

Iowa Nutrient Research Center

ACCOMPLISHMENTS AND IMPACTS, 2013 - 2019

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.*

About

- The center has received just over \$10 million in state appropriations in its first six years to support 92 water quality projects. More than 95 percent of INRC funding has gone directly for research. Significant additional leveraging of center-supported projects comes through federal, state and NGO funding.
- INRC launched a new website in 2018 at <https://www.cals.iastate.edu/inrc/> and expanded outreach through regular news articles, additional online resources and research-related tours and networking .
- Staff: Matt Helmers, Director; Kay Stefanik, Assistant Director; Malcolm Robertson, Program Manager; Ann Robinson , Communication Specialist; Wendy Borja-Diaz, Accountant.

Research Impacts

- INRC-supported research shows that **multi-objective oxbows** can reduce nitrate in tile drainage — earning them a spot in the Iowa Nutrient Research Strategy’s menu of conservation options.
- The center continues to fund projects aimed at making **cover crops** more practical and profitable as a way to improve water quality, including by helping farmers successfully integrate **cover crops** and livestock systems.
- The next generation of nitrate-cleansing **bioreactors** may be filled with corn cobs. INRC-supported research is looking at the feasibility of this lower-cost option as a carbon source for water quality bioreactors.
- Can we **monetize soil health**? One project is looking at the potential to incentivize use of no-till and cover crops through a market-based approach that would equip rural appraisers to consider soil health indicators when conducting land valuations.
- Several INRC projects are focused on **developing and refining modeling tools** to estimate nitrogen and phosphorus loss from Iowa’s watersheds, and **more accurately predict the impact of conservation practices.**
- INRC-sponsored research on the **social dimensions of conservation** aims to address barriers to adoption and guide more effective conservation messaging.

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 2019-2020

Edge-of-field research

- Evaluating the water quality benefits of reconstructed multi-purpose oxbows
- Watershed-scale phosphorus inputs from streambanks

Land management research

- Evaluating the potential for drainageways at the Kirkwood Community College farm to serve as test sites for innovative grass waterway designs
- Impacts of cover crops on phosphorus and nitrogen loss with surface runoff
- Improving outcome predictability, multifunctionality and cost-effectiveness in nutrient reducing prairie strips
- Interseeding grass and legume cover crops into early vegetative stage corn
- Perennial turfgrass cover crops in maize production systems

Nutrient management research

- Assessing the effectiveness of individual versus multiple nutrient reduction practices on water quality and economic viability
- Investigating the double-impact of soil health promoting practices on water quality
- Mitigating reduced yields of corn following a winter rye cover crop: What role does allelopathy play?
- The root of the matter: Are changes in corn root morphology responsible for improved yield and higher nitrogen use efficiency in diversified cropping systems?

Multi-objective research

- Evaluating rotations of cover crops and summer annual forages for yield, nutritional value, effect on soil nutrient profile and economic sustainability as forage resources for beef cattle
- IIHR-Hydrosience & Engineering work plan for the Iowa Nutrient Research Center (2019-2020)
- Increasing farmer engagement with conservation practices through more effective communication strategies: A media content analysis, stakeholder survey and digital message test
- Integrating social and biophysical indicators of nutrient reduction progress in Iowa watershed projects
- Linking agricultural practices to water quality improvement: The importance of scale in accurately characterizing nonpoint source nutrient loads in Iowa streams

Description of INRC-funded projects since 2013, with project reports, are available online, at <https://www.cals.iastate.edu/nutrientcenter/project>.
