

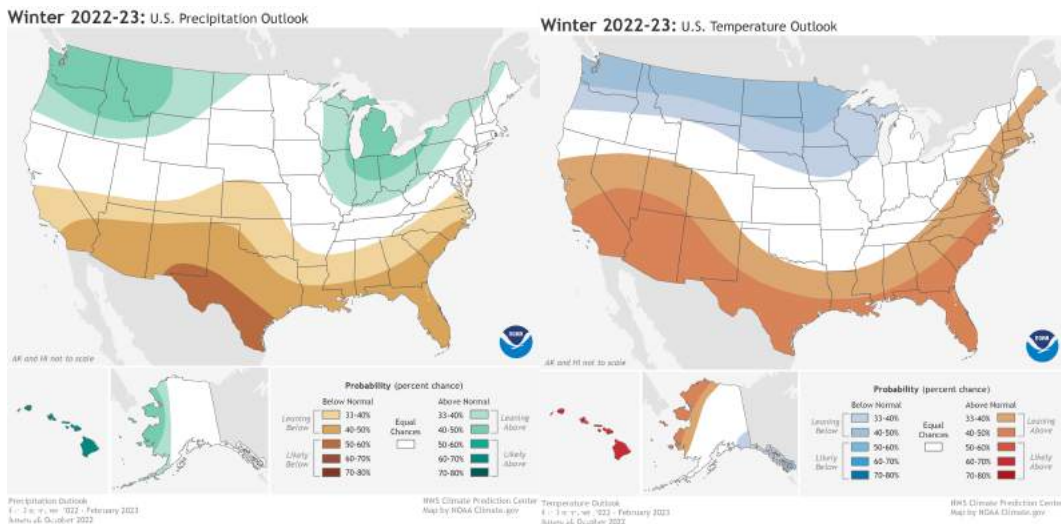
Report to White Lake Town Board January 2023

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LIMNOSCIENCES

1. Rainfall Below Normal in 2022, And Less Variability in Lake Levels

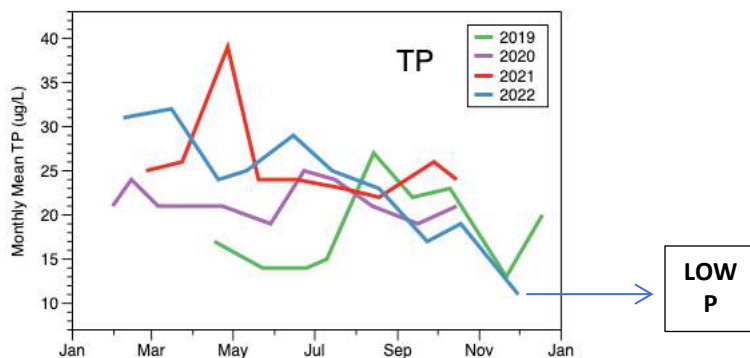
The lake level on December 30 was 63.7 feet NAVD 88, equivalent to the level at the end of the previous two months, and the total lake level variation in 2022 was 7.2 inches, which was less than what was seen in 2019-2021. Rainfall for the year totaled 47.2 inches, and four months (February, and October through December) had very little rain. The volume of direct precipitation was equivalent to 61.8% of the volume of the lake (see p. 3 of this report).

According to the NC Climate Office and NOAA, La Niña is influencing winter weather for the third year (which is unusual), with warmer and dryer conditions expected through February.



2. Phosphorus Levels Low in November

Monthly sampling provides information on nutrients and water chemistry parameters such as pH and dissolved oxygen. November 2022 levels of the nutrient phosphorus were the lowest found in the past four years (and equivalent to the low levels found historically), which is very good news. Nitrogen levels were also at their lowest point for the period.



3. More Historical Studies and Recommendations—A 1979 Report by the NC Wildlife Resources Commission

The report, titled “A Preliminary Survey of the Aquatic Vegetation in White Lake, North Carolina and its Value to the Fishery Resources”, includes water quality measurements, an evaluation of the aquatic vegetation, a survey of the fish population, and a survey of fish food organisms. The 1978-79 study was conducted in response to “concerns [that] have been voiced by property owners, local residents, town officials and other individuals utilizing White Lake that the aquatic vegetation is restricting recreational uses and some action is needed to control the problem”.

Three recommendations were included in the report (which is attached):

- No chemical, biological or mechanical techniques should be used in White Lake to control vegetation.
- Strong considerations should be given to reducing the total number of boats using White Lake.
- Horsepower restrictions should also be strongly considered.

This report was developed before the invasive aquatic weed hydrilla had been found in NC (in the early 1980s)—invasive species are the only types of vegetation that are managed in State Lakes (such as the herbicide treatment that was done in Lake Waccamaw to eradicate hydrilla from a portion [$<10\%$] of the lake). Hydrilla was found throughout White Lake in 2017, but since then it has been found very rarely, even though the lake was not treated. This is more good news.



White Lake: Monthly Rainfall (in inches)

Monthly Rainfall (inches) for White Lake 2012-2022

Month	2022	2021	2020	2019	2018	2017	2016	2015	2013	2012	Monthly Average for Region
January	5.75	8.25	4.5	2.75	4.20	7.0	3.0	2.5	1.75	2.75	3.81
February	1.0	9.2	6.7	2.25	2.00	1.5	10.7	5.5	2.5	4.0	3.44
March	2.45	2.7	3.7	3.25	3.95	3.7	1.55	4.15	1.0	7.0	3.91
April	3.75	1.75	5.1	7.25	6.75	6.75	6.75	4.55	1.75	2.25	3.12
May	2.2	3.0	12.25	1.20	7.70	2.7	4.5	4.20	2.25	9.25	3.67
June	6.2	7.9	7.15	5.25	10.00	4.5	3.65	8.70	17.0	2.0	4.70
July	10.5	7.5	6.85	6.00	4.75	6.75	3.75	3.0	11.25	8.6	5.75
August	5.5	6.5	7.55	5.35	6.25	5.6	4.12	9.4	8.25	9.75	5.95
September	6.5	3.2	5.95	5.00	29.45	5.2	15.0	4.7	1.0	5.0	5.29
October	0.6	0.6	3.35	3.60	2.25	2.95	14.25	9.75	1.75	2.25	3.38
November	1.55	0.4	7.5	4.90	4.25	1.0	0.50	7.25	0	2.25	3.16
December	1.2	3.4	4.25	6.00	7.5	5.45	5.1	6.5	5.75	4.25	3.14
Total	47.2	54.4	74.85	52.80	89.05	53.1	72.87	70.20	54.25	59.35	49.32
% of Lake Volume	61.8	71	97	69	116	69	95	91	70	77	64

(Volume of Total Rainfall on Lake Surface/Total Lake Volume) x 100 Gives an Estimate of Volume of Rainfall as % of Lake Volume



White Lake: Annual Lake Elevations, High and Low

2019 High (January 25): 64.6 Ft NAVD 88

2019 Low (July 9): 63.5 Ft NAVD 88

2020 High (June 16): 65.2 Ft NAVD 88

2020 Low (January 1): 64.3 Ft NAVD 88

2021 High (February 19): 65.3 Ft NAVD 88

2021 Low (November 29): 63.9 Ft NAVD 88

2022 High (January 17): 64.3 Ft NAVD 88

2022 Low (May, Oct-Dec.): 63.7 Ft NAVD 88

2019 Lake Level Variation (High to Low): 12.7 Inches

2020 Lake Level Variation (High to Low): 10.3 Inches

2021 Lake Level Variation (High to Low): 16.8 Inches

2022 Lake Level Variation (High to Low): 7.2 Inches

Variation (Highest-Lowest) Over the Four-Year Period 2019-2021: 21.1 Inches

Mean High-Water Level: 64.85 Feet NAVD 88