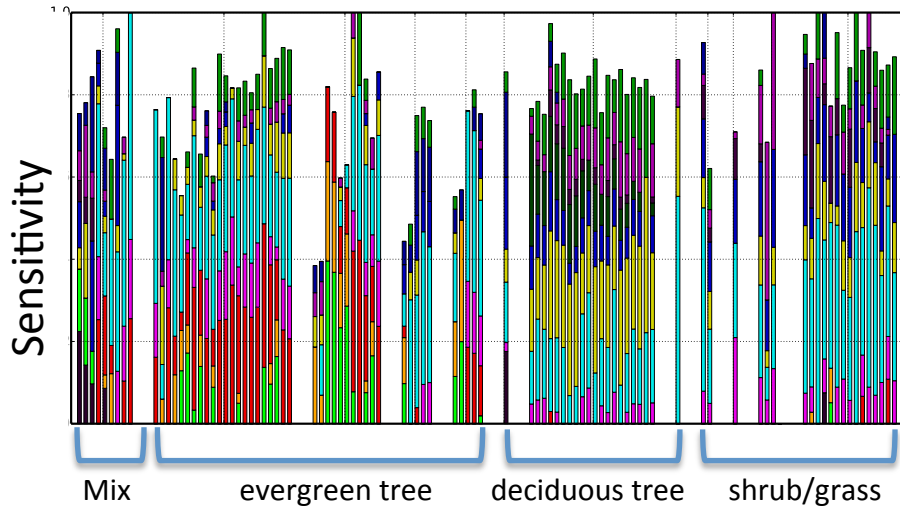


The impact of parametric uncertainties on biogeochemistry in the E3SM v1 land model



Sensitivity of gross primary productivity (GPP) to E3SM land model parameters at 96 globally distributed FLUXNET sites, grouped by plant functional types.



Scientific achievement

A global sensitivity analysis was performed using a new methodology on the E3SM v1 land model (ELM v1), indicating the key parameters that drive uncertainty in model projections across 96 sites representing a wide range of climatic conditions and vegetation types.

Significance

Out of 68 model parameters analyzed, fewer than 20 have a significant influence on land model quantities of interest. These parameter sensitivities depend on climate variables, and are largely consistent among sites within a biome.

Impact

Understanding these sensitivities will aid in prioritization of model development and observations targeted to reduce prediction uncertainties. The methods developed here are a significant step towards formal model calibration at a global scale.

Ricciuto, D., Sargsyan, K., & Thornton, P. (2018). The impact of parametric uncertainties on biogeochemistry in the E3SM land model. *Journal of Advances in Modeling Earth Systems*, 10. <https://doi.org/10.1002/2017MS000962>.