
Modelling plant trait diversity in tropical forests

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Abstract

Functional diversity plays an important role for vegetation dynamics, ecosystem productivity and ecosystem resilience. Classifying vegetation as plant functional types (PFTs) has been hypothesized to oversimplify ecosystem response to climate change and the role functional diversity plays in it. With the development of a flexible individual trait approach in the dynamic global vegetation model LPJmL-FIT we are able to investigate how changes in plant trait diversity influence ecosystem function. When considering trade-offs between traits we are able to reproduce observed trait distributions in tropical South America and follow observed spatial gradients of important plant functional traits. We show which role plant trait diversity plays under future climate change to maintain ecosystem function, such as carbon storage, for ecosystem resilience. Modelled results have wider implication for the provision of ecosystem services.

Keywords: plant trait diversity, tropical forest, ecosystem modelling, ecosystem resilience, future climate change

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