Refinement and regionalization of phosphorus assessment tools in Mississippi

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Abstract

Phosphorus is a major nonpoint source pollutant that causes eutrophication in surface waters. Phosphorus (P) Indices are applied assessment tools used to identify agricultural fields most vulnerable to P loss by accounting for major source and transport factors controlling P movement. There is a wide range in formulation and management recommendations of P Indices among the southern states leading to differences in P-management recommendations under relatively similar site conditions. This situation creates the need for rigorous evaluations of P Indices to determine directional and magnitudinal correctness. Mississippi State University-based investigators participate in a southern multistate research program with the objectives to coordinate and advance P management in the region by ensuring that P assessment tools developing using guidance in the 2011 NRCS 590 standard are compared to water quality data. The research goals include producing tools that provide more consistent results across physiographic regions that will encourage greater similarity between southern state P Index ratings and ensuing recommendations. Values of annual P loss measured in two Mississippi physiographic regions, i.e. agricultural fields in the Mississippi Delta and pastures in the poultry production counties in South Mississippi, are used to compare southern P Index assessments against water quality data, and to calibrate and validate the Agricultural Policy/Environmental eXtender (APEX) model. Results will show the assessment for P loss vulnerability estimated by different southern P Indices and the performance of the APEX model before and after calibration and validation procedures for the proposed scenarios.