

## *Bay Lakes Are Shallow Basins*

Much work was done on the Bay Lakes in the 1940's and 50's and the descriptor "Bay Lake" was coined by one of the researchers, Dr. David G. Frey, after studies comparing and contrasting six lakes: Jones, Salters, Singletary, White, and Black (now called Bay Tree) in Bladen County, and Lake Waccamaw in Columbus County (Frey, 1949).

Table 1 provides a summary of Frey's original data for White Lake, as well as comparative data from a more recent survey conducted by NC State University Aquatic Weed Extension personnel. The lake surface area calculations were very close between the two surveys, with a difference of a tenth of a percent, while there was a 15% difference in lake volume between the two surveys, as a result of the difference in depth determinations between years, with 2017 depths being 0.3 m (1 ft.) less than what was measured 70 years ago. No lake elevation data was collected in 1949, while the lake elevation measured on 12/17/19 by a registered land surveyor (Lloyd Walker) was 64.50' (NAVD 88), very near the time of the NCSU survey (11/29/17).

Table 1. White Lake Morphometric Data: Comparisons between historical survey data (from Frey, D.G. 1949. Morphometry and hydrography of some natural lakes of the North Carolina Coastal Plain: The Bay Lake as a morphometric type. *J. Elisha Mitchell Scientific Society* v. 65(1): 1-37), and a recent NC State University 2017 survey using Lowrance and Biobase software. Metric unit conversions are included.

	Frey 1949	NCSU 2017
Lake area	1,068 acres 4,322,043 m <sup>2</sup>	1,067 acres 4,317,966 m <sup>2</sup>
Volume	12,844,100 yd <sup>3</sup> 9,820,019 m <sup>3</sup>	6,796 acre-feet 8,382,730 m <sup>3</sup>
Mean depth	7.5 ft 2.3 m	6.4 ft 1.9 m
Maximum depth	10.6 ft. 3.2 m	9.6 ft. 2.9 m
Shoreline length	4.77 miles 7,724.9 meters	

Frey noted that White Lake had "the most nearly regular basin of any of the lakes examined" with broader terraces on the eastern and western shorelines gradually sloping towards the deeper region of the lake (Fig. 8; Frey 1949).

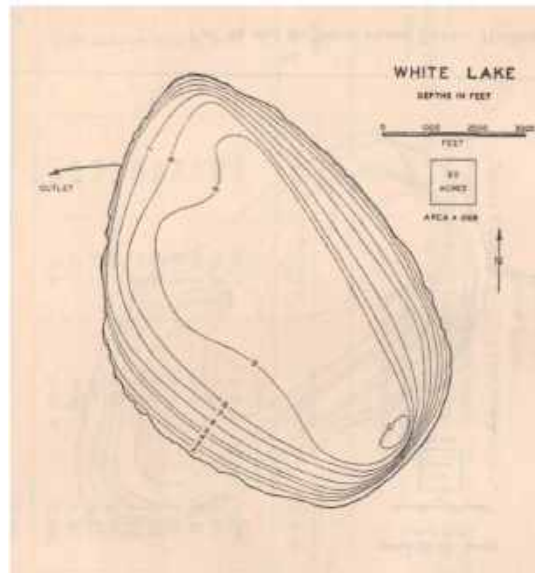


Figure 8. Bathymetric map of White Lake by Frey (1949); depth contours are marked in feet. The maximum length of the lake was measured as 1.81 miles. The outlet on the west side is Turtle Cove, in its original location. Scan of original reprint.

A more recent bathymetric map was created from 202 survey points, based on a 5.75 -acre grid pattern (NCSU 2017). It reflects conditions during summer low lake levels (Fig. 9).



Figure 9. A bathymetric map of White Lake created from BioBase software, using depth measurements obtained with a Lowrance sonar receiver. The depth contours reflect conditions in 2019, when lake levels were approximately 1 foot lower than in 2017.