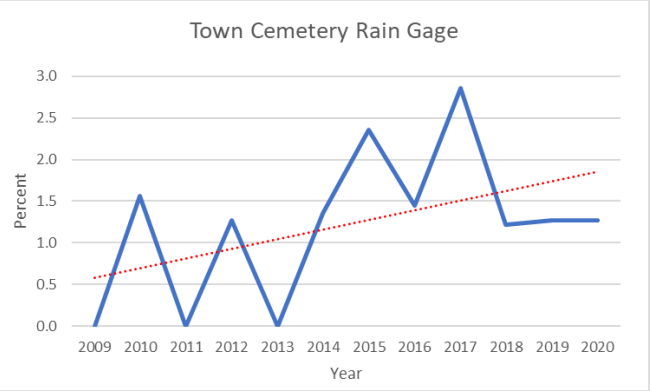
TOWN OF HILLSBOROUGH

Climate Impact

The Effect of Rainfall Intensity on Flooding

Scientists have proven that human activities — including increased emissions and certain development practices — have impacted our climate. For this reason, the Town of Hillsborough Stormwater and Environmental Services Division refers to the current climate crisis as "climate impact."



Percentage of rain events with 1 inch or more per hour of precipitation recorded at the Hillsborough Town Cemetery 2009-20.

Increased rainfall

One measure of climate impact is increased precipitation — or, more specifically, increased frequency of intense rainfall events. As long-term temperatures increase, more evaporation occurs. This results in more water vapor in the air. When precipitation conditions are favorable, more saturated air results in heavier precipitation. According to the Fourth National Climate Assessment of the U.S. Global Change Research Program, extreme precipitation events have increased by 27% in the Southeast United States since 1958.

Studying local impact

To study the local impact of climate change on rainfall, the Stormwater and Environmental Services Division looked at data from a rain gauge in the Town Cemetery from 2009 through June 15, 2020. For 2015-2020, an average of four rain gauges spread around town was used.

Increased intensity

Rainfall intensity is important to understanding the occurrence of flooding, and the town rain gauges record rainfall in 15-minute increments, allowing the division to look at how much rain fell in a given period of time. The division compared the percentage of each year's rain events with 1 inch or more of rain falling per hour over the 2009-2020 period and determined that the percentage has indeed been trending higher.

Impact on flooding

Increased rainfall intensity can contribute to flooding. Intense rainfall events are like trying to pour water through a funnel — do it too quickly and the funnel will overflow. And, while soil moisture, land cover, impervious surfaces and other factors affect the overall impact of intense rainfall, when the town gets a lot of rain in a short period of time, the runoff can overwhelm stormwater infrastructure, spilling into streets, yards and parks.

Reducing flooding

The Stormwater and Environmental Services Division's mission to reduce stormwater runoff pollution also helps reduce flooding. Removing impervious surfaces and building rain gardens and bioretention cells not only reduces stormwater runoff pollution but also helps slow the flow of stormwater, giving it a chance to soak into the ground or evaporate. Planting projects also slow the flow of stormwater and help reduce soil moisture, as the trees and other plants pull water from the soil through their roots and allow it to evaporate into the air.