

**Minutes of the SERA-IEG 17 Annual Meeting  
held in Madison, Wisconsin  
July 28 to 31 2009**

Preceded by an NRCS workshop  
“Developing Water Quality Criteria in the Upper Mississippi River Basin”

Hosted by the University of Madison, Wisconsin and USDA-ARS in Madison, Wisconsin.  
Organizing Committee: Peter Vadas, John Panuska and Laura Wood-Good

**Wednesday, July 28**

The meeting was arranged with three sessions on Planning and Policy, Tools and Modeling, and Practice and Implementation, each followed by a brief discussion period. As the organizers have planned to post the presentations on-line, the readers are referred to the conference program (Appendix A) and the SERA-17 website for details on the presentations (as well as other presentations). Brief notes on the discussion are as follows:

- Planning and Policy: Discussion questions for Caitlin Kozelove and Andrew Sharpley focused on how the science community can get involved in the front end of policy development rather than being called in after the policy has already been written. The issues can be complex because EPA has some restrictions on directly funding research for policy and soliciting specific help for policy development. Some policy decisions are determined in courts, with strict timelines and action points set forth by a judge.
- Tools and Modeling: Discussion focused on the methods used for simplification of SNAP+ and how nutrient management plan writers are recommending that the manure be redistributed in Wisconsin. Interdependencies in the input parameters of SNAP+ allow select indicator variables to be used to develop relationships through multiple linear regression which can quickly and accurately predict the Index value. Manure redistribution (application to forages like alfalfa/grass mixtures) and changes in cropping rotations allow more opportunities for agronomic utilization of manure resources on Dairies.

**Wednesday PM**

Following lunch, Andrew Sharpley presented the progress and questions raised by the SERA-17 Ad-hoc “590 Revision Committee.” The presentation was followed by considerable discussion concerning the following points in the committee charge:

- When should an index be used? It is in general too much work to require that the P-index be run for every field in a state. Therefore, there should be some criteria for determining which fields need the index. Simply choosing a lower soil-test P threshold would miss fields that have high transport and are receiving manure. Only targeting manure-amended soils would miss high soil-test P fields and fields that may be receiving high fertilizer P inputs (e.g., specialty crops). Therefore, the potential for transport must be considered. This could be determined through topographic or soil-based GIS tools that could identify locations with potential for high transport, in addition to manure-applied soils.
- What are the minimum criteria of a P index? P index should have the following basic components :
  - Estimate of P loss from the source

- P loss from the soil
- Transport risk from erosion
- Transport risk from runoff
- P indices should be validated against either field data or modeling data to show that they are directionally correct and magnetically correct.
- What is the cutoff where the P-index shouldn't be run (i.e., an upper soil test threshold)? Use of an upper soil test threshold was unsatisfactory because transport factors could result in low potential for P loss even though the soil test P is relatively high. From a resource conservation standpoint, there may be an upper cutoff, but this cutoff would not have any relationship to water quality, rather it would have to be based on an arbitrary multiple of the upper limit of agronomic crop response. The only way to set it as a water quality standard is to incorporate transport factors as are done by P indices.
- What is the upper limit (as determined by a P-index) where P should not be applied? There was considerable discussion about how this should be set. Because all P-indices have different scales, a single index number could not be selected. Therefore, a more elaborate method would have to be used to determine if the very-high index category (or category at which P could not be applied) was appropriate. There were multiple methods suggested, but no consensus on which one would be best.
  - A model could be selected that predicts P-loss, and for any field where the model predicts P-loss in excess of a given load, the P-index would need to rate that field as "very high" or "no P application." Problems are that the models would have to be validated and calibrated, they would be complex if a single model was to be applied across all conditions. Furthermore, there was no consensus on the value of P loss (lbs/ac) at which the cut-off would occur.
  - A set of conditions could be stated, at which point the model must restrict P application to 0, such as x erosion, y manure application, z runoff. However, because conditions are so diverse, it would be difficult to choose the factors and their respective values that would trigger 0 P application.
  - States would have to set the upper-limit such that 10% of the fields would be in the very high (0 P application) category. However, this would not be related to water quality goals and may be difficult to determine in advance of P-index implementation.

Following this discussion, the groups separated into three break out sessions: Planning and Policy (moderator, John Lory), Tools and Modeling (moderator, Nathan Nelson), and Practice and Implementation (moderator, Forbes Walker). The breakout sessions were to determine the 5 goals that could be part of a 5-year plan for SERA-17. The break-out groups reconvened and reported following a 2-hour discussion. The break-out group reports are as follows:

### **Planning and Policy**

Current activity of the policy committee is largely focused on the work of the NRCS P Index committee. The group in Madison was asked to define specific action items for the coming years. We defined two additional areas of focus for the next year:

1. Define/identify how to have a front-end impact on P related issues with EPA and NRCS.

A common concern among the group was that the science of phosphorus loss was frequently being ignored or the scientific input was provided so late in the policy process that it had little

effect, particularly with EPA. The result is that proposed regulatory approaches can reflect thinking that is a decade or more in the past or is wrong. Members of the group discussed successful efforts at the state level to work with regulators to develop and implement innovative scientifically sound regulatory strategies but stated the process at the national level remains problematic. The group wants to prioritize ways to actively communicate with EPA and NRCS at the national level so they are more likely to avail themselves of the technical resources within SERA17 as part of developing policy.

Action items:

- Effort to establish a mechanism that allows scientists from SERA17 to meet regularly with EPA and NRCS staff to facilitate their availability to answer technical questions. John Lory will initiate.
- Contact ASA and discuss their technical contact process with EPA.
- Consider adding an International Policy Chair to facilitate communication on similar issues in other countries, particularly Canada.

2. Continue development of white papers addressing pressing phosphorus management issues.

The group was supportive of SERA17 continuing efforts to define and promote policies and strategies to improve P management. White papers can help define issues for the group, define future activities and communicate new ideas to a larger audience. A definite need for two papers was discussed. The third was listed as a possible future project.

- Summarize what is known and what is needed to link nutrient management standards to total maximum daily loads.
- Define the philosophical basis for P loss assessment: What should be the objective? What is the ultimate goal for farmers using P loss assessment? Should P loss assessment tools provide a means for reduction of P loss?
- Evaluate P, K and N availability numbers from manure and propose a means to facilitate a more universal approach nationally to establishing such values in the future.

Action items:

- Brad Joern plans on initiating a paper on linking nutrient management standards to TMDL's. He is appreciative of any potential cooperators who contact him.
- The policy group will build on the work of the NRCS P Index committee on the second topic after it finishes its work.

Respectfully submitted by:

John A. Lory  
Chair, SERA17 Policy Committee  
University of Missouri

**Tools and Modeling**

- Encourage states to move toward a quantitative P Index ("absolute" lb/ac). The index would not have to report the lbs/ac value to the producer, but the index would have to be validated against modeled or measured data to provide a relationship between the index and P load.
  - state based
  - developed through calibration with models

- potential for delivery linked to TMDLs
  - including uncertainty analysis
- Review/improve P subroutines in SWAT. Particular emphasis would be directed toward describing the inorganic P pools and their transformation rates.
  - determine and outline methods to quantify the inorganic P pools and transformation rates so they could be measured and used as direct inputs to the model.
- Facilitate communication between the experimenters and modelers.
  - Mechanism to facilitate identifying technical needs of models (modelers) and supplying needed data.
- Characterizing P fractions and availability of manures in soil relative to agronomic and environmental availability
  - relate these to modeled soil pools.
- Collecting data for edge of field P loss.
  - including timing, site, and management data.
  - Need many sites with average annual P loss.
  - began 2 years ago...need to finish
- Additional items discussed but not listed as an immediate priority
  - Next generation mechanistic production and runoff, soil, particulate, and dissolved P model at the precision ag (deca-meter) scale. The PALMS model is an example of the hydrology, but it lacks the chemistry components. A low priority relative to other needs at the current time, but a long-term goal.
  - Model of in-stream P transformation and conservation of mass. (Mike White already in the process of doing this) – high priority
  - Model of deposition between field and stream. High priority, but not in our area of expertise.
  - Bring measured and model uncertainties into the light. This is a high priority, but is a component of our other goals and does not need to be listed separately.
  - Incorporating P loss through tile drains into models. The current routines are not connected to soil test P, do not conserve mass, and are not based on field management. This is a high priority.
  - Ensure national funding for the National Models. Medium priority
  - Update model parameters and databases due to climate change (RUSLE2, climate parms in SWAT). low priority
  - Development of Regional P-indices (physiographic regions) with common platform between regions. (Low probability of success)
  - Improve the way that SWAT handles snowmelt runoff.

Submitted by Nathan Nelson, Modeling Workgroup Chair, Kansas State University

### **Practice and Implementation**

1. SERA-17 should consider looking beyond P and incorporating environmental effects of other nutrients in our discussions
  - a. Other items to consider are
    - i. Inclusion of N
    - ii. Inclusion of air quality
    - iii. Inclusion of C
  - b. Focus could be on the environment while maintaining agricultural productivity

- c. The new SERA-17 could be “Minimizing Losses of Agricultural Nutrients in the Environment”
- 2. We should look beyond the P-Index
  - a. Consider P and nutrient imbalances
  - b. Regional/geographic imbalances
    - i. Where should the livestock be??
  - c. Nutrient trading issues
    - i. How much are N / P / C credits worth?
- 3. Improve communication
  - a. There are a lot of stakeholders
    - i. EPA and regulatory agencies
    - ii. Environmental interest groups
    - iii. Integrators
    - iv. Marketing groups (i.e., Wal-Mart)
    - v. Agricultural producers
  - b. Change will happen – adaptive management, continuous improvement.
  - c. We need more partnerships...we know the problems, we must work together for the solutions.
- 4. Research Funding Agenda
  - a. NIFA had a narrow agenda (climate, biosecurity, food security)
    - i. How do we refocus the agenda?
  - b. Researchers (ARS, NRCS, Land grant universities)
  - c. What is the influence ASA-CSSA-SSSA on congress and NIFA?
- 5. Next Generation Technologies
  - a. What are they?
  - b. We may have them, but they aren't cost effective
  - c. How will we fund research, incentives to change practices, move nutrients to where they are needed?

Submitted by Forbes Walker, BMP committee chair, University of Tennessee

#### **Thursday, July 29 - Field trip (Appendix B)**

#### **Friday, July 30 - Business Meeting**

Due to the small number of people, we did not break out into workgroups, rather we discussed the topics from the breakout sessions.

Tools and Modeling: It has been mentioned that we were going to review and update the subroutines in the process-based models for a few years. We feel that we will see more progress in this now that we have established a more solid connection with the model developers. It has immediate relevance for P-index validation and must be a priority. However, the updates will not meet the short-term needs of the 590 committee. Funding has also been an issue with updating the model routines. NRCS provides some funding for SWAT through Texas A&M, some of that may be available to facilitate the research. EPA also has IAG (IEG) (interagency agreement) with USDA that could be used for that. Options for validation with current models.

- Peter Vadas spread-sheet – Needs quantity of runoff, which is not a trivial input and may require users to run complex simulation models to estimate runoff, which is subject to errors if they are not calibrated with field data.
- Use a process-based model – Difficult to require states to run. Likely that states who have not put effort into their P-index would not have the resources to properly set-up and run the models. Furthermore, we would prefer that the P sub-routines are updated prior to running all the simulations.
- We could tap into the CEAP National Assessment datasets that already have the model runs completed. These would be calibrated and could be readily available in a database. They represent a wide range of conditions across the Nation. Andrew will inquire about the availability of these datasets. Some CEAP watershed studies may also provide measured field data and/or calibrated model data specific to their states.

**Planning and Policy:** They are working on increasing liaisons with EPA to get in on the front end of issues. They will maintain contact and dialog with the EPA CAFO rule office. They should work to educate EPA on the differences between the Chesapeake Bay and the rest of the country so that EPA will realize that what is right for the Bay is not necessarily correct elsewhere. They could also provide input on TMDL creation and ways to meet the TMDLs.

**Practice and implementation:** They would like to work on communication, marketing, and building links between SERA-17 and other organizations. They would like to expand the scope of SERA-17 to include environmental effects of N (and other nutrients). A more comprehensive nutrient management perspective. In order to do this effectively, we should seek cooperation and membership from a broader group of scientists. We will look into sending a SERA-17 rep to the NC 113 meeting at the November ASA meetings (if NC113 is meeting then). We can also invite a member of NC 113 to visit with us at that time. We can include more N topics at our annual meeting and may look to position and focus our future meetings to attract these individuals to SERA-17. We'd also like to get more involved with NGOs. We could invite a panel of NGO reps to meet with us at our next meeting. We are looking for ways to influence NIFA funding to direct some of their programs toward water quality issues.

**Following workgroup discussion, we discussed SERA-17 Business as follows:**

**2011 Meeting** – there were two proposals for meeting locations, Fort Lauderdale Florida, and Fort Worth TX. With practically no debate, it was unanimously decided to have the 2011 meetings in Florida. Potential meeting outline is as follows:

- Location will likely be Ft. Lauderdale, which is close to the everglades.
- Field trip on the first day (to allow people options to attend or skip it). The field trip will likely include an airboat tour of the everglades
- Two full days of conference (rather than one and ½ days). Hot topics include the Everglades agricultural area, numeric nutrient TMDLs, Fertilizer restrictions, urban runoff.

**2012 Meeting** – Don Flaten volunteered to host the 2012 SERA-17 meetings in Manitoba Canada. If there is sufficient interest in traveling to Manitoba, then he will prepare a full proposal to be presented at the 2011 meetings.

**Incoming Chair** – John Lory was nominated as incoming chair. There were no other nominations. The voting was unanimous in favor of John as the incoming chair. Therefore, the 2010/2011 SERA-17 Leadership is

- Incoming chair – John Lory
- Chair – Peter Vadas
- Outgoing chair – Nathan Nelson

**Other Announcements:**

- We will have a SERA-17 meeting at the ASA meetings on Monday, Nov. 1<sup>st</sup> from 7 to 9 pm. The location will be announced when room assignments are made.
- There were 14 or 15 papers submitted to the special issue of the Canadian Journal of Soil Science associated with last year's conference. The papers have all been returned from review and are in the revision process. Anticipated publication date will be early 2011. All persons in attendance at the 2009 SERA-17 meeting will receive a paper copy of the special issue.
- Arrangements will be made to have the presentations from the 2010 SERA-17 conference available on the SERA-17 website (pending authorization of the presentors).
- USDA is looking to launch a publicity and education campaign related to nutrient management and environmental issues. Look for the official announcement at the ASA meetings. There will likely be funding available for educational and demonstration projects.

With no other business, the meeting was adjourned at 11:00 AM

**SERA-17 Annual Meeting**  
**Integrating Science, Policy and Implementation**  
**Madison, WI July 27-30, 2010**  
**Pyle Center, University of Wisconsin-Madison Campus**

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***Tuesday, July 27 NRCS Pre-conference Workshop***

**Developing Water Quality Criteria in the Upper Mississippi River Basin**

1:00 – 1:15 pm	Introduction to meeting objectives: Pete Nowak, UW-Madison
1:15 – 1:45 pm	Upper MS CEAP Report Results – Bob Kellogg and Jerry Lemunyon, NRCS
1:45 – 2:15 pm	Setting Nutrient Water Quality Standards in Upper MS River Basin State – Tom Davenport, U.S. EPA
2:15 – 2:45 am	Mini-panel and questions
2:45 – 3:00 pm	Break
3:00 – 3:30 pm	Lessons Learned from Regionalizing P-Indices – Doug Beegle, Penn State Univ.
3:30 – 4:00 pm	SERA-17 P-Index Workgroup – Andrew Sharpley, Univ. Arkansas
4:00 – 4:30 am	Mini-panel and questions

***SERA-17 Annual Meeting***

5:00 – 6:00 pm	Reception: Alumni Lounge (cash bar)
6:00 – 8:00 pm	Dinner: Alumni Lounge. Keynote Speaker: Tom Davenport, USEPA Region 5

***Wednesday, July 28***

8:00 – 8:15 am	Introduction to meeting objectives: Peter Vadas
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***Topic I: Planning/Policy***

**Moderator: John Lory**

8:15 – 8:40 am	Speaker 1: Where do we need to be. Caitlin Kozelove – EPA, Washington DC
8:40 – 9:05 am	Speaker 2: The role of science in getting us where we need to be Andrew Sharpley – Univ. Arkansas
9:05 – 9:15 am	Mini-panel and questions



- Appendix A -  
2010 SERA-17 Meeting Program

9:15 – 9:25 am Short Break (10 min)

**Topic II: Analytical Tools & Models**

Moderator: Nathan Nelson

9:25 – 9:50 am Speaker 3: The role of models in getting us where do we need to be  
Mike White – USDA-ARS, Temple, TX.

9:50 – 10:15 am Speaker 4: The role of science in model development/use – John  
Norman, Emeritus Professor, UW Madison

10:15 – 10:25 am Mini-panel and questions

10:25 – 10:45 am Break with refreshments: Alumni Lounge

**Topic III: Practice Implementation**

Moderator: Forbes Walker

10:45 – 11:10 am Speaker 5: Challenges at the policy/implementation interface  
Karl Czymmek – Cornell Univ.

11:10 – 11:35 am Speaker 6: Challenges at the extension/producer interface  
Jerry Griswold – NRSC Retired

11:35 – 11:45 am Mini-panel and questions

11:45 – 12:00 pm Open discussion

12:00 – 1:00 pm Lunch: Alumni Lounge

1:00 – 1:45 pm SERA 17/NRCS National 590 Revision Committee Update  
Andrew Sharpley, Univ. Arkansas

1:45 – 2:30 pm Breakout Groups Round 1

2:30 – 2:50 pm Break: Alumni Lounge

2:50 – 4:00 pm Breakout Groups Round 2

4:00 – 5:00 pm Report Back from Breakout Groups: Auditorium

5:00 – 6:00 pm Reception - Open poster session (cash bar)

6:00 – 8:30 pm Dinner: Alumni Lounge. Keynote Speaker: Dick Lathrop - WDNR & UW  
Center for Limnology History of the Madison lakes water quality

- Appendix A -  
2010 SERA-17 Meeting Program

***Thursday, July 29***

8:00 – 8:15 am Introduction: Peter Vadas

***Topic: Two WI Watershed WQ Management Projects***

**Moderator: John Panuska**

8:15 – 8:40 am Speaker 1: Policy – Pete Nowak – Nelson Institute, UW Madison  
Steve Richter – Nature Conservancy, Madison, WI

8:40 – 9:05 am Speaker 2: Model – John Panuska – BSE, UW Madison

9:05 – 9:30 am Speaker 3: Implementation – Tom Cox, Ag. & Applied Econ, UW –  
Madison

9:30 – 9:45 am Speaker 4: Yahara Clean Project – Kevin Connors

***Field Trip***

10:00 – 10:30 am Board Buses and Travel to stop 1

10:30 – 11:30 pm Stop 1 – Yahara Clean Project Site – Pheasant Branch

11:30 – 1:15 pm Travel to Lake Mendota Co. Park for lunch

1:15 – 3:30 pm Stop 2 – Pleasant Valley Project.

3:30 – 4:30 pm Return to Madison

***Friday, July 30***

8:00 – 8:15 am Introduction: Peter Vadas

8:15 – 9:30 am Panel Discussion: 3-5 year strategic plan for SERA-17

9:30 – 9:45 am Break

9:45 – 11:00 am Workgroup meetings

11:00 – 12:00 pm Business meeting and adjourn

**SERA-17 Annual Meeting**  
**Integrating Science, Policy and Implementation**

***FIELD TRIP PROGRAM***

**Pyle Center, University of Wisconsin - Madison Campus  
Madison, WI**

**July 27 - 30, 2010**

**The organizers wish to thank the Wisconsin Department of Agriculture,  
Trade and Consumer Protection – Bureau of Land and Water Resource  
Management For their financial support of the meeting**

- Appendix B -  
2010 SERA-17 Field Trip Program

*Thursday, July 29*

*Topic: Two WI Watershed WQ Management Projects*

**Start at Pyle Center, UW Campus (A)**

- 8:00 – 8:15 am Introduction: Auditorium: **Pete Vadas**  
Moderator: **Jim VandenBrook**, WI DATCP. *A short explanation of state and local agency responsibilities with regard to agricultural runoff in WI.*
- 8:15 – 8:40 am Policy – **Pete Nowak** – Nelson Institute, UW Madison. *The WI Buffer Initiative and what we learned from it. (15 min)*  
**Steve Richter** – **The Nature Conservancy, Madison, WI.** *Managing Ag. watersheds for fresh water diversity. (10 min)*
- 8:40 – 9:05 am Modeling – **John Panuska** – Biological Systems Engineering, UW Madison. *Testing models to target management in the Pleasant Valley watershed.*
- 9:05 – 9:20 am Implementation – **Tom Cox**, Ag. & Applied Economics, UW – Madison. *Optimizing economic & environmental tradeoffs for whole farm management.*
- 9:20 – 9:45 am *Historical and current efforts to curb agricultural phosphorus inputs to Lake Mendota* – **Kevin Connors**, Director, Dane County Land and Water Resources Department.

*Field Trip*

- 10:00 – 10:30 am Board Buses and Travel to stop 1: refreshments on buses
- 10:30 – 12:00 pm **Yahara Clean Project Site (B)** – Pheasant Branch Conservancy, springs and hill. Participants will break into 3 groups that will rotate through each of the three stops. Each stop will be 15 minutes for presentation and questions.
- Intensive dairy agriculture and phosphorus runoff in the N. Fork of the Pheasant Branch (hill top), **Pat Sutter**, Dane County Conservationist.

- Appendix B -  
2010 SERA-17 Field Trip Program

- Phosphorus runoff issues at the urban-agriculture interface (base of the hill at sign), **Jeremy Balousek**, Dane County Urban Conservation Engineer.
- Agricultural runoff and efforts to improve Lake Mendota water quality (at the springs) **Susan Josheff**, Basin Supervisor, WI DNR.
- 12:00 – 1:15 pm      Travel to **Lake Mendota Co. Park (C)**, for lunch.
- 1:15 – 2:15 pm      Travel from Lake Mendota Park to Pleasant Valley (two buses)  
Landscape guides as we travel from a glaciated landscape to the Driftless Area: **Fred Madison**, UW-Madison, **Chris Baxter**, UW Platteville (one on each bus.)
- Discussion of on-farm runoff research in WI: **Dennis Frame**, **Amber Radatz**, **Eric Cooley**, WI Discovery Farms; **Dennis Busch** and **Chris Baxter**, Pioneer Farm (at least one person from Discovery Farms and Pioneer Farm on each bus.)
- 2:15 – 4:00 pm      **Pleasant Valley Project** (each of the two buses will make the stops in a different order tour the watershed separately, so each set of talks at the two stops will be given twice).
- At watershed outlet (30 mins) (D):  
A.) Monitoring and sediment fingerprinting: **Rebecca Carvin**, **Faith Fitzpatrick**, USGS. B.) Wisconsin's agricultural runoff performance standards and how they are being tested in this project: **Gordon Stevenson**, Section Chief, Runoff Management, WI DNR.
- At Kellercrest Farm (30 mins) (E):  
Implementing field practices to control runoff P losses and how it affects farm productivity: **Mark and Tim Keller**, Kellercrest Farm, and **Jim Leverich**, On-Farm Research Coordinator, UW-Extension
- 4:00 – 4:45 pm      On bus back to Madison (A):  
High runoff phosphorus loss potential areas in the Pleasant Valley Watershed: **Curt Diehl**, **Duane Wagner**, Dane County Land Conservation Department (one on each bus)  
Nutrient management planning for Wisconsin farms: **Sue Porter**, **Sara Walling**, WI Department of Agriculture, Trade and Consumer Protection. (one on each bus)

- Appendix B -  
2010 SERA-17 Field Trip Program

**FIELD TRIP ROUTE MAP**

