

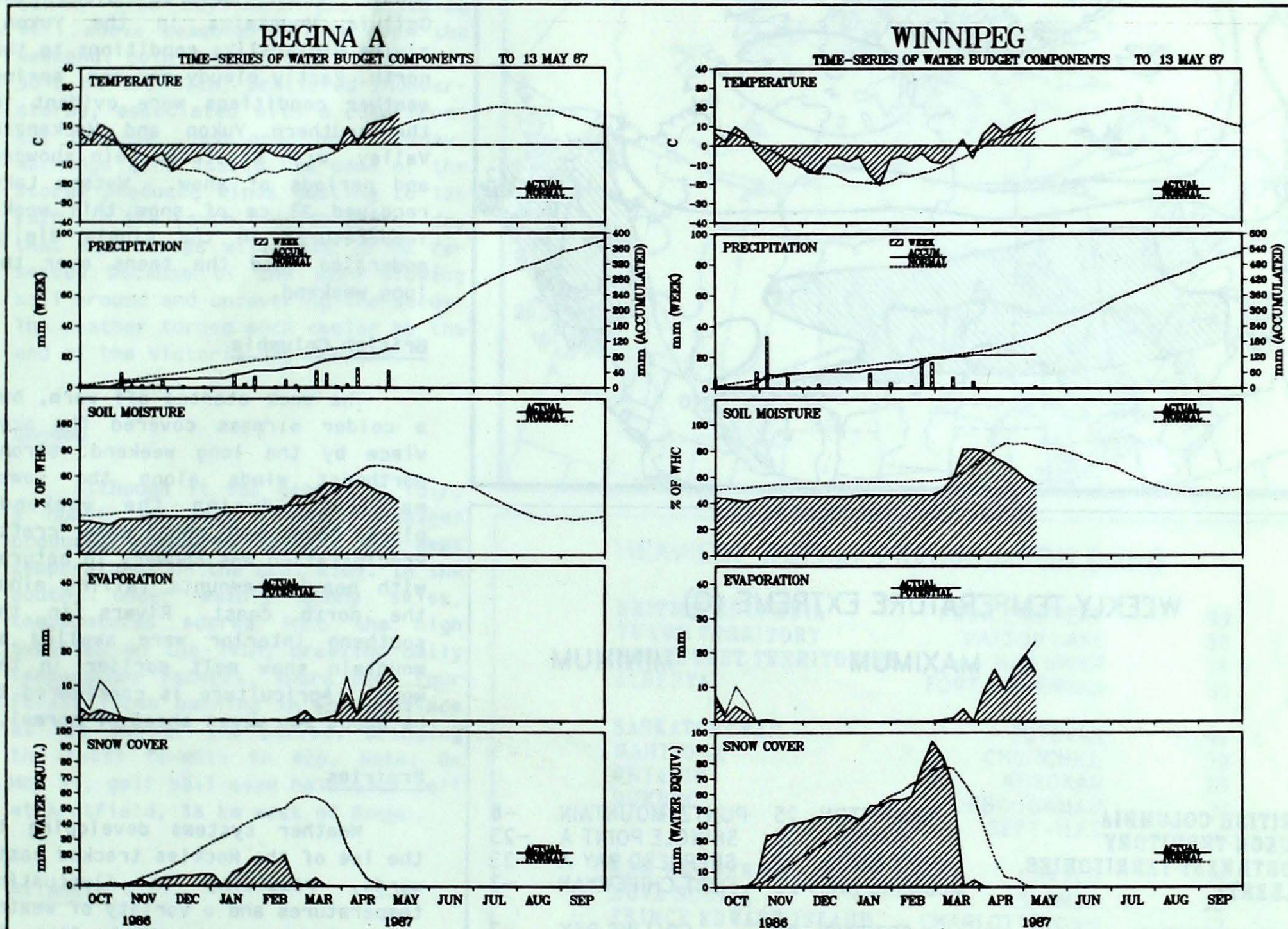


# Climatic Perspectives

A weekly review of Canadian climate

May 12 to 18, 1987

Vol.9 No.20

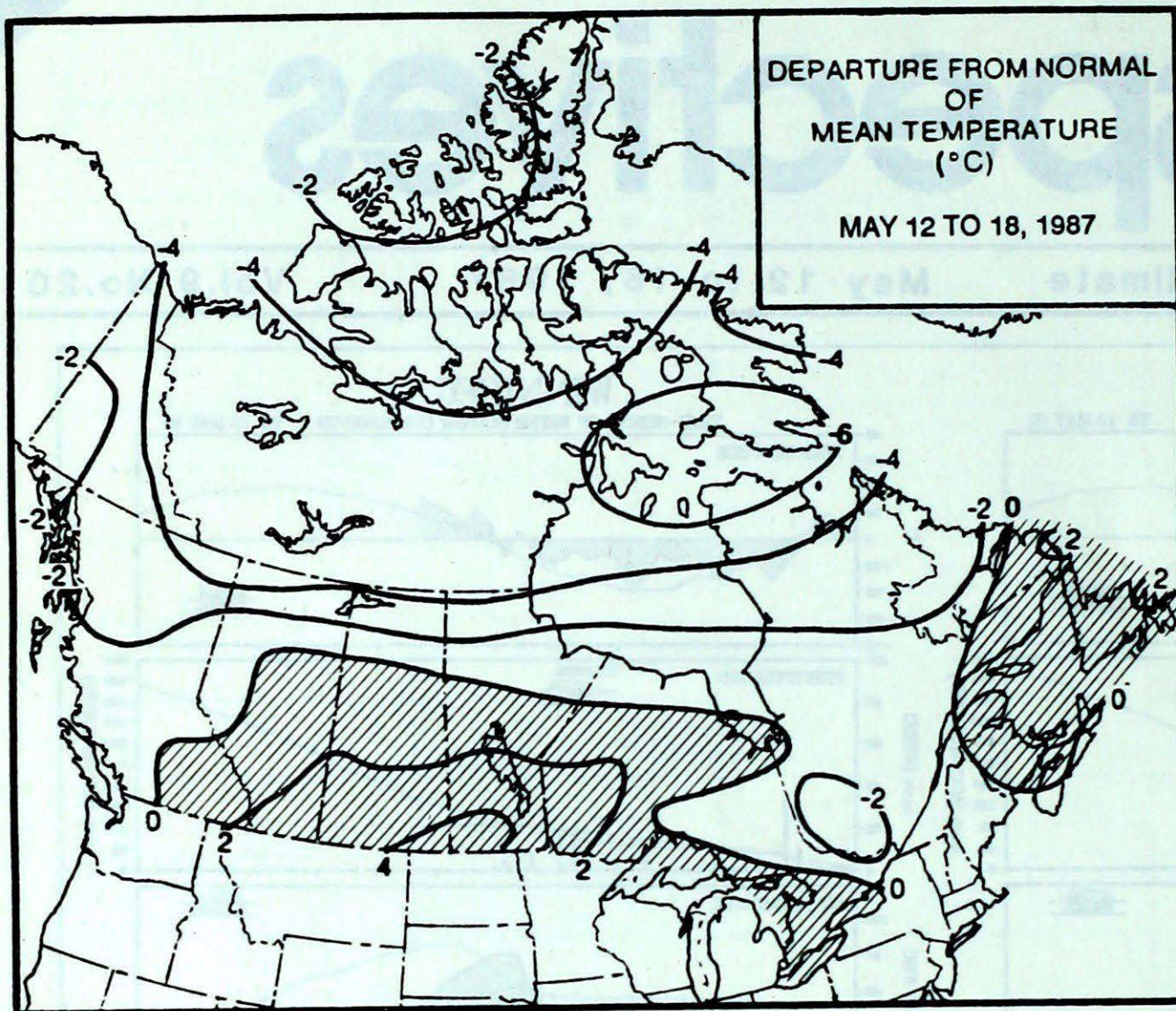


These water budget time series show the progressive development of the dry conditions that have lead to the serious forest fire hazard in Saskatchewan and Manitoba this spring. See page 3 for further explanation. The plotted values are based on a 7-day mean or total. Note that the soil moisture graph, which portrays the water holding capacity (WHC) of the soil, is a routine Canadian Climate Centre product derived from an operational water budget model. A coincidence between low values of the water-budget soil moisture and forest fires has been documented.

S. Ishida/CCA

- **Weather becomes more unsettled over much of the country**
- **Cooler temperatures descend from the north with snow in some regions**

# TEMPERATURE



## ACROSS THE COUNTRY...

### Yukon and Northwest Territories

An Arctic vortex persisted over the Archipelago, giving cloudy skies and unseasonably cold temperatures over much of the Arctic; light snowfalls were reported everywhere. An Arctic front hovered along the Ogilvie Mountains in the Yukon, giving winter-like conditions to the north. Partly cloudy and cool spring weather conditions were evident in the southern Yukon and Mackenzie Valley, with scattered rain showers and periods of snow. Watson Lake received 23 cm of snow this week. Temperatures in the single digits moderated into the teens over the long weekend.

### British Columbia

The week started off warm, but a colder airmass covered the province by the long weekend. Strong northwest winds along the lower mainland, during the weekend, played havoc with small water craft. Precipitation was showery in nature, with heavier amounts falling along the north coast. Rivers in the southern interior were swelled by mountain snow melt earlier in the week. Agriculture is considered to be about two weeks ahead of normal.

### Prairies

Weather systems developing to the lee of the Rockies tracked eastwards, resulting in fluctuating temperatures and a variety of weather conditions. A southerly flow, in advance of a vigorous low pressure system, briefly pumped record breaking warm air into the southeast on the 12th. Snow and blowing snow moved into the northern areas on the 13th, while scattered showers and thunderstorms affected the agricultural districts. By the weekend, Churchill had 30 cm of new snow on the ground. An approaching cold low brought increasing cloud, showers and thunderstorms into Alberta the final day of the period; snow began falling overnight as temperatures dropped to near freezing. Farmers in southwestern Manitoba have delayed seeding until soil moisture improves.

## WEEKLY TEMPERATURE EXTREME (C)

	MAXIMUM	MINIMUM
<b>BRITISH COLUMBIA</b>	PENTICTON 25	PUNTZI MOUNTAIN -6
<b>YUKON TERRITORY</b>	DAWSON 19	SHINGLE POINT A -23
<b>NORTHWEST TERRITORIES</b>	FORT SMITH 13	SHEPHERD BAY A -23
<b>ALBERTA</b>	MEDICINE HAT 28	FORT CHIPEWYAN -7
<b>SASKATCHEWAN</b>	ESTEVAN 33	COLLINS BAY -7
<b>MANITOBA</b>	DAUPHIN 34	CHURCHILL -14
<b>ONTARIO</b>	TORONTO INT'L 30	MOOSONEE -8
<b>QUEBEC</b>	ROBERVAL 29	KUUJJIARAPIK -9
<b>NEW BRUNSWICK</b>	CHARLO 27	ST STEPHEN -1
<b>NOVA SCOTIA</b>	GREENWOOD 22	SHELBURNE -1
<b>PRINCE EDWARD ISLAND</b>	CHARLOTTETOWN 19	CHARLOTTETOWN -2
<b>NEWFOUNDLAND</b>	GOOSE 26	CHURCHILL FALLS -6

## ACROSS THE NATION

WARMEST MEAN TEMPERATURE	16	ESTEVAN	SASK
COOLEST MEAN TEMPERATURE	-15	ALERT	NWT

**Ontario**

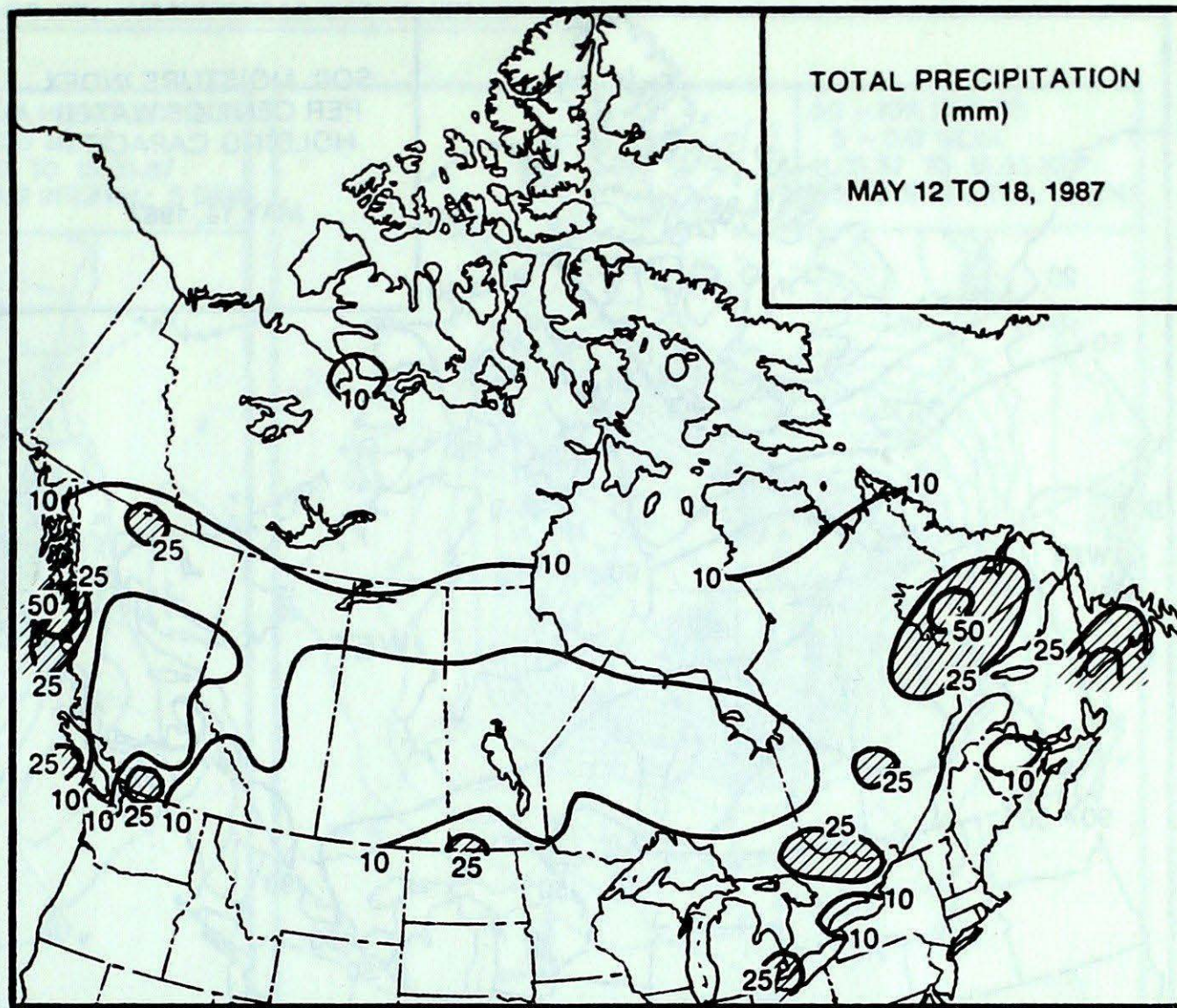
Disturbances crossing northern Ontario produced showery, cooler weather conditions. The rainfalls, in the order of 10 to 25 millimeters, brought some relief to the forest fire situation in the drier northern areas. It was mostly sunny in the south, with daytime highs climbing well above seasonal values over the weekend. Both Toronto and Windsor hit 30°C on the 17th. Scattered thunderstorms, associated with a cold frontal passage, developed on Thursday. Warnings were issued, as some of the storms produced winds gusting to 120 km/h. In the south, fields are so dry that some crops will have to be re-seeded because of the wind blowing soil around and uncovering the seeds. The weather turned much cooler by the end of the Victoria Day weekend.

**Quebec**

Although it was generally fair, a number of cold frontal passages produced scattered showers and kept temperatures on the cool side. In the south, under mainly sunny skies, temperatures soared into the high twenties on the 14th, breaking daily temperature records. There were four forest fires burning in the province at the end of the period, bringing the total to-date to 426. Note: On May 11, golf ball size hail also fell at Arntfield, 18 km west of Rouyn.

**Atlantic**

It was a generally fair week, with cold frontal passages producing showers during the early and middle parts of the period. Southerly winds gusted to 100 km/h off the northern tip of Cape Breton Island. Temperatures fluctuated from very warm values Tuesday and Thursday to daily record, near freezing, lows over the weekend. Snow flurries were reported in Newfoundland Sunday morning. On the Island, maximum readings hovered only in the single digits holiday Monday. In Labrador, it started out cool and unsettled. The interior received up to 30 cm of snow. Daily maximum temperature records were set during the middle of the week, then it turned much cooler.

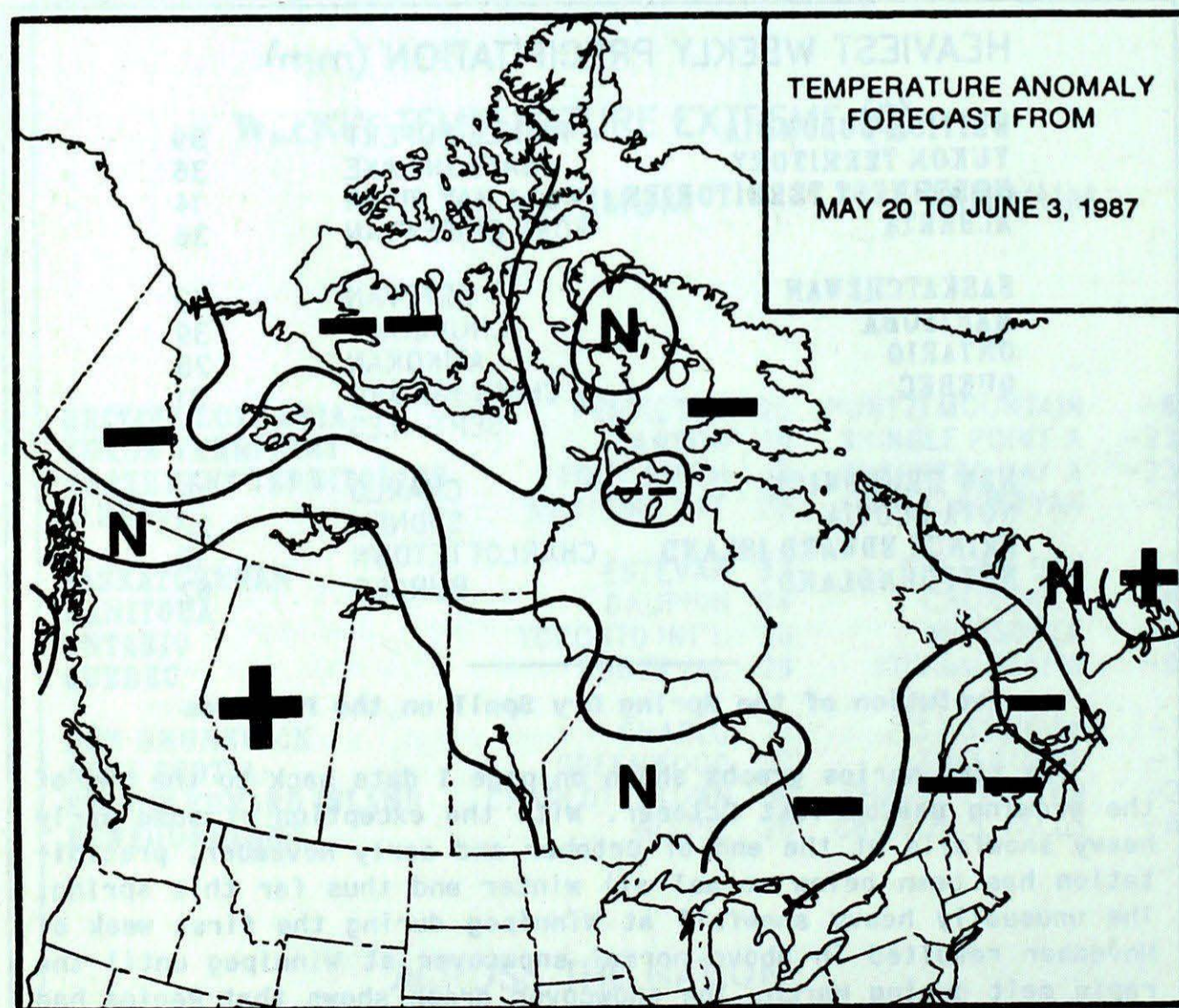
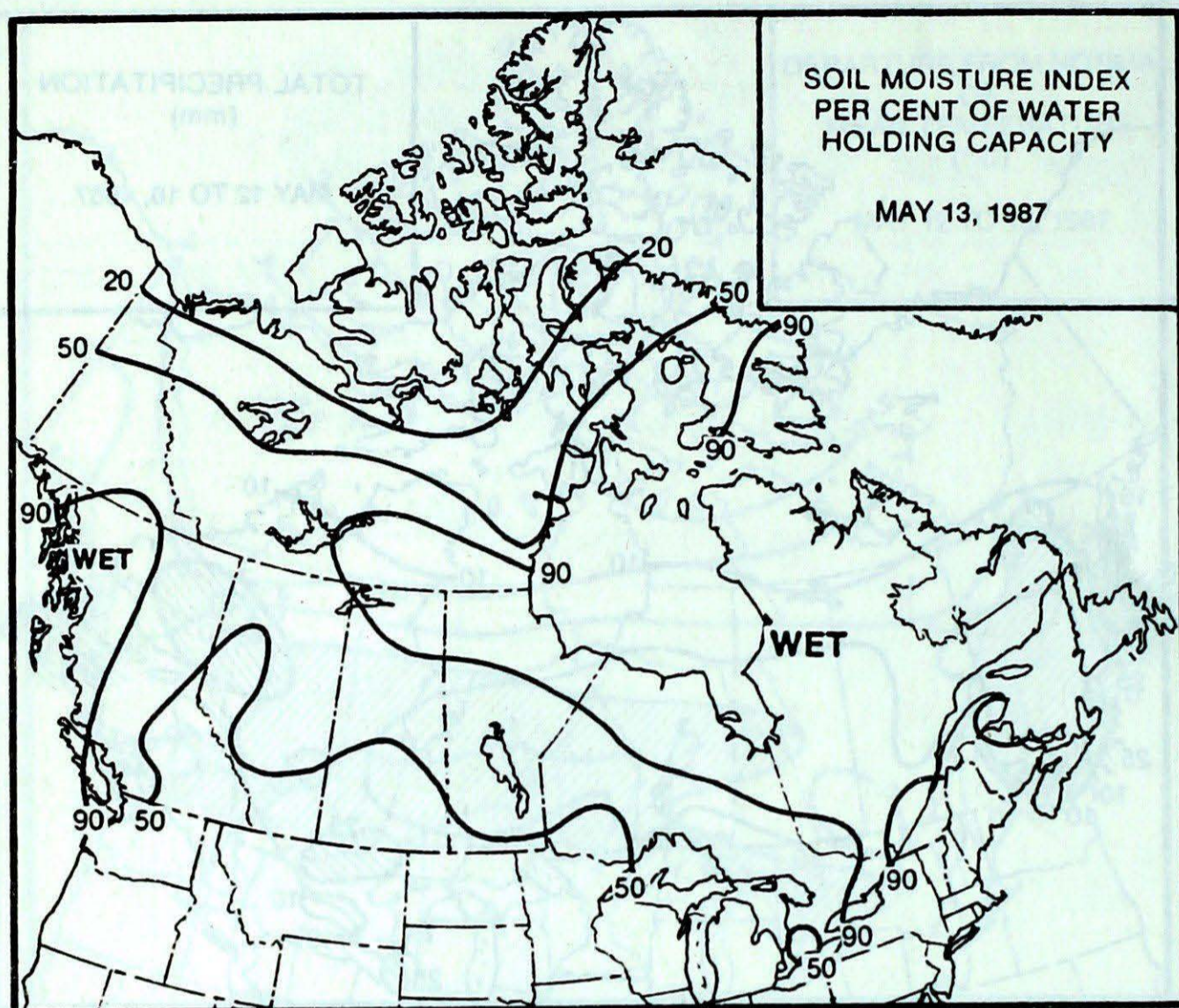
**HEAVIEST WEEKLY PRECIPITATION (mm)**

BRITISH COLUMBIA	PRINCE RUPERT	89
YUKON TERRITORY	WATSON LAKE	36
NORTHWEST TERRITORIES	HAY RIVER	14
ALBERTA	FORT CHIPEWYAN	36
SASKATCHEWAN	ESTEVAN	42
MANITOBA	CHURCHILL	39
ONTARIO	ATIKOKAN	28
QUEBEC	CHIBOUGAMAU	31
	SEPT-ILES	
NEW BRUNSWICK	CHARLO	15
NOVA SCOTIA	SYDNEY	22
PRINCE EDWARD ISLAND	CHARLOTTETOWN	17
NEWFOUNDLAND	BURGEO	62

**Evolution of the Spring Dry Spell on the Prairies**

The time series graphs shown on page 1 date back to the end of the growing season last October. With the exception of some early heavy snowfalls at the end of October and early November, precipitation has been below normal all winter and thus far this spring. The unusually heavy snowfall at Winnipeg during the first week of November resulted in above normal snowcover at Winnipeg until the rapid melt during March. The snowcover graph shows that Regina had much below normal snowcover. These graphs demonstrate that one of the critical contributing factors to the dry spring were the extremely warm temperatures in March which rapidly depleted the snowcover one month earlier than normal. This early melt caused the springtime peak in soil moisture to occur one month early which set the stage for a premature drop in soil moisture conditions brought on by the warm, dry weather of April and early May.

# FORECAST



### Temperature Anomaly Forecast

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

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 VOLUME 9

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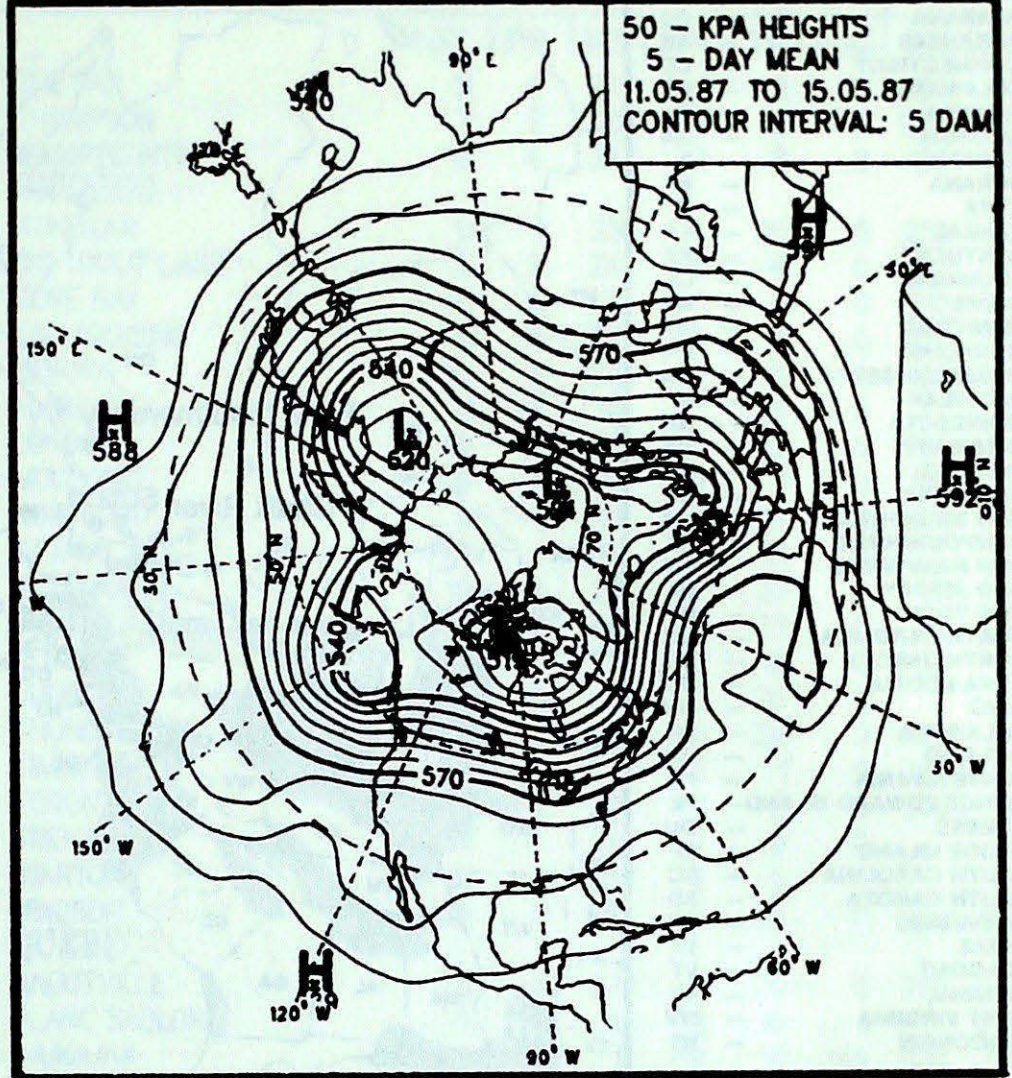
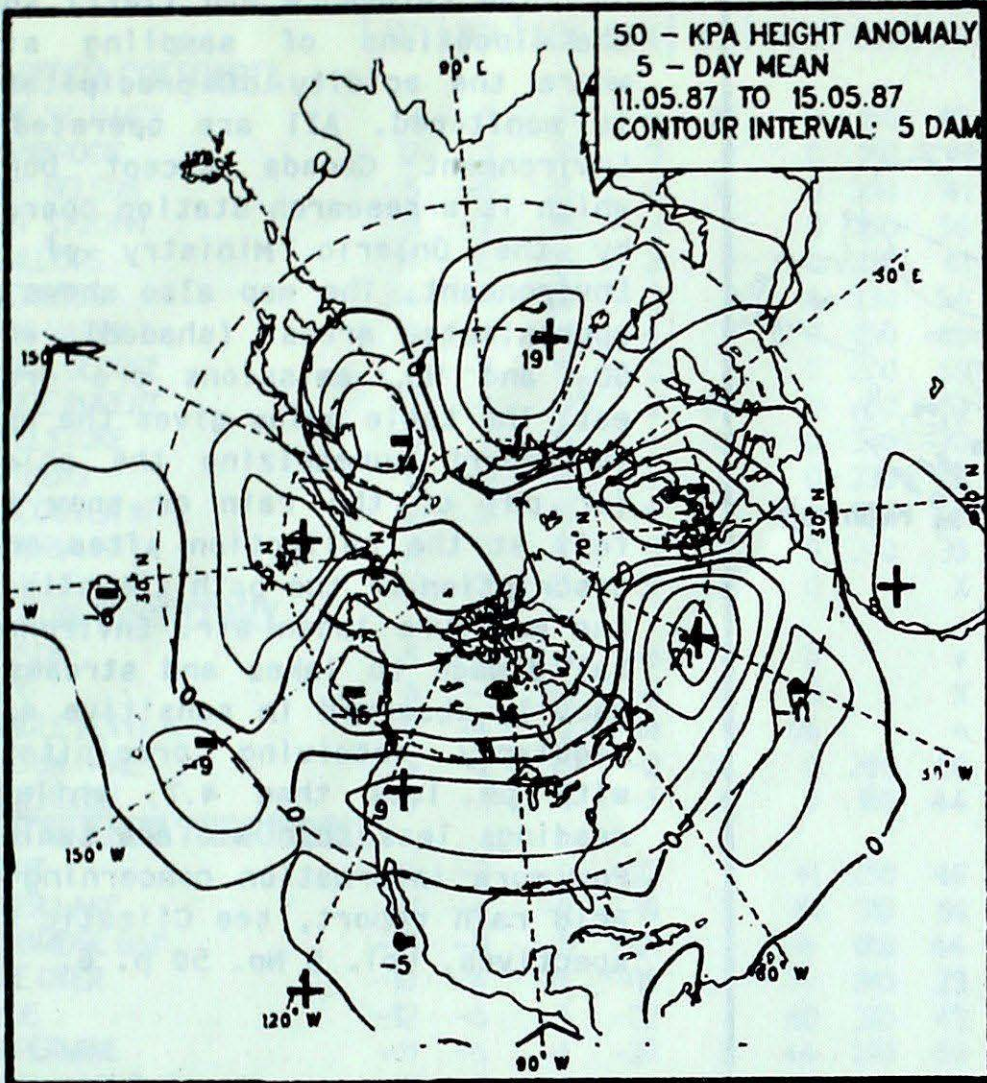
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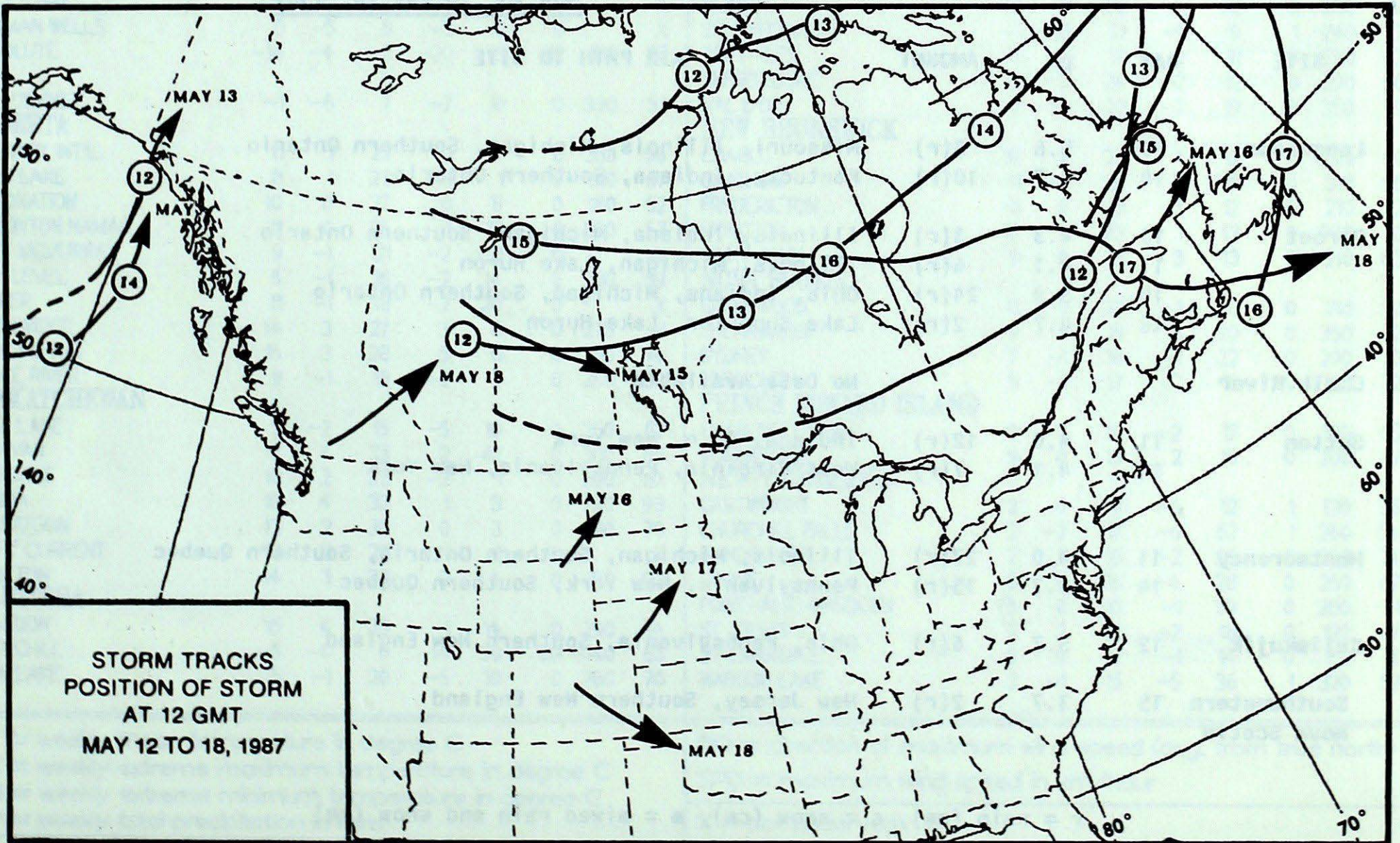
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50 KPa ATMOSPHERIC CIRCULATION



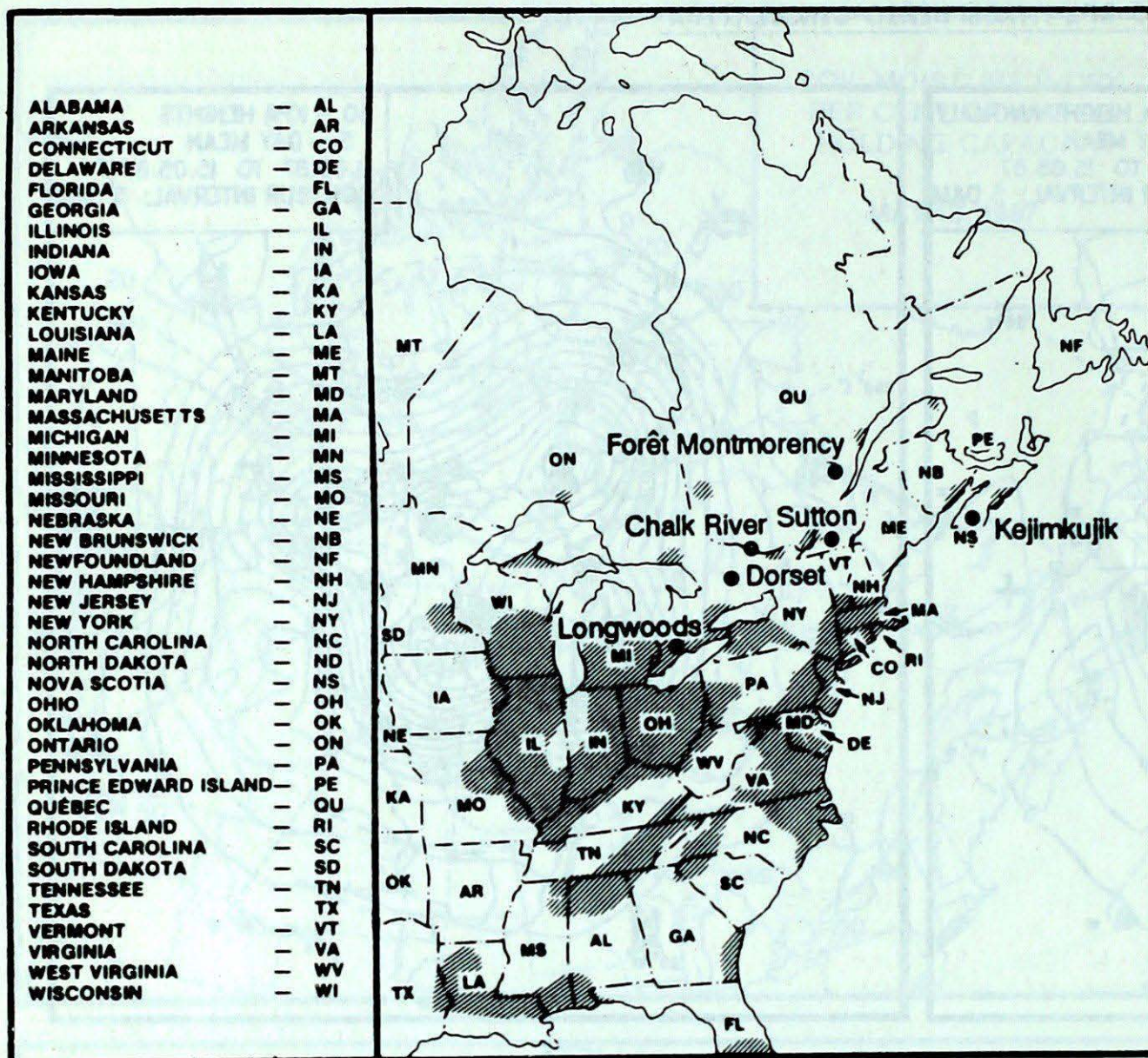
MEAN 50 KPa HEIGHT ANOMALY (dam)  
May 11 to 15, 1987

MEAN 50 KPa HEIGHTS (dam)  
May 11 to 15, 1987



# ACID RAIN

## 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  $\text{SO}_2$  and  $\text{NO}_x$  emissions are greatest. The table below gives the weekly report summarizing the acidity (or pH) of the 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 less than 4.7, while pH readings less than 4.0 are serious. For more information concerning the acid rain report, see Climatic Perspectives, Vol. 5 No. 50 p. 6.

May 10 To May 16, 1987

SITE	DAY	pH	AMOUNT	AIR PATH TO SITE
Longwoods	10	5.8	3(r)	Missouri, Illinois, Michigan, Southern Ontario
	14	4.7	10(r)	Kentucky, Indiana, Southern Ontario
Dorset	10	4.3	3(r)	Illinois, Indiana, Michigan, Southern Ontario
	11	4.1	6(r)	Illinois, Michigan, Lake Huron
	14	3.9	24(r)	Ohio, Indiana, Michigan, Southern Ontario
	16	4.7	2(r)	Lake Superior, Lake Huron
Chalk River			No Data Available	
Sutton	11	4.0	12(r)	Indiana, Ohio, New York
	14	4.1	7(r)	West Virginia, Pennsylvania, New York
Montmorency	11	4.0	27(r)	Illinois, Michigan, Southern Ontario, Southern Quebec
	14	3.7	15(r)	Pennsylvania, New York, Southern Quebec
Kejimikujik	12	3.7	6(r)	Ohio, Pennsylvania, Southern New England
Southwestern Nova Scotia	15	3.7	2(r)	New Jersey, Southern New England

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

## TEMPERATURE, PRECIPITATION AND MAXIMUM WIND DATA FOR THE WEEK ENDING 0600 GMT MAY 19, 1987

STATION	TEMPERATURE				PRECIP.		WIND MX		STATION	TEMPERATURE				PRECIP.		WIND MX	
	AV	DP	MX	MN	TP	SOG	DIR	SPD		AV	DP	MX	MN	TP	SOG	DIR	SPD
<b>BRITISH COLUMBIA</b>									THE PAS	11	4	24	-1	1	0	290	76
CAPE ST. JAMES	8	-1	11	5	27	0	150	87	THOMPSON	7	2	21	-4	2	0	330	54
CRANBROOK	12	1	21	3	2	0	160	41	WINNIPEG INT'L	15	4	34	2	8	0	190	70
FORT NELSON	5	-5	15	-3	16	0	330	41	<b>ONTARIO</b>								
FORT ST. JOHN	8	-2	15	-1	2	0	250	56	ATIKOKAN	11	1	23	-4	28	0	230	52
KAMLOOPS	14	0	25	3	2	0	230	61	BIG TROUT LAKE	5	2	24	-5	4	0	280	56
PENTICTON	14	1	25	2	1	0	330	54	GORE BAY	10	0	21	1	8	0	210	46
PORT HARDY	9	-1	14	4	11	0	090	46	KAPUSKASING	9	0	27	-3	1	0	320	50
PRINCE GEORGE	7	-2	15	-2	3	0	200	59	KENORA	14	3	28	3	5	0	160	56
PRINCE RUPERT	7	-1	12	2	89	0	150	52	KINGSTON	11	-1	19	1	16	0		X
REVELSTOKE	13	1	25	4	17	0	340	70	LONDON	14	2	29	3	22	0	260	54
SMITHERS	6	-3	16	-2	1	0	230	37	MOOSENEE	6	0	28	-8	2	0	220	78
VANCOUVER INT'L	12	0	18	6	7	0	290	65	NORTH BAY	9	-1	21	-1	25	0	350	48
VICTORIA INT'L	11	0	17	5	6	0	240	35	OTTAWA INT'L	12	-1	24	2	21	0		X
WILLIAMS LAKE	6P	-2	15	-3P	3	0		X	PETAWAWA	10	-2	27	-3	26	0		X
<b>YUKON TERRITORY</b>									PICKLE LAKE	9	3	24	-3	28	0	230	76
DAWSON	5	-3	19	-6	0	0		*	RED LAKE	12	3	25	-1	16	0	190	63
MAYO	6	-1	16	-2	0	0		X	SUDBURY	9	-1	18	0	26	0		X
SHINGLE POINT A	-9	-4	-2	-23	1	56		*	THUNDER BAY	10	1	24	-2	24	0	300	57
WATSON LAKE	5	-2	15	-2	36	0	280	56	TIMMINS	9	-1	23	-3	1	0	200	50
WHITEHORSE	5	-1	16	-5	4	0	160	44	TORONTO INT'L	13	1	30	1	8	0	260	56
<b>NORTHWEST TERRITORIES</b>									TRENTON	13	0	24	2	9	0		X
ALERT	-15	-3	-9	-22	1	41	350	46	WIARTON	11	1	25	0	5	0		X
BAKER LAKE	-11	-4	-5	-19	2	61	310	59	WINDSOR	16	1	30	5	25	0	240	107
CAMBRIDGE BAY	-13	-3	-5	-21	2	36	010	44	<b>QUEBEC</b>								
CAPE DYER	-10	-4	-5	-15	2	77	310	33	BAGOTVILLE	8	-1	27	-2	20	0	280	78
CLYDE	-12	-5	-5	-22	1	40	310	43	BLANC SABLON	4	1	9	-3	16	1		X
COPPERMINE	-11	-5	-4	-20	5	44	270	50	INUKJUAK	-4	-3	1	-9	10	46	030	54
CORAL HARBOUR	-13	-7	-6	-22	3	64		X	KULUJUAQ	-3	-4	3	-8	15	0	300	44
EUREKA	-13	-2	-7	-18	0	9	290	46	KULUJUAPIK	-1	-2	17	-9	18	1	190	56
FORT SMITH	2	-5	13	-6	10	0		X	MANIWAKI	8	-3	25	-3	10	0	310	46
IQUALUIT	-10	-7	-3	-16	1	31	340	37	MONT JOLI	10	1	25	3	11	0	240	78
HALL BEACH	-13	-3	-6	-23	2	37	290	41	MONTREAL INT'L	11	-2	25	1	16	0	300	56
INUVIK	-9	-7	0	-18	2	39		X	NATASHQUAN	5	0	12	-1	22	0	170	61
MOULD BAY	-12	0	-4	-18	6	44		X	QUEBEC	10	-1	24	-2	22	0	280	67
NORMAN WELLS	0	-5	8	-8	0	0		X	SCHIEFFERVILLE	-1	-2	13	-9	19	1	240	72
RESOLUTE	-14	-4	-8	-20	3	22	150	37	SEPT-ILES	6	0	18	0	31	0	290	63
YELLOWKNIFE	-1	-6	7	-7	0	0	330	52	SHERBROOKE	9	-2	24	-2	12	0	270	56
<b>ALBERTA</b>									VAL D'OR	7	-2	22	-2	19	0	350	59
CALGARY INT'L	11	1	25	0	7	0	350	96	<b>NEW BRUNSWICK</b>								
COLD LAKE	11	1	23	1	1	0	310	57	CHARLO	10	2	27	1	15	0	290	59
CORONATION	10	0	27	0	8	0	180	52	CHATHAM	11	1	25	2	8	0	310	56
EDMONTON NAMAQ	11	0	25	1	12	0	320	57	FREDERICTON	11	0	23	3	12	0	210	52
FORT MCMURRAY	9	-1	21	-2	8	0		X	MONCTON	10	0	23	1	13	0	030	70
HIGH LEVEL	6	-1	16	-2	14	0	300	59	SAINT JOHN	9	0	18	3	13	0	210	63
JASPER	8	-1	18	-2	20	0		X	<b>NOVA SCOTIA</b>								
LETHBRIDGE	14	3	27	3	0	0	270	81	GREENWOOD	11	0	22	1	10	0	210	80
MEDICINE HAT	15	3	28	5	0	0	280	74	SHEARWATER	9	0	18	3	20	0	350	52
PEACE RIVER	9	-1	18	-2	3	0	250	50	SYDNEY	7	-1	18	-1	22	0	200	70
<b>SASKATCHEWAN</b>									YARMOUTH	9	-1	17	2	15	0	190	72
CREE LAKE	5	-2	15	-5	10	0	260	52	<b>PRINCE EDWARD ISLAND</b>								
ESTEVAN	16	4	33	2	42	0	300	85	CHARLOTTETOWN	9	0	19	-2	17	0	180	65
LA RONGE	10	2	23	-2	1	0	290	67	SUMMERSIDE	9	0	19	2	16	0	200	67
REGINA	15	4	32	1	3	0	280	98	<b>NEWFOUNDLAND</b>								
SASKATOON	13	2	30	0	3	0	310	70	CARTWRIGHT	3	0	19	-4	12	1	130	56
SWIFT CURRENT	13	2	29	1	1	0		X	CHURCHILL FALLS	2	-2	17	-6	52	1	260	54
YORKTON	14	3	33	2	4	0	270	93	GANDER INT'L	7	1	18	-2	25	0	260	74
<b>MANITOBA</b>									GOOSE	5	0	26	-4	28	0	250	67
BRANDON	15	4	33	1	14	0	290	74	PORT-AUX-BASQUES	5	0	10	-1	59	0	280	61
CHURCHILL	-5	-4	6	-14	39	20	040	65	ST JOHN'S	7	2	18	-2	18	0	190	67
LYNN LAKE	5	-1	20	-5	10	0	280	70	ST LAWRENCE	5	0	12	-1	14	0		X
									WABUSH LAKE	2	-1	15	-5	36	1	320	52

AV = weekly mean temperature in degree C  
 MX = weekly extreme maximum temperature in degree C  
 MN = weekly extreme minimum temperature in degree C  
 TP = weekly total precipitation in mm  
 DP = departure of mean temperature from normal in degree C  
 SOG = snow depth on ground in cm, last day of the period

DIR = direction of maximum wind speed (deg. from true north)  
 SPD = maximum wind speed in km/hour  
 X = not observed  
 P = value based on less than 7 days  
 \* = missing

### The Forage Drought Early Warning System Report (FoDEWS)

J.A. Dyer  
Soil and Climate Section  
Regional Development Branch  
Agricultural Canada

Report No. 3 April 1, 1987

#### BACKGROUND

This report identifies possible drought stricken areas for the Prairie Provinces by the end of May. It includes weather based estimates of soil moisture reserves for silty clay loam, under a perennial forage pasture. Weather records from three selected past years are used as proxy future weather. At each update historical records are replaced by the most recent daily weather observations.

Two contour maps show the dryness relative to past years. In Figure 1, various percent of normal classes are shown. Figure 2 shows areas with reserves below the lowest levels at several

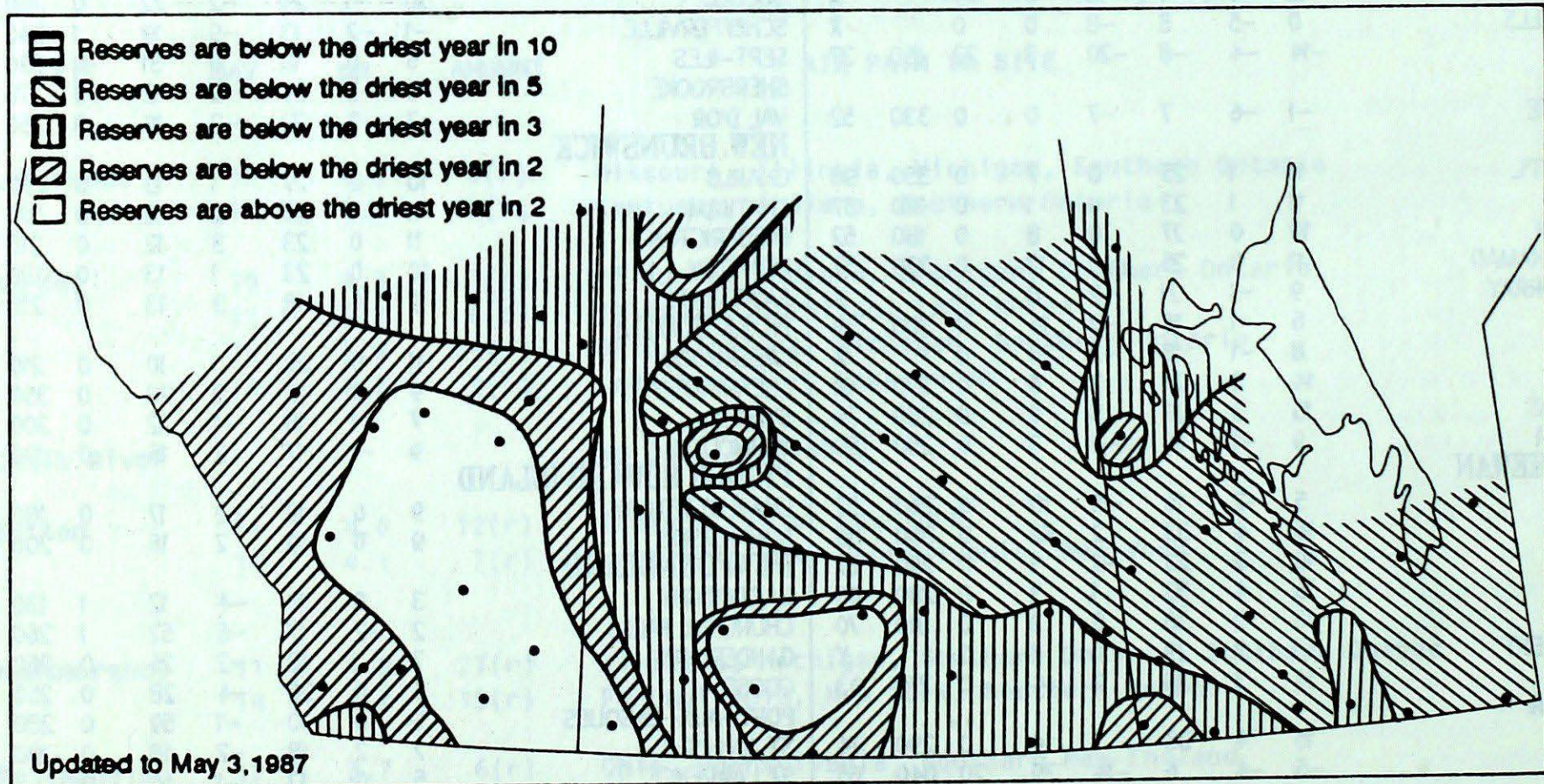
different frequencies of occurrences. To illustrate; in the "below one year in three" area, 20 out of a sample of 30 years can be expected to have more moisture reserves than the given level. The report now includes 58 weather stations, but should still only be interpreted as a general outlook or reconnaissance. The LRRC Research Branch is acknowledged for providing the weather data used in this report and A.E.S. of Environment Canada is acknowledged for collection of the original weather records.

UPDATE - May 3, 1987

The extremely dry month of April

experienced by most the region has had a marked effect on soil moisture reserves. The most affected areas are in Manitoba and north-eastern Saskatchewan. The area between Yellow Grass and Hudson Bay is below 60% of normal. A similar area extending east into most of Manitoba and west to Rosetown has well below the driest year in five expectations. Portage La Prairie and Morden are at the driest year in three levels. In Saskatchewan, Swift Current, Moose Jaw, Aneroid and West Poplar River still have above normal moisture reserves. In Alberta, only Cardston is abnormally dry, although many sites are slightly below normal at present.

Figure 1



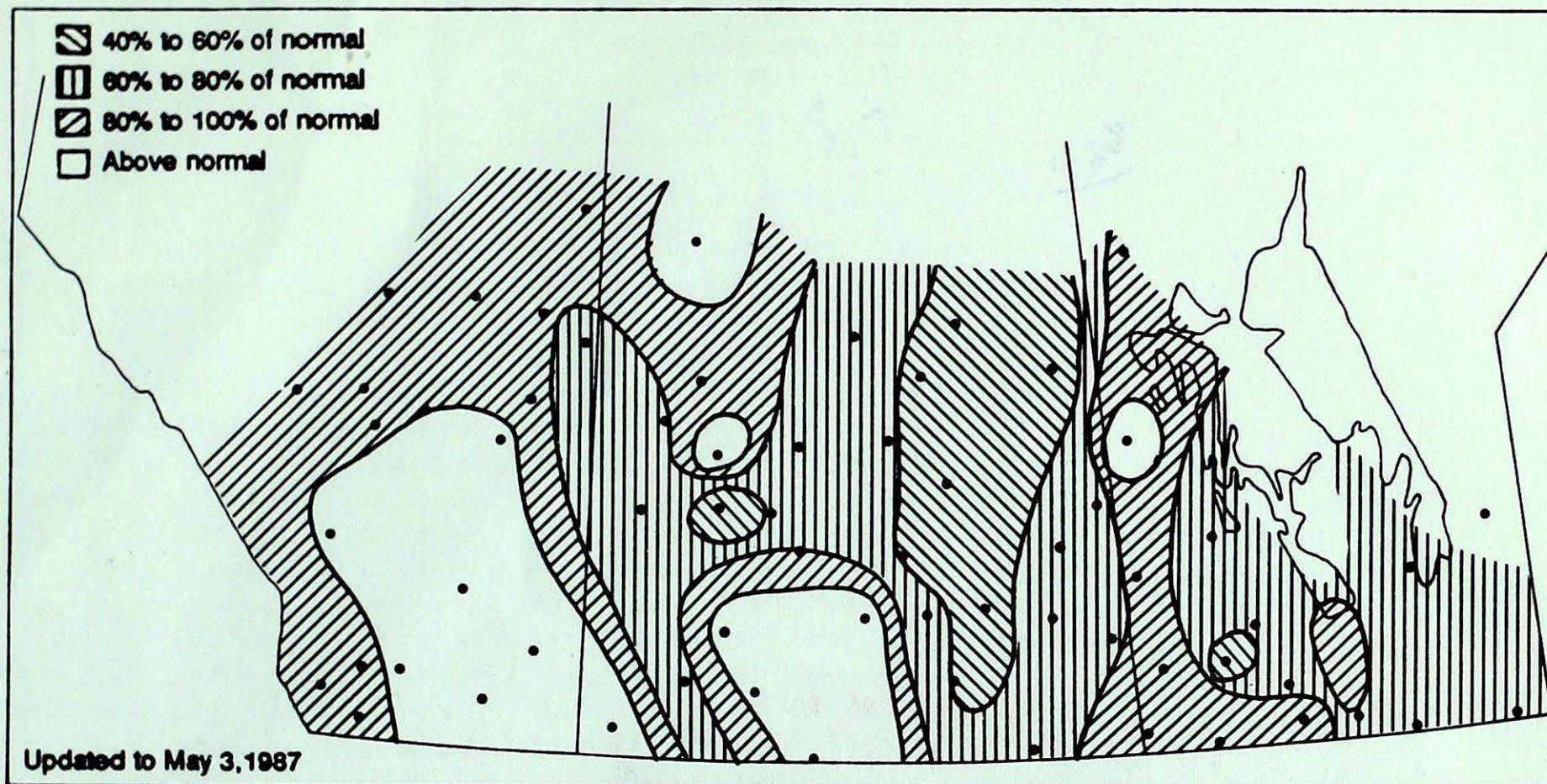
Projected soil moisture reserves under perennial by July 31, expressed as percent of normal

...continued on next page



Forage Drought Early Warning System, Report No. 4.... Continued

Figure 2



Zones showing the frequency at which the projected moisture conditions for May 31, can be expected to return in future years

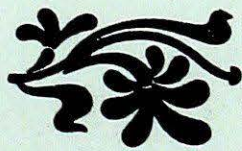


Figure 1  
Regional map of the United States showing the location of the study area in the Southeastern United States.

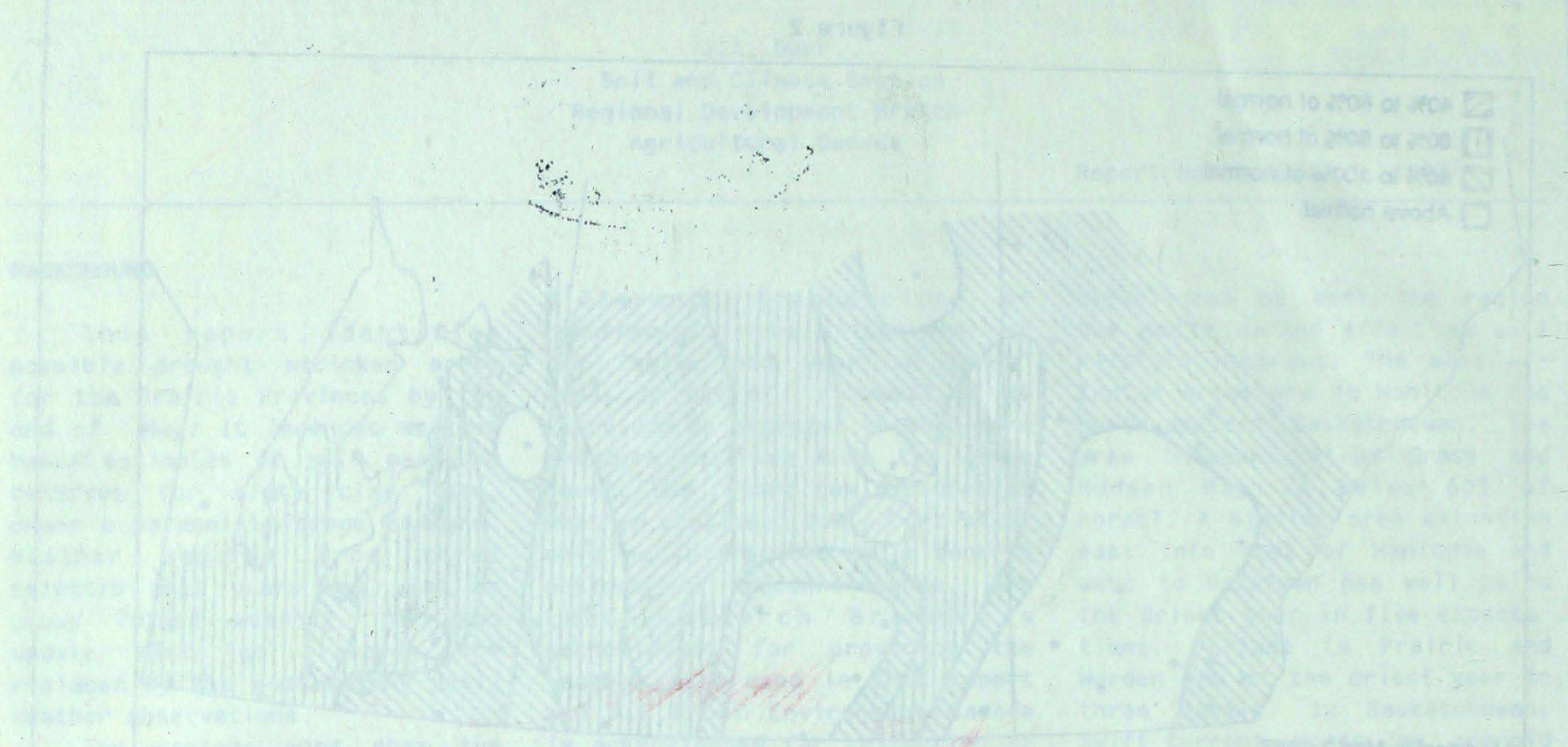


Figure 2  
Detailed map of the study area showing the location of the study area in the Southeastern United States. The map includes state boundaries and a shaded region in the Southeast. A legend in the top left corner lists categories: 'Area to 1975 or 1980', 'Area to 1985 or 1990', 'Area to 1995 or 2000', and 'Other areas'. The shaded region is labeled 'Study Area'.



Legend  
Area to 1975 or 1980  
Area to 1985 or 1990  
Area to 1995 or 2000  
Other areas

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