**Introduction / Background**

**What is a microplastic?**
- A plastic less than 5 mm long
- Produced through infiltration into the environment or through weathering of larger macroplastics

**Why are we studying it?**
- Microplastics increase health concerns in organisms and affect overall water quality
- Though there is a general understanding of the fates and transports of microplastics, there is insufficient data to make a good assumption on microplastics effects on freshwater quality
- There is a need for more research in quantifying and identifying microplastics in freshwater environments specifically

**Research Questions**
- How many and what types of microplastics are most prevalent within Nebraska freshwater bodies?
- What are the effects of these concentrations and types of microplastics on water quality?

**Methods**

**Water Sampling**
- Grab Sample (active sampling)
  - 4L Amber bottle

**Water Quality Tests**
- Temperature, pH, & conductivity
- Nitrate, Nitrite, & Phosphate
- Total Solids, Dissolved & Suspended Solids

**Extraction**
- Water Samples
  - Sieving water through (2000, 500, 250, 125, & 63 µm sieves) and leaving the samples to density separate overnight in NaCl solution.

**Quantification**
- Used Nikon SMZ25 Stereo Dissecting Microscope for quantification

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**Results**

**Microplastic fragment & fiber found in Elkhorn River**

**Map of Elkhorn River sites, made by Moriah Brown**

**MP Concentrations from Elkhorn River sites**

**Microplastic size classification per grab sample from Elkhorn River**

**Conventional Water Quality Parameters measured**

**Total Solids vs. MP Concentration from the Elkhorn River**

**Nitrate vs. MP Concentration from the Elkhorn River**

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**Summary**

- The farther downstream in the watershed, more microplastic accumulation was observed.
- The most frequently observed MP sizes were within 250-500 µm.
- Initial data may indicate a correlation between Nitrate concentration and microplastic concentration, but there was no correlation with Total Solids.

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**Conclusions / Implications**

- The source of MP found in the Elkhorn River can come from a combination of sources, including WWTP effluent and runoff from agricultural activities.
- This is one of the first data sets on MP in agricultural waterways.

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**Future Directions**

- Analyzing the microplastic types & quantities in Nebraska freshwater along with their impacts.
- Continue extracting MP from net water samples and sediment samples in the lab.
- Developing more sustainable designs to products and industries that release microplastics into the environment

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- Nasrin Naderi, graduate assistant
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