TIMESCALES AND MAGNITUDE OF LEGACY BIOSOLIDS PHOSPHORUS TRANSPORT

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How long will legacy phosphorus (P) from biosolids application continue to impact waterways in the St. Johns River basin? We report on synthesis of information from ongoing co-funded laboratory and field experiments to inform a conceptual model to provide quantitative predictions of P export from biosolids application sites and their corresponding timescales. The data synthesis provides local-scale estimates for individual field sites and generalized guidance about translating these to the landscape scale. The model framework scales up from sites to landscapes to evaluate controls on time lags between land use shifts and water quality changes in the context of watersheds and river networks. We used the resulting model to develop loading and transport mass balance budgets that represent the legacies of P accumulated in the soils, which is an important step towards the goal of predicting P export and evaluating the resultant impact on water quality. We included fundamental information about P transport through soils typical of biosolid application sites, with emphases on biosolid sources, soil types, and water table position. To assess the relative contribution of biosolids application to the whole-landscape nutrient mass balance, we evaluated current and legacy loads, their storage and release based on soil characteristics, and correlations with P source strengths and travel times to receiving waters.

PRESENTER BIO: Dr. Jawitz's research emphasizes hydrology and water quality at the landscape scale. His notable contributions are related to landscape-scale coupled hydrologic and biogeochemical modeling, restoration of degraded ecosystems, and water resource sustainability.