

Section 5

North Carolina's Weather and Climate

As you read, look for:

- the difference between weather and climate
- average temperatures and precipitation in the state
- types of severe weather
- vocabulary terms **weather, climate, westerlies, humidity, precipitation, tornado, hurricane**

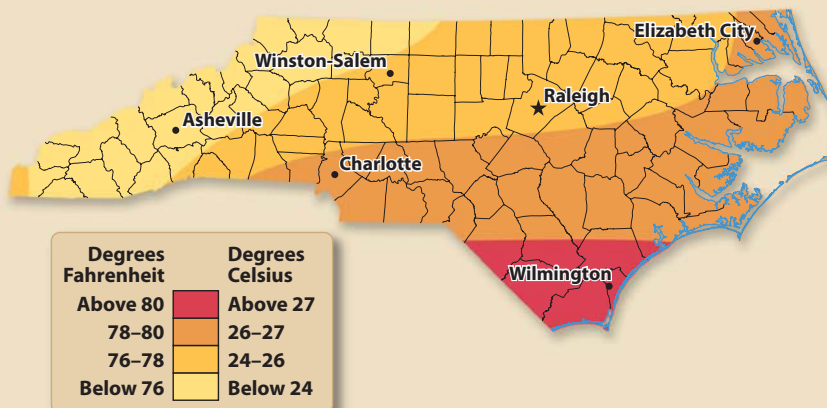
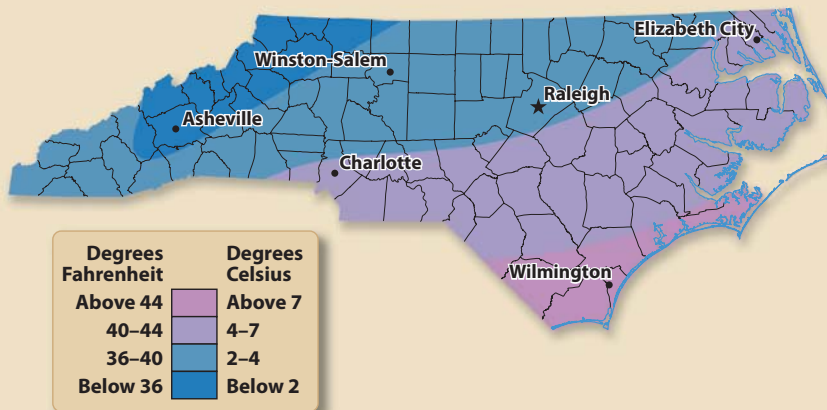
North Carolinians live in different regions, but they all breathe the same air. Or, as scientists describe it, they have a common *atmosphere*. Scientists refer to short-term atmospheric conditions as **weather** and to long-term conditions as **climate**. In general, everywhere in North Carolina has a temperate climate, which means there are no extremes in temperature and precipitation. There is, however, a lot of variation in the weather.

Below: Thundershowers are a frequent occurrence each summer day in the Mountains region. Moist air coming from the west rises when it hits the Blue Ridge and often condenses into rain as it cools. The rapid change in temperature can produce long zigzags of lightning.



Map 4 Average January Temperatures

Map Skill: What is the average January temperature of Raleigh?



Map 5 Average July Temperatures

Map Skill: What is the average July temperature of Wilmington?

“It’s Not the Heat; It’s the Humidity”

North Carolina’s temperatures run about the same from Jockey’s Ridge to Blue Ridge. In most places in the state, many winter days get decently warm in the afternoon, and many summer days start out okay in the morning. This is because North Carolina receives westerly winds most days. These **westerlies** bring warmer air in the winter and cooler air in the summer. For example, the average temperature each year at Wilmington is only eight degrees higher than the average in Asheville. This is true whether it is January or July.

More extreme temperatures tend to occur in particular places. Fayetteville and the surrounding Sandhills tend to have more days with a temperature above 90 degrees than any other place in the state. On the highest mountain peaks, like Mt. Mitchell and Grandfather Mountain, the thermometer is most likely to dip well below zero. The most extreme night in state history was on January 21, 1985, when Grandfather Mountain recorded -32°F (Fahrenheit) and Mt. Mitchell -34°F . That same night, the whole state was below zero, except for Cape Hatteras, which was the “hottest” place at 6° above zero.

The temperature does not feel very temperate on hot, humid days. **Humidity** is a measure of the amount of moisture in the air. In most places of the state, the humidity is often above 50 percent. This makes most state residents less comfortable, regardless of what the temperature is or where they are. For example, Cape

Hatteras and Charlotte each have the highest average humidity across the state, 65 percent.

Different Storms in Different Places

The rate of **precipitation** (rain, snow, sleet, hail) varies considerably from place to place across the state. The highest levels of rain occur in the southwest mountains, because the westerlies bring summer storms from the Great Plains. Because there is so much precipitation in the mountains, the Piedmont is the driest part of the state. This is because

most of the rain in the Piedmont comes from clouds that first have to cross the mountains, where they drop most of their moisture.

Anywhere in North Carolina can get snow, but the mountains get the bulk of it. The northwestern mountains get the highest levels of snowfall, because they are the first lines of high peaks that polar air reaches. Although there are very high peaks in the Smoky Mountains, they get less snow on average. There is also less snow east of the Blue Ridge, because the heavy snow clouds have already dumped their moisture, just like the rain clouds. Sometimes, everywhere in western North Carolina that is at least 1,000 feet above sea level gets some snow, but it rains at lower levels. On days like that, Hickory or Rutherfordton will see flakes, but Asheboro and Albemarle will see drops.

Some of the worst weather in the state occurs when the temperature is just around freezing, and the rain turns to ice. These ice storms happen most often in the Piedmont. Sometimes the ice will be as thick as an inch around tree limbs and power lines, breaking both of them. Even more dangerous are smaller storms that lay thin layers of ice on roads and streets. Motorists at night often cannot tell where this “black ice” is, and frequent wrecks occur.

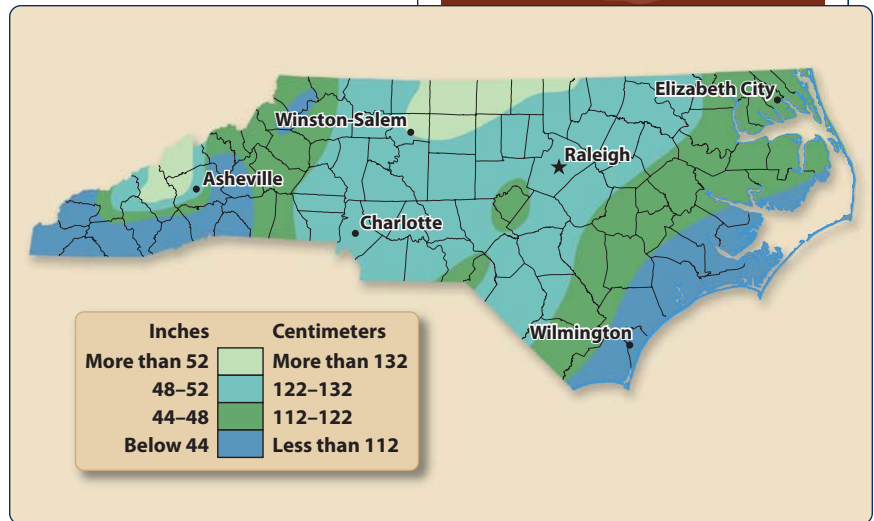
When moist air coming up from the Gulf of Mexico collides with drier, colder air from the polar regions, blizzards result. In 1993, “the storm of the century” in the state dumped fifteen inches of snow on the Coastal Plain, while the mountain areas got a lot less.

The whole state experiences thunderstorms during the summer. Some of these intense bursts of heavy rain showers pour down on just one or two places in a region. Other times, a whole front of storms—where the downpour is usually in a line that runs north to south—sweep across the state. These fronts most often come from the west and bring hail (rain that freezes high up in the atmosphere).

Sometimes **tornadoes** come with the storm fronts. (Tornadoes are funnel-shaped storms whose rotating winds can reach as much as 250 miles an hour or more.) Compared to the Great Plains states, North Carolina does not have frequent tornadoes. When tornadoes do occur, they tend to hit the Sandhills and certain counties in the southern half of the Coastal Plain. Duplin and Onslow counties have had more tornadoes touch down than any other place in the state in the last fifty years. The worst tornado in state history hit March 25, 1985. It touched down in at least fifteen eastern counties. Forty people died, and 400 more were injured.

Map 6 Average Annual Precipitation

Map Skill: About how much precipitation does Asheville receive each year?



Did You Know?

Summer is the wettest season, and July is the wettest month.

Figure 1 Enhanced Fujita Scale for Tornadoes

Category	Wind Speeds (mph)	Potential Damage
EF0	65–85	Light damage
EF1	86–110	Moderate damage
EF2	111–135	Considerable damage
EF3	136–165	Severe damage
EF4	166–200	Devastating damage
EF5	Over 200	Incredible damage



North Carolinians are far more likely to die from being struck by lightning than from tornadoes. Our state ranks third in the nation in the number of citizens killed by lightning, just behind Texas and Florida.

The Path of Hurricanes

Hurricanes are tropical storms that bring high winds and heavy rains. North Carolina's hurricanes most often develop over the Atlantic Ocean, where they pick up enough moisture to create a huge vortex (rotation) of water high in the atmosphere. The rain rotates very rapidly around a center known as "the eye." If the "wall" at the edge of the eye is strong enough to hold together, the force of the wind and rain can do very heavy damage when the storm hits land.

Hurricanes generally damage North Carolina in three ways. First, the wind and rain create a "storm surge" that brings a huge tide onto the beach, wiping out the sand, plants, and manmade structures in its path. A hurricane that hit the Outer Banks in 1845 actually cut two inlets, Hatteras and Oregon, in the sand. Second, the swirling winds can do great damage. This occurred in 1954 when Hurricane Hazel's winds pounded the state's Coastal Plain for thirty-six hours. In some places, the winds exceeded 150 miles an hour, enough to tear up houses in less than a minute. Third, hurricanes usually slow up and weaken over land, since they can no longer suck up water from the ocean. They end up dumping their water onto the state, causing widespread flooding. This was the case in 1999, when Hurricane Floyd caused un-

Map 7 Hurricane Paths

Map Skill: What area seems to be the most active for hurricanes?

Figure 2 Saffir-Simpson Hurricane Scale

Scale Number or Class	1	2	3	4	5
Wind Speeds (mph)	74–95	96–110	111–130	131–155	Over 155
Storm Surge (in Feet)	4.0–4.9	5.0–7.9	8.0–11.9	12.0–18.0	Over 18.0
Expected Damage	Minimal	Moderate	Extensive	Extreme	Catastrophic

precedented flooding on the rivers of the Coastal Plain. Princeton, a small suburb of Tarboro on the Tar River, was destroyed by the flood.

Hurricanes can also enter the state from other states, most often coming from the south. Hurricane Hugo did major damage in 1989 after almost wiping out the South Carolina coast. Electric power was off in the Charlotte area for weeks. Even the mountains can be affected by these tropical storms. Two groups of clouds converged near Grandfather Mountain to

cause the “1916 Flood,” which swept away houses and bridges all along the Catawba River. Witnesses saw a six-foot-high wave go downriver near where the Interstate 40 bridge crosses the river today.

The frequency of hurricanes comes and goes in cycles. There were twice as many major hurricanes in the 1950s as in the 1960s. No significant storms came along in the 1970s, but the frequency of the storms coming to North Carolina increased dramatically in the 1980s and 1990s.

Although North Carolinians cannot predict which part of their state will be hit when a hurricane develops, they can plan for the likelihood of a storm. Most develop during the hurricane “season” that starts in June, peaks in September, and lasts until the end of November. North Carolinians then worry about other types of storms as the weather cools.



Above: Hurricane Floyd flooded much of the Coastal Plains. Thousands of residents lost their cars, animals, and houses.

It's Your Turn

1. What is the difference between weather and climate?
2. What are the four types of precipitation?
3. Which is a “tropical” storm—a tornado or a hurricane?

Did You Know?

The U.S. National Weather Service started naming hurricanes in 1953, using women’s names. In 1979, it began including men’s names.