



**AGENDA  
CITY OF HARRISONVILLE  
PUBLIC WORKS COMMITTEE  
REGULAR MEETING  
CITY HALL  
JANUARY 3, 2018  
6:00 PM**

- I. Call to Order**
  - 1. Roll Call**
- II. Approval of Minutes**
  - 1. Public Works Committee - Regular Meeting - Dec 5, 2017 6:00 PM**
- III. Stormwater Issues**
  - 1. Brian Rast - Army Corp of Engineers**
- IV. General Discussion**
- V. Adjourn**

**Posted on City Hall Bulletin Board this 2<sup>nd</sup> day of January, 2018**

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**Randall K. Jones, City Clerk**

**The Board of Aldermen meeting is an open meeting but is not a meeting of the public. There is a place on the agenda for comments of citizens under PUBLIC PARTICIPATION. Our rule is that comments by any individual or group shall not exceed (4) minutes. The Board of Aldermen request that concerns be initially addressed at the appropriate action level before coming to the Board of Alderman**



**MINUTES  
CITY OF HARRISONVILLE  
PUBLIC WORKS COMMITTEE  
REGULAR MEETING  
CITY HALL  
DECEMBER 5, 2017  
6:00 PM**

**I. Call to Order**

The meeting was called to order at 6:00 PM by Chair Brian Hasek

Attendee Name	Organization	Title	Status	Arrived
David Dickerson	Harrisonville	Member	Present	
Matt Turner	Harrisonville	Member	Present	
Brian Hasek	Harrisonville	Chair	Present	
Clint Long	Harrisonville	Member	Present	
Brad Bockelman	Harrisonville	Member	Present	

*Also present were Happy Welch, City Administrator; Eric Patterson, Director of Public Works; Rodney Jacobs, Street Superintendent; April Clark, Administrative Assistant for Public Works*

**II. Approval of Minutes**

**1. Public Works Committee - Regular Meeting - Oct 3, 2017 6:00 PM**

*A correction to the October 3, 2017, minutes was made to Page 2, Stormwater Issues. The correction was made to read, "..... The Christie Group is responsible for maintaining the creek area in front of their vacant properties. Comfort Inn, Russell Stover's, and Sutherland's will maintain the portion of the creek that joins their properties."*

<b>RESULT:</b>	<b>ACCEPTED AS AMENDED [UNANIMOUS]</b>
<b>MOVER:</b>	Matt Turner, Member
<b>SECONDER:</b>	David Dickerson, Member
<b>AYES:</b>	Dickerson, Turner, Hasek, Long, Bockelman

**III. Agenda Items**

**1. Request to establish traffic pavement marking lines on Jefferson Parkway**

*Street Superintendent Rodney Jacobs explained that he was asked if traffic striping could be placed on Jefferson Parkway. Alderman Matt Turner said that he had asked Superintendent Jacobs about this because he had been contacted by some concerned citizens. Alderman Turner said the citizens thought striping would make it easier to avoid the ditches on the sides of the road at night. He also said that this request was made when the last street light was located at the Community Center. Now there will be one or two more street lights added between the Community Center and Waters Road due to*

*the development of Harrisonville Villas. It was discussed by the Committee that this was not a common practice for the City, and that it wouldn't be done at this time.*

<b>RESULT:</b>	<b>DISCUSSION</b>
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## 2. Change to Sewer Rates 700.480 B.2.b

*Public Works Director Eric Patterson explained that we have received the new operating permits from DNR, Department of Natural Resources, for the Water and Wastewater Plants. He said that DNR is requiring that disinfection, likely UV, be added to the process at the Wastewater Plant. He initially thought it would only be required at the main plant, but it will also include the south plant. He explained that the cost of this addition will be more than the sewer rate/fees will cover. He also explained how the sewer charge is currently figured and billed. Director Patterson stated that we are the only city in our area that takes an average of the three months with lowest water usage and bases the sewer charge on it for the entire year. All other cities charge sewer according to water use per month. He explained to the Committee that in order to bring the sewer fund up to a point of covering basic expenses, the sewer charge would need to be figured each month on actual monthly water usage. He did say that anyone using at or under the minimum wouldn't see a change in their bill. He went on to explain that in the next year or two, there would need to be a rate increase as well.*

*Discussion was held regarding possible increases in order to get the sewer plant to meet the current DNR requirements. Director Patterson said if we don't do something to bring the rate up ourselves, DNR will require a rate study and the increase might be more. Mayor Brian Hasek asked what the timeline is to get this done. Director Patterson said we need to be under construction within 3 years and 3 months. DNR would like it complete by then, but we can probably get them to agree to being under construction within that time period.*

*Mayor Hasek asked if we could do this in phases. Director Patterson said he'd like to do the monthly rate based on water usage first, within the next year. Then, in the following year, we will need to decide on the rate increase. Alderman David Dickerson asked how much time we have to decide. Director Patterson said there is some time, but we need to really look at it and do something fairly soon. He explained that DNR's reasoning for a rate increase is that we won't meet their new requirements, and most cities did this several years ago. He said some cities actually implement a rate increase each year in order to avoid a big increase all at once.*

*Mayor Hasek asked if we are currently subsidizing the sewer fund with the water fund, does it mean we're overcharging on water? Director Patterson said it does not mean that, it means that we're not replacing water mains like we should because we're using those funds to maintain the sewer.*

*Alderman Brad Bockelman said we should do the adjustment to the current rate as soon as possible. Mayor Hasek agreed and said then the rate increase could be done at the end of 2019. That should be far enough apart to be able to explain the reason, which is to meet DNR requirements. Mayor Hasek asked that this be put on the January 2018 meeting agenda.*

*Director Patterson also said that having the UV will add an additional \$50,000-\$75,000 cost for the electric at the main plant alone. This DNR requirement is not a one-time cost.*

**RESULT: DISCUSSION****IV. Stormwater Issues**

Director Patterson said he had no new issues at this time. Mayor Hasek said starting next year, he would like to look at the list of things we've had on the back burner and see what can be done.

Alderman Matt Turner said he will be talking to Tommy Cook, owner of the Harrisonville Trade Fair, regarding his offer of donating some land for a retention pond behind Walker Addition. He would like to find out if he's still interested in doing that and be able to give him some answers about how the City would be involved and how it would be done.

Director Patterson said he would like to start a program with backflow preventers, where we have them and if residents need one, we'll provide it and they can install it. The backflow preventers still need to be cleaned every year. This will at least show that the City is doing what we can. He suggested waiving the building permit fee for installation if residents are willing to install one.

**V. Public Works Project Updates**

Director Patterson said they are working on the Jefferson Parkway sidewalk. The SRF has reimbursed for Change Order No. 1. He will be talking to them about reimbursing for additional engineering.

Director Patterson said the Ann Terrace project is progressing and is almost complete. City Engineer Ted Martin is continuing to talk with some of the property owners regarding the project.

**VI. Airport Reports****1. Lawrence Smith Memorial Airport Report**

*Director Patterson reviewed the report in Manager James Green's absence.*

**RESULT: DISCUSSION****VII. General Discussion**

Mayor Hasek said he was asked if the ends of the u-turn islands at Commercial Street and 291 Highway could be painted white, so they can be seen better. Director Patterson will contact MODOT.

Alderman Dickerson said he has been asked several times about getting a 3-way stop at Love's, instead of the current one stop sign. Director Patterson said it's not warranted. Mayor Hasek agreed and said every time those trucks stop, it takes longer to start them and then causes traffic backups. The only place a stop sign could be placed is on the northbound side.

Alderman Turner asked about a stop sign on Independence at the square/Wall Street. There was some discussion.

### **VIII. Adjourn**

Alderman Dickerson made a motion to adjourn and Alderman Long seconded. The motion carried and the meeting was adjourned at 7:00 PM.

\_\_\_\_\_  
Brian Hasek, Mayor & Ex-Officio  
Chairman of the Board of Aldermen

ATTEST:

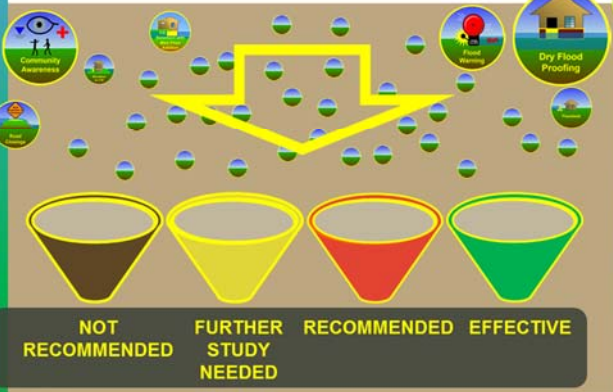
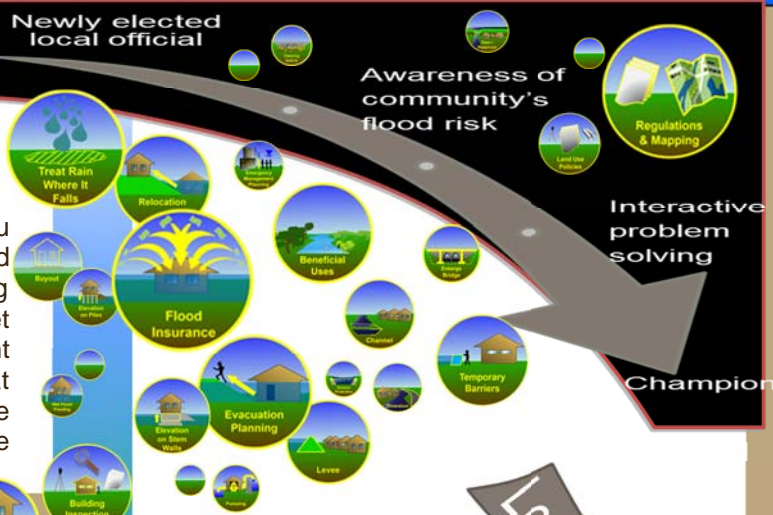
\_\_\_\_\_  
Randall K. Jones, City Clerk

Minutes Acceptance: Minutes of Dec 5, 2017 6:00 PM (Approval of Minutes)

**SOLUTIONS**

**Total Flood Risk Management**

is about communities looking at the **full** menu of measures that solve flooding problems and **sharing** the responsibility of managing flooding. A community that uses a diverse set of features and activities can be more resilient to severe floods. Floodplain leaders that understand the process know the importance of evaluating each measure and involving the public in the decision process.



A playbook for how to beat flooding.

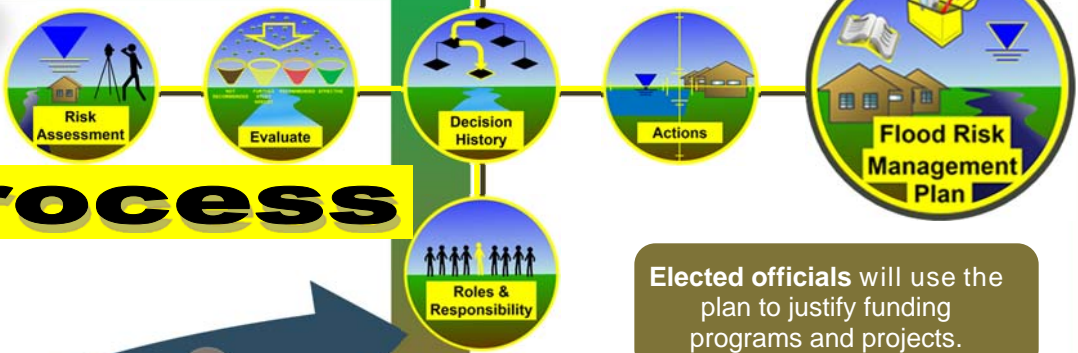
**FLOODPLAIN MANAGEMENT PLAN**

= Sustained effort

The process avoids pitfalls of ignoring flood hazard

**CONNECT THE DOTS**

**Process**



Elected officials will use the plan to justify funding programs and projects.

A floodplain management plan is not a tool, rather, it is the **toolbox**. This toolbox is an effective way to help justify the funding needed from elected officials.

**THE PROCESS OF FLOOD RISK MANAGEMENT**

*This is how communities will thrive*  
 Too many communities assume the threat of flooding is not great. Too many have been **set back decades** due to floods. Ask your community to lead the way to flood resilience with a sustained effort.



- A floodplain management plan offers several benefits.
- The way to make a community **thrive**
  - Playbook
  - Engaged elected officials,
  - Help for floodplain leaders unlock doors to flood mitigation
  - Prioritized actions to solve flood hazards

human health life safety cultural heritage environmental economic activity



Attachment: Attachment 1 (Brian Rast - Army Corp of Engineers)

# What is a flood master plan?

Flooding is our nation's worse cause for disasters. A flood master plan is the same as floodplain management plan or risk management plan and is like a playbook used by teams in sports and has these parts:

- Identifies flood risks, has a risk assessment, and clearly describes the problem
- Is based on the flood risk assessment, states the goals to address flood problems
- Provides evaluation on the full menu of measures or the tools for reducing risks to property owners
- Narrows down the menu of measures to the right tools
- Establishes a list of actions with specifics on when and whom will pursue each action
- Includes public participation in decisions
- Complements the existing local hazard mitigation plan in a county

Sustaining one of these plans is the way for a community to become resilient to flood hazards. The plan helps communities **prepare, absorb, recover, and adapt** for floods.

# PLANNERS AND ENGINEERS CAN HELP

The planners and engineers at the Corps of Engineers, state, and other agencies have staff ready to answer your questions and help your community. We regularly provide workshops to communities and agencies across the nation. A variety of tools can also be leveraged including

- Comprehensive floodplain management planning
- Building structure inventory
- Nonstructural assessments
- Cost estimating
- Flood warning systems
- Public involvement and outreach
- Inundation mapping

As risk management professionals, the floodplain leaders are skilled in looking at each community's unique needs and applying the right measure from the menu of measures. Professionals that can assist include certified floodplain managers, engineers, economists, and community planners.

Our risk professionals provide support in flood risk management through special technical services under the Flood Plain Management Services Program, the Planning Assistance to States Program, and pre-flood preparation activities through the Flood Control and Coastal Emergencies Program.



**US Army Corps of Engineers.**

Contact:



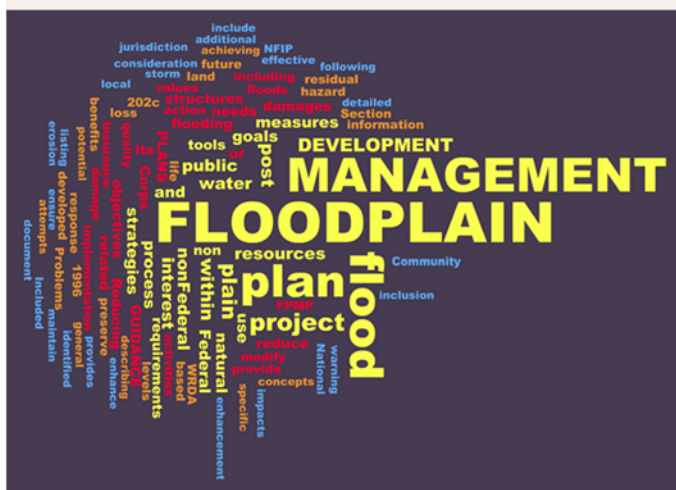
# Total! FLOOD Risk Management

## How to win: Your Community's Flood Master Plan

The story that can tell how you are beating floods



Attachment: Attachment 1 (Brian Rast - Army Corp of Engineers)



## WHAT ELSE CAN BE DONE TO STOP FLOODING?

### Possible Solutions to Flooding...

Many don't realize that the solutions to reducing flood risks vary between measures that deal either with the way a floodplain is managed to how floodwaters are managed. This is shown in the two boxes below. The flood risk is best addressed with more than one flood risk adaptive measure. Each one deserves a community-level evaluation, including reasons for and against the measure. Many of these items are activities, while some are features that can be built.

#### FLOOD RISK ADAPTIVE MEASURES FOR

#### FLOODPLAINS

##### Nonstructural measures

- Elevation
- Relocation
- Buyout / Acquisition
- Dry flood proofing
- Wet flood proofing

##### Nonphysical nonstructural measures

- Flood Warning Systems
- Flood Insurance
- Floodplain Mapping
- Flood Emergency Preparedness Plans
- Land Use Regulation
- Zoning
- Evacuation Plans
- Risk Communication

#### FLOOD RISK ADAPTIVE MEASURES FOR

#### FLOODWATERS

Physical or structural measures include constructible features such as

- Detention Basins
- Dams
- Floodwalls
- Levees and berms
- Channel
  - ◆ straightening
  - ◆ widening
  - ◆ deepening
  - ◆ diversions
- Bridge enlargements
- Conveyance modifications

And these activities

- Clearing and snagging debris
- Pumping
- Land treatment and infiltration

## The Strategies and Tools

For many years, federal agencies have recommended combining these strategies and tools in different ways to address the specific needs of each community.

### Modifying human susceptibility to flood hazards

- land use regulations
- public redevelopment policies
- flood warning systems
- flood proofing of structures in the floodplain
- process for relocation of structures

### Modifying the impact of flooding

- information and education
- flood insurance
- tax adjustments
- emergency relief
- post-flood recovery processes

### Preserving and restoring floodplain environmental quality

- wetlands protection and restoration
- erosion and sediment control
- water quality enhancement
- enhancement of recreation and education opportunities
- preservation of cultural resources

### Modifying floodwaters

- stormwater detention basins
- levees, floodwalls, and landforms
- channel alterations, diversions, and bypasses
- pump stations

**Nonstructural measures** are permanent or contingent measures applied to a structure and/or its contents that prevent or provide resistance to damage from flooding. Nonstructural measures differ from structural measures in that they focus on reducing the consequences of floods in floodplains instead of focusing on reducing the chance of flooding (the effect on floodwaters).

## Frequently Asked Questions

### 1) Can our community rely on a levee alone or are other measures needed?

The most resilient approach to flooding is to combine several measures with levees so property owners can drive down flood risks to a level acceptable. Additional measures include flood warning tools and evacuation routes.

### 2) Will we still have to pay flood insurance?

Paying is required for federally backed mortgages. Insurance is a good idea, because this transfers risk and makes communities more resilient to floods.

### 3) How will our community ever sort out and even fund the right options?

Develop a floodplain management plan with the community to evaluate measures and prioritize actions. Such a playbook helps elected officials justify funds. A floodplain management plan provides a story of the history that fully explains your community's flood risk management efforts.

The flood risk management professionals in your community, state, tribe, and at the Corps of Engineers have joined on state lead Silver Jackets teams that do flood hazard mitigation and will

- Help you understand your flood risk, including where flooding can happen, how often, and details about the danger
- Provide leadership in all aspects of floodplain management
- Look at combining measures that make sense in your community for your specific flood problem



**US Army Corps of Engineers** Our risk professionals provide support in flood risk management through special technical services under the Flood Plain Management Services Program, the Planning Assistance to States Program, and pre-flood preparation activities through the Flood Control and Coastal Emergencies Program.

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The planners and engineers at the Corps of Engineers, state, and other agencies have staff ready to answer your questions and help your community. We regularly provide workshops to communities and agencies across the nation. A variety of tools can also be leveraged including

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As risk management professionals, the floodplain leaders are skilled in looking at each community's unique needs and applying the right measure from the menu of measures. Professionals that can assist include certified floodplain managers, engineers, economists, and community planners.

Robert Gonsalves

### Website:

<http://silverjackets.nfrmp.us/State-Teams>

### Contact Us:

### PHOTOS ON THE COVER:

US Army Corps of Engineers

**Top:** Kansas, flood warning system with gage and forecast point; **Middle:** West Virginia, home elevation; **Bottom:** Certified flood barrier (*Aqua Fence*)



## Possible Solutions To Flooding



Attachment: Attachment 2 (Brian Rast - Army Corp of Engineers)

# Flood Risk and Flood Risk Adaptive Measures

**Brian Rast, P.E.**  
**USACE Kansas City District**  
**Advisor, National Nonstructural Committee**

**January 3, 2018**



Attachment: Attachment 3 (Brian Rast - Army Corp of Engineers)



US Army Corps of Engineers  
**BUILDING STRONG®**



## Consequences Associated with Flooding

- Life Loss
- Damage to Property
- Emergency Costs
- Business Losses
- Health and Welfare



# Is this the new Normal?

Property damages of \$10.2 Billion annually from 1985-2015)



**Hurricane Sandy**



**Louisiana Flooding**

## 2016 Major Disaster Declarations (Flooding)

Arkansas	Kentucky	Louisiana	Wisconsin	Montana	Oklahoma	West Virginia
Texas	Montana	Texas	Mississippi	Pennsylvania	Texas	Delaware
New Jersey	Louisiana	Virginia	Maryland	Georgia	District of Columbia	
Georgia	Oregon	Alaska	Oklahoma	Texas	Arkansas	Washington
Alabama	Missouri	Washington	Mississippi	Iowa		



# Flood Risk

3.1.c

$$\text{Risk} = f [(\text{Probability of Flooding}) \times (\text{Consequences})]$$

(Probability of Flooding) is the frequency of flooding or how often does flooding occur in a particular location. Reduce the frequency of flooding and risk is reduced.

(Consequences) are the potential damages and life loss associated with flooding. The structures (critical, residential, commercial, public, and industrial), land use (agricultural, urban, public) , and infrastructure (highways, roads, rail, utilities) make up the potentially damageable assets. Reduce the consequences of flooding and risk is reduced.

Note: If critical facilities become inoperable during a flood event, the area of impact extends beyond the area of flooding (i.e. electrical service, communications, water and wastewater, etc.).



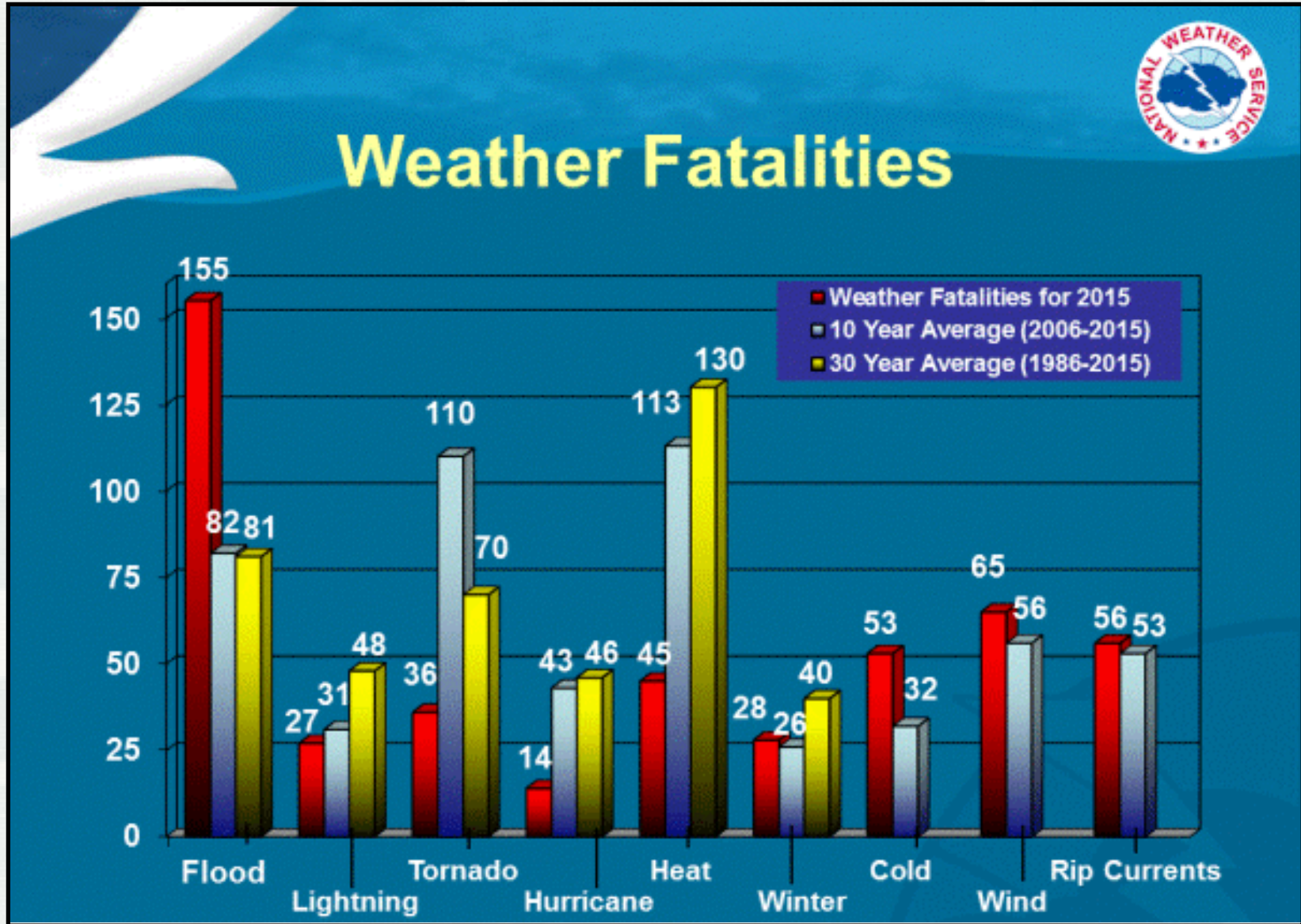
## What is Risk?

The possibility of suffering harm or loss, plus the consequences of occurrence.

## What is Risky Behavior???



# 2015 U.S. Weather Related Fatalities



Attachment: Attachment 3 (Brian Rast - Army Corp of Engineers)



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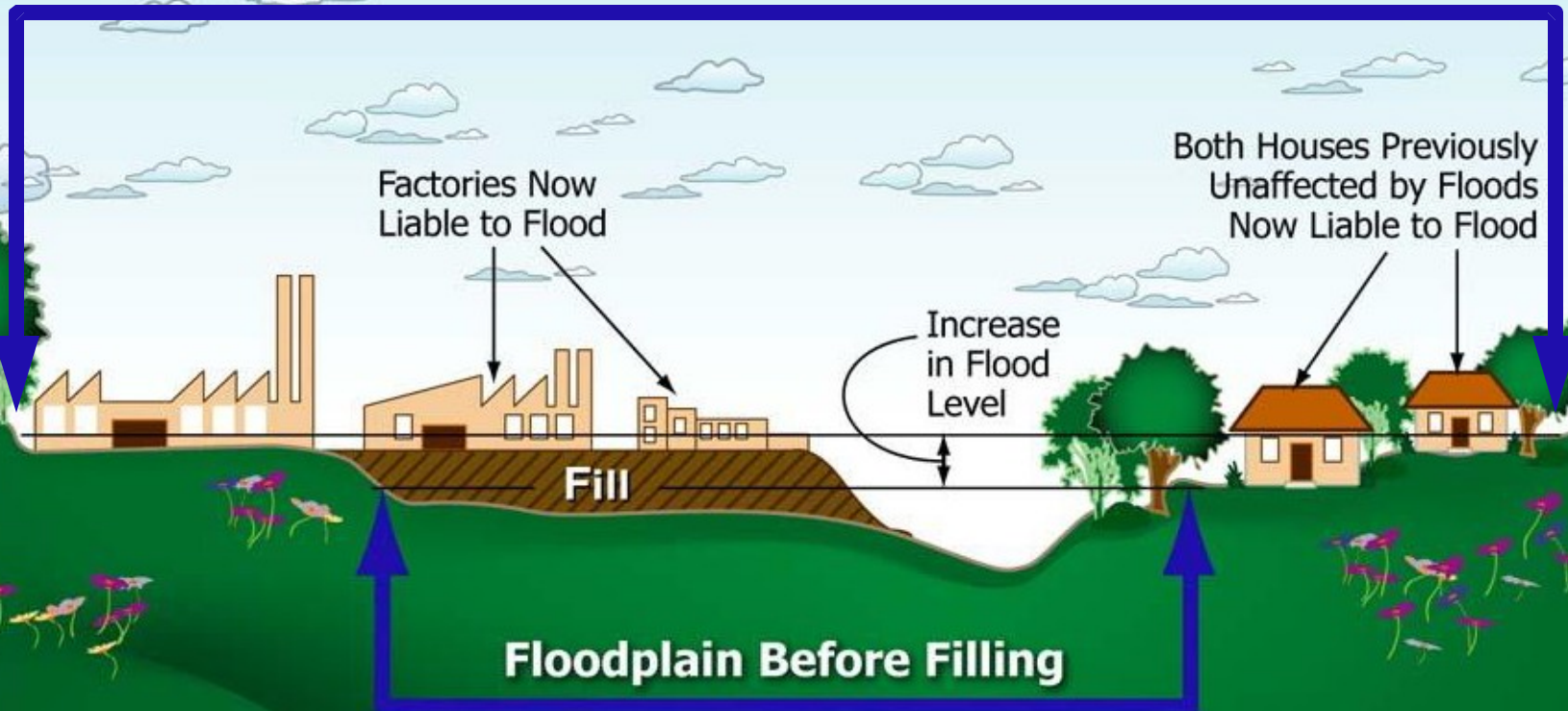
# 2015 U.S. Flood Fatalities by Age and Gender

	Female	Male	Unknown	Total	Percent
0 to 9	8	8	1	17	9.66
10 to 19	4	12	1	17	9.66
20 to 29	2	19	0	21	11.93
30 to 39	10	17	0	27	15.34
40 to 49	5	19	0	24	13.64
50 to 59	9	20	0	29	16.48
60 to 69	10	7	0	17	9.66
70 to 79	8	4	0	12	6.82
80 to 89	4	3	0	7	3.98
90 to --	0	0	0	0	0.00
Unknown	0	5	0	5	2.84
<b>Total</b>	60	114	2	176	
<b>Percent</b>	34.09	64.77	1.14		

Attachment: Attachment 3 (Brian Rast - Army Corp of Engineers)



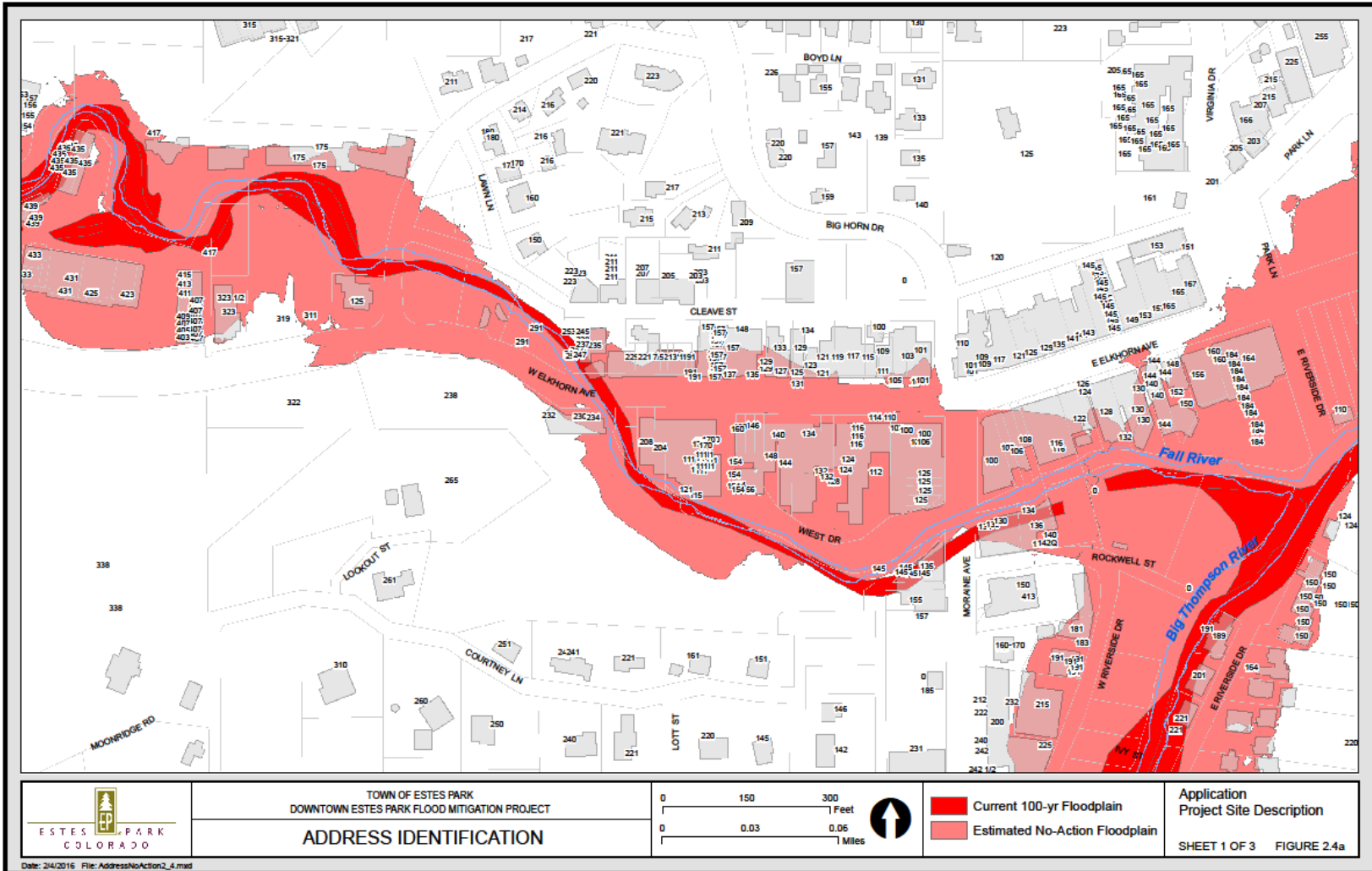
# Today's Floodplain Is Not Necessarily Tomorrow's Floodplain



If large areas of the floodplain are filled, then there will be an increase in the land area needed to store flood waters.

**This means your home or business may be impacted!**

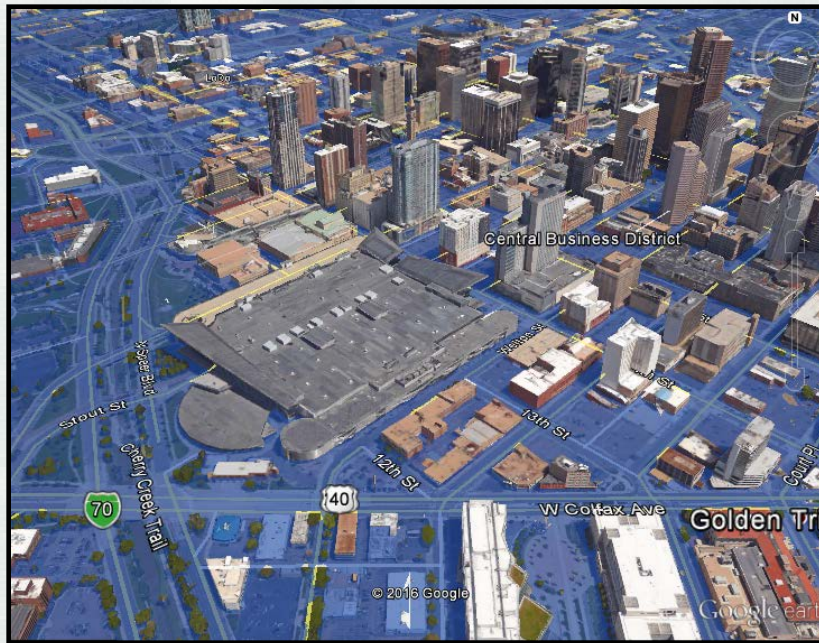
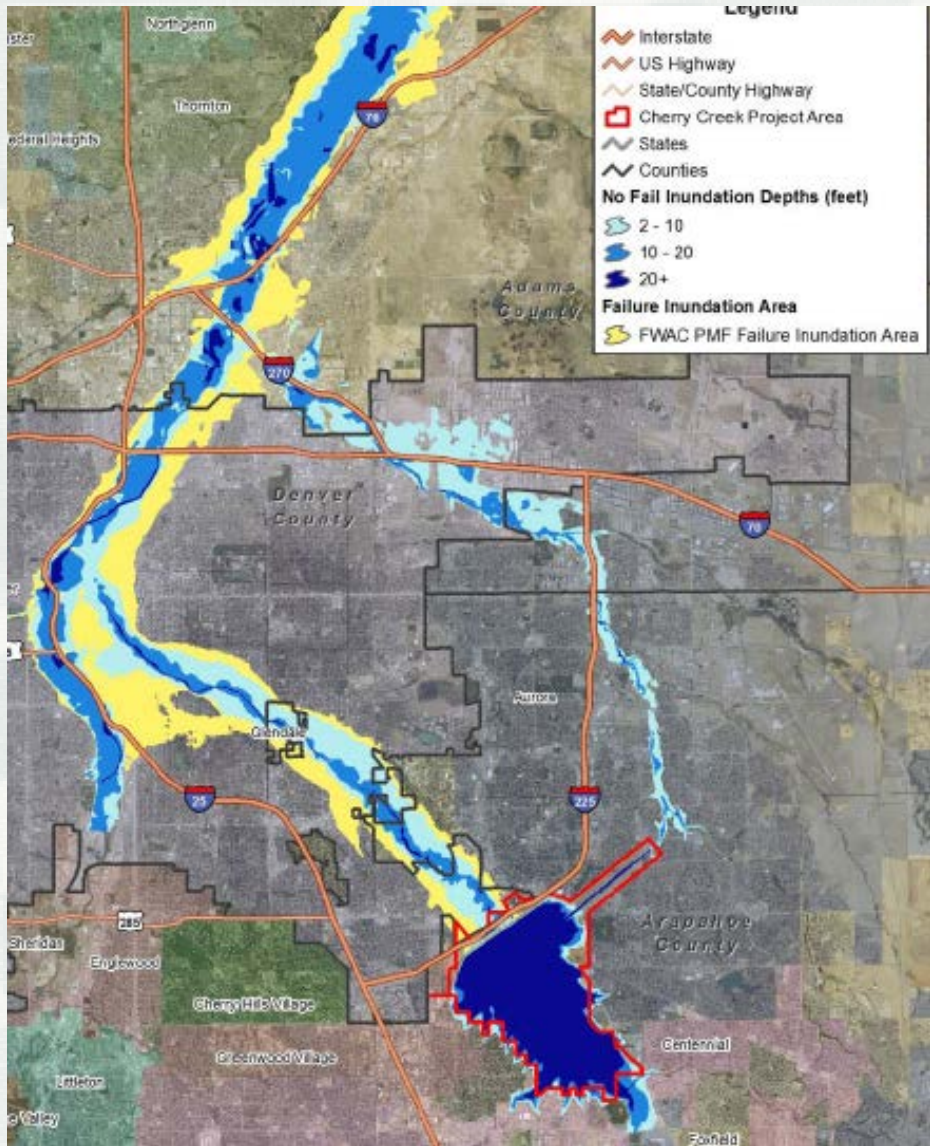
# Changing Flood Risk



Attachment: Attachment 3 (Brian Rast - Army Corp of Engineers)



# Dam Safety and Nonstructural FRAM



- Evacuation Planning
- Flood Warning
- Emergency Preparedness Plans

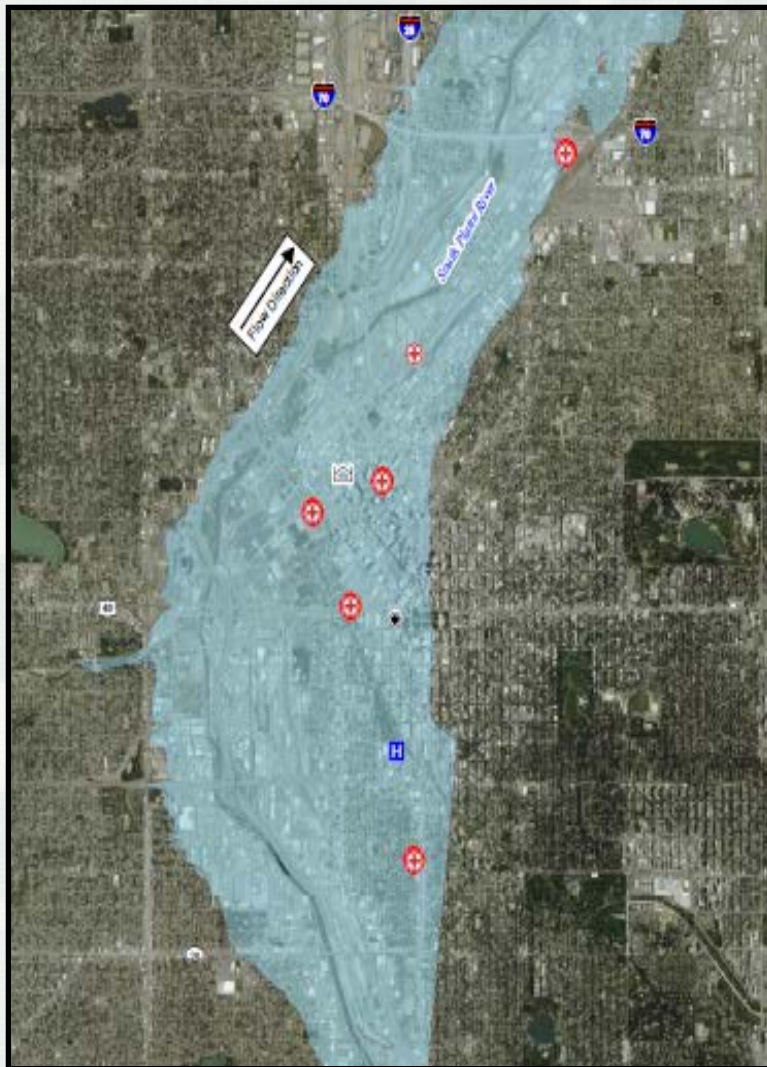
Attachment: Attachment 3 (Brian Rast - Army Corp of Engineers)



# Managing Flood Risk

3.1.c

$$\text{Risk} = f [(\text{Probability of Flooding}) \times (\text{Consequences})]$$



- Identify the Flood Risk
- Communicate the Risk
- Mitigate the Risk

Critical facilities support health and well being for the general population. If a critical facility becomes inoperable during a flood event, the area of impact extends beyond the area of flooding

- Fire and Rescue
- Hospitals
- Emergency Operation Centers
- Energy Generation
- Communication Systems

Attachment: Attachment 3 (Brian Rast - Army Corp of Engineers)



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Packet Pg. 20

# Critical Facilities and Flood Risk

3.1.c



Attachment: Attachment 3 (Brian Rast - Army Corp of Engineers)



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Packet Pg. 21

# Critical Facilities and Flood Risk



Attachment: Attachment 3 (Brian Rast - Army Corp of Engineers)



## Desperation Flood Response



## Desperation Flood Proofing

Attachment: Attachment 3 (Brian Rast - Army Corp of Engineers)

# Self-Help Flood Risk Management Measures



Attachment: Attachment 3 (Brian Rast - Army Corp of Engineers)



# The Intangibles of FRM

3.1.c

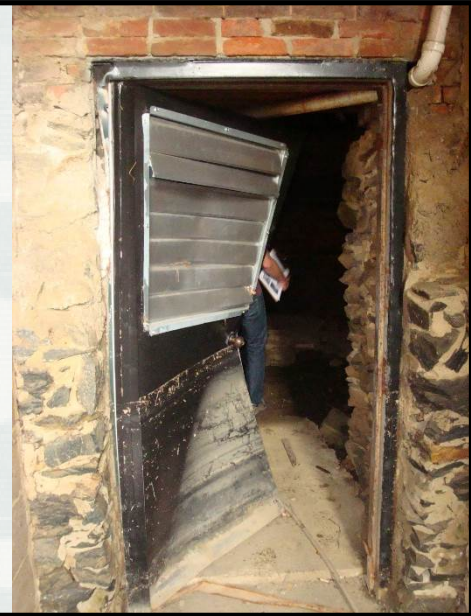
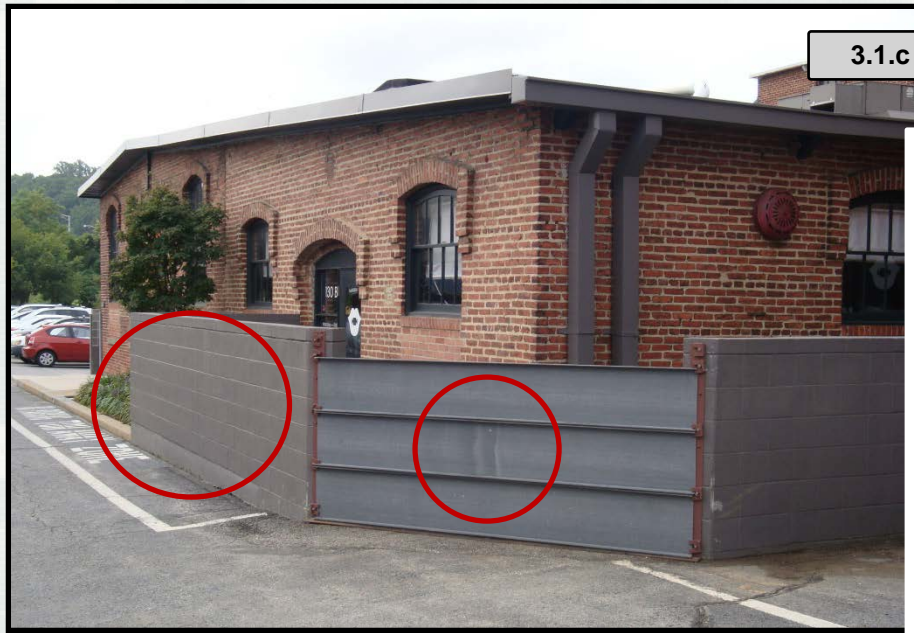


Attachment: Attachment 3 (Brian Rast - Army Corp of Engineers)



# The Intangibles of FRM

3.1.c



Attachment: Attachment 3 (Brian Rast - Army Corp of Engineers)



# \* Caution Caution Caution \*

3.1.c

While nonstructural flood risk adaptive measures may result in lower property damages, there could be potential restrictions which the property owner needs to investigate prior to implementation:

- Local Ordinances
- State Regulations
- National Flood Insurance Program (NFIP)

Not all of the methods shown in this presentation will comply with local code or the NFIP minimum requirements and may not be creditable for flood insurance savings. USACE is focusing on damage reduction.

Flood insurance is always recommended, even for structures which may have been retrofitted with nonstructural measures



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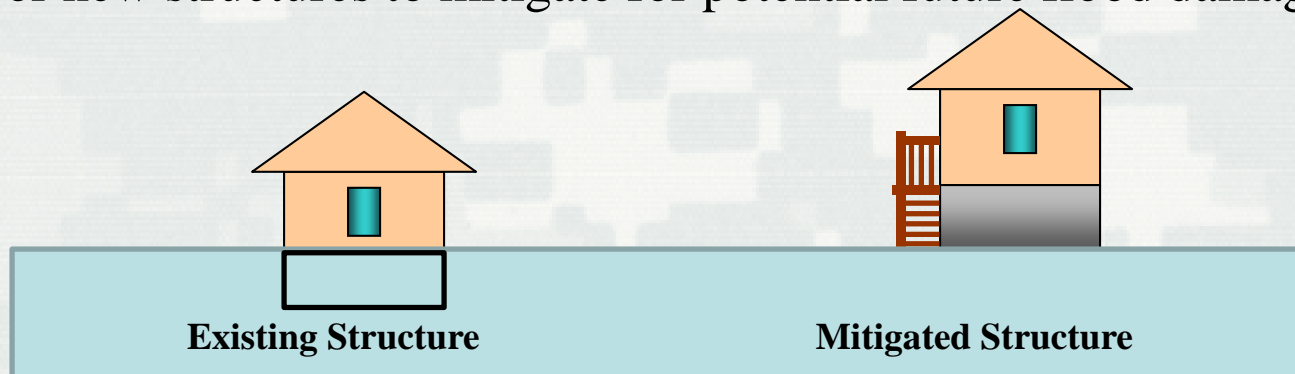
Packet Pg. 27

# Nonstructural Flood Risk Management Definition

Nonstructural flood risk management can be categorized as a set of **physical** or **nonphysical** measures utilized for mitigating loss of life as well as existing and future flood damages.

The physical measures adapt to the natural characteristics of the floodplain without adversely affecting or changing those natural flood characteristics. These measures are generally compliant with the NFIP and cause no adverse affects to the floodplain, flood stages, velocities, or the environment. Nonphysical measures are typically applied as management measures in the floodplain.

Because of their ability to adapt to flood risk, these measures may also be referred to as **Flood Risk Adaptive Measures** and can be incorporated into existing or new structures to mitigate for potential future flood damages and life loss.



# Nonstructural Flood Risk Adaptive Measures

The most common physical FRAM measures implemented for flood damage and life loss reduction are:

**Acquisition**

**Relocation**

**Elevation**

**Dry Flood Proofing**

**Wet Flood Proofing**

**Basement Removal**

Nonphysical measures can be considered separately or as a combination of floodplain management and planning functions. Representative nonphysical measures are:

**Floodplain Mapping**

**Land Use**

**Flood Insurance**

**Evacuation Plans**

**Flood Warning**

**Zoning**

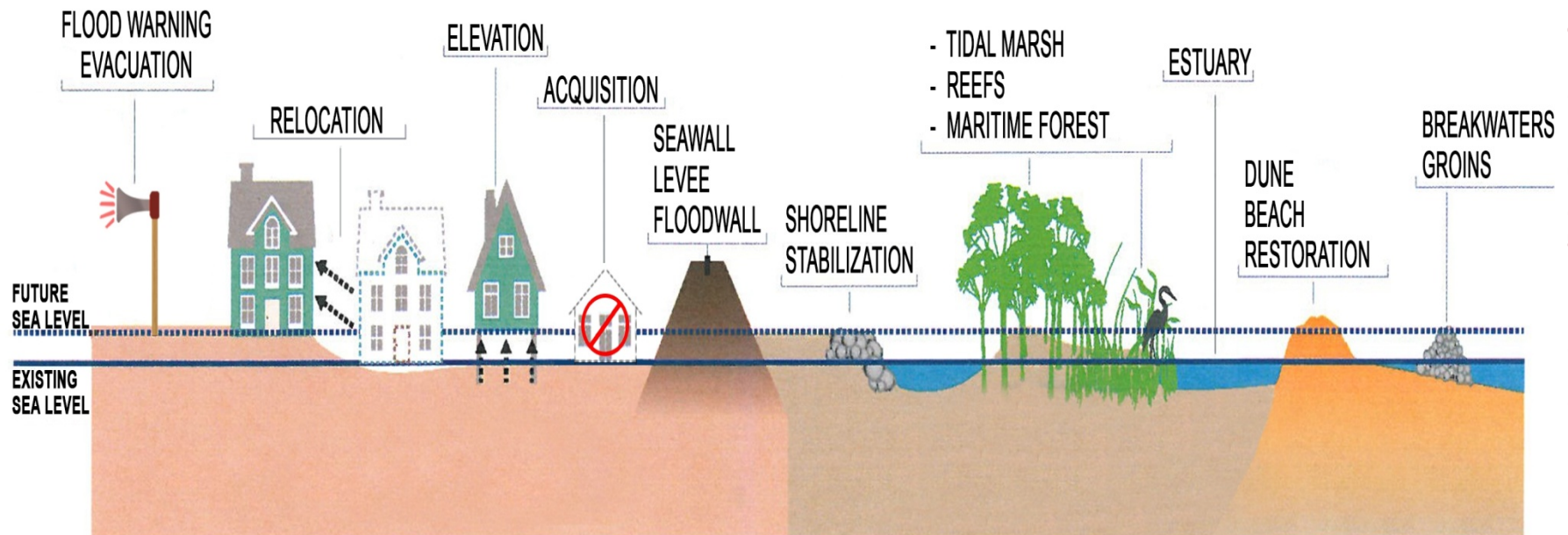
**Operational Changes**

**Emergency Preparedness Plans**



# FLOOD RESILIENCY

A systemic approach to resisting catastrophic loss



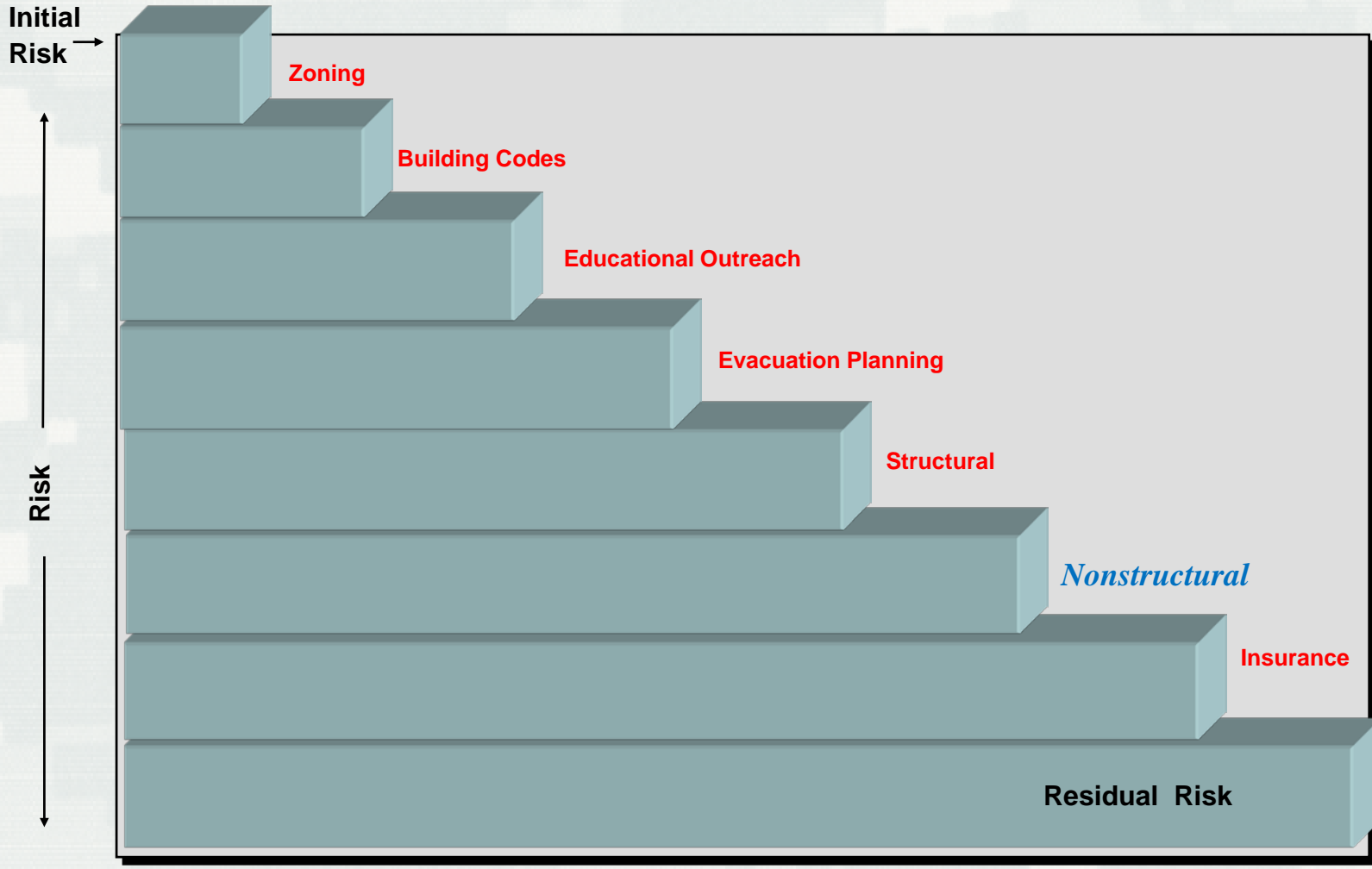
Attachment: Attachment 3 (Brian Rast - Army Corp of Engineers)



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Packet Pg. 30

# Flood Risk = $f$ [Probability of Flooding x Consequences]<sup>1</sup>



# Flood Risk and Flood Insurance

## Elevation Lowers Premiums

Premium at 1 foot  
Below BFE

\$9,500/year  
\$95,000/10 years



Premium set at  
the BFE

\$1,420/year  
\$14,100/10 years



Premium at 3 feet  
above BFE

\$427/year  
\$4,270/10 years



Zone A Example  
Under the Flood Insurance Reform Act of 2012



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Packet Pg. 32

# National Flood Barrier Testing & Certification Program

The **Association of State Flood Plain Managers (ASFPM)**, in partnership with **FM Approvals** and the **USACE Nonstructural Flood Proofing Committee (NFPC)** are implementing a National program of testing and certifying flood barrier products used for flood proofing and flood fighting. This program currently tests barrier products in two broad categories, **Temporary Flood Barriers** and **Closure Devices**.

The purpose of this Program is to provide an unbiased process of evaluating products in terms of resistance to water forces, material properties, and consistency of product manufacturing. This will be accomplished by testing the product against water related forces in a laboratory setting, testing the product against material forces in a laboratory setting, and periodic inspection of the product manufacturing process for consistency of product relative to the particular product that received the original water and material testing.



web: <http://nationalfloodbarrier.org/>



**BUILDING STRONG**

Packet Pg. 33



## Water Testing Based On ANSI

### Hydrostatic Tests

- Static Water
- Various Water Depths

### Wave Induced Hydrodynamic Tests

- Small: 2 – 3 inch
- Medium: 6 – 8 inch
- Large: 10 – 12 inch

### Performance (Water) Testing

> 1 inch Overtopping (1 hour)

#### Impact

##### 12 inch Diameter Log

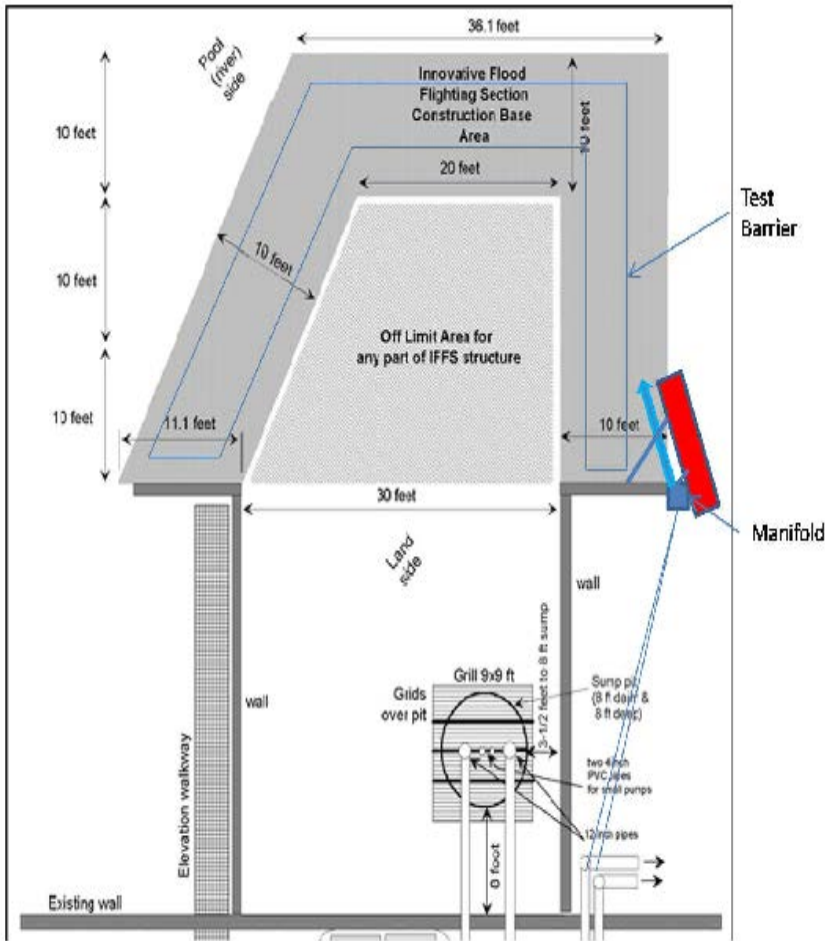
- 610 lb
- 7 ft/s

##### 17 inch Diameter Log

- 790 lb
- 7 ft/s

#### Current (1 hour)

- Maximum Rated Height + 1 inch (7 ft/s)

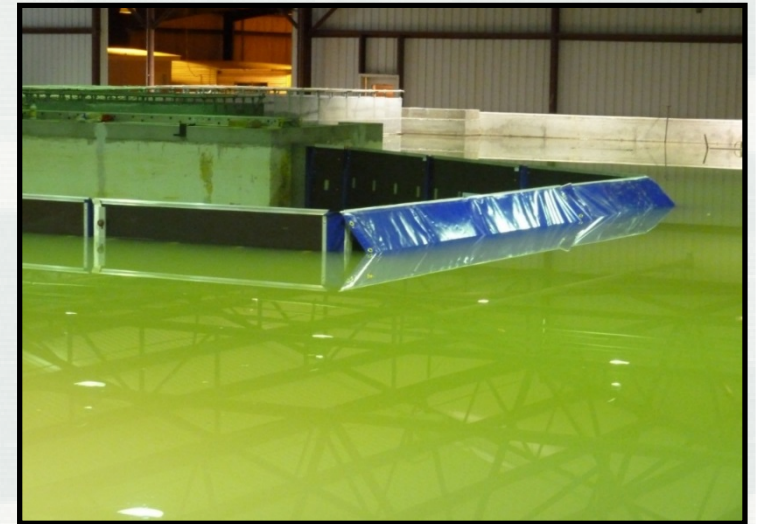


# ERDC



Engineer Research and Development Center

3.1.c



- Overtopping
- Dynamic wave
- Static pool

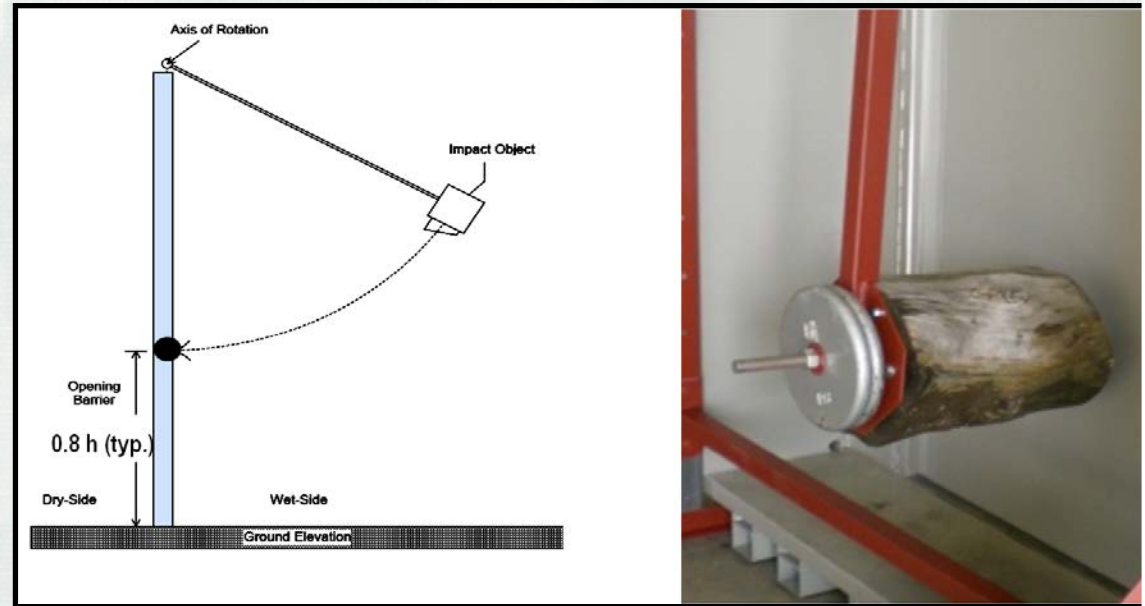
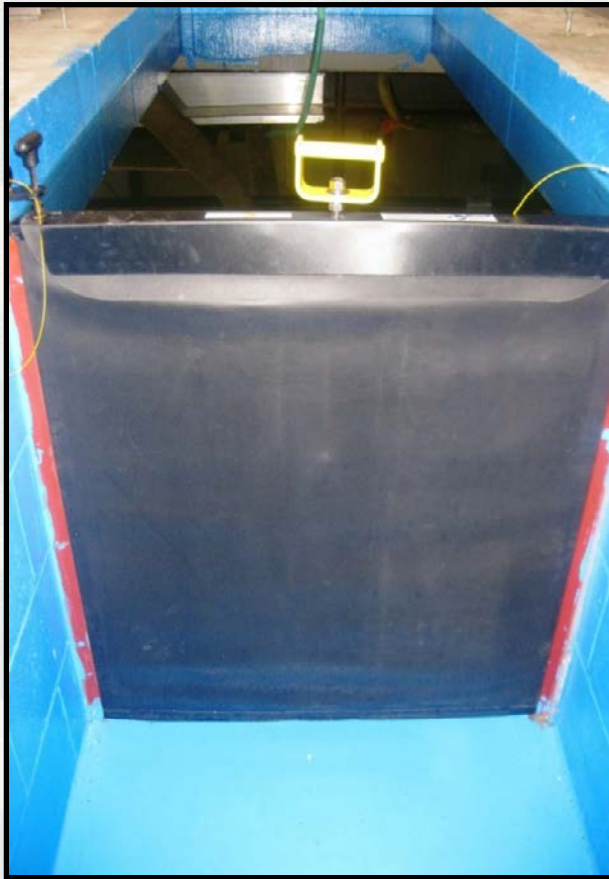
Attachment: Attachment 3 (Brian Rast - Army Corp of Engineers)



**BUILDING STRONG**

Packet Pg. 35

# Opening Barrier Testing



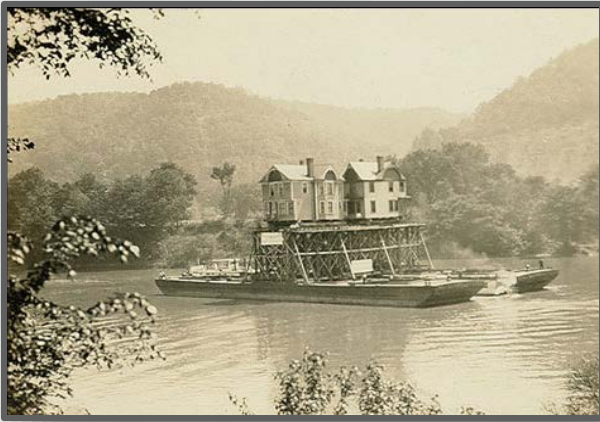
- Hydrostatic Load Test
- Dynamic Impact Load Test

Photo courtesy of Protray, Inc.

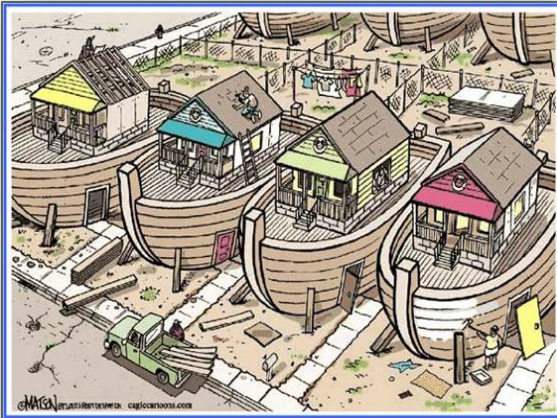


**BUILDING STRONG**

Packet Pg. 36



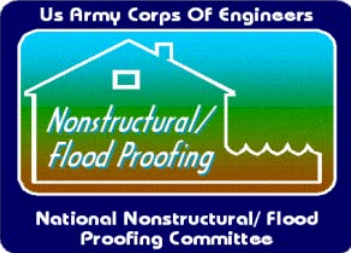
# Thank You



# Nonstructural / Flood Proofing Webinar

Presentation to City of Harrisonville, MO  
Public Works

Brian Rast  
USACE Kansas City District  
Advisor, National Nonstructural Committee  
January 3, 2018



US Army Corps of Engineers  
**BUILDING STRONG**<sup>®</sup>



Attachment: Attachment 4 (Brian Rast - Army Corp of Engineers)

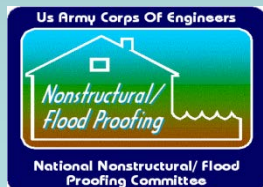
# Who is the NFPC Committee

## Members

- **Chair: Randall Behm, Omaha District**
- **Secretary: Kim Gavigan, Los Angeles District**
- **Stuart Davis, IWR**
- **Clark Frentzen, South Pacific Division**
- **Joe Remondini, Tulsa District**
- **Steve O’Leary, Huntington District**
- **Keven Lovetro, New Orleans District**

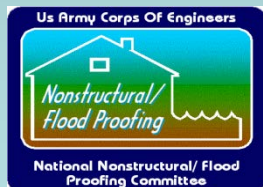
## Advisors

- **Robert Finch, Honolulu District**
- **Mary Weidel, Detroit District**
- **Brian Rast, Kansas City District**



# NFPC Activities

- **Nonstructural Technical Support and Review**
- **Nonstructural and Floodplain Management Training**
- **Publications of Nonstructural Mitigation Measures**
- **Collaboration with ASFPM and FM Approvals on National Flood Barrier Testing and Certification Program**
- **Collaboration with FEMA on Technical Bulletin Revisions**
- **NFPC Web Site**
- **Inventory of Nonstructural Flood Risk Management Activities**

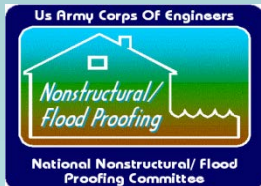


# What is Nonstructural Flood Risk Management

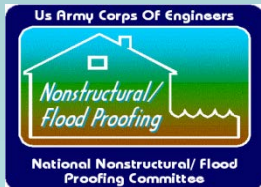
Proven methods and techniques for reducing flood risk and flood damages. Nonstructural measures can be very cost effective. A particular advantage of Nonstructural measures when compared to structural measures is the ability of Nonstructural measures to be sustainable over the long term with minimal costs for O&M, Repair, Rehabilitation, and Replacement. While structural measures may impact the characteristics of the floodplain by altering it, Nonstructural measures adapt to the natural floodplain.

## Typical Nonstructural Techniques

Elevation	Fill Basement with Main Floor Addition
Acquisition	Wet Flood Proofing
Floodwalls/Berms	Dry Flood Proofing
Relocation	Flood Warning System
Land Use Regulations	Flood Plain Management Plans
Flood Insurance	Floodplain Evacuation
Emergency Preparedness	

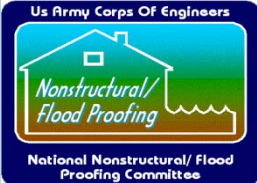


# Elevation



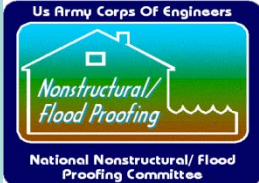
Attachment: Attachment 4 (Brian Rast - Army Corp of Engineers)

# Dry Flood Proofing and Floodwalls



Attachment: Attachment 4 (Brian Rast - Army Corp of Engineers)

# Barriers and Closures

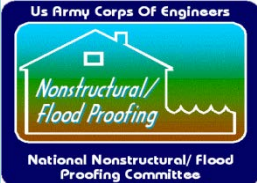


Attachment: Attachment 4 (Brian Rast - Army Corp of Engineers)

# Floodplain Evacuation via Relocation / Acquisition

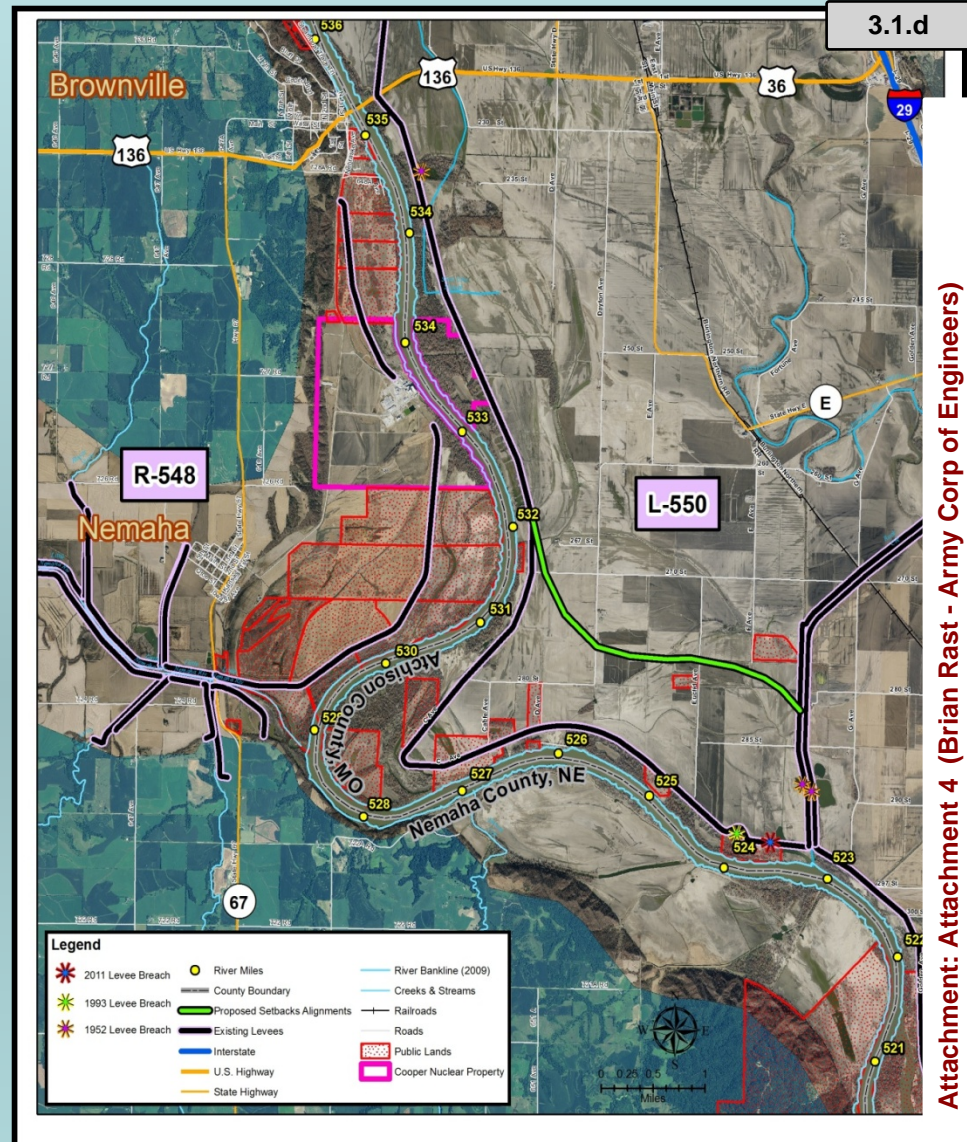
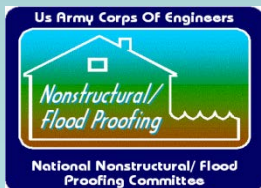


Attachment: Attachment 4 (Brian Rast - Army Corp of Engineers)



# Floodplain Evacuation ??

- Reduces Flood Stages
- Reduces Erosive Velocities
- Increases System Reliability
- Increases System Sustainability
- Restores Historic Floodplain
- Increases Habitat Benefits
- Economically Feasible when compared to Repairs In-Place

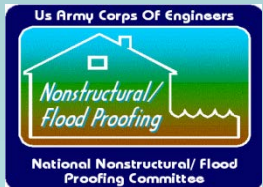


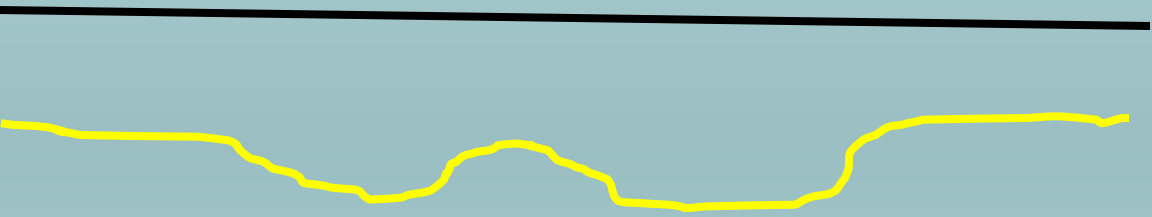
Attachment: Attachment 4 (Brian Rast - Army Corp of Engineers)





# Tools and Processes have Changed!



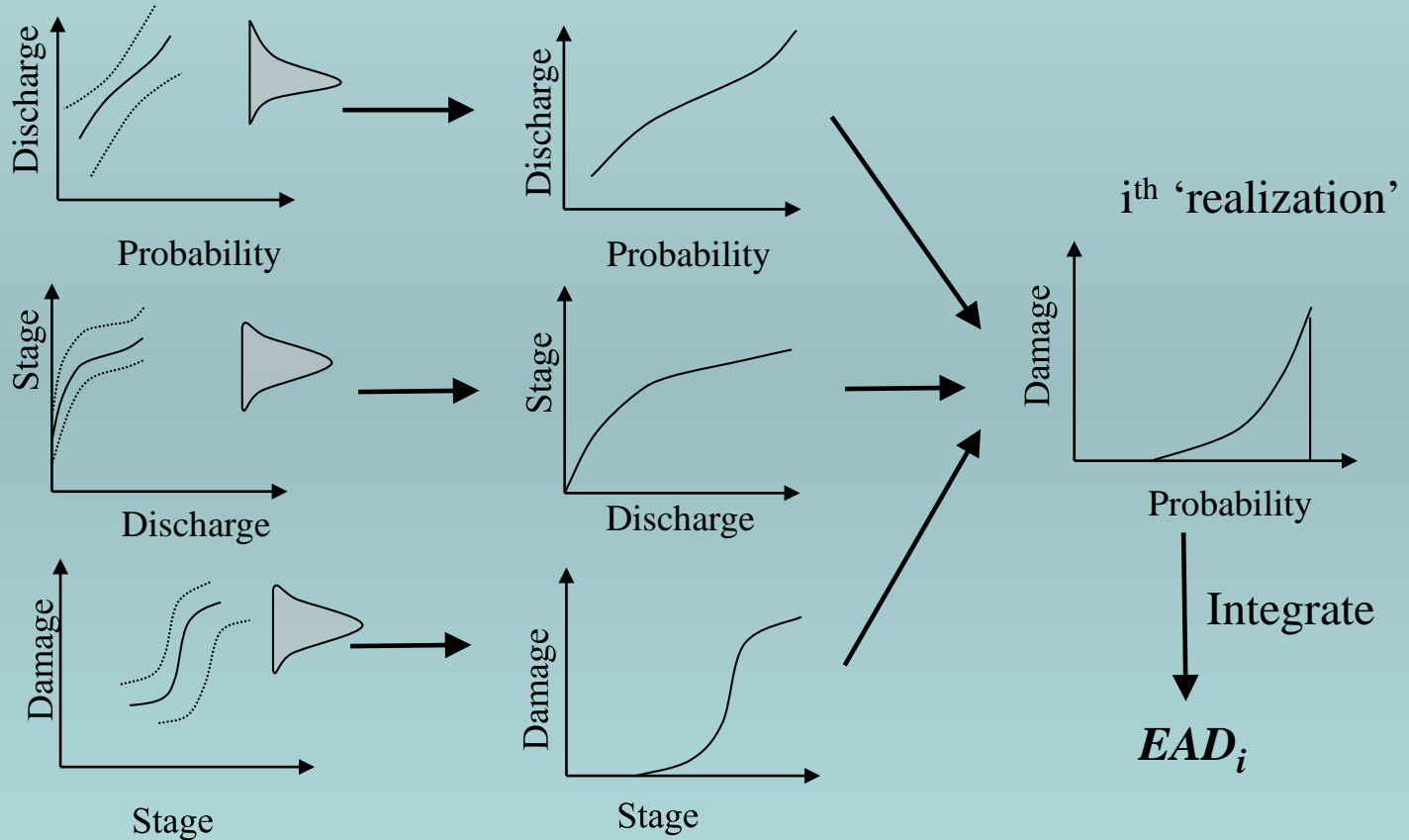


Levees are constructed based upon maximum net benefits for a single level of protection as shown in “black” levee top profile. Levees are not constructed with a roller coaster level of protection as shown in “yellow”

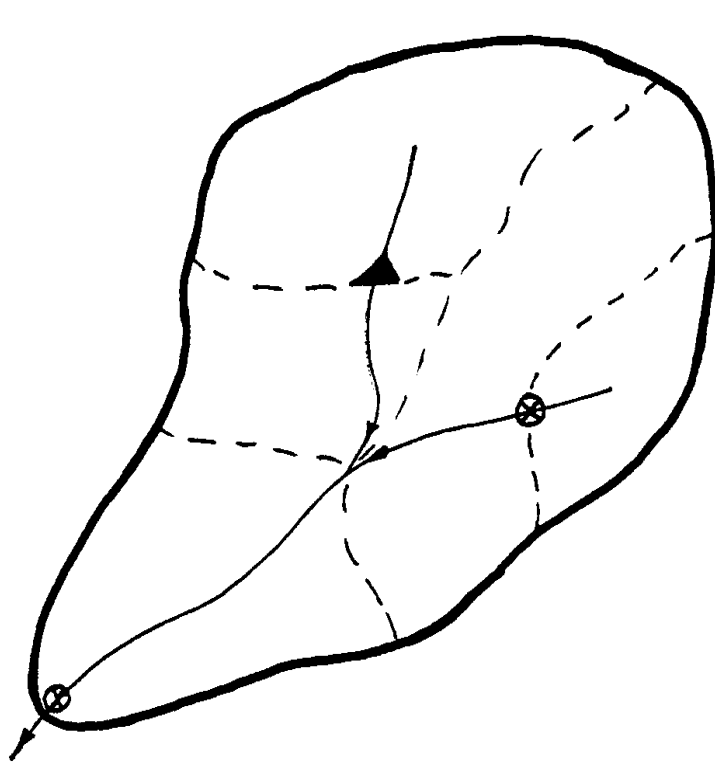


# Flow-Frequency; Stage-Discharge; Damage-Frequency Relationships

(used in both nonstructural and structural assessments)



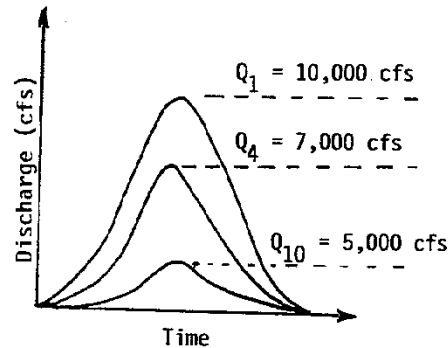
# Hydrologic Studies



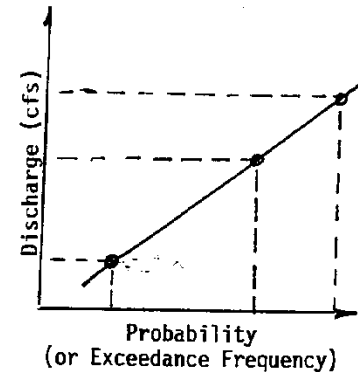
- ⊗ Streamgauge
- ▲ Reservoir
- - - Subbasin Boundaries

## Sub-basin Delineations

- Stream Topology
- Streamgauge Locations
- Project Locations



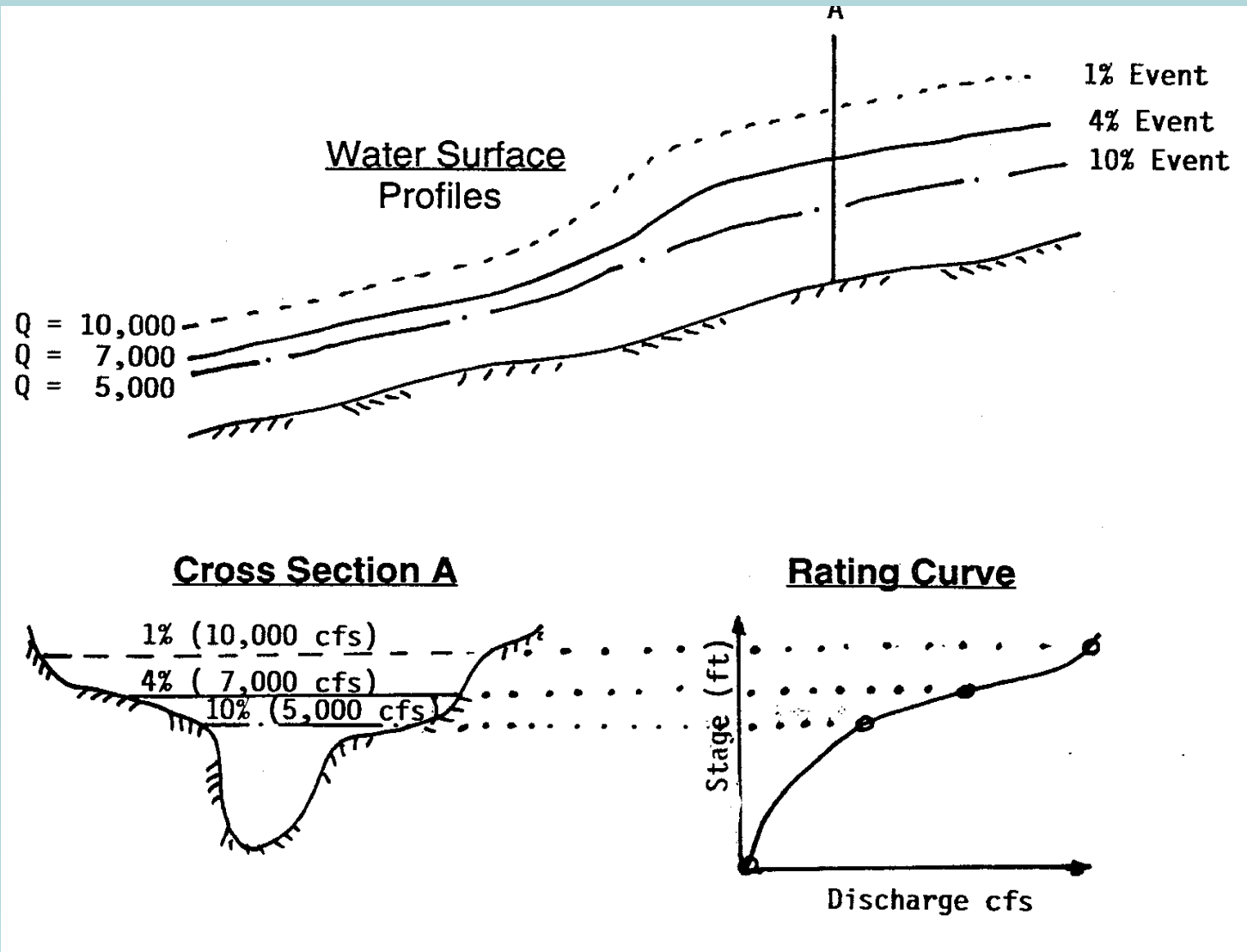
Discharge Hydrograph  
At Outlet



Frequency Curve

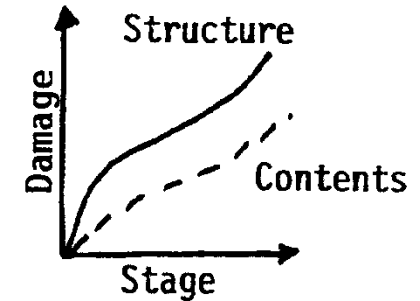
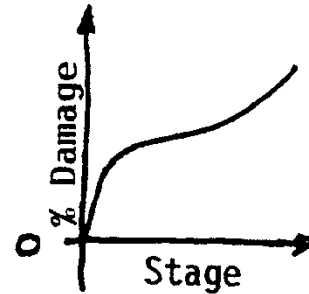
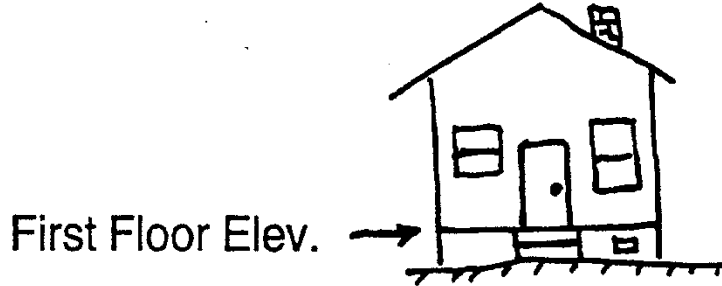


# Hydraulic Studies



# Nonstructural Building Inventory Data

3.1.d



- Structure ID
- Location/Address
- Structure Value
- Content Ratio
- Damage Category
- Depth-Damage Function
- First Floor Elevation
- Lowest Adjacent Ground Elevation
- Coordinates (location by xyz)
- Stream Station (river mile)

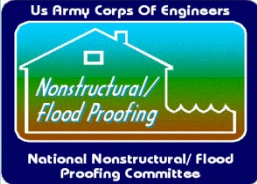
**Structure Types:** one story, two story, split entry, tri level  
slab, crawl space, basement

**Construction Material:** wood, brick, steel frame, masonry, concrete,  
stucco, pebble Dash



# Nonstructural Toolbox Materials

FLOOD DAMAGE REDUCTION MATRIX		FLOOD DAMAGE REDUCTION MEASURES														STRUCTURAL MITIGATION MEASURES			
		NON-STRUCTURAL MITIGATION MEASURES														STRUCTURAL MITIGATION MEASURES			
		Elevation on Foundation Walls	Elevation on Floors	Elevation on Posts or Columns	Elevation on Piles	Elevation on Fill	Elevation	Vertical Floodwalls and levees	Floodwalls and levees	Floodwalls and levees with closures	Dry Flood proofing	Wet Flood proofing	Flood Warning Systems	NFIP Flood Plain Registration	Flood Insurance	Flood Mitigation 1	Channel	Levee/Wall	Dams
Flood Characteristics	Flood Depth																		
	Shallow (<3 ft)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Moderate (3 to 6 ft)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Deep (greater than 6 ft)	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Flood Velocity																		
	Slow (less than 3 fps)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Moderate (3 to 5 fps)	N	N	Y	Y	Y	Y	Y	Y	Y	N	N	Y	Y	Y	Y	Y	Y	Y
	Fast (greater than 5 fps)	N	N	N	Y	N	Y	Y	Y	Y	N	N	Y	Y	Y	Y	Y	Y	Y
	Flash Flooding																		
	Yes (less than 1 hour)	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	Y	Y	Y	Y	Y	Y	Y
No	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Ice and Debris Flow	Yes	N	N	N	Y	Y	Y	Y	Y	Y	N	N	Y	Y	Y	Y	Y	Y	
	No	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Site Characteristics	Site Location																		
	Coastal Flood Plain																		
	Beach Front	N	N	N	Y	N	Y	Y	N	N	N	Y	Y	Y	N	?	N	N	
	Interior (Low Velocity)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	N	N	
	Riverine Flood Plain	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
	Soil Type																		
	Permeable	Y	Y	Y	Y	Y	Y	N	N	M	V	Y	Y	Y	Y	Y	Y	Y	
	Impermeable	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Structure Foundation																		
	Slab on Grade	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Crawl Space	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Basement	Y	N	N	N	N	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	
Building Characteristics	Structure Construction																		
	Concrete or Masonry	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Metal	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
	Wood	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
	Structure Condition																		
	Excellent to Good	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Fair to Poor	N	N	N	N	N	N	Y	Y	Y	N	N	Y	Y	?	Y	Y	Y	
	Economic																		
	Structure Protected	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	
	Cost to Implement	M	M	M	M	M	H	M	M	L	L	L	L	N/M	H	H	H	H	
Potential Flood Insurance Cost Reduction (Residential)	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	Y	-	Y	Y	Y	Y		
Potential Flood Insurance Cost Reduction (Commercial)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	-	Y	Y	Y	Y		
Potential Adverse Flooding Impact on Other Property	N	N	N	N	Y	N	N	Y	Y	N	N	N	Y	N	N	Y	Y		
Reduction in Admin Costs of NFIP	N	N	N	N	Y	Y	Y	N	N	N	N	N	-	?	?	?	?		
Reduction in Costs of Disaster Relief	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
Reduction in Emergency Costs	N	N	N	N	Y	Y	N	N	N	N	N	N	N	?	Y	Y	Y		
Reduction in Damage to Public Infrastructure	N	N	N	N	N	Y	Y	N	N	N	N	N	N	?	Y	Y	Y		
Potential for Catastrophic Damages if Design Elevation Exceeded	N	N	N	N	N	N	N	Y	Y	N	N	N	N	N	N	Y	Y		
Promotes Flood Plain Development	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	Y	Y		
If ID/NFIP/Restoration/Local Characteristics	Environmental																		
	Ecosystem Restoration Possible	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	
	Potential Adverse Environmental Impact	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	Y	Y	
	Recreation																		
	Recreation Potential	N	N	N	N	N	Y	Y	N	N	N	N	N	N	N	?	N	N	
Social	Community Remains Intact	Y	Y	Y	Y	Y	N	N	Y	Y	Y	Y	Y	Y	?	Y	Y	Y	
	Population Protected	N	N	N	N	N	Y	N	N	N	N	Y	N	?	Y	Y	Y	Y	
	Potential Structure Habitability Increase	Y	Y	Y	Y	Y	N	Y	Y	Y	N	Y	N	Y	Y	Y	Y	Y	



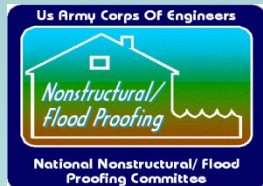
Attachment: Attachment 4 (Brian Rast - Army Corp of Engineers)



# National Objective

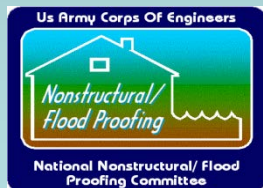
## Maximize Net National Economic Development (NED) Benefits

*The basis for damage reduction benefits is the comparison of the Without-Project Condition (expected future condition) against the With-Project Condition (project in place) over a period of analysis (50 years by regulation).*



# *Net Benefit Analysis for Flood Damage Reduction Benefits*

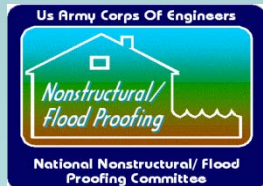
*Specific methodology applies to both  
structural and nonstructural alternatives*



# *National Economic Development Benefits*

## *(NED Benefits) Part 1*

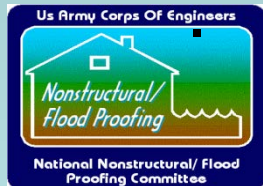
*NED benefits are a stream of economic benefits that accrue over the period of analysis. This stream is discounted to present value and then annualized.*



# *National Economic Development Benefits*

## *(NED Benefits) Part 2*

*For flood risk management studies, NED benefits are computed by subtracting annual flood damages estimated under with-project conditions from annual flood damages estimated under without-project conditions.*



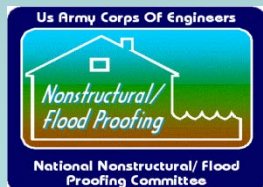
# ***National Economic Development Benefits***

## ***(NED Benefits)***

### ***Part 3***

*Future without-project conditions are defined as the most likely future for the study area absent of Federal action. An evaluation of existing conditions is a necessary step planners take before determining the most likely future.*

*Also called the no-action alternative*



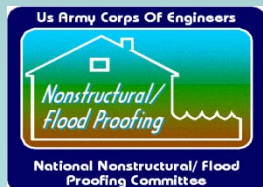
# ***National Economic Development Benefits***

## ***(NED Benefits) Part 4***

*Properly conducted planning studies consider a number of with-project conditions, each corresponding to an alternative plan.*

### ***Key Message:***

*Alternative plans are structural, non-structural, or a combination of both.*

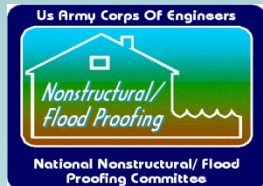


# Statute

## WRDA 2007 Sec 2033

“ A feasibility study for a project for flood damage reduction shall include, as part of the calculation of benefits and costs...

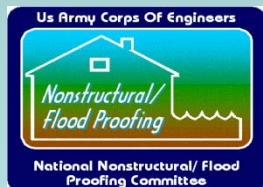
(4) calculations to ensure that the benefits *and costs* associated with structural and non-structural alternatives are *evaluated in an equitable manner.*”



# Guidance

## Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies (P&G)

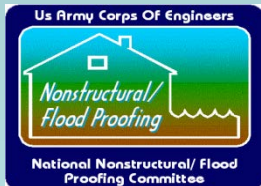
Requires that “nonstructural measures be considered as a means for addressing problems and opportunities” in water and related land resources implementation studies...  
“*alone or in combination* with structural measures.”



# Guidance

## *Proposed Principles & Standards for Water and Related Resources Implementation Studies 3 December 2009*

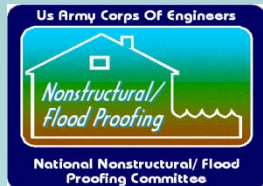
*“At least one alternative with nonstructural measures shall be formulated and identified as the **‘primarily nonstructural alternative.’** Various combinations of structural and nonstructural elements shall be formulated when reasonable to ensure the best alternative is identified.”*



# Guidance

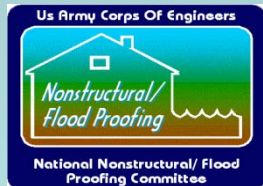
## *Proposed Principles & Standards for Water and Related Resources Implementation Studies 3 December 2009*

*“As a minimum, the final array shall include the No Action alternative, **the primarily nonstructural alternative**, and the environmentally preferable alternative.”*



# *Data Requirements for Computing Economic Benefits*

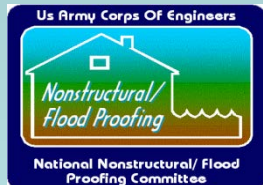
- Structure Inventory & Depreciated Replacement Costs
- Depth-Damage Relationships for Structures & Contents
- Content-to-Structure Value Ratios
- Ground and First Floor Elevations
- H&H Water Surface Profiles or 8 Flood Frequencies
- Measurement Errors for All of the Above



# Structure Inventory

## 5 data elements for each structure

- **Type** – corresponds to depth-percent damage curve
- **Value** -- replacement value less depreciation
- **Location** -- with reference to river/stream stationing X and Y coordinates
- **Ground Elevation** -- Z coordinate
- **First Floor Elevation** -- critical to damage estimation

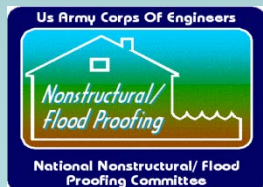


# Nonstructural Analysis Using HEC Flood Damage Analysis Model V.1.2.5a

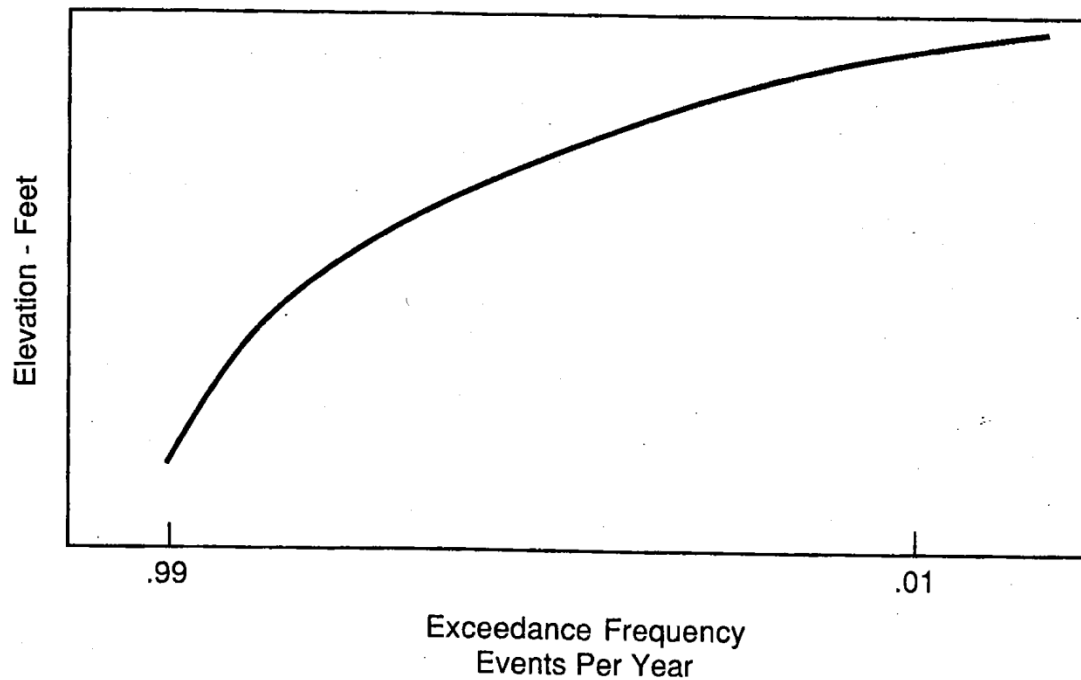
Structure output data requires  
extensive tracing to analyze structure-  
specific data

Intensive management of structure  
records to evaluate structure-raising at  
various heights vs. a fixed height  
above ground

Only benefits are analyzed within a  
risk-informed framework

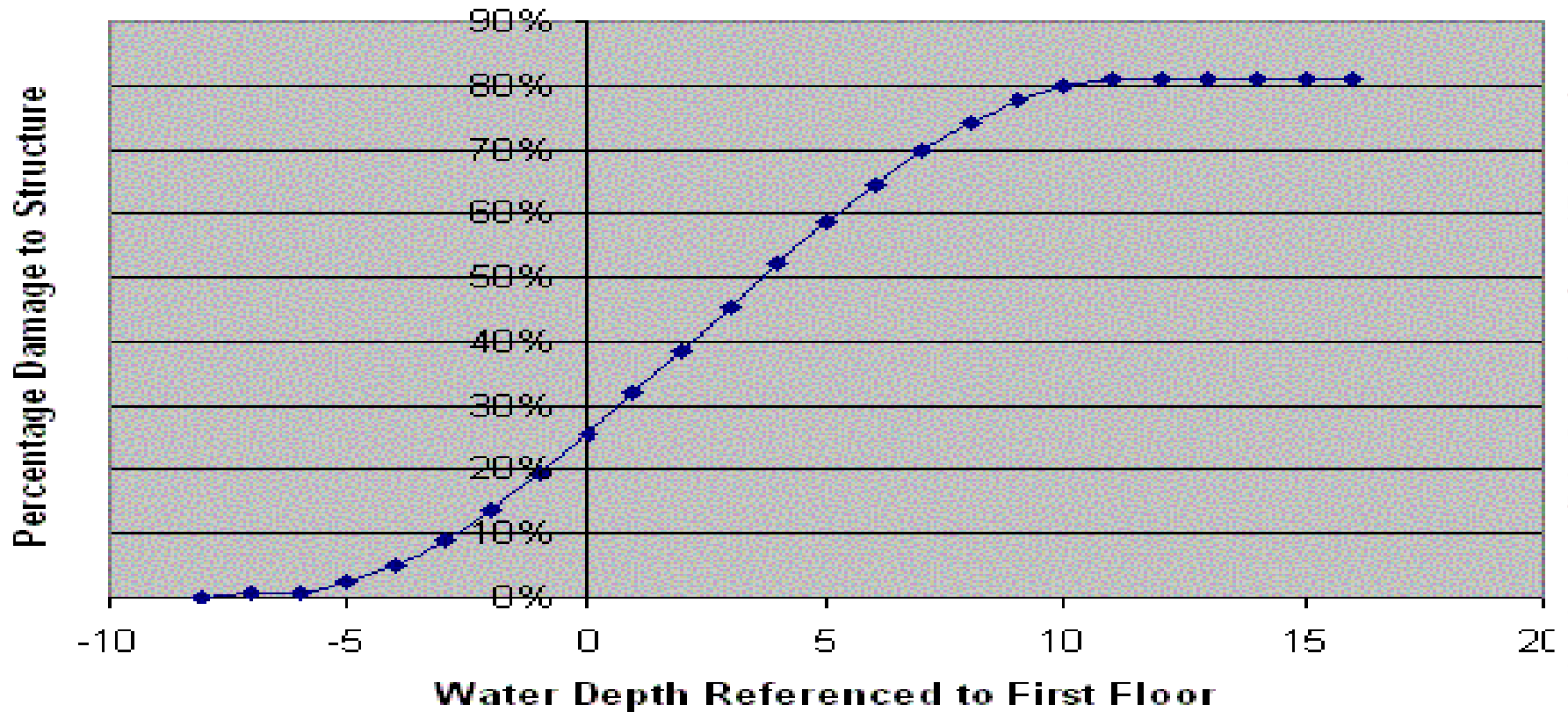


# Stage Frequency Relationship

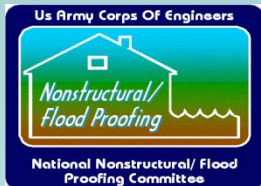


# One Story Residence with Basement Damage-Function

3.1.d

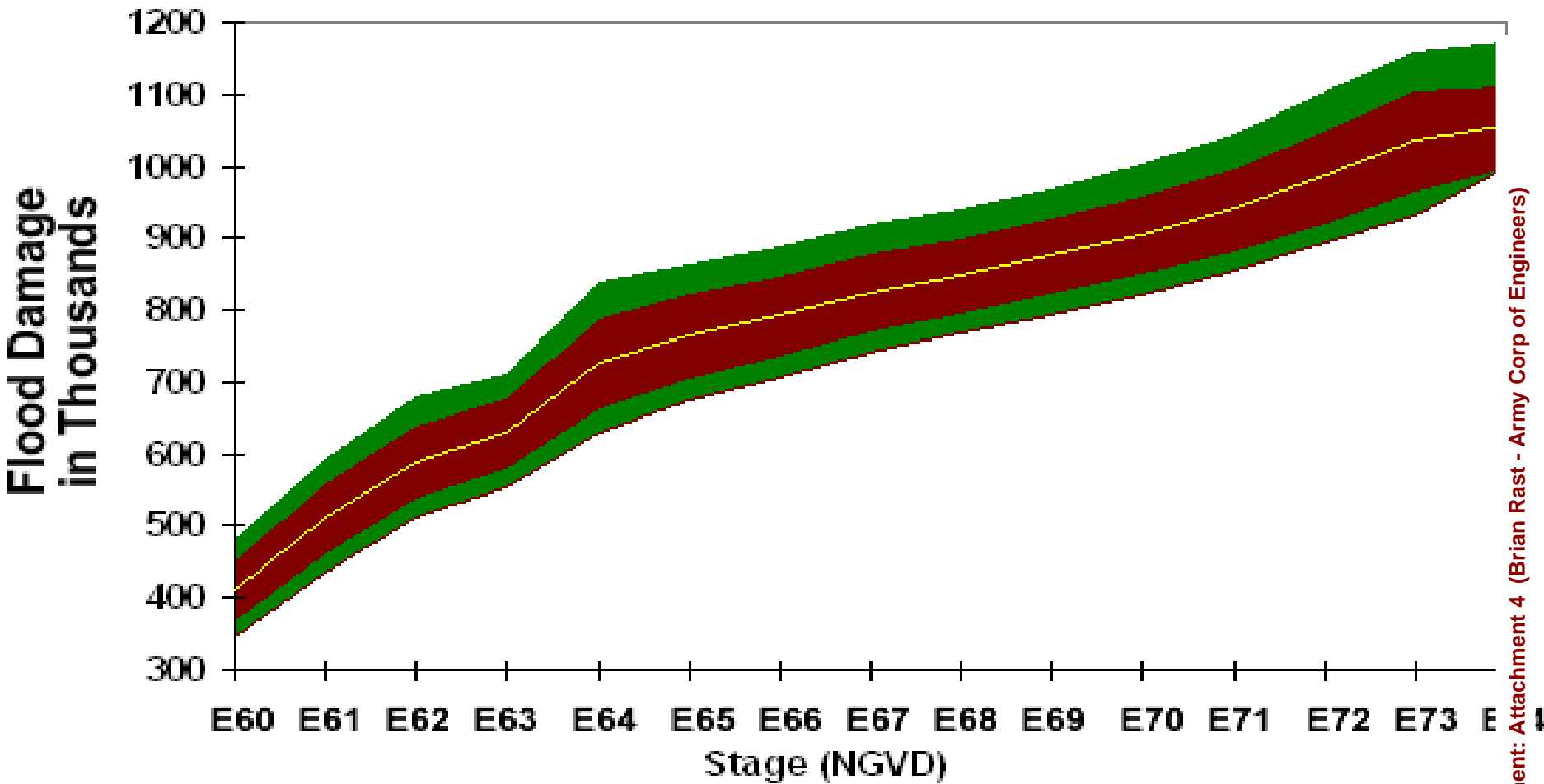


Attachment: Attachment 4 (Brian Rast - Army Corp of Engineers)

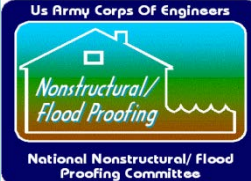


# Uncertainty in Stage-Damage Curve

3.1.d

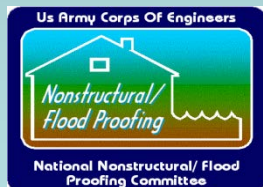


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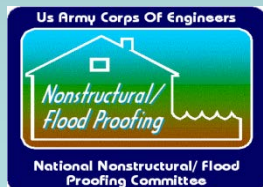
# Benefit Analysis for Structural Plans

- Stage-frequency relationships under without-project conditions are used to estimate expected annual damages.
- For structural plans, the stage-frequency relationships are changed.
- If the structural plan is effective in reducing stages for the full range of frequency events, flood risk is reduced and expected annual damages are reduced.
- The reduction in expected annual damages is the measure of economic benefits.



# Benefit Analysis for Nonstructural Plans

- Stage-frequency relationships under without-project conditions are used to estimate expected annual damages.
- For non-structural plans, an alternative with-project condition, the stage-frequency relationships are not changed.
- If the nonstructural plan is effective in reducing the susceptibility of the structure to damage for the full range of frequency events, then flood risk is reduced and expected annual damages are reduced.
- The reduction in expected annual damages is the measure of economic benefits.

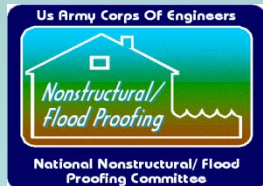


# Objectives for Nonstructural Analysis

Alternatives are screened according to the criteria of completeness, effectiveness, efficiency, and acceptability

Evaluate economic feasibility on a structure-by-structure basis – each structure represents a project increment

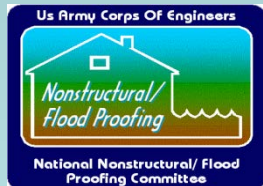
Evaluate economic feasibility as a collection of structures within a reach, location, or community



# Residential Structure Elevation

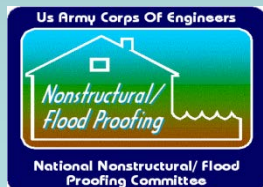
Evaluate damages and damages reduced on a structure-by-structure basis

Structures raised to a target elevation vs. fixed height above ground



# Net Benefit Analysis

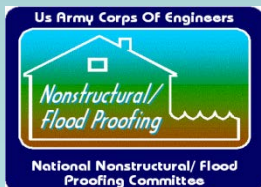
- Net benefits are the difference between annualized plan benefits and annualized plan costs.
- Net benefits can be positive or negative.
- If net benefits are positive, then the plan is economically justified. The benefit-to-cost ratio is equal to 1.0 to 1.0 or greater.
- If net benefits are negative, then the plan is not economically justified. The benefit-to-cost ratio is less than 1.0 to 1.0.



# Nonstructural Economic Results

ID	STREET	CITY	Nonstructural Technique	100yr Cost	Annualized Cost	Benefits (x1000)	BCR	Net Benefit
400802	110 FREEDLAND DR	Harwood	Flood Wall	348,000	19,245	10.761	0.56	-8,484
400667	438 LIND BLVD	Harwood	Elevate Structure	123,330	6,820	10.181	1.49	3,360
400707	106 RIVERSHORE DR	Harwood	Elevate Structure	112,176	6,203	2.100	0.34	-4,103
400754	324 RIVERTREE BLVD	Harwood	Elevate Structure	118,513	6,554	10.363	1.58	3,809
400007	17373 25 ST SE	Harwood Twp	Buy Out	129,564	7,165	12.832	1.79	5,667
400008	2551 173 AVE SE	Harwood Twp	Buy Out	113,870	6,297	10.018	1.59	3,721
400009	2623 173 AVE SE	Harwood Twp	Buy Out	147,854	8,177	10.397	1.27	2,220
400025	2769 173 AVE SE	Harwood Twp	Buy Out	123,074	6,806	4.205	0.62	-2,601
400009	2623 173 AVE SE	Harwood Twp	Buy Out	147,854	8,177	10.397	1.27	2,220
400001	17369 25 ST SE	Harwood Twp	Elevate Main Floor	112,176	6,203	14.768	2.38	8,565
400002	17135 25 ST SE	Harwood Twp	Elevate Main Floor	113,114	6,255	13.632	2.18	7,377
400004	17201 27 ST SE	Harwood Twp	Elevate Main Floor	112,661	6,230	21.166	3.40	14,936
400005	2569 172 AVE SE	Harwood Twp	Elevate Main Floor	113,566	6,280	12.193	1.94	5,913
400006	17283 26 ST SE	Harwood Twp	Elevate Main Floor	111,885	6,187	12.316	1.99	6,129
400010	2675 173 AVE SE	Harwood Twp	Elevate Main Floor	109,137	6,035	19.609	3.25	13,574
400011	2651 173 AVE SE	Harwood Twp	Elevate Main Floor	110,236	6,096	20.908	3.43	14,812
400012	17321 27 ST SE	Harwood Twp	Elevate Main Floor	108,070	5,976	16.894	2.83	10,918

Attachment: Attachment 4 (Brian Rast - Army Corp of Engineers)



**Remember to use all of the benefits for the entire damage area, not just the buildings with a positive BCR**

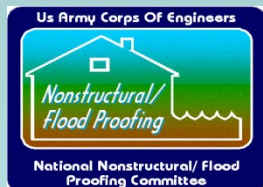


# NFPC Web Site

<http://www.usace.army.mil/Missions/CivilWorks/ProjectPlanning/nfpc.aspx>

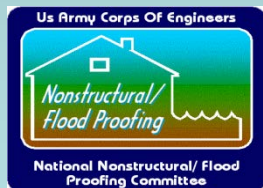
Email: NFPC committee: [dll-cenwo-nfpc@usace.army.mil](mailto:dll-cenwo-nfpc@usace.army.mil)

Nonstructural Publications Provided on Web Site



# Training Opportunities

- **PROSPECT # 345: Nonstructural Measures for Flood Risk Management**
- **FRM-Center of Expertise: Nonstructural Workshops (2.5 – 4 day)**
- **Planners Associates (O’Leary)**
- **Conference Workshops: ASFPM, State FPM, and FRM-SJ**



# A PRESENTATION FOR COMMUNITIES AND TRIBES

## TECHNICAL ASSISTANCE FOR COMMUNITIES USACE: FLOOD RISK MANAGEMENT PROGRAMS

**Brian Rast, PE, CFM, PMP**

Lead Silver Jackets Coordinator  
Advisor, Nonstructural Committee  
Kansas City District

**January 3, 2018**



**US Army Corps  
of Engineers**



# US ARMY CORPS OF ENGINEERS (USACE)

## WHO WE ARE

**37,000** dedicated Civilians and Soldiers delivering engineering services to customers in the United States and worldwide.

**43 Districts**, 9 Centers and Labs, and 3 Army units/commands

This Corps team is working to strengthen our Nation's security by **building and maintaining America's infrastructure** and providing military facilities. We are also researching and developing technology and **using our engineering expertise** to promote stability and improve quality of life.

Examples:

- Energizing the economy by dredging America's waterways to support the movement of critical commodities
- Operating multipurpose reservoirs reducing flood hazards, providing for water quality and endangered species, and even recreation at 404 lakes.
- Building hurricane and storm damage reduction infrastructure, including beach nourishments, groins, and dikes that reduce risks from disasters.
- Restoring the Nation's environment, like in the Everglades, along the Louisiana coast, and on many of our Nation's major waterways.
- Doing clean-up on sites contaminated with hazardous, toxic or radioactive waste.



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# US ARMY CORPS OF ENGINEERS (USACE) AUTHORITIES AND PROGRAMS

- Silver Jackets: State lead hazard mitigation (flood, drought)
- Flood Plain Management Services Program (FPMS)
- Planning Assistance to States Program (PAS / Section 22)
- General Investigations (large-scale flood risk management)
- Continuing Authorities Program (CAP)
  - Section 205; Flood Risk Management (codified as “Small Flood Control Projects”)
  - Section 14; Emergency Streambank and Shoreline Protection
  - Section 206; Aquatic Ecosystem Restoration



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# CONTACTS, LEAD SILVER JACKETS COORDINATORS

Interested parties can contact our lead Silver Jackets Coordinators (below) or the appropriate State or Tribal Planning Assistance to States coordinator at USACE to request assistance. USACE will coordinate all requests for assistance to ensure that studies are initiated on State or Tribal prioritized needs

## **In Iowa, USACE Rock Island District**

Jason Smith, (309) 794-5690

1500 Rock Island Drive, Second Floor, Clock Tower

Rock Island, Illinois 61201

## **In Kansas and Missouri, USACE Kansas City District**

Brian Rast, (816) 389-3337

601 E. 12th Street, Suite 529, Richard Bolling Federal Building

Kansas City, Missouri 64106

## **In Nebraska, USACE Omaha District**

Tony Krause, (402) 995-2326

1616 Capitol Ave

Omaha, Nebraska 68102



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# FORM LETTER FOR REQUESTING ASSISTANCE

[date]

Silver Jackets Coordinator  
USACE [name] District  
[address]

Dear Sir:

This is in reference to your Corps of Engineers **Flood Plain Management Services Program**. We understand that Section 206 of the Flood Control Act of 1960 (Public Law 86-645), as amended, authorizes the Corps to help others mitigate flood losses. The [name of state, eligible Native American Indian tribe, local government, or other non-Federal entity] requests assistance for [body of water or waterway], located in [City, Township or Borough], in [County and State].

[Add brief paragraph describing problem or need].

Property descriptions, [any site plans, maps and/or photographs you have] are enclosed. Upon your review of this initial request, we would like to discuss the availability of information, required schedule, and level of effort required [to negotiate the appropriate charge if applicable]. Please contact [name, title, phone number] to arrange a further discussion of this request.

[signature of cooperating agency or individual]



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# FORM LETTER FOR REQUESTING ASSISTANCE

[date]

Silver Jackets Coordinator  
USACE [name] District  
[address]

Dear Sir:

This is in reference to the Corps of Engineers **Planning Assistance to States Program**. We understand that the provisions of Section 22 of the Water Resources Development Act of 1974 (Public Law 93-251), as amended, provides authority for the Corps to assist in the preparation of comprehensive plans for the development, utilization, and conservation of water and related land resources. The [name of state, eligible Native American Indian tribe, local government, or other non-Federal entity] requests planning assistance for [body of water or waterway], located in [City, Township or Borough], in [County and State].

[Add brief paragraph describing problem or need].

Property descriptions, [any site plans, maps and/or photographs you have] are enclosed.

We would like to discuss the availability of information, required schedule, and level of effort required in order to negotiate appropriate Cost Sharing Agreement to initiate a Section 22 study. Please contact [name, title, phone number] to arrange a further discussion of this inquiry.

[signature of cooperating agency or individual]



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# FLOOD PLAIN MANAGEMENT SERVICES PROGRAM

Authority and Scope: Section 206 of the Flood Control Act of 1960, as amended, provides authority for the Corps of Engineers to provide a full range of flood risk information, technical services and planning guidance to support and promote effective flood risk and floodplain management.

Average Budgets: May range from \$20,000 - \$150,000. Subject to availability of funds from Congressional appropriations.

The Flood Plain Management Services (FPMS) program is to **advise**, **recommend**, **educate**, **inform** and **provide technical support** to others, both external and internal, so that informed decisions with respect to floodplain management can be made.

Under FPMS, the Corps of Engineers can provide:

- Technical services
- Planning assistance and guides and pamphlets for floodplain management

*The FPMS program services are provided free to tribal governments.*



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# INTERAGENCY NONSTRUCTURAL FLOOD RISK MANAGEMENT PROPOSALS

In April of each year, the Corps of Engineers has put out special calls for proposals, related to **Flood Plain Management Services (FPMS)** funding.

The FY 2017 budget was increased in order to achieve the Administration's objective to utilize the **agency's expertise** in engineering to provide local communities, tribes, and states with technical and planning assistance regarding the development and implementation of nonstructural approaches to manage and reduce flood risks.

**Interagency** work promotes participation by Corps staff in small efforts undertaken in conjunction with other partners in order to achieve flood risk management benefits that could not be achieved by any one party alone. These Calls for Proposals invites proposals for that purpose, with a focus on nonstructural approaches. Nonstructural measures seek to reduce human exposure or vulnerability to a flood hazard without altering the nature or extent of that hazard (e.g., reduce consequences). Natural and nature-based approaches are encouraged.

How to get selected? Proposals must **leverage resources** invested by others. Show your work and partner agency work, past, present and future, as the leveraging.



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# FLOOD PLAIN MANAGEMENT SERVICES PROGRAM PRINCIPLES

3.1.e

- Provide technical assistance that is focused on reducing flood risk
- Development of guides and pamphlets for communication and education of flood risk
- Proper use of floodplains (coastal and riverine)
- Support of the National Flood Insurance Program (NFIP)

*“Many communities are not aware of their risk of flooding”*



Attachment: USACE Information (Brian Rast - Army Corp of Engineers)



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# PLANNING ASSISTANCE TO STATES (PAS) PROGRAM

Authority and Scope: Section 22 of the Water Resources Development Act of 1974, as amended, provides authority for the Corps of Engineers to assist states, local governments, federally-recognized Native American Tribes and other non-federal entities in the preparation of comprehensive plans for the development, utilization and conservation of water and related land resources.

Average Budgets: May range from \$50,000 - \$300,000. Subject to availability of funds from Congressional appropriations.

Under the Section 22 or PAS Program, the Corps of Engineers can provide technical planning assistance in all areas related to water resources development.

## Studies:

- Are planning level of detail
- Do **not** include detailed design for project construction.

The studies generally involve:

- Analysis of existing data for **planning** purposes using standard engineering techniques.
- All efforts are required to be conducted by USACE personnel.



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# PLANNING ASSISTANCE TO STATES PROGRAM PRINCIPLES

## Program Coverage

### Water and related resource planning

- Study authority – not implementation authority
- Annual reporting requirements for program execution

### Study Sponsors

- Non-Federal: must be recognized body of the State/Tribe
- Non-profits not allowed to cost-share PAS Studies

Yearly limit of \$2 Million per State (when funds are available)

*This program can provide study-level technical assistance on a variety of natural hazards including*

- *Flooding*
- *Drought*
- *Water Supply*
- *Climate resilience*



*The Corps comprehensive plans for the development, use, and conservation of water and land-related resources.*



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# GENERAL INVESTIGATIONS

Authority and Scope: Specifically named Congressional line items that fit with USACE mission areas, including flood risk management, coastal storm damage reduction, and ecosystem restoration.

Average Budgets: Typically over \$500,000 and may lead to multi-million dollar construction projects.

A General Investigation (GI) study often begins with a request for assistance from a community or a local or state government entity with a water resource need (e.g., navigation, flood protection or ecosystem restoration) beyond its capability.

Before initiating a study, the Corps generally requires two types of congressional authority - authorization and appropriations.

There are two project phases before construction begins using GI funding:

- Feasibility
- Preconstruction engineering and design (PED).

PED phase that the Project Partnership Agreement (PPA) is developed.

A PPA cannot occur until after Congress has authorized the project for construction.



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# CONTINUING AUTHORITIES PROGRAM (CAP)

**Flood Risk Management**: Authority: Section 205, Flood Control Act of 1948, as amended

- Allows for construction of projects (structural or nonstructural) to reduce damages caused by flooding and focuses on solving local flood problems in urban areas, towns and villages
- Cost share for Design and Implementation is 65% federal, 35% non-federal
- Maximum federal share for planning, design and construction - \$10,000,000

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**Aquatic Ecosystem Restoration**: Authority: Section 206

- Allows for structural or operational changes to restore historic habitat conditions of aquatic ecosystems at any location to benefit fish and wildlife resources
  - Maximum federal share for planning, design and construction - \$10,000,000
- 



# CONTINUING AUTHORITIES PROGRAM (CAP)

## Emergency Streambank and Shoreline Protection: Authority: Section 14

- Allows for construction of emergency streambank and shoreline protection to prevent erosion from damaging nonprofit public facilities
- Maximum federal share for planning, design and construction - \$5,000,000



*The Section 14 program addressed a streambank erosion problem in Kansas on the Golden Eagle Project to protect a water intake structure.*



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# COST SHARE REQUIREMENTS FLOOD RISK MANAGEMENT

## For Studies Only

- Flood Plain Management Services (FPMS)
  - Cost Share: 100% Federal
- Planning Assistance to States (PAS)
  - Cost Share: 50% Federal 50% Sponsor
- General Investigations Program (> \$20M)
  - Cost Share Study: 50% / 50%
  - Cost Share Construction: 65% Federal 35% Sponsor
  - **Additional Congressional authorization** required in Water Resources Development Act for any construction alternatives with “federal interest”

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## From Studies to Design to Construction

- Continuing Authorities Program (CAP), \$20M limit
  - Cost Share Study: 50% / 50%
  - Cost Share Construction: 65% Federal 35% Sponsor



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# QUESTIONS



US Army Corps of Engineers.



# FOR MORE INFORMATION

## Corps of Engineers, Flood Risk Management (FRM)

- <http://www.iwr.usace.army.mil/Missions/Flood-Risk-Management/Flood-Risk-Management-Program/>

## Corps of Engineers, Silver Jackets: **Interagency Program Guide**

- [http://silverjackets.nfrmp.us/Portals/0/doc/Pennsylvania/PA\\_SJ\\_Program\\_Guide\\_Revised\\_2015.pdf?ver=2015-10-23-223334-177](http://silverjackets.nfrmp.us/Portals/0/doc/Pennsylvania/PA_SJ_Program_Guide_Revised_2015.pdf?ver=2015-10-23-223334-177)

## Corps of Engineers, National Nonstructural / Flood Proofing Committee

- [www.usace.army.mil/missions/civilworks/projectplanning/nfpc.aspx](http://www.usace.army.mil/missions/civilworks/projectplanning/nfpc.aspx)

## **Corps of Engineers, FPMS Factsheet**

- [www.usace.army.mil/missions/civilworks/projectplanning/nfpc.aspx](http://www.usace.army.mil/missions/civilworks/projectplanning/nfpc.aspx)

## **Corps of Engineers, PAS Factsheet**

- [http://www.iwr.usace.army.mil/Portals/70/docs/frmp/PAS\\_Factsheet\\_13\\_SEP12.pdf](http://www.iwr.usace.army.mil/Portals/70/docs/frmp/PAS_Factsheet_13_SEP12.pdf)

## **Corps of Engineers, FRM FAQ and CAP details**

- <http://www.iwr.usace.army.mil/Missions/Flood-Risk-Management/Flood-Risk-Management-Program/Frequently-Asked-Questions/FAQ-USACE-FRM-Authorities/>



# THANKS FOR YOUR TIME!



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Packet Pg. 95



**Floodplain Administration**  
ENGINEERING DEPARTMENT

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To: Elected Officials and Staff  
 From: Ted Martin, P.E. CFM, City Engineer/Floodplain Administrator  
 Date: January 2, 2018  
 RE: Federal and State Stormwater Contacts

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There are no federal, state, or local permits regulating the cleanup of trash and debris along streams. When planning to do any other work in and along a stream channel, including but not limited to, removal of live trees, filling, and/or grading, then the residents should first call:

**Regulatory Branch, U.S. Army Corp of Engineers; 816.389.3990**

Other resources with the State of Missouri:

1. Terry Williams – Missouri Department of Natural Resources (MDNR) Environmental Supervisor, Unit Chief, Kansas City District; 816.251.0747. *Local specialist can provide guidance on regulatory issues;*
2. Stacia Bax – MDNR Stormwater Permits, 401 Water Quality Certification Permits. 573.526.4586. *State permit authority under the Clean Water Act;*
3. Andy Carmack – Missouri Department of Conservation (MDOC) - Jackson & Cass County, Department of Conservation Private Land Manager; 816.622.0900; ext. 1240. *Free advisors to landowners on streambank stabilization questions;*
4. Bob Mattucks – MDOC Fisheries Management Biologists, 816.622.0900; ext. 1241. *Local contact for wildlife concerns around a creek.*

Attachment: Memo From City Engineer 1-3-18 (Brian Rast - Army Corp of Engineers)

# Activities Requiring Permits

Contractors	Builders	Planners
Excavators	Engineers	Homeowners
Consultants	Landowners	Farmers

The Corps of Engineers is charged with the responsibility for protecting the public interest in waters of the United States. This is accomplished through a Department of the Army permit program. Under this program, most activities involving work in waters of the United States, including wetlands, require authorization from the Corps of Engineers. Individuals, companies, corporations, Federal and State agencies, and local governments planning construction activities in a stream, river, lake or wetland should contact the Kansas City District, U.S. Army Corps of Engineers, **BEFORE ANY WORK IS BEGUN.**

## Why?

Because your proposed work may be subject to one or both of the following Federal Acts:

**Section 10 of the Rivers and Harbors Act of 1899** regulates any work or structure in, over, or under navigable waters of the United States. This includes such items as boat docks, boat ramps, powerlines, excavation, filling, etc.

**Section 404 of the Clean Water Act** regulates the discharge of dredged or fill material in all waters of the United States, including rivers, streams, lakes and wetlands. This includes work such as site development fills, causeways or road fills, dams and dikes, artificial islands, bank stabilization (riprap, seawalls and breakwaters) levees, landfills, fish attractors, mechanized clearing of wetlands, and certain types of excavation activities, etc.

## Be Sure Before you Start Construction

Department of the Army permits must be obtained prior to starting any work within the Corps' jurisdiction. Persons planning any construction activities in or near any water body should write or call:

Corps of Engineers, Kansas City District  
Regulatory Branch  
601 East 12<sup>th</sup> Street, Room 402  
Kansas City, MO 64106  
Telephone: 816-389-3990  
FAX: 816-389-2032

<http://www.nwk.usace.army.mil/Missions/RegulatoryBranch.aspx>

A map of the Kansas City District, Regulatory Program Service Areas can be found at:  
[http://www.nwk.usace.army.mil/Portals/29/docs/regulatory/2016-01-21\\_NWK\\_Boundary\\_Map.pdf](http://www.nwk.usace.army.mil/Portals/29/docs/regulatory/2016-01-21_NWK_Boundary_Map.pdf)



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of Engineers  
Kansas City District