

# FEMA and USACE Collaboration on Levee Risk Communication ASFPM's Annual National Conference

June 2018



### **Setting the Stage**



## **Setting the Stage**

### Participants

- FEMA LAMP
- USACE LSAC communication and FPMS Study
- NeDNR CTP mapping effort
- NEMA potential PDM grant
- Community All of the above + more than we recognize
  - Evacuation planning
  - Levee O&M
  - Risk Communication
  - Local funding
  - Etc. etc. etc.
- OA (Community Engineer)





### Themes





**Clear Roles** and Responsibilitie S

### **Collaboratio**

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**Context** 













Increasing Resilience Together





























# The Importance of Clear Roles and E Responsibilities

- Federal programs can be confusing
- Intersections of State and Federal work add complexity to understanding these relationships
  - NDNR working w/ USACE through FPMS
  - NDNR working w/ FEMA through CTP
  - NEMA working w/ FEMA through HMGP
  - Community Engineer frequent collaborator through NeFSMA
- Need to know who is on first Who has what actions
  - Agency roles vs. community roles
  - Communities recognize they are ultimately responsible for taking care of their citizens, but hesitate to take action for two reasons.
    - Uncertainty if they are stepping on another agencies toes
    - Uncertainty if spending limited funds is being done efficiently and not duplicative of another effort.





US Army Corps of Engineers®









### Scollaboration: Why We Need It

Clarkson NE

### Wise use of resources

 Four agencies had work or planning underway in this project area.

### Tax dollars at work

• We SHOULD be leveraging resources and efforts.

### Community consideration

- Timeline alignment
- Getting to good mitigation requires cross-cutting programs
  - Flood Exposure and Mapping (working together puts us all on the same page and timeline)
  - Risk assessment/vulnerability
  - Planning and coordination of authorities





### **Solution:** How Does It Happen?



Have a process in place that facilitates collaboration.





### **\*\*** The Importance of Collaboration

"While we typically collaborate with USACE on our levee-related work, this was the first time we've jointly presented with a shared goal of communicating localized levee-related flood risk. And it made a real difference."

- Rick Nusz, FEMA Region VII

# The Big Picture Benefit of Collaboration

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# Context is Critical

### THE CHALLENGE

Getting people to manage their risk as well as managing their community's NFIP status, PL 84-99 status, and their levee's accreditation

### SOLUTIONS

- USACE LSAC screening findings
  - = localized picture of risk
    - Potential consequences (financial, life safety, critical facilities)
    - Key drivers of risk for the levee (actionable information for the community)
- Meaningful maps
- Planning and mitigation are part of the conversation
- Current events and personal experience









### **USACE Risk Framework for Levee Systems**

![](_page_20_Figure_1.jpeg)

\*Avoiding life loss is USACE's top priority.

![](_page_20_Picture_3.jpeg)

![](_page_20_Picture_4.jpeg)

### **Bayesian Updating**

1

Absent any information, our best estimate of conditional performance would initially be based on the average rate of failure for all levees

As we gain information, our estimate of conditional performance can be improved

2

Mathematically we can estimate this using Bayes' Theorem (1763) 3

We can estimate this using Bayes' Theorem (1763)

![](_page_21_Picture_7.jpeg)

![](_page_21_Picture_8.jpeg)

### **Historic Performance**

- Has the levee breached?
- Has the levee overtopped?
- How many times has the levee been loaded to 25% of the levee height?, 50% and 75%.
- Has heroic flood fighting occurred to prevent breach or overtopping?

![](_page_22_Picture_5.jpeg)

![](_page_22_Picture_6.jpeg)

### Levee Screening Approach - Consequences

# Initial Distribution of People and Damageable

- Protected Area (National Levee Database)
- HAZUS

FEMA

Population at Risk and Economics

Dedictribution of Decol

- Evacuation Effectiveness = f()
  - Evacuation Planning
  - Community Awareness
  - Flood Warning Effectiveness
  - Population Density
  - Overtopping vs. Breach (warning)

Estality rates from Dutch (Jonkman) Possar

![](_page_23_Picture_13.jpeg)

Slide 23

### **Assessing Risk**

![](_page_24_Figure_1.jpeg)

Increasing Resilience Together

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Performance Index v. Life Loss

![](_page_25_Figure_1.jpeg)

**FEMA** 

Ris

Increasing Resilience Together

Source: Communicating Benefits and Risks Associated with Levee Systems (2012)

### Example Levee District Protects community of East Community, Flood State

Population at risk 425(day), 483 (night)	Weighted fatality rate 1.0%		Performance index prior to overtopping 9.48E-05
Life loss estimate (Overtopping Breach)= (Breach Prior to Overtopping) = 7		Economic \$44,714,179	
Toe annual chance exceedance (ACE) 1.00E-00 (1 year)	Design capacity ACE 1.00E-02 (100 year)		Overtopping ACE 5.00-03 (200 year)

![](_page_26_Picture_2.jpeg)

![](_page_26_Picture_4.jpeg)

### (Example) Recommendations

The non-federal sponsor should focus on operation and maintenance activities.

 These activities should include removing unwanted vegetation, removing encroachments, improving the animal control program, verifying the condition of the culverts, monitor sod cover and repairing any depressions on the levee surface.

• Updating the emergency response manual to provide updated evacuation routes and times.

![](_page_27_Picture_4.jpeg)

![](_page_27_Picture_5.jpeg)

### Understanding Your Flood Risk

![](_page_28_Picture_1.jpeg)

![](_page_28_Picture_2.jpeg)

- Clarkson has already experienced flooding.
- The ultimate the City of 0 your flood r so that you become mo risk.

![](_page_28_Picture_5.jpeg)

### Understanding Your Flood Risk

- How can this project help?
  - The Natural Valley analysis shows the potential impact fo the city if the levee was not present – through determining flood elevations and depths.

at the City should focus on?

e available.

### **USACE Risk Framework for Levee Systems**

![](_page_28_Figure_11.jpeg)

#### Lower Elkhorn Multi-Plan update in 2019

help communicate risl

### Clarkson – Maple Creek RB and LB Levee Screening Results Levee Safety Program

U.S. Army Corps of Engineers Omaha District Lowell Blankers 9/27/2017

![](_page_28_Picture_16.jpeg)

![](_page_28_Picture_17.jpeg)

**Mitigation Matters** 

- Mitigation Priorities highlighted for the City of Clarkson in the 2014 Lower Elkhorn Natural Resources District Multi-Jurisdiction Hazard Mitigation Plan Update
  - ✓ Levee floodwall construction and/or improvements
  - Grade control structures
  - Stormwater system and drainage improvements
  - Flood-prone property acquisition
  - $\checkmark$  Create a city/village-wide plan to prioritize all flood-related projects
  - ✓ Participate in the Community Rating System
  - ✓ Public Awareness
  - Comprehensive city disaster/emergency response plan
  - ✓ Formal evacuation plan

![](_page_28_Picture_29.jpeg)

![](_page_28_Picture_30.jpeg)

The meeting resulted in several actionable next steps: Flood profile provided by FEMA to help the community make its accreditation and mitigation decisions.

The community requested additional **information on insurance policies** from FEMA.

The fire chief acknowledged the **importance of developing an evacuation plan** and requested support in developing one, which the Omaha District provided.

The **city continues to assess** the feasibility of its bridge mitigation project and will use the data being developed.

## Outcomes

Updates will continue between all stakeholders on data development, timelines and mitigation

efforts.

![](_page_30_Picture_0.jpeg)

![](_page_30_Picture_1.jpeg)

Smaller communities=Consolidated roles=Efficient decision making

![](_page_30_Picture_3.jpeg)

Getting the right people in the room

![](_page_30_Picture_5.jpeg)

The value of conversations; pre-meeting information gathering

![](_page_30_Picture_7.jpeg)

Forest top-of-mind

![](_page_30_Picture_9.jpeg)

![](_page_30_Picture_10.jpeg)