

The Need

- **The Upper Mississippi River transports the bulk of the nutrients and pollutants which contribute to the size of the Dead Zone in the Gulf of Mexico, an oxygen-starved area that cannot support life.**



The Need

- **The Mississippi River is divided into six major hydrologic subbasins defined by the U.S. Geological Survey**
 - Upper Mississippi
 - Lower Mississippi
 - Missouri
 - Ohio
 - Tennessee
 - Arkansas-Red-White



The Need

- **Public and scientific views of wetlands have changed greatly over time. Only a few decades ago, wetlands generally were considered to be of little or no value. It is now recognized that wetlands have beneficial functions such as wildlife habitat, floodwater retention, protection of the land from erosion, shoreline protection in coastal areas, and water-quality improvement by filtering of contaminants.**

The Need

- **The Dead Zone in the Gulf of Mexico is the largest in North American and the second largest in the world.**
- **Dead zones occur not only in the Gulf, but in the many streams and rivers of the Mississippi River watershed.**
- **The Gulf Dead Zone is caused, in large part, by how people in 31 states use and abuse their rivers and the adjacent lands.**

Upper Mississippi River Basin

- **The UMRB is a highly regulated and degraded ecosystem: The mainstem Mississippi River bears little resemblance to the natural, free-flowing river system of the past, and the lands surrounding the tributary watersheds have been extensively changed by human settlement and commerce.**
- **The downstream effects of a single dam can alter the character of an entire watershed (Master et al. 1998), resulting in the destruction of native plant and animal communities, and an overall reduction of natural biodiversity.**

Characteristics of a Healthy River

- **A natural flow that varies in magnitude, frequency, duration, timing, and rate of change**
- **Transportation of sediment and nutrients**
- **Strong and varied plant communities**
- **Productive and diverse habitat that can support numerous animal species**
- **Good water quality**
- **Many macro invertebrates (bugs!)**
- **Diversity of fish and wildlife species**
- **A community that protects it through wise management and community planning**

Impervious Cover: Roofs and Roads

- A number of studies show that water quality is significantly degraded once the impervious cover in a watershed reaches ~10% (Booth 1991, Booth and Reinelt 1993, MWCG 1995). When pavement covers 20% of a watershed, the risk of flooding starts increasing by 10%.
- As the percent impervious cover increases, urban pollutant loads increase (Schueler 1987), stream temperature increases (Galli 1991), channel stability and fish habitat quality decreases (Booth 1991), as do aquatic insect diversity and abundance (Klein 1979, Jones and Clark 1987).

Upper Mississippi River Basin

- About half of the **30 million residents** of the watershed rely on the water from the Upper Mississippi River and its tributaries for municipal and industrial water supplies.
- It is critical habitat for 286 state-listed or candidate species and 36 federal-listed or candidate species of **rare, threatened or endangered plants and animals** endemic to the Upper Mississippi River Basin.

Human Changes on the River

- Levee construction, resulting in a 50% reduction in floodplain area.
- Construction of 36 locks and dams, converting most of the free-flowing river into a series of slackwater “pools.”
- Channelization of the formerly meandering river to maintain the nine-foot navigation channel.
- Human settlement and use of the watershed degraded water quality and increased the amount and altered the rate of sediment and nutrient flows.
- Connecting Lake Michigan to the Illinois River created a pathway for invasion of non-native species.

What Do People Know?

- **94% of Americans say that environmental issues are important, yet over 65% cannot define basic terms such as wetland, watershed, non-point source pollution, and riparian zone.**
- **86% of Americans do not know that riparian refers to the banks of a river or stream.**

What Do People Need to Know?

- **Basic Definitions.** If populations do not know the difference between a wetland and a watershed, they will be less likely to understand Total Maximum Daily Loads (TMDL).
- **TMDL is the maximum amount of pollution that a waterbody can assimilate without violating state water quality standards.**

Watersheds Can Benefit from Wetlands

- Improve water quality by breaking down, removing, using or retaining nutrients, organic waste and sediment carried to the wetland with runoff from the watershed
- Reduce severity of floods downstream by retaining water and releasing it during drier periods.
- Protect stream banks and shore lines from erosion.
- Recharge groundwater, potentially reducing water shortages during dry spells.
- Provide food and other products—such as commercial fish and shellfish—for human use.
- Provide fish and wildlife—including numerous rare and endangered species—food habitat, breeding grounds, and resting areas.
- Increase opportunities for recreation—bird watching, waterfowl hunting, photography—and outdoor education.

Watersheds Hurt by Loss of Wetlands

- **Twenty-two states have lost at least 50% of their original wetlands since the 1780s.**
- **Seven states—Indiana, Illinois, Missouri, Kentucky, Iowa, California and Ohio—have lost over 80%.**
- **Since the 1970s states with the most losses are Louisiana, Mississippi, Arkansas, Florida, South Carolina and North Carolina.**
- **Wetlands drained for agricultural purposes has been reduced while development continues to account for a larger percent.**

Source Mitch and Gosselink, Wetlands, 2nd Edition, Van Nostrand Reinhold, 1993

What Do People Know?

- **The National Geographic–Roper 2002 Global Geographic Literacy Survey poll showed that 11% of young U. S. citizens could not locate the United States on a world map.**
- **Of these students, 29% could not locate the Pacific Ocean.**

What Do People Know?

- **Ninety percent of high school seniors do not have an adequate grasp of important people, events, and concepts in American history.**
- **One-third of fourth-graders and eighth-graders do not meet a basic threshold of knowledge either.** (U.S. History National Assessment of Educational Progress report)

Yet Some Solutions Can Be Simple

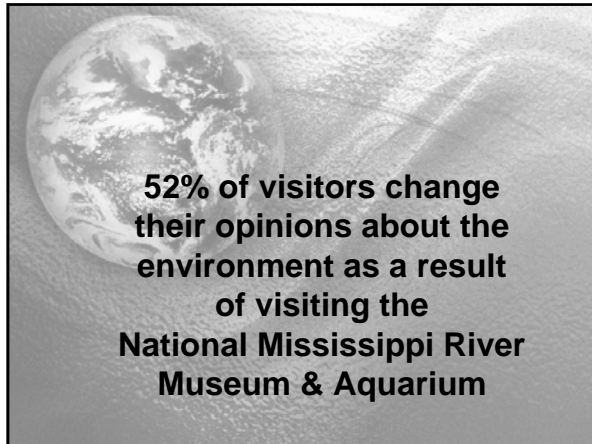
- **Mulch mowing lawns can provide up to 25% of fertilizer needs, reducing the amount of fertilizer in the watershed.**
- **Sweeping a driveway instead of hosing it down saves 150 gallons of water and keeps pollutants such as motor oil out of the watershed.**



Yet Some Solutions Can Be Simple

- **Drop off motor oil at a recycling center. Approximately 60% of Americans change their own oil. Due to the lack of convenient collection facilities, these do-it-yourselfers simply dump the used motor oil into the environment. Over 200 million gallons of oil, or the equivalent of 5 oil tankers the size of the Exxon Valdez spilling their entire load, is tossed in the garbage or poured down the sewer every year.**





Our Goal


- **50% increase in literacy – 2.5 million people in first five years.**
- **Ultimate change in human understanding and behavior.**

... Rivers to the Sea can make a difference in peoples' understanding of the rivers and oceans in the United States. We must implement Rivers to the Sea and other programs for the future of our planet.




Jean-Michel Cousteau
*Founder and President
Ocean Futures Society*

- **Current Audience of 230,000 people annually**
- **Visitors come from all 50 states and over 70 foreign countries**



NATIONAL MISSISSIPPI RIVER MUSEUM & AQUARIUM
IN ASSOCIATION WITH THE SMITHSONIAN INSTITUTION

Rivers to the Sea



Gulf of Mexico Aquarium

Iowa Will Play a Major Role in Watershed Education:

- Water Quality
- Hypoxia Reduction
- Improved Agricultural Practices
- Education
- Environment
- History
- The future of the Mississippi River and the rivers of America.

Smithsonian Ocean News Kiosk



Rivers to the Sea

What's In Water? Let's Shrink and Find Out!

What's Your Watershed Address?



River and Gulf Interactive Model



Rivers to the Sea

Hey, That's My River!

What Can I Do?



Hurricane Theater



Children's Splash Zone

Crawl Through a Coral Tunnel

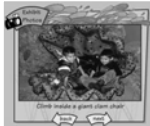
Create Your Own Waves

Discover Animals' Secrets



Sit in a Giant Clam Chair

Ride on Sea Creatures



National Rivers Hall of Fame

- The people of America's Rivers and the major waterways in America

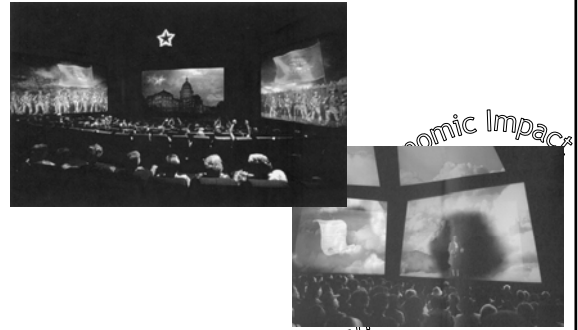


National Rivers
Hall of Fame

RiverMax Theater



A Theater that will engage guests in the "Experience" of America's rivers



River Research Center

- **Conservation Research**
 - Habitat Restoration
 - Captive Breeding Program
- **Water Quality Research**
- **Cultural Research**
 - Captain William Bowell Library

Species Conservation



Water Quality Research

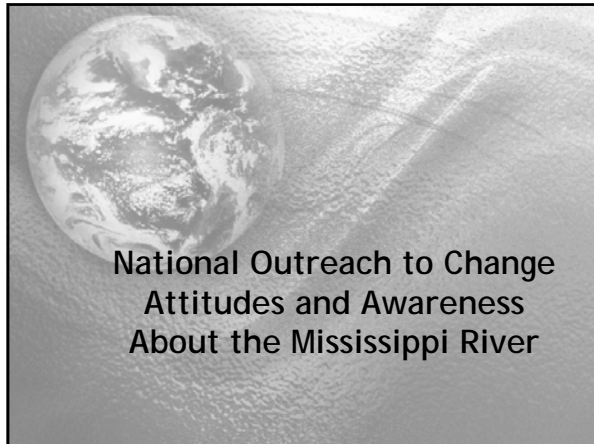


Testing Water Quality at Summer Camp

Cultural Research



Collections of the Captain William Bowell, Jr. Library



- ### The Museum is Leading a Consortium of 35 River-Focused Organizations for the Mississippi River
- American Land Conservancy
 - American Rivers
 - Coalition to Restore Coastal Louisiana
 - Ducks Unlimited
 - Environmental Defense
 - Friends of the Mississippi River
 - Great River Greening
 - Great Rivers Habitat Alliance
 - Great Rivers Land Trust
 - Green Lands, Blue Waters
 - Gulf Restoration Network
 - Illinois Stewardship Alliance
 - Institute for Ag & Trade Policy
 - Iowa Environmental Council
 - Iowa Natural Heritage Foundation
 - Lower Mississippi River Conservation Committee
 - Mississippi River Basin Alliance
 - Mississippi River Natural and Recreational Corridor
 - Mississippi River Trail
 - National Audubon Society
 - National Fish and Wildlife Foundation
 - National Wildlife Federation
 - National Mississippi River Museum & Aquarium
 - Parks & Trails Council of Minnesota
 - River Action
 - Saint Paul Riverfront Corporation
 - The Conservation Fund
 - The Nature Conservancy
 - The Wetlands Initiative
 - Trailnet/Confluence Greenway
 - Trust for Public Land
 - Upper Mississippi River Basin Association
 - US Business Council for Sustainable Development
 - US Fish & Wildlife Service
 - West Wisconsin Land Trust

River Restoration Benchmarks *Land*

DRAFT Attachment B Restoration Plan Targets for Land, Water and People Goals and Objectives DRAFT

OBJECTIVES	Count	LMB	UWB	Notes
Objective L1: Protect (i.e. no net loss) wetlands, forests and prairie within the floodplain (includes lands between the levees, if levees present)				categories sufficient. Restore natural mosaic, and important wetlands, forests and prairie in basin
A. Bank protection and maintain natural functions of active floodplain lands	250,000 acres (this may be significantly more than is net changed as a result of RFP)	250,000 acres (no net loss)	600,000 acres	Leads to LMB and UWB targets. LMB is 20% of UWB. UWB is 600,000 acres in ag lands with 50% of that targeted for protection. In some programs (e.g. RFP, etc.)
B. Protect and sustainably manage current levels of large tract forests, prairie, and wetlands on the basin	address 1 million acres of large protected forests and prairie			Need to sustain manage flood on national scale. Priority in current RFP. Check with FWS

- ### River Restoration Benchmarks *Land*
- Objective L1: Protect (i.e. no net loss) wetlands, forests and prairies within the floodplain (includes lands between the levees, if levees present)**
 - Categories: bluffslands, floodplain, channel mosaic, and important wetlands, forests and prairie in basin
 - Objective L2: Restore, reconnect and maintain levee lands and waters within the floodplain using economically sustainable solutions**
 - Link to environmental and economic outcomes, and ecosystem functions (e.g. flood damage reduction, water quality, biodiversity)
 - Objective L3: Protect and restore river habitat (islands, side channels, aquatic plants, etc.)**

River Restoration Benchmarks *Water*

DRAFT Attachment B Restoration Plan Targets for Land, Water and People Goals and Objectives DRAFT

OBJECTIVES	Count	LMB	UWB	Notes
Objective W1: Reduce pollutants in waters entering the Mississippi River		30% reduction in nitrogen if reduction in important waters		
A. Reduce pollutants from agriculture and urban runoff				Need to define a target for baseline water and water supplies using state of charge and baseline water management for drinking water. No target for UWB.
B. Restore and maintain wetlands to capture pollutants				Targets from NRCSS, USFWS, EPA, etc.
C. Improve drainage management to reduce pollutants				Agricultural Drainage Management Systems
Objective W2: Restore habitat for wildlife, recreation and fishing	1 million acres of wetland and 1 million acres of riparian buffer and prairie in the basin			FSA, NRCS, USFWS and NRP
A. Increase wetland/riparian habitat cover in key wetland and riparian lands				Targets from NRP

- ### River Restoration Benchmarks *Water*
- Objective W1: Reduce pollutants in waters entering the Mississippi River**
 - Objective W2: Restore habitat for wildlife, recreation and fishing**
 - FSA, NRCS, USFWS and HAP
 - Objective W3: Reduce flood damage**
 - Need damage costs from FEMA (6.5 million annually) NWF, insurance companies (by county)

River Restoration Benchmarks *People*

DRAFT Attachment B
Restoration Plan Targets for Land, Water and People Goals and Objectives DRAFT

PEOPLE				
<p>Goal: The People of the Mississippi and the Nation trust the Mississippi as a national treasure to be protected, restored, enjoyed and sustainably managed and a resource that enriches both the economy and the quality of life.</p> <p>People need to be more connected to the Mississippi River. All citizens, including those who live along the shoreline of the Mississippi River Basin will have a better knowledge and awareness of environmental benefits and steps that they can take to achieve cleaner lands and water.</p>				
OBJECTIVES	Goal	LWR	WRM	Notes
Objective P1: Increase number of people connected to the river				
A - Increase the number of visits to river-related museums, interpretive centers, wildlife refuges, parks, events, trails, and programs and provide for exhibits that explicitly explain and interpret the messages of the Group.		achievable		Need to identify which resources, parks and refuges and their current attendance figures (as baseline). Current attendance for refuge is 3.7 million
B - Increase accessibility and number of access points		achievable		Need to identify current number of points of access. Goal: access 200 points to golf
C - Increase number of River school districts using MS River in curriculum				GAP - need data on # of current school districts with curriculum already and total number of SDsD
D - Mississippi River Trail will be complete, safe and usable		100%		Mississippi River Trail will be complete, safe and usable
Objective P2: Mobilize citizens and elected officials at all levels in support of river restoration				

River Restoration Benchmarks *People*

- Objective P1: Increase number of people connected to the river
- Objective P2: Mobilize citizens and elected officials at all levels in support of river restoration
- Objective P3: Improve the economic well being of the people through sustainable, natural resource- based economic development while being mindful of rural and urban communities

River Restoration Benchmarks *People*

Objective P1: Increase number of people connected to the river

- A - Increase the number of visits to river-related museums, interpretive centers, wildlife refuges, parks, events, trails, and programs and provide for exhibits that explicitly explain and interpret the messages of the Group.
 - Need to identify which museums, parks and refuges and their current attendance figures (as baseline) Current attendance for refuge is 3.7 million
- B - Increase accessibility and number of access points
 - Need to identify current number of access (as baseline) Boat access - 517 Itasca to gulf
- C - Increase number of River school districts using MS River in curriculum
 - GAP - need data on # of current school districts with curriculum already and total number of SDsD - Mississippi River Trail will be complete, safe and usable
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River Restoration Benchmarks *People*

Objective P2: Mobilize citizens and elected officials at all levels in support of river restoration

- A - Increase communications with 53 Reps, 20 Senators, and 10 govts
 - There are 32 congressional districts, plus 3 that border the Gulf. 69 state senate and 122 state assembly districts along the banks, plus 10 state senate and 12 assembly districts along the Gulf coast. Entirety of states that border of the Mississippi = 79 federal districts, plus 439 state senate and 1,037 state assembly districts
- B - Cultivate and support high profile/influential public and private champions for River restoration
- C - Recruit community foundations, businesses, private industry, trusts, corporations, NGOs and individuals to invest/join in River restoration
 - There are 22 Community Foundations
- D - Develop watershed plans for impaired waters
 - 9 major watersheds (USGS)
- E - Engage the River communities in some river related activity

River Restoration Benchmarks *People*

Objective P3: Improve the economic well being of the people through sustainable, natural resource- based economic development while being mindful of rural and urban communities

- A - Create a loose association of cities and/or counties on riverfronts that will meet annually to share best practices related to sustainable economic development opportunities and environmental restoration projects

Conference on River and Ocean Literacy

June 7-8, 2006



CoOL Participants

- Delta Cultural Center
- Effigy Mounds National Monument
- E.B. Lyons/Mines of Spain
- Historic New Orleans Collections
- Iowa DNR Guttenberg Fish Hatchery and Aquarium
- Mark Twain Boyhood Home and Museum
- Mississippi River Museum at Mud Island
- Mississippi River Visitor Center
- Mississippi Valley Welcome Center
- Muscatine History and Industry Center
- Nahant Marsh Education Center
- National Eagle Center
- National Great Rivers Museum
- National Mississippi River Museum & Aquarium
- Putnam Museum
- Science Museum of Minnesota
- Stonefield State Historic Site
- Villa Louis

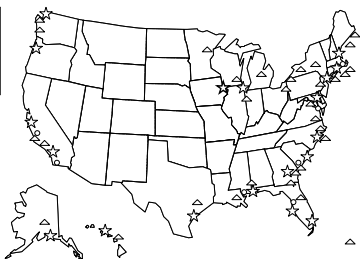
Wyland Ocean Challenge - Barging Down the Mississippi



Ocean Literacy Coalition Network:

Includes Coastal America - 22 ecosystem learning centers that serve 25 million people a year

Table	
CELCA -	☆
COSEEs -	○
Sea Grant Programs -	△



The National Mississippi River Museum & Aquarium is on the Executive Committee of the Coastal America Coastal Ecosystem Learning Center which will implement the Ocean Literacy Coalition Network.

62 Museums in Mississippi River Network of Museums



Reading List

- **Conservation Priorities for Fresh Water Biodiversity in the Upper Mississippi River Basin (NatureServe and The Nature Conservancy, 2003, <http://www.natureserve.org/publications/upperMSriverbasin.jsp>)**
- **A River That Works (Upper Mississippi River Conservation Committee, January 2003, <http://www.mississippi-river.com/umrcc/index.html>)**
- **Citizens' Agenda for Rivers (American Rivers, http://www.americanrivers.org/site/PageServer?pagenam=hr_read)**