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ENVE 4999 - Mason's Island Independent Study

Blog Post

I have spent the past semester doing a research project on coastal erosion issues on a small island off the coast of Connecticut, Mason's Island. This area is a primarily residential island, and the shoreline directly next to their only access road to most of the houses has been facing notably extreme erosion in recent years. The area of concern consists of the eroding marsh next to the ocean, followed by a thin strip of manicured grass before the road. Concerned residents of the Island measured a total loss of land between the road and the sea of three feet six inches since July of 2020, which puts into perspective just how rapid and serious this erosion is. Overall, my goal was to research and present possible solutions for this erosion, as well as to help the residents of the Island with any other research questions they had- such as the land permitting of the area, the cost estimates of a solution, and what could be done as a possible short term solution.

This project has been a great learning experience, a great connection builder, and a great wake up call more than anything. In the beginning, the possibilities seemed endless. I could take the challenge of an eroding beach and apply anything I wanted to it- my initial thought was that an expansive living shoreline, maybe even planted this year, would surely restore the area and prevent any further problems within a neat timeframe. However, as I dug into more and more research I realized that this was not at all the case. More and more factors limiting the potential implementation of a living shoreline built up against my case, and I had to learn how much time and money would be required to approach a shoreline restoration the sustainable way. Having taken the *Climate Resilience and Adaptation: Municipal Policy and Planning* class last semester,

I was familiar with the fact that many complex social and legal factors go into solving any climate related issue, but completing this study made that all feel a lot more real.

This independent study was initially advertised to me as a living shoreline research project, so a lot of my time and effort focused on the potential of that solution specifically. However, as I learned, a living shoreline is not nearly as simple as it sounds in principle. On this area of Mason's Island in particular, the fetch (wave energy due to wind) was so high that it would erode away any marsh put in, and so I needed to research how I could blend green and gray infrastructure to have a protected living shoreline that would still do its job. An additional challenge to living shorelines was learning about the permitting process. One aspect that I found particularly frustrating was how long it would take to get anything done- I couldn't understand how the shoreline could be eroding more and more every day, yet it would take months or even years to actually be able to do anything about it in a legal manner.

Although I have mainly only discussed the limitations of my project so far, I also feel that it was an abundantly positive experience. I am more seasoned as an engineering student, and being able to say that I have the beginnings of a living shoreline project under my belt is a great feeling. I am amazed about how passionate I became regarding the subject of living shorelines, and about Mason's Island in particular. In the end, I was able to accomplish my goal of coming up with a recommendation for a solution to this specific case of shoreline erosion, which I determined would be a combination of a living shoreline and a hard protective rock sill in front. This served as a great learning experience, as I discovered that despite being an environmental engineer, sometimes the solution to a problem cannot be 100% green if it is to be fully effective. In addition, I was able to learn a new skill in Microsoft Excel by making a living shoreline cost calculator that can hopefully be used for many other shorelines. Overall, I am thankful for being

able to take this semester to do so much in depth research into the concept of living shorelines, and I feel that I will be able to apply this knowledge to future projects in order to benefit myself and others.