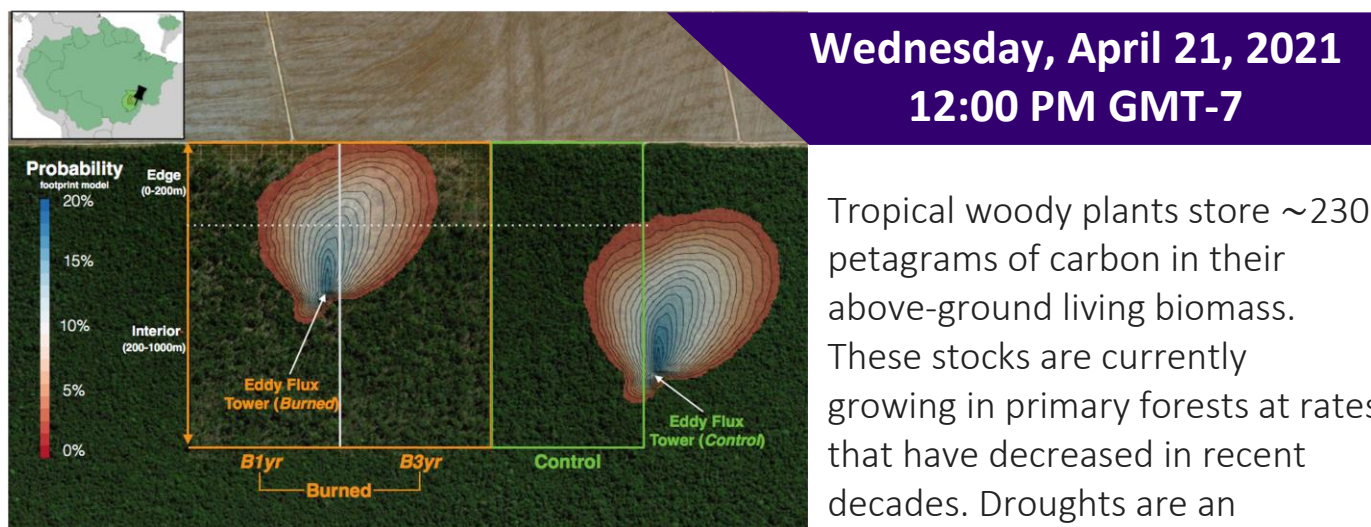


Biology Seminar

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A Thirsty future: will tropical forests survive with more droughts and fires?



Tropical woody plants store ~230 petagrams of carbon in their above-ground living biomass. These stocks are currently growing in primary forests at rates that have decreased in recent decades. Droughts are an important mechanism in reducing

forest carbon uptake and stocks by elevating tree mortality, increasing autotrophic respiration, and promoting wildfires. With continued climate change, the intensity and frequency of droughts will likely increase, with land-use change intensifying their effects. It is unclear at what point the impacts of severe, repeated disturbances by drought could exceed tropical forests' capacity to recover. Although specific threshold conditions beyond which ecosystem properties could lead to alternative stable states are largely unknown, the growing body of scientific evidence points to such threshold conditions becoming more likely as climate and land use change across the tropics. A major cause for concern is that forest responses to fire and drought can be abrupt and catastrophic. Focused field observations, experiments, and improved numerical models are critical for significantly improved understanding of tropical forest responses to future perturbations related to changing climate and drought and fire frequency and intensity.

