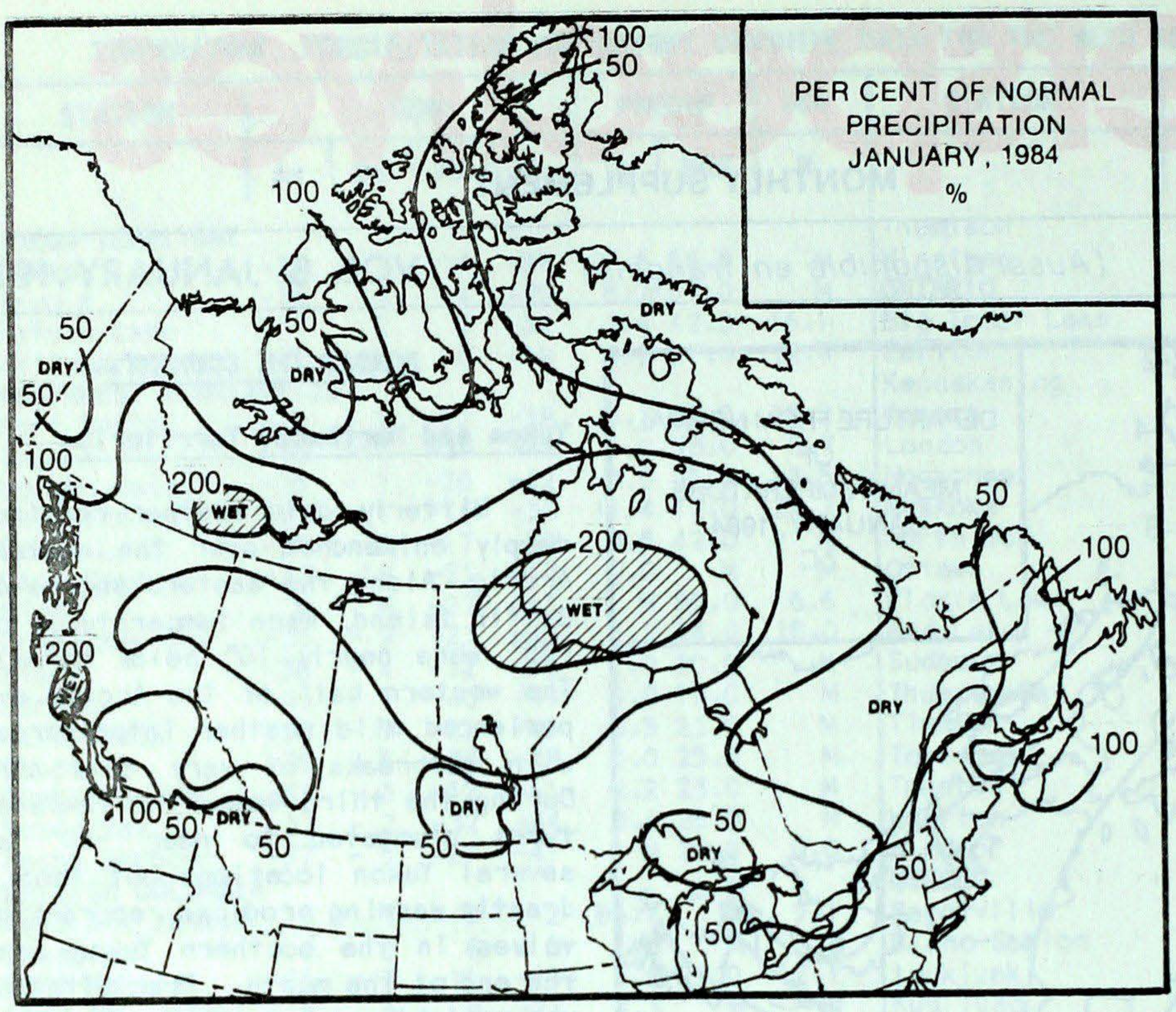
ACROSS THE COUNTRY...

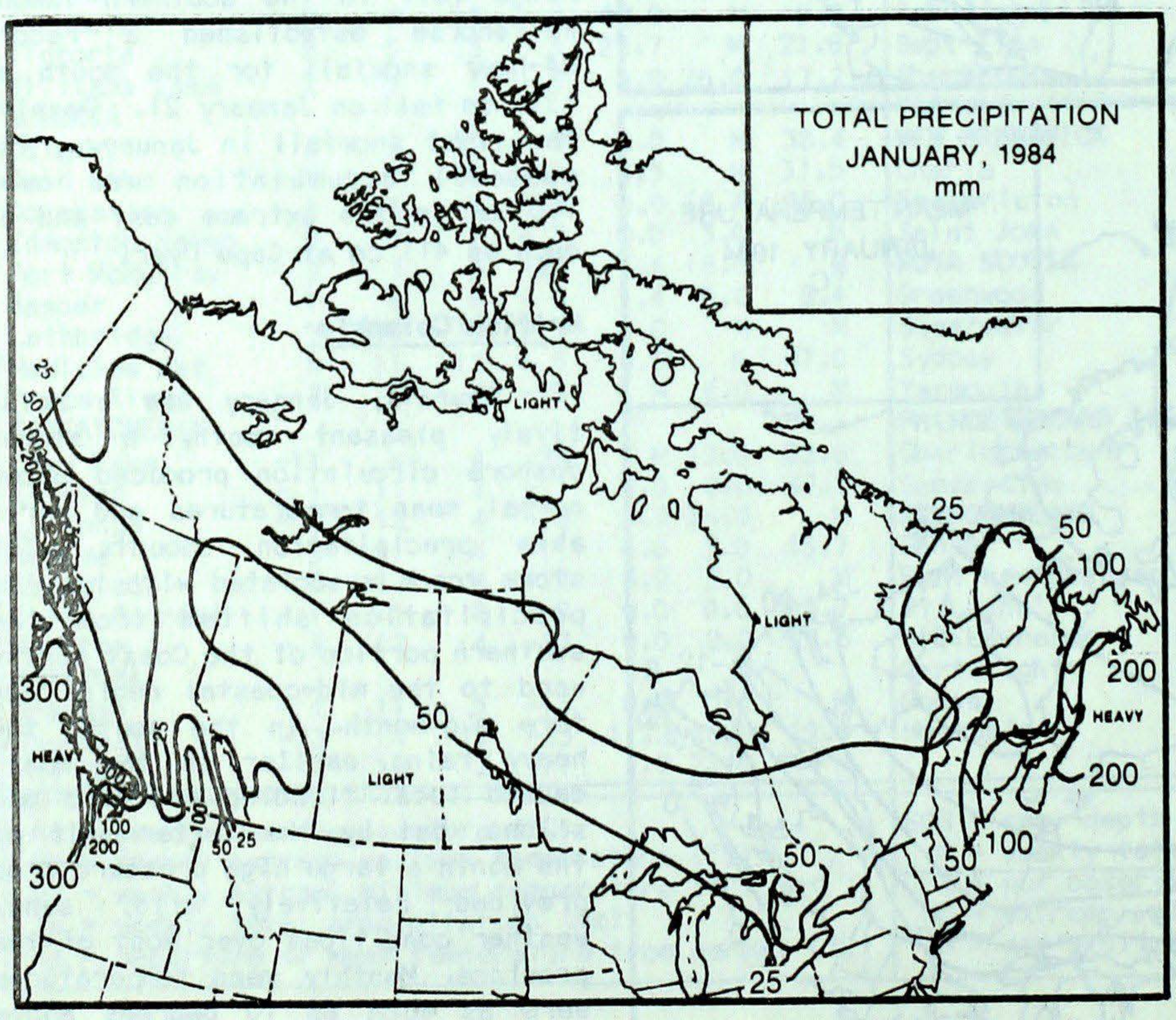
Yukon and Northwest Territories

Bitterly cold weather remained deeply entrenched over the eastern Arctic. Along the eastern shores of Baffin Island, mean temperatures of -35° were nearly 10° below normal. The western half of the Arctic experienced mild weather interspersed with outbreaks of very cold air. During the third week, the temperatures plummeted to near -50° at several Yukon locations but then a drastic warming produced record-high values in the southern Yukon near the end of the month. Precipitation was variable across the North, ranging from 20 per cent of normal in the High Arctic to 250 per cent of normal in the Mackenzie District. After many weeks of dry weather, appreciable snow in the 20 to 35 cm range fell in the southern Yukon, Whitehorse established a record 24-hour snowfall for the month as 17.6 cm fell on January 21. Despite the light snowfall in January , the seasonal accumulation was over 150 cm in the extreme east and as much as 411 cm at Cape Dyer.

British Columbia

Overall, January was a relatively pleasant month. a strong onshore circulation produced above normal mean temperatures and variable precipitation amounts. The storm track associated with heavier precipitation shifted from the southern portion of the Coast northward to the mid-coastal region before mid-month. In the south, the heavy rains earlier in the month caused local flooding and some mud slides, but by the latter half of the month a large high pressure area provided relatively mild, sunny weather conditions over most of the province. Monthly mean temperatures were as much as 10 degrees above





normal in the Peace River District. Both Kelowna and Cranbrook established January maximum temperature records of 11.5 and 11.1 degrees respectively. Precipitation at many interior sites was below normal, but above normal along the Coast.

Prairies

January was a warmer than normal month with mean temperatures averaging as much as 8 to 10 degrees above normal in Alberta and 5 to 7 degrees across the southern Prairies. Except for the more northerly areas cold Arctic outbreaks were generally short lived; as a result, areas in the south experienced considerable day-to-day variation. Precipitation was light across the south, but snowfall in more northern districts was above normal. Churchill recorded 50.5 cm of snow this month, almost triple its normal amount. In contrast several communities in southern Saskatchewan and Manitoba have received less than 50 per cent of their normal seasonal snowfall to date. Brandon had only 5.5 cm of new snow this month; its seasonal snowfall to date is only 36 per cent of the long term normal. At month's end snow depths were extremely variable, ranging from a trace in southern Alberta to more than 75 cm in the northeast. Banff recorded an unusually heavy rainfall of 20.3 mm on January 4th-5th, establishing a new 24-hour rainfall record for the month.

Ontario

Record-cold in the South and near normal temperatures in the North highlighted Ontario's weather. Bitterly cold air covered the lower Great Lakes during the second and third week and numerous coldest minimums were set. At Peterborough, the temperatures dropped to a bone-chilling -37.8° on January 28 and Windsor established an all-time record-cold of -27.2° on the morning of January 21. snowfall amounts ranged from 30 to 50 cm across the Province, but up to 70 cm fell in the snowbelt areas to the lee of Lake Huron and Georgian Bay. Wiarton's snowfall of 124 cm increased

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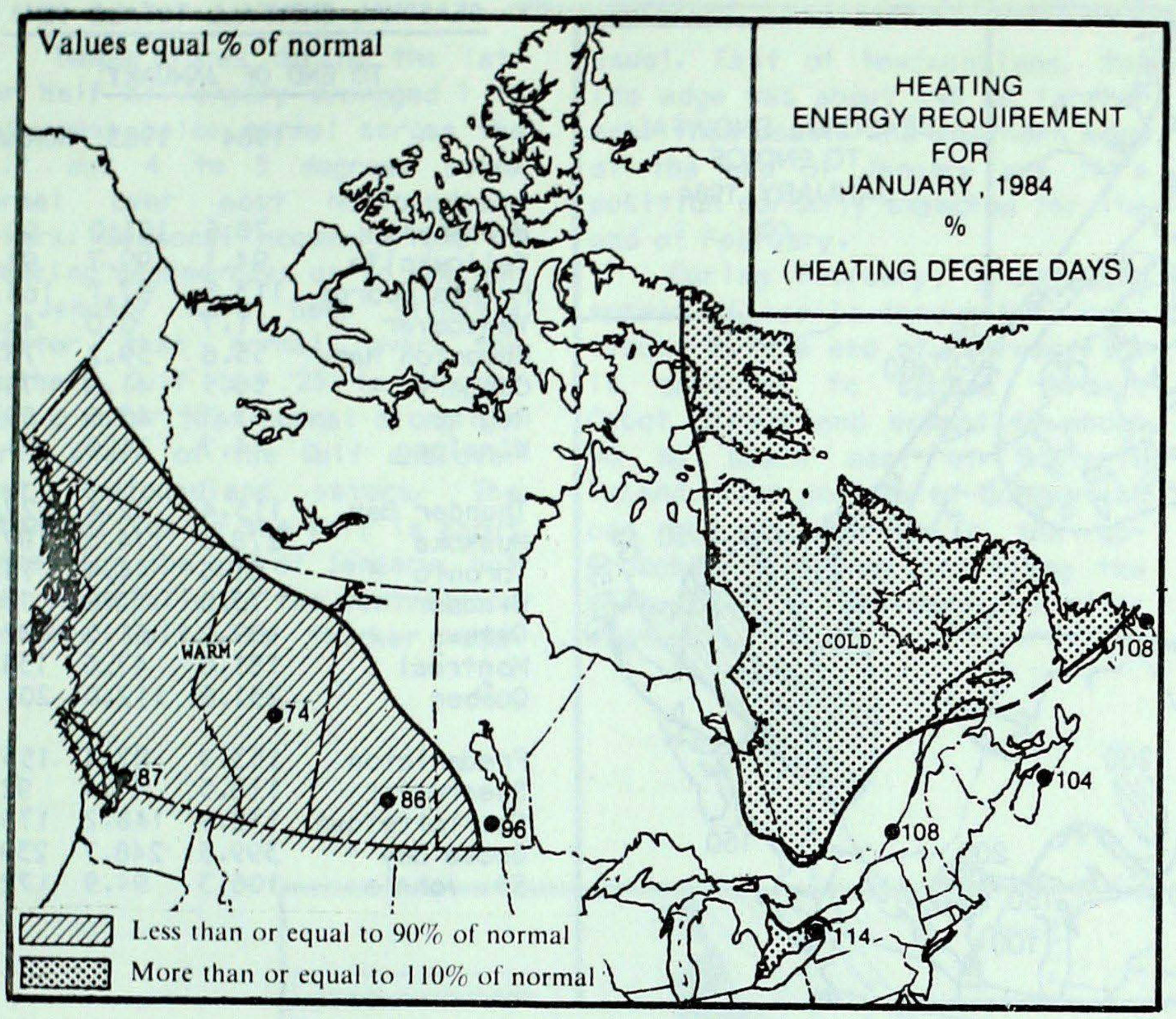
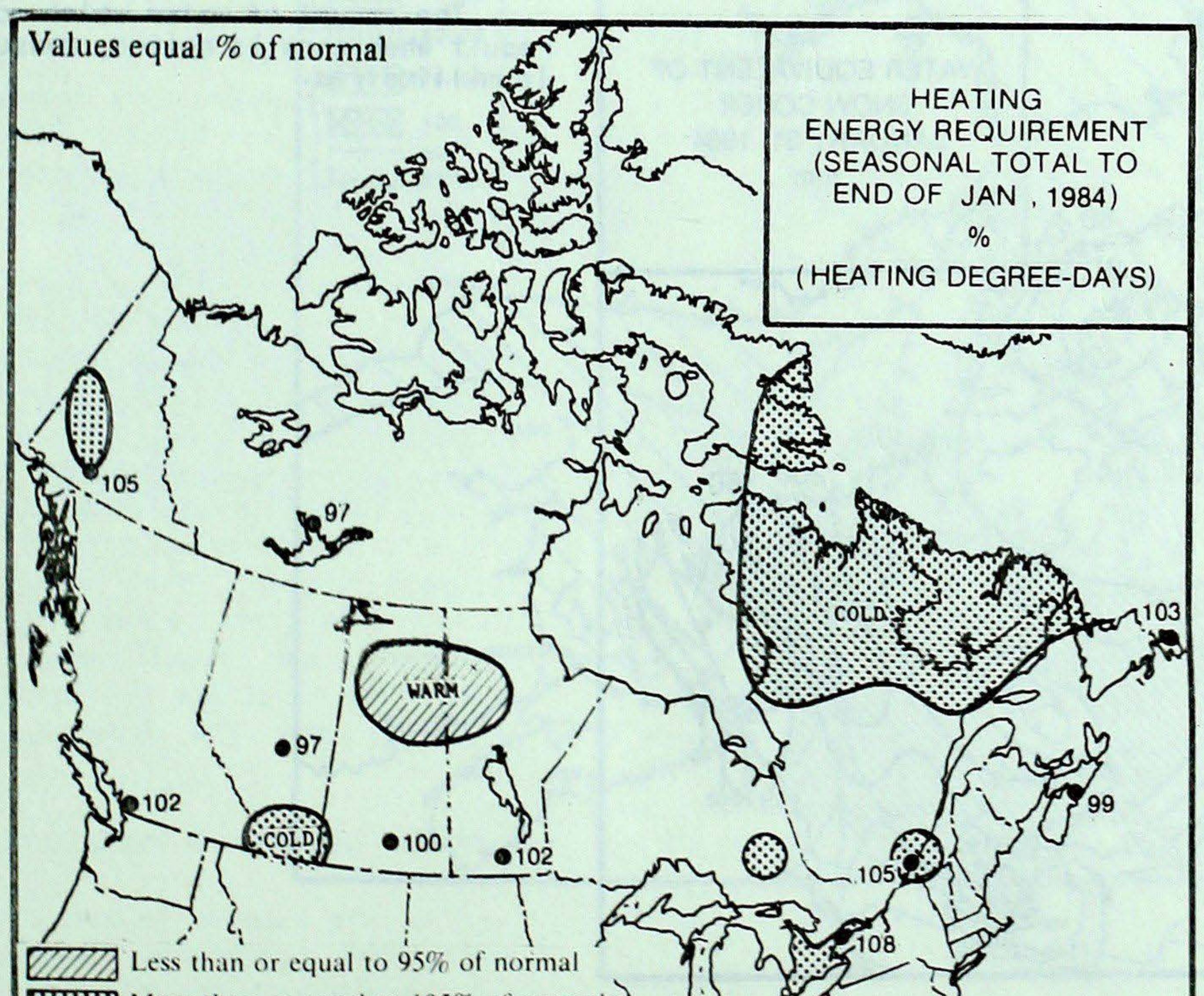
ENERGY REQUIREMENT

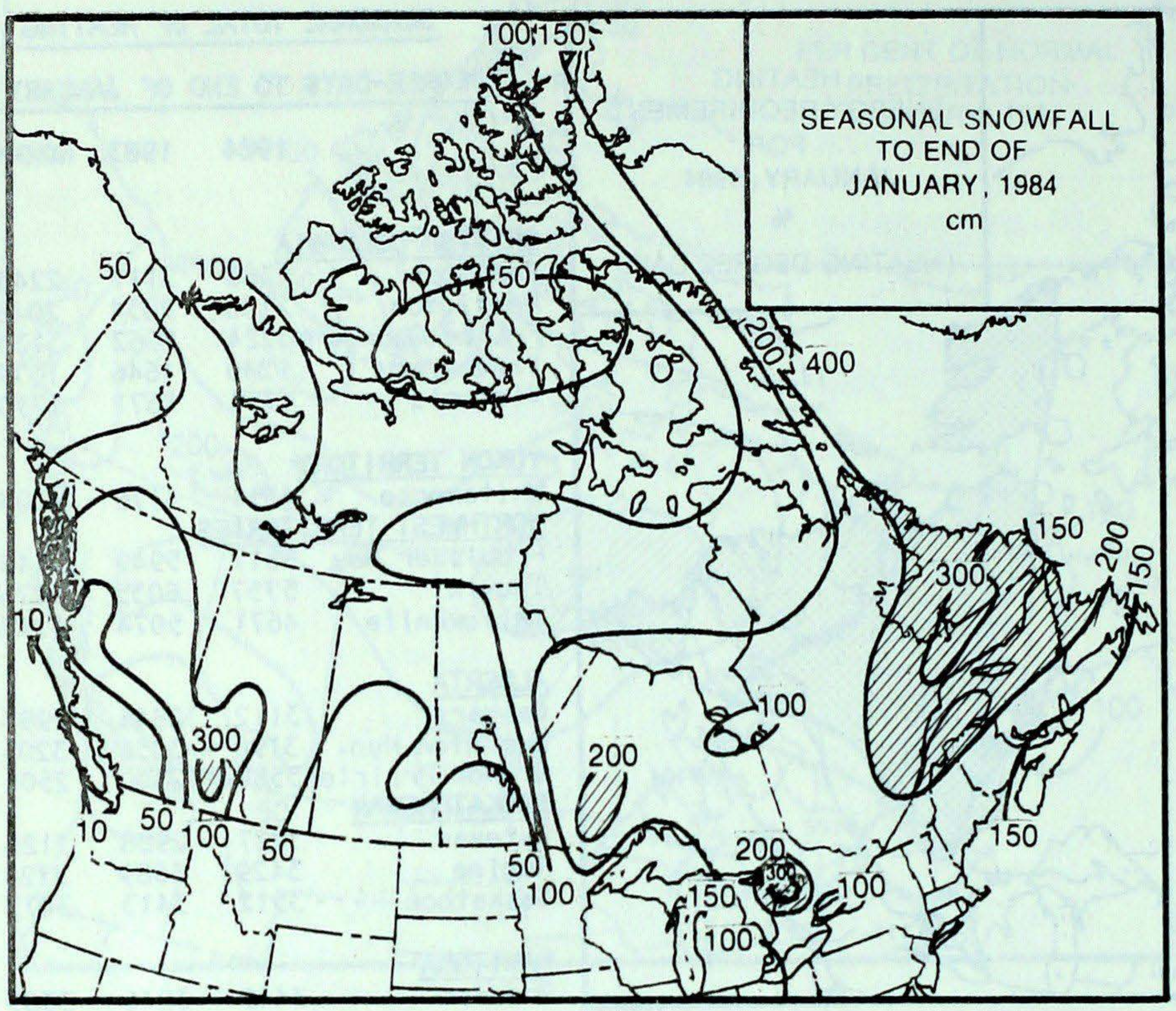




SEASONAL TOTAL OF HEATING DEGREE-DAYS TO END OF JANUARY

	1984	1983	NORMAL
BRITISH COLUMBIA			
Kamloops	2360	2117	2245
Penticton	2138	2034	2046
Prince George	3224	2962	3133
Vancouver	1740	1646	1677
Victoria	1751	1671	1710
YUKON TERRITORY			
Whitehorse	4351	4176	4103
NORTHWEST TERRITORIES			
Frobisher Bay	5817	5949	5446
Inuvik	5757	6035	5776
Yellowknife	4671	5074	4748
ALBERTA			
Calgary	3112	2846	2984
Edmonton Mun.	3190	3056	3205
Grande Prairie	3580	2500	2505
SASKATCHEWAN			
Estevan	3227	2988	3126
Regina	3429	3689	3728
Saskatoon	3512	3413	3473
MANITOBA			
Brandon	3449	3246	3369
Churchill	4747	5108	4881
The Pas	3727	3812	3809
Winnipeg	3450	3155	3276
ONTARIO			
Kapuskasing	3715	3570	3594
London	2395	2013	2184
Ottawa	2690	2423	2602
Sudbury	3150	2830	2999
Thunder Bay	3297	3094	3149
Toronto	2441	2063	2187
Windsor	2190	1747	1937
QUÉBEC			
Baie Comeau	3377	3255	3262
Montréal	2626	2355	2469
Québec	2889	2688	2814
Sept-Iles	3564	3502	2625
Sherbrooke	2895	2684	2887
Val-d'Or	3543	3314	3454
NEW BRUNSWICK			
Charlo	3011	2919	2840
Fredericton	2589	2452	2560
Moncton	2519	2438	2515
NOVA SCOTIA			
Halifax	2049	1985	2060
Sydney	2230	2196	2204
Yarmouth	2047	2182	2229
PRINCE EDWARD ISLAND			
Charlottetown	2320	2296	2357
NEWFOUNDLAND			
Gander	2722	2707	2623
St. John's	2460	2061	2067

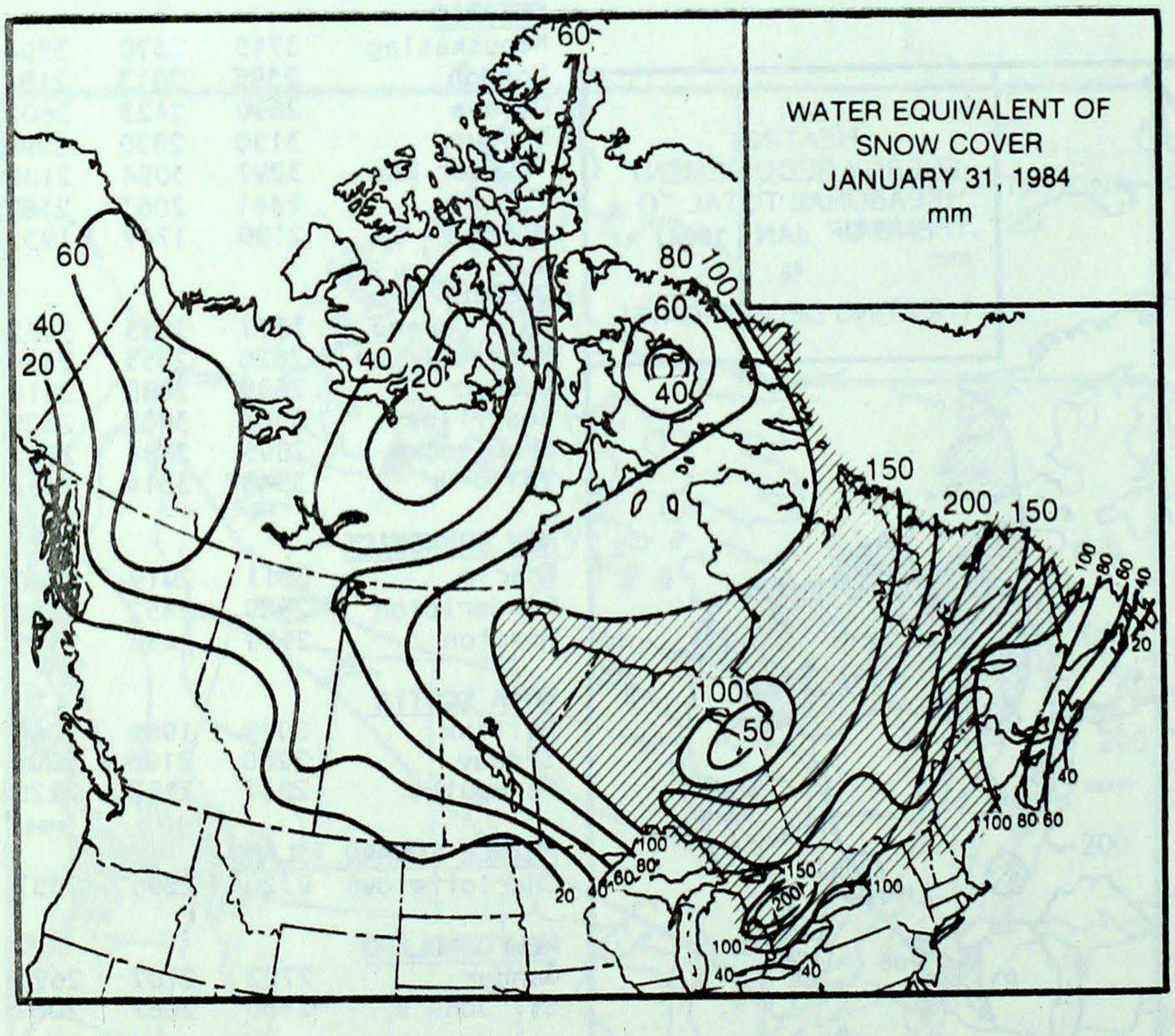
SNOWFALL



SEASONAL SNOWFALL TOTALS (CM)

TO END OF JANUARY

	1984	1983	NORMAL
Whitehorse	70.6	101.0	90.7
Yellowknife	94.1	99.7	94.2
Prince George	113.5	87.1	164.0
Vancouver	11.7	0.0	46.0
Edmonton Nam.	55.6	39.2	78.2
Calgary	56.5	41.0	73.3
Regina	43.3	46.6	65.0
Winnipeg	44.7	31.0	71.7
Thunder Bay	115.4	92.4	127.7
Muskoka	278.5	174.5	197.4
Toronto	81.6	44.4	74.8
Windsor	73.8	12.8	70.4
Ottawa	189.0	61.5	132.0
Montréal	181.6	47.6	134.4
Québec	231.6	112.0	201.9
Fredericton	153.9	87.4	155.9
Shearwater	118.5	47.4	92.9
Charlottetown	132.9	148.2	173.8
Goose Bay	399.5	248.7	239.3
St. John's	106.3	94.9	172.1



Snow Cover

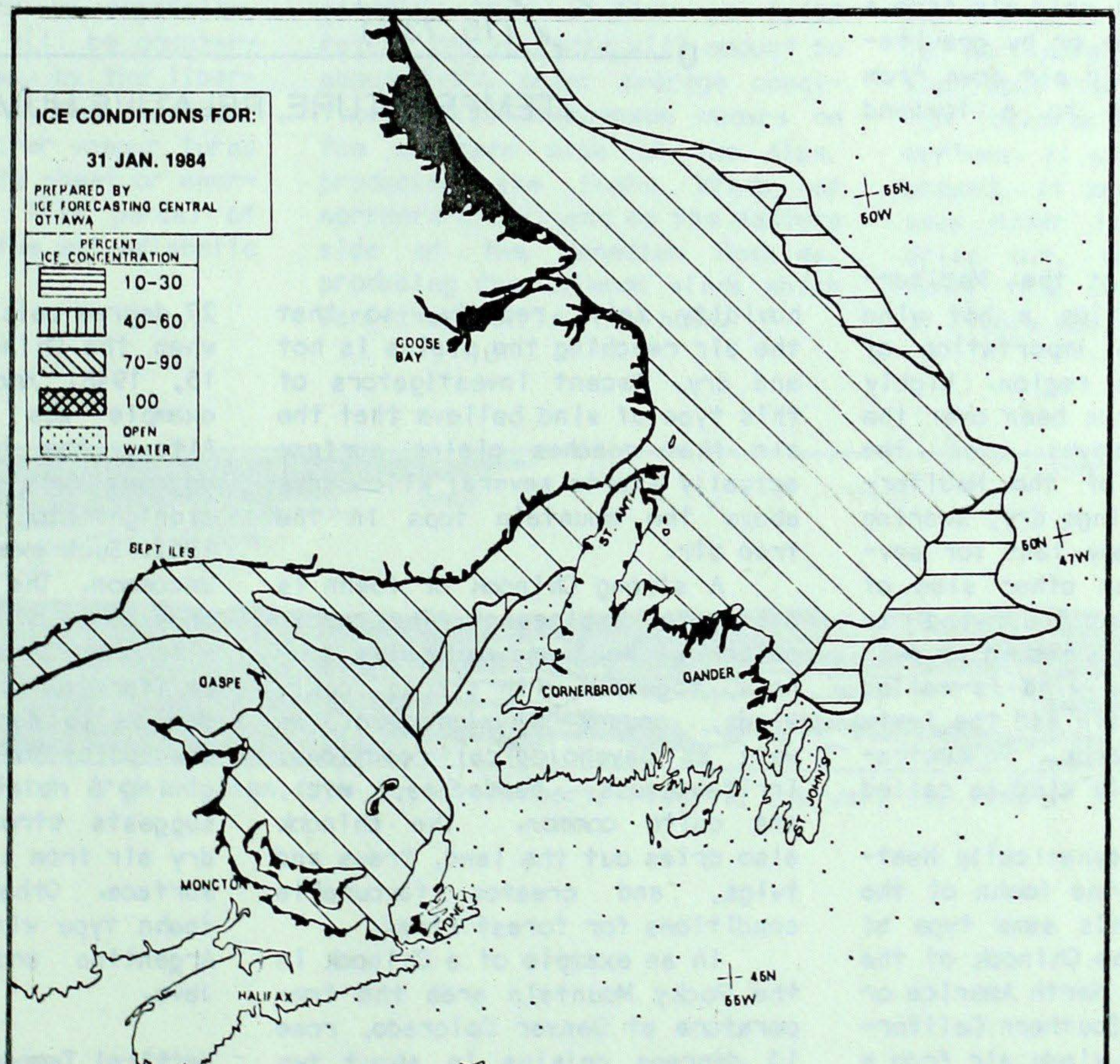
The amount of water which would result when snow is melted, measured in millimetres.

Ice Forecast off the East Coast for February

Temperatures during the latter half of January averaged 1 to 2 degrees below normal across the Gulf and 4 to 5 degrees below normal over east Newfoundland waters. Seasonal accumulations of freezing degree-days up to the end of January have been slightly greater than normal over the southern Gulf but 25 to 30 per cent greater than normal along the north shore of the Gulf and over east Newfoundland waters. The extent of ice in the Gulf is about normal for the end of January, but ice, especially in the central and northern Gulf, is thicker than usual. East of Newfoundland, the ice edge was about 240 km farther east than usual. The southern edge at the end of January was in a position normally expected for the end of February.

During February, growth and spread of ice is forecast to continue. By the end of February ice is expected to spread through Cabot Strait and extend to about 96 km south east of Scatarie Island. Thus periods of congestion can be anticipated in the approaches to Sydney and along the West Coast of Newfoundland after mid-month.

Drift of ice east of Newfoundland is forecast to be eastward throughout February. However, periods of ice growth and southward ice drift, especially during the latter half of the month, will advance the southern edge to south of St. John's. Brief periods of ice congestion are anticipated in Notre Dame Bay during February and in the approaches to St. John's during the last half of the month. Also, there is a potential for drift of sea ice and icebergs into the Hibernia drill area after mid-February.



The Chinook Winds

by
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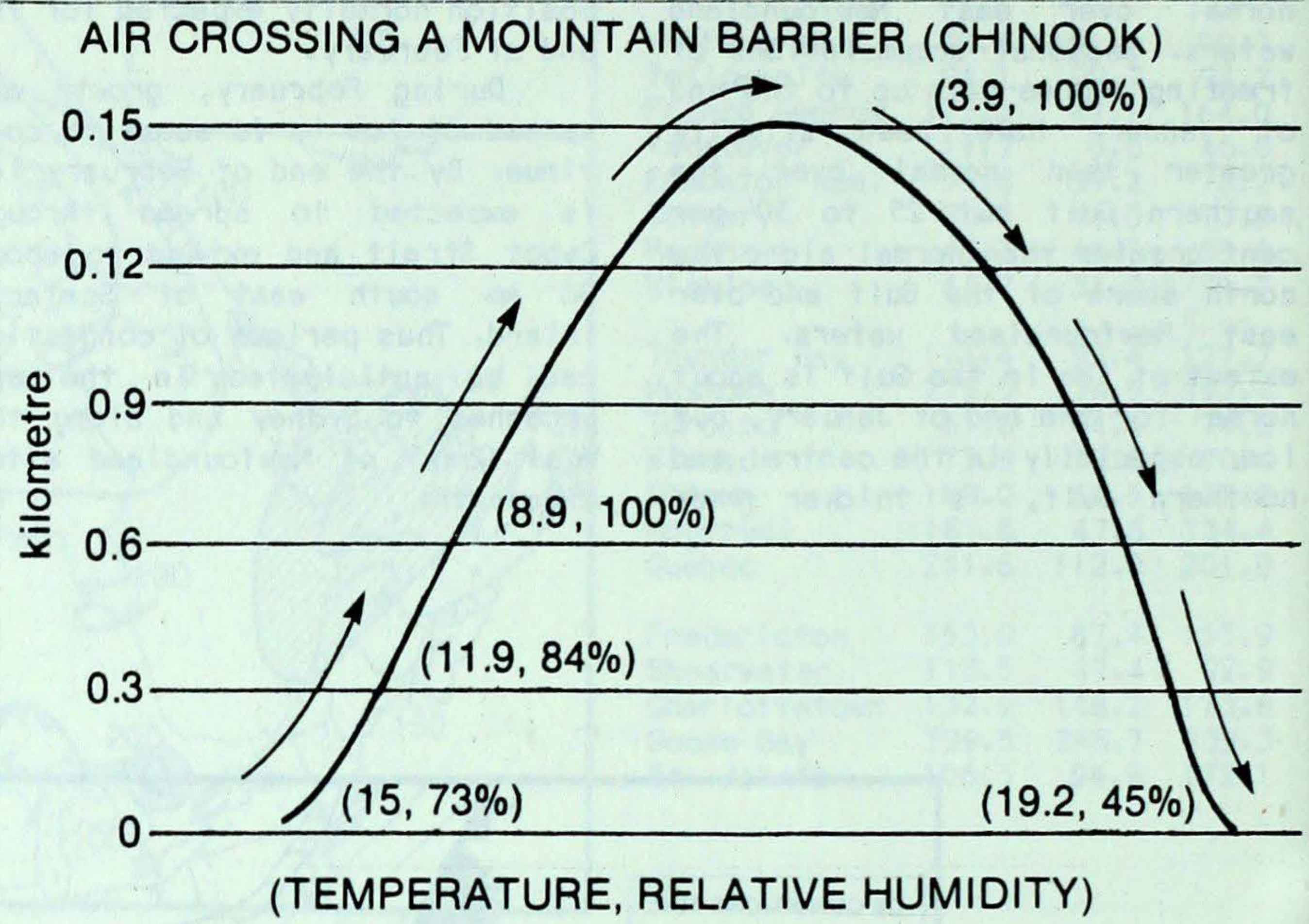
Calgary Weather Office
Atmospheric Environment Service

Since the blowing of the wind is one of the most obvious ways in which weather appeals to our senses, there are literally hundreds of different local names given to winds that are peculiar to various localities. Some of these local names refer to winds that are a result of the operation of widespread weather precesses, others are due to regional influences, and still others to relatively local effects. These local winds are actually of two main types, hot and cold. Hot winds may be caused by simple importation of hot air from a warm source region or by dynamic heating of air as it descends from a high region to a low one. Cold winds may be caused by the bringing of cold air from a cold source region or by gravitational flow of cold air down from an elevated area to a lowland area.



Hot Winds

The sirroco of the Mediterranean area typifies a hot wind caused by simple importation of warm air into a region. Highly heated air that has been over the Sahara Desert moves over the southern border of the Mediterranean Sea and brings dry, searing conditions that may last for several days. On the other side of the Mediterranean the wind is humid from moisture picked up over the sea. The same wind is called the leveche in Spain and the leste in the Canary Islands. In Australia a hot northerly wind is called a brickfelder.

The typical dynamically heated warm wind is the foehn of the northern Alps. This same type of wind is called the Chinook of the western plains of North America or the Santa Ana of Southern California. In all these winds air from a plateau or mountain area is brought vigorously down into an adjoining plains region. The forced descent of the air heats it dynamically. At the same time the humidity falls rapidly, so that the air reaching the plains is hot and dry. Recent investigators of this type of wind believe that the air that reaches plains surface actually starts several kilometres above the mountain tops in the free air.

A strong Chinook or foehn is distinctly unpleasant. The combination of heat and excessive dryness, together with strong, gusty winds, causes physiological as well as psychological reactions; irritableness, headaches, etc., are quite common. The chinook also dries out the land, trees and twigs, and creates favourable conditions for forest fires.

In an example of a Chinook in the Rocky Mountain area the temperature at Denver Colorado, rose 12 degrees celsius in about two hours when the warm dry air from aloft reached the surface shortly after midnight on Jan. 27, 1940. Another example was at Havre, Montana, the temperature rose 27 degree celsius in about an hour when the Chinook arrived on Feb. 15, 1948. Another more dramatic example was at Pincher Creek, Alta., the temperature rose 28 degrees celsius in one hour from midnight to one AM. Jan. 27, 1962. Such examples are not at all uncommon. The extreme dryness of many cases of this type especially with the Santa Anas of Southern California when the temperature may be 16 degrees celsius with a dew point of minus 18 degrees, giving a relative humidity of 8%, suggests strongly that unusually dry air from aloft is reaching the surface. Other local names for foehn type winds are the Zonda of Argentina and the Koembang of Java.

Vertical Temperature Distribution

As one ascends in the atmosphere, the temperature decreases (on an average) at the rate of 9.8C/km up to 10 kilometres. In any specific situation, however, the temperature may behave in an infinity of different ways. The rate of decrease of temperature in the vertical is called the lapse rate.

Adiabatic Processes

When air moves vertically as it does when it rises over a mountain, the temperature is greatly affected. The basic reason for this is that air expands when it rises and contracts when it sinks.

Any process in which no heat is added or subtracted, is said to be adiabatic.

If a parcel of air is lifted and no heat is added or subtracted it expands (pressure, reduction) and cools at the dry adiabatic lapse rate.

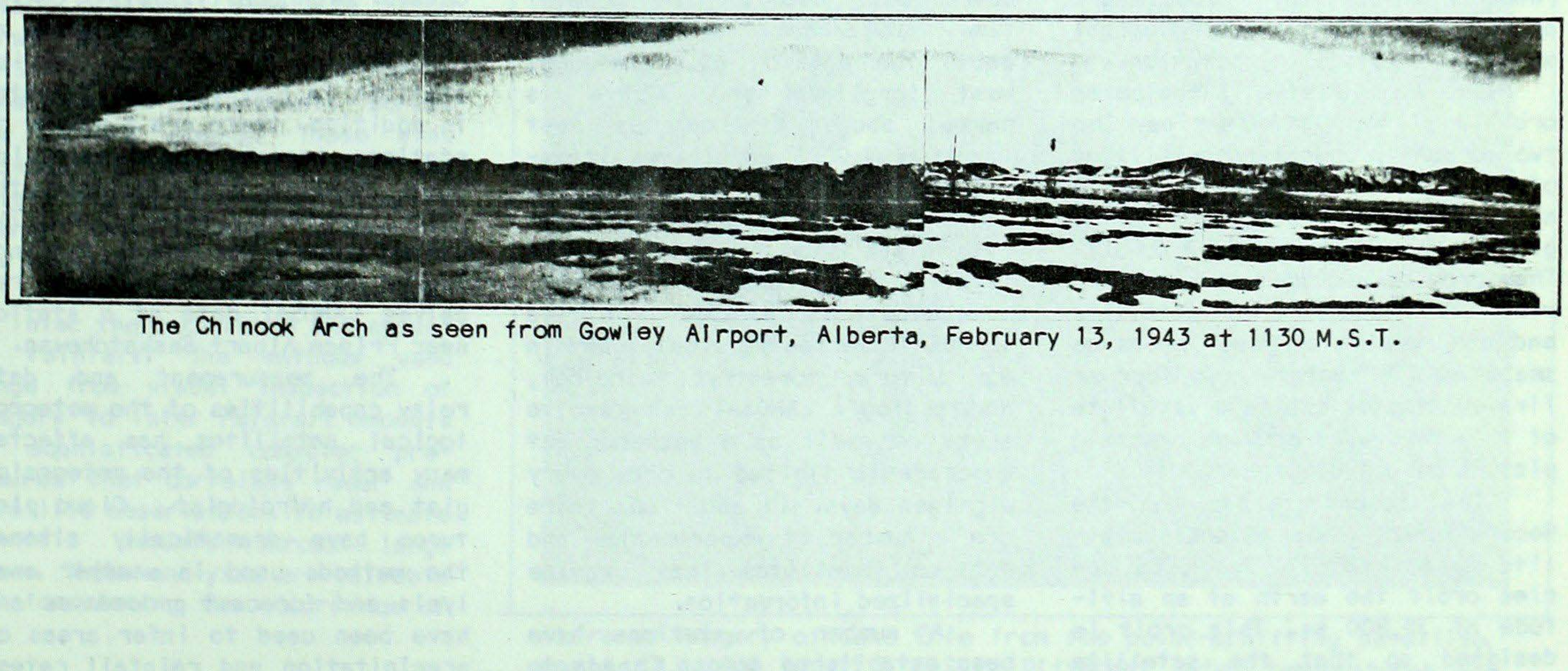
If the parcel is saturated, the air will cool by expansion, but this cooling will be counteracted, or retarded, by the liberated latent heat (when condensation occurs or water vapour turns into water droplets -heat or energy is released). This parcel of air will cool at the wet adiabatic lapse rate.

When moist air flows up the side of a mountain range, the temperature drops at the dry adiabatic lapse rate until it becomes saturated, and after that at the saturated (wet-moist) rate. After saturation, part of the water vapour that condenses falls as rain or snow. When the air, which has lost much of its moisture during ascent, subsides (descends) on the other side of the mountain, the temperature rises at the dry adiabatic lapse rate after the clouds have evaporated. Because of the difference between the two lapse rates, the air on the lee side of the mountain will be warmer than it was at the same level on the windward side. The extent of the increase will depend on the temperature and moisture content of the air initially, the height to which it is lifted, and the fraction of liquid water precipitated. With a lift of 2,400 metres the increase will amount to about 5.5°C under average conditions. This phenomenon occurs on the southern side of the Alps, producing the Foehn Winds of northern Italy, and on the eastern side of the Canadian Rockies, producing the Chinook winds which warm the Prairie Provinces.

A strong Chinook (foehn) is usually preceded by an advancing low-pressure system with strong winds in the middle and upper atmosphere. As the upper system approaches the mountain range, the pressure at the low levels in the lee begins to fall, and a trough of low pressure forms over the lowlands. At the time when the upper system crosses the range, strong downslope winds set in between the divide and the low-level pressure trough. The high temperature and the low relative humidity that accompany these winds are due to the adiabatic heating of the descending air.

Chinooks and foehns are intensified considerably if there is ascending motion with precipitation on the windward side of the mountain.

The onset of a Chinook is marked by a rise in temperature and a drop in humidity. The change is particularly sharp in winter when cold raw air is present over the lowlands before the warm air arrives. If snow is present on the ground, it melts rapidly. If the snow cover is light, the ground dries out, where it is deep a heavy thaw sets in, and flooding of rivers may result.

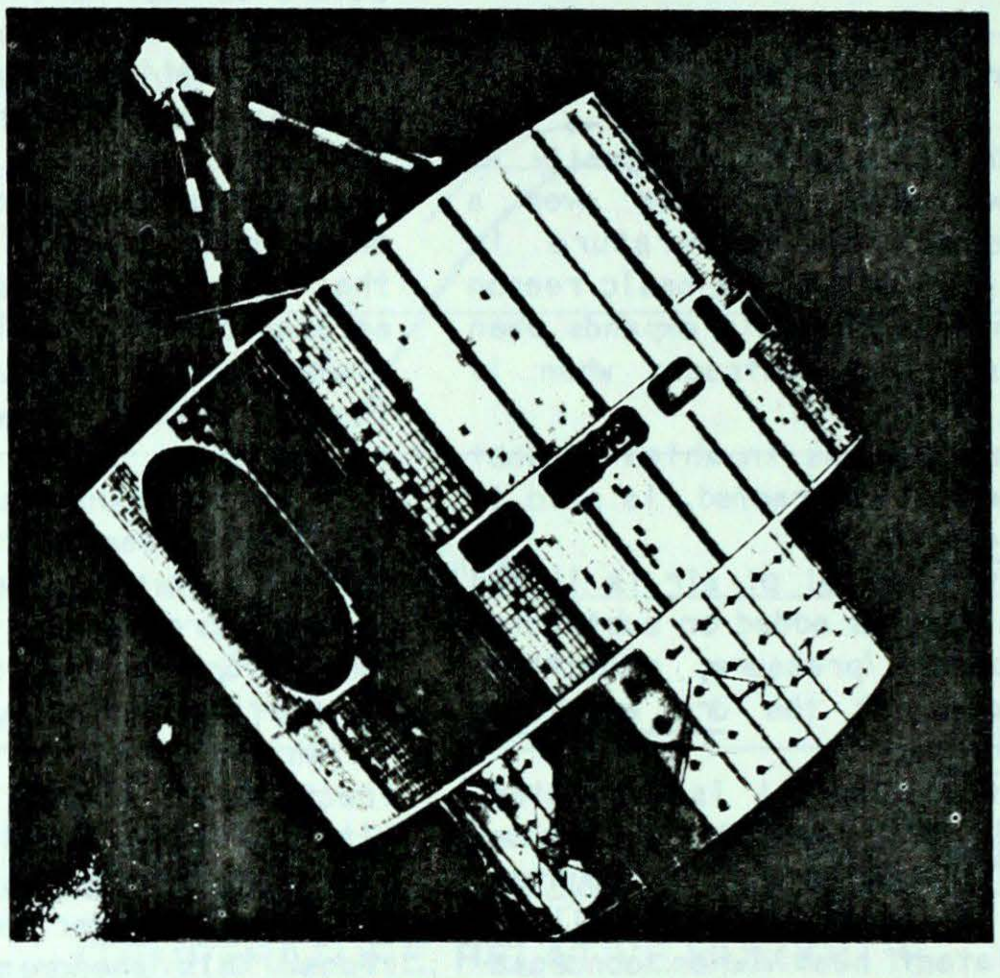


The Chinook Arch as seen from Gowley Airport, Alberta, February 13, 1943 at 1130 M.S.T.

Satellite Applications in Meteorology and Hydrology

by
Kirk J. Johnstone
Canadian Climate Centre

Not since the first scientific applications of computers has any technological advance influenced the activities of meteorologists and hydrologists as much as the satellite. The computer affected nearly all applications of meteorology and hydrology, from weather and flood forecasting to the design of hydrologic structures, by providing an unprecedented capability to perform repetitive numerical calculations. The satellite has provided an entirely new viewpoint for the observation of weather and water. The new space view has provided information previously unavailable to meteorologists, hydrologists, and other environmental scientists. This wealth of data has influenced many aspects of our knowledge of the environment and had a significant effect on man's application of that knowledge. Since the first pictures of the Gulf of St. Lawrence were obtained in 1960 with the Television and Infrared Observational Satellite 1 (TIROS 1), the United States has engaged in a program to develop and implement the use of improved meteorological and land resource satellites. Today there are two primary meteorological satellite systems in operation.



Geostationary satellite GOES

The first system is the polar orbiting TIROS-N/NOAA series. The two currently operating satellites of the TIROS-N/NOAA series move in a north-south orbit around the globe, known as a polar orbit. They provide pictures of a 2000 km wide swath beneath the satellite and can resolve or "see" areas as small as 125 hectares. In four or five successive orbits a satellite of this type will provide a mosaic picture of all of Canada.

The second system is the Geostationary Observational Satellite System (GOES). The GOES series orbit the earth at an altitude of 35,800 km. This orbit is designed so that the satellite remains stationary above a point on the equator, enabling the provision of repetitive pictures of the same portion of the earth. Two GOES satellites are in routine operational use at the present time. GOES/East is positioned above the equator at 75 degrees west longitude and GOES-W is parked above 135 degrees west longitude. GOES satellites transmit a picture every half hour. The pictures are frequently seen in film clips shown by a number of television stations.

Data from the LAND SATellite (LANDSAT) series is widely used in agriculture, forestry, hydrology, and geology. LANDSAT can resolve areas as small as a hectare, but coverage is limited to once every eighteen days. In addition, there are a number of experimental and defence satellites that provide specialized information.

A number of stations have been established across Canada to receive the satellite data. GOES data are routinely received at stations operated in Vancouver and Toronto by the Atmospheric Environment Service of Environment Canada. High quality data from the TIROS-N series are received at Atmospheric Environment Service stations in Edmonton and Toronto. In addition, there are a number of stations across Canada receiving lower quality pictures from the polar orbiting satellites. The Canada Centre for Remote Sensing, Energy Mines and Resources, receives LANDSAT data at a station near Prince Albert Saskatchewan.

The measurement and data relay capabilities of the meteorological satellites has affected many activities of the meteorologist and hydrologist. Cloud pictures have dramatically altered the methods used in weather analysis and forecast procedures and have been used to infer areas of precipitation and rainfall rates. A special sensor on the TIROS-N series can provide information on the vertical distribution of temperature and humidity throughout the atmosphere. Both series of meteorological satellite provide a date relay service for remote automatic weather stations that make surface measurements. And experimental satellites, such as SEASAT and NIMBUS can provide information on surface winds over the ocean, snow cover, and snow water equivalent.

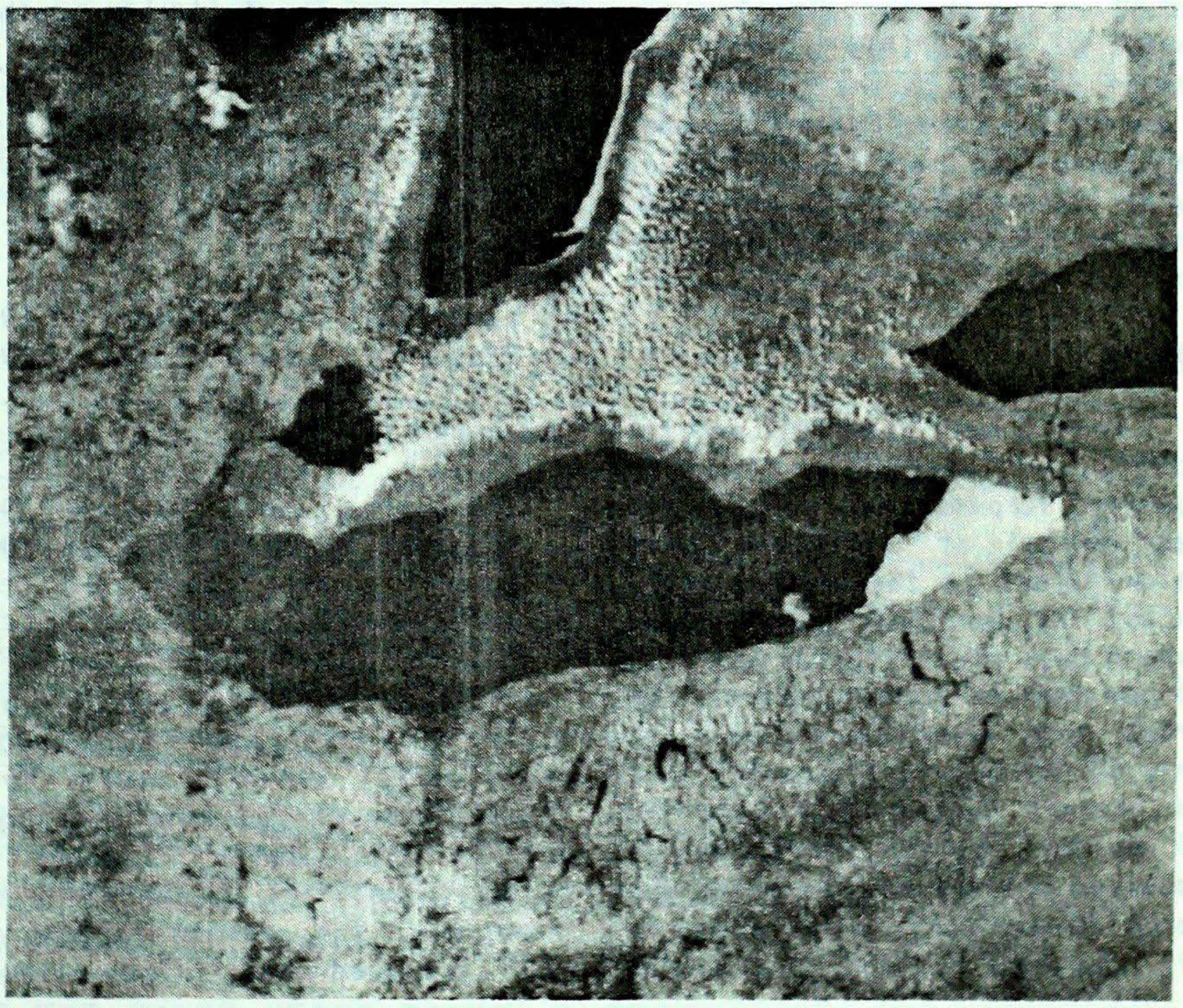
The first pictures from meteorological satellites were manually inspected for clouds and used to infer the position of fronts, lows and other weather phenomena. The pictures provided a large snapshot of the cloud systems, filling in many gaps on the meteorologist's weather map. Today, satellite pictures are still used in much the same way, but improved data and computer processing power have greatly enhanced the utility of the data. Computer software and graphics make it now possible to quickly overlay standard meteorological observations such as pressure, wind, or temperature on the cloud pictures. This new capability has lead to new insights to the behaviour of the atmosphere and the improved interpretation of data for weather forecasting. Should a microwave sensor known as a scatterometer be again placed on a polar orbiting satellite (the first was on the short-lived SEASAT), it will be possible to obtain wind measurements across the world's oceans. These wind mesurements would improve the safety and efficiency of offshore energy developments, fisheries, and shipping.

Cloud pictures are also used to infer the occurrence and amount of rainfall. The methods used range from visual inspection of imagery to infer rainfall amounts to sophisticated computer procedures that correlate radar and satellite observations to estimate rainfall amounts across large areas. These analyses are valuable for forecasting the occurrence of flash floods and the monitoring and forecasting of crop yields of foreign countries, to name but two applications.

The ability of satellites to relay data from remote automatic weather stations to urban centres is of tremendous value. The polar orbiters have the ability to locate buoys drifting across the oceans while data is relayed from the buoy to the receiving station. This capability enables the collection of data from across the oceans without the tremendous expense of anchoring buoys at sea. Although GOES satellites cannot locate moving data collection platforms, as the automatic data collection and transmission stations are called, GOES satellites can relay observations from many more platforms than the polar orbiters, and much more frequently. Recently there has been a tremendous increase in the use of data collection platforms and the data relay capability of the GOES satellites for the collection of many types of environmental data from remote and hard-to-access regions of Canada.

Satellites have also exposed the intricacy and detail of ocean-surface currents. The high resolution data from the polar orbiters can be used to observe the swirls, eddies, and meandering of the warm Gulf Stream and other ocean-surface currents. But even the less spectacular maps of ocean-surface temperature are of value. One of the many uses of these maps is the identification of areas where different species of fish are most likely to be harvested.

Only a few applications of satellite data have been mentioned here. And the number of applications for satellite data should continue to increase in the future as our knowledge of environmental remote sensing improves. The continuing interest in observing environmental parameters from space will result in many further changes in the application of the environmental sciences.



Infrared imagery of Lake Erie from the polar-orbitting satellite, April 14, 1982 at 1513 E.S.T. Different water temperatures are shown as different shades of grey. Note the ice cover in the eastern end and cloud cover just north of the lake.

CLIMATIC EXTREMES - JANUARY, 1984

MEAN TEMPERATURE:		
WARMEST	Victoria Marine, BC	7.0°
COLDEST	Eureka, NWT	-40.5°
HIGHEST TEMPERATURE:	Lethbridge, ALTA	16.0°
LOWEST TEMPERATURE:	Mayo, YT	-52.0°
HEAVIEST PRECIPITATION:	McInnes Island, BC	684.6 mm
HEAVIEST SNOWFALL:	Blue River, BC	158.8 cm
DEEPEST SNOW ON THE GROUND ON JANUARY 31, 1984	Cartwright, NFLD.	146 cm
GREATEST NUMBER OF BRIGHT SUNSHINE HOURS:	Goose Bay, NFLD.	145 hrs

...continued from page 2B

the seasonal accumulation to 375 cm.

Except for the Niagara Peninsula, a deep snow cover in the 25 to 60 cm range lay almost everywhere. St. Catharines had the least amount of snow on the ground, only 2 cm. In the Bruce Peninsula, heavy snowfalls and very cold temperatures during mid-month threatened the survival of Ontario's deer population.

Québec

Frigid cold and light snowfall controlled Québec's weather. Monthly temperatures ranged from near normal at Sherbrooke to 5° below normal in the central areas. Except for locations along eastern Hudson Bay, precipitation was about 75 per cent of normal. Montréal and areas from Roberval eastward had only 30 mm. Snowfall exceeded 50 cm in eastern Québec, but less than 25 cm fell in the North. Kuujjak received only 18 cm. The skies were about 25 per cent duller along the St. Lawrence Valley, the Eastern Townships and extreme northern Québec; however, hours of bright sunshine were nearly 50 per cent above normal in the western part of the province. The following monthly records were set:

	New Record	Old Record	
Low mean temperatures			
La Grande	-27.0	-26.6	1982
Gaspé	-14.2	-14.0	1974
Least snowfall			
Ste-Agathe	39.2	40.1 cm	1980
Roberval	25.5	26.9 cm	1968

Atlantic Provinces

January's weather was cold and dull. Only Labrador experienced above normal sunshine hours. Mean temperatures ranged from near normal in Nova Scotia to about 6° below normal at St. Anthony. At Goose Bay, the average reading of -23° produced the third coldest January on record. Very cold air sent temperatures tumbling down to record-low values at numerous locations during the 4th week; at Charlo, -36.5° was the lowest ever. Storms crossing the East Coast deposited variable amounts of precipitation. Snowfall was above average almost everywhere, but parts of Nova Scotia had only 60 per cent of their normal amount. On January 26, Goose Bay received 35.7 cm of snow - the most in 24 hours. Hours of bright sunshine were below normal in the Maritimes. A meager 60 hours of sunshine at Summerside was only 50 per cent of normal, and the lowest on record.

On January 10, a major storm dumped in excess of 30 cm of snow on the Maritimes, forcing schools in Prince Edward Island to be closed. Ice buildup on electrical wires caused widespread power failures in Nova Scotia. Heavy rain and mild temperatures led to ice jams on the North and Salmon Rivers on the 25th. Flooding occurred in the vicinity of Truro, basements and roads were covered with water over a metre deep.

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

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JANUARY 1984 JANVIER

STATION	Temperature °C / Température °C: Mean / Moyenne	Difference from Normal / Écart à la normale	Maximum / Maximale	Minimum / Minimale	Snowfall (cm) / Chute de neige (cm)	Total Precipitation (mm) / Précipitation totale (mm)	% of Normal Precipitation / % de précipitation normale	Snow on ground at end of month (cm) / Neige au sol à la fin du mois (cm)	No. of days with Precip. 1.0 or more (mm) / Nombre de jours de préc. 1.0 ou plus (mm)	Bright sunshine (hours) / Durée de l'insolation (heures)	Degree Days below 18°C / Degrés-jours au-dessous de 18°C	Mean Sea Level Pressure (kPa) / Pression au niveau moyen de la mer (kPa)	Mean Vapour Pressure (kPa) / Pression de vapeur moyenne (kPa)
BRITISH COLUMBIA COLOMBIE-BRITANNIQUE													
Abbotsford A	3.7	2.1	14.8	-9.7	5.8	308.4	147	0	18	77	444.3	102.4	.72
Alert Bay	4.8	2.0	12.2	-2.5	3.1	247.4	127	0	20		403.9	102.3	.74
Blue River A	-6.1	4.6	6.1	-32.0	158.8	54.3	66	80	12	36			
Bull Harbour	5.3	2.1	11.9	-3.2	0.0	507.8	209	0	21		393.8	102.1	.83
Burns Lake													
Cape St. James	6.7	2.8	9.8	3.2	0.0	243.0	150	0	21	45	349.7	101.7	.91
Cape Scott	6.0	1.9	11.2	-0.2	TR	413.5	123	0	22		372.6	102.1	.92
Castlegar A	-1.7	2.1	7.5	-17.2	38.6	66.0	82	TR	12	52	609.6	102.7	
Comox A	4.3	2.1	12.5	-4.8	2.3	103.7	54	0	16		427.5	102.3	.76
Cranbrook A	-4.8	3.8	11.1	-24.8	13.9	9.5	22	0	5	76	685.6	102.5	.42
Dease Lake	-11.7	8.0	5.0	-31.0	61.0	51.0	183	51	9	60	922.5	101.7	.24
Ethelda Bay	4.8	2.9	10.2	-2.3	0.9	516.7	157	0	22		408.0		
Fort Nelson A	-18.6	5.2	0.8	-32.8	20.8	19.7	79	26	7	61	1133.9	101.9	.12
Fort St. John A	-7.7	10.0	8.6	-26.1	33.0	24.4	69	3	8		796.5	101.8	.28
Hope A	3.5	3.9	15.0	-8.2	9.0	485.1	189	0		18	447.0	102.6	.67
Kamloops A	-3.3	2.8	9.3	-19.2	14.8	21.8	69	10	6	61	657.7	102.6	.45
Kelowna A	-2.0	3.1	11.5	-19.2	23.3	36.2	109	4	8	46	617.6	102.6	.48
Langara	5.4	3.1	10.8	2.0	0.6	203.2	128	0	22		390.7	101.4	.79
Lytton	1.7	5.5	14.4	-15.0	TR	52.4	76	0	5	67	505.7	102.4	.55
Mackenzie A	-6.4	7.9	7.2	-20.1	79.8	85.2	131	36	12	29	756.6		
McInnes Island	5.9	3.0	9.6	0.6	0.2	684.6	245	0	23		376.2	101.9	.87
Marry Island	5.3	1.5	10.7	-1.0	5.0	166.0	127	0	16	65	394.2		
Penticton A	0.1	2.8	9.7	-13.4	13.4	15.6	49	0	5	48	557.0	102.7	.48
Port Alberni A													
Port Hardy A	4.6	2.2	12.2	-4.5	TR	361.8	171	0	20	54	415.6	102.2	.79
Prince George A	-4.1	8.0	7.3	-23.9	64.4	75.4	131	17	12	32	684.8	102.2	.40
Prince Rupert A													
Princeton A	-3.4	4.5	10.3	-25.4	8.4	40.6	74	8	5	82			
Quesnel A													
Revelstoke A	-2.5	4.1	6.5	-16.0	136.0	161.1	145	44	16	42	635.6	102.7	.48
Sandspit A	5.2	3.2	11.2	-1.0	0	210.3	146	0	16	39	395.7	101.6	.82
Smithers A	-3.7	7.2	10.9	-23.1	25.4	47.5	85	2	10	43	672.1	101.9	.40
Stewart A													
Terrace A	-0.8	5.1	7.6	-12.5	50.6	166.6	108	0	17	41	581.6	101.9	.53
Vancouver Harbour	5.1	1.7	11.9	-2.8	6.4	308.8	142	0	17		400.1		
Vancouver Int'l A	4.4	1.9	13.0	-6.7	3.0	223.9	146	0	16	75	422.1	102.4	.78
Victoria Gonz.Hts.	6.1	2.0	13.0	-2.4	1.4	99.5	90	0	14	87	369.5		
Victoria Int'l A	5.0	1.9	15.4	-6.5	2.2	96.2	62	0	13	87	402.7	102.4	.79
Victoria Marine	7.0	3.2	14.7	-3.1	TR	256.5	132	0	16		380.4	102.4	.80
Williams Lake A	-5.0	5.4	9.2	-27.5	46.0	40.0	91	30	7	60	715.3	102.3	.40

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YUKON TERRITORY TERRITOIRE DU YUKON													
Burwash A	-18.5	5.9	6.3	-47.7	6.0	6.0	25	1	1		1146.1	101.3	.20
Dawson A	-25.1		-5.6	-49.9	19.9	17.3		43	5		1337.7	101.8	.10
Mayo A	-24.0	5.0	-3.0	-52.0	40.2	25.5	146	45	9		1302.7	101.8	.11
Watson Lake A	-17.5	9.2	3.7	-40.5	65.2	48.9	148	45	10	25	1101.7	101.7	.16
Whitehorse A	-12.8	7.9	4.1	-42.6	32.4	16.8	95	20	6	35	956.6	101.4	.24
NORTHWEST TERRITORIES TERRITOIRES DU NORD-OUEST													
Alert	-33.6	-1.5	-22.4	-43.3	10.5	7.7	108	19	3		1600.4	101.4	.03
Baker Lake	-34.3	-1.3	-13.8	-41.9	8.4	8.4	109	31	1	17	1621.3	101.3	.02
Combridge Bay A	-34.9	-1.3	-15.4	-45.1	5.4	5.4	112	23	2		1640.1	101.6	.03
Cape Dyer A	-31.2	-9.1	-14.4	-43.6	18.0	10.2	16	44	4		1557.1	100.4	.03
Cape Parry A	-29.7	-0.9	-7.6	-44.9	7.0	4.6	65	14	2		1480.5	101.9	.06
Clyde			-24.5	-43.4	5.4	5.4	55	80	2			100.7	.02
Coppermine	-30.7	-0.6	-8.2	-42.0	5.0	3.8	41	20	1	6	1508.6	102.1	.05
Coral Harbour A	-32.3	-2.6	-17.6	-45.4	10.4	9.1	110	20	4	19	1561.3	100.6	.03
Eureka	-40.5	-4.1	-22.5	-48.5	0.8	0.6	21	19	0		1803.6	101.3	.01
Fort Reliance	-28.3	1.3	-9.0	-40.2	11.5	6.3	53	18	2		1435.9	102.1	.05
Fort Simpson A	-25.6	2.6	-4.4	-44.2	39.5	43.3	241	45	10	19	1351.6	102.0	.08
Fort Smith A	-24.8	2.0	-8.3	-41.4	42.8	27.3	148	37	9	38	1340.4	101.9	.09
Frobisher Bay A	-33.3	-7.7	-17.0	-44.9	9.2	9.0	34	27	2	9	1590.8	100.6	.03
Hall Beach A	-36.3	-5.3	-22.8	-45.7	1.4	1.4	16	23	1		1681.6	100.7	.02
Hay River A	-23.8	2.0	-5.8	-38.2	28.5	28.5	137	32	10		1295.6	102.0	.08
Inuvik A	-28.4	1.2	-4.2	-48.0	28.4	15.4	86	69	6		1436.5	102.0	.06
Mould Bay A	-34.7	-1.2	-16.4	-45.8	4.2	2.8	104	26	1		1622.6	101.7	.03
Norman Wells A	-26.3	2.6	-5.6	-40.1	14.0	14.0	72	12	5	22	1372.0	102.0	.05
Pond Inlet A													
Resolute A	-35.3	-3.2	-27.2	-45.0	0.6	0.6	18	25	0		1656.9	101.6	.03
Sachs Harbour A	-30.2	0.2	-13.7	-43.9	2.6	2.6	84	19	3		1493.7	101.9	.05
Yellowknife A	-27.7	1.1	-7.1	-42.0	19.3	19.1	144	10	6	30	1415.8	102.0	.04
ALBERTA													
Banff	-5.3	6.2	7.0	-30.5	16.3	31.3	82	14					
Brooks	-8.1	5.8	8.0	-34.5	31.0	24.3	111	2		82			
Calgary Int'l A	-3.6	8.2	12.4	-26.5	13.0	9.8	60	TR	4	103	670.0	102.0	.31
Cold Lake A	-11.5	7.5	6.8	-31.9	22.6	15.3	69	20	6	101	913.9	101.9	.23
Coronation A	-10.9	5.6	6.3	-34.1	29.8	21.4	100	21	7	100	895.2	102.0	.27
Edmonton Int'l A	-7.3	9.2	7.1	-29.6	24.6	25.5	105	15	8	73	785.9	101.9	.29
Edmonton Municipal A	-6.2	8.8	8.5	-24.6	19.8	23.1	94	9	7	70	750.9	101.9	.31
Edmonton Namao A	-7.2	8.4	7.5	-27.0	18.3	15.9	64	4	3		760.2	101.9	.29

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STATION	Temperature °C / Température °C: Mean / Moyenne	Difference from Normal / Ecart à la normale	Maximum / Maximale	Minimum / Minimale	Snowfall (cm) / Chute de neige (cm)	Total Precipitation (mm) / Précipitation totale (mm)	% of Normal Precipitation / % de précipitation normale	Snow on ground at end of month (cm) / Neige au sol à la fin du mois (cm)	No. of days with Precip. 1.0 or more (mm) / Nombre de jours de préc. 1.0 ou plus (mm)	Bright sunshine (hours) / Durée de l'insolation (heures)	Degree Days below 18°C / Degrés-jours au-dessous de 18°C	Mean Sea Level Pressure (kPa) / Pression au niveau moyen de la mer (kPa)	Mean Vapour Pressure (kPa) / Pression de vapeur moyenne (kPa)
Edson A	-6.1	9.3	10.0	-31.4	45.3	34.9	137	23	7	62	747.8	101.9	.33
Fort Chipewyan A	-22.4	3.7	-1.5	-41.0	26.4	26.4	129	32					
Fort McMurray A	-16.2	5.6	7.4	-33.8		19.9	88	13	8	77	1059.3	101.9	.17
Grande Prairie A	-10.8	6.9	6.9	-27.5	42.4	30.2	89	7	9	53	818.3	101.9	.29
High Level A	-19.2	5.4	2.8	-40.1	22.6	14.5	63	50	10	48	1186.4	101.9	.11
Jasper	-5.3	7.5	6.3	-28.5	35.2	38.4	112	17	8	53	720.2	102.3	.39
Lethbridge A	-2.5	7.8	16.0	-30.4	20.7	19.5	83	0	7	75	679.4	102.0	.41
Medicine Hat A	-5.9	6.7	10.6	-32.4	18.0	16.5	73		6	98	741.3	102.0	.37
Peace River A	-10.5	9.9	7.0	-33.9	21.1	21.2	96	4	5		885.9	101.8	.27
Red Deer A	-9.7	5.8	10.0	-32.0	26.5	24.3	102	17	5		803.6	102.0	.31
Rocky Mountain House	-6.6	6.4	12.4	-32.3	48.1	36.7	133	20	7		760.8	101.9	.32
Slave Lake A	-8.9	9.1	10.0	-27.5	27.1	22.9	86	5	7	68	831.2	101.8	.27
Suffied A	-7.4	6.3	10.5	-29.6	23.3	19.7	93	2	5	97	784.2		
Whitecourt	-6.5	10.1	10.5	-28.3	36.2	29.7	101	17	10		758.4	101.5	.31
SASKATCHEWAN													
Broadview	-12.4	5.5	4.5	-34.6	11.8	7.1	40	4	3	119	943.8	102.0	.24
Collins Bay	-26.0	0.2	-7.4	-37.4	61.0	44.2	261	81	12	82	1361.8	101.8	.07
Cree Lake	-21.8	3.3	1.5	-43.6	26.7	21.3	141	18	7	71	1245.5	101.9	.12
Estevan A	-10.9	5.4	5.6	-33.7	17.2	17.1	89	3	5	110	896.2	102.1	.29
Hudson Bay	-15.8	5.5	6.0	-36.6	21.4	15.8	80	25	6	118	1048.3	101.9	.19
Kindersley KY	-10.9	6.3	4.9	-32.1	11.4	9.8	57	5	4			102.1	.27
La Ronge A	-17.4	4.2	5.0	-35.6	24.0	22.8	131	31	89		1096.1	102.0	.17
Meadow Lake	-13.2	6.3	6.8	-36.5	11.2	13.0	60	12	6	111	970.8	101.9	.22
Moose Jaw A	-9.3	5.5	6.3	-25.5	15.3	18.5	99	TR	7	111	844.9	102.0	.31
Nipawin A	-16.0		6.5	-36.5	14.7	15.4		23	7	106	1053.3	102.0	.19
North Battleford A	-12.3	6.7	6.6	-32.4	13.9	11.7	59	8	4		938.0	102.0	.23
Prince Albert A	-14.2	7.3	7.2	-36.5	8.7	11.7	70	16	3	110	999.2	102.0	.20
Regina A	-11.9	6.0	4.4	-35.0	11.7	14.2	86	6	4	121	928.4	102.1	.25
Saskatoon A	-12.2	7.1	5.5	-33.4	7.6	9.0	51	5	5		935.7	102.0	.22
Swift Current A	-9.3	5.4	8.5	-32.9	15.7	15.2	72	8	7	99	855.9		
Wynyard	-12.4	6.6	4.0	-33.0	9.2	9.4	52	4	3	113	942.4	101.9	.22
Yorkton A	-13.2	6.7	5.3	-34.9	10.1	9.6	42	4	3	116	979.1	102.0	.19
MANITOBA													
Bissett	-19.8	1.1	3.1	-39.9	24.3	19.6	64	37	8	110	1171.8	102.0	.15
Brandon A	-13.8	5.9	4.0	-34.0	5.5	5.5	28	4	1		983.5	102.1	.21
Churchill A	-28.2	-0.7	-10.6	-30.6	50.5	44.9	293	43	9	80	1432.6	101.4	.05
Dauphin A	-14.3	5.2	5.0	-32.3	7.8	9.4	38	9	2	109	1002.3	102.0	.19
Gillam A	-27.7	0.3	-10.1	-41.6	35.2	22.8	129	69	8		1417.7	101.7	.06
Gimli	-17.8	2.4	5.2	-35.2	25.0	18.4	70	18	6	118	1109.2	102.0	.16
Island Lake	-24.5	0.3	-2.6	-39.8	43.2	27.2	124	44	9		1317.9	101.9	.09
Lynn Lake A	-26.1	0.8	-3.5	-43.8	38.7	31.8	172	46	9	83	1357.7	101.8	.07
Norway House A	-24.1		-0.5	-40.0	41.8	36.2		62	11			101.9	.10
Pilot Mound	-13.6	5.1	4.3	-35.0	5.8	5.6	26	22	3		980.2	102.0	.23
Portage la Prairie A	-14.2	4.1	5.3	-33.5	18.0	14.0	53	12	4		1000.0		
The Pas A	-19.0	3.7	3.4	-37.5	32.9	26.5	147	28	8	106	1145.5	101.9	.14
Thompson A	-26.3	3.3	-7.5	-43.5	30.5	29.1	154	36	7	106	1373.2	101.8	.07
Winnipeg Int'l A	-16.7	2.6	4.3	-33.1	16.2	12.2	57	11	5	126	1074.8	102.1	.17
ONTARIO													
Atikokan	-19.0	-0.6	2.4	-41.8	34.8	23.6	66	60		89	1148.6	102.0	.17
Earlton A	-19.5	-3.2	2.4	-41.2	42.1	32.3	57	72	11		1163.2	102.0	
Geraldton	-22.2	-2.2	1.3	-43.4	58.6	42.5	111	61	10		1246.0	102.0	.12
Gore Bay A	-13.2	-3.1	1.6	-32.6	73.1	30.8	50	70	12		966.2	102.0	.24
Hamilton	-7.2	-2.2	4.1	-25.3	31.2	39.0	59	7	13	104	779.5		
Hamilton A	-9.0	-2.6	2.2	-24.7	34.6	37.2	53	11	9		838.0		
Kapuskasing A	-21.4	-2.8	1.3	-39.0	39.1	34.7	65	59	12		1221.5	102.0	.11
Kenora A	-17.8	0.7	3.4	-38.0	22.0	21.0	74	45	8		1110.8	102.0	.15
Kingston A	-9.9	-2.2	2.3	-29.2	37.0	37.4	47	18	12	80	865.5	102.1	.28
Lansdowne House	-24.5	-1.8	-3.1	-39.4	28.6	26.0	86	72	8		1318.4	101.8	.09
London A	-9.5	-3.1	1.9	-28.8	48.4	51.3	68	25	11	81	854.0	102.1	.28
Moosonee	-23.9	-3.5	0.5	-40.2	23.6	18.8	46	28	7	134	1299.5	101.9	.11
Mount Forest	-11.5	-3.1	0.3	-28.4	67.9	50.2	71	42	15	79	913.8	102.0	.27
Muskoka A	-12.9	-2.5	1.0	-34.0	65.2	56.1	65	72	18			102.0	.24
North Bay A	-15.7	-2.7	0.3	-33.5	48.8	40.5	64	62	13	78	1045.8	101.7	.19
Ottawa Int'l A	-12.7	-1.8	2.3	-29.4	42.2	37.4	61	58	11	105	950.4	102.0	.23
Petawawa A													
Peterborough A	-12.1	-2.8	1.7	-37.9	40.2	28.7	51	52	12		933.4		
Pickle Lake	-23.9	-2.5	-1.0	-41.1	39.0	28.6	75	65	5		1293.8	101.9	.10
Red Lake A	-20.9	0.1	1.9	-40.2	30.1	23.2	81	50	10	103	1207.3	101.9	.13
St. Catharines A	-6.0	-1.7	3.6	-23.4	29.5	32.0	56	2	15		745.4		
Sarnia A	-8.4	-2.7	2.8	-27.0	31.0	24.4	46	26	11	84	817.4		
Sault Ste. Marie A	-13.2	-3.1	1.5	-32.9	52.2	39.4	49	54	14	79	967.0	102.0	.22
Simcoe	-9.0	-3.4	3.0	-27.0	40.2	43.3	64	22	14		837.3	102.2	.31
Sioux Lookout A	-20.9	-1.5	2.1	-40.9	27.8	28.2	78	66	10		1209.3	102.0	.18
Sudbury A	-16.2	-2.5	1.4	-33.8	52.3	36.8	64	55	14	99	1060.1	102.0	.20
Thunder Bay A	-16.4	-1.0	6.0	-34.6	30.5	20.9	51	33	7	119	1066.7	102.0	.16
Timmins A	-20.7	-3.4	1.2	-41.7	46.8	37.2	66	109	10		1200.8	102.0	.13
Toronto	-6.6	-2.0	3.5	-20.6	43.7	42.7	70	17	10		762.1		
Toronto Int'l A	-9.7	-3.0	2.3	-26.8	33.4	30.2	85	17	7		858.9	102.1	.29
Toronto Island A	-6.8	-1.9	4.2	-20.1	38.3	42.4	76	14	10		767.2	102.1	.30
Trenton A	-9.5	-1.9	3.4	-30.2	53.0	37.6	55	12	14		853.0	102.1	.29
Trout Lake (Big)	-26.6	-2.1	-3.1	-40.1	27.7	20.6	83	78	6		1380.6	102.0	.08
Waterloo-Welington A	-10.4	-3.2	2.0	-31.9	43.2	39.8	66	31	9		879.9		
Wawa A	-19.0		2.4	-41.8	34.8	23.6		60	13	89	1148.6	102.0	.17
Wiarton A	-9.8	-2.7	1.6	-22.9	124.2	77.0	79	60	18	55	844.8	102.0	.26
Windsor A	-7.4	-2.5	4.2	-27.2	25.8	26.3	48	11	5		788.4	102.1	.30

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STATION	Temperature °C / Température °C: Mean / Moyenne	Temperature °C / Température °C: Difference from Normal / Ecart à la normale	Temperature °C / Température °C: Maximum / Maximale	Temperature °C / Température °C: Minimum / Minimale	Snowfall (cm) / Chute de neige (cm)	Total Precipitation (mm) / Précipitation totale (mm)	% of Normal Precipitation / % de précipitation normale	Snow on ground at end of month (cm) / Neige au sol à la fin du mois (cm)	No. of days with Precip. 1.0 or more (mm) / Nombre de jours de préc. 1.0 ou plus (mm)	Bright sunshine (hours) / Durée de l'insolation (heures)	Degree Days below 18°C / Degrés-jours au-dessous de 18°C	Mean Sea Level Pressure (kPa) / Pression au niveau moyen de la mer (kPa)	Mean Vapour Pressure (kPa) / Pression de vapeur moyenne (kPa)
QUEBEC													
Bagotville A	-18.7	-2.9	5.1	-37.9	31.7	21.2	33	66	9		1138.5	102.1	.14
Baie Comeau A	-17.6	-3.9	1.1	-38.4	32.8	24.0	26	99	8	95	1104.3	102.0	.16
Blanc Sablon	-15.9	-5.5	3.0	-31.8	84.0	98.0	75	44	18	109	1015.3	101.6	.19
Chibougamau A	-23.7	-4.0	-1.1	-44.5	41.2	40.0	56	75	11	125	1293.9	102.0	.11
Kuujjuac A	-27.5	-4.2	-10.1	-38.2	18.0	14.6	44	39	7	54	1412.2	101.2	.05
Gaspe A	-14.2	-3.3	2.7	-35.5	48.6	43.8	42	48	10	94	997.5	101.9	
Lnukjuac A	-26.8	-2.3	-6.0	-38.2	21.0	19.4	198	27	9	40	1388.7	100.9	.06
La Grande Riviere	-27.0		-2.9	-40.0	28.8	22.3		15	6		1399.5	101.6	.07
Maniwaki	-15.8	-2.3	2.2	-38.1	42.0	32.6	59	53	11	100	1052.7	102.0	.18
Matagami A	-23.1	-3.0	1.0	-42.9	45.1	45.1	77	91	11	116	1275.0		
Mont Joli A	-13.4	-1.8	4.4	-30.8	35.6	31.5	36	39	11	61		102.1	.13
Montreal Int'l A	-12.2	-2.0	3.2	-28.3	31.4	27.4	38	23	8	91	935.5	102.1	.25
Montreal Mirabel Int'l A	-14.0		2.3	-33.3	50.0	50.8		84	10	123	992.5	102.1	.21
Natashquan													
Nitchequon	-28.2	-5.2	-4.1	-46.5	29.6	18.6	50	41	9	97	1431.0	101.7	.07
Kuujjuarapik A	-26.5	-4.0	-2.8	-40.9	25.3	24.1	93	21	8	88	1382.5	101.4	.07
Quebec A	-13.4	-1.3	3.0	-30.9	61.0	48.3	54	98	13	66	971.4	102.1	.20
Roberval A	-18.8	-3.0	-13.7	-23.9	25.5	25.5	38	77	10	118	1141.2	102.1	.13
Ste.Agathe des Monts	-14.6	-1.2	0.7	-33.4	39.2	39.5	41	88	9	107	1010.3	102.0	.19
St.Hubert A	-12.5	-2.4	3.2	-28.4	34.7	37.2	45	34	11		944.4	102.1	.22
Schefferville A	-28.0	-5.2	-5.5	-48.0	31.4	24.4	52	62	8		1424.8	101.5	.06
Sept-Iles A	-18.7	-4.7	0.4	-37.8	35.7	27.5	29	60	11	105	1135.7	101.9	.13
Sherbrooke A	-12.5	-0.8	4.9	-34.4	42.8	40.2	55	41	14	73	946.1	102.1	.25
Val d'Or A	-20.5	-3.7	0.7	-40.9	37.8	30.8	51	74	11	116	1194.3	102.0	.13
NEW BRUNSWICK NOUVEAU-BRUNSWICK													
Charlo A													
Chatham A	-11.4		6.3	-30.2	90.8	93.9	95	24	10	81	920.9	102.0	.26
Fredericton A	-10.9		4.9	-32.2	108.6	113.2	110	20	12	102	894.8	102.0	.26
Moncton A	-9.4		5.7	-28.4	111.8	123.8	99	23	18	75	847.6	101.9	.29
Saint John A	-8.9		5.6	-28.9	91.4	141.6	95	15	18	102	825.3	101.9	.31

STATION	Temperature °C / Température °C: Mean / Moyenne	Temperature °C / Température °C: Difference from Normal / Ecart à la normale	Temperature °C / Température °C: Maximum / Maximale	Temperature °C / Température °C: Minimum / Minimale	Snowfall (cm) / Chute de neige (cm)	Total Precipitation (mm) / Précipitation totale (mm)	% of Normal Precipitation / % de précipitation normale	Snow on ground at end of month (cm) / Neige au sol à la fin du mois (cm)	No. of days with Precip. 1.0 or more (mm) / Nombre de jours de préc. 1.0 ou plus (mm)	Bright sunshine (hours) / Durée de l'insolation (heures)	Degree Days below 18°C / Degrés-jours au-dessous de 18°C	Mean Sea Level Pressure (kPa) / Pression au niveau moyen de la mer (kPa)	Mean Vapour Pressure (kPa) / Pression de vapeur moyenne (kPa)
NOVA SCOTIA NOUVELLE-ECOSSE													
Eddy Point	-4.7		9.3	-15.4	42.0	177.1	128	14	13	77	705.0	101.9	.42
Greenwood	-6.0		8.6	-22.5	68.2	97.3	77	2	16		744.7	101.9	.39
Halifax Int'l A	-5.7		7.4	-20.4	38.8	194.9	128	5	18		734.6	101.9	.39
Sable Island	0.3		10.9	-8.2	12.7	112.1	76	1	13	39	547.5	101.9	.55
Shearwater A	-4.6		8.0	-20.1	44.3	172.0	120	11	17	87	699.1	101.9	.42
Sydney A	-5.7		8.4	-20.9	68.3	205.8	138	20	16	57	734.5	101.9	.38
Truro	-6.9		7.7	-26.0	49.8	144.8	136	3	14	69	772.4	102.0	.36
Yarmouth A	-3.4		7.4	-16.3	55.4	144.8	103	T	18	66	664.0	101.9	.44
PRINCE EDWARD ISLAND ILE-DU-PRINCE-EDOUARD													
Charlottetown A	-7.8		5.0	-24.0	67.6	94.0	80	22	16		800.3	101.9	.34
Summerside A	-8.3		4.4	-23.1	99.7	104.6	102	26	15	60	815.4	101.9	.33
NEWFOUNLAND TERRE-NEUVE													
Argentia	-3.1	-1.6	12.0	-13.5	27.8	118.1	104	TR	14		649.0	101.8	.40
Battle Harbour	-17.1	-7.5	2.5	-32.2	28.7	34.0	40	83	9		1088.8	101.5	.17
Bonavista	-6.1	-1.8	10.2	-17.1	44.6	124.8	138	7	13		746.6	101.8	.36
Burgeo	-6.7	-2.6	6.0	-19.1	93.7	249.2	162	13	16	95	752.4	101.8	.35
Cartwright	-19.6	-6.4	-0.4	-32.0	86.7	85.9	96	146	11	115		101.5	.11
Churchill Falls A	-26.6	-6.3	-4.7	-43.3	37.0	30.0	41	140	8	139	1382.2	101.7	.07
Comfort Cove	-10.1	-3.7	5.4	-24.4	129.7	151.6	158	93	14		868.7	101.7	.28
Daniel's Harbour	-9.5	-2.6	7.4	-21.4	133.4	130.3	131	8	22	36	843.2	101.7	.29
Deer Lake A	-11.6	-4.8	5.4	-31.6	117.6	84.7	90	71	19		917.3	101.8	.27
Gander Int'l A	-9.4	-3.2	5.6	-21.5	124.0	157.7	145	28	14	99	847.6	101.7	.24
Goose A	-23.0	-6.6	1.2	-37.1	65.7	51.8	70	95	6	145	1271.5	101.7	.08
Hopedale	-22.4	-6.5	-3.5	-32.8	34.4	34.4	46	97	5		1253.4	101.4	.10
Port-aux-Basques	-5.9	-1.8	5.0	-15.0	70.4	164.6	123	13	21	45	738.1	101.8	.36
St. Anthony	-14.7	-4.8	1.0	-30.1	61.3	67.8	70	58	15		1016.6	101.5	.20
St. John's A	-5.5	-1.6	13.3	-17.2	53.2	188.8	121	2	17	74	726.4	101.8	.40
St. Lawrence	-4.4	-1.3	8.8	-16.6	59.9	159.0	134	12	17		696.2		
Stephenville A	-7.3	-2.3	7.0	-18.3	121.1	136.3	118	39	24	50	785.1	101.7	.30
Wabush Lake A	-26.2	-3.9	-4.3	-43.6	41.9	32.8	50	133	10	95	1370.6	101.7	.06

JANUARY 1984 JANVIER

STATION	Temperature °C *Température °C*				Snowfall (cm) *Chute de neige (cm)*	Total Precipitation (mm) *Précipitation totale (mm)*	% of Normal Precipitation *% de précipitation normale*	Snow on ground at end of month (cm) *Neige au sol à la fin du mois (cm)*	No. of days with Precip. 1.0 or more (mm) *Nombre de jours de préc. 1.0 ou plus (mm)*	Bright sunshine (hours) *Durée de l'insolation (heures)*	Degree Days above 5°C *Degrés-jours au-dessus de 5°C*		Mean Dew Point °C *Point de rosée moyen °C*
	Mean *Moyenne*	Difference from Normal *Écart à la normale*	Maximum *Maximale*	Minimum *Minimale*							This Month *Présent mois*	Since Jan 1st *Depuis le 1er janv.*	
AGROCLIMATOLOGICAL STATIONS AGROCLIMATOLOGIQUES													
BRITISH COLUMBIA COLOMBIE-BRITANNIQUE													
Agassiz	4.5	3.3	15.0	-5.5	4.0	387.2	169	0	20	65	35.5	35.5	
Kamloops													
Sidney													
Summerland	-0.6	2.8	11.5	-14.5	11.0	21.2	60	0	6	58	4.5	4.5	
ALBERTA													
Beaverlodge	-6.8	9.1	7.5	-25.0	27.9	22.2	67	1	4	57	0.0	0.0	
Ellerslie	-7.5		9.0	-28.5	17.6	18.0		11	5	74	0.0	0.0	
Fort Vermilion													
Lacombe	-7.4	8.1	9.0	-33.0	28.8	24.0	112	24	6	67	0.0	0.0	
Lethbridge													
Vauxhall													
Vegreville	-9.8	8.3	8.5	-33.0	19.3	21.1	127	15	9		0.0	0.0	
SASKATCHEWAN													
Indian Head	-12.3	5.6	5.4	-34.5	14.2	12.2	58	16	6		0.0	0.0	
Melfort	-14.3	6.6	4.5	-35.0	7.4	12.2	65	21	5		0.0	0.0	
Regina	-12.5	5.5	5.0	-38.0	8.8	18.2	101	2	6		0.0	0.0	
Saskatoon	-12.4		6.0	-32.0	7.3	8.6		1	3	124	0.0	0.0	
Scott	-13.4	5.7	8.0	-35.0	14.3	9.8	58	5	5	115	0.0	0.0	
Swift Current South	-9.0	5.8	9.0	-34.5	13.0	14.0	85	3	4	71	0.0	0.0	
MANITOBA													
Brandon	-13.1	6.2	4.5	-34.5	4.8	4.8	23	7	2	113	0.0	0.0	
Glenlea	-17.0	2.7	3.0	-35.5	12.4	12.4	48	27	5	117	0.0	0.0	
Morden	-12.4	4.9	6.0	-30.0	6.4	6.8	29	4	3	113	0.0	0.0	
ONTARIO													
Delhi	-9.3	-3.3	2.5	-30.0	33.6	36.1	54	16	11	75	0.0	0.0	
Flora	-10.8		0.1	-30.5	34.4	41.2		39	11	102	0.0	0.0	
Guelph	-9.9	-2.7	1.5	-33.5	43.6	43.0	76	31	10	100	0.0	0.0	
Harrow	-7.9	-3.1	2.5	-28.0	17.0	19.2	33	15	4	97	0.0	0.0	
Kapuskasing													
Merivale													
Ottawa	-13.0	-2.2	4.6	-31.7	31.7	31.5	57	41	10	103	0.0	0.0	
Smithfield	-9.0	-1.5	2.5	-29.5	39.2	44.2	54	16	15		0.0	0.0	
Vineland Station	-6.0	-1.9	3.7	-23.0	20.2	30.0	47	3	8	89	0.0	0.0	
Woodslee													
QUEBEC													
La Pocatiere	-13.8	-2.5	3.0	-29.0	41.4	29.5	37	7	9	96	0.0	0.0	
L'Assompion	-14.3	-2.4	2.5	-37.0	34.2	36.8	49	66	13	88	0.0	0.0	
Lavaltrie													
Lennoxville													
Normandin	-21.9	-3.9	2.5	-43.5	20.8	18.0	28	54	6	122	0.0	0.0	
St. Augustin													
Ste.Clothilde	-11.3	-1.3	4.5	-32.5	34.2	34.2	48	22	12	90	0.0	0.0	
NEW BRUNSWICK NOUVEAU-BRUNSWICK													
Fredericton													
NOVA SCOTIA NOUVELLE-ECOSSE													
Kentville	-5.6	-0.6	8.5	-21.0	56.4	93.4	69	8	15	74	0.0	0.0	
Nappan	-7.9	-1.1	6.0	-26.0	70.5	105.7	93	34	18	72	0.0	0.0	
PRINCE EDWARD ISLAND ILE-DU-EDOUARD													
Charlottetown	-7.6	-1.0	5.0	-25.0	73.8	116.4	114	28	13	71	0.0	0.0	
NEWFOUNDLAND TERRE-NEUVE													
St.John's West													

ACID RAIN REPORT ISSUED BY ENVIRONMENT CANADA FOR FEB. 5-11, 1984

LONGWOODS NEAR LONDON ONTARIO

Longwoods received moderately acidic snow with a pH reading of 4.5 on Feb. 5. This snowfall was associated with air which came from Wisconsin and Michigan. Air which passed over the Ohio Valley brought strongly acidic snow with a pH of 3.8 to the region on Feb. 10.

DORSET* MUSKOKA ONTARIO

The region received strongly acidic snow on Feb. 5 and 10 with pH readings of 3.7 and 3.4 respectively. The air associated with these snowfalls came from the U.S. midwest and southern Ontario.

CHALK RIVER OTTAWA VALLEY ONTARIO

Air which had passed over Wisconsin, Michigan and the Sudbury region produced strongly acidic snow with a pH of 4.0 at Chalk River on Feb. 5. The strongly acidic rain which fell February 11, with a pH of 3.9, was produced in air which came from Ohio and southern Ontario.

MONTMORENCY QUEBEC CITY QUEBEC

The region received strongly acidic snow with a pH of 3.7 on Feb. 9. The air associated with this snowfall came from northern Quebec.

KEJIMIKUJIK SOUTHWESTERN NOVA SCOTIA

The region received slightly acidic precipitation on Feb. 5 with a pH of 5.0 and Feb. 6 with a pH of 4.8. The air associated with the rain on Feb. 5 came from the south off of the Atlantic Ocean. The snow on Feb. 6 was produced in air which passed over Pennsylvania, New York and New England. Air which passed over northeastern Quebec and New Brunswick brought moderately acidic snow with a pH reading of 4.6 to Kejimkujik on Feb. 7. On the next day, Feb. 8, the region received moderately acidic snow with a pH reading of 4.5. This snow was associated with air which moved from northern Quebec across the Quebec City area to Maine and then to Nova Scotia. The strongly acidic snow which fell Feb. 11, with a pH reading of 4.2, was produced in air which came from Virginia along the east coast of North America.

*Data supplied by the Ontario Ministry of the Environment.

Environmental damage to lakes and streams is usually observed in sensitive areas regularly receiving precipitation with pH less than 4.7.

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