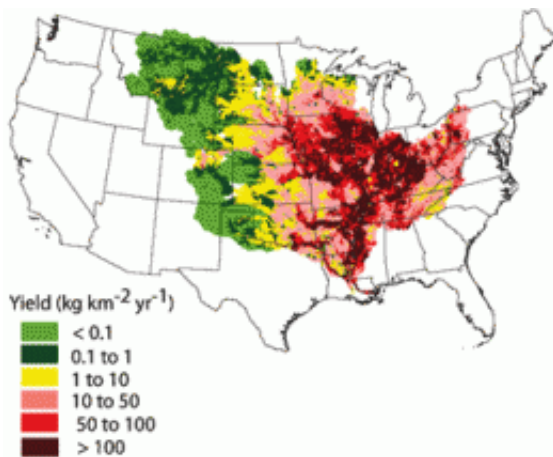


The Mighty Mississippi Basin and Gulf Suffocating: Inertia Not An Option

July 27 2009, by Mary Anne Simpson



Phosphorous Delivered to Gulf of Mexico. Courtesy of USGS

The Water Science and Technology Board, (WTSB), Division on Earth and Life Sciences of the National Research Council has released for publication its study for improving water quality in the Mississippi River Basin and Northern Gulf of Mexico. The purpose of the study was to create an action plan for reducing nutrient load in the effected areas causing low levels of oxygen and creating a condition called hypoxia.

Hypoxia is caused by an excess discharge of nutrients, in particular phosphorous and nitrogen into a waterway. A chain of naturally occurring events take place which include widespread [algae blooms](#) and ends with the decomposition of the dead algae blooms which in turn

depletes dissolved oxygen from the water column causing hypoxia in the Northern Gulf of Mexico and Mississippi River Basin.

The hypoxic conditions and related [nutrient](#) pollutants in the basin region literally chokes the oxygen from the waterway causing [fish](#) kills and potential toxic effects to humans and fish alike. The problem has increased dramatically over the past decades for varying reasons including changing land use, urbanization and the introduction of new varieties of agricultural products.

According to the study, "Nutrient Control Actions for Improving Water Quality in the Mississippi River Basin and Northern Gulf of Mexico, 2009" data compiled since 1985 of the region is complicated by the fact that the source of phosphorous and nitrogen discharges are attributable to numerous watersheds and tributaries involving a huge land mass spanning 31 states, covering approximately 41-percent of the conterminous land in the United States with multiple governmental authorities responsible for managing the Mississippi River Basin leading to the Gulf of Mexico. Cooperative efforts between state, federal and cross-discipline regulatory schemes (ie. water quality and nutrient control) was key in the assessment of downstream effects and analysis of decades of data in order to create the WTSB recommendations.

The plan for implementation was produced by the National Research Council, WTSB at the behest of the U.S. Environmental Protection Agency and Department of Agriculture with the objective of implementing the Clean Water Act. The specific charge of the request was to advise the EPA in the following areas: 1) initiate nutrient pollutant control programs; 2) identifying alternatives for allocating nutrient load reductions across the river basin and 3) documenting the effectiveness of pollutant loading reduction strategies on the gulf hypoxic zone and state designated uses. Special committees were formed and met during the last half of 2008 under the auspices of the WTSB.

The final report and study recommends a long terms solution to the hypoxic conditions present in the Mississippi River Basin and the Northern Gulf of Mexico. The proposed plan to reduce nutrient discharges across the river basin and ecological water will take up to a decade to realize a difference in water quality downstream in the gulf. Nine states; Arkansas, Illinois, Indiana, Iowa, Kentucky, Mississippi, Missouri, Ohio and Tennessee contribute three-fourths of the phosphorous and nitrogen discharged into the Gulf of Mexico, according to the American Chemical Society study by Anderson et. al. 2008.

WTSB recommends a targeted approach to curb nutrient discharges by prioritizing intervention at the highest nutrient loading areas by directing conservation in watershed areas located in the river basin area. As a corollary objective the EPA and Department of Agriculture should identify specific areas within watersheds where the expenditure of funds and resources will have the highest probability of achieving a positive result.

WTSB suggests EPA and the Department of Agriculture establish a Nutrient Control Implementation Initiative, (NCII) and a new Mississippi River Basin Water Quality Center. The WTSB further recommends certain goals for evaluating, demonstrating and creating an institutional model for local, state and federal counterparts to share research and their efforts to control nutrient discharges. WTSB recommends that Municipal and industrial point dischargers should be required as a condition to their permit under the National Pollutant Discharge Elimination System to monitor phosphorous and nitrogen levels. Further, WTSB recommends a cost analysis of community and governmental efforts of various nutrient control actions. Lastly, conduct a pilot project and compile and disseminate a best practices guidelines.

According to the report, the most significant task for improving water quality everywhere, but in particular the Mississippi River Basin comes

from nonpoint source pollutants derived from runoff flowing across agricultural land, forests, urban lawns, streets and other paved areas. The primary culprit for this region is the use of nitrogen and phosphorous based fertilizers used in agriculture. A relatively recent change in land use including subsurface drainage, increase demand for commodities and use of fertilizers with added boosts of phosphorous and nitrogen has made the most significant impact in nutrient pollution in the region.

Row crops like soybeans and corn contribute 25-percent phosphorous and 52-percent nitrogen of all nutrients in the Gulf of Mexico. Pasture and range land is the next highest source of nutrient discharge with a combined discharge of 42-percent, 'other crops' discharge approximately 32-percent of all nutrients with 'urban and population' contributing 21-percent. The least nutrient discharger is 'natural land' and atmospheric conditions contribute only nitrogen at a rate of about 16-percent.

The report states that unequivocal and decisive action is necessary for the implementation of its recommendations. For years the region has languished in a state of inertia due to a variety of reasons. Some reasons simply lack awareness of the current scientific knowledge gathered by the USGS SPARROW modeling team identifying sources and related work developing an adaptive management paradigm. More importantly, the expansive, complex, ecosystem combined with an ever fluctuating human factor will never have a perfect approach. The quest for perfection has in effect resulted in no action whatsoever to ameliorate the deteriorating conditions.

Other objections by some include a lack of knowledge of the level of reduction of nutrient discharges it would take to improve water quality. The report finds that whether the recommended Mississippi [River Basin](#) Water Quality Center uses the EPA's 45-percent reduction of nutrient discharges or 20 to 30-percent reduction in nutrient discharges is not the

pivotal question. A dramatic reduction in phosphorous and nitrogen is necessary now. Other objections include state and federal conflicts, leadership and other bureaucratic turf wars for funding.

The report concludes that the Clean Water Act has broad authority and overlapping authority with the states concerning nutrient use and discharge into the region. Governmental agencies and non-profit association do have access to resources including conservation and remediation funding. The recommended [Mississippi River Water Quality](#) Center would serve as the vehicle to incorporate federal, state, private sector, NGOs and interested citizens in the creation of an overall plan of action. The report indicates that the current state of inertia is not an option.

Source:

[Nutrient Control Actions for Improving Water Quality in the Mississippi River Basin and Northern Gulf of Mexico](#) (2009), Water Science and Technology Board (WSTB)

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Citation: The Mighty Mississippi Basin and Gulf Suffocating: Inertia Not An Option (2009, July 27) retrieved 26 April 2024 from <https://phys.org/news/2009-07-mighty-mississippi-basin-gulf-suffocating.html>

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