

# Sixteenth Meeting of the Mississippi River/Gulf of Mexico Watershed Nutrient Task Force

Chicago, Illinois  
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## Task Force Participants

### Federal

Benjamin Grumbles, U.S. Environmental Protection Agency

Robert Magnien (for Vice Admiral Conrad Lautenbacher), National Oceanographic and  
Atmospheric Administration

Gary Mast, U.S. Department of Agriculture

Tim Petty, Department of the Interior

David Vigh, U.S. Army Corps of Engineers

### State

Len Bahr, Louisiana Governor's Office

Jerry Cain, Mississippi Department of Environmental Quality

Kary Claghorn (for Bill Northey), Iowa Department of Agriculture

David Hanselmann, Ohio Department of Natural Resources

Charles Hartke, Illinois Department of Agriculture

Bryan Hopkins, Missouri Department of Natural Resources

Brad Moore, Minnesota Pollution Control Agency

Russell Rasmussen, Wisconsin Department of Natural Resources

Earl Smith, Arkansas Natural Resources Commission

## Welcome and Introductions of Task Force Members

**Benjamin Grumbles:** Good afternoon. I would like to welcome everyone to the 16<sup>th</sup> Public Meeting of the Mississippi River/Gulf of Mexico River Basin Watershed Nutrient Task Force. We are happy to be here today for some final discussion about the 2008 Hypoxia Action Plan and its companion, the 2008 Annual Operating Plan. We will hear some public comments today and finish with updates from the Sub-basin groups. I will now turn things over to our host, the Director of the Illinois Department of Agriculture, Mr. Chuck Hartke.

**Charles Hartke:** Good morning. As Director of the Illinois Department of Agriculture I would like to welcome you to the Land of Lincoln located in the heart of the nation's Corn Belt. More specifically let me welcome you to Chicago. I am pleased that so many people have gathered to continue to work to design a plan that will allow for significant reductions in nutrient losses throughout the Mississippi River Basin. One of the most important factors surrounding this

plan is that it is science-based. However, we must continue to seek improved technologies and find a way to provide increased financial and technical assistance to producers.

I can tell you that improved technologies and financial and technical assistance can work. Illinois farmers reduced soil erosion rates on cropland from 6.2 tons per acre per year in 1982 to 4.0 tons per acre in 1997, the most recent year data available. That is equivalent to a 35 percent reduction, equal to about 55 million tons of soil each year. Over the course of the last decade there have been significant improvements in nutrient-use efficiency throughout the Midwest. In Illinois specifically, farmers are producing more corn, soybeans and wheat without increasing fertilizer use.

In fact, a recent study by the University of Illinois shows that each year over the last decade, Illinois farmers have removed more phosphorus in grain than what was added in fertilizer. The study also showed the net nitrogen balance over the last decade has been approximately 10 pounds per acre per year, which is about 2/3 less than the balance during the mid-1970s through early 1990s. Despite the efforts of farmers in Illinois and throughout the basin, river nutrient concentrations have not responded much to these changes. Unfortunately this illustrates the tremendous challenges that exist when trying to reduce losses from corn and soybean production.

One other item I would like to touch on is the importance of cooperative and joint efforts and partnerships that are vital to continuing to advance this work plan forward. I am pleased with the proactive role the Illinois Farm Bureau, commodity groups and the state's fertilizer industry have taken in the last ten years. These groups have collectively supported research, developed and disseminated educational resources, and identified outside funds to further support technical assistance and financial incentives for farmers employing nutrient reduction practices. As we continue to move forward, I can assure all of you that Illinois agriculture will continue to build on past successes. Successes like I mentioned earlier today will serve as a foundation for identifying new production methods designed to preserve the prime agricultural soils found in the Midwest, protect local water quality and find new solutions to the hypoxia problem in the northern Gulf of Mexico.

**Benjamin Grumbles:** Thanks Chuck. I would now like to ask the Task Force Members to introduce themselves.

**David Hanselmann:** I am Dave Hanselmann of the Ohio Department of Natural Resources.

**Tim Petty:** I am Tim Petty. I am the acting Assistant Secretary for Water and Sciences, Department of the Interior.

**Earl Smith:** I am Earl Smith, Arkansas Natural Resources Commission.

**Gary Mast:** I am Gary Mast, US Department of Agriculture. USDA has been very involved with conservation programs that affect the Gulf of Mexico and hypoxia issues. I think you need to be brought up to date a little bit with what is happening in Washington, D.C. As we are here at this conference, they are in deep discussion on farming. As many of you know, the conservation

programs and technical assistance dollars that have come from USDA are appropriated and put into law in the Farm Bill. That Farm Bill has about two or three days to get hammered out. If they do not get it hammered out, there will not be the week of floor time (which would be next week and the last week before March 15) to get it all bundled up, so it can be passed in both the House and the Senate, and signed by the President. This could have a few implications on a conservation title—the baseline funding will be a lot lower if they go back to the 2002 Farm Bill. The other option is to go back to the old law, which goes back to 1948 or 1949, with no funding. We are talking right now with the FSA programs and NRCS programs, close to 5 billion dollars a year. A lot of that is spent in the Mississippi watershed.

This administration really has put forth a huge effort to be reform-minded when looking at the new Farm Bill. In that reform-minded Bill, we are looking at an increase of \$7.8 billion over the next ten years for conservation, which will directly affect the Mississippi River Basin. Also, we would have a Regional Watershed Enhancement Program, which will target areas around the country. Examples would be the Mississippi and the Chesapeake Bay. That will give us some great opportunities. We have made a lot of progress, as our friend here from Illinois has talked about. If this Farm Bill does not go through, if we take a step back, it will not be good for the work that we are doing. Let's hope things happen.

Agriculture is a big player here. Agriculture is very different than it was two years ago. We are now producing for food, fiber, and fuel. Ethanol was previously the best thing since sliced bread and now that is not the case. We also said that we were going to cover the world with corn. Have you heard of soy products? Now people are going to plant soy as well as corn. The whole economic structure is changing. Nutrients have become more expensive, and now farmers are becoming more careful of where they are putting the nutrients, making sure not to waste them. Along with all the change in agriculture, comes tremendous opportunity.

**Karey Claghorn:** Deputy Secretary of Agriculture. I work in the Iowa Department of Agriculture and Land Stewardship.

**David Vigh:** U.S. Army Corps of Engineers, representing George Dunlop, the Assistant Secretary of the Arms Office. Three plus years ago we started this reassessment process. It has been a lot of work, with many, many challenges. We have had four science symposia, and collected other information. A great deal of effort has gone into this reassessment process over the last few years. One thing that has been a reoccurring theme through the entire process (I have participated both as a Task Force member and as a committee member) has been a greater focus on action and ensuring the science was right. That was a critical concern of ours. I believe we have done a very good job of bringing both those things to the plate. The Army Corps is pleased to be part of this effort.

**Len Bahr:** My Name is Len Bahr and I am with the Louisiana Governor's Office. Just briefly, for those of you who do not know about the Mississippi River Delta: it is one of the most productive estuarine, complex ecosystems in the world in terms of fisheries, and is currently under three different and distinct threats. One of these is hypoxia—which is the purpose of this meeting. Another is the catastrophic loss of coastal wetlands as a result of river channeling and

river modifications that have had unexpected consequences. The third is climate change, which is not only real, but is now affecting the global system in ways that were certainly not anticipated several years ago. For example, pH in the ocean is dropping. The ocean is becoming more acidic, making it more difficult for reef-born organisms. We in Louisiana are extremely concerned about not just reexamining the Action Plan, but also speeding things up by implementing real actions in an effective time scale. I did not get a chance to read the article I was quoted in this morning, I apologize if I sounded a little too negative. I am just very frustrated, as it has been a long time and I want to see something actually happen so that we can divert river water and manage the river in ways that saves our coast at the same time.

**Robert Magnien:** My Name is Robert Magnien with the National Oceanic and Atmospheric Administration (NOAA). I am here today representing the head of NOAA, Vice Admiral Conrad Lautenbacher. The Admiral could not be here today, but I can assure you he is extremely interested and concerned with this issue and supports the Task Force's mission. We are very proud that NOAA was able to supply a considerable amount of the science that went into the very rigorous reassessment and that we were able to produce a body of work for the Science Advisory Board that really shows, beyond a reasonable doubt, what the problem is and what we need to do about it. NOAA is not content with completing the science—we also want to see action taken. The issues faced here (in terms of nutrient pollution) affect, obviously, the Gulf of Mexico, but almost all of our coastal waters as well. This puts economic interests, public health, and water quality (not only on our coast, but obviously in the Basin itself) at risk. There are a lot of win-win opportunities to help improve the situation in the Basin and along our coasts, and there is a sense of urgency in our efforts to try to turn this around before some of these important resources are lost. Our efforts will be to help support the other Task Force members, as well as chip in what we can and help implement the things that need to be done to reduce nutrient loads in the Gulf.

**Jerry Cain:** Jerry Cain, Mississippi Department of Environmental Quality

**Russell Rasmussen:** Russell Rasmussen, Director of Bureau of Watershed Management with the Wisconsin Department of Natural Resources. I am a relatively recent addition to the Task Force. I just wanted to express how impressed I have been in the last four meetings I have attended with the work of the Coordinating Committee and the Task Force Members—how all members of these various states have come together to try to address a common problem. I also want to compliment the work of the EPA and especially Ben, who has had the difficult task of guiding us through the process. I also wanted to talk about an example in eastern Wisconsin, about a program that is starting up. We have had a nutrient program with our agriculture sector for quite sometime and it has been wholly underfunded and understaffed. In a bipartisan show of support, in our last budget our legislation has allotted 6 million dollars annually for nutrient management activities. We are quite excited about that. It starts in our fiscal year of 08-09, which starts July 1st.

We are not a zero-budget state, so that means that unless there is some affirmative action taken, that 6 million dollars will be issued continuously, every year, until something changes. It is not administrated in our Department, but another that has much more credibility in the Agriculture sector. It is based on education for farmers, and the goal is to have a majority of farmer-produced nutrient management plans that allow for an understanding and implementation in much broader fashion. It also provides precaution for development. I think this will have major positive impacts; I also know that there are many other states that are doing similar types of projects and activities to reduce the amount of nutrients going into their water. Even though the main focus started at a local water quality improvement level, I think that it will help the hypoxia issue.

**Brad Moore:** I am Brad Moore, Commissioner of the Minnesota Pollution Control Agency.

**Bryan Hopkins:** I am Bryan Hopkins. I am the Water Coordinator of Wetlands for the Missouri Department of Natural Resources. I am here representing our Director, Doyle Childers. Missouri has long valued our water resources. We have a substantial history in that respect. We look forward to continuing to show good stewardship of our water resources and will have positive impacts downstream. We look forward to participating in this process.

**Benjamin Grumbles:** Thank you. I just want to underscore my appreciation to all the states that have traveled long distances, the state commissioners themselves, their appointees or designees, and also the federal agencies. We have a significant involvement with 9 federal agencies and 10 states, and I feel like we are making progress as we have gone through this process, improving the Action Plan, and putting greater specificity into a developing the Annual Operating Plan. We are also all working in a collaborative way to address one of the greatest challenges, in terms of water quality and productivity, economic profitability. I think that we are all gaining from this, but I think that I can speak for all of us, in that we all want to see greater progress, accelerate the progress in meeting the specific goals—the Coastal Goal and throughout the Mississippi River Basin. I would like to introduce Darrell Brown with the EPA Office of Water. He is going to walk us through the changes made to the Action Plan, since it was released for public comment. Darrell will also describe the development of an Annual Operating Plan.

## **Final Action Plan and Annual Operating Plan**

*Presentation A: Review of Revised Action Plan and Annual Operating Plan by Darrell Brown*

### **Public Comments**

**Benjamin Grumbles:** Let me turn to the Task Force members to see if you have any comments or questions for Darrell in the review of the Hypoxia Action Plan and Annual Operating Plan. With no questions, that brings us to the point where we hear from the public. Those of you, who

are here and have signed in, can speak. We will start with Kristin Perry, Chair of Missouri Clean Water Commission.

*Presentation B: Soil Dumping in Missouri by Kristin Perry*

**Kristin Perry:** I am Kristin Perry, the Chairwoman of the Missouri Clean Water Commission. I was appointed by the Governor 8 years ago. We are a citizen commission but we actually have statutory power, and we oversee the implementation of the Clean Water Act in Missouri. In real life I am an attorney. My husband and I have a soil testing laboratory where we test feeds, water and fertilizer for 39 states and 9 foreign countries. We also have a branch laboratory in Adelaide, South Australia. Finally, my real passion in life is running Missouri's agricultural leadership program.

Something of major importance was brought to our attention just about a year ago. At the request of the Fish and Wildlife Service, the Army Corps of Engineers is building 22.9 miles of chutes. These chutes are 200 feet wide, 25 feet deep, and as you see, 22 miles long. 13 of these chutes are in the state of Missouri. The budget for this project for the last 2 years is 50 million dollars. On some of the early projects the excavated soil was put offsite on land. But on the last few projects, the Corps of Engineers has been dumping 24 million tons of dirt directly into the Missouri River. They are digging the ditch and piling it up on the side, with the intent that it will erode at the bottom and the top will fall in, and some of the excavated material is just being thrown directly into the river.

Their intent is that these chutes will go 50 feet wider and all of the dirt will be dumped in the water and float down the Missouri River. This is not sand—this is Missouri's richest alluvial soil. It is 670 parts per million phosphorus, and it is 606 acres of soil, 25 feet deep. For the projects, they cut through what was farmland in Missouri and they were taking pipes and dumping excavated soil out into the middle of the Missouri River. This particular project has 5.1 million tons of soil. This is what that same project looked like in August, and from the air. They put the soil pile out in the Missouri River, and around May 8 it completely washed away. This was the soil pile that had been pushed out into the river. It is gone now.

If you put 24 million tons into dump trucks, you could put them nose to nose from the city of New York to Los Angeles and back. This is a proposed site where the Clean Water Commission is to look at a permit at our next meeting. This is farm ground in which they are digging these chutes. This is the Rush Bottoms project, where they pushed the top 2 feet because they told the Clean Water Commission that they could only save 2 feet of soil. And the rest, they bring in a dredger that mixes the soil and they are digging 100 feet a day of that soil. You can see the soil profile after 2 feet have been removed. There is another 4 feet of rich and very high in nutrients soil. The contractor told me that it is just as easy to take that pipe and put it back on the land and reinforce the federal levy. But the Corps had chosen to take that 3,500 feet directly into the middle of the Missouri River and you can see where it is just being dumped.

By the way, the Corps is in agreement because these are their numbers, there is no controversy on this issue over the amount of nutrients being dumped in the water. From your SAB numbers we calculated that the amount from the projects just in Missouri was 47 percent of the annual load of phosphorus. If you are wondering where some of our new phosphorus is

coming from, it is not agriculture. Go look at the Army Corps of Engineers. This is not even including the dyke notching. That 47 percent is what all of these projects would do if they were done in one year. Now, that is not exactly true. They started those 3 years ago and the planned erosion is planned to go on for a longer period of time. The citizens of Missouri are very upset. We spend \$40.9 million—not federal dollars, this is what we tax ourselves in the state of Missouri—for soil and water conservation. \$27 million of the funding is matched by farmers in our state, and 6.9 is matched along the counties along the Missouri River in our state. We are wondering why our government can throw dirt in when the rest of us are working so hard to keep it out.

This last slide is a project where they put the soil back to build a road and reinforce the levy. We need your help—the Corps of Engineers seems to think that the Missouri River is sediment deprived. They are proposing a \$658,000 study so that they can show that the sediment should be put directly into the river. I see this as a direct conflict between what they want to do and the science that you all are producing. The Supreme Court says that when there is a conflict between the Endangered Species Act and the Clean Water Act that they should be read together. And that can be done—it does not affect these projects, there is shallow water habitat. They want to have the ditches. The soil is being thrown into the river for economic reasons and no other. We want that to be kept out. The Clean Water Commission has the power to issue an order to stop dumping, and now the Corps is upset that they do not get to do projects. We say they can do the projects, they just may not put the dirt in the water. We really need some help on this and we would really like to get EPA on board.

**Robert Perry:** I am Robert Perry, here with the Perry Agricultural laboratory. An awful lot of the science we are talking about when reforming the Action Plan is based on a model. A model, such as the SPARROW model is only as good as the data that has been fed in to it. A key bit of information that was not fed into the model is the rich alluvial soil that the Army Corps of Engineers are releasing, sometimes described as “dumping” into the Missouri River. This has been done as part of their river mitigation projects. It was to increase shallow water habitat by digging chutes and causing bank destabilization. The 13 projects on hold in Missouri would place 14,000 metric tons of phosphorus in the river. This would be 47% of the annual flux.

Last summer, each day the Corps dug at Rush Bottoms, they put 12 metric tons of phosphorus in the Missouri River. In one month they placed 1.2% of the annual phosphorus flux in the river. Your first order of business here, if you are serious about accountability and action and reducing the amount of nitrogen, phosphorus and carbon going down the river, should be to call Under Secretary of the Army, John Paul Woodley, and tell him no more soil in the river! The habitat they wish to create can be created by removing the soil from the sites and stabilizing the chute banks; and when they do bank notching, they can remove the soil from that area of the bank. In addition, an accounting should be done of the amount of soil, total nitrogen, phosphorus and carbon that the Corps’ projects have placed in the river; and the SPARROW model should be modified to include the Corps activities.

Many people have wondered how, after agriculture has made so much progress in reducing soil erosion and improving nutrient efficiencies, has hypoxia gotten worse? Well, a large part of the problem is the Army Corps for polluting the river and EPA letting them.

**Dan McGuinness:** I am the Director of Conservation from the Audubon Mississippi River Initiative. Thank you for the opportunity to comment today. The last time I spoke before this group was at the Science Museum of Minnesota in 2004. Since that meeting in 2004, and as you completed your work on the current draft of the 2008 Gulf Hypoxia Action Plan and the strategy for reducing Gulf hypoxia, the significance of this issue and the urgency with which we need to take action was reinforced when the National Academy of Science released its report on the Mississippi River and the Clean Water Act in October, 2007. That report, funded by the McKnight Foundation, clearly reinforced the fact that urgent action is needed, more quickly, with greater funding and with more collaboration and public outreach among stakeholders than in the past. Many of you Task Force members supported those views in your comments this morning and we fully agree.

In light of that report, Audubon is doing two things that I think can help support the work that you are doing. Two years ago we expanded our program from just the Upper Mississippi River to the entire Mississippi River from headwaters to the Gulf. They are now integrating our infrastructure up and down the river. One of the key goals that we have is to improve water quality throughout the Mississippi and Atchafalaya River Basins and that we improve water quality in the Gulf—since clean water is fundamental to better habitat for birds, fish, wildlife and people regardless of the habitat they use along this system. Second, we are developing a 10-point program for along the Mississippi River Basin that starts to deal with not only water quality, but how sediment and nutrients are currently transported through the system, some places where they are not currently transported and should be, and how that same sediment sometimes carries some undesirable nitrogen and phosphorus problems along with it. Managing the sediment is a key issue in this Mississippi River system—both how it gets into it and how it gets into the Gulf. We are taking a careful look at the whole process of how sediment moves through the system and how we can manage it more effectively within the system.

Audubon also believes that there needs to be a renewal of political will among federal and state elected officials to address this issue and that this political will needs to be expressed in more funds to do the complex work in the system and in the watersheds within the system to actually reduce nitrogen and phosphorous pollution in the streams, rivers and in the Gulf of Mexico. In some respects, it is easy for me to stand up here and point the finger at all of you and elected officials, but there is a role for the non-profit community and we accept some of the responsibility. We want to match you by coming to the table together to build a stronger constituency for the health of this river and the Gulf. That means bringing to the table the agricultural producers, processors, shippers and the marketers of agricultural commodities throughout this basin and really working to improve the health of this system. I think we could waste a lot of time fighting each other, but we need to look for the common ground where we can really come together to form that strong constituency. I am here today to say that we at Audubon will also do our part and we will match your commitment in the public sector with leadership on this issue out here in the basin. It will take the work of that constituency, the federal agencies, the state agencies and Congress to achieve this ambitious goal.



**Nancy Erickson:** Good afternoon, my name is Nancy Erickson. I am the Director of Natural Resources at the Illinois Farm Bureau and we appreciate the opportunity to give our thoughts to the Task Force this afternoon. Before I begin my comments, I would like to take this opportunity to thank Director Hartke for all the diligent work that he has done with the Task Force over the last several years. We really appreciate your dedication and the work you have done with the group.

The Illinois Farm Bureau is a voluntary grass-roots group whose members include about three fourths of the farmers in Illinois. For years we have supported voluntary, incentive-based practices and programs for agriculture because those programs work. We have continued to urge that there be recognition that these voluntary, incentive-based programs work for agriculture—the challenge has been that these programs have historically been underfunded. We urge the Task Force to not only encourage actions that are voluntary, practical and effective, but to also support funding for states and locally-led watershed groups to increase the positive water quality and conservation trends that we have seen. As with current voluntary programs at the federal, state and local levels have not only been underfunded, but because of this lack of funding they have also been understaffed. There are many more farmers wanting to connect with these programs than there have been funding to do so for the last few decades.

Regardless of inadequate funding, agriculture has a positive conservation story to tell. Conservation tillage practices have reduced soil erosion, as Director Hartke said, by about 35 percent on cropland in our state. Illinois landowners planted more than 31 million trees from 1988 to 1997. Illinois farmers planted more than 35,000 miles of conservation buffers from 1997 to 2002. Farmers are making a more efficient use of fertilizers and between 1997 and 2001 about 181,000 acres of buffers were installed in Illinois.

Agricultural groups in Illinois also formed the Council of Best Management Practices a few years ago. The agricultural groups in the CBMP have contributed financially to many projects supporting positive practices and have recently linked with various other organizations and agencies to support positive voluntary best management practices. An example—in the first 2 years of a recent project, the CBMP has enrolled approximately 25,000 acres out of a total watershed of about 36,000 acres in a 4-year nutrient management plan program in the Lake Bloomington watershed. That number represents over 130 different landowners, producers and farmers involved with the program. The strength of these local and state programs is that local groups and landowners actually take ownership of programs to continue positive environmental trends, and that is key.

Another action that the Task Force could take would be to encourage the administration of conservation programs at state or local watershed levels. We believe that states should be able to develop their own strategies. We do not need a one-size-fits-all approach telling the states where BMPs should be placed and conservation practices implemented. The issue that you are addressing is obviously a very complex one and there are no easy answers. Whenever you deal with a natural system, it is going to be leaky and wet and it is going to take time to see results, even if there was sufficient funding for these various programs. Simple solutions will not work when the situation is far more complicated than some have publicly acknowledged. Although, I think that there is more recognition as we go through this process that it is a very complicated system. The Science Advisory Panel's draft report stated that it may no longer be

possible to achieve a hypoxic zone of 5,000 square kilometers by 2015. We agree and urge that this goal be adjusted. Other goals that would reduce nitrogen and phosphorus by 45 percent are substantial and even more questionable given the fact that others have stated that actions to meet the target will take decades and significant uncertainties remain. Care must be taken to avoid unrealistic goals set in the midst of uncertainties that have severe economic impacts on agriculture.

A final thing that I would urge the Task Force to do is to support monitoring and evaluation that would enable states and local watershed groups to be more specific in their planning process and in the implementation of those plans. Sound monitoring and evaluation will help assist watershed coordination, planning, assessment, and monitoring and program plan implementation. We urge that expectation and goals regarding the Gulf be realistic and address the concerns at the state and local watershed level that actually have to implement those conservation practices. I think we can all accomplish a lot if we work together.

**Doug Gronau:** Thank you for the opportunity to comment today. I am a farmer from Vail in west-central Iowa and sit on the Board of Directors of the Iowa Farm Bureau Federation (IFBF). I want to express some ideas about the Mississippi River/Gulf of Mexico Watershed Nutrient Task Force draft Action Plan. Farm Bureau policy on this issue says, "We support the right of states to develop a volunteer plan of action to address the agricultural nonpoint source portion of the EPA's Gulf of Mexico program. We believe the program's goals and objectives can best be administered at the local level through soil and water conservation organizations and farm groups. Any policies made regarding the Gulf of Mexico hypoxia area must be backed by sound scientific research and proper consideration to impacts on agriculture production."

The science available suggests that current nutrient impairment problems are not due to mismanagement of fertilizers and manures, but more due to historic changes in land use and hydrology that came with the conversion of prairie and wetlands to cropland. The notion that nutrients in surface water are the result of excess nutrients in the soil is inaccurate, and implies that if there were no excess nutrients on farm fields then nutrient losses would not occur. This needs to be clear in the Action Plan.

The Corn Belt and Iowa have fertile fields and generally ample precipitation. Whenever excess water moves over or through the soil, nutrient losses can occur. Iowa State University recommends fertilizer rates for corn after soybeans of 100-150 pounds of nitrogen per acre, depending on the price of fertilizer, the expected price for grain and the supply of subsoil moisture. This amount of fertilizer is necessary to produce economically viable corn yields but can also result in soil water nitrate concentrations of more than 20 milligrams per liter. This amount can be above the drinking water standard and also well above levels being considered to protect aquatic life in the Gulf of Mexico if rainfall results in surface run-off or subsurface tile drainage into streams or rivers.

This is a real dilemma for me and other farmers. The complexity of managing these factors need to be better explained to the public in the Action Plan. Some improvement in in-field nutrient management is possible, but within limits. Off-site practices are also likely needed. There are no easy answers and any improvements will be incremental. Targeting of current best management practices and site-specific design of treatment technologies is critical.

The potential for relative reductions in nitrate leaching in Iowa and the Corn Belt for specific corn-soybean management changes shows that switching from row crops to perennials may yield the largest relative reduction in nitrogen losses, compared with reductions in fertilizer rates and timing, reduced tillage or installation of wetlands. However, limited economic returns and management gaps inhibit the widespread adoption of perennials at this time. Therefore, care must be taken in the action plan to avoid premature economic policy recommendations that may promote the wrong practices (such as restructuring of current agricultural support payments or the reduction or elimination of farm program safety nets). Some of those options may include creation of economic incentives for specific technologies, but these must be considered in the context of the available peer-reviewed science, social structures and political realities.

One way the federal government could help is through significant federal investment in monitoring and evaluation that would enable states and local watersheds to be more strategic in their state planning and program implementation. This is supported by research conducted by the Center for Agriculture and Rural Development at Iowa State University in the 2006 through 2007 study of Conservation Practices in Iowa: Historical Investments, Water Quality and Gaps. This study found that we have made great progress in Iowa, and that the use of only seven major conservation practices has resulted in total nitrogen reductions of as much as 38 percent and total phosphorus reductions of as much as 58 percent. But to achieve additional significant reductions that may get us closer to, but may still be short of potential aquatic life standards, could cost more than an additional \$600 million a year in Iowa. That is a relative 40 percent increase over current conservation program investments (voluntary investments).

This study also found that cost-effective measures are different across different watersheds, and watershed residents should gain a good knowledge of their watersheds before adopting any control policies that have been promising elsewhere. Targeting different pollutants will mean different land use options, so it is important watersheds identify their needs before any policy discussions. It also found that programs must target nitrogen and phosphorus reductions to be most effective. This study gives us an idea of the magnitude of the work remaining and the challenges of meeting potential aquatic life standards, whether they benefit state waters or the Gulf of Mexico. Any future nutrient reduction goals that states may adopt need to be accompanied by significant federal resources and given adequate time for implementation. Iowa is well on its way in developing state nutrient standards. A significant federal investment in monitoring and evaluation would enable states like Iowa to be more strategic with their nutrient reduction program planning and implementation.

That is one reason why the Iowa Farm Bureau and other agricultural groups were members of a state Watershed Quality Planning Task Force in 2006 and 2007. Its six major recommendations are now moving through our state legislature and should be a solid foundation for better watershed coordination, planning, assessment, and monitoring and program implementation strategies. With this information in mind, the IFBF asks the Task Force to finalize an Action Plan that recognizes the right of states to develop their own strategies to address stormwater runoff, supports federal water monitoring and science development, and avoids federal numeric targets or standards for nitrogen and phosphorus or federal regulatory actions affecting fertilizer applications.

**Benjamin Grumbles:** I want to thank all the public commenters that we heard from. I would turn to any of the Task Force members to see if there are any comments you would like to make based on what we have heard or if there are any follow up questions from our staff.

**Len Bahr:** I have one thing for Dan McGuinness—I come bearing greetings from your colleague in Louisiana, Paul Kemp, who has impressed me very much for years and since he joined Audubon in terms of the very broad challenge that Audubon has taken on. I absolutely support looking at the whole river as a system and not a series of piece-meal project problems. I think that is the only way we will be successful in solving many problems throughout the Basin.

**David Vigh:** I just wanted to say a few things to all the public presenters. Dan, good to see you again, Audubon Society is a very valuable partner for the things we do on the Hypoxia Task Force. I particularly liked your comments about conservation and consortiums in support of constituencies. That is a very important source of groups we will be working on with that. Nancy I really enjoyed the positive stories you passed along. We have been working together and look forward to whatever we do in the future. Doug, I really liked some of your comments on science and impacts, as well as some of the strategic implementation. I wanted to save Kristin's for last. I really do appreciate your comments and I received them with an open mind. There is a lot going on with the Missouri River and Corps projects along the River. We have stopped that project and we are in the process of starting a study. As you know we are in discussion and trying to start moving together. I know we will come to some reasonable conclusion to the effort. It is always good to hear other sides to the story and we appreciate it very much.

**Kristin Perry:** Do you think this project can be accomplished without dumping the sediment in the river?

**David Vigh:** I believe there are alternatives that can be looked at and this is the purpose of the new study being implemented. Whether we pump it back on land or do something else with it, as you mentioned, there are arguments about sediment-starved parts of the system. We have to look at all the aspects of it. That is one thing about the Corps of Engineers—we are a balancing agency. We look at social, economic and environmental impacts, and try to come up with the best decisions. It is not always the most popular decision; sometimes it is not the right decision. Sometimes it is the correct decision. We will continue to work together on this.

**Kristin Perry:** How can EPA let our government perform activities given absolutely no time frame?

**Benjamin Grumbles:** You are referring to the Corps management of the sediments?

**Kristin Perry:** They are putting the sediments in the water, which is illegal for every other citizen of this country.

**Benjamin Grumbles:** Is this because it is a civil works project? Is that your point?

**Kristin Perry:** I am thinking it looks like the government is allowed to do that, but the citizens cannot. They have a stormwater permit, they do not have a discharge permit and now they have an order from the Clean Water Commission that says that they may not put soil into the Missouri River. Now they are interested in negotiating.

**Benjamin Grumbles:** What authority are you pointing to in terms of the order to the Corps not to put soil into the water?

**Kristin Perry:** I am talking about the sediments section of the Clean Water Act.

**Benjamin Grumbles:** And then a 404 permit or a 402 permit?

**Kristin Perry:** Is a 404 permit nationwide stormwater permit? As you saw, what they are pumping out is not stormwater—that is just soil put in a dredge pipe and run out into the river. There is no permit to do that.

**Benjamin Grumbles:** And that reflects the longstanding history of the 404 program that the Corps of Engineers does not issue permits to themselves.

**Kristin Perry:** And there is no sort of state certification.

**Benjamin Grumbles:** It is not a specific permit. They go through the process of the Clean Water Act. I do not know the specifics of it, but we will be happy to talk to John Paul about it.

**Kristin Perry:** I am happy to hear that. The question goes for all of you—we all know that every construction project in this country has to keep soils out of the water. How does that fly in the face of the conservation program, what the Corps is doing and what our government is doing?

**Benjamin Grumbles:** This is a good topic because land use management projects and soil and erosion control projects are largely carried out through the state clean water programs and authorities—permits, local ordinances, Clean Water Act state-issued permits. EPA takes very seriously the challenge and threats that sediment and construction-site runoff poses on-site as well as downstream. We are working on reissuing and revising the permitting programs under the Clean Water Act. We are working on effluent guidelines for the construction and development sector, which we think will help. A key point of this effort that we are engaged in here with the massive size and breadth of the Mississippi River/Atchafalaya system is that we have to use our skills and tools of cooperative conservation and collaboration. There are regulatory programs that do come into play, often at the local level when it comes to sediment and land use and erosion control. We have learned a lot over the last few years as we have benefitted from the increasing amount of information and science on the key challenges and

threats. We know it is not just nitrogen, but also phosphorus. We know that there is a significant role of sediment in the transport of nutrients. What we are hoping to do through the Action Plan is to have a sustained network of state, tribal, local and federal agencies with greater involvement of the private sector throughout the whole 31-state basin to focus in on the greatest priorities and risks to water quality both in the Basin and in the Gulf. We appreciate your comments on the soil and sediment, and we will take that to heart.

**Len Bahr:** Let me weigh in on something with trepidation. There is another side of this we should not lose sight of. I think Dan was mentioning some of it. There is a distinguished geologist now retired from the US Geological Survey named Robert Meade, who has done maybe the most exhaustive studies of the entire river system, including the sediment budget of the entire river. He has shown that in the last 150 years, there has been a decline in suspended sediment load in the river system by something like 70 percent. The water that gets to our dump system is not getting it like it used to. The primary reason is the damming of the Missouri River. I do not know where the sediment that you are concerned about is being put back in the river but I suspect it is upstream of some of these dams.

**Kristin Perry:** It is all downstream and it is not dirt. It is 605 acres of soil 25 feet deep. It is a resource to us and it goes against everything the people of Missouri believe in.

**Len Bahr:** It is a resource to us as well.

**Kristin Perry:** We do not really want to give you our soil! Why pay for the sins of the Corps for some dam somewhere by taking our valuable resources and causing more problems with nutrients and blaming agriculture?

**Benjamin Grumbles:** Albert, did you have something to say?

**Albert Ettinger:** Albert Ettinger, I work for the Environmental Law and Policy Center in Chicago. I also frequently represent other environmental groups, including the Sierra Club. I want to thank Director Hartke, who has spent a long time in Illinois, for all the work he has done and for mentioning one of the principle sources and one of the largest sources of the nutrients to the Gulf of Mexico—the water reclamation district and the city of Chicago (point source). How ironic that we are right now considering the renewal of the NPDES permit for the city of Chicago’s water reclamation district. We hope that Region 5 and EPA look very carefully at that permit and try to make sure that they fashion that permit in such a way that there are no net nutrients going into the Gulf of Mexico from the metropolitan water reclamation district. And we think that is possible. It is not necessarily possible economically by putting sewage treatment at the plant, but a better way to do it is to build restoration wetlands—restoring wetlands on the Illinois River.

There have been some very interesting proposals on wetlands reconstruction. You may have heard in other contexts that a number of us are very dubious of pollution trading in some contexts. It has been a real issue—how are you going to measure reductions going in here so

that you can allow greater inputs someplace else? There have been plans developed here in which you could actually restore wetlands in which you could actually gauge the nutrients coming into the wetlands, gauge the nutrients coming out, unlike some of the other schemes we have seen in Chesapeake Bay and other places. This really provides an enforceable scheme and something that I would be comfortable writing into an NPDES permit, knowing that it could actually be enforced.

The last two things I would mention, and this was mentioned by the Science Advisory Board, we have a real challenge here and I applaud the progress that has been made. Although I may not be as enthusiastic as some of the people have been about the extent of the progress made in the face of challenge, but also with the energy bill that was just passed. We are already seeing corn and soybeans in a lot of CRP land now. And as the Science Advisory Board recognizes, that is going to exacerbate the problem that we already have. Finally, I do not want to leave my friends in agriculture entirely out of this. We still have not seen anything close to the sound regulation of CAFOs and the Science Advisory Board also recognizes that CAFOs, or agriculture and livestock production, as a major source of phosphorus. I do not think USEPA is going to address that issue properly and we need to see a much more thorough regulation that will keep phosphorus just. The approach now at EPA basically says that we take the phosphorus off the CAFO and into the field and it is fine if the phosphorus then washes off into the water. That is not going to cut it. We need a policy and a plan that do not allow phosphorus to get out of the CAFOs and into the water.

**Benjamin Grumbles:** I would just note that in addition to having members of the public traveling to this event and also Task Force and Coordinating Committee members coming to this event a lot of agencies have staff who are attending this meeting. I know just from an EPA standpoint that Tim Henry from Region 5 is here, and I appreciate you being here Tim. Also Bill Honker from Region 6, Art Spratland from Region 7, and Bryon Griffith who heads up the Gulf of Mexico Office with Phil Bass up in Mississippi. The additional comments that we have received in addition to the six have been helpful.

Albert, Gary Mast and I greatly champion market-based approaches and water quality trading. Wetlands for water quality trading is a great and promising area, as long as it is done with accountability. So I appreciate you mentioning the opportunities for measurable and enforceable market-based approaches. That is an important one.

**Doug Daigle:** Doug Daigle, Coordinator for the Lower Mississippi River Sub-Basin Committee. It occurred to me during the sediment discussion that it would be remiss if we did not mention an effort that began here in Illinois with the Lieutenant Governor to really push the idea of getting some of their excess sediment down to us that had formerly been used by their parks project and they have tried to work this through Congress. I am not sure of the status of this, though. We had a sediment deficit down at the bottom and they had too much, so this was an effort where there seemed to be some synergy. Obviously it is never as easy to pull off something as the concept was, but it should be mentioned as an innovative attempt.

**Len Bahr:** There is also a fellow by the name of John Marlon some of you may know who has been advocating a hard look at this for some time. Again it fits into the idea of looking at the river as a whole system and the sediment budget for a whole system.

**Robert Perry:** I would like to point out that the sediment we are talking about is 643 parts per million phosphorus. A hog lagoon is going to run less than 100 parts per million phosphorus. I do not think many people understand this sort of chemistry.

## **Task Force Agreement on Final Action Plan**

**Benjamin Grumbles:** As has been stated, we agreed to recommence this reassessment back in September 2004. Since then we have conducted four science symposia surrounding Gulf hypoxia and nutrients transport in the Basin. We were in Missouri, Iowa, Louisiana, and Minnesota. We completed a major technical report, compiled the information on point sources in the basin. In 2006, we asked the EPA Science Advisory Board to provide independent advice on scientific advances. We measured our progress on implementing the 2001 Action Plan. We updated the science, drawn conclusions, and crafted language and actions to increase the specificity and accountability. As the chair of the hypoxia Task Force, I ask the Task Force members for their concurrence from this point on approving the 2008 Action Plan. Are there any objections?

**Bryan:** Yes, there is.

**Benjamin Grumbles:** Bryan.

**Bryan Hopkins:** I think it is important that we have a little bit of background before we kind of get into what is problematic. The SPARROW model that came out, and the way it came out, has been counterproductive to say the least. There are some significant concerns over validity of some of the interpretation of the results and where the sources are being indicated. Remember, it is all a predictive tool based on a very small number of actual measurements and data that are 16 years old, and are a key portion of the foundation of it. The model when it is presented, rather than talking about watersheds that might be indicated as potential sources so that it will be a guidance tool—it was presented as a toggling entire states on and off—red or a different color. You either have a problem or you do not have a problem. And certainly in the case of this, to a lot of folks' disagreement, the entire state of Missouri gets toggled on as the second leading phosphate producer. And we are not naïve that this is a data presentation issue. We will go on record as saying we have significant problems with a lot of the underpinnings of the SPARROW model's source data. But even then it would indicate that Missouri may have somewhere between 10 or 15 percent ownership on phosphate. That hardly toggles an entire state on and it hardly puts Missouri second-ranking as leading phosphate producer to the Gulf of Mexico.

I tell that story because it is important to understand what happens when things are presented that way. Instead of identifying the whole state, the model could have shown 2 or 3 watersheds to point our interest towards, that we could actively maybe look towards some



improvements on. Keep in mind, we have an aggressive soil and water program in our state. We have \$23 million in on-the-ground funding that happens every year towards soil and soil retention, and all of those have ancillary water quality improvements. And to look at ways to look at some of those resources and how they may be targeted towards one or two watersheds is a completely different scenario than where we are today. We are looking at a state that is completely red, so that everyone in the state who has an interest in this, regardless of your interest, is now confused and wondering if this is widespread. It has created an atmosphere that has changed the landscape significantly.

So having said that, the real problem is the Operating Plan. I think it is worth saying that before I describe the Operating Plan we have, not the Action Plan but the Operating Plan, is that the Operating Plan is an excellent concept. It is an implementation tool; its intent is to look at what can be done on an annual basis and what can be achieved. Frankly, I would have seen that this had value and efficacy five years ago. And I have heard folks declare a victory that we have an Operating Plan and that we are going to move forward. I completely concur with that. But the end result is that we have an Operating Plan that was still a draft, and we are receiving e-mails with changes in language literally up to a handful of days before attending this meeting. And, in that draft—I am not going to pick this apart because this is not the right format, and I do not think it is even necessary—but under Action Plan One it says complete and implement complete and comprehensive nitrogen and phosphorous reductions for the states in the Mississippi River, and that sounds like it is a reasonable thing to be looking at. But when you look at the implementation plan, which is the spreadsheet below it, it says who's the lead agencies and it lists 6 different federal entities: USEPA, US Army Corps of Engineers, USDA, NOAA, etc and it says that part of the actual deliverables are to propose a template for developing a state-wide nutrient reduction strategy.

We have federal agencies in this document that are going to develop a state-wide nutrient reduction strategy. In the action plan it says that this will be targeted at the top three states, which I assume now we were not sure, but I guess we are red so we are one of those top three. Then, when you look at this it says when is this going to be achieved by, and it says that the states are responsible for “nutrient reduction activities” by June 15, 2008. Now, I do not think anyone who worked on this spreadsheet was trying to imply that we are going to have a federal nutrient reduction strategy that the states are 100% responsible for implementing with no additional funds and that we have to see on-the-ground activity by June 15<sup>th</sup>. I do not think there is anyone in here that would stand up and say that is what we are after. My comment is that the mechanism for developing these reportable items on an annual basis is rushed, and premature, and in an effort to have some kind of measurable element to roll out is nothing that I think anyone here could be very proud of at this point in time. I think that an Action Plan that—not an Action Plan, sorry, an Annual Operating Plan—that had discrete goals of what it is going to try to accomplish over 2008 is necessary. It defines what meat and potatoes items we really want to see characterized—lists of state activities, GAP analysis—and puts parameters on how that data would be gathered, what kind of data we are after and where it would go, and then that becomes populated in 2009. Then you begin to see on-the-ground movement.

We have an Annual Operating Plan that is a pivotal part of the Action Plan which is a moving target. It is even hard to come to the point of saying that we disagree with it, but the

message coming from my Task Force member is that this is not something we can support at this time. I also think that there is another fundamental element here that is worth discussing, and that is for all of water quality movement forward. There is no doubt that the most important piece of legislation in the US, certainly environmentally, is the Clean Water Act. And from the very beginning it has been looking at, especially when you move past point sources, at a watershed-based approach. We have another long, historically active and successful program of soil and water conservation—NRCS through USDA—watershed-based approaches. One of the things that is in the Action Plan is that states that are identified as being the highest nutrient contributors will develop Action Plans. Well, the state of Missouri has always valued water quality and we have said already that we have an aggressive soil and water program that is state-funded, at levels that other states might wish they could achieve. We have not been flat-footed in this, we have been moving forward on nutrient reduction in our state. We are moving forward on nutrient reduction criteria and we do not intend to stop moving forward on any of that. But, we find it very counter-productive when we have a plan here that targets states rather than watersheds. When I say watersheds I am talking about small-scale watersheds so you know where your problems are. This leads to my last point. One of the most effective ways to achieve change in the absence of any funding is that you look for existing partners and how you can take those partners and come to an agreement where their existing programs can be nuanced towards new achievability. The fact is that the SPARROW model has value in respect because it points to some watersheds that would need to be explored further, based on either monitoring or confirmation on the ground from folks in the state that have a background in that. We may end up looking towards those areas, and we have plenty of opportunities to nuance programs that we have in the state towards achieving those goals.

You cannot rush the process, and here is why. I cannot give you a list of five, ten, fifteen programs in the state of Missouri that have nutrient reduction interests. And if I was to give just all the activities accomplished by our soil and water program alone I would have to give it to you on a CD. Where do we list those programs? Then, if the state of Missouri is rushed to do this and we leave off key partners, then what have we done in terms of coalition building? If we drag partners to the table that do not have a clear picture, and I cannot give them a clear picture because I do not have a clear picture of what is in the Annual Operating Plan, do you picture a situation where we are sitting around a table looking how to accomplish the really aggressive nutrient reduction strategies in the absence of any new funding? That is the critical issue here. I do not want to leave a message here that Missouri does not value nutrient reduction. I do not want to leave a message that Missouri does not value nutrient reduction that has a positive impact on the Gulf of Mexico. We fully intend to keep moving on the path that we have been moving on and fully intend to move forward towards addressing nutrient loads. And we absolutely embrace the concept that every move forward that the state of Missouri makes will lead to a positive move in terms of Gulf of Mexico and the hypoxia issue. We are significantly concerned with the process and I will be the first to admit that the state has not been as engaged as it should have been. And in some ways that may have caused some folks to kind of try to ease down on our reaction here. But at the end of the day the message from my Task Force member is we cannot support this as written.

The language changes we would like to see are a watershed-based approach in terms of targeting where some of the first initial plans will go. Of course they will end up being state based, but they need to be talking in terms of watershed. That is entirely consistent with pre-existing programs, whether they are federal, state or otherwise. The other thing that we would need to see is a significant scale-back on the Annual Operating Plan so that it is done right. Then, the meat and potatoes that will show up in 2009 are things that we can actually get done, not so we can say that we got the plan in place, it is all been done in 2008, and we are moving forward. I know that is an important element for some people, but we want to do it right. So, I hope that this is an understandable position. There have been significant conversations about this. I will tell you that this was not reached trivially, or by one or two individuals, but that there was substantial discussion on this. There is still ample opportunity. We will provide language that the Action Plan could include—we will do it in a very timely fashion—that could move us forward and that could even be reached via consensus through e-mails and conference calls. But the Annual Operating Plan needs to be revisited in a substantial way.

**Benjamin Grumbles:** Well, Bryan, I think all of us want to help get you up-to-speed and work with you and your Task Force member on all of this. It is a bit of a surprise to hear this in terms of the Coordinating Committee and the hard work that they have done. The hallmark of this whole effort has been to work in a collaborative way and to have action and to have meaningful progress. I do not think anyone can use the phrase “rush to judgment” on it when we have spent such an extensive amount of time on the reassessment and all of the symposia. But, I recognize that you and the state of Missouri, which we embrace as part of this collaborative effort, are relatively new to this. I would say the points you make about the SPARROW model, about the timing and specificity of the Annual Operating Plan, are ones where all of us as Task Force members need to have further discussion—about the specificity, about the timing of it. EPA, USGS and others who were part of the lengthy discussions yesterday on the use and availability of the SPARROW model as a tool, recognize that it is a tool and that it is only as good as the data that goes into it—but that it is an important tool. I would just also say, both as an EPA person and as a Task Force member, that this whole effort is an attempt to embrace the watershed approach. So I look forward to learning more about the state of Missouri when it is talking about a watershed approach.

All of us, whether upstream or downstream, want to make progress in a responsible way that is good for our constituencies, but is also true to the goals that we agreed to in the revisions of the Action Plan agreed to in Cincinnati. It is unfortunate that Missouri feels so strongly about the Annual Operating Plan, but I feel as though we still need to get into the specifics of that—but what was on the table was the Action Plan itself. We have spent so much time laying out a broad, collaborative framework that also includes the most recent science that we have gotten, have obtained from other areas, and that the SAB has given us, so I really think it is important that the Task Force can move forward on and reach agreement on the Action Plan itself, with the understanding that a significant and important step in additional improvement on that is to have a more specific Annual Operating Plan. And I can tell you that, when you get into specifics of an operating plan, it really is important that agencies and Task

Force members are comfortable with the specifics, because that really is an important part of where the rubber meets the road.

As a 20+ member Task Force we are not going to get into that level of specificity for each and every item. What we need to do is complete the task that was agreed to in 2004, that was due in 2005 but that we wanted to take an additional amount of time to build in the science the acceptability and make sure that we were focused on the right areas of new priorities. I think it is important for the federal and state level to reach agreement and be supportive of this Action Plan. But with the understanding that we are going to talk more tomorrow about some of the concerns you have raised and others that have risen about the level of specificity and timing of the Annual Operating Plan. Does any other Task Force member want to comment at this point?

**Bryan Hopkins:** I think it is important to understand that my involvement in this is certainly recent. This is not my view. This is a well-considered and well-formed interpretation of what is in the interest of the state of Missouri, and I am here to reflect that. There is a difference between my recent appearance in the Coordinating Committee and whether or not the state of Missouri's been paying attention to this problem. I do believe that the language elements in the Action Plan are pretty achievable. But, I do not know that. I would need to review that. I do not want to put words in my director's mouth. My hope is that we can achieve an Action Plan that everybody is on the same page with. I do not see that train as having derailed. There are some language issues that folks maybe can have some time to work on. And what does that time mean? I am hoping we are talking weeks. The Annual Operating Plan is an area that is significant. It is important to draw distinction between the two. I would not describe this as a derailed moment.

**Benjamin Grumbles:** I would not either.

**Russell Rasmussen:** I just have a question, because I am confused watching all the back and forth here. First of all, are we separating out the Action Plan from the Annual Operating Plan? You mentioned they are joined at the hip, but for purposes of our discussion are we looking to see how we feel about the Action Plan as opposed to the Annual Operating Plan? Secondly, and this is mostly for Bryan, are you objecting to both at this point?

**Bryan Hopkins:** I reiterate that I am carrying a message, but it is also one with which I concur. The Annual Operating Plan would need to be revisited in a substantial way in terms of its scope and the reduction of its scope for this year in order to not take ten steps back. The Action Plan has some language issues that have to do with state versus watershed orientation that I am hopeful we can work through in a pretty timely manner.

**Brad Moore:** Just a couple comments. First of all, I do not think it is appropriate to wait on the Action Plan. I look at my committee member Wade and the hours that he has put in on this and there is been a ton of collaboration. When I read that plan, and my state is very different from Missouri and Wisconsin and all, but there is plenty of flexibility in this Action Plan for states to craft and move in their own directions. In fact, that would be the likely big criticism of it, that

there is that flexibility. And with respect to the Annual Operating Plan, I recognize your views in terms of the state of Missouri and you have thought it through. But, I have got to tell you when I look at the same language you do and think of my own state, I can take that language and craft it in a process that works for us.

For example, you talked about watersheds. The second point says targeting the top nutrient watersheds. That implies the watershed approach. Everyone here on the Coordinating Committee is an expert in terms of public process and partnership building. Of course they want this to be done here. I do not see any language here in this document that prevents the state of Missouri from designing and developing the partnerships on a basis of what works for them. I am not sure where the fears are. When I look at the Action Plan it has tremendous flexibility to work with the citizens, locally, in ways they see fit. In fact, the last point is about agencies providing input and assistance. And part of the beginning of the page talks about however full implementation of this Action will require full additional funding. So, Mr. Chair at least on the Annual Operating Plan there are areas to work on but on the Action Plan we should move forward.

**Karey Claghorn:** Since Missouri just got their red state status and they need more time, that may be something we could consider. Also, have we made enough of a point that the cities and towns are appropriately mentioned as point sources as well?

**Benjamin Grumbles:** I would just like to say a few things and Karey I appreciate your comment there. I do not think it is a constructive way to discuss the SPARROW model by saying “red states.” I think what we need to do is recognize that it is a tool, and it is based on 1992 data. The key is that as we get into the specifics of the Annual Operating Plan, we need to be working on improved data, and that is just one tool. I think it is important not to have the division or the disagreement over some of the results or recommendations of that one application of that model to be used as a way to slow up important progress in reaching understandings and moving forward with an Action Plan. The Action Plan is far broader, important and significant as a collaborative effort amongst federal and state entities, than one application of a model, which is one tool. We will have discussions about the specifics of the Annual Operating Plan and the timeliness of when it would be ready. That is a good area to talk about specific things like that. The Action Plan is broad and it reflects the latest science we have and I think it is a strong statement that is also flexible and reflects state and federal agencies own individual needs on how they will move forward.

I also agree with you completely that we not get wrapped around the axel of finger pointing and particularly finger pointing at agriculture as if it were the only contributor to the problem and the solution. Municipal sewage treatment plants, industrial plants, other point sources—all of us, the way we live in society in suburbs with runoff of different sorts or civil works projects can have an impact on the problem that is contributing to the hypoxic zone. As I went through the text of the Action Plan, I felt that it was clear, particularly what the SAB report said about there being multiple sources. And that even includes atmospheric deposition, particularly of nitrogen, but also phosphorus. I think that the spirit of that is something that, if you look at that, is reflected. I feel that the Task Force members helped the overall cause by

discussing the overall Action Plan and when they are working on their agency's own budgets and priorities to make clear that it is not just any one particular sector or source or level or component of society. It is more complex than that. I wanted to say that and I appreciate your comment on that. Let me turn to any other Task Force members that have any other comments.

**David Vigh:** I just wanted to say that the Corps of Engineers supports moving forward with the Action Plan 2008, pending some of the wording that has to be finalized and worked out. I do agree in principle with what Bryan brought up that the Annual Operating Plan, which is our nuts and bolts of what we are going to do annually, needs some more work. I think that the rest of the Task Force agrees that it needs some more work, but I think that the Action Plan should move forward.

**David Hanselmann:** I appreciate the commentary we have been having here and the focus on watersheds and recognizing the varieties of sources of nutrients. I think we have considerable input from the Coordinating Committee, the scientific community and a lot of stakeholders. On balance I think it produced a great new Action Plan and certainly one Ohio could support. After that we could focus on the Annual Operating Plan, and work on that because we realize that some additional work is needed there. But, in terms of the Action Plan we would recommend we move forward with this and focus on the implementation of it for the next several years.

**Gary Mast:** As I have been mulling over the Action Plan, of course my skin is a little raw in that it certainly looks at agriculture, and I guess my concern is that we have not spent a lot of time looking at other sources of nitrogen and phosphorus in the community of the Mississippi River. That would be my only apprehension that maybe it is not quite broad enough. I would also like to say that we certainly work with all our federal partners. I think we have done a pretty good job of putting the money where the mouth is with all the dollars we have put out for conservation programs. We continue to want to be a good partner and do the right thing.

**Janice Ward:** The Department of the Interior supports this plan and one of the things we see that is a great strength of the plan is that we have elements of not only science and advancing science, but then the use and integration of that science in the development and improvement of conservation planning. Because we are a department that has both science pieces and a few management pieces through the Fish and Wildlife and the Park Service, we especially appreciate marrying those two things together. I think that challenges us all, both the federal agencies and the states, to work together through all these multiple interests and programs that we have to run to find those commonalities and make advances in this adaptive management process that we have put forward in the Task Force.

**Len Bahr:** I finally read the quote attributed to me in the paper this morning and I think there are a lot of words in the Action Plan, but I think there some really important ones. I think our state would not be considered unsupportive of the need for an Action Plan. We need action. To further postpone would send a bad signal. I think we certainly want to see this process go forward as quickly as possible.

**Robert Magnien:** I think as we all know this is a consensus process and there are a lot of diverse interests represented here. I do not think it is any big secret that I did not get everything that I thought NOAA would like to see in this plan. I think everybody compromised to make this happen. I am also quoted in that article. As I said I would, I thought what we really need is to get more into the action game, and there is an opportunity to do that in the Annual Operating Plan, so let's go forward with this Action Plan that we have worked so hard on and get to the Annual Operating Plan and hopefully that will be more specific and we can take a more proactive stance. I made this comment yesterday at the SPARROW presentation—that tool has been out there in front of us for a couple of years. I asked a question of this Task Force a year or two ago—can we use this for our plan, for our action and for our implementation plan? I think the answer was yes. We just have not come forward and asked USGS or whoever how we want it to be used. Let's get it out front and get the questions that we want answered instead of waiting for others to make those decisions. Let's get this Action Plan approved and move on to the Annual Operating Plan where we can be more specific and really make some progress.

**Russell Rasmussen:** I want to be clear on Wisconsin's position. We also support approval of the Action Plan. We have got some concerns about the Annual Operating Plan. We do think that the SPARROW model does certainly emphasize agricultural sources. There are urban models that can be used in conjunction with SPARROW to have a better prediction of the balance between the sources of urban and agricultural areas. That can be done through the Annual Operating Plan and I do not think the Action Plan needs to be changed to address that concern.

**Earl Smith:** It sounds like it is not the Action Plan that is the limit for us but the Annual Operating Plan. Can Missouri accept the Action Plan or did they propose some verbiage that could be inserted into the Action Plan to get Missouri comfortable and allow the Action Plan to move forward?

**Bryan Hopkins:** I do want to comment on this, but it is important that I preface it because I have to guess at the responses of a work group that I will be bringing this message home to. I am very confident that the language changes that would be necessary to approve the Action Plan would not alarm anybody who has been working on this, and will alleviate some of the concerns on our end that have been inflamed by the way that the SPARROW model data was represented. The concerns of Missouri with the Action Plan can probably be alleviated with some language changes that will not run contrary to the positions that people on this committee would support. In other words, we will be able to reach approval on the Action Plan. But I am going to need a week and a half to run that process through. The Annual Operating Plan everybody agrees needs some work, so maybe we can stop characterizing it as an issue and say, "this needs work." I am pretty confident that we can reach approval on the Action Plan.

**Benjamin Grumbles:** I would suggest a couple things. One, which I think would be an imminently fair and reasonable way to proceed (but it is not my decision, it is yours), would be to make very clear that the state of Missouri has concerns about the Action Plan, but is really

focused more on the discussion we will have tomorrow on the Annual Operating Plan. I do not believe in having formal votes or anything, it will just be that your area of concern is more focused on the Annual Operating Plan and how the public has used or misused data on a particular study. We would work through that in the context of the Annual Operating Plan discussion tomorrow and over the next several weeks. The goal would be to have Missouri and other states on board with us and other federal agencies, and to have the Annual Operating Plan released in May. One option that I would suggest you consider very carefully would be to say that Missouri has concerns about the Action Plan, but is not voting against the Action Plan. Missouri feels as though the Annual Operating Plan needs to be discussed tomorrow and will be discussed as necessary at the Task Force level by conference call over the coming weeks as a good forum in which to address that. This is fair to your other Task Force members who came here thinking that the Action Plan they put a lot of work into is ready to be approved.

The other approach would be to simply say to you, we understand you are catching up and you have got a Task Force member with some concerns, and that first option does not quite cut it—that you can try to reach out and spend some time on it tonight for tomorrow morning. I feel it is really important tomorrow to move forward and reflect the will of Task Force members and move forward on the Action Plan. My preference would be to do it right now and say there is some concern that can be worked out. I am confident it can be worked out through the Annual Operating Plan discussion. Those are two suggestions. I think that we could make it very clear that Missouri has some concerns or questions about the Action Plan, but that you are not casting a "no" vote on it. What you are casting is a vote for clarifying matters on how it would be implemented through the Annual Operating Plan and that discussion will occur tomorrow and over the next several weeks.

**Bryan Hopkins:** I will gladly make some phone calls and see what level of flexibility there is on this to try to achieve something in this time frame. It is my personal preference. I hope you recognize that this is not exactly a comfortable chair I am in right now. Also, these scenarios and potentials were discussed, and abstaining was discussed, which is kind of what we were looking to. We vocalized some issues. We will put it in neutral and forward some language changes to you. Based on the discussions that happened before I came up, the decision was to formally indicate that the plan as it is written is not something that we can support. I will make some phone calls.

**Benjamin Grumbles:** Do Task Force members object if we postpone until tomorrow morning the question that I asked about 40 minutes ago whether or not members concurred on that?

**Earl Smith:** Ben, since the thrust of this has been to build coalitions and things like that, in order to allow Missouri to be fully aboard, a few more hours will not harm us.

**Benjamin Grumbles:** This is a good collaborative effort. I think that we are precisely back on track now in terms of the schedules to have important presentations on the implementation of the Action Plan.



## Presentations in Support of Implementation of the Action Plan

**Dennis McKenna:** I am Dennis McKenna of the Illinois Department of Agriculture and a representative of the Coordinating Committee. I asked Dr. Mark David from the University of Illinois to talk about his recent research in the state regarding nutrients and their impact on water quality. Recently Dr. David was a member of the SAB Hypoxia Advisory Panel. I know it took a lot out of him.

### *Presentation C: Water Quality in Illinois by Dr. Mark David*

**Benjamin Grumbles:** Any question or comments?

**David Vigh:** Mark, I was wondering, you said you think your research has shown that a sequence might be different in different streams? Is there any indication that that sequence is correct?

**Mark David:** I do not think that anyone has come up with anything else if it is not that sequence, I am not sure how you get from nutrients to bioimpairment directly. Most people would agree it is through productivity. You could get impacts to productivity without dissolved oxygen in the sequence. However, we typically do not get those types of things. I am sure there are some cases where that might happen, but typically that sequence is the way. We can see the sequence working in various ways. It is just in the case of the place where nutrients are pretty high. It is not nutrients that are the controlling factor.

**Russell Rasmussen:** In Wisconsin we did a similar study, but we did find a correlation with phosphorous and chlorophyll-*a*. I think that when you recognize that fact that nutrients are not a limiting factor in Illinois' case, something else is. If you corrected that factor, nutrients might then become a limiting factor.

**Mark David:** Yes. That is possible. We did not find the correlation between nitrogen and chlorophyll-*a*.

**Russell Rasmussen:** I do not think that anyone is expecting to find one. If you find one, it is because it is co-correlated with something else like watershed size or some other impairment. In freshwater, I have never seen a direct nitrate biological impairment. I would agree.

**David Hanselmann:** I was just curious, if you had enough reservoirs with long residence times, where the cumulative effect of phosphorous, especially, would become an issue?

**Mark David:** We do not have that many reservoirs, except for the ones that we worked on, that are regulated for phosphorous. There is already a nutrient standard for reservoirs in the state.

**David Hanselmann:** And also nitrates, I guess, as well—reservoirs that provide drinking water.

**Mark David:** Right, but there are waters that clearly go above 10, there are at least two towns in this state that remove nitrates by ion exchange. We have moved that way, but it has been a difficult thing to try and reduce nitrate.

**Benjamin Grumbles:** Thanks, Professor, and thanks for your service on the Science Advisory Board. We will now hear from the Sub-Basin Committees on their current activities. Doug, I understand you are going to give us a quick update on the Lower Mississippi Sub-basin Team?

*Presentation D: Report on 2007 Activities of the Lower Mississippi River Sub-basin Committee on Hypoxia by Doug Daigle*

**Benjamin Grumbles:** Thanks, Doug, we appreciate it. Any questions or comments?

**Len Bahr:** I just want to point out that Doug has done a phenomenal job, and has worn many hats. I lean on Doug quite a bit and he goes above and beyond the call of duty.

**Benjamin Grumbles:** Thanks for adding that, Len, I appreciate it. Alright now we are turning to the Ohio River Sub-basin Team. David, I believe that you are going to give us an update.

*Presentation E: Update from the Ohio River Basin Team by David Hanselmann*

**Benjamin Grumbles:** David, thank you for that overview of the activities of the sub-basin. I understand now that we are on the third and final presentation from the Upper Mississippi Sub-basin Team, I believe that Dean Lemke will lead us through that.

*Presentation F: Report from the Upper Mississippi River Sub-Basin Hypoxia Nutrient Committee by Dean Lemke*

**Benjamin Grumbles:** Thanks Dean. That is a good point to end on: the many things that states are doing. We will talk more tomorrow about things that state and federal partners are doing. Not just to tout them, but to get out the word so that we all understand things that can be done and are working. We have come to the end of the program, here. I want to thank everybody, the public who made it and who are still here after the afternoon discussions. I also want to thank the Task Force members and the Coordinating Committee members who came today.

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## **Addendum to Public Meeting Notes**

*Presentation G: Nutrient Removal Studies by Thomas E. Kunetz*

## **Attachment A**

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# Review of Revised Action Plan and Annual Operating Plan

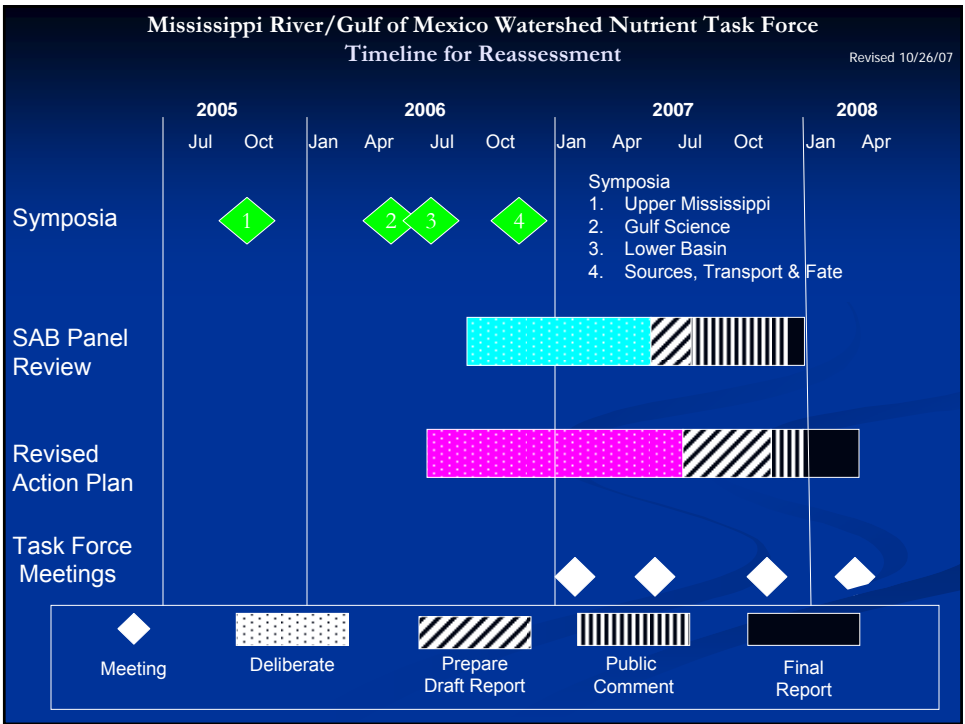
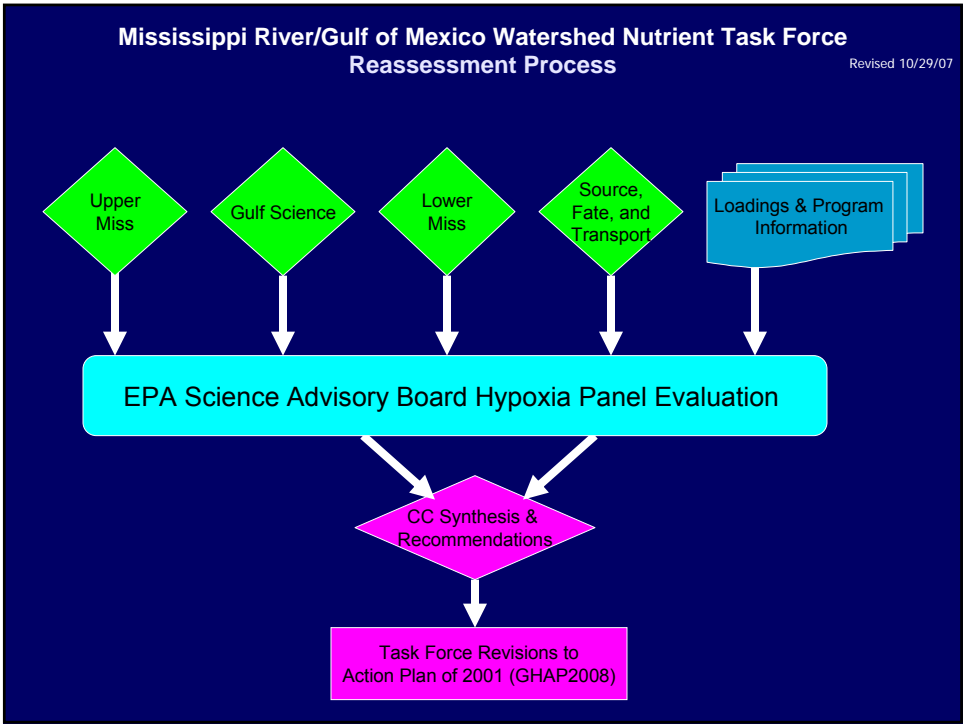
Darrell Brown  
February 28, 2008

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## Topics

- Reassessment Process
  - Draft GHAP2008
  - Comments
  - Revisions to GHAP2008
-



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## Themes – p.3

- ❑ Acknowledge the social, political and economic changes and links to emerging issues and policies
  - ❑ Ensure greater specificity and accountability and tie to funding strategies
  - ❑ Track program and environmental progress
  - ❑ Adapt to new scientific findings
  - ❑ Maximize opportunities for stakeholder involvement
  - ❑ Re-examine roles and responsibilities of Task Force partners.
- 

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## Principles – p.4

- ❑ Encourage actions that are voluntary, incentive-based, practical and cost-effective.
  - ❑ Utilize existing programs, including existing state and federal regulatory mechanisms
  - ❑ Follow adaptive management
  - ❑ Identify additional funding needs and sources during the annual budget process
  - ❑ Identify opportunities for, and potential barriers to innovative and market-based solutions, and
  - ❑ Provide measurable outcomes as outlined in goals and strategies
-

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## GHAP 2008 Process

- 11th Task Force Meeting
    - St. Paul – Sept 2004
    - Agreed to begin reassessment process that led to four science symposia and review by SAB
  - 14th Task Force Meeting
    - New Orleans - June 2007
    - Agreed to extend release date of GHAP by a season to incorporate final SAB report findings
- 

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## GHAP 2008 Process (cont.)

- Coordinating Committee Developed Revised Action Plan
    - Analyzed trends in size of hypoxic zone and trends in nutrients
    - Measured progress
    - Updated science
    - Drew conclusions from the Reassessment
    - Prepared draft for 15th Meeting
-

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## GHAP 2008 Process (cont.)

- 15th Task Force Meeting
    - Cincinnati - October 2007
    - Agreed to:
      - Release the 2008 Action Plan for public comment
      - Develop a one-year (2008) Operating Plan that would be released with the Final 2008 Action Plan and contain:
        - Current activities
        - Important milestones
        - FY08 funding
        - Critical needs for FY09
- 

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## Public Comments

- Received over 700 comments from:
    - Individuals
    - Academic institutions
    - Environmental and trade groups
    - State and Federal agencies
  - Comments have been posted to web
  - Response to comments will be posted to web after release of final GHAP
-



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## Comment Topics

- ❑ Implementation approaches
  - ❑ Action Plan Goals
  - ❑ Tracking and accountability
  - ❑ Communication and outreach
  - ❑ State and Federal nutrient reduction strategies
  - ❑ Economic Impacts
  - ❑ Increased and coordinated funding
  - ❑ Advancing the science
- 

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## Broadcast Email

- ❑ Broadcast email (657 nearly identical emails)
    - “Pleased that the Task Force is taking the most current science and applying it to the plan”
    - Need for timeline including concrete interim steps
    - “Overarching need for funding to fully implement the plan”
    - “More emphasis should be given to the adoption of numeric nitrogen and phosphorus water quality criteria”
-

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## Approaches and Goals

- Approaches –
    - Voluntary
    - Regulatory
    - Voluntary Incentive-based
    - Delivery through existing mechanisms
    - Need new/different institutional framework
  - Goals –
    - Support goals
    - Oppose goals
    - Support directionally correct progress
  - Need Improved Tracking, Accountability, Communication and Outreach
- 

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## State Nutrient Reduction Strategies

- Key element to the plan
  - Need for accelerated schedules
  - Need quantitative targets for nutrient reductions
  - Incorporate drinking water protection and local benefits in Action #1
  - Need for flexibility in strategies
  - Support for federal strategies
  - Roles of States versus Federal agencies
-

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## Economics and Funding

- Economic Impacts
    - Impacts of plan on agricultural communities
    - Impacts of inaction on Gulf communities and resources
    - General lack of economic data
  - Need for Increased and Coordinated Funding
    - Nearly every comment addressed this issue
- 

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## Advancing the Science

- Need plan based on sound science – comments that science is sound, and that science is still lacking
  - Need for expanded monitoring in the Gulf and in the Basin
  - Need for improved and higher resolution models
  - Need for improvements in cropping technologies to achieve the goals of the plan
  - Need to address/mitigate expanding biofuels
-

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## Major Changes to Action Plan

- ❑ Change from 10 to 11 actions – split Action #1 into 2 actions (#1 State Strategies, #2 Federal Strategies)
  - ❑ Reworded Action #3 to highlight/clarify intent of “Gaining additional benefits”
  - ❑ Retain 2013 target date for State nutrient reduction strategies, language change, “Implementation should begin as soon as possible but no later than 2013.”
  - ❑ Revised water quality standards language in Federal Strategies Action
  - ❑ Role of feds and states – language changes to reflect mutual roles
  - ❑ Drinking water protection and local water quality emphasis added
- 

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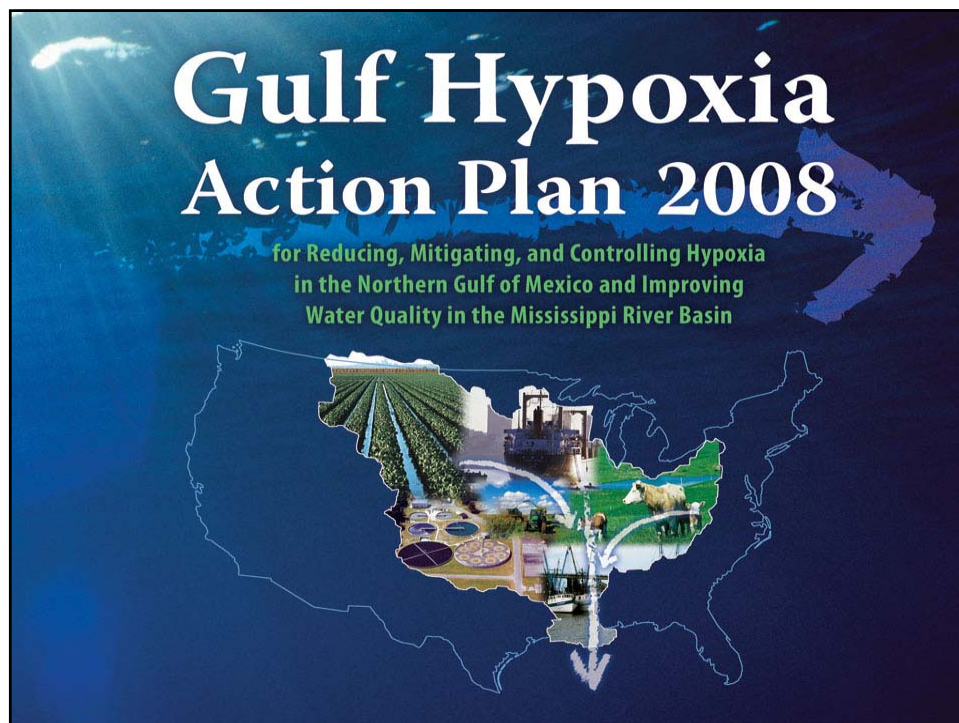
## Annual Operating Plan

- ❑ Designed to provide greater specificity and accountability
  - ❑ Provides a roadmap for implementing each action
  - ❑ Includes:
    - Funding levels and milestones for current FY
    - Critical needs for following FY
-

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## Annual Operating Plan (cont.)

- CC discussion on level of detail led to two documents:
    - Annual Operating Plan
      - Programs and activities that implement one or more of the actions in the Action Plan and are supported by at least one Task Force member
      - Currently contains 100 items
    - List of Task Force Member Activities
      - Additional on-going activities that generally support the goals of the plan
      - Currently contains 112 items
  - Release with Final Action Plan in Late April/May
- 



## **Attachment B**

# Soil Dumping in Missouri

February 29, 2008  
Kristin Perry, Chair  
Missouri Clean Water Commission

## Background

- At the request of the Fish and Wildlife Service and to comply with the 2003 Biological Opinion, the U.S. Army Corps of Engineers is digging 22.9 miles of chutes through river-bottom ground along the Missouri River in Missouri.
- These chutes are intended to create habitat for the endangered pallid sturgeon.
- The 2007 and 2008 budget for these projects in Missouri is estimated at 50 million dollars.

## Chute Projects

- 13 chutes – 22.9 miles in Missouri
- Total of 21 in four states of Missouri River Basin
- On some prior projects in Missouri, the soil was side cast, used along the levee or used to build roads.
- The remaining projects were scheduled to be dumped directly into the river.
- The decision to dump the soil seems to have been made by the Corps for economic reasons as the cheapest way to get rid of the dirt.

## Overton North Chute Project





**Soil placed on edge to promote  
undercutting and erosion**



# Jameson Island Chute (Saline County)





Jameson project on August 21, 2007  
Chute will be 1.9 miles long  
25 feet deep and is planned to be  
200 feet wide.



**Jameson – Pre-flood  
looking north**



**Jameson chute from the air  
during May 07 flood – looking south**



## Jameson spoils pile in river



**Total amount of soil to be dumped  
by projects in Missouri**

**24 million tons**

This would fill 1 million semi-trailers

Placed nose to tail the line of trucks  
would reach from New York to Los  
Angeles ...And...back!

**Proposed Barney Bend project site  
(Atchinson County)**



## Barney Bend

- Construction has not begun
- Federal levee a few hundred feet away
- Chute to be 9200 feet long (1.6 miles), 200 feet wide, five feet deep at summer flows

## Rush Bottoms Chute (Holt County)



**Dredger at Rush Bottoms  
pushes through 100 feet of  
dry land per day.**







**Rush Bottoms:  
Slurry from dredger pumped 3500  
feet to Missouri River**



**Rush Bottoms:  
13,000 tons per day  
Soil dumped into river**



**These chute projects will put  
31,000,000 lbs of P in the river**

**This equals 47% of the annual  
phosphorus load on the entire  
Missouri River basin.**

## **We tax ourselves to save soil**

- Missouri citizens paid \$40.9 million dollars in 2007 for state soil and water conservation taxes.
- \$27 million dollars of that was to be matched by landowners who take advantage of cost share programs to keep soil out of their watersheds.
- \$6.9 million is allocated to be matched by landowners in counties along the Missouri River.

**Worthwine project (Andrew County)  
Soil was used to reinforce levy and  
build road**



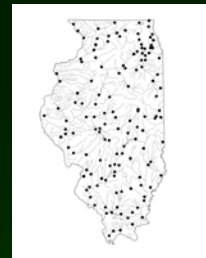
- The shallow water habitat can be built, the soil saved and nutrients kept out of the river, if alternative construction methods are used.

## **Attachment C**

# Water Quality in Illinois

M.B. David<sup>1</sup>, T.V. Royer<sup>2</sup>, M.R. Whiles<sup>3</sup>,  
C.A. Mitchell<sup>1</sup>, K.M. Starks<sup>1</sup>, T.N. Heatherly<sup>3</sup>, A.R.  
Childers<sup>1</sup>, M.D. McDaniel<sup>1</sup>, and P.D. Bedore<sup>1</sup>  
<sup>1</sup>University of Illinois at Urbana-Champaign,  
<sup>2</sup>Indiana University, and <sup>3</sup>Southern Illinois University

## What I will cover



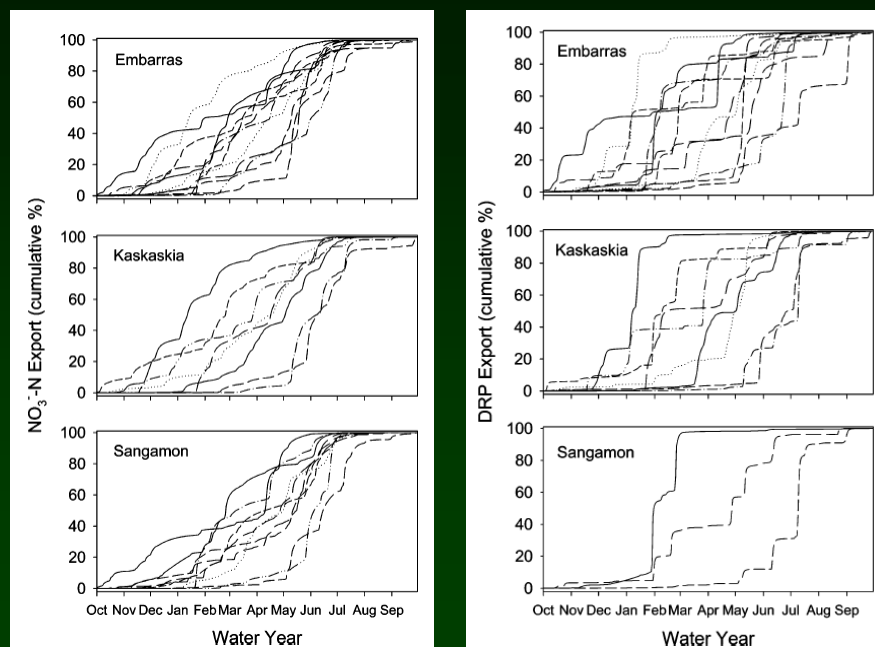
- water quality in Illinois
  - concentrations and loads
- statewide sampling results and relationships
  - chlorophyll-*a*
  - dissolved oxygen
  - macroinvertebrates
  - sediment P
- how can we use results?
- would reducing nutrients help improve water quality?

## Sources of Nutrients in Illinois

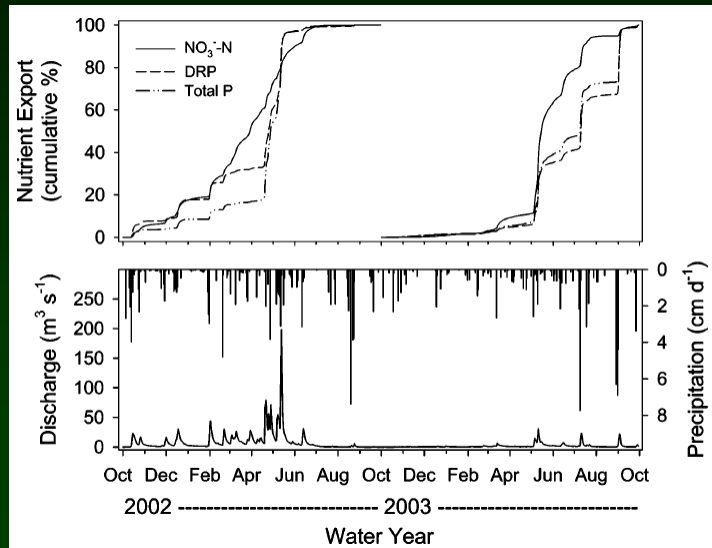
- agriculture
  - surface runoff
  - tile drainage
  - many watersheds > 90% row crop
  - animal agriculture less important
- sewage effluent
  - Illinois has ~ 12.8 million people
  - dominates upper Illinois River
  - generally, no N or P removal technology used



## Nutrient Export Patterns



## Importance of a Few Storm Events



## Nutrient Concentrations - seldom limiting

Table 1. Distribution of water chemistry values from the 2004 state-wide surveys.

	Minimum	25th Percentile	Median	75th Percentile	Maximum
High-Q† survey (May–July, <i>n</i> = 138)					
DRP‡ (mg L <sup>-1</sup> )	<0.005	0.038	0.069	0.156	1.9
Total P (mg L <sup>-1</sup> )	0.013	0.123	0.185	0.326	2.0
NH <sub>4</sub> -N (mg L <sup>-1</sup> )	0.008	0.040	0.058	0.089	0.387
NO <sub>3</sub> -N (mg L <sup>-1</sup> )	0.10	1.0	4.3	10.2	20.2
Total N (mg L <sup>-1</sup> )	0.37	2.2	5.6	11.0	20.9
Silica (mg L <sup>-1</sup> )	1.5	6.7	9.6	11.8	16.6
pH	7.0	7.7	7.9	8.1	8.7
Specific conductivity (μS cm <sup>-1</sup> @ 25°C)	106	586	658	751	2240
Turbidity (NTU§)	<1	21	36	61	614
Low-Q survey (Sept., <i>n</i> = 109)					
DRP (mg L <sup>-1</sup> )	0.001	0.029	0.081	0.345	2.8
Total P (mg L <sup>-1</sup> )	0.007	0.112	0.168	0.456	2.8
NH <sub>4</sub> -N (mg L <sup>-1</sup> )	0.002	0.011	0.022	0.042	0.696
NO <sub>3</sub> -N (mg L <sup>-1</sup> )	<0.05	0.18	1.5	3.9	18.0
Total N (mg L <sup>-1</sup> )	0.21	1.0	2.5	5.0	18.7
Silica (mg L <sup>-1</sup> )	1.3	6.4	8.6	11.2	29.2
pH	6.8	7.6	7.9	8.2	8.9
Specific conductivity (μS cm <sup>-1</sup> @ 25°C)	132	556	664	814	3246
Turbidity (NTU)	<1	10	18	29	159



## Objectives of Our Statewide Sampling

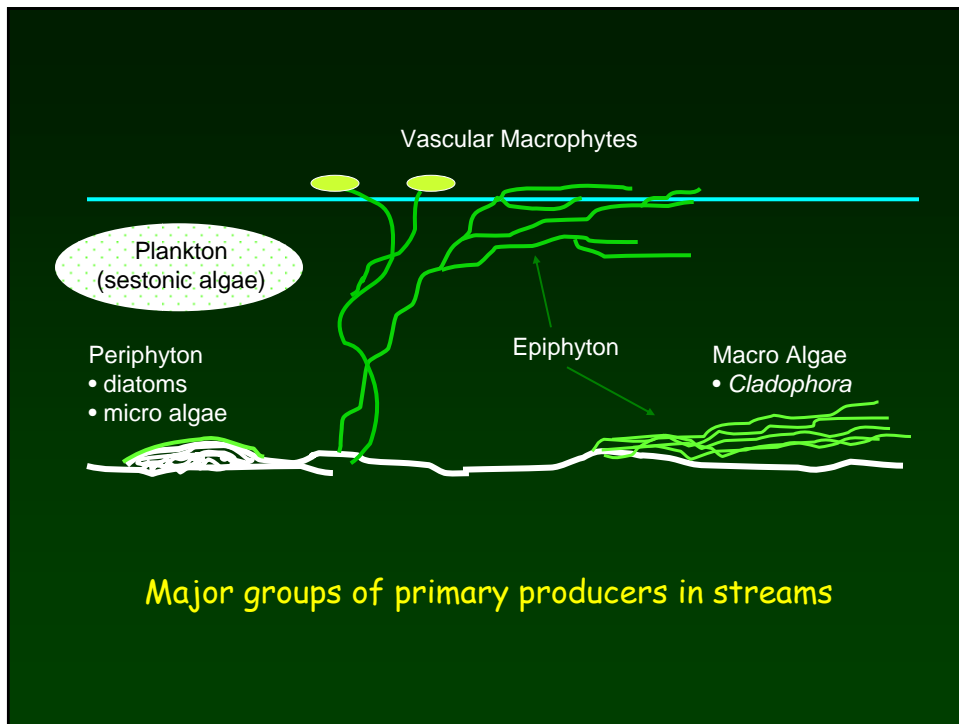
- determine relationship among nutrients, dissolved oxygen, and chl-*a* in streams, and relationships to biotic integrity
  - strength in Illinois streams and rivers
  - nutrients and macroinvertebrates
- examine role of landscape and anthropogenic factors on these relationships
  - including environmental factors other than nutrients
- quantify controls on P forms and amounts in streams
  - biotic and abiotic sediment P controls
  - timing and forms of P released from watersheds

## Operational Model



- how strong is this relationship in Illinois streams?
- is there a common characteristic among streams that do or do not conform to this model?
- how might we modify the model to fit various categories of Illinois streams?





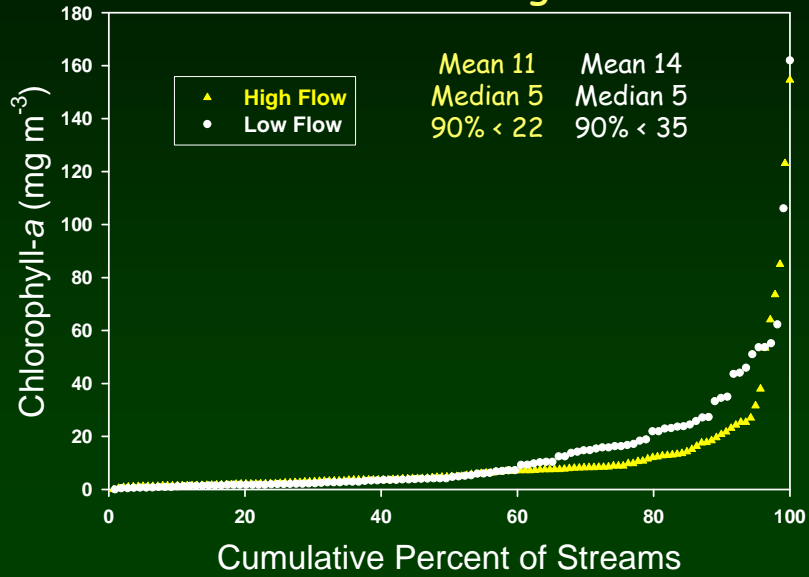
## Experimental Approach

- extensive and intensive sampling throughout state
- extensive sites
  - selected from IEPA ambient water quality network
  - 138 sampled during spring to early summer 2004 (high flow)
    - 53 sampled for macroinvertebrates spring 2005
  - 109 sampled during September 2004 (low flow)
  - 26 sites during summer 2005 (artificial substrate)
  - 53 sites summer/fall 2006 (continuous DO)
- intensive sampling sites
  - 5 in Chicago area (urban region)
  - 5 in east-central Illinois (tile-drained region)

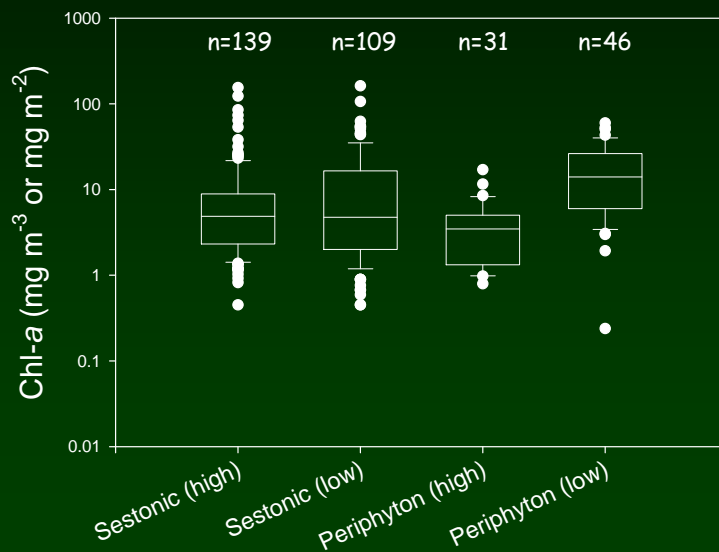
Extensive  
Sampling 2004



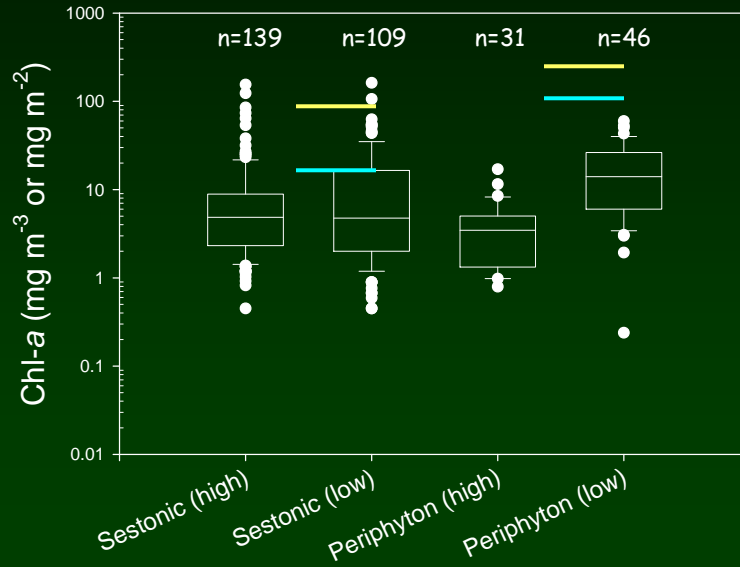
## Statewide Study - 2004 Sestonic Algae



## Statewide Study - 2004

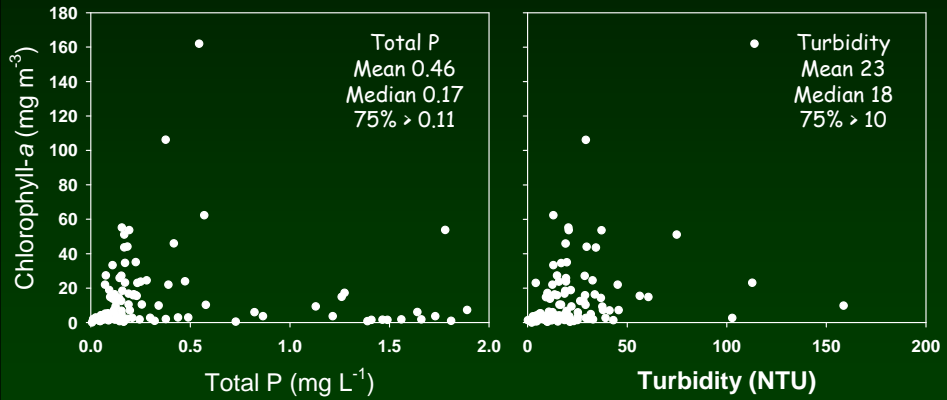


## Statewide Study - 2004



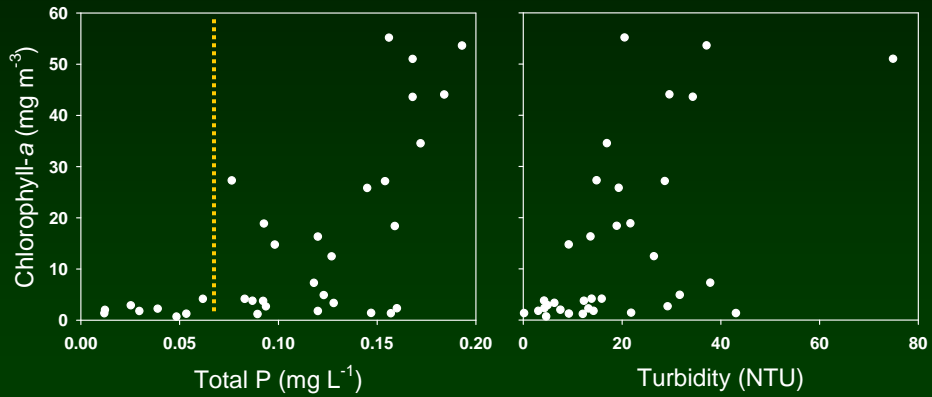
## Statewide Study - 2004

### Sestonic Algae - Low Flow



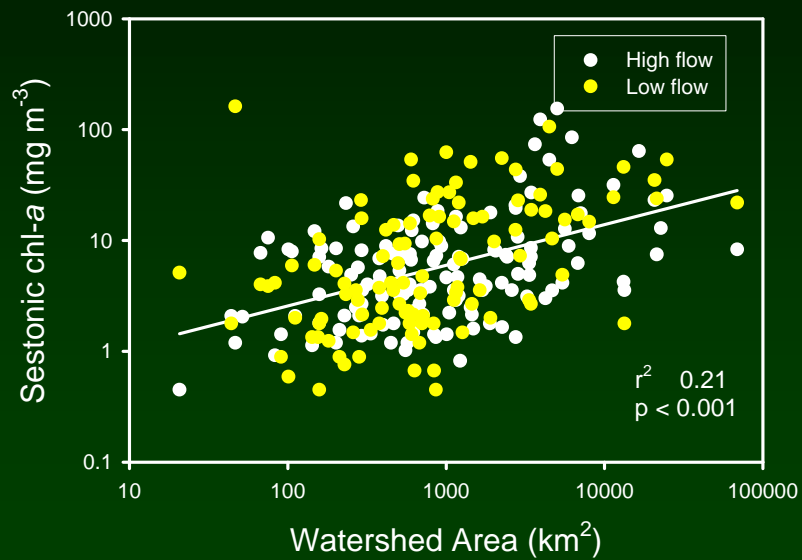
## Statewide Study - 2004

Sestonic Algae - Low Flow  
Total P < 0.2 mg L<sup>-1</sup> and Cover < 25%



## Statewide Study - 2004

Sestonic chl-*a* and watershed area



## Other Studies



Macroinvertebrates



Macro-algae

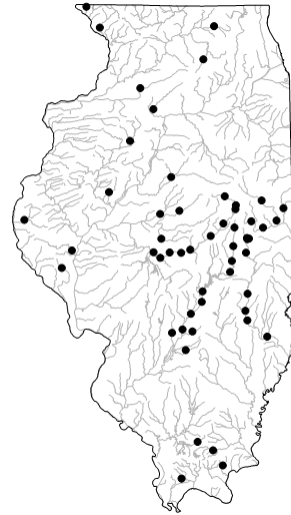


Artificial substrates



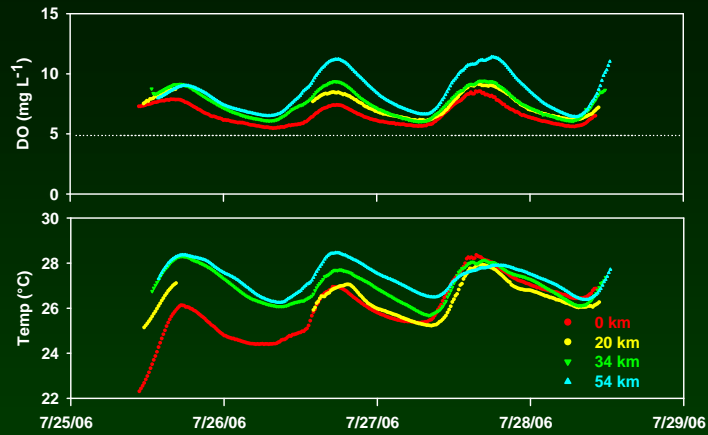
Dissolved oxygen

## Dissolved Oxygen in Rivers of the State

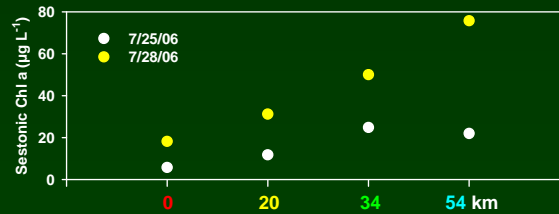




## Lower Kaskaskia River



Total P 0.07 - 0.17  
 Turbidity 7 30



## Dissolved O<sub>2</sub> metrics

### DO concentration (mg/L)

72-hr Max  
 72-hr Min  
 72-hr Range  
 72-hr Mean  
 Mean Daily Max  
 Mean Daily Min  
 Mean Daily Range

### DO % Saturation

72-hr Max  
 72-hr Min  
 72-hr Range  
 72-hr Mean  
 Mean Daily Max  
 Mean Daily Min  
 Mean Daily Range

### Average hours per day

Below 5 mg/L DO

Below 3 mg/L DO

Above 100% saturation

## Measured Stream Variables



### Water chemistry

NO<sub>3</sub>-N  
NH<sub>4</sub>-N  
TKN  
Organic N  
Total N  
DRP  
Total P  
Organic P  
DOC  
Silica

### Biological parameters

Sestonic chl *a*  
Periphytic chl *a*  
Biomass

### Physical parameters

Turbidity  
% Canopy cover  
Sediment type  
Watershed area  
Stream length

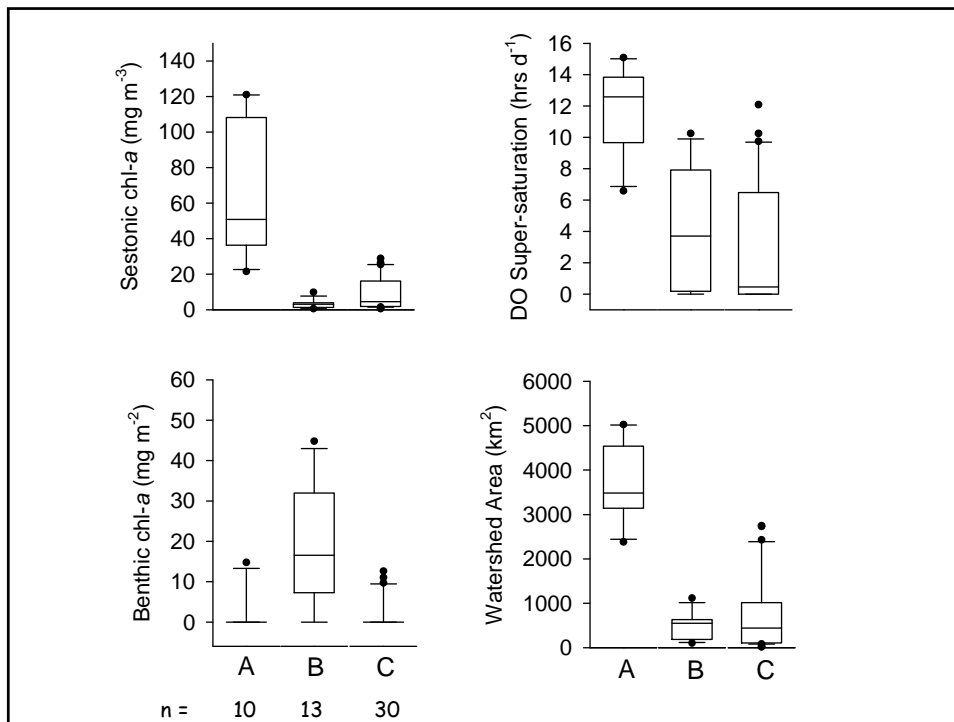
### Macro-invertebrate

Data (2004)  
Taxa richness  
Shannon diversity  
MBI value  
% EPT  
EPT richness



## Used Cluster Analysis to Group

- found 5 clusters using 6 variables
  1. DO daily minimum
  2. sestonic chl-*a*
  3. periphytic chl-*a*
  4. watershed area
  5. canopy cover
  6. total P
- P really not meaningful, 3 clusters without total P
  - cluster a - high sestonic, larger watersheds (n=10)
  - cluster b - high periphytic, small watersheds (n=13)
  - cluster c - low chl *a*, small to medium watersheds (n=30)



## Conclusions - 2006 DO Data

- only weak correlations in data set, many variables co-correlated
- cluster analysis supports conceptual models
  - large river (sestonic, lower DO)
  - small streams with clear water (periphyton, high min DO, large diel DO range)
  - many intermediate streams (little productivity, limited DO diel range)
- algal production not limited by P (always in excess)
  - sestonic and total P weakly correlated (but also sestonic and watershed size, where total P is generally higher)

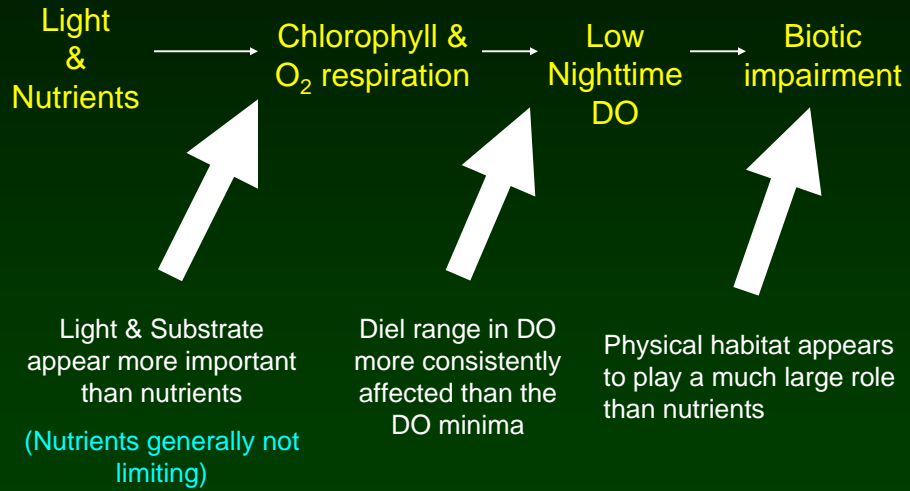
## Nutrient Criteria with Complex Relationships (how do we use these results?)

- correlations/regressions unlikely to work  
much of the data are not normally distributed as well
- nutrient, chl-*a*, dissolved oxygen, and biotic integrity linked but not straightforward
- can not study every site
- how to get overall relationships?

## Initial Operational Model



## Modifications to Original Model

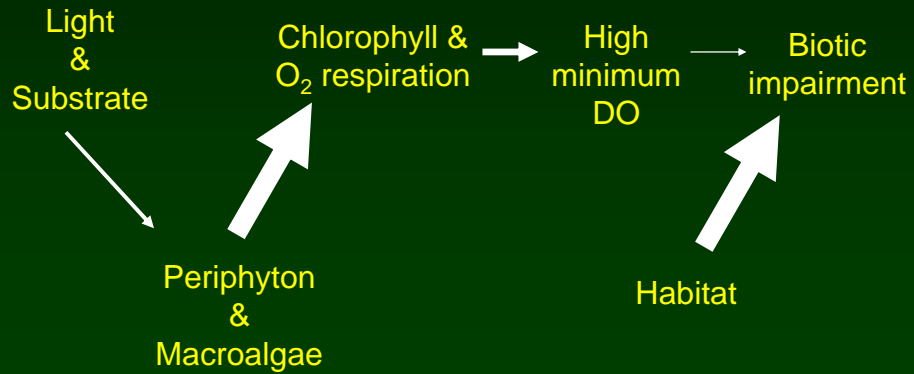


Small to medium streams



## Modified Model for Illinois (1)

*Small to medium streams*  
(in which nutrients are almost never limiting)



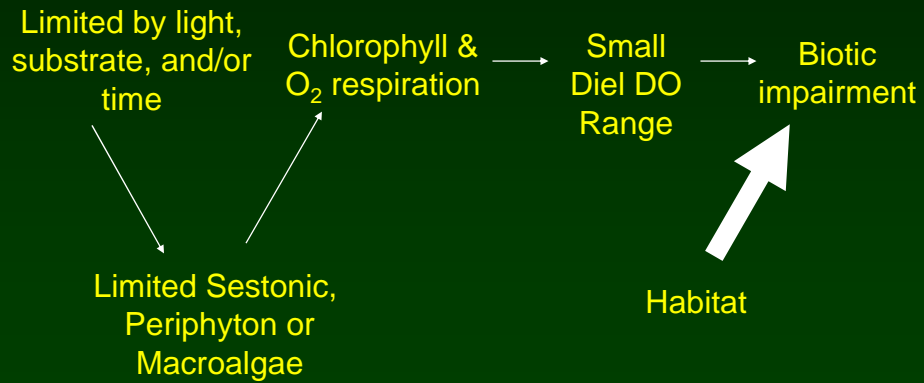
Medium streams





## Modified Model for Illinois (2)

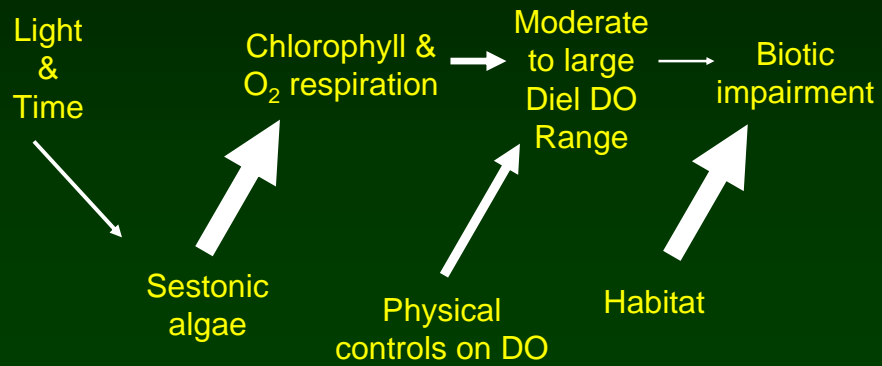
*Medium streams*  
(in which nutrients are never limiting)





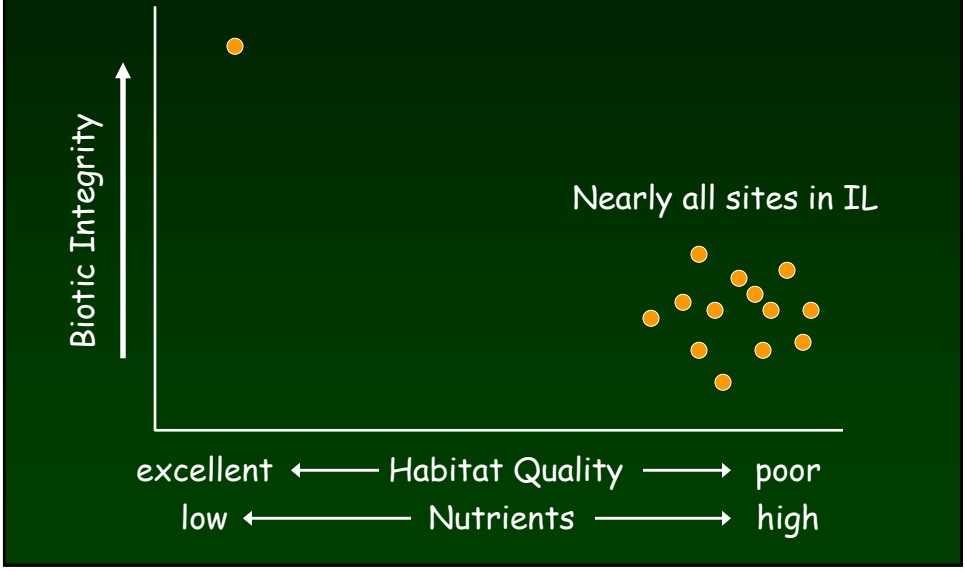
### Modified Model for Illinois (3)

*Medium to large rivers*  
(in which nutrients are never limiting)

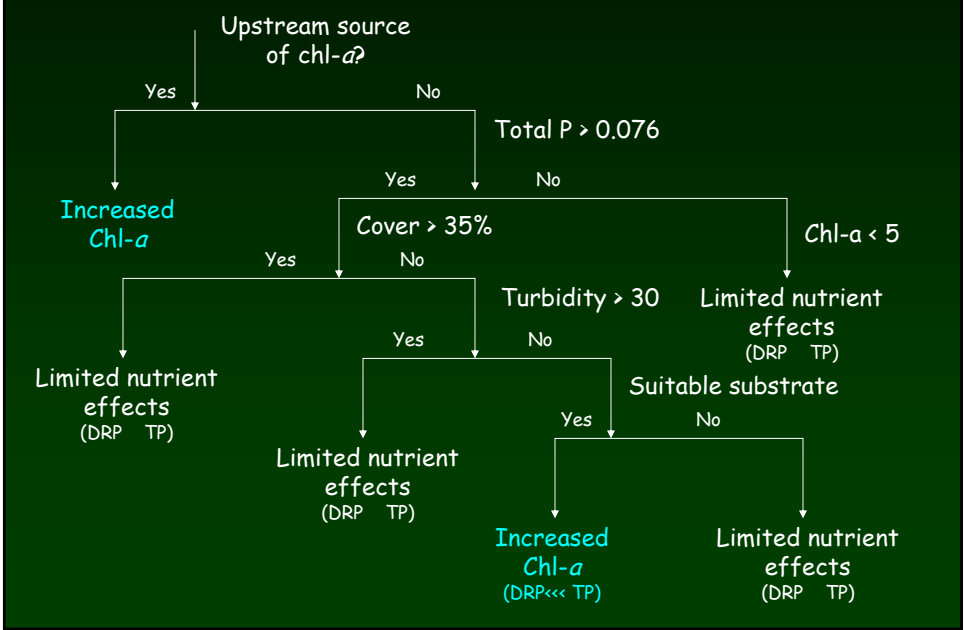




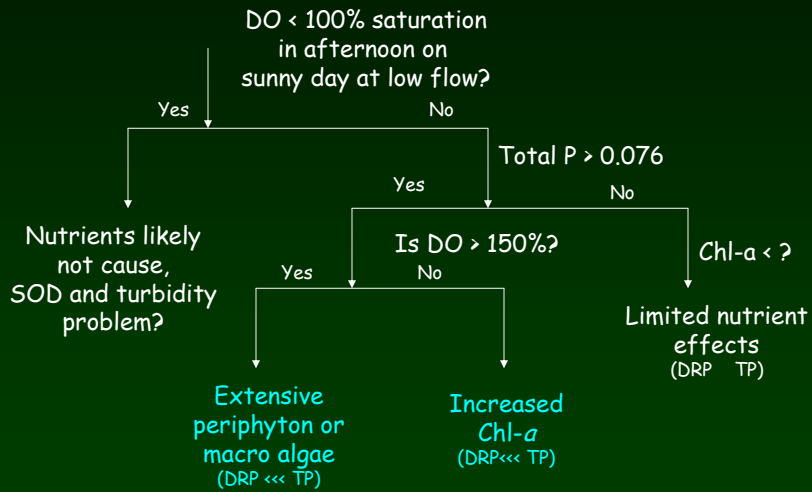
## Nutrients and Biotic Integrity



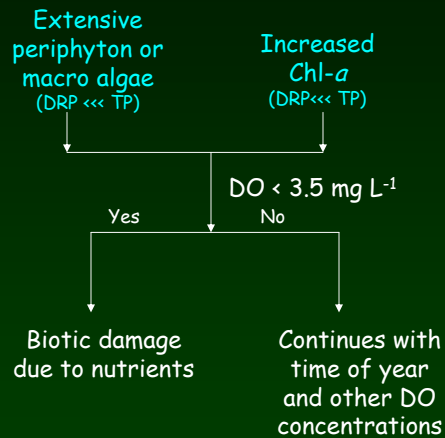
## Would a decision tree work?



## Could DO be used to identify sites?



## Then link to low DO and biotic integrity



## Sediment P Sorption



- sediments in Illinois streams are a reflection of stream P concentrations
  - biotic and abiotic processes
- sediments have no effect on stream P loads
- could affect concentrations at low flow
  - if P inputs were reduced sediment effect would be short-term (< 1 year)

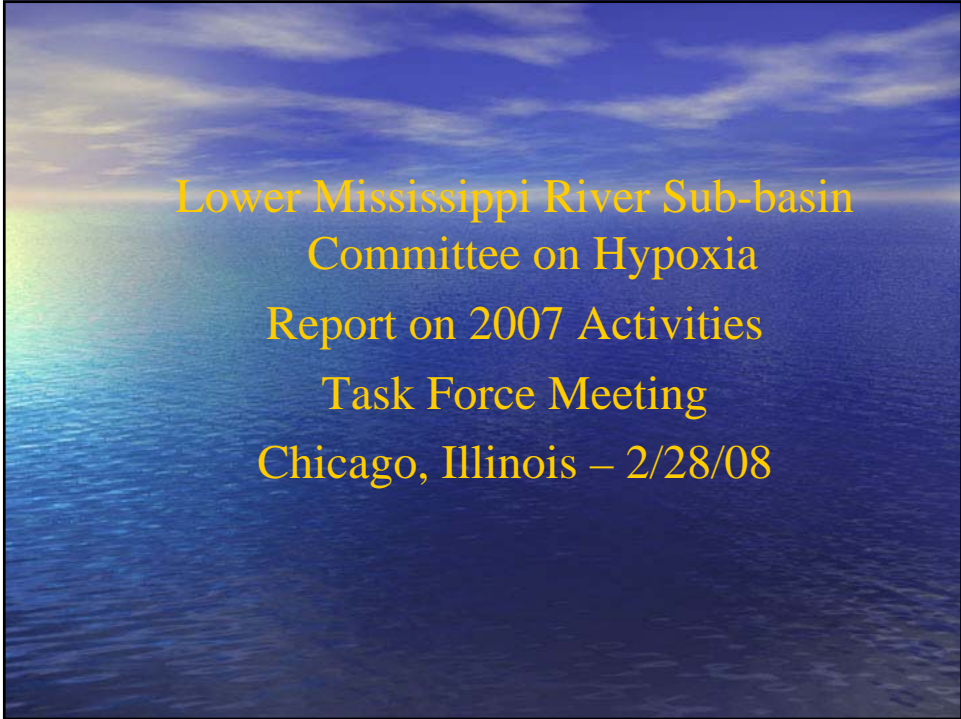
## Conclusions

- complex relationships at each step
  - many factors confounded
- nutrients almost never limiting algal biomass
- cluster analysis supports conceptual models
  - large river (sestonic, lower min DO, large diel range)
  - small streams with clear water (periphyton, high min DO)
  - many intermediate streams (little productivity, limited DO diel range)
- physical habitat (including sediment) major limit to biotic integrity throughout the state
  - improve habitat (reduce sediments), nutrients likely become more of a problem
  - relationships difficult to establish because Illinois lacks a wide range of conditions

## Would reducing nutrients really help improve water quality in Illinois streams?

- in many streams, it would be difficult to show improvement
  - sediment, channelization, carp
- need to make major reductions
  - both agriculture and sewage effluent
- we examined two streams with sewage effluent inputs, one removes P, one doesn't
  - no impact on chl-*a* (sestonic or periphytic)
  - concentrations still high due to agriculture
- reducing nutrients might, in some streams, reduce chl-*a* and alter DO, but might not affect biotic integrity

## **Attachment D**



Lower Mississippi River Sub-basin  
Committee on Hypoxia  
Report on 2007 Activities  
Task Force Meeting  
Chicago, Illinois – 2/28/08



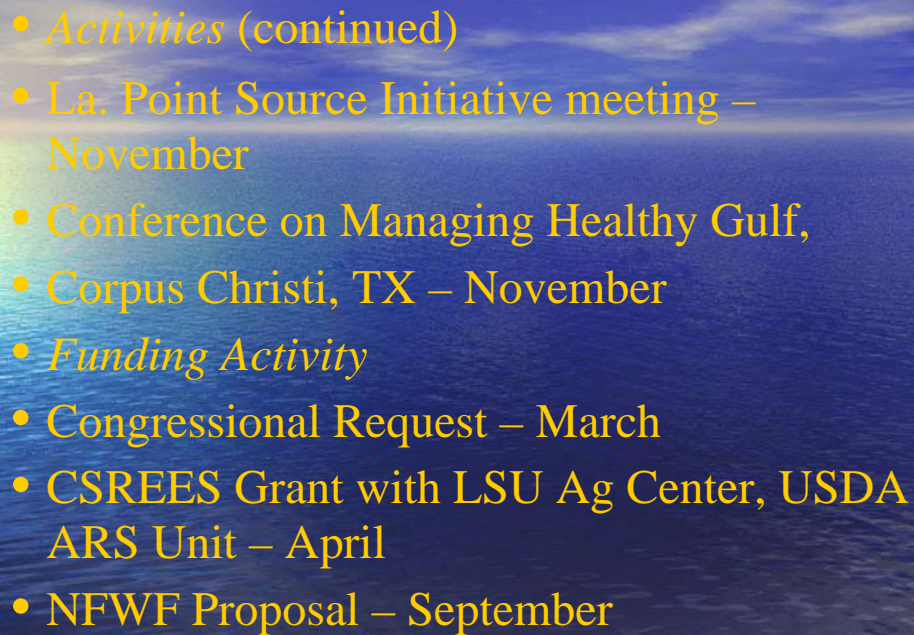
Activities

- Participation in Action Plan Revision Process via Coordinating Committee
- Outreach:
  - La. Governor's Coastal Commission – May
  - Planning CTIC Workshop in MO
  - Grand Isle Stakeholders' Meeting

## LMRSBC Activities

- Participation in Action Plan Revision Process via Coordinating Committee
- Draft Inventory of LMR Nutrient Reduction Activities – June (posted to web)
- Outreach:
  - La. Governor's Coastal Commission – May
  - Planning CTIC Workshop in MO
  - Grand Isle Stakeholder meeting – September
  - La. Point Source Initiative meeting – November
  - Conference on Managing Healthy Gulf, Corpus Christi, TX – November

- Grand Isle Stakeholder meeting – September
- La. Point Source Initiative meeting – November
- Conference on Managing Healthy Gulf,
- Corpus Christi, TX – November

- 
- *Activities (continued)*
  - La. Point Source Initiative meeting – November
  - Conference on Managing Healthy Gulf,
  - Corpus Christi, TX – November
  - *Funding Activity*
  - Congressional Request – March
  - CSREES Grant with LSU Ag Center, USDA ARS Unit – April
  - NFWF Proposal – September

- 
- Focus Watersheds - Proposals
  - Mississippi – Lake Washington
  - Louisiana – Cabin Teele
  - *Meeting*
  - LMRBC Meeting – Olive Branch, MS – September
  - With LMRCC





Lower Mississippi River Sub-basin  
Committee on Hypoxia

[lmrsbc@gmail.com](mailto:lmrsbc@gmail.com)

[www.epa.gov/gmpo/lmrsbc/index.html](http://www.epa.gov/gmpo/lmrsbc/index.html)

## **Attachment E**

# Ohio River Basin Team

*A partnership helping to protect and  
restore local waters and  
the Gulf of Mexico*

February 2008 Update

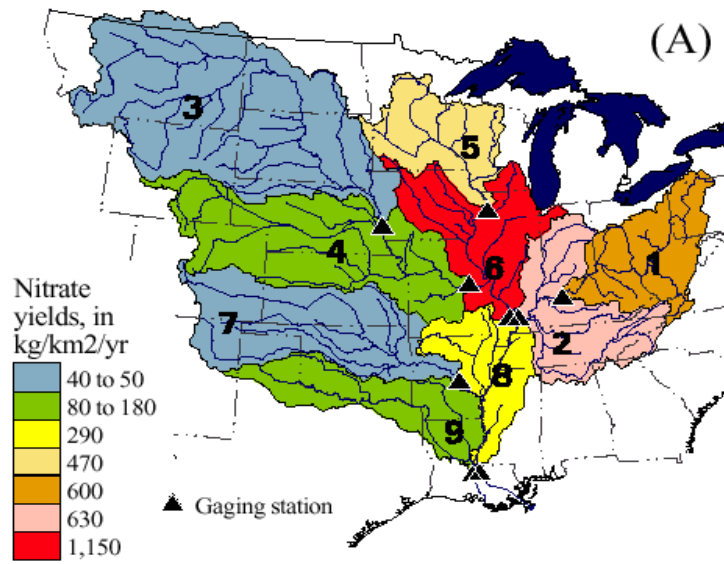
## Ohio River Basin Steering Committee Members

- Illinois Dept of Agriculture
- Indiana Dept of Environmental Management
- Kentucky Dept of Environmental Protection
- Kentucky Division of Conservation
- Ohio Dept of Natural Resources
- Ohio EPA
- Pennsylvania Conservation Commission
- Tennessee Dept of Environmental Cons
- West Virginia Conservation Agency
- West Virginia Dept of Agriculture
- West Virginia Dept of Environmental Protection
- ORSANCO

# The Ohio River Basin



## Nitrogen Source Distribution



Goolsby, et al

## Accomplishments

- Phase 1 of basin nutrient reduction strategy (framework) complete
- Some implementation underway (e.g., Scioto CREP, Great Miami WQ Trading)
- Supported revised Action and Operating Plans
- Hosted 15<sup>th</sup> Task Force Meeting (Cincinnati)

## Next Steps

- ORB partners to meet in Spring 08
- State led (ORB Basin) nutrient reduction strategies build on phase 1
- Further/concurrent implementation
  - (e.g., Little Miami CREP application, Grand Lake)
- Point source workshop on advanced nutrient treatment
- Expand stakeholder involvement

- Thank you

– And we look forward to working with all of you to implement the Action Plan.

## Concept of Framework Document

- Reduction goals and approach for sub-basin and states are under development.
- Initial Nutrient Reduction Strategy will focus on protecting local waters per Action Plan Goal 2.
- Strategy should be adaptable to address emerging issues.

## Framework of a Nutrient Reduction Strategy

1. The current situation
2. Sources of nutrients
3. Nutrient reduction targets and goals
4. Available tools for nutrient reduction
5. Identifying and involving stakeholders in strategy development and implementation
6. Next Steps



## Combinations of Practices



## Rural Drainage





## Rural Drainage



## Urban Storm Water BMP



## Scioto CREP practice



## Scioto CREP practice



## WQ Trading Example (holding pond and plan needed)



## Urban CSO



## Urban CSO



## Public Treatment Works



## Nutrient Load Reductions 2006 Examples

- Scioto Watershed CREP
  - 57,000 out of 70,000 acres enrolled
    - 36,000 lb. P/yr
    - 73,000 lb. N/yr
- Great Miami Trading
  - 68,000 lb. P over 5 to 20 years
  - 176,000 lb. N over 5 to 20 years

## **Attachment F**



## UMRSHNC Tier 1

- Illinois Department of Agriculture
- Iowa Department of Agriculture and Land Stewardship
- Minnesota Pollution Control Agency
- Missouri Department of Natural Resources
- Wisconsin Department of Natural Resources

## UMRSHNC Tier 2 Stakeholder Group

- 5 Tier 1 State Agencies
- 5 State Agencies – Ag, Conservation, Environmental Protection
- 5 Land Grant Universities
- 5 Ag Stakeholder Organizations
- 5 Environmental, Consumer, City Utility Organizations
- 5 Federal Agencies – NRCS, ARS, USGS, EPA V & VII



## Stakeholder Group

Illinois Environmental Protection Agency	Iowa Farm Bureau Federation
Iowa Department of Natural Resources	Minnesota Soybean Association
Minnesota Department of Agriculture	Missouri Corn Growers Association
Missouri Department of Agriculture	Professional Dairy Producers of Wisconsin
Wisconsin Department of Agriculture, Trade and Consumer Protection	Prairie Rivers Network
University of Illinois	Metropolitan Water Reclamation District of Greater Chicago
Iowa State University	Cedar Rapids Water Department
University of Minnesota	The Nature Conservancy
University of Missouri	Audubon
University of Wisconsin	USDA NRCS
Illinois Fertilizer and Chemical Association	USDA ARS
	U.S. Geological Survey
	EPA Regions 5 and 7 (ex-officio)
	Tier 1 State Agencies (5)

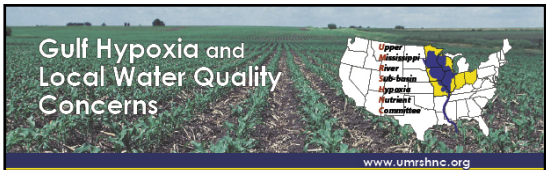
## Recent Activities To Support Task Force and Coordinating Committee

Science Re-assessment

Hypoxia Action Plan

Annual Operating Plan

Lists of State Program Activities



**A workshop assessing tools to reduce agricultural nutrient losses to water resources in the Corn Belt.**

**September 26 – 28, 2005**  
**Iowa State Center • Iowa State University**  
**Ames, Iowa**

A workshop with a 'decidedly different' approach to encourage interaction and the exchange of information on tools to reduce nutrient losses to water resources in the Corn Belt. Sessions feature a short, introductory presentation followed by a panel discussion. Session topics include:

- Fate and transport of nutrients
- Water management
- Wetlands
- Buffer and vegetative filter strips
- Nitrogen rates
- Nitrogen application timing, forms, and additives
- Phosphorus fertilizers
- Animal manures
- Erosion control practices to reduce sediment and nutrients
- Alternative cropping and cover crops
- Field-scale tools
- Watershed-scale tools
- Evaluating nutrient loss reduction effects
- Soil organic matter content

Early registration for this program is \$175 and includes meals, workshop materials and a copy of the workshop proceedings. Registration also includes admission to Iowa State University's Reiman Gardens for an evening reception and social.

Visit [www.umshnc.org](http://www.umshnc.org) to complete your registration today.

For more information:

Visit our Web site at [www.umshnc.org](http://www.umshnc.org) for additional information. If you have additional questions regarding this workshop please contact the Iowa State University Agribusiness Education Program by calling (515) 432-7548 or e-mail us at [aeep@iastate.edu](mailto:aeep@iastate.edu).

Sponsored by:

- Upper Mississippi River Sub-basin Hypoxia Nutrient Committee (UMSHNC)
- Iowa State University College of Agriculture
- U. S. Environmental Protection Agency Regions 5 and 7, and the Office of Wetlands, Oceans and Watersheds
- USDA - Agricultural Research Service

IOWA STATE UNIVERSITY  
 University Extension



## WORKSHOP STEERING COMMITTEE

James Baker, Ph.D., Iowa State University (retired), Chair  
 Dean Lemke, Iowa Dept of Agriculture and Land Stewardship  
 Dennis McKenna, Illinois Department of Agriculture  
 John Sawyer, Ph.D., Iowa State University  
 Dan Jaynes, Ph.D., National Soil Tilth Lab, ARS-USDA  
 Gyles Randall, Ph.D., University of Minnesota  
 Mark David, Ph.D., University of Illinois  
 George Czapar, Ph.D., University of Illinois  
 Larry Bundy, Ph.D., University of Wisconsin  
 Tom Hunt, Ph.D., University of Wisconsin  
 Newell Kitchen, Ph.D., ARS-USDA, University of Missouri  
 Eileen Kladviko, Ph.D., Purdue University  
 Brent Pringnitz, Iowa State University

## WORKSHOP & PROCEEDINGS

- 75 Leading Management Practice Scientists in Corn Belt
- 15 Papers & Science Panels – “What is the State of the Science?” for 15 Critical Issues
- Proceedings - ASABE Publishing Peer-Reviewed Papers as Single Technical Reference Text “whole is greater than the sum of the parts”, CD & Web Versions

## Water Quality & Cost-Assessment Case Studies

Inform & Lead to Implementation of Nutrient Reduction Goals at Large Watershed Scale

- What Practices, Locations & Intensity?
- What Resources Needed? Recognize Change is Cost-Driven

Case Studies of Individual Watersheds in 5 States & Extrapolate Findings Across Sub-basin

“Bottom-Up” Rather than “Top-Down” Assessment

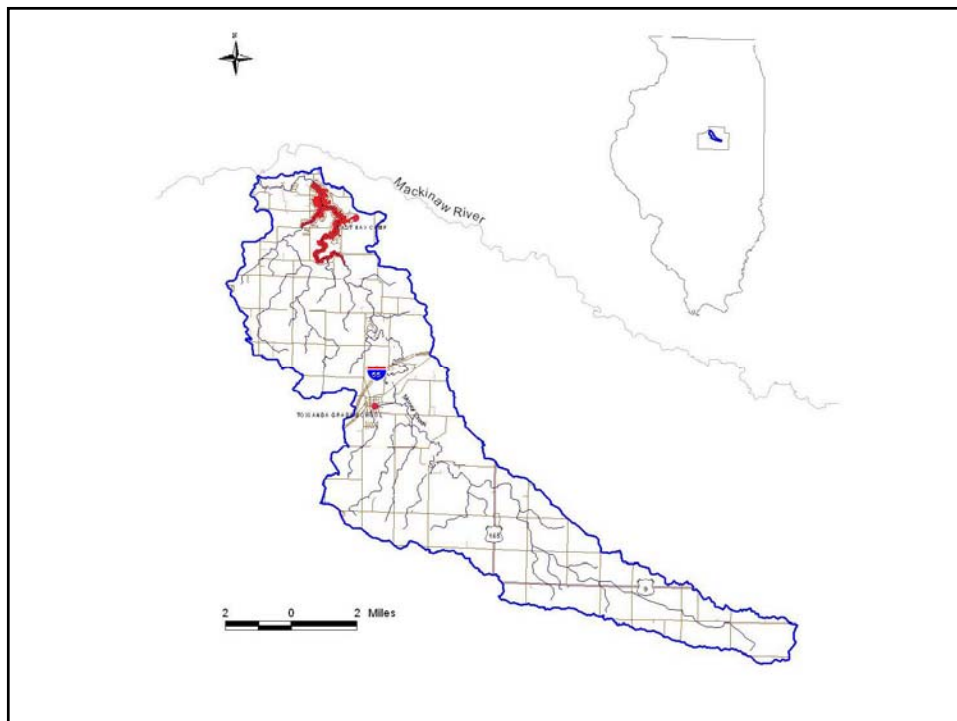
# “Pilot” Case Studies

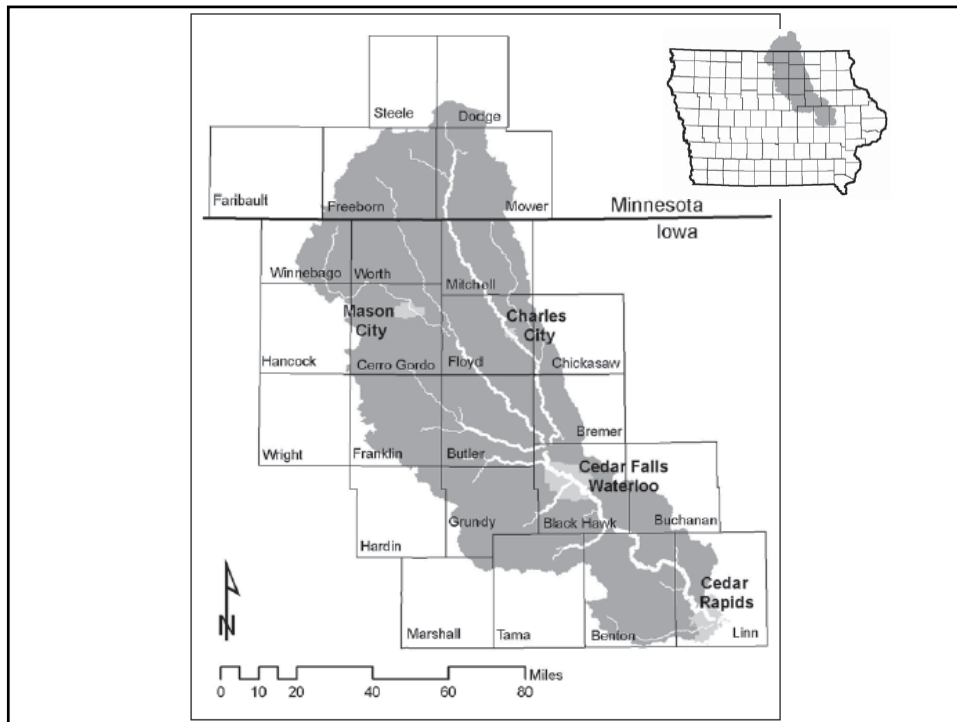
Primarily State Funded – Small UMRSHNC Match Funds

Goal of Completing Pilots by Fall 2007

Two Pilots

- Lake Bloomington Watershed, Illinois
- Cedar River, Iowa





## Future Activities

Assist/support SPARROW-model science reviews and input workshop.

Sponsor two (2) hypoxia symposia at Soil and Water Conservation Society annual meeting, Tucson July 28-29.

For More Information

[WWW.UMRSHNC.ORG](http://WWW.UMRSHNC.ORG)



## **Attachment G**

# ***NUTRIENT REMOVAL STUDIES***

**THOMAS E. KUNETZ, P.E.**

*Assistant Chief Engineer, Engineering Department*

**Metropolitan Water Reclamation  
District of Greater Chicago**

February 28, 2008

*CHICAGO*

## ***The Metropolitan Water Reclamation District of Greater Chicago***

- 119 year-old self-governed agency
- Serves Chicago and 124 other municipalities
- 2008 budget over \$1.4 billion
- 5 million residents, equivalent of 5 million commercial/industrial users
- Treats 1.5 billion gallons per day of wastewater
- Stormwater Management
- Oversees 883 square miles containing 76 miles of main waterways and 1,300 smaller streams

*CHICAGO*



## The Metropolitan Water Reclamation District of Greater Chicago



CH2M HILL

## Water Reclamation Plants



PLANT	DESIGN AVERAGE FLOW (MGD)
Stickney	1200
Calumet	354
North Side	333
Egan	52
Kirie	30
Hanover Park	12
Lemont	2.3

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## ***Current Nutrient Removal In All Plants (2007 Data)***

PLANT	TN in	TN out	Reduction	TP in	TP out	Reduction
Stickney	46.01	10.09	78%	10.64	1.01	91%
Calumet	18.40	9.77	47%	4.29	2.16	50%
Northside	19.82	10.24	48%	2.86	1.34	53%
Kirie	24.75	8.23	67%	4.14	0.95	77%
Egan	29.74	15.01	50%	6.71	0.65	90%
Hanover	32.60	14.53	55%	5.88	3.22	45%
Lemont	25.69	17.11	33%	4.16	2.62	37%

*CH2M HILL*

## ***Master Plan Objectives for Stickney, Calumet, and North Side WRPs***

- Reviewed biological and chemical treatment options for compliance with potential pollutant limits.
  - Nutrient removal technologies were evaluated without knowing actual future permit limits.
  - Technologies were evaluated using moderate and stringent limit levels of:
    - Moderate: TN=6-8 mg/L, TP= 0.5 - 1.0 mg/L
    - Stringent: TN= 5 mg/L, TP= 0.1 - 0.5 mg/L

*CH2M HILL*

## **Master Plan Nutrient Removal Recommendations for Stringent Conditions**

### **North Side WRP:**

- Utilize the four-stage Bardenpho process with chemical phosphorus removal and effluent filtration

### **Stickney WRP:**

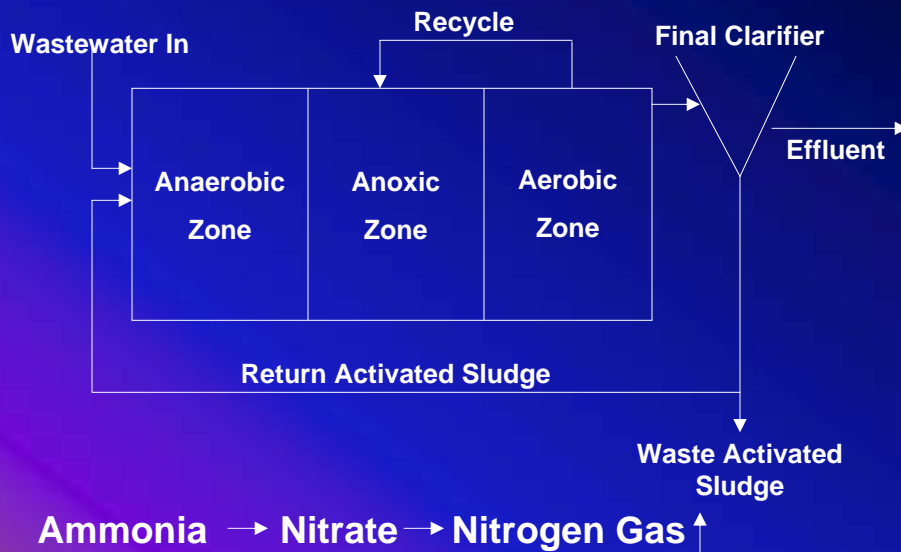
- Chemical phosphorus removal selected
- Process or Step-feed mode with IFAS for Nitrogen removal

### **Calumet WRP:**

- Dual point chemical phosphorus removal
- Biological nitrogen removal using MLE Process

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## **Biological Treatment Processes for Nutrient Removal**



## Chemical Treatment Processes for Nutrient Removal

### Process:

- Chemicals are used to bind with phosphorus creating precipitates
- Ferric Chloride reacts with PO<sub>4</sub> to precipitate
  - $\text{FeCl}_2 + \text{PO}_4^{3-} \longrightarrow \text{FePO}_4 + 3\text{Cl}^-$

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## Nutrient Removal Costs at WRPs

Total Phosphorus: 0.5mg/L Total Nitrogen: 6 to 8 mg/L.  
All costs are given in 2006 dollars.

PLANT	CAPITAL COST	ANNUAL M&O
Stickney	\$1,588,964,000	\$94,915,000
Calumet	\$577,000,000	\$28,000,000
North Side	\$389,265,000	\$4,464,000
Kirie	\$79,302,000	\$965,000
Egan	\$36,047,000	\$2,373,000
Hanover Park	\$15,860,000	\$949,000
Lemont	\$7,352,000	\$56,000
<b>Total</b>	<b>\$2,693,791,000</b>	<b>\$131,722,000</b>

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## Egan WRP Phosphorus Study

- WERF Study
- Addition of Ferric Chloride to precipitate phosphorus
- Sand filtration
- Study effects in Salt Creek
- To date, achieved 0.3 mg/l effluent TP consistently

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## Water Environment Research Foundation:

***IS WETLANDS TREATMENT MORE  
ECONOMICAL AND  
ENVIRONMENTALLY FRIENDLY  
THAN HARD STRUCTURE  
APPROACH?***

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## Constructed Wetland (Nutrient Farming)

- Shallow cells to control water flow
- Monoculture plantings
- Nitrogen and phosphorus uptake in plants
- Phosphorus capture in soil
- Nitrogen release through bacterial denitrification
- Periodic harvesting of plants for phosphorus removal

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## **WERF ECONOMIC COMPARISON (2005 REPORT)**

- For 3.0 mg/l TN, 1.0 mg/l TP:
  - 189,000 acres needed
  - Cost saving of \$133,000,000/yr over hard structure
  - Present Value cost savings of \$1,810,000,000 over hard structure
- For 2.18 mg/l TN, 0.5 mg/l TP:
  - 322,000 acres needed
  - Cost saving of \$164,000,000/yr over hard structure
  - Present Value cost savings of \$2,230,000,000 over hard structure

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## **MWRD Constructed Wetland Nutrient Removal Pilot Projects**

### Centennial Trail

Minimize Effluent Nutrient  
concentrations (mg/l)

### Powerhouse Marsh

Maximize nutrient load uptake (pounds)

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## ***CENTENNIAL TRAIL***

- 175 acre site between Des Plains River and Chicago Sanitary and Ship Canal
- 3 Treatment cells
- Step-feed operation
- 28.6 acres
- Will treat flow of 1.74 MGD

*CH2M HILL*



## ***CENTENNIAL TRAIL (CONT)***

- **NUTRIENT REDUCTION:**
  - **NITRATE NITROGEN BY 75% (5.6 TO 1.4 MG/L).**
  - **TP BY 32% (1.13 TO 0.76 MG/L).**
- **PUMP STATION REQUIRED.**
  - **CONVENTIONAL POWER LINE.**
  - **AUGMENTATION WITH WIND TURBINE.**
- **ESTIMATED CONSTRUCTION COST IS \$3,520,000.**
- **SCHEDULED CONSTRUCTION COMPLETION IN 2010.**



## **POWERHOUSE MARSH**

- 65-acre site south of the Lockport Powerhouse
- 8 Wetland treatment cells
- Operating in Parallel, 1 set of 3 cells, 1 set of 5 cells
- 29 acres
- Will treat flow of 9 mgd

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## **POWERHOUSE MARSH (CONT)**

- **NUTRIENT REDUCTION:**
  - **NITRATE NITROGEN BY 29% (5.6 TO 4.0 MG/L), 20.0 METRIC TONNES/YR.**
  - **TP BY 32% (1.13 TO 0.76 MG/L), 1.16 METRIC TONNES/YR.**
- **NO PUMP STATION REQUIRED, GRAVITY FLOW, DUE TO HEAD DIFFERENTIAL FROM CSSC.**
- **ESTIMATED CONSTRUCTION COST IS \$2,955,000.**
- **SCHEDULED CONSTRUCTION COMPLETION IN 2010.**

*CH2MHILL*

## **CALUMET TREATMENT WETLANDS**

- **CITY OF CHICAGO APPROACHED MWRD TO PARTICIPATE IN POTENTIAL WETLAND PROJECT.**
- **PROJECT IN CONCEPTUAL STAGE.**
- **570-ACRE SERIES OF SITES CONTAINS 456 ACRES OF TREATMENT WETLAND CELLS.**
- **HABITAT PROTECTION AND RECREATIONAL OPPORTUNITIES WILL BE INCORPORATED.**

*CH2MHILL*



## CALUMET TREATMENT WETLANDS (CONT)

- TO TREAT 50 MGD OF CALUMET WRP EFFLUENT.
- NUTRIENT REDUCTION:
  - NITRATE NITROGEN FROM 8.4 TO 4.3-5.1 MG/L, 280 METRIC TONNES/YR.
  - TP FROM 2.87 TO 2.5-2.6 MG/L, 20-22 METRIC TONNES/YR.
- ADDED BENEFIT OF LAKE MICHIGAN DISCRETIONARY DIVERSION OFFSET.
- PIPE REQUIRED FROM CALUMET WRP DISCHARGE TO TREATMENT WETLAND.
- ESTIMATED CONSTRUCTION COST IS \$74,722,000.

## ***THE WETLANDS INITIATIVE (TWI) GOOSE POND NUTRIENT FARM PILOT PROJECT***

- TWI PROPOSAL TO RESTORE AND ENHANCE 1,325 ACRES WITHIN LEVEES NEAR BUREAU, ILLINOIS, ALONG ILLINOIS RIVER.
- PILOT TO DEMONSTRATE ENVIRONMENTAL, ECONOMIC, AND SOCIAL BENEFITS OF NUTRIENT MANAGEMENT.
- WILL CONDUCT SCIENTIFIC AND ECONOMIC RESEARCH OVER 10-YEAR PERIOD.
- MWRD NEGOTIATING AN AGREEMENT TO PROVIDE FINANCIAL AND TECHNICAL SUPPORT ONCE THE PROJECT SECURES NECESSARY PERMITS, LAND RIGHTS AND COMPLETES DESIGN MEETING PROJECTED COST ESTIMATES.

*CH2M HILL*

## ***ILLINOIS WATERWAY HYDRIC SOIL REVIEW***

- WILL COMPILE DIGITAL SOILS DATA FOR EACH COUNTY ALONG ILLINOIS RIVER WATERSHED, WITH ASSISTANCE FROM IDNR.
- WILL USE NATIONAL HYDRIC SOILS LIST TO FIND ALL SOIL TYPES WITH HYDRIC INCLUSIONS AND COMPILE INTO GIS SHAPEFILE.
- WILL ANALYZE AND RANK ORDER LOCATIONS FOR POTENTIAL NUTRIENT FARMING SITES AND PRODUCE MAP.

*CH2M HILL*



**QUESTIONS?**

*CHAMPAGNE*