



# McPherson County



# FEMA

*Floodplain Mapping Project  
Data Development Kickoff Meeting*

*July 1, 2021*

# wood.

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!***



**THANK  
YOU**



# 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*





## *Today's Goals*

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*Share details on the mapping project*

*Get initial feedback on modeling methods*

*Review future steps*

# *Background*

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# Background

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- Lower Smoky Hill Watershed Data Development Project
  - *Flood Study Review Meeting: April 11, 2018*
  - *Regulatory Mapping for the McPherson County portion of this project was put on hold due to a flood mitigation project in Lindsborg*
- Upper Cottonwood Watershed BLE Project
  - *Discovery Meeting and BLE Review: September 26, 2019*
- Lower Middle Arkansas Custom Watershed BLE Project
  - *Discovery Meeting and BLE Review: January 13, 2021*

# Background

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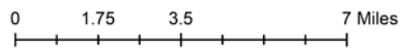
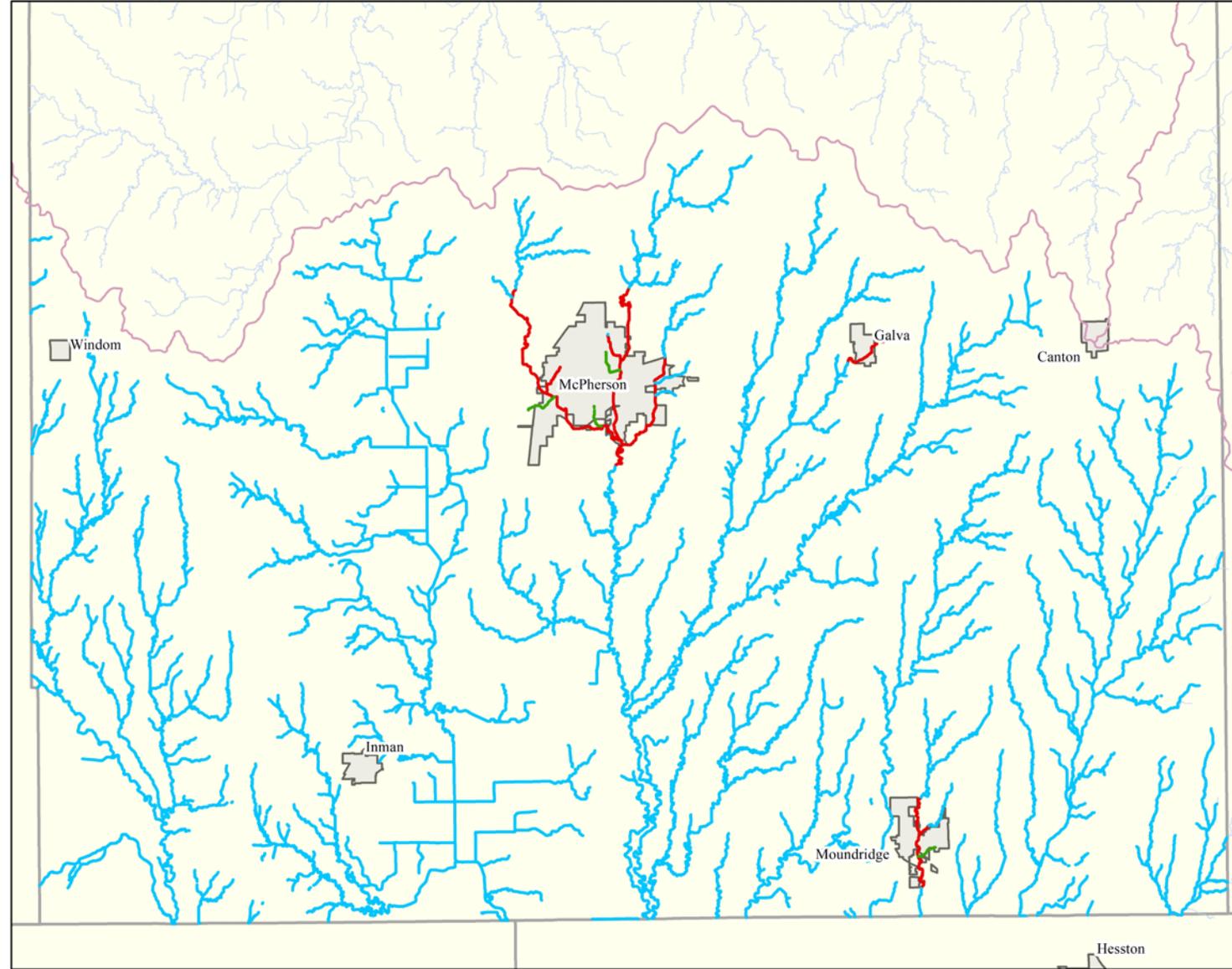
- McPherson County Effective Mapping is dated January 16, 2009
- The Lower Smoky Hill portion of the County will be moving forward with a regulatory update.
- Through Discovery and conversations with County stakeholders, it was determined that updated modeling and mapping would benefit the remainder of the County as well.
  - This will result in a County-wide Regulatory Update

# *Review of the Work Ahead and How We Propose Doing It*

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## 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 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 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 Lower Smoky Hill Watershed and Upper Cottonwood Watershed Studies.**





## ***New Zone AE with Floodway***

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- McPherson:
  - Bull Creek and 1 Tributary
  - Dry Turkey Creek and 1 Tributary
  - East Branch Dry Turkey Creek
- Galva:
  - Galva Drain
- Moundridge:
  - Black Kettle Creek and 1 Tributary



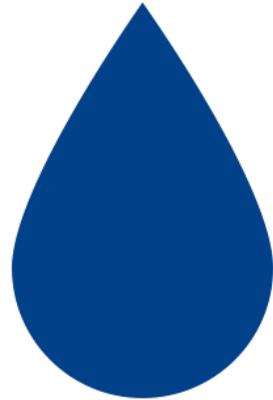
## ***New Enhanced Zone A and Zone A***

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- Enhanced Zone A
  - McPherson:
    - 2 Tributaries to Bull Creek
    - 1 Tributary to Dry Turkey Creek
  - Moundridge:
    - 1 Tributary Black Kettle Creek
- Zone A
  - Remainder of Streams in the Little Arkansas HUC8 portion of the County

# Definitions

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**Hydrology**  
*How Much Water?*



**Hydraulics**  
*How High Will Water Get?*



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

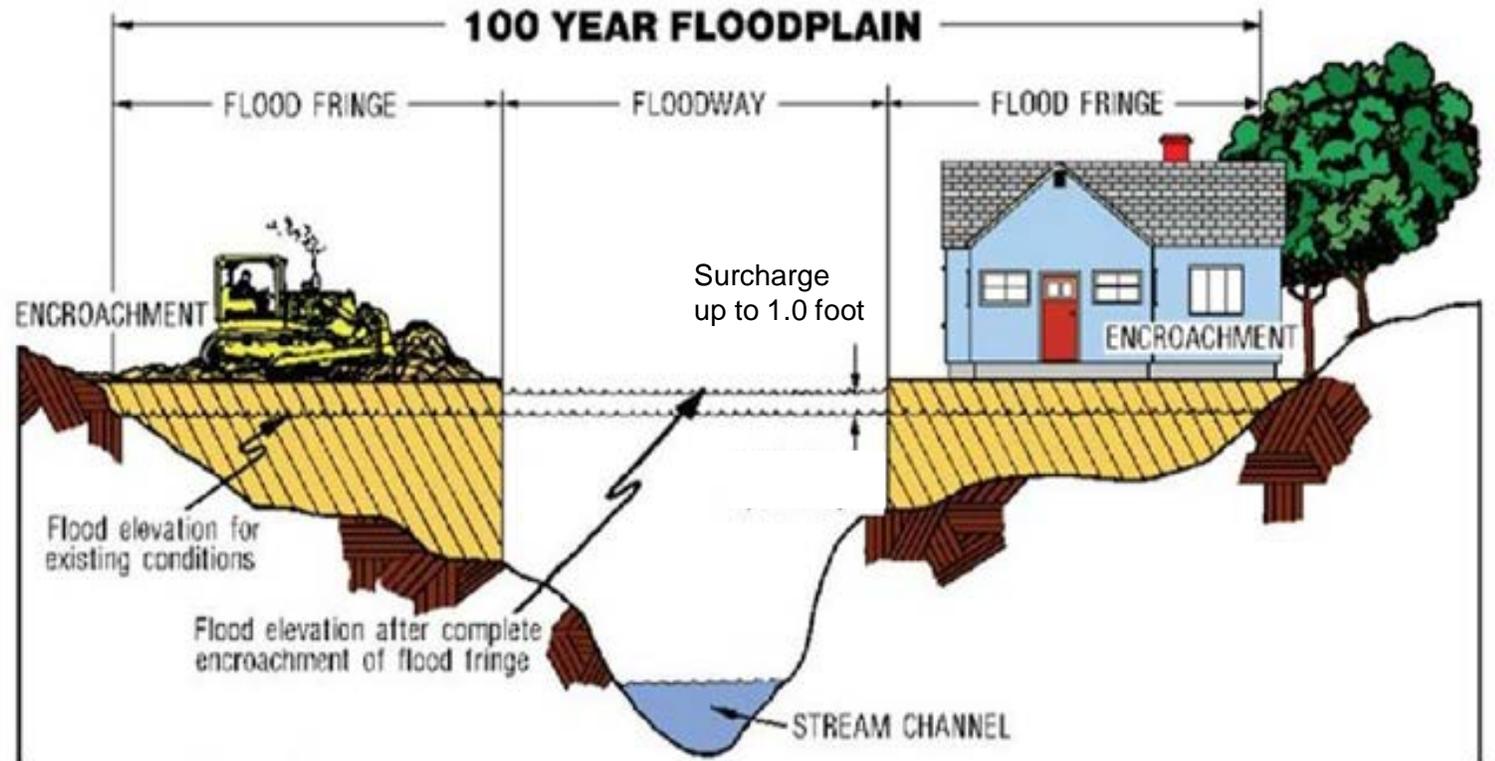
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- Enhancements will be made to the BLE modeling that was performed for the Zone A streams.
  - Comments made and additional information gathered during the Discovery phase will be used to enhance the modeling
  - Enhanced Zone A streams will include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



*The Zone AE modeling includes the development of a floodway*

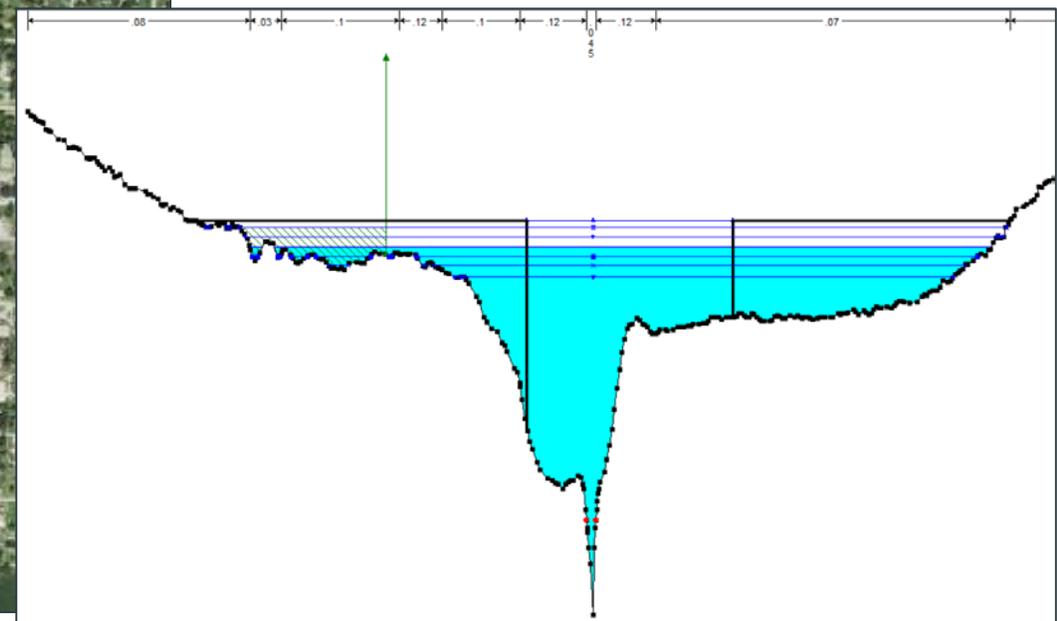
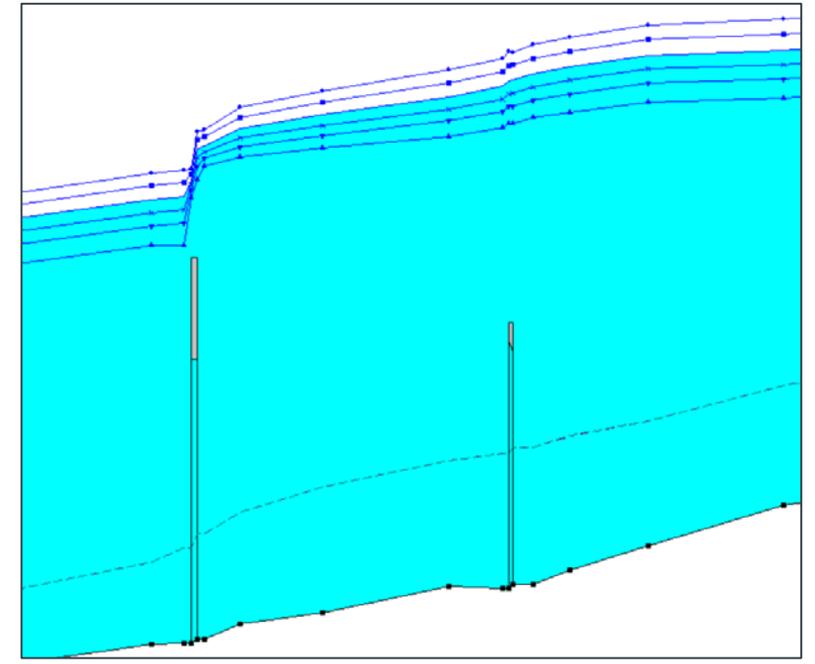
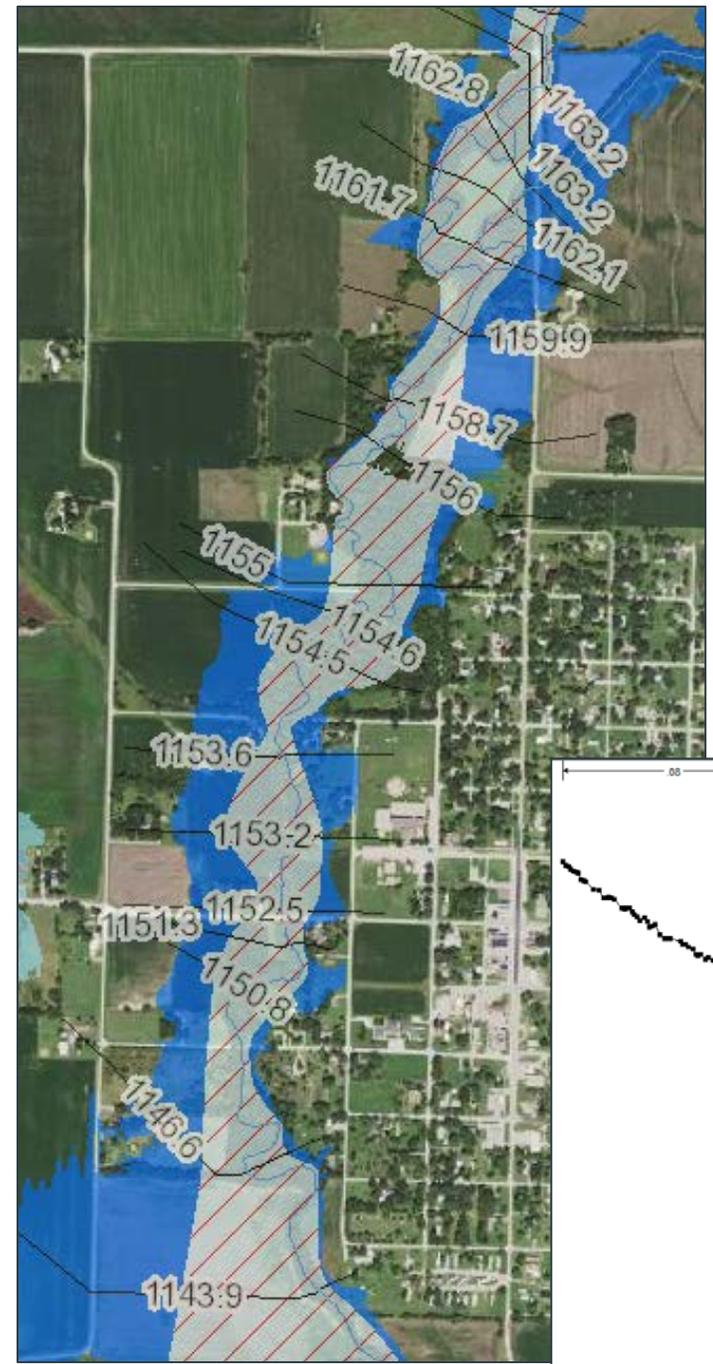
A Floodway is the area within the floodplain that must be reserved in order to discharge the base flood without cumulatively increasing the WSE by more than 1.0 foot.



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

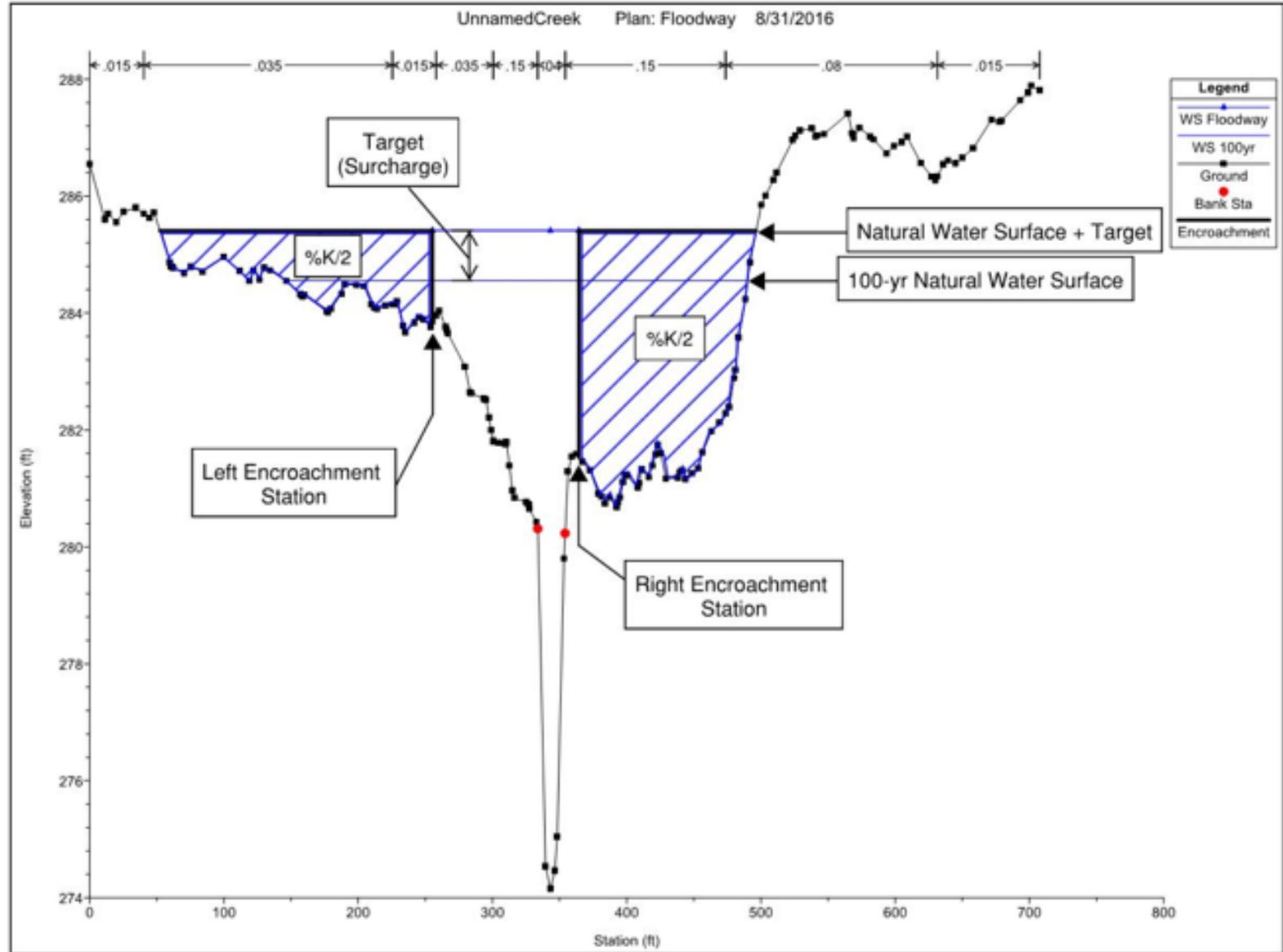
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# 1D Modeling

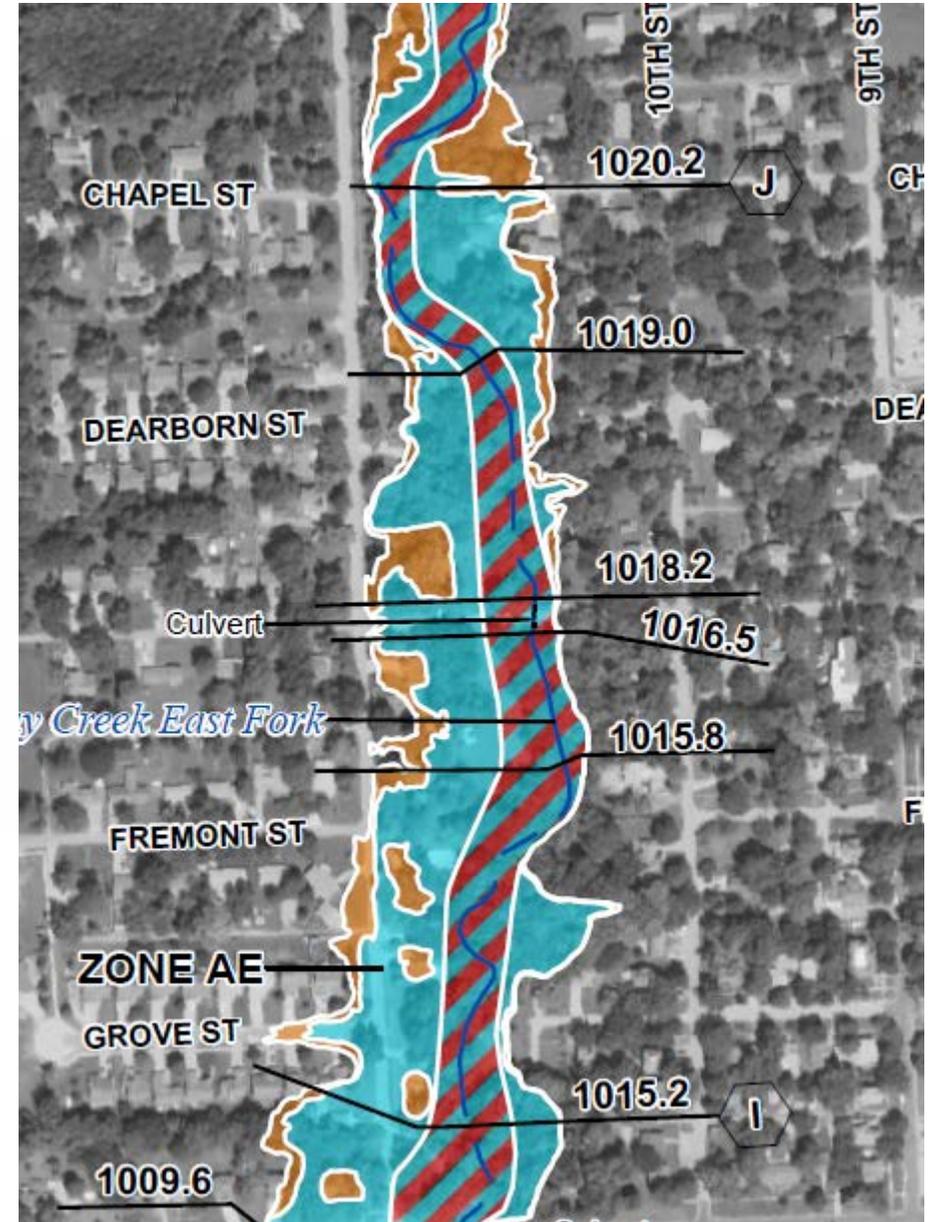
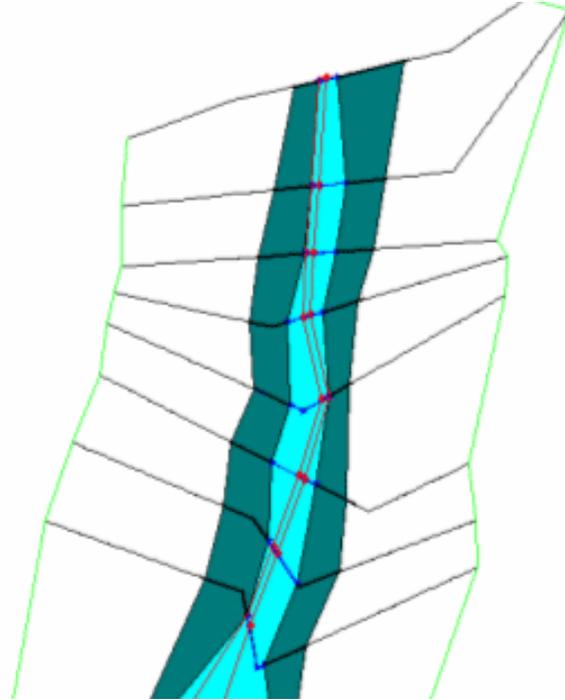




# 1D Floodways



# 1D Floodways



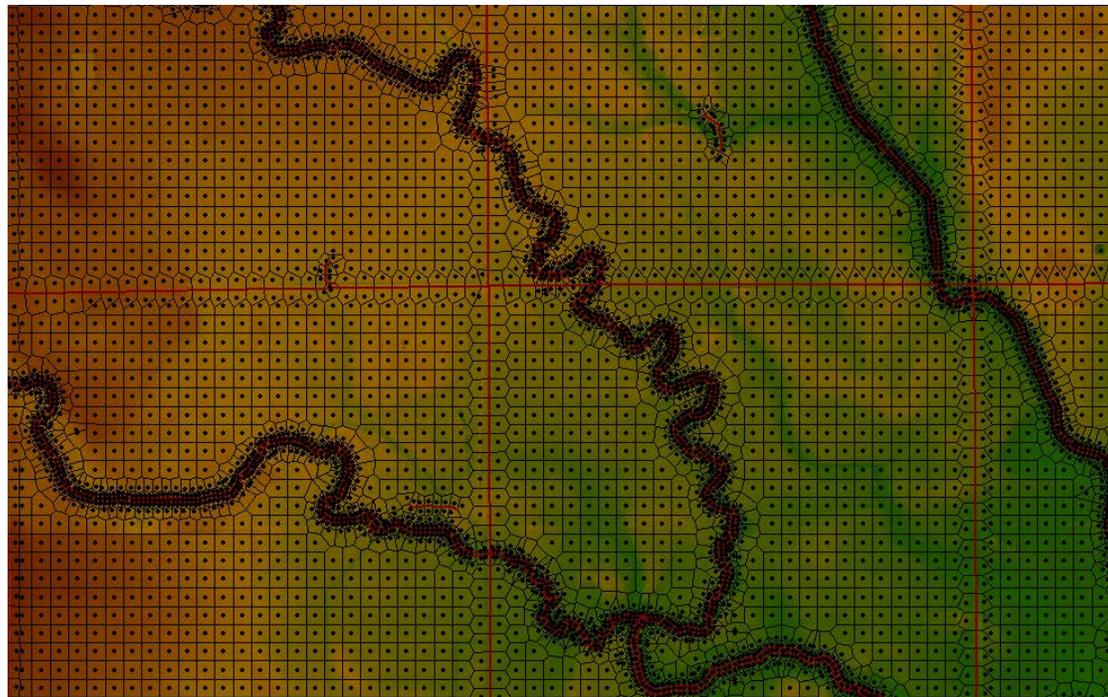


## ***Benefits of 1D modeling for Zone AE streams***

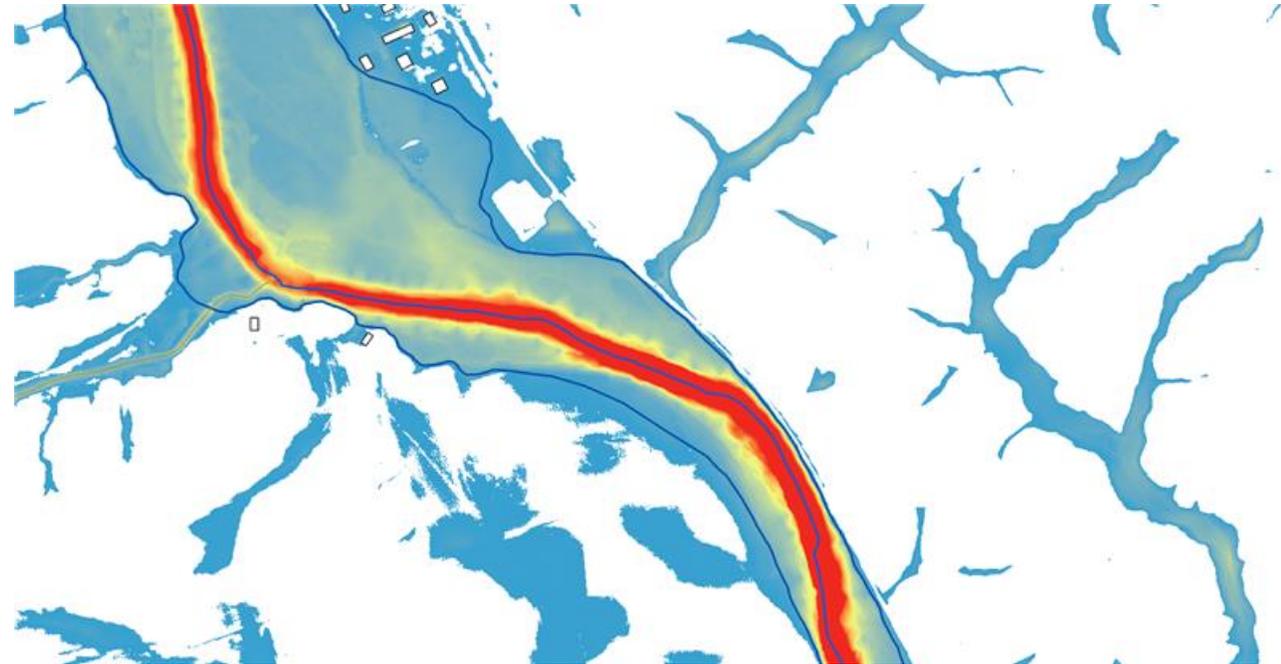
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- The local consulting community has more experience with 1D modeling
  - Especially important when considering LOMR applications and use of the modeling
- 1D Floodway Guidance is more established
- 1D modeling has similar accuracy to 2D modeling in areas with more relief (steeper terrain)
- Note that the modeling done for the Lower Smoky Hill Watershed was mostly done using 1D

# 2D Modeling

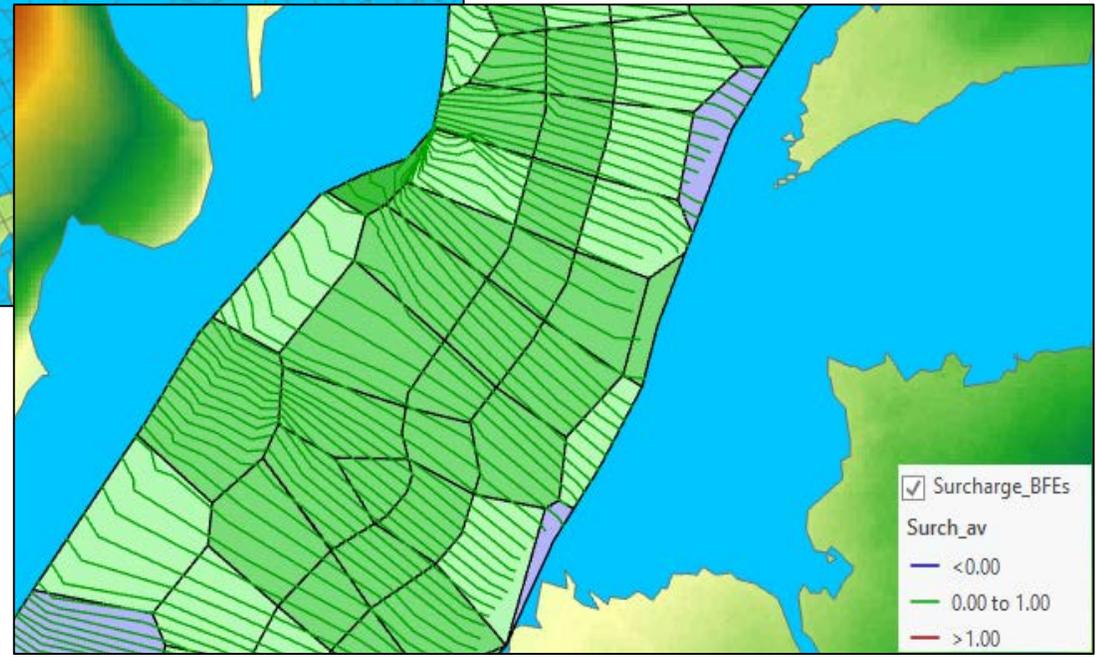
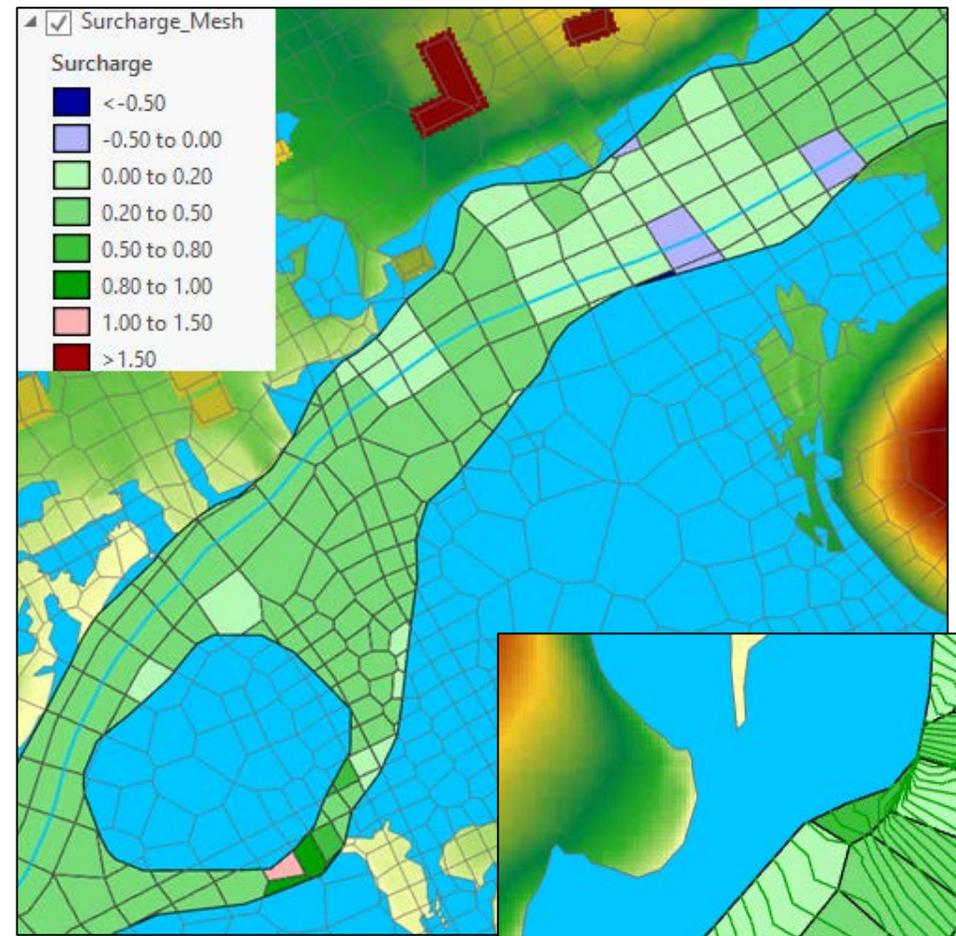


# 2D Floodways



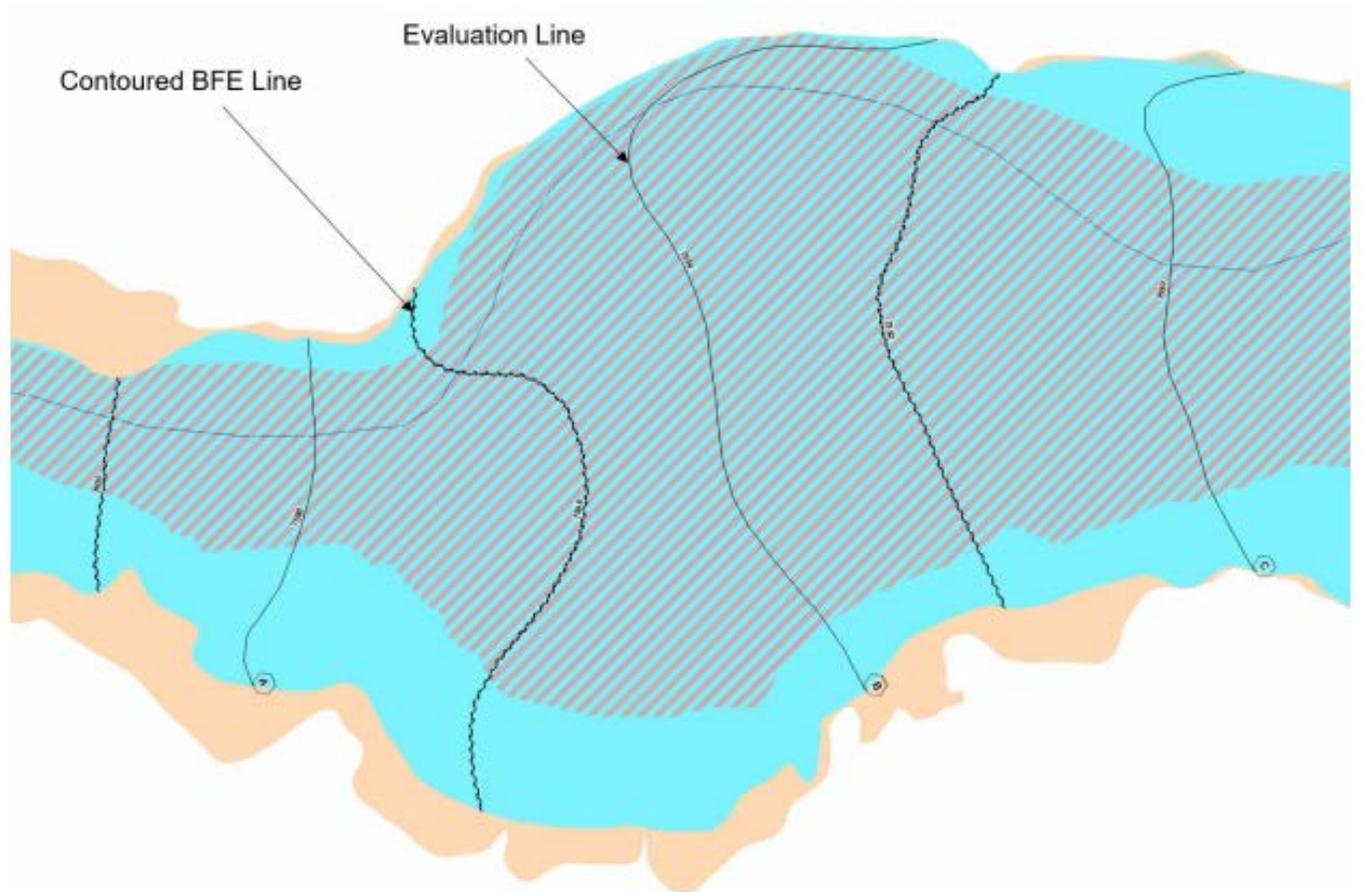


# 2D Floodways





# 2D Floodways





## ***Benefits of 2D modeling for Zone AE streams***

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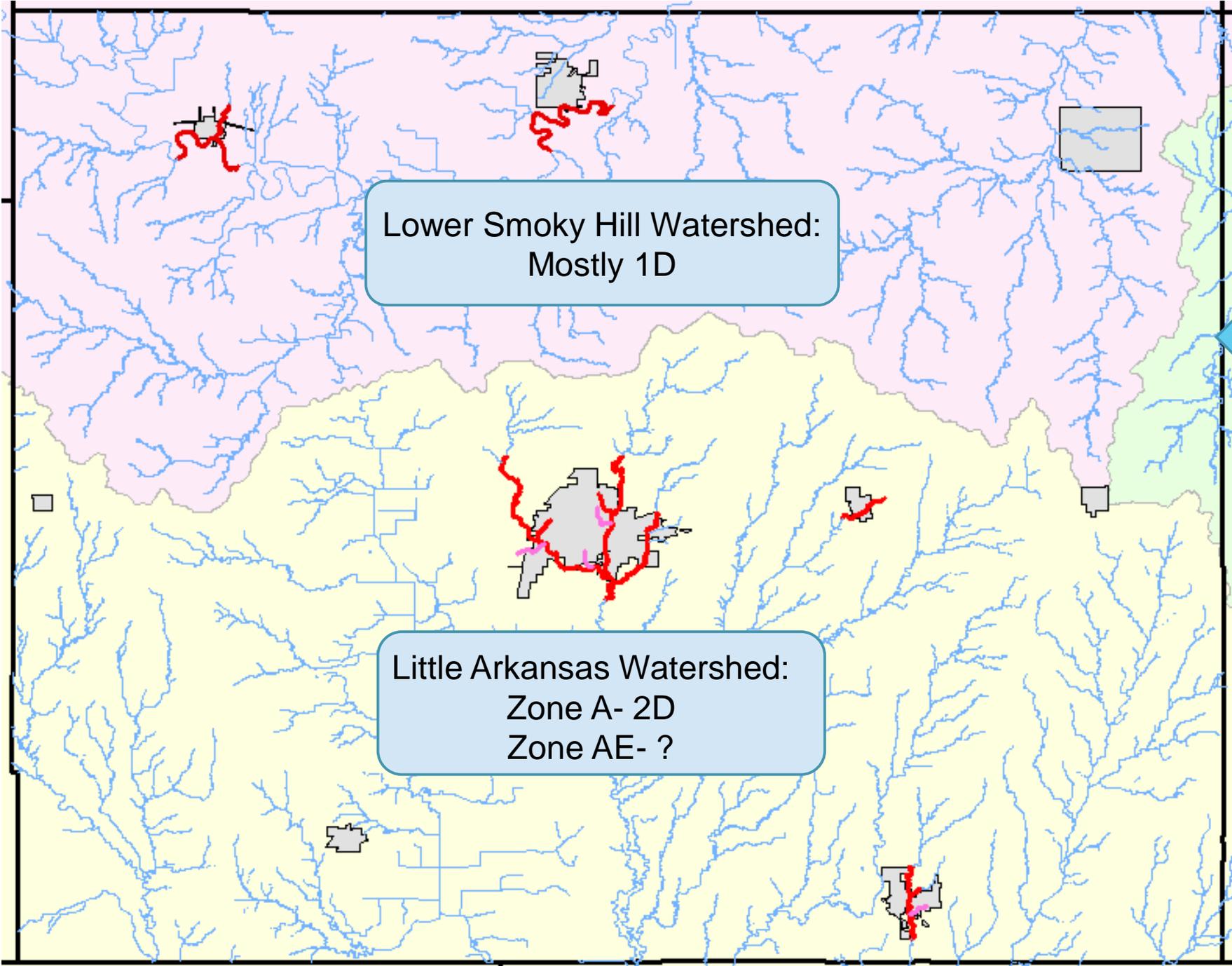
- 2D more accurately portrays flooding where water flows in multiple directions, such as flat areas and braided streams.
- 2D modeling is at the forefront of modern modeling practices
  - 2D will be used for the Zone A streams as well
  - Note that 2D floodway guidance has been released, but has not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



## **Zone AE Hydrology**

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- HEC-HMS (Rainfall-Runoff) Modeling will be performed
  - Used as flows for 1D modeling or calibration information for the 2D modeling



Lower Smoky Hill Watershed:  
Mostly 1D

Little Arkansas Watershed:  
Zone A- 2D  
Zone AE- ?

Upper Cottonwood  
Watershed: 2D



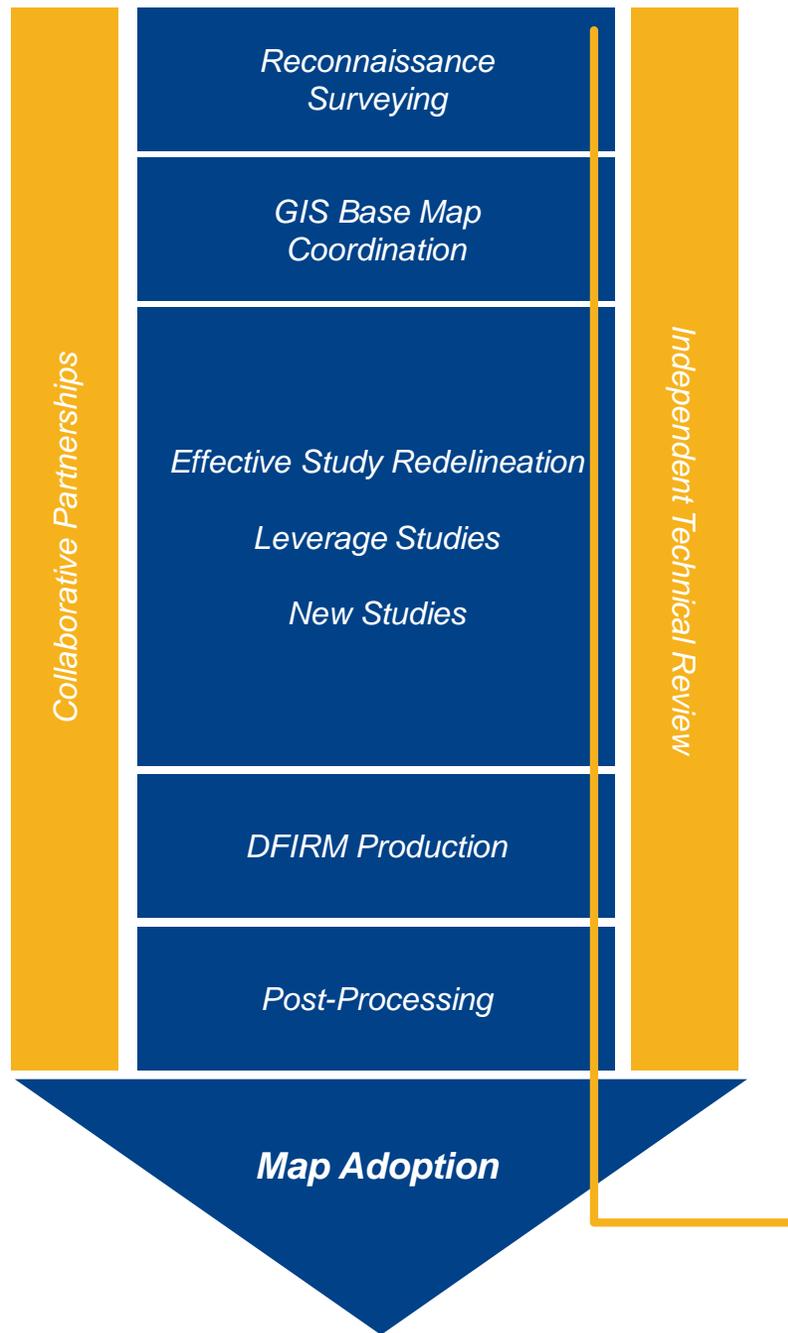
## *Zone AE Recommendation and Discussion*

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At this time, it would be Wood's recommendation to pursue 2D modeling for the Zone AE with Floodway streams in this project (Little Arkansas HUC 8) given the terrain in the area, but we want to hear **your thoughts**.

# *Next Steps*

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## 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



## ***Our Next Steps:***

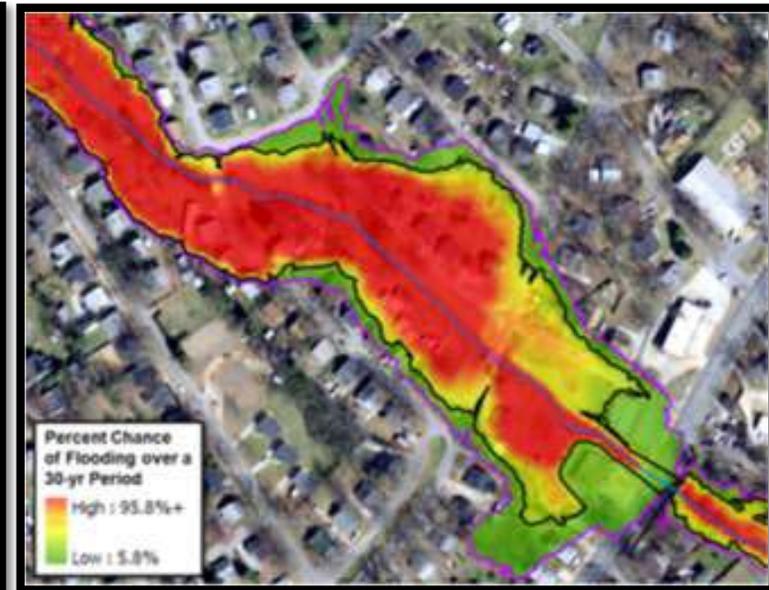
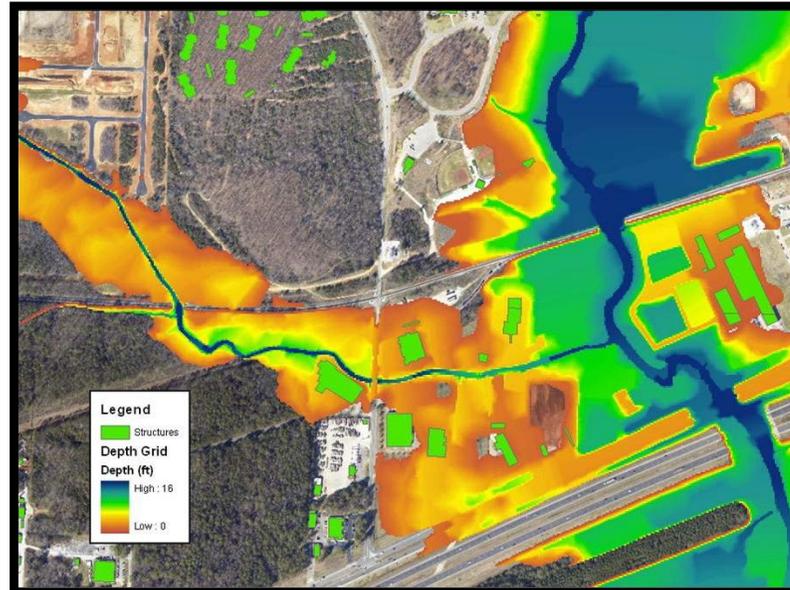
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- We will complete the engineering analysis previously described
- We will develop your draft regulatory floodplain maps.
  - Also known as your Flood Insurance Rate Map (FIRM)
- We will develop your draft Flood Insurance Study (FIS).
- We will have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



## Our Next Steps:

- We will also be developing flood risk products for all of McPherson County as part of this project.
  - Will use the latest data available for all streams



# 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:**

[~February 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**





## *Key Takeaways*

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*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*

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# 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?***

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