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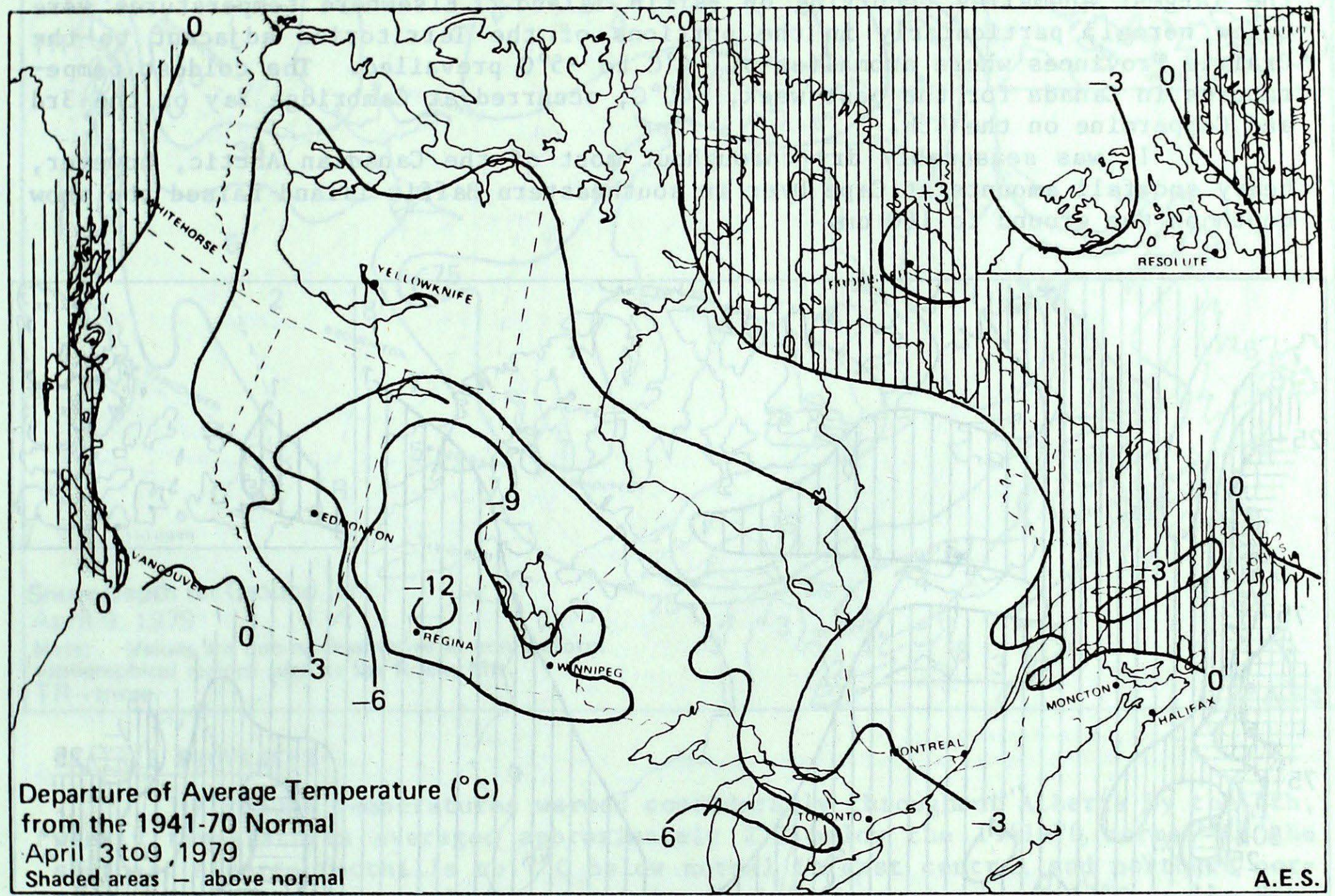
**A WEEKLY REVIEW OF CANADIAN CLIMATE**

**CLIMATIC PERSPECTIVES**  
~~NON-CIRCULATING~~

THE CANADIAN CLIMATE CENTRE,  
 ATMOSPHERIC ENVIRONMENT SERVICE,  
 4905 DUFFERIN ST., DOWNSVIEW, ONTARIO M3H 5T4

APRIL 12, 1979

VOL. 1 NO. 9



Departure of Average Temperature (°C)  
 from the 1941-70 Normal  
 April 3 to 9, 1979  
 Shaded areas — above normal

**WEATHER HIGHLIGHTS FOR THE WEEK - APRIL 3 - 9, 1979**

Severe Storms Strike Southern Ontario

A major change in the atmospheric flow pattern took place during the week creating significant weather events from Saskatchewan to southern Ontario. A deep arctic vortex, previously quasi-stationary over the Northwest Territories, moved southwestward over Lake Huron early April 6. Rain, freezing rain, blowing snow and 110 km/h winds produced by the associated surface low nearly paralyzed transportation and commerce in southern Ontario and caused property damage in the millions of dollars. In the wake of this disturbance extremely cold air resulted in many low daily minimum and maximum temperature records being broken or equalled on the eastern Prairies and northwestern Ontario.

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



On April 8 and 9 another vigorous disturbance deposited freezing rain in southwestern Ontario and up to 40 cm of snow at localities in the vicinity of western Lake Ontario.

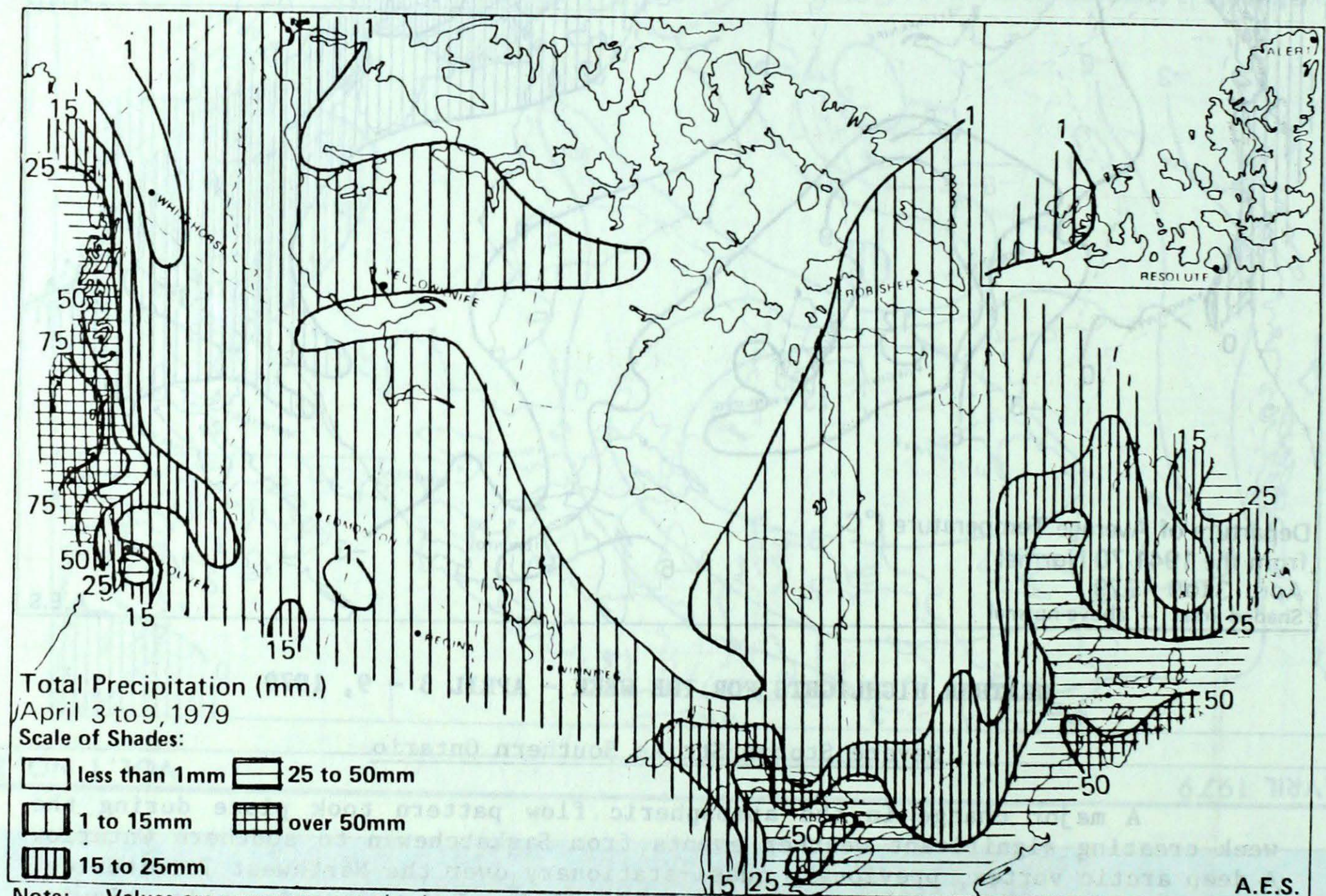
### YUKON AND NORTHWEST TERRITORIES

Weekly temperatures averaged slightly above normal in the southwest of the Yukon and slightly below normal elsewhere as a warming trend gradually enveloped the Territory. The temperature rose to 9°C at Dawson on the 8th.

Precipitation amounts, less than 7 mm, were seasonably light throughout the Yukon.

Temperatures in the eastern Arctic ranged from 1°C to 5°C above normal, the largest anomalies occurring on Baffin Island. Elsewhere temperatures were below normal, particularly in the portions of the Territories adjacent to the Prairie Provinces where anomalies of -4°C to -5°C prevailed. The coldest temperatures in Canada for the past week, -40°C, occurred at Cambridge Bay on the 3rd and Coppermine on the 4th.

It was seasonably dry throughout most of the Canadian Arctic, however, heavy snowfall amounts at Cape Dyer in southeastern Baffin Island raised the snow depth on the ground to 160 cm.



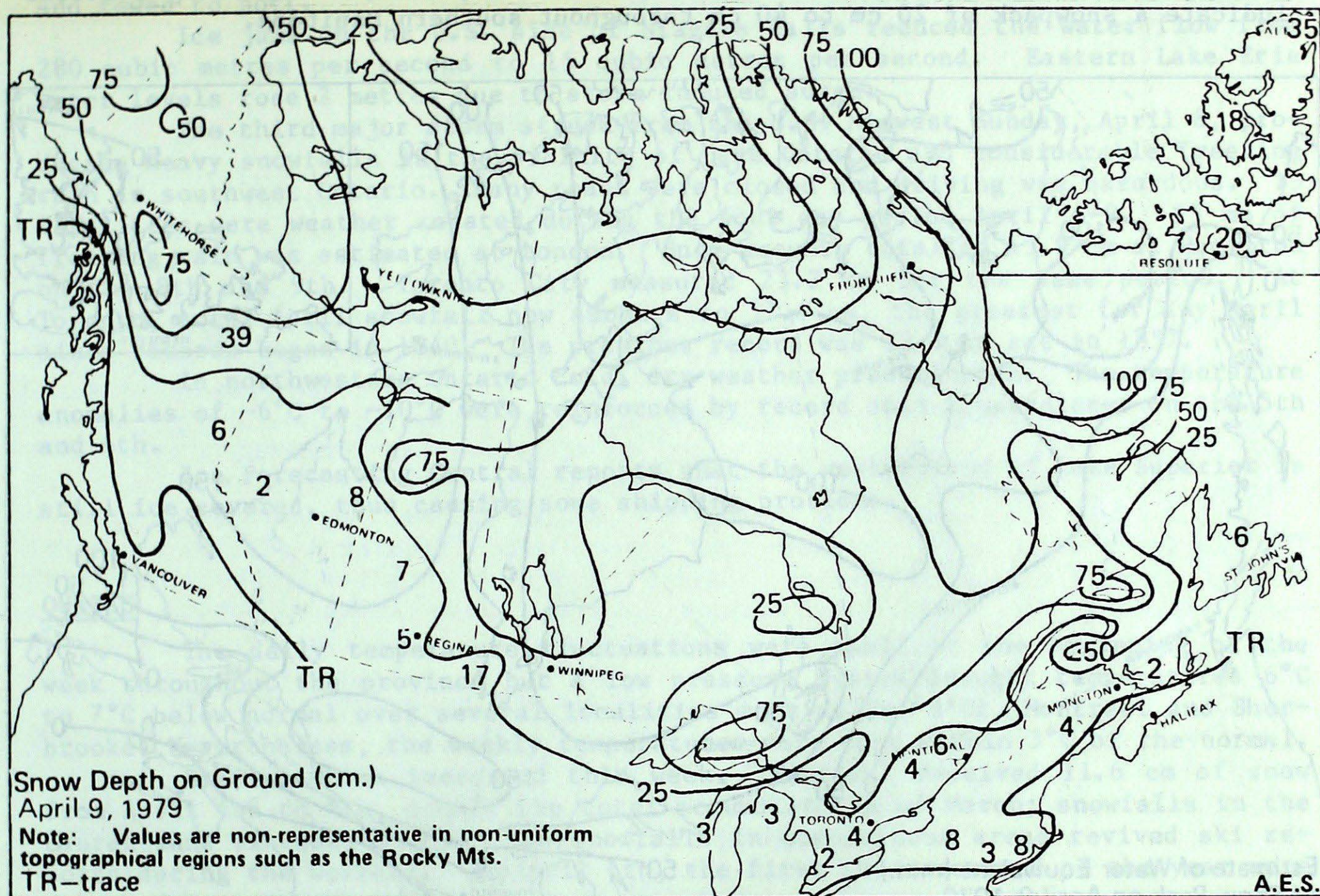
### BRITISH COLUMBIA

Precipitation was much greater than the 1941-70 normal along most of the coastal portions of the province in sharp contrast to the unusually dry weather of the past few weeks. For example, the 61.6 mm received at Bull Harbour and 51.2 mm at Port Hardy, are approximately twice the 1941-70 average for the week. Inland, amounts were generally near normal with the exception of Central B.C.



where the totals of 15 mm which fell were slightly higher than the normal.

Weekly temperatures ranged from 1°C to 4°C below normal in most of the interior; along coastal regions and the southwest interior, temperatures were near normal. Penticton and Castlegar recorded the highest temperatures in Canada for the week, 18°C, on the 6th and 5th respectively.



### PRAIRIE PROVINCES

Although temperatures warmed considerably throughout Alberta by the 6th, weekly temperatures averaged approximately 2°C below the 1941-70 normal in the southern Alberta foothills to 7°C below normal in east central and northern portions of the province. Calgary recorded a maximum temperature of 17°C on the 8th.

Scattered precipitation amounts up to 10 mm to 20 mm fell along the foothills; elsewhere, precipitation was seasonably light.

Unofficial reports indicated that the incidence of scours and intestinal disease in newborn calves was normal in southern Alberta due to improved weather in the latter part of the week.

Exceptionally cold weather, weekly temperatures averaging 5°C to 13°C below normal, continued to envelop Saskatchewan and Manitoba although substantial warming took place in western Saskatchewan beginning April 6 as Swift Current recorded a maximum of 15°C on the 9th.

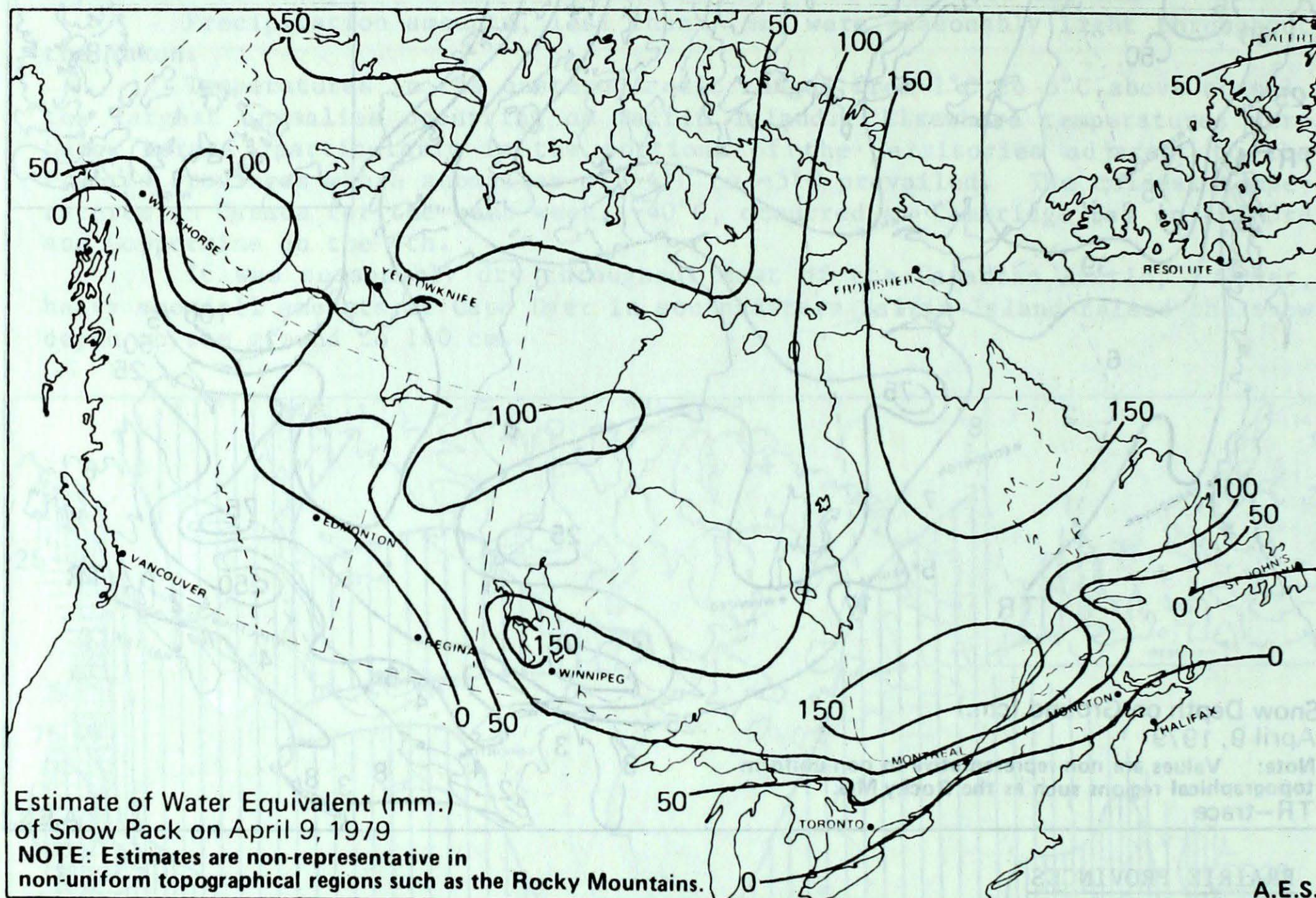
Every reporting station in Saskatchewan broke or equalled a low daily minimum or maximum temperature record on the 5th. Meadow Lake broke its previous low daily minimum record of -20°C, set in 1939, by 10°C.

In Manitoba several low daily maximum temperature records were broken or equalled on the 5th. e.g. Pilot Mound -11°C (previous record -6°C, 1939), Winnipeg -9°C (previous record -8°C, 1916).



Low temperature records continued to be set on the 6th throughout both provinces. The low daily minimum of  $-27^{\circ}\text{C}$  at Brandon easily surpassed the previous low extreme of  $-21^{\circ}\text{C}$  set in 1923.

Precipitation was seasonably light throughout the agricultural zone of Saskatchewan; in southern Manitoba amounts ranged from 7 mm to 15 mm compared to the weekly normal of 5 mm to 6 mm. Reports from principal reporting stations indicate a snowpack of 20 cm to 40 cm throughout southern Manitoba.



### ONTARIO

Three major storms, particularly the last two, battered southern Ontario during the past week.

Heavy, wet snow, intermixed with periods of rain, returned the snow cover to southern Ontario on April 4. 12 cm fell at Toronto City, a record amount for the day.

The next storm, an intense low which reached its maximum strength of 98.5 kPa Friday morning was spawned by a deep atmospheric arctic vortex, previously stationary over the Northwest Territories, which tracked southeastward over the Great Lakes. As a result southern Ontario was beset by 110 km/h winds, rain, freezing rain and blowing snow. Southern Ontario's first tornado of the year was sighted near Leamington late April 5. 20 to 25 cm of snow fell in the vicinity of eastern Lake Superior. The overall effect was near catastrophic. Traffic and power disruptions were prevalent over southern Ontario. Two major road accidents involved 60 cars on Highway 400 north of Toronto. 25 Air Canada flights were cancelled; many schools were closed. Property damage soared into the millions of dollars as roofs of homes were blown away, large office windows destroyed and several small aircraft located at airports throughout southern



Ontario damaged. A peak gust of 128 km/h was recorded at Trenton on the morning of the 6th.

On Lake Erie, 5 metre waves on the 6th caused the cargo of 160,000 bushels of corn of a lake freighter to shift, making the ship list and take on water. The crew of 20 was evacuated safely and the freighter was later recovered intact and towed to port.

Ice jams on the U.S. side of Niagara Falls reduced the water flow from 280 cubic metres per second to 15 cubic metres per second. Eastern Lake Erie water levels rose 2 metres due to storm induced surge.

The third major storm struck from the U.S. Midwest Sunday, April 8, producing heavy snowfalls in the vicinity of Lake Ontario and considerable freezing rain in southwest Ontario. Many roads were closed and driving was hazardous. 13 fatalities were weather related during the four day period April 6-9. 13 mm of freezing rain was estimated at London. Snow amounts totalled 43.9 cm at Hamilton on the 8th and 9th. Toronto City measured 23.2 cm for the same period. At Toronto, total April snowfall now amounts to 37.6 cm, the greatest for any April since records began in 1840. The previous record was 32.8 cm set in 1857.

In northwestern Ontario cold, dry weather predominated. The temperature anomalies of  $-6^{\circ}\text{C}$  to  $-10^{\circ}\text{C}$  were reinforced by record cold temperatures on the 5th and 6th.

Ice Forecasting Central reports that the western end of Lake Superior is still ice covered, thus causing some shipping problems.

### QUEBEC

The daily temperature fluctuations were small at the beginning of the week throughout the province but a low pressure system brought temperatures  $6^{\circ}\text{C}$  to  $7^{\circ}\text{C}$  below normal over several localities such as Val d'Or, Montreal and Sherbrooke. Nevertheless, the weekly temperatures were kept within  $3^{\circ}\text{C}$  of the normal.

Precipitation increased this week. Montreal received 11.6 cm of snow from April 4th to 5th, double the total accumulations of March; snowfalls in the Laurentians exceeded 25 cm. The snowfalls in mountainous areas revived ski resorts during the weekend. On April 6th, the first thunderstorms of the year were observed in southern Quebec.

### ATLANTIC PROVINCES

A series of low pressure systems moved through the area during the week producing various amounts of precipitation. In excess of 50 mm fell in many sections of the Maritimes with lesser amounts reported in Newfoundland.

A storm on the 6th with associated lightning, snow and rain caused poor driving conditions and minor power outages particularly in Nova Scotia.

Weekly temperatures ranged from  $1^{\circ}\text{C}$  to  $4^{\circ}\text{C}$  above normal in western Newfoundland, coastal Labrador and northern New Brunswick, to slightly below normal elsewhere.

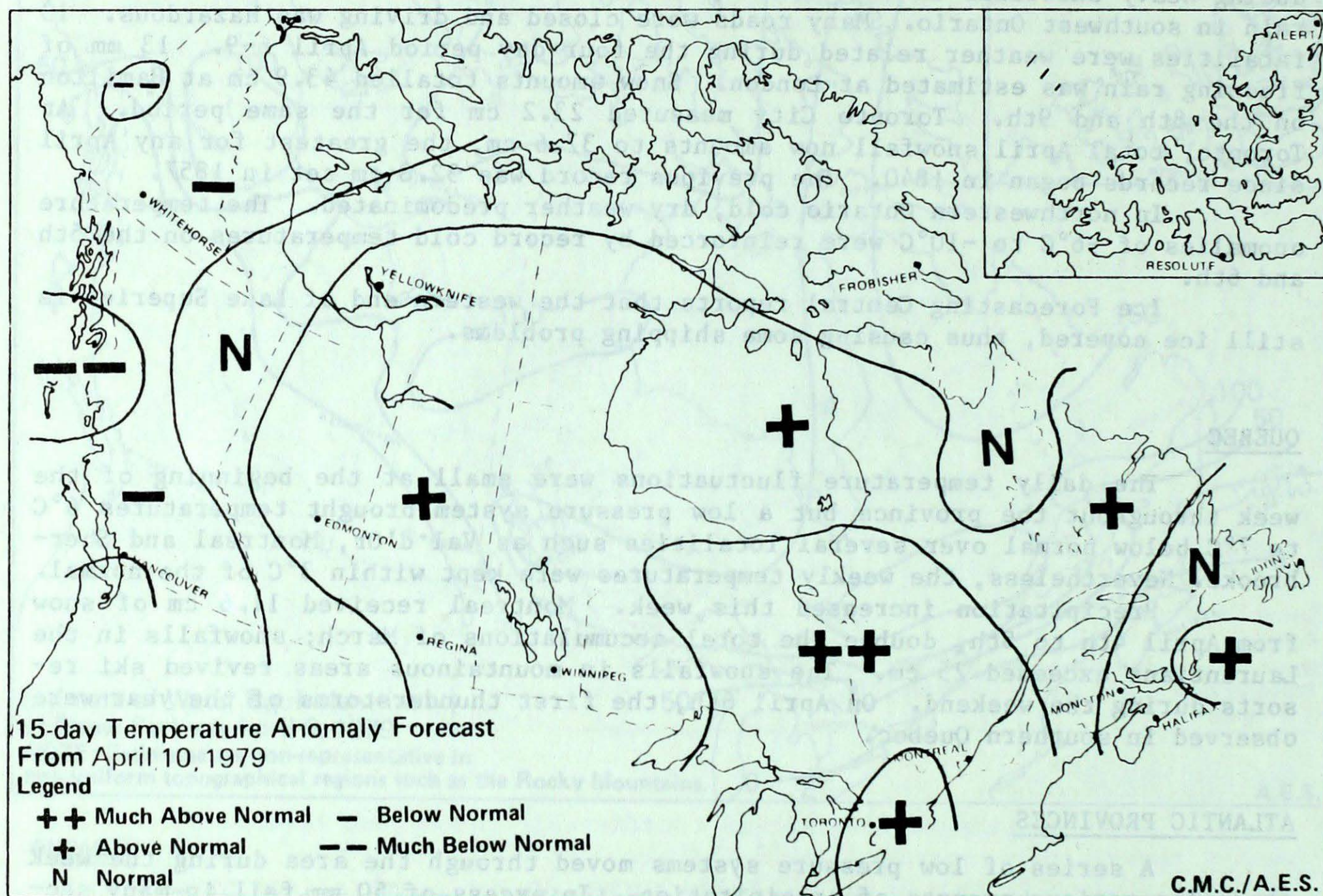
All east coast shipping routes are generally open, especially the entrance to the St. Lawrence River. An exception is Chaleur Bay, between Gaspé and New Brunswick, where ice cover is causing some difficulty to shipping.



## HEATING DEGREE-DAY SUMMARY

Note: Due to computer oriented errors the Heating Degree-Day map and Summary have been omitted from this issue. Errors in heating degree-day calculations for western Canada locations appeared in the previous two issues. These errors have been corrected and both map and summary will appear in the next issue.

## 15 DAY TEMPERATURE ANOMALY FORECAST

Forecast Method

Analogue technique based on point prediction at 70 Canadian stations.

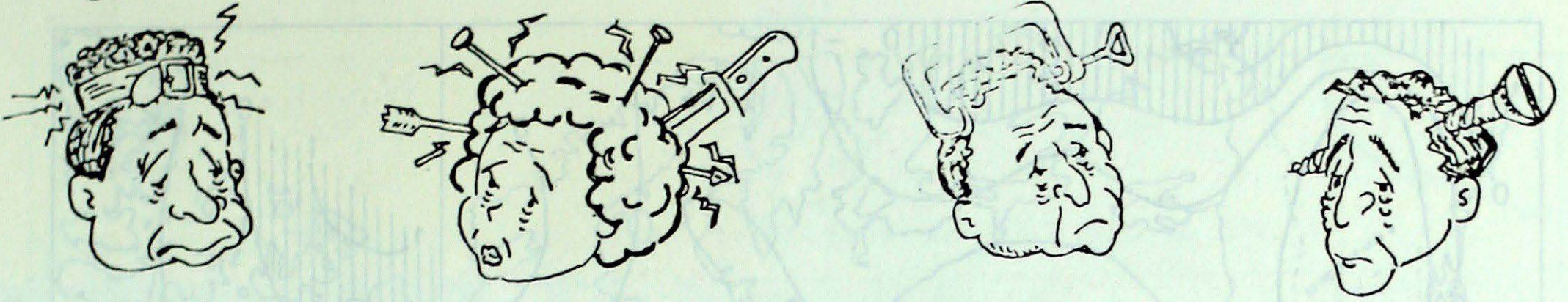
Temperature Scale

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

<u>Station</u>	<u>Current Temperature Anomaly (<math>\Delta T</math>) Forecast</u>	
Dawson	Below Normal	$(-2.1^{\circ}\text{C} \leq \Delta T \leq -0.6^{\circ}\text{C})$
Frobisher	Near Normal	$(-0.9^{\circ}\text{C} \leq \Delta T \leq +0.9^{\circ}\text{C})$
Trenton	Above Normal	$(+0.5^{\circ}\text{C} \leq \Delta T \leq +1.8^{\circ}\text{C})$
Vancouver	Below Normal	$(-0.3^{\circ}\text{C} \leq \Delta T \leq -1.0^{\circ}\text{C})$

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





### WEATHER-MIGRAINE STUDY

An AES study to explore the link between weather and migraine headaches is underway in the Metro Toronto area with the help of the Migraine Foundation. More than 300 weather migraine volunteers have been interviewed and instructed on filling out a log of daily headache occurrences for a six-month period. Information about when and how severely they have suffered an attack is being tabulated and will subsequently be correlated with weather observations. Symptomatically, most migraineurs report the onset of an attack when barometric pressure drops or with strong winds, chilling temperatures or glare from the surface of snow or water on bright, sunny days.

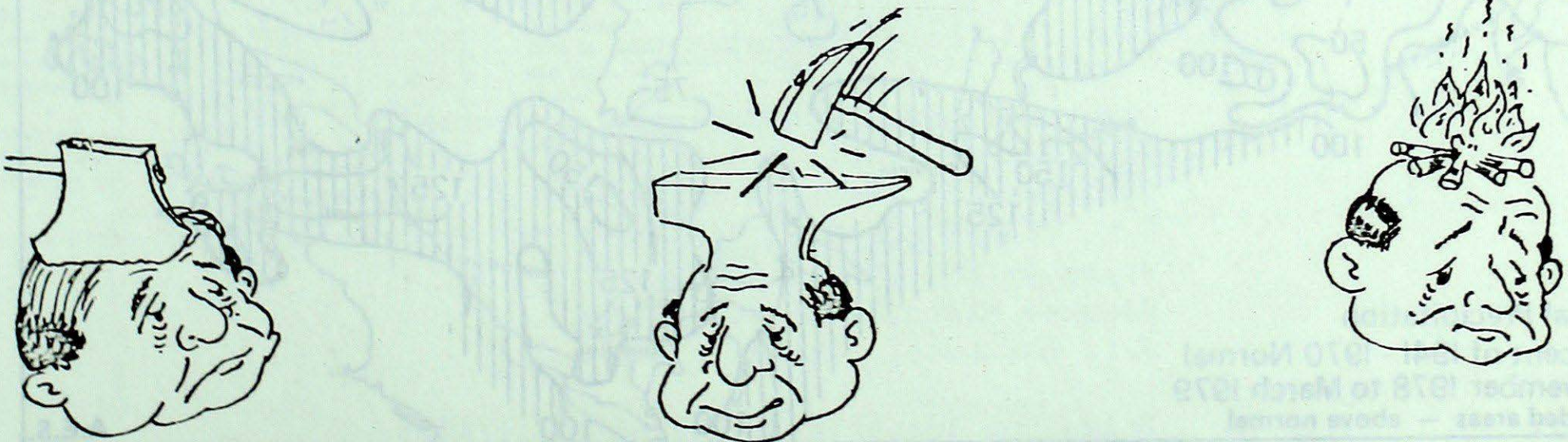
Migraine is defined as a periodic vascular headache that is usually, but not always accompanied by nausea. 20 to 30% of sufferers have warning signs - the "aura" of a classic migraine, which can include momentary loss of vision, double vision, perception of flashing lights, etc. Some physicians feel it is a basic, inherited defect, a metabolic disturbance that makes a person prone to migraine. Some people will have more than one "trigger" mechanism that may bring on an attack. Bright sunshine, strong perfume, peanuts, chocolate, cheese, excitement, sudden drops in atmospheric pressure, anxiety, menstruation are some of the hundreds of possible triggers.

The exact nature of the migraineur's reaction to the weather will be difficult to uncover. Very often, people respond a day or two after a weather change, and this tends to blur or hide the connection. Personal differences - general health, age, temperament - also affect people's biological response, often making the weather's influence even more difficult to detect.

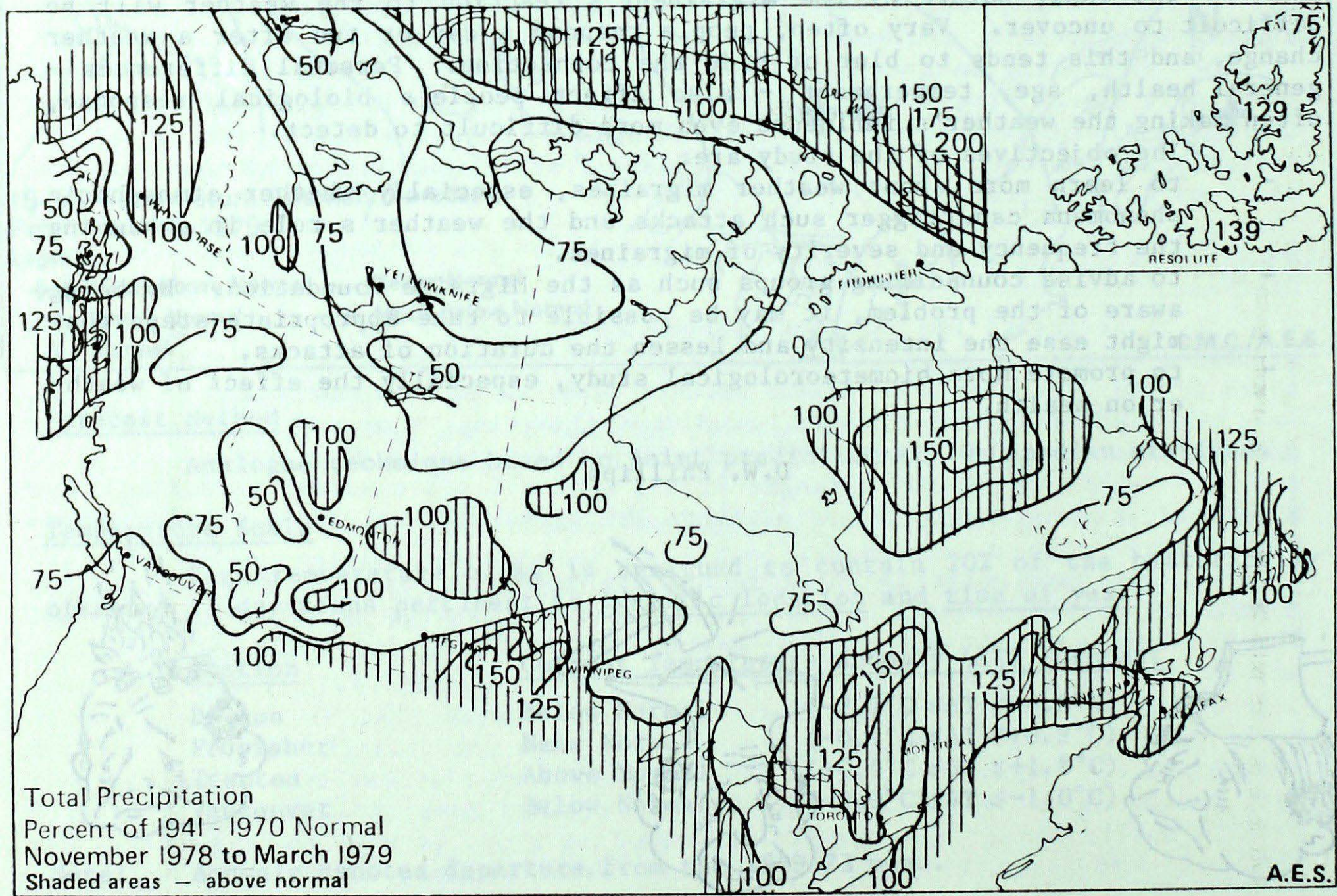
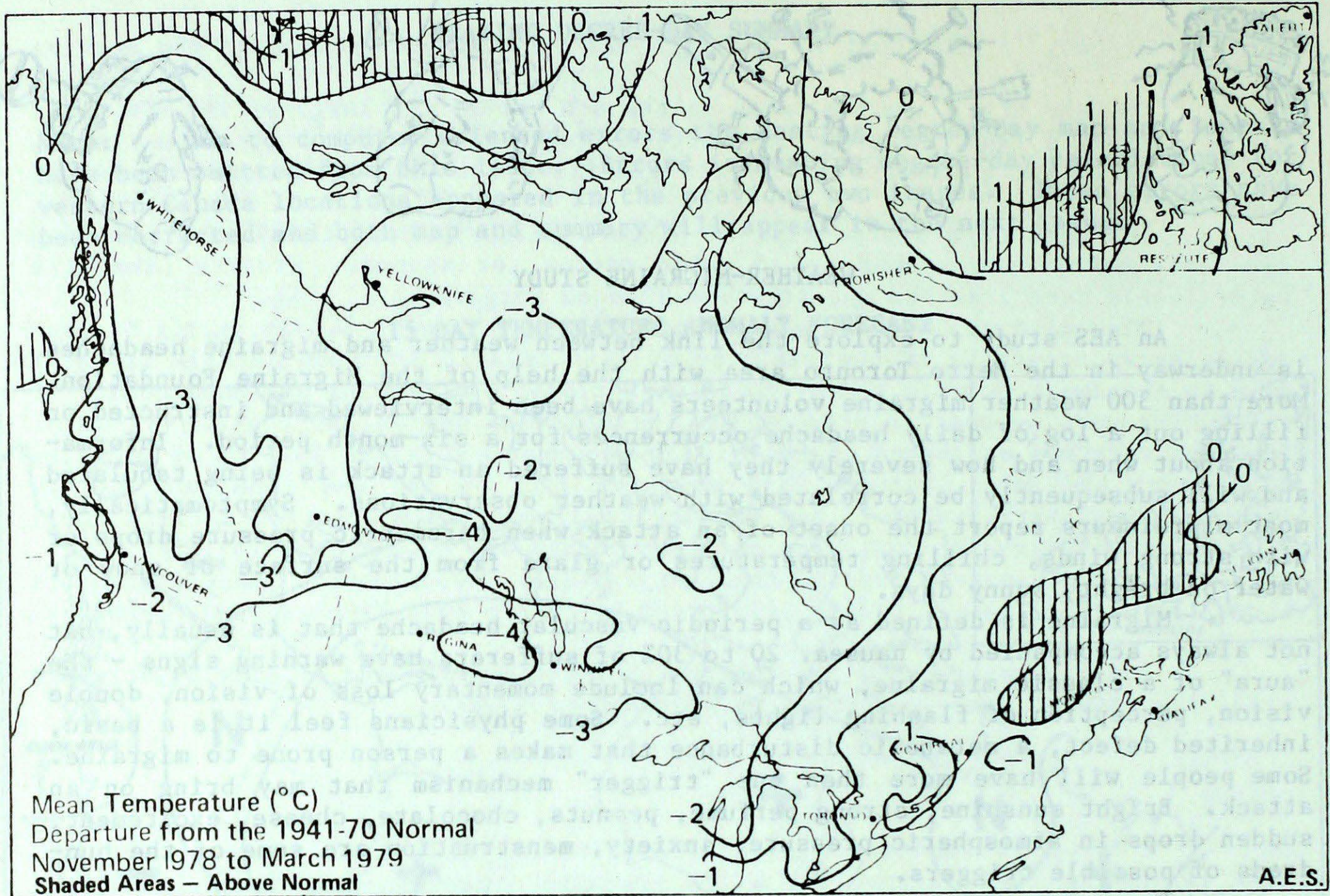
The objectives of the study are:

- to learn more about weather migraines, especially whether atmospheric phenomena can trigger such attacks and the weather's role in enhancing the frequency and severity of migraines.
- to advise counselling groups such as the Migraine Foundation. By being aware of the problem, it may be possible to take appropriate steps that might ease the intensity and lessen the duration of attacks.
- to promote more biometeorological study, especially the effect of weather on health.

D.W. Phillips







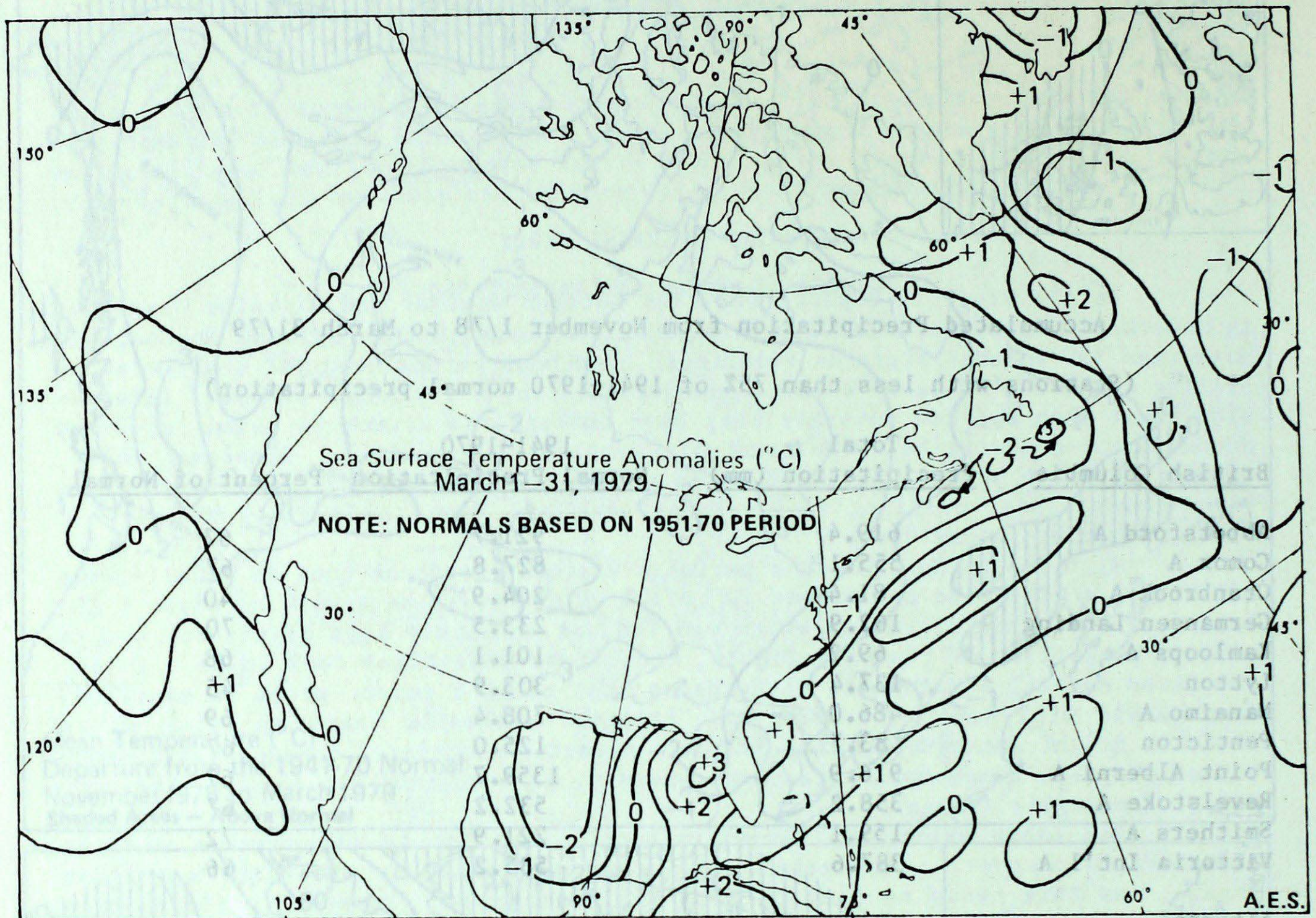


Accumulated Precipitation from November 1/78 to March 31/79

(Stations with less than 75% of 1941-1970 normal precipitation)

<u>British Columbia</u>	<u>Total Precipitation (mm)</u>	<u>1941-1970 Normal Precipitation</u>	<u>Percent of Normal</u>
Abbotsford A	619.4	921.7	67
Comox A	555.1	827.8	67
Cranbrook A	81.4	204.9	40
Germansen Landing	162.9	233.5	70
Kamloops A	69.2	101.1	68
Lytton	137.4	303.9	45
Nanaimo A	486.0	708.4	69
Penticton	83.7	125.0	67
Point Alberni A	916.9	1359.7	67
Revelstoke A	358.2	532.2	67
Smithers A	159.1	221.9	72
Victoria Int'l A	387.6	585.2	66
<u>Alberta</u>			
Banff	114.6	154.3	74
Calgary Int'l A	46.1	87.8	53
Coronation A	62.0	93.2	67
Edson A	52.8	131.9	40
Grande Prairie A	96.7	145.0	67
Jasper	89.0	134.5	66
Lethbridge A	85.8	115.4	74
Medicine Hat A	60.8	93.0	65
Red Deer A	49.2	91.3	54
Rocky Mountain House	60.8	113.0	54





## CLIMATIC PERSPECTIVES

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TEMPERATURE AND PRECIPITATION DATA FOR THE WEEK ENDING 0600 G.M.T. APRIL 10, 1979

Station	Temperature (°C)				Precip. (mm)		Station	Temperature (°C)				Precip. (mm)		Station	Temperature (°C)				Precip. (mm)	
	Average	Departure from Normal	Extreme Maximum	Extreme Minimum	Total	Departure from Normal		Average	Departure from Normal	Extreme Maximum	Extreme Minimum	Total	Departure from Normal		Average	Departure from Normal	Extreme Maximum	Extreme Minimum	Total	Departure from Normal
<b>BRITISH COLUMBIA</b>							Lethbridge A	2	-2	16	-13	18.9	12.6	Toronto Int'l A	-1	-5	9	-8	31.5	17.2
Abbotsford	8	-1	14	1	29.4	4.1	Medicine Hat A	1	-3	16	-14	2.9	-0.5	Trenton A	1	-4	9	-7	22.6	7.0
Blue River	M	M	M	M	M	M	Peace River A	-7	-6	7	-23	3.6	0.0	Trout Lake	-13	-5	1	-28	0.8	6.0
Bull Harbour	7	0	10	2	61.6	30.2	Red Deer A	-2	-3	16	-16	4.4	0.0	Wawa A	-7	M	7	-25	22.3	M
Castlegar A	8	0	18	-3	2.5	-4.7	Rocky Mountain House	-2	-4	13	-17	10.4	4.6	Warton A	-2	-4	4	-8	29.4	17.3
Cranbrook A	6	1	16	-9	2.6	-0.6	Vermilion A	-6	-6	12	-22	1.6	-1.9	Windsor A	1	-5	8	-6	53.3	37.8
Comox A	8	1	14	2	14.2	1.0	Whitecourt	-2	-3	13	-15	5.8	-1.9	<b>QUEBEC</b>						
Estevan Point	M	M	M	M	M	M	<b>SASKATCHEWAN</b>							Bagotville A	-1	-1	6	-10	8.0	-2.7
Fort Nelson A	-5	-4	10	-21	1.3	-3.7	Broadview	-12	-11	-1	-24	11.8	8.5	Bais Comeau	-1	0	3	-7	28.3	18.6
Fort St. John A	-4	-4	6	-17	2.4	-2.5	Buffalo Narrows	-10	-11	10	-29	10.6	9.1	Border	-11	1	1	-25	14.4	6.9
Kamloops A	6	-2	16	-4	3.6	1.9	Cree Lake	-12	M	8	-36	3.2	M	Chibougamau	-5	M	1	-16	9.6	M
Lytton	9	-1	15	2	0.4	-3.3	Estevan A	-7	-9	4	-21	7.6	1.0	Fort Chimo A	-12	0	2	-22	9.4	3.2
Penticton A	8	0	18	-2	0.3	-4.3	Hudson Bay	-12	-11	-1	-30	M	M	Gaspé A	0	3	7	-4	35.6	23.1
Port Hardy A	6	0	10	2	51.2	24.5	Kindersley	-3	-5	13	-20	0.0	-1.6	Grindstone Island	M	M	M	-4	M	M
Prince George A	3	0	9	-3	15.1	8.0	La Ronge A	-12	-10	5	-30	6.2	4.2	Inoucdjouac	-15	0	-3	-26	5.3	3.2
Prince Rupert A	5	0	10	0	88.2	49.3	North Battleford A	-11	-11	2	-26	2.7	-1.3	Maniwaki	-1	-2	7	-11	20.6	8.6
Quesnel A	4	-1	12	-4	16.8	11.1	Prince Albert A	-12	-11	1	-29	1.8	-4.8	Matagami A	-7	M	4	-18	8.0	M
Revelstoke A	4	-2	11	-3	15.6	3.3	Regina A	-10	-11	-1	-23	4.6	0.9	Mont Joli A	-2	-2	4	-10	28.8	14.7
Smithers A	4	1	11	-3	4.6	-0.3	Saskatoon A	-9	-10	5	-25	1.4	-2.1	Montréal Int'l A	1	-3	8	-6	21.2	4.9
Terrace A	4	-1	9	0	15.0	-3.5	Swift Current A	-3	-5	15	-22	3.0	0.3	Natashquan A	-1	1	4	-7	20.4	0.8
Vancouver Int'l A	9	0	14	2	14.9	-0.1	Uranium City	-12	M	7	-33	14.9	M	Nitchequan	-9	-1	-1	-23	8.1	0.3
Victoria Int'l A	9	1	14	3	11.2	1.7	Wynyard	-12	-13	-1	-26	1.9	-0.2	Port Manier	-1	1	3	-6	22.0	9.0
Williams Lake A	2	-2	12	-5	15.4	8.3	Yorkton A	-12	-11	-3	-25	4.9	1.3	Poste de la Baleine	M	M	M	-25	M	M
<b>YUKON TERRITORY</b>							<b>MANITOBA</b>							Québec A	-1	-2	5	-8	15.3	-0.4
Dawson A	-4	1	9	-23	1.4	-0.3	Bissett	-10	-11	4	-29	12.9	7.3	Riviere du Loup	-1	0	4	-6	23.2	18.5
Mayo A	-4	0	6	-13	3.3	1.4	Brandon A	-11	-11	0	-27	8.4	3.2	Roberval A	-2	-1	6	-8	18.7	9.7
Watson Lake A	-5	-2	6	-25	6.8	3.9	Churchill A	-20	-6	-8	-29	0.0	-4.1	Schefferville A	-10	-1	0	-25	18.2	7.6
Whitehorse A	-1	1	6	-20	0.0	-3.6	Dauphin A	-10	-10	-1	-26	11.3	5.5	Sept-Îles A	-1	1	4	-7	29.9	14.8
<b>NORTHWEST TERRITORIES</b>							Gillam A	-15	M	-1	-30	0.6	M	Sherbrooke A	0	-1	9	-8	M	M
Alert	-27	2	-16	-33	0.0	-1.5	Cimli	-9	-9	0	-25	13.2	8.1	Val d'Or A	-4	-3	5	-16	7.2	-2.4
Baker Lake	-23	-1	-13	-32	1.8	0.0	Lynn Lake	-14	-9	1	-30	0.8	-2.4	<b>NEW BRUNSWICK</b>						
Cambridge Bay A	-29	-3	-14	-40	0.0	-1.0	Norway House	-12	M	2	-30	1.1	M	Charlo A	-1	2	5	-8	34.0	27.0
Cape Dyer	M	M	M	M	M	M	Pilot Mound	-11	-11	-2	-26	6.4	1.1	Chatham A	0	-1	9	-7	30.4	8.7
Chesterfield Inlet	-22	-1	-12	-29	0.7	-1.7	Portage la Prairie	-9	-10	0	-23	12.7	6.9	Fredrickton A	1	-2	10	-8	49.9	31.3
Clyde	-20	1	-10	-29	0.0	-3.0	The Pas A	-11	-8	0	-26	12.8	7.7	Moncton A	0	-1	8	-5	45.0	22.0
Coppermine	-23	-2	-10	-40	1.6	-1.2	Thompson A	-16	-8	2	-33	0.8	-2.4	Saint John A	1	-1	7	-5	43.4	15.2
Coral Harbour	-19	1	-7	-32	0.0	-3.8	Winnipeg Int'l A	-9	-9	1	-25	6.9	1.4	<b>NOVA SCOTIA</b>						
Ennadai	-22	-5	-5	-37	0.0	-2.3	<b>ONTARIO</b>							Greenwood A	2	-1	12	-4	43.0	21.0
Eureka	-29	3	-13	-37	0.0	-0.6	Armstrong A	-8	-5	3	-24	M	M	Shearwater A	2	-1	7	-1	53.5	23.3
Fort Simpson	-11	M	9	-38	2.4	-0.2	Atikokan	-9	-10	3	-20	8.2	-3.5	Sydney A	1	0	7	-4	43.0	20.8
Fort Smith A	-11	-4	7	-34	5.0	1.3	Earlton A	-4	-2	5	-15	3.8	-5.7	Truro	M	M	M	-1	M	M
Frobisher Bay A	-12	5	4	-26	14.0	9.2	Geraldton	-11	-7	5	-31	0.8	-15.5	Yarmouth A	3	-1	10	-2	57.2	31.2
Hav River A	-13	-4	5	-29	0.5	-2.6	Gore Bay A	-1	-3	5	-8	8.2	-6.8	<b>PRINCE EDWARD ISLAND</b>						
Inuvik A	-20	-3	-13	-37	3.4	0.4	Kapusking A	-6	-3	7	-24	2.3	-11.0	Charlottetown	0	-1	6	-5	34.1	8.8
Mould Bay	-32	-5	-20	-39	1.2	0.7	Kenora A	-8	-8	3	-20	4.0	-5.4	Summerside	0	-1	6	-5	31.4	10.4
Norman Wells A	-15	-3	-1	-31	1.0	-2.6	Kingston A	1	-4	9	-7	M	M	<b>NEWFOUNDLAND</b>						
Resolute A	-27	0	-18	-36	0.0	-1.1	Lansdowne House	-10	-5	3	-23	1.2	-6.5	Battle Harbour	-2	1	1	-5	21.3	4.9
Sachs Harbour	-26	-2	-19	-36	0.6	0.1	London A	-2	-6	7	-7	42.4	24.6	Cartwright	-3	1	5	-9	12.2	-11.0
Yellowknife A	-15	-4	1	-33	2.2	-0.6	Moosonee	-9	-4	4	-22	8.0	-2.4	Deer Lake	1	4	7	-4	8.7	-5.6
<b>ALBERTA</b>							Mount Forest	-4	-6	5	-14	50.0	36.6	Gander Int'l A	-1	-1	4	-6	16.9	-2.5
Banff	0	-1	12	-15	8.9	0.3	Muskoka A	-2	-4	5	-14	28.7	16.4	Goose A	-3	1	5	-15	18.4	2.1
Calgary Int'l A	0	-2	17	-15	6.8	1.0	North Bay A	-3	-3	4	-14	23.1	9.9	Hopedale	-5	2	3	-16	17.1	4.6
Cold Lake A	-6	-7	11	-24	1.4	-3.4	Ottawa Int'l A	0	-3	9	-8	17.0	4.1	St. Anthony	-2	M	3	-5	32.4	M
Coronation A	-3	-3	14	-18	0.4	-4.6	Petawawa A	-10	-7	4	-25	0.0	-8.6	St. John's A	0	-1	6	-4	15.6	-10.7
Edmonton Mun. A	-2	-4	15	-16	4.4	-0.5	Pickle Lake	-10	-7	4	-25	0.0	-8.6	Stephenville A	1	1	6	-4	11.9	-4.1
Edmonton Namao A	-2	-4	14	-17	1.2	-3.9	Red Lake A	-10	-9	4	-24	10.7	3.7	Wabush Lake	-9	-1	1	-26	25.9	15.4
Edson A	-3	-5	12	-18	9.6	0.1	Simcoe	-1	-5	8	-6	M	M							
Fort Chipewyan	-10	-7	10	-34	6.0	-1.8	Sioux Lookout A	-9	-8	3	-21	2.3	-7.9							
Fort McMurray A	-8	-7	15	-31	2.0	-2.8	Sudbury A	-3	-2	5	-12	15.1	6.2							
Grande Prairie A	-3	-3	8	-17	3.7	-1.6	Thunder Bay A	-7	-7	4	-17	17.2	4.7							
Jasper	1	-1	10	-11	14.0	8.8	Timmins A	-5	-3	7	-20	2.6	-7.5							

M-Denotes missing data