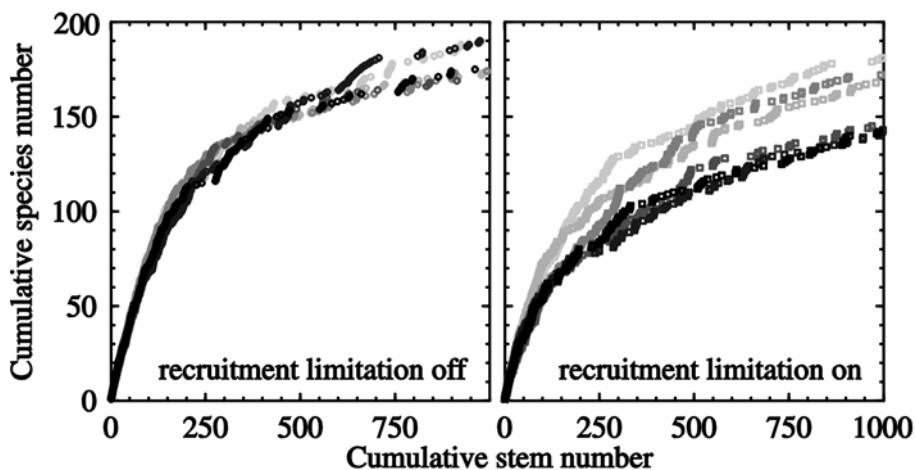


## Mechanisms promoting tropical tree species richness investigated with a process-based forest growth model

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We investigated how disturbance and recruitment limitation promote tree species richness in a tropical rain forest. Most investigations on species richness were so far performed with simple conceptual models in which main competing processes were not represented adequately. Therefore, we here analysed simulation scenarios run with the process-based forest growth model FORMIND2.0 [1,2]. The model simulates the spatio-temporal dynamics of an uneven-aged mixed forest stand in Sabah, Malaysia. It calculates the carbon balance of individual trees, competition for light and space, and covers recruitment processes by explicit seed dispersal.

The impact of two mechanisms on the richness of the 468 tree species of the forest site were assessed: recruitment limitation and gap disturbances. In cases without recruitment limitation cumulative species numbers per cumulative stem numbers did not vary with disturbance, while in recruitment limited simulations species numbers were higher in forest sites with less disturbances (Fig. 1). These results support evidences from field data in a 50 ha forest in Panama [3].



**Fig 1:** Cumulative species numbers as function of cumulative stem numbers (all trees  $d > 1\text{cm}$ ). Recruitment limitation either off or on. Disturbance varied through the falling probability of dying trees which then create canopy gaps. Light grey: disturbance low; dark grey/black: disturbance high.

### References

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