Title: Carbon–Nutrient Economy of the Rhizosphere: Improving Biogeochemical Prediction and Scaling Feedbacks from Ecosystem to Regional Scales

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Project: University project

Project Abstract: Our project has advanced the science of plant-soil-microbial dynamics across these areas: i) nutrient cycling and plant uptake; ii) root exudation and priming; and, iii) mycorrhizal dynamics. Our project has accomplished 5 main developments:

1. Incorporation of phosphorus cycling into the Fixation & Uptake of Nutrients (FUN 3.0) model;
2. Coupling of FUN 3.0 into the E3SM Land Model (ELM);
3. Data collection across a large mycorrhizal gradient in the US, as well data in the tropics, to parameterize, test, and validate the model;
4. Scaling up mycorrhizal association measurements across landscapes using airborne hyperspectral remote sensing data;
5. Evaluation of global carbon and nutrient cycle impacts in the Community Land Model (CLM5.0) from a suite of new global mycorrhizal association maps.