Environment Canada Environnement Canada

# Climatic Perspectives



*September 20 to 26, 1993* ***A weekly review of Canadian climate and water*** *Vol. 15 No. 39*

# A cool, unsettled autumn week

*Typical autumn weather was evident across much of Canada. Weather conditions were changeable and temperatures fluctuated markedly from region to region.*

In the Yukon and northern British Coumbia, a strong westerly circulation pushed Pacific disturbances inland, producing light snowfalls and rain showers. A vigorous system dumped 50 mm of rain on Atlin, B.C. and blanketed the mountains with snow. Nighttime temperatures dropped well-below freezing. In the southern and central interior of B.C., it was, for the most part, another beautiful fall week for apple picking and grape harvesting, both of which are underway.

On Monday, up to 20 cm of new snow fell in the mountain parks of Alberta. The next day, September 21, accumulations of 10 to 20 centimetres were reported in higher elevations of the southwest and in the Cypress Hills. Elsewhere across the south, 10 to 40 millimetres of rain was recorded. New daily record-low temperatures of -4°C and -5°C were established at Red Deer, Jasper and Edmonton. In Saskatchewan and Manitoba, the week started out wet, with rain mixed with some snow. Warmer weather arrived during the middle of the week, but another blast of cold Arctic air slipped southwards for the weekend.

In Ontario, patchy frost occurred in the southwest, where the tomato harvest nears completion. The warm weather of this past summer, together with adequate rainfalls, have translated into an above-normal yield of vegetables. In general, there have been few if any complaints about this year's harvest from the farming community.

Mainly sunny weather prevailed in the Maritimes during the first part of the week. Cloud and showers moved in on Thursday. Sunny conditions returned on Saturday and rain again on Sunday. Some frost was reported during the early part of the period.

On the island of Newfoundland, sunshine dominated during the first three days of the period, except on the west coast, where strong westerly onshore winds pushed low cloud inland. A low pressure system brought rain on the 23rd and 24th. Sunshine returned for the weekend.

A nearly stationary low pressure system dominated the weather across Labrador, producing rain during the early part of the week.

In the north, low pressure disturbances moved across the Arctic Islands and the Northwest Territories, giving snowy and windy conditions, while the more southern areas enjoyed relatively pleasant temperatures. Eventually colder air spilled southwards, with snow covering the northern Mackenzie district. Later in the week, a vigorous disturbance affected the southern Mackenzie, producing a mixture of rain and snow. Yellowknife established a new daily 24-hour precipitation record of 14 mm on the 26th. Numerous wind and gale warnings were issued for the southern Arctic coastline. Blizzard conditions affected parts of Baffin Island, with more settled weather arriving towards the end of the period.

## Prairie harvest update

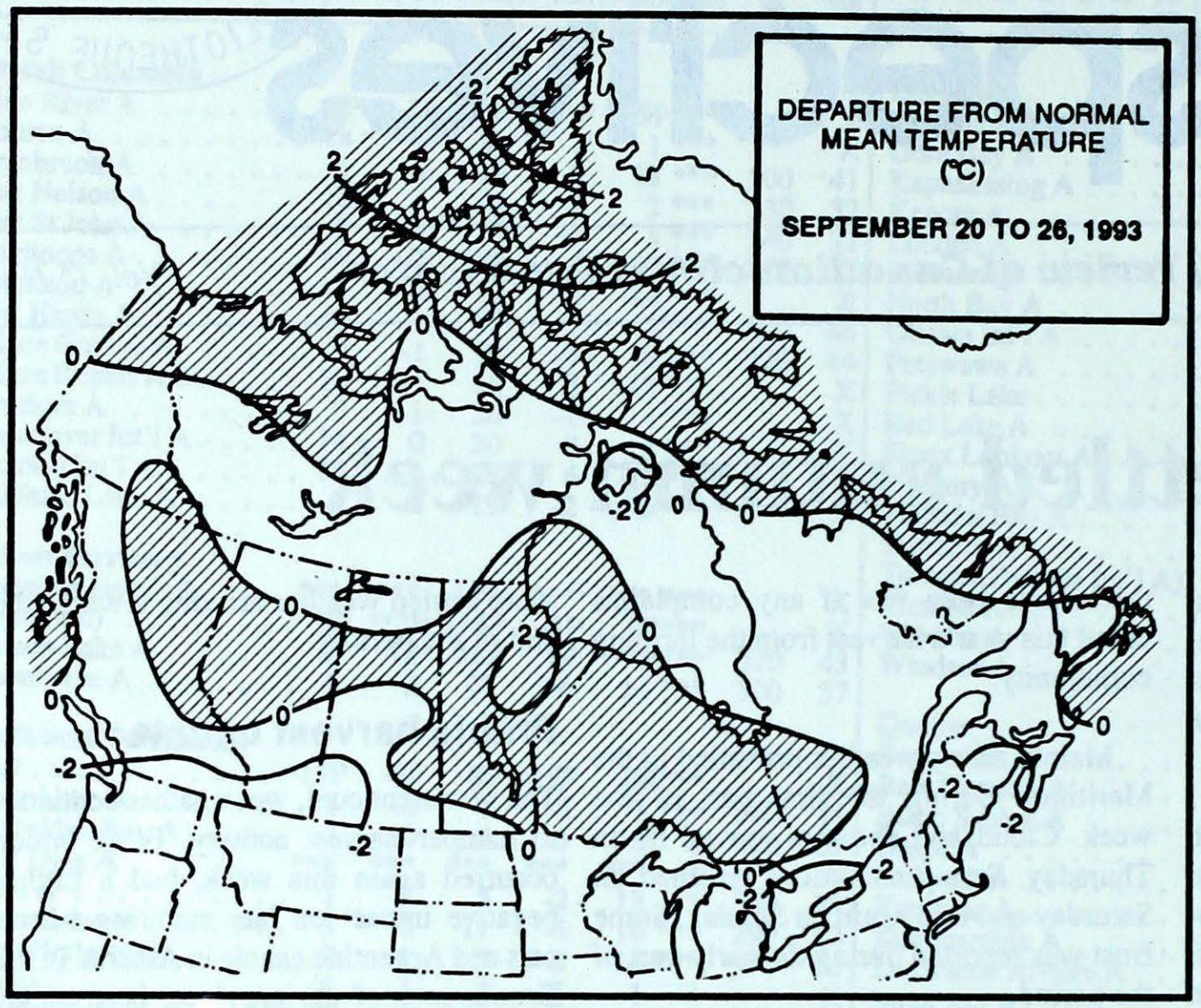
The persistent cool, wet weather continues to hamper harvest activity. Frost, which occurred again this week, had a further negative impact on late maturing wheat, oats and Argentine canola in Alberta. In the Brooks area of the province, bean yields are expected to be reduced by half. On a positive note, pasture conditions are in good shape in almost all areas, although the cold weather has slowed grass growth.

In Saskatchewan, harvesting is proceeding, even though the crops are damp. The heavy snow on September 11 and 12, flattened standing crops and has made swathing difficult. Eight northeastern rural communities declared a state of emergency due to the impact the snow has had on the crops.

In Manitoba, the harvest was most advanced in the east, where more than half of the wheat and 20% of the canola has been combined. In the Swan River area, combining just started last week. Most wheat is being graded #3 and feed, due to weathering and shriveled kernels. Harvested hay is generally of good quality.

## *A look ahead...*

For the week of October 4, above-normal temperatures should prevail across most of Canada except in northern Quebec, Labrador and Baffin Island.




## Weekly normal temperatures (°C)

| | max. | min. |
|---|---|---|
| **Whitehorse A** | 10.8 | 1.5 |
| **Iqaluit A** | 2.9 | -1.7 |
| **Yellowknife A** | 7.9 | 1.8 |
| **Vancouver Int'l A** | 17.3 | 9.1 |
| **Victoria Int'l A** | 18.2 | 8.1 |
| **Calgary Int'l A** | 15.8 | 2.6 |
| **Edmonton Int'l A** | 15.1 | 2.1 |
| **Regina A** | 15.8 | 2.6 |
| **Saskatoon A** | 15.5 | 2.9 |
| **Winnipeg Int'l A** | 15.8 | 4.2 |
| **Ottawa Int'l A** | 17.6 | 7.6 |
| **Toronto (Pearson Int'l A)** | 19.4 | 8.4 |
| **Montréal Int'l A** | 18.2 | 8.2 |
| **Québec A** | 16.2 | 5.9 |
| **Fredericton A** | 18.3 | 5.8 |
| **Saint John A** | 16.6 | 6.8 |
| **Halifax (Shearwater)** | 17.9 | 9.3 |
| **Charlottetown A** | 16.9 | 8.3 |
| **Goose A** | 12.6 | 3.5 |
| **St John's A** | 14.8 | 6.7 |

## Weekly temperature and precipitation extremes

| | Maximum temperature (°C) | | Minimum temperature (°C) | | Heaviest precipitation (mm) | |
|---|---|---|---|---|---|---|
| **British Columbia** | Port Alberni A | 26 | Prince George A | -6 | Prince Rupert A | 131 |
| **Yukon Territory** | Watson Lake A | 16 | Faro (aut) | -6 | Teslin (aut) | 34 |
| **Northwest Territories** | Fort Smith A | 18 | Alert | -21 | Yellowknife A | 15 |
| **Alberta** | Red Deer A | 24 | Grande Prairie A | -5 | Medicine Hat A | 42 |
| **Saskatchewan** | Estevan A | 23 | Saskatoon A | -5 | Swift Current A | 41 |
| **Manitoba** | Brandon A | 23 | Thompson A | -6 | Dauphin A | 25 |
| | | | | | Island Lake | 25 |
| **Ontario** | Kenora A | 21 | Timmins A | -3 | Armstrong (aut) | 34 |
| **Quebec** | Montréal Int'l A | 20 | Val-d'Or | -3 | Kuujjuaq A | 44 |
| **New Brunswick** | Fredericton A | 21 | St-Léonard A | -2 | Saint John A | 26 |
| **Nova Scotia** | Greenwood A | 21 | Greenwood A | 0 | Yarmouth A | 22 |
| | Yarmouth A | 21 | | | | |
| **Prince Edward Island** | Charlottetown A | 20 | Charlottetown A | 3 | Charlottetown A | 23 |
| **Newfoundland** | Goose A | 21 | Badger (aut) | -5 | St. Lawrence | 41 |

### Across The Country...

| | | |
|---|---|---|
| **Highest Mean Temperature** | Lytton (B.C.) | 15 |
| **Lowest Mean Temperature** | Alert (N.W.T.) | -13 |

93/09/20-93/09/26

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The purpose of the publication is to make topical information available to the public concerning the Canadian Climate and its socio-economic impact.

The data in this publication are based on unverified reports from approximately 225 Canadian synoptic weather stations. Information concerning climatic impacts is gathered from AES contacts with the public and from the media. Articles do not necessarily reflect the views of the Atmospheric Environment Service.

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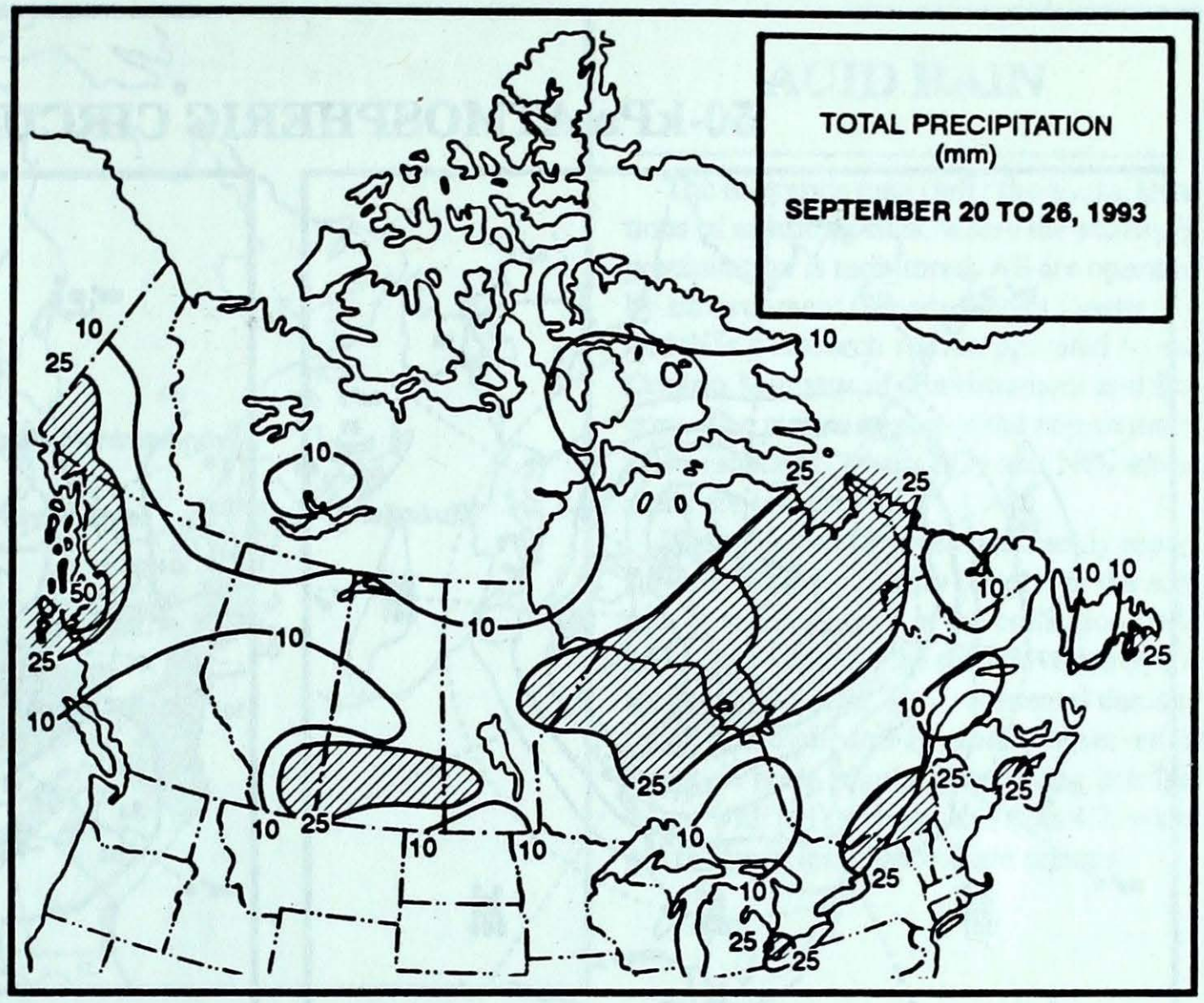
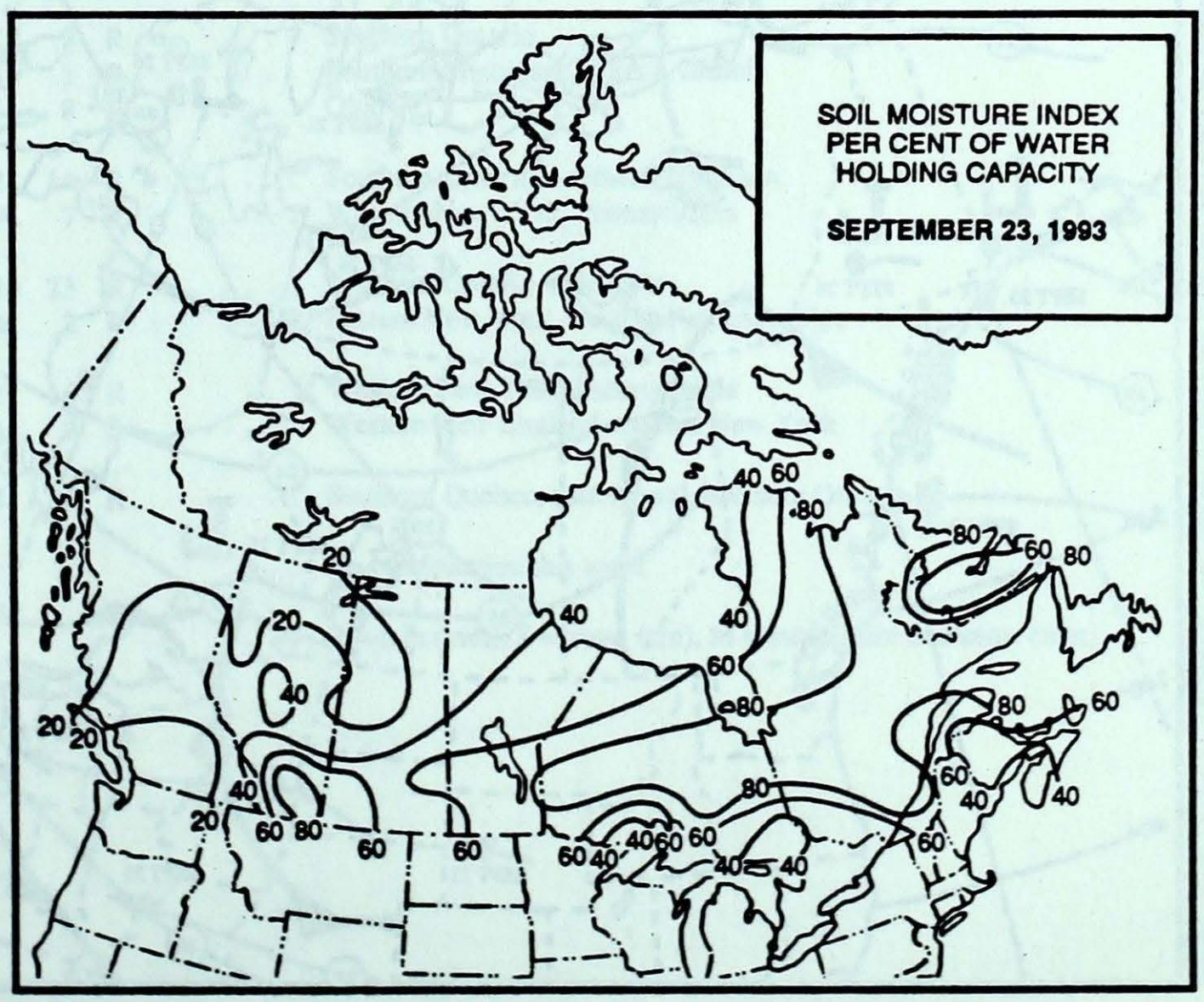
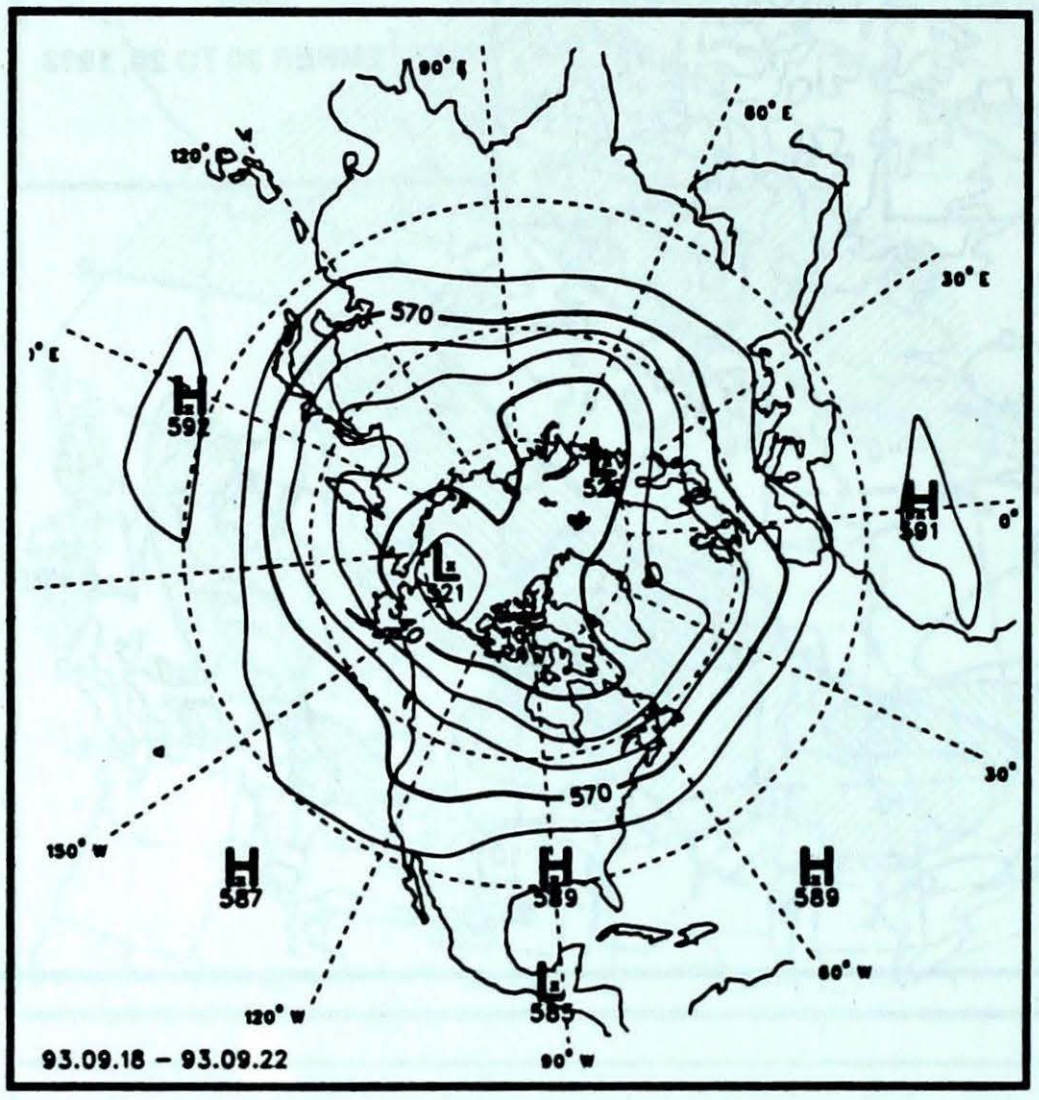
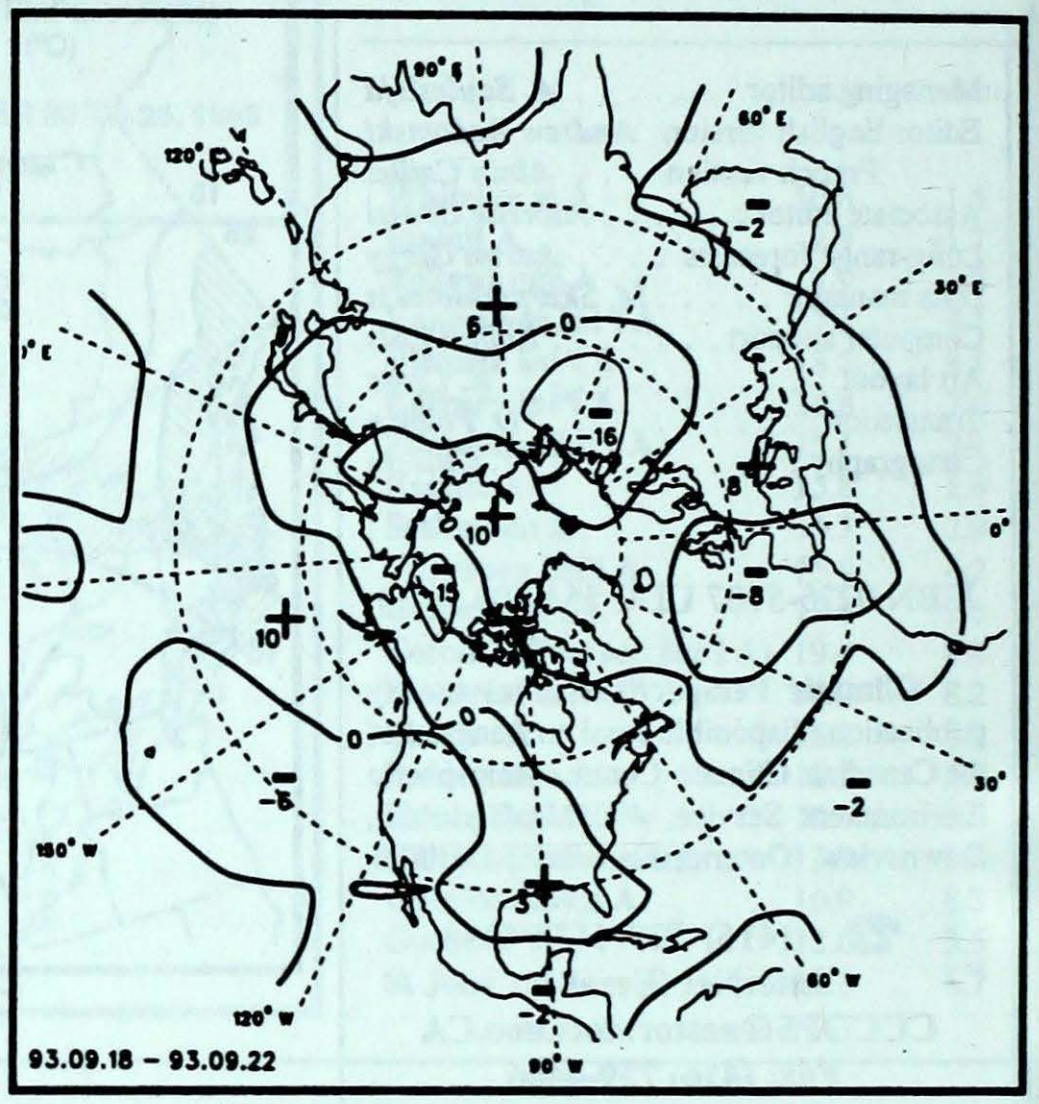


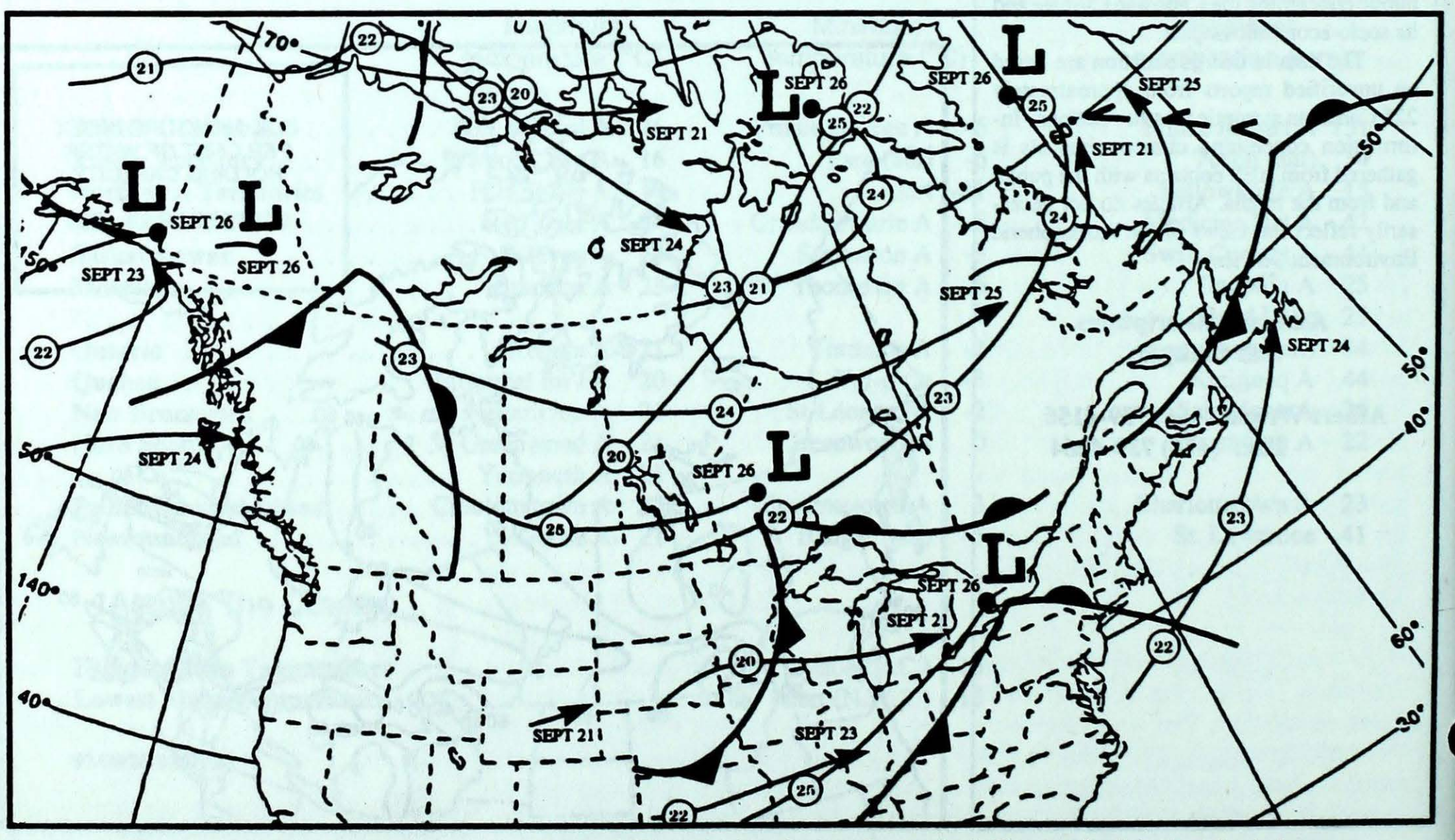
# 50-kPa ATMOSPHERIC CIRCULATION




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

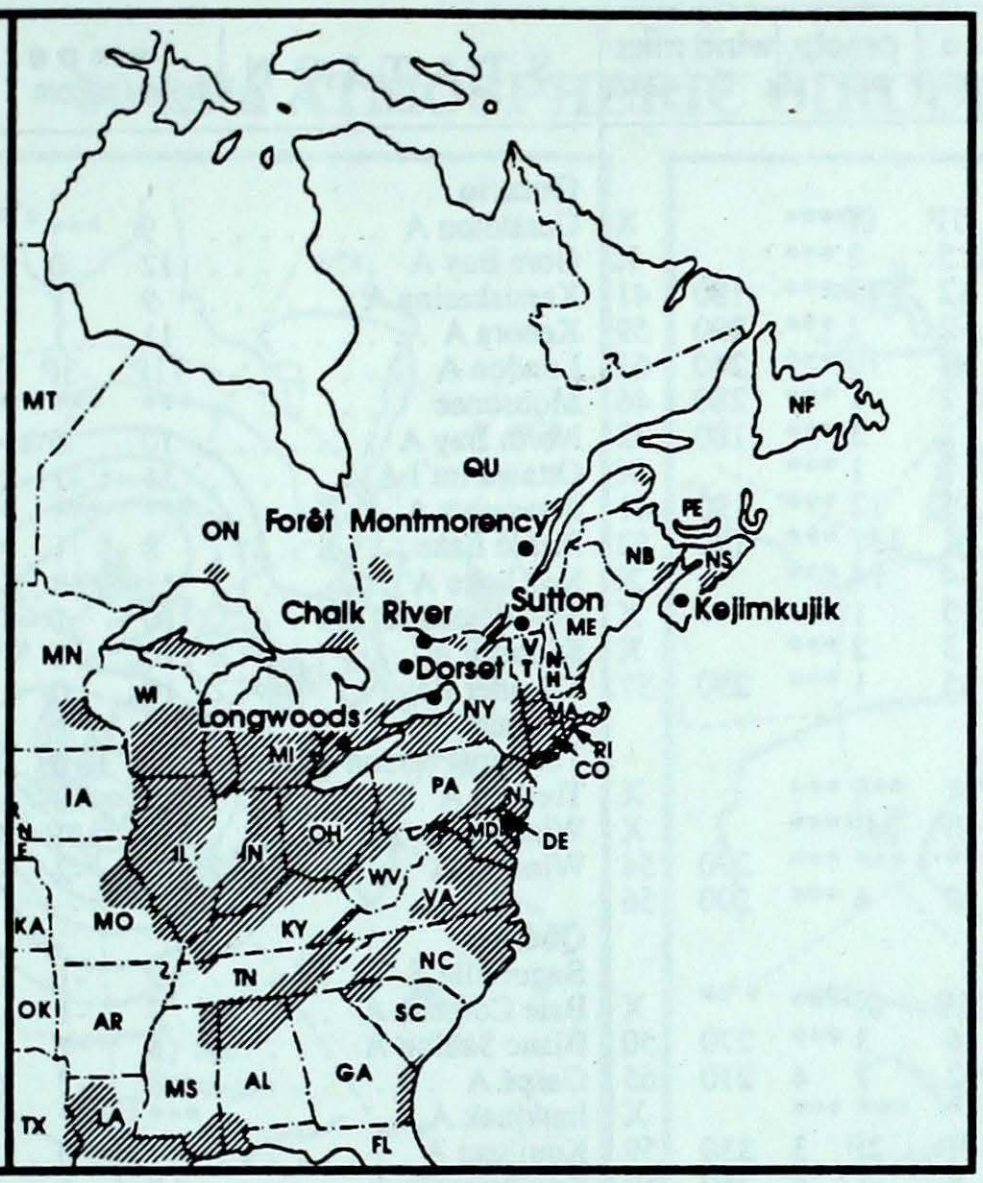



Mean geopotential height anomaly
50-kPa level (10 decametre intervals)




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

ALABAMA - AL
ARKANSAS - AR
CONNECTICUT - CO
DELAWARE - DE
FLORIDA - FL
GEORGIA - GA
ILLINOIS - IL
INDIANA - IN
IOWA - IA
KANSAS - KA
KENTUCKY - KY
LOUISIANA - LA
MAINE - ME
MANITOBA - MT
MARYLAND - MD
MASSACHUSETTS - MA
MICHIGAN - MI
MINNESOTA - MN
MISSISSIPPI - MS
MISSOURI - MO
NEBRASKA - NE
NEW BRUNSWICK - NB
NEWFOUNDLAND - NF
NEW HAMPSHIRE - NH
NEW JERSEY - NJ
NEW YORK - NY
NORTH CAROLINA - NC
NORTH DAKOTA - ND
NOVA SCOTIA - NS
OHIO - OH
OKLAHOMA - OK
ONTARIO - ON
PENNSYLVANIA - PA
PRINCE EDWARD ISLAND - PE
QUÉBEC - QU
RHODE ISLAND - RI
SOUTH CAROLINA - SC
SOUTH DAKOTA - SD
TENNESSEE - TN
TEXAS - TX
VERMONT - VT
VIRGINIA - VA
WEST VIRGINIA - WV
WISCONSIN - WI




# 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 Environment and Energy. The map also shows the approximate areas (shaded), where $SO_2$ 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 |
|---|---|---|---|---|---|
| | | | | | September 19 to 25, 1993 |
| Longwoods | 20 | 4.5 | 3 | R | Southern Ontario |
| | 23 | 4.3 | 1 | R | Southern Michigan, Indiana, Illinois |
| | 25 | 4.5 | 8 | R | Ohio |
| Dorset * | 22 | 4.2 | 14 | R | Southern Ontario, southern Michigan |
| | 25 | 4.6 | 7 | R | Western New York, Pennsylvania |
| Chalk River | 22 | 4.3 | 23 | R | Southern Ontario, Michigan |
| | 25 | 4.3 | 2 | R | Eastern New York, western Pennsylvania |
| Sutton | 23 | 4.2 | 16 | R | Western New York, Pennsylvania |
| | 25 | 4.4 | 5 | R | Western New England, eastern New York |
| Montmorency | 23 | 4.4 | 21 | R | Southern Quebec, eastern and Southern Ontario |
| Kejimkujik | | | | | No precipitation this week |

R = rain (mm), S = snow (cm), M = mixed rain and snow (mm)

| STATION | temperature mean | anom | max | min | precip. ptot | st | wind max dir | vel |
|---|---|---|---|---|---|---|---|---|
| **British Columbia** | | | | | | | | |
| Blue River A | 12P | 2P | 20P | 1P | 0P | *** | | X |
| Comox A | 12 | -1 | 22 | 5 | 2 | *** | | X |
| Cranbrook A | 8 | -2 | 20 | -2 | 14 | *** | 180 | 41 |
| Fort Nelson A | 8 | 1 | 20 | -2 | 2 | *** | 290 | 59 |
| Fort St John A | 10 | 1 | 18 | -4 | 10 | *** | 240 | 61 |
| Kamloops A | 13 | -1 | 24 | 2 | 1 | *** | 280 | 46 |
| Penticton A | 11 | -3 | 23 | 2 | 3 | *** | 180 | 32 |
| Port Hardy A | 11 | -1 | 16 | 3 | 1 | *** | | X |
| Prince George A | 9 | 0 | 19 | -6 | 12 | *** | 190 | 41 |
| Prince Rupert A | 10 | -1 | 16 | 1 | 131 | *** | 180 | 52 |
| Smithers A | 8 | -1 | 18 | -4 | 14 | *** | | X |
| Vancouver Int'l A | 12 | -1 | 19 | 5 | 1 | *** | | X |
| Victoria Int'l A | 11 | -2 | 22 | 3 | 2 | *** | | X |
| Williams Lake A | 10 | 0 | 21 | -5 | 1 | *** | 290 | 37 |
| **Yukon Territory** | | | | | | | | |
| Komakuk Beach A | *** | *** | *** | *** | *** | *** | | X |
| Teslin (aut) | 5P | *** | 13P | -2P | 34P | *** | | X |
| Watson Lake A | *** | *** | 16 | *** | *** | *** | 270 | 54 |
| Whitehorse A | 6 | 0 | 16 | -2 | 4 | *** | 200 | 56 |
| **Northwest Territories** | | | | | | | | |
| Alert | -13P | -1P | 0P | -21P | 0P | *** | | X |
| Baker Lake A | 0 | 0 | 8 | -6 | 3 | *** | 270 | 50 |
| Cambridge Bay A | -3 | -1 | 1 | -12 | 7 | 4 | 210 | 65 |
| Cape Dyer A | *** | *** | *** | *** | *** | *** | | X |
| Clyde A | -1P | 1P | 4P | -3P | 2P | 3 | 330 | 59 |
| Coppermine A | 0 | 2 | 4 | -6 | 7 | 4 | 260 | 69 |
| Coral Harbour A | -4 | -2 | 2 | -11 | 13 | 14 | 330 | 57 |
| Eureka | -12 | 0 | -6 | -18 | 1 | 5 | | X |
| Fort Smith A | 5 | -1 | 18 | -6 | 6 | *** | 300 | 35 |
| Hall Beach A | -1 | 2 | 2 | -3 | 14 | 9 | 360 | 43 |
| Inuvik A | 2 | 1 | 14 | -13 | 5 | 998 | 200 | 41 |
| Iqaluit A | 2 | 1 | 7 | -2 | 12 | 3 | 050 | 57 |
| Mould Bay A | *** | *** | -2 | *** | *** | 6 | | X |
| Norman Wells A | 4 | 0 | 17 | -5 | 3 | *** | 330 | 59 |
| Resolute A | -5 | 2 | 0 | -10 | 4 | 8 | 100 | 80 |
| Yellowknife A | 4 | -1 | 13 | -5 | 15 | *** | 300 | 52 |
| **Alberta** | | | | | | | | |
| Calgary Int'l A | 9 | -1 | 22 | 0 | 3 | *** | 270 | 72 |
| Cold Lake A | 8 | 0 | 19 | -3 | 2 | *** | 310 | 56 |
| Edmonton Namao A | 10 | 1 | 21 | -1 | 1 | *** | 290 | 74 |
| Fort McMurray A | 8 | 0 | 19 | -2 | 18 | *** | 260 | 37 |
| Grande Prairie A | 9 | 1 | 20 | -5 | 5 | *** | 260 | 76 |
| High Level A | 7 | -1 | 19 | -4 | 9 | *** | 280 | 59 |
| Lethbridge A | 9 | -2 | 24 | 0 | 21 | *** | 250 | 70 |
| Medicine Hat A | 8 | -3 | 23 | -2 | 42 | *** | 240 | 46 |
| Peace River A | 9 | 0 | 18 | -5 | 11 | *** | 280 | 63 |
| **Saskatchewan** | | | | | | | | |
| Cree Lake | *** | *** | *** | *** | *** | *** | | X |
| Estevan A | 10 | 0 | 23 | 1 | 23 | *** | 310 | 82 |
| La Ronge A | 8 | 0 | 20 | -3 | 20 | *** | 350 | 46 |
| Regina A | 9 | 0 | 20 | -1 | 33 | *** | 320 | 78 |
| Saskatoon A | 8 | -1 | 22 | -5 | 0 | *** | 320 | 70 |
| Swift Current A | 9 | -1 | 21 | -3 | 41 | *** | 310 | 70 |
| Yorkton A | 9 | 1 | 21 | -1 | 10 | *** | 320 | 69 |
| **Manitoba** | | | | | | | | |
| Brandon A | 10 | 1 | 23 | 1 | 10 | *** | 290 | 74 |
| Churchill A | 4 | 1 | 17 | -3 | 7 | *** | 320 | 67 |
| Lynn Lake A | 4 | 0 | 16 | -5 | 19 | 3 | 260 | 37 |
| The Pas A | 8 | 1 | 20 | 0 | 21 | *** | 020 | 61 |
| Thompson A | 5 | 1 | 18 | -6 | 16 | 3 | 240 | 30 |
| Winnipeg Int'l A | 11 | 1 | 22 | 1 | 6 | *** | 320 | 57 |

| STATION | temperature mean | anom | max | min | precip. ptot | st | wind max dir | vel |
|---|---|---|---|---|---|---|---|---|
| **Ontario** | | | | | | | | |
| Geraldton A | 9 | *** | 20 | -1 | 28 | *** | 250 | 59 |
| Gore Bay A | 12 | 0 | 18 | 4 | 4 | *** | 210 | 44 |
| Kapuskasing A | 9 | 1 | 19 | -2 | 5 | *** | 260 | 52 |
| Kenora A | 11 | 1 | 21 | 1 | 11 | *** | 320 | 46 |
| London A | 11P | -3P | 19P | 3P | 10P | *** | 070 | 56 |
| Moosonee | *** | *** | *** | *** | *** | *** | | X |
| North Bay A | 10 | 0 | 19 | 0 | 10 | *** | 080 | 39 |
| Ottawa Int'l A | 11 | -1 | 20 | 2 | 24 | *** | 320 | 50 |
| Petawawa A | *** | *** | *** | *** | *** | *** | | X |
| Pickle Lake | 8 | 1 | 17 | 0 | 21 | *** | 240 | 54 |
| Red Lake A | *** | *** | 19 | *** | *** | *** | 250 | 46 |
| Sioux Lookout A | 10 | 1 | 20 | 1 | 29 | *** | 330 | 48 |
| Sudbury A | 10 | 0 | 20 | 2 | 6 | *** | 280 | 43 |
| Thunder Bay A | 10 | 0 | 21 | 0 | 8 | *** | 280 | 67 |
| Timmins A | 9 | 1 | 20 | -3 | 4 | *** | 310 | 56 |
| Toronto(Pearson Int'l A) | 12 | -2 | 21 | 2 | 11 | *** | 300 | 56 |
| Trenton A | 12 | -2 | 21 | 0 | 16 | *** | 230 | 67 |
| Wiarton A | 10P | -3P | 19P | 0P | 20P | *** | 050 | 43 |
| Windsor A | 14 | -2 | 21 | 7 | 29 | *** | 070 | 56 |
| **Québec** | | | | | | | | |
| Bagotville A | 9 | -1 | 19 | -1 | 11 | *** | 300 | 48 |
| Baie Comeau A | 7 | -1 | 16 | -2 | 7 | *** | 240 | 59 |
| Blanc Sablon A | 8 | *** | 12 | -1 | 10 | *** | 220 | 70 |
| Gaspé A | 8 | -1 | 20 | -2 | 4 | *** | 260 | 52 |
| Inukjuak A | *** | *** | 10 | *** | *** | 3 | | X |
| Kuujjuaq A | 4 | 0 | 10 | -1 | 44 | *** | 340 | 87 |
| Kuujjuarapik A | 5 | -1 | 13 | 1 | 24 | *** | 320 | 72 |
| La Grande Rivière A | 5 | 0 | 13 | -3 | 33 | *** | 310 | 57 |
| Mont Joli A | 9 | -1 | 19 | 0 | 8 | *** | 250 | 54 |
| Montréal Int'l A | 12 | -1 | 20 | 1 | 35 | *** | 280 | 39 |
| Natashquan A | 6 | -2 | 16 | 0 | 12 | *** | 270 | 61 |
| Québec A | 11 | -1 | 20 | 1 | 32 | *** | 270 | 46 |
| Schefferville A | 4P | 0P | 12P | -1P | 33P | 3 | 290 | 78 |
| Sept-Îles A | 7 | -1 | 15 | -1 | 10 | *** | 290 | 59 |
| Sherbrooke A | 9 | -1 | 19 | -1 | 26 | *** | 280 | 44 |
| Val-d'Or A | 9 | 0 | 18 | -3 | 15 | *** | 300 | 50 |
| **New Brunswick** | | | | | | | | |
| Fredericton A | 10 | -2 | 21 | -1 | 19 | *** | 300 | 54 |
| Miscou Island (aut) | 12P | 0P | 19P | 5P | 11P | *** | | X |
| Moncton A | 10 | -2 | 20 | 1 | 13 | *** | 250 | 52 |
| Saint John A | 10P | -2P | 19P | 2P | 26P | *** | 110 | 43 |
| St Leonard A | 9 | *** | 18 | -2 | 13 | *** | 310 | 54 |
| **Nova Scotia** | | | | | | | | |
| Greenwood A | 10 | -3 | 21 | 0 | 15 | *** | 250 | 67 |
| Shearwater A | 12 | -1 | 19 | 5 | 20 | *** | 090 | 46 |
| Sydney A | *** | *** | 19 | *** | *** | *** | 270 | 54 |
| Yarmouth A | 12 | -1 | 21 | 5 | 22 | *** | 310 | 46 |
| **Prince Edward Island** | | | | | | | | |
| Charlottetown A | 12 | -1 | 20 | 3 | 23 | *** | 260 | 46 |
| East Point (auto) | 14P | ***P | 19P | 8P | 12P | *** | | X |
| **Newfoundland** | | | | | | | | |
| Cartwright | 9 | 1 | 19 | 2 | 13 | *** | 210 | 74 |
| Churchill Falls A | 6P | 2P | 16P | -3P | 7P | *** | | X |
| Gander Int'l A | 10 | -1 | 16 | 3 | 4 | *** | 250 | 61 |
| Goose A | 9 | 0 | 21 | -1 | 9 | *** | 250 | 67 |
| Stephenville A | 11 | -1 | 18 | 4 | 17 | *** | 260 | 65 |
| St John's A | 12 | 1 | 18 | 6 | 18 | *** | 260 | 61 |
| St Lawrence | 11 | 1 | 18 | 5 | 41 | *** | | X |
| Wabush Lake A | 5 | 0 | 14 | -2 | 17 | *** | 290 | 61 |

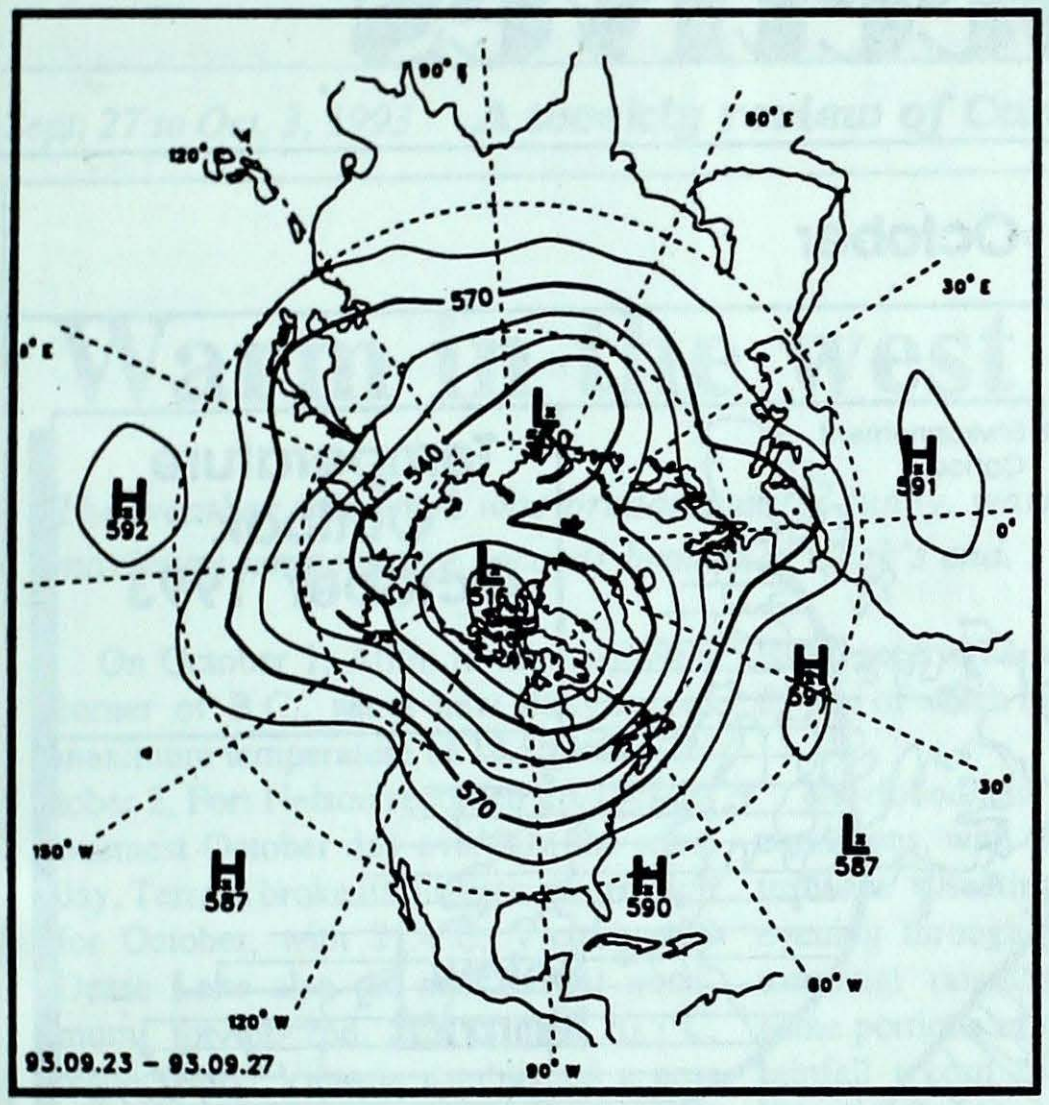
93/09/20-93/09/26

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

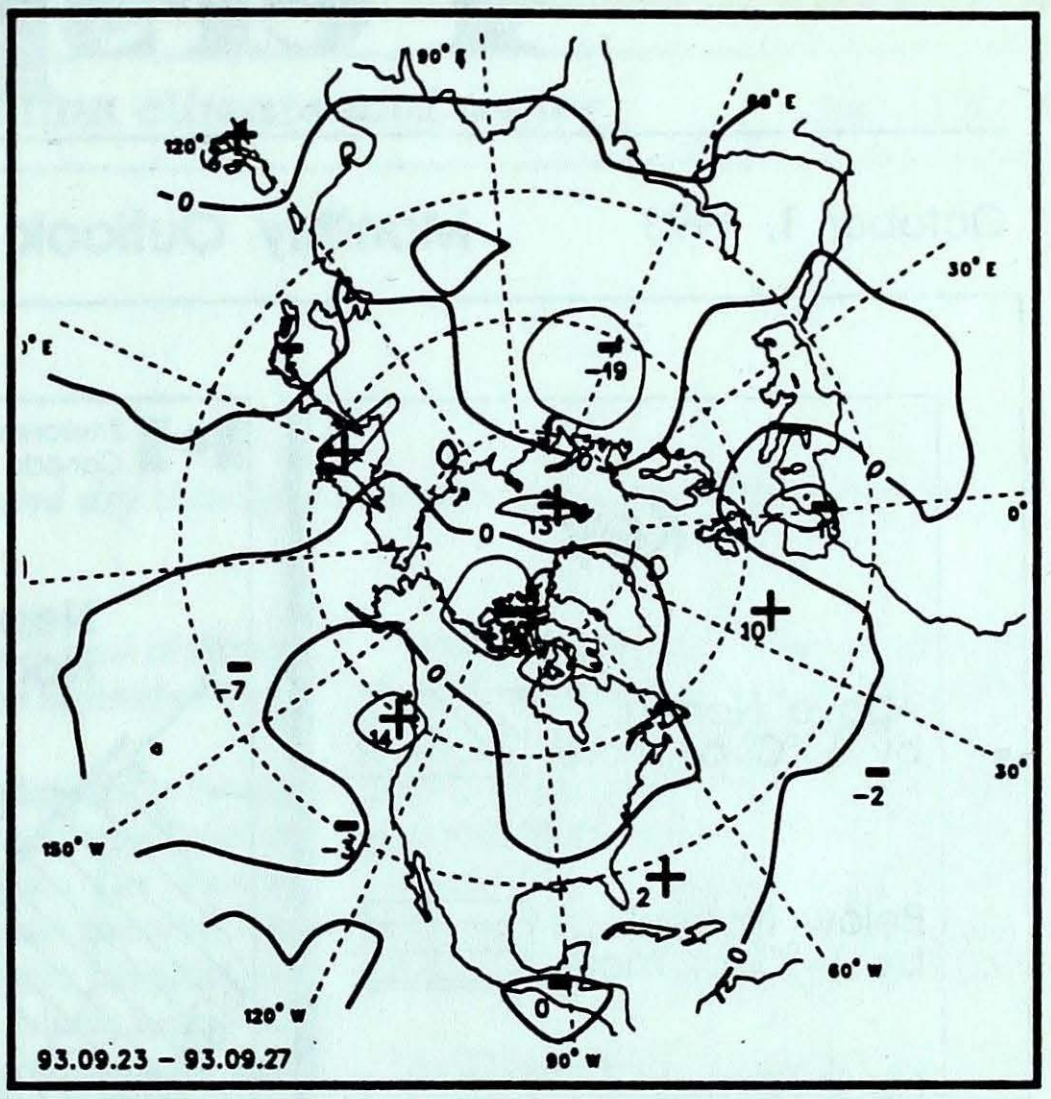
**ptot** = weekly precipitation total in mm
**st** = snow thickness on the ground in cm
**dir** = direction of max wind, deg. from north.
**vel** = wind speed in km/h

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

# 50-kPa ATMOSPHERIC CIRCULATION




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




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

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# Climatic Perspectives

October 1, 1993

## Monthly Outlook - October

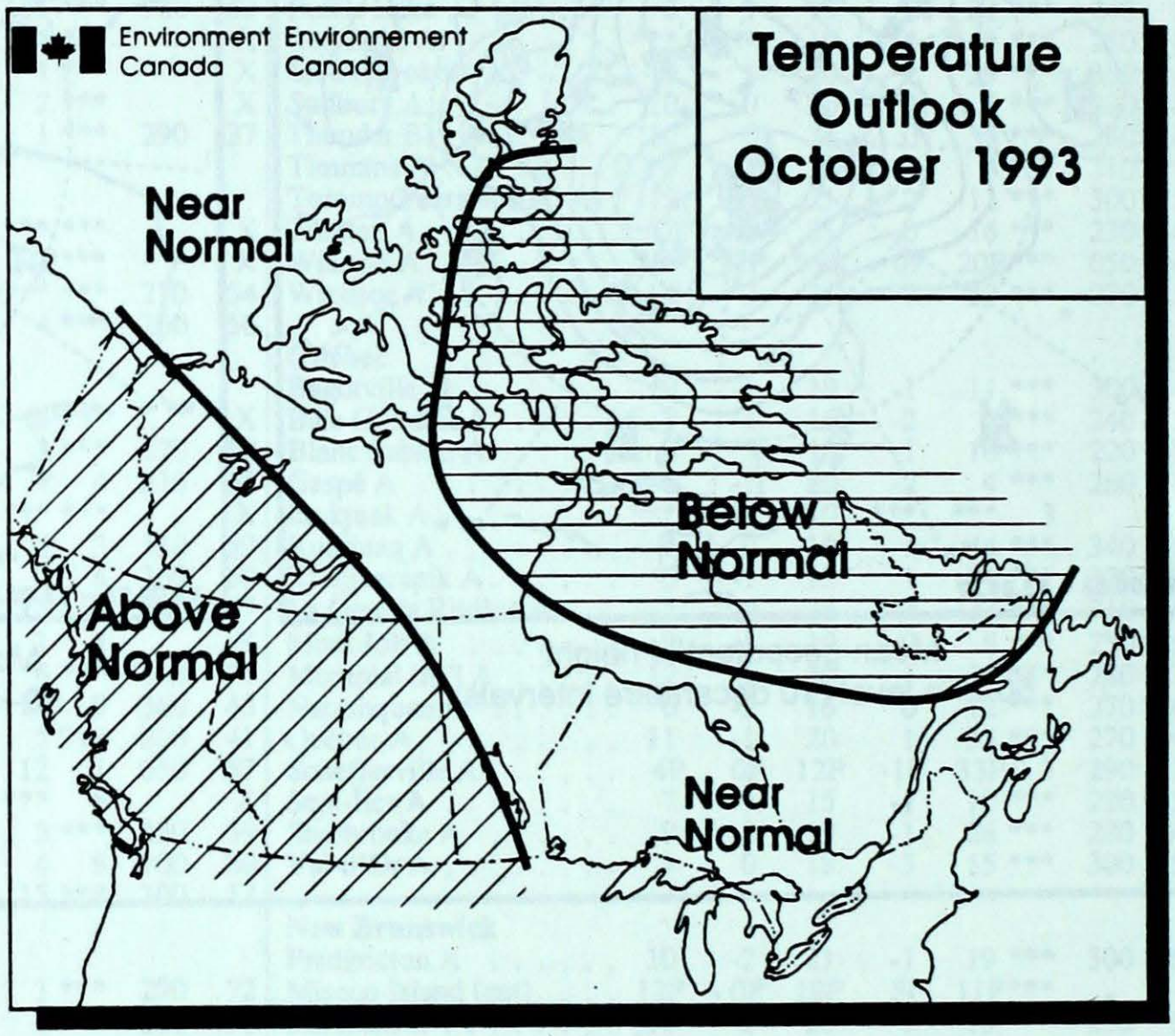
### Key

Above Normal by 1 °C or more

Below Normal by 1 °C or more

Near Normal within 1 °C

**Normal Period 1951-1980**




## *Normal Temperatures °C (1951-80)*

October

| | Max | Min |
|---|---|---|
| Whitehorse | 4 | -2 |
| Yellowknife | 1 | -4 |
| Iqaluit | -2 | -8 |
| Vancouver | 14 | 6 |
| Victoria | 14 | 6 |
| Calgary | 12 | -1 |
| Edmonton | 11 | -2 |
| Regina | 12 | -2 |
| Winnipeg | 11 | 0 |
| Toronto | 14 | 4 |
| Ottawa | 13 | 3 |
| Montreal | 13 | 5 |
| Quebec | 11 | 2 |
| Halifax | 13 | 4 |
| Fredericton | 13 | 2 |
| Charlottetown | 12 | 4 |
| Goose Bay | 6 | -1 |
| St. John's | 10 | 4 |

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