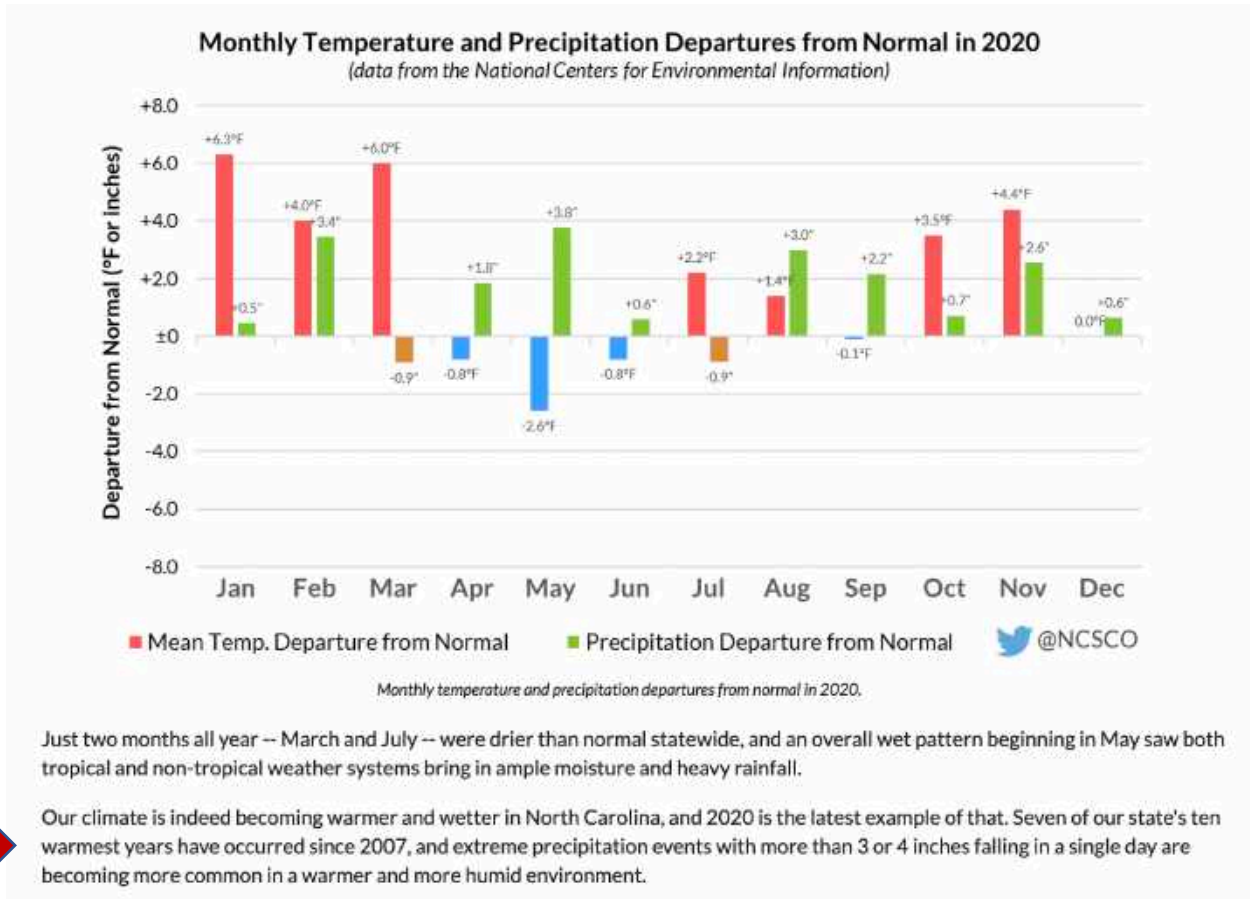


White Lake Report to Town Board March, 2021

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From: "An Extreme, Unusual 2020: the Weather Year in Review" (North Carolina Climate Office Blog, January 12, 2021; accessed March 1, 2021)

<https://climate.ncsu.edu/climateblog?id=331>

The new year is following the same pattern of extreme precipitation events as 2020, with February 2021 having two rainfall events of 3+ inches, and a total for the month of 9.2 inches. The departure from normal was even higher than in 2020, at 5.75 inches. Total rainfall for January 2021 was 8.25 inches, which was a 4.4-inch departure from normal (which was also higher than in 2020).

White Lake is greatly influenced by the weather--changing weather patterns can affect both lake levels and lake clarity.

2018

2019

2020



Photos of White Lake, taken from the same pier on March 15, 2018 (clarity 1.5 ft.), March 18, 2019, (clarity to lake bottom) and March 6, 2020 (clarity 6.5 ft). The yellow material floating on the lake surface is pine pollen.

February 24, 2021



Photo on the left taken February 24, 2021 from the same pier as above. Photo on the right is a view of a Secchi Disk at a station in the middle of the lake on February 25, with clarity = 4 feet.

Lake clarity is affected by extreme rainfall in two ways:

Increased stormwater runoff, which carries pollutants, nutrients, and debris



Because lake levels are so high now, there is backflow from the lake into stormwater outfalls. Much debris can be observed in shallow areas of the lake, which is what most property owners are seeing.



Increased amounts of nutrients coming from the rainfall itself

Rainfall at White Lake can have relatively high levels of nitrogen in forms that can be readily used by phytoplankton (algae suspended in the water column) to fuel growth.

Big rains = more nutrients = more phytoplankton.



Samples are collected and sent off for laboratory analysis of nutrients and algae. February's data analysis is not complete yet, but an examination of a sample by the specialist who identifies the algae has been done: "it is dominated by a small unicellular desmid...I don't have any doubt that that species alone could give the lake a green color. It reminds me of a similar situation that occurred at a quarry lake years ago". Desmids are a special group of algae that are found in acidic Coastal Plain lakes such as White Lake, and they have tended to be most abundant in the summer months.

There was an increase in a different kind of algae last February; its abundance declined by March and clarity improved. Each month is different, and so we can say that White Lake is a *dynamic system*, particularly given that it is so shallow (which means that it can change quickly). Algae can be abundant in winter as well as summer, and the variability is related to temperature, nutrient availability, and sunlight availability.

Understanding the changes to White Lake involves recognizing this relationship:

Big rains = more nutrients = more phytoplankton

We have had all three of these so far this year.