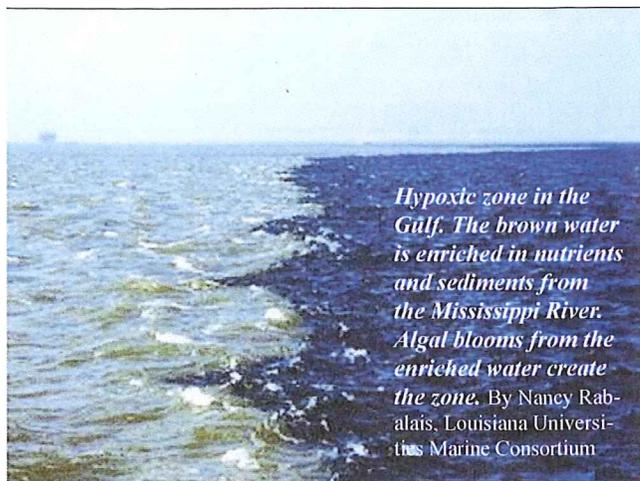


Dead Zone

Task Force seeks solution to nutrient pollution in the Gulf of Mexico

By Allison Fleck
Division of Water

Agencies working to reduce oxygen depletion in the Gulf of Mexico caused by nutrient pollution in the Mississippi River say that partnerships, funding and community involvement are key elements in the effort to develop and implement a coordinated strategy to reduce the volume of nutrients entering the Gulf via the river.



Hypoxic zone in the Gulf. The brown water is enriched in nutrients and sediments from the Mississippi River. Algal blooms from the enriched water create the zone. By Nancy Rabalais, Louisiana Universities Marine Consortium

In April, the Kentucky Division of Water and the Soil and Water Conservation Society hosted the biannual meeting of the Mississippi River/Gulf of Mexico Watershed Nutrient Hypoxia Task Force in Louisville. Membership on the Hypoxia Task Force includes five federal and 12 state agencies with responsibilities overseeing activities in the Mississippi River and its basin and in the Gulf. Kentucky became a member in 2010. The task force provides guidance and support for organizations working on nutrient reduction. The meetings provide an opportunity for members to share ideas, report achievements and coordinate future plans.

What is hypoxia?

Hypoxia means “low oxygen” and is primarily a problem for estuaries and coastal waters. It can be caused by a vari-

ety of factors, including excess nutrients and waterbody stratification due to saline or temperature gradients.

Many of us think of nutrients as good things. After all, humans and animals eat food to obtain vital nutrients for growth and development. In the context of water, nutrients refer primarily to nitrogen and phosphorus, but in both cases it is possible to get too much of a good thing. The nutrient increase in the Gulf of Mexico

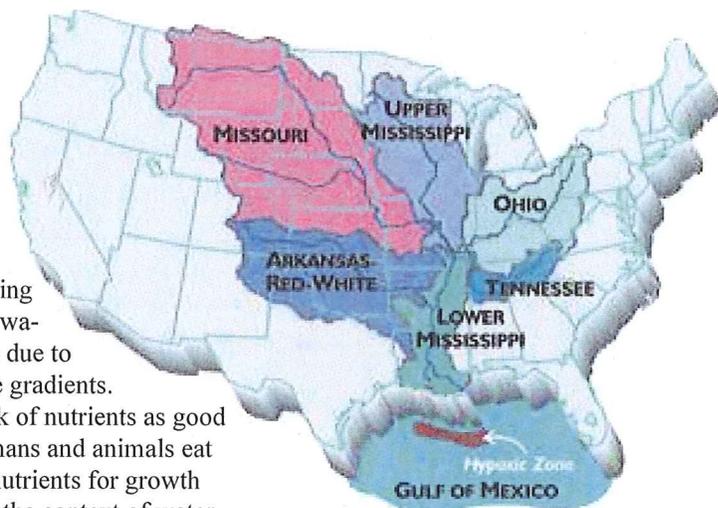
has been attributed to several sources:

- Over-application of fertilizers on agricultural fields, golf courses and suburban lawns.
- Erosion of soil full of nutrients.
- Discharges from sewage treatment plants.
- Deposition of atmospheric nitrogen.

Within the past 50 years, the over-enrichment of water by nutrients has emerged as one of the leading causes of water quality impairment. When too many of these nutrients run off into waterways, they upset the natural balance of aquatic ecosystems and cause immense algal blooms that overrun waterways and block sunlight. As dead algae decompose, oxygen is consumed in the process, resulting in low levels of oxygen in the water. When the concentration of dissolved oxygen decreases to a level that can no longer support living aquatic organisms, hypoxic areas, or “dead zones,” occur.

Why are dead zones worse in summer?

The hypoxic zone in the Gulf of Mexico forms every summer as a result of spring rains washing excessive nutrients into the Mississippi River, which then carries them into the Gulf. Because the nutrient-laden freshwater is less dense and



This map shows the watersheds that contribute to nutrient loading in the Gulf by way of the Mississippi River. Inside Climate News image

remains above the more dense saline gulf water—and the freshwater being warmer—stratification of the water results, preventing the mixing of oxygen-rich surface water with oxygen-poor water on the bottom of the Gulf. Without mixing, oxygen in the bottom water is limited and the hypoxic condition remains.

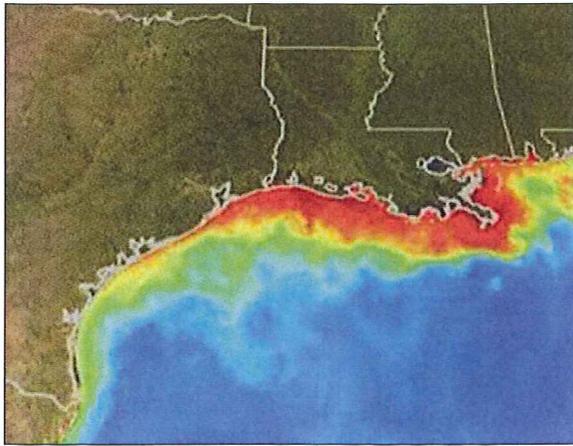
National Oceanic and Atmospheric Administration (NOAA) scientists found the size of the 2012 dead zone to be the fourth smallest since mapping of the annual hypoxic began in 1985. At that time it was roughly the size of Delaware at 2,889 square miles. The smaller size was attributed to prevailing and persistent drought conditions. The largest dead zone yet recorded was in 2002 and measured 8,484 square miles.

This summer, NOAA is predicting the dead zone will be larger than average due to heavy spring rains, late snows, above-normal river levels and forecasts for continued above-normal precipitation in the Mississippi Basin.

Why is it important to reduce dead zones?

Direct effects of hypoxia include fish kills, which deplete valuable fisheries and disrupt ecosystems. Mobile animals, such as adult fish, can typically move to waters with more oxygen during hypoxic events, while less mobile or immobile animals, such as oysters, crabs and shrimp often die.

Continued on next page



NOAA data was used to create this image of the Mississippi River dead zone in the Gulf of Mexico. Reds and oranges represent low oxygen concentrations. NOAA image

Iowa supported the state's 2012 Nutrient Reduction Strategy and encouraged Iowans, policy makers, farms, business and academia to embrace the plan's implementation.

Water quality trading through partners is also an

important tool to reduce the nutrient load in the Ohio River Basin. It allows facilities with high pollution control costs to buy reduction credits from entities with lower costs, such as farmers who implement conservation practices on their land. Kentucky, Indiana and Ohio recently signed such an agreement with the Electric Power Research Institute.

Land grant universities are essential partners as well, said Dr. David Shaw, an agriculture scientist at Mississippi State University. Shaw said academic institutions are well positioned to facilitate dis-

cussions among farmers, crop consultants and product suppliers.

• Funding

With federal funding for nutrient reduction remaining tight, private sources of funding are becoming more essential. Bill Herz with the Fertilizer Institute in Iowa said the nonprofit Foundation for Agronomic Research helps fund projects to improve and sustain agriculture while protecting and enhancing the environment. The institute sponsors the 4R Nutrient Stewardship program, which encourages farmers to use "the right fertilizer source, at the right rate, at the right time and in the right place."

In Illinois, the Nutrient Research & Education Council is funded by private money through a \$.75 per ton assessment on each ton of fertilizer sold in the state to fund projects that promote nutrient stewardship and enhance communication.

• Communication

Tom Blewitt with the University of Wisconsin Extension Service said it is important to communicate with

Continued to Page 12

Hypoxia also affects the ability of young fish or shellfish to find the food and habitat necessary to become adults. As a result, fish and shellfish stocks may be reduced because fewer young reach adulthood, and species that rely on those fish for food may also be affected.

Nutrient pollution is devastating to communities that depend on ecosystem services like tourism, recreation and fisheries. For people living alongside these waters, the decaying smell and the toxins released by the algae can irritate eyes, throats and skin.

What is being done to solve the problem?

Hypoxia Task Force's 2008 Action Plan describes a national strategy to reduce, mitigate and control hypoxia in the northern Gulf of Mexico. The plan stresses voluntary actions, use of existing programs, partnerships, private funding sources and education and outreach. During the April meeting, several members reported on progress being made by their agencies and states.

• Partnerships

Nancy Stoner, the Environmental Protection Agency's (EPA) acting assistant administrator for water, said federal agencies are assisting states with water quality monitoring, outreach and data analysis. For example, the U.S. Department of Agriculture sponsors the Healthy Water Initiative while NOAA modeling helps provide the basis for tracking the size and extent of the hypoxic area.

The Agribusiness Association of

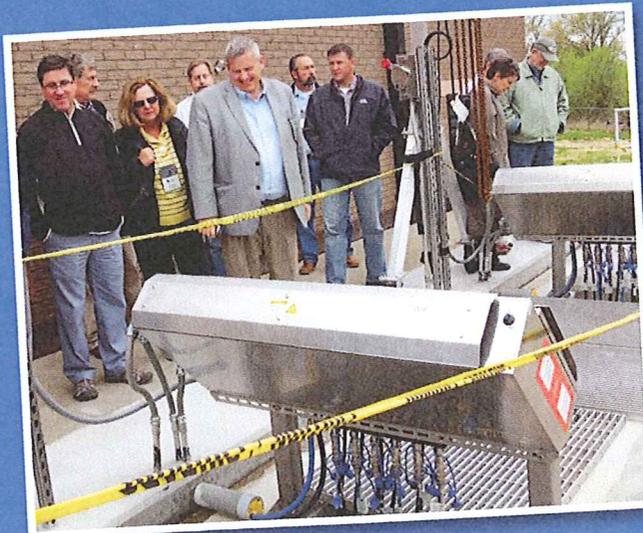
On the Home Front

Hypoxia Task Force members toured the Floyd's Fork water quality treatment plant to learn about Kentucky's efforts to reduce nutrient loading to local waterways that eventually reach the Gulf. The plant treats wastewater to tertiary-level standards, meaning at least 90 percent of its major pollutants are removed before

being discharged into the Floyd's Fork Creek, a tributary to the Salt River, which empties into the Ohio River, traveling into the Mississippi River and finally into the Gulf of Mexico.

At left, members look at the ultra-violet emission panels used to disinfect wastewater at the plant.

Photo by Allison Fleck



Dead Zone

Continued from Page 10

stakeholders in order to leverage resources. "Transforming communities is a critical way to think about how we do our extension work," he said. "People who have ownership—who have a stake in what's going on—become part of finding a solution. We have to work together to get that message out."

Shaw agreed. "It all boils down to communication. There needs to be a dialogue in such a way that the research is relevant and can be effectively utilized," he said.

Dr. M. Scott Smith, dean for the University of Kentucky School of Agriculture and director of the Kentucky Cooperative Extension Service and Agricultural Experiment Station, said the cooperative extension service system represents a valuable communication resource, but that the public has to be persuaded of the importance of the Gulf issue. "The [Kentucky] cooperative extension service has an essential infrastructure that is incredibly well supported by counties and local governments," Smith said. "But we're a long way from the Gulf of Mexico and there are a lot of other issues. I'm not sure our population would embrace talk about the Gulf of Mexico."

Kentucky activities

Peter Goodmann, assistant director of the Kentucky Division of Water, said that while the division is working on a draft nutrient reduction strategy for the state, many of the actions needed to reduce nitrogen loads are already in place in Kentucky—and other states—within existing efforts to restore water quality.

"The tools provided by the Clean Water Act, the last several farm bills, state cost-share programs, wetlands projects, nonpoint source pollution programs and wastewater permits all are geared to reduce pollution and improve water quality," Goodmann said. "We also work closely with the Kentucky Agriculture Water Quality Authority to promote the adoption of best management practices to protect water quality."

Goodmann said Kentucky also needs to take a new look at how watersheds are prioritized.

"Since the watershed framework was incorporated in 1996, we've learned a lot more about repairing damaged watersheds," said Goodmann. "It's time to revisit how we prioritize watersheds for improvement, but flexibility remains an important element since every watershed is unique."

Conclusion

Certainly the goal of the Hypoxia Task Force is to bring a variety of interests together working toward a common goal of improving the health of the Gulf of Mexico—a sentiment best expressed by Iowa Agriculture Secretary Bill Northey.

"The challenge is to make changes that can make a difference," he said. "In Iowa, we have a plan for point and nonpoint sources [of pollution]. We've moved past 'who's at fault' and moved on to 'let's all work together to make improvements.' That's an important place to be: moving forward."