Environment Canada Environnement Canada

Climatic Perspectives

Monthly review OCTOBER Vol.9 1987

CLIMATIC HIGHLIGHTS

by
P. Scholefield, CCRM

Dry, Warm Weather Continues in Southern B.C.

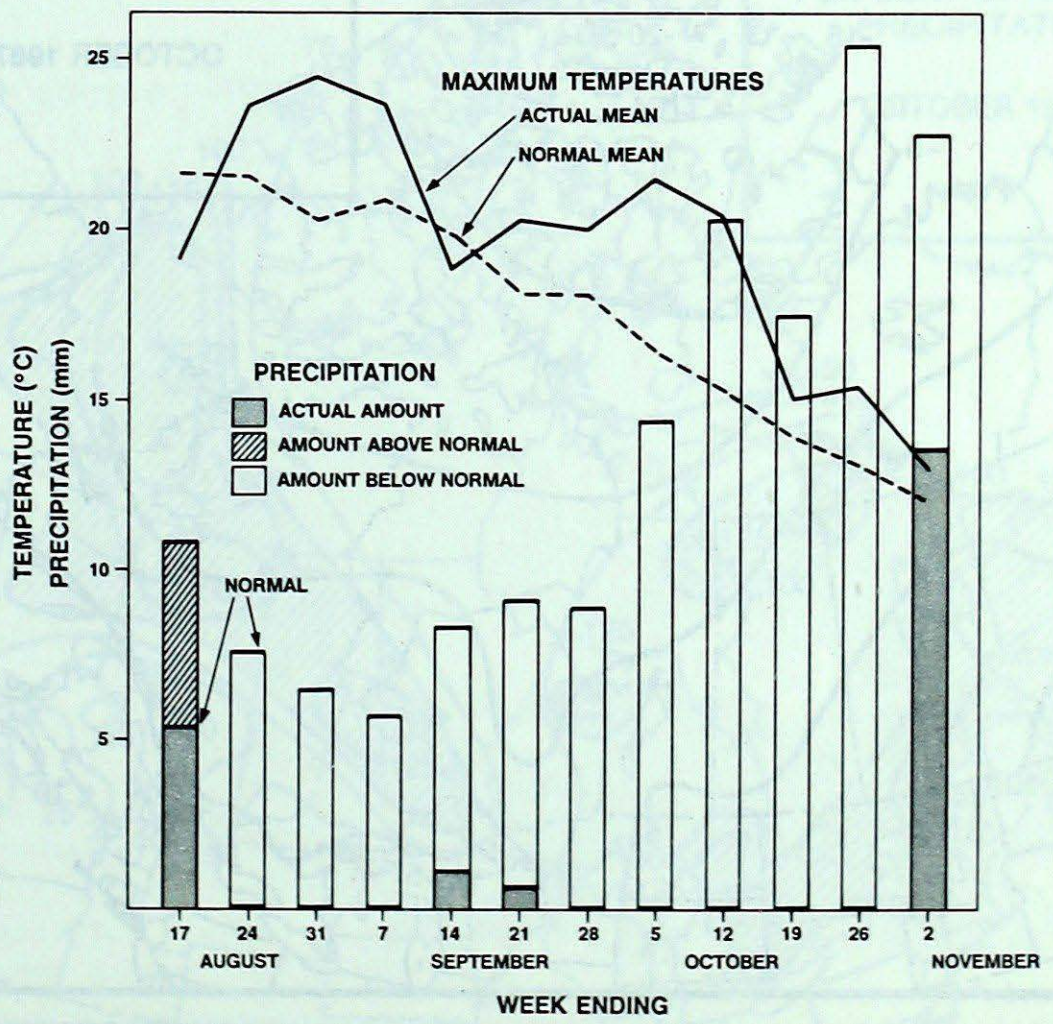
The extremely persistent upper level ridge along the west coast of North America (see page 5B) continued to divert Pacific weather systems to the north, resulting in record sunny, warm dry weather at many locations in southern B.C.

The continued lack of precipitation associated with the warm weather has now become critical in many areas. Some wells on south coastal Islands have dried up completely and the annual salmon spawning migration is being hampered by the dangerously low water levels in coastal streams and rivers. In the southern interior, lake and reservoir levels are so low that there is a serious threat of a major winter kill of fish which would be disastrous for the sports fishing industry. Fruit farmers and ranchers in the area could also be facing disaster unless the natural and man-made reservoirs are sufficiently recharged this fall and winter.

Southern B.C., particularly along the coast, is noted for its relatively dry summers caused by the usual northward extension of the sub-tropical Hawaiian surface high pressure system. Normally, a well-defined rainy system begins during the latter part of September or early October as the Hawaiian high retreats southward allowing the intrusion of moisture-laden Pacific storms. This year's dry season has not only been more intense than usual, but has persisted right through the month of October. The first significant rainfall of the month finally occurred during the last four days and even then, the weekly totals were below normal for the time of year.

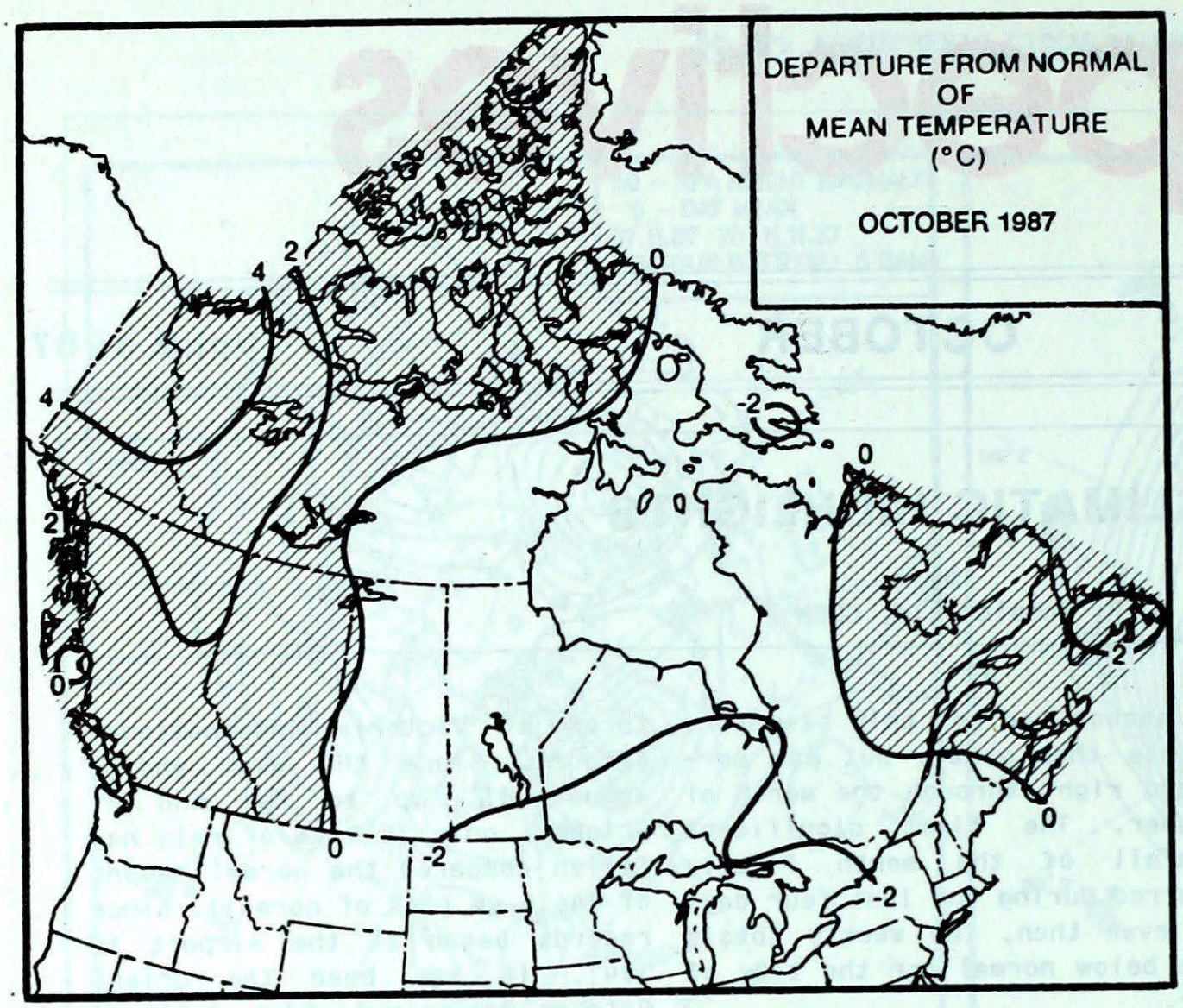
The accompanying graph illustrates the severity of this recent episode of dry weather and shows its relationship to the concurrent spell of unusually warm temperatures at Victoria International Airport. Since the week ending August 17, up to the end of October, only 15.4 mm of rain has fallen compared the normal amount of 146.6 mm (11% of normal). Since records began at the airport in 1941, it has been the driest October on record which followed the second driest September on record. In fact, the 49.4 mm that has been recorded since June 1st (26% or normal) makes it the driest 5-month period ever.

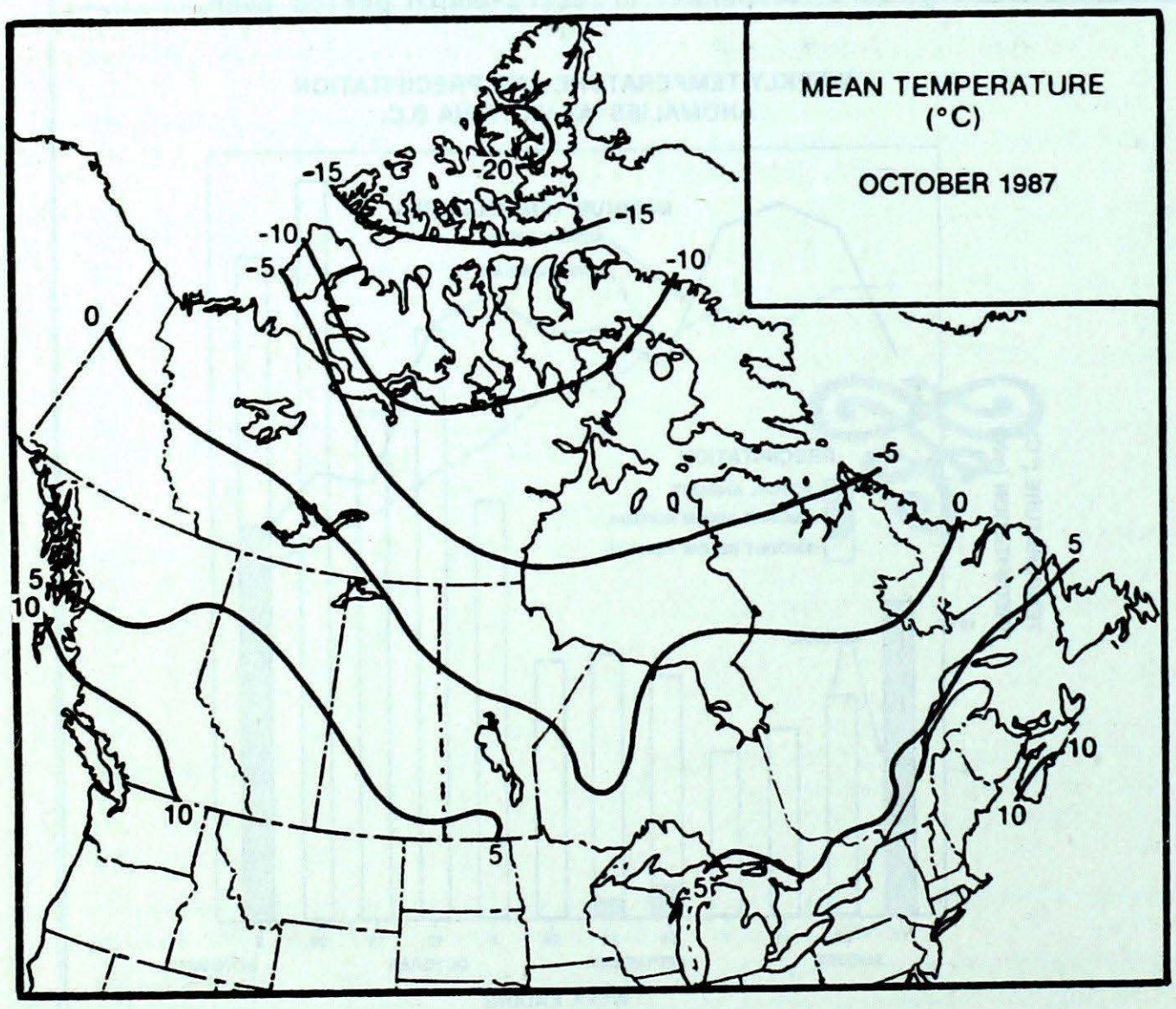
WEEKLY TEMPERATURE AND PRECIPITATION ANOMALIES AT VICTORIA B.C.



Canada

TEMPERATURE





ACROSS THE COUNTRY

Yukon and Northwest Territories

The weather was variable and generally cold except when impulses of mild Pacific air penetrated northwestern regions, pushing temperatures to above normal values in concert with increased precipitation.

Early in the month, the southern Yukon and District of Mackenzie recorded record daily temperatures between 13 and 20°C. This situation re-occurred again at the end of the month under a southwest circulation. By mid month in these regions, temperatures barely rose above the freezing point and in the far north they dropped below -25°C.

An active weather disturbance affected all the Territories during the 2nd week of the month with most regions receiving a mixture of rain and snow.

British Columbia

Most of the province was under the influence of a ridge of high pressure during the month, resulting in above normal mean monthly temperatures except near normal conditions along the north coast and over central B.C. the largest anomalies were in the northeast where they approached 3°C above normal. Vancouver established a new mean monthly temperature record of 12°C. Numerous stations set new maximum temperature records for the month.

Precipitation was generally light except in a narrow zone to the north stretching from McInnes Island to Fort St. John. At many sites, it was the driest October ever with monthly amounts varying between 5 - 25% of normal (primarily in the south).

Fruit growers combated the shortage of rain by irrigating their orchards. Despite the unusual drought conditions, the grape and apple harvest finished two weeks ahead of schedule. Forest fire conditions on the other hand were critical throughout the month and there was concern about salmon spawning in rivers with reduced water levels.

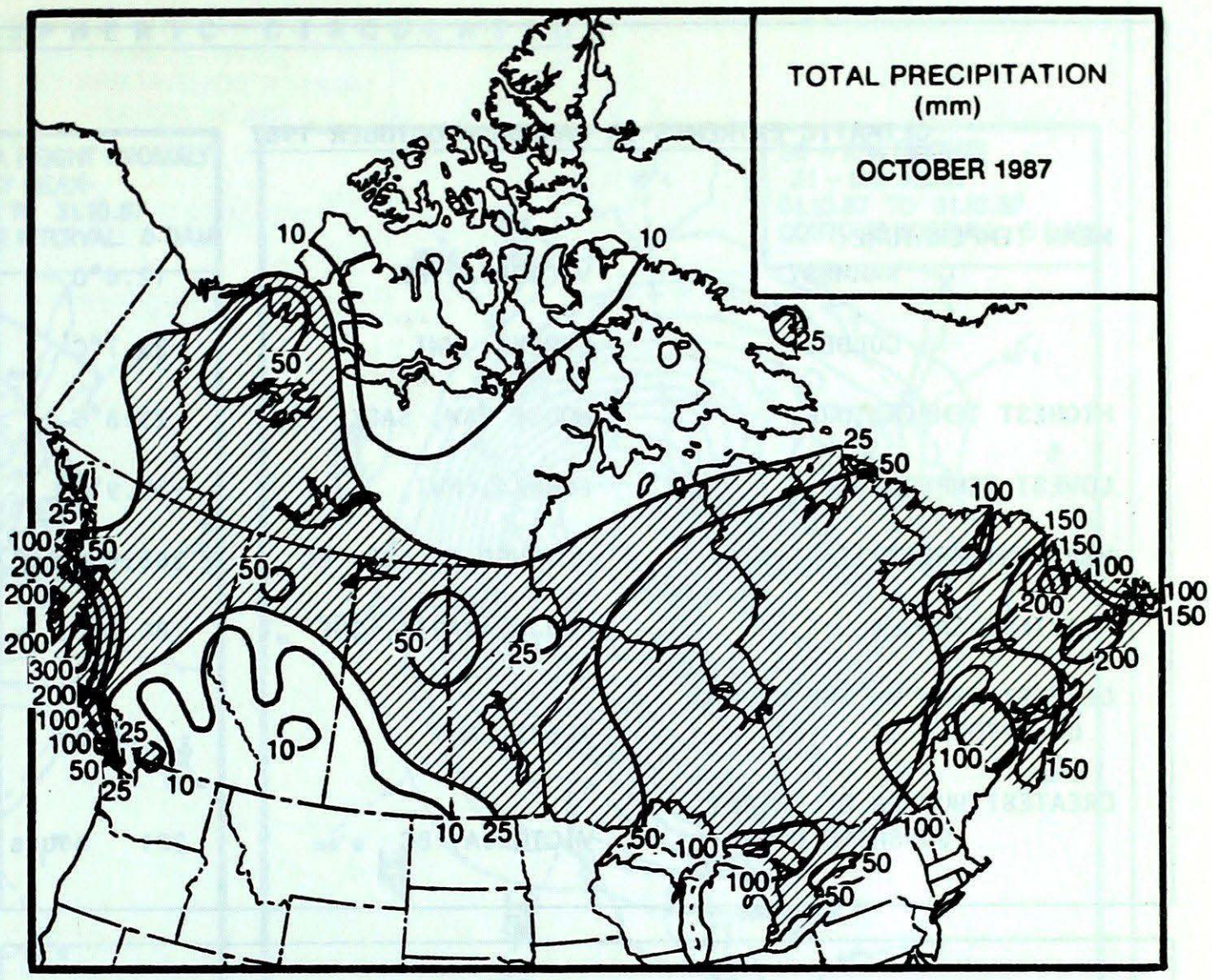
PRECIPITATION

Prairie Provinces

It was a pleasant month in Alberta while winter-like conditions affected Saskatchewan and Manitoba.

For the second consecutive month, Alberta benefited from above normal mean monthly temperatures. Several locations recorded record monthly maximum temperatures at the beginning of the month (29.1°C at Edmonton and 28.6°C at Fort McMurray on the 2nd). Further eastward, a surge of Arctic air dropped temperatures to daily low record values. The situation improved at the end of the month when Kindersley (Sask.) and Pilot Mound (Man.) recorded daily maximum records.

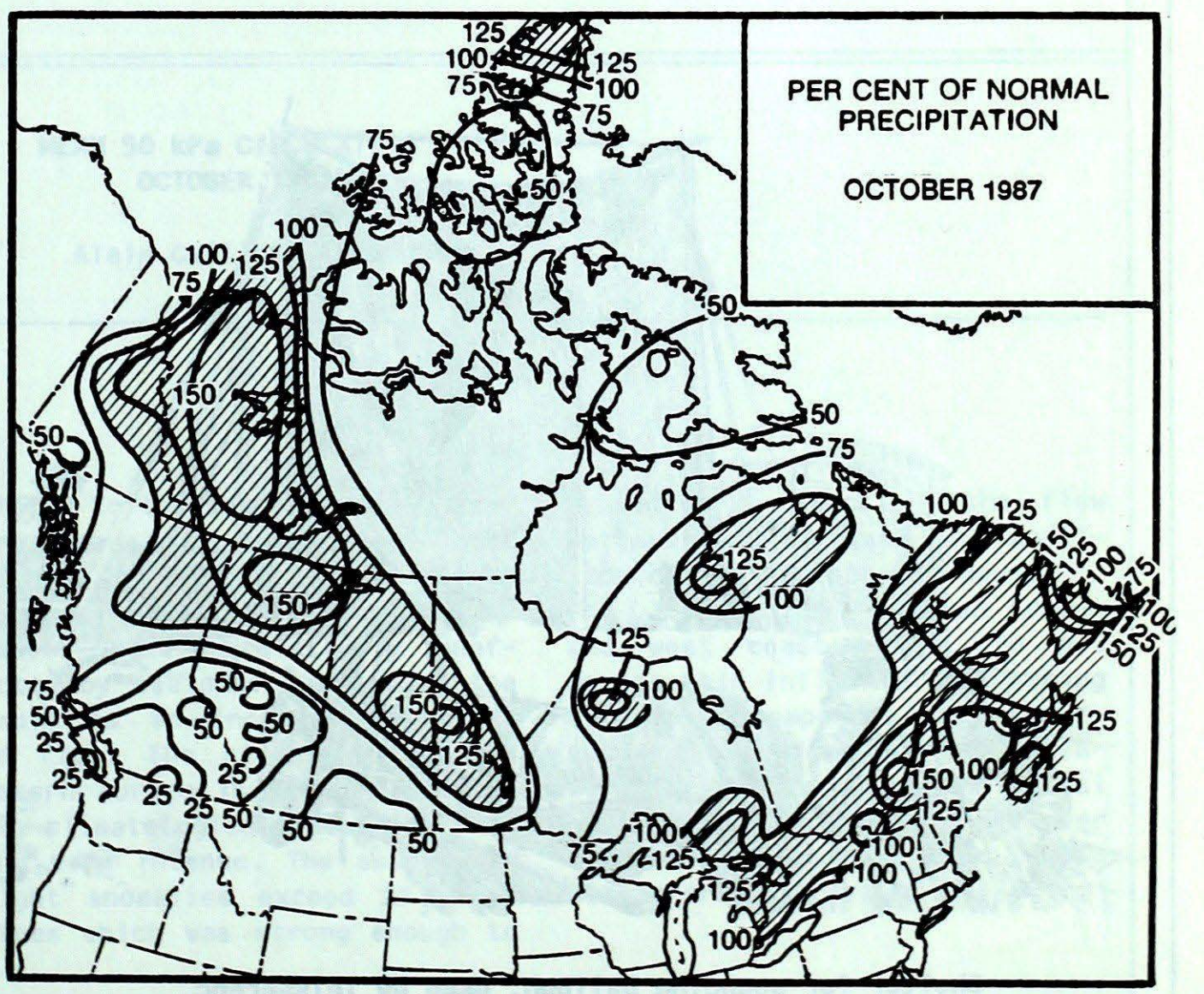
On the 7th, the first big snowstorm hit northern and central Saskatchewan. On the 21st, another snowstorm hit the area bringing monthly snowfall totals to double the normal values (eg. 63.3 cm at Collins Bay). Precipitation was variable in Alberta being generally light in the south (2 mm at Calgary) Snowfalls were rare. Banff received only 2 cm (on the 17th) which was part of a weekend snowstorm which affected southern Alberta.



Ontario

It was a cool, cloudy month in all regions of Ontario. It was the first month since November, 1986 that temperatures were below normal across the entire province. Despite a brief period of Indian summer in the middle of the month, southern and central Ontario recorded their coldest October since 1981 (since 1980 in the north and northeast). The mean monthly temperature at Waterloo was within 1/10°C of the all-time low record for October.

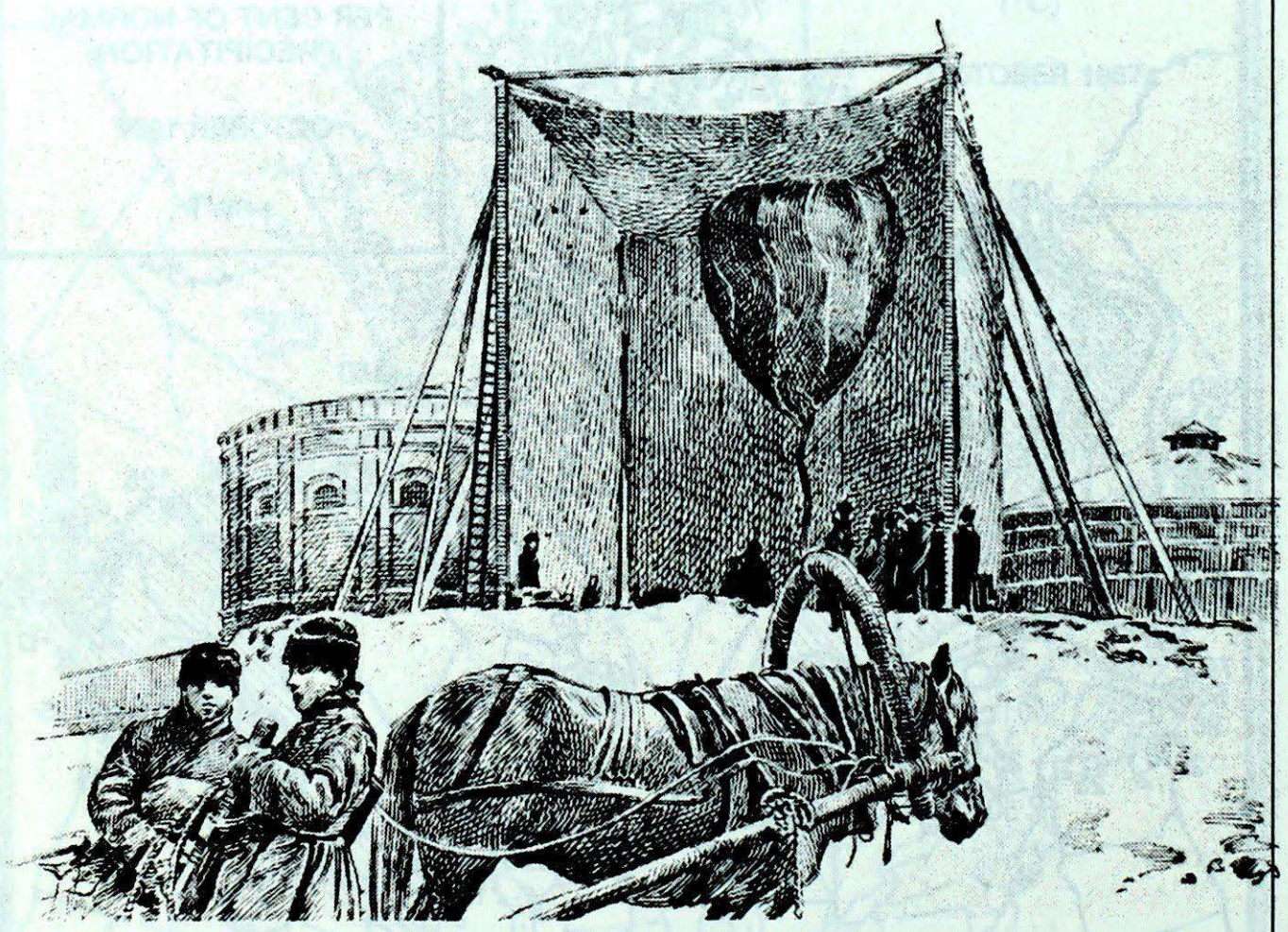
It was also a rainy month, particularly at Sault Sainte Marie which received 129 mm of precipitation, the greatest amount in the province and the wettest since 1979. Precipitation fell in the form of snow in northern regions : 47 cm at Big Trout Lake, twice the amount as normal, 21 cm at North Bay, the largest October accumulation since 1962. There was also a shortage of sunshine which gave the feeling that winter had arrived much sooner than usual.



EXTREMES

CLIMATIC EXTREMES IN CANADA - OCTOBER 1987

MEAN TEMPERATURE:		
WARMEST	VICTORIA, BC	12.6°C
COLDEST	EUREKA, NWT	-23.7°C
HIGHEST TEMPERATURE:	MOOSE JAW, SASK	29.8°C
LOWEST TEMPERATURE:	EUREKA, NWT	-35.9°C
HEAVIEST PRECIPITATION:	MCINNES ISLAND, BC	366.9 mm
HEAVIEST SNOWFALL:	KUUJJUARAPIK, QUE	80.8 cm
DEEPEST SNOW ON THE GROUND ON OCTOBER 31, 1987:	ALERT, NWT	29 cm
GREATEST NUMBER OF BRIGHT SUNSHINE HOURS:	VICTORIA, BC	221 hours



Shelter for sounding balloon, used by Teisserenc de Bort, Moscow, 1900, 1901

Québec

October was relatively warm in eastern Québec but cold in the west where anomalies reached -2°C.

The temperature regime was variable throughout the month. Daily record maximum temperatures were set during the first and third week - above 20°C in the south. However, the criteria for an Indian summer of 3°C above normal for at least 3 consecutive days were not met. Numerous daily minimum records were broken between the 10th and 12th.

Except for the Iles-de-la-Madelaine, the whole province received some snow during the month. The heaviest falls were at Kuujjuarapik (80.8 cm) and at Matagami (55.4 cm) which was a new monthly record. In central and northern parts of the province, the snow cover is not yet sufficient for winter sports activities. Ski resorts have started producing artificial snow.

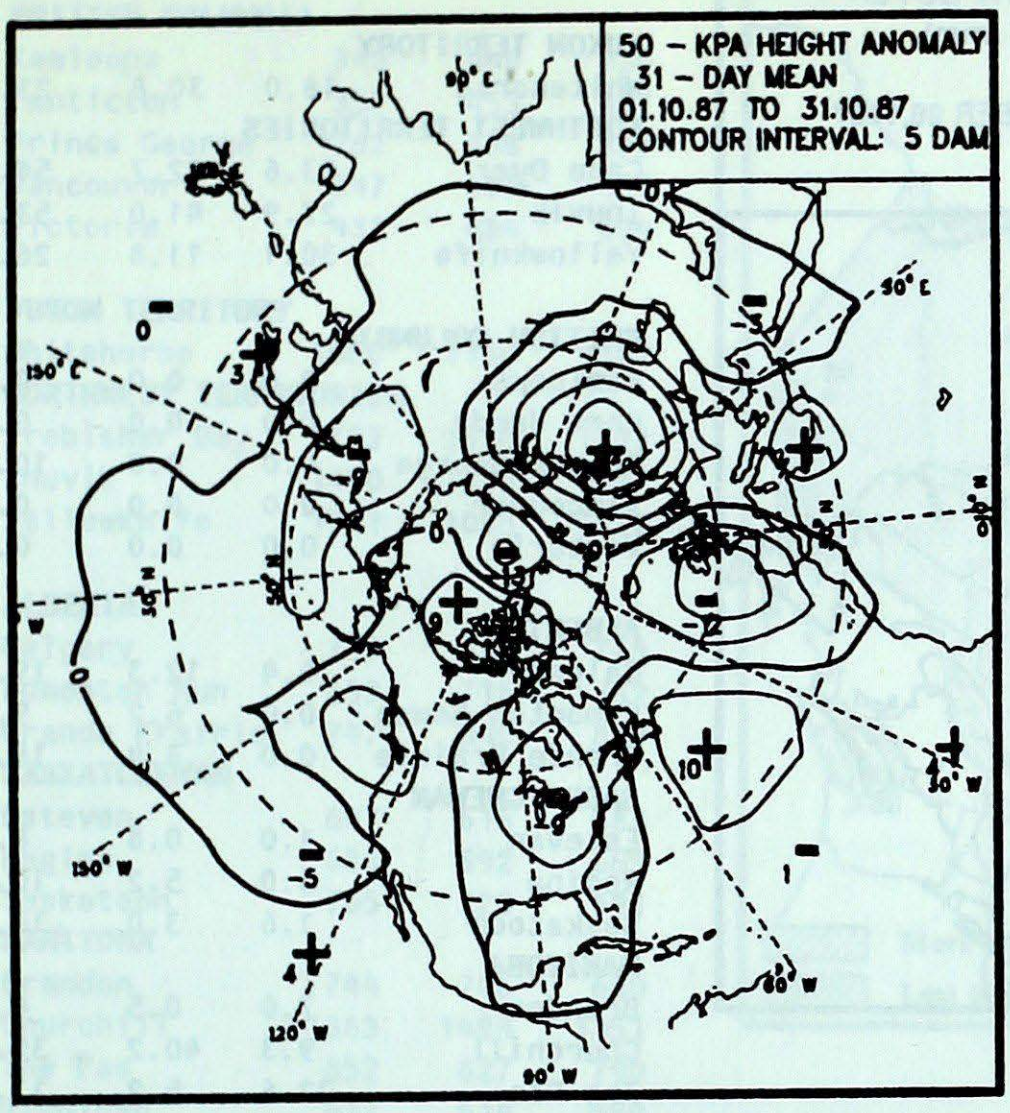
Maritimes

It was a generally mild month with variable amounts of precipitation. Now that the storm season has begun, it shouldn't be too long before the whole region is affected.

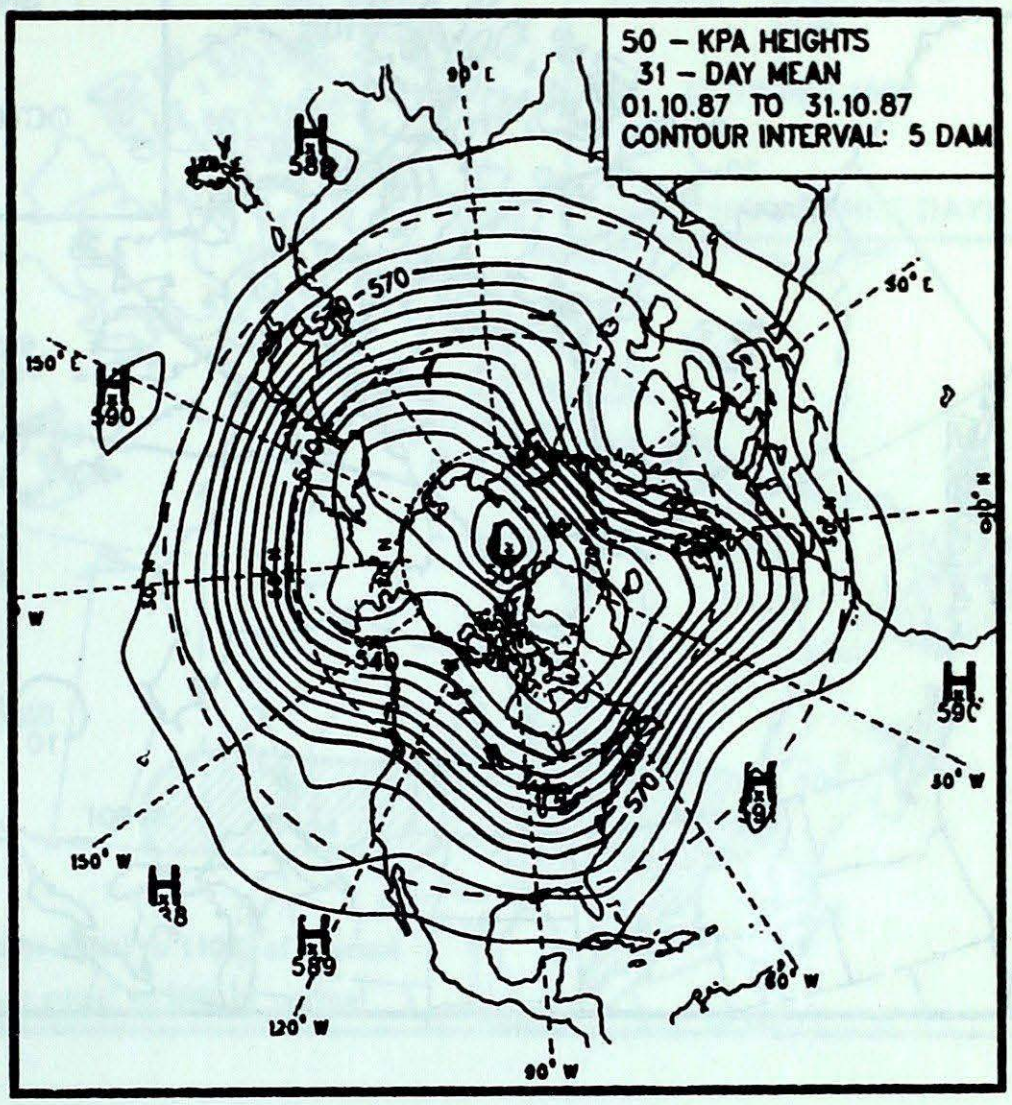
Even though mean monthly temperatures were above normal, there were some strong fluctuations. During the first and third weeks, the mercury climbed above 20°C at several locations (St. John on the 22nd) after having previously fallen to daily record low values.

Precipitation was above normal except in New Brunswick and eastern Newfoundland. Almost all of the Martimes receives some snow in October, but this year only Summerside (P.E.I.) received a measurable amount and it was only 0.2 cm! Newfoundland felt the brunt of the first major storm of the season which began on the 2nd. Winds gusted to 140 km/h. Another storm on the 9th caused winds gusting to 95 km/h, then one on the 29th forced the closure of schools and roads in the Codroy region. Fifteen cms of snow fell in 24 hours which broke existing daily records for eastern and central Newfoundland.

ATMOSPHERIC CIRCULATION



Mean 50 kPa height anomaly (dam)



Mean 50 kPa heights (dam)

MEAN 50 kPa CIRCULATION
OCTOBER 1987

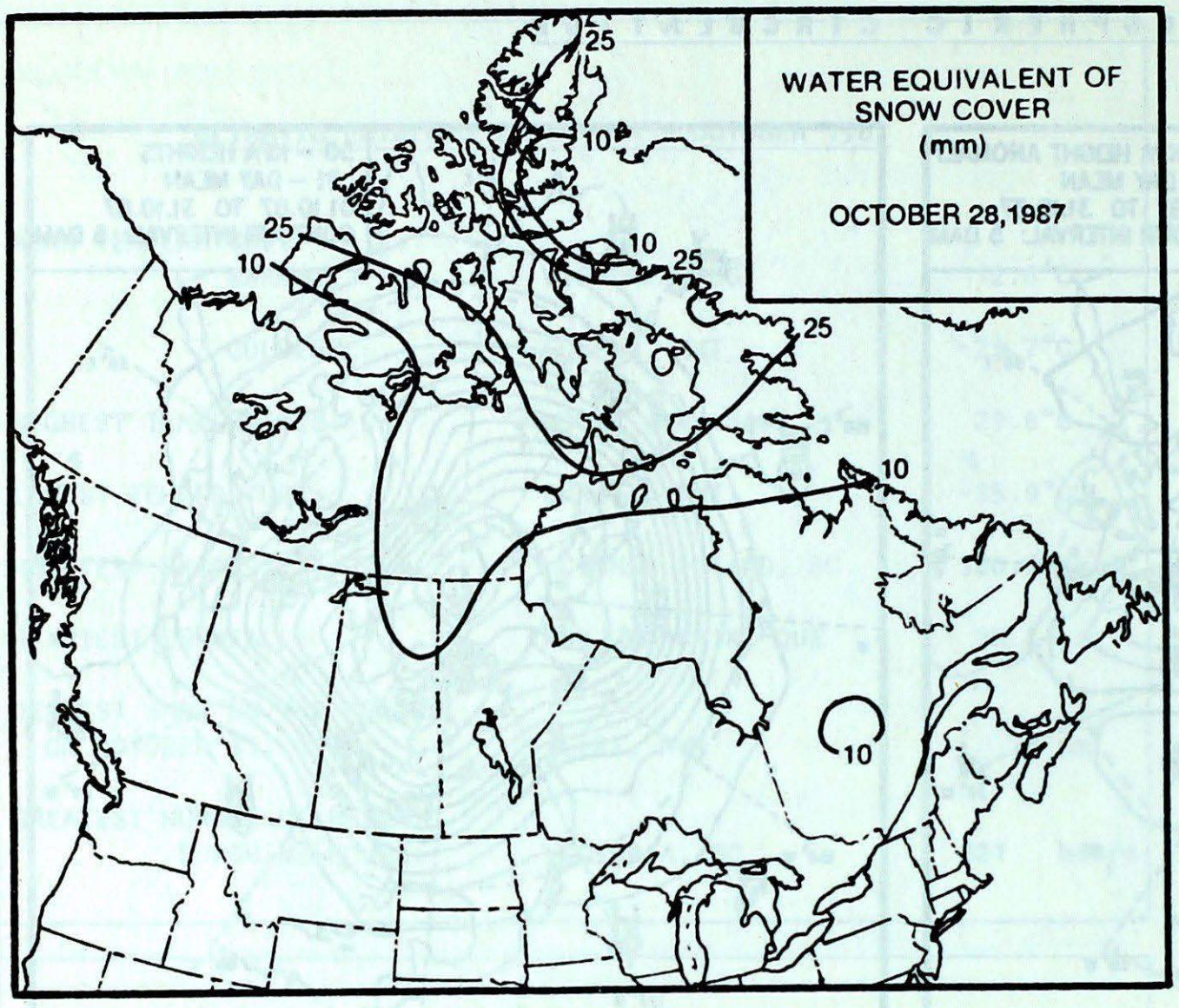
Alain Caillet, CCRM

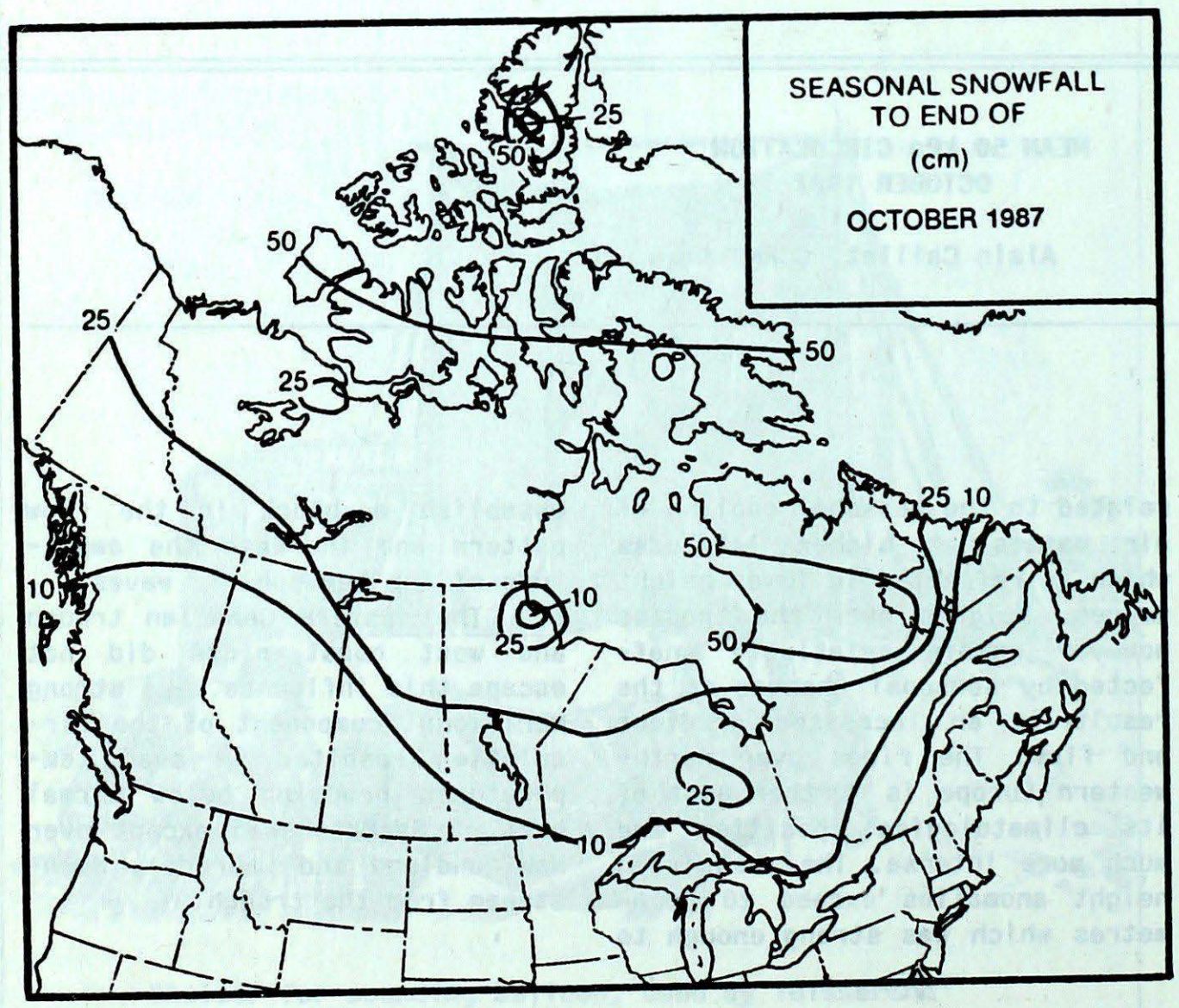
The evolution of the upper level flow pattern in October reflected the changing solar radiation regime as well as the exceptionally warm temperature regime which has persisted over western Europe for nearly two months.

On the monthly mean chart, one notes immediately the tighter gradient and the pronounced ridge over Scandanavia. The intensification of the flow is directly related to the seasonal cooling of air masses at higher latitudes which is reflected in lower height values. Heights over the tropics however remain relatively unaffected by seasonal changes so the result is an increased gradient and flow. The ridge over northwestern Europe is further east of its climatological position and much more intense. The associated height anomalies exceed 20 decametres which was strong enough to establish a block in the flow pattern and increase the amplitude of the hemispheric waves.

The eastern Canadian trough and west coast ridge did not escape this influence. The strong meridional component of the circulation resulted in mean temperatures dropping below normal east of Saskatchewan except over Newfoundland and Labrador, downstream from the trough.

SNOWFALL



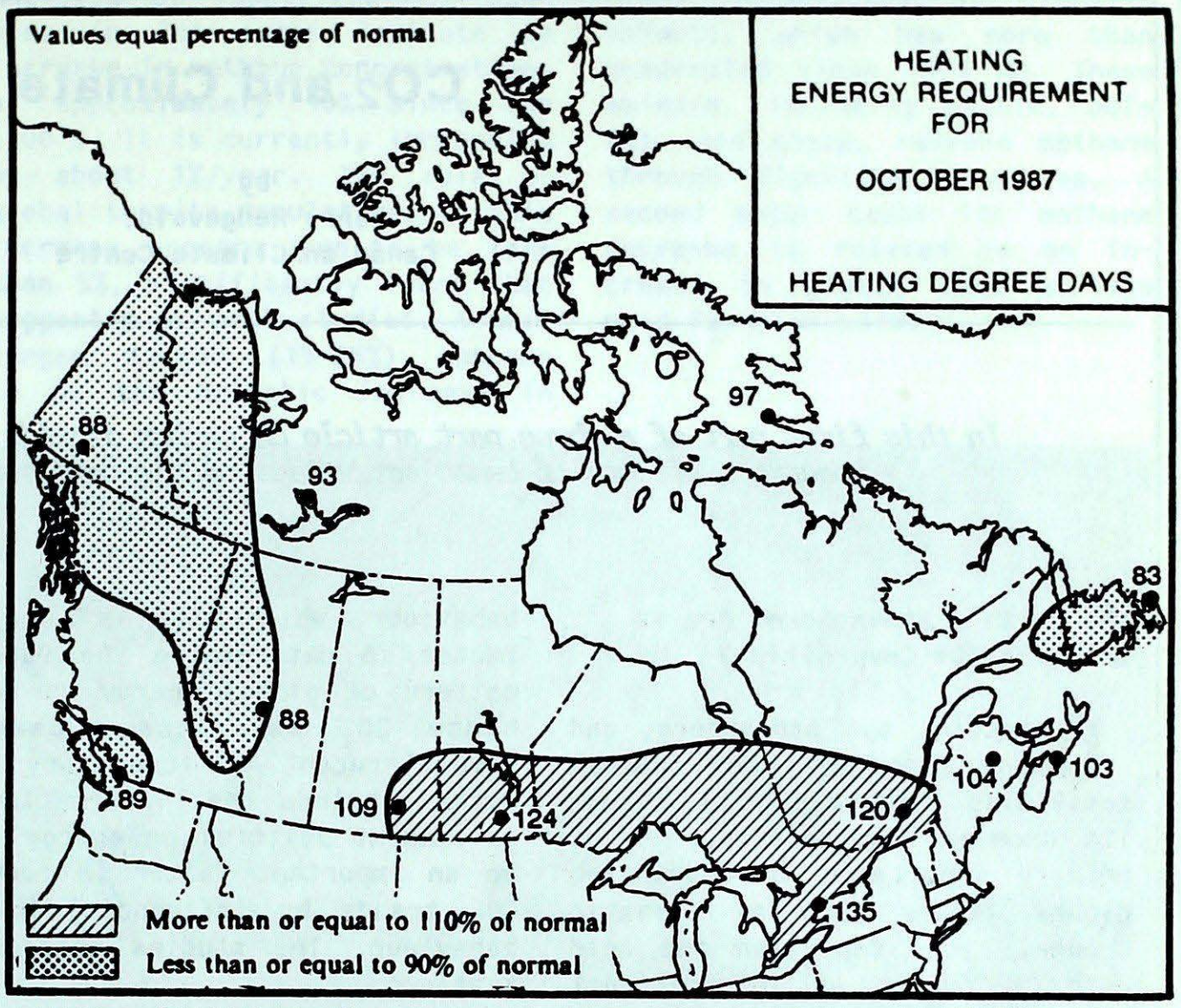


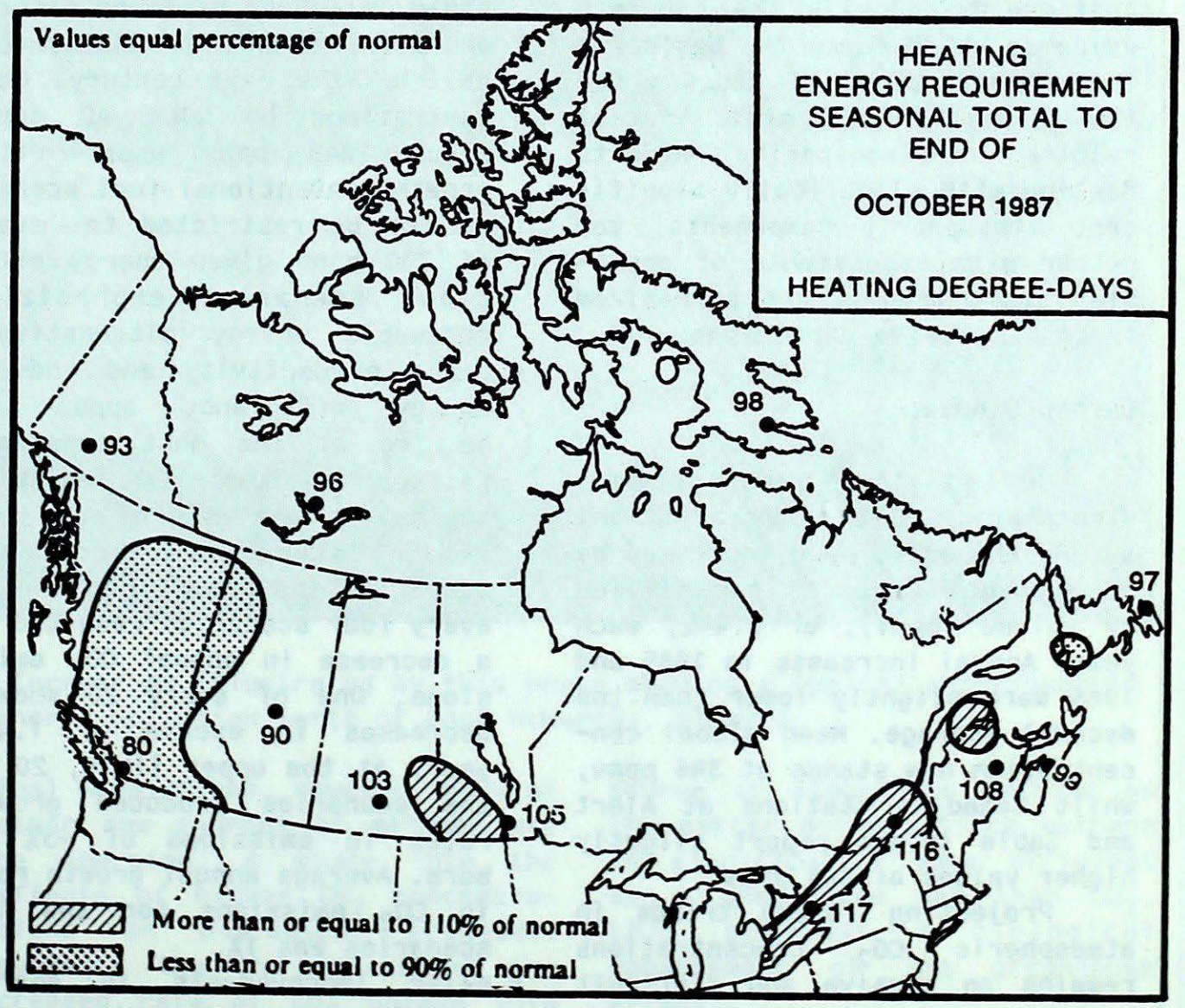
SEASONAL SNOWFALL TOTALS (CM)
TO END OF OCTOBER

	1987	1986	NORMAL
YUKON TERRITORY			
Whitehorse	18.0	30.8	21.4
NORTHWEST TERRITORIES			
Cape Dyer	83.6	22.7	54.3
Inuvik	27.9	41.0	53.0
Yellowknife	30.1	11.8	26.7
BRITISH COLUMBIA			
Kamloops	0.0	0.0	0.4
Port Hardy	0.0	0.0	0.2
Prince George	0.0	0.0	10.4
Vancouver	0.0	0.0	0.0
Victoria	0.0	0.0	0.0
ALBERTA			
Calgary	0.4	12.3	19.4
Edmonton Namao	0.0	6.2	9.7
Grande Prairie	0.0	8.4	16.3
SASKATCHEWAN			
Estevan	1.0	0.8	8.2
Regina	5.0	5.2	10.0
Saskatoon	1.6	3.0	10.4
MANITOBA			
Brandon	7.0	0.5	6.7
Churchill	9.3	40.2	35.7
The Pas	22.6	5.2	11.7
Winnipeg	10.4	0.0	5.4
ONTARIO			
Kapuskasing	28.4	37.4	23.5
London	0.8	0.0	1.9
Ottawa	1.6	0.2	2.7
Sudbury	13.0	1.6	6.5
Thunder Bay	8.5	10.0	3.3
Toronto	1.0	0.0	0.9
Windsor	0.0	0.0	0.1
QUEBEC			
Baie Comeau	3.4	3.0	6.1
Montréal	0.4	0.0	1.7
Quebec	0.4	0.0	4.4
Sept-Iles	1.6	1.0	10.6
Sherbrooke	8.4	0.0	5.6
Val-d'Or	13.8	9.0	15.7
NEW BRUNSWICK			
Charlo	0.0	1.0	5.8
Fredericton	0.0	0.0	2.3
Moncton	0.0	0.0	3.1
NOVA SCOTIA			
Shearwater	0.0	0.0	1.7
Sydney	0.0	0.0	2.6
Yarmouth	0.0	0.0	1.9
PRINCE EDWARD ISLAND			
Charlottetown	0.0	1.0	2.6
NEWFOUNDLAND			
Gander	1.0	25.8	12.3
St. John's	0.0	2.2	4.4

SEASONAL TOTAL OF HEATING DEGREE-DAYS TO END OF OCTOBER

	1987	1986	NORMAL
BRITISH COLUMBIA			
Kamloops	340	440	436
Penticton	357	453	427
Prince George	762	836	897
Vancouver	347	401	436
Victoria	432	484	494
YUKON TERRITORY			
Whitehorse	1060	1150	1142
NORTHWEST TERRITORIES			
Frobisher Bay	1793	2020	1827
Inuvik	1410	1565	1637
Yellowknife	1091	1095	1132
ALBERTA			
Calgary	713	793	765
Edmonton Mun	659	716	732
Grande Prairie	747	840	849
SASKATCHEWAN			
Estevan	607	616	588
Regina	688	692	669
Saskatoon	705	720	691
MANITOBA			
Brandon	744	746	650
Churchill	1383	1498	1351
The Pas	852	827	790
Winnipeg	617	614	590
ONTARIO			
Kapuskasing	848	978	808
London	452	405	383
Ottawa	504	520	451
Sudbury	632	697	614
Thunder Bay	717	768	693
Toronto	446	445	381
Windsor	361	265	282
QUÉBEC			
Baie Comeau	907	1015	846
Montréal	465	512	401
Quebec	617	685	554
Sept-Iles	909	1035	905
Sherbrooke	674	702	650
Val-d'Or	855	945	781
NEW BRUNSWICK			
Charlo	671	848	608
Fredericton	561	684	524
Moncton	506	700	522
NOVA SCOTIA			
Halifax	418	551	423
Sydney	518	699	496
Yarmouth	502	600	488
PRINCE EDWARD ISLAND			
Charlottetown	481	656	484
NEWFOUNDLAND			
Gander	683	901	707
St. John's	688	894	709





FEATURE

CO_2 and Climate

by
Henry Hengeveld,
Canadian Climate Centre

In this first part of a three part article on carbon dioxide and the climate, we will learn about the effects of human activities on the composition of the atmosphere.

The Earth's Atmosphere: Are We Changing Its Composition?

Observing the atmosphere, and understanding how human activities have and will change its chemical composition, are of primary importance in addressing global issues such as climatic change, ozone depletion and acid rain. A number of international programs to monitor the concentrations of various atmospheric constituents have been established during the past decade in order to address this requirement. These continue to provide the concrete evidence which forms the basis for the present state of concern for the global environment. Recent results of monitoring efforts dealing with climatically significant atmospheric components, together with assessments of possible future trends, are summarized in the following paragraphs.

Carbon Dioxide:

During the past decade, atmospheric CO_2 concentrations around the world have increased by an average 1.5 parts per million by volume (ppmv), or 0.44%, each year. Annual increases in 1985 and 1986 were slightly lower than the decadal average. Mean global concentration now stands at 346 ppmv, while Canadian stations at Alert and Sable Island report slightly higher values of 348 ppmv.

Projecting future trends in atmospheric CO_2 concentrations remains an elusive and difficult task. A primary obstacle is the unpredictable nature of human behaviour, which will be a major factor in determining the future pattern of global energy use and hence CO_2 emissions. However several recent American study reports conclude that international government policies on energy can be an important factor in future CO_2 trends by influencing human behaviour. The studies concluded that:

- although policy decisions are not likely to significantly affect trends in CO_2 concentration prior to 2050 AD, they could well have profound effects on these trends in the second half of the next century. Concentrations by 2100 AD could reach 1040 ppmv under rapid growth/conventional fuel scenarios or be restricted to levels of 700 ppmv given energy efficient scenarios emphasizing renewable energy alternatives;
- Labor productivity and end-use energy efficiency appear to be two of the most important factors in future CO_2 emission trends. An analysis of 400 possible future socio-economic scenarios indicated that one of every four scenarios resulted in a decrease in annual CO_2 emissions. One of every 20 showed decreases in excess of 1.4%/year. At the upper limit, 20 of the scenarios produced growth rates in emissions of +3% or more. Average annual growth rate in CO_2 emissions for the 400 scenarios was 1%.
- major improvements in energy efficiencies and end-use requirements, hence reductions in CO_2 emissions, are already being realized in some locations.

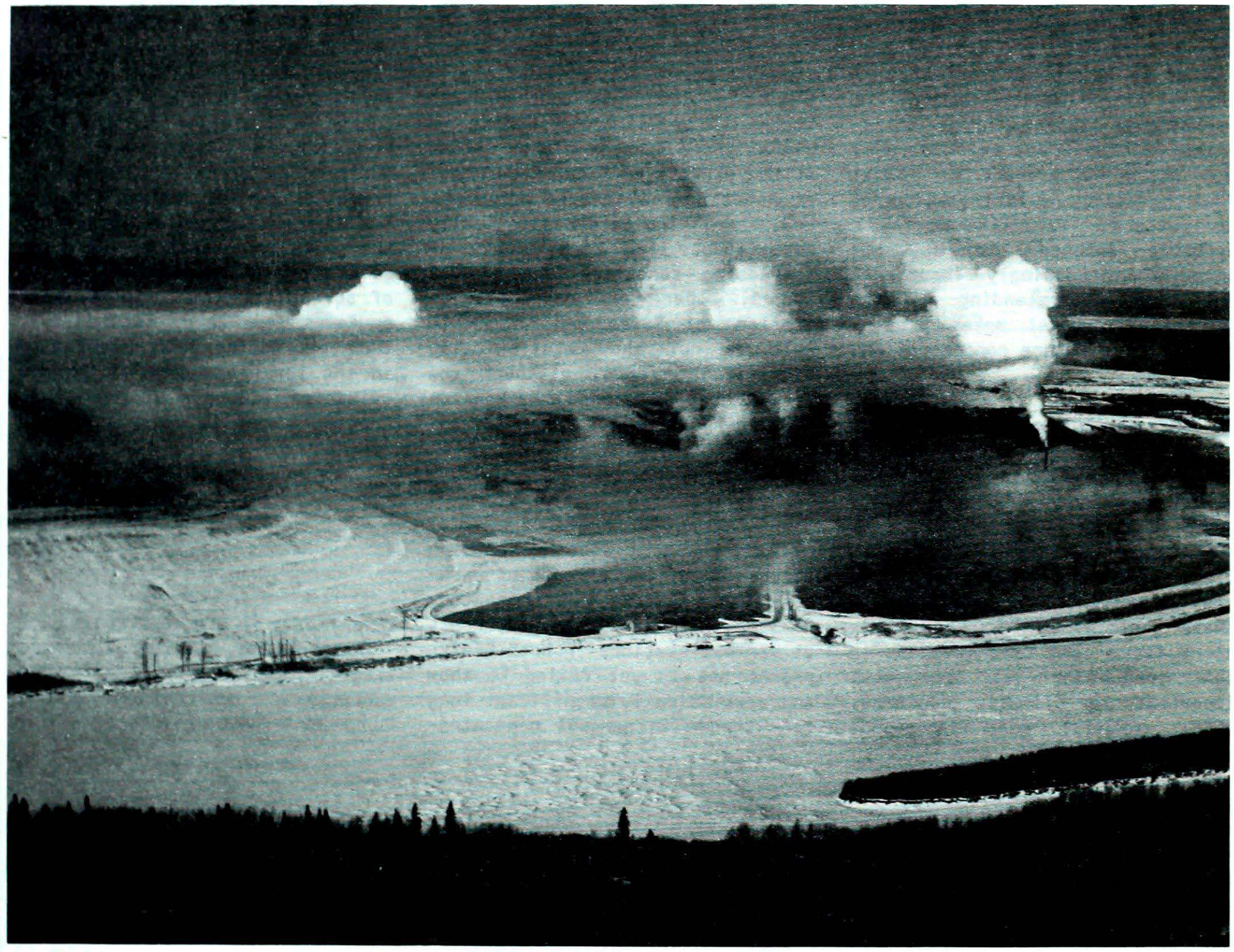
" .... International government policies on energy can be an important factor in future CO_2 trends by influencing human behaviour."

A second contributing factor to uncertainty in predicting future CO_2 concentration stems from an incomplete understanding of the global uptake and release of CO_2 through natural processes. At present, approximately 42% of CO_2 emissions from fossil fuel combustion appears to be removed from the atmosphere by these processes. Ocean waters are the most likely sink for much of the removed CO_2. Increased carbon sedimentation on the continental shelves of the ocean may also be an important but, as yet, largely overlooked sink. A better understanding of the ocean processes involved and how they alter in the future will be an important step towards improved predictions of future CO_2 concentrations, although secondary to the question of energy consumption patterns and related CO_2 emissions. Historically, deforestattion has also been an important factor in CO_2 emission trends. Present estimates for the net role of global forests suggest related CO_2 emissions are now 20% or less than that due to fossil fuel combustion. This

percentage is expected to decrease in the future.

Methane:

CH_4 is the second most abundant trace greenhouse gas in the atmosphere, with present concentration of 1.6 ppmv. However, molecule-by-molecule it is about 3.3 times more effective as a greenhouse gas than CO_2. New analyses of fossilized air bubbles in ice cores indicate an increase in methane concentrations of approximately 90% since the 1600's. It is currently increasing by about 1%/year. The role of global termite populations in this increase appears now to be less than 5%, significantly lower that suggested in past studies. A much larger factor (15-25%) appears to be the dramatic increase in global population of domestic animals, which has more than quadrupled since 1890 AD. These animals, including cattle, buffalo and sheep, release methane through digestive processes. A second major cause for methane increase is related to an increase in global land acreage used for rice paddies.



On a clear day one cannot always see forever as illustrated by this photo showing a typical anthropogenic source of atmospheric pollution north of Fort McMurray, Alberta

" ... molecule-by-molecule it is about 3.3 times more effective as a greenhouse gas than CO_2.

Future trends in methane concentrations are expected to follow trends in human and domestic animal populations. However, several other new sources of methane may be emerging. A study into the effects of higher CO_2 concentrations on biological processes suggests tha the consequent increased rate of CO_2 uptake into organic matter in wetlands will in turn produce an additional source of atmosphere methane as the matter decays. Since methane is significantly more efficient as a greenhouse gas than CO_2, this provides a biological enhancement of the greenhouse effect.

Another study has concluded that increased global concentra-

tion of carbon monoxide (CO) may be reducing concentrations of the chemical radical OH. OH is a sink for methane through chemical processes.

Nitrous Oxide:

N_2O currently has an abundance of 306 parts per billion (ppb) and is increasing less rapidly (0.2 to 0.3%/year) than methane. It has increased by approximately 8% over the last several centuries. The dominant natural source of N_2O is believed to be the biological process of nitrification. Much of the increase in atmospheric concentrations is likely due to release of N_2O as a by product of fossil fuel burning. Denitrification of agricultural fertilizers is a probable secondary source, but becoming increasingly important. The poor understanding of the N_2O global budget makes predictions of its future concentrations difficult.

Chlorofluorocarbons:

Chlorofluorocarbons (CFCs) are industrially manufactured gases used for various commercial applications, including refrigeration, foam production and spray can propellants. Once released, these gases remain in the atmosphere for a long time (decades to centuries). The two CFCs most important to climatic concerns, $CFCL_3$ (CFC-11) and CF_2 (CFC-12), now have concentrations of 220 and 380 parts per trillion by volume, respectively. Although their emission rates have not changed significantly since 1976, their concentrations in the atmospheric have been increasing at the of 5-6%/year. In addition to being powerful greenhouse gases, CFCs are also believed to be a major factor in the potential depletion of the stratospheric ozone layer.

Surface Ozone:

Measurements of surface ozone concentrations at several locations in both the Southern and Northern Hemisphere suggest a global trend towards higher values at the earth's surface. Recordings at Point Barrow, Alaska and Mauna Loa, Hawaii indicate statistically significant long term trends of increasing concentrations of 0.8 and 1.2% per year respectively. Stations at Samoa and the South Pole do not show statistically significant trends, although the former has a tendency towards decreasing values.

Aerosols:

The lack of a global aerosol climatology precludes a thorough assessment of the effects of aerosols on climate at planetary scales. A decade of measurements at various stations in both hemispheres has as yet failed to show any statistically significant long term trends in aerosol concentrations or related effects. However, winter-time concentrations of aerosols in the lower 5 km of Arctic air masses (often referred to as Arctic haze) do show significant trends towards higher concentrations. The increased long range transport of pollutants from the European continent and the loss of removal processes due to stable winter air masses and lack of sunlight are contributing factors. Glacial ice core acidity measurements, which indicate relatively constant values until the 1950's, reveal a 75% increase in acid content of snowfall between 1956 and 1977. Such trends are similar to those of European SO_2 emissions. In addition to affecting the Arctic radiation energy balance during the dark winter and early spring, the sooty components of the aerosols also reduce the reflection of spring sunshine from the snow surfaces as they settle out, thus increasing heat absorption in the lower atmosphere. The net climatic effect of increased Arctic haze is still poorly understood.

---

next month in the second part of "CO_2 and the climate" Climatic Response and How will changing atmospheric composition affect climate.

OCTOBER 1987

STATION	Temperature C Mean	Difference from Normal	Maximum	Minimum	Snowfall (cm)	% of Normal Snowfall	Total Precipitation (mm)	% of Normal Precipitation	Snow on ground at end of month (cm)	No. of days with Precip 1.0 mm or more	Bright Sunshine (hours)	% of Normal Bright Sunshine	Degree Days below 18 C
BRITISH COLUMBIA													
ABBOTSFORD	11.4	1.3	29.3	-0.5	0.0		19.6	12	0	4	195	142	205.6
ALERT BAY	9.6	0.3	23.9	3.3	0.0		29.7	14	0	13	X		259.1
AMPHITRITE POINT	11.7	1.1	19.9	6.1	0.0		117.0	32	0	7	X		196.1
BLUE RIVER	5.3	-0.2	23.1	-8.1	0.0		48.9	60	0	8	125	137	MSG
BULL HARBOUR	9.8	0.4	26.3	2.7			212.2	78	0	15	X		255.5
CAPE SCOTT	10.7	0.5	20.4	4.3			232.0	66	0	14	X		226.5
CAPE ST.JAMES	11.0	1.1	16.2	6.9	1.0		136.4	69	0	16	127	*	217.3
CASTLEGAR	8.5	0.4	22.7	-3.5	0.0		5.0	9	0	1	194	155	294.6
COMOX	10.1	0.9	21.8	0.9	0.0		17.9	14	0	4	X		123.9
CRANBROOK	6.4	0.5	23.3	-7.1	0.0		5.0	27	0	2	218	*	359.5
DEASE LAKE	1.9	0.6	19.1	16.6	14.1	80	22.3	63	6	8	82	94	495.4
ETHELDA BAY	8.5	-0.3	19.0	-1.0	0.0		349.4	86	0	15	X		294.1
FORT NELSON	3.9	2.8	24.4	-5.0	5.6	29	20.0	82	1	6	121	*	437.7
FORT ST.JOHN	6.4	2.1	22.5	-5.0	3.4	18	28.7	103	0	5	X		357.3
HOPE	12.1	1.7	27.7	0.8	0.0		29.8	17	0	3	156	149	183.5
KAMLOOPS	9.0	0.6	28.1	-3.5	0.0		6.0	39	0	3	178	131	279.3
KELOWNA	7.7	0.8	24.4	-5.0	0.0		4.5	23	0	2	197	131	320.7
LANGARA	9.6	0.6	17.4	5.4	0.0		199.6	75	0	24	X		261.2
LYTTON	11.2	1.1	27.8	-1.2	0.0		1.0	2	0	1	160	117	210.7
MACKENZIE	4.4	0.8	23.0	-10.0			60.4	102	0	8	141	121	420.7
MCINNES ISLAND	10.6	1.1	18.2	5.6	0.0		366.9	109	0	14	X		228.5
PENTICTON	9.1	0.4	24.9	-3.8	0.0		5.4	35	0	2	200	127	278.4
PORT ALBERNI	11.0	*	27.1	-2.5	0.0	*	25.5	*	0	5	IX1	*	217.4
PORT HARDY	9.5	0.8	25.6	1.9	0.0		122.5	50	0	12	127	129	275.8
PRINCE GEORGE	5.2	0.4	25.2	-9.5	0.0		39.8	67	0	8	157	143	379.7
PRINCE RUPERT	8.6	0.7	21.7	-0.8	0.0		304.8	83	0	21	90	138	289.5
PRINCETON	8.1	1.5	27.7	-6.5	0.0		1.0	4	0	1	210	*	MSG
QUESNEL	5.9	0.2	26.8	-8.5	0.0		12.2	25	0	6	X		374.0
REVELSTOKE	7.0	0.1	18.7	-2.8	0.0		26.6	31	0	5	151	167	341.6
SANDSPIT	9.8	0.8	18.2	3.0	0.0		99.6	51	0	***			252.4
SMITHERS	4.9	0.2	24.4	-6.7	1.0	12	60.2	94	0	10	119	130	405.5
TERRACE	6.7	0.3	20.3	-0.3	0.2	5	153.9	71	0	14	99	158	342.8
VANCOUVER HARBOUR	12.0	1.3	21.9	4.9	0.0		32.6	20	0	7	X		192.5
VANCOUVER INT'L	11.0	1.0	21.2	2.7	0.0		20.4	17	0	4	193	159	218.4
VICTORIA GONZ. HTS	12.6	1.8	24.6	5.3	0.0		3.8	5	0	1	221	152	169.3
VICTORIA INT'L	10.9	1.0	27.6	0.9	0.0		13.6	17	0	3	214	148	219.1
VICTORIA MARINE	10.7	0.8	21.5	3.3	0.0		24.5	18	0	4	X		226.0
WILLIAMS LAKE	6.3	1.2	27.1	-8.2	0.0		5.6	18	0	2	170	125	365.5

STATION	Temperature C Mean	Difference from Normal	Maximum	Minimum	Snowfall (cm)	% of Normal Snowfall	Total Precipitation (mm)	% of Normal Precipitation	Snow on ground at end of month (cm)	No. of days with Precip 1.0 mm or more	Bright Sunshine (hours)	% of Normal Bright Sunshine	Degree Days below 18 C
YUKON TERRITORY													
DAWSON	-0.4	5.0	14.7	-16.3	8.2	34	29.0	103	6	8	X		575.4
MAYO	1.7	4.0	15.1	-10.0	12.2	58	40.0	141	7	10	X		512.9
WATSON LAKE	3.3	3.4	17.6	-8.0	15.0	69	27.1	77	4	8	88	92	457.9
WHITEHORSE	2.6	2.2	14.9	-11.8	8.5	52	7.2	33	3	2	98	104	472.1
NORTHWEST TERRITORIES													
ALERT	-18.1	1.6	-6.8	-35.5	40.4	258	20.6	152	29	5	8	94	1119.1
BAKER LAKE	-8.2	-0.5	2.3	-20.6	23.5	101	15.6	50	8	8	*		811.7
CAMBRIDGE BAY	-11.7	0.0	0.6	-24.8	14.3	92	8.2	55	16	1	74	127	920.6
CAPE DYER	-7.9	-0.2	-1.7	-19.4	56.8	57	46.0	45	9	10	X		804.9
CAPE PARRY	-2.5	4.3	3.8	-8.2	12.4	45	8.0	39	8	4	X		634.7
CLYDE	-7.6	-0.7	-1.4	-18.6	30.8	82	21.4	62	24	7	43	90	792.2
COPPERMINE	-4.6	2.0	5.5	-21.4	11.1	52	10.2	43	6	5	67	145	699.6
CORAL HARBOUR	-8.9	-1.1	1.2	-20.0	14.6	54	18.6	50	12	5	92	106	824.4
EUREKA	-23.7	-1.6	-10.2	-35.9	4.4	58	3.3	47	5	0	14	162	1292.2
FORT RELIANCE	-2.5	-0.7	12.5	-13.5	22.6	111	21.0	75	2	5	X		636.4
FORT SIMPSON	1.1	3.0	21.2	-9.8	17.9	96	40.9	170	9	9	46	53	525.1
FORT SMITH	1.0	0.7	24.9	-8.7	22.8	143	27.8	104	7	7	68	77	505.7
IQALUIT	-7.6	-2.6	-1.4	-18.6	30.8	77	21.4	48	24	7	43	74	792.2
HALL BEACH	-10.3	0.2	-1.2	-22.1	17.0	79	15.8	74	17	4	X		875.9
HAY RIVER	2.4	1.5	25.0	-5.2	12.5	66	39.0	127	1	9	X		480.4
INUVIK	-3.2	4.9	5.7	-16.2	15.9	42	9.2	27	4	3	45	89	655.4
MOULD BAY	-16.1	1.5	-2.6	-33.4	18.2	165	7.5	79	10	3	19	177	1058.8
NORMAN WELLS	-0.7	3.9	12.3	-15.1	26.6	106	46.5	173	6	9	57	96	579.1
POND INLET	-11.6	0.4	-0.5	-24.0	16.0	48	8.8	34	8	3	X		916.3
RESOLUTE	-15.1	0.0	-4.1	-28.9	4.0	27	4.0	28	4	1	84	354	1027.4
YELLOWKNIFE	0.1	1.7	17.1	-8.2	30.1	130	37.3	108	1	11	40	71	555.3
ALBERTA													
BANFF	6.0	1.6	24.0	-7.5	2.0	11	8.6	27	0	4	X		
BROOKS	6.9	0.6	27.0	-8.0	0.0		6.8	39	0		187	*	
CALGARY INT'L	7.1	1.6	26.9	-7.6	0.4	2	2.0	11	0	1	208	118	337.1
COLD LAKE	4.6	0.1	25.2	-7.0	2.2	31	5.8	33	0	3	131	84	414.2
CORONATION	4.8	0.0	26.0	-11.9			11.6	77	0	3	192	107	411.1
EDMONTON INT'L	5.7	1.0	29.1	-8.3			6.0	38	0	3	185	113	379.9
EDMONTON MUNI.	7.0	1.2	28.6	-6.8			5.0	30	0	1	192	118	343.3
EDMONTON NAMAO	6.1	1.0	28.4	-7.4			5.3	29	0	2	X		368.8
EDSON	4.8	1.7	27.3	-10.0			4.6	16	0	2	170	112	407.5
FORT CHIPEWYAN	2.0	1.0	26.5	-10.0	23.2	128	42.8	138			X		

OCTOBER 1987

STATION	Temperature C Mean	Difference from Normal	Maximum	Minimum	Snowfall (cm)	% of Normal Snowfall	Total Precipitation (mm)	% of Normal Precipitation	Snow on ground at end of month (cm)	No. of days with Precip 1.0 mm or more	Bright Sunshine (hours)	% of Normal Bright Sunshine	Degree Days below 18 C
FORT MCMURRAY	3.7	0.4	28.6	-5.4	7.8	61	30.4	108	0	7	122	97	443.6
GRANDE PRAIRIE	5.9	1.7	27.4	-9.5			9.1	34	0	2	171	*	372.3
HIGH LEVEL	2.0	0.7	25.2	-10.7	9.7	63	62.4	424	0	8	96	67	496.8
JASPER	6.2	1.5	25.0	-8.1			8.4	28	0	3	180	*	367.9
LETHBRIDGE	3.5	1.0	27.5	-7.7	5.8	49	9.2	51	0	2	212	121	294.4
MEDICINE HAT	7.6	0.2	27.8	-7.5	0.0		8.6	53	0	2	210	121	321.2
PEACE RIVER	4.9	1.2	25.3	-9.5			20.6	103	0	4	X		404.7
RED DEER	5.8	1.2	27.8	-9.7	0.2	1	7.4	35	0	2	X		389.1
ROCKY MTN HOUSE	4.9	0.0	27.7	-8.8			15.8	74	0	4	X		405.5
SLAVE LAKE	4.7	0.6	27.1	-8.8	1.0	6	5.2	20	0	2	149	100	410.5
SUFFIELD	7.7	0.7	28.2	-6.8	0.0		7.4	48	0	1	217	117	318.6
WHITECOURT	5.6	2.0	28.5	-5.7			16.4	59	0	2	X		384.3
SASKATCHEWAN													
BROADVIEW	3.8	-0.8	27.4	-9.1	3.2	37	9.8	44	0	2	192	120	440.8
COLLINS BAY	-0.9	0.0	19.9	-11.7	63.3	209	48.7	128	19	13	57	*	592.4
CREE LAKE	0.8	-0.8	20.5	-8.2	44.4	300	46.9	155	9	9	83	85	535.2
ESTEVAN	5.0	-1.4	29.3	-10.0	1.0	14	6.0	27	0	2	193	102	403.3
HUDSON BAY	2.6	-1.3	25.9	-10.0	32.8	324	53.4	200	0	6	107	*	479.0
KINDERSLEY	4.8	-0.5	26.4	-13.3	2.8	41	7.8	56	0	2	X		407.4
LA RONGE	2.1	-1.4	23.2	-8.8	45.6	465	43.5	145		4	X		496.3
MEADOW LAKE	3.9	-0.7	25.0	-10.3	3.6	41	8.8	50	0	3	137	*	437.6
MOOSE JAW	5.6	-0.8	29.8	-8.4	5.7	75	9.5	51	0	2	191	110	384.7
NIPAWIN	2.7	*	26.4	-10.5	11.8	*	36.5	*	0	6	109	*	459.2
NORTH BATTLEFORD	4.4	-0.5	26.4	-7.0	1.0	14	6.8	43	0	2	X		417.1
PRINCE ALBERT	3.6	-0.1	26.2	-6.9	8.9	95	30.8	142	0	5	120	81	448.1
REGINA	4.2	-1.0	29.0	-10.3	5.0	60	11.0	58	0	3	179	106	428.0
SASKATOON	4.5	-0.4	25.7	-8.3	1.6	17	9.2	53	0	2	X		417.7
SWIFT CURRENT	5.1	-0.7	28.3	-13.1	3.4	37	5.6	30	0	2	200	118	399.5
WYNYARD	3.5	-1.3	26.1	-9.8	5.8	51	22.6	92	0	7	X 156	104	439.1
YORKTON	2.8	-2.0	27.7	-10.4	10.4	138	27.9	122	0	7	169	107	468.4
MANITOBA													
BRANDON	2.9	-2.3	24.8	-13.5	7.0	107	15.8	73	6		X		467.8
CHURCHILL	-2.1	-0.6	7.7	-11.8	9.1	31	28.4	66	1	11	39	63	621.8
DAUPHIN	3.9	-1.6	27.1	-7.8	15.1	181	32.5	112	0	5	141	92	436.7
GILLAM	-1.1	-0.7	16.1	-12.7	25.8	122	23.2	71	9	7	X		592.7
GIMLI	3.4	-2.2	22.5	-8.9	18.8	254	40.6	107	0	6	158	109	451.9
ISLAND LAKE	1.8	-1.4	20.1	-7.3	18.0	109	32.0	73	3	12	X		502.2
LYNN LAKE	-0.7	-0.7	21.6	-5.2	47.7	170	54.8	132	13	10	63	88	553.9
NORWAY HOUSE	1.6	*	18.5	-9.4	13.0	*	28.0	*	0	8	*		509.8
PORTAGE LA PRAIRIE	4.5	-2.0	24.5	-8.1	18.8	298	37.9	123	0	9	X		419.1

STATION	Temperature C Mean	Difference from Normal	Maximum	Minimum	Snowfall (cm)	% of Normal Snowfall	Total Precipitation (mm)	% of Normal Precipitation	Snow on ground at end of month (cm)	No. of days with Precip 1.0 mm or more	Bright Sunshine (hours)	% of Normal Bright Sunshine	Degree Days below 18 C
THE PAS	2.6	-1.0	22.6	-6.8	22.6	221	50.4	151	0	10	75	62	477.1
THOMPSON	0.2	0.0	23.3	-11.0	28.2	102	27.8	57	9	8	92	116	553.4
WINNIPEG INT'L	3.4	-2.7	23.1	-10.5	10.4	200	33.4	108	0	7	159	104	451.7
ONTARIO													
ATIKOKAN	2.6	-2.4	22.0	-6.8	18.4	153	45.2	72	0	9	95	84	478.3
BIG TROUT LAKE	0.2	-1.6	16.5	-9.0	46.6	*	83.2	148	7	11	75	*	553.3
EARLTON	3.9	-1.5	19.0	-6.0	5.1	68	53.8	76	0	10	X		440.9
GERALDTON	0.7	-3.2	20.2	-10.5	14.6	135	76.0	117	0	8	X		535.4
GORE BAY	6.5	-1.8	16.1	-1.2			110.8	163	0	14	X		355.7
HAMILTON RBG	8.1	-2.5	20.3	-2.8	0.0		54.6	79	0	10	153	*	
HAMILTON	7.1	-2.3	19.8	-3.4	1.0	76	61.2	99	0	9	X		337.8
KAPUSKASING	2.0	-2.4	19.3	-9.9	28.4	134	85.4	110	1	12	X		497.1
KENORA	3.1	-2.5	20.7	-6.6	13.2	178	33.0	81	0	8	X		466.3
KINGSTON	7.7	-1.7	17.2	-4.6	0.2	20	86.4	112	0	11	135	89	318.4
LANSDOWNE HOUSE											X		
LONDON	6.8	-2.6	19.5	-3.5	0.8	42	84.2	114	0	11	121	85	346.6
MOOSONEE	1.9	-2.2	16.0	-11.2	10.4	71	50.6	68	0	11	65	74	500.9
MUSKOKA	5.1	-2.4	20.0	-6.5	6.4	200	108.9	115	0	15	X		399.1
NORTH BAY	4.1	-2.3	17.9	-4.5	20.6	298	99.8	113	0	13	102	85	430.5
OTTAWA INT'L	6.4	-1.7	20.2	-4.3	1.6	59	67.4	98	0	12	128	*	360.1
PETAWAWA	4.8	-2.3	22.5	-7.6	7.2	146	96.2	144	0	14	X		410.9
PETERBOROUGH	5.5	-2.4	19.1	-6.6			64.0	106	0	8	X		387.3
PICKLE LAKE	0.3	-2.4	19.4	-9.5	20.0	95	40.2	63	0	10	X		549.7
RED LAKE	2.1	-2.4	20.2	-9.5	13.4	122	36.2	71	0	9	120	*	494.0
ST. CATHARINES	8.3	-2.6	20.4	-2.7	0.0		53.4	81	0	9	X		299.7
SARNIA	7.5	-3.0	20.9	-1.9			95.5	159	0	12	147	101	323.7
SAULT STE. MARIE	5.6	-2.0	18.2	-3.9	5.3	86	129.4	174	0	18	108	91	382.4
SIOUX LOOKOUT	2.1	-2.6	20.1	-5.1	25.6	179	45.8	70	0	8	X		497.4
SUDBURY	4.4	-1.9	17.1	-5.0	13.0	206	70.7	94	0	12	106	86	421.9
THUNDER BAY	3.1	-2.6	18.2	-7.2	8.5	257	50.1	91	0	7	103	80	462.6
TIMMINS	2.8	-2.0	19.0	-8.7	33.0	261	87.7	127		11	X		468.5
TORONTO	8.8	-2.2	18.2	-0.5	0.0		47.0	77	0	7			285.5
TORONTO INT'L	7.0	-2.3	20.4	-3.6	1.0	111	48.1	77	0	8	X		339.9
TORONTO ISLAND	8.8	-1.3	18.3	0.8	0.0		45.1	79	0	8			280.4
TRENTON	6.7	-2.5	18.6	-4.3	0.0		48.2	68	0	11	X		350.4
WATERLOO-WELL	5.7	-3.1	19.7	-5.5			75.0	114	0	9	X		380.7
WAWA	3.6	*	15.4	-9.2	10.0	*	91.8	*	0	15	X	*	446.1
WIARTON	6.7	-2.3	21.0	-2.0			105.4	128	0	16	102	76	349.6
WINDSOR	8.4	-2.7	21.0	-0.5			56.3	98	0	10	X		291.2

OCTOBER 1987

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									
QUEBEC													
BAGOTVILLE	4.8	-0.5	20.3	-4.4	6.4	54	88.9	123		12	X		407.9
BAIE COMEAU	4.3	0.0	12.9	-6.5	3.4	55	95.5	106		14	129	*	423.0
BLANC SABLON	4.4	0.5	15.7	-6.8	4.2	46	150.0	163	0	12	115	*	
CHIBOUGAMAU	1.7	-0.9	17.1	-8.3	34.8	150	67.6	78	5	13	63	88	505.0
GASPE	6.0	0.2	18.8	-7.2	1.2	24	116.0	126	0	9	139	*	372.8
INUKJUAK	-1.2	-0.8	6.5	-9.5	65.8	299	57.2	124	7	17	46	88	592.9
KUUJJUAQ	-0.9	0.0	10.2	-8.0	34.8	127	52.4	107	7	15	39	79	585.9
KUUJJUARAPIK	1.4	-0.6	9.4	-5.0	80.8	295	60.8	82	2	18	68	145	362.5
LA GRANDE RIVIERE	-0.1	*	11.4	-7.4	42.7	*	38.7	*	5	16	62	*	562.4
MANIWAKI	4.5	-2.0	20.3	-5.9	9.4	229	87.4	121	0	11	91	75	417.4
MATAGAMI	1.3	-1.7	16.6	-10.5	55.4	322	96.0	155	1	10	78	83	516.4
MONT JOLI	6.5	0.8	21.2	-4.2	3.6	48	106.6	140	0	13	148	127	356.9
MONTREAL INT'L	7.6	-1.1	20.1	-4.1	0.4	23	56.9	75	0	9	141	103	321.2
MONTREAL M INT'L	6.2	*	20.0	-4.9	3.4	*	73.0	*	0	11	148	*	366.3
NATASHQUAN	5.1	1.0	13.9	-5.6	2.6	66	162.6	150	2	9	130	100	399.8
QUEBEC	6.0	-0.6	20.3	-4.6	0.4	9	135.8	149	0	14	127	109	371.9
ROBERVAL	5.2	0.0	22.1	-5.3	11.4	112	109.4	171	0	11	105	*	506.4
SCHEFFERVILLE	-1.2	0.2	13.1	-10.3	44.6	98	56.8	75	2	12	70	*	592.9
SEPT-ILES	4.2	0.6	14.0	-6.3	1.6	15	113.4	117	0	11	134	106	428.8
SHERBROOKE	5.9	-0.7	23.2	-7.5	8.0	142	117.1	134	0	11	130	*	375.6
STE AGATHE DES MONTS	4.3	-1.1	19.1	-5.0	8.0	105	87.2	98	0	12	117	91	424.3
ST-HUBERT	6.8	-1.6	20.1	-5.6	1.8	100	59.2	76	0	10	*		344.9
VAL D'OR	2.7	-1.9	18.4	-6.9	13.6	93	68.6	83	0	11	96	107	468.2
NEW BRUNSWICK													
CHARLO	5.9	0.1	17.7	-5.3			72.3	87	0	12	157	122	375.0
CHATHAM	7.3	0.2	20.1	-5.8			92.0	96	0	9	155	109	329.8
FREDERICTON	7.4	-0.1	20.8	-5.5	0.0		69.9	71	0	10	146	*	329.2
MONCTON	8.4	0.8	20.5	-4.3	0.0		95.1	96	0	9	174	122	297.6
SAINT JOHN	8.1	0.5	19.9	-3.9			143.5	112	0	12	171	121	306.5

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	8.8	0.2	22.0	-3.5			141.4	144	0	14	X		284.0
HALIFAX INT'L	9.1	0.5	19.4	-0.9	0.0		146.3	109	0	14	0		275.5
SABLE ISLAND	12.2	0.7	20.3	2.7	0.0		179.2	154	0	14	140	116	180.8
SHEARWATER	9.6	0.1	18.0	-1.0	0.0		160.0	132	0	13	145	92	259.9
SYDNEY	9.0	0.6	20.2	-1.6	0.0		193.5	157	0	15	146	110	278.2
YARMOUTH	9.5	0.0	19.2	-1.6	0.0		126.8	108	0	10	156	104	264.4
PRINCE EDWARD ISLAND													
CHARLOTTETOWN	8.7	0.6	20.0	-1.2	0.0		138.4	130	0	13	X		288.4
SUMMERSIDE	9.1	0.5	20.5	-0.9	0.2	10	140.8	149	0	10	133	100	275.2
NEWFOUNDLAND													
BATTLE HARBOUR	4.3	0.1	16.6	-6.0	11.0	297	122.8	158	0	11	X		409.8
BONAVISTA	8.8	1.6	20.5	-0.6	0.0		77.8	76	0	12	X		285.3
BURGEO	8.2	1.1	17.6	-1.3	0.0		259.6	181	0	16	*		303.5
CARTWRIGHT	4.7	1.6	14.4	-3.5	1.2	10	129.9	180	0	14	104	116	414.0
CHURCHILL FALLS	0.6	0.7	15.0	-10.4	34.8	64	113.5	131	2	17	76	114	539.3
COMFORT COVE	7.3	1.3	21.4	-2.4	1.0	7	96.6	87	0	14	X		330.3
DANIEL'S HARBOUR	7.8	1.9	19.9	0.5	0.0		205.5	227	0	15	110	131	314.6
DEER LAKE	6.9	1.6	23.2	-7.0	0.0		130.8	124	0	16	X		348.9
GANDER INT'L	7.7	1.7	21.1	-2.7	1.0	8	80.2	76	0	13	119	107	319.1
GOOSE	4.1	1.4	14.8	-4.8	2.6	10	91.7	119	0	11	108	115	430.8
PORT-AUX-BASQUES	7.9	0.9	16.1	-0.8	0.0		234.0	176	0	15	105	*	313.4
ST ANTHONY											X		
ST JOHN'S	9.0	2.1	24.6	-2.0			80.6	55	0	11	123	111	280.1
ST LAWRENCE	9.1	1.9	20.5	-1.8	0.0		223.8	151	0	16	X	*	
STEPHENVILLE	9.0	2.0	20.9	0.5			183.4	164		14	82	*	280.0
WABUSH LAKE	-0.1	0.6	13.3	-13.1	50.4	100	87.0	103	4	16	76	*	571.5

AGROCLIMATOLOGICAL STATIONS

OCTOBER

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	12.1	1.2	27.5	0.0	0.0	27.6	16	0	5	184	220.1	2273.6
KAMLOOPS												
SIDNEY	11.9	*	27.0	3.0	0.0	9.8	*	0	3	198	216.5	2086.3
SUMMERLAND	9.7	0.7	24.0	0.0	0.0	4.0	23	0	2	198	147.9	2494.4
ALBERTA												
BEAVERLODGE	6.0	1.6	27.0	-9.0	0.0	12.0	42	0	4	159	66.8	1385.6
ELLERSLIE												
FORT VERMILLION												
LACOMBE	5.6	0.9	29.0	-9.0	1.5	6.1	35	0	3	207	56.0	1391.5
LETHBRIDGE												
VAUXHALL												
VEGREVILLE	5.4	1.3	28.0	-12.5	0.0	0.7	5	0	0		68.9	1526.8
SASKATCHEWAN												
INDIAN HEAD	4.0	-1.3	28.5	-10.0	2.4	10.4	42	0	4		45.0	1894.5
MELFORT	2.9	-1.3	25.5	-8.0	27.2	39.4	149	0	8	121	35.0	1665.0
REGINA	3.3	-1.2	29.0	-13.0	3.0	13.2	72	0	4		26.3	1747.3
SASKATOON	5.0	-0.2	26.0	-6.5	3.1	11.3	65	0	3	135	*	1899.0
SCOTT	4.0	-0.2	26.0	-11.0	5.0	6.3	46	0	2	176	62.4	1596.4
SWIFT CURRENT SOUTH	6.0	0.1	28.5	-13.0	3.0	6.0	37	0	4	185	80.8	1890.7
MANITOBA												
BRANDON	4.1	-1.5	26.4	-10.7	6.2	16.2	69	0	11		50.8	1965.0
GLENLEA	3.0	-2.8	21.5	-12.0	13.0	37.2	99	0	8	158	30.0	1943.3
MORDEN	5.1	-1.9	24.0	-10.0	8.6	18.6	59	0	4	161	62.5	2203.5
ONTARIO												
DELHI	6.7	-3.2	20.0	-6.5	TR	83.5	111	0	12	143	70.3	2268.3
ELORA	6.0	-2.5	19.0	-3.0	0.0	79.4	120	0	13		49.7	1965.0
GUELPH	6.0	-3.2	20.1	-5.3	0.0	74.0	101	0	13	128	53.2	2077.6
HARROW	8.6	-2.7	20.0	-1.0	0.0	66.6	119	0	142	159	111.9	2652.3
KAPUSKASING	1.9	-2.7	19.0	-11.5	32.0	84.5	113	0	13	76	40.8	1486.8
MERIVALE												
OTTAWA	6.7	-1.8	19.8	-5.3	4.2	61.1	90	0	11	128	72.9	2172.9
SMITHFIELD	7.5	-1.4	18.5	-3.5	0.0	59.1	73	0	11		88.5	2328.7
VINELAND STATION	8.5	-2.5	19.5	-2.2	0.0	51.8	88	0	10	138	110.1	2376.9
WOODSLEE												
QUEBEC												
LA POCATIERE	6.8	-0.1	17.5	-3.0	0.0	74.4	104	0	8	146	68.1	1623.1
L'ASSUMPTION	6.8	-1.2	19.5	-6.0	1.0	66.4	83	0	10	119	77.0	2001.5
LENNOXVILLE												
NORMANDIN	3.7	-0.9	18.0	-8.0	18.0	77.4	130	0	9	107	31.1	1407.2
ST. AUGUSTIN												
STE CLOTHILDE	6.8	-1.5	21.0	-7.0	0.0	56.4	68	0	9	133	77.7	2059.0
NEW BRUNSWICK												
FREDERICTON	7.9	0.2	21.0	-4.5	0.0	71.3	71	0	11	147	106.5	1678.9
NOVA SCOTIA												
KENTVILLE	10.0	0.9	26.0	-2.0	0.0	109.3	107	0	14	151	159.1	1899.6
NAPPAN	9.6	1.3	19.0	-5.5	0.0	119.7	118	0	9	161	136.5	1721.5
PRINCE EDWARD ISLAND												
CHARLOTTETOWN	9.4	0.7	20.0	-2.0	TR	139.0	134	0	13	148	138.8	1734.2
NEWFOUNDLAND												
ST. JOHN'S WEST	9.3	2.2	23.0	-4.0	0.0	102.8	71	0	11	102	140.5	1234.1