MISG outline

1-2 pages

Winter processes in the Laurentian Great Lakes are comparatively understudied compared to summer processes.

* Logistically hard to sample during the winter
  + Need expensive and specialized equipment
  + Ice is not renowned for being a stable structure, making sampling a safety risk
  + Traditional limnology viewed winter as a time of inactivity and senescence
* Has led to a gap in our knowledge concerning biogeochemical and ecological processes in our lakes.

Introducing winter severity

* How I am defining it: Snow and Ice thickness
* Can I bring up climate change???
  + I am not sure how touch and go this is.
* Creates a physical barrier between the lake surface, the atmosphere, and the terrestrial environment.
* Has impacts on underlying ecological and biogeochemical processes during the winter
  + Effects also impact the subsequent spring and summer.
  + Influences lake productivity, carbon cycling, and nutrient availability.

Tie to larger problems and Sea Grant “mission and vision”

* Sea Grant Mission
  + Committed to research, education, and outreach. Facilitate partnerships with institutions and people to cultivate a healthy ecosystem, community, and economy in the Great Lakes.
* Sea Grant Vision
  + Envision a healthy, sustainable, and accessible Great Lakes ecosystem and communities that depend upon them.
* How to frame my research
  + Changing winter conditions can upset “normal” lake processes and have cascading effects on ecology and biogeochemical processes. This could threaten the Great Lakes' water quality and the health of the biota. Our research will focus on the shifting microbial communities and their responses to varying winter severity. Microorganisms provide a significant proportion of productivity in lakes and, therefore, have bottom-up impacts on other trophic levels. Understanding how these communities are changing will better inform management practices.

Methods

* Introduce the winter grab network and the sampling efforts. I could perhaps make a table with # of PIs and # of sites.
* Sampled winter, spring, and summer of 2024 and winter 2025.
* I want to talk about BONCAT here. This would be my novel contribution to the field and to the project.
  + No one has used BONCAT in winter limnology to look microbial communities in the Great Lakes (to my knowledge).
  + Focus on this since I think it will make my proposal more enticing.

Expected outcomes?

* We expect to find that changes in winter severity will provide top-down controls on microbial communities in terms of composition (16s sequencing) and the active taxa present (BONCAT).
  + We also expect that impacts on microbial community composition will have echoing impacts on the following spring community.