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A WEEKLY REVIEW OF CANADIAN CLIMATE

CLIMATIC PERSPECTIVES

THE CANADIAN CLIMATE CENTRE,
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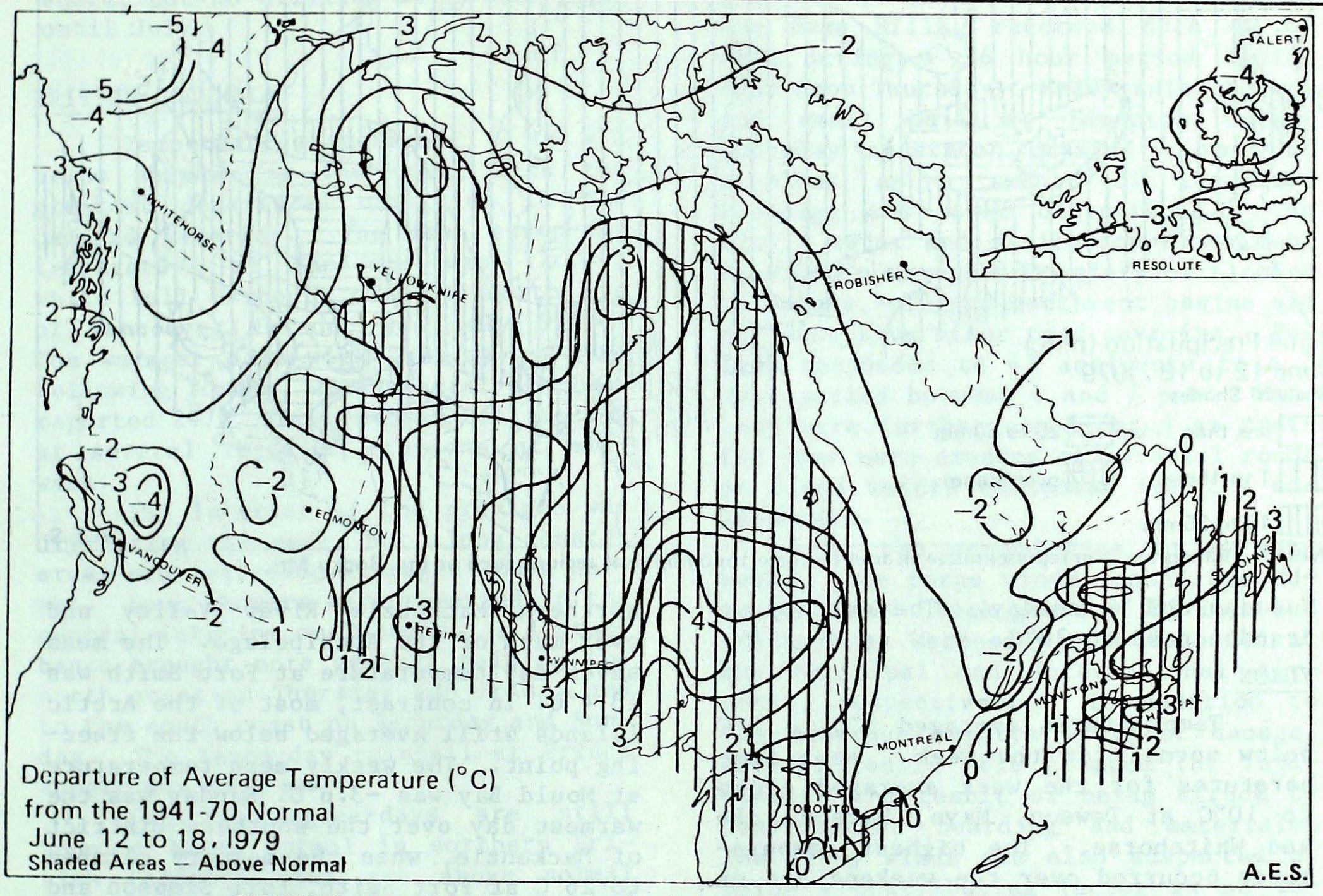
JUNE 22, 1979 VOL. 1 NO. 19



Departure of Average Temperature (°C)
from the 1941-70 Normal
June 12 to 18, 1979
Shaded Areas – Above Normal

A.E.S.

WEATHER HIGHLIGHTS FOR THE WEEK - JUNE 12 - 18, 1979

Cool over British Columbia and Quebec, but very warm over the eastern Prairies and Maritimes

Mean temperatures averaged below normal over British Columbia, the Yukon, Quebec and the northern Arctic during the week. In contrast, it was relatively warm for the time of the year over the eastern Prairies, northwestern Ontario and the Maritimes.

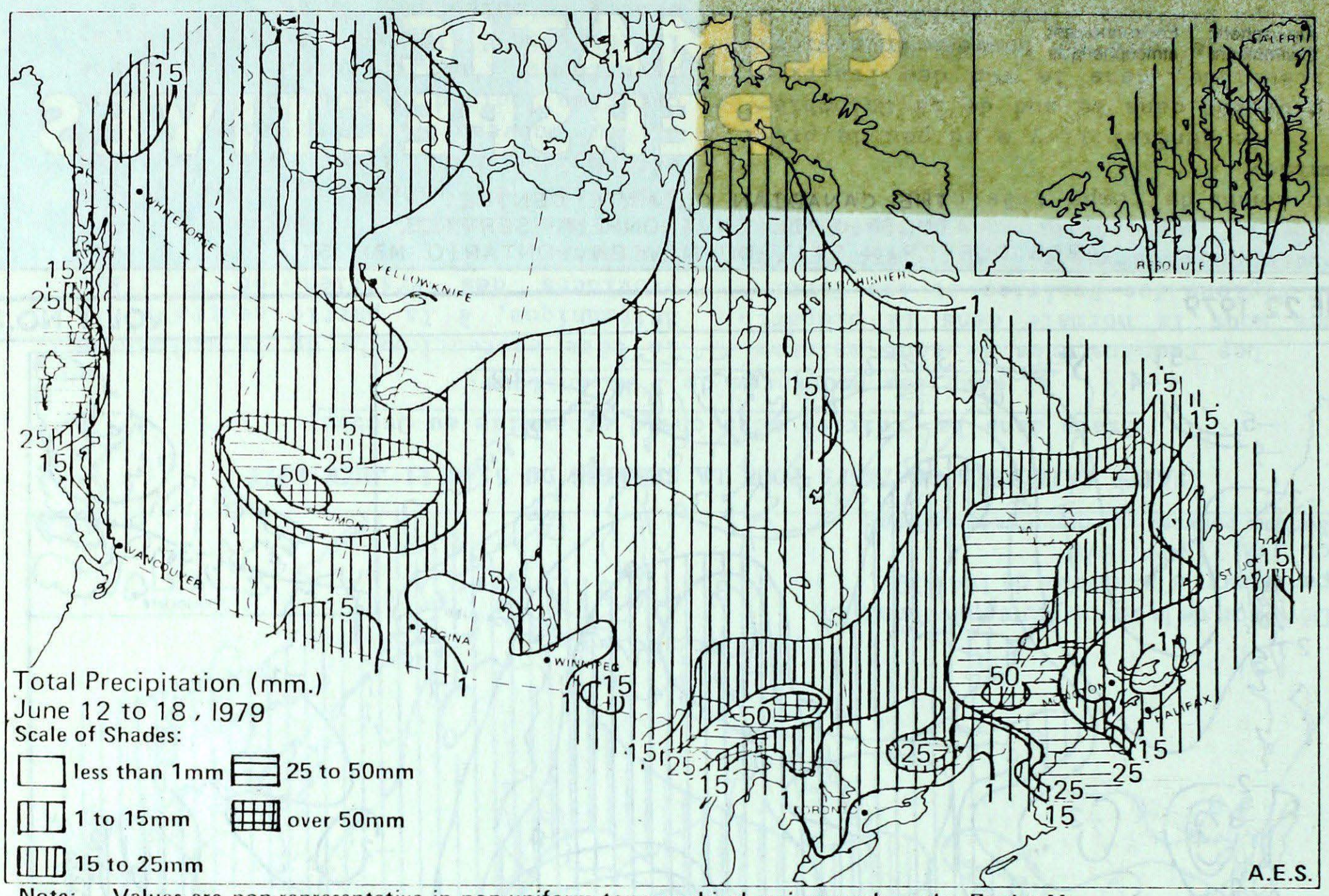
Precipitation was relatively light over much of Canada during the week, but heavy rain was reported over central portions of Alberta and Saskatchewan, northeastern Ontario, central Quebec and southern Nova Scotia.

Agricultural conditions are reasonably good across the nation, but dry warm winds are causing poor germination and growing conditions over parts of southern Alberta.

A rash of forest fires has broken out over northwestern Ontario due to continued dry weather there.

The warmest weather of the season so far was reported over southern Saskatchewan and southern Manitoba on

NOTE: The data shown in this publication are based on unverified reports from approximately 170 Surface Synoptic reporting stations of the Atmospheric Environment Service.



Note: Values are non-representative in non-uniform topographical regions such as the Rocky Mts.

Tuesday and Wednesday. The mercury at Brandon rose to 38°C.

YUKON

Temperatures averaged 3°C to 5°C below normal for the week. Mean temperatures for the week averaged close to 10°C at Dawson, Mayo, Watson Lake and Whitehorse. The highest temperatures occurred over the weekend and on Monday, when Mayo recorded 20°C. Frost was reported on both Friday and Saturday at Dawson, when the mercury fell to -2°C.

Precipitation was generally above normal for the week over the Territory. Dawson recorded a seven-day total of 21.4 mm, of which 13.8 mm fell on Sunday. Nearby Mayo, however, received only 3.6 mm during the week.

NORTHWEST TERRITORIES

Mean temperatures over the southern District of Mackenzie and most of the District of Keewatin averaged near normal to about 2°C above normal for the week. The remainder of the Territories was well below normal, with anomalies as great as 3°C along the extreme northern Mackenzie River Valley and over much of the Archipelago. The mean seven-day temperature at Fort Smith was 13.4°C. In contrast, most of the Arctic Islands still averaged below the freezing point. The weekly mean temperature at Mould Bay was -3.6°C. Sunday was the warmest day over the southern District of Mackenzie, when the mercury climbed to 26°C at Fort Smith, Fort Simpson and Hay River. In contrast, the minimum temperature at Resolute on Tuesday was -13°C.

Most stations reported light precipitation during the week, but amounts were above normal for the time of the year at some high-latitude stations. Sachs Harbour received 40.6 mm of precipitation in one day, Friday.

Ice conditions in the Beaufort Sea are looking favourable as the ice is slowly starting to deteriorate with water pooling on the surface. Consolidated ice is still reported in Amundsen Gulf. Ice conditions in the area of the western drill sites are variable due to varying wind conditions, but a drilling start-up in July is likely.

Canada's most powerful ice breaker, the John A. Macdonald, has moved little during the past week and is having difficulty in breaking through consolidated ice to open water, as ridging in the consolidated ice is reported 2 metres above the ice surface, making the ice 10 metres thick in places.

Ice conditions in the eastern Arctic are ahead of schedule everywhere, but no drilling will take place until July.

BRITISH COLUMBIA

Temperatures averaged 1°C to 4°C below normal for the week, with the greatest departures occurring in the central interior. The mean seven-day temperature at Kamloops was 17.0°C, while Bull Harbour, off the north tip of Vancouver Island, was only 9.9°C. The warmest days were Tuesday and the following Sunday, when several stations reported 29°C. Temperatures fell to 1°C at several interior stations at mid-week.

The interior of the province was dry during the week, but along coastal areas precipitation averaged above normal. Some showers were reported in the central interior on Tuesday. A disturbance brought more general rain to the north coast on Thursday and Friday and to the south coast on Saturday and Sunday. The seven-day rainfall at Prince Rupert was 29.2 mm.

Growing degree-days are still running below normal in northern British Columbia, but are above normal along the southern coastal region of the province.

ALBERTA

Most of Alberta reported mean temperatures normal to 2°C below normal for the week. The mean temperature for the seven-day period was 16.0°C at Medicine Hat. Banff and Rocky Mountain House, in contrast, each reported a mean of 10.7°C. The warmest weather occurred on Tuesday, when Lethbridge reached 31°C and Medicine Hat 34°C. Frost was reported in the foothills on Friday and Saturday, as minima reached 0°C at Banff, Calgary, Jasper and Rocky Mountain House.

A vigorous disturbance moved across the northern half of the province during mid-week. Moderate to strong winds and heavy rainfall accompanied the passage of the low. The heaviest rainfall was reported in the Whitecourt, Grande Prairie and Slave Lake forest districts. While a number of forest look-out towers reported between 50 mm to 70 mm, Goose Mountain look-out at an elevation of 1,500 m in the Swan Hills, recorded 85.6 mm of rain during a 36 hour period ending near noon Thursday. Heavy rain showers and small hail at Edmonton during Thursday afternoon created a rash of problems as a result of localized flooding and power disruptions. The city's water and sanitation department received numerous complaints of flooded basements, plugged catchment basins and at least five minor road cave-ins. Police responded to 43 accidents in a 3 hour period between 4 and 7 p.m. Matters were further complicated as traffic jams were created on arterial roads as flood waters collected in city underpasses.

For the second time in as many weeks, gale force winds lashed the Edmonton area. Peak gusts of 82 km/h and 106 km/h on Wednesday were recorded at the Municipal and International Airports, respectively. In addition to the numerous reports of minor damage, several people were treated for injuries as the result of being struck by construction boarding and materials. The gusty winds are also suspected of being a contributing factor in an industrial accident in which a heavy construction crane being repaired toppled and claimed the life of one man.

Growing degree-days up to June 16 are still running less than normal for this time of the year.

Over southern Alberta, agricultural conditions are extremely variable due to differing field conditions at time of planting. Unseasonably dry weather during the past three weeks have resulted in poor crop germination in many regions. Almost constant warm winds are blamed for drying out the topsoil in most areas, leaving seeds without sufficient moisture to begin growing. Plants which have germinated

are starting to show signs of stress. Complicating the situation is soil crusting, caused by winds and lack of rain, which is slowing plant growth. Irrigation is underway in the sugarbeet area west of Lethbridge.

SASKATCHEWAN AND MANITOBA

Temperatures averaged 1°C to 3°C above normal over most of Manitoba and Saskatchewan. The mean temperature for the week was 18.8°C at Brandon and 18.7°C at Regina. In contrast, Churchill was 7.6°C. Tuesday and Wednesday were very hot over southern regions, with temperatures rising well up into the thirties at many communities. A number of stations reported record high temperatures for June 12th and 13th. Brandon reported 38°C on the 13th, and this is the highest temperature reported so far this summer in Canada. 37°C was also recorded at Broadview, Estevan and Yorkton, although Churchill was still reporting freezing temperatures during the week; the mercury fell to -2°C on Tuesday and -1°C on Friday at that station. However, no frost was reported in Saskatchewan.

Precipitation was fairly light during the week over most of the regions, but the west central portion of Saskatchewan reported 10 mm to 20 mm during the week. Buffalo Narrows reported exceptionally heavy rain, however, 40.6 mm. Hodgson reported egg-yolk size hail during a thunderstorm on Wednesday.

Growing degree-days up to June 16 are still running below normal for this time of the year in Saskatchewan and southern Manitoba, but they are above normal over northern sections of Manitoba. Planting is now fully underway.

ONTARIO

Temperatures over northern Ontario averaged 2°C to 4°C above normal for the week, but over central, southern and eastern regions of the province they were generally near normal. The mean temperature at Windsor for the seven-day period was 19.9°C, while at Wawa, on the eastern shore of Lake Superior, it was only 13.3°C. Temperatures Tuesday through Thursday were decidedly chilly over most of the province and a number of daily low maximum temperature records were set. Moosonee reported -2°C on Tuesday, a record low minimum temperature for the date. Temperatures warmed rapidly to above normal values by the weekend. Armstrong reported 32°C on Thursday.

Precipitation averaged below normal over most of the province for the week. In the north many stations received about 10 mm; however, Timmins was deluged by 63.6 mm, most of which (58.8 mm) fell on Sunday. Only spotty precipitation fell over the south, but Ottawa was the major exception. It reported 44.2 mm on Saturday.

The heavy rain of the past few weeks has kept the danger of forest fires to a minimum in northeastern Ontario. Over the northwestern part of the province, however, precipitation has been much less. As a consequence, the forest fire danger is extreme and a number of fires have broken out during the past week. Two fires have already destroyed 8,000 and 5,000 hectares, respectively, so far.

The growing degree-days to June 16 are running normal to above normal for this time of the year over most of the province. They are still below normal in the Kenora area, however.

The Ontario Ministry of Natural Resources reports that the deer population came through the past winter in good shape, with only the normal winter mortality rate of 2 to 10 per cent. The early spring thaw, which generally began a month earlier than in 1978, was credited with the reduction in starvation.

QUEBEC

Three different types of weather prevailed over Quebec this week. First, the circulation around a depression over the Maritimes brought cold arctic air over the province. Then, a main air mass from the southwest invaded most of the regions while a new disturbance was approaching Hudson Bay. The eastward motion of the disturbance allowed a cold front to sweep the province and the rest of the week was under the influence of an approaching high pressure area covering most of the country.

Several records were broken this week. At the beginning of the week, a new record of minimum temperature was set at Dorval on the 13th and records of low maximum were lowered at Bagotville and Roberval on the 12th. The warm air mass set new high records from the 15th to the 17th in Sherbrooke, St. Hubert, Quebec City and Baie Comeau; the maximum reached 33°C in St. Hubert. Despite the warm weather over the weekend, mean temperatures for the seven-day period averaged generally slightly below normal.

The week was marked by heavy but local precipitation. Quebec city received 78 mm of rain in less than 2 hours (120 minutes); the torrential downpour broke the records for the amount of precipitation in 30, 60 and 120 minutes and it was also a record for 24 hours. This thunderstorm produced hail of up to 2.5 cm in diameter. Damage resulted from overflowing of sewers; basements were flooded and soil was eroded where it was not protected by dense enough vegetation. Severe thunderstorms also occurred on the 16th at Baie Ville in Nicolet County where a gust damaged farm buildings and some 20 campers in a camp ground; one person was injured.

The northeastern regions also received large amounts of precipitation during the week. It rained on each of the 7 days of the week at Sept-Iles and the total exceeded 55 mm.

MARITIME PROVINCES

Temperatures averaged 1°C to 3°C above normal over most of the Maritimes during the seven-day period. Greenwood reported a mean temperature of 18.4°C for the week, while Yarmouth was only 14.1°C. Saturday was the warmest day of the season so far. Temperatures rose into the thirties at all but exposed coastal localities, and many people flocked to the beaches and camp grounds. The mercury rose to 34°C at both Chatham and Fredericton. Several records of high minimum and maximum temperatures were broken during the week-end. In contrast, Charlo and Fredericton, New Brunswick, reported 3°C on both Wednesday and Thursday mornings.

Precipitation was below normal for the week over most of the Maritimes. However, showers and thunderstorms were reported over New Brunswick on Tuesday, Prince Edward Island on Saturday and Nova Scotia on Monday. Yarmouth received 49.1 mm over the week, most of which, 42.8 mm, fell on Monday. A woman was struck by lightning near Charlo, New Brunswick, on Saturday.

Growing degree-days are running well above normal for the time of the year over all of the Maritimes and the considerable sunshine and light rainfall of the past week has helped agriculture greatly. Grass and hay are growing fast, and early crops are being cut in Prince Edward Island, and will soon be cut in New Brunswick and Nova Scotia. The strawberry crop is being picked unusually early this year.

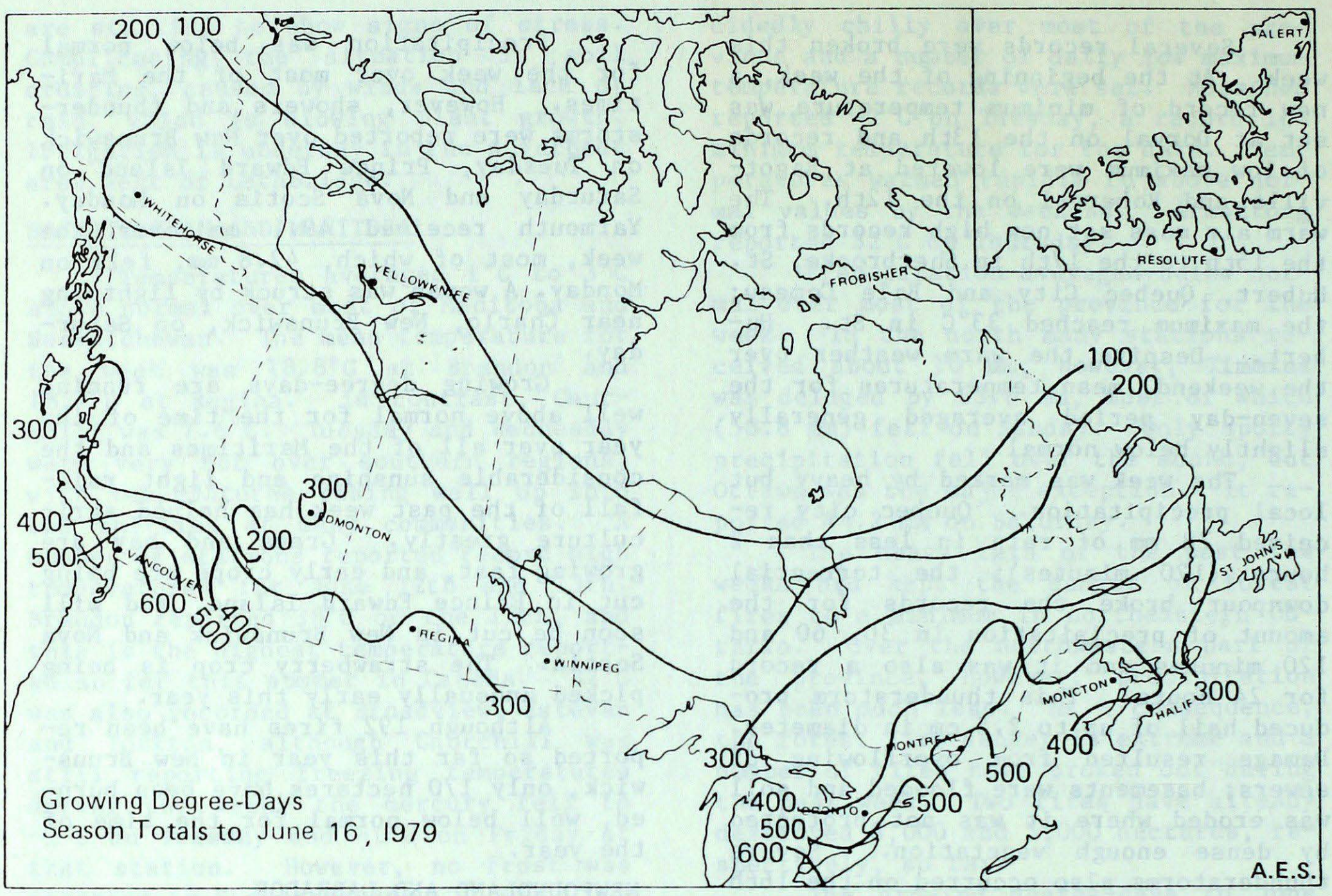
Although 192 fires have been reported so far this year in New Brunswick, only 170 hectares have been burned, well below normal for the time of the year.

NEWFOUNDLAND AND LABRADOR

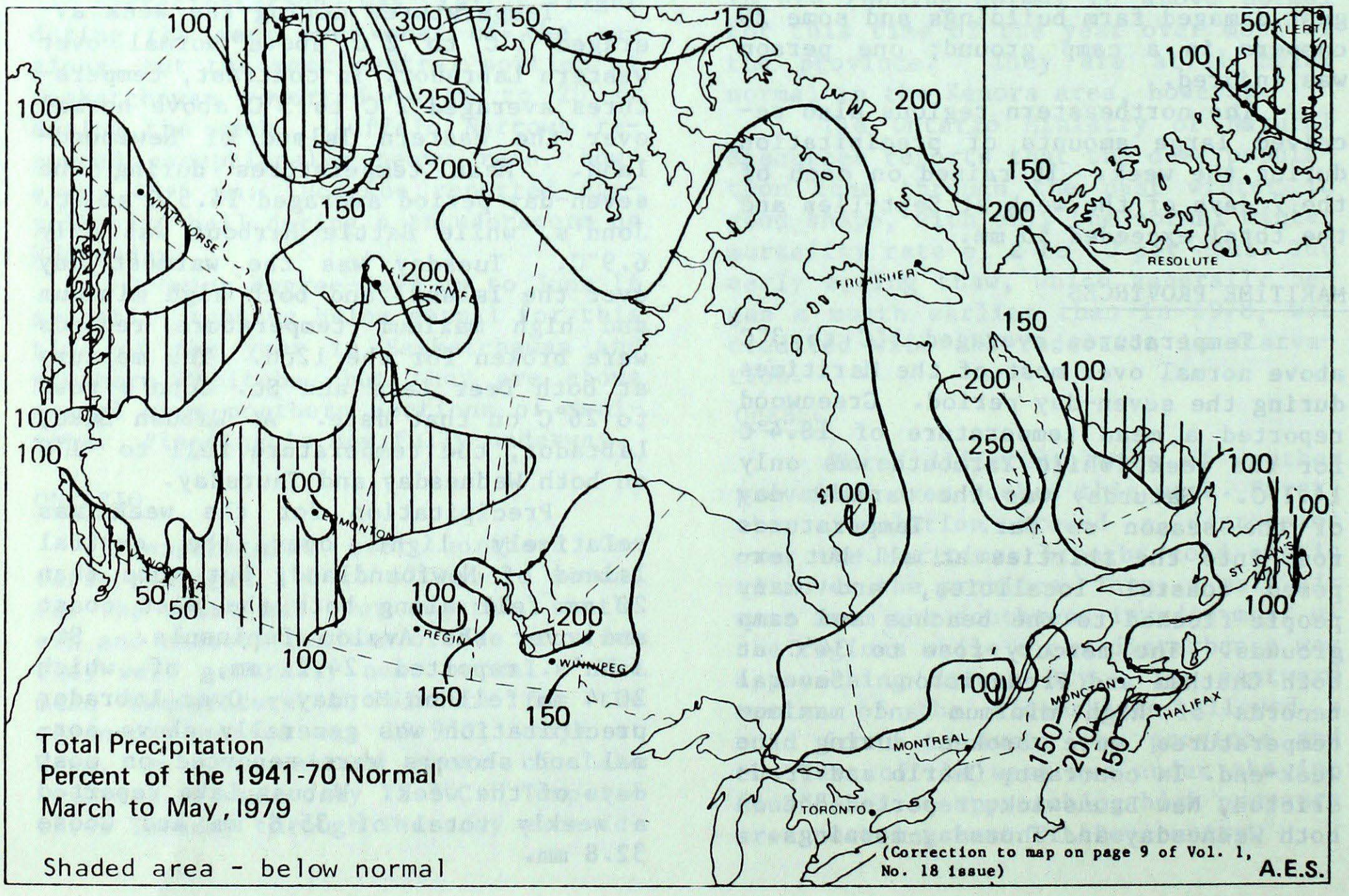
Temperatures during the week averaged 1°C to 2°C above normal over western Labrador. In contrast, temperatures averaged 2°C to 3°C above normal over the eastern Island of Newfoundland. Mean temperatures during the seven-day period averaged 14.5°C at St. John's, while Battle Harbour was only 6.9°C. Tuesday was the warmest day over the Island, and both high minimum and high maximum temperature records were broken for the 12th. The mercury at both Deer Lake and St. John's rose to 26°C on that date. At Wabush Lake, Labrador, the temperature fell to -1°C on both Wednesday and Thursday.

Precipitation for the week was relatively light over the central Island of Newfoundland, but more than 20 mm fell along both the west coast and over the Avalon Peninsula. St. John's reported 24.2 mm, of which 20.4 mm fell on Monday. Over Labrador precipitation was generally above normal and showers were reported on most days of the week. Wabush Lake reported a weekly total of 35.8 mm and Goose 32.8 mm.

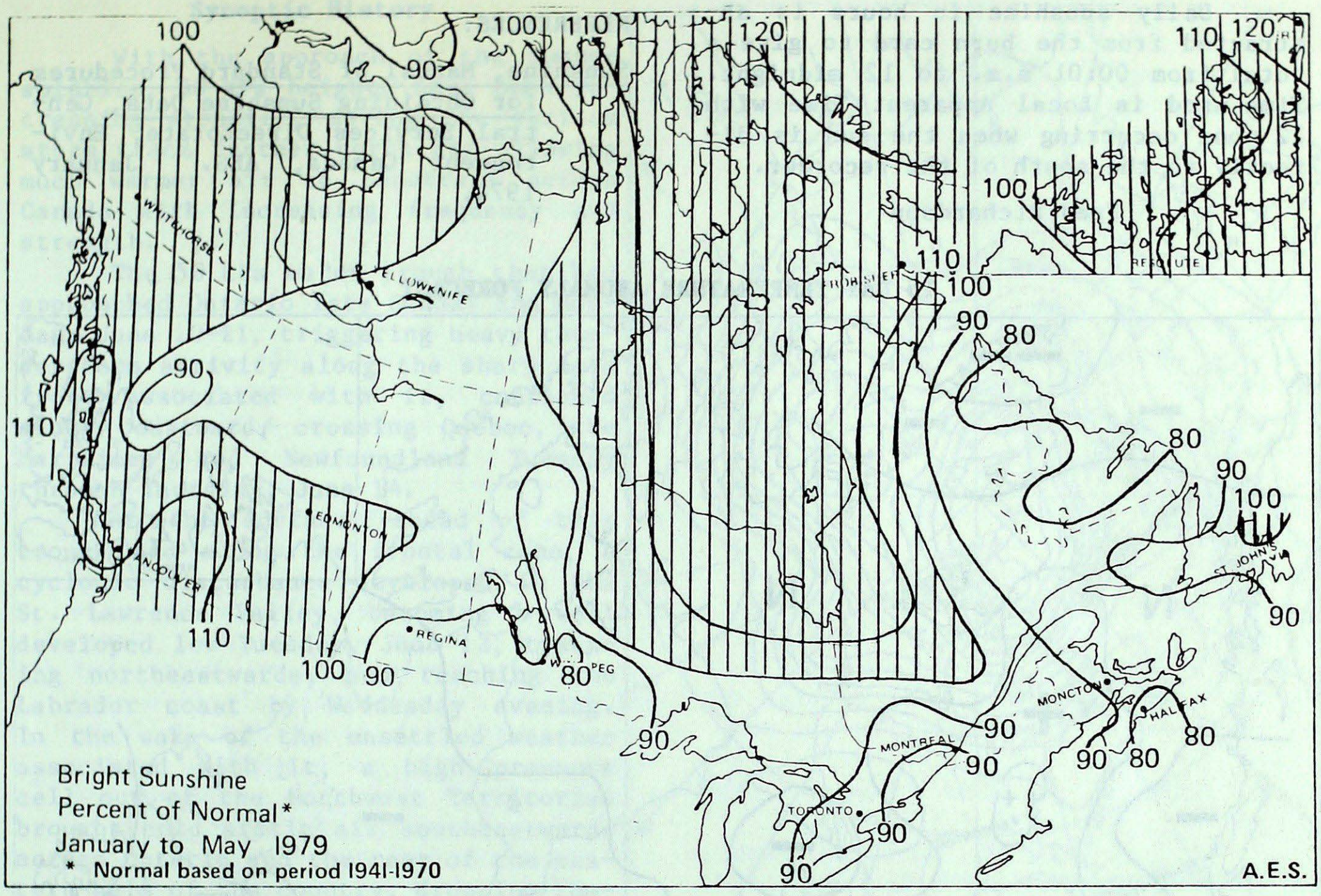
GROWING DEGREE-DAYS



TOTAL PRECIPITATION PERCENT OF 1941-70 NORMAL



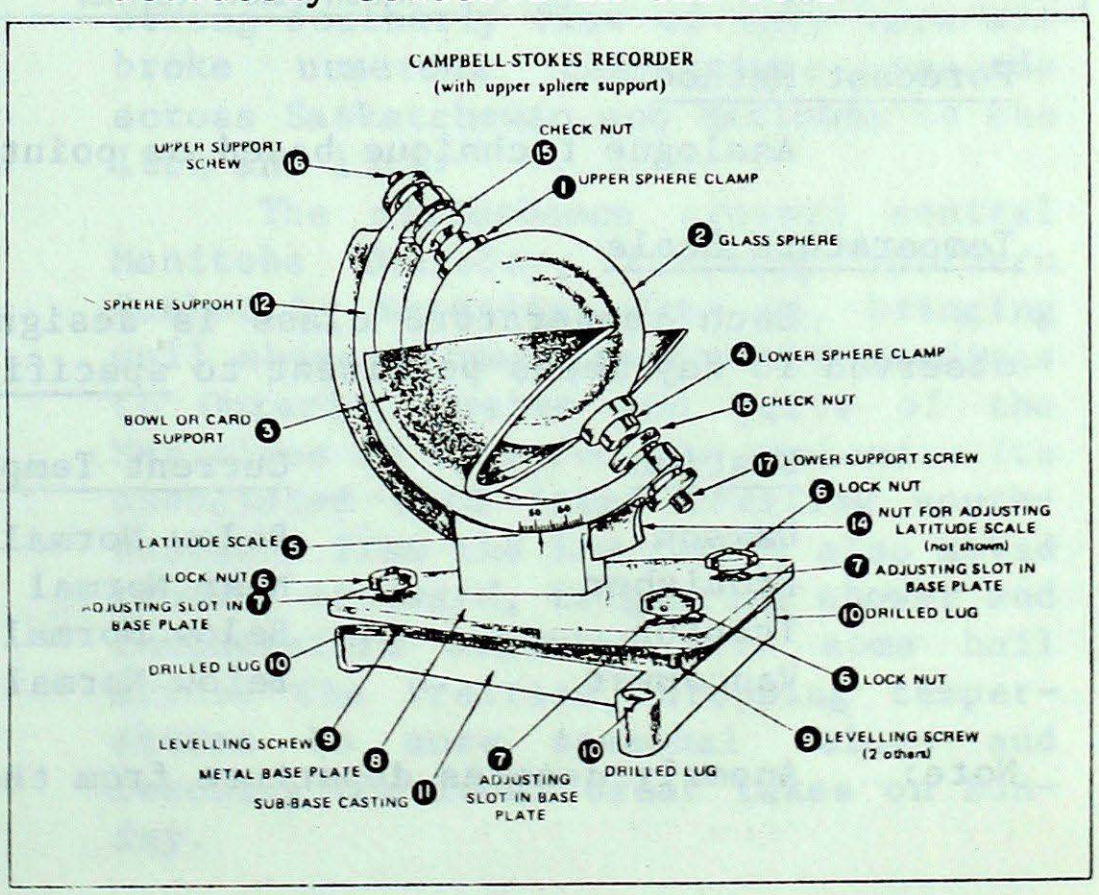
Bright Sunshine



Commencing with this issue, and as available for future issues, a seasonal map of bright sunshine compared to 1941-1970 normal values will be included.

By definition,"duration of bright sunshine" refers to the duration of sunshine of sufficient intensity to scorch or burn the standard sunshine card installed in the Campbell-Stokes Sunshine Recorder and usually refers to the period when the sun is 3 degrees above the horizon at sunrise to 3 degrees above the horizon at sunset with uninterrupted access to the recorder.

The Campbell-Stokes Sunshine Recorder consists essentially of a glass sphere 10 cm in diameter, mounted concentrically in a section of a spherical bowl whose diameter is such that the sun's rays are focused sharply on a sunshine card held in position by a pair of grooves in the bowl. There are three sets of grooves to accept cards of different lengths and shapes for different seasons of the year. The focused rays of the sun burn a trace or scorch on the sunshine card. As the sun "moves" across the sky the burn moves lengthwise along the card, opposite in direction to the apparent motion of the sun. In order to ensure accurate results, the bowl and the sphere are made with great precision and the mounting is so designed that the sphere will be acurately centered in the bowl.



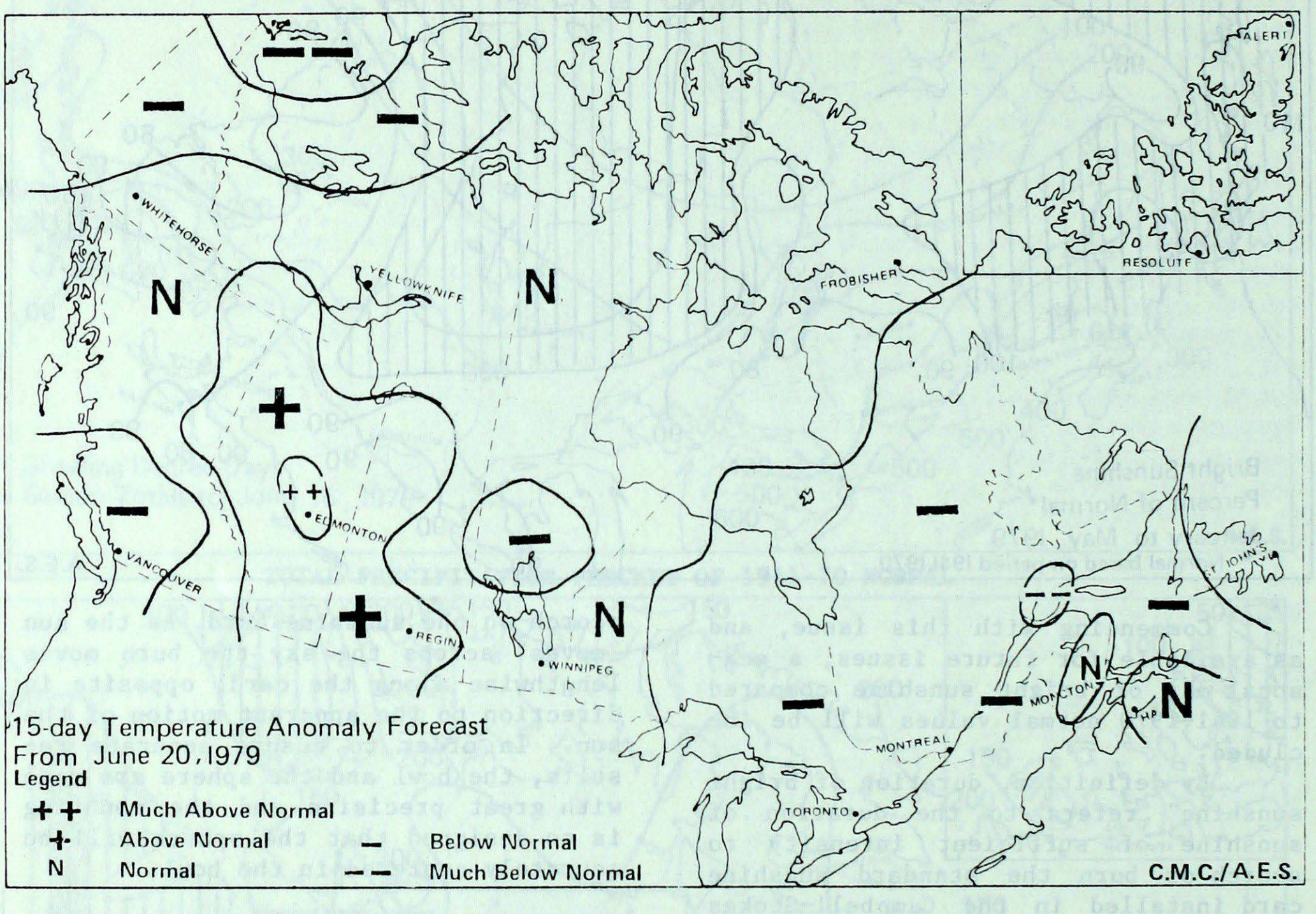
Daily sunshine in hours is abstracted from the burn card to give a total from 00:01 a.m. to 12 midnight. Time used is Local Apparent Time with 12 noon occurring when the sun is directly to the south of the recorder.

Fred Richardson

REFERENCES:

Sunshine, Manual of Standard Procedures for Obtaining Sunshine Data, Central Services Directorate, Environment Canada, AES. January 1974.

15 DAY TEMPERATURE ANOMALY FORECAST



Forecast Method

Analogue technique based on point prediction at 70 Canadian stations.

Temperature Scale

Each temperature class is designed to contain 20% of the historically observed 15 day means pertinent to specific location and time of year:

Station	Current Temperature Anomaly (ΔT) Forecast	
Dawson	Below Normal	($-1.3^{\circ}C < \Delta T < -0.4^{\circ}C$)
Frobisher	Near Normal	($-0.4^{\circ}C < \Delta T < 0.4^{\circ}C$)
Trenton	Below Normal	($-1.4^{\circ}C < \Delta T < -0.4^{\circ}C$)
Vancouver	Below Normal	($-1.1^{\circ}C < \Delta T < -0.3^{\circ}C$)

Note: Anomaly denotes departure from the 1949-73 mean.

Synoptic History

With the approach of the summer solstice, 50 kPa heights have been increasing steadily, moving the surface storm track further north and allowing much warmer air to penetrate across Canada with increasing frequency and strength.

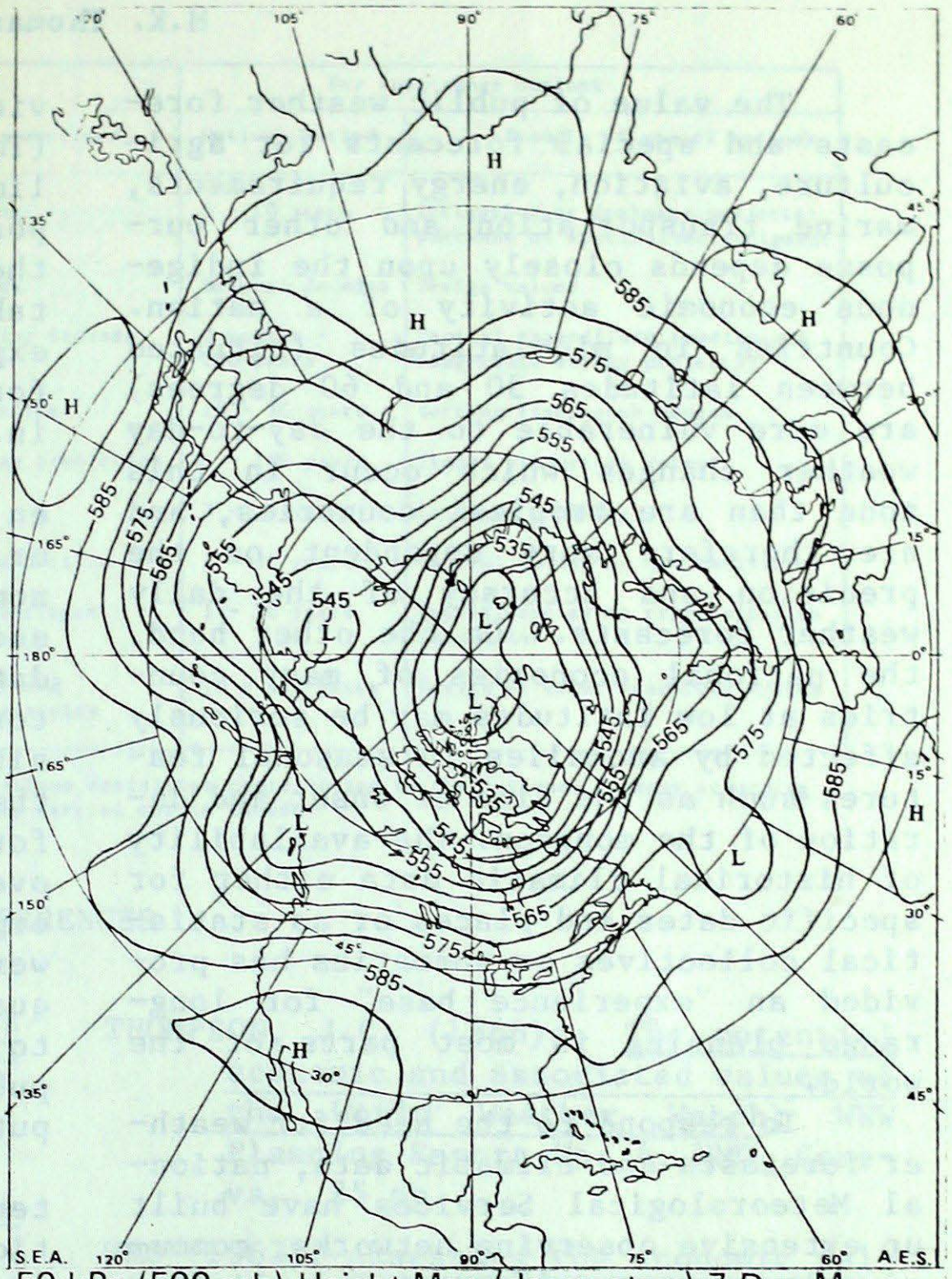
The 50 kPa major trough that had approached Ontario late Sunday and Monday, June 10-11, triggering heavy thunderstorm activity along the sharp cold front associated with it, continued slowly eastward, crossing Quebec, the Maritimes and Newfoundland Tuesday through Thursday, June 14.

At the surface, ahead of this trough and along the frontal zone, a cyclonic disturbance developed in the St. Lawrence Valley, becoming a well developed low Tuesday, June 12, tracking northeastwards, and reaching the Labrador coast by Wednesday evening. In the wake of the unsettled weather associated with it, a high pressure cell out of the Northwest Territories brought cold arctic air southeastwards across Ontario and the rest of the eastern half of the country, dropping temperatures below normal during the first half of the period.

These cold temperatures were short lived, due to the approach of a 50 kPa ridge from western Canada which reached Ontario Thursday, June 14, weakening and moving across eastern Canada during the weekend. This put all of the eastern half of the country back into a southwesterly upper air flow, allowing above normal temperatures to penetrate northwards once again.

In western Canada a persistent upper level trough over British Columbia and Alberta throughout the period gave both provinces below normal temperature readings. Across the Canadian Prairies a general southwesterly upper air flow, with 50 kPa ridging dominant during the first and latter parts of the period, gave generally fair conditions with above normal temperatures.

A short wave 50 kPa trough crossing southern British Columbia Tuesday, June 12, caused a low pressure disturbance to develop in Alberta. By Wednesday, a strong cyclonic circulation



50 kPa (500 mb) Height Map (decametres) 7 Day Mean June 11 to 17, 1979

(counter clockwise) around its centre, caused blowing dust, with central portions of Alberta and Saskatchewan receiving significant precipitation amounts. Ahead of this vigorous low, a strong southerly flow of very warm air broke numerous temperature records across Saskatchewan and Manitoba on the 12th and 13th.

The disturbance crossed central Manitoba Thursday, reaching northern Quebec by Saturday, June 16, bringing well above normal temperature readings to Ontario, Quebec and parts of the Maritimes in time for the weekend. Its associated cold front trailing southwestward from the low centre also moved rapidly eastward, triggering shower and thunderstorm activity with some hail across the Prairies, dropping temperatures to more seasonal values and reaching the lower Great Lakes on Sunday.

Andy Radomski

CLIMATIC FORECASTS? - THE VALUE OF CLIMATIC INFORMATION AND PREDICTIONS

Part II

M.K. Thomas

The value of public weather forecasts and special forecasts for agriculture, aviation, energy requirements, marine transportation and other purposes depends closely upon the indigenous economic activity of a nation. Countries in mid-latitudes (situated between latitudes 30 and 60 degrees) are more vulnerable to the day-to-day weather changes which occur in this zone than are tropical countries, and are therefore more dependent on the precision and accuracy of the daily weather forecasts. On the other hand, the national economies of many countries at low latitudes may be seriously affected by anomalies in seasonal features such as the time of onset and duration of the monsoon. The availability of historical climatic data either for specific dates and places or as statistical collectives or summaries has provided an "experience base" for long-range planning in most parts of the world.

To respond to the need for weather forecasts and climatic data, national Meteorological Services have built up extensive observing networks, communication systems, forecast and climatological offices and research departments. In addition some Services are developing special units to deal with the applications of meteorology to benefit the national economy and the environment. Several publications exist in which the value of meteorological and climatological services to governments, industry and the general public is dealt with rather extensively (see references).

In order to obtain more information concerning the need for a climatic change information service in Canada, a survey was conducted across various environmental and economic sectors. Technical specialists and planners in agriculture, construction, energy, fisheries, forestry, land-use, transportation and water resources were interviewed and a report was prepared (Thomas and McKay (1978)). Due to the limited space available, it is only possible to represent the results of the survey by way of the accompanying table. More details relating to the expressed requirements for climate forecasts and outlooks are contained in the report mentioned above.

Whereas prime attention was given to the need for climatic outlooks or forecasts, spokesmen for most economic and environmental sectors stressed the need for a current climate data information system so that operators and planners may know what the situation is in different parts of their country, even though reliable forecasts may not be available. Moreover, notwithstanding the fact that empirical and statistical forecasts were viewed with scepticism in some quarters, there was a general desire to see these forecasts prepared and published in order that they might be put widely to the test.

There is a great need for a better knowledge of the impacts of climatic anomalies on the various sectors of our modern socio-economic system. Ultimately, through the mathematical modelling of weather and climate and through the development of transfer mechanisms, quantitative climatic anomaly impact models must be developed with respect to agriculture, energy, transportation and other activities significant to national economies. In the meantime, meteorologists are urged to respond positively to the need for climatic forecasts and for general climatic anomaly information. Meteorological Services will contribute greatly to advancing the socio-economic development of their countries by devoting a larger share of their resources to this sector than has been done in the past.

(From WMO Bulletin April 1979.
Vol. XXVIII, No. 2).

Field of activity	For "operational" purposes		For long-range outlook	
	Forecast period	Example of activities concerned	Outlook period	Example of use of outlook
AGRICULTURE	1 - 18 months	Harvesting and planting	5 - 10 years	Irrigation or drainage projects; purchase of specialized equipment
CONSTRUCTION	1 - 3 months	Planning work schedules	Several decades	Design values
ENERGY	1 - 3 months	Heating/air-conditioning demands	3 months - 100 years	Capital expenditure (medium-and long-range energy projects)
FISHERIES	1 - 6 months	Fish population prediction	10 - 30 years	Setting fish-catch quotas
FORESTRY	Seasonal	Insect pest and disease prediction	1 - 100 years	Timber production rates
LAND RESOURCES			3 - 25 years	Land-use planning
TOURISM/RECREATION	Seasonal	Planning recreation activities	1 - 30 years	Capital outlay on new facilities
TRANSPORTATION	1 - 3 months (Winter)	Planning activities contingent upon snow and ice	1 - 30 years	Capital outlay on transportation facilities
WATER RESOURCES	1 - 6 months	Freshwater supplies; flood prediction; hydro-electricity	10 - 100 years	Design of water resources system

The climatic forecast and outlook periods required by various activities contributing to the national economy according to a recent survey carried out in Canada.

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CLIMATIC PERSPECTIVES

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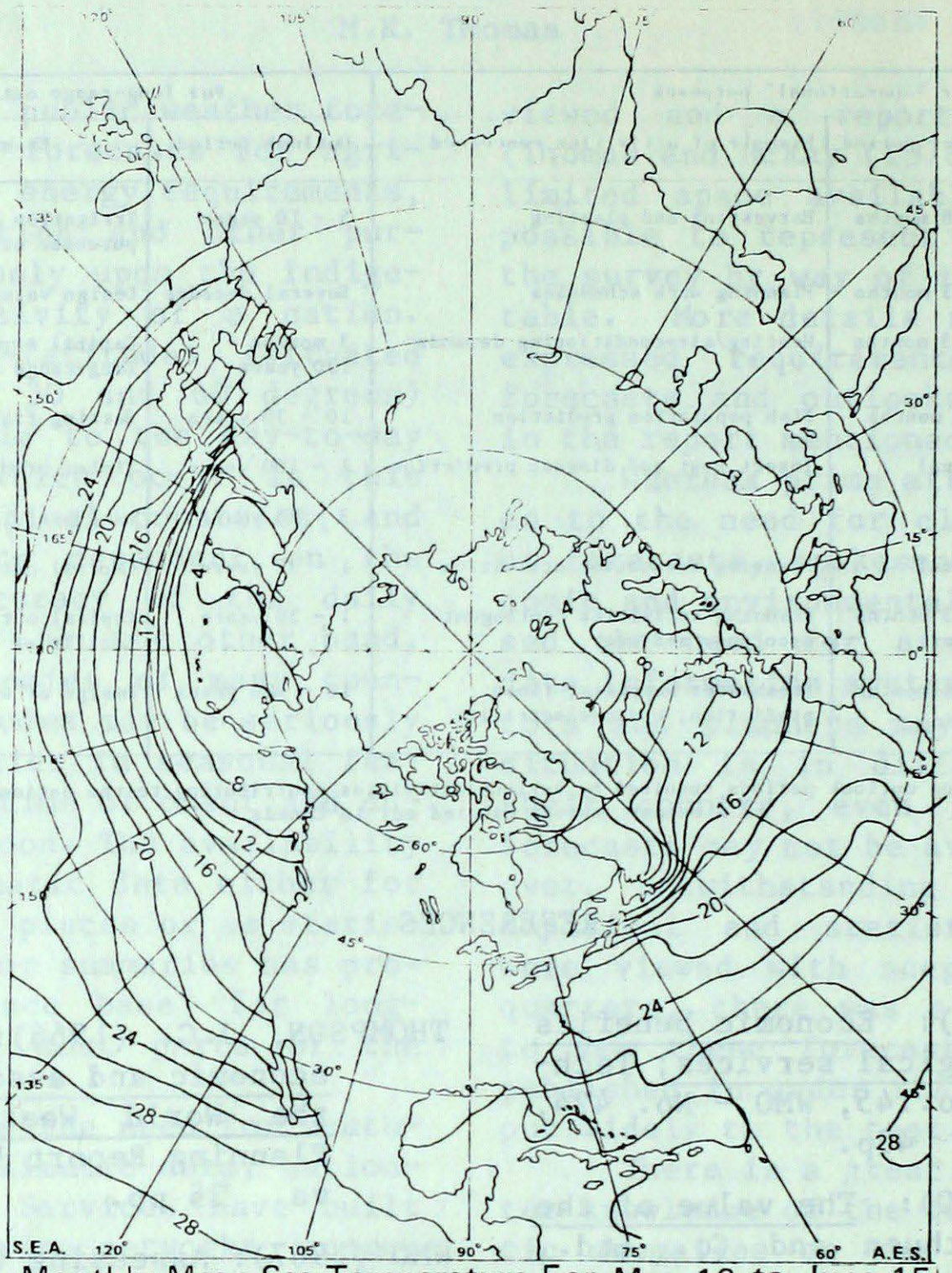

Monthly Mean Sea Temperature For May 16 to June 15

ON THIS DATE ...

.....June 19, 1959, a severe, localized storm moved from Nova Scotia to the Northumberland Strait. A stable high pressure centre in Newfoundland acted as a blockade to the usual easterly flow of weather systems. From June 14 to 18, an upper level vortex off the U.S. coast and its associated small storms at lower levels, intensified as they moved northeastward over the Atlantic and cold air began to feed into the west-east flow. An additional wave off Hatteras moved in under this low pressure aloft. Blocked by the Newfoundland high pressure, the vortex was redirected northwestward. In addition, a small tropical storm, resembling a hurricane, merged with the storms over the Maritimes exagerating the effect. Summerside, Prince Edward Island, reported winds of 90 km/h and gusts of up to 113 km/h.

Unfortunately, the storm coincided with a particularly good salmon run and the hazardous wave conditions created by the storm trapped more than 50 salmon boats, resulting in high loss of life.

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ERRATA:

1 - Vol. 1 - No. 17: The article "Climatic Forecasts? - The Value of Climatic Information and Prediction" was written from excerpts from WMO Bulletin April 1979 not 1977.

2 - Vol. 1 - No. 18: The "Total Precipitation" map printed on page 9 was analysed in percent of 1941-1970 normal instead of total precipitation in millimetres. This map is reprinted in this issue.

TEMPERATURE AND PRECIPITATION DATA FOR THE WEEK ENDING 0600 G.M.T. JUNE 19, 1979

Station	Temperature (°C)				Precip. (mm)	
	Average	Departure from Normal	Extreme Maximum	Extreme Minimum	Total	Departure from Normal
BRITISH COLUMBIA						
Abbotsford	12	- 3	20	4	11.8	- 2.0
Blue River	M	M	M	M	M	M
Bull Harbour	10	- 2	15	2	13.0	- 0.4
Castlegar A	15	- 2	29	3	9.2	- 0.8
Cranbrook A	14	- 1	27	1	1.4	- 8.8
Comox A	13	- 3	20	7	8.6	0.6
Estevan Point	M	M	M	M	M	M
Fort Nelson A	12	- 3	23	1	3.4	- 8.2
Fort St. John A	12	- 2	22	5	4.0	-13.8
Kamloops A	17	- 1	29	6	2.6	- 1.4
Lytton	15	- 4	23	7	6.0	2.9
Penticton A	16	- 1	28	4	10.0	0.7
Port Hardy A	11	- 1	18	3	9.2	- 2.2
Prince George A	12	- 1	23	3	8.2	- 3.1
Prince Rupert A	11	- 1	14	6	29.2	11.1
Quesnel A	12	- 2	24	4	11.0	0.5
Revelstoke A	15	- 2	29	3	1.6	-13.8
Smithers A	11	- 2	23	3	3.0	- 2.7
Terrace A	13	- 2	23	8	6.6	1.0
Vancouver Int'l A	14	- 2	20	8	12.7	2.2
Victoria Int'l A	13	- 2	21	7	7.4	1.5
Williams Lake A	11	- 4	23	1	1.2	+ 8.9
YUKON						
Dawson A	9	- 5	19	- 2	21.4	13.5
Mayo A	11	- 3	20	2	3.6	- 2.7
Watson Lake A	11	- 3	18	3	13.6	1.8
Whitehorse A	10	- 3	19	4	14.9	9.3
NORTHWEST TERRITORIES						
Alert	- 3	- 3	4	- 6	0.0	- 3.9
Baker Lake	6	3	17	- 3	0.0	- 4.8
Cambridge Bay A	0	- 2	7	- 4	0.0	- 4.4
Cape Dyer	- 1	M	4	- 7	0.0	M
Chesterfield Inlet	4	1	15	- 1	2.7	- 4.4
Clyde	- 1	- 1	6	- 6	0.0	- 3.3
Coppermine	5	1	16	- 1	6.0	1.7
Coral Harbour	2	1	10	- 3	1.8	- 4.4
Ennadai	7	0	21	- 1	7.7	2.7
Eureka	- 1	- 4	3	- 4	5.1	4.0
Fort Simpson	13	- 3	26	1	3.5	- 3.2
Fort Smith A	13	0	26	1	14.0	6.3
Frobisher Bay A	3	- 1	8	- 1	0.5	- 7.2
Hall Beach A	M	M	3	M	3.6	M
Hay River A	12	0	26	3	1.5	- 2.5
Inuvik A	8	- 4	23	0	1.6	- 1.8
Mould Bay	- 4	- 4	1	- 9	0.0	- 0.6
Norman Wells A	M	M	25	M	M	M
Resolute A	- 2	- 2	3	-13	4.0	0.2
Sachs Harbour	M	M	0	M	M	M
Yellowknife A	12	0	22	5	0.0	- 2.5
ALBERTA						
Banff	11	- 1	23	0	0.8	-13.6
Calgary Int'l A	12	- 1	28	0	13.7	- 8.5
Cold Lake A	13	- 1	25	5	34.6	18.0
Coronation A	13	- 1	28	2	6.4	- 4.4
Edmonton Mun. A	14	- 1	25	5	47.7	24.5
Edmonton Namao A	13	- 2	23	4	57.2	43.4
Edson A	11	- 3	23	2	38.8	22.6
Fort Chipewyan	14	0	24	4	0.8	- 7.6
Fort McMurray A	14	1	25	5	16.7	0.0
Grande Prairie A	13	- 1	21	5	31.3	19.3
Jasper	11	- 2	24	0	4.0	- 7.9
Lethbridge A	14	- 1	31	2	5.6	-14.3
Medicine Hat A	16	0	34	3	16.4	2.3
Peace River A	14	0	23	5	M	M
Red Deer A	12	- 1	26	1	10.0	-14.3
Rocky Mountain House	11	- 2	24	0	14.1	-13.1
Vermilion A	13	- 1	24	4	25.2	10.7
Whitecourt	11	- 1	22	3	68.2	50.5
SASKATCHEWAN						
Broadview	17	3	37	6	0.0	-18.8
Buffalo Narrows	14	M	24	5	40.6	M
Cree Lake	12	M	24	2	11.1	M
Estevan A	18	2	37	7	2.7	-19.0
Hudson Bay	17	3	27	4	M	M
Kindersley	16	1	33	4	6.2	- 5.6
La Ronge A	15	3	27	6	16.6	5.4
North Battleford A	16	1	28	5	12.0	- 0.5
Prince Albert A	16	2	30	3	9.9	- 0.9
Regina A	19	3	36	6	6.2	-11.9
Saskatoon A	16	1	31	5	5.4	- 5.0
Swift Current A	16	1	31	4	18.0	0.3
Uranium City	13	M	24	3	0.0	M
Wynyard	17	2	36	5	0.2	-13.9
Yorkton A	18	2	37	4	0.4	-12.2
MANITOBA						
Bissett	17	M	28	3	2.9	M
Brandon A	19	3	38	6	0.4	-14.8
Churchill A	8	1	19	- 2	M	M
Dauphin A	18	2	37	4	0.0	-21.4
Gillam A	13	M	26	2	12.6	M
Gimli	17	2	33	6	3.8	-11.3
Lynn Lake	13	3	24	3	13.4	8.8
Norway House	15	M	26	4	11.0	M
Pilot Mound	18	3	35	7	0.6	-14.9
Portage la Prairie	19	2	36	6	1.1	-20.7
The Pas A	16	1	26	5	5.3	- 4.5
Thompson A	14	3	26	1	9.9	1.4
Winnipeg Int'l A	18	2	34	6	1.0	-16.5
ONTARIO						
Armstrong A	15	2	32	1	M	M
Atikokan	16	3	28	0	12.4	-12.7
Earlton A	16	1	28	3	16.6	- 2.8
Geraldton	15	4	26	1	16.0	-14.8
Gore Bay A	16	0	25	6	19.6	9.7
Kapuskasing A	16	2	28	0	22.2	3.7
Kenora A	19	3	31	10	3.6	-15.7
Kingston A	16	- 1	26	4	M	M
Lansdowne House	16	3	27	7	12.6	- 2.7
London A	17	- 1	30	4	2.6	-18.5
Moosonee	15	3	29	- 3	7.2	- 8.8
Mount Forest	M	M	M	3	M	M
Muskoka A	16	0	29	3	M	M
North Bay A	16	0	25	3	3.2	-16.4
Ottawa Int'l A	17	- 1	30	7	47.1	27.9
Petawawa A	17	M	31	3	16.8	M
Pickle Lake	17	4	27	4	1.9	-14.1
Red Lake A	16	1	26	3	0.5	-11.6
Simcoe	19	2	31	4	M	M
Sioux Lookout A	17	2	30	4	1.2	-19.0
Sudbury A	16	0	28	3	8.3	- 4.7
Thunder Bay A	16	2	29	2	3.0	-18.7
Timmins A	16	1	29	2	63.6	45.6
Toronto Int'l A	18	0	30	5	0.0	-15.7
Trenton A	18	0	29	4	0.0	-13.2
Trout Lake	15	4	26	5	1.6	-15.8
Wawa A	13	M	24	1	M	M
Wiarton A	16	1	28	4	8.0	- 6,2
Windsor A	20	0	31	9	0.0	-26.2
QUEBEC						
Bagotville A	15	- 1	29	1	34.3	12.5
Baie Comeau	12	- 2	29	1	28.6	7.6
Border	6	0	14	1	M	M
Chibougamau	12	M	24	3	22.0	M
Fort Chimo A	6	- 1	13	- 2	10.6	- 0.8
Gaspé A	15	- 1	23	5	20.8	5.1
Grindstone Island	14	2	24	8	7.8	-12.0
Inoucdjouac	4	0	16	- 2	17.1	9.7
Maniwaki	15	0	29	2	9.0	- 5.5
Matagami A	13	M	27	0	16.4	M
Mont Joli A	13	- 1	28	4	17.6	3.3
Montréal Int'l A	18	- 1	30	7	4.4	-18.0
Natashquan A	11	1	16	5	22.0	7.0
Nitchequon	9	- 1	16	2	31.0	7.9
Port Menier	13	1	28	6	23.1	6.8
Poste de la Baleine	7	1	21	- 2	6.4	- 5.3
Québec A	16	- 1	30	5	88.4	69.6
Riviere du Loup	14	- 2	25	5	38.6	30.0
Roberval A	15	0	29	6	M	M
Schefferville A	7	- 2	17	1	17.1	- 7.6
Sept-Iles A	11	- 1	18	2	M	M
Sherbrooke A	16	0	31	0	4.2	-11.2
Val d'Or A	15	0	28	2	M	M
NEW BRUNSWICK						
Charlo A	15	0	30	3	36.0	23.7
Chatham A	17	1	34	5	12.5	- 5.3
Fredericton A	18	2	34	3	5.6	-11.8
Moncton A	17	2	31	5	6.9	-13.2
Saint John A	16	2	30	5	21.4	- 1.3
NOVA SCOTIA						
Greenwood A	18	3	31	6	2.4	-15.2
Shearwater A	17	3	30	9	5.5	-15.2
Sydney A	16	3	28	6	7.8	-11.7
Truro	16	2	29	4	1.6	-22.2
Yarmouth A	14	1	21	7	49.1	27.0
PRINCE EDWARD ISLAND						
Charlottetown	17	2	30	6	0.4	-21.3
Summerside	17	2	31	7	13.0	- 3.9
NEWFOUNDLAND						
Battle Harbour	7	1	16	3	6.2	- 8.2
Cartwright	8	- 1	20	2	18.8	2,3
Deer Lake	13	0	26	4	8.8	-17.2
Gander Int'l A	14	2	25	5	3.6	-11.4
Goose A	10	- 2	19	2	32.8	19.2
Hopedale	6	- 1	15	1	10.2	- 4.9
St. Anthony	9	M	19	2	9.8	M
St. John's A	15	4	26	5	24.2	8.5
Stephenville A	13	1	24	5	21.1	4.8
Wabush Lake	8	- 2	20	- 1	35.8	20.2

M-Denotes missing data