

# IOWA Nutrient Research Center



## Accomplishments and Impacts, 2013 - 2018

The Iowa Nutrient Research Center (INRC) was established by the Iowa Board of Regents in response to legislation passed by the Iowa Legislature in 2013, with the purpose: *to pursue a science-based approach to nutrient management research through evaluating the performance of current and emerging nutrient management practices, and using an adaptive management framework to provide recommendations for the implementation of nutrient management practices and the development of new nutrient management practices.*

### Funding

- The center has received \$8.72 million in state appropriations to support 76 water quality projects in its first five years.
- More than 95 percent of INRC funding has gone directly for research in the following categories: Nutrient management (21), Edge-of-field (17), Land use (13) and Multi-objective (25).
- Significant additional leveraging of center-supported projects comes through federal, state and NGO funding.

### Research impacts

- Successfully integrating **cover crops** into Iowa crop and livestock systems is a major focus of the Iowa Nutrient Research Center, due to strong interest from farmers and the INRC Advisory Council. The center has funded about a dozen projects aimed at making cover crops more practical, profitable and effective as a way to improve water quality and soil health.
- **Saturated riparian buffers** are a new edge-of-field conservation technology gaining interest for the ability to reduce nitrogen in tile drainage water and provide added benefits like wildlife habitat and carbon sequestration. Saturated riparian buffers are expected to last 20-40 years and require little maintenance. INRC helped support development of federal and state conservation standards to make the practice eligible for available cost-share incentives.
- **Denitrifying bioreactors**, an edge-of-field practice that filters tile drainage water through woodchips, can significantly reduce nitrogen pollution. New research is investigating corn cobs or other carbon sources for bioreactors, which may be more economical and reduce other pollutants, including bacteria or phosphorus.
- Building cost-effective **prairie for nutrient reduction** is a focus of the STRIPS project, which has pioneered a way to convert 10 percent of crop fields to native prairie strips, reducing soil loss and phosphorus export by 90 percent and nitrogen loss in surface runoff by 85 percent or more. Established so far on more than 60 commercial farms across Iowa and the Midwest, strips also provide habitat for pollinators and wildlife.

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## Administration

The Iowa Nutrient Research Center is headquartered at Iowa State University and operates in collaboration with the University of Iowa and University of Northern Iowa. The INRC director, appointed by the Dean of the College of Agriculture and Life Sciences, receives input from an eight-member advisory council, mandated by authorizing legislation to represent the:

- Iowa Secretary of Agriculture
- Iowa Department of Agriculture and Land Stewardship - Division of Soil Conservation and Water Quality
- Iowa Department of Natural Resources
- University of Northern Iowa, nutrient researcher
- Iowa State Association of Private Colleges, nutrient researcher
- University of Iowa, Iowa Institute of Hydraulic Research (IIHR) - Hydrosience and Engineering
- Iowa State University Extension and Outreach, Vice President
- Iowa State University, College of Agriculture and Life Sciences, Dean

## New Projects Funded for 2018-2019

### Edge-of-field research

- Before the Streams: Modeling the Effectiveness of In-Field and Edge-of-Field Practices in Reducing Nitrogen Loads
- Corn Cobs as an Alternative Carbon Source to Enhance Bioreactor Performance for Improved Water Quality
- Evaluation of Saturated Buffers as a Conservation Drainage Practice for Treating Agricultural Subsurface Drainage

### Land use research

- Enhancing the Value of Cover Crops through Integration of Row Crop and Cattle Enterprises
- Influence of Spatial Planting Arrangement of a Winter Cereal Rye Cover Crop on Corn Productivity

### N & P management research

- Corn Management Following Cereal Rye Cover Crop with Strip Tillage and In-Row Fertilization
- Evaluation of Measurement Methods as Surrogates for Tile-Flow Nitrate-N Concentrations
- Improving Cereal Rye Cover Crop BMPs to Increase Adoption of Cover Crops by Iowa Farmers
- New Technologies to Reduce Barriers to Implementation of Nutrient Loss Reduction Strategies
- Quantifying Hotspots of Nitrate and Dissolved Phosphorus Losses from Cropped Depressions and Impacts at the Catchment Scale

### Multi-objective research

- Correlation of a Soil Health Assessment Tool and Phosphorus Loss with Surface Runoff in Agricultural Fields
- IIHR-Hydrosience & Engineering Work Plan for the Iowa Nutrient Research Center (2018-2019)
- Monetizing Soil Health: An Innovative Strategy to Drive Greater Adoption of Cover Crops and No-Till
- Quantifying the Effects of BMPs on Sediment and Phosphorus Delivery to a Range of Eastern Iowa Rivers
- Understanding Farmer and Landowner Decision-Making and Message Preference Concerning Conservation Practice Adoption in the Clear Creek Watershed
- Using the Agricultural Conservation Planning Framework (ACPF) to Optimize the Allocation of Scarce Conservation Funding

Description of INRC-funded projects since 2013, with project reports, are available online, at:

<https://www.cals.iastate.edu/nutrientcenter/project>.

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