

Diving into Utah's water with spectrofluorometry

Lindsay Capito, Julie Kelso (graduate mentor), Michelle Baker (faculty advisor), Biology Department

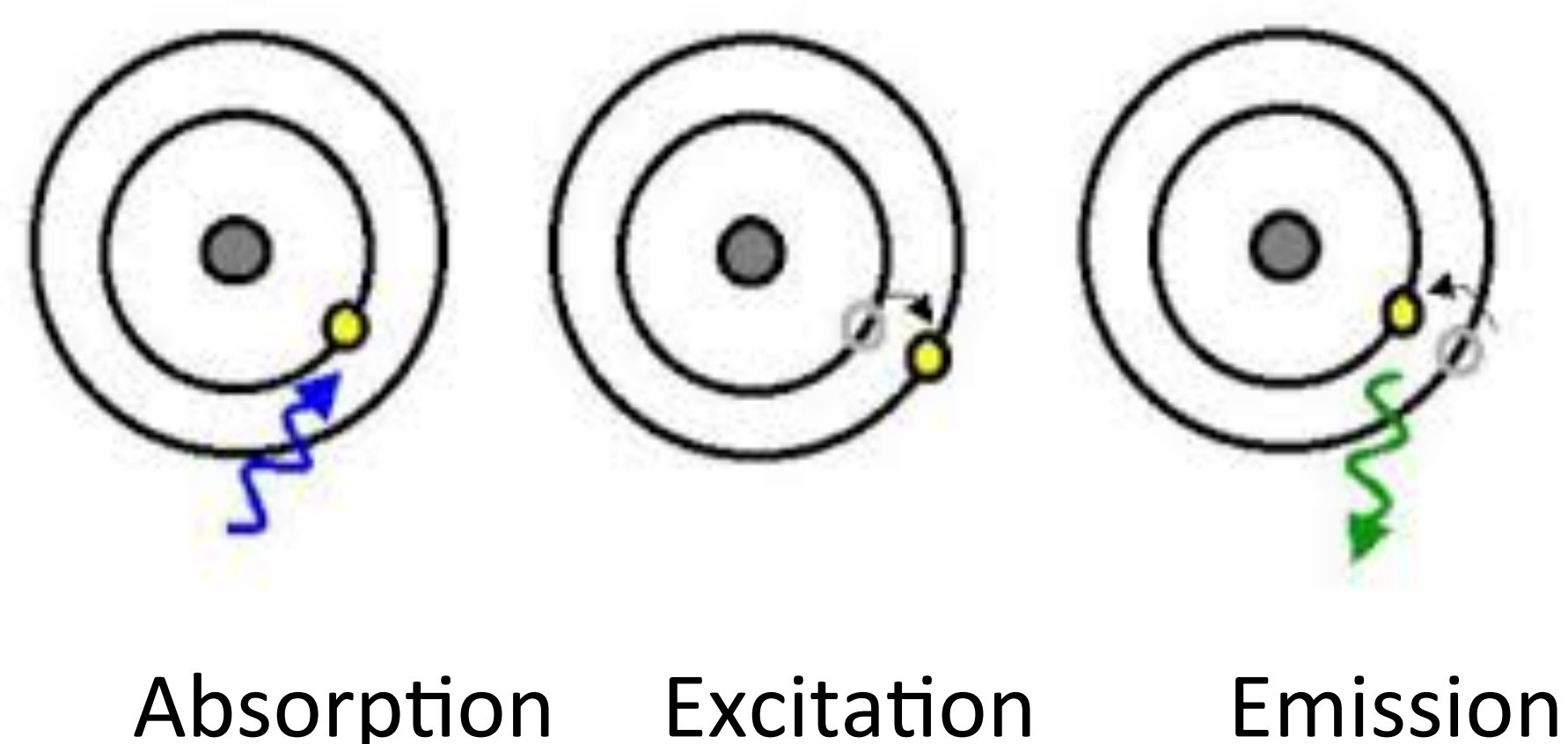
Introduction

- 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

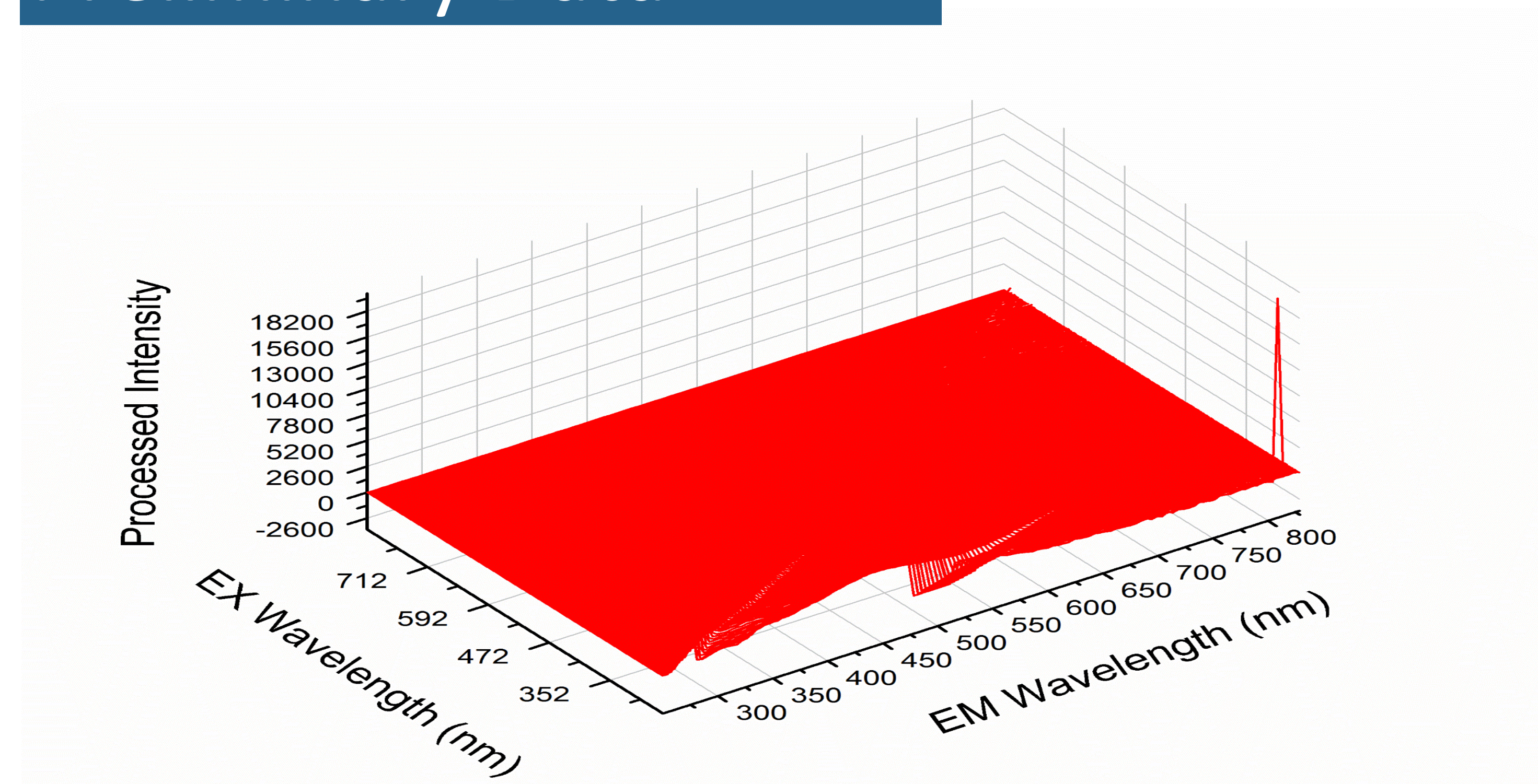


Figure 1. Three dimensional excitation, emission, and intensity graph

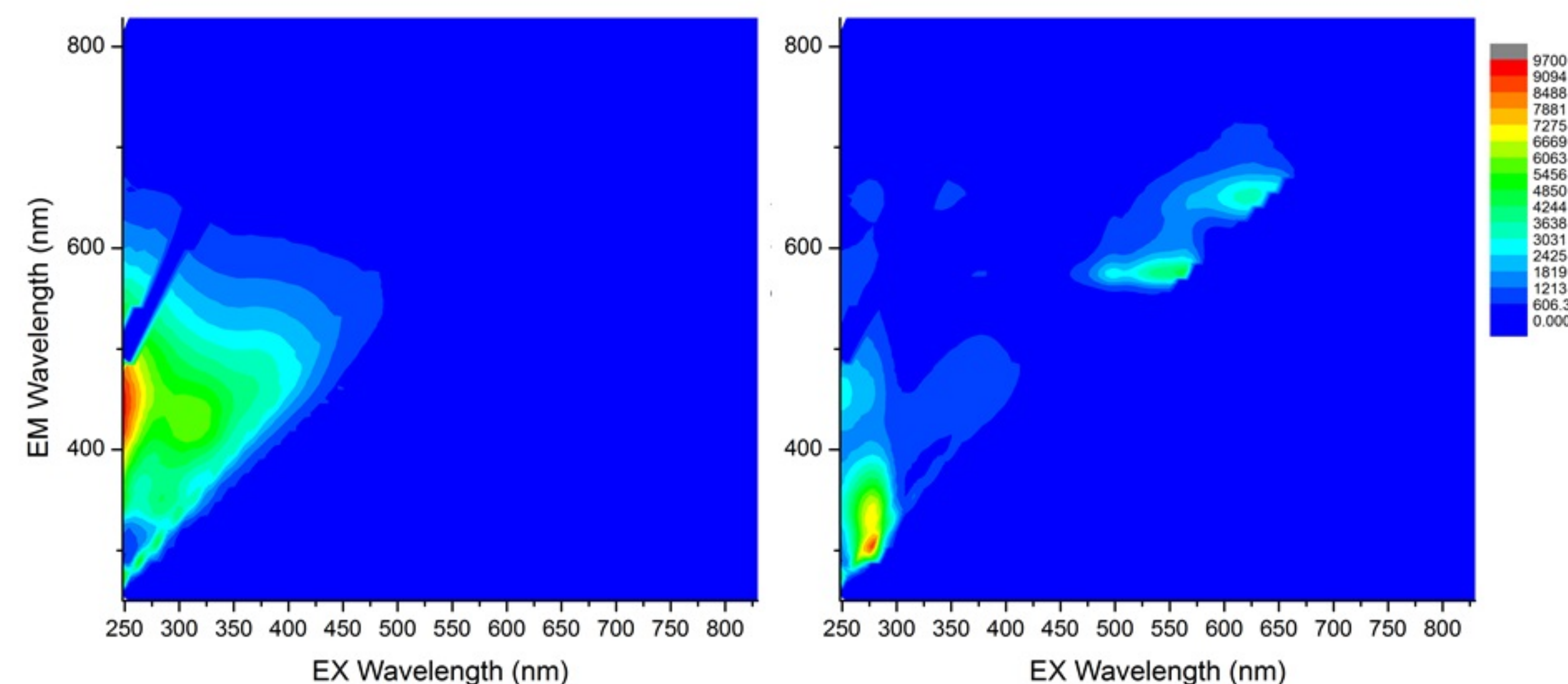


Figure 2. Terrestrial leachate EEM with peak at EX 250 and EM 450(left). Algal leachate EEM with peak at EX 260 EM 300 (right)

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!

