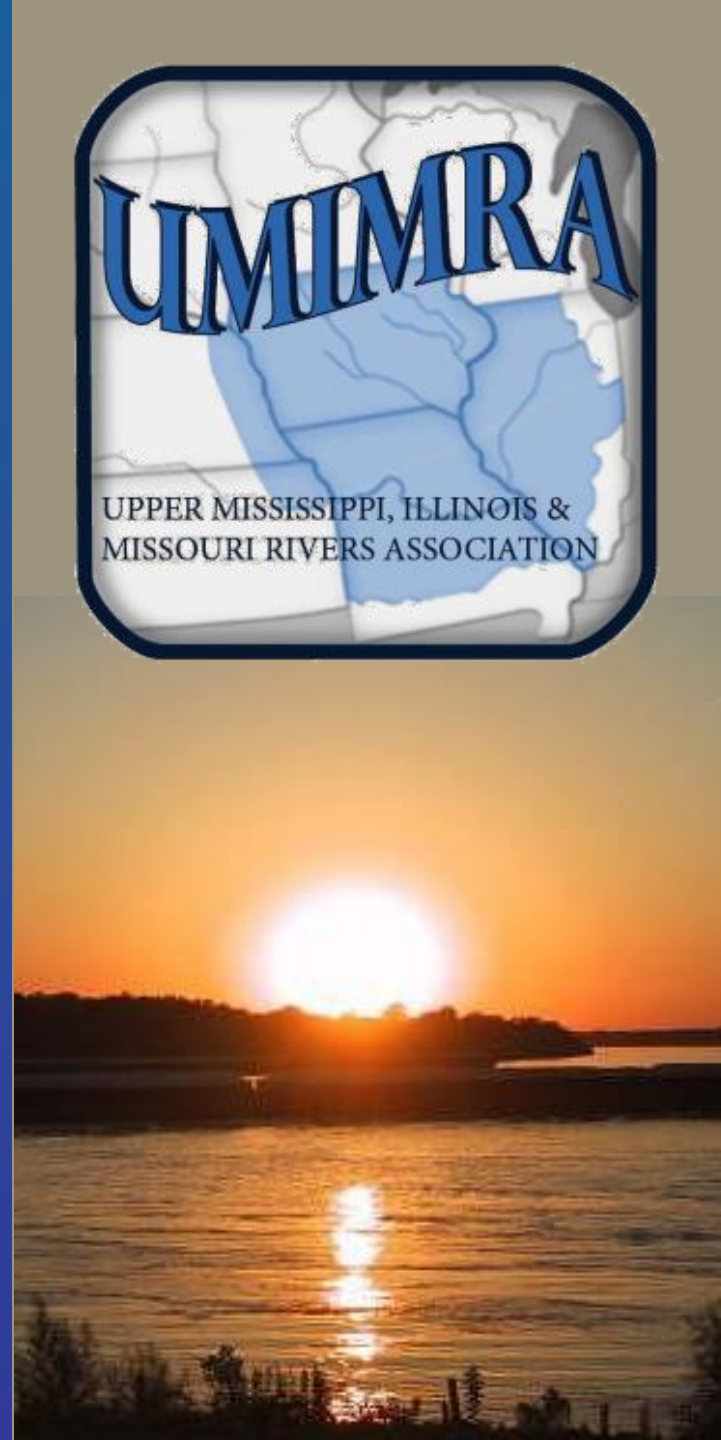
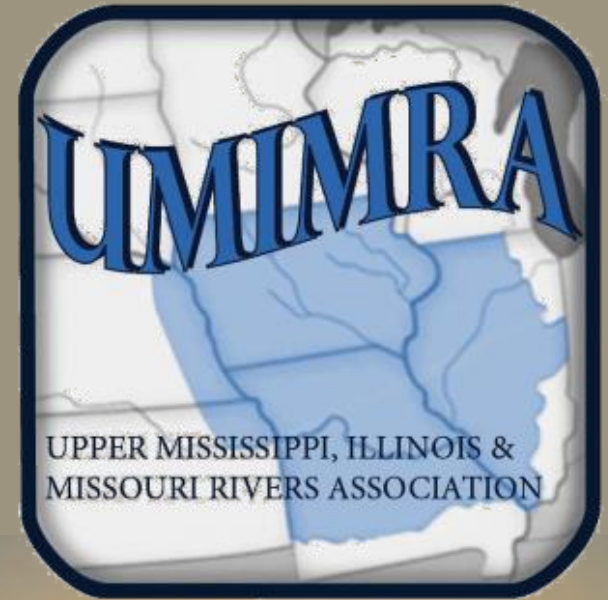


# Upper Mississippi Flood Control

## HOW TO MOVE FORWARD

September 19, 2019  
National Waterways  
Conference



# Hunt-Lime – inadequate levee heights & foreshore concerns, May 1993



# Hunt Lima Levee Overtop July 9, 1993



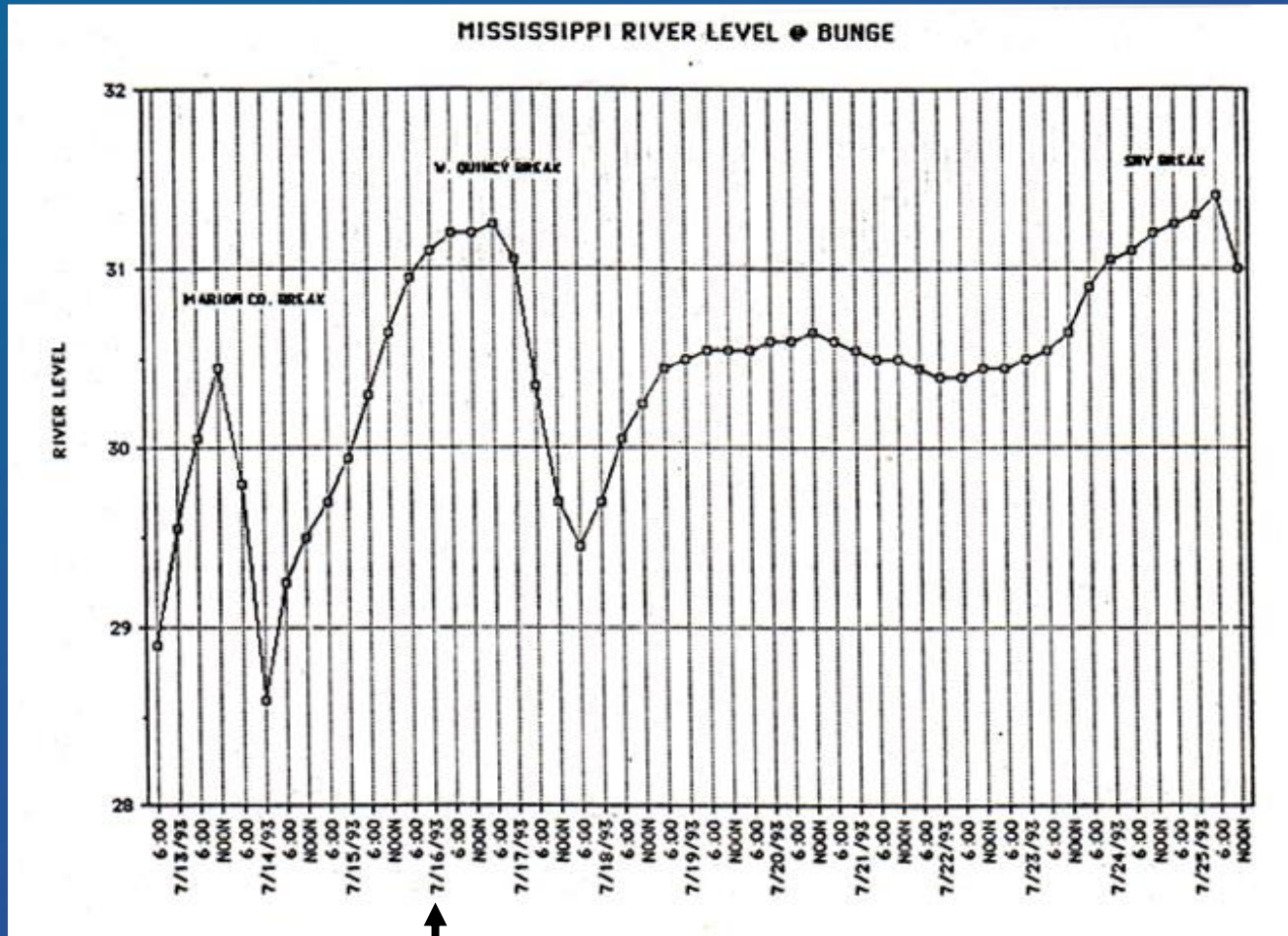
# South Indian Grave July 12, 1993



# North Indian Grave July 13, 1993



# Sny Island Local Gauge



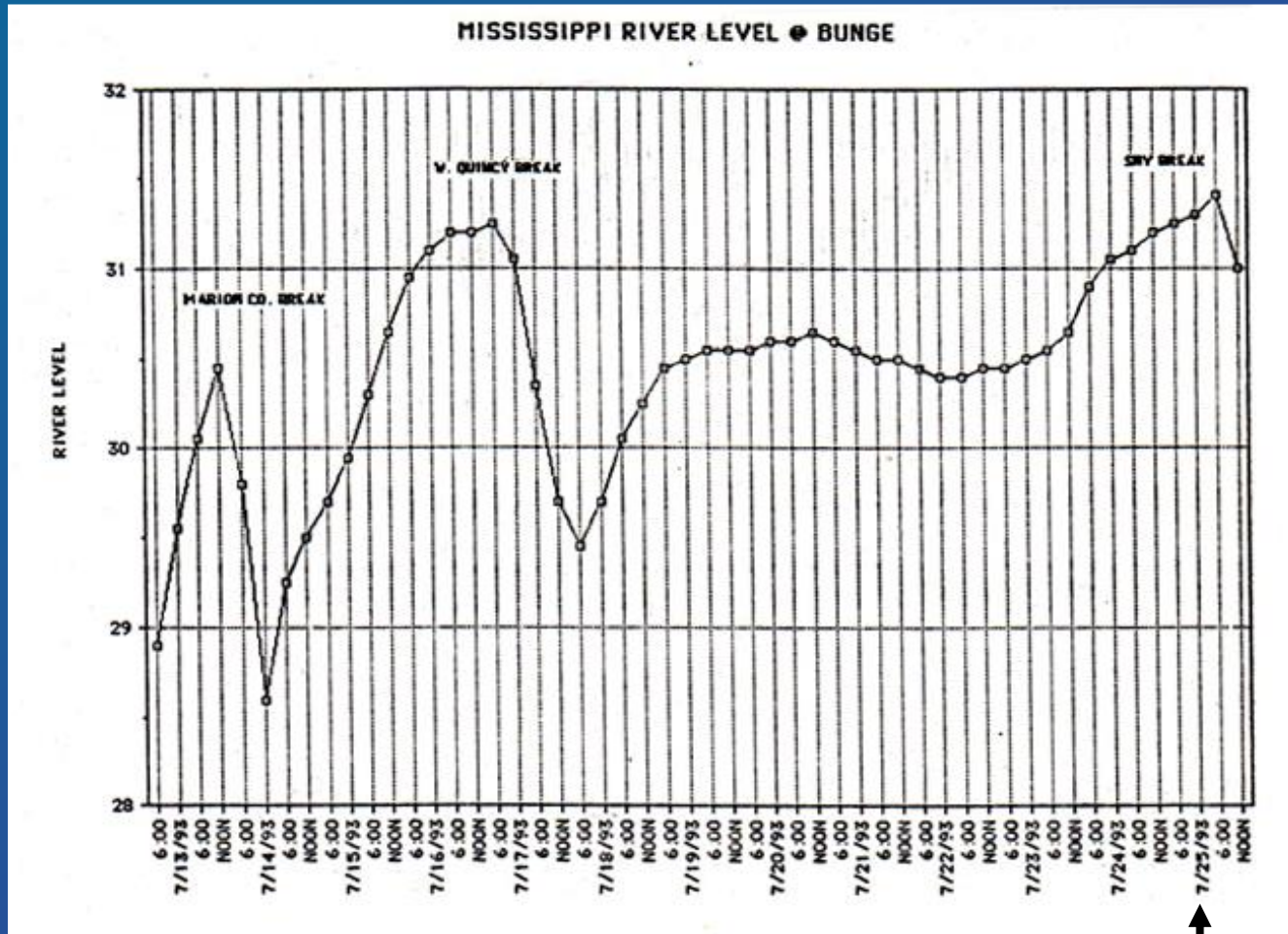
July 16

# West Quincy (Fabius River DD) Sabotage July 16, 1993



Image source: The Weather Channel

# Sny Island Local Gauge



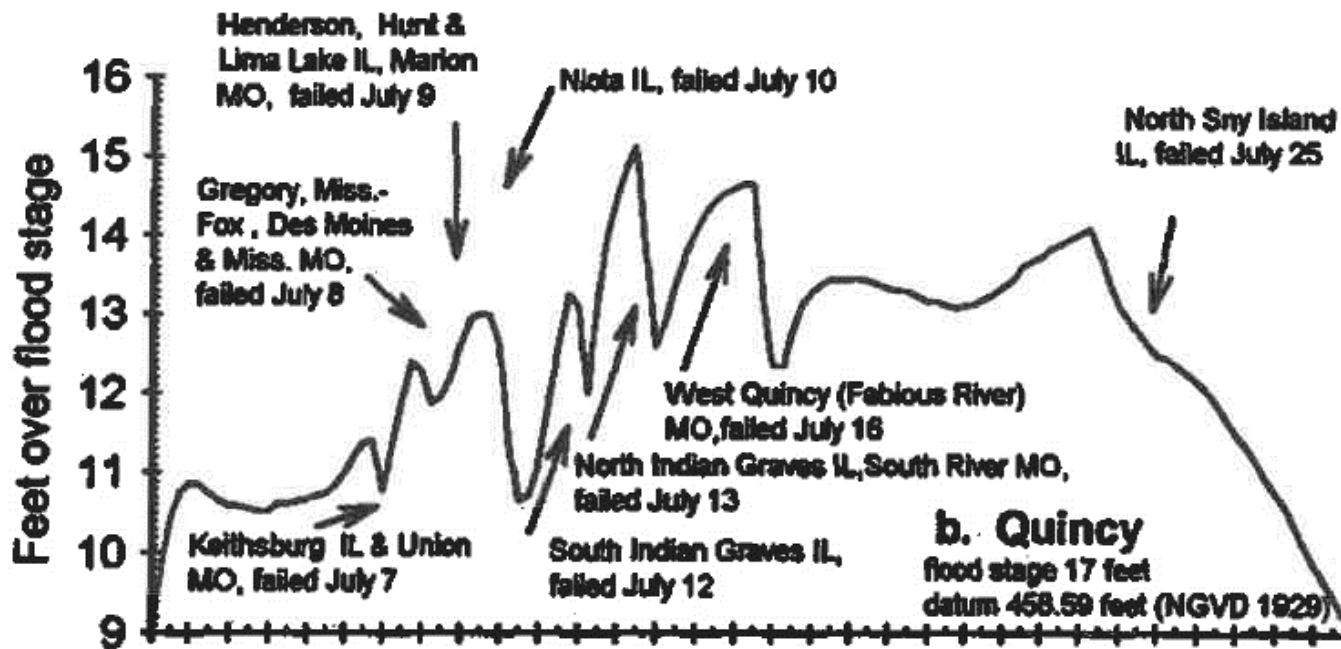
July 25



# Sny Island levee breaks July 25, 1993



# Stage values at 6 hour intervals



# Oakville levee break, June 14, 2008



# June 17, 2008 Henderson County, IL across from Burlington, Iowa



# Hunt Lima June 18, 2008 break at Lock & Dam 20



# Hunt Lima DD, June 20, 2008



# Gregory DD break May 30, 2019



# Gregory DD aftermath, spring 2019





# Hunt Lima DD, May 30 – June 2, 2019





# Greatest Flood of Record

- 1) 32.13 ft. on 7/13/1993
- 2) 31.16 ft. on 06/01/2019
- 3) 30.80 ft. on 06/18/2008
- 4) 28.90 ft. on 04/25/1973
- 5) 27.75 ft. on 04/21/2013
- 6) 27.31 ft. on 05/16/2001
- 7) 26.75 ft. on 07/08/2014
- 8) 25.30 ft. on 10/04/1986
- 9) 25.16 ft. on 06/01/2013
- 10) 24.18 ft. on 05/29/1996

# The 1954 Flood Control Act was based on the 1947 Flood of Record



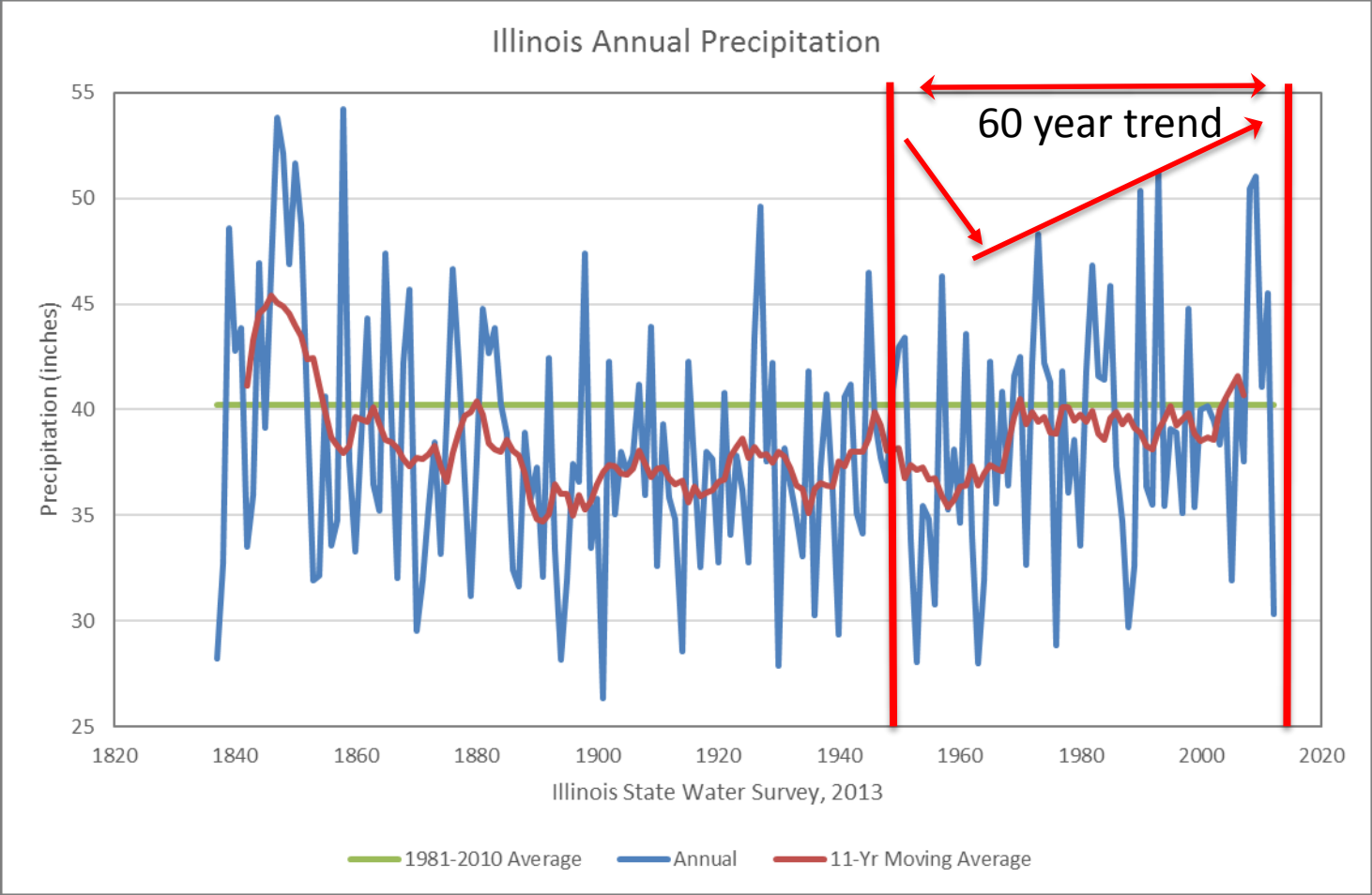
<b>1993</b>	<b>32.13</b>	] 7.5' difference
<b>2019</b>	<b>31.16</b>	
<b>2008</b>	<b>30.80</b>	
<b>1947</b>	<b>23.90</b>	

(Quincy gauge shown)



What is Really Happening in the  
Upper Mississippi?

# Rainfall Change

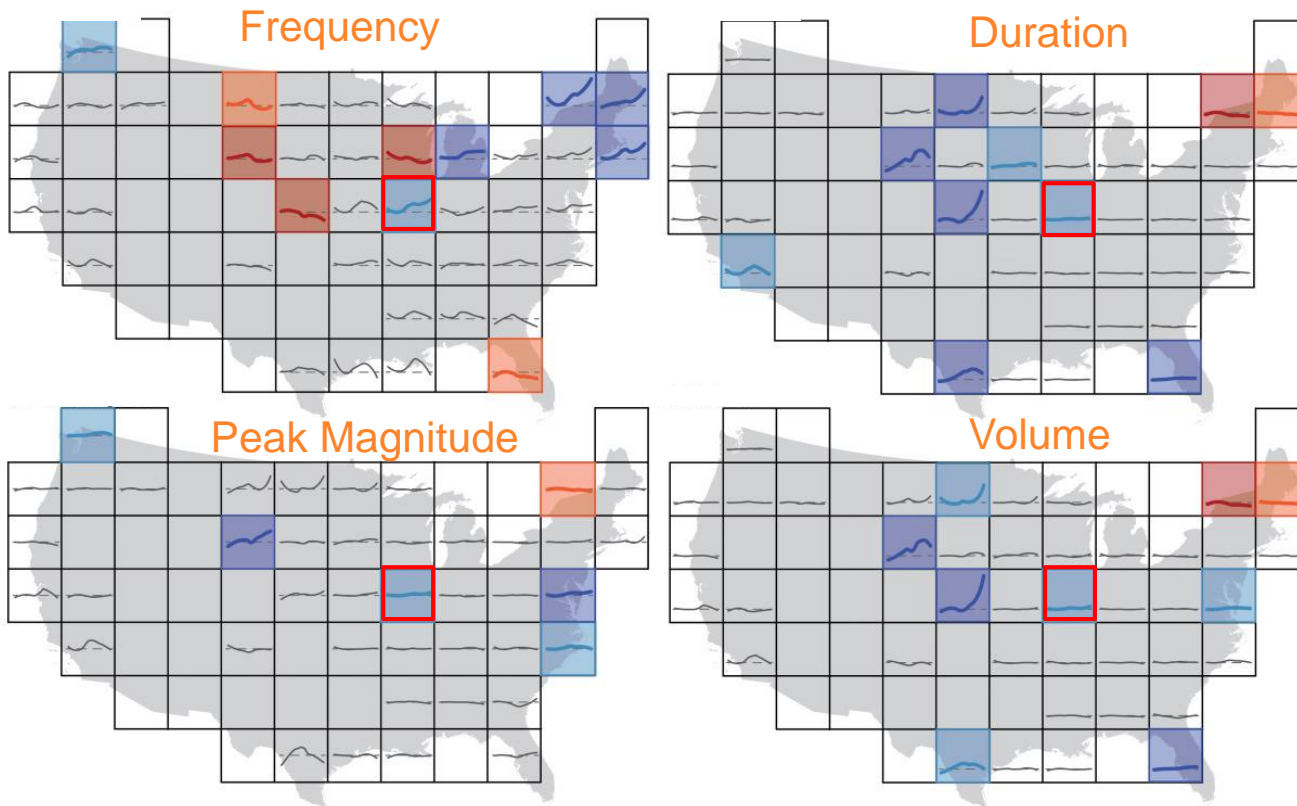


# 2016 Fragmented patterns of flood change across the USA



1940 – 1969 Base

1970 – 2013 Current

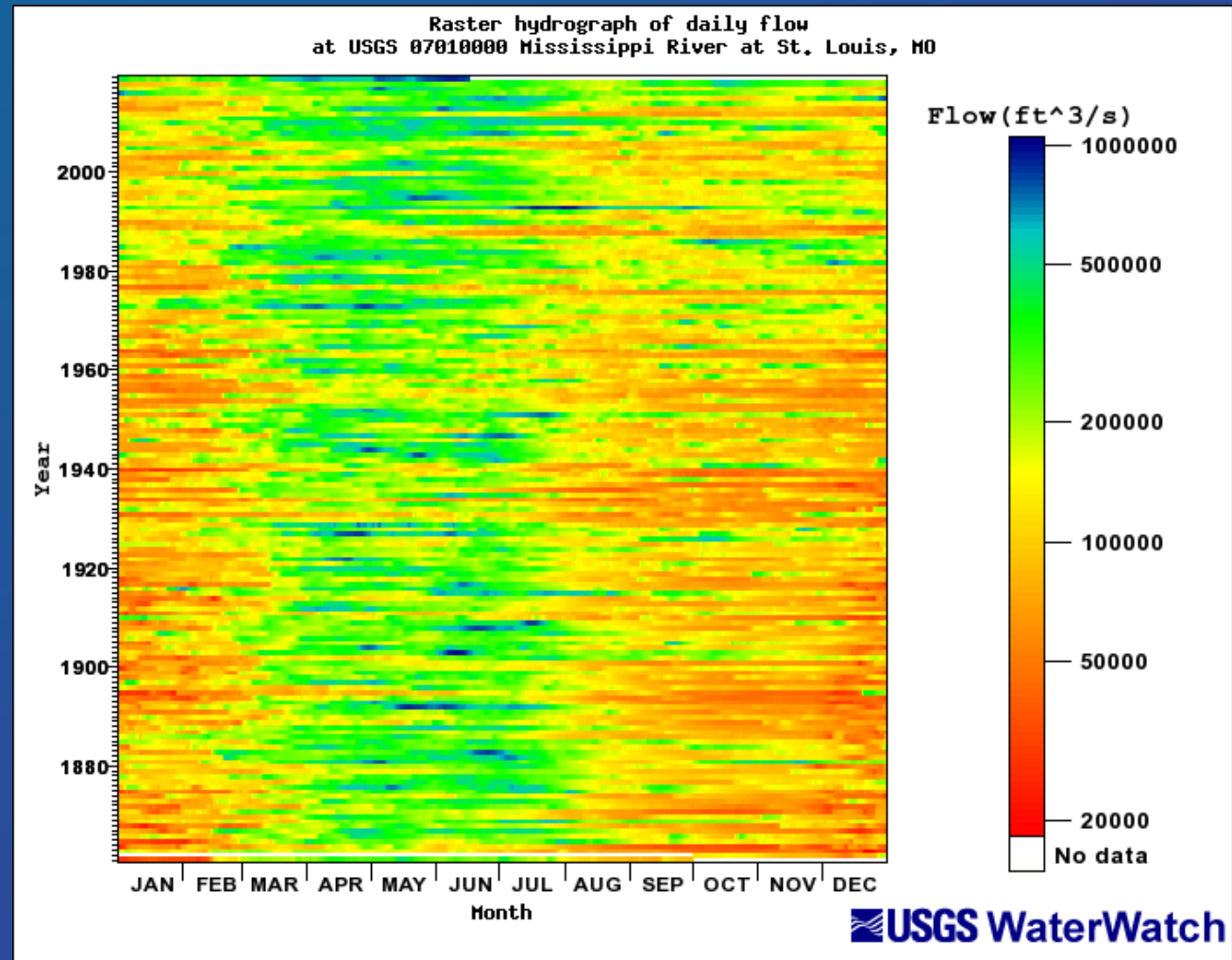


Key: Significant negative trend ■ Significant increasing trend ■

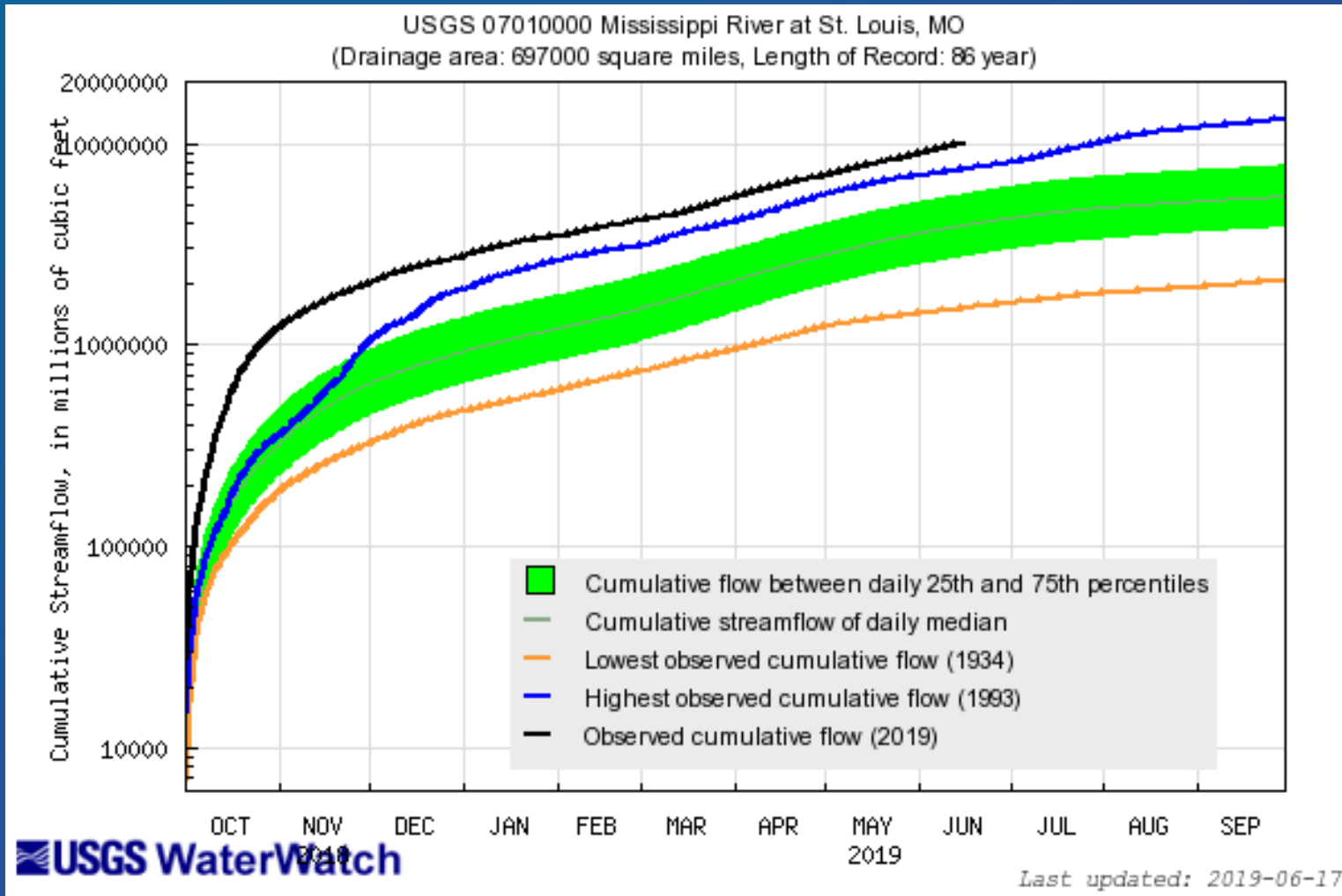
# The Water Ecosystem Out of Balance



- Used to have decades of dry fall periods with periodic high fall flows – indicated by braces right hand side of chart.
- Last 40 years have seen the paradigm flip with more wet falls than dry falls – as indicated in boxed area upper right.
- Impacts
  - Ecosystem Health
  - Recreation
  - Economy



# 2019 Cumulative River Flow at St Louis





## Many Studies – No Action



- 1994 USACE Post-flood report
- 1994 White House “Blueprint for Change” S.A.S.T.
- 1994 Galloway Report, Management Review Committee
- 1995 Floodplain Management Assessment, USACE
- 1997 A Balanced Management – Delft Hydraulics
- 2008 USACE UMR Comprehensive Plan
- 2011 USACE Working Plan
- 2016 America’s Watershed Initiative “D” rating
- 2019 UMRBA Watershed Study initiatives

Develop a Systemic Plan based on prior studies – a plan that can be refined over time



2.6 million acres in floodplain

10% limited agricultural or in conservation districts

5% required for storage for MR&T benefit (MRC recommendation)

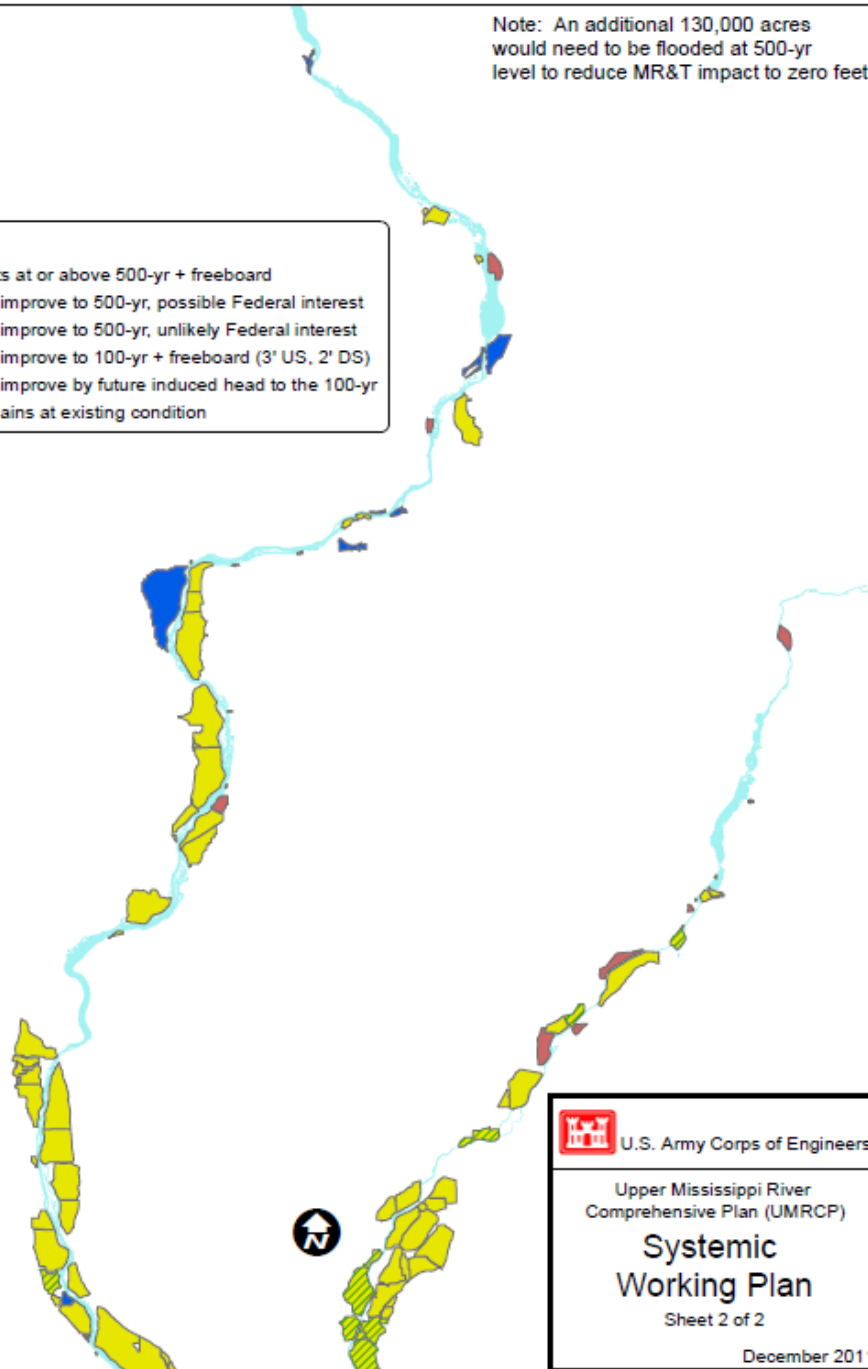
28% could improve to 500 year protection


57% Federal & some unprotected private as open waterway (no-change)

Note: An additional 130,000 acres would need to be flooded at 500-yr level to reduce MR&T impact to zero feet.

**Legend**

- Exists at or above 500-yr + freeboard
- Can improve to 500-yr, possible Federal interest
- Can improve to 500-yr, unlikely Federal interest
- Can improve to 100-yr + freeboard (3' US, 2' DS)
- Can improve by future induced head to the 100-yr
- Remains at existing condition



 U.S. Army Corps of Engineers

Upper Mississippi River  
Comprehensive Plan (UMRCP)

**Systemic  
Working Plan**

Sheet 2 of 2

December 2011



# 2011 Working Plan

# Draft Legislation

## New Authorization based on WRDA 99 Section 459



- 1) Develop a Plan in the interest of systemic flood damage reduction
- 2) Specifically address recommendations to authorize construction of a systemic flood control plan for the Upper Mississippi
- 3) Consult with appropriate Federal & State Agencies AND....

# Draft Legislation

## New Authorization based on WRDA 99 Section 459 cont'd



- 3) ...the Governors of the States, representatives of the levee districts, agricultural stakeholders, and other interested parties
- 4) Evaluate project implementation under the USACE Water Infrastructure Program as authorized by the Water Infrastructure Finance & Innovation Act (WIFIA), and
- 5) Evaluate as a public private partnership, with Federal participation on non-structural / easement tasks and local / state participation on structural improvements to meet NED (cost benefit).

# In Summary



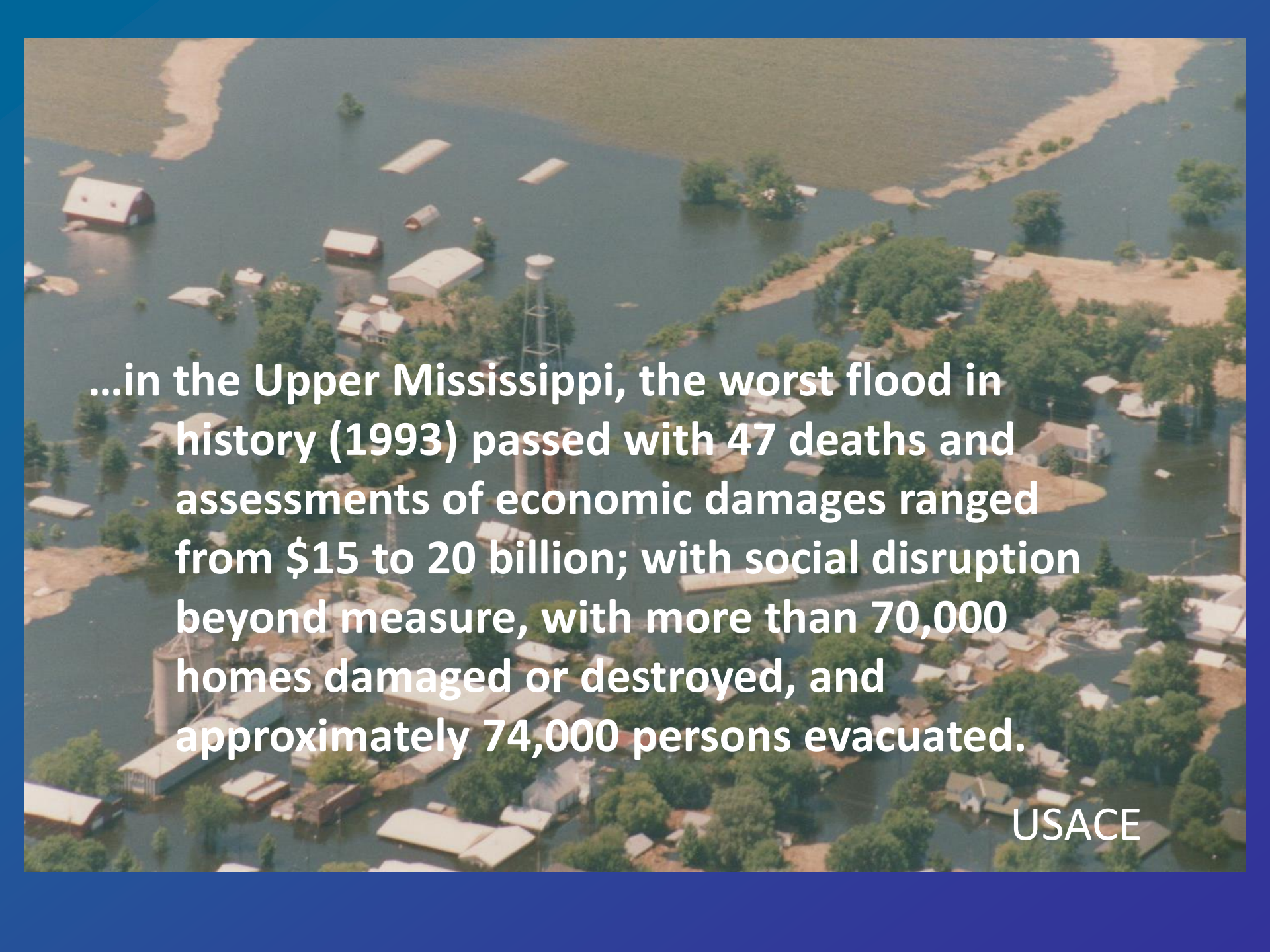
- 1) Goal is to avoid catastrophic events and convey a major flood
- 2) Immediate need is to fine tune past work (the 2011 working plan) as a Public-Private plan (\$3M requested)
- 3) Concentrate immediate work on main stem and complete plan in 2021
- 4) Request MRC oversight & leadership on implementation

## In Closing...



...in the Lower Mississippi, the worst flood in history (2011) passed with no loss of life and relatively little damage, even though it threatened to destroy 1.5 million homes, \$230 billion in crops and infrastructure, and many lives

USACE

An aerial photograph showing a severe flood in a rural area. The water is dark and covers most of the landscape, with only patches of land and trees visible. Several buildings, including barns and houses, are partially submerged. A tall water tower stands prominently in the center. The scene illustrates the extent of the 1993 Upper Mississippi River flood.

**...in the Upper Mississippi, the worst flood in history (1993) passed with 47 deaths and assessments of economic damages ranged from \$15 to 20 billion; with social disruption beyond measure, with more than 70,000 homes damaged or destroyed, and approximately 74,000 persons evacuated.**

USACE





“It’s time to implement the  
Comprehensive Plan and make us  
one River.”

UMIMRA

A photograph of a sunset over a body of water. The sun is a bright, glowing orb in the center of the frame, partially obscured by a dark silhouette of a forested shoreline. The sky is a gradient of orange and yellow, and the water below reflects the sun's light, creating a shimmering path. The foreground shows dark silhouettes of trees and bushes.

# Thank you!

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Chairman, UMIMRA  
[mdk@klingner.com](mailto:mdk@klingner.com)