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Soil Erosion, Row Crops and Tile Drainage Add Up to Trouble for America's Corn Belt and Gulf Coast

Mississippi River Collaborative calls for improved conservation plans to preserve cropland and prevent polluted runoff

In addition to hurricanes and fluctuating markets, every summer, shrimpers and fishers in the Gulf of Mexico face another serious threat: the Dead Zone. While pollution sources exist along the entire length of the Mississippi River, recent reports affirm that the Corn Belt states are the most serious offenders in this yearly occurrence.

Scientists from the University of Illinois and Cornell University found that farm fields in the Corn Belt that use tile drainage are the largest contributors of nitrogen pollution to rivers that empty into the Mississippi River and, ultimately, the Gulf of Mexico.

The Dead Zone in the Gulf of Mexico is an area the size of New Jersey where there is not enough oxygen in the water to support shrimp, fish and other marine life. It forms every summer, caused by high levels of nitrogen and phosphorus pollution carried by the Mississippi River. The nitrogen and phosphorus stimulate excessive growth of algae; when this algae dies, its decomposition uses up much of the oxygen in the water, which chokes marine life. The pollution comes from chemical fertilizer that runs off of farm fields, sewage treatment plants, and polluted runoff from cities.

“The Corn Belt states have developed highly productive farming systems, but they are also very leaky systems,” said Susan Heathcote, Water Program Director at the Iowa Environmental Council. “We leak nitrogen and phosphorus pollution through drainage systems and erode precious top soil into our streams and rivers at unsustainable rates. This pollution damages our waterways and threatens our farmers’—and shrimpers’—ways of life.”

The Illinois-Cornell research team analyzed 10 years of data from the 1,768 counties in the Mississippi River basin, generally known as the Corn Belt—an area spanning Illinois, Indiana, Iowa, Ohio and southwest Minnesota. The data included crop acres and yields, census and livestock head counts, fertilizer use and tile drainage systems, nitrogen concentrations in waterways and river flow

measurements. In the Corn Belt, where land is flat and tile drainage systems and channelized ditches and streams are common, the researchers found that the extensive row cropping combines with precipitation and soil erosion to create pathways that transport nitrogen from the soil into our waterways. Tile drainage systems are a type of below-ground plumbing that moves excess water away from plant roots and out to above-ground waterways. When tile systems drain water, they also drain excess fertilizers and pesticides—including the component nitrogen—that make their way into the Mississippi River and downstream to the Gulf.

Another report, *Losing Ground*, released in mid-April by the Environmental Working Group (EWG), shows that soil erosion from cropland in some areas of Iowa—a Corn Belt state—is up to 12 times higher than the federal government’s average estimates. This surface erosion is a pathway for phosphorous to enter waterways causing the pollution, which -- combined with nitrogen pollution -- causes the Dead Zone.

“Together, the Illinois-Cornell research and the EWG report show how closely agricultural pollution and soil erosion are linked to each other,” said Stacy James, Water Resources Scientist at Prairie Rivers Network. “Intensive, heavily fertilized row crops and tile drainage systems have become the foundation of the agricultural system in the Corn Belt, but at a great cost to our water and soil quality. We have to embrace measures that will reverse this degradation.”

Both reports provide evidence that voluntary conservation programs are not enough to counter the damage caused by federal subsidy policies that encourage farmers to plant crops fencerow to fencerow. Managing nutrient losses and soil erosion from our agricultural fields will require a broad range of measures, including regulations. The EWG report calls for the U.S. Department of Agriculture (USDA) to step up enforcement of soil conservation requirements on agricultural cropland to curtail the unsustainable rates of soil loss and associated phosphorous pollution. Other solutions may include incentives, such as cost-sharing programs, that encourage landowners to address nitrogen and phosphorous pollution by modifying tile drainage systems with wood chip trenches, managing drainage to reduce the flow in tile channels during winter and early spring and establishing wetlands at tile drainage outlets.

The EWG report also recommends strengthening provisions in the Farm Bill when it is reauthorized in 2012, including:

- requiring all producers participating in existing or new crop and revenue insurance programs to meet Conservation Compliance standards;
- requiring vegetative buffer zones at least 35 feet wide between row crops and all lakes, rivers and smaller streams; and
- adequately funding USDA’s technical staff so it can implement increased inspections and enforcement of conservation practices.

The Mississippi River Collaborative supports these report recommendations and will work to see them implemented in the next Farm Bill. The Collaborative recognizes that reducing agricultural runoff and increasing soil conservation are critical to preserving the future productivity of our agricultural lands. These issues strongly relate to improving water quality in the Mississippi River basin and downstream in the Gulf of Mexico.

“Scientists have done the research,” said Matt Rota, Science and Water Policy Director for the Gulf Restoration Network. “We know that soil erosion and agricultural pollution hurt our farmers, our waters, and our Gulf. Now it’s time to do something about it—before it’s too late.”

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The report “Losing Ground” is available at www.ewg.org/losingground. A short video showing EWG’s aerial footage of soil erosion damage is available at www.youtube.com/watch?v=ehlUKkw69Dg.

Reports of the Illinois-Cornell research team’s findings appear in the May-June 2011 and the September-October 2010 issues of the *Journal of Environmental Quality*.

The Mississippi River Collaborative is a partnership of environmental organizations and legal centers from states bordering the Mississippi River as well as regional and national groups working on issues affecting the Mississippi River and its tributaries. The Collaborative harnesses the resources and expertise of its diverse organizations to comprehensively reduce pollution entering the Mississippi River as well as the Gulf of Mexico. For additional information, contact Suzanne Campbell, Coordinator for the Mississippi River Collaborative at 865.963.5383 or Suzanne@tcwn.org.