

# LAKE BOTTOM SEDIMENT ANALYSIS WITH SOIL AND WATER ASSESSMENT TOOL APPLICATION

Sudhanshu Sekhar Panda

---

AUTHORS: Gainesville State College - Institute of Environmental Spatial Analysis, 3820 Mundy Mill Road Oakwood Georgia 30566

REFERENCE: *Proceedings of the 2013 Georgia Water Resources Conference*, held April 10–11, 2013, at the University of Georgia

---

**Abstract.** Urban sprawl and poor land management in the watershed of the lake Sidney Lanier, a multipurpose reservoir have affected the water quality of the lake. A major impairment of the lake was sediment deposition. The main goal of this study was to develop the sediment profile of the Lake through actual field samples collection using Ponar Grabber from beneath the lake at various locations and laboratory analysis. Another objective of this study was to analyze the variation in soil texture at different locations and understand the reason for these differences. Aerial photographs from the 1950's (before reservoir construction) and recent land-use maps were used to explain the lack of samples in some locations and the results for obtained samples. Subwatersheds were delineated for each sampling locations using ArcSWAT for further analysis of the sedimentation occurrence and the soil profile. ArcSWAT was used to generate past, present, and future sediment analysis from each of the subwatersheds to compare to the current field samples. The results from the study showed higher percentage of silt in the northern part of the lake and more sandy sediments near the dam. Significant amount of clay was found close to the dam and central part of the reservoir. It was also observed that sediment profile of sampling locations in the reservoir closely matched to the soil and land-use types present in the catchment area inferring that there was low soil movement in the reservoir after it was built. The ArcSWAT analysis showed that higher soil deposition happened in the past years than present. In 1995, 78509 tons of soil was deposited into the reservoir and 24853 tons in 2009. This study will provide an insight towards the lake's longevity and water quality change due to sediment deposition because of unfavorable land management activities in the watershed.