

## **December 2007 New Hampshire Climate and Climate Forecasts**

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### **What to expect in December in New England**

From the Northeast Regional Climate Center (NRCC):

The winter season in New England's climate begins in earnest during December. Polar air masses reaching our region from the dark, snow-covered areas of northern Canada are noticeably colder than during November and the winter snow cover is established during December over much of the six-state region, although snow cover varies from December to December along southern New England's coastline and may in fact not become established until some time in January.

Day length reaches the annual minimum of 8.5 hours in the north and 9 hours in the south during late December as the earth reaches the winter solstice position in its orbit around the sun. The short day, along with the low angle of the sun and abundant clouds, means that the sun is rather ineffective at providing heat during the month. Daytime temperatures fall from the 30s and 40s to the 20s and 30s during December. Across northern New England, overnight minimums, which average in the 15-20° range early in the month, fall to near 5° in the north and 10-15° in the south by month's end. Across the southern three states, overnight minimums average in the 20-30° range early in December and fall to the teens and low 20s by month's end.

One to five days of sub-zero temperatures are expected in the southern portions of northern New England with 5 to 10 such days in the northern locales. Communities across southern New England can expect 0 to 2 days of sub-zero readings. In 4 or 5 years out of 10 temperatures may dip below 0° in the interior and northern portions of the three-state region and from 1 to 3 years out of 10 along the coasts.

During the cold December of 1980, the temperatures across New England fell into the -30s at some northern stations. A warm December, such as in 1984, may pass without a 0° reading across southern sections of New Hampshire, Vermont and across most of southern New England, and will bring a day or two of temperatures in the 40s and 50s to northern stations in northern New England and the 50s, 60s, and even the low 70s elsewhere.

Average December precipitation, rain plus the melted equivalent of snowfall, is less than November's for many locations in the northern portions of the region where relatively dry continental polar air is more common. Many of our coastal communities in southern New England receive an increase in precipitation totals to a December maximum as storm tracks over the United States tend to converge over New England.

Total precipitation for the month ranges from 3.5 to 5 inches across most of southern New England, the mountainous areas of southern Vermont, southeastern New Hampshire, and the southern interior of Maine extending to the coast. Elevations over 2000 feet in northern New Hampshire can expect 5 to 7 inches, while on the other hand, the rest of Vermont, interior portions of New Hampshire, and northern Aroostook County, ME can expect from 2.5 to 3.5 inches of precipitation. Much of the December precipitation total falls as snow, especially in central and northern locations, as well as at higher elevations. Rain, however, makes up much of the total in our coastal regions.

Snowfall totals vary from year to year, but average from 3 to 15 inches across southern New England with amounts up to 20 inches in the northwestern hills of Connecticut and Massachusetts. Across northern New England, totals range from 10 to 20 inches across the southern areas and 20 to 30 inches across central and northern communities. Greater snowfall totals are expected over Vermont's higher mountains, while 3 to 6 feet is common over 2000 feet in northern New Hampshire. The number of days with measurable rain or snowfall during December averages somewhere between 10 and 16 days throughout the region.

December is a cloudy month in our climate with 30 percent to about 50 percent of possible sunshine for much of the region, and 20 percent to 30 percent in our northern-most locales. Heating degree day totals average between 1200 and 1500 across the northern three states and between 900 and 1250 across the south during December.

### **December Records in New Hampshire**

Based upon station data archived at the NRCC. Records are based upon the full period of record available for each station.

Dec. 8, 1998 was the warmest date throughout the state where records were broken. Record lows varied a bit and some occurred in the early 1900s. A number of precipitation records were set in 1969. This is liquid precipitation, so if it snow, the amount is how much liquid there would have been from the melted snowfall. The record for the heaviest snowfall was set in 2003 in both the north and the south.

#### **Max Temp Records for December (°F) (1977-2006)**

##### Northern NH

North Conway	71	12/8/98
Lakeport	69	12/8/98

##### Southern NH

Concord	73	12/7/98
Epping	76	12/7/98

#### **Min Temp Records for December (°F)**

##### Northern NH

First Conn. Lake	-44	12/30/33
Berlin	-44	12/31/17

##### Southern NH

Concord	-22	12/17/51
Epping	-22	12/21/80

#### **Precipitation Amount (liquid, in inches)**

##### Northern NH

Mt. Washington	7.44	12/27/69
Errol	3.85	12/27/69

##### Southern NH

Newport	3.25	12/27/69
Epping	3.16	12/26/69

### **Snowfall (in inches – single 24-hr period)**

#### Northern NH

Mt. Washington	37.5	12/15/68
Errol	28	12/7/03

#### Southern NH

Newport	19	12/7/03
Epping	17	12/29/67

### **Forecast Probabilities for a 'White' Christmas (12/25/07)**

#### **For Northern NH:**

- 44 percent probability for precipitation to fall on that date
- 27 percent probability for snow to fall on that date
- 85 percent probability that there will be snow on the ground already
- 0.6 inches of snowfall (median of the average snowfall depth over all December 25ths for each station – includes years with no snowfall)
- 7 inches of snow on the ground (median of the average snowfall depth over all December 25ths for each station – includes years with a snow depth of zero)

#### **For Southern NH:**

- 41 percent probability for precipitation to fall on that date
- 17 percent probability for snow to fall on that date
- 75 percent probability for there to already be snow on the ground
- 0.6 inches of snowfall (median of the average snowfall depth over all December 25ths for each station – includes years with no snowfall)
- 5 inches of snow on the ground (median of the average snowfall depth over all December 25ths for each station – includes years with a snow depth of zero)

These probabilities are based upon the median probabilities from all available stations with 10 or more years over the entire period that the station had data that are in the Northern or Southern NH domain.

### **Forecast for December**

New Hampshire is forecasted to have temperatures above normal and precipitation similar to the climatological averages from past years.

### **Forecast for December to February**

New Hampshire has a strong probability of seeing above normal temperatures during this three-month period. However, the precipitation is expected to be close to climatological norms. This is similar to what the three-month climatological forecast was in November. In other words, the probability for NH to have above or below average amounts of precipitation are negligible. What this implies is that with normal precipitation amount, but above normal temperatures, NH will probably see less snow than typical. The precipitation that does fall will either be as rain, or perhaps freezing rain. Without the slow melt-rate of snow, this could suggest an increased chance of flooding, especially if the ground freezes enough to discourage soil absorption.

La Nina is expected to strengthen into early 2008. However, very little correlation has been found between La Ninas and climate in New Hampshire. Globally, however, a La Nina has been associated with "above-average precipitation over Indonesia and below-average precipitation over the central equatorial Pacific. For the contiguous United States, potential

impacts include above average precipitation in the Northern Rockies, Northern California, and in southern and eastern regions of the Pacific Northwest. Below-average precipitation is expected across the southern tier, particularly in the southwestern and southeastern states.”

(Climate Prediction Center/NCEP/NWS El Nino/Southern Oscillation (ENSO) Diagnostic Discussion issued on Nov. 8, 2007.)