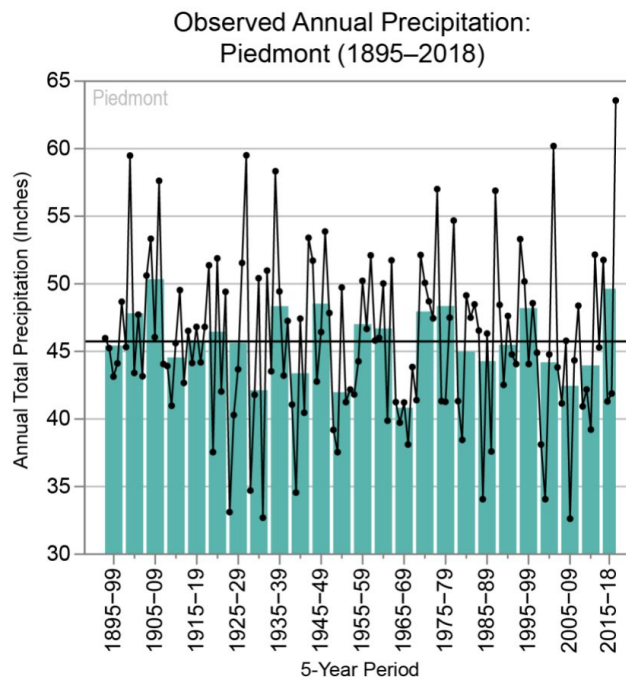


## Local Climate Change Impacts on Precipitation, Storms and Flooding

**Summary:** Although it is thought that annual precipitation may likely increase in NC with climate change, there is not a clear predicted trend yet. However, extreme rainfall during any one storm event has already begun, and three of the 5 biggest floods on the Haw River in the past 25 years have happened since 2018.

According to the [NC Climate Science Report](#) led by the North Carolina Institute for Climate Studies published in March, 2020, there is no trend in annual precipitation. That said, extreme rainfall has increased. 2018 was North Carolina's wettest year on record, a fact due in part to Hurricane Florence. Overall, the 2015–2018 period saw an increase in the number of days with very heavy rain, defined as 3" or more in 24 hours. Annual precipitation is expected to increase. These changes are driven primarily by increases in atmospheric water vapor as the climate warms.



The bar graph shows the observed annual total precipitation for the Piedmont region of North Carolina for 1895–2018, as averaged over 5-year periods, with the last bar representing a 4-year period (2015–2018). Dots show annual. The horizontal black line shows the long-term average of 45.7 inches per year for 1895–2018. Sources: NCICS, NOAA NCEI, and the State Climate Office of North Carolina. (North Carolina Science Report p.133)

In terms of local impacts to the Piedmont region of North Carolina the study states that “based on the virtual certainty that water vapor in the atmosphere will increase as global warming occurs, it is very likely that the risk of extreme precipitation will increase everywhere in the Piedmont. (NCSR, 134)” It is also expected that thunderstorms and Tornadoes will occur more frequently (NCSR, 140).

These events, according to the [Climate Risk Assessment and Resilience Plan](#) published by the Department of Environmental Quality in June, 2020 will increase the potential for flooding inland and in coastal areas. This can cause further unwanted discharge from industry infrastructure into the local watershed, damage public and private structures such as homes, roads, and utilities, and leave the most vulnerable populations at risk of not being able to escape flood conditions or drastic weather events.

Additionally, inland flooding will increase pressure of outdated and/or undersized storm drainage infrastructure, leading to more drastic floods thus increasing economic and agricultural losses. In addition inland habitats, fisheries, and the protective services that natural areas provide to local communities could be severely damaged or destroyed. Increased flooding will also put at risk archaeological and historic sites on floodplains within every river basin in the state, and inundate more cultural resources.

As a reference point, consider the top 5 historic crests, as provided by the [National Weather Service](#), of the Haw River (Bynum)--three of which have occurred since 2018.

#### Haw River Historic Crests

- (1) 21.76 ft on 09/06/1996 (Hurricane Fran)
- (2) 17.71 ft on 11/13/2018
- (3) 17.67 ft on 03/14/1975
- (4) 17.62 ft on 09/18/2018
- (5) 17.40 ft on 02/07/2020