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Modeling Carbon and Functional Diversity Recovery in Central African Secondary Forests Using Canopy Structure

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Central african forests are subject to increasing anthropic disturbance, with slash and burn agriculture and wood extraction as the leading causes of disturbance. The extent of resulting fallows and secondary forests are currently poorly investigated in the region while they are crucial to map and to monitor to better understand forest state, functioning and potential recovery of the second largest tropical forest of the world.
In this study, we explore the hypothesis that recovery rate of carbon and functional diversity can be modelized by change in canopy structure. To estimate the carbon recovery rate in secondary forest, 15 permanent forest inventories of 1ha each are conducted in the Mabali research centre of the Equateur province in DRC. We use space for time substitution method to create a chronosequence covering forests of different ages and/or different types of past disturbance. UAV's LIDAR data acquired during the field campaign over the plots and the surrounding forest are processed to extract meaningful canopy features. By exploring the relationship between forest structure and forest recovery rate, we aim to deepen the understanding of the complexity of secondary forests and provide datasets for the calibration of Land Surface Modeling and satellite-based biomass estimation.