

Hypoxia Task Force and LGU SERA-46 Priorities for Collaborative Work Working Document September 2017

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 (Early 2018).

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.***

Action Items:

- a. Share *PM 2015 Concepts and Rationale for Regional Nitrogen Rate Guidelines for Corn* (Iowa State University, April 2006) on HTF SharePoint site.
 - b. Develop phosphorus 2-pager to explain current situation on phosphorus recommendations. (Timeline: Spring 2018)
2. ★ Work with NIFA and other HTF agencies to identify and share information on latest research relevant to HTF work 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. SERA-46 can share topic-specific information via short presentations on monthly calls as requested and link HTF to USDA Current Research Information System (CRIS) database.

Action Items:

- a. Share North Central Region Water Network webinar series with HTF CC.
3. ★ Explore opportunities for collaboration toward HTF goals with the agriculture and food industry.

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 ecosystem services should be considered.

1. 🌱 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.

Action Items:

- a. Share *Prairie strips improve biodiversity and the delivery of multiple ecosystem services from corn-soybean croplands* (Schulte et. al, 2017; PNAS) with HTF CC members.
 - b. Develop multifunctional landscapes team.
2. Communicate progress related to development of 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. 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.

Action Items:

- Relative to above stated metric, define reasonable industry average estimates of efficiency currently, by objective, and as occurred during the HTF baseline period.
 - Develop a 2-page summary of social and economic barriers related to split application of N fertilizer (Timeline: late Jan-early Feb 2018).
3. 🌱 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.
4. ✪ Work in partnership with ASA’s CCA Program to:
- a. Identify and summarize pertinent CCA training available in each state.
 - b. Increase opportunities for Soil and Water Conservation competency area. Where appropriate, develop training that addresses state nutrient-related regulations and policies to strengthen nutrient management and reduce nutrient loss from agricultural lands.
 - c. 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.
- Action Item:
- Track training opportunities with Kyra Reumann-Moore (EPA); will move forward with “b” and “c”.
5. Consolidate existing economic information related to nutrient reduction basin-wide.
- Action Item:
- Create summary of existing information and data gaps (Timeline: Spring 2018).

✪ Monitoring and Tracking of Progress

1. ✪ Communicate Edge-of-Field Monitoring Data as it becomes available.
- Action Items:
- Use special issue of JSWC on Edge-of-Field as a product; provide feedback to HTF.
 - Encourage standardized sampling procedures such as NRCS 201 and 202 for continuous monitoring projects.
 - Share information about the MANAGE database (https://data.nal.usda.gov/dataset/measured-annual-nutrient-loads-agricultural-environments-manage-database_5599), specifically how states can best use it. Share on HTF CC call early 2018.

2. 🌱 Develop a Measurement Framework that Mississippi and Atchafalaya Basin (MARB) states, with partners, will use to report progress on nonpoint source nutrient reductions individually by state and in aggregate for the MARB. Activities will include:
 - a) Compile existing practice information from the two pilot states.
 - b) Pilot the conservation practice framework for the two pilot states.
 - c) Derive estimate of relative nutrient reductions associated with conservation practices for the two pilot states.

3. 🌱 Develop and implement the following projects designed to result in the implementation of a system to track social and civic progress related to effective stewardship and support of nutrient reduction activities at various scales.
 - a) Phase 1 – See progress described in Accomplishments
 - b) Phase 2 – Developing civic engagement measures to assess and encourage non-government stewardship of state-level nutrient reduction strategies. Through funding provided by EPA and GOMA, Phase 2 activities will follow a similar process used in Phase 1, including the following:
 - i. ***Continue active facilitation of the work group established in Phase 1.***
 - ii. ***Facilitate a series of webinars and conference calls that will culminate in an applied research symposium focused on civic engagement considerations and opportunities related to nutrient reduction.***
 - iii. ***Develop and release a synthesis report with recommendations and next steps.***
 - iv. ***Expand website (Human Dimension in Water: <https://h2o.ssrc.msstate.edu/>) to incorporate civic engagement materials and products.***
 - c) Building upon the “Recommendations and Next Steps” identified in the *Phase 1 Synthesis Report: Social Indicators to Accelerate the Implementation of Nutrient Reduction Strategies*, operationalize these recommendations to result in an implementable social indicators system that will guide, evaluate and advance implementation of strategies to reduce nutrient loss from agricultural lands across the 15 HTF and GOMA states. This process would center around the expansion, modification, and use of the [Social Indicator Planning and Evaluation System \(SIPES\)](#) and continue to incorporate the input of the Social Indicators/Civic Engagement Work Group established during Phase 1.
 - i. ***Working with the administrators of the SIPES/SIDMA tools (Michigan State University Institute of Water Research) and the work group, develop the following documents:***
 - ***a concept paper that prioritizes and identifies approaches for a project that will operationalize the “Recommendations and Next Steps” identified in the Phase 1 Synthesis Report; and***

- *a detailed scope of work/proposal to be used to solicit funding for a project that will implement the concept paper.*
 - ii. *Work with the HTF NPS Measures Work Group to explore the inter-relationships of the environmental measures and social indicators being concurrently developed.*
 - iii. *Work with the SI/CE Work Group to identify a core set of social indicators to be used in social science surveys in priority nutrient reduction watersheds.*
 - iv. *Work with the HTF to identify a reporting format and methodology that would allow the tracking of consistent, correlatable social indicators and civic engagement measures at various temporal and spatial scales.*
- d) Implement Phases 1 and 2 at the state level; and
- e) Tracking progress/change incrementally and evaluating project effects.

Accomplishments

Strengthening Networks

✦ 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.

Delivery: *Wes Burger analysis summarized in PowerPoint posted on HTF SharePoint site.*

✦ Work within LGUs 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.

Delivery:

University of Minnesota

What is the University of Minnesota doing towards a consistent message across disciplines/specialist on the subject of nutrient management and water quality?

The nutrient management team (approximately 15 members) consists of departmental faculty, regional and local Extension educators, and scientists in the areas of soil fertility, drainage, water quality, soil water management, irrigation, manure, and general cropping systems. The team meets 2-3 times a year for the purpose to share and express consistent messages, coordinate group research projects, inform team members of ongoing activities as well as to identify gaps in educational priorities.

Similarly, the U of M Extension Crops Team meets twice a year to provide a forum for exchange of information and provide a platform for consistency of programming among its members. This team of approximately 40 people has state specialists and regional and local educators that have integrated research and educational programs in the area of general crop production, integrated pest management, cover crops, pesticide safety, soil and nutrient management, water quality, and soil health. .

Education programs at the University of Minnesota:

Nitrogen Smart is a training program exclusively for producers that presents fundamentals for maximizing economic return on nitrogen investments while minimizing nitrogen losses. The workshops throughout the state deliver high-quality, research-based education so producers can better manage nitrogen. The curriculum was developed by several nutrient management specialists and extension educators.

Nitrogen: Minnesota's Grand Challenge and Compelling Opportunity Conference. This conference brings the latest in research on nitrogen management. This annual event brings together approximately 250 farmers, ag professionals, and people from government and non-government agencies to learn about issues relate to nitrogen management and water quality.

Conservation Systems Research and Outreach

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. Delivery: Midwest Cover Crop Council (<http://mccc.msu.edu/>) and NCCC-211 (<https://www.nimss.org/projects/view/mrp/outline/17036>) are the best sources for land grant university cover crop information.

☛ 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.

Delivery: C1400 Ten Ways to Reduce Nitrogen Loads from Drained Cropland in the Midwest (University of Illinois Extension, 2016) posted to HTF SharePoint site; Phosphorus issues referred to SERA-17.

Monitoring and Tracking of Progress

- ☛ Consider current social, economic, and public policy research and opportunities/needs for expansion.
 - 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.

- **Form subcommittee including SERA-46, NC1190 (ERS has a member), and others, including a request for HTF participation**
- **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**

Delivery: *Phase 1 – Refining and improving existing social indicators to guide, evaluate, and accelerate implementation of state-level nutrient reduction strategies through a regionally inclusive and consistent expansion of the use of SIPES/SIDMA tools throughout the MARB. The following Phase 1 activities have been completed through funding provided by EPA and GOMA:*

- i. Established and facilitated active work group that includes members of the SERA-46 and NC-1190 Committees, HTF Coordinating Committee, GOMA Water Resources Team, and social and environmental scientists from the 15 HTF and GOMA states.*
- ii. Facilitated numerous webinars and conference calls culminating in “Applied Research Symposium: The Social Dimensions of Nutrient Reduction.”*
- iii. Developed and released “Social Indicators to Accelerate the Implementation of Nutrient Reduction Strategies Synthesis Report.”*
- iv. Established website: Human Dimension in Water*
<https://h2o.ssrc.msstate.edu/>