Topics: Forest Biomass

Title: Biomass mapping of tropical evergreen forest by airborne LiDAR

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Abstract:

Forest biomass is one of the worldwide concerns in forest management, especially for REDD+. Because tree height is known as the most important parameter for biomass estimation, airborne LiDAR is often used to measure canopy height and forest structure parameters. This report shows the results of estimation of terrain condition and above ground biomass estimation as well the transformation from LiDAR point data to image data. The study area was the tropical evergreen forest in Amazon. The ground survey data of DBH of each tree (about 5,000 trees), length of fallen trees along the sites and ground level were obtained at two permanent transect sites of 20 m \* 2.5 km. An image with pixel size of 50 cm were created from the airborne LiDAR with 20points/m2. Canopy height and ground profiles were obtained but we found that certain terrain shapes influence the accuracy of ground level and canopy height. Then forest biomass was estimated and mapped from the canopy height image by the comparison with the ground. A pair of LiDAR data with four year difference could show the ecosystem dynamics, such as death and growth of individual tree. These results were used for biomass mapping of whole Amazon forest combined with satellite LiDAR data and global dataset of MODIS.