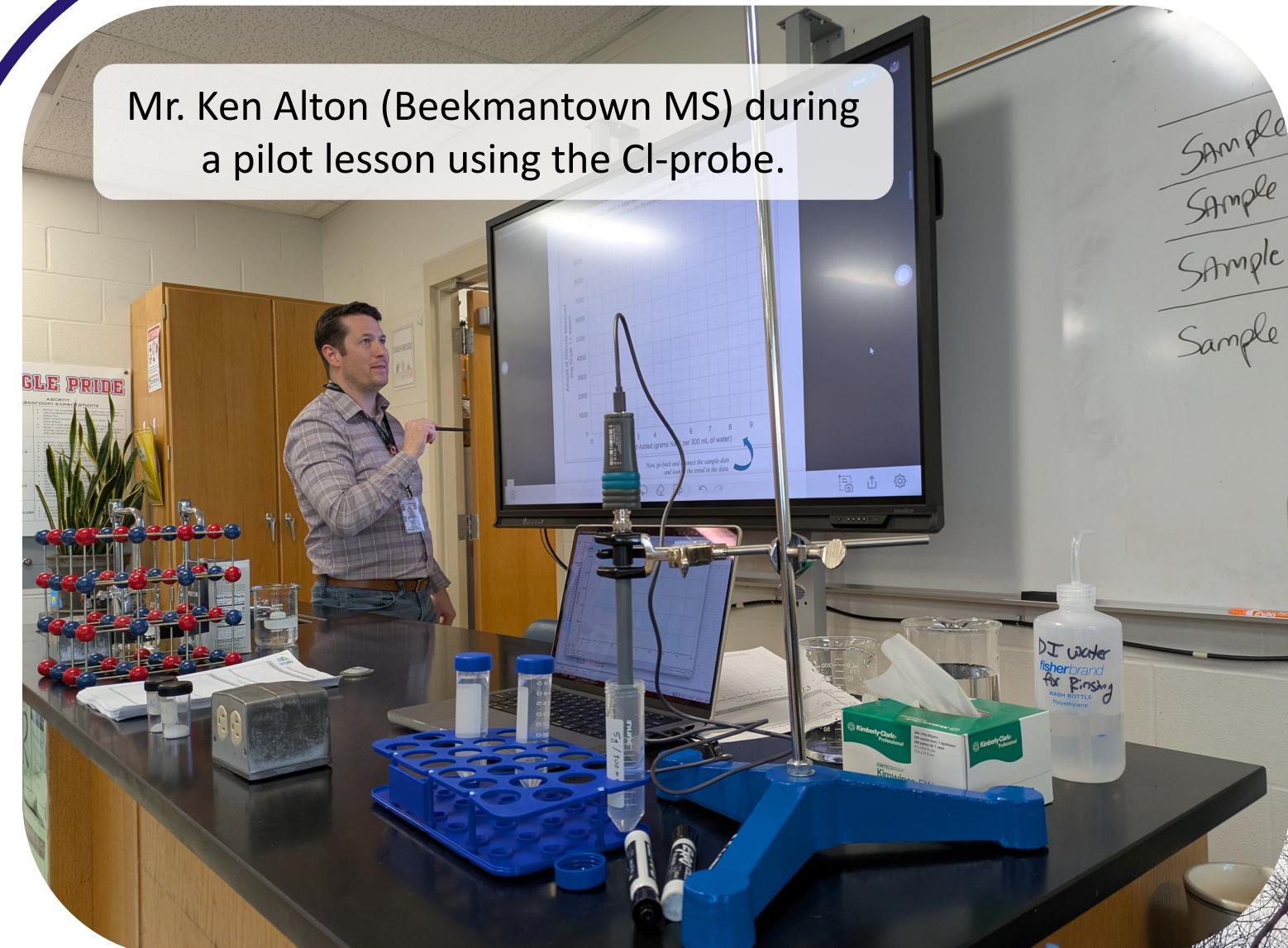


Sampling Salty Water in Champlain Basin Streams: Educational and Informational

Owen Allen, Leif Goldie, Nancy Price, and Mary Alldred



Chloride from road salt (NaCl , MgCl_2 , CaCl_2) is an environmental contaminant. Our project builds place-based lesson plans that use real methods and data to help middle- and high-school students connect human activities to the increase in chloride in watersheds.

- In the 1st project year, we:
- Chose sampling sites,
 - Collected samples for chloride data, &
 - Developed protocols for teachers to sample and use the chloride measurement probe.

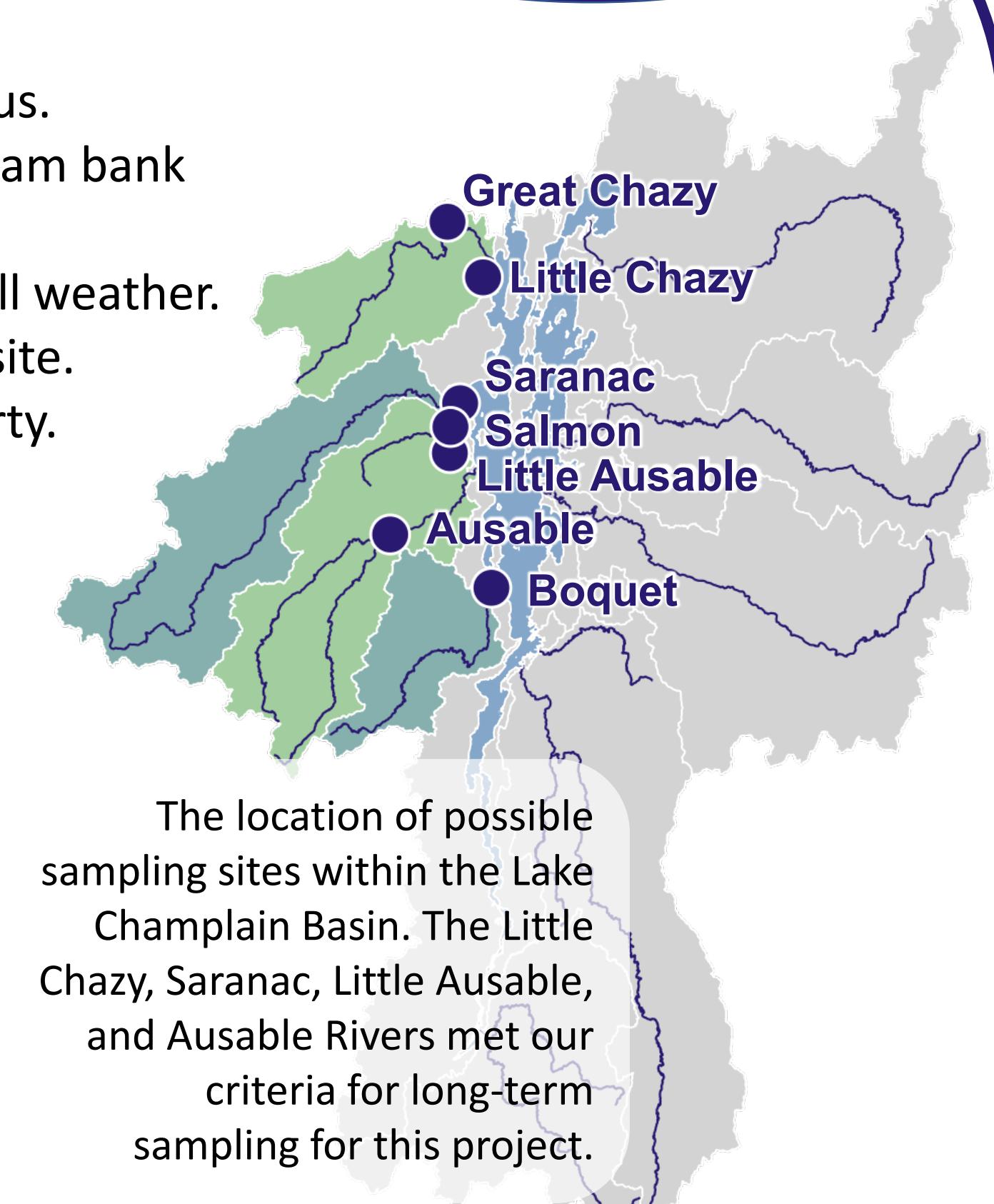
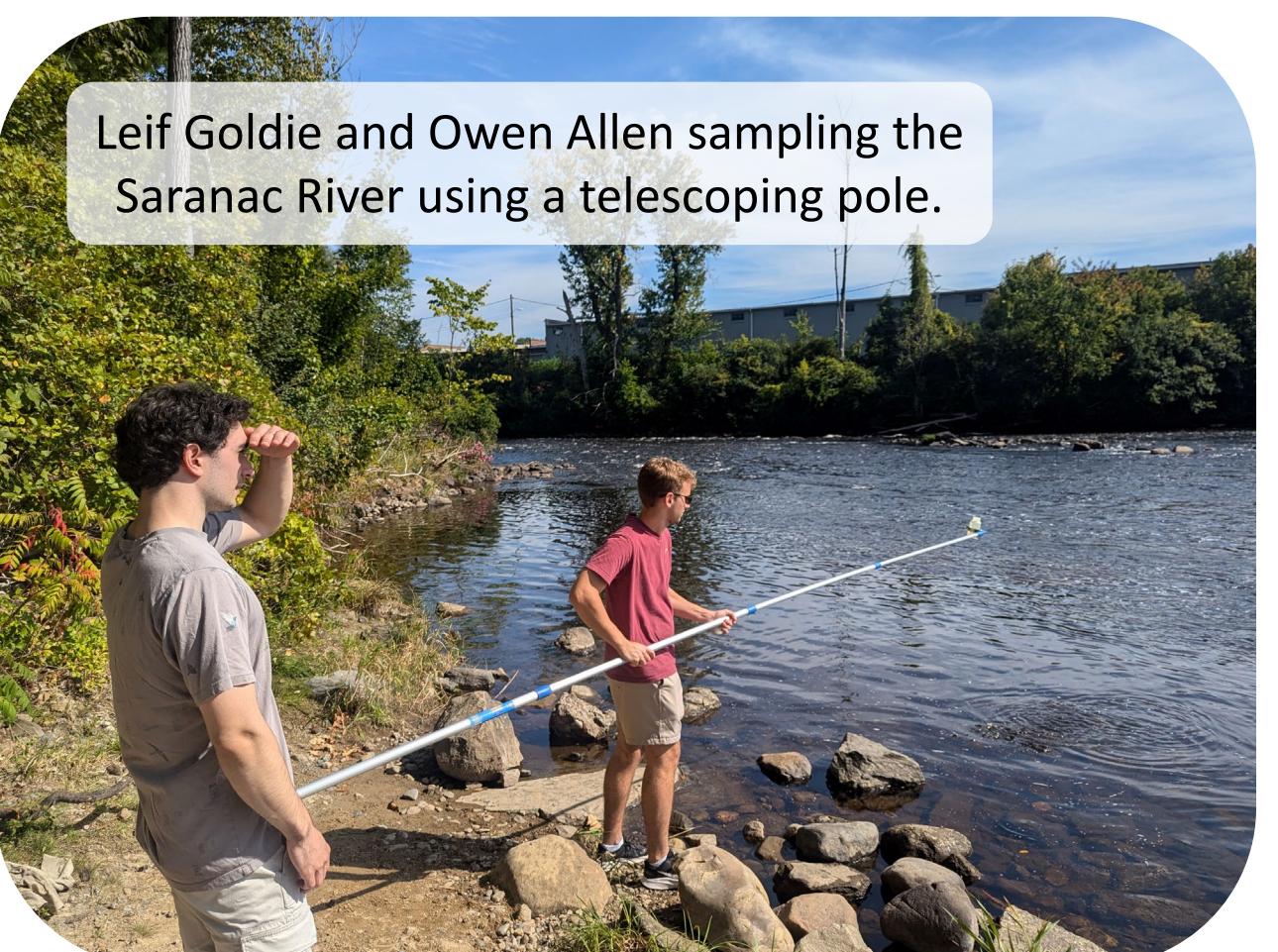


Purpose

Site Selection

We chose sites based on the following criteria:

- Proximity to a USGS gauging station.
- Distance from SUNY Plattsburgh campus.
- Water within reach from bridge or stream bank with a 16 ft (~4.8 m) telescoping pole.
- Bridge or bank is safe for sampling in all weather.
- Safe parking and walking route to the site.
- Permission to access via private property.

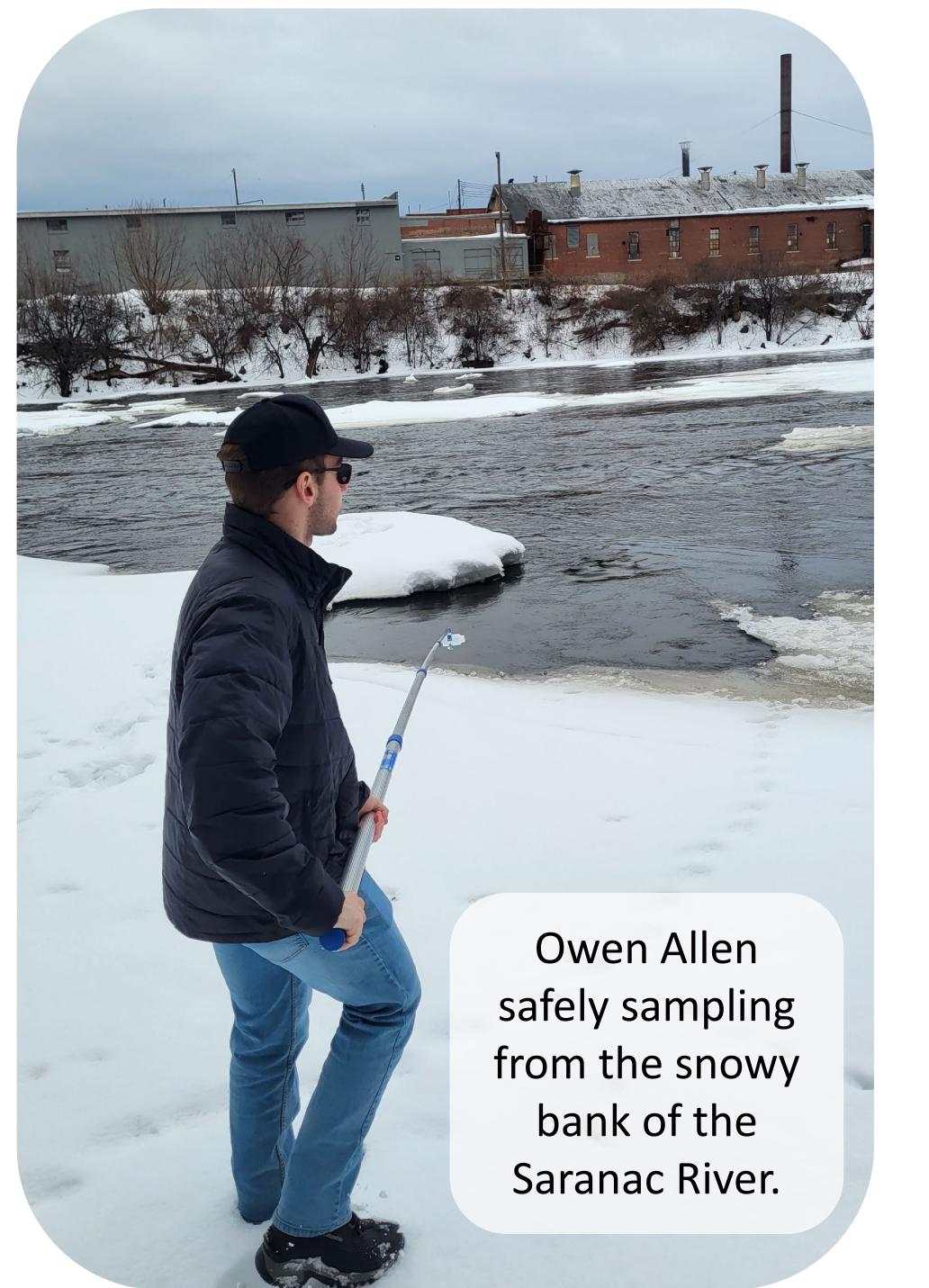


Sharing the site-selection process with middle- and high-school students teaches them about sampling methods, including challenges and limitations. This helps them understand more about *Planning & Carrying Out an Investigation*, an important part of the state science standards.

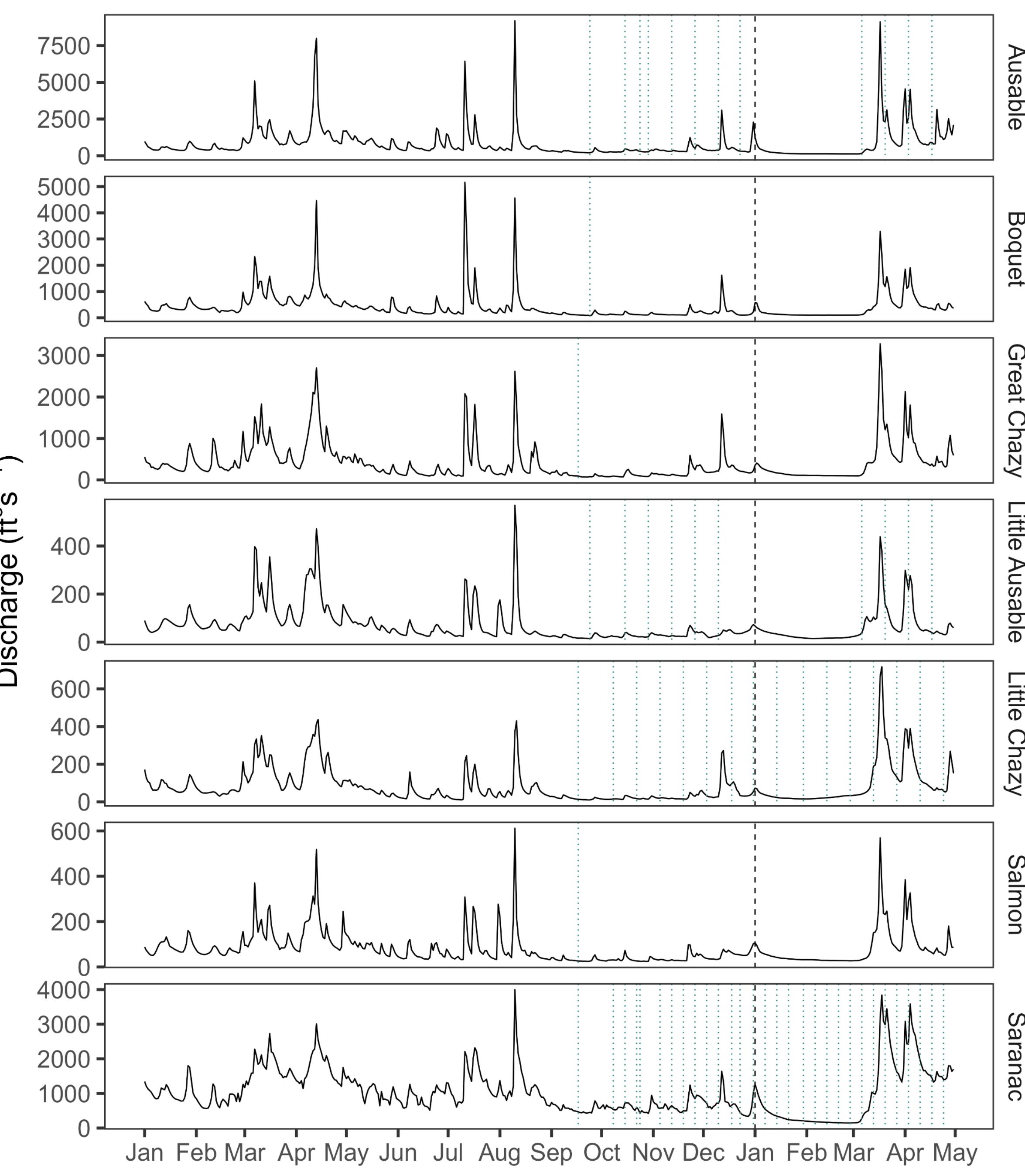


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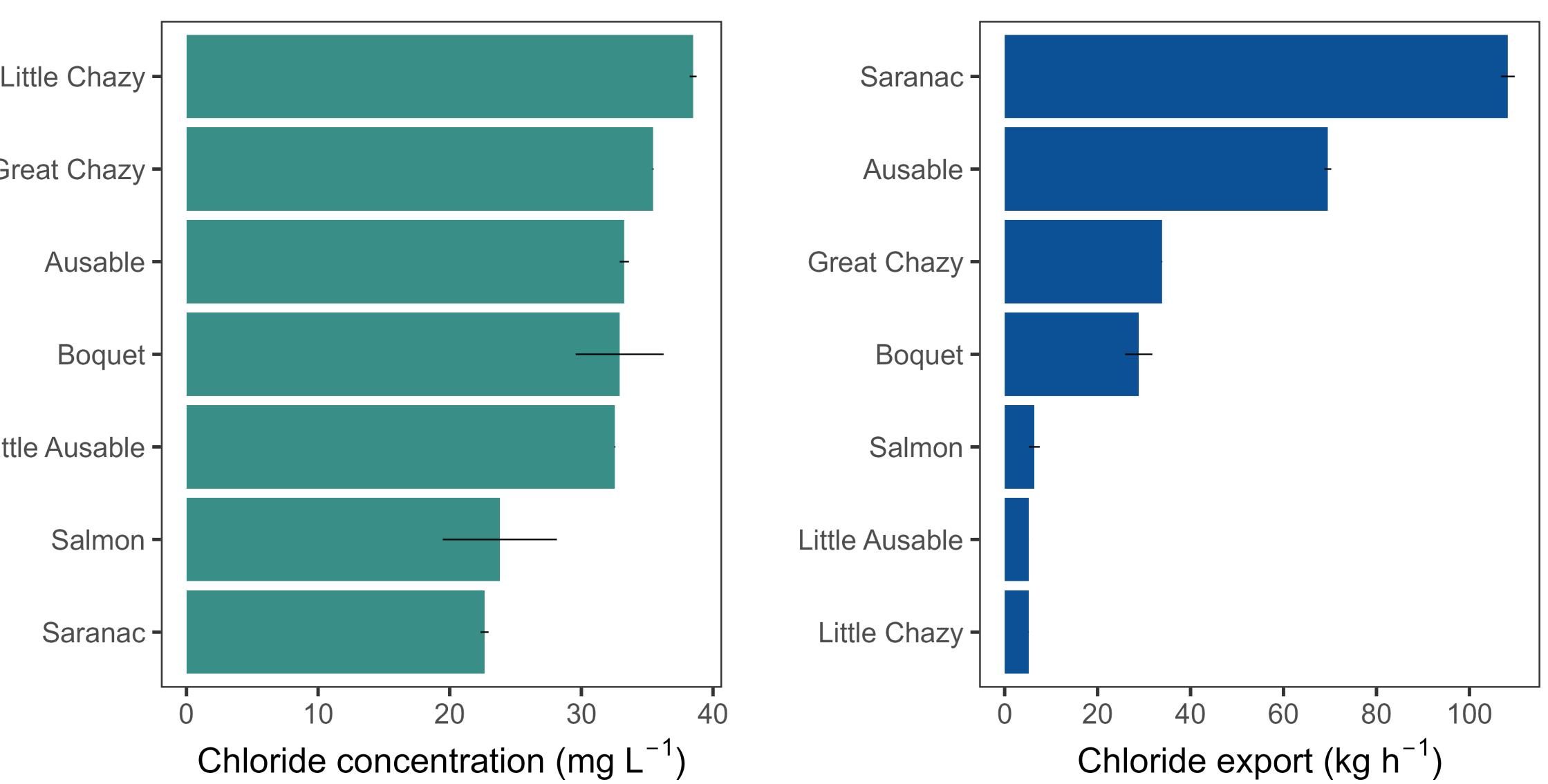
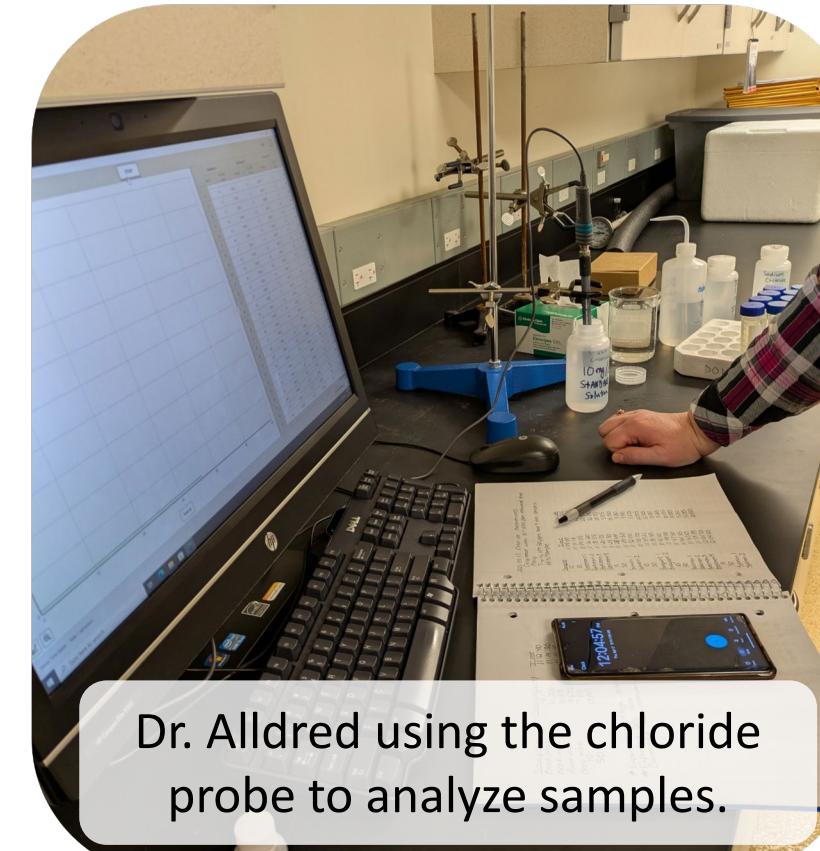
Sampling



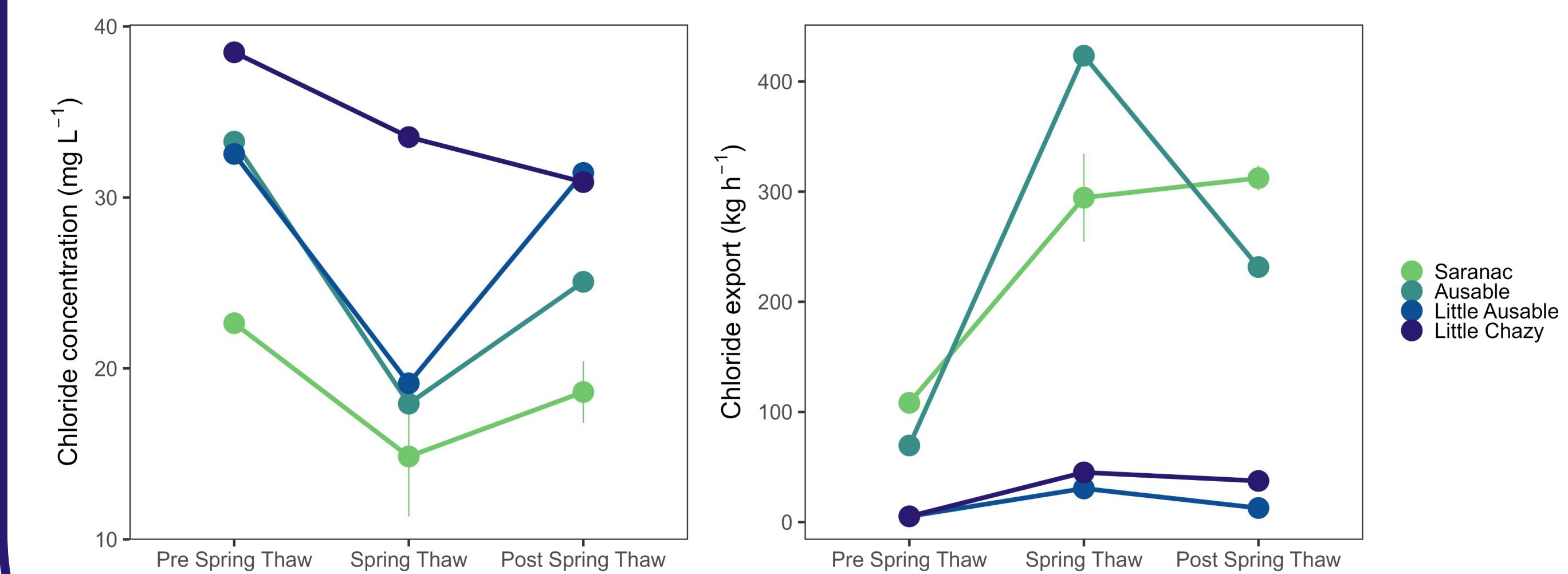
We sampled the Saranac River weekly and the Little Chazy, Little Ausable, and Ausable Rivers biweekly, as indicated by the blue lines on the discharge plot.



We made sampling kits with telescoping sampling poles for loan to schools, and we developed a sampling protocol for participating teachers. This protocol needed to be easy to follow, produce reliable chloride data, and work in all weather conditions.

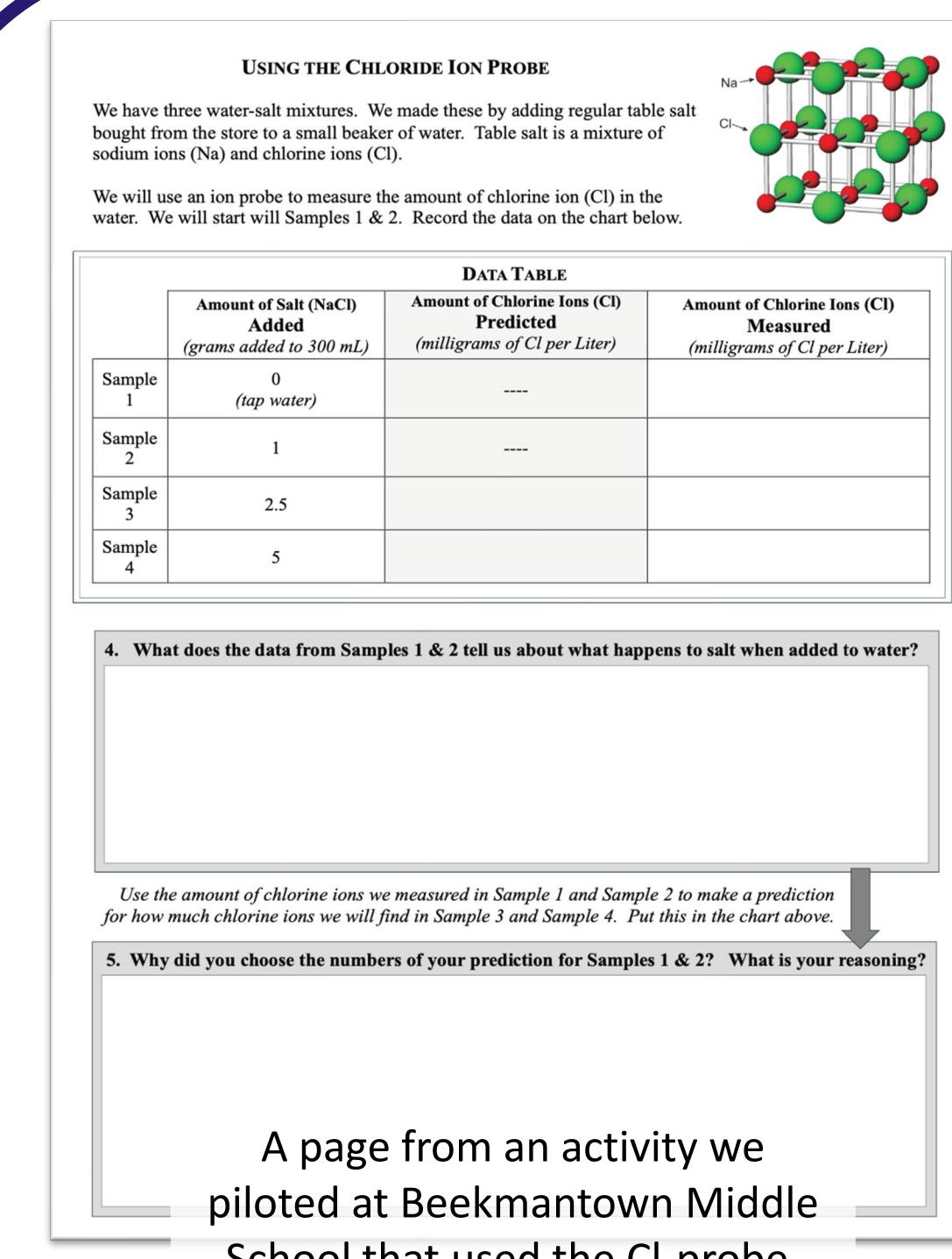


Preliminary data showed that the Little Chazy River had the highest chloride concentration (above left), but the Saranac River exported the greatest amounts of chloride (kg h^{-1}) due to higher discharge rates (above right).



We were able to show a correlation between peaks in chloride exported and the timing of road salt use.

Results



The end goal of this project is to build middle- and high-school lesson plans (with feedback from area teachers) that allow students to:

1. Collect and analyze their own samples for elevated chloride using kits developed as part of the project, and
2. Query a database of chloride data that we collected to test hypotheses.

We will continue sampling for two years to provide data needed for these lesson plans.