

**WIU CENTENNIAL HONORS COLLEGE**  
**Thomas E. Helm Undergraduate Research Day 2023**

**Abstract**

Poster

Major: Zoology

Faculty Mentor(s): Victoria Livingston

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**Trace Metal Analysis and Water Quality in  
Lake Ruth, Macomb, Illinois**

**Cari Wilson**

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Lake Ruth was built in 1908, when a drainage ditch was dammed on the southern end of Western Illinois University's Macomb campus. Lake Ruth is an annual stopping point and temporary home for migratory birds such as Canadian geese. Along with these birds, Lake Ruth is also home to a variety of flora and fauna including a variety of small fish and turtle species.

This study is important because it is a stopping point and temporary home for migratory birds such as geese. Several pairs of Canadian geese have been seen nesting on the banks of Lake Ruth in the spring. A 2010 study by Alhashemi et al., and a 2020 study by Susanti et al., both highlight waterfowl susceptibility to heavy metals. Understanding the quantity of trace metals in the lake's waters could give us insight into the quantity of metals that the organisms in this ecosystem are bioaccumulating.

Water samples were collected from Lake Ruth during the 2022-2023 research season. Samples were collected from five different points around the bank of the lake. After collection, samples were tested for water quality parameters including temperature, dissolved oxygen content, pH, and conductivity. Then samples were tested for cadmium, copper, lead, nitrate, and phosphate concentrations. Water concentrations were compared to the US EPA standards for freshwater ecosystems to determine if a toxic concentration is present. Pearson correlations were calculated to determine any possible relationships between trace metals or nutrients.