



Center for Advanced Forestry Systems 2021 Annual Meeting Project Final Report



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PROJECT ID: CAFS.18.74

PROJECT TITLE: Environmental predictors of form and quality.

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PROJECT DESCRIPTION:

This project evaluates the impact of environmental variables in the formation of taper and defects for commercial forest plantations.

HYPOTHESES or OBJECTIVES:

It is well known that the size of the canopy has an impact in wood formation rate, hence influencing the form of trees planted on a given site. The magnitude of canopy formation is a function of site resources; therefore, it is hypothesized that areas with different access to water throughout the day will have different canopy sizes, hence determining different taper and or stem quality patterns.

METHODS:

Trees are going to be characterized using a ground-based Lidar to estimate changes in diameter along the stem of the trees. A taper equation including exogenous variables will be calibrated and tested against independent data. Likewise, ramicorns and forking will be also evaluated as a function of site characteristics. A parameter prediction method will be developed using generalized additive models as function of major climatic variables.

MAJOR FINDINGS:

Taper is affected by water deficit patterns in Georgia.

Ramicorns are affected by both water deficit and water availability.

Generated the methodology for a new taper equation approach that can identify these changes.

DELIVERABLES:

A taper equation fitting protocol using the Kilkki system of equations was developed to be applied by the CAFS members.

Maps of parameters for taper and for defects are made available to members.

Two master thesis were finished under this project.

MEMBER COMPANY BENEFITS:

Identifying the variables that determine changes in taper allows for the utilization of localized functions to further improve volume estimation.