Oxygen Effects on Carbon Trace Gas Production in Wet, Tropical Forest Soils. (S03-teh152709-Poster)

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Abstract:
This study explores the effects of soil oxygen variations on rates of methanogenesis in wet, tropical forest soils. We collected soils from field sites in the Luquillo Experimental Forest, PR that experience different soil oxygen conditions, and incubated them in closed chambers across a range of oxygen partial pressures. Methanotrophy was inhibited through the introduction of difluoromethane to the headspace. Soils that originated from more anaerobic plots showed higher rates of methanogenesis, regardless of oxygen concentration. Rates of methanogenesis were similar for soils collected from both the 15 cm depth and from 40 cm below the surface. Soils from more aerobic plots showed much weaker rates of methanogenesis. These results suggest that methanogenic populations are relatively insensitive to variations in oxygen conditions. Net methane flux is probably regulated by fluctuations in rates of methanotrophy, rather than by changes in rates of methanogenesis. This is in agreement with our field data, which suggests that more anaerobic plots possess higher rates of methanogenesis, and that methanotrophy increases with increasing oxygen concentration.

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