

**Building Science Assessments
for State-Level Nutrient
Reduction Strategies**

**November 13-15, 2012
Davenport, Iowa**

Workshop Program

**November 13-15, 2012
Blackhawk Hotel | Davenport, Iowa**



*Hosted by the Soil and Water Conservation Society
945 SW Ankeny Rd
Ankeny, Iowa 50023
www.swcs.org*

Sponsored by





Building Science Assessments for State-Level Nutrient Reduction Strategies

A multi-day workshop – November 13-15, 2012 in Davenport, Iowa – intended to:

- a) present the process and results of the science assessment work being done in Iowa on nutrient reduction,
- b) provide a workshop environment for state and regional teams in the Mississippi River Basin to collaborate on developing or advancing the process for their state science assessments,
- c) offer presentations and posters on additional science resources available to state teams for developing their assessments, and
- d) discuss current information on additional science questions.

Summary: Hear how Iowa created their state science assessment and generated results. The focus of the workshop is to examine the process and lessons learned, consider the extent to which this can be used by other states, and provide an opportunity to develop state or regional partnerships and next steps.

Workshop Planning Committee:

- Katie Flahive, US EPA
- Jim Gulliford, Soil and Water Conservation Society
- Matt Helmers, Iowa State University
- Eric Hurley, USDA-NRCS
- Richard Ingram, Mississippi Department of Environmental Quality
- Dewayne Johnson, Soil and Water Conservation Society
- John Lawrence, Iowa State University
- Dean Lemke, Iowa Department of Agriculture and Land Stewardship
- Dennis McKenna, Illinois Department of Agriculture
- Shawn Richmond, Iowa Department of Agriculture and Land Stewardship



*Hosted by the
Soil and Water Conservation Society
945 SW Ankeny Rd
Ankeny, Iowa 50023
www.swcs.org*

Building Science Assessments for State-Level Nutrient Reduction Strategies

The 2008 Action Plan of the Mississippi River Gulf of Mexico Watershed Nutrient Task Force envisions a national strategy to reduce nitrogen and phosphorus in waters of the Mississippi River Basin that affect both water quality across the basin and hypoxia in the Gulf of Mexico. The primary goal of the action plan is the development of statewide nutrient reduction strategies for all 12 states of the basin by 2013.

Iowa has chosen to develop a science assessment of nutrient reduction practices that function within agricultural fields, at the edge of fields, and downstream to more efficiently utilize nitrogen and phosphorus in-field, and capture nutrients that escape from crop production systems. This assessment examines the efficacy of nutrient utilization and capture practices, their applicability across the Iowa agricultural landscape, and the economic cost or benefit to the farmer of applying the practices. The Iowa science assessment is offered as an example of a process that other state collaborations can use to build a science framework to support their strategies to reduce nutrient loss.

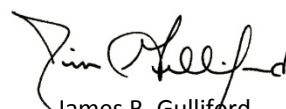
The workshop will also feature presentations and posters of other relevant university, state, and federal agency science contributions that support the science basis for the development of state nutrient reduction strategies.

Interaction with presentation authors will be featured and each basin state will be encouraged to caucus several times over the course of the workshop to consider the applicability of the science assessment process to the development of their statewide strategy.

We believe that sound science and economic analysis enhances the viability of each state nutrient reduction strategy, and increases its credibility within the agricultural community, environmental organizations and the public.

Finally, the 2008 Action Plan recognizes that scientific uncertainties exist regarding source, transport and fate of nitrogen and phosphorus in surface waters of the basin. The workshop will present a number of these continuing questions, and consider the implication of these uncertainties and their relevance to state nutrient reduction strategies.

Thank you for joining us in this workshop and for your interest in advancing efforts on the part of agriculture to effectively utilize nutrients and prevent their loss into local, regional and coastal waters of the Mississippi River Basin.



James B. Gulliford
Executive Director

Soil and Water Conservation Society

Workshop Agenda

November 13 – Day One – Nutrient Application Data & Baseline Conditions

- 1:00 p.m. Welcome and Opening Speakers – What can make a state collaboration work
- Jim Gulliford, Soil and Water Conservation Society
 - Bill Northey, Iowa Secretary of Agriculture
 - Wendy Wintersteen, Dean, College of Agriculture and Life Sciences, Iowa State University
- 1:30 p.m. Overview – Nutrient fate and transport
- Mark David, University of Illinois, Urbana-Champaign
- 2:30 p.m. Iowa's Baseline conditions – Land use, nutrient inputs, conservation systems
- Reid Christianson, Center for Watershed Protection (formerly with Iowa State University)
- 3:15 p.m. Refreshment Break
- 3:30 p.m. Panel & Open Discussion: Challenges in attempting to assess the baseline conditions
- Mark David, University of Illinois, Urbana-Champaign
 - Reid Christianson, Center for Watershed Protection (formerly with Iowa State University)
- 5:00 p.m. Reception: Review and discuss posters on Models, Data, Status, Process, etc.
Each participating state planning team and federal agency was asked to consider preparing a poster of material which may be helpful to other participants. Please use this time to discuss these posters with the presenters.
- 6:30 p.m. Adjourn for day, dinner on your own.

November 14 – Day Two – Iowa N & P Reduction Practices, Other State Experiences

- 8:00 a.m. Nitrogen reduction: Practice review and load estimates
- Matt Helmers, Iowa State University
- 9:00 a.m. Phosphorus reduction: Practice review and load estimates
- Tom Isenhardt, Iowa State University
- 10:00 a.m. Nutrient Load Estimations for Point and Nonpoint Sources
- Calvin Wolter, Iowa Department of Natural Resources
- 10:30 a.m. Refreshment Break
- 10:45 a.m. Panel discussion on N and P reduction tools
- Dan Jaynes, USDA-ARS National Laboratory for Agriculture and the Environment
 - Matt Helmers, Iowa State University
 - Tom Isenhardt, Iowa State University
 - Calvin Wolter, Iowa Department of Natural Resources
- Noon Extended lunch on your own. 90-minutes for state collaboration.
- 1:30 p.m. Economics of load reduction strategies
- John Lawrence, Iowa State University
- 2:45 p.m. Refreshment Break



- 3:00 p.m. Components of the Minnesota State-Level Science Assessment and Watershed Nitrogen Reduction Planning Tool
 - David Mulla, University of Minnesota
- 3:45 p.m. Field scale assessment of management for water quality in Wisconsin
 - Laura Ward Good, University of Wisconsin-Madison
 - Dennis Busch, University of Wisconsin-Platteville
 - Eric Cooley, UW Discovery Farms
- 4:30 p.m. Ongoing federal research, science contributions, models
 - Anne Rea, Environmental Protection Agency
 - Dale Robertson, U.S. Geological Survey
- 5:00 p.m. Moderated group discussion among states on applicability, relative to progress to date.
- 5:30 p.m. Adjourn for day - Dinner on your own.

November 15 – Day Three – Additional Questions, Resources, and Moving Forward

Science questions raised in the development of a science assessment

- 8:00 a.m. Impact of stream bank and bed erosion on Phosphorus loading on streams
 - David Mulla, University of Minnesota
 - Chris Lenhart, University of Minnesota
 - 9:00 a.m. Effect of Conservation Tillage Systems on Dissolved Phosphorus
 - David Baker, Heidelberg University
 - Greg Mclsaac, University of Illinois, Urbana-Champaign
 - 10:00 a.m. Soil sustainability impacts of nutrient management practices in ag landscapes
 - Mike Castellano, Iowa State University
 - 10:30 a.m. Refreshment Break
 - 10:45 a.m. Group Discussion: Assessment of Presentations and Analysis of Research Gaps & Needs
 - Jane Frankenberger, Purdue University
 - Mark David, University of Illinois, Urbana-Champaign
 - Jim Gulliford, Soil and Water Conservation Society (moderator)
 - Noon Adjourn
-

Workshop Sponsors:



Workshop Presenters



David Baker, Heidelberg University

Dr Baker is the founder and Director Emeritus of the Water Quality Laboratory at Heidelberg University. The laboratory operates a long-term, detailed, tributary loading program in Ohio, as well as chemical and biological studies in Lake Erie bays and nearshore areas.

dbaker@heidelberg.edu



Dennis Busch, University of Wisconsin-Platteville

Dennis Busch earned his undergraduate degree in agriculture from the University of Wisconsin-Platteville and a PhD in Water Resources Science from University of Minnesota. Dennis spent several years in the Minnesota Extension Service working with crop and livestock producers as a Manure Management Extension Educator, and is currently the Research Manager at UW-Platteville Pioneer Farm.

buschd@uwplatt.edu



Mike Castellano, Iowa State University

Mike Castellano is an assistant professor in the Department of Agronomy at Iowa State University. His research focuses on nitrogen transformation and transport.

castelmj@iastate.edu



Reid Christianson, Center for Watershed Protection

Reid is a Water Resources Engineer for the Center for Watershed Protection and is involved with a variety of projects including agricultural best management practice tracking, conceptual urban stormwater management designs, and stormwater guidebook development. Before working at the Center, he worked at Iowa State University researching the impacts of agricultural best management practices on water quality and on baseline conditions for the Iowa Nutrient Reduction effort.

reidc@iastate.edu



Eric Cooley, UW Discovery Farms

Eric Cooley earned undergraduate degrees in nuclear engineering from Thomas Edison State College and soil and water conservation from UW-Madison and a master's degree in soil physics from UW Madison. Eric started work for Discovery Farms in December 2004 as an outreach specialist and is currently the research coordinator for the Discovery Farms Program.

etcooley@wisc.edu



Mark David, University of Illinois, Urbana-Champaign

Mark B. David is a Professor in the Department of Natural Resources and Environmental Sciences at the University of Illinois at Urbana-Champaign. His research is focused on nutrients in agricultural landscapes, including sources, transport, and methods to reduce losses.

mbdavid@illinois.edu

Workshop Presenters



Jane Frankenberger, Purdue University

Jane Frankenberger is professor of agricultural and biological engineering at Purdue University, leading research and extension programs focused on agricultural conservation, drainage management, and water quality. She develops tools and resources with the goal of improving the effectiveness of watershed management, and currently serves as Science Advisor for Water Quality for the USDA Natural Resources Conservation Service.

frankenb@purdue.edu



Laura Ward Good, University of Wisconsin-Madison

Laura Ward Good is a soil scientist who leads development of agricultural nutrient management planning and runoff phosphorus loss assessment tools. She is with the Non-Point Demonstration Project in the University of Wisconsin-Madison Department of Soil Science.

lwgood@wisc.edu



Matt Helmers, Iowa State University

Dr. Matt Helmers is an Associate Professor and Extension Agricultural Engineer in the Department of Agricultural and Biosystems Engineering at Iowa State University. His research and extension focus at Iowa State is in the areas of water quality and water resources management.

mhelmers@iastate.edu



Tom Isenhardt, Iowa State University

Dr. Isenhardt is an Associate Professor of Natural Resource Ecology and Management in Iowa State University's College of Agriculture and Life Sciences. His research interests include stream, riparian, and watershed management; design and establishment of conservation buffers to improve the environmental efficiency of agriculture, land use/hydrology and stream bed and bank erosion; watershed assessment; and land use and greenhouse gas emissions.

isenhardt@iastate.edu



Dan Jaynes, USDA-ARS National Laboratory for Agriculture and the Environment

Dan Jaynes is a Research Soil Scientist at the USDA-Agricultural Research Service, National Laboratory for Agriculture and the Environment in Ames IA and a Collaborating Professor in Agronomy at Iowa State University. He has studied the fate and transport of agrichemicals in the landscape for the past 25 years and authored 150+ scientific publications.

Dan.Jaynes@ars.usda.gov



John Lawrence, Iowa State University

John Lawrence is the Associate Dean, Extension Programs and Outreach in the College of Agriculture and Life Sciences and Director, Agriculture & Natural Resources Extension at Iowa State University. In this position he leads the extension and outreach programs to farmers, agribusiness and natural resource managers in the state of Iowa.

jdlaw@iastate.edu

Workshop Presenters



Chris Lenhart, University of Minnesota

Chris Lenhart is a Research Professor in Bioproducts & Biosystems Engineering at the U of MN, with degrees from Notre Dame, UW-Madison and the Univ. of Minnesota. He does research involving hydrologic, geomorphic and ecological interactions and is interested in stream and wetland restoration.

lenh0010@umn.edu



Greg Mclsaac, University of Illinois, Urbana-Champaign

Gregory Mclsaac holds a PhD in Agricultural Engineering and is an associate professor emeritus affiliated with the University of Illinois at Champaign Urbana Department of Natural Resources and Environmental Sciences.

gmcisaac@illinois.edu



David Mulla, University of Minnesota

Dr. Mulla received a Ph.D. degree in Agronomy from Purdue University with emphasis in soil physics (1983). Since 1995 he has been Professor and Larson Chair for Soil & Water Resources in the Dept. of Soil, Water, and Climate at the Univ. of Minnesota.

mulla003@umn.edu



Anne Rea, Environmental Protection Agency

Anne Rea, Ph.D. is the Associate National Program Director for Nitrogen, in the Office of Research and Development's Safe and Sustainable Water Resources research program. She co-leads the Nitrogen Research Roadmap effort which aims to identify the research needed to lay the foundation for the Agency, federal partners and stakeholders to move toward sustainable reactive nitrogen and co-pollutant management.

Rea.Anne@epamail.epa.gov



Dale Robertson, U.S. Geological Survey

Dr. Dale M. Robertson is a Research Hydrologist with the U.S. Geological Survey, Wisconsin Water Science Center, in Middleton, WI. His current research deals with estimating loads and concentrations of nutrients and sediment in streams over large geographic areas, such as the Great Lakes and Mississippi River Basins, developing nutrient criteria for streams and rivers, modeling mixing and eutrophication in lakes, and examining the effects of climate change on the physical dynamics, ice cover, and productivity of lakes.

dzrobert@usgs.gov



Calvin Wolter, Iowa Department of Natural Resources

Calvin Wolter is GIS Analyst for the Iowa Geological and Water Survey of the Iowa Department of Natural Resources. His research efforts have included developing nutrient budgets for the State of Iowa as well as providing environmental model support for TMDL development.

calvin.wolter@dnr.iowa.gov