



## **Simulating tropical carbon stocks and fluxes in a changing world using an individual-based forest model.**

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Large areas of tropical forests are disturbed due to climate change and human influence. Experts estimate that the last remaining rainforests could be destroyed in less than 100 years with strong consequences for both developing and industrial countries.

Using a modelling approach we analyse how disturbances modify carbon stocks and carbon fluxes of African rainforests. In this study we use the process-based, individual-oriented forest model FORMIND. The main processes of this model are tree growth, mortality, regeneration and competition. The study regions are tropical rainforests in the Kilimanjaro region and Madagascar.

Modelling above and below ground carbon stocks, we analyze the impact of disturbances and climate change on forest dynamics and forest carbon stocks. Droughts and fire events change the structure of tropical rainforests. Human influence like logging intensify this effect.

With the presented results we could establish new allometric relationships between forest variables and above ground carbon stocks in tropical regions. Using remote sensing techniques, these relationships would offer the possibility for a global monitoring of the above ground carbon stored in the vegetation.