Iowa Nutrient Research Center

Science for Iowa's Water

2021 Annual Review

Iowa State University

The University of Iowa

UNI University of Northern Iowa

Message from the Director

Since the Iowa Nutrient Research Center's establishment, we have strived to fulfill our mission of pursuing science-based approaches to evaluating the performance of current and emerging nutrient management practices and providing recommendations on practice implementation and development. In 2021, the INRC awarded $1.4 million across 11 new projects. This brings us to 115 total funded projects with over $13.7 million awarded since 2013 to researchers at Iowa State University, University of Iowa and University of Northern Iowa. In addition to our grant funding program, the INRC is actively engaged in a variety of endeavors to support nutrient reduction in Iowa and the Midwest as outlined in this annual review. We invite you to visit our website to learn more and stay up-to-date on research, events, seminars and other activities.

- Matthew Helmers, Director

2021 Activities

Nutrient Reduction Practice Video

The INRC produced a video in spring 2021 to share the latest information on nitrate removal in saturated buffers with one of the practice developers, Professor Tom Isenhart. Watch at https://www.cals.iastate.edu/inrc/video. We appreciate the efforts of two video interns in 2021 who worked on this video and others.

Research News

The INRC released 12 news stories in the last year to share highlights of INRC-funded research with readers of farm publications and university news. These articles, along with related content, can be found at https://www.cals.iastate.edu/inrc/news.

Water Research Seminar Series

INRC continued its water quality research seminar series in 2021, with themes of "Findings from Watersheds Around the Country" and "New Technologies, New Tools and Emerging Concerns." The two series included nine presentations and a field day, attracting more than 200 scientists, students, farmers and representatives of agencies and private organizations from Iowa and beyond. Recordings of the seminars are archived on the INRC website.

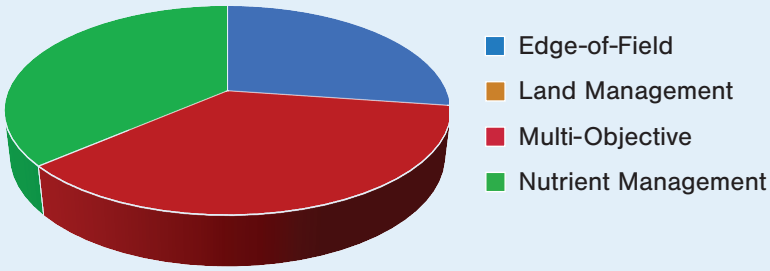
INRC Digital Repository

A selection of peer-reviewed journal articles, extension publications and educational material developed from INRC-funded research are now available as PDFs in the INRC Digital Repository at https://www.cals.iastate.edu/inrc/research-publications.

INRC Projects by the Numbers

- 11 new projects funded in 2021
- 115 total projects funded 2013–2021
- $1.4 million awarded for FY2022–2023
- Over $13.7 million awarded 2013–2021
- 14 undergraduate and 8 graduate students supported by projects finished in FY2021–2022

2021 Project Breakdown by Category



Nutrient Reduction Practice Field Tours

The INRC hosted two field tours in summer 2021. K-12 educators from across Iowa joined the INRC and Iowa Agriculture Literacy Foundation for a two-day, “Step Up to the Science of Water Quality” training in August. In September, a group of faculty and graduate students took part in the “Water Quality Research in the Field” tour. Both tours were led by nationally recognized INRC-funded researchers talking about their work.

Outreach and Education

INRC staff have given presentations to diverse groups including farmers, researchers, the Iowa Legislature, the National Academy of Sciences and the Iowa Agribusiness Association. The center has co-sponsored many webinars and field days with partners including Iowa Learning Farms and the Iowa Agriculture Literacy Foundation. The INRC also co-led planning for the 2021 IA-MN-SD Drainage Research Forum held in Ames, Iowa.

Marsh Madness Wetland Models

A new conservation education trailer “Marsh Madness” was developed by the Iowa Learning Farms in collaboration with the INRC. The educational trailer brings the sights, sounds and science of the state’s wetland ecosystems to Iowans. The trailer includes three-dimensional wetland models demonstrating the unique landscape placement and hydrology of three wetland types typically found in Iowa.

2021 Funded Projects

Nutrient Management

- Can adjustments to nitrogen rates reduce corn yield drag and disease implications following a cereal rye cover crop?
- Furthering our understanding of the interactions of cereal rye allelochemicals with Pythium species and their impact on corn in the cereal rye-corn production system
- Managing crop residue to reduce optimum nitrogen fertilizer inputs and increase yield
- Quantifying soil nitrogen dynamics in manured fields

Edge-of-Field

- Continued assessment of corncobs as an alternative carbon source to enhance bioreactor performance for improved water quality
- Developing design criteria to test a new saturated waterway conservation practice
- Influence of bank stabilization on floodplain sediment and phosphorus storage

Multi-Objective

- Building cross-scale predictability of land-to-aquatic nitrogen loads in agriculture-dominated watersheds
- How effective can carbon credit programs be in reducing nutrient losses: An assessment of public and private conservation programs and their interactions
- Identifying the barriers and strategies to accelerate adoption of critical edge-of-field conservation practices: A farmer-centric integrated research and extension approach
- IIHR Hydroscience and Engineering work plan (2021-2022)

Iowa Nutrient Research Center Advisory Council

- Iowa Secretary of Agriculture
- Administrative Director, Iowa Department of Agriculture and Land Stewardship Division of Soil Conservation
- Iowa Department of Natural Resources
- Nutrient researcher, University of Northern Iowa
- Nutrient researcher, State Association of Private Colleges
- IIHR – Hydroscience and Engineering, University of Iowa
- Vice President, Iowa State University Extension and Outreach
- Dean, College of Agriculture and Life Sciences, Iowa State University

Iowa Nutrient Research Center

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INRC is an equal opportunity center, administered by Iowa State University. ISU's full non-discrimination policy and contacts for accommodation inquiries, are found at www.policy.iastate.edu/policy/discrimination.