Improving predictions of Amazon forest dynamics with a new phosphorus cycle model

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Tropical forests represent a large sink of carbon, however, the future of this sink in response to changing environmental conditions such as temperature and increased droughts is uncertain. Dynamic global vegetation models (DGVMs) are currently used to predict the response of forest carbon to these climate variables. The models predict that rising atmospheric CO_2 concentrations will mitigate the negative impacts on vegetation carbon of higher temperatures and increasingly drier dry seasons in the Amazon. However, the response of tropical forests to rising CO_2 concentrations is still uncertain. Nutrient availability, particularly phosphorus (P) may act to constrain this predicted fertilization effect. I will present work on the development of a dynamic soil phosphorus model evaluated with P observations across the Amazon basin. The model will initially be coupled to an individual, trait-based forest model (TFS) (Fyllas et. al. in prep), which is tailored to be used alongside permanent sample plots in the Amazon.