ForestSAT 2026

Association for Forest Spatial Analysis Technologies

May 4-8, 2026 | Gainesville, Florida, USA

Title: Wall-to-Wall canopy metrics from Airborne Laser Scanning data using open-source tools

Instructors/Affiliation:

- Dr. Jeff Atkins, Virginia Commonwealth University
- Dr. Inacio Bueno, University of Florida

Description: This workshop provides a hands-on introduction to generating wall-to-wall canopy structural metrics from Airborne Laser Scanning (ALS) data using open-source R tools. Participants will learn the ecological and statistical foundations of LiDAR-derived canopy metrics, as well as practical skills for processing. las point clouds into usable products. The training covers cloud quality checks, normalization, terrain and canopy modeling, metric derivation, and spatial interpolation to create continuous raster-based representations of forest structure. Through lectures, coding demonstrations, and guided exercises, attendees will gain the expertise to compute, analyze, and visualize canopy metrics and apply them to ecological questions such as biomass estimation, forest type classification, and disturbance assessment.

Learning Objectives:

- Import and inspect ALS point cloud data in R.
- Build terrain and canopy height models.
- Derive standard and custom canopy metrics.
- Interpolate metrics into raster maps and visualize results.

Target audience: Graduate students, researchers, and professionals in forestry, ecology, and remote sensing who want to learn how to process ALS data into canopy metrics using open-source methods. Participants should have basic knowledge of R.

Format & Activities:

- Short lecture introducing forest structure and LiDAR-derived metrics.
- Live demonstrations of ALS processing workflows in R.
- Hands-on coding exercises with .las files.
- Guided practice in building CHM and DTM, normalizing point clouds, and filtering outliers.
- Calculation of standard and custom canopy metrics.
- Exercises on interpolating metrics into raster surfaces.
- Visualization, plotting, and comparison of results.
- Interactive Q&A and discussion.

Expected outcomes: Participants will leave the workshop with both theoretical and practical understanding of how to derive canopy structural metrics from ALS data. They will have the skills to process raw LiDAR point clouds, generate terrain and canopy models, compute a variety of metrics, and create wall-to-wall raster-based maps.

Language: English

Requirements: Computer with R studio installed.

Schedule: March 05, 2026, 9:00 AM – 2:00 PM (EST)

Duration: 4 hours.

Instructor Biography: Jeff Atkins is an Assistant Research Professor at Virginia Commonwealth University. He studies forest structure, disturbance, and climate responses, applying remote sensing tools such as terrestrial laser scanning and UAV imagery. He also leads ForestMicroNet, a USDA-funded forest microclimate network in the southern US. Dr.

Inacio Bueno is a postdoctoral researcher at the University of Florida with expertise in remote sensing, data science and forest modeling.

Agenda

Eastern Time (ET)	**Topic**	**Instructor**
9:00 – 10:00 AM	Introduction and data handling	Jeff Atkins
10:00 – 11:00 AM	Terrain and canopy models	Jeff Atkins
11:00 – 12:00 AM	**Break**	
12:00 – 1:00 PM	Deriving metrics	Inacio Bueno
1:00 – 2:00 PM	Mapping and visualization	Inacio Bueno