

June 23-27, 2013

50TH ANNIVERSARY MEETING

ASSOCIATION FOR TROPICAL BIOLOGY AND CONSERVATION
& ORGANIZATION FOR TROPICAL STUDIES

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Tropical forest degradation and carbon stocks: Insights from a large scale field assessment

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Americas B-C (Herradura San Jose)

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Tropical forest research and conservation have been predominantly focused on the impacts of deforestation. However, vast areas of humid tropical forests are degraded by logging and wildfires every year. As a result, there is an urgent need to determine how different processes of forest degradation, as well as their combined effects, impact the ecology of human-modified tropical forests, including their ability to conserve carbon stocks. Nevertheless, the majority of research on carbon stocks in degraded forests has been limited in spatial scale, and focused on only one type of human impact. Here we present the results of a large scale study on the impacts of forest degradation on above and belowground carbon stocks in two different regions of the Eastern Brazilian Amazon, sampling 231 0.25 ha plots. Degradation type (logged, burned and logged and burned forests) and distance to forest edge were the two most important drivers of aboveground carbon stocks in degraded forests. The combination of both logging and wildfires resulted, on average, in a loss of 55% of aboveground carbon stocks compared to undisturbed forests. Large trees (≥ 30 cm DBH) stored the greatest amount of carbon, but were also the most vulnerable to the impacts of logging and burning with a loss of 65% of their total carbon stocks in severely degraded forest. Soil carbon stocks were seemingly unaffected by forest degradation. Forests already degraded by past logging and fire need urgent attention as they are particularly susceptible to additional degradation events, which can potentially create a positive feedback of carbon collapse and increase greenhouse gases emissions. Conservation policies and climate mitigation actions, such as REDD+, will remain limited in their effectiveness unless they tackle both forest degradation as well as deforestation.

Presentations

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Meeting Information

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