

**Centennial Honors College**  
**Thomas E. Helm Undergraduate Research Day 2024**

**ABSTRACT**

Major: Forensic Chemistry

Poster

Faculty Mentor(s): Matthew McConnell

John Determan

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**Analysis of Pollutants in Local Freshwater Sources Using High-Performance Liquid Chromatography**

**Breanna Christensen**

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Water is often tested for chemical content as certain pollutants pose considerable health and environmental risks. Some water contaminants of interest include atrazine, dicamba, 2,4-D, estrone, estradiol, and per- and polyfluoroalkyl substances (PFAS). Such contaminants are often found in natural waterways and wells, due to the use of pesticides in the fields and hormones in livestock as well as manufacturing waste disposal. High concentrations of pesticides in waterways can be deadly for aquatic organisms, and pesticides can cause serious health effects to humans, including cancer. Estrogenic hormones in water act as endocrine disruptors, showing the potential to negatively affect the fertility of humans and fish alike.

Thus, it is crucial to monitor chemical content in waterways and well water to prevent them from entering drinking water and harming local ecosystems. Water samples have been taken from local waterways and wells, as they are potential agricultural runoff sites. Research thus far involved preparing the water samples and several chemical standards of interest to undergo high-performance liquid chromatography (HPLC). HPLC allows for the identification of absorbance peaks of the standards to be used for analyzing water samples. By comparing the peaks of the standard chemicals to those of the water samples, the chemicals present in the water samples can be identified and quantified. The results will help to understand to what degree chemicals are polluting local waterways, which can be applied in determining their dispersion patterns and in finding methods to remove the contaminants from the water.