Introduction

- Working as a undergraduate student under Dr. Michelle Baker and PhD student Julie Kelso, I have been analyzing water samples from Utah streams.
- Dissolved organic matter (DOM) plays a major role in freshwater ecosystems.
- DOM can be terrestrially or microbially derived.
- Anthropogenic sources are also significant, especially in urban areas.
- Certain compounds in DOM fluoresce when electrons become excited by the addition of energy, emitting light which can be detected and used to characterize sources of DOM.

Methods

- Samples were collected biweekly from several sites; the Logan river, Provo river and Red Butte Creek.
- Samples are analyzed using an Aqualog spectrofluorometer that works by shining a laser through a cuvette containing the sample. The laser excites electrons in certain compounds causing them to “jump” to a higher energy orbital.
- As the electrons return to their ground state energy is emitted in the form of light, which the Aqualog detects and measures.
- Three dimensional graphs are created from this data. The “peaks” depicted on the excitation-emission matrices (EEMs) are used to identify the sources of DOM as either microbially or terrestrially derived.

Preliminary Data

![Three dimensional excitation, emission, and intensity graph](image1)

Figure 1. Three dimensional excitation, emission, and intensity graph

![Terrestrial leachate EEM with peak at EX 250 and EM 450(left). Algal leachate EEM with peak at EX 260 EM 300 (right)](image2)

Figure 2. Terrestrial leachate EEM with peak at EX 250 and EM 450(left). Algal leachate EEM with peak at EX 260 EM 300 (right)

Implications

- These data will help to identify composition and sources of DOM in Utah streams.
- The biweekly nature of the study will allow observations to be made about temporal fluctuations of DOM in these sites.
- This research is ongoing so stay tuned to the Baker lab for more exciting water discoveries!