CONSERVATION INNOVATION GRANTS

Final Report

Grantee Name: University of Arkansas
Project Title: To Coordinate and Synthesize P Management Nationally, Harmonizing Site Phosphorus Loss Risk Assessment Across Three Regional Projects
Grant Number: 69-3A75-17-33
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Period Covered by Report: October 1, 2017 to September 30, 2022
Project End Date: September 30, 2022

1. Project Summary:

There is growing concern that existing phosphorus (P) management guidelines are not bringing about as great a reduction in soil P levels and P loss from agricultural lands as expected or desired. This project will coordinate and synthesize P management nationally, harmonizing site assessment and nutrient management recommendations compliant with the 2010 NRCS 590 Standard, and promoting consistency among state recommendations. This project will work with regional efforts to calibrate and harmonize P Indices across the U.S. and demonstrate their accuracy in identifying the magnitude and extent of P loss risk and their utility to improving water quality. These regional efforts are Coastal Plain, Northeast, Heartland, and Southeast States. The overarching goal of this project is to improve the effectiveness of site risk assessment using P Indices compliant with the NRCS 590 Nutrient Management Standard across the nation. This project will work with State, Regional and National NRCS personnel charged with nutrient management and water quality to ensure lessons learned in the four regional projects are extended nationally.

2. Project Goal and Objectives:

Overarching project goal is to synthesize outcomes from three regional companion CIG projects - the Coastal Plan, Northeast, and Southeast - promoting consistency among Indices across the U.S. These goals are designed to ensure that nutrient runoff risk assessment, nutrient management, and conservation practice planning is grounded in the best available science, reflects local environmental and agronomic conditions, anticipates impacts to water quality and farm management, and provides consistent recommendations within and across varied physiographic regions of the U.S. The comprehensive knowledge gained from this synthesis of four regional coordinated CIG projects will be delivered to NRCS decision makers. Three regional CIG's were not funded and one changed direction in 2019.

3. Project Background:

Assessment of the risk of phosphorus (P) loss from any given site is still central to the Natural Resources Conservation Service (NRCS) 590 Nutrient Management Standard (U.S. Department of Agriculture-Natural Resources Conservation Service, 2011). Also, the 2003 revision of EPA regulations for Concentrated Animal Feeding Operations (CAFOs; U.S. Environmental Protection Agency, 2003) recommends the P Index as a field-specific P loss assessment tool on permitted CAFOs. Currently, 48 U.S. states have adopted a P Index as a site assessment tool to identify critical source areas and to target practices to reduce P loss, and in most of these states the P Index is required by the NRCS 590 Nutrient Management Standard and other state and federal programs.

Despite the apparent success of the P Index concept, there remain concerns about the effectiveness of the Indexing approach for attaining water quality goals. Different versions of the P Index have emerged to account for regional differences in soil types, land management, climate, physiographic and hydrologic controls, manure management strategies, and policy conditions. Along with this development, differences in P Index manure management recommendations under relatively similar site conditions have also emerged.

There are approved conservation practices (CPs) that address NRCS's goals of reducing nutrient runoff (both surface and subsurface), through the mechanisms of avoiding (at the source), controlling (during transport), and trapping (at the water resource edge or in the water resource). However, many of these practices can have indirect and unintended consequences. If these consequences are not carefully managed or simply acknowledged, they can actually increase nutrient loss, particularly in environmentally reactive forms of P (i.e., dissolved P).

While we have several excellent and effective CPs, none are a panacea and indirect consequences are known but can be managed when farmers, farm consultants, and advisory personnel are provided with practical knowledge and sound applied science in a way that they can understand, adopt and then adapt.

4. Project Methods:

The group consists of Andrew Sharpley (Chair), Claire Baffaut (MO), Carl Bolster (KY), Kevin King (OH), Peter Kleinman (PA), John Lory (MO), Vimala Nair (FL), Deanna Osmond (NC), Peter Vadas (WI), and Mike White (TX).

Meetings were held at the SERA-17 Conference in Maumee Bay State Park, OH in August 2017, in Baltimore, MD, November 2018, and in San Antonio, November 2019 to hear and discuss concerns related to the current P Indices and the process of revising, reviewing, and verifying P Indices. This input is valuable to the broader harmonization of Indices across the U.S. where possible. Additional stakeholder listening sessions will be held between October 1, 2019 and June 30, 2020. Travel to these meetings were funded in part by this CIG.

The group met:

a. Via conference calls held bi-monthly to determine progress on each of the individual CIG projects and to promote commonalities among the five efforts (i.e., Chesapeake Bay States, Heartland States, Southern U.S. States, Ohio, and Wisconsin). Unfortunately, the Chesapeake Bay, Heartland States, Ohio, and Wisconsin were unfunded as a CIG, and the Southern U.S. States project was redirected to focus on reviewing and revising soil test P recommendations and crop response.

b. At the end of the American Society of Agronomy Meetings, Baltimore, MD from November 4 to 7, 2018. Travel to this meeting was funded in part by this CIG.

c. In collaboration with the SERA-6 at Oklahoma State University, Stillwater, Oklahoma from June 9 to June 11, 2019. The meeting was hosted by Dr. Hailin Zhang. Travel to this meeting was funded in part by this CIG.

d. In Raleigh, North Carolina as part of Deanna Osmond's project, which will combine with Mid-Atlantic Soil Testing and Plant Analysis Work Group (MASTPAWG) and the Southern Extension and Research Activity – 6 (SERA-6; see http://aesl.ces.uga.edu/sera6/), which was slated for February 12-13, 2020. This meeting was cancelled due to the Covid-19 pandemic. All other face-to-face meetings in 2020 prior to March 31 were also postponed due to the pandemic.

e. At the annual Tri-Society meeting of Soil, Agronomy, and Crop Societies of America in San Antonio, November 13 to 14, 2019. The meeting was hosted by Dr. Gurpal Toor.

f. All other in-person meeting scheduled 2020 and 2021 were cancelled due to the Covid-19 pandemic and were rescheduled as virtual meetings.

g. Due to Covid-19 related travel restrictions (2020 thru 2021), funds were budgeted for travel were used as salary for one Master's Graduate to collate, analyze, and help with technical report preparation (journal papers, presentations, and fact sheets) related to this project. The Graduate facilitated preparation of the following report are Bolster et al. 2019, Fiorellino et al. 2017, Sharpley et al. 2020a and 2020b,Williams et al. 2017, and Sharpley et al. 2019.

5. Project Results:

Objective 1: Develop a national database of existing plot- and watershed-scale sites with more than three years of water quality measurement (flow & P concentration) and sufficient land management information to populate P Indices and predictive models approved under the 590 Standard.

a. Following the initial database development meeting at the beginning of October 2017, a data sharing agreement was developed for the project to ensure anonymity of sources and expectations for public release/publication. Recognition of soil phosphorus testing deficiencies, led the Southern Region CIG led by Deanna Osmond to conduct a survey of Soil Testing Laboratories for current analytical methodologies and use of derived data to inform fertilizer recommendations of Land Grant Universities.

   This project morphed unto MASTPAWG with a primary focus on harmonizing soil test P and K recommendations across southern U.S. states, via a survey Land-Grant Soil Test Laboratories and private Laboratories providing service to farmers and farm advisors. Soil test P is a critical parameter of all P Indices and the subsequent nutrient management recommendations. In this respect, this project will coordinate with the FRST program that will provide valuable information across the U.S., which is critical to reliable estimates of field-by-field P loss risk assessments. See Lyons et al., 2020.

b. Work by Dr. Carl Bolster to develop a field database was undertaken. Sites were from the Northeast, Southeast, Heartland, and Lake Erie Basin regions, which are part of this GIC, were included. Members of this CIG facilitated this database, which was called "**P L**oss in runoff **E**vents from **A**gricultural fields **D**atabase (PLEAD)." See Bolster et al., 2019.

c. Phosphorus losses from agricultural lands continue to be at the forefront of scientific and policy discussions around the country. The tools to conduct edge-of-field monitoring have been evolving with the advent of scientific knowledge and new technology. It would be timely to have an overview of best practices to conduct edge-of-field monitoring, tools, and technology that could be used to pursue such efforts. Many PIs used in the country have rarely used edge-of-field P loss data to fine tune and calibrate PIs. Thus, it would be useful for researchers to know what options exist for edge-of-field monitoring.

   A review and analysis of the limits of soil tests and small-scale rainfall simulators to estimate dissolved P losses from legacy sources in pastures was prepared and published. See Nash et al., 2021.

d. Managing agricultural nutrients to achieve water quality goals involves complexities best organized around source and transport processes, as captured in site assessment tools used for nutrient management decision support. Source is governed by nutrient use efficiency (NUE) by crops and land management, while transport is governed by landscape and hydrologic controls. These concepts are useful for strategic and operational decisions around nutrient management in the field. However, experience shows us that nutrient management outcomes are influenced by several factors across many scales, most uncontrollable, which must be considered when transferring science into policy and when establishing realistic public expectations. Key factors influencing these nutrient management concepts, complexities, inherent tradeoffs, and outcomes are summarized in Sharpley et al., 2019.

Objective 2: Harmonize risk assessment and subsequent nutrient management recommendations of P Indices across the U.S. compliant with the 2012 NRCS 590 Standard, promoting consistency among state recommendations and changing land management to bring about a decrease in P loss from a given site.

a. A critical development has been the completion of updating the P subroutines used in Soil & Water Assessment Tool (SWAT). SWAT had been using routines developed in the 1980's by Sharpley, Jones and Cole and were based primarily on the land application of mineral fertilizers, which were important at the time. Parallel USDA-ARS efforts culminated in the incorporation of APLE (developed by Peter Vadas, Madison, WI) into SWAT by Mike White, ARS Temple, Texas. While APLE operates on an annual time step, the new P routines in SWAT operate on a daily basis. These new routines are designed to improve the simulation of P transport from newly applied manure and to better route P through soil, as layers become saturated with respect to P sorption. The group met at the end of the American Society of Agronomy Meetings, Baltimore, MD from November 4 to 7, 2018. This was also part of the SERA-17 2018 meeting (Innovative Solutions to Minimize Phosphorus Losses from Agriculture). Travel to this meeting was funded in part by this CIG.

   APLE is a spreadsheet-based model developed for predicting annual field-scale P loss in surface runoff and changes in soil test P. This empirically based model was designed for use by those without significant modeling experience. However, a significant limitation with the model is that it does not calculate runoff. Moreover, APLE is deterministic and thus predicts a single value for a given set of inputs, thereby ignoring any uncertainties associated with model inputs. Here, we describe modifications to APLE that allow users to estimate runoff using the Curve Number method. Using Monte Carlo simulations, the updated version of APLE also provides users the ability to account for model input uncertainties in estimating model prediction errors. We provide examples of using the revised version of APLE (ver. 3.0) for calculating P loss from two fields in Mississippi over a 4-yr period and calculating the change in Mehlich-3 P concentrations over a 9-yr period at three locations in Maryland following cessation of P application. Both examples demonstrate that incorporating estimates of uncertainties in both measured data and model predictions provides modelers with a more realistic understanding of the model's performance. See Bolster and Vadas 2022 and Fiorellino et al., 2017.

b. The impact of mineral fertilizer, swine slurry, and cattle grazing on soil P variability across fields over time, where rate and timing of P applications were determined by P Index evaluation. The results provide information on the reliability of using P Indices as part of the required nutrient management planning process (i.e., via the NRCS CPS 590) to minimize the loss of P in runoff. See Sharpley et al., 2020a.

c. Various soil extraction methods are used to indicate plant available P in soil but do not account for soil specific sorption of subsequent applications of P. Thus, estimates of soil phosphorus sorption saturation (PSS; estimated from Mehlich-3 extractable P, Al, and Fe) have been used in conjunction with Mehlich-3 extractable soil phosphorus (M3P) to overcome these limitations. Results from this study on the capacity of these soils to sequester applied P will help elucidate the potential for future field management to influence the legacy of P sinks transitioning to sources of

P. It was specifically hypothesized that measurement of PSS and M3P over spatial (in-field) and temporal (biannually) scales provide a more reliable assessment of nutrient management recommendations on legacy soil P than M3P alone. See Sharpley et al., 2020b.

Objective 3: Synthesize, summarize, and describe the science-based information and lessons learned from the three regional P Index assessment projects (i.e., Chesapeake Bay Watershed, the Heartland Region, and Southern States) and build a harmonized framework that yields consistent P-based risk assessment across the U.S.

a. An outcome of the related Ohio CIG project, the newly revised Ohio P Index or On-Field Ohio was independently reviewed by the PI of this CIG. Information was exchanged among all projects to harmonize On-Field Ohio with other Indices. See Williams et al., 2017.

b. An assessment of the use of P indexing in assessing risk in karst topographies was undertaken. The Phosphorus (P) Index risk assessment tool has been widely adopted across the United States to identify and rank site vulnerability to P runoff as part of the Natural Resources Conservation Service nutrient management planning (NMP) process. However, limited success has been achieved in addressing the risk of P loss by subsurface flow pathways, despite its relative importance in certain areas of the United States, particularly in those U.S. states dominated by karst terrain. Indices adopted in Illinois and Indiana require setbacks (widths 15–72 m) around surface karst features. The remaining states with karst address the risk of P loss in NMP development rather than the application of a P Index. Given the spatially variable hydrogeologic properties of karst, technically rigorous field-scale factors are unlikely to be developed in the near future.

   Although on-farm NMP occurs at the field scale, there is a lack of consistent and well-maintained geographical information system databases of karst features and geologic mapping at this scale. As an example, in Arkansas, the Arkansas Geological Survey topographic-scale geologic mapping (which includes an inventory of karst features) usually maps one to three quads a year; other states map at a similar rate. Thus, NMP development and risk assessment at a state level, where policy is made, would be aided by consistent karst feature databases and geologic mapping. See Sharpley et al., 2019.

6. Project Outputs:
Media and publications

Lyons, S.E., D.L. Osmond, N.A. Slaton, J.T. Spargo, P.J.A. Kleinman, D.K. Arthur, and J.M. McGrath. 2020. FRST: A national soil testing database to improve fertility recommendations. Agricultural & Environmental Letters 2020;5;e20008. Available at https://doi.org/10.1002/ael2.20008.

Bolster, C.H., C. Baffaut, N.O. Nelson, D.L. Osmond, M.L. Cabrera, J.J. Ramirez-Avila, A.N. Sharpley, T.L. Veith, A.M.S. McFarland, A.G.M.M.M. Senaviratne, GM. Pierzynski, and R.P. Udawatta. 2019. Development of PLEAD: A database containing event-based runoff phosphorus loadings from agricultural fields. *Journal of Environmental Quality* 48 (2):510-517. Available at https://dl.sciencesocieties.org/publications/jeq/articles/48/2/510?highlight=&search-result=1.

Nash, D.M., A.J. Weatherley, P.J.A. Kleinman, and A.N. Sharpley. 2021. Estimating dissolved P losses from legacy sources in pastures - the limits of soil tests and small-scale rainfall simulators. *Journal of Environmental Quality* 50:1-21. Available at https://doi.org/10.1002/jeq2.20265.

Sharpley, A.N., M.J. Helmers, P.J.A. Kleinman, K. King, A. Leytem, and N. Nelson. 2019. Managing crop nutrients to achieve water quality goals. *Journal of Soil Water and Conservation* 74(5):91A-101A. Available at https://doi.org/10.2489/jswc.74.5.91A.

Bolster, C. H., and Vadas, P.A. 2022. Updates to the Annual P Loss Estimator (APLE) model. *Journal of Environmental Quality* 51:1096–1102. Available at https://doi.org/10.1002/jeq2.20378

Fiorellino, N.M., J.M. McGrath, P.A. Vadas, C.H. Bolster, AND F.J. Coale. 2017. Use of Annual Phosphorus Loss Estimator (APLE) model to evaluate a Phosphorus Index. *Journal of Environmental Quality* 46:1380-1387. Available at https://doi.org/10.2134/jeq2016.05.0203.

Sharpley, A.N., M.B. Daniels, K.R. Brye, K. VanDevender, J. Burke, L.G. Berry, and P. Webb. 2020a. Fate and transport of phosphorus-containing land-applied swine slurry in a karst watershed. *Agrosystems, Geosciences, & Environment* 2020;3:e20096. Available at https://doi.org/10.1002/agg2.20096.

Sharpley, A.N., K.R. Brye, J. Burke, L.G. Berry, M.B. Daniels, and P. Webb. 2020b. Can soil phosphorus sorption saturation estimate future potential legacy phosphorus sources? *Agrosystems, Geosciences, & Environment* 2020;3:e20122. Available at https://doi.org/10.1002/agg2.20122.

Williams M.R., K.W. King, G.A. LaBarge, R.B. Confesor Jr., and N.R. Fausey. 2017. Edge-of-field evaluation of the Ohio phosphorus risk index. *Journal of Environmental Quality* 46:1306-1313. Available at https://doi.org/10.2134/jeq2016.05.0198.

Sharpley, A.N., P.D. Hays, K.W. VanDevender, and M.B. Daniels. 2019. Phosphorus runoff risk assessment in karst regions of the U.S. *Agricultural & Environmental Letters* 5:e20001. Available at https://doi.org/10.1002/ael2.20001.

Kleinman, P. J. A., Osmond, D. L., Christianson, L. E., Flaten, D. N., Ippolito, J. A., Jarvie, H. P., Kaye, J. P., King, K. W., Leytem, A.B., McGrath, J. M., Nelson, N. O., Shober, A. L., Smith, D. R., Staver, K. W., and Sharpley, A. N. 2022. Addressing conservation practice limitations and trade-offs for reducing phosphorus loss from agricultural fields. *Agricultural & Environmental Letters* 7, e20084. Available at https://doi.org/10.1002/ael2.20084

Kleinman, P. J. A., Osmond, D. L., Christianson, L. E., Flaten, D. N., Ippolito, J. A., Jarvie, H. P., Kaye, J. P., King, K. W., Leytem, A.B., McGrath, J. M., Nelson, N. O., Shober, A. L., Smith, D. R., Staver, K. W., and Sharpley, A. N. 2022. Addressing conservation practice limitations and trade-offs for reducing phosphorus loss from agricultural fields. *NRCS Technical*. In review.

R.O. Maguire, R.O., Q.M. Ketterings, J.L. Lemunyon, A.B. Leytem, G. Mullins, D.L. Osmond, and J.L. Weld. 2018. Phosphorus indices to predict risk of phosphorus losses. SERA-17 White Paper. Available at https://drive.google.com/file/d/1kjLplHwx0OZprQFc5CYgRqQA-78xDfF5/view.

Conference attendance:

Biswanath, D., V.D. Nair, A.N. Sharpley, D. Franklin, P.J.A. Kleinman, and W. Harris. 2017. An environmental phosphorus-monitoring tool for soils of the Eastern and Midwestern USA. Abstract. 106645. *In* Managing, Manipulating, and Predicting Phosphorus Losses in Phosphorus Saturated Soils. Soil Science Society of America Annual Meeting, Tampa, FL. October 22 to 25, 2017. Available at https://scisoc.confex.com/scisoc/2017am/webprogram/Paper106645.html.

Sharpley, A.N. The Drive to Improve Water Quality via Conservation Adoption: Who's At the Wheel and Where Are We Headed? At the 73rd Soil and Water Conservation Society Annual Conference, July 29 to August 1, 2018. Albuquerque, NM. Available at https://www.swcs.org/static/media/cms/18AC_Abstract_Book_D8E7B6D74B7CF.pdf.

Bolster, C.H., T.L. Veith, C. Baffaut, N.O. Nelson, D.L Osmond, M.L. Cabrera, P.J.A. Kleinman, G.M. Pierzynski, J. Ramirez-Avila, A.N. Sharpley, D.W. Sweeney and R.P. Udawatta. 2018. Development of a New Database Containing Event-Based P Loadings from Agricultural Fields. At the American Society of America Annual Meeting, November 2018, in Baltimore, MD. Available at https://scisoc.confex.com/scisoc/2018am/meetingapp.cgi/Paper/113464.

Sharpley A.N. 2018. Addressing Agricultural Phosphorus Legacies: Redefining the Scientific, Economic, and Policy Nexus to Mitigate Future Water Resource Impairment." at the American Geophysical Union Fall Meeting, Washington, DC. Abstract H52D-01. December 10 to 14, 2018. Available at https://agu.confex.com/agu/fm18/meetingapp.cgi/Paper/363302.

7. Project Impacts:

A) Summarize the work performed during the project period covered by this report:

Via bi-monthly conference calls, project team members coordinated data collection, collation, and analysis efforts. This included soil test P determination and data base development as outlined in project results. This will harmonize soil test P and K recommendations across U.S. states, via a survey Land-Grant Soil Test Laboratories and private Laboratories providing service to farmers and farm advisors.

B) Describe significant results, accomplishments, and lessons learned. Compare actual accomplishments to the project goals in your proposal:

a. The intent of this project was not to influence the direction or work of each project but to combine information from each of them to provide guidance for national frameworks and strategies for reliable P runoff risk-assessment tools.

b. Provided evidence that P Indices are grounded in the best available science, reflects local environmental and agronomic conditions, and impacts to water quality and farm management are consistent recommendations within and across varied physiographic regions of the U.S.

c. Soil test P measurement and crop response reevaluated in light of field trials that are in many cases 30 to 40 years old and do not use current and improved crop varietals.

d. Use of field methodology to provide data to assess the reliability of P Indices.

e. Modifications to APLE routines that improve reliability and validity of predictions that can be incorporated into P Indices to assess site vulnerability to P runoff and impact of nutrient and land management on P runoff..

f. Recognition of conservation tradeoffs across geographic location NRCS-CEAP Conservation Insight document is undergoing final NRCS review. See Kleinman et al., 2023 (in review).

C) Action on Deliverables:

- *Two round table meetings to solicit stakeholder (NRCS personnel, regional and national regulators, Land Grant University faculty, stakeholder and farmer groups) input on lessons learned and proposed changes to P Indices and harmonizing nutrient management recommendations.*

Meetings held at the SERA-17 Conference in Maumee Bay State Park, OH in August 2017, in Baltimore, MD, November 2018, and in San Antonio, November 2019 heard and discussed concerns related to the current P Indices and the process of revising, reviewing, and verifying P Indices; among attending NRCS, Extension and research personnel. This input was valuable to the broader harmonization of Indices across the U.S. where possible. Additional stakeholder listening sessions were held between April 1, 2020 and September 30, 2021 via teleconferencing, within the constraints of the Covid-19 pandemic.

SERA-17 white paper developed on "Phosphorus Indices to Predict Risk of Phosphorus Losses" available at https://drive.google.com/file/d/1kjLplHwx0OZprQFc5CYgRqQA-78xDfF5/view.

- *Formal interaction with NRCS personnel (e.g., State Specialists involved with nutrient management planning, Water Quality and Quantity National Technology Development Team, National Water Management Center, and Ecological Sciences Division) and informal interaction by Project personnel to facilitate adoption of recommended changes to state P Indices including consideration of a regional P Index.*

  At the request of NRCS, conservation tradeoffs were discussed and a Technical Report, later becoming a CEAP Conservation Insight paper, was developed. Conference calls among interested and available State Conservationists was held at the beginning of the project to describe the goals and likely outcomes. Document is now under final review by NRCS personnel. See Kleinman et al., 2023 (in review).

- *Prepare and submit updates to model routines that better estimate source and transport controls of P runoff, promote incorporation into nonpoint source models used by NRCS, such as APEX, TBET and APLE.*

  New routines developed for APLE and SWAT models are designed to improve the simulation of P transport from newly applied manure and to better route P through soil, as layers become saturated with respect to P sorption. See Bolster and Vadas, 2021.

- *Establish a network of sites where nutrient management tools can be consistently evaluated and compared. Water quality databases (obscured to meet confidentiality requirements) and nutrient management research publications for these sites will be made available to the public through SERA-17.*

  a. Development of database "**P** **L**oss in runoff **E**vents from **A**gricultural fields **D**atabase (PLEAD)." See Bolster et al., 2019. (https://dl.sciencesocieties.org/publications/jeq/articles/48/2/510?highlight=&search-result=1).

  b. A discussion led to the development of standardized methodology to conduct EOF P losses would be timely and useful for the scientific community. See Nash et al., 2021.

  c. P Indices are increasingly being used as regulatory tools in several states in the country. At the same time, several issues exist in the current structure of P Indices such as weighing factors used in source and transport factors. It would be timely to strengthen the science behind P Indices to avoid future conflicts/lawsuits in heavily regulated states. A position paper/review article that explains how different weighing factors used in P Indices were developed with suggestions for future research directions to strengthen the science behind P Indices. See Maguire et al., 2018.

  d. Phosphorus recommendations across state boundaries are often different even when the same soil sample has been submitted. This may be due to extractant, soil test philosophy, or a combination of the two. Faculty from different regions, many members of SERA-17, are addressing this under the FRST effort. See Lyons et al., 2020.

E) Provide the following in accordance with the Environmental Quality Incentives Program (EQIP) and CIG grant agreement provisions:

1. A listing of EQIP-eligible producers involved in the project, identified by name and social security number or taxpayer identification number. **Not applicable.**

2. The dollar amount of any direct or indirect payment made to each individual producer or entity for any structural, vegetative, or management practices. Both biannual and cumulative payment amounts must be submitted. **Not applicable.**

3. A self-certification statement indicating that each individual or entity receiving a direct or indirect payment for any structural, vegetative, or management practice through this grant is in compliance with the adjusted gross income (AGI) and highly-erodible lands and wetlands conservation (HEL/WC) compliance provisions of the Farm Bill. **Not applicable.**