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# Successes & Challenges Implementing CAM on the Upper Mississippi River System (UMRS)



CAMNet Rendezvous 2008, David Galat, USGS

Upper Mississippi  
River Basin

Upper Mississippi  
River System

4 Reaches

12 Geomorphic  
Reaches

28 Nav. Pools

Local  
Projects





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# Successes

- Navigation & Ecosystem Sustainability Program (NESP) authorized in 2007 WRDA
- Stakeholder agreement on a conceptual model of the UMRS
- Resource agency agreement on vision and goals for UMR Ecosystem restoration
- Acknowledgement of need for a more holistic approach to restoration



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# NESP



## Mission Statement

'The Navigation and Ecosystem Sustainability Program (NESP) is a long-term program of navigation improvements and ecological restoration for the Upper Mississippi River System (UMRS) over a 50-year period that will be implemented in increments through integrated, adaptive management.'



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# WRDA Authorization



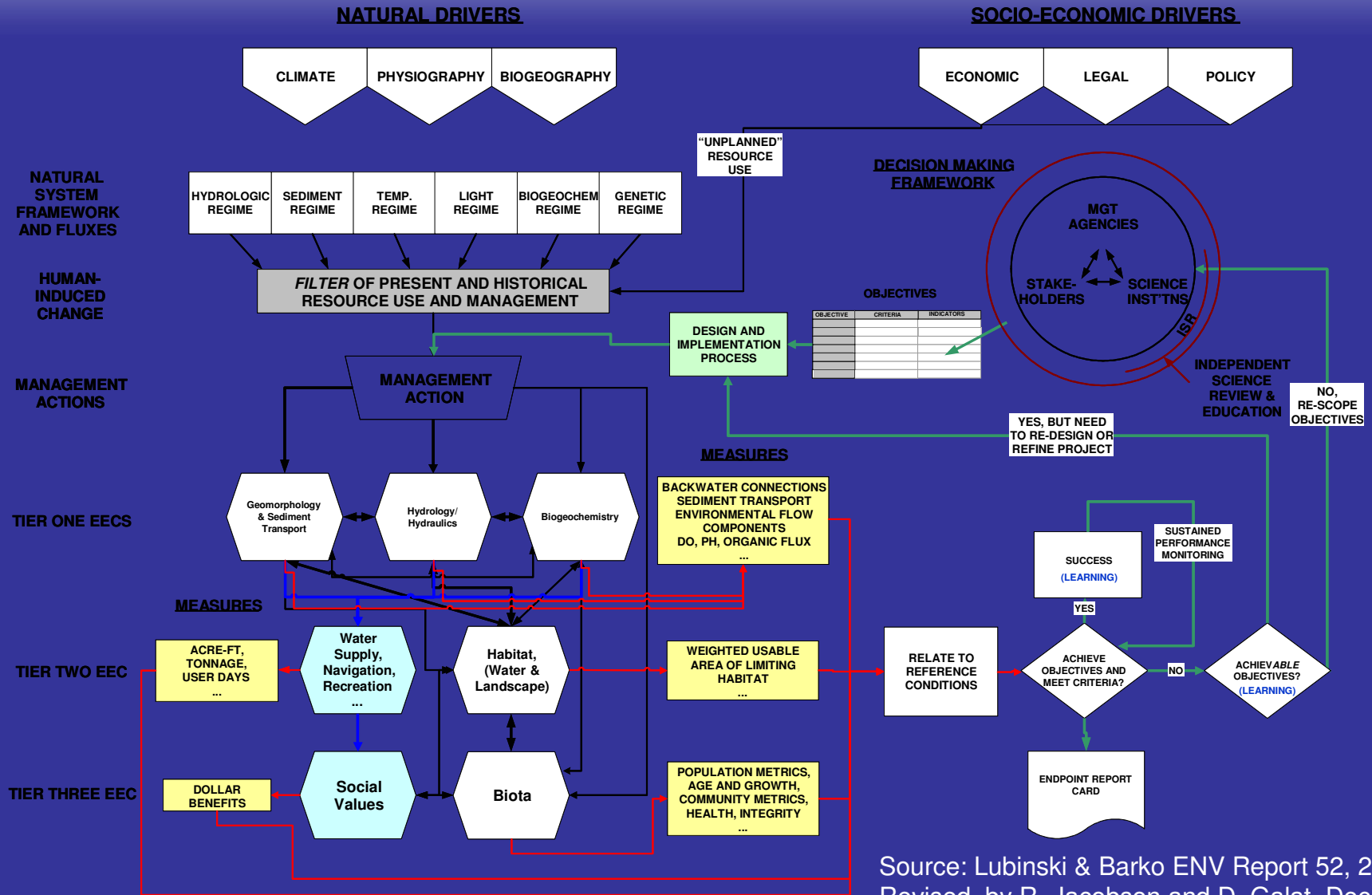
**Sec 8004. (b) (1) IN GENERAL.** —The Secretary shall carry out, consistent with requirements to avoid adverse effects on navigation, ecosystem restoration projects to attain and maintain the *sustainability of the ecosystem* of the Upper Mississippi River and Illinois River...

**Sec 8004. (h) (2) PRIORITY.** —The ranking system shall give greater weight to projects that restore *natural river processes*,...



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# General Conceptual Model of the UMRS

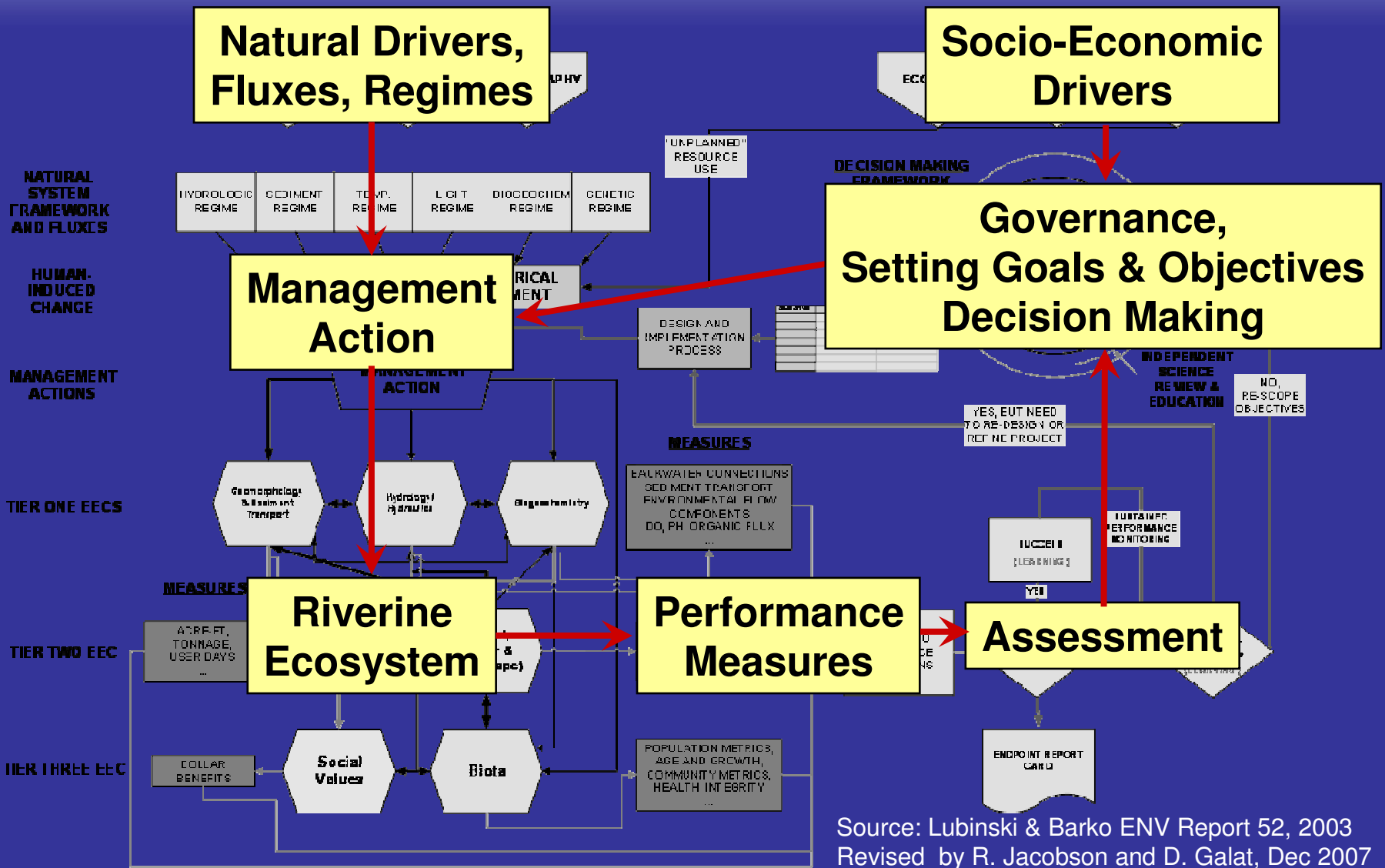


Source: Lubinski & Barko ENV Report 52, 2003  
Revised by R. Jacobson and D. Galat, Dec 2007



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## Vision Statement

(Upper Mississippi River Summit 1986)

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



## Overarching System-scale Goal

(Environmental Management Program Coordination Committee 2008)

*“To conserve, restore, and maintain the ecological structure and function of the Upper Mississippi River System to achieve the vision”*

## System-scale Goals

(Environmental Management Program Coordination Committee 2008)

Manage for:

1. A more natural hydrologic regime (**hydrology & hydraulics**);
2. Processes that shape a physically diverse and dynamic river channel (**geomorphology**);
3. Processes that input, transport, assimilate, and output materials within UMR basin river-floodplains, e.g., water quality, sediments, and nutrients (**biogeochemistry**);
4. A diverse and dynamic pattern of habitats to support native biota (**habitat**), and;
5. Viable populations of native species within diverse plant and animal communities (**biota**).
6. Add a human use goal?
7. Add a learning goal?

## Reach-scale Objectives

TBD



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# NESP Challenges



- Restore Processes Over Building Projects
- My backyard mentality



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# Ecosystem Restoration Implementation



Total Ecosystem First Increment Plan (15 year)		
Ecosystem Measures	Number of Projects	Costs (2003 millions) Measure
Cultural Stewardship	78	\$13.0
Cultural Mitigation		\$13.0
Forest Management	0	\$37.6
Island Building	23	\$150.9
Fish Passage	4	\$209.0
Floodplain Restoration (Pools 1-13)	10	\$18.0
Floodplain Restoration (Rest of UMR-IWW)	7	\$140.0
Water Level Management - Pool	13	\$61.7
Water Level Management - Backwater	5	\$38.3
Backwater Restoration (Dredging)	33	\$145.5
Side Channel Restoration	29	\$80.8
Wing Dam/Dike Alteration	19	\$28.5
Island Protection	33	\$31.1
Shoreline Protection	40	\$37.6
Topographic Diversity	9	\$13.5
Dam Point Control	2	\$25.3
<b>Total</b>	<b>227</b>	<b>\$1,315.8</b>
Real Estate		\$146.0
<b>Grand Total</b>		<b>\$1,461.8</b>

Source: Tim Schlagenhaft and Mike Davis, MNDNR



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# Process



Ecological Process – Seasonal changes in water levels

Seasonal low water levels expose sediments, seeds germinate, plants emerge



Ecological Process – macrophyte production  
Vegetation collects sediment and improves water clarity



Ecological Process – energy transfer

Vegetation provides food and cover for wildlife

Clear water helps vegetation persist



Source: WIDNR

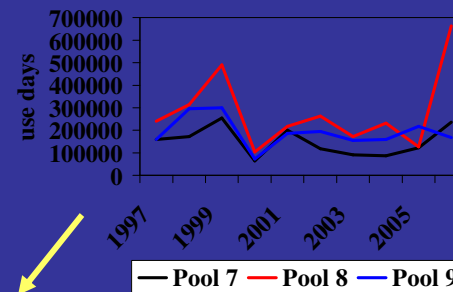
Ecological Process – sediment retention



Ecological Outcome

Wildlife numbers increase

Hunting/wildlife viewing



— Pool 7 — Pool 8 — Pool 9

**= Ecosystem Service**



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# Challenge

## A System-wide Approach Emphasizes Processes Over Projects

**Project-based objective:** Reconnect Schenimann Chute to the main channel at river mile 62.2

**Process-based objective:** Increase lateral connectivity and material exchange throughout the Mississippi Open River Reach

**Avoid substituting activities for outcomes, projects for performance**



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# Challenges of Process/function Based Restoration at Large Spatial Scales



## System/Reach

Design &  
implementation more  
uncertain

Outcomes subtle

Performance indicators  
difficult to quantify

Lower public visibility

Lower comfort level

## Pool/Project

Design & implementation  
w/in existing planning  
framework

Outcomes obvious

Performance indicators  
easier to quantify

Higher public visibility

High comfort level