APPLICATION OF PHOSPHORUS IMMOBILIZING TECHNOLOGY ON A LEGACY BIOSOLIDS SITE

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Phosphorus (P) flux from agricultural areas and ranchlands receiving P inputs (e.g., inorganic fertilizers and biosolids) presents a risk to the downstream, oligotrophic ecosystems of South Florida. Recent work has reported an increase in downstream P correlated in time with increasing biosolids additions within the St. John's River basin. Any biosolids that can be diverted from landfill/incineration and safely applied to land is a net benefit to society. However, preserving surface and groundwater quality is of paramount importance. Here, we investigate the performance, potential hazard and cost-effectiveness of adding immobilizing-phosphorus technologies (IPTs) as soil amendments to reduce P loss from soils receiving biosolids additions. IPTs to be investigated include freely-available waste byproducts such as drinking water treatment residuals and residuals from the processing of alum, as well as materials such as biochar and commercially-available remediation products. Investigation will initially include bench-scale sorption studies examining a larger suite of IPTs, then transition to column studies examining P loss/retention from soil amended with a smaller suite of IPTS before transitioning finally into field trials using only the most promising candidate IPTs. Evaluation of IPTs will include consideration of method of land-application, such as the potential for IPTs to be applied to drainage features and at the edge of fields, as well as the need for strategic, site-specific environmental engineering that considers site hydrology and P input locations.

PRESENTER BIO: Dr. Judy's research program focuses on examining interactions between contaminants of concern and biological and non-biological soil constituents. Contaminants of interest include nanomaterials, per- and polyfluorinated compounds, antibiotics, microplastics and nutrients. Dr. Judy's areas of expertise include ecotoxicology, nano and micro scale characterization, metals analysis and environmental chemistry.