



## Representing Microbial Processes in Environmental Reactive Transport Models

P. Van Cappellen

School of Earth and Atmospheric Sciences, Georgia Institute of Technology, Atlanta, Georgia 30332-0340, USA  
(pvc@eas.gatech.edu/+1-404-894-5638)

Microorganisms play a key role in the biogeochemical functioning of the earth's surface and shallow subsurface. In the context of reactive transport modeling, a major challenge is to derive, parameterize, calibrate and verify mathematical expressions for microbially-mediated reactions in the environmental. This is best achieved by combining field observations, laboratory experiments, theoretical principles and modeling. Here, I will illustrate such an integrated approach for the case of microbial respiration processes in aquatic sediments. Important issues that will be covered include experimental design, model consistency and performance, as well as the bioenergetics and transient behavior of geomicrobial reaction systems.