# FY 2009 OPERATING PLAN

## A COMPILATION OF ACTIONS TO IMPLEMENT THE *GULF HYPOXIA ACTION PLAN 2008*

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The *Gulf Hypoxia Action Plan 2008* provides an overview of how federal agencies, states and tribes within the Mississippi/ Atchafalaya River Basin are working together to take action to reduce the size of the hypoxic zone, while protecting and restoring the human and natural resources of the Mississippi River Basin. The Task Force has committed to using an adaptive management approach to guide the implementation of the Action Plan, as well as future reassessments. This adaptive management approach involves continual feedback between the effects of management actions and the interpretation of new scientific information to improve and inform management strategies, and target actions within watersheds where they will be most effective.

This FY 2009 Operating Plan is a compilation of actions that the various state and federal members of the Task Force have planned to undertake during FY 2009 to implement the *Gulf Hypoxia Action Plan 2008*. Each item in this Operating Plan specifically implements one of the eleven actions in the 2008 Action Plan. The Operating Plan includes, where known, funding levels and specific milestones for the current fiscal year. In some cases the plan identifies critical needs for the next fiscal year to acknowledge and analyze barriers to progress and to assist in state and federal planning and funding. **Inclusion of an action in this operating plan is at the discretion of the individual Task Force agencies and does not convey endorsement by all the members of the Task Force. Rather these items are listed here to illuminate the cumulative efforts of the individual Task Force agencies in implementing the *Gulf Hypoxia Action Plan 2008*.**

One of the keys to the success of implementing the plan is to determine first what is being done currently by the Task Force partners that can aid in achieving each specific action in the 2008 Action Plan. The Appendix at the end of this document has been developed partially as a response to those deliverables. The Appendix provides an overview of ongoing activities that will result in improvements to state and local water quality and the reduction and mitigation of hypoxia in the Gulf of Mexico, and complement the listed actions in the Annual Operating Plan. The Appendix is by no means a comprehensive list, and will change as projects are completed, new projects are proposed and funded, and as items are incorporated into the state and federal nutrient reduction strategies as they are developed.

In addition to the yearly Operating Plans and Appendices, starting in FY10, an annual report will be issued that will measure the results of these actions. Task Force Agencies will use this information and input from the public through an adaptive management process to modify their actions as needed for subsequent Operating Plans and Appendices.

## 1.) Complete and implement comprehensive nitrogen and phosphorus reduction strategies for states within the Mississippi/Atchafalaya River Basin encompassing watersheds with significant contributions of nitrogen and phosphorus to the surface waters of the Mississippi/Atchafalaya River Basin, and ultimately to the Gulf of Mexico.

**Coordinating Committee Action Lead: EPA, Illinois**

### Summary of Expected Results

A few states, with assistance from federal agencies, will begin developing nutrient reduction strategies, including the most appropriate watersheds to target. This will be an important first step in reducing nutrients delivered to the Gulf of Mexico. However, full implementation on this action will require significant additional funding.

### FY 2009 Implementation Plan

| Lead Agency | **FY 2009 Actions** | Milestones | FY 2009 Funding | Critical Needs for 2010 |
|---|---|---|---|---|
| Coordinating Committee | Proposed template for developing state-wide nutrient reduction strategies. | January 2009 | | |
| Mississippi/ Atchafalaya River Basin (MARB) States | ▪ Identify planned nutrient reduction activities and the corresponding availability and needs for funding.<br>▪ Begin developing nutrient reduction strategies including a analysis of implementation costs | | | Funding for State level nutrient reduction strategies at a cost of $200,000 to $500,000 per state. |
| Sub-basin Committees (SBC) | ▪ Continued work on coordinated effort on state level nutrient reduction plans.<br>▪ Continued progress on coordinated policy decisions, budgeting and message among federal agencies and within agencies, and on state level among state agencies. | | | ▪ $150,000 for operating budget for each established Sub-basin Committee (2-3 years) |
| Louisiana/ Lower Mississippi River SBC (LMRSBC) | Continue to develop state level nutrient reduction strategy. | | | Data on nutrient reduction and loading |
| Iowa | ▪ Continue to identify methodologies and | ▪ Ongoing | | ▪ Federal funding to Iowa to develop the |

| Lead Agency | **FY 2009 Actions** | Milestones | FY 2009 Funding | Critical Needs for 2010 |
|---|---|---|---|---|
| Iowa | leadership from the technical and social sciences for developing a state-level strategy for nutrient reductions, for use at such time as federal funding is made available to develop the strategy.<br>▪ Continue the Cedar River watershed study to assess the needed management practices, level of deployment, targeted locations, and resources needed to meet the nutrient reduction targets of the hypoxia goal, to inform the future state-level strategy development. | ▪ Complete study January 2009<br>▪ Publish and disseminate findings July 2009 | ▪ $60,000 | state-level strategy. |
| Minnesota | ▪ Nitrogen Contributions to the Mississippi River Basin in partnership with the Minnesota Department of Agriculture and University of Minnesota.<br>▪ Develop eutrophication standards for rivers<br>▪ Draft 2008-2012 Nonpoint Source Management Program Plan recently came off notice for public comment and has been sent to EPA for approval. | ▪ Funding available July 2009<br>▪ Quarterly reports beginning Q4<br>▪ Triennial rule revision process (started)<br>▪ Public notice of intent to revise WQ standards (end of 2008)<br>▪ Draft language/ criteria (end of 2009)<br>▪ 319 grant applications were accepted through 10/10/08<br>▪ Notification of grant awards to be made by the end of the 2008 calendar year.<br>▪ EPA awards the grants sometime during | LCCMR (Legislative Citizen Commission on Minnesota Resources) | |

| Lead Agency | **FY 2009 Actions** | Milestones | FY 2009 Funding | Critical Needs for 2010 |
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| | | summer 2009. | | |
| Mississippi | Working with agricultural stakeholders and resource agencies, MDEQ will facilitate development of a nutrient reduction template for the Mississippi Delta to guide future nutrient reduction planning, monitoring, and implementation activities. This project was specifically designed to support the *Gulf Hypoxia Action Plan 2008*. The project will be implemented in the following phases:<br>▪ Development of a Nutrient Reduction Template for the Mississippi Delta. A nutrient reduction strategy template for Mississippi's primary row-crop agricultural area will be developed. Template components will include establishing and facilitating appropriate support forums (e.g., Nonpoint Source and Point Source Work Groups, Delta Water Quality Research Initiative), identifying desired strategic outcomes, identifying and selecting implementation areas, identifying and facilitating needed research, identifying appropriate management practices, watershed planning and implementation, developing and implementing a standardized pre and post-implementation monitoring strategy, strategy evaluation and revision, and template transferability and testing.<br>▪ Implementation of the Nutrient Reduction Strategy Template through the Development of Local Watershed Management Plans in Selected Mississippi Delta Watersheds. Efforts are underway to support the development and/or revision of 5-6 local watershed plans to serve as implementation | ▪ Start Date – 1/09; Completion Date – 12/11<br>▪ Start Date – 5/09; Completion Date – 9/09 | ▪ $150,000 EPA Gulf of Mexico Program Office grant.<br>▪ $100,000 EPA 319 NPS Program for 2 new plans; plan revisions will be funded through existing project | ▪ $75,000 EPA funding for FY10 (and $75,000 EPA funding for FY11).<br>▪ Farm Bill Program and other funding to support agricultural implementation activities. |

| Lead Agency | **FY 2009 Actions** | Milestones | FY 2009 Funding | Critical Needs for 2010 |
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| Mississippi | pilots for the nutrient reduction strategy. These local plans will also address developed nutrient TMDLs in these watersheds. | | funding. | |
| | ▪ <u>Pre and Post-implementation Monitoring to Quantify Changes in Water Quality in the Selected Watersheds.</u> | ▪ Start Date – 4/09; Completion Date – TBD | ▪ EPA 319 NPS Program ($120-150,000 for each of the 5-6 projects), EPA 106 Program, USGS and USACE in-kind monitoring. | ▪ Continued funding support through 319 NPS and 106 Programs, USGS, and USACE.<br>▪ Additional funding to fully support these nutrient monitoring activities. |
| | ▪ <u>Implementation of Local Watershed Management Plans in the Selected Watersheds.</u><br>– New riverine watershed project #1 (TBD)<br>– New riverine watershed project #2 (TBD)<br>– Potential riverine project #3 (Steele Bayou)<br>– Lake watershed project #1 (Lake Washington)<br>– Lake watershed project #2 (Wolf/Broad Lake)<br>– Revised lake watershed project #3 (Bee Lake) | ▪ Start Date – 10/09; Completion Date – 9/10 | ▪ FY09 EPA 319 NPS Program incremental funding ($1.6-2.4 mil in FY09 for the new riverine projects), +NRCS Farm Bill funds, USACE funding, and other leveraged resources. | ▪ It is estimated that over $4.1-4.9 million of 319 funding will be used to implement these projects. This does not represent the 40% required cost-share for these funds nor significant NRCS Farm Bill and USACE funding.<br>▪ Continued funding support through Farm Bill, USACE, and other sources. |
| | ▪ <u>Farmer-to-Farmer Exchange with Upper Mississippi River State</u>. MDEQ and Delta F.A.R.M. will work with an upper Mississippi River State to conduct a farmer-to-farmer exchange. MDEQ will provide travel assistance for its farmers to the upriver State. This will be reciprocated from the partnering State. | ▪ Delta farmers to Upper Mississippi River State (Spring 2009)<br>▪ Upper Mississippi River State farmers to Mississippi Delta and Gulf of Mexico (Summer 2009) | ▪ $150,000 EPA Gulf of Mexico Program Office grant; 319 NPS Program ($TBD) | ▪ $75,000 EPA funding for FY10 (and $75,000 EPA funding for FY11). |

| Lead Agency | **FY 2009 Actions** | Milestones | FY 2009 Funding | Critical Needs for 2010 |
|---|---|---|---|---|
| Mississippi | Future Actions – post 2009<br>▪ <u>Project Evaluation and Assessment.</u> Comparison of the pre and post-implementation water quality data and the use of other assessment tools will provide a better understanding of what nutrient, sediment, and other pollutant load reductions are achievable. The quantification of achievable nutrient and sediment load reductions, implementation costs, as well as environmental values using the concept of ecosystem services will provide a better understanding of the costs and benefits of these watershed projects and can be used to calibrate the nutrient reduction strategy, improve future TMDLs, recalibrate existing TMDLs, and provide useful information for the development of nutrient criteria.<br>▪ <u>Template Transferability.</u> Coordination with other Gulf Coast and upstream Mississippi River States will be a part of this effort to maximize the flow and use of information developed through this effort.<br><br>Working with the five Gulf coastal states, MDEQ will facilitate development of a nutrient reduction template for coastal watersheds to ensure a consistent, but flexible, strategy. This project was designed to support both the Gulf Hypoxia Action Plan 2008 and Governors' Action Plan. The three-year project will be implemented and supported using a phased approach.<br>▪ <u>Development of an Aligned Nutrient</u> | ▪ Start Date – 10/10; Completion Date – TBD<br><br>▪ Start Date – 10/11<br><br>▪ Start Date – 10/08; | ▪ $75,000 NOAA | ▪ Continued EPA funding support to complete Nutrient Reduction Strategy evaluation and assessment component<br><br>▪ Continued funding by NOAA |

| Lead Agency | **FY 2009 Actions** | Milestones | FY 2009 Funding | Critical Needs for 2010 |
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| Mississippi | Reduction Template for Coastal Watersheds. The focus of this project is the development of a nutrient reduction strategy template for Gulf coastal watersheds. The development process will be a collaborative effort among the States of Florida, Alabama, Louisiana, Texas, and Mississippi. Because of the difference in land use, it is anticipated that this strategy will be weighted more to address industrial and municipal point sources that the Delta strategy. The development process will include establishing and facilitating appropriate support forums, identifying desired strategic outcomes, identifying and selecting implementation areas, identifying and facilitating needed research, identifying appropriate management practices, watershed planning and implementation, developing and implementing a standardized pre and post-implementation monitoring strategy, strategy evaluation and revision, and template transferability and testing. | Completion Date – 4/09 | grant | ($125,000 for FY10 and $150,000 for FY11). |
| | Future Actions – post 2009<br>▪ Implementation of the Nutrient Reduction Strategy Template through the Development of a Local Watershed Management Plan in a Selected Mississippi Coastal Watershed. Efforts are underway to support the development of a local watershed plan to serve as an implementation pilot for this nutrient reduction strategy template. This local plan will also address a developed Nutrient TMDL, where possible. | ▪ Start Date – 10/09; Completion Date – TBD | ▪ $50,000 EPA 319 NPS Program | ▪ Farm Bill Program and other funding to support implementation activities. |
| | ▪ Pre and Post-implementation Monitoring to | ▪ Start Date – TBD; | ▪ EPA 319 NPS | ▪ Continued funding support through |

| Lead Agency | **FY 2009 Actions** | Milestones | FY 2009 Funding | Critical Needs for 2010 |
|---|---|---|---|---|
| Mississippi | Quantify Changes in Water Quality in the Selected Watershed. | Completion Date – TBD | Program ($150,000), EPA 106 Program, as well as USGS in-kind monitoring. | 319 NPS and 106 Programs, and USGS<br>▪ Additional funding to fully support the nutrient monitoring activities. |
| | ▪ Implementation of Local Watershed Management Plan in the Selected Watershed. | ▪ Start Date – TBD; Completion Date – TBD | ▪ EPA 319 NPS Program incremental funding, NRCS Farm Bill funds, and other leveraged resources. | ▪ Continued funding support through Farm Bill and other sources. |
| | ▪ Project Evaluation and Assessment. Comparison of the pre and post-implementation water quality data and the use of other assessment tools will provide a better understanding of what nutrient, sediment, and other pollutant load reductions are achievable. The quantification of achievable nutrient and sediment load reductions, implementation costs, as well as environmental values using the concept of ecosystem services will provide a better understanding of the costs and benefits of these watershed projects and can be used to calibrate the nutrient reduction strategy, improve future TMDLs, recalibrate existing TMDLs, and provide useful information for the development of nutrient criteria. | ▪ Start Date – TBD; Completion Date – TBD | | ▪ Continued EPA funding support to complete Nutrient Reduction Strategy evaluation and assessment component |
| | ▪ Template Transferability. Coordination with other Gulf Coast and upstream Mississippi River States will be a part of this effort to maximize the flow and use of information | ▪ Start Date – TBD | | |

| Lead Agency | **FY 2009 Actions** | Milestones | FY 2009 Funding | Critical Needs for 2010 |
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| | developed through this effort. | | | |
| Missouri | ▪ Continue development of rule-making for establishing state-wide nutrient criteria for lakes and reservoirs.<br>▪ Initiated a workgroup to determine those watersheds that will most likely be impacted by the establishment of nutrient criteria<br>▪ Continue efforts establishing reference streams and rivers for use in future nutrient criteria development on flowing waters of the state. | ▪ Presented to the State Clean Water Commission in 2008. Currently in review process (economic impact analysis) | | ▪ Coordinate tools and programs that can be used to assist nutrient reduction efforts in water bodies affected by the establishment of nutrient criteria.<br>▪ Review department programs for opportunities to combine scope and budget to address nutrient issues on a targeted basis. |
| TF Federal Agencies | TF Federal members to provide input and assistance as needed and able to states in development of nutrient reduction strategies. | | | |
| EPA | EPA Region 6 to provide technical assistance to the State of Louisiana, in its efforts to develop comprehensive nitrogen and phosphorus reduction strategies, provided the state welcomes this assistance, and limited to assistance that can be provided within existing staffing and budgetary constraints. | | | Additional resources especially travel funds, to aid in efforts with State of Louisiana. |

## 2.) Complete and implement comprehensive nitrogen and phosphorus reduction strategies for appropriate basin-wide federal programs and projects. Target first those federal programs and projects with significant federal lead or co-implementation responsibilities.

**Coordinating Committee Action Lead: EPA**

**Summary of Expected Results**

By the end of FY08, all Federal agencies on the Task Force will have compiled a list of major projects and programs with the greatest possibilities to impact nutrient levels.

| Lead Agency | **FY 2009 Actions** | Milestones | FY 2009 Funding | Critical Needs for 2010 |
|---|---|---|---|---|
| Mississippi | ▪ Potential Federal program support for the activities identified for Action 1 will be identified and solicited through federal agencies with offices in Mississippi. | ▪ Start Date – 10/08; Completion Date – 9/09 | TBD | ▪ Commitments, by agency, to begin to align listed programs with needs for hypoxia. |
| TF Federal Agencies | ▪ List of programs with greatest impacts on nutrient levels, by agency.<br>▪ Commitment by Agency to begin to align listed programs with needs for hypoxia. | | | ▪ EPA: Funding to support States implementation of nitrogen and phosphorus reduction strategies, including $500,000 for development of nutrient criteria in three states in the basin.<br>▪ Develop interagency coordination strategy to leverage USDA, EPA, ACE, and other funding mechanisms for private landowners implementing conservation practices to address nutrient runoff from neighboring properties |
| DOI-NPS | ▪ Continue to implement basin-wide nutrient reduction plans for two national park units in the Upper Mississippi River Basin (St. Croix National Scenic Riverway, through its Nutrient Reduction Goal for 2020, and Mississippi National River and Recreation Area, through its involvement in Minnesota's Lake Pepin TMDL process).<br>▪ Continue contributing to the Yellow River Initiative and its efforts to | Ongoing | $150K per study | Funding in current budget request |

| Lead Agency | **FY 2009 Actions** | Milestones | FY 2009 Funding | Critical Needs for 2010 |
|---|---|---|---|---|
| DOI-NPS | reduce erosion and related nutrients affecting the Yellow River in and near Effigy Mounds National Monument. | | | |
| EPA | ▪ Develop a straw federal strategy to improve the effectiveness of Clean Water Act programs in the Mississippi Basin.<br>▪ Convene a stakeholder discussion of the straw Clean Water Act federal strategy to inform content and implementation. | ▪ March 2009 | $100,000 | |

## 3.) While developing comprehensive state and federal nitrogen and phosphorus reduction strategies and continuing current reduction efforts, examine and, where possible, implement opportunities to enhance protection of the Gulf and local water quality through existing federal and state water quality, water management and conservation programs.

**Coordinating Committee Action Lead: USDA, USACE**

### Summary of Expected Results

List of existing State and Federal program that could be aligned to maximize benefits to alleviate hypoxia and improve water quality in the MARB, including: nutrient loss to MARB surface waters; nutrient removal in the lower Mississippi Basin. Programs could include wildlife habitat enhancement, conservation practices, navigation controls, wastewater discharge permit programs, etc. Task Force members will review the programs within their purview, determining how appropriate adjustments might be made to the implementation of these programs to best achieve additional nutrient retention and capture benefits. MARB States implementing best management practices in local watersheds to ensure significant additional focus in nutrient reduction efforts.

### FY 2009 Implementation Plan

| Lead Agency | **FY 2009 Actions** | Milestones | FY 2009 Funding | Critical Needs for 2010 |
|---|---|---|---|---|
| MARB States | Continue to work with Federal Agencies on EQIP, CRP, CREP, and Wetland Reserve. | | | |
| Illinois | ▪ Enforce siting and construction requirements of Livestock Management Facilities Act (LMFA). Under LMFA, livestock waste handling facilities are required to be designed, constructed and maintained to be zero discharge facilities.<br>▪ Enforce livestock waste management plan requirements of the LMFA. Livestock producers with animal unit capacities of 1,000 animal units or greater are required to prepare and implement a waste management plan.<br>▪ Cost-share the construction of soil and water conservation practices in nutrient-impaired TMDL watersheds and throughout the State<br>▪ Cost-share the development and implementation of farm nutrient management plans statewide | | | |
| Iowa | ▪ Continue and expand implementation of the Iowa | ▪ Ongoing | ▪ $20.7 | ▪ Funding increase to allow |

| Lead Agency | **FY 2009 Actions** | Milestones | FY 2009 Funding | Critical Needs for 2010 |
|---|---|---|---|---|
| Iowa | CREP constructing targeted nitrogen-removal wetlands removing 40-90% nitrate from large cropland drainage areas.<br>▪ Continue implementation of Iowa-funded and led water quality programs and initiatives for nonpoint source landscapes, much of which directly addresses and reduces nutrient and sediment transport to water resources.<br>▪ Continue to provide state and local support to federally funded Farm Bill conservation and water quality programs which provide technical and financial assistance to landowners, much of which reduces nutrient and sediment transport to water resources. | ▪ Ongoing<br>▪ Ongoing | million state and federal match<br>▪ $93.2 million including local & landowner match | program expansion |
| Louisiana | ▪ Support Louisiana Environmental Leadership Program with Louisiana industries and municipalities to implement technology-based nutrient removal in wastewaters.<br>▪ Implementing nutrient BMPs in LA watersheds through LA Dept. of Ag and Forestry and local Soil and Water Conservation Districts. | | | |
| Minnesota | ▪ Continue development of the Lake Pepin TMDL<br>▪ Continue development of the Minnesota River TMDL. | ▪ Public review/ EPA approval between 2/2009 - 7/2009<br>▪ Develop implementation plan 4/2009 - 12/2009<br>▪ Undertake project to develop N reduction implementation strategies to integrate into Lake Pepin TMDL implementation plan.<br>▪ Public review/ EPA approval 3/2009 - 8/2009<br>▪ Develop implementation | | |

| Lead Agency | **FY 2009 Actions** | Milestones | FY 2009 Funding | Critical Needs for 2010 |
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| | | plan 6/2009 - 12/2009 | | |
| Mississippi | ▪ Leadership and Support of the Gulf of Mexico Alliance Nutrient Reduction Priority Issue Team. Mississippi is the lead State for the Gulf of Mexico Alliance's (GOMA) Nutrient Reduction Priority Issue Team (PIT). On behalf of the State, the Mississippi Department of Environmental Quality (MDEQ) serves at the request of the Governor and provides staff and other resources to lead and support this team. The team is co-led by MDEQ's Water Quality Monitoring and Water Quality Assessment Program Managers. Team members represent environmental agencies from the five Gulf of Mexico Alliance States and federal agencies such as EPA, NOAA, USGS and other DOI agencies. Additional MDEQ staff support other GOMA PITs. | ▪ Start Date –10/08; Completion Date – Ongoing | | ▪ Continued support by Gulf States, EPA, NOAA, and DOI. |
| | ▪ Enhanced Nutrient Reduction/Hypoxia Focus for Mississippi's Basin Management Approach. MDEQ's Basin Management Approach, with over 50 participating State and Federal resource agencies and stakeholder organizations and significant local support, is incorporating appropriate Gulf Hypoxia Action Plan 2008 actions and GOMA Governors' Action Plan actions into its Yazoo River, Coastal Streams, Pascagoula River, and Pearl River Basin collaborative watershed management process. This will ensure a significant additional focus on nutrient reduction efforts in these basins. | ▪ Start Date –10/08 ; Completion Date – Ongoing | ▪ State and 319 NPS funding | ▪ Continued support by State and Federal agencies and encouragement to fully support this enhanced emphasis on nutrient reduction and Gulf hypoxia. |
| | ▪ Continue Implementation of Mississippi's Nutrient Criteria Development Plan. MDEQ's Nutrient Development Task Force will continue its work to develop recommendations for the promulgation of future Nutrient criteria. This process has been progressing since 2000. | ▪ Ongoing through 2011 (per current Nutrient Criteria Development Plan) | | ▪ Funding support for nutrient monitoring. |
| | ▪ Creation of Special Projects Team to Coordinate | ▪ Start Date – 10/08 | ▪ State and | ▪ Continued funding support |

| Lead Agency | **FY 2009 Actions** | Milestones | FY 2009 Funding | Critical Needs for 2010 |
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| Mississippi | <u>MDEQ Efforts to Support the Mississippi River/Gulf of Mexico Watershed Task Force and Its Gulf Hypoxia Action Plan 2008 and the Gulf of Mexico Alliance and Its Governors' Action Plan.</u> A Special Projects Team that reports to the Director of the Office of Pollution Control is being created. A primary function of this team is to coordinate MDEQ program efforts to support the Mississippi River/Gulf of Mexico Watershed Task Force and its Gulf Hypoxia Action Plan 2008 and the Gulf of Mexico Alliance and its' Governors' Action Plan. | | other funding | |
| | ▪ <u>Creation of Three FTEs to Provide Additional Staff Support.</u> MDEQ has establishing to three FTEs to allow its staff to better support current, planned, and future nutrient and hypoxia-related activities and projects of the Gulf of Mexico Alliance; Hypoxia Task Force, Coordinating Committee, and Sub-basin Committee; the Nutrient Criteria Development Team; and to enhance needed program integration resulting from these efforts. One position will report to the Director of the Office of Pollution Control and facilitate the activities of the Special Projects Team. The other two positions are to provide needed program support to the Water Quality Assessment and Water Quality Standards Programs, whose managers serve as Co-chairs of GOMA's Nutrient Reduction PIT. | ▪ Start Date – 10/08 | | ▪ Continued funding support |
| | Activities facilitated through GOMA's Nutrient Reduction Priority Issue Team (led by MDEQ): | | | |
| | ▪ <u>Establish a Regional Coordinator for the Nutrient Reduction Priority Issue Team.</u> MDEQ has received funding to establish this position from NOAA. The Coordinator will coordinate activities of the Nutrient PIT among the Gulf States and work with the other GOMA Priority Issue Teams and the Gulf Hypoxia | ▪ Start Date – 10/08 | ▪ $150,000 NOAA grant | ▪ Continued funding by NOAA ($100,000 for FY10 and $100,000 for FY11) |

| Lead Agency | **FY 2009 Actions** | Milestones | FY 2009 Funding | Critical Needs for 2010 |
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| Mississippi | Task Force.<br>▪ Funding for Coordination, Collaboration, and Participation in Support of Gulf of Mexico Alliance Activities. To ensure needed participation in Nutrient Reduction PIT activities, funding has been made available for MDEQ staff and outside experts. This funding will also be used to support MDEQ participation in other GOMA PIT activities. | ▪ Start Date – 10/08 | ▪ $75,000 NOAA grant | ▪ Continued funding by NOAA ($100,000 for FY10 and $100,000 for FY11) |
| Missouri | ▪ Continue state-wide implementation of agricultural best management practices via the Department of Natural Resources Soil and Water Conservation Program.<br>▪ Through permitting process, ensure that Concentrated Animal Feeding Operations address required phosphate issues. Continue to provide departmental guidance on broader nutrient management planning required of permitted facilities.<br>▪ Continue to support Missouri Conservation Reserve Enhancement Program (Mo CREP) efforts to retire environmentally sensitive lands via the Conservation Reserve Program (CRP). Continue Mo CREP's active involvement in the protection of 83 watersheds in the state. | | ▪ $22 million in cost-share funding | Seek modification of legislative language regarding the Soil and Water Conservation Program to further promote the use of Special Area Land Treatment (SALT) practices on a state-wide basis. |
| Ohio | ▪ Continue to implement the Scioto Watershed CREP through 2011 (addresses N, P and sediment).<br>▪ Provide technical support for two or more Water Quality Trading projects | | | ▪ Based on existing implementation plans (TMDL and/or local plans), overall need for non-point source pollutant reductions, and state and local delivery capacity, $7 million annually for implementation projects.<br>▪ Continued work on CREP application for the Little Miami River with Little Miami River Partners |

| Lead Agency | **FY 2009 Actions** | Milestones | FY 2009 Funding | Critical Needs for 2010 |
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| TF Federal Agencies | Identify barriers to aligning existing programs, projects and initiatives with needs of hypoxia. Develop strategies when appropriate or possible to reduce or eliminate barriers. | Start Date – 08/08 | | |
| DOI - USGS | Continue to incorporate science needs for improving conservation programs design and implementation of various agencies into research and monitoring programs and vice versa. | Ongoing | ½ FTE | Funding in current budget request. |
| DOI - FWS | Provide technical assistance and work with partners in implementing fish and wildlife habitat restoration and improvement projects with ancillary nutrient reduction benefits on private lands on 50,000 acres and 200 stream miles in the Mississippi River Basin. | Ongoing | $4.9M | ▪ Provide similar level of technical assistance and extend to 2,500 additional acres of private lands and 10 additional stream miles in the Mississippi River Basin.<br>▪ Funding is not in current budget request. |
| DOI/ USACE | Work with the Long Term Resource Monitoring Program (LTRMP) Strategic Planning Team to incorporate considerations of value and multiple uses of the data by other programs such as the Hypoxia Task Force, middle Mississippi watershed. | FY 08 | | Continued funding as established. |
| EPA | ▪ Participate and provide leadership to the Gulf of Mexico Alliance Water Quality and Nutrient Reduction teams.<br>▪ EPA Region 5 will evaluate five major municipal collection systems for sanitary system overflows to address wet weather sources of urban nutrient discharge.<br>▪ EPA Region 6 will continue to work with states within our jurisdiction on nutrient criteria development, but with Louisiana and Arkansas in particular, given their importance to the Gulf hypoxia issue. | | | Identify barriers to aligning existing programs, projects and initiatives with needs of hypoxia. |
| USDA | Provide information and guidance to state USDA leaders for appropriate incorporation into state level priorities for delivery of USDA programs. | Start Date – 08/08 | | |

## 4.) Develop and promote more efficient and cost-effective conservation practices and management practices for conserving nutrients within the Mississippi/Atchafalaya River Basin watershed and evaluate their effectiveness at all scales beginning with local watersheds and aggregating them up to the scale of the Mississippi/Atchafalaya River Basin.

**Coordinating Committee Action Lead: USDA, USACE, LMRSBC**

**Summary of Expected Results**

Initial results from two of USDA's national conservation and water quality research programs; 1) Conservation Effects Assessment Project results relating to nutrients and the Upper Mississippi Sub-basin, a quantification of the environmental benefits of conservation practices in terms of water quality and water quantity, and 2) Water Availability and Watershed Management National Program (211) on methods for reducing nutrients from agricultural systems.

Continue State support of agricultural research, water quality and nutrient management initiatives through research and the implementation of BMP pilot projects. Increased knowledge of the effects of best management practices at various spatial scales on nitrogen and phosphorus loads to surface waters of the MARB resulting from implementation of projects by MARB States.

**FY 2009 Implementation Plan**

| Lead Agency | **FY 2009 Actions** | Milestones | FY 2009 Funding | Critical Needs for 2010 |
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| Lead Agency | **FY 2009 Actions** | Milestones | FY 2009 Funding | Critical Needs for 2010 |
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| Illinois | ▪ Conduct Certified Livestock Manager training workshops throughout the state.<br>▪ Develop refined hydric soils maps of the Illinois River Basin, in cooperation with NRCS, for utilization in site selection by the Metropolitan Water Reclamation District of Greater Chicago for nutrient farming consideration.<br>▪ Use fertilizer tonnage tax proceeds to support research on nutrient use efficiency<br>▪ Support research on nutrient abatement trading using constructed wetlands as an alternative to conventional point source wastewater treatment.<br>▪ Provide training for Soil and Water Conservation District employees on preparation and review of nutrient management plans<br>▪ Support the CBMP Lake Bloomington watershed project which provides producers with incentive payments for following nutrient best management practices. An estimated 65% of all eligible acres will be enrolled in the program in 2008. | | ▪ Sand County Foundation | |

| Lead Agency | **FY 2009 Actions** | Milestones | FY 2009 Funding | Critical Needs for 2010 |
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| Iowa | ▪ Continue development of the Integrated Drainage & Wetland Landscape Systems initiative for reducing nutrients to water resources, and achieve federal wetland regulatory and policy concurrence | ▪ Ongoing | | |
| | ▪ Continue research under Wetlands, Nutrients and Water Management, and Des Moines Lobe Targeted Watershed Grant projects with Iowa State University to develop new technologies and improve water quality impacts of management practices. | ▪ Ongoing | ▪ $400K state + $200K federal | |
| | ▪ Continue Iowa Learning Farm demonstrations and studies to improve water quality through crop residue management practices, and Integrated Farm and Livestock Management program to demonstrate improved nutrient management practices. | ▪ Ongoing | ▪ $680K | |
| | ▪ Continue use of fees paid by farmers on the sale of agricultural chemicals to develop improved practices for reducing nutrients to water resources. | ▪ Ongoing | ▪ $550K | |
| Louisiana | ▪ Support LA State Dept. of Ag and Forestry, USDA and LSU Ag Center programs for developing nutrient management and control plans for inclusions in BMPs.<br>▪ Implementation of nutrient BMPs in Louisiana watershed pilot projects under Lower Mississippi River Sub-basin Committee | | | |
| Minnesota | ▪ "Highway 90 Drainage Project" monitoring nutrients in subsurface drainage - MN Dept of Agriculture.<br>▪ Nutrient Management Initiative for farm N rate evaluation - MN Dept of Ag<br>▪ Support the Technical Service Provider training program for nutrient management<br>▪ Support the development of Controlled Drainage<br>▪ Agricultural Watershed Restoration Project to look at hydrologic restoration compatible with Ag. Land use - MN | ▪ Results to be presented at the Southern MN Nutrient/ Pest Mgmt. & Crop Production Meeting 2/09 | | ▪ Funding ended 9-30-08, need additional funding for the future.<br>▪ Funding from Environmental Quality Incentives Program (EQIP) |

| Lead Agency | **FY 2009 Actions** | Milestones | FY 2009 Funding | Critical Needs for 2010 |
|---|---|---|---|---|
| Minnesota | BWSR<br>▪ N reduction through wetland restoration with tile outlets into restored wetlands - MN Board of Water & Soil Resources (BWSR) and USDA Natural Resources Conservation Service (NRCS). | | | |
| Mississippi | ▪ Co-lead Newly-created Delta Water Quality Research Initiative. Recently, a collaborative effort has been established to better support the water quality research needs of MDEQ in the Mississippi Delta. This effort, the Delta Water Quality Research Initiative, will bring together the water quality expertise of numerous State and Federal agencies, academic institutions, and conservation organizations. This initiative is co-led by MDEQ and the USDA Agricultural Research Service's National Sedimentation Laboratory. One of the initial activities of this initiative will focus on the research and review of nutrient-related BMP effectiveness data and studies and lead to recommendations of appropriate BMPs to be incorporated into the Delta Nutrient Reduction Strategy and nutrient reduction watershed projects where appropriate. This effort will also focus on what additional knowledge is needed regarding BMP effectiveness. | ▪ Start Date – 10/08 | ▪ Leveraged from existing programs | ▪ Funding for priority water quality research projects and in-kind support by State and Federal agencies with water quality monitoring and research capabilities. |
| Missouri | ▪ Through the Department of Natural Resources Soil and Water Conservation Program, continue to provide funding for the Nonpoint Source Special Areas Land Treatment programs (AgNPS SALT). These programs supports 72 active watershed projects and an additional 12 are proposed for funding in 2008.<br>▪ Through Missouri's Nonpoint Source Grant Program (Funded pursuant to Section 319 of the Clean Water Act), support projects that improve the quality of Missouri's waters listed as impaired or threatened by nonpoint source pollution and includes projects that reduce sediment, nitrogen and phosphorus on a watershed scale. | | ▪ $7 million<br>▪ $4 million | ▪ Explore the use of 319 funds to leverage state Soil and Water Conservation Program funding to support nutrient related projects on targeted watersheds.<br>▪ Continue efforts to make the highly successful AgNPS SALT practices available to all Soil and Water Districts. These efforts will expand the scope of those cost-share practices addressing sediment, nutrients and pesticides. |

| Lead Agency | **FY 2009 Actions** | Milestones | FY 2009 Funding | Critical Needs for 2010 |
|---|---|---|---|---|
| Ohio | ▪ Conduct a pilot study to further develop and test controlled drainage structures and bioreactor treatment practices for tile outlets.<br>▪ Share results of several pilot projects assessing the pollutant assimilative capabilities and other ecological services of self-forming/wide channel designs in drained areas.<br>▪ Develop and publish a manual for the implementation of best practices for modified channels for drained/tiled agricultural fields. | | | |
| Wisconsin | ▪ Develop phosphorus and nitrogen water quality based indices for Ag lands (pilot projects in SW corner of state)<br>▪ Implement Discovery Watershed Approach (see Senate Farm Bill)<br>▪ Promote cellulosic alternatives for ethanol production. | | | |
| DOI-NPS | Evaluate (through monitoring and modeling) the success of nutrient management practices applied in the St. Croix and Lake Pepin watersheds. | Ongoing | 0.5FTE | Funding in current budget request |
| USDA | ▪ Provide Conservation Effects Assessment Project (CEAP) results relating to nutrients and the Upper Mississippi Sub-basin. Assessment completed, next steps:<br>– Conduct technical review of Upper MS CEAP report,<br>– Release Upper MS CEAP report,<br>– Complete CEAP assessment of effects of conservation practices for other sub-basins within MARB,<br>– Interpret CEAP results, identify potential program improvements, and develop strategies for using NRI/CEAP for monitoring progress/trends.<br>▪ Provide results from ARS's Water Availability and Watershed Management National Program (211) on methods for reducing nutrients from agricultural systems.<br>▪ Expand Conservation Reserve Program's Farmable Wetlands Program to include land on which a constructed wetland is to be developed that will receive flow from a row-crop agriculture | ▪ CEAP Report<br><br>▪ Ongoing | ▪ $300,000 | ▪ Provide CEAP results relating to nutrients for remaining sub-basins within the MARB.<br>▪ Obtain resources/priority necessary for development and implementation of strategies to use NRI/CEAP for monitoring progress from agricultural land management activities to provide 5 - 10 year estimates with trends.<br>▪ Obtain resources/priority necessary for a systematic evaluation of emerging nutrient reduction strategies implemented at the watershed scale. |

| Lead Agency | **FY 2009 Actions** | Milestones | FY 2009 Funding | Critical Needs for 2010 |
|---|---|---|---|---|
| | drainage system and is designed to provide nitrogen removal in addition to other wetland functions. | | | |
| USACE | Develop measures for effective incorporation into project planning. | | | FY 09 crosswalk w/Great Lakes division and regulatory programs. |

## 5.) Identify and, where possible, quantify the effects of the hypoxic zone on the economic, human and natural resources in the Mississippi/Atchafalaya River Basin and Northern Gulf of Mexico, including the benefits of actions to reduce nitrogen and phosphorus and the costs of alternative management strategies.

**Coordinating Committee Action Lead: NOAA, USDA**

**Summary of Expected Results**

Analysis of the economic costs of alternative management options for reducing nutrient loads from the agriculture sector.

Identify strategy (including critical needs) for expanded research on the biological and economic impacts of hypoxia on Gulf natural resources.

**FY 2009 Implementation Plan**

| Lead Agency | **FY 2009 Actions** | Milestones | FY 2009 Funding | Critical Needs for 2010 |
|---|---|---|---|---|
| Iowa | Assess costs of achieving the target nutrient reductions at large watershed scale, through the Cedar River watershed study to assess the costs and needed management practices to meet the nutrient reduction targets of the hypoxia goal. | ▪ Complete the study January 2009<br>▪ Publish and disseminate findings July 2009 | $60,000 | |
| Louisiana | Partner with NOAA on Ecological Impacts of Gulf Hypoxia on Living Resources | | | |
| Mississippi | Future Actions – post 2009<br>▪ Nutrient Reduction Watershed Project Evaluation and Assessment. A component of the evaluation and assessment activity of the nutrient reduction watershed projects discussed under Action 1 will include using the concept of ecosystems services to develop a better understanding of the environmental benefits and economic values created by the implemented nutrient reduction watershed projects. This information will be used to calibrate the Nutrient Reduction Strategy, improve future TMDLs, recalibrate existing TMDLs, and provide useful information for the development of nutrient criteria. | ▪ Start Date – 10/10; Completion Date – TBD | | ▪ $75,000 EPA funding for FY10 (and $75,000 EPA funding for FY11) |

| Lead Agency | **FY 2009 Actions** | Milestones | FY 2009 Funding | Critical Needs for 2010 |
|---|---|---|---|---|
| NOAA | Continued funding and management of NGOMEX research program | Outcomes of current NGOMEX projects | Funding levels for FY09 NGOMEX to be determined | ▪ Additional funding for full implementation of tier 3 of the Gulf of Mexico Hypoxia Monitoring Implementation Plan (see Action 9 for Implementation Plan funding levels).<br>▪ Hypoxia appropriations increased to levels authorized under HABHRCA. |
| USACE - ERDC | Build data collection/monitoring into project actions | ▪ By August 08, evaluate some possible quantification efforts such as contributing to NGOMEX | $250K | Need $200K additional resources for FY09. |
| USDA | Analyze the economic costs of alternative management options for reducing nutrient loads from the agriculture sector. | ▪ CENR Update | | |

## 6.) Coordinate, consolidate and improve access to data collected by State and Federal agencies on Gulf Hypoxia and Mississippi/Atchafalaya River Basin program activities and results.

**Coordinating Committee Action Lead: ERDC (USACE)**

**Summary of Expected Results**

Begin to determine information needs and strategy to address gaps, inconsistencies, data sharing and comparability issues.

**FY 2009 Implementation Plan**

| Lead Agency | **FY 2009 Actions** | Milestones | FY 2009 Funding | Critical Needs for 2010 |
|---|---|---|---|---|
| Louisiana | Support NOAA and other state, university and federal partners in identifying and consolidating data and information collected on GOM hypoxia for improved access and assessment | | | |
| LMRSBC/ Arkansas | Compile available data on nutrient loading and removal in the Lower Mississippi River Sub-basin | | $90K (from EPA) | |
| Mississippi | ▪ Continue Participation with Regional Technical Assistance Group (RTAG) and EPA Region IV.<br>▪ Support the Lower Mississippi River Conservation Committee's Collaborative Efforts to Implement EPA's National Flowing Waters Assessment of the Lower Mississippi River. MDEQ is working with LMRCC member States Louisiana, Arkansas, Tennessee, Missouri, and Kentucky to implement water quality monitoring activities on the lower Mississippi River. During FY09, data that was recently collected by MDEQ will be analyzed and assessed.<br>Activities facilitated through GOMA's Water Quality Priority Issue Team (supported by MDEQ):<br>▪ <u>Conduct Monitoring and Data Comparability Workshops</u>. A series of workshops are planned to address the issues of monitoring, data comparability, and nutrient fate and transport studies. These will build upon already-funded workshops that will focus on the development of a standard nutrient-study design. The workshops will be co-facilitated with GOMA's MDEQ-led Nutrient Reduction Priority Issue Team and conducted in concert with the National Water Quality Monitoring Council (NWQMC). Each workshop will focus on the development of a site-specific nutrient source, | ▪ Ongoing<br>▪ Start Date – Ongoing; Completion Date – 9/09<br><br>▪ Start Date – 10/08 | <br><br><br><br><br><br><br>▪ $46,000 NOAA grant | ▪ Continued support by EPA Region IV and VI.<br><br><br><br><br><br><br>▪ Continued funding support by NOAA. |

| Lead Agency | **FY 2009 Actions** | Milestones | FY 2009 Funding | Critical Needs for 2010 |
|---|---|---|---|---|
| Mississippi | fate, and transport study design. The studies will be designed to establish site-specific nutrient criteria and, in combination with each other, to help develop regionally-applicable simplified methods to establish nutrient criteria. It is anticipated that one to two workshops will be required to complete the study design for each selected site. | | | |
| | ▪ Support for Implementation of Coastal Monitoring around the Gulf of Mexico. Building on the information jointly collected by the Water Quality and Nutrient Reduction Priority Issue Teams on the location and makeup of existing coastal monitoring programs, the Water Quality Priority Issue Team will work with existing monitoring programs along the Gulf coast to standardize monitoring methods and will partner with local, state, and federal agencies, and non-governmental organizations to implement standardized water resource monitoring in those areas of the coast where gaps presently exist. | ▪ Start Date – 10/08 | ▪ $150,000 NOAA grant | ▪ Continued funding by NOAA ($160,000 requested to begin implementation of standardized coastal monitoring). |
| | ▪ Provide Additional Support to the GOMA Nutrient Reduction Priority Issue Team. Continued support will be provided to the GOMA Nutrient Reduction Issue Team to accomplish the following collaborative actions:<br>– Identify and coordinate local, state, and federal data management systems in an effort to develop nutrient criteria.<br>– Administer workshops that will lead to the classification of coastal/estuarine ecosystems to support the establishment of nutrient criteria. Classification helps identify what monitoring design is best suited for a particular location and how to interpret cause-and-effect responses.<br>– Conduct nutrient sources, fate, and transport studies in order to create simplified monitoring methods targeted to different coastal systems. | ▪ Start Date – 10/08 | ▪ $180,000 NOAA grant to support site-specific nutrient fate and transport studies. | ▪ $189,500 continued NOAA funding to support site-specific nutrient fate and transport studies. |
| | ▪ Establish Design Criteria and Data Standards for a Regional Data Management System. This project will establish design criteria and data standards for a regional statistical system to house data for nutrient criteria development and data related to Gulf | ▪ Start Date – 10/09 | | ▪ $200,000 NOAA grant funding (and $150,000 FY11 NOAA grant funding). |

| Lead Agency | **FY 2009 Actions** | Milestones | FY 2009 Funding | Critical Needs for 2010 |
|---|---|---|---|---|
| Mississippi | hypoxia. The project would first implement a feasibility study to evaluate the development of a new data management system versus the use or modification of an existing data system.<br>▪ Evaluation of EPA's Gulf of Mexico Database, Recruitment Model, and Growth Model for Determining the Impacts of Site Specific Dissolved Oxygen Criteria on Marine and Estuarine Species in the Gulf of Mexico. This project will involve reviewing EPA's dissolved oxygen (DO) database and models, identifying data gaps, collecting additional existing information to refine the database and models, and coordinating a peer review of the database and models. Subsequent funding will be used to fill data gaps. | ▪ Start Date – 10/09 | | ▪ $50,000 requested from NOAA ($150,000 requested from NOAA for FY11). |
| Missouri | Continue participation with Regional Technical Assistance Group (RTAG) and EPA region 7. All nutrient data available to the state is made available to this workgroup | | | |
| Minnesota | ▪ Continue to develop electronic submittal of Discharge Monitoring Reports for NPDES permitted facilities.<br>▪ Continue implementation of Hydstra for storage, management and sharing of data from stream gages and sampling | ▪ Electronic audit of 2008 data is to be run target-3/09 | | |
| Ohio | ▪ Share information and developments related to our soil and water information management systems (e.g., aggregating load reductions) and Ohio's new GIS database project. | | | |
| Wisconsin | ▪ Develop a "Tributary Monitoring Plan" including a better information base for nutrient loading and to be able to assess improvements on a smaller area scale over time.<br>▪ Upper Miss. River Tributary analysis to be set up so data is collected consistently for parameters, analysis, and for multiple states with consistent frequency. (St. Croix, Chippewa, Black, Wisconsin R) | | ▪ $20,000 | Develop a consistent multi-state regional system that is monitored on a consistent basis year after year. (Partner with USGS) |
| EPA/USGS | Continue to enhance the coordinated delivery of information from National Water Information System (NWIS)/STORET | Ongoing | $284,000 | Similar funding in current budget request. |

| Lead Agency | **FY 2009 Actions** | Milestones | FY 2009 Funding | Critical Needs for 2010 |
|---|---|---|---|---|
| NOAA<br>NOAA | ▪ Continued development of a data portal to maximize accessibility to, and exchange of, hypoxia data as called for in tier 1 of Gulf of Mexico Hypoxia Monitoring Implementation Plan.<br><br>▪ Continue to make available data from monitoring cruises and other projects through NOAA National Coastal Data Development Center. | | ▪ TBD | ▪ Funding for Data Management core system requirement (tier 1) of Gulf of Mexico Hypoxia Monitoring Implementation Plan (see Action 9 for Implementation Plan funding levels). |
| USACE - ERDC | Have existing Corps programs and projects data available | ▪ FY 2009 | $75K | Develop Corps support and programs with hypoxia focus, $300K |

## 7.) Track interim progress on the actions to reduce nitrogen and phosphorus by producing an annual report on federal and state program nutrient reduction activities and results.

**Coordinating Committee Action Lead: EPA**

**Summary of Expected Results**

Develop report tracking Federal and State nutrient reduction activities, results and progress on implementation of the 2008 Gulf Hypoxia Action Plan.

**FY 2009 Implementation Plan**

| Lead Agency | **FY 2009 Actions** | Milestones | FY 2009 Funding | Critical Needs for 2010 |
|---|---|---|---|---|
| Illinois | Implement system to track estimated reductions in nutrient losses for all cost-shared conservation practices. | | | |
| Iowa | ▪ Continue assessing nutrient load reductions from all Iowa funded and led conservation programs.<br>▪ Assist USDA in assessing nutrient load reductions from all federally-funded Farm Bill conservation programs conducted in Iowa. | ▪ Ongoing<br>▪ Ongoing | | |
| Louisiana | Work closely with State, University, USDA, EPA and other agencies and groups to track Louisiana nutrient reduction activity | Planning Mtg. - April 10 | | |
| Louisiana/ EPA | Participate in National Flowing Waters Assessment including water quality, sediment and biological monitoring for the lower Mississippi River | | | |
| Minnesota | E-Link reporting of phosphorus and sediment reductions associated with BMPs | | | Funding for nitrogen crediting routine |
| Mississippi | ▪ Work closely with State, university, USDA, EPA, and other agencies and groups to track Mississippi nutrient reduction activities.<br>▪ Report tracking of 319 NPS-funded nutrient reduction watershed projects through GRTS. | ▪ Ongoing<br>▪ Ongoing | ▪ EPA NPS Base | |

| Lead Agency | **FY 2009 Actions** | Milestones | FY 2009 Funding | Critical Needs for 2010 |
|---|---|---|---|---|
| Mississippi | | | Program Support | |
| Missouri | ▪ Continue implementation of the Missouri Soil and Water Information Management System (MoSWIMS). The system is designed to automate tracking and application procedures for the matrix of agricultural best management practices that are offered via the Department of Natural Resources Soil and Water Conservation Program. The system has application in developing models to estimate load reductions associated with the various cost share practices.<br>▪ Continue developing the Conservation Management Tool (CWT). The CWT is an interactive mapping and data collection system. This tool is being designed to facilitate on site planning and design of soil and water cost share practices and will map and record individual activities directly in an interactive GIS data base. | | | |
| Wisconsin | GRTS-state reporting of progress | | | |
| DOI-USGS | Annually provide nutrient loads from MARB from July to June; nutrient loads from MARB and its sub-basins from October to September | July 2008; Nov 2008 (Updated annually and posted http://toxics.usgs.gov/hypoxia/mississippi/flux_ests/index.html) | $40K | Funding in current budget request |
| DOI-NPS | Annually provide nutrient load estimates from a new gage site at the mouth of the St. Croix River, installed to track progress toward nutrient reduction goals. | Ongoing | $250K | Funding in current budget request |
| EPA | ▪ Develop framework for annual report on federal and state nutrient reduction activities and results. | ▪ Workgroup created by 6/15/08<br>▪ Develop draft format for | ▪ 1 FTE to develop/ produce | ▪ Develop national benchmarks for tracking progress.<br>▪ First annual report published October |

| Lead Agency | **FY 2009 Actions** | Milestones | FY 2009 Funding | Critical Needs for 2010 |
|---|---|---|---|---|
| EPA | ▪ Create Coordinating Committee Workgroup for report development | report by 7/15/08 | annual report | 2009 in conjunction with FY10 Operating Plan. |
| NOAA | ▪ Annual prediction on size of hypoxic zone<br><br>▪ Annual monitoring survey of hypoxic zone to assess progress towards Action Plan goals. | ▪ Hypoxic zone forecast by July 2008<br>▪ Press release on results of mid-summer survey | TBD | ▪ Identify funding source to maintain current monitoring effort for FY10.<br>▪ Funding for Expanded Spatial and Temporal Survey Coverage core system requirement (tier 1) of Gulf of Mexico Hypoxia Monitoring Implementation Plan (see Action 9 for Implementation Plan funding levels). |
| USDA | Collect FY08 data on conservation practices and summarize basin totals. | | | |

## 8.) Continue to reduce existing scientific uncertainties identified in the SAB and MMR reports regarding source, fate and transport of nitrogen and phosphorus in the surface waters of the Mississippi/Atchafalaya River Basin to continually improve the accuracy of management tools and efficacy of management strategies for nutrient reduction.

**Coordinating Committee Action Lead: USGS, Ohio**

**Summary of Expected Results:** Management action to mitigate hypoxia in the northern Gulf of Mexico and to improve water-quality conditions in the Mississippi River Basin requires a base of scientific knowledge encompassing geographic scales and scientific disciplines that is required by few other national environmental challenges. Implementation of this action will continue to reduce scientific uncertainties, which is necessary to implement the Task Force Action Plan in a manner that enables management actions to adapt to new and changing scientific information.

**FY 2009 Implementation Plan**

| Lead Agency | **FY 2009 Actions** | Milestones | FY 2009 Funding | Critical Needs for 2010 |
|---|---|---|---|---|
| Illinois | ▪ Report on long-term nitrate monitoring in the Upper Sangamon (Lake Decatur) Watershed.<br>▪ Report on impacts of market-based mechanisms on nutrient loading from agricultural watersheds.<br>▪ Sediment and Nutrient Monitoring at Selected Watersheds within the Illinois River Watershed for Evaluation of the Effectiveness of the Illinois River CREP.<br>▪ Hydrologic and Hydraulic Model Development for the Illinois River Basin. | | ▪ USEPA Targeted Watershed Grant) | |
| Iowa | ▪ Continue water quality monitoring to document performance of nitrogen-removal wetlands developed under the Iowa CREP.<br>▪ Continue water quality monitoring of the Wetlands, Nutrients and Water Management research and Des Moines Lobe Targeted Watershed Grant projects. | ▪ Ongoing<br>▪ Ongoing | ▪ $100,000<br>▪ $600,000 | |
| Minnesota | Continue the Watershed Pollutant Load Monitoring program | Annual report of pollutant loads from each watershed targeted for March 2009 (this would be the first | | The future of this programs funding relies on the Constitutional Amendment vote regarding the dedication of fund from an increase in sales tax. |

| Lead Agency | **FY 2009 Actions** | Milestones | FY 2009 Funding | Critical Needs for 2010 |
|---|---|---|---|---|
| | | report) | | |
| Mississippi | ▪ Development of Pilot Nutrient Criteria for a Mississippi Estuary. This project is designed to develop a monitoring and modeling framework to characterize nutrient levels in a selected Mississippi Gulf Coast estuary. Project components include capturing site-specific estuary characteristics and information, water quality monitoring, development of appropriate hydrodynamic and water quality models for the selected system, and analysis of the results. The output for the project will be the development of pilot nutrient criteria for the selected estuary.<br><br>The Mississippi State University-led Northern Gulf Institute (NGI) is a consortium of universities in the five Gulf Coast states and is located at Stennis Space Center, Mississippi. NGI supports the research needs of the Gulf of Mexico Alliance and is a member of GOMA's Nutrient Reduction PIT. NGI has a group of nutrient and hypoxia-related research projects currently underway to help us understand the mechanisms leading to hypoxia or will, ultimately, lead to the development of tools for the management of the causes of hypoxia. In addition to those projects already discussed, NGI is currently conducting the following university-facilitated nutrient and hypoxia-related research:<br>▪ Research to Characterize Macrobenthic Subsystem Function That May Respond to | ▪ Start Date – 1/09; Completion Date – 12/11 | ▪ $ 250,000 EPA Gulf of Mexico Program Office grant. | ▪ $250,000 requested from EPA. |

| Lead Agency | **FY 2009 Actions** | Milestones | FY 2009 Funding | Critical Needs for 2010 |
|---|---|---|---|---|
| Mississippi | Hypoxia and Other Stressors. Dr. Chet Rakocinski of the University of Southern Mississippi (USM) is leading a project, "Macrofaunal Indicators of Hypoxia," which is a collaborative effort with another USM project, "Monitoring and Assessment for Ecosystem Management." These projects are attempting to characterize the macrobenthic subsystem function that may respond to hypoxia and other stressors.<br>▪ Research to Study Material Exchange with Marshes and Groundwater. Dr. Jaye Cable of Louisiana State University (LSU) in his project, "Investigating Material Exchange Between the Marsh and Channel Along an Estuarine Gradient," is studying material exchange with marshes and groundwater, which are two key sources for carbon to the coastal ocean. Along the northern Gulf of Mexico coast, prolific point and non-point sources of carbon and nitrogen exist in the form of major rivers and expansive wetland ecosystems. Understanding the dynamics of these systems is vital to the ultimate understanding of the nutrient-hypoxia system along the northern Gulf of Mexico.<br>Future Actions – post 2009<br>▪ <u>Development of a Decision Support Toolbox for Gulf Region Decision Makers.</u> This project is designed to use products generated by the Nutrient Reduction PIT in support of the Governors' Action Plan and incorporate them into a decision support toolbox for Gulf Region water resource decision makers. | ▪ Start Date – 10/09; Completion Date – 9/12 | | ▪ $50,000 requested from NOAA ($150,000 requested from NOAA for FY11). |

| Lead Agency | **FY 2009 Actions** | Milestones | FY 2009 Funding | Critical Needs for 2010 |
|---|---|---|---|---|
| Mississippi | ▪ Pilot Studies to Evaluate the Use of Mississippi Wetlands for Treated Wastewater Assimilation. This is the first of several planned projects to explore the use of wetland systems for treated wastewater assimilation as a way of reducing nutrient loads to surface waters. MDEQ has been aggressively soliciting funding for this needed research project and hopes to secure funding during FY09. | ▪ Start Date – TBD; Completion Date – TBD | ▪ $80,000 from EPA Region 4 and GMPO | ▪ $120,00 from EPA |
| Missouri | ▪ As part of a two year expansion, 31 new gauges were added to rivers and streams across the state. Added water quality monitoring (nutrients, et. al) to four gauges in the Elk River Watershed.<br>▪ Continue to provide funding to the University of Missouri for ongoing monitoring of nutrients for 100 lakes in Missouri. | | | ▪ Actively pursuing cost-share partnerships with communities, organizations and other state agencies to add several new gauges on rivers and streams in 2009.<br>▪ Determine relevant monitoring data generated by other agencies or groups in the state of Missouri such as the University of Missouri, the Missouri Department of Conservation, Stream Teams or other watershed stewardship organizations. |
| Wisconsin | ▪ Initiate long term load monitoring stations with USGS<br>▪ Collect baseline nitrogen monitoring data from point sources | | In-kind | |
| DOI-USGS | ▪ Continue stream flow and water quality (WQ) measurements to compute nutrient loadings and detect trends in the MARB; add sampling at Mississippi River at Vicksburg | Ongoing | ▪ $2.2 M + $100K for Vicksburg | ▪ Fill gap in monitoring network between the Ohio/ Mississippi confluence and the Old River diversion. Expand limited monitoring in the upper MARB and on large tributaries to the Mississippi that are sampled only every 2 or 3 years to estimate nutrient loads at these sub-basins. Funding needs TBD. |
| | ▪ Continue collecting data and information on nutrient levels in the Upper Mississippi River | Ongoing | ▪ $5Mil | ▪ Obtain yearly $5M funding from USACE |

| Lead Agency | **FY 2009 Actions** | Milestones | FY 2009 Funding | Critical Needs for 2010 |
|---|---|---|---|---|
| DOI-USGS | Basin (Long Term Resource Monitoring Program)<br>▪ Continue development of new regional scale Spatially Referenced Regressions on Watershed Attributes (SPARROW) models.<br>▪ Operation of continuously measured nitrate at 2 sites on the Mississippi and Atchafalaya Rivers. | Ongoing<br><br>Ongoing, except Atchafalaya nitrate gage currently unfunded- Need $25 K additional funding for FY08. | ▪ $525K<br><br>▪ $25K | ▪ Funding in current budget request<br><br>▪ Funding gap; not in current budget request. |
| DOI-NPS | ▪ Complete a two-park project (St. Croix and Mississippi Rivers) with USGS to assess the role of riverine backwaters in cycling nutrients.<br>▪ Complete a nitrogen source study on Lake St. Croix to evaluate the importance of point vs. nonpoint source nitrogen contributions to the Lower St. Croix National Scenic Riverway.<br>▪ Continue long-term monitoring of nutrients via the NPS Inventory and Monitoring Network.<br>▪ Continue to emphasize the importance of key USGS stream gauging stations, offering NPS support for their continued operation when necessary. | ▪ FY 2008-2010<br><br>▪ Ongoing<br><br>▪ Ongoing | ▪ $357,300<br><br>▪ 1/2FTE | ▪ Pilot study with partners (USGS-Baton Rouge) to "Identify Hypoxia Effects on Natural Resources" at Jean Lafitte Historical Park and Preserve and strategies to reduce excessive nutrients.<br>▪ Funding in current budget request. |
| EPA | ▪ Improve and utilize hydrologic models, including SPARROW, to identify watersheds within the MARB with the greatest loadings of nitrogen and phosphorus.<br>▪ Ongoing efforts by EPA HQ and regional offices in partnership with the states to advance nutrient criteria development, and research to reduce the scientific uncertainties regarding source, fate and transport of | ▪ Continue to improve SPARROW model capabilities: rank 8 digit HUCs using 2002 WQ data by 9/08, provide outreach on results to State Ag programs. | $100,000 | ▪ Draft long-term research and monitoring strategy to reduce existing scientific uncertainties regarding nitrogen and phosphorus source, fate and transport.<br>▪ Need point source data on effluent flows and concentrations (missing from EPA's Permit and Compliance System) to improve definition of nutrient sources within the MARB |

| Lead Agency | **FY 2009 Actions** | Milestones | FY 2009 Funding | Critical Needs for 2010 |
|---|---|---|---|---|
| EPA | nitrogen and phosphorus. | | | ▪ Further analysis of nutrient pollution contributions from point sources and non-agricultural sectors, including a full analysis of costs. |

## 9.) Continue to reduce uncertainty about the relationship between nitrogen and phosphorus loads and the formation, extent, duration, and severity of the hypoxic zone, to best monitor progress toward, and inform adaptive management of the Coastal Goal.

**Coordinating Committee Action Lead: NOAA, MS**

**Summary of Expected Results**

By FY09 develop long term research and monitoring strategy, and identify barriers to implementation (including lack of funding).

**FY 2009 Implementation Plan**

| Lead Agency | **FY 2009 Actions** | Milestones | FY 2009 Funding | Critical Needs for 2010 |
|---|---|---|---|---|
| Louisiana | Work with NOAA, EPA, LUMCON, LSU, Texas A&M and other universities on continuing to document severity and causes of Gulf hypoxia and to meet the Action Plan Goals. | | | |
| Mississippi | Activities facilitated through GOMA's Nutrient Reduction Priority Issue Team (led by MDEQ):<br>▪ Characterization of Nutrient Sources, Fate, and Transport across the Gulf Region. This project will establish the design and facilitate the development of a series of pilot projects across varying water body systems and seasonal conditions to collect data and information regarding the sources, fate and transport of nutrients through the different systems. First year funding will complete one intensive study. Additional studies and data analyses will be based upon subsequent funding. | ▪ Start Date –10/08; Completion Date – 9/11 | ▪ $225,000 NOAA grant. | ▪ Continued funding by NOAA ($200,000 for FY09 and $200,000 for FY10). |
| | ▪ Development of an Index of Biotic Integrity and a Waterbody Classification System for the Gulf of Mexico. This project will attempt to develop an index (or indices) of biotic integrity for Gulf waters which will provide information regarding the linkage between biological community structure and nutrient concentrations. The project will also establish a classification system for the different | ▪ Start Date –10/08; Completion Date – 9/11 | ▪ $145,663 NOAA grant | ▪ Continued funding by NOAA ($100,000 for FY10 and $100,000 for FY11). |

| Lead Agency | **FY 2009 Actions** | Milestones | FY 2009 Funding | Critical Needs for 2010 |
|---|---|---|---|---|
| Mississippi | water body types in the Gulf of Mexico. A universal classification system for Gulf waters is a necessary component for the generation of an index (indices). The project will use data collected by the Gulf States through the National Coastal Assessment Program.<br><br>Through the Northern Gulf Institute, NOAA is supporting the following project that is being implemented by the University of Southern Mississippi:<br>▪ Monitoring and Assessment of Coastal and Marine Ecosystems in the Northern Gulf. This project is aimed at understanding coastal nutrient, carbon, and trace element fluxes in several key environments off the Mississippi Coast. The overarching goal is to better understand the transport and processing of nutrients and pollutants through the coastal transition zone. More specifically, the project focuses on issues of coastal eutrophication, fluxes of carbon through the coastal environment, and hypoxia in the Mississippi Bight. The hypoxia monitoring effort in this project would complement the eastern extension in hypoxic zone monitoring proposed as a core system requirement in the Gulf Hypoxia Monitoring Implementation Plan. | ▪ Start Date – 2/08; Completion Date – 1/09 | ▪ $154,602 NOAA grant | ▪ Continued funding by NOAA /NGI ($200,000 for FY10 and $210,000 for FY11). |
| EPA | ▪ Gulf Hypoxia Modeling and Research Support | ▪ Report on new suite of multiple regression models for hindcasting and forecasting hypoxia in the Gulf of Mexico<br>▪ Report on development and application of | ▪ $100K<br>▪ 8.5 FTE | ▪ 10 days OSV Bold ship support to address gaps in water quality/biogeochemical processes regulating hypoxia<br>▪ Maintain FY09 funding level and FTE |

| Lead Agency | **FY 2009 Actions** | Milestones | FY 2009 Funding | Critical Needs for 2010 |
|---|---|---|---|---|
| EPA | | mass balance models for the northern Gulf of Mexico hypoxic zone | | |
| | ▪ Interagency Agreement between EPA/ORD and Naval Research Laboratory – Support for Gulf Hypoxia Modeling and Linking Satellite Ocean Color Remote Sensing and Hydrodynamic Modeling to Understand the Mechanisms Regulating Hypoxia in the Northern Gulf of Mexico | ▪ Develop a hydrodynamic simulation model sufficient to support coupled hydrodynamic-water quality modeling for the hypoxic zone | ▪ $250K<br>▪ 2000 technical support hours for EPA/ OEI/ EMVL | ▪ Maintain funding and technical support levels |
| | ▪ Region 6 RARE project - Development of a Relational Database to Aid in Modeling and Managing Water Quality in the Gulf of Mexico Hypoxic Zone | ▪ Complete QA/QC and reporting for all data<br>▪ Complete final report | ▪ $40K<br>▪ 1 FTE | |
| NOAA | Continued funding and management of NGOMEX research program | Outcomes of current NGOMEX projects | Funding levels for FY09 NGOMEX to be determined | ▪ Funding for core system requirements (tier 1) of Gulf of Mexico Hypoxia Monitoring Implementation Plan:<br>– Expand temporal and spatial coverage of monitoring surveys: $1.7M<br>– Autonomous underwater vehicle pilot study: $0.3M<br>– Data management: $0.7M<br>– Outreach: $0.4M<br>TOTAL TIER 1: $3.1M<br>▪ Funding for tier 2 system requirements of Gulf of Mexico Hypoxia Monitoring Implementation Plan, to maintain and expand observing systems ($1.4M) |

| Lead Agency | **FY 2009 Actions** | Milestones | FY 2009 Funding | Critical Needs for 2010 |
|---|---|---|---|---|
| NOAA | | | | ▪ Funding for tier 3 system requirements of Gulf of Mexico Hypoxia Monitoring Implementation Plan, to improve understanding of causes and impacts of hypoxic zone ($2.2M)<br>▪ Hypoxia appropriations increased to levels authorized under HABHRCA |

## 10.) Promote effective communications to increase awareness of hypoxia and support the activities of the Task Force.

**Coordinating Committee Action Lead: TF Communications Sub-committee**

### Summary of Expected Results

Revise the communications strategy to reflect post-Action Plan release critical needs. Use FY08 progress on expanding public awareness on Gulf hypoxia as a platform to increase partnership building and effective stakeholder outreach efforts.

Gulf Hypoxia Monitoring Stakeholders Group that includes "Education & Outreach activities necessary to raise public awareness on the health & economic impacts of Hypoxia" will develop a web site to communicate hypoxia related items. This group is closely connected to outreach efforts of the Gulf of Mexico Alliance and Gulf of Mexico Coastal Ocean Observing System. http://www.ncddc.noaa.gov/activities/gulf-hypoxia-stakeholders/view.

**FY 2009 Implementation Plan**

| Lead Agency | **FY 2009 Actions** | Milestones | FY 2009 Funding | Critical Needs for 2010 |
|---|---|---|---|---|
| Illinois | Sponsor session on nutrient sources in Illinois, contributions to Mississippi River loads, nutrient standards and nutrient-reduction costs to wastewater agencies and agriculture at Water 2008 Conference. | | | |
| Iowa | ▪ Farmer-to-farmer exchange with lower Mississippi River state(s) – work with lower Mississippi River state(s) to conduct a farmer-to-farmer exchange, starting in the down river state(s) and reciprocated back to Iowa from the partnering state(s).<br>▪ Increase awareness of Gulf hypoxia and actions within Iowa needed for nutrient reductions, through publicizing the 2008 Gulf Guardian Award to the Iowa CREP, a "Partnership of Iowa Agriculture to Reduce Nutrients to the Gulf"<br>▪ Conduct the conference "Hypoxia in the Gulf of Mexico: Implications and Strategies for Iowa", sponsored by the Leopold Center for Sustainable Agriculture, Iowa State University.<br>▪ Sponsor a session on Gulf hypoxia and the Integrated Drainage & Wetland Landscape Systems initiative at the Iowa-Minnesota Drainage Research Forum.<br>▪ Continue to sponsor and support media releases and | ▪ March 2009 Iowa group hosted at lower state(s)<br>▪ June 2009 lower state group hosted at Iowa<br>▪ Ongoing<br>▪ October 2009<br>▪ December 2009<br>▪ Ongoing | | |

| Lead Agency | **FY 2009 Actions** | Milestones | FY 2009 Funding | Critical Needs for 2010 |
|---|---|---|---|---|
| Iowa | articles on Gulf hypoxia and Iowa initiatives to address needed nutrient reductions.<br>▪ Conduct a series of meetings to inform policymakers, agencies, environmental and farm organizations on Gulf hypoxia and the Integrated Drainage & Wetland Landscape Systems initiative for nutrient reductions. | | | |
| Louisiana | ▪ Actively participate in the Lower Mississippi River Sub Basin Committee to foster local hypoxia awareness, demonstrate effective nutrient BMPs and meet shared TF goals<br>▪ Participate in Louisiana Hypoxia Working Group to coordinate information and actions on Gulf hypoxia for interested lower basin partners and citizens | | | |
| Minnesota | ▪ Collaborate with Conservation Technology Information Center (CTIC) to develop and support a Coalition for Nutrient Management in Southern Minnesota to: assess information and assistance needs in southern Minnesota and work collaboratively to address those needs. Ultimately, the partnership strives to increase the awareness, understanding and use of best management practices for optimal nutrient efficiency.<br>▪ Improve MPCA website for linkages to Hypoxia MN Pollution Control Agency (website includes links to a variety of hypoxia related documents - http://www.pca.state.mn.us/water/). Construct an improved portal. | | | |
| Mississippi | ▪ <u>Development of Targeted Education & Outreach Materials and Activities.</u> Through GOMA's Nutrient Reduction Priority Issue Team, MDEQ will coordinate with GOMA's Education & Outreach Priority Issue Team to develop targeted education & outreach materials and activities to better inform stakeholders of the Gulf hypoxia issue and why it is important to them.<br>▪ <u>Connecting the Dots: From Nutrient TMDLs to</u> | ▪ Start Date – 10/08<br><br>▪ Start Date – 10/08 | | ▪ Continued NOAA funding to support GOMA's Education & Outreach Priority Issue Team. |

| Lead Agency | **FY 2009 Actions** | Milestones | FY 2009 Funding | Critical Needs for 2010 |
|---|---|---|---|---|
| Mississippi | Nutrient Reduction Strategies to Gulf Hypoxia to Nutrient Criteria. MDEQ will continue to provide education & outreach to stakeholders and State and Federal resource agencies with it's newly developed State-specific PowerPoint presentation Connecting the Dots: From Nutrient TMDLs to Nutrient Reduction Strategies to Gulf Hypoxia to Nutrient Criteria.<br>▪ Actively Participate in the Lower Mississippi River Sub-basin Committee's Coordination Efforts. Actively participate with the Lower Mississippi River Sub-basin Committee to foster local hypoxia awareness, demonstrate effective nutrient BMPs, share information on State nutrient reduction activities, and meet shared Task Force goals. | ▪ Ongoing | | ▪ Funding support to Lower Mississippi River sub-basin Committee. |
| Missouri | ▪ Provide information and education on nutrient issues effecting water quality in the state, including the relationship of nutrient loading to hypoxia in the Gulf of Mexico.<br>▪ Host information on the Department of Natural Resources website on nutrient issues, best management practices, and other tools to reduce the impact of nutrient loading to the waters of the state and Mississippi River basin. | | | |
| Ohio | ▪ Continued coordinated work with the Conservation Technology Information Center (CTIC).<br>▪ Consultations with neighboring states on hypoxia issues, including joint effort with Indiana involving Wabash watershed. | | | |
| Wisconsin | Develop information and education efforts in state to explain, promote, and implement activities recommended by the Task Force. | | | |
| DOI-NPS | Continue outreach to Park Service visitors on the importance of nutrient reductions to water quality. | Ongoing | 1/2FTE | Funding in current budget request. |
| DOI-USGS | Continue web page support and update of USGS nutrient | Ongoing | 0.2 FTE | Funding in current budget |

| Lead Agency | **FY 2009 Actions** | Milestones | FY 2009 Funding | Critical Needs for 2010 |
|---|---|---|---|---|
| | concentration and load data and SPARROW results | | | request |
| EPA | ▪ Revise Task Force Communications Strategic Plan to reflect post-Action Plan release goals, priorities, and outreach efforts | ▪ Draft strategy 12/31/08<br>▪ Finalize strategy by 1/31/09<br>▪ Begin implementation by 2/1/09 | ▪ In-kind | |
| | ▪ Develop and release revised website that increases navigability, fortifies Task Force brand, includes updated and more robust information, reflects theme "Moving Forward on Gulf Hypoxia", and has the capacity to highlight implementation activities. | ▪ Phase I: Release updated website by 10/7/08<br>▪ Phase II: Maintain website and update with implementation activities continuously post 10/7/08 | ▪ $25K | ▪ Continued contractor support |
| | ▪ Develop and distribute outreach materials for targeted audiences. | ▪ Develop draft set of communication materials by 8/31/09<br>▪ Update with findings from Annual Report, publish, and distribute communications materials by 11/30/09. | ▪ $10K | ▪ Publication of Annual Report FY09 in October 2009. |
| | ▪ Develop stakeholder database for targeted outreach | ▪ Finalize 3/31/09 | ▪ $5K | ▪ Contractor support |
| NOAA | Outreach in collaboration with GOM Alliance and GCOOS. | Gulf Hypoxia Monitoring Stakeholder web site | | Funding for Outreach core system requirement (tier 1) of Gulf of Mexico Hypoxia Monitoring Implementation Plan. (see Action 9 for Implementation Plan funding levels) |
| USACE | Distribute Task Force material through out the Corps and to partners | FY 2009 | | Corps developed hypoxia outreach material, $60K. |
| USDA – NRCS | Poll USDA state leadership to identify communication tools including field guides, job sheets, etc. currently in use. | | In kind | |

| Lead Agency | **FY 2009 Actions** | Milestones | FY 2009 Funding | Critical Needs for 2010 |
|---|---|---|---|---|
| USDA-NRCS | Poll completed next steps:<br>– Review input from NRCS state offices.<br>– Identify national technical tools available.<br>– Provide list of communication tools currently available and in use. | | | |

**11.) In five years (2013) reassess nitrogen and phosphorus load reductions, the response of the hypoxic zone, changes in water quality throughout the Mississippi/Atchafalaya River Basin, and the economic and social effects, including changes in land use and management, of the reductions in terms of the goals of this Action Plan. Evaluate how current policies and programs affect the management decisions made by industrial and agricultural producers, lessons learned and determine appropriate actions to continue to implement or, if necessary, revise this strategy.**

**Coordinating Committee Action Lead: EPA**

**Summary of Expected Results**

Complete Reassessment strategy by Q1 FY 2009.

Draft list quantitative measures that measure progress towards "Coastal Goal" and "Within Basin Goal".

**FY 2009 Implementation Plan**

| Lead Agency | **FY 2009 Actions** | Milestones | FY 2009 Funding | Critical Needs for 2010 |
|---|---|---|---|---|
| EPA | Complete Reassessment Strategy | Oct 2008 | .25 FTE | |
| MARB States | Identify quantitative measures of in-basin nutrient reductions that exhibit progress towards both the "Within Basin" and "Coastal" goals. | | | |

# APPENDIX

## TASK FORCE STATE MEMBER ACTIVITIES

## STATE of ARKANSAS

- Implement 2005 legislation requiring: registration and completion of individual "on-farm" nutrient management plans, and restrictions on land application of nutrient enriched materials in designated watersheds.
- Reestablish 15,000 acres of woody and warm-season grass buffers in the Illinois River (tributary to Arkansas River) watershed through the Illinois River *CREP* project.
- Implement nutrient reduction programs in Point Remove, Arkansas County, and Bayou Bartholomew watersheds. These areas are tributaries to the Mississippi River via the Arkansas and Red Rivers.
- Assist Lower Mississippi River Sub-Basin Committee Coordinator with compilation and reporting of nutrient reduction activities in lower Mississippi River Basin states through scheduled public workshops and final publications.

## STATE of ILLINOIS

**Education and outreach**

- Continue to support ongoing projects of the Illinois Council on Best Management Practices (CBMP), a coalition of producer organizations and the agricultural industry, http://www.cbmp.uiuc.edu/ including: 1) a statewide educational campaign on phosphorus best management practices, funded through the Fertilizer Research and Education Council, that reached over 75,000 producers with a brochure included in a weekly Illinois Farm Bureau publication; and 2) an educational program in the Indian Creek watershed in southeast Illinois, which is funded by The Fertilizer Institute, that will focus on nutrient best management practices and nutrient management plan record-keeping.
- Use fertilizer tonnage tax proceeds to support website with information on soil temperatures throughout the State and educational outreach to producers and agricultural retailers stressing the importance of utilize nitrification inhibitors during fall anhydrous ammonia application.
- Conduct Illinois Tillage Seminars
- Use Section 319 funds to support projects to promote the reduction of nutrient use on lawns and farm lands.
- Through educational exhibits at several museums, zoos and schools, provide nutrient reduction and nonpoint source pollution information to Illinois citizens.

**Monitoring, modeling and research**

- Fox River Watershed Investigation, Stratton Dam to the Illinois River

- Continued support of two of the Corps of Engineers Long Term Resource Monitoring Program stations on the Illinois and Mississippi Rivers.

**Implementation**

- Continue to work with USDA Farm Service Agency, Association of Illinois Soil and Water Conservation Districts, SWCDs, and others on the Conservation Reserve Enhancement Program - Ongoing Program with 232,000 acre goal. Have enrolled 126,016 acres on the federal side, and 78, 546 acres in the state program.
- Continue to support TNC's efforts in Mackinaw River basin to help guide and influence the use of conservation-oriented agricultural techniques for water quality improvement.
- Cost-share the construction of stream-bank stabilization and restoration practices
- Use Section 319 funds for (1) 8 projects implementing urban green infrastructure practices to reduce nutrient nonpoint source pollution; (2) 16 stream, lake or and wetland restoration/protection projects; and (3) 2 animal waste/exclusion projects.
- Continue to develop and implement total maximum daily loads (TMDLs) in watersheds tributary to lakes that exceed the 0.05 mg/L TP lake water quality standard.
- Continue to develop and implement total maximum daily loads (TMDLs) in watersheds tributary to drinking water intakes that exceed the 10 mg/L nitrate potable drinking water quality standard.

## STATE of IOWA

**Implementation and Watershed Protection**

- Continue to implement the Iowa Conservation Reserve Enhancement Program (CREP) constructing highly-targeted nitrogen-removal wetlands for cropland drainage. State and federal funding for FY09 totals $20.7 million. The program currently has 72 wetlands constructed or under development totaling 715 acres of wetland pool which treat the drainage from 86,100 watershed acres and remove 40-90% of nitrate, for an estimated 53,600 tons of nitrate removed over design life.
- Continue to implement the Iowa Watershed Protection Program currently supporting 72 watershed protection projects, which primarily reduce nutrients and sediment to water resources. Continue watershed planning assistance and assessment of nutrient load reductions from the watershed projects. FY09 funding is $7.8 million state, $3.8 million Section 319 Clean Water Act funds, and $2.9 million landowner match funds for a total of $14.5 million.
- Continue to implement the competitive grant award program to local sponsors through the Watershed Improvement Review Board, much of which reduces nutrients and sediment to water resources. FY09 funding is $5 million state funds and $14.2 million of estimated local match funds, for a total of $19.2 million.
- Continue to implement the Iowa Financial Incentive Program for cost-sharing implementation of soil and water conservation practices on private working lands to reduce erosion, sedimentation, and nutrient transport to water resources. FY09 state funding is $11.9 million,

which with landowner match funds of $5.7 million is estimated to total $17.6 million in conservation practices.

- Continue to implement the District Initiatives program, which for FY09 provides $3.2 million state funds to leverage federal conservation programs and increase Iowa landowner participation in federal conservation programs.
- Continue to implement the Local Water Protection Program which for FY09 provides $18 million, comprised of $12 million to implement animal waste management practices and $6 million for general nonpoint source practices. The program assists landowners with the installation of practices to protect and improve water quality.
- Continue to implement the Resource Enhancement and Protection program which for FY09 provides $3.2 million, consisting of $1.6 million for watershed and water quality protection projects and $1.6 million for cost-sharing management practices for water quality enhancement.
- Continue to provide state personnel support and funding to Iowa's 100 Soil and Water Conservation Districts (SWCDs) which assist implementation of federal, state and local conservation programs that reduce nutrients and sediment. Federal programs delivered through SWCDs include Environmental Quality Incentives Program, Wetland Reserve Program, Conservation Security Program, Conservation Reserve Program, Conservation Reserve Enhancement Program, Watershed Protection and Flood Prevention, Conservation Technical Assistance, and Resource Conservation and Development.
- Continue development of TMDLs for water bodies impaired by nutrients, and collection of water quality nutrient monitoring data for streams and lakes.

**Research and Technology Development**

- Continue the Wetlands, Nutrients and Water Management research initiative with Iowa State University to develop new technologies and improve targeting and efficiency of water quality management practices. Continue water quality monitoring of research sites evaluating various management practices and CREP nitrogen-removal wetland field sites. FY09 state funding is $0.4 million.
- Continue technology development through the EPA Targeted Watershed Grant "Integrated Drainage-Wetland Systems for Reducing Nitrate Loads from Des Moines Lobe Watersheds" with Iowa State University. FY09 federal funding is estimated at $0.2 million.
- Continue development of the Integrated Drainage & Wetland Landscape Systems Initiative for reducing nitrogen and phosphorus to water resources across 6 million acres of croplands targeted for nitrate reduction to water resources. For FY09, achieve federal wetland regulatory and policy concurrence, and begin the process of identifying and selecting 25 pilot sites to serve both as demonstrations as well as study sites to confirm nutrient reductions and other benefits.
- Conduct the Cedar River watershed study to assess the costs and needed management practices at large watershed scale to meet the nitrogen and phosphorus reduction targets of the Gulf hypoxia goal. Funding for FY09 is $60,000.
- Continue Integrated Farm and Livestock Management program funding of research and demonstrations through Iowa State University on impacts of nutrient management, harvest of

crop biomass for bio-energy, and cover crops on water quality of drainage and surface runoff. FY09 state funding is $0.21 million.

- Continue to invest fees paid by farmers on the sale of agricultural chemicals towards developing new technologies and improved practices for reducing nutrients from cropped landscapes to water resources. FY09 funding is estimated at $0.55 million.

**Education and Outreach**

- Continue websites, publications, and educational/outreach initiatives sponsored by the Cooperative Extension Service of Iowa State University addressing nutrient management in cropped landscapes, detailing topics such as nitrogen and phosphorus fertility recommendations, real-time soil temperatures website to determine acceptability of fall N fertilization for water quality improvement, livestock waste management systems and land application, phosphorus index for water quality improvement, etc.
- Continue Iowa Learning Farm demonstrations, education, and outreach through Iowa State University to improve water quality through crop residue and tillage management. FY09 funding is $0.47 million.
- Continue outreach and education concerning Gulf hypoxia and nutrient reductions to farm organizations, drainage and watershed management groups, and the 2009 Iowa Water Conference.

## STATE of LOUISIANA

- Review of nutrient removal BATs with EPA for industrial and municipal permits
- Develop watershed implementation plans with nutrient BMPs under LA 319 NPS Program
- Ongoing Implementation of the Louisiana Nutrient Criteria Development Plan
- Working with Governor's Office and Congressional Delegation on Gulf Hypoxia funding initiatives
- Participate in the Nutrient Reduction and Water Quality Priority Issue Teams of the Gulf of Mexico Alliance to coordinate with Gulf States on nutrient reduction, sources, fate, transport and criteria development
- Participate with EPA Flowing Waters Assessment Program to conduct environmental and water quality monitoring on the Lower Mississippi River Louisiana segment

## STATE of MISSISSIPPI

**Mississippi Department of Environmental Quality (MDEQ) Program Activities**

- Development of Nutrient TMDLs. Nutrient TMDLs will continue to be developed in accordance with Consent Decree requirements. This will be the 10th and final year of implementing the EPA Consent Decree.
- Implementation of point source TMDLs through NPDES Program. For approved TMDLs, NPDES permits are required to be consistent with TMDL load allocations.

- Continue nutrient monitoring where required in NPDES permits. Nutrient monitoring is required in numerous permits which will provide needed data to help with future planning and decision-making.
- Increased emphasis on nutrient reduction activities during development of local watershed plans throughout the State. Implementation plans for priority watersheds identified through Mississippi's Basin Management Approach are being developed and implemented. In watersheds with nutrient impairments, the plans will address nutrient problems and use the load reduction in approved nutrient TMDLs as the reduction targets.
- Enhanced nutrient focus for 319 NPS Program. The FY2009 Nonpoint Source Program Work Plan has an enhanced focus on supporting nutrient reduction activities. FY09 319 NPS funding is being targeted to support the nutrient reduction watershed management efforts (i.e., local watershed team building, management planning, pre and post-implementation monitoring, and implementation activities) and the Base Education/Outreach Program will have a greater focus on nutrients education.
- Support expanded CAFO training program. MDEQ, MDAC, NRCS, Farm Bureau, Extension Service, and the Board of Animal Health are working together through the Poultry CAFO Advisory Committee to expand a required CAFO training program (in which CEUs are earned by CAFO permittees) to make the training available to interested AFOs on a voluntary basis.

**Mississippi Department of Agriculture and Commerce (MDAC)-Supported Activities**

- Support for chicken litter pilot digester projects. MDAC has been working with the Mississippi Land, Water, and Timber Board to fund three pilot digester projects that have multiple beneficial uses – the creation of methane for home use and the reduction/elimination of chicken litter (2 projects) and cow manure (1 project).

**State Office Natural Resources Conservation Service (NRCS)-Facilitated Activities**

- Implementation of new precision agriculture program. Implementation of a new precision agriculture program which makes funding available for technology transfer to producers to reduce nutrient overloading.
- Support for development of comprehensive nutrient management plans. A steering committee of state and federal agencies and agricultural stakeholders has been meeting during the past year to develop the components, tools, and processes for generating comprehensive nutrient management plans (CNMP).
- Implementation of new nutrient management standard. A new nutrient management standard has been developed for Mississippi. This standard establishes updated guidelines for nutrient and conservation management.
- Implementation of new manure transfer program. To reduce nutrient overloading, a new manure transfer program will transfer manure to watersheds with phosphorus-deficient soils.

**Other Northern Gulf Institute (NGI)-Facilitated Activities Addressing the Gulf of Mexico**

Additional research facilitated by NGI related to Gulf of Mexico water quality is currently underway.

- Research on optical assessment of algal blooms in the northern Gulf of Mexico. Dr. Stephen Lohrenz of USM is developing and implementing robust protocols for harmful algal bloom (HAB) recognition in his project, "Satellite and In-situ Optical Assessment of Algal Blooms Events in the Northern Gulf of Mexico." The technologies developed in this work may help us develop tools directly applicable to hypoxia.
- Research on computer-assisted predictions of water quality. Dr. William McAnally of Mississippi State University (MSU) in his project, "Spatial Technology and High Performance Computing for Improving Prediction of Surface Water Quality," is working to improve model predictions of water quality.
- Modeling Mobile Bay sediments and pollutants. Another of Dr. McAnally's projects, "Modeling Mobile Bay Sediments and Pollutants with New Technologies," is developing a management-oriented model of sediment and pollutants for Mobile Bay and the major tributaries to the Bay. An extension of this work will help us model the amount of nutrients and pollutants that are entering the Gulf of Mexico from the Mobile Bay system.

## STATE of MISSOURI

- Continue to implement a matrix of agricultural best management practices via the Department of Natural Resources Soil and Water Conservation Program. The program provides technical staff and cost share funding for all the counties of the state. An estimated $22 million in cost share funding for on-site projects will be implemented in 2008. The program has prevented an estimated 12 million tons of soil from being introduced into waterways of the state for the 2004-2008 time frames. Specific program information and support is available at: http://www.dnr.mo.gov/env/swcp/
- Continue to support the Animal Waste Treatment Loan Program used to finance animal waste treatment systems for independent livestock and poultry producers at below conventional interest rates. The program is authorized for a total of $10 million in revolving funds.
- Proposed Constitutional and Statutory Change in November, 2008 session. Language changes would allow the Storm Water Grant and Loan Program that is currently administered by DNR to disperse more funds for storm water issues by re-offering unused funds, eliminating the 50% grant to loan ratio requirement and creating a revolving fund for loans.
- Continue current steps to develop a needs assessment framework for Soil and Water Conservation Program funding. This recent process dictates that each district develop a 5 year needs assessment and is anticipated to allow more flexibility in program allocations to better address specific resource concerns such as nutrient loading.
- For 2008, increase the incentive rate for development of Nutrient Management Plans (N 590) and Waste Utilization Practices (N633), currently funded through the Soil and Water Conservation program.
- Implementation of the state water quality anti-degradation policy. Program requires re-evaluation of point sources on classified streams and in some cases will require steps to achieve greater pollution reduction via permitting process.

- Implementation of Missouri Nonpoint Source Management Plan, requiring continued development of TMDL's strategies associated with the 303(d) impaired waters. A revised list of impaired waters will be submitted by the Department of Natural Resources to EPA review in 2008. A portion of the impaired water bodies on the list will be required to initiate nutrient reduction actions when nutrient levels adversely affect beneficial water uses. A list of impaired waters and those with specific nutrient impact can be found at: http://www.dnr.mo.gov/env/wpp/waterquality/303d.htm

- Provide reporting and guidance on Gulf Hypoxia issues to the Water Quality Coordinating Committee. The Water Quality Coordinating Committee is an informal interagency and public committee dealing with water quality issues, with representatives of nonprofit organizations, universities and colleges, cities and businesses, as well as state, federal and local agencies.

- Through the permitting process, the state will require Concentrated Animal Feeding Operations to further address phosphate levels. The Department of Natural Resources will also continue development of broader nutrient management planning guidance for permitted facilities.

- Continued support of a state-wide Volunteer Water Quality Monitoring Program. State partners provide training and equipment to this citizen monitoring group, which submits physical, chemical and biological data from monitoring sites throughout the state. Over 4,000 citizen volunteers have attended at least one of the training workshops. The program provides screening-level data used by state and local decision makers to determine current stream conditions and to identify potential problems or trends in water quality. A similar program is supported for monitoring the states lakes and reservoirs (Lakes of Missouri Volunteer Program).

- Administer the Watershed Management Plan Development Grants. The program provides directed 319 funding to restore waters impaired by nonpoint source pollution. Program is targeted at water bodies that are on the states Targeted Nonpoint Source 303(d) list. The funded watershed plans support activities that will result in achievement of load reduction goals set forth in the corresponding TMDL developed for the affected water body.

- Continue to implement phase I and II storm water regulations. Permits require regulated MS4s to have storm water management programs in place by March 10, 2008. These efforts have the potential to address a significant amount of nutrient related issues associated with storm water pollution from large and small metropolitan areas.

## STATE of OHIO

- Ohio strives to capitalize on existing program efforts. Below are key linkages and statements relating to major program efforts and guiding documents for the Ohio River Basin within the state of Ohio. These linkages provide the detailed information on programs such as Farm Bill Conservation efforts, local watershed plan implementation, state water quality studies (Total Maximum Daily Load (TMDL) Reports), point source programs, monitoring, etc.

- Ohio TMDLs addressing nutrients that are completed or in progress are shown in the map at the website below. A list of watersheds by name is also listed on the website. http://www.epa.state.oh.us/dsw/tmdl/OhioTMDLs_InProgress.html.

- Local watershed plans can be found at the website below. These plans address all sources of impairment, including those associated with excessive nutrient loading. http://www.dnr.state.oh.us/soilandwater/water/watershedprograms/default/tabid/9192/Default.aspx.
- Information on Ohio's soil and water conservation districts and their non-point source and nutrient/sediment programs can be found at http://www.dnr.state.oh.us/soilandwater/default/swcds/default/tabid/9093/Default.aspx.
- Continued implementation of state programs addressing small, medium and large AFOs.
- Continued implementation of the Ohio NPS Management Plan and 319 Grants Program.
- Research, development and education efforts related to advanced treatment of nutrients at wastewater treatment plants will continue.
- NPDES, CSO/wet weather and other federally delegated programs will continue.
- ORSANCO and Ohio DNR will continue to act as liaisons with other ORB states.

## STATE of WISCONSIN

- NR 217 requirement for phosphorus effluent limits
- Non-point source specific performance standards that apply—Target Dates
- Stormwater & CAFO permits
- TMDL on Rock River
- TMDL on Lake Pepin with MN
- Begin to collect nitrogen data from WWTPs
- Farm Nutrient Management Plans performance standards (acreage goals)

# TASK FORCE FEDERAL MEMBER ACTIVITIES

## United States Army Corps of Engineers

- Navigation Environmental Sustainability Program (NESP). This is an upper Mississippi River program with a significant ecosystem restoration component. Many of the projects that develop in the future will help with sediment and nutrient retention/treatment.
- Environmental Management Program (EMP). This is an upper Mississippi River program that has two components, one being development and construction of ecosystem restoration projects which will help with sediment and nutrient retention/treatment, and the other being a water constituent monitoring program, providing valuable water quality data to be used by many state and Federal agencies as well as non-government groups.

- Middle Mississippi River Watershed Study. The study will look at watershed issues in the middle Mississippi River area including ecosystem restoration, management, socioeconomic concerns and balance, as well as environmental monitoring needs. From this study, future projects for the benefit of the middle Mississippi River watershed will develop.
- Lower Mississippi River Watershed Study. While the focus of this study is related to recreational and economics needs and existing infrastructure, it will have some importance in influencing some future growth and development in the Lower Mississippi River, which it turn, could have impacts to hypoxia issues including sediment and nutrient input.
- Louisiana Coastal Area Study (LCA). While not specifically authorized, some aspects of LCA associated with other programs and projects are moving forward including scientific investigation for long distance sediment transport and freshwater diversions for building new wetlands and nutrient uptake.
- Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA). Projects for ecosystem restoration and protection are planned and constructed annually by inter-agency groups each year. For example, West Bay Sediment Diversion project is a joint effort by the Corps and the State of Louisiana to transport sediment from the river by a specifically designed channel or bank cut for the purpose of building marsh, which in turn reduces sediment and nutrient load to the hypoxic zone in the Gulf of Mexico.

## United States Department of Agriculture (USDA)

- USDA will provide technical and/or financial assistance through the following conservation programs to help reduce nutrient (nitrogen and phosphorus) runoff and leaching to local receiving waters as well as to the Gulf of Mexico: Environmental Quality Incentives Program (EQIP), Conservation Reserve Program (CRP) and Conservation Reserve Enhancement Program (CREP), Wetland Reserve program (WRP), Conservation Technical Assistance (CTA), Conservation Security Program (CSP), PL 83 566 Watershed Projects, and the Resource Conservation and Development Program (RC&D).
- USDA will continue to test and demonstrate innovative management practices for reducing nutrient losses to surface waters and evaluate current conservation practices for water quality benefits at the watershed scale. Recent progress has been made in the areas of improving modeling of riparian zone function for more accurate water quality assessments, developing new management practices for reducing nitrate losses in drainage waters, improving water quality models for large-scale watersheds, assessing the water quality effects of management practices in tile drained agriculture, developing sensors and procedures for improved nitrogen fertilizer management in corn and designing wetland systems for tile drained agricultural landscapes. These and other research findings for FY2007 can be found at the following web sites:

  http://www.ars.usda.gov/SP2UserFiles/Program/211/NP211AnnRptFY07.pdf
  http://www.fsa.usda.gov/Internet/FSA_File/fsa_final_report_crumpton_rhd.pdf
  http://www.fsa.usda.gov/Internet/FSA_File/iameetingagenda.pdf.

**2008 Farm Bill**
The 2008 Farm Bill, The Food, Conservation, and Energy Act of 2008, reinforces the importance of conservation on working lands. It increases authorized funding for conservation programs administered by NRCS by $4.2 billion over the life of the bill as compared to 2002 Farm Bill.

Key USDA programs were reauthorized and some, such as the Agricultural Water Enhancement Program (AWEP) under the Environmental Quality Incentives Program, were expanded. AWEP Offers financial and technical help to assist farmers and ranchers install or implement conservation practices for agricultural water conservation water quality enhancement activities.

Other highlights that relate to the 2008 Hypoxia Annual Operating Plan:

- Authorizes 32,000,000 acres to be enrolled in the Conservation Reserve Program (2010-2012).
- Allows up to 3,041,200 acres of wetlands to be enrolled in the Wetland Reserve Program, adding 766,200 acres.
- Renames the Conservation Security Program to the Conservation Stewardship Program – authorizes additional funding to enroll up to 12,769,000 each year for producers to improve conservation treatment on their lands that benefit soil, water, and air resources.
- Expands partnership opportunities through the Cooperative Conservation Partnership Initiative (CCPI). Directs 6 percent of funds and acres from Farm Bill Conservation Title programs, except CRP, WRP, FRPP, and GRP, be used for targeted conservation activities and areas.

## United States Department of Commerce

### National Oceanic and Atmospheric Administration (NOAA)

- Through the Gulf of Mexico Ecosystems and Hypoxia Assessment (NGOMEX) program, NOAA supports research designed to provide managers with tools, techniques, and information to make informed decisions and assess alternative management strategies regarding the hypoxic zone. Ongoing research projects include efforts led by:
  - Drs. Nancy Rabalais (Louisiana Universities Marine Consortium, LUMCON) and Eugene Turner (Louisiana State University, LSU) that provides a continuing and consistent series of long-term data that document the temporal and spatial extent of hypoxia (including production of the Action Plan Coastal Goal metric); identifies relationships among river discharge and constituent loads, physical conditions (especially currents), and biological and chemical parameters; links coastal ecosystem studies with Mississippi River data on discharge, concentration, and loads of relevant constituents; refines models of the severity and extent of hypoxia (including the predictive model used as a basis for NOAA's annual hypoxic zone forecast), and continues public outreach, including a web site, to translate research results to a broad cross-section of the public;
  - Dr. Steve DiMarco (Texas A&M University) that investigates short- and long-term variability in currents, stratification, and dissolved oxygen associated with the hypoxic zone; determines spatial variability of benthic and water column respiration rates; and develops a realistic

coupled physical-biological-geochemical numerical model of the northeastern Gulf of Mexico;

- Dr. Dubravko Justić (LSU) to develop a process-based hypoxia module for the Louisiana shelf to advance hypoxia modeling by incorporating experimental results to estimate the importance of benthic and epibenthic oxygen production; partition the total oxygen uptake in the Gulf's hypoxic zone into water-column and benthic respiration; and estimate the relative forcings of biology and physics as controls of hypoxia in relatively stagnant bottom waters;
- Dr. Wayne Gardner (University of Texas at Austin) to determine biological and chemical processes that maintain and extend bottom water hypoxia in the summer after initial hypoxia development, important supportive data to improve the accuracy of predictive models of hypoxic zone expansion;
- Dr. Stephen Brandt (NOAA Great Lakes Environmental Research Laboratory) to integrate ecosystem measurements through a variety of models designed to assess the effects of hypoxia on Gulf pelagic food webs and production; quantify habitat suitability for economically and economically important fishes; and provide tools to forecast food-web interactions, habitat suitability, and fish production in relation to hypoxia; and
- Dr. Peter Thomas (University of Texas at Austin) that determines the effects of Gulf hypoxia on reproductive output in benthic copepods and Atlantic Croaker; develops reproductive output indicators (biomarkers) for Atlantic Croaker environmental exposure to hypoxia; and develop predictive models on the effects of hypoxia on fish and copepods populations based on impacts on reproduction.

- Workshop technical report "Ecological Impacts of Hypoxia on Living Resources" and publication of dedicated issue of the Journal of Experimental Marine Biology and Ecology on ecological impacts of hypoxia.
- Review and selection of proposals from fiscal year 2009 competitive funding announcement for the NGOMEX program. This program has focused on the development of models providing quantitative predictions of the spatial and temporal extent and severity of Gulf hypoxia given varying levels of nutrient inputs, physical forcing, and other anthropogenic or natural factors that control hypoxia, and quantitative models to predict the individual and population level effects of different spatial and temporal extents of Gulf hypoxia on ecologically and commercially important aquatic species and, where feasible, the socioeconomic consequences.
- Completion of a 2009 Southeast Area Monitoring and Assessment Plan (SEAMAP) summer groundfish survey in support the Gulf of Mexico Hypoxia Watch program
- Continue to explore funding options for the "Gulf of Mexico Hypoxia Monitoring Implementation Plan" and identification of funding source to maintain, at a minimum, the current monitoring effort of the hypoxic zone.
- Continued development of "Hypoxia Monitoring Stakeholder" web site capabilities and integration with Hypoxia Watch site. Pursue of hypoxia data portal and transition of web mapping capabilities to operational status.

- Continued assistance to the Gulf of Mexico Alliance's Nutrient Priority Issue Team in their efforts to address Gulf hypoxia and partner with the Task Force
- Collaboration with Gulf states to implement components of the Gulf Alliance Action Plan; nutrient reduction is one of five priority issues.

## United States Department of the Interior (DOI)

### National Park Service

- Publish special issue of Journal of Paleolimnology to summarize a body of research on historic nutrient loading and current conditions in two riverine lakes (Lake St. Croix and Lake Pepin) in or near NPS units, 2008.

### United States Fish and Wildlife Service

- Work with private landowners throughout the MARB to implement a variety of land treatment and wetland restoration, enhancement or creation activities primarily focused on improving habitat for a variety of fish and wildlife species. Many activities have ancillary benefits of reducing nutrients entering the basin's streams. Numerous programs are involved, the major of which is the Partners for Fish and Wildlife Program.

### United States Geological Survey

- Application of the SPARROW model/statistical methods to identify watersheds contributing the phosphorus, nitrogen, and sediment loadings (by Dale Robertson, G.E. Schwarz, D.A. Saad, and R.B. Alexander; to be submitted to and published by the Journal of the American Water Resources Association in Winter/Spring 2009) (Note: the application is based on the approved SPARROW model published in ES&T (Winter 2008), "Differences in Phosphorus and Nitrogen Delivery to the Gulf of Mexico from the Mississippi River Basin" (http://water.usgs.gov/nawqa/sparrow/gulf_findings/ )
- National SPARROW model simulation and journal article on projected water-quality impacts (including delivery of nitrogen and phosphorus through 2016) from corn-based ethanol production (anticipated Summer 2009)
- National SPARROW model simulation on sediment (anticipated Summer 2009)
- Several studies and reports discussing hydrologic and biogeochemical controls affecting nutrient transport in agricultural streams. (http://water.usgs.gov/nawqa/jeq_launch.pdf ; http://jeq.scijournals.org/content/vol37/issue3/#SPECIAL_SUBMISSIONS; http://in.water.usgs.gov/NAWQA_ACT/index.shtml )
- Several studies to evaluate the role of nutrients in determining riverine ecosystem productivity and eutrophication, nutrient cycling and transport. Report on the role of nutrients in determining food sources and nutrient flows through river food webs. (http://wa.water.usgs.gov/neet/products.html )
- Scientific journal articles: (1) microbial ecology of denitrifiers in restored and natural wetlands in the Lower Mississippi Valley; (2) scientific hydrologic restoration/nutrient retention of restored

Lower Mississippi Valley wetlands) (Lead Scientist, Dr. Stephen Faulkner, Research Ecologist USGS National Wetlands Research Center) (Anticipated Winter 2009)

- Regional-based USGS publications in selected river basins in the Mississippi River Basin, including
  - Trends in herbicide concentrations of streams in corn-soybean agricultural areas of the central United States, 1992-2004
  - Trends in nutrient and suspended-sediment concentrations and loads in the Upper Mississippi, Ohio, and Great Lakes River Basins
  - Spatially referenced regression modeling of total nitrogen and total phosphorus loading in the Arkansas-White-Red, Lower Mississippi, Texas-Gulf River Basin
  - Nutrient and suspended-sediment trends in the Missouri River Basin
  - Assessment of nutrient eutrophication using algal, fish, and invertebrate indices in the Corn belt and Northern Great Plains and Mostly Glaciated Dairy Region Nutrient Ecoregions

## United States Environmental Protection Agency (USEPA)

### USEPA, Office of Water

- Participate and provide leadership to the Gulf of Mexico Alliance Water Quality and Nutrient Reduction teams.

### USEPA Office of Water, Office of Science and Technology

- Provide financial and technical support to States for numeric nutrient criteria development.

### USEPA Office of Water, Office of Wetlands, Oceans, and Watersheds

- Make available a compilation and summary of information on TMDLs completed in Basin States that deal with nutrients.
- Provide technical and financial assistance to Basin States developing nutrient TMDLs for shared water bodies.
- Complete assessment of scientific, modeling, and technical aspects of nutrient pollutant load allocations for TMDLs in Basin States.
- Provide technical and policy information on listing of impaired waters in Gulf of Mexico.
- Initiate MARB/Gulf of Mexico TMDL workplan.

### USEPA Office of Research and Development, National Health and Environmental Effects Research Laboratory

Research in ORD has focused on improving the scientific understanding of processes regulating hypoxia and the science supporting nutrient management decisions in the Mississippi River Basin. The goals of this research project are to develop model applications, data products and other tools

to quantify the relationship between nutrient loads and extent of hypoxia, quantify sources of uncertainty in nutrient load reduction targets, forecast the effects of nutrient management actions in the Basin on the extent of hypoxia, and provide defensible options to guide restoration management decisions.

- An Interagency Agreement with the Naval Research Laboratory and ORD will integrate satellite ocean color remote sensing imagery, hydrodynamic and water quality modeling and in situ measurements with the objective to assess and predict coastal ocean processes regulating the development and size of hypoxic bottom waters.
- Report on the conditions and seasonal trends of water quality in the Gulf of Mexico hypoxic zone.
- Report on development and application of mass balance models for the northern Gulf of Mexico hypoxic zone.
- Report on physical and biogeochemical processes influencing seasonal and spatial dynamics of the northern Gulf of Mexico hypoxic zone
- Compile and report on geospatial database to support Gulf Hypoxia research, nutrient management and regional water quality programs. The effort will combine data collected from multiple federal, state, and academic projects into a single database structure.

## USEPA Region 4

- Complete 20 TMDLs for nutrient impaired waters draining to the MS River
- Conduct NPDES compliance inspections of CAFOs major municipals, and major industrials discharging nutrients to MS and tributaries
- Conduct workshops and other compliance assistance seminars to CAFOs, municipalities, states and tribes regarding nutrient mgt in MS River Basin
- Work with MS, TN, and KY 319 Programs to reduce N and P from nonpoint sources
- Provide assistance to MS, TN, KY on Plans for development and development of numeric criteria for nutrient reduction in the MS Basin

## USEPA Region 5

- Develop a stream classification system and a set of diagnostic indicators to identify impairment related to nutrient effects (near completion) in Region 5, with ORD.
- Investigating the relationship between nutrients, algal biomass, continuous dissolved oxygen, and biological communities in wadeable streams in the nutrient rich areas of Region 5.
- March 2008 meeting focused on developing scientifically-defensible criteria and implementation guidance.
- Conduct 12 CAFO inspections in R5 states, targeting those CAFOs with the most severe impacts.

- Evaluation of 5 major municipal collection systems within R5 for sanitary system overflows to address wet weather sources of urban nutrient discharge.
- Continue work with State Nutrient Workgroups, IL, IN, MI, MN, OH, WI.

## USEPA Region 6

- Has entered into an IAG with USDA/ARS to compile and analyze all existing databases along the length of the Red River, from headwaters in NM to confluence with the Mississippi River. This project began in 2007, and will be completed in 2009.
- Work with States within the region to assist them with implementation of their water quality monitoring programs. Arkansas and Louisiana are conducting water quality monitoring for nutrients.
- Participation in the SPARROW modeling effort, partly via a Regional Geographic Initiative-funded project which is funding data collection for SPARROW for the Lower Mississippi River Basin, via an Interagency Agreement between Region 6 and Region 5. Headquarters, Region 5, and the Gulf of Mexico Program are also funding the overall "100 Watersheds" work.
- The 319 Program in Region 6 works with our states to reduce water quality problems related to nonpoint sources of pollution. Approximately 70% of our 319 efforts address nutrient reduction.
- The CWPPRA Program in Region 6 currently has 3 coastal restoration projects that focus on reintroduction of Mississippi River water into coastal basins. When constructed, these projects will provide for the removal of some nitrogen and phosphorus from the loadings that would otherwise go to the Gulf. The Region works with the State of Louisiana on these projects. Approximately $500,000 in CWPPRA funds will be spent this year to reach the 95% design for river reintroduction into the Maurepas Swamp. The other two projects are still in initial design phase.

## USEPA Region 7

- Region 7 Technical Advisory Group
  - Lake and Reservoir Benchmark document
  - Streams and Rivers Benchmark document
  - Continue work with State Nutrient Workgroups, MO, IA, NE, KA
- Missouri River Nutrient Workgroup - USEPA Regions 7 & 8 are in the beginning stages of forming a workgroup of federal, state, tribal and university scientist to develop nutrient benchmarks for the Missouri River.
  - The workgroup is currently attempting to gathering all existing nutrient and biological data on the Missouri River from a variety of federal, state, tribal and university data sources.
  - Once gathered, the workgroup plans to compile all nutrient and biological data (i.e., phytoplankton, periphyton, macroinvertebrate data) and begin developing nutrient causal and response benchmarks.