

**Project # 50978**

***Prediction of response in soil microbiome carbon utilization to changing moisture conditions***

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**Abstract:**

The goal of this project is to attain a systems level understanding of the soil microbiome and its phenotypic response to changing moisture through a tractable, spatially explicit examination of the molecular and ecological interactions occurring among natural microbial consortia. We propose a set of integrated experiments that together address the functional relationships of decomposing microbial communities and their response to changing moisture. We posit that moisture affects the physiology and interactions within and between consortia, resulting in predictable phenotypes. By defining phenotypes at the reduced complexity scale, we will be able to model and ultimately predict the soil microbiome's phenotypic response to changing moisture conditions, and to define the soil metaphenome as the product of community genomes (metagenomes) and environmental resources that are available.