

WATERWAYS

A Quarterly Publication of the Iowa Drainage District Association

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Study: Relationship between farming, phosphorus in Mississippi River not clear-cut

In their eagerness to cut nitrogen and phosphorus pollution in the Mississippi River and Gulf of Mexico, people have often sought simple explanations for the problem: too many large animal operations, for instance, or farmers who apply too much fertilizer, which then flows into waterways.

But according to new modeling research that examined phosphorus loading from all 1768 counties in the Mississippi River Basin (MRB), the causes aren't nearly so straightforward. Livestock manure is widespread in many MRB counties, for example, but it shows little relationship to water quality, say researchers at the University of Illinois at Urbana-Champaign and Cornell University in the May-June 2011 issue of the *Journal of Environmental Quality*.

Moreover, areas that load the most phosphorus into the Mississippi are also places where farmers add less phosphorus to the soil than they remove each year in crop harvests, suggesting that overzealous fertilizer use is not the issue.

"If it were that, it would be easy to solve. But it's not that," says Mark David, a University of Illinois biogeochemist who led the research. "It's much more complex. So I think in that sense, addressing the problem is harder."

Soil erosion and tile drainage contribute large amounts of phosphorus to the Mississippi and Gulf of Mexico each year, helping fuel a "dead zone" of oxygen-starved water in the Gulf that reached near-record size last summer. Local water quality may also decline due to phosphorus-driven algal blooms.

In an effort to pinpoint the most important sources of phosphorus across the entire MRB, David's team calculated the yearly phosphorus inputs and outputs for every county in the basin from 1997 to 2006. After aggregating these and other data within 113 watersheds throughout the MRB, they then estimated the river load of phosphorus from every county between January and June for the same time period. Not surprisingly, counties with intensive row crop agriculture,

such as those in the upper Midwest Corn Belt states of Iowa, Illinois, and Ohio, contributed the most phosphorus to rivers. However, these same counties often showed negative phosphorus balances, meaning that phosphorus outputs in crops exceeded inputs by farmers.

In other words, farmers in these regions are actually mining stored phosphorus from the soil, rather than putting more into the system, David says. "But that negative balance doesn't have much to do with the phosphorus that gets in the river." Instead, the overall intensity of agriculture seems to matter most. "When I'm sitting here in Illinois in a watershed that's 95 percent corn and soybeans, it's going to lose some phosphorus," he says, "whether the balance is negative or positive."

In addition, although animal manure is considered a major phosphorus source to streams and rivers, it was relatively unimportant to phosphorus loading across the entire MRB. David suspects the reason is that most large-scale animal farms have moved to western states in the basin, such as Colorado, where there's less precipitation to carry manure nutrients into the Mississippi.

Phosphorus from human waste did prove significant. Counties encompassing Chicago and other major metropolitan areas "showed up as hot spots," David says, because most municipalities don't remove phosphorus from the otherwise clean sewage effluent they discharge into streams. The team further found that about half of the variation in phosphorus loadings was not explained by their models, suggesting that other factors also contribute, such as stream bank erosion and phosphorus deposits in river sediments.

Overall, the findings suggest that reducing phosphorus pollution will require broad adoption of practices that limit nutrient runoff, such as cover crops, buffer strips, and incorporation of fertilizers. It will also require limits on phosphorus discharge from cities.

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Waterways is a quarterly publication of the Iowa Drainage District Association. Comments can be directed to the association at:

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Achieving these objectives across the entire MRB won't be easy, but David hopes the study helps people move beyond common assumptions about causes to focus on the real issues.

“To me the value of the study is that it helps shift the debate,” David says. “The problem is not as simple as two things. It's not as simple as too much fertilizer or manure.”

The research was funded by the National Science Foundation's Biocomplexity in the Environment/Coupled Natural-Human Cycles Program. Source – Environmental Protection – May 9, 2011

Executive Director Notes

The 2011 session of the legislature has finally adjourned after one of the longest sessions in history. IDDA once again had a good year seeing passage of several pieces of legislation that originated in the Drainage Interim Study Committee that met in December. I have just about wrapped up my county visits for the year with a couple of more to go which I hope to be able to complete in August. Planning is underway for our annual meeting on December 2nd in Fort Dodge. The next issue of Waterways will have a complete agenda on the meeting and registration instructions.



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EPA challenged on Mississippi River policy

Facing potential lawsuit from environmental activists, the federal Environmental Protection Agency (EPA) is expected to respond soon to a petition calling for an enforceable set of numeric water quality standards for the Mississippi River basin, including Iowa.

The petition, originally filed by several environmental activist organizations in 2008, asked the EPA to set up mandatory nationwide numeric standards for nitrogen and phosphorus loss from farm fields. It also requests the agency to set up a total maximum daily load (TMDL) for the Mississippi River and the Gulf of Mexico.

In April, a group called the Minnesota Center for Environmental Advocacy sent a letter to EPA saying it would file a lawsuit if the agency did not quickly respond to the 2008 petition.

Farm Bureau and other agriculture groups have fought similar plans by the EPA, including a TMDL plan in the Chesapeake Bay region. The agriculture groups say that numeric standards and a TMDL would be costly and ineffective, especially in the vast Mississippi River basin, which includes parts of 30 states.

In addition, the agriculture groups say the numeric standards and TMDL do not take into account the successful voluntary efforts by farmers to reduce nutrient loss.

Iowa Developing Plan

In Iowa, the Iowa Department of Agriculture and Land Stewardship (IDALS) is working with Iowa State University to develop a technical assessment of the effectiveness of current best management practices to reduce nutrient levels in the streams that ultimately lead to the Mississippi River and the Gulf of Mexico. That assessment is expected to be released this fall.

Rick Robinson, Iowa Farm Bureau Federation Environmental Policy Advisor, who recently attended a Chesapeake Bay watershed meeting to learn more about how the federal government's TMDL might work, said the implementation cost, just for Virginia farmers and municipalities is estimated at \$7 billion over the next five years.

Where that money will come from is uncertain, but state officials are expecting the federal government to step up with the funds, an iffy proposition given the federal budget situation.

Costly to implement

"They are also hopeful for implementation flexibility for farmers, but rules for states have not been written yet," Robinson said. "The expectation is that either a specific set of prescribed best management practices will have to be adopted, or individual resource management plans will have to be written for each farm wanting more site-specific options. Either would be costly to implement.

"States need to take control of their own destiny over these nutrient issues and do what's right and effective for their needs and conditions," he added.

The EPA, to date, has encouraged state-centered efforts like the one in Iowa. Agency officials have also said the EPA does not want to impose a single nutrient standard in the vast Mississippi basin, as it did in the Chesapeake region.

In addition, the U.S. Department of Agriculture has launched its Mississippi River Basin Initiative, which offers grants for voluntary processes to reduce nutrient loss. But, environmental groups counter that the statewide and voluntary programs will not be strong enough to improve water quality. *Source - Iowa Farm Bureau Spokesman*



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Final Legislative Report

Here are the bills that passed this year that deal with drainage issues:

SF 393 – The bill is a result of the Drainage Interim Study Committee that met in December of 2010. It deals with how to deliver written drainage communications to state agencies. (The bill stemmed from a court decision that found that a communication that had been delivered to the DNR was deficient because it was not addressed to a specific individual.)

The bill provides that if a written communication is to be delivered to a state agency, it may be delivered to the administrative head of the state agency or its governing body. Written communications are defined as notices, service of process, demands statements or reports. The written communication could also be delivered to a person designated by the administrative head of the state agency or its governing body. If it cannot be determined of the administrative head of the agency is or who the head of the governing body is, the communication can be delivered to the state executive council.

If the communication is directed to a local government, it can be delivered to the governing body of the local government or a person designated by the governing body. The bill was signed into law on April 12 and took effect on July 1st.

SF 428 – This bill is also a result of the Drainage Interim Study Committee. It is in response to the same court case mentioned above. In the same case, a judge held that a state owned lake did not receive any benefit from the contemplated drainage improvements. IDDA felt very strongly that we did not want a court decision on the books that gave the state license for trying to escape drainage assessments. The bill makes it clear that state owned lakes and wetlands receive benefits from drainage. It provides that “when state-owned land under the jurisdiction of the department of natural resources is situated within a levee or drainage district, the commissioners assessing benefits shall ascertain and return in their report the amount of benefits and the apportionment of costs and expenses to the land, and the board of supervisors shall assess the amount against the land. In estimating benefits to land which is a state-owned lake or state-owned wetland, the commissioners shall ascertain benefits as provided in section 468.40.” The bill was signed into law on April 14th and was took effect upon enactment which means it is already a part of state law.

SF 654 – The first section of this legislation provides specifically that drainage disputes are not subject to the farm mediation process. Drainage law has a very specific process to follow to handle disputes. In an earlier court case, a judge had ruled that mediation should be used to resolve a drainage dispute. This legislation ensures that existing drainage law will be used.

The second part of the legislation deals specifically with drainage districts with pumping stations. It deals with how funds are disbursed and financial transactions are accounted for within those districts.

The third part of the legislation related to compensation of elected trustees and the clerk to the drainage board. Currently, state law fixes that compensation at \$40/day. This legislation increases that amount to “an amount not to exceed two hundred dollars per day each and necessary expenses”. The bill was signed into law on April 27th and took effect on July 1.

SF 509 – This is the appropriations bill for agricultural and related programs. Funding for the CREP program was set for \$1 million. Funds for the ag drainage well closure program were deleted. Instead, IDALS is to provide a report by November 15 as detailing the inventory of the yet to be closed Ag drainage wells, a timeline for closing them and a cost estimate for closing them. The bill was signed by the Governor on July 21st.

Unattributed Wisdom

“If at first you don’t succeed, don’t try skydiving.”



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The Missouri River Compromise

From the St. Louis Post Dispatch. A great op-ed from friend of the Missouri River Robert Schneiders.

By Robert K. Schneiders

To halt future floods along the Missouri River, causes of the 2011 flood must first be understood by all parties.

The flood had three main causes.

First, the U.S. Army Corps of Engineers kept its upstream reservoirs high during the past winter and early spring to provide water for the lower river navigation channel, the reservoir fishery and hydropower generation. Only 22 percent of reservoir storage capacity was available at the end of January, when the corps began refilling the reservoirs. The corps believed that amount of storage would be sufficient to capture the Missouri's predicted high runoff in 2011.

We now know that 22 percent was not enough. Because of the corps' miscalculation, masses of water had to be evacuated from the upstream reservoirs to prevent the flood from becoming truly out of control.

Second, the navigation channel from Ponca, Neb., to the river's mouth hemmed in the Missouri and diminished its carrying capacity. The restricted navigation channel did not have the ability to safely carry away the high flows exiting Gavin's Point Dam. The corps' pile dikes and revetments forced the Missouri up and then out of its banks. Once freed from its engineered prison, the river tore through the valley with terrifying speed and power. It knocked over buildings, ate away its banks and outflanked countless pile dikes. Although not a single lower-basin government official has admitted it, the navigation channel has been a major cause of flooding in the lower valley.

Third, the loss of Conservation Reserve Program acres throughout the Missouri basin represents another cause of the flood. Since 2007, millions of acres of the basin's most erosive land went from grassland to cropland. Thousands of square miles of the Dakotas went into row crops in the recent Great Dakota Plow-up. When monsoonal rains hit the upper basin in May, the exposed cropland rapidly drained the rainwater into the Missouri. Corps hydrologists may not have factored in the loss of CRP acres into their spring 2011 runoff projections. Thus, the reservoirs filled faster and higher than anyone in the corps initially thought possible.

During the first meeting of the Missouri River Working Group in Washington, D.C., senators from upper and lower basin states agreed that flood control must be the corps' top priority along the Missouri. However, they did not agree on



how to achieve flood control. Nonetheless, a compromise solution is possible; it could include five provisions.

- Reinststate the former CRP lands. Representatives should be able to readily agree on this flood-control method.

- Dismantle the navigation channel and widen the river from Ponca to Kansas City. This reach is the least utilized by the barge industry. The navigation channel here is not economically justifiable. It also is the narrowest river reach and the most flood-prone. Right now, the worst flooding is occurring along this stretch of river. Widening this section would provide measurable flood control.

- Maintain but widen the navigation channel between Kansas City and the mouth to satisfy the navigation interests in Missouri. This reach is the most utilized by the barge industry and the most important economically to Missouri.

- Draw down the upstream reservoirs to a new base level. Establish the new base level at 30 percent of available system storage or 40 percent if it is deemed necessary. But the new base level must not threaten the reservoir fishery. A lower base level also would reduce the flood threat at Williston, Bismarck, Fort Yates, Pierre, Fort Pierre and possibly Niobrara.

- Alter the reservoir release schedule. Abandon the eight-month uniform release schedule from Gavin's Point Dam. Oscillate reservoir levels according to changing runoff conditions. More water could be pushed through the system in March and April and October and November to free reservoir storage space for an approaching super flood. Higher releases in those months would aid the Mississippi barge industry. Such a release schedule would take place before the spring planting season and after the fall harvest, assisting lower valley farmers. Raising the reservoirs in the May to June period would benefit the reservoir fishery.

This compromise represents a win for everyone along the Missouri River. However, if the lower-basin states insist on maintaining the defunct navigation channel all the way to Ponca and only lowering the reservoir system base level, the upper basin will lose. Under such a scenario, the navigation channel will remain vulnerable to high flows.

Consequently, the corps would have to establish a noticeably lower reservoir base level to ensure that a more voluminous Missouri (in this era of climate change), does not enter that flood-prone channel. If the reservoir system base level drops too low, the upstream fishery will suffer.

Let's all hope that Missouri, the dominant state in the basin, at last is willing to compromise.

Robert Kelley Schneiders has written the books "Unruly River: Two Centuries of Change Along the Missouri" (University Press of Kansas, 1999), and "Big Sky Rivers: The Yellowstone and Upper Missouri" (University Press of Kansas, 2003). He is the co-founder and director of Eco InTheKnow, LLC, www.ecointheknow.com.

New Farmers Drainage District Case moves back to DNR

District Court in Monona County has sent the New Farmers Drainage District Case back to the DNR for further review. The case revolved around weed spraying that took place in a drainage ditch in Monona County. The state Department of Natural Resources contends that the spraying created conditions which led to a fish kill.

The case has gone through a long and tedious administrative process. First, it was heard by an Administrative Law Judge who sided with the state. It then went before the state Natural Resources Commissions and Environmental Protection Commission – both of which also sided with the state.

In sending the case back to DNR for further review, the court found that IDNR improperly withheld providing the opinions of Iowa State University Weed Scientist Bob Hartzler. Craig Levien, the attorney representing the district said that the opinion is favorable “as it will require the commissions to consider strong material evidence contrary to their findings in this case.”

Dates have not been set as to when this case will go back before the two commissions.

FSA requests policy change on CRP buffer issue

Earlier this year, federal policy that has been in place since 1998 was changed to prohibit maintenance activities on CRP buffer strips in drainage districts during the nesting season of May 15 to August 1. Help may be on the way. IDDA has learned that a new conservation practice has been proposed that may permit drainage district activity. Additionally, a waiver has been requested for the nesting season in 2011. The conservation practice proposal is under review by the Deputy Administrator of Farm Programs in Washington D.C.

Mark your Calendars

The IDDA annual meeting will be Friday, December 2nd at the Starlight Hotel in Fort Dodge.

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