



**Supplemental Figure 1.** Oxygen and methane consumption over the course of 24 hours in microcosms incubated under different oxygen tensions, over the course of 12 weeks. It is evident that as the communities simplify, oxygen consumption is reduced. By the time of the first sampling, the 150–225  $\mu\text{M}$  (50-75% air) treatments remained constantly oxygenated while 15-75  $\mu\text{M}$  (5-25% air) treatments went hypoxic before the next oxygen addition. Oxygen and methane were measured immediately after recreating the atmosphere and after 24 hours. Blue columns, red columns, oxygen and methane, respectively, measured immediately after the atmosphere was created. Green columns, purple columns, oxygen and methane, respectively, measured after 24 hours. Error bars indicate standard error across the replicates.