Environment Canada Environnement Canada

dian Climate Centre

Climatic Perspectives

A WEEKLY REVIEW OF CANADIAN CLIMATE

JULY 15,1983 (Aussi disponible en français) VOL.5 NO.28

FOR THE PERIOD JULY 5-11, 1983

• More severe weather on the Prairies

Violent thunderstorms struck the prairies on the weekend. On July 8, a tornado touched down near Lloydminster on the Alberta-Saskatchewan border carving a path about 10 km long from Paradise Valley to Blackfoot. No deaths occurred, although one person was seriously injured from the flying debris and some farm animals were killed. The storm destroyed two granaries and several barns in its path.

(cont'd on page 7)

• Mud slides in southeastern British Columbia

On July 11, heavy rainfalls of 50-70 mm triggered several major mud slides near Revelstoke. Portions of the Trans-Canada Highway throughout southeastern British Columbia had to be closed. Traffic was routed to other highways. One section of the railroad track east of Revelstoke was covered by a mud slide 150 metres wide and 2 metres deep.

• Drilling season starts in the Beaufort Sea page 5

Due to computer problems this issue contains limited data.

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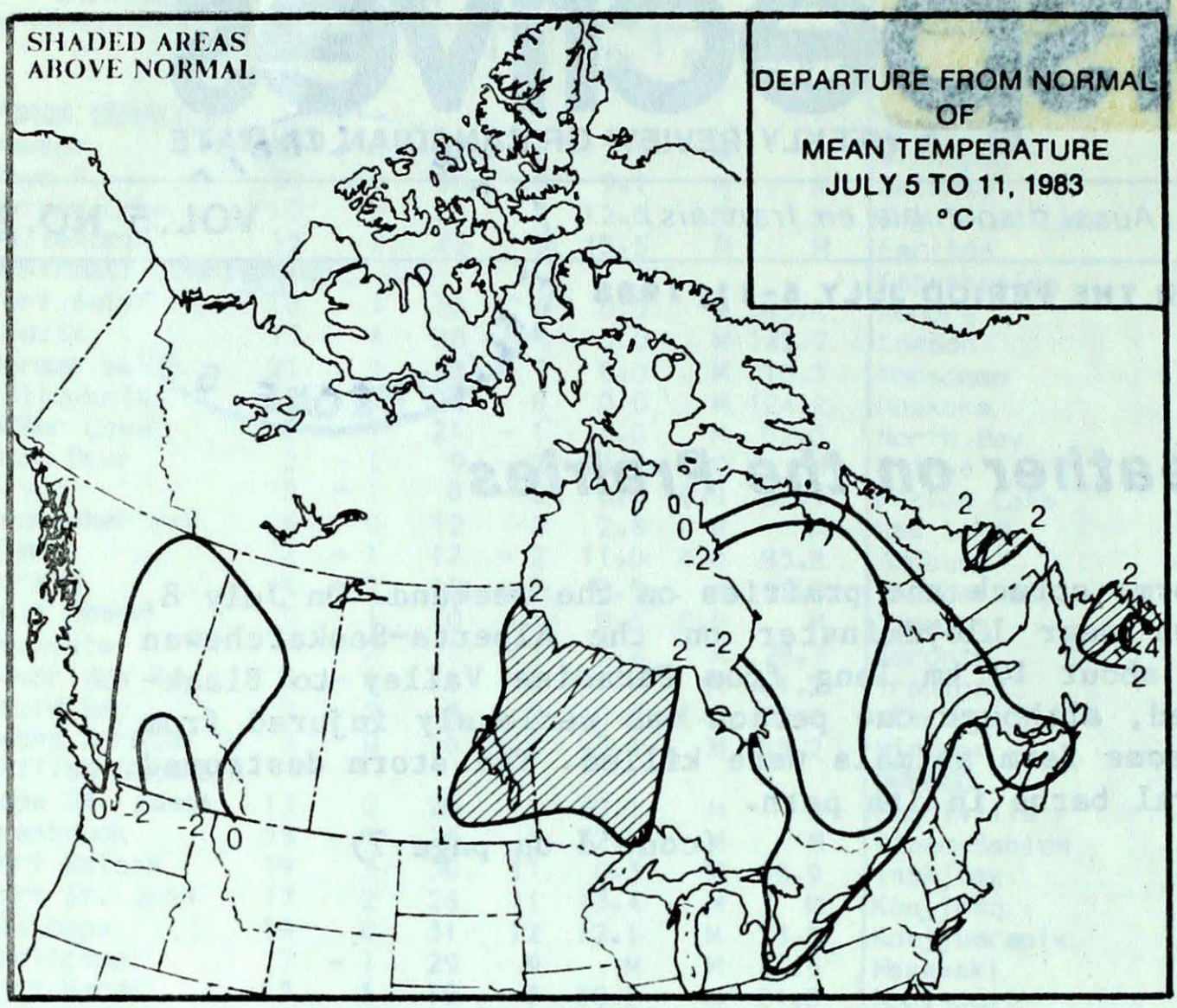
NOTE: The data shown in this publication are based on unverified reports from approximately 225 Canadian synoptic stations.

Canada



WEEKLY TEMPERATURES EXTREMES (°C)

	MAXIMUM		MINIMUM	
YUKON TERRITORY	27	Dawson	5	Whitehorse Shingle Point
NORTHWEST TERRITORIES	M		M	
BRITISH COLUMBIA	M		M	
ALBERTA	27	Medicine Hat	8	Peace River
SASKATCHEWAN	36	Swift Current	4	Yorkton
MANITOBA	33	Winnipeg	2	Brandon
ONTARIO	34	Thunder Bay	2	Timmins
QUEBEC	35	Gaspé	0	Kuujjuak
NEW BRUNSWICK	35	Charlo	7	Fredericton
NOVA SCOTIA	29	Greenwood	8	Sydney
PRINCE EDWARD ISLAND	30	Charlottetown	9	Charlottetown
NEWFOUNDLAND	35	Goose	6	Hopedale

ACROSS THE NATION

Warmest mean temperature	M
Coolest mean temperature	M

ACROSS THE COUNTRY...

Yukon and the Northwest Territories

A series of weather systems kept a pall of dark clouds over the southern Yukon. In contrast, the North enjoyed sunny skies and warm temperatures. Local thunderstorms dumped 30-60 mm of rain; for example, Mule Creek received 59 mm in one day. Lightning strikes ignited many forest fires west of the Mackenzie Valley; by the end of the week 72 fires were burning in the Yukon.

British Columbia

Dull showery weather continued to plague much of the province, delaying the hay harvest and other agricultural activities. Prince George had measurable precipitation each day of the week. Thundershowers were prevelant and hail was reported in several areas. Rivers in the interior were swelling due to the large runoff and riverbank erosion and mud slides are of concern.

Prairies

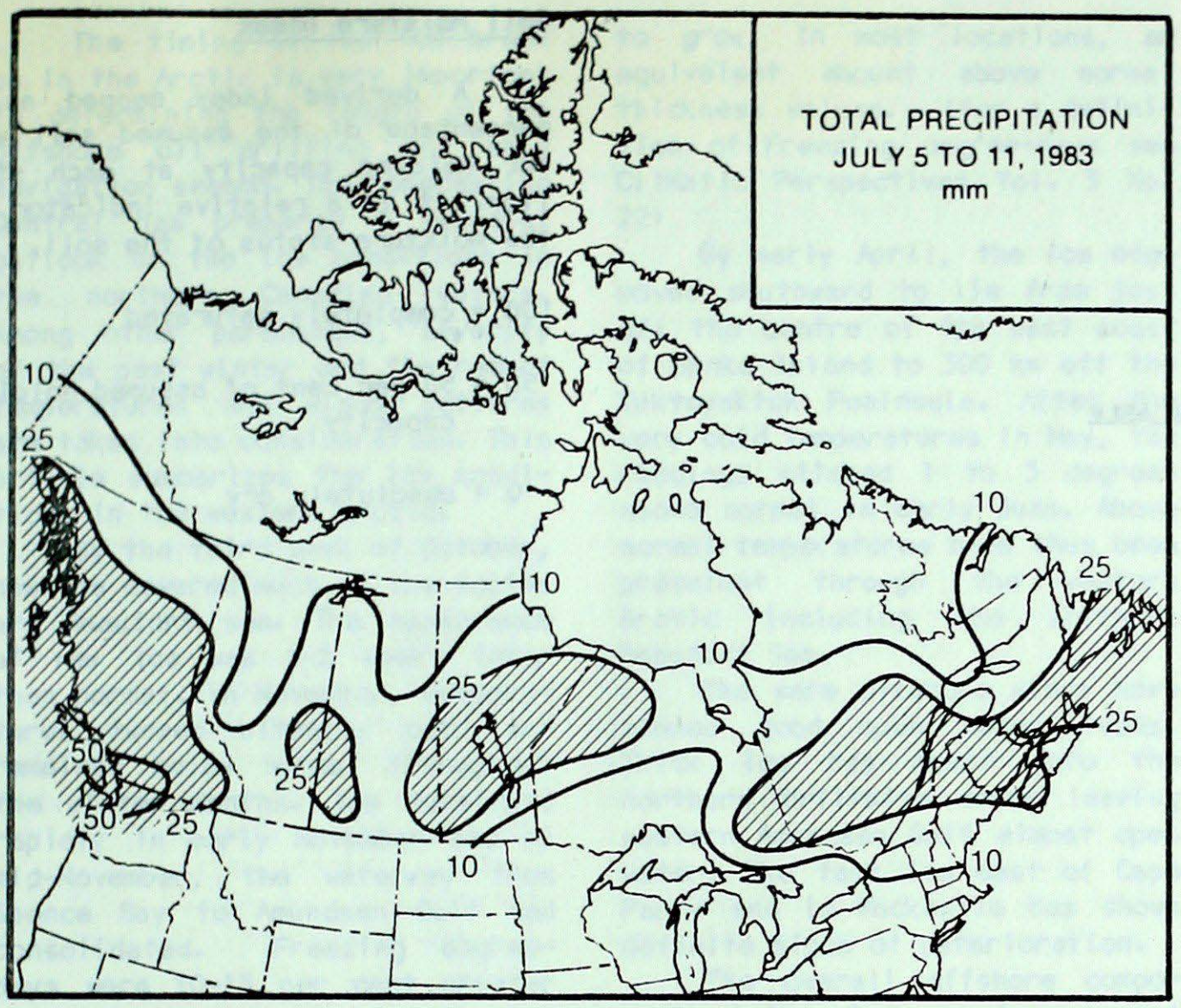
Once again showery unsettled weather predominated, but mean temperatures did manage to register near normal. In many communities farmland were nearly saturated and some low lying areas were under water.

Dry weather continued in the southwest corner of Alberta (Pincher Creek has had only 40 per cent of its normal rainfall) resulting in water flow cutback from irrigation reservoirs in the Lethbridge area.

Severe thunderstorms were reported in several communities. Tornadoes touched down southeast of Red Deer and west of Lloydminster on July 6 and July 8, respectively, damaging houses, barns and killing livestock. On July 9, Regina received 50 mm of rain in one hour; base ball size hail was reported southwest of Swift Current.

Ontario

Following the passage of the violent thunderstorms that swept southern Ontario on July 4, the



HEAVIEST WEEKLY PRECIPITATION (mm)

YUKON	12.9	Whitehorse
NORTHWEST TERRITORIES	M	
BRITISH COLUMBIA	M	
ALBERTA	37.4	Coronation
SASKATCHEWAN	122.6	Regina
MANITOBA	30.5	Brandon
ONTARIO	29.2	Big Trout Lake
QUEBEC	33.8	Bagotville
NEW BRUNSWICK	25.2	Fredericton
NOVA SCOTIA	52.2	Sydney
PRINCE EDWARD ISLAND	M	
NEWFOUNDLAND	M	

A Look at the forest fires in British Columbia

Cloudy and damp weather has kept the forest fire danger at moderate to low levels. Owing to the continued hot and dry weather, the risk of fires was high in the extreme northern British Columbia and the Yukon. Lightning caused at least 40 fires in early July. The number of fires to date is 858 burning 79,000 hectares compared with last year's figures of 1,360 fires and 119,000 hectares. Total costs for fire fighting to date are $13.8 million compared with $16.7 million last year.

temperatures plummeted to record low values.

Many record lows were set, including a chilling 0.5° at Guilford just south of Algonquin Park on July 6 - low enough to coat the area with a light frost.

On July 4, thunderstorms dumped heavy rain across southern Ontario. Chatham received 60 mm on that day. In the north, heavy rains inundated Geraldton with 54 mm of rain in 24 hours.

The hot, dry weather of late June and early July has had a noticeable effect on Ontario's agriculture. The heat was blamed for the disappointing strawberry harvest this year. Pea yields were down about 50 per cent from normal - the wet spring delayed planting and the early summer heat hampered the growth of this cool weather crop.

Québec

Record-setting hot weather continued. Nineteen stations experienced daily record highs. In addition, Sherbrooke, Mont-Joli and Gaspé recorded their highest ever as the temperatures climbed into the high thirties. After the hot spell, cooler air covered the province on July 7, and 10 daily record lows were set. On July 4, severe thunderstorms struck Trois-Rivières. Winds gusting near 95 km/h uprooted large trees in the area. Near the end of the week, 22 forest fires were burning in Québec. So far this year 237,000 hectares of timber has been destroyed by the fires compared to the 5-year average of 5,400 hectares to date.

Atlantic Provinces

Oppresively hot temperatures in the mid-thirties, produced numerous daily record high values across the provinces. In addition, a reading of 31.5° on July 6 was the highest ever recorded at St. John's. Rain in the 25 to 50 mm range fell almost everywhere. On July 4, Hopedale received a record 42 mm erasing the old record of 36 mm set in 1966. The wet weather helped extinguish numerous forest fires in the

(cont'd on page 7)

SOIL MOISTURE

NOT AVAILABLE

Soil Moisture Index

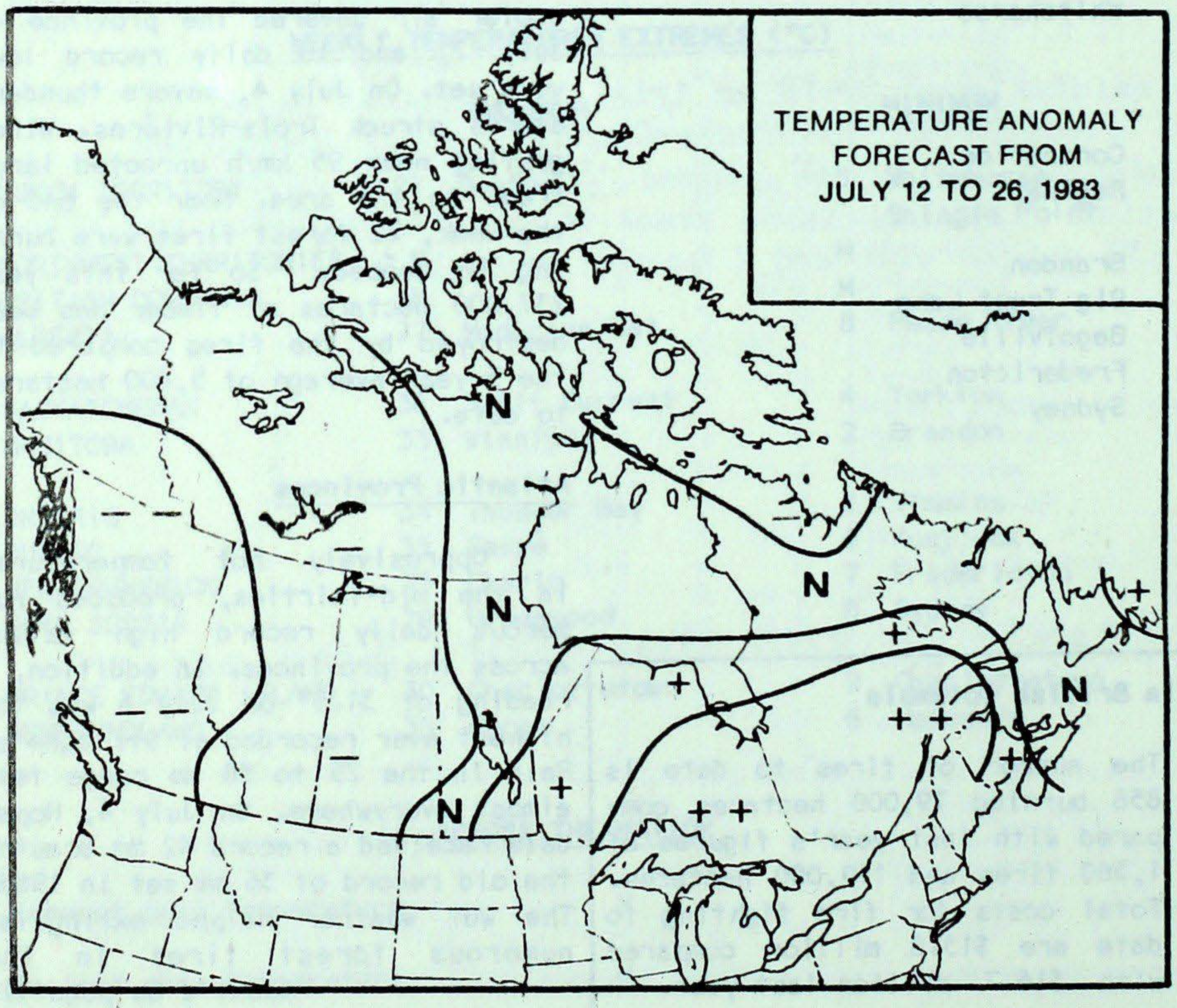
A derived index mapped as a percentage of the assumed soil water holding capacity at each station. It is a relative indicator of the moisture status of the soil.

100 = completely saturated

50 = 50 per cent of assumed holding capacity

0 = absolutely dry

TEMPERATURE ANOMALY FORECAST



Temperature Anomaly Forecast

The temperature anomaly forecast, for each of the 70 Canadian stations, is prepared by searching historical weather maps to find cases similar to the present one. The principle used is that a prediction for the next 15 days may be based on what is known to have actually happened during 15-day periods. After the five best cases are selected, the surface temperature anomalies are calculated. This results in five separate forecasts, which are averaged to provide the forecast depicted.

++ much above normal

\+ above normal

N normal

\- below normal

-- much below normal

SUMMARY OF ICE CONDITIONS IN THE WESTERN ARCTIC

The timing of the ice break up in the Arctic is very important in determining the length of the offshore oil drilling and ship navigation season. Ice Forecasting Central has prepared a seasonal outlook of the ice conditions in the northern Canadian waters. Among other parameters, severity of the past winter and the recent temperatures and winds patterns are taken into consideration. This article summarizes the ice conditions in the western Arctic.

By the third week of October, new ice covered much of the southern Beaufort sea. The appearance of new ice was 1-2 weeks later than normal. In November, temperatures turned bitterly cold and remained below normal throughout the winter months. Ice developed rapidly in early November and by mid-November, the waterway from Spence Bay to Amundsen Gulf had consolidated. Freezing degree-days were 10-15 per cent greater than normal, This enabled the ice to grow, in most locations, an equivalent amount above normal thickness values. (for a definition of Freezing degree-days see Climatic Perspectives Vol. 5 No. 22)

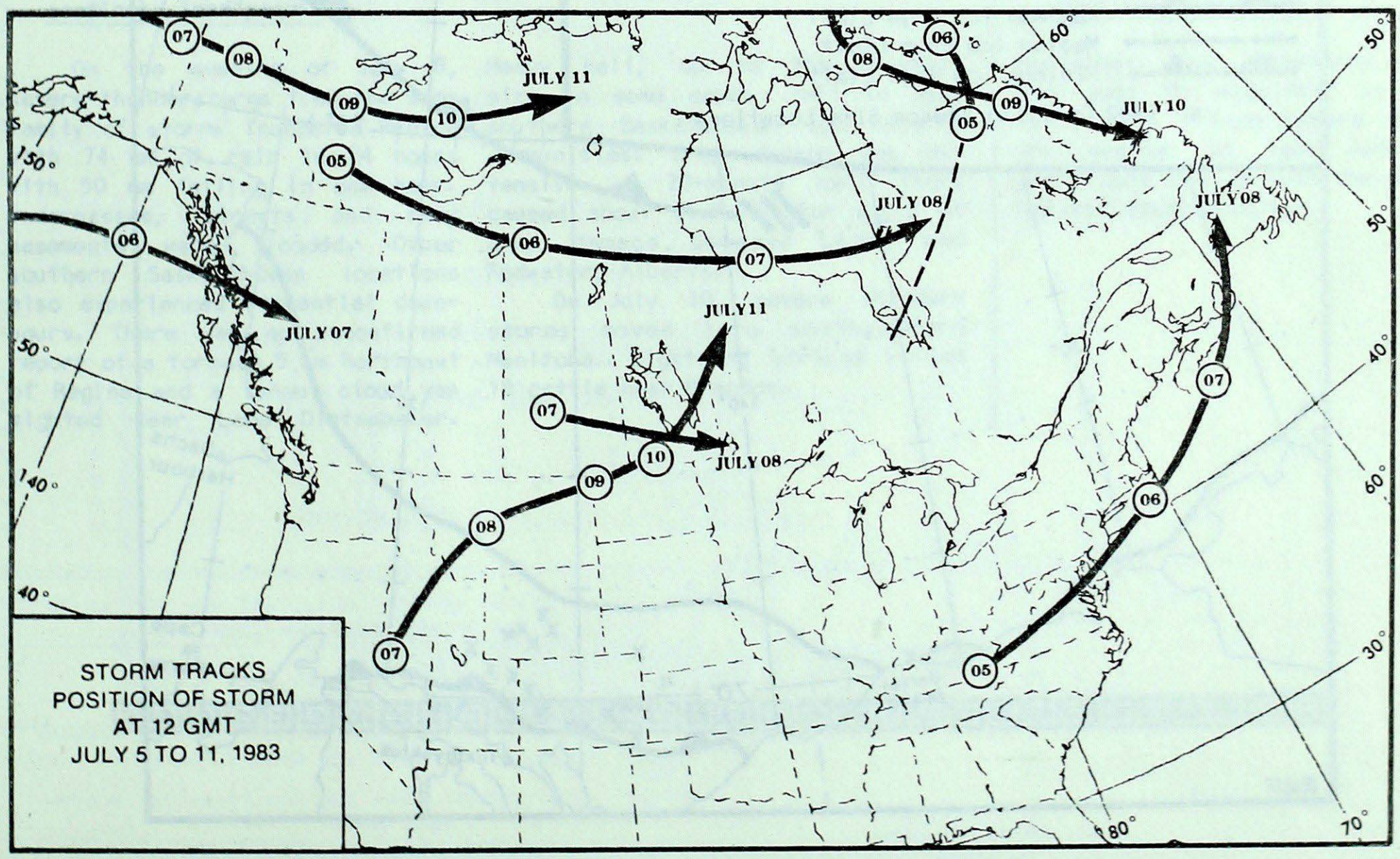
By early April, the ice edge moved southward to lie from just off the centre of the west coast of Banks Island to 300 km off the Tuktoyaktuk Peninsula. After the very cold temperatures in May, the readings climbed 1 to 3 degrees above normal in early June. Above normal temperatures have thus been prevalent through the western Arctic including the southern Beaufort Sea.

The warm offshore winds have opened good open water leads. Thick ice has moved into the northern drillsite areas leaving western Amundsen Gulf almost open water. The fast ice east of Cape Parry and in Mackenzie has shown definite signs of deterioration.

The overall offshore component of the wind and above normal temperatures are expected to widen the open water lead in the southern Beaufort Sea. Depending upon the local wind conditions, clearing of all drillsites is not expected until the end of July. Complete fracture of the ice along the Tuktoyaktuk Peninsula will not take place until the end of July.

- Information provided by the Ice Forecasting Central

STORM TRACKS



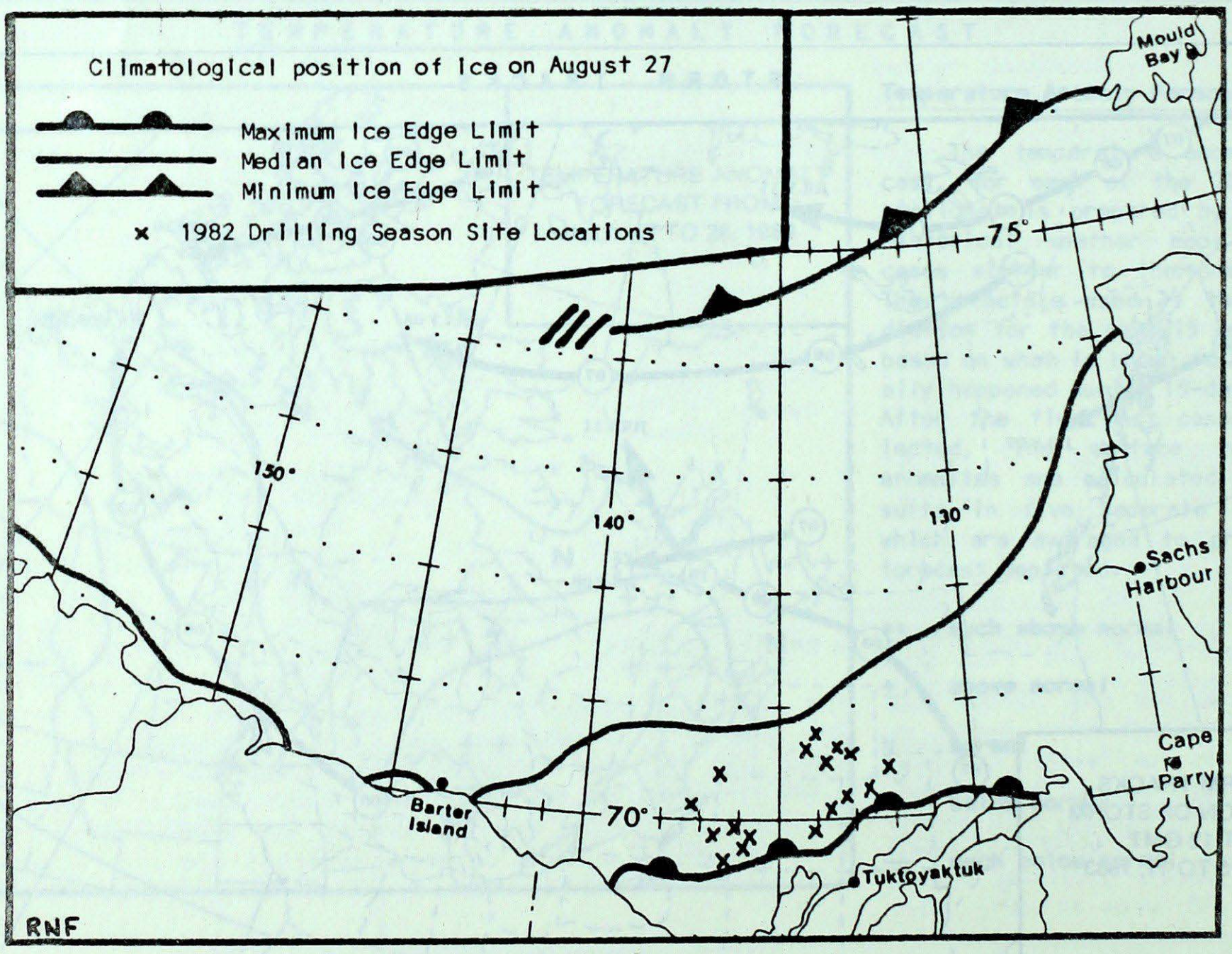
SOUTHERN BEAUFORT SEA ICE HAZARD

by
B. Ramsay
Ice Forecasting Central

Over the past several years, offshore exploration activity in the southern Beaufort sea has become an increasingly important key to Canada's economic future. This search for the anticipated wealth of hydrocarbon resources beneath the sea bed is taking place in one of the most difficult and unforgiving environments in the world. The drilling areas are almost completely ice covered for over nine months of the year, and an invasion of the multi-year arctic ice pack remains a constant threat throughout the drilling season. The ice hazard has spurred rapid technological advances in terms of drilling platforms- from offshore drillships, to artificial sand or gravel islands, to semi-lightweight concrete caisson structures set down upon submerged sand berms. In the 1982 season, another new system known as the SSDC - single steel drilling caisson was deployed and this year, Conical Drilling Unit - which is a floating structure incorporating a downbreaking cone to fracture and deflect the ice will be deployed.

Sea ice remains a major problem to these activities. Since 1976 the Beaufort weather and ice office (BWIO) at Tuktoyaktuk has been providing ice information, dedicated forecast support, and consulting services on a contractual basis to the major offshore operators. Current and forecast ice regime guidance is received by BWIO from ice forecasting central (IFC) in Ottawa.

During the winter months, fast ice grows along the coast out to 50 to 100 kilometres offshore. The multi-year arctic pack edge pushes south to lie, on average, within 120 to 200 kilometers of the coast. Between these two boundaries thick winter ice puts a halt to virtually all shipping and drilling activity, By the end of May, daily mean temperatures usually start to move above freezing, and the first signs of spring melt become apparent during the first half of June. By late in the month, warm offshore winds normally create areas of open water in the Mackenzie and Kugmallit Bays, in western Amundsen Gulf, and along the fast ice edge of the Tuktoyaktuk Peninsula. Although large areas of open water appear in the drill site area by early July, complete clearing of all sites does not occur until later in the month. This is due to the



injection of additional amounts of mobile ice into the area earlier in the month. With the final fracture of the fast ice in Amundsen Gulf and along the Tuktoyaktuk Peninsula. Offshore drilling activity starts in July as soon as ice conditions are deemed acceptable. During August and much of September, the open water in the southern Beaufort west of Banks Island and off the Tuktoyaktuk Peninsula continues to expand. However, any prolonged period of cool northwesterly winds can push the Arctic pack edge south again, threatening the drillsites.

By late September, mean daily temperatures drop below freezing once more. The prevailing northwesterly winds push the Arctic pack southward, and new ice appears along the shore during the first week of October. New ice appears in the drillsite area a week to 10 days later, and freeze-up progresses rapidly from there. Drillships are usually able to operate on-site until late October. However, ice conditions can significantly reduce or extend the season. In 1982, for example, a mild fall coupled with favourable offshore winds, resulted in the best ice conditions over the southern Beaufort in many years, and the last drillship (Explorer 4) did not return to Mckinley Bay until November 18. In contrast, intrusions of multi-year ice into the drill area in September 1980 lead to the drillships returning to Mckinley Bay during the period 20 September to 12 October.

Throughout the break-up and freeze-up cycle, BWIO acts as a distribution centre for ice analyses and forecasts prepared by IFC, and provides forecasts, warnings, and advisories of various ice, meteorological, and oceanographic parameters. Additionally, weather and ice information is supplied to the computerized ice monitoring system operated by Dome Petroleum. Thus, government and private industry continue to work together in order to ensure a safe working environment for offshore oil and gas exploration, in spite of the ever-present hazard of sea ice in the southern Beaufort Sea.

...continued from page 1

On the evening of July 8, severe thunderstorms from the same family of storms inundated Regina with 74 mm of rain in 24 hours with 50 mm falling in one hour. Underpasses, streets and many basements were flooded. Other southern Saskatchewan locations also experienced torrential downpours. There was an unconfirmed report of a tornado 5 km northeast of Regina and a funnel cloud was sighted near Lake Diefenbaker. Heavy hail, up to the baseball size in some cases, fell in many southern Saskatchewan and Alberta communities. Crop damage was extensive. A 20-minute hail storm caused about $1.5 million worth of crop damage between Legal and Redwater, Alberta.

On July 10, severe thunderstorms moved into southwestern Manitoba. Lightning strikes killed 18 cattle near Brandon.

...continued from page 3

Maritimes. The strawberry yield was good to excellent in Nova Scotia. In Prince Edward Island dry weather of late June and early July has delayed the potato harvest considerably.

TEMPERATURE, PRECIPITATION AND BRIGHT SUNSHINE DATA FOR THE WEEK ENDING 0600 GMT JULY 12, 1983

STATION	TEMP				PRECIP		SUN
	Av	Dp	Mx	Mn	Tp	SOG	H
YUKON TERRITORY							
Dawson	16	M	27	8	3.6	M	M
Mayo A	16	M	26	6	8.6	M	M
Watson Lake	12	M	19	3	12.0	M	M
Whitehorse	13	M	22	5	12.9	M	M
NORTHWEST TERRITORIES							
Fort Smith	16	M	26	4	17.2	M	M
Inuvik	M	M	M	M	M	M	M
Norman Wells	17	M	24	9	4.4	M	M
Yellowknife	M	M	M	M	M	M	M
Baker Lake	M	M	M	M	M	M	M
Cape Dyer	M	M	M	M	M	M	M
Clyde	M	M	M	M	M	M	M
Frobisher Bay	M	M	M	M	M	M	M
Alert	M	M	M	M	M	M	M
Eureka	M	M	M	M	M	M	M
Hall Beach	M	M	M	M	M	M	M
Resolute	M	M	M	M	M	M	M
Cambridge Bay	M	M	M	M	M	M	M
Mould Bay	M	M	M	M	M	M	M
Sachs Harbour	M	M	M	M	M	M	M
BRITISH COLUMBIA							
Cape St. James	M	M	M	M	M	M	M
Cranbrook	M	M	M	M	M	M	M
Fort Nelson	15	M	M	M	M	M	M
Fort St. John	14	M	M	M	M	M	M
Kamloops	18	M	M	M	M	M	M
Penticton	16	M	M	M	M	M	M
Port Hardy	15	M	M	M	M	M	M
Prince George	14	M	M	M	M	M	M
Prince Rupert	M	M	M	M	M	M	M
Revelstoke	M	M	M	M	M	M	M
Smithers	M	M	M	M	M	M	M
Vancouver	16	M	M	M	M	M	M
Victoria	15	M	M	M	M	M	M
Williams Lake	M	M	M	M	M	M	M
ALBERTA							
Calgary	17	M	23	10	15.2	M	M
Cold Lake	18	M	24	12	31.8	M	M
Coronation	19	M	24	13	37.4	M	M
Edmonton Namao	17	M	22	12	24.0	M	M
Fort McMurray	17	M	23	11	16.5	M	M
Jasper	14	M	20	8	6.7	M	M
Lethbridge	19	M	25	12	17.8	M	M
Medicine Hat	20	M	27	13	5.2	M	M
Peace River	14	M	20	8	2.2	M	M
SASKATCHEWAN							
Cree Lake	17	M	25	6	0.4	M	M
Estevan	23	M	32	9	20.1	M	M
La Ronge	17	M	26	5	5.7	M	M
Regina	21	M	24	8	22.6	M	M
Saskatoon	21	M	31	10	14.4	M	M
Swift Current	20	M	36	9	40.1	M	M
Yorkton	20	M	32	4	29.7	M	M
MANITOBA							
Brandon	21	M	31	2	30.5	M	M
Churchill	14	M	27	2	17.8	M	M
The Pas	19	M	29	5	28.2	M	M
Thompson	16	M	28	3	25.3	M	M
Winnipeg	22	M	33	5	0.0	M	M
ONTARIO							
Big Trout Lake	19	M	29P	9	29.2	M	M
Earlton	17	M	34	6	28.6	M	M
Kapuskasing	17	M	33	5	2.8	M	M
Kenora	23	M	34P	15P	0.0	M	M
London	19	M	26P	11P	M	M	M
Moosonee	16	M	25P	1P	12.8	M	M
Muskoka	16	M	29	5	3.4	M	M
North Bay	16	M	27	5	1.2	M	M
Ottawa	19	M	26	10	14.9	M	M
Pickle Lake	20	M	29P	9P	19.0	M	M
Red Lake	21	M	28	12	1.9	M	M
Sudbury	17	M	31	9	0.8	M	M
Thunder Bay	19	M	34	9	0.2	M	M
Timmins	17	M	29	2	29.0	M	M
Toronto	19	M	30	8	0.0	M	M
Trenton	19	M	27	10	2.0	M	M
Wiarton	17	M	28	6	1.2	M	M
Windsor	20	M	30	10	0.0	M	M
QUEBEC							
Bagotville	15	M	27	8	33.8	M	M
Blanc-Sablon	M	M	M	M	M	M	M
Inukjuak	6	M	14P	2P	M	M	M
Kuujjuaq	9	M	21	0	17.2	M	M
Kuujjuarapik	7	M	24	1	6.0	M	M
Manawaki	15	M	24	5	4.5	M	M
Montréal	16	M	29	8	M	M	M
Mont-Joli	15	M	25	9	15.2	M	M
Natashquan	15	M	25	4	14.6	M	M
Nitchequon	10	M	18	1	21.2	M	M
Québec	17	M	26	8	23.8	M	M
Schefferville	10	M	22	3	9.7	M	M
Sept-Iles	13	M	23	6	3.6	M	M
Sherbrooke	15	M	27	6	M	M	M
Val-d'Or	14	M	29	5	35.2	M	M
NEW BRUNSWICK							
Charlo	17	M	35	7	17.6	M	M
Fredericton	18	M	29	7	25.2	M	M
Saint John	16	M	24	8	27.0	M	M
NOVA SCOTIA							
Greenwood	17	M	29	8	30.4	M	M
Shearwater	16	M	23	10	19.0	M	M
Sydney	18	M	27	8	52.2	M	M
Yarmouth	16	M	22P	11P	22.5	M	M
PRINCE EDWARD ISLAND							
Charlottetown	17	M	30P	9P	10.0	M	M
Summerside	18	M	29	10	27.8	M	M
NEWFOUNDLAND							
Gander	18	M	31	10	33.6	M	M
Port aux Basques	M	M	M	M	M	M	M
St. John's	18	M	32	9	32.4	M	M
St. Lawrence	16	M	23	9	25.0	M	M
Cartwright	15	M	32	7	19.8	M	M
Goose	17	M	35	7	13.9	M	M
Hopedale	12	M	15	6	3.3	M	M

Av = weekly mean temperature (°C)
Mx = weekly extreme maximum temperature (°C)
Mn = weekly extreme minimum temperature (°C)
Tp = weekly total precipitation (mm)
Dp = Departure of mean temperature from normal (°C)

SOG = snow depth on ground (cm), last day of the period
H = weekly total bright sunshine (hrs)

X = not observed
P = extreme value based on less than 7 days
M = not available at press time

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