

# SUSTAINABLE PHOPHORUS MANAGEMENT IN FLORIDA

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Phosphorus is a necessary ingredient for life and commerce. The element is integral to bones and many of life's most important molecular processes like energy production and genetics. It is also an essential macronutrient for agricultural crop production. Finally, P is an important intermediary component for many industrial chemical processes.

Anthropogenic handling of P, particularly in food production and waste streams, is currently a leaky, mostly linear process. On the supply side, P is applied to food crops and urban landscaping where it may not be needed for optimal growth. On the waste side, P is delivered in reuse water to customers who do not know the contents and cannot factor extant nutrient concentrations into landscaping decisions. Similarly, biosolids, either through direct land application or through derivative products, typically have N:P ratios much lower than plant requirements. Overapplication of P is especially problematic in Florida where native soils are often P replete or have low P binding capacity, creating conditions where excess P accrues on the landscape, creating a nutrient pool susceptible to widespread loading to waterbodies. The leaky, linear supply chain presents abundant opportunities to close loops. New beneficial P recycling practices will increase efficiency and reduce adverse environmental impacts. Moving from a linear to a circular P supply chain requires innovation and modification at all stages from source to disposal. There are substantial opportunities to use organic waste to create energy and liberate inorganic phosphorus for reuse, avoiding the waste stream. Within the waste stream, products like reclaimed water can be delivered using a more complete understanding of nutrient supply and demand. Likewise, biosolids can be composted and processed to deliver nutrients congruent with crop requirements. And as an end user, agriculture can implement revised BMPs that both optimize agronomic efficiency and protect the ecosystem. Enlightened policy will move Florida toward sustainable P use, benefitting a growing population.

**PRESENTER BIO:** Dr. Dobberfuhr is the Water Resources bureau chief at the St. Johns River Water Management District and supported by a dedicated staff of talented biologists and ecologists. He has been with the agency for 20 years, conducting applied research and restoration in wetlands, rivers, and lakes throughout northeast Florida.