ILLINOIS

Illinois State Water Survey

PRAIRIE RESEARCH INSTITUTE

Johnson, Massac and Pope Counties, Illinois Flood Risk Review Meeting

June 4, 2024

Credit: Illinois Department of Natural Resources

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FLOOD RISK REVIEW MEETING - JOHNSON, MASSAC, AND POPE COUNTIES

JUNE 4, 2024

(Ctrl)

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)?**
   - ◯ 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
- Risk Communication and Mitigation Actions
- Project Objectives and Goals
- Project Scope
- Levees
- Hydrologic Study Methods
- Hydraulic Study Methods
- Web Map Overview and Draft Floodplain Review
- Communication and Next Steps
- Community Participation
- Discussion

Rollcall

Johnson County*

Village of Belknap
Village of Buncombe
Village of Cypress
Village of Goreville
Village of New Burnside
Village of Simpson
City of Vienna*

Pope County*

Village of Eddyville
City of Golconda*

Massac County

City of Brookport*
Village of Joppa*
City of Metropolis*+ (8)

Other agencies

FEMA
IEMA
IDNR
USACE
Anyone else

* Participates in NFIP; + (CRS rating)

Introduction

Introduction

Who We Are

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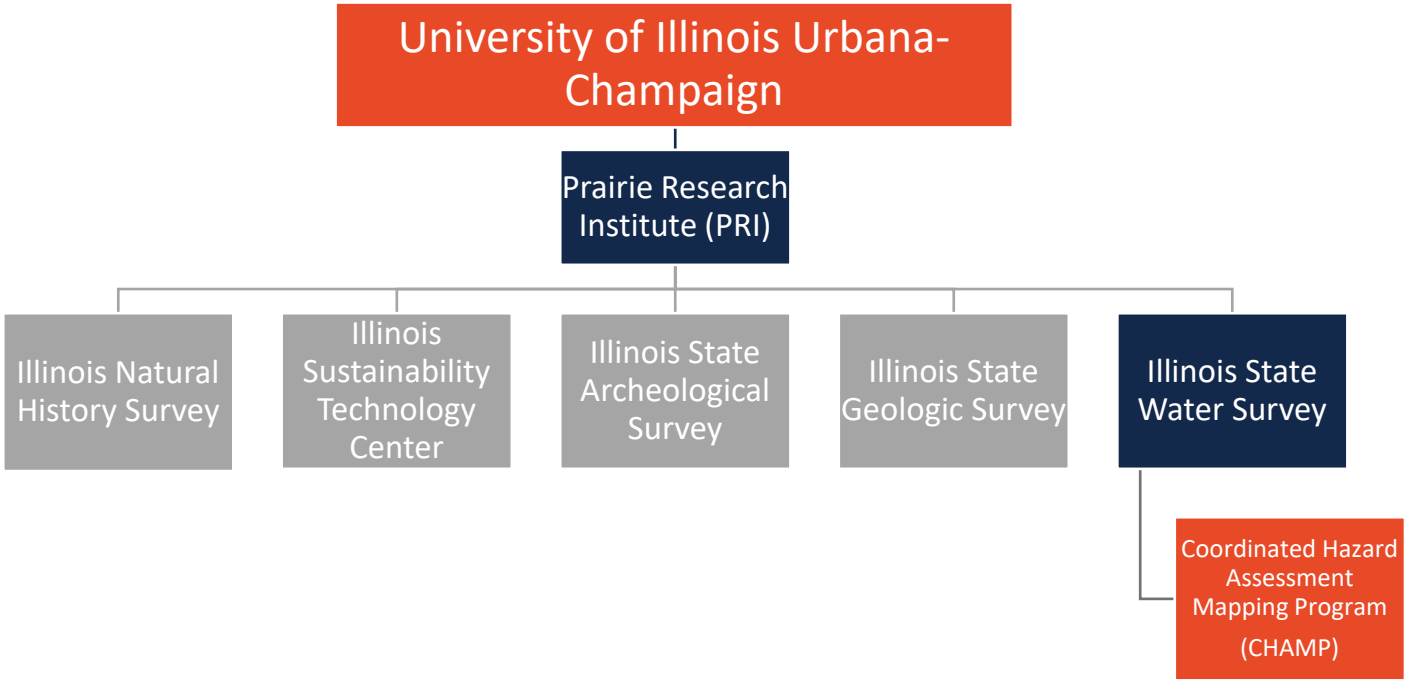

https://www.illinoisfloodmaps.org/

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

Introduction

Our Partners

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FEMA

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

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.

Illinois Department of Natural Resources

Your Community

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

Risk Communication and Mitigation Actions

Hazard Mitigation- FEMA Disaster Declarations

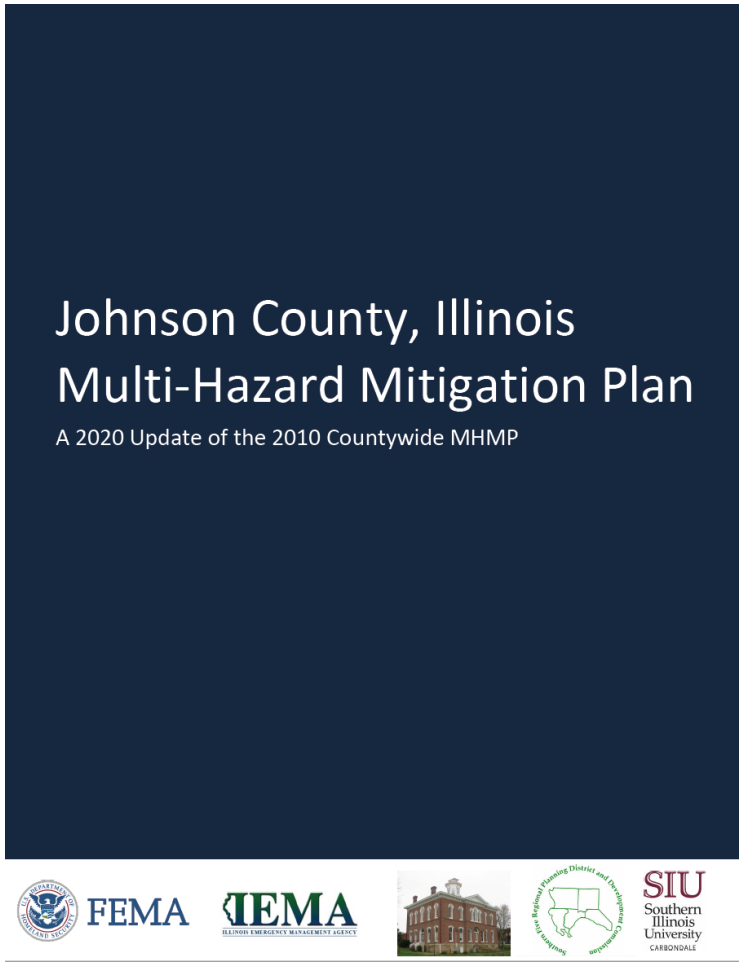
2000 to present

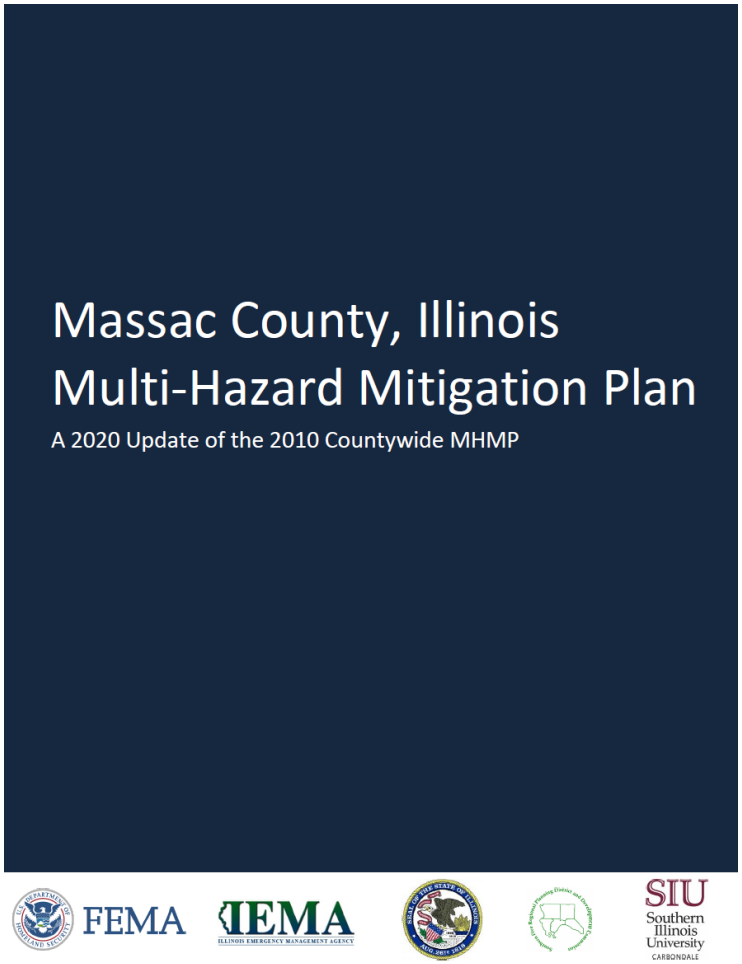
https://www.fema.gov/data-visualization/disaster-declarations-states-and-counties

Date of Declaration	Disaster Number	Type of Assistance	Disaster Description
06/07/2011 **Massac & Pope only**	DR-1991-IL	IA	Severe Storm
03/02/2009 **All 3 counties**	DR-1826-IL	All: PA	Severe Winter Storm
05/15/2003 **Pope only**	DR-1469-IL	IA	Severe Storm

IA: Individual Assistance
PA: Public Assistance

Hazard Mitigation Plans





Pope County Multi-Jurisdictional Hazard Mitigation Plan under way with Hardin Co, IL

Flood Events

Massac County Flood Vulnerability Ranking: Elevated

Table 4-F1. NCDC-recorded Flooding Events that caused Death, Damage (over $100,000) or Injury in Massac County

Location or County	Date	Deaths	Injuries	Property Damage
Big Bay	3/18/2008	0	0	500.00K
Brookport	3/1/2011	0	0	200.00K
Brookport	5/1/2011	0	0	2.000M
Brookport	3/1/2018	0	0	100.00K
Metropolis*	02/10/2019	0	0	750.00K
	Total:	**0**	**0**	**3.780M**

Johnson County Flood Vulnerability Ranking: Elevated

Table 4-F1. NCDC-recorded Flooding Events that caused Death, Damage or Injury in Johnson County

Location or County*	Date	Deaths	Injuries	Property Damage
GOREVILLE	3/18/2008	0	0	1.600M
BELKNAP	5/1/2011	0	0	120.00K
TUNNEL HILL	4/29/1996	0	0	50.00K
COUNTYWIDE	12/17/2001	0	0	40.00K
VIENNA	3/1/1997	0	0	20.00K
VIENNA	7/7/2016	1	1	15.00K
COUNTYWIDE	1/3/2000	0	0	10.00K
BELKNAP	4/24/2011	0	0	10.00K
JOHNSON (ZONE)	1/23/2002	0	0	5.00K
	Total:	**1**	**1**	**$1,870,000**

*NCDC records are estimates of damage compiled by the National Weather Service from various local, state, and federal sources. However, these estimates are often preliminary in nature and may not match the final assessment of economic and property losses related to a given weather event.

Pope County Flood Vulnerability Ranking: High

FEMA CIS Data

3/21/2024

Community Name	No Of Policies	Total Coverage	No Of Rep Losses	Total Premium	Total Claims Since 1978	Total Paid Since 1978
JOHNSON COUNTY	2	$560,000	0	$3,996	3	$10,052
VIENNA, CITY OF	4	$1,115,000	0		1	$7,357
MASSAC COUNTY	46	$10,069,000	0	$145,927	31	$530,469
BROOKPORT, CITY OF	33	$2,714,000	0		4	$37,272
JOPPA, VILLAGE OF	0	-	0	-	-	-
METROPOLIS, CITY OF	45	$8,988,000	12	-	-	$1,817,946
POPE COUNTY	0	0	0	$0	1	$657
GOLCONDA, CITY OF	0	-	0	-	2	$305

Mitigation Goals

- **Goal 1: Lessen the impacts of hazards to new and existing infrastructure**
- *Objective*: Retrofit critical facilities and structures with structural design practices and equipment that will withstand natural disasters and offer weather-proofing.
- *Objective*: Equip public facilities and communities to guard against damage caused by secondary effects of hazards.
- *Objective*: Minimize the amount of infrastructure exposed to hazards.
- **Goal 2: Create new or revise existing plans/maps for the County**
- *Objective*: Support compliance with the NFIP for each jurisdiction in the County.
- *Objective*: Review and update existing, or create new, community plans and ordinances to support hazard mitigation.
- *Objective*: Conduct new studies/research to profile hazards and follow up with mitigation strategies.
- **Goal 3: Develop long-term strategies to educate County residents on the hazards**
- *Objective*: Raise public awareness on hazard mitigation.
- *Objective*: Improve education and training of emergency personnel and public officials

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

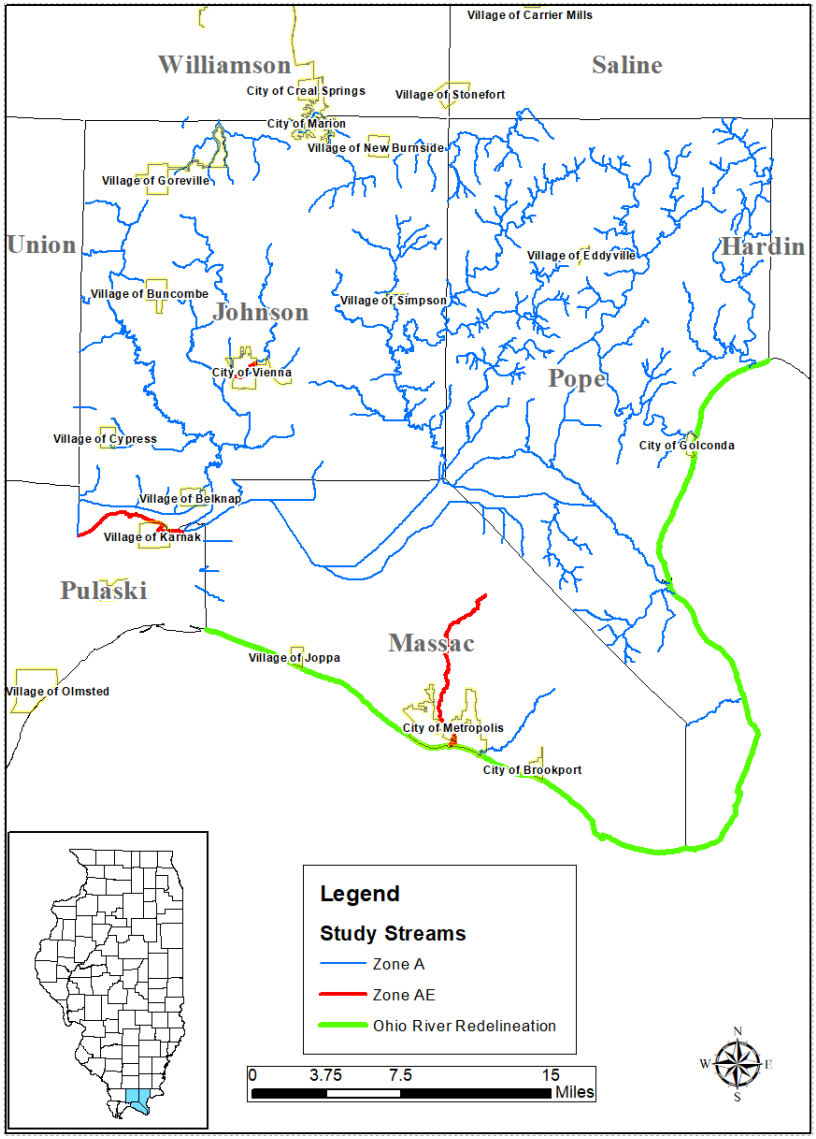
- National Insurance Program (NFIP)
- Hazard Mitigation Planning
  - Mitigation Best Practices
  - Mitigation Planning and Grants
  - Regulations and Guidance

Project Objectives and Goals

Project Goals and Objectives

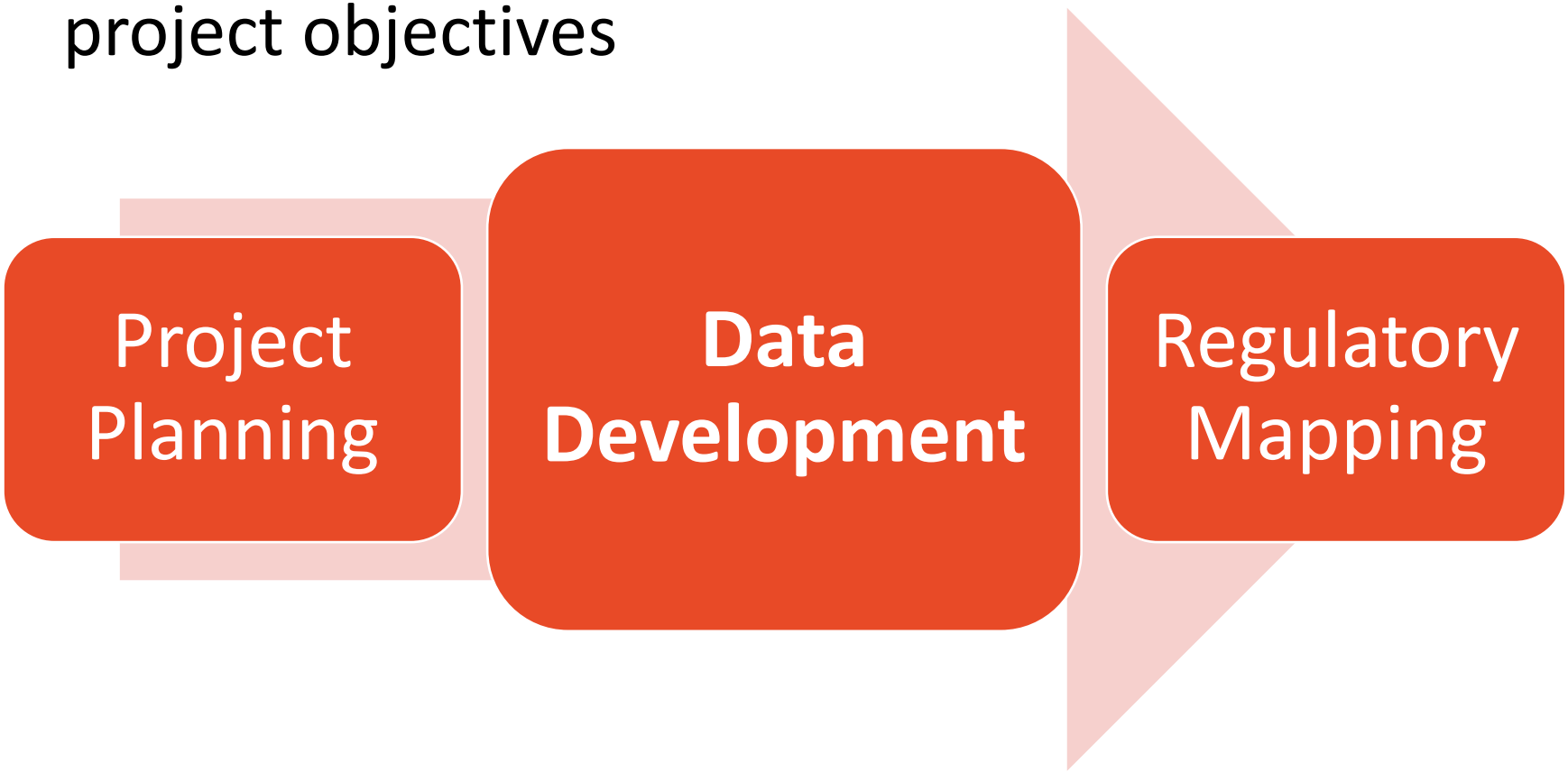
Project Study Scope

- Over 600 miles of streams were modeled to develop Zone A floodplain
- 20 miles of streams were modeled to develop Zone AE floodplain
- 58 miles of the Ohio River was re-delineated using the most current topographic data.



Project Objectives

Several project phases comprise the overall project objectives



Illinois Countywide Digital FIRM* Funding Status

<u>102 Counties</u>

79 effective digital FIRMs

7 with Preliminary DFIRM's

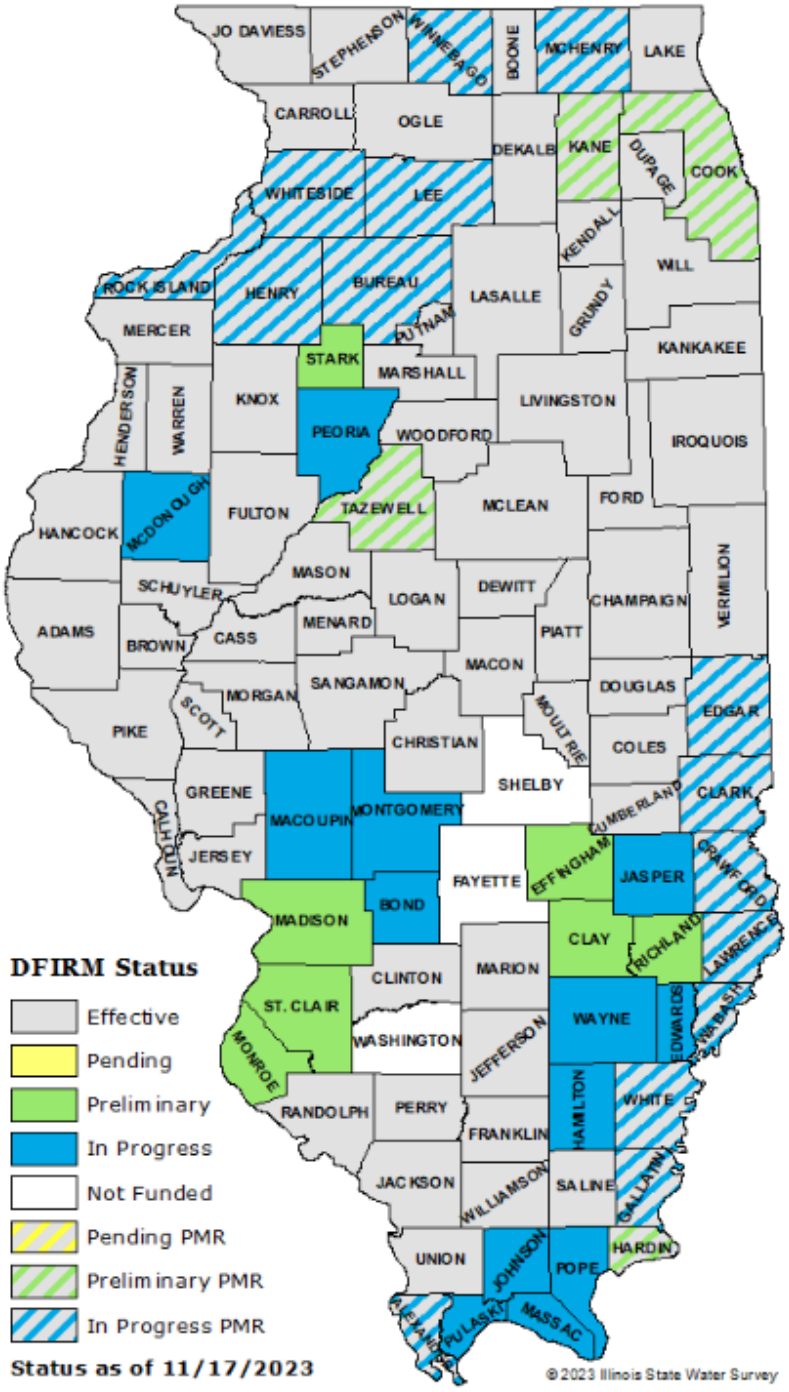
13 with Data Development in progress

3 not funded

4 Preliminary PMR

15 PMR in progress

* Flood Insurance Rate Map



Effective FIRM & FIS Dates

Johnson County Unincorporated FIRM: 08/24/1984; FIS: no FIS

- City of Vienna- FIRM: 07/18/1983; FIS: 6/15/1983

Massac County Unincorporated FIRM: 11/26/2010 and 7/5/1983; FIS: 11/26/2010

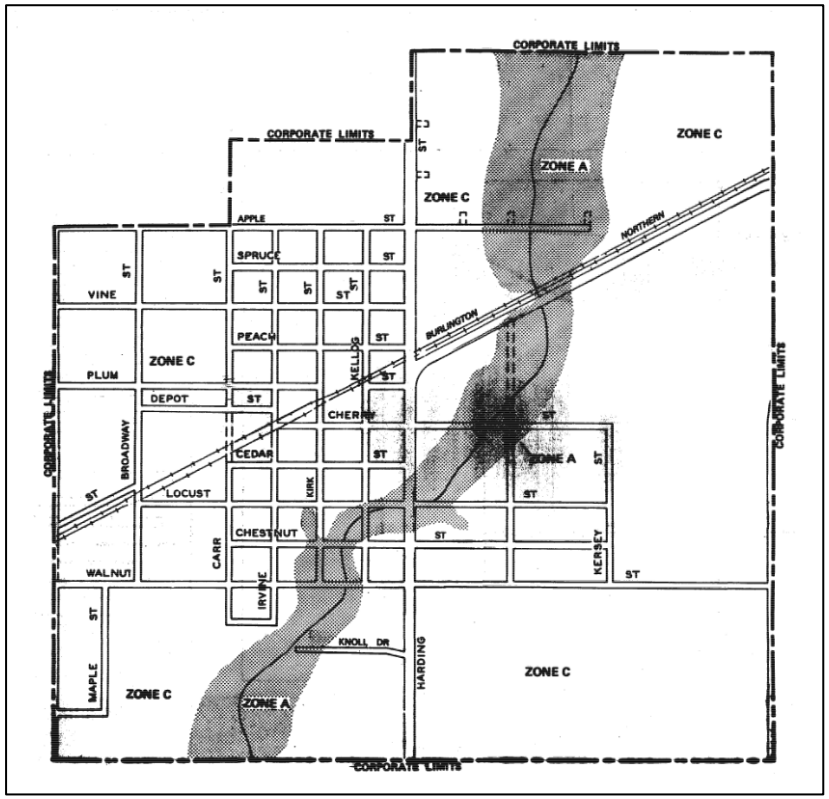
- City of Brookport FIRM: 1/26/2010; FIS:11/26/2010
- Village of Joppa FIRM: 03/02/1983; FIS: 12/15/1982
- City of Metropolis FIRM: 10/18/1983; FIS: 04/18/1983

Pope County Unincorporated FIRM: 12/01/1983; FIS: 06/01/1983

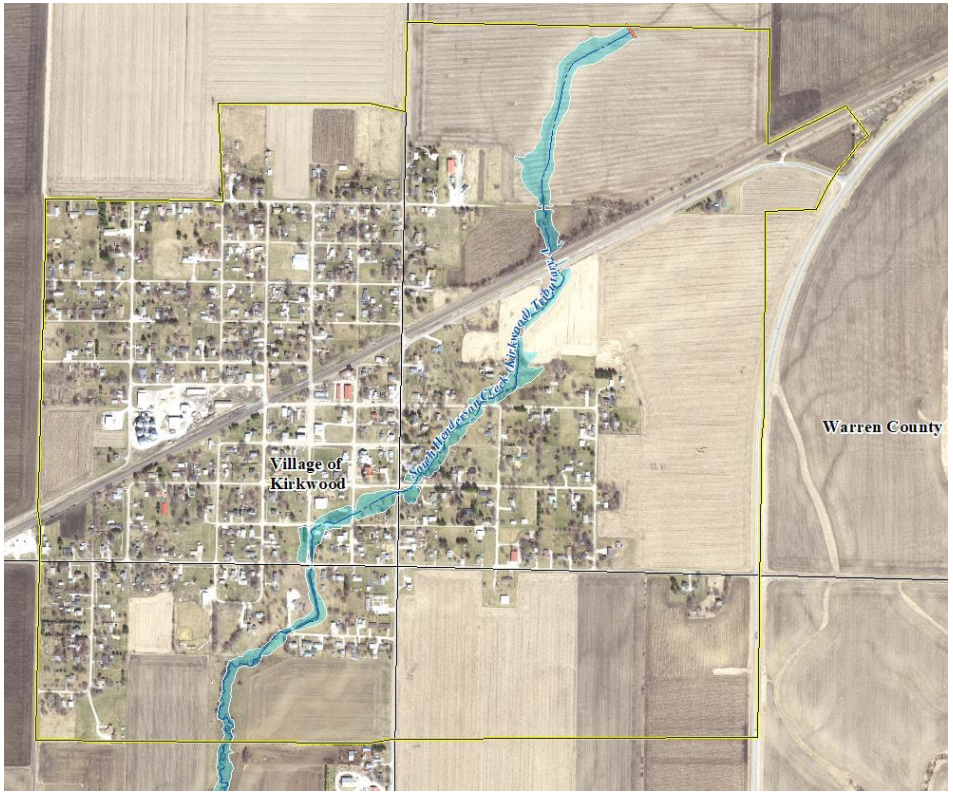
- City of Golconda-none; Map Rescinded in 1983
- Village of Hamletsburg (disincorporated)FHBM: 07/30/1976; FIS: none

Example of Paper map vs. Digital map

Old Paper Map

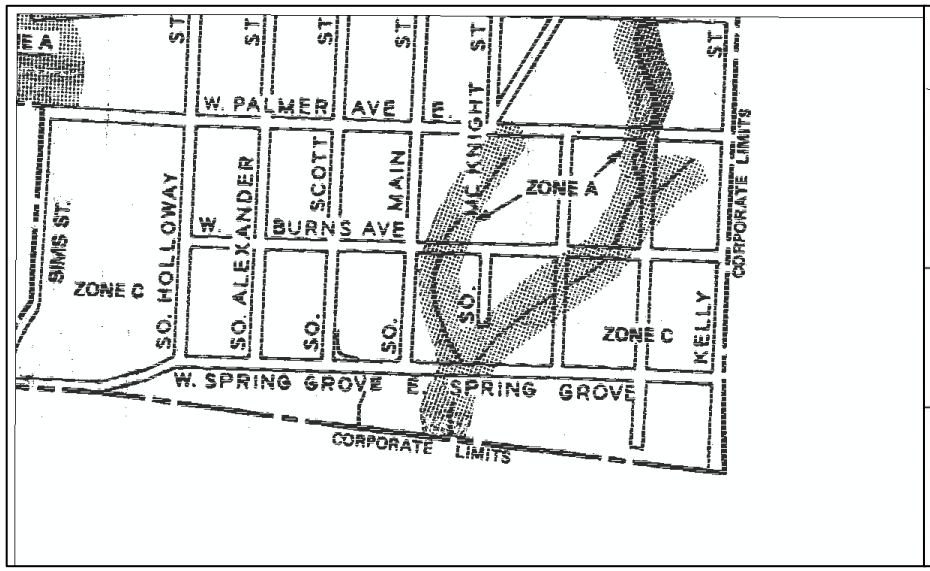


Current Effective Digital Map

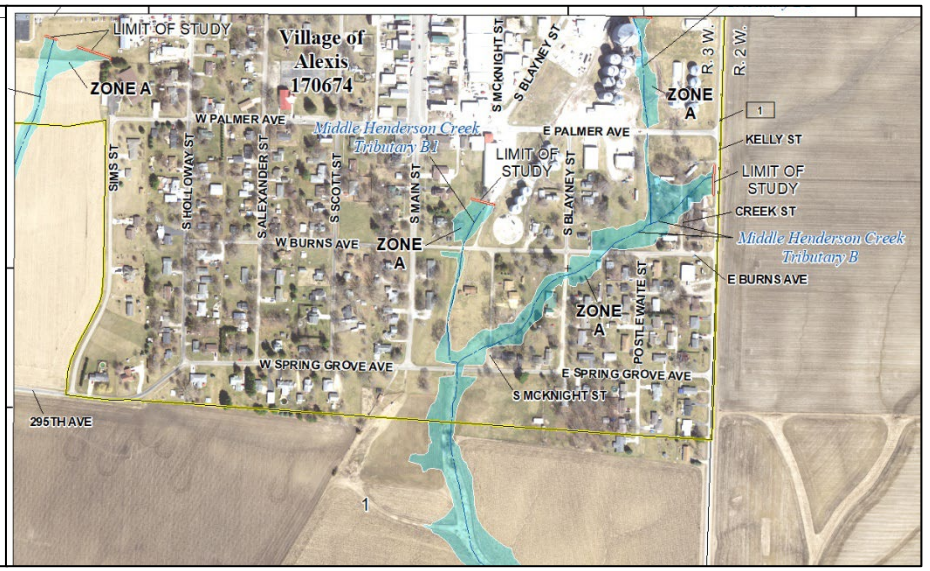


Paper Map to Digital Map

Old Paper Map

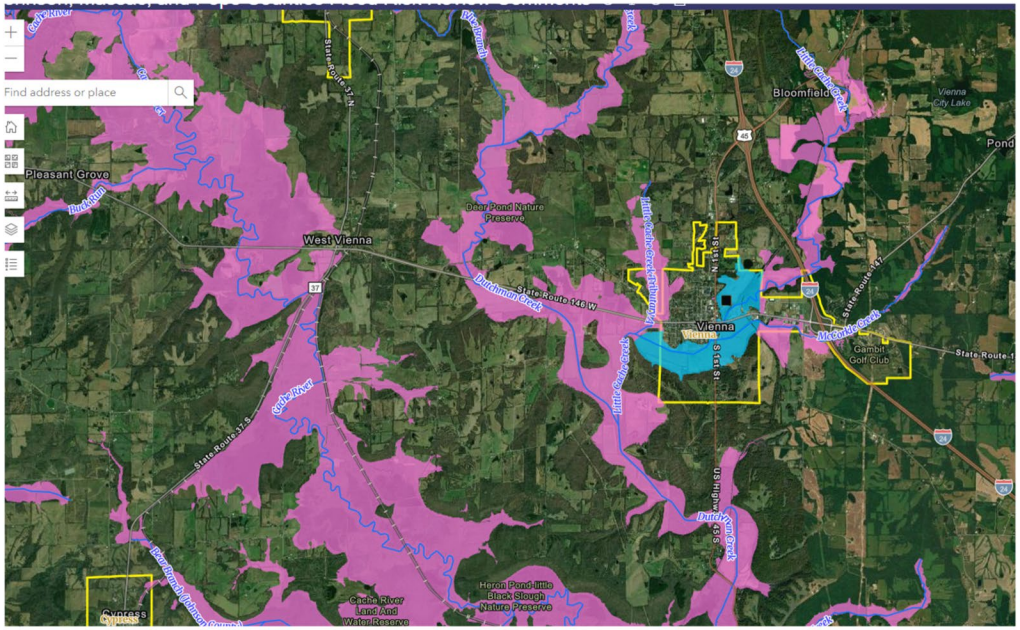


Current Effective Digital Map

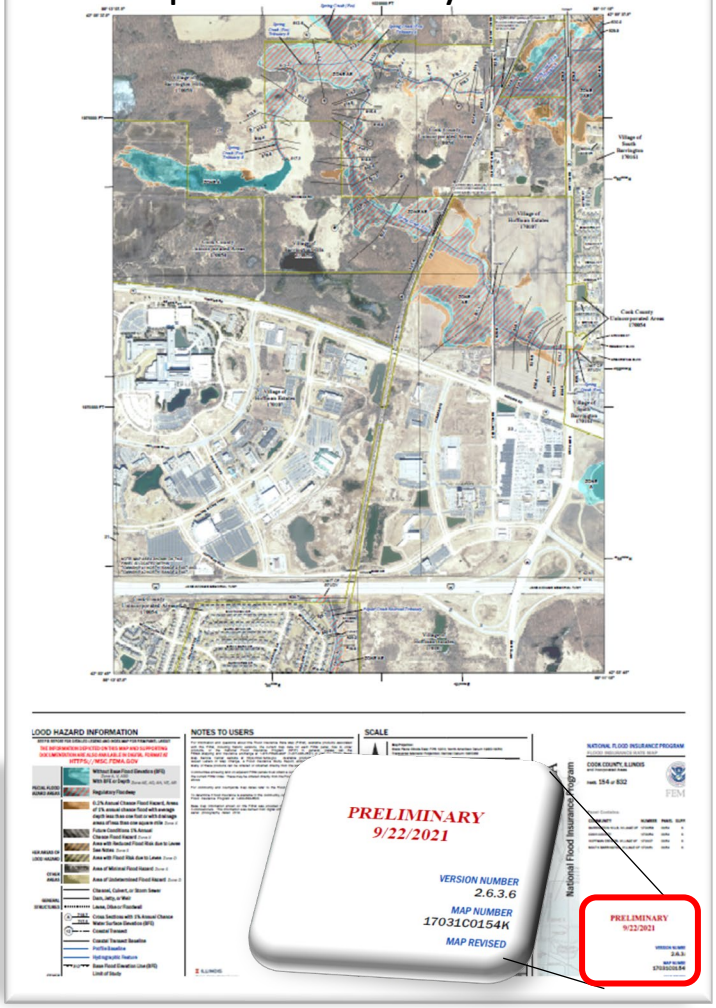


Draft Mapping vs. Preliminary Mapping

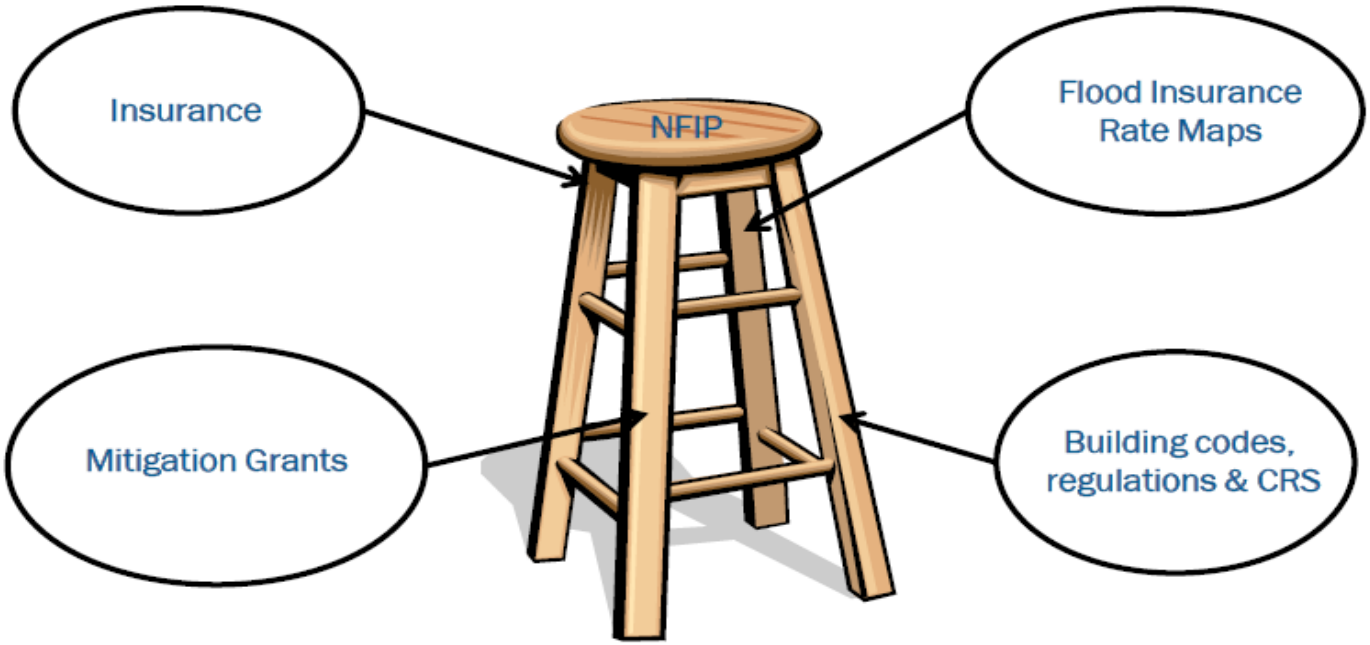
Draft Mapping



Example Preliminary FIRM Panel



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.

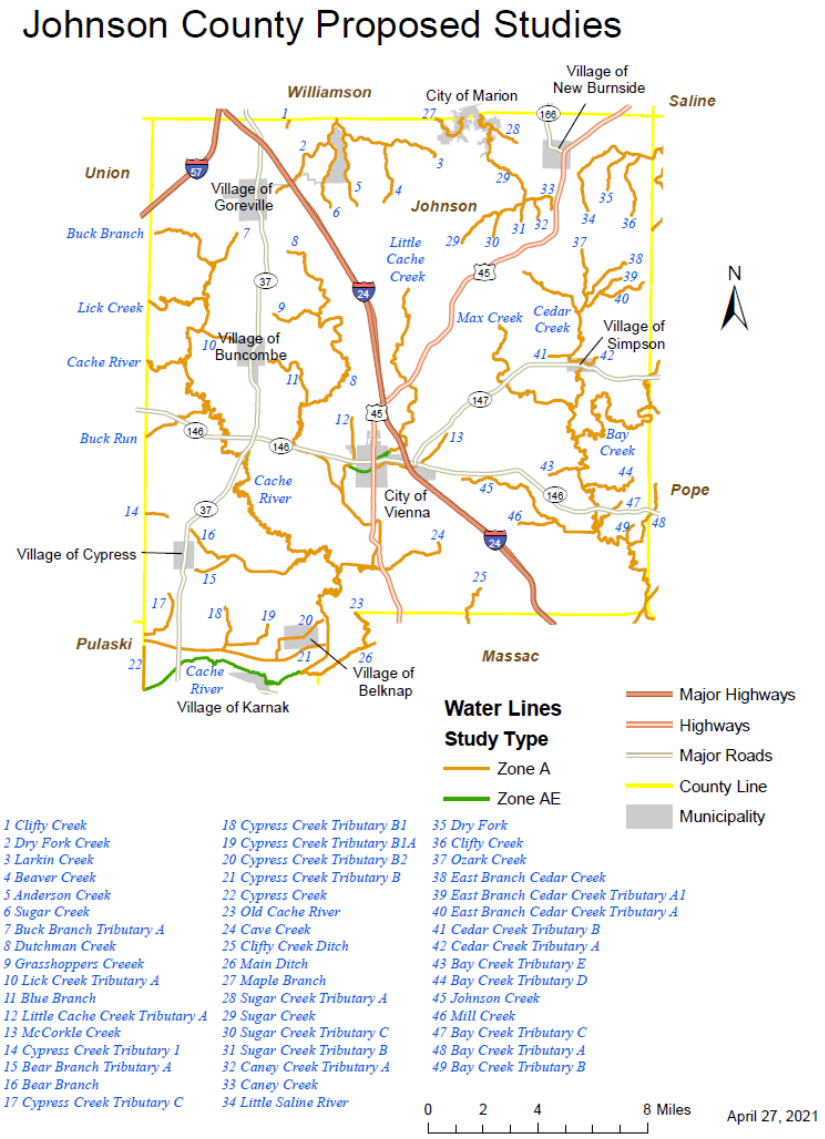
The Base Flood Elevation (BFE) is the elevation of surface water resulting from a flood that has a 1% chance of equaling or exceeding that level in any given year.

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.

Project Scope

Johnson County

- Over 240 miles of stream miles were modeled to develop Zone A floodplain
- 9.2 miles of stream miles were modeled to develop Zone AE floodplain



Project Scope

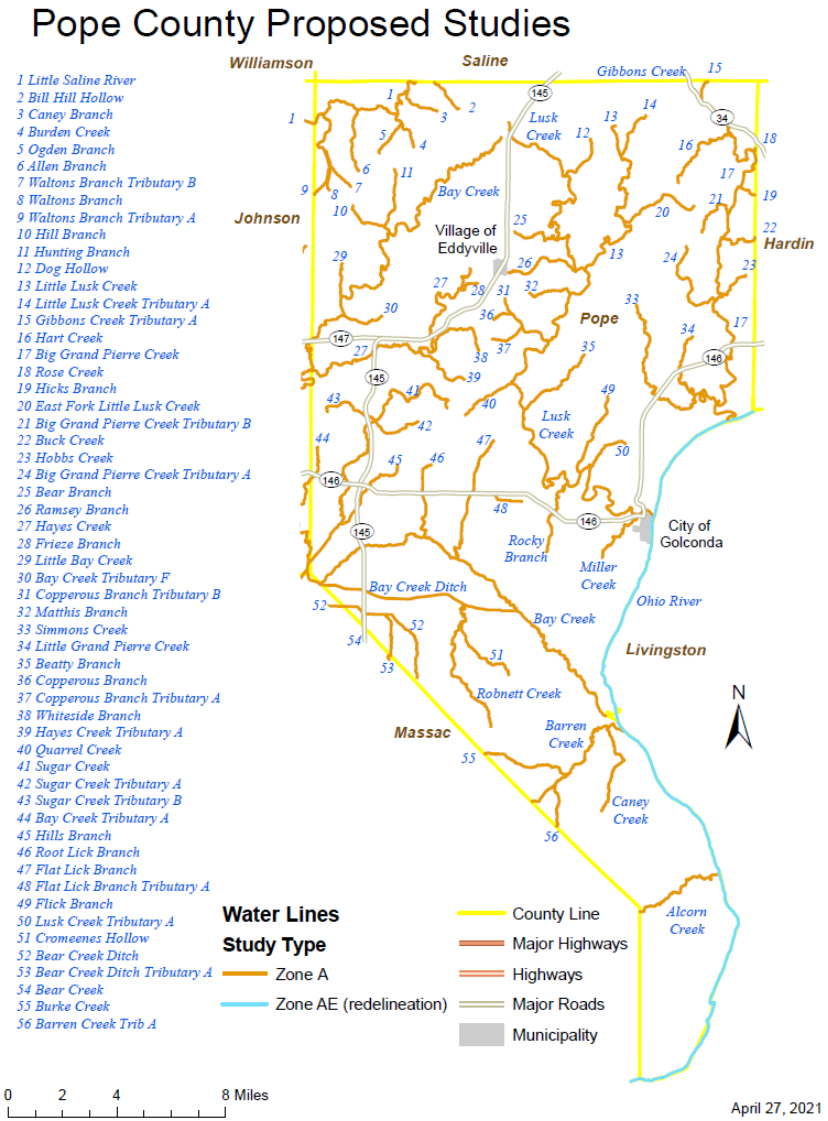
Massac County

- 35 miles of stream miles were modeled to develop Zone A floodplain
- 11.3 miles of stream miles were modeled to develop Zone AE floodplain
- 27 miles of the Ohio River was re-delineated using the most current topographic data.

Project Scope

Pope County

- Over 250 miles of stream miles were modeled to develop Zone A floodplain
- 31 miles of the Ohio River was re-delineated using the most current topographic data.



Project Milestones

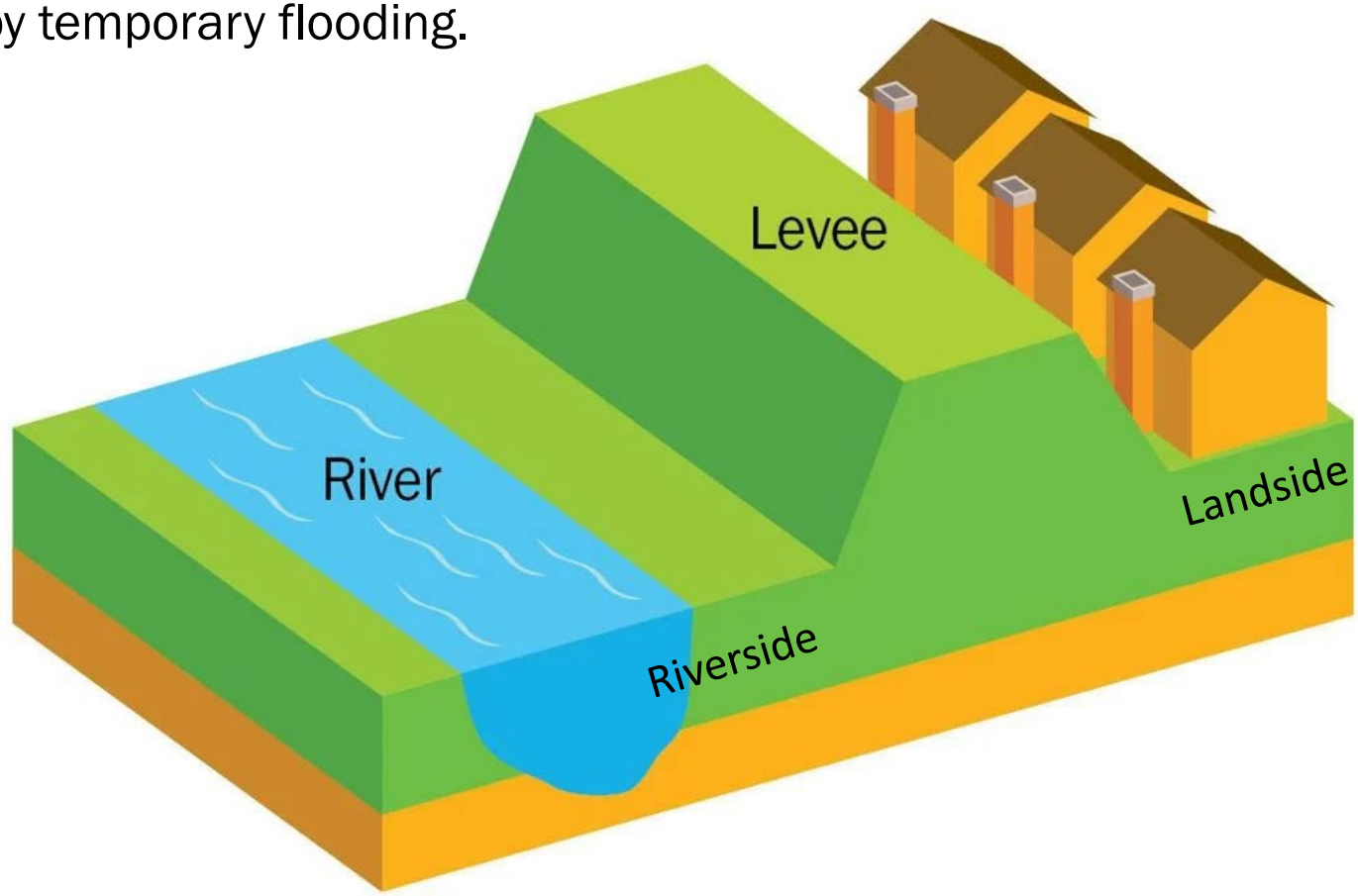
- Project Initiation Community Coordination call- April 27, 2021
- FEMA SID620- Proposed Engineering Models letters- June 23,2021
- Flood Risk Review Meeting (today) with community 30-day comment period
- State Review and Approval
- Development of Digital Flood Insurance Rate Maps (DFIRMs)
- Release of Preliminary DFIRMs and Public Open House
- DFIRMs become Effective

* Some were mailed

Levees

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 - Accreditation

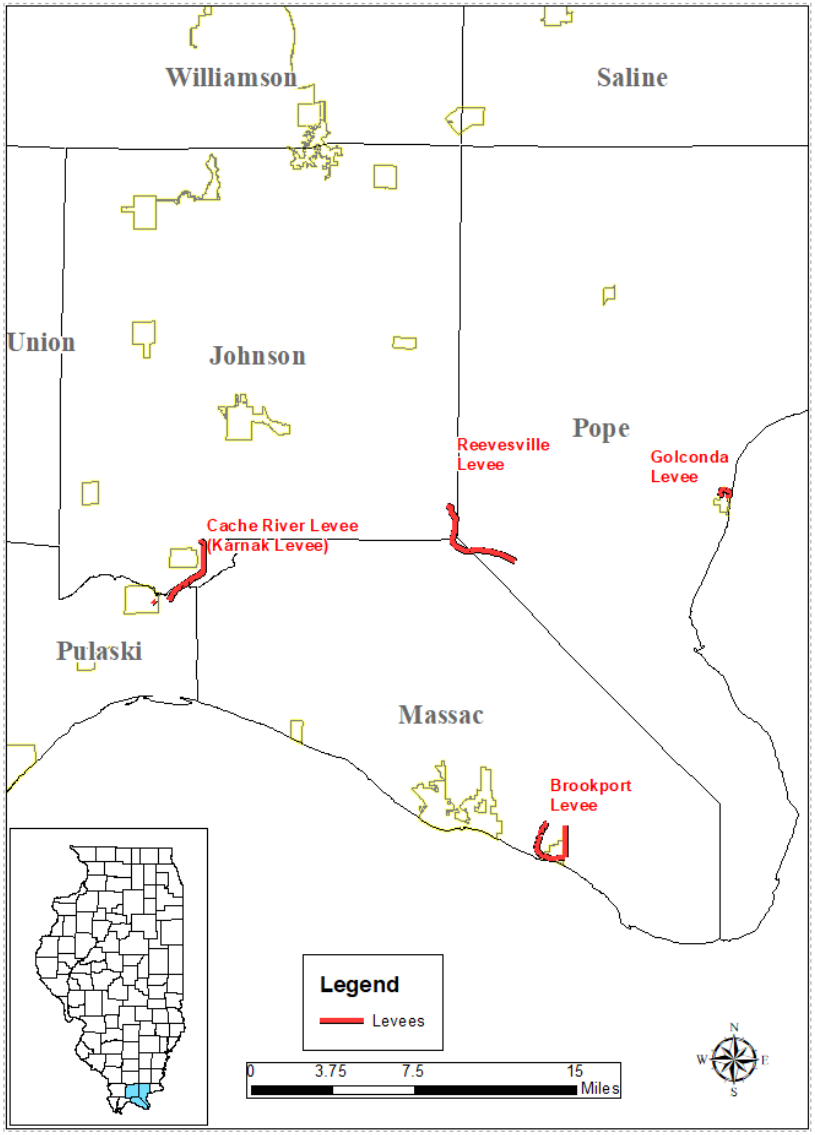
An **accredited levee system** is a system that FEMA has determined meets requirements of the NFIP regulations as cited in the Code of Federal Regulations (CFR) at Title 44, Chapter 1, Section 65.10 (44 CFR 65.10) and that FEMA has recognized on a FIRM as reducing the flood hazards posed by a base (1-percent-annual-chance)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

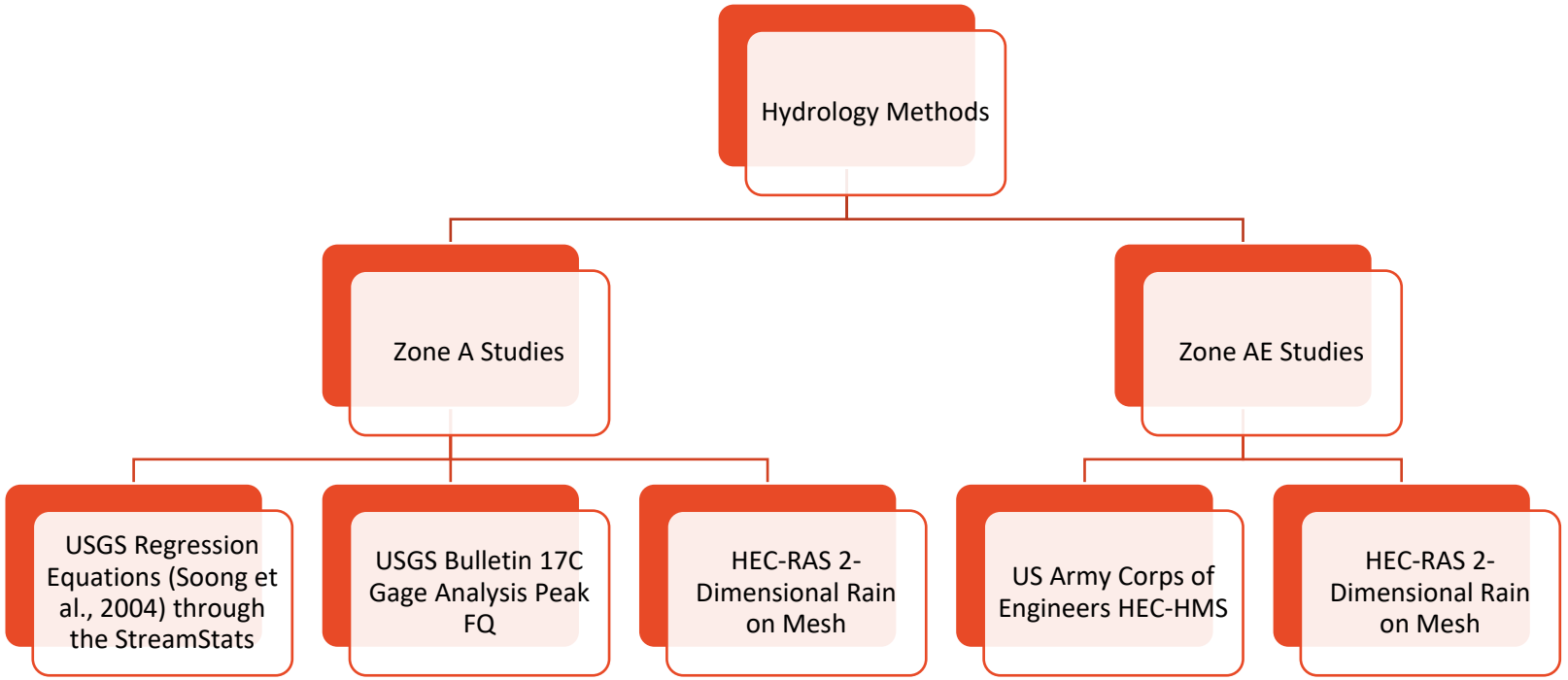
Levee Mapping Status

- Cache River Levee (Karnak Levee)
  - Non-Accredited
- Reevesville Levee
  - Non-Accredited
- Brookport Levee
  - Non-Accredited
- Golconda Levee
  - Non-Accredited



Hydrology Study Methods

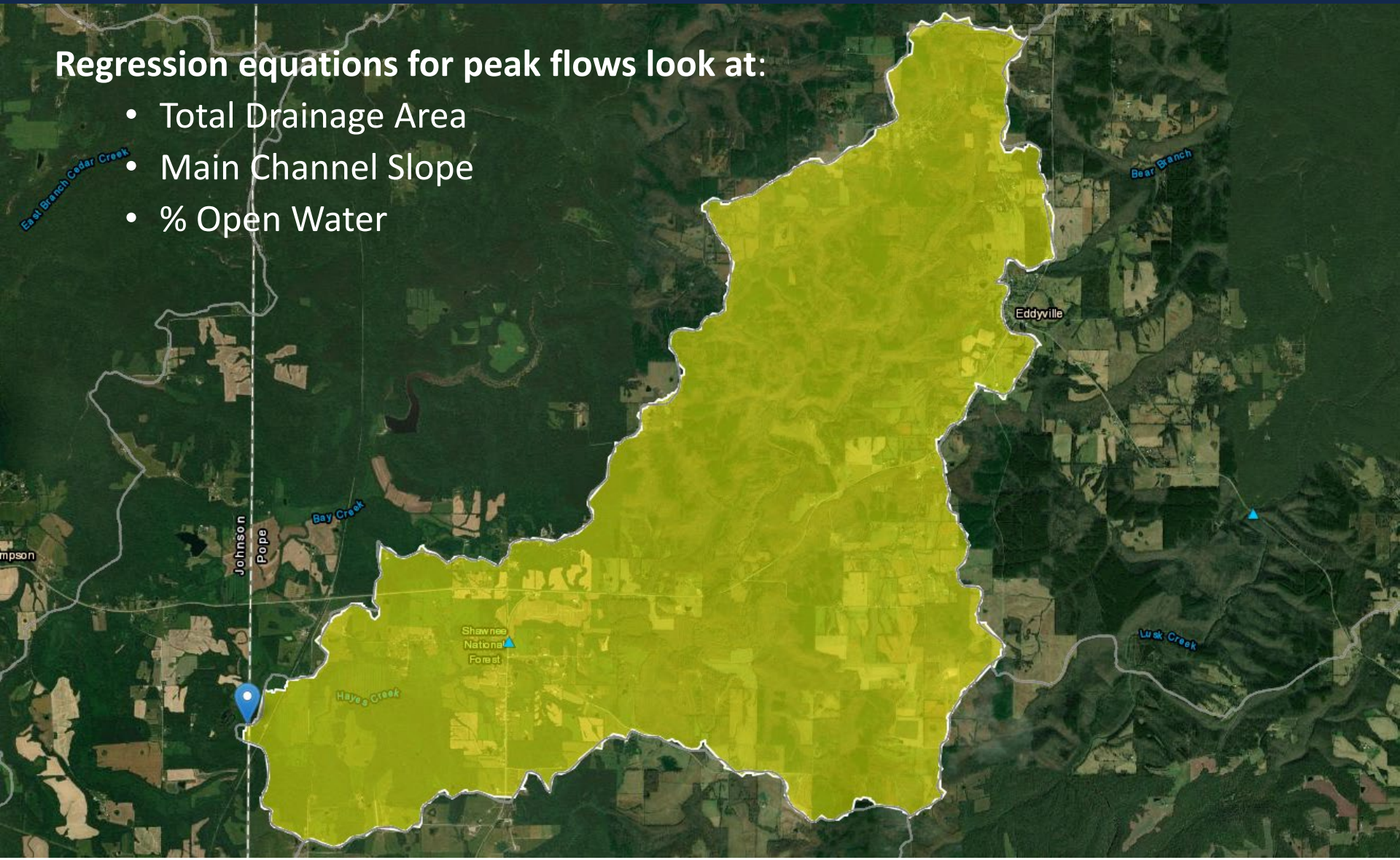
Hydrology Study Methods



Flood Events Studied

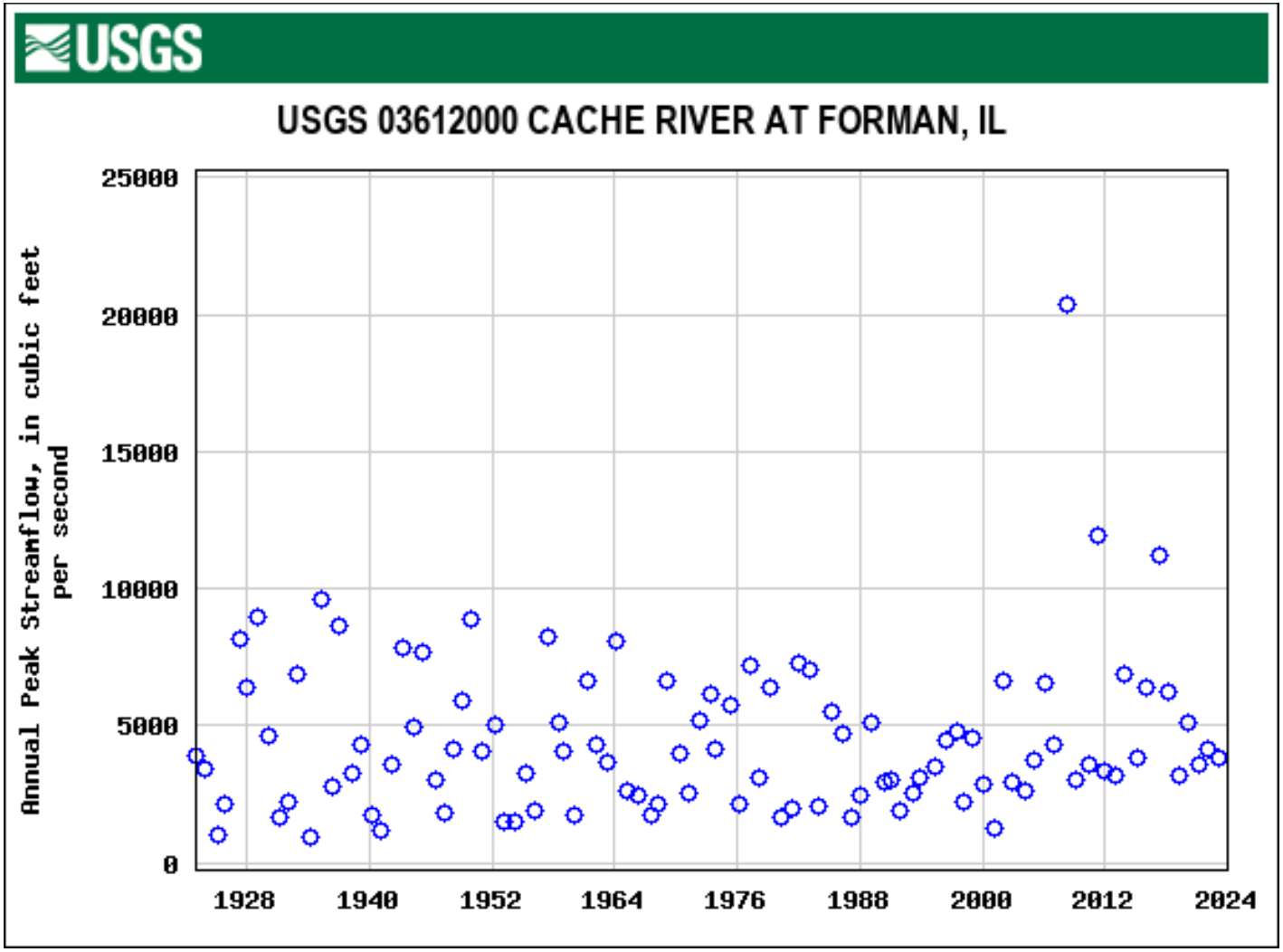
10%, 4%, 2%, 1% (base flood), 0.2%, and 1%+ flow frequencies.

Hydrology Study Methods



Hydrology Study Methods

Cache River Zone A Study: Bulletin 17C Gage Analysis



Hydrology Study Methods

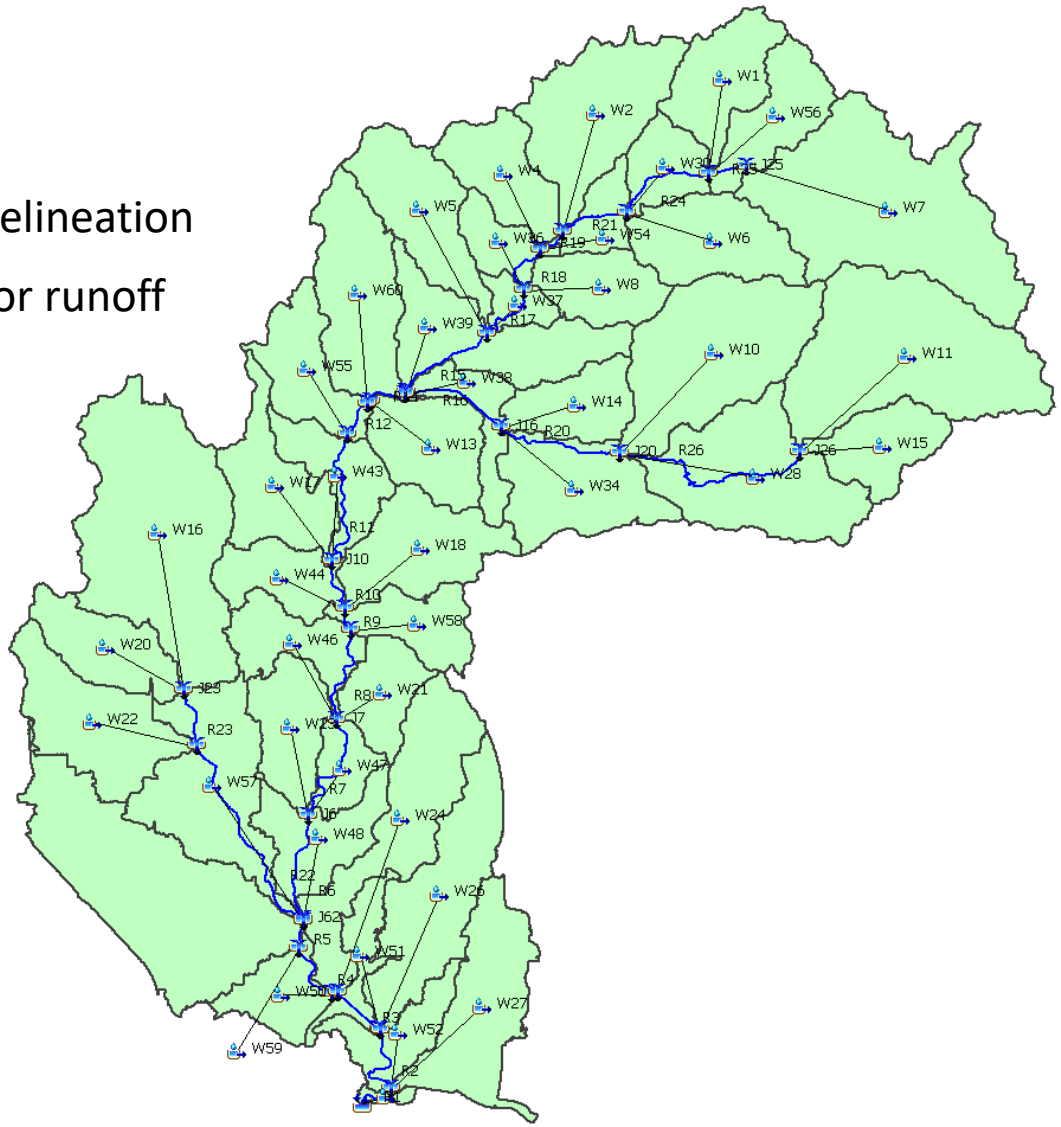
HEC-HMS Modeling

US Army Corps of Engineer HEC-HMS

- LiDAR terrain data used for subbasin delineation
- 2019 Land Use Data /2021 Soils data for runoff parameters
- Bulletin 75 Rainfall Data

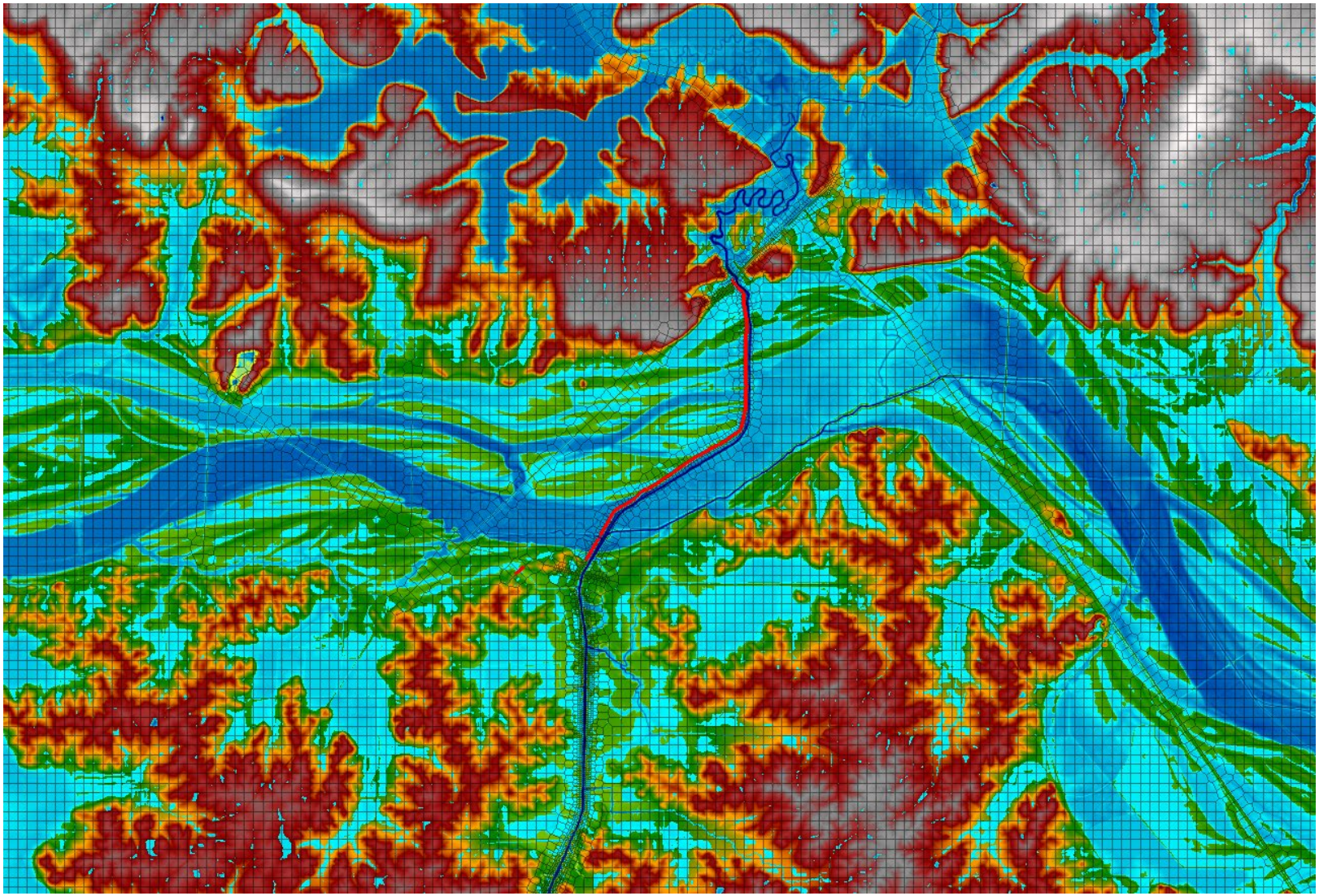
Modeling developed for:

- Little Cache Creek
- Massac Creek



Hydrology Study Methods

2-Dimension HEC-RAS “Rain on Mesh” Model for Cache River



Calculated Discharges

Little Cache Creek and Massac Creek

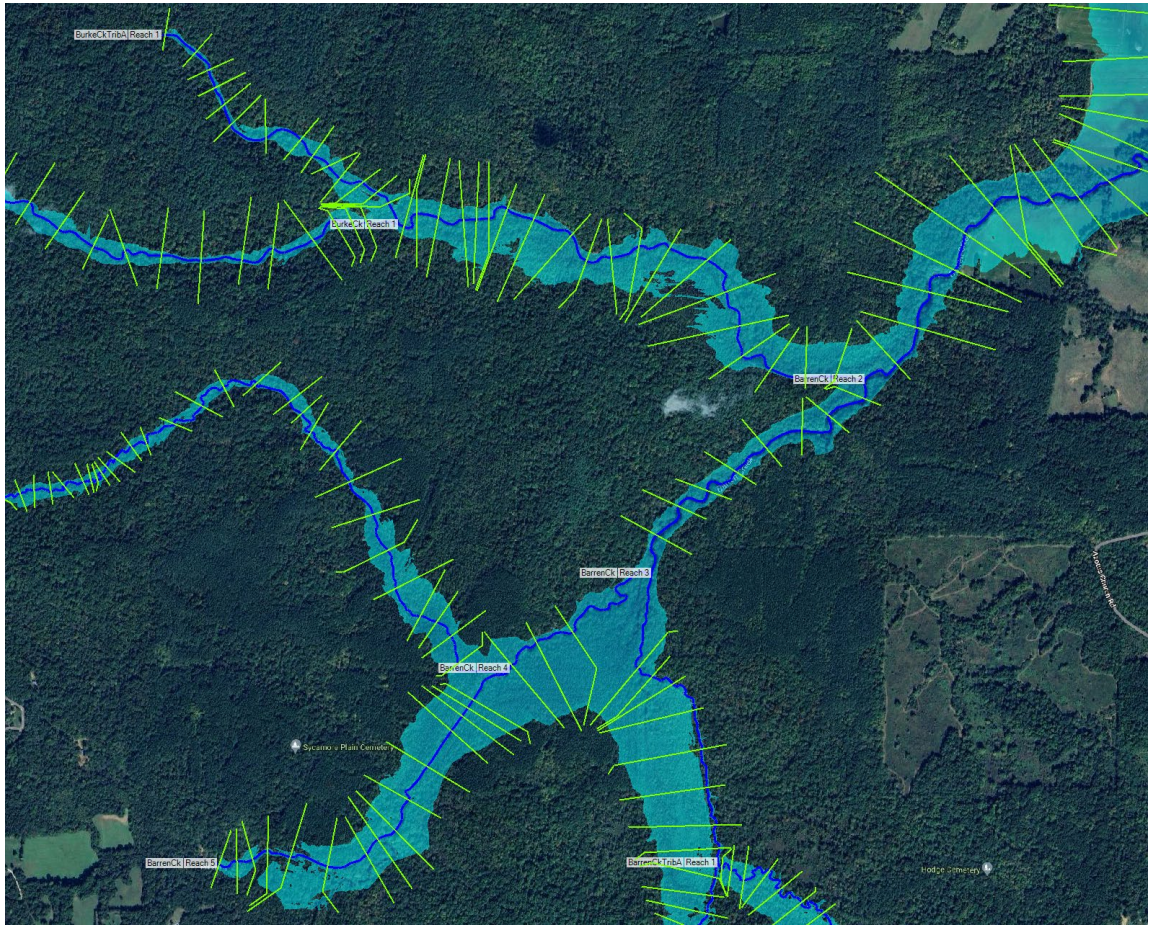
Stream	Location	Effective 1% Discharge (cfs)	Revised HEC-HMS 1% Discharge (cfs)	% Difference
Little Cache Creek	At U.S. Route 45	6,532	5,432	-17%
Massac Creek	At Mouth	16,800	12,465	-26%

Hydraulic Study Methods

HEC-RAS 1D Modeling

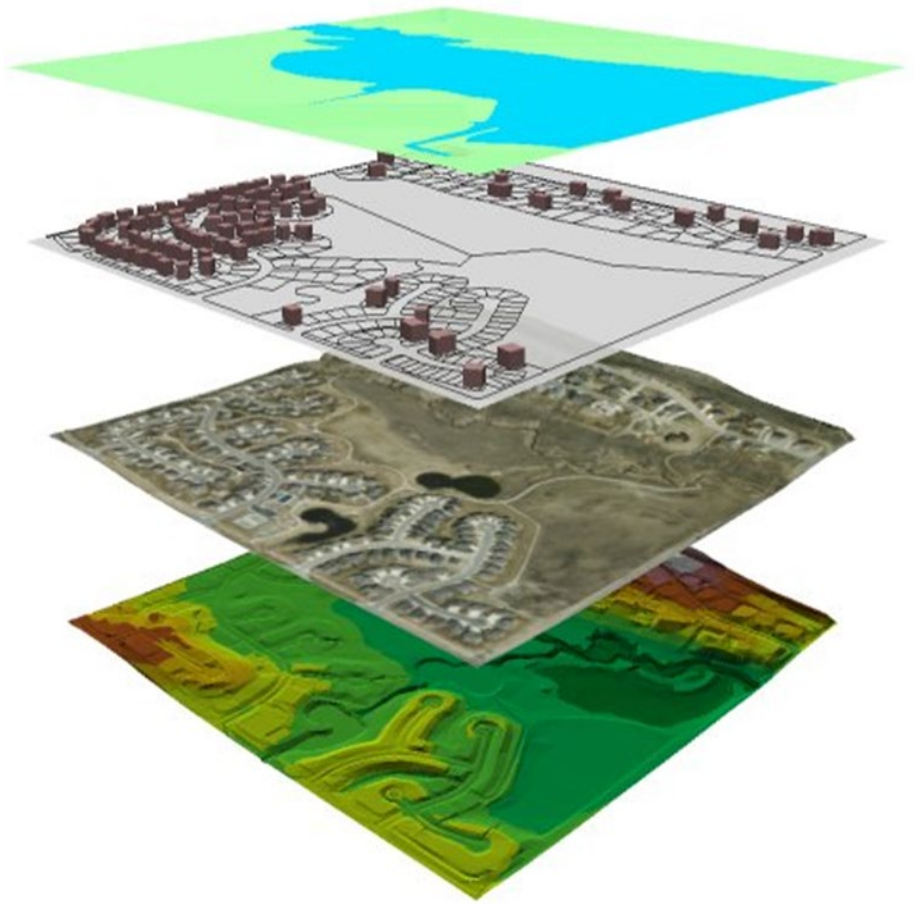
Army Corps of Engineers Hydrologic Engineering Center River Analysis System (**HEC-RAS**) used for hydraulic modeling to determine water elevations

1D Analysis for majority of streams in Johnson, Massac, and Pope Counties.



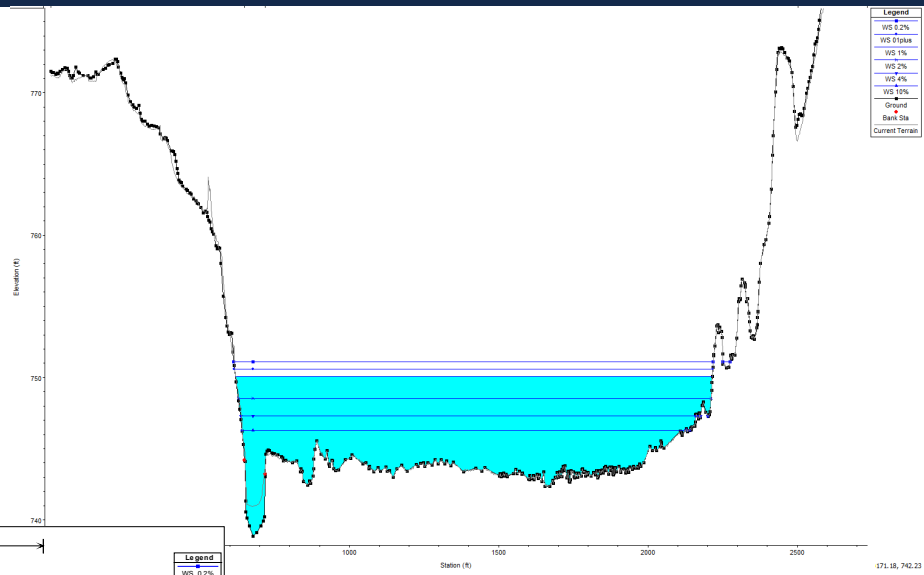
Hydraulic Data

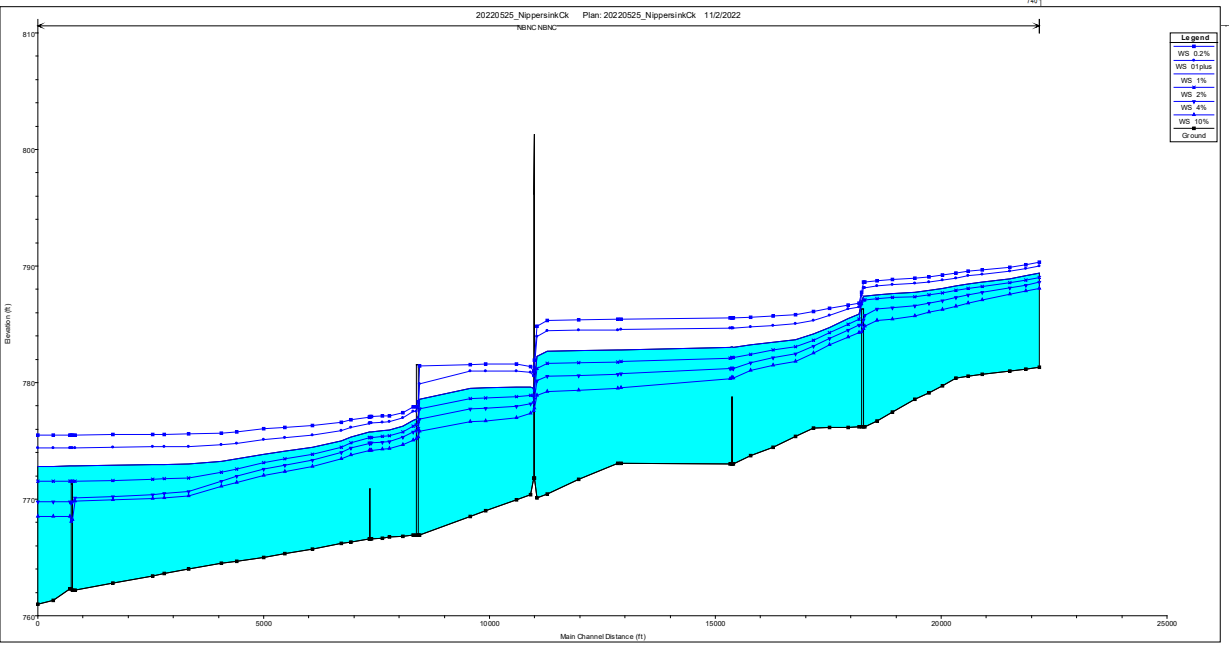
- LiDAR Topography – 2011-2014
- As-built Plans
- Field Survey – Collected in 2021 by IDNR-OWR
- USGS - National Land Cover Database
- Basemap Ortho Photos



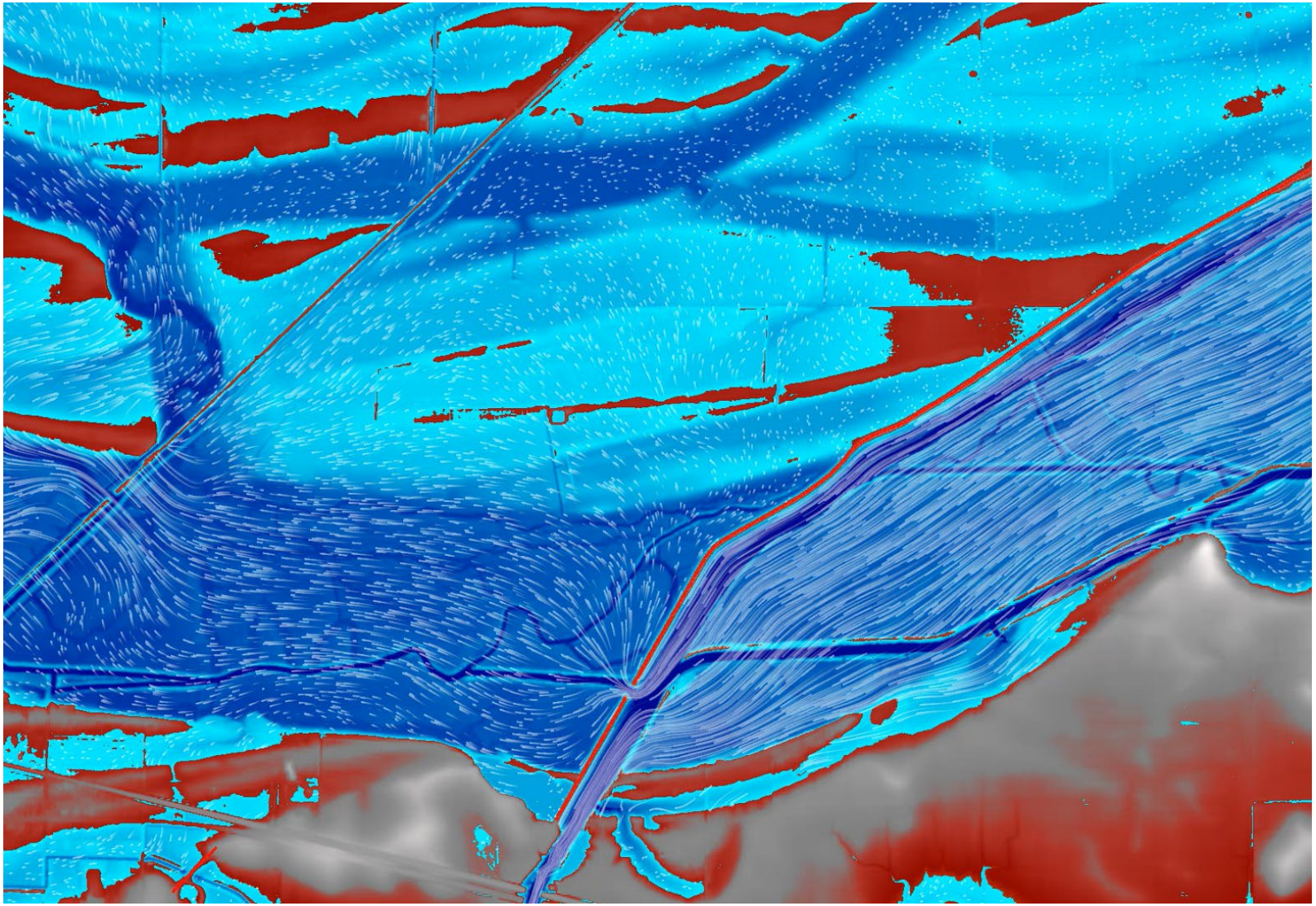
Hydraulics

- Water Surface Elevations
- Exported to GIS for mapping

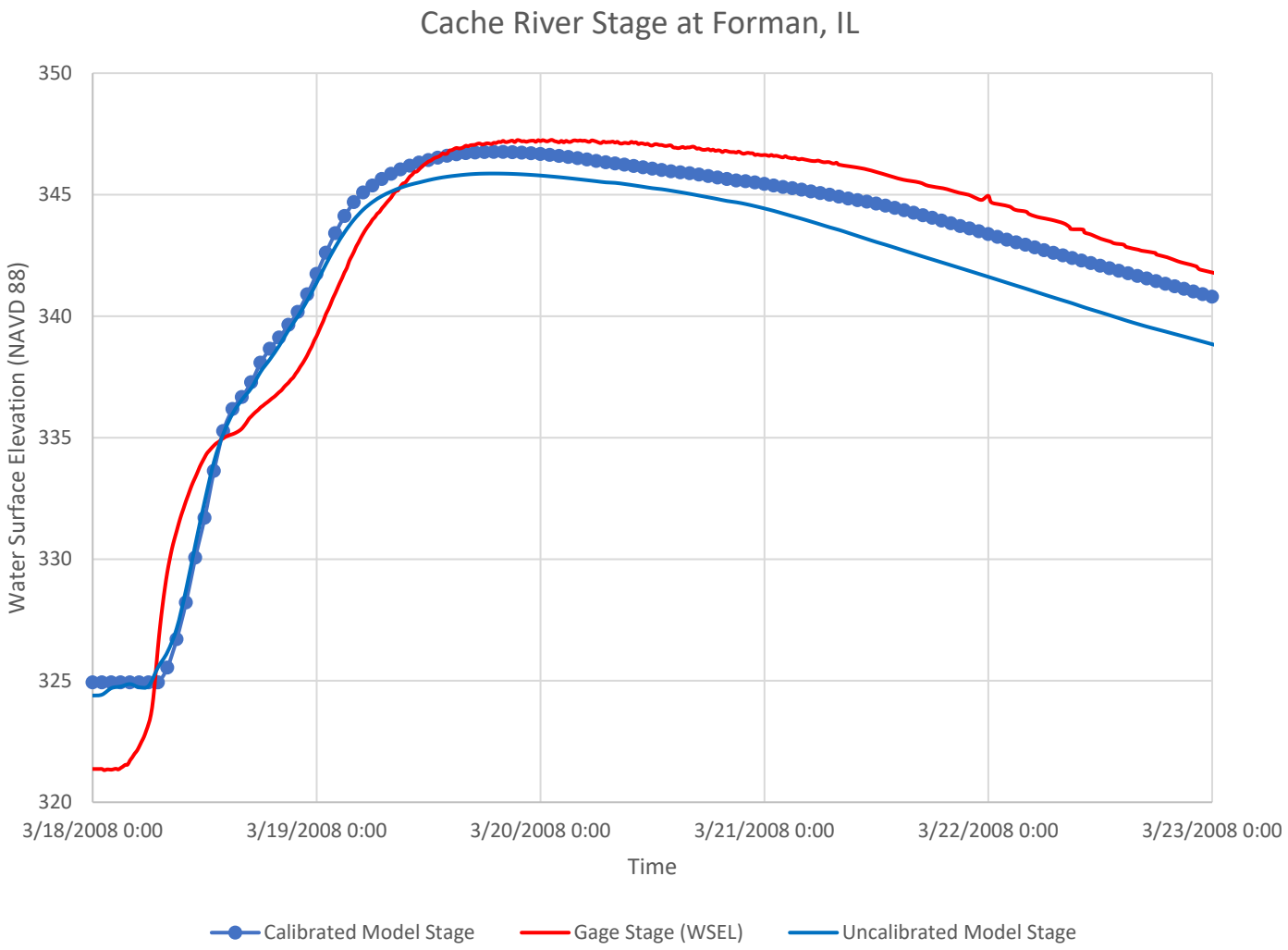




HEC-RAS 2D Modeling

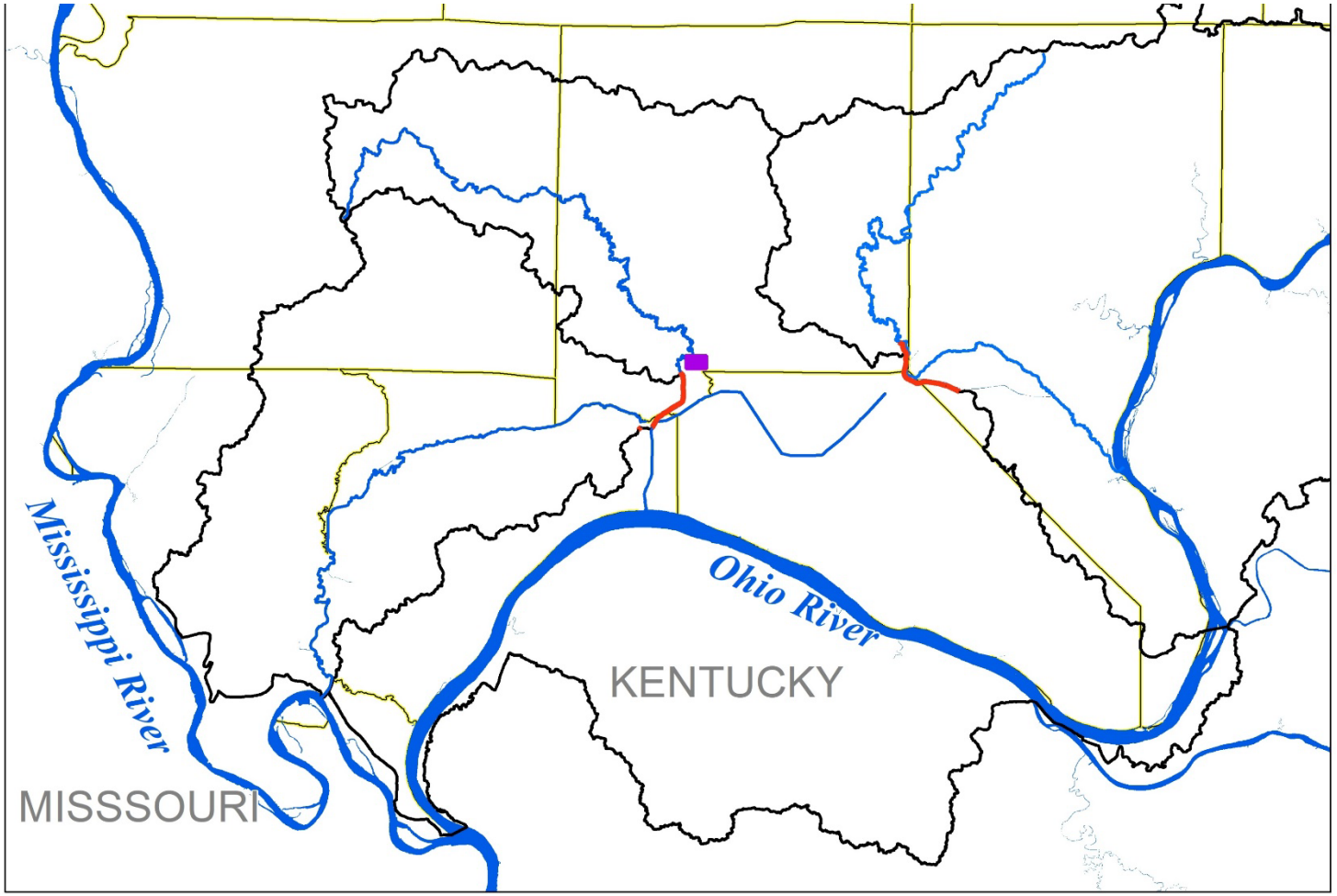


HEC-RAS 2D Modeling Calibration



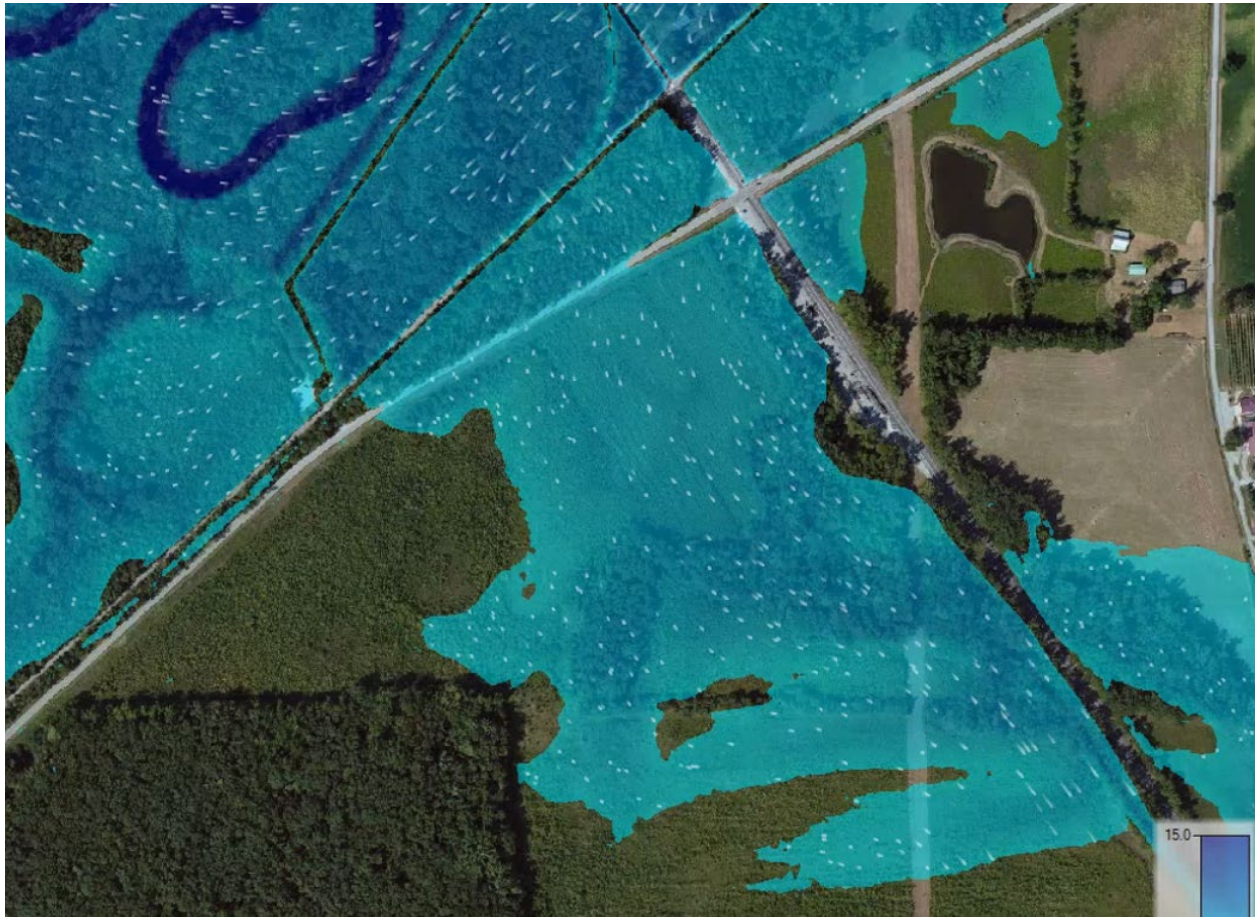
March 2008 Aerial Imagery Comparison

Cache River Belknap Road Overflow

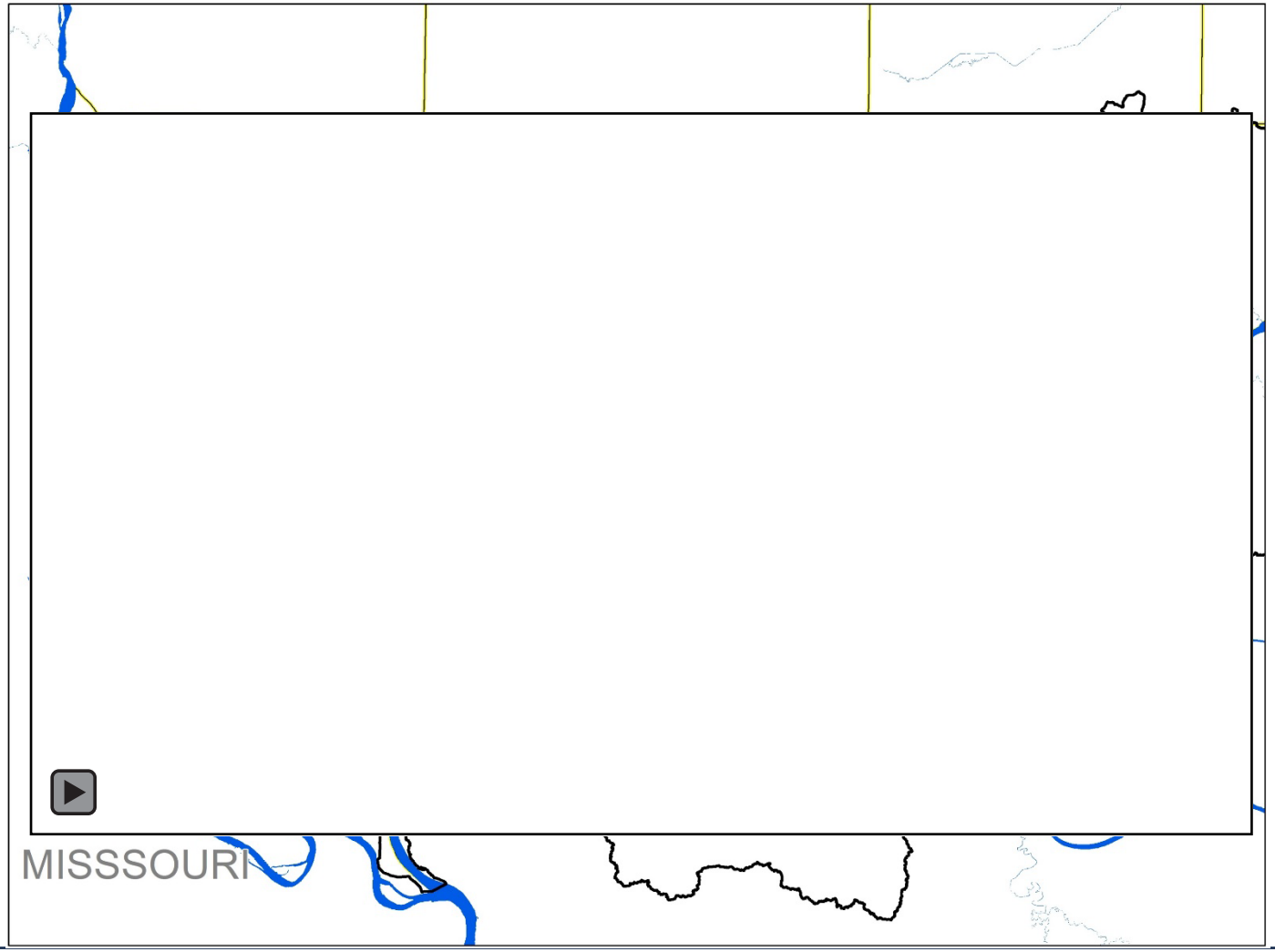


March 2008 Aerial Imagery Comparison
Cache River Belknap Road Overflow - draft delineations

March 2008 Aerial Imagery Comparison
Cache River Belknap Road Overflow- 2D model

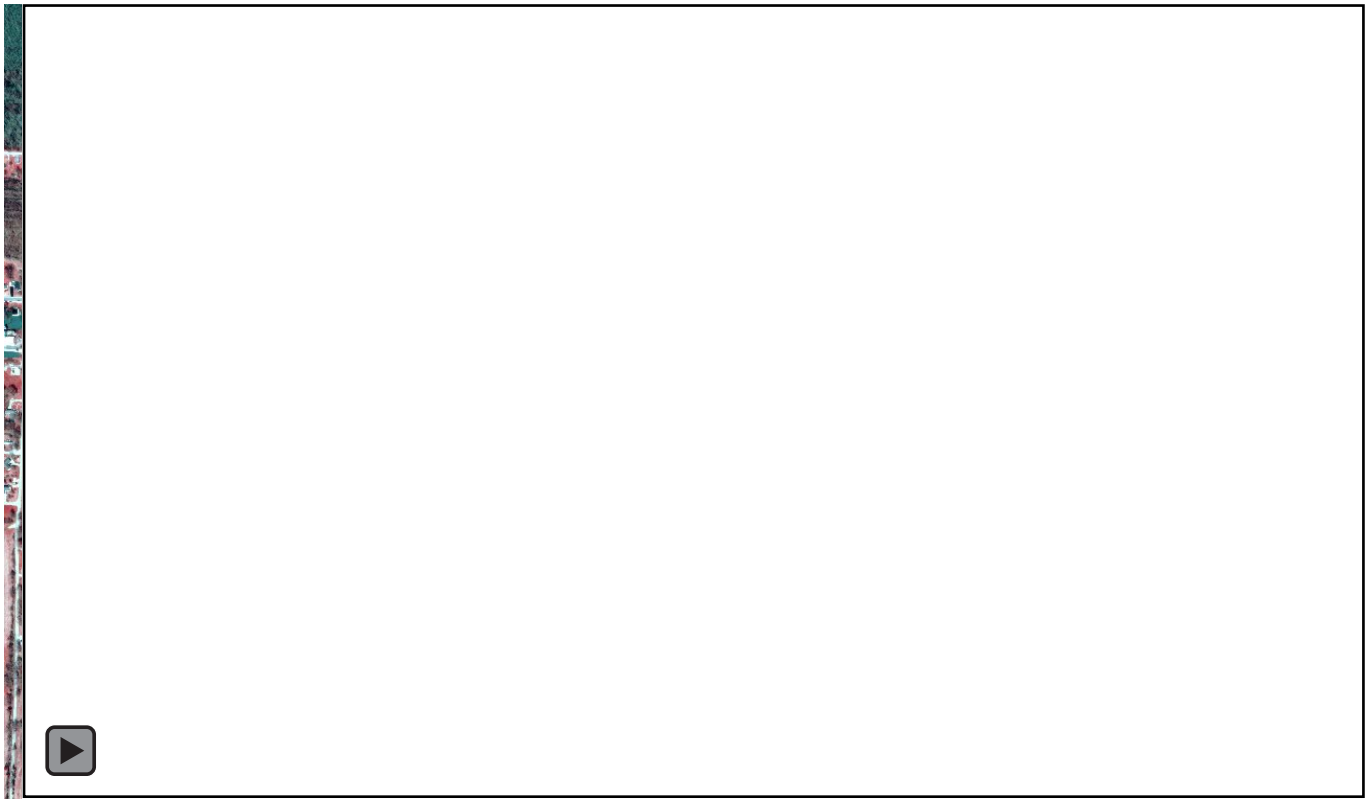


March 2008 Aerial Imagery Comparison
Karnak levee Breach and Post Creek Cutoff

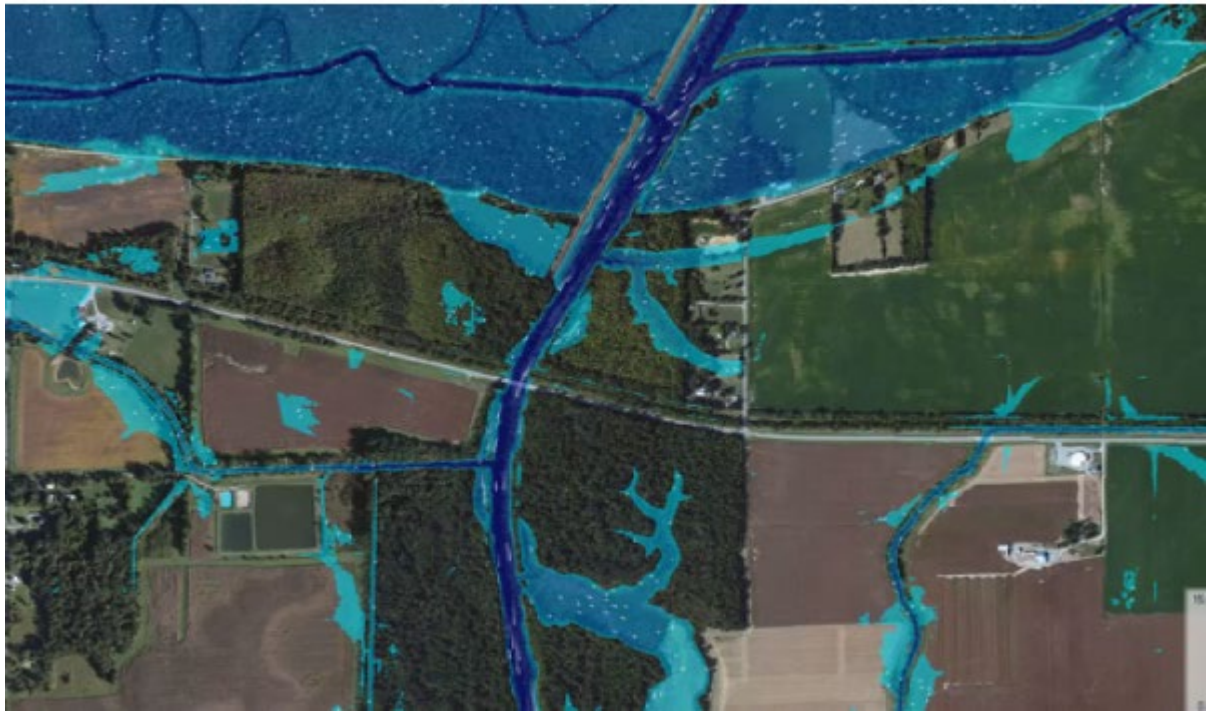


March 2008 Aerial Imagery Comparison

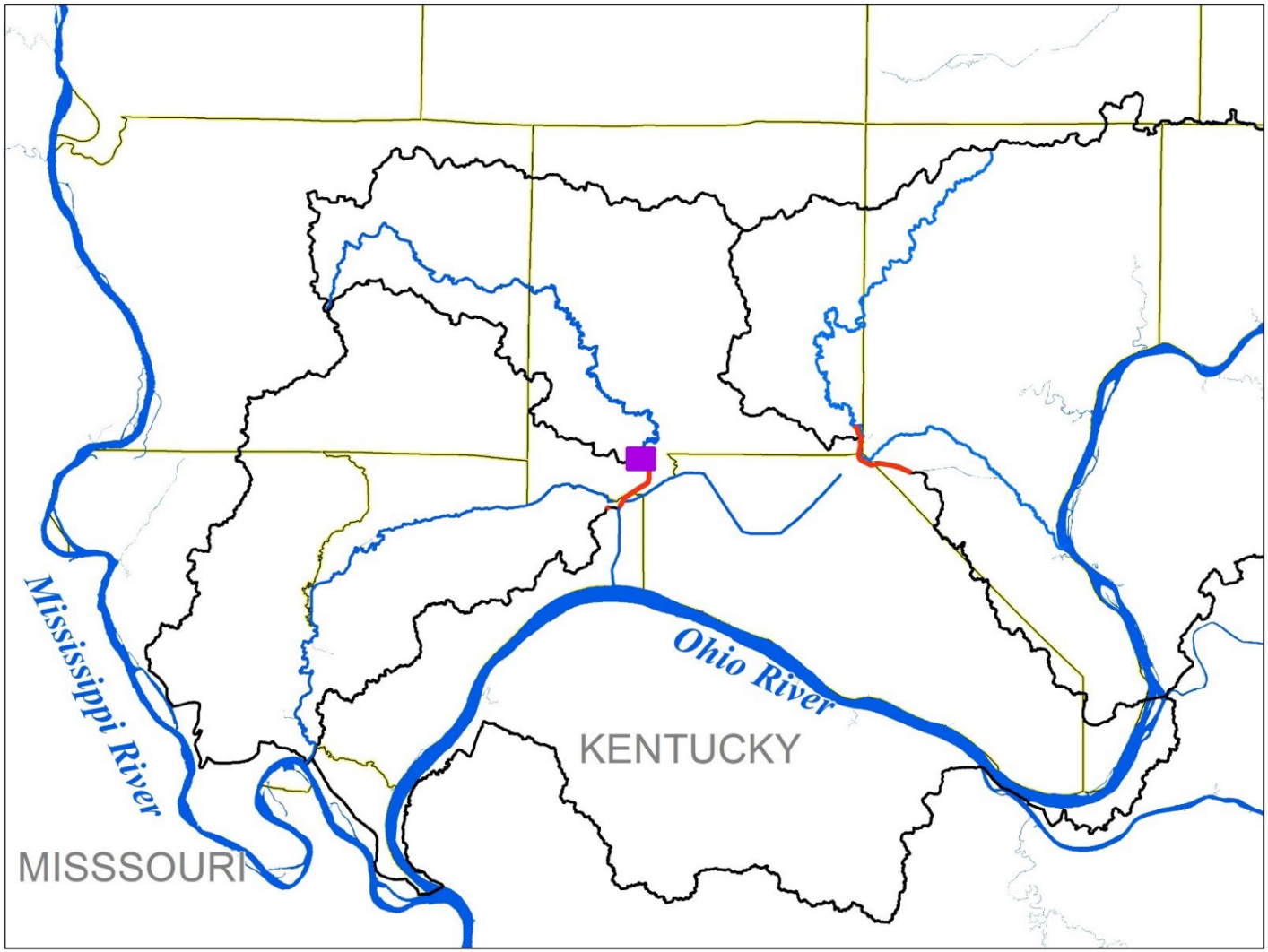
Karnak levee Breach and Post Creek Cutoff – draft delineations



March 2008 Aerial Imagery Comparison
Karnak levee Breach and Post Creek Cutoff- 2D model

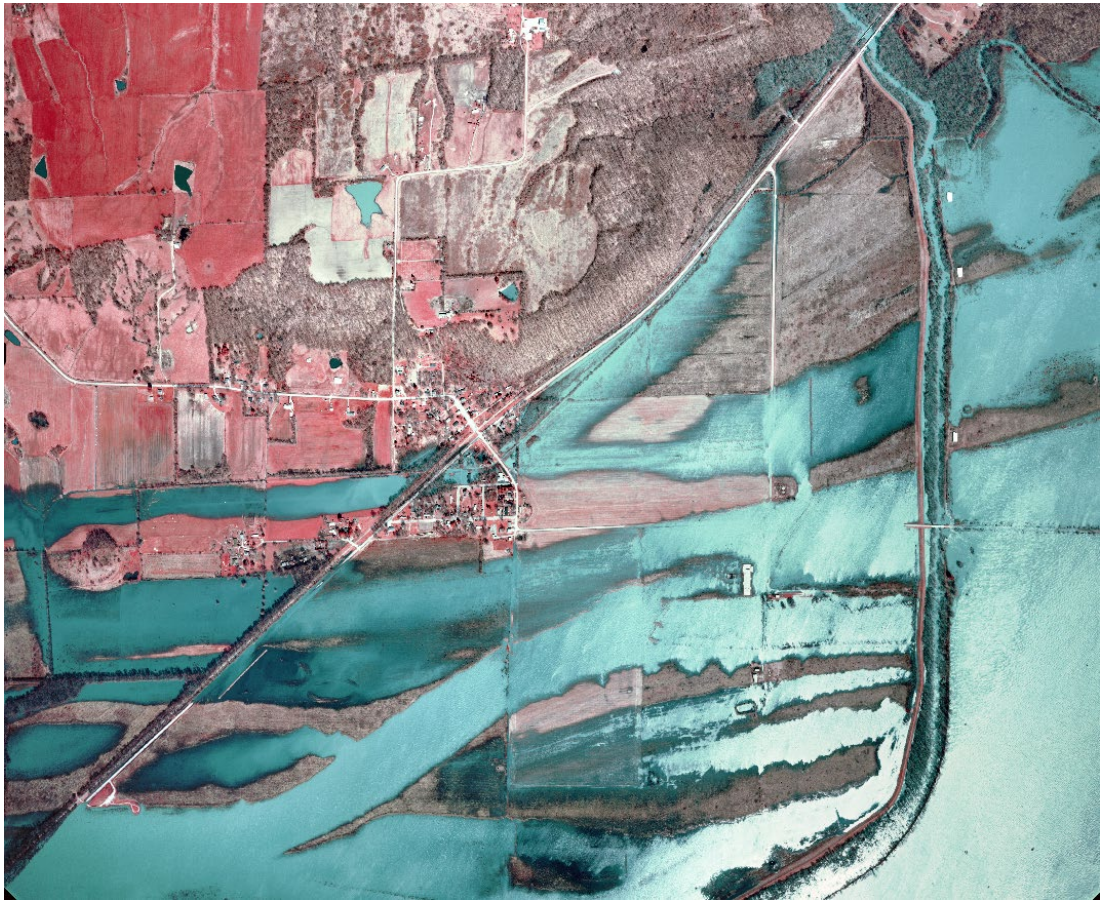


March 2008 Aerial Imagery Comparison
Karnak Levee Near Belknap

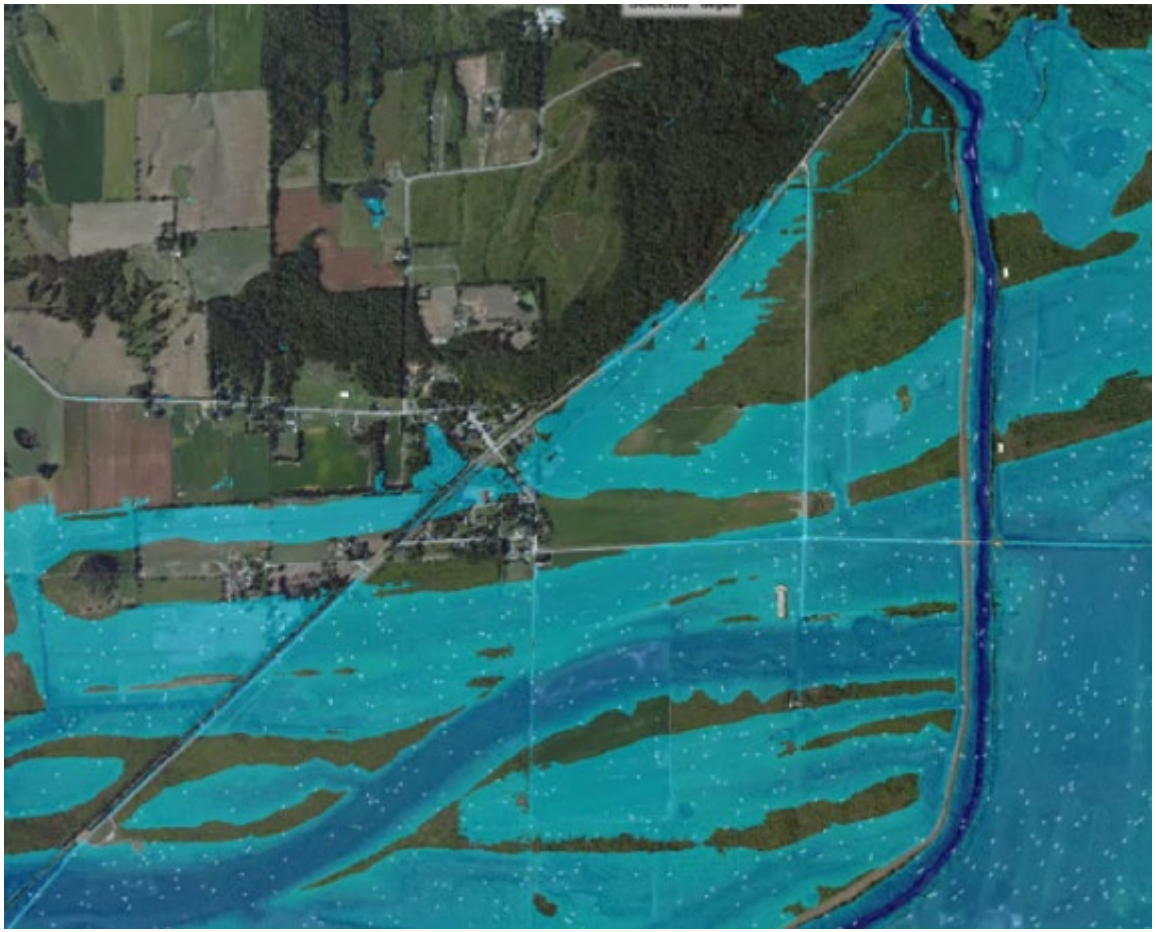


March 2008 Aerial Imagery Comparison

Karnak Levee Near Belknap – Draft delineations



March 2008 Aerial Imagery Comparison
Karnak Levee Near Belknap- 2D model



Floodplain Delineations

- Modeling was completed on LiDAR Terrain Data that was acquired between 2011 and 2014.
- Newer LiDAR Terrain Data that was acquired in 2020 became available after the modeling had commenced.
- Floodplain Delineations & Ohio River Re-delineation were performed on newer 2020 Terrain Data

2020 LiDAR Information

County	Year Acquired	Derived Product	Grid Size (ft)	Bare Earth 95% Confidence Vertical Accuracy (m)	Vertical Datum
Johnson County	2020	DTM	1.5	0.111	NAVD 88
Massac County	2020	DTM	1.5	0.111	NAVD 88
Pope County	2020	DTM	1.5	0.111	NAVD 88

Base Flood Elevation Comparisons

Little Cache Creek

Location	Effective BFE (NAVD88)	Updated BFE (NAVD88)	Difference
Approximately 5,400 feet downstream of U.S. Route 45	364.9	363.4	-1.5
Approximately 4,000 feet downstream of U.S Route 45	365.0	365.9	0.9
Just downstream of U.S. Route 45	366.7	366.7	0.0
Just upstream of U.S. Route 45	368.0	367.3	-0.7
Just downstream of State Route 146	369.5	367.5	-2.0
Just upstream of State Route 146	369.6	368.8	-0.8
Approximately 3,500 feet upstream of State Route 146	369.9	369.5	-0.4

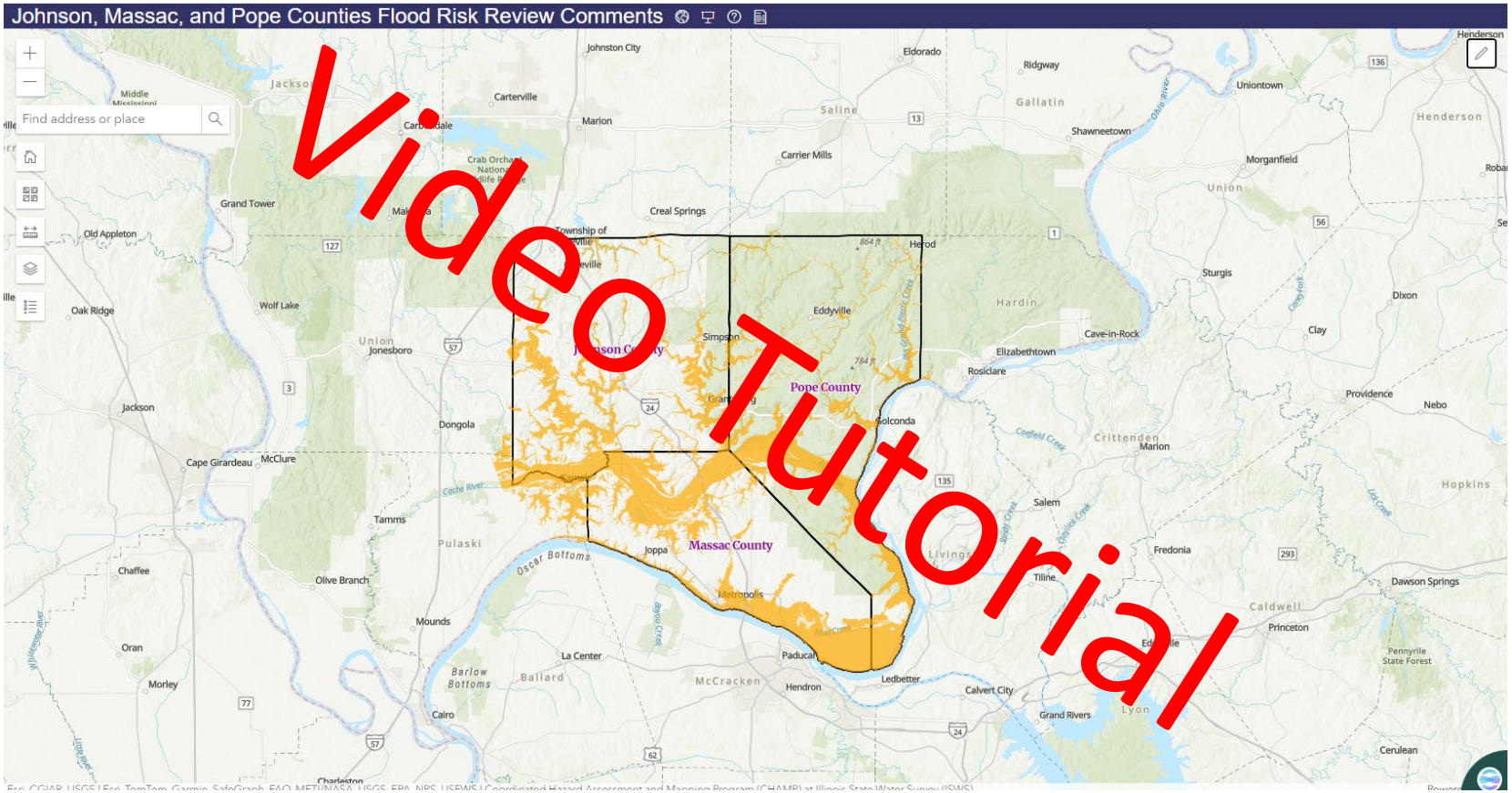
Base Flood Elevation Comparisons

Massac Creek

Location	Effective BFE (NAVD88)	Updated BFE (NAVD88)	Difference
Approximately 3,700 feet downstream of Country Club Road	337.7	340.1	2.4
Just downstream of Country Club Road	344.8	344.4	-0.4
Just upstream of Country Club Road	347.7	345.6	-2.1
Approximately 1.1 miles upstream of Country Club Road	355.0	351.4	-3.6
Just downstream of I-24	368.7	368.4	-0.3
Just upstream of I-24	374.0	371.1	-2.9
Just downstream of Massac Creek Road	377.0	376.7	-0.3
Just upstream of Massac Creek Road	378.0	380.0	2.0
Just downstream of Rosebud Road	401.0	400.7	-0.3
Just upstream of Rosebud Road	402.0	402.0	0.0
Just downstream of U.S. Route 45	404.5	404.4	-0.1

Webmap

Webmap Comment Feature

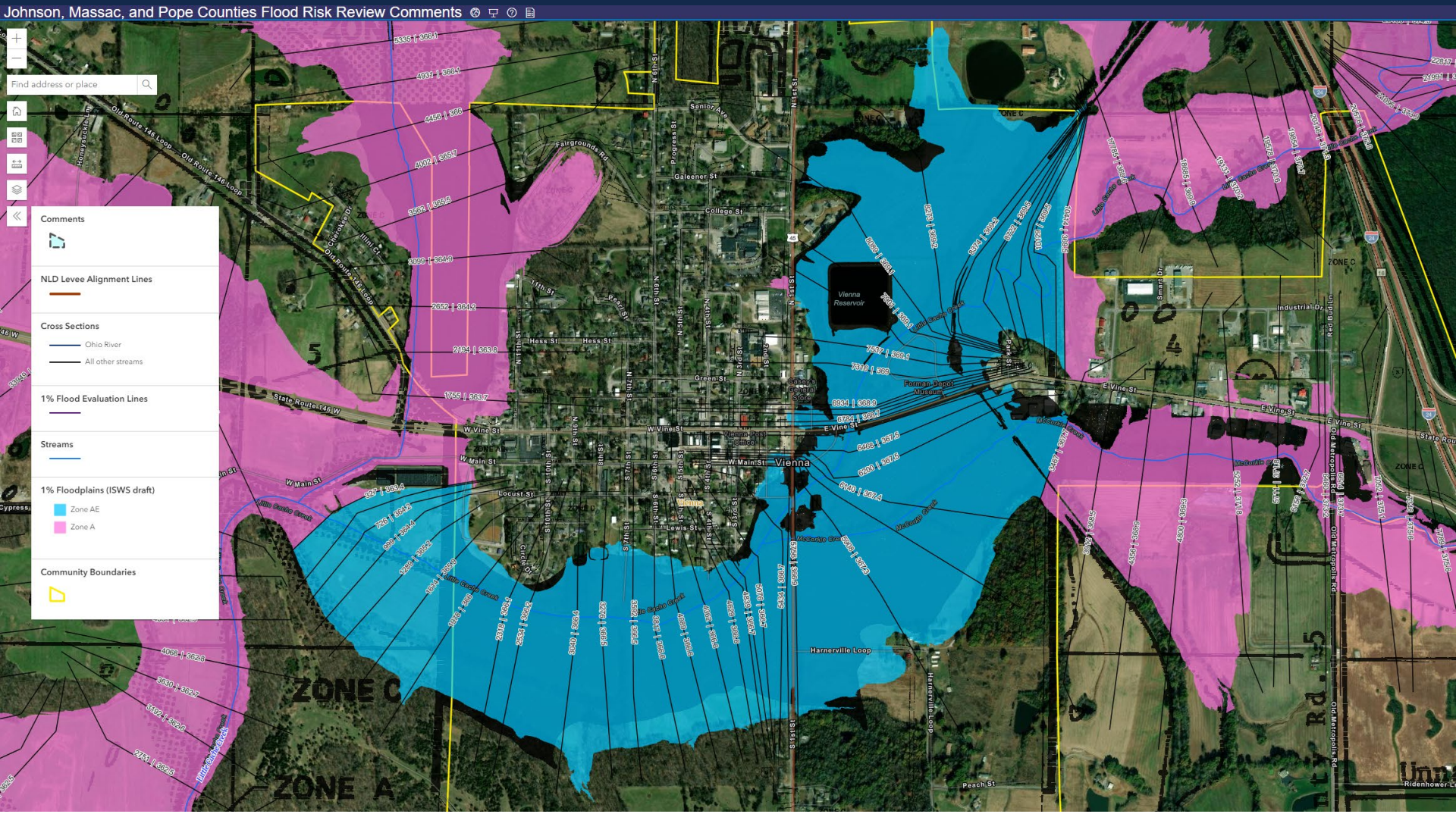


https://www.illinoisfloodmaps.org/commentmap/cache.htm

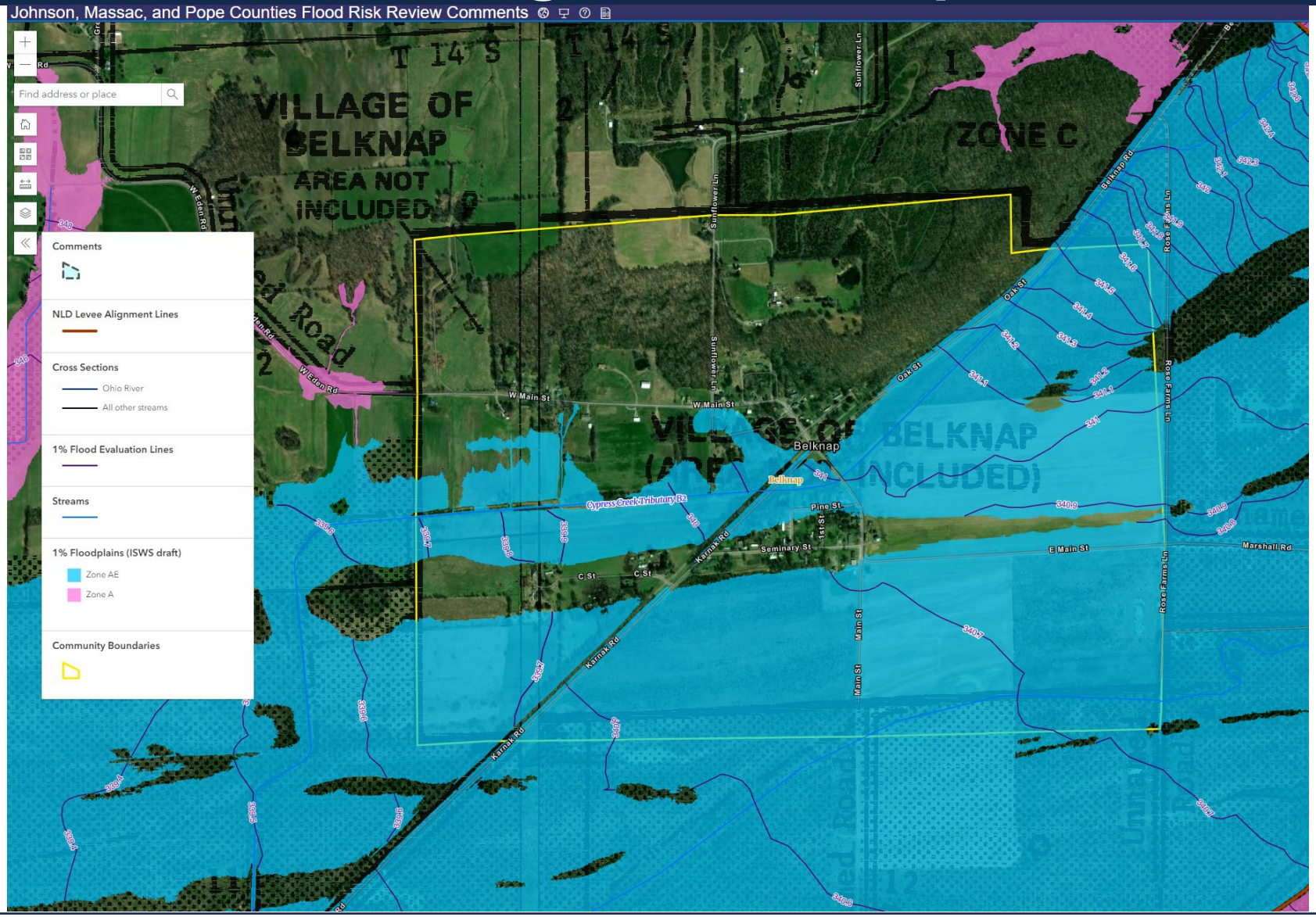
Log in: watershed **Password: illinoisfloods!123**

Draft Floodplain Results

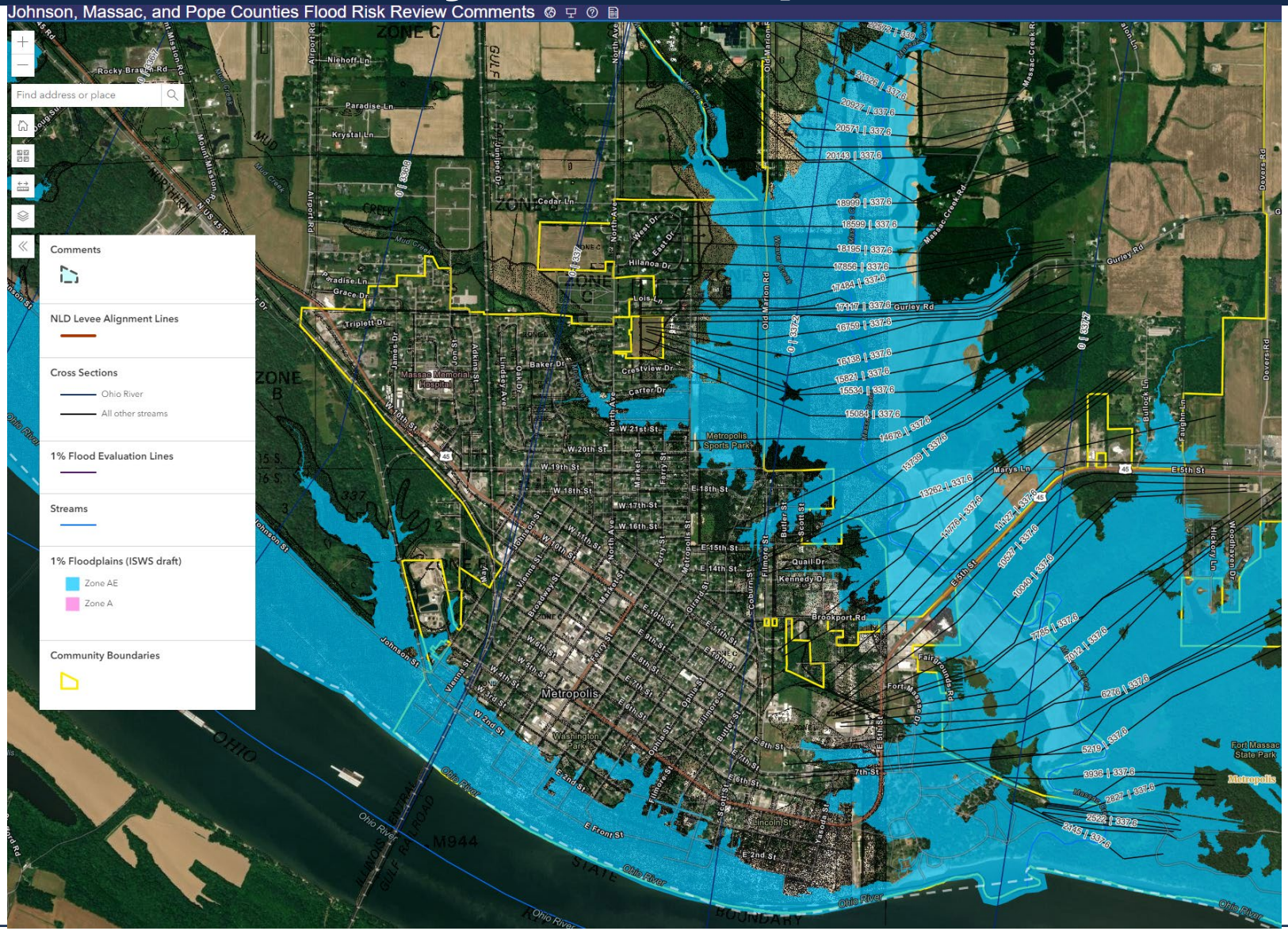
Little Cache Creek – City of Vienna



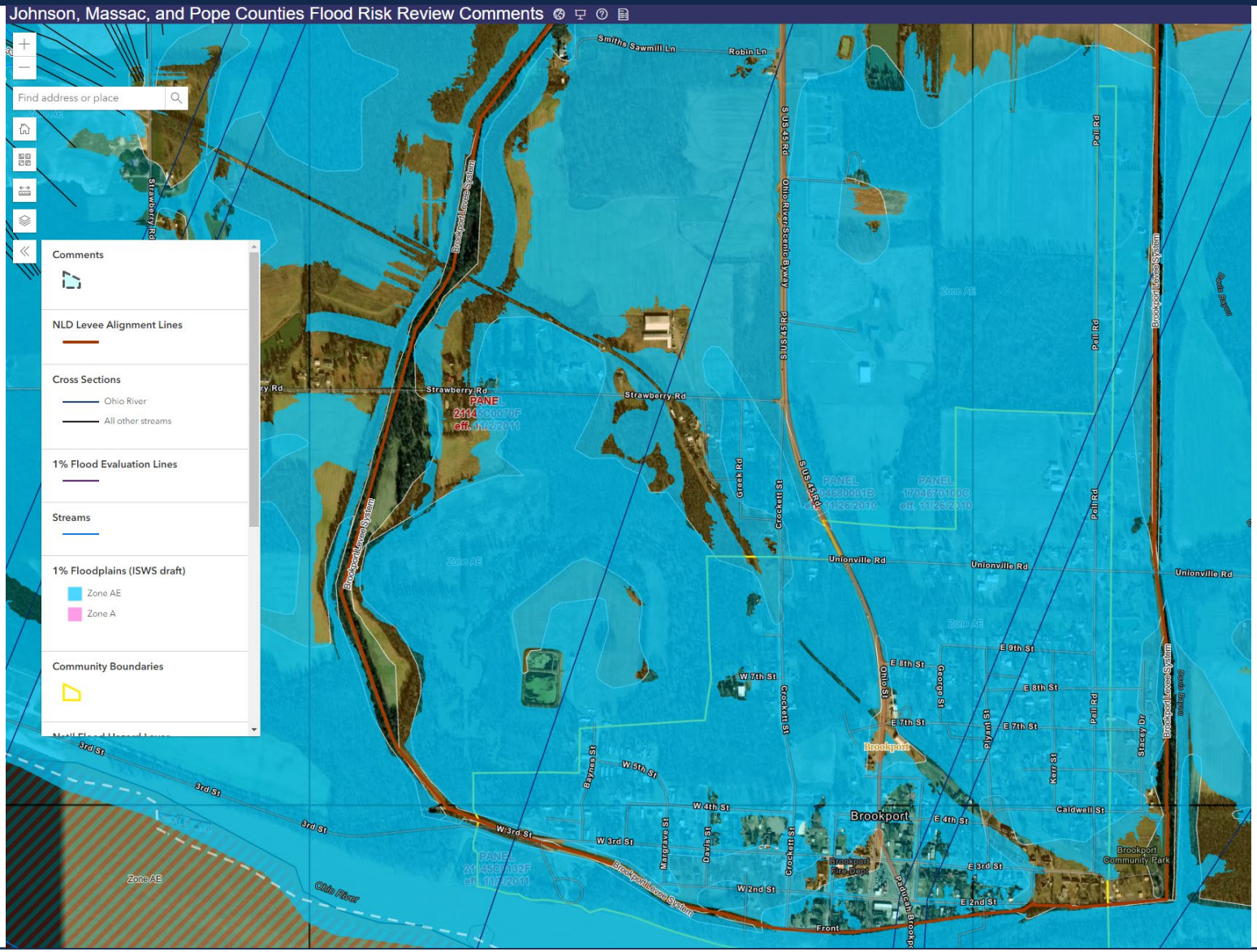
Cypress Creek Tributary 2 and Cache River – Village of Belknap



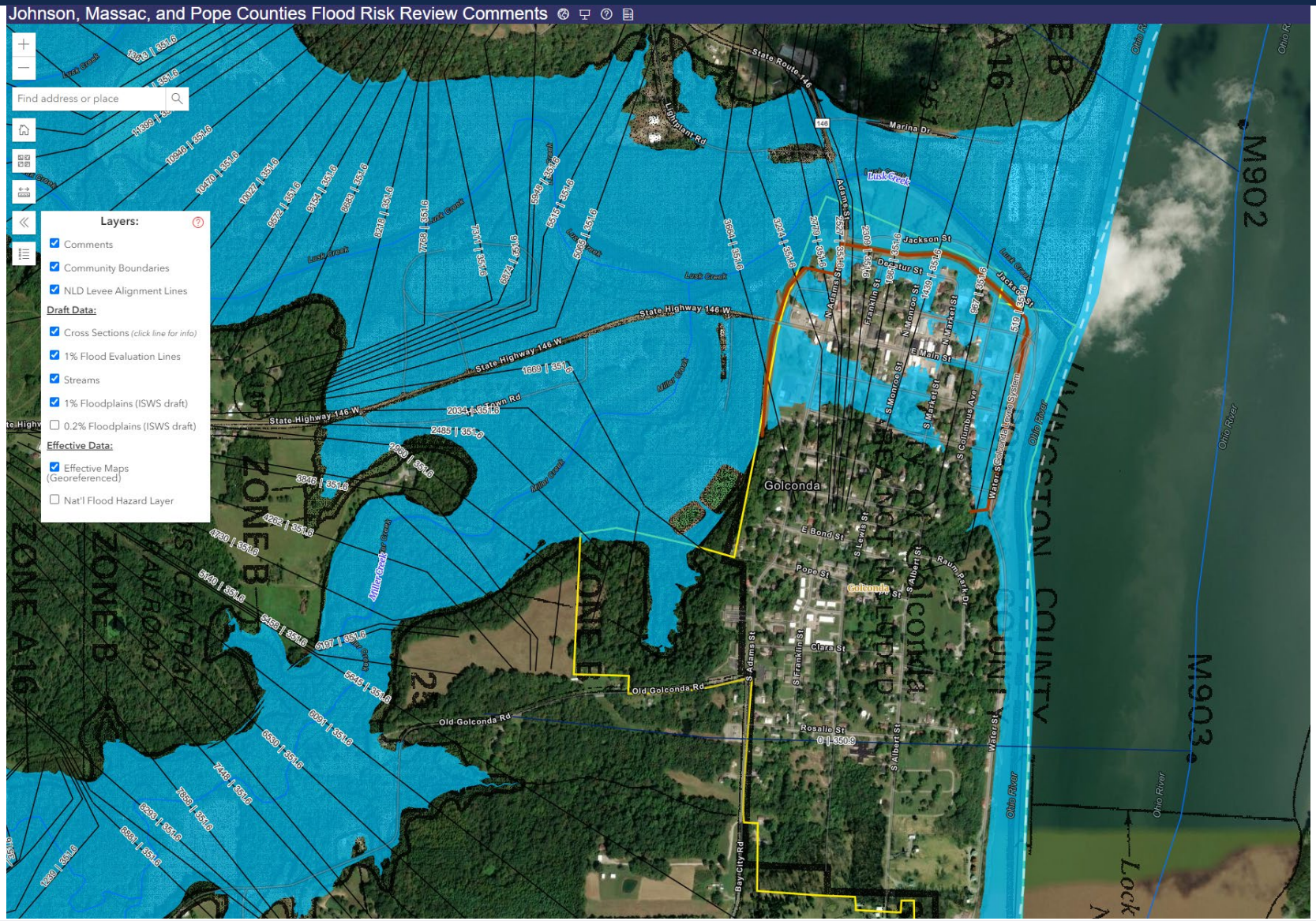
Ohio River and Massac Creek – City of Metropolis



Ohio River– City of Brookport



Ohio River– City of Golconda



Communication and Next Steps

Communication Plan

- Project Initiation Community Coordination meeting – virtual April 27, 2021
- Proposed Engineering Methods Notification (FEMA SID 620) letters- June 23, 2021
- 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 database30-Day Comment Period starts today

Schedule

~~Project Initiation Community Coordination meeting – April 27, 2021~~

Flood Risk Review Meeting (today); Comment period ending July 8, 2024

Submit Flood Studies to IDNR for State review

Complete draft FIRM database to conclude data development phase of project

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

Community Participation

Community Impact

Why New Floodplain Maps 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.

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FLOOD RISK REVIEW MEETING - JOHNSON, MASSAC, AND POPE COUNTIES

JUNE 4, 2024

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)?**

   ◯ a lot
   ◯ some
   ◯ not much

3. **Has this meeting helped you know how to better 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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