Mississippi River Gulf of Mexico Watershed Nutrient Task Force

FY 2010 OPERATING PLAN

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

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 approach involves continual feedback between the effects of management actions and the interpretation of new scientific information to improve and inform management strategies, and to target actions within watersheds where they will be most effective.

This *FY 2010 Operating Plan* is a compilation of actions that the various state and federal members of the Task Force have planned to undertake during FY 2010 to implement the *Gulf Hypoxia Action Plan 2008*. Each item in this Operating Plan specifically implements one of the 11 actions in the 2008 Action Plan. The Operating Plan includes, where known, background information on milestones reached in FY 2009 and actions to be undertaken in FY 2010. 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*.**

In addition to the activities listed in the *FY 2010 Operating Plan* that specifically address the actions in the 2008 Action Plan, Task Force member organizations are engaged in numerous other ongoing activities that result in improvements to state and local water quality and the reduction and mitigation of hypoxia in the Gulf of Mexico. The Appendix at the end of this document has been developed to highlight these complementary actions. The Appendix is by no means a comprehensive list, and it will change as projects are completed, new projects are proposed and funded, and items are incorporated into the state and federal nutrient reduction strategies as they are developed.

In addition to the yearly Operating Plans and Appendices, this year the Task Force will also issue an annual report that will measure the results of these actions. Task Force agencies will use this information and input from the public in 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, have begun to develop 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.

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011
Mississippi/Atchafalaya River Basin (MARB) States	Identify planned nutrient reduction activities and the corresponding availability and needs for funding. Continue developing nutrient reduction strategies, including an analysis of implementation costs.	Ongoing	Funding for state-level nutrient reduction strategies at a cost of $200,000 to $500,000 per state.
Subbasin Committees (SBC)	Continue coordinated work on state-level nutrient reduction plans. Continue progress on coordinated policy decisions, budgeting, and message among federal agencies and within agencies, and on state level among state agencies.	Ongoing	$150,000 for operating budget for each established Subbasin Committee (2–3 years).
Illinois	Identify planned nutrient reduction activities and the corresponding availability and needs for funding. Begin developing nutrient reduction strategies, including an analysis of implementation costs.	Ongoing Initiate state agency discussions regarding feasibility of developing strategy. Initiate 18-month study of nutrient loadings in Illinois watersheds.	Adequate funding to develop nutrient reduction strategy.

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011
	Continued work on coordinated effort on state-level nutrient reduction plans. Continued progress on coordinated policy decisions, budgeting, and message among federal agencies and within agencies, and on state level among state agencies.	Ongoing	
Iowa	Continue to identify methodologies and 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.	Ongoing	Federal funding to Iowa to develop state-level strategy
	Completed 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 future state-level strategy development.	Complete the final report and publish/disseminate the report and findings	
Louisiana	Identify planned nutrient reduction activities and the corresponding availability and needs for funding.	Ongoing	
	Continue progress on coordinated policy decisions, budgeting, and message among federal agencies and within agencies, and on state level among state agencies.	Ongoing	
	Continue to develop state-level nutrient reduction strategy. Presented and discussed Louisiana Nutrient Reduction Strategy at US Department of Agriculture (USDA) Louisiana State Technical Committee meetings in 2008/2009, and 2008 LA Environmental Leadership Program (ELP) Nutrient Reduction Workgroup meeting. At these meetings, also discussed and gave update on activities of Hypoxia Task Force and status of petitions and initiatives for nutrient reduction. Received commitment from the Natural	Continue refinement of goals, target watersheds, best management practices (BMPs), and technology-based point source technologies for inclusion in Louisiana Nutrient Reduction Strategy. This effort will include communication outreach on the status of strategy development with federal, state, and local Louisiana agencies, including at USDA State Technical Committee meetings, LA ELP meetings and award ceremonies, and with local Louisiana Soil and Water Conservation District meetings and	A unified federal and state effort to find and procure funding for Mississippi River Basin states. Develop and apply comprehensive nutrient reduction strategies.

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011
	Resources Conservation Service (NRCS) and agriculture participants to give priority where possible to nutrient reduction in application of Farm Bill programs.	activities. Louisiana Department of Environmental Quality (DEQ) will integrate the newly implemented statewide watershed program and designated watershed coordinators into needs of the nutrient reduction strategy and solicit their support and input.	
Louisiana (cont)	Louisiana also worked with the State of Mississippi and other Gulf states through a Gulf of Mexico Alliance National Oceanic and Atmospheric Administration (NOAA) grant to facilitate the development of a nutrient reduction strategy/template for coastal watersheds to ensure consistent, flexible approach. (See State of Mississippi's description of this project.)		
Minnesota	Identify planned nutrient reduction activities and the corresponding availability and needs for funding. Develop nutrient reduction strategies, including an analysis of implementation costs. Initial focus on developing databases and program pilot/demos. Lake Pepin Nutrient strategy is under way. Initiation of coordinated strategy identification and documentation is on hold.	Continue to work on individual strategies. Evaluate adequacy of existing databases.	
	Continue work on coordinated effort on state-level nutrient reduction plans. Continue progress on coordinated policy decisions, budgeting, and message among federal agencies and within agencies, and on state level among state agencies. Provided presentation to Water Policy forum within Minnesota Pollution Control Agency (MPCA). Developing data, research, and demonstrations before undertaking state-coordinated plan for nutrient reduction.	Discuss work plan schedule for consolidating individual strategies into overall state strategy document.	

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011
	Nitrogen Contributions to the Mississippi River Basin in partnership with the Minnesota Dept. of Agriculture and University of Minnesota.	State legislature did not provide matching funds. Federal funds were returned. No immediate plans to resubmit this strategic activity.	
Minnesota (cont)	Develop eutrophication standards for rivers. Triennial rule revision process was started. Public notice of intent to revise water quality standards (done 7/09). Produced technical reports related to standards development.	Develop draft rule criteria. Also developing criteria specific to the Mississippi River pools, considering nitrate aquatic life toxicity standards for rivers.	Adequate staffing is necessary to complete this work.
	Draft 2008–2012 Nonpoint Source Management Program Plan recently came off notice for public comment and has been sent to EPA for approval. Draft language/criteria (end of 2009). Clean Water Act (CWA) §319 grant applications were accepted through 10/10/08. Notifications of grant awards were made by end of the 2008 calendar year. Environmental Protection Agency (EPA) awarded CWA §319 grants in 7/09. Plan is completed and accessible through the Web at www.pca.state.mn.us/water/nonpoint/mplan.html.	Work plans due August 25, 2009. Applications due for the next round of funding in summer 2010.	Continued high-level funding is extremely important to fund these projects. Also, adequate staffing is critical to modify the plan to make it a more current, living document.
Mississippi	Development of a Nutrient Reduction Strategy Template for the Mississippi Delta; Co-leads – Mississippi Department of Environmental Quality (MDEQ), Delta Farmers Advocating Resource Management (FARM)	Ongoing; Completion date: 9/30/09 for initial draft.	$75,000 (EPA)
	Implementation of the Nutrient Reduction Strategy Template through the development/revision of local watershed management plans in selected Mississippi Delta watersheds.	Ongoing	

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011
	Harris Bayou (new riverine nutrient reduction watershed project); Lead – Delta FARM	Start Date: 9/09; Completion Date: 6/10. Finalize Local Watershed Management Plan.	
Mississippi (cont)	Porter's Bayou (new riverine nutrient reduction watershed project); Lead – Delta FARM	Start Date: 9/09; Completion Date: 6/10. Finalize Local Watershed Management Plan.	
	Steele Bayou (existing riverine watershed project with revised nutrient reduction component); Leads – US Army Corps of Engineers (USACE), Delta FARM	Start Date: 9/09; Completion Date: 6/10. Revise Local Watershed Management Plan to include nutrient reduction strategy.	
	Lake Washington (existing lake watershed project with revised nutrient reduction component); Lead - MS Soil and Water Conservation Commission, Washington County Soil & Water District	State Date: 8/09; Completion Date 6/10. Revise Local Watershed Management Plan to include nutrient reduction strategy.	
	Wolf/Broad Lake (existing lake watershed project with revised nutrient reduction component); Lead – Delta FARM	Start Date: 6/09; Completion Date: 6/10. Revise Local Watershed Management Plan to include nutrient reduction strategy.	
	Bee Lake (existing lake watershed project with revised nutrient reduction component); Lead – Delta Wildlife.	Start Date: 9/09; Completion Date: 6/10. Revise Local Watershed Management Plan to include nutrient reduction strategy.	
	Pre-implementation monitoring to quantify changes in water quality in the selected Delta watersheds.	Ongoing	
	Harris Bayou (new riverine nutrient reduction watershed project); Lead – Delta FARM	Start Date: 9/09. Develop and Implement Water Quality Monitoring Plan with nutrient monitoring.	
	Porter's Bayou (new riverine nutrient reduction watershed project); Lead – Delta FARM	Start Date: 9/09. Develop and Implement Water Quality Monitoring Plan with nutrient monitoring.	
	Steele Bayou (existing riverine watershed project with revised nutrient reduction component); Leads – USACE, Delta FARM	Ongoing. Revise and continue to Implement Water Quality Monitoring Plan with nutrient monitoring.	

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011
Mississippi (cont)	Lake Washington (existing lake watershed project with revised nutrient reduction component); Lead – MS Soil & Water Conservation Commission, Washington County Soil & Water District.	Ongoing. Continue to Implement Water Quality Monitoring Plan with nutrient monitoring.	
	Wolf/Broad Lake (existing lake watershed project with revised nutrient reduction component); Lead – Delta FARM	Ongoing. Revise and Implement Water Quality Monitoring Plan with nutrient monitoring.	
	Bee Lake (existing lake watershed project with revised nutrient reduction component); Lead – Delta Wildlife.	Ongoing	
	Implementation of Local Watershed Management Plans in the selected delta watersheds.		
	Harris Bayou (new riverine nutrient reduction watershed project); Lead – Delta FARM	Start Date: 9/09; Completion Date: 6/10. Implement Local Watershed Management Plan.	
	Porter's Bayou (new riverine nutrient reduction watershed project); Lead – Delta FARM	Start Date: 9/09; Completion Date: 6/10. Implement Local Watershed Management Plan.	
	Steele Bayou (existing riverine watershed project with revised nutrient reduction component); Leads – USACE, Delta FARM	Start Date: 9/09; Completion Date: 6/10. Implement Revised Local Watershed Management Plan.	
	Lake Washington (existing lake watershed project with revised nutrient reduction component); Lead – MS Soil & Water Conservation Commission, Washington County Soil & Water District.	Start Date: 9/09; Completion Date: 6/10. Implement Revised Local Watershed Management Plan.	
	Wolf/Broad Lake (existing lake watershed project with revised nutrient reduction component); Lead – Delta FARM	Start Date: 9/09; Completion Date: 6/10. Implement Revised Local Watershed Management Plan.	
	Bee Lake (existing lake watershed project with revised nutrient reduction component); Lead – Delta Wildlife.		

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011
Mississippi (cont)	Post-implementation monitoring to quantify changes in water quality in the selected delta watersheds.		
	Harris Bayou (new riverine nutrient reduction watershed project); Lead – Delta FARM	Start Date: TBD	
	Porter's Bayou (new riverine nutrient reduction watershed project); Lead – Delta FARM	Start Date: TBD	
	Steele Bayou (existing riverine watershed project with revised nutrient reduction component); Leads – USACE, Delta FARM	Start Date: TBD. Post-implementation monitoring (with nutrients).	
	Lake Washington (existing lake watershed project with revised nutrient reduction component); Lead – MS Soil & Water Conservation Commission, Washington County Soil & Water District.	Start Date: TBD. Post-implementation monitoring (with nutrients).	
	Wolf/Broad Lake (existing lake watershed project with revised nutrient reduction component); Lead – Delta FARM	Start Date: TBD. Post-implementation monitoring (with nutrients).	
	Bee Lake (existing lake watershed project with revised nutrient reduction component); Lead – Delta Wildlife.	Start Date: 10/09. Post-implementation monitoring (with nutrients).	
	Farmer-to-farmer exchange with upper Mississippi River state: Delta farmers to upper Mississippi River state (Spring 2009), and upper Mississippi River state farmers to Mississippi Delta and Gulf of Mexico (Summer 2009).	Ongoing. Delta Farmers to Iowa (6/10); Iowa Farmers to Delta (7/10).	
	Future Action – post-2011: Project Evaluation and Assessment. Start Date: 10/11; Completion Date: TBD.	On Hold	

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011
Mississippi (cont)	Template Transferability. Coordination with Mississippi/Atchafalaya River Basin (MARB) and Gulf Coast states will be a part of this effort to maximize the flow and use of information developed through this effort. Start date 10/11.	Ongoing. Coordination with MARB and Gulf Coast States to maximize transfer of strategy.	
	Development of an Aligned Nutrient Reduction Strategy Template for Coastal Watersheds. Start Date: 10/08; Completion Date: 4/09.	Ongoing. Draft template will be completed by 12/09.	
	Implementation of the Coastal Watershed Nutrient Reduction Strategy Template through the development of Local Watershed Management Plans in selected Mississippi coastal watersheds. Start Date: 10/09; Completion Date: TBD.	Develop Local Watershed Management Plan.	
	Pre-implementation monitoring to quantify changes in water quality in selected coastal watersheds.	Start Date: TBD; Completion Date: TBD. Develop Local Watershed Management Plan.	
	Implementation of Local Watershed Management Plans in the selected coastal watersheds.	Start Date: TBD; Completion Date: TBD. Develop Local Watershed Management Plan.	
	Post-implementation monitoring to quantify changes in water quality in the selected coastal watersheds.	Start Date: TBD; Completion Date: TBD. Develop Local Watershed Management Plan.	
	Project evaluation and assessment/comparison of the pre and post-implementation water quality data and the use of other assessment tools to provide a better understanding of what nutrient, sediment, and other pollutant load reductions are achievable.	Start Date: TBD	
	Delta Wildlife and Monsanto Company – Implementation of nutrient reduction best management practices to support implementation of the Mississippi Delta Nutrient Reduction Strategy.	Ongoing. Implementation of nutrient reduction best management practices to support implementation of the Mississippi Delta Nutrient Reduction Strategy.	

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011
Mississippi (cont)		Delta FARM – Implementation of nutrient reduction best management practices to support implementation of the Mississippi Delta Nutrient Reduction Strategy.	
		NRCS – Technical and funding resources to support implementation of the Mississippi Delta Nutrient Reduction Strategy.	
Missouri	Identify planned nutrient reduction activities and the corresponding availability of and need for funding. Begin developing nutrient reduction strategies, including an analysis of implementation costs. A needs assessment was conducted for the state's Soil and Water districts in an effort to determine which stewardship practices would resonate with producers in each district. A new "tool kit" of water quality protection practices was made available statewide to support the needs assessment process.	The needs assessment results have been used to compartmentalize the funding to the districts to allow new resource concerns to be addressed. A significant number of these new tools are water-quality-related and address the sources of nutrients to rivers and streams.	Provide professional development for staff and public outreach to promote the adoption of new practices available for each district as part of the needs assessment process.
	Continue coordinated work on state level nutrient reduction plans. Continue progress on coordinated policy decisions, budgeting, and message among federal agencies and within agencies, and on state level among state agencies. Continue to work to provide coordination between the various programs in the state. Formal coordination between staff working on numeric nutrient standards, §319 nonpoint source prevention programming, and the state's Soil and Water Conservation Program.	Continued coordination and a systematic effort within the Department of Natural Resources to involve staff across divisions. Participation in planning meetings and overall Department strategic planning efforts.	

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011
Missouri (cont)	Continue development of rulemaking for establishing statewide nutrient criteria for lakes and reservoirs. Initiated a workgroup to determine the watersheds that will most likely be impacted by the establishment of nutrient criteria. Continue efforts establishing reference streams and rivers for use in future nutrient criteria development on flowing waters of the state. Currently in negotiation with EPA on final rulemaking. The draft procedures and approach defined by the Department of Natural Resources have been approved by the Clean Water Commission.	Refine process with EPA and return to Clean Water Commission for final approval and movement forward with formal rulemaking. Initiated a formal workgroup to develop numeric nutrient criteria for rivers and streams.	
Ohio	Identify planned nutrient reduction activities and the corresponding availability and needs for funding. Begin developing nutrient reduction strategies including an analysis of implementation costs.	Ongoing Will look similar to those reported in 2009 Ohio report.	Same as those reported for 2009 unless other states wish to alter cost estimates of $200,000 to $500,000 per state.
	Continued work on coordinated effort on state level nutrient reduction plans. Continued progress on coordinated policy decisions, budgeting and message among federal agencies and within agencies, and on state level among state agencies.	Ongoing Some increased activity within the Ohio River Basin due to support from Targeted Watershed Grants through the Electric Power Research Institute (EPRI) through the Ohio River Valley Water Sanitation Commission (ORSANCO).	Same as those reported for 2009. $150,000 for operating budget for each established Subbasin Committee (2–3 years).

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011
Wisconsin	Continued work on coordinated effort on state-level nutrient reduction plans. Continued progress on coordinated policy decisions, budgeting, and message among federal agencies and within agencies, and on state level among state agencies. Achieved 68% reduction in phosphorus discharged from wastewater treatment plants (WWTP) since 1993. Municipal separate storm sewer system (MS4) and concentrated animal feeding operation (CAFO) permits require nutrient management. 18% of farm acreage with "Adequate" nutrient management plans.	Nutrient WQS criteria development for lakes and rivers	
Task Force Federal Agencies	Task Force federal members to provide input and assistance as needed and able to states in development of nutrient reduction strategies.	Ongoing	
US Environmental Protection Agency (USEPA)	Office of Science and Technology (OST) working to finalize technical guidance for states to assist with the derivation of numeric nutrient criteria based on stressor-response variables.	Ongoing	
	EPA Region 6 to provide technical assistance to the State of Louisiana in the state's 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.	Ongoing correspondence with states regarding consideration of SPARROW information in state strategy development.	Additional resources, especially travel funds, to aid in efforts with State of Louisiana.

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011
USEPA (cont)	Gulf of Mexico program office funded and began work on the cooperative agreement *Development of Nutrient Reduction Strategies for the MS Delta.* Draft *Delta Nutrient Reduction Strategies* document sent out for comment by Delta FARM and MDEQ (Gulf of Mexico Program Office (GMPO) staff on development teams).	Ongoing	
	TF federal members to provide input and assistance as needed and able to states in development of nutrient reduction strategies. Gulf of Mexico Program professional staff participated on the teams responsible for the draft *Delta Nutrient Reduction Strategies* document, which has been distributed for comment. The cooperative agreement *Development of Nutrient Reduction Strategies for the MS Delta* was funded, and work is ongoing with MDEQ.	Ongoing	Increased funding for states and tribes to implement known/ proven nutrient reduction strategies (e.g., wetlands, fertilizer ordinances, urban stormwater BMPs).
	Gulf of Mexico Program funded and began work with Louisiana State University (LSU) on the cooperative agreement *Using Wetlands for Nutrient Reduction in the Mississippi Basin: Potential for Minimizing Greenhouse Gases*. This project pulses river floodwater into natural, restored, and constructed wetlands to determine nutrient and greenhouse gas removal/creation levels.	Study completed, follow-up actions in progress.	
National Oceanic and Atmospheric Administration (NOAA)	Task Force federal members to provide input and assistance as needed and able to states in development of nutrient reduction strategies. Provided funding to Mississippi and Gulf of Mexico Alliance for the development of nutrient reduction strategies and a nutrient criteria framework.	Ongoing	

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011
US Army Corps of Engineers (USACE)	Task Force federal members to provide input and assistance as needed and able to states in development of nutrient reduction strategies.	Ongoing	
	Identify planned nutrient reduction activities and the corresponding availability of and need for funding. LA *Beneficial Use of Dredged Material* report developed and currently under review. Program was developed under Louisiana Coastal Area program.	Get report approval by vertical team; begin identified projects associated with Corps navigation channels.	Cost share and funds from identified sources.
	Continued coordinated work on state-level nutrient reduction plans. Continued progress on coordinated policy decisions, budgeting, and message among federal agencies and within agencies, and on state level among state agencies. Provided help to Iowa for its wetland Conservation Reserve Enhancement Program (CREP) permits, Phase I.	Provide help to Phase II Iowa CREP as program develops for permit efforts.	
US Department of Agriculture (USDA)	Task Force federal members to provide input and assistance as needed and able to states in development of nutrient reduction strategies.	Ongoing	
US Department of the Interior (USDOI) – National Park Service (NPS)	Task Force federal members to provide input and assistance as needed and able to states in development of nutrient reduction strategies.	Ongoing	
USDOI–US Geological Survey (USGS)	Task Force federal members to provide input and assistance as needed and able to states in development of nutrient reduction strategies.	Ongoing	
	Commitment by agency to begin to align listed programs with needs for hypoxia.	Ongoing	

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 FY09, 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	FY 2010 Planned Actions	Critical Needs for 2011
Lower Mississippi River Subbasin Committee (LMRSBC)	Work with lower river basin states and stakeholders to coordinate development of nutrient reduction plans and strategies	Ongoing	
	Completion of second EPA funding grant for Subbasin Committee.	Completed	
US Environmental Protection Agency (USEPA)	EPA/Office of Wastewater Management (OWM) – Promote watershed-based permitting for implementing nutrient criteria in permits.	Ongoing	
	EPA/OST – EPA Headquarters and Regions providing technical support to MARB states in developing numeric nutrient criteria, as well as advancing research to reduce the scientific uncertainties regarding source, fate, and transport of nitrogen and phosphorus.	Ongoing	
	Gulf of Mexico Program funded and began cooperative agreement work with MDEQ on St. Louis Bay pilot nutrient criteria project, "Development of Pilot Nutrient Criteria for a Mississippi Estuary." Held workshop with Gulf of Mexico Alliance (GOMA) partners to plan the implementation of this project.	Ongoing The results of this work will eventually support nutrient efforts in all Gulf states, including the Mississippi River drainage.	

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011
	List of programs with greatest impacts on nutrient levels, by agency.	Initial Assessment and Watershed Protection Division (AWPD)/Watershed Branch (WB) compilation completed. Effort is ongoing.	
USEPA (cont)		Iowa CREP & Iowa Initiative (USDA); Delta FARM. (Mississippi); Mollicy Farms, Louisiana (US Fish and Wildlife Service (USFWS)); Gulf of Mexico Alliance coordinated Governors Action Plan with specific nutrient "Action Steps".	Agency expanded use of constructed, restored, and natural wetlands to remove nutrients.
	Commitment by EPA to begin to align listed programs with needs for hypoxia.	Continue National Academy of Sciences (NAS) project to assess implications of CWA §303(d) programs on nitrogen- and phosphorus-impaired waters. Work with basin states as they compile and submit §303(d) lists in 2011.	
US Army Corps of Engineers (USACE)	List of programs with greatest impacts on nutrient levels, by agency.	After §5022 guidance is released, will reach out to other divisions and add to the project list.	
	Commitment by agency to begin to align listed programs with needs for hypoxia, such as Water Resources Development Act (WRDA) §5022.	Ongoing. Get guidance signed and distributed as appropriate. Begin looking at resource leveraging once guidance is final.	
US Department of Agriculture (USDA)	Commitment by USDA to begin to align listed programs with needs for hypoxia.	Depends on outcome of Working Agricultural Lands abstract at September Task Force meeting.	Adequate financial and technical resources and partner participation.
	List of programs with greatest impacts on nutrient levels, by agency. April 2009 – Developed Mississippi River Basin (MRB) performance indicators for the Conservation Reserve Program (CRP).	Develop and begin implementing an Agricultural Working Lands Initiative to accelerate nutrient management and reduce loadings in identified watersheds within the Mississippi River Basin.	

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011
	Commitment by agency to begin to align listed programs with needs for hypoxia. June 29 – Published interim rule for Farmable Wetland Program (FWP).		Develop interagency coordination strategy to leverage state, federal, and non-governmental organization (NGO) funding for developing constructed wetlands under FWP to provide nitrogen removal in row-crop agricultural drainage areas.
US Department of the Interior (USDOI) – National Park Service (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).	Ongoing	
	Continue contributing to the Yellow River Initiative and its efforts to reduce erosion and related nutrients affecting the Yellow River in and near Effigy Mounds National Monument.	Ongoing	
	Commitment by NPS to begin to align listed programs with needs for hypoxia.	Ongoing	

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

State and federal partners will examine programs that could be aligned to maximize benefits to alleviate hypoxia and improve water quality in the MARB, including nutrient loss to MARB surface waters and nutrient removal in the lower Mississippi Basin. Programs could include wildlife habitat enhancement, conservation practices, navigation controls, wastewater discharge permit programs, and the like. 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 are implementing best management practices in local watersheds to ensure significant additional focus on nutrient reduction efforts.

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011
Illinois	Continue to work with federal agencies on Environmental Quality Incentive Program (EQIP), CRP, CREP, and Wetland Reserve. Technical assistance provided through §319 funds for staffing of Soil and Water Conservation Districts (SWCD) personnel. State side of CREP fully funded to implement the remaining 106,000 acres in CREP memorandum of understanding (MOU).	Ongoing Will submit proposal to USDA to reopen CREP program and expand statewide and add additional practices that will help with nutrient reduction.	Funding for monitoring and assessment of practice implementation.
	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. Reviewed 87 applications.	Ongoing	
Illinois (cont)	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. Received 195 waste management plans and/or certifications.	Ongoing	

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011
	Cost-share the construction of soil and water conservation practices in nutrient-impaired total maximum daily load (TMDL) watersheds and throughout the state. In 2009 provided $552,846 in cost-share and incentive payments for 222 conservation practices projects funded through §319 nonpoint source grant program.	Ongoing	
	Cost-share the development and implementation of farm nutrient management plans statewide. Sixty-six plans written and 37 plans implemented in 2009.	Ongoing	
Iowa	Continue and expand implementation of the Iowa CREP constructing targeted nitrogen-removal wetlands removing 40%-90% nitrate from large cropland drainage areas.	Ongoing	Funding increase to allow program expansion.
	Continue implementation of Iowa-funded and -led water quality programs and initiatives for nonpoint source landscapes, many of which directly address and reduce nutrient and sediment transport to water resources.	Ongoing	
Iowa (cont)	Continue to provide state and local support to federally funded Farm Bill conservation and water quality programs, much of which provides technical and financial assistance to landowners to reduce nutrient and sediment transport to water resources.	Ongoing	

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011
Louisiana	Continued to work with federal agencies on EQIP, CRP, CREP, and Wetland Reserve. For FY 2007/2008 supported USDA in implementing approximately 97,813 acres of BMPs in the targeted Ouachita River Basin/Upper Mississippi River Alluvial Plains Ecoregion through EQIP; 51,689 acres through CRP; 15,793 acres through WRP; 50,000acres through CREP; and 1,259 acres through the Wildlife Habitat Incentives Program (WHIP).	Expand work with USDA through participation on LA State Technical Committee to apply Farm Bill programs for nutrient reduction in targeted watersheds having the most nutrient drainage to the Gulf. Support USDA/NRCS in its planned Gulf of Mexico/Hypoxia Nutrient Management Initiative through more innovative use of Farm Bill programs. Support development of watershed information for LA NRCS State Conservationist to help in a unified Louisiana response to the national NRCS hypoxia initiative. Work with Louisiana USDA offices (NRCS/FSA/ARS) to coordinate nutrient reduction work between federal and state programs and funding.	National and state support for use of Farm Bill programs for nutrient reductions in all Mississippi River Basin watersheds.
Louisiana (cont)	Support Louisiana Environmental Leadership Program with Louisiana industries and municipalities to implement technology-based nutrient removal in wastewaters. Held annual LA ELP nutrient reduction workgroup meeting in 10/08. Discussed Hypoxia Task Force activities, nutrient reduction strategy, EPA petitions to develop nutrient standards and TMDLs and heard reports on technology-based nutrient reductions by LA ELP member industries and municipalities. Recognized Marathon Petroleum Company, LA Refining Division, with special 2009 LA ELP award for nitrate reduction to the Mississippi River. Marathon successfully implemented a new nitrogen removal technology system that was shown to have a nitrogen removal efficiency of 89.7%, resulting in 78,745 pounds of nitrates removed from the river discharge in 2007.	Hold annual LAELP nutrient reduction workgroup meetings to present current hypoxia information and continue implementation of technology-based nutrient discharge reductions. Continue to recognize nutrient discharge reductions to the Mississippi River and Gulf with special nutrient reduction ELP awards. Supported a proposal by the University of New Orleans in response to EPA Gulf of Mexico Program Office request for proposals (RFP) to update data and information on nutrient releases to the Mississippi River. If funded, will update previous report on nutrient releases published in 2000.	National support for development of cost-effective technology-based nutrient removal approaches and outreach supporting activities to assist financially limited municipalities in implementing nutrient removal technologies.

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011
	Implementing nutrient BMPs in LA watersheds through LA Dept. of Agriculture and Forestry (LDAF) and local SWCDs. For FY 2007/2008 the LDAF/SWCDs implemented agriculture BMPs using incremental §319 funds on approximately 11,000 acres in the targeted Ouachita River Basin/Upper Mississippi River Alluvial Plains Ecoregion. Included among these BMPs were conservation residue management, field borders, prescribed grazing, and nutrient management. In addition, the Vermilion SWCD, in partnership with USDA and Louisiana Department of Environmental Quality (LDEQ), has initiated the Coulee Baton Microwatershed Project to address water quality problems, especially nutrient releases caused by both agricultural nonpoint source and local sewage issues. Coulee Baton microwatershed was selected because of its proximity to and drainage to the Gulf of Mexico.	Continue Louisiana Nonpoint Source Program §319 funding of LDAF/SWCD BMP application work in the targeted Ouachita River Basin/Upper Mississippi River Alluvial Plains Ecoregion, which drains the largest Louisiana land-derived nutrient loads to the Gulf. Work closely with LDAF/SWCD and USDA to get the best nutrient BMPs implemented in the targeted watersheds by coordinating state and federal programs and funding.	Continued close coordination between Louisiana USDA and state agricultural and environmental programs and adequate funding to support planned activities.
Minnesota	Continued to work with federal agencies on EQIP, CRP, CREP, and Wetland Reserve. Provided presentation to State Technical Committee (STC) on Hypoxia Action Plan, in anticipation of FY10 focused nutrient initiative. NRCS selected Cannon, Crow, and Le Sueur rivers for EQIP/Farm Bill program focus.	Define approach for focus watersheds. Establish monitoring approach.	
	Continued development of the Lake Pepin TMDL. Public review/EPA approval between 2/09 and 7/09. Develop implementation plan 4/09–12/09. Undertake project to develop nitrogen reduction implementation strategies to integrate into Lake Pepin TMDL implementation plan.	Continue work on analysis and initiate nitrogen reduction strategies for selected watersheds.	

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011
	Continue development of the Minnesota River TMDL. Stakeholder meeting process completed. Computer modeling completed. Allocation methodology developed.	Complete the draft TMDL report, put on public notice, and submit to EPA for approval. Begin work on the implementation plan, assuming EPA approval.	Federal cost-sharing programs need to be used/modified for implementation. Need to know specific practices to implement in watershed (priority and targeting assistance). Funding for implementation.
Mississippi	Continue to work with federal agencies on EQIP, CRP, CREP, and Wetland Reserve.	Ongoing. Continue to identify/solicit funding/leverage opportunities.	Support for nutrient reduction watershed projects through these programs.
	Potential federal program support for the activities under Action 1 will be identified and solicited through federal agencies with offices in Mississippi. Start Date: 10/08; Completion Date: 9/09.	Continuing during development and implementation of local watershed management plans that implement the delta and coastal watershed nutrient reduction strategy templates.	Federal program support for implementation of local watershed management plans that implement the delta and coastal watershed nutrient reduction strategy templates from Farm Bill and other sources.
Mississippi (cont)	Leadership and support of the Gulf of Mexico Alliance Nutrient Reduction Priority Issue Team. Mississippi is the lead state for GOMA's Nutrient Reduction Priority Issue Team (PIT). Start Date: 10/08; Completion Date: Ongoing.	Continuing leadership and support of the GOMA Nutrient Reduction PIT and its activities.	Continued state funding and program support.
	Enhanced nutrient reduction/hypoxia focus for Mississippi's Basin Management Approach. Completed.	Continued nutrient reduction/hypoxia focus for Mississippi's Basin Management Approach.	
	Continue implementation of Mississippi's Nutrient Criteria Development Plan.	Ongoing through 2011 (per current Nutrient Criteria Development Plan).	Funding support for monitoring and nutrient criteria development.

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011
	Creation of Special Projects Team to coordinate MDEQ efforts to support the Mississippi River/Gulf of Mexico Watershed Task Force and its Gulf Hypoxia Action Plan 2008 and the GOMA and its Governors' Action Plan.	Ongoing	
	Creation of three full-time equivalents (FTEs) to provide additional staff support.	Continue two FTEs; create/hire third FTE.	Continuing funding support (§319, state).
	Regional Coordinator hired and established for the Nutrient Reduction PIT.	Ongoing	Continuing funding support for the GOMA Nutrient Reduction PIT Coordinator (NOAA).
	Funding for coordination, collaboration, and participation in support of GOMA activities.	Ongoing	Continuing funding support (NOAA).
Missouri	Continue to work with federal agencies on EQIP, CRP, CREP, and Wetland Reserve. Recently worked with NRCS to suggest state watersheds for application of the new EQIP funds, a portion of which will be delivered on a watershed basis.	Will work to refine those locations and then seek to partner with USDA to expand the on-the-ground practices through coordination with the state Soil and Water Conservation Program.	Continued cooperation in reviewing watershed data and watershed planning to ensure that programs are working in sync with others to expand the effect of efforts to address resource concerns.
Missouri (cont)	Worked with USGS to refine the SPARROW model output for ranked watersheds. The results of these efforts re-ranked a watershed in Missouri from "top 10" in the Mississippi Basin to near 100th.	Will continue to review state water quality data and information to better refine where the largest loads of nutrients are in the state, allowing the best and most accurate targeting of resources to these locations.	Coordination with federal and state partners to review data that will allow the best scientifically based choices to be made when determining where to target resources for nutrient reduction.
	Continue statewide implementation of agricultural BMPs through the Department of Natural Resources Soil and Water Conservation Program. Expanded the cost-share practice docket from 17 practices to 41. Most of the added practices are designed to protect water quality in a more targeted fashion.	Assist the districts in technical application of new practices and development of an outreach campaign to producers concerning the adoption of the new practices that are now available.	

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011
	Through permitting process, ensure that CAFOs address required phosphate issues. Continue to provide departmental guidance on broader nutrient management planning required of permitted facilities. Draft rulemaking is under way, and a technical committee has been established to work through the development of guidance documents and rule recommendations with regard to CAFO operations in the state.	Work to develop expanded capacity for nutrient management planning that will be required by both CAFO and sub-CAFO operations.	
	Continue to support Missouri Conservation Reserve Enhancement Program (MO CREP) efforts to retire environmentally sensitive lands through the CRP. Continue MO CREP's active involvement in the protection of 83 watersheds in the state.	Ongoing	
Ohio	Continue to work with federal agencies on EQIP, CRP, CREP, and Wetland Reserve.	Ongoing	Funding for technical assistance staffing at state and local levels.
	Continue to implement the Scioto Watershed CREP through 2011 (addresses nitrogen, phosphorus, and sediment).	Ongoing	Same as that listed for 2009. (i.e., at least $7 million shortfall for needed additional implementation).
	Provide technical support for two or more Water Quality Trading projects.	Ongoing	
Tennessee	Continue to implement watershed restoration projects through the CWA §319 Nonpoint Source Program and the state-funded Agricultural Resources Conservation Fund to lessen water pollution transport to streams in Tennessee and ultimately to the Gulf of Mexico.	Ongoing	Continuation of funding to accomplish watershed projects.
Wisconsin	Continue to work with NRCS and USGS on EQIP, CRP, CREP, and Wetland Reserve.	Ongoing	

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011
US Environmental Protection Agency (USEPA)	Identify barriers to aligning existing programs, projects, and initiatives with needs of hypoxia. Develop strategies when appropriate or possible to reduce or eliminate barriers.	Continue National Academy of Sciences (NAS) project to assess implications of CWA §303(d) programs on nitrogen- and phosphorus-impaired waters.	
	Participate and provide leadership to the GOMA Water Quality and Nutrient Reduction teams. EPA Region 5 will evaluate five major municipal collection systems for sanitary system overflows to address wet-weather sources of urban nutrient discharge. EPA Region 6 will continue to work with states within its jurisdiction on nutrient criteria development, but with Louisiana and Arkansas in particular, given their importance to the Gulf hypoxia issue.	Ongoing. Arkansas has proposed a chlorophyll-a criterion for Beaver Reservoir. The state is also carrying out studies of least-impacted reference lakes for nutrient criteria development. Louisiana is expected to propose draft methodology for developing nutrient criteria in flowing waters in late 2009. Ongoing: Gulf of Mexico Program professional staff are federal co-leads on Water Quality and Nutrients teams.	Additional resources to aid in criteria development efforts with states.
USEPA (cont)	GOMA Governors' Action Plan II 2009-2014 development and roll-out completed. GMPO has federal co-leads for Gulf of Mexico Alliance Water Quality and Nutrient Reduction teams.	Ongoing	
National Oceanic and Atmospheric Administration NOAA	Identify barriers to aligning existing programs, projects, and initiatives with needs of hypoxia. Develop strategies when appropriate or possible to reduce or eliminate barriers.	Ongoing	
US Army Corps of Engineers (USACE)	Identified barriers to aligning existing programs, projects, and initiatives with needs of hypoxia. Develop strategies when appropriate or possible to reduce or eliminate barriers. Draft guidance; educate Mississippi Valley Division (MVD) environmental team leaders.	Ongoing. Guidance still in review for signature. Team leaders briefed. Continue to push overt inclusion of hypoxia considerations in all reports in Mississippi Valley Division Corps.	

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011
	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. Open dialog with the Environmental Management Program (EMP) program.	On hold. EMP program, of which LTRMP is part, is being transitioned to the Navigation and Ecosystem Sustainability Program (NESP) program. Will need to wait for successful transition—no new starts for Environmental Management Program (EMP) now. Hopefully, can have a meeting and get into use needs this year.	
US Department of Agriculture (USDA)	Provide information and guidance to state USDA leaders for appropriate incorporation into state-level priorities for delivery of USDA programs.	Complete. National Bulletin 450.8.14 provides guidance for state NRCS leaders to begin developing strategies for using conservation programs to achieve additional reductions in nutrient loadings.	
	NRCS delivers conservation technical assistance through its voluntary Conservation Technical Assistance Program (CTA). CTA is available to any group or individual interested in conserving natural resources and sustaining agricultural production in this country and helps to maintain and improve water quality.	Ongoing	
USDA (cont)	EQIP was reauthorized in the Farm Security and Rural Investment Act of 2002 (Farm Bill) to provide a voluntary conservation program for farmers and ranchers that promotes agricultural production and environmental quality as compatible national goals. EQIP offers financial and technical assistance to help eligible participants install or implement structural and management practices on eligible agricultural land. During FY08 over $220 million was obligated in the 10 Mississippi River corridor states plus Indiana and Ohio. In both 2008 and 2009, Indiana NRCS obligated over 50 percent ($16.9 million) of each fiscal year's EQIP allocation toward Conservation Cropping Systems practices in response to continuing concerns about water quality, energy, fossil fuels, and agricultural input costs.	Ongoing	

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011
	CRP, administered by the Farm Service Agency (FSA), is a voluntary program for agricultural landowners. Through CRP, it is possible to receive annual rental payments and cost-share assistance to establish long-term, resource- conserving covers on eligible farmland. CREP is a voluntary land retirement program that helps agricultural producers protect environmentally sensitive land, decrease erosion, restore wildlife habitat, and safeguard ground and surface water.	Ongoing	
USDA (cont)	The Wetlands Reserve Program (WRP) is a voluntary program offering landowners the opportunity to protect, restore, and enhance wetlands on their property. NRCS provides technical and financial support to help landowners with their wetland restoration efforts. The NRCS goal is to achieve the greatest wetland functions and values, along with optimum wildlife habitat, on every acre enrolled in the program. This program offers landowners an opportunity to establish long-term conservation and wildlife practices and protection. Due to the success of the projects, Wetland Reserve Enhancement Program (WREP) projects implemented in the Lower Missouri River Basin of Nebraska were expanded in the upper reach of the Missouri River in 2009, providing many public benefits such as wildlife habitat, flood prevention, and water quality improvement.	Ongoing	

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011
	The Conservation Stewardship Program (CSP) encourages agricultural and forestry producers to maintain existing conservation activities and adopt additional ones on their operations. CSP is a new voluntary conservation program that provides financial and technical assistance to conserve and enhance soil, water, air, and related natural resources. CSP provides opportunities to both recognize excellent stewards and deliver valuable new conservation.	Ongoing	
	Other USDA programs, including the Public Law (P.L.) 83-566 Watershed Protection and Flood Prevention Program, the Resource Conservation and Development Program, and Conservation Innovation Grants under EQIP provide additional water quality benefits.	Ongoing	
USDA (cont)	Coordinated delivery of IA CREP with Iowa Department of Agriculture and Land Stewardship (IDALS). See Iowa.		
US Department of the Interior (USDOI) – US Geological Survey (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	
		Participate in the GOMA Nutrient Reduction and Water Quality Priority Issue Team.	
	Identify barriers to aligning existing programs, projects, and initiatives with needs of hypoxia. Develop strategies when appropriate or possible to reduce or eliminate barriers.	Ongoing	
USDOI–National Park Service (NPS)	Identify barriers to aligning existing programs, projects, and initiatives with needs of hypoxia. Develop strategies when appropriate or possible to reduce or eliminate barriers.	Ongoing	

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

Expected outcomes include 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 Subbasin, and 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 (National Program #211) on methods for reducing nutrients from agricultural systems.

This work continues 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 BMPs at various spatial scales on nitrogen and phosphorus loads to surface waters of the MARB result from the implementation of projects by MARB states.

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011
Illinois	Conduct Certified Livestock Manager training workshops throughout the state. Held 13 workshops, trained 584 producers; currently license 992.	Ongoing Plan 13 workshops in 2010.	
	Completed development of refined hydric soils maps of the Illinois River Basin, in cooperation with NRCS, for use in site selection by the Metropolitan Water Reclamation District of Greater Chicago for nutrient farming consideration.	Completed	
	Use fertilizer tonnage tax proceeds to support research on nutrient use efficiency. Funded $362,188 in projects, for reports. See http://frec.cropsci.illinois.edu/2009	Ongoing	

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011
	Support research on nutrient abatement trading using constructed wetlands as an alternative to conventional point source wastewater treatment.	Ongoing	
Illinois (cont)	Provide training for Soil and Water Conservation District employees on preparation and review of nutrient management plans. 42 SWCD employees certified in 2009.	Ongoing Provide training to all employees not currently certified.	Additional funding.
	Support the Council on Best Management Practices (C-BMP) Lake Bloomington watershed project, which provides producers with incentive payments for following nutrient BMPs. An estimated 65% of all eligible acres will be enrolled in the program in 2008. With additional sign-ups, over 70% of producers in the watershed have a nutrient management plan.	Project no longer funded. New project in the watershed is investigating interactions between bioenergy, carbon allowances, and water quality BMPs.	
Iowa	Continue development of the Iowa Drainage and Wetland Landscape Systems Initiative for reducing nutrients to water resources, and achieve federal wetland regulatory and policy concurrence.	Ongoing. Implement initial pilot projects to serve as demonstrations and study sites to confirm nutrient reductions and other benefits. Continue the Iowa Wetlands Initiative Workgroup, composed of seven federal and state agencies, to develop and oversee pilot demonstration monitoring, studies, and assessments.	Funding to expand monitoring and assessments of pilots, and for additional pilot projects.
	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	

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011
	Continue Iowa Learning Farms 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	
Iowa (cont)	Continue use of fees paid by farmers on the sale of agricultural chemicals to develop improved practices for reducing nutrients to water resources.	Ongoing	
Louisiana	Support LA State Dept. of Agriculture and Forestry, USDA, and LSU Agricultural Center programs for developing nutrient management and control plans for inclusion in BMPs. Continued working with Louisiana Agriculture partners at LA Dept. of Agriculture and Forestry, USDA, and LSU to develop and refine nutrient-specific BMPs. Results indicate that many conventional BMPs are also effective for nutrient removal in Louisiana.	Support federal, state, and university development and application of BMPs for nutrient reduction in runoff to state waterbodies.	Enhanced support and application of most effective Farm Bill programs for nutrient reduction in targeted waterbodies.
	Implementation of nutrient BMPs in Louisiana watershed pilot projects under Lower Mississippi River Subbasin Committee. After several years of BMP application and monitoring in Cabin-Teele watershed as a pilot project, funding and staff support was terminated due to funding cutbacks in USDA/ARS. A new pilot project for the Bayou Macon watershed has been started to replace the Cabin-Teele pilot project under the newly implemented Louisiana §319-funded Clean Waters watershed program. Progress is continuing in the other LMRSB Committee pilot project for Coulee Baton Microwatershed Project. BMPs that address sediment, bacteria, and nutrient runoff are being applied, and a new local sewage management program is being added.	Develop close working relationship with the new watershed coordinator in the targeted Ouachita River Basin to implement the Bayou Macon watershed project. The project will include nutrient BMP application and monitoring. Continue to support and monitor BMP application and nutrient reduction in Coulee Baton Microwatershed Project. Implement local sewage management component.	Seek specific funding source for Lower Mississippi River Subbasin Committee pilot projects.

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011
Minnesota	Support the Technical Service Provider training program for nutrient management. Finished report was issued 6/09 and is available at http://tsp.umn.edu	Core inter-agency coordination is planned to deliver additional courses and course development.	Funding to develop the plan for additional course.
	Support the development of controlled drainage.	Research into the effectiveness of controlled drainage in a cold climate is under way. Promotion of controlled drainage is occurring by the Minnesota Dept. of Agriculture and the University of Minnesota. NRCS is considering whether and how to include controlled drainage in EQIP docket.	
	Agricultural Watershed Restoration Project to look at hydrologic restoration compatible with agricultural land use - MN Board of Water and Soil Resources Phase 2 began - studies to evaluate options and benefits of hydrologic restoration practices.	Ongoing Reports from the phase 2 studies are scheduled to be submitted and reviewed in fall 2009, although some studies have been extended. Phase 3 - Implementation is to begin.	A portion of Phase 3 has been funded by Clean Water Legacy funds. Funding for the rest of Phase 3 is necessary.
	Nitrogen reduction through wetland restoration with tile outlets into restored wetlands - Minnesota Board of Water and Soil Resources and USDA NRCS. Received approximately $9M from 2009 legislative session. CREP2 construction of wetlands continued.	Ongoing. Plan to begin construction of Phase 1 of the Reinvest in Minnesota-Wetlands Reserve Program (RIM-WRP) partnership wetlands.	Additional funding to continue the RIM-WRP partnership to construct additional wetlands.
	"Highway 90 Drainage Project" monitoring nutrients in subsurface drainage - MN Dept of Agriculture.	Results to be presented at the Southern MN Nutrient/Pest Management and Crop Production Meeting 2/09.	
Mississippi	Co-led newly created Delta Water Quality Research Initiative. Initiative established and functioning.	Ongoing	Federal support for monitoring and assessment activities.
	Nutrient Reduction Watershed Project evaluation and assessment.	On hold until completion of implementation phase of projects.	

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011
Missouri	Through the Department of Natural Resources Soil and Water Conservation Program, continue to provide funding for the Agriculture 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. Through Missouri's Nonpoint Source Grant Program (funded pursuant to § 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. Includes projects that reduce sediment, nitrogen, and phosphorus on a watershed scale. Fifteen million dollars has been dedicated from the Soil and Water Programs reserve funds to sustain the current AgNPS SALT across the state. This funding will support these programs through the year 2015. Three targeted watersheds have been established by the Department. Coordination between §319 program staff and Soil and Water Conservation program is ongoing. Funding for these watersheds has been expanded by the Soil and Water Program: $177,249 will be provided in addition to the traditional district allocations for those watersheds.	Continue to fund and monitor the SALT projects across the state.	
Ohio	Conduct a pilot study to further develop and test controlled drainage structures and bioreactor treatment practices for tile outlets.	Ongoing	
	Share results of several pilot projects assessing the pollutant assimilative capabilities and other ecological services of self-forming/wide-channel designs in drained areas.	Ongoing	

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011
Ohio (cont)	Develop and publish a manual for the implementation of best practices for modified channels for drained/tiled agricultural fields.	Ongoing Finalize manual.	
Tennessee	Continue to support research by the University of Tennessee Institute of Agriculture in setting conservative fertilizer recommendations for agricultural crops, in order to educate producers regarding "most profitable yield" concept. Continue to support educational outreach programs such as Tennessee Yards and Neighborhoods and educational efforts of urban stormwater programs to focus on appropriate fertilizer use principles.	Ongoing	Continuation of funding to accomplish tasks.
Wisconsin	Develop phosphorus and nitrogen water-quality-based indices for agricultural lands (pilot projects in southwest corner of state).	Ongoing	
	Implement Discovery Watershed Approach (see Senate Farm Bill).	Did not pass. Was not included in Farm Bill.	
	Promote cellulosic alternatives for ethanol production.	Continue working with other agencies to promote use of grasses and wood wastes for direct energy production. i.e., state heating and cooling boilers.	

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011
US Environmental Protection Agency (USEPA)	EPA has awarded $3.7 million through its Targeted Watershed Grants Program that focus on water quality trading or other market-based water quality projects to reduce nitrogen, phosphorus, sediment, or other pollutant loadings that cause low oxygen levels in the Northern Gulf of Mexico. The awardees include the Conservation Technology and Information Center (CTIC), the Electric Power Research Institute, Iowa State University, the Miami Conservancy District, the Nature Conservancy, Ohio State University, The Wetlands Initiative, the University of Kentucky, West Virginia University, and the World Resources Institute. The projects are located in the three Mississippi River subbasins with the highest nutrient loads contributing to hypoxia in the Northern Gulf of Mexico: the Ohio River, the Upper Mississippi River, and the Lower Mississippi River.	Grant awards will be finalized in early FY 2010.	
US Department of Agriculture (USDA)	Provide Conservation Effects Assessment Project (CEAP) results relating to nutrients and the Upper Mississippi Subbasin. Assessment completed; next steps: Conduct technical review of Upper MS CEAP report. Release Upper MS CEAP report. Complete CEAP assessment of effects of conservation practices for other subbasins within MARB. Interpret CEAP results, identify potential program improvements, and develop strategies for using National Research Initiative (NRI)/CEAP for monitoring progress/trends.	Release Upper Mississippi River (UMR) CEAP report early in FY10. Complete CEAP assessment for other subbasins – will continue into FY11.	Commitment to use NRI to assess trends relating to nutrients.

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011
USDA (cont)	CEAP was initiated by NRCS, ARS, and the Cooperative State Research, Education, and Extension Service (CSREES) in response to a general call for better accountability of how society would benefit from the 2002 Farm Bill's substantial increase in conservation program funding. The original goals of CEAP were to estimate conservation benefits for reporting at the national and regional levels and to establish the scientific understanding of the effects and benefits of conservation practices at the watershed scale. As CEAP evolved, the scope was expanded to provide research and assessment on how to best use conservation practices in managing agricultural landscapes to protect and enhance environmental quality.		
	CEAP activities are organized into three interconnected efforts: *Bibliographies, literature reviews, and scientific workshops* to establish what is known about the environmental effects of conservation practices at the field and watershed scales. *National and regional assessments* to estimate the environmental effects and benefits of conservation practices on the landscape and to estimate technical review of UMR CEAP report complete conservation treatment needs. The four components are *Cropland*, *Wetlands*, *Grazing lands* (including rangeland, pastureland, and grazed forest land), and *Wildlife*.		

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011
USDA (cont)	*Watershed studies* to provide in-depth quantification of water quality and soil quality impacts of conservation practices at the local level and to provide insight on what practices are the most effective and where they are needed within a watershed to achieve environmental goals.		
	Provide results from ARS's Water Availability and Watershed Management National Program (National Program #211) on methods for reducing nutrients from agricultural systems.	Ongoing. Highlights of hypoxia-related accomplishments from past year can be found at http://www.ars.usda.gov/SP2UserFiles/Program/211/NP%20211FY09SelAccomp.pdf.	
	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 drainage system and is designed to provide nitrogen removal in addition to other wetland functions.	Ongoing	
USDA–Agricultural Research Service (ARS)	CEAP ARS Watershed Assessment Studies. These Agricultural Research Service watershed studies provide information needed to verify the accuracy of models used in the National Assessment. Fourteen watersheds were selected with a focus on water and soil quality and water conservation as primary resource concerns on rain-fed agricultural land.	Ongoing. The STEWARDS watershed data system permits a user to assess diverse data related to ARS research watersheds. The data system is now available at http://129.186.109.10/stewards.1. Other CEAP highlights from 2009 can be found at http://www.nrcs.usda.gov/Technical/nri/ceap/watershed.html http://www.ars.usda.gov/SP2UserFiles/Program/211/CEAP%20National%20AD-421%202009.pdf.	
US Department of the Interior (USDOI) – National Park Service (NPS)	Evaluate (through monitoring and modeling) the success of nutrient management practices applied in the St. Croix and Lake Pepin watersheds.	Ongoing	

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

These actions further the analysis of the economic costs of alternative management options for reducing nutrient loads from the agriculture sector, as well as identify strategies (including critical needs) for expanding research on the biological and economic impacts of hypoxia on Gulf natural resources.

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011
Iowa	Completed study of assessing the 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 final report and publish/disseminate the report and findings	
National Oceanic and Atmospheric Administration (NOAA)		Conduct workshop on the application of hypoxia impact studies to fisheries management activities, and foster collaboration between hypoxia researchers and fisheries scientists and managers.	

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011
NOAA (cont)	Continued funding and management of the Gulf of Mexico Ecosystems and Hypoxia Assessment (NGOMEX) research program.	Initiation of project to assess the economic impacts of the hypoxic zone on the brown shrimp fishery through the development of a shrimp bioeconomic model. Continued research on the reproductive impacts of hypoxia on Atlantic croaker. Initiate modeling effort to scale up the physiological findings to population-level effects through both population and croaker movement modeling. Initiate project to develop quantitative tools to probabilistically forecast the production of economically and ecologically important fishes, which include Gulf menhaden, bay anchovy, Atlantic bumper, and Spanish bumper in response to hypoxia. Food web interactions will also be explored and incorporated into the models through exploration of fish/zooplankton predator-prey interactions.	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.) Hypoxia appropriations increased to levels authorized under the Harmful Algal Bloom and Hypoxia Research and Control Act (HABHRCA).
U.S. Army Corps of Engineers (USACE)	USACE – Engineer Research and Development Center (ERDC): Build data collection/monitoring into project actions. By 8/08, evaluate some possible quantification efforts such as contributing to NGOMEX.	On hold. No funds identified to move forward on this action.	Funding – Need about $100K for ERDC to move forward.
US Department of Agriculture (USDA)	Analyzed the economic costs of alternative management options for reducing nutrient loads from the agriculture sector. Committee on Environment and Natural Resources (CENR) update.	Ongoing	

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

These actions will cumulatively help to determine information needs and strategies to address gaps, inconsistencies, data sharing, and comparability issues.

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011
Lower Mississippi River Subbasin Committee (LMRSBC)	Completion of report summarizing data sources for nutrient loading and removal in lower Mississippi River Basin.	Completed	
Iowa	Continue assessing nutrient load reductions from all Iowa-funded and -led conservation programs.	Ongoing	
	Assist USDA in assessing nutrient load reductions from all federally funded Farm Bill conservation programs conducted in Iowa.	Ongoing	
Louisiana	Support NOAA and other state, university, and federal partners in identifying and consolidating data and information collected on northern Gulf of Mexico hypoxia for improved access and assessment. Attended meeting organized by Northern Gulf Institute (NGI) and NOAA at Stennis Space Center in 2008 on hypoxia assessment and data management. Supported NGI, NOAA, and participating federal and state agencies and universities in seeking approaches to Gulf data management. LDEQ received EPA grant for project called "Ecological Assessment of the Mississippi River in Louisiana." Grant amount: $158,761. Contract period: 5/08–12/09. Project includes monitoring nutrient and other ecological conditions at 16 stations on Louisiana's lower Mississippi River and provides for data assessment, management, and storage. Project is a collaborative effort under the EPA National Rivers and Streams Assessment with Lower Mississippi River Conservation Committee (LMRCC) and Mississippi River federal and state agencies, including MDEQ.	Attend and participate in NOAA 2/10 workshop on hypoxia monitoring, data exchange and access. Workshop to develop Hypoxia Monitoring Implementation Plan and schedule 2010 Hypoxia Zone monitoring. Finish compiling and evaluating data from Mississippi River project. Compare nutrient data in Louisiana with nutrient data from upriver states for a first-ever Lower Mississippi River cooperative nutrient assessment.	Funding for second round of Lower Mississippi River ecological monitoring. Lower River has received considerably less funding than upper river and is the critical link to the Gulf of Mexico and Gulf Hypoxia.

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011
Minnesota	Continue to develop electronic submittal of Discharge Monitoring Reports (DMRs) for National Pollutant Discharge Elimination System (NPDES)-permitted facilities. Electronic signature issue was resolved.	Ongoing. Starting in September 2009, two organizations will be able to submit DMRs electronically through the MPCA Online Services Portal. This will be for 11 facilities with the largest volume of data submitted.	Increasing the functionality of the Online Services Portal.
	Continue implementation of Hydstra for storage, management and sharing of data from stream gauges and sampling. Electronic audit of 2008 data was run in 3/09. Staff is working though issues that arose.	Continue to enhance the cooperative stream gauge Web site.	Ability to make the data more electronically accessible to other programs.
	eLINK reporting of phosphorus and sediment reductions associated with BMPs.		The reporting system needs an improved nitrogen reduction component.
Mississippi	Continue participation with Regional Technical Advisory Group (RTAG) and EPA Region 4.	Ongoing	
	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 recently collected by MDEQ will be analyzed and assessed.	Completed monitoring; assessment of data ongoing.	
Missouri	Continue participation with RTAG and EPA Region 7. All nutrient data available to the state are made available to this workgroup.	Ongoing	
Ohio	Share information and developments related to our soil and water information management systems (e.g., aggregating load reductions) and Ohio's new geographic information system (GIS) database project.	Ongoing	

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011
Tennessee	Continue to input watershed project data into the EPA Grants Reporting and Tracking System.	Ongoing	Continuation of funding to accomplish tasks.
Wisconsin	Developed 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. Upper Mississippi River Tributary analysis to be set up so data are collected consistently for parameters, analysis, and for multiple states with consistent frequency (St. Croix, Chippewa, Black, Wisconsin Rivers).	Developed, but funding not available to implement.	
US Environmental Protection Agency (USEPA)	EPA/USGS: Continue to enhance the coordinated delivery of information from National Water Information System (NWIS)/STORET.	Ongoing	
National Oceanic and Atmospheric Administration (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. Continue to make available data from monitoring cruises and other projects through NOAA National Coastal Data Development Center.	Ongoing	Funding for Data Management core system requirement (tier 1) of Gulf of Mexico Hypoxia Monitoring Implementation Plan.
		Hypoxic zone monitoring implementation plan meeting to advance effort to identify potential funding sources, additional partners, and collaborators.	Full implementation of monitoring plan.

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011
U.S. Army Corps of Engineers (USACE)	Compiled available data on nutrient loading and removal in the Lower Mississippi River Subbasin; however, project on hold with no funds to move forward.	On hold due to lack of funding.	ERDC could use about $200K for the effort, leveraged against work for Goal 5.
	Distribute Task Force material throughout the Corps and to partners. Distributed 2008 Action Plan material.	Will continue to distribute as needed. All six Mississippi Valley Division (MVD) districts and regional partners have a copy of the 2008 Action Plan or have been sent a link to the plan. National leaders received copies or links as well.	
US Department of the Interior (USDOI) – US Geological Survey (USGS)	EPA/USGS: Continue to enhance the coordinated delivery of information from NWIS/STORET.	Ongoing. Initial web services to integrate access to USGS and EPA data bases are available at http://qwwebservices.usgs.gov Work with USDA-ARS on strengthening our collaboration with the ARS STEWARDS CEAP data sets through the qw web services.	

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

Coordinating Committee Action Lead: EPA

Summary of Expected Results

These actions result in the development of a report tracking federal and state nutrient reduction activities, results, and progress on the implementation of the 2008 Gulf Hypoxia Action Plan.

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011
Illinois	Implement system to track estimated reductions in nutrient losses for all cost-shared conservation practices.	Ongoing for all Illinois Department of Agriculture and section 319 projects.	
Iowa	Continue assessing nutrient load reductions from all Iowa funded and led conservation programs.	Ongoing	

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011
	Assist USDA in assessing nutrient load reductions from all federally-funded Farm Bill conservation programs conducted in Iowa.	Ongoing	
Louisiana	Work closely with state, university, USDA, EPA, and other agencies and groups to track Louisiana nutrient reduction activity. Planning Meeting - April 10, 2008. Attended and Participated in all 2008 USDA State Technical Committee meetings to discuss BMP application and nutrient reduction. NRCS has been cooperating with LDEQ to develop approaches to quantifying nutrient reduction activity in targeted watersheds for state reporting. For point sources, LDEQ has supported a 2009 proposal by the University of New Orleans to revise a 2000 report on nutrient discharges to the Mississippi River. The proposal, if funded, will allow assessment of nutrient reduction activity in the Mississippi River. It was submitted in response to an RFP from EPA's Gulf of Mexico Program Office.	Continue work with Louisiana USDA offices to quantify nutrient reductions on Louisiana agricultural lands with emphasis on targeted watersheds with significant nutrient drainage to the Gulf of Mexico. If funded, track progress on Mississippi River nutrient discharge study and work with river industries and municipalities to assess the data and check progress on river nutrient reductions.	National support for Farm Bill programs showing significant nutrient reduction potential. Target support for EQIP, CRP, WRP, and CREP.
Louisiana (cont)	Participate in National Flowing Waters Assessment, including water quality, sediment, and biological monitoring for the lower Mississippi River. Completed field collections in 11/08 for EPA-funded National Rivers and Streams Assessment (NRSA) project, "Ecological Assessment of the Mississippi River in Louisiana." All data were QA/QC checked in the field and sent to appropriate EPA laboratories for analysis. Review of laboratory results is ongoing, and final report preparation has begun.	Upon completion of the final report, conduct a thorough review of project results with Louisiana partner agencies LA Department of Wildlife and Fisheries and USGS for indications of need for further research and for management opportunities. Also collaborate with upriver states of Mississippi, Arkansas, Tennessee, Kentucky, and Missouri to compile and analyze Lower Mississippi River water quality data with emphasis on nutrients.	The 2008 EPA NRSA of the Lower Mississippi River was the first-ever holistic study of water and ecological quality. No study of this magnitude had been conducted despite the significant economic and ecological importance of the lower river. More financial support for holistic water quality and ecological work comparable to the 2008 project is justified and needed to adequately document the nutrient relationships between the Lower Mississippi River and Gulf of Mexico.

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011
Mississippi	Work closely with state, university, USDA, EPA, and other agencies and groups to track Mississippi nutrient reduction activities.	Ongoing	
	Report tracking of CWA §319 NPS-funded nutrient reduction watershed projects through the Grant Reporting and Tracking System (GRTS).	Ongoing	
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 BMPs that are offered through 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. MoSWIMS is now field applied to all 114 district offices, and efforts to refine the system and expand capabilities are under way.	An effort to include a mapping and project-planning function is under way. The goal is to be able to spatially place the practices supported by the $47 million Soil and Water Program with respect to location within state watersheds. The function will be used to assist in modeling benefits of the stewardship practices occurring within those watersheds.	
Missouri (cont)	Continue developing the Conservation Management Tool (CMT), 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 database. The goal is to interface the CMT tool with MoSWIMS (see above) software to provide both project tracking and special data on practice implementation.	Continued work with IT staff and University of Missouri partners.	
Tennessee	Coordinate with conservation agencies on methods to track nutrient reduction progress.	Ongoing	

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011
Wisconsin	Issued 28 grants for nutrient management and reduction projects in 2009, 45 in 2008, and 17 in 2007.	Ongoing Annual phosphorus load tracking for point sources to begin in 2010.	
US Environmental Protection Agency (USEPA)	Developed framework for Task Force annual report on federal and state nutrient reduction activities and results. Created Coordinating Committee Workgroup for report development. Completed the development of the annual report and presented it at the 18th annual Task Force meeting. Created quantitative indicator working group and success story working group with members of federal and state agencies.	Continue to improve upon framework for annual report and engage working groups.	
National Oceanic and Atmospheric Administration (NOAA)	Annual prediction on size of hypoxic zone.	Ongoing	Continued financial support for NGOMEX program, which is funding projects to improve predictive capabilities, with a goal of increased accuracy and 6-month forecasts.
NOAA (cont)	Annual monitoring survey of hypoxic zone to assess progress toward Action Plan goals.	Ongoing	Secured funding for sustaining and expanding monitoring of the hypoxic zone through the Gulf of Mexico Hypoxia Monitoring Implementation Plan.
US Department of Agriculture (USDA)	Collected FY08 data on conservation practices and summarize basin totals. Data available at: http://wmc.ar.nrcs.usda.gov/partnerships/MSRB/Results.html.		
	Estimate and report CRP nutrient reductions for MRB. Produced 2008 CRP annual report.		

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011
US Department of the Interior (USDOI) – National Park Service (NPS)	Annually provide nutrient load estimates from a gauge site at the mouth of the St. Croix River, installed to track progress toward nutrient reduction goals.	Ongoing	
USDOI–US Geological Survey (USGS)	Provided spring (April/May) nutrient loads from MARB and annual nutrient loads from MARB and its subbasins, reported in 7/08 and 11/08, respectively.	Ongoing. Nutrient loads posted at http://toxics.usgs.gov/hypoxia/mississippi/oct_jun/index.html. Estimate spring nutrient loads – anticipated release in 6/10. Estimate annual nutrient loads for Water Year 2009 (Oct–Sept) from MARB and its subbasins – anticipated release in 5/10.	

8. Continue to reduce existing scientific uncertainties identified in the Science Advisory Board and the Monitoring, Modeling, and Research (MMR) Workgroup 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 are 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.

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011
Illinois	Report on long-term nitrate monitoring in the Upper Sangamon (Lake Decatur) watershed.	Project no longer funded.	
	Report on impacts of market-based mechanisms on nutrient loading from agricultural watersheds.	Ongoing; ends 12/09.	

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011
	Sediment and nutrient monitoring at selected watersheds within the Illinois River watershed for evaluation of the effectiveness of the Illinois River CREP. For 2008 annual report see: http://dnr.state.il.us/orc/conservation_programs/crep/12-30%20final%20CREP%20Report%202008.pdf	Ongoing	Funding to expand monitoring and evaluation.
	Hydrologic and hydraulic model development for the Illinois River Basin.	Completed	
Iowa	Continue water quality monitoring to document performance of nitrogen-removal wetlands developed under the Iowa CREP.	Ongoing	
	Continue water quality monitoring of the Wetlands, Nutrients and Water Management research and Des Moines Lobe Targeted Watershed Grant projects	Ongoing	
Louisiana	Evaluate nutrient concentrations and water quality in Mississippi River from three long-term monthly monitoring stations and other documented data sources.	Ongoing	
Minnesota	Continue the Watershed Pollutant Load Monitoring program. Annual report of pollutant loads from each watershed targeted for 3/09 (which would be the first report).	Ongoing	

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011
Mississippi	Development of pilot nutrient criteria for a Mississippi estuary.	Ongoing	Continued funding support from Gulf of Mexico Program Office.
	Research to characterize macrobenthic subsystem function that may respond to 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.	Ongoing. Completion date: 9/30/10.	
Mississippi (cont)	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.	Ongoing	$324,700 from NOAA (through Northern Gulf Institute).
	Pilot studies to evaluate the use of Mississippi wetlands for treated wastewater assimilation.	Ongoing	

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011
Mississippi (cont)	USACE (through the Delta Water Quality Research Initiative) – Establish long-term monitoring stations in the Mississippi Delta. The USGS will install and operate 12 real-time hydrologic and water-quality monitoring stations in the Yazoo River Basin along the Big Sunflower and Yazoo rivers. The purpose of the project is to collect sufficient hydrologic, suspended-sediment, nutrient, and water quality data to describe current hydrologic and water-quality conditions of streams in the basin, describe spatial and temporal variations in the hydrologic characteristics of the streams monitored, and compute annual loads of sediment and nutrients. Eight stations will be established as permanent stations at fixed locations on larger streams for which historical data exist. Four additional stations will be established to collect baseline data on smaller streams. Where possible, remediation efforts or BMPs will be implemented. At these four stations, data will typically be collected for 3 years before the stations are relocated to other streams of interest. Data produced through this initiative will be used to improved water quality models for nutrient transport, water quality criteria development, waste load allocation development, and TMDL development. This action was developed through consultation with the Delta Water Quality Research Initiative. Funding is provided by the USACE, MDEQ, and USGS.	Ongoing	Continued funding support through EPA programs, USGS, and USACE.

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011
Mississippi (cont)	USACE (through the Delta Water Quality Research Initiative) – Denitrification in the surface waters of the Big Sunflower Basin, Mississippi. Current nutrient load models rely on denitrification coefficients developed in the Midwest. The purpose of this work is to determine Yazoo Basin-specific coefficients to better describe and model processes occurring within the Yazoo Basin. The USGS will study denitrification in the Big Sunflower River and its major tributaries. The objective of this study will be to determine whether there is significant denitrification occurring in the streams of the Big Sunflower Basin and to determine a denitrification rate and the total mass of nitrogen lost from the rivers due to denitrification. This action was developed through consultation with the Delta Water Quality Research Initiative.	Ongoing	
	USACE (through the Delta Water Quality Research Initiative) – Evaluating the Role of Ground- and Surface-Water Interaction on the Transport of Nutrients in the Big Sunflower Basin, Mississippi. The USGS will study the role of ground water and surface water interaction on the transport of nutrients. The objective of this work is to answer two questions, the second related to the first: (1) What is the total flux (movement of water) between streams in the Big Sunflower Basin and the alluvial aquifer? (2) How does this affect water quality in the basin? This action was developed through consultation with the Delta Water Quality Research Initiative.	Ongoing	

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011
Mississippi (cont)	USACE through the Delta Water Quality Research Initiative – Characterize the occurrence of phosphorus in the Mississippi River valley alluvial aquifer in the Mississippi Delta. Recently the USGS and other agencies have reported that certain aquifers may produce groundwater with higher phosphorus concentrations than previously thought. In many areas summer stream flow is augmented by irrigation runoff. It is possible that in some areas of the Mississippi Delta, in-stream phosphorus concentrations may be influenced more by groundwater quality than by conventional agricultural activities, such that these ground-water-supplemented streams exceed the proposed total phosphorus criterion. The USGS will evaluate the spatial distribution of dissolved phosphorus concentrations in ground water within the Mississippi Delta. These data can be used to help determine irrigation runoff/ dissolved phosphorus impact on delta streams with regard to TMDLs and nutrient criteria. This action was developed through consultation with the Delta Water Quality Research Initiative.	Ongoing	
		USACE (through the Delta Water Quality Research Initiative) – Implement pre- and post-project nutrient monitoring of edge-of-field sediment reduction control structures installed along Steele Bayou below the Yazoo National Wildlife Refuge. In FY10, USACE will add two additional sites to include pre-project monitoring of nutrient runoff and will add nutrient monitoring to the existing four sediment-monitoring sites. This monitoring effort is intended to document incremental sediment and nutrient reduction from construction of sediment control structures.	Continued funding through USACE programs.

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011
Missouri	As part of a 2-year expansion, 31 new gauges were added to rivers and streams across the state. Added water quality monitoring (nutrients, etc.) to four gauges in the Elk River watershed. Continue to provide funding to the University of Missouri for ongoing monitoring of nutrients for 100 lakes in Missouri.	Ongoing	
Wisconsin	Failed to initiate long-term load monitoring stations with USGS due to lack of funding.	Project on hold due to lack of funding.	
	Collect baseline nitrogen monitoring data from point sources.	Nitrogen was added to the point source permits application monitoring requirement, and monitoring is ongoing.	
US Environmental Protection Agency (USEPA)	Improve and use hydrologic models, including SPARROW, to identify watersheds within the MARB with the greatest loadings of nitrogen and phosphorus. Ongoing. EPA HQ continues to work with USGS to refine SPARROW and to apply the revised model to various applications in the MRB. EPA AWPD Watershed Branch convened a meeting in July in Washington, DC, with USGS and Region 5 staff.	EPA HQ will continue to work with USGS to refine SPARROW and to apply the revised model to various applications in the MRB. Gulf of Mexico Program funded and began cooperative agreement work with MDEQ on St. Louis Bay pilot nutrient criteria project, "Development of Pilot Nutrient Criteria for a Mississippi Estuary."	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. Further analysis of nutrient pollution contributions from point sources and non-agricultural sectors, including a full analysis of costs. Identify and apply regional models to characterize sources, loads, ecosystem responses, and socioeconomic impacts of nutrients.

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011
US Department of the Interior (USDOI) – National Park Service (NPS)	Complete a two-park project (St. Croix and Mississippi Rivers) with USGS to assess the role of riverine backwaters in cycling nutrients.	Ongoing	Fill gap in monitoring network. Obtain funding.
	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.	Ongoing	
	Continue long-term monitoring of nutrients through the NPS Inventory and Monitoring Network.	Ongoing	
	Continue to emphasize the importance of key USGS stream gauging stations, offering NPS support for their continued operation when necessary.	Ongoing	
		Begin a study on Identifying hypoxia effects on natural resources at Jean Lafitte Historical Park and Reserve, and identify strategies to reduce excessive nutrients.	

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011
USDOI–US Geological Survey (USGS)	Continued stream flow and water quality measurements to compute nutrient loadings and detect trends in the MARB; added sampling at Mississippi River at Vicksburg.	Ongoing	Funding to restore monitoring network to add sites previously dropped from USGS monitoring networks in MARB National Stream Quality Accounting Network (NASQAN) and National Water-Quality Assessment Program (NAWQA).
	Continue collecting data and information on nutrient levels in the Upper Mississippi River Basin (Long-Term Resource Monitoring Program).	USGS/USACE: Continue research and monitoring on riverine ecosystems, processes, and biota, including long-term monitoring of water quality and other ecological variables in the Upper Mississippi River and tributaries in collaboration with USFWS, Minnesota, Wisconsin, Iowa, Missouri, and Illinois (http://www.umesc.usgs.gov). Planning to update bathymetry of Upper Mississippi River in 2010.	
	Continue development of new regional scale Spatially Referenced Regressions on Watershed Attributes (SPARROW) models.	Ongoing Anticipated release of regional models is fall 2010.	
	Operation of continuously measured nitrate at two sites on the Mississippi and Atchafalaya rivers until 1/09, when funding was discontinued.	If funding becomes available, operate real-time nitrate analyzers at Mississippi River-Baton Rouge and Atchafalaya River-Morgan City.	Funding – Need about $35,000 per site.
		SPARROW model application and development: Apply SPARROW model to evaluate the water quality effects of increased corn and ethanol production; Continue development of time-based SPARROW model; continue development of national sediment SPARROW model.	

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

This work aims to develop long-term research and monitoring strategies, and identify barriers to implementation (including lack of funding).

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011
Louisiana	Work with NOAA, EPA, Louisiana Universities Marine Consortium (LUMCON), LSU, Texas A&M, and other universities on continuing to document the severity and causes of Gulf hypoxia and to meet the Action Plan Goals. Attended hypoxia meetings sponsored by NOAA and Northern Gulf Institute (NGI) with EPA, USGS, and other federal agencies and Mississippi, Louisiana, and Texas universities doing research in the Gulf of Mexico.	Plans are being made for attending 2/10 workshop on hypoxia fishery impacts and monitoring innovations. One of workshop goals is to revise and update the Gulf Hypoxia Monitoring Implementation Plan.	Task Force support for continued funding of shelf-wide hypoxia monitoring to assess Action Plan Goals.
Mississippi	Characterization of Nutrient Sources, Fate, and Transport across the Gulf Region. Start Date: 10/09; Completion Date: 9/11.	Ongoing	Continued funding from NOAA.
	Development of an Index of Biotic Integrity and a Waterbody Classification System for the Gulf of Mexico. Start Date: 10/08; Completion Date: 9/11.	Ongoing	Continued funding from NOAA.
	Monitoring and Assessment of Coastal and Marine Ecosystems in the Northern Gulf (NASA). Start Date: 2/08; Completion Date: 1/09.	Ongoing	Continued funding and technical support from NASA.

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011
US Environmental Protection Agency (USEPA)	Gulf Hypoxia Modeling and Research Support. In FY 2009, reported on new suite of multiple regression models for hindcasting and forecasting hypoxia in the Gulf of Mexico. Also reported on development and application of mass balance models for the northern Gulf of Mexico hypoxic zone.	Reports/publications on physical and biogeochemical processes and models linking near coastal water to continental shelf hypoxia in the northern Gulf of Mexico. Shelf-wide assessment of sediment biogeochemical processes, carbon deposition, and metabolism to improve modeling of sediment-water column exchange and its significance to hypoxia.	
	Interagency Agreement between EPA/ Office of Research and Development (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. Hydrodynamic model (2-km spatial resolution) calibration ongoing.	Develop new algorithms to improve the eutrophication model, and linkages of the hydrodynamic and eutrophication models Develop new remote sensing algorithms to estimate biogeochemical parameters to improve coupled hydrodynamic-eutrophication modeling of the hypoxic zone.	
	Region 6 Regional Applied Research Effort (RARE) project - Development of a Relational Database to Aid in Modeling and Managing Water Quality in the Gulf of Mexico Hypoxic Zone. Datasets from EPA/Gulf Ecology Division (GED), LUMCON, Nutrient Enhanced Coastal Ocean Productivity (NECOP), Louisiana-Texas Shelf Physical Oceanography Program (LATEX), Southeast Area Monitoring and Assessment Program (SEAMAP) formatted and QA/QC'd.	Final report to Region 6 due 12/09. Region 6 RARE project - Development of an Approach to Establish Numeric Nutrient Criteria for the Northern Gulf of Mexico Hypoxic Zone (proposed at $200K; partially funded at $80K).	Additional funding to complete tasks in work plan.

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011
USEPA (cont)	Gulf Hypoxia Modeling and Research Support. A suite of qualitative and quantitative indicators were included in the development of the 2009 annual report as an update to the Action Plan. Gulf of Mexico Program reports on a new suite of multiple regression models for hindcasting and forecasting hypoxia in the Gulf of Mexico, as well as development and application of mass balance models for the northern Gulf of Mexico hypoxic zone.	Continued funding for indicator development, data source identification, and continued monitoring support. Additional indicators will be explored and reported on for the FY10 annual report.	Identify methods and data needed to estimate ecosystem and socioeconomic impacts of excess nutrients. Identify and develop environmental and biological indicators or nutrient impacts.
National Oceanic and Atmospheric Administration (NOAA)	Continued funding and management of NGOMEX research program.	Hypoxia modeling workshop to foster collaboration and explore mechanisms to integrate modeling approaches and types. Hypoxic zone monitoring implementation plan meeting to advance effort to identify potential funding sources, additional partners, and collaborators. Continued development of predictive models to advance understanding of the relationship between the hypoxic zone and nutrients: Refinement of statistical and 2-D models to advance efforts in assessing causal relationships between nutrient loading and hypoxic zone size, and to develop a forecast with a 6-month window. Refinement of 3-D hydrodynamic model to advance quantitative predictions of the relationship between hypoxia development and causative factors.	Funding for core system requirements (tier 1) of Gulf of Mexico Hypoxia Monitoring Implementation Plan: Expansion of temporal and spatial coverage of monitoring surveys: $1.7M Autonomous underwater vehicle pilot study: $0.3M Data management: $0.7M Outreach: $0.4M TOTAL TIER 1: $3.1M 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	FY 2010 Planned Actions	Critical Needs for 2011
NOAA (cont.)			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). Hypoxia appropriations increased to levels authorized under HABHRCA.
		Expansion of hypoxic zone monitoring surveys from one to three shelf-wide surveys, through NGOMEX program. Extension of the hypoxic zone shelf-wide surveys to the Mississippi Bight (through NGI grant to USM). Continue effort to determine biological and chemical processes that maintain and extend bottom-water hypoxia in the summer after initial hypoxia development.	

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

These items revise the communications strategy to reflect post-Action Plan release critical needs, as well as use FY09 progress on expanding public awareness on Gulf hypoxia as a platform to increase partnership building and effective stakeholder outreach efforts.

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011
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.	Completed	
Iowa	Farmer-to-farmer exchange with lower Mississippi River state(s). Iowa group hosted at lower state(s) 3/09. Lower state group hosted in Iowa 6/09.	Ongoing. Lower Mississippi River states farmers to Iowa (6/10); Iowa farmers to Lower Mississippi River states (7/10).	
	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."	Ongoing	
	Conducted the conference "Hypoxia in the Gulf of Mexico: Implications and Strategies for Iowa," sponsored by the Leopold Center for Sustainable Agriculture, Iowa State University, in 10/09.	Completed	
	Sponsor a session on Gulf hypoxia and the Integrated Drainage and Wetland Landscape Systems initiative at the Iowa-Minnesota Drainage Research Forum in 12/09.	Completed	
	Continue to sponsor and support media releases and articles on Gulf hypoxia and Iowa initiatives to address needed nutrient reductions.	Ongoing	
Iowa (cont)	Conduct a series of meetings to inform policymakers, agencies, environmental organizations, and farm organizations on Gulf hypoxia and the Iowa Drainage and Wetland Landscape Systems Initiative for nutrient reductions.	Ongoing. Continue the Iowa Wetlands Initiative Workgroup, composed of seven federal and state agencies, to develop and oversee pilot demonstration monitoring, studies, and assessments.	

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011
Louisiana	Actively participate in the Lower Mississippi River Subbasin Committee to foster local hypoxia awareness, demonstrate effective nutrient BMPs, and meet shared Task Force goals. Attended Lower Mississippi River Subbasin Committee (LMRSBC) meetings held in association with Coordinating Committee and Task Force meetings. Gave LMRSBC status reports on Coordinating Committee conference calls.	Continue LMRSBC work on developing state nutrient-reduction strategies.	Obtain funding for LMRSBC member states to develop nutrient-reduction strategies. Continued funding for support of LMRSBC Coordinator.
	Participate in Louisiana Hypoxia Working Group to coordinate information and actions on Gulf hypoxia for interested lower basin partners and citizens. Held Louisiana Hypoxia Working Group meetings at LSU and other local agency offices. Presented and discussed information for working group members on status of the Mississippi River/Gulf of Mexico Watershed Nutrient Task Force and Coordinating Committee.	Continue to hold Louisiana Hypoxia Working Group meetings for information dissemination and exchange.	
Louisiana (cont.)		Recognize Mississippi River Basin states, NGOs, citizens, and others for activities that educate the public about Gulf hypoxia and provide solutions to address it through Gulf of Mexico Program Gulf Guardian Awards Program. Gulf Guardian Award presented to Iowa Department of Agriculture and Land Stewardship and Iowa Farm Bureau in 2008. Plans under way to recognize the Science Museum of Minnesota and Minnesota Pollution Control Agency in 2009. Special Appreciation Certificates also given to Gulf Guardian Award winners by Louisiana Governor.	

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011
Minnesota	Collaborated with Conservation Technology Information Center (CTIC) to develop and support a Coalition for Nutrient Management in Southern Minnesota. Improved MPCA Web site for linkages to Hypoxia Minnesota Pollution Control Agency (Web site includes links to a variety of hypoxia-related documents: http://www.pca.state.mn.us/water. Constructed an improved portal. Coalition steering committee has met several times, and the larger coalition has met once so far. Reports are available under CTIC's Upstream Heroes at http://www.upstreamheroes.org/southernminnesota.php. Focus is on nutrient efficiency. Effort to recognize benchmark activities and practitioners is being developed by the Coalition.		
Mississippi	Development of targeted education and outreach materials and activities. Start Date: 10/08.	Ongoing	Continued support from MDEQ §319 NPS Base Program and GOMA Education PIT.
	Connecting the Dots: From Nutrient TMDLs to Nutrient Reduction Strategies to Gulf Hypoxia to Nutrient Criteria. Start Date: 10/08. Numerous presentations made at national, regional, state, and local forums.	Updated presentation and continued outreach.	
	Actively participate in the Lower Mississippi River Subbasin Committee's coordination efforts.	Ongoing	

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011
Missouri	Provide information and education on nutrient issues affecting water quality in the state, including the relationship of nutrient loading to hypoxia in the Gulf of Mexico. Host information on the Department of Natural Resources Web site on nutrient issues, BMPs, and other tools to reduce the impact of nutrient loading on the waters of the state and Mississippi River Basin. Conservation Technology Information Center (CTIC) has partnered with state and federal programs to offer nutrient reduction workshops and soil testing in the southeast part of the state (boot heel). Field workshops and tours have been conducted, and the program intends to expand its outreach in the area.	A workgroup has been formed to expand the information hosted on the state's Soil and Water Conservation Programs Web site, as well as the 114 Web sites associated with the districts.	
Ohio	Continued coordinated work with the CTIC.	Ongoing	
	Consultations with neighboring states on hypoxia issues, including joint effort with Indiana involving Wabash watershed.	Ongoing	
Tennessee	Continue to participate in Gulf of Mexico Hypoxia Coordinating Committee and Task Force activities.	Ongoing	
Wisconsin	Continued participation in Gulf of Mexico Hypoxia Coordinating Committee and Task Force activities. Partnering with NRCS to target EQIP, the Nature Conservancy in southwestern Wisconsin for the Pleasant Valley watershed, and University of Wisconsin (UW)–Platteville on Pioneer Farm research.	Ongoing	

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011
US Environmental Protection Agency (USEPA)	Revise Task Force Communications Strategic Plan to reflect post-Action Plan release goals, priorities, and outreach efforts.	Ongoing	
	Develop and release revised Web site 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. Major formatting of the Web site has been completed; it now features extensive background on hypoxia and lists upcoming events, tools, links, and other resources.	Ongoing. Extensive "Web 2.0" additions to the Web site are planned, making it more user-friendly and audience-targeted, including enhanced social networking and communication tools.	
		EPA continues to develop the Nutrient Outreach Web site, designed to raise awareness of the problem of nutrient pollution, its magnitude, and alternatives to minimize it. The Web site is a "one-stop shop" designed to educate the general public on the ecologic, human health, and economic impacts of nutrient pollution. Furthermore, the Web site is intended to engage people in ameliorating this problem by presenting them with day-to-day activities they can implement in their households and out in their communities.	
USEPA (cont)	Gulf of Mexico Program published newspaper articles on nutrients and rain gardens, a factsheet on hypoxia for homeowners by 9/30/09, and ongoing development of radio spots on nutrients and hypoxia.	Ongoing	

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011
	The Gulf of Mexico Program funded and began work on a cooperative agreement with the Mobile Bay National Estuary Program (NEP) titled "Interacting with the Watershed: A Nutrient Adventure." An interactive 15-minute video about the impacts of excess nutrients on Gulf coastal ecosystems and waters is in production for use at Coastal Ecosystem Learning Center kiosks.	Ongoing	
	Develop and distribute outreach materials for targeted audiences. Completed: Gulf of Mexico Program published newspaper articles in the *Sea Coast Echo* (Bay Saint Louis, MS) on fertilizer use/hypoxia and rain gardens. Reached 22,000 people two times through these two articles. Completed: By 9/30/090, Gulf of Mexico Program/Mississippi State University hypoxia fact sheet for homeowners.	Ongoing: Gulf of Mexico/Office of Wetlands, Oceans, and Watersheds (OWOW) nutrient/ hypoxia radio spots for rural and coastal communities. Gulf of Mexico Program will publish hypoxia fact sheet for agriculture in partnership with Mississippi State University.	Reach underserved and underrepresented populations; Reach Upper Mississippi Basin populations.
National Oceanic and Atmospheric Administration (NOAA)	Outreach in collaboration with Gulf of Mexico Alliance and the Gulf of Mexico Coastal Ocean Observing System (GCOOS). Created Gulf Hypoxia Monitoring Stakeholder Web site.	Ongoing Creation of new position to coordinate outreach and communication between land and sea grants in the Gulf of Mexico, Great Lakes, and Midwest. Gulf of Mexico Hypoxia Monitoring Implementation Plan meeting to advance effort to identify potential funding sources, additional partners, and collaborators.	Funding for Outreach core system requirement (tier 1) of Gulf of Mexico Hypoxia Monitoring Implementation Plan. (See Action 9 for Implementation Plan funding levels).
US Department of Agriculture (USDA)	Poll USDA state leadership-identified communication tools, including field guides, job sheets, etc. currently in use. Poll completed and data available at http://wmc.ar.nrcs.usda.gov/partnerships/MSRB/NutrientReductionTools.html.		

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011
US Department of the Interior (USDOI) – National Park Service (NPS)	Continue outreach to Park Service visitors on the importance of nutrient reductions to water quality.	Ongoing	
USDOI–US Geological Survey (USGS)	Continued webpage support and update of USGS nutrient concentration load data and SPARROW results.	Ongoing; SPARROW results at http://water.usgs.gov/nawqa/sparrow. Load data available at http://toxics.usgs.gov/hypoxia/mississippi/oct_jun/index.html.	
		Develop a SPARROW decision support tool to enable water resource managers to predict effects of large-scale upstream nutrient reductions on nutrient loads delivered to downstream waterbodies.	

11. In four 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 the 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

Partners will continue to develop quantitative measures that measure progress toward the "Coastal Goal" and "Within Basin Goal."

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011
Illinois	Identify quantitative measures of in-basin nutrient reductions that exhibit progress toward both the "Within Basin" and "Coastal" goals.	Ongoing	

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011
Louisiana	Identify quantitative measures of in-basin nutrient reductions that exhibit progress toward both the "Within Basin" and "Coastal" goals. Louisiana DEQ (LDEQ) has supported a proposal by the University of New Orleans (UNO) entitled "The Study of Nutrient Releases to the Mississippi River in Louisiana Industrial Corridor–2009 Revision." The proposal was submitted in response to an RFP from the EPA Gulf of Mexico Program Office in support of nutrient reduction action items in the Governor's Action Plan of the Gulf of Mexico Alliance. The proposal cost was for $46,741; if funded, the study would update the status of nutrient discharges to the Mississippi River from a 2000 report.	If the study is funded, LDEQ will work with EPA, UNO, and Mississippi River dischargers to identify and quantify nutrient discharges to the River, document discharge reductions, and enhance ongoing nutrient reduction efforts and technologies.	Continue federal and state logistical and financial support for nutrient discharge reductions to the Mississippi River and Gulf. Support would also include interagency organizations, including the Gulf or Mexico Alliance, Lower Mississippi River Conservation Committee (LMRCC), ORSANCO, and the Mississippi River/Gulf of Mexico Watershed Nutrient Task Force.
Minnesota	Identify quantitative measures of in-basin nutrient reductions that exhibit progress towards both the "Within Basin" and "Coastal" goals. Currently report phosphorus reductions along with sediment load reductions from funded nonpoint projects through eLINK database.	Continue tracking and reporting reductions.	Need to develop nitrogen reduction component for eLINK data tracking.

Lead Agency	FY 2009 Actions	FY 2010 Planned Actions	Critical Needs for 2011
Mississippi		Using the information generated through the implementation of the nutrient reduction strategies in the Mississippi Delta and coastal watersheds, identify quantitative measures of in-basin nutrient reductions that exhibit progress toward both the "Within Basin" and "Coastal" goals. This information will also be used to quantify potential load reductions on a basin-wide and/or ecoregional scale, to revise the strategy, and to support future TMDL modeling studies. In addition, an assessment will be made to identify what load reductions are achievable, document the costs, and assess the environmental and socioeconomic values to stakeholders. Finally, this information can be used to compare to, and understand the appropriateness of, nutrient criteria, which are currently scheduled for development in 2011.	
Missouri	Identify quantitative measures of in-basin nutrient reductions that exhibit progress toward both the "Within Basin" and "Coastal" goals. Initiated a review of water quality data for the state and developed estimated nutrient loading for Hydrologic Unit Code (HUC) 8 watersheds in the state.	Continue to refine this database with a resolution down the HUC 12/14 level.	
Ohio	Identify quantitative measures of in-basin nutrient reductions that exhibit progress toward both the "Within Basin" and "Coastal" goals.	Ongoing	
Wisconsin	Collecting baseline information from all point sources in watershed.	Plan to expand to collect 12 monthly samples from point sources and then quarterly samples afterward.	

APPENDIX

This Appendix highlights some of the numerous complementary actions Task Force member organizations are engaged in that result in improvements to state and local water quality and the reduction and mitigation of hypoxia in the Gulf of Mexico. These actions do not necessarily address one of the eleven Action Items in the *Gulf Hypoxia Action Plan 2008*, but represent important contributions towards advancing and improving nutrient management and hypoxia in the Mississippi River Basin and Northern Gulf of Mexico. This Appendix is by no means a comprehensive list, and it will change as projects are completed, new projects are proposed and funded, and items are incorporated into the state and federal nutrient reduction strategies. This list includes recently completed projects, ongoing projects, and new projects planned for FY 2010.

TASK FORCE STATE MEMBER ACTIVITIES

STATE OF ILLINOIS

Education and Outreach

- Continue to support ongoing projects of the Illinois Council on Best Management Practices (C-BMP), a coalition of producer organizations and the agricultural industry, http://www.cbmp.uiuc.edu.
- Use fertilizer tonnage tax proceeds to support Web site with information on soil temperatures throughout the state and educational outreach to producers and agricultural retailers stressing the importance of using nitrification inhibitors during fall anhydrous ammonia application.
- Conduct Illinois Tillage Seminars.
- Use §319 funds to support projects to promote the reduction of nutrient use on lawns and farmlands, including projects that are educationally based or implementation-based and that reduce, control, or eliminate the use of nutrients on lawns and farmlands. Currently there are at least 13 projects funded under §319 that meet these goals.
- Through educational exhibits at several museums, zoos, and schools, provide nutrient reduction and nonpoint source pollution information to Illinois citizens.

Monitoring, Modeling, and Research

- Continuation of Fox River Watershed Investigation, Stratton Dam to the Illinois River. Project is expected to reach completion during FY10.

- 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, 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 The Nature Conservancy's (TNC) 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. During the last reporting period, 82 projects on nearly 10 miles of stream bank were constructed at a total cost of $726,000.
- Use §319 funds for (1) 10 projects implementing urban green infrastructure practices to reduce nutrient nonpoint source pollution; (2) 17 stream, lake, or/and wetland restoration/protection projects; and (3) 4 animal waste/exclusion projects.
- Continue to develop and implement 52 Total Maximum Daily Loads (TMDLs) in watersheds tributary to lakes that exceed the 0.05 mg/L total phosphorus lake water quality standard.
- Continue to develop and implement one TMDL in watershed 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 FY10 totals $20.3 million. The program currently has 72 wetlands constructed or under development totaling 715 acres of wetland pools, which treat the drainage from 86,100 watershed acres and remove 40 to 90 percent of nitrate, for an estimated 53,600 tons of nitrate removed over design life.
- Continue to implement the Iowa Watershed Protection Program currently supporting 60 watershed protection projects, which primarily reduce nutrients and sediment to water resources. Continue watershed targeting and assessment of nutrient load reductions from the watershed projects. FY10 funding is $5.2 million state, $3.5 million §319 Clean Water Act funds, and $2.9 million landowner match funds for a total of $11.6 million.

- Implement the Iowa Jobs initiative for watershed protection projects, conservation practice flood damage repair and reclamation, which will significantly reduce nutrients and sediment to water resources. FY10 funding is $7.0 million state funds and estimated landowner match of $2.33 million, for a total of $9.33 million.
- Continue to implement the competitive grant award program to local sponsors through the Watershed Improvement Review Board. Much of the funding is used to reduce nutrients and sediment to water resources. FY10 funding is $5 million state funds and $12.5 million of estimated local match funds, for a total of $17.5 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. FY10 state funding is $12.4 million, which with landowner match funds of $12.4 million is estimated to total $24.8 million in conservation practices.
- Continue to implement the District Initiatives program, which for FY10 provides $1.5 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 FY10 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 FY10 provides $1.6 million for watershed and water quality protection projects, $1.6 million for cost-sharing management practices for water quality enhancement, and with $1.3 million landowner match totals $4.5 million.
- Continue to implement the Watershed Development and Planning Assistance Grant program to assist local watershed project sponsors in the assessment, targeting, and planning of water quality and watershed protection projects. FY10 state funding is $0.2 million with local match of $0.1 million for a total of $0.3 million.
- 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 the 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 waterbodies 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 the targeting and efficiency of water quality management practices. Continue water quality monitoring of research sites evaluating various management practices and monitoring of CREP nitrogen-removal wetland field sites. FY10 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. FY10 federal and state funding is $0.3 million.
- Continue development of the Integrated Drainage and 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 FY10, implement initial pilot projects to serve both as demonstrations and as study sites to confirm nutrient reductions and other benefits. Funding for FY10 is $0.4 million plus low-interest loan, which with $1.2 million landowner match totals $2.1 million of cost-share, landowner match, and debt service reduction.
- Complete the final report of the Cedar River watershed case study assessing the costs and needed management practices at the large-watershed scale to meet the nitrogen and phosphorus reduction targets of the Gulf hypoxia goal. Funding for FY10 is $10,000.
- 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. FY10 state funding is $0.1 million.
- Continue to invest fees paid by farmers on the sale of agricultural chemicals toward developing new technologies and improved practices for reducing nutrients from cropped landscapes to water resources. FY10 funding is estimated at $0.54 million.
- Continue to conduct cover crop farm demonstrations and nitrogen management assessments for corn following cover crops. FY10 funding is $0.1 million.

Education and Outreach

- Continue Web sites, 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 Web site to determine acceptability of fall nitrogen fertilization for water quality improvement, livestock waste management systems and land application, phosphorus index for water quality improvement, etc.
- Continue Iowa Learning Farms demonstrations, education, and outreach through Iowa State University to improve water quality through crop residue and tillage management. FY09 funding is $0.45 million.
- Continue outreach and education concerning Gulf hypoxia and nutrient reductions to farm organizations, Iowa drainage districts, and watershed management groups.

STATE OF LOUISIANA

- Review nutrient removal best available technologies (BATs) with EPA for industrial and municipal permits.
- Develop watershed implementation plans with nutrient BMPs under LA §319 Nonpoint Source Program.
- Continue ongoing implementation of the Louisiana Nutrient Criteria Development Plan.
- Work 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. The Consent Decree schedule for TMDL development was completed in June 2009. Nutrient TMDLs were developed and approved for 12 waterbody segments in FY09 in accordance with Consent Decree requirements. Mississippi currently has 132 impaired water segments that require TMDLs on the 2008 List of Impaired Waterbodies, and impaired waters that need TMDLs will continue to be added to future lists. Most of the waterbodies are listed for biological impairment, which means that the pollutants causing the biological impairment have not yet been identified through a stressor identification process. MDEQ is planning to complete 36 stressor identifications in FY10 and begin TMDL development on the appropriate pollutants, but it is not yet known how many of those will be nutrients.
- Over 300 total nitrogen and/or total phosphorus TMDLs have been developed in more than 100 waterbody segments across the state. Where there were point sources in the watershed, NPDES facilities were included in the waste load allocation (WLA) of the TMDL. The facilities were assigned nutrient loads based on a cap at estimated existing levels or on a reduction of the estimated existing levels as determined by the TMDL. These loads are being implemented as permits are reissued.
- Continue nutrient monitoring where required in NPDES permits. Nutrient monitoring is required in numerous permits; it 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 Nonpoint Source Program. The FY09 Nonpoint Source Program Work Plan has an enhanced focus on supporting nutrient reduction activities. FY09 §319 Nonpoint Source funding was 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 nutrient education. This effort is ongoing.
- Support expanded Concentrated Animal Feeding Operation (CAFO) training program. MDEQ, Mississippi Department of Agriculture and Commerce (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 continuing education units (CEUs) are earned by CAFO permittees) to make the training available to interested animal feeding operations (AFOs) on a voluntary basis.
- Delta Nutrient Studies: Completed a third sampling at 50 sites in the Mississippi Delta in fall of 2008 (previous samplings were 2002 and 2006). Work included nutrients, physical parameters, 48-hour continuous monitoring using deployed sondes (dissolved oxygen, pH, specific conductance, temperature, and turbidity), macroinvertebrate sampling, and habitat assessment. From these sites, 15 sites were selected for quarterly sampling, which was completed in 2009. All of these data were provided to MDEQ to be used for nutrient criteria development in the Mississippi Delta.

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

- Implementation of a new precision agriculture program that 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 (CNMPs).
- 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: The program will reduce nutrient overloading by transferring 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 under way.

- 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 in developing 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," involves developing a management-oriented model of sediment and pollutants for Mobile Bay and the major tributaries to it. An extension of this work will help in modeling the amount of nutrients and pollutants that are entering the Gulf of Mexico from the Mobile Bay system.

Other U.S. Army Corps of Engineers (USACE) Activities

- Mississippi Delta Headwaters Project. Authorized in 1984 as the Demonstration Erosion Control Project, the Delta Headwaters Project has performed bank stabilization and constructed grade-control and water-retarding structures in 16 watersheds in the eastern Bluff Hill region of the Yazoo River Basin. The watersheds range in size from 220 acres to 423,000 acres and total 2,950 square miles. The project has reduced the loss of land due to erosion and sedimentation and prolonged the life of the four Yazoo River Basin flood control reservoirs by reducing sediment transfer within the watershed streams. Research by the University of Colorado has shown nutrient reduction benefits derived from the project. The project is estimated to provide between $100,000 and $1,000,000 per year of benefits from phosphorus removal depending on the size of the watershed.
- Steele Bayou Sediment Reduction Control Structures. The Upper Steele Bayou project, completed in the late 1990s, included construction of edge-of-field sediment control structures to prevent gullying. Post-project analysis showed a 50 percent reduction in total suspended solids, a 30 percent reduction in total phosphorus, and a 20 percent reduction in total nitrogen. In 2004 the USACE initiated another initiative designed to correct gullying issues along the middle reach of Steele Bayou by constructing 25 sediment control structures funded through the USACE ($1.8 million). In Phase 3 of the project, the USACE plans to construct seven water-control structures along Steele Bayou below the Yazoo National Wildlife Refuge in FY10 (funding TBD). For this project the USACE is constructing the larger water control structures and Delta FARM has completed 30 smaller structures funded by a $300,000 §319 grant through the Mississippi Department of Environmental Quality.

USDA–Agricultural Research Service National Sedimentation Laboratory (ARS/NSL) Research to Evaluate Nutrient Reduction Strategies in the Mississippi Delta (August 2009)

Assessment of Management Practices to Mitigate Sediment and Nutrient Impacts

- Conservation Reserve Program: In long-term CEAP research in Beasley Lake watershed, USDA-ARS/National Sedimentation Laboratory (NSL) scientists are evaluating effects of CRP establishment on sediment and nutrient runoff losses. Lake monitoring includes various parameters, including nutrient, pesticides, suspended sediment, turbidity, and chlorophyll. Periodically, fish populations are assessed.
- Reduced tillage, cover crops, and vegetative buffers: Sediment runoff is impeded under reduced tillage and cover crop systems with and without vegetative buffers. Vegetative buffers alone also reduce sediment loss, but results are mixed with respect to nutrients and soluble organic carbon. USDA-ARS/NSL scientists are conducting several experiments in the delta to address gaps in the database quantifying impacts of tillage, cover crops, and buffers on nutrient losses.
- Vegetated agricultural drainage ditches: Vegetated agricultural drainage ditches have been shown to help reduce nutrient loads leaving fields before they enter rivers, lakes, and streams. USDA-ARS/NSL scientists plan to continue experimental assessments of nutrient mitigation in 2010 by manipulating vegetation and hydroperiod for improved ditch efficiency. Locations for additional field experiments and routine monitoring are being explored in the Mississippi Delta for 2010. Similar experiments with pesticide mitigation are planned as well in similar locations.
- Wetlands: USDA-ARS/NSL scientists continue to demonstrate constructed and natural wetlands' abilities to mitigate sediments and nutrients. In fall 2009, a study examining the ability of rice to mitigate pesticides and nutrients will be conducted in wetland mesocosms. Similar studies will be conducted on equal and larger-scale systems in 2010. Vegetation will be expanded beyond rice to additional aquatic plants. Other planned studies will examine how mixtures of sediment, nutrients, and pesticides from agricultural runoff may affect the biology of wetlands and influence potential for processing and mitigation pollutants.
- Retention Ponds: USDA-ARS/NSL scientists will conduct one study in fall 2009 to evaluate pesticide and nutrient dissipation in retention ponds. Larger-scale experiments are planned for 2010.

Nutrient and Ecological Assessments in Mississippi Delta Watersheds

- USDA-ARS/NSL scientists propose a long-term project in three selected small delta watersheds to provide data supporting MDEQ calibration and improvement of nutrient criteria. Sites representative of conditions typical of those documented by existing data sets will be selected for study in 2010. Efforts will be made to select sites that correspond to locations of previous water quality, fish, or Index of Biotic Integrity (IBI) collections. Changes in water quality, habitat, and biological community will be observed.
- Mississippi Delta streams can process and transport nutrients differently under a variety of conditions, including variable flow, dissolved oxygen, and organic carbon levels. In other studies, USDA-ARS/NSL scientists plan to conduct experiments to address these variables as they relate to nutrient processing and transport during 2010.

U.S. Geological Survey (USGS) Research to Evaluate Nutrient Reduction Strategies in the Mississippi Delta (August 2009)

- NASQAN and National Monitoring Network (NMN) sites: Long-term monitoring of nutrients is being conducted by personnel of the USGS-Mississippi Water Science Center (MWSC) at two locations. The first is the Yazoo River below Steele Bayou near Long Lake, Mississippi, which is funded as part of the USGS National Stream Quality Accounting Network. The second is the Mississippi River at Vicksburg, Mississippi, which is funded as part of the Ocean Action Plan National Monitoring Network.
- Personnel of the USGS-MWSC are developing a SPARROW model for total nitrogen and total phosphorous for streams in the south-central United States. The models will allow users to generated load estimates at unsampled stream locations in the study area, as well as understand sources and transport mechanisms of nutrients to the northwestern Gulf of Mexico. The study area includes the Lower Mississippi, Arkansas-White-Red, and Texas-Gulf basins. Results of the modeling will be released in the spring of 2010.

STATE OF MISSOURI

- Continue to implement a matrix of agricultural BMPs through 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 frame. In the 2009 the cost-share docket was expanded from 17 practices to 41. Most of the newly added practices are designed to promote stewardship activities that mitigate water quality impacts from agriculture. 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.
- Constitutional and statutory changes were enacted to allow the Stormwater Grant and Loan Program that is currently administered by the Department of Natural Resources (DNR) to disperse more funds for stormwater issues by re-offering unused funds, eliminating the 50 percent grant-to-loan ratio requirement, and creating a revolving fund for loans. Draft rulemaking is in progress to support this change in the Stormwater Grant Loan Program.
- 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 it is anticipated to allow more flexibility in program allocations to better address specific resource concerns such as nutrient loading. Current fiscal year practices have been allocated to each district on the basis of the 2008 needs assessment. This will promote efforts to adopt many of the new practices offered by the expanded practice docket. A new needs assessment has been requested of the 114 district offices and will be used to guide funding for the next fiscal cycle.
- Implementation of the state water quality anti-degradation policy. Program requires reevaluation of point sources on classified streams and in some cases will require steps to achieve greater pollution reduction through the permitting process.

- Implementation of Missouri Nonpoint Source Management Plan, requiring continued development of TMDL strategies associated with §303(d) impaired waters. The DNR will submit a revised list of impaired waters for EPA review in 2009/2010. A portion of the impaired waterbodies 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. It includes representatives of nonprofit organizations, universities and colleges, cities and businesses, and state, federal, and local agencies.
- Continued support of a statewide 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 state's 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. It is targeted at waterbodies that are on the state's Targeted Nonpoint Source 303(d) list. The funded watershed plans support activities that will result in achieving the load reduction goals set forth in the corresponding TMDL developed for the affected waterbody. The most recent call for proposals was released in August 2009.
- Ongoing effort to implement phase I and II stormwater regulations. Permits required regulated municipal separate storm sewer systems (MS4s) to have stormwater management programs in place by March 10, 2008. These efforts have the potential to address a significant number of nutrient-related issues associated with stormwater pollution from large and small metropolitan areas. Possible interface with stimulus funding.
- Four million dollars has been made available specifically for water quality practices as part of the expansion of the cost-share practice docket in the state Soil and Water Conservation Program. The majority of these practices will result in a reduction of nutrients entering the state's rivers, streams, and reservoirs. Traditional soil protection practices will still be funded at the same levels of the last 3 years' average, and these practices also provide nutrient-reduction benefits. A total of $26 million will be offered across 114 districts in FY10. The Soil and Water Program is estimated to have prevented a total of 2.2 million tons of soil and associated nutrients from entering the state's waters in 2009.
- 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.

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 Ohio. These linkages provide the detailed information on programs such as Farm Bill conservation efforts, local watershed plan implementation, state water quality studies (TMDL reports), point source programs, monitoring, and so forth.

- Ohio TMDLs addressing nutrients that are completed or in progress are shown in the map at the Web site below. In the Ohio River watershed, 17 TMDL reports have been approved, 5 TMDL reports are in draft status, and 12 TMDL reports are in preparation. A list of watersheds by name is on the Web site at http://www.epa.ohio.gov/dsw/tmdl/OhioTMDLs_InProgress.aspx.
- Twenty-seven local watersheds within the Ohio River watershed have completed plans or have plans in progress. The plans address all sources of impairment, including those associated with excessive nutrient loading. All address local efforts to combat nutrient loading to some degree. Load reduction goals and project cost estimates are typically included in the endorsed plans. These planning efforts, along with TMDL report information, form the basis of Ohio's Gulf hypoxia-related nutrient reduction strategy at this time. Local watershed plans can be found at http://www.dnr.state.oh.us/soilandwater/water/watershedprograms/default/tabid/9192/Default.aspx.
- Scioto Watershed CREP is ongoing, with 65,000+ acres put under conservation practices to date. The 2009 annual report will be released in January 2010, as a follow-up to the 2008 report. Assistance to the Little Miami and Sugar Creek water quality trading projects is ongoing, with load reductions of 18,500 pounds of total phosphorus and 92,000 pounds. of total nitrogen reported for 2009. NRCS and FSA have Ohio Farm Bill conservation activity for FY 2009. The Little Miami watershed CREP application is 50 percent complete. Information on Ohio's Soil and Water Conservation Districts and their nonpoint source and nutrient/sediment programs can be found at http://www.dnr.state.oh.us/soilandwater/default/swcds/default/tabid/9093/Default.aspx.
- Ohio continues to implement state programs addressing small, medium, and large AFOs. A new nutrient management planning tool and trainings were delivered statewide. Approximately 75 complaints on small and medium operations were responded to. One court-ordered enforcement consent order on a medium-sized AFO operator was executed. There are currently 130 large AFOs within the Ohio River watershed under permit by the Ohio Department of Agriculture; 15 applications requesting expansion are pending.
- Continued implementation of the Ohio NPS Management Plan and §319 Grants Program. Active §319 grants that address nutrient reduction and/or assimilation include projects in the Big Darby (two), Stillwater, and Little Miami watersheds.
- Ohio participated in the Wastewater Treatment Plant Nutrient Reduction and Energy Efficiency Workshop in November 2008. Research, development, and education efforts related to advanced treatment of nutrients at wastewater treatment plants will continue.
- Ohio EPA approved the Columbus Wet Weather Management Plan. Under the approved plan, Columbus will have constructed projects that will eliminate over 0.5 billion gallons of combined sewer overflow each year by the year 2011. By 2025, over 85 percent of the current

Columbus sewer overflow will have been eliminated. NPDES, combined sewer overflow (CSO)/wet weather, and other federally delegated programs will continue.

- ORSANCO and Ohio DNR will continue to act as liaisons with other Ohio River Basin (ORB) states. The last ORB Steering Committee meeting was on August 20, 2009 via conference call.
- Ohio DNR has been working with the Muskingum Watershed Conservancy District (MWCD) for several years on a cooperative agreement covering local watershed planning and implementation projects. ODNR would administer a watershed planning and implementation program on behalf of the MWCD and funded by local landowner fees within the watershed. Conservation projects addressing sediments, nutrients, and habitat restoration are expected to be funded in 2010. The MWCD will also use this program to address local infrastructure projects, repairs on dams, and other related projects to help with stormwater management.

STATE OF WISCONSIN

- State administrative code NR 217 requirements for phosphorus effluent limits are implemented for 1 mg/L or an alternative limit for municipal publicly owned treatment works (POTWs) that discharge 150 lb/mo and industries that discharge 90 lb/mo. The average discharge is 0.5mg/L total phosphorus. This has resulted in a 68 percent reduction in phosphorus loads since 1993.
- Nonpoint source-specific performance standards that apply. State administrative code NR 151 requires agriculture performance standards that are cost share-dependent. Urban performance standards apply at the time of the Wisconsin Pollutant Discharge Elimination System (WPDES) permit application. Priority watersheds in planning must have total suspended solids (TSS) control by 2013. Priority watershed projects implemented achieved 50 percent of targeted phosphorus and sediment reduction amounts. Performance standards include:
  - Croplands:
    - Control cropland erosion to meet tolerable rates.
    - Build, modify, or abandon manure storage facilities to accepted standards.
    - Divert clean runoff away from livestock and manure storage areas located near streams, rivers, lakes, or areas susceptible to ground water contamination.
    - Apply manure and other fertilizers according to an approved nutrient management plan.
  - Manure management prohibitions:
    - No overflow of manure storage facilities.
    - No unconfined manure piles near waterbodies.
    - No direct runoff from feedlots or stored manure into state waters.
    - No trampled streambanks or shorelines from livestock.

- Stormwater permits issued in the Mississippi River Basin total 3,300 industrials, 130 municipals, and 600 construction sites. MS4 permits require 20 percent and 40 percent reduction in sediment load by target dates. This will reduce phosphorus by 10 to 30 percent. Ninety-two CAFO permits have been issued in this basin.
- TMDL on the Rock River is under development and will have phosphorus limits below current levels. This TMDL included more than 75 individual permits and approximately 200 general permittees.
- TMDL on Lake Pepin with Minnesota is to be completed at the end of 2009 and is to be on public comment in early 2010.
- Begin to collect total nitrogen data from wastewater treatment plants (WWTPs) in January 2009 with permit application. Expanding now to require 12 samples collected over a year, then quarterly thereafter, from all dischargers.
- Farm Nutrient Management Plans performance standards (acreage goals) are administered by Wisconsin's Department of Agriculture, Trade, and Consumer Protection.
- Statewide lawn fertilizer ban on phosphorus in 2009.
- Future direction, proposing cropland phosphorus index requirements, TMDL-derived performance standards, more stringent than statewide. Critical sites may not be limited to croplands. Areas where livestock are pastured/confined may have phosphorus concentrations 10 times higher than croplands (and these areas seldom have soils tested).
- Proposed criteria for phosphorus in development:
  - 100 µg/L total phosphorus for "rivers"
  - 75 µg/L total phosphorus for "streams"
  - 15 to 40 µg/L total phosphorus for lakes and reservoirs, depending on type
  - Site-specific criteria for Lake Pepin
  - Nitrogen criteria in next phase.

TASK FORCE FEDERAL MEMBER ACTIVITIES

UNITED STATES ARMY CORPS OF ENGINEERS (USACE)

- Navigation and Ecosystem Sustainability Program (NESP) 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. Program remains

underfunded in 2009 and 2010. Fifteen ecosystem projects valued at $120 million are in advanced planning and design phases. The program is currently getting $10 million per year—half for the ecosystem part and half for the navigation part, but no construction funds. A wide range of potential projects including floodplain restoration, side-channel restoration, island construction, forest restoration, and embankment modifications are expected to have beneficial effects on water nutrient loading.

- Environmental Management Program (EMP) is an upper Mississippi River program with two components—development and construction of ecosystem restoration projects, which will help with sediment and nutrient retention/treatment, and 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. The EMP is in the process of being transitioned to NESP, and no new starts under EMP are allowed. The transition plan aims for a seamless transition to NESP of all projects, designs, and construction efforts, including the monitoring program. To date, EMP has built 50 ecosystem-related projects benefitting more than 83,000 acres. EMP funding ranged from $17 million to $30 million annually.

- The Middle Mississippi River Watershed 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. This study focused on the Mississippi River from the Missouri River to the Ohio River and concluded in early 2009. Outcomes included regional natural resource goals, objectives, and strategies; development of an ecosystem restoration planning tool; and reach assessments. Interagency Middle Mississippi River Partnership has taken ownership now and will move the region forward on study outcomes.

- Lower Mississippi River Watershed Study. Although 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 in turn could affect hypoxia issues such as sediment and nutrient input. The draft report was delivered July 31, 2009, and is being reviewed before approval. Looking for cost-share partners to go to feasibility phase and then project implementation. Report recommends a watershed study and implementation plan/potential feasibility reports involving 239 projects identified by an NGO, and it is being revised to include a couple multipurpose projects that could go right to feasibility now with an appropriate cost-share partner. Watershed study is a 2- to 3-year effort at $2.5 million cost-shared.

- Louisiana Coastal Area Study (LCA). Although 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. Louisiana Coastal Area project has several authorized components per WRDA 07 but remains largely unfunded as a more comprehensive approach to coastal Louisiana issues develops in the Louisiana Coastal Protection and Restoration (LACPR) effort. Some funded aspects of LCA include activities such as freshwater water symposia and research, beneficial use of dredged material, modeling, innovative mapping efforts, and a science and technology program.

- Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA). Projects for ecosystem restoration and protection are planned and constructed by inter-agency groups each year. For example, the 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. At the end of 2008, there were 145 active approved projects, 74 had been constructed, 17 were under construction, and 26 had been de-authorized or transferred to another program. Funding for FY09 and FY10 is at about $5 million for planning each year and about $82 million for construction each year. Total wetland acres to benefit from all projects over their individual 20-year project life would be 110,415 wetland acres. The program began in 1990 and is authorized until 2019.

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), Wetlands Reserve Program (WRP), Conservation Technical Assistance (CTA), Conservation Security Program (CSP), P.L. 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 FY07 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 with installing or implementing conservation practices for agricultural water conservation water quality enhancement activities.

Other highlights that relate to the 2010 Hypoxia Annual Operating Plan:

- Authorizes 32 million 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 and authorizes additional funding to enroll up to 12,769,000 additional acres 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, Farm and Ranch Land Protection Program (FRPP), and Grasslands Reserve Program (GRP), be used for targeted conservation activities and areas.

UNITED STATES DEPARTMENT OF COMMERCE (DOC)

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]) lead monitoring 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); identify relationships among river discharge and constituent loads, physical conditions (especially currents), and biological and chemical parameters; link coastal ecosystem studies with Mississippi River data on discharge, concentration, and loads of relevant constituents; refine models of the severity and extent of hypoxia (including the predictive model used as a basis for NOAA's annual hypoxic zone forecast); and continue public outreach, including a Web site, to translate research results to a broad cross-section of the public. In FY 09, advanced the completing of the forecast of the hypoxic zone size by one month (June) and completed mid-summer survey of hypoxic zone (Action Plan metric). Published a paper in *Environmental Science and Technology* that indicated increasing size of hypoxia for similar loads of nitrogen. Field and laboratory analyses are continuing.
- Dr. Steve DiMarco (Texas A&M University) 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. In FY09, conducted isotopic analysis of waters from 2007 and 2008 hypoxia events off Texas and found the 2007 event was due to waters from the Brazos River, while waters during the 2008 event were from the Mississippi/Atchafalaya rivers. Deployed a monitoring mooring at Site C of the hypoxic zone. Numerical model has been developed. Model development and field and laboratory analyses are continuing.
- Dr. Dubravko Justić (LSU) is 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. Papers published in 2009 indicated that wetland loss in Barataria Estuary does not significantly contribute to Gulf hypoxia, indicated that through advances in hydrodynamic modeling supports conclusions that local winds and freshwater discharge are the primary factors influencing stratification on LA-TX shelf, and presented a production-respiration model for the northern Gulf of Mexico. Additional modeling efforts are ongoing.

- Dr. Wayne Gardner (University of Texas at Austin) is 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. Project is still early in data collection stage. Several field surveys have been completed as have methods development and validation. Field and laboratory analyses are continuing.
- Dr. Stephen Brandt (NOAA Great Lakes Environmental Research Laboratory) is 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 ecologically and economically important fishes; and provide tools to forecast food web interactions, habitat suitability, and fish production in relation to hypoxia. Conducted significant diet analyses on key species for inclusion in food web model and completed several fish field surveys. Determined that hypoxia has a clear signature on the growth and distribution of prey fish in the northern Gulf. Field and laboratory analyses are continuing.
- Dr. Peter Thomas (University of Texas at Austin is to determine 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 develops predictive models on the effects of hypoxia on fish and copepods populations based on impacts on reproduction. Identified mechanism for sublethal hypoxia-induced reproductive impairment in Atlantic croaker and biomarker to determine fish exposure to hypoxia. Field and laboratory analyses are continuing.
- 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 were completed. Special issue of the *Journal of Experimental Marine Biology and Ecology* on the ecological impacts of hypoxia is in press and will be published in fall 2009. Workshop technical report is nearing completion and will also be released in fall 2009.
- Review and selection of proposals from FY09 competitive funding announcement for the NGOMEX program have been completed. 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. Two large regional projects to improve understanding of the causative factors and quantitative predictions of the spatial and temporal extent of hypoxia will be awarded. Three additional projects will also be awarded; they will focus on the development of quantitative models of the ecological impacts of hypoxia on key living resources, including a socioeconomic assessment of hypoxia impacts on the shrimp fishery. Note that

final announcement regarding the outcomes of this task is awaiting final administrative clearance. Additional information on these projects will be provided once the clearance process is complete.

- Completion of a 2009 Southeast Area Monitoring and Assessment Plan (SEAMAP) summer groundfish survey in support the Gulf of Mexico Hypoxia Watch program. The 2009 mid-summer SEAMAP survey of the hypoxic zone was completed, and data are available on the Hypoxia Watch Program Web site. An additional survey of the hypoxic zone will be completed in fall 2009. These surveys are planned to continue into 2010.
- 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. Several partners are contributing support for FY10 monitoring that will lead to (1) an increase in the number of shelf-wide surveys; (2) an expansion of monitoring to east of the Mississippi River delta; (3) application of autonomous underwater vehicles (AUVs); (4) progress in establishing a hypoxia data portal; and (5) dedicated resources toward communication and outreach.
- The "Hypoxia Monitoring Stakeholder" Web site has been updated and integrated with the Hypoxia Watch site. The development of a map-based data portal is ongoing.
- Will continue 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. Assisted with the development of the GOMA Action Plan II and efforts to develop a framework for nutrient criteria development.

UNITED STATES DEPARTMENT OF THE INTERIOR (DOI)

National Park Service (NPS)

- Published nine articles describing historic nutrient loading and current conditions in Lake St. Croix and Lake Pepin in special issue of *Journal of Paleolimnology*, vol. 41, no. 4, May 2009 special issue: *Recent Environmental History of the Upper Mississippi River.*

United States Geological Survey (USGS)

Recently Completed USGS National and Regional Reports

- Rankings of watershed nutrient yields in the Mississippi/Atchafalaya River Basin. "Incorporating Uncertainty into the Ranking of SPARROW Model Nutrient Yields from the Mississippi/Atchafalaya River Basin Watersheds" was published in *Journal of the American Water Resources Association*. Article, maps, and data tables are available at http://water.usgs.gov/nawqa/sparrow/nutrient_yields.

- Hydrologic and biogeochemical controls affecting nutrient transport in agricultural streams. Nine articles discussing hydrologic and biogeochemical controls affecting nutrient transport in agricultural streams were published in the *Journal of Environmental Quality*. Available at: http://jeq.scijournals.org/content/vol37/issue3.
- Online tool to predict atrazine concentrations in streams in the United States. Predictions and interactive mapping of atrazine for any stream in the United States are available at http://infotrek.er.usgs.gov/warp. Documentation of the Watershed Regressions for Pesticides (WARP) model is available at http://pubs.er.usgs.gov/usgspubs/ofr/ofr20091122.
- Nutrient Trends in Streams and Rivers of the United States, 1993–2003. Available at http://water.usgs.gov/nawqa/pubs/nutrient_trends.
- Trends in Nutrient and Suspended Sediment Concentrations and Loads in the Upper Mississippi, Ohio, and Great Lakes River Basins. Available at http://pubs.usgs.gov/sir/2008/5213.
- Nutrient and Suspended Sediment Trends in the Missouri River Basin, Available at http://pubs.usgs.gov/sir/2006/5231.
- Trends in Nutrient and Sediment Concentrations and Loads in Major River Basins of the South-Central United States, 1993–2004. Available at http://pubs.usgs.gov/sir/2007/5090.
- A Quarter-Century of Declining Suspended Sediment Fluxes in the Mississippi River and the Effect of the 1993 Flood. Available at http://www3.interscience.wiley.com/journal/122557772/abstract.
- Status and Trends of Selected Resources of the Upper Mississippi River System: A Synthesis Report of the Long Term Resource Monitoring Program: summary of the recent status and trends for selected indicators of the ecological condition of the Upper Mississippi and Illinois Rivers. Available at http://pubs.usgs.gov/mis/LTRMP2008-T002.
- The Role of Nutrients in Determining Riverine Ecosystem Productivity and Eutrophication, Nutrient Cycling and Transport. Reports are available at http://wa.water.usgs.gov/neet/products.html.
- The Importance of Hydrology in Restoration of Bottomland Hardwood Wetland Functions. Available at http://librrefmgr.cr.usgs.gov/rmwp?&func=view&qid=2&recordID=57&sortKey=Date&returnTo=summary&.
- Effects of Residence Time on Summer Nitrate Uptake in Mississippi River Flow-Regulated Backwaters. Available at http://www3.interscience.wiley.com/journal/118677506/abstract.
- Contribution of Sediment Fluxes and Transformations to the Summer Nitrogen Budget of an Upper Mississippi River Backwater System. Available at http://www.springerlink.com/content/m121345j22t8j0j7/?p=2d0ae302877d47faada6dfe7a4da04b9&pi=7.
- Multi-scale Measurements and Modeling of Denitrification in Streams with Varying Flow and Nitrate Concentration in the Upper Mississippi River Basin. Available at http://www.springerlink.com/content/f00r657809770131.

- Salinity, Soil Total Nitrogen, and Flood Duration and Frequency Affected Forest Structure and Growth along Tidal/Non-Tidal Salinity Gradients. Available at http://www.bioone.org/doi/abs/10.1672/08-77.1. *Wetlands*, Vol. 29, No. 2, June 2009.
- Nutrient Dynamics in the Lower Mississippi River Floodplain: Comparing Present and Historic Hydrologic Conditions. Available at http://www.bioone.org/doi/abs/10.1672/08-62.1.

Planned 2010 USGS Regionally Based Products

- The Quality of Our Nation's Water—Nutrients in the Nation's Streams and Ground Water (anticipated release fall/winter 2010).
- Regional SPARROW models and decision support tool (Upper Mississippi, Great Lakes, Ohio River Basin; Missouri River Basin; and the Lower Mississippi, Arkansas-White-Red, and Texas Gulf Basin) for total nitrogen and total phosphorus (anticipated release fall 2010).
- Optimal Nitrogen Management for the Nation's Coastal Waters (anticipated release fall 2010).
- Several studies and reports discussing hydrologic and biogeochemical controls affecting nutrient transport in agricultural streams. (http://in.water.usgs.gov/NAWQA_ACT)
- Several studies and reports to evaluate the role of nutrients in determining riverine ecosystem productivity and eutrophication, nutrient cycling and transport. (http://wa.water.usgs.gov/neet/products.html)
- Trends in Herbicide Concentrations in Streams in Corn-Soybean Agricultural Areas of the Central United States, 1992–2004 (anticipated release fall 2009).
- 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 (anticipated release summer 2010).
- Nutrient Inputs to Streams from Groundwater: Implications for Management (anticipated release fall 2010).
- Relationships between Nutrients, Chlorophyll, and Habitat in Agricultural Streams: Implications for Nutrient Criteria (anticipated release fall/winter 2010).
- Summer Nitrate Uptake and Denitrification in an Upper Mississippi River Backwater Lake: The Role of Rooted Aquatic Vegetation (anticipated release fall/winter 2010).
- Nutrient in the Upper Mississippi River: Transport, Processing, and Effects on the River (anticipated release winter 2010).
- Large-scale Longitudinal and Seasonal Patterns in Nutrients, Chlorophyll, and Suspended Solids in the Upper Mississippi River (anticipated release fall 2010).

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (USEPA)

USEPA Office of Water, Office of Wetlands, Oceans, and Watersheds (OWOW)

- Made available a compilation and summary of information on TMDLs completed in EPA Region 5 states and Mississippi. Information has been collected, and compilation and summary of information are being conducted.
- Provide technical and financial assistance to Mississippi River Basin states developing nutrient TMDLs for shared waterbodies, through a series of NAS projects focused on the Mississippi River watershed and the Gulf of Mexico. AWPD/WB continues to work with the basin states to determine the most effective §303(d) strategies for listing waters impaired by nutrients. The NAS project is also assisting EPA in evaluating options for developing basin-specific nutrient caps and for determining appropriate TMDL endpoints throughout the watershed that will address both near-field (within state), main stem Mississippi River, and far-field (Gulf of Mexico) objectives.
- Complete assessment of scientific, modeling, and technical aspects of nutrient pollutant load allocations for TMDLs in basin states.
- Continue MARB/Gulf of Mexico TMDL work plan.

USEPA Office of Science and Technology (OST)

- In FY09 (December 2008) the report *State Adoption of Numeric Nutrient Standards (1998–2008)* was published. The report provides a status of progress made by the 50 states in adopting numeric nutrient standards for major waterbody types (lakes and reservoirs, rivers and streams, estuaries, and wetlands) since 1998 when EPA released its "National Strategy for the Development of Regional Nutrient Criteria."
- In FY09 provided technical assistance to seven MARB states. Data analysis support was provided through the Nutrient Technical Support Center (NSTEPS) to these seven MARB states.
- Continue to provide financial and technical support to states for numeric nutrient criteria development.

USEPA Region 4

- In FY08-09, 186 TMDLs for total nitrogen and total phosphorus were developed. The primary basins addressed were the Yazoo River, Mississippi, 78 segments for TN and TP, and the Stone River, Tennessee, 9 segments for total nitrogen and total phosphorus. For the TMDL portion, more effort will be devoted to supporting state implementation activities because the Consent Decree commitments in Tennessee and Mississippi have been met. No new nutrient TMDLs in the basin are planned at this time. Kentucky might initiate nutrient TMDL development in FY10.
- Eight CAFO inspections were conducted in FY09—seven in Mississippi and one in Tennessee. The City of Memphis WWTP in Tennessee was given a full inspection. Also, there were major litigations involving the CSO and MS4 facilities in Louisville and Lexington, Kentucky. More compliance inspections and compliance monitoring activities will be undertaken in 2010.

- The CAFO coordinator held two workshops for the Perdue Chicken producers in FY09 on nutrient management and litter control. CAFO workshops regarding the new rule requirements are being planned for FY10. MS4 permits will be reviewed and modified to address nutrient TMDL load reduction requirements.
- Work with Mississippi, Tennessee, and Kentucky §319 programs to reduce nitrogen and phosphorus from nonpoint sources. The §319 program funds focused on impaired waterbodies, most of which involved nutrient controls. In Mississippi, the §319 program is an active partner in the extensive BMP efforts in the Delta region to benchmark total nitrogen and total phosphorus reduction efforts to meet TMDL targets. The §319 program will continue to support nutrient management planning activities in each state.
- Provide assistance to Mississippi, Tennessee, and Kentucky on plans for development and development of numeric criteria for nutrient reduction in the Mississippi Basin. The three states are on track to meet their nutrient criteria development planning goals. Region 4 completed interagency agreements (IAGs) with USGS in Mississippi and Kentucky to gather and assess monitoring data to aid in the development of nutrient criteria. EPA will continue to work with the states to expedite nutrient criteria development in light of the Florida litigation and Consent Decree requiring EPA to promulgate numeric nutrient criteria.

USEPA Region 5

- Investigating the relationship between nutrients, algal biomass, continuous dissolved oxygen, and biological communities in wadeable streams through the National Rivers and Streams Assessment (NRSA). Field work began in 2008 and continues through September 2009.
- The annual Pre-Surface Water Monitoring and Standards (SWiMS)/ Regional Technical Advisory Group (RTAG) Meeting took place in February 2009 in Chicago, Illinois, focusing on developing scientifically defensible criteria and implementation guidance.
- Through June 30, 2009, 19 compliance inspections targeting CAFOs with the most severe impacts were conducted in Mississippi River Basin states.
- Continue work with State Nutrient Workgroups in Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin.
- As of June 2009, completed 8 of 60 nutrient TMDLs for nutrient-impaired waters draining to the Mississippi River and its tributaries; issued 52 NPDES permits with nutrient limits or monitoring requirements for major municipal and industrial facilities discharging into the Mississippi; and conducted 25 federal workshops, presentations, or other similar compliance assistance seminars for CAFOs or municipalities regarding nutrient management in the Mississippi Basin.

USEPA Region 6

- Entered into an IAG with USDA/ARS to compile and analyze all existing databases along the length of the Red River, from headwaters in New Mexico to confluence with the Mississippi River. This project began in 2007 and will be completed in 2009. Phase 1 data collection is complete, Phase 2 is ongoing, and Phase 3 (criteria development) was approved in early 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 through a Regional Geographic Initiative-funded project that is funding data collection for SPARROW for the Lower Mississippi River Basin, through 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. Work on regional SPARROW models is progressing, but unforeseen quality assurance problems are delaying the effort. The project also suffers from lack of funding.
- The §319 program in Region 6 works with states to reduce water quality problems related to nonpoint sources of pollution. Approximately 70 percent of the region's §319 efforts address nutrient reduction. A special high-level meeting took place between the Region 6 Water Quality Protection Division Director and the NRCS State Conservationists to strive for collaboration on use of EQIP and §319 activities for addressing watershed restoration and nutrient reduction. Also, the Mollicy Farms project (The Nature Conservancy) returned 10,000 acres of farmland in the Ouachita Basin in Louisiana to natural floodplain, which will aid in reducing nutrient inputs to the Gulf of Mexico.
- The Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA) Program in Region 6 has three coastal restoration projects that focus on reintroducing 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. The Maurepas Swamp project reached 30 percent design at the end of 2008 and has been delayed since then pending negotiation between EPA, the State of Louisiana, the USACE, and the CWPPRA Task Force regarding how to proceed toward final design 1. Phase 1 (data collection) is complete, Phase 2 (data analysis) is ongoing, and additional funding for Phase 3 (criteria development) was approved in early 2009.

Abbreviations and Acronyms

AFO	animal feeding operation
ARS	Agricultural Research Service
AUV	autonomous underwater vehicles
AWEP	Agricultural Water Enhancement Program
AWPD	Assessment and Watershed Protection Division
BAT	best available technology
BMPs	best management practices
CAFO	concentrated animal feeding operation
CCPI	Cooperative Conservation Partnership Initiative
CEAP	Conservation Effects Assessment Project
CENR	Committee on Environment and Natural Resources
CEUs	continuing education units
CMT	Conservation Management Tool
CNMP	comprehensive nutrient management plans
CREP	Conservation Reserve Enhancement Program
CRP	Conservation Reserve Program
CSO	combined sewer overflow
CSP	Conservation Stewardship Program, or Conservation Security Program
CSREES	Cooperative State Research, Education, and Extension Service
CTA	Conservation Technical Assistance
CTIC	Conservation Technology and Information Center
CWA	Clean Water Act
CWPPRA	Coastal Wetlands Planning, Protection and Restoration Act
DMR	Discharge Monitoring Report
ELP	Environmental Leadership Program
EMP	Environmental Management Program
EPA	Environmental Protection Agency
EPRI	Electric Power Research Institute
EQIP	Environmental Quality Incentive Program
ERDC	Engineer Research and Development Center
FARM	Farmers Advocating Resource Management
FRPP	Farm and Ranch Land Protection Program

FSA	Farm Service Agency
FTE	full-time equivalent
FWP	Farmable Wetland Program
GCOOS	Gulf of Mexico Coastal Ocean Observing System
GED	Gulf Ecology Division
GIS	geographic information system
GMPO	Gulf of Mexico Program Office
GOMA	Gulf of Mexico Alliance
GRP	Grasslands Reserve Program
GRTS	Grant Reporting and Tracking System
HAB	harmful algal bloom
HABHRCA	Harmful Algal Bloom and Hypoxia Research and Control Act
HUC	Hydrologic Unit Code
IAG	interagency agreement
IBI	Index of Biotic Integrity
IDALS	Iowa Department of Agriculture and Land Stewardship
LACPR	Louisiana Coastal Protection and Restoration
LATEX	Louisiana-Texas Shelf Physical Oceanography Program
LCA	Louisiana Coastal Area Study
LDAF	LA Dept. of Agriculture and Forestry
LDEQ	Louisiana Department of Environmental Quality
LMFA	Livestock Management Facilities Act
LMRCC	Lower Mississippi River Conservation Committee
LMRSBC	Lower Mississippi River Subbasin Committee
LSU	Louisiana State University
LTRMP	Long-Term Resource Monitoring Program
LUMCON	Louisiana Universities Marine Consortium
MARB	Mississippi/Atchafalaya River Basin
MDAC	Mississippi Department of Agriculture and Commerce
MDEQ	Mississippi Department of Environmental Quality
MMR	Monitoring, Modeling, and Research
MO CREP	Missouri Conservation Reserve Enhancement Program
MOU	memorandum of understanding
MPCA	Minnesota Pollution Control Agency
MS4	Municipal separate storm sewer system

MSU	Mississippi State University
MVD	Mississippi Valley Division
MWCD	Muskingum Watershed Conservancy District
MWSC	Mississippi Water Science Center
NAS	National Academy of Sciences
NASQAN	National Stream Quality Accounting Network
NAWQA	National Water-Quality Assessment Program
NECOP	Nutrient Enhanced Coastal Ocean Productivity
NEP	National Estuary Program
NESP	Navigation and Ecosystem Sustainability Program
NGI	Northern Gulf Institute
NGO	nongovernmental organization
NGOMEX	Gulf of Mexico Ecosystems and Hypoxia Assessment
NMN	National Monitoring Network
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRI	National Research Initiative
NRSA	National Rivers and Streams Assessment
NSL	National Sedimentation Laboratory
NSTEPS	Nutrient Technical Support Center
NWIS	National Water Information System
ORB	Ohio River Basin
ORD	Office of Research and Development (EPA)
ORSANCO	Ohio River Valley Water Sanitation Commission
OST	Office of Science and Technology (EPA)
OWM	Office of Wastewater Management (EPA)
OWOW	Office of Wetlands, Oceans, and Watersheds (EPA)
PIT	Priority Issue Team
POTW	publicly owned treatment works
RARE	Regional Applied Research Effort
RC&D	Resource Conservation and Development Program
RFP	request for proposal
RIM-WRP	Reinvest in Minnesota-Wetlands Reserve Program

RTAG	Regional Technical Advisory Group
SBC	Subbasin Committees
SEAMAP	Southeast Area Monitoring and Assessment Program, or Southeast Area Monitoring and Assessment Plan
SPARROW	Spatially Referenced Regressions on Watershed Attributes
STC	State Technical Committee
SWCD	Soil and Water Conservation District
SWiMS	Surface Water Monitoring and Standards
TMDL	total maximum daily load
TNC	The Nature Conservancy
TSS	total suspended solids
UMR	Upper Mississippi River
UNO	University of New Orleans
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USDOI	U.S. Department of the Interior
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
USM	University of Southern Mississippi
UW	University of Wisconsin
WARP	Watershed Regressions for Pesticides
WB	Watershed Branch
WHIP	Wildlife Habitat Incentives Program
WLA	waste load allocation
WPDES	Wisconsin Pollutant Discharge Elimination System
WRDA	Water Resources Development Act
WREP	Wetland Reserve Enhancement Program
WRP	Wetlands Reserve Program
WWTP	wastewater treatment plant