Kansas Department of Agriculture
Division of Water Resources

FEMA

wood.

Harvey County

Floodplain Mapping Project
Data Development Kickoff Meeting

July 1, 2021

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!

Kansas
Department of Agriculture
Division of Water Resources

Introductions

Kansas Department of Agriculture

Tara Lanzrath, CFM
Floodplain Mapping Coordinator

Joanna Rohlf, CFM
Floodplain Mapping Specialist

William Pace, CFM
Floodplain Mapping Specialist

Steve Samuelson, CFM
State NFIP Coordinator

Cheyenne Sun Eagle
NFIP Specialist

FEMA – Region VII

Andy Megrail
Regional Project Officer

Wood Environment & Infrastructure Solutions

Joe File, PE, CFM
Senior Associate / Program Manager

Maria Neeland, PE, CFM
Project Manager / Engineer

Kansas Department of Agriculture
Division of Water Resources

Today's Goals

Share details on the mapping project

Get initial feedback on modeling methods

Review future steps

Background

Background

- Upper Cottonwood Watershed BLE Project
  - *Discovery Meeting and BLE Review: September 26, 2019*
- Walnut Custom Watershed BLE Project
  - *Discovery Meeting and BLE Review: March 4, 2020*
- Lower Middle Arkansas Custom Watershed BLE Project
  - *Discovery Meeting and BLE Review: January 13, 2021*

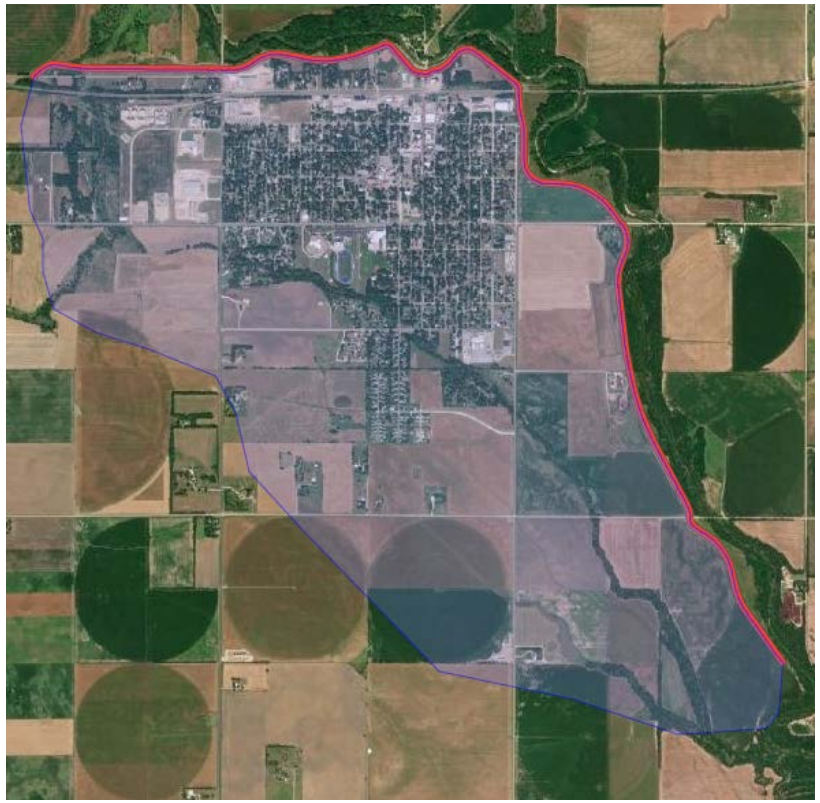
Background

- Harvey County Effective Maps are dated October 6, 2010 and August 4, 2014
  - Note that the mapping associated with the Halstead Arkansas River Levee system was included in the 2014 mapping update.
- Through Discovery and conversations with County stakeholders, it was determined that updated modeling and mapping would benefit Harvey County

Kansas Department of Agriculture
Division of Water Resources

Halstead Arkansas River Levee

- FEMA Accredited Levee System
- There will be no impacts to this levee certification as part of the mapping update
  - The adjacent streams are not being re-studied as part of this project.



Review of the Work Ahead and How We Propose Doing It

Harvey County 2021 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 - HEC-HMS

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

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 AE with Floodway - Excess Rainfall on Grid

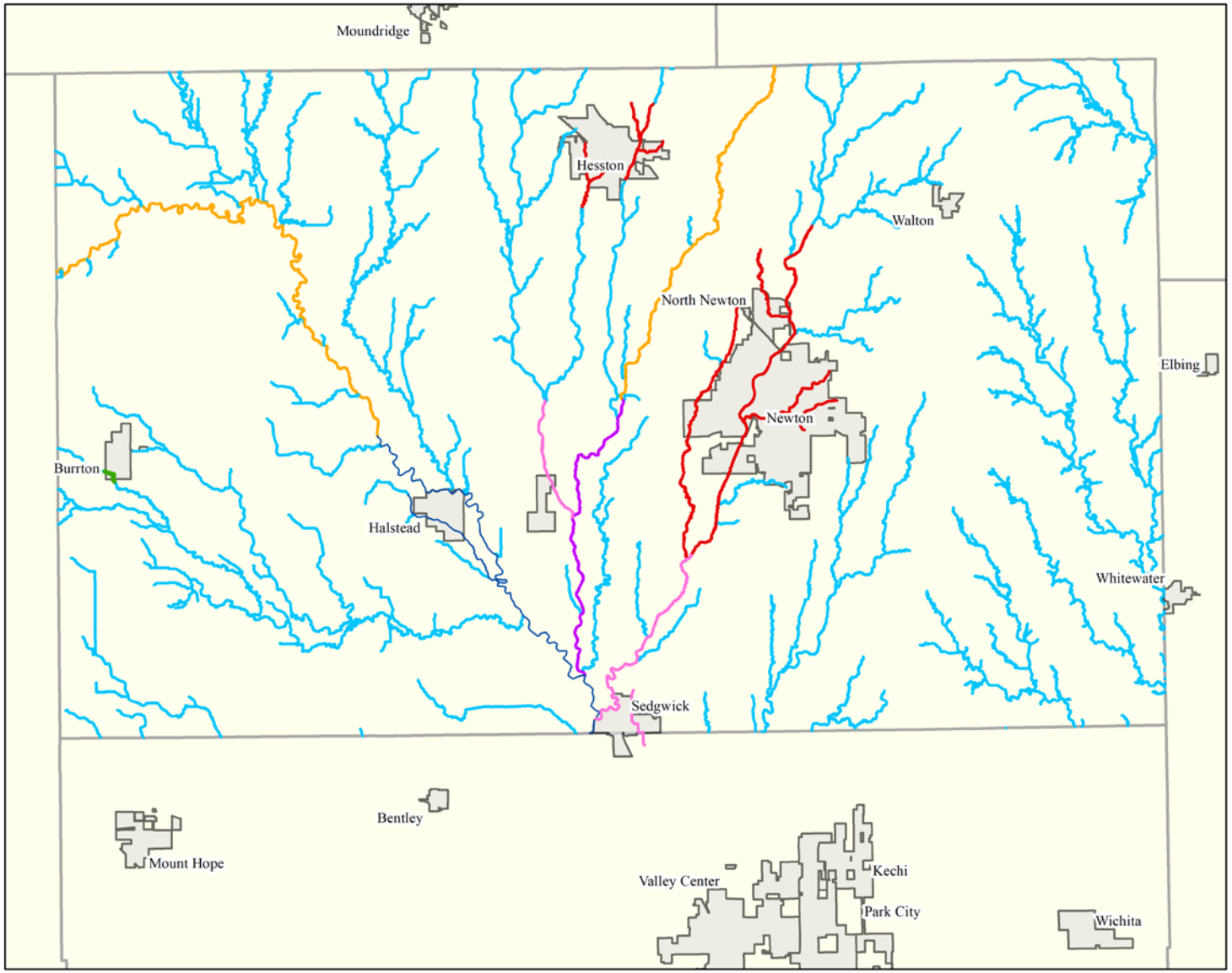
New Zone AE studies will be developed for these streams using 1D or 2D Hec-Ras hydralics and excess rainfall-on grid hydrology. Floodways will be developed. Field measured structure data will be incorporated into the modeling. BFEs will be shown on the maps.

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 Zone AE with Floodway Studies

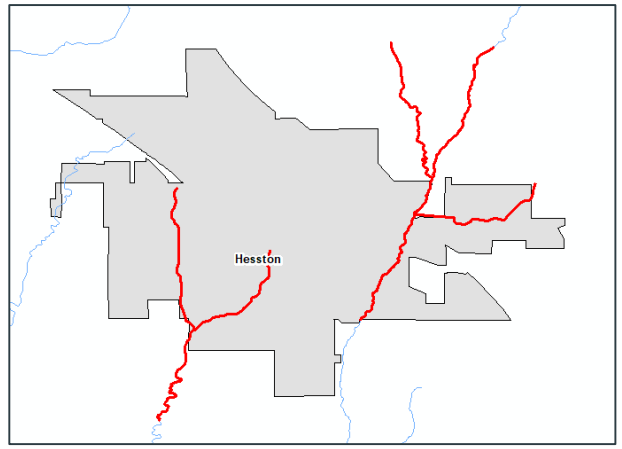
0 2.5 5 10 Miles N

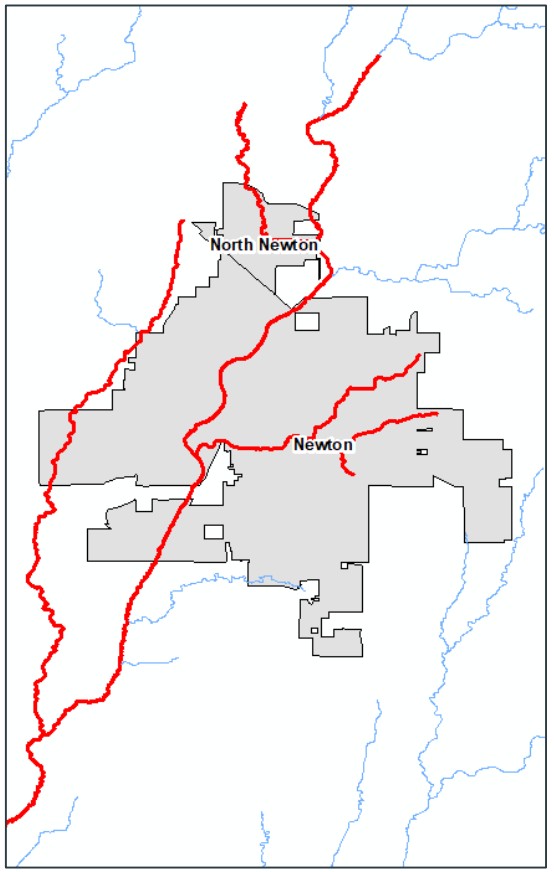


Kansas Department of Agriculture
Division of Water Resources

New Zone AE with Floodway

- Hesston:
  - Dry Creek and 1 Tributary
  - Middle Emma Creek and 2 Tributaries
- Newton:
  - Country Club Branch Slate Creek
  - Mud Creek
  - Sand Creek
  - Slate Creek
  - South Branch Slate Creek
- North Newton:
  - Kidron Creek
  - Sand Creek

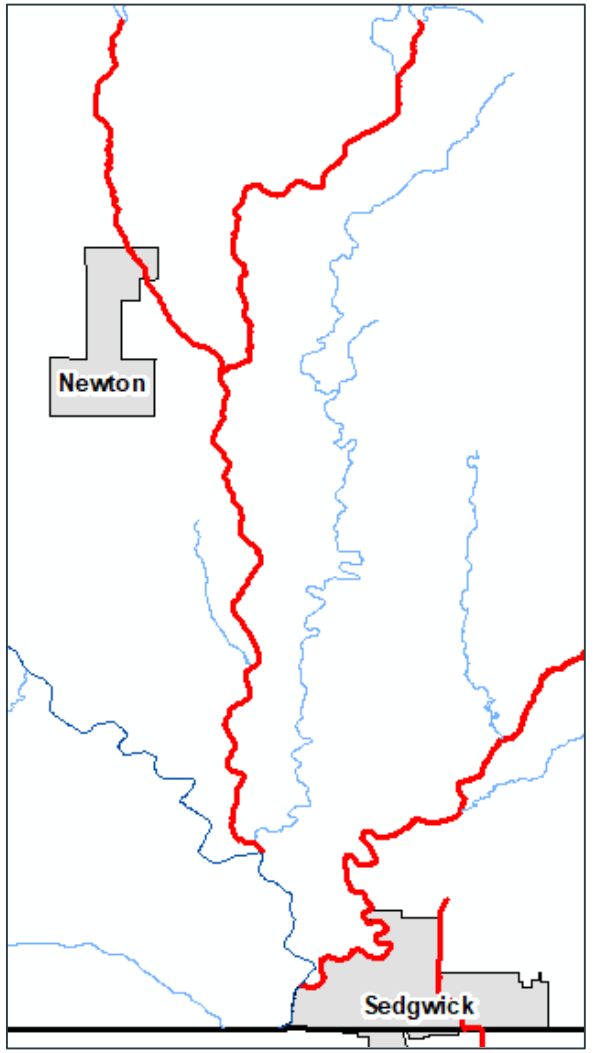




Kansas Department of Agriculture
Division of Water Resources

New Zone AE with Floodway

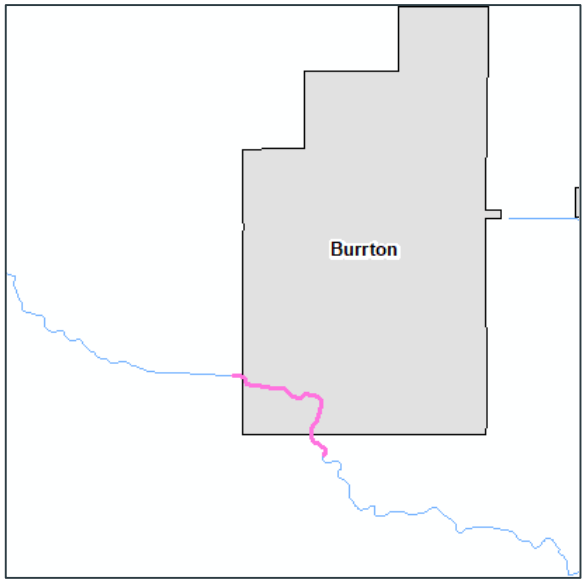
- Sedgwick:
  - 1 Tributary to the Little Arkansas River
  - Sand Creek
- Separated Portion of Newton and in County
  - Emma Creek
  - East Emma Creek
  - West Emma Creek



Kansas Department of Agriculture
Division of Water Resources

New Enhanced Zone A and Zone A

- Enhanced Zone A
  - Burrton:
    - 1 Tributary to Kisiwa Creek
- Zone A
  - Remainder of Streams in County, not previously discussed



Definitions

Hydrology

How Much Water?

Hydraulics

How High Will Water Get?

Kansas Department of Agriculture
Division of Water Resources

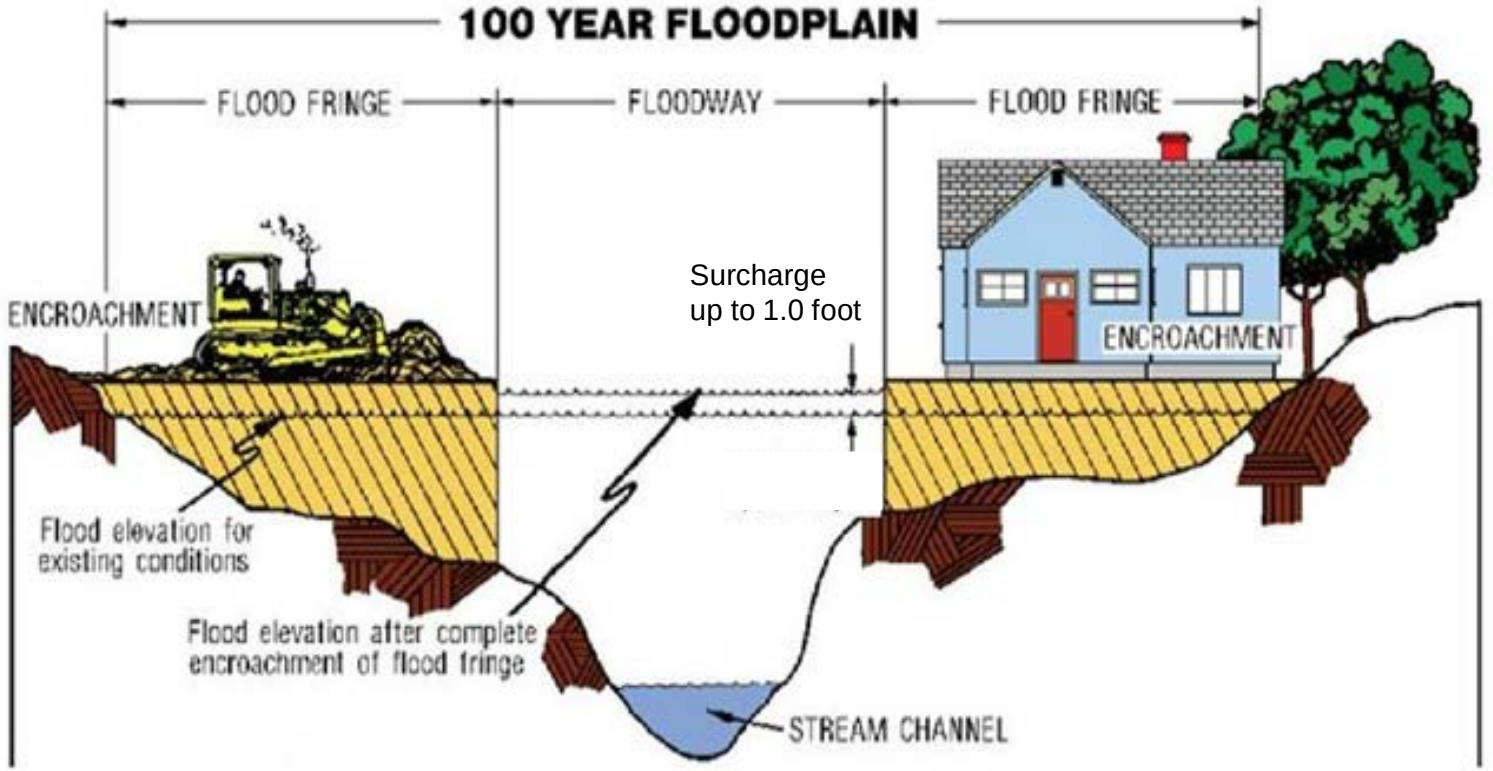
2D Hydraulic Modeling will be used for the Zone A streams

- Enhancements will be made to the BLE modeling that was performed for the Zone A streams.
  - Comments made and additional information gathered during the Discovery phase will be used to enhance the modeling
  - Enhanced Zone A streams will include field measured data for culverts and bridges
- The hydrology is built into the RAS modeling platform using excess rainfall-on-grid methodology.

Kansas Department of Agriculture
Division of Water Resources

The Zone AE modeling includes the development of a floodway

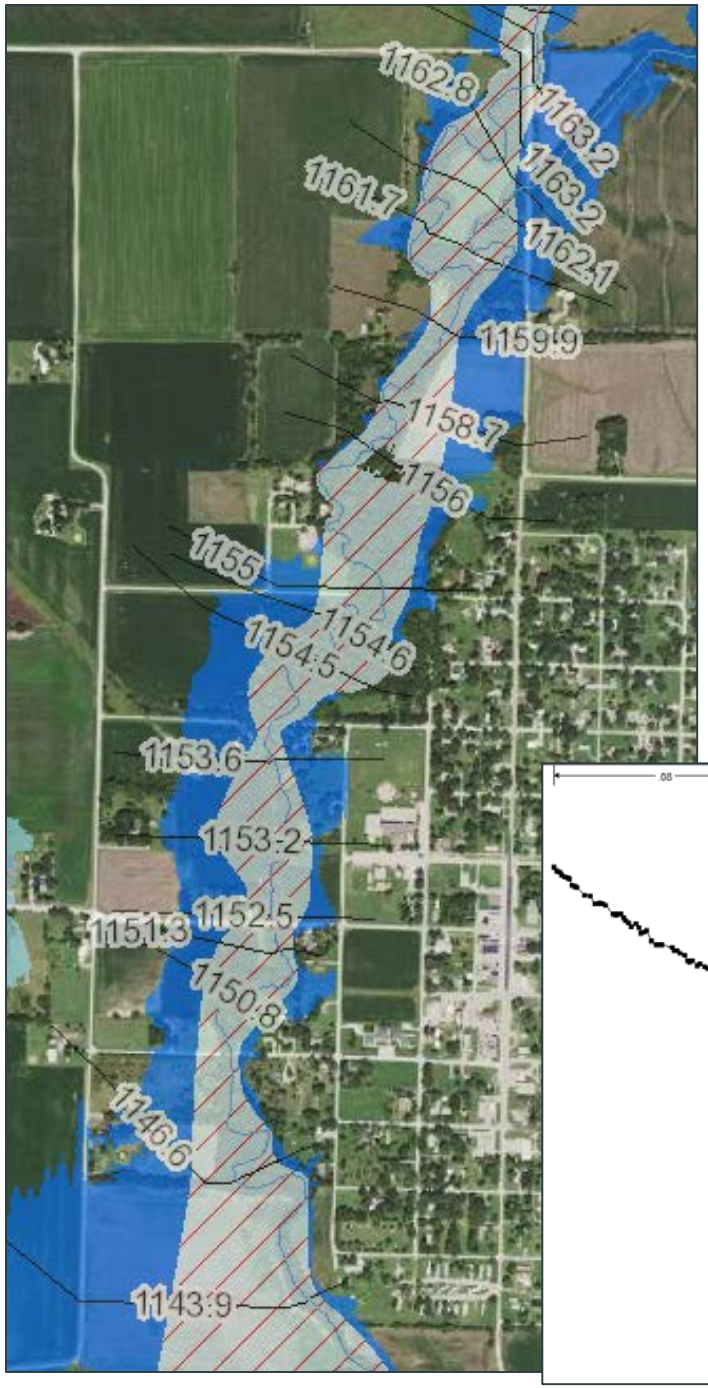
A Floodway is the area within the floodplain that must be reserved in order to discharge the base flood without cumulatively increasing the WSE by more than 1.0 foot.

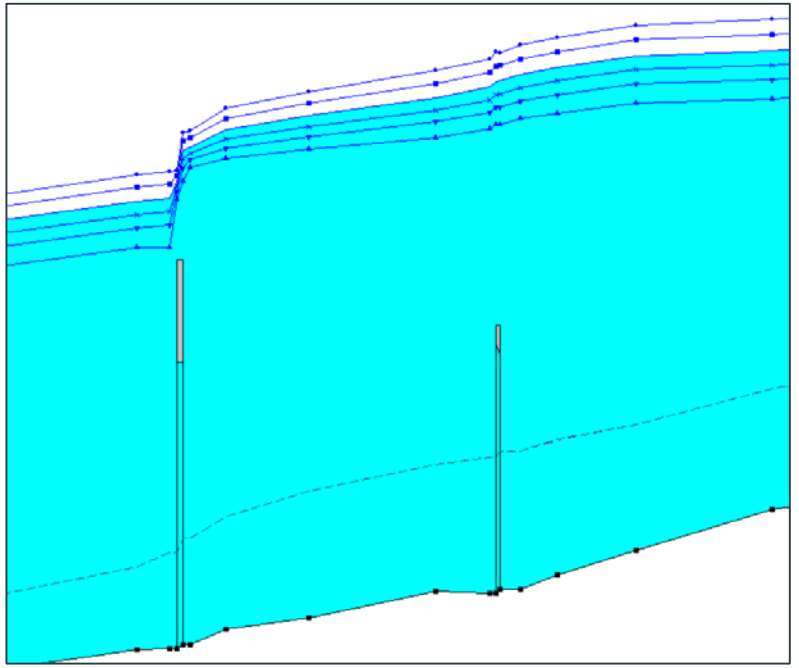


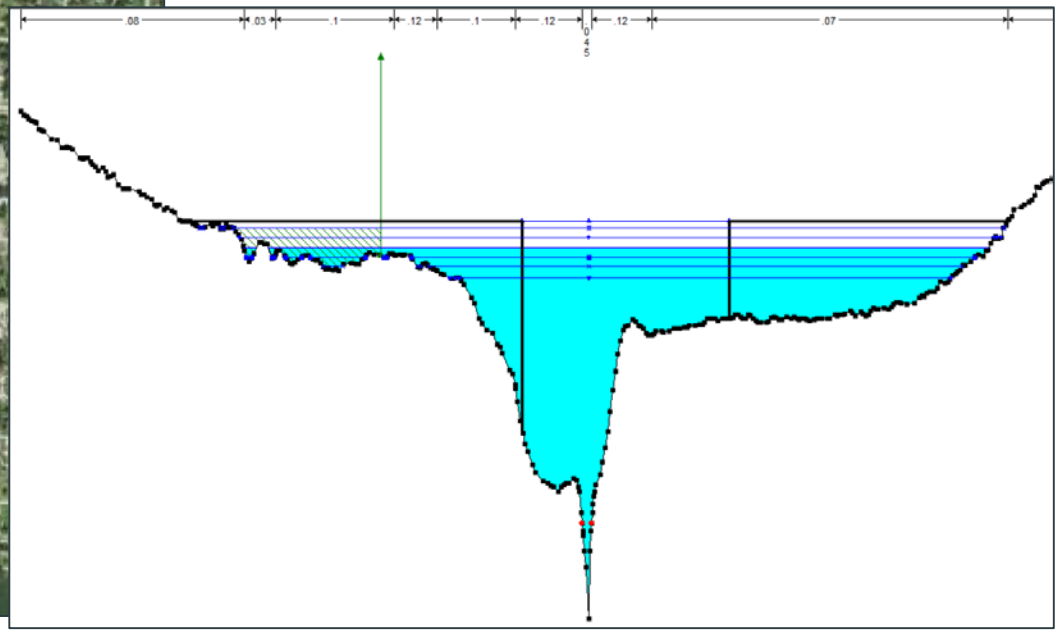
1D or 2D Hydraulic Modeling can be performed for the Zone AE streams

Kansas Department of Agriculture
Division of Water Resources

1D Modeling

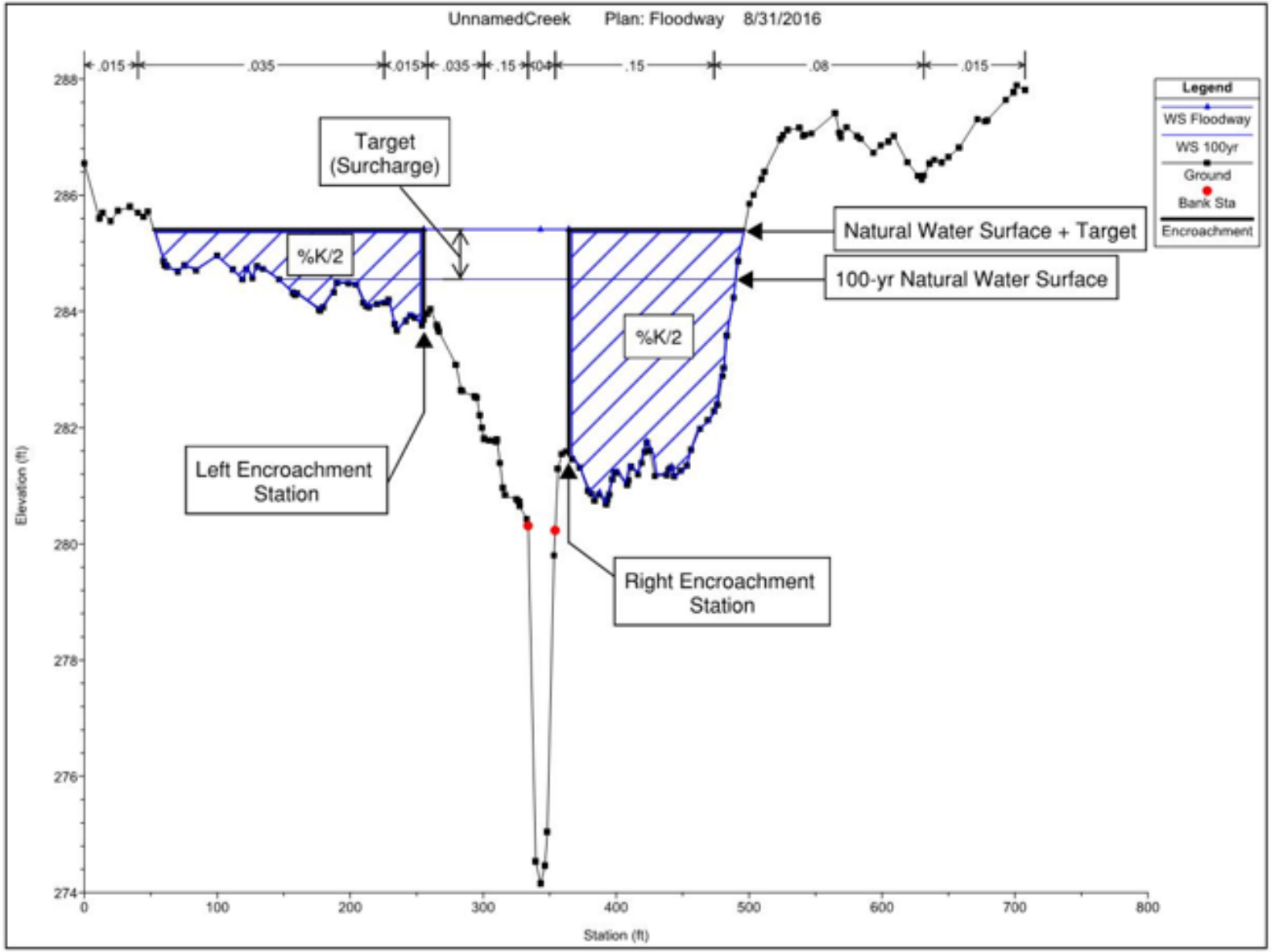






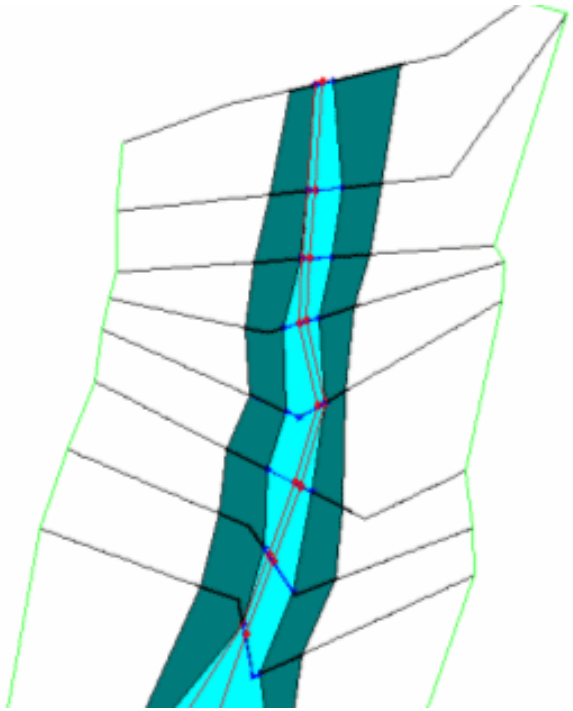
Kansas Department of Agriculture
Division of Water Resources

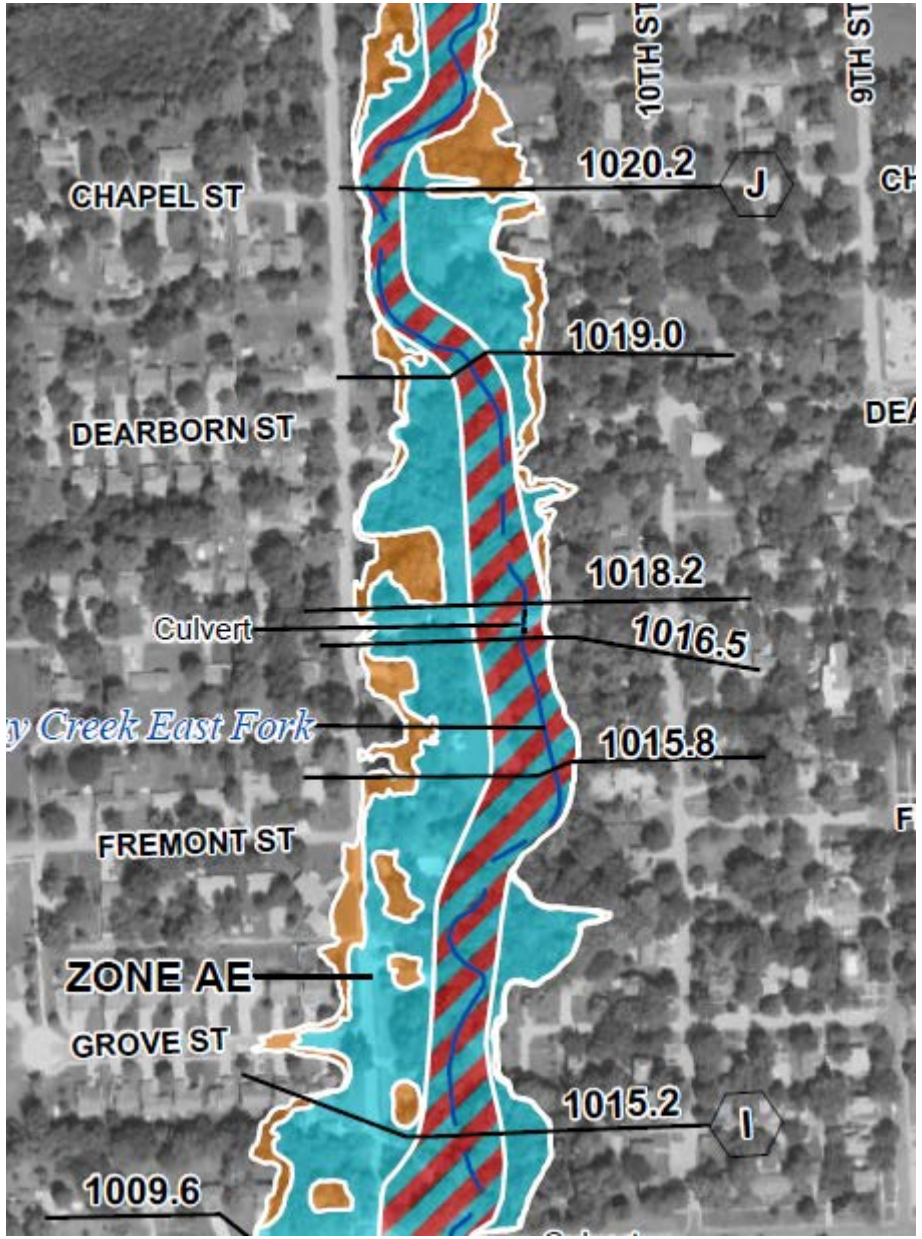
1D Floodways



Kansas
Department of Agriculture
Division of Water Resources

1D Floodways





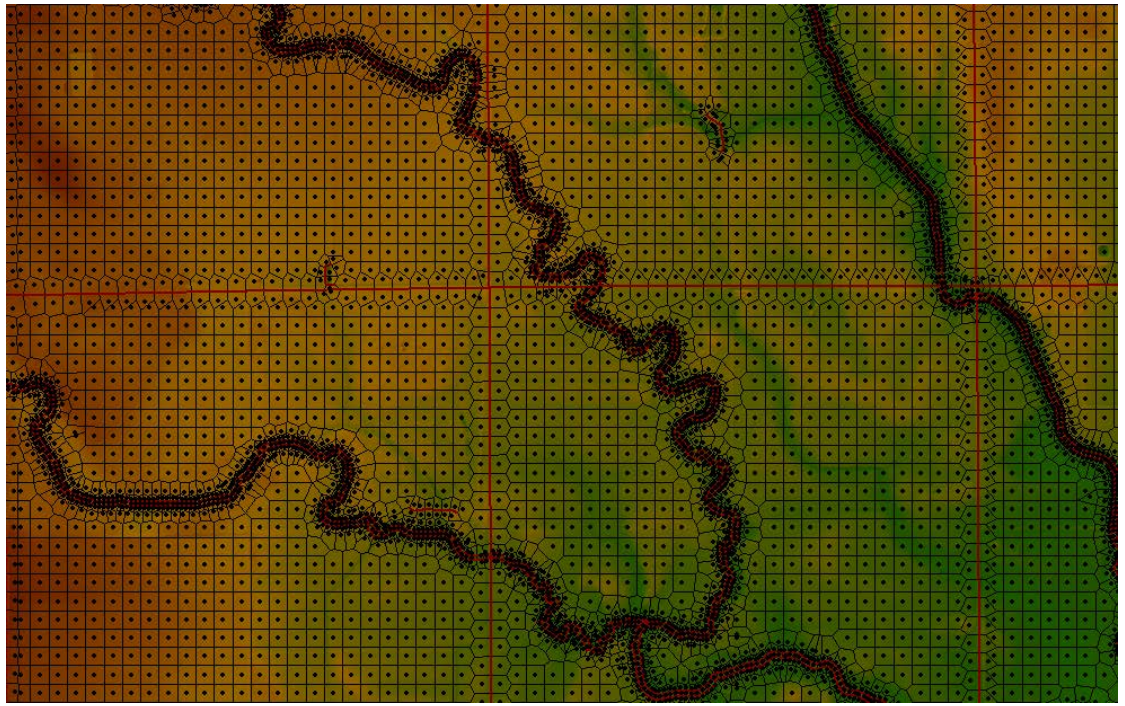
Kansas Department of Agriculture
Division of Water Resources

Benefits of 1D modeling for Zone AE streams

- The local consulting community has more experience with 1D modeling
  - Especially important when considering LOMR applications and use of the modeling
- 1D Floodway Guidance is more established
- 1D modeling has similar accuracy to 2D modeling in areas with more relief (steeper terrain)
- Note that the modeling done for the area adjacent to the Halstead Arkansas River levee system was done using 1D

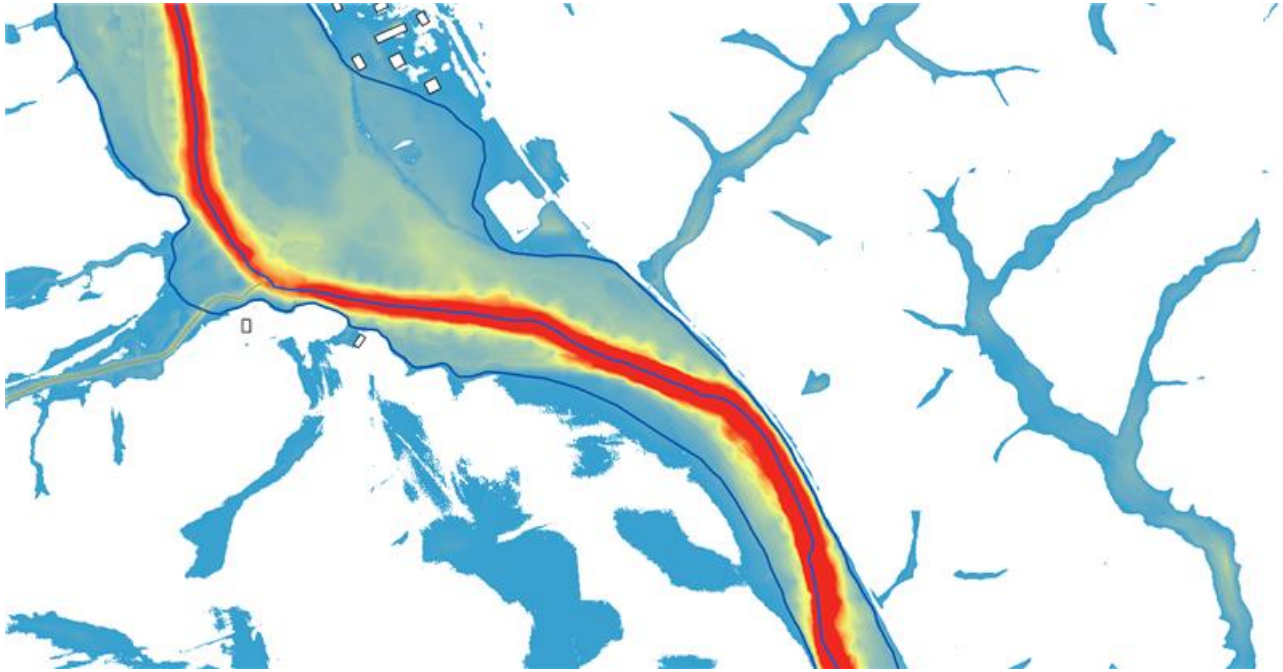
Kansas
Department of Agriculture
Division of Water Resources

2D Modeling



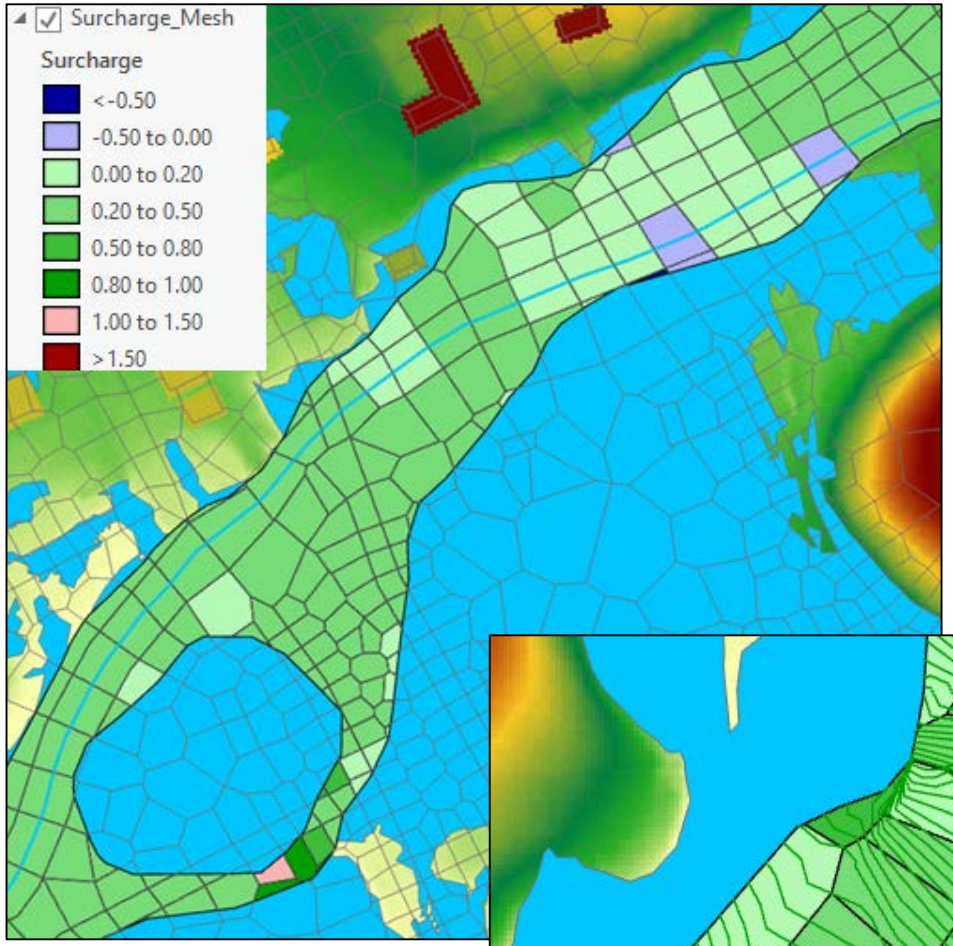
Kansas
Department of Agriculture
Division of Water Resources

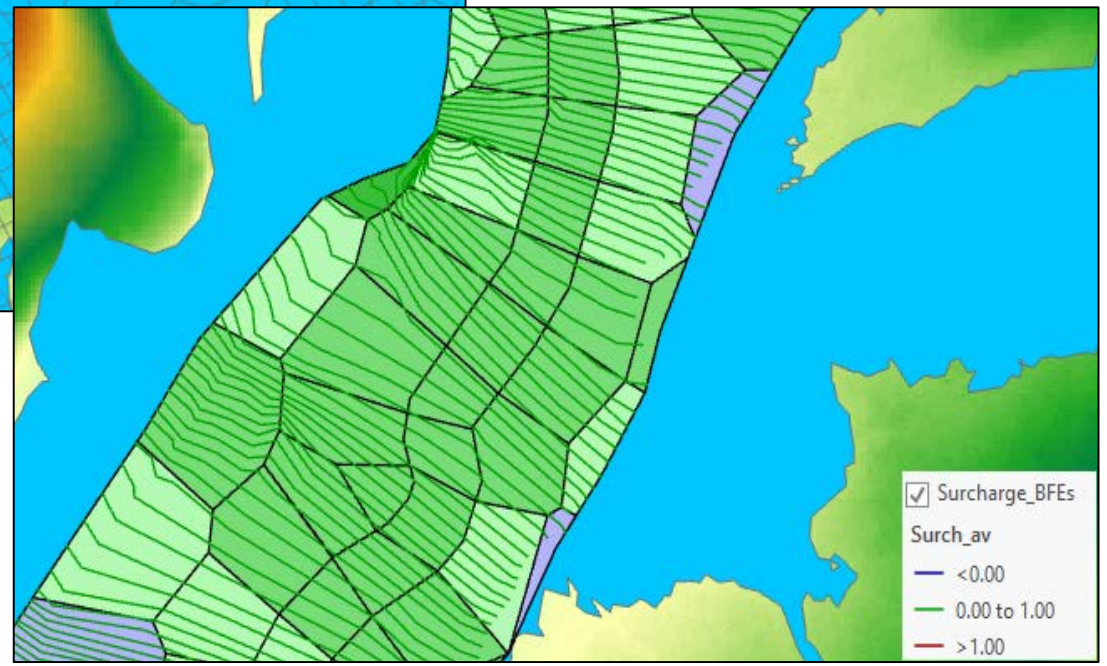
2D Floodways



Kansas
Department of Agriculture
Division of Water Resources

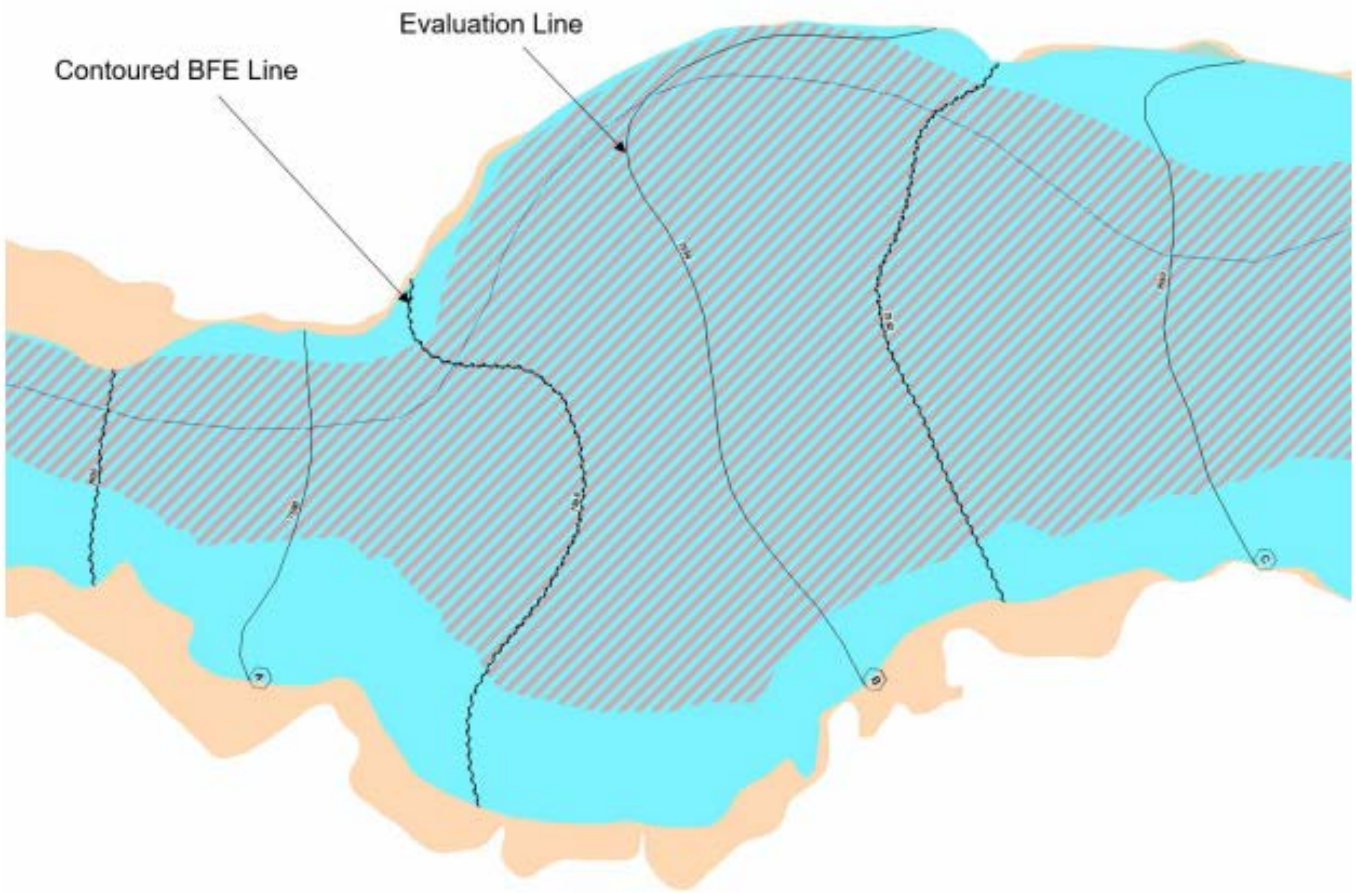
2D Floodways





Kansas
Department of Agriculture
Division of Water Resources

2D Floodways



Kansas Department of Agriculture
Division of Water Resources

Benefits of 2D modeling for Zone AE streams

- 2D more accurately portrays flooding where water flows in multiple directions, such as flat areas and braided streams.
- 2D modeling is at the forefront of modern modeling practices
  - 2D will be used for the Zone A streams as well
  - Note that 2D floodway guidance has been released, but has not been put into practice for long

Kansas Department of Agriculture
Division of Water Resources

Zone AE Hydrology

- Gage Analyses will be performed for the streams with USGS stream gages
  - Used as flows for 1D modeling or calibration information for the 2D modeling
- HEC-HMS (Rainfall-Runoff) Modeling will be performed for the streams in Hesston, Newton, and North Newton
  - Used as flows for 1D modeling or calibration information for the 2D modeling
- Hydrology information from the 2D modeling will be used for the other Zone AE streams

Kansas Department of Agriculture
Division of Water Resources

Zone AE Recommendation and Discussion

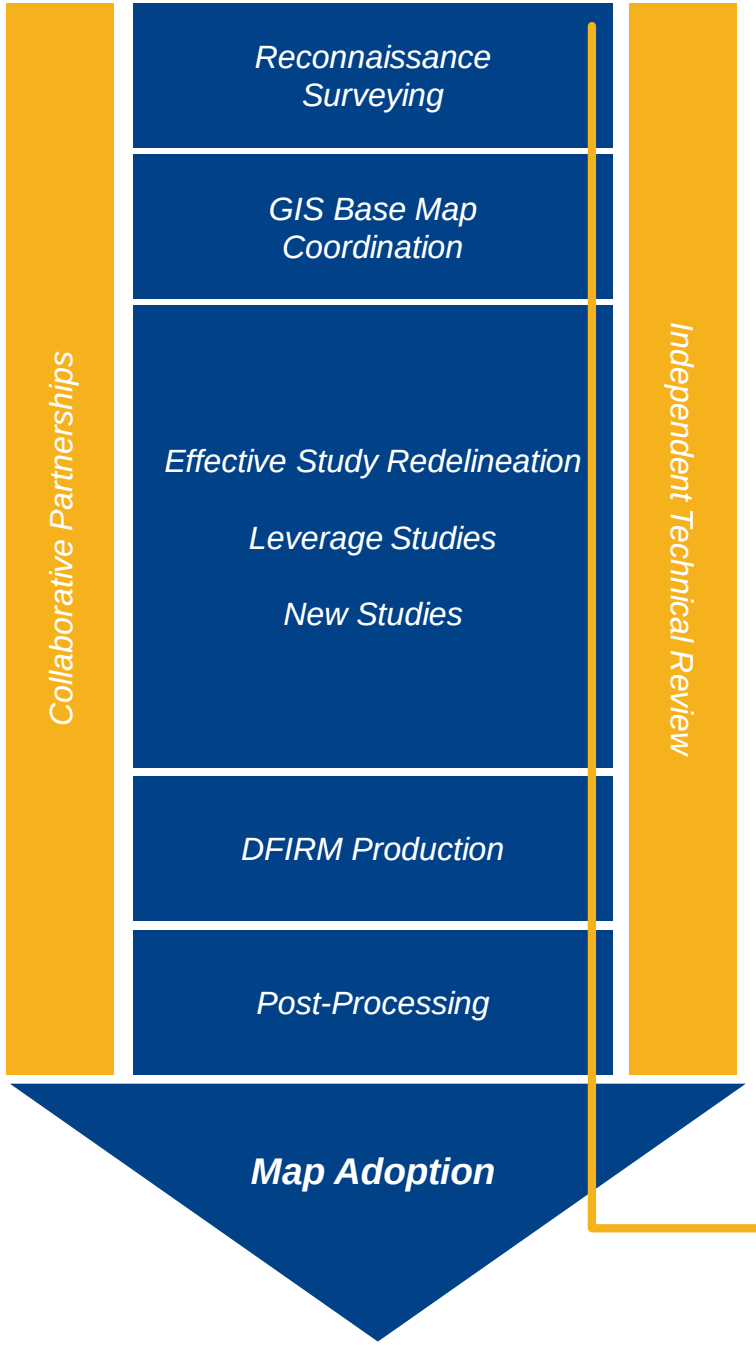
At this time, it would be Wood's recommendation to pursue 2D modeling for the Zone AE with Floodway streams that will be studied as part of this project, given the terrain in the area, but we want to hear **your thoughts**.

Kansas Department of Agriculture
Division of Water Resources

Non-Accredited Levees

- There is 1 Non-Accredited Ag Levee in the County
- This levee is upstream of the FEMA mapping extents

Next Steps



Project Tasks

1. Discovery
2. Base Map Preparation
3. Survey and Topography
4. New Studies
5. DFIRM and FIS Production
6. Post-Preliminary

We are at the beginning of data development

Kansas Department of Agriculture
Division of Water Resources

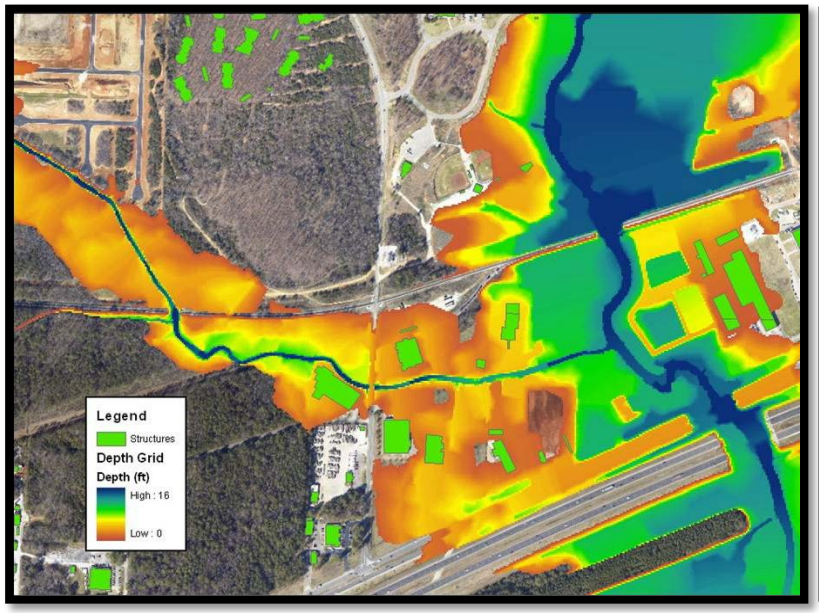
Our Next Steps:

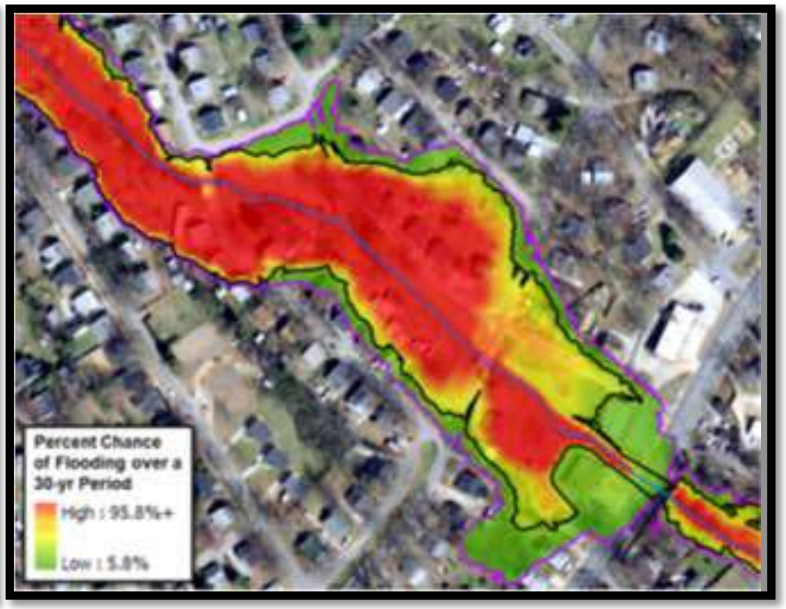
- We will complete the engineering analysis previously described
- We will develop your draft regulatory floodplain maps.
  - Also known as your Flood Insurance Rate Map (FIRM)
- We will develop your draft Flood Insurance Study (FIS).
- We will have a community review period and a public review period

Kansas Department of Agriculture
Division of Water Resources

Our Next Steps:

- We will also be developing flood risk products for the streams included in this study.





Project Timeline

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

Data Development Work:
[Now until early 2022]

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

Flood Risk Review Meeting:

[~March 2022]

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

Project Timeline, continued

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

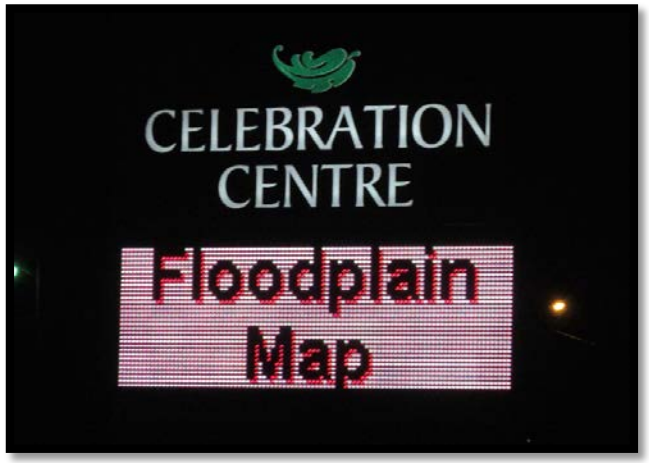
Public review of the draft maps

- *Includes Public Open House*

Preliminary Map Products

- *Preliminary DFIRM Community Coordination Meeting*

Post-Preliminary Processing



Kansas Department of Agriculture
Division of Water Resources

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://www.agriculture.ks.gov/divisions-programs/dwr/floodplain/mapping/mapping-projects/lists/mapping-projects/

Web Review Map

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

Story Maps

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


Any Questions?