Climate of Connecticut

Introduction

This publication consists of a narrative that describes some of the principal climatic features and a number of climatological summaries for stations in various geographic regions of the State. The detailed information presented should be sufficient for general use; however, some users may require additional information.

The National Climatic Data Center (NCDC) located in Asheville, North Carolina is authorized to perform special services for other government agencies and for private clients at the expense of the requester. The amount charged in all cases is intended to solely defray the expenses incurred by the government in satisfying such specific requests to the best of its ability. It is essential that requesters furnish the NCDC with a precise statement describing the problem so that a mutual understanding of the specifications is reached.

Unpublished climatological summaries have been prepared for a wide variety of users to fit specific applications. These include wind and temperature studies at airports, heating and cooling degree day information for energy studies, and many others. Tabulations produced as by-products of major products often contain information useful for unrelated special problems.

The Means and Extremes of meteorological variables in the Climatography of the U.S. No.20 series are recorded by observers in the cooperative network. The Normals, Means and Extremes in the Local Climatological Data, annuals are computed from observations taken primarily at airports.

The editor of this publication expresses his thanks to those State Climatologists, who, over the years, have made significant and lasting contributions toward the development of this very useful series.

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Topographic Features- Connecticut occupies the southwestern portion of New England. The State extends for 90 miles in an east-west direction and 75 miles from north to south. With a total area of 5,009 square miles, Connecticut is the Nation's third smallest state.

The topography of Connecticut is primarily hilly. The highest terrain is found in the northwest portion of the State, with elevations of 1,000 to 2,000 feet. The southwestern quarter and most of the eastern half have elevations of 300 to 1,000 feet. The State is bisected by the Connecticut River which rises to the north. Smaller river basins in the State with their headwaters in the southern half of Massachusetts include the Housatonic in the west and the Shetucket and Quinebaug which eventually form the Thames in the east. The narrow river valleys and steep hillsides in much of the western highlands make for destructive flash flooding during periods of unusually heavy or intense rainfall.

The entire southern border of Connecticut is formed by the Long Island Sound. The coastline of approximately 100 miles in length is indented by small coves and the mouths of numerous rivers and streams.

The chief characteristics of Connecticut's climate are: equitable distribution of precipitation among the four seasons; large ranges in temperature, both daily and annual; great differences in the same season or month of different years; and considerable diversity of weather over short periods of time.

Connecticut lies in the "prevailing westerlies", the belt of generally eastward moving air encircling the globe in the mid-latitudes. Embedded in this circulation are extensive masses of air originating in higher or lower latitudes and interacting to produce low pressure systems. Relative to most other sections of the country, a large number of such storms pass over or near to Connecticut.

The majority of air masses affecting the State belong to three types: cold, dry air originating in the North American sub-arctic; warm, moist air streaming northward from the Gulf of Mexico and subtropical waters (Gulf Stream) to the east; as well as cool, damp air moving in from the North Atlantic. Because the atmospheric flow is usually from continental areas, Connecticut is influenced more by the first two types than it is by the third. In other words, the adjacent ocean constitutes an important modifying factor, especially along the immediate coast, but does not dominate the State's climate.

The procession of contrasting air masses and the relatively frequent passage of storm circulations bring about a roughly twice-weekly alternation from mainly fair to cloudy or stormy conditions. These fluctuations are often attended by abrupt changes in sunshine, temperature, moisture, wind direction and speed. There is usually no regular or persistent rhythm to this sequence, and it can

be interrupted by intervals during which the weather patterns continue stable for several days or even several weeks on certain occasions.
Connecticut's weather, however, is cited for variety rather than monotony. Changeability is one of the features on a longer timescale. That is, the same month or season will often exhibit varying characteristics over the years. A "normal" month, season or year is the exception, rather than the rule.

The basic climate does not result from the predominance of any single controlling weather regime. It is the integrated effect of a large variety of weather patterns. Thus, weather averages in Connecticut are not sufficient for important planning purposes and should be supplemented by more detailed climatological analysis.

Temperature- Despite Connecticut's small size, there is a difference of seven degrees Fahrenheit (° F) in the mean annual temperature from north to south. In the higher elevations of the northwest corner, the mean annual value is about 45, while along the immediate coast it is about 52° F. However, most of the State ranges from 47 to 49 in the eastern and western highlands to near 50° F in the central valley. The State's extreme temperatures are 106 and -32° F.

The greatest contrast of temperature over the State occurs during the winter. The average minimum in January and February is 12 to 14° F in northwestern Litchfield County, as compared with an average of about 22 in coastal sections and 18 in the central valley. The average number of days with minimum temperatures of 0° F or lower is about 12 at the higher elevations, five in the lower uplands and central valley and two less along the shore of Long Island Sound. On average, about 60 to 70 days with a maximum temperature 32° F or lower can be expected in the colder regions of Connecticut, as compared to 25 to 35 days in the coastal sections and the central valley.

Summer temperatures are comparatively uniform over the State. The maximum July temperature averages 82 to 84° F, except where altitude or nearness to the ocean reduces the average by about three degrees Fahrenheit. The central valley experiences the greatest number of 90° F or hotter days. Here, temperatures at or above 90 occur an average of 18 days per year with a variation from five in a cool summer to over 30 for a hot summer. At the highest elevations, there is one such "hot" day annually, on average. The coast averages four to seven days at or above 90 per year. In much of the eastern and western highlands, the occurrence of 90 temperatures is a little less frequent than in the central valley.

Temperatures reach 100° F or higher only rarely. While most of the long-term weather observing sites across the State have recorded temperatures this high, it is only an occasional summer that 100° F or higher occurs generally over Connecticut.

During July, the average minimum temperature ranges from about 58 in the northwestern section of the State to about 66° F in the coastal sections. Over most of the State, average July minimum temperatures are within a degree or two of 62° F.

The freeze-free period ranges from 155 to 170 days over much of the State. In the northwest as well as in local areas of the western and eastern highlands, the freeze-free period is 125 to 135

days. Along the immediate coast, approximately 180 to 210 days elapses between the last spring and first fall freeze. In the major agricultural areas, the growing season begins about mid-April for grasses and hardy crops and mid-May for frost-sensitive crops. It comes to an end for most crops in early October in the interior and by late October for the immediate coast. Due to elevation, special exposure to nocturnal cooling, and other factors, these dates vary considerably in local areas. There is also a good deal of variation among different years in the length of the freeze-free period.

Precipitation- Precipitation tends to become evenly distributed throughout the year in all parts of Connecticut. Low pressure centers and fronts are the principal year-round precipitation producers. Storms moving up the Atlantic coast generally yield the greatest precipitation amounts. In the summer, bands or areas of showers and thunderstorms make up the difference resulting from decreased activity of low pressure systems. Showers and thunderstorms are usually of brief duration and they are often scattered in comparison with general storms, but they yield the heaviest rainfall.

Variations in precipitation from month to month are sometimes extreme. A month yielding five inches or more may by preceded or followed by one with less than two inches of precipitation, in any season. Months with less than one inch are known to occur, as well as those with precipitation in excess of 10 inches. Such large fluctuations, however, are not characteristic of the precipitation supply in Connecticut. Consequently, prolonged droughts and widespread floods are infrequent.

Annual precipitation averages 44 to 48 inches over most of the State. Amounts vary from 41 to 43 inches in the north-central portion to near 54 inches in a small area of the northwest.

Considerable variation in annual precipitation occurs over short distances in northwestern Connecticut. This reflects the topographic differences in the area where valleys around 500 feet mingle with mountains of 1,500 to 2,000 feet elevation. The annual precipitation increases from about 45 inches in the Housatonic River Valley to 54 inches at high elevations less than 10 miles to the east.

While there are no pronounced wet and dry months as in other climates, February and October are relatively dry. The average precipitation for these two months is three inches or slightly less in comparison with close to three and a-half to four inches in the other months. Measurable precipitation falls on an average of one day in three. Periods of five days or more of successive daily precipitation occur a few times during most years. Conversely, extended periods of little or no precipitation are observed nearly every summer or fall, usually lasting from 10 to 20 days.

Rainfall amounts of 4.5 inches in 24 hours have occurred in all parts of Connecticut. Such heavy rainfalls are most common in the summer and fall. The average annual snowfall increases from the coast to the northwest corner of the State, with the greater area of the State receiving three to four feet of snow. Along the coast, the annual totals range from about 20 inches in the southeast to near 35 inches in west and central sections. In some winters, coastal stations will receive less than 15 inches of snow and in other years they receive 60 inches of snowfall. In the highlands of northwestern Connecticut, the average annual amount increases with elevation to over seven feet

inches at a few sites. Total snowfalls of over 150 inches have been recorded at higher elevations in particularly snowy winters.

Most of the snow falls in January and February, but in most winters substantial amounts occur from December and March storms as well. Except for the northwest highlands, snowfalls of more than one inch are quite rare before mid-November and after mid-April. April snowfall can total 10 inches or more in the northwest portion of the State every few years.

The average number of days per year with snow on the ground similarly shows an increase from the shore to the northwest. During an average winter, a measurable snow cover is present most of the time from late December to early March in the greater portion of the State. In the immediate coastal areas, a snow cover does not last more than a few days unless a heavy snowstorm is followed by prolonged cold temperatures.

During the colder months the prevailing wind is northwest to north over Connecticut, while April through September south or southwest winds predominate. The mean hourly wind speed ranges from about seven mph in the summer and early fall to about 10 mph in the winter and spring.

An important feature of the climate is the sea breeze along the coast. During the late spring and summer, this onshore wind blows from the cool ocean during the afternoon and penetrates five to 10 miles inland. It is occurs often enough to give lower mean summer maximum temperatures in a narrow coastal belt than prevail over interior lowlands.

Thunderstorms occur on an average of 20 to 30 days per year, with the greatest frequency during the summer months and in the afternoon or evening hours. Occasionally these storms are accompanied by destructive wind and/or hail with damage sustained to crops and property. Nearly every winter a damaging storm of freezing rain occurs. Electricity and telephone lines can be brought down, and trees and utility poles can be snapped. Transportation can be disrupted.

Aside from infrequent tornadoes and hurricanes, coastal storms or “Nor’easters” are the most serious weather hazard in Connecticut. These storms generate very strong winds, heavy rains and produce the greatest snowstorms. If these storms persist at the time of high tide, heavy water damage results along the shore.

An average of one tornado strikes Connecticut each year. The central valley is the most likely part of the State to receive a tornado with the summer being the most likely season of occurrence.

As they move on a path well out over the ocean, tropical systems and their remnants occasionally affect Connecticut during the summer or fall. However, hurricanes have been known to strike the State with full force, The Great New England Hurricane of 1938, Hurricane Gloria in 1985 and to a less extent Hurricane Bob in 1991, for example, resulting in loss of life and enormous property damage.

The Connecticut River shows an annual rise in early spring as the result of melting snow in central and northern New England. Melting of snow combined with heavy rainfall is one of the principal causes of flooding in the Connecticut River basin. A secondary period of flooding is caused by heavy rains which may be associated with a tropical system or its remnants in summer or fall, normally the low water season.

The percentage of possible sunshine averages 55 to 60 percent, ranging from 45 percent in the interior during the months of November, December and January to near 65 along the coast in the summer. The average number of clear days per year is between 100 and 125, with the greatest number per month usually occurring in September and October. An average of 140 cloudy days occurs annually. One or more prolonged periods of cloudy skies are commonly observed during the winter and early spring.

Heavy or dense fog is observed on an average of about 25 times per year in both coastal and inland locations. Along the coast, heavy fog is most common during the late winter and early spring. Meanwhile, inland locations tend to have the greatest number of dense fog days in late summer and fall.

The humidity tends to be the lowest in the spring and highest in the late summer and early fall. While an occasional summer day is uncomfortable due to a combination of heat and humidity, the frequency of such days is much less in Connecticut than in the South and Midwest.

Climate and the Economy- Connecticut is primarily an industrial State, although agriculture is of considerable local and regional importance. The agriculture is of an intensive type with high crop yields.

The climate plays a significant role in the State's agriculture. The patterns of temperature and precipitation are favorable to a wide variety of crops as well as to dairying and poultry raising, which are important in the State. A summer mean temperature of about 70° F in the eastern and western highlands favors the growth of pasture and hay crops. The production of a good hay crop is important as livestock must be barn-fed for several months of the year.

Tobacco for cigars is still grown in portions of the Connecticut River valley, however, on a smaller scale than in years past. Humidity conditions from July through September are advantageous to the air-curing process. There are times, however, when persistent high humidity requires preventative measures against fungi spoilage of the tobacco leaves.

Apples, peaches, strawberries and commercial truck crops are produced principally in the central valley and coastal uplands. There is also production of nursery and greenhouse plants. The climate is satisfactory for a great variety of ornamental flowers, shrubs and trees. Field corn is grown mainly in the dairying sections of the highlands, and the production of small grains is of minor importance. These two crops are used mainly for livestock feed.

Forests cover represents the dominant vegetation. The forests are valuable to the State's economy, not only for wood products, but as a scenic attraction in the autumn and as a preventative factor in the control of erosion and floods.

The ample rainfall, dependable runoff and groundwater supplies have made Connecticut desirable for a great variety of industries. Comfortable summer temperatures and vigorous, but not unduly severe, winter temperatures have also made the State tolerable for the many aspects of an industrial economy.

The tourist and vacation trade represent a considerable part of the economy. The climate is generally agreeable for many recreational activities. Pleasant temperatures and frequent sunny days prevail during the summer and early fall at both seaside and interior resorts. Some winter sports activities are found in the State.

In summary, the climate of Connecticut contributes greatly to its prominence as an industrial, agricultural and recreational area. It is a rich natural asset to the "Constitution State".