

NOVA SCOTIA DEVELOPMENT ATLAS CLIMATE



DEPARTMENT OF DEVELOPMENT



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INTRODUCTION

This *Climatology Series* is part of a *Development Atlas* prepared by the Nova Scotia Department of Development.

The eighteen maps which comprise the series show some of the most pertinent characteristics of the climate. Apart from general interest they have relevance to tourism, industrial development, agriculture, recreation, gardening and many other outdoor pursuits.

The maps are derived from a report commissioned by the Department of Regional Economic Expansion on climatic factors affecting tourism in the Maritime Provinces. Prepared by the Atmospheric Environment Service in Halifax the report will shortly be published with many more maps and an explanatory text.

A. D. Gates of the Atmospheric Environment Service compiled the original maps. The series would have been impossible to present without the co-operation of Mr. Gates and the Atmospheric Environment Service.

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HIGH SUMMER

High summer is very important to Nova Scotians. It is defined here as the period when mean daily maximum temperatures are 65° F or higher; at these temperatures recreation outdoors is possible without protective clothing. In this period most farming activity takes place and most tourism visits are made. In some favoured areas almost one third of the year is within this category. In a few places from Brier Island around Cape Sable to Liverpool high summer is never reached. Even here despite coastal fogs and cool ocean temperatures daily maximum temperatures do often exceed 65° F. However when calculated over the summer period the average falls below 65° F.

BEGINNING

Southerly and inland places attain daily maxima of 65° F first. The interior of the south-western peninsula experiences high summer a month before places on the coast. Temperatures on the coast are frequently 10°-15° F cooler than those inland for the entire summer. Mainland Nova Scotia, except for the Atlantic coastal strip begins high summer by 10th June. Cape Breton is a further ten days behind.

END

The cooling influence of the Atlantic Ocean reduces coastal temperatures below the 65° F maxima by 31st August, (even though the ocean is then at its warmest). On the north shore the shallow extremely warm waters of the Northumberland Strait maintain temperatures at the high summer level until 20th September and beyond. High summer ends by 10th September in Cape Breton and at the same time in upland parts of the mainland. The south-west interior and lowland parts of the mainland away from the Atlantic coast retain maxima above 65° F until late September.

DURATION

The longest period of high summer is experienced in the interior, including the eastern section of the Cornwallis-Annapolis valley. All of the mainland, except for the Atlantic and Bay of Fundy coastal strips, experiences over 100 days of high summer. As mentioned previously some parts of the Atlantic coast do not statistically ever experience high summer, although individual days especially in July and August do have maxima well over 65° F.



**Nova Scotia
CLIMATOLOGY
SERIES**

**BEGINNING OF HIGH
SUMMER**

MEDIAN DATE, MEAN DAILY MAXIMUM TEMPERATURE 65°F
SUMMER OUTDOOR ACTIVITIES BEGIN.



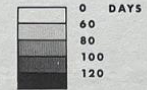
END OF HIGH SUMMER

MEDIAN DATE, MEAN DAILY MAXIMUM TEMPERATURE 65°F
SUMMER OUTDOOR ACTIVITIES END.



**DURATION OF HIGH
SUMMER**

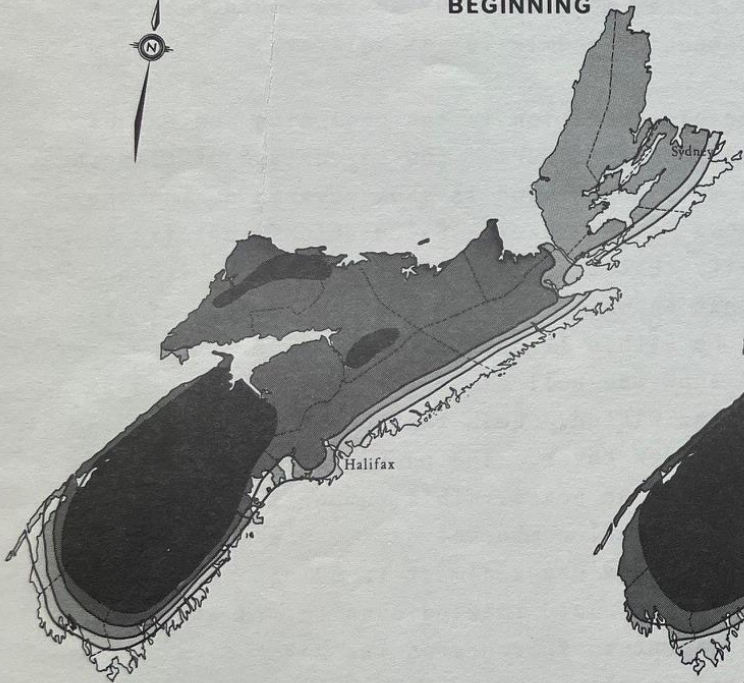
MEDIAN NUMBER OF DAYS WHEN DAILY MAXIMUM
TEMPERATURE 65°F OR HIGHER, AND SUMMER OUTDOOR
ACTIVITIES POSSIBLE.



DATA AVERAGED: 1961-1970
SOURCE: A.D. GATES, CLIMATIC ATLAS OF THE MARITIMES, ATMOSPHERIC ENVIRONMENT SERVICE, HALIFAX.



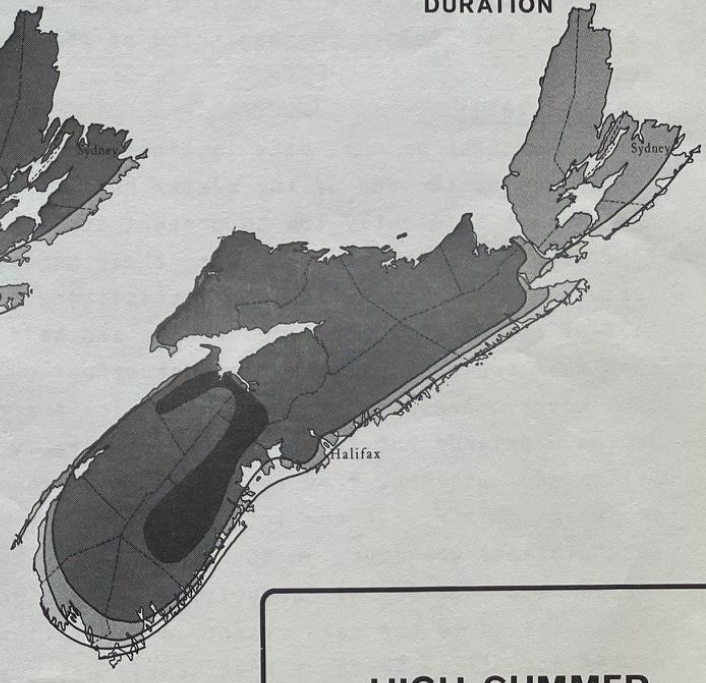
BEGINNING



END



DURATION



HIGH SUMMER

Graphics by
MARITIME RESOURCE MANAGEMENT SERVICE
Compiled and Edited by
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DEPARTMENT OF DEVELOPMENT
Scale

Miles 10 0 10 20 30 40 50 60 70 80 90 100 Miles

1973

SNOW COVER

Winter in Nova Scotia is best defined as the period of snow cover. In the fall, snow cover usually begins at the time when the daily maximum temperature falls to 40° F, by which time frost is occurring almost every night. The end of snow cover coincides with the rise of daily minimum temperatures to 29° F, well before the beginning of the frost free season.

FEBRUARY 28TH

Snow cover on this date is significant because it is towards the end of the winter but temperatures are still sufficiently low to prevent thawing. Therefore accumulations are at or near their maximum extent. A median figure indicates statistically that half of all measurements are greater and half less than that shown. Altitude has most effect on the snow cover. Depths of 20" are shown for the Cape Breton Highlands but they may be considerably underestimated. Distance from the Atlantic is the other important factor. In the interior southwest maximum accumulations are found on South Mountain. The influence of the Bay of Fundy is marked but does not spread inland to the same extent as the influence of the Atlantic. Northern Nova Scotia has 8-12" of snow on the ground because the Northumberland Strait

has frozen. Inland from the north shore the Cobequid Hills have a median depth of 16-20".

MAXIMUM DEPTH

The pattern is almost identical to that of February 28th. Depths however are appreciably greater with 20-30" on the north shore, more than 30" on the South Mountain and in the Cobequids and 12-16" at Halifax.

DURATION

Considerable variation in the beginning and end of the snow cover season occurs. The percentage of time on the average, when the ground is snow-covered during the season is shown in the boxes. Calculations indicate a 90% probability that the season length will be within 21 days of that shown. The length of two thirds of all seasons will be within 12 days of that shown.

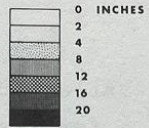
However snow may well disappear from the ground at times during the winter. Less than one inch of snow is not counted as snow cover. The number of days with snow cover is shown in the boxes. This number is a percentage rather than the actual number of days. Near the Atlantic coast this percentage drops almost to 50% as warmer air temperatures induce rapid thawing even in mid winter. Inland and adjacent to frozen seas the percentage reaches 75%-85% as thawing occurs on relatively fewer days.



**Nova Scotia
CLIMATOLOGY
SERIES**

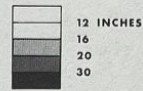
**MEDIAN SNOW COVER –
FEBRUARY 28th**

IN HALF OF ALL YEARS, ACTUAL DEPTH AT THIS DATE WILL BE GREATER THAN AMOUNT SHOWN AND IN HALF OF ALL YEARS DEPTH WILL BE LESS.



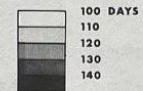
**ANNUAL MAXIMUM SNOW
DEPTH**

EXCEEDED ONE IN EVERY TWO SEASONS.



**DURATION OF SNOW
COVER**

MEDIAN DURATION IN DAYS, PERCENTAGE OF THIS PERIOD WITH GROUND ACTUALLY SNOW COVERED SHOWN IN BOXES.

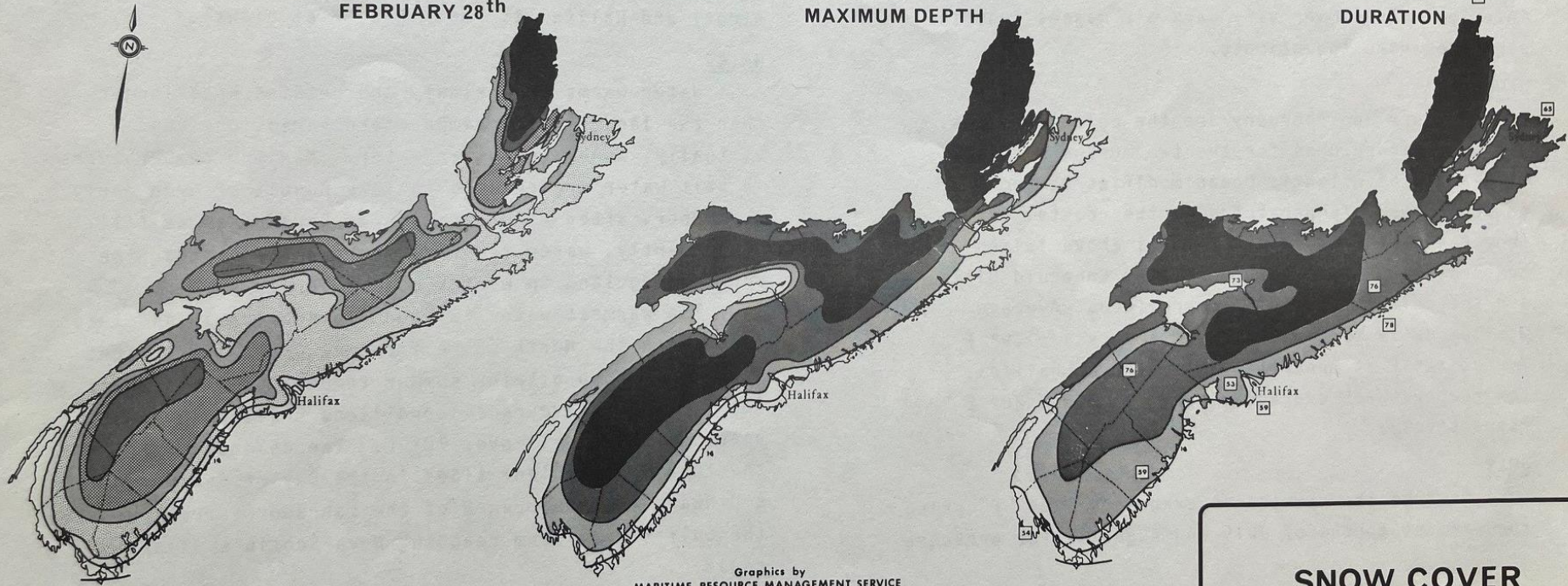


DATA AVERAGED 1961-1970
SOURCE: A.D. GATES, CLIMATIC ATLAS OF THE MARITIMES, ATMOSPHERIC ENVIRONMENT SERVICE, HALIFAX

FEBRUARY 28th

MAXIMUM DEPTH

DURATION



SNOW COVER

Graphics by
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DEPARTMENT OF DEVELOPMENT

Scale
Miles 10 0 10 20 30 40 50 60 70 80 90 100 Miles

1973

TEMPERATURES

Winter and summer are distinct seasons in Nova Scotia. 'Spring' lasts about two weeks, although the autumn is more extended, lasting 8-12 weeks. During winter the climate is dominated by cold air masses from the north and continental interior. In summer very warm air masses from the south dominate the climate.

JANUARY

January and February are the coldest months. Average temperatures for the two months are very similar. The Atlantic Ocean modifies extreme temperatures. Temperatures in the coastal strip from Cape North to Digby are well above inland temperatures. North of Truro, the Cobequid Hills are the coldest part of the province. Average maximum daily temperatures in January are 29° F at Truro, 32° F at Annapolis and 33° F at Halifax. Low temperatures average 10° F, 18° F and 20° F respectively.

JULY

Most of the province averages over 60° F during the warmest months of July and August. The presence

of the Atlantic Ocean reduces temperatures by as much as 5° F for several miles inland. The warmest part of the province is the interior south-west. Kentville attains typical daily maximum temperatures of 78° F (55° F at night). Truro averages 75° F (52° F at night) and Halifax is 73° F (56° F at night).

WATER

Water warms more slowly and retains heat longer than the land. Daily temperature variations are virtually non-existent in water. Maximum temperatures in salt water are reached in late August or even early September, after air temperatures have begun to fall. Consequently, water temperatures are warmer than the surrounding land in winter and cooler in summer.

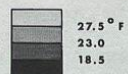
The warmest water is found in shallow inland lakes. In the sea the north shore from New Brunswick to the Strait of Canso attains summer temperatures in excess of 68° F. Under favourable conditions shallow water on beaches may be well over 70° F. The coldest waters are the turbid, turbulent tides in the Bay of Fundy. A southward flowing branch of the Labrador current prevents the Gulf Stream from reaching Nova Scotia's Atlantic coast.



**Nova Scotia
CLIMATOLOGY
SERIES**

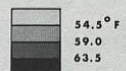
JANUARY

MEAN TEMPERATURE IN °F.



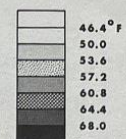
JULY

MEAN TEMPERATURE IN °F.



WATER

SEA SURFACE TEMPERATURES AUGUST 9, 1972.
INLAND TEMPERATURES ARE APPROXIMATE.



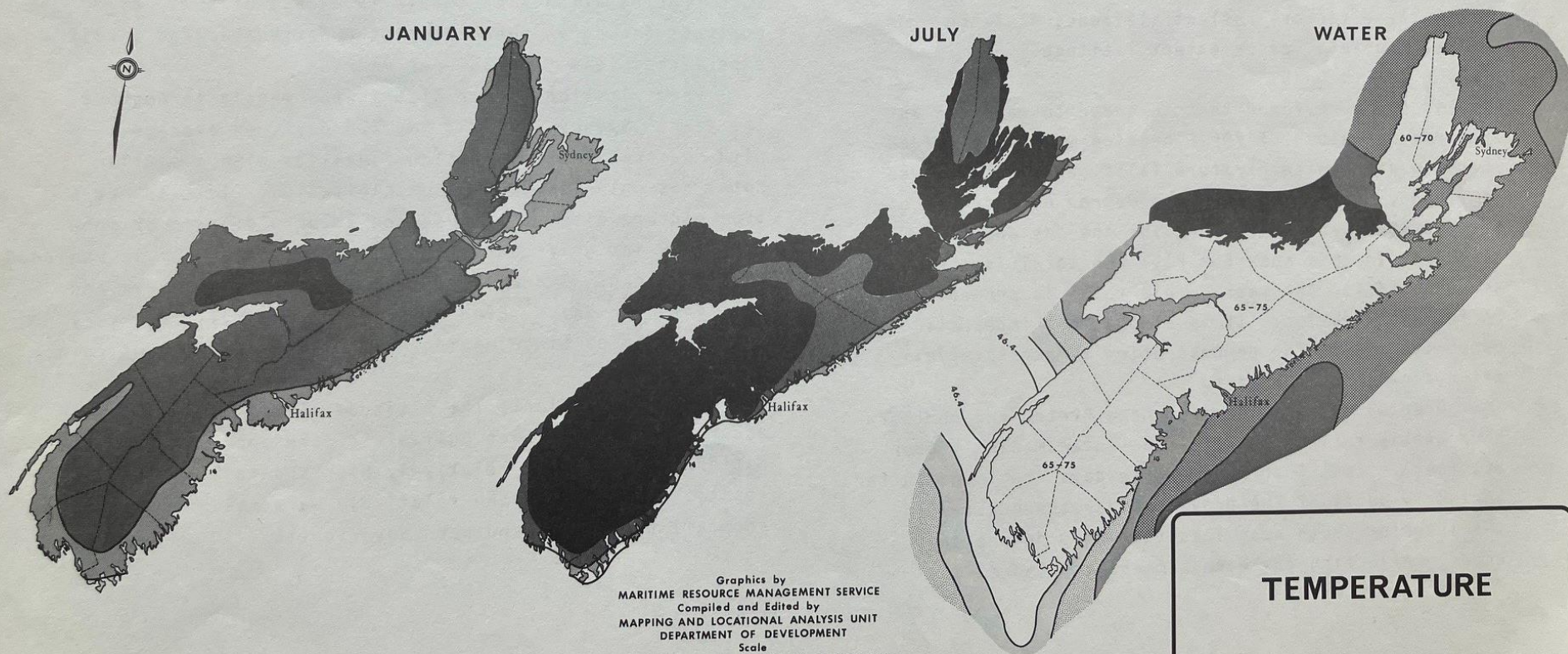
DATA AVERAGED: 1941-1970
SOURCE: A.D. GATES, CLIMATIC ATLAS OF THE MARITIMES, ATMOSPHERIC ENVIRONMENT SERVICE, HALIFAX.



JANUARY

JULY

WATER



TEMPERATURE

Graphics by
MARITIME RESOURCE MANAGEMENT SERVICE
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DEPARTMENT OF DEVELOPMENT
Scale

Miles 10 0 10 20 30 40 50 60 70 80 90 100 Miles

1973

ANNUAL CONDITIONS

Yearly averages are of little practical use. But they do show some of the extreme climatic differences within the province. The three maps shown here represent the major climatic factors: temperature, precipitation and snowfall. (Precipitation includes snowfall but variations in total snowfall are sufficiently significant to be treated independently). Variations in all three factors reflect altitude, distance from the sea and to a lesser extent latitude.

HEATING DEGREE DAYS

It has been found that in order to maintain an indoor temperature of 70° F heating must be provided when the average temperature falls below 65° F. One degree day is counted for each degree of difference between the mean temperature for the day and the standard (in this case 65° F). The total is then accumulated for the year. This total is proportional to fuel consumption. It is also a most interesting composite figure for demonstrating temperature variation throughout the year.

Over 8500 degree days in Cape Breton and northern Nova Scotia reflect the altitude (predominantly over 800 feet). Less than 8000 degree days are found in the southerly parts of the province near the coast. In the interior south west less than 7500 degree days occur, reflecting the warm summers and the mild

winters modified by the proximity to the Atlantic.

PRECIPITATION

Maximum amount of rain and snow fall on higher land and near the Atlantic coast. Most precipitation falls on the Highlands in Cape Breton which receive over 60" each year. The Atlantic Coast experiences almost as much precipitation with totals in excess of 55". By contrast the north shore along the Northumberland Strait experiences less than 35" per year.

Precipitation is not distributed evenly throughout the year. Sydney with 53" has 179 days, on average, with measurable precipitation. Halifax with a similar total has only 148 days of precipitation. This is not a true picture either, because the amounts of rain or snow are often insignificant. If 0.1" or more per day is regarded as significant, Sydney has precipitation on 106 days and Halifax on 90 days. Even this amount may fall in a very short period of time leaving most of the day free of rain.

SNOWFALL

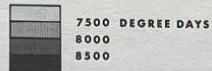
Snowfall reflects the altitude of the land mass very accurately. The frozen Gulf of St. Lawrence distorts the pattern by producing relatively high snowfall on adjacent coasts. By contrast the relatively warm Atlantic reduces snowfall throughout southern Nova Scotia.



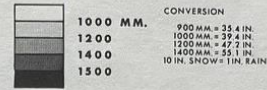
**Nova Scotia
CLIMATOLOGY
SERIES**

**MEAN ANNUAL HEATING
DEGREE DAYS**

BASE TEMPERATURE 65°F.

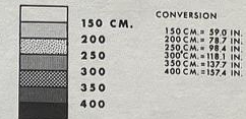


**AVERAGE TOTAL ANNUAL
PRECIPITATION**



CONVERSION
900 MM. = 35.4 IN.
1000 MM. = 39.4 IN.
1200 MM. = 47.2 IN.
1400 MM. = 55.1 IN.
10 IN. SNOW = 1 IN. RAIN

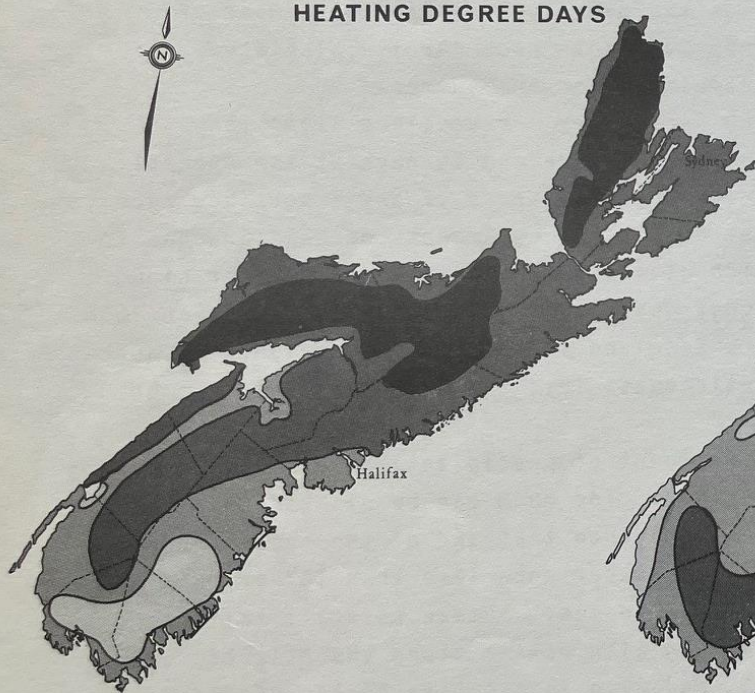
**AVERAGE TOTAL ANNUAL
SNOWFALL**



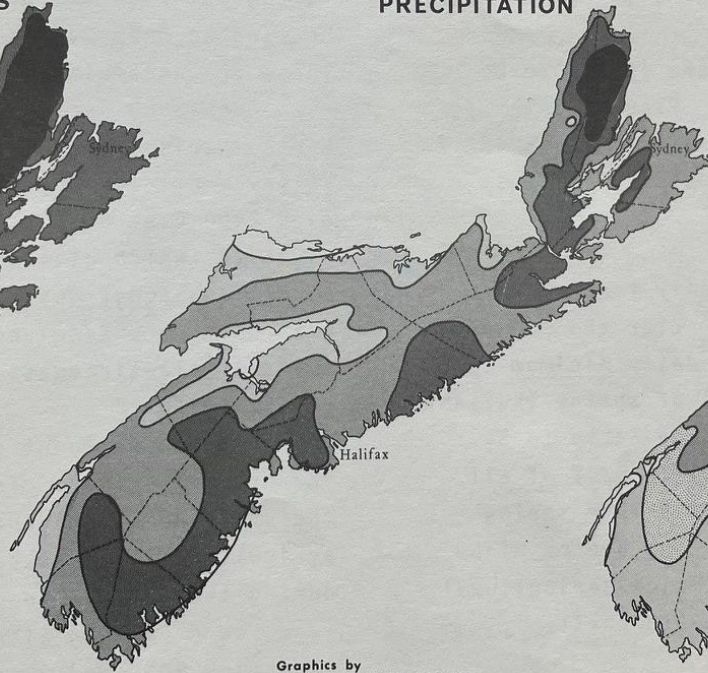
CONVERSION
150 CM. = 59.1 IN.
200 CM. = 78.7 IN.
250 CM. = 98.4 IN.
300 CM. = 118.1 IN.
350 CM. = 137.8 IN.
400 CM. = 157.5 IN.

DATA AVERAGED 1941-1970
SOURCE: A. D. GATES, CLIMATIC ATLAS OF THE MARITIMES, ATMOSPHERIC ENVIRONMENT SERVICE, HALIFAX.

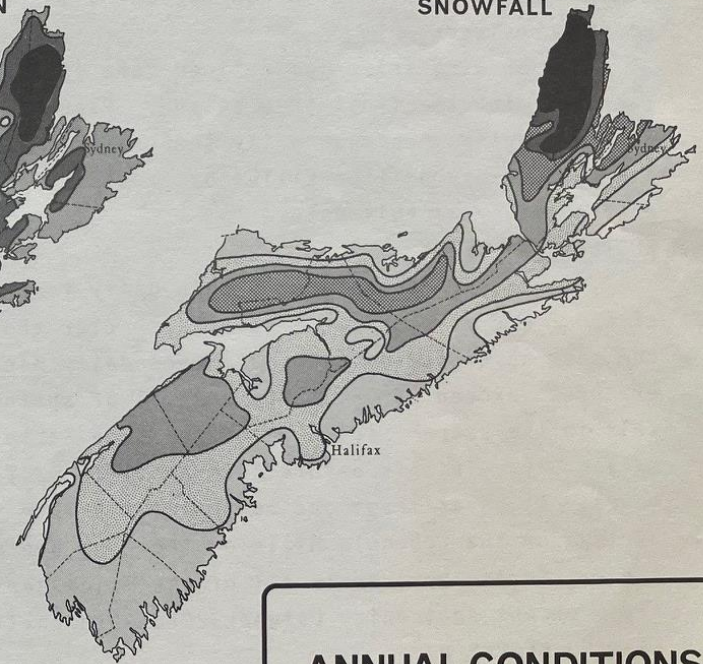
HEATING DEGREE DAYS



PRECIPITATION



SNOWFALL



ANNUAL CONDITIONS

Graphics by
MARITIME RESOURCE MANAGEMENT SERVICE
Compiled and Edited by
MAPPING AND LOCATIONAL ANALYSIS UNIT
DEPARTMENT OF DEVELOPMENT
Scale

Miles 10 0 10 20 30 40 50 60 70 80 90 100 Miles

1973

AGRO-METEOROLOGY; GROWING SEASON

Of all economic activities agriculture is most dependent on climate. The three most significant agriculture regions of the province are the Annapolis Valley, Northumberland plain and the Cobequid shore. Secondary areas are in Lunenburg and Antigonish counties and parts of Cape Breton. The information contained in these maps is also relevant to gardeners in other parts of the province.

The growing season as defined here is not to be confused with the frost-free season. Plant growth usually begins when mean daily temperatures reach 42° F. Many plants may well be killed by frost for at least one month beyond this date.

BEGINNING

It has been found that a mean daily temperature of 42° F occurs usually fifteen days after the end of the snow cover season (the date when daily minimum temperatures exceed 29° F.) The arrival of spring is first felt in the extreme south-west from Cape Sable to St. Mary's Bay. This is before 10th April in half of all years. It is at least one month later before spring arrives on the Cobequid Hills or the Cape Breton Highlands. Spring arrives in all of the major agricultural areas except Antigonish between 20th-30th April.

GROWING DEGREE DAYS

Most of the province has average daily temperatures

above 42° F by the beginning of May. From then until September all plants are growing (many agricultural crops are not planted until the beginning of June because of frost hazard and wet soil conditions). The actual amount of heat received at the surface of the earth is extremely important in determining growth. Taking 42° F as the base temperature the number of heating degrees available each day is calculated. These are accumulated for the summer.

Over 2600 heat units are received along the Northumberland plain shore and throughout the Annapolis Valley. All agricultural areas of any importance receive over 2400 heat units. Lower amounts of heat are due to altitude (which give higher rainfall and greater cloud cover) and foggy coasts. Near Cape Sable less than 1600 heat units are received in the growing season. Throughout the Atlantic coast less than 2000 units is common.

PRECIPITATION

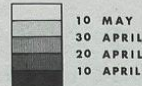
A certain amount of precipitation is required during the growing season. Too much can be disastrous. It is therefore no coincidence that two of the three important agricultural areas experience less than 15" of rainfall during the growing season. Summer rainfall reflects the year round pattern with maxima along the Atlantic coast, exceeding 20", and also in the Cape Breton Highlands.



**Nova Scotia
CLIMATOLOGY
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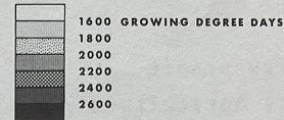
BEGINNING OF GROWING SEASON

MEDIAN DATE, 15 DAYS AFTER END OF SNOW COVER SEASON. MEAN DAILY TEMPERATURE IS 42° F.



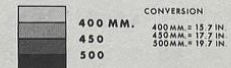
**GROWING DEGREE DAYS:
MAY - SEPTEMBER**

BASE TEMPERATURE 42° F.



**PRECIPITATION:
MAY - SEPTEMBER**

GROWING SEASON FOR MOST CROPS.



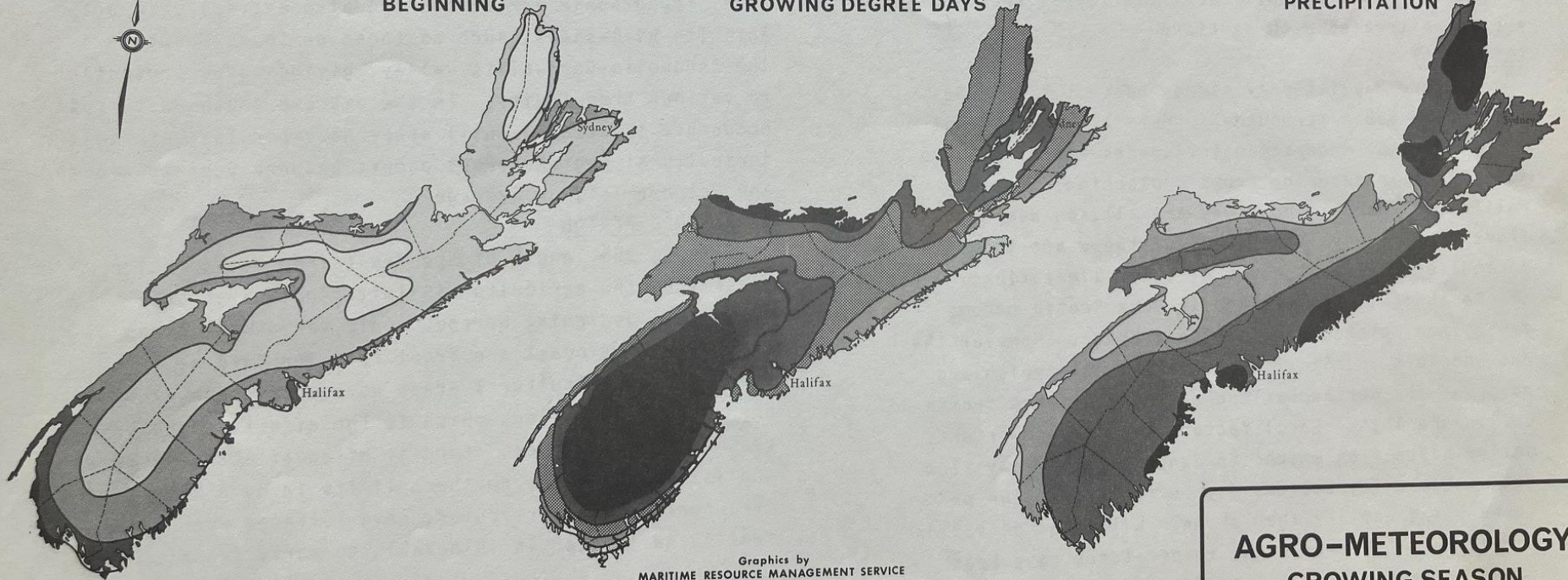
DATA AVERAGED 1941-1970.
SOURCE: A.D. GATES, CLIMATIC ATLAS OF THE MARITIMES, ATMOSPHERIC ENVIRONMENT SERVICE, HALIFAX.



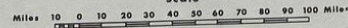
BEGINNING

GROWING DEGREE DAYS

PRECIPITATION



Graphics by
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DEPARTMENT OF DEVELOPMENT
Scale



1973

**AGRO-METEOROLOGY
GROWING SEASON**

AGRO-METEOROLOGY: FROST

If all other conditions are favourable, it is frost which most often limits agricultural/horticultural activity. The effect of frost is difficult to generalize. Unlike a little extra rain or a little less sun an unexpected frost may destroy a crop. Not all frosts however are killers. As with any statistically derived figures frost dates should be treated with caution.

LAST FROST

Before May 1st only narrow coastal strips between Cape Sable-Yarmouth-St. Mary's Bay are frost free. Coastal moderating influences are of extreme importance in securing frost protection. Canso, Halifax, Liverpool and Digby are all, on average, frost free by May 15th. None of these are important agricultural areas because of other limitations. Most of the agricultural regions in Nova Scotia become frost free before June 1st, on average. However the Musquodoboit and Stewiacke valleys, Antigonish and parts of the Northumberland plain experience frosts until June 15th. Local factors are very important. Valley sides from which the dense cold air may flow down into valley bottoms may be frost free two or three weeks earlier than shown. Within an elevation of 225 feet, minimum night temperatures have been shown to vary from 52° F to 25° F at the foot of

the slope. Even at 25 feet air temperatures remained only just below freezing.

FIRST FROST

This pattern is generally similar to that of the last frost. It is the moderating influence of the sea which gives maximum protection from early frost. Local topographic variations are also extremely important with hill-sides, such as those on South Mountain in the Annapolis-Cornwallis valley, giving added protection to various tree fruits. In the extreme south-west frost occurrence is delayed until after November 1st. In most agricultural regions frost occurs between September 15th and October 1st, on average.

FROST FREE PERIOD

It is the length of the frost free period which determines the agricultural limitations of an area rather its beginning or end. Only very small areas of the south-west coast are frost free for over half the year. Most agricultural areas have an average 120-140 day frost free period, which is the effective growing season for most crops. Corn is often affected by frost and is very near its northern limits in Nova Scotia. Strawberries, in particular, have suffered from late frosts and tobacco is vulnerable to early frost.