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The nitrogen budget for different forest types in the central Congo Basin

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Characterization of fundamental processes in different forest types is vital to understand the interaction of forests with their changing environment. Recent data analyses, as well as modeling activities have shown that the CO_2 uptake by terrestrial ecosystems strongly depends on site fertility, i.e. nutrient availability. Accurate projections of future net forest growth and terrestrial CO_2 uptake thus necessitate an improved understanding on nutrient cycles and how these are coupled to the carbon (C) cycle in forests. This holds especially for tropical forests, since they represent about 40–50% of the total carbon that is stored in terrestrial vegetation, with the Amazon basin and the Congo basin being the largest two contiguous blocks. However, due to political instability and reduced accessibility in the central Africa region, there is a strong bias in scientific research towards the Amazon basin. Consequently, central African forests are poorly characterized and their role in global change interactions shows distinct knowledge gaps, which is important bottleneck for all efforts to further optimize Earth system models explicitly including this region. Research in the Congo Basin region should combine assessments of both carbon stocks and the underlying nutrient cycles which directly impact the forest productivity. We set up a monitoring network for carbon stocks and nitrogen fluxes in four different forest types in the Congo Basin, which is now operative. With the preliminary data, we can get a glimpse of the differences in nitrogen budget and biogeochemistry of African mixed lowland rainforest, monodominant lowland forest, mixed montane forest and eucalypt plantations.