

## **Scientific and Technological Tools to Implement Iowa Nutrient Reduction Strategy**

**Issue:** New scientific tools and techniques and an improved understanding of the physical, chemical and biological processes are needed to predict nutrient mobilization, fate and transport in Iowa's waterways. It also is important to improve scientific understanding of best management practices (BMP) at scales ranging from individuals to watersheds.

**Objective:** Five research projects focus on developing scientific and technological tools to aid in the implementation of the Iowa Nutrient Reduction Strategy. A science and process-based framework using an integrated watershed approach will provide improved understanding of the complex nutrient management issues in Iowa, and the basis for possible solutions.

**Approach:** The first project will quantify the benefits of BMPs and land management practices, and associated hydrology on nutrient loading to water resources using hydrodynamic modeling tools. Three new models will be implemented to quantify nitrogen removal benefits over a range of precipitation and stream flow.

The second project will quantify the benefits of BMPs and land management practices, and associated hydrology on sediment and phosphorus loading to water resources using hydrodynamic modeling tools.

The third project will explore optimal placement of BMPs and land management practices for reduction of nitrogen, sediment and phosphorus loading to water resources. Using the suite of numerical tools developed in the first two projects, researchers will identify combinations of physical setting and current land use that result in the most nutrient reduction compared to current conditions.

The fourth project will develop a functional, web-based database of available nutrient data sets in Iowa to be used by the Iowa Nutrient Research Center and other researchers.

The fifth project will involve measurement of field data parameters to support modeling. Scientists will conduct field monitoring of nitrogen, sediment and phosphorus inputs and outputs for select BMPs installed in priority watersheds.

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