Reactive Transport Modeling of Microbial-mediated degradation in MAR

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Reactive Transport (RT) is relevant to the evaluation of reaction rates in porous media because it controls the locations where reactions occur and the biogeochemical conditions that allow reactions occur. However, it is complex because it requires modeling not only the chemical reactions but also the transport of numerous chemical species. This is especially true for modeling microbe-mediated kinetic reactions, where actual rates are controlled by microbial community growth and by access of reacting species to microbial sites. As a result, RT has not yet reached a sufficient level of maturity for practical application. To advance along this path, we are developing an objective oriented code which can be linked to general purpose transport codes and which should facilitate testing different concepts. Specifically, here we will show some preliminary results of nitrogen communities growth and its impact on the degradation of emerging organic contaminants, which is relevant for Managed Artificial Recharge.