March 11, 2025

Living Lab Program for Climate Change and Conservation - Final Report

Project title:

Lead researcher(s): Dr. Pam Shaw

Research findings

[Please include key quantitative and qualitative research accomplishments. Bullets are acceptable]

- During the 2024/2025 project year, the research team completed a preliminary microclimate data and red huckleberry leaf onset and fall phenology comparison between the BC Parks sites and non-BC Parks sites.
- With the project spanning across six low elevation sites, we feel we have good foundation to build upon with three study sites representing the CWHxm and three sites representing the CDFmm BEC units. The BC Parks Bowser Ecological Reserve and Koksilah River Provincial Park are essential to this framework, and we look forward to building a complete baseline of all six study sites with continuous years of data collection at each site.

Methods summary

- Deployed field cameras and downloaded microclimate data for both 2024 and 2025 growing seasons at BC Parks sites (Koksilah River Provincial Park and Bowser Ecological Reserve).
- Hired two Vancouver Island University students to analyze and interpret data.
- Expanded database that includes daily phenology and microclimate observations.
- Produced a summary report that includes plot establishment (site description, equipment installation), data collection and analysis methodology, and summary of phenology and microclimate data.

Key outcomes for BC Parks

[e.g., what are the consequences of your research for park values (conservation, recreation, and/or cultural)?, bullets are acceptable]

- Our project aims to increase understanding of ecosystem resilience to climate change to provide practical scientific information to contribute to maintaining and restoring dry coastal ecosystems on southeastern Vancouver Island. When applicable, we will deliver data and reports for the BC Parks and Protected Areas research sites as well as the other comparative plant phenology research sites on Vancouver Island to build a broader landscape understanding of climate change impacts to coastal ecosystems. Our goal is to uphold BC Parks' mandate of protecting natural environments and outdoor recreation by providing detailed information derived from our analysis of plant phenological data. By monitoring the potential changes in our ecosystems due to projected climate shifts, we aim to assist institutions like BC Parks in anticipating the implications for their natural landscapes and operations.

Relevance to BC Parks management

[Provide any recommended steps BC Parks can take to incorporate your project's findings in our day-to-day management of the park system]

- Research sites in BC Parks were established in fall 2020, and we continue to collect baseline data to determine climatic and phenological trends. Over time, we expect that the data collected will begin to illustrate shifts in the timing of the growing season and timing of plant development phases on Vancouver Island, and to project potential impacts of climate change in the study area. Increased understanding of species and ecosystem shifts will contribute to protected areas management into the future. As BC Parks moves forward with climate change research to inform management planning, this research approach may be implemented more broadly to complement/verify projected climate change impacts.

Project's challenges/opportunities

- The greatest challenge the team experienced was technical challenges with the microclimate station at the Bowser Ecological Reserve (BER) research site. We conduct regular maintenance and quality checks after the cameras are deployed in spring. At this time, we found data gaps in the microclimate data. Despite replacing the entire microclimate station last year (the Ministry of Forests contributed a replacement data logger and a new solar panel), we were still having the same issues as previous years with the logger's battery dying shortly after replacing it. To solve this issue, this year we replaced most of the sensors (air temperature, soil temperature, and soil moisture) with a new brand. Thus far, we have not had any more technical issues and do not foresee any more issues in the future.
- Preliminary results based on the 4.5 years of data from BC Parks research sites are showing interesting trends across and between research sites. More data collection will be crucial to develop baseline microclimate – phenology relationships and to project potential impacts to plant growth and survival with climate change. The study is now fully implemented so we are set up to continue data collection to reach the project goals.
- We have been struggling to find sustainable funding for this project. For it to be successful, we need funding for both long-term monitoring to build our data set, as well as funding to synthesize the data.

Conclusions/next steps

- We currently have 4.5. years of data and will continue to search for funding to build our dataset. Now that we have a more robust study design, we can enhance our results generated across southeastern Vancouver Island ecosystems and help to assist with land management of parks over time. Furthermore, Vancouver Island University student involvement will be critical for longer-term data retrieval on site, and to help with microclimate data and photo analysis and interpretation.
- For 2025, we will be deploying the cameras on March 13th and March 17th to capture another full year of data. We will also focus on beginning the longer-term analysis phase of this project after year 5, including projecting potential impacts of climate change.

References and links

[Optional - Provide any other links or information related to the project, including existing blogs, related publications, or other media]

Checklist

- Have you filled out the separate Living Lab Story Form? If not, this is due no later than 30 days after the end of the term of your agreement.
- Have you added any relevant Living Lab project data or reports to the BC Data warehouse and/or EcoCat? Please contact Stephen Ban (Stephen.ban@gov.bc.ca) or Jeanine Bond (Jeanine.bond@gov.bc.ca) for assistance.
- Invoice submitted? An invoice is required to receive the final instalment of your Living Lab transfer agreement funds. The invoice should include:

- the university address,
- the Transfer Payment number (as per your agreement),
- a one-line description of what the project is about,
- the amount due (you may need to send this via your financial arm) and indicate that this is the final instalment. The invoice should follow or accompany the completion of this final report template of which both are due on or before March 17th, 2025. **If we do not receive an invoice from you by this date, we will not be able to issue your final payment.**