State of Wisconsin

Department of Agriculture, Trade and Consumer Protection

Department of Natural Resources

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To John Fields or	From Dept. Ag.	
Co./Dept. Hypoxia Group	Co. Dept. Nat. Res.	
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August 2, 1999

Gulf of Mexico Hypoxia Working Group
National Centers for Coastal Ocean Science
WS 13446 SSMC4
1305 East-West Highway
Silver Spring, MD 20910

Subject: ***Gulf of Mexico Hypoxia Assessment***

Dear Members of the Hypoxia Working Group:

We are writing to express our comments in response to the May 4, 1999 notice in the Federal Register of technical reports regarding hypoxia in the Gulf of Mexico. Wisconsin is very concerned about the findings of these scientists that this oxygen depletion condition exists in the Gulf of Mexico and is apparently getting worse. We support the need to learn more about this predicament and to take appropriate steps. The work that has been put into these reports is very helpful in better understanding the dimensions of the hypoxia and possible causes.

It is our understanding that these reports were intended to be a first step in developing a common understanding of the problems in the Gulf. The reports were to include the sources of those problems from throughout the drainage basin, the possibility for improvements or restoration and the suggested actions that could have positive impacts on the Gulf situation. We believe that the approach of engaging the scientific community at the outset has been an effective means to collect the best science and through a public review and analysis process identify areas of agreement as well as areas where data gaps or valid technical disagreements exist. We acknowledge the hard work that many dedicated individuals performed in producing the assessment reports. However, our staff identified some specific technical concerns that still need to be addressed. We have attached this list of technical concerns for your consideration in developing the upcoming integrated report.

We are now at a point in the overall process where it is critical to fully involve state representatives. The next stages, the integration report, and the action plan, will go beyond science and data and begin to incorporate legal, political, and social aspects into the planning process. Only with state representation can you obtain the necessary expertise to develop meaningful and effective management programs in a basin as large and diverse as this basin.

From the same perspective, the absence of state involvement in the preparation of these reports has resulted in reports which did not utilize the full data sets which exist (because of reliance of published reports) or the most recent information regarding agriculture practices. There is also a lack of consideration of the implementation of federally subsidized conservation reserve program or wetland reserve projects or in states like Wisconsin with large state nonpoint management programs, implementation of best management practices in the target areas.

These limitations in the technical reports again mandate the full involvement of state representatives to most accurately reflect the current state conditions.

The State of Wisconsin is recognized as a leader in preserving the quality of our environment. We have a long history of blending both regulation and cooperation into effective management strategies that allow us to take advantage of the energy and creativity of the citizens of this state whether they live in the cities or the rural areas. Our approaches have also allowed looking at issues comprehensively to ensure that environmental investments can return multiple benefits. Therefore, we were pleased to note that the report dealing with the reduction in nutrient loads suggested a combination of sectors and actions. Differences among the states will mandate diverse management expectations if we are to be effective in not only protecting an important national resource like the Gulf, but also the resources and livelihoods of all the citizens in the basin.

We believe it is critical that the assessment that will summarize the findings in these reports focus strictly on the science of the problem and not contain recommended solutions, which is the policy that should follow the technical work. Following the public review and completion of the assessment, the preparation of an action plan should be a joint effort with the states. This partnership is essential to successfully manage an ecosystem of this scale.

We are committed to participating in the development of the assessment and the action plan. Thank you for an opportunity to comment and we look forward to a fuller involvement.

Sincerely,

George

George E. Meyer, Secretary
Wisconsin Department of Natural Resources

Ben Brancel

Ben Brancel, Secretary
Wisconsin Department of Agriculture, Trade and Consumer Protection

c: Carol Browner, EPA
Francis X. Lyons, EPA, Region 5
NOAA Coastal Ocean Program

TECHNICAL CONCERNS FROM THE STATE OF WISCONSIN DEPARTMENT OF NATURAL RESOURCES AND DEPARTMENT OF AGRICULTURE, TRADE & CONSUMER PROTECTION REGARDING THE *GULF OF MEXICO HYPOXIA ASSESSMENT*

August 2, 1999

Characterization of Hypoxia

1. Additional work needs to be done to show the areal extent of hypoxia prior to, and at 50- or 100-year intervals since European settlement. This information needs to be presented in a map form that may be compared against the maps of hypoxia shown in the assessment for the years 1992-1995. More recent maps showing the areal extent of hypoxia in the years since 1995 should also be made available.

Ecological and economic consequences of hypoxia

2. We support the recommendations in section 5.3 of the Report for Topic #2: "A comprehensive research plan is needed as a focus for efforts directed at assessing both ecological and economic effects of hypoxia in the northern Gulf of Mexico."
3. More work needs to be done to determine in-stream loss of nitrogen, such as denitrification or burial in reservoirs or in flood plains, to understand the degree to which nitrogen deposited in the upper reached of the Mississippi River Basin are actually delivered to the Gulf of Mexico.
4. Impacts on the fishery and the economic implications are based on examples from other locations and may not be representative of actual Gulf responses.

Flux and sources of nutrients in the Mississippi-Atchafalay River Basin

5. We believe you have not taken full advantage of analyzing available state water quality data. For example, sub-basin loadings exist and are available for many tributaries in the basin. These data should be collected, compiled, and added to the data sets that were used to identify the significant nutrient source tributaries.
6. Additional work needs to be done to identify and include estimates of nitrogen contributions to the atmosphere from municipal and industrial facilities and motor vehicles. Prior published research indicates total air deposition of nitrates may be equal to 174 percent of the average total annual flux of nitrate to the Mississippi River Basin, and that air deposition may account for up to 23 percent of the total nitrogen load (this assessment indicates that the relative contribution is 10 percent).
7. Additional work needs to be done to identify nutrient, sediment, and water flux to the Gulf of Mexico prior to 1950. For example, published data from U.S.G.S indicates sediment delivery was approximately double in the 1700s, compared to delivery rates today. Composition of the particle size of the delivered sediment radically changed after the

introduction of extensive lock and dam systems in the 1950s, significantly reducing the coarse fraction.

8. Additional research and computer modeling needs to be done to characterize the quantity and quality of flood flows "before" and "after" the construction of locks and dams, and extensive reductions in the riparian in the Mississippi River basin. These models should also consider the influence of the inter-coastal wetland areas in moderating flood flows, along with the "before" and "after" impact of off-shore oil extraction on inter-coastal wetland areas. In particular, this research should identify the effect of the available flood storage capacity and areal extensiveness of wetlands on the ratio of organic and inorganic nitrogen, the ratio of colloidal, fine, medium, and coarse sediments, and the extent and duration of flood levels of fresh water delivered to the Gulf of Mexico.

9. Identification of nitrogen as the major causative factor with hypoxic conditions in the gulf is not clearly correlated with the trend data that is illustrated in the reports. Further, nitrate flux is characterized as steadily increasing since the 1950's to a level that is three-times greater. A more accurate depiction is that nitrate levels peaked in the early 1980s and have been steadily declining, with the exception of the 1993 flood year. While reducing nitrogen loading should have positive impacts from the perspective of either or both local and regional water quality conditions, additional modeling work could improve the understanding of the relationship of nitration flux in tandem with fresh water flux to the problem of hypoxia in the Gulf of Mexico.

10. The relationship and relative impacts of nitrogen, phosphorus and silica loads in terms of enriching the Gulf productivity versus inducing hypoxic conditions needs to be better understood. In particular, additional work needs to be done to identify how the reduction in volume and change in composition of the size fraction of the suspended sediments influence the bottom morphology and benthic habitat of the Gulf of Mexico, and the relationship this may have on conditions contributing to hypoxia formation.

Effects of reducing nutrient loads to surface waters within the Mississippi River Basin and the Gulf of Mexico.

11. More work needs to be done in evaluating the Gulf system response to nutrient reductions both in terms of load reductions levels and time of response.

12. The analyses did not include the results of nonpoint source program implementation ranging from BMPs to wetland reserve or restoration acreage.

13. The importance of the coastal wetlands to the gulf fishery and the relationship to solids, nutrient, and sediment loading in the basin needs to be better understood through data collection and modeling.

Reducing nutrient loads, especially nitrate-nitrogen, to surface water, groundwater, and the Gulf of Mexico.

14. We support the stated need for linkage of the water quality model with the hydrodynamic model of Gulf of Mexico circulation, expansion of the model spatial domain, and refinement of horizontal and vertical spatial resolution in the model, along with expanding the water quality model itself to include a sediment diagenesis submodel, multiple phytoplankton groups and silica as a potential limiting nutrient. In addition, the models should consider the relative amounts of inorganic nitrate to organic nitrogen found in the water.

15. We support the stated need for additional study to determine the advantages or disadvantages of large scale diversions of the Mississippi River into the coastal zone.

16. The remedial options should be considered options only and not proposed solutions.

17. It is critical that the next phase of the planning effort define the management target for the Gulf so that alternative management approaches can be modeled against that target. The variables in the gulf could include horizontal and vertical extent of hypoxia, duration severity of conditions or combinations of these four measures of effect.

Evaluation of economic costs and benefits of methods for reducing nutrient loads to the Gulf of Mexico

18. The economic value of the Gulf fishery and the value of the basin agriculture need to be assessed more completely.

19. The analysis should include the (long-term) reductions in atmospheric sources of nitrogen that would result from transition to the "fuel-cell" technology for power generation and automobiles, and the affect that this would have on air deposition rates of nitrogen.

20. The analysis should identify the number of years in which a significant (20 percent) reduction in nitrogen loadings would be achieved, given the current rate of nitrogen level reductions and the current degree to which conservation plans and practices are being adopted by agricultural land users.

21. The analysis should address the costs of restoring wetlands for flood storage purposes, as well as potential nitrogen reduction purposes.