

Hypoxia Task Force and LGU SERA-46 Priorities for Collaborative Work Working Document May 2015

This document outlines emergent opportunities for potential short- and long-term collaborative work between the Hypoxia Task Force and LGU SERA-46. It is a work in progress, reflecting the most recent thinking of HTF and SERA-46 members about where collaboration will contribute most to state-level nutrient strategies and reducing the hypoxic zone in the Gulf of Mexico.

Each item in this summary can be tied to the three broad, proposed objectives:

Objective 1: Establish and strengthen relationships that can serve the missions of multiple organizations addressing nutrient movement and environmental quality.

Objective 2: Expand the knowledge base through the discovery of new tools and practices as well as the continual validation of recommended practices.

Objective 3: Improve the coordination and delivering of educational programming and increase the implementation effectiveness of nutrient management strategies that reduce nutrient movement for agricultural and non-agricultural audiences.

Additional information will be necessary to operationalize these ideas, such as:

- How will SERA-46 and HFT integrate these ideas with existing efforts?
- How will these ideas be resourced (e.g. funded, staffed)?

Answering these questions will be important next steps in moving priorities for land-grant HTF collaboration forward.

Document Key

★ = SERA-46 Priority

Items in Bold Italics = Short-term deliverables (May-Dec 2016).

Note that some priority items may have short-term deliverables that are not yet developed and that all items will be communicated within the land-grants as being priorities for HTF and LGU collaboration.

★ Strengthening Networks

1. ★ Refer the pertinent work of other multistate committees and land-grant university researchers and extension educators to the HTF and its member agencies. ***A specific priority is to communicate to the HTF the reasons for differences in state LGU recommended N/P application rates for similar soil types and fields.***

2. 🌱 Work with NIFA and other HTF agencies to identify and share information on latest research being done across university systems with a priority for those being done under federal grants, e.g., the USDA-funded Climate and Corn-based Cropping Systems Coordinated Agricultural Project, commonly known as the Sustainable Corn Project, and others. With sufficient support, SERA-46 could serve a clearing house role.
3. 🌱 Work within LGU's to develop more consistent messaging across disciplines/specialists. A specific proposal is to convene livestock and crop specialists to discuss how they can work with farmers on nutrient management strategies that address water quality.
4. 🌱 Strengthen communication between SERA-46, HTF, and agriculture and food industry groups such as Field to Market.
5. 🌱 ***Identify common attributes and gaps across state nutrient reduction strategies - Review the HTF states' nutrient reduction strategies to identify the state goals, approaches and common attributes. Highlight opportunities for cross state information sharing to enhance other HTF state strategies.***

Conservation Systems Research and Outreach

Overview

Develop recommendations for integrated agricultural conservation systems that meet state and basin-wide nutrient management goals, incorporate ecoregional differences, consider the cumulative impacts of practices. Guidelines should include costs and known benefits. Consider hurdles and identify potential future challenges to widespread adoption of systems of conservation practices for water quality improvement. State priority watersheds will be critical to leverage resources and demonstrate innovative and successful approaches to achieving nutrient management goals. While achieving state and basin wide nutrient goals are most critical, design and performance of multifunctional landscapes that address other ecosystems services should be considered.

Priority Activities

1. Assist in the optimization of cover crop practice performance as a part of conservation practice systems. Provide analytical and technical assistance for practice design at field and watershed scales, taking into account local and ecoregional conditions and variations; agronomic, economic, soil health, water quality benefits; and validation of results, benefits and challenges.
2. 🌱 ***Translate science regarding the issues and solutions in tile drained areas into accessible information for states to adopt into policies to address nutrient use and movement, particularly where corn is the main crop and where N movement is the main issue in the broad landscape. This item has been referred to NCERA 217, Drainage design and management practices to improve water quality. Members of NCERA 217 have agreed to accomplish this within 12-18 months.***

3. Expand research and outreach on multifunctional agricultural landscapes that provide a broad suite of societal and ecosystem services. Wetted buffers, saturated buffers, prairie strips, and other buffers incorporating native vegetation and embedded in agricultural working lands are examples of practices that address multiple ecosystem services in agricultural landscapes.
4. Develop a fertilizer efficiency metric that quantifies nutrient loss to the environment in terms of water quality related to the 4Rs. Improve understanding and translate into adoptable options for quantifying efficiency to improve metrics and accounting for nutrient reduction.
 - a. An example metric: units of nutrients lost (or used by the target crop) per total units made available, including nutrients in the soil pool and atmospheric deposition.

Relative to this metric, define reasonable industry average estimates of efficiency currently, by objective and as occurred during the HTF baseline period.

5. Determine how the fertilizer industry and markets can support increased implementation of post-emergence side dressing (split spring application) and minimize fall application. Analyze whether the current infrastructure for delivering fertilizer to the grower is adequate for spring fertilization.
6. 🌟 Consider current social, economic, and public policy research and opportunities/needs for expansion. Examples include:
 - a) Develop and implement a social indicators system that will guide, evaluate and advance implementation of strategies to reduce nutrient loss from agricultural lands across the 12 HTF states. This process would consider the input of numerous stakeholders, as well issues derived from hypoxia- and water resource management-related literature, such as the [Social Indicator Planning and Evaluation System \(SIPES\) Handbook](#). Once baseline data is collected, it will be used to inform education and outreach in high priority watersheds. “Post-programming” data collection will follow to evaluate program impact and inform the next generation of outreach.
 - i. Form subcommittee including SERA-46, NC1190 (ERS has a member), and others, including a request for HTF participation*
 - ii. Develop a social indicators framework strawman and seek funding for a social indicators system development, including identification of needs at state and basin-wide levels*
 - b) <http://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1178&context=usarmyresearch> and
 - c) <https://www.extension.purdue.edu/extmedia/FNR/fnr-488-w.pdf>
8. 🌟 Create a network of watershed practitioners and farmer leaders to strengthen the implementation effectiveness of nutrient management strategies that reduce nutrient movement.

- a) **Organize infrastructure for 12-state leadership team with members from LGUs, agribusiness, NGOs, and state and local conservation agencies.**
 - b) **Identify common areas and gaps across existing state extension programs so that they can be further developed to enhance cultivating farmer leadership, civic engagement, and other strategies for increasing success of watershed projects.**
 - c) Facilitate the development and activities of a network of watershed practitioners and farmers, prioritizing (but not limited to) the tile-drained areas of the corn belt. Extension and other organizations are already facilitating farmer leadership in watershed projects within the 12 HTF states. This effort would connect watershed practitioners and farmers working in priority watersheds to increase the pace and quality of learning. Topics could include:
 - communicating the latest research on conservation practices, including cumulative impact of practices and cost effectiveness,
 - engaging farmers in watershed leadership,
 - strategies for increasing adoption of conservation practices, and
 - effective use of monitoring by citizens, farmers, and agency staff in watershed projects at field and watershed scales.
9. 🌱 Develop training and educational materials that will provide basic information about agriculture and nutrient management to agency staff, conservation NGOs and others who are less familiar with agriculture. Training could be state-specific or regional in nature. Example topics include:
- a. Nutrients 101 – what are the major nutrients of concern and why, in what forms do they exist in the soil and fertilizers, the “4 R concept”(right source, rate, timing and placement).
 - b. Development of soil fertility recommendations – why they vary from state to state.
 - c. Agricultural best management practices (BMPs) – what works, why there are barriers to adoption, what consultants recommend and why.
 - d. Row crop production 101 – how do you grow a crop? What decisions are made? Soil testing, variety selection, planting, tillage, weed and pest control etc.
10. 🌱 Work in partnership with ASA’s CCA Program to:
- a. Identify and summarize pertinent CCA training available in each state.
 - b. Assess the feasibility of more CCAs producing customized whole farm conservation plans
 - c. Where appropriate, develop training that addresses state nutrient-related regulations and policies to strengthen nutrient management and reduce nutrient loss from agricultural lands.
 - d. Facilitate learning among CCAs, agencies, university researchers and extension professionals, and farmers to improve adoption of nutrient management practices that reduce nutrient loss from agricultural lands.

★ Monitoring, Calibration and Validation

1. ★ Determine the potential for use of comparable edge of field monitoring measures from state to state.
2. ★ Building from the work by the Monitoring Collaborative, identify further gaps in data available.
3. ★ Conduct a 12-state survey of experts to better understand the scope of both edge-of-field and in-stream monitoring and means to link them for research purposes as well as developing the means to track progress from the field to the watershed to the Gulf, including:
 - a) what research monitoring is being done in the 12 state region;
 - b) where is it being done;
 - c) what is the focus of each study;
 - d) what water quality data are being obtained at different scales;
 - e) what other data are being obtained;
 - f) how is the data being used;
 - g) what is the availability of the data; and
 - h) how is monitoring being funded?
4. ★ Conduct a survey of experts within the 12 state region and other regions, such as the Great Lakes and Chesapeake Bay, to determine
 - a) what data are needed at different scales;
 - b) where will it come from;
 - c) how will it be used;
 - d) what will be the data security, confidentiality and ownership;
 - e) who will do the data collection;
 - f) what will it cost;
 - g) how will it be funded;
 - h) what data is already being obtained; and
 - i) how is it being used?