TESTING PERFORMANCE EFFICIENCY OF INNOVATIVE NUTRIENT REDUCTION TECHNOLOGIES WITH IN-SITU MESOCOSMS

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There are limited data tracking the improvements gained from sediment nutrient management. Prior to conducting a large scale and costly restoration project that may include sediment removal or chemical inactivation to improve water quality in a waterbody, it is important to understand how the action may affect the overlying water column and downstream water bodies after implementation and long-term. We have conducted numerous laboratory bench scale assessments to evaluate treatment alternatives such as sediment capping by applying chemical, physical or biological treatments to in-tact sediment cores to assess the performance efficiency of innovative nutrient reduction technologies. We have since scaled up from the laboratory and have deployed in-situ mesocosms within two lakes in Central Florida to assess the performance and cost effectiveness of two sediment inactivation treatment alternatives. The mesocosms (limnocorrals) enclose a portion of the lake and benthic sediments. Ongoing water quality and sediment sampling to assess changes in pre/post application conditions is currently underway. The experimental design includes multiple levels of replication and will span both the wet and dry seasons to assess temporal effects on product performance. The research objective is to demonstrate the performance and cost-effectiveness of the two treatment alternatives at the mesocosm scale in-situ prior to applying the product at full scale. The results obtained from this project can be broadly used to assist with watershed restoration planning as sediment nutrient removal or chemical/biological amendments can be compared against other aquatic system restoration BMPs along with costs to develop long-term plans. More specifically, the results can be used in the prioritization of removal or chemical inactivation of various sediment types, and to quantify the potential beneficial impacts of sediment nutrient management on water quality.

PRESENTER BIO: Dr. Szafraniec is a Principal Scientist at Wood with over 18 years of experience conducting ecological and water quality assessments and designing restoration projects. She has recently been focusing her research to advance concepts in biogeochemistry with the goal of tracking pollutant sources and optimizing ecosystem restoration project performance.