

Climate Change and Temperature in the Piedmont

Average and Extreme Temperatures - Summary for North Carolina

From *North Carolina Climate Risk Assessment and Resilience Plan, Key Findings*

It is very likely that North Carolina temperatures will increase substantially in all seasons.

- It is likely that the number of hot and very hot (over 95°F) days will increase and the number of cold days (daytime of 32°F or lower) will decrease.
- Warmer nights will very likely increase, reducing relief from the heat of the day and increasing heat-related stress on public health; households and people who lack access to sufficient cooling will be most vulnerable.
- Extreme heat events will become more frequent, longer lasting, and more intense, exacerbating demands for water.
- Severe droughts will become more intense, in a warming North Carolina, as rising temperatures and the resulting increase in evaporation will accelerate the rate at which soils dry out.
- Plants and animals that rely on cooler temperatures may not be able to thrive in warmer temperatures and may migrate to cooler areas, or be out-competed by more heat-tolerant species. Warmer nights will put more stress on agricultural crops that need nighttime cooling.

Summary of Temperature Changes in the Piedmont, from *The North Carolina Climate Science Report (NCCSR)*, led by the North Carolina Institute for Climate Studies.

Average Temperature Trends in annual average temperatures in the Piedmont

Temperatures have been increasing since the 1970s and have remained consistently above average since the 1990s. The most recent 4-year period (2015–2018) was well above average and is the warmest 4-year period on record, and 15 of the last 18 years have been above the long-term average of about 59° F for the Piedmont region.

Hot Days and Warm Nights

The Piedmont region has not experienced an overall increase in the number of very hot days (maximum temperature of 95°F or higher), though there has been an increase in the number of very warm nights (minimum temperature of 75°F or higher) in recent years. On average, the Piedmont region sees about 13 days per year at or above 95°F. Changes in the annual number of very hot days have not followed the same pattern as annual average temperatures.

Heat Index Will Rise

The heat index is a measure that combines air temperature and relative humidity to get at how the human body experiences these conditions. It is very likely that there will be more days with dangerously high heat index values due to increases in temperature and humidity.

Cold Days

Occurrences of cold days (maximum temperature of 32° or lower) are relatively infrequent, with just over 2 days per year on average. There is no overall trend, but the number has been above the long-term average since 2014, caused in part by occurrences of a winter weather pattern popularly known as the polar vortex—an area of upper-level low pressure that is nearly always present over the North and South Poles. Occasionally, the arctic vortex is displaced southward over eastern North America and becomes nearly stationary, bringing unusually cold weather to the eastern United States. Some recent years have featured unusually persistent patterns with extended cold and stormy weather in the eastern United States. A number of research studies have found a link between cold winters and the fact that the Arctic is warming more rapidly than lower latitudes. The current scientific consensus is that observed winter temperature trends, including the lack of recent warming in the eastern United States, cannot be explained without including the potential effects of Arctic warming.