GLPA Gun Lake Sediment Testing for Copper 2023 Results

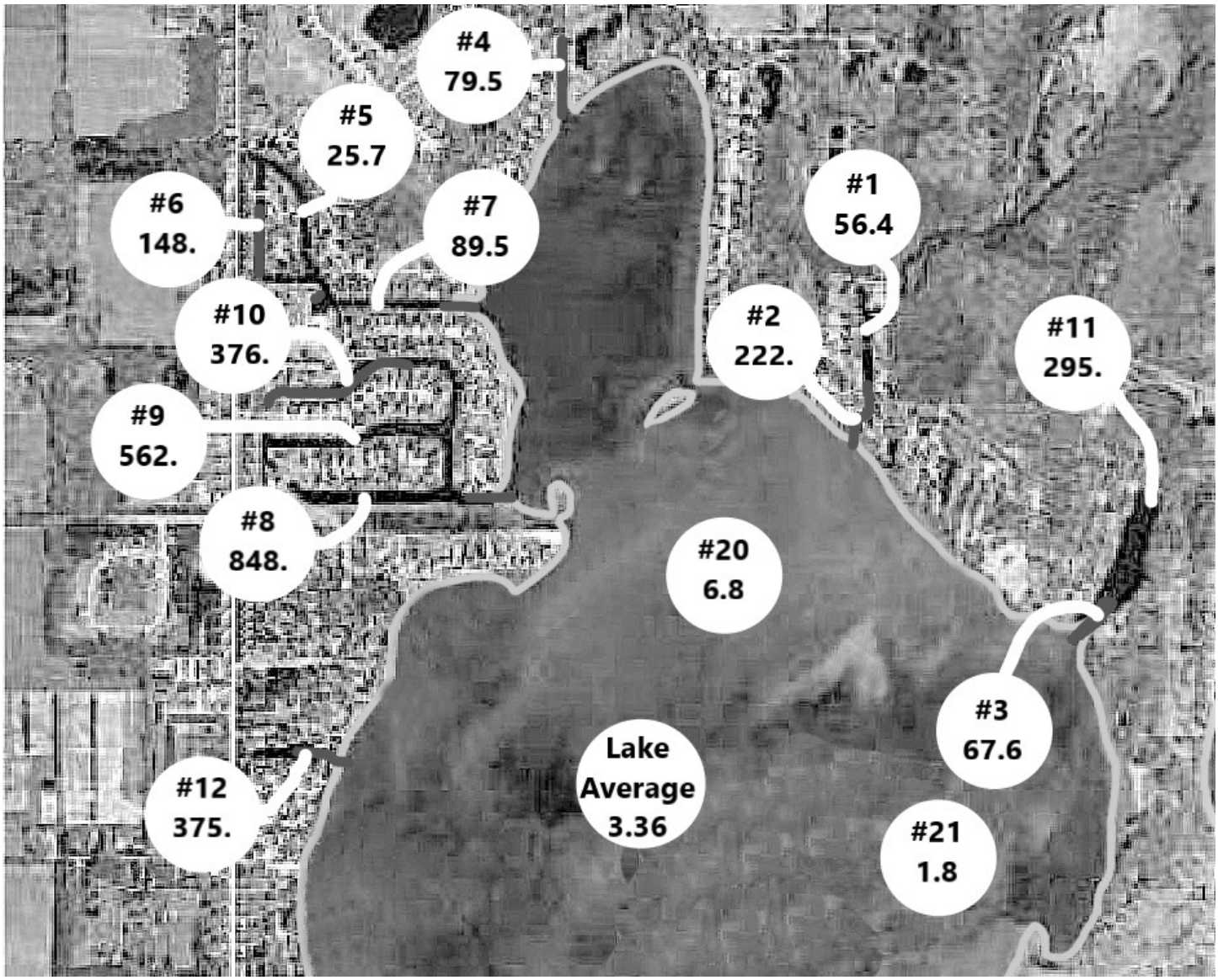
Samples were taken by Prein & Newhof Laboratory technician Steve Cathey on Mar 30, 2023; and reported on April 4, 2023. Nick Zyskowski from the GLPA provided boat transportation and familiarity with the areas of the lake.

18 samples were taken in the various channels shown below (all have been treated for decades with copper-based algaecides*); plus 3 samples were collected in random locations in the lake (usually not treated for algae) to achieve a "base level" of copper for comparison. The average level in the lake is 3.36 mg of copper per kg. *Locations 5, 6, and 7 (known as the Cuddy Channel) was dredged in 2016, so reflect lower numbers due to less exposure to algaecides.

The top number in each white circle is the testing site ID; the second number is the copper level as measured in milligrams/kg. The lines point to the approximate location of the sample taken.

Special Note: this is copper embedded in the sediment/muck of the channels – the higher levels might pose a possible threat to the macroinvertebrates that live in the mud and provide food for fish and countless aquatic creatures. The channels represent less than 1% of the total area of Gun Lake; but provide valuable habitat and protection for young fish.

The North Side Channels:



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The South Side Channels:

Points taken from the Thesis of Ben Willis, Clemson U, Dec 2012 "Detecting Copper Residues in Sediment from Aquatic Copper-based Pesticide Applications"

The toxicity/bioavailability of copper in sediment is dependent on: the sediment type and particle size, the organic material in the sediment (the more organic material = less toxic), the pH, and the water hardness (harder = less toxic).

To truly know the toxicity of copper in sediments, benthic fauna assessments must be done.

The USEPA recommends using a copper-sensitive macroinvertebrate called Hyalella Azteca for testing, because it tolerates a wide range of sediment types. Depending on the bioavailability of the copper, H. Azteca can withstand copper levels from 26 to 592 mg Cu/kg.