



LESSONS LEARNED FROM 20+ FLOOD RESPONSE PLANS

IAFSM ANNUAL CONFERENCE

MARCH 2019





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...



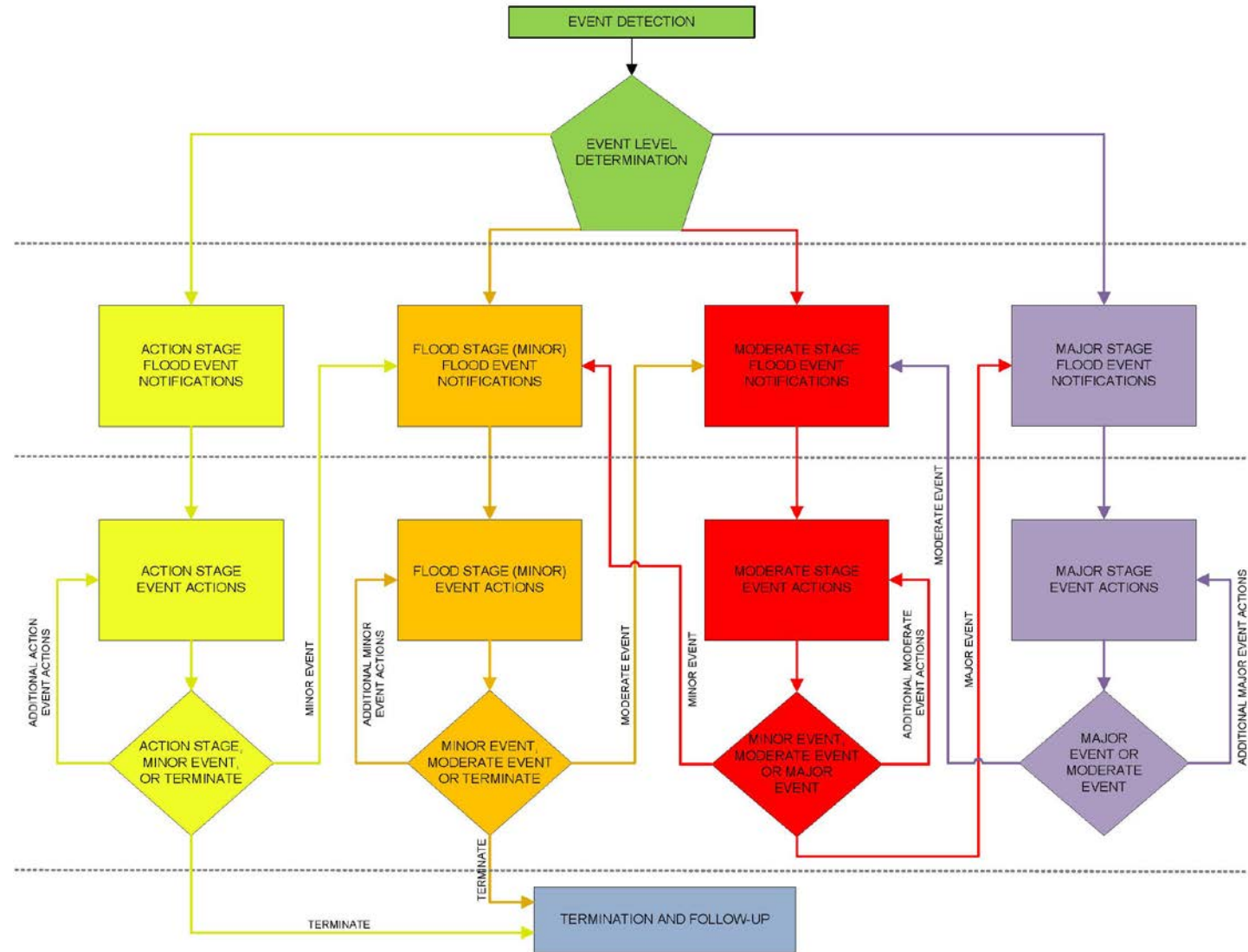
1. Documents the flood response process and informs those involved in the chain of command
2. Lists specific responsibilities and task assignments tied to stages of the flood fight
3. Prevents duplication of efforts and wasted resources; avoids gaps in response and recovery
4. Provides continuity during events if experienced staff is not available

STEP 1
Event Detection &
Level Determination

STEP 2
Notification &
Communication

STEP 3
Expected Actions

STEP 4
Termination & Follow-up



20+ Flood Response Plans...



ISJ INITIATED



OCRA FUNDED



IDHS MANAGED



CBBEL DEVELOPED

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	1,067	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



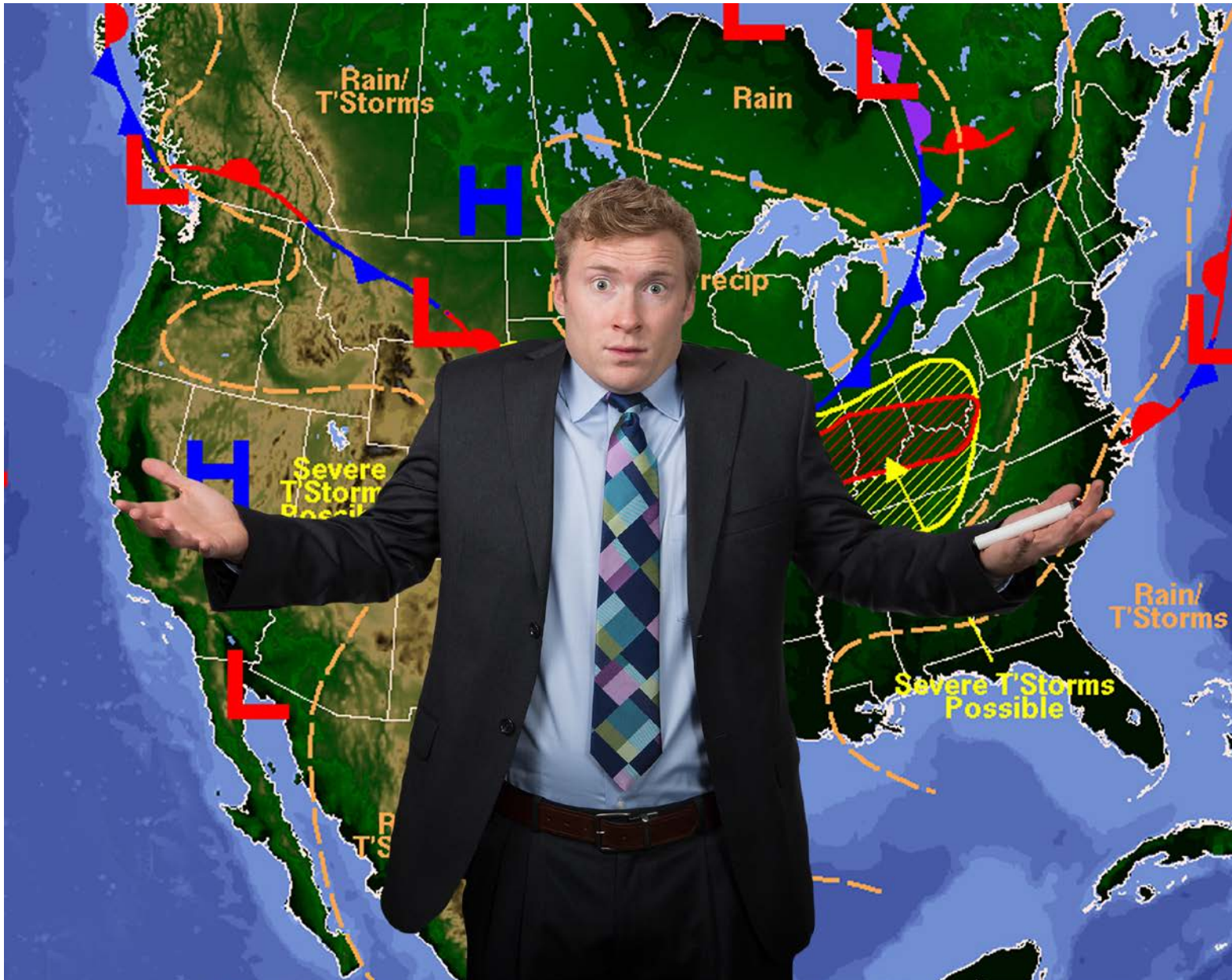
LESSONS LEARNED FROM 20+ FLOOD RESPONSE PLANS





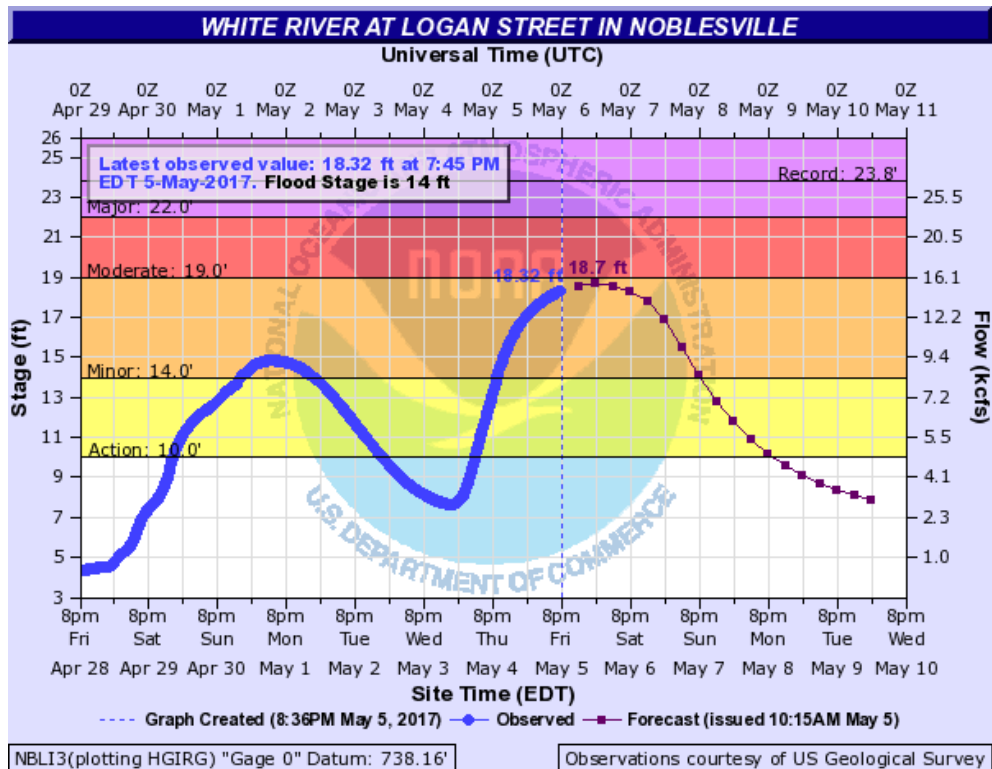
FORECAST IS NOT ALWAYS ACCURATE



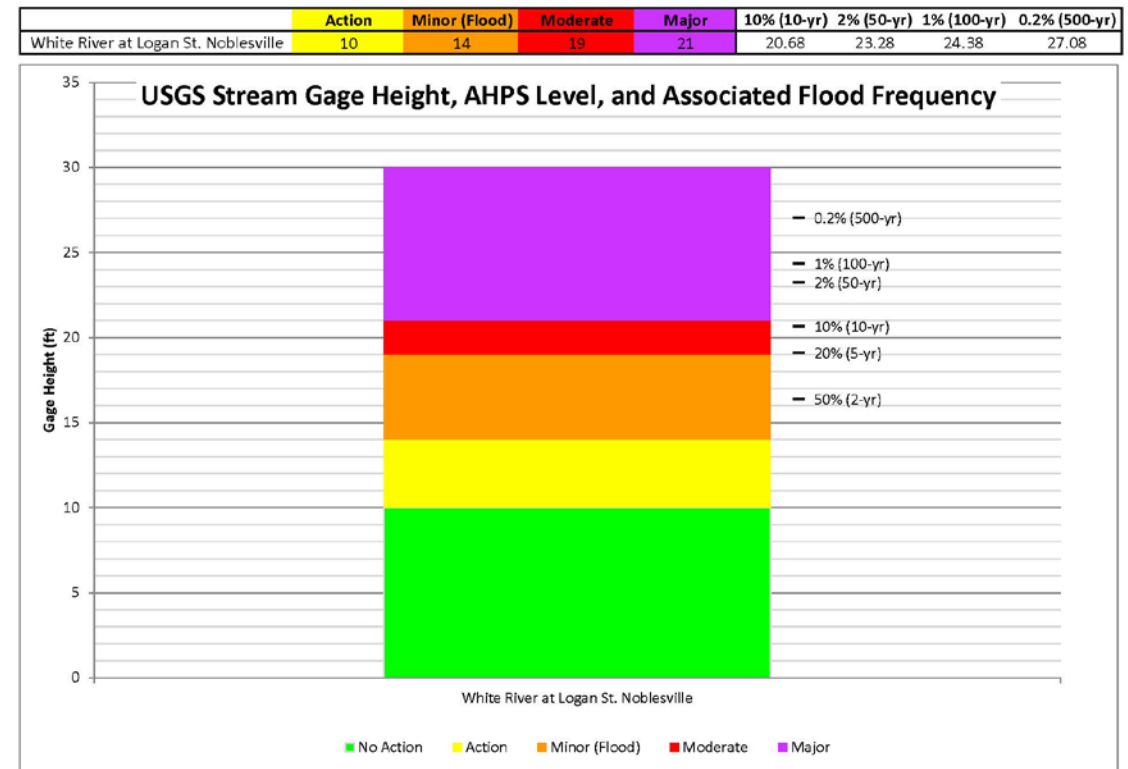


VARIABLES IN
FORECASTING
WEATHER...

FRP – FLOOD DETECTION & FORECAST RESOURCES

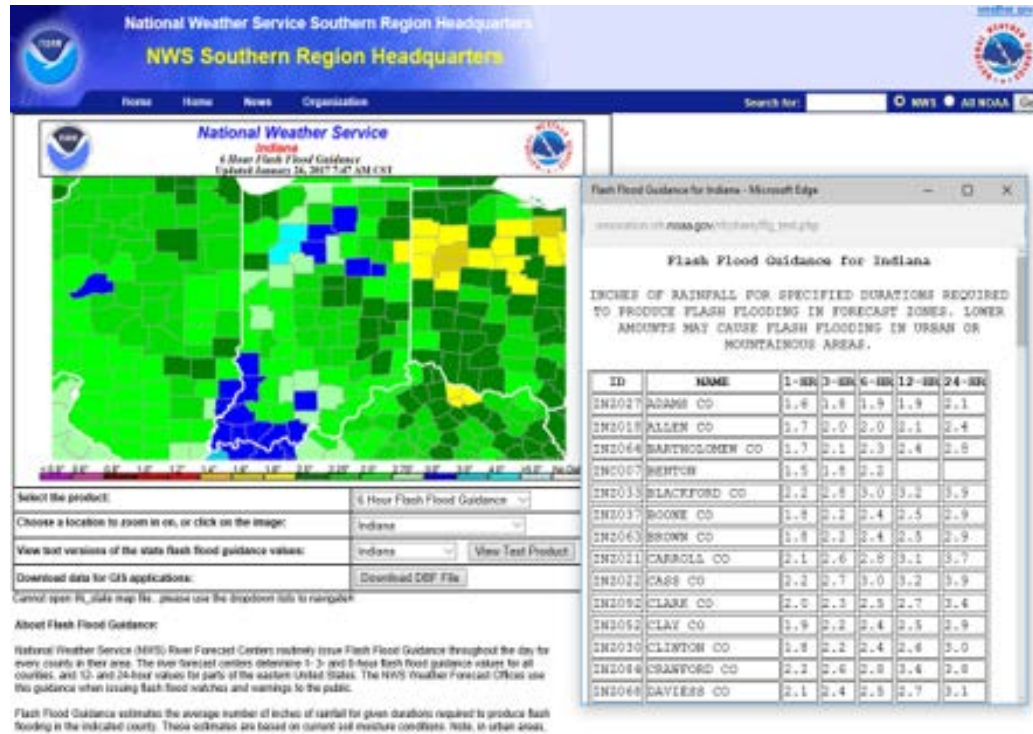


Advanced Hydrologic Prediction Service (AHPS)

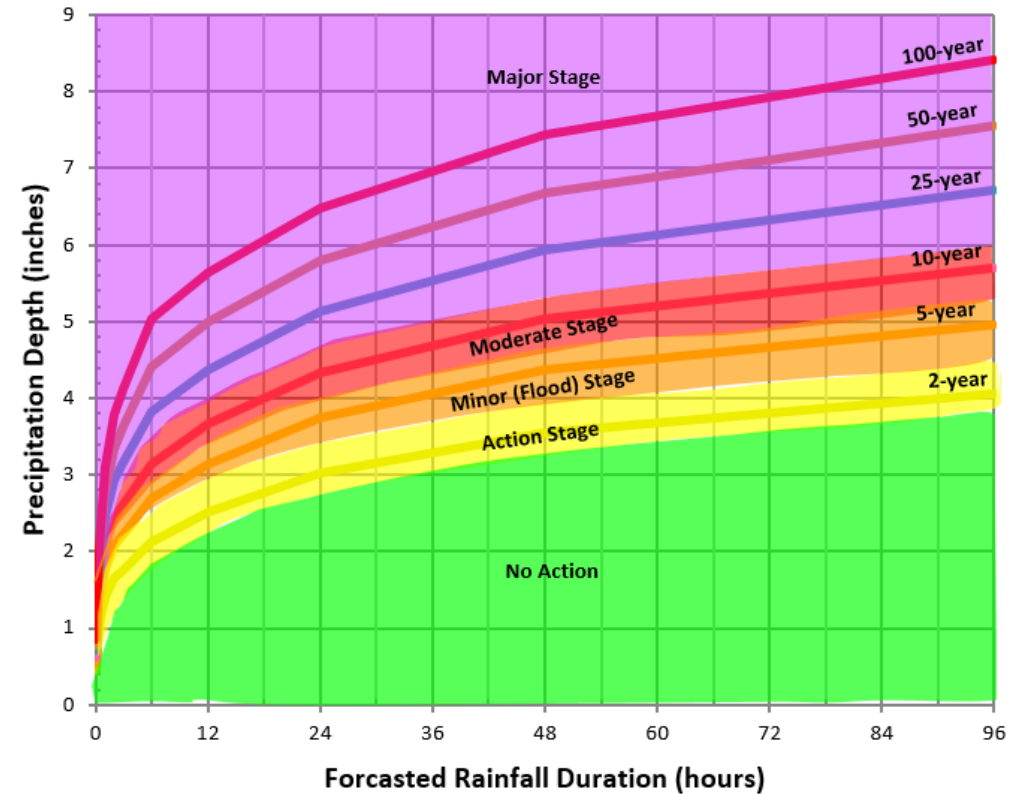


Compiled by CBEL

FRP – FLOOD DETECTION & FORECAST RESOURCES



NWS Flash Flood Guidance



Compiled by CBBEL

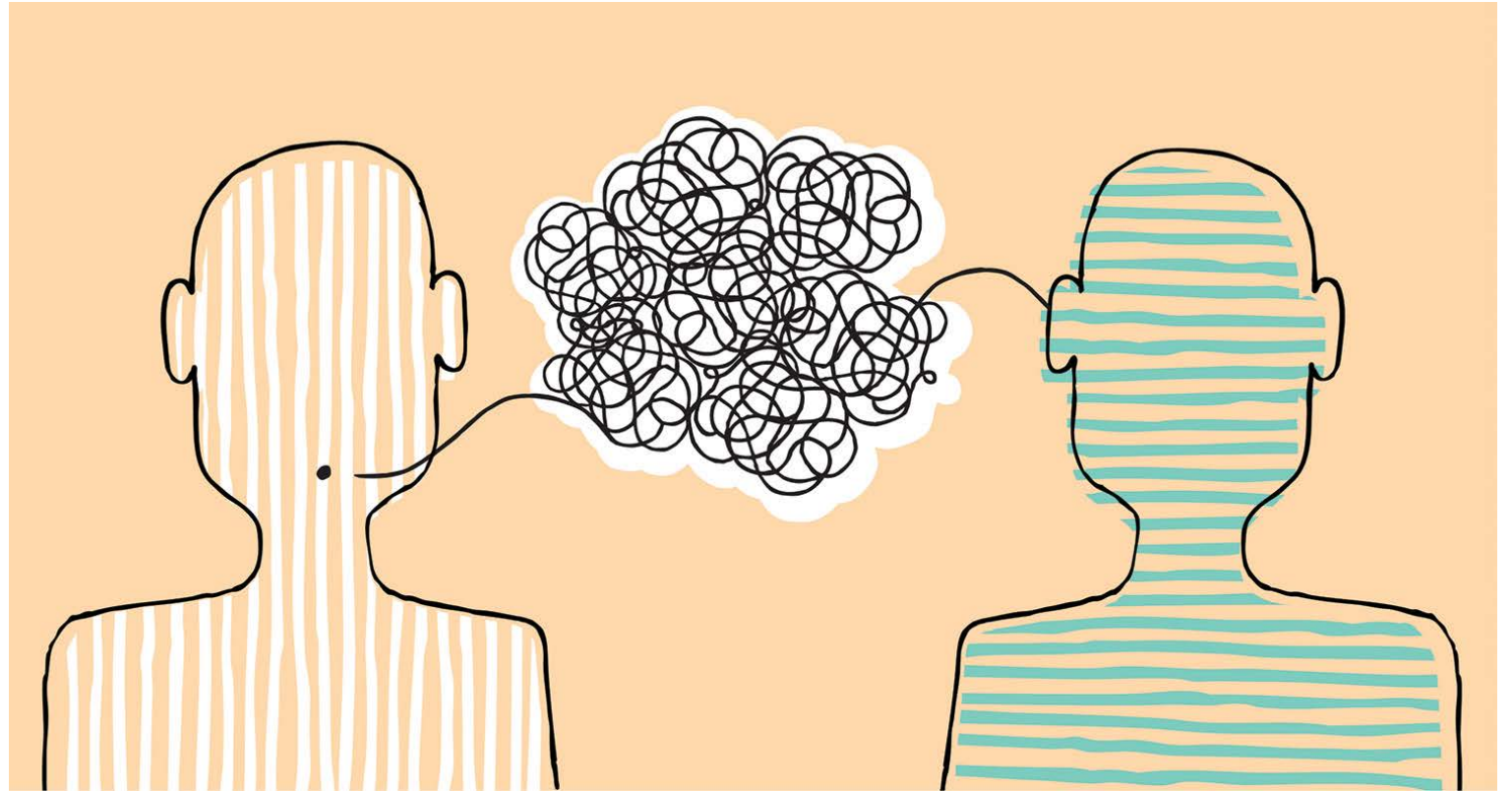


NEED FOR A CLEAR & CONCISE MESSAGE



COMMUNICATE RISK

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



PRESCRIPTED MESSAGES

FRP Coordinator

Moderate Stage Flood Event

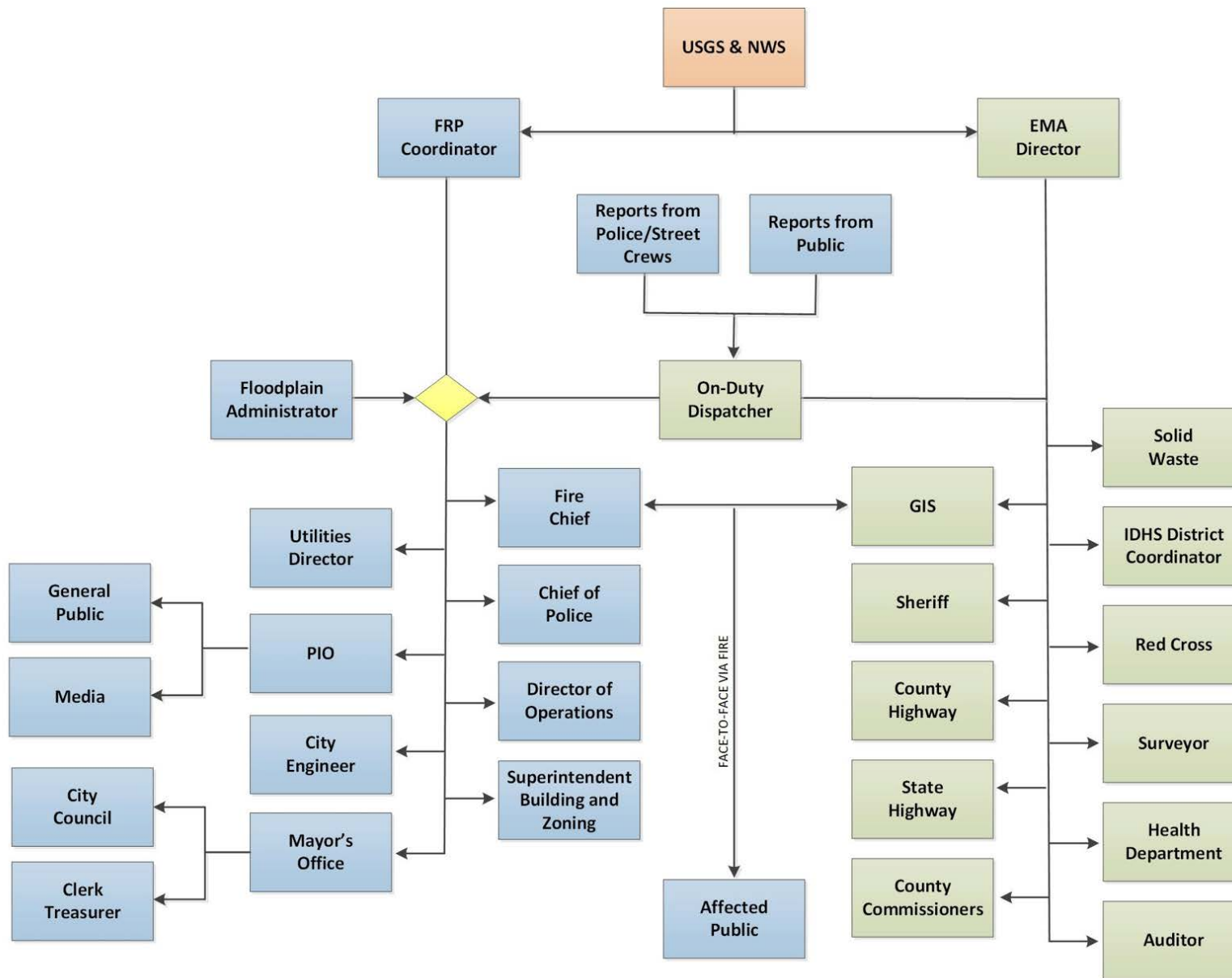
- This is **(name)**, FRP Coordinator. I am making this call in accordance with the City's Flood Response Plan.
- A Moderate Stage Flood Event has been detected affecting the Crawfordsville area.
- Moderate flooding condition exists along the **(name)** rivers and/or low-lying areas **(use information from Section 1.5 (extent and severity) 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 FLOW CHART



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)



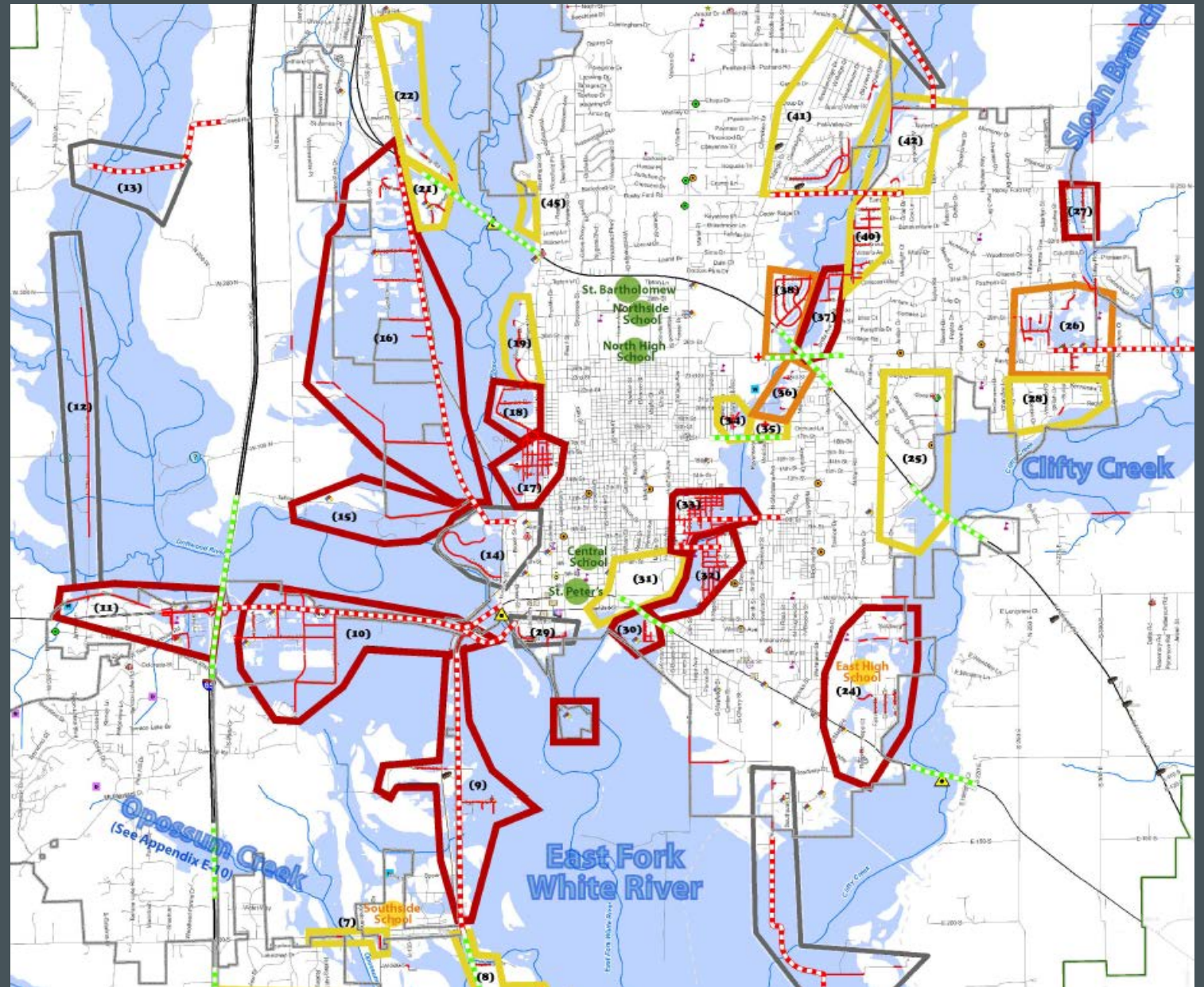


GREATER UNDERSTANDING OF FLOOD RISK



FLOOD IMPACT AREAS

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





Flood Inundation Mapper

Print Map

Basemaps



Zoom History



Indiana: St. Marys Ri...

Estimated Flood Conditions



Adjust flood opacity

☒ view grids

Selected Gage Height:

27.00 feet

Selected Discharge:

15130.00 cfs

Selected NAVD88 Altitude:

787.10 feet

Click on map for
estimated water depth



Available Layers

- ☐ National Weather Service Radars
- ☐ Flood Watches/Warnings
- ☐ AHPS Forecast Sites

Flood depth (in feet)

Area in floodplain

- ☐ 0 - 2
- ☐ 2 - 6
- ☐ 6 - 15
- ☐ 15 +

Area of uncertainty (where applicable)



USGS FIM sites (NWS forecast category)

- ☐ No forecast information available
- ☐ Major flooding
- ☐ Moderate flooding
- ☐ Minor flooding
- ☐ Action stage
- ☐ No flooding

Levee centerline (where applicable)

Limit of study area



W. County Road 750 N

N Barrington Dr

W County Road 850 N

N Piqua Rd

W Wayne Ln

W Chapel

Chase Dr

W Quaye Rd

W Honeye

0.5 km

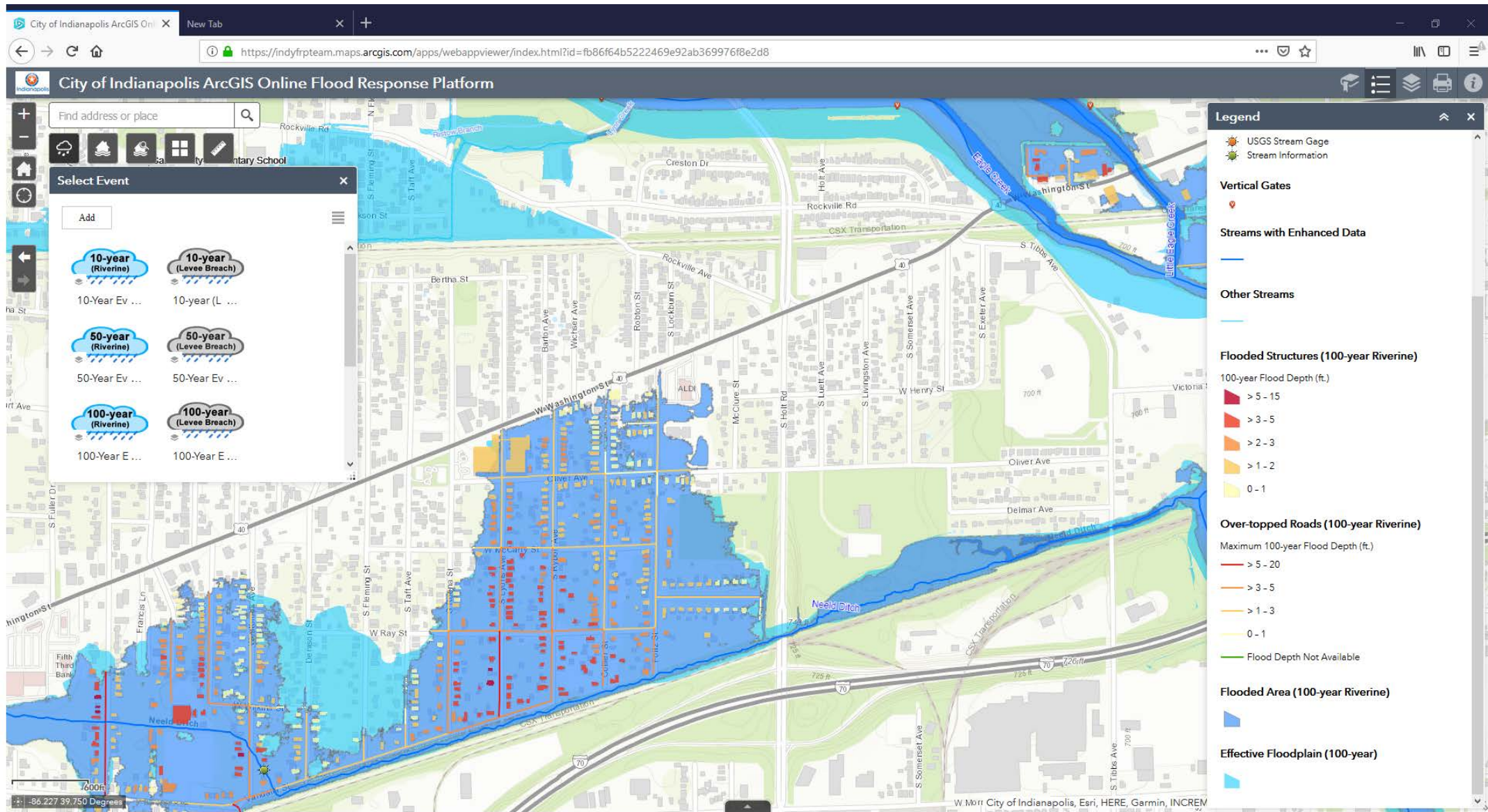
0.5 mi

Map Scale: 1:18056

Geographic

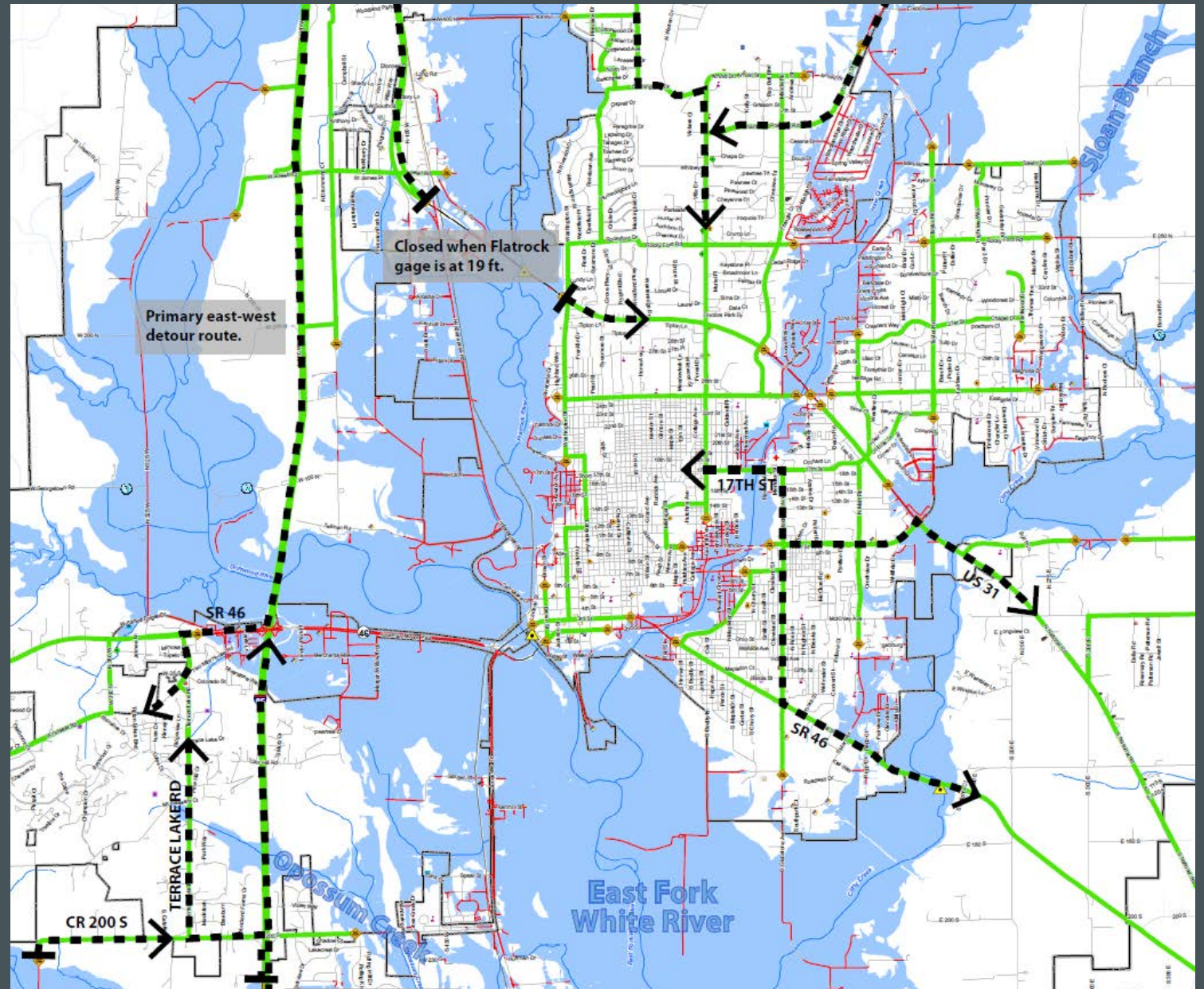
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ESRI, HERE, Garmin, INCREMENT P, USGS, METI/NASA, USDA, EPA



FLOOD-SAFE ROUTES

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

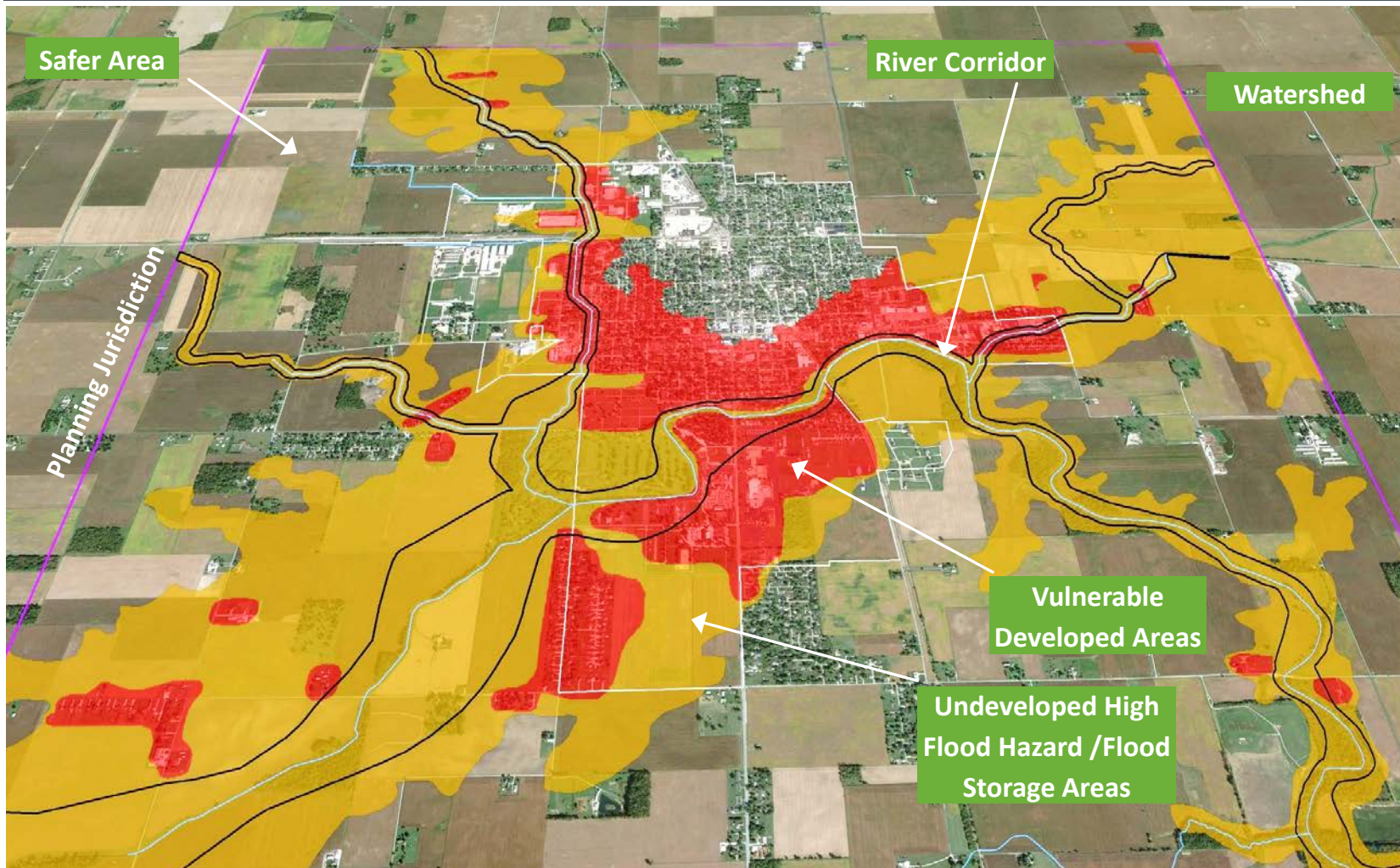




FLOOD MITIGATION AND SMART GROWTH



FLOOD RESILIENCE PLANNING AREAS



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



POST-FLOOD DOCUMENTATION



DOCUMENTATION CHECKLIST

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



SUMMARY OF LESSONS LEARNED

FORECAST IS NOT
ALWAYS
ACCURATE

NEED FOR A
CLEAR AND
CONCISE MESSAGE

OPPORTUNITY
FOR CRS CREDITS

GREATER
UNDERSTANDING
OF FLOOD RISK

FLOOD
MITIGATION AND
SMART GROWTH

POST-FLOOD
DOCUMENTATION



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