



Modeling forest biomass of the Congo basin from extensive commercial inventories

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Mapping the vegetation Carbon stocks is crucial to understand the global climate change. The Carbon stock maps have direct implications in economy and environmental policy. This is especially true in tropical forests where most of the uncertainties on carbon fluxes and stocks are concentrated. Substantial efforts have been done recently to map forest carbon in tropical areas, especially by using remote sensing-based approaches.

However, there is no way to bypass a calibration step where biomass is locally measured through forest inventories. The great importance of this learning step and its possible issues has been documented, highlighting the importance of terrestrial datasets.

In our work, we have gathered a very large dataset of forest inventories covering the Congo Basin. It consists of 73 000 0.5ha plots of commercial inventories covering 4 million hectares in Cameroon, Republic of Congo, Gabon, Central African Republic, and the Democratic Republic of the Congo. These terrestrial data are of great value to understand and model the spatial distribution of various forest properties, among which the Carbon stock. They can also make a great tool to control and improve the performance of the remote sensing methods.

In our study, we rely on these plots to test the validity of previously published pantropical Carbon maps. After gathering the data with extra care due to the heterogeneous inventory methods, we used bioclimatic models, topography, and remote sensing observation to extrapolate the forest carbon estimates at the Congo basin scale.