



## **Linkages between Aggregate Turnover Rate and Soil Organic Matter Dynamics**

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A large body of microbiological study in recent years have shown that soil aggregates are hotspots of elevated biological activity and diversity. In addition, soil aggregation has been linked with long-term stabilization of soil organic matter. Microaggregates ( $<250 \mu\text{m}$ ) are thought to provide physical protection to particulate and mineral-associated SOC. Studies of soil organic matter dynamics and stabilization often involve fractionation of soil aggregates and particulate of organic matters based on density, size, and/or strength. However, such fractionations rarely consider the turnover rate and age distribution of aggregates. Therefore, the role of the transient life-cycle of aggregates on soil organic matter dynamics and stabilization remains largely unknown. In this presentation, we use a physically-based model of soil aggregate life-cycle to elucidate how turnover rates of soil aggregates and soil organic matter are coupled. Specifically, we show to what extent aggregate turnover rate contributes to physical stabilization of soil organic matter and how this varies with environmental drivers of aggregation dynamics.