

## Poster #9-27

### Quantifying Forest Degradation Using GLAS Lidar

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In order to provide useful analysis and predictions of the global carbon cycle, Earth System models require information on forest structure. For demographic models, this requires tree number density according to size class. For regions of the Earth with detailed forest inventories, it is possible to initialize and test models based on inventory data. Unfortunately, large-scale, accurate, and current forests inventories are not available for vast regions of tropical forest. One potential source for future forest structure information is the GEDI Lidar that is expected to be deployed to the International Space Station in May 2019 and subsequent forest structure data as called for by the recent NASA Earth Science Decadal Survey. We explore lidar data from the GLAS Sensor onboard the ICESat satellite that operated from from 2003 to 2009. These distributions of power density in the retrieved lidar waveforms represent forest structure integrated over the lidar footprints (60 - 80 m diameter). These distributions (or metrics of the distributions) are compared for areas of intact forest in demarcated reserves with areas that have been identified as deforested or degraded by forest fire within Brazil. Active fire locations are from NASA's Fire Information for Resource Management Systems (FIRMS) for the period of 2003-2009 and are based on MODIS active fire signals. Higher resolution burn patterns that combine Landsat and MODIS data (such as the BDR algorithm or Imazon's burned area product) are also compared for limited time periods or areas as available.