Climate Corps Blog: Olivia Lemieux (Mapping Vernal Pools in Andover)

My name is Olivia Lemieux and I am currently a Junior studying Environmental Science and Ecology and Evolutionary Biology in the Honors Program at the University of Connecticut.

Last semester (Fall 2020), I took the Climate Corps course offered by Dr. Julianna Barrett and Professor Bruce Hyde in which I learned about the challenges Connecticut and nearby regions are currently facing or expected to face as a result of climate change. This information was presented in tandem with insight into how policy and planning measures can and are being instituted to build community resilience and facilitate climate change adaptation. I really appreciated the proactive stance this course took on climate change issues and felt that I learned a great deal while gaining critical thinking, assessment, and planning skills, so I chose to pursue the follow-up component of the Climate Corps program in order to apply and build upon the skills I had learned while also familiarizing myself with what work in the environmental field could look like.

This follow-up component involved collaborating with community partner Hank Gruner, a herpetologist and member of the Andover Conservation Commission (of Andover, CT), to map potential vernal pool locations throughout Andover, CT, as a preliminary step in critical vernal pool habitat conservation. I worked with fellow UConn student Gregory Roberts to accomplish this task.

With the guidance of Mr. Gruner and technological expertise of Dr. Tao Wu, we used ArcGIS Online and ArcPro software, as well as Google Earth for reference, to create an updateable map of potential vernal pools within Andover, and we added visualization and calculations of critical conservation zones within and around each vernal pool. Creation of this map was Phase I of a two-phase plan proposed by the Andover Conservation Commission and

Inland Wetlands and Watercourses Commission to conserve vernal pool habitat across Andover. The specific end-goal for this project was therefore to create a map that facilitated the in-field location and quality assessment of vernal pools that will take place in Phase II of this plan. The conservation of vernal pools in Andover aided by our mapping will increase the resilience of the town's vernal pool obligate species in the face of climate change by reducing the total alteration/decrease of vernal pool habitat expected from climate-driven changes in drought and flooding cycles.

The biggest challenges of this project came down to technology issues. This semester was my first time working with GIS software, so there was a bit of a learning curve, but Dr. Wu made these difficulties negligible through her invaluable guidance. Another challenge this project presented which I certainly could not have anticipated was having to learn how to distinguish between potential vernal pools and hemlock and conifer tree shadows on satellite imagery maps. Although this doesn't sound like something that should be an issue (trees and vernal pools don't register as landscape features that should appear interchangeable), the image quality of the maps we were working with, though impressive and highly advanced, was not at a level where we could easily distinguish these features due to the extremely small scale we were working at. Review of Google Earth imagery, specifically across different times of the year, was crucial in combatting this issue.

The challenges faced through this project were negligible relative to the rewards. At the beginning of this endeavor, I honestly didn't even know what a vernal pool was, however, as soon as I began to learn about the unique ecology of vernal pools and the organisms that use them, I became increasingly passionate about this project and the implications it could have for vernal pool conservation. Despite having taken many environmental science-related courses and

having learned a great deal about climate change and human impacts on the natural environment, until this point I had very little experience with actively working to combat some of these issues. This experience was the first of its kind for me and validated my choice in majors and career interests while providing me with a sense of both accomplishment and hope in the face of climate change.

At the end of the day, though, the greatest parts of this project were the interactions I had and connections I was able to make because of it. I learned so much from Hank Gruner about wetland conservation processes and the values of vernal pool habitat and from Dr. Wu about ArcGIS functions. It was also so nice to be able to continue my learning under the knowledgeable and personable Dr. Barrett and Professor Hyde, and I made a great friend in my partner Greg while also learning how to be a better work partner through my collaboration with him.

Overall, I am so grateful for this experience and all that I gained from it and I look forward to using what I've learned to continue working towards a greener future and a more resilient socioecological system.

Gregory Roberts

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Vernal Pools Blog

The project that my groupmate, Olivia Lemieux, and I were tasked with this past semester, was to assist herpetologist and Andover Conservation Commission member Hank Gruner with mapping potential vernal pools and their critical zones for conservation within Andover, CT. We were aided by Dr. Wu in creating, combining, and analyzing the map and its respective features that was the main outcome of this venture. However, this project is only Phase I of a two phase enterprise to identify and provide conservation value to the vernal pools of the town.

The largest challenges we faced with this project was on the technical side of how we were going to be able to add to the map layer and combine our data later. ArcGIS Online is a phenomenal way to collaborate and create map layers together, but it falls short on the personalization of said map layers. This is because it does not have as many options for layers that the paid for desktop version does, which is understandable but luckily, we had both versions at our disposal. Another challenge faced was identifying the potential vernal pools on the Spring 2010 CT map layer, as the satellite images were good, we just could not zoom in enough to verify a pool solely on ArcGIS. Instead, we went between ArcGIS and Google Earth to access the pools through year to year, and season to season satellite images to see if they were seasonal pools or present throughout the year. Also, differentiating a potential pool from a hemlock tree,

conifer, or even a trampoline tended to be a challenge throughout due to the similarity between the look and shadowing of all that are listed.

I believe the best part of this project was learning about vernal pools themselves as well as learning how a position in the environmental field will look like. Vernal pools are breeding and development locations for many amphibians and crustaceans throughout the spring season and sometimes throughout the summer. The area surrounding the pool is also important because it provides critical habitat for the juveniles and adults in the following seasons and provides passage to other pools that might be able to support proliferation. When we did the presentation of the work to the Andover Wetlands Commission and the Conservation Commission, it helped expand on the municipal side of the class that was brought up in prerequisite class to this independent study.

I did really enjoy working with Olivia Lemieux, Hank Gruner, Dr. Barrett and Dr. Wu throughout the entirety of this project. It helped me progress in coordination with a team especially without being in-person due to covid. It will help me reach my goal of working in a pollution control or conservation field in the environmental sciences after graduating from the University of Connecticut.