

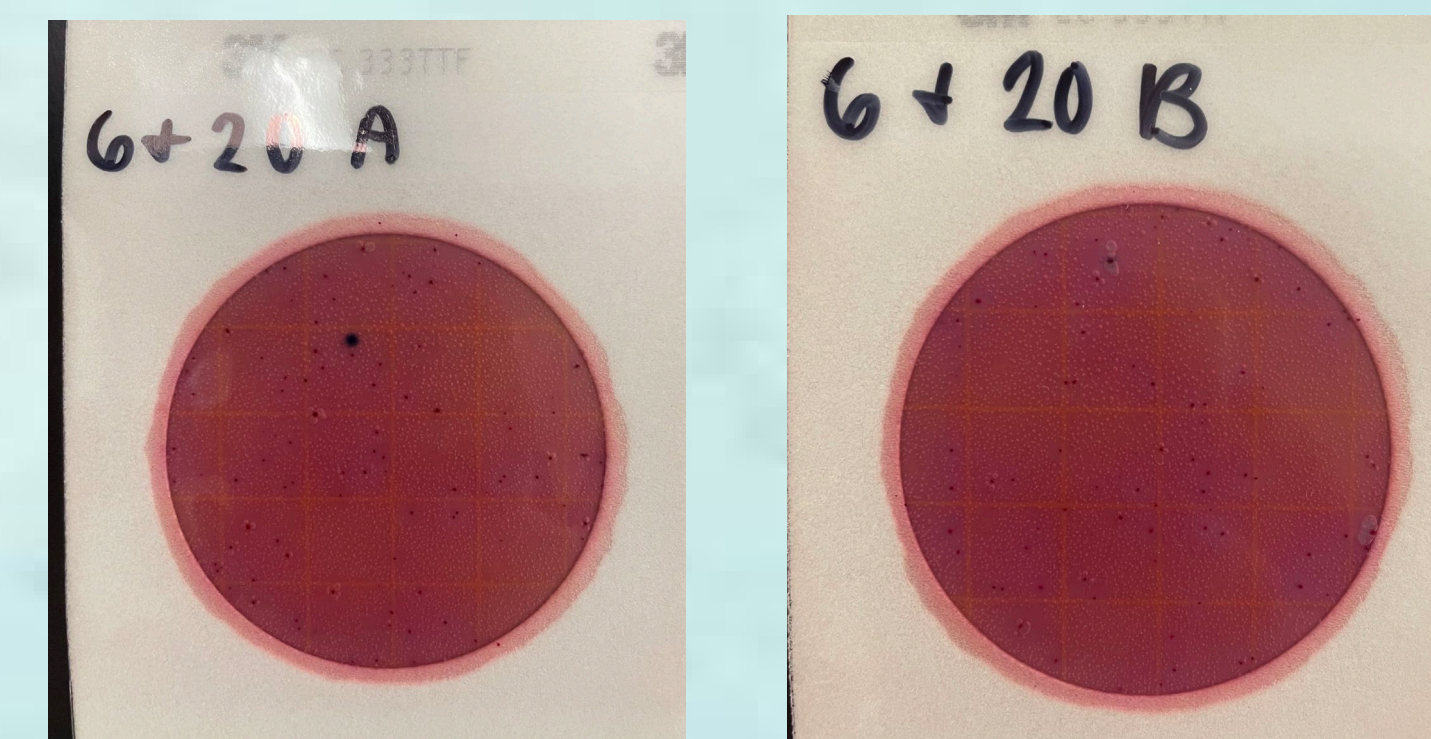
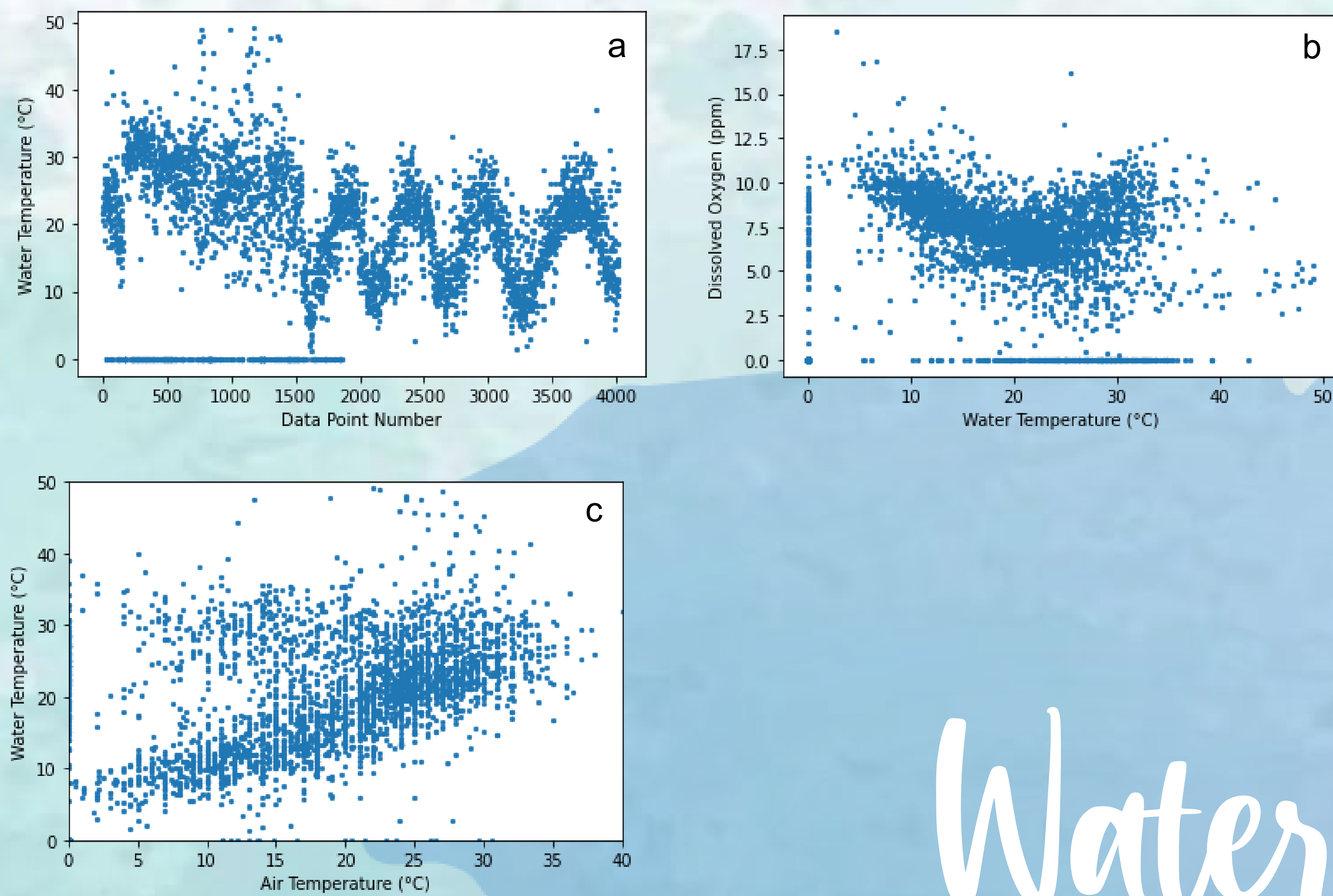
Objectives

This Water Quality Monitoring Creative Inquiry project has multiple objectives:

- We work in partnership with the South Carolina Adopt-a-Stream (AAS) program monitoring two surface water sites.
- We use the AAS database to evaluate long-term trends across the state.
- We collaborate with the Anderson Regional Joint Water System (ARJWS) to evaluate their long-term raw water quality data and compare to AAS data.
- We measure additional water quality parameters, such as anion content using ion chromatography (IC).



AAS Database Analysis



Photos from AAS sampling events. From top left: 6 & 20 Creek; Karinna Thompson measuring calcium hardness; Ada Smith, Peyton Smith, Sophia Della Rocca, Karinna Thompson, and Claire Funk working in our outdoor lab; Anthony Villanueva recording data; 18 Mile Creek; Petrifilm plates showing just one *E. coli* colony (on plate B).

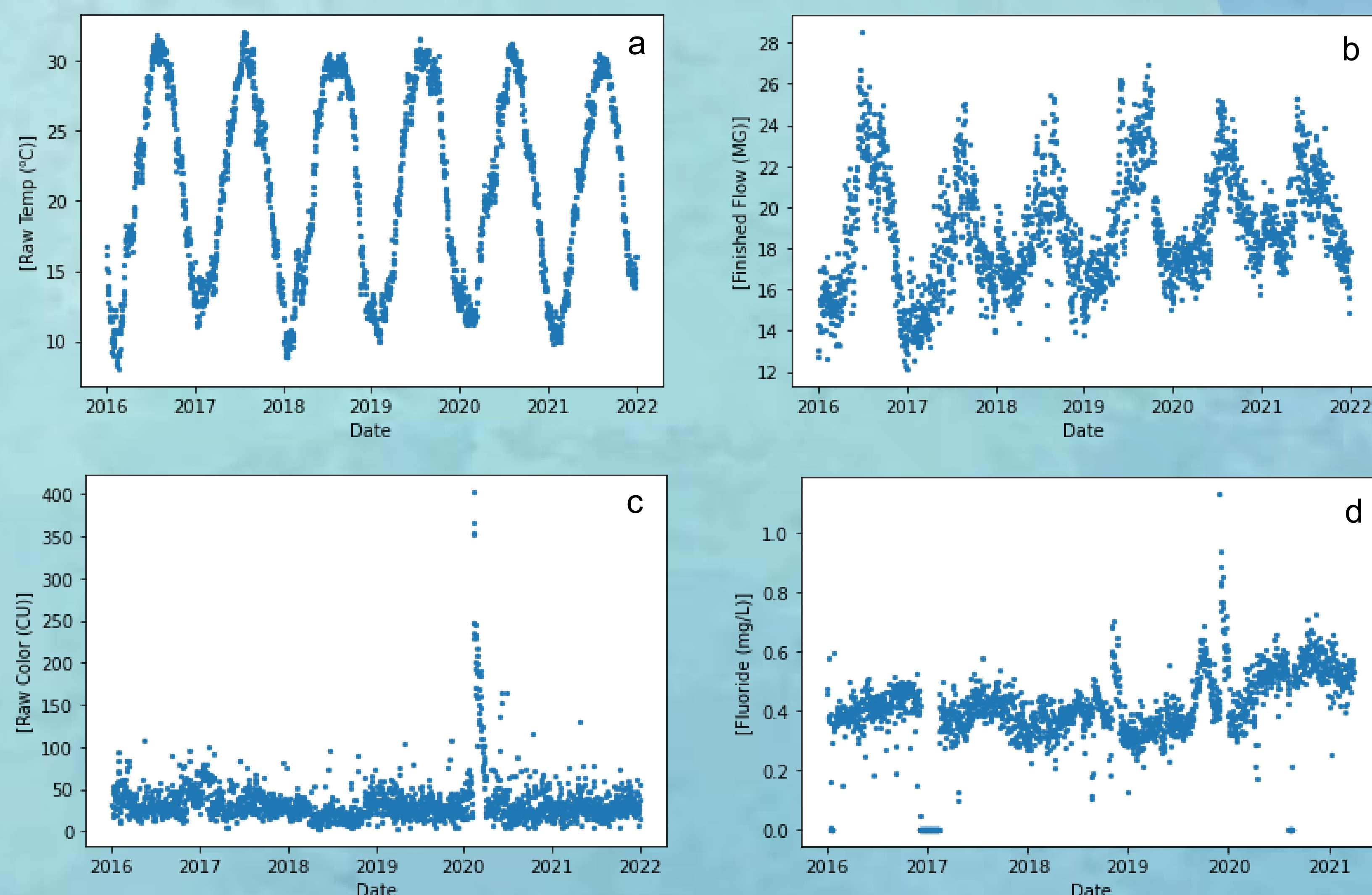
Water Quality Monitoring

Peyton Smith, Karinna Thompson, Andrew Stickler, Claire Funk, Ada Smith, Sophia Della Rocca, Anthony Villanueva, David A. Ladner

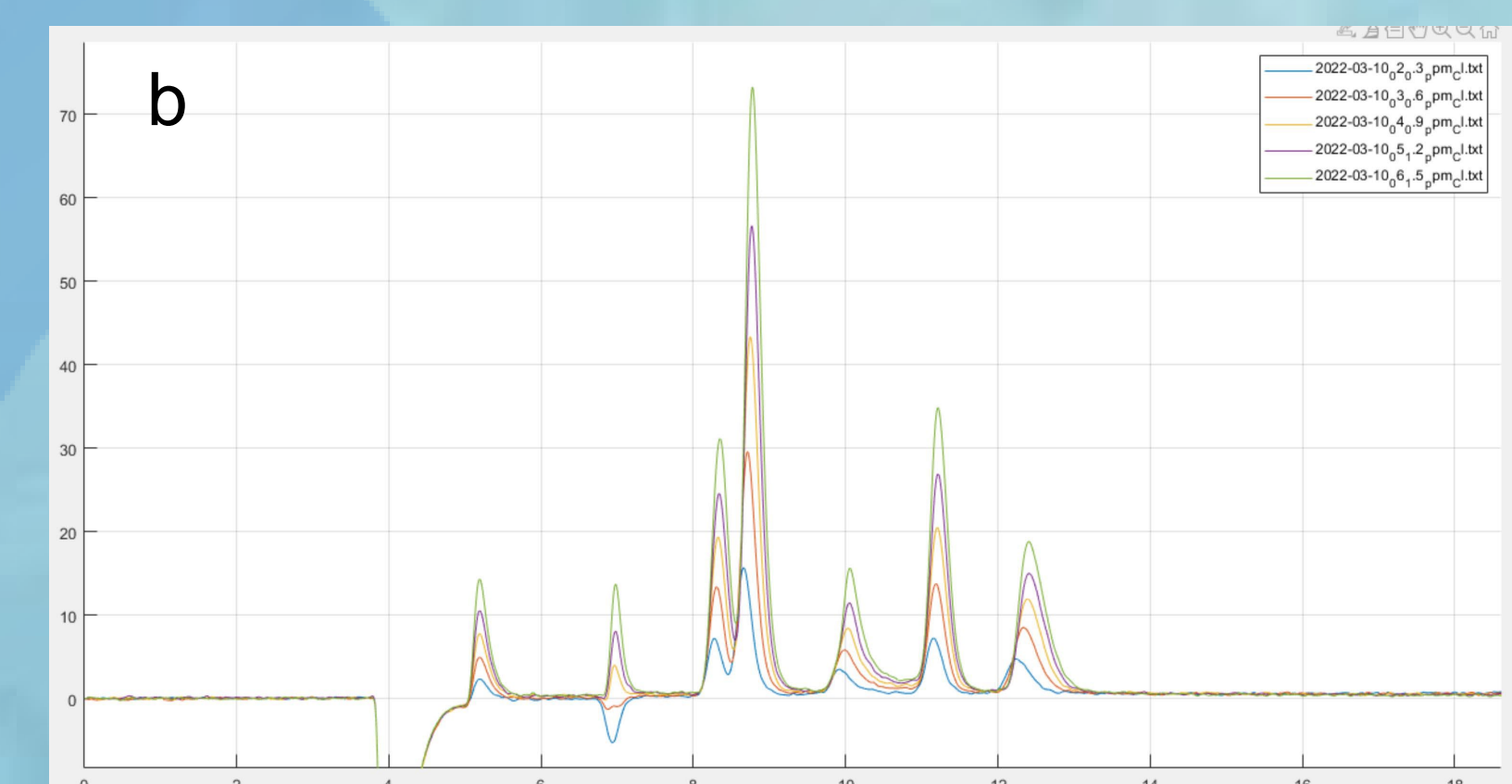
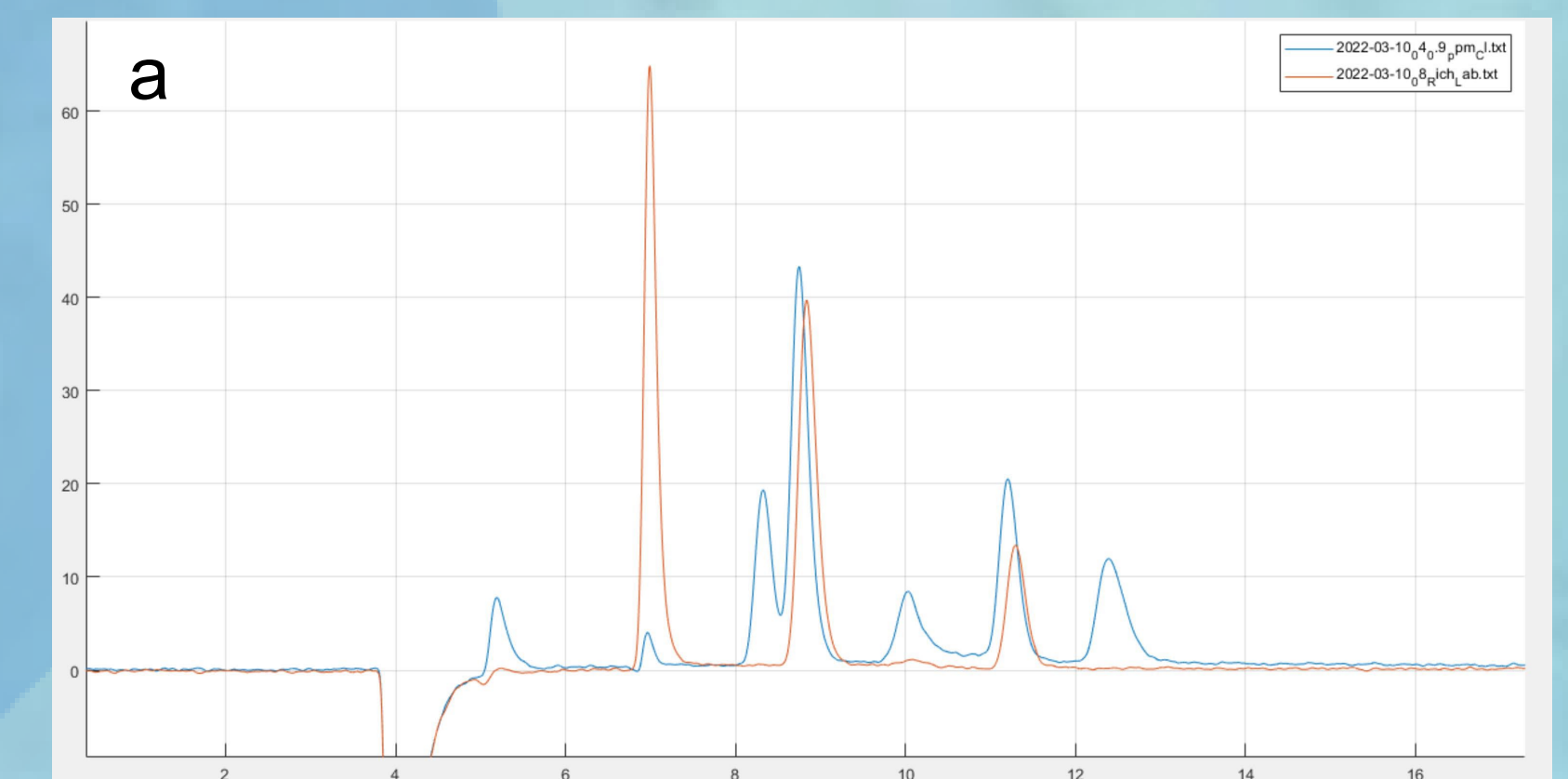
Example plots from our analysis of the AAS database. (a) Water temperature varies over time as the database procedures have become standardized. (b) Dissolved oxygen varies with water temperature sometimes in unexpected ways. (c) Water temperature and air temperature often correlate, but not always.

Ion Chromatography

ARJWS Data Analysis



Example plots from our analysis of ARJWS data. (a) Raw water temperature varies seasonally. (b) Total plant production also varies seasonally. (c) Color varies with rain events. (d) Fluoride concentration is meant to be constant, but sometimes has mild excursions.



Ion chromatography graphs. (a) Various concentrations of a seven anion standard. The standards were characterized by their chloride concentration, 0.3, 0.6, 0.9, 1.2, and 1.5 ppm, respectively. (b) Seven anion standard (blue) and an ambient water sample taken from 18-mile Creek (orange).

Future Work

The goal for future work is to harness the various water quality sampling and data analysis efforts to gain insight into the coupling between our natural and engineered water systems. Bringing data sets together and creating predictive models will help us achieve that end.