Kansas Department of Agriculture
Division of Water Resources

FEMA

WSP

Barton County

Floodplain Mapping Project Data Development Kickoff Meeting

April 23, 2024

While we are waiting, please enter your name and community in the chat box!

Your engagement in this process is important to the success of this project, so thank you for taking the time to be here today!

Introductions

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Floodplain Mapping Coordinator

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State NFIP Coordinator

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NFIP Specialist

FEMA – Region VII

Dawn Livingston
Regional Project Officer

WSP USA Environment & Infrastructure Inc.

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Project Manager / Engineer

Erika Stanley
Sr. GIS Analyst

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Today's Goals

Share details on the mapping project

Get initial feedback on modeling methods

Review future steps

Background

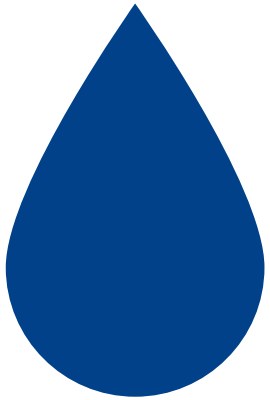
Background

It was determined that updated modeling and mapping for portions of Barton County using newer Lidar and 2D modeling techniques, would be beneficial.

- Barton County Effective Mapping
  - PMR completed in 9/15/2019 for the Cow Watershed
  - Remainder of the county maps are dated 9/2/2009
- Lower Middle Arkansas Custom Watershed BLE
  - Discovery Meeting held on 1/12/2021 & 1/13/2021
- Middle Smoky Hill Custom Watershed BLE
  - Discovery Meeting held on 3/10/2021
- Pawnee-Walnut Custom Watershed BLE
  - Discovery Meeting held on 7/26/2023
- Upper Middle Arkansas Custom Watershed BLE
  - Discovery Meeting held on 12/12/2023

Review of the Work Ahead and How We Propose Doing It

Definitions



Hydrology

How Much Water?

Hydraulics

How High Will Water Get?

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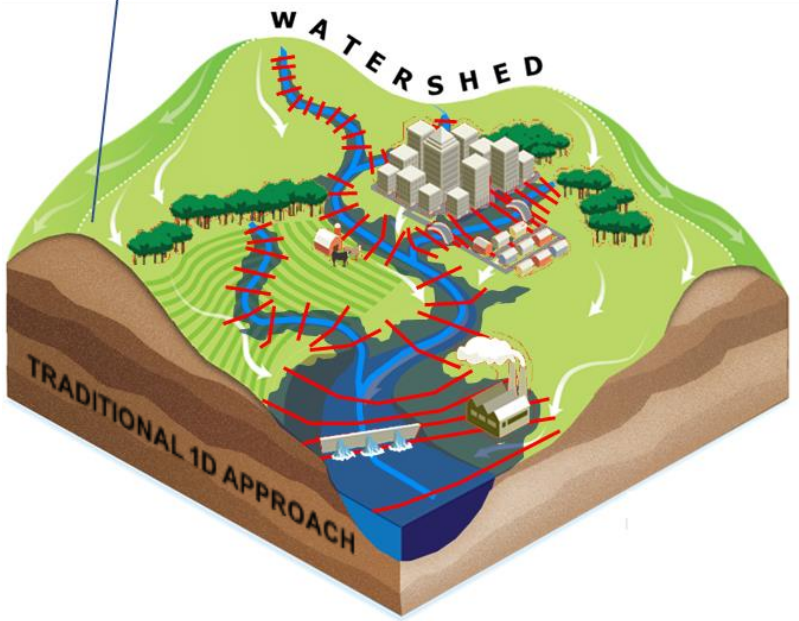
2D Modeling is being used

- Fluvial flooding only.
- Data along studied streams.
- Event-based analyses.



- Fluvial and pluvial flooding.
- Data for entire watershed.
- Probabilistic analyses.

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Model Enhancements

- Enhancements will be made to the BLE modeling that was performed.
  - Lidar, flown in 2018, will be used.
  - Comments made will be used to enhance the modeling.
  - Additional review/refinement of mesh will be done to improve accuracy of modeling.
  - Enhanced Zone A, Zone AE with Floodway, Zone AE without Floodway, and Zone AH on selected streams will include field surveyed structure data, as-built survey plans, and additional land use refinements.

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Model Enhancements

- The hydrology is built into the RAS modeling platform using excess rain-on-mesh modeling.
- HEC-RAS calculates the excess rainfall using NRCS Curve Number methodology.
- Details added to 2D mesh as needed.
- Add detail to significant flood control dams as needed.
- Model flows will be compared to Kansas regression flows and gage (where available) for validation.

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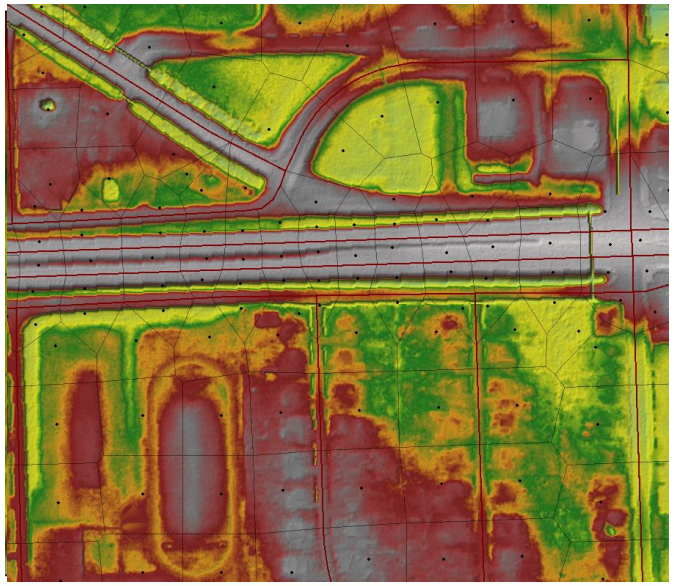
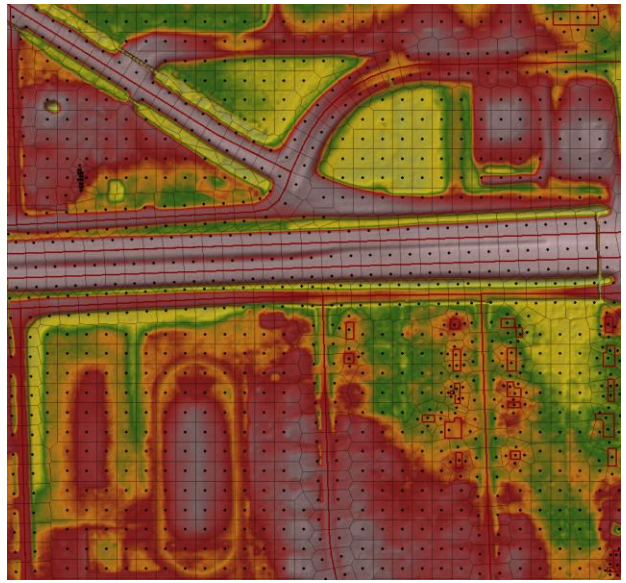
Model Enhancements

- Refined Mesh
  - Will allow for greater accuracy in flood modeling due to increased cell density



Courser Mesh



Refined Mesh

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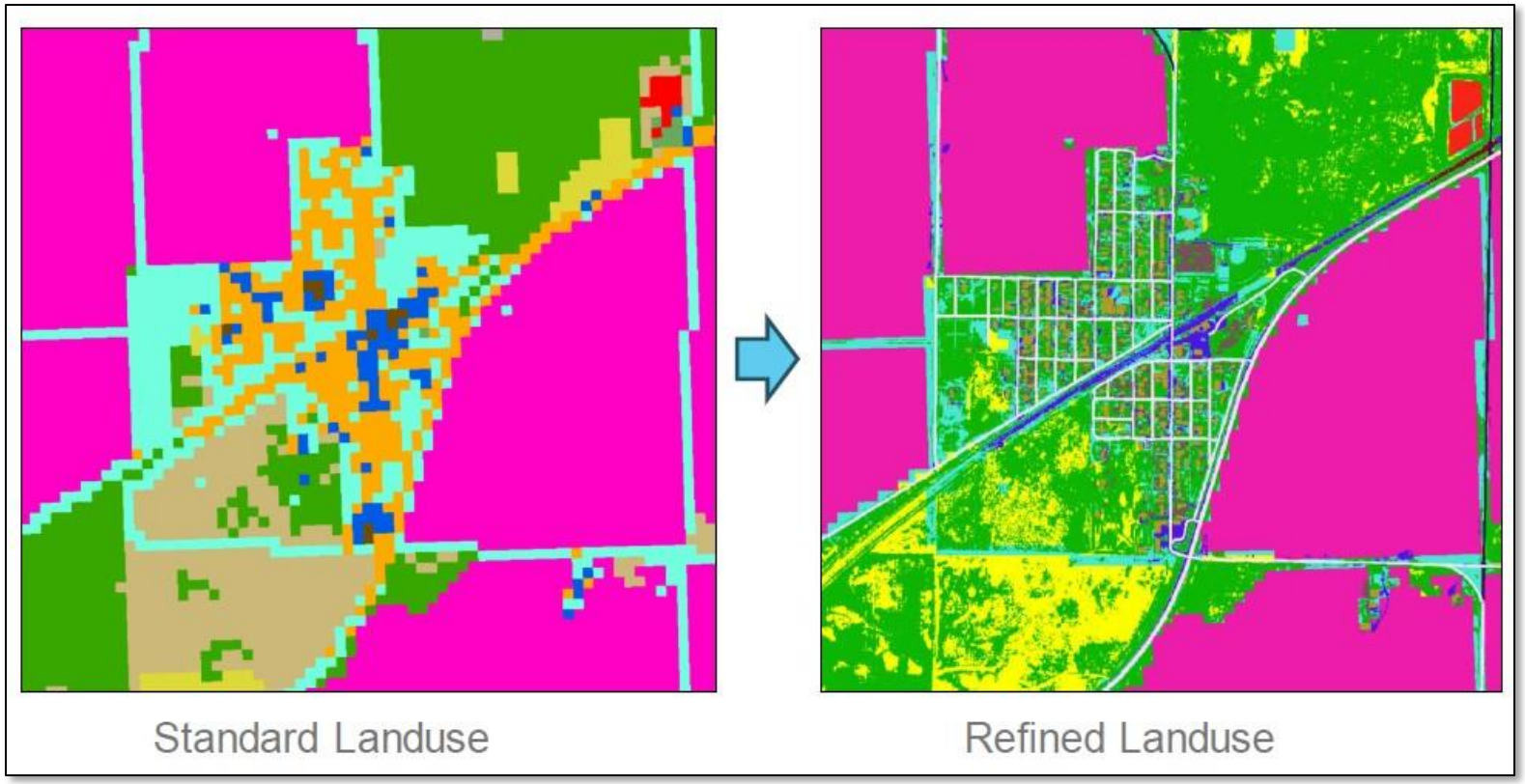
Model Enhancements

- Refined Land Use
  - Will allow for greater accuracy in surface modeling due to more detailed land use



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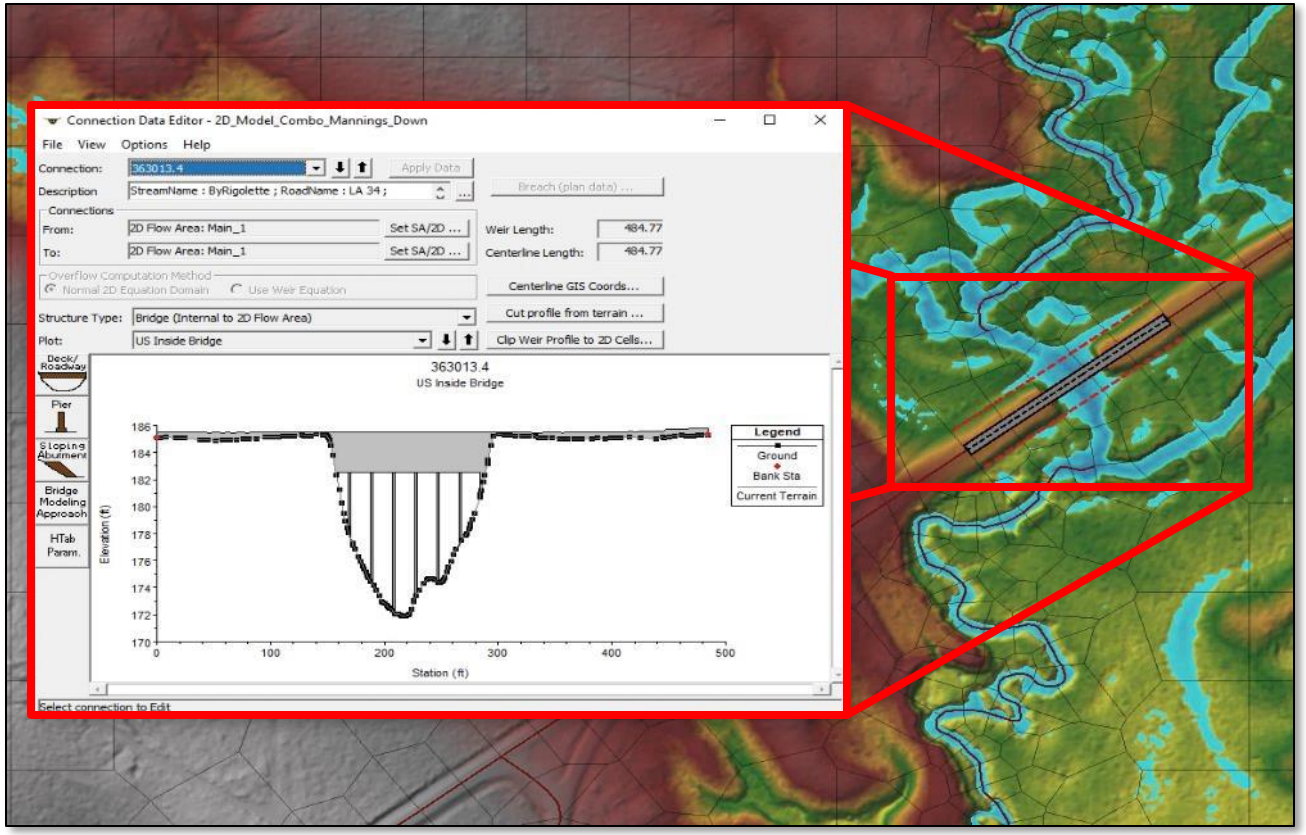
Model Enhancements

- Detailed structure modeling incorporated into Refined models, where data is available
  - Do you have any recent structure improvements, or planned improvements, that has data that can be shared?
  - Field collected structure data, if necessary



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Gage Data

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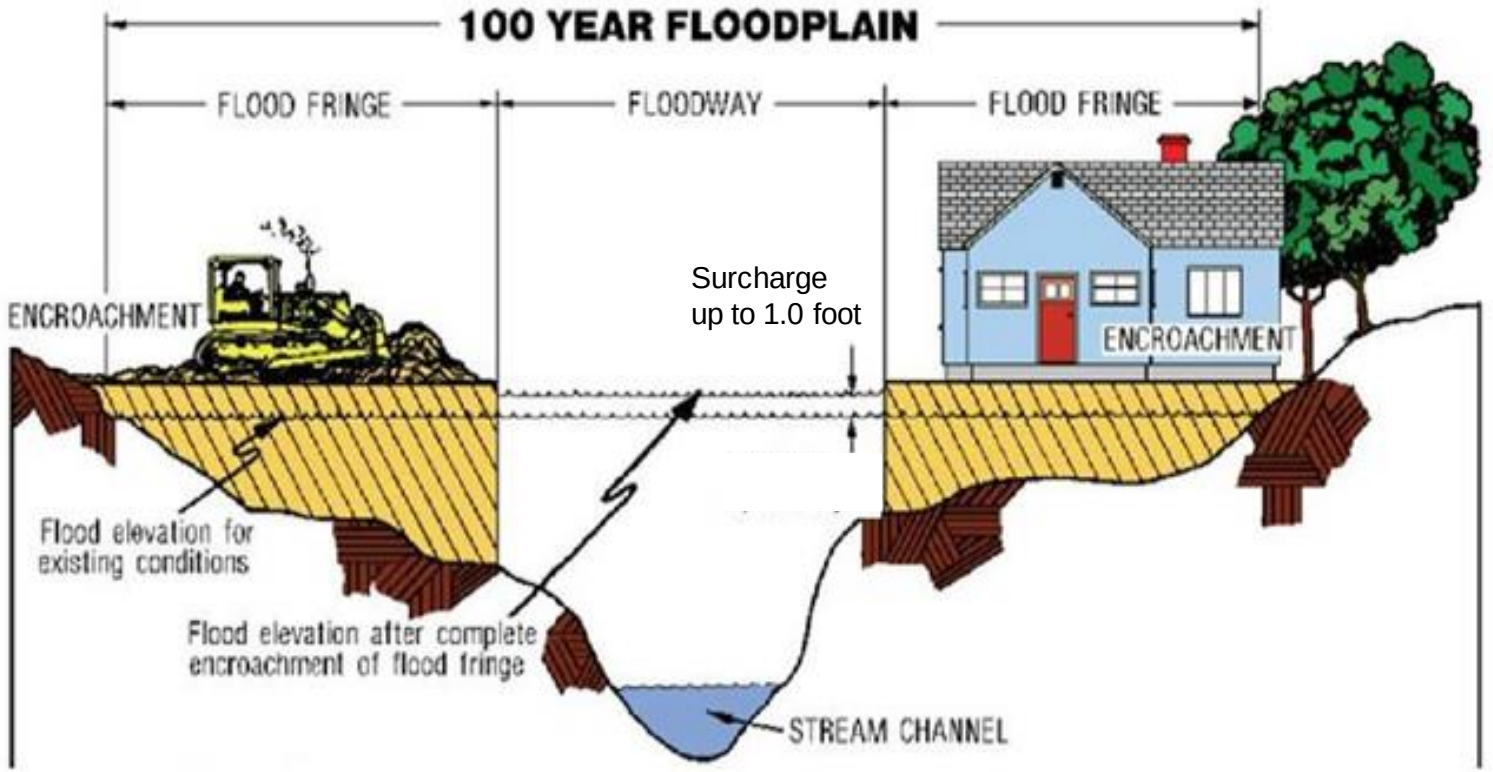
A portion of the Zone AE modeling includes the development of a floodway

A Floodway is the area within the floodplain that must be reserved in order to discharge the base flood without cumulatively increasing the WSE by more than 1.0 foot.



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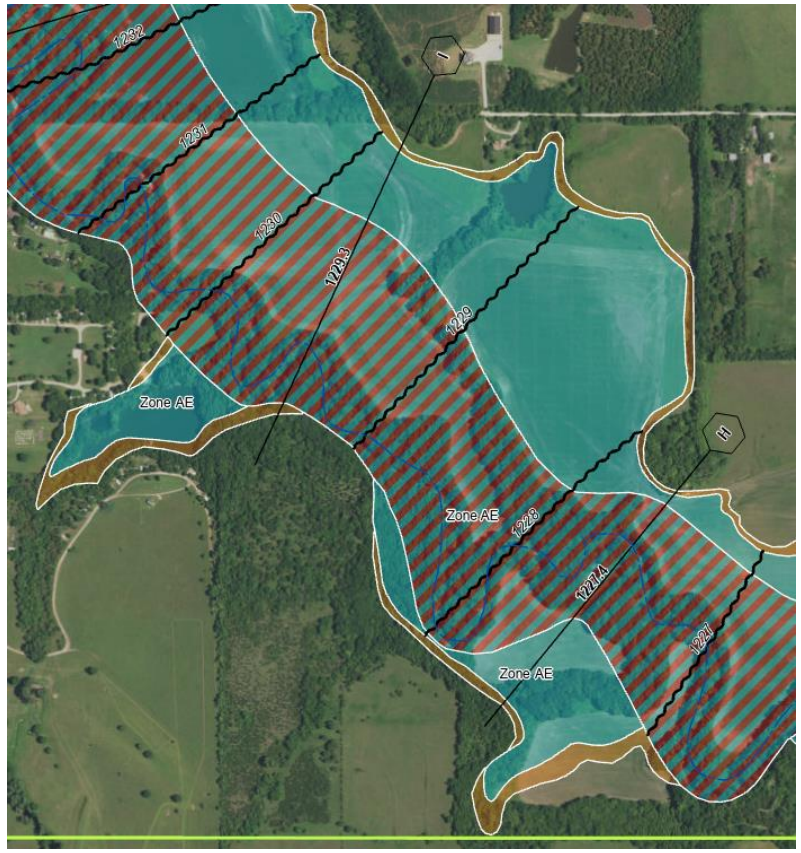
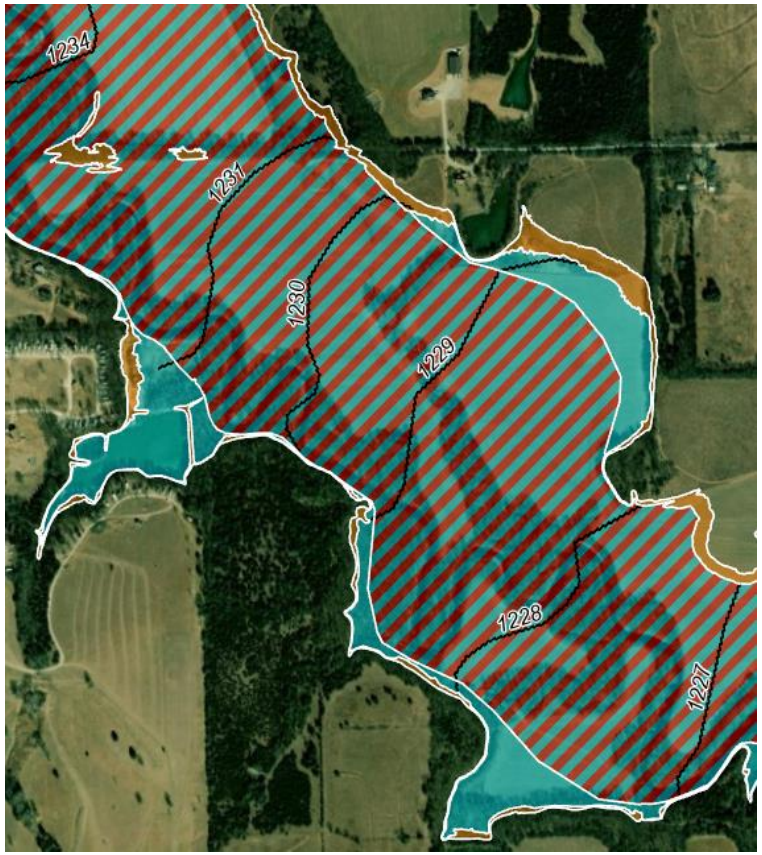
Floodways will be developed using the 2D models





Data Development Scope

Barton County 2023 Proposed Mapping Updates

Scoped Studies

New Zone A - Excess Rainfall on Grid

New Zone A studies will be developed for these streams using 2D "excess rainfall-on grid" hydrology and 2D Hec-Ras hydraulics.

New Zone A - Gage Analysis

New Zone A studies will be developed for these streams using 2D Hec-Ras hydraulics and hydrology calibrated to Gage Analysis flows.

New Zone AE with Floodway - Gage Analysis

New Zone AE studies will be developed for these streams using 1D or 2D Hec-Ras hydralics and hydrology calibrated to Gage Analysis Flows. Floodways will be developed. Field measured structure data will be incorporated into the modeling. BFEs will be shown on the maps.

New Zone AH - Excess Rainfall on Grid

New Zone AH studies will be developed for these streams using2D Hec-Ras hydralics and "excess rainfall-on grid" hydrology. Field measured structure data will be incorporated into the modeling. BFEs will be shown on the maps.

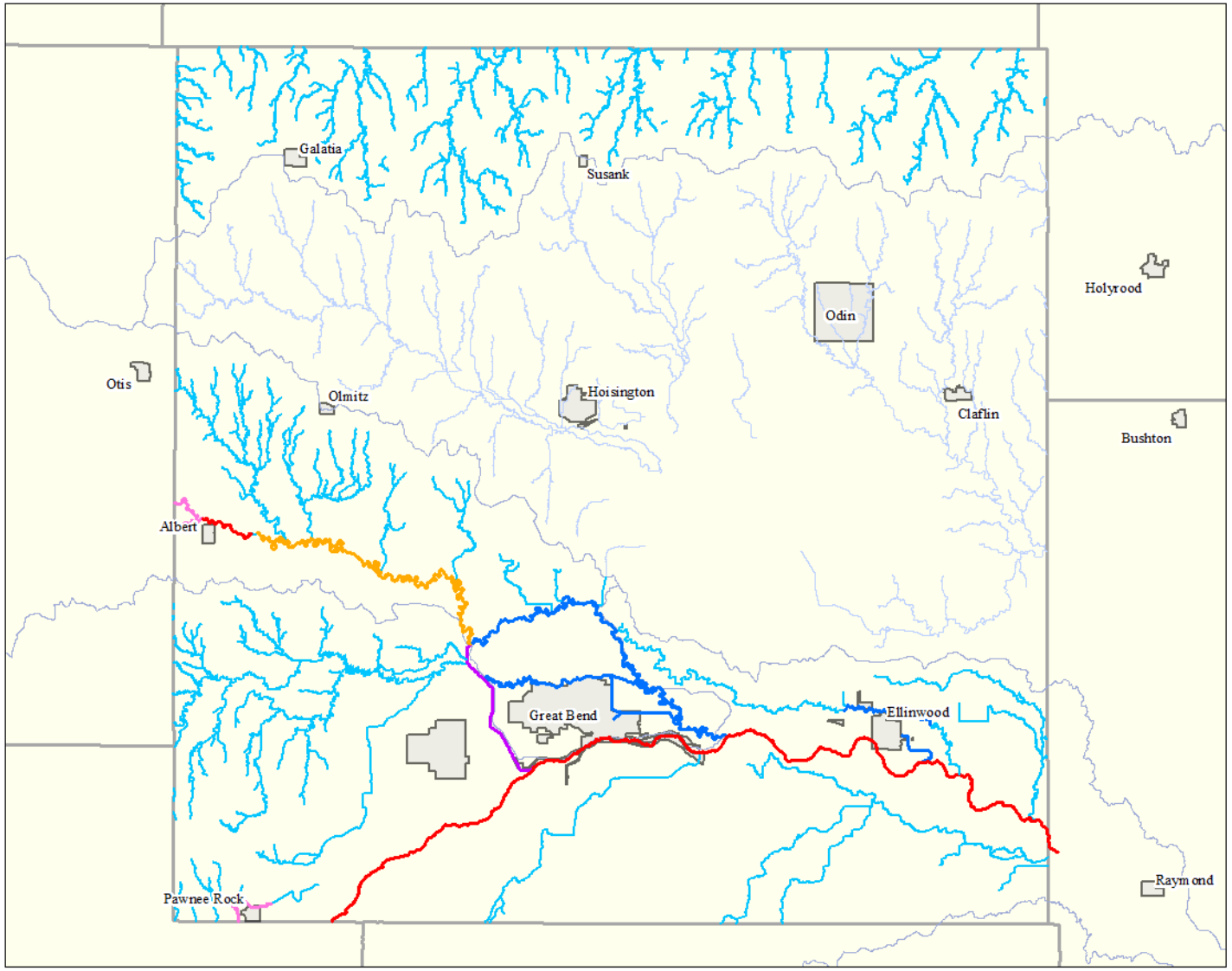
New Zone AH - Gage Analysis

New Zone AH studies will be developed for these streams using2D Hec-Ras hydralics and hydrology calibrated to gage analysis flows. Field measured structure data will be incorporated into the modeling. BFEs will be shown on the maps.

New Enhanced Zone A - Excess Rainfall on Grid

New Enhanced Zone A studies will be developed for these streams using 2D "excess rainfall-on grid" hydrology and 2D Hec-Ras hydraulics. Field measured structure data will be incorporated into the modeling.

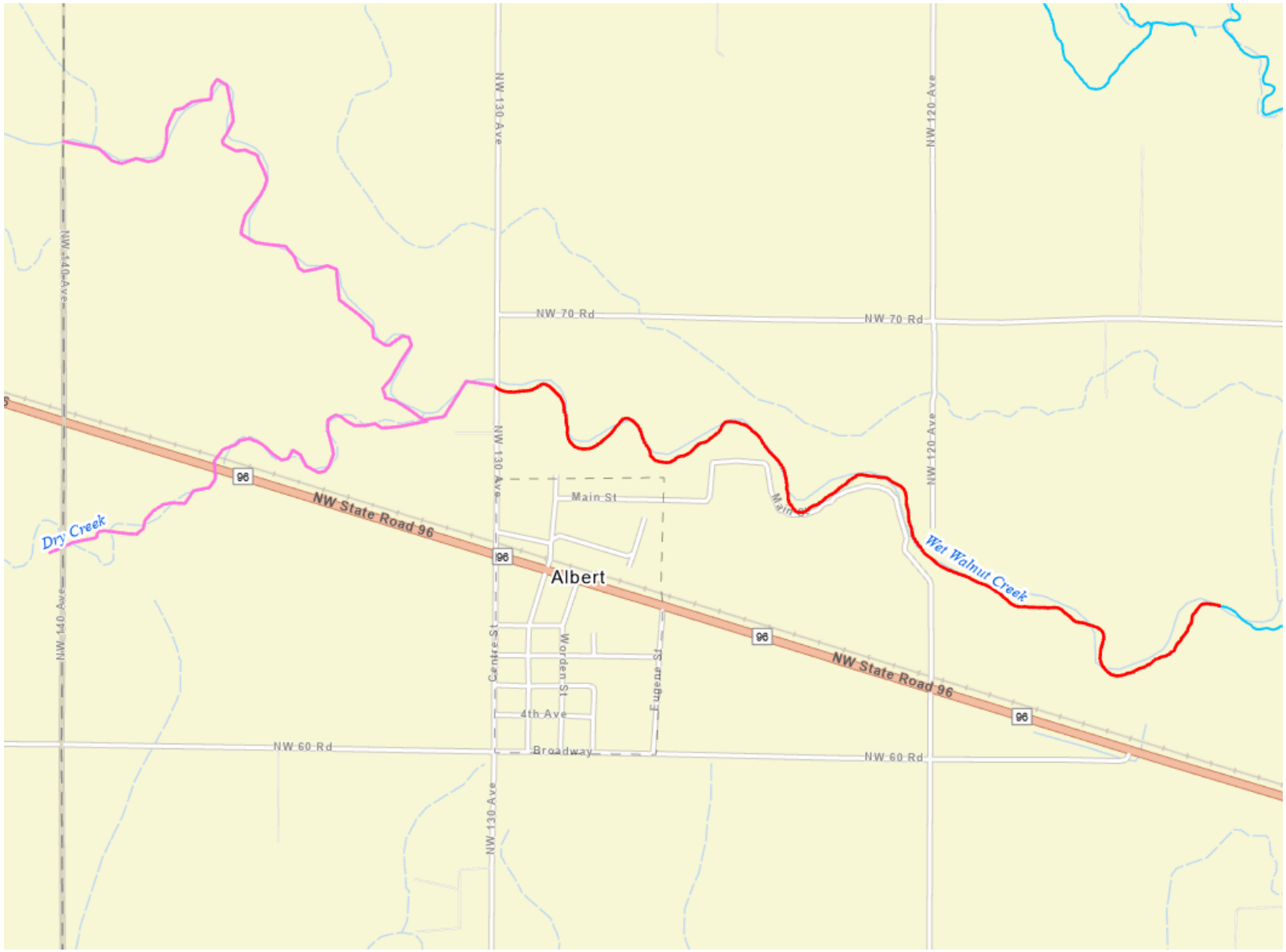
Incorporation of Existing Studies from the Cow Watershed project



Albert

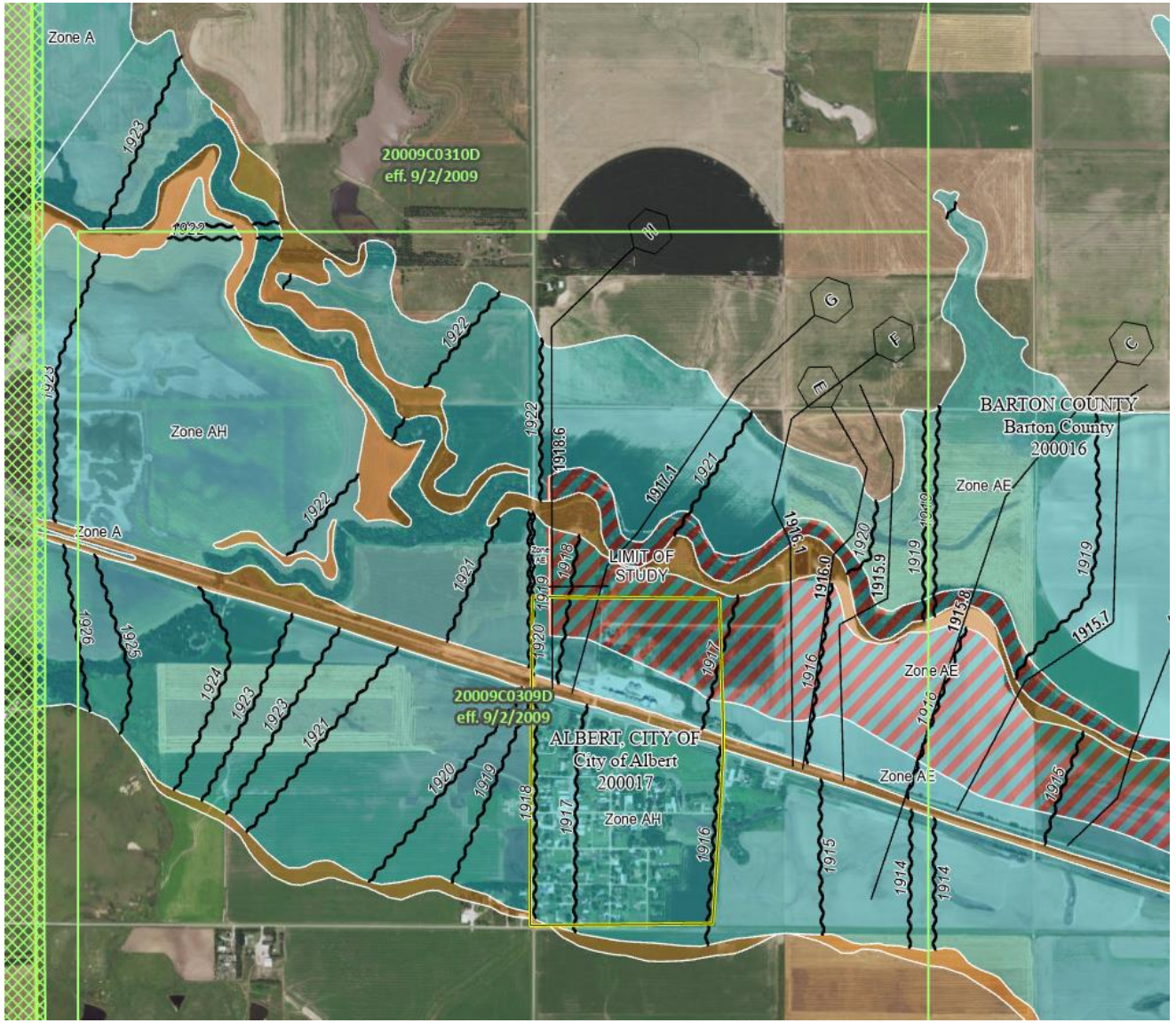
New Zone AE with Floodway

New Zone AH for Wet Walnut Creek



Albert

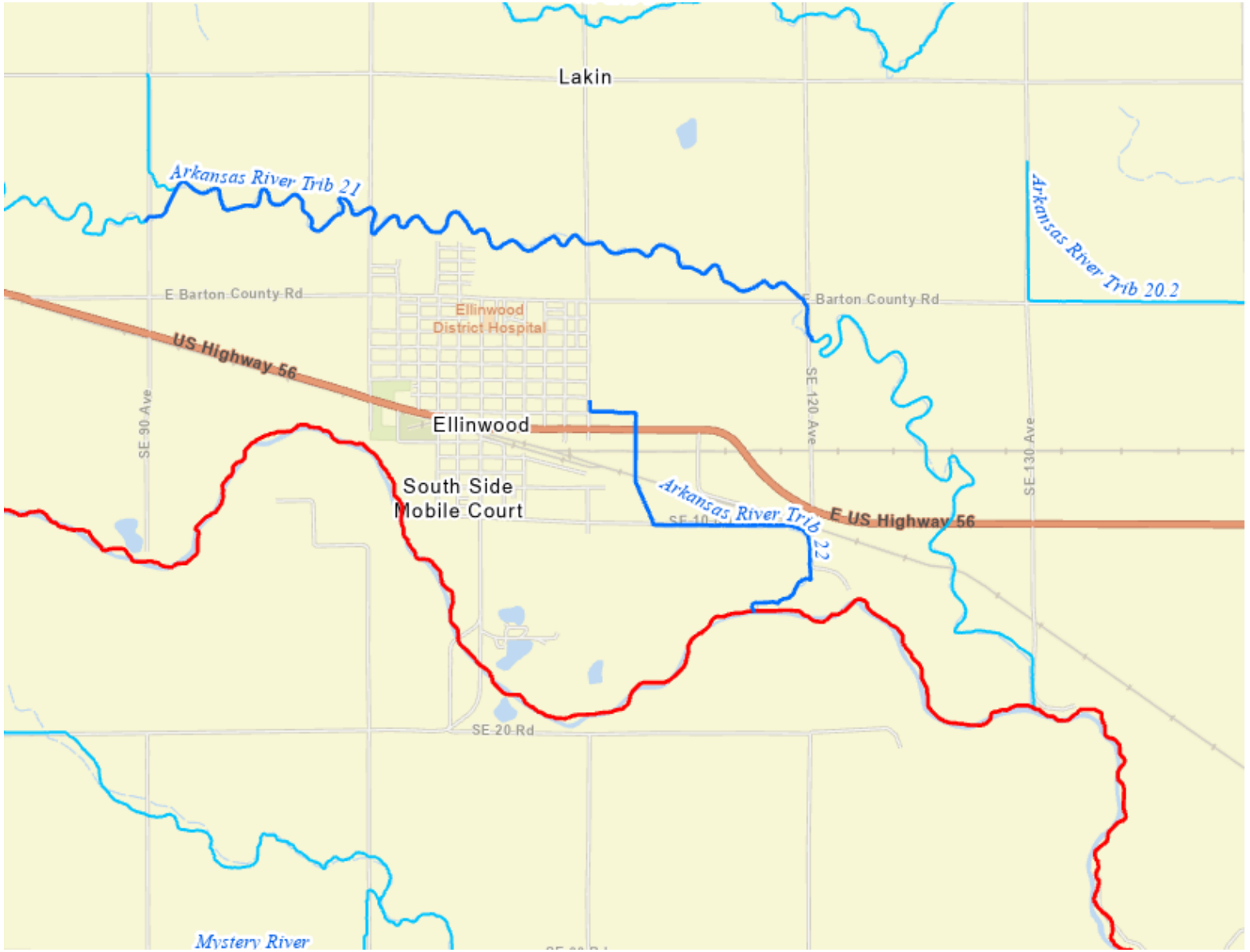
Effective Zone AH is between Walnut Creek and Dry Creek



Ellinwood

New Zone AE with Floodway for Arkansas River

Enhanced Zone As

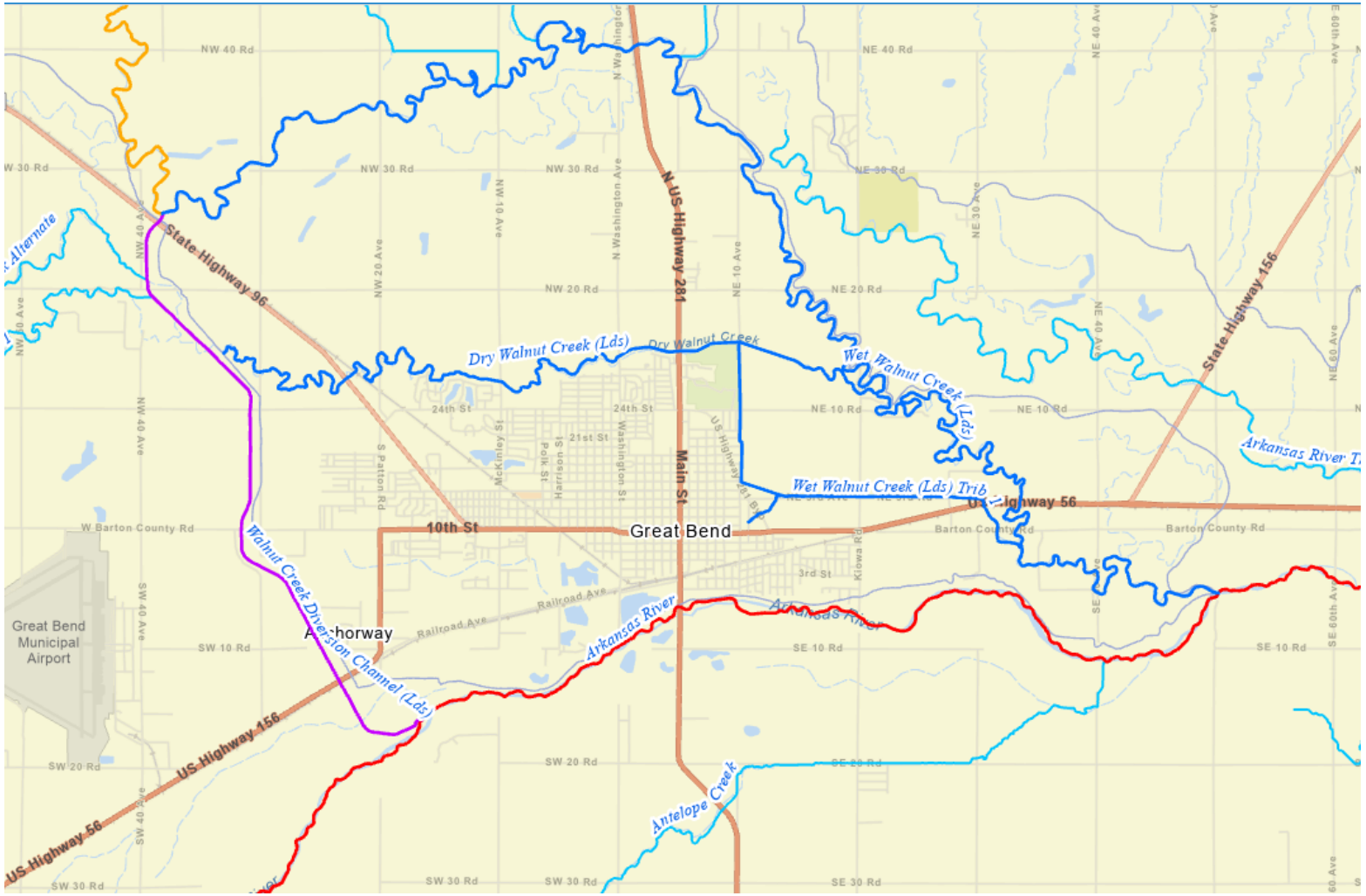


Great Bend

Zone AE with floodway on Arkansas River

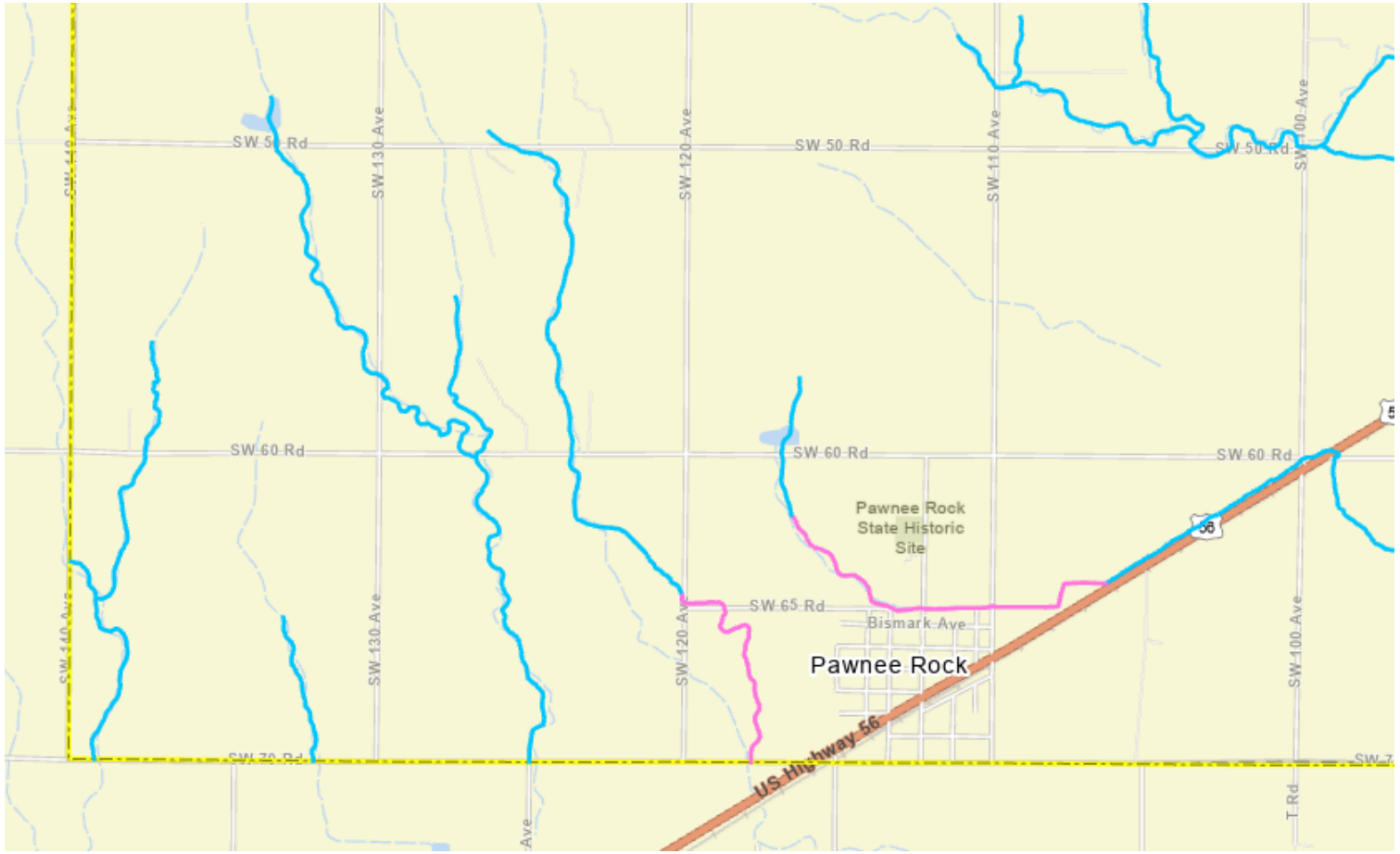
New Zone AE without floodway for West Walnut Diversion Channel

New Enhanced Zone As



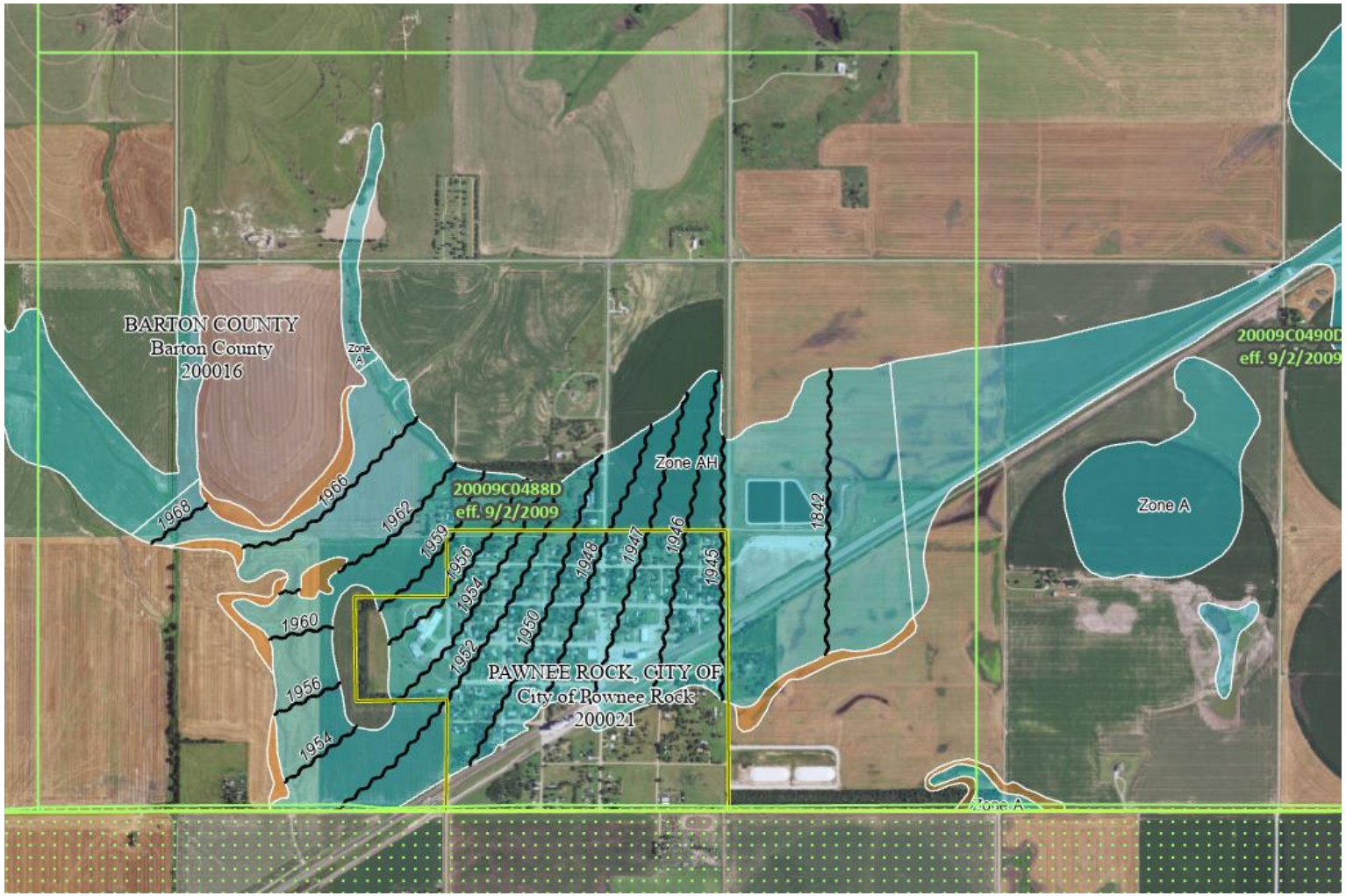
Pawnee Rock

New Zone AH for Ash Creek Tributaries A and B



Pawnee Rock

New Zone AH for Ash Creek Tributaries A and B



New Zone As

Gage calibration on Wet Walnut Creek

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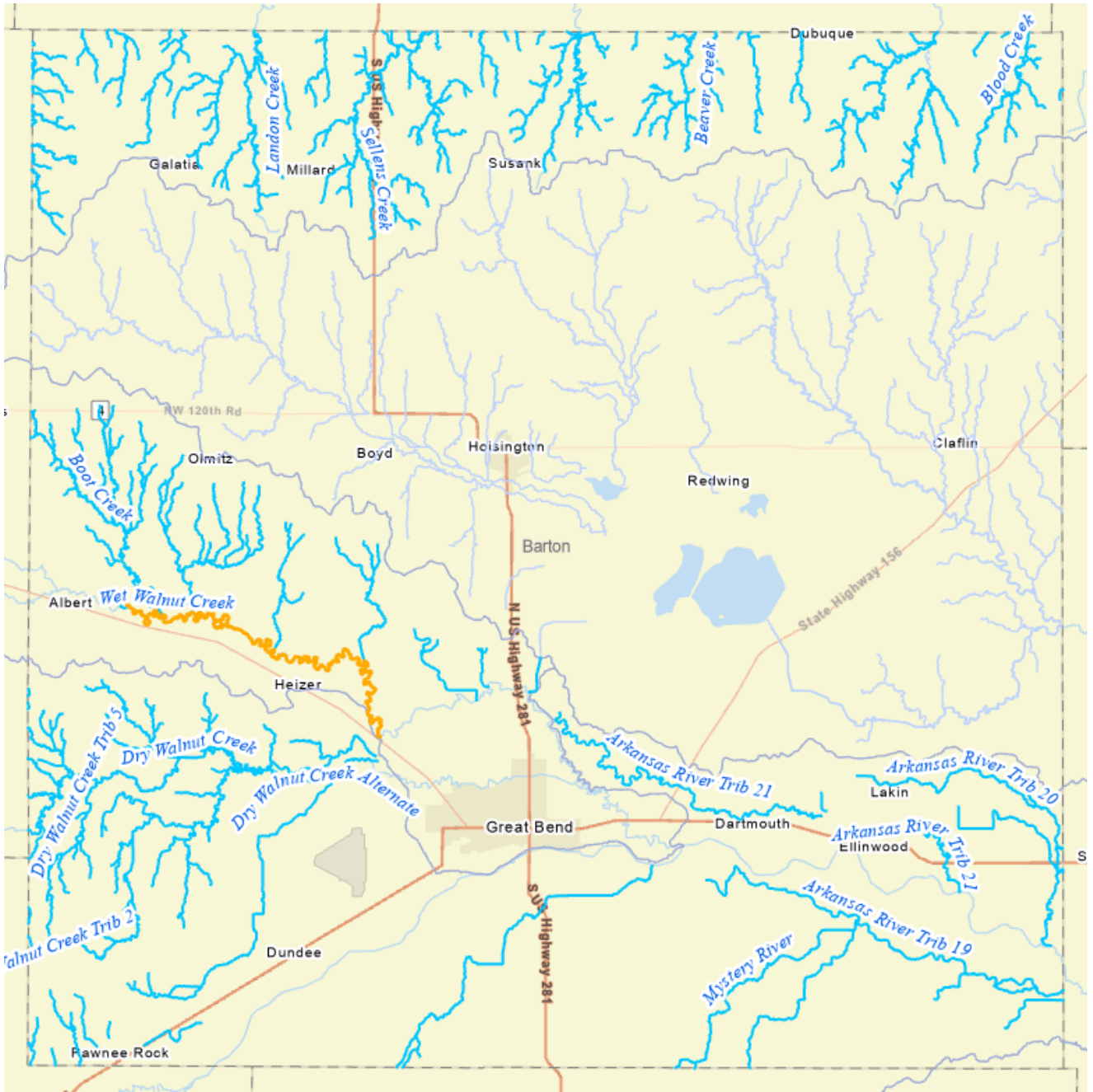

Incorporation of Existing Studies for Cow Watershed

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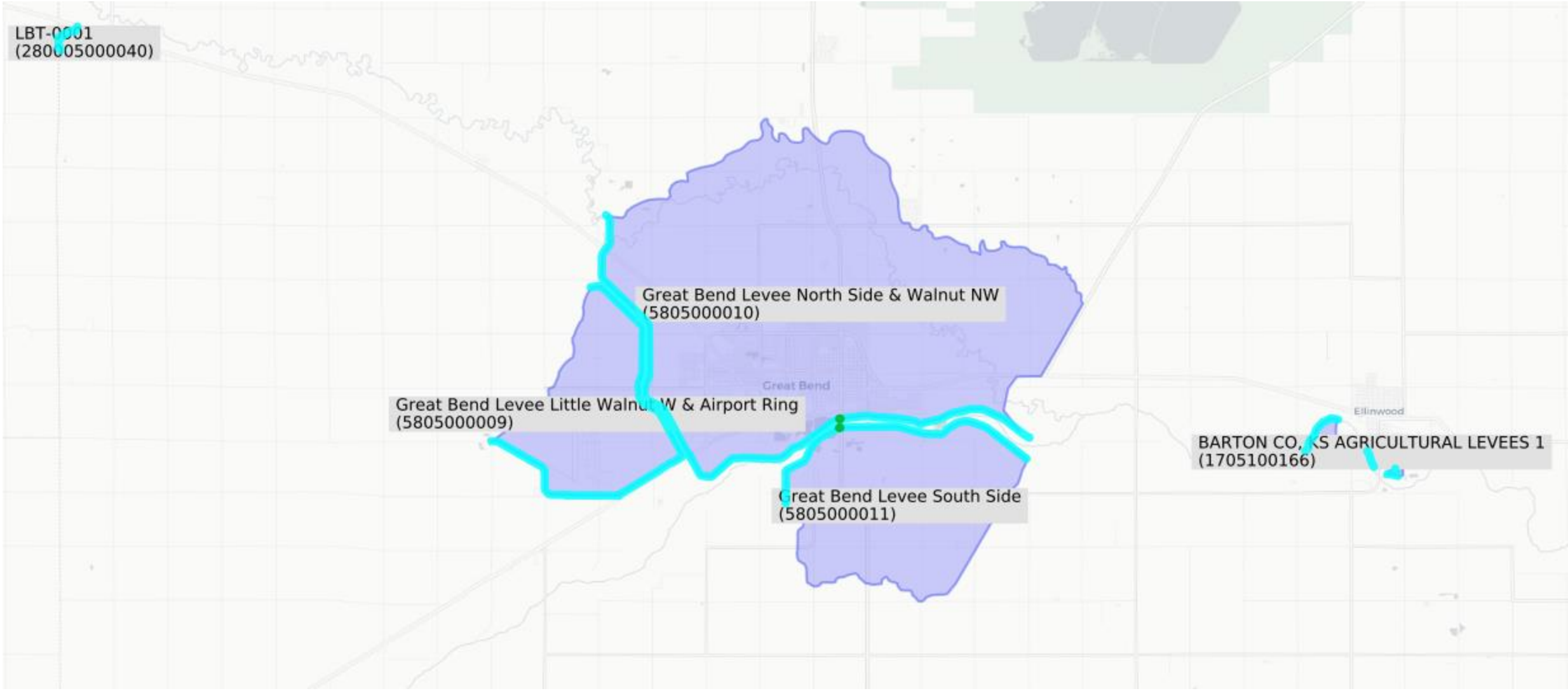
Levees

There are 7 levees in the project area.



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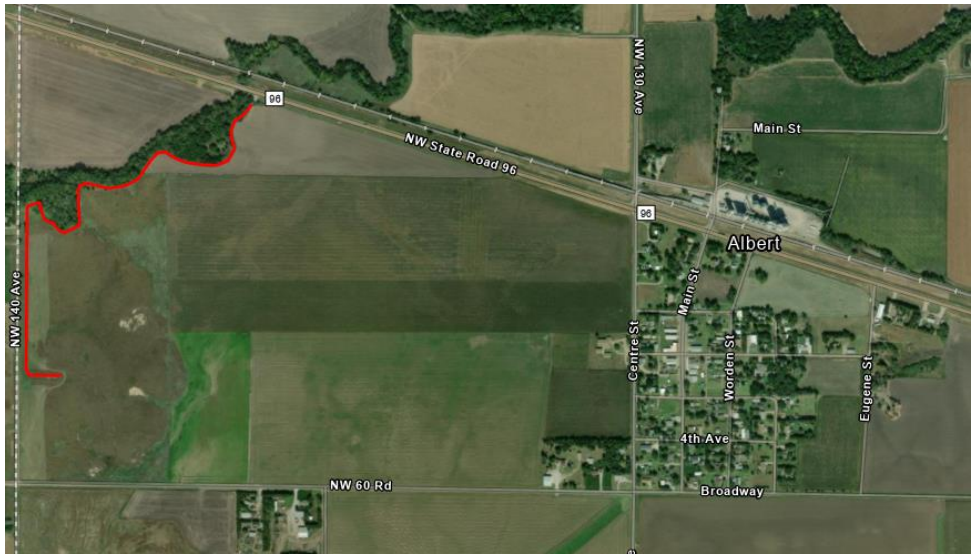
Accredited Levees

- Great Bend Levee North Side & Walnut NW
- Great Bend Levee Little Walnut W & Airport Ring
- Great Bend Levee South Side

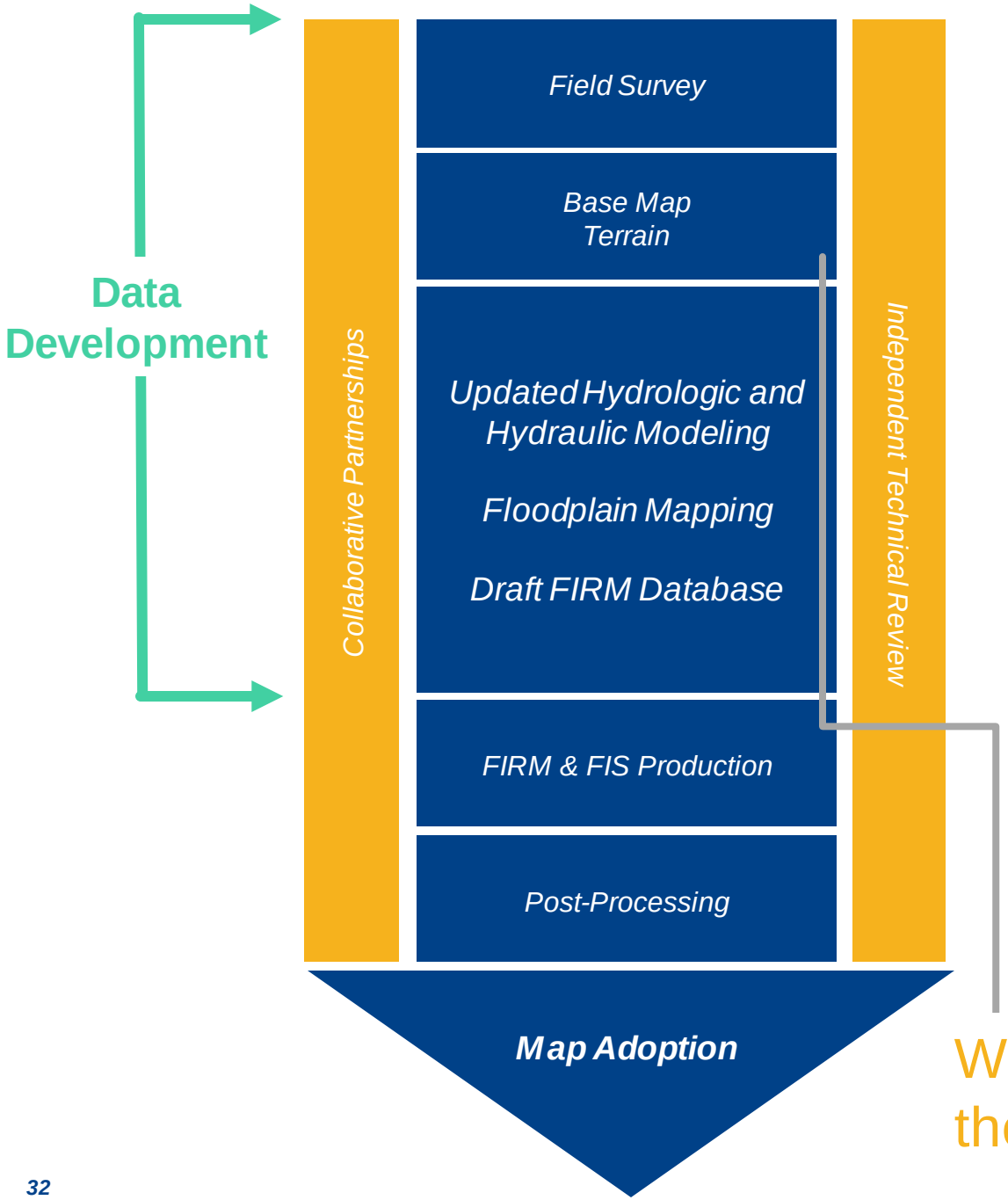
Non-accredited Levees

- Agricultural levees near Ellinwood



- Agricultural levee near Albert

Next Steps



Project Tasks

1. Field Survey
2. Base Map and Topography Preparation
3. Hydrologic and Hydraulic Modeling
4. Floodplain Mapping
5. DFIRM and FIS Production
6. Post-Preliminary

We are about to begin the modeling task

Our Next Steps:

- We will complete the engineering analysis previously described.
- Several rounds of reviews will be completed.
- We will develop your draft regulatory floodplain maps.
  - Also known as your Flood Insurance Rate Map (FIRM)
- We will develop your draft Flood Insurance Study (FIS).
- We will have a community review period and a public review period

Our Next Steps:

We will also be developing flood risk products for the studied areas in Barton County as part of this project.

**Data and tools that can help you plan for ways to reduce your community's flood risk.*

Water Surface Elevation Grids

Water Depth Grids

Project Timeline

Kick-off Meeting and Initial Community Feedback:
[TODAY!]

Data Development Work:
[Now until Summer of 2025]

- *Base Map*
- *Topographic Data*
- *Field Survey*
- *Develop Hydrologic and Hydraulic Models*
- *Floodplain Mapping*

Flood Risk Review Meeting:

[~April 2025]

- *Your **review** and **feedback** on the draft maps*

Project Timeline, continued

Community **comments** will be **addressed**

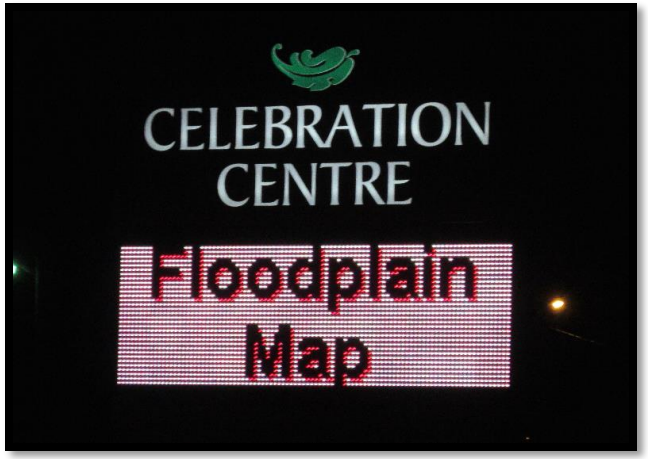
Public review of the draft maps

- *Includes Public Open House*

Preliminary Map Products

- *Preliminary DFIRM Community Coordination Meeting*

Post-Preliminary Processing



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Key Takeaways

Floodplain Mapping Projects take time

Your involvement in this process will result in better flood information for your community

DON'T HESITATE TO CALL, WE ARE HERE TO HELP

Resources

Online Project Information

Project Website

- Scoping Maps, Project Timeline, Meeting Presentations, Newsletters, Technical Reports, Web Review Map
- https://agriculture.ks.gov/divisions-programs/dwr/floodplain/mapping/mapping-projects/lists/mapping-projects/lower-middle-arkansas-custom-watershed

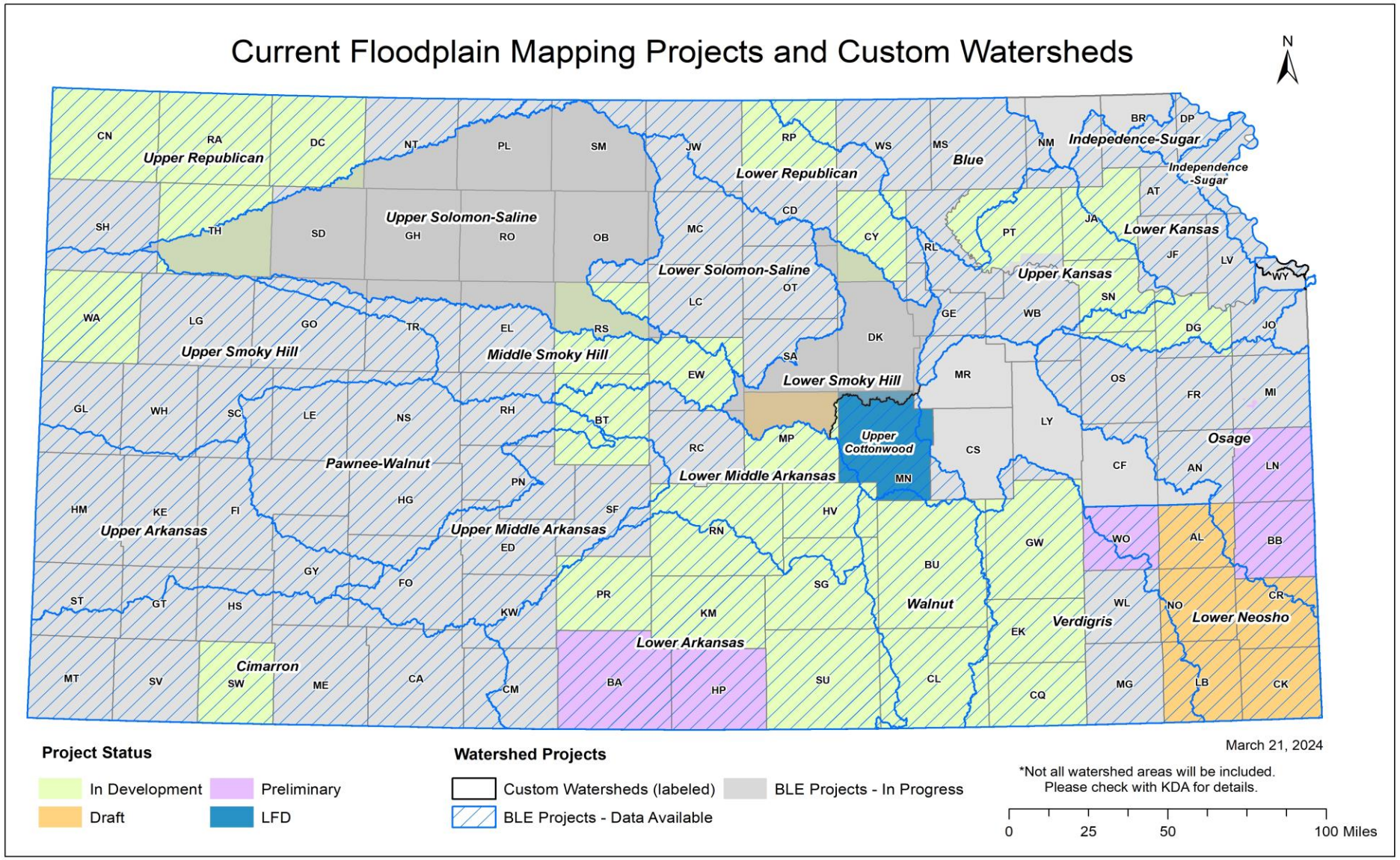
Web Review Map: https://gis2.kda.ks.gov/gis/barton/

- Provide comments on areas impacted by past floods, community needs, etc.
- Review of floodplain data

Story Maps

- “Floodplain Current”: Mapping Process ‘Nuts and Bolts’

We are doing similar work across Kansas…



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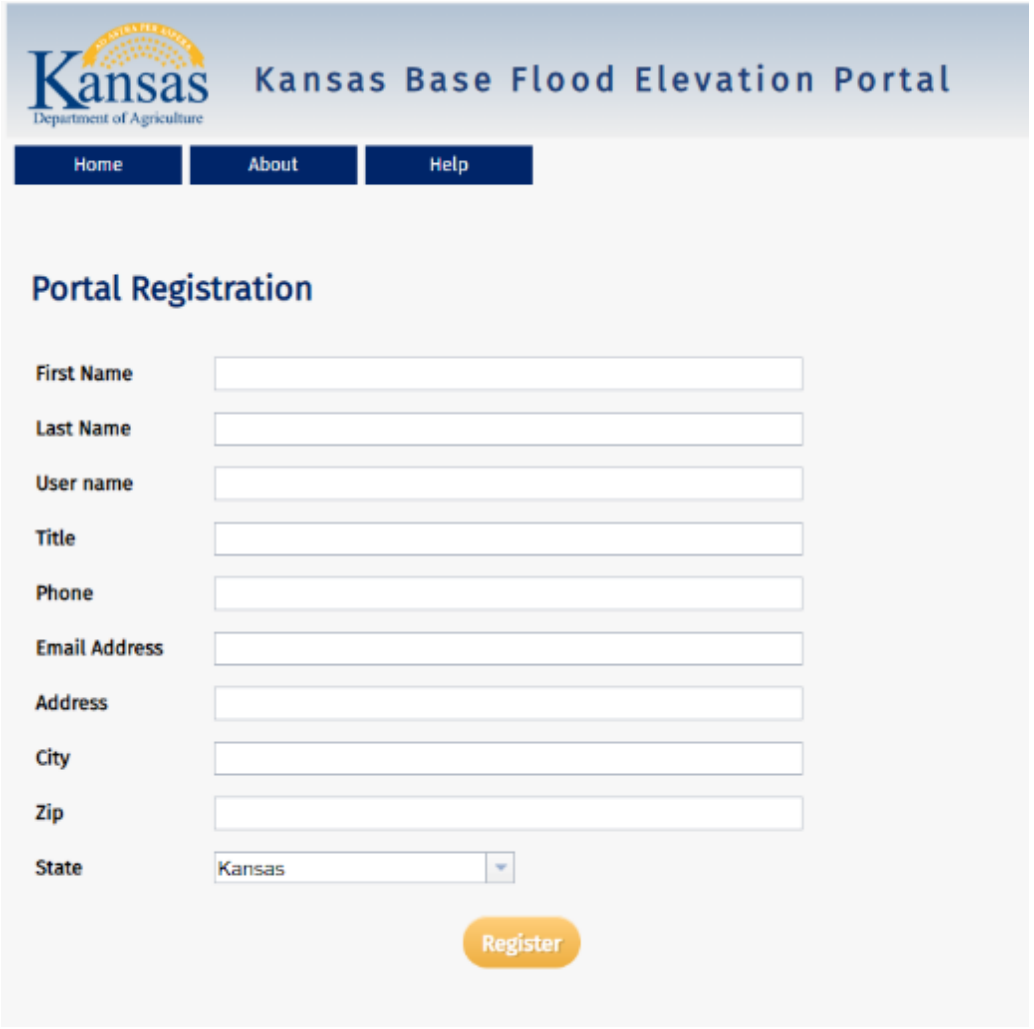
BFE Portal

For Zone A floodplains, you can request BFE data. Keep in mind, BFE data is subject to change.




Any Questions?

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Contacts

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