Progress Report

Integrating SAE methods with stand-level forest inventory and growth projection for southern pine plantations

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Project Overview

Main objective:

To evaluate the applications of unit-level SAE techniques in improving the stand-level inventory and model projection systems for southern pine plantations.

Phase I

Forest inventory at a specific point in time

Detailed information for the targeted populations under different forest conditions at a specific point in time.

For example, obtaining finer details of a stand, especially in areas with limited or no ground samples.

Phase II

Growth projection between two inventory points

Applicability of using past inventories and/or historical remote sensing data as auxiliary information to update the estimates of variable of interest at time II.

Current Progress

Graduate Student Recruiting:

- One PhD student, Prajwol Subedi, started on June 1, 2025
- One post-doctoral researcher, Nawa Pokhrel, is expected to start on August 1, 2025
- Searching for one more graduate student, possibly in Institute of Artificial Intelligence.

Data compilation:

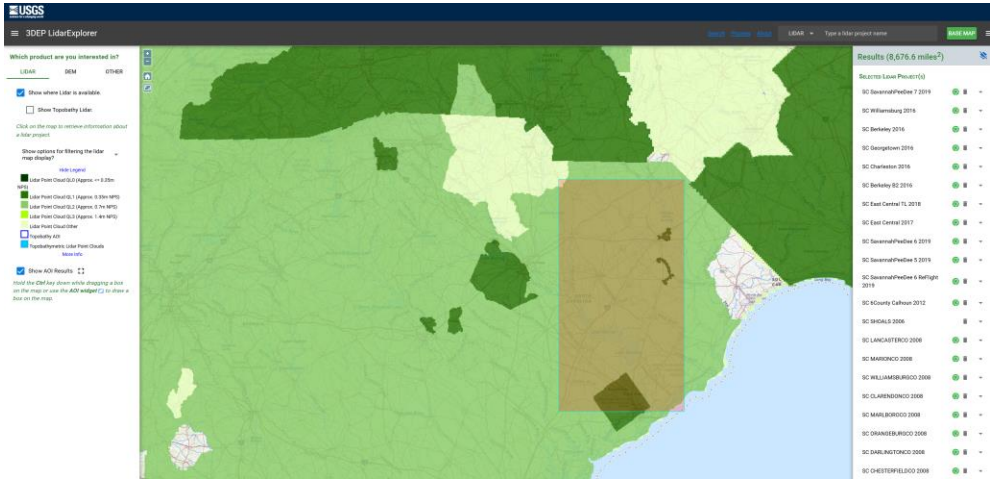
- Waiting for another MOU to be signed
- Wateree data from South Carolina provided by Forest Investment Associates (FIA) and American Forest Management (AFM)

Current Progress

Wateree data (FIA & AFM)

1. Ground inventory data: 1314, 1/10th-acre circular plots. Plot location is recorded with a typical below canopy GPS accuracies of 3-5 meters.

2. Lidar data: 2019 Lidar acquisition in SC downloaded from 3DEP LidarExplorer (SC SavannahPeeDee 2019).



Current Progress

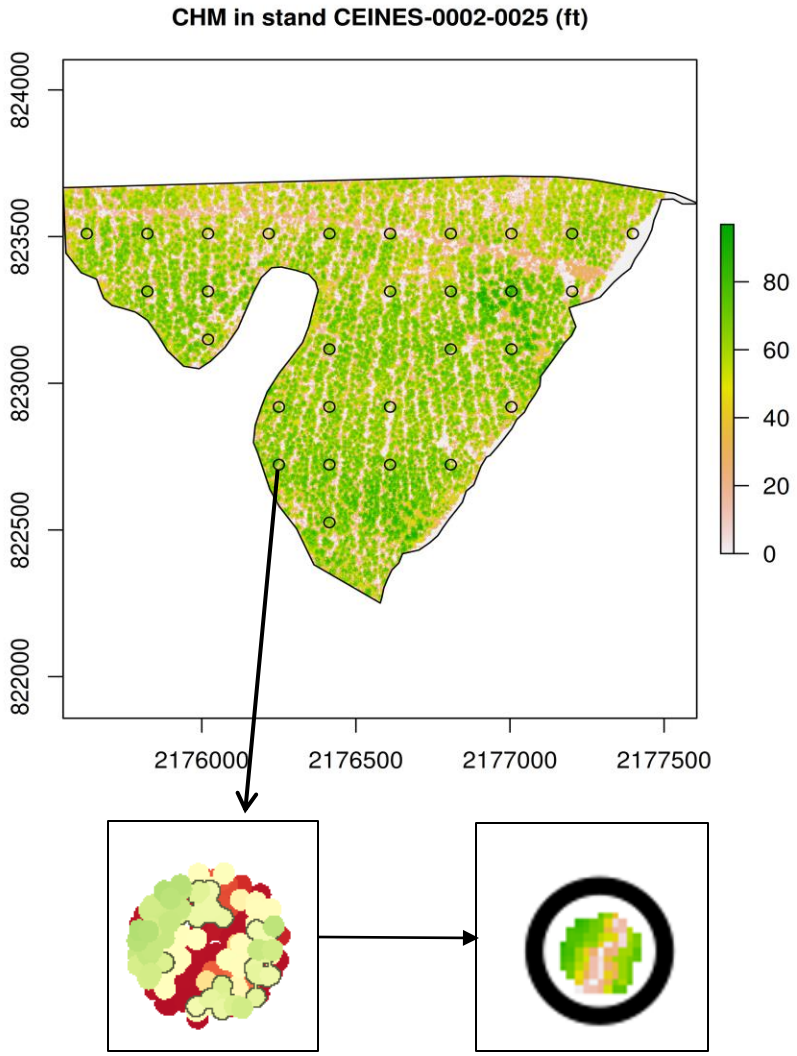
Canopy height model (CHM) construction

1. Wall-to-wall CHM derived from Lidar point cloud with the resolution of 1 m.

2. Number of pixels per plot
   Total 24 stands
   Plot number: 28 ~ 92 per stand
   mean pixel number: 326 ~ 358 per plot

3. CHM bins: proportion of ground area covered by 10-foot height class
   (0-10], (10-20],…, (80-90], (90-100]

4. Other details of CHM construction.



Future Plans

Examine the unit-level SAE model performance for different stand variables with the Wateree dataset

Request additional data from other industry partners

Recruit additional students for the project