

Modelling Biogeochemistry-Climate Interactions

The research aims at a better understanding and quantification of the biogeochemical cycles as a component of the climate system. This project employs numerical models of the climate system, including biogeochemical components of the ocean and the land biosphere as important tool. The foci of the simulations include past and future interactions between climate variability / climate change and of biogeochemical fluxes and pools of land ecosystems, and in particular the understanding of biospheric processes and human intervention affecting key land-atmosphere feedback mechanisms, such as the sensitivity of the global carbon cycle to atmospheric CO₂ and temperature change.

Publications:

Zaehle, Sönke, et al. „Nitrogen Availability Reduces CMIP5 Projections of Twenty-First-Century Land Carbon Uptake*.“ /Journal of Climate/ 28.6 (2015): 2494-2511. (link to article <[http:// journals.ametsoc.org/doi/ abs/10.1175/JCLI-D-13-00776.1](http://journals.ametsoc.org/doi/abs/10.1175/JCLI-D-13-00776.1)>)

Müller, W. A., and Coauthors, 2025: ICON: Toward Vertically Integrated Model Configurations for Numerical Weather Prediction, Climate Predictions, and Projections. /Bull. Amer. Meteor. Soc./, *106*, E1017– E1031, <https://doi.org/10.1175/BAMS-D-24-0042.1> <[https:// doi.org/10.1175/BAMS-D-24-0042.1](https://doi.org/10.1175/BAMS-D-24-0042.1)>.