# Lake of Egypt Water Quality Assessment
# March and November 2020

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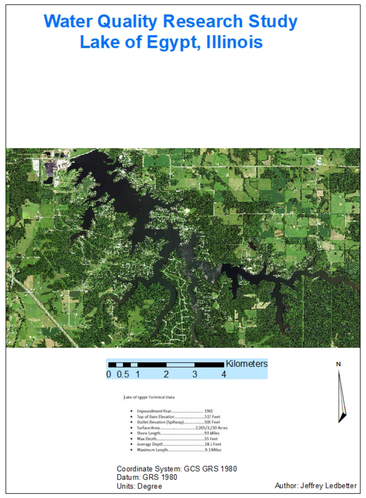
## Introduction and objectives

**Lake of Egypt is located in Southern Illinois 5 miles east of the I57/ I24 interchange. It covers 3,230 acres, has 93 miles of shoreline, contains 13 billion gallons of water and has a watershed of 63.1 square miles. It was build in 1961 for the general purpose of furnishing water to the Coal Electric Power Plant located on its northern shore.**

**The homeowners association requested a non-bias water quality report to assess for toxins and heavy metals. There had been many reports of unexplained smells coming from the lake and homeowners and fishermen were concerned about the quality of water.**

**Assessment of the water in 10 random locations from the northern shore to the southern shore to include each branch of the lake using a simple water test kit.**

## Studv area and datasets

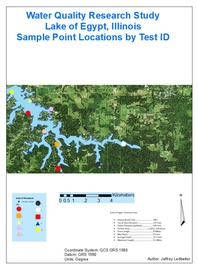



## Method

- Two collections were conducted, March and November of 2020.
- Locations were recorded using a Trimble TDC150 using submeter software.
- Tests were conducted using the Earthforce LeMotte 3-5886 test kit.
- Temperature, Dissolved Oxygen, Oxygen Saturation, Coliform Bacteria, Phosphates, Nittrates, pH, Mercury, Lead, Iron and Copper were tested
- Data was recorded to Excel and saved as CSV file
- CSV file was uploaded to Map Document and point locations were plotted


*The Trimble TDC150, shown to the left, is a mobile GNSS positioning device that uses Android Technology. The software for this project utilized the submeter accuracy. Points were plotted within 10 cm..*

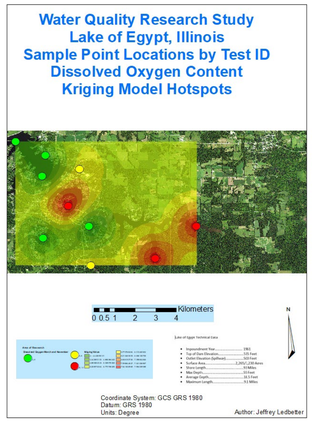
*Excel CSV files, to the right, were created for both collection dates and the test results were recorded for later interpolation. Each file was uploaded in ARCMap and joined to the map document.*


*The two maps, above, show the point locations recorded from the testing dates.*

## Results

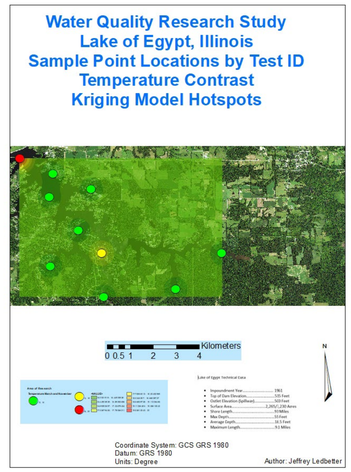
**The overall water quality of Lake of Egypt was found to be in normal levels. There was a 2 degree water temperature change in a couple of areas but not statistically significant to make a scientific conclusion. The differences in Dissolved Oxygen concentration in sample locations 5,6, and 7 had a statistically significant difference in both collections. These differences may be attributed to air temperature, wind, or boating traffic at the time of collections. Nitrate, Phosphorus, and pH levels were all normal. All of the Heavy Metal tests came back as negative or within normal levels. The overall assessment showed no sign of toxins and the water to be within normal levels for a Southern Illinois Lake.**




*The map to the left shows the Kriging results of the Dissolved Oxygen content with the three hotspots in random locations.*

Lake of Egypt Technical Data

- Impoundment Year..... 1961
- Top of Dam Elevation..... 515 Feet
- Outlet Elevation (Spillway)..... 500 Feet
- Surface Area..... 2,265/3,230 Acres
- Shore Length..... 93 Miles
- Max Depth..... 55 Feet
- Average Depth..... 18.5 Feet
- Maximum Length..... 9.1 Miles




## References

1. Illinois Environmental Protection Agency Bureau of Water Division of Water Pollution Control Planning Section. 1994, Quality Assurance and Field Methods. Lab-8 http://www.epa.state.il.us/water/water-quality/methodology
2. U.S. Environmental Protection Agency (EPA). 2002, Volunteer Lake Monitoring. EPA440-4-9102. Lab-8 http://water.epa.gov/type/watersheds/monitoring/upload/2002_08_02_monitoring
3. U.S. Environmental Protection Agency (EPA). 2014, Monitoring and Assessing Water Quality – Volunteer Monitoring. Lab-8 http://water.epa.gov/type/rsl/monitoring/
4. Earthforce, Inc LaMotte, low cost water monitoring kit 3-5886, www.earthforce.org
5. ChemCare, Heavy Metal Test Kit, www.chemcare.com

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