

Forest Structure at Five LBA Study Sites

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Insufficient knowledge of the spatial distribution of forest biomass in the Amazon limits the accuracy of estimates for carbon release resulting from deforestation. Recent research has attempted to improve the estimation of Amazon forest biomass through detailed analysis of extensive plot studies, remotely sensed variables, and knowledge of regional soils and climate. Because plot surveys are scarce, remote sensing offers an alternative approach to improve our knowledge of regional biomass. Remotely sensed variables are sensitive to underlying forest structural properties. We measured forest structure variables during field studies at five old growth forest sites in the Brazilian Amazon. The data collected included the frequency of stem diameters, tree heights, and crown diameters. Above-ground biomass at the sites ranged from 155 to 297 Mg ha⁻¹ using an allometric equation developed by Chave et al. (2005) based on tree diameter at breast height (DBH), total height, and wood density. A single Weibull function based on DBH for 1539 trees fit total tree height with a small uncertainty (RMS error = 1.2 m) and a minimal bias (mean of residuals = -0.2 m) for all sites. These results suggest that remotely sensed tree height may be a useful predictor of forest biomass at a regional scale.

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