

Operation Watershed

Responding to the Historic Mississippi River Flood of 2011

Overview Presentation

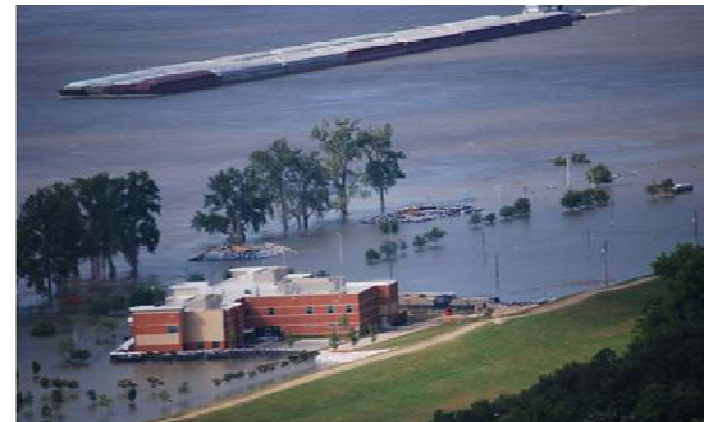
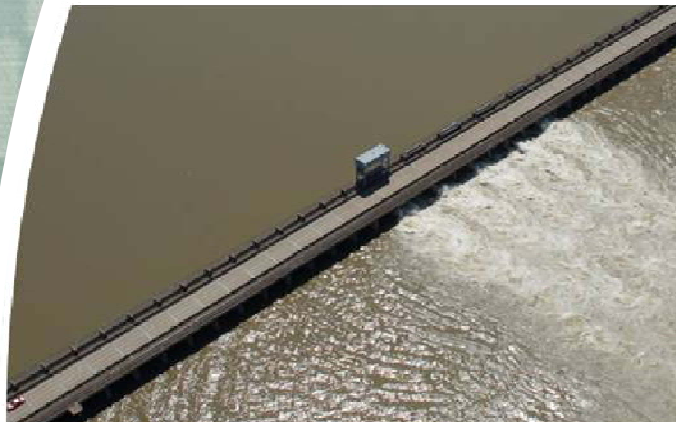
Scott Whitney

MVD REGIONAL FLOOD RISK MANAGER

November 2012



US Army Corps of Engineers
BUILDING STRONG®



Presentation Outline

ACT I: MR&T & THE 2011 FLOOD: Facts and Figures

ACT II: OPERATION WATERSHED: Response and Recovery

- 1) Organizational Structure
- 2) Damage Assessments and Documentation
- 3) Data Management
- 4) Post Flood Report
- 5) Repair/Recovery Status

ACT III: RISK COMMUNICATION STRATEGY

- (1) Regional Communication Plan
- (2) Interagency Recovery Task Force
- (3) Flood Preparedness
- (4) Tools and Products



The United States is at Risk!



- ✓ **Flooding is the costliest natural hazard in the nation**
- ✓ **Consequences of Flooding:**
 - **Loss of Life**
 - **Loss of business revenue**
 - **Property damage**
 - **Infrastructure damage**
 - **Environmental damage**
 - **\$\$\$ Recovery**

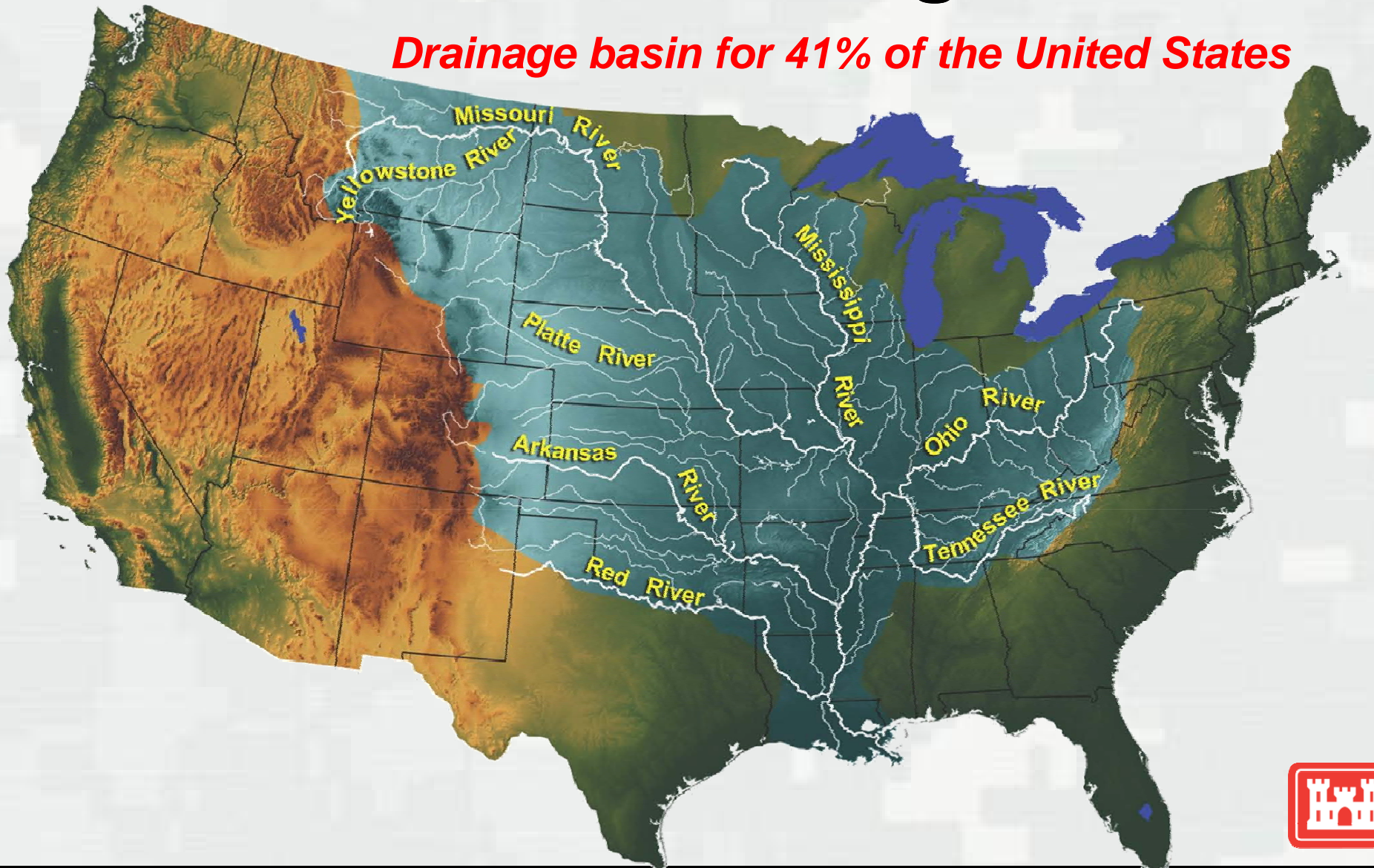
- ✓ **Flood events are getting more extreme and frequent**
- ✓ **Need to break cycle of damage-repair-damage-repair**
- ✓ **Flood Risk Management is a SHARED RESPONSIBILITY!**

A NATION AT RISK: Throughout the Nation, both existing and new development are locating in flood prone areas, often behind aging and poorly maintained flood risk management infrastructure. There is limited information available on the extent of current-day and potential future flood risks and a widespread lack of understanding of flood risks by the public and decision makers.



Mississippi River Watershed World's 3rd Largest

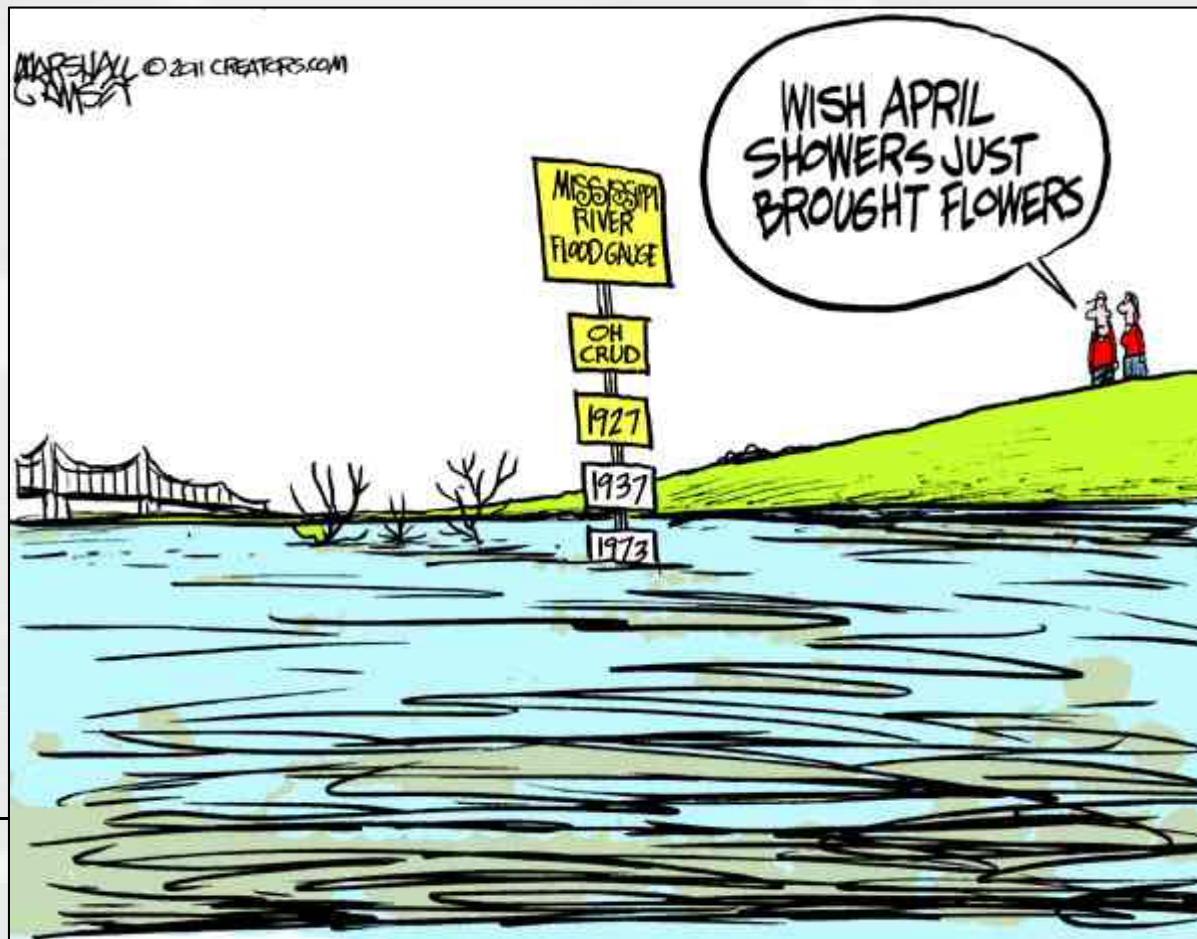
Drainage basin for 41% of the United States



ACT ONE:

MR&T & THE 2011 FLOOD:

Facts and Figures



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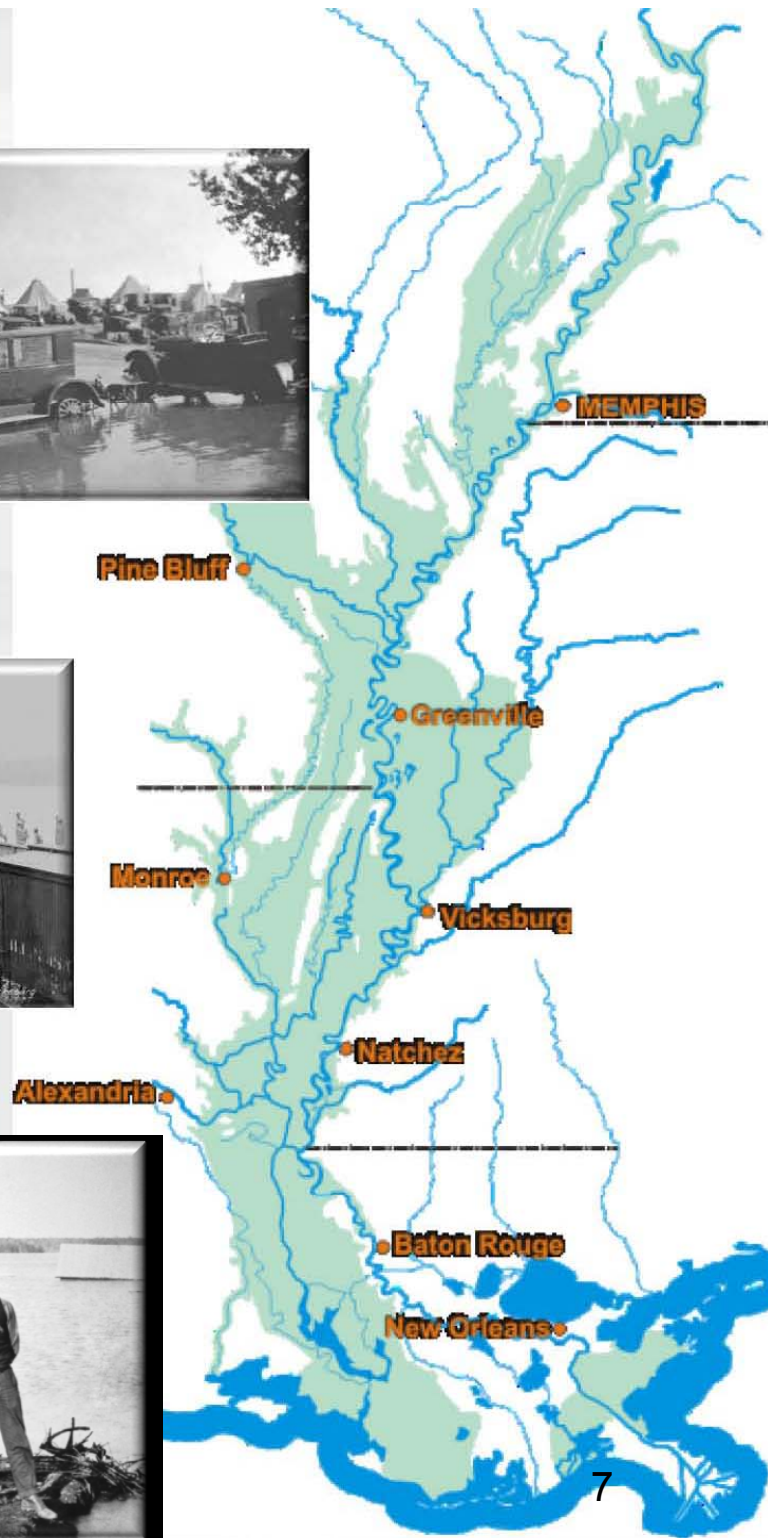
Mississippi River & Tributaries Project



- Most comprehensive and Successful FRM system in the world.
- Comprised of Levees, Channel Stabilization, Tributary improvements and Floodways
- 35,000-square-mile flood plain
- \$14 billion invested
- \$612 billion in flood damages prevented
- 44 to 1 return on investment
- 4.5 million people protected
- MR&T Project Currently 89% Complete



1927 Flood



Legend

 1927 Flooded Area

26,000 Square Miles Flooded
500 People Killed
325,000 Refugees



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HYPO - FLOOD 58A STORMS

JAN. 1937



HYPO - FLOOD 58A STORMS

FEB. 1938



HYPO - FLOOD 58A STORMS

JAN. 1950



HYPO - FLOOD 58A STORMS

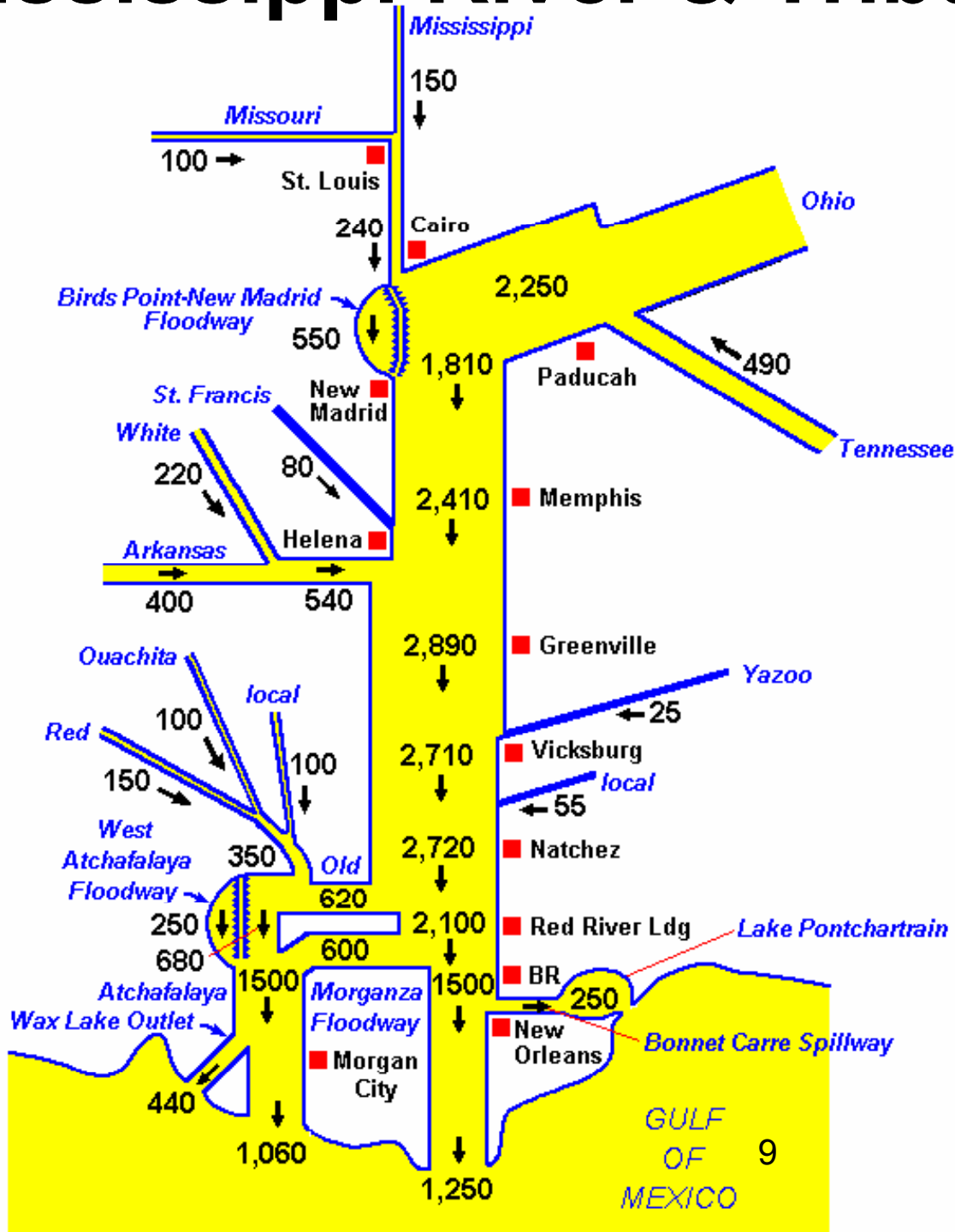
FEB. 1938

JAN. 1950

JAN. 1937



Mississippi River & Tributaries Project



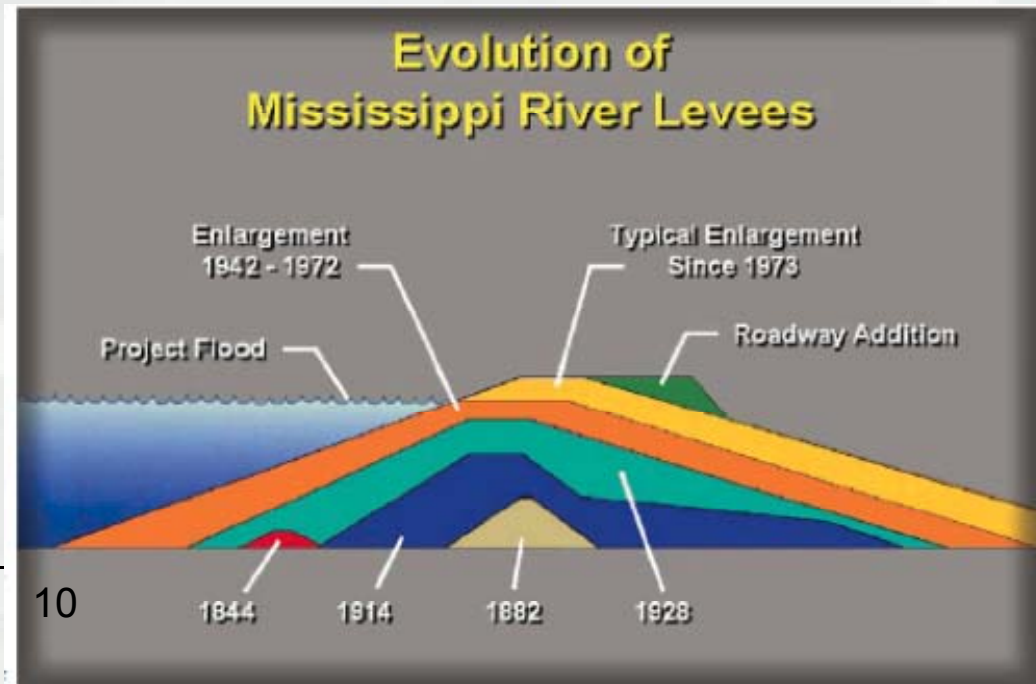
*Project
Design
Flood*



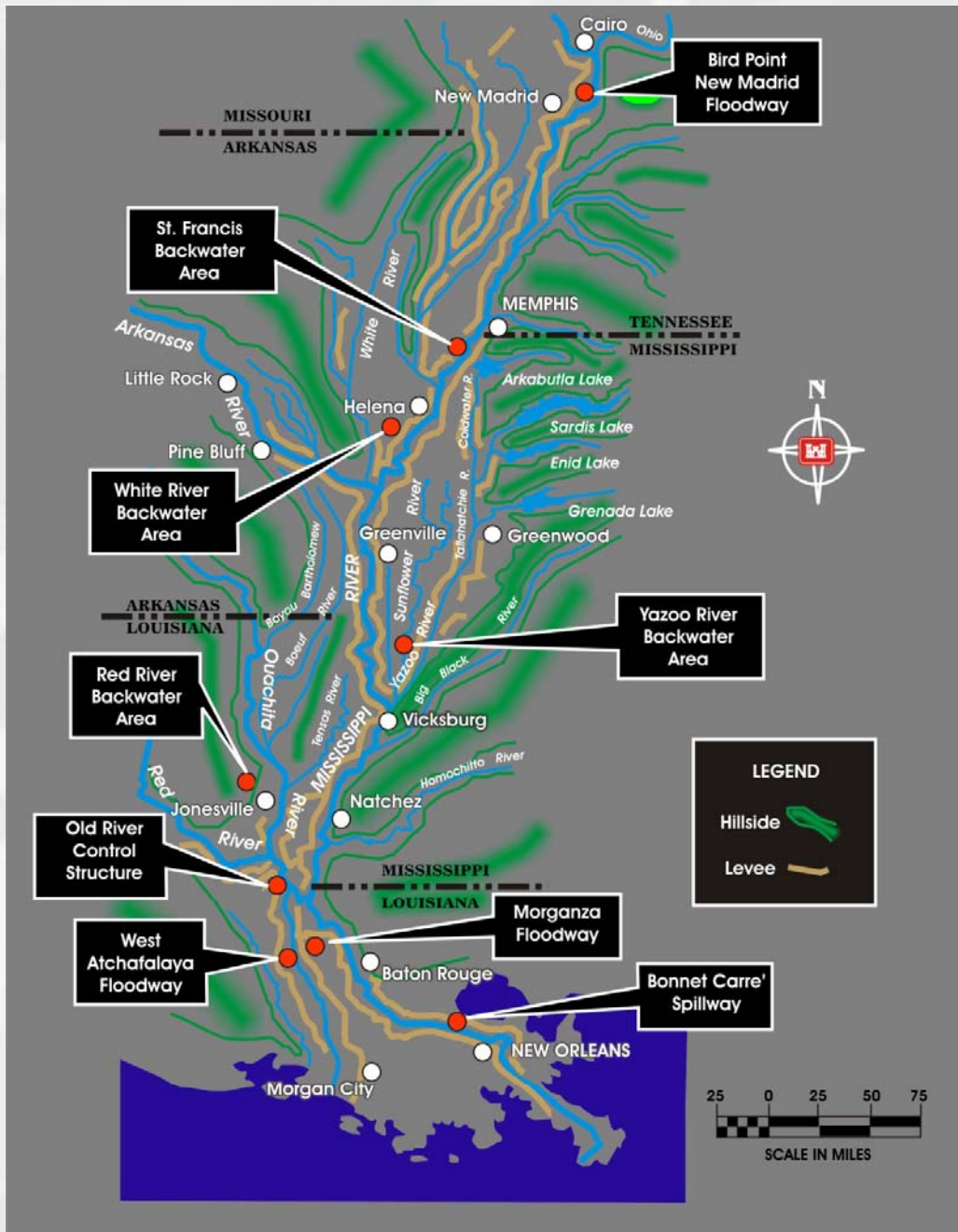
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MR&T Levees

- Backbone of the MR&T
- Extends from Cape Girardeau, MO to Venice, LA.
- Total of 3,787 miles of embankments and floodwalls.
- 2,216 miles are main stem Mississippi River Levees
- 1,571 miles are backwater, tributary, and floodway levees.
- No project levee built to Mississippi River Commission standards has ever failed
- Grade and section of the present levee system dwarfs by comparison those of the levee system overwhelmed during the 1927 flood
- Technological advances in levee design and construction



Floodways and Backwater Areas



Floodways

- (1) Birds Point – New Madrid
133,000 acres
- (2) Morganza Floodway
71,500 acres
- (3) Bonnet Carré Spillway
7,600 acres
- (4) West Atchafalaya Floodway
154,000 acres

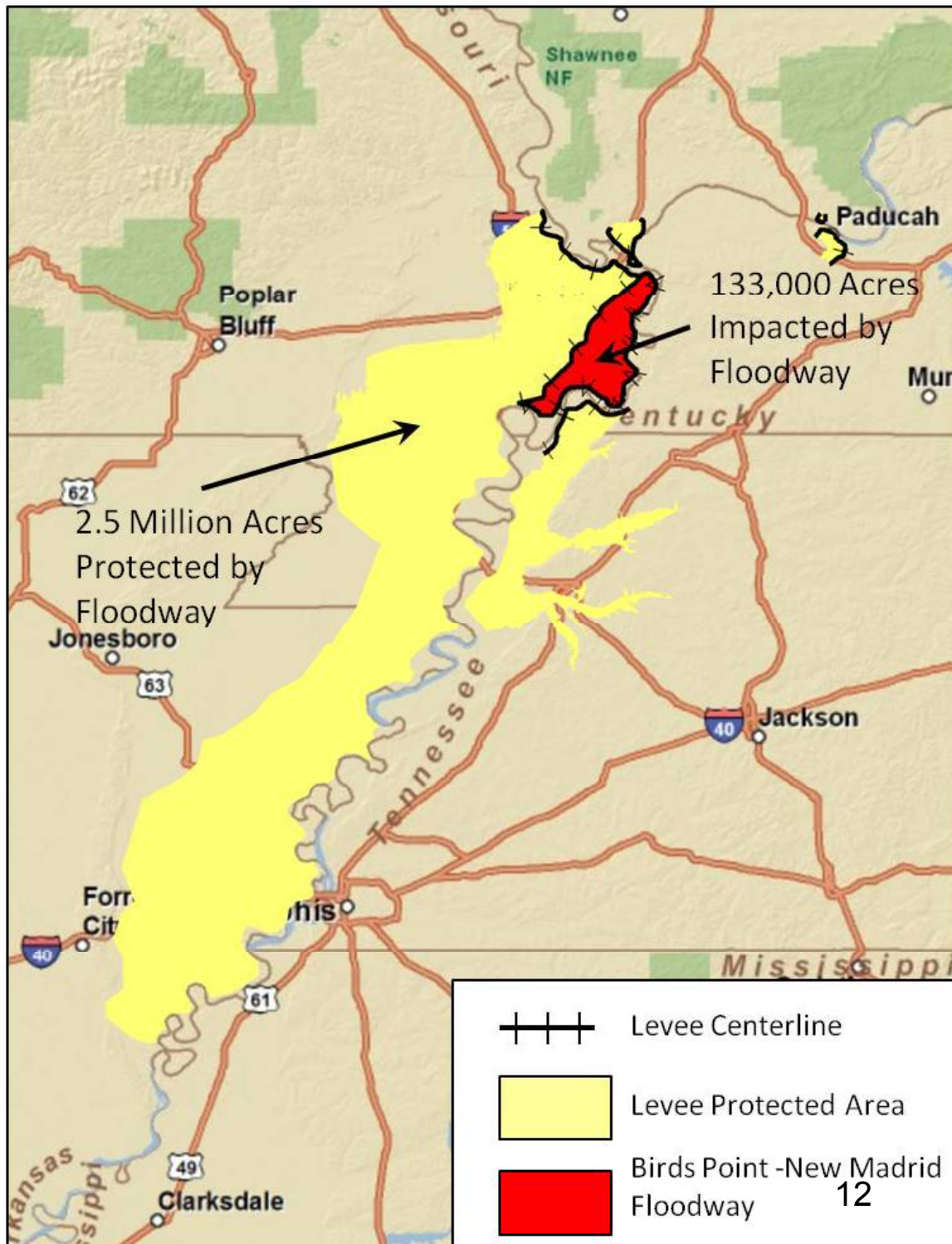
Backwater Areas

- (a) St. Francis Backwater Area
500,000 acres
- (b) White River Backwater Area
145,000 acres
- (c) Yazoo Backwater Area
634,000 acres
- (d) Red River Backwater Area
373,000 acres



Birds Point- New Madrid Floodway

- completed in 1933, has been operated in 1937 and 2011
- varies in width from about three to ten miles and has a length of nearly 36 miles
- 133,000 acres vs 2.5 million acres protected
- designed to divert 550,000 cfs from MR during PDF.
- fuseplug levees at its upper and lower end require explosives for activation
- operation of the BP-NM floodway is not about a single town or place



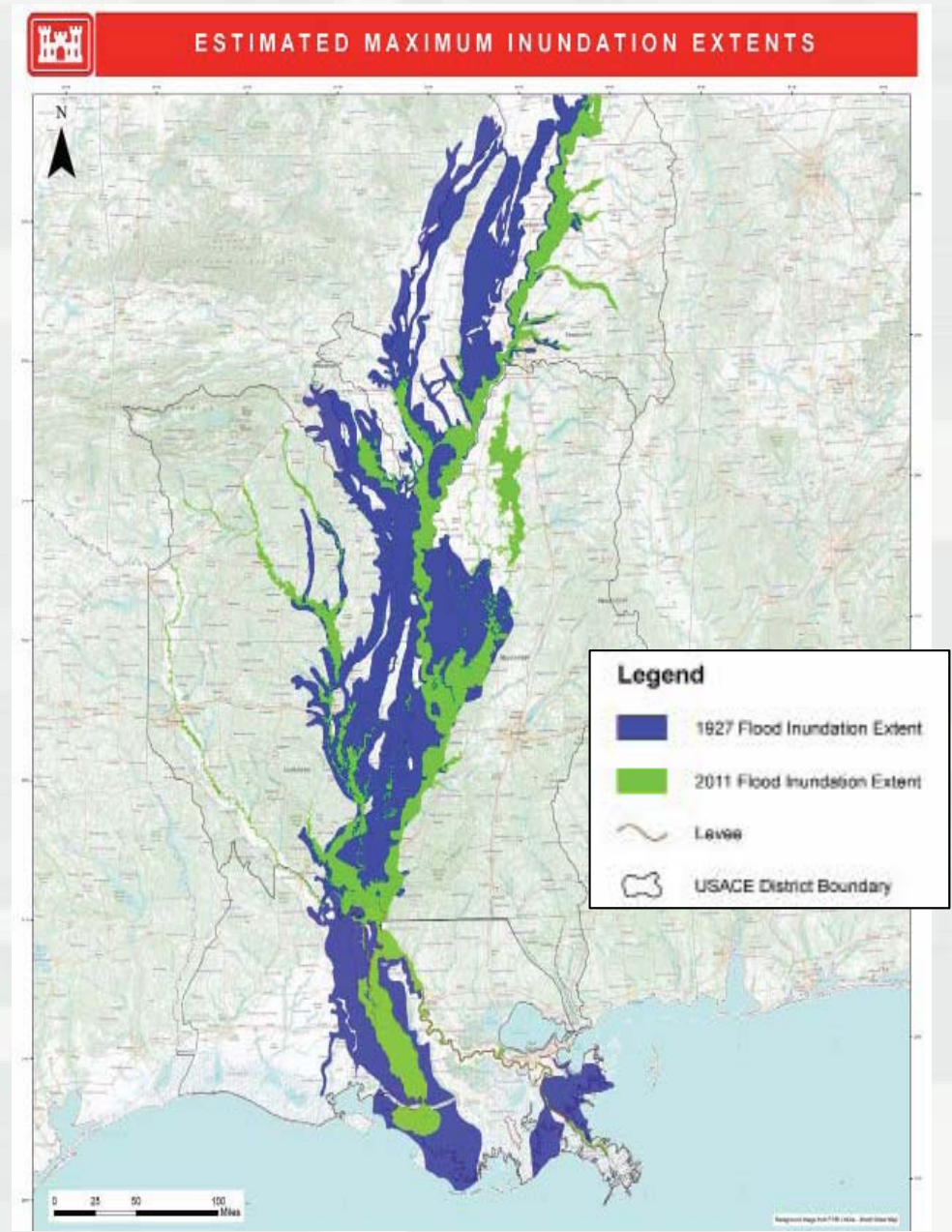
“CRITICAL LESSONS LEARNED AND APPLIED”

Room for the River Concept

- **1927 Flood**
 - Flooded 26,000 square miles = 16,800,000 acres
 - Levees only policy – No floodways or backwater areas
- **2011 Flood**
 - Flooded 9,900 square miles = 6,350,000 acres
 - Flooded 38% of area flooded by 1927 Flood
 - MR&T project includes levees and floodways and backwater areas to **Make Room for the River**
- **Floodways and Backwater Areas**
 - Total acreage of floodways = 366,000 acres
 - Total used during 2011 Flood = 212,000 acres
 - Total acreage of backwater areas = 1,652,000 acres
 - Total used during 2011 Flood = 335,000 acres (interior flooding)
 - Over 1.5 million acres of floodways and backwater areas were not inundated during the 2011 Flood
 - While the 2011 Flood is not as large as the Project Design Flood, there is still **Room for Larger Floods**

MR&T and 2011 Flood - Key Messages

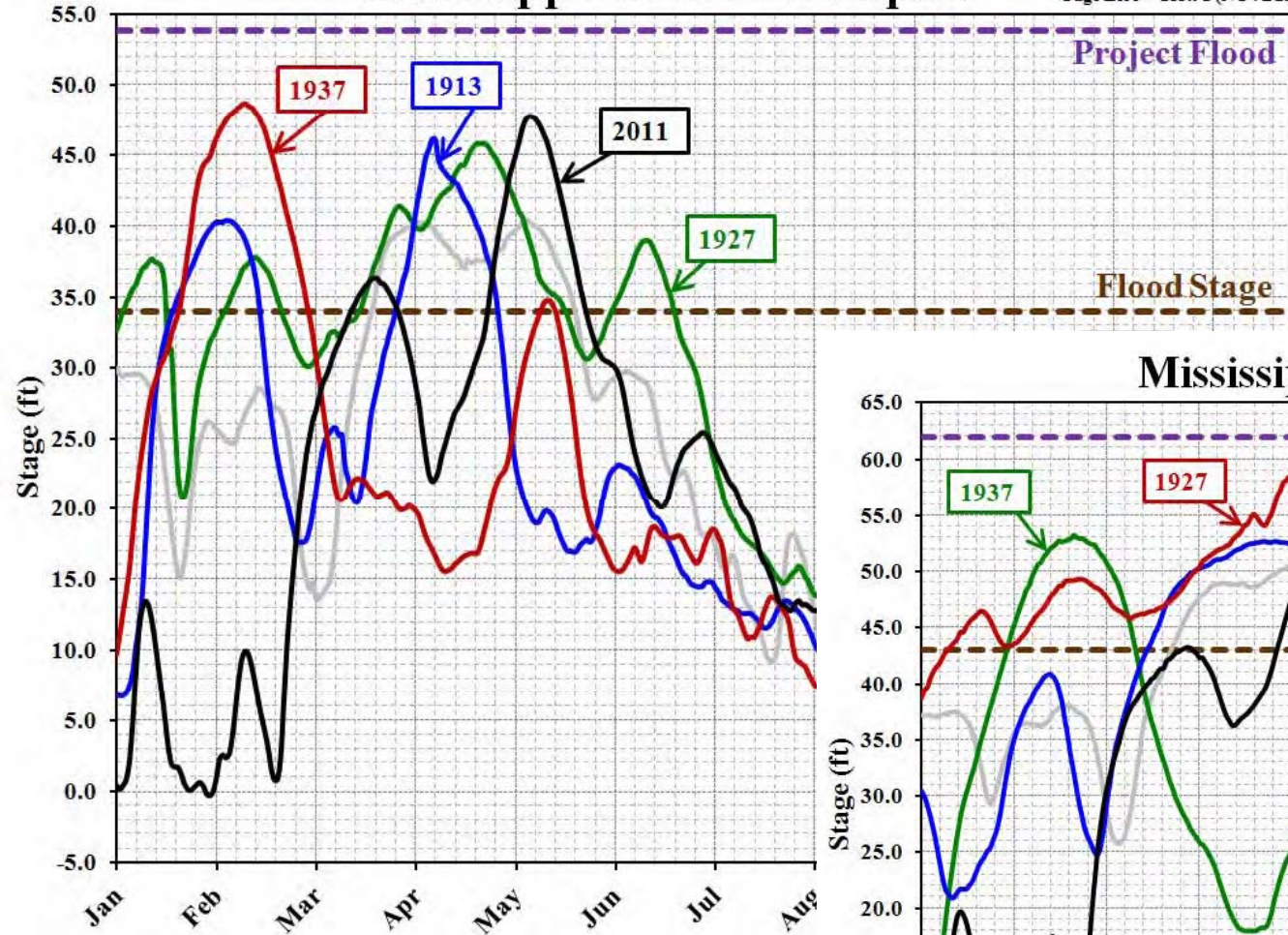
- MR&T System performed as designed with not a single life lost or acre of land flooded that was not intended
- Many of our flood control and navigation systems remain in a state of vulnerability and risk due to damages incurred in 2011 historic flooding
- Recovery efforts in full swing due to \$1.724B funding from Disaster Appropriations Act. Current plan is to have all repairs done by 2014.
- Will require extra vigilance and advance preparedness to ensure the safety and security of our citizens, infrastructure and industry
- System-wide performance assessments reveal lessons-learned to be applied in preparation for and system reliability in future flood events.



“Profiling Epic Flood Events”

Mississippi River at Memphis

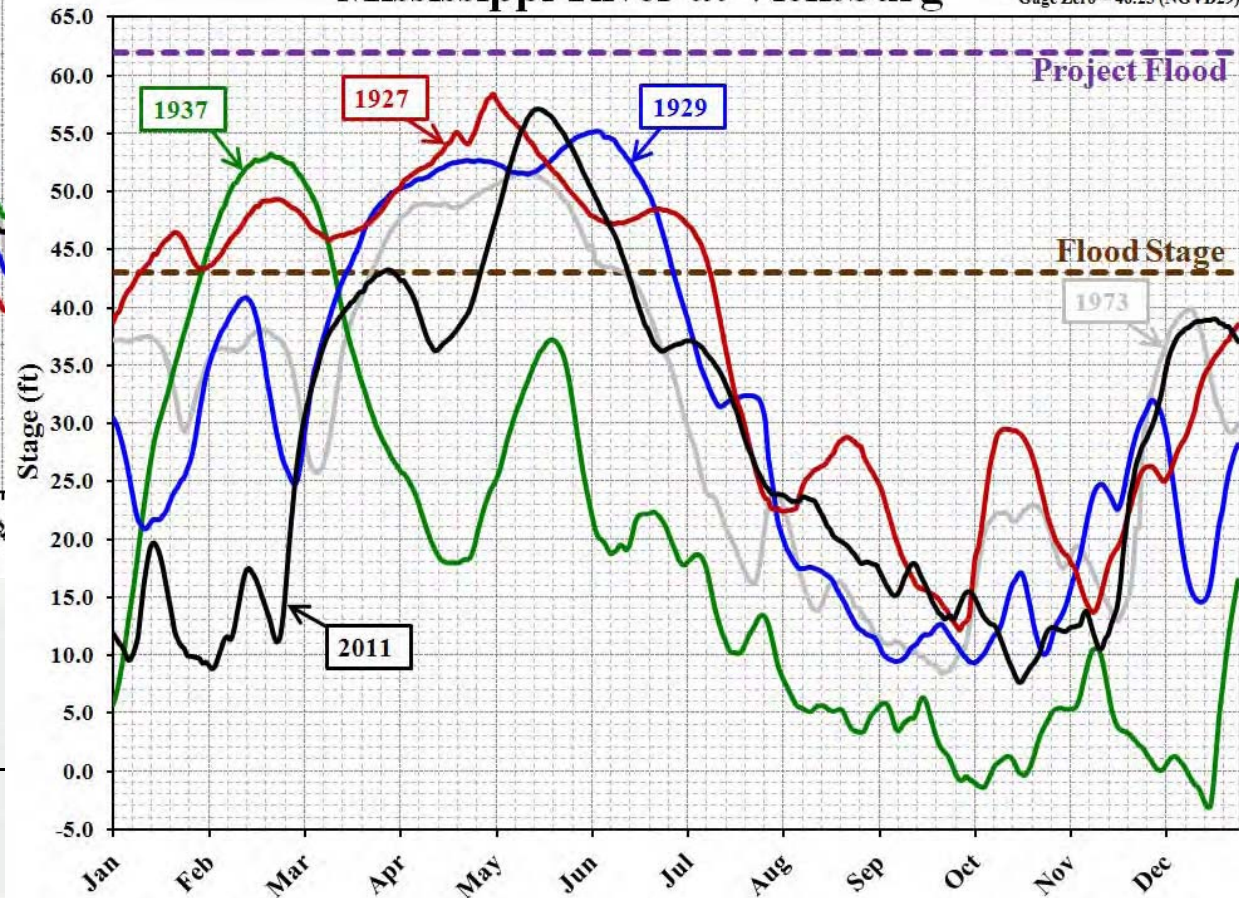
Gage Zero = 183.91 (NGVD29)



- Collaborative Response
- Consequences
- Lessons Learned
- Collaborative Recovery
- Legacy Documentation

Mississippi River at Vicksburg

Gage Zero = 46.23 (NGVD29)



ACT TWO:

OPERATION WATERSHED:

Response and Recovery

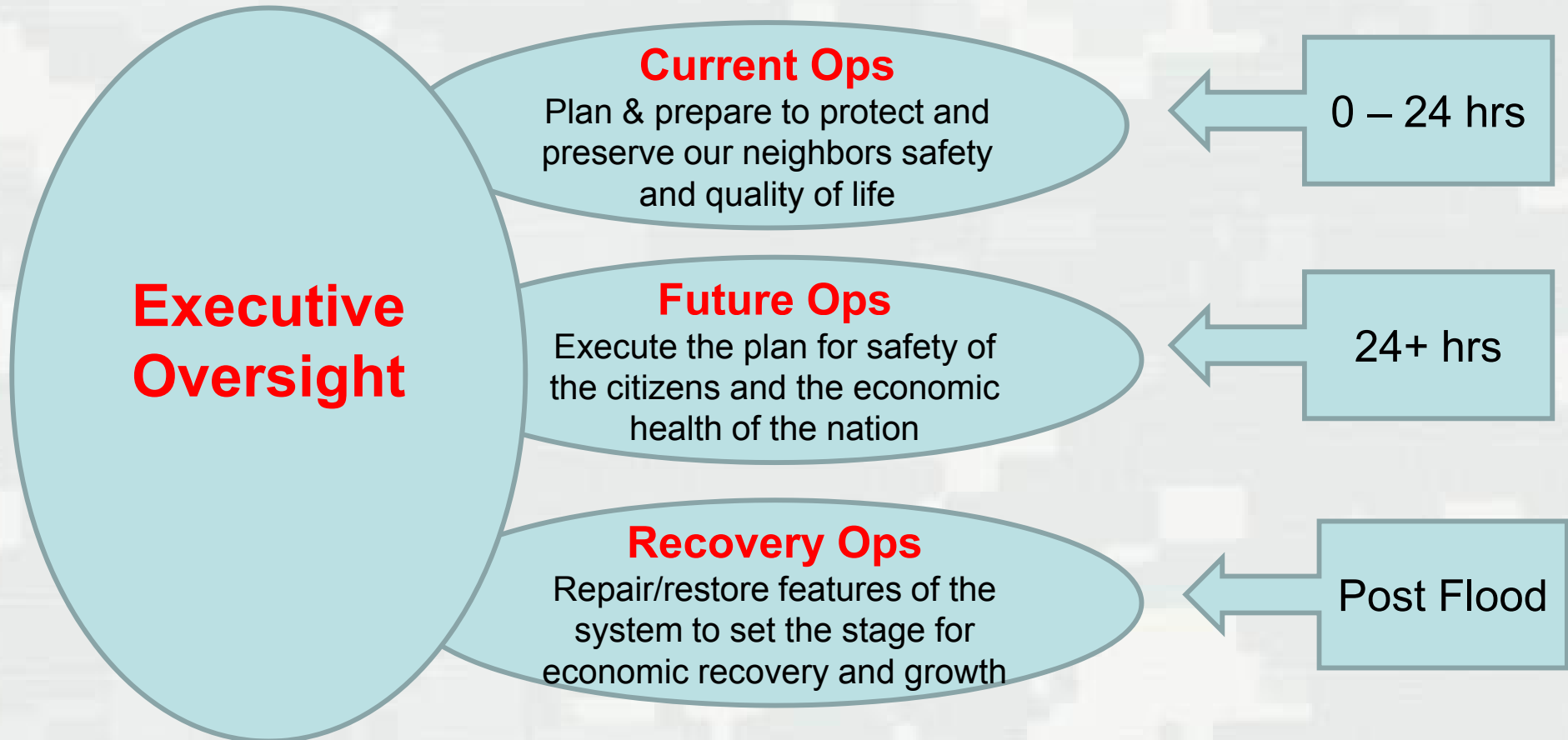


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Operation Watershed

Responding to the Historic Mississippi River Flood of 2011

RESPONSE OVERVIEW



Operation Watershed

Current Operations (0-24hrs)

- **Purpose:** to provide real-time tracking of ongoing floodfight and latest weather and river forecasts for command decisions
- **How:** Emergency Operations Center active 24-hr/d and 7d/wk with Command Briefings every 12 hrs.
- **Example** format for command briefings:
 - ▶ Weather conditions and forecasts
 - ▶ Deployment of Flood Fight Forces and Resources
 - ▶ Water Control – Current and Projected River Stages and Flows
 - ▶ District Commander Briefings
 - ▶ Future Operations
 - ▶ Recovery Operations
 - ▶ FEMA Briefing
 - ▶ USGS Briefing
 - ▶ USCG Briefing
 - ▶ Media and Social Network Briefing
 - ▶ Safety and Security Briefings



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Future Operations (24+ hrs)

- **Purpose:** Tactically and Strategically evaluate issues, challenges, decisions, contingencies and conditions likely to occur in next 24+ hours.
- **How:** Extensive internal and external coordination, communication and collaboration. Development of Tactical and Strategic condition based alternatives.
- **Examples** of some of the Future Ops activities:
 - ▶ Contingency plans, inventories, contract capabilities, equipment, supplies, and vendors in the case of a breach.
 - ▶ ERDC levee breach plugs staging for emergency deployment
 - ▶ Levee breach scenarios and updated inundation maps reflecting the most recent crest projections
 - ▶ Organizing Public meetings well in advance of crest
 - ▶ Interagency Coordination with USEPA, States, USGS and USCG



Operation Watershed

Recovery Operations

- **Purpose:** Secure necessary interagency support and resources needed to efficiently and effectively restore functionality and levels of protection for damaged FRM systems, assess and document system performance, and implement mitigation measures & system improvements.
- **How:** Internal and External Collaboration and synchronization to ensure structured and timely damage assessment, design and construction.
- **Examples of some of the Recovery Ops activities:**
 - ▶ Damage Assessments Documentation
 - ▶ Interim vs Permanent Repairs
 - ▶ Replacement, rehabilitation or repair plans
 - ▶ NEPA requirements
 - ▶ Scope, schedule and budget
 - ▶ Risk assessments, preparedness and prioritization
 - ▶ National and Regional synchronization and sequencing
 - ▶ Interagency collaboration and communication
 - ▶ Post Flood System Performance Evaluation

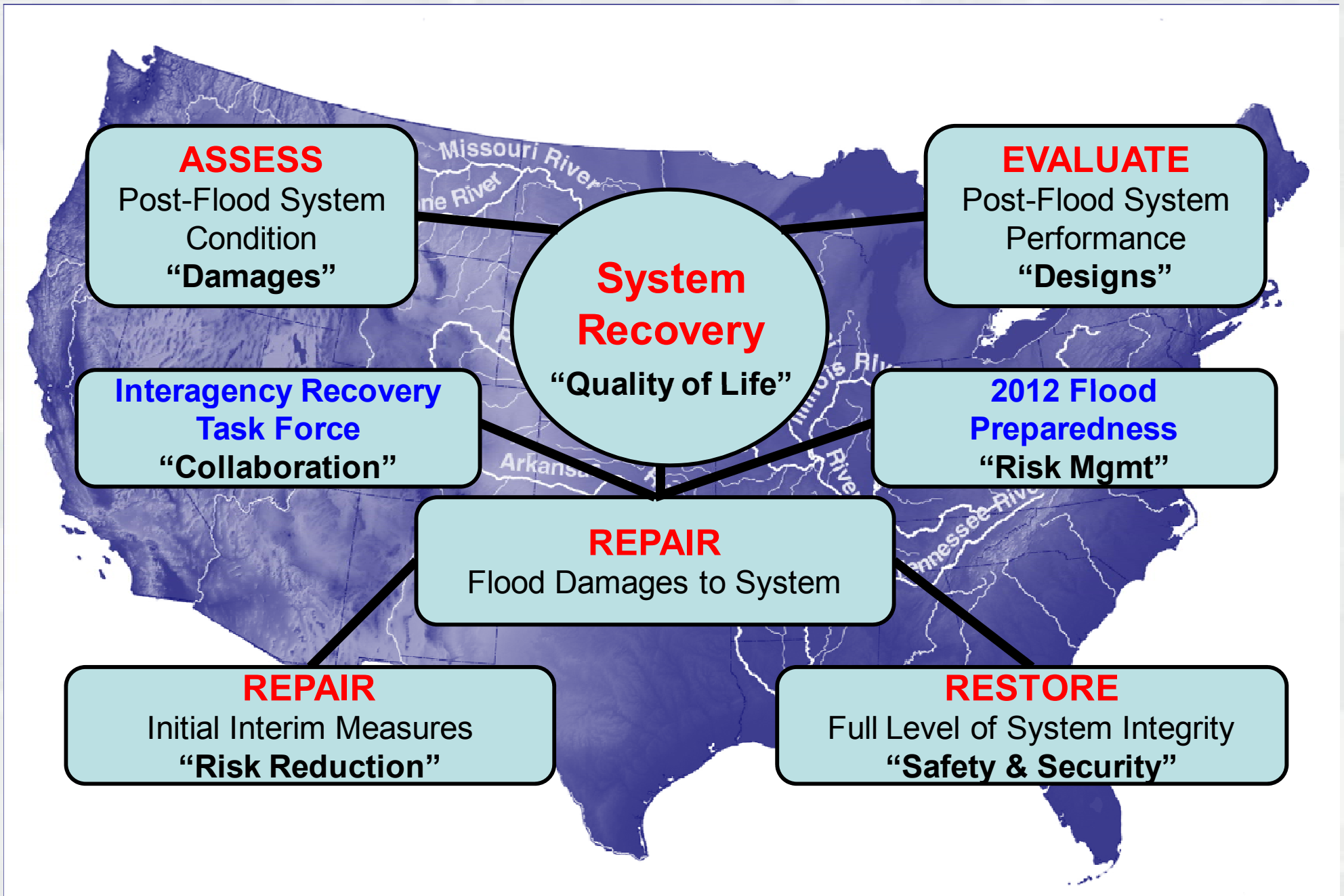


The MVD 2011 Flood “War Room”



Operation Watershed - Recovery

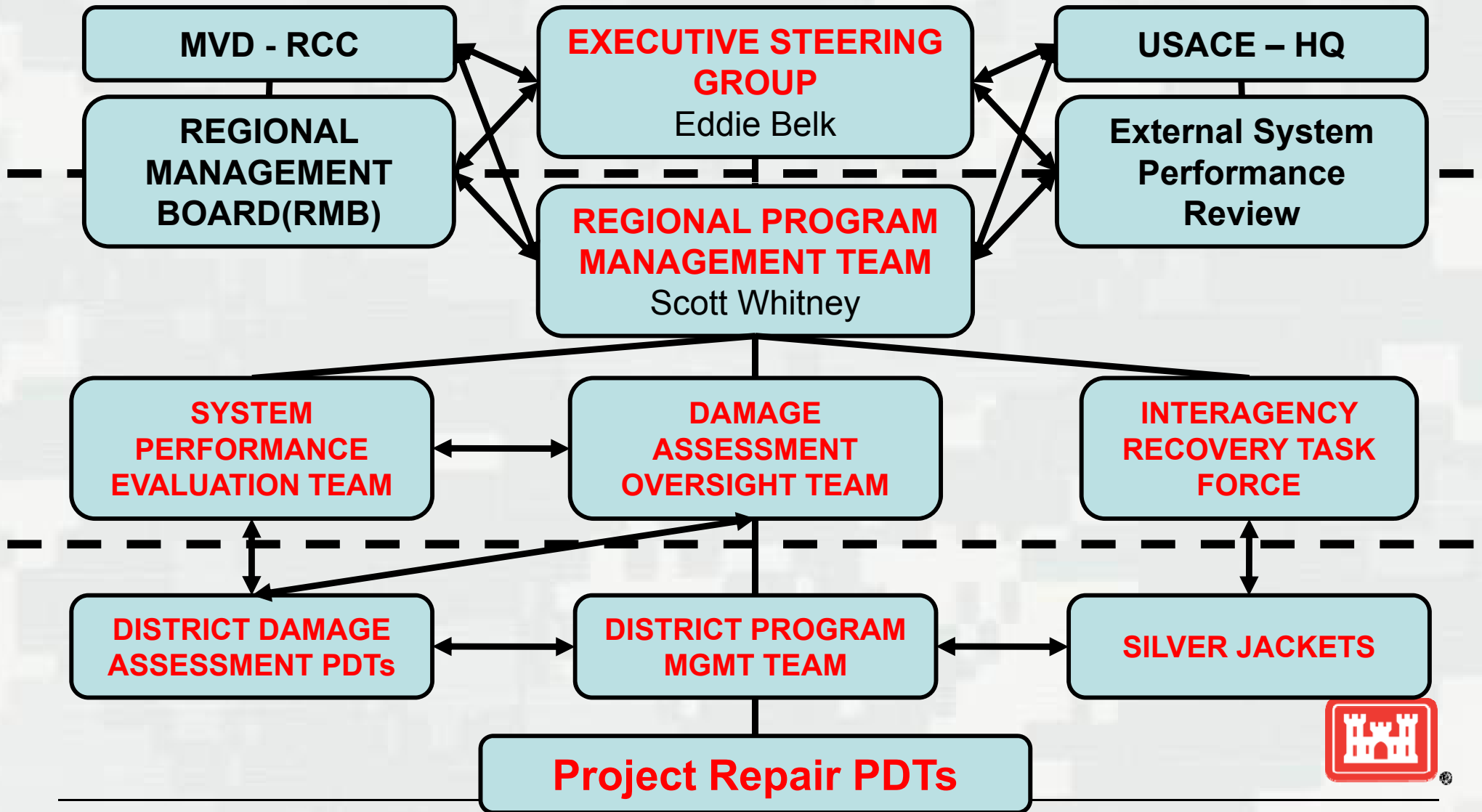
Responding to the Historic Mississippi River Flood of 2011



Operation Watershed

Responding to the Historic Mississippi River Flood of 2011

RECOVERY - MANAGEMENT STRUCTURE



Operation Watershed

Responding to the Historic Mississippi River Flood of 2011

DAMAGE ASSESSMENTS

Damage Assessment Reports:

- (1) Physical data collection
- (2) Historic perspective analysis
- (3) Repair options
- (4) District QA review
- (5) ROM Repair Cost



Risk Information Paper

- POC's
- Overview
- Damages
- Consequences
- Considerations
- Prelim Schedule



US Army Corps
of Engineers
Vicksburg District

Information Paper No. 16 Francis Sand Boil (Rosedale)

OPERATION WATERSHED RECOVERY – PHASE I CRITICAL SITES

Contacts

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OVERVIEW

OW-R PRIORITY: 16 of 93

DISTRICT: Vicksburg District

TYPE: Levee Damage – Boil and Seepage

RM: 615.5L (STA. 151+00)

FRAGO CLASS: 2 - Significant Potential for Loss of Life and Significant Economic Damage

RISK: 67,180 residents, \$2.8B infrastructure

REPAIR: Eleven 8" relief Wells

REPAIR COST: \$474,000

Damage Assessment

A large, high energy sand boil was identified moving significant quantities of silt and fine sand material at the toe of a 200 foot seepage berm. The boil was bagged by the Levee Board with prison labor for initial containment and subsequently the sandbag ring was encircled by a larger earthen berm constructed by Corps hired labor forces. A filter of sand and stone was constructed over the boil throat to filter fines and dissipate energy. The stabilization of the boil took 4 days of 24 hr/day effort. Flow from the boil was estimated at approximately 300gals/min. This boil appeared to have the potential to result in backward erosion and piping that could eventually lead to loss of berm and levee foundation material. Two additional sand boils were identified approximately 100 – 150 feet from the berm toe. These boils were classified as moderate energy levels and moved approximately 5-7 cubic yards of material. These boils were also bagged by the local prisoners. Heavy seepage and numerous pin boils were noted and monitored along the slope and toe of the berm upstream and downstream of these boils for a reach of approximately 2,000 feet.

Risk and Consequence

If the East Bank Mississippi River Levee System were to fail at the Francis site, the population at risk would be 67,180. The value of the non-residential structures is \$561,855,000, and the value of the 22,599 residential structures is \$2,261,510,000.



Figure 1: Francis Initial Sandbag Ring

Critical Repairs

Remediation, for at least a 500 ft reach of this area, is recommended prior to the next high water season.

The preliminary repair recommendation for this site includes eleven 8 inch diameter relief wells, 100 ft deep, 50 ft spacing, located at the existing berm toe. The estimated cost of this repair is \$474,113.

Special Considerations

The Francis site, is covered under the 1998 MRL SEIS. (Work item 616-L). The current US Fish & Wildlife Service letter, concerning T&E species on this site, will need to be updated before further construction can proceed. 404 water quality permits, and mitigation for impacted areas have been completed for this project area. Cultural resources surveys have not been completed for item 616-L. In the event that the project design is not consistent with the above SEIS, an EA will be completed. This segment of EBMRL has recently been certified, but if left unrepaired, the sandboil site at Francis could decertify this portion of levee. Based on preliminary estimates for the recommended repair, all of the ROW that will be required to install the relief wells is already owned by the Board of Mississippi Levee Commissioners

Schedule

Final Design completed – 30 May 2012

RTA – 31 May 2012

Contract Award – 31 Aug 2012

Acquisition Strategy

Work will be combined with another similar MRL projects (Winterville).

2011 FLOOD DAMAGE RISK MATRIX

Failure Likelihood

CRITICAL REPAIRS

| | | | | |
|----------|------------|------------|------------|------------|
| High | Class IIIb | Class II | Class II | Class I |
| Moderate | Class IV | Class IIIa | Class II | Class II |
| Low | Class IV | Class IIIa | Class IIIa | Class II |
| Remote | Class IV | Class IV | Class IV | Class IIIb |
| | Level 0 | Level 1 | Level 2 | Level 3 |

Consequences

NON-CRITICAL REPAIRS



MVD 2011 Miss River Basin FLOOD DAMAGE REPAIR REQUIREMENTS

TOTAL ≈ 1.585 B

As of 1 Mar 2012

Failure Likelihood

High

Moderate

Low

Remote

**NON-
CRITICAL
REPAIRS**

CRITICAL REPAIRS

143 Projects ≈ \$1.042 billion

262 Projects ≈ \$543.2 million

Level 0

Level 1

Level 2

Level 3

Consequences



Mississippi Valley Division

Requirements for 2011 MR Basin Flood Recovery

As of 1 Mar 2012

| <u>District Impacts</u> | <u>Critical</u> | <u>Non-Critical</u> | <u>Total</u> |
|-------------------------|-------------------|---------------------|-------------------|
| ➤ St. Paul | \$ 12.2 M | \$ 0.7 M | \$ 12.9 M |
| ➤ Rock Island | \$ 1.1 M | \$ 0.8 M | \$ 1.9 M |
| ➤ St. Louis | \$ 10.9 M | \$ 6.9 M | \$ 17.8 M |
| ➤ Memphis | \$ 283.8 M | \$ 111.8 M | \$ 395.6 M |
| ➤ Vicksburg | \$ 125.4 M | \$ 264.5 M | \$ 389.9 M |
| ➤ New Orleans | \$ 608.5 M | \$ 158.7 M | \$ 767.2 M |
| ➤ MVD Totals | \$ 1.042 B | \$ 543.4 M | \$ 1.585 B |

Authorized Nationwide Supplemental Funding (\$1.724 B):

- Public Law 84-99 = \$388M
- Mississippi River & Tributaries = \$802M
- Operations & Maintenance = \$534M

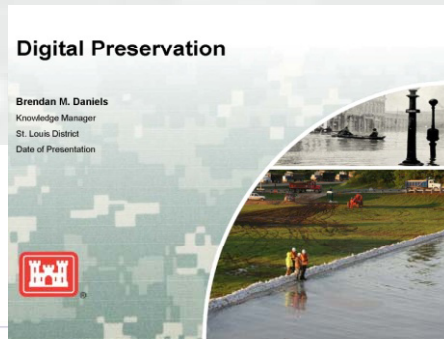


MVD DATA MANAGEMENT TEAM

Key Accomplishments

2011 Spring Flood Data Catalog

| Date Type | Location | Data Format | Storage | Associated System | Availability | District (Special) | POC Organization |
|----------------------------------|-------------|---------------------------|-----------------|---------------------|---------------|--------------------|------------------|
| Other Action Report | Unspecified | Word | District Server | ProjectWise | District Wide | MSA | CDM&G/STV |
| Architectural Plans - Ties | Unspecified | AutoCAD | District Server | AutoCAD | District Wide | EDDC | CDM&G/STV |
| Archaeological Mapping Data | Block Point | TIF/JP2/Shape | District Server | Unspecified | Local | MSA | CDM&G/P&E |
| Waterworks Data | Wichita | Not Available | Not Available | Unspecified | EDDC | EDDC | CDM&G/STV |
| Communications, Damage to System | Unspecified | Word with PDF Attachments | District Server | ProjectWise Outlook | District Wide | MSA | CDM&G/STV |
| Damage Assessment Photographs | MSA | PDF | District Server | ProjectWise Outlook | District Wide | MSA | CDM&G/STV |
| Elevations, Water Surface | Block Point | AutoCAD | District Server | ProjectWise | District Wide | MSA | CDM&G/STV |
| Facebook Updates | Block Point | Facebook | Internet | | | | |
| Gate Change Letters | Smart Curve | Word | District Server | | | | |
| Plot Book Tracker | MSA | PDF | District Server | | | | |



- Made extensive contacts throughout MVD with managers and SMEs.
- Produced a catalog of metadata that describes flood data from the Spring 2011 flood. Includes POC information.
- Produced a Digital Preservation Handbook and accompanying training module which was used to inform key employees of digital data best practices.

- Delivered first-of-its-kind data assessment and review data for the MR&T Post Flood Report.
- Delivered recommendations to improve data storage and sharing in MR&T Post Flood Report.



Data Management - Next Steps

| | |
|--|------------------------------|
| Inventory – Identify data/documents to preserve | • Complete |
| Secure – Capture both printed and digital data | • Complete at District Level |
| Identify – Catalog and inventory individual data sources | • Complete at District Level |
| Store – Develop regional retrieval system for accessing data | • Awaiting Funding |
| Access – Create open platform for retrieval system to share data with agencies | • Awaiting Funding |
| Archive – Develop and implement migration plan to ensure long-term survival | • Awaiting Funding |
| Training – train districts on preservation methods to be used on their data | • Complete |
| Report – Complete Post Flood Report components and recommendations | • Complete |



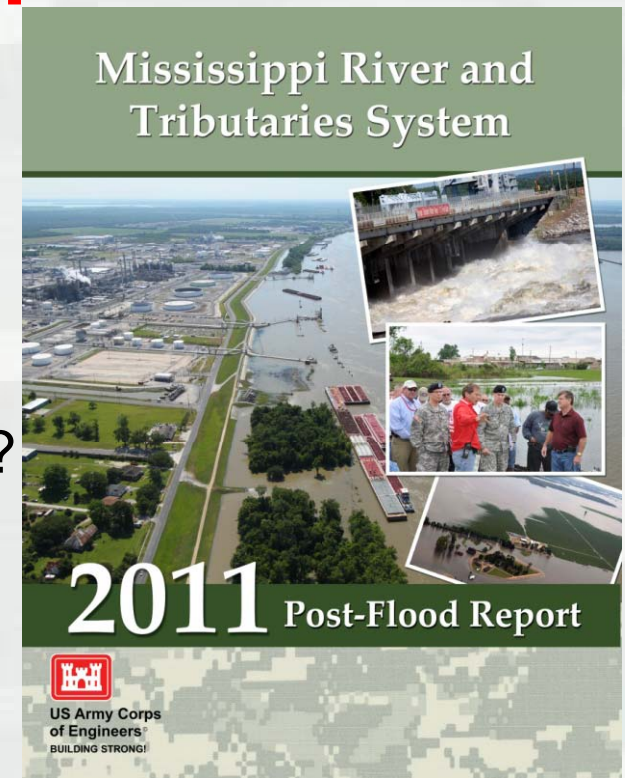
MR&T Post-Flood Report

Addresses primary questions:

- How did the MR&T perform?
- How could the MR&T perform now?
- What does the MR&T need to perform in the future?

Final Products (Oct-Nov 2012)

- **Main report** provides narrative characterization and recommendations for the future operation, studies, performance and recovery of MR&T
- **Appendices** provide extensive datasets and support documentation that will be useful to current and future MR&T operators and managers
- Extensive **regional database** of Post Flood Data will be archived
- **Summary report** will be glossy 30-50 pg executive overview



OW-R Flood Damage Repair Plan

IMPLEMENTATION AND ACQUISITION STRATEGY

- Maximize System Risk Reduction by Next Flood Season
- Substantially Complete all Remaining Items Prior to 2014 Flood Season
- MVD currently funded for roughly \$1.2B in construction repairs
- Activities associated with ongoing design, coordination and construction
Plans and Specifications, Contract Documentation, Advertisement & Awards, Real Estate (LERRDs), Environmental Assessments, Tracking and Communication



BUILDING STRONG®

Mississippi River Levees

BP-NM Center Crevasse (Aug 2011)



BP-NM Center Crevasse (Jul 2012)



Buck Chute (Nov 2011)



Buck Chute (May 2012)



Mississippi River Levees

Duncan Point (June 2011)



Duncan Point (Jun 2012)



CHANNEL IMPROVEMENT

Meriwether-Cherokee Bend – 16 Aug 2011



Meriwether-Cherokee Bend – 2 Feb 2012



STRUCTURES

Morganza stilling basin (3 Aug 2011)



Morganza stilling basin (13 Jun 2012)



Morganza lower guide levee (15 Jul 2011)



Morganza lower guide levee (16 Aug 2011)



DREDGING

New Orleans – St. Louis Cathedral



Baton Rouge – USS Kidd



2011 Record Flood



2012 Record Drought



ACT THREE:

RISK COMMUNICATION STRATEGY



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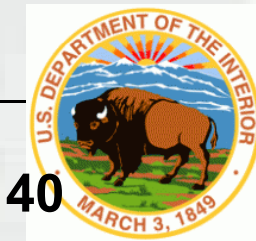
Regional Communication Plan

Operation Watershed Recovery/RFRM

The Regional Communication Strategy created a **framework and guide** for both the internal and external transfer of OW-R Flood Repair Plan information via CorpsMap, fact sheets, talking points, presentations, press releases, social media, and website. It will also highlight some of the **key participants** and groups with whom regular communication is required (e.g. stakeholders, levee districts, congressional, Interagency Recovery Task Force (IRTF), State emergency managers...etc). It is important that this **shared responsibility** be well coordinated and controlled to ensure our communications are responsive, purposeful, and consistent



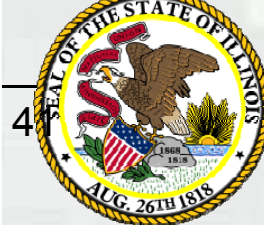
INTERAGENCY RECOVERY TASK FORCE



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INTERAGENCY RECOVERY TASK FORCE

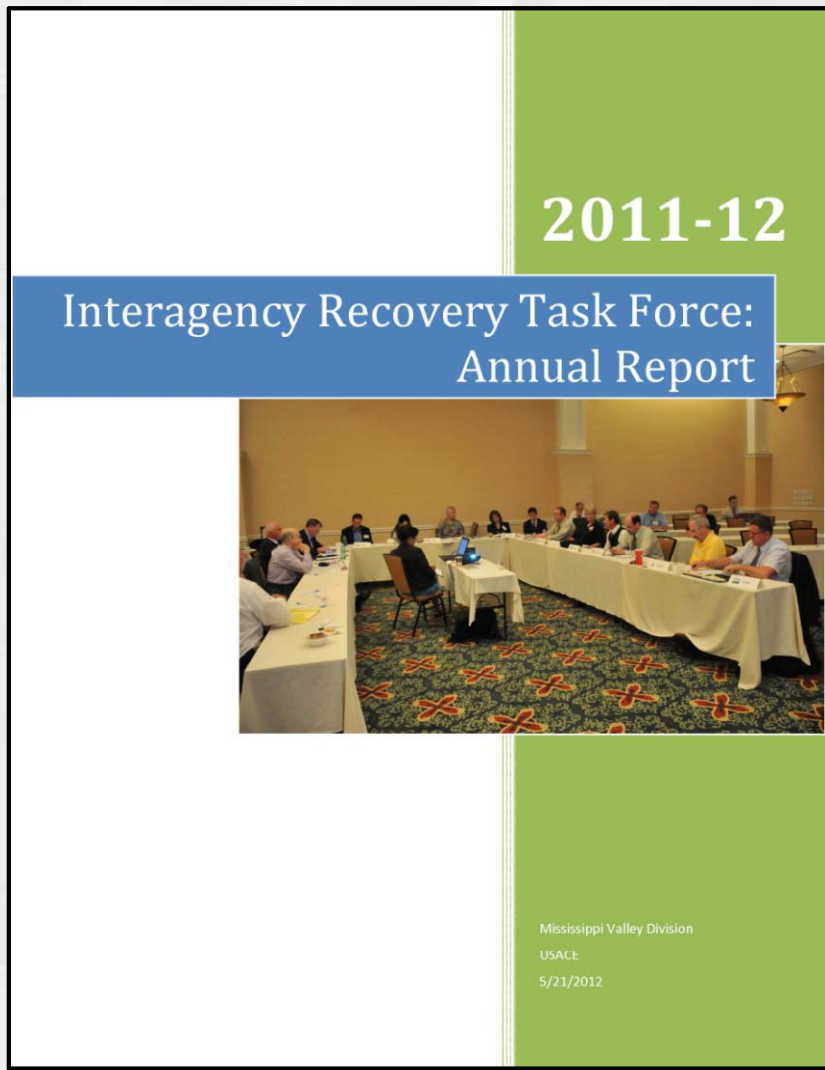
- A multi-agency forum did not exist to solve the many regional issues and challenges presented in the recovery from this historic flood event.
- Provide Safety and Security for Citizens Lives and Livelihoods
- Create strong regional effort to inspect, review, reset and restore our flood risk management system
- Pursue all potential funding methods from federal and state sources.
- Give consideration to traditional and non-traditional alternatives in repair and restoration.
- Implement a collaborative and communicative approach across regional and state boundaries to prioritize our efforts and resources during the challenging recovery process



US Army Corps of Engineers®



IRTF ANNUAL REPORT



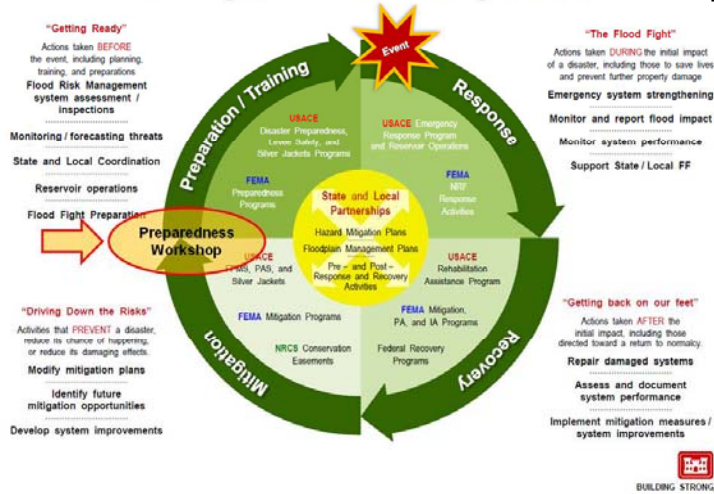
- Purpose
- Meeting Summaries
- Products
- Lessons Learned
- Next Steps



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MVD 2012 Flood Season Preparedness

Life-Cycle Risk Management

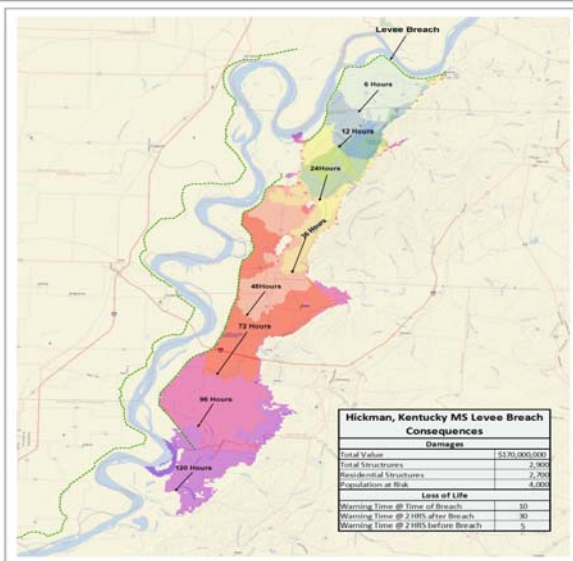


Key Questions:

- How do the 2011 flood damages increase risk?
- Which damaged sites are the most concern?
- What are the potential consequences?
- What is the plan for repairing damages?
- What do we do in the interim?
- How do we best communicate the risks?

Key Products:

- Regional and Local Flood Risk Workshops and Training exercises
- Inundation maps, Risk Mgmt Papers, Interagency Collaboration
- Regional Communication Plan, Website
- Synopsis Report



MVD RFRM WEBSITE

- ✓ USACE RFRM Links, Contacts and Resources
- ✓ Public documents & presentations
- ✓ Key Messages
- ✓ Operation Watershed Recovery Components
- ✓ Public, Partner and Stakeholder Accessibility

The screenshot shows the website for the US Army Corps of Engineers Mississippi Valley Division. At the top, there is a logo of a castle and the text "US Army Corps of Engineers Mississippi Valley Division" and "BUILDING STRONG®". Below the logo, there are navigation links: "WHO WE ARE", "MISSION", "Other USACE Links", and "MS River Commission (MRC)".

The main content area is titled "Regional Flood Risk Management Program". It includes a paragraph explaining that the USACE established the National Flood Risk Management Program in May 2006 to integrate and synchronize flood risk management programs and activities. It also lists specific goals of the program, such as providing floodplain information, assessing flood hazards, and improving public awareness.

On the left side, there is a sidebar menu with categories like "Regional Flood Risk Management Programs" (including Flood Season Preparedness, Silver Jackets, National Flood Risk Management Programs, Operation Watershed Recovery, Interagency Recovery Task Force, MR&T Post Flood Report, Damage Assessments, Construction, Press Releases) and "Information Resources" (listing various districts like St. Paul, Rock Island, St. Louis, Memphis, Vicksburg, and New Orleans).

On the right side, there are "Hot Topics" sections for "2011 Fall Our Mississippi" and "2012 Winter Our Mississippi", each featuring a cover image and a list of links.

At the bottom of the page, there is a "Points of contact:" section.

<http://www.mvd.usace.army.mil>



CORPSMAP

- ✓ External Web based site locator
- ✓ Pop-up window provides general overview of site specific flood damages and status of recovery.
- ✓ Provides access to project information papers as well as risk management and construction fact sheets
- ✓ Describes interim risk management measures

US Army Corps of Engineers - Mississippi Valley Division

US Army Corps of Engineers
Mississippi Valley Division

Operation Watershed

Layers

- Expand All Collapse All All Off Redraw
- Operation Watershed
 - 2011 Levee Sites
 - 2011 Levee Sites(PL84-99)
 - 2011 Channel Improvement Site
 - 2011 Channel Improvement Site
 - 2011 Major Structures Sites
 - 2011 Major Structures Sites(PL84-99)
 - 2011 Dredge Sites
 - 2011 Dredge Sites(PL84-99)
- Flood Season Preparedness
 - 2012
 - Risk Class 1 Site (See Leger)
 - Risk Class 2 Site (See Leger)
 - Risk Class 3 Site (See Leger)
- National Levee Database
- USACE Civil Works
 - Federal
 - Current Weather
 - ESRI ArcOnline Services

Legend Search Map Ready

Information Paper Buck Chute

OPERATION WATERSHED RECOVERY – CRITICAL REPAIR SITES

Contacts

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OVERVIEW

DISTRICT: Vicksburg District
TYPE: Boils and Seepage
RMC: 804.659.61(10-10) (SEL)
FRAGO CLASS: 1 – High Potential for Loss of Life
RISK: 1,099 residential, 5188 SM infrastructure
REPAIR: Item, 30 Relief Wells, and 12 Horiz. drains
EST. REPAIR COST: \$2,640,000

Damage Assessment

In early 2010, MVK was notified of multiple boils in the project area. In early summer of 2010, the boils were subsided as River Levels reached flood stage and the flow of the boils increased. In February, 2011, when conditions in the project area were dry, two of the largest boils were pumped, revealing voids at boil sources as wide as 20 ft and as deep as 10 ft. The voids revealed no obvious "pipes" that continued downward or laterally from the void bottom. As River levels continued to rise and approach flood stages in March 2011, the boil area voids were backfilled with sand material, covered with a monomex fiber fabric, and either sandbagged or earthen dams were constructed around them. In May 2011, an emergency berm was constructed over the area which encompassed the worst known boil area. The top of the berm was constructed to approximate elevation 82 ft. Because of the high exit gradients for the predicted flood stages for the known boil areas, and the consequences of failure at this location, it was decided to flood the entire project site by raising water levels in Eagle Lake to approximate elevation 90.0 ft through the use of Maddy Bayou Control Structure. In order to reduce the risk of failure without raising water levels in Eagle Lake, remediation is recommended prior to the next high water season.

Risk and Consequence

If the East Bank Mississippi River Levee System were to fail at the Buck Chute site, the population at risk would be 3,096. The value of the non-residential structures is \$3,141,000 and the value of the 1,436 residential structures is \$175,000.

Critical Repairs

The re-est recommendation for this site includes a 1700 ft reach of earthen berm 200 to 240 ft wide and relief wells from Station 100+50 to 121+00. A 400 ft section of the berm includes a drainage and collection feature, including horizontal drains and a pervious sand layer. The item includes 30 relief wells and 12 horizontal drains. In-place berm volumes will be approximately 1,600 cubic yards of sand for the drainage feature and 190,000 cubic yards for the remaining berm.

Special Considerations

The site is covered under the 1998 MRL SEIS, as item 456-L, and covers multiple work items. The SEIS does not cover planned relief wells for this site; however, an EA was prepared to cover these wells and a FONSI signed. Coordination under Section 9 of the Endangered Species Act has been completed. The 404 water quality permit for the project has been obtained, and all project impacts have been mitigated for, as this site is a part of the existing MRL mitigation program. This segment of EBMRL is not currently certified, but this fix, along with other work MVK currently has planned in the area, will allow certification of the levee system. The Board of Mississippi Levee Commissioners has acquired the necessary ROW for the project.

Schedule

Bids solicited - 10 Aug 2011
Contract Awarded - 30 Aug 2011
Anticipated contract duration 120 days. Scheduled completion in January 2012.

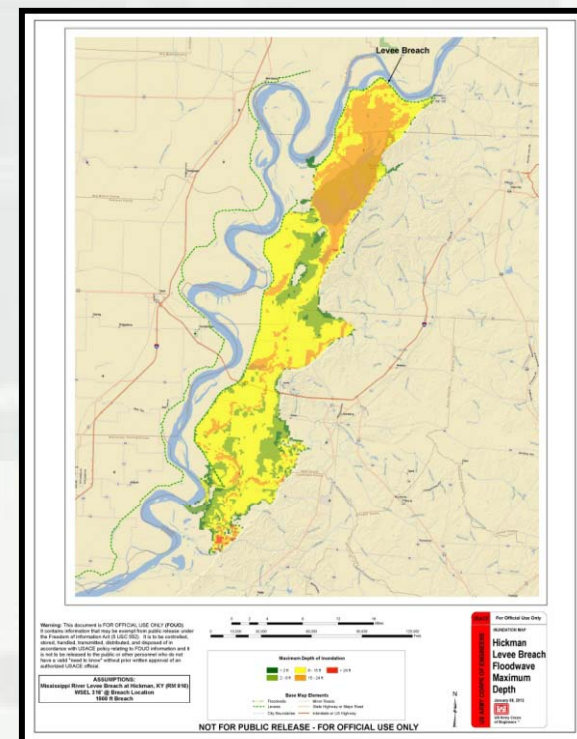
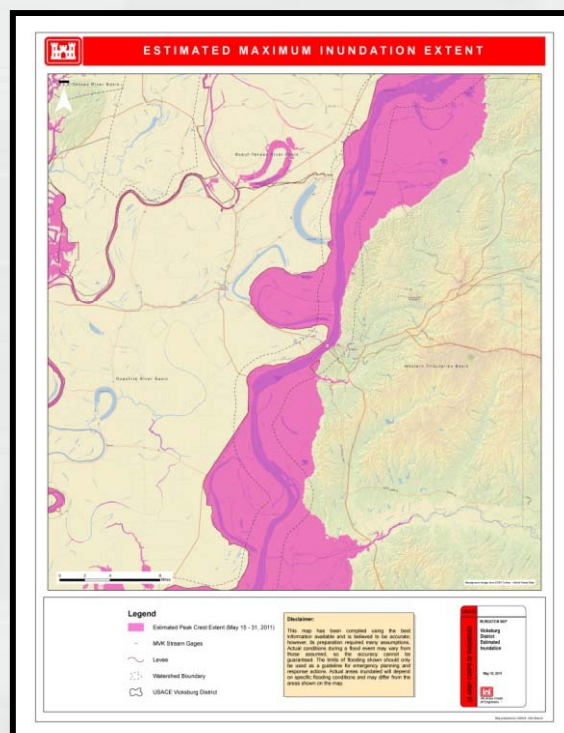
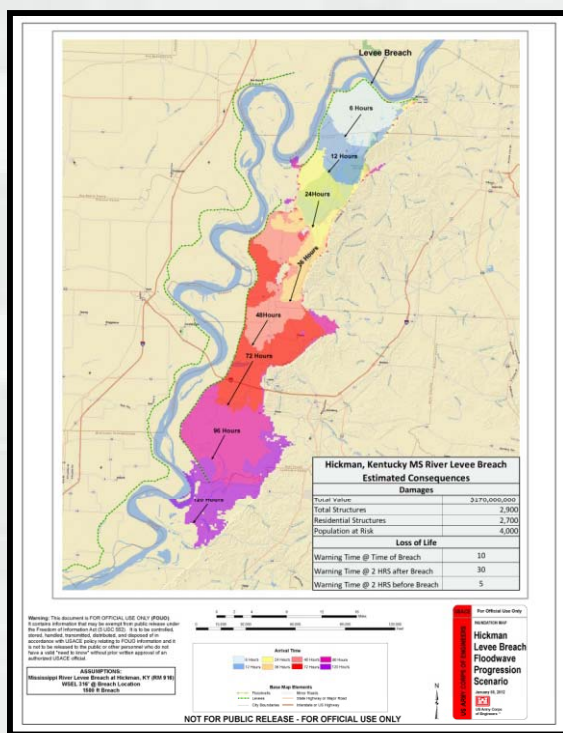
Acquisition Strategy

Unrestricted competitive bid awarded 30 Aug 2011 to Pithway Construction, LLC for \$3,100,250.00. This site was combined with No. 8 site, Albernarle.

sk Class 1 Site (See Legend for Definition) -94.04297, 31.57854

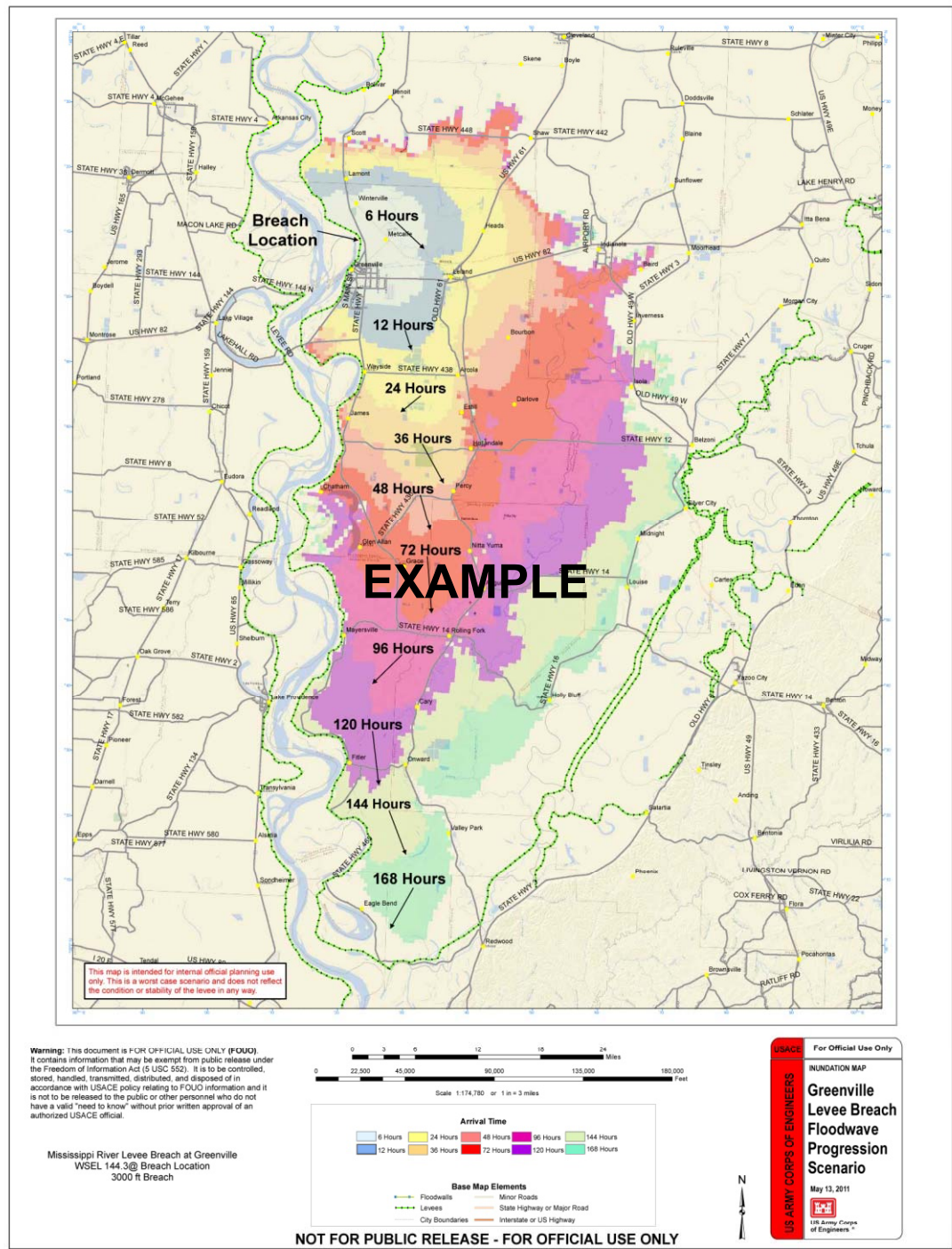
INUNDATION MAPS

- Post Flood Report – Communication Team
 - ▶ AARs, public meetings, and personal interviews
 - ▶ What did and didn't happen to communicate the flood event before, during and after the event.
 - ▶ Our partners want MAPS!



Example of Breach Inundation Maps Greenville, MS

- Communication
- Contingency Plans
- Evacuations
- Consequences
- Life/Safety Risks
- Infrastructure



SOCIAL MEDIA

- Use of social media: Facebook, Youtube, Twitter
 - ▶ Over 10,000 Facebook “friends” in three week period
 - ▶ Immediate responses to questions, press releases, links to other pages

The screenshot shows the Facebook profile for 'Floodfight 2011- Operation Watershed', a government organization. The profile picture is a red shield with a white castle icon. The page features a 'Wall' section with several posts. The most recent post is a news release from NOLA.com dated January 13, 2011, at 2:29pm, titled 'Mississippi, Atchafalaya rivers drop, flood worries ease'. It includes a photo of a river and text stating that the Corps of Engineers is ending flood inspections. Below this post, a comment from 'Candy Johnson Robertson' is visible, and a text box for writing a comment is at the bottom. The left sidebar shows navigation options like 'Wall', 'Info', 'Friend Activity', and 'Photos', along with a 'Like' count of 8,783.

The screenshot shows a YouTube video player for the video 'Army Corps Of Engineers Opts To Blow Up Levee'. The video is uploaded by 'PigMine3' and has 4,225 videos in the channel. The video content shows a man in a military uniform speaking at a press conference, with a CNN logo visible. The video player shows 343 views and 5 likes. To the right of the video player is a list of related videos, including 'Response to: ARMY CORPS OF ENGINEERS', 'Army Corps Blows Up Missouri Levee To Save', 'US Army: Corps of Engineers: Fort Carson', 'SAVING CAIRO: Officials blow up Miss.', 'Explosion Footage As US Army Corps Of', 'Corps Blows Up Birds Point Levee', 'US Army Corps of Engineers in', 'Spike Lee on Bill Maher: Someone blew', and 'fox2now.com Levee Breach by Army Corp of'. The bottom of the page shows a comment section with a sign-in prompt and a comment from 'hhdstone' dated 9 months ago.

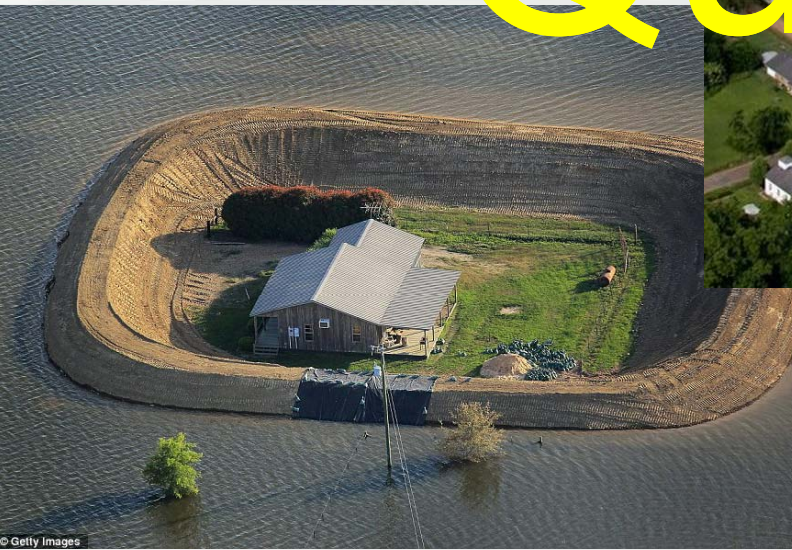


Operation Watershed

Responding to the Historic Mississippi River Flood of 2011



Questions ?



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