



## **Modelling the drought sensitivity in the Amazon rainforest**

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Dynamic Global Vegetation Models (DGVMs), e.g. LPJ-Guess model, have been widely applied to study transient aspects of ecosystem response (e.g. vegetation dynamics and biogeochemistry) to climate change and certain other aspects of global change. However, there are still considerable disagreements between model simulations and observations, especially in tropic region. It has been observed that Amazon rainforest green up during dry seasons while model simulations show plant productivity in Amazon rainforest rapidly decreases during drought. Amazon rainforest is the planet's largest forest and biologically richest ecosystem, and the changes in the biophysical state of the Amazon rainforest have a strong effect on global climate through associated changes in carbon and hydrological cycles. Therefore, it is of significance to study mechanisms that are not correctly treated in models in order to improve the understanding about carbon and hydrological cycle in Amazonia.

The Gross Primary Production (GPP), one of ecological term to describe terrestrial carbon balance, provide important information about the environmental under global climate change, as the critical component of the global carbon cycle is the vegetation, mainly due to photosynthesis. Thus GPP is considered for uncertainty analysis and model evaluation. In addition, LPJ-Guess model is used to model GPP. Results show that increasing soil depth, and considering rooting depth and groundwater depth, allow broadleaf evergreen forests in tropical Amazonia to maintain biophysical function through seasonal drought, as a result of better agreement between modeled GPP and observed GPP.