

Honors Senior Spotlight



Emily Morgese, '20

Hometown: Garnerville, New York

Major: Biology

Thesis Title: *Characterization and Comparison of Nitrogen Fixing Bacteria associated with the Rhizosphere of *Spartina alterniflora* at the Pleasant Point Salt Marsh*

Thesis Advisor: Dr. Nikolas Stasulli and Dr. Roman Zajac

What is your thesis about?

Nitrogen is necessary for living organisms to create biomass, however, atmospheric nitrogen is not readily available in a form that can be utilized by organisms. To deal with this, nitrogen fixing organisms "fix" nitrogen into forms that can be taken up and utilized by other organisms. The process of nitrogen fixation

is mainly carried out by an enzyme called Nitrogenase. Oxygen is harmful to this process and degrades the nitrogenase enzyme. Some species of nitrogen fixers have evolved ways to detoxify oxygen so that nitrogen fixation can still occur in the presence of oxygen. For my project I am looking at the nitrogen fixing bacteria that are associated with the roots of a common salt marsh cordgrass, *Spartina alterniflora*. Salt marshes generally have 3 zones and oxygen content varies across the marsh. I am hoping to identify different species of nitrogen fixers throughout the 3 zones of the marsh and see if they have any specialized characteristics that reveal distinct differences between species from different zones.

What motivated and/or inspired you to select this as your research topic?

My two favorite biology courses have been Microbiology and Ecology. I wanted to come up with a project that incorporated both fields. Since learning about nitrogen fixing bacteria and the relationship they have with plants, I have been really interested in learning more about how they function within their different environments. I thought that getting the opportunity to do a hands on research project would be the best way for me to learn more about them!

Do you have any advice for future Honors students thinking about writing an Honors Thesis?

I know it can be nerve-racking to think about planning your own project and doing research on your own, but if you pick something that you're interested in and passionate about, it's actually a very rewarding and exciting experience. I won't lie, completing a thesis is a lot of work, but don't forget to take some breaks to focus on yourself every now and then!

After graduating, what are your plans?

I am planning on going to graduate school for Biology Education and making a career out of teaching what I love to others.