Gulf Hypoxia Action Plan 2008

for Reducing, Mitigating, and Controlling Hypoxia in the Northern Gulf of Mexico and Improving Water Quality in the Mississippi River Basin

Mississippi River Gulf of Mexico Watershed Nutrient Task Force

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Sediment loads from the Mississippi and Atchafalaya Rivers empty into the Gulf of Mexico.

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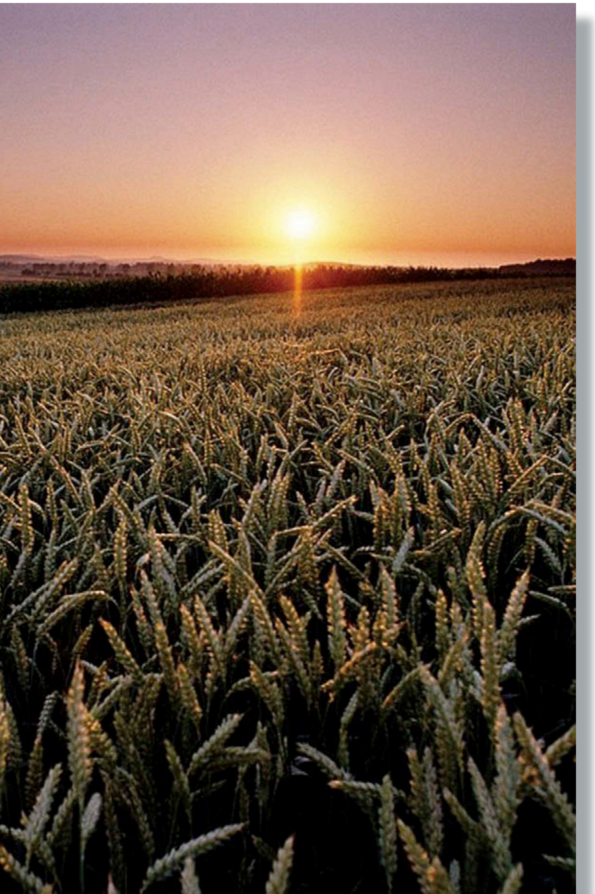

Moving Forward

More than thirty years after the passage of the Clean Water Act, a large area of low oxygen or hypoxia, absent of most marine life and threatening to inexorably change the biology of the region, continues to form in the Gulf of Mexico during periods in the summer off the coasts of Louisiana and Texas. The hypoxia is primarily caused by excess nutrients—originating from the great productivity of Middle American cities, farms, and industries—which cause extensive growths of algae that deplete the oxygen in the water when they die, sink to the bottom, and decompose. The condition is exacerbated by the stratification of the water column—the result of warmer, low salinity surface waters that isolate the organic-rich bottom waters from the surface and prevent oxygen exchange with the atmosphere—which occurs where the Mississippi River meets the Gulf of Mexico.

The watershed of the Mississippi River drains 41 percent of the contiguous United States and includes waters from several major river systems, including the Missouri/Platte River Basin, the Ohio/Tennessee River Basin, and the Arkansas/Red/White River Basin. The Mississippi River Basin includes two functionally distinct zones, each with its own potential to contribute to the reduction of Gulf hypoxia. These zones include the huge Mississippi watershed with its tributary network, and at the lower end of the river system, the deltaic zone that formerly dispersed river water naturally throughout Southeast Louisiana via a distributary (deltaic) network. While the tributaries of the Mississippi River are the sources of nutrient loading to the river trunk, the distributaries within the Mississippi Delta are critical to the final dispersal of nutrients and sediments into the Gulf of Mexico and the salinity of the estuaries and coastal waters.

The distributary zone includes the entire area influenced by river flow south of the Old River Control Structures, where the Atchafalaya River diverges from the lower Mississippi River and

on Gulf Hypoxia

the Red River merges with the Atchafalaya (Figure 1). During the past two centuries the hydrology of the distributary zone was totally modified by the construction of flood levees and closing of key distributaries for flood control and navigation enhancement programs. These structures isolated the river from its delta, causing an ongoing catastrophic collapse in the deltaic landscape, primarily wetlands. The hydrologic changes that have caused such damage to South Louisiana also exacerbate Gulf hypoxia by jetting most nutrient-rich river water and sediments directly into the Gulf of Mexico, bypassing the deltaic wetlands that require the nutrients and sediments.

States and Tribes within the entire Mississippi/Atchafalaya River Basin and Federal agencies 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. In January 2001, the Mississippi River/Gulf of Mexico Watershed

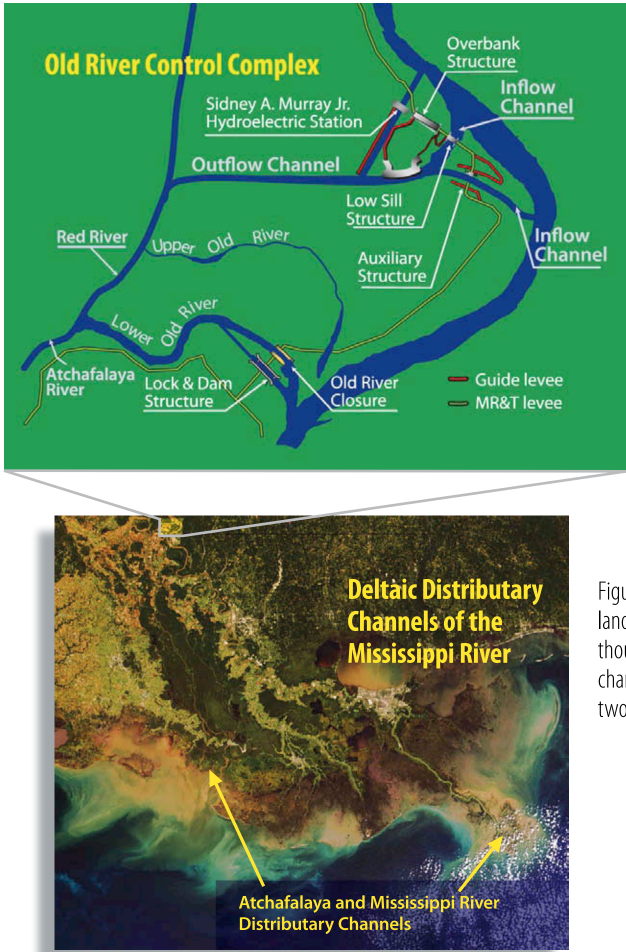

Figure 1. Deltaic plain of Louisiana showing land built, maintained, and nourished over thousands of years by many distributary channels of the Mississippi River, including the two that are currently active.

Nutrient Task Force issued the Action Plan for Reducing, Mitigating, and Controlling Hypoxia in the Northern Gulf of Mexico. The plan was submitted in accordance with the Harmful Algal Bloom and Hypoxia Research Control Act of 1998. The plan stimulated a great deal of collaboration in understanding science and planning; however, much work remains to be done to implement it.

The Task Force has updated the initial plan through a multiple-step reassessment. This *2008 Action Plan* reflects the Task Force's efforts to track progress, update the science, and adapt actions to improve the effectiveness of the efforts throughout the Basin. Building on the *2001 Action Plan*, this plan lays out specific steps that need to be accomplished to reach the goals. It also reiterates the long term goals and continues the Task Force's commitment to an adaptive management approach to reduce the size and impact of the Gulf hypoxic zone and improve water quality in the Basin. This adaptive management approach involves continual feedback between the interpretation of new information and improved management actions and is the key to targeting actions within watersheds where they will be most effective.

Six major policy themes provided direction for the reassessment. These themes address needed improvements to the *2001 Action Plan* within the adaptive management framework and include:

1. Acknowledge the social, political and economic changes and links to emerging issues and policies. The vast drainage basin of the Mississippi/Atchafalaya River Basin and the adaptive management framework of the Action Plan require that the Task Force analyze the broad landscape and policy changes that impact the hypoxic zone and water quality in the Basin. These trends may include wetland trends in both the upper and lower basin, channelization of the Mississippi River and how it affects the hydrology of the Mississippi and Atchafalaya deltas, and the role of energy and agriculture markets on land use in the Mississippi/Atchafalaya River Basin.

2. Ensure greater specificity and accountability and tie to funding strategies. The Task Force must identify the appropriate actions and engage State, Tribal, and Federal agencies and stakeholders to identify the appropriate funding strategies that will be the most effective in ensuring timely implementation to achieve measurable and effective results.

3. Track program and environmental progress. The Task Force needs to improve communication, better understand the results of its efforts, and improve tracking and integration of results into improved design and targeting of adaptive strategies in future reassessments.

4. Adapt to new scientific findings. The Task Force has been active in soliciting and evaluating the latest scientific findings through a series of symposia on relevant topics and advice from a panel of experts under the United States Environmental Protection Agency's (EPA) Science Advisory Board.

5. Maximize opportunities for stakeholder involvement. Given the cooperative and voluntary nature of the Action Plan, the Task Force must engage a wide range of stakeholders and facilitate broad acceptance of the plan in order to maximize opportunities for stakeholders to pursue the identified actions.

6. Reexamine roles and responsibilities of Task Force partners. A reassessment of the roles and responsibilities assigned to the Federal agencies, the States, Tribes, and the Sub-Basin Committees in achieving the goals of the Action Plan will improve future implementation and action.

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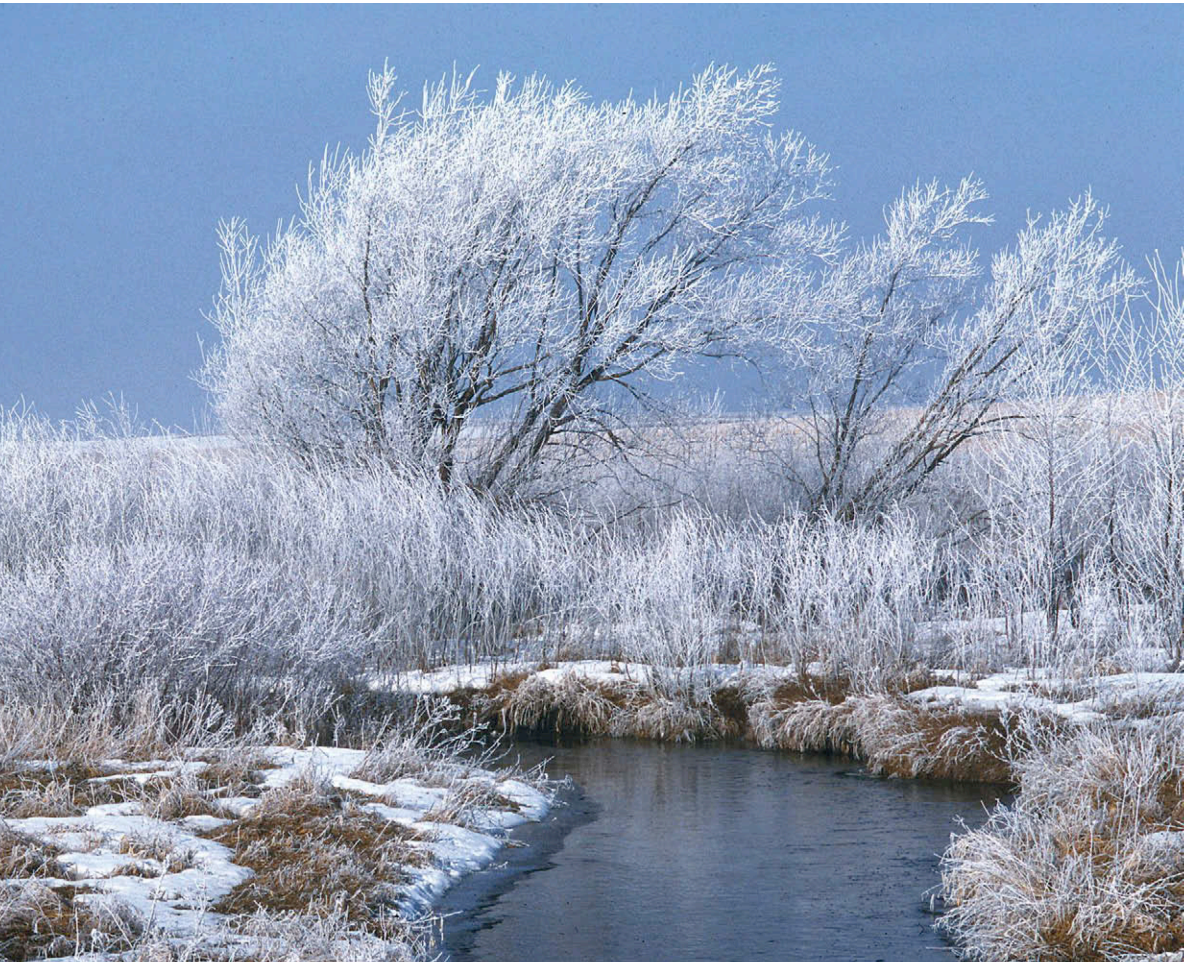
Framework for Action



Bear Creek in Story County, Iowa is a United States Department of Agriculture National Demonstration Area for conservation buffers.

Principles

Throughout the process of the reassessment, the Task Force has reaffirmed these six overarching principles as guidance to reach the three major goals of this plan:

- Encourage actions that are voluntary, incentive-based, practical, and cost-effective;
- Utilize existing programs, including existing state and federal regulatory mechanisms;
- Follow adaptive management;
- Identify additional funding needs and sources during the annual agency budget processes;
- Identify opportunities for, and potential barriers to, innovative and market-based solutions; and
- Provide measurable outcomes as outlined below in the three goals and eleven actions.

Goals

The Task Force has revised and reaffirmed the three goals that conform to these principles and will provide the overall measure of the results of the plan:

1 **Coastal Goal:** Subject to the availability of additional resources, we strive to reduce or make significant progress toward reducing the five-year running average areal extent of the Gulf of Mexico hypoxic zone to less than 5,000 square kilometers by the year 2015 through implementation of specific, practical, and cost-effective voluntary actions by all Federal agencies, States, and Tribes, and address all categories of sources and removals within the Mississippi/Atchafalaya River Basin to reduce the annual discharge of nitrogen and phosphorus into the Gulf.*

2 **Within Basin Goal:** To restore and protect the waters of the 31 States and Tribal lands within the Mississippi/Atchafalaya River Basin through implementation of nutrient and sediment reduction actions to protect public health and aquatic life as well as reduce negative impacts of water pollution on the Gulf of Mexico.

3 **Quality of Life Goal:** To improve the communities and economic conditions across the Mississippi/Atchafalaya River Basin, in particular the agriculture, fisheries and recreation sectors, through improved public and private land management and a cooperative, incentive-based approach.

* The Task Force understands the difficulty of meeting the 2015 goal so is therefore including a revision that takes into account the uncertainty of the task but attempts to maintain momentum and progress achieved to date. As such, at this time, the Task Force accepts the advice of EPA's Science Advisory Board on this topic. . .*"The 5,000 km^2 target remains a reasonable endpoint for continued use in an adaptive management context; however, it may no longer be possible to achieve this goal by 2015. . .it is even more important to proceed in a directionally correct fashion to manage factors affecting hypoxia than to wait for greater precision in setting the goal for the size of the zone. Much can be learned by implementing management plans, documenting practices, and measuring their effects with appropriate monitoring programs."* (EPA Science Advisory Board 2008, 2).

Critical Needs

Much planning and implementation is under way at the local level, as well as through federal and state programs, to address scientific and management concerns and to put the conservation practices and management practices and technologies in place to reduce nutrient loads. Progress is being made; however, ongoing programs, rather than new initiatives, are responsible for most of the progress. Furthermore, progress is often the result of collateral benefits resulting from actions States and Federal agencies have taken independently of the hypoxia Action Plan to generally improve the state of the science, restore local water quality, or improve the efficiency of industrial and agricultural activities. The Task Force members are committed to continue, within these existing programs, current activities that contribute to meeting the goals of this plan, while increasing the targeting within this reassessment to fill gaps that are observed within the existing programs.

However, while landowners, States and Federal agencies have undertaken numerous nutrient reduction activities, these activities have not resulted in a reduction of the hypoxic zone. Resources are insufficient to attain the goals of the Action Plan, and the lack of resources is the primary barrier to successful implementation of the plan. Federal, state, and local governments and non-governmental organizations all have a role in the reduction in the size of the hypoxic zone. To achieve results, significant resources must be provided and targeted toward implementing the most effective nutrient reduction actions in Mississippi River Basin states with the greatest loadings of nitrogen and phosphorus to the Gulf. The difference between the results that might be achieved using existing programs and resources and the results that would be realized with additional legislative, regulatory, or financial support is considerable. These specific, critical needs are summarized later in this document and will be defined more precisely in the Annual Operating Plan that accompanies this document. The Annual Operating Plan will also describe the interim steps, funding needs, and associated timeline that will guide implementation of the eleven actions listed in the final section of this Action Plan.

Water Quality Credit Trading Program

The nutrient trading program administered by the Miami Conservancy District for the Great Miami River Watershed in Ohio allows National Pollutant Discharge Elimination System (NPDES) permitted dischargers to purchase credits from best management practices installed by upstream nonpoint sources (i.e., agricultural producers) to offset nutrient loadings. While no Total Maximum Daily Load (TMDL) is in place yet, point sources in the watershed are concerned that upstream nonpoint source loadings will result in a stringent TMDL in future years. The point sources are purchasing reductions upstream in order to improve water quality enough to lessen the stringency of or eliminate the need for a TMDL. The program also employs trade ratios to encourage early investing. The trades are administered in a reverse auction format, where nonpoint sources submit bids for the amount they will accept in order to implement practices. Currently, there are 28 projects and more than 112 tons (244,606 lbs.) of nutrient reduction is targeted over the terms of the projects. Funded best management practices include conservation tillage, conservation crop rotation, conservation cover, milk house/cow lot treatment, pasture seeding/prescribed grazing, sod establishment, hayland, manure storage, grid sampling/variable rate technology, and filter strips.

Bottomland hardwood forests improve water quality by filtering and flushing nutrients and by reducing sediment before it reaches open water.