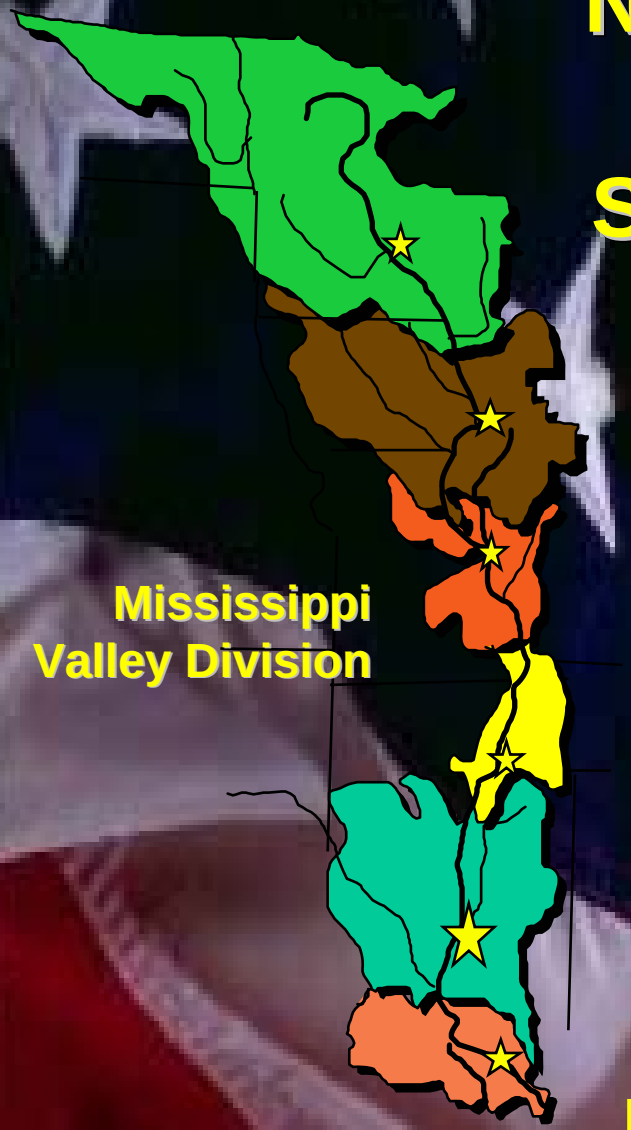


Navigation & the Environment: Recommendations for a Sustainable Upper Mississippi River - Illinois Waterway Navigation System

NFRPA
Sept 13 2006

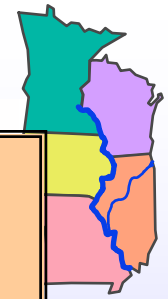
Ken Barr Corps of Engineers

Upper Mississippi River System

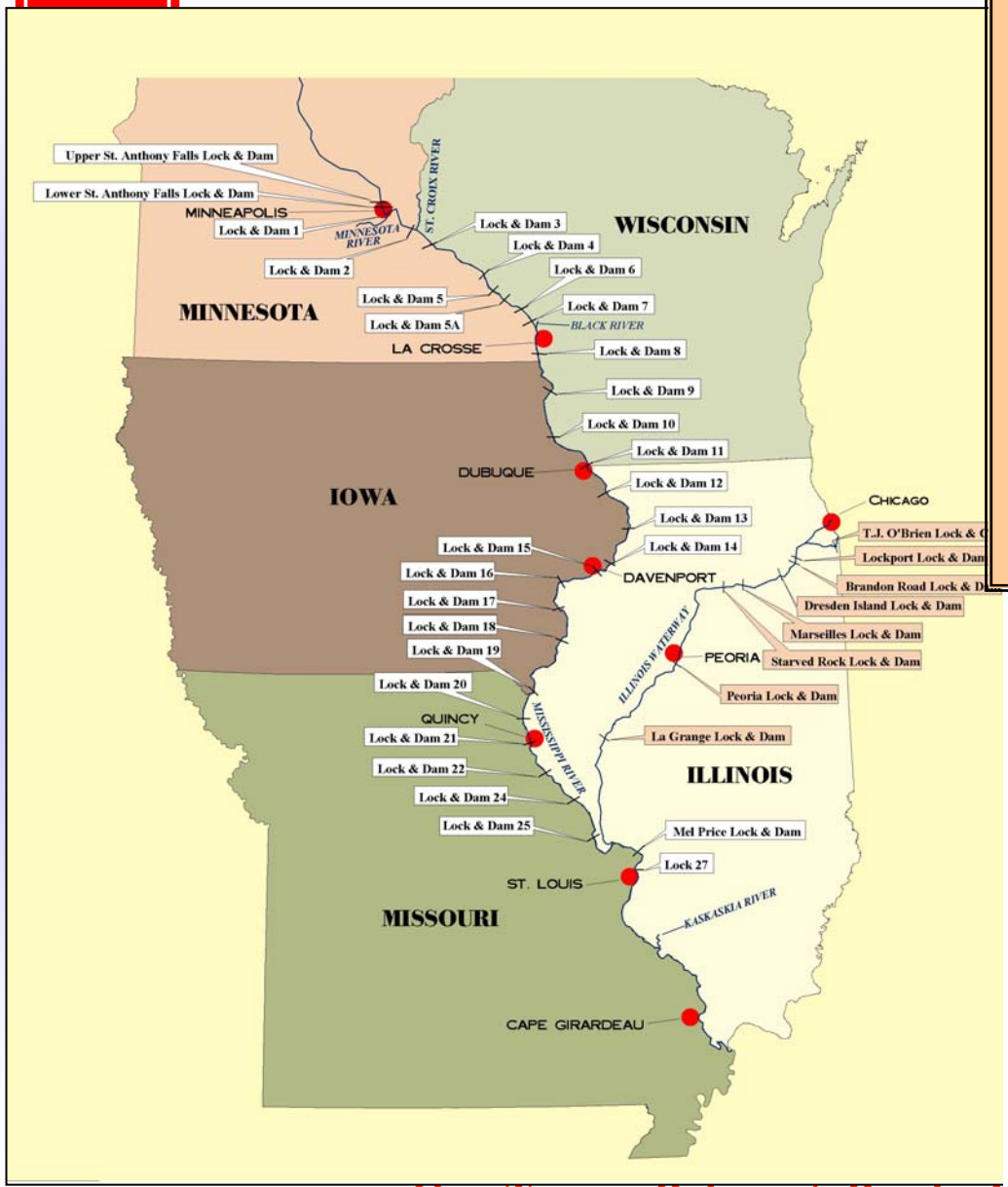
Navigation and Ecosystem Sustainability Program

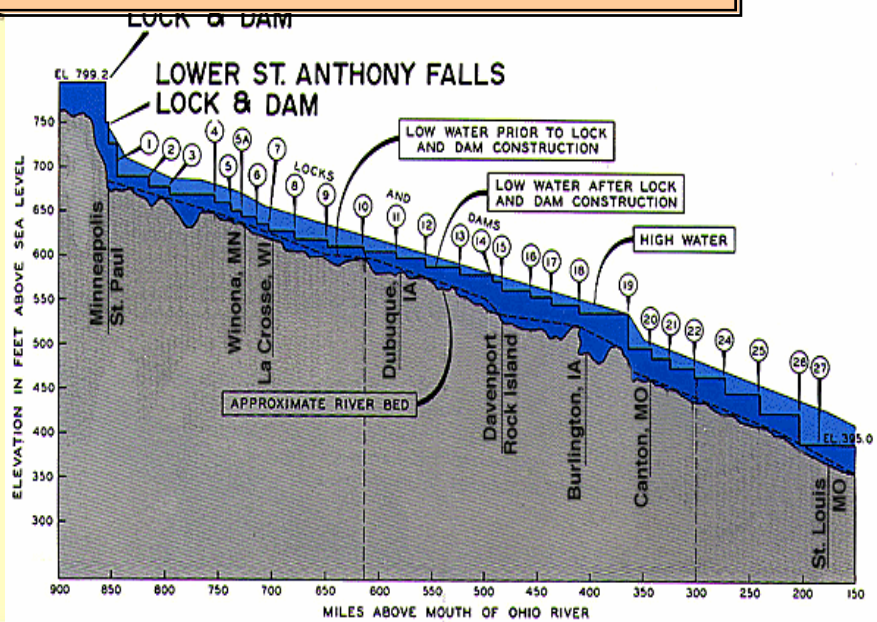
One Team: Relevant, Ready, Responsive and Reliable

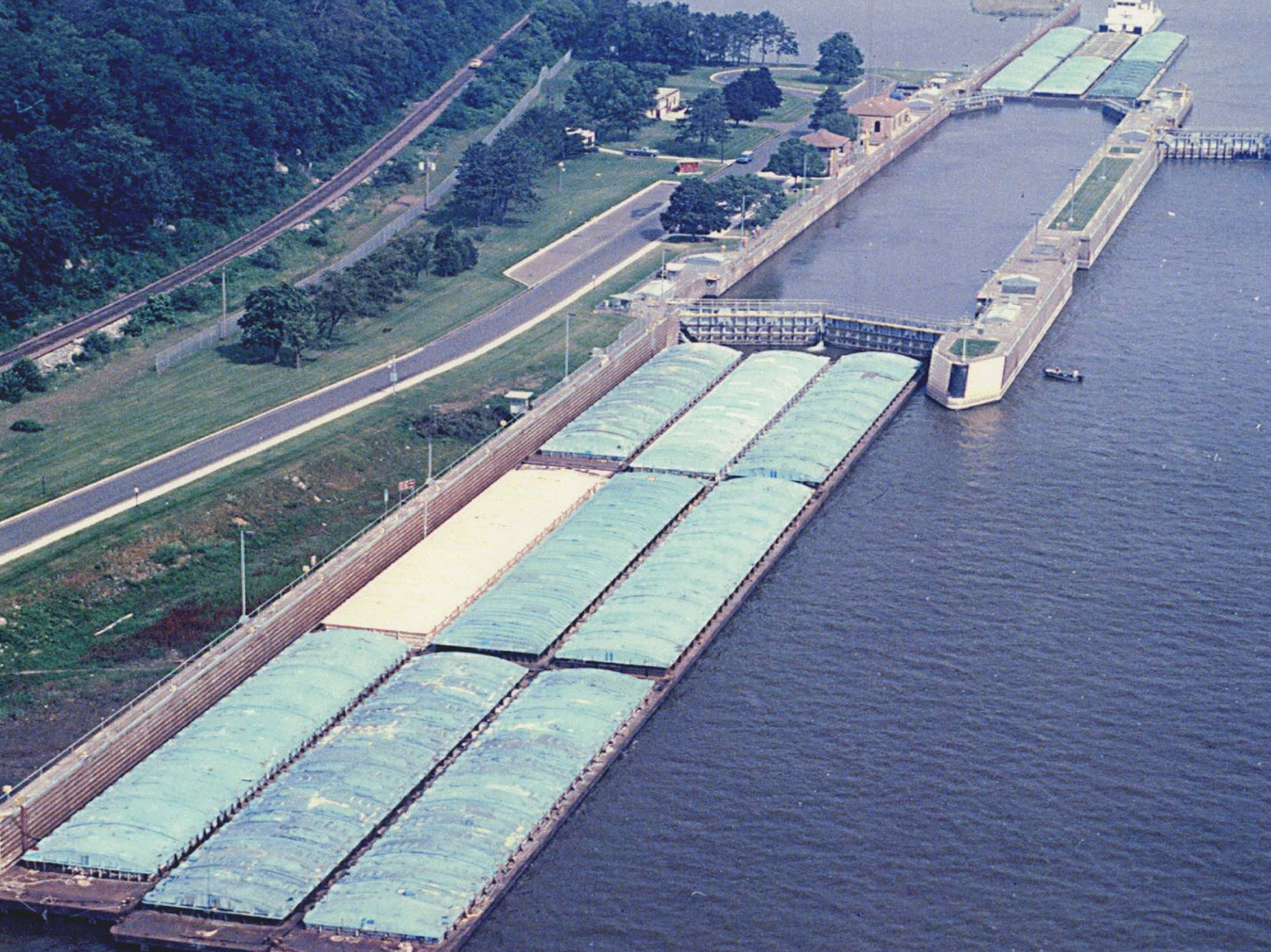
UMR-IWW NAVIGATION SYSTEM



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

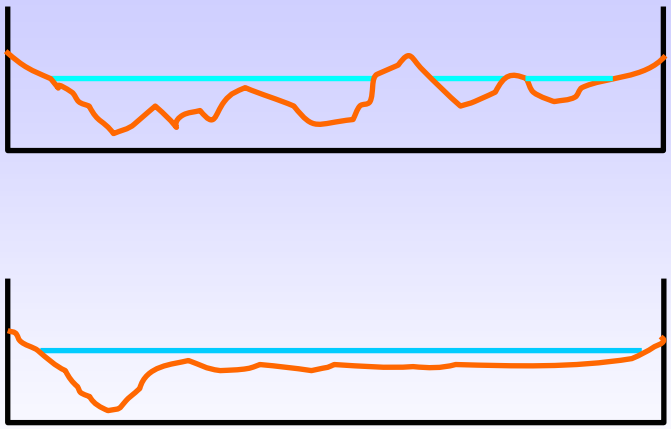


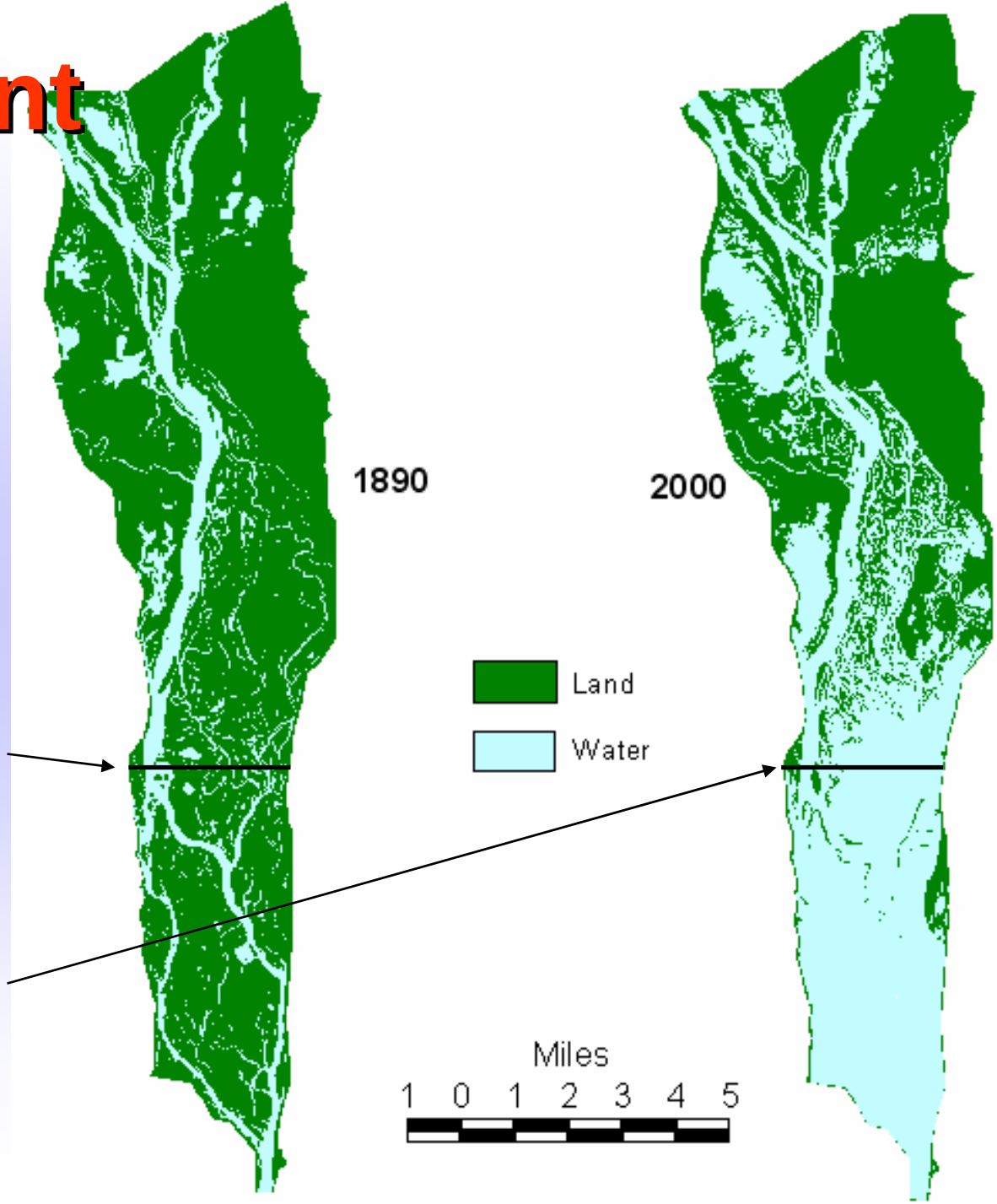




Impoundment & Loss of Diversity

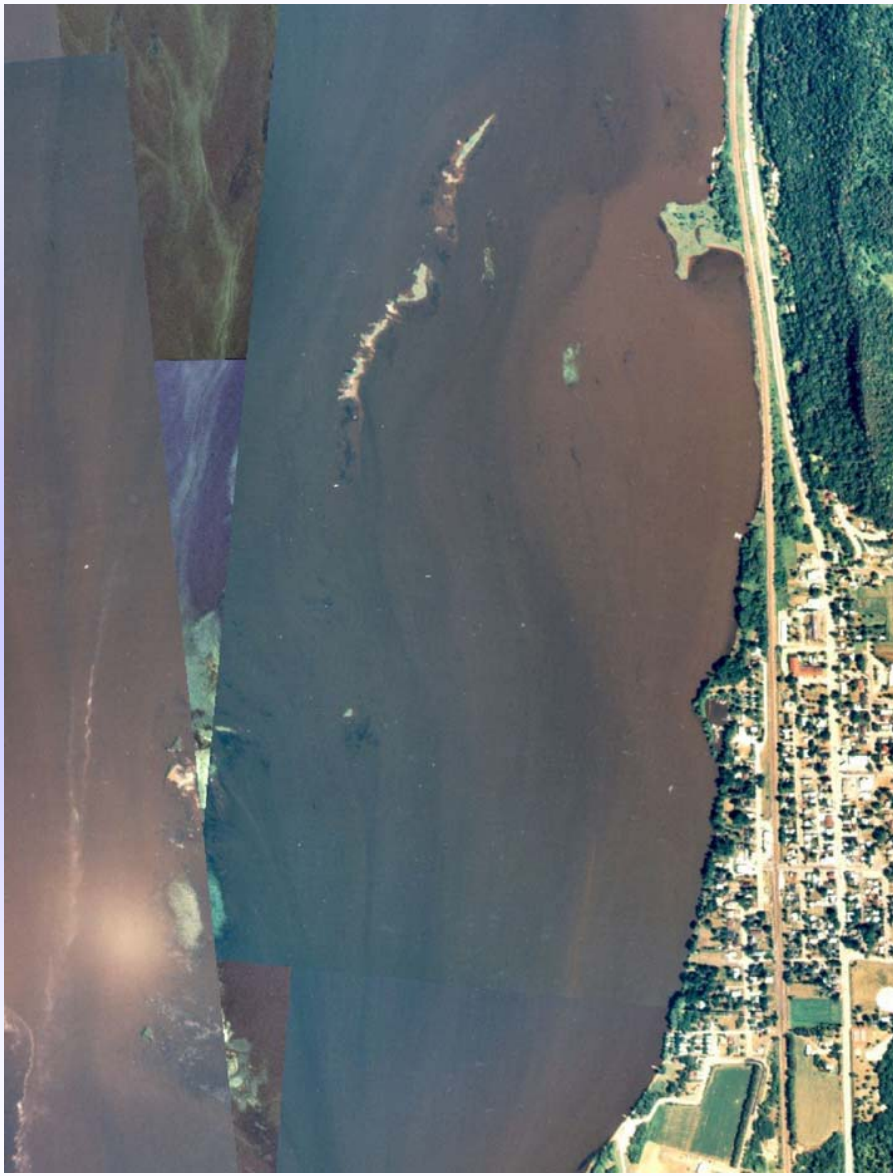
Channel Cross-section





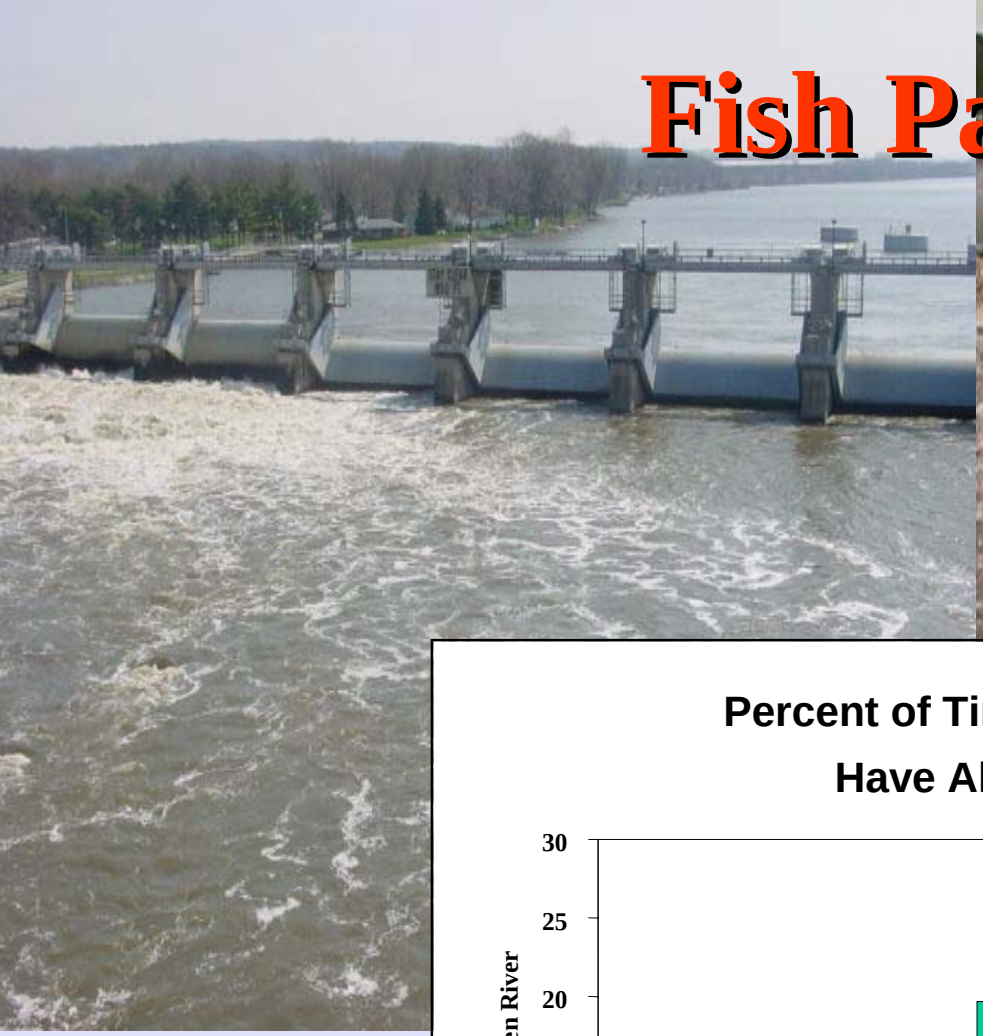
Loss of Island Habitat

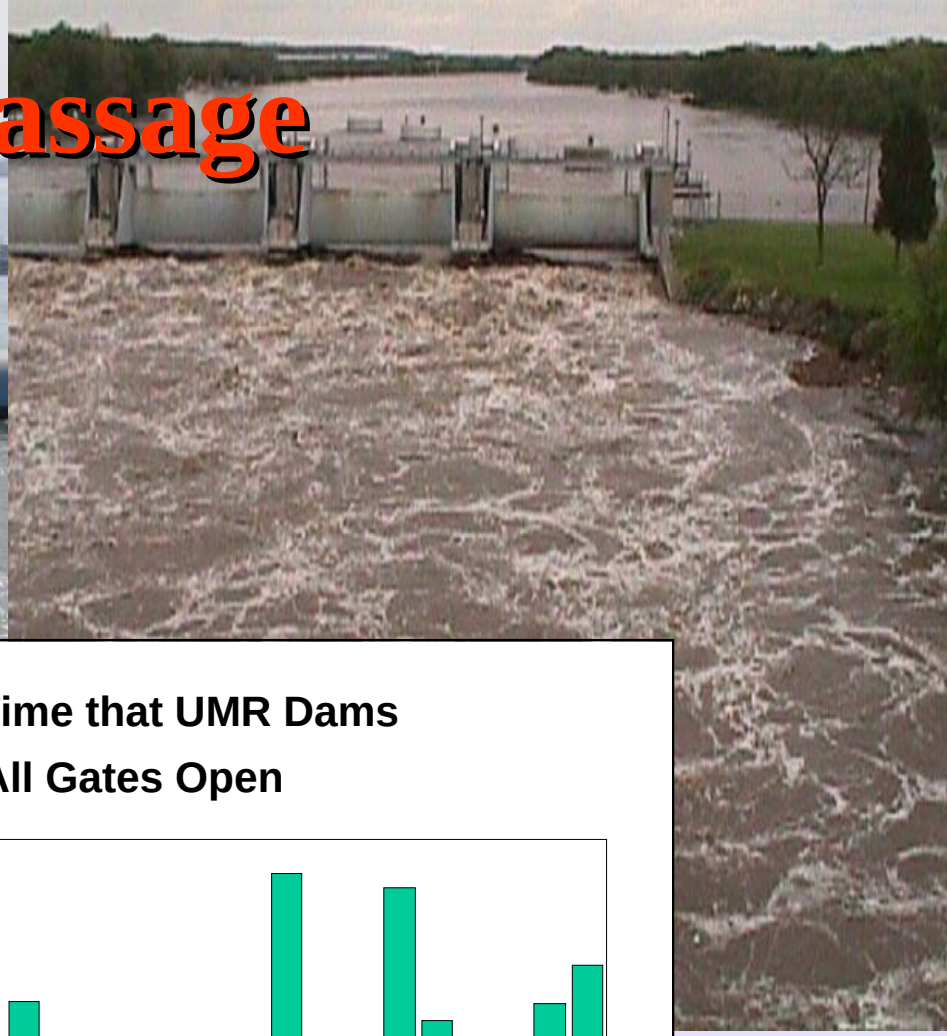
October 1961

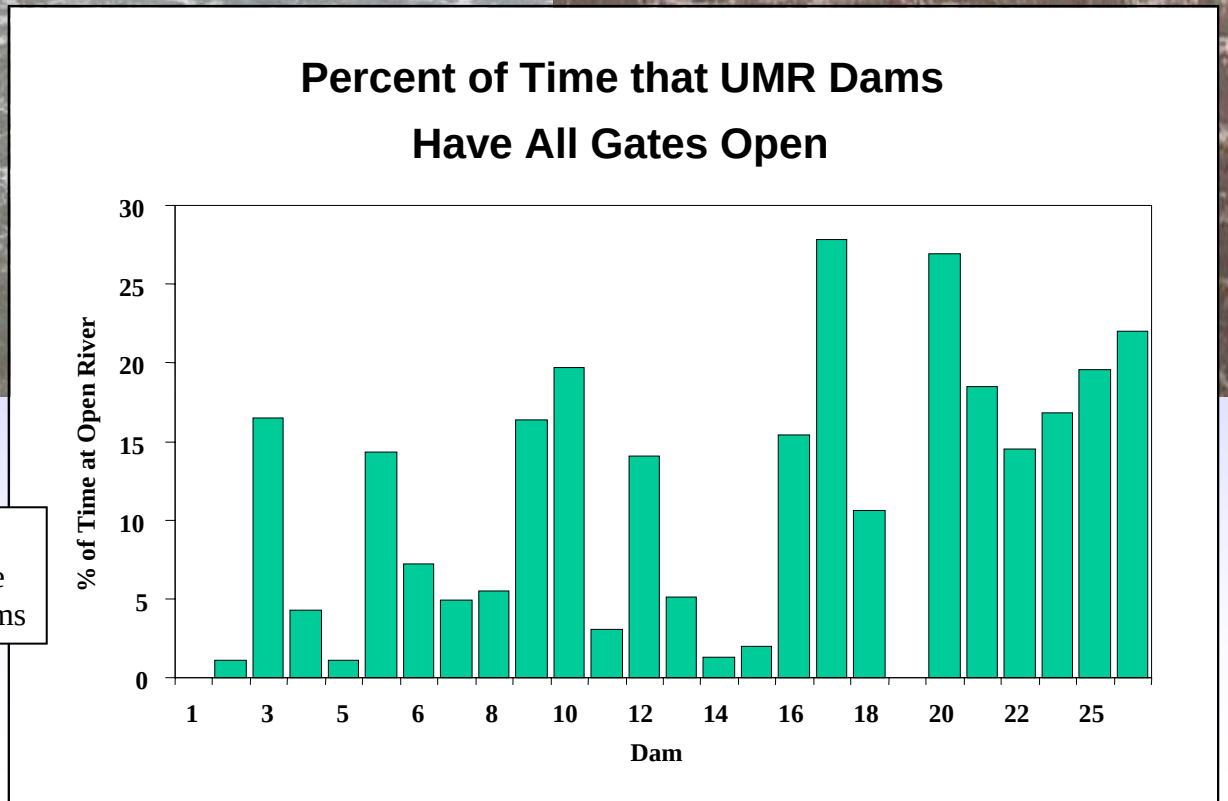


August 1994

Fish Passage







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

Migratory Fish Species of the UMR

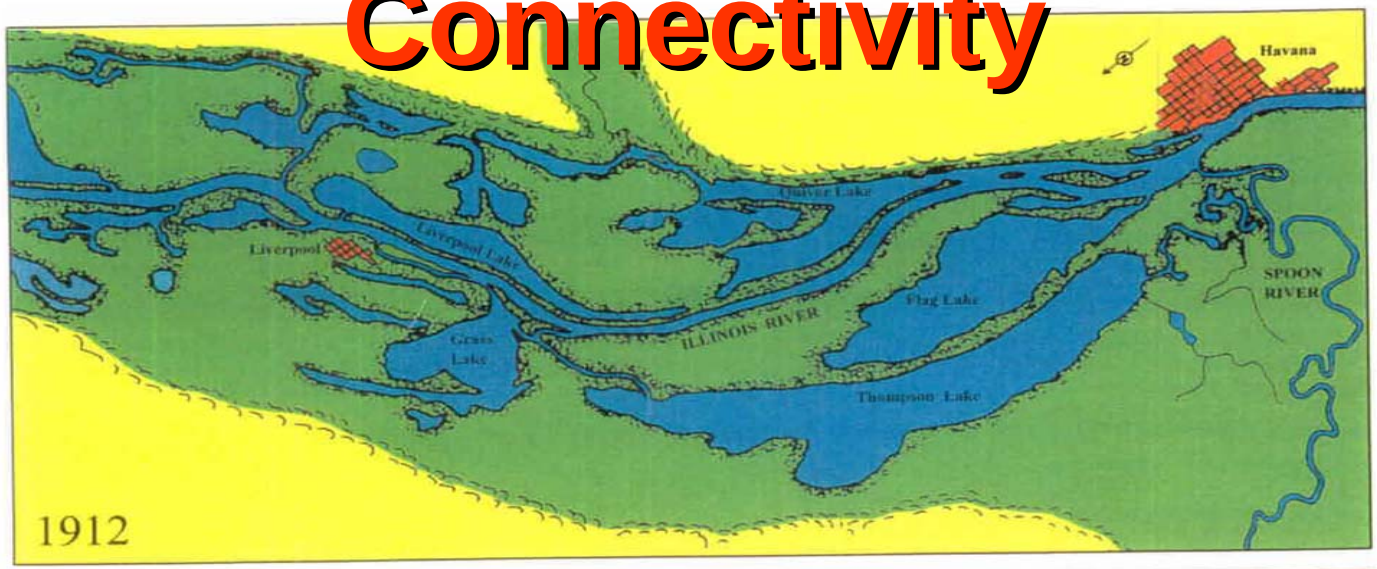
American eel
spotted sucker
silver lamprey
shorthead redhorse
lake sturgeon
black redhorse
pallid sturgeon[A]
golden redhorse
longnose gar
silver redhorse
shovelnose sturgeon
northern hog sucker
goldeye
white sucker
mooneye
channel catfish
paddlefish[B]
blue catfish

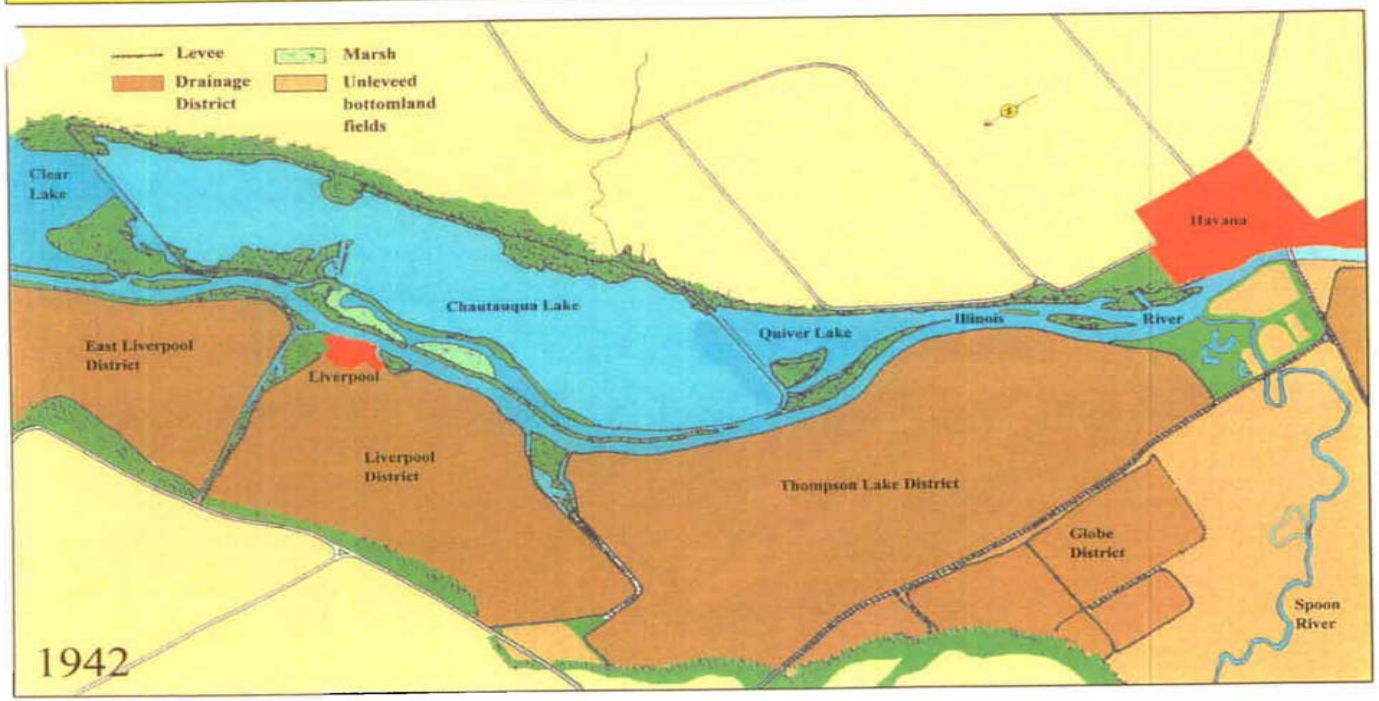
Alabama shad
flathead catfish
skipjack herring
white bass
gizzard shad
yellow bass
threadfin shad
northern pike
blue sucker[B]
smallmouth bass
smallmouth buffalo
largemouth bass
bigmouth buffalo
sauger
quillback
walleye
highfin carpsucker
freshwater drum

[A] federally listed endangered species

[B] candidate for federal listing

Loss of Floodplain Connectivity

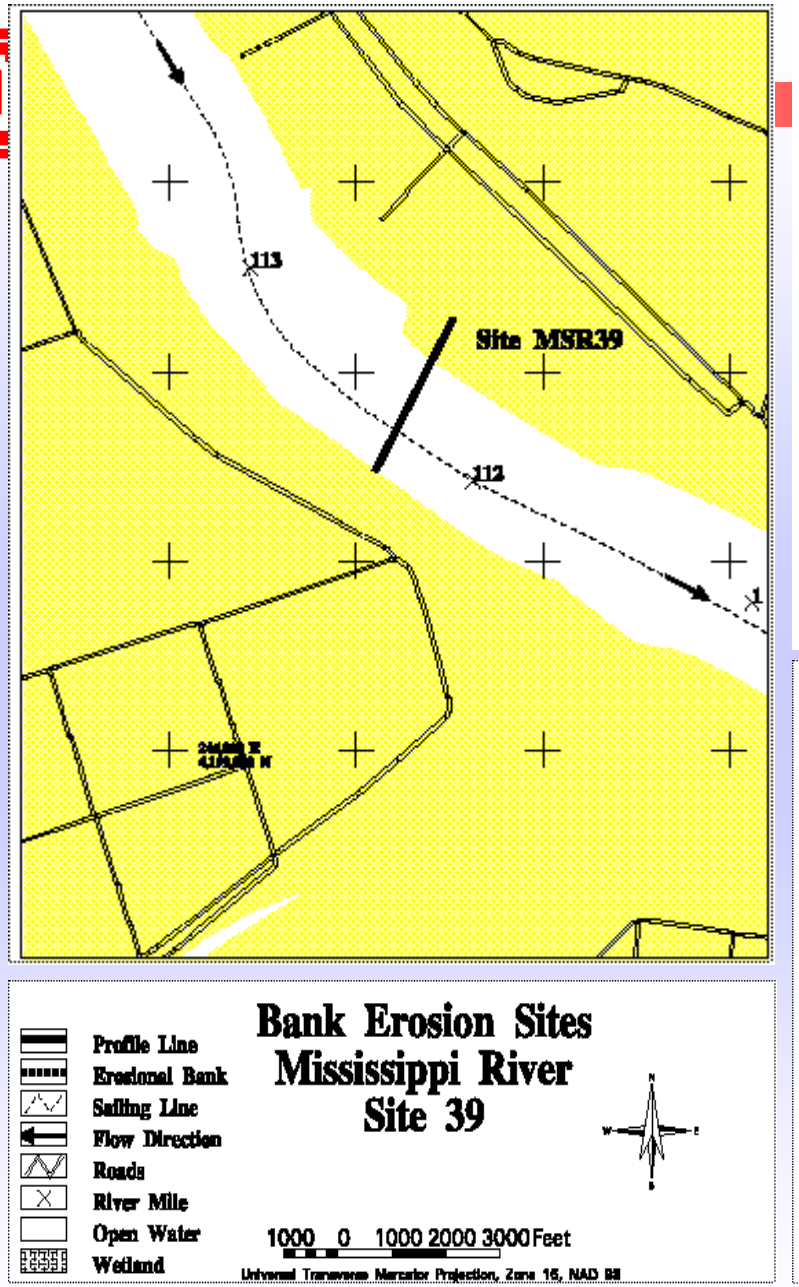




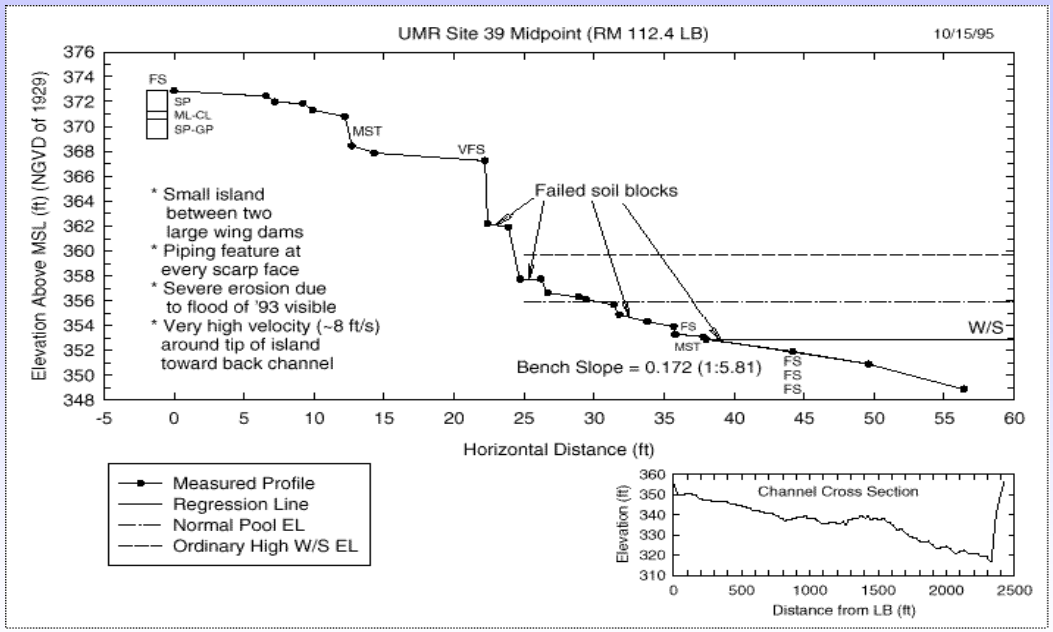
System Impacts

System Impacts

- Fish
- Plants
- Mussels
- Bank Erosion
- Backwater Sediment



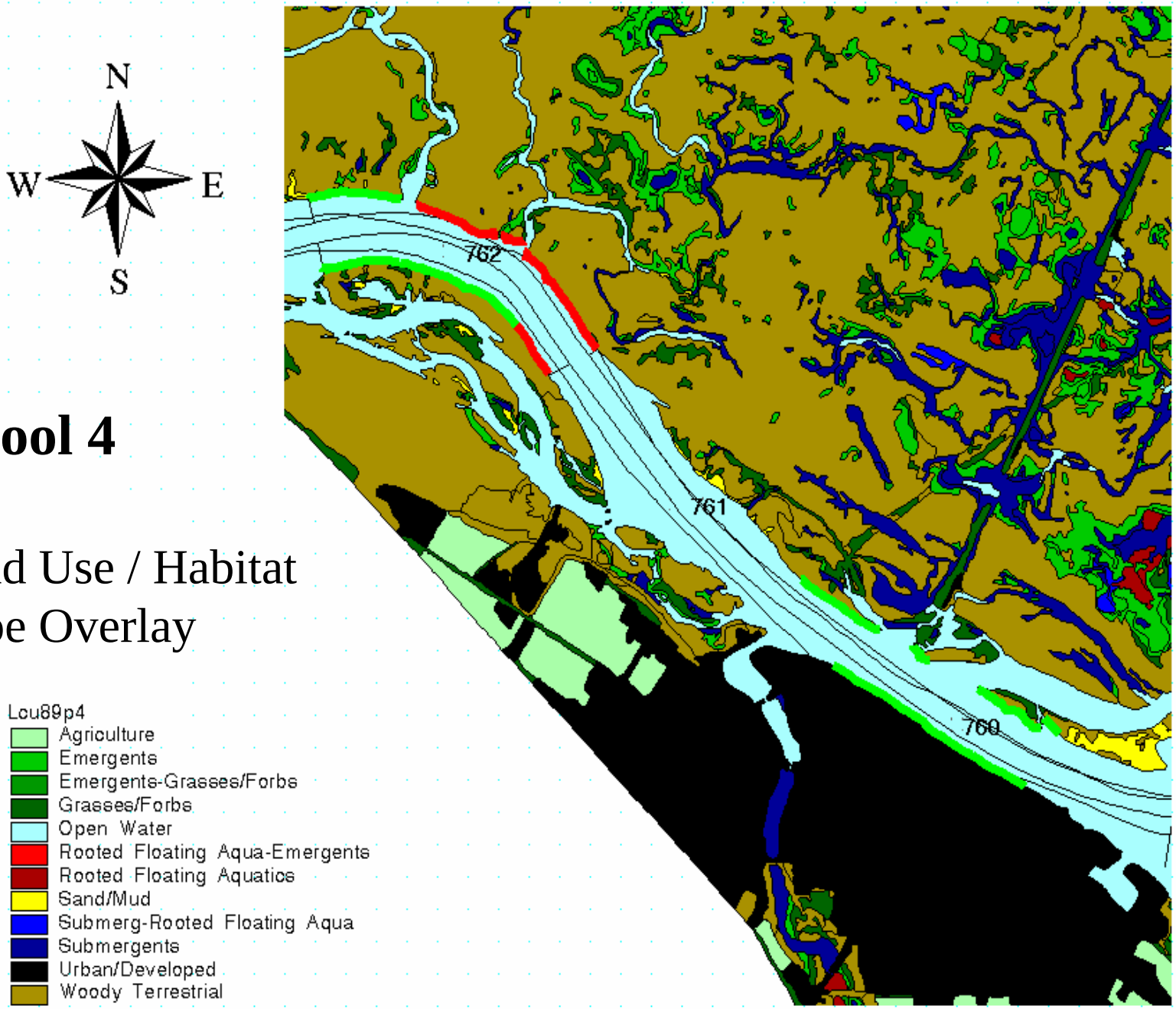
113
Site MSR39
112
Bank Erosion Sites
Mississippi River
Site 39
Profile Line
Erosional Bank
Sailing Line
Flow Direction
Roads
River Mile
Open Water
Wetland
1000 0 1000 2000 3000 Feet
Universal Transverse Mercator Projection, Zone 16, NAD 83



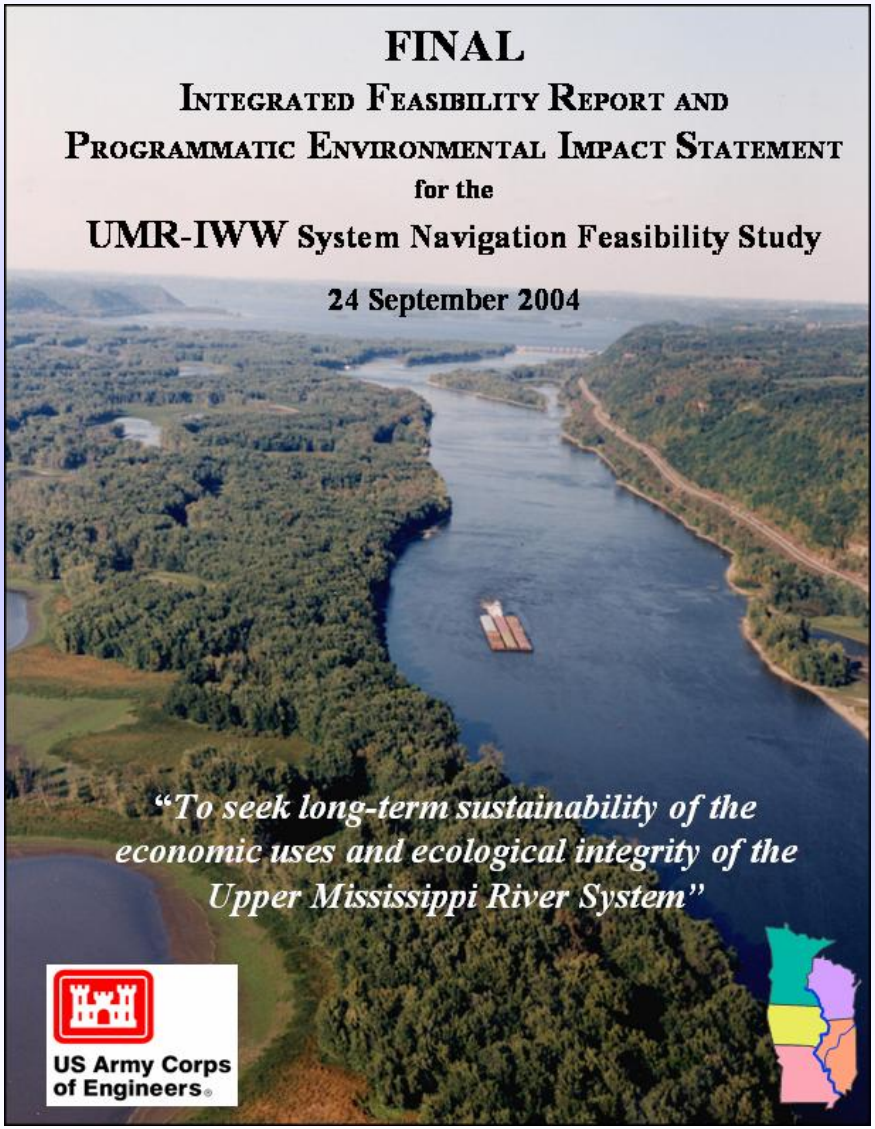
UMR Site 39 Midpoint (RM 112.4 LB)
10/15/95
Elevation Above MSL (ft) (NGVD of 1929)
Horizontal Distance (ft)
FS
SP
ML-CL
SP-GP
MST
VFS
Failed soil blocks
* Small island between two large wing dams
* Piping feature at every scarp face
* Severe erosion due to flood of '93 visible
* Very high velocity (~8 ft/s) around tip of island toward back channel
W/S
Bench Slope = 0.172 (1:5.81)
Measured Profile
Regression Line
Normal Pool EL
Ordinary High W/S EL
Channel Cross Section
Elevation (ft)
Distance from LB (ft)

Pool 4

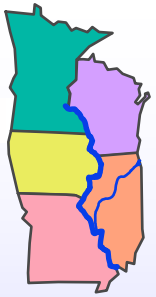
Land Use / Habitat Type Overlay

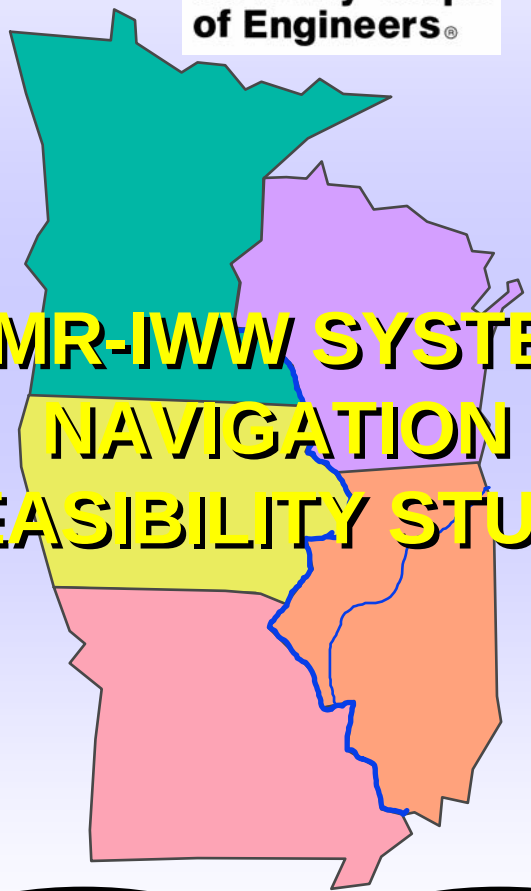


INTEGRATED FEASIBILITY REPORT AND PEIS



COLLABORATION





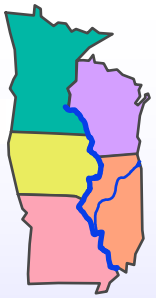
PUBLIC

NGO's

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



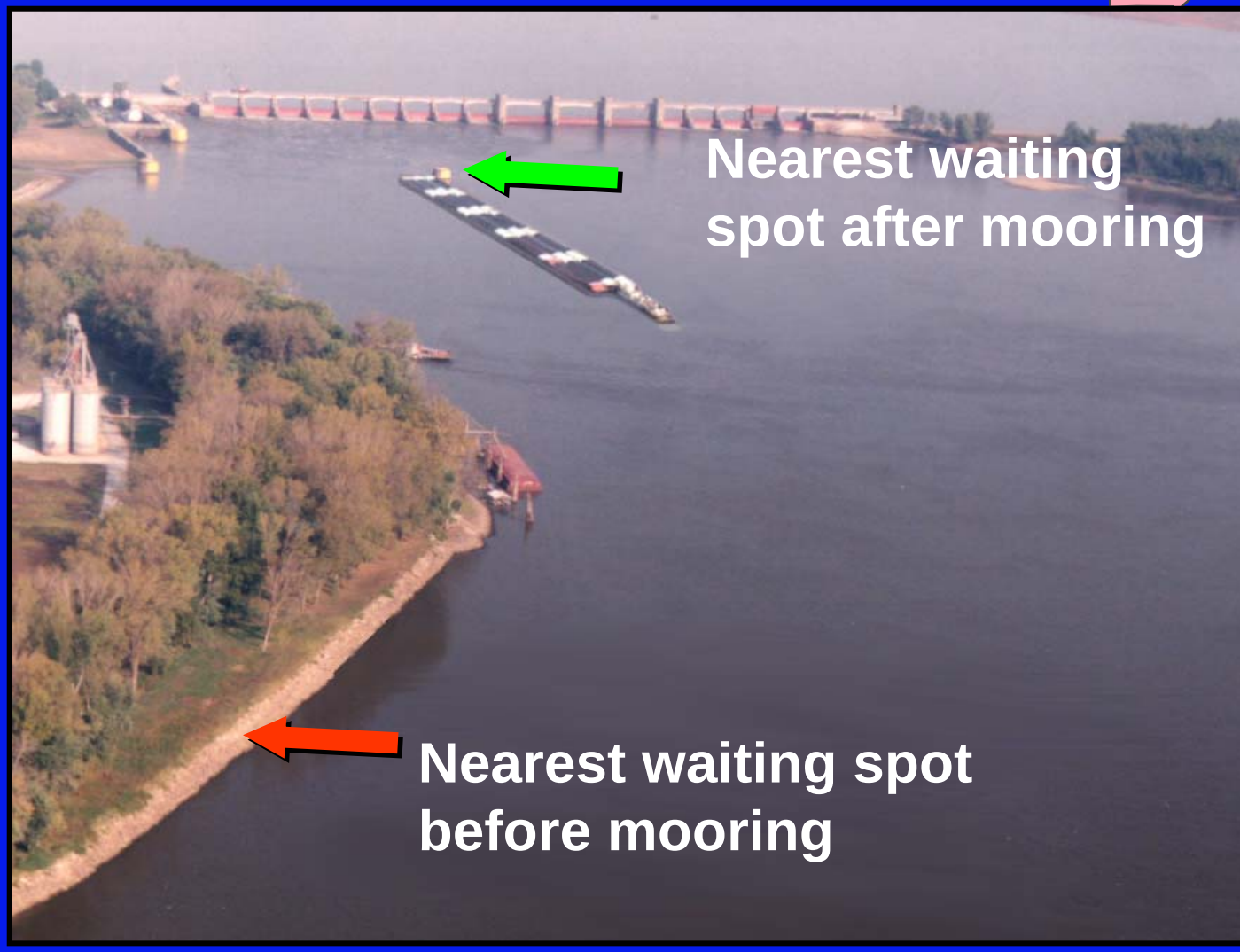
$1.88 billion in First 15 years

- 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

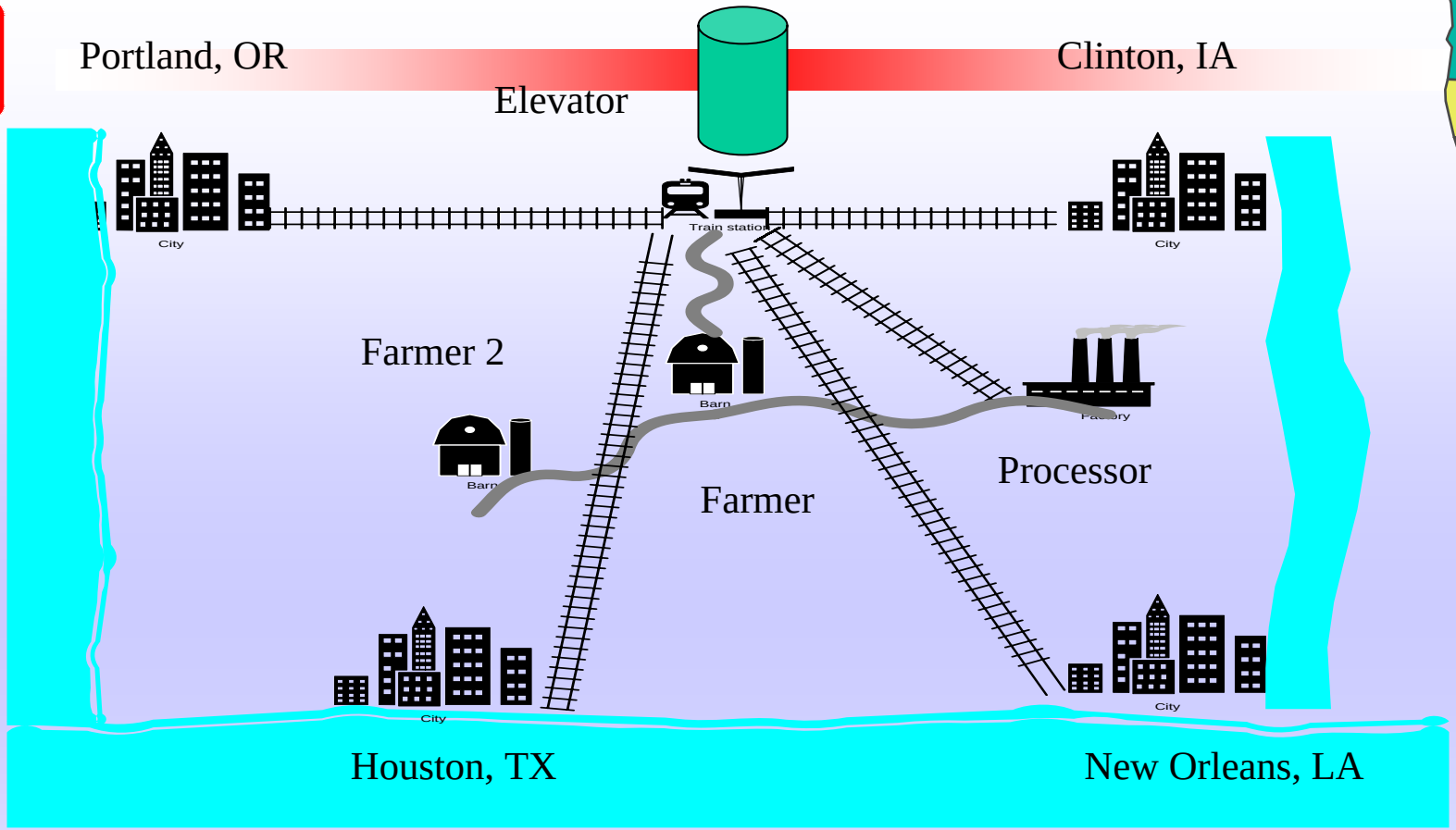
Small-Scale Measures: Moorings

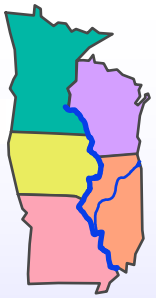
Adjacent Moorings

4-5 Minutes Average Savings



New Locks

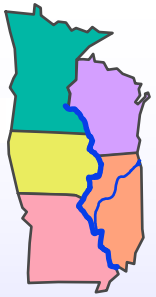




Alternatives

1. Use the corn
2. Sell local
3. Sell to processor
4. Sell to Elevator
   a. processor
   b. New Orleans
   c. Houston
   d. Portland

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
- Forest & Cultural Resources Mngt Plans
- 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

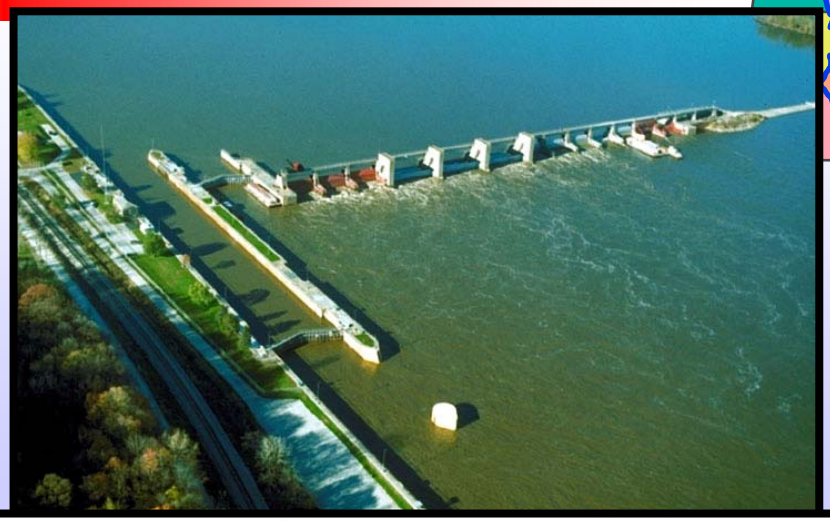
Island Building

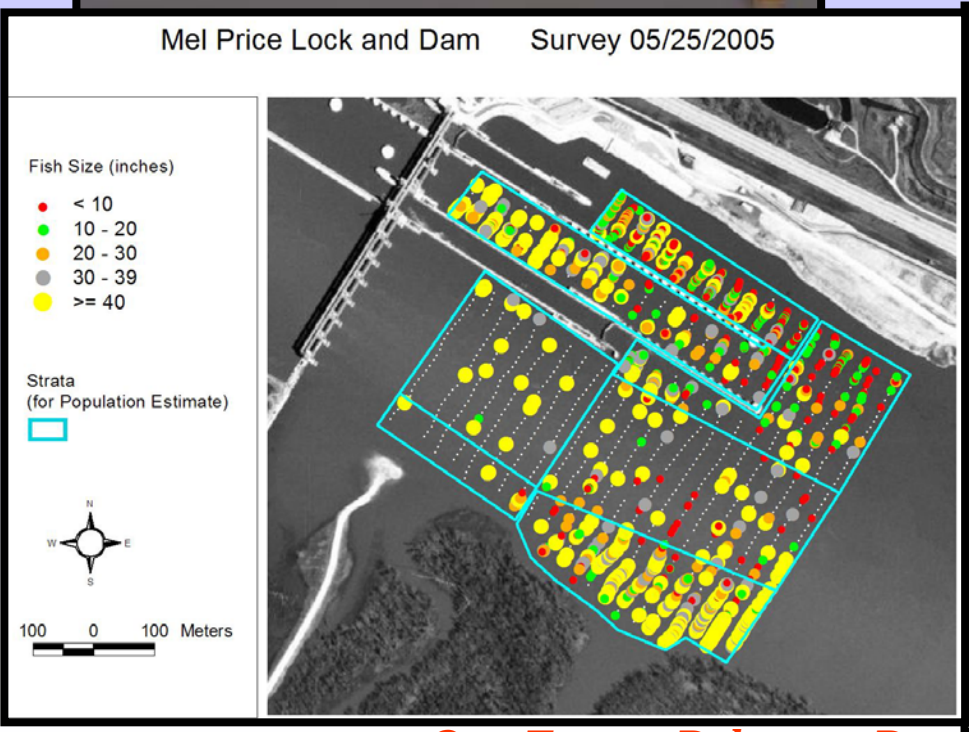
October 1961

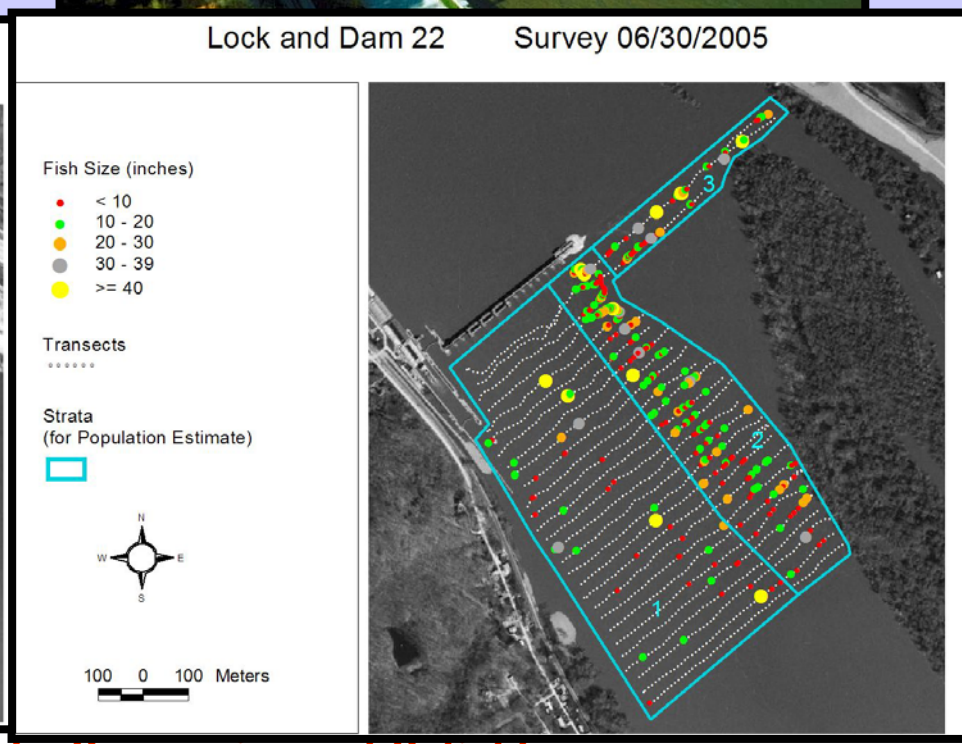
August 1994

August 2000

FISH PASSAGE – Monitoring







Water Level Management

Side Channel Restoration

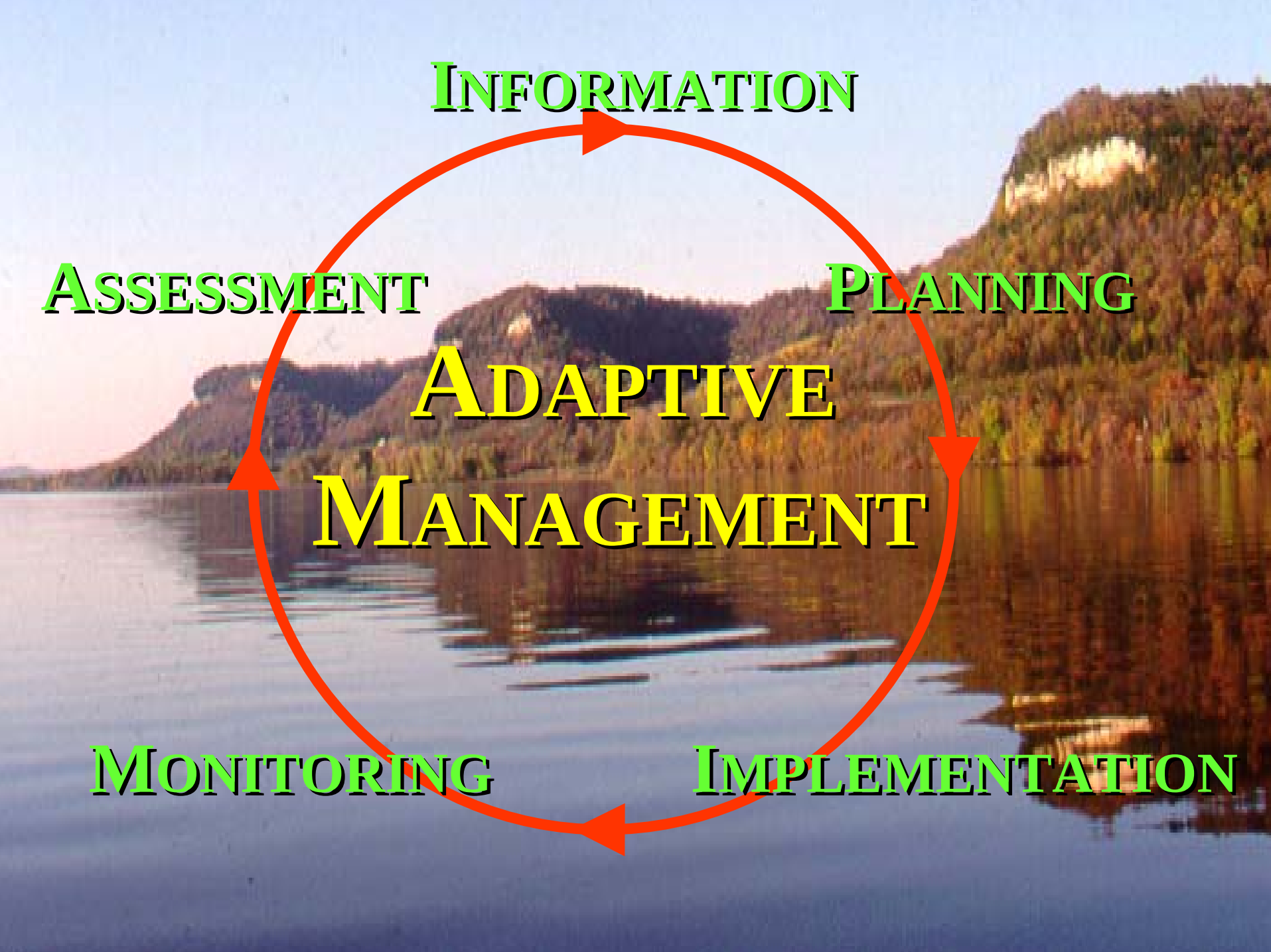
Floodplain Restoration

Upper Mississippi River: Shoreline Erosion – Adverse Impacts to Cultural Resources

Impact examples:
- Inundation
- Sustained high water levels
- Directed river current
- Wave action
  - Boats
  - Wind/Ice

Adverse effects:
- Site destruction
- Looting/vandalism (Illegal on federal lands)

SYSTEMIC FOREST MANAGEMENT ON THE UPPER MISSISSIPPI RIVER SYSTEM


Information
Planning
Implementation
Monitoring
Assessment
Adaptive
Management

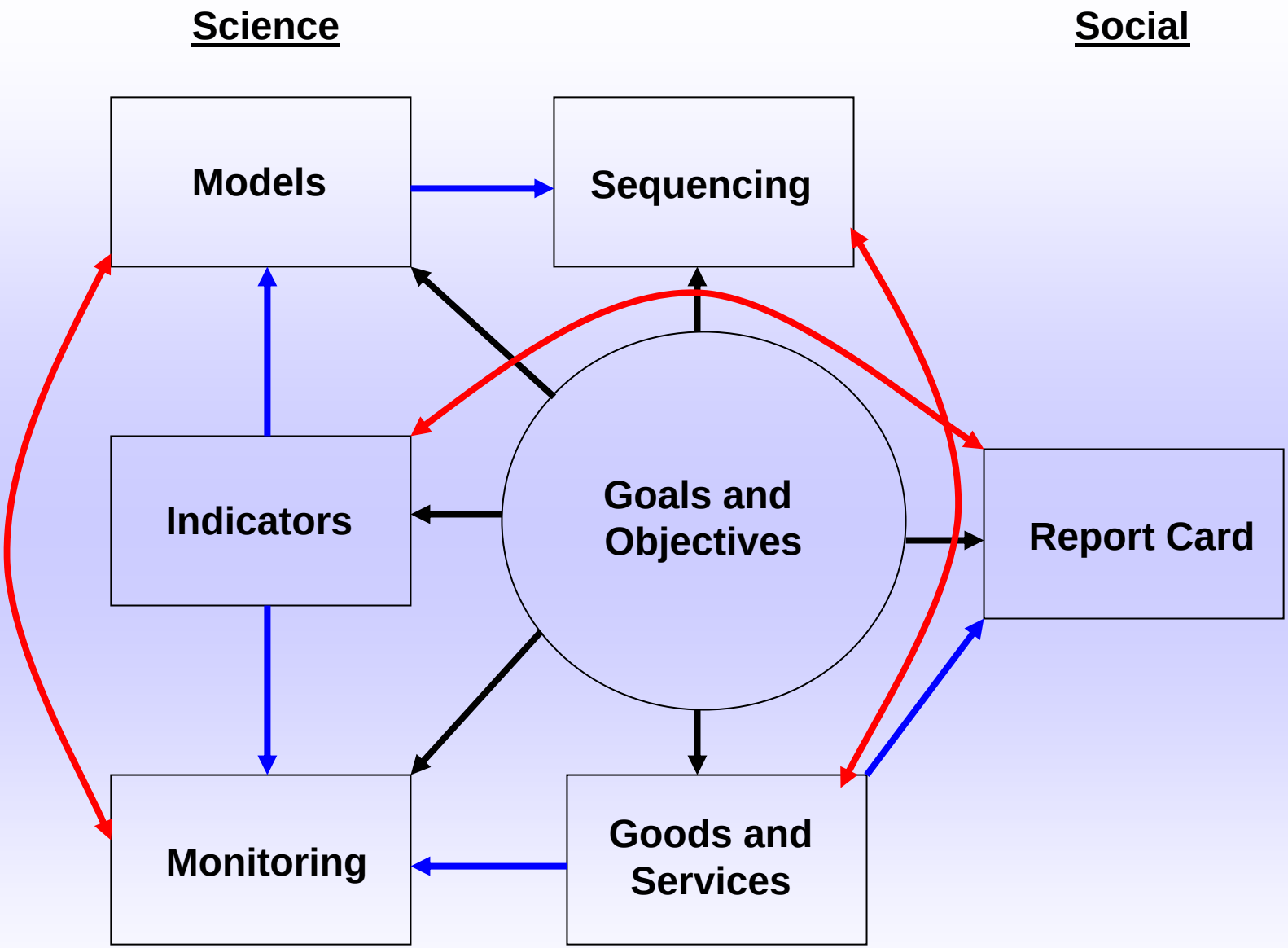
NESP Science Panel Team Members

SP

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

RST

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


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

Dual Purpose Plan …

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