

What's the weather going to be like in 2020, and what will that mean for North Carolina?

This is excerpted from a longer document prepared by Dr. Sethu Raman, Ryan Boyles and Dev Niyogi of the State Climate Office of North Carolina.

Impact of Climate on People

Citizens of North Carolina are individually affected by weather and climate in a wide variety of ways, depending on where they live, where they work, and their resources. For example, ground wells in eastern North Carolina are slowly drying up as the water tables continue to drop. At the same time, many residents in eastern N.C. are worried about potential flooding given the forecasts for more hurricanes in the next 25 years. North Carolina needs to plan now to prepare for future emergency situations including:

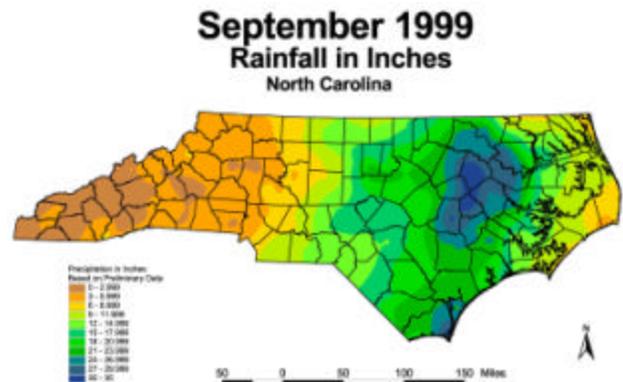
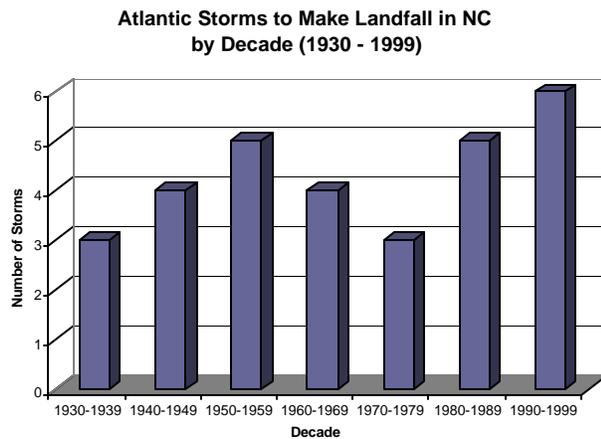
- Tropical storms and hurricanes
- Flooding
- Winter storms
- Drought

Also, North Carolina needs to educate its citizens on weather and climate issues so that they can prepare and plan effectively to protect lives and property. Additionally, improved education of weather and climate issues will improve planning of business and lifestyle choices.

Tropical Cyclones and Hurricanes

Tropical storms have been the cause of tremendous damage in North Carolina since settlers first arrived to our shores. Recently, scientists have been able to identify and document large-scale forces that impact the frequency and strength of tropical storms.

- The number of tropical storms are expected to continue to be greater than average in the Atlantic for the next 20-25 years.
- With increasing population and wealth along the coastal areas, loss to life and property will likely also increase unless steps are taken to mitigate damages.



Drought and Water Issues

- Historically, water has been readily available for most needs in North Carolina. Recent droughts have shown that water is becoming an increasingly precious resource.
- Almost all water resources in North Carolina come from precipitation – rainfall supplies moisture for agriculture and most river systems in N.C. originate within our state boundaries and are fed by precipitation.
- The likelihood of future droughts and increasing demand on water supplies needs to be accounted for in planning initiatives.
- Preliminary research on the Pacific Decadal Oscillation suggests that the next 10 years could bring more drought to parts of North Carolina.

Impact on Commerce

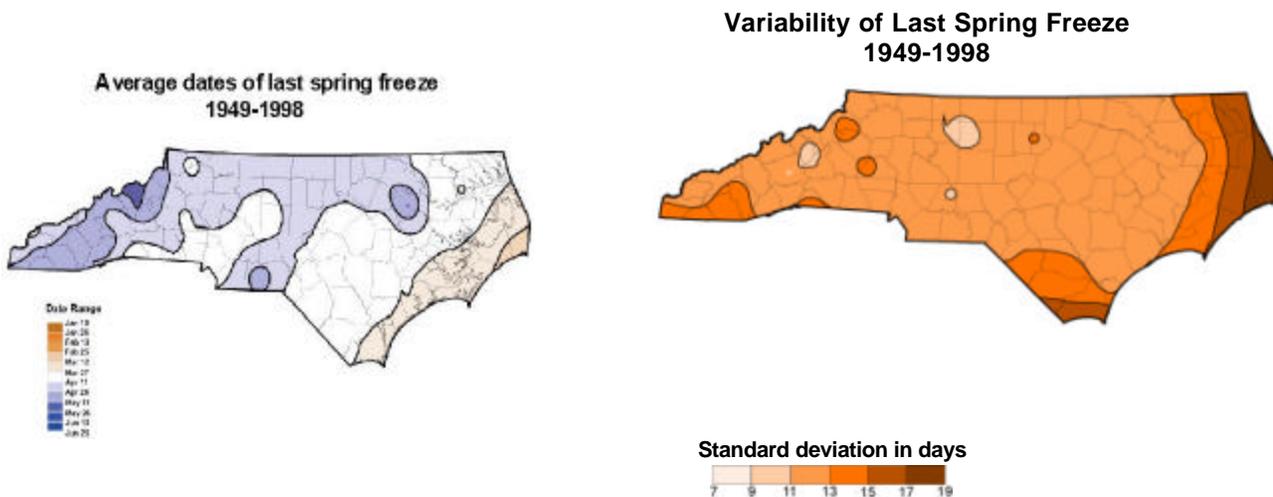
Weather and climate directly affect business in North Carolina in several ways. First, most businesses require energy, and energy production is directly linked to the climate. Utilities constantly monitor weather and climate forecasts in order to ensure power is available when and where it is needed.

- A forecast error of 5 °F results in \$25 million loss in revenue for utilities in North Carolina. A 50% improvement in forecasts would help save \$12 million.

Second, the geography and climate of North Carolina, from its mountains to the coast, brings many visitors and permanent residents to our state. This is not only important to the tourism industry, but also to businesses that need a strong, growing workforce.

- Tourism is a \$10 billion industry in North Carolina. At least \$10 million increase could be expected with improved weather and climate information at the local scale (assuming at least 0.1% increase in tourism).

When severe weather occurs, commerce can be devastated if proper emergency management and hazard mitigation is not implemented. Recent hurricanes, floods, and winter storms have proven just how important management of weather and climate events are for day-to-day business as well as future commerce growth. More than anything, North Carolina needs improved weather monitoring and forecasting in order to better mitigate possible damages.



Impact on Agriculture

Weather is the primary driving force behind the strength of any agricultural industry.

- Crop Management - 6% of planted area is not harvested due to weather-related events. This translates to \$4.8 million lost in harvesting alone.
- Pest Management – The number and timing of pesticide applications depend on weather information. An estimated \$144 million is used for pest management in North Carolina. Improved weather information would yield at least 10% saving, or \$14.4 million per year.

North Carolina needs to utilize scientific advances to improve crop planning and damage mitigation, especially given the prospect of more extreme variations in a regional climate change scenario.

Policy Issues

Local and state agencies and decision makers need to take into account weather and climate in their planning initiatives. Despite increasing press coverage of weather and climate events, many policymakers do not understand the basic issues of climate and so cannot account for its impacts. The State Climate Office of North Carolina exists to help educate citizens, businesses, and policymakers on the importance of weather and climate in short- and long-term planning.

Short-term Climate Variability

Our understanding of short-term climate variations has greatly improved over the past 10-20 years.

- Recent research in the State Climate Office has linked Pacific Ocean temperatures to precipitation and temperature patterns in North Carolina during El Nino (warm sea surface temperatures) and La Nina (cool sea surface temperatures).
- Similarly, changes in air pressure and water temperature patterns in the North Atlantic Ocean have been related to climate variations in North Carolina.
- Scientists are currently investigating the possible influences of longer-term factors, such as the Pacific Decadal Oscillation on climate in N.C. Preliminary research suggests that as the surface of the northern Pacific Ocean cools or warms over longer periods of time, there is a linkage to weather in our state.

Continued research in these areas will improve seasonal and short-range climate forecasts, which are critical for such industries as agriculture and energy management.