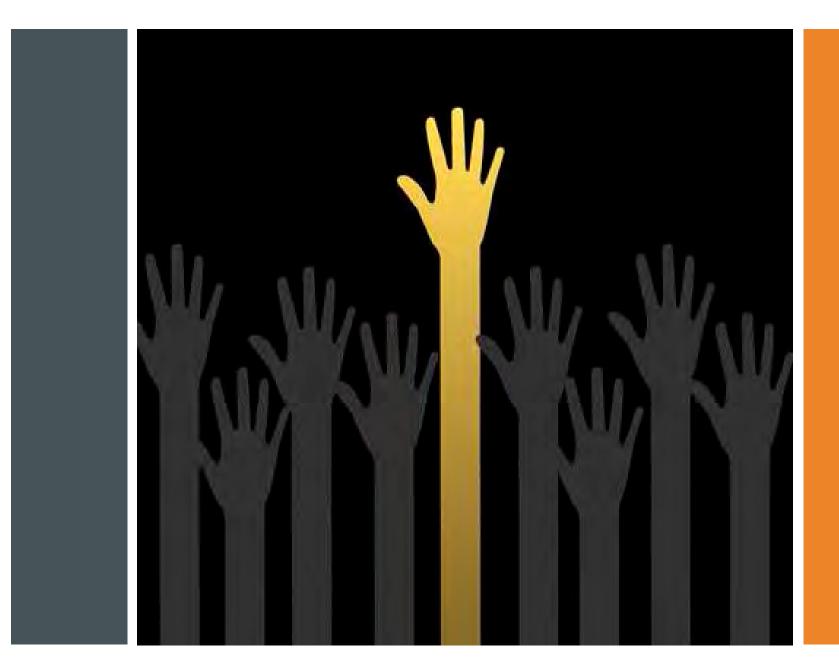
I0 LESSONS LEARNED FROM 20+ FLOOD RESPONSE PLANS

INAFSM ANNUAL CONFERENCE

SEPTEMBER 2018 – EVANSVILLE, IN





DOES YOUR COMMUNITY HAVE A FLOOD RESPONSE PLAN?

WITH EVERY MAJOR FLOOD

- OVERWHELMING
 LEVEL OF ACTIVITY
- NEED FOR QUICK INFORMATION AND RESPONSE
- NEED TO BE PREPARED AND HAVE A GOOD PLAN



FLOOD RESPONSE PLAN...

- PURPOSE: reduce risk of loss of life, injury and damage to property
- SCOPE: limited to the actions of the FRP Coordinator



FLOOD RESPONSE PLAN...

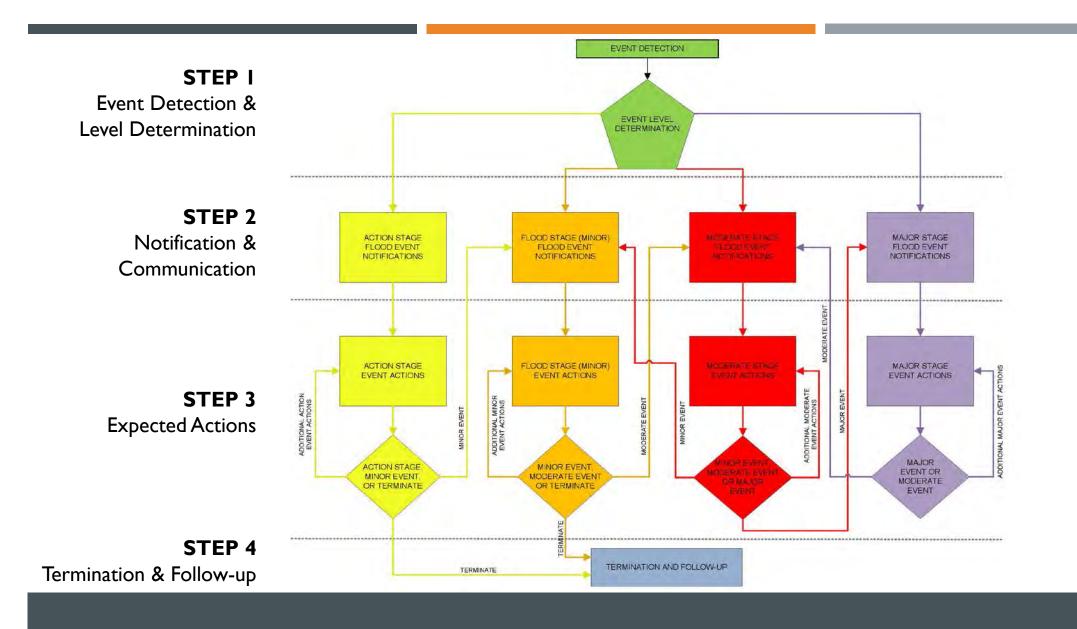


- I. Documents the flood response process
- 2. Informs those involved in the chain of command
- 3. Lists specific responsibilities and task assignments
- 4. Provides a schedule of activities tied to stages of the flood fight

A GOOD PLAN...

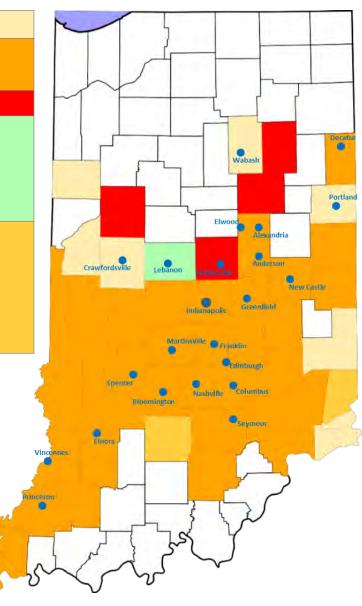


- I. Prevents duplication of efforts and wasted resources
- 2. Helps avoid gaps in response and recovery
- 3. Provides continuity during events if experienced staff is not available



JUNE 2008 FLOOD DISASTER AREAS & FUNDING

Public AssistancePublic and IndividualAssistanceIndividual AssistancePublic Assistance(Category B) limitedto direct FederalassistanceIndividual Assistance(Category B) limitedto direct Federaland Public Assistance(Category B) limitedto direct Federaland Public Assistance(Category B) limitedto direct Federalassistance



City/Town	County	Population	Funding Source
Spencer	Owen	2,271	CBBEL/USGS
Indianapolis	Marion	863,002	Self-Funded
Columbus	Bartholomew	46,850	Self-Funded
Decatur	Adams	9,524	OCRA/IDHS
Lebanon	Boone	16,098	OCRA/IDHS
Nashville	Brown	I,067	OCRA/IDHS
Elnora	Daviess	657	OCRA/IDHS
Princeton	Gibson	8,362	OCRA/IDHS
Noblesville	Hamilton	60,183	OCRA/IDHS
Greenfield	Hancock	21,709	OCRA/IDHS
Portland	Jay	6,161	OCRA/IDHS
Franklin	Johnson	24,867	OCRA/IDHS
Anderson	Madison	55,130	OCRA/IDHS
Alexandria	Madison	5,024	OCRA/IDHS
Martinsville	Morgan	11,669	OCRA/IDHS
New Castle	Henry	17,426	OCRA/IDHS
Seymour	Jackson	19,384	OCRA/IDHS
Edinburgh	Johnson	4,577	OCRA/IDHS
Vincennes	Knox	17,924	OCRA/IDHS
Elwood	Madison	8,416	OCRA/IDHS
Crawfordsville	Montgomery	16,001	OCRA/IDHS
Bloomington	Monroe	84,465	OCRA/IDHS
Wabash	Wabash	10,253	OCRA/IDHS

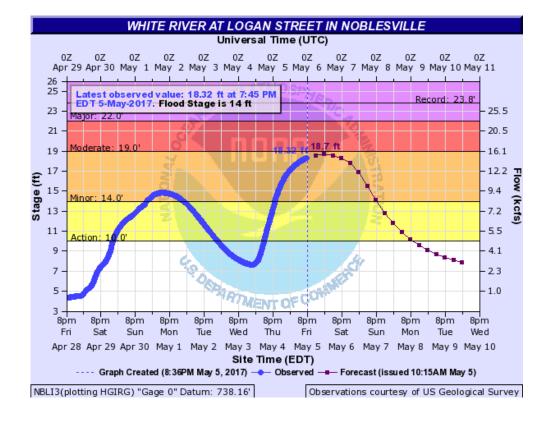
IO LESSONS LEARNED FROM 20+ FLOOD RESPONSE PLANS

I. FORECAST IS NOT ALWAYS ACCURATE

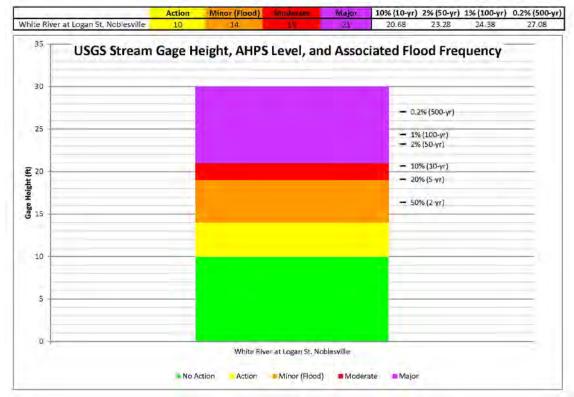


VARIABLES IN FORECASTING WEATHER...

FRP – FLOOD DETECTION & FORECAST RESOURCES







Compiled by CBBEL

FRP – FLOOD DETECTION & FORECAST RESOURCES

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Faint Flood Coldance estimates the evenings swetter of index of liance? for going dealers required in produce here thereby is the indicated county. These estimates are bears or consult out residure conditions. Here, in other press.

9 100-year **Major Stage** 8 50-year 7 25-year Precipitation Depth (inches) 6 10-year 5-year Moderate Stage 5 Minor (Flood) Stage 2-year 4 Action Stage 3 2 No Action 1 0 0 12 24 36 48 60 72 84 96

Forcasted Rainfall Duration (hours)

Compiled by CBBEL

NWS Flash Flood Guidance

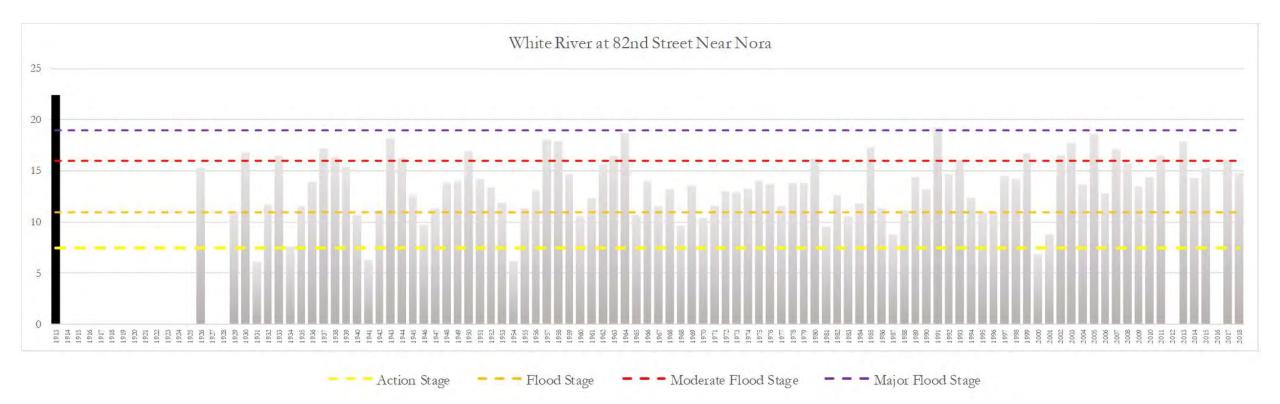
2. HAVE AN ALTERNATE TO YOUR ALTERNATE

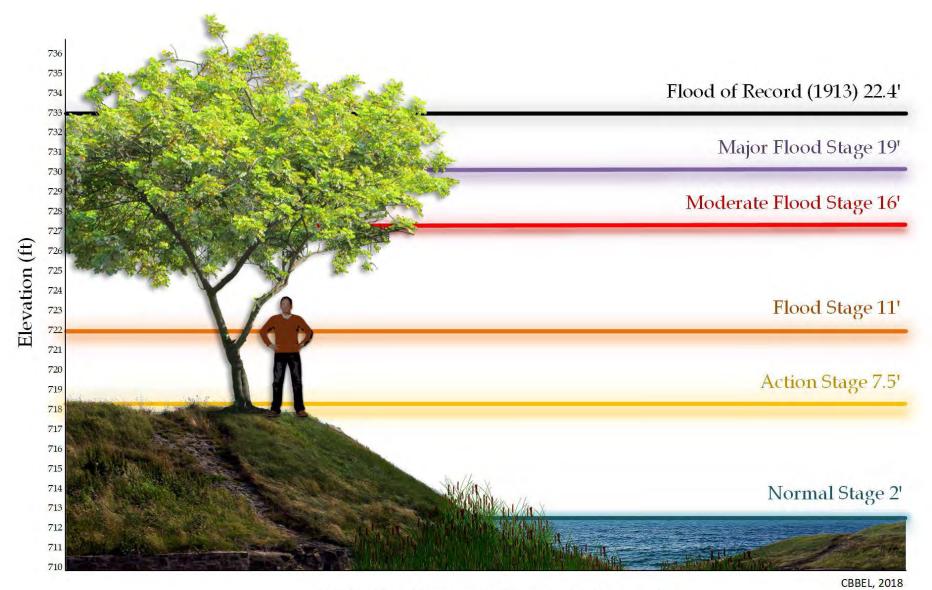
RECENT FLOODS...

- 33% floods since 1996 on weekends and/or holidays
 - July 4th 2003
 - Labor Day 2005
- Flood Disaster
 Declaration
 - September 2006
 - June 2008
 - April 2011
 - February 2018



PAST FLOOD EVENTS



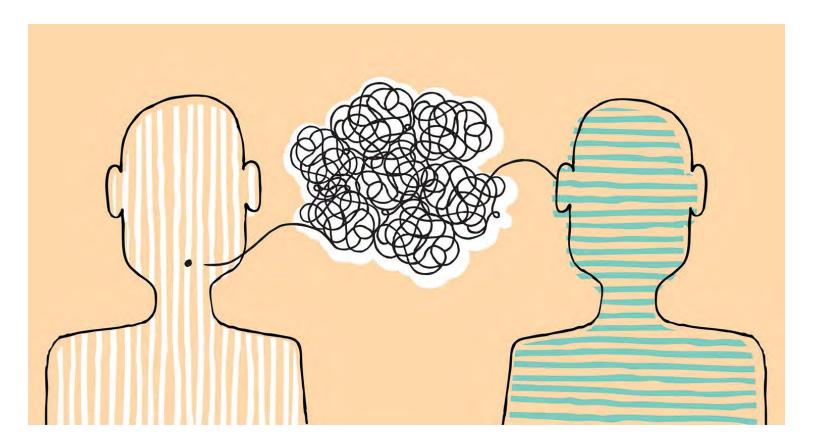


AHPS Flood Stages @ Nora in Indianapolis

3. NEED FOR A CLEAR & CONCISE MESSAGE

COMMUNICATE RISK

- Need to understand risk from flooding
- Improved
 preparedness
- Support for mitigation measures



PRESCRIPTED MESSAGES

FRP Coordinator

Moderate Stage Flood Event

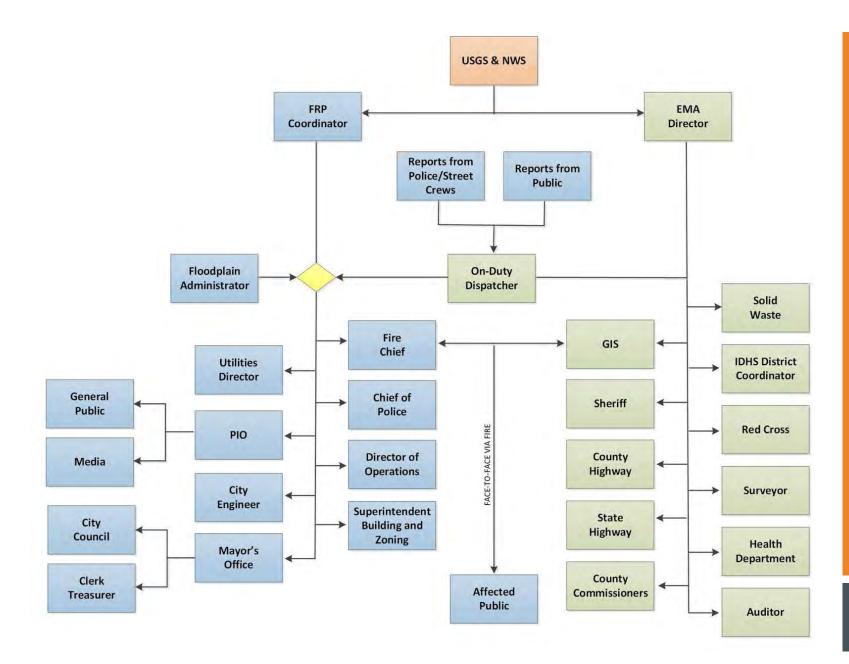
- This is (name), FRP Coordinator. I am making this call in accordance with the City's Flood Response Plan.
- A Moderate Stage Flood Event has been detected affecting the Crawfordsville area.
- Moderate flooding condition exists along the <u>(name)</u> rivers and/or low-lying areas <u>(use information from Section 1.5 (extent and severity)</u> to be more specific if flooding is isolated to a certain area).
- · The FRP has been activated, currently at the Moderate Stage Flood Event level.
- [if applicable] The forecast is for additional rain and we expect to reach (level) Flood Stage Event within the next (number of hours or days). Based on this forecast, the following areas may be affected (list areas).
- Prepare to evacuate along the (identify potential evacuee / evacuation limits).
- I will keep you apprised of the situation. The best number to contact me during this event is (emergency contact number).

Public Information Officer

Announcement for Moderate Stage Flood Event

THE CITY OF CRAWFORDSVILLE ANNOUNCED AT (time) TODAY THAT STRUCTURES AND ROADS ADJACENT TO THE (name of river or stream) AND IN LOW-LYING AREAS MAY EXPERIENCE MODERATE FLOODING. THE AREAS AND/OR ROADS OF CONCERN INCLUDE (vary depending on area affected). SHOULD THIS CONDITION WORSEN, THE FOLLOWING AREAS SHOULD PREPARE TO EVACUATE: (list areas and location of shelters for both residents and pets)

THE CITY OF CRAWFORDSVILLE SPOKESPERSON SAID THAT PEOPLE SHOULD AVOID DRIVING OR WALKING ON ROADS OR BRIDGES THAT ARE COVERED BY WATER. THE DEPTH OF THE WATER OR STRENGTH OF THE CURRENT MAY BE DECEIVING. AS LITTLE AS TWO FEET OF WATER CAN CARRY AWAY A CAR AND SIX INCHES CAN KNOCK A PERSON OFF THEIR FEET. ADDITIONAL INFORMATION WILL BE RELEASED AS PROMPTLY AS POSSIBLE.



NOTIFICATION & COMMUNICATION FLOWCHART

4. VALUE OF A TABLETOP EXERCISE





FRP REVISITED

FLOOD FIGHT
 ANNUAL REVIEW
 PERIODIC TEST

5. OPPORTUNITY FOR CRS CREDIT



CRS CREDIT 365 POINTS

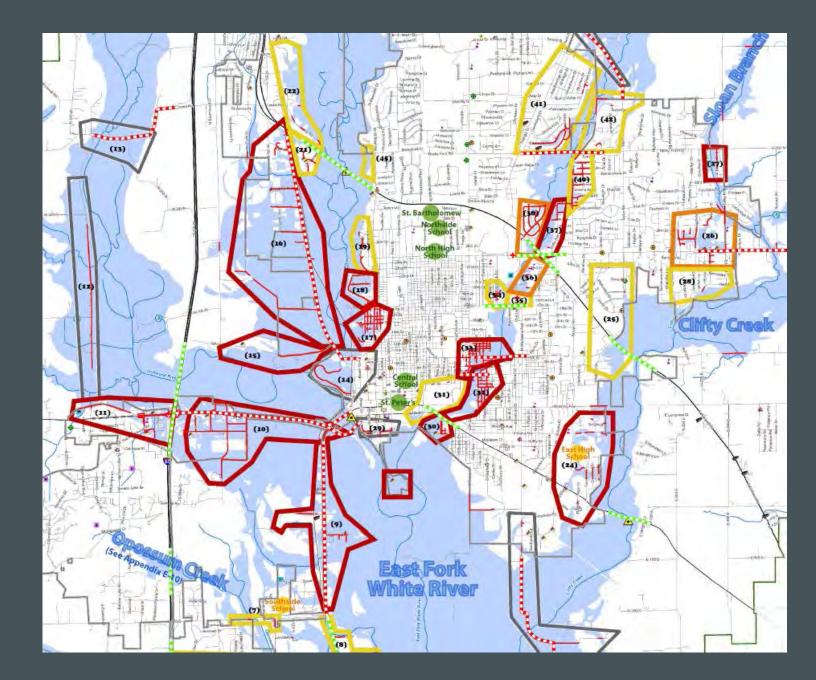
- FTR Flood Threat Recognition System (75 Pts)
- EWD Emergency Warning
 Dissemination (75 Pts)
- FRO Flood Response
 Operations (115 Pts)
- CFP Critical Facilities
 Planning (75 Pts)
- StormReady Community (25 Pts)

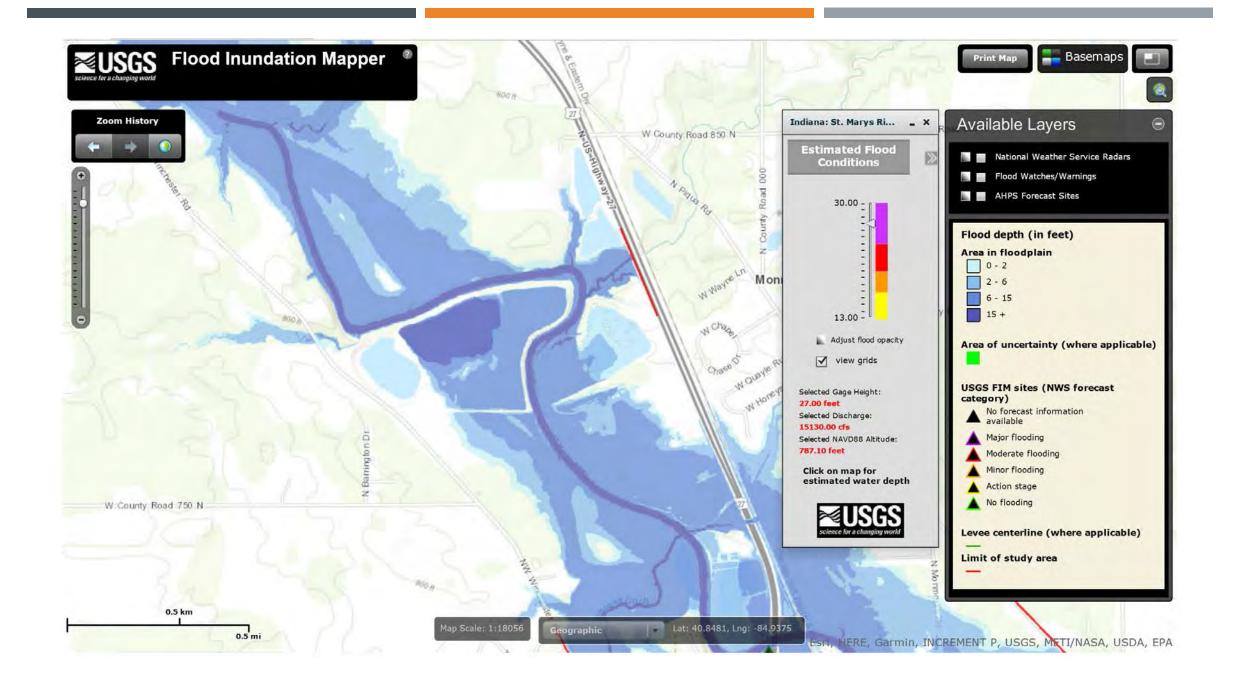


6. GREATER UNDERSTANDING OF FLOOD RISK

FLOOD IMPACT AREAS

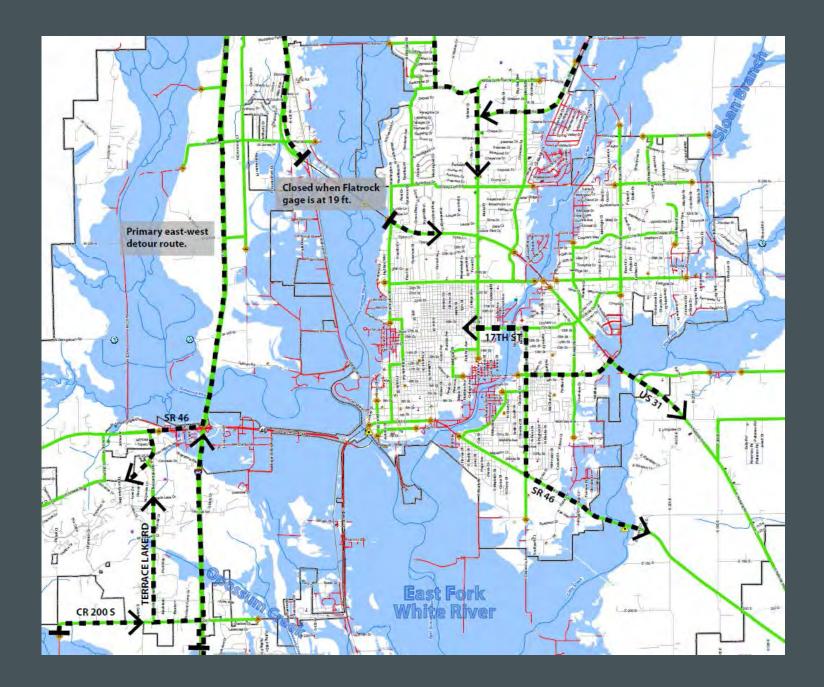
- 10, 50, 100 & 500-YR
- COLOR CODED
 PRIORITY AREAS
- OVERTOPPED ROADS
- SHELTER ACCESS
- BETTER DATA USGS INUNDATION & BLDG FOOTPRINTS





FLOOD-SAFE ROUTES

- 500-YR FLOOD
- OVERTOPPED ROADS
- FLOOD-SAFE ROUTES



7. FLOOD MITIGATION AND SMART GROWTH

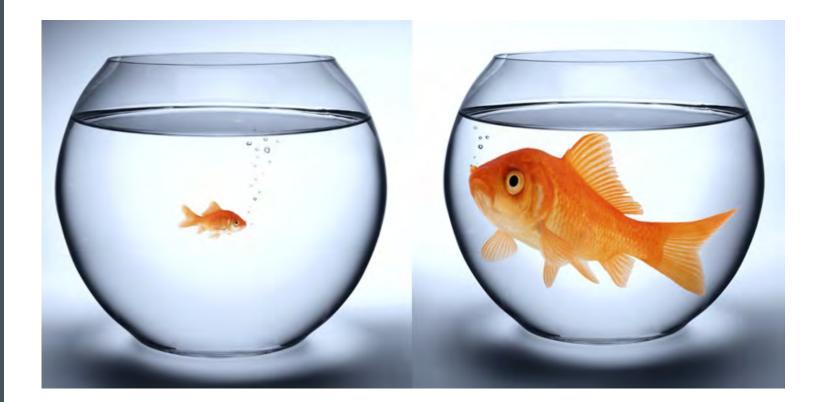
FLOOD RESILIENCE PLANNING AREAS

Safer Area River Corridor Watershed	Planning Area	Area Boundary
	River Corridor	Floodway or FEH area, whichever is greater
Classifier of the second	Undeveloped High Flood Hazard/Flood Storage Area	Undeveloped land in the floodway fringe
	Vulnerable Developed Area	Existing developed land in the SFHA
Undeveloped High	Safer Area	Outside SFHA but within planning jurisdiction
Flood Hazard /Flood Storage Areas	Watershed	Fintire drainage area

8. ONE SIZE DOES NOT FIT ALL

FLEXIBLE APPROACH

GAGED STREAMS
UNGAGED STREAM
LEVEE PROTECTED
RESOURCES
QUALITY OF DATA



9. POST-FLOOD DOCUMENTATION



DOCUMENTATION CHECKLIST

- HIGH WATER MARKS
- DAMAGES BLDGS & INFRASTRUCTURE
- RAINFALL DATA
- USGS & AHPS LEVELS
- FIRM & FLOODED AREAS
- DEBRIS REMOVAL



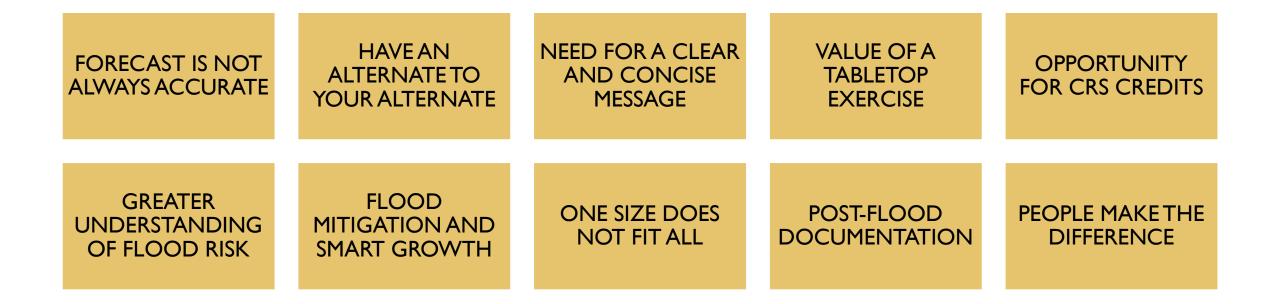


10. PEOPLE MAKE THE DIFFERENCE



LOCAL LEADERSHIP

SUMMARY OF LESSONS LEARNED



SO WHAT?



- States at Risk: America's Preparedness Report Card, 2015
- Threats posed by changing climate: extreme heat, drought, wildfire, inland (riverine) flooding and coastal flooding
- Inland (riverine) flooding:
 - Severity of high runoff events
 - Population living in SFHA

CLIMATE PREPAREDNESS CRITERIA

- I. Is the state taking actions to address its CURRENT RISKS from the climate threat?
- 2. Has the state undertaken activities to UNDERSTAND IT'S FUTURE CHANGES IN VULNERABILITY AND RISKS from climate threat?
- 3. Has the state PLANNED FOR ADAPTION TO THE FUTURE CHANGES IN RISKS from each climate threat?
- 4. Is the state IMPLEMENTING SPECIFIC ACTIONS to address future changes in risks to each climate threat?

n/a Alabama n/a Alaska n/a Atizona

- F Arkansas
- A- California

n/a Colorado

- Connecticut
- 8+ Delaware
- D- Florida
- C- Georgia
- n/a Hawall
- n/a Idaho
- D- Illinois

- C- Indiana
 - lowa
- D+ Kansas
 - Kentucky
- /a Louisiana
- C Maine
- 1/a Merviand
 - Massachusetts
- B= Michigan
- i/a Minnesota
- i/a Mississipp
- Missouri
- i/a Montana

- C- Nebraska
- n/a Nevada
- n/a New Hampshire
- New Jersey
- n/a New Mexico
- New York
- B- North Carolina
- C+ North Dakota
-) Ohio
- Oklahoma
- C+ Oregon
- **B**+ Pennsylvania
- Rhode Island

- South Carolina
- South Dakota
- Tennessee
- n/a Texas
- n/a Utah
- n/a Vermont
- B Virginia
- 8 Washington
- D+ West Virginia
- C+ Wisconsin
- n/a Wyoming

* graded using different method. See Methodology.







SO WHAT?



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