

CLIMATE ADAPTIVE FOREST MANAGEMENT IN COLORADO

LARIMER AND JACKSON COUNTIES

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PROJECT INTRODUCTION

- Climate change and its impacts to North American forests necessitates forward thinking on the part of land managers and scientists
- In Colorado, climate change impacts and future projections indicate
 - A warmer and drier climate
 - Increased fire frequency and severity outside the historical range of variation
 - Uncertainty as to how forests will persist in the future
- Solid, evidence-based research is falling behind the general understanding of what changes climate change will bring
 - Increased need to find management strategies to directly address the current and future challenges
- The Adaptive Silviculture for Climate Change Network works to implement long term research on the best methods to prepare forests for climate change
 - ASCC organizes experimental treatments around the ability for the forest system in question to withstand (resistance), rebound (resilience) and adapt (transition) to climate change
 - ASCC has 11 sites across the United States, just added one in the Colorado State Forest

INTERNSHIP GOALS

- Compile the newest site's research and project details into an ArcGIS StoryMap and informative web page
- What is a StoryMap?
 - Incorporates different interactive elements like maps, slide shows, and images into one format to help tell a story
- The StoryMap and webpage will help promote this research in the scientific community
 - Also provides education and outreach to others in non-scientific field about the process of experimental forest management

HOW DOES THIS APPLY TO YOUR EDUCATION

- My planned degrees: Natural Resource Management (NRM), Ecological Restoration, Forestry
 - **NRM:** Compiling information and considering many aspects like water resources, timber harvest, climate science, and history
 - **Restoration Ecology:** Entire project was about preparing ecosystems for the future or bringing ecosystems to a healthier state
 - **Forestry:** Learned a significant amount about adaptive silviculture, data collection, and the process of setting up a research plot

WHAT YOU DID

- To start off
 - Began to research the ASCC project—peer reviewed journals and videos on climate change in Colorado
 - Gained knowledge of expected climate changes and forest management tactics in subalpine forests from many, many peer reviewed journal articles.
 - Generally learning how to use GIS and how to code HTML
- Starting to build the StoryMap
 - Began writing a script for how the story would be told
 - Compiling the information was the hardest part because each round of edits brought more conflicting topics and details to be included.
 - 3 rounds of revisions, needed to balance multiple viewpoints and conflicting suggestions
- Began matching images to the text I wrote
 - Created maps and chose images to help visualize data, decided what was in or out
 - Then readjusted the text to better explain topics or to match the images
- Creating the webpage
 - The content was very similar to the content that was intended for a forester audience
 - The only additional steps were to learn how to code and loading small parts of the webpage
- Field Trips
 - One as an introduction to the project and the site
 - The first trip allowed me to learn about how to set up plots at Breast Height, coring, and taking tree heights
 - I also was able to take pictures for the website
 - The second trip allowed me to practice the skills I had learned before as well as learning how to set up plots myself

Figure 1. (image)



View from one of the plots during the second fieldtrip where I got experience cruising and navigating between plots.

WHAT YOU LEARNED

- How general research projects are started and conducted
- I learned a lot about the theory and methods of adaptive silviculture
 - Forestry is not just a tool for timber production and fire management, but for climate management as well
- Learning to take constructive criticism and how to be patient with the revision process
- I am an independent worker first, but working as a group is well within my skillset
 - As I became more comfortable with my mentors, it became much easier to ask for help-- this will carry over into other positions I have

Figure 2 and 3 (images)



Me using a laser rangefinder to take tree heights



A few of the crew members collecting preliminary data for the ASCC State Forest project during my first fieldtrip

NEXT STEPS

- I will continue working on the StoryMap script until it is ready to be published
- The project will continue with vegetation surveys and treatment assignments taking place in Summer of 2022