

SERA17 meeting – 15-17 August 2017

Multistate Research Activity Accomplishments Report

- Project/Activity Number: SERA17
- Project/Activity Title: Organization to Minimize Nutrient Loss from the Landscape
- Period Covered: 1 October 2017 – 30 September 2018
- Date of This Report: 10 January 2018
- Annual Meeting Date(s): 15-17 August 2017

Participants: 84 registered

Summary and Minutes of the Annual Meeting

Tuesday 15 August

Session I Phosphorus in the Water (8-11 am)

Speakers

Amy Shober, University of Delaware, SERA17 Chair

Welcome and Introductory Remarks

Helen Jarvie, Centre for Ecology and Hydrology, Wallingford, UK

Clearer Views through Murky Waters: Historical perspectives on Eutrophication

Merrin Macrae, University of Waterloo

Impacts of Land Management Practices on Phosphorus Losses from Agricultural Fields and Watersheds in Ontario, Canada

Laura Johnson, Heidelberg University

Phosphorus Along the Land to Lake Continuum

Discussion - participants

Katie Flahive, USEPA

Laura Johnson

Helen Jarvie

Karl Czymmek, Cornell University

Nathan Nelson, Kansas State University

Mark Smith, USDA-NRCS

Tom Bruulsema, IPNI, Guelph, Ontario, Canada

Forbes Walker, University of Tennessee

Keith Reid, Agriculture and Agri-Food Canada

Steve Davis, USDA-NRCS

Tom Morris, University of Connecticut

Deanna Osmond, North Carolina State University

Peter Kleinman, USDA-ARS, Pennsylvania

Session II: Rapid Fire Poster Session Talks (10:30 – 11:00 am)

Mart Ros, Cornell University

The Future of the New York phosphorus index

Stephen Crittenden, Cornell University

Using soil phosphorus saturation ratios to compare manure application cutoffs across states

Santina Wortman, USEPA
US Action Plan for Lake Erie (coming soon...)

Chuck Anderson, The Andersons, Inc, Maumee, Ohio
Soluble Phosphorus in Agriculture: Are there options?

Chad Penn, USDA-ARS, National Soil Erosion Research Laboratory, Indiana
Phos Capture

Session III: Introduction to the Lake Erie Harmful Algal Bloom (11:00 – noon)

Speakers

Jeff Reutter, Stone Lab, Ohio State University Sea Grant
Toxic Algae, Undrinkable Water, and Dead Zones in Lake Erie: Understanding the Problems and Solutions

Dave Spangler, Lake Erie Charter Boat Captain
Lake Erie Economic and Environmental Impacts

12:00-1:00pm Lunch at Maumee Bay State Park

1:00-4:00pm Boat Tour of Lake Erie to see the algal bloom conditions in the Lake. Coordinated by Dave Spangler, Lake Erie Charter Boat Captain

5:00-8:00pm Dinner at Maumee Bay State Park with Poster Session

Dinner Speaker:

Frank Gibbs, Resource Soil Scientist (Retired) USDA-NRCS, Northwest Ohio
Soil Health Challenges and Successes
Smoking Tile Evaluations

Wednesday 16 August

Session IV: Phosphorus Management and Losses in the Western Lake Erie Basin

Speakers

Chris Van Esbroeck, Ontario Ministry of Agriculture, Food and Rural Affairs
Phosphorus Management Practice for Mitigating Losses

Mark Williams, USDA-ARS
Evaluating Field-Scale Phosphorus Losses across the Western Lake Erie Basin

- Lots of questions! Reutter, Cook, Karen Chapman.

Todd Redder, Limno Tech
Application of Linked Watershed-Lake Models to Connect Land Management in the Maumee Basin to Western Lake Erie Nutrient Loading and Harmful Algal Blooms

Greg LaBarge, The Ohio State University
Farmer Water Quality Concerns/Motivations in the Western Lake Erie Basin

Mark Fritz, Ohio Agribusiness Association
Ohio's Voluntary Approach: The 4R Certification Program for Ag Retailers and Crop Consultants

Glen Arnold, The Ohio State University
Application of Livestock Manure to Growing Crops to Better Utilize the Nutrients

Session V: Field Tour noon – 5:00 pm

Laura Johnson, Heidelberg University
USGS/Heidelberg Stream Gauge at Waterville

Kevin King, USDA-ARS
Edge-of-Field Monitoring of Phosphorus Losses from Agriculture

Logan Haake, Legacy Farms Coop
Agri-retailer Perspectives on HABs and 4-R Nutrient Stewardship

5:00-7:30pm Dinner (provided as part of the field tour)

Thursday 17 August

Business meeting – 30 people attending.

1. Amy Shoher, chair, opened the meeting at 8:15 am.
2. Chair for next year. Nomination for Gurpal Toor, University of Maryland, to serve as chair-elect for 2019 was accepted. Opened floor for other nominations; none received. Vote was unanimous in favor.
3. Committee and workgroup (WG) leaders – Aquatics committee: Doug Smith and Brian Haggard. Policy workgroup: John Lory. Modeling workgroup: Nathan Nelson (Pete Vadas). BMP WG – was Forbes; now Deanna, but she turned it over to someone else. Past minutes indicate the WG decided not to write more factsheets.
4. Doug Smith noted we have had requests for updating factsheets. Deanna asked if funding was available. Katie Flahive asked how much would be needed. Could you follow the example of “Ten ways to reduce nitrates” done by NSERA? When are we getting something like this for P? Forbes Walker agreed that the BMPs need revision, takes \$.
5. Amy asked about goals for the teams. Policy group with USEPA. John Lory asked if that would be something useful to resurrect. Extension and BMP groups could be combined. At this point we decided to remain in plenary to discuss all workgroup themes together.
6. Soil test calibrations – other regional groups are discussing. Deanna noted a lot of momentum: on this topic: with the Soil Health Institute, and the southern workgroup (SERA6?) and others, all but WERA. We do not want to duplicate efforts of others. Peter Kleinman noted that this group has a track record of pulling people together. Need to look across issues – agronomic, environmental, and soil health. Embarrassment in soil testing for the number of soil tests, number of recommendations, and industry approaches. LGU recommendations are often considered obsolete. Need to look at this comprehensively. Karl Czymmek asked if we could step back and come up with a new paradigm. Peter agreed there is room for SERA17 to do this. Amy noted that the idea of a white paper has been discussed before, but never happened. We could do it. In the North Central region, Dorivar Ruiz-Diaz could be interested. Tom Bruulsema noted the need for definition of an optimum range for soil test P.
7. Nathan Nelson asked what we need for modeling. Since last year’s meeting, CIG groups submitted papers. Three groups. Do we have enough critical mass to discuss that today? David Radcliffe not present. Only Karl and Nathan were interested in continuing the model WG.
8. Karl Czymmek noted that a broad based factsheet on tile drains is an important need. Seeking basic level science about the role of tile drains. Peter Kleinman noted that we have addressed this before, but clearly more is needed. Katie Flahive noted that white papers are overwhelming to policy people. States are asking “how to manage P in my landscape.” They want a simple 20 page document. Forbes Walker noted that Purdue University is leading a multi-state drainage

project. Lindsay Pease noted that it's mostly on drainage practices, drainage water recycling, climate change, etc. Katie asked, how do we make a 20K thing happen?

9. Deanna – don't think the policy group needs to meet. Have talked with Katie. Found solution. Katie – they are a lot of work to put together. We have weekly calls among EPA regions. Don't need planned bimonthly discussion pieces. Katie can call on SERA17 exec as needed instead. Also needs to know about what's bubbling up. Kristen – group organizes calls monthly – always looking for agenda topics. Loose affiliation of technically aware people.
10. Katie noted that the NRCS 590 is up for review (internal). Reviewed every five years. Opportunity to engage. EPA in past has engaged on such reviews. Can EPA and SERA17 have dialogue? Two people have had requests for review of state 590 (Karl and Deanna, NY and NC). NRCS can't present to SERA17 until internally approved. Deanna advised Katie to talk to Dana Ashford. Katie noted that EPA wants input. Forbes pointed out that NRCS has only an "acting" national agronomist.
11. Amy: WGs to include soil test, BMP. What about policy? Farm Bill? Sally Flis asked, are you allowed to comment on the Farm Bill? Karl – tri-societies to comment on Farm Bill. We can leave it to them.
12. Forbes asked what changes to 590 will be proposed. Deanna noted that soil health (SH) language was to be included. Amy stated that the P index was the issue last time; this time, soil test threshold and APEX instead. Katie asked is there new science in this area that would support changes. Karl note that the tile drain issue Pete mentioned could impact 590.
13. Amy noted that we have two conclusions: continue WGs on BMP, and soil test calibration.
14. Pamela Joosse asked, is there evidence for soil health and water quality? Should or should not be in? Ontario is asking. What's the win-win? Doug Smith noted he had data but it was not yet worked up. Deanna noted she had data from NCSU – but was not sure what Soil Health (SH) is; it seems to involved different practices, in different places, with different effects. No relation between WQ and soil health metrics. Southern soils and climate. Pamela agreed it is difficult to define soil health. It could be that practices good for WQ are also good for SH.
15. Peter Kleinman noted that this is a good controversial topic from which SERA17 should not shy away. Examples of SH run amuk. Where does SH and soil P management intersect? Not too narrow. Possible to roll into BMP group? Amy – BMP group does not need to mean factsheets only. Peter noted the need for a committed lead. Amy – allocate to BMP group? Deanna – someone needs to frame it. Then see who wants to participate in the white paper. PK – time for new blood to step up. Forbes – drained versus undrained landscape. Western folks – very different. Amy – contacts in AZ.
16. Emily Duncan noted that at the 20 EOF monitoring locations in the Western Lake Erie Basin, the plan is to sample all 40 of our fields, agronomically and for SH – for LTAR. Dave Huggins, Deanna, Rick Haney involved. **Emily agreed to lead the effort to develop a white paper on soil health and phosphorus.** Deanna suggested to get a co-leader – make sure you get help. **Doug Smith agreed to contribute. Nathan Nelson, who is also collecting SH data, agreed to collaborate. Forbes, Deanna, Amy all volunteered to contribute data.** Karl noted that Quirine Ketterings has data. Peter noted the need to define regional issues, to avoid getting bogged down. Emily proposed to start with "what is SH?" Keith Reid suggested the process should identify uncertainty, certainty, source side of P, and then the transport side – no evidence of changes to the claimed transport benefits.
17. Deanna noted need for framing first. Everyone comes in with their regional agro-ecological perspectives. A separate focused meeting is needed. We discussed options for such a meeting. Amy asked if we could leverage the tri-societies? Deanna noted \$10-15K would likely do it. SHI? Mini-grants. NIFA does fund travel. Pamela – thinking a little bigger – workshop like the EOF

workshop of the SWCS. Could be the theme of SERA17 next year. Katie – Another SH meeting funded by Buffet? Deanna – Emily could start with a list-serve? Karl – propose a session for ASA Baltimore? Forbes – some would have to fly, but we could be somewhere central. Gurpal noted that the University of Maryland’s NSF synthesis center may have \$ for getting people together for big ideas. Merrin Macrae noted that the Canadian Water Network has a \$20K grant for workshops. Sally noted that industry already talking about SH with CropLife America and is involved in the Soil Health Partnership. TFI could host in DC for up to 12 people. Doug Smith noted that funds were available potentially, but must be spent this year. Katie could host too. [Many ideas floated, nothing agreed upon.]

18. Deanna – pick some people with data. Goal and objectives. Then get additional volunteers. Then decide how to move forward. Need different people from different regions to help you frame this. Canadians, Huggins. Sally, Nathan, Forbes, Merrin, Doug, Peter, April Leytem. Soil test calibration. Need a meeting on this one. Many dimensions. Sources of recommendations, varieties, modeling, lost data sets. Coalition of the willing. Bring in other networks. White paper then reach out to other groups. Broad terms. Forbes – SERA-6? Nathan – other soil test groups – could bring in at outline stage of white paper. Kovar – methods manual.
19. Deanna – Quirine, Andrew and I got CIG grants. Delayed one year. Soil test P. regional recommendations. Is there need to update to today’s conditions. Need to complement where you guys want to go. SHI – bang on how bad LGU recs are. But this is because no one has funded recalibration. Hailin and Deanna co-chaired SHI NM section. Bring everyone along for this conversation. Want to be sure this is in accord with the other groups. PK to lead, Deanna to be part. Deanna – was going to focus first on the south. PK – Northeast effort. Andrew, Paul Withers going to China – asked for an agenda – November. IPNI, Amy, Doug coalition of the willing. Deanna – ask chairs of regional committees. Peter – first focus it. Stratification. Sally – companies looking to get a single soil test – can’t TFI do it? Peter – need considerations of VRT, etc. Amy – sufficiency approach. When it went regulatory we had to allow more wiggle room. 50 ppm was critical, but the variability was so great, we couldn’t make that the zero application level. Peter noted from a Toronto meeting the need for probabilistic terms to avoid absurd lines. Amy suggested to bring in Josh McGrath – he has a field gridded in 10 foot square sections. Nathan Keith Forbes Quirine Emily Sally. Getting to be a pretty big group. **Peter Kleinman agreed to send an email outlining a series of conference calls with the aim of writing a white paper on soil test calibration.**
20. Katie Flahive – BMP factsheets. Interested in updates. Conservation district new staff doing 319s need these. Keep in mind – these people don’t get journals. Special issues on relevant themes – need to be translated and we have \$ to fund this. \$20K for editorial – no problem. Deanna – question – where do your CDs get info from? NRCS people? Amy – all from national. Katie – NACD. CDs get more than half of 319 funds. Lindsey – on committee for BMPs, particularly for drainage. Update all, and add drainage. **Forbes Walker agreed to head up the BMP effort.**
21. **SERA17 web site** – Tom Bruulsema taking over from Andrew Sharpley.
22. Kovar – organic P methodology not in manual. Needs update. Questions still come in on chapter with Hailin. If anyone wants to update a chapter contact John Kovar. Will contact Barb to ask her to lead the organic P method part. Gurpal expressed interest in making it a formal book with tri-societies. Methods books sell well. **Gurpal to follow up.**
23. Deanna noted that a report has been prepared on the winter spreading of manure. Karl and Merrin to review. Deanna to send copies to them. **Tom agreed to put it on the web site once reviewed.**
24. Meeting for next year. We discussed a Canadian proposal for a meeting in the Niagara Falls region. A considerable number of SERA17 members would have difficulty getting to Canada.

Doug Smith moved and Peter Kleinman seconded that the next meeting be held in Baltimore with ASA. Carried. We agreed it should be a working meeting on the two themes of Soil Health and Soil Test Calibration, both in relation to phosphorus loss.

25. Farther future meeting idea noted: Lake Champlain with Miner Institute as host.
26. Amy encouraged SERA17 members to be members of the ASA community. It has 1500 members. Doug Smith will be chairing the community and soliciting session ideas.
27. Business meeting was adjourned by noon.

Session VI: SERA17 Early Career Members Oral Session (1:00 - 2:00 pm)

Janine Plach, University of Waterloo

Risk of Phosphorus loss from agricultural soils in the lower Great Lakes Region of Canada and USA

Mark River, Duke University

DRP Loads to Western Lake Erie: the Hidden Influence of Nanoparticles

Jessica Susser, University of Toledo

Can we reduce phosphorus runoff into Lake Erie by stimulating soil biota?

Lauren Kinsman-Costello, Kent State University

Mud Matters: Biogeochemistry of phosphorus flux between sediments and surface waters

2:00 pm Adjourned

Accomplishments:

The 2017 SERA17 meeting brought together 84 participants with diverse backgrounds. It included both scientists and practitioners from Canada and the USA. Guidance to the future work of SERA17 was provided at this meeting. Discussion resulted in conclusions for two areas of continuing focus: soil health, and soil test calibration. Workgroups have been set up to address these topics, and further development of these ideas is planned for the 2018 meeting to be held on 8 November in Baltimore, Maryland. The full list of accomplishments of the many distinguished scientists, both presenters and discussants, is too lengthy to list here, but can be appreciated by consulting their publication track records.

Impacts:

Many of the presenting scientists are currently involved in a 5-year project supported by the fertilizer industry's 4R Research Fund. This project is connected to the ongoing [4R Nutrient Stewardship Certification Program](#) in the Western Lake Erie watershed. The program currently involves agri-retailers impacting more than half the 5+ million acres of cropland in the watershed. The control of phosphorus losses impacting the water quality of Lake Erie is a very difficult challenge, with considerable scientific uncertainty, as well as logistical challenges to implementing the management changes known to provide potential benefit. Several industry representatives involved in the leadership of the 4R certification effort participated in this SERA17 activity and gained a deeper understanding of the sciences relevant to management of phosphorus loss.

Minutes taken by Tom Bruulsema. Email tom.bruulsema@ipni.net for more detail.