Thirteenth Public Meeting of the Mississippi River/Gulf of Mexico Watershed Nutrient Task Force

Sheraton Crystal City Hotel
Arlington, Virginia
Thursday, January 11, 2007

Meeting Summary Excerpts

Task Force Participants

Federal
Mr. George Dunlop, U.S. Army Corps of Engineers
Mr. Benjamin Grumbles, U.S Environmental Protection Agency
Mr. John Dunnigan, National Oceanic and Atmospheric Association-U.S. Department of Commerce
Mr. Gary Mast, U.S. Department of Agriculture

State
Mr. John Kessler (for Sean Logan (tentative)), Ohio Department of Natural Resources
Mr. Charles Hartke, Illinois Department of Agriculture
Dr. Len Bahr, Louisiana Governor's Office of Coastal Activities
Mr. Wayne Anderson (for Mr. Brad Moore), Minnesota Pollution Control Agency
Mr. Earl Smith (for Mr. Randy J. Young), Arkansas Soil and Water Conservation Commission
Mr. Russell Rassmussen, Wisconsin Department of Natural Resources
Mr. Richard Ingram, Mississippi Department of Environmental Quality

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I. Sub-basin Team Updates

Discussion following presentation by Dean Lemke, Iowa Department of Agriculture and Land Stewardship: Update on the Upper Mississippi Sub-basin Hypoxia Nutrient Committee (UMRSHNC). See Attachment B.

Wayne Anderson: Dean, could you just add, for the two pilots, what the level of reduction will be needed for those TMDLs?

Dean Lemke: For the Cedar River, it's 35%—

Dennis McKenna: *[inaudible response from audience]*

Dugan Sabins (Louisiana Department of Environmental Quality, for Dr. Len Bahr): I'd like to add on that from the Lower Basin standpoint we are very interested in the opportunities that UMRSHNC is presenting us. Doug [Daigle] will give an overview of our work. Certainly working with John in Ohio, there's some activities that UMRSHNC has initiated being first out of the gate of our sub-basin committees. We can learn from your two example watersheds. I would ask is there any Iowa Conservation Resource Enhancement Program (CREP) wetland project in the Iowa watershed area that would be a part of your assessment?

Lemke: I think that technology is needed to include in the assessment.

Sabins: I already know you have some on the ground, are there any in that watershed?

Lemke: That's a good question. In terms of existing wetlands, I am not sure. Application of that technology will certainly be one that we'll look at. I invite the other sub-basins to share any ideas and comments on what we'd be doing. We're very interested in your perspectives as well. We appreciate your leadership in your respective areas, thanks.

Benjamin Grumbles: Dean, thank you. There's some irony that the further to the top you go in the Mississippi River system the greater the need for a bottom–up approach when it comes to networking with constituencies miles away from where we're measuring progress. I appreciate your efforts. Now we move from UMRSHNC to OSUB, the Ohio Sub-basin Team. We're lucky to have John Kessler with us, from Ohio Department of Natural Resources (Ohio DNR). The Ohio Sub-basin Team was formed to address the states of Illinois, Indiana, Ohio, West Virginia Pennsylvania, Virginia, and Kentucky. The Ohio DNR and Ohio River Valley Sanitation Commission (ORSANCO) have led the effort on the discussions on this team's nutrient reduction strategy for the basin, so I welcome you, John, to inform Task Force members and the public on your efforts.

Discussion following presentation by John Kessler, Ohio Department of Natural Resources: Update on the Ohio Sub-Basin Team. See Attachment C.

Lemke: John, you mentioned the potential for some kind of conference or initiative on point sources and water quality trading. From the upper basin perspective, we narrow our focus on our strongest area of expertise, the nonpoint source landscape. We have many point sources that we're not addressing, so we'd welcome any support we can get from the Ohio Sub-basin Team or the Lower Basin Team on point sources and water quality trading. Do you have any specific plans for the conference, or how to address urban sources or the trading issue?

Kessler: We really don't have any more specific plans. It was an initial offer and I'm following up on some informal discussion about this from last year. I'd recommend that we place heavy emphasis on the trading examples through the two pilots in Ohio. Are they completely successful? We don't know yet, but they are off to a decent start. I'd also encourage looking at a wet weather issues such as large municipal combined sewer overflow situations. There are some advanced treatment techniques that involve looking at nutrients in the point source world. It would depend on what you think the needs of our partners are and what emphasis should be put on the point sources loading. If that discussion pans out and we do want to spend some time on the point sources, we could help.

Grumbles: John I appreciate your strong interest in trading. From an EPA perspective, certainly in the context of the Gulf and the Mississippi River watershed hypoxia challenge, it is an important one. Nationally, continued interest and focus on market-based approaches, particularly trading credit for water quality upgrading, is important because government budgets are not going to make the type of progress that we want, so we have to incentivize conservation and stewardship. I think connected to that growing interest in trading, including pilots on trading, is the need for monitoring and numeric criteria. In order to have a market, you need to be able measure for a credit-trading program, so I appreciate your interest in that. EPA has established a blue ribbon water quality trading award that, on an annual basis, we're going to identify those local entities doing the most to advance trading.

Charles Hartke: John I was thinking—and maybe this is to you, to Dean, or to any of the sub-basins divisions. Do we have any idea of what percentage of the nutrient load comes from each nutrient sub-basin?

Kessler: Yes, we do.

Hartke: The Ohio sub-basin delivers 20% of the load?

Kessler: one-third.

Hartke: UMRSHNC, Dean?

Katie Flahive (U.S. Environmental Protection Agency): We're actually going to have a session on this when we get to the MART report, which will include these figures.

Hartke: Thank you.

Anderson: I would like to follow-up on that comment. As you developed your strategies, how did you tie them to the reduction goal? Can you account for your target?

Kessler: No we cannot. That's the next step. The only connection that was used by the two local projects in Ohio was that the trading program got a grant from USDA and used the hypoxia reduction as part of their process, and we also did that in the CREP proposal.

Sabins: We've been working closely with John and the Ohio Sub-basin Team as well as ORSANCO. We probably share the same point source considerations, having a large point source discharger base down in Louisiana. We see a natural marriage with you and the Upper River Team in trying to organize a point source initiative. Doug will probably mention point source issues in our lower basin report, and Katie will have a good summary of point source discharges through the MART report. I think we have a good basis to tie all the point sources in the basin together, and I think this something unique that is starting to fall out. It's taken us awhile to get a clear picture of how to go about it, but working together we can do that, so I appreciate what you guys have already put together on the Ohio River.

Grumbles: John, thank you. We'll now turn to the Lower Mississippi Basin Team. The Lower Mississippi Sub-basin Team was formed under the *Action Plan* for the states of Arkansas, Tennessee, Louisiana, and Missouri. Doug Daigle is here to explain the activities of the team.

Discussion following presentation by Doug Daigle, Lower Mississippi River Sub-Basin Team: Update on the Lower Mississippi Sub-Basin Team. See Attachment D.

Anderson: Doug, just like the other basins, you've shown some really positive things are happening. Is there capacity and readiness for more activity to be taken in your sub-basin?

Doug Daigle: Yes, I'd say so. We're moving ahead and we're looking to get funding once we identify the things we want to do.

Grumbles: Your helpful presentation underscores some of the conversation we had in the executive session yesterday and the lessons learned from the science symposia about the importance of wetlands to help assimilate waste and improve water quality and reduce nutrient loadings. That's a theme that all of us are identifying as we look at the vision for the road map to

the reassessment. We're looking at wetlands and water diversions as one of the important tools to help make real progress.

Lemke: I want to encourage you from the upper basin to continue the work that you're doing on the unique distributary function you have down there, which is much different from on the rest of the river system. I am encouraged by you looking at these river diversions, building nutrient sinks into them and optimizing that ecosystem. I encourage you and the state of Louisiana and the Corps to evaluate the old river control structure and the ratio of that discharge. There is emerging science that the Atchafalaya fraction may have more impact on the Gulf zone than the Mississippi fraction, and I believe there are flood control issues there. Floods don't occur there all the time, so maybe there is a new management plan that could be achieved that could optimize our resource situation in relation to the Gulf and the Atchafalaya basin and the needs there and balancing that off with the Mississippi. I think the efforts that you are doing down there will compliment what we are trying to do in the upper basin. We are going to need both ends there. I am really encouraged by what you folks are doing, and I encourage you to look at that Atchafalaya system more.

Grumbles: Doug, thank you.

II. Reassessment of the 2001 *Action Plan*

Discussion following presentation by Tony Maciorowski, U.S. Environmental Protection Agency: Science Advisory Board (SAB) Status. See Attachment F.

Lemke: Tony, the SAB is considering updated science of what nutrient reduction targets are appropriate to meet the needs for hypoxia reduction. It is also considering the role of phosphorus in the hypoxic zone. If phosphorus is determined to have a role, there will be a need for the expert panel to identify the target reduction for phosphorus. I don't know if I should ask if they are doing that or not. The Task Force will need some kind of target reduction, and it seems the best body is the Science—

Maciorowski: If you are make a formal request of that from the Task Force, which would need to be transmitted through Ben, back through the appropriate channels of the SAB as a formal of a request. They have been discussing phosphorus, as you are aware, and it looks like they are interested in both nitrogen and phosphorus. The original charge cannot be amended, but if you have additional requests, that needs to be made known formally back to Ben and back to the SAB. It sounds very bureaucratic, but the main reason why it's bureaucratic is to maintain the independence of the panel.

Lemke: Let me clarify. I think it's in the charge, but I am not sure if the charge is being equally interpreted. So I make that point that, without a target, I think it is going to be difficult for the Task Force to bring forth a revised *Action Plan*. I believe it is in the charge, but I am not sure if the SAB is interpreting this.

Maciorowski: Again, I am not at liberty to talk about the ongoing substantive deliberations of the panel. It's not my role as an EPA employee. I will say that in these kinds of situations, we won't provide a target per say, but a range of targets, because the actual target is often a policy call. Their job is to look at the scientific underpinnings of what's feasible and what's sound.

Grumbles: Dean, I think that is a good question. The Coordinating Committee members, as they listen to the discussion and the dialogue about this issue, should take note so we can be following up in the work plan, which includes a February face-to-face with the Coordinating Committee members. I sense this will be one of those items that will need more discussion to help with us with our communications with the SAB as a collective Task Force as to how they are proceeding in interpreting and implementing the charge.

Maciorowski: I just want to mention that I put the Web site up there to say that up until this point everything that has been discussed and/or presented and/or written and meeting minutes are up on the Web site. There's a lot of stuff up there, so it is quite voluminous to go through, but things are listed by teleconfence and by meeting. This would be the public record of those SAB meetings to date.

Grumbles: Task Force members talked yesterday about the Feb 28th meeting and location. Can you explain?

Maciorowski: That would be at the SAB Conference Center 1025 F Street in Washington, DC.

Grumbles: It will not be in New Orleans?

Maciorowski: No.

Grumbles: Have there been other considerations about future meetings in New Orleans?

Maciorowski: For this meeting we're just looking at CR's and justifications, and because they would still be in the earliest deliberations on the report itself, it would be better to have it here in DC. At the June meeting, they will probably have a more substantive report, which would provide more of a public interest. I can imagine that meeting would be held somewhere other than DC.

Lemke: Mr. Chairman I just want to add that the upper basin states would like to extend the invitation to the SAB. We would imagine Chicago would be a good place if you need the kind of logistics that I think you do. We don't want to compete with our friends in the lower basin for where the meeting is held, but we do want to extend the invitation.

Grumbles: Tony, thank you very much.

Discussion following presentation by Katie Flahive, U.S. Environmental Protection Agency: Management Action Reassessment Team Report. See Attachment H.

Sabins: Louisiana has taken a big interest in this because of the number of point sources on our reach. I will be taking this report to our point source group under our phase two, as Doug mentioned in his report, to continue our work on the lower basin river. This is what Louisiana industry came up with in their report that we came out with in 1998, that the sewage treatment plants had considerable loading in this regard, perhaps more than industries. This work confirms that. We are using an environmental leadership program supported by EPA and by states to entice them to reduce their nitrogen and phosphorus loads as part of an ongoing effort to eventually develop nutrient criteria. We've gotten good support. So we're bringing in the cities of New Orleans and Baton Rouge as the two major dischargers, but we also have minor discharges that we will bring these numbers to and bring in industry that will work with them on methodologies. There is no reason why we can't work with municipalities up river in Mississippi

and Tennessee, so I think there is a lot good potential with our point source initiative, thank you very much.

Flahive: I have one more comment. We have compiled on an individual basis, every calculation and all the data that we found, on every facility in the basin. It's a very large spreadsheet. It's been made available to the SAB and it's going up on our Web site.

Grumbles: If there are 4952 sewage treatment plants, does this data also include non-sewage treatment plants, the industrial dischargers?

Flahive: 4952 is the SIC code for sewage treatment plants and they are the largest contributers. The data does get into detail on 33,000 individual facilities.

Grumbles: Great, thanks Katie. I am glad I asked that question *[laughter].* Any other comments or questions?

Flahive: I also want to encourage you to take a look through the Farm Bill information that was compiled by USDA, because that information has been very helpful to us in looking at what's going on in the basin.

Grumbles: Thank you Katie.

III. Basin-wide Initiatives

Discussion following presentation by Mark Peters, Natural Resources Conservation Service, U.S. Department of Agriculture: Basin-wide Economic Assessment.
See Attachment I.

Grumbles: Any Task Force members from Illinois or Iowa want to talk about their economic assessment work?

Lemke: I think we heard this morning in the UMRSHNC report that they differ in scope than what Mark is talking about in that they are watershed specific and the direction is bottom up. We start with what water quality practices are needed to achieve the goal and what are the costs. Our goal in putting it together was to characterize the practices and the costs for just the Upper Mississippi Basin. It's a different scale and a different scope than what Mark reviewed here. I would offer the opinion that they both have their value with their respective contributions. Beyond that I don't have anything else to add unless there are questions.

Grumbles: Dennis [McKenna], I want to acknowledge you and your work and to encourage your organizations to work with the Task Force so we can have an overall assessment, or the economics of localized efforts. Any other comments on the road map ahead for the economics? We do have some additional questions in the coming weeks and months that we'll be able to address in greater detail within the Coordinating Committee concerning the two items that Mark highlighted here.

Discussion following presentation by Karen Scanlon, Conservation Technology Information Center (CTIC): Producer Partnership Initiative. See Attachment J.

George Dunlop: During the public comments at the last Task Force meeting, a gentleman from the Farm Bureau Federation made a presentation. He advised us that there have been some striking breakthroughs in the agricultural chemical sector in being able to have products for farmers and others that would reduce the solubility of nitrogen, and he characterized these as "striking breakthroughs." Did I hear that correctly, are we on the cusp of a breakthrough in the technologies that are available to those who use agricultural chemicals?

Scanlon: I don't know if I can back up the terminology of a "striking breakthrough", but I think there is merit into looking into what industry has to offer. There are tools and techniques that are worth investigating.

Grumbles: Karen's focus is really on increasing participation, transferring information about technology and keeping democratic processes going. We have many agricultural experts on the Task Force and in the room that can get into that issue. There is no one silver bullet. The technology and innovation keep marching on. I appreciate your question on that, George. That is a key question. I appreciate the leadership of those on the Task Force involved in educating producers, growers and ourselves on the technologies available.

Earl Smith: I just want to get a feel for your view about how you'd coordinate with sub-basins team to accomplish these goals?

Scanlon: Sure, first we start with basic conversations with the chair or coordinator of the sub-basin teams. I think it's important to arrange face-to-face discussions so we can talk about the best way for us to meet our common goals of getting agriculture and producers more involved as stakeholders in this process. I think it is going to take some good conversations. I know in the lower basin you have agricultural outreach as one of your goals, and I think that fits nicely with the proposal we submitted to the EPA. It will be easy to align those two, and we can work to make sure CTIC's efforts compliment the goals in the lower basins. I hope to do that with all the sub-basin teams.

Kessler: I just want to follow-up quickly. The Ohio basin representatives intend on inviting Karen to our next face-to-face meeting so she can discuss CTIC's goals with our steering committee. That meeting will probably occur in late January or February.

Grumbles: Thank you Karen.

Discussion following presentation by Janice Ward, U.S. Geological Survey: National Water Quality Monitoring Network Update

Grumbles: Thank you. I did want to say to Tim Petty, Deputy Assistant Secretary for Water and Science that I appreciate his engagement and interest. Your presence and your data on the water quality monitoring effort are such a critical component to measuring progress and determining where we go from here, and I really appreciate it. I think I've asked this before, but could you remind us about what happened in year 2000 and why that bar is so low? Was it a drought year?

Ward: It was an extreme drought year, so we had very little flow come down the river.

Len Bahr: I just want to follow-up on that. There were 3 things that happened with that 18 month period: there was an unprecedented drought, at least in the southern Mississippi area; it was an extremely hot and clear time with a lot of evapotranspiration happening; and there was a lower sea level because of a westerly wind blowing for a long time. We ended up with a lot of marsh left high and dry. We lost 19,000 acres of salt marsh that year and a lot of swamp forest. That was a good year for hypoxia but a bad year for everything else.

Gary Mast: Janice, how far can you go back with reliable information?

Ward: It varies and depends on the station in the Mississippi basin, but a lot of the records go back to the middle seventies. I'm actually glad that you asked that. I mentioned before that we improved our load estimation procedures. We're in the process of going back and recalculating the entire period of record using these new procedures.

Mast: Can you do any modeling back to 1900?

Ward: No, these load estimation procedures are statistical, so we can't extend it back because it is not valid unless you have data in that period that you are going to. Through SPARROW and other watershed models it can be done, though we have not gone back in time. Part of the problem is the lack of historical land use information and point source information; a lot of that wasn't available, so it would be a rough envelope calculation.

John Dunnigan: Janice, thank you very much. The National Water Quality Monitoring Network is a critical piece that we all need to support. The kind of analysis you are showing here points to that exactly. Agencies including USGS, EPA, NOAA and the Army Corps have worked hard to create a structure and to develop models for how a network could work in this area and other areas. I think this analysis makes the case of why the network should be supported.

Grumbles: Thanks Janice.

IV. Public Comment Period

See Attached Written and Oral Comments.

Current State of Hypoxia in the Gulf

Alan Lewitus, NOAA
National Ocean Service
National Centers for Coastal Ocean Science
Center for Sponsored Coastal Ocean Research

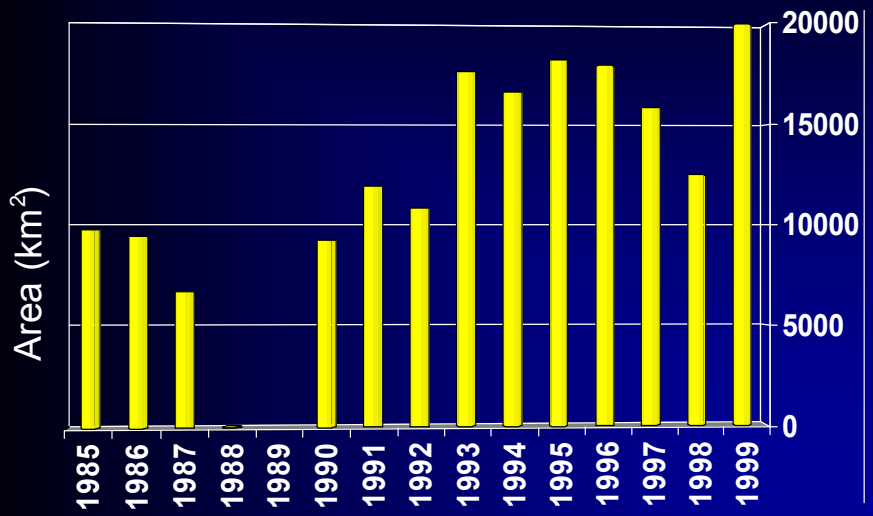
Rick Greene, USEPA
Office of Research and Development
Gulf Ecology Division

13th Hypoxia Task Force Meeting
10-11 January 2007

History

- Boesch & Rabalais begin monitoring (1985)
- NOAA's Coastal Ocean Program study documented issue (NECOP 1990-96; supplemental research 1997-1999) – evidence for increasing hypoxic zone over time

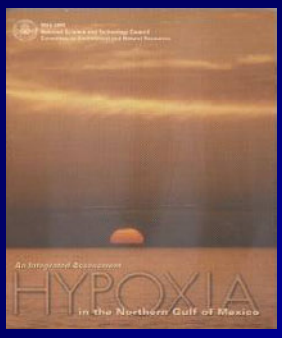
Areal Extent of Gulf of Mexico Hypoxic Zone: 1985-1999



Rabalais et al.

History (continued)

- **EPA organized Mississippi River/Gulf of Mexico Watershed Nutrient Task Force (1997)**
- **NOAA published CENR state-of-knowledge reports (2000)**



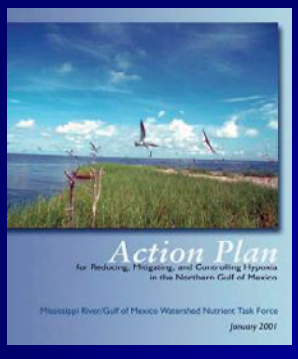
CENR Conclusions

- Hypoxia has increased since the 1950's
- River N load is main driver of hypoxia
- NO_3 load is > 3X that of 1950's:

  90% of nitrate inputs from non-point sources;
  74% of nitrate load is from agricultural non-point sources.

History (continued)

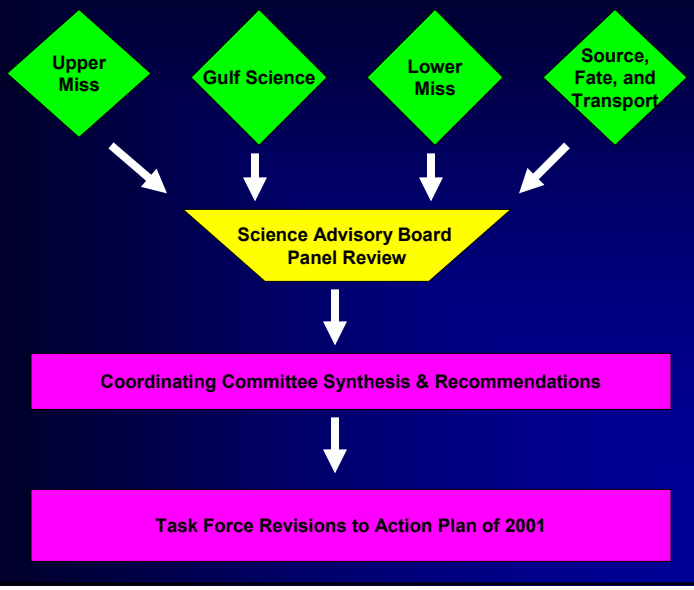
- Task Force issues "Action Plan for Reducing, Mitigating, and Controlling Hypoxia in the Northern Gulf of Mexico" (2001)
  - Coastal Goal – reduce the 5-year running average of the hypoxic zone to less than 5,000 km^2 by the year 2015



Adaptive Management Framework

- From Action Plan: periodically review the results of monitoring and research to assess changing conditions, evaluate performance of specific management actions, and revise this plan, through the Task Force.

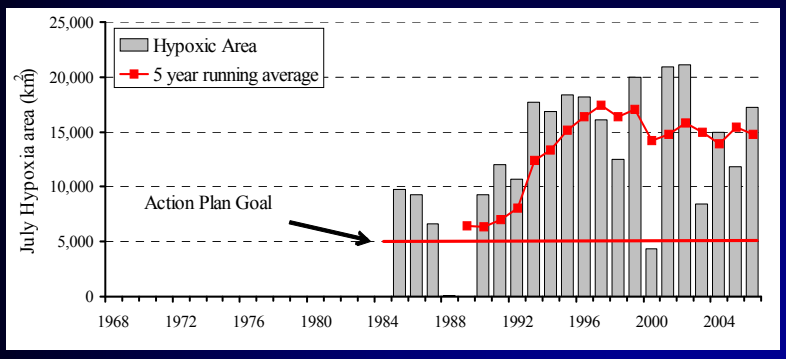
Task Force Reassessment Process



Multiple lines of evidence from multiple sources are consistent with the general pattern of coastal eutrophication observed in other U.S. systems and around the world

- **Long-term increases in nutrient loads (predominantly nitrate) to the Louisiana continental shelf have resulted in excess primary production and ultimately increases in bottom water hypoxia**

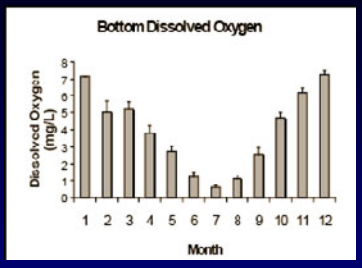
Since mid 1990s, the 5-yr running average size of hypoxic zone has hovered around 15,000 km^2



Areal extent of the hypoxic zone at the peak time of hypoxia (July) has been well characterized and is a good indicator of the intensity of hypoxia in any given year

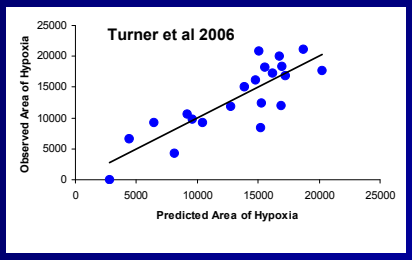
Temporal characteristics of hypoxia are fairly well known, except for timing of development in spring

Station C6* (Rabalais et al., 1998)



Model: Hypoxia area (km2) = 0.0998 x May NOx flux + 672 x Year -13.4 x 105 (R^2 = 0.82)

Statistical models suggest that spring/early Summer nutrient fluxes (primarily nitrate) are good predictors of mid summer size of hypoxia

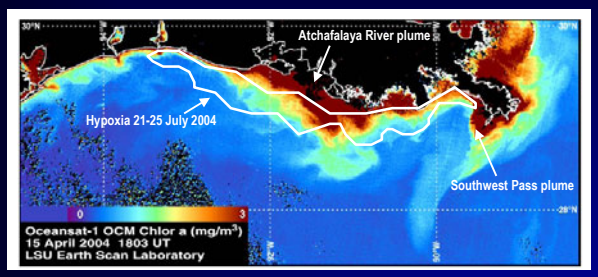


Long-term increases in nitrogen loads have caused elevated ratios of nitrogen-to-phosphorus in Gulf waters such that phosphorus limitation occurs in the near-field at certain times of the year, including the spring bloom period

Dagg et al.

Management strategies for hypoxia should include nitrogen as well as phosphorus since both nutrients (and their ratio) are important in primary productivity and biogeochemical processes

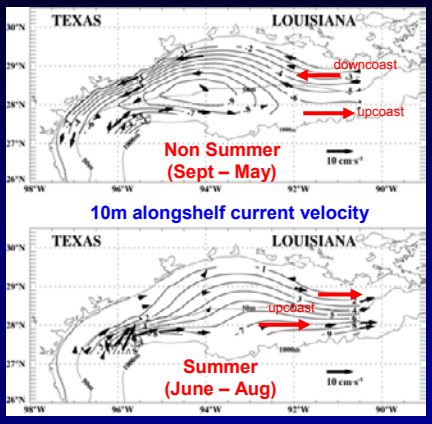
Atchafalaya River freshwater discharge and nutrients may have relatively larger influence on hypoxia across the Louisiana Continental Shelf than previously thought, at least equivalent to Mississippi River



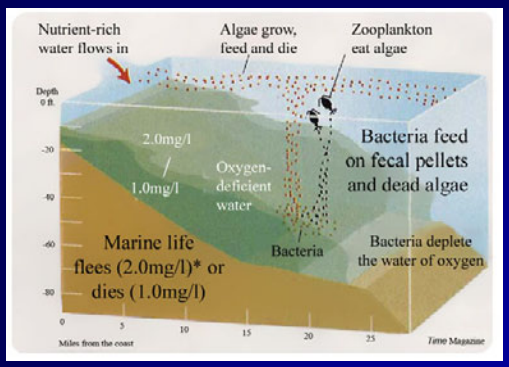
Clear differences between the Atchafalaya and Mississippi margins are evident. The passes of the MR deliver constituents to a relatively deep coastal ocean environment. The AR distributary system discharges to a shallow broad shelf.

Winds stress and freshwater discharge dominate physical processes influencing hypoxia

Along shelf currents reverse during Summer -- elevated chlorophyll and production in the Louisiana Coastal Current (along inshore edge of hypoxic zone) may be significant source of organic matter to Louisiana Continental Shelf bottom waters



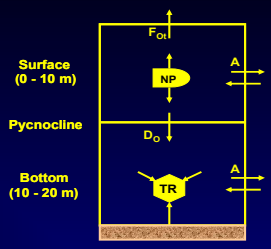
Below pycnocline and benthic processes (aerobic & anaerobic respiration) contribute to seasonal depletion of bottom water O_2 and maintenance of hypoxic bottom waters – yet available information is surprisingly small



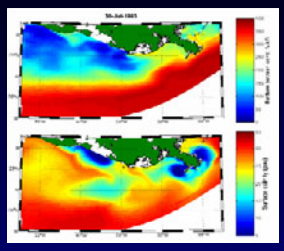
Hypoxia modeling

Existing Gulf hypoxia models range from simple regression models to complex 3-D simulation models

Justic et al. (1996)

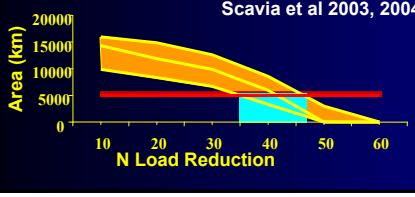


Hetland – ROMS model

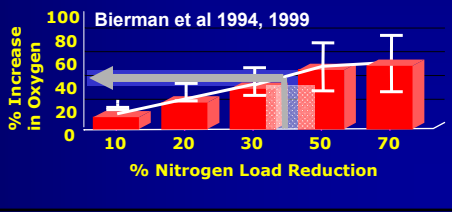


Existing models provide scientific rationale for a N load reduction target of 35 - 45% to achieve *Action Plan* target of 5,000 km²

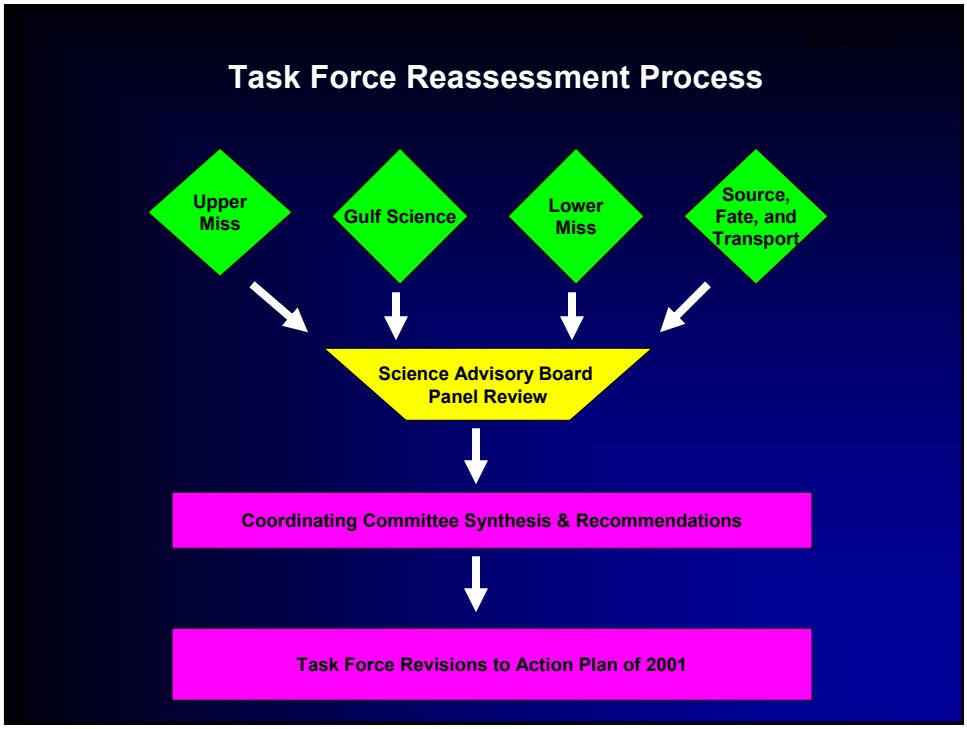
Scavia et al 2003, 2004



Bierman et al 1994, 1999



Task Force Reassessment Process



UPPER MISSISSIPPI RIVER SUB-BASIN HYPOXIA NUTRIENT COMMITTEE

UMRSHNC

UMRSHNC ORGANIZATONAL FRAMEWORK

- Tier 1 State Agencies of the Task Force
- Tier 2 30 Member Appointed Stakeholder Group
- Tier 3 Open Invitation Public Input Meetings

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

Tier 1 Meetings

- Initial Organizational Meeting
  - August 20, 2004
- 24 Meetings to Date
  - 23 Teleconferences
  - 1 In-Person Meeting

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

Stakeholder Group Meetings

April 12-13, 2005, Moline, Illinois
- Background, Input on Technical Workshop

September 27, 2005, Ames, Iowa
- Reassessment & Workshop Feedback

April 11-12, 2006, Moline, Illinois
- Watershed Modeling & Monitoring

September 12-13, 2006, Moline, Illinois
- Input on Action Plan Revision

UMRSHNC Role - Facilitate Networking Within 5 States

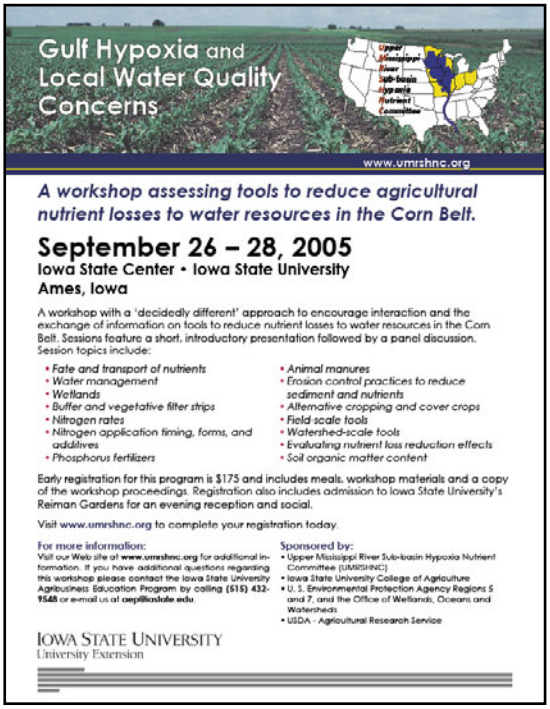
- Concerning Goals/Action Steps of the Action Plan
- Agencies, NGO's, Stakeholders
- Not Direct Implementation – Recognize Implementation Role of the States

Goals

1. Technical Networking
2. Policy
3. Publications & Outreach

GOAL – TECHNICAL NETWORKING
Exchange Technologies/Programs

- Nitrogen & phosphorous fertility recommendations by state
- Existing/planned state-level programs targeted to reduction of nutrient discharge & transport
- Research underway/needed for reducing nutrient discharge & transport



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 Kladivko, 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
- Peer Review of Papers Complete
- ASABE Publish 15 Papers as Single Technical Reference Text "whole is greater than the sum of the parts", CD & Web Versions – Spring 2007 Release
- Executive Summary, Potentially Policy White Paper & Fact Sheets for Use in Watershed Projects

GOAL – POLICY

Network to Identify Common Positions Among Upper Mississippi States

- Policy and Funding
- Facilitate individual states informing decision-makers concerning policy matters targeted to the Upper Mississippi region

GOAL – PUBLICATIONS & OUTREACH

Inventory Existing Programs and Activities

- Within the Upper Mississippi States
- Nutrient Transport from Point & Nonpoint Sources
- Implementation, Demonstration, & Research Initiatives
- Develop & Conduct Public Information Strategy

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

Watershed Case Study Approach

1. Achieve Funding for Studies
2. Overall Coordination – 5 State Team
3. Expert Science Panel Within Each State
4. Select "Range" of Watersheds
5. Assess Changes Needed to Meet Goals Using Practice Approach & Modeling
6. Estimate Costs of Changes
7. Extrapolate to Estimate Practices & Costs for Entire Sub-basin

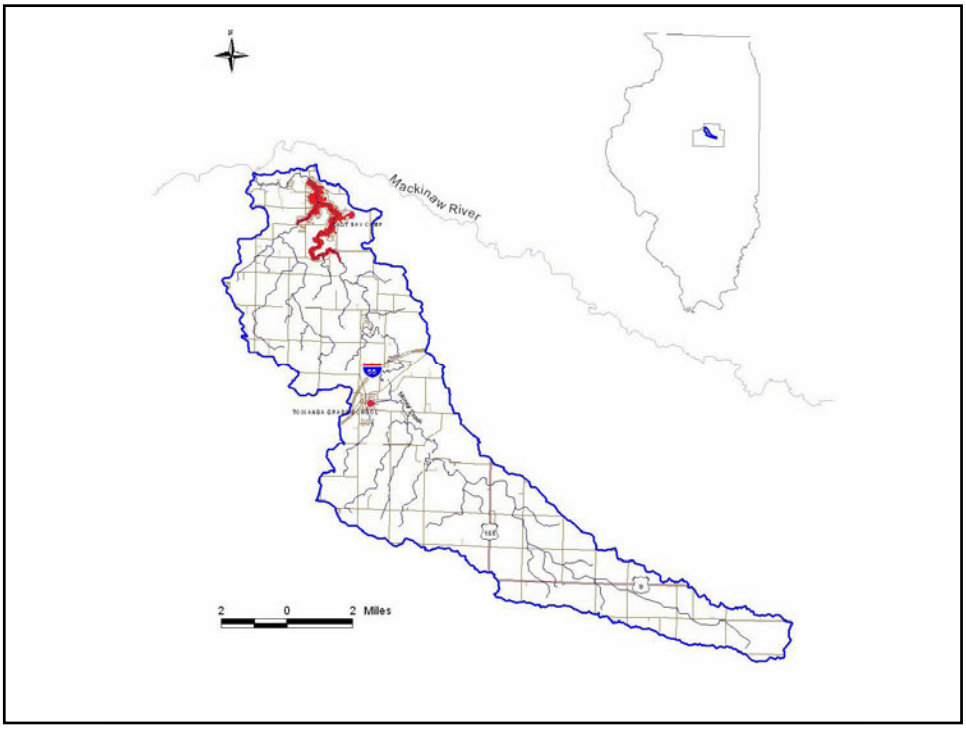
“Pilot” Case Studies

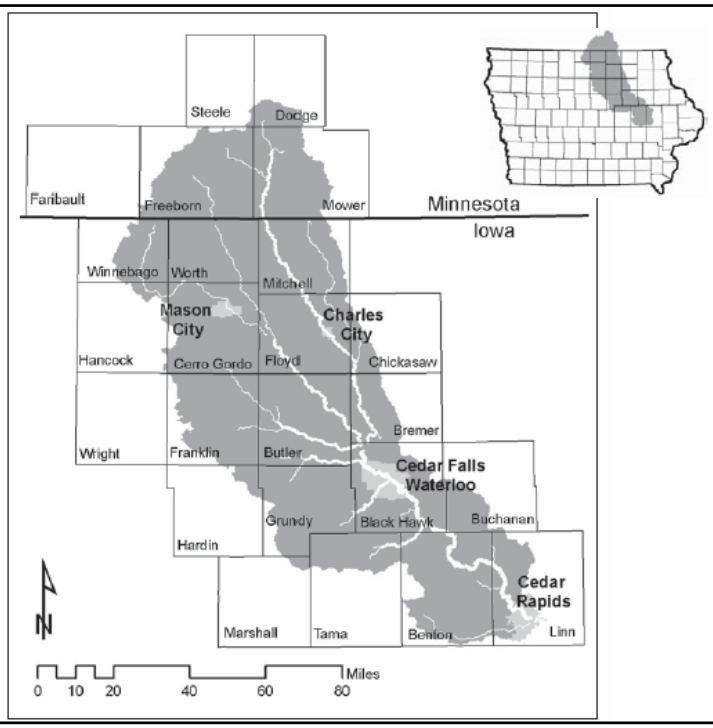
Primarily State Funded – Small UMRSHNC Match Funds

Goal of Completing Pilots by Fall 2007

Two Pilots

- Lake Bloomington Watershed, Illinois
- Cedar River, Iowa





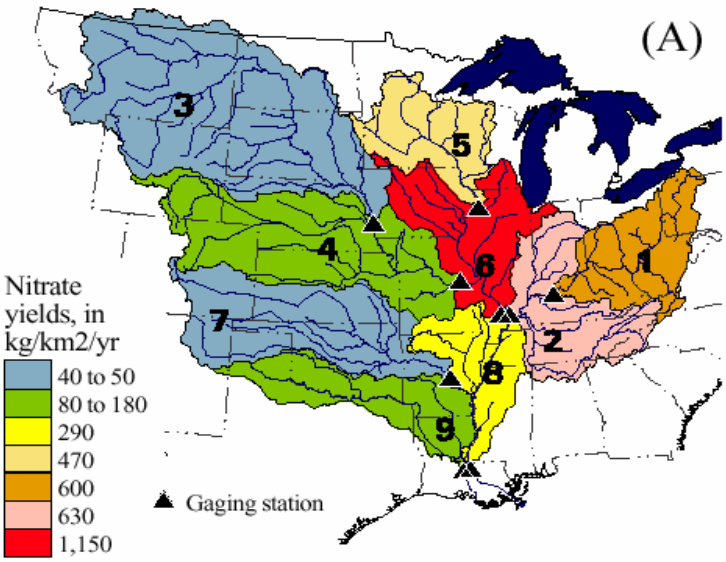
For More Information

WWW.UMRSHNC.ORG

Report of the Ohio River Sub Basin Committee

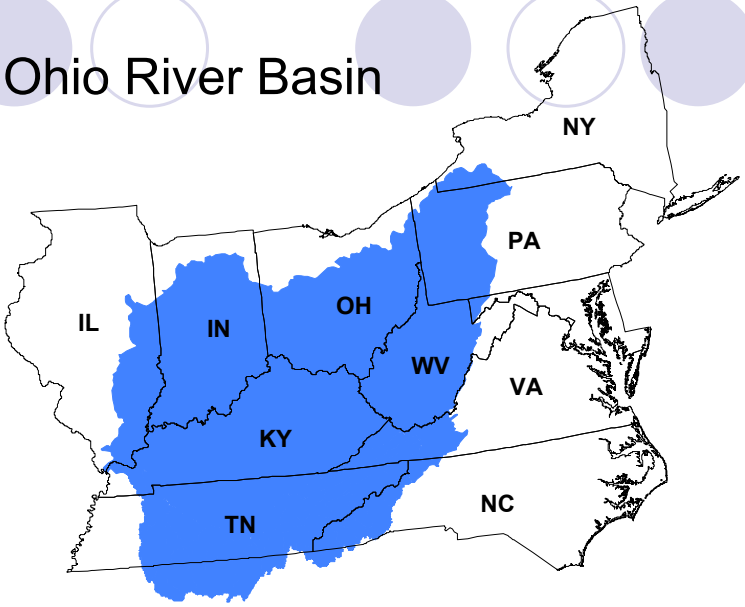
January, 2007

Nitrogen Source Distribution



Goolsby, et al

The Ohio River Basin



Action Plan Goals for the Gulf and the Basin:

- *Coastal Goal: By 2015, reduce the average zone to < 5,000 Km^2*
- *Within Basin Goal: To restore and protect the waters of the 31 States and 77 Tribes in the Basin*
- *Quality of Life Goal: Improve the communities and economic conditions across the Mississippi Basin*

Plan lists 11 Actions

- #1 December, 2000, integrated budget proposal for additional funds
- **#2 Summer, 2001, establish Sub-basin Committees**
- #3 Fall, 2001, develop a Hypoxia Research Strategy
- #4 Spring, 2002, expand the long-term monitoring for the zone
- **#5 Spring, 2002, expand the monitoring within the Basin**

11 Actions (Continued)

- **#6 Fall, 2002, develop strategies for nutrient reduction for each sub-basin**
- #7 December, 2002, Corps of Engineers (COE) study of nutrient reduction from COE projects or operations
- **#8 January, 2003, reduce loadings from point sources**

11 Actions (Continued)

#9 Spring 2003, increase assistance to landowners for voluntary actions to restore or create wetlands and forested buffers

#10 Spring 2003, increase assistance to agricultural producers/ businesses for implementation of best management practices

#11 December 2005 and every five years thereafter, the Task Force assess results

Sub Basin Committee will include states plus stakeholder representatives (developing).

Steering Committee consists of state agencies (established).

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

Funding Support

- US EPA provided $165,000 in grant support in 2004.
- Funding of current project ended on June 30, 2006.
- Project report was due October 1, 2006.
- Proposal accepted for a separate grant - 2 years, $90K.

Progress to Date

- Five Steering Committee meetings.
- Briefings on Gulf Hypoxia.

  (five participating states have not been Task Force members)
- Presentations on Nutrient Reduction efforts.
- Framework for Nutrient Reduction Strategy completed.
- Ohio elected chair state and invited to join the Task Force.
- Makeup of Stakeholder Group determined.

Framework for Development 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

Concept of Framework Document

- Reduction targets for Mississippi River and Gulf of Mexico will not be available for several years.
- Initial Nutrient Reduction Strategy will focus on protecting local waters per Action Plan Goal 2.
- Strategy should be adaptable to address emerging targets.

Steering Committee Recommendations

- Require effluent monitoring of total N and total P at major POTWs and appropriate industrial discharges.
- Add total N and total P at ambient monitoring sites as indicated by MMR strategy.
- Monitor Ohio River and major tributary sites per MMR Strategy
  - Cross sectional composites
  - 15 samples per year

Upcoming Activities - ORSBC

- Assess available treatment techniques for meeting stringent N and P limits.
- Complete formation of stakeholder group.
- Develop outreach materials – brochures, presentations, web site.
- Follow development of Miami Conservancy District Trading program.
- Possible involvement in proposals by others.

Ohio River Basin Symposium

- Possible topic – nutrient management in urban areas.
- Could include point source control, wet weather sources.
- Role of trading might also be explored.
- Timing – 2007?

Combinations of practices

Scioto CREP practice

Scioto CREP practice

Scioto CREP practice

WQ Trading example (holding pond and plan needed)

WQ Trading example

Urban example

Urban example

- Key issues for Ohio Basin stakeholders:
  - SAB results and “drivers”
  - Role of sub-basin teams
  - Accountability
  - Priorities and funding

- Thank you
- Any questions?

Lower Mississippi River Sub-basin Committee on Hypoxia

Gulf Hypoxia Task Force Meeting

January 11, 2007

Summary of LMR Sub-basin Committee Activities in 2006

- Sub-basin Committee Meetings
  - May 31 – New Orleans, LA – in conjunction with LMR Nutrient Symposium
  - September 19 – Vicksburg, MS – in conjunction with Lower Mississippi River Conservation Committee meeting

LMR Sub-basin Coordinator Activities 2006

- Participated in stakeholder meetings:
  - Yazoo Management District, Delta Water Meeting Stoneville, MS, March 21-22
  - Lower Mississippi Alluvial Valley Stakeholder Meeting, Memphis, TN, April 4-6

  Presentations

  EPA Science Advisory Board, December 6

  Restore America's Estuaries Conference, Dec. 13

Other activities in LMR Sub-basin

- Cotton Fertilizer BMP Initiative – PPI/IPNI
  www.ppi-far.org/ppiweb/usams.nsf

LMR Sub-basin Committee Focus Watersheds

Bayou Bartholomew, AR

Cabin Teele, Coulee Baton, LA

Lower St. Francis River, MO

Lake Washington, MS

Dry Creek/West Hatchie River, TN

Lower Mississippi River Nutrient Symposium

- "Nutrient Loading & Removal in the Lower Mississippi River: Data, Trends, Opportunities"
  New Orleans, LA; June 1-2, 2006

http://www.epa.gov/msbasin/taskforce/reassess2005.htm

LMR Symposium – Major Topics

- Nutrient trends in LMR Basin
- Status of monitoring in LMR Basin
- Agricultural management practices
- Wetlands and nutrient assimilation
- Municipal & Point Sources
- Future trends

LMR Nutrient Reduction Strategy

- Hypoxia *Action Plan* calls for Sub-basin Committees to develop nutrient-reduction strategies:
  - *Establish baseline of existing efforts;*
  - *Identify opportunities to restore wetlands;*
  - *Set reduction targets for nitrogen losses to surface waters;*
  - *Set needs for additional assistance/funding.*

Baseline of existing efforts/assessments

- Several key assessments are underway:
- USDA Conservation Effects Assessment Program (CEAP) – December 2008
- USGS Nutrient Trends Report for South-Central U.S. – March 2007
- EMAP for Lower Mississippi River – 2009
- USFWS Atchafalaya Basin Assessment

Areas of opportunity in the LMRB

- Agricultural Management & Practices
  - Drainage Management –
  - Efficiency & Fertility Management-
  - Flooding of Winter Fields-
  - Conservation Tillage

  Agricultural Initiatives: Louisiana Master Farmer Program; PPI BMP Initiative

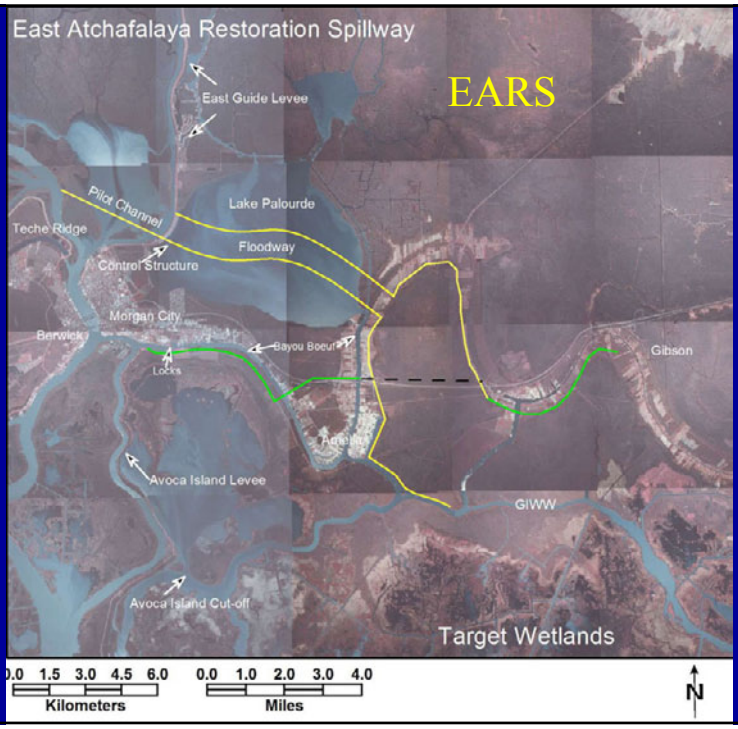
Areas of Opportunity

- Municipal & Point Sources
  - *Major Municipalities:* St. Louis, Memphis, Baton Rouge, New Orleans

    Citizen Monitoring, Stormwater Management, Wastewater Treatment
  - *Point Sources:* Louisiana Industrial Corridor
    - Louisiana Point Source Initiative: Phases I&II (La. DEQ, BASF, Exxon-Mobil, others)

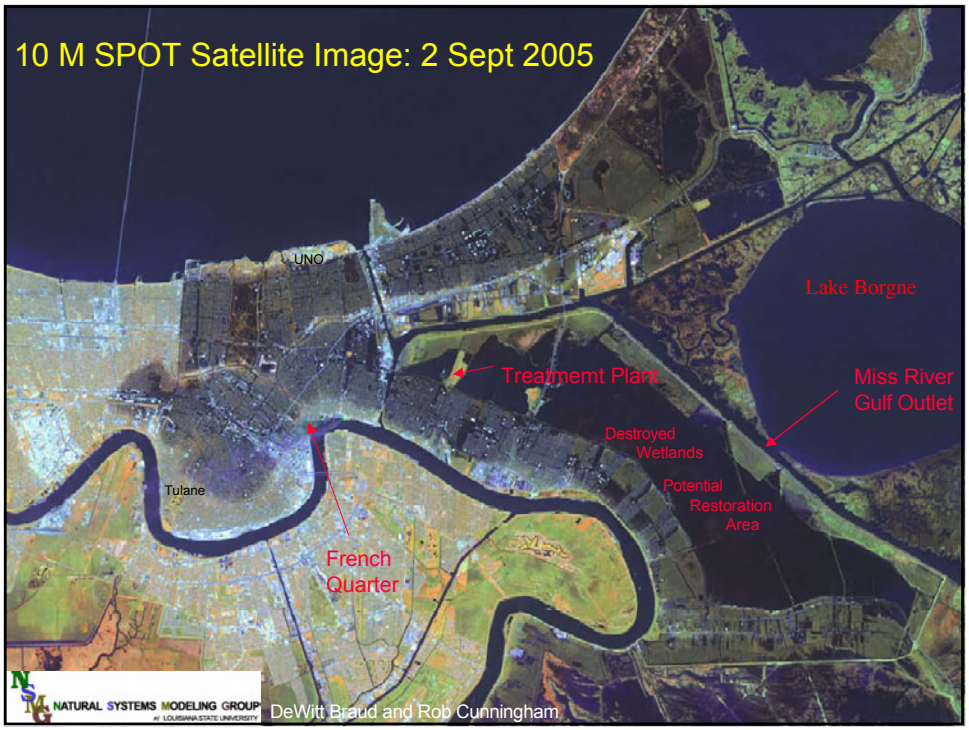
Areas of Opportunity

- Wetland Conservation, Protection, Restoration
  - Lower Mississippi Alluvial Valley:
    - Reforestation
    - USDA Programs
  - Atchafalaya Basin
  - Coastal/Deltaic Wetlands



Areas of Opportunity

- Innovative Projects
  - Loosahatchie River, TN: 5 growing municipalities join to reduce wastewater inputs from new treatment plants
  - New Orleans SWB: Wetland Restoration Project

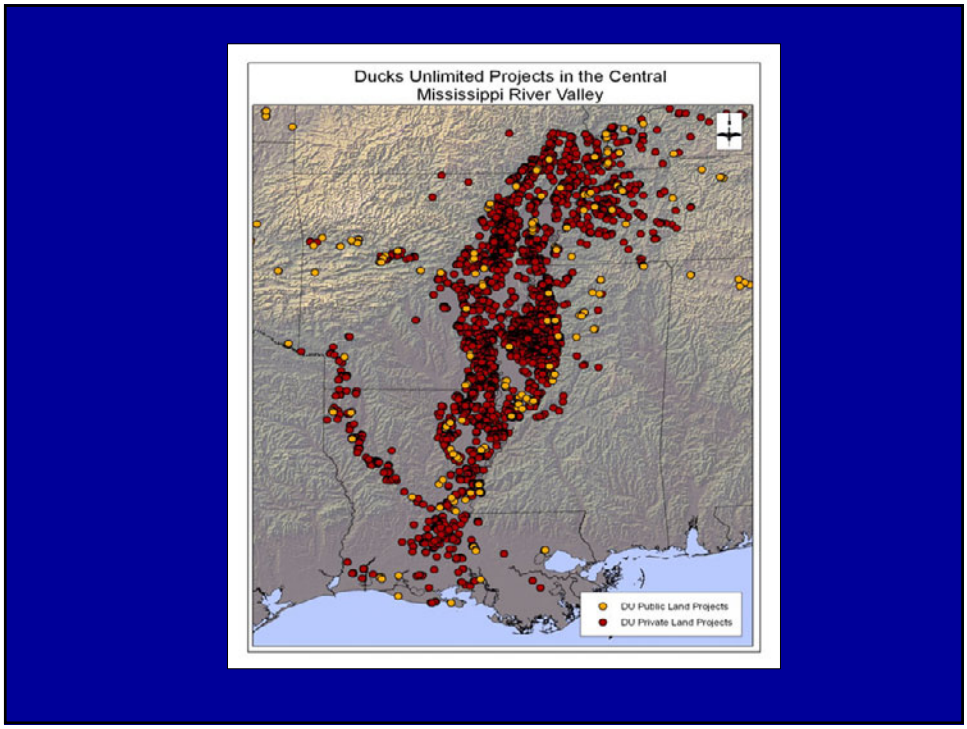


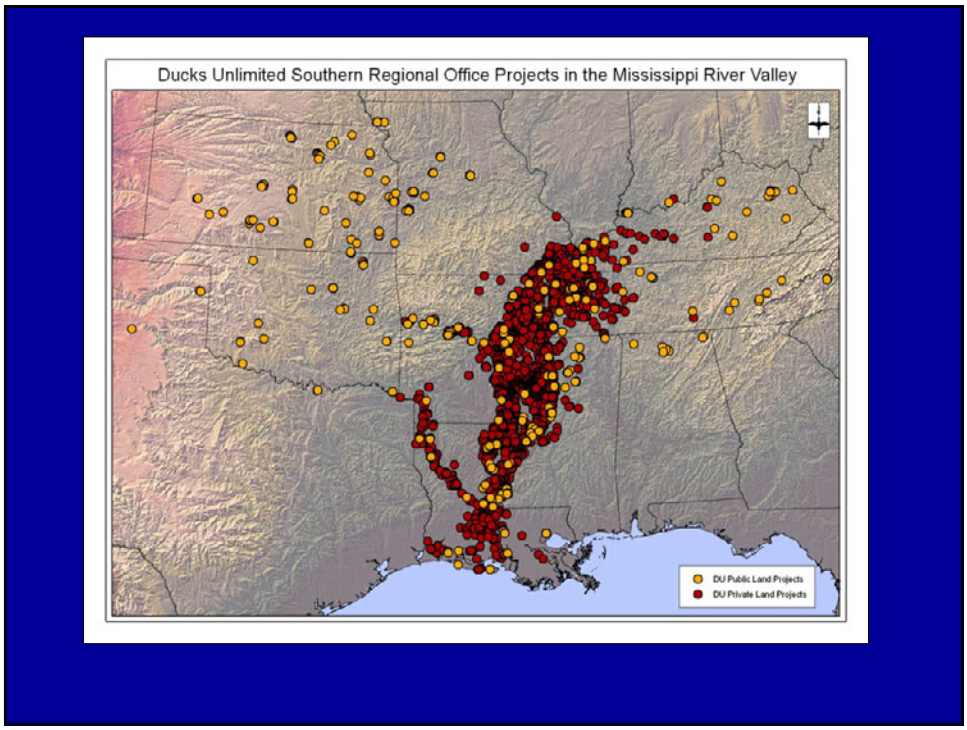
Multiple Benefits

- Restore critical damaged infrastructure
- Enhance 10,000-30,000 acres of wetlands, re-establish cypress swamps
- Reduce wastewater flow into river
- Protect from future storm vulnerability
  - Orleans Parish
  - St Bernard Parish

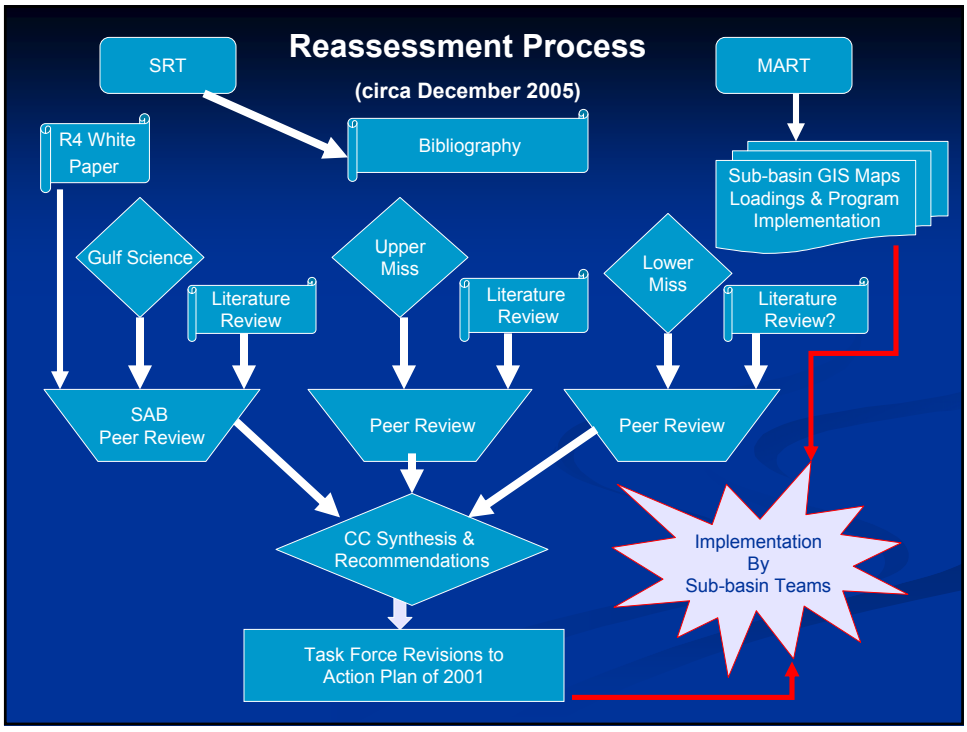
Lower Mississippi River Sub-basin Committee on Hypoxia

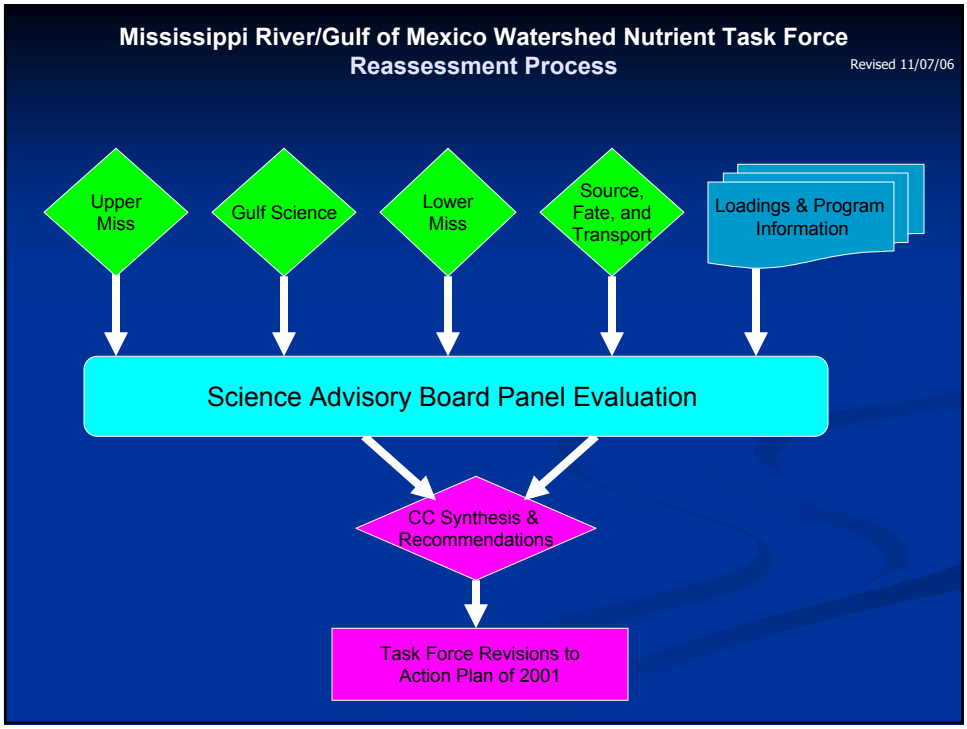
- www.epa.gov/gmpo/specialactivities/subbasincommittee.htm

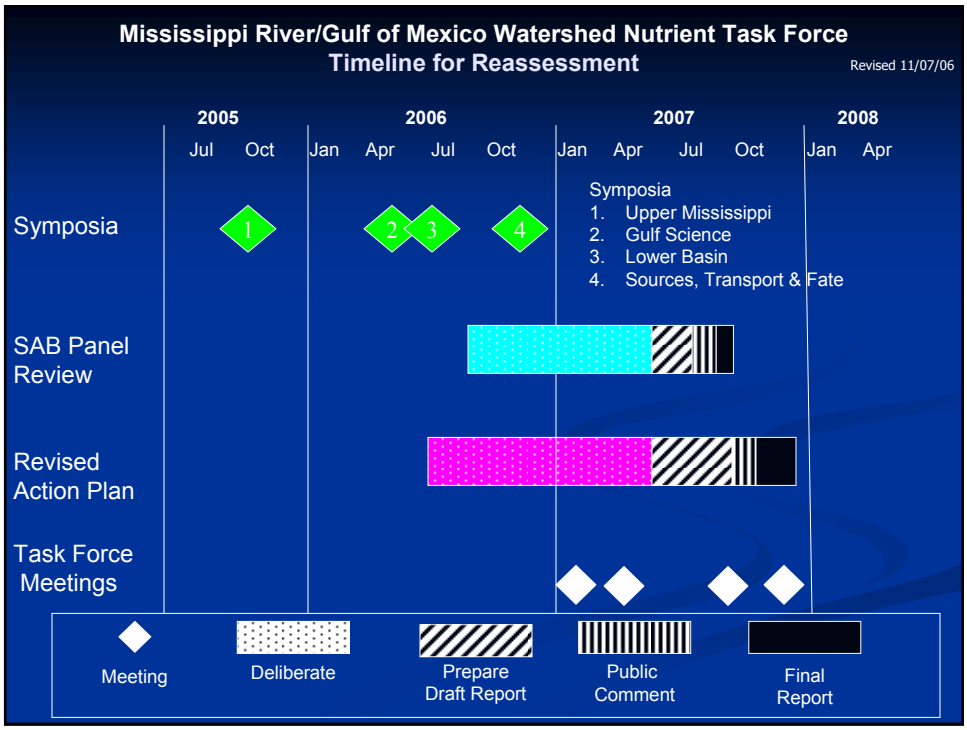

Ducks Unlimited Projects in the Central Mississippi River Valley
DU Public Land Projects
DU Private Land Projects

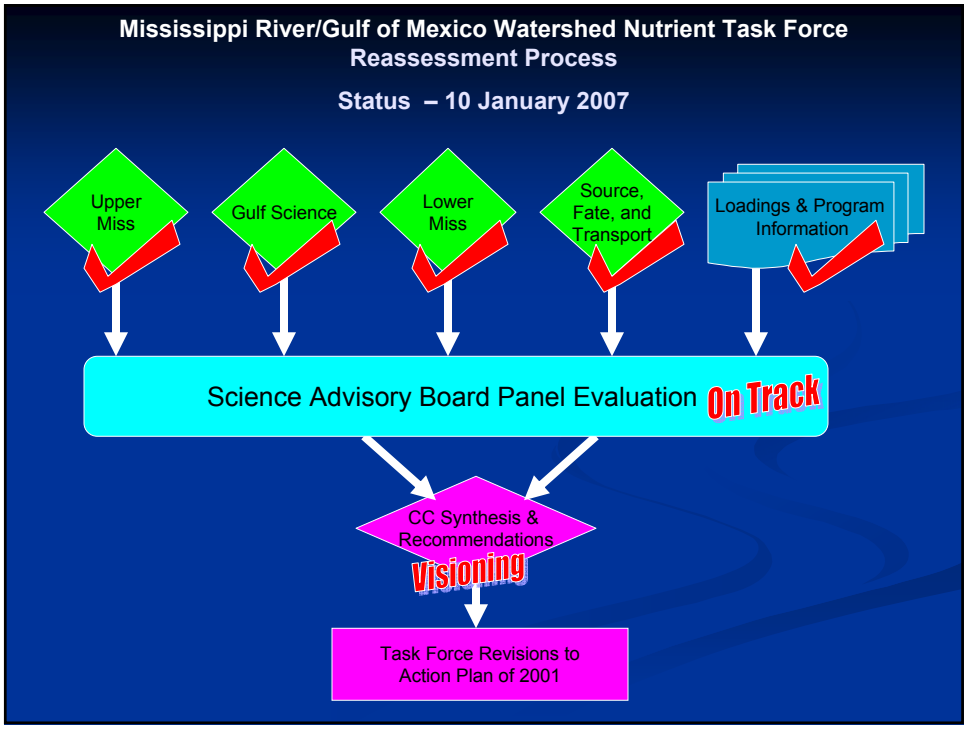

Ducks Unlimited Southern Regional Office Projects in the Mississippi River Valley
DU Public Land Projects
DU Private Land Projects

Mississippi River /Gulf of Mexico Watershed Nutrient Task Force 2007 Workplan




Mississippi River/Gulf of Mexico Watershed Nutrient Task Force
Reassessment Process
Revised 11/07/06
Upper Miss
Gulf Science
Lower Miss
Source, Fate, and Transport
Loadings & Program Information
Science Advisory Board Panel Evaluation
CC Synthesis & Recommendations
Task Force Revisions to Action Plan of 2001


Mississippi River/Gulf of Mexico Watershed Nutrient Task Force
Timeline for Reassessment
Revised 11/07/06
2005
2006
2007
2008
Jul Oct Jan Apr Jul Oct Jan Apr Jul Oct Jan Apr
Symposia
1 2 3 4
Symposia
1. Upper Mississippi
2. Gulf Science
3. Lower Basin
4. Sources, Transport & Fate
SAB Panel Review
Revised Action Plan
Task Force Meetings
Meeting
Deliberate
Prepare Draft Report
Public Comment
Final Report



2007 Workplan (draft)

MONTH	TASK FORCE	COORDINATING COMMITTEE	SCIENCE ADVISORY BOARD
Jan	• Action Plan Visioning Approval		
Feb		• Strawman outline of Action Plan	• Public Meeting
Apr	• Discuss ongoing activities • Discuss Strawman proposal • Major issues raised by Members		
May	• Request public input	• Revise Strawman based on Task Force comments	
Jun		• Revise Strawman to incorporate public input	• Public Meeting
Jul			• Draft Report Released
Aug		• Address SAB draft report • Develop Draft of Action Plan	
Sep	• Initial Draft of Action Plan Released • Public Comments Open		• Final Report Released
Oct		• Revisions Based on Public Comments • Respond to Public Comments	
Nov	• Final Action Plan Approval		

US EPA SAB Hypoxia Advisory Panel

http://www.epagov/sab/panels/hypoxia_adv_panel.htm

Panel Formation

- **Feb to Sep 2006**
  - **Nominations Request FR**
    - **Invitations for comment on "short list"**
    - **Determination Memorandum**
    - **Biosketches**
    - **Charge to panel**

Meetings

- **Sep 2006 – Organizational Meeting**
  - **Follow up teleconferences**
    - **Subgroup 1 – Causes of Hypoxia (Three teleconferences)**
    - **Subgroup 2 – Nutrient Sources, Fate and Transport (Three teleconferences)**
    - **Subgroup 3 – Scientific Basis for Goals and Management Options (Two teleconferences)**

Meetings (cont'd)

- **December 2006 – Fact finding Meeting**
  - **Presentations by invited experts**
  - **Development of report outline**
  - **Individual writing assignments**
  - **Follow up teleconferences**
    - **Subgroup 1 – Causes of Hypoxia (Jan 26, 2007)**
    - **Subgroup 2 – Nutrient Sources, Fate and Transport (Jan 25, 2007 three teleconferences)**
    - **Subgroup 3 – Scientific Basis for Goals and Management Options (Feb20, 2007)**

Meetings (cont'd)

- **Feb 28–Mar 2, 2007 Writing Meeting**
  - Continue to develop, deliberate, and refine text
  - Follow teleconferences TBD
- Anticipated Meeting in June
- Additional teleconferences or face-to-face meeting as required

Final Report

- Peer review by independent external experts
- Quality review by Charter SAB
- Transmittal to the Administrator

http://www.epagov/sab/panels/hypoxia_adv_panel.htm

Task Force Priority Themes for Revising the Action Plan

Robert Magnien, NOAA and Dennis McKenna, Illinois DA
Co-Chairs, Visioning Workgroup of the Coordinating Committee

What are these "visioning" recommendations?

- Themes that identify high priority issues and opportunities for the Task Force, partners and stakeholders to consider in revising the Action Plan
- Position Task Force to better integrate Action Plan with related efforts, ongoing programs and new trends

Why were these "visioning" recommendations compiled?

- To initiate the process of revising the Action Plan and maintain schedule
- To identify key issues that would likely require substantive engagement of partners and stakeholder to incorporate appropriately
- To identify information needs while time remained to address them

Theme A.

Acknowledging Context Changes & Linking to Emerging Issues and Policies

- Wetland loss and water diversions in Lower Basin
- Rapid changes in agriculture driven by biofuels demand
- Reauthorization of Farm Bill

Theme A. (cont.)

Wetland loss and water diversions in Lower Basin

- Huge losses of wetland have occurred
- MS River channel has been stabilized, diverting sediment offshore
- Alternatives are being considered for wetland restoration and diversion of MS River flows
- Relationship of these issues to hypoxia still under investigation

Theme A. (cont.)

Rapid changes in agriculture driven by biofuels demand

- Ethanol production driving up demand for corn
- Other biofuels being considered based upon many economic and environmental (e.g. C balance) factors
- Nutrient loading impacts generally not being considered

Theme A (cont.)

Reauthorization of Farm Bill

- Opportunities to target nutrient reduction practices
- Potentially more resources for conservation
- Could provide significant support for Action Plan implementation

Theme B.

Greater Specificity and Accountability & Its Tie to Funding Strategies

- Increased specificity in implementation actions while maintaining flexibility
- Greater specificity will lead to improved tracking of progress
- Greater specificity will aid in identifying gaps and justifying funding

Theme C.

Tracking Program and Environmental Progress

- Serious gaps exist in ability to track program implementation and environmental effectiveness
- More specificity in Action Plan will improve framework for tracking but additional resources will be needed

Theme D.

Need to Adapt to New Scientific Findings

- A fundamental principle of the Action Plan – adaptive management
- CC-organized topical symposia and expert panel under EPA/SAB providing latest info.
- Issues include implications of N vs. P controls, sufficiency of new info. to modify goals, etc.
- Further consideration awaits SAB findings

Theme E.

Maximizing Opportunities for Stakeholder Involvement

- Action Plan built upon cooperative and voluntary implementation
- Thus, stakeholder involvement in crafting revisions to the Plan is essential
- Sub-Basin Committees have made great strides toward enhancing stakeholder involvement

Theme F.

Reexamining Roles and Responsibilities of Task Force Partners

- A reassessment of roles and responsibilities of federal agencies, states, tribes, and sub-basin committees in achieving goals of the Action Plan is desirable
- With no additional funding, many tasks assigned to states have not been completed
- Sub-basin committees have started to play a larger role in Task Force activities, especially outreach to stakeholders

Task Force and Coordinating Committee committed to a robust public participation process as the revision process moves forward

Mississippi River/Gulf of Mexico Watershed Nutrient Task Force

Themes for Revisions of the 2001 Action Plan

January 10, 2007

At the 12th meeting of the Task Force, the decision was made to pursue a scoping effort that would guide the process of revising the 2001 Action Plan. The scoping effort conducted by the Coordinating Committee took the form of "themes" that were recommended to, and adopted by, the Task Force at its 13th meeting on Jan. 10, 2007. Following are six themes that will serve as the foundation for the process of assembling information, engaging various partners and stakeholders, and developing revisions of the Action Plan. These themes in no way preclude consideration of other issues that may emerge during the process.

A. Acknowledging Context Changes & Linking to Emerging Issues and Policies.
Since the completion of the Action Plan in January of 2001 many issues in the Basin and the Gulf that relate to the hypoxic zone remain the same but some new trends, events, policies, and advances in scientific understanding will need to be considered in crafting any updates to this Action Plan. Three major issues stand out.

There remains a long-term trend in wetland loss in the lower basin and two major hurricanes impacted significant amounts of coastal wetlands in ways that are still being debated. The significance of these wetland changes, and plans for their restoration (including water diversions), to the Northern Gulf of Mexico hypoxic zone is still under debate and it is one of the issues that is expected to be addressed by the EPA SAB.

With the increased desire for energy independence, it is likely that more crop land will be converted to corn production and other crops, including possibly perennials, to provide the biomass for the manufacturing of ethanol. As corn is a heavy nitrogen-consuming plant, a shift to this crop could affect loadings into the watershed significantly, depending on the scale. At the same time it is projected by many that a significant inroad to cellulosic energy production using perennial plants is a realistic national goal especially within the Midwestern United States, within the time frame of the Action Plan. A change to perennials has the potential to significantly reduce watershed loads of both nitrogen and phosphorus to a level much lower than any of the strategies currently being considered. Those espousing this vision see the current increase of corn production as a temporal bridge to a future of cellulosic production. The Coordinating Committee felt that it was critically important for the Task Force to become engaged in the discussion of this important agricultural trend to ensure that the water quality, nutrient loading and hypoxic zone implications of this move to biofuels are understood by all concerned and are reflected in any revisions to the Action Plan.

The third major issue that has risen to prominence in the Coordinating Committee discussions is the reauthorization of the Farm Bill. Realistically, this Bill has the greatest near-term potential to infuse funding into practices that are effective at reducing nutrient losses to downstream waters. It is, therefore, important for the Task Force and Coordinating Committee to interface with discussions that may lead to a reauthorization to insure that appropriate connections are made with the Task Force's desire to effect nutrient load reductions in the Gulf of Mexico basin.

B. Greater Specificity and Accountability & Its Tie to Funding Strategies. The Coordinating Committee members universally felt that the identification of implementation actions in the revised Plan would benefit, overall, from more specificity and accountability. This is not intended to mean moving to a more rigid "one-size-fits-all" prescription, but rather increased specificity in the implementation actions to be pursued while maintaining the flexibility to adjust to more efficient and effective actions if warranted. The specificity in actions would also greatly improve the Task Force's ability to identify metrics that can be used to quantitatively track progress, an ability that is lacking now. The hope is that greater specificity and accountability would benefit both loading reduction and speed up the development of effective hypoxia reduction actions. Greater specificity in a revised Action Plan would also permit a much more strategic approach to funding by clearly identifying links to existing sources of funding and identifying gaps that could serve as justification for new funding.

C. Tracking Program and Environmental Progress. There remain serious gaps in our ability to track and evaluate the effectiveness of programs and management efforts and their interactions in reducing the hypoxic zone. Addressing the prior theme regarding more specificity in implementation actions will assist in tracking but more attention should be paid and resources expended on improving the understanding of the effectiveness of our efforts to date to better design and target them for the future.

D. Need to Adapt to New Scientific Findings. A fundamental principle established in the first Action Plan is that the Plan will be adaptive and evolve as new scientific information emerges that justify changes in actions or approaches. The Coordinating Committee has been active in soliciting the latest scientific findings through a series of symposia on relevant topics. A panel of experts has been established under the EPA's Science Advisory Board to address key questions that are critical to the revision of the Action Plan. Among the issues that are expected to be evaluated are the relative roles of nitrogen and phosphorus in controlling hypoxia and how that affects a nutrient control strategy for the basin. Another issue is whether sufficient evidence exists to change the Action Plan's long-term goals, especially the coastal goal. The Task Force should anticipate further discussions of these issues after the SAB panel completes its report.

E. Maximizing Opportunities for Stakeholder Involvement. Given the cooperative and voluntary nature of the Action Plan, its implementation will be dependent upon broad acceptance and a willingness to pursue the identified actions. Thus, the Coordinating Committee recognizes the engagement of stakeholders as a high priority during the deliberations leading up to the Action Plan updates and has been exploring new options for doing so. The Sub-Basin Committees have already made great strides over the past several years in reaching stakeholders that were not previously engaged.

F. Reexamining Roles and Responsibilities of Task Force Partners. A reassessment of the roles and responsibilities assigned to the federal agencies, the states and tribes, and the sub-basin committees in achieving the goals of the Action Plan is desirable. With no additional funding to the states, many of the tasks assigned to the states have not been completed. Although the sub-basin committees have received only limited funding by USEPA, they have played a key role in information exchange among the states, established outreach to key stakeholders, and developed and sponsored two of the science workshops conducted as part of the science re-assessment.

Management Action Reassessment Team

Katie Flahive
US EPA
January 11, 2007

MART Co-Chairs
Mike Sullivan, USDA
Wayne Anderson, MN

Action Plan Reassessment and MART

- Task Force initiated MART in June, 2005, Co-Chaired by USDA, EPA and MN
- Status of existing available programs in the MRB that assist landowners, municipalities, and others in the basin to reduce nutrient loadings – majority of these reach out to control NPS
- MRB Point Source Reassessment

MART Report Format

1. Introduction
2. Discussion: Programs to meet the Goals of the Action Plan
3. Status: Implementation of Action Items No. 9 and No. 10 and other Indicators
4. Acronyms and Abbreviations

MART: Program Status Report

- Distribution of Farm Bill Programs from 2000 - 2005
- Distribution of the Section 319 NPS Program, and loading reductions resulting from that program from 2002 - 2006
- Distribution of the Partners for Fish and Wildlife Program (PFW)
- Distribution of Combined Sewer Overflows

Action Item No. 9

- Conservation Reserve Program: total ac enrolled, 2005 = 23,779,808
- Wetland Reserve Program: total ac enrolled, 2005 = 603,441
- Vegetated or forested buffers established along rivers and streams of priority watersheds: ~332,000 ac riparian buffers regardless of program, 2002 to 2005 (but from USDA programs)
- Number and percent of wetland acres restored, enhanced, or created : ~785,000 acres of wetland creation, enhancement and restoration, 2002-2005

Action Item No. 10

- Environmental Quality Incentives Program: total ac enrolled, 2000-2005 = 34,877,812
- Conservation Tillage: ~11.8 million ac under residue management, 2002 -2005
- Nutrient Management Planning: ~10.3 million ac under nutrient management, 2002-2005
- Section 319 of the Clean Water Act: projects focusing on N and P, 2002-2006
  - N = 25,542,923 lbs/yr reduced
  - P = 15,248,562 lbs/yr reduced

Other Programmatic Indicators

- Conservation Security Program: 80 watersheds (8-dig), ~126,000 farms, 59 million ac, 2004-2005
- Partners for Fish and Wildlife Program: 5,528 projects, 573,931 ac, 814 stream miles, 2001-2006
- Combined Sewer Overflows: 475 facilities, 2004

Point Source Mass Loadings Report Format

1. Introduction
2. Results
3. Data Description
4. Methodology
5. Changes to the 1998 Assessment
6. Acronyms and Abbreviations
7. References Cited

Compliance and Reporting

- What is a NPDES permit?
  - License granting permission discharge
  - It is revocable for cause (noncompliance)
- When permit contains monitoring requirements or limits, facilities must monitor and report to states monthly
- States enter all data into EPA's Integrated Compliance Information System/Permit Compliance System
- Data from PCS was used to analyze PS loadings to the MARB

Loadings of TN, TP, and BOD

	# Permits	Kg per day	Pounds per year
TN	31,817	578,681 kg/day	465,736,936 lb/yr
TP	30,498	97,840 kg/day	78,744,078 lb/yr
BOD	33,326	690,863 kg/day	556,023,814 lb/yr

	Method	Source of Pollutant Concentration Value	Source of Discharge Flow Value	SIC Code	TN	TP	BOD
1	EDS Retrieval	PCS Database	PCS Database	Any	11.1%	14.1%	62%
2	Estimate	TPC	CWNS existing flow	Any	45.2%	44.9%	9.2%
3	Estimate	TPC	Design flow adjusted by coeff. = 0.72	4952 only	34.3%	33.9%	22.8%
4	Estimate	TPC	Design flow adjusted by p-factor & operation days	Not 4952			
5	Estimate	TPC	No design flow or actual flow; TFV adjusted by design flow coeff. = 0.28	Any	9.4%	7.0%	6%

Sewage Treatment Plants

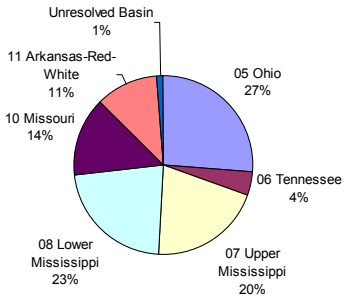
- Compared mass load contribution from sewage treatment plants (SIC=4952) to other industrial categories
- Sewage treatment plants contribute approximately:
- 64.1% TN load
- 65.7% TP load
- 62.5% BOD load

MRB Loads	SIC=4952 (kg/day)	SIC ≠ 4952 (kg/day)
N	370, 789	207,892
P	64, 291	33, 549
BOD	431,499	259,364

Report notes the top ten contributing non-sewage treatment SIC categories

Annual point source TN load contributions by Sub-Basin

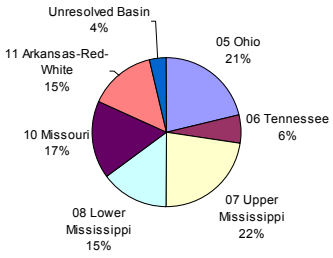
2-digit HUC/Hydrologic Region	Number of permits (for N loading)	Nitrogen load (kg/day)	% of TN load
05 Ohio	8881	152,982	26.4
06 Tennessee	1353	24,511	4.2
07 Upper Mississippi	4915	116,553	20.1
08 Lower Mississippi	6283	128,757	22.3
10 Missouri	6189	83,183	14.4
11 Arkansas R-W	3680	66,019	11.4
Unresolved Basin*	516	6,667	1.2
Total	31,817	578,672	100.0



*Permits whose hydrologic region was not identified in the PCS database, and which could not be assigned to a hydrologic region because latitude and longitude data were missing for the permit and could not be accurately resolved from other address information from the permit

Annual point source TP load contributions by Sub-Basin

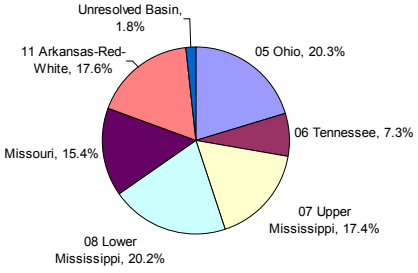
2-digit HUC/Hydrologic Region	Number of permits (for P loading)	TP load (kg/day)	% of TP load
05 Ohio	7960	21,013	21.5%
06 Tennessee	1248	5,898	6.0%
07 Upper Mississippi	4736	21,966	22.5%
08 Lower Mississippi	6329	14,411	14.7%
10 Missouri	6086	16,637	17.0%
11 Arkansas R-W	3630	14,338	14.7%
Unresolved Basin*	509	3,575	3.7%
Total	30,498	97,838	100.0%



*Permits whose hydrologic region was not identified in the PCS database, and which could not be assigned to a hydrologic region because latitude and longitude data were missing for the permit and could not be accurately resolved from other address information from the permit

Annual point source BOD load contributions by Sub-Basin

2-digit HUC/Hydrologic Region	Number of permits (for BOD loading)	BOD load (kg/day)	% of BOD load
05 Ohio	9417	140,419	20.3%
06 Tennessee	1493	50,702	7.3%
07 Upper Mississippi	5031	120,212	17.4%
08 Lower Mississippi	6738	139,229	20.2%
10 Missouri	6251	106,572	15.4%
11 Arkansas R-W	3781	121,350	17.6%
Unresolved Basin*	525	12,380	1.8%
Total	33,236	690,864	100.0%



*Permits whose hydrologic region was not identified in the PCS database, and which could not be assigned to a hydrologic region because latitude and longitude data were missing for the permit and could not be accurately resolved from other address information from the permit

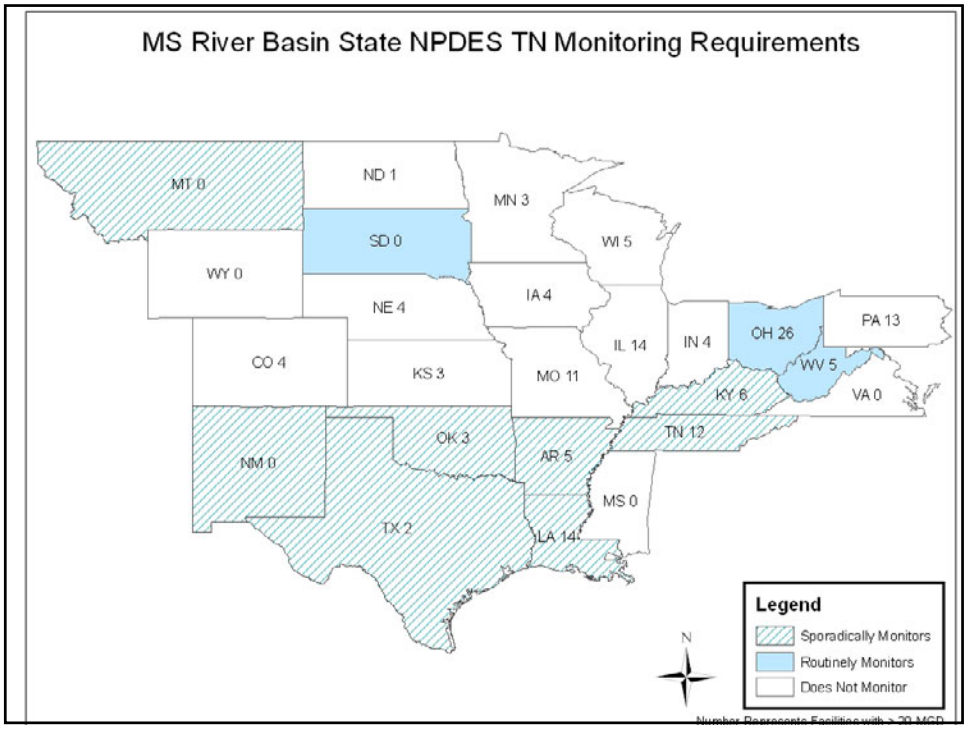
1998 vs. 2006

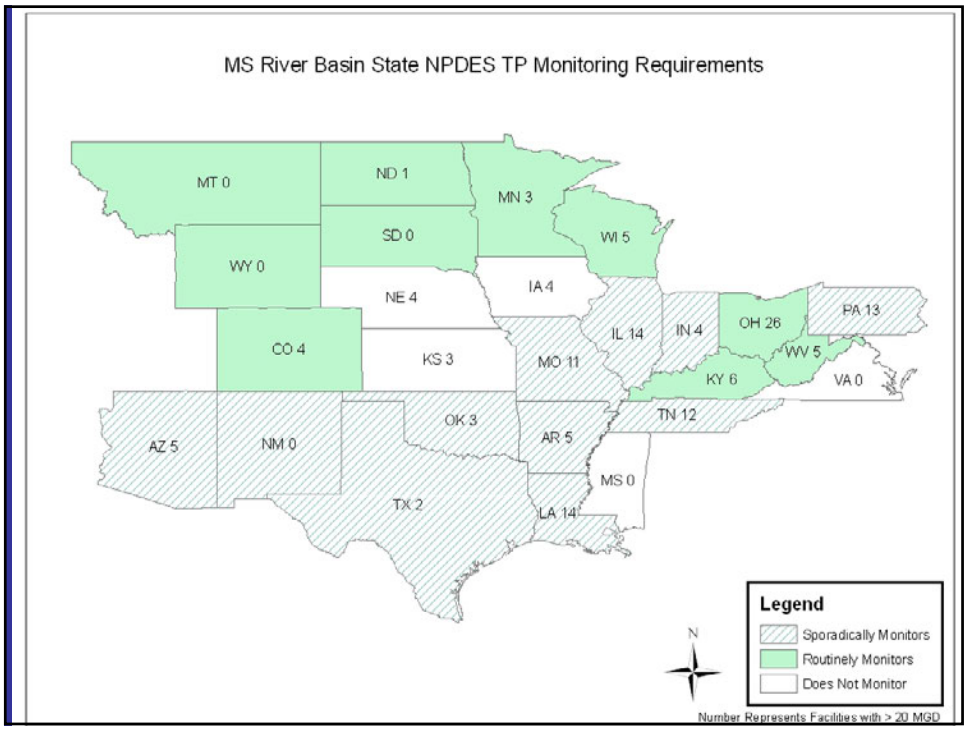
- Estimated total MRB point source mass loadings for TN and TP in the current reassessment are substantially lower than those estimated in 1998
- More permitted discharges were considered now
- Estimated total mass loading for N is ~73% of the previous estimate
- Estimated total mass loading for P is ~59% of the previous estimate

	1998 Assessment (based on 1996 data)	2006 Assessment (based on 2004 data)
Number of discharges considered	11,500 facilities	31,817 permits (TN) 30,498 permits (TP) 33,236 permits (BOD)
TN load	642 million lb/yr	466 million lb/yr
TP load	133 million lb/yr	79 million lb/yr
BOD load	Not estimated	566 million lb/yr

Current Point Source Loadings

- Difficult to determine trends and establish accurate baseline due to lack of effluent monitoring data for nutrients (TN and TP)
- Why is monitoring minimal?
  - Few permit requirements
    - Little numeric nutrient criteria designed to be protective of the Gulf or MARB
    - Many impaired waters do not have TMDLs yet
  - Most likely to monitor for TP due to localized effects
  - More likely to monitor for ammonia instead of TN or nitrate


MS River Basin State NPDES TN Monitoring Requirements
MT 0
ND 1
MN 3
SD 0
WI 5
WY 0
IA 4
NE 4
IL 14
IN 4
OH 26
PA 13
CO 4
KS 3
MO 11
WV 5
KY 6
VA 0
TN 12
NM 0
OK 3
AR 5
MS 0
TX 2
LA 14
N
Legend
Sporadically Monitors
Routinely Monitors
Does Not Monitor


MS River Basin State NPDES TP Monitoring Requirements
MT 0
ND 1
MN 3
SD 0
WI 5
WY 0
IA 4
NE 4
IL 14
IN 4
OH 26
PA 13
CO 4
KS 3
MO 11
WV 5
KY 6
VA 0
TN 12
AZ 5
NM 0
OK 3
AR 5
MS 0
TX 2
LA 14
N
Legend
Sporadically Monitors
Routinely Monitors
Does Not Monitor
Number Represents Facilities with > 20 MGD

Point Source Conclusions

- Sewage Treatment Plants (4952) contribute the largest % of TN, TP, and BOD load in the MRB
- 2006 shows loading decrease for TN and TP in comparison to the 1998 report
  - Methodology adjustments: same procedures from 1998, changes made when the accuracy of the results could improve
    - 1998 report used many data sources: PCS, electronic and paper reports from state and USEPA regional offices; many approximations and assumptions
    - 2006 report relied almost entirely on PCS data w/adjustment factors to improve lit. estimated values for pollutant concentrations and facility flows
  - TPC values (estimates from literature) had been updated for some industry categories since the 1998 report, for example, TPC for P in 4952 was reduced for the 2^{o} tx level from 7.0 mg/L in 1993 tables to ~2.0 mg/L in 1999 tables and for 3^{o} tx from 3.5 mg/L in 1993 tables to 0.8 mg/L in 1999 tables
  - Possible that improvements in nutrient removal by dischargers represent lower nutrient content discharged between 1996 and 2004

Basin-wide Economic Assessment

Mark Peters
U.S. Department of Agriculture
Natural Resources Conservation Service

Questions

- Do we need to do a new economic study?
- When in the reassessment process should it be done?
- What should be the scale of the study?

Do we need to do a new economic study?

No

- Determination of quantitative goals and targets should be driven by the science
- Original economic study is sufficient

Yes

- Changes in the Basin require a new study
- Original study not sufficient

When should the economic study be done?

- As an action item in the Action Plan
- Before the goals and targets for the revised Action Plan are determined

What is proper scale of study?

- Representative watershed
- National

Decision

- New economic study is needed
- Where in the reassessment process and the scale of study to be discussed further by the Coordinating Committee

Building Innovative Industry-Producer Partnerships to Reduce Hypoxia in the Gulf of Mexico

Karen A. Scanlon
Executive Director
Conservation Technology Information Center

Conservation Technology Information Center

CTIC is the trusted and reliable source for technology and information about agricultural conservation.

MISSION: Provide reliable, profitable solutions to improve the relationship between agriculture and the environment.

CTIC

- Non-profit, membership organization
- Governed by a 15-member Board of Directors
- 1982…established as Conservation Tillage Information Center
- 1987…"technology" Center at Purdue Research Park, West Lafayette, Indiana

A Public/Private Partnership

Members

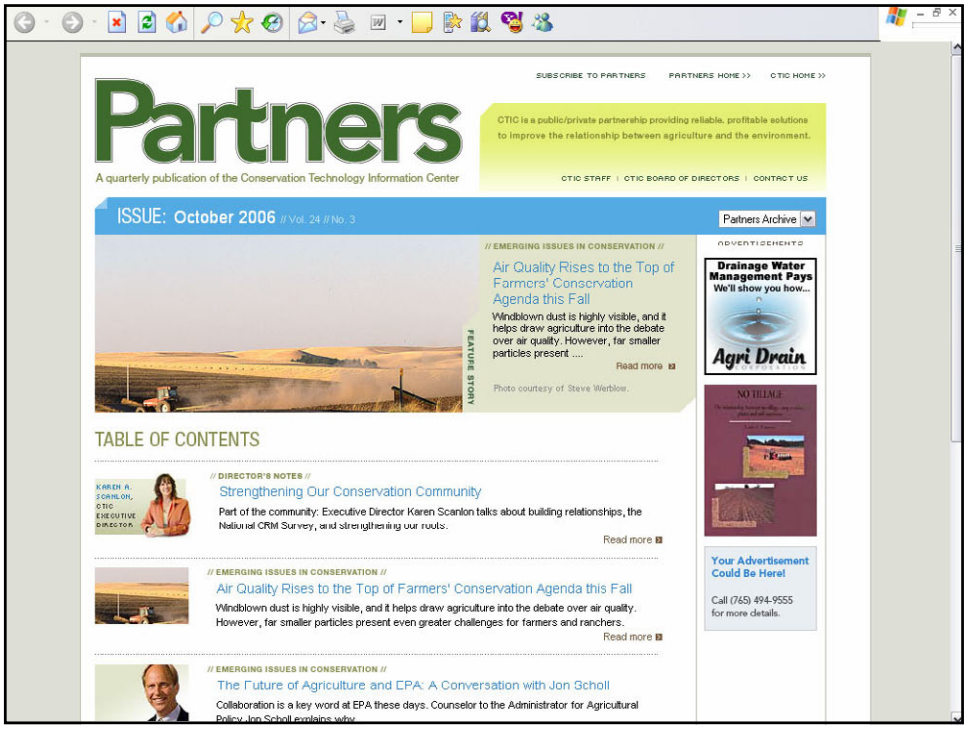
- Individuals, agribusiness, media, commodity groups, conservation organizations, associations

Advisors & Partners

- Federal agencies, universities, extension, research institutions

What We Do

- Collect, compile, interpret and disseminate information about agricultural conservation
- Distribute national messages
- Facilitate workshops, conferences and trainings
- Lead local, regional and national projects to advance conservation in agriculture



Building Innovative Industry-Producer Partnerships to Reduce Hypoxia in the Gulf of Mexico

Project Goals

- Increase agricultural industry leaders' involvement in identification of effective approaches to address nutrient management challenges in the Mississippi Basin.

Three Project Phases

Phase I

- Ag Industry Leader Workshop
  - Provide update on hypoxia zone
  - Discuss role of ag in addressing nutrient loading concerns
  - Present practices and methodologies available from industry to help producers meet nutrient management goals
  - Obtain commitment from ag industry to work with local producer coalitions in Phase II

Project Goals

- Increase applications of practices and methodologies available from ag industry in local nutrient management plans targeted at reducing nutrient loads to the Mississippi River.

Three Project Phases

Phase II

- Local Producer Coalitions Address Nutrient Management Goals
  - Identify one existing or potential coalition in each of three sub-basins
  - Hold workshops to help coalitions develop innovative plan for meeting nutrient management goals
  - Bring ag industry leaders from Phase I to workshops to provide guidance on best-available practices and methodologies

Project Goals

- Create a model for transferring best-available industry practices and methodologies to the local level.

Three Project Phases

Phase III

- Mississippi River Basin Conference
  - Present successes, challenges and outcomes of project
  - Hear from industry and producer partners
  - Present model approach to be used in other watersheds to build industry-producer partnerships

Outcomes – short term

- Ag industry better understands hypoxic zone issues and relation to agriculture
- Ag industry identifies effective approaches and methodologies for helping producers improve nutrient management
- Ag producers know more about practices and methodologies available for improving nutrient management

Outcomes – medium term

- Ag industry leaders assist ag producers in development of effective nutrient management plans
- Ag producers develop nutrient management plans specific to their operations
- Model approach shared with Mississippi River Basin stakeholders

Outcomes – long term

- Reduced nutrient loads from agriculture to the lower Mississippi River
- Reduction in size of the hypoxic zone

Thank you

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USGS Monitoring Network and Estimation of Fluxes at Selected Sites in the Mississippi River Basin, 1980-2005

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Acknowledgements:

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Brent Aulenbach, Atlanta, GA

Richard Alexander, Reston, VA

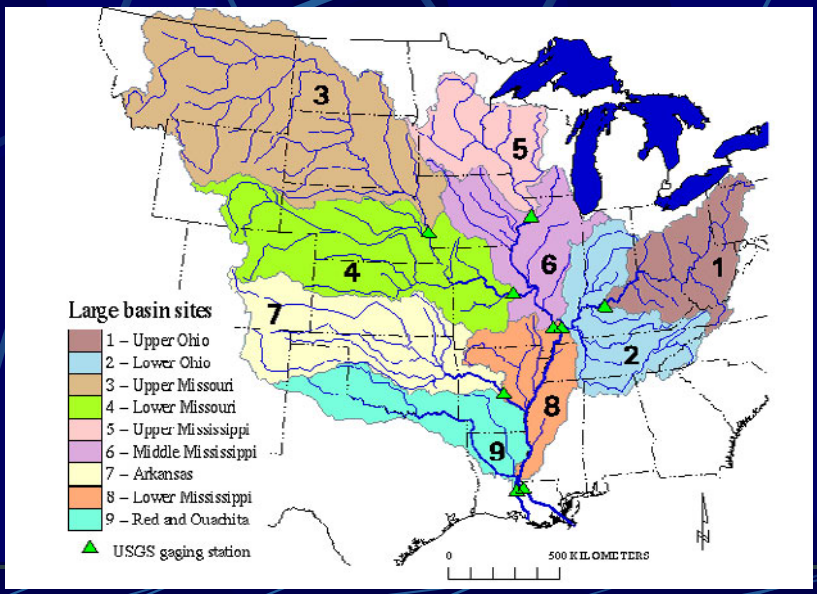
USGS

Research Question

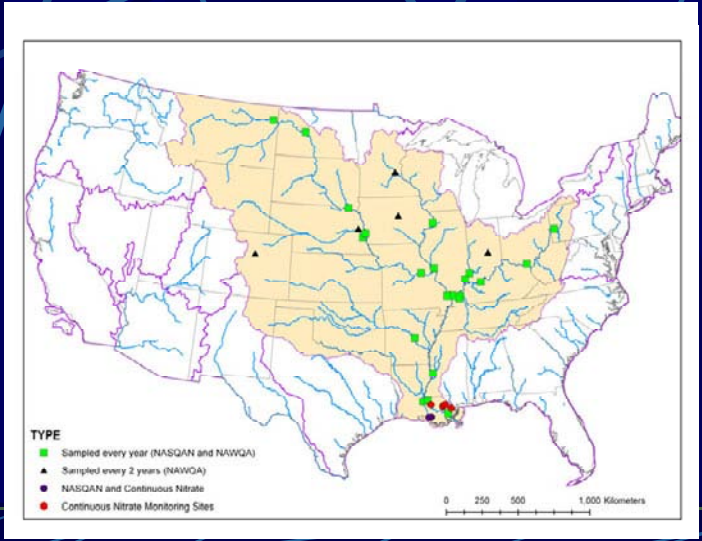
- Nutrient Task Force Action Plan Short-term Action 11

By 12/2005, and every five years thereafter, the Task Force will assess the nutrient load reductions achieved and response of the hypoxic zone, water quality throughout the Basin, and economic and social effects. Based on this assessment, the Task force will determine appropriate actions to continue to implement this strategy or, if necessary, revise the strategy.

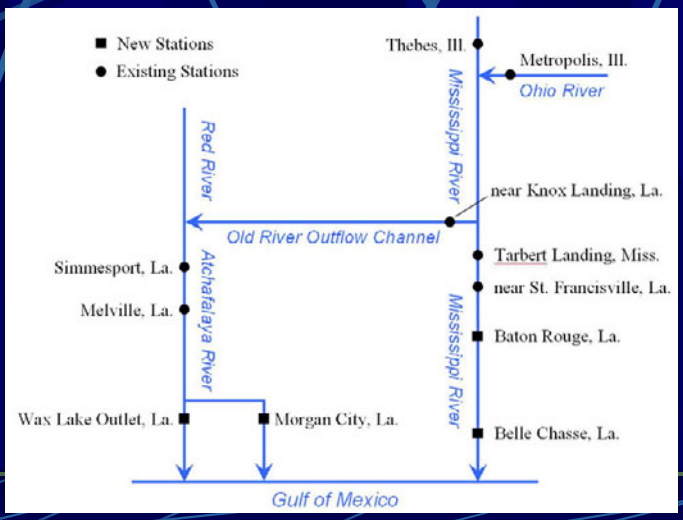
Mississippi River Subbasins



Current Mississippi Monitoring Network



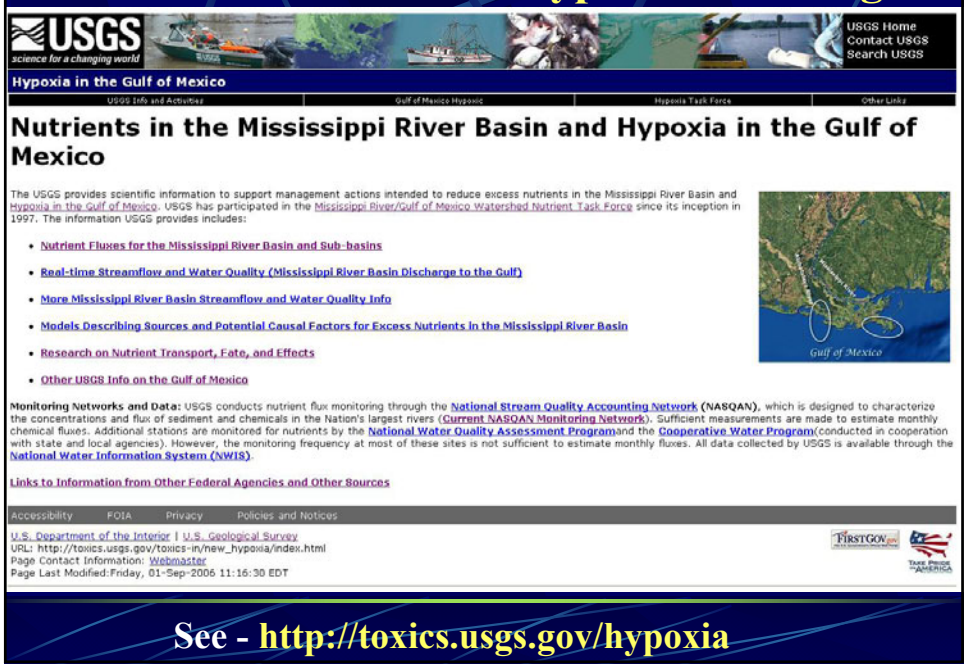
Network for Estimating Flux to the Gulf of Mexico



Monitoring Network Changes from 1996 to 2006

- Sampling changes- 52 sites (4-12 samples/yr) to 30 sites (10-18 samples/yr) = less spatial coverage, improved flux estimates
- 4 new sites in lower Miss = improve flux estimates to Gulf of Mexico
  - Lower Atchafalaya River at Morgan City*
  - Wax Lake Outlet at Calumet*
  - Mississippi River at Baton Rouge*
  - Mississippi River at Belle Chasse
- New continuous nitrate analyzers at 3 sites with asterisks = improve nitrate flux estimates
- Testing new continuous phosphate analyzer at Baton Rouge = improve phosphorus flux estimates
- Combining USGS data with State data suitable for flux estimation = improve spatial coverage of network

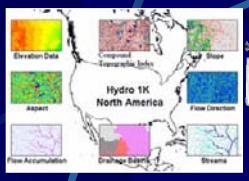
New USGS Nutrients-Hypoxia Web Page



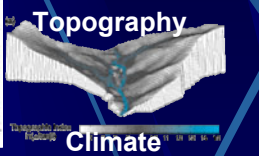
See - http://toxics.usgs.gov/hypoxia

Modeling Enhances Understanding Improvements to SPARROW

http://water.usgs.gov/nawqa/sparrow/

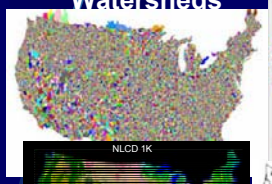


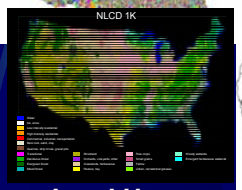
Watersheds



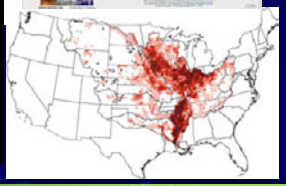
Topography

Climate





Land Use

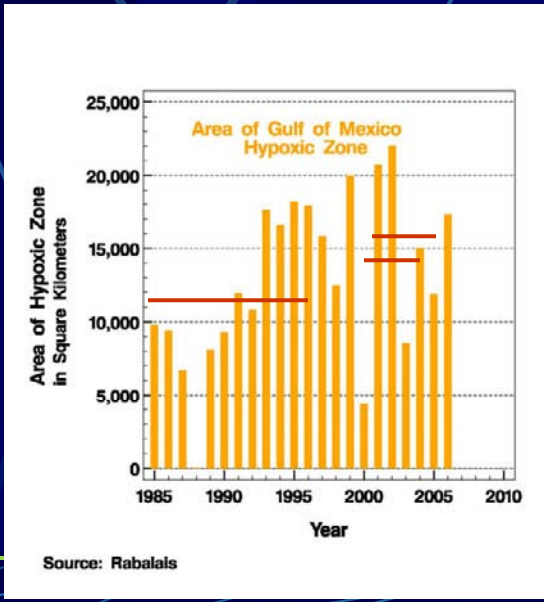


Artificial Drainage

- Model structure: specification, stream load estimation, documentation
- Data infrastructure: climate, 1-km DEM, cropping /drainage, 30-m NLCD land use
- Model accuracy improved 25 to 30%
- Support from EPA to develop specific regional models

Size of Hypoxic Zone

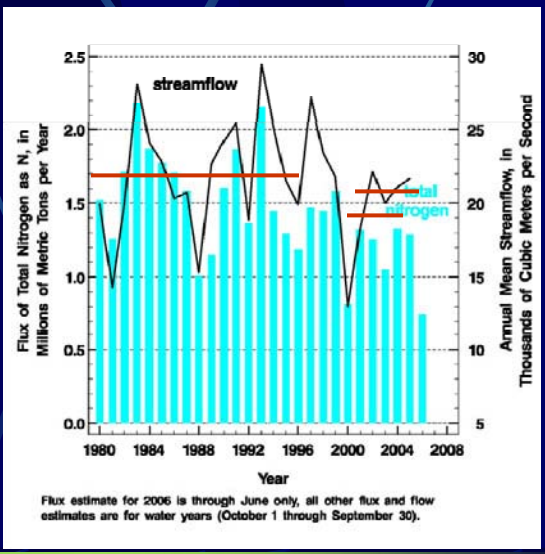
- 1985-1996 average
  - 11,360 Km^2
- 2001-2005 average
  - 15,630 Km^2
  - 37.6% increase
- 2000-2004 average
  - 14,140 Km^2
  - 24.5% increase



Flux to Gulf of Mexico: Streamflow

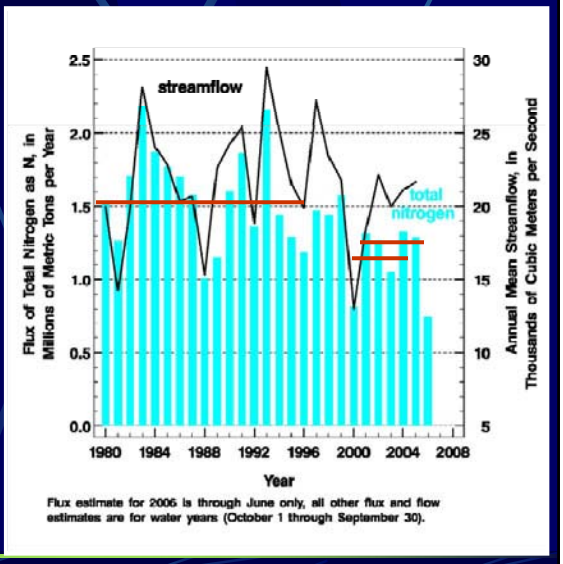
- 1980-96 Average
  - 21, 950 M^3/s
- 2001-2005 Average
  - 20,660 M^3/s
  - 5.8% decrease
- 2000-2004 Average
  - 18,930 M^3/s
  - 13.7% decrease
- Five 5-year windows
  - 9.5% decrease

Note 2006 is a partial year



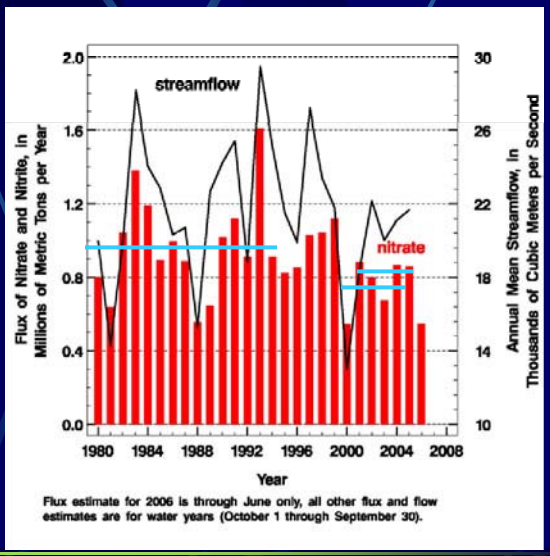
Flux to Gulf of Mexico: Total Nitrogen

- 1980-96 Average
  - 1.569 MMT
- 2001-2005 Average
  - 1.247 MMT
  - 20.5% decrease
- 2000-2004 Average
  - 1.153 MMT
  - 26.5% decrease
- Five 5-year windows
  - 18.8% decrease



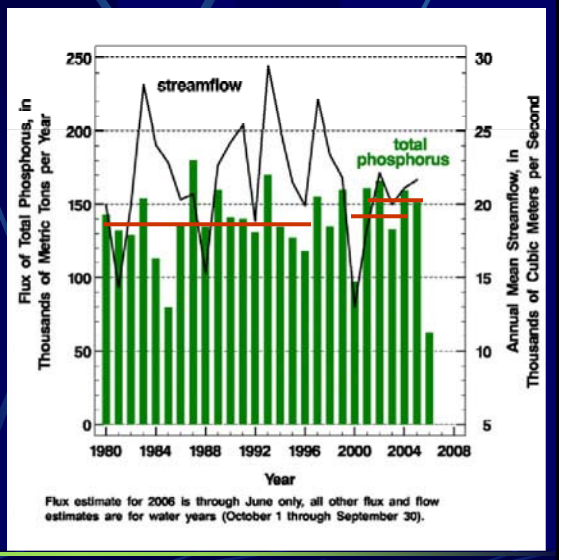
Flux to Gulf of Mexico: Nitrate

- 1980-96 Average
  - 956,900 MMT
- 2001-2005 Average
  - 816,600 MMT
  - 13.3% decrease
- 2000-2004 Average
  - 753,600 MMT
  - 20.8% decrease
- Five 5-year windows
  - 12.4% decrease



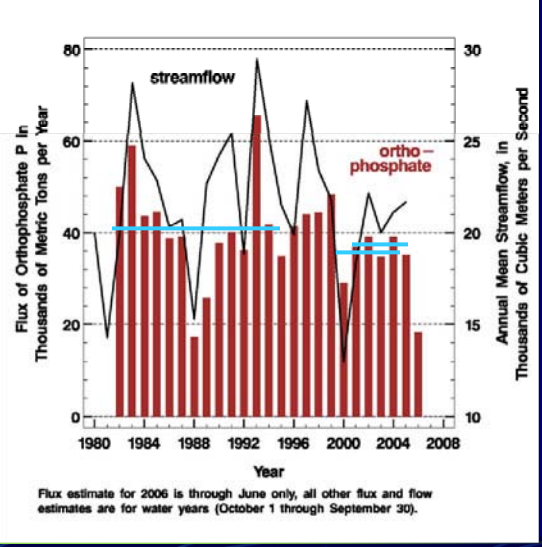
Flux to Gulf of Mexico: Total Phosphorus

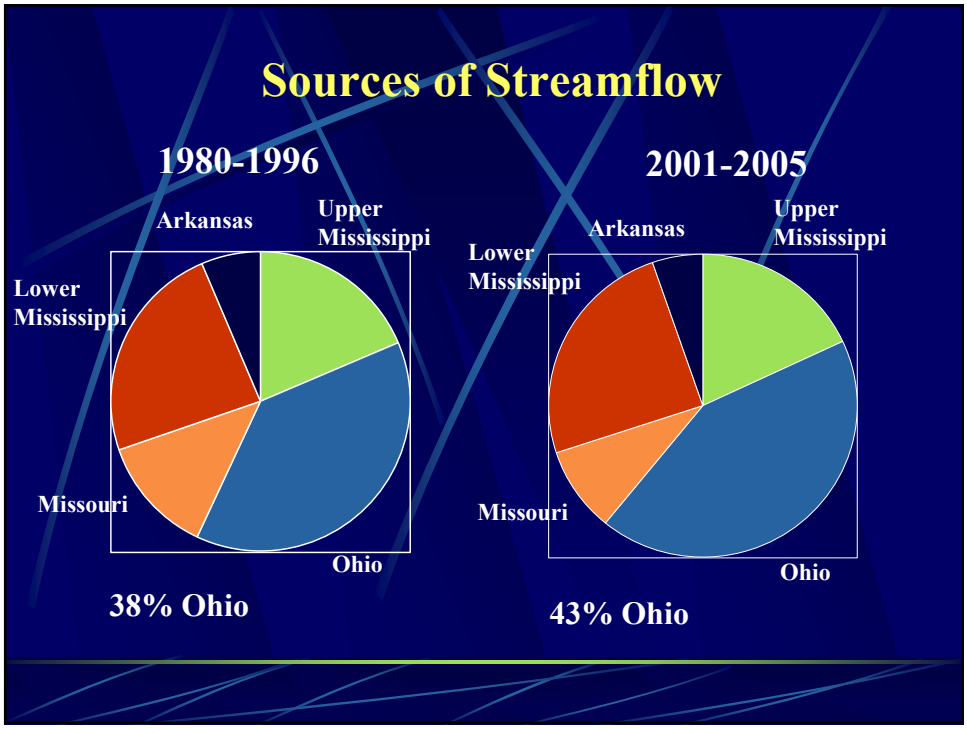
- 1980-96 Average
  - 136,700 MT x 1000
- 2001-2005 Average
  - 154,200 MT x 1000
  - 12.8% increase
- 2000-2004 Average
  - 143,100 MT x 1000
  - 4.7% increase
- Five 5-year windows
  - 6.2% increase

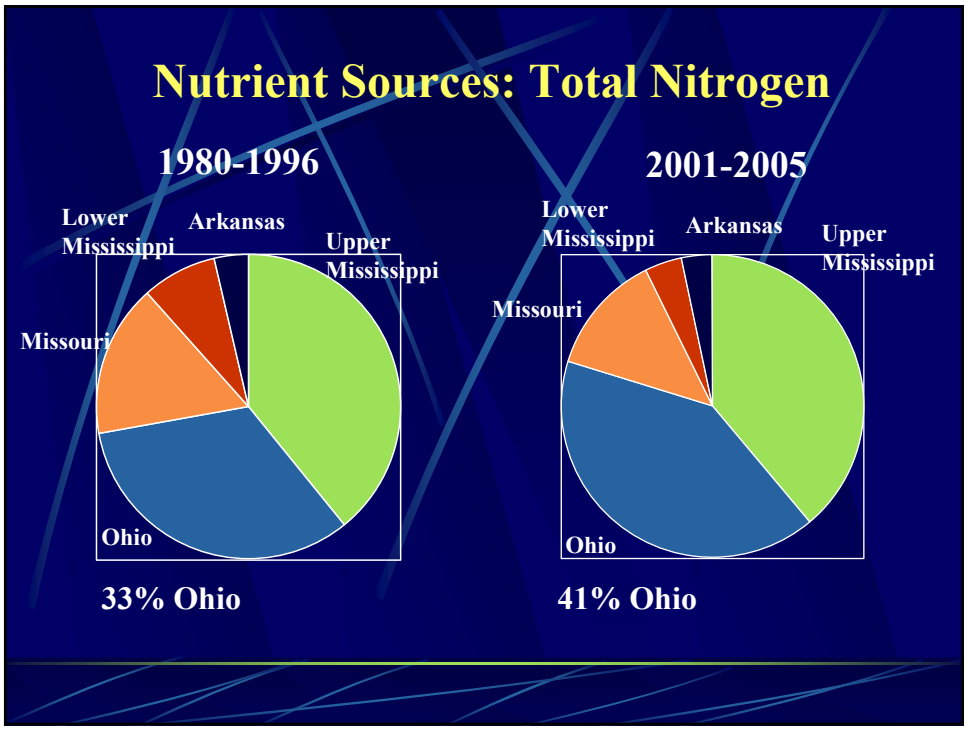


Flux to Gulf of Mexico: Orthophosphate

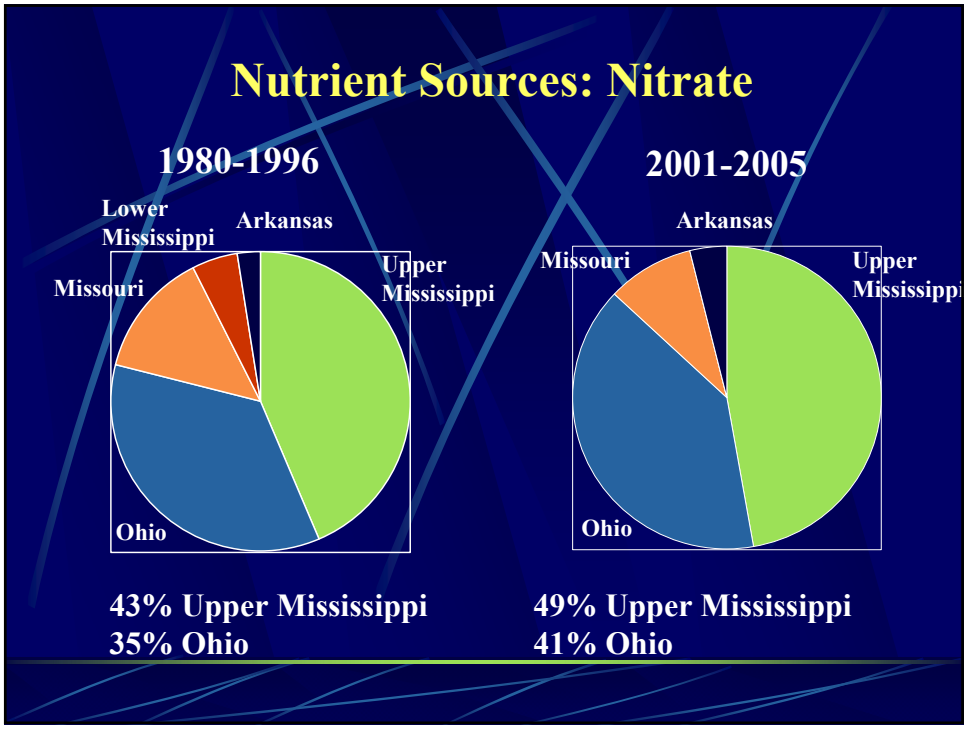
- 1980-96 Average
  - 41,030 MT x 1000
- 2001-2005 Average
  - 37,000 MT x 1000
  - 9.8% decrease
- 2000-2004 Average
  - 35,780 MT x 1000
  - 12.8% decrease
- Five 5-year windows
  - 7.1% decrease




Sources of Streamflow
1980-1996
Arkansas
Upper Mississippi
Lower Mississippi
Missouri
Ohio
38% Ohio
2001-2005
Arkansas
Upper Mississippi
Lower Mississippi
Missouri
Ohio
43% Ohio


Nutrient Sources: Total Nitrogen
1980-1996
Lower Mississippi
Arkansas
Upper Mississippi
Missouri
Ohio
33% Ohio
2001-2005
Lower Mississippi
Arkansas
Upper Mississippi
Missouri
Ohio
41% Ohio

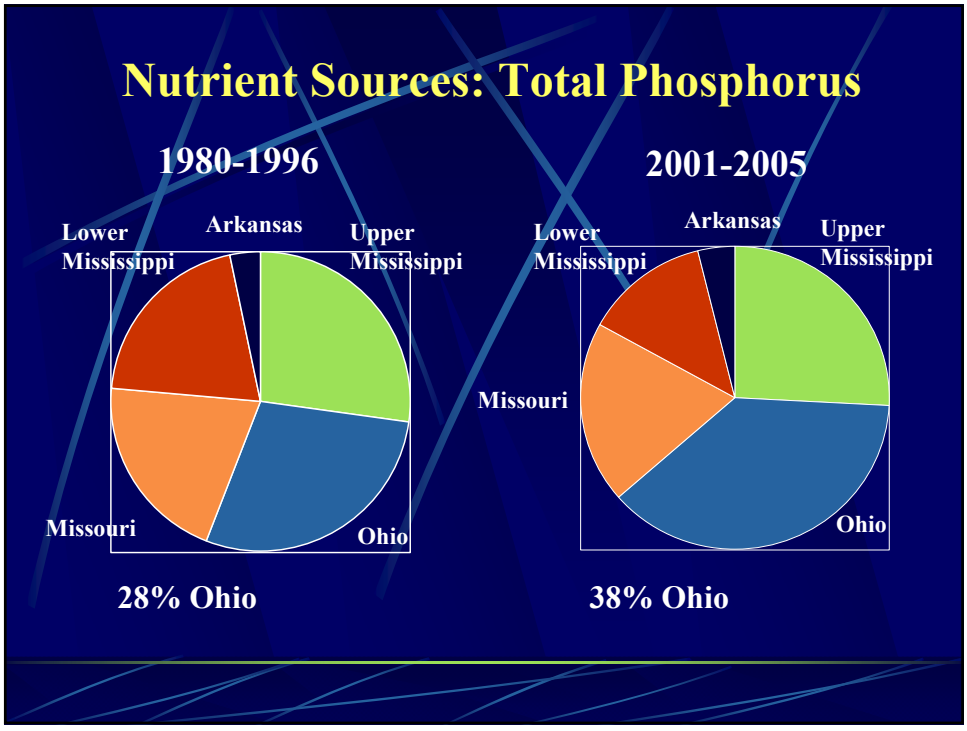
Nutrient Sources: Nitrate



43% Upper Mississippi
35% Ohio

49% Upper Mississippi
41% Ohio

Nutrient Sources: Total Phosphorus



28% Ohio

38% Ohio

Summary and Conclusions

- USGS WQ monitoring has decreased since 90s, but intent is to maximize information in the Miss basin
- USGS improving flux estimation to GOM (sites, frequency), through monitoring and SPARROW improvements
- Streamflow and season are critical influences on GOM hypoxia
- Natural variations in streamflow and flux are large and can mask changes that result from management controls unless large changes are maintained over many years

WQ Monitoring, Miss River Basin

Station ID	Station Name	Sampling Schedule
03086000	Ohio River at Sewickley, PA	annual
03216600	Ohio River at Greenup Dam near Greenup, KY	annual
03303280	Ohio River at Cannelton Dam at Cannelton,	annual
03374100	White River at Hazleton, IN	annual
03378500	Wabash River at New Harmony IN	annual
03438500	Cumberland River at Smithland, Kentucky	annual
03609750	Tennessee River at Highway 60 near Paducah	annual
03612500	Ohio River at Dam 53 near Grand Chain IL	annual
05288705	Shingle Creek at Minneapolis, MN	every 2 yrs
394340085524601	Sugar Creek at New Palestine, IN	every 2 yrs
05420500	Mississippi River at Clinton IA	annual
05451210	South Fork Iowa River near New Providence,	every 2 yrs
05587455	Mississippi River below Grafton, IL	annual
06185500	Missouri River near Culbertson MT	annual
06338490	Missouri River at Garrison Dam ND	annual
06467500	Missouri River at Yankton, SD	annual
06610000	Missouri River at Omaha NE	annual

WQ Monitoring, Miss River Basin (continued)

Station ID	Station Name	Sampling Schedule
06713500	Cherry Creek at Denver, CO	every 2 yrs
06800000	Maple Creek near Nickerson, NE	every 2 yrs
06805500	Platte River at Louisville, NE	annual
06934500	Missouri River at Hermann MO	annual
07022000	Mississippi River at Thebes IL	annual
07263620	Arkansas River at David D. Terry Lock & Da	annual
07288955	Yazoo River near Long Lake, MS	annual
07373420	Mississippi River near St. Francisville LA	annual
07374000	Mississippi River at Baton Rouge, LA	annual and continuous nitrate
07374525	Mississippi River at Belle Chasse, LA	annual
07381495	Atchafalaya River at Melville LA	annual
07381590	Wax Lake Outlet at Calumet, LA	annual and continuous nitrate
07381600	Lower Atchafalaya River at Morgan City, LA	annual and continuous nitrate

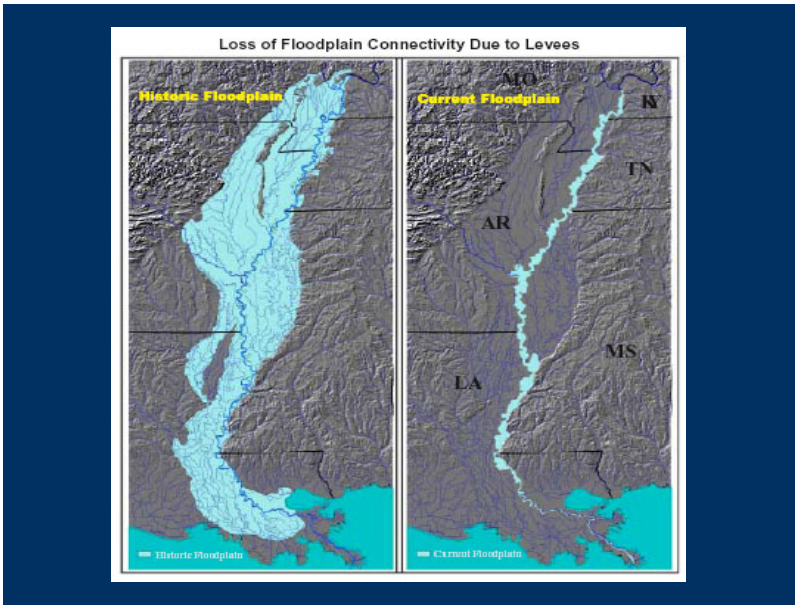
Restoring a Functional Distributary System for the Lower Mississippi/Atchafalaya Rivers: Challenges and Implications for Coastal Restoration and Gulf Hypoxia

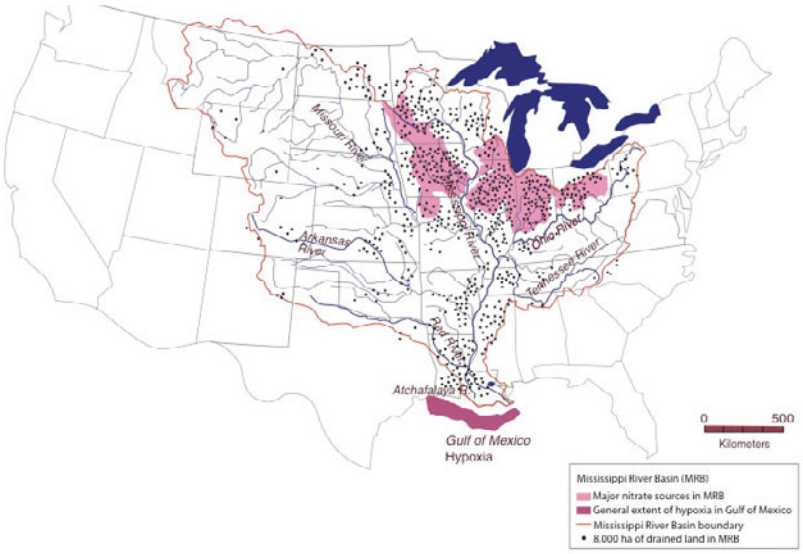
13th Meeting Gulf Hypoxia Task Force
Arlington, VA
Jan. 11, 2007
Len Bahr, Ph.D.

Coastal calamities resulting from hydrologic alterations to the river system and its delta

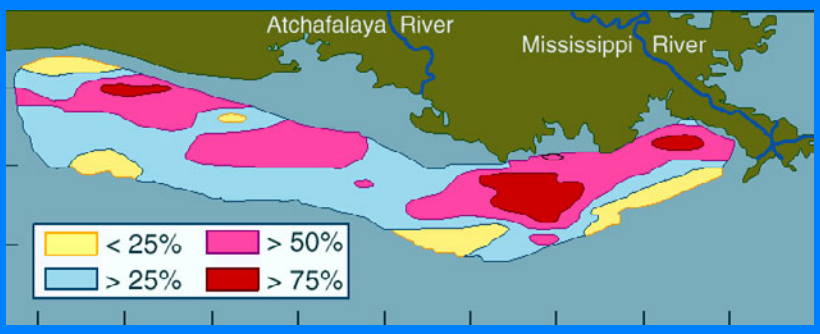
- Land loss – shorthand for landscape inundation (primarily the conversion of 1,900 square miles of wetlands to open water)
- Increasing risk of hurricane flooding to urban centers – risk became reality in 2005
- Gulf hypoxia resulting from excess nitrate loading to shelf - primarily runoff from corn belt in upper Miss. watershed


Mississippi River Drainage Basin
Basin Facts
Drains 41% of continental U.S.
Includes 31 states & 2 Canadian provinces
Total area drained 3.2 million square Km
Mean discharge nearly 20,000 m³/sec


Loss of Floodplain Connectivity Due to Levees
Historic Floodplain
Current Floodplain
MO
KY
TN
AR
MS
LA
Historic Floodplain
Current Floodplain



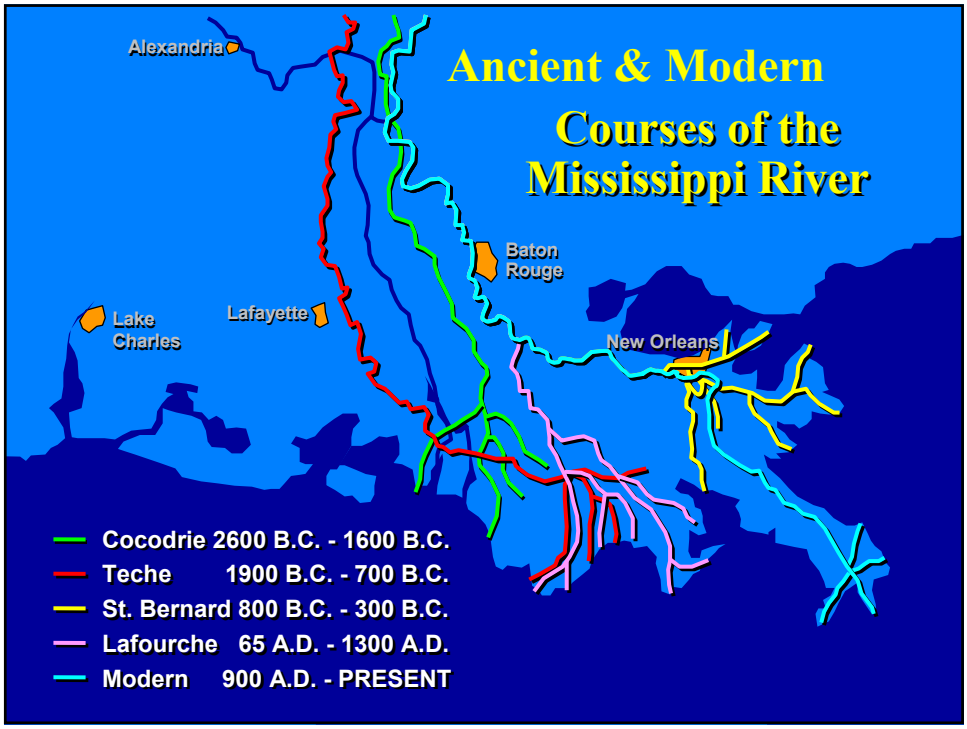
Extent of Hypoxia in the Gulf



Frequency of Occurrence 1985 - 1999

Rabalais, et al.

Miss. R. Deltaic Plain



Seven Millennia of Change

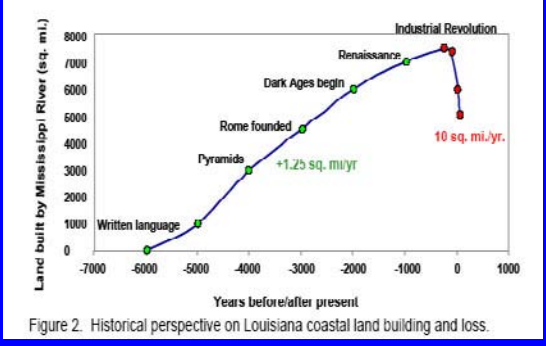


Figure 2. Historical perspective on Louisiana coastal land building and loss.

Past and Projected Wetland Loss in the Mississippi Delta (1839 to 2020)

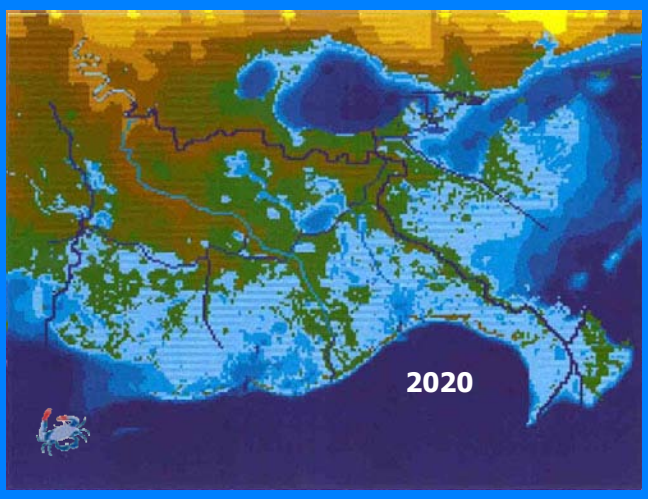
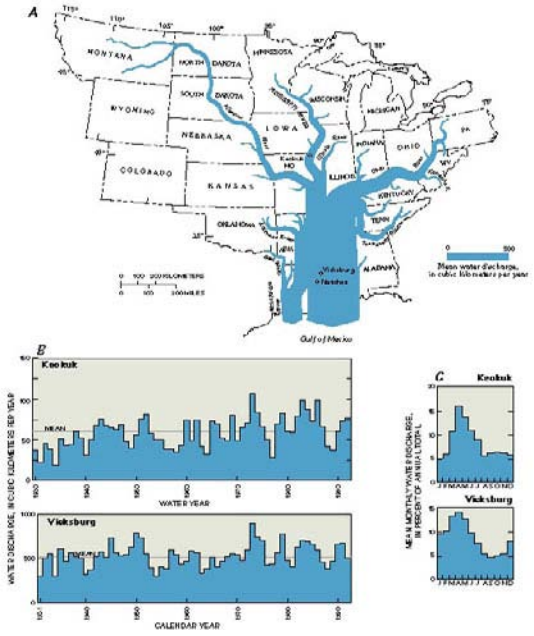
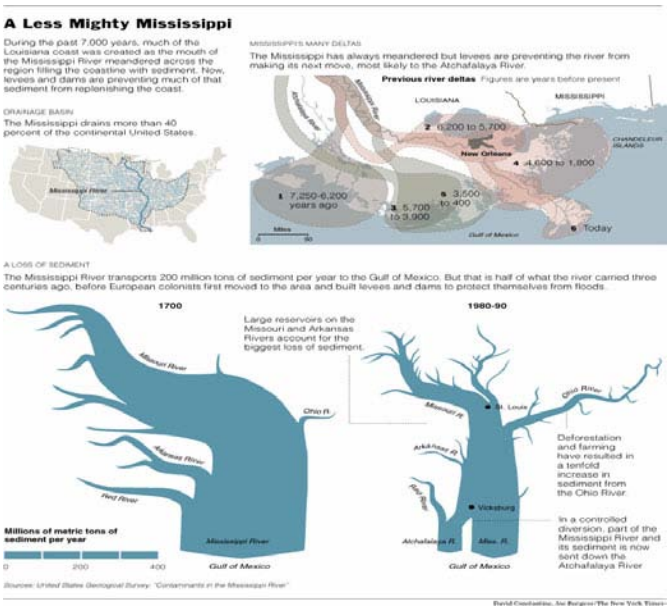


Figure 5--*Water Discharge*





Water control infrastructure

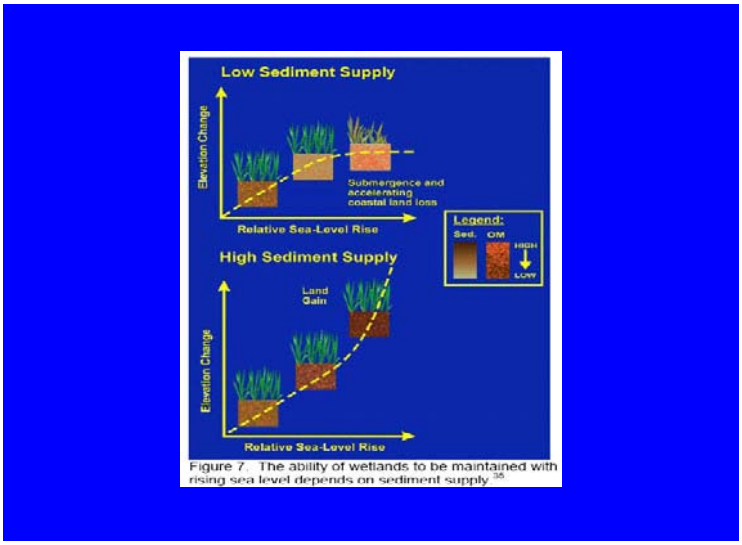
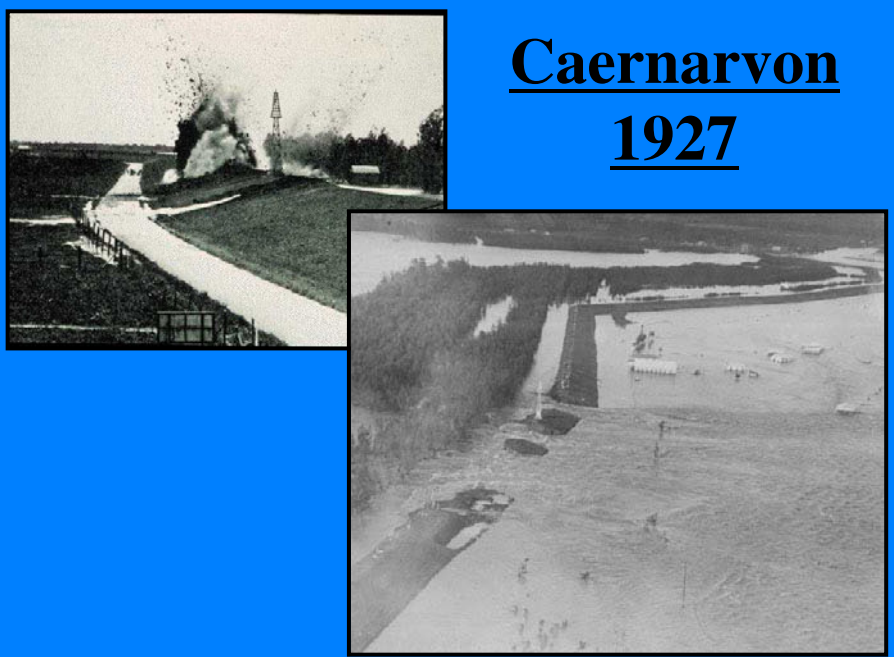
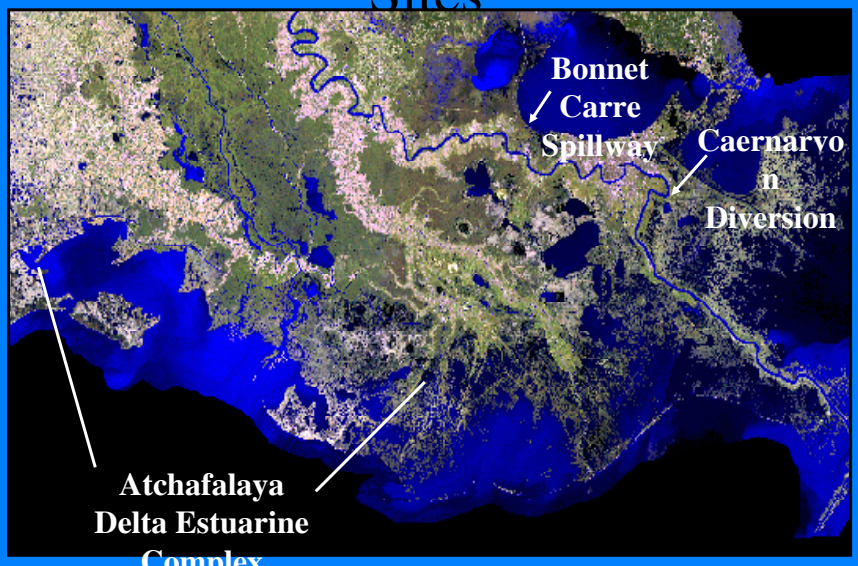


Figure 7. The ability of wetlands to be maintained with rising sea level depends on sediment supply.[35]

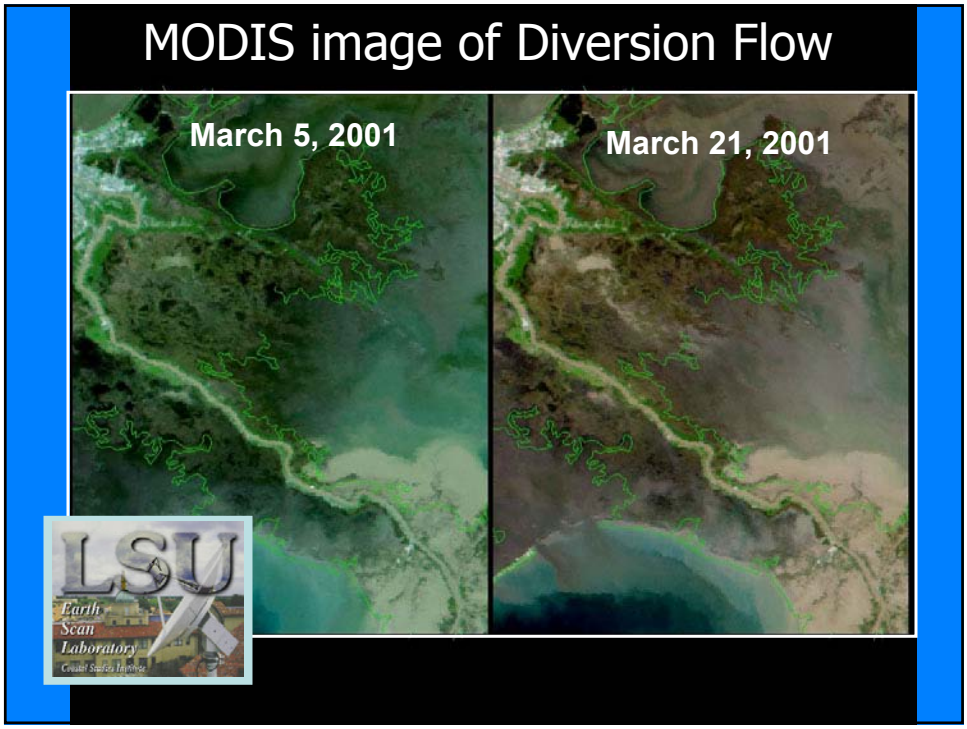

LSU
Earth Scan Laboratory
30N
29N
28N
Atchafalaya River Outflow
Mississippi River Outflow
GULF OF MEXICO
92W
91W
90W
89W

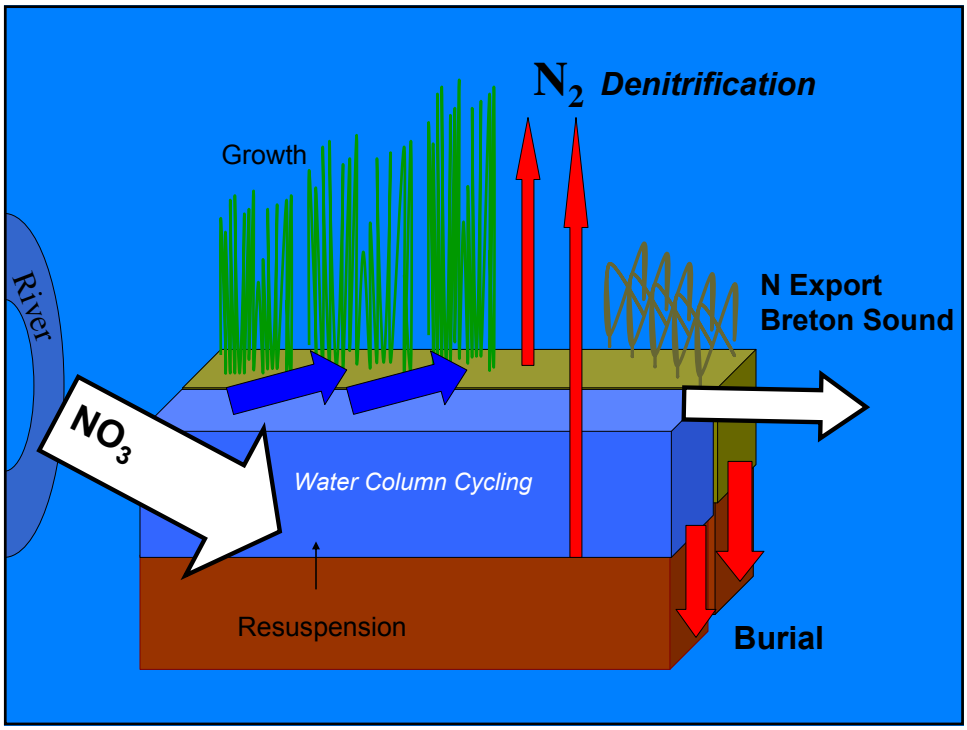

Caernarvon
1927

Freshwater Introduction Study Sites

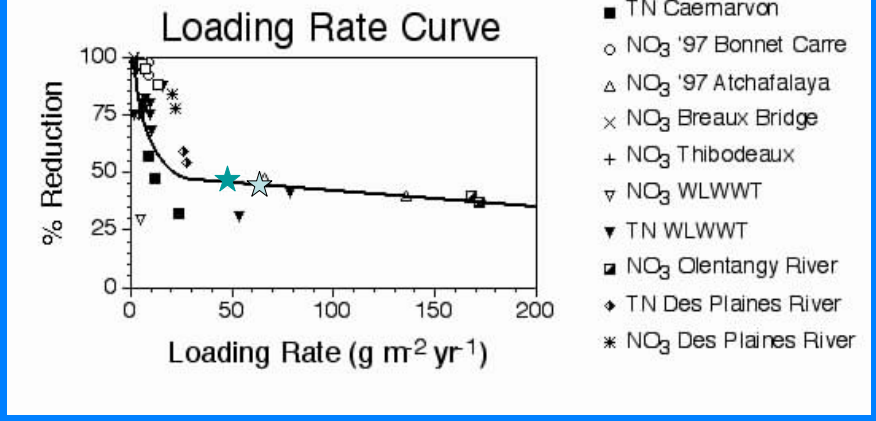


Caernarvon Freshwater Diversion


MODIS image of Diversion Flow
March 5, 2001
March 21, 2001
LSU
Earth Scan Laboratory

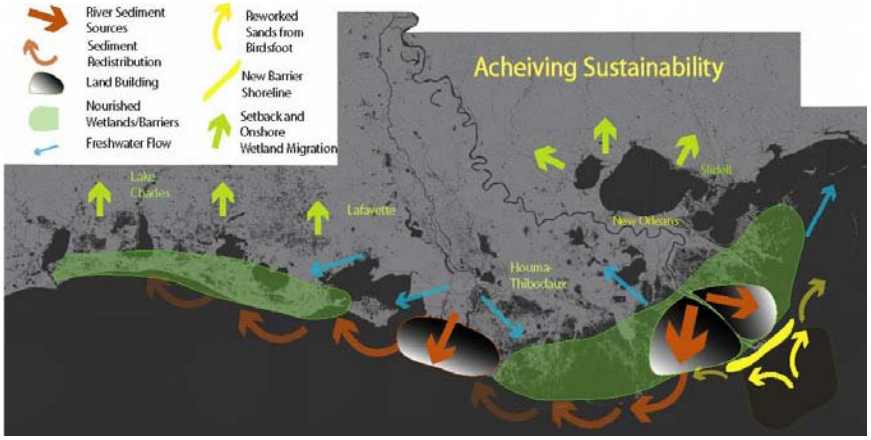

N_2 Denitrification
Growth
River
NO_3
Water Column Cycling
N Export
Breton Sound
Resuspension
Burial

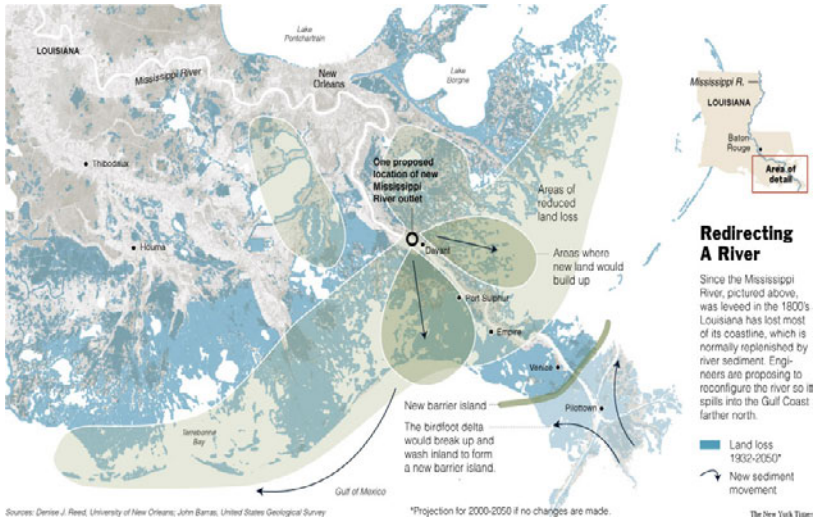
TN NO_3



the quick way to restore marshes

Massive “replumbing” – turning the river loose!





Impediments to restoration (in addition to $15+ billion to fund the effort).

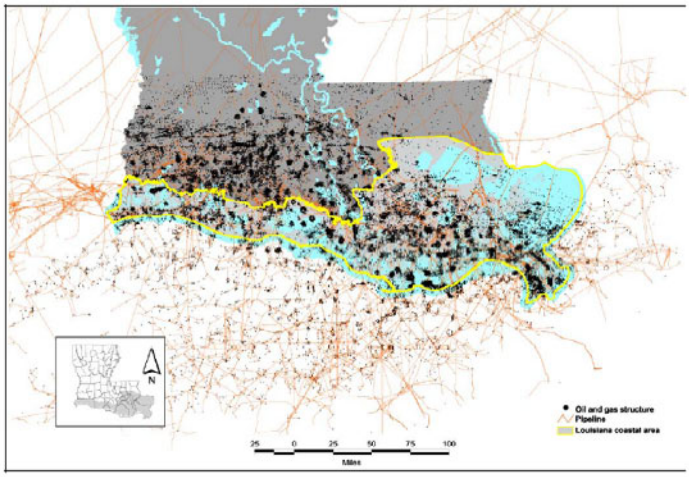
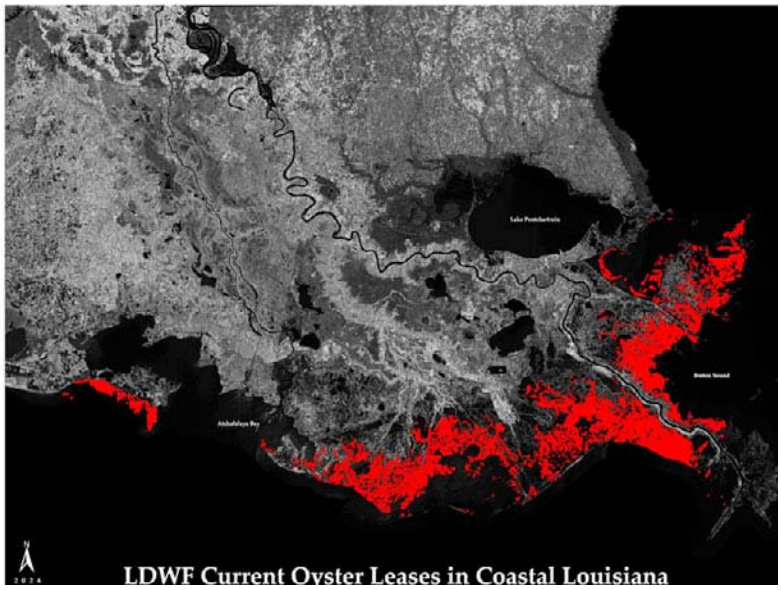


Figure MR-27. Oil and Gas Structures and Pipelines within the LCA.



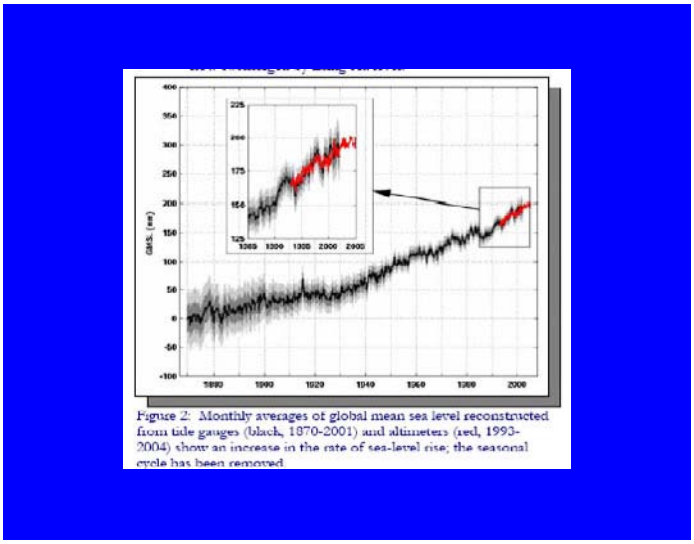
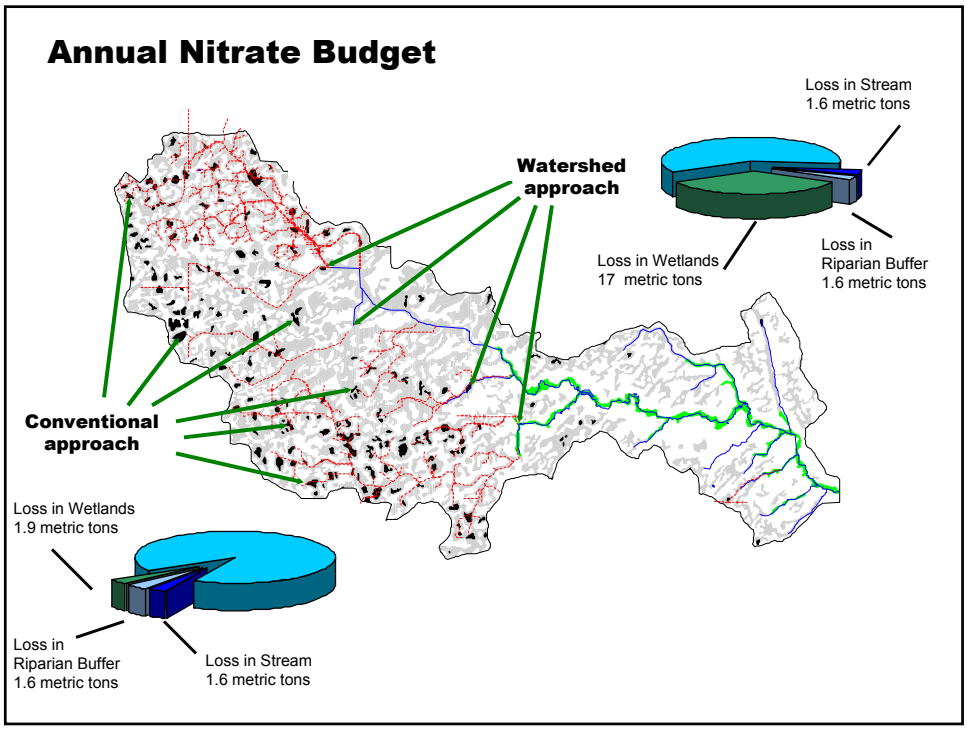


Figure 2: Monthly averages of global mean sea level reconstructed from tide gauges (black, 1870-2001) and altimeters (red, 1993-2004) show an increase in the rate of sea-level rise; the seasonal cycle has been removed.

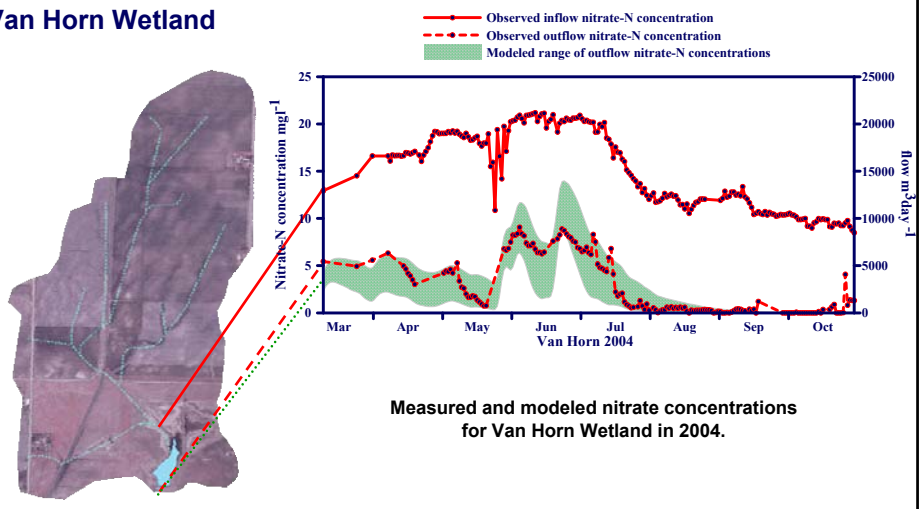
Strong objections from the environmental community to diverting large volumes of Mississippi River water because of excess nutrients. In other words, we need help from our upstream partners to reduce Nitrate runoff.


Iowa Hypoxia Reduction Initiative
Iowa Conservation Reserve Enhancement Program (CREP)
Iowa Dept of Agriculture & Land Stewardship
USDA Farm Service Agency


Annual Nitrate Budget
Loss in Stream
1.6 metric tons
Watershed approach
Loss in Wetlands
17 metric tons
Loss in
Riparian Buffer
1.6 metric tons
Conventional approach
Loss in Wetlands
1.9 metric tons
Loss in
Riparian Buffer
1.6 metric tons
Loss in Stream
1.6 metric tons

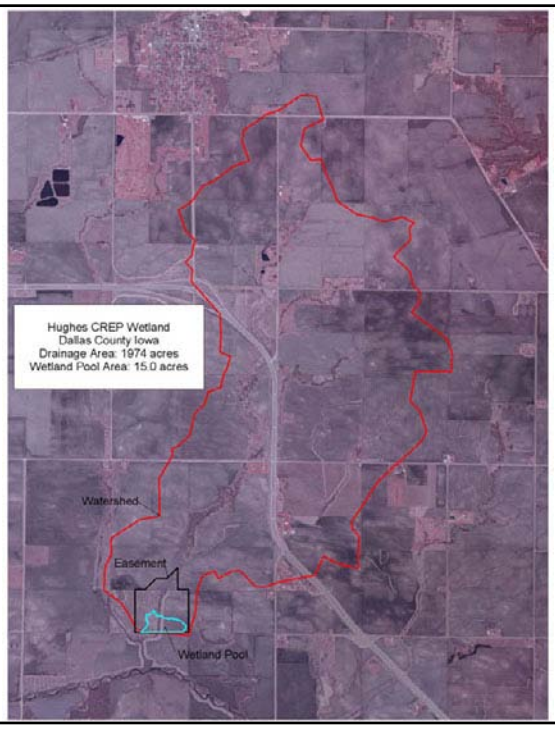
Model validation and hindcasting of wetland performance

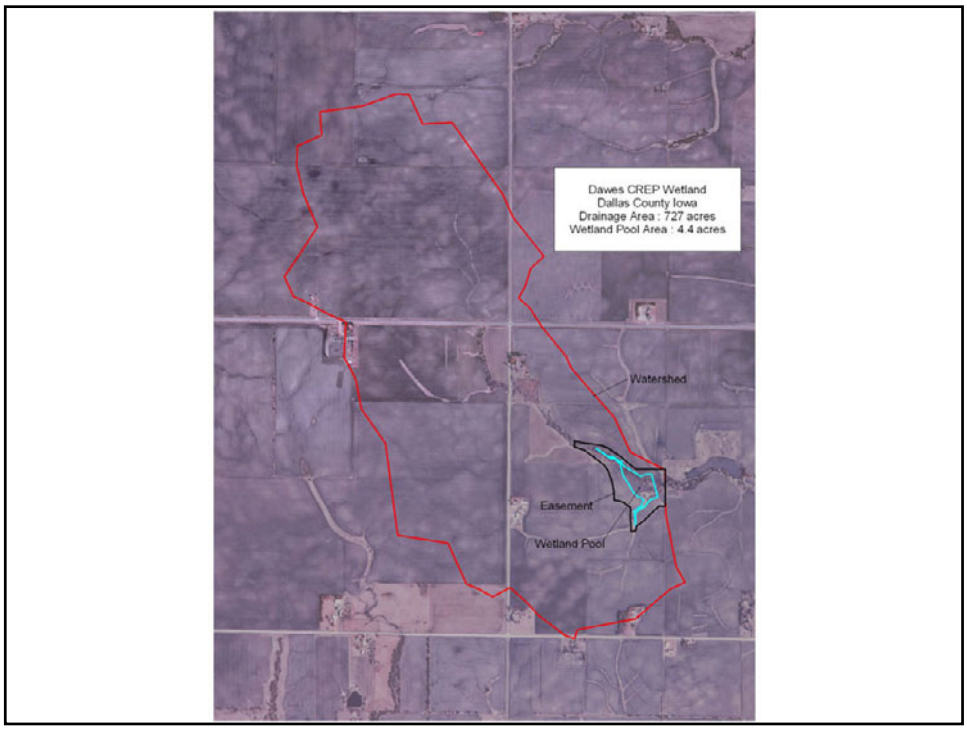
Van Horn Wetland



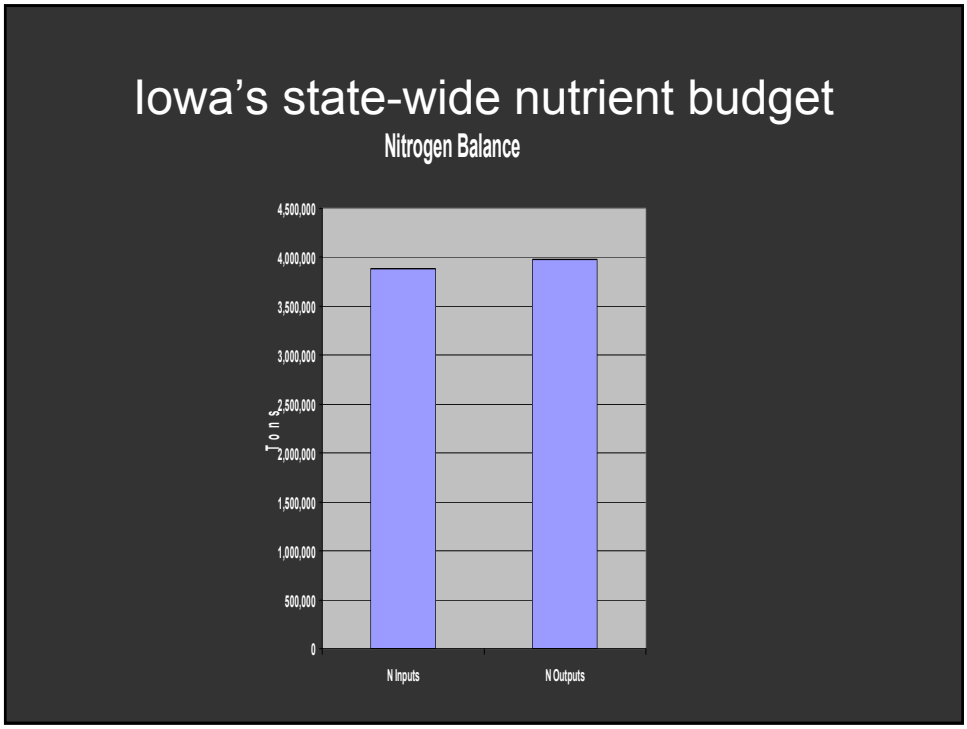
Measured and modeled nitrate concentrations for Van Horn Wetland in 2004.

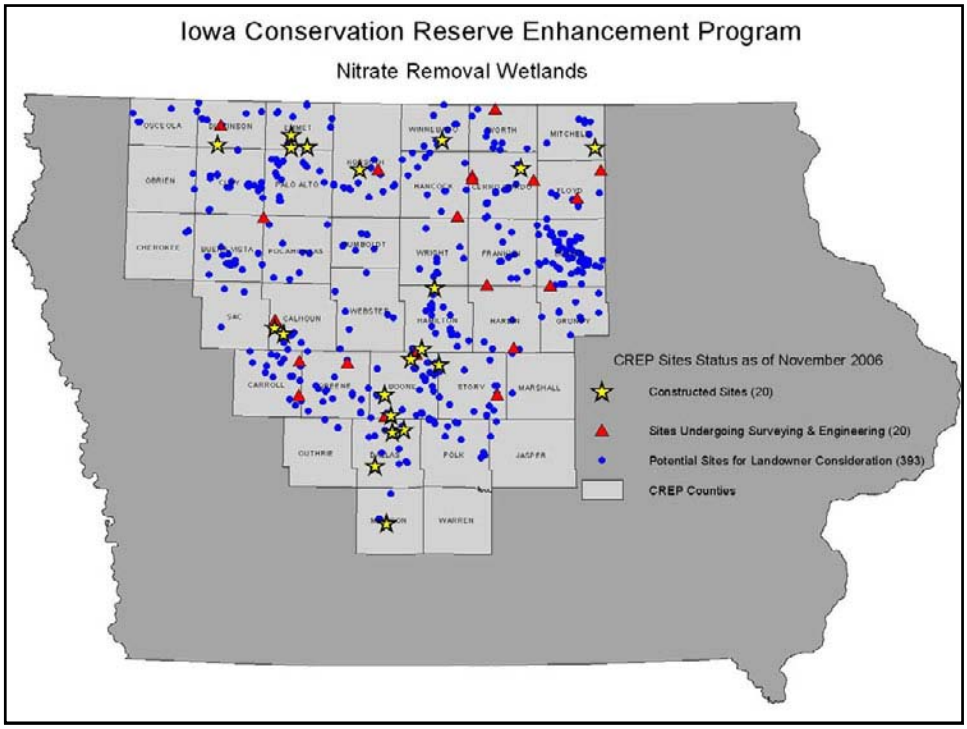
W.G. Crumpton, Iowa State University




Dawes CREP Wetland
Dallas County Iowa
Drainage Area : 727 acres
Wetland Pool Area : 4.4 acres
Watershed
Easement
Wetland Pool

Iowa's state-wide nutrient budget





SUCCESSES

Summary of 20 Constructed Sites

(totals for 20 sites)

• Wetland pool	191 ac
• Watershed area treated	27,813 ac
• N removal (lifetime)	14,323 tons
• Avg cost/watershed acre	$240.15/ac
• Avg cost/yr/watershed acre	$1.60/ac/yr
• Avg cost/lb N removed	$0.22/lb

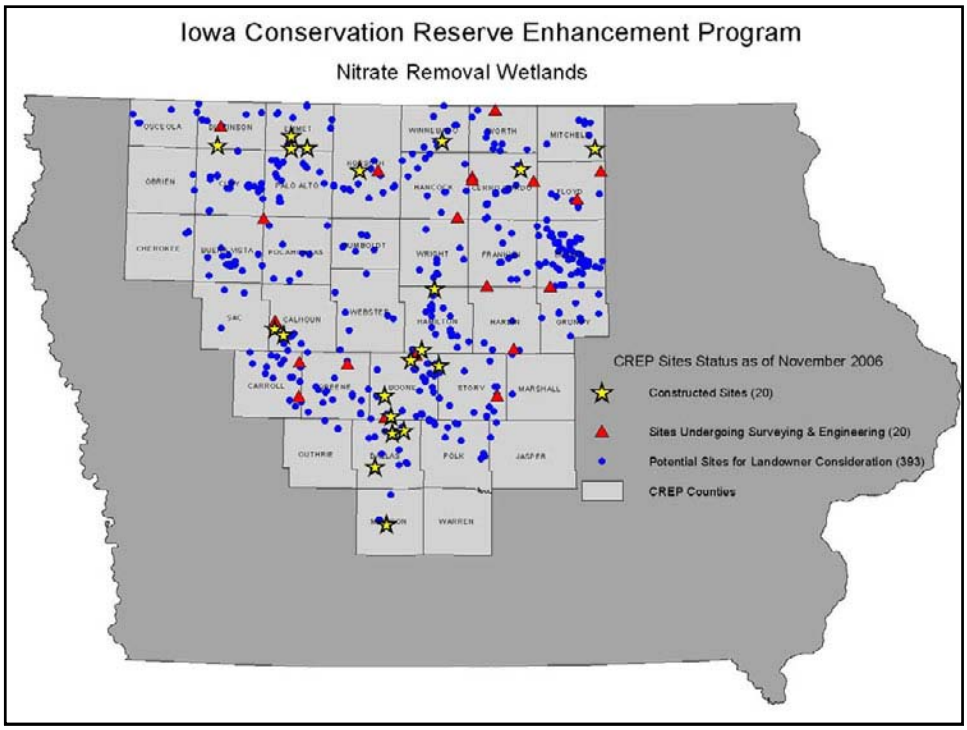
CHALLENGES

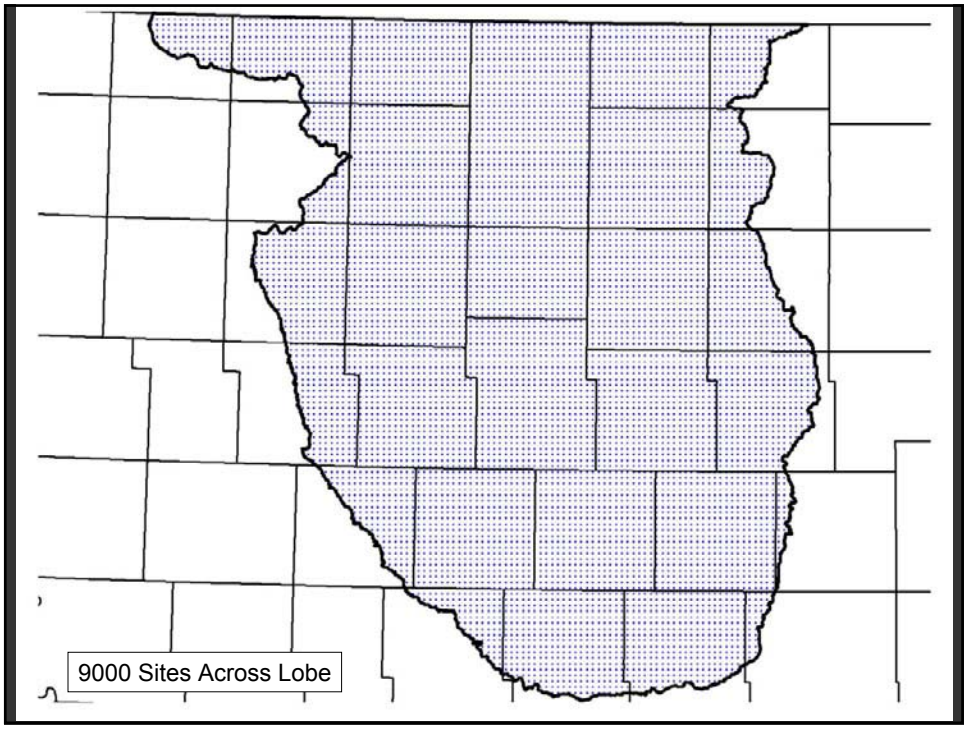
- Initial 6 wetlands constructed under Corps of Engineers Nationwide Permit #27 – NRCS determination with CWA404 regulatory concurrence
- Regulatory reversal requiring individual Clean Water Action Section 404 permits – June 2004
- Program stopped and negotiation/agreements to resolve permitting issues – 2 years
- Resolution – both USDA NEPA and CWA404 site assurances

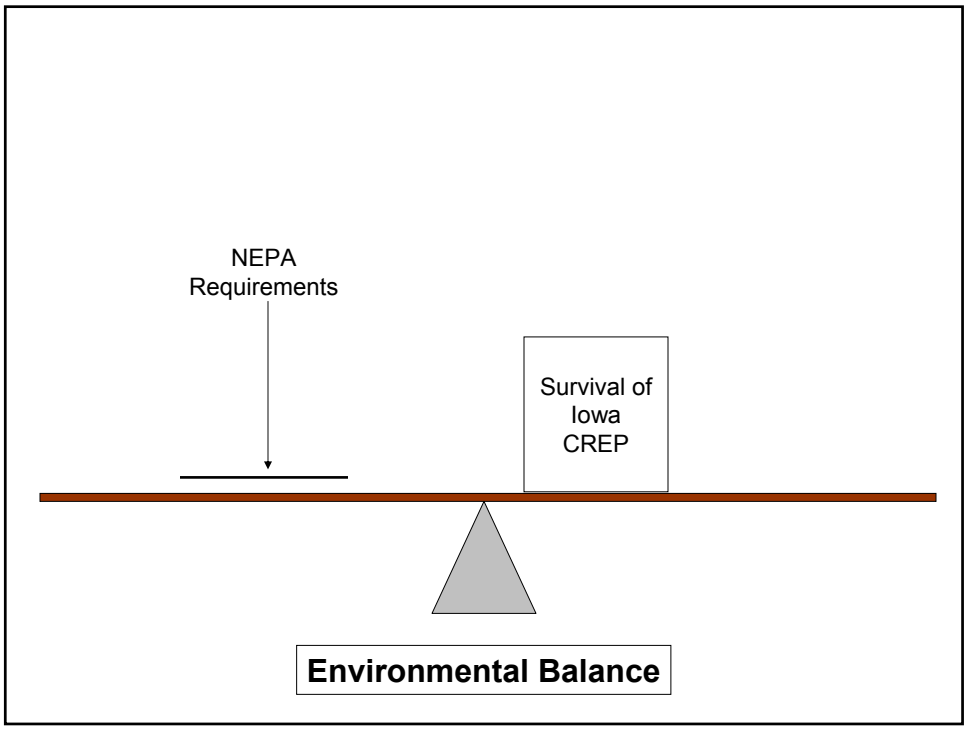
Needed "Scaling" of Practice Adoption to Achieve N Reductions to Gulf

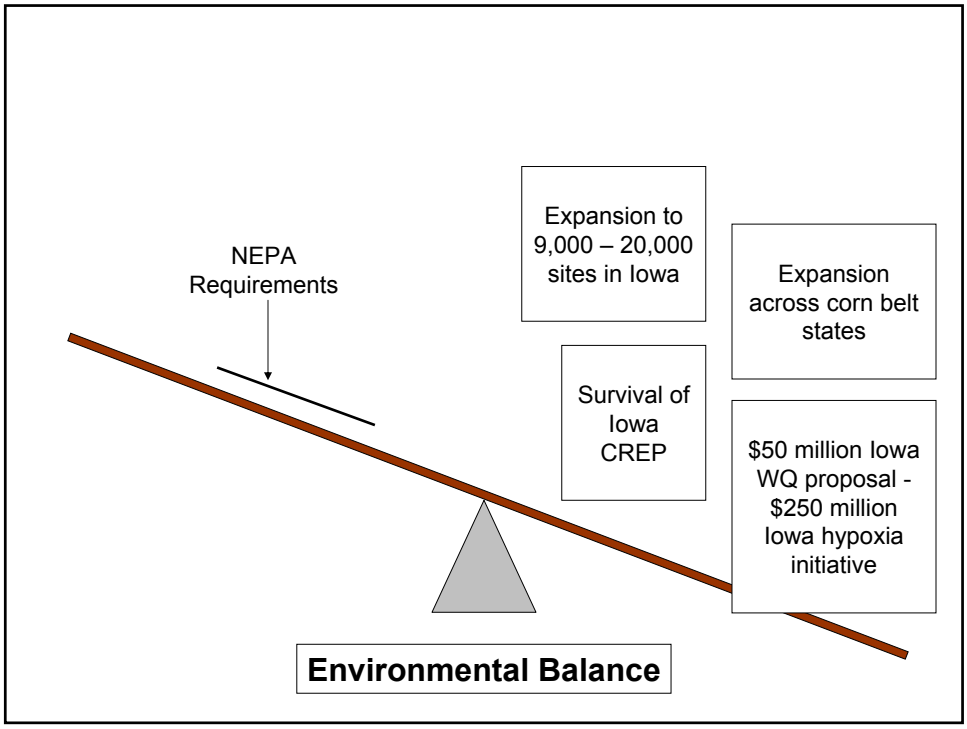
- Current Iowa CREP – 25 sites/year will reduce Iowa NO_3 export by 0.2%/year, 1% every 5 years
- Adoption level to achieve 40-50% reduction of statewide NO_3 transport to water resources

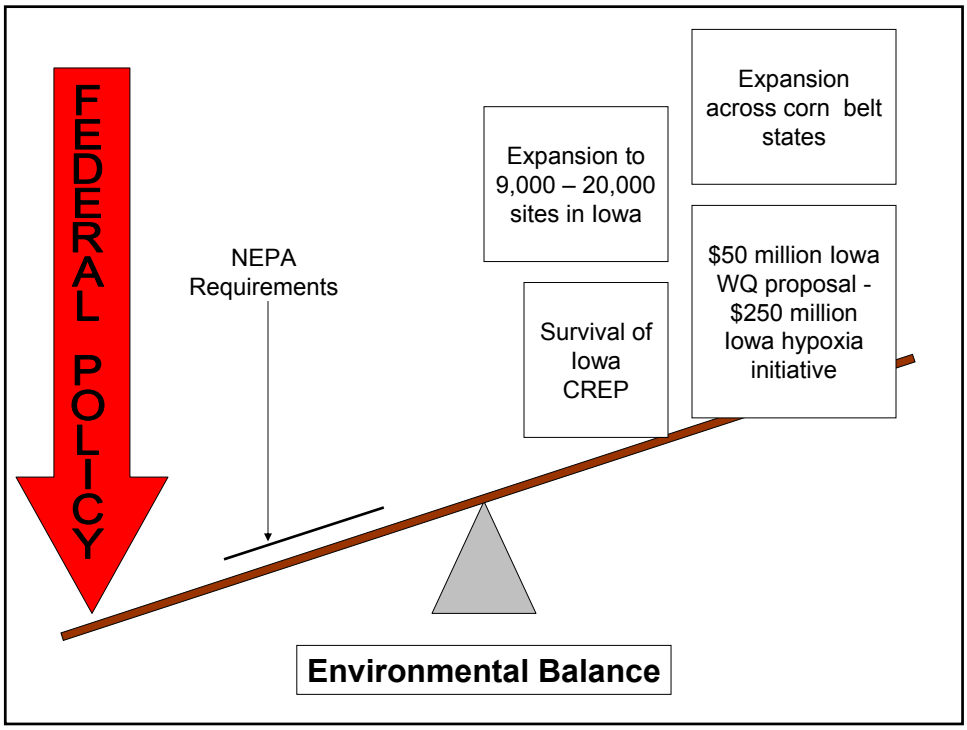
  9,000 – 20,000 sites in Iowa
- Expansion of off-field N sink technology to other corn belt states to meet Gulf hypoxia NO_3 reduction goal




9000 Sites Across Lobe


NEPA
Requirements
Survival of
Iowa
CREP
Environmental Balance


NEPA
Requirements
Expansion to
9,000 – 20,000
sites in Iowa
Expansion
across corn belt
states
Survival of
Iowa
CREP
$50 million Iowa
WQ proposal -
$250 million
Iowa hypoxia
initiative
Environmental Balance


FEDERAL POLICY
NEPA
Requirements
Expansion to
9,000 – 20,000
sites in Iowa
Expansion
across corn belt
states
Survival of
Iowa
CREP
$50 million Iowa
WQ proposal -
$250 million
Iowa hypoxia
initiative
Environmental Balance

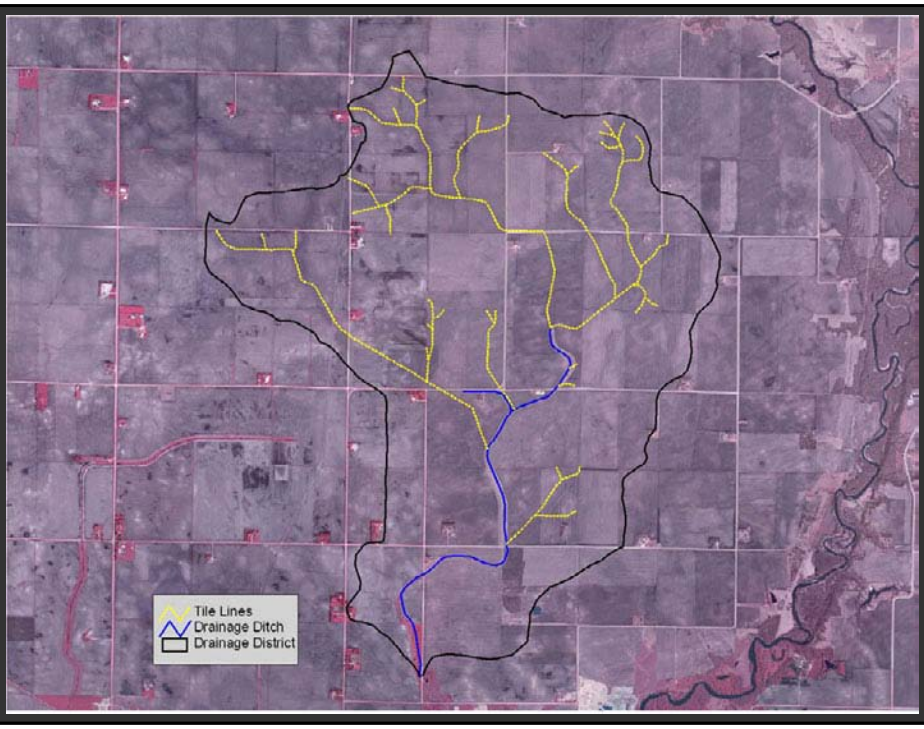
Future Vision

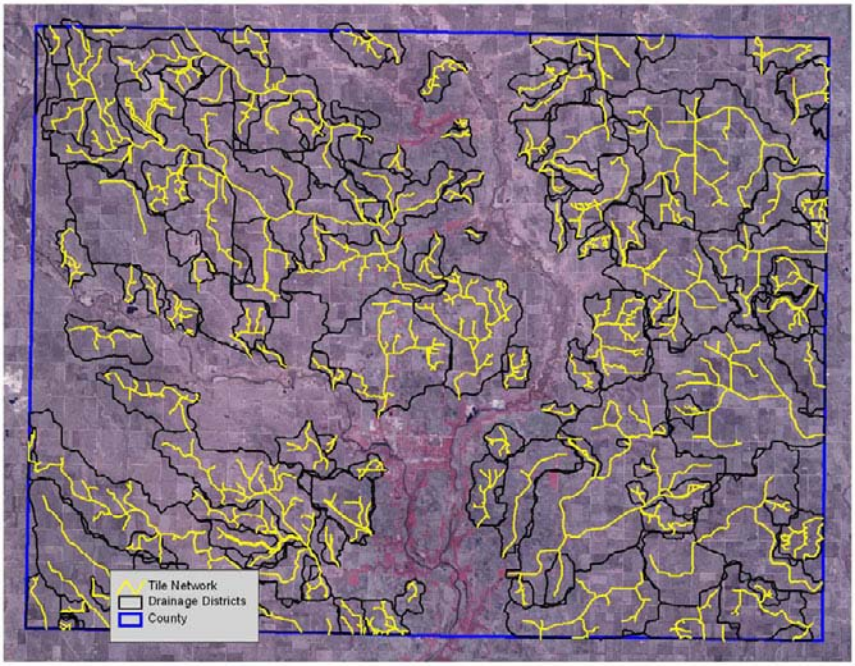
New Technology

- **"Fractional Flow" Wetlands**
- **Funding - EPA Targeted Watershed Grant**

Implement Through Existing Local Watershed Management Units

- **Drainage Districts**





Development of N Wetland Sinks Through Existing Drainage Districts

- 3000 drainage districts in Iowa manage common-outlet drains for 6 million acres
- Governing boards of trustees (typically county board of supervisors)
- Extensive statutory & case law base
- Taxing powers
- Power of eminent domain
- Construct and maintain drains

Development of N Wetland Sinks Through Existing Drainage Districts

- **Integrate N sink wetland restoration during near-future replacement of DD main tiles & outlets at end of service life**
- **"Pilot implementation" through CREP cost-share funds to drainage districts for wetland restoration**
- **DRIVER – Revise federal wetland regulation "sequential assessment" 404(b)1 guidelines to allow "mitigation" with N sink wetlands over "avoidance" – potential for N sink wetland restorations to be market-driven at private expense**

Federal Policy Scenarios

Scenario 1 – Continue Existing IA CREP

- **N Reduction - 0.2%/year (Iowa)**
- **Needed Policy Change – None**

Scenario 2 – Expand CREP in Iowa & Foster N Sink Wetland CREPs in Other States

- **N Reduction – 1%/year**
- **Needed Policy Change – streamline CWA404 regulatory process**

Federal Policy Scenarios

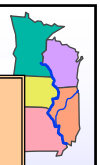
Scenario 3 – Approach Hypoxia N Reduction Goal at Landscape Scale

- **N Reduction – ultimately 10-25%+**
- **Needed Policy Change – facilitate market-driven adoption by drainage districts through sequential assessment 404(b)1 guidelines change**

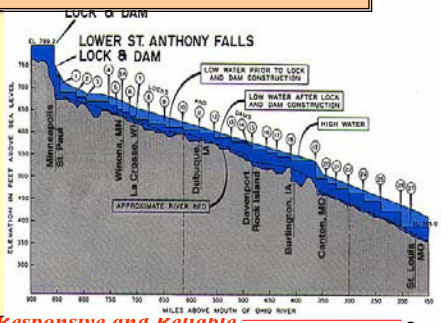

Navigation & the Environment:
Recommendations for a
Sustainable Upper Mississippi
River -
Illinois Waterway
Navigation
System
Mississippi
Valley Division
Hypoxia Task Force
January 2007
Ken Barr Corps of Engineers


UPPER MISSISSIPPI RIVER SYSTEM
NAVIGATION AND ECOSYSTEM
SUSTAINABILITY PROGRAM
One Team: Relevant, Ready, Responsive and Reliable
2

UMR-IWW NAVIGATION SYSTEM

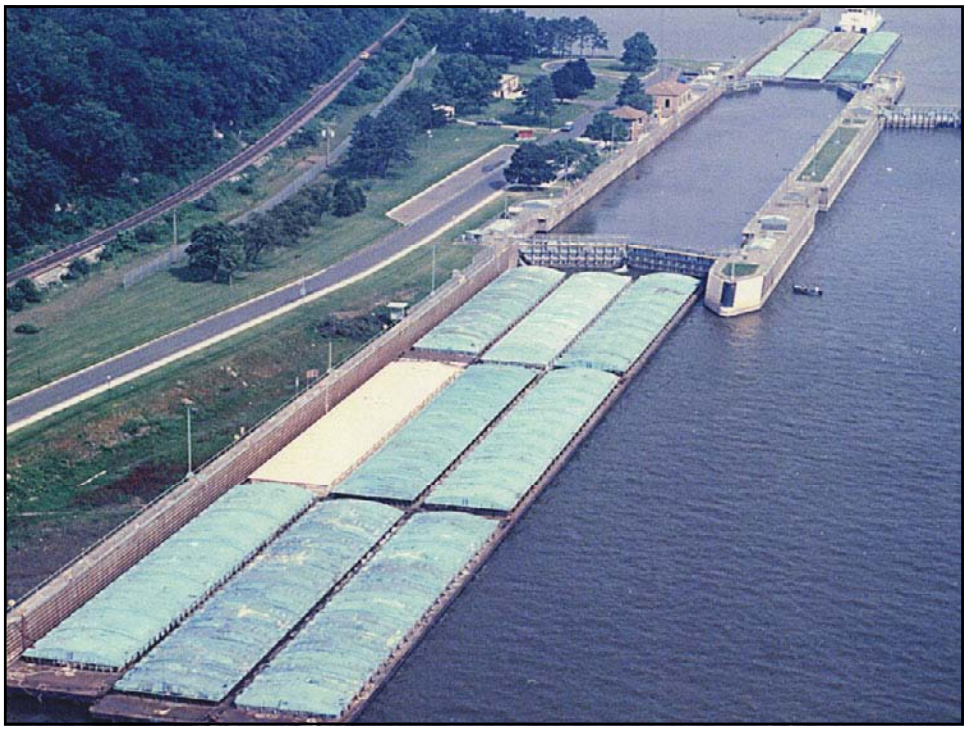


- 37 Lock Sites
- 1,200 Miles of River
- 226,000 refuge acres
- Significant Ecosystem (2.5 million acres)
- Constructed 1930-45

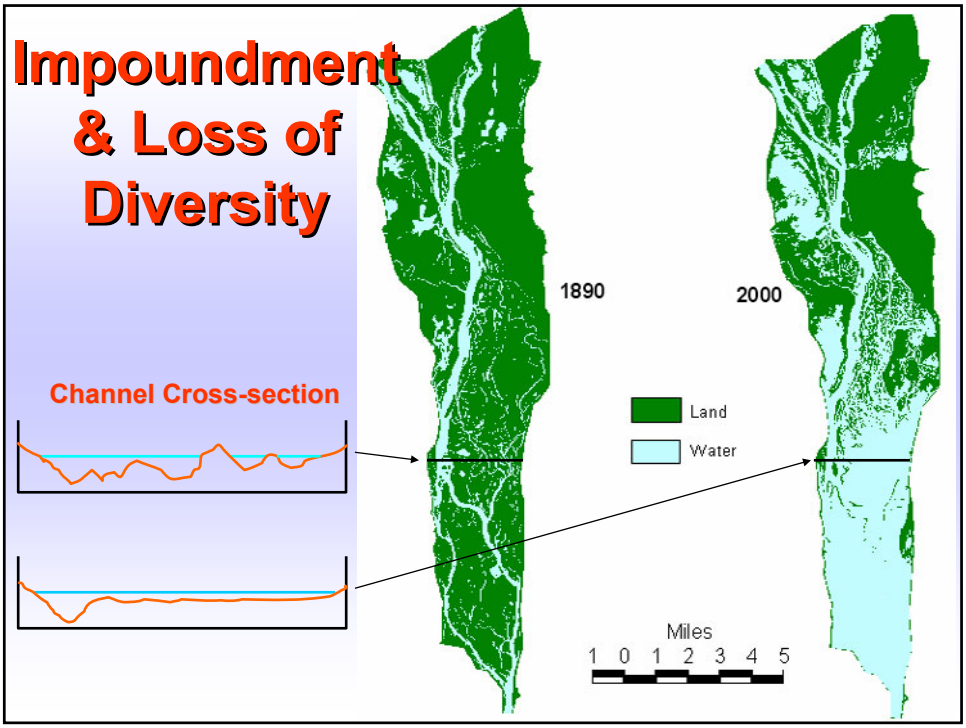


One Team: Relevant, Ready, Responsive and Reliable

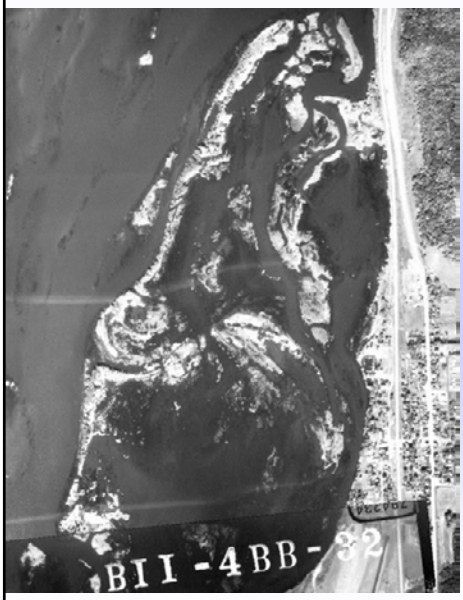
3



Impoundment & Loss of Diversity



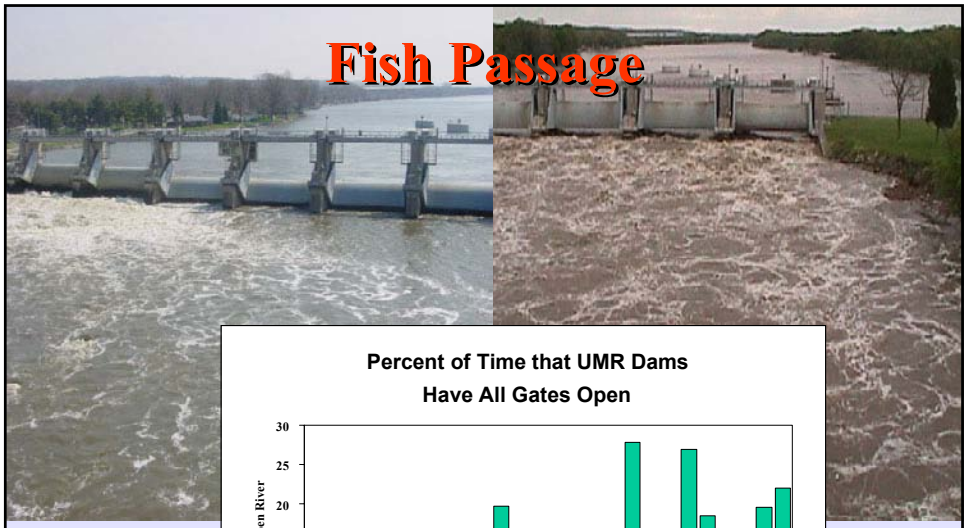
Loss of Island Habitat



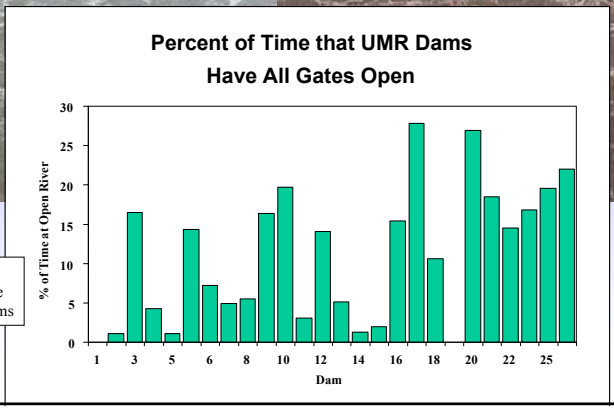
October 1961

August 1994

Fish Passage



Percent of time that there are opportunities for fish passage through UMR navigation dams



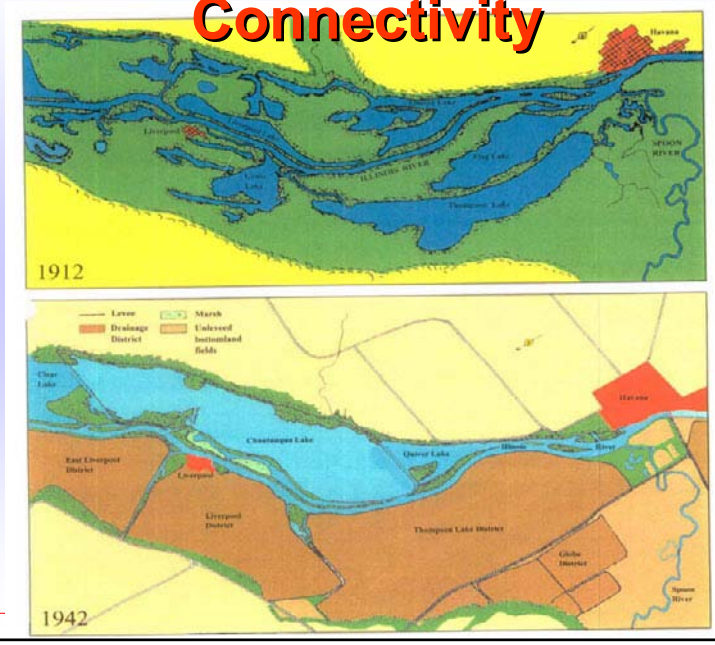
Migratory Fish Species of the UMR

American eel
spotted sucker
silver lamprey
shorthead redhorse
lake sturgeon
black redhorse
pallid sturgeon[A]
golden redhorse
longnose gar
silver redhorse
shovelnose sturgeon
northern hog sucker
goldeye
white sucker
mooneye
channel catfish
paddlefish[D]
blue catfish

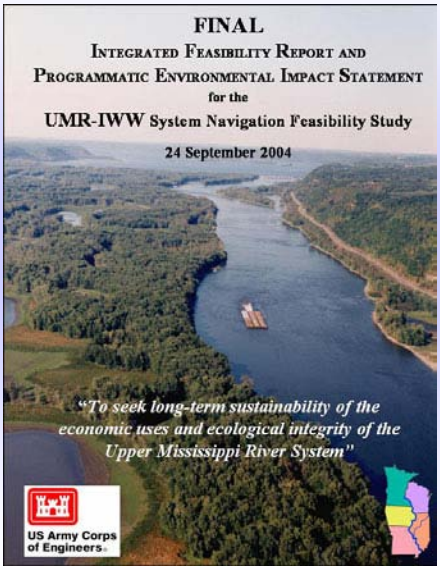
Alabama shad
flathead catfish
skipjack herring
white bass
gizzard shad
yellow bass
threadfin shad
northern pike
blue sucker[B]
smallmouth bass
smallmouth buffalo
largemouth bass
bigmouth buffalo
sauger
quillback
walleye
highfin carpsucker
freshwater drum

[A] federally listed endangered species
[B] candidate for federal listing

Loss of Floodplain Connectivity



INTEGRATED FEASIBILITY REPORT AND PEIS



One Team: Relevant, Ready, Responsive and Reliable

RECOMMENDED DUAL PURPOSE PLAN

- $2.4 Billion Navigation Efficiency Framework
- $5.3 Billion Ecosystem Restoration Framework
- Adaptive Implementation
  - ✓ Nav. Eff. 15 yr increment = $1.88 B
  - ✓ Eco. Rest. 15 yr increment = $1.46 B
  - ✓ Decision Checkpoints at 3, 7, and 15 yrs.

NAVIGATION IMPLEMENTATION

$1.88 billion in First 15 years

- Mooring Facilities @ Locks 12, 14, 18, 20, 22, 24 and LaGrange
- Switchboats @ Locks 20 through 25
- Adaptive Implementation of 1200’ chambers at Locks 20 through 25, LGR, and PEO
- Mitigation for Site Specific and System Effects
- Continued Study and Monitoring

ECOSYSTEM RESTORATION IMPLEMENTATION

$1.46 billion in First 15 years

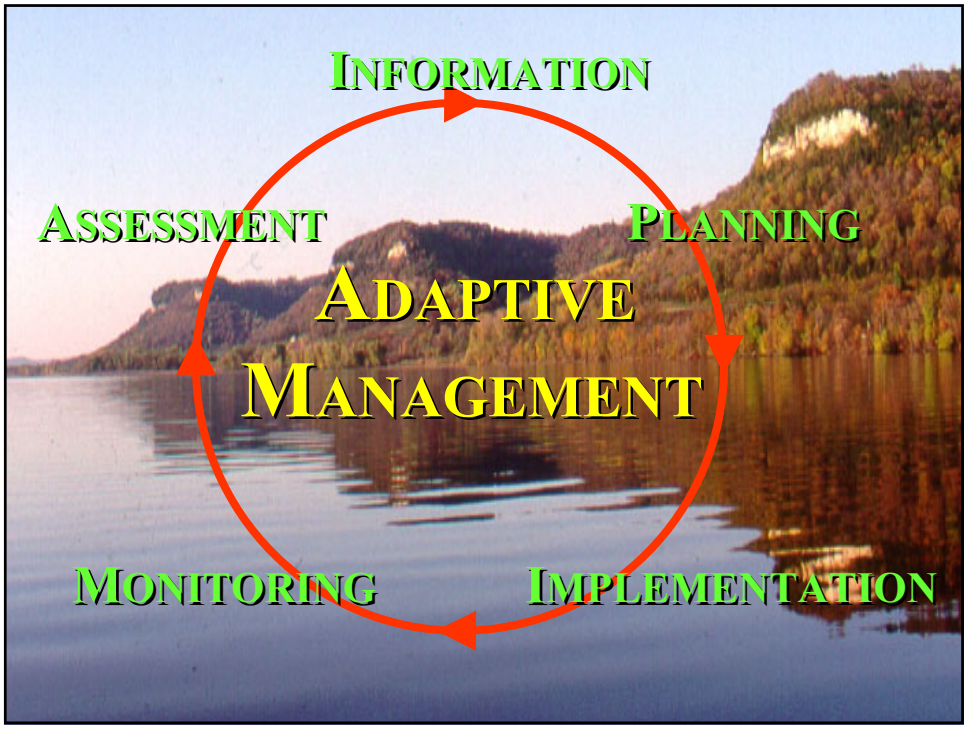
- Fish Passage @ Dams 4,8,22, and 26
- Changes in Water Level Control @ Dams 25 and 16
- Adaptive Implementation of 225 small projects of less than $25 million each
  - Island Building
  - Water Level Management
  - Backwater/Side Channel Restoration
  - Wing Dam/Dike Alterations
  - Island Shoreline Protection
- 35,000 Acres of Floodplain Restoration
- Continued Study and Monitoring

Island Building

October 1961 August 1994 August 2000

Water Level Management

Floodplain Restoration



NESP Science Panel Team Members

SP

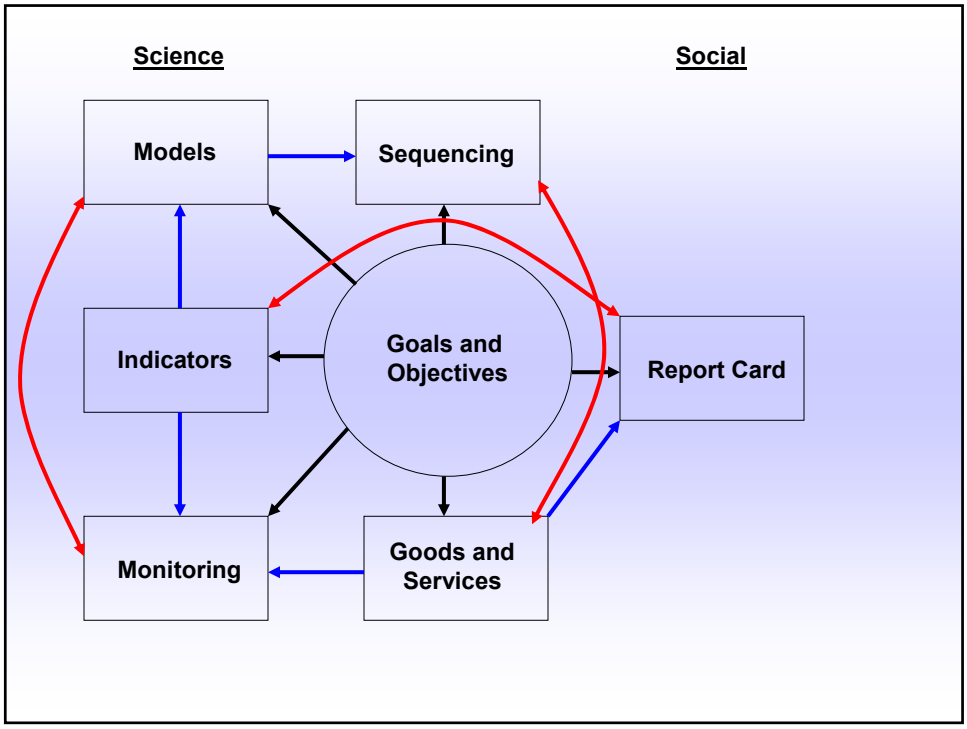
John W. Barko	David L. Galat
Steve Bartell	**Barry L. Johnson**
Charlie Berger	Kenneth Lubinski
Robert Clevenstine	John M. Nestler
Mike Davis	Larry Weber

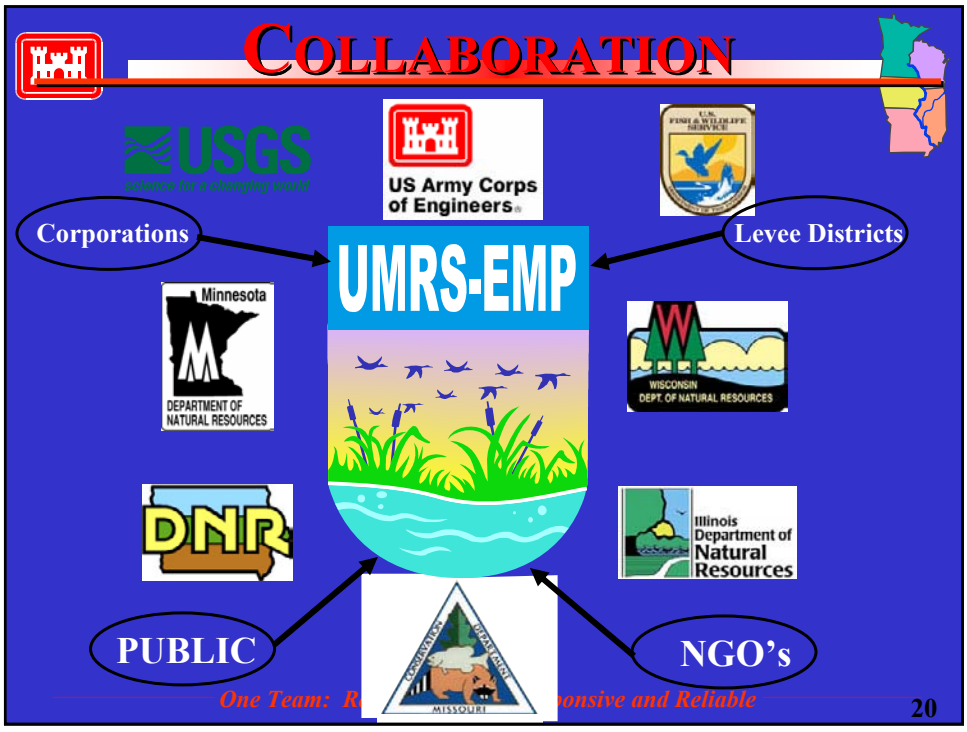
RST

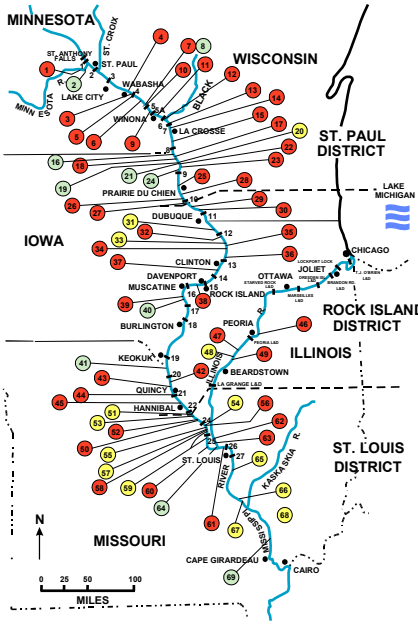
Claude Strauser	Kevin Landwehr
Jon Hendrickson	Charles Theiling
Tom Keevin	Dan Wilcox

One Team: Relevant, Ready, Responsive and Reliable

18


Science
Social
Models
Sequencing
Indicators
Goals and Objectives
Report Card
Monitoring
Goods and Services


COLLABORATION
USGS
science for a changing world
US Army Corps of Engineers
Corporations
Levee Districts
UMRS-EMP
Minnesota
DEPARTMENT OF NATURAL RESOURCES
WISCONSIN
DEPT. OF NATURAL RESOURCES
DNR
Illinois Department of Natural Resources
PUBLIC
NGO's
MISSOURI
One Team: R onsive and Reliable
20



UPPER MISSISSIPPI RIVER SYSTEM ENVIRONMENTAL MANAGEMENT PROGRAM

HABITAT REHABILITATION AND ENHANCEMENT PROJECTS

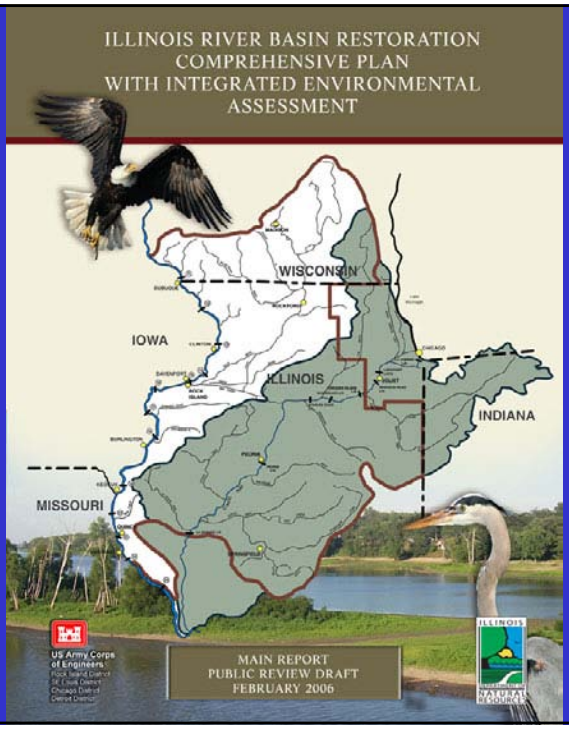
SITE NO.	PROJECT
1.	RICE LAKE, MN
2.	LONG MEADOW LAKE, MN
3.	PETERSON LAKE, MN
4.	INDIAN SLOUGH, WI
5.	FINGER LAKES, MN
6.	ISLAND 42, MN
7.	SPRING LAKE PENINSULA, WI
8.	SPRING LAKE ISLANDS, WI
9.	POLANDER LAKE, MN
10.	SMALL SCALE DRAWDOWN, WI
11.	TREMPEALEAU REFUGE, WI
12.	LONG LAKE, WI
13.	LAKE ONALASKA, WI
14.	EAST CHANNEL, WI/MN
15.	POOL 8 ISLANDS, WI
16.	POOL SLOUGH, IA/MN
17.	BLACKHAWK PARK, WI
18.	LANSING BIG LAKE, IA
19.	CONWAY LAKE, IA
20.	LAKE WINNESHIEK, WI
21.	CAPOLI SLOUGH, WI
22.	POOL 9 ISLAND, WI
23.	COLD SPRINGS, WI
24.	HARPERS SLOUGH, IA/WI
25.	AMBROUGH SLOUGH, WI
26.	BUSSEY LAKE, IA
27.	GUTTENBERG PONDS, IA
28.	MISS RIVER BANK STABILIZATION, IA/MN/WI
29.	BERTOM-McCARTNEY LAKES, WI
30.	POOL 11 ISLANDS, IA/WI
31.	POOL 12 OVERWINTERING, IA-IL
32.	PLEASANT CREEK, IA
33.	SMITH CREEK, IA
34.	BROWN'S LAKE, IA

SITE NO.	PROJECT
35.	SPRING LAKE, IL
36.	POTTERS MARSH, IL
37.	PRINCETON REFUGE, IA
38.	ANDALUSIA REFUGE, IL
39.	BIG TIMBER, IA
40.	LAKE ODESSA, IA
41.	FOX ISLAND, MO
42.	GARDNER DIVISION, IL
43.	COTTONWOOD ISLAND, MO
44.	MONKEY CHUTE, MO
45.	BAY ISLAND, MO
46.	PEORIA LAKE, IL
47.	BANNER MARSH, IL
48.	NAVY ISAND, IL
49.	CHAUTAUQUA REFUGE, IL
50.	CLARKSVILLE REFUGE, MO
51.	TED SHANKS, MO
52.	PHARRS ISLAND, MO
53.	ANGLE BLACKBURN, MO
54.	REDS LANDING, IL
55.	NORTON WOODS, MO
56.	STAG & KEETON ISLANDS, MO
57.	SANDY CHUTE, IL
58.	BATCHTOWN MGMT. AREA, IL
59.	POOLS 25 & 26, MO
60.	CUIVRE ISLAND, MO
61.	DRESSER ISLAND, MO
62.	STUMP LAKE, IL
63.	SWAN LAKE, IL
64.	CALHOUN POINT, IL
65.	JEFFERSON BARRACKS, IL
66.	FT. CHARTRES SC, IL
67.	ESTABLISHMENT CHUTE SC, MO
68.	STONE DIKE ALTERATIONS, MO/IL
69.	SCHENIMANN CHUTE, MO

STATUS AS OF: MARCH 2005

- UNDER CONSTRUCTION OR CONSTRUCTED
- GENERAL DESIGN INITIATED
- PLANNING PROCESS
- LOCK & DAM SITES

One Team: Relevant, Ready, Responsive and Reliable




Dual Purpose Plan …
To seek long-term sustainability of the economic uses and ecological integrity of the Upper Mississippi River System

Action Items and Agreements

Mississippi River/Gulf of Mexico Watershed
Nutrient Task Force 13th Meeting
Arlington, Virginia
11 Jan 2007

Revised Action Plan

- Timeline for Reassessment:
  - The target for completing the reassessment and developing a final, revised Action Plan continues to be late 2007.
  - The Task Force is aware that this target may need to be adjusted to provide adequate time to receive and review recommendations from the EPA Science Advisory Board and stakeholders.

Revised Action Plan

- Themes for revisions of the Action Plan:
  - The Task Force endorses the visioning document themes for revisions to the Action Plan.
  - The Coordinating Committee will use the themes to guide the preparation of a revised Action Plan, with the understanding that new trends, events, policies and advances in scientific understanding will need to be considered in crafting a revised Action Plan.

Annual Work Plan

- The Coordinating Committee will implement the 2007 Workplan with support from the Task Force.
- 2007 public Task Force meetings will be held:
  - April, September and November
- Coordinating Committee work schedule
  - Monthly conference calls
  - Face-to-face meetings in February, August and October
  - Evaluate whether to request the SAB to consider additional questions

Economic Analysis

- The Task Force agrees that a new economic study is needed.
- USDA, in cooperation with other Task Force members, will continue to evaluate approaches to combine national, regional and watershed studies of management options to get a more complete picture of economic costs and benefits of nutrient reductions in the Mississippi Atchafalaya River Basin.
- The Coordinating Committee will evaluate appropriate timing and scale options for economic analyses and report to the Task Force.
- We encourage the project sponsors of water quality and cost-assessment case studies planned for individual watersheds to continue to share information on the project design and results with the Task Force.

Public Comments

- The Task Force remains committed to receiving information and recommendations from all stakeholders throughout the Mississippi Atchafalaya River Basin
- The Coordinating Committee will prepare responses to public comments grouped by major topic areas and post them to the Task Force website found at epa.gov/msbasin

Funding Sub-basin Teams

- The Task Force recognizes that funding from federal and state members of the Task Force is of continued importance. Consistent with the Action Plan item #1 ("Integrated Federal Budget"), we commit to a continued dialogue on opportunities for increased funding for the work of sub-basin teams and implementation by states and others.

Regulatory Coordination

- The Task Force agrees to empanel a team from the Federal regulatory and resource agencies to identify environmentally beneficial opportunities to improve regulatory processes as they impact nutrient reduction initiatives.

Mississippi River Basin & Gulf of Mexico Hypoxia Task Force
Thirteenth Meeting, January 10-11, 2007

Comments offered by

Donald F. Boesch[1] and Don Scavia[2]

We offer the following comments as senior environmental scientists who have been engaged in a wide variety of scientific assessments of coastal environmental issues throughout the nation and internationally. In particular, we have conducted, directed and synthesized scientific investigations concerning the diagnosis and reversal of eutrophication, including long-term involvement with Gulf of Mexico hypoxia.

We each played roles in producing the Integrated Assessment of Hypoxia, completed in 2000, that led to the Action Plan for Reducing, Mitigating and Controlling Hypoxia in the Northern Gulf of Mexico. It is now approaching a decade since the formation of the Task Force and almost exactly six years since the submission of the Action Plan to Congress. We are deeply concerned about the lack of tangible progress in its implementation. The time frames of all 11 of the short-term actions have been exceeded and most of these actions—all of which were to have been completed by December, 2005—remain to be addressed or fully executed. Needless to say, nutrient loads to the Gulf have not declined, nor has the scale of hypoxia been reduced. In fact, some signs (record-size hypoxia and increased fertilizer application) suggest we are actually headed in the wrong direction.

At the same time, Gulf hypoxia was cited no less than four times in the report of the U.S. Commission on Ocean Policy[3] as a prime example of the problems in our nation's ocean environments, the need to address related causes on land, and the requirements for interagency coordination. Moreover, the United Nations Environmental Programme, at its recent Intergovernmental Review of the Global Programme Action for the Protection of the Marine Environment from Land-Based Sources[4], underscored the expanding number of hypoxic zones around the world, for which Gulf hypoxia is clearly the global "poster child." Our national resolve, as well as our international leadership, are clearly in question.

With this background in mind and the Task Force reportedly developing a new vision, we offer the following recommendations for accelerating the achievement of goals of the Action Plan:

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[1] Donald F. Boesch is a Professor in and President of the University of Maryland Center for Environmental Science in Cambridge, Maryland. He initiated the first strategic research on Gulf of Mexico hypoxia in the early 1980s and served on the Editorial Board for the 1999 Hypoxia Assessment Reports. Currently, he chairs the Science Board for the Louisiana Coastal Area Ecosystem Restoration Program.

[2] Don Scavia is Professor of Natural Resources and Environment at the University of Michigan and Director of the Michigan Sea Grant Program. He chaired the CENR Hypoxia Working Group responsible for the Assessment Reports and 2000 Integrated Assessment and has recently published on hypoxia models.

[3] U.S. Commission on Ocean Policy. 2004. *An Ocean Blueprint for the 21st Century*. Washington, DC.

[4] http://www.unep.org/Documents.Multilingual/Default.asp?ArticleID=5393&DocumentID=486&l=en

1. Refocus the Reassessment on Nutrient Load Reductions

Short-term action number 11 of the Action Plan states:

> "By December 2005 and every five years thereafter, the Task Force will **assess the nutrient load reductions achieved and the response** of the hypoxic zone, water quality throughout the Basin, and economic and social effects. **Based on this assessment**, the Task Force will determine appropriate actions to continue to implement this strategy or, if necessary, revise the strategy." [Emphasis added.]

With the EPA Science Advisory Board Panel on Hypoxia starting approximately 10 months later than planned, it is clear that the Reassessment will not be completed until sometime in 2008 based on interpretation of the Timetable for Reassessment[5]. Furthermore, it appears that neither the SAB Panel nor the various symposia and workshops conducted as part of the Reassessment are, in fact, addressing the central objective envisioned in the Action Plan, namely assessing the nutrient load reductions achieved and the responses to these nutrient load reductions.

Instead, almost all of these activities seem to be revisiting and questioning the findings of the 2000 Integrated Assessment, but without the experience of nutrient load reductions and responses to them, as was the intent of adaptive management framework elected by the Action Plan. It is if, after failing to produce any results in terms of reducing nutrient loads or hypoxia for six years, we are once again asking does hypoxia really occur, is it caused by nutrient enrichment, are these nutrients primarily from agriculture, and how can nutrient loads be reduced?

From our vantage point, the Reassessment has unfortunately been marred by preoccupation with red herrings (e.g., conducting a time-consuming peer review of leaked versions of the Region 4 White Paper to confirm what the EPA already knew: the analysis was seriously flawed); costly compilation of unnecessary bibliographies; poorly focused symposia dominated by individuals with little knowledge of the comparative science of eutrophication; synthesis papers that have not been credibly completed; and a SAB Panel process that has not only excluded participation by those most experienced in Gulf hypoxia science or otherwise involved in the earlier Integrated Assessment, but also dissuaded professional contact with them. The long overdue Management Action Reassessment Team report, which at least was supposed to inventory information on management activities undertaken, is so general and disconnected with actions specific to nutrient source reductions as to be useless in tracking progress in Action Plan implementation or load reductions.

In short, we feel that the Reassessment has to date failed to meet the objectives originally set for it in the Action Plan. However, it is not too late. We urge the Task Force to refocus the Reassessment to assess the nutrient load reductions achieved, the efforts taken to achieve them, and what it would take for those efforts to be more

---

[5] As indicated at http://www.epa.gov/msbasin/taskforce/pdf/timeline_process01_06.pdf.

effective in terms of meeting the overall environmental goals of the Plan. On the basis of such assessment a revised Action Plan should be developed with more specificity in terms of nutrient load reduction allocations and practices, accountability for both processes and outcomes, and identification of the programs and resources needed to achieve results. If we have learned anything from shortcomings of the Chesapeake Bay Program's efforts to reverse eutrophication[6], it is that even the best plans only work if they are implemented.

2. Purposefully Implement the Action Plan

Lack of specific new funding has been used as a reason for inaction in implementing the Action Plan. This is a poor excuse. The Federal government alone provided $167 billion in subsidies to agriculture from 1995 to 2005 ($20 billion conservation subsidies alone), a significant fraction of that in the Mississippi Basin. The Environmental Working Group has shown that the 124 counties that account for 40% of spring nitrate fertilizer pollution in the Gulf received $11.4 billion in subsidies from 1995 through 2002[7]. EPA, USDA, USGS, USACE and state agencies and Land Grant universities have substantial capacities to develop basin and state specific allocation strategies and implementation plans. In short, much more could have been done during the last six years and much more could be done between now and 2015 to reduce nutrient loads by improved fertilization and drainage practices, waste treatment, and wetland and riparian zone restoration. And, this can be done within the scope of existing resources, programs, and capacities. However, the parties to the Action Plan have been on hold waiting for new federal funding or the next Farm Bill. The Task Force should develop specific implementation actions to be taken based on the significant existing resources and authorizations.

3. Align New Farm Bill Programs with Action Plan Objectives

Having said that much can be done under existing authorities, there are potentially great opportunities afforded by the enactment of a new Farm Bill as the present legislation expires this November. There are many downward fiscal, political, and fair-trade pressures on commodity based subsidies[8] and financial support for agriculture may be more acceptable if it accomplishes a greater public good, such as improved water quality. The Task Force should examine how a new Farm Bill could be written that would facilitate accomplishment of the goals of the Hypoxia Action Plan, particularly by providing incentives for avoiding excessive fertilization, more effective animal waste management, drainage mitigation, and wetland conservation and restoration.

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[6] D.A. Fahrenthold. 2007. A revitalized Chesapeake may be decades away. EPA official warns of slow progress toward 2010 goals. *Washington Post*, January 5, 2007. http://www.washingtonpost.com/wp-dyn/content/article/2007/01/04/AR2007010401051.html

[7] Environmental Working Group. 2006. *Dead in the Water: Reforming Wasteful Farm Subsidies Can Restore Gulf Fisheries*. Washington, DC http://www.ewg.org/reports/deadzone/execsumm.php

[8] Agriwelfare. Editorial in the *Washington Post*, January 8, 2007. http://www.washingtonpost.com/wp-dyn/content/article/2007/01/07/AR2007010700953.html

4. Minimize the Effects of Expanded Biofuel Production on Gulf Hypoxia

Interests in reducing dependence on foreign oil and gas and greenhouse gas emissions are driving a great expansion of biofuel production in the U.S. In the Midwest, this is manifest in a dramatic growth in ethanol distilleries that mainly use corn as the feedstock. By one recent estimate the existing and new distillation plants under construction will require 139 million tons of corn per year, more than twice the present level of U.S. corn exports[9]. While there are many public policy questions concerning the wisdom of this spike in corn-based ethanol production (whether as much or more fossil fuel energy is consumed than is yielded by the biofuel energy, increases in food prices, should corn be grown to feed people or SUVs, etc.), we focus here on the repercussions of expanded biofuel production on nutrient loading downstream and, thus, hypoxia in the Gulf. Increases in the demand and prices of corn are likely to increase the application of fertilizers (particularly in the production of high nitrogen demanding corn crops), reduction in crop rotation, and expansion of land under corn into marginal and often poorly drained lands. Indeed, these seem to be going on already. These changes in agricultural practices could increase nutrient loading, counteracting any efforts to reduce loading under the Action Plan.

On the other hand, if biofuel production evolves to utilize cellulosic sources, including perennial plants, such production could require less fertilization, drainage or barren soil conditions, thus reducing nutrient losses downstream. And if those cellulosic sources come as part of broader conservation measures, such as riparian buffers, even greater gains in water quality will be made.

In any case, the present and projected growth of biofuel production in the Mississippi Basin should be taken into account in developing strategies to achieve Action Plan goals. At a minimum, increased biofuel production should be planned, allocated, managed, and accounted for in a way that makes it "hypoxia neutral."

5. Integrate Nutrient Reduction with Coastal Restoration

The Action Plan recognized that there may be opportunities afforded by efforts to restore the Mississippi Deltaic Plain that could help reduce nutrient loads to the hypoxia sensitive parts of the continental shelf of northern Gulf. One of the key strategies in this coastal restoration is the diversion of river water into adjacent wetlands and estuaries to provide sediments to nourish rapidly subsiding wetlands, build new wetlands through the delta-building process, and stem saltwater intrusion into low salinity estuaries. General knowledge suggest that considerable nitrate can be removed from the river water as it flows through the estuarine-wetland complex through biological assimilation and denitrification and recent studies of small diversions (e.g. Caernarvon) confirm that. The benefits of nitrate removal for

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[9] L.R. Brown. 2007. Distillery demand for grain to fuel cars vastly understated. *Earth Policy Institute Eco-Economy Updates*, January 4, 2007. http://www.earth-policy.org/Updates/2007/Update63.htm

hypoxia mitigation are being included among the evaluation and design criteria for coastal restoration options in the Louisiana Coastal Area (LCA) Ecosystem Restoration Program. However, injecting nutrient-rich river water into these estuarine ecosystems may result in a new set of problems, including harmful algal blooms and hypoxia[10]

There is an emerging scientific consensus, however, that for coastal restoration to be effective the vast majority of the sediment load of the Mississippi and Atchafalaya system must be retained in the coastal zone or inner continental shelf. Presently, more than half of this load is deposited in deeper waters of the Gulf off the deepwater passes of the Birdsfoot Delta. Conserving and utilizing this material would entail abandoning the Birdsfoot Delta and allowing most of the lower Mississippi River flow to enter the shallow shelf west or east of the river[11]. Such large diversions would, or course, mean that fresh water and nutrients presently mixing with deep Gulf waters would be retained on the shelf where they would likely exacerbate hypoxia by increasing density stratification and increasing biological production. However, a substantial consensus of scientists suggests that such large changes are required if the ecosystem, the landscape, and the habitability of southeastern Louisiana is to be maintained. Therefore, substantial reductions in nutrient loading will be required by the time (ten or more years out) when large, shelf-freshening diversions are implemented if substantial expansion of hypoxia is to be avoided.

Integrated planning of hypoxia reduction and coastal restoration is urgently needed[12] as coastal restoration planning proceeds. The Task Force should develop a formal mechanism with the U.S. Army Corps of Engineers and the State of Louisiana to accommodate this integrated planning.

6. Structure Research, Monitoring and Modeling to the Adaptive Management Framework

Research, monitoring and modeling activities undertaken as part of or in support of the Action Plan to reduce Gulf hypoxia should be structured as essential parts of an adaptive management program, as called for in the Action Plan. This would provide a powerful mechanism whereby research priorities can be judged and differentiated between "need to know" and "nice to know." Furthermore, it provides a framework for the design and interpretation of monitoring results that goes beyond just making systematic measurements. Finally, it provides a means for guiding the development of appropriate models that avoids the twin traps of reliance on just one model and the

---

[10] N. Rabalais. 2005. Consequences of Mississippi River diversion for Louisiana coastal restoration. *National Wetlands Newsletter*. 27(4): 21-24.

[11] National Research Council. 2005. *Drawing Louisiana's New Map: Addressing Land Loss in Coastal Louisiana*. National Academies Press, Washington, DC http://books.nap.edu/catalog/11476.html

[12] D.F. Boesch. 2006. Scientific requirements for ecosystem-based management in the restoration of Chesapeake Bay and Coastal Louisiana. *Ecological Engineering* 26:6-26. http://www.umces.edu/president/EBM%20CB-LA.pdf

seductive allure of more and more complex and detailed models. The apparent interest in developing complex, eco-hydrodynamic models, like the Chesapeake Bay water quality model, for example, is particularly troubling for such an open boundary, event-dominated system such as the Louisiana shelf. While this would be scientifically challenging, it could lead to a false sense of certainty and, as in the Chesapeake, be one more reason to delay implementation until we "get the numbers right." This is why an adaptive management approach was adopted in the Action Plan.

We hope we have demonstrated our knowledge of and commitment to the task in hand and sincerely hope that our frank recommendations are helpful to the Task Force.

RICHARD HUGH BAKER
6TH DISTRICT, LOUISIANA

COMMITTEE ON
FINANCIAL SERVICES

CHAIRMAN
SUBCOMMITTEE ON
CAPITAL MARKETS, INSURANCE AND
GOVERNMENT SPONSORED ENTERPRISES

SUBCOMMITTEE ON
FINANCIAL INSTITUTIONS
AND CONSUMER CREDIT

SUBCOMMITTEE ON
HOUSING AND
COMMUNITY OPPORTUNITY

COMMITTEE ON
TRANSPORTATION AND INFRASTRUCTURE

SUBCOMMITTEE ON HIGHWAYS
TRANSIT AND PIPELINES

SUBCOMMITTEE ON AVIATION

SUBCOMMITTEE ON
WATER RESOURCES AND ENVIRONMENT

COMMITTEE ON
VETERANS' AFFAIRS
SUBCOMMITTEE ON HEALTH

SUBCOMMITTEE ON
ECONOMIC OPPORTUNITY

Congress of the United States
House of Representatives
Washington, D.C. 20515–1806

January 9, 2007

Ms. Katie Flahive
MS River/Gulf of Mexico Watershed Nutrient Task Force
c/o Office of Watersheds, Oceans and Wetlands
U.S. Environmental Protection Agency
1200 Pennsylvania Ave.
Mail Code 4503T
Washington, DC 20460

Dear Ms. Flahive,

I am writing to express my long-standing and active support for addressing the problem of hypoxia in the Gulf of Mexico.

The effects of hypoxia on our coast and coastal fisheries have the potential to seriously impact the life and livelihood of commercial and recreational fishing on the Louisiana and Texas coasts. For this reason, the reduction, mitigation and control of hypoxia in the Gulf of Mexico is imperative to protect this ecologically and commercially important region. I am pleased that the Mississippi River/Gulf of Mexico Watershed Nutrient Task Force completed an Action Plan detailing a national strategy to reduce the frequency, duration, size, and degree of oxygen depletion of the hypoxic zone of the northern Gulf of Mexico. It is imperative that the Action Plan be implemented.

As a conferee to the House-Senate committee negotiating the Water Resources and Development Act (WRDA), I supported language authorizing the Corps of Engineers to begin working with other federal and state agencies to address the hypoxia situation in the Gulf of Mexico. Unfortunately the House and Senate adjourned before this legislation was considered; however, as a senior member of the Water Resources and Environment Subcommittee, this legislation is a top priority for me in the 110th Congress.

In closing, I believe that Congress should fulfill its obligation to address the problem of hypoxia in the Gulf, and I will work with my colleagues to meet that goal.

Sincerely,

Richard H. Baker
Member of Congress

RHB\asc

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UNITED HOUMA NATION

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GOLDEN MEADOW, LA 70357
(985)475-6640
FAX (985)475-7109

BRENDA DARDAR ROBICHAUX, PRINCIPAL CHIEF

December 29, 2006

Mississippi River/Gulf of Mexico
Watershed Nutrient Task Force
c/o Darrell Brown, Chief
Coastal Management Branch
US Environmental Protection Agency
1200 Pennsylvania Avenue, N.W. 4504T
Washington, DC 20460

To Whom It May Concern:

The spread of hypoxia in the Gulf is a serious national problem and deserves a national solution. It endangers productive coastal fisheries in the Gulf, especially off Louisiana's coast.

The Houma Nation has had many members who have relied on the Gulf for their livelihood, working as commercial fishermen and shrimpers, as well as harvesting fo their own families and communities. Hypoxia in the Gulf is one of several problems that are impinging on the Houmas' lives on the Louisiana coast, along with land loss and the damage from the storms in 2005. All of these problems need to be resolved s o that the people and fisheries can continue to exist sustainably.

The Houma Nation supports national action on this problem. We would ask that the states and agencies on the Task Force honor their commitment to reduce the spread o f Gulf hypoxia through collaborative action.

Sincerely,

Brenda Dardar Robichaux

Brenda Dardar-Robichaux
Principal Chief

cc: Sen. Mary Landrieu
Sen. David Vitter
Rep. Charlie Melancon

January 11, 2007

Members of the Mississippi River & Gulf of Mexico
Watershed Nutrient Task Force
c/o Katie Flahive
Office of Wetlands, Oceans, and Watersheds
U.S. Environmental Protection Agency
Ariel Rios Building
1200 Pennsylvania Avenue, N.W.
Mail Code: 4503T
Washington, DC 20460

Dear Task Force Members:

We write on behalf of our organizations – national, regional, and local groups concerned with the health of America's water bodies – to urge you to take more ambitious and expeditious action to help remedy the pollution that is contributing to the serious problem of oxygen depletion in the Gulf of Mexico. You can take advantage of your unique and diverse membership to provide leadership on this crucial issue.

In recent years, the Task Force has devoted significant effort to re-assessing the hypoxia problem in general, instead of focusing on implementing (and undertaking limited reassessment of that implementation) the Action Plan. Meanwhile, funding for carrying out the plan itself has not been forthcoming, and almost no significant progress in reducing nutrients contributing to the Dead Zone has resulted from the Action Plan since its publication in 2001.

We know much of what needs to be done. States must establish standards for nutrients in their waterways, both to preserve their own designated uses but also to protect downstream uses – as federal regulations require. Major nutrient sources, such as wastewater treatment plants, factory farms, and municipal stormwater systems, must cut their pollution with available controls. Recognized pollution sinks, such as wetlands and riparian buffers, must be protected and expanded. And the tools to address these needs also exist; fully implementing the Clean Water Act and the conservation provisions of the Farm Bill will enable states and private entities to prevent significant quantities of nutrients from reaching the river system and, eventually, the Gulf.

In the past year, several of our organizations have been asked why we are not as engaged in the Task Force meetings as we were formerly. Our reply is that we are frustrated by the lack of concrete actions to accomplish even the simplest goals outlined in the Action Plan. We feel that in addition to aggressively seeking funding for implementation actions, the Task Force must push forward with completion of actions outlined within the Action Plan that do not require significant funding. For example, action 7 in the short term actions listed by the Action Plan (p. 14) states that the U.S. Army Corps of Engineers (COE), "if authorized by the Congress and funded in the Fall of 2001, complete a reconnaissance-level study of potential nutrient reduction actions that could

be achieved by modifying COE projects or project operations. *Prior to completion of the reconnaissance study, the COE will incorporate nitrogen reduction considerations, not requiring major modification of significant new costs, into all project implementation actions*" (italics added). Although the absence of funding by Congress has prevented completion of the first part of the reconnaissance study, the Corps should have been able to "incorporate nitrogen reduction considerations" into project implementation actions by now. However, to our knowledge they have not done so. In fact, we have seen no significant shift in how the COE is implementing its current projects in the Mississippi River basin to reduce Dead Zone-causing nutrients.

As key federal, state, and tribal leaders with responsibility for environmental quality, farming policy, and water resources, your perspective on these issues is crucial. If you collectively dedicate yourselves to implementing the Action Plan and securing funds for states and tribes to carrying out the necessary actions, even while the plan re-assessment is underway, significant progress will be achieved. In particular, if you announce your commitment to taking the requisite actions – regulating pollution sources, protecting pollution sinks, setting adequate standards, and provide the financial resources needed to make such action possible – others will do so as well.

Our organizations stand ready to help. If you will call on one another and on other leaders to act and to fund adequate improvements, we will stand with you. What we cannot abide is further delay pending analysis; lengthy reassessment without real progress will lead us to seriously and publicly question whether the Task Force can deliver on the Action Plan's promise.

Sincerely,

Jon Devine
Natural Resources Defense Council

Matt Rota
Gulf Restoration Network

Judith Petersen
Kentucky Waterways Alliance

Albert Ettinger
Environmental Law and Policy Center of the Midwest

Tracy Kuhns
Louisiana Bayoukeeper, Inc.

Muffy Harmon
Des Moines Founders Garden Club

Stacy James
Prairie Rivers Network

T. Logan Russell
Delta Land Trust

Nelson Ross
Tennessee Izaak Walton League

Kris Sigford
Minnesota Center for Environmental Advocacy

Ed Hopkins
Sierra Club

Betsy Lawton
Midwest Environmental Advocates, Inc.

Diana McKeown
Clean Water Action Midwest Office

Cynthia Pansing
Mississippi River Basin Alliance

Kathy Andria
American Bottom Conservancy

Thirteenth Public Meeting of the Mississippi River/Gulf of Mexico Watershed Nutrient Task Force

Public Comments

January 11, 2007
Sheraton Crystal City Hotel
Arlington, Virginia

Moderator
Benjamin Grumbles, U.S. Environmental Protection Agency

Commentors
Alex Echols, Sand County Foundation
Steve Commerford, Minnesota Soybean Growers Association
John Torbert, Iowa Drainage District Association
Mindy Selman, World Resources Institute
Steve Harper, O'Brien and Gere Engineers
Doug Daigle, Mississippi River Basin Alliance
Dan Coleman, O'Brien and Gere Engineers
Dan Boesch, University of Maryland
Don Scavia (submitted with D. Boesch), University of Michigan
John Devine, Natural Resources Defense Council
Sylvia Malm,***** U.S. Environmental Protection Agency
Brenda Dardar-Robichaux,* United Houma Nation
Honorable Richard Hugh Baker,* U.S. House of Representatives (6th District, Louisiana)
****provided written comments only.***

Benjamin Grumbles: Now we're at a portion of the program that is extremely important, and we have received so many thoughtful comments. Many of these comments are written and are available out on the table outside the door, and we will also make those available on the Web site as soon as we can. I should note also that the meeting notes from today will also be made available on the Web site in the coming days or weeks. The best thing to do is to go ahead and invite those who signed up for the public comments today to come up to the microphone and speak. I would ask those of you who will be speaking, as a courtesy, as powerful as your message is, if you could leave it at 5 minutes or less that would be helpful given the number of commenters we have. The first on the list is Alex Echols with the Sand County Foundation. Alex is no stranger to us here in terms of his involvement and his organization's involvement in this issue.

Alex Echols: Thank you Ben. I hadn't planned on commenting until I talked to several members of your team today. I want to thank you for this opportunity. Sand County Foundation has been very active in trying to put together performance-based assessments of nutrient management practices, and we've done that through a series of partnerships. My main point here is that this problem is too big for any of us to solve alone. That power of partnerships is going to be essential for this. We have had 3 years of doing field research to do a comparison of various nutrient management techniques. We started in Wisconsin with Discovery Farms, recently spread into Illinois in working with the Council on Best Management Practices, and most recently we expanded into Iowa with the Iowa Soybean Association. In each case, we made a strategic initiative focusing on working with mainstream farmers, not with folks in the farming business, but with real farmers. We are in the process of broadening this coalition for the Upper-Midwest to create an initiative where farmers and conservation groups can come together to create some common objectives. There are a couple of things that we've learned from this. Number one, we need to have better quantification of what the results are of various

management practices. I loved what Dean Lemke talked about of how many dollars per pound it takes to strip nitrogen out from wetlands processes. I know something about the WRP [Wetland Reserve Program]. If 20 years ago I'd known more about how to cite wetlands, we would have written a better WRP than we did. Wetlands are very efficient at stripping nitrogen out of water. But it's not if you don't expose them to that nitrogen load. A couple of observations—there's always a discussion that there's not enough money to solve this problem. Don't focus on what you can't do, let's focus on what we can do. We've learned a few things in our 5 years of working on this. Number one, we can radically improve the performance of our management and return on investment. In our limited set of 200 projects that we've done on about 50–60 thousand acres over the past 5 years, we've seen a tenfold improvement in the performance of the nitrogen management because of incentive-based approaches, working collaboratively and cooperatively, as opposed to the traditional approach. A couple of other observations, I would encourage you to continue to reach out to the agricultural community as part of your panel and all your processes. I would encourage you to use incentives. I would encourage you, wherever possible, to use the process of enabling actions as opposed to restrictive actions, for example, simplifying the 404 process so it's easier to put in wetlands. Don't look for a single magic bullet; there isn't one. We're going to need a variety of techniques, whether it's drainage management, bioreactors, wetlands, agronomic cover crops, we need to have all those tools in the arsenal, but what we really need is to understand the performance of each of them.

Steve Commerford: We have the privilege of being Tier 2 members of the UMRSNC for about 2 years. I just want to make a couple of quick points. One is in relation to an observation of some of discussions that have taken place over the past few years that I think should be addressed from both a policy perspective and as a component of the Science Advisory Board reassessment, and that is an effort to get a better handle on background levels of nutrient loading. The landscape delivers nutrients—nitrogen, phosphorus, are the two we're primarily looking at—and that's a reality of our agricultural ecosystem. There would be nutrients coming off that landscape regardless of agricultural activities. We do have to have some consideration for a nutrient loading that's background for an agricultural system, too. I don't think we should be discriminating against an agricultural ecosystem in favor of a native ecosystem. There are loadings there, and they need to be accounted for. If we fail to do that, we're starting from a zero base, and trying to have a reference base of zero isn't really realistic. That should be a component in the discussions about policy or the goal setting as well as, and hopefully, there should be a consideration in terms of the scientific review. It would probably take some policy discussion because that can be defined differently, but I think there needs to be a fair consideration of the practical definition that accounts for what background levels are for nutrient loading for an agricultural system or else our goals are going to be very unrealistic. Thank you.

John Torbet: Iowa Drainage District Association is a private, nonprofit organization representing about 3,000 drainage districts and 6 million plus drained acres in Iowa. I just want to point out that under current state law, we have absolutely no water quality responsibilities. Many states have drainage districts. In Iowa, we are a little different as we have the option of county management of those districts through the County Board of Supervisors, or what you know as Commissioners in many states. What that does is that create for us an automatic political and administrative infrastructure for the district that most states don't have. We have watched this Task Force very carefully, as you have been meeting, and we have been strong supporters of the Iowa CREP program over the years. We're amazed at how the program has ground to a halt over the past 2 years as they have had to work their way through regulatory issues. We've had many conversations about watershed-based approaches to these issues, and I've been to other conferences where they have talked about watershed-based government

as an approach to this issue. I would point out that in Iowa, we have that and they are called drainage districts. That is why I believe, as Executive Director of this organization, that drainage districts, as an entity, should not stay out of water quality business nor are we going to be able to stay out of the water quality business. I think it is inevitable, with the push and the direction that these issues are going, that people are going to look at the infrastructure we have and look at the management abilities we have and make the assumption that we are going to be a major player. I want to support Dean Lemke's call for relaxation of federal rules with respect to sequential assessment with respect to the permitting process. I think we have opportunities coming up now especially with conversations about the new Farm Bill—perhaps for some pilot programs or some modeling programs—so we can move forward on these issues. With the Iowa CREP [Conservation Reserve Enhancement Program], we have a demonstrated practice that works very well, and what we need is help getting those practices on the ground and not hindrances from the federal government.

Grumbles: Next on my list is Mindy Selman with the World Resources Institute.

Mindy Selman: Thanks. In regards to the biofuels and water quality impacts issue, I just wanted to make the Task Force aware that the World Resources Institute has identified this as a problem that we are looking into. We currently have a modeling effort underway to look at current feedstocks like corn as well as cellulosic feedstocks like switchgrass in looking at land use change and the water quality impacts associated with those. We have some preliminary results. We'd be happy to share that data with the Task Force and also run different scenarios you would be interested in to feed into your work. Some of our preliminary results show that scaling up from 5 billion gallons to the 7.5 billion gallons for the RFS [Renewable Fuel Standard] would lead to a 1.5 percent increase in nitrogen loss to water. An increase of 10 billion gallons a year would lead to a 2.9 percent nitrogen loss to water, and 15 billion would lead to a 5.6 percent increase loss to water. So those are preliminary results, and they are nationwide. But we can scale those down to the Mississippi River basin. So just to let you know we do have that project underway that can help.

Grumbles: Thank you, we appreciate that very much. Next on the list is Steve Harper from O'Brien and Gere Engineers.

Steve Harper: I appreciate the opportunity to come and listen to this meeting and a couple of previous meetings. I am kind of new to this game, but quickly, before I ask what is probably a stupid question, I want to save a little credibility by saying that what I am about to ask is not something that I am advocating. I haven't ignored all the science and the watershed-based approaches that I think are very important. The question that I am going to ask is to define the boundaries of a problem, and so if I can clarify a few assumptions. First of all, hypoxia is a result of the eutrophication processes going on in the sediments and is also a result of stratification and poor mixing. Second of all, the things that we're seeing as solutions are going to cost, let's say at least 10 billion, maybe even 100 billion, and likely to affect millions of people over a very large land space. So, thinking about those, then asking is there a better way or a different way, and have we thought about this? Has any of the science considered building, for example, in the Atchafalaya and the Mississippi channels that go out into the ocean that might be 20–30 meters deep and 1,000 meters wide and a pipe that's 100 meters in diameter to change the stratification? What would be the cost of that, what would be the possibilities, and thereby not affect all these people upstream? Would it be possible to mechanically mix the water, or a section of the Atchafalaya and how much would that cost and look at those as sort of boundary conditions? I don't know if it is reasonable to ask a question like this at a meeting like this. Have there been thoughts of that; have there been costs associated with that?

Grumbles: I think the most reasonable thing to do is make sure we have your question, get back to you, and get the right staff, and probably in consultation with Tony Maciorowski and the Science Advisory Board to get the answer to your question, rather than turning to folks up here. If staff can make sure they heard the questions, we can make sure we can get back to you in the best way possible. Doug Daigle is next. Where's Doug?

Doug Daigle: Hi, I just want to make it clear that I am speaking on behalf of myself as an independent operator, but also as someone who has been involved with this process for while. I debated whether to say anything, but I was convinced by the presentation by USDA about the economic assessment. My concern is that that has the potential to shut down this entire process because it's one of those well-intentioned but pre-emptive things being proposed to attempt to deal with perceived threats that could come about at future points somehow that would have negative impacts, but it has nothing to do with the current *Plan*. That plan is a cooperative, voluntary effort that is a result of an agreement between the states and the federal partner agencies, and it's the vehicle that's on the table now. There is no second version yet, although the revision is going to agreed upon by you and the mandate we're operating from came from you're your predecessors. I just wanted to offer some thoughts and open a discussion about process we're working under because I don't see where—I understand anxieties and I understand people don't want certain things to happen—I don't see how those threats gain traction. If I understand it correctly, the agreement involves a simple process. You get an integrated budget that sets up a pool of money, you go through a planning process, and then there is a series of actions with resources from that budget being directed to those actions, which are very broad, like assistance to landowners to restore wetlands. That vagueness would leave open the flexibility that the states expect and want to implement that kind of program. We all know that that didn't happen before to a great extent because of the funding not being provided. Those set of actions constitute the agreed upon *Plan*. In the back of the report, there is the 30 percent reference number, which has been misrepresented and misunderstood. It was an attempt to answer the question: "Well, as we do those things, what should be aiming for?" If you read it, it does explain what it means, but it doesn't require anyone to reduce anything by 30 percent. You want to aim in the aggregate for the 30 percent reduction of nitrate loading out of the mouth of the river. They didn't know at the time, and we still don't know, what exactly that would entail to reach that goal provided a nonbinding, numbered as a reference, the goal of reducing to 5,000 square miles by 2015 again, provided something to shoot for. Don Scavia, at the last SAB and meeting in October in Washington, DC, explained how that number was reached as a pragmatic agreement amongst all the people involved, again, a nonbinding number. The revision of the *Plan*, and anything that is required in the future is going to be what you all agreed to with various input from a variety of parties. The fear is that some draconian measure will be imposed on someone. I am not sure who that would that come from. I guess Congress would do it, but I don't see that happening. If someone on the Task Force proposed it, how would you deal with it? You would get together, discuss it, and work out an agreement. I guess I want to discuss how this process works because the fear that I have, as well as others, is that we can work ourselves into a mode where we won't end up doing anything trying to ward against perceived threats.

That leads to a further thought I want to put out there for further consideration, which is that we really do need more resources to this effort and because of how the budget process has worked out, Congress is going to start looking at the 2008 budget. I think there will be some attempts in Congress to provide resources for action on this problem. How much it is? I don't know, and again, I don't think we should let worrying about the cost of meeting the total goal stop us from directing resources toward alleviating this problem. I hope the Administration considers this as

well. Can we get some resources in there? I think the states have been very clear that they want to see new money in there, not money shifted out of their current programs. Congress will work that out. It's not going to be as much as that first draft budget, but that's something we all understand, I think.

Again, I just want to offer those thoughts. I am concerned about us getting deflected by putting a lot of attention into potential threats that haven't even been put on the table. I understand a state like Iowa saying we can't achieve a 40 percent reduction in fertilizer use. Guess what, neither can Louisiana, but no one is asking us to do that. If it was put on the table, in this cooperative process, you would get together and decide what is feasible to do. This is also what I would hope would happen when this SAB [Science Advisory Board] process is completed and in the revision discussions as well. We have a cooperative plan that is often discussed as if it were a regulatory plan and that for some reason we need to keep that in mind as we often forget it. Thank you.

Grumbles: Next is Dan Coleman with O'Brien and Gere Engineers.

Dan Coleman: O'Brien and Gere is very involved with the Chesapeake Bay Program, particularly with respect to nutrient reduction programs for point sources, particularly municipal waste water treatment plants. My comments are going to be based on my observations and experiences over the years from that program, which can be extrapolated for use in the Gulf Program.

The first comment I have is that with the Chesapeake Bay Program nutrient loadings were identified for municipal waste water treatment plants along with other sources. The issue was that once it took awhile to get loadings and the result of that to meet the deadline in these reductions, which was set many years ago. There was not enough time for adequate improvements needed to meet the deadline. We're really on the front end of construction for these programs, and already there is a significant escalation in construction costs because there is too much work for the amount of contractors that are available in the region. And that is causing financial impacts that need to address these.

Second thing is, I believe there need to be incentives (someone mentioned incentives earlier). I think federal funding needs to be provided for these programs. In this case, the Chesapeake Bay Program has not been provided these resources and it has been a stress on municipalities to address these without proper funding. The states, in some cases, have been making funds available. For example, Maryland has a flush tax that provides 100 percent funding for upgrades, but Maryland is the most impacted by the Chesapeake Bay, so they have a high level of interest in solving this problem. Virginia, due to the lesser amount of coastline involved has provided a lesser amount of funds available and has not been a consistent source. Pennsylvania has a number of plants impacted by the Chesapeake Bay Program but does not have a funding program in place, because I think there is a function of how far you get away from the problem area. There should be federal funding identified and provided for upgrades.

If nutrient trading is going to be a part of the point source reduction strategy, that needs to be in place early in the program. For example, Virginia developed their trading program only after everyone had their loading allocations, which was too late to have a significant impact, particularly on the front end where trading would have assisted people in delaying construction, thereby gaining some time to address these issues. Whether at the state level or some other level, these programs need to be in place early in the program for point sources to take advantage of them.

Nutrient load caps for municipal waste water treatments is problematic because what I see happening is that it's not going to stop development, it's going to stop it only within the service area of the municipal treatment plants. Development I believe is still going to happen. It's going to happen farther out, contributing to urban sprawl, and contributing to nonlocalized sewage treatment facilities, small plants, and septic systems, which I think, in the long-run, is going to be very counterproductive to reducing nutrient loadings in the Bay, and I think that's something to think about for the Gulf Program. That's all I wanted to say. I appreciate the opportunity.

Grumbles: Thank you, and it is highly relevant to be talking about the Chesapeake Bay and comparing it to some of the challenges to the Gulf of Mexico. Speaking of the Chesapeake watershed, Don Boesch.

Don Boesch: I am with part of the country across the river that is concerned with decreasing dead zones and making public commitments to reverse the trend. I want to talk today about the Gulf hypoxia assessment. I appreciate the opportunity to speak here. I have also provided written comments, so I'll review them here quickly. These comments were put together by Don Scavia and I, and we have both been involved in this issue for a long time. I think I was responsible for initiating this work on Gulf hypoxia, about 23 years ago, and Don led the federal integrated assessment back in 2000 and 2001. In talking to other scientists involved in this issue back then, we're all concerned about lack of progress and implementation of the *Action Plan*. This is no surprise to you. I think you've seen this editorialized in newspapers, but we're here to offer some recommendations on how to advance it. We're also dismayed by the reassessment process that seems to be taking a very long time. It'll be about 3 years in the making for a reassessment cycle of 5 years, and it also seems to be distracting away from the original intent of reassessment in the *Hypoxia Action Plan*. There has been at least one slide since I've arrived of the adaptive management concept. It's a way to deal with uncertainties and taking steps and doing things, which I think was the original intent of the *Action Plan* goals—nutrient reductions and what the consequences are of those reductions. So our first point is to refocus the assessment. We need to the refocus assessment on primarily point of the *Action Plan*, understanding achievements of what we've learned about it and what the consequences are. The risk is the way things are going now things that are being revisited in the Assessment can be, at a minimum, distracting, and, as Doug Daigle indicated, could actually be stalling and backsliding types of activities.

This lead us to the second point that even while we are waiting for the money that hopefully as a society we'll produce to deal with this problem—and we do need money—there is a lot we can do with existing programs. I was impressed with Dean's presentation on CREP and with what they are doing in Iowa, but you can also see the scale that is disproportionate to what it's going to take. I get the impression that the things we are doing that are good, we'd probably be doing anyway even if we didn't have the *Action Plan*. So what can we do to kick it up a notch?

Third, we need to align the new Farm Bill provisions with the *Action Plan* to produce benefits. We should have a Farm Bill that promotes both sustainable agriculture and a sustainable environment. The Task Force could examine how the Farm Bill could be beneficial, including providing incentives for avoiding excessive fertilization, effective animal waste management, drainage mitigation, and wetland conservation.

Fourth, we need to decrease the effects of biofuel production in the United States. There are significant policy questions about the increased use of corn-ethanol (whether there is more fossil fuel energy consumed and its tie to greenhouse gases, increased food prices, and the

debate of having corn used as food for SUV's or people). The corn-ethanol issue could worsen hypoxia in the Gulf. These potential changes in agricultural practices could increase nutrient loading and counteract current efforts under the *Action Plan*.

In a post-Katrina world, the only way that landscapes on the Mississippi Deltaic Plain can be sustained over the long run is the kinds of large diversions near the mouth of the River, the abandonment of the Birdsfoot Delta—there is a growing scientific consensus about that—that would eject large quantities of river water directly onto the inner shelf, east or west of the delta, with the risk of increasing hypoxia due to the increased effect of stratification as well as direct nutrient loading of the water and nutrients, much of which is mixed in deep Gulf water and doesn't affect the shelf. From a Louisiana restoration perspective, they are going to need cleaner water to do this without negative, unacceptable consequences. The issue now is change in terms of the impact downriver. We're thinking just about the impact on key issues, such as how does this affect the shrimp catch, to how does this affect the options for sustainability of the whole landscape, so I hope you give that some thought as well.

Finally, my last point is to structure the research, monitoring, and modeling to this adaptive management framework is a very vibrant way to move forward to learn as we do and to cut to the chase, making sure we are spending time on need-to-know things versus nice-to-know things. From spending a good portion of my career working on the Chesapeake Bay, I am concerned of the seductive effects of this pursuit of perfection in knowledge of large predictive models. We have burned a lot of time here in the Chesapeake trying to get the numbers right, rather than implementing plans and moving forward. Now, I think we're paying the price for that, as the previous speaker said, as we come up to our goals and make progress, but still coming up a bit short. So had we begun taking the steps in the right direction, even though we didn't know exactly how far we had to go early on, I think we'd be much further along. So thanks very much.

Grumbles: Thank you, Don. Next is John Devine with the Natural Resources Defense Council.

John Devine: Thank you very much. Thank you for holding this meeting and thank you for your concern with hypoxia. I will be very brief because many of my concerns have already been discussed. Today I have delivered a letter from 15 national, regional, and local groups concerned about the hypoxia problem. In general, what the letter says is that we're concerned with lack of progress in addressing the problem and in implementing the *Action Plan* and concern with the Task Force's seeming greater interest in reassessing the plan over the next year or so. So we hope that you to will take a look at that. And that is all that I had to say. Thank you very much.

Grumbles (for Sylvia Malm): Thank you. I'd also like to note that Sylvia Malm, if she were here, would give her comments. She actually works for the Office of Groundwater and Drinking Water at USEPA. She wanted me to share her comments that throughout this meeting, she has been struck by the common challenges of addressing nitrates in the Gulf hypoxia context and in source water protection under the Safe Drinking Water Act (SDWA). This effort is another opportunity to integrate statutes and missions and objectives in a constructive way, and that the SDWA, when it was amended in1996, required states to assess potential threats to sources of drinking water. Given our challenge with the Gulf hypoxia, this is a source-water protection and pollution-prevention issue. It is a great opportunity to integrate various efforts and also to achieve local benefits for reducing nitrates in drinking water and achieving the objectives of the source water protection programs. That's a perspective from the office that deals with drinking water at USEPA.

As usual, we've had many insightful and eloquent statements made in the public comment section.