



MANAGING AGRICULTURAL LANDSCAPES FOR ENVIRONMENTAL QUALITY

STRENGTHENING THE SCIENCE BASE

October 11-13, 2006

Westin Crown Center Hotel • Kansas City, Missouri

A multidisciplinary workshop for scientists and the people who use science to quantify the environmental benefits of applying conservation on agricultural land at landscape or watershed scales

Please join us in Kansas City for this workshop that will strive to...

- bring together the scientific and technical communities working to quantify the environmental benefits of applying conservation practices on agricultural land at landscape or watershed scales.
- expose the research community to the needs and expectations of policymakers and conservation practitioners struggling to account for the environmental benefits of projects intended to enhance soil quality, water quality, water conservation, air quality, and fish and wildlife populations and habitat.
- characterize the implications for conservation policy and practice from what research results have shown to be the environmental outcomes from the use of conservation on landscape or watershed scales.

Sponsored by:

- Agricultural Research Service
- Agriculture and Agri-Food Canada
- Cooperative State Research, Education and Extension Service
- Economic Research Service
- Farm Service Agency
- International Cooperation Office, Mexico National Institute for Forestry, Agriculture and Animal Husbandry Research
- Natural Resources Conservation Service
- U.S. Fish and Wildlife Service
- U.S. Forest Service
- U.S. Geological Survey

The workshop will be multidisciplinary in nature—involving agronomists, biologists, ecologists, economists, hydrologists, sociologists, soil scientists, and others working to improve our ability to quantify the effects of conservation practices on soil, water, air, and habitat at landscape or watershed scales. A series of provocative plenary sessions—featuring the presentation of commissioned papers and invited “perspectives”—will set the stage for more specific discussions in concurrent sessions, a poster paper session, and evening roundtables. These discussions will be organized around what we know and how we might think in the future about four key issues:

- What should we measure, and how, to account for the environmental effects of applying conservation on landscape or watershed scales?
- What methods are needed to conduct relevant environmental management research at landscape or watershed scales?
- What does the science have to say about targeting within landscapes or watersheds to improve conservation effectiveness?
- What expectations should we have about the timing between conservation implementation and the resulting environmental effects?



Organized by the
Soil and Water Conservation Society

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Managing Agricultural Landscapes for Environmental Quality **Strengthening the Science Base**

Wednesday, October 11

- 7:00 a.m. Registration
- 8:30 a.m. **Opening Session** (a moderated panel discussion)
Demands on the science: Needs and expectations of conservation policymakers and practitioners.
Moderator
Otto Doering, Purdue University, West Lafayette, Indiana
Panelists
Steve John, Agriculture Watershed Institute, Decatur, Illinois
Todd Ambts, Wisconsin Department of Natural Resources, Madison
Davis Minton, Minton Farms, Dexter, Missouri
Jason Weller, Office of Management and Budget, Washington, D.C.
Bill Puckett, Natural Resources Conservation Service, Washington, D.C.
Anne Simmons, Committee on Agriculture, U.S. House of Representatives (invited)
- 10:00 a.m. Break
- 10:30 a.m. **Concurrent Sessions** (4 sessions; 4 speakers each)
- 12:00 noon Lunch
- 1:15 p.m. **Plenary Session: *What should we measure, and how, to account for environmental effects?***
Lead Author/Presenter
Peter Groffman, Institute of Ecosystem Studies
Collaborators
Paul Capel, U.S. Geological Survey
Wanhong Yang, University of Guelph, Guelph, Ontario
Jeff Arnold, Agricultural Research Service
Kurt Riitters, U.S. Forest Service
Perspectives
Integrating the Biophysical and Social Sciences
Kenneth Sylvester, University of Michigan, Ann Arbor
What Science Can and Cannot Provide Policymakers
Otto Doering, Purdue University, West Lafayette, Indiana
- 2:45 p.m. Break
- 3:15 p.m. **Concurrent Sessions** (4 sessions; 5 speakers each)
- 5:00 p.m. Adjourn
- 5:30-7:00 p.m. **Reception** (cash bar) **and Poster Papers**

Thursday, October 12

- 8:00 a.m. **Plenary Session—*Methods for environmental management research at landscape and watershed scales***
Lead Author/Presenter
Phil Robertson, Michigan State University, Hickory Corners
Collaborators
Richard Lowrance, Agricultural Research Service, Tifton, Georgia
Cathy Kling, Iowa State University, Ames
David Mulla, University of Minnesota, St. Paul
Wes Burger, Mississippi State University, Mississippi State
Perspectives
Coping with the Data Dilemma
Fran Pierce, Washington State University, Pullman
Responding to New Research Paradigms
Colien Hefferan, Cooperative State Research, Education and Extension Service, Washington, D.C.

- 9:30 a.m. Break
- 10:00 a.m. **Concurrent Sessions** (4 sessions; 5 speakers each)
- 12:00 noon Lunch
- 1:15 p.m. **Plenary Session—*The science of targeting within landscapes and watersheds to improve conservation effectiveness***
Lead Author/Presenter
 Todd Walter, Cornell University, Ithaca, New York
Collaborators
 Mike Dosskey, National Agroforestry Center, Lincoln, Nebraska
 Madhu Khanna, University of Illinois, Champaign-Urbana
 Mark Tomer, Agricultural Research Service, Ames, Iowa
 Jim Miller, Agriculture and Agri-Food Canada
 John Wiens, The Nature Conservancy, Arlington, Virginia
- Perspectives*
The Disproportionality Conundrum
 Peter Nowak, University of Wisconsin, Madison
Buying Environmental Services: Some New Uses for Old Economic Tools
 Roger Claassen, Economic Research Service, Washington, D.C.
- 2:45 p.m. Break
- 3:15 p.m. **Concurrent Sessions** (4 sessions; 5 speakers each)
- 5:00 p.m. Adjourn
- 5:30-6:30 p.m. **Reception (cash bar) and Poster Papers**
- 7:30 p.m. **Key-issue Roundtables** (four roundtables; workshop participants interact with lead authors, collaborators, and “perspective” presenters from the plenary session of their choice)

Friday, October 13

- 8:00 a.m. **Plenary Session—*Realistic expectations about the timing between conservation implementation and environmental effects—lessons learned from long-term research [for what scale of change is possible over what period of time]***
Lead Author/Presenter
 Stan Gregory, Oregon State University, Corvallis
Collaborators
 Kathryn Boyer, Natural Resources Conservation Service, Corvallis, Oregon
 Theo Dillaha, Virginia Tech University, Blacksburg
 Jane Elliott, Environment Canada, Ottawa, Ontario
 Matt Baker, Utah State University, Logan
 Art Allen, U.S. Geological Survey, Fort Collins, Colorado
- Perspectives*
The Promise of Adaptive Management
 Mary Watzin, University of Vermont, Burlington
The Chesapeake Bay Experience: Learning About Adaptive Management the Hard Way
 Tom Simpson, University of Maryland, College Park
- 9:30 a.m. Break
- 10:00 a.m. **Concurrent Sessions** (4 sessions; 5 speakers each)
- 12:00 noon **Concluding Luncheon Session** (moderated panel discussion)
Demands on the science: A second look at the needs and expectations of conservation policymakers and practitioners
Moderator
 Otto Doering, Purdue University, West Lafayette, Indiana
 Panel members from the opening session return to offer their reactions to the workshop and suggest next steps to meet their needs. The panelists will be joined during this closing session by Ghassem Asrar, deputy administrator for natural resources and sustainable agricultural systems, Agricultural Research Service, Beltsville, Maryland, and Craig Cox, executive director, Soil and Water Conservation Society, Ankeny, Iowa.
- 1:30 p.m. Adjourn

Workshop Registration

Registration for the workshop is available online at **www.swcs.org**. Registration includes three lunches, two receptions, and all refreshment breaks.

Advance registration: \$250

After September 29 or Onsite: \$300

Workshop registration will include a book of abstracts of all papers presented during the concurrent and poster paper sessions, and a post-workshop report based on the opening and closing sessions, the four themed plenary sessions, and related discussions.

Cancellations of workshop registrations must be received by SWCS, in writing, prior to September 15 to qualify for a full refund of the registration fee. A \$50 processing fee will be assessed on cancellations of workshop registrations between September 16 and September 29. No refunds of workshop registration fees will be offered after September 29.

Hotel Room Reservations

The Westin Crown Center Hotel has reserved a block of rooms for the workshop—listed as “Soil and Water Conservation Society CEAP Workshop”—at a rate of \$91 per night, plus tax. That rate is within the federal per diem for 2006. Hotel room reservations must be made by September 11, 2006. After that date, space availability at the hotel will determine whether any rooms can be reserved, and the special workshop room rate will no longer apply.

To make hotel room reservations, please call the Westin Crown Center Hotel at (816) 474-4400 or go to **www.swcs.org**.

Airport Shuttle Service and Hotel Parking

A KCI shuttle service is available between the Kansas City airport and the Westin Crown Center hotel. The cost is \$25 roundtrip or \$15 one way. For further information about this shuttle service, call 1-800-243-6383.

For those who drive to Kansas City, self-parking is available at the hotel for \$13 per night. Valet parking also is available at \$15.50 per night.

For additional information about the *Managing Agricultural Landscapes for Environmental Quality: Strengthening the Science Base* workshop, please visit **www.swcs.org** or contact SWCS at (515) 289-2331 x114.





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Measurement

Measuring Socioeconomic Dimensions

- Integrating Economic Analysis into Watershed Evaluation of Beneficial Management Practices (WEBS) (Carlyle Ross)
- Evaluating relative costs and benefits of environmental services using a geographic framework: Where do conservation practices generate the most bang for the buck? (Lisa A. Wainger)
- Economic Costs and Benefits Associated with Improved Environmental Quality in Two Agricultural Watersheds (John Westra)
- A Watershed Report Card: Social Considerations in Establishing and Implementing TMDLs (Gail Brant)

Monitoring and Estimation Techniques

- Designing stream sampling protocols for measuring ecological effects of conservation practices (Peter Smiley)
- Equipment and Methods for Environmental Monitoring of Edge-of-Field, Stream, and Subsurface Tile Sites for the Wisconsin Discovery Farms Program (David W. Owens)
- Estimating Soil Moisture on Agricultural Landscape: From a Point Scale to a Watershed Scale (Kangsheng Wu)
- Modelling the effects of rangeland conservation practices on water-soil quality, and plant productivity. (Kenneth Spaeth)

Lessons Learned

- Changes in Cropping Patterns Affect Nitrate-N in the Raccoon River Basin (Jerry Hatfield)
- Atmospheric Transport and Deposition of Agricultural Chemicals in Rainfall (Jason Vogel)
- The Need to Account for Site-Specific Information on Farming Activities in Assessing the Environmental Impact of Agriculture. (Jay Atwood)
- Effectiveness of agricultural best management practices on the ecological integrity of a Mackinaw River subwatershed, Illinois (Maria Lemke)
- Learning from the National Non Point Source Monitoring Program (Thomas Davenport)

Models and Measurement

- The USGS National Water-Quality Assessment Program: Understanding the Effects of Nutrients on the Ecology of Agricultural Streams (Mark Munn)
- Assessing Watershed Soil Quality: Approaches and Preliminary Results (Douglas Karlen)
- The Impact of Agricultural Conservation Practices on Stream Biota: A Spatially-Explicit Model (Richard Iovanna)
- Evaluation of BMPs Using Statistical and SWAT Modeling in the Goodwater Creek Watershed (Amanda Koelling)
- Riparian land management for sediment trapping in a headwater catchment of Northern Laos (Olga Vigiak)

Indicators and Indices

- Canada's National Program to Assess Environmental Performance of Agriculture: National Agricultural Environmental Health Analysis and Reporting Program (Warren Eilers)
- Developing Standards for Nitrogen and Phosphorus to Prevent Eutrophication of Canadian Agricultural Streams (Patricia Chambers)
- County- and watershed-level assessment of NRCS conservation program effectiveness: Development of a new Michigan-wide assessment method (Nancy French)

- Measuring the Success of Conservation Programs (Kitty Smith)
- Key National Indicators of Soil and Water Conservation & maintenance for Sustainable Rangelands (Dennis Child)

CEAP—An NRCS Perspective

- Measuring agricultural conservation practice effects on fish and wildlife (Charles Rewa)
- Relative Magnitudes and Sources of Sediment in CEAP-Benchmark Watersheds (Roger Kuhnle)
- The Prairie Pothole Regional Assessment: Results of a Survey to Estimate Ecosystem Services Derived from USDA Conservation Reserve (CRP) and Wetlands Reserve Program (WRP) Lands (Robert Gleason)
- The Conservation Effects Assessment Project (CEAP) for Wetlands in the Lower Mississippi Alluvial Valley (LMV) (Stephen Faulkner)
- Grazing Lands CEAP: An NRCS Vision (Leonard Jolley)

Impacts of Best Management Practices

- Watershed Evaluation of Beneficial Management Practices (WEBS) in the Lower Little Bow River Basin of Southern Alberta (Jim Miller)
- Effects of Best-Management Practices in Three Agricultural Watersheds in Wisconsin, 1989-2002 (David J. Graczyk)
- Assessing The Relative Timing And Contribution Of Mechanical And Hydrologic Effects Of Vegetation On Stream-Bank Stability (Andrew Simon)
- Environmental impacts of managed haying and biomass harvests in Conservation Reserve Program buffers (Verel W. Benson)
- Has The Conservation Reserve Program Benefited Grassland Birds in the United States? (James Herkert)

Research Methods

Watershed-scale Approaches

- National, Holistic Watershed-Scale Approach for Studying Agricultural Chemicals (Paul Capel)
- Incorporating field-level model results into large scale watershed assessments to assess the effects of conservation practices (Steven Potter)
- Using Paired Watersheds to Evaluate the Effects of Agricultural Best Management Practices on Water Quality in South-Central Minnesota (Adam Birr)
- An Integrated Economic-Hydrologic Modeling Framework for the Watershed Evaluation of Beneficial Management Practices (Wanhong Yang)

A Matter of Scale

- A Multiscale Approach for Assessing Effects of Landscape Characteristics on Stream Biota in Midwestern Agricultural Basins (Julie Hambrook Berkman)
- Comparison of Plot Studies and Farm Simulations for Different Manure Management Strategies. (A. M. Garcia)
- The Effectiveness of Conservation Practices on Water Quality: A State-Level Analysis at the Watershed Scale (Manoj Jha)
- Integrating field studies and watershed models to improve lake water quality (Chandra Madramootoo)
- Regionalization of SWAT Model Parameters in Arkansas Priority Watersheds (Margaret Gitau)

Research Tells Us

- Conservation Practices and Water Quality in the Iowa River's South Fork Watershed (Tomer Mark)
- Impact of Beneficial Management Practices (BMPs) on Water Quality for Three Beef Cattle Farms in the Salmon River Watershed in British Columbia. (Cindy Meays)
- Impacts of Decade-Long Precipitation Variations on Watershed Sediment Yield and Implications for the Conservation Effects Assessment Project. (Jurgen Garbrecht)
- Potential use, limitations, and research needs for duration curves for evaluating the effectiveness of land management practices (James Bonta)
- Application of SWAT to assess the Illinois Conservation Reserve Enhancement Program in the La Moine River Basin (Thomas K. O'Donnell)

Integrating Economics

- Integrated Analysis of Weed Management Practices to Reduce Atrazine Contamination in a Missouri Watershed (Tony Prato)
- Watershed-Scale Economic Assessment of BMP Effect on Improving Water Quality within South Tobacco Creek, Manitoba (Mohammad Khakbazan)
- Economic and Phosphorus-related Effects of Precision Feeding and Forage Management on a dairy farm: Cannonsville Reservoir Watershed, NY. (Lula Ghebremichael)
- Water Resource Degradation in the Boone Watershed: Integrating Economic and Watershed Models (Silvia Secchi)
- Environmental and Economic Assessment of Five Conservation Practices in the Stepler – South Tobacco Creek Watershed Project (James Yarotski)

Research Techniques

- Effects of input uncertainties on scenario predictions for national assessments of conservation practices (Xiuying Wang)
- Integrating multi-temporal and multi-platform agricultural remote sensing with water quality and geospatial data for evaluating the effectiveness of conservation practices in Michigan. (Colin Brooks)
- Relating Herbicide Loadings to Satellite-Derived Land Use on Watersheds with Runoff-Prone Soils (Gab-Sue Jang)
- Estimating Preferential Flow to a Subsurface Drain with Implications for Glyphosate Transport in a Small Agricultural Watershed (Wesley Stone)
- Watershed-level influences on the development of environmental performance standards for stream sediments in potato production regions of Atlantic Canada (Glenn Benoy)

Communicating with Constituencies

- I-FARM: A web-based model for quantifying farm and regional scale - impacts of bio-refinery feedstock supply (Ed van Ouwkerk)
- Community-Agriculture Cooperation to Protect Source Quality: Institutions, Programs and Social Relations (Stephen Gasteyer)
- Public Benefit and Cost Analysis of Alterations to Intensive Livestock Operations: Agricultural Operations Act Saskatchewan Case Study (Edward Knopf)
- Estimating the In-stream Water Quality Benefits of Conservation Practices at a Regional Scale: An Integrated Modeling Approach (Santhi Chinnasamy)
- From Conflict to Cooperation: Enlisting Stakeholders to Address Water Quality Disputes in an Embattled Watershed (Jennie Popp)

Targeting

Policy Initiatives and Targeting

- Establishing Seven Small Watershed Monitoring Sites Across Canada (B. Harker)
- Agroforestry in the 2007 Farm Bill: Using science to target landscape change and inform policy (Dean Current)
- Adoption of Conservation Initiatives on Midwest Farms: Farm Size Matters (Zachary Cain)
- Why Science Is Not Enough: Collaborative Watershed Planning (Pamela Helfer)

Field Risk Assessment and Targeting

- Targeting Best Management In Contrasting Watersheds (Andrew Sharpley)
- Model Validation Challenges (Steven Potter)
- Documenting the effects of agricultural practices on stream habitats and their species: Case studies from Oregon, Wyoming, South Dakota, and Washington. (Kathryn Boyer)
- Targeting riparian buffer strips for water quality protection: where and when do they work? (Sharon Reedyk)
- Nutrient and Herbicide Transport in Streams of the Salt River Basin, Missouri (Robert N. Lerch)

Modeling and Targeting

- Considerations for national-level targeting of conservation program efforts for water quality protection (Robert Kellogg)

- Watershed Conservation Management Planning Using the Integrated Field and Channel Technology of AnnAGNPS and CONCEPTS (Eddy Langendoen)
- Using the Spatially Explicit Delivery Model and the Revised Universal Soil-Loss Equation to Target High-Risk Sediment Loading Areas at Multiple Scales (Glenn O'Neil)
- Using AnnAGNPS to Evaluate BMP Effectiveness in Reducing N and P into the Choptank River and the Chesapeake Bay (Carrie Graff)
- Assessing ephemeral gully erosion in the Cheney Lake CEAP Watershed using GIS, TIEGEM and the AnnAGNPS model to improve conservation effectiveness (Lyle Frees)

Stakeholder Planning Groups and Targeting

- Evaluation of Conservation Practices in a Mixed-Land Use Watershed using Interdisciplinary Analyses (Jan Boll)
- Coupling conservation practice with conservation need: The potential to use CEAP modeling to improve conservation application (Susan S. Andrews)
- The Public Policy Challenge of Working Agricultural Landscapes: Trade Offs among Ecosystem Services and Traditional Agricultural Commodities--Implication for Watersheds (Steven Kraft)
- United States and Australian Environmental Conservation Programs: Contrasts in History, Propensity to Conserve, and Focus (Felix Spinelli)
- Targeting for Environmental Improvement When Multiple Conservation Programs Co-exist: an Application to the Upper Mississippi River Basin (Hongli Feng)

Agency Programs and Targeting

- Willingness of Michigan Farmers to Participate in and Cooperate Within the Conservation Security Program (Sandra Batie)
- Improving the cost-effectiveness of USFWS wetland easements through the mapping of agricultural land values across landscapes (Steven Shultz)
- An Agency Approach to Resource Management Plans (Corey Mason)
- Missing The Bull's Eye With Targeting? (Gary Bentrup)
- Multi-Attribute Decision Analysis for Improving Federal Conservation Program Effectiveness (C. Derya Ozgoc-Caglar)

Modeling and Targeting

- Using Genetic Algorithms and an Integrated Water Quality-Economic Model to Identify Optimal Placement of Conservation Practices in a Watershed (Sergey Rabotyagov)
- Simulating the Effects of Alternative Management Practices on Suspended Sediment and Phosphorus Loads to Green Bay using the Soil and Water Assessment Tool (SWAT) and SNAP-Plus (Paul Baumgart)
- Integrated management strategy for the development and implementation of an atrazine TMDL for Aquilla Lake. (Monty Dozier)
- An Application of a National-Level Modeling Approach for Estimating Cropland Acres in Need of Conservation Treatment (Jerry Lemunyon)
- Effect of Irrigation Practices on Water Use in the Groundwater Management Districts Within the Kansas High Plains, 1991-2003 (Charles Perry)

Techniques for Targeting

- Remote Sensing Techniques to Target Conservation Efforts at the Field Level and Beyond (Brian Gelder)
- A GIS-based Approach to Target Low Cost Agricultural Land Sensitive to Degradation (Nicholas Schmitz)
- An Evaluation of Data Availability and Monitoring of Conservation Policies and Practices in the Lower Little Blue River Watershed of Nebraska and Kansas. (Lisa Kelly)
- Stream Bank and Overland Flow Contribution to Suspended Sediment in Two Iowa CEAP Watersheds (Thomas Isenhardt)
- Effectiveness and Optimization of BMPs in Improving Water Quality Impacted by Land-Application of Animal Manure (Indrajeet Chaubey)

Realistic Expectations

Environmental Response to Management Changes

- Detecting Water Quality Responses to Land Management Changes: Why Is It so Difficult? (R. Peter Richards)
- Soil Cover Change: Cropping Intensification vs Conservation Tillage (Ted Huffman)
- Soil Management Practices to Reduce Erosion and Improve Soil Quality (Randall Reeder)
- Using Small-Plot Research Information to Guide Development of Conservation Practice Research at the Watershed Scale (Gyles Randall)

The Timing of Environmental Response

- Transport of Agricultural Chemicals: Estimating Lag Times in Different Hydrologic Environments (David Wolock)
- Evaluating the Timeframe for Measuring Changes in Stream Nitrate Concentrations from Large-Scale Land Use Change (Keith Schilling)
- Long-term watershed studies of conservation tillage highlight the impact of infrequent events on sediment and herbicide transport (Martin Shipitalo)
- Multi-year change in water quality from small, single use pasture watersheds (Lloyd Owens)

Socioeconomic and Programmatic Perspectives

- CEAP-ARMS: Evidence on Conservation Practice Adoption from an Integrated National Survey (Glenn Schaible)
- Valuing and Compensating Environmental Services from Wisconsin Agricultural Landscapes: The Role of Private Markets (Frank Casey)
- BMP Challenge: Protecting corn farmers who adopt BMPs from yield and income risk, and documenting economic and environmental outcomes (Thomas Green)
- Maximizing Conservation Benefits from the 2997 Farm Bill: Holistic Policy Options from an NGO (Mark Muller)
- Adaptive Management and CEAP: Linking Project Management with Better Accountability (Andrew Manale)

Simulating and Measuring Environmental Response

- Simulation of Conservation Practice Adoption and Water Quality Impacts in an Iowa CEAP Watershed with SWAT (Philip Gassman)
- Evaluating Nutrient Load Reductions to NYC Cannonsville Reservoir Due to Watershed Management and Land Use Change, Using the Variable Source Loading Function Model (Elliot Schneiderman)
- Effect of Sprinkler and Surface Irrigation on Return Flow Water Quality and Quantity (D.T. Westermann)
- Impacts of Intensive Potato Production on Water Yield and Sediment Load (Black Brook Experimental Watershed:1992-2002) (Lien Chow)

Environmental Response: Short/Long-term Expectations

- A Historical Look at Land Use Changes and Conservation Problems in the Goodwin Creek CEAP Watershed (Seth Dabney)
- Assessing the biodiversity benefits of farmland revegetation in the Western Australian wheatbelt. (Patrick Smith)
- Steep slopes and narrow valleys: Should we be farming here? (Joe Bragger)
- The Effluent Limitations Guidelines and NPDES Permit Regulations For CAFO's: Status Of Implementation, And Response To The 2nd Circuit Court Decision (Allison Wiedeman)