

Innovative field and tracer methods improve fully coupled models simulating surface and subsurface processes

*Philip Brunner¹

1. Center for Hydrogeology and Geothermics, University of Neuchatel

Recent developments in physically based models allow for a fully coupled simulation of surface and subsurface processes. In a parallel development, new field approaches can provide the observation data required to parametrize and calibrate these complex models (Brunner et al., 2017). The combination of advanced modelling techniques with innovative tracer analysis methods has the potential to overcome the non-uniqueness and considerable uncertainties of these complex models. In this presentation, these new developments are illustrated with several examples. Finally, open questions and future research directions in modeling surface and subsurface flow processes in a holistic way are discussed.

Reference: Brunner, P., Therrien, R., Renard, P., Simmons, C. T., and Franssen, H.J. H. (2017), Advances in understanding river-groundwater interactions, *Rev. Geophys.*, 55, 818,854

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