

Evaluating Synthetic Aperture Radar (SAR) for forest operations

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ABSTRACT

Studies in the past decade have investigated the relationship between forest biomass and synthetic aperture radar(SAR) backscatter. SAR uses an active sensor emitting pulses of microwaves which scatter upon contact with terrestrial structures. The relatively long microwaves can penetrate cloud cover, and to a limited extent, vegetative canopies giving rise to an interaction with woody stems and boles. Hence, in addition to canopy structure, backscatter has the potential to characterize forest biomass. A study was performed on The Timber Company timberlands in southeast Georgia to evaluate the relationship between forest biomass and radar backscatter. P-, L-, and C-Band multipolarized SAR data was acquired by the Jet Propulsion Laboratory from a high-altitude aircraft. The radar data were analyzed against average stand basal area, height and stand biomass for 32 stands. A least-squares approach was used to develop equations predicting forest biomass from radar backscatter.