

Eawag Seminar Invitation

Uncertainty in projections of hydrological biogeochemical and environmental models

Speaker **Prof. Dr. Lutz Breuer**

*Chair in Landscape, Water and Biogeochemical Cycles
Justus Liebig University Giessen, Germany*

When **December 17, 16.00 – 17.00**

Where **Online via Zoom, contact seminars@eawag.ch for access details.**

Abstract Although we have studied hydrological and related biogeochemical or ecological processes for years and decades, our understanding of feedbacks between the water cycle, vegetation, soil, geology and humans is still limited. Part of this knowledge gap is due to processes in the groundwater that are far more difficult to investigate than aboveground processes. The intrinsic complexity of all processes involved makes it difficult to provide reliable information on water quantity and quality. However, stakeholders, politicians and society need such information. Given the enormous environmental changes we are facing today, they also want projections in space and time for which we have to rely on models. The question is how reliable these models are and what projections they make.

'Ignorance is bliss' says a well-known paper about uncertainty in hydrological modelling. While uncertainty estimates have become a common part in hydrological modelling, this is not the case when it comes to simulating other water-related target, such as solutes or habitats, especially when groundwater processes are involved. This lecture will outline feasible ways of tackling uncertainty in coupled models of hydrology, ecology and biogeochemistry. Various components of uncertainty will be examined, including those of model parameters, model input data, and model structure. Case studies presented will include spatial prediction of groundwater nitrate concentrations in Germany, trace gas emissions from groundwater-impacted meadows and the future occurrence of rare and endangered plant species in a floodplain of the Rhine River.