



**ILLINOIS**

Illinois State Water Survey

**PRAIRIE RESEARCH INSTITUTE**

# McDonough County Flood Risk Review Meeting

May 18, 2023



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**PRAIRIE RESEARCH INSTITUTE**



**FEMA**

FLOOD RISK REVIEW MEETING - MCDONOUGH COUNTY, ILLINOIS

MAY 18 | 2023

PRE-MEETING SURVEY

1. How much do you know about your community's flood risk?

- a lot
- some
- not much

2. How much do you know about FEMA Risk Mapping, Assessment and Planning (Risk MAP) process?

- a lot
- some
- not much

3. Are you able to communicate flood risk to your community?

- yes
- no

4. Would you know where to go to get flood mitigation help?

- yes
- no

# Agenda

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Rollcall

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Introduction

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Project Objectives, Goals & Scope

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Hydrologic & Hydraulic Study Methods & Models

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Web Map Overview and Draft Floodplain Review

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Communication and Next Step

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Risk Communication & Mitigation Actions

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Community Participation

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Discussion

# Rollcall

## McDonough County

Village of Bardolph †  
Village of Blandinsville  
City of Bushnell †  
City of Colchester †  
Village of Good Hope †  
Village of Industry †  
City of Macomb\*†  
Village of Plymouth  
Village of Prairie City †  
Village of Sciota  
Village of Tennessee  
McDonough County\*†

## Other Agencies

Other local stakeholders  
Townships  
FEMA  
IDNR  
IEMA  
Other Agencies

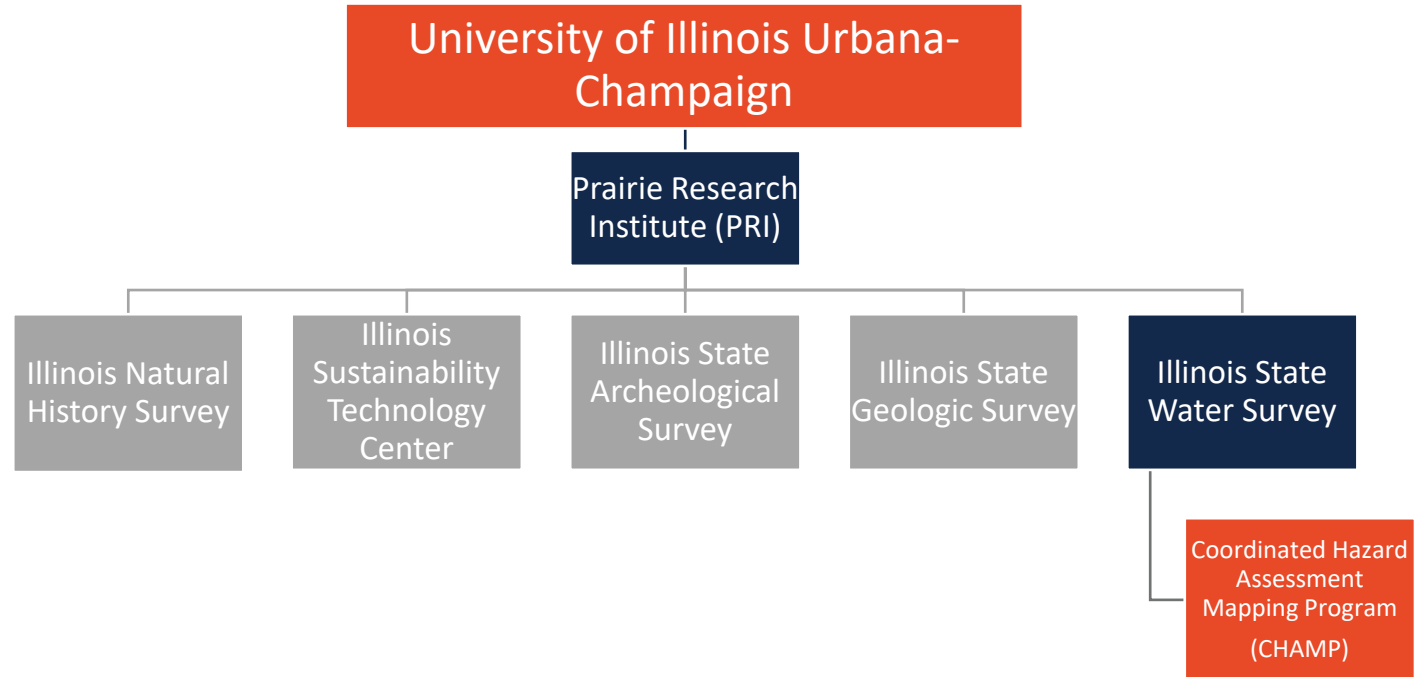
\* Participating in NFIP

† Multi-Jurisdictional All Hazards Mitigation Plan Update Participants

# Introduction

# Introduction

## Who We Are



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<https://www.illinoisfloodmaps.org/>

<https://www.isws.illinois.edu/champ>

# Introduction

## Our Partners

### FEMA

ISWS is a Cooperating Technical Partner (CTP) with the Federal Emergency Management Agency (FEMA)



### IDNR-OWR

ISWS partners with The Illinois Department of Natural Resources-Office of Water Resources (IDNR-OWR). Together we prioritize Illinois floodplain studies and mapping projects.



### Your Community

ISWS provides ongoing engagement with state and local officials and watershed stakeholders to reduce flood risk.



# Project Objectives and Goals

# Illinois Countywide Digital FIRM Funding Status

102 Counties

79 effective digital FIRMs ✓

09 funded for mapping

10 funded for data development

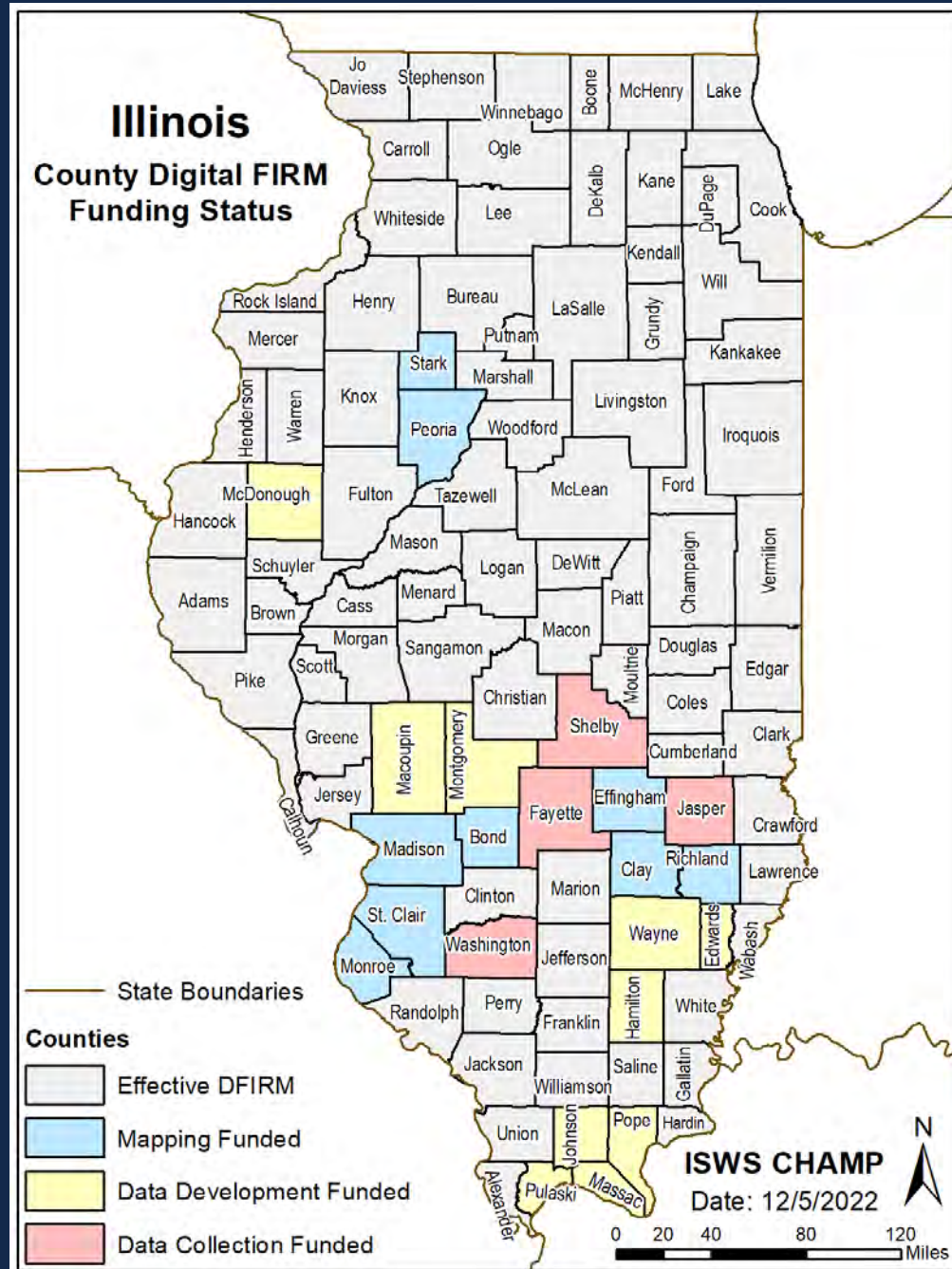
04 funded for data collection

McDonough County

In data development phase

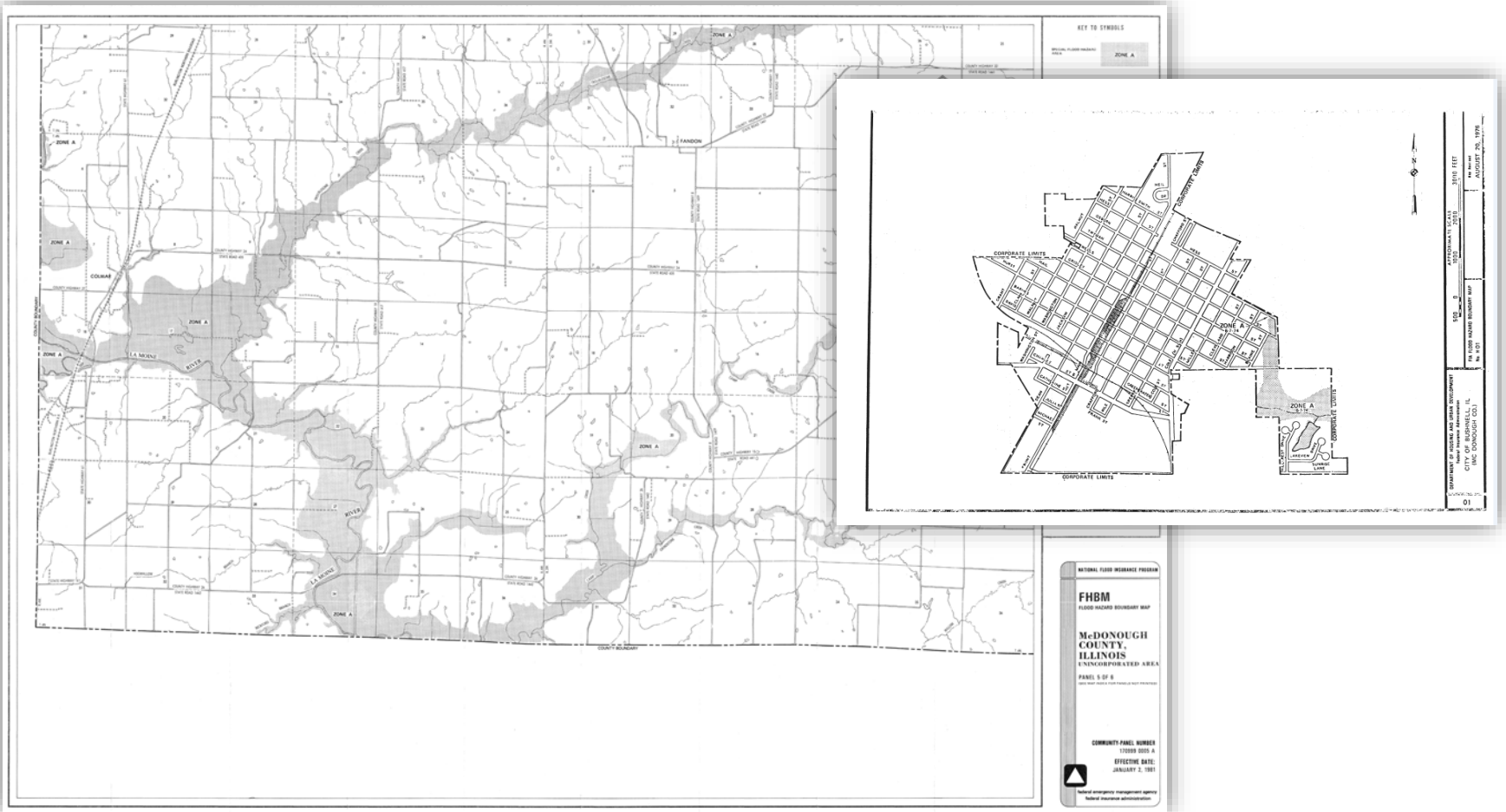
??Preliminary funding

available??



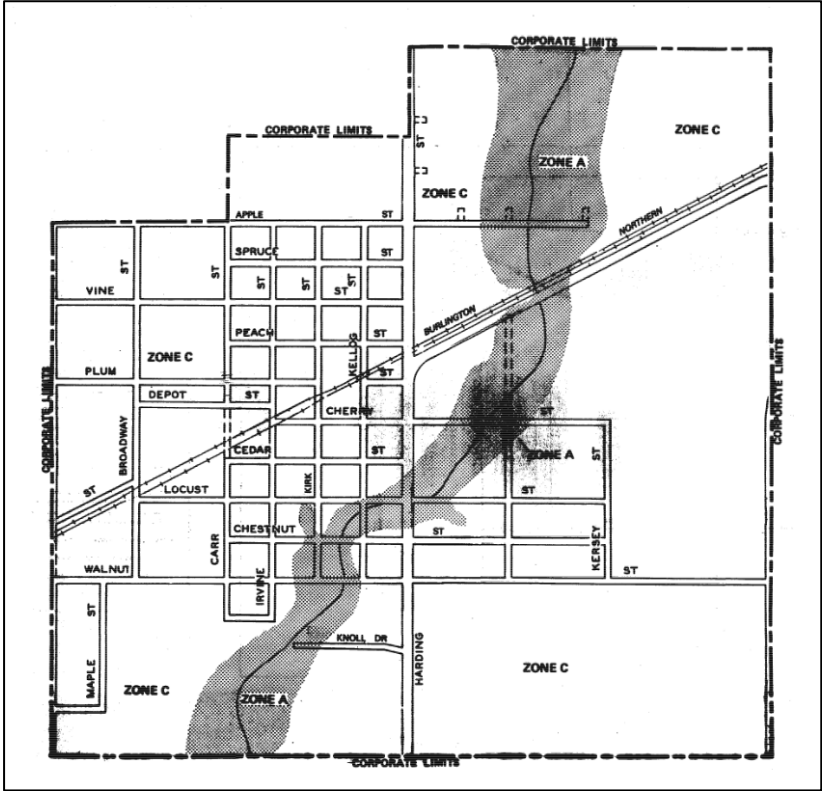
# Effective Paper FIRM

A graphical representation of the real world



# Example of Paper map vs. Digital map

## Old Paper Map



## Current Effective Digital Map



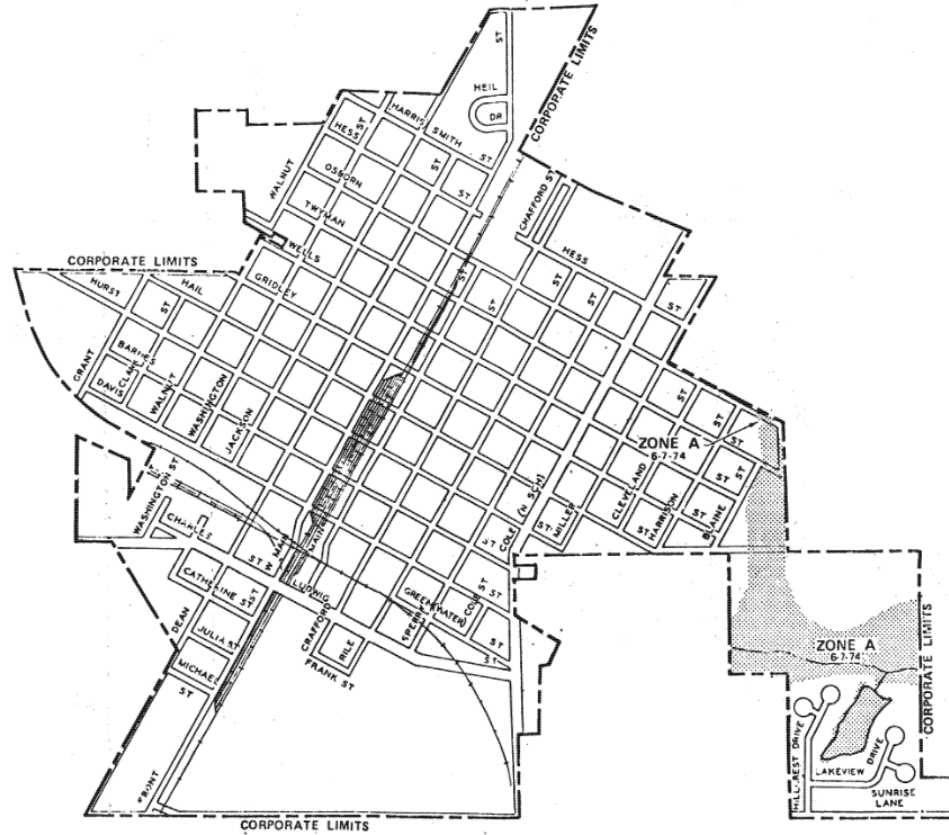
# Paper Map to Digital Map



# Effective Map & FIS Dates

Community Name	Effective Map Date	Effective FIS Date
City of Bushnell	08/20/1976	NA
City of Macomb	None	NA
McDonough County Unincorporated	01/02/1981	NA

# City of Bushnell



DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT Federal Insurance Administration CITY OF BUSHNELL, IL (MC DONOUGH CO.)	500 0 1000 3010 FEET APPROXIMATE SCALE 7000	VIA REVISION AUGUST 20, 1976
	RIA FLOOD HAZARD BOUNDARY MAP No. H 01	
01		

# Data Development <-- --> Regulatory Mapping



**Flood Risk Review Meeting**

draft engineering model results and draft floodplain delineations



**End of Data Development**

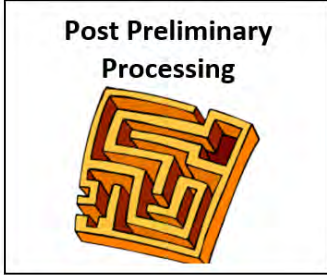
Resolve FRR comments  
If necessary, update the models/delineations/Db  
Issue FEMA "621" letter



**Preliminary Products**

Released as Preliminary Products (FIRM Db, FIRM Panels, FIS)

Plus PSOMA



**Final Products**

Released as Final Products - Pending (FIRM Db, FIRM Panels, FIS)

Plus FSOMA



**Effective Products**

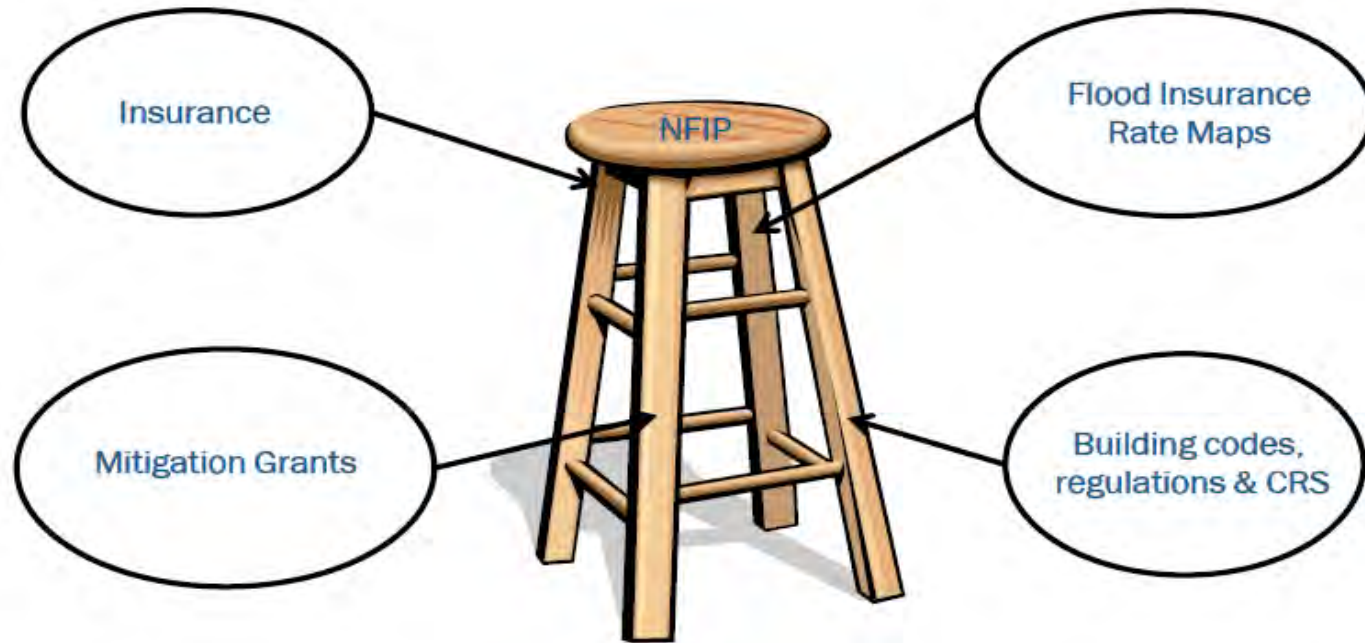
Previously released Final Products are Effective (FIRM Db, FIRM Panels, FIS)

Plus Revalidation Letters





# National Flood Insurance Program



- Insure homes and businesses against flood-related losses
- Identify and map flood hazards
- Mitigate to reduce flood impacts
- Adopt and enforce floodplain management regulations

# Project Scope

# What is a Special Flood Hazard Area?

The FEMA Special Flood Hazard Area (SFHA) represents areas mapped as having a 1% annual chance of being inundated by the base flood in any given year.

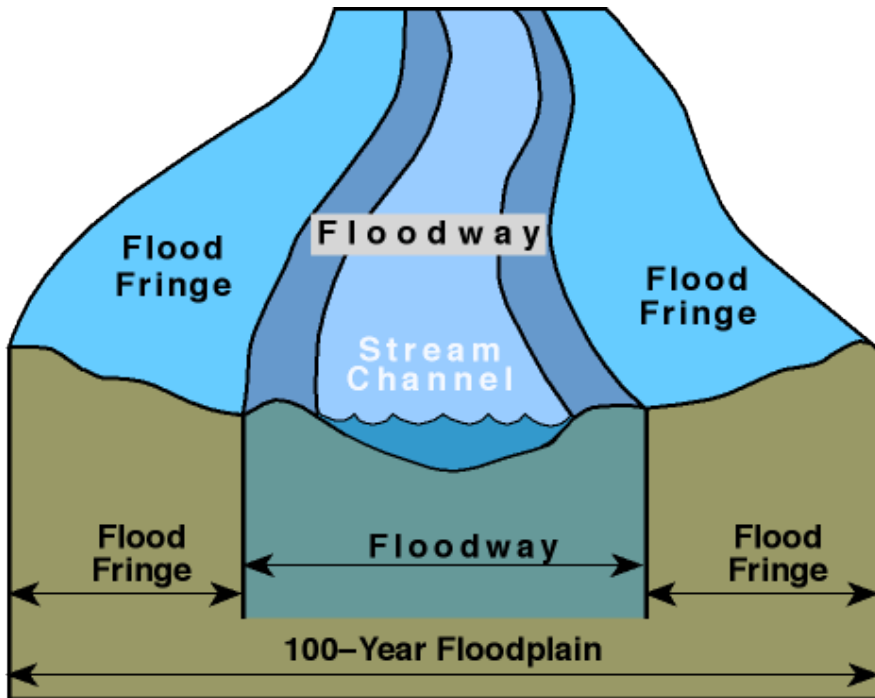
Riverine hydraulic analysis typically results in SFHA designation as Zone A or Zone AE, based on the analysis level deemed appropriate for the study area.

The Base Flood Elevation (BFE) is the elevation of surface water resulting from a flood that has a 1% chance of equaling or exceeding that level in any given year.

<b>Zone A</b>	Areas subject to inundation by the 1-percent-annual-chance flood event. <b>NO Base Flood Elevations are shown.</b>
<b>Zone AE</b>	Areas subject to inundation by the 1-percent-annual-chance flood event. <b>Base Flood Elevations ARE shown.</b>

# Floodway

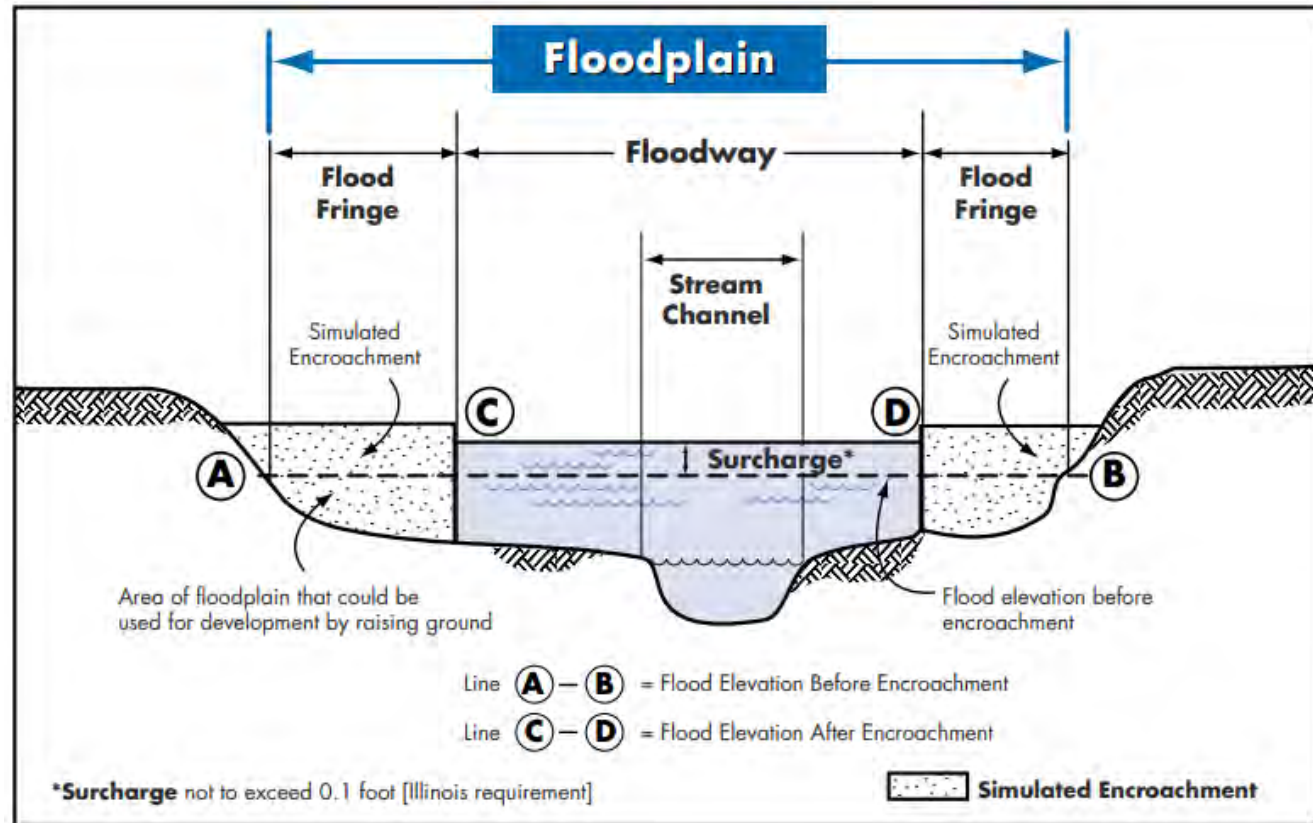
The **floodway** is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.



# Floodway

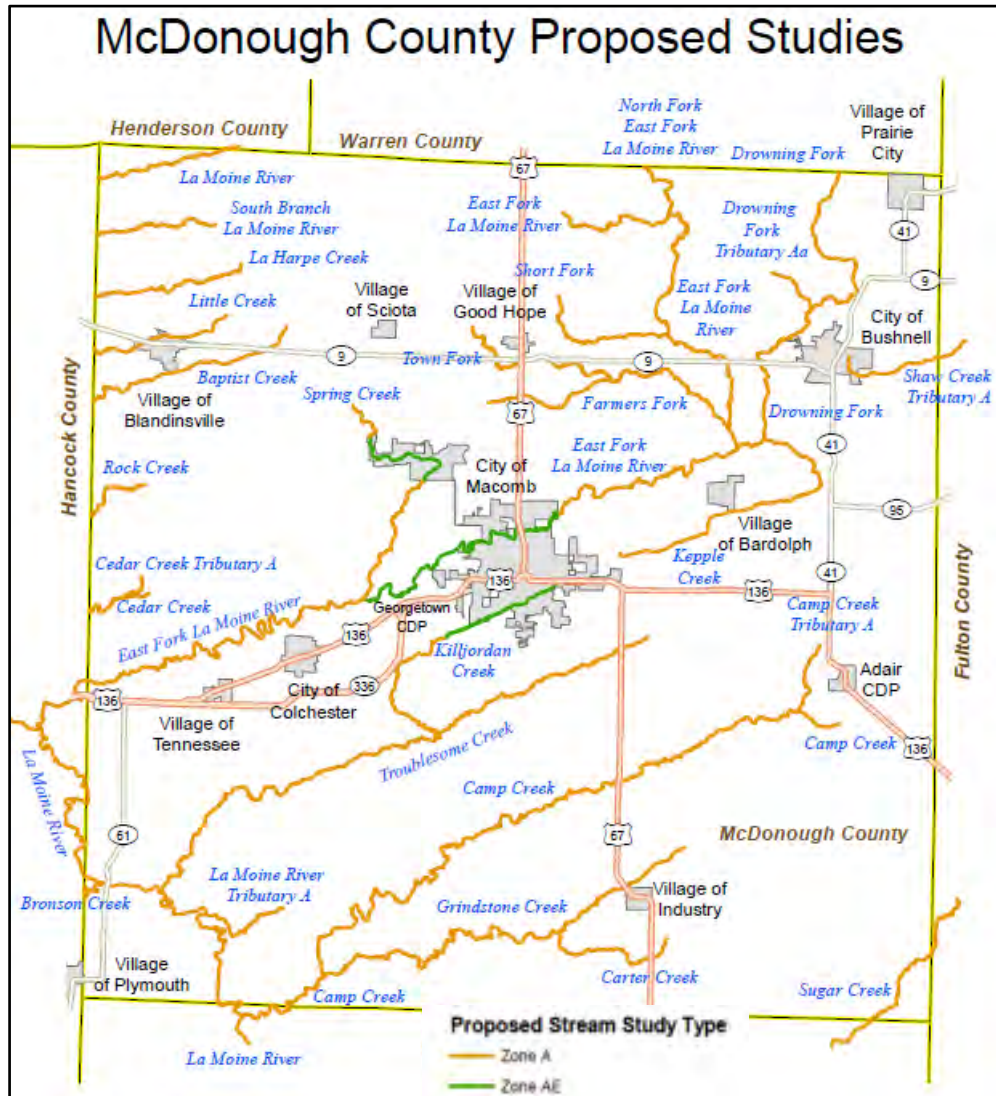
## Illinois Floodways are unique:

- 0.1-foot maximum surcharge
- Max 10% reduction is storage volume
- Max 10% increase in flow velocity



Credit: [https://www2.illinois.gov/dnr/WaterResources/Documents/Resman\\_ILFPMQuickGuide.pdf](https://www2.illinois.gov/dnr/WaterResources/Documents/Resman_ILFPMQuickGuide.pdf)

# Project Scope



## McDonough County Data Development Summary:

- 20.6 miles of **Zone AE** streams studied
- 251 miles of **Zone A** streams studied

# Project Milestones

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Project Initiation Community Coordination meeting October 13, 2020, via Zoom

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FEMA Standard ID 620 letters- emailed January 25, 2021; 30-day comment period

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Flood Risk Review Meeting (today)- with community 30-day comment period

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State Review and Approval

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Development of Digital Flood Insurance Rate Maps (DFIRMs)

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Release of Preliminary DFIRMs and Public Open House

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DFIRMs become Effective

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# Hydrology Study Methods



# Hydrology

## Annual Chance Flood Frequency Intervals required for FEMA

- For the Zone AE hydrology, HEC-HMS rainfall-runoff model studied the 10%, 4%, 2%, 1% (base flood), 0.2%, and 1%+ flow frequencies.
- For the Zone A hydrology USGS StreamStats was used to calculate the 10%, 4%, 2%, 1% (base flood), 0.2%, and 1%+ flow frequencies.

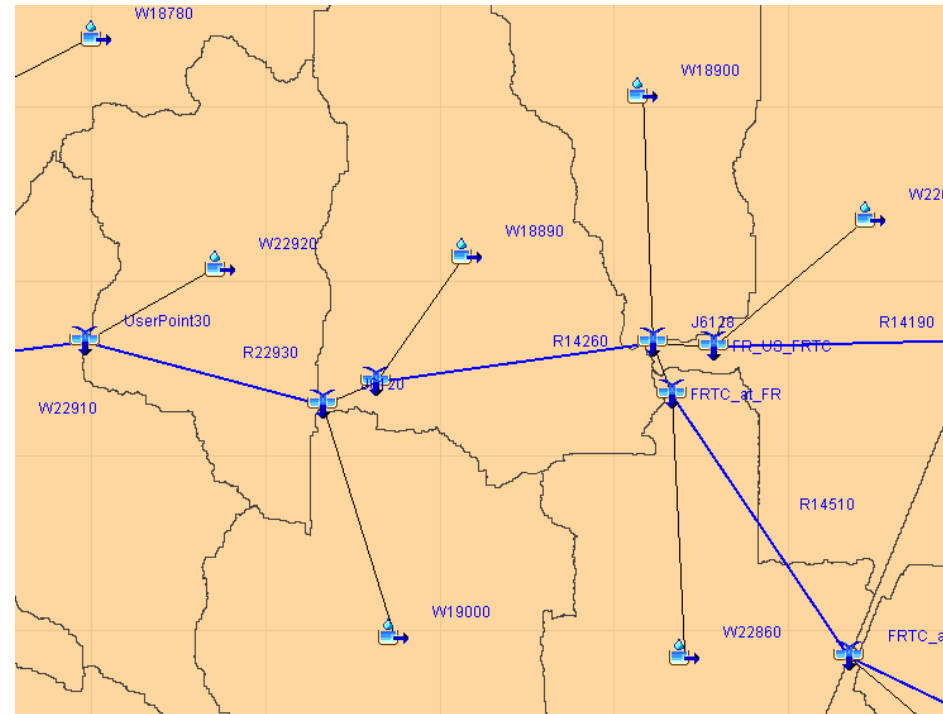


# Hydrology Study Methods

## HEC-HMS modeling used for Zone AE studies

### HMS model inputs are:

- 2012 LiDAR terrain data for subbasin delineation
- 2017 Land Use and 2018 Soils data for runoff parameters
- Updated Bulletin 70 (2019) – [Same as Bulletin 75 (2020)] Rainfall values with Huff Distribution (1990)

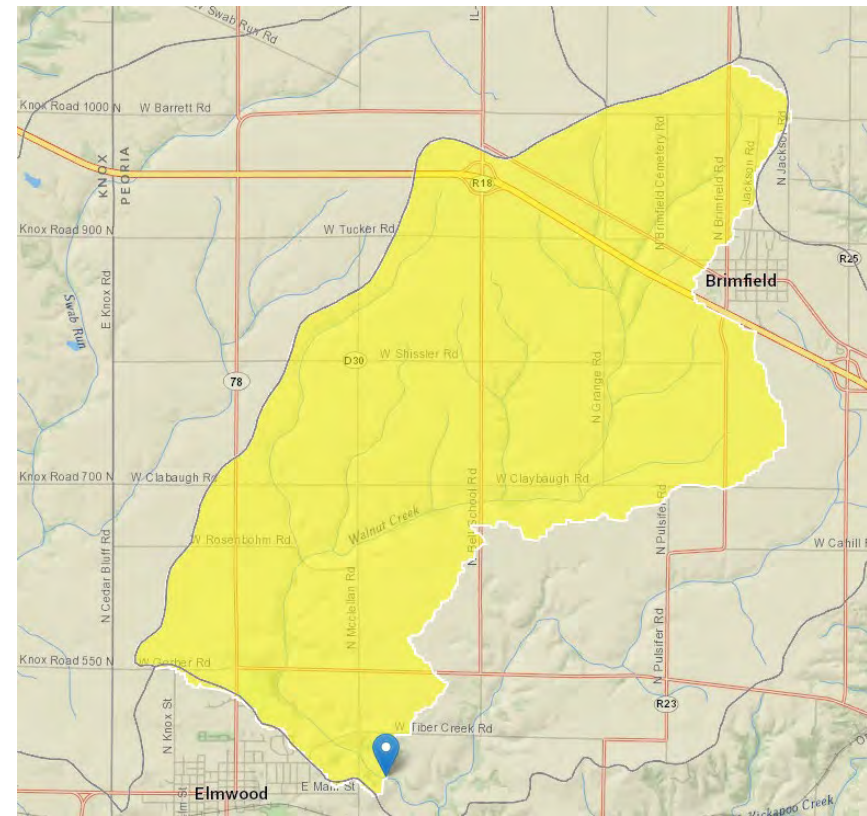


# Hydrology Study Methods

## USGS Regression Equations (Soong et al., 2004) used for Zone A studies

Regression equation for peak discharges in McDonough County are a function of:

- Total Drainage Area
- Main Channel Slope
- Basin Length



# Spring Lake

- Reservoir storage HEC-HMS



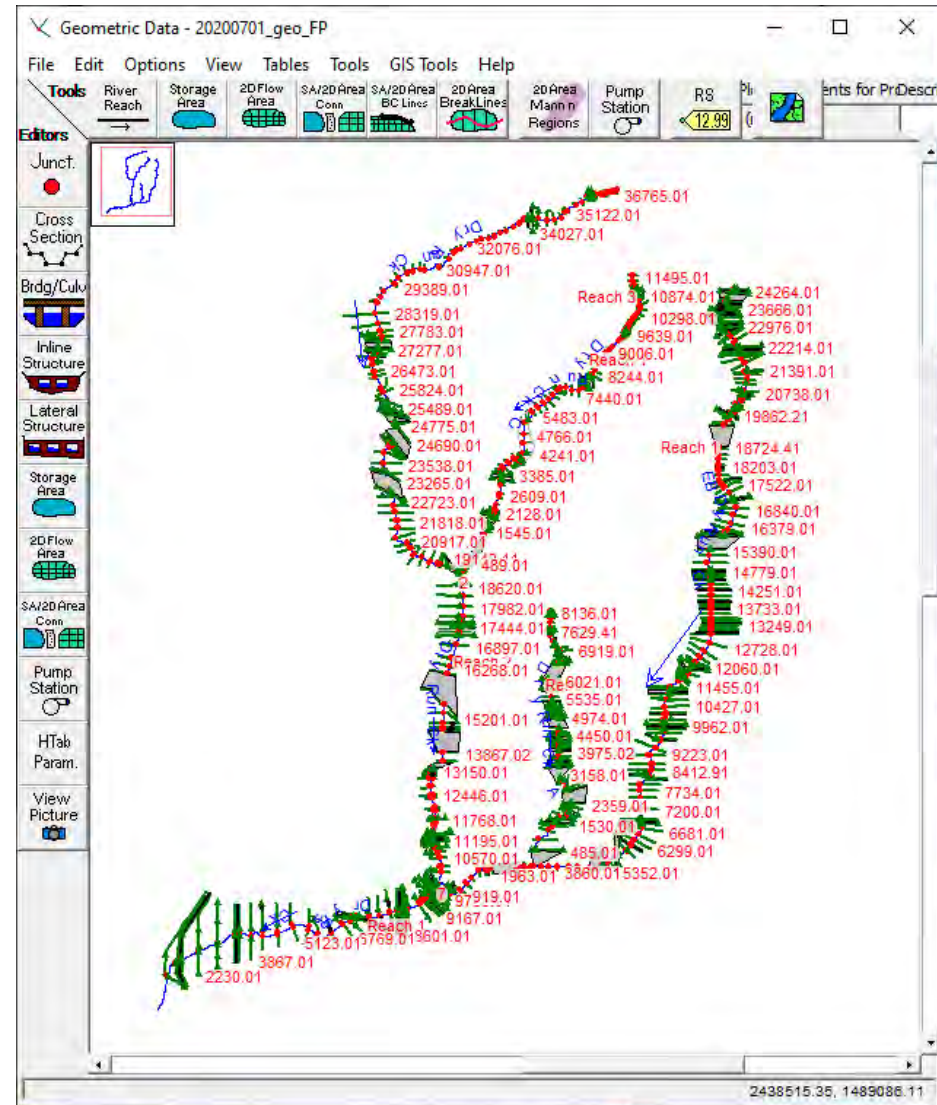
Principal Overflow Spillway looking northeast



# Hydraulic Study Methods

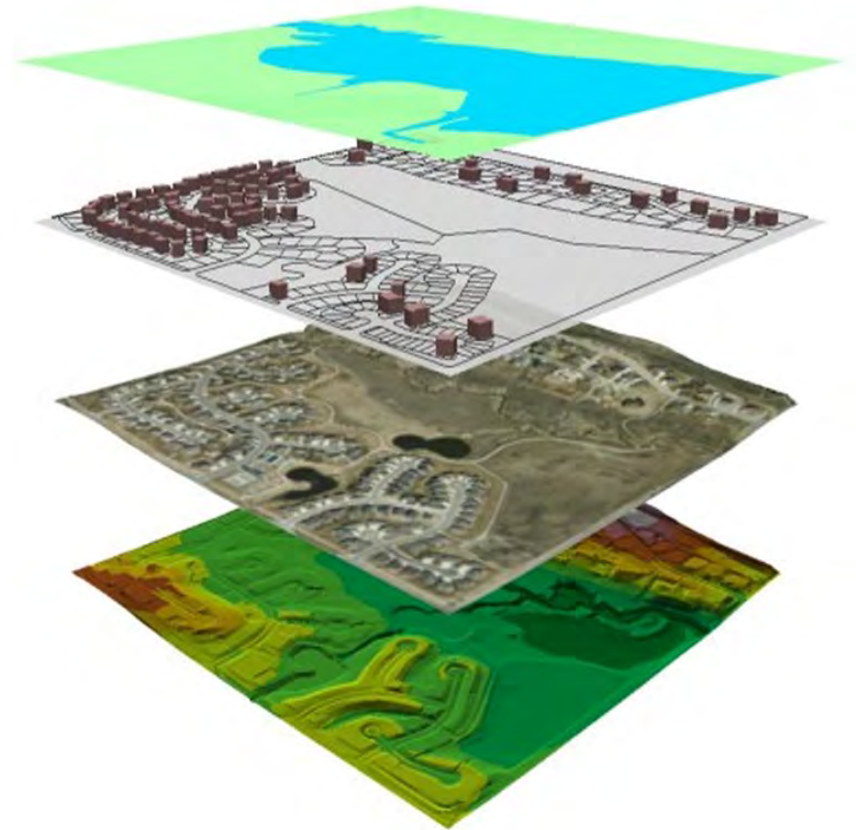
# Hydraulics

- Army Corps of Engineers Hydrologic Engineering Center River Analysis System (HEC-RAS)
- 1D Steady State Analysis (Modeling to all FEMA Standards, Technical References, and Guidelines)



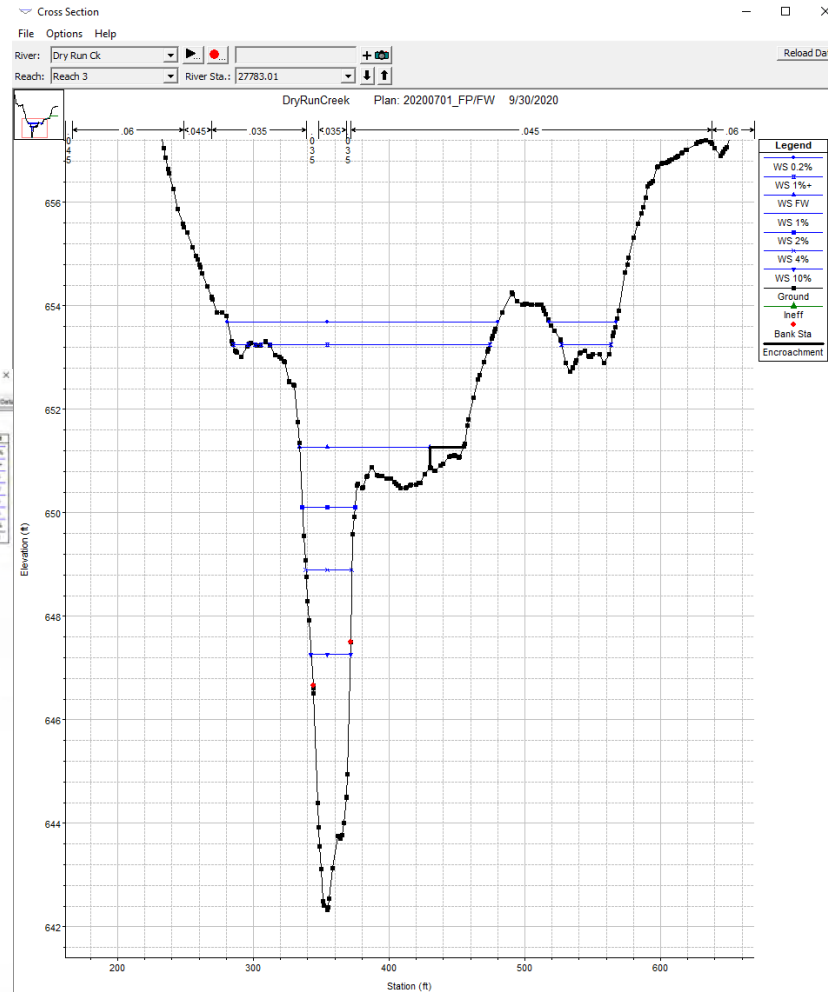
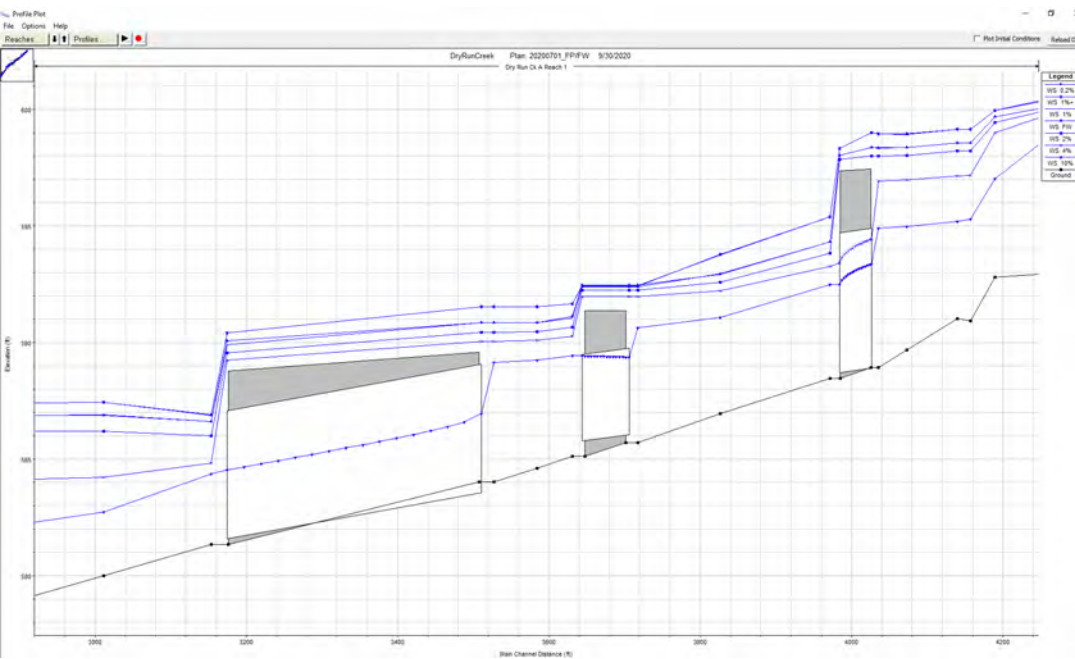
# Hydraulic Data

1. LiDAR – 2012
2. As-built Plans
3. Field Survey – Collected by IDNR- OWR
4. USGS - National Land Cover Database
5. Basemap Ortho Photos - 2017



# Hydraulics

- Water Surface Elevations
- Exported to GIS for mapping





# Hydraulics: Results

## Base Flood Elevation (BFE) Comparison

There are no effective Zone AE studies in McDonough County to compare the new BFE's to.

# April 2013 Flood Event (Wigwam Hollow Road)



# FLOOD OF 2013 HIGH WATER MARKS MACOMB, IL

Spring 2013 rains resulted in flooding of many streams and rivers in West Central Illinois including the LaMoine River in Macomb. Flooding resulted in road closures, home and business damage and near contamination of the City's water supply. The National Weather Service registered the stage height at 29 feet which broke the previous record of 27 feet in 1965.

LIDAR Data Courtesy of the Illinois Height Modernization Program (ILHMP)

Flood extents were approximated based on GPS high water marks

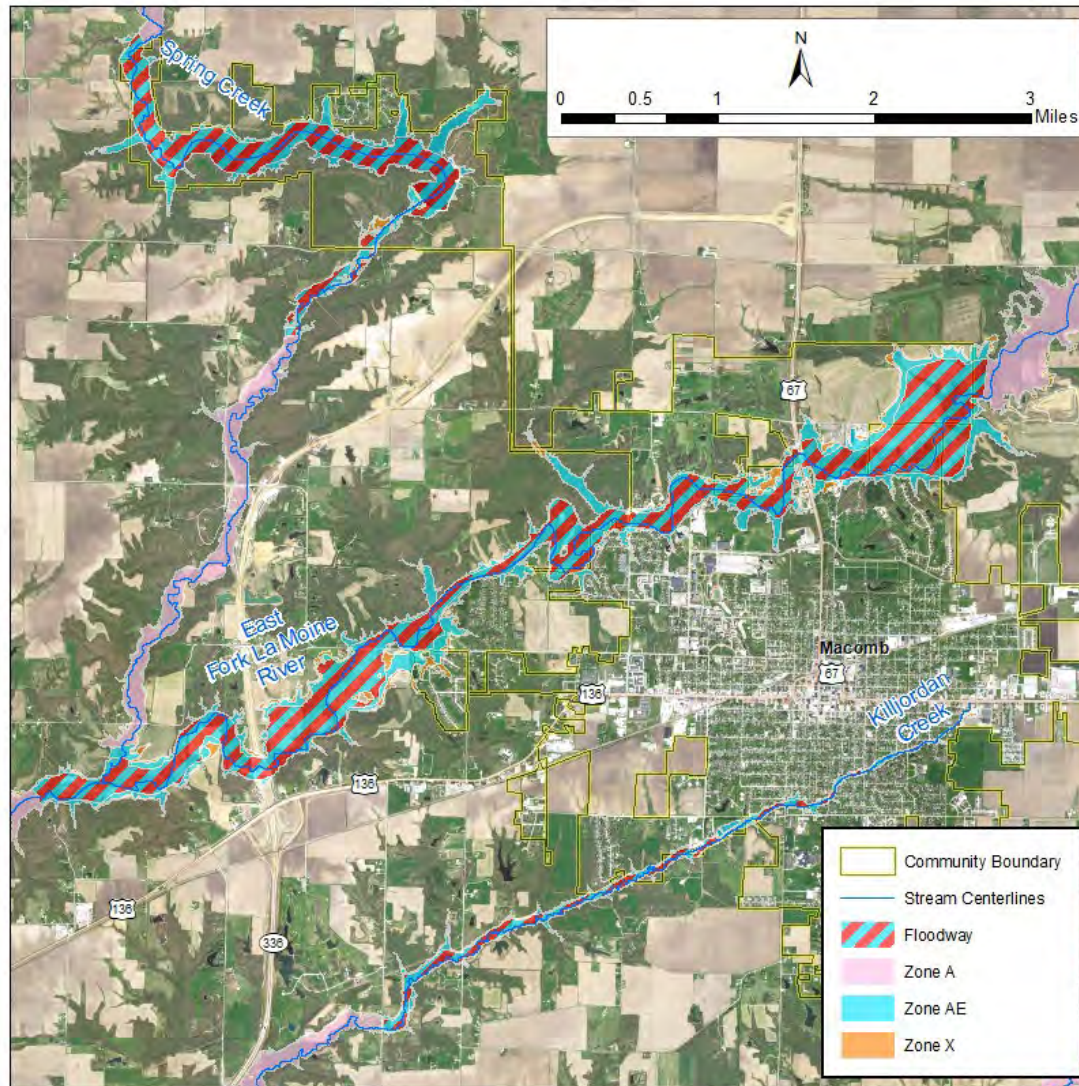


Presenters: Richard Ostrowski, Graduate Student; Ryan Trullinger, Graduate Student; Chad Sperry, Director, WIU GIS Center

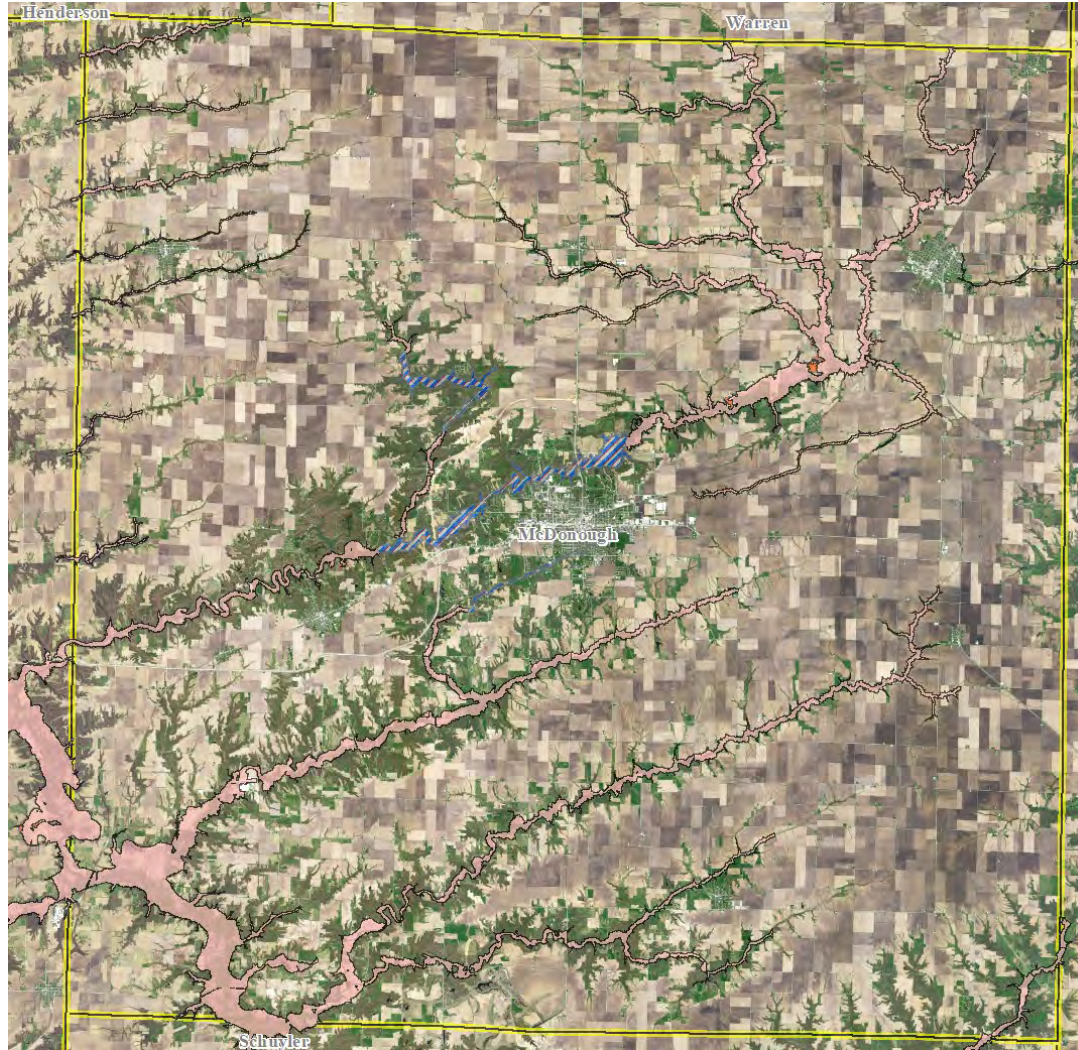
# 2013 Validation Event



# Proposed Zone AE Mapping

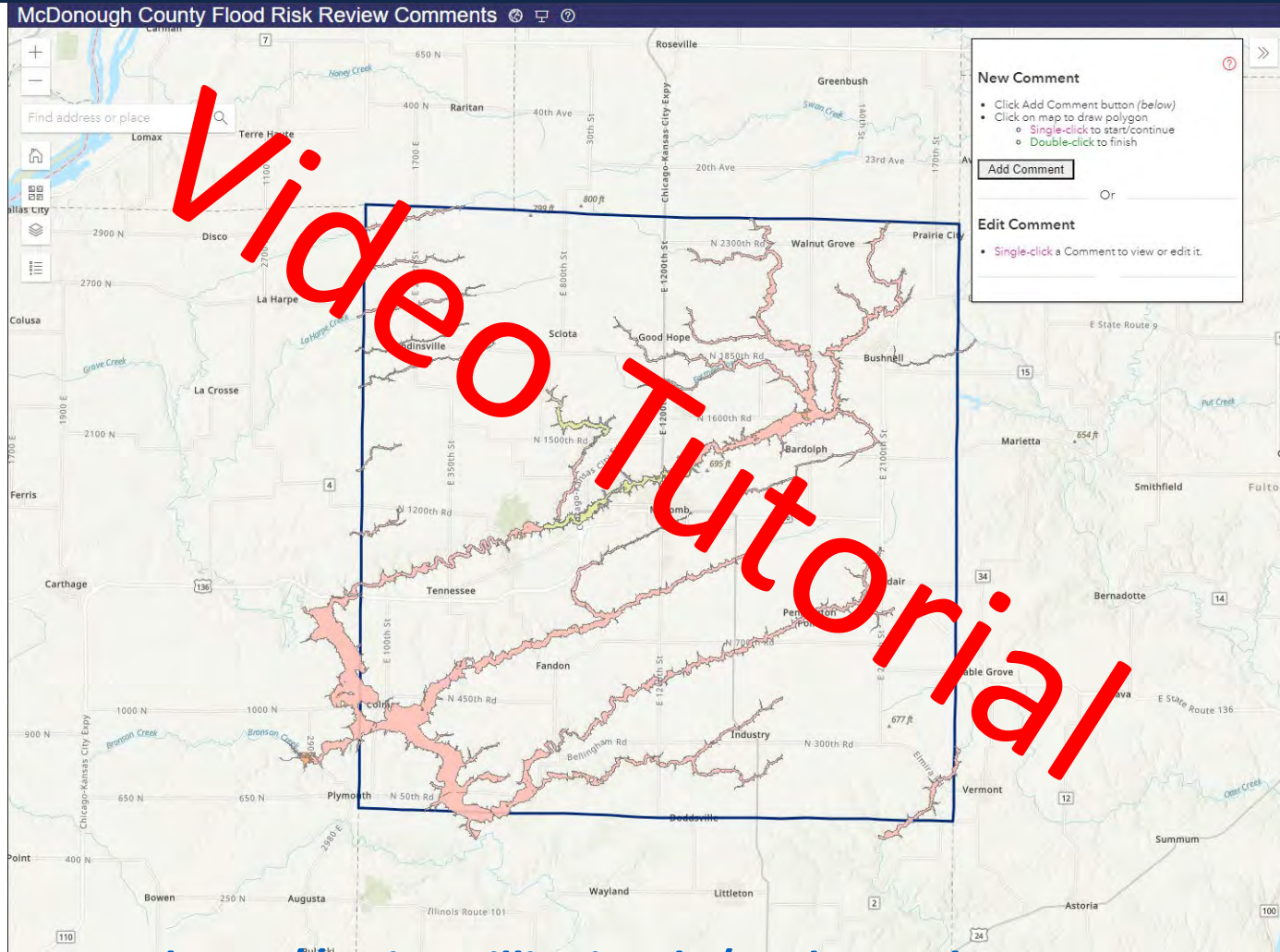


# Proposed Zone AE and A Mapping



Webmap

# Webmap Comment Feature



<https://go.isws.illinois.edu/mcdonough>

Password: watershed Log in: illinoisfloods!123



# Communication and Next Steps

# Communication Plan

Project Initiation Community Coordination meeting – virtual  
10/13/2020

Proposed Engineering Methods Notification (FEMA SID 620) letter-  
01/25/2021- email attachment

**Flood Risk Review Meeting (today)**

30-Day Comment Period starts today

Data Submission Notification (FEMA SID621) Letter

# Data Submission Notification Letter FEMA SID 621

Mailed to community CEO's

Informs the communities that the data collection and analysis (Data Development) phase of the project is concluding, and the FIRM database is being validated by FEMA

Gives Communities 30 days to comment on the data in the FIRM database  
30-Day Comment Period starts today

# Schedule

~~Project Initiation Community Coordination meeting –  
10/13/2020~~

~~ISWS to finish floodplain studies by Fall 2022~~

**Flood Risk Review Meeting (today); Comment period ending  
June 15, 2023**

Submit Flood Studies to IDNR for State review

Complete draft FIRM database to conclude data development  
phase of project by Fall 2023.

Digital Flood Insurance Rate Map Project to follow pending  
conclusion of data development

# Risk Communication and Mitigation Actions

# Hazard Mitigation- Declarations 1999 to present

<https://www.fema.gov/disaster/declarations>

Declaration	Date of Declaration	Disaster Description	Type of Assistance
DR-4489-IL	March 26, 2020	COVID-19 Pandemic	Individuals and Public
EM-3435-IL	March 13, 2020	COVID-19	Public Assistance
DR-4116-IL	May 10, 2013	Severe Storms, Straight-line Winds and Flooding	NA
DR-1960-IL	March 17, 2011	Severe Winter Storm and Snowstorm	Public Assistance
EM-3269-IL	December 29, 2006	Snow	Public Assistance
EM-3230-IL	September 7, 2005	Hurricane Katrina Evacuation	Public Assistance
DR-1469-IL	May 15, 2003	Severe Storms, Tornadoes and Flooding	Individual Assistance
DR-1416-IL	May 21, 2022	Severe Storms, Tornadoes and Flooding	Individual Assistance
EM-3161-IL	January 17, 2001	Severe Winter Storm	Public Assistance
EM-3134-IL	January 8, 1999	Winter Snowstorm	Public Assistance

# Hazard Mitigation

## Mitigation Actions with potential to virtually eliminate or significantly reduce impacts from flood hazards:

Purchase back up generators for government ops. during outages

Create new backup 911 Center

Harden essential buildings

Repair/reline sewer system to mitigate risk from flooding; improve storm sewer capacity

Construct retention basin

Repair drainage tiles and culverts to alleviate reoccurring flooding issues

## Mitigation Actions with potential to reduce impacts from flood hazards:

Educate resident about the NFIP and benefits of participating

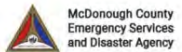
## McDonough County Multi-Jurisdictional All Hazards Mitigation Plan Update

McDonough County, Illinois

### Participants:

McDonough County  
Bardolph, Village of  
Bushnell, City of  
Colchester, City of  
Good Hope, Village of  
Industry, Village of  
Macomb, City of  
McDonough District Hospital  
Prairie City, Village of  
Western Illinois University

**March 2022**



The five year update of this Plan must be completed on or before September 20, 2027.

# Risk Communication and Mitigation Actions

## Floodsmart.gov

- Community Resources
  - Flood Maps
  - Cost of Flooding
  - What is Covered?
  - How to Reduce Your Costs
  - Tools

## FEMA.gov

- National Insurance Program (NFIP)
- Hazard Mitigation Planning
  - Mitigation Best Practices
  - Mitigation Planning and Grants
  - Regulations and Guidance



# Community Participation

# Community Impact

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## Why New Floodplain Map Can Affect a Community:

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Can affect which residents are required to carry flood insurance

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Depicts areas of communities which are subject to floodplain management regulations

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Can affect community planning and flood mitigation

# Community Participation



Now is the time to review the draft floodplain mapping for your community

Who is affected?

Is the mapping reasonable and/or consistent with your community's experience with flooding?

Make comments if something does not look right or make sense.

Provide data or information if it could support a change in the draft mapping

Ask questions.

**FLOOD RISK REVIEW MEETING MCDONOUGH COUNTY, ILLINOIS**

**MAY 18, 2023**

**POST-MEETING SURVEY**

1. **After this meeting how much more do you know about your community's flood risk?**
  - a lot
  - some
  - not much
  
2. **After this meeting how much do you know about FEMA Risk Mapping, Assessment and Planning (Risk MAP) process?**
  - a lot
  - some
  - not much
  
3. **Has this meeting provided new information and resources to help communicate flood risk to your community?**
  - yes
  - no
  
4. **Has this meeting helped you know where to go to get flood mitigation help?**
  - yes
  - no



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Questions?



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## Illinois State Water Survey

### PRAIRIE RESEARCH INSTITUTE

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[www.illinoisfloodmaps.org](http://www.illinoisfloodmaps.org)

# Additional Contacts

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Illinois NFIP Coordinator: Erin C. Conley, CFM

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