Environment Canada Environnement Canada

Climatic Perspectives

January 2 to Jan 8, 1989 **A weekly review of Canadian climate** *Vol. 11 No. 2*

Major winter storms erupt across the country

After a two-week period of relatively tranquil weather during the festive holiday season, the country was besieged by some of the worst winter storms of the season.

Back to back storms lash Newfoundland

Two intense low pressure systems moving across eastern Newfoundland early in the week gave hurricane-force winds, copious amounts of snow and rain to eastern sections. Snowfall totals of 25-35 cm accompanied the storm on January 3rd with wind gusts to 100-110 km/h common.

On January 5th, the most intense storm of the season (the lowest pressure being 940 mb) affected the area packing winds as high as the 141 km/h recorded at Cape Race. A significant storm surge forced residents to evacuate several communities. Gander's 66.4 cm of snow so far this month is rapidly approaching the January average snowfall of 78.7 cm. The seasonal total now stands at 283 cm compared to an average of 405 cm for the whole winter season.

G. MacMillan, AES Gander

Blizzard sweeps south-eastern Prairies

Southern Manitoba was struck by a severe winter storm on the late afternoon and evening of Friday, January 6, 1989. By early Saturday morning (Jan. 7) the storm had intensified to give blizzard conditions in the southeastern part of Manitoba. Temperatures hovered near the -20°C mark throughout the day and winds, at times exceeding 70 km/h, drove wind chill values over 2100 w/sq. m - dangerous conditions for people stranded outdoors. By early Sunday (Jan. 8) morning, the storm has blown itself out and by midnight, the temperature had dropped to - 33°C. In the aftermath of the storm, Winnipegers dug out from 29.8 cm of wind drifted snow. The impact of the storm was less than in the most recent blizzard in November of 1986 when 35.8 cm of snow fell in Winnipeg.

J. Bendell, AES Winnipeg

Heavy snow at last in southern Alberta

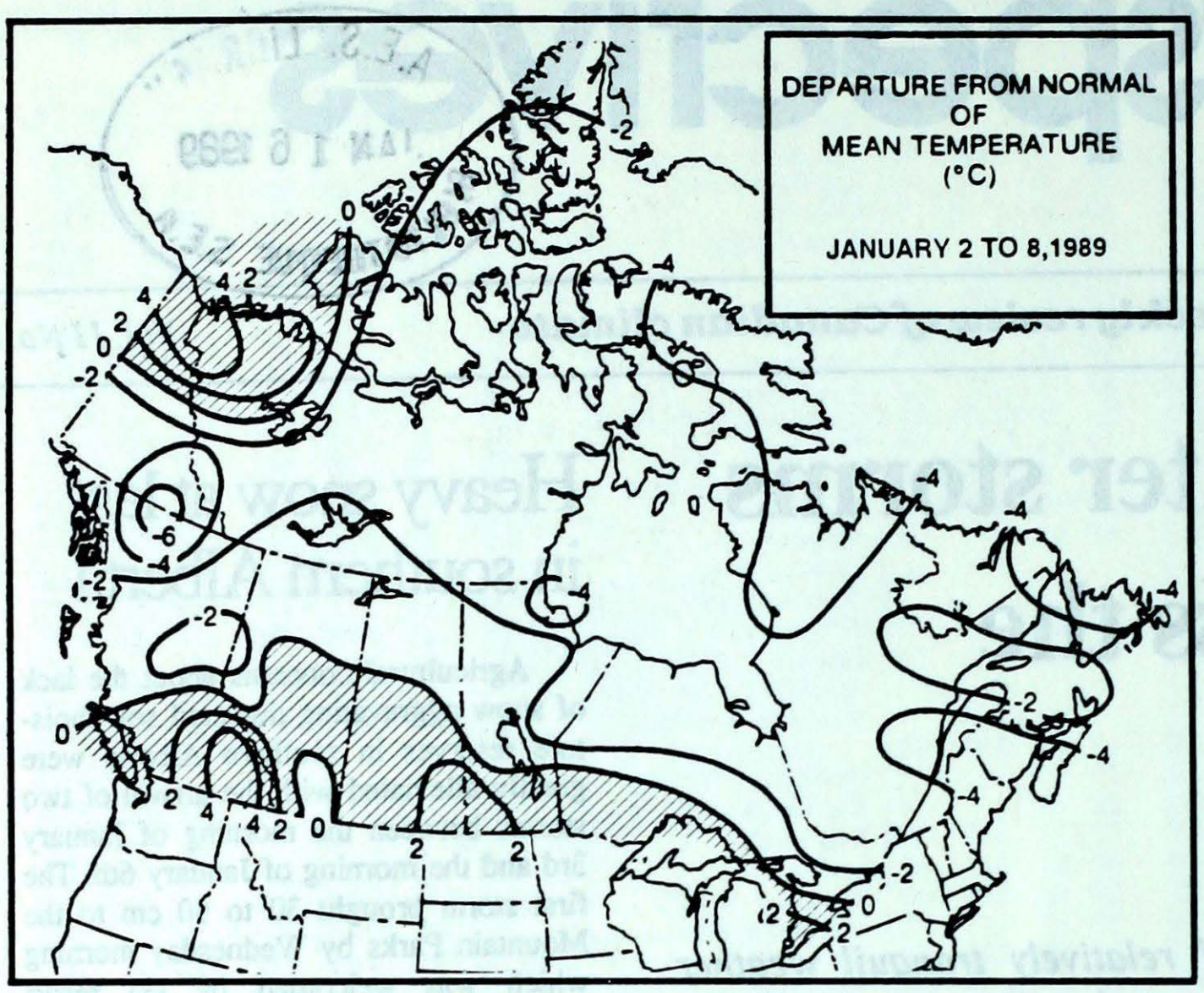
Agricultural concerns about the lack of snow aggravating depleted soil moisture reserves in southern Alberta were greatly alleviated with the arrival of two storms between the morning of January 3rd and the morning of January 6th. The first storm brought 30 to 50 cm to the Mountain Parks by Wednesday morning which was welcomed by ski resort operators. The second storm developed over northern Idaho and spread snow into the Lethbridge region early Thursday and continued well into Friday. Total snowfall from these two storms was estimated at 10 to 25 cm in Calgary with 35 - 50 cm in the nearby foothills. At Lethbridge, 30 - 35 cm fell in the city and up to 100 cm in the foothills.

W. Prusak & the Alberta Weather Centre.

A look ahead ...

After a very cold wintry start to the second week of January across the Prairies, temperatures are expected to climb to above normal values towards the weekend over western Canada and over the Great Lakes Basin. Near normal temperatures are expected elsewhere. Northern Newfoundland and Labrador, however, will continue to experience considerably below normal readings. Cooler air will cover most of Canada as a dome of cold air, currently situated over the arctic islands, moves southward at the beginning of the week of January 16th *(prepared January 11)*.

A. Shabbar, Canadian Climate Centre



Weekly Temperature extremes (°C)

		Maximum temperature		Minimum temperature
British Columbia	Victoria Int'l	12	Fort Nelson	-39
Yukon Territory	Haines Junction	-1	Watson Lake	-46
Northwest Territories	Clinton Point	-10	Shepherd Bay A	-48
Alberta	Calgary Int'l	7	Fort Chipewyan	-40
			Rocky Mtn House	
Saskatchewan	Swift Current	4	Cree Lake	-45
Manitoba	Dauphin	-5	Churchill	-42
			Thompson	
Ontario	Windsor	13	Lansdowne House	-43
Québec	Maniwaki	6	La Grande Riviere	-37
New Brunswick	Moncton	8	Chatham	-26
Nova Scotia	Greenwood	10	Greenwood	-24
Prince Edward Island	Charlottetown	6	Charlottetown	-19
Newfoundland	Daniel's Harbour	9	Wabush Lake	-35

Across The Country...

Warmest Mean Temperature	Kindakun Point (BC)	3
Coolest Mean Temperature	Eureka (NWT)	-39

89/01/02-89/01/08

Across the country...

Yukon and Northwest Territories

A strong high pressure area from the North Pole gave a very cold week all across the north. Strong winds associated with this bitter cold created extreme wind chill, therefore numerous advisories had to be issued. Records were only broken in the southeastern sections of the Yukon. Despite the cold, Haines Junction managed a warm minus 1°C on the 2nd. Most of the precipitation fell at the beginning of the period with the greatest snowfall of 21 cm at Drury Creek.

British Columbia

The primary weather story this week was the first major snowfall of the season occuring over the southwest coast of the province. Luckily the 10 to 20 cm of snow fell on Sunday, which minimized any traffic chaos in Victoria and Vancouver. Overall, the week began mild and wet and then ended cold and snowy. In the interior of the province, colder temperatures aided logging operations as well as providing excellent conditions for winter sports.

Prairies

Snow and frigid cold was the story of the week. Snowfalls of 20-40 cm and up to 100 cm over the foothill and mountain regions blanketed southern Alberta which pleased both farmers and skiers. Central and Northern regions though received less. Lack of snow and cold temperatures in Edmonton have allowed the frost to penetrate deep into the soil, breaking water lines. Across the rest of the Praires, frigid cold and blizzards continued to dominate the weather. Southeastern Saskatchewan and southern Manitoba were particularily ravaged by the blizzard with between 20 and 30 cm of snow. The storm exacted a human toll. Three Manitobans lost their lives in two separate head on collisions due to the low visibility in blowing snow. Two people were killed when their car struck a milk tanker and one person died when two snowmobiles collided. Many regions of the central and northern Praires endured temperatures of around -40°C.

Ontario

Cold weather briefly settled in over Ontario last week, plunging lows to the minus thirties in the North and minus twenties in the South. Mild weather with wet snow, freezing rain and rain occured over the weekend. In addition, rare January thunderstorms swept from Windsor to Ottawa. Some of these storms were accompanied by intense lightning, hail, and heavy rain. In Ottawa, this was the first January thunderstorm since at least 1957. The same intense system brought heavy snow to the North, with Timmins, Wawa, and Kapuskasing all reporting 15 to 30 cm of snow on January 8. The Trans-Canada Highway north of the Soo was closed for a period on January 8th due to snow and blowing snow.

Quebec

A series of fast-moving, active weather disturbances affected the province this week causing weather conditions to vary dramatically. Numerous daily cold temperature records were broken early in the week while several high temperture records were broken on the last day of the period (the 8th). The most active system moved into the province from the southwest on the the 8th, accompanied by a thrust of mild air and violently strong winds which followed a cold frontal passage later in the day. Winds gusted to in excess of 100 km/h on Montreal's south shore causing damage to roof tops and downing electrical lines. At Saint-Mathieu-de-Beloeil, the roof of a hangar blew off and small aircraft inside were damaged.

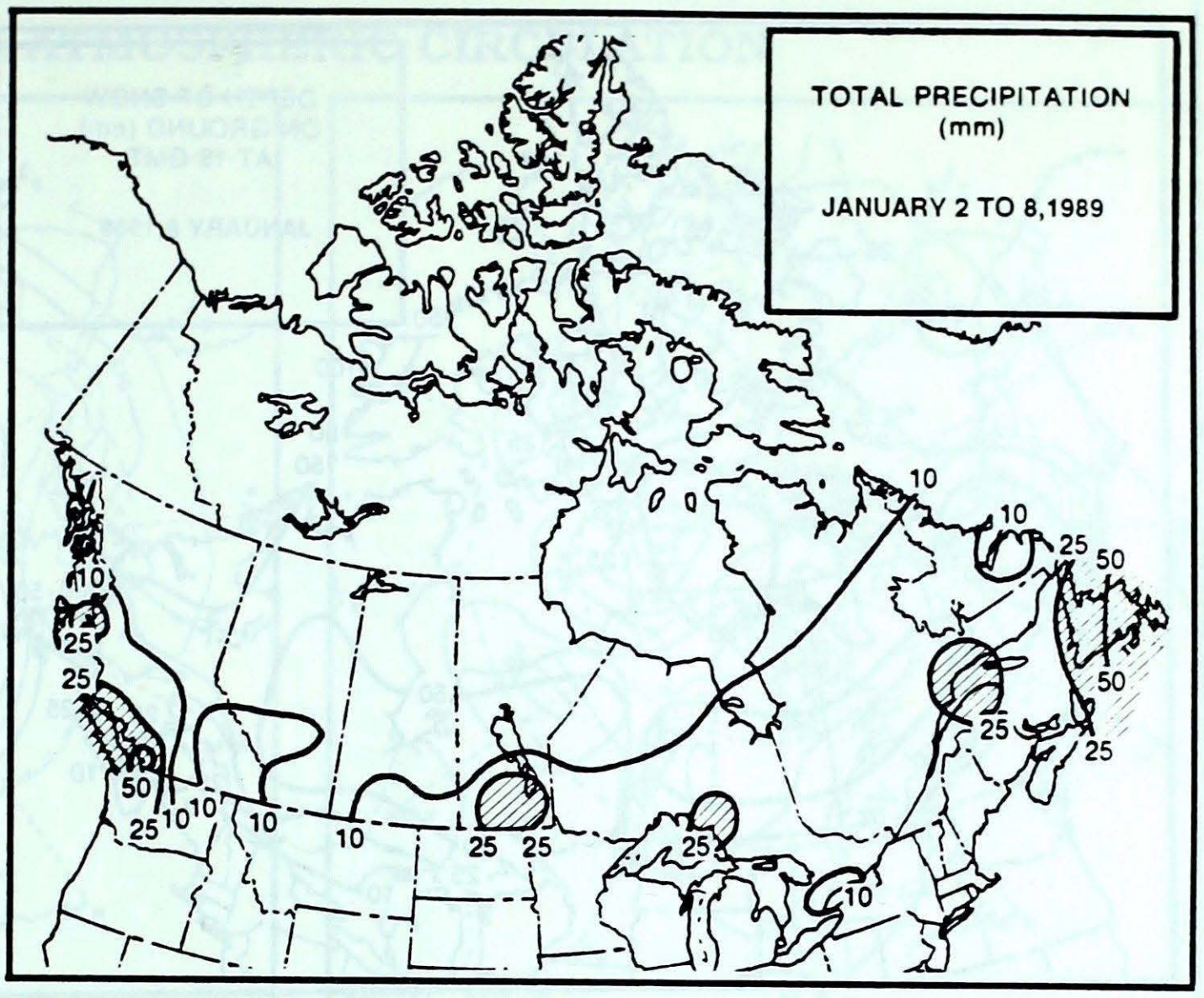
Maritimes

Two violent storms brushed Nova Scotia with snow and very high winds. Sable Island bore the brunt of these storms receiving a weekly total of 83 mm of precipitation, mostly in the form of snow. The storm on the 5th produced 20 cm of snow and strong winds for some eastern parts of Nova Scotia, causing hazardous driving conditions. On Cape Breton Island, schools were closed and even the mail was prevented from delivery as the storm lashed the island. Ferries to Newfoundland had to return to North Sydney after encountering high seas off the coast.

Newfoundland

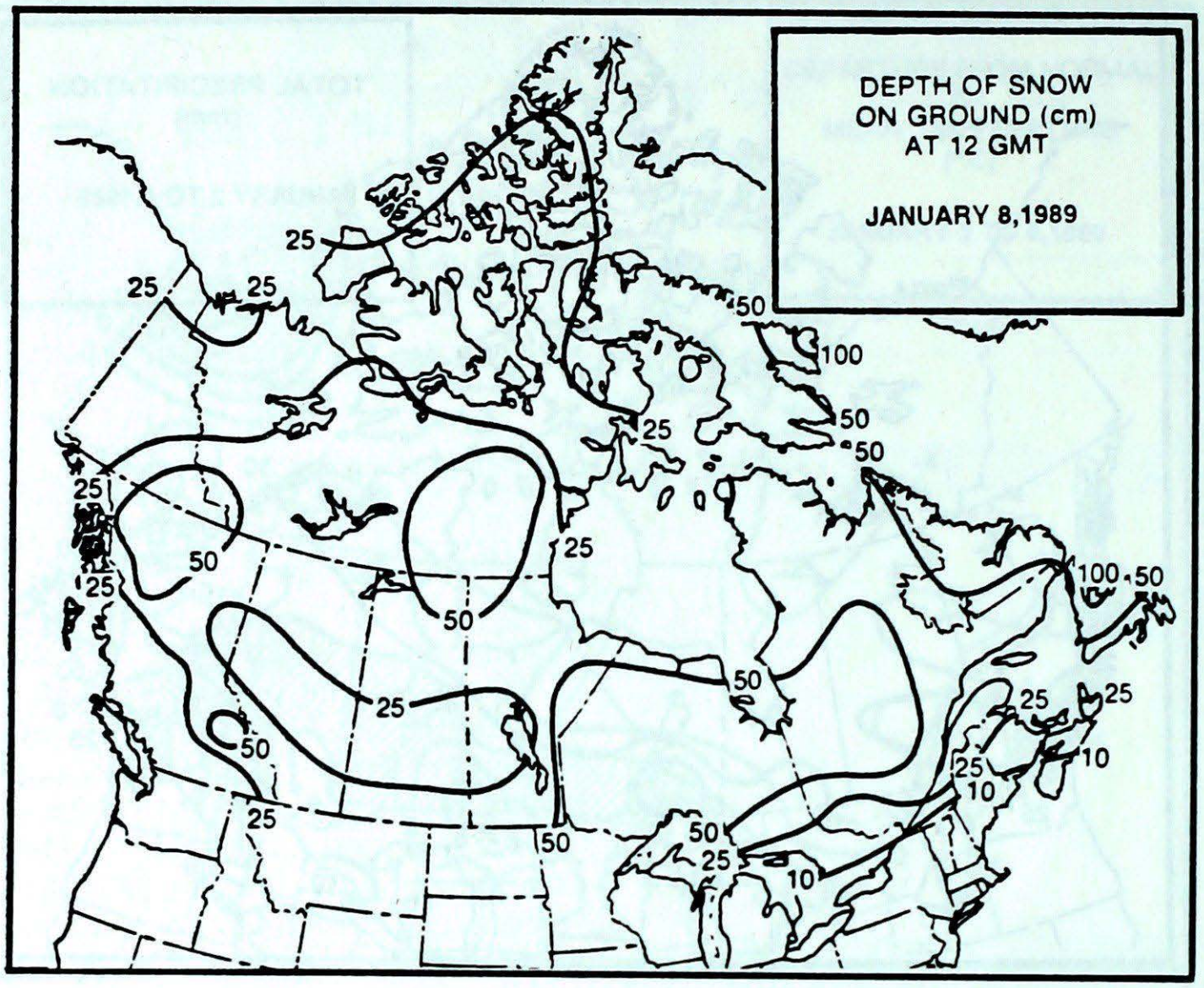
Major storms on the third and again on the fifth highlighted the week's weather. On Tuesday, a 965 mb low, tracking just east of the island, brought snow and strong winds to the area. On Thursday, a 940 mb low tracking across eastern Newfoundland gave snow, rain and strong winds to the region. High winds and tides forced Beaches, a small community in White Bay to be evacuated due to high water levels. Meanwhile, at Placentia in the south, a storm surge resulted in extensive flooding with many residents forced to be evacuated.

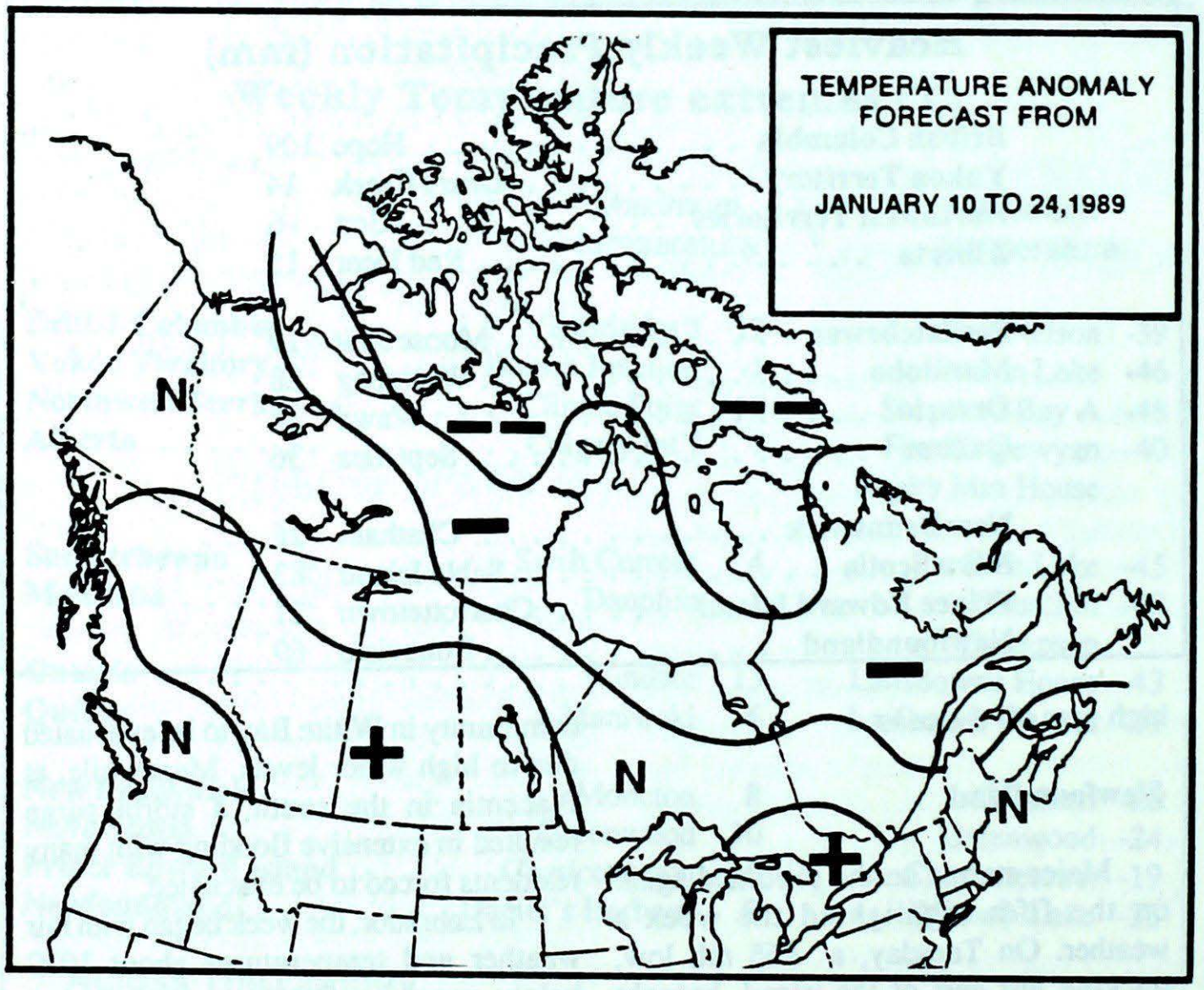
In Labrador, the week began with fair weather and temperatures about 10°C below normal. On Thursday, eastern locations received 15-25 cm of snow with wind gusts to 118 km/h at Cartwright. On January 8, a storm centre moving across the region gave 15-20 cm of snow to most locations.



Heaviest Weekly Precipitation (mm)

British Columbia	Hope	109
Yukon Territory	Drury Creek	14
Northwest Territories	Alert	6
Alberta	Red Deer	15
Saskatchewan	Moose Jaw	19
Manitoba	Winnipeg	28
Ontario	Wawa	34
Québec	Sept-Iles	36
New Brunswick	Chatham	26
Nova Scotia	Sable Island	83
Prince Edward Island	Charlottetown	21
Newfoundland	Bonavista	69





+ +	much above normal
+	above normal
N	normal
-	below normal
- -	much below normal

Temperature Anomaly Forecast

This forecast is prepared by searching historical weather maps to find cases similar to the present. the historical outcome during the 15 days subsequent to the chosen analogues is assumed to be a forecast for the next 15 days from now.

CLIMATIC PERSPECTIVES
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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.

Unsolicited articles are welcome but should be at maximum about 1500 words in length. They will be subject to editorial change without notice due to publishing time constraints. The contents may be reprinted freely with proper credit.

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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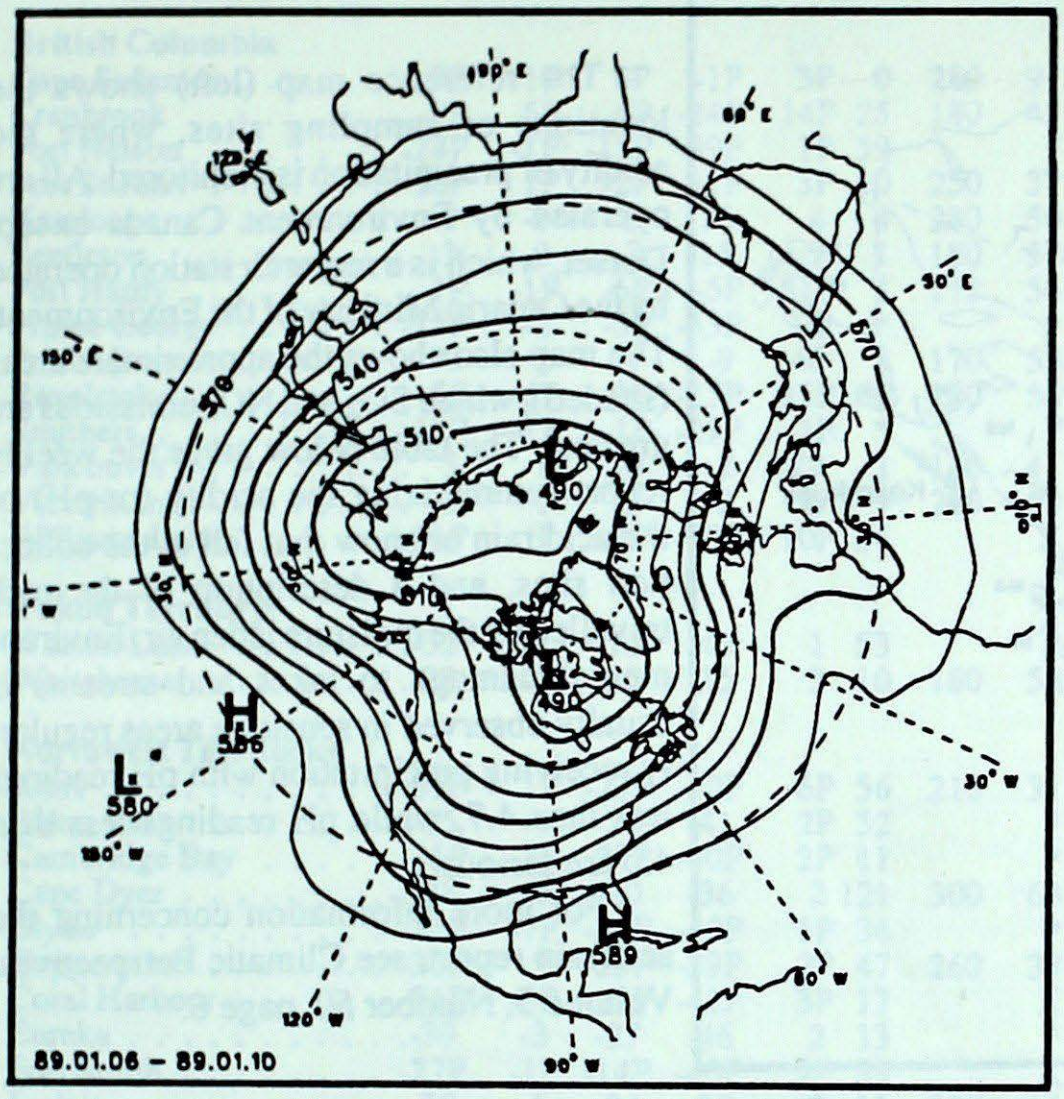
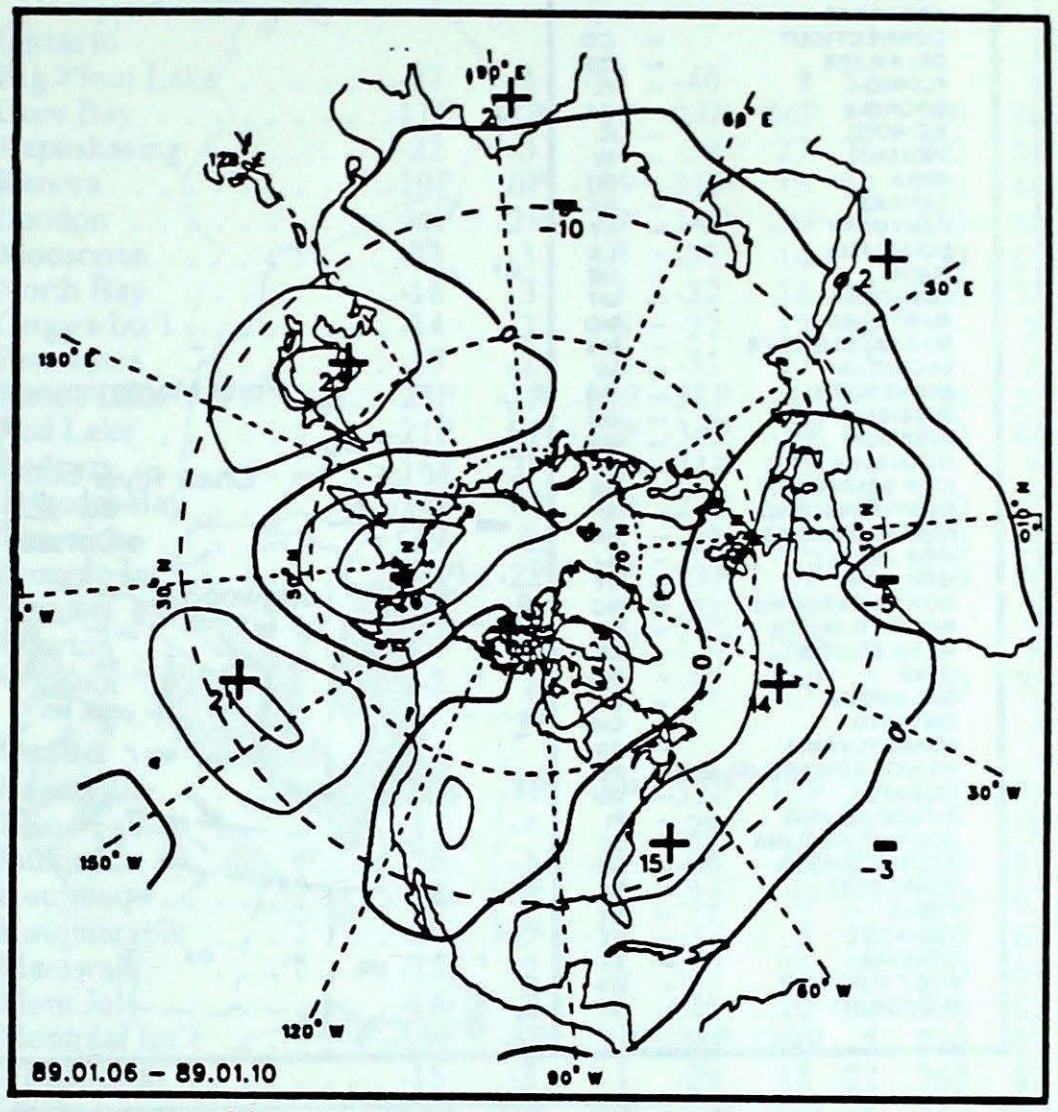
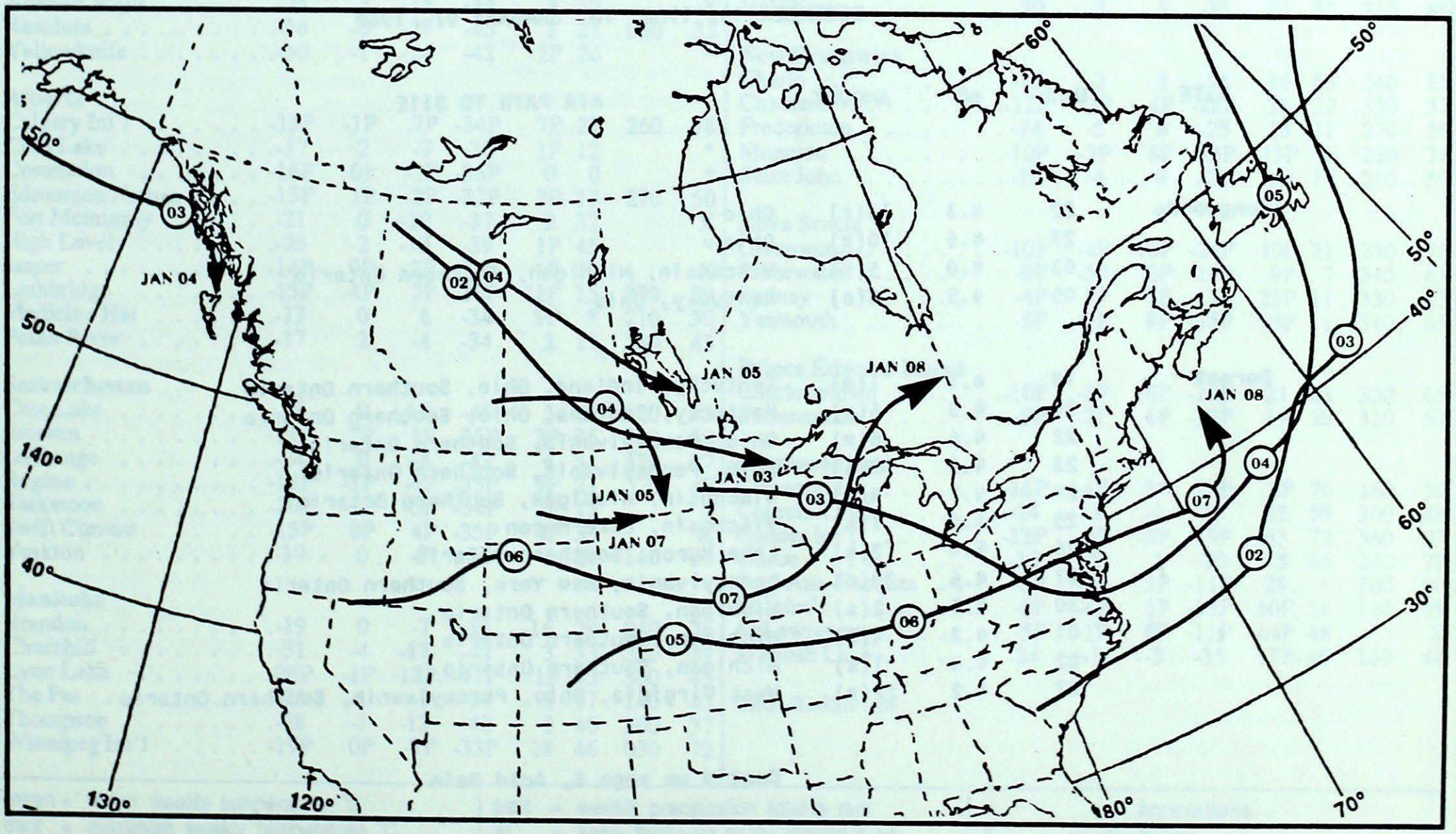
50 kPa ATMOSPHERIC CIRCULATION



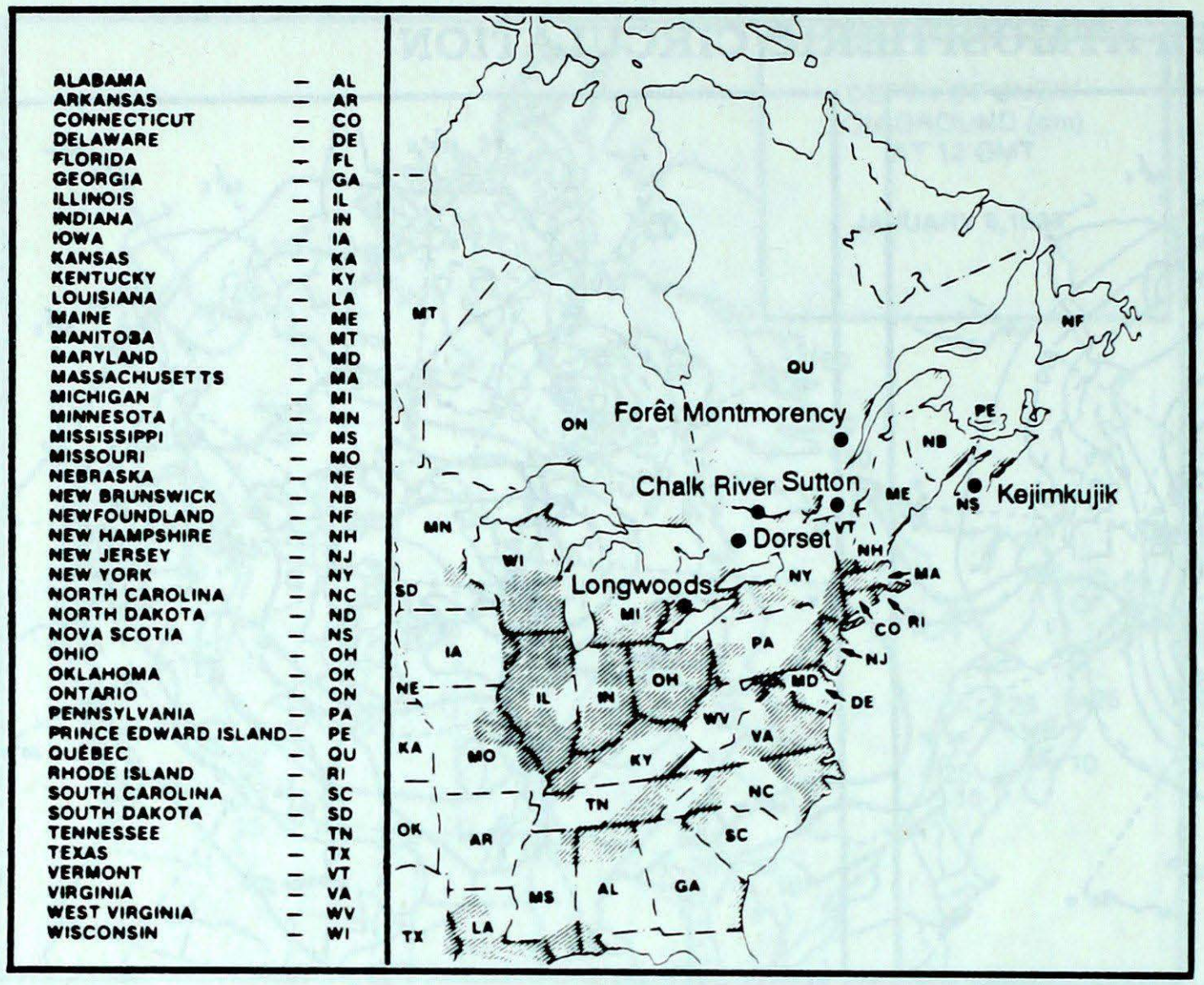
Mean geopotentiial height
50 kPa level (10 decameter intervals)



Mean geopotential height anomaly
50 kPa level (10 decameter intervals)



Storm track - Position of storm at 12 GMT each day during the period.



ACID RAIN REPORT

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 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.

For more information concerning the acid rain report, see Climatic Perspectives, Volume 5, Number 50, page 6.

DECEMBER 18, 1988 TO JANUARY 07, 1989

SITE	DAY	pH	AMOUNT	AIR PATH TO SITE
Longwoods	22	4.3	13(r)	Ohio
	27	4.6	10(r)	Ohio
	03	4.0	5(s)	Wisconsin, Michigan, Southern Ontario
	05	4.5	3(s)	Kentucky, Ohio
Dorset	19	4.1	1(m)	Kentucky, Indiana, Ohio, Southern Ontario
	20	4.3	6(m)	Kentucky, Indiana, Ohio, Southern Ontario
	22	4.6	6(m)	Ohio, Pennsylvania, Southern Ontario
	23	4.6	5(s)	Ohio, Pennsylvania, Southern Ontario
	24	4.7	4(s)	Wisconsin, Michigan, Southern Ontario
	25	4.9	1(s)	Wisconsin, Lake Huron
	26	5.4	2(s)	Lake Huron, Southern Ontario
	27	4.6	20(s)	Pennsylvania, New York, Southern Ontario
	30	4.1	2(s)	Michigan, Southern Ontario
	01	4.3	4(s)	Michigan, Southern Ontario
	02	4.4	1(s)	Michigan, Southern Ontario
	07	4.2	22(r)	West Virginia, Ohio, Pennsylvania, Southern Ontario

Cont'd on page 8, Acid Rain

STATION	temperature mean	anom	max	min	precip. ptot	st	wind max dir	vit
British Columbia								
Cape St.James	3P	-1P	6P	-1P	3P	0	280	91
Cranbrook	-9P	5P	6P	-24P	14P	25	180	43
Fort Nelson	-24P	-1P	-15P	-39P	1P	59		*
Fort St.John	-16P	1P	-2P	-31P	3P	10	250	37
Kamloops	-7	-1	3	-16	4	4	280	50
Penticton	-3	0	7	-15	7	1	180	57
Port Hardy	1P	-1P	6P	-5P	51P	1	110	56
Prince George	-15P	-2	-5P	-33P	2P	*		*
Prince Rupert	0	2	7	-9	46	8	170	52
Revelstoke	-5P	6P	3P	-15P	15P	60	180	56
Smithers	-11P	-1P	-1P	-29P	2P	*		*
Vancouver Int'l	3	1	10	-2	29	1	140	41
Victoria Int'l	3	1	12	-2	35	*	220	59
Williams Lake	-11P	1	-1P	-19P	10P	36		X
Yukon Territory								
Watson Lake	-32	-7	-15	-46	1	53		*
Whitehorse	-23	-3	-12	-35	3	10	180	59
Northwest Territories								
Alert	-31P	1P	-23P	-40P	6P	56	210	31
Baker Lake	-35	-4	-28	-41	2P	52		*
Cambridge Bay	-35P	-3P	-27P	-40P	2P	11		*
Cape Dyer	-28	-6	-20	-36	2	121	300	63
Clyde	-33P	-7P	-28P	-40P	1P	36		*
Coppermine	-31P	*	-23P	-39P	2P	47	260	37
Coral Harbour	-31P	-3P	-23P	-41P	3P	17		X
Eureka	-39	-3	-27	-46	2	13		*
Fort Smith	-27P	-1P	-14P	-40P	2P	33		X
Iqaluit	-30	-5	-24	-38	2	11	320	35
Hall Beach	-31	-2	-20	-42	2	42	300	33
Inuvik	-24	5	-16	-35	3	38		X
Mould Bay	-34	-2	-19	-42	2	26		X
Norman Wells	-25	3	-15	-34	3	12		X
Resolute	-36	-5	-27	-43	1	21	030	33
Yellowknife	-30	-1	-14	-42	2P	26		*
Alberta								
Calgary Int'l	-13P	-1P	7P	-34P	7P	22	260	78
Cold Lake	-17	2	-7	-30	1P	12		*
Coronation	-16P	0P	-1P	-36P	0	0		*
Edmonton Namao	-15P	1P	-2P	-32P	2P	13	270	50
Fort Mcmurray	-21	0	-10	-37	2	32		X
High Level	-26	-2	-13	-39	1P	45		*
Jasper	-14P	0P	-2P	-27P	1P	38		X
Lethbridge	-15P	-4P	7P	-38P	11P	35	270	89
Medicine Hat	-13	0	6	-34	9P	*	210	50
Peace River	-17	2	-4	-34	2	11	280	43
Saskatchewan								
Cree Lake	-26	0	-10	-45	5	47	320	33
Estevan	-14P	2P	1P	-35P	2P	35	310	69
La Ronge	-24	0	-8	-42	4	31	320	37
Regina	-18P	-1P	-4P	-35P	9P	21	320	43
Saskatoon	-20P	-1P	-5P	-34P	2P	15		*
Swift Current	-15P	0P	4P	-35P	4P	35		X
Yorkton	-19	0	-7	-35	4	24	140	50
Manitoba								
Brandon	-19	0	-7	-33	16	29	040	76
Churchill	-31	-4	-17	-42	3	33	320	39
Lynn Lake	-28P	-1P	-13P	-41P	1P	45	300	43
The Pas	-23	-1	-9	-37	1	17	140	43
Thompson	-28	-1	-13	-42	2	40	300	37
Winnipeg Int'l	-19P	0P	-7P	-33P	28	46	030	72

STATION	temperature mean	anom	max	min	precip. ptot	st	wind max dir	vit
Ontario								
Big Trout Lake	-27	-3	-15	-40	3	57		*
Gore Bay	-11P	-1P	5P	-24P	26P	15	250	78
Kapuskasing	-22	-3	-7	-39	27	75	300	46
Kenora	-19P	0P	-10P	-31P	13	52	030	48
London	-4P	2P	9P	-14P	24P	1	250	80
Moosonee	-23	-3	-7	-37	14	*	330	61
North Bay	-16	-3	5	-32	16	17	240	72
Ottawa Int'l	-14	-3	6	-27	12	14		X
Petawawa	-15	-2	6	-31	17	15		X
Pickle Lake	-23P	-1P	-10P	-38P	6P	*	030	39
Red Lake	-21P	0P	-10P	-34P	9P	81	050	44
Sudbury	-16P	-3P	4P	-31P	23P	29		X
Thunder Bay	-14P	0P	-3P	-27P	18	*	070	48
Timmins	-19	-2	1	-37	22	50	310	46
Toronto Int'l	-7P	-2P	4P	-23P	9P	1	240	80
Trenton	-8	-1	8	-22	10	0		X
Wiarton	-7P	-1P	7P	-17P	26P	2		X
Windsor	-2	2	13	-12	13P	0	240	78
Québec								
Bagotville	-23P	-7P	-8P	-32P	12P	27	240	78
Blanc Sablon	-14	*	3	-29	11	8		X
Inukjuak	-26	-3	-16	-36	2P	28	260	31
Kuujjuaq	-27	-4	-16	-32	5P	27	030	63
Kuujjuarapik	-27	-5	-12	-37	3	14	020	67
Maniwaki	-15	-2	6	-32	22	20	230	69
Mont Joli	-13	-2	6	-26	10	31	330	83
Montréal Int'l	-15P	-6P	1P	-28P	19P	5	230	93
Natashquan	-15	-3	1	-29	15	22	360	83
Québec	-18P	-7P	-6P	-31P	27P	25	240	100
Schefferville	-26	-3	-3	-36	13	30	250	44
Sept-Iles	-15	-1	2	-33	36	19	210	61
Sherbrooke	-15	-4	5	-32	17	22	260	91
Val D'or	-20	-3	3	-35	21	31	210	69
New Brunswick								
Charlo	-15	-2	3	-24	16	55	240	65
Chatham	-12P	-2P	4P	-26P	26	22	330	57
Fredericton	-14	-5	6	-25	15	11	270	56
Moncton	-10P	-2P	8P	-23P	13P	6	260	74
Saint John	-12	-4	8	-23	19	15	210	59
Nova Scotia								
Greenwood	-10P	-4P	10P	-24P	10P	21	250	76
Shearwater	-9P	-5P	0P	-19P	9P	7	340	63
Sydney	-4P	0P	7P	-12P	25P	11	330	85
Yarmouth	-5P	-3P	8P	-15P	13P	1	340	65
Prince Edward Island								
Charlottetown	-10P	-3P	6P	-19P	21	23	330	65
Summerside	-9P	-2P	6P	-18P	19	28	310	57
Newfoundland								
Cartwright	-16P	-4P	3P	-27P	2P	70	160	50
Churchill Falls	-24	-3	-2	-35	22	59	300	48
Gander Int'l	-12P	-6P	-5P	-19P	63	72	360	93
Goose	-19	-3	1	-30	5	36	340	72
Port-Aux-Basques	-5P	-2P	3P	-11P	28	*	100	80
St John's	-8P	-4P	1P	-15P	50P	36	180	89
St Lawrence	-5P	-1P	6P	-11P	44P	48		X
Wabush Lake	-24	-1	-3	-35	17P	40	160	44

89/01/02-89/01/08

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.
vit = wind speed in km/h

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

Acid Rain, Cont'd from page 5

SITE	DAY	pH	AMOUNT	AIR PATH TO SITE
Chalk River	22	4.4	6(s)	Pennsylvania, New York, Eastern Ontario
	23	4.2	2(r)	Pennsylvania, New York, Eastern Ontario
	24	4.4	2(s)	New York, Eastern Ontario
	27	4.6	9(s)	New York, Eastern Ontario
	28	3.9	2(s)	Southern and Central Ontario
	01	4.0	8(s)	Michigan, Southern Ontario
	07	4.1	13(r)	Virginia, Pennsylvania, New York, Eastern Ontario
Sutton	23	4.5	2(s)	Virginia, New Jersey, New York
	24	4.0	3(r)	Pennsylvania, New York
	25	4.4	5(s)	Ontario, New York
	27	3.9	12(m)	West Virginia, Pennsylvania, New York
	28	4.2	7(m)	New England
	30	3.8	2(s)	Southern Ontario, New York
	31	3.6	3(s)	Eastern Ontario, Southern Quebec, New York
	01	3.7	2(s)	New Jersey, Pennsylvania, New York
	02	3.8	11(s)	Pennsylvania, New York
Montmorency	20	3.8	15(m)	Pennsylvania, New York, Southern Québec
	21	4.2	2(s)	Northwestern Québec
	23	4.1	9(s)	Pennsylvania, New York, Southern Québec
	24	4.3	9(s)	New England, Southeastern Québec
	27	4.8	8(s)	Pennsylvania, New York, Southern Québec
	28	4.3	3(s)	New England, Southern Québec
	30	4.1	3(s)	Southern Ontario, Southern Québec
	01	4.3	3(s)	New York, Southern Québec
	02	4.3	6(s)	Southern Ontario, Southern Québec
	07	4.4	5(s)	New Jersey, New England, Southern Québec
Kejimkujik	19	4.0	2(s)	Southern Québec, New England
	23	4.3	2(s)	Virginia, New Jersey, Atlantic Ocean
	24	4.6	13(r)	Atlantic Ocean
	27	4.2	4(r)	Virginia, New Jersey, New York
	28	4.4	22(r)	Virginia, New Jersey, Atlantic Ocean
	02	4.8	5(s)	New Brunswick, Nova Scotia, Atlantic Ocean
	03	5.1	2(s)	Québec, Maine, New Brunswick
	07	5.0	2(s)	Atlantic Ocean

r = rain (cm), s = snow (cm), (m) = mixed rain and snow (mm)