Progress Report

Stand and Tree Responses to Late-Rotation Fertilization

CAFS.16.69

Eric Turnblom, Kim Littke, Jason Cross, Mason Patterson, and Rob Harrison (UW)

Kim Littke

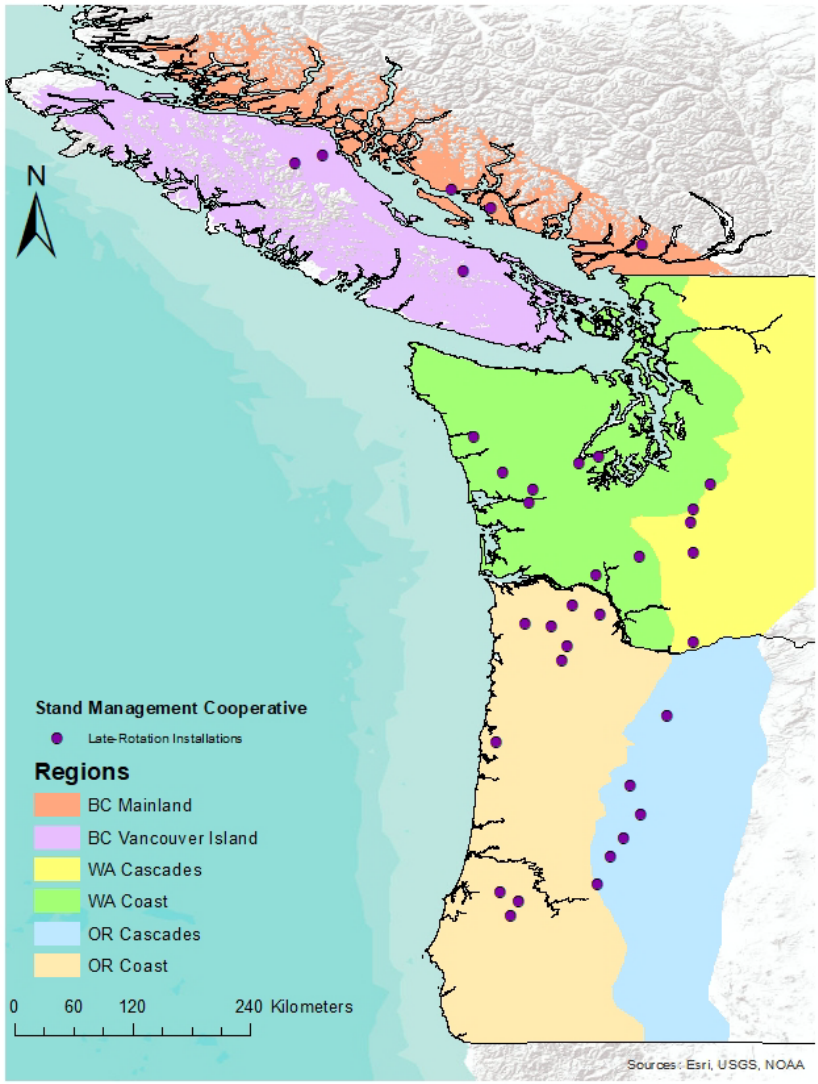
Project Overview

Objectives

- Determine the average, area-based volume response to late-rotation fertilization
- Estimate the regional economic returns of late-rotation fertilization
- Validate the models developed from the CAFS-supported Paired-Tree Study
- Assess the ability to predict response to fertilization using plant root simulator (PRS) probes

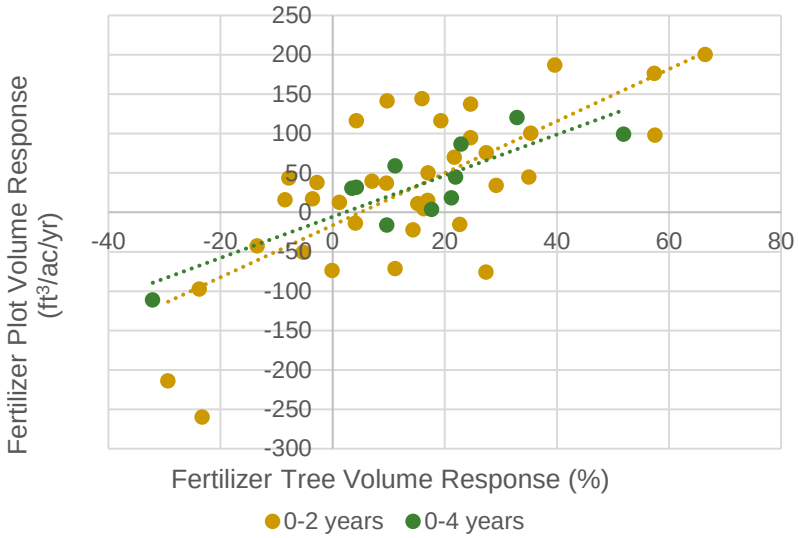
Methods

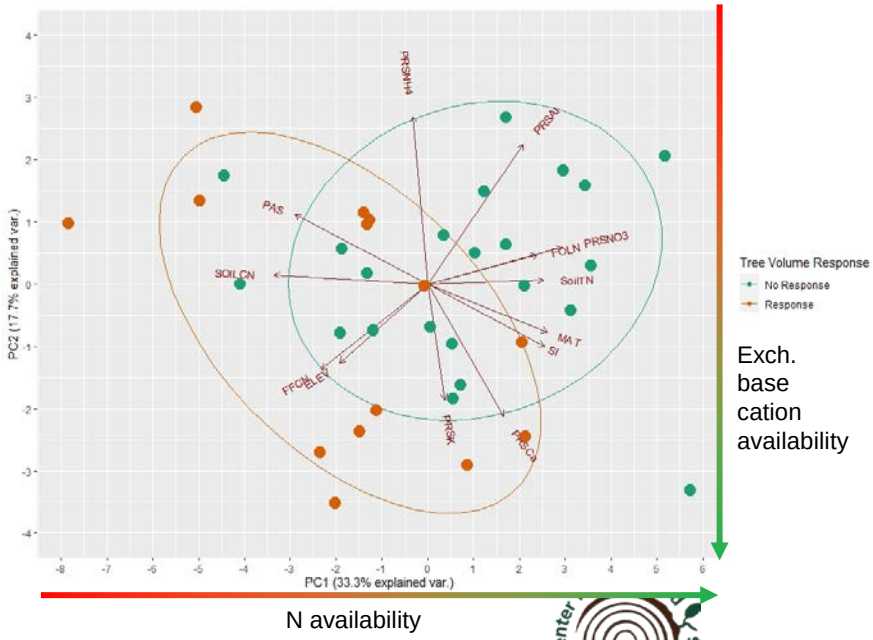
- Established randomly located paired-plot Douglas-fir installations in BC, WA, and OR
- Sampled soil and installed Plant Root Simulator probes prior to fertilization
- Fertilized with urea at 200 lb N/acre
- Measure fertilizer response over 2-8 years and at harvest



Current Progress

- All installations measured for two-year response
  - 11/34 measured for four-year response
- Tree volume response is positively related to plot response
  - Variability is related to difference in mortality after fertilization
  - Mortality in fertilized plots tended to be smaller trees
- Responsive installations have higher elevation and forest floor and soil C:N ratio
  - Lower site index, foliar N, and PRS nitrate and aluminum
  - Best response on installations with high PRS Ca and K





Future Plans

- Remaining 22 installations will be measured for four-year response in Fall 2021 and 2022
- Four installations destroyed by fire or windstorms
    - New installations will be established in Spring 2022
- Spring 2022: Prepare manuscript describing relationships between PRS nutrient adsorption, soil and site productivity, and 4-year fertilizer response