



ILLINOIS

Illinois State Water Survey

PRAIRIE RESEARCH INSTITUTE

Peoria County Flood Risk Review Meeting

December 9, 2022



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FEMA

FLOOD RISK REVIEW MEETING -PEORIA COUNTY, ILLINOIS

DECEMBER 9, 2022

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

Rollcall

Introduction

Project Objectives and Goals

Project Scope

Hydrologic Study Methods & Models

Hydraulic Study Methods, Models and LOMRs

Web Map Overview and Draft Floodplain Review

Communication and Estimated Schedule

Risk Communication & Mitigation

Community Participation and Open Discussion

Rollcall

Peoria County

Village of Bartonville*
Village of Bellevue
Village of Mapleton
City of Peoria*
Village of Peoria Heights*
City of West Peoria
Peoria County

Other Agencies

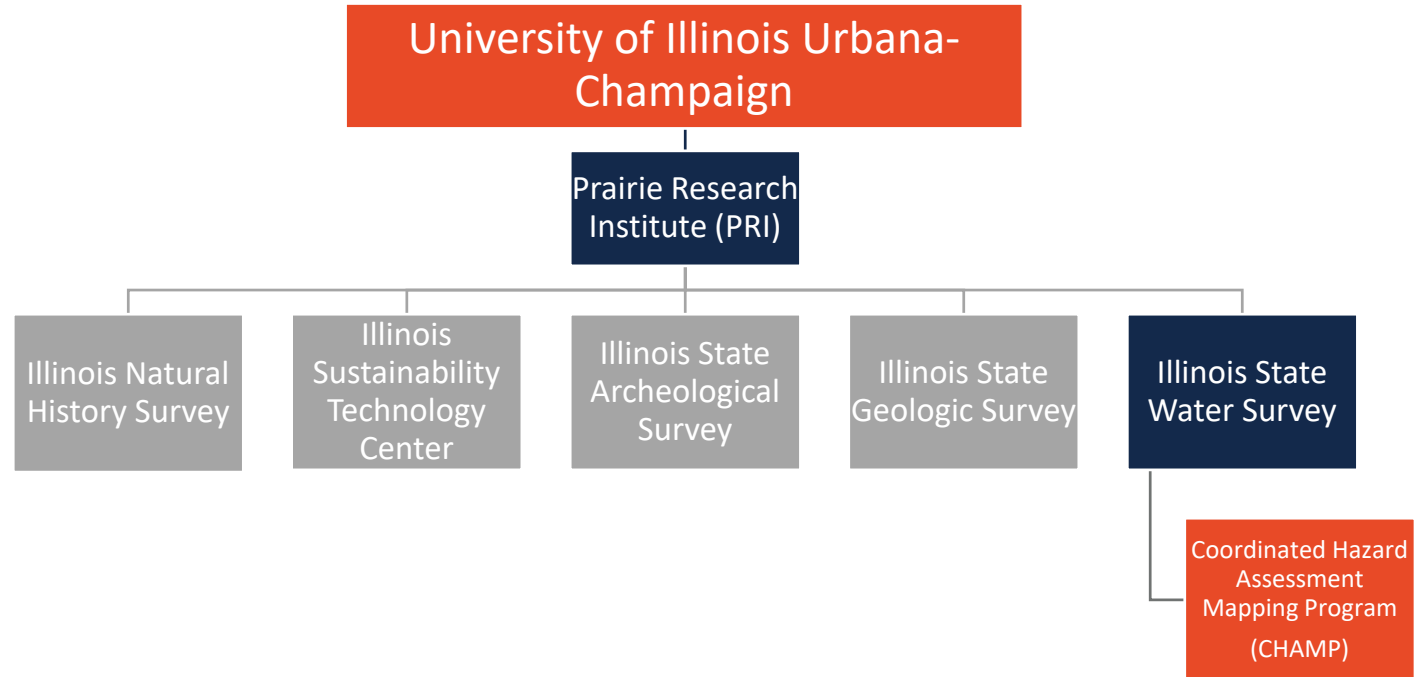
Other local stakeholders
FEMA
IDNR
IEMA
Other Agencies

* Participating in NFIP

Introduction

Introduction

Who We Are



I ILLINOIS
Illinois State Water Survey
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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)



The Cooperating
Technical Partners (CTP)
Program

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.

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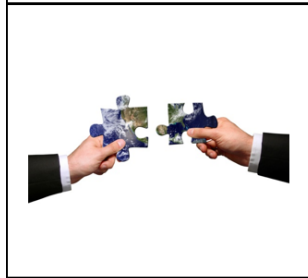
Project Goals and Objectives

Data Development <-- --> Regulatory Mapping



Flood Risk Review Meeting

draft engineering model results and draft floodplain delineations



End of Data Development

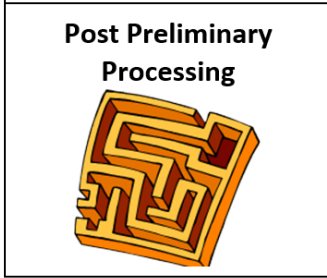
Resolve FRR comments
If necessary, update the models/delineations/Db
Issue FEMA "621" letter



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



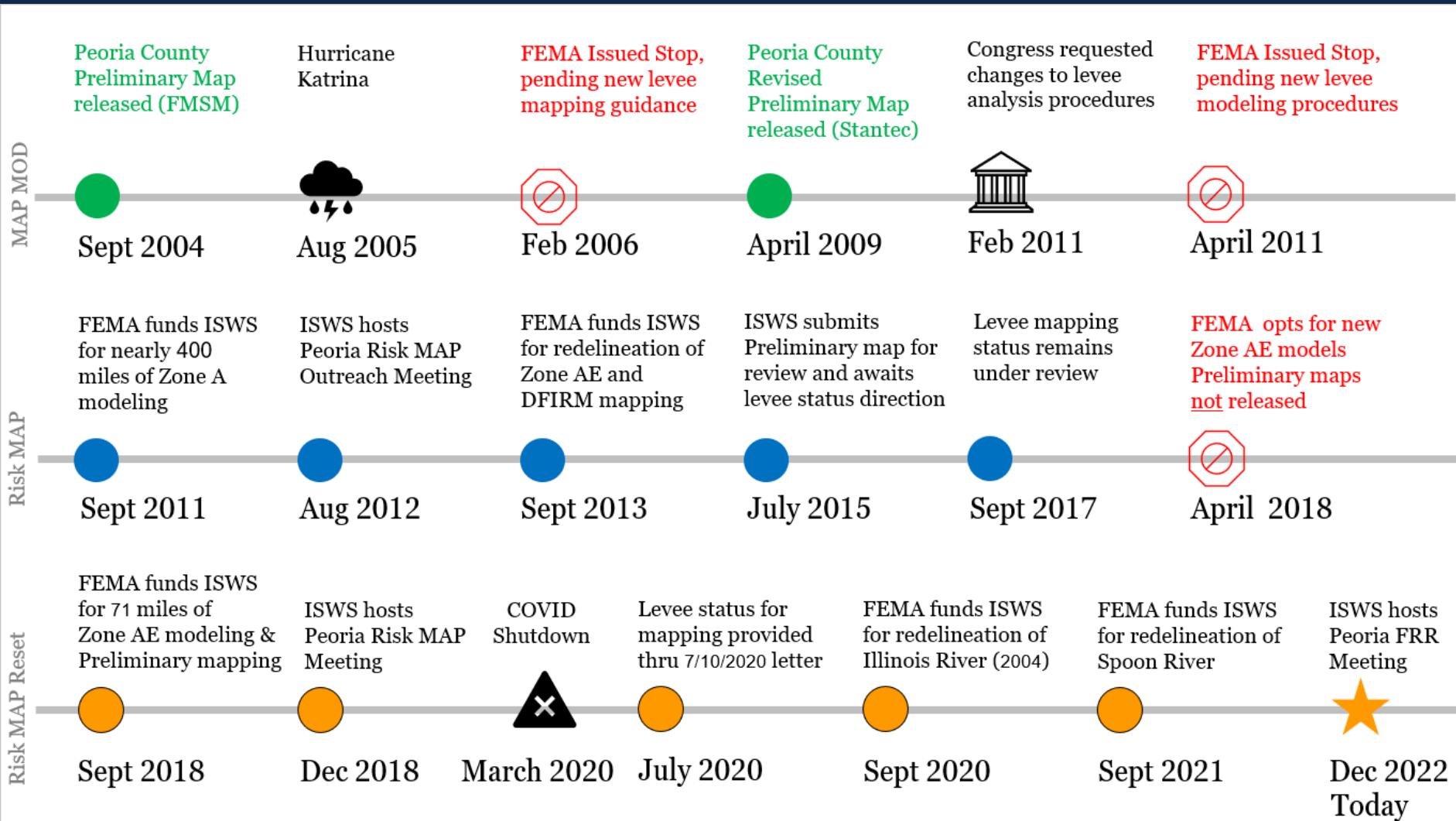
Effective Products

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

Plus Revalidation Letters



Peoria County- Project History



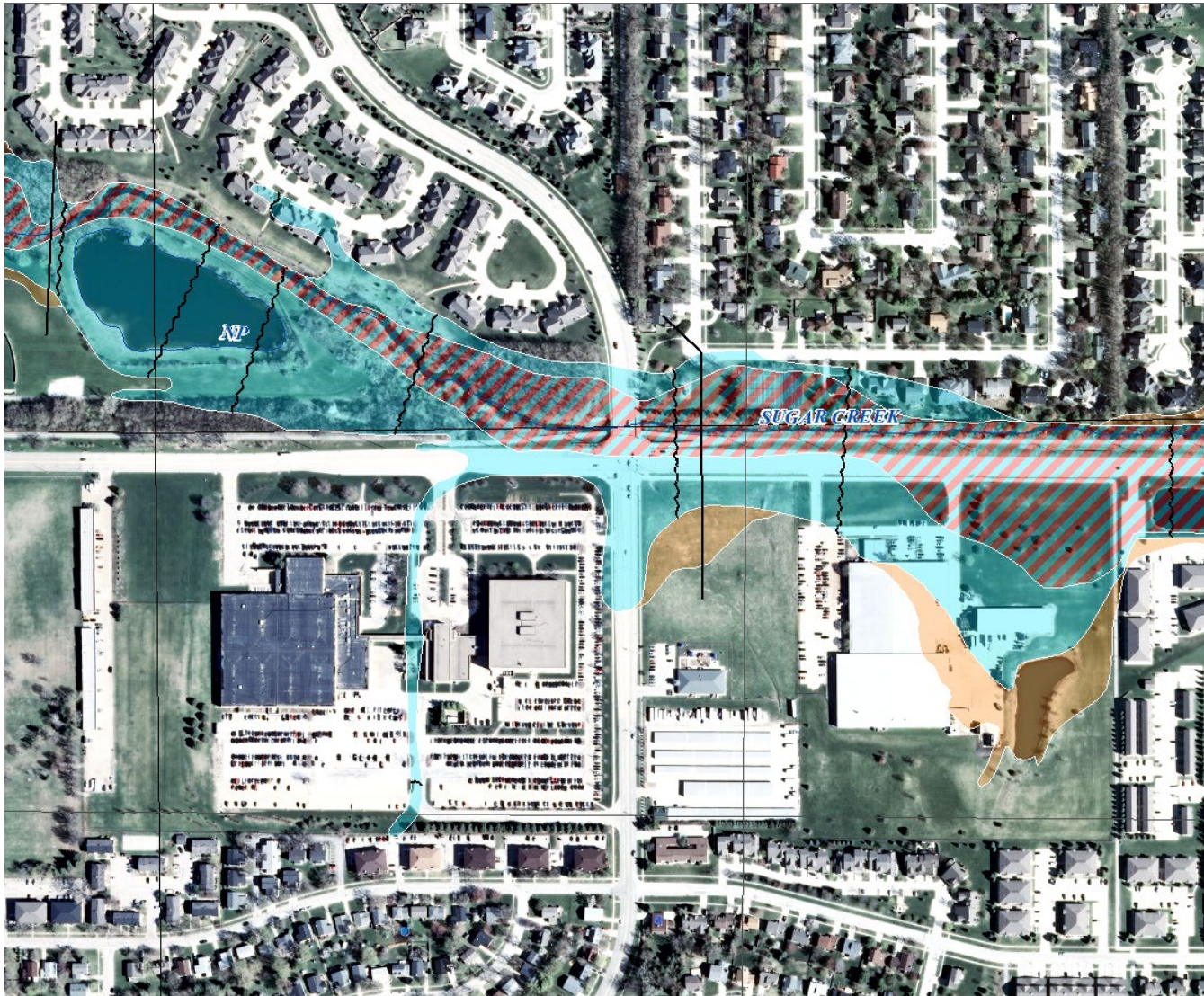
Peoria Co - Effective Map & FIS Dates

Community Name	Eff Map Date	Eff FIS Date	Comments
BARTONVILLE, VILLAGE OF	11/2/1983	5/2/1983	
BELLEVUE, VILLAGE OF			
BRIMFIELD, VILLAGE OF			
CHILLICOTHE, CITY OF	2/2/1977		
DUNLAP, VILLAGE OF			
ELMWOOD, CITY OF			
FARMINGTON ,CITY OF	2/4/2011		Multi County with Fulton County
GLASFORD, VILLAGE OF			
HANNA CITY, VILLAGE OF			
KINGSTON MINES, VILLAGE OF	11/16/1983	5/16/1983	
MAPLETON, VILLAGE OF	3/28/1975		FHBM (not FIRM)
NORWOOD, VILLAGE OF			
PEKIN, CITY OF	6/4/1980	Dec 1979	Multi County with Tazewell County
PEORIA, CITY OF	2/1/1980	Aug 1979	
PEORIA COUNTY	6/1/1983	12/1/1982	
PEORIA HEIGHTS, VILLAGE OF	11/1/1979	5/1/1979	Multi County with Tazewell & Woodford
PRINCEVILLE, VILLAGE OF			
WEST PEORIA, CITY OF	6/1/1983		Incorporated in 1993 Map date from Peoria Unincorporated Areas

Paper Map to Digital Map



Paper Map to Digital Map



Levee - Overview

FEMA does not design, build, inspect, operate, maintain, or certify levees. However, as administrator of the NFIP, FEMA is responsible for accurately identifying flood hazards and communicating those hazards and risks to affected stakeholders.

Levee - Definition

Per 44 CFR 59.1, a **levee** is a manmade structure, usually an earthen embankment, designed and constructed in accordance with sound engineering practices to contain, control, or divert the flow of water to reduce flood hazards posed by temporary flooding.

Levees - Certification

- **Certification** of analyses is a statement that the analyses have been performed correctly and in accordance with sound engineering practices.
- Certification of structural works is a statement that works are designed in accordance with sound engineering practices to provide risk reduction from the base flood.
- Certification of “as built” conditions is a statement that the structure(s) has been built according to the plans being certified and is in place and is fully functioning.
- Certification documentation is the responsibility of the local project sponsor.

Levee -Data

- A levee submittal must include detailed plans that describe the operation, maintenance, and emergency preparedness activities to be implemented.
- These plans must be officially adopted and be under the jurisdiction of Federal or State agencies, an agency created by Federal or State law, or an NFIP participating community.
- An officially adopted plan is a plan that is signed by the Chief Executive Officer (CEO) or highest elected official of the community or the appropriate head of the agency or entity that is accepting the ultimate responsibility for all the tasks and actions listed in those plans.
- All plans must be prepared for the specific levee system for which accreditation is being evaluated.

Levee – Compliance Review

- The review of the levee accreditation submittal is a compliance review.
- It is neither a technical review nor an evaluation of design, it also is not performed to determine how a levee will perform during a flood event.
- The incoming data supporting 44 CFR 65.10 requirements must be certified by a registered P.E., licensed by their respective states, or by a federal agency with responsibility for levee design.
- The compliance review is performed to ensure that all data demonstrating compliance with 44 CFR 65.10 is submitted, so FEMA can delineate the appropriate NFIP SFHA and zones on NFIP maps.

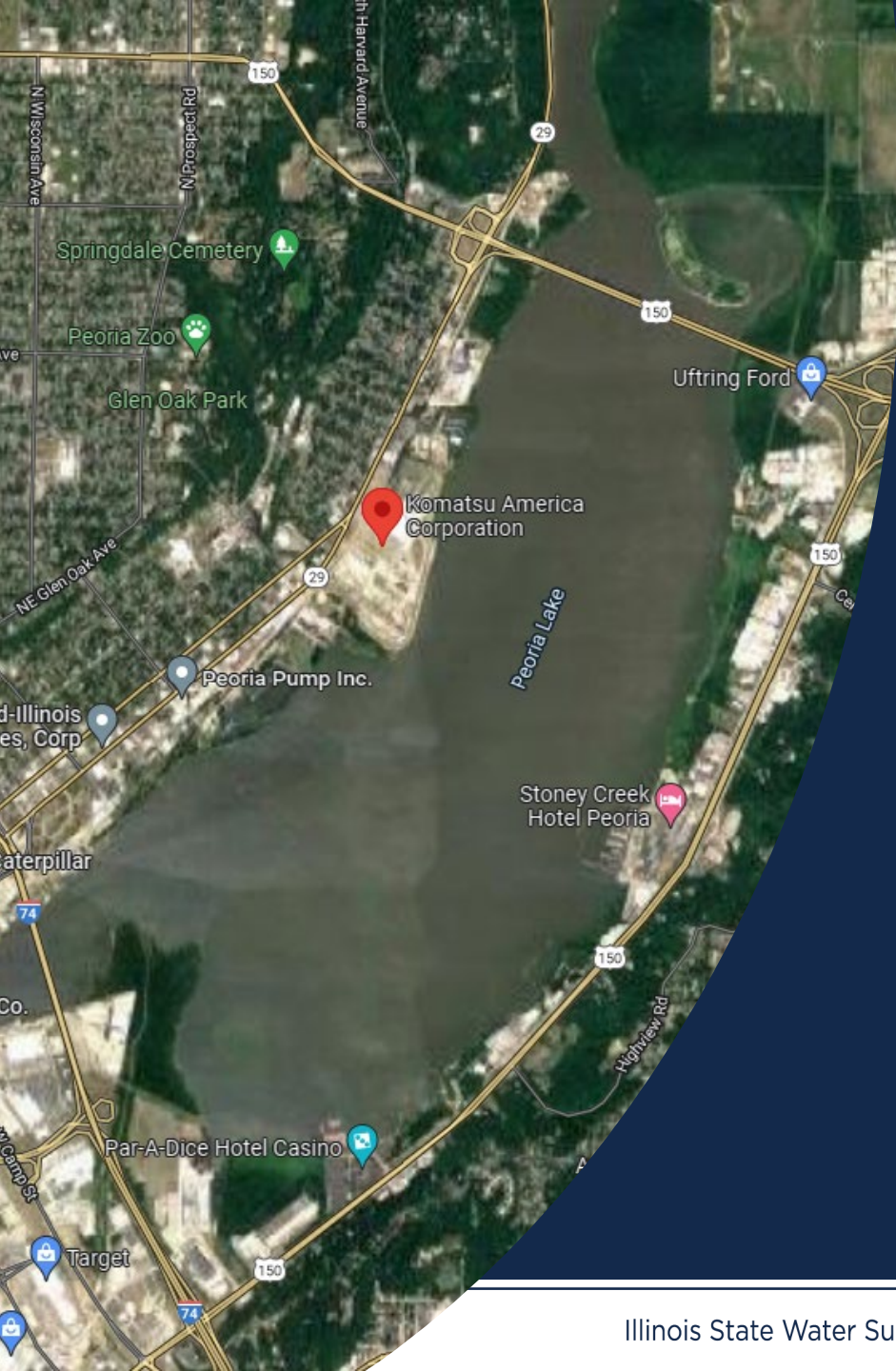
Levees - Accreditation

An **accredited levee system** is a system that FEMA has determined meets requirements of the NFIP regulations as cited in the Code of Federal Regulations (CFR) at Title 44, Chapter 1, Section 65.10 (44 CFR 65.10) and that FEMA has **recognized on a FIRM as reducing the flood hazards posed by a base (1-percent-annual-chance) flood.**

This determination is based on the submittal of data and documentation as required by 44 CFR 65.10. The area landward of an accredited levee system is shown as Zone X (shaded) on the FIRM except for areas of residual flooding, such as ponding areas, which are shown as SFHA.

Levees - Summary

- FEMA maps the flood hazards associated with levee systems based on information provided by others.
- This information can be submitted to FEMA at any time.
- A review is performed to ensure that all data demonstrating compliance is submitted, so that FEMA can delineate the appropriate SFHA and zones on the FIRM.
- A levee is accredited when FEMA has recognized it on a FIRM as reducing the flood hazards posed by the 1-percent-annual-chance flood.
- This can be achieved through a Physical Map Revision (PMR) or a Letter Of Map Revision (LOMR).



Peoria County Levees

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.

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

Vertical Datums

Datums are reference points from which other things are measured.

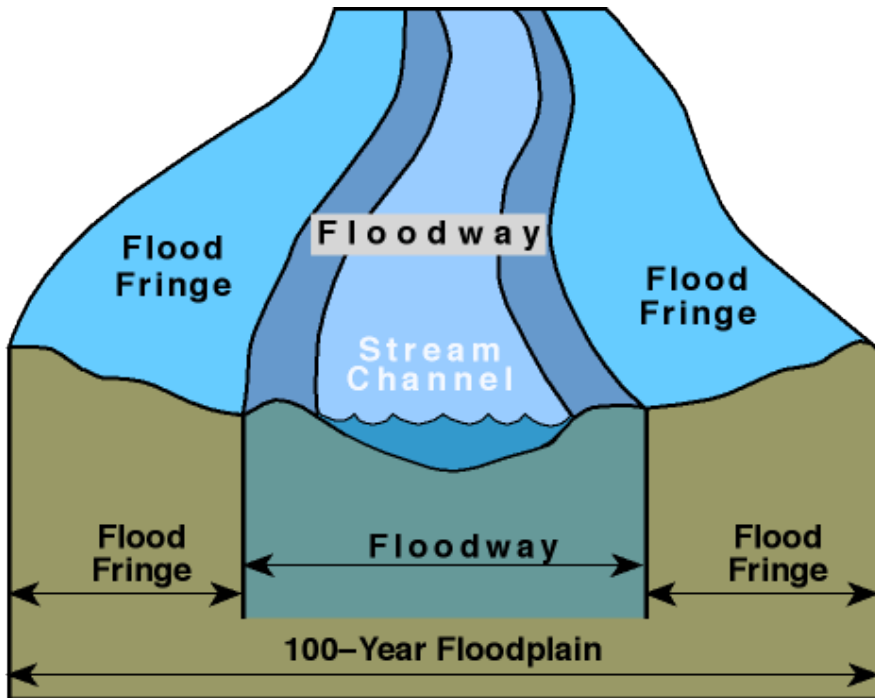
The effective FIRM maps for Peoria County use elevations that reference the National Geodetic Vertical Datum of 1929 (NGVD29)

The new studies and mapping prepared for this project references the North American Vertical Datum of 1988 (NAVD88)

The county averaged conversion from NGVD29 to NAVD88 in Peoria County is -0.3 feet.

Floodway

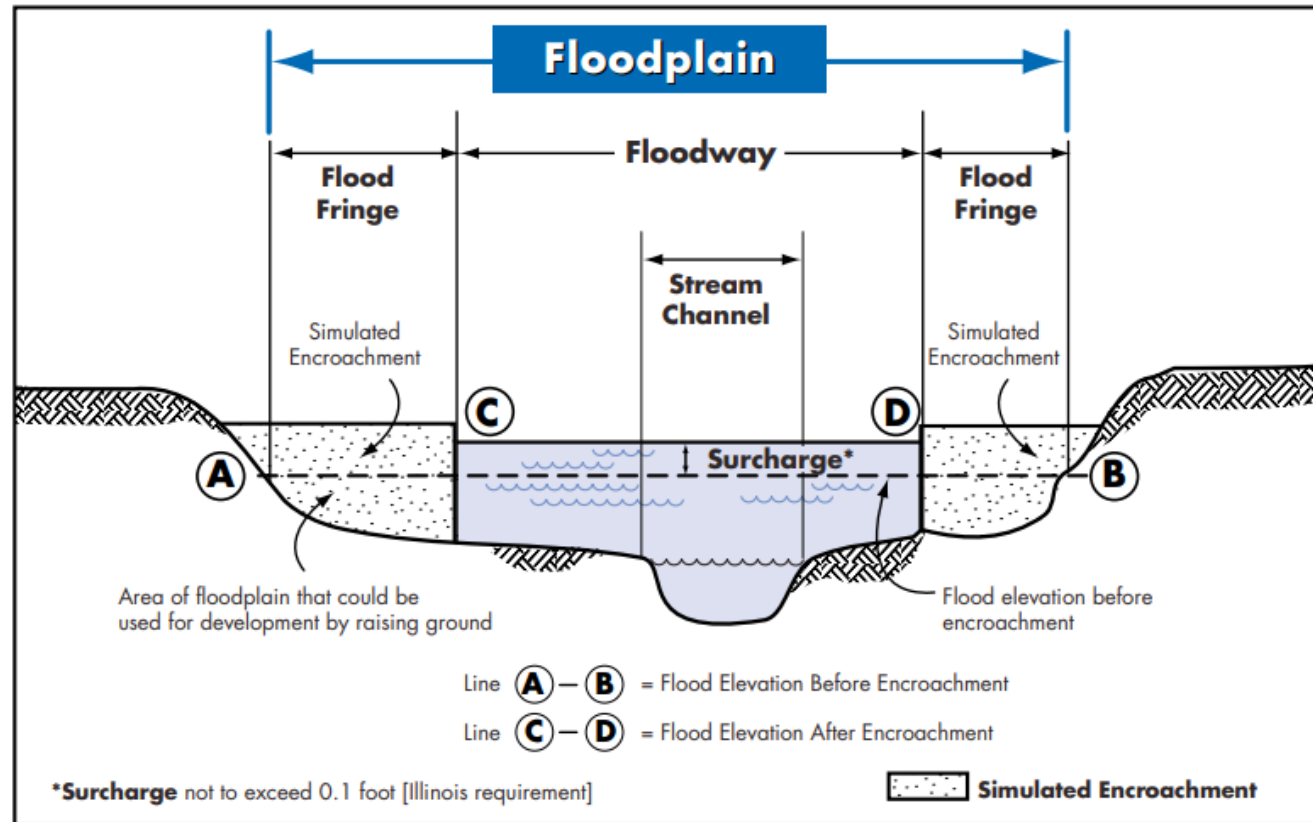
The **floodway** is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.



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

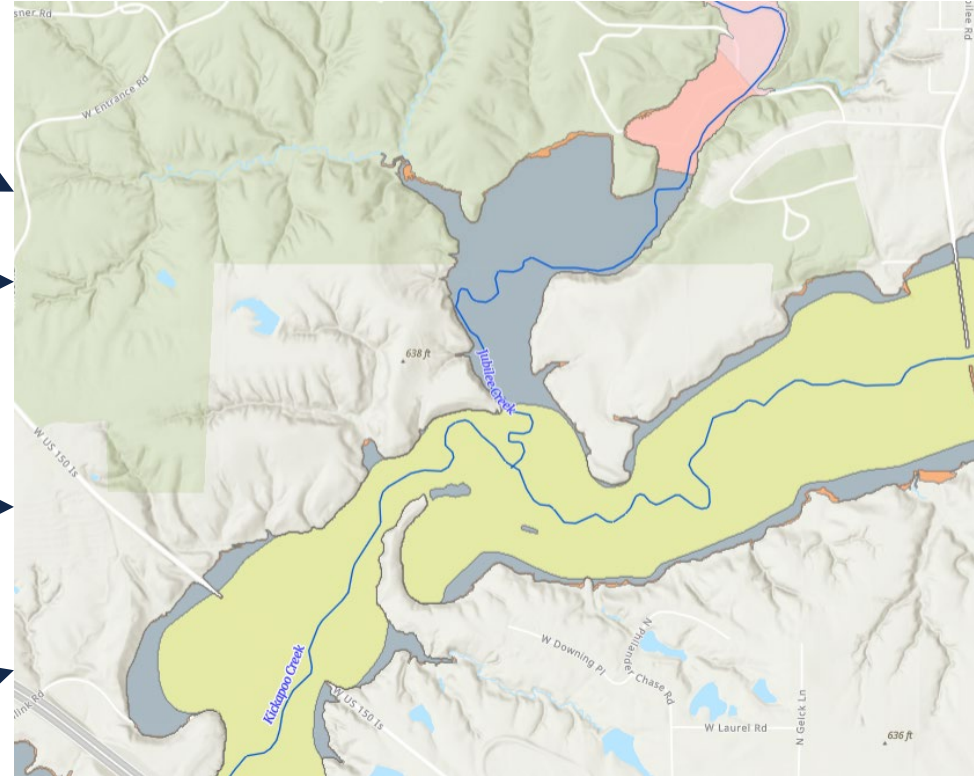
Project Scope

New Zone A Studies
(ISWS, 2011)

New Zone AE Studies
(ISWS, 2018)

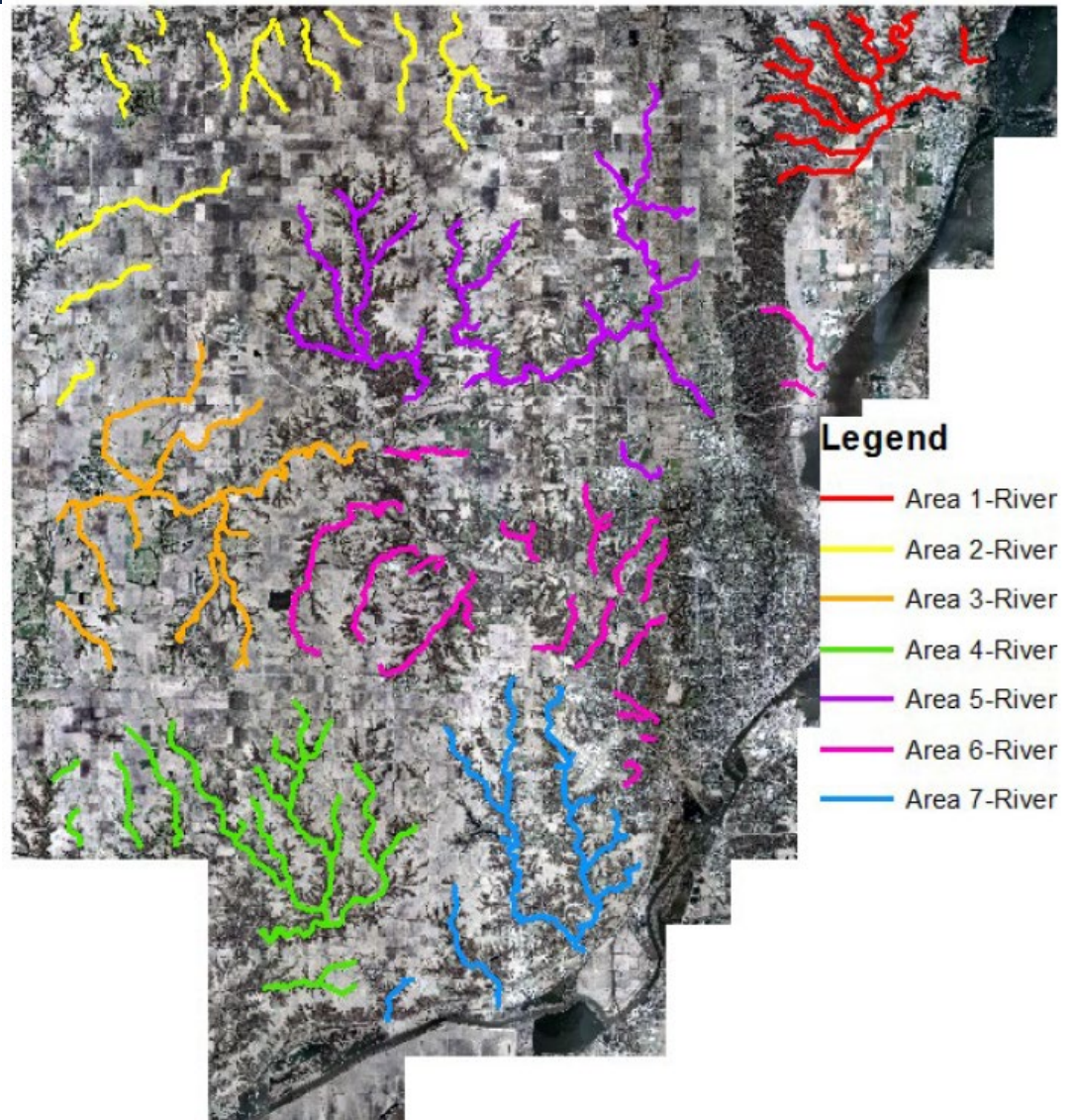
New Illinois River Study
(USACE, 2004/2005)

Letters of Map Revision
(LOMRs)



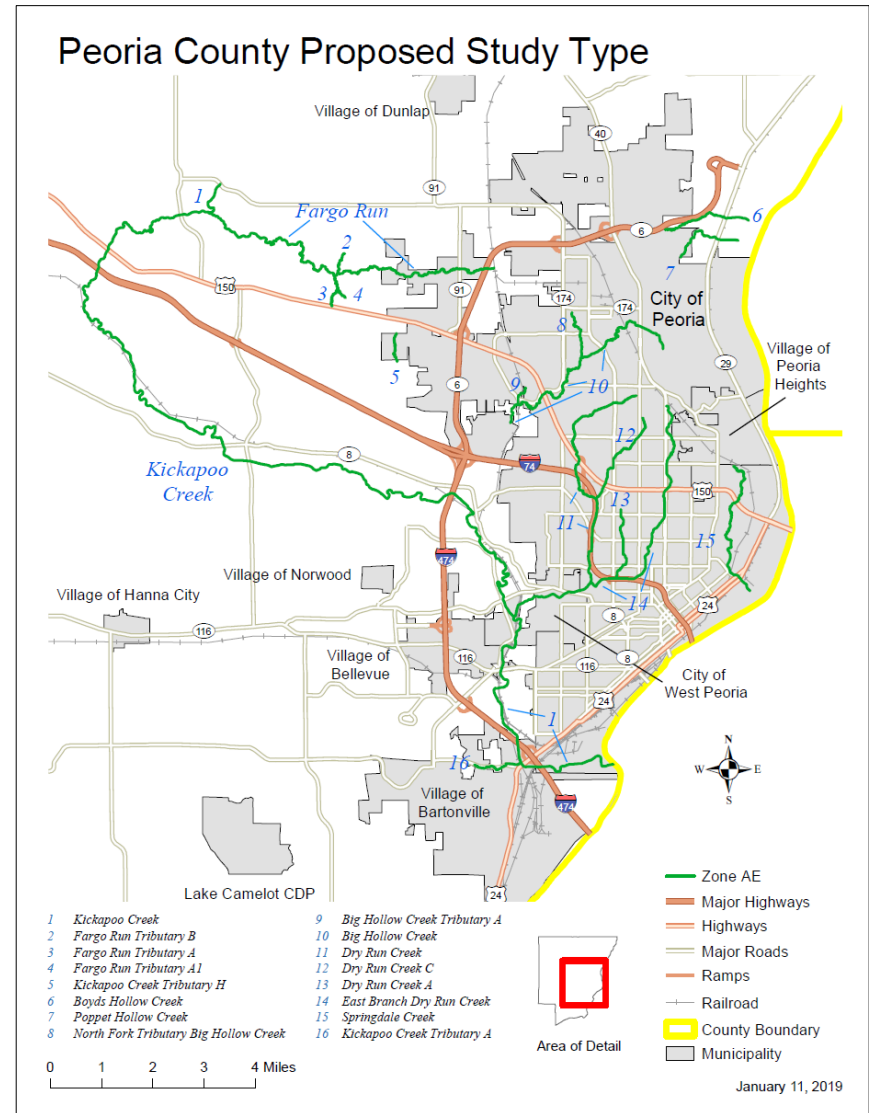
Project Scope

396 miles of Zone A streams were studied by ISWS.



Project Scope

71 miles of Zone AE streams were studied by ISWS.



Project Scope

46 miles of Zone AE floodplain and floodway delineated for the Illinois River based on Corps of Engineers study.

9 miles of Zone AE floodplain re-delineation for the Spoon River.

Stream Name Changes

Community	Old Name	New Name
City of Peoria	Unnamed Tributary to Big Hollow Creek	Big Hollow Creek Tributary A
City of Peoria Peoria County Unincorporated Areas	Unnamed Tributary to East Branch Dry Run Creek	East Branch Dry Run Creek Tributary A
Village of Bartonville Peoria County Unincorporated Areas	Unnamed Tributary B	East Branch Lamarsh Creek Tributary B
Village of Bartonville Peoria County Unincorporated Areas	La Marsh Creek Tributary	East Branch Lamarsh Creek Tributary C
Village of Bartonville Peoria County Unincorporated Areas	Unnamed Tributary to Kickapoo Creek	Kickapoo Creek Tributary A
City of Peoria Peoria County Unincorporated Areas	Unnamed Tributary to Kickapoo Creek	Kickapoo Creek Tributary H
City of Peoria Peoria County Unincorporated Areas	Unnamed Branch of Kickapoo Creek	Kickapoo Creek Tributary M
City of Peoria Peoria County Unincorporated Areas	Unnamed Tributary to Unnamed Tributary to Kickapoo Creek	Kickapoo Creek Tributary M1
Peoria County Unincorporated Areas	Unnamed Tributary	Spoon River Tributary A
Peoria County Unincorporated Areas	Unnamed Tributary	Spoon River Tributary D
Peoria County Unincorporated Areas	Unnamed Tributary	Spoon River Tributary E
Peoria County Unincorporated Areas	Unnamed Tributary	Spoon River Tributary E1
Peoria County Unincorporated Areas	Unnamed Tributary	Spoon River Tributary H

Project Milestones

Outreach meeting December 4, 2018, in City of Peoria

Flood Risk Review Meeting (today)

Community Comment Period (30 Days) – We are extending this to over 50 days for this project

State Review and Approval

Development of Digital Flood Insurance Rate Maps (DFIRMs)

Release of Preliminary DFIRMs and Public Open House

DFIRMs become Effective (Future Project Phase)

Hydrology Study Methods

Hydrology Study Methods

3 Hydrology methods were used in Peoria County

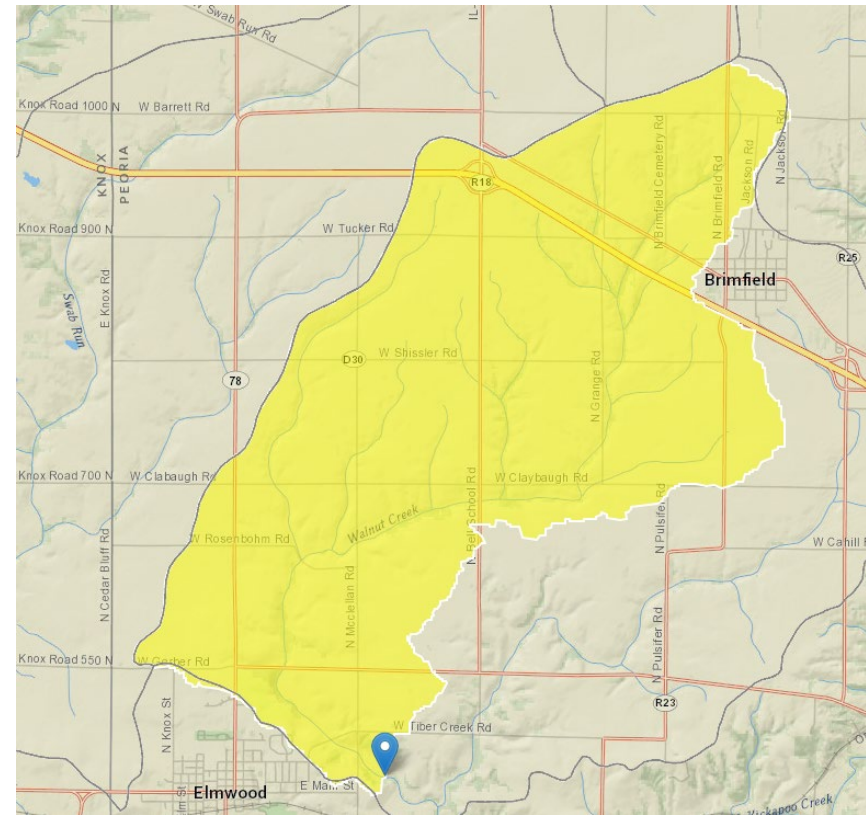
- Zone A Flood Studies used USGS Regression Equations (Soong et al., 2004) through StreamStats batch processor.
- Zone AE Flood Studies used HEC-HMS modeling
- Kickapoo Creek was studied using both Stream Gage Analysis and HEC-HMS modeling. Flows from HEC-HMS modeling were selected for the final analysis.

Hydrology Study Methods

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

Regression equation for peak flows in Peoria County are a function of:

- Total Drainage Area
- Main Channel Slope
- Basin Length

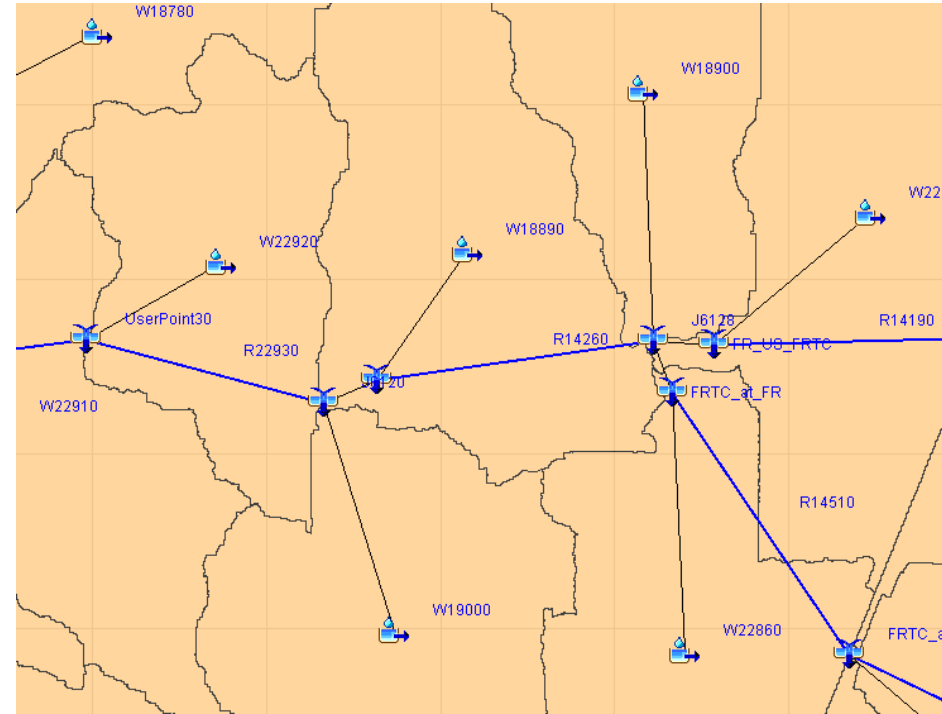


Hydrology Study Methods

HEC-HMS modeling used for Zone AE studies

HMS model uses:

- 2011/2012 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)

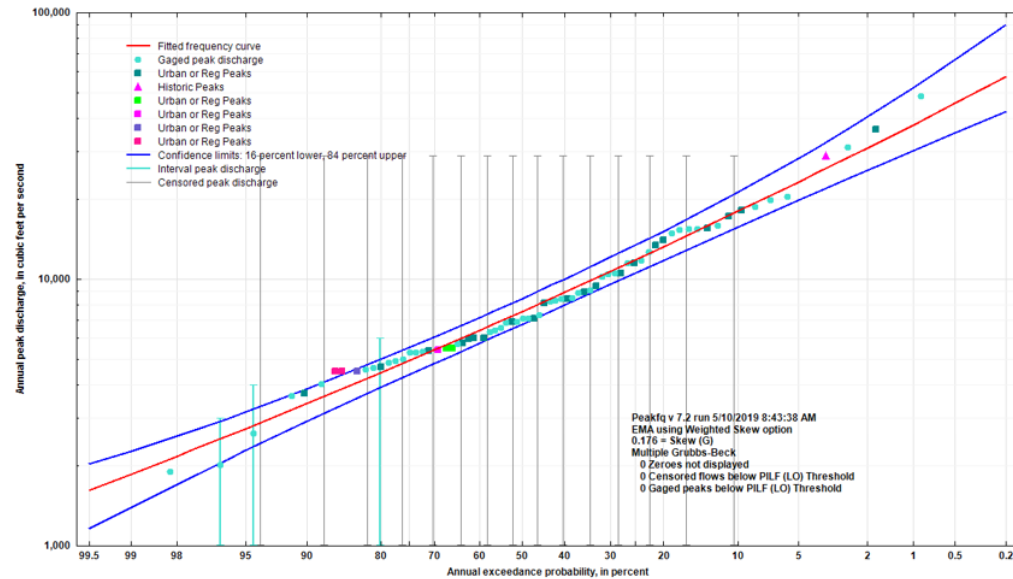


Hydrology Study Methods

Stream Gage Analysis was considered for Kickapoo Creek

Gage Analysis based on:

- Gage 05563000 near Kickapoo, IL (71 years of record)
- Gage 05563500 at Peoria, IL (76 years of record)



Hydrology Study Methods

The Illinois River was restudied by USACE and published in 2004. Flows were based on gage analysis from flows recorded between 1940 and 1998.

For more information about the hydrology methods used for the Illinois River, refer to the Upper Mississippi Flood Frequency Study

<https://www.mvr.usace.army.mil/Missions/Flood-Risk-Management/Upper-Mississippi-Flow-Frequency-Study/>

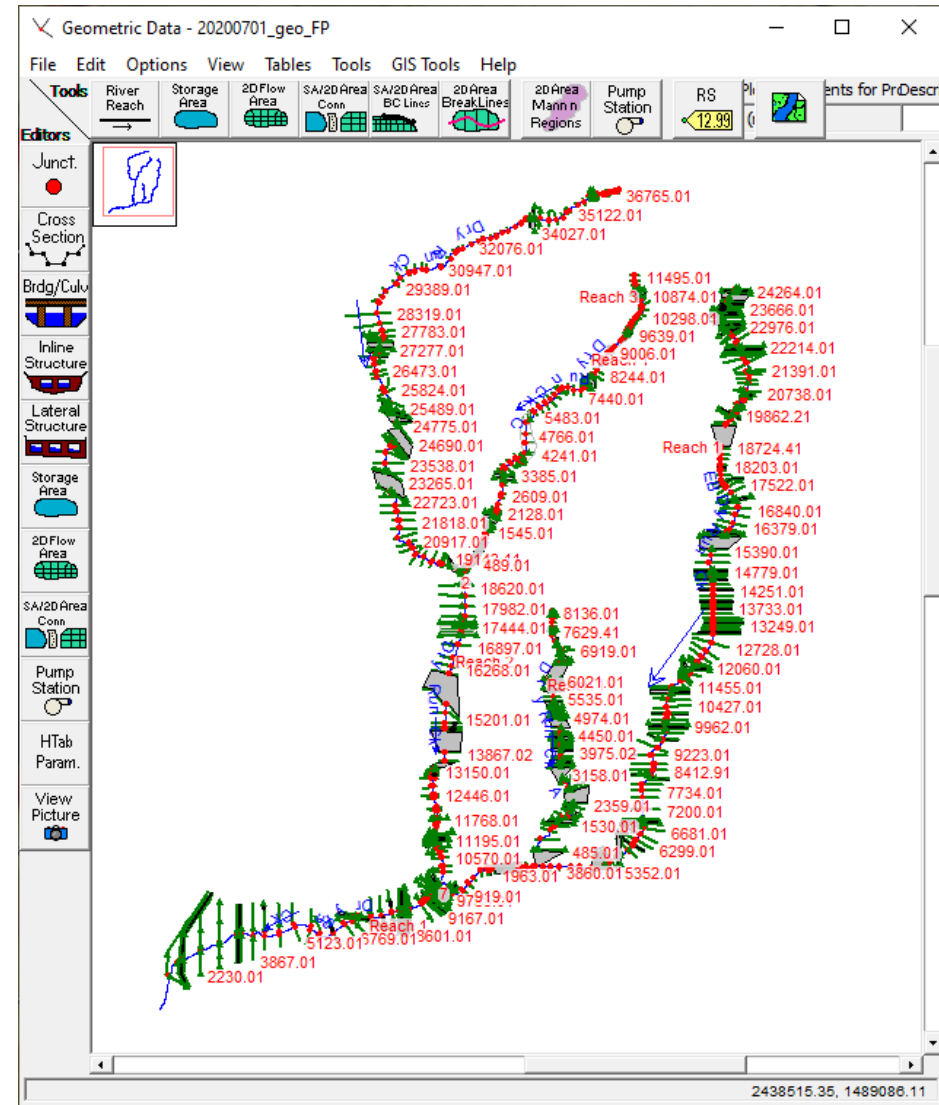
Hydrology Study Methods

- For the Zone A floodplain studies funded in 2011 only the 1% (base flood) annual chance peak flow was calculated
- For the Zone AE studies funded in 2018, the 10%, 4%, 2%, 1% (base flood), 0.2%, and 1%+ flow frequencies were calculated
- For the Illinois River, the 10%, 2%, 1% (base flood), and 0.2% flow frequencies were calculated

Hydraulic Study Methods

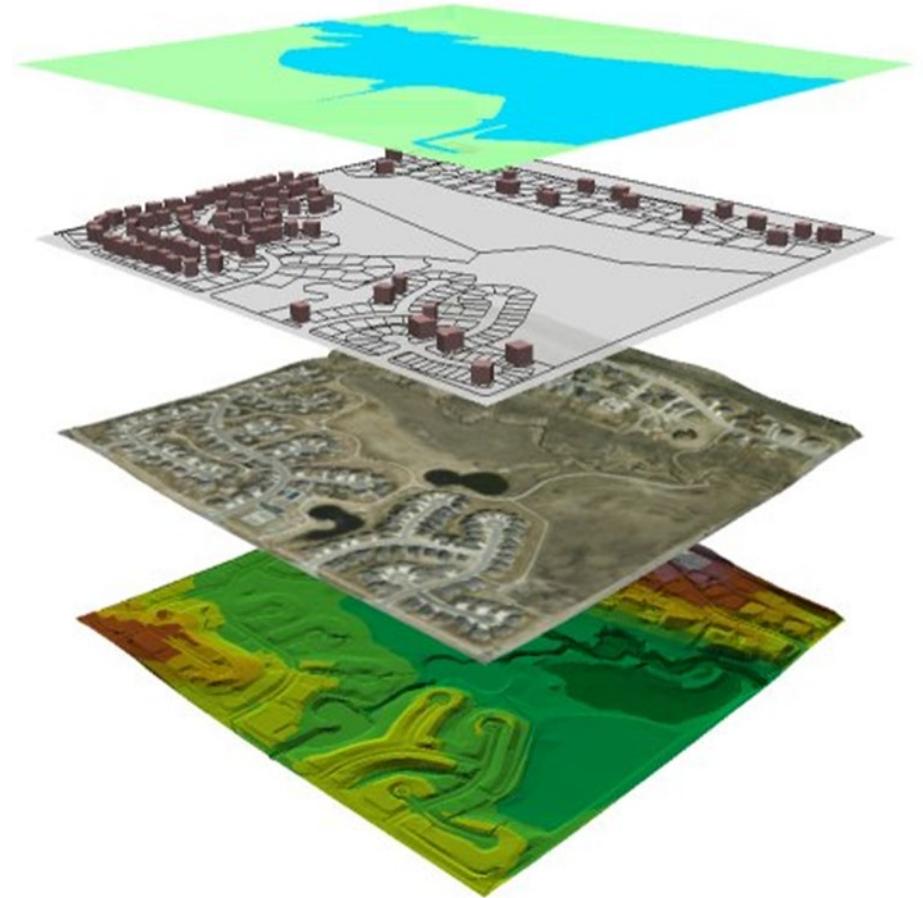
Hydraulics

- 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)



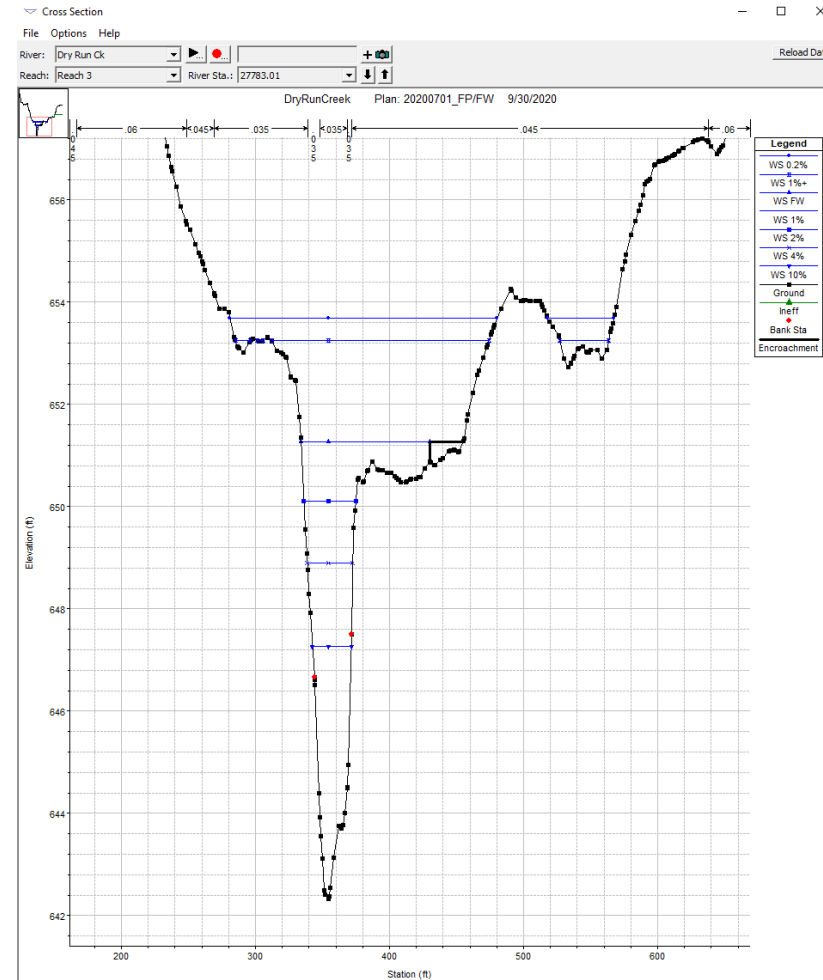
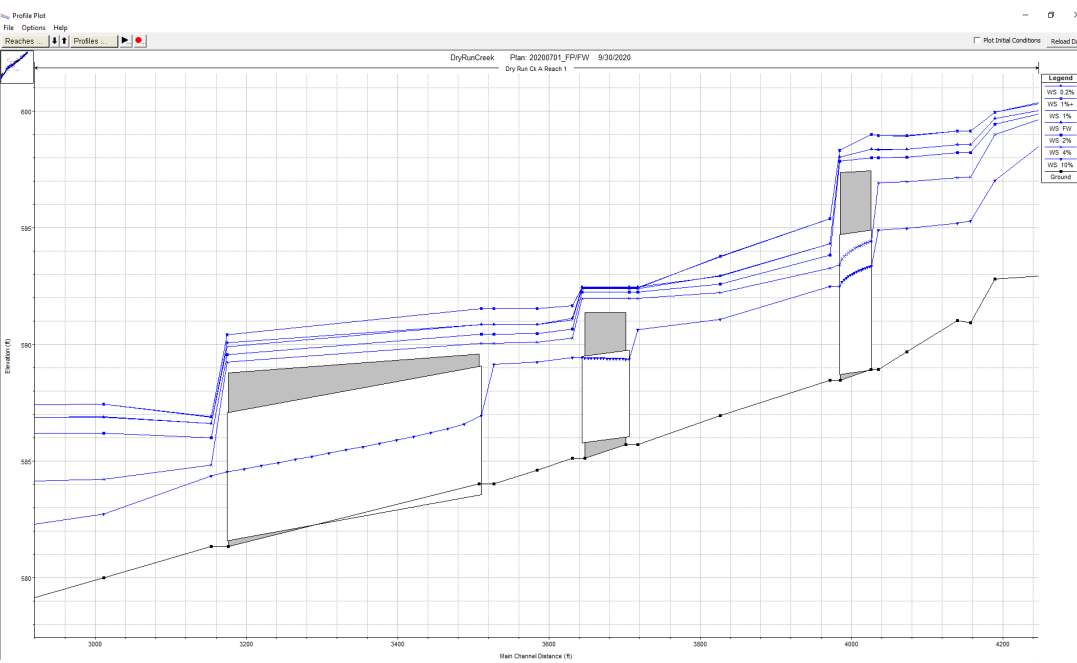
Hydraulic Data

- LiDAR – 2012 & Digital Elevation Model (DTM)
- As-built Plans
- Field Survey – Data Acquired in 2019 by:
 - Berns Clancy & Assoc
 - DJ Henkel & Assoc
 - Orion Engineers, LLC
- USGS - National Land Cover Database
- Basemap Ortho Photos



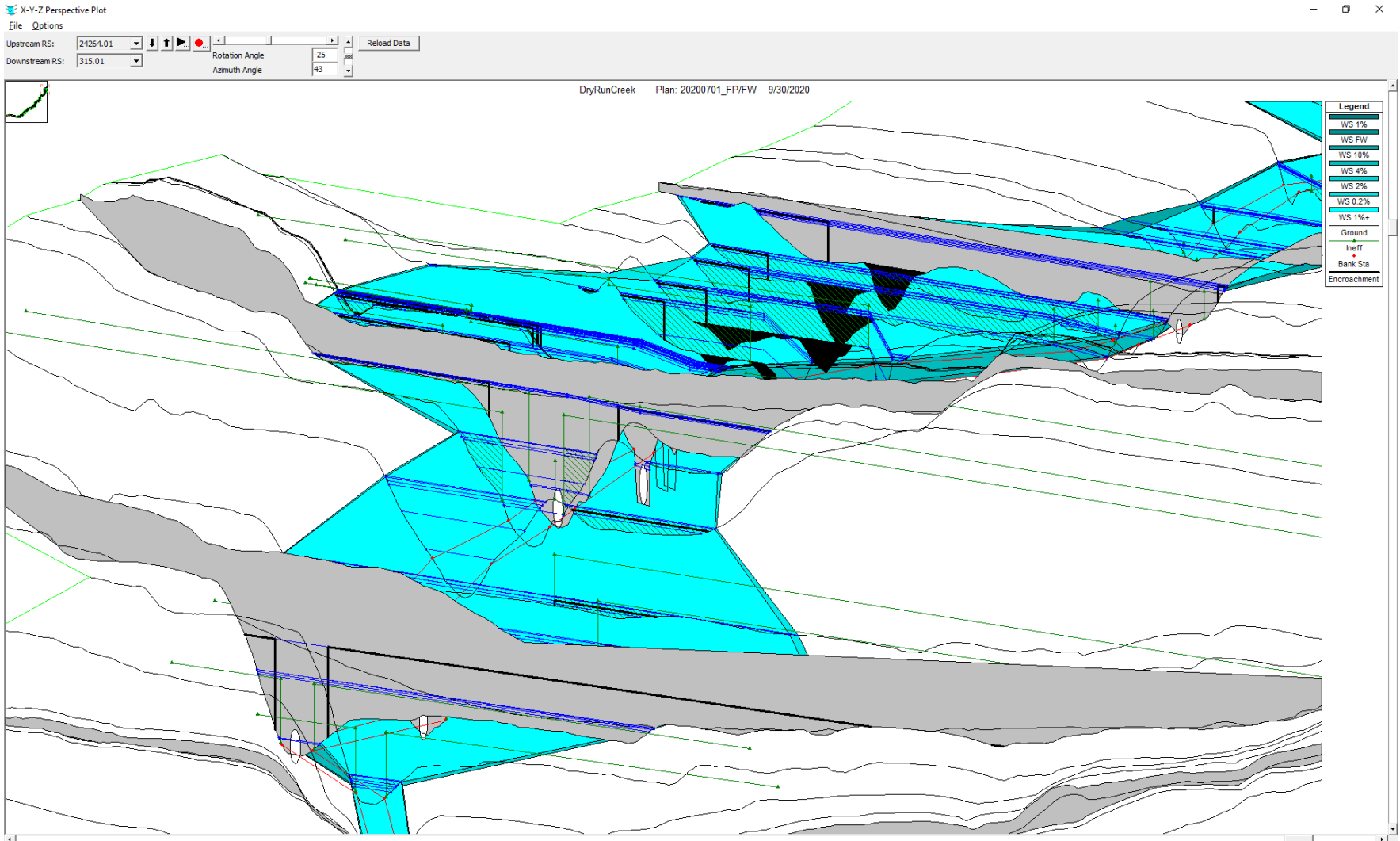
Hydraulics

- Water Surface Elevations
- Exported to GIS for mapping



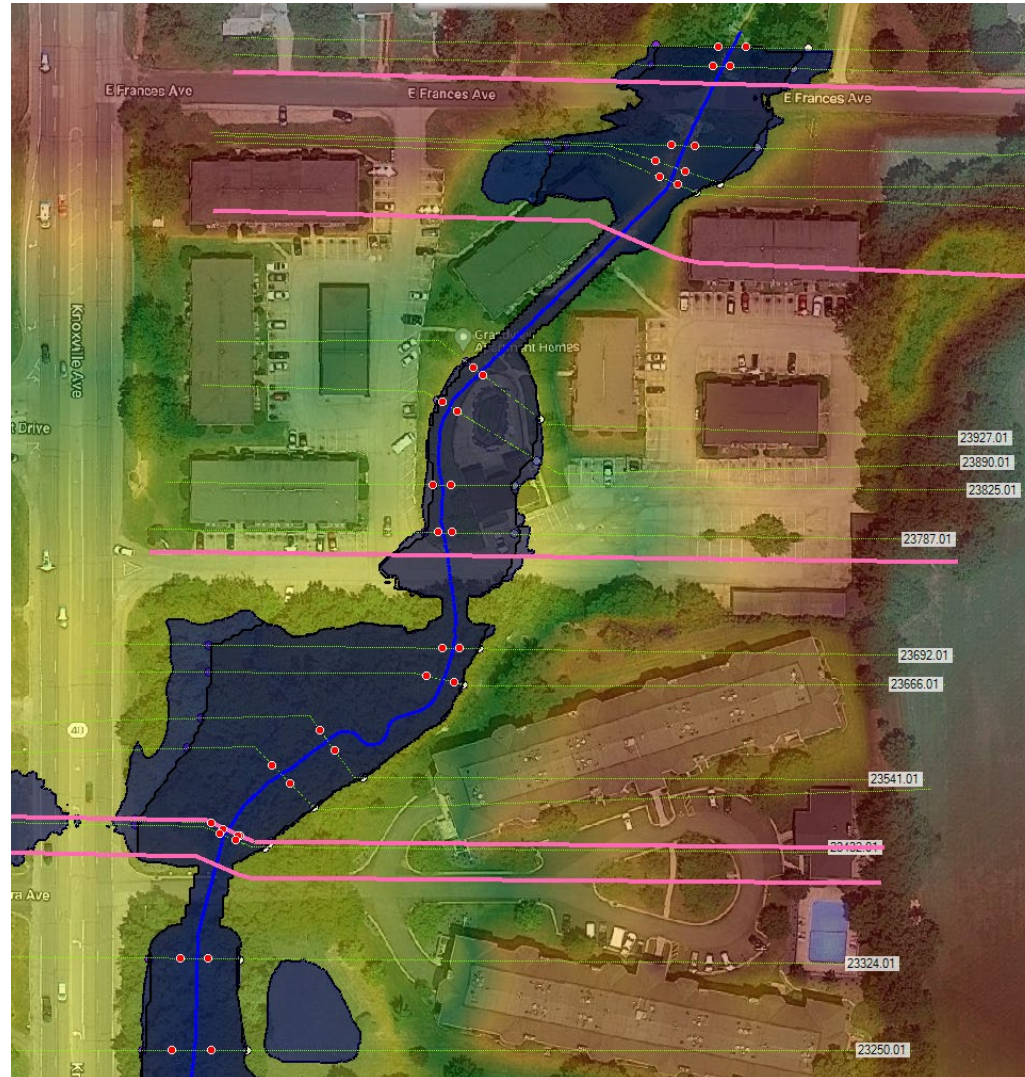
Hydraulics

X-Y-Z 3D PLOT



Hydraulics

Resulting Floodplain



LOMRs



Letters of Map Revision (LOMRs)

Incorporate or
Supersede
Effective LOMRs?

LOMR Case No.	FY 18 Proposed PSOMA	Reason for FY18 Proposed PSOMA
15-05-2741P	Incorporate LOMR	2015 Zone AE LOMR more current and detailed than ISWS Zone A
15-05-6957P	Supersede LOMR	LOMR superceded by FY18 ISWS Zone AE study
18-05-3106P	Incorporate LOMR	2018 Zone AE LOMR more current and detailed than ISWS Zone A
12-05-6386P	Supersede LOMR	LOMR superceded by FY18 ISWS Zone AE study
12-05-6047P	Supersede LOMR	LOMR superceded by FY18 ISWS new hydrology
12-05-5395P	Supersede LOMR	LOMR superceded by FY18 ISWS Zone AE study
12-05-6068P	Supersede LOMR	LOMR superceded by FY18 ISWS Zone AE study
12-05-6071P	Incorporate LOMR	2012 LOMR reach was not part of FY18 H&H scope
13-05-1142P	Supersede LOMR	LOMR superceded by FY18 ISWS Zone AE study
14-05-7931P	Incorporate LOMR	2015 Zone AE LOMR more current and detailed than ISWS Zone A
98-05-183P	Supersede LOMR	LOMR superceded by FY18 ISWS Zone AE study
12-05-7861P	Incorporate LOMR	Komatsu Levee Accreditation LOMR.
06-05-BA71P	Incorporate LOMR	Zone AE LOMR more detailed than ISWS Zone A
96-05-2804P	Supersede LOMR	LOMR was superseded by LOMR 07-05-4651P and ISWS Zone A
97-05-055P	Supersede LOMR	Evonik (Village of Mapleton) Chemical Plant Levee LOMR
04-05-0083P	Supersede LOMR	Lonza Levee LOMR
05-05-A234P	Incorporate LOMR	2005 LOMR model more detailed (included structures) than ISWS Zone A model
07-05-4651P	Supersede LOMR	2007 Zone A LOMR is less current than ISWS Zone A model

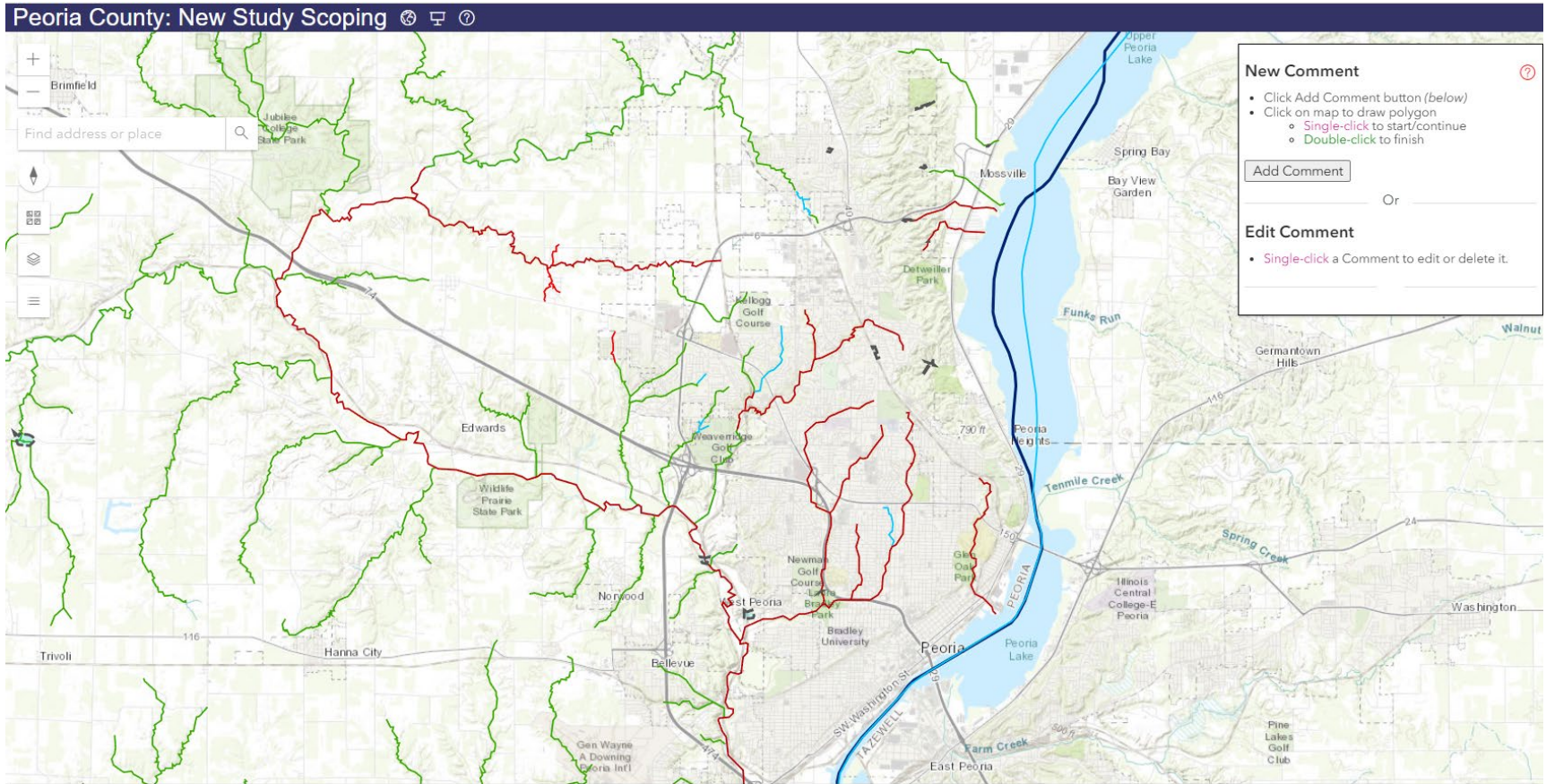
Hydraulics: Results

Comparison of New BFEs with Effective BFEs					
Stream Name	Change in Feet	Comment	Stream Name	Change in Feet	Comment
SA1 Kickapoo	Up to 8 feet	Higher flows	Dry Run	Up to 4 feet and down to 9 feet	New discharges are lower than effective discharges, limitations of comparison analysis (newer topo and GIS systems).
Kickapoo Creek Tributary A.	Up to 4 feet	Higher flows	Dry Run Creek A	Up to 7 feet, down to 11 feet.	New discharges are lower than effective discharges, limitations of comparison analysis (newer topo and GIS systems).
SA2 Fargo, Fargo Run Tributary A, Fargo Run Tributary A1, Fargo Run Tributary B, Fargo Run Tributary C.	No effective studies	NA	Dry Run Creek C	Up to 6 feet, down to 3 feet.	New discharges are lower than effective discharges, limitations of comparison analysis (newer topo and GIS systems).
Big Hollow	Up to 11 feet, down to 4 feet	Higher flows, restrictive structure, limitations of comparison analysis (newer topo and GIS systems).	East Branch Dry Run Creek	Up to 5 feet, down to 9 feet.	New discharges are lower than effective discharges, limitations of comparison analysis (newer topo and GIS systems).
Big Hollow Creek Tributary A	Up to 11 feet	Higher flows, limitations of comparison analysis (newer topo and GIS systems).	Springdale	No effective study to compare to along the reach of the new study.	NA
North Fork Tributary Big Hollow Creek.	Down to 8 feet.	New discharges are lower than effective discharges.	Boyds Hollow	Up to 4 feet, down to 4 feet.	New discharges are lower than effective discharges, limitations of comparison analysis (newer topo and GIS systems).
Illinois River	Up to 0.2 feet, down to 1 foot.	None	Poppet Hollow	Up to 3 feet.	Restrictive structure

Webmap Results

Webmap Demonstration

Webmap URL: <https://www.illinoisfloodmaps.org/commentmap/peoria.htm>



Login: watershed

Password: illinoisfloods!123

Webmap Comment Feature

New Comment ?

- Click Add Comment button (*below*)
- Click on map to draw polygon
 - Single-click to start/continue
 - Double-click to finish

Add Comment

Or

Edit Comment

- Single-click a Comment to view or edit it.

Embarras Watershed

Communication and Next Steps

Communication Plan

Outreach Meeting- 12/04/2018 – in person

Proposed Engineering Methods Notification (FEMA SID 620) letter-
02/15/2019

Flood Risk Review Meeting (today)

50-Day extended 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

~~Outreach December 2018~~

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

Flood Risk Review Meeting (today)

Submit Flood Studies to IDNR for State review

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

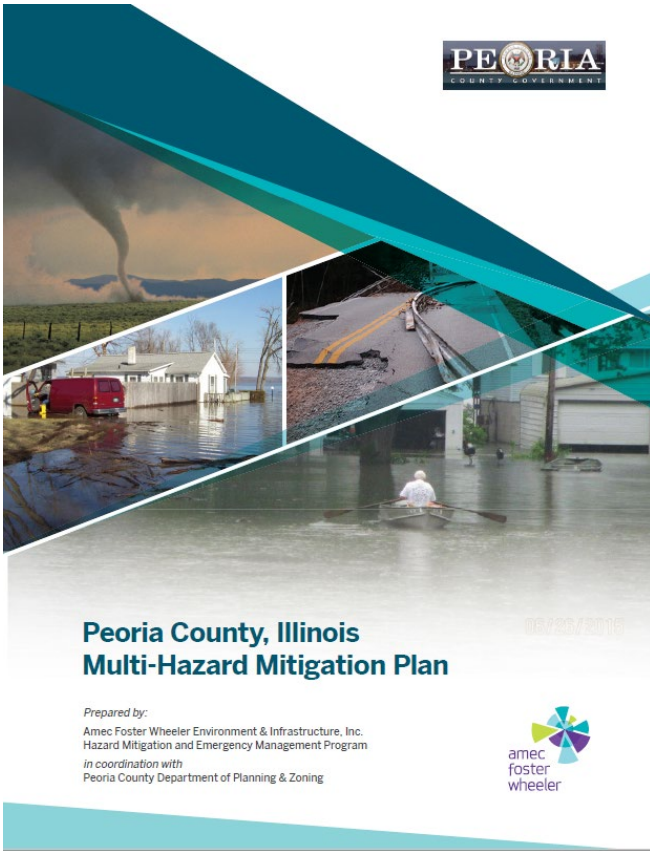
Digital Flood Insurance Rate Map Project to follow pending conclusion of data development

Risk Communication and Mitigation Actions

Hazard Mitigation



Peoria County Hazard Mitigation Plan (May 2018)



Hazard	Probability of Future (Frequency)	Magnitude/Severity	Hazard Rating
Flood	High	High	Severe
Severe Winter Storm	High	High	Severe
Tornado	High	High	Severe
Severe Thunderstorms	High	Medium	Severe
Extreme Temperatures	High	Medium	High
Hazardous Material Incidents	High	Medium	High

Hazard Mitigation- Declarations 2005-2022

Date of Incident	Date of Declaration	Disaster Description	Type of Assistance
Disaster Declaration, FEMA	March 26, 2020	COVID-19 Pandemic	Individuals and Public
Secretarial Disaster, USDA	August 12, 2015	Excessive Rainfall, and Flooding	--
Disaster Declaration, FEMA	May 10, 2013	Severe Storms, Straight-line Winds, and Flooding	Individual & Public
Secretarial Disaster, USDA	August 15, 2012	Drought- Fast Track	--
Secretarial Disaster, USDA	August 1, 2012	Drought, Excessive Heat	
Disaster Declaration, FEMA	March 17, 2011	Severe Winter Storm and Snowstorm	Public
Disaster Declaration, FEMA	October 3, 2008	Severe Storms and Flooding	Public and Individual
Emergency Declaration, FEMA	December 29, 2006	Snow	Public
Emergency Declaration, FEMA	September 7, 2005	Hurricane Katrina evac.	Public

Hazard Mitigation-Declarations 1973-2001

Date of Incident	Date of Declaration	Disaster Description	Type of Assistance
Emergency Declaration, FEMA	January 17, 2001	Severe Winter Storm	Public
Emergency Declaration, FEMA	January 8, 1999	Winter Snowstorm	Public
Disaster Declaration, FEMA	March 29, 1985	Severe Storms	Public and Individual
Disaster Declaration, FEMA	December 13, 1982	Severe Storms, Tornadoes, and Flooding	Public and Individual
Emergency Declaration, FEMA	January 16, 1979	Blizzards and Snowstorms	Public
Disaster Declaration, FEMA	April 30, 1979	Severe Storms and Flooding	Public and Individual
Disaster Declaration, FEMA	June 10, 1974	Severe Storms and Flooding	Public and Individual
Disaster Declaration, FEMA	April 26, 1973	Severe Storms, and Flooding	Public and Individual

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

Community Participation

Community Impact

Why New Floodplain Map Can Affect a Community:

Can affect which residents are required to carry flood insurance

Depicts areas of communities which are subject to floodplain management regulations

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 PEORIA COUNTY, ILLINOIS

DECEMBER 9, 2022

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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Illinois State Water Survey

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Questions?