Kansas Department of Agriculture
Division of Water Resources

FEMA

AtkinsRéalis

Elk County

Floodplain Mapping Project
Data Development Kickoff Meeting

April 11, 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!

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Division of Water Resources

Introductions

Kansas Department of Agriculture

Tara Lanzrath, CFM
NFIP Coordinator

Cheyenne Sun Eagle, CFM
NFIP Specialist

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Floodplain Mapping Coordinator

Keegan Schultz
Floodplain Outreach Coordinator

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FEMA – Region VII

Dawn Livingston
Regional Project Officer

AtkinsRéalis

Mike Schlesener, GISP
Project Manager

Brandon Gonzalez, PE
Engineer

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Today's Goals

Share details on the mapping project

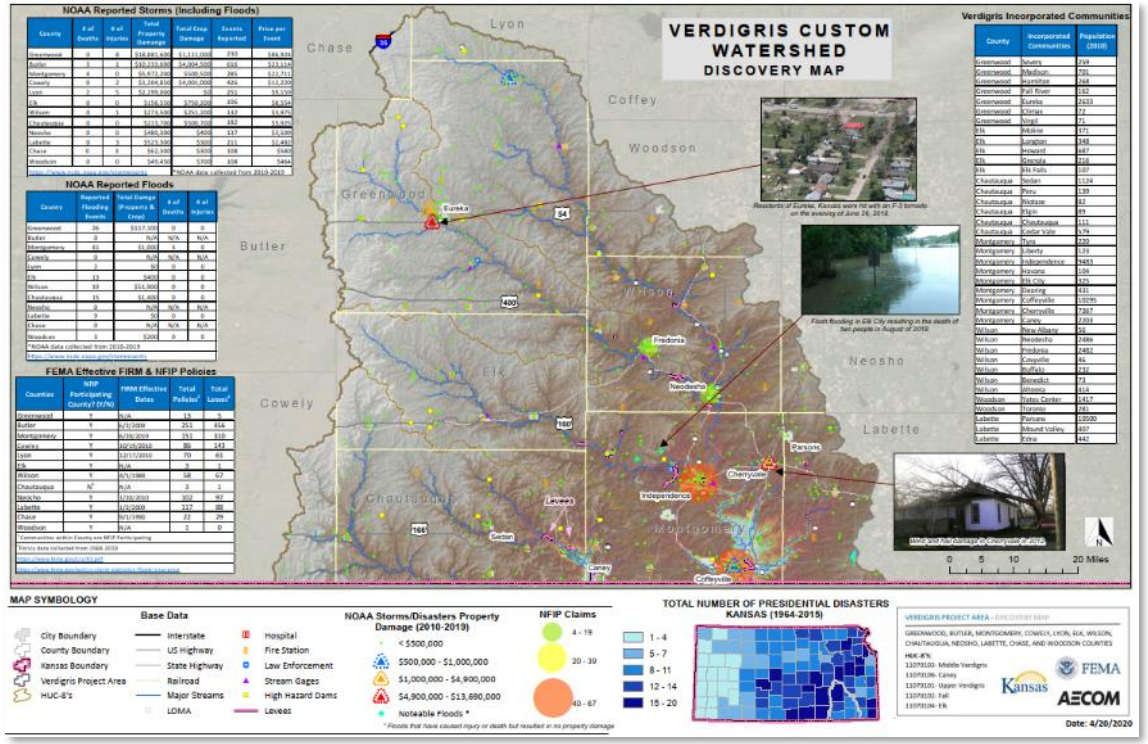
Get initial feedback on modeling methods

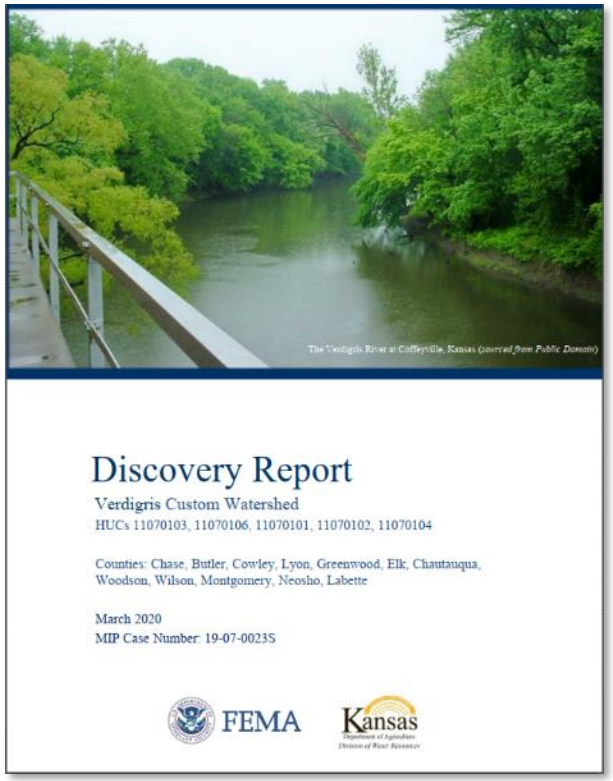
Review future steps

Background

Background

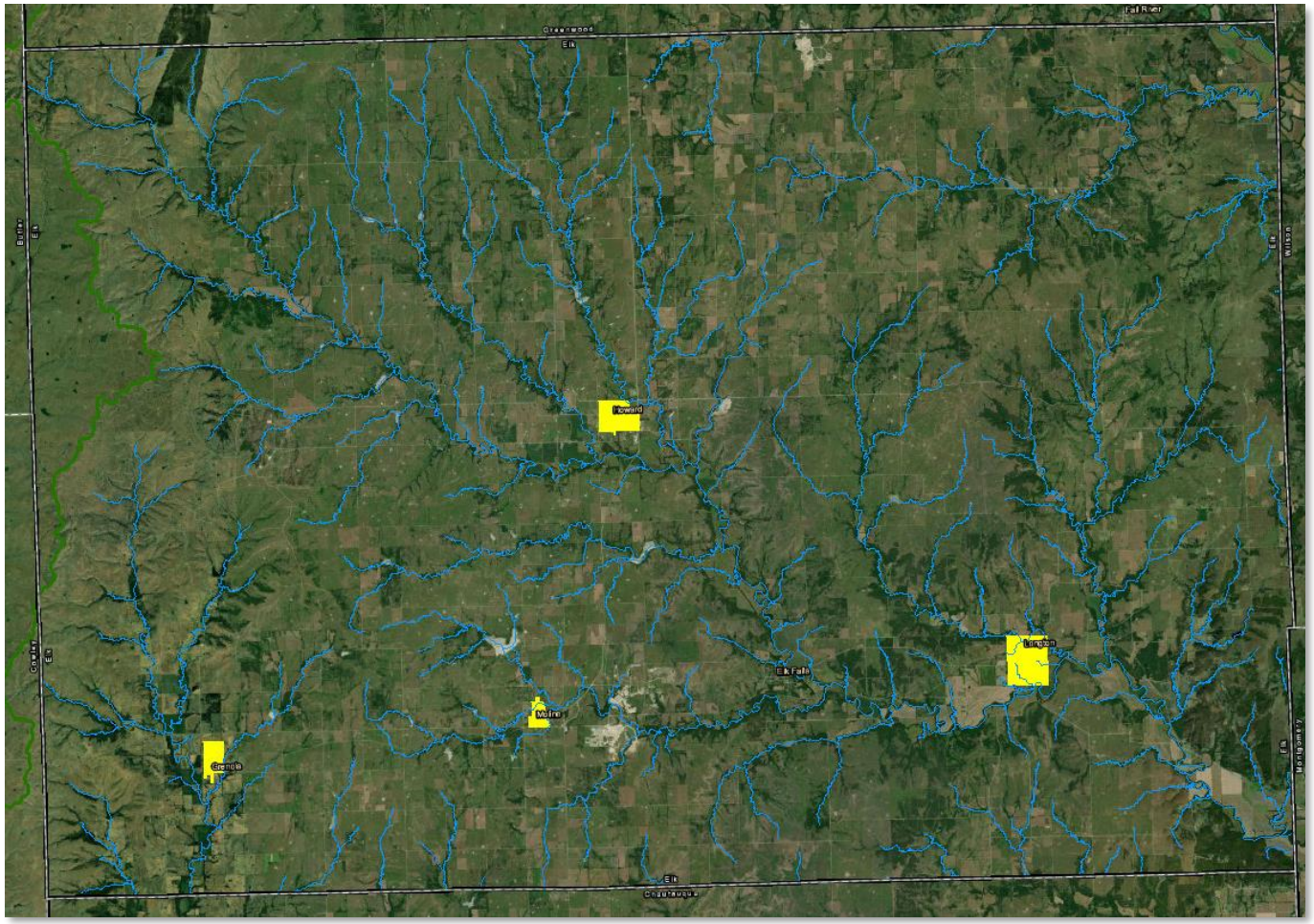
- Verdigris Custom Watershed Base Level Engineering Project
  - *Kick-off Meeting: January 2020*
  - *Discovery Meetings and BLE Review: April - May 2020*



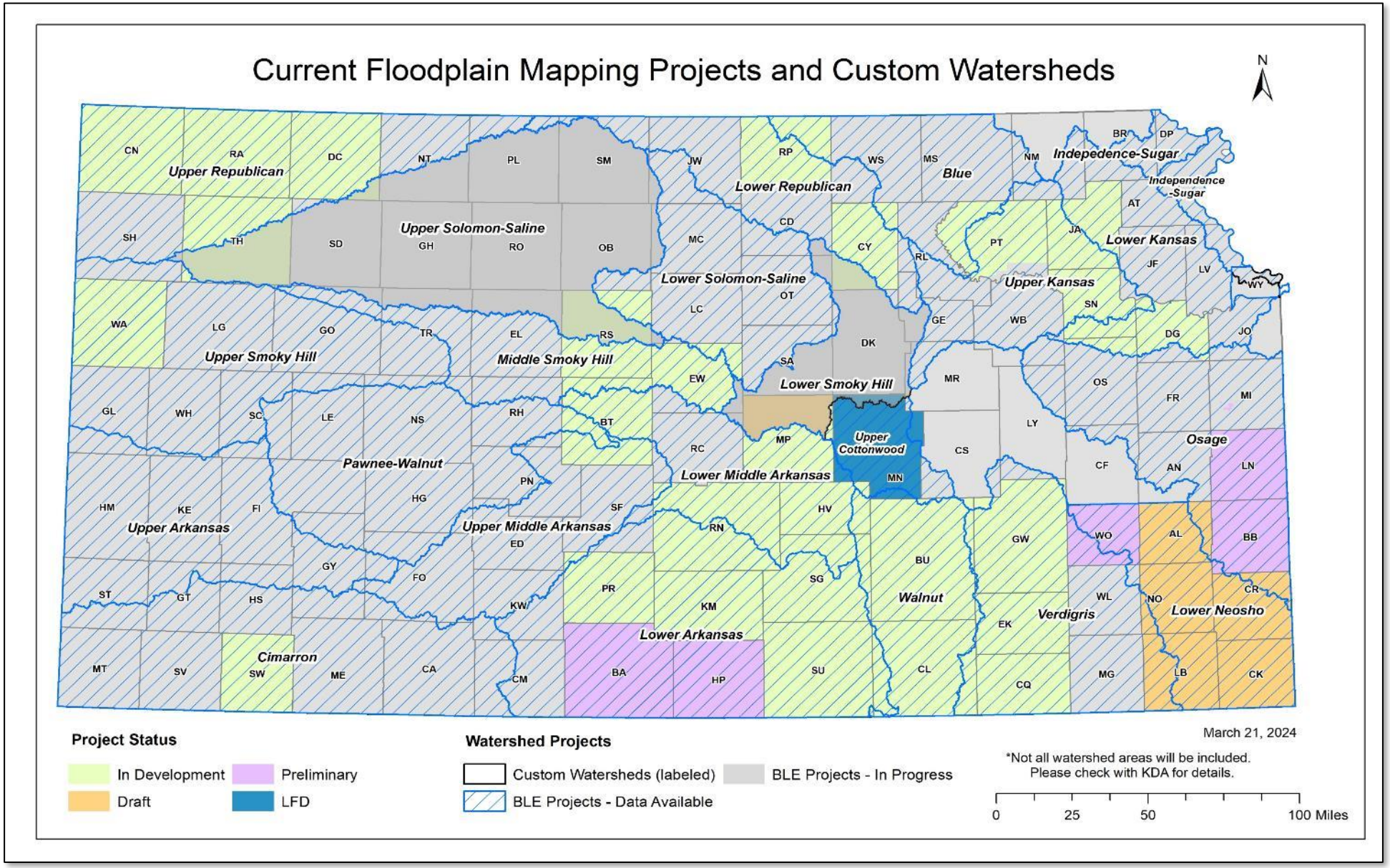


Background

- First-time Countywide
  - Effective:
  - Grenola – 1975,
  - Howard – 1977,
  - Longton – 1990,
  - Moline – 2008.
- Data Development Kickoff Meeting was held virtually June 21, 2022.
  - Technical issues led to re-scoping and selecting AtkinsRéalis as contractor.
- Re-kick off meeting - April 2024

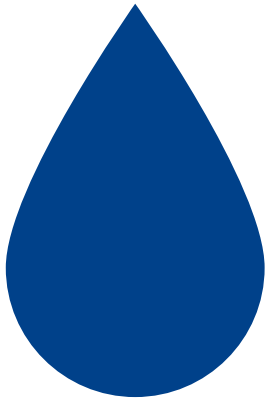


We are doing similar work across Kansas…



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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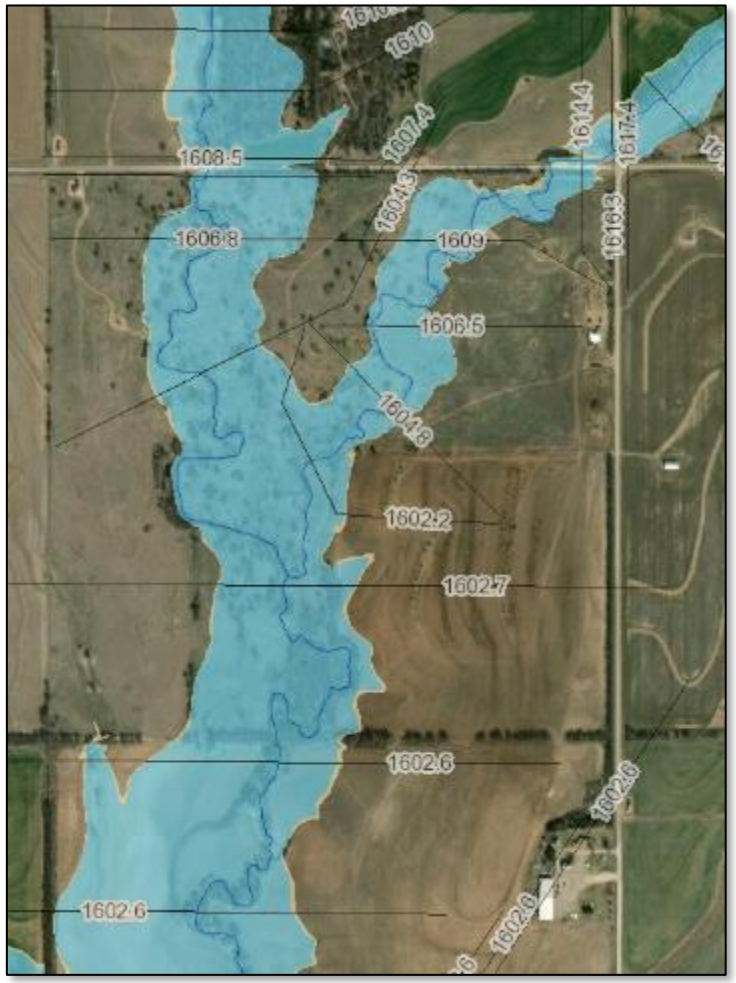
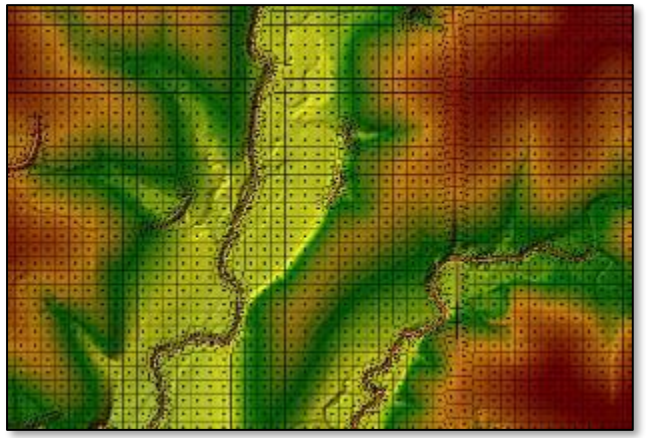
We Use 2D Hydraulic Modeling in our Base Level Engineering

The current maps are done with one-dimensional (1D) modeling. Two-dimensional (2D) modeling will be used for the new modeling.



1-D 2-D



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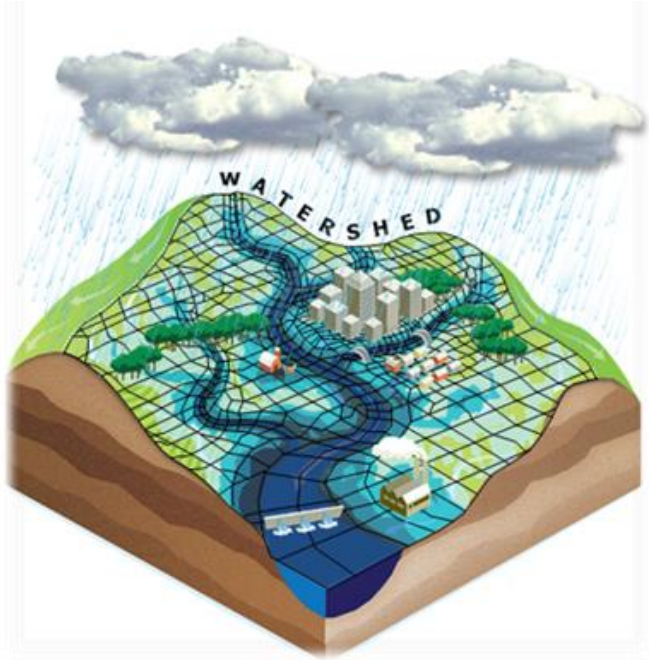
Differences between traditional 1D studies and 'new' 2D studies

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

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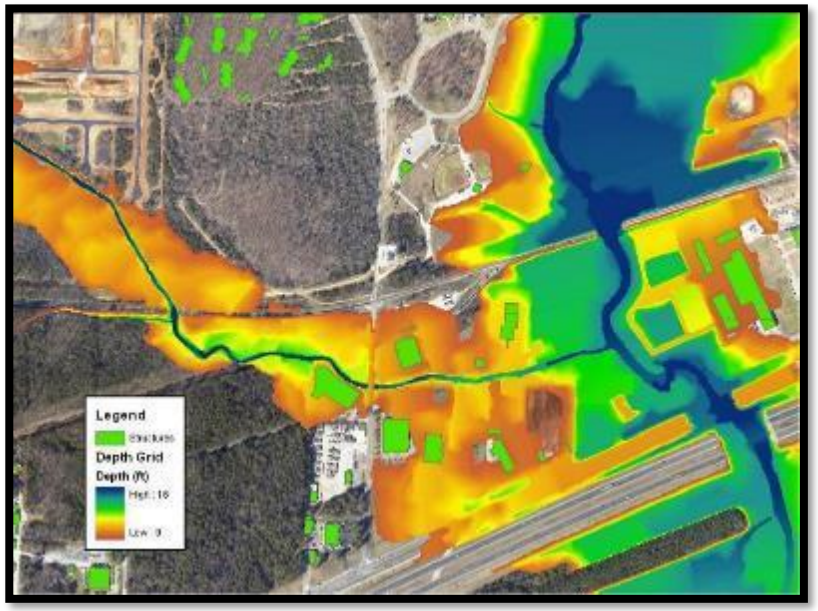
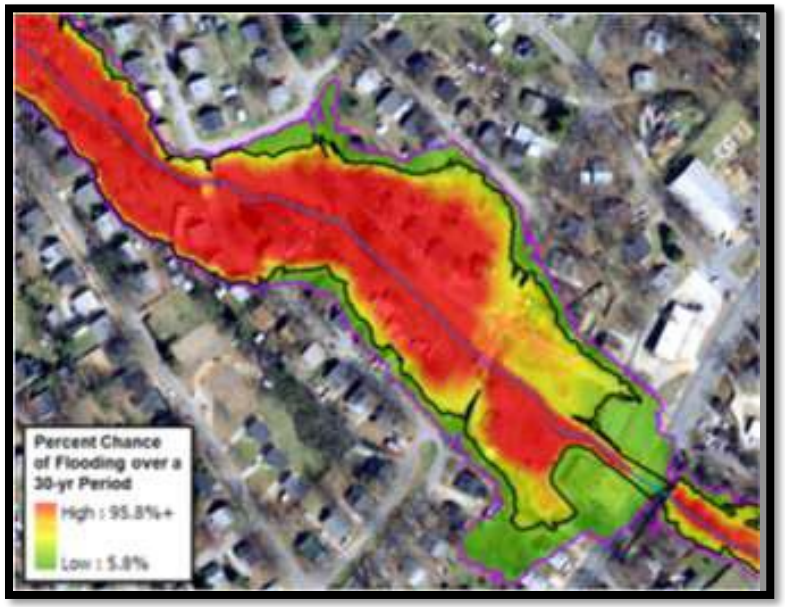
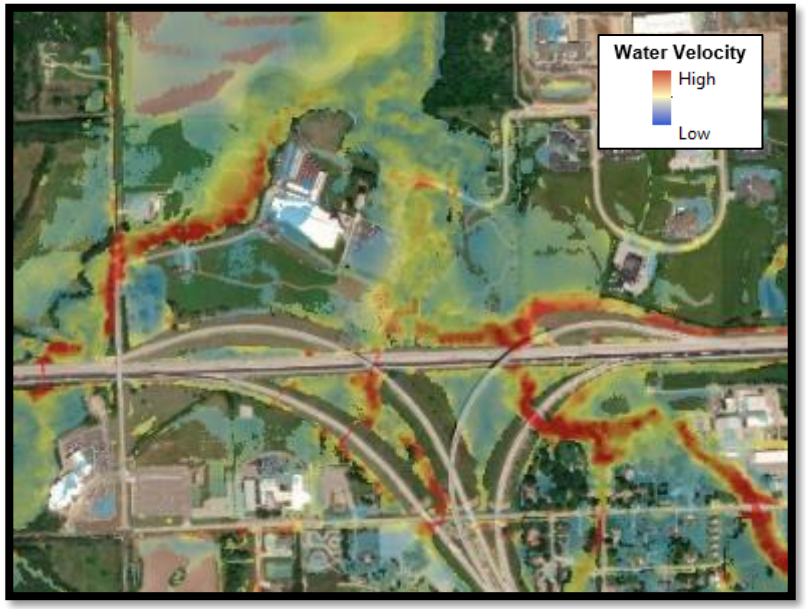
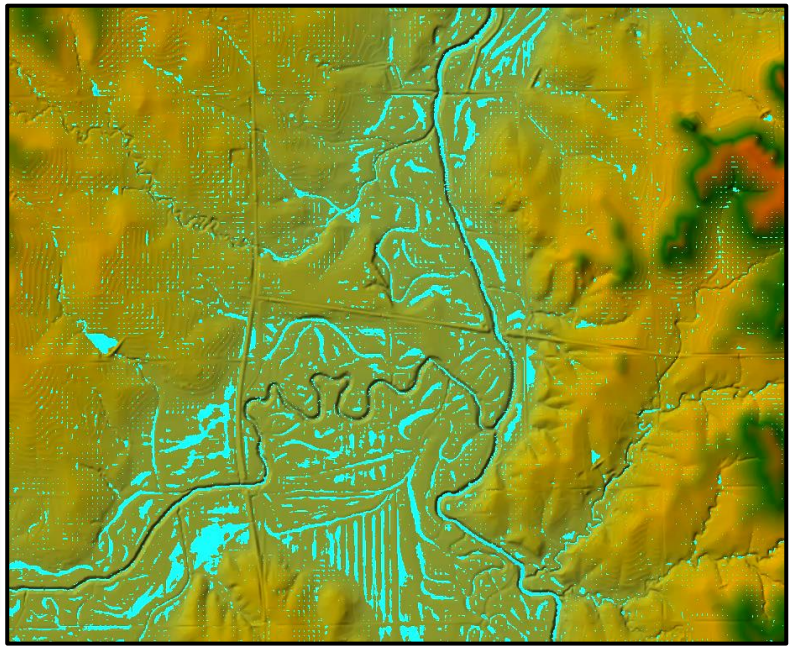
More precise data and modeling methods gives you more information about flood risk









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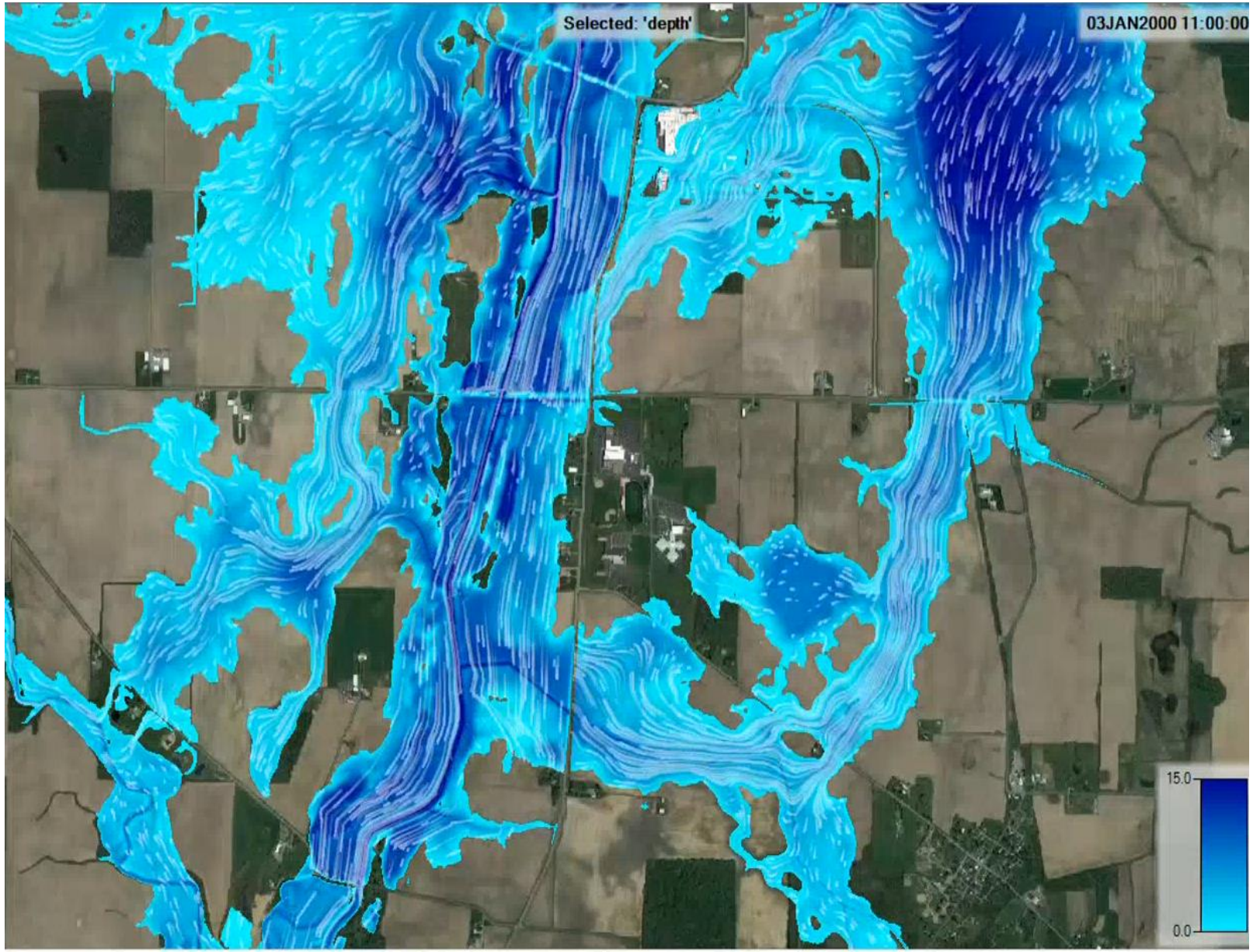
More precise data and modeling methods gives you more information about flood risk



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Model Enhancements

- 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

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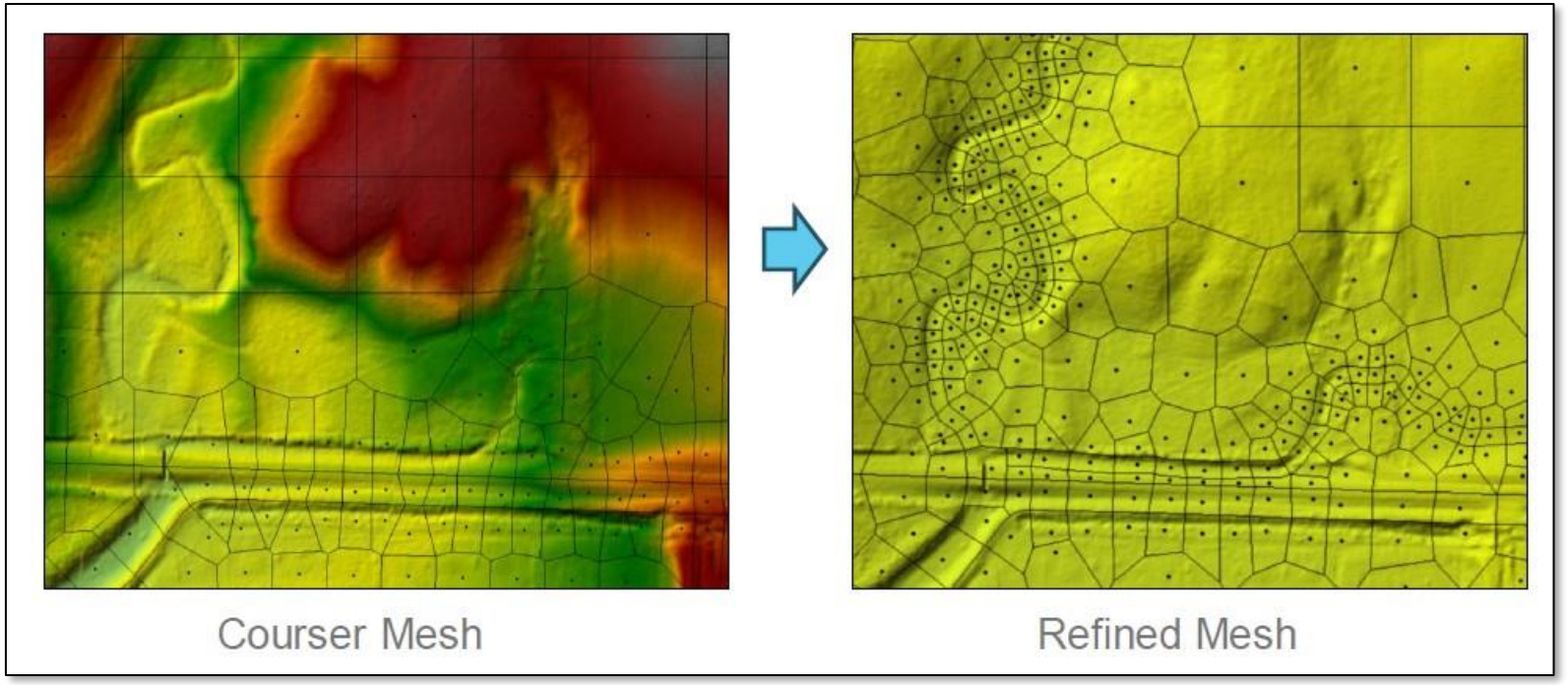
Model Enhancements

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



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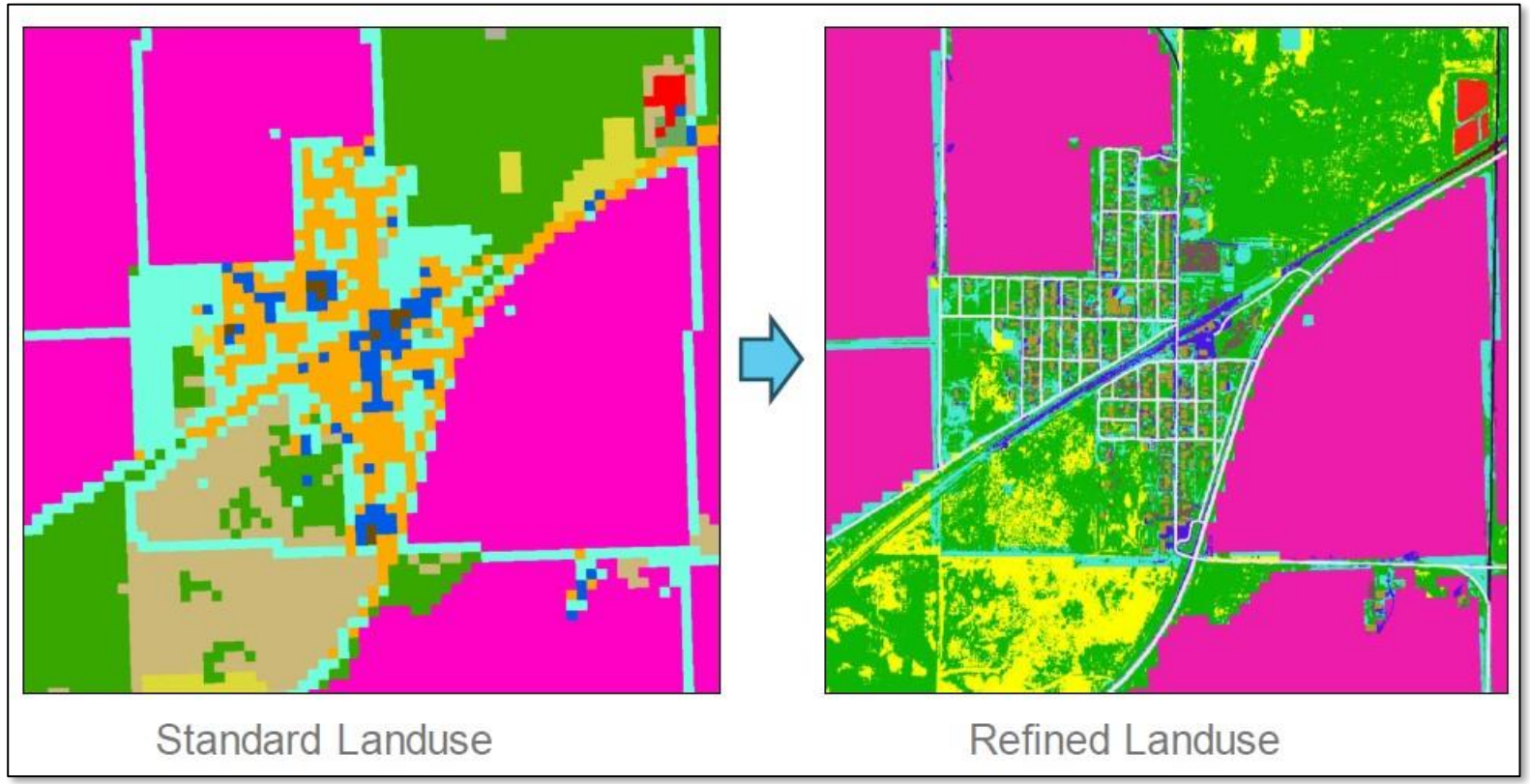
Model Enhancements

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



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Model Enhancements

- Gages will be re-verified in refined model

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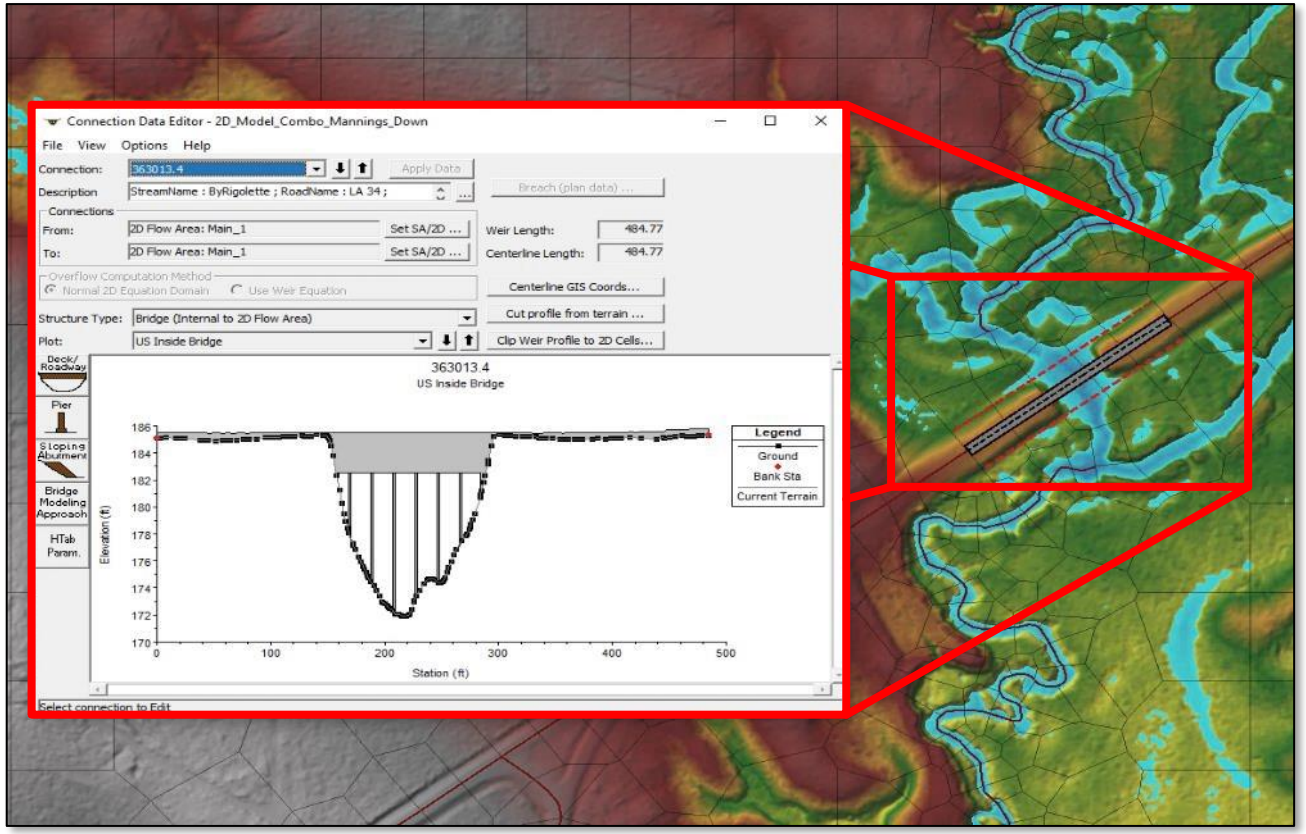
Model Enhancements

- 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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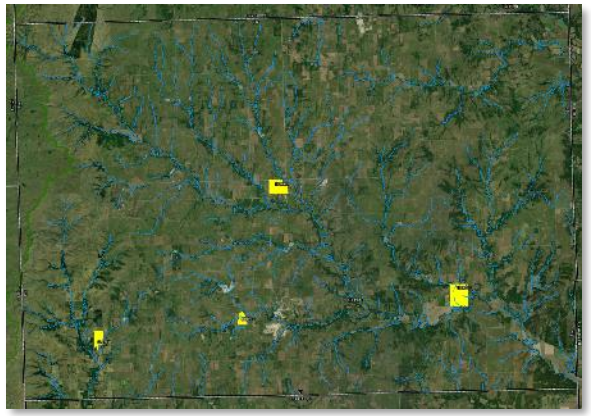
Model Enhancements

- Enhancements can be made to the BLE modeling that was performed.
  - New Lidar, flown in 2018, 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

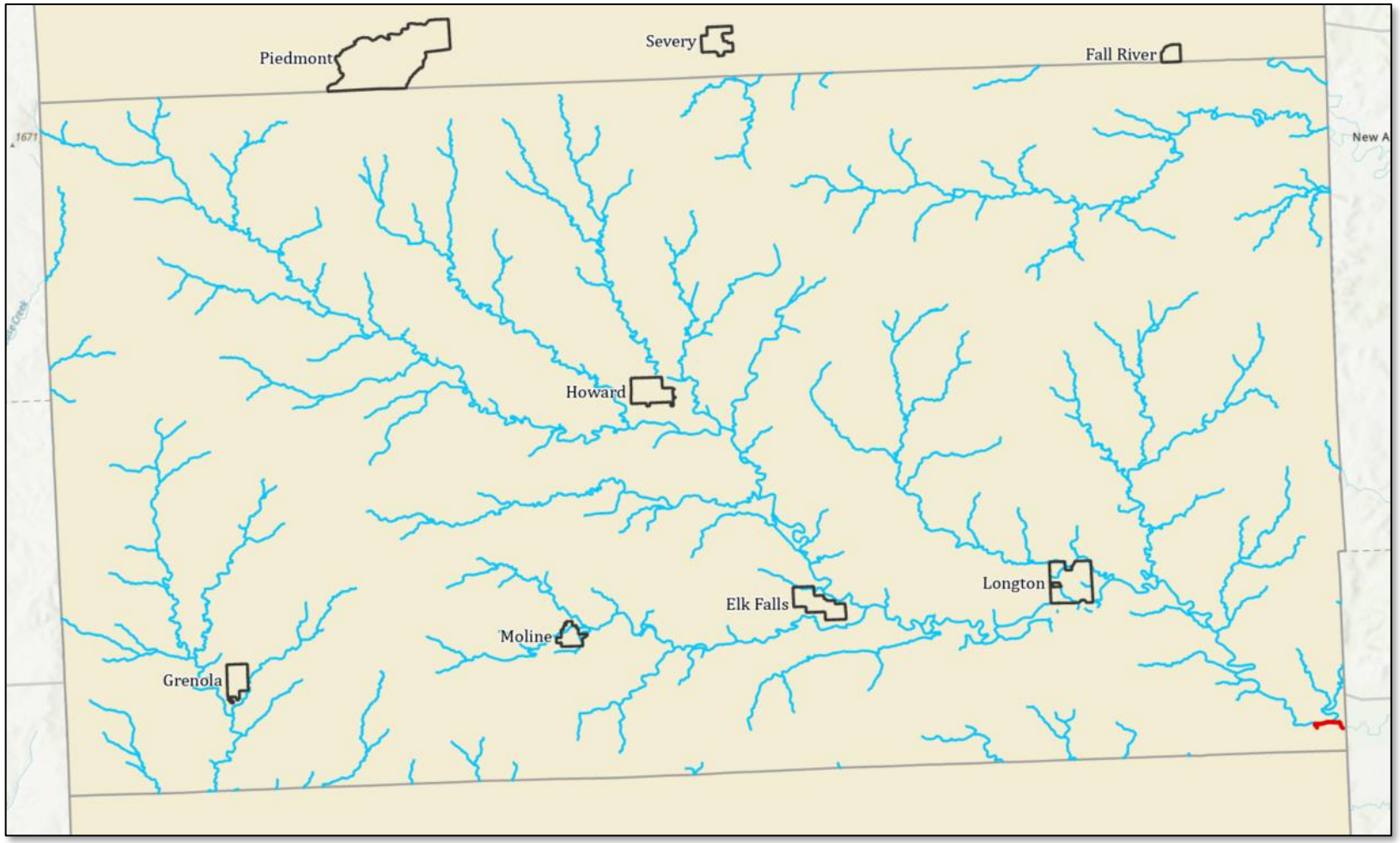
Data Development Scope

- All Zone A 2D BLE (712 mi.)
- 26 FIRM Panels
- Non-Accredited levee (Elk River, SE corner of county)



Current Effectives:

- Grenola – 1975
- Howard – 1977
- Longton – 1990
- Moline – 2008



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Levees

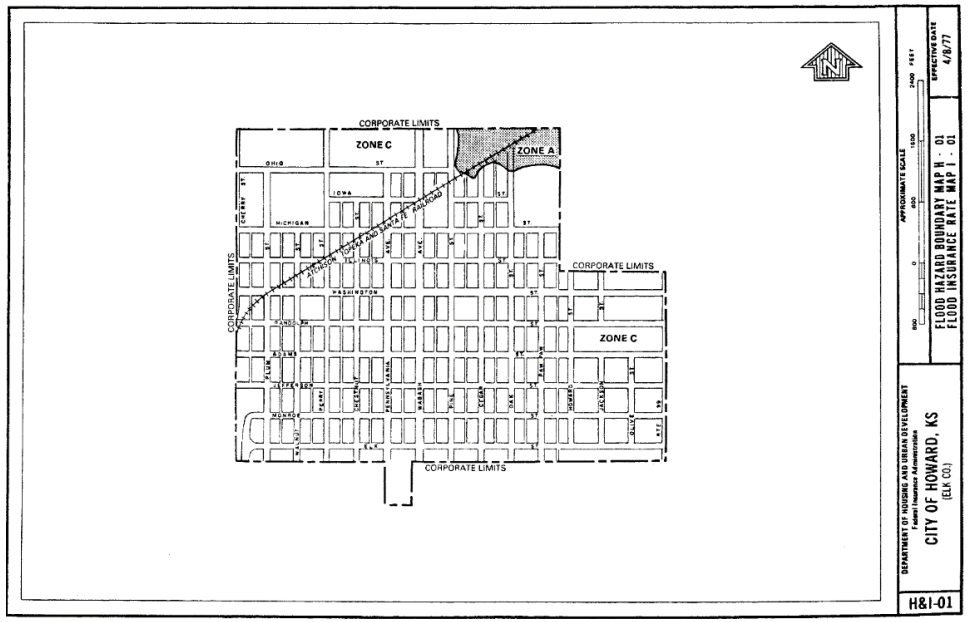
There is 1 non-accredited levee in the project area. The levee will be considered hydraulically insignificant.

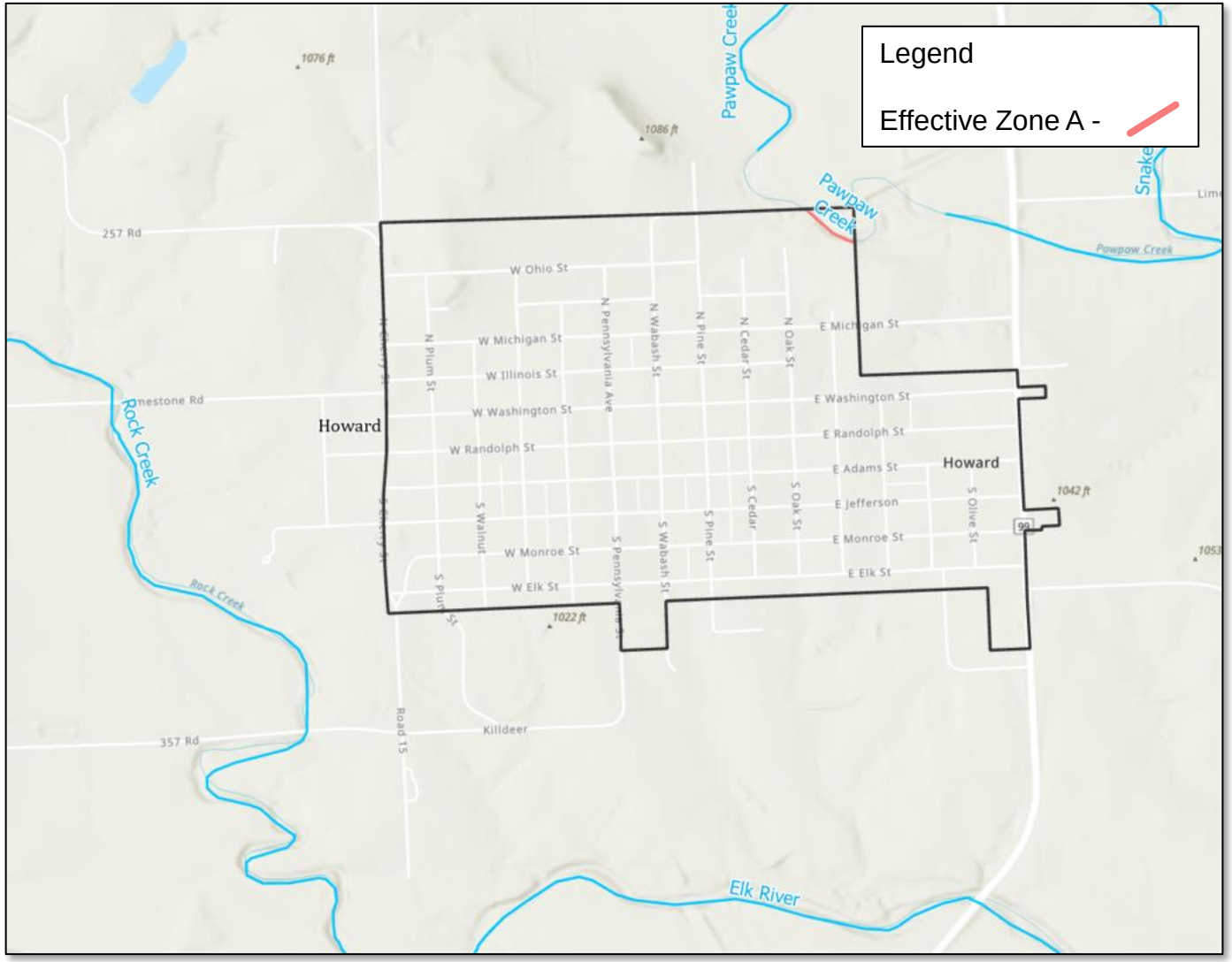
- Non-Accredited levee (Elk River, SE corner of county)

Data Development Scope

City of Howard

Effective Zone A – 0.10 miles

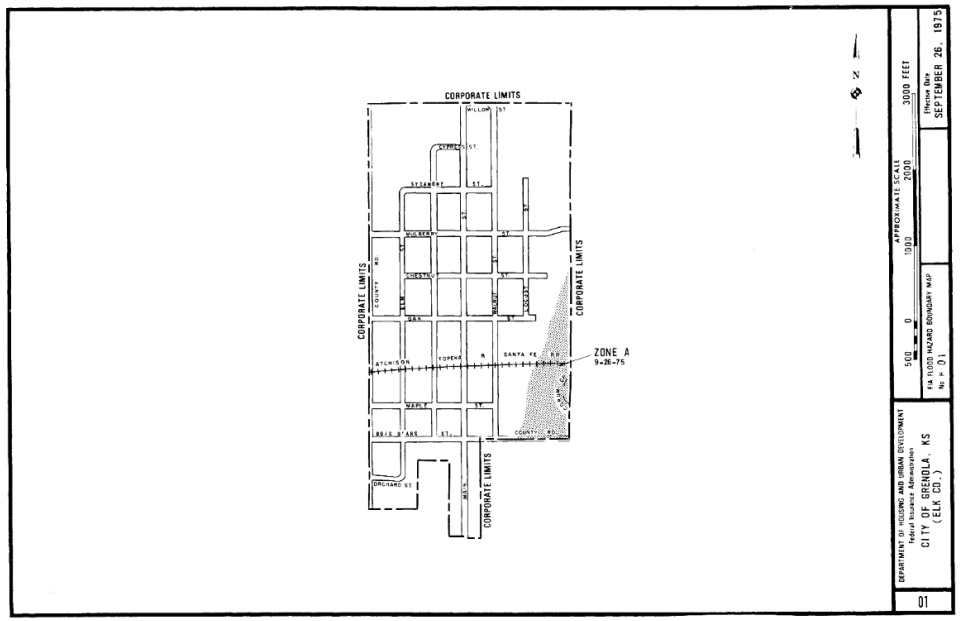




Data Development Scope

City of Grenola

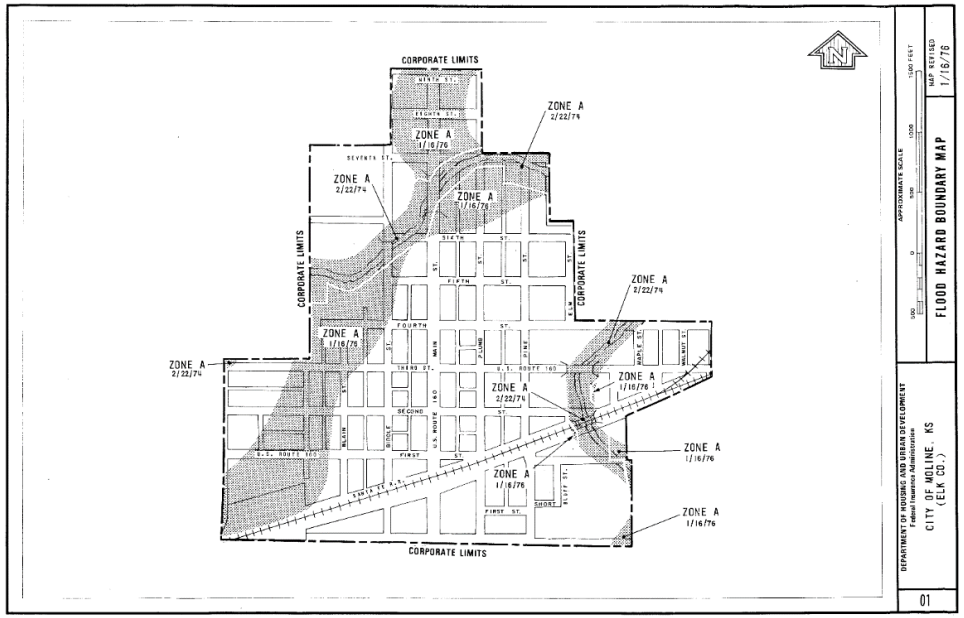
Effective Zone A – 0.09 miles

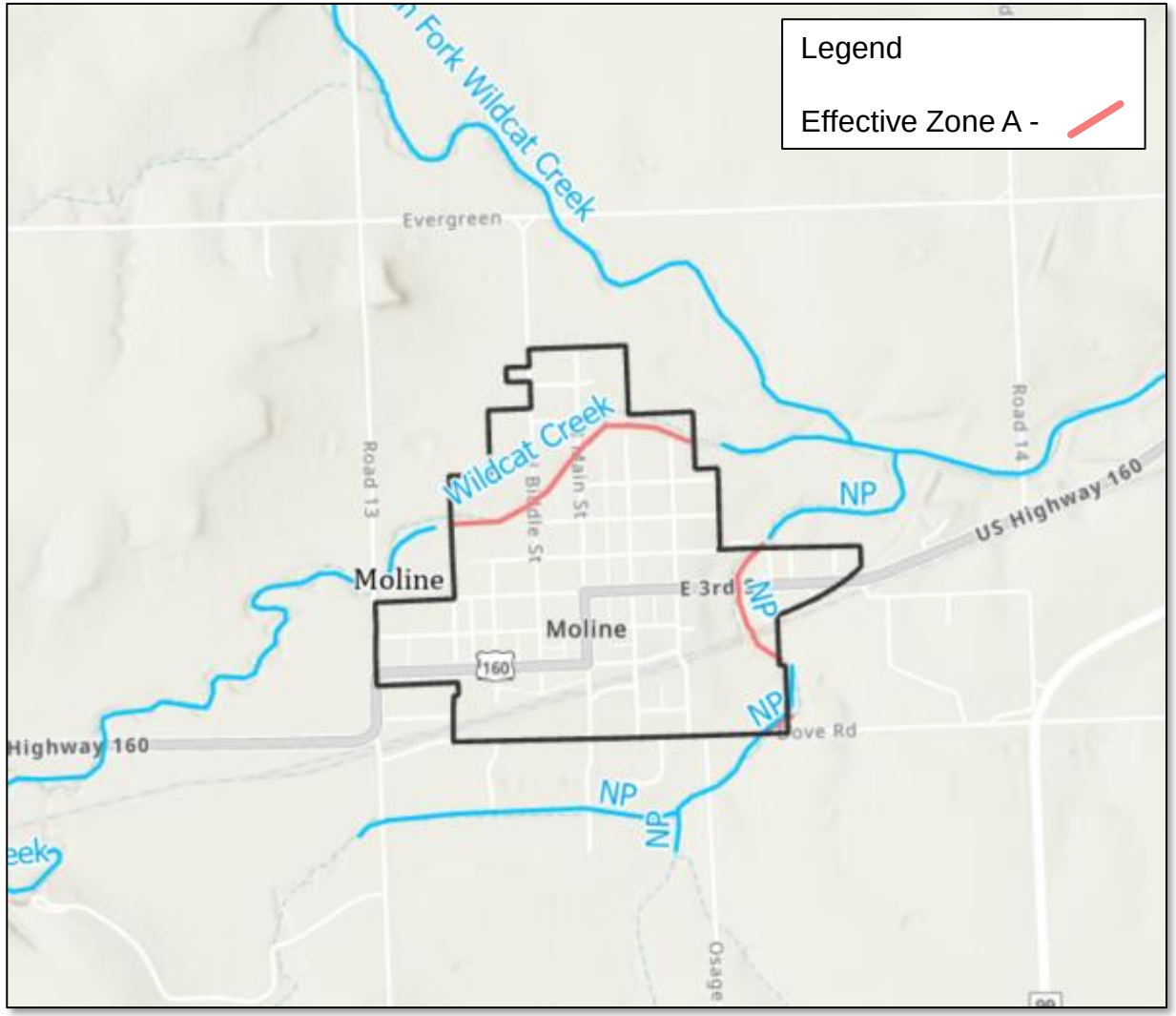


Data Development Scope

City of Moline

Effective Zone A – 0.72 miles

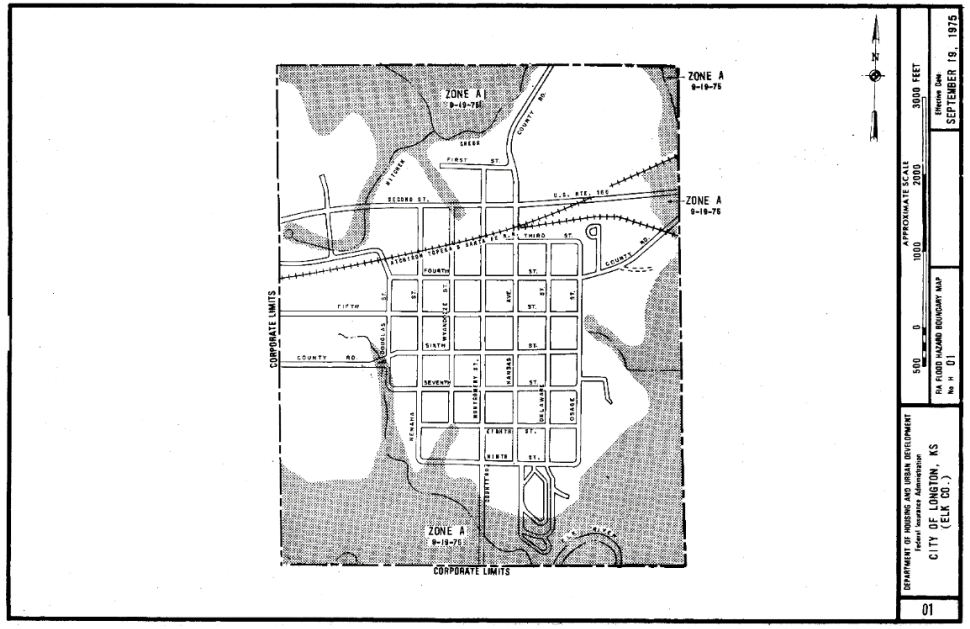


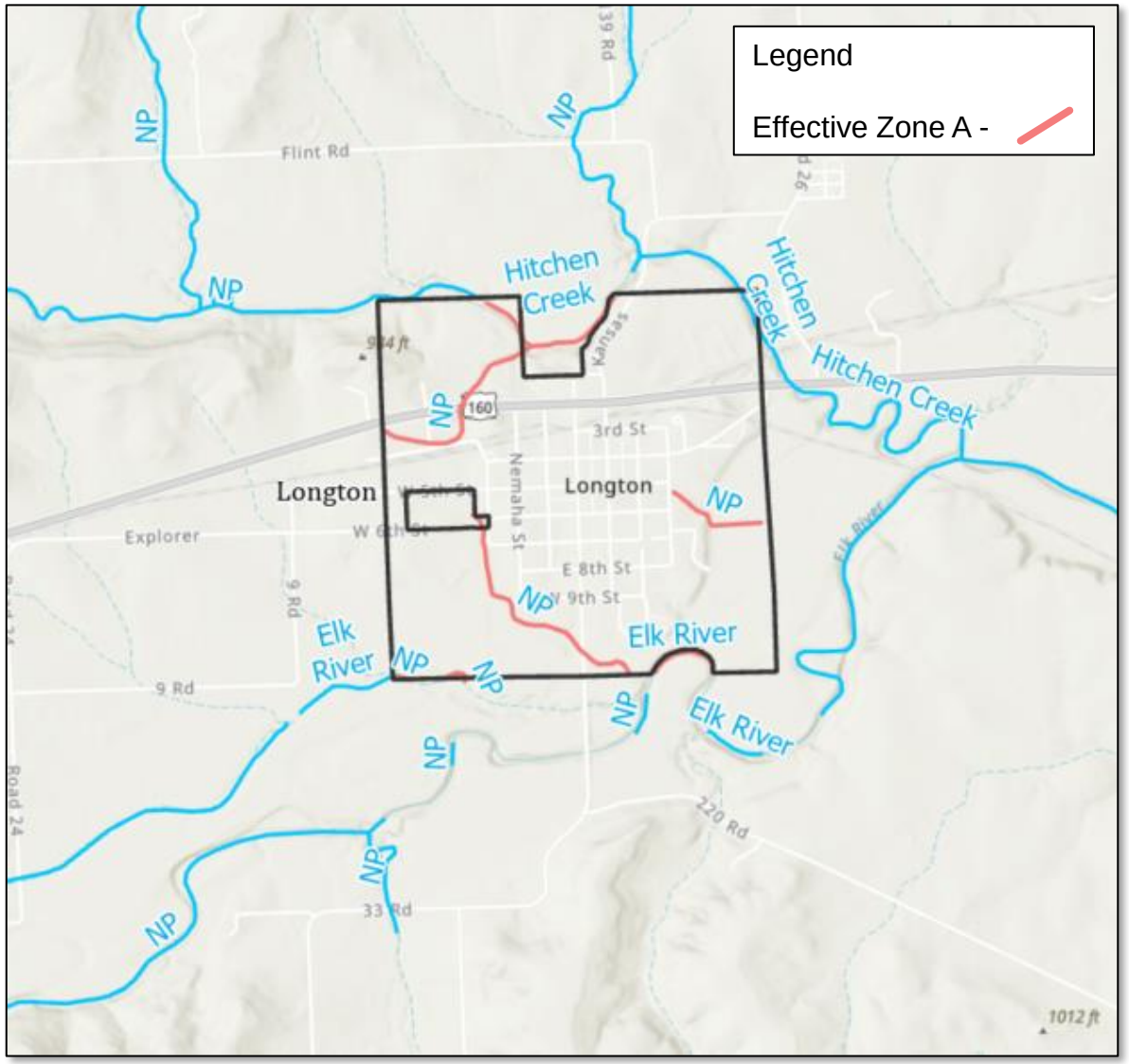


Data Development Scope

City of Longton

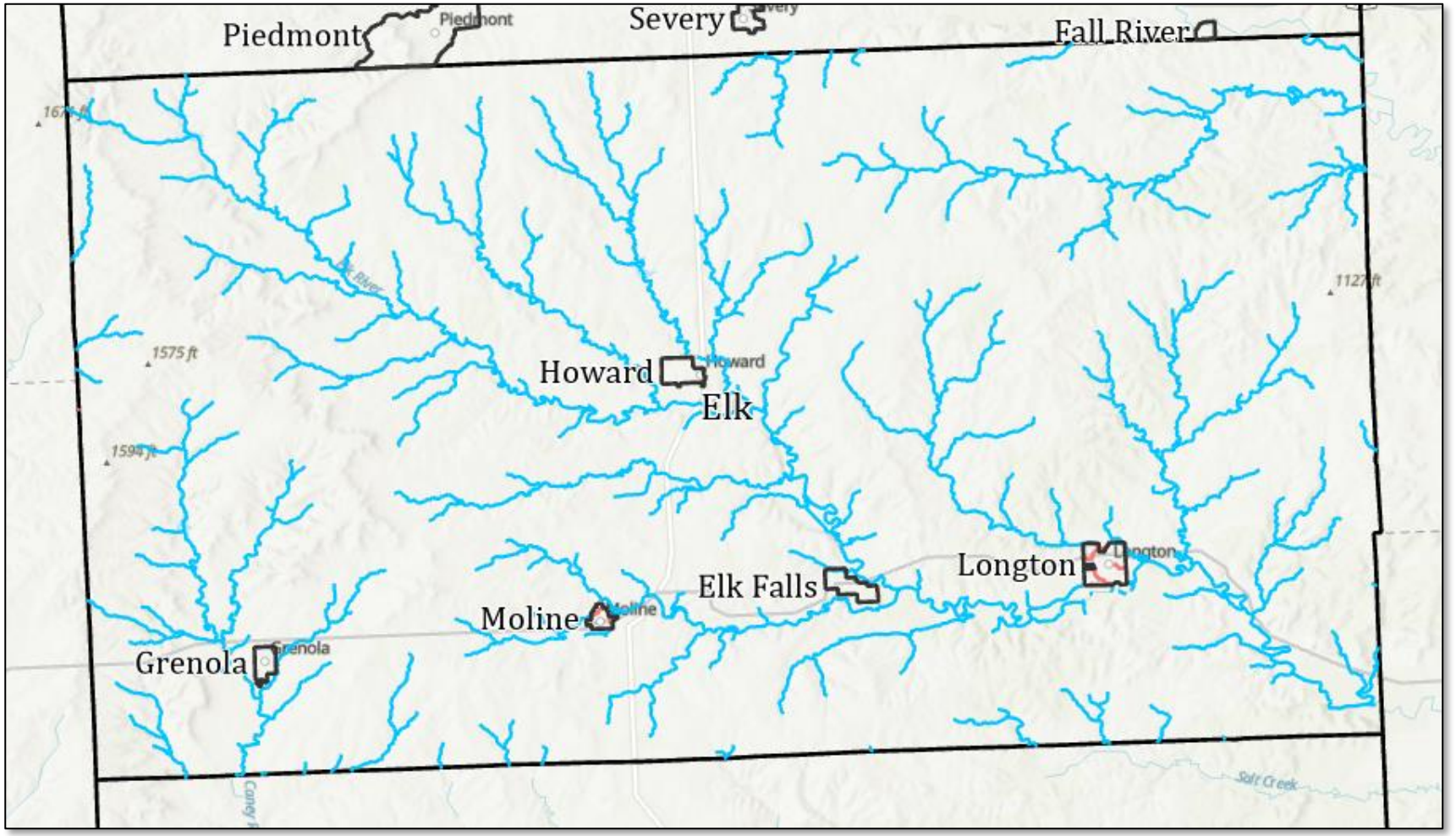
Effective Zone A – 2.50 miles



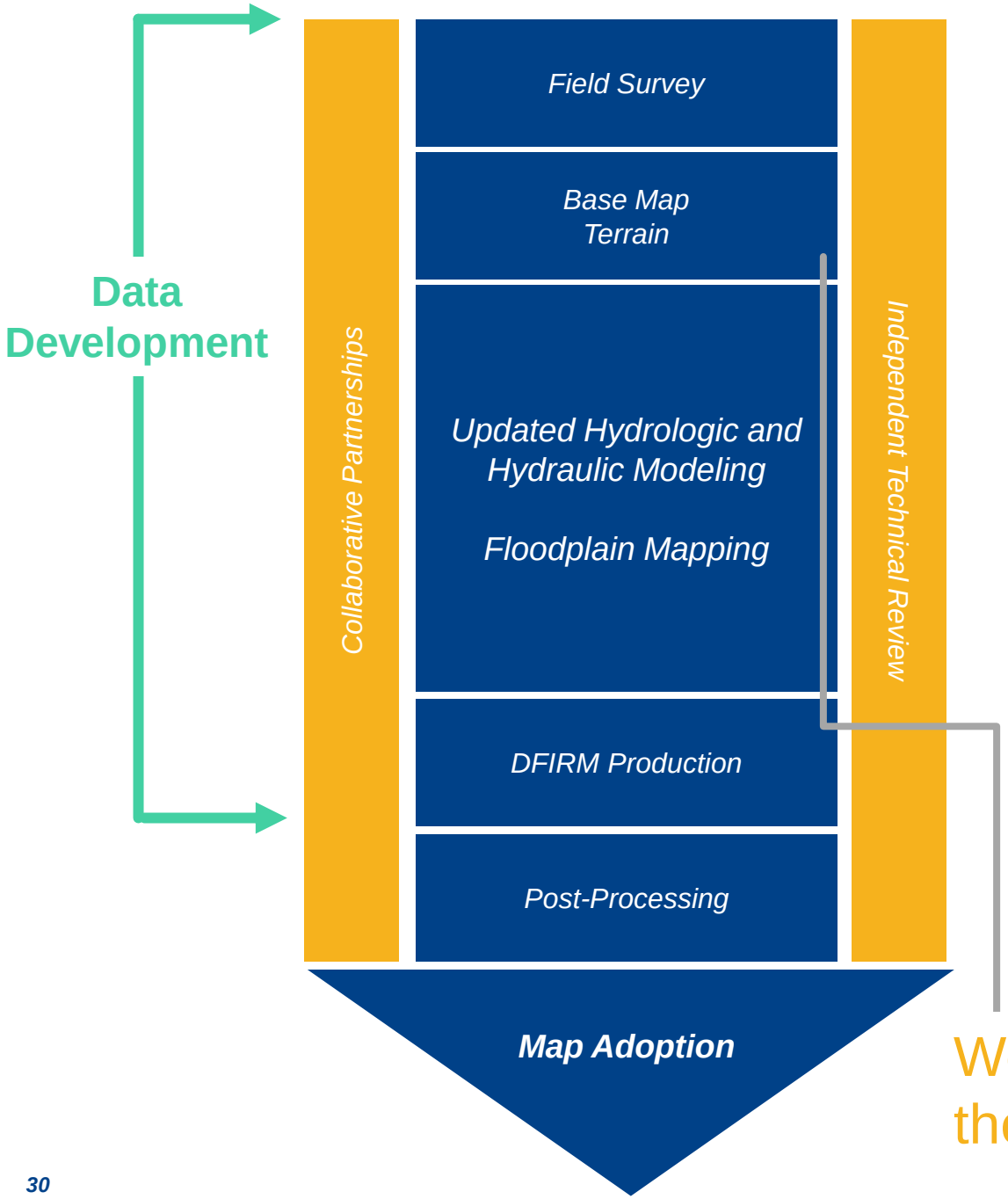


Data Development Scope

- Cities with Zone A
  - Elk Falls



Next Steps



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

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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

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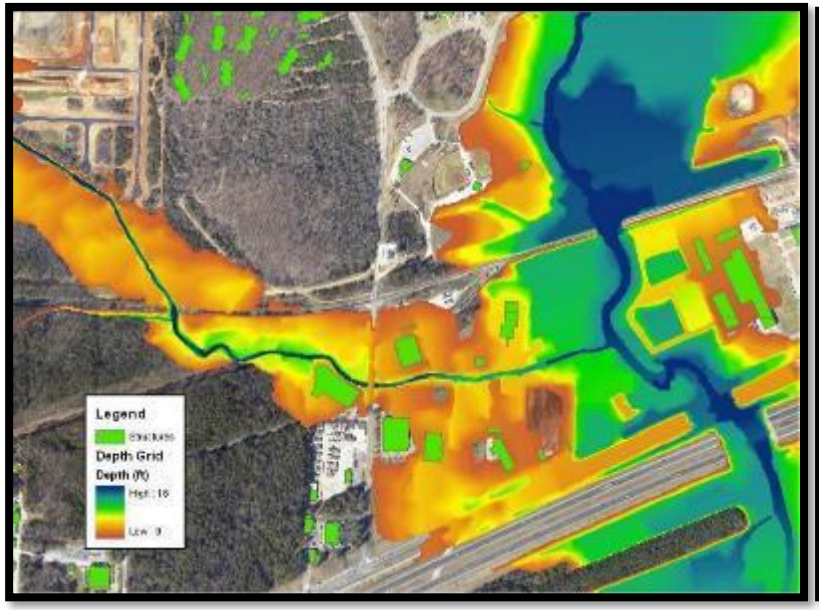
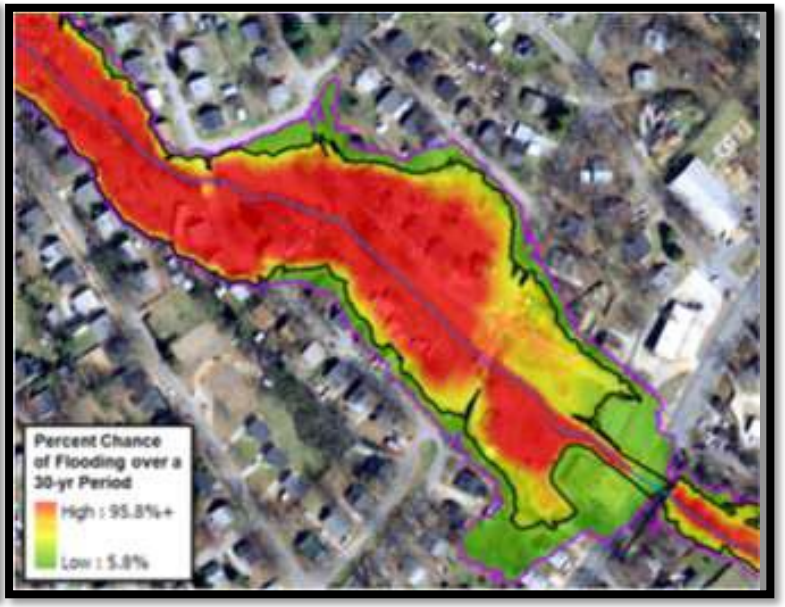
Our Next Steps:

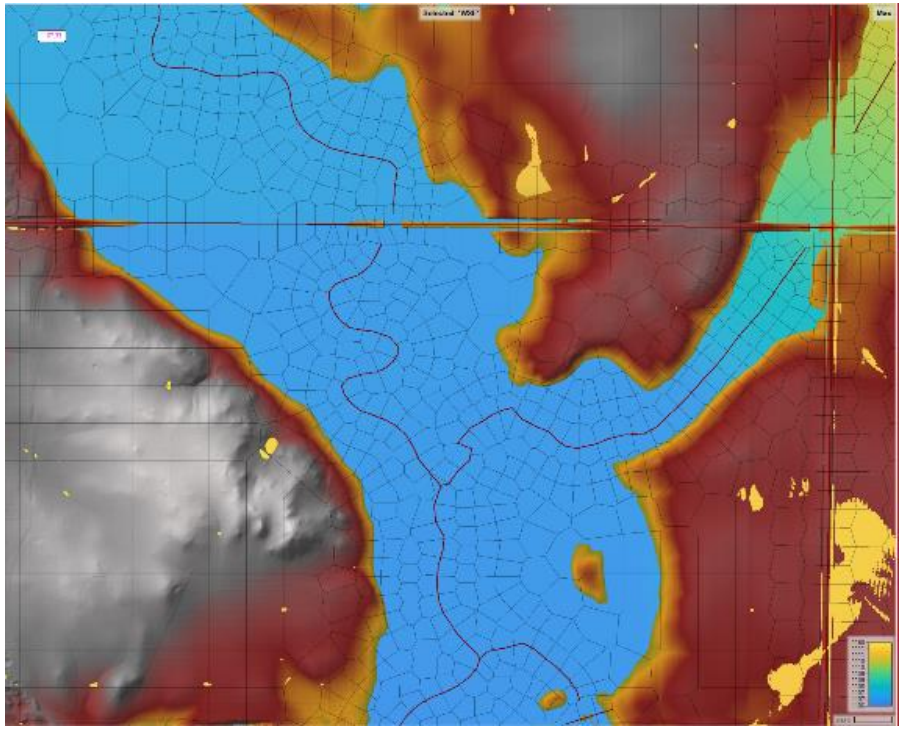
- We will also be developing flood risk products for Elk County as part of this project.
  - Water Surface Elevation (WSE) Grids
  - Depth Grids
  - Percent Annual Chance & 30yr Chance Grids
  - Velocity Grids
  - Changes Since Last Firm (CSLF)



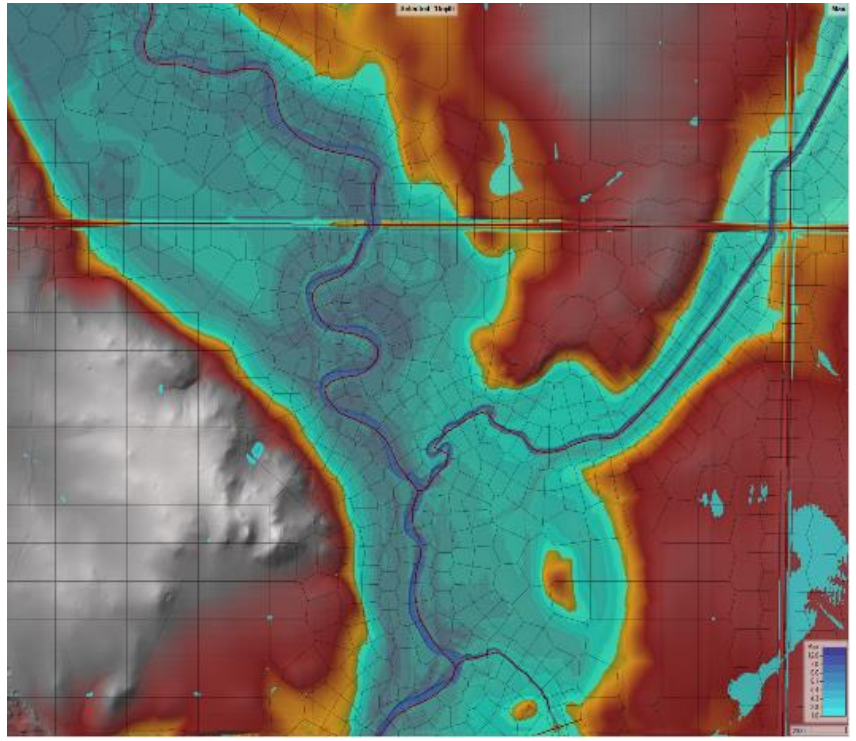


Flood Risk Products

- 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.

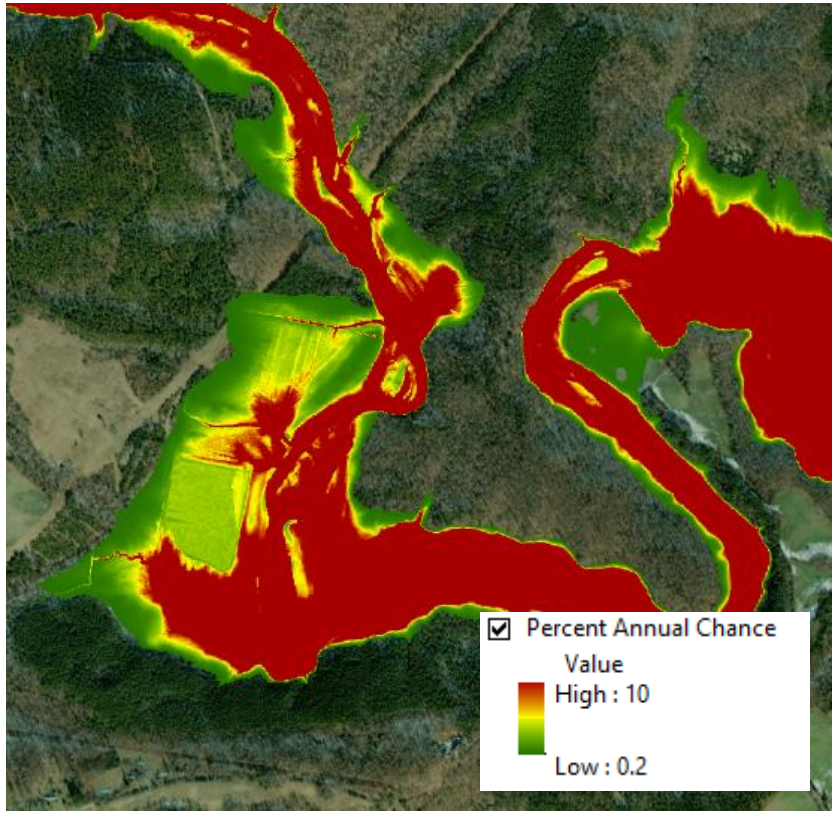


- Flood Depth Grids
  - Raster output from model that displays varying depths of flooding within derived floodplain extents
  - Used to find depth of flooding at any location, like residential structures, based on a subtraction of ground elevations from water surface elevation.

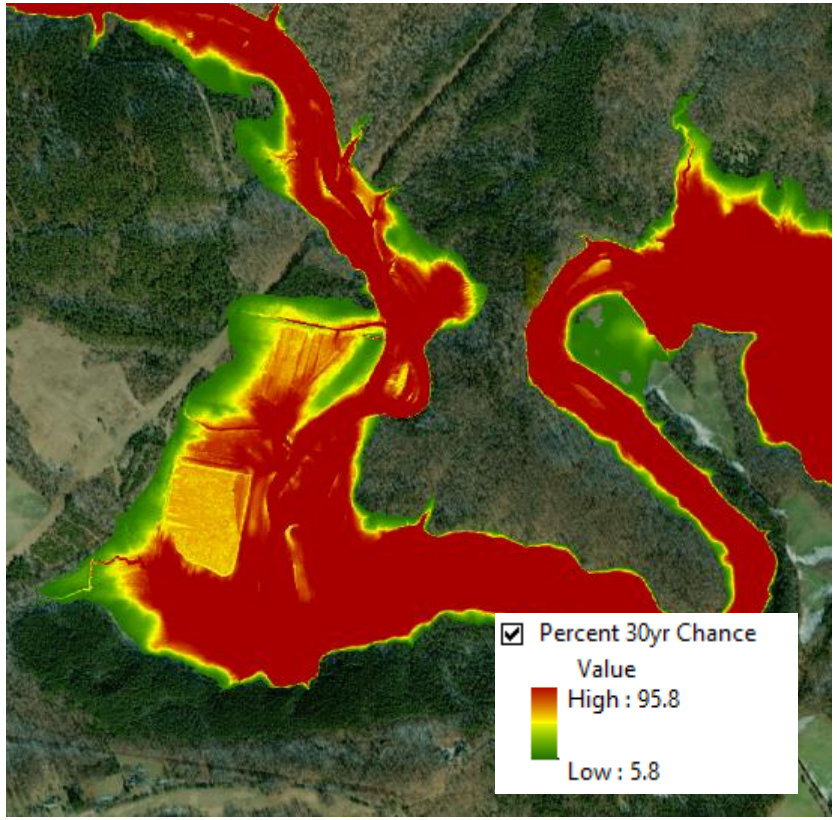


Flood Risk Products

- 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.

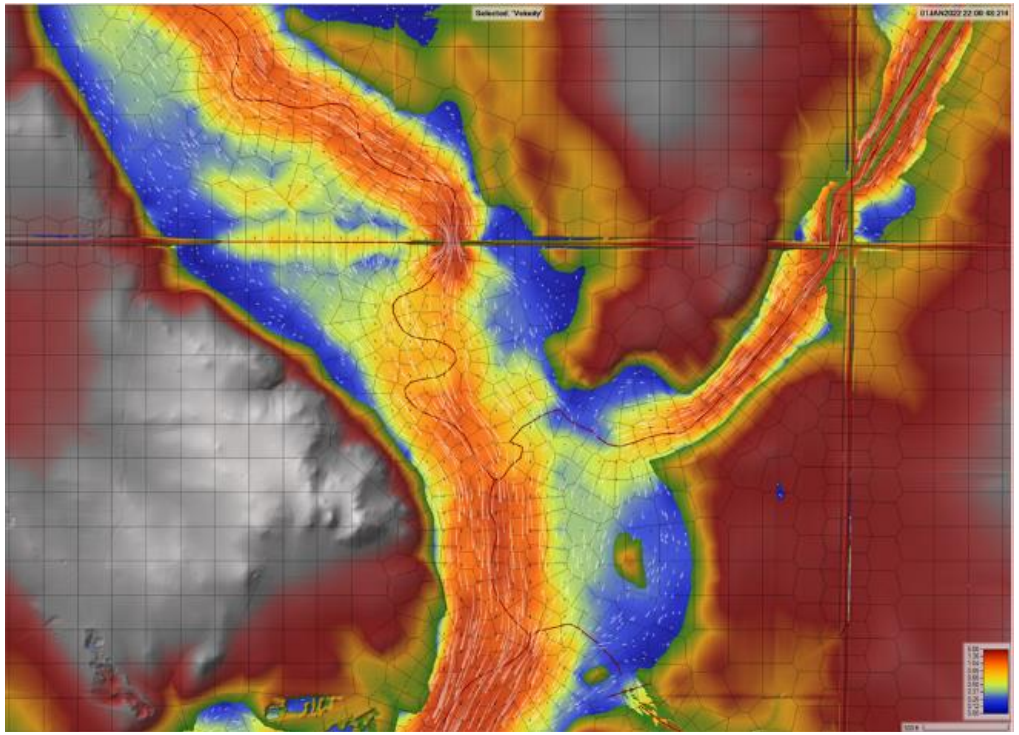


- Percent 30-yr Chance Grid
  - Raster output from model that displays varying likelihood, in percentage, of chance that any given cell within the raster has of flooding within a 30 year period.



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

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

Data Development Work:
[Spring ‘24 – Spring ‘25]

- *Topographic Data*
- *Develop Hydrologic and Hydraulic Models*
- *Floodplain Mapping*

Flood Risk Review Meeting:

[~ Spring ‘25]

- *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/

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

- 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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