

Poster #1-51**Biomass Accumulation in Second Growth Forests of Puerto Rico Using Airborne Lidar**

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Second-growth tropical forests provide important ecosystem services, such as carbon sequestration and soil stabilization. Understanding the patterns and controls of biomass accumulation in second-growth tropical forest landscapes is therefore key for advancing ecological research and earth system modeling. Here, we present an update on our efforts assessing rates and controls of second-growth forest biomass accumulation following land use abandonment across Puerto Rico. In 2017, prior to the recent catastrophic hurricanes, we surveyed the highly heterogeneous landscape dominated by second-growth forests, using a combination of field data and airborne lidar from the NASA G-LiHT imager. We estimated regrowth rates by comparison of current biomass stocks with existing detailed maps of land use history. We developed a lidar-biomass calibration model based on FIA forest inventory data. That model was applied to lidar data spread across Puerto Rico to produce biomass estimates for ~32,000 ha of forests at 26 m resolution. We developed a preliminary multivariate analysis of rates and controls of forest regrowth following land abandonment, considering gradients of soil fertility, topography, climate, and forest age. Knowledge gained from our analysis is important for improving the representation of processes controlling tropical forest carbon in Earth System Models such as E3SM-FATES.