



USACE & FEMA: Working Together to Address the Nation's Levee Challenges

ASFPM – Phoenix, Arizona

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Presenters:

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Today's Agenda

1. The levee challenge & our objectives for this discussion
2. Session Format – How will this interactive session work?
3. Major Areas to be covered
 - ▶ Joint USACE/FEMA efforts
 - ▶ FEMA activities
 - ▶ USACE activities
4. Answer your questions!



This Levee Session's Objective



- **KNOWLEDGE** - Provide you with insight into:
 - ▶ USACE's and FEMA's joint efforts
- **PARTICIPATION** - Provide a forum that encourages you to ask questions and provide feedback.

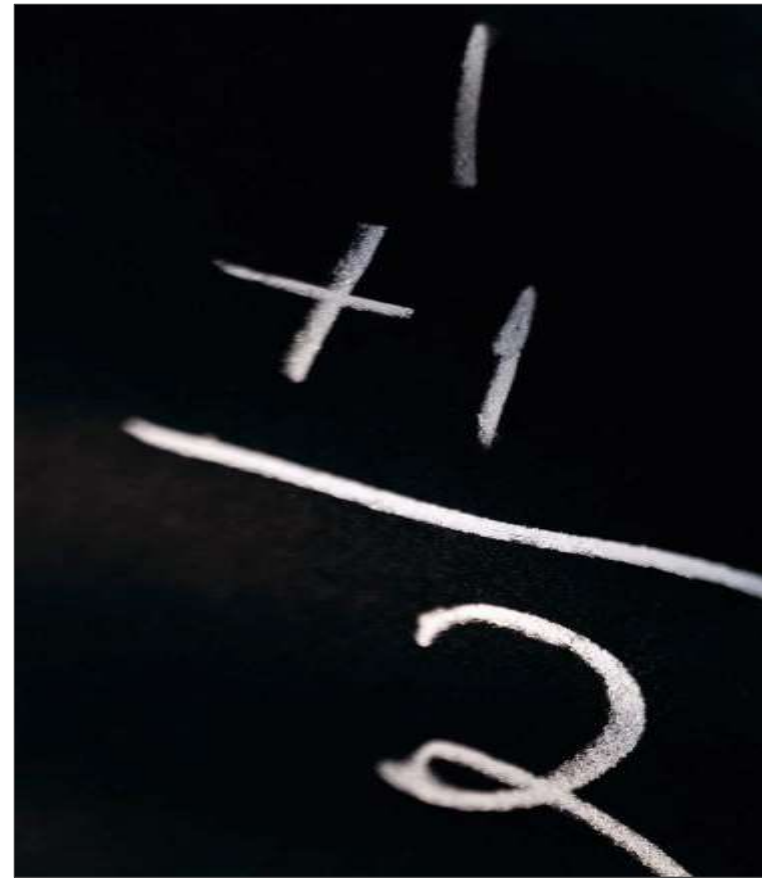
The Continuing Levee Challenge

- The nation has thousands of miles of levees.
- Levees are aging, yet more stuff is being put behind them every day.
- ASCE's 2017 report card on America's infrastructure gave a grade of "D" to levees.
- Most people living behind levees assume they are safe and protected from flooding.



Format for Today's Discussion

- **Step #1** – Facilitator provides a “question/comment”
- **Step #2** – FEMA & USACE panelists provide a response
- **Step #3** – Audience comments/ expands on question/response
- **Step #4** – Panelists may provide additional responses



Question #1 – High level Overview

What are FEMA's roles & responsibilities for levees?

What are the USACE's roles & responsibilities for levees?

Flood Hazard Analysis & Mapping

Through the National Flood Insurance Program, FEMA:



- Presents flood hazard and risk information to the public
- Establishes appropriate flood hazard zone determinations
- Establishes mapping standards
- Meets regulatory requirements
- Accredits levee systems on FIRMs
- Develops and shares outreach and risk communication material
- Collaborates with stakeholders

National Flood Insurance Program: FEMA Risk MAP (Mapping, Assessment, Planning)

Through collaboration with State, Local, and Tribal entities, Risk MAP will deliver quality data that increases public awareness and leads to action that reduces risk to life and property



USACE Levee Safety Program Mission



...ensure levee systems provide benefit to the Nation by **working with stakeholders to assess, communicate, and manage the risks** to people, the economy, and the environment...

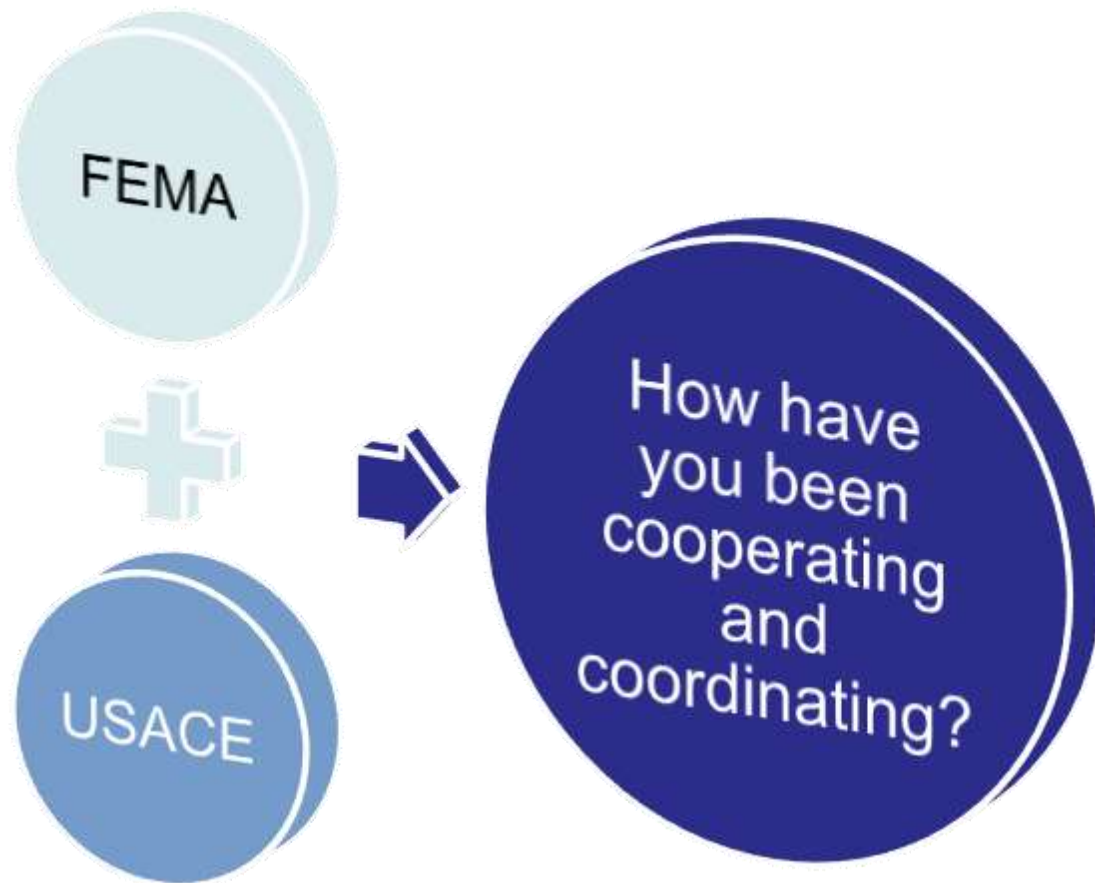
Risk-Informed Decision Making

Goals for USACE Levee Safety Program

- Develop increased understanding of benefits and risks of levee systems
- Promote actions to manage risks
- Make transparent and credible decisions
- Make wise federal investment decisions



Question #2



USACE – FEMA Coordination

- FEMA and USACE are federal partners.
- Coordinating at the federal level to share data, engage stakeholders, build partnerships and deliver consistent messages.
- Anticipate the question: “How will this information from USACE impact my levee accreditation (my NFIP map)?”
- There are direct links between USACE inspections, screenings, and risk assessments; this information can influence how a levee system is mapped by FEMA on a Flood Insurance Rate Map.



FEMA – USACE Coordination

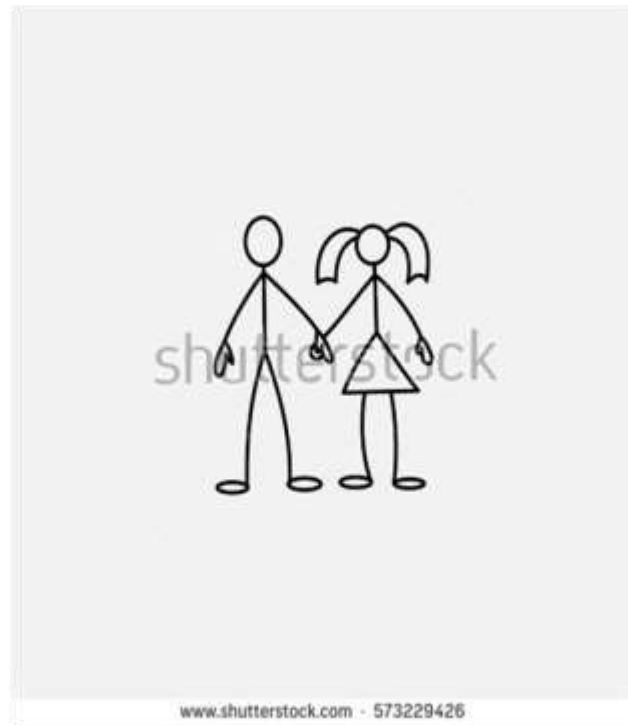
Challenges... and Opportunities:

- Ensuring information is current
- Focus on risk communication and risk reduction:
 - USACE's primary relationship is with levee sponsor
 - FEMA's primary relationship is with community
- Coordination of activities between the two agencies:
 - 10 FEMA Regions
 - 8 USACE Divisions
 - 41 USACE Districts
 - Thousands of communities and levee sponsors

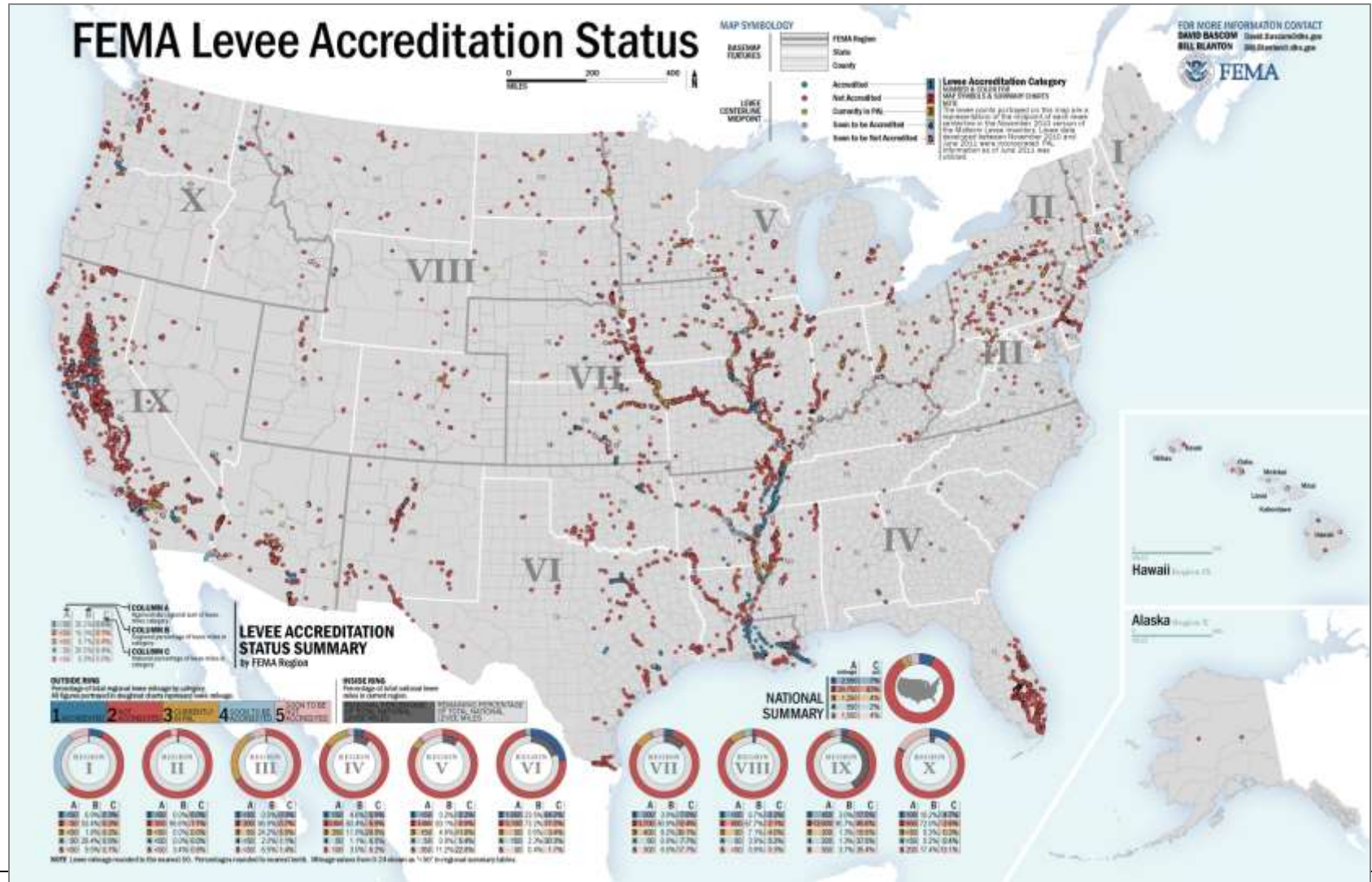


USACE – FEMA Coordination Activities

- USACE & FEMA policy alignment
- Risk communication strategy, outreach and alignment of messaging
- Teaming to help local communities make sound flood risk management decisions – planning & mitigation
- Exploring other opportunities for FEMA/USACE collaboration
- Use NLD for levee data storage
- Data sharing
- Voluntary levee inventory and review



Inventory of Levee Status



NATIONAL LEVEE DATABASE – NEW LOOK



Levees of The Nation



Public Released May 2018

NATIONAL LEVEE DATABASE – NEW LOOK

Your feedback is extremely important to us. Please use the feedback tool to submit as many comments as you like.

Back | National Levee Database

HOME SEARCH DASHBOARD MAP MORE + SIGN IN

Praine Du Pont / Fish Lake System **USACE**

Location: Dage, St. Clair County, Illinois
USACE District: St. Louis
USACE Region: 2

Category by: USACE-Non-USACE
Basemap: Base
LEGEND

SYSTEM DETAILS

30 km

Project Description

The Prairie du Pont and Fish Lake levee system is located in St. Clair and Monroe Counties, Illinois. The system reduces the risk of flooding from the Mississippi River to the communities of Dage, North Dage, Stule, East Carondelet, and a small portion of Columbia. The levee system, originally constructed in the 1970s, consists of 15.2 miles of earthen embankment along Prairie du Pont Creek, the Mississippi River and Carr Creek. Within the nearly 11,000 acres of leveed area are the major transportation routes U. Route 3 and Interstate 255, as well as residential, commercial, and industrial properties, including Dage's Union Pacific yard and truck-transfer station. The levee system is federally authorized and constructed and locally operated and maintained. It consists of two segments: the Prairie du Pont segment, operated and maintained by the Prairie du Pont Sanitary and Levee District, and the Fish Lake segment, operated and maintained by the Fish Lake Drainage and Levee District No. 8. Together these two levee segments provide benefits to a population of approximately 7,000 and approximately \$425 million in property value. During the 2015 flood event, it is estimated that the system prevented \$112 million in flood damages.

View system details

Risk Characteristics

Levee Safety Action Risk Classification: **High**

People at Risk	Structures at Risk	Property Value
7969	2786	\$611M

Risk Characterization Summary
The Prairie du Pont and Fish Lake levee system has prevented the community from flooding during numerous major flood events. During the record-setting Flood of 1993, significant seepage was observed throughout the levee and this remains a primary concern with the system. Though the Sponsor has made significant investments in remediation, additional work is needed. There remains a possibility that in any given year floodwaters could overlap or breach the levee system. A levee failure could result in flooding of depths of up to 34 feet, loss of life, and significant economic damage.

View risk details

Structure and Features

Total Miles	Length of Embankment (miles)	Length of Channel (miles)
15.44	15.37	8.07
Avg. Year Constructed	Average Slope	Number of Channel Sections
No Data Entered	No Data Entered	1

View structure profile

Inspection Status/Results

Current Inspection Rating: **Minimally Acceptable**
System Inspection Date: 10/08/2006

View all inspections

National Flood Insurance Program

Accreditation: No Data Entered
Accreditation Date: No Data Entered

View accreditation details

Key Documents

Fact Sheet

View all attachments

Segments

Prairie Du Pont Segment
Fish Lake Drainage & Levee District No. 8

View segment details

Public Release May 2018

OTHER DATA SHARING

- Integrated Water Resources Science and Services (IWRSS)
 - USACE, USGS, NOAA, and FEMA
 - Collaborative interoperability data standards for climatic and hydrological data
 - Establish flood inundation map sharing
- Fort Worth District and FEMA Region 6 Flood Inundation Mapping Pilot Collaboration
- Inspection Information Results
- Risk Assessment Results
- SWIF where accreditation is a local objective



Question #3

So what are your agencies working on in addition to the NLD and data sharing?

And how are you letting us know?

Risk Assessment & Communication

Why should FEMA and USACE work together to assess and communicate risk?

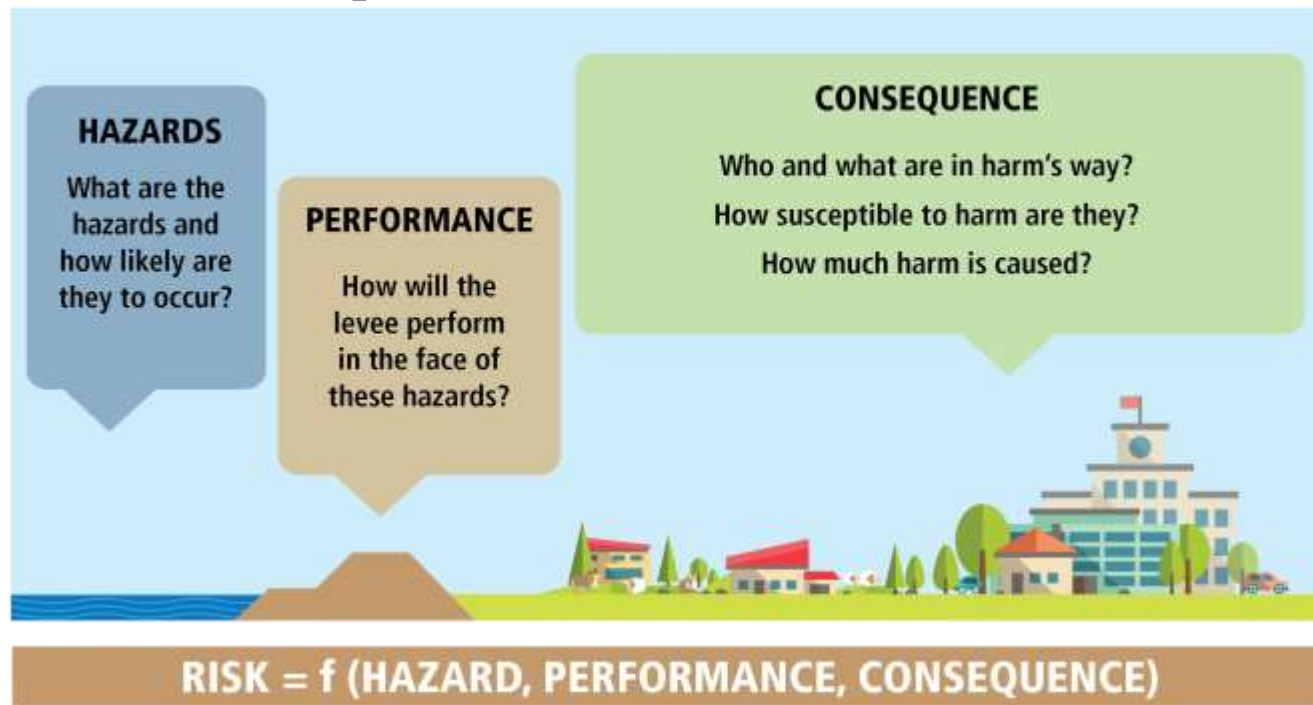
- Complementary goals for both agencies
- Provide timely and best available information to inform public and reduce risks to life and property



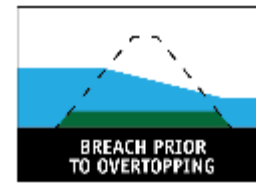
Implementation of USACE Risk Communication Guidance

- USACE Guidance for engaging sponsors and FEMA in Levee Safety Program activities (includes communicating risks associated with levees):
 - Placing information in a risk context
 - Focusing on risk factors and risk reduction actions
- Objectives:
 - Improve public sponsor engagement in and knowledge of USACE levee safety activities
 - Develop increased understanding of benefits and risks of levee systems
 - Promote actions to manage risks
 - Build foundation for shared responsibilities of solutions

Sharing Risk assessment Results with sponsors and others



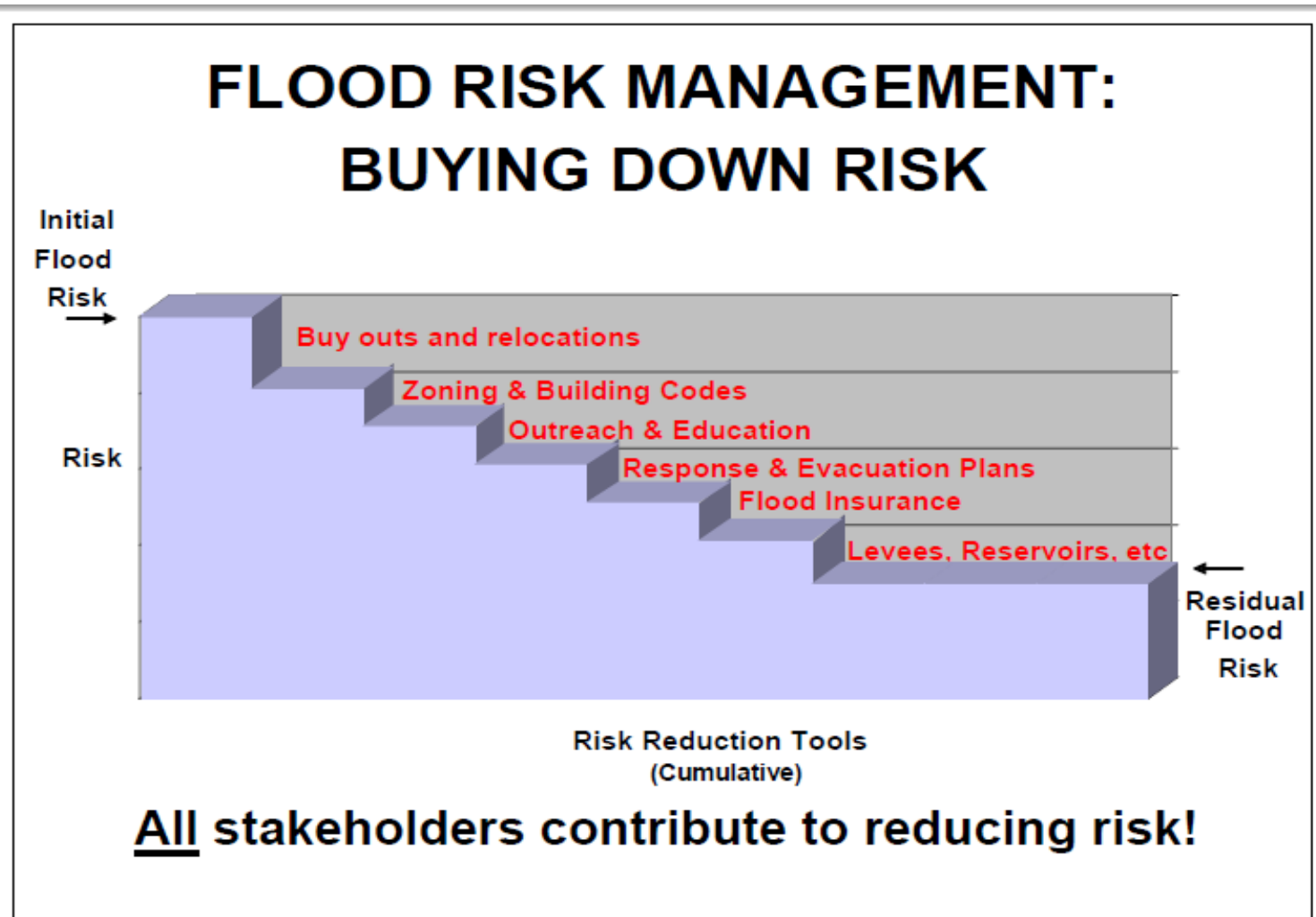
Inundation scenarios are used to evaluate levee-related flood risks



Assessments Support Risk Management

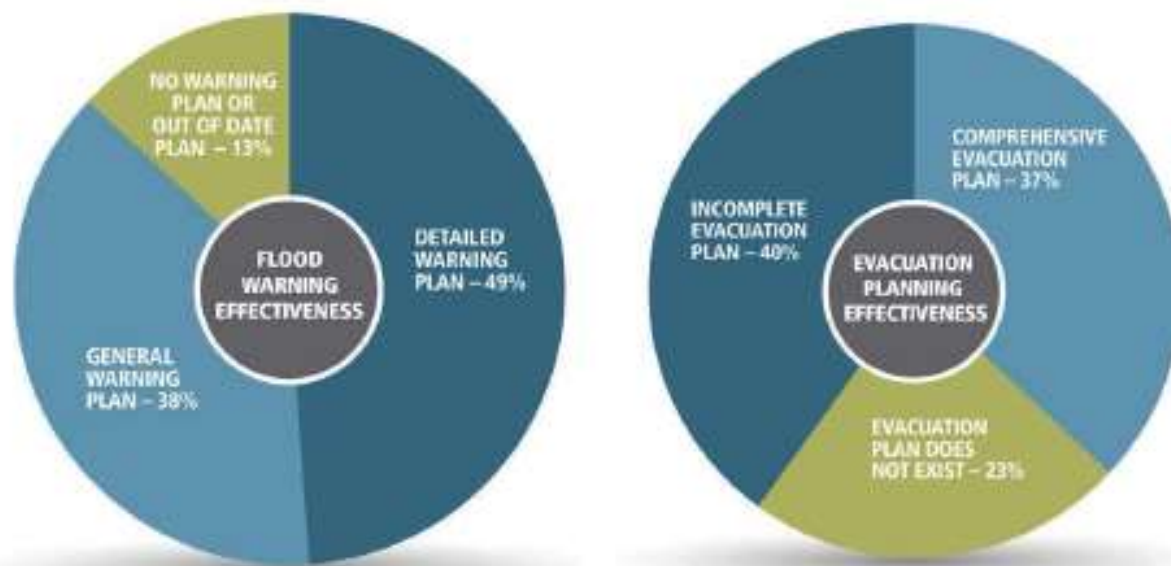


There Are Ways to Reduce Risk Beyond Building Bigger, Safer Levees



REDUCING CONSEQUENCES OF FLOODING TO PEOPLE – EVACUATION EFFECTIVENESS

35



- A Guide to Public Alerts and Warnings for Dam and Levee Emergencies by Mileti and Sorensen (2015)
- USACE Guidance on Emergency Action Plans for Dams and Levees (2018)



RISK COMMUNICATION IS CRUCIAL & URGENT FOR LEVEE SAFETY PROGRAM SUCCESS

- Need to get full benefit from Risk Assessments – we've invested a lot
- Information must be timely to be helpful
- Important service we are providing to our sponsors and communities
- Moral obligation, especially where there are life safety concerns
- Lead the way in risk informed decision making for communities and sponsors



Question #4

Your Cooperation and communication is appreciated, what is its impact on:

- Our certification/accreditation efforts?
- Will risk informed analysis have an impact?

USACE Activities versus FEMA 44 CFR 65.10 Requirements

NFIP REQUIREMENTS AND RELATION TO USACE ACTIVITIES

NFIP REQUIREMENTS (44 CFR 65.10)		CAN COMPLIANCE BE DETERMINED THROUGH:		
CFR CRITERIA CATEGORY	CFR CRITERIA SUBCATEGORY	USACE INSPECTION	USACE SCREENING	USACE RISK ASSESSMENT
Design Criteria	Freeboard (levee height)	NO	RARELY	YES
	Closure devices for all openings	NO	RARELY	YES
	Embankment protection	NO	RARELY	YES
	Embankment and foundation stability	NO	RARELY	YES
	Settlement	NO	RARELY	YES
	Interior drainage	NO	NO	RARELY
Operation Plans	Closures	YES	YES	YES
	Interior Drainage Systems	YES	YES	YES
Maintenance Plan		YES	YES	YES

Why a USACE Levee Inspection Alone ≠ Accreditation for the NFIP



- Visual Inspection
- No engineering analyses, including hydraulic modeling performed
- Focus on condition to top of levee regardless of design level (100 year or 1% is used for the NFIP)
- Inspection information informs the NFIP

Why a USACE Levee Risk Screening Alone \neq Accreditation for the NFIP



- Screenings look at performance from a levee safety perspective – not just the 1%
- Screenings are a screening level assessment based on best available information
- Level of rigor of analysis will not allow for an accreditation decision for all NFIP criteria

What USACE levee activity can meet most of the NFIP levee accreditation requirements in 44 CFR 65.10?

Higher Level Risk Assessments

- Semi-quantitative RA
- Quantitative RA

Questions to be answered by a USACE Higher Level Risk Assessment

- What are the most likely failure modes?
- What are the primary risk drivers?
- What is the current estimated risk?
- What Risk Reduction Measures are appropriate?
- Is further investigation needed?
- *New question added: How might this information inform accreditation on a FEMA Flood Insurance Rate Map?*

Benefits to the Risk Assessment Approach

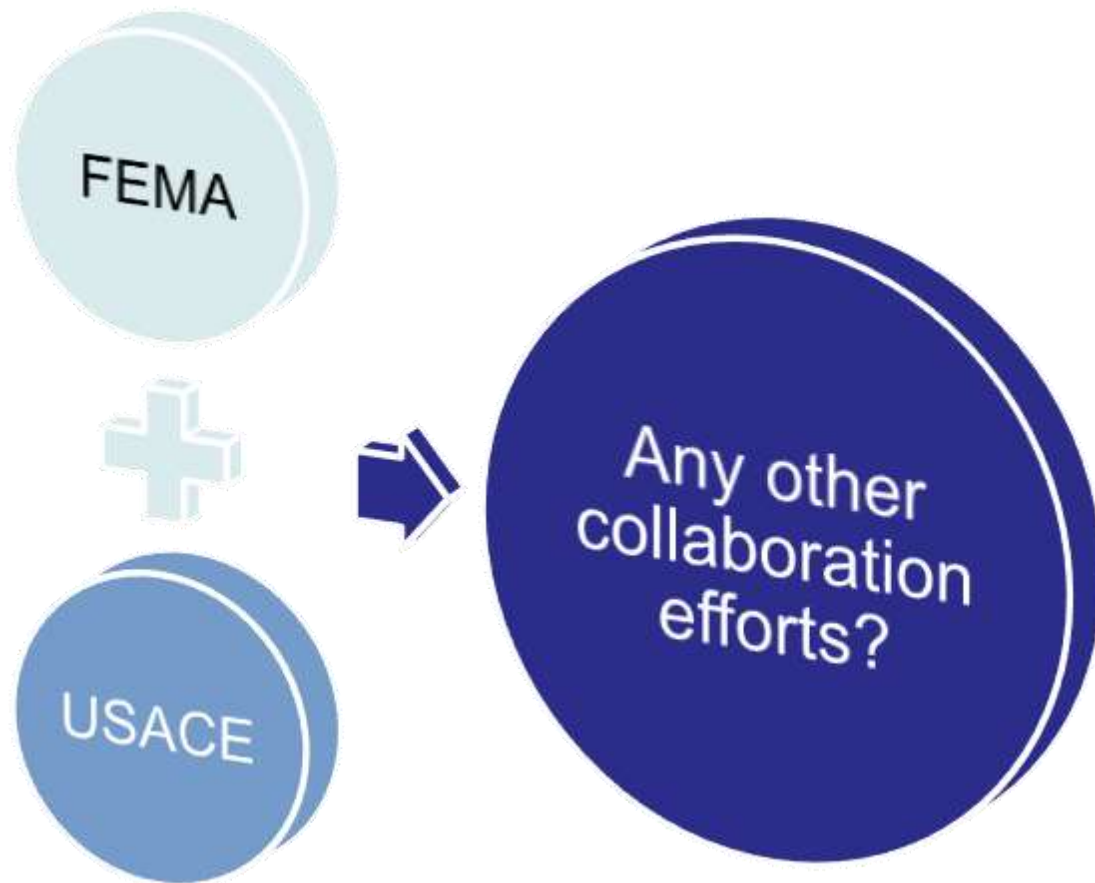
- Analysis based on a range of flood events
- Being able to prioritize actions and determine sense of urgency of implementing actions
- Identification of potential consequences for different scenarios
- Understanding of areas of uncertainties and confidence in decisions
- Supports risk management decisions – levee sponsor, community, and individual residents

Cost Sharing Risk Assessments

- A QRA will provide adequate information to reach an accreditation decision
- An accelerated levee system evaluation can be initiated by a written request from an NFS or a public entity representing a community.
- USACE will estimate the cost and schedule; requester agrees to 50% cost share.
- Template agreement is available at:

<http://www.usace.army.mil/missions/civilworks/projectpartnershipagreements>

Question #5



FEMA – USACE Policy Alignment

- Feb. 2018: FEMA updated levee-related Guidance and Standards for Flood Hazard Mapping:
 - Consolidated guidance and transform to new format
 - Alignment with Risk MAP project lifecycle

- Objectives as it relates to USACE:
 - Align definitions / terminology
 - Identify required collaboration points with USACE
 - Explore additional opportunities for data sharing
 - Define expectations for inter-agency coordination throughout the Risk MAP project lifecycle

Levee Safety Engineering Circular

EC 1165-2-218
[PUB. DATE]

US Army Corps of Engineers

WATER RESOURCE POLICIES AND AUTHORITIES

LEVEE SAFETY PROGRAM - POLICY AND PROCEDURES

CECW-CE Engineer Circular 1165-2-218	DEPARTMENT OF THE ARMY U.S. Army Corps of Engineers Washington, DC 20314-1000	EC 1165-2-218 [PUB. DATE]
	Water Resource Policies and Authorities LEVEE SAFETY PROGRAM - POLICY AND PROCEDURES	
	Distribution Instruction Statement Distribution is LIMITED . Internal distribution ONLY . NOT approved for public release.	

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Levee Inspection ECB schedule

* RP = Update to
the Interim
Eligibility Criteria
PGL

Initiate
NLD/LIS
Update

Draft ECB
Coordinate
with
NLD/LST/RP*

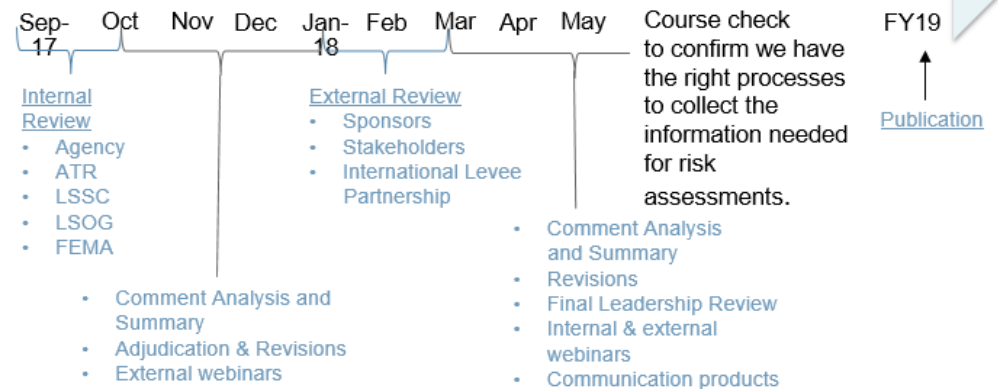
ECB ATR

Evaluate/Adjudicate
ATR Comments

External Review

Finalize ECB
NLD/LST/RP*

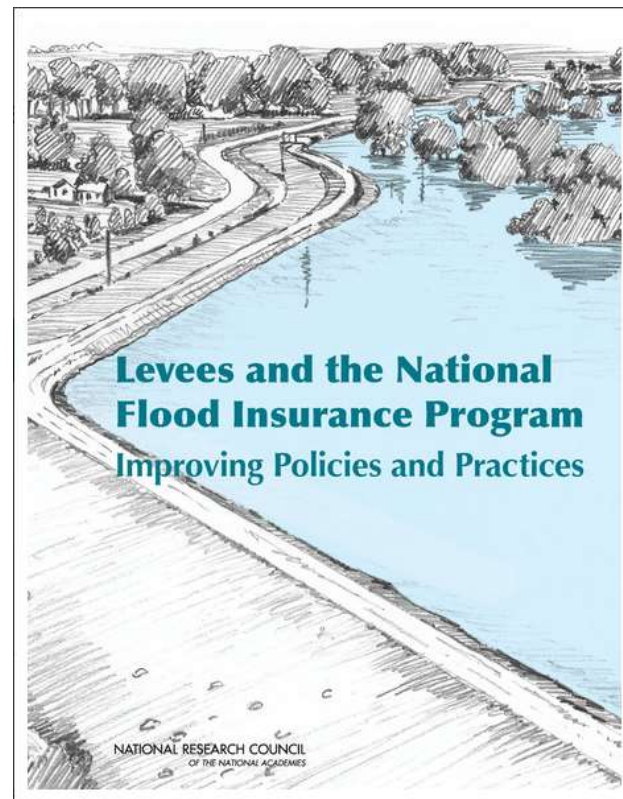
Training &
Roll Out



LEVEE SAFETY EC SCHEDULE

FEMA's Future: Identifying and Communicating Flood Risk

- Biggert-Waters Flood Insurance Reform Act of 2012 (BW-12)
- Water Resources Reform and Development Act (WRRDA) of 2014
- National Research Council (NRC) – National Academy of Sciences (NAS)
- American Society of Civil Engineers (ASCE) 2014 Report on National Flood Risk Management
- Association of State Floodplain Managers (ASFPM), National Association of Flood & Stormwater Management (NAFSMA), etc.
- Technical Mapping Advisory Council (TMAC)



National Flood Mapping Program

42 U.S.C. §4101b (Section 216 of BW12)

(b) Mapping

(1) In general

In carrying out the program established under subsection (a), the Administrator shall—

(A) identify, review, update, maintain, and publish National Flood Insurance Program rate maps with respect to—

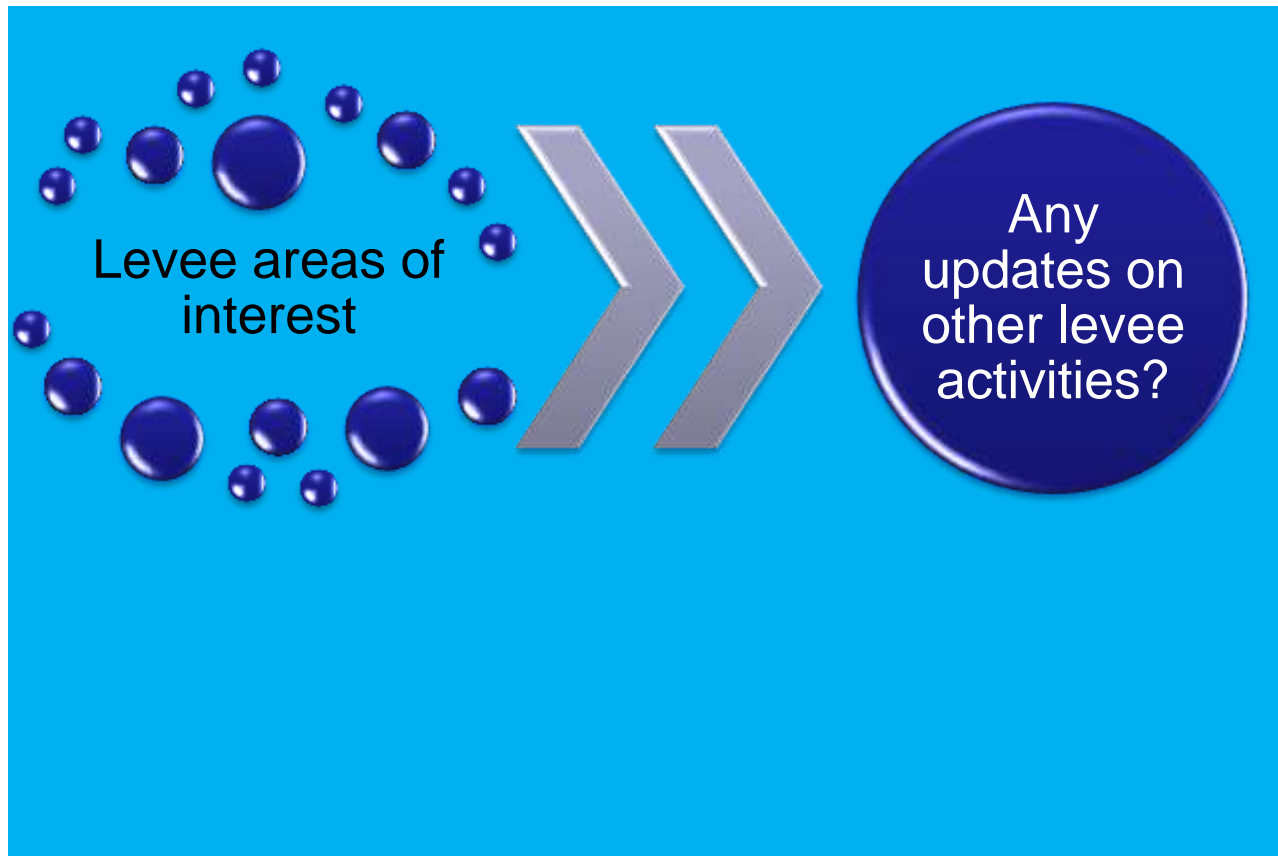
- (i) all populated areas and areas of possible population growth located within the 100-year floodplain;
- (ii) all populated areas and areas of possible population growth located within the 500-year floodplain;
- (iii) areas of residual risk, including areas that are protected by levees, dams, and other flood control structures;
- (iv) areas that could be inundated as a result of the failure of a levee, dam, or other flood control structure;
- (v) areas that are protected by non-structural flood mitigation features; and
- (vi) the level of protection provided by flood control structures and by non-structural flood mitigation features;

(B) establish or update flood-risk zone data in all such areas, and make estimates with respect to the rates of probable flood caused loss for the various flood risk zones for each such area

FEMA's Future: Identifying and Communicating Flood Risk

- Goal is to develop a framework to better analyze & identify flood risk associated with levees, regardless of accreditation status.
- 44 CFR 65.10 does not allow us to:
 - Price risk appropriately for NFIP (FEMA)
 - Communicate residual risk (FEMA)
 - Manage risk (Communities)
- Data informs actuarial risk rating for flood insurance premiums for the NFIP
- Partner with USACE given their role as the international leader with expertise on conducting flood risk assessments for levee systems.

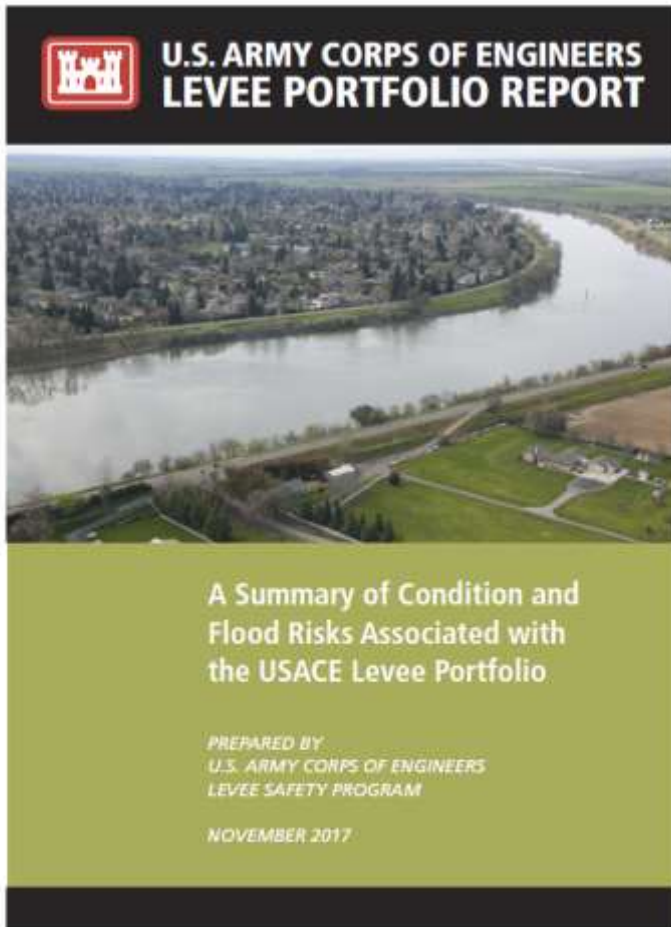
Question #6 – for USACE



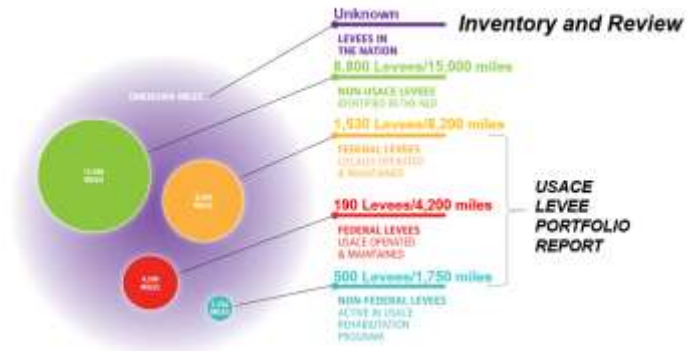
HQ USACE - Led Activities

- ☐ Levee Portfolio Report
- ☐ Non-Project Segments
- ☐ WRRDA 2014 Section 3013 Levee Veg Revisit
- ☐ Voluntary Inventory and Review of Any Levee in the Nation
- ☐ Voluntary Federal Levee Safety Guidelines

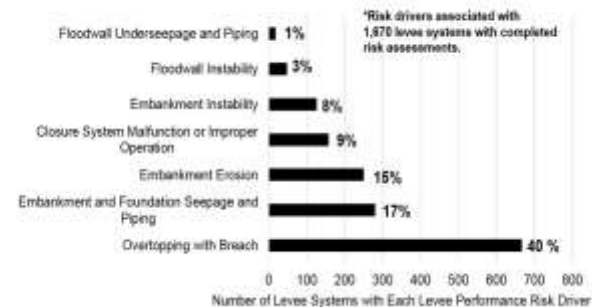
Levee portfolio report



REPORT ONLY COVERS USACE LEVEES



RISK FACTORS CONTRIBUTING TO BREACH PRIOR TO OVERTOPPING

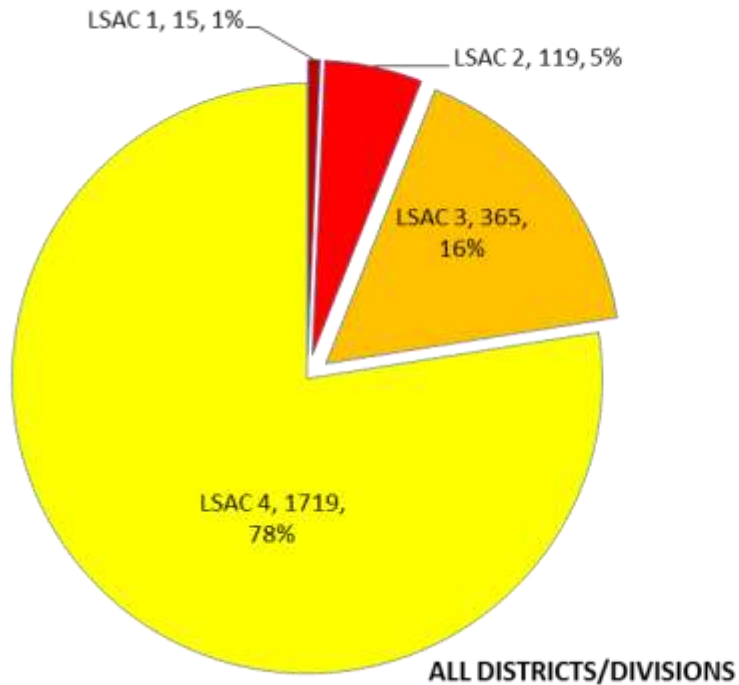


WHAT IS 'AT STAKE' BEHIND THE USACE LEVEE PORTFOLIO?

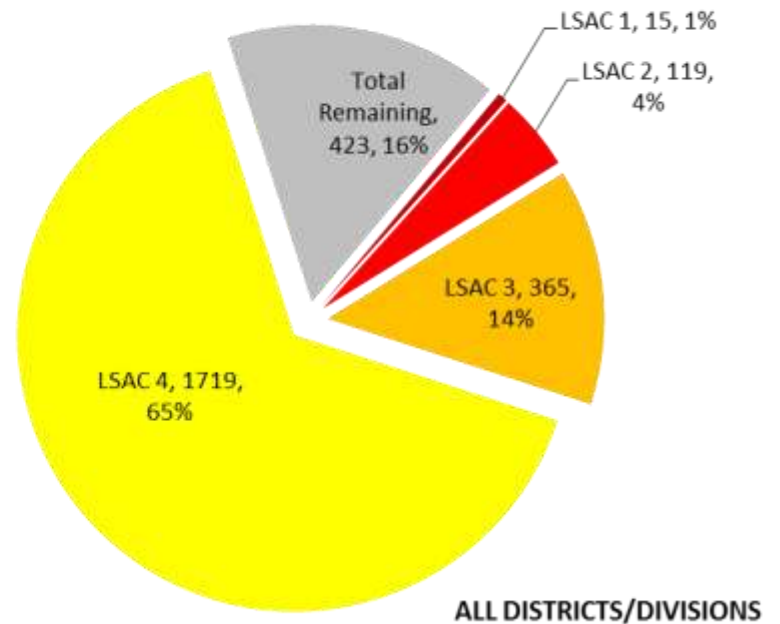
- ☐ Over 11 million people live and work behind levees
- ☐ Over \$1.3 trillion of property value behind levees
- ☐ 86% of people live behind 7% of levees

Levee Safety Action Classification (LSAC) Recommendations

LSOG LSAC Recommendations



LSOG LSAC Recommendations



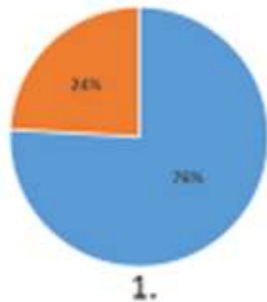
Screening Level Risk Assessments (SLRA) for Non-Project Segments connected to USACE Levees

For tracking purposes giving district credit for four distinct areas.

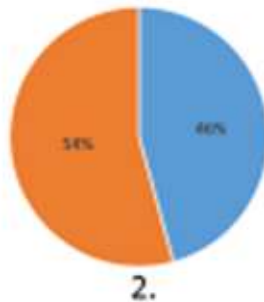
- 1) Segment entered into the NLD
- 2) SLRA started in the Levee Screening Tool (LST)
- 3) Screening entering into the approval process within the LST
- 4) HQ LSO Approved screening

Each quadrant of the pie chart represents one of the areas above.

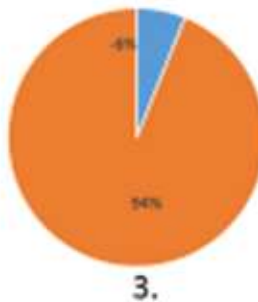
% loaded into NLD



% Started in the LST



% in LST Approval Process



% HQ LSO Approved



Progress By Division

Division	Number of Non-Project Segments	Number of Segments in the NLD	Number of Segments in the LST	Number of Segments submitted or Better in the LST	Number of Segments HQ LSO Approved
LRD	20	18	17	3	0
MVD	211	97	49	0	2
NAD	57	2	2	-32	0
NWD	212	96	50	0	3
POO					
SAD	46	43	12	0	0
SFD	92	81	73	0	0
SWD	6	0	0	0	1
Total	444	337	203	-32	6

Objective is to have all Non-Project Segments through HQ LSO Approval by the End of FY 2019.

Overall Scoring being tracked towards 2019 will be:

95%-100% Green
80%-95% Amber
<80% Red

Voluntary National Levee Inventory and Review

Inventory

- General Location and Condition of Nation's Levees
- Consequences behind levee systems
- National Levee Database

Ongoing Activity

Review

- Inspection
- Screening Level Risk Assessment
- Levee System Summary

One Time Activity

Partnership/ Communication

- Create ongoing Partnership with State and Tribe
- Training / Sharing Best Practices
- Effective Communication

Ongoing Activity

WRRDA 2014 – Title IX, Section 9004

BENEFIT: INCREASE UNDERSTANDING OF RISK

- Establish a baseline understanding of levee condition and risks
- Identify orphan levees
- Inform state emergency management efforts
- Identify risk management partners



BENEFIT: IMPROVE TECHNICAL CAPACITY



- Build inspection, assessment & communication capacity w/in states & owner/operators
- Assist w/ data management (National Levee Database)
- Provide access to tools



FEDERAL Levee Safety Guidelines



FEMA



WRRDA 2014 – SECTION 3013

- Comprehensive review of the guidelines ([ETL 583](#) and [PGL](#)) to determine if they are appropriate for all regions.
- Provide [greatest benefits](#) for public safety and ensure levee safety investments [minimize environmental impact](#).
- Account for woody vegetation [benefits](#) to levee safety.
- Consult with [federal agencies, state, tribal, regional and local government, NGOs, and the public](#).
- Solicit and consider views of [independent experts](#).
- Produce a [summary report to congress](#).
- No USACE directed vegetation removal unless it is shown to present an unacceptable risk.
- Reconsider any previous action affected by the former guidelines.



US Army Corps
of Engineers.



Last Opportunity – Final Audience Feedback



- What is the best way for us to help you stay engaged?
- Have you noticed improved FEMA-USACE coordination?
- Any other issues/concerns or questions you would raise?

Not the End

WE ALL STILL HAVE WORK TO DO!

