



MONTHLY SUPPLEMENT INCLUDED

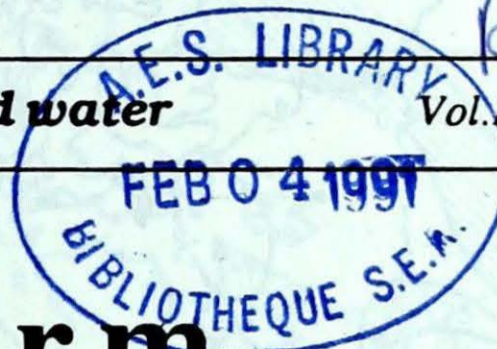
Climatic Perspectives

Archives

Jan 7 to Jan 13, 1991

A weekly review of Canadian climate and water

Vol. 13 No. 02



Major Atlantic storm claims 33 lives at sea

Newfoundland's first storm this year was a brutal reminder of the fearsome might of the raging sea. The storm claimed the lives of 33 sailors, 400 km off the east coast of St. John's, when the *Protector*, a Hong Kong-owned cargo ship succumbed to the five-storey high seas and 140 km/h winds on January 12. The ship disappeared from radar just as a rescue aircraft arrived.

This storm was characterized by its remarkably rapid intensification, hurricane force winds, heavy snowfall, windchill and blizzard conditions. It was tracked northeastward across the Newfoundland Grand Banks on January 10th and 11th.

Severe blizzard conditions inland, with winds gusting to 169 km/h, made it impossible to continue business as usual with schools and businesses closing, transportation services being stopped and generally putting activities at a standstill. The storm claimed another life during a traffic accident, and many more people were injured in the nine vehicle pile-up on the Trans Canada Highway, just west of the community of Grand Falls.

At the Gander airport, snow accumulation during the 11th and 13th was 41.6 cm and 13.4 cm respectively, while other areas of the island received average depths of 50 cm, with drifts much higher.

B.C. Avalanche

The sudden change in temperature experienced out west, although quite common for this time of year, caused havoc when Kamloops thermometer increased to +8.0 °C on January 12th.

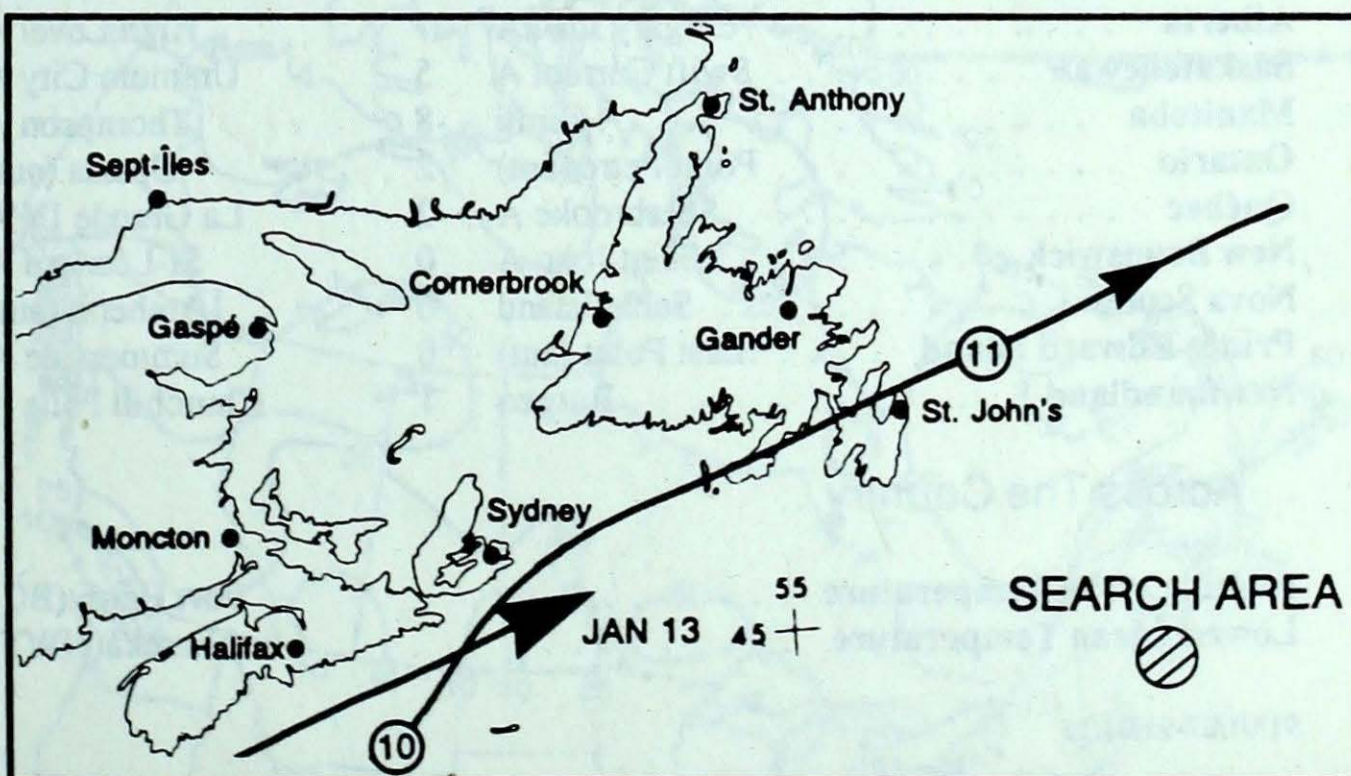
Routine avalanche control measures prevented fatal accidents from occurring along highways, but the sudden warming trend, this week, threatened to bring down 60 cm accumulation of snow from the mountainous Coquihalla Summit. The Avalanche Control Section of B.C. acted instinctively, employing the services of their ammunition laden helicopter to bombard the site and shake the snow drift free from the slope. The "quick sand" like snow

covered 30 metres of the south bound lane of the Coquihalla Highway and measured 4 metres deep.

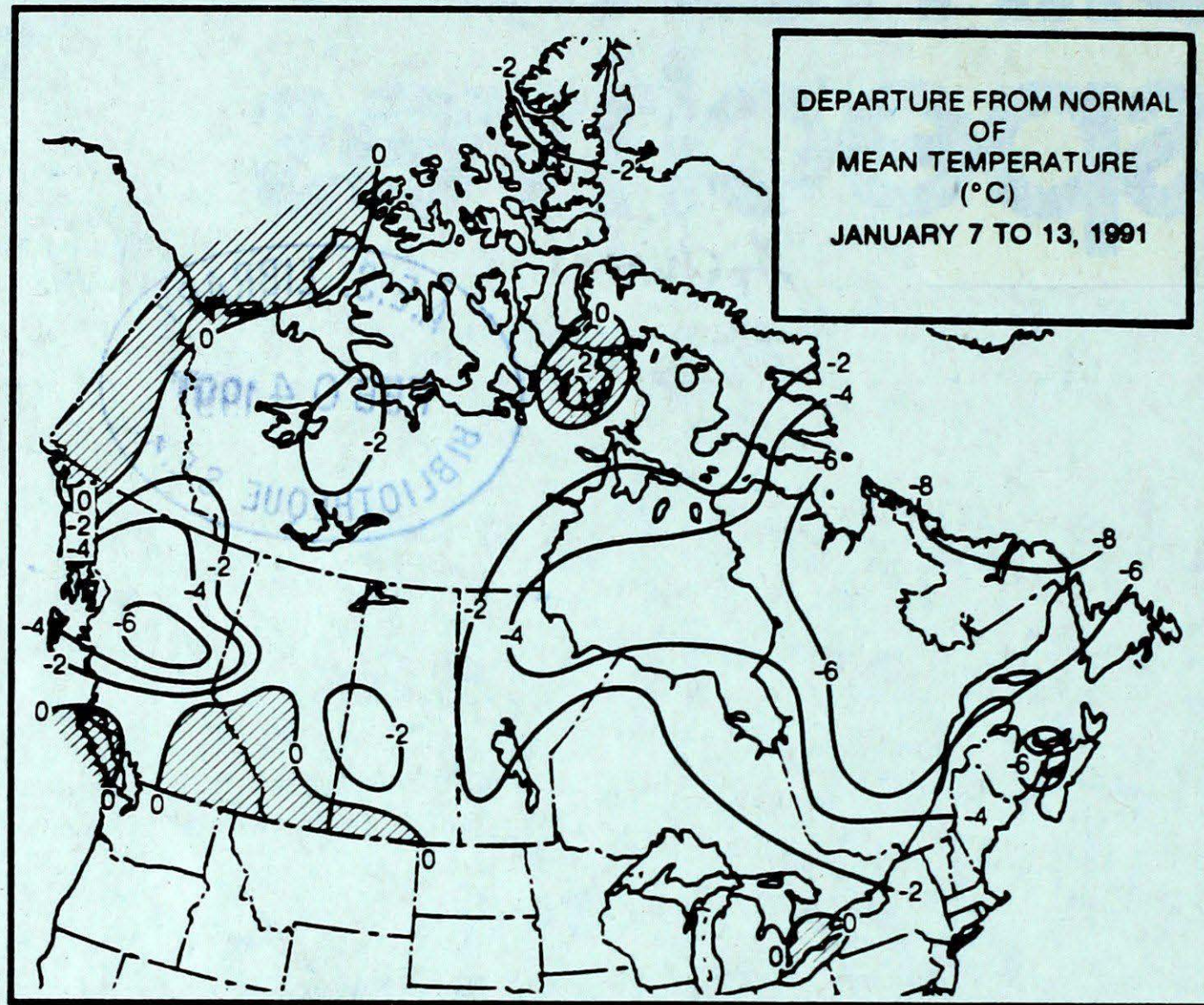
Mild weather to continue across the west...

For the week of January 21, temperatures will be mild across southeastern British Columbia, the Prairies and the central parts of the Northwest Territories.

Elsewhere, below normal temperatures are expected, especially across the Yukon, the Arctic Islands, and the Atlantic Region. Precipitation is likely in B.C., the Yukon, the Mackenzie District of the Northwest Territories and the Atlantic region will probably be hit with yet another winter storm.



Track of Atlantic storm responsible for cargo ship destruction January 10 - 11



Weekly normal temperatures (°C)

| | max. | min. |
|---------------------------|-------|-------|
| Whitehorse A | -19.8 | -28.1 |
| Iqaluit A | -21.3 | -29.4 |
| Yellowknife A | -25.5 | -33.9 |
| Vancouver Int'l A | 5.2 | -0.1 |
| Victoria Int'l A | 5.9 | 0.4 |
| Calgary Int'l A | -8.1 | -19.3 |
| Edmonton Int'l A | -14.4 | -25.0 |
| Regina A | -13.2 | -23.9 |
| Saskatoon A | -15.2 | -25.3 |
| Winnipeg Int'l A | -14.1 | -24.1 |
| Ottawa Int'l A | -7.2 | -16.3 |
| Toronto (Pearson Int'l A) | -3.2 | -11.5 |
| Montréal Int'l A | -6.6 | -15.3 |
| Québec A | -8.3 | -17.4 |
| Fredericton A | -4.8 | -15.2 |
| Saint John A | -3.4 | -13.6 |
| Halifax (Shearwater) | -0.8 | -8.8 |
| Charlottetown A | -3.6 | -11.6 |
| Goose A | -13.0 | -22.0 |
| St John's A | -0.7 | -7.4 |

Weekly temperature and precipitation extremes

| | Maximum temperature (°C) | Minimum temperature (°C) | Heaviest precipitation (mm) |
|-----------------------|--------------------------|--------------------------|-----------------------------|
| British Columbia | Victoria Int'l A 12 | Prince George A -46 | Abbotsford A 151 |
| Yukon Territory | Whitehorse A 1 | Watson Lake A -49 | Shingle Point A 3 |
| Northwest Territories | Cape Dyer A -10 | Eureka -47 | Inuvik A 8 |
| Alberta | Calgary Int'l A 7 | High Level A -44 | Lethbridge A 9 |
| Saskatchewan | Swift Current A 5 | Uranium City A -45 | Yorkton A 15 |
| Manitoba | Gimli -8 | Thompson A -46 | Gimli 7 |
| Ontario | Point Petre (aut) 2 | Upsala (aut) -42 | Warton A 23 |
| Québec | Sherbrooke A -2 | La Grande IV A -41 | Bagotville A 33 |
| New Brunswick | Saint John A 0 | St-Léonard A -30 | Moncton A 42 |
| Nova Scotia | Sable Island 6 | Amherst (aut) -24 | Sable Island 64 |
| Prince Edward Island | East Point (aut) 0 | Summerside A -22 | Charlottetown A 52 |
| Newfoundland | Burgeo 1 | Churchill Falls A -38 | Gander Int'l A 70 |

Across The Country...

| | |
|--------------------------|------------------|
| Highest Mean Temperature | Port Hardy(BC) 4 |
| Lowest Mean Temperature | Eureka(NWT) -41 |

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VOLUME 12

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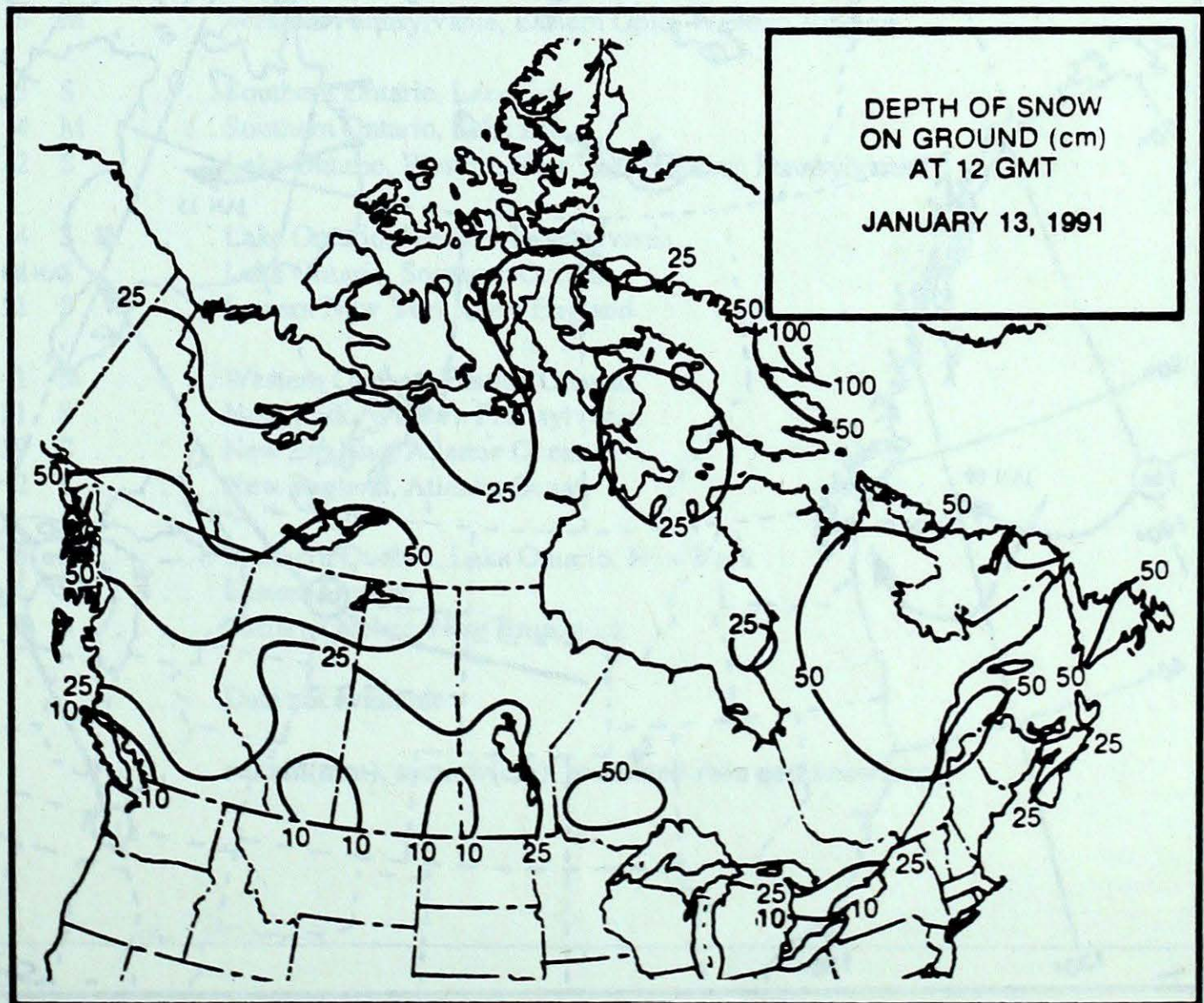
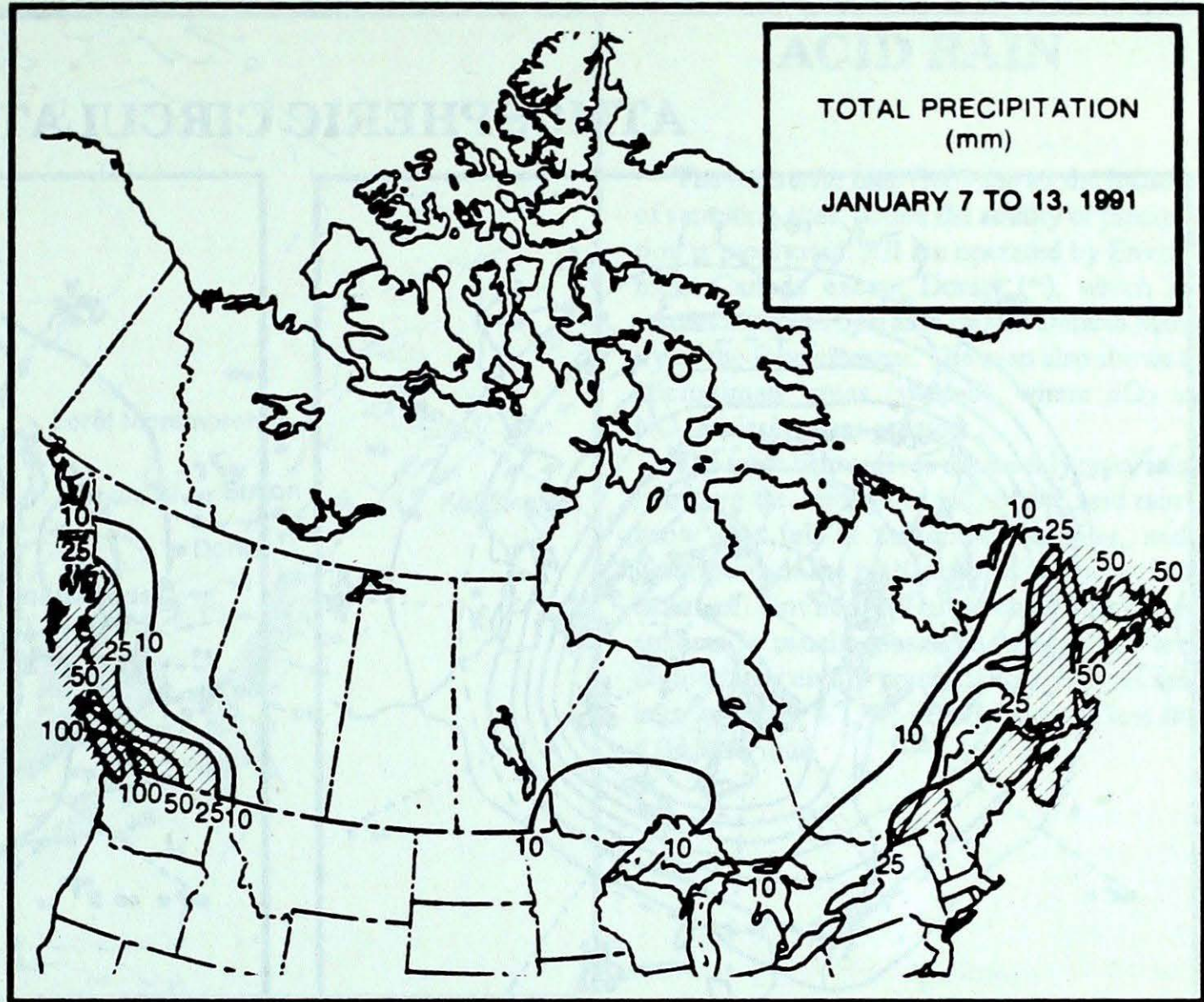
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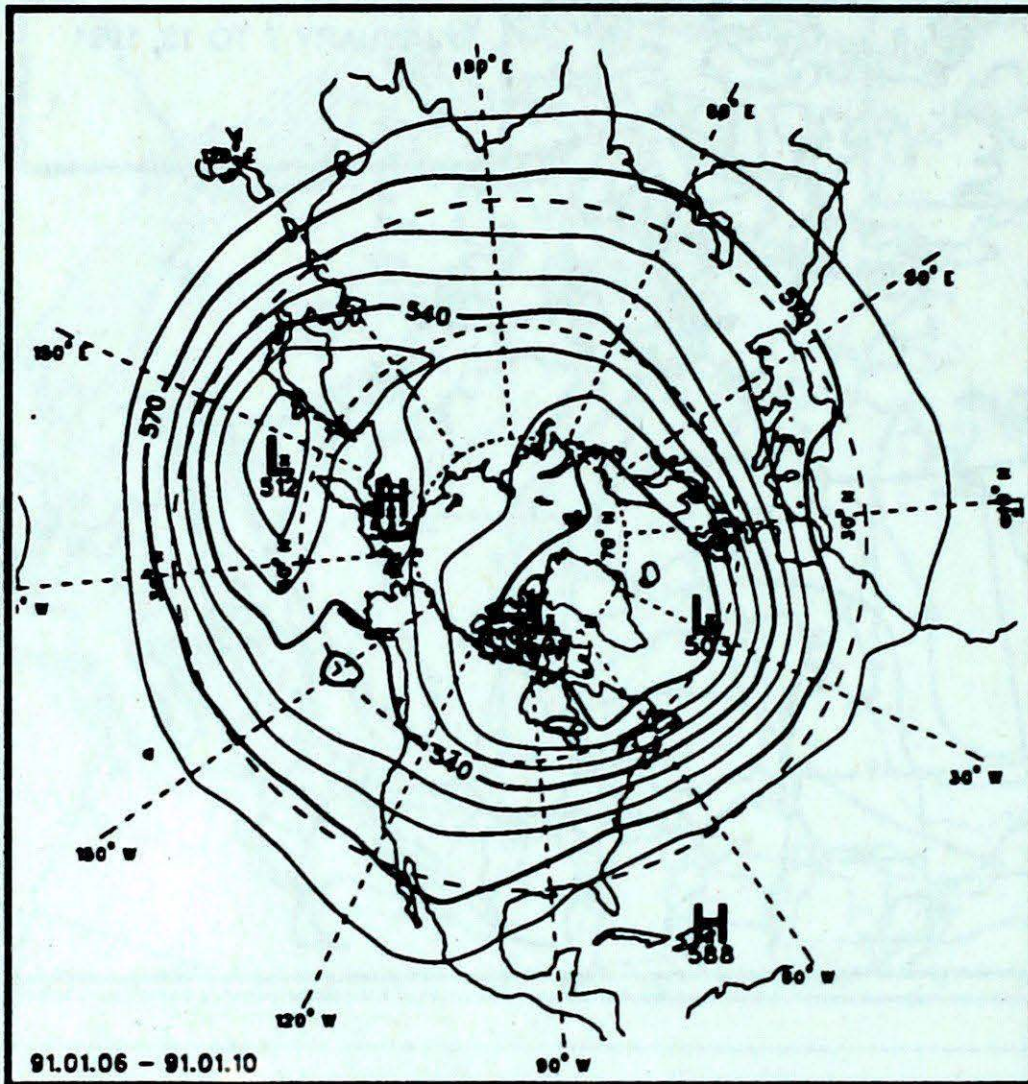
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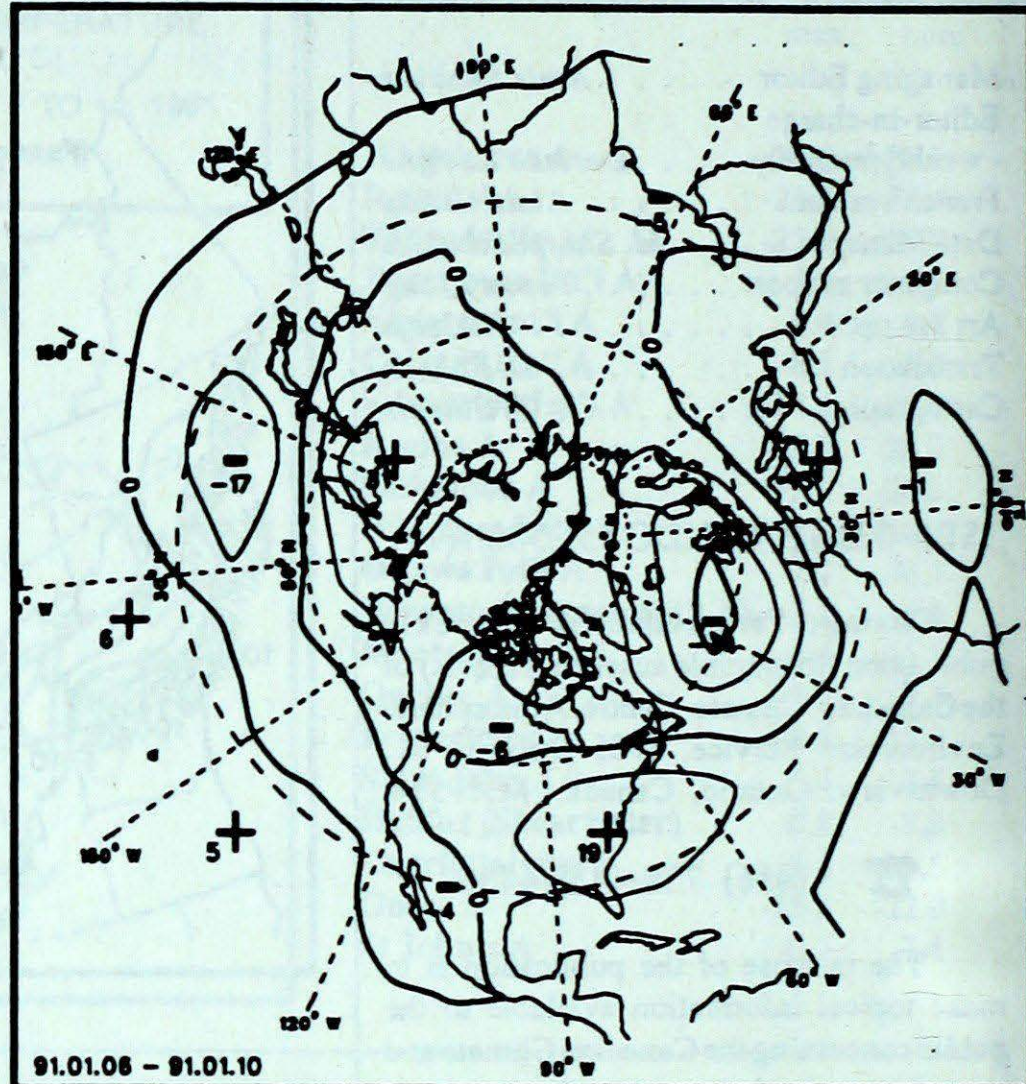
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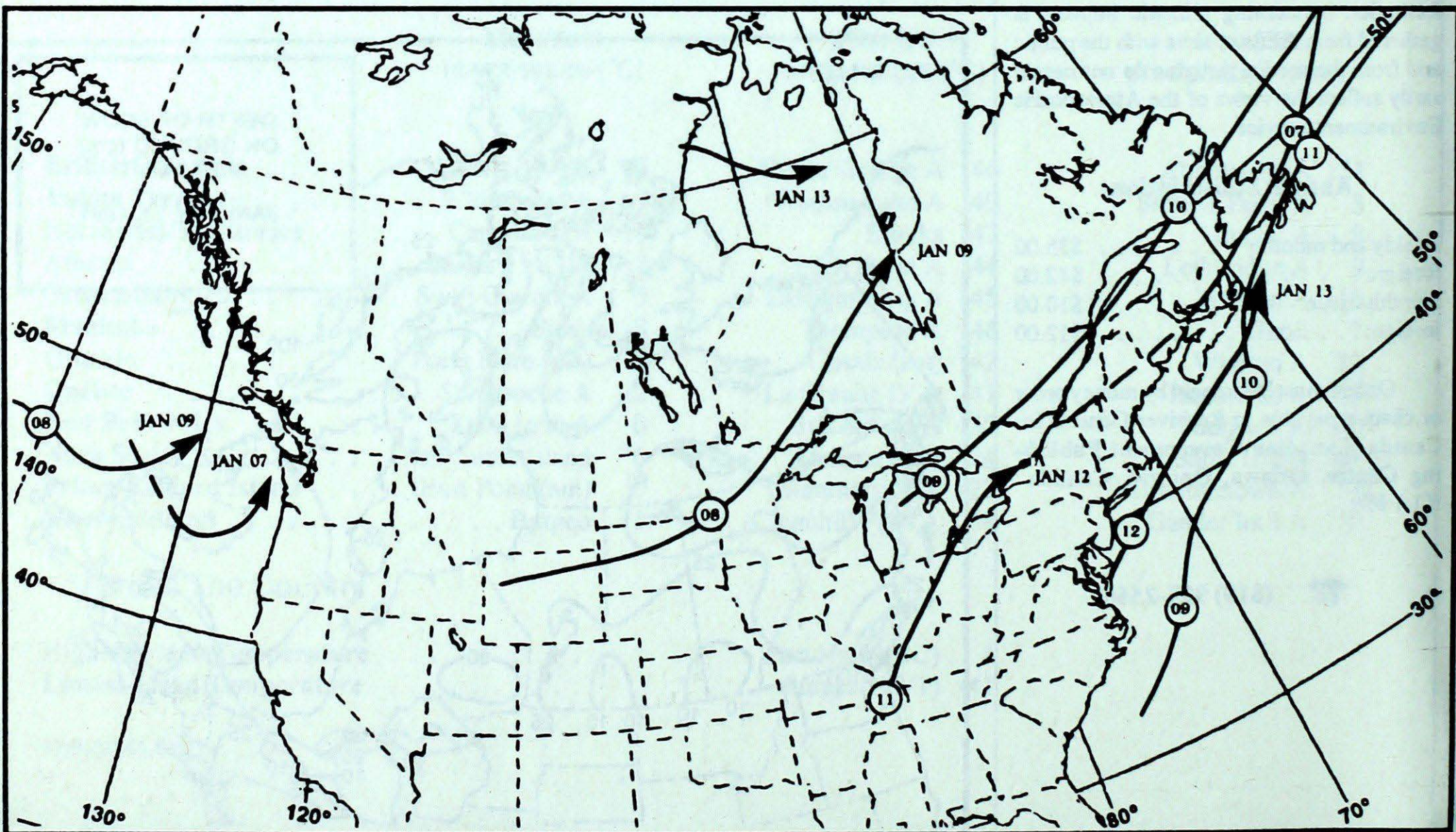
ATMOSPHERIC CIRCULATION



Mean geopotential height
50-kPa level (10-decametre intervals)



Mean geopotential height anomaly
50-kPa level (10-decametre intervals)

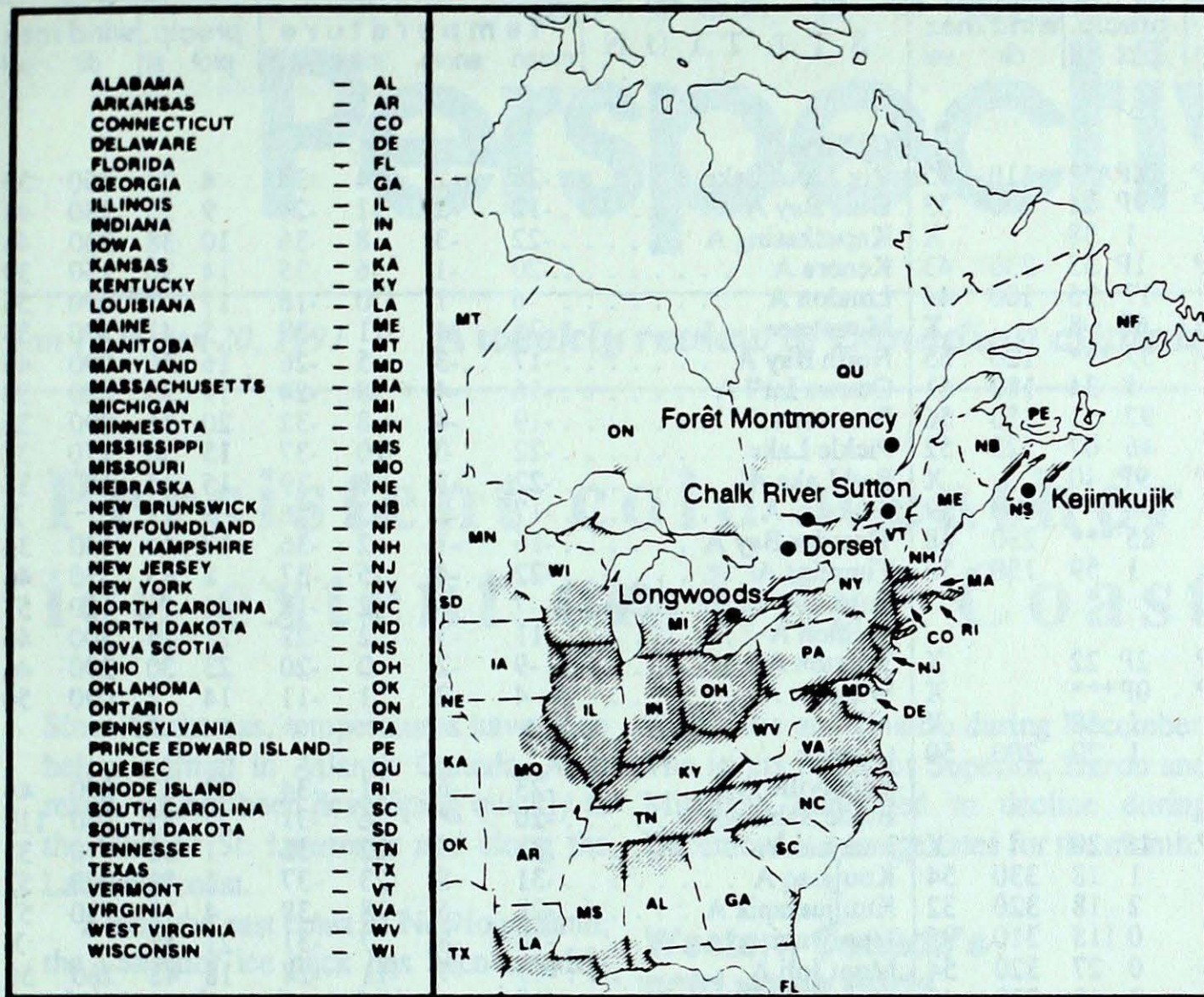


Tracks of low pressure centres at 12:00 U.T. each day during the period.

ACID RAIN

The reference map (left) shows the locations of sampling sites, where the acidity of precipitation is monitored. All are operated by Environment Canada except Dorset (*), which is a research station operated by the Ontario Ministry of the Environment. The map also shows the approximate areas (shaded), where SO₂ and NO_x emissions are greatest.

The table below gives the weekly report summarizing the acidity (or pH) of the acid rain or snow that fell at the collection sites, and a description of the path travelled by the moisture laden air. Environmental damage to lakes and streams is usually observed in sensitive areas regularly receiving precipitation with pH readings less than 4.7, while pH readings less than 4.0 are serious.



| Site | day | pH | amount | air path to site | Jan.6 to Jan.12, 1991 |
|-------------|-----|-----|--------|---|-----------------------|
| Longwoods | 11 | 4.1 | 16 M | Western Pennsylvania, Eastern Ohio, Western Virginia | |
| Dorset* | 8 | 4.1 | 3 S | Southern Ontario, Lake Erie | |
| | 9 | 4.3 | 4 M | Southern Ontario, Lake Erie | |
| | 11 | 4.6 | 12 S | Lake Ontario, Western New York, Eastern Pennsylvania | |
| Chalk River | 8 | 4.1 | 4 S | Lake Ontario, Western Pennsylvania | |
| | 9 | 4.2 | 4 S | Lake Ontario, Southern Ontario | |
| | 11 | 4.3 | 11 S | Eastern New York, New England | |
| Sutton | 6 | 4.0 | 1 S | Western Quebec, Eastern Ontario | |
| | 9 | 4.3 | 11 S | New York, Western Pennsylvania | |
| | 11 | 5.0 | 19 S | New England, Atlantic Ocean | |
| | 12 | 4.3 | 2 S | New England, Atlantic Ocean | |
| Montmorency | 9 | 4.7 | 6 S | Southern Quebec, Lake Ontario, New York | |
| | 11 | 4.4 | 4 S | Eastern Quebec | |
| | 12 | 4.5 | 4 S | Eastern Quebec, New Brunswick | |
| Kejimikujik | | | | Data not available | |
| | | | | r=rain(mm), s=snow(cm), m=mixed rain and snow(mm) | |

| STATION | temperature | | | | precip. | | wind max | | STATION | temperature | | | | precip. | | wind max | |
|------------------------------|-------------|------|------|------|---------|-----|----------|---------------------------------|-----------------------------|-------------|------|------|------|---------|-----|----------|-----|
| | mean | anom | max | min | ptot | st | dir | vel | | mean | anom | max | min | ptot | st | dir | vel |
| British Columbia | | | | | | | | Ontario | | | | | | | | | |
| Cape St James | 3P | -1P | 7P | -1P | 18P*** | | 110 | 95 | Big Trout Lake | -26 | -2 | -14 | -37 | 4 | 37 | 150 | 39 |
| Cranbrook A | -9P | 4P | 7P | -20P | 9P | 21 | 200 | 33 | Gore Bay A | -12 | -2 | -1 | -21 | 9 | 25 | 280 | 44 |
| Fort Nelson A | -28 | -2 | -16 | -40 | 1 | 38 | | X | Kapuskasung A | -22 | -3 | -8 | -36 | 10 | 38 | 330 | 46 |
| Fort St John A | -20P | 1P | 3P | -35P | 1P | 53 | 230 | 43 | Kenora A | -20 | -1 | -6 | -35 | 14 | 36 | 150 | 39 |
| Kamloops A | -9 | -3 | 8 | -20 | 17 | 16 | 100 | 44 | London A | -6 | 1 | 0 | -16 | 17 | 7 | 090 | 56 |
| Penticton A | -8P | -6P | 6P | -11P | 6P | 8 | | X | Moosonee | -25 | -4 | -11 | -39 | 5 | 41 | 270 | 33 |
| Port Hardy A | 4 | 1 | 8 | 0 | 57*** | | 120 | 65 | North Bay A | -17 | -3 | -5 | -26 | 16 | 36 | 090 | 46 |
| Prince George A | -21 | -7 | 4 | -46 | 5 | 34 | 180 | 61 | Ottawa Int'l A | -16 | -4 | -8 | -24 | 19 | 33 | 080 | 50 |
| Prince Rupert A | -4 | -2 | 7 | -18 | 92 | 1 | 150 | 56 | Petawawa A | -19 | -4 | -8 | -32 | 20 | 36 | 290 | 35 |
| Revelstoke A | -8 | 3 | 2 | -19 | 46 | 67 | 320 | 52 | Pickle Lake | -22 | 0 | -10 | -37 | 15 | 30 | 170 | 37 |
| Smithers A | -17P | -4P | 2P | -35P | 9P | 40 | | X | Red Lake A | -22 | -1 | -8 | -39 | 15 | 44 | 150 | 35 |
| Vancouver Int'l A | 2 | 0 | 11 | -4 | 106*** | | 090 | 39 | Sudbury A | -17 | -2 | -3 | -26 | 3 | 17 | | X |
| Victoria Int'l A | 3 | 0 | 12 | -2 | 85*** | | 230 | 48 | Thunder Bay A | -16 | -1 | -2 | -36 | 17 | 44 | 140 | 33 |
| Williams Lake A | -16 | -3 | 6 | -37 | 1 | 59 | 150 | 56 | Timmins A | -22 | -4 | -5 | -37 | 8 | 43 | 330 | 46 |
| Yukon Territory | | | | | | | | Toronto(Pearson Int'l A) | | | | | | | | | |
| Komakuk Beach A | -27P | -3P | -11P | -46P | 2P | 22 | | X | Trenton A | -11 | -3 | 2 | -22 | 21 | 19 | 300 | 46 |
| Teslin (aut) | -24P | * | -5P | -45P | 0P*** | | | X | Warton A | -9 | -2 | 0 | -20 | 23 | 30 | 290 | 46 |
| Watson Lake A | -32 | -3 | -14 | -49 | 1 | 58 | | X | Windsor A | -4 | 2 | 1 | -11 | 14 | 2 | 090 | 50 |
| Whitehorse A | -22 | 2 | 1 | -43 | 1 | 29 | 200 | 50 | Québec | | | | | | | | |
| Northwest Territories | | | | | | | | Bagotville A | | | | | | | | | |
| Alert | -34P | -2P | -25P | -40P | 1P | 20 | | X | Blanc Sablon A | -20 | * | -6 | -31 | 27 | 55 | 360 | 119 |
| Baker Lake A | -34 | -1 | -26 | -39 | 1 | 18 | 330 | 54 | Inukjuak A | -31 | -6 | -22 | -35 | 1 | 30 | 170 | 37 |
| Cambridge Bay A | -34 | -1 | -24 | -41 | 2 | 18 | 320 | 32 | Kuujuuaq A | -31 | -8 | -23 | -37 | 1 | 52 | 280 | 52 |
| Cape Dyer A | -24 | -2 | -10 | -36 | 0 | 118 | 310 | 95 | Kuujuarapik A | -28 | -6 | -18 | -38 | 4 | 12 | 130 | 57 |
| Clyde A | -30 | -4 | -19 | -36 | 0 | 27 | 320 | 54 | Maniwaki | -18 | -3 | -7 | -31 | 21 | 40 | | X |
| Coppermine A | -30 | -4 | -20 | -38 | 3 | 49 | 210 | 48 | Mont Joli A | -19 | -7 | -11 | -27 | 18 | 48 | 280 | 56 |
| Coral Harbour A | -33 | -3 | -28 | -39 | 0 | 15 | | X | Montréal Int'l A | -15 | -4 | -6 | -25 | 27 | 33 | 060 | 39 |
| Eureka | -41 | -5 | -36 | -47 | 1 | 6 | | X | Natashquan A | -21 | -8 | -5 | -28 | 12 | 67 | 310 | 63 |
| Fort Smith A | -29 | -1 | -13 | -44 | 2 | 57 | | X | Québec A | -17 | -5 | -8 | -28 | 20 | 61 | 070 | 56 |
| Hall Beach A | -31 | 0 | -21 | -36 | 0 | 30 | | X | Schefferville A | -31 | -8 | -20 | -40 | 2 | 71 | 310 | 50 |
| Inuvik A | -31 | 1 | -16 | -44 | 8 | 39 | | X | Sept-Îles A | -22 | -8 | -12 | -29 | 7 | 52 | 320 | 56 |
| Iqaluit A | -31 | -6 | -23 | -38 | 0 | 24 | 360 | 48 | Sherbrooke A | -16 | -3 | -2 | -31 | 28 | 40 | 280 | 37 |
| Mould Bay A | -33 | 0 | -23 | -44 | 2 | 21 | 200 | 44 | Val-d'Or A | -22 | -5 | -7 | -36 | 8 | 30 | 330 | 43 |
| Norman Wells A | -31 | -1 | -20 | -37 | 2 | 17 | | X | New Brunswick | | | | | | | | |
| Resolute A | -32 | 0 | -26 | -39 | 0 | 28 | 210 | 33 | Charlo A | -19 | -5 | -10 | -26 | 12 | 85 | 260 | 65 |
| Yellowknife A | -32 | -3 | -14 | -44 | 2 | 42 | 100 | 41 | Chatham A | -16 | -6 | -7 | -25 | 23 | 24 | 300 | 74 |
| Alberta | | | | | | | | Fredericton A | | | | | | | | | |
| Calgary Int'l A | -12 | 2 | 7 | -27 | 2 | 2 | 260 | 56 | Moncton A | -16P | -7P | -5P | -26P | 42P | 45 | 290 | 67 |
| Cold Lake A | -25 | -3 | -4 | -43 | 1 | 18 | | X | Saint John A | -14 | -6 | 0 | -24 | 40 | 46 | 300 | 56 |
| Edmonton Namao A | -18 | 1 | 4 | -32 | 0 | 15 | | X | Nova Scotia | | | | | | | | |
| Fort McMurray A | -25 | -2 | -5 | -42 | 0 | 24 | | X | Greenwood A | -11 | -5 | 2 | -22 | 39 | 28 | 300 | 74 |
| High Level A | -27 | 1 | -13 | -44 | 4 | 52 | | X | Shearwater A | -10 | -5 | 3 | -21 | 33 | 16 | 280 | 78 |
| Jasper | -14 | 1 | 6 | -35 | 0 | 30 | | X | Sydney A | -9 | -4 | 1 | -16 | 39 | 26 | 300 | 96 |
| Lethbridge A | -8 | 4 | 7 | -28 | 9 | 10 | 260 | 78 | Yarmouth A | -8 | -4 | 5 | -16 | 34 | 14 | 310 | 70 |
| Medicine Hat A | -15 | -1 | 6 | -36 | 9 | 5 | 220 | 70 | Prince Edward Island | | | | | | | | |
| Peace River A | -24 | -1 | -6 | -37 | 1 | 21 | | X | Charlottetown A | -13 | -6 | -2 | -22 | 52 | 37 | 300 | 65 |
| Saskatchewan | | | | | | | | Summerside A | | | | | | | | | |
| Cree Lake | -28 | 1 | -11 | -44 | 2 | 47 | 130 | 33 | -14 | -6 | -3 | -22 | 41 | 41 | 300 | 69 | |
| Estevan A | -19 | -3 | 3 | -38 | 3 | 7 | 120 | 41 | Newfoundland | | | | | | | | |
| La Ronge A | -27 | -2 | -9 | -44 | 1 | 42 | | X | Cartwright | -22P | -8P | -12P | -27P | 22P | 118 | 330 | 63 |
| Regina A | -20 | -2 | 1 | -36 | 0 | 9 | 130 | 57 | Churchill Falls A | -29 | -6 | -19 | -38 | 4 | 83 | 260 | 59 |
| Saskatoon A | -24 | -4 | -7 | -39 | 0 | 7 | | X | Gander Int'l A | -13 | -7 | -3 | -22 | 70 | 50 | 300 | 96 |
| Swift Current A | -16 | 0 | 5 | -34 | 1 | 18 | 250 | 54 | Goose A | -25 | -8 | -15 | -31 | 5 | 73 | 260 | 52 |
| Yorkton A | -25 | -5 | -11 | -42 | 15 | 22 | 140 | 44 | Port Aux Basques | -9 | -5 | 0 | -18 | 64 | 61 | 310 | 126 |
| Manitoba | | | | | | | | St John's A | | | | | | | | | |
| Brandon A | -25 | -5 | -11 | -40 | 3 | 26 | | X | St Lawrence | -9 | -4 | 0 | -16 | 46 | 24 | | X |
| Churchill A | -34 | -6 | -26 | -39 | 0 | 30 | 260 | 32 | Wabush Lake A | -29P | -5P | -19P | -35P | 5P | 59 | 260 | 65 |
| Lynn Lake A | -32 | -3 | -19 | -42 | 1 | 28 | | X | 91/01/07-91/01/13 | | | | | | | | |
| The Pas A | -26 | -3 | -15 | -37 | 3 | 17 | 140 | 39 | | | | | | | | | |
| Thompson A | -32 | -4 | -22 | -46 | 2 | 56 | | X | | | | | | | | | |
| Winnipeg Int'l A | -21 | -2 | -9 | -37 | 5 | 18 | 150 | 33 | | | | | | | | | |

mean = mean weekly temperature, °C
 max = maximum weekly temperature, °C
 min = minimum weekly temperature, °C
 anom = mean temperature anomaly, °C

ptot = weekly precipitation total in mm
 st = snow thickness on the ground in cm
 dir = direction of max wind, deg. from north.
 vel = wind speed in km/h

— Annotations —
 X = no observation
 P = less than 7 days of data
 * = missing data when going to printing.