

# PRECISION SILVICULTURE IN THE 21ST CENTURY: LINKING GIS AND REMOTE SENSING TO DEVELOP SITE SPECIFIC SILVICULTURAL REGIMES IN SOUTHERN PINE PLANTATIONS

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## Abstract

Precision forestry systems are being developed for pine plantations in the Southern United States by the Forest Nutrition Cooperative to improve the sustainability, productivity and profitability of forest management. Precision silviculture requires foresters to develop site specific prescriptions for different portions of individual stands. This presentation illustrated the applications of GIS and GPS technology using data on soils and stands, including remotely sensed data, to develop and implement precision silvicultural practices in the southern United States. This presentation detailed the work that has been done to develop the fundamental links between soils, geology, climate and species needed to make precision silviculture a reality. In this approach, climatic conditions (solar radiation, temperature, rainfall) are used along with species-specific ecophysiological parameters (photosynthesis, respiration, carbon allocation) to produce spatially-explicit, site-specific estimates of forest productivity based on detailed land classification systems that integrate geology, topography and soils data. Leaf area estimates obtained from Landsat satellite imagery are input into 3PG, an ecophysiological based process model of forest growth, to predict potential productivity, identify the climatic and soil factors that limit growth, and determine the potential response to silvicultural treatments designed to ameliorate these limiting factors. The work that has been done to develop and test this approach with *Pinus taeda* in the southern United States will be illustrated.

[Abstract Only]

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