

The foundational species eelgrass (*Zostera marina*) creates vast seagrass beds throughout the Northern hemisphere, providing many marine species an essential nursery and habitat. Due to various factors such as climate change and poor water conditions, globally, seagrass beds have been observed to be shrinking and disappearing (Valdez et al. 2020). One driving factor in seagrass decline is the potential algal overgrowth of epiphytic algae, which grow on the surface of eelgrass. High growths of epiphytic algae can create inadequate light levels for seagrass to grow, leading to the progressive decline of seagrass meadows (Heck & Valentine 2006, Valdez et al. 2020).

Small invertebrates that live in seagrass meadows graze on epiphytic algae, which may positively impact seagrass growth. Though studied in smaller mesocosms and some field experiments, the relationship between eelgrass and its microfaunal inhabitants is still wildly unknown and inconclusive (Reed & Hovel 2006, Murphy et al. 2021). We know that microfaunal species composition varies throughout the season, though the exact relationships and abundance of specific species are unknown at certain points in time. Therefore, this summer my advisor Dr. Katie DuBois and I investigated the seasonal variation of microfaunal found on eelgrass beds and see how it differs between northern and southern sites.

To survey the biological diversity of microfauna found in *Zostera marina* beds, we sampled previously established transect lines in 6 field sites in Maine ranging from Machias, Maine (44°41' N) to Portland, Maine (43°40' N). At each transect line, we measured the overall health of each seagrass bed by quantifying shoot density and canopy height. We then surveyed the community of each site by using a mesh bag to collect seagrass and with it any microfauna on or near the seagrass. Furthermore, we deployed temperature loggers at each site to record the variation in water temperature. I then identified and copy the heatwave this summer. In the

community composition portion of my research, I conducted 180 samplings where I identified the organisms found on seagrass. We have observed that there is a geographic difference between the community composition of northern and southern eelgrass meadows. I will be continuing the research to

find if there are certain keystone grazers associated with healthy eelgrass meadows.

Rusack Coastal Studies Fellowship
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References

1. Valdez et al. (2006). 7, (2020). 2. Heck & Valentine (2006). 330, 420–436
3. Reed & Hovel (2006). 326, 133–143 (2006). 4. Murphy et al. (2021). 44, 442–452 (2021).