



UFZ-Seminar

Research Unit



Water Resources and Environment



22 February 2021, 3 p.m.

Seminar Room 1, Brückstr. 3a, Magdeburg (online seminar)

Ferdi L. Hellweger

Wasserreinigung / Water Quality Engineering, Technical University of Berlin

will give a talk on:

Modeling cyanobacteria ecology and toxin production (and some out-of-the-box thinking about management)

We develop and apply gene-level models to understand the ecology of cyanobacteria. These models generally simulate individual cells using agent-based modeling (ABM) and resolve a number of intracellular mechanisms, like gene expression, protein translation and protein function. Starting with a model of *Prochlorococcus* over ten years ago, we have continually revised and advanced a workflow for the development of these models. Our model development is highly-data driven. For example, our ongoing development of the *Microcystis* model builds on a meta-analysis of literature encompassing over 500 laboratory experiments from over 70 papers. In this seminar, I will present two case studies: (1) *Anabaena* – nitrogen interaction, (2) *Microcystis* growth and toxin production (work in progress). I will also share some thoughts and “out-of-the-box” ideas about management. To learn more about our work see these papers:

<https://onlinelibrary.wiley.com/doi/full/10.1111/1462-2920.13299>

<https://pubs.acs.org/doi/abs/10.1021/acs.est.9b04218>