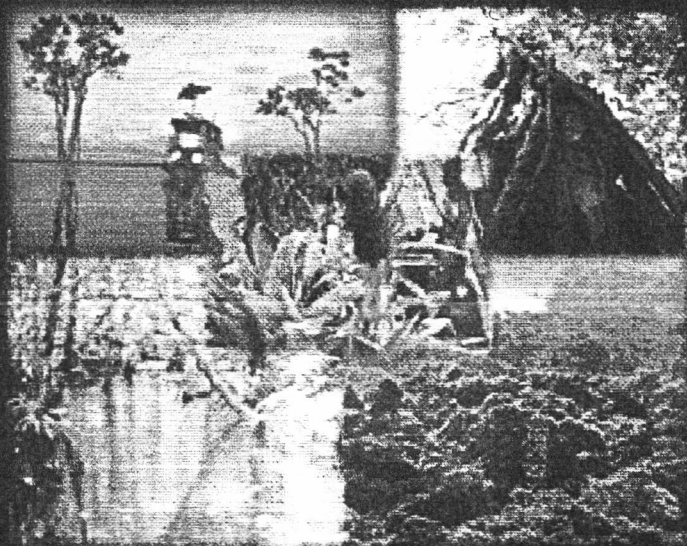


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Coarse Woody Debris in Logged and Undisturbed Forests: Determination of Stocks Using a New Methodology for Wood Density and Void Estimation

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Coarse woody debris (CWD) can make up a large proportion of carbon stocks in tropical forests. Knowledge of the stocks and fluxes of CWD is needed for modeling carbon budgets in these forests. We measured the CWD stock in two Amazonian forests in Para, Brazil: the Tapajos National Forest, (3.08ES, 54.94EW) and the Fazenda Cauaxi, (3.75ES, 48.37EW). Measurements were conducted under two logging practices (reduced-impact and conventional logging) and a relatively undisturbed forest. We sampled CWD volume by line-intersect sampling. Wood density was determined using a unique plug extraction technique for 5 wood decay classes for diameters greater than 10 cm. All samples less than 10 cm diameter were lumped into two smaller classes, 2-5cm and 5-10 cm. We analyzed digitized photographs of radial log sections in order to estimate void spaces for all density samples. Wood density for five decay classes from fresh to rotten were 0.62, 0.72, 0.63, 0.58, and 0.29 g cm⁻³. Densities for smaller classes were 0.36 g cm⁻³ and 0.45 g cm⁻³ for 2-5 cm and 5-10 cm diameter classes respectively. The proportion of void space for decay classes 1 to 5 were 0.02, 0.01, 0.09, 0.19 and 0.27. Total CWD volume and preliminary mass estimation at Cauaxi was 110 m³ ha⁻¹ and 55 Mg ha⁻¹ for undisturbed forest, 191 m³ ha⁻¹ and 109 Mg ha⁻¹ for conventional logging, and 144 m³ ha⁻¹ and 75 Mg ha⁻¹ for reduced-impact logging. Total volume and mass estimation for Tapajos was 117 m³ ha⁻¹ and 52 Mg ha⁻¹ for undisturbed forest, and 116 m³ ha⁻¹ and 54 Mg ha⁻¹ for reduced-impact logging.