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LEAF AREA INDEX MEASUREMENTS AT CAXIUANÃ FOREST AND AT BRAGANÇA MANGROVE IN PARÁ STATE

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Leaf area index (LAI) is a major control on land surface exchange rates of energy and carbon. Field measurement of LAI is critical both for parametrizing models for scaling up leaf gas exchange to the canopy level and for use in calibrating remote sensing information on canopy structure. In this study, we characterized LAI in three sites in the primary rain forest of Caxiuanã National Forest, and at a mangrove forest on the coast near Bragança, Pará State. The data collection occurred during a field campaign in November 2001. We collected data with a pair of LAI-2000 canopy analyzers (LI-COR). In Caxiuanã forest, we sampled two 1 ha plots (a Control and a dry-down or 'Esecaflor' site) on a 10 m $\times$ 10 m grid. We also sampled four 100 m transects at 10 m spacing near the eddy flux tower. We obtained the vertical distribution of LAI for each Caxiuanã forest site by recording LAI at successive levels on canopy access towers. In the mangrove forest, we collected forty samples at 5 m spacing near the eddy flux tower. Results from Caxiuanã showed that mean LAI was similar for Control (5.41) and Esecaflor (5.46). The LAI profile in the Control plot varied linearly from 4.64 at 2 m to 2.57 at 30 m height. There was a similar pattern at the Esecaflor plot, which varied from 4.58 at 2 m to 2.01 at 30 m. The tower site had higher LAI values than the first two plots, with a LAI average of 5.70. The LAI profile at the tower site varied non-linearly, from 5.57 at 2 m to 1.1 at 30 m height. Compared to the rain forest, the mangrove site had low LAI values (2.73), reflecting the lower density of trees, and also the occurrence of tide channels. The two experimental plots at Caxiuanã forest have similar patterns of horizontal and vertical LAI distribution and these patterns seem to be different from tower site. The mangrove forest site had distinctly different characteristics from the rain forest, reflected in low LAI values. With these data, we can now examine how differences in C and energy exchange in mangrove and rain forest, as recorded by eddy covariance, are related to differences in canopy structure.