

EGU22-13225

<https://doi.org/10.5194/egusphere-egu22-13225>

EGU General Assembly 2022

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Parameter sensitivity of plant productivity in a plant hydraulics-enabled DGVM

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Limited process-representation of plant hydraulics in Dynamic Global Vegetation Models (DGVMs) impacts our ability to improve our understanding of the effect of plant water availability on vegetation dynamics and vegetation carbon content. More detailed plant hydraulics have so far been only introduced in a few DGVMs. Here, we apply the new hydraulics version of the DGVM LPJ-GUESS to explore the impact of hydraulic functional traits on plant productivity and succession dynamics. We perform a sensitivity analysis on hydraulic and shade-tolerance traits across different Plant Functional Types (PFTs).

Our study is performed at multiple sites along a water-availability gradient in a temperate environment. We put special focus on exploring the simulated interplay between shade-tolerant and intolerant broadleaf summergreen PFTs and discuss the most sensitive parameters and the implications of constraining them for future climate projections.