



# Hazard Mitigation

Roxanne Gray  
Mitigation Section Supervisor

Benefit-Cost Analysis for Mitigation Projects  
November 11, 2014





# Unified Hazard Mitigation Assistance Program



**Hazard Mitigation Grant Program**




**Pre-Disaster Mitigation Program**

**Flood Mitigation Assistance Program**





# Eligible Sub-Applicants

Entity	Program Name		
	 HAZARD MITIGATION GRANT PROGRAM	 PRE-DISASTER MITIGATION	 FLOOD MITIGATION ASSISTANCE
State Agencies	✓	✓	✓
Tribal Governments	✓	✓	✓
Local Governments	✓	✓	✓
Private Non-Profit Organizations (PNPs)	✓		



# Cost Sharing

Programs	Mitigation Activity Grant (Percent of Federal/Non-Federal Share)	Management Costs (Percent of Federal/Non-Federal Share)	
		Grantee	Sub-Grantee
HMGP	75/25	100/0	-/- *
PDM	75/25	75/25	75/25
PDM – Sub-grantee is a small impoverished community	90/10	75/25	90/10
PDM – Tribal grantee is small impoverished community	90/10	90/10	90/10
FMA	75/25	75/25	75/25
FMA – repetitive loss property	90/10	90/10	90/10
FMA – severe repetitive loss property	100/0	100/0	100/0





# Examples of Mitigation







# Acquisition/Demolition



**Communities acquire land, demolish structures and keep the land in open space designation**

**Images from Darlington, WI**





# Elevation



**Elevation raises a structure out of the floodplain. Wisconsin has specific regulations to follow with elevation projects. See DNR for more information.**

**Image from Soldiers Grove, WI**



# Floodwall



**Floodwalls can prevent water from inundating structures that cannot be elevated, relocated, or demolished.**

**Image from Darlington, WI**





# Community Safe Room



**Community Safe Rooms built to FEMA-361 standards can withstand winds up to 250 MPH**

**Image from Town of Dunn, WI**



# Stormwater Detention



**Detention ponds can store storm water runoff, decreasing flash flooding in urban areas.**

**Image from MMSD Stormwater Detention Project (Wauwatosa, WI)**





# Stormwater



**Stream restoration allows watersheds to better manage flooding**

**Image from Theinsville, WI**





# River Warning Systems



**River warning systems installed on conservation dams to warn county officials about expected dam breaching.**

**Images from Vernon County**





# Wisconsin Mitigation Priorities

- Acquisition/Demolition
  - Substantially Damaged Properties
  - Severe Repetitive Loss and Repetitive Loss Properties
- Elevation in flood fringe
- Floodproofing or retrofitting
- Safe Rooms
- Structural projects that protect improved property
- Development or update of all hazard mitigation plans





# Repetitive Loss

## Severe Repetitive Loss

- At least 4 NFIP claim payments over \$5,000 each, and cumulative exceeds \$20,000; or
- 2 payments exceeds the market value of the structure
- **FMA – 100% funding**
- Highest priority

## Repetitive Loss

- Incurred flood-related damage on 2 occasions that equaled or exceeded 25% of the market value at the time of each event; and
- At the time of second event of flood-related damage, the flood insurance policy includes ICC coverage.
- **FMA – 90/10% funding**





# Requirements

- Participating in the NFIP and in good standing
- *Cost-Beneficial*
- Environmentally Sound
- Considered other alternatives
- Best alternative
- Solve the problem
- Plan requirement





# FEMA Benefit-Cost Analysis (V5.0)

- Project benefits must be greater than the project costs of at least 1 to 1 ratio
- Modules:
  - Flood (riverine, coastal zone A and V)
  - Damage Frequency Assessment
  - Tornado Safe Room
  - Wildfire
  - Earthquake
  - Hurricane Wind
  - Hurricane Safe Room





# Flood Projects

## Riverine

- Floodplain properties
- Acquisition, relocation and demolition
- Elevation

## Damage Frequency Assessment

- Acquisition, relocation, demolition, elevation of non-floodplain properties
- Structural (detention ponds, stormwater improvement, lift stations, etc.)



# Damage Frequency Assessment

- Documented damages from 2 events of known frequency/occurrence interval, OR
- Documented damages from 3 events of unknown frequency/recurrence interval
- H&H analysis, if available (can use for predicted damages)
- Damage figures/dates
- Types of damages (structural, contents)
- Cost Estimate
- Level of protection
- Project life
- Estimate of damages/losses after mitigation
- Annual maintenance costs
- Loss of function





# Damage Frequency Assessment

- Damage Documentation Sources (credible)
  - Insurance claims
  - Property owner surveys
  - Receipts, invoices, contractor cost estimates
  - Updated flood map information
  - Wisconsin DNR
  - NWS NCDC
  - USACE
  - USGS
  - Water management agencies
  - Local newspaper stories



# Riverine

- Can aggregate properties in a project
- If determined substantially damaged by local floodplain coordinator (over 50% damaged,) *BCA is waived*; automatically cost-effective





# If not substantially damaged

- Minimum Required Documentation
  - Project Cost
  - Project Life
  - FIS Data (discharge, frequency, flood profiles, streambed elevation)
  - Lowest finished floor elevation
  - Size and type of structure
  - Replacement value
  - Contents value
  - Displacement Costs



# Environmental Benefits

- Policy: Consideration of Environmental Benefits in Evaluation of Acquisition Projects under the HMA Programs, issued 6/18/13
- For acquisition if BCA is .75, can look at counting environmental benefits (economic value for green open space and riparian area)
- Based on size (square feet) of the land (lot)
- Riparian: Land directly abuts a natural body of water
- Green open space: Does not directly touch a natural body of water





# Environmental Benefits

## Green Open Space

- Total Estimated Benefits are \$7,853 per acre per year
- Total Estimated Benefits (projected for 100 years with 7% discount rate) is \$2.57 per square foot

## Riparian

- Total Estimated Benefits are \$37,493 per acre per year
- Total Estimated Benefits (projected for 100 years with 7% discount rate) is \$12.29 per square foot





# The Best Changes!

- Policy Memo: Cost Effectiveness Determinations for Acquisitions and Elevations in SFHA using Pre-Calculated Benefits, issued 8/15/13 and 10/8/13
- For acquisition, if the property is located in the SFHA per FEMA FIRM and the total cost is \$276,000 or less it is cost-effective
- For elevation, if the property is located in the SFHA per FEMA FIRM and the total cost is \$175,000 or less it is cost-effective.
- Projects containing multiple structures, the average cost of all structures must meet the criterion.





# Jefferson County Impact

- 2010 Mitigation Application included 35 structures.
- 9 had a BCR greater than 1.0
- Aggregated another 11 with BCR less than 1.0 for total of 20 properties
- Remaining 15 did not qualify
- If the pre-calculated policy had been in place we would have been able to include a total of 31 properties (only 4 were over \$276K)





# Jefferson County Impact

- Additional benefits:
  - County would have saved time and resources as would not have had to gather as much info for each property including FFE
  - State staff time and resources would have been saved as BCA would not have been required
- Estimate that probably 90 to 95% of our projects will fall under the pre-calculated benefit policy





# More Changes Additional Benefits (BCA V5.0)

- Social Benefits
  - Mental health treatment cost default value of \$2,443 x number in per household
  - Lost productivity value of \$8,736 x number of wage earners in the residence
- Revised methodology for residential displacement costs
  - Lodging and meals per diem rates for a community as determined by GSA or DOD
  - Default is \$77/day lodging and \$46/day meals



# Additional Benefits (BAC V5.0)

- Non-traditional benefits
  - Eliminated or reduced volunteer labor costs (\$21.78 per hour for Wisconsin)
  - Large acquisition projects, include future street maintenance costs avoided
  - Flood mitigation projects that eliminates the need to carry flood insurance or reduces claim administration burden can count as a benefit





## Example

- Elevation of a floodplain structure
  - Previous BCA: .88
  - BCA after additional benefits: 1.87



## In Summary

New FEMA policies and changes to the BCA modules will make more mitigation projects cost-effective, and will save time and resources!





# Questions?



## Contact Info:

**Roxanne Gray**  
State Hazard Mitigation Officer  
(608) 242-3211  
[Roxanne.Gray@Wisconsin.gov](mailto:Roxanne.Gray@Wisconsin.gov)

**Katie Sommers**  
State Hazard Mitigation Officer  
608-242-3222  
[Katie.sommers@wisconsin.gov](mailto:Katie.sommers@wisconsin.gov)

**Chad Atkinson**  
Disaster Response/Recovery Planner  
608-242-3252  
[Chad.atkinson@wisconsin.gov](mailto:Chad.atkinson@wisconsin.gov)

**Caitlin Shanahan**  
Disaster Response/Recovery Planner  
608-242-3219  
[Caitlin.shanahan@wisconsin.gov](mailto:Caitlin.shanahan@wisconsin.gov)



WEM Hazard Mitigation:

<http://emergencymanagement.wi.gov/mitigation>

FEMA Hazard Mitigation Assistance:

<http://www.fema.gov/hazard-mitigation-assistance>

FEMA Benefit-Cost Analysis:

<http://www.fema.gov/benefit-cost-analysis>