

Biodiversity and ecosystem functioning in miniature worlds

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Abstract. Bacteria drive many functionally important processes in aquatic ecosystems. Nonetheless, the bacterial component of aquatic ecosystems is often treated as a "black box" with neither a complete understanding of how bacterial communities are structured, nor of how changes to the composition of bacterial communities influence ecosystem functioning, nor whether such compositional changes influence the ecology of larger organisms. The talk will describe experimental approaches we have used for opening the black box to understand linkages between bacterial community structure and function, focusing on understanding how interactions among bacterial taxa can be measured, how interactions evolve, and how interactions can be manipulated in the lab or in nature. We find that interactions among bacterial taxa are dynamic over ecological and evolutionary timescales. For example, during ecological succession, strong interactions are dampened to become more neutral. Over evolutionary timescales, the types of interactions that emerge depend on the composition and diversity of the surrounding community. I will discuss experimental approaches to extrapolate these findings from the lab to the field.