

BayCEER Kolloquium

Lectures in Ecology and
Environmental Research

winter 2026



UNIVERSITÄT
BAYREUTH

Donnerstag/Thursday

22.01.2026

12:30 in H6, GEO



Dr. Frederic Leuther

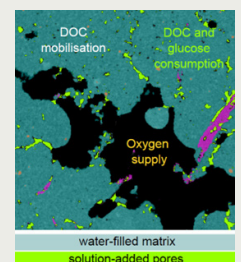
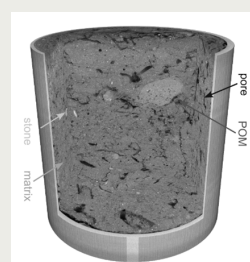
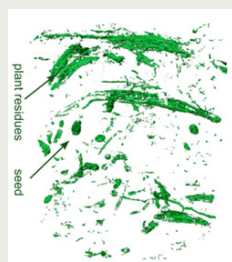
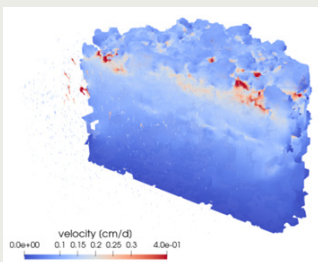
Soil Physics, BayCEER

Temporal dynamics in soil structure and the effects on water fluxes and organic carbon turnover in soils.

Öffentlicher Vortrag im Habilitationsverfahren (Zwischenevaluation)

Soil structure, i.e., the spatial arrangement of minerals, organic matter, and pores, is key to understanding various soil functions, from water storage to carbon and nutrient cycling. The scientific community, however, is still debating how to characterize soil structure, how to quantify its impact on various functions, and if and how soil structure should be considered in soil-plant-atmosphere models.

In this presentation, I will introduce methodological developments based on X-ray computed tomography for quantifying structural indicators and their effects on soil hydraulic properties and organic carbon turnover. Based on laboratory and field experiments, we were able to show that soil structure is altered by the soil management system and is subject to seasonal fluctuations driven by abiotic and biotic factors. It affects water flow during evaporation, carbon mobilisation and mineralization, and provides physical protection for organic matter. In view of various soil physical challenges, considering spatial heterogeneity and their temporal dynamics in our studies increases the complexity of the soil system, but when taken into account, it offers an opportunity to adapt soil management to promote certain soil functions.



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