Progress Report

INTERN: Improving Forest Sample Estimation Through UAS Canopy Structure Stratification

Project Code: CAFS.21.90

Mark Kimsey, University of Idaho
Logan Wimme, University of Idaho

Presenter: Logan Wimme, University of Idaho

Project Overview

o Collaboration with WA DNR, Landvest, and University of Idaho
   o Peter Gould, WA DNR
   o Weikko Jaross, Landvest

o Mentorship
   o Learn from experienced professionals
   o Participate in weekly team meetings
   o Feedback on my performance

o **Objective:** Evaluate the use of UAS to improve traditional stand inventories through photogrammetric stratification of imagery derived canopy height models

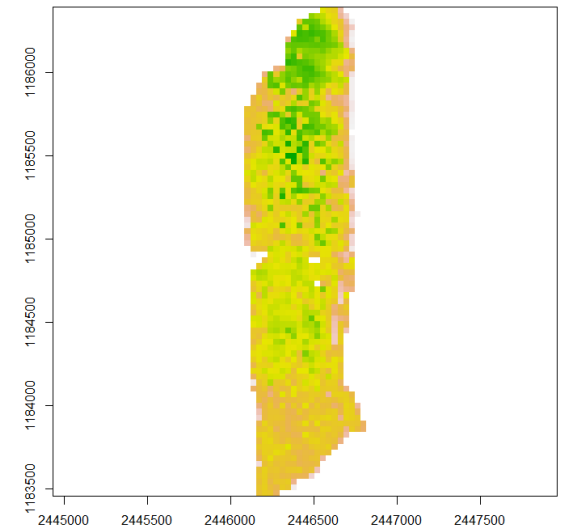o **Goal:** Increase accuracy and reduce cost of traditional inventories

Project Overview

o **Methods:**
  - o Six stands selected
    - o 3 Westside, 3 Eastside Washington
  - o Aerial imagery collected with DJI Mavic 2 Pro drone
  - o Agisoft Metashape software used to generate 3D point cloud from imagery
  - o 3D point cloud used to create canopy height model (CHM)
  - o Rasterized height pixels from CHM clustered to identify within-stand strata
  - o Sample sizes created for each strata according to within strata variability and strata size
  - o Plots randomly placed within strata
  - o Plots cruised and compared to cruise results of traditional/current inventory methods

o **Six sites selected**
  - o Capra U2 (48 ac)
  - o Oxbow U2 (14 ac)
  - o Oxbow U5 (9 ac)
  - o Q Wild Wood U1 – (93 ac)
  - o Q Wild Wood U3 – (34 ac)
  - o Q Wild Wood U4 – (3 ac)

o **Drone flights completed**

o **Canopy stratification completed**

o **Stratified plots generated**

o **Stratified cruises completed**

o **Traditional cruises completed**
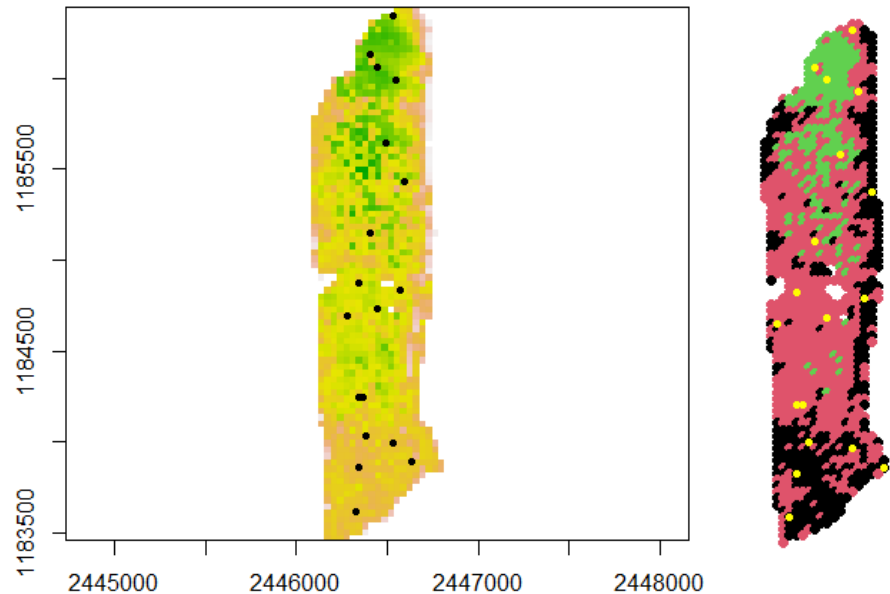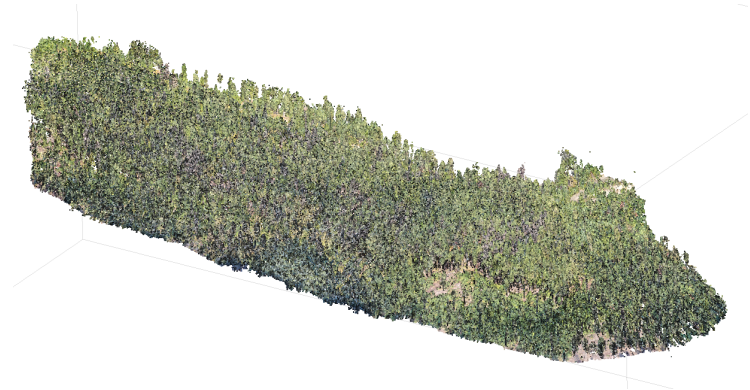
- Obtain volume estimates from DNR (traditional)
- Compare volume estimates (traditional vs stratified)
- Conduct cost analysis
- Assess effectiveness of UAS stratification approach
  - Did we meet our goal?
  - Can this become operational?