Long-term impacts of selective logging on Amazon forest dynamics from multi-temporal airborne lidar

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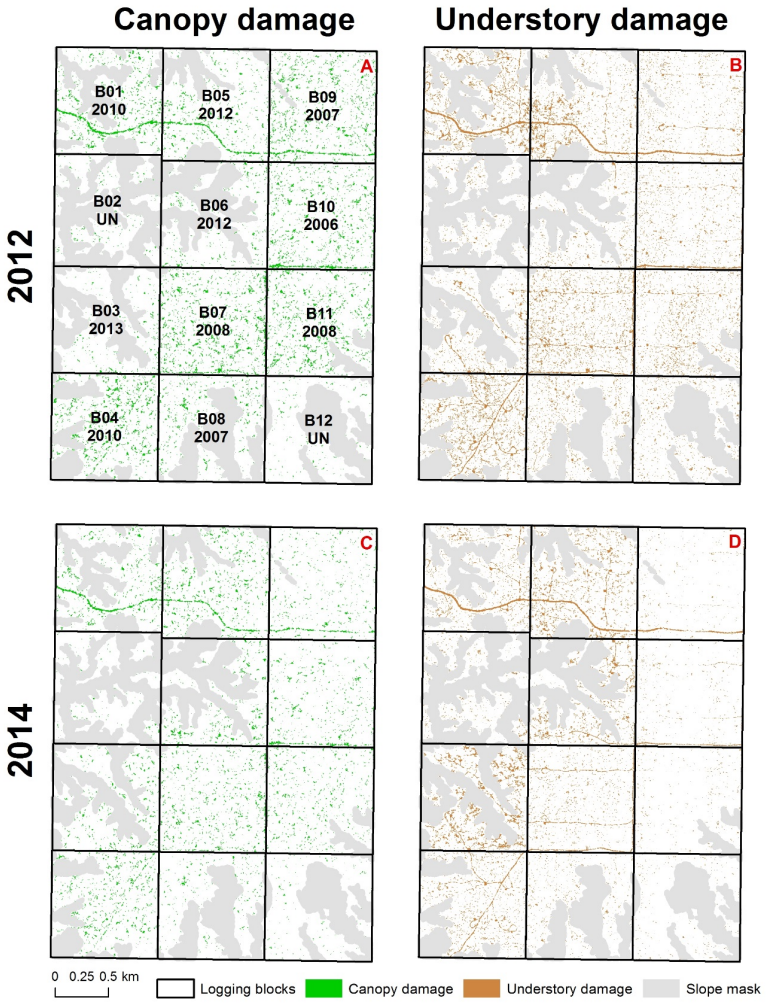

Fig. 1. Canopy gaps (green) and understory damage (brown) detected in 2012 and 2014 airborne lidar data for logged and unlogged (UN) 100 ha blocks in Paragominas, PA Brazil.

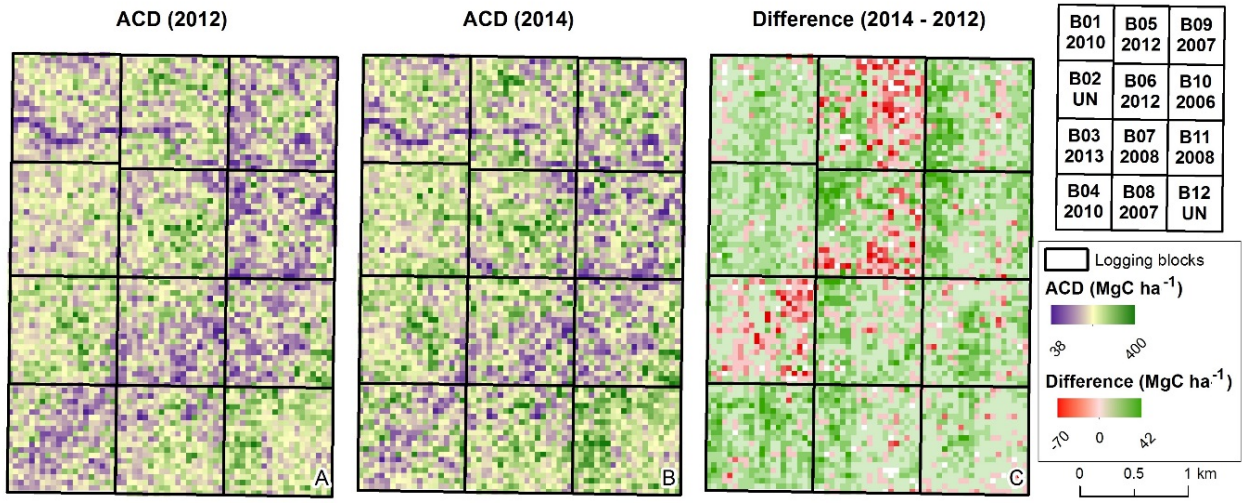

Fig. 2. Differences in estimated aboveground carbon density (ACD) in 2012, 2014 highlight the heterogeneity of carbon losses from recent (2012-2013) and older logging activities (2006-2010).

- Lidar-derived estimates of canopy turnover and gap formation remained elevated in logged forest for at least 8 years following harvest, delaying carbon recovery.
- 75-90% of new canopy damage in previously-logged forests was <5 m from understory damage, an indicator of collateral damage, even from reduced-impact logging (RIL).
- By contrast, rapid regrowth in skid trails and log decks erased the signature of understory damage in lidar data within 3-5 years following harvest.
- Carbon losses from reduced-impact logging between 2012-2014 lidar collections averaged 10.4±1.9 Mg C ha^{-1}.