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

Re: Comments on Council on Environmental & Natural Resources (CENR) Hypoxia Work Group Reports

I would like to complement the various committees on their compilation of a vast amount of information from a wide array of sources in a very short period of time. I believe that they have done a credible job of data assemblage in the time frame allowed. However, as with any job of such proportions, errors and omissions occur and misinterpretations creep in. On behalf of agriculture in Louisiana and otherwise in the Mississippi River Basin, I must comment on some of our most critical concerns.

First of all the short period of time that has been made available to review this mass of information and to respond was grossly inadequate. We were not informed that the reports were available until the Hypoxia meeting in Memphis on June 30, 1999. Only one of the reports was available for distribution at that meeting. Accessing them by Internet proved to be a laborious endeavor. I asked our faculty in various areas to review and comment on the reports and they have done so, but all have commented that the time period was too abbreviated for a thorough review. Actions to date indicate that agriculture is being targeted. With this in mind, it would have been contributory to a balanced interpretation of the data and its completeness if agriculture would have had the full 90 days to prepare its comments. This not being the case, we are submitting the following abbreviated and quickly constructed concerns.

The existence of a large area of low oxygen concentration in the Gulf of Mexico to the west of the mouth of the Mississippi during the summer and early fall cannot be disputed, and all scientists should be concerned about its impacts on Gulf of Mexico fisheries. That this area is responsive to the flow of the Mississippi and its contributions of sediment and nutrients and other factors not yet fully understood is not in question. The historic significance of this occurrence, however, has not been determined, nor has the true threats and/or benefits of Gulf nutrients been adequately evaluated. The fact that Louisiana leads the nations in many categories of marine fisheries landings (i.e.,

shrimp, blue crabs, oysters, yellowfin tuna, menhaden) is no accident. The tremendous northern Gulf fisheries and wildlife productivity is heavily dependent on the Mississippi River nutrient laden freshwater, and actions affecting this important natural function must be approached cautiously. The Mississippi has always carried a load of rich sediment. The alluvial soils of Louisiana were built by these deposits. Unquestionably, the channeling of the Mississippi for flood control has concentrated the outflow into a few channels and may have concentrated the area of low oxygen. This same channeling has contributed greatly to the loss of our coastal wetlands on which many of our estuarine fisheries species depend for their growth and reproduction.

The panel evaluating Hypoxia-related fisheries impacts could not document any significant problems. The reported decline in the brown shrimp harvests may well be attributable to the loss of nursery grounds from coastal erosion. In general, the harvest and catch per unit of time do not appear to be negatively impacted for pelagic species in the Gulf. Oceans worldwide where hypoxia has been associated with fishery declines have also experienced problems with serious pollution and long-term over fishing. Chesapeake Bay is an estuary without the openness of the Gulf and is not comparable. The use of these areas to forecast doom for the Gulf is without scientific merit. The panel correctly recommends further study before any conclusions can be reached on hypoxia-related Gulf fisheries impacts.

The panel on nutrient source and flux concentrated almost exclusively on agriculture as the primary nutrient loading source. Agriculture was poorly represented on the panels, and this may have resulted in inadequate data collection and interpretation. Some of the soils in the upper-Midwest are shallow overlaying glacial till and cannot be compared to deeper soils with intervening clay layers farther south. The inclusion of rice fields and fields with ditches for draining surface runoff into the same category with tiled fields is not sound, and runoff from rice fields cannot be compared to tile drainage from Wisconsin corn fields. The rate of nitrogen loss from cultivated fields in different areas of the Mississippi drainage requires further study on a more localized basis. The nitrogen content of the drainage from tiled fields is reflected in the water data although it is not clear what percentage of the nitrogen gets into the streams from the field edge. It is also not clear what percentage of the fields are fertilized in the fall or how many farmers apply "insurance" nitrogen. Farm fertilizer, manure applications, soil mineralization and natural soil nutrient discharges are important sources of nitrogen in the waters of the Mississippi drainage, however, more research is needed to actually quantify the true significance of these nutrient contributions.

Additionally, we believe that the contribution of other nitrogen sources has have not been adequately appraised. The first of those is point source contribution from municipal waste water treatment plants and home sewage treatment systems. According to the report on sources of nutrients, there are 11,500 municipal and industrial waste water treatment plants in the MRB. The discussion in the text

admits that the data base may not be complete, but proceeds to calculate as though it were. This area certainly requires further study. The contribution of home septic systems, particularly in times of floods or storm events has not been addressed.

The elevated nutrients in streams following storm events have been attributed to the flushing of excess nitrogen stored in the soil. Unquestionably, this occurs, however, storm events of 3 or 4 inches create storm surges in sewer systems that most plants cannot handle. In these events it is normal practice for plant operators to open bypass valves and discharge directly into the receiving stream to protect the plant. A one and one-half inch rain recently created a 100 million gallon storm surge at Baton Rouge, LA sewer plants. Floods also inundate sewer systems and plants, especially systems using oxidation ponds or wetlands as treatment systems, and wash the nutrient rich contents into streams. As noted in the report, storm events have become more common and this pattern is expected to continue. Sewer-related nutrient contributions are not adequately addressed in the report.

The nutrient contribution of storm water from urban areas was considered to be insignificant by the panel. Urban areas constitute 0.6% of the basin or 4,757,295 acres. A 1998 USGS report of a 3-year runoff water quality study conducted in Baton Rouge, LA, showed an average of 14.7 pounds per acre per year of nitrogen in runoff from commercial, industrial and residential areas. The residential area sampled released 21.6 pounds of nitrogen per acre per year. These residential rates could be significant on a basin-wide basis if they are consistent across the area. Garden shop sales of fertilizer were $8.3 billion in 1997 and $8.4 billion in1998. At $20 for 50 pounds of fertilizer, this dollar volume would equal 10,500,000 tons of fertilizer sold to homeowners nationwide. Using this assumption, homeowner fertilizer applications equal approximately ½ of the amount by volume applied commercially by farmers in the MRB; however, this volume is applied to only 0.6% of the basin land area. The 21 pound per acre annual nitrogen contribution to storm water seems modest when these estimated urban application rates are considered.

Additionally, there is considerable variance between an early estimate of atmospheric nitrogen deposited in the basin by Dinnel (1995) who estimated atmospheric deposition at 174% of riverine flux. The current report estimates this contribution at about 85% of the flux. No discussion of the differences is included in the report.

Another concern relates to the possibility that a significant portion of the excessive shallow water Gulf nutrients may be contributed by a quickly degrading coastal ecosystem. Louisiana is currently losing 20-25 square miles of coastal wetlands per year. These fragile organic soils make up some of the riches soils in America. It has been estimated that each square mile may contain 1.28 billion pounds of organic matter and sediment per foot of depth. The potential impact of this nutrient contribution does not seem to be adequately considered in the panel reports. A major recommendation needing consideration is stepped up strategies that adequately address coastal restoration in Louisiana. Any actions that reduce coastal land loss will also significantly reduce a

major Gulf nutrient source. Additionally, restoration actions involving the enhanced diversions and flow of nutrient/sediment rich River water will not only help restore land area and vegetation but help reduce nutrient loads. The placement of River nutrients and sediments in degraded coastal wetland areas would greatly benefit the marsh and may help reduce hypoxia as well.

The proposed remedies listed in the CENR report appear drastic for a problem that has not been fully established. The transformation of 24 million acres of the Mississippi River Basin into wetlands and/or riparian zones will remove 3.4% of the basin from agricultural production. Homes and farm families will have to relocate, and their relocation will occupy more upland land areas. The implementation of a mandatory 20% reduction in the use of nitrogen fertilizer may jeopardize the financial survival of a great many of the corn and wheat farmers in the most productive farmland in the U.S. and the world. The assertion that local commodity prices will rise to make up for the lost yield simply denies any real understanding of how agricultural commodities are priced. Many other factors must be considered (i.e., imports, foreign production adjustments, etc.) when world commodity market price predictions are evaluated objectively.

Great nonpoint source runoff reducing advances have been and are being made in the MRB through the voluntary implementation of Best Management Practices (BMPs). With proper farmer financial incentives, there will no doubt be expanded BMP adoption nationwide. Successes include widespread use of conservation tillage, nutrient management, animal waste management, and integrated pest management (IPM). Additionally, water quality related research and extension efforts within the LSU Agricultural Center have and will continue to expand. Secure funding for these efforts, however, must be available.

In closing, we highly suggest that questions regarding the source of Mississippi River nutrients, measurable fisheries impacts, and reasonable / effective management alternatives be addressed before additional hypoxia-related policy actions are proposed. We must continue to work together to reduce agricultural related nonpoint source runoff, however, mandatory policy actions should not replace the cooperative, voluntary actions that are now being implemented by producers throughout the MRB. Proposed actions should not devastate the most productive agricultural region in the country.

Sincerely,

Bill Richardson

William B. Richardson, Chancellor
and Chalkley Family Endowed Chair

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