

**Appendix B**  
**Multistate Extension and Research Activity Proposal**

**Activity Number**

Southern Extension and Research Activity (SERA) - 17

**Requested Duration**

From October 1, 2013 to September 30, 2018

**Project Title**

Organization to Minimize Nutrient Loss from the Landscape

**Statement of Issue and Justification**

Nutrient runoff from the landscape continues to be one of the major causes of water quality impairment in the U.S. and around the world. What is not as clear, however, is the relative contribution of agricultural nutrients to total inputs from urban, municipal and many other sources. Thus, there continues to be a need for information on the fate and transport of nutrients, especially phosphorus (P) and as appropriate nitrogen (N), where water quality is concerned, in order to develop and implement efficient and cost-effective best management practices (BMPs) to reduce the potential for loss.

Over the last 20 years, there has been a dramatic increase in the number and range of research and extension personnel investigating the fate and transport of P and N in agricultural and urban runoff. This research and outreach can be fractured and contradictory. Thus, there continues to be a need for SERA-17 as a resource for research and extension on issues related to agricultural management that affect nutrients, runoff, conservation and water quality. The main justification for continuing the organizational entity of SERA-17 is to ensure research and outreach collaboration that is used as source of information for policy makers (e.g., USEPA, NRCS, non- governmental organizations (NGOs), and state agencies).

**Objectives:** An overarching goal of SERA-17 is to bring together a diversity of disciplines to discuss, disseminate, coordinate, and facilitate the research and management needs related to the management of nutrients (particularly P), transport in surface and subsurface flows, and their impact on the quality of receiving waters. Specifically, to;

- Develop an interdisciplinary approach to identify P sensitive watersheds and water bodies; expanding and improving upon risk and site assessment tools.
- Develop a science-based foundation for best management practices (BMPs) to reduce field landscape nutrient losses to surface waters by erosion and runoff (surface and subsurface).

- Develop and disseminate a manure management strategy based on both P and N.
- Provide nutrient management and loss information to agencies (USEPA, NRCS) to help them better prevent nonpoint source degradation of surface waters by nutrients, while maintaining agricultural productivity.
- Coordinate responses to ever-changing policy needs as Government, Land Grants, and NGOs develop, plan and implement strategies to bring about long-term, lasting reductions in nutrient loss potential from agricultural production activities.
- Develop state-of-the-science white papers on strategic or targeted topics related to the measurement, analysis, prediction, and policy of nutrient management, fate and transport of nutrients in water, water quality impairment, and remediation.

**Procedures and Activities:** SERA-17 is an organization of research scientists, policy makers, extension personnel, and educators, which develops and promotes innovative solutions to minimize nutrient loss from agriculture by supporting;

- Information exchange between research, extension, and regulatory communities.
- Recommendations for nutrient management and research.
- Initiatives that address nutrient loss in agriculture.

SERA-17 functions on a voluntary basis as an information exchange group, which has over 300 members from around the world. While most of its members are from the U.S. and then Canada, SERA-17 is a truly international activity and is the “go-to” organization for expert, up-to-date science-based information on agricultural nutrient management (particularly P), conservation mitigation, and resultant water quality impairment. SERA-17 operates with six current working groups;

**Aquatics** - to elucidate the environmental fate of nutrients, especially agricultural P, by improving understanding of how terrestrial and aquatic systems interact. Specific objectives are to:

- Coordinate the study of P spiraling in fluvial systems impacted by agriculture.
- Assess the role of sediments in P cycling of aquatic systems.
- Develop protocols for standardized study of P in aquatic systems.
- Identify priority research areas.

**BMPs** - to identify and promote practices that control nutrient loss, especially P, from agriculture. Specific objectives are to:

- Publish BMP factsheets.
- Coordinate research to quantify the effectiveness of various BMPs.
- Promote the development of new BMPs.

**Modeling** - to assess the current state of modeling nutrient fate (especially P) and transport in the environment and identify priority areas for research and model development.

**Policy** - provide consensus-based scientific recommendations for key issues involving nutrient transport, landscape management and policy. We do this primarily through science-based documents aimed to guide management and policy, as well as discussions with federal agencies. Document development occurs at the request of our national partners, such as NRCS and USEPA, or when key scientific arise, such as during recent lawsuits involving P management. An informal exchange group between SERA-17, NRCS, and USEPA meets regularly to provide nutrient management information, primarily focused on P, and for these groups to better explain their policies and needs to SERA-17. SERA-17 membership to this group includes the executive committee (past, present, and future chair) and one member from the Chesapeake Bay area.

**Testing** - to promote standardized P testing protocols related to the study and management of P in the terrestrial environment. Specific objectives are to;

- Oversee the publication of testing methods endorsed by SERA-17.
- Coordinate research that evaluates existing tests.
- Coordinate research to develop new tests.
- Identify areas for improved testing.

**Transport** - Improve understanding of the role of landscape processes in nutrient transport by;

- Summarizing available information.
- Identifying knowledge gaps to prioritize research.
- Improving representation of landscape processes in site risk assessment tools.

### **Expected Outcomes and Impacts:**

- An annual meeting of members. Currently, this is associated with the Annual American Society of Agronomy and Soil Science Meetings every two years. Each third year, SERA-17 meets independently at a different location in the U.S. or Canada, where local members volunteer to organize the meeting and obtain funds to support the meeting.
- Thirty-two, two-page factsheets broadly divided into three groups; (1) BMPs that impact the type or source of P (Source BMPs), (2) BMPs affecting P (Transport BMPs), and (3) BMPs that impact both the source and transport of P (Source and Transport BMPs). These factsheets are available on the SERA-17 website.
- White papers and state-of-the-science reports are prepared and published by SERA-17 members on key, topical issues related to the management of agricultural nutrients and water quality impacts. These reports are available on the SERA-17 website.

- State-of-the-science publications of methods of analyses for forms of P in soils, residuals, manures, water, and environmental risk assessment.
- Books printed by commercial publishers on a range of issues ranging from conservation management to modeling the fate and transport of P in the environment.
- Recommendations for revision of NRCS and USEPA nutrient management policy, at the request of these agencies.
- Consensus-based scientific guidance and leadership in potential litigation.

**Internal and External Linkages:** SERA-17's membership is well connected to Land Grant Universities, private sector, and public sector. These linkages are critical to the functioning of SERA-17.

**Governance:** SERA-17 leadership is provided by an in-coming chair, a current-year chair, and a past-chair. Each year, a new chair is elected at the annual SERA-17 meeting and leadership begins on a calendar year basis. The chair is responsible for the annual program in consultation with the past and in-coming chairs. Each work group has a leader, who is informally selected from time to time. Most of the work group efforts occur at the annual meeting. White paper development is provided by temporary committees composed of SERA-17 members with subject-matter expertise.

**Budget:** Not funded.

**Authorization:**