<table>
<thead>
<tr>
<th>TIME</th>
<th>SESSION</th>
<th>ROOM</th>
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<tbody>
<tr>
<td>10:00-11:00 am</td>
<td><strong>OPEN PLENARY SESSION</strong></td>
<td>Monsanto Room</td>
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<td></td>
<td>Welcome <em>George Czapar</em></td>
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<td>SERA-46 Update <em>Amanda Gumbert</em></td>
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<tr>
<td>11:00-Noon</td>
<td><strong>BREAKOUT SESSIONS</strong></td>
<td>Monsanto Room, Sims Room (first floor)</td>
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<td></td>
<td>Agriculture Water Quality Partnership Forum</td>
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<td>Urban Stormwater Working Group</td>
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<tr>
<td>Noon-1:30 pm</td>
<td><strong>LUNCH</strong></td>
<td>On own</td>
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<tr>
<td>1:30-4:00 pm</td>
<td><strong>POLICY WORKING GROUP</strong></td>
<td>Monsanto Room</td>
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<tr>
<td>4:30-6:00 pm</td>
<td><strong>RESEARCH SHOWCASE</strong></td>
<td>Heritage Room (first floor)</td>
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@IllinoisNLRS  #NLRS2018
Illinois Nutrient Loss Reduction Strategy Workshop

George Czapar
gfc@illinois.edu
NLRS is a science-based partnership effort

Collaboration with stakeholders
Expanding education and outreach
Helping identify research needs
Helping leverage additional funding
Illinois legislature: *Food and Agriculture Act, 1995*
Strategic Research Initiatives - 1998

- Food Safety
- Information Systems and Technology
- Rural Community Development
- Swine Odor and Waste Management
- Water Quality
How to develop nutrient standards that are protective of water quality, but are also realistic and achievable?
C-FAR
Strategic Research Initiative
Water Quality
2007 Water Quality Nutrient Standards Forum

The Illinois Council on Food and Agricultural Research (C-FAR) sponsored an educational forum on the latest research in Illinois water quality on Tuesday, October 23 at the University of Illinois at Springfield. The forum focused on the impact of multiple factors affecting Illinois surface waters.

To better understand the role agriculture and other factors play in influencing the quality of Illinois' rivers, streams, and lakes, researchers from across the state have collaborated in a multidisciplinary, multi-institutional research effort funded by the State of Illinois via C-FAR. In 2003, C-FAR established its water-quality strategic research initiative focused on improving the research base to aid in the State of Illinois’ development of nutrient standards for the surface waters of Illinois.

The following are presentations from the forum:

- **Introduction** - Dr. George Czaper, Water Quality SRI Leader, University of Illinois
- **Spatial and Temporal Relationships between Biotic Integrity of Illinois Streams, Dissolved Oxygen, and Nutrients** - Dr. Mark David, Natural Resources and Environmental Sciences, University of Illinois at Urbana-Champaign

For more information on the forum, please visit the [C-FAR website](http://www.cfar.illinois.edu).

*Image: Water quality forum attendees*
C-FAR work helped secure additional USDA projects

Integrated Watershed Project
- Research
- Outreach
- Education

Salt Fork River Watershed Tile Modification Project
Field Day Photos and Information

Embarrass River Watershed Project - Wetlands & Bioreactors
Assist and encourage adoption of best management practices (BMPs) to protect and improve water quality in Illinois
Water Quality

The Illinois Nutrient Loss-Reduction Strategy

Consider best management practices and make changes that fit your family farm.

What’s Your Strategy?

TEST YOUR FARM’S WATER QUALITY

In this Edition:
- 2018 IFCA & NREC Projects Underway
- Strip Freshwater Promote Reduced Tillage
- Lake Springfield Watershed Project—Continued!
- Nitrogen Research Results & Outreach

For the last several years, IFCA has been involved in many projects that are funded through NREC (the Nutrient Research and Education Council). All of the projects are aimed at keeping nutrients in the field through improved utilization using the right source, rate, time and place. Dan Schaefer and Jason Selberg utilize a kiosk trained, GPS tracking systems, fertilizer tools and soil sampling services to perform and document this work, and share this data collected with University researchers for their analysis.

In 2018, ISU is assisting university researchers with five NREC funded projects:

1. Douglas County Nitrogen Management System in the Drained Fields: (testing field for the N lines in different nitrogen management environments in a corn/soy rotation and corn with and without cover crops)
2. Evaluating INLS Activities, Platt County: (evaluating the effectiveness of N changes, cover crops, and incorporation or conversion/rotation)
3. Comprehensive Corn Nitrogen Research Program (implementing on-farm sideband N trials to develop up to date Massman Return to Nitrogen (MR2N) recommendations for Illinois farmers)
4. Teaching Soil N & Availability (cycling the nitrogen and spade of N is the end throughout the growing season and over various environmental conditions to determine how to better predict and manage N movement)
5. Cereal Rye Ahead of Corn: Evaluating Nitrogen Catch & Release: (studying effective cover crop adoption timing and evaluating the N immobilization and release in a cover system)

https://www.ifca.com/4R/Reports
https://www.ilcorn.org/priority-issues/water-quality
https://www.ilfb.org/take-action/current-priorities/protecting-our-environment
Additional support from Illinois EPA

Illinois Nutrient Loss Reduction Implementation: Coordination of Watershed Scale Programs and Development of Agricultural Water Quality Team

August 1, 2007 through June 30, 2022
Agricultural Water Quality Team

Laura Christianson
Crop Sciences

Jonathan Coppess
Agriculture and Consumer Economics

Paul Davidson
Agricultural and Biological Engineering

Suzanne Bissonnette
Agriculture and Natural Resources

Maria Villamil
Crop Sciences

Cameron Pittelkow
Crop Sciences

Reid Christianson
Crop Sciences

George Czarap
Crop Sciences
NLRS is a science-based partnership effort

Collaboration with stakeholders
Expanding education and outreach
Helping identify research needs
Helping leverage additional funding
Illinois NREC – Illinois agriculture’s investment in Nutrient Research and Education
SERA-46

Land Grant Universities Working Collaboratively with the Hypoxia Task Force

Amanda Gumbert, University of Kentucky
Beth Baker, Mississippi State University, Co-Chair
2017: 22,720 km² (8,776 mi²/5.6m ac); largest size measured to date since the standardized mapping cruises began in July 1985. Source: Nancy Rabalais (LUMCON)

Source: https://gulfhypoxia.net/research/shelfwide-cruise/?y=2017
2018: 2,720 sq. miles (1.7m acres); slightly larger than state of Delaware, well below projected estimate of 6,570 sq. miles.
Too Much of a Good Thing
Science-based Goal

Coastal Goal
By 2035, reduce 5-year running average size of the Gulf hypoxic zone to 5,000 km²

Interim Target
20% reduction of nitrogen and phosphorus loading by 2025

From Nancy Rabalais (LSU/LUMCON)
Role of Land Grant Universities (LGUs) in U.S.

**Morrill Act, 1862**
Teach such branches of learning as are related to agriculture and the mechanic arts.

**Hatch Act, 1887**
Provide federal funds to state land grant colleges to create agricultural research facilities.

**Smith Lever Act, 1914**
Provide education to adults off-campus that is relevant, understandable and practical.
What is SERA-46?

• Southern Extension and Research Activities committee number 46.
• Formal USDA National Institute of Food and Agriculture (NIFA) and land-grant university funded committee designed to promote multistate, research and extension activities.
• Created to operationalize a non-funded Cooperative Agreement between the Hypoxia Task Force and land-grant university Extension and Experiment Stations in the North Central and Southern Regions of the United States
USDA-NIFA coordinates multistate efforts via regional committees

Strong linkage/coordination with Hypoxia Task Force

12 LGUs in Mississippi River Basin
LGU Expertise in Addressing Gulf of Mexico Hypoxia

Soil Scientists

Ecologists

Engineers

Social Scientists

Economists

NRCS-USDA
SERA-46 Goal

Promote effective implementation of science-based approaches to nutrient management/conservation that reduce nutrient losses to the environment.
Priorities for Collaborative Work

Developed May 2015
Revised September 2017

Three Focus Areas
1. Strengthening Networks
2. Conservation Systems
Research and Outreach
3. Monitoring and Tracking of Progress
Progress

Conservation Systems Research and Outreach #1 - Assist in the optimization of cover crop practice performance.

Nutrient & Sediment Loss from Farm Fields

90+ samples in 2018 • 20 rain events

With the data collected we know how much water leaves the field in each event, and how much sediment & nutrients are lost in each event. Data provides information about conservation effectiveness and information for improved in-field management of soil and water. The goal is improve in-field management practices to conserve water, improve soil health, and document farmer environmental stewardship.

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<th>Mean</th>
<th>Median</th>
<th>Max</th>
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<th>Max</th>
<th>Mean</th>
<th>Median</th>
<th>Max</th>
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<tbody>
<tr>
<td>Sediment (lb/ac)</td>
<td>314</td>
<td>206</td>
<td>9241</td>
<td>0.59</td>
<td>0.19</td>
<td>6.0</td>
<td>0.69</td>
<td>0.23</td>
<td>7.9</td>
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<tr>
<td>Nitrogen (lb/ac)</td>
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<td>Phosphorus (lb/ac)</td>
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Average load reductions (lbs/ac)

- Suspended Solids: 33%
- Nitrogen: 41%
- Phosphorus: 27%

Photo courtesy Mississippi State University
Progress

Conservation Systems Research and Outreach #2
Translate science in tile drained areas into accessible information for states to adopt into policies to address nutrient use and movement, particularly with corn and N.
Progress

Conservation Systems Research and Outreach #4 - Work in partnership with American Society of Agronomy’s Certified Crop Advisor (CCA) program.

• Collaboration with state CCA boards to update performance objectives to include hypoxia

• Providing training opportunities in Soil and Water Conservation competency area that includes state nutrient-related regulations and strategies for reducing nutrient losses
Monitoring and Tracking Progress #3 – Using Social Indicators and Civic Engagement to Advance Nutrient Reduction Efforts

Delivery

• Civic Engagement workshop May 2018
• Established an information hub: Human Dimension in Water
  https://h2o.ssrc.msstate.edu/

Rogers’ Innovation-Decision Process Model

Progress

Conservation Systems Research and Outreach #3 – Create a network of watershed practitioners and farmer leaders to strengthen the effectiveness of nutrient management strategies.

Photo courtesy University of Kentucky
Watershed Leadership Summit 2018

Map:
https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/programs/farmb/crop/?cid=stelprdb1254130
• Needs Identified
  • Network of watershed project successes
  • Watershed coordinator certification program/professional development effort
  • More precision tools for targeting conservation practice implementation
  • More communication

• Outcome
  • Network of watershed leaders
Watershed Leadership Summit 2019

• Long Beach, MS
Farmer and Farm Advisor Leadership Needs Assessment

Rebecca Power (University of Wisconsin) and Jamie Benning (Iowa State University)
Purpose

• Characterize farmer and farm advisor leadership in watershed management
• Identify successful methodologies for fostering farmer-led watershed initiatives
• List existing leadership training programs for watershed practitioners, farmers and farm advisors
• Identify geographical, content and pedagogical gaps in existing educational programs

Methods

• Literature Review
• Program Scan
• Interviews
Farmer Watershed Leadership

Peer-to-peer Decision-making
- Recruiting other farmers
- BMP demonstrations
- Mentoring

Consultation
- Serving on advisory groups
- Assisting watershed staff
- Informing goal setting

Watershed Leadership
- Formal leadership role
- Defining goals and strategies
- Directing resource distribution

Level of Engagement
General Observations

• Farmers and farm advisor leadership is critical for watershed management
• Farmer leadership in watershed initiatives is not new
• Concept is not yet widespread
• There are currently no learning networks dedicated to farmer-led watershed initiatives
• A platform or forum for sharing experiences and ideas may be beneficial to farmers and supporting organizations
• Some level of financial, technical, material, or educational support will be required for most farmer-led watershed projects
Continued Work

• MARB Nonpoint Sources Nutrient Reduction Measurement Framework

• Facilitate dialogue between SERA-46 members and state HTF members

• Cross-MARB communication of science directly to state agencies for translation into their nutrient reduction policies and programs
Future Efforts and Needs

• Expand farmer-led watershed leadership efforts.

• Expand economics shared priority around on-farm economic tools, costs, and benefits.

• Expand research and education on multifunctional agricultural landscapes that provide a broad suite of societal and ecosystem services.
Valuable Collaborations

• State and Federal agencies represented by Hypoxia Task Force membership

• Direct farmer and farm advisor interaction
  • Extension audiences

• State Departments of Agriculture
  • Some states have records of success
    • Iowa State University a resource for science, research, technology, on-farm practices

• Other multi-state committees
  • SERA-17, NC-1190, etc.
For More Information

http://northcentralwater.org/sera-46/

https://www.epa.gov/ms-htf/hypoxia-task-force-partnerships
Thank You!
BREAKOUT SESSIONS

AWQPF
Monsanto Room
(stay here)

USWG
Sims Room
(upstairs)