

Abstract Submitted
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Relaxation of a natural microbial ecosystem to a metabolic steady state¹ OSHANI FERNANDO, ALEXANDER PETROFF, Clark University — Ecosystems persist over geological time scales as organisms with complimentary metabolisms mediate nutrient cycles. The dynamics by which these cycles form and are stabilized remain poorly understood. Here we investigate the dynamics by which a natural microbial community, extracted from salt marsh sediment and containing oxygen consuming and oxygen producing microbes, relaxes to a metabolic steady state in a quasi-two-dimensional chamber. Filtered pore water continuously flows through the chamber, refreshing it at a rate of 0.8 l/hr. We measure the two dimensional distribution of oxygen at five minute intervals for several days, and infer the instantaneous rates of oxygen production and consumption. Preliminary results show that the metabolic activity of oxygen-producing and oxygen-consuming microbes relaxes to a steady state along a low dimensional trajectory. In future work, we will regularly extract DNA from the effluent to characterize the community dynamics both in the initial convergence to steady state and in the following days.

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