

# **Water Level Fluctuations in the Illinois River: Effects on Floodplain Management and Wetlands**

2009 Governor's Conference on the Illinois River  
Soil & Water Movement Session 1: WATER

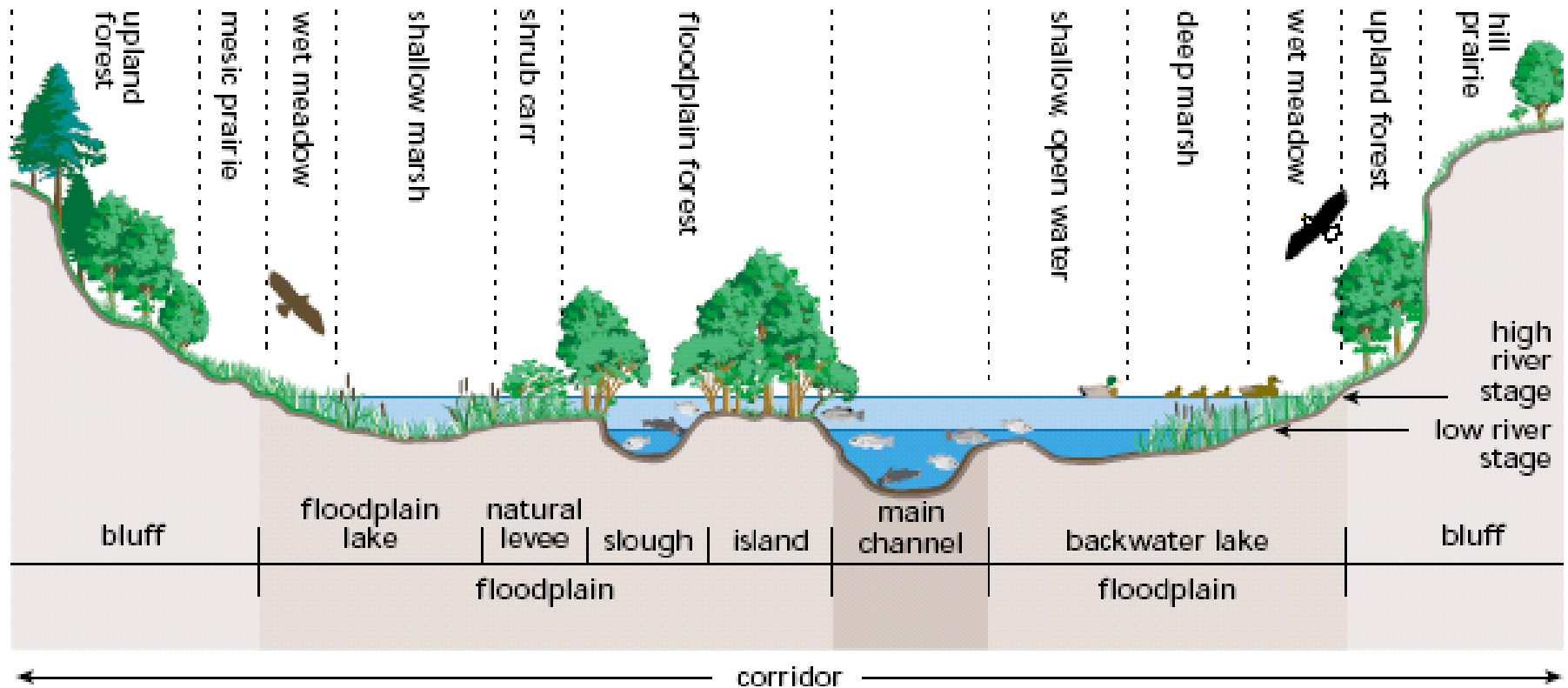
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<sup>3</sup>Rock Island District, U.S. Army Corps of Engineers, Rock Island, IL

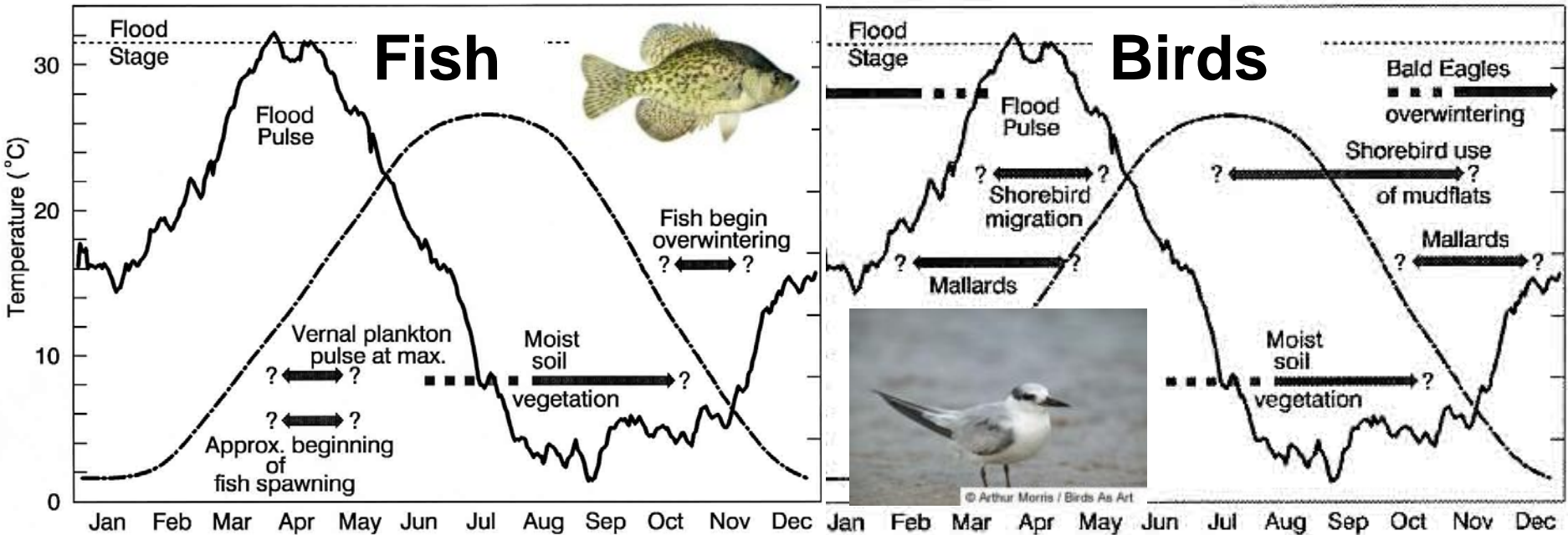
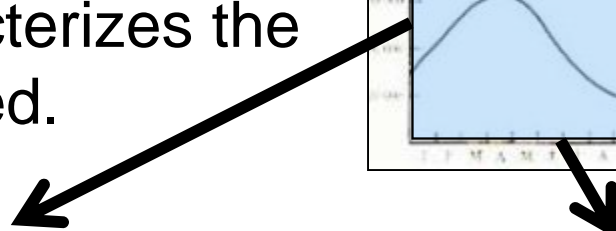
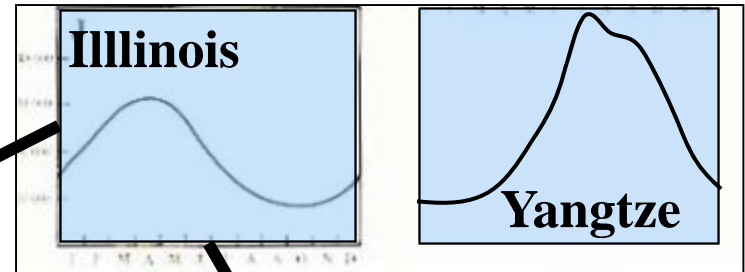
# The Natural River

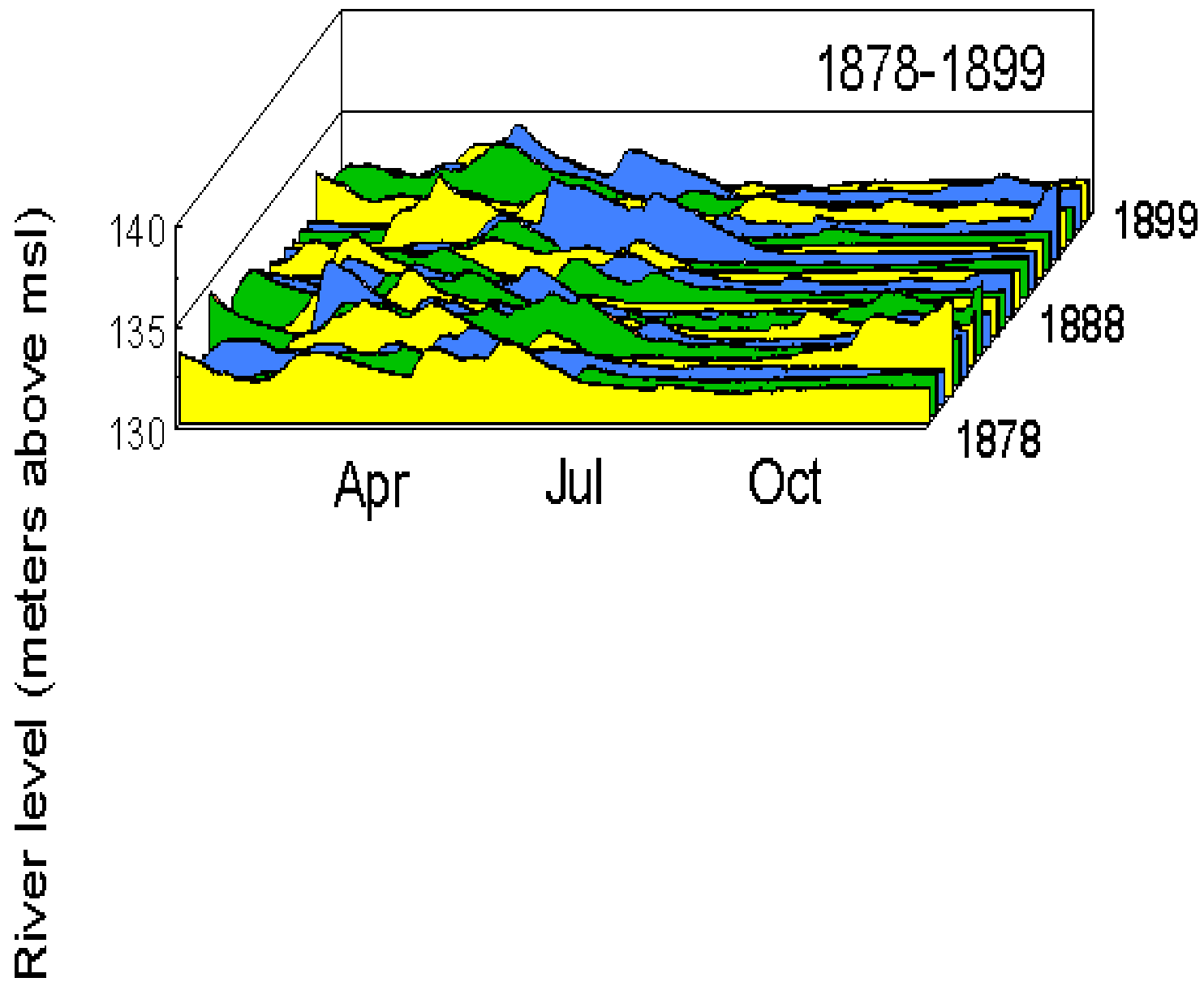


**Representative cross-section of the Illinois River-floodplain ecosystem.**

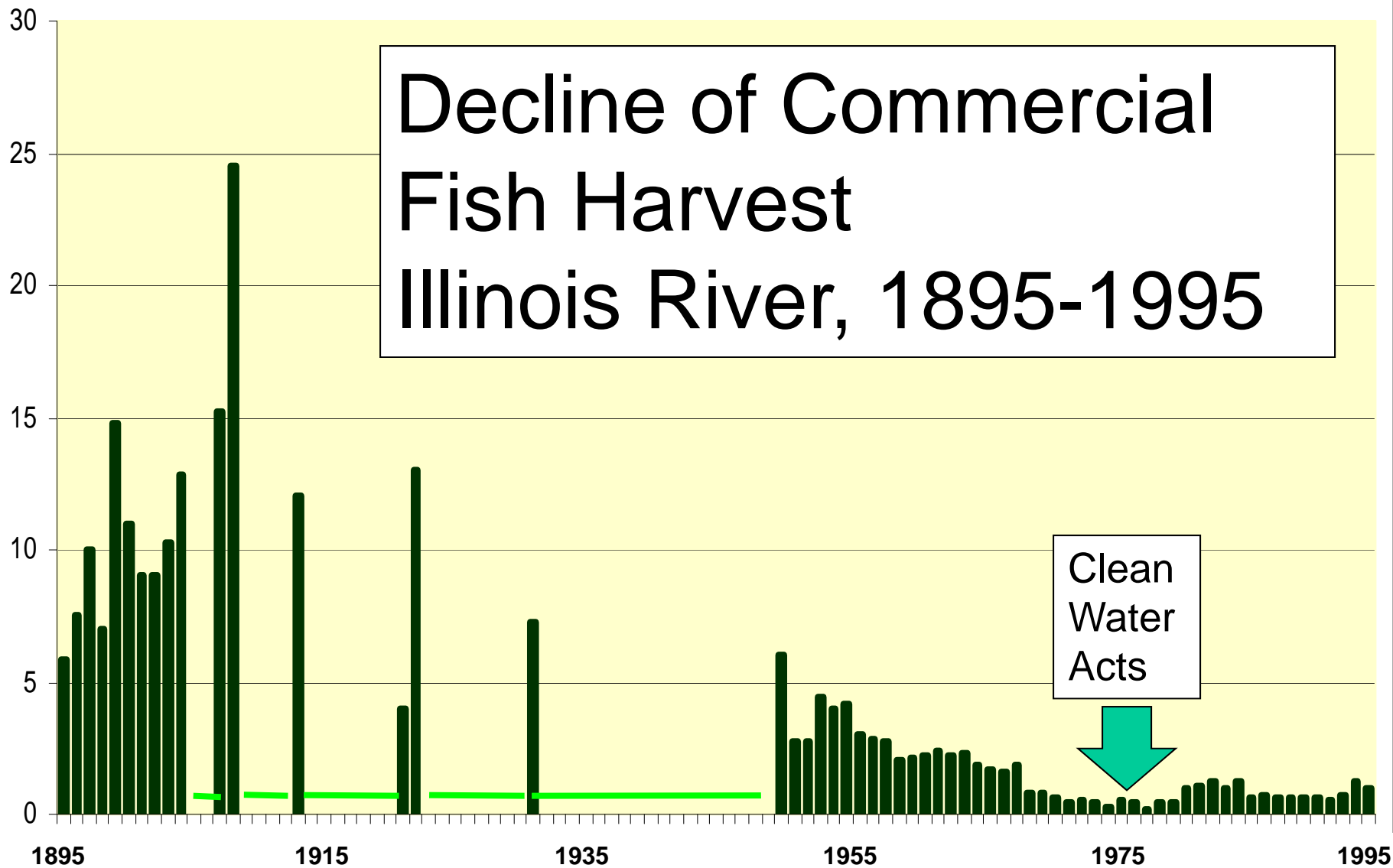
# Principle of Floodplain-River Ecosystem Conservation:

Organisms have adapted to the **floodpulse** that characterizes the river where they evolved.





# Decline of Commercial Fish Harvest Illinois River, 1895-1995





# 1996

• **Jan** Planning Committee evaluates economic/natural resources information

• **Mar** Six Issues and Teams

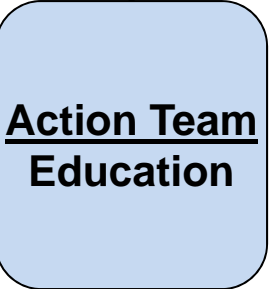
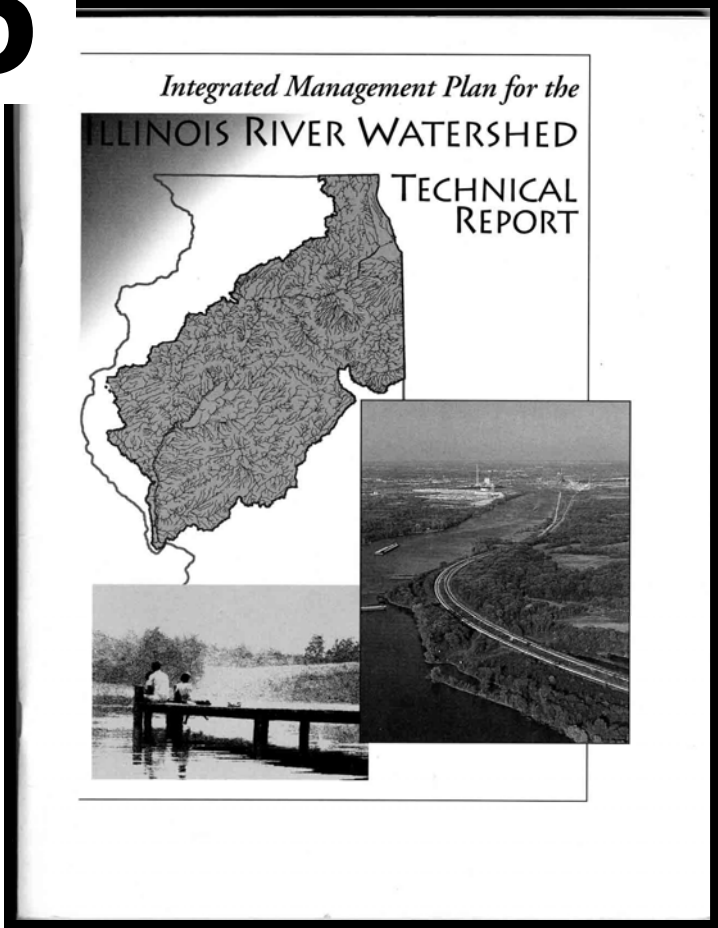
• **Apr-Jun** Teams meet, develop solutions

• **Jul** Planning Committee provides additional direction

• **Aug-Oct** Teams prepare action plans & recommendations

• **Nov** Planning Committee considers Team results; makes recommendations to Strategy Team

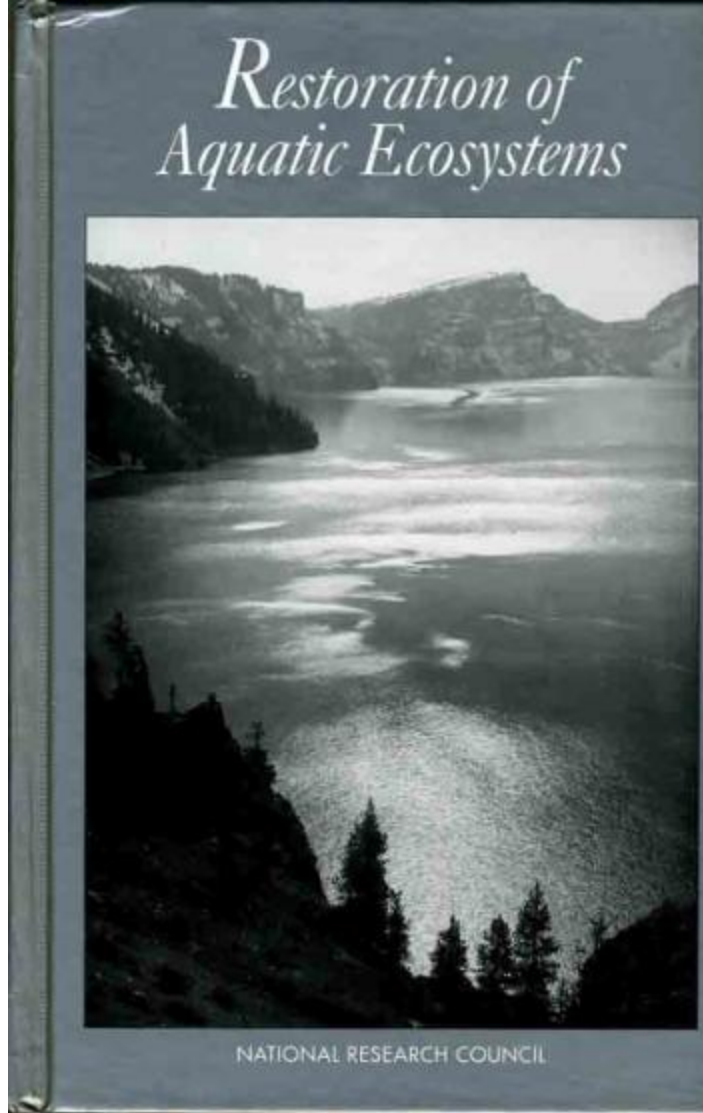
• **Jan 1997** Integrated Plan



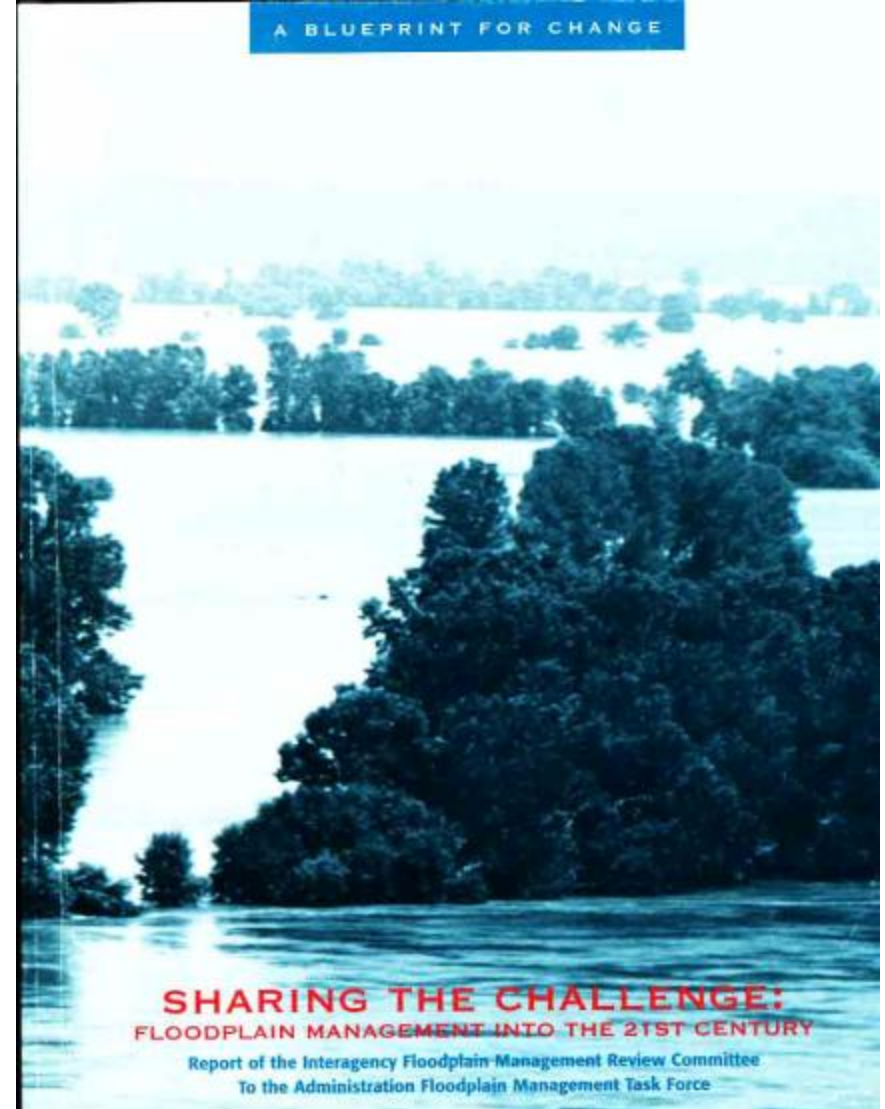
# 1993 Flood on the Illinois River







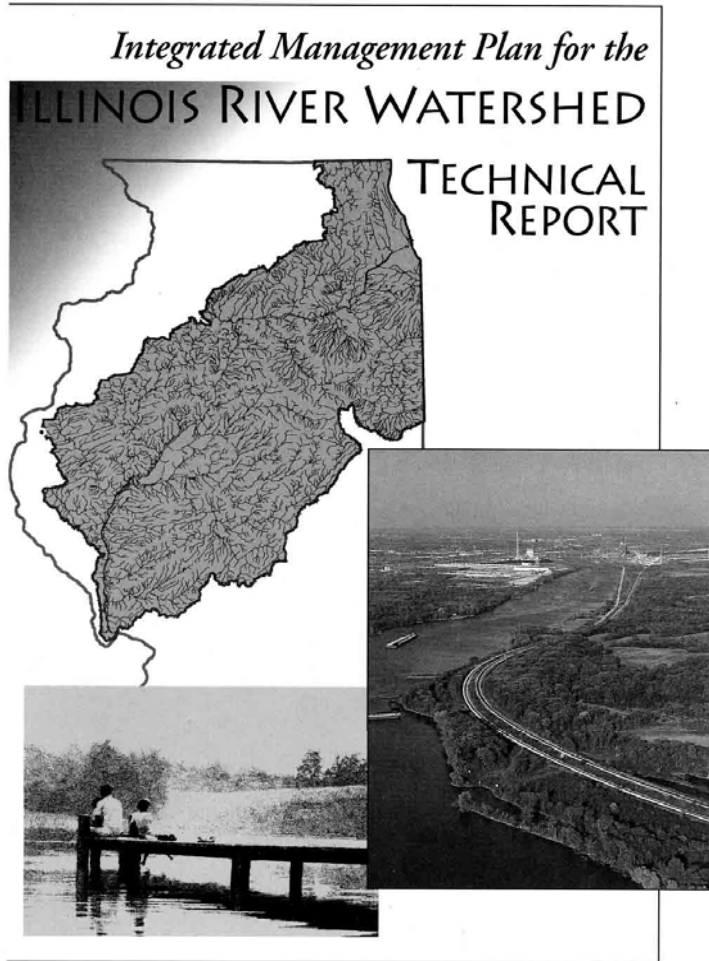
1992. Review of science, technology & public policy related to “restoration” of rivers, lakes & wetlands.



1994. Review of national floodplain management policy, to reduce risk, improve economic efficiency, & enhance the environment.

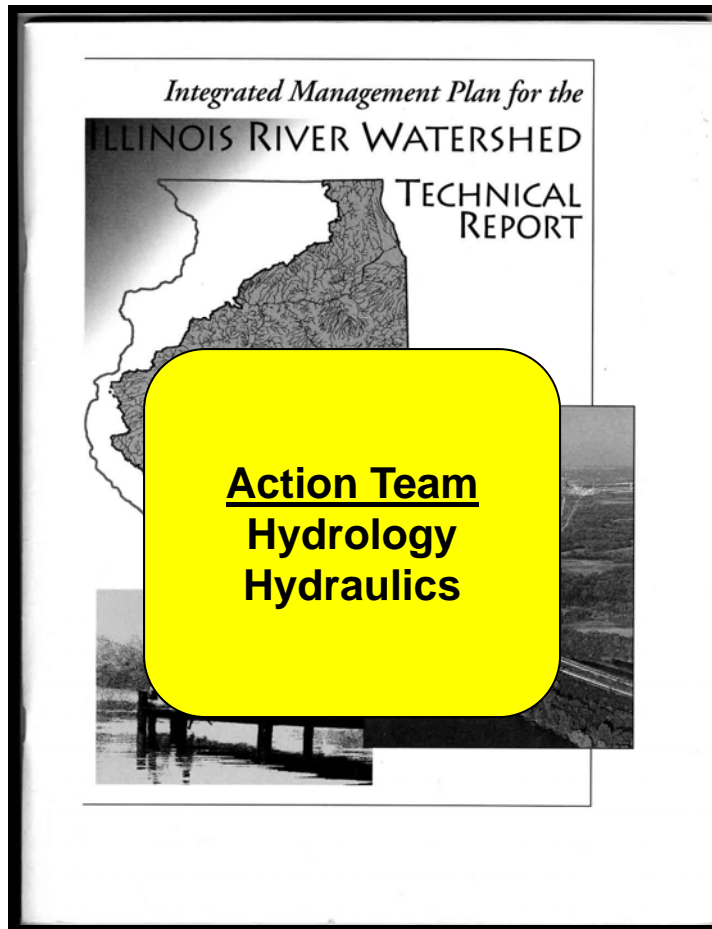


# Jan 1997



- Recommendations (34)
  - Corridor
  - Soil & Water Movement
  - Ag practices
  - Economic development
  - Local action
  - Education
- Specific **plans** for action; **targets**

# 1997



## SOIL & WATER MOVEMENT

- (7) Identify the causes of unnatural and natural water level fluctuations
- (8) Establish **water level management** programs throughout the watershed for sediment management, waterbanking, and flood crest reduction.
- (9) Selective **dechannelization** of tributaries on a voluntary basis.
- (12) Improve **monitoring** of water & sediment
- (13) **Build wetlands** and other water retention capacity in urban and rural areas in the Illinois Basin, in collaboration with appropriate public landowners and volunteering private landowners.

# After 1997

## Illinois River Basin Restoration Comprehensive Plan – USACOE & IDNR

**Vision:** A naturally diverse and productive Illinois River Basin that is sustained by natural ecological processes and managed to provide for compatible social and economic activities.

3. Limiting Factor: Loss of Habitats and Functions

➤ **Goal 3:** Improve floodplain, riparian, and aquatic habitats and functions.

5. Limiting Factor: Altered Hydrology and Water Levels

➤ **Goal 5: Naturalize** Illinois River and tributary **hydrologic regimes** and conditions to restore aquatic and riparian habitats.

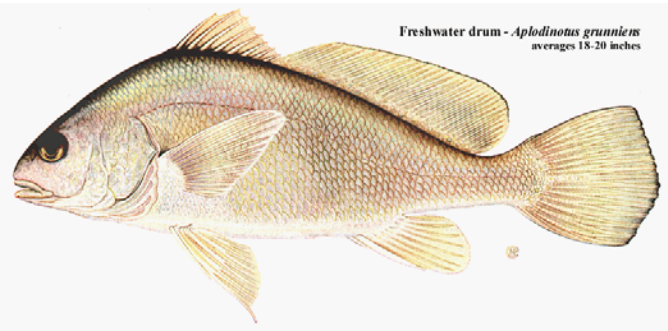
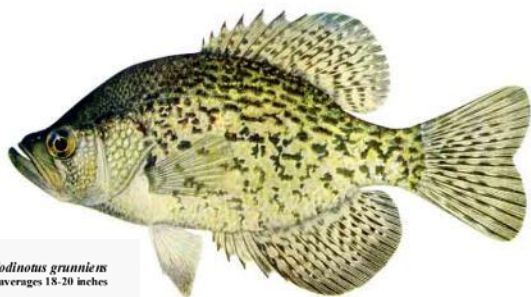
# Post 1997: New Analyses of Hydrology of the Illinois River

## Natural Factors

- Precipitation Fluctuations
- Watershed Characteristics

## Human Induced Factors

- Land-Use
- Hydraulic Modifications
  - Locks & Dams
  - Levees
- Water Diversions

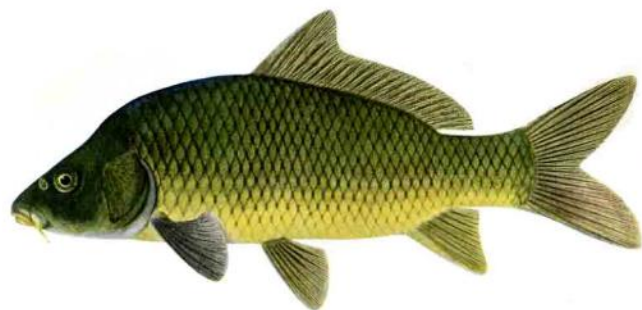


## Many native fishes require “natural” water regime

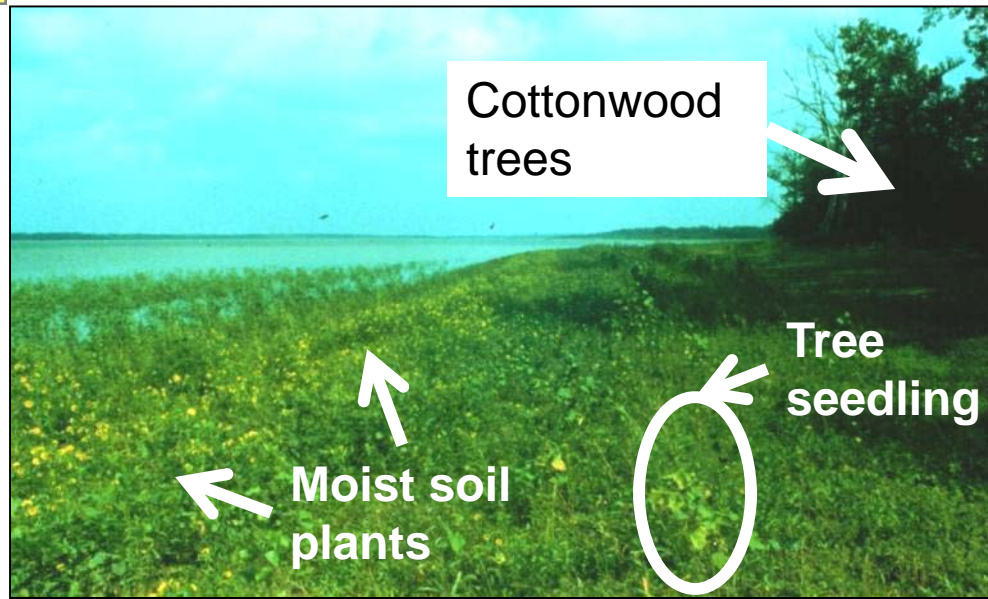
Valued native fishes require “natural” spring flood to spawn and rear young and “natural” stable or slowly rising water to overwinter.

## Erratic regime favors nonnative species

“Reversals” rapid rates of rise and fall, and midwinter water fluctuations disadvantage native fishes







## Lack of flood harms native vegetation

Moist soil plants need Spring floods to kill seedling trees. If water levels are too stable, trees will grow and shade out the moist soil plants.

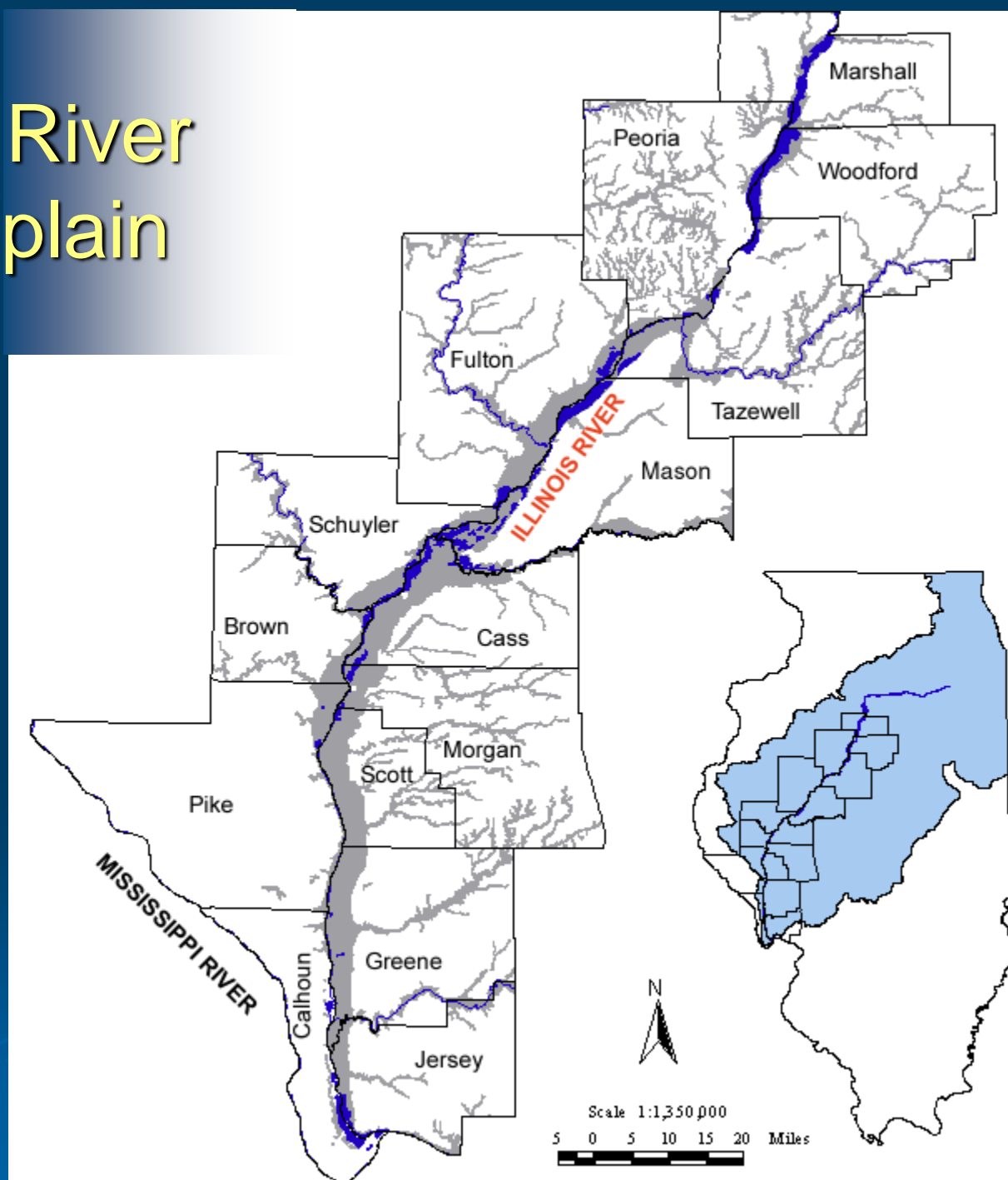


## Excessive flooding also harms vegetation

Unnaturally frequent, little floods during the Summer growing season drown the moist soil plants.



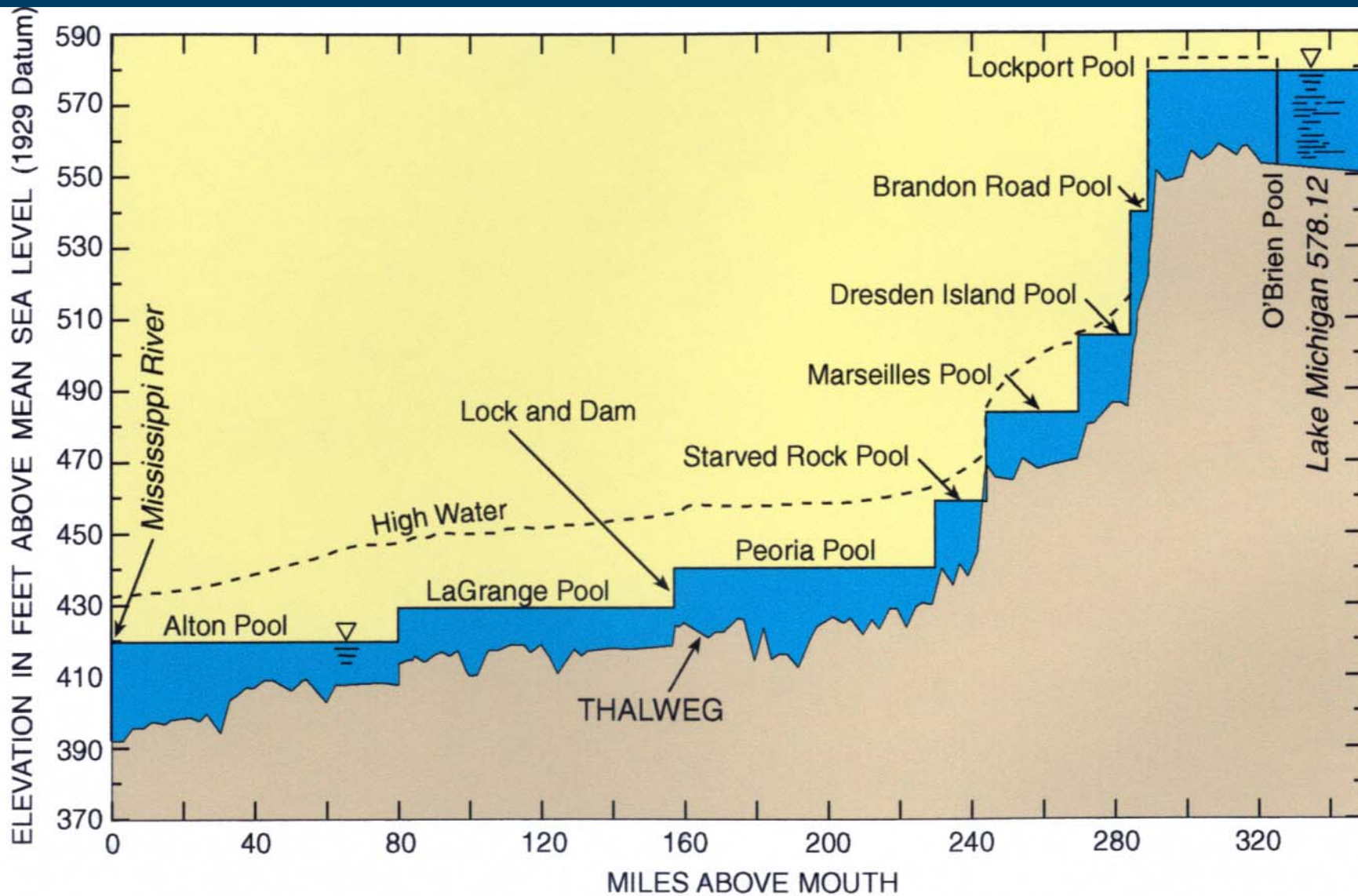
# Lower Illinois River and its Floodplain

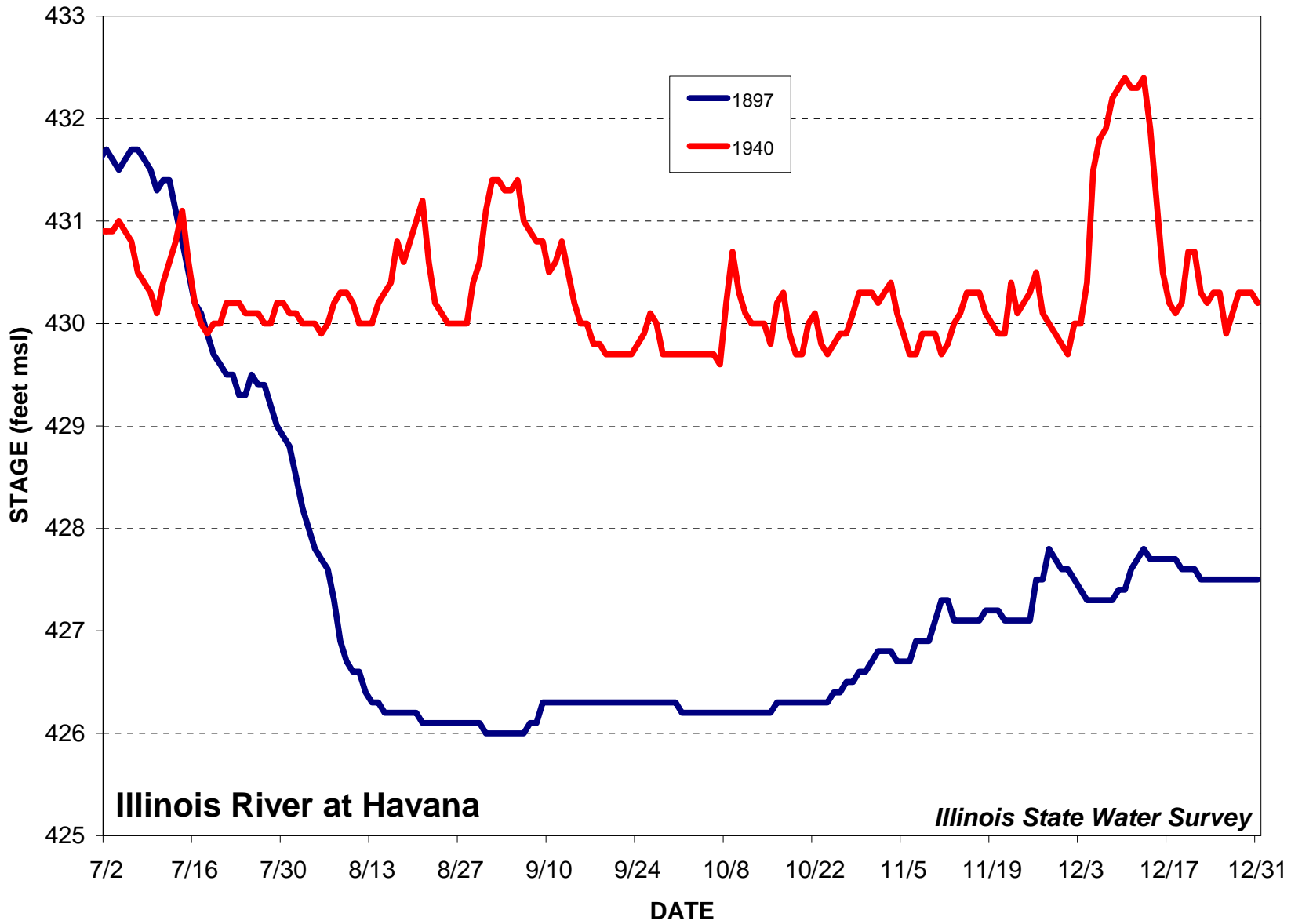


# Levee and Drainage Districts



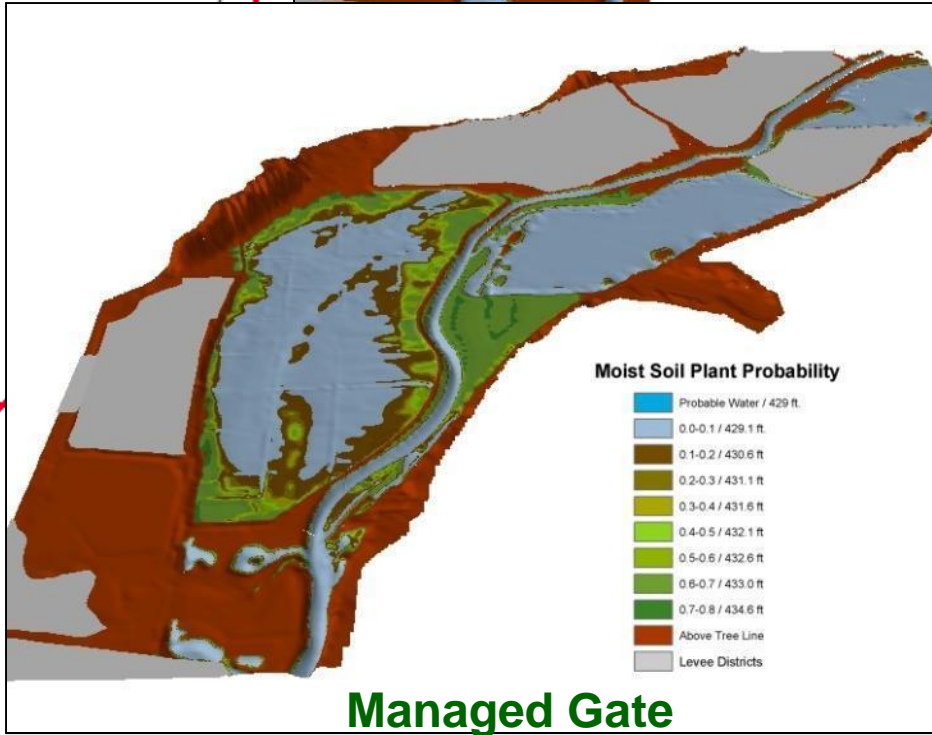
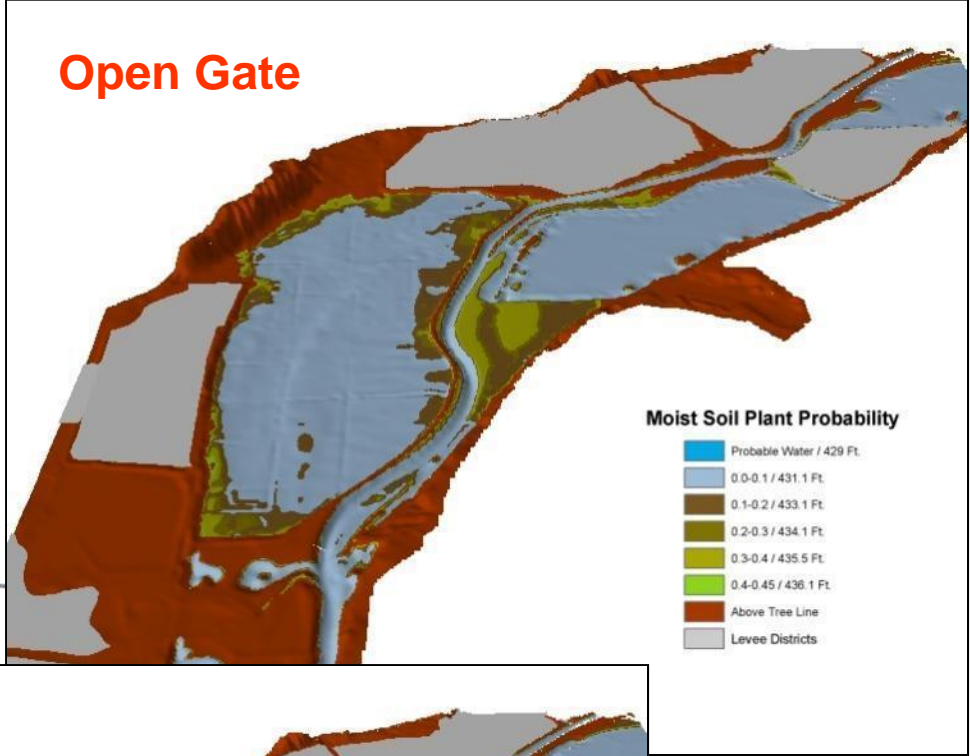
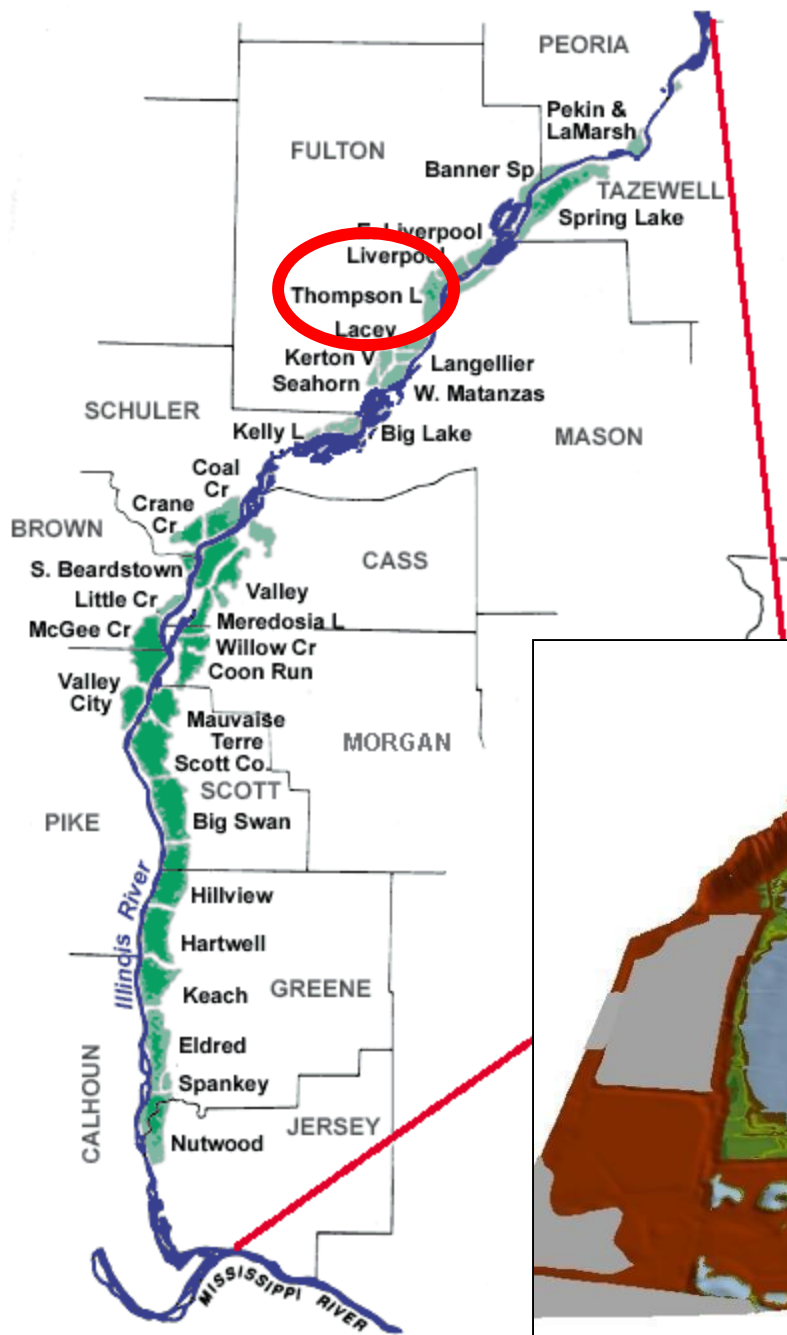
# Profile of the Illinois River





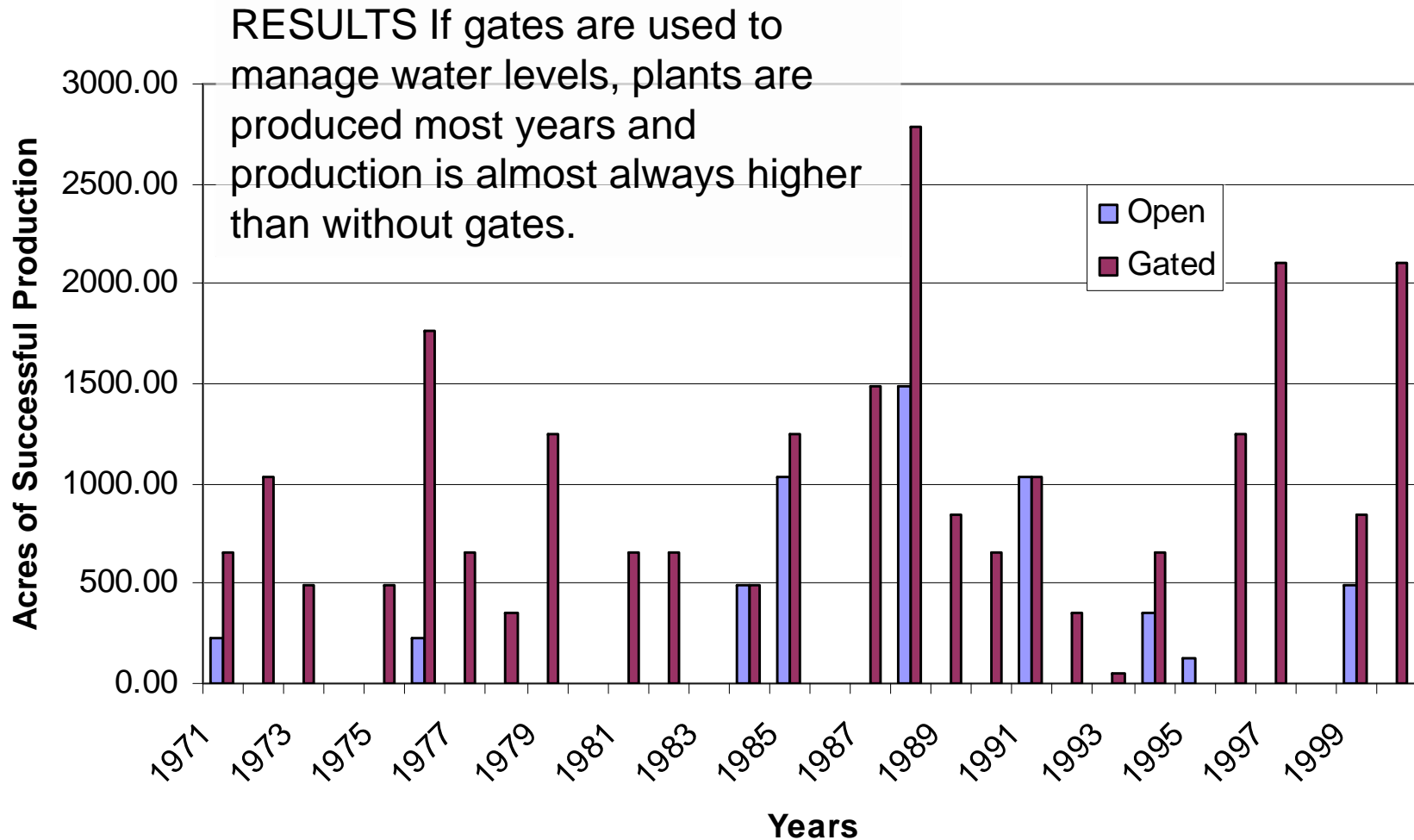
**Illinois River at Havana**

*Illinois State Water Survey*





1. 1971-2001 water level hydrographs (daily water levels) in Illinois River were used as input to **hydraulic model (ISWS)** of The Nature Conservancy's Emiquon Floodplain Naturalization Project.
2. Output from Emiquon hydraulic model was used as input to the **moist soil plant model**.





# Potential Naturalization Impacts

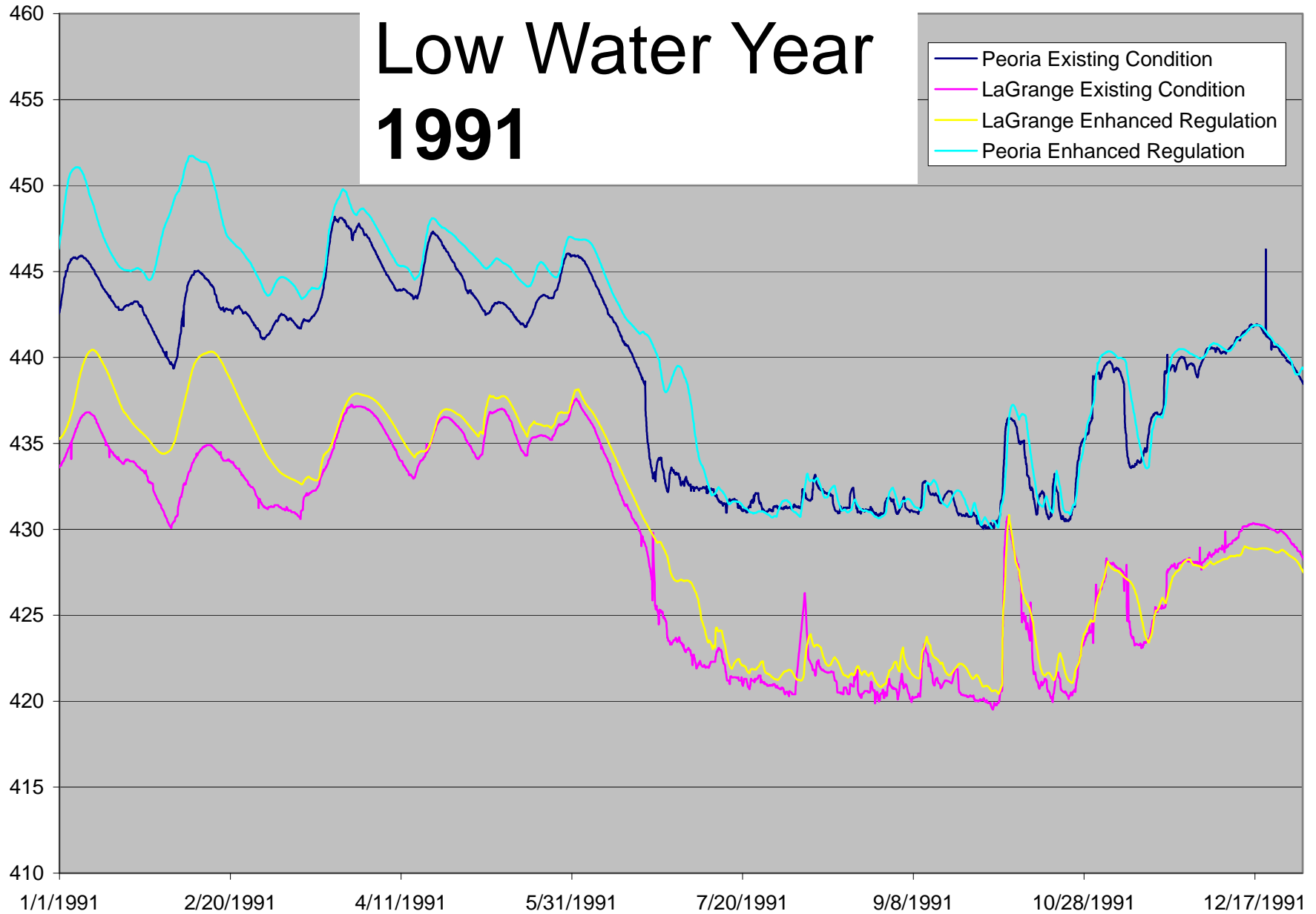


<b>TNC's Emiquon Project</b>	<b>Farming Eliminated</b>	<b>Refuge Management</b>	<b>Refuge with Recreation</b>	<b>Net Change (Potential)</b>
<b>Land</b>	<b>- 2,550 ha</b>	<b>2,550 ha</b>	<b>2,550 ha</b>	<b>2,550 ha</b>
<b>Labor</b>	<b>- 17 jobs</b>	<b>10 jobs</b>	<b>66 jobs</b>	<b>+49 jobs</b>
<b>Output Value</b>	<b>\$ - 1,251,031</b>	<b>\$ 500,000</b>	<b>\$ 3,280,000</b>	<b>\$ +2,028,969</b>

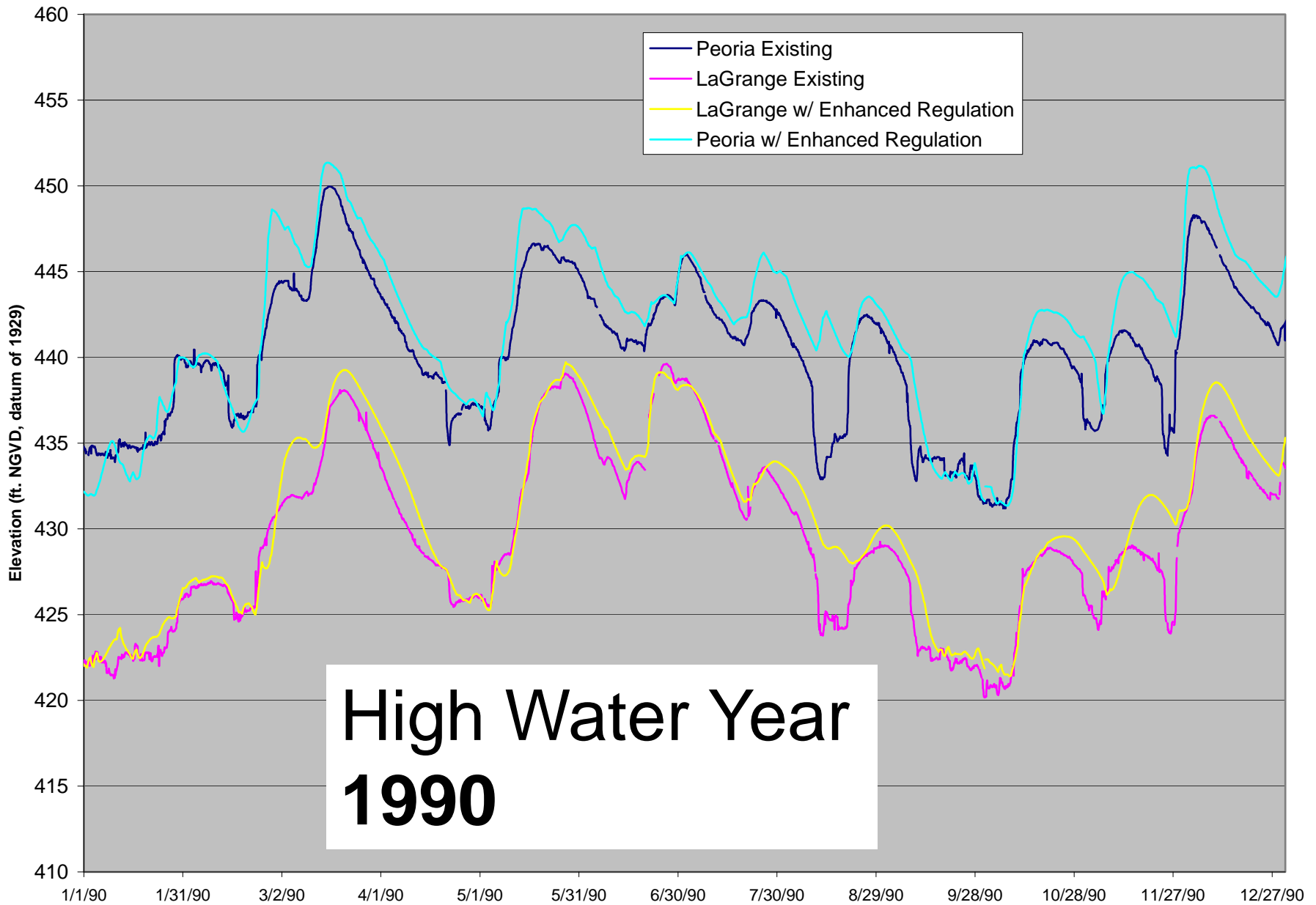
# Enhanced Water Level Management



## Low Water Year 1991



# Enhanced Water Level Management



High Water Year  
**1990**



US Army Corps  
of Engineers®

# Illinois River Basin Restoration 519 Comprehensive Plan



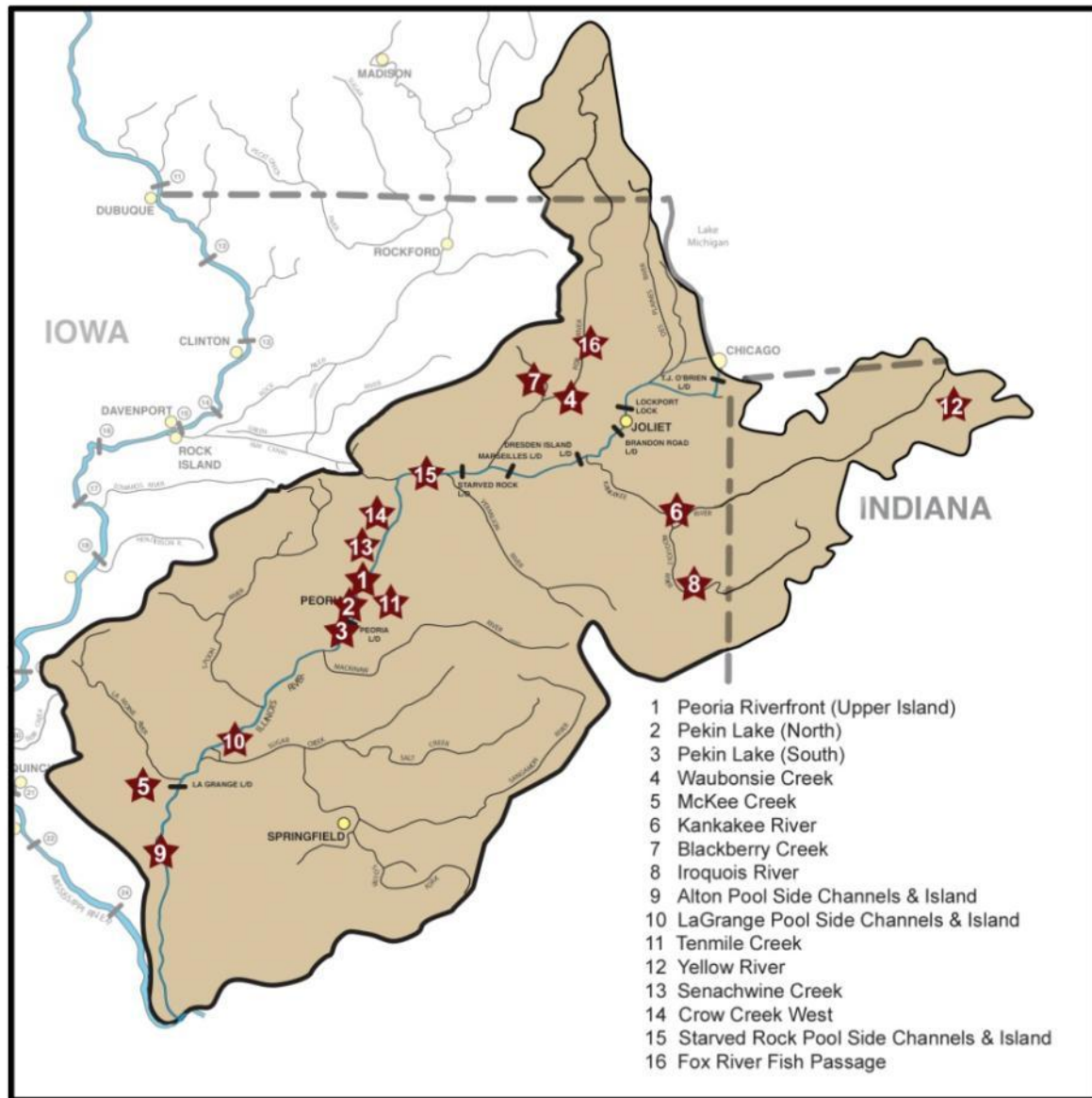
2007



*One Team: Relevant, Ready, Responsive and Reliable*

# 519 - Critical Restoration Projects

1. Peoria Upper Island
2. Pekin Lake (Northern Unit)
3. Pekin Lake (Southern Unit)
4. Waubonsee Creek
5. McKee Creek
6. Kankakee River
7. Blackberry Creek
8. Iroquois River
9. Alton Pool
10. LaGrange Pool
11. Tenmile Creek
12. Yellow River
13. Senachwine Creek
14. Crow Creek West
15. Starved Rock Pool
16. Fox River Fish Passage



End of  
Sparks  
Presentation