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### MODELING THE IMPACTS OF DROUGHT-FIRE RELATIONSHIP ON CARBON STOCKS IN AMAZONIA

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The large amount of carbon stored as biomass in the Amazon Basin makes this area a critically important component of the global carbon cycle. Its importance is compounded by the vulnerability of these carbon stocks to drought, fire and other disturbances. The responses of forests to drought-fire disturbance have important implications for tropical forest structure, biodiversity, and ecosystem processes. During recent years understory fires have affected large areas of Amazon forest, especially for the southeastern Amazon forest, during severe droughts. However modeling fire in tropical forests is still at an early stage. There are only few models of fire for the Amazon, and all of them attempt to describe the risk of fire rather than measure fire impact on carbon stocks by forest degradation (increased tree mortality, reduced tree growth). Most of the existing ecosystem models used to predict potential forest disturbance in Amazonia only accounts for the effects of climate forcing, although the interaction between fires and droughts is perhaps a more direct mechanism of abrupt forest degradation. In this study we focus on evaluate the potential responses of Amazonian vegetation, using a dynamic forest carbon model, Fire-CARLUC (De Faria et al. 2017) then we estimate the effects of drought-fire interactions on fire-induced forest degradation. We performed three experimental runs under three historical droughts (2005, 2007 and 2010). This anomalously dry and hot microclimate condition and an increased fuel loads generate by Fire-CARLUC drought component, suggest an high severity fires consequently high tree mortality rates with potential killing up to 40% of the trees. Combined these synergistic effects of drought on forest flammability, may strongly influence the stability of tropical forests. .