



# Cheyenne County




**FEMA**

***Floodplain Mapping Project  
Data Development Kickoff Meeting***

*May 30, 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!***



**THANK  
YOU**





# *Introductions*

## **Kansas Department of Agriculture**

**Joanna Rohlf, CFM,  
GISP**

*Floodplain Mapping  
Coordinator*

**William Pace, CFM**

*Floodplain Mapping  
Specialist*

**Cheyenne Sun Eagle,  
CFM**

*NFIP Coordinator*

**Keegan Schwartz**

*Floodplain Outreach  
Specialist*

## **FEMA – Region VII**

**Dawn Livingston**

*Regional Project Officer*

## **AtkinsRéalis**

**Mike Schlesener, GISP**

*Project Manager*

**Brandon Gonzalez, PE**

*Engineer*





## *Today's Goals*

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*Share details on the mapping project*

*Get initial feedback on modeling methods*

*Review future steps*





# *Background*



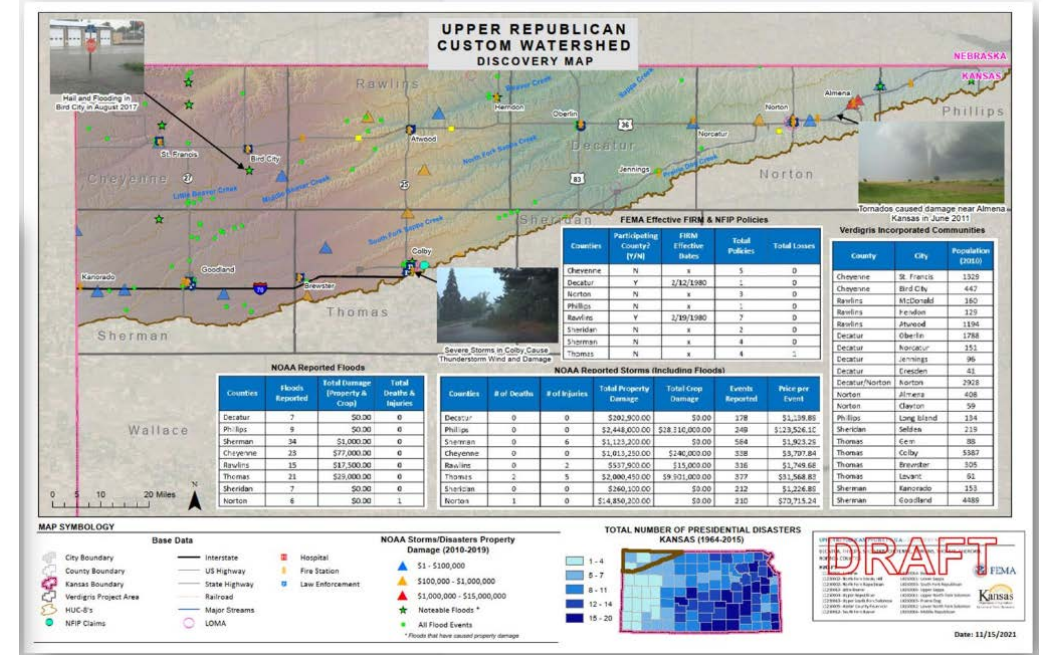


# Background

- Upper Republican Custom Watershed Base Level Engineering Projects
  - BLE Kick-off Meeting:*
    - Upper Republican – June 2021*
  - Discovery Meetings and BLE Review:*
    - Upper Republican - April – August 2022*

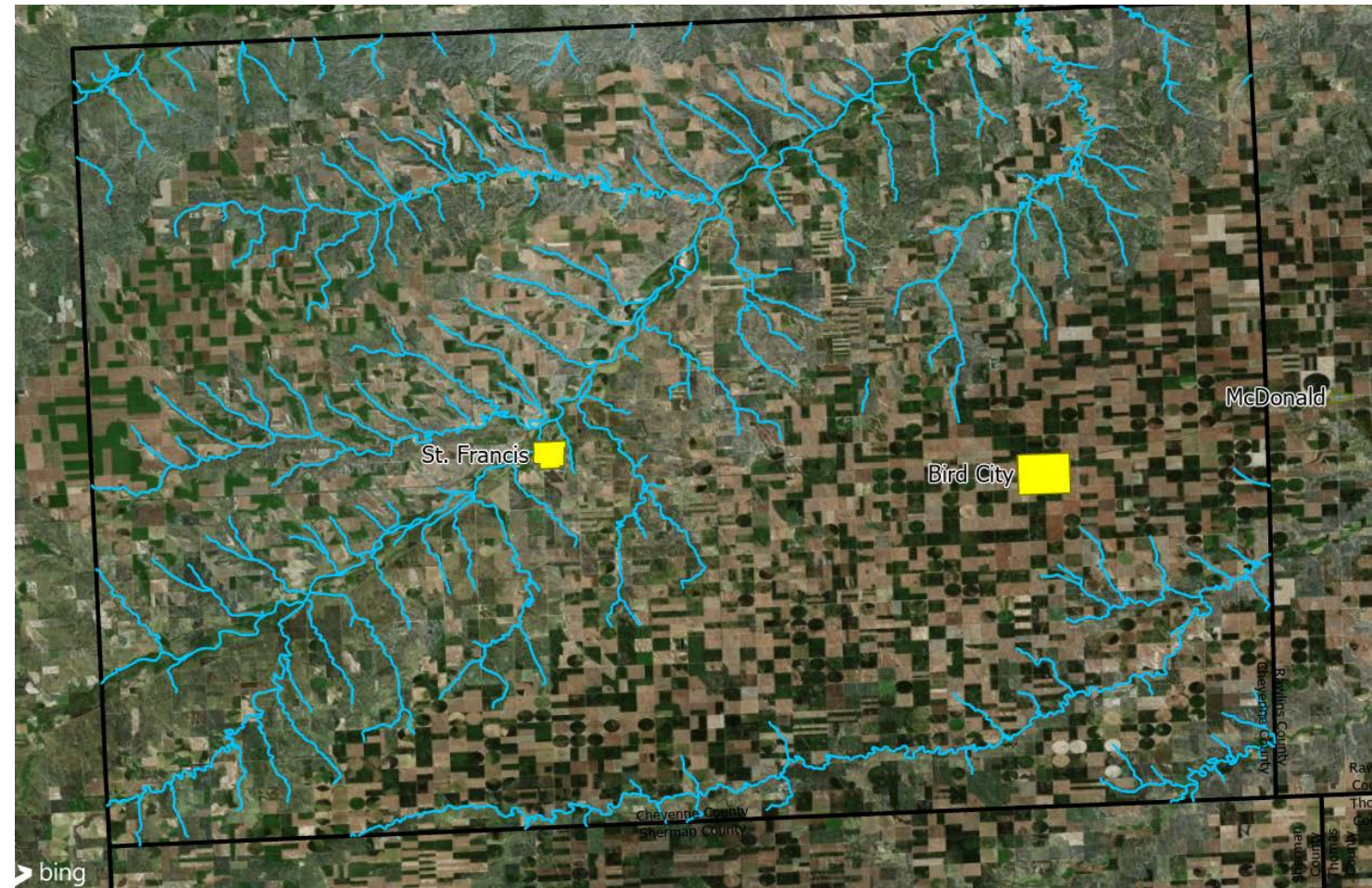


**Discovery Report**  
 Upper Republican Custom Watershed  
 HUCs 10250001, 10250002, 10250003, 10250004, 10250010, 10250011, 10250012, 10250013, 10250014, 10250015  
 June 2022  
 MIP Case Number: 20-07-00138



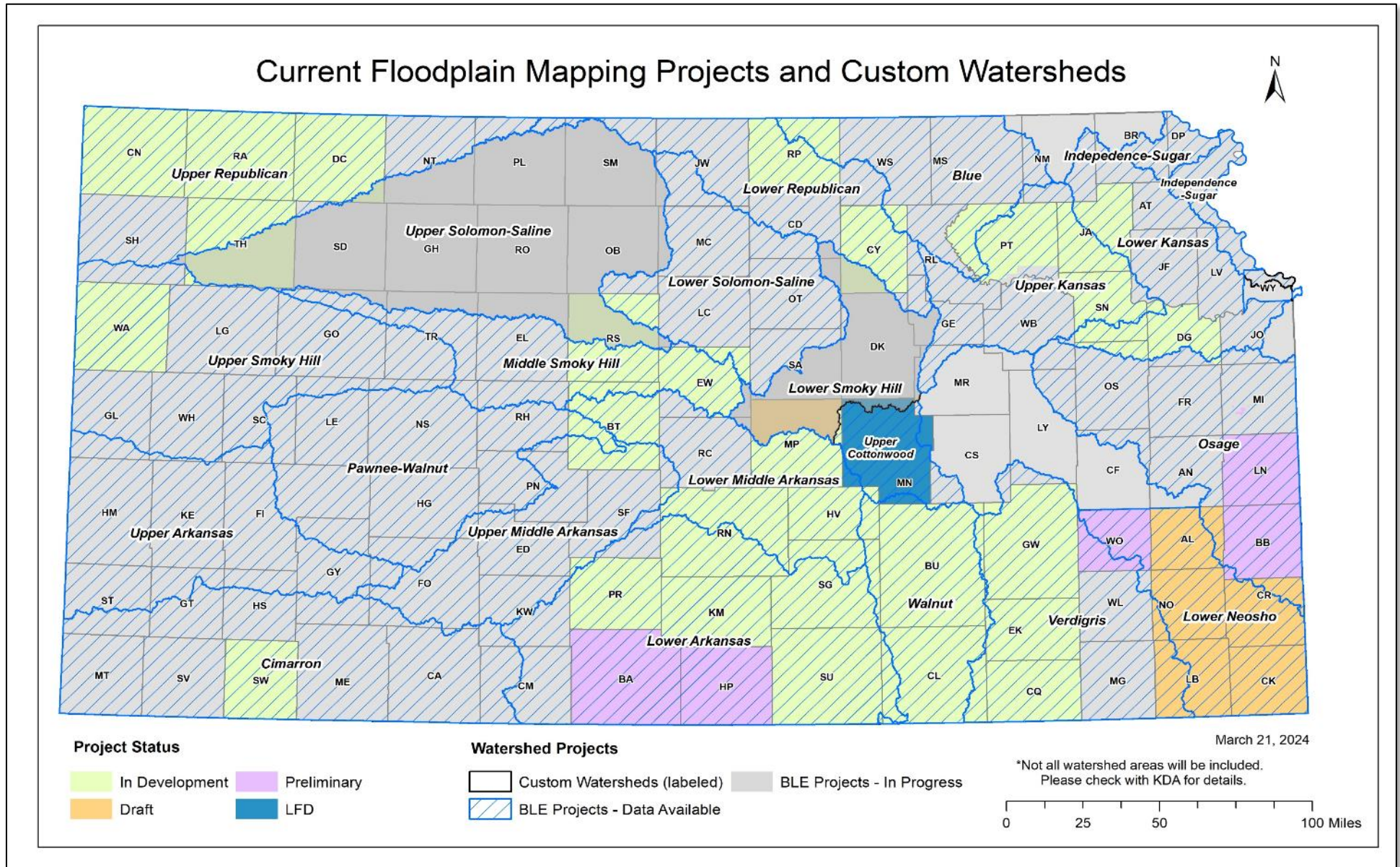
# Background

- First-time Countywide
  - Current Effectives:
    - St. Francis - 1975
    - Bird City - 1976





# We are doing similar work across Kansas...







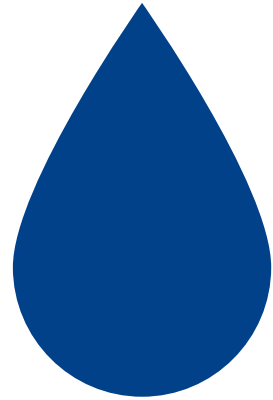
# *Review of the Work Ahead and How We Propose Doing It*

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# Definitions

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**Hydrology**  
*How Much Water?*



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



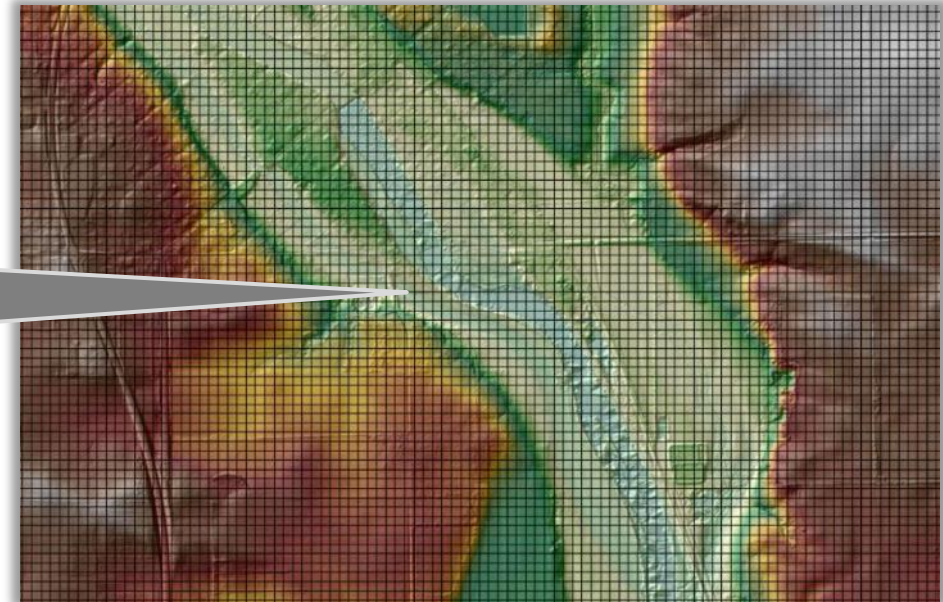






# Differences between traditional 1D studies and 'new' 2D studies

In a 2D model, elevations are in every cell eliminating interpolation



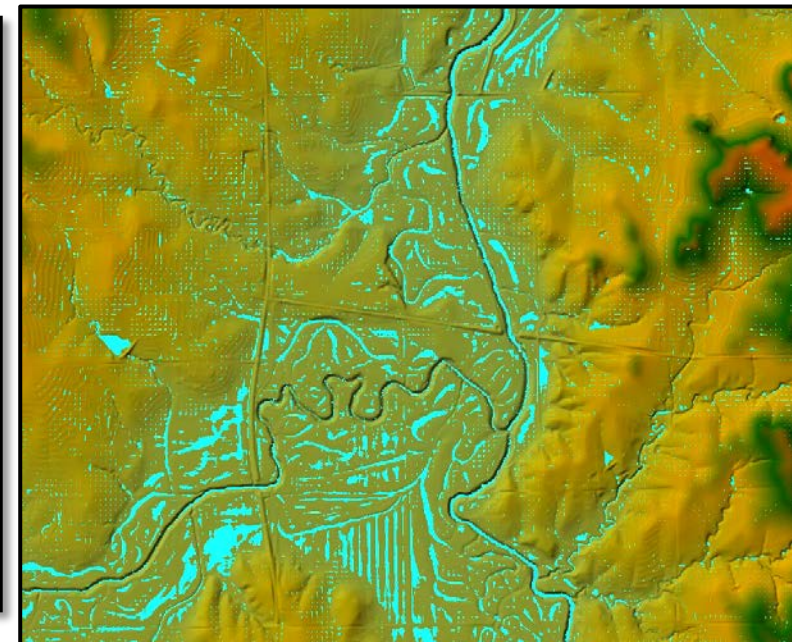
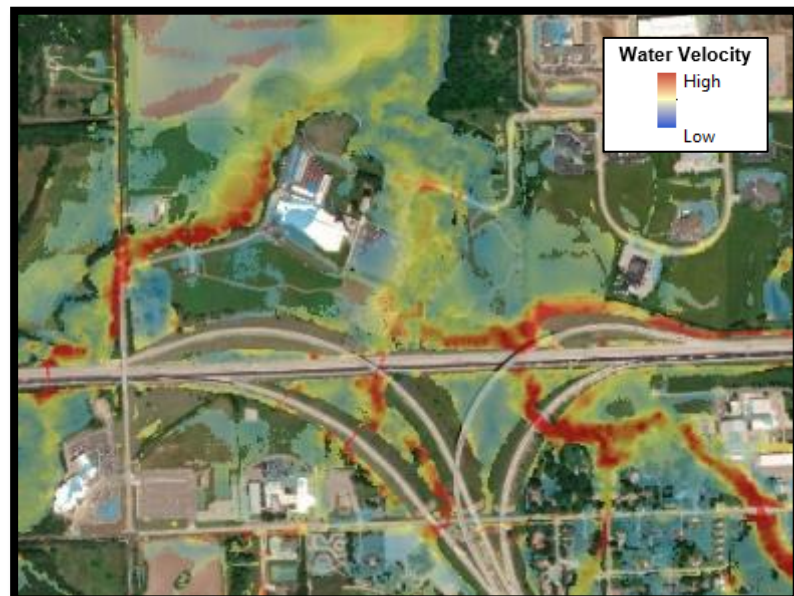
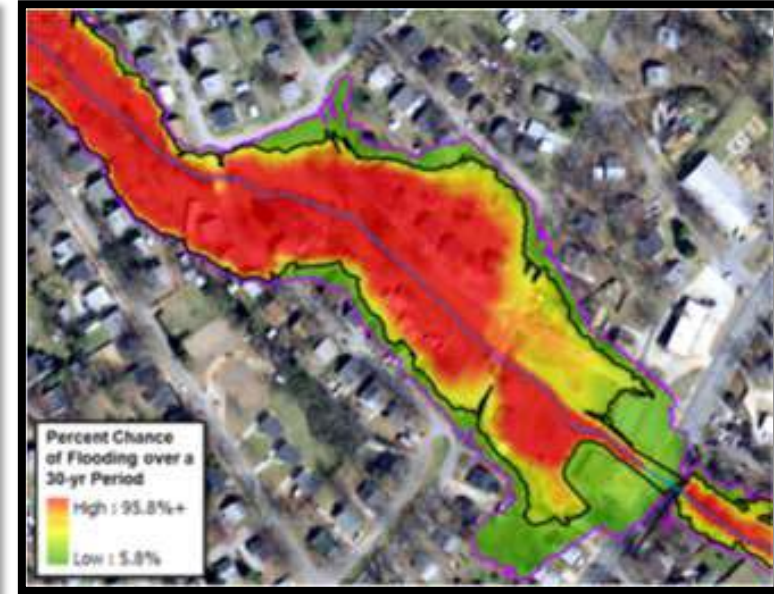
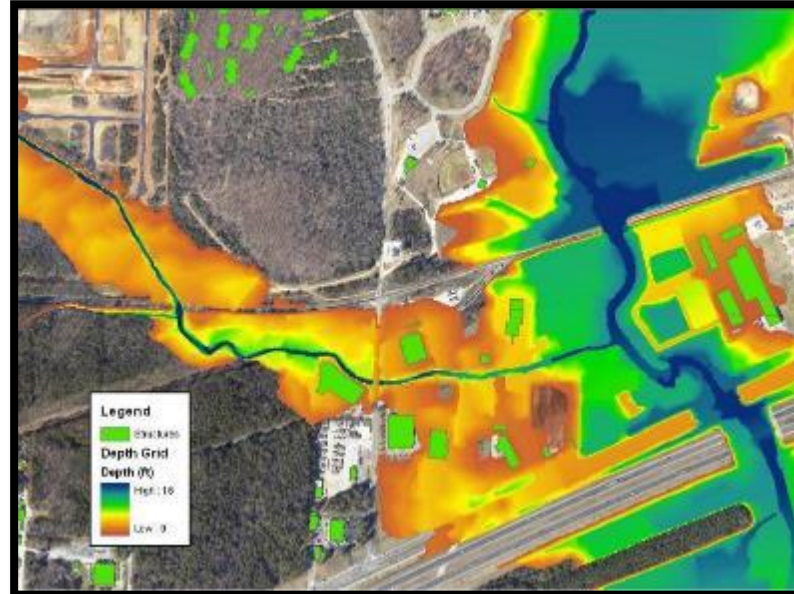
- 2D Studies evaluate flood risk beyond the channel banks
- More refined model in complex areas on a cell-by-cell basis





*More precise data  
and modeling  
methods gives  
you more  
information about  
flood risk*

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## ***Model Enhancements***

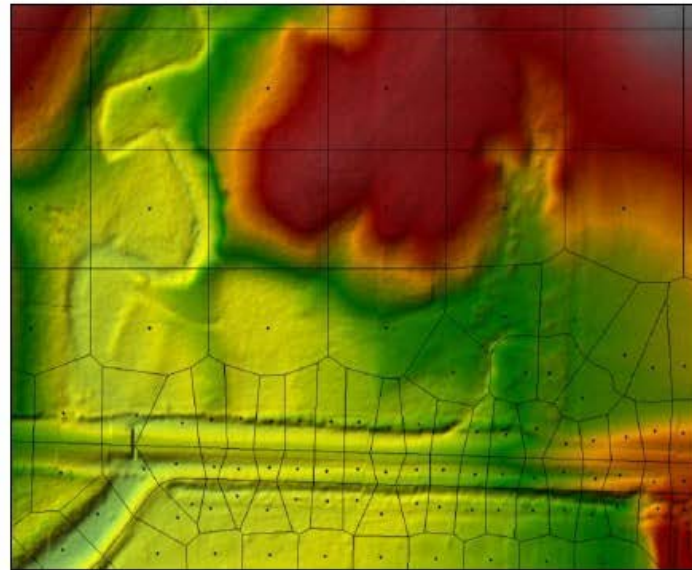
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- Enhancements will be made to the BLE modeling that was performed.
  - Updated to newest version of HEC-RAS
  - Refined model meshes in cities with additional detail including:
    - Ground and channel Manning's roughness
    - Land use refinement
    - Re-verify gage analysis against refined results
    - Detailed structure modeling
      - Where data is available
      - Field collected structure data, if necessary

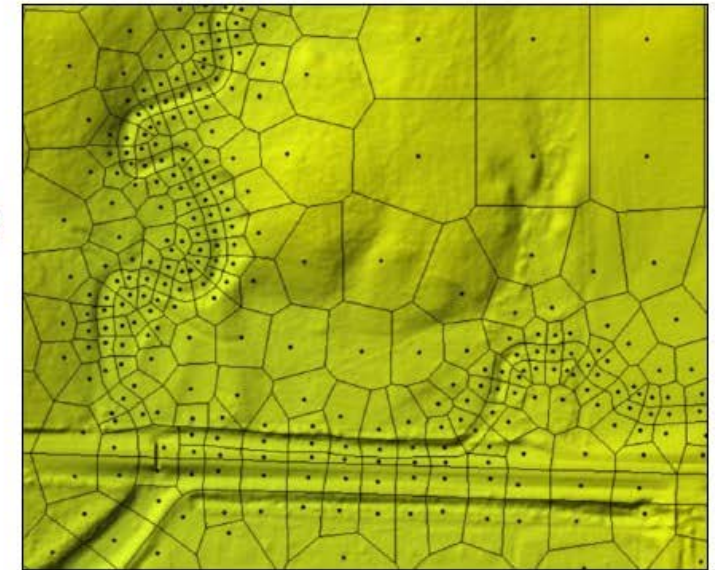


# Model Enhancements

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



Coarser Mesh



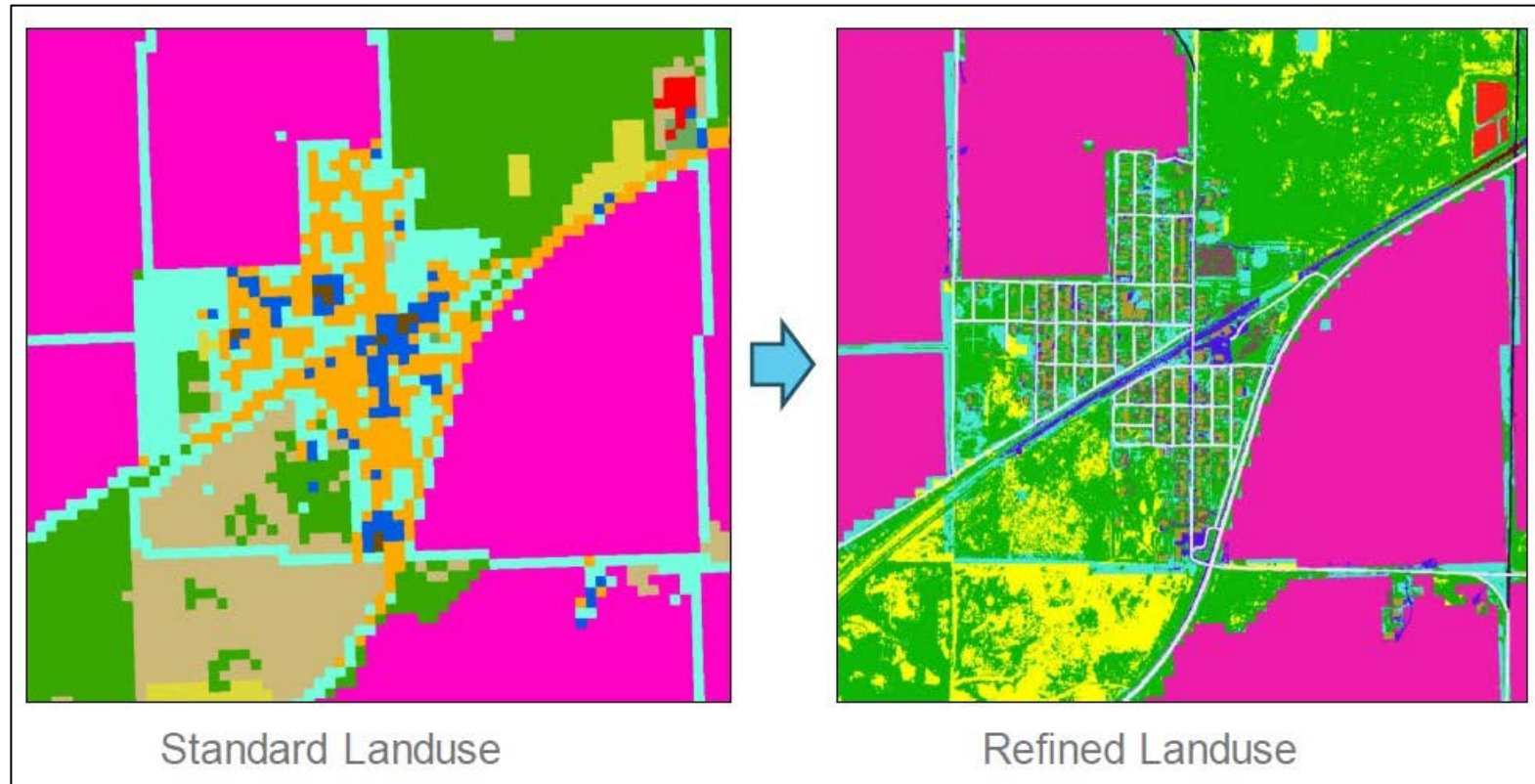
Refined Mesh





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

## Model Enhancements

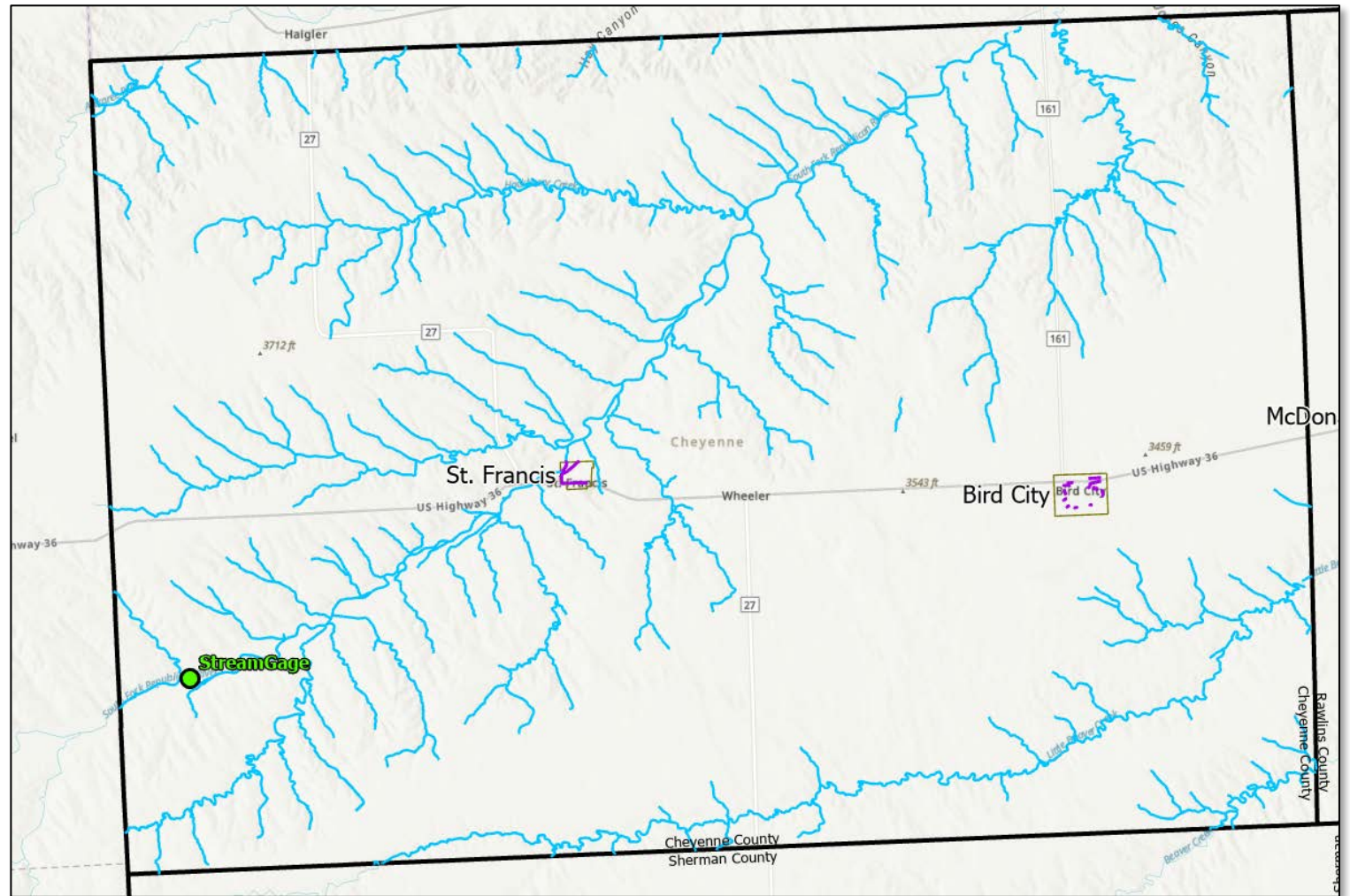






# Model Enhancements

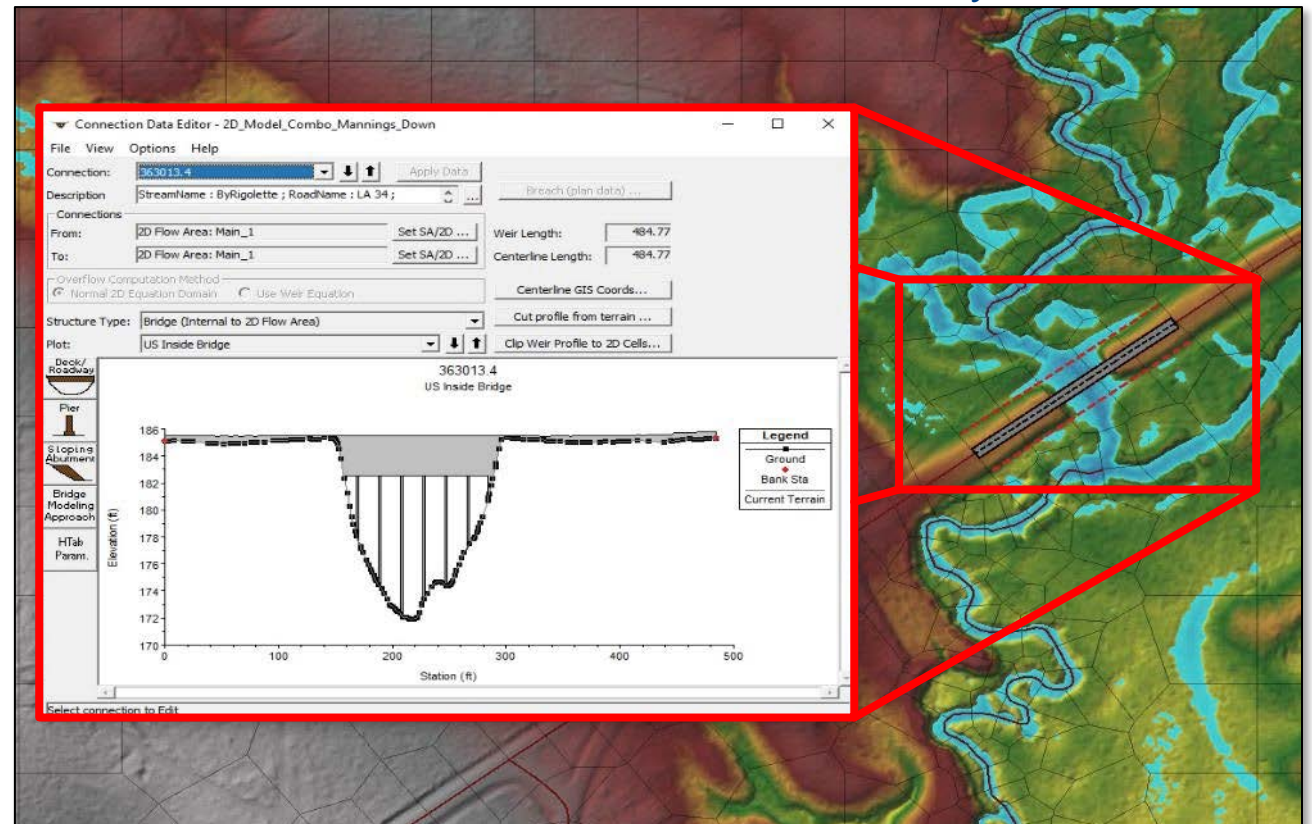
- Gages will be re-verified in refined model





# 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







## ***Model Enhancements***

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- Enhancements can be made to the BLE modeling that was performed.
  - Lidar, flown in 2016, will be incorporated.
  - Comments made and additional information gathered during the Discovery and Data Development phase can be used to enhance the modeling.
  - With your feedback additional review/refinement of mesh can be done to improve accuracy of modeling.





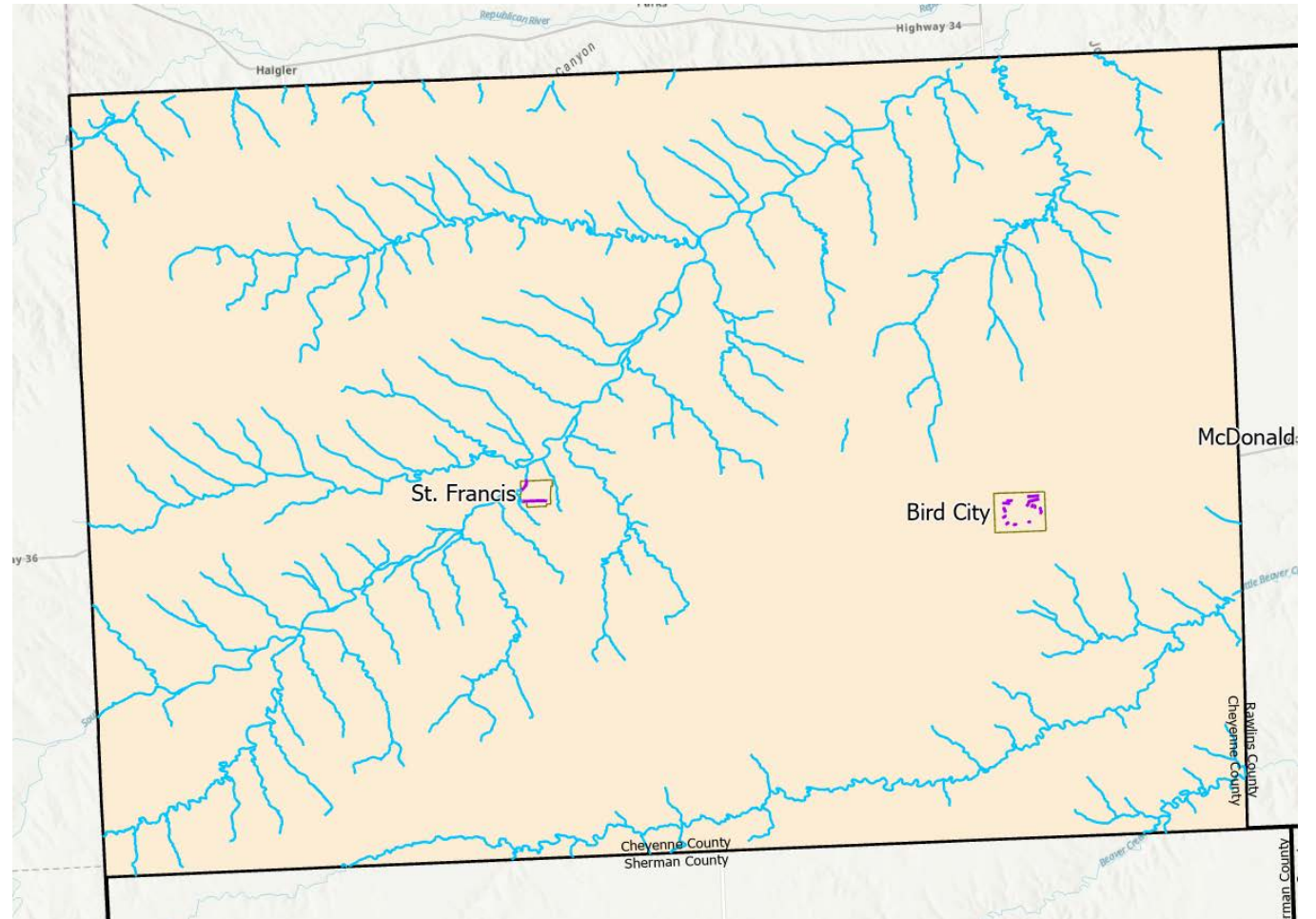
# *Data Development Scope*

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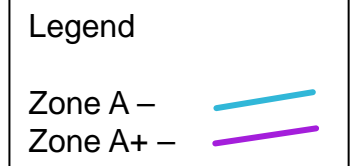
# Data Development Scope

- All Zone A 2D BLE (621 mi.)



## Current Effectives:

- St. Francis – 1975
- Bird City – 1976







## Levees

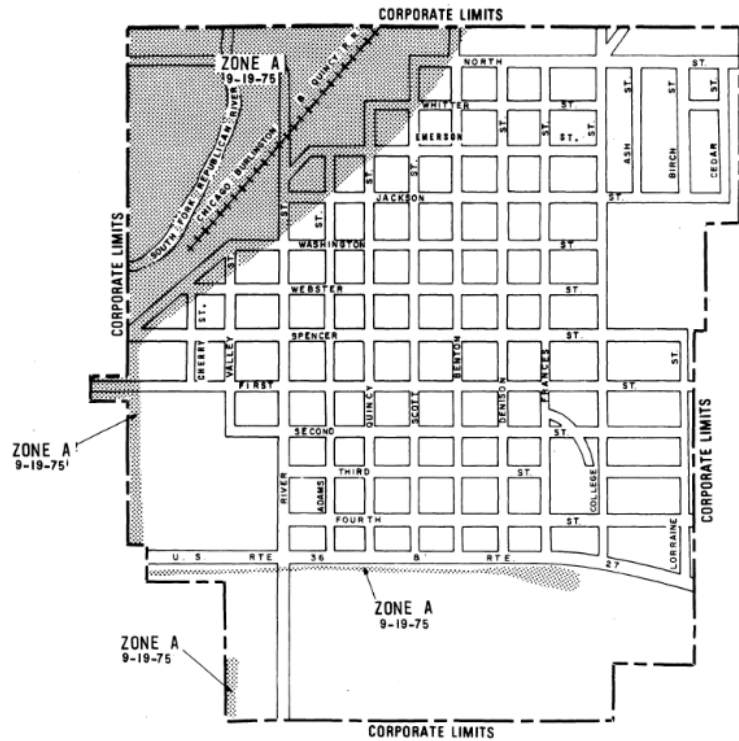
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There are no non-accredited levees in the project area.



# Data Development Scope

City of St. Francis  
Zone A+ – 1.1 miles

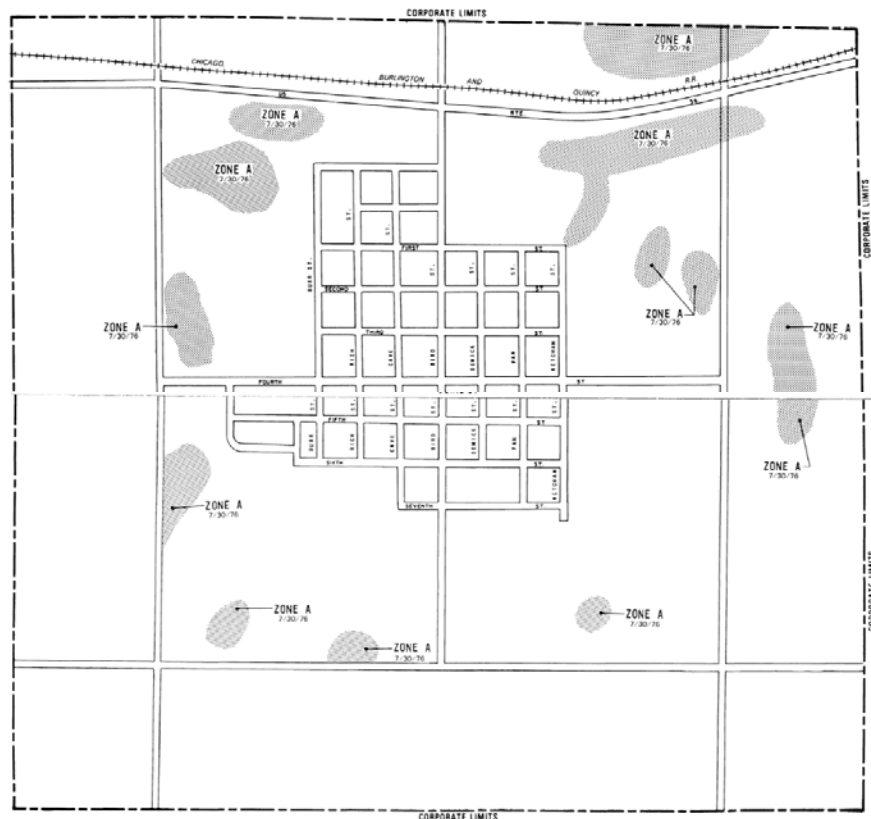




# Data Development Scope

City of Bird City

Zone A+ – 1.84 miles







- Mapping determinations will be made for Zone A streams and playas using acceptable mapping criteria.
  - Mapped streams have defined bed and banks
  - Mapped playas have drainage areas of 1 sq. mile or greater
  - Mapped playas shows extended static ponding in model

## *Draft Mapping*

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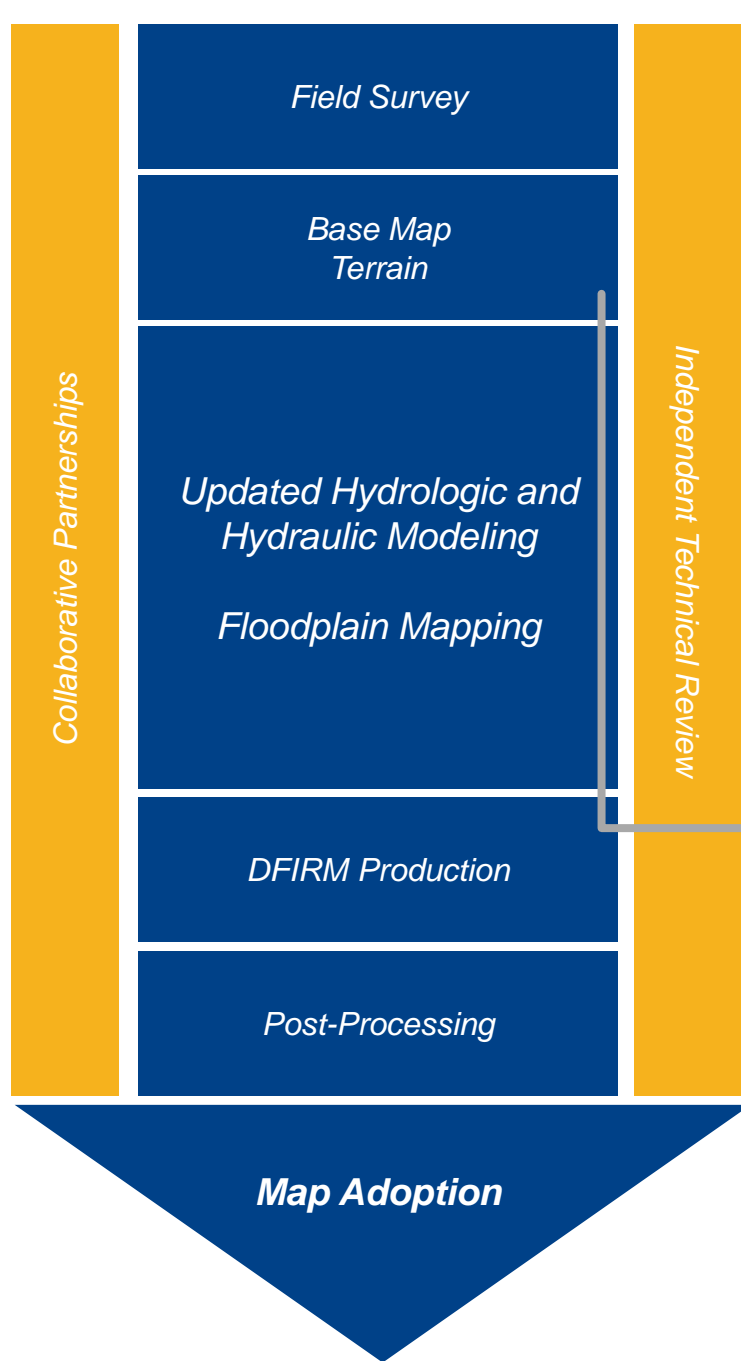


# *Next Steps*

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Data  
Development



## Project Tasks

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

We are about to begin  
the modeling task





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

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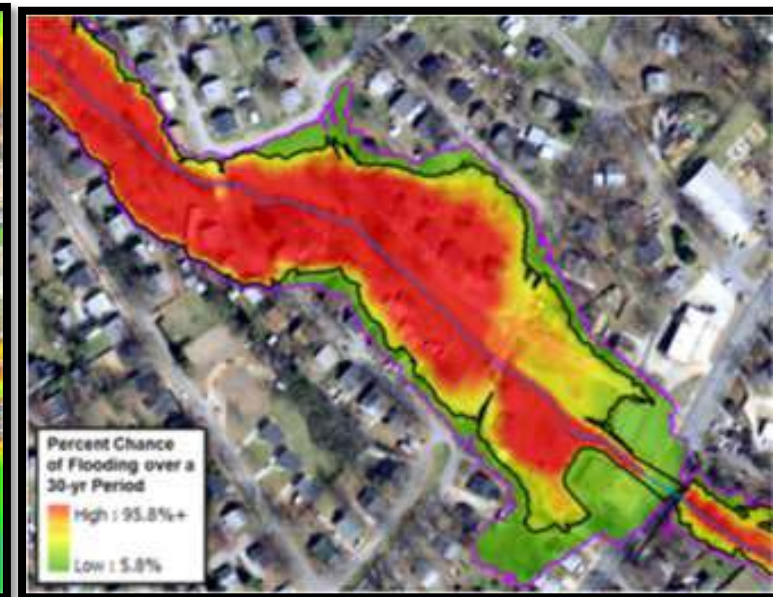
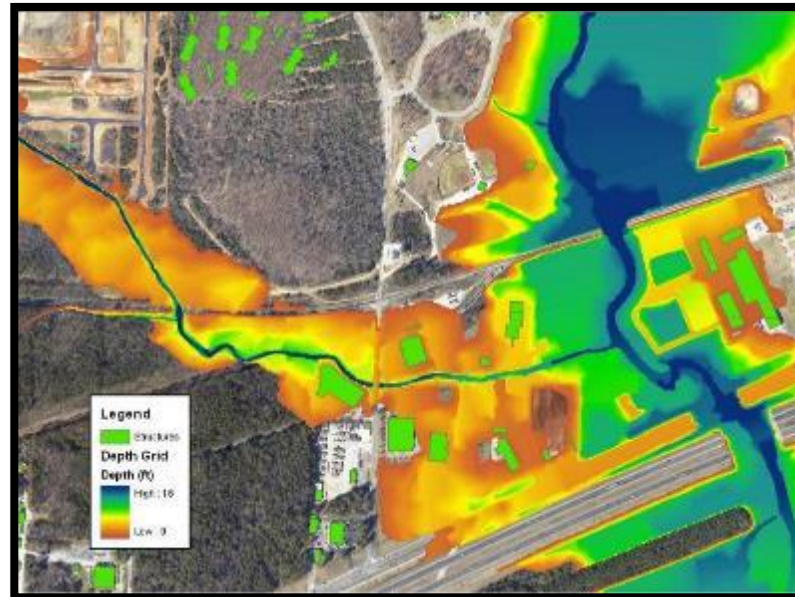
- We will complete the engineering analysis previously described.
- Several rounds of reviews will be completed.
- We will develop your draft regulatory floodplain maps.
  - Also known as your Flood Insurance Rate Map (FIRM)
- We will develop your draft Flood Insurance Study (FIS).
- We will have a community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





## Our Next Steps:

- We will also be developing flood risk products for Cheyenne County as part of this project.
  - Water Surface Elevation (WSE) Grids
  - Depth Grids
  - Percent Annual Chance & 30yr Chance Grids
  - Velocity Grids

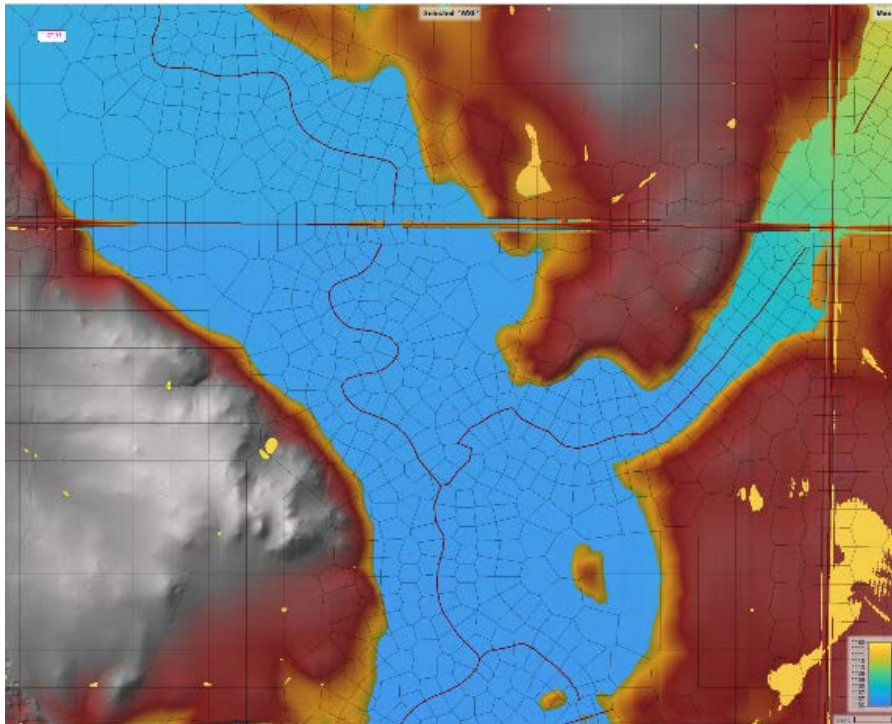




# Flood Risk Products

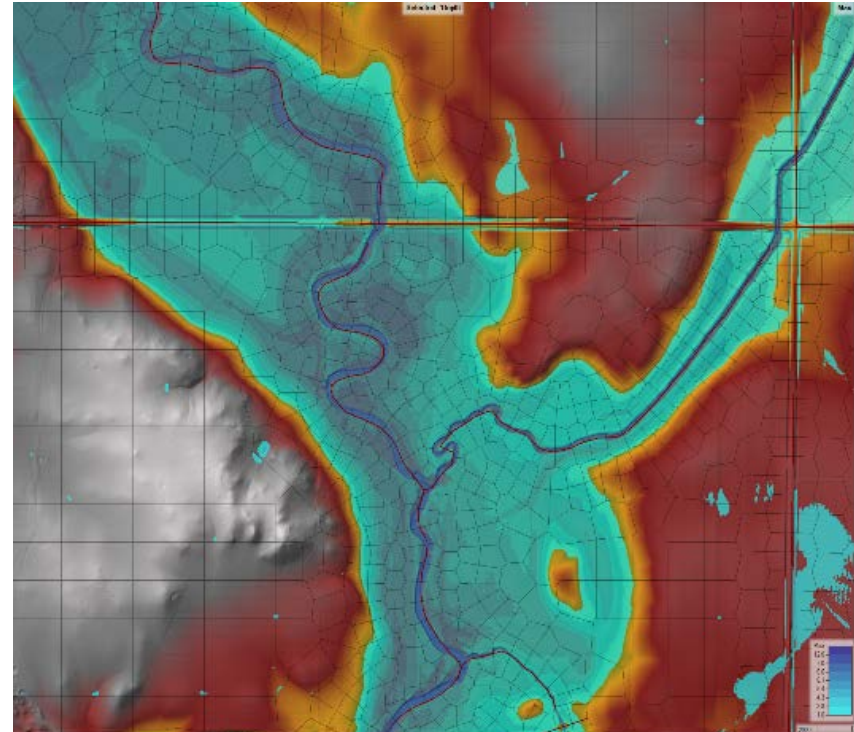
## Water Surface Elevation Grids

- Raster output from model that displays varying water surface elevations within derived floodplain extents
- Used to find base flood elevation throughout the floodplain rather than just at the extent lines.



## Flood Depth Grids

- Raster output from model that displays varying depths of flooding within derived floodplain extents
- Used to find depth of flooding at any location, like residential structures, based on a subtraction of ground elevations from water surface elevation.

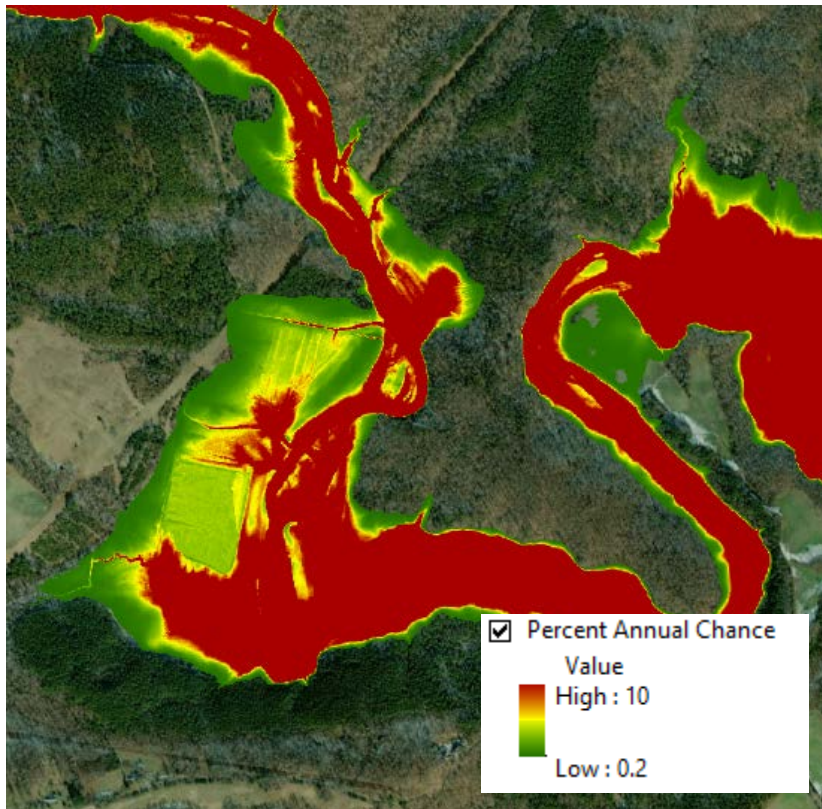




# Flood Risk Products

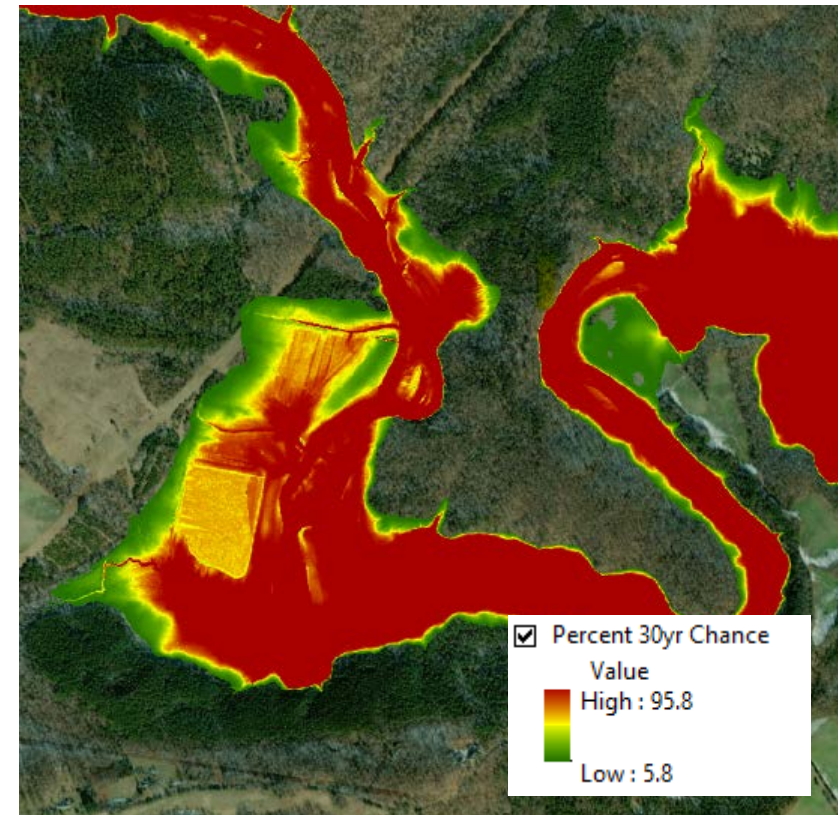
- Percent Annual Chance Grids

- Raster output from model that displays varying likelihood, in percentage, of chance that any given cell within the raster has of flooding within a single year.



- Percent 30-yr Chance Grid

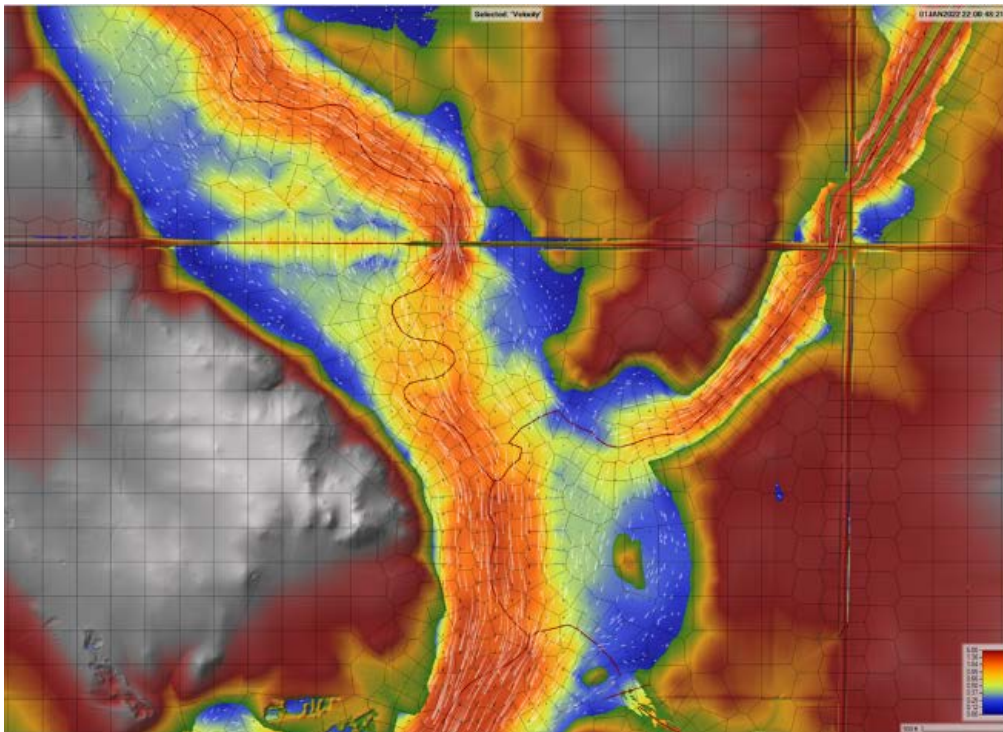
- Raster output from model that displays varying likelihood, in percentage, of chance that any given cell within the raster has of flooding within a 30 year period.





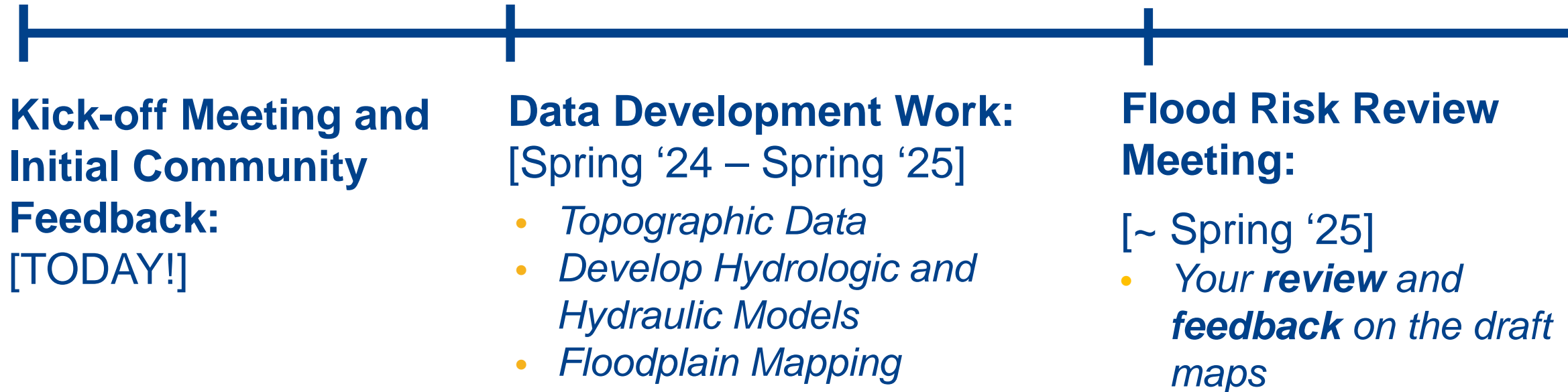
# Flood Risk Products

- Velocity Grids
  - Raster output from model that displays varying velocities within the floodplain extents.
  - Can be used to help visualize areas within the floodplain with the highest velocities.





# Project Timeline





## 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 Websites:

- Scoping Maps, Project Timeline, Meeting Presentations, Newsletters, Technical Reports, Web Review Map <https://agriculture.ks.gov/divisions-programs/dwr/floodplain/mapping/mapping-projects/>
  - **Upper Republican:**
    - <https://agriculture.ks.gov/divisions-programs/dwr/floodplain/mapping/mapping-projects/lists/mapping-projects/upper-republican-custom-watershed>

**Web Review Map:** <https://gis2.kda.ks.gov/gis/cheyenne/>

Provide comments on areas impacted by past floods, community needs, etc.

- Review of floodplain data

## Story Maps

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





***Any Questions?***

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# Contact Information

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