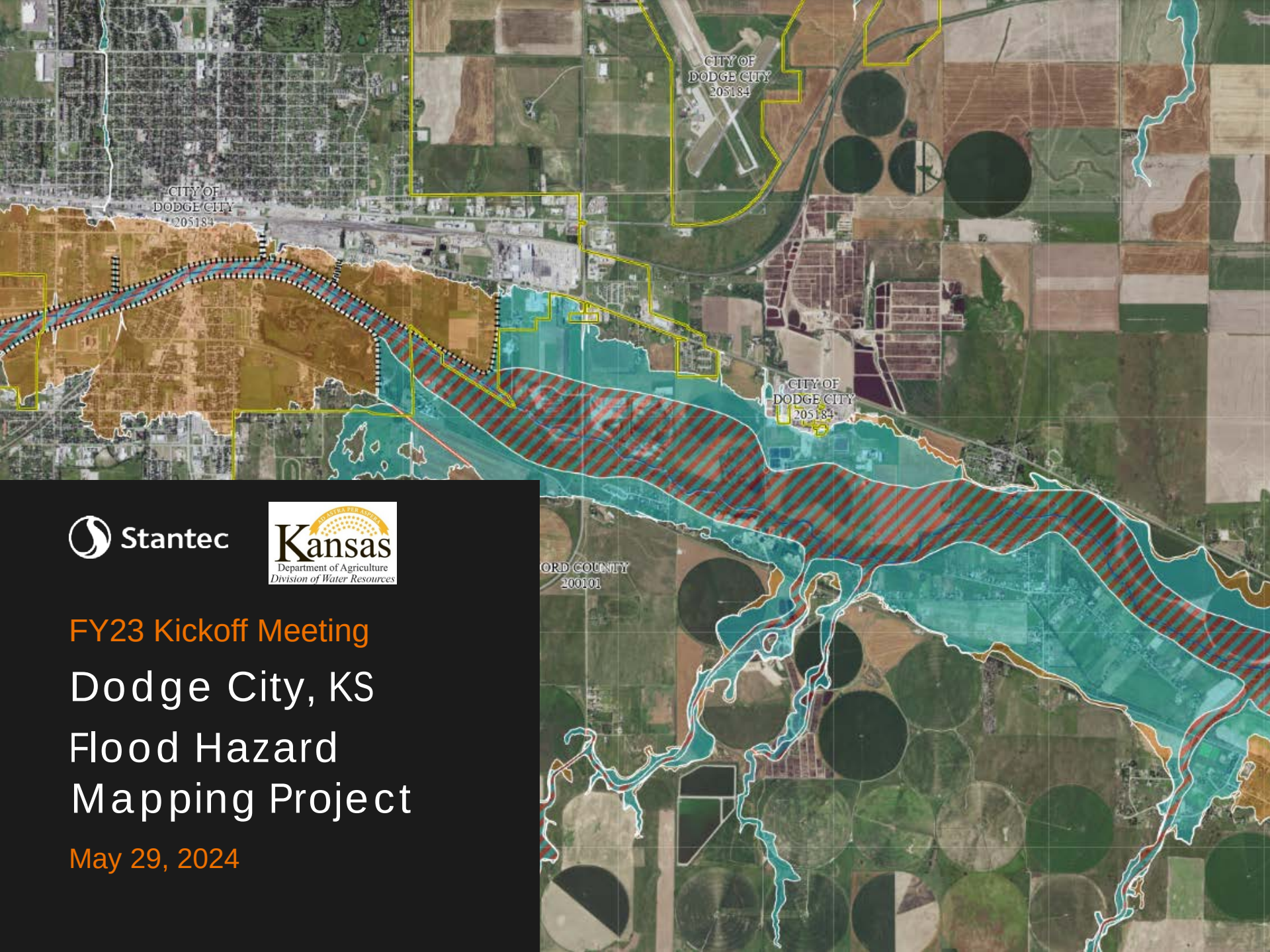

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FY23 Kickoff Meeting

Dodge City, KS Flood Hazard Mapping Project

May 29, 2024

Introductions

- Kansas Department of Agriculture
- FEMA
- Stantec
- Ford County
- City of Dodge City

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Agenda

1. Background
2. Project Scope
3. Path Forward

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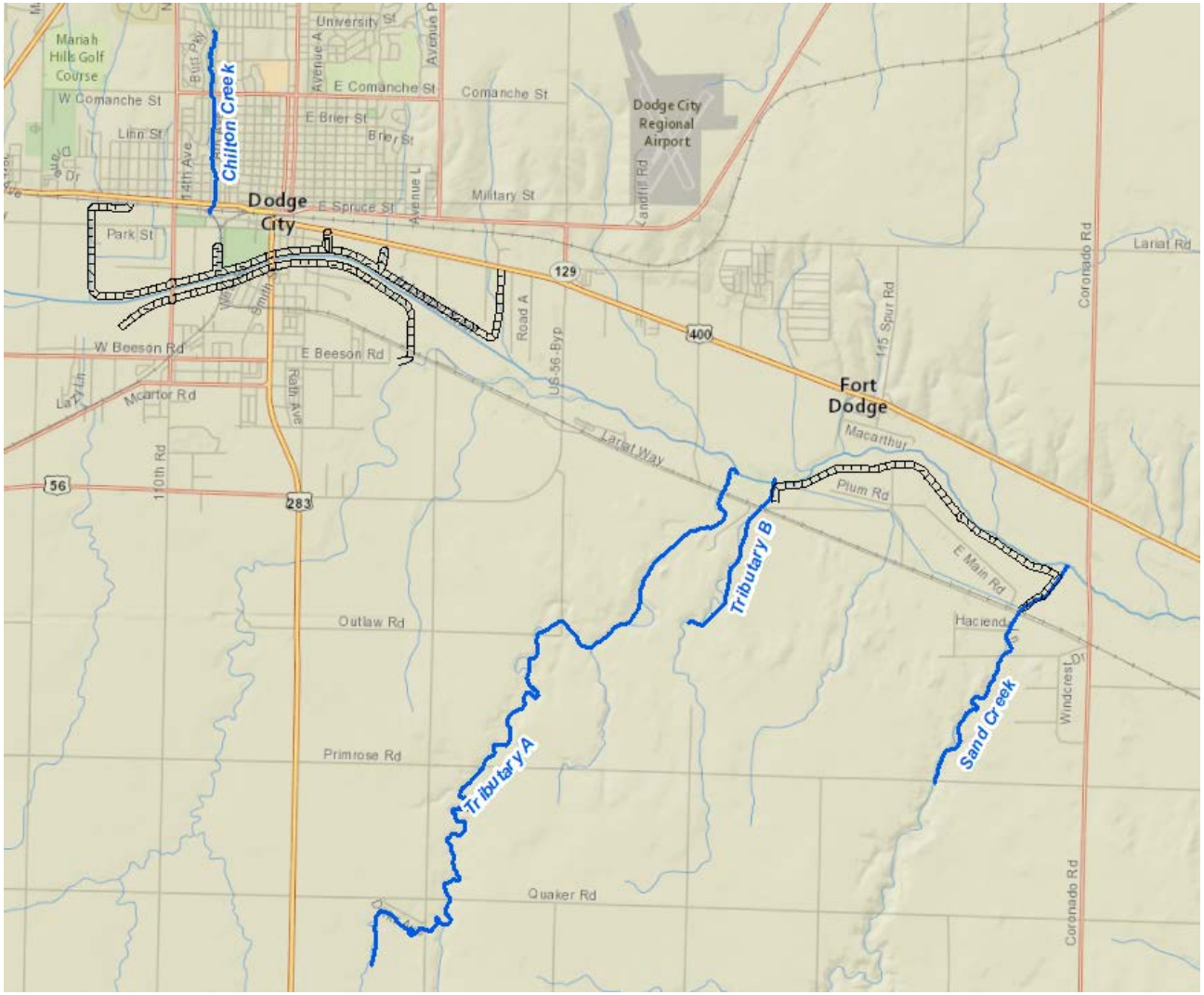
Background

- 11/13/2015: Local Levee Partnership Team (LLPT) meeting
  - City of Dodge City working towards levee accreditation
- 9/10/2020: KDA funds technical assistance project to investigate alternate gage analysis for Western Kansas/Dodge City
- 12/1/2020: Results of technical assistance shared with stakeholders, consensus on Mixed Distribution Gage Analysis
- 02/2022 – 01/2023: FY21 Data Development Arkansas River incorporating updated Mixed Distribution hydrology and channel excavation
- 5/29/2024: FY23 Data Development of enhanced studies of Arkansas River Tributaries

Project Scope



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Project Scope

- **Terrain** Data Capture
  - Compile available LiDAR (2018) for study streams and submit to FEMA's Mapping Information Platform (MIP)

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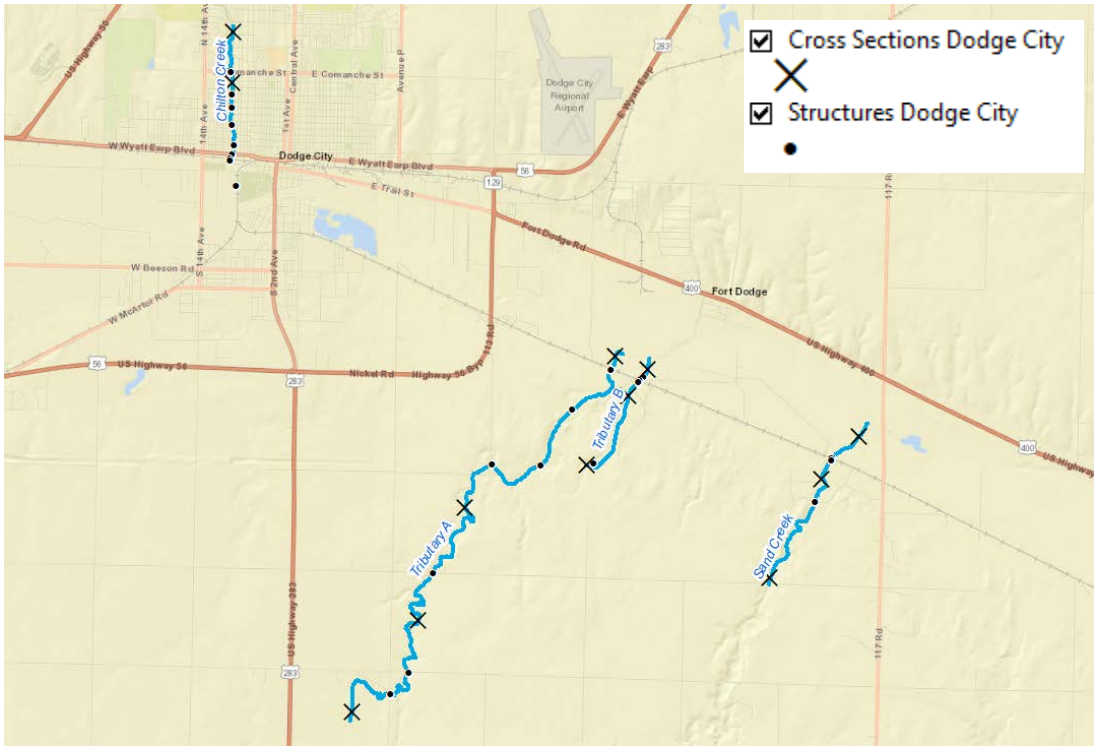
Project Scope

- **Survey** Data Capture
  - Survey of 25 structures and 12 channel cross-sections along the 4 study streams
  - Format to meet FEMA's Data Capture Standards (DCS)



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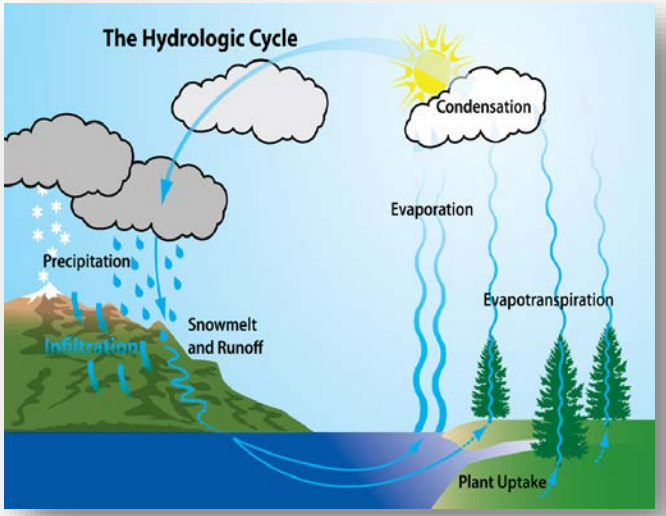
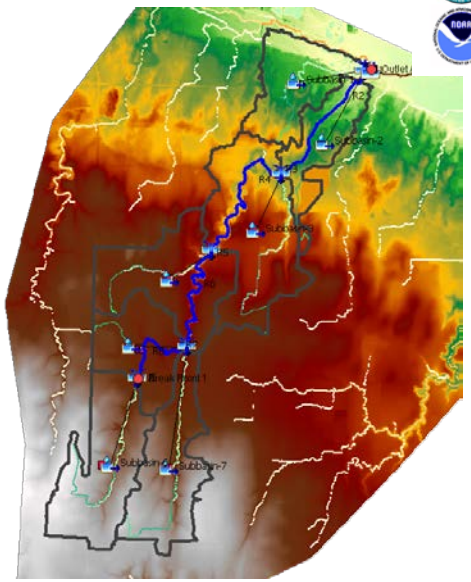
Project Scope

Note

- Effective studies completed in 1984 & 1993
- Chilton Creek - no effective floodway

- **Hydrologic** Analysis
  - Develop HEC-HMS rainfall runoff models for each tributary
    - 10%, 2%, 4%, 1%, 1%+ and 0.2% annual chance events
  - Format to meet FEMA's Data Capture Standards (DCS)





NOAA Atlas 14

Precipitation-Frequency Atlas of the United States

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Project Scope

- **Hydraulic** Analysis
  - Develop enhanced hydraulic models of each tributary
    - 2-dimensional (2D) analysis
    - HEC-RAS v 6.5
    - 10%, 2%, 4%, 1%, 1%+ and 0.2% annual chance events
    - Floodway analysis
  - Format to meet FEMA's Data Capture Standards (DCS)

Enhanced study streams mapped as Zone AE.

- BFEs are published on the FIRMs.
- Channel data is usually based on a combination of LiDAR and field survey collection.
- Structures along the stream are surveyed and included in the modeling.
- The floodway is included in the modeling.

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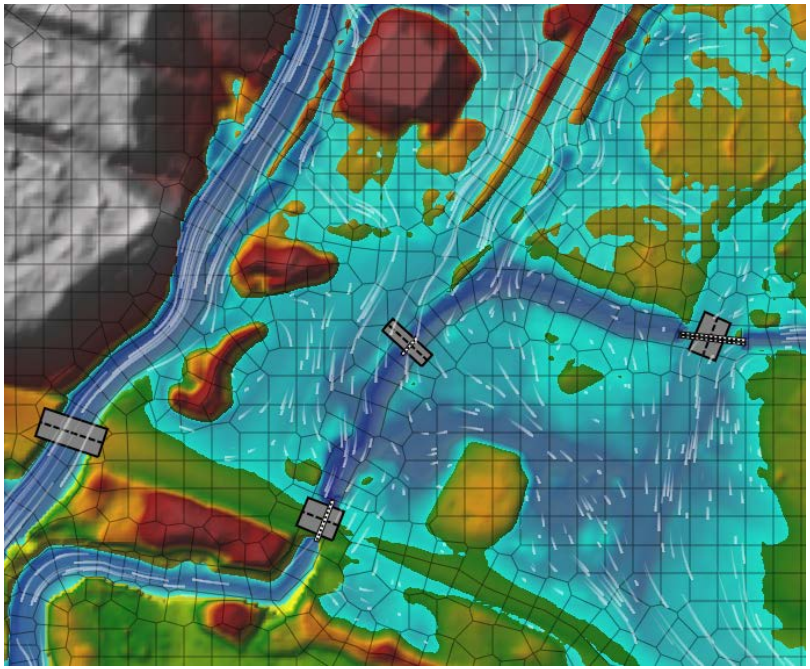
2D Enhanced Hydraulic Analysis



Comprehensive

- Allows for simulation of floodplain flows, split flows, and complicated routing of floodwaters.

Adaptable

- Readily adapted to support mitigation feasibility analysis and detailed design.

Configurable

- Readily updated with new terrain data to evaluate changes to flood hazards with shifts in river morphology.

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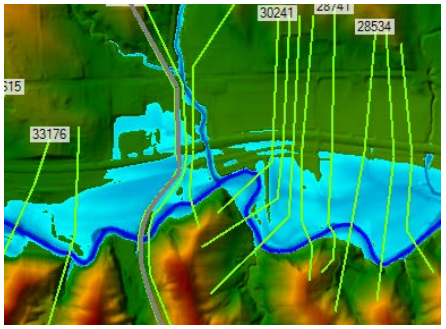
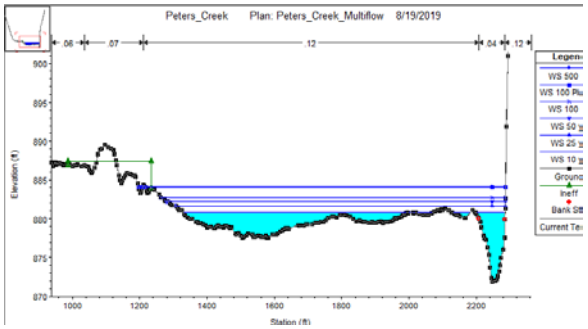
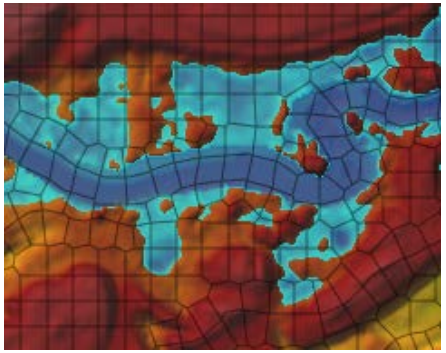
1D vs 2D Hydraulics

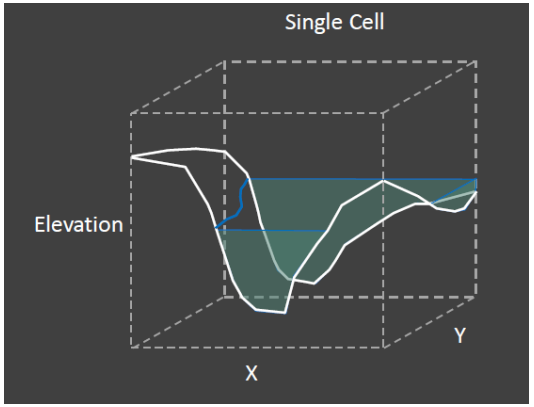
1D Modeling
- Driven by cross-sections
- Major assumption, 1D flow





2D Modeling
- Driven by mesh/grid
- Flow in multiple directions





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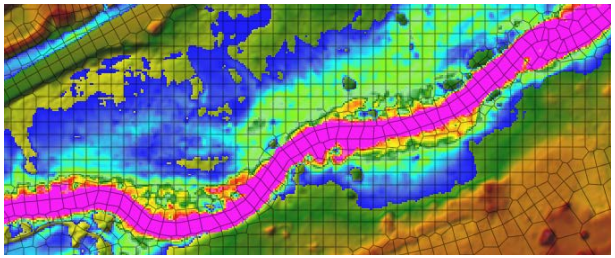
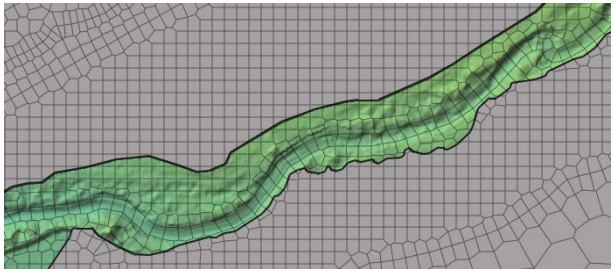
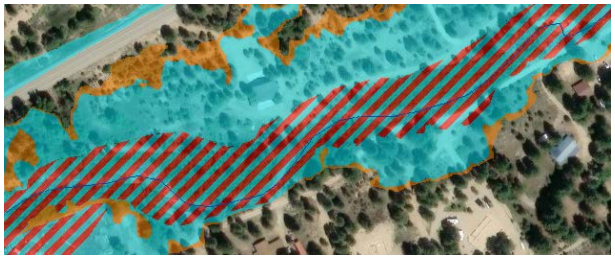
2D Enhanced Hydraulic Analysis

2D Floodway Criteria

- The initial encroachments developed using high depth x velocity & effective floodway (if available)
- 1-foot surcharge requirements
- Generally, 2D unsteady floodways are wider than 1D
  - Impact to mesh cells vs cross-section
  - Steady vs unsteady







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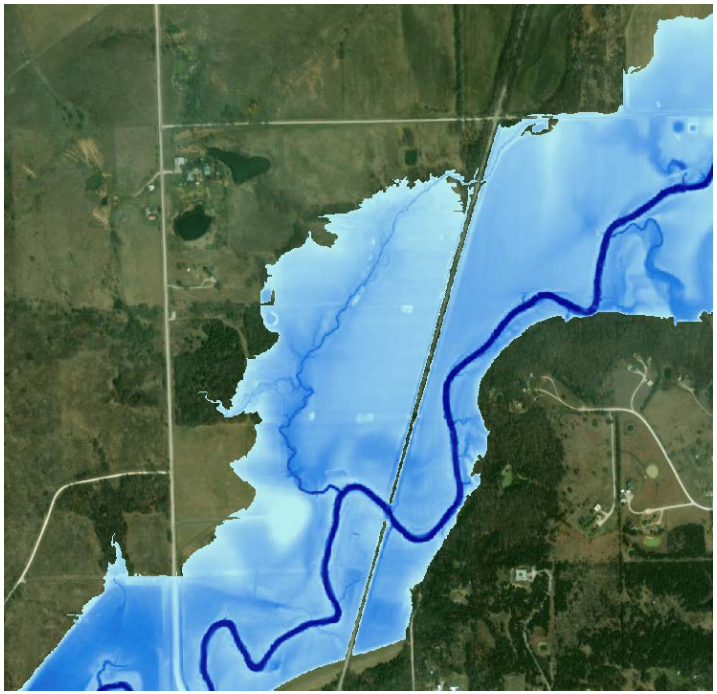
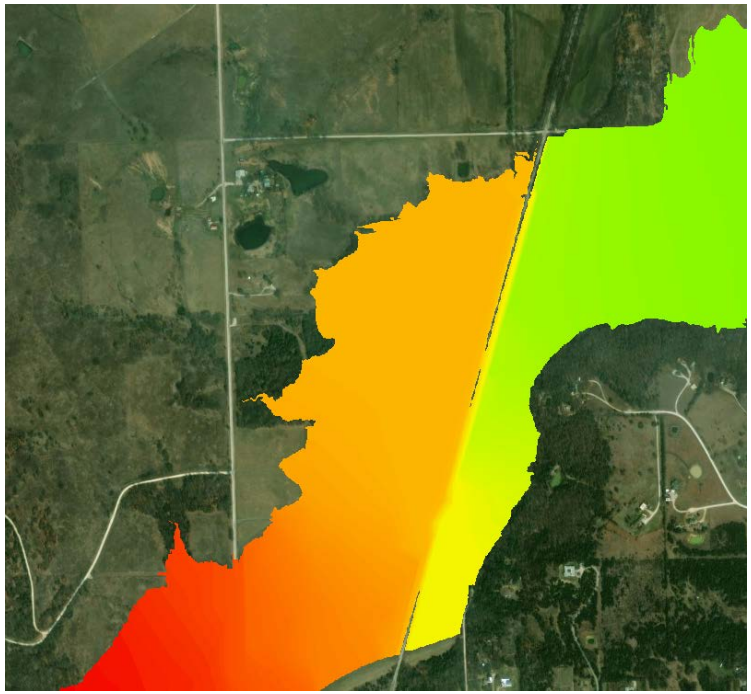
Project Scope

- **Flood Risk Products**
  - Develop flood risk products for new tributary studies
    - WSE grids, Depth grids, % Annual Chance grid, etc
    - Supplemental Changes Since Last FIRM (CSLF)





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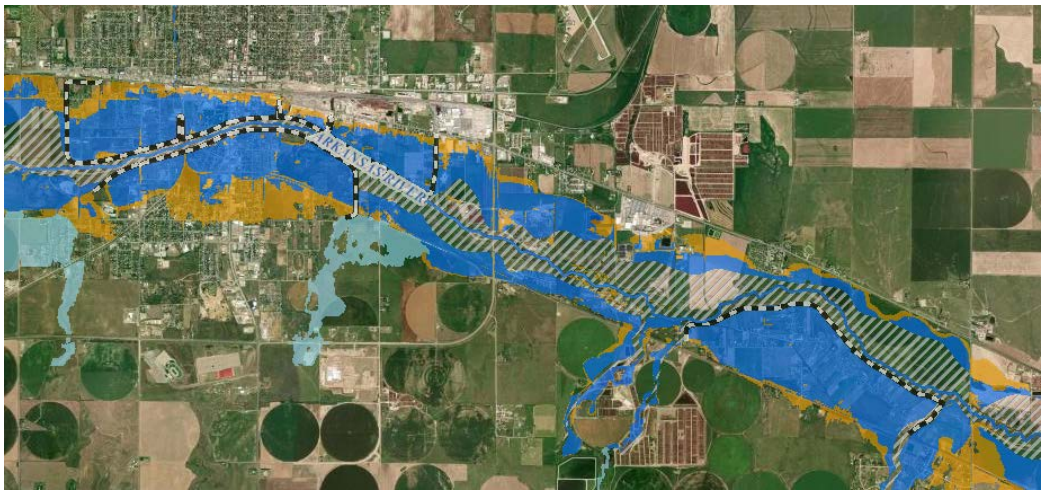
Project Scope

- **Floodplain Mapping**
  - Tie-in new studies with FY21 Arkansas River mapping
  - Floodway delineation
  - Floodway Data Tables
  - BFEs and evaluation lines mapped
  - Flood Risk Review (FRR) meeting with community showing mapping results for community review



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Path Forward

Schedule

- May 2024 – Complete Terrain Data ☑
- June 2024 – Complete Survey Data
- August 2024 – Complete Hydrologic Data
- March 2025 – Complete Hydraulic Data
- July 2025 – Complete Floodplain Mapping
- July 2025 – Complete Flood Risk Products
- August 2025 – Flood Risk Review Meeting

Data will be hosted on KDA's web viewer as it becomes available
https://gis2.kda.ks.gov/gis/dodgecity/

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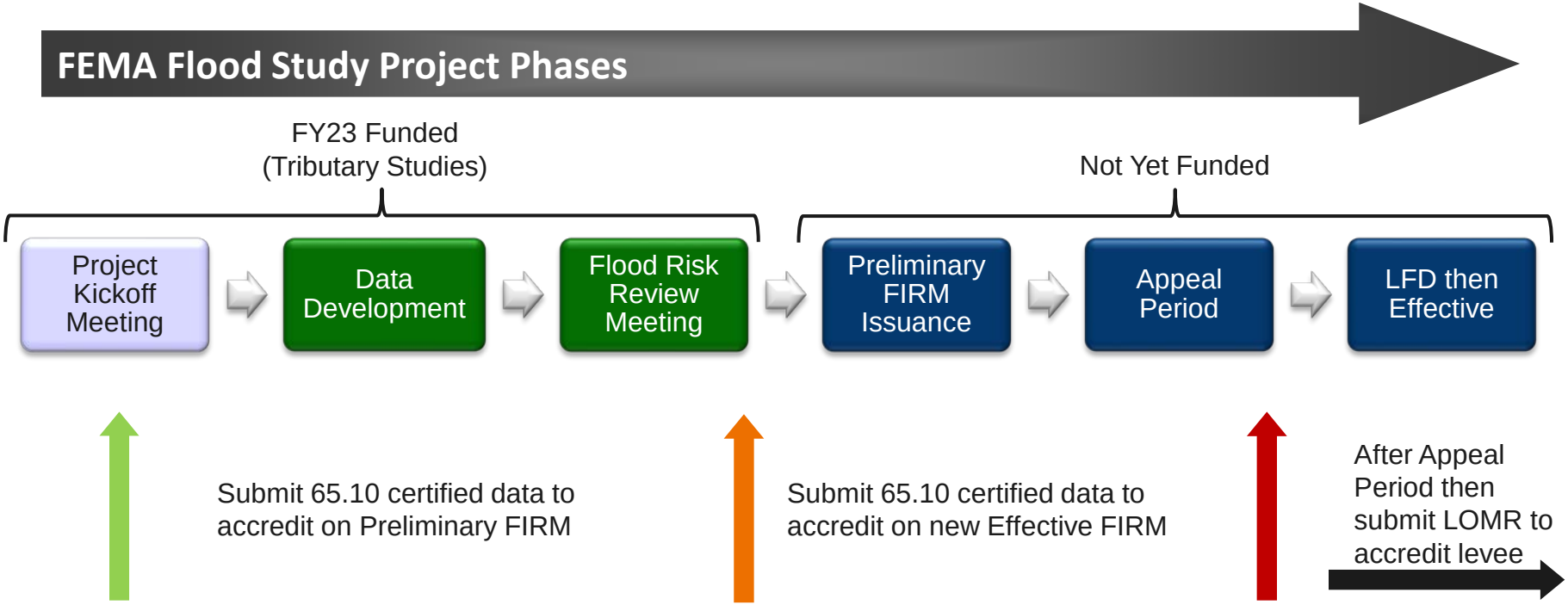
Path Forward

Opportunities to change levee mapping approach

- Current scoped approach is Natural Valley (FY21 Draft Data)
- Certified data can be submitted to FEMA at any time during this project



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