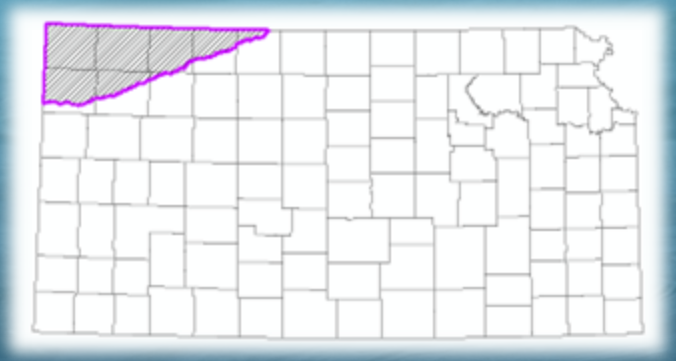
Upper Republican Custom Watershed Discovery Meeting



August 5th, 2022

While we are waiting, please enter your name and community in the chat box!

FEMA

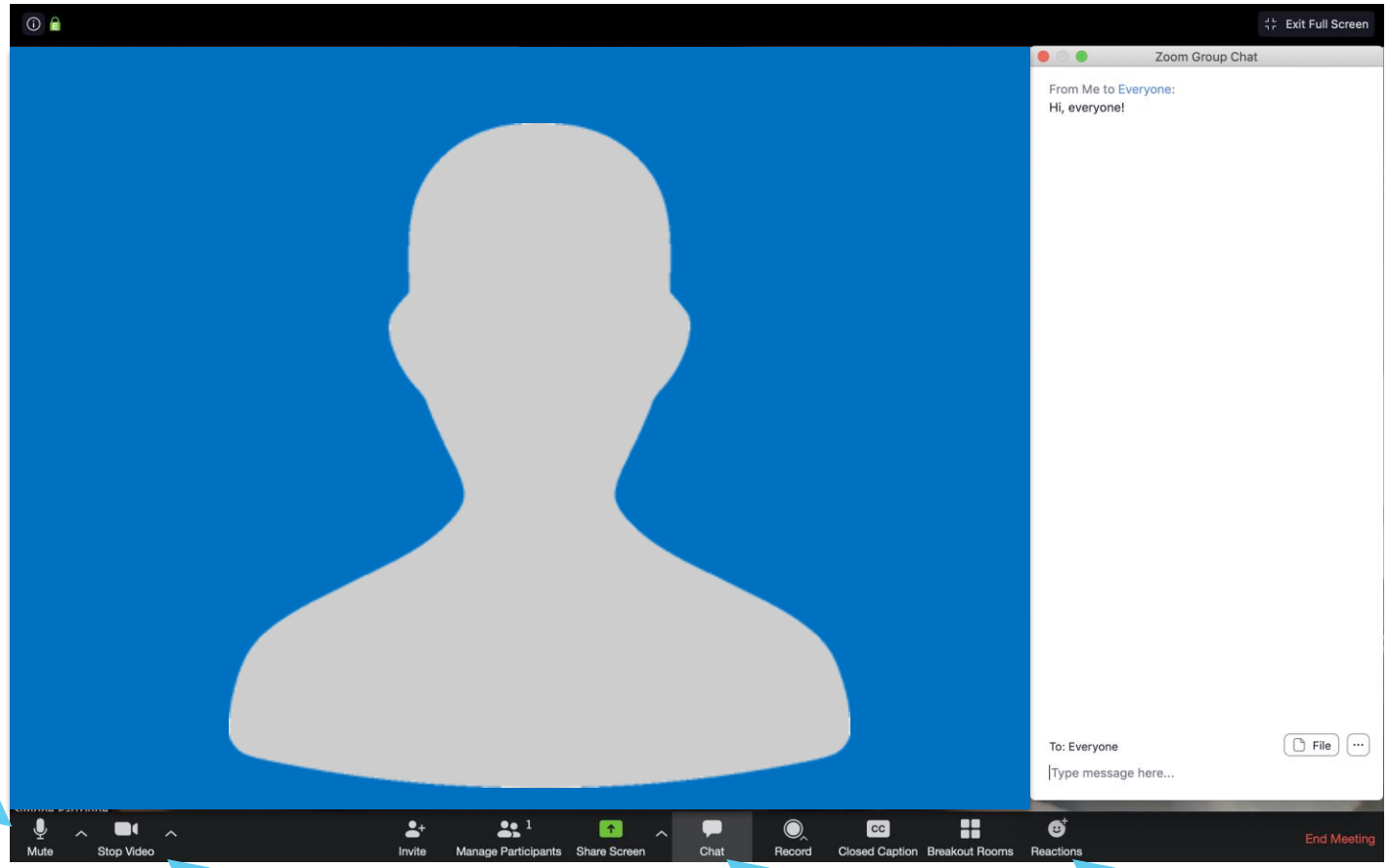
Kansas Department of Agriculture
Division of Water Resources

AECOM

Thank you for joining us today!

Your input is very important to this work.

Zoom Features



Mute / Unmute

Start your Video

Use the Chat Feature

Reactions

Kansas Department of Agriculture
Division of Water Resources

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Rules of the Road

- Attendees may be muted during the presentation, to help eliminate background noise.
- Check out the chat to ask questions during the presentation! Or feel free to “raise your hand.” We will pause for questions and unmute the lines at various stopping points.
- For technical difficulties: send a private chat to Bill Pace or email *william.pace@ks.gov*.
- We’ll be recording this webinar for those who aren’t able to attend today.

Kansas Department of Agriculture Division of Water Resources AECOM

Introductions

Kansas Department of Agriculture

Joanna Rohlf, *GISP, CFM*
Floodplain Mapping Coordinator

William Pace, *CFM*
Floodplain Mapping Specialist

Tara Lanzrath, *CFM*
State NFIP Coordinator

Cheyenne Sun Eagle, CFM
NFIP Specialist

AECOM Technical Services, Inc.

Daniel Curley
Project Manager

Hayden Edwards,
Engineer

Dani Halloran
Graduate Water Resources Engineer

FEMA Region VII

Dawn Livingston, *Regional Project Officer*

Kansas Department of Agriculture
Division of Water Resources

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Today's Goals

Review	Review WHY WE DO THIS WORK
Share	Share WHERE WE ARE NOW & what the data is telling us about flood risk
Discuss	Discuss how WE CAN HELP
Preview	Preview the PLANNED WORK AHEAD and how we propose doing it.
Next Steps	Discuss Next Steps and YOUR ROLE in the Process

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Division of Water Resources

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Why We Do This Work

FEMA Floodplain Mapping Program

- Risk Mapping, Assessment, and Planning (Risk MAP).
- Performed on a watershed basis.
- Consists of both Regulatory & Non-Regulatory Products.
- Through Risk MAP, we provide updated floodplain maps, as well as other (free!) data and tools that can help you plan to reduce your community's risk.

RiskMAP
Increasing Resilience Together

Planning: The "P" in Risk MAP

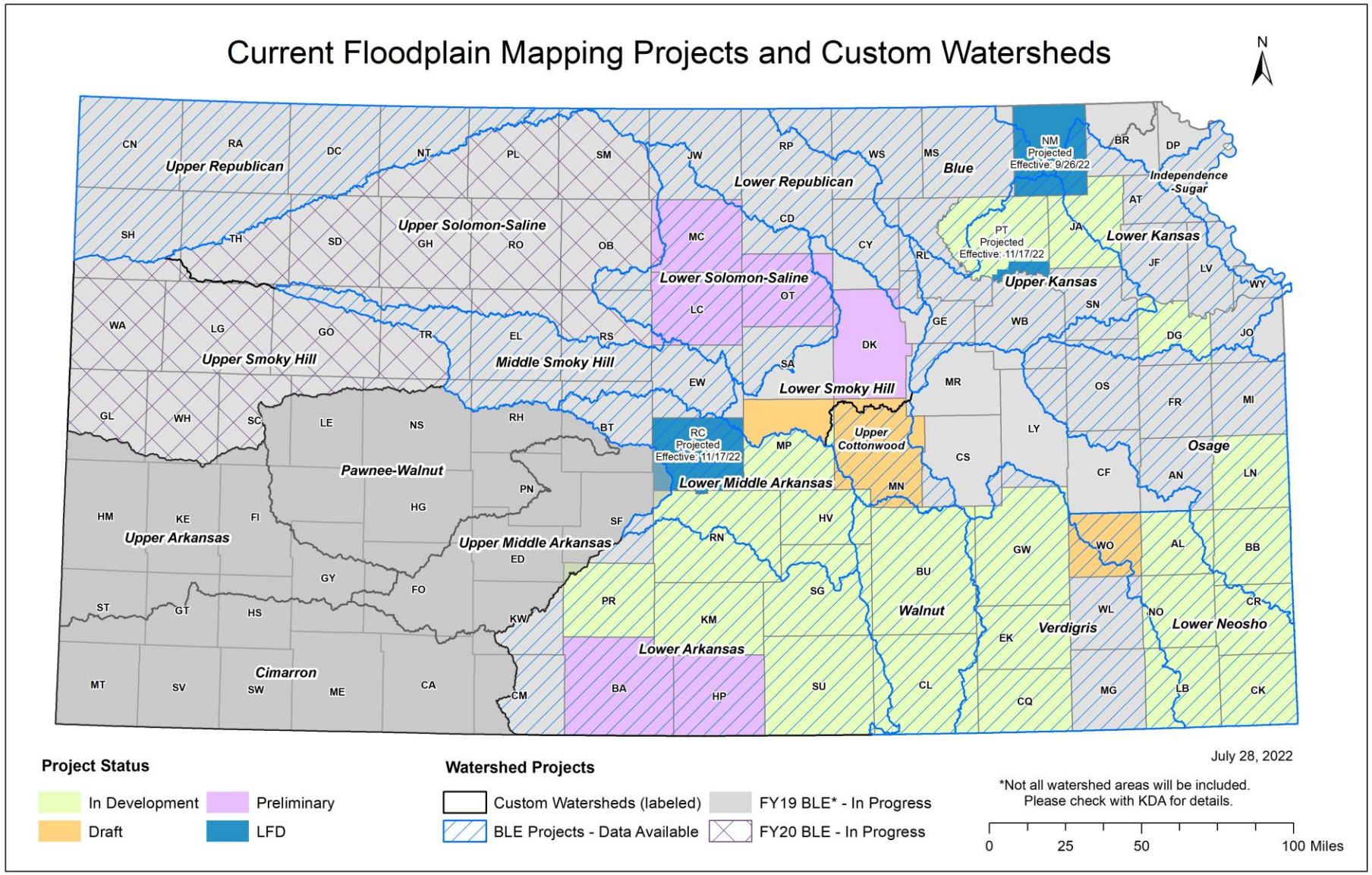
- The flood risk data from this work can – and should – inform your regional Hazard Mitigation Plan (HMP).
  - Region A: Cheyenne, Decatur, Rawlins, Sheridan, Sherman, and Thomas Counties
  - Region B: Norton and Philips Counties

- Common themes in the regional plans:
  - Many incorporated communities located along major rivers/creeks with SFHA Zone A and some AE.
  - Study drainage issues in flood prone areas and make recommendations for flood control measures, flood management procedures, and low-water crossing improvements.

Regulatory FIRM Status

- Mapping Update Anticipated for 2024
  - Rawlins, Decatur, Thomas.
- Other Counties - TBD Based on Needs

We are doing this work across Kansas…



Participation in the National Flood Insurance Program

- Blue = Participates Red = Not Participating

- Cities of Bird City, St. Francis, Clayton, Dresden, Jennings, Norcatur, Oberlin, Almena, Norton, Long Island, Atwood, Herndon, McDonald, Selden, Goodland, Kanorado, Brewster, Colby, Gem

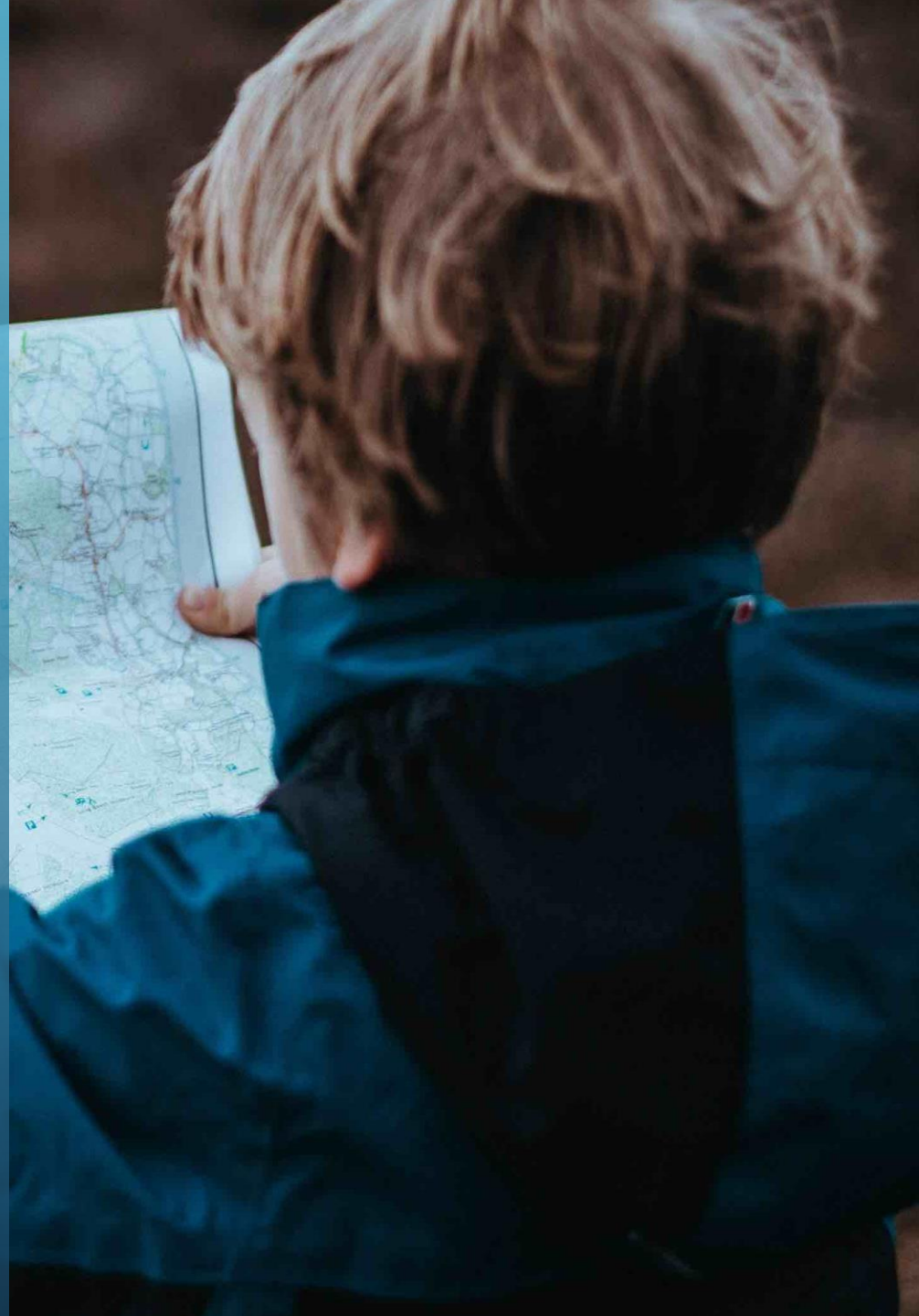
- Cheyenne, Decatur, Norton, Phillips, Rawlins, Sheridan, Sherman, Thomas Counties

Number of Flood Insurance Policies

- Cheyenne County – 0
  - St. Francis - 15
  - Bird City - 0
- Decatur County – 0
  - Oberlin - 0
  - Norcatur - 0
  - Jennings - 0
- Norton County – 0
  - Norton - 3
  - Almena - 0
  - Clayton - 0
- Phillips County – 0
  - Long Island - 0
  - Glade* - 1
- Rawlins County – 0
  - McDonald - 0
  - Atwood - 3
  - Herdon - 1
- Sheridan County – 0
  - Seldon - 0
  - Hoxie* - 0
- Sherman County – 0
  - Kanorado - 0
  - Goodland – 2
- Thomas County – 0
  - Gem - 0
  - Colby - 2
  - Brewster - 0
  - Levant - 0

** Community not in Upper Republican Watershed*

Where We Are Now & What the Early Flood Risk Data is Telling Us



Base Level Engineering is Complete

- BLE is an engineering approach that provides an initial high-level (or "base line") understanding of flood hazards, with enough information for us to draft initial floodplain designations.

- We're starting to develop and share this initial data because we've learned that the earlier we start partnering with you, the more accurate the map.

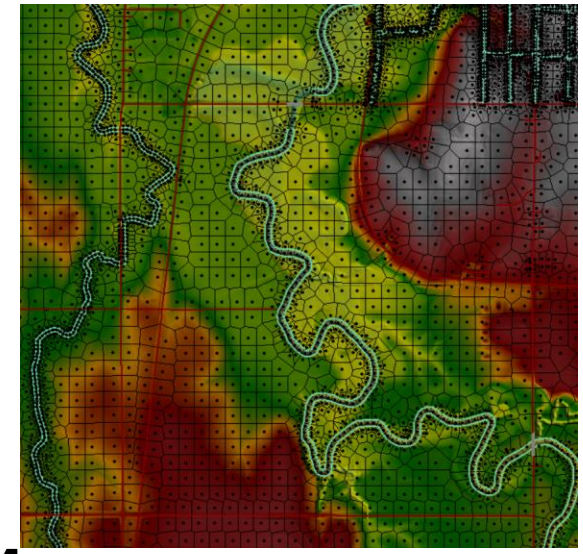
FLOODPLAIN: On the maps we create, the floodplains, also known as Special Flood Hazard Areas (SFHAs), are areas with high flood risk – where a flood of a certain level has a 1-percent chance of happening each year.

We Use 2D Hydraulic Modeling and LIDAR in our BLE

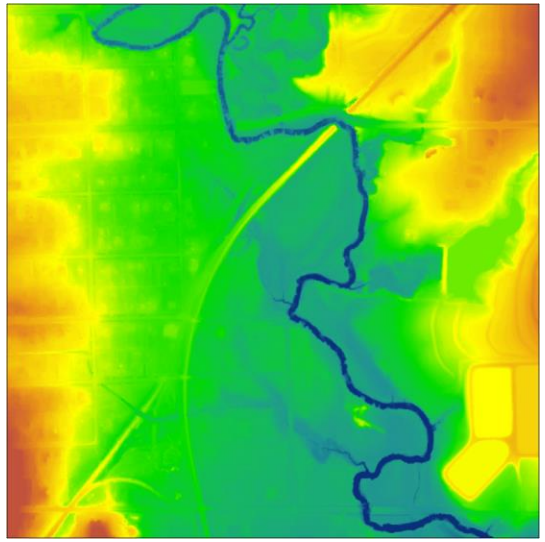
- Your current maps are done in one dimension (1D) and are based on 10-meter Digital Elevation Model

- Two-dimensional (2D) modeling and LIDAR- enhanced maps provide greater resolution and the ability to analyze how water moves across land using elevations and depth grids

2D

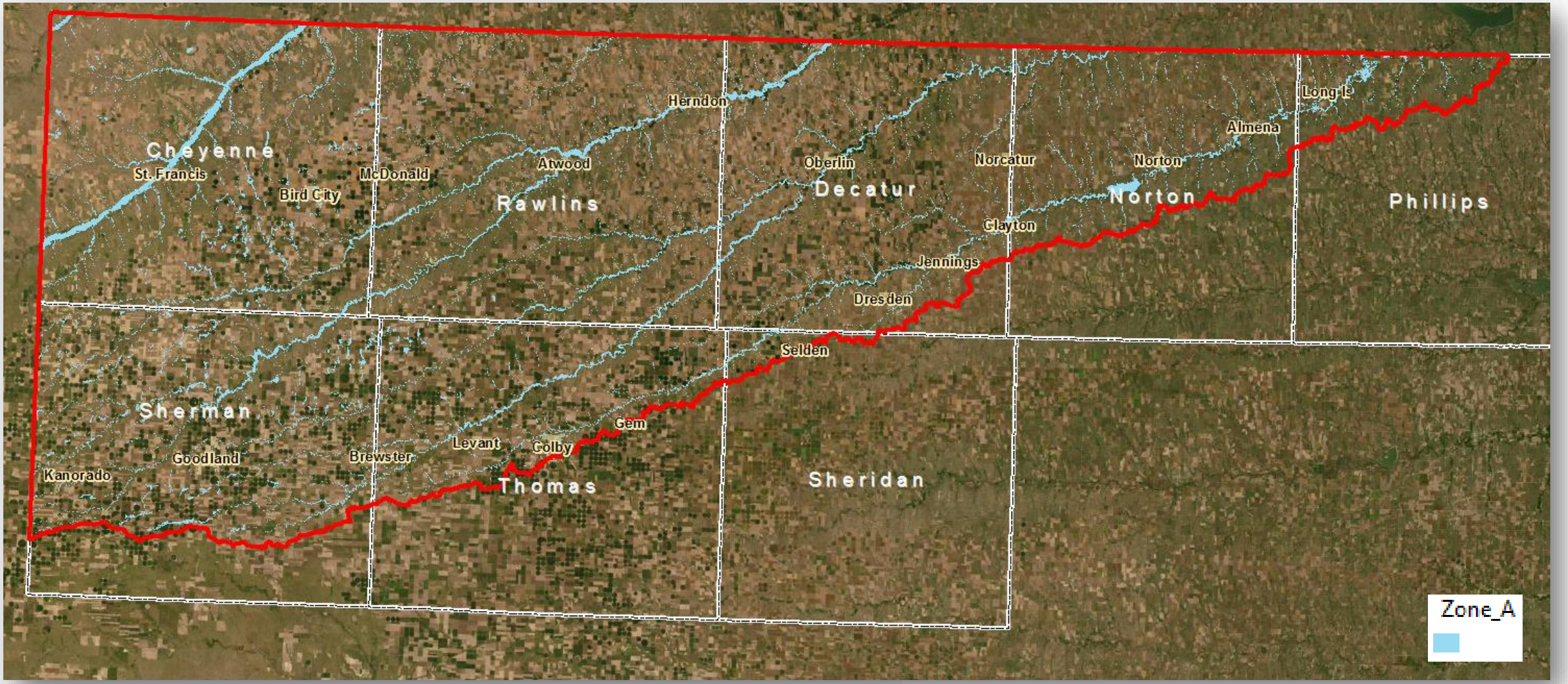


LiDAR



BLE Study Area

BLE floodplains are complete for this study area



Limitations of BLE Modeling

- Hydraulic structures, such as culvert and bridge openings, are not included
- Storm sewer networks in communities are not included
- Levees are not accurately modeled because closure structures are not included into the model to prevent backwater

Where We Are Now: DISCOVERY

This is one of the most important phases of our work, where we:

- Review the flood risk information together and get your feedback;
- Identify the new data we might need to accurately update your flood risk; and
- Determine, with you, where mitigation (taking steps to reduce risk) makes sense for your community.

Discovery Reports and Maps

Discovery Report

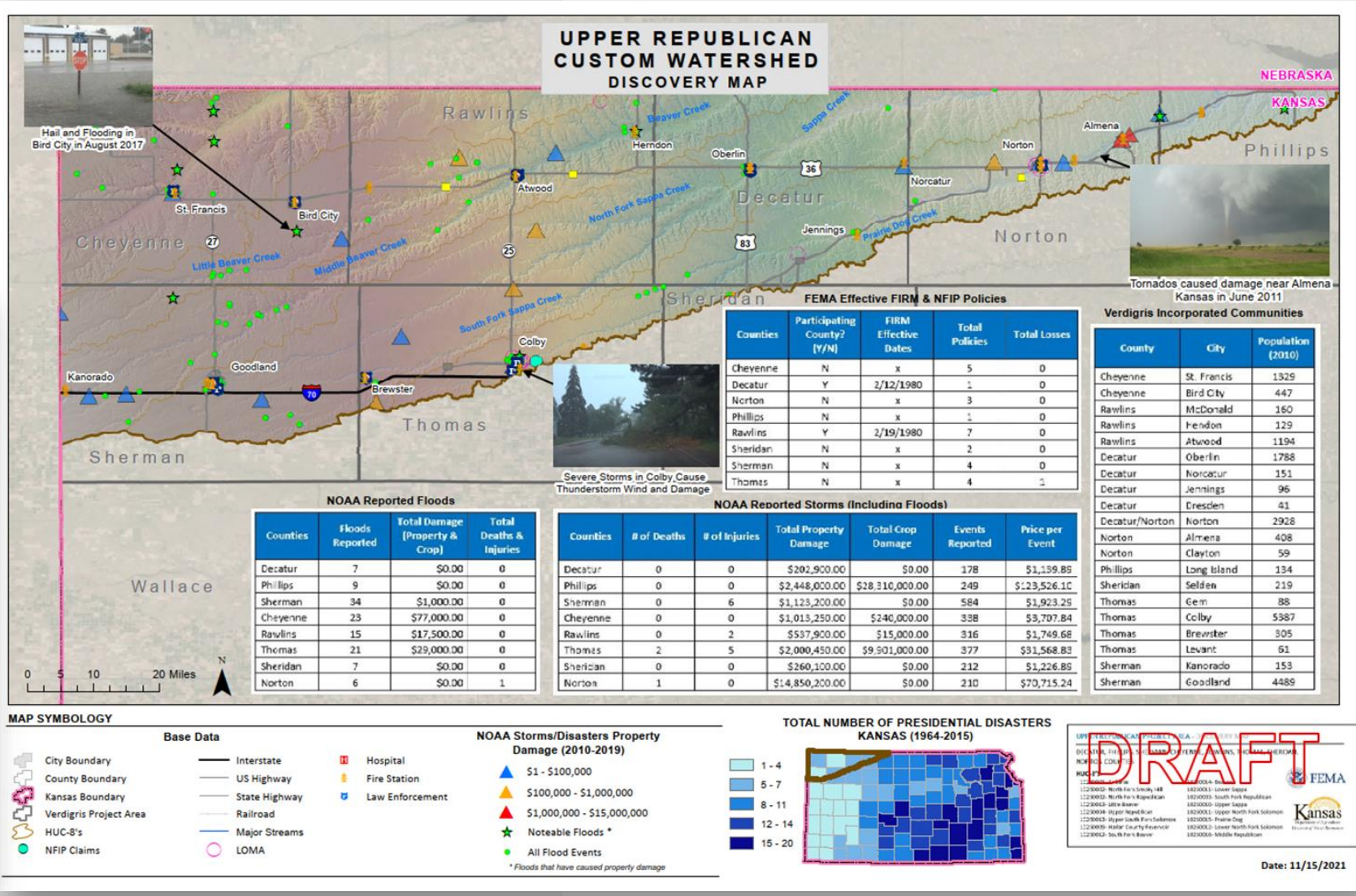
Upper Republican Custom Watershed

HUCs 10250001, 10250002, 10250003, 10250004, 10250010, 10250011, 10250012, 10250013, 10250014, 10250015

June 2022

MIP Case Number: 19-07-0028S

FEMA Kansas



Counties	Participating County? (Y/N)	FIRM Effective Dates	Total Policies	Total Losses
Cheyenne	N	x	5	0
Decatur	Y	2/12/1980	1	0
Norton	N	x	3	0
Phillips	N	x	1	0
Rawlins	Y	2/19/1980	7	0
Sheridan	N	x	2	0
Sherman	N	x	4	0
Thomas	N	x	4	1

County	City	Population (2010)
Cheyenne	St. Francis	1329
Cheyenne	Bird City	447
Rawlins	McDonald	160
Rawlins	Herndon	129
Rawlins	Atwood	1194
Decatur	Oberlin	1788
Decatur	Norcatur	151
Decatur	Jennings	96
Decatur	Dresden	41
Decatur/Norton	Norton	2928
Norton	Almena	408
Norton	Clayton	59
Phillips	Long Island	134
Sheridan	Selden	219
Thomas	Gem	88
Thomas	Colby	5387
Thomas	Brewster	305
Thomas	Levant	61
Sherman	Kanorado	153
Sherman	Goodland	4489

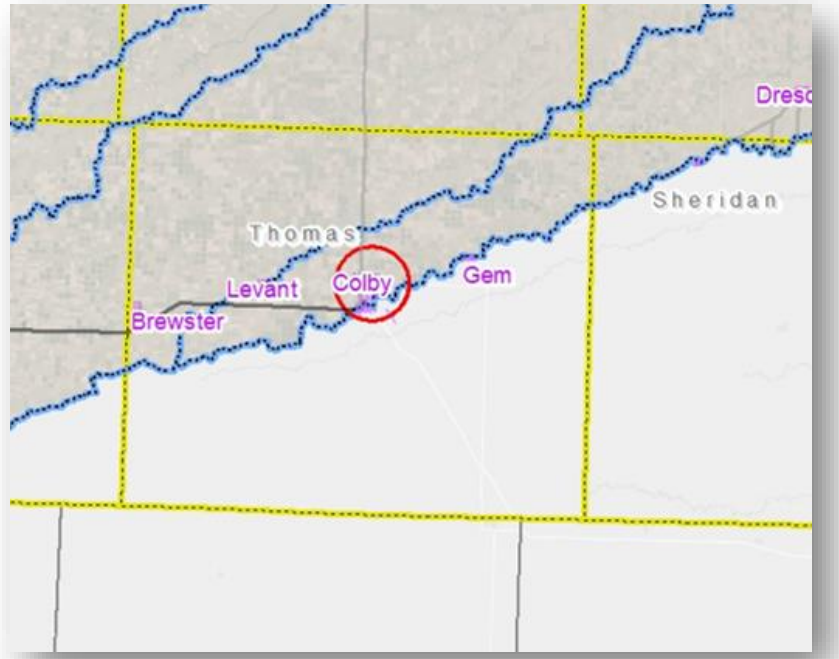
Counties	Floods Reported	Total Damage (Property & Crop)	Total Deaths & Injuries
Decatur	7	$0.00	0
Phillips	9	$0.00	0
Sherman	34	$1,000.00	0
Cheyenne	23	$77,000.00	0
Rawlins	15	$17,500.00	0
Thomas	21	$29,000.00	0
Sheridan	7	$0.00	0
Norton	6	$0.00	1

Counties	# of Deaths	# of Injuries	Total Property Damage	Total Crop Damage	Events Reported	Price per Event
Decatur	0	0	$202,900.00	$0.00	178	$1,139.89
Phillips	0	0	$2,448,000.00	$28,310,000.00	249	$123,526.10
Sherman	0	6	$1,123,200.00	$0.00	584	$1,923.29
Cheyenne	0	0	$1,013,250.00	$240,000.00	338	$3,707.84
Rawlins	0	2	$537,900.00	$15,000.00	316	$1,749.68
Thomas	2	5	$2,000,450.00	$9,901,000.00	377	$31,568.83
Sheridan	0	0	$260,100.00	$0.00	212	$1,226.89
Norton	1	0	$14,850,200.00	$0.00	210	$70,715.24

Repetitive Loss Structures

Insurable buildings for which the NFIP paid 2 or more claims of more than $1,000 in a 10-year period.

- One cluster of NFIP claims in Thomas County



NOTE: if you have an area where structures have been repeatedly damaged, we want to know! It's worth taking a closer look, and we might be able to help.

Draft Floodplains

NATIONAL FLOOD INSURANCE PROGRAM

DISCOVERY 2D BLE WORKMAP

Colby, Kansas
Thomas County

FEMA

Kansas Department of Agriculture

MAP SYMBOLOGY

SPECIAL FLOOD HAZARD AREAS

- 2D BLE ZONE A

OTHER FEATURES

- 100 — Zone A Base Flood Elevation
- Stream lines
- Effective Zone AE
- Municipal Boundary
- County Boundary

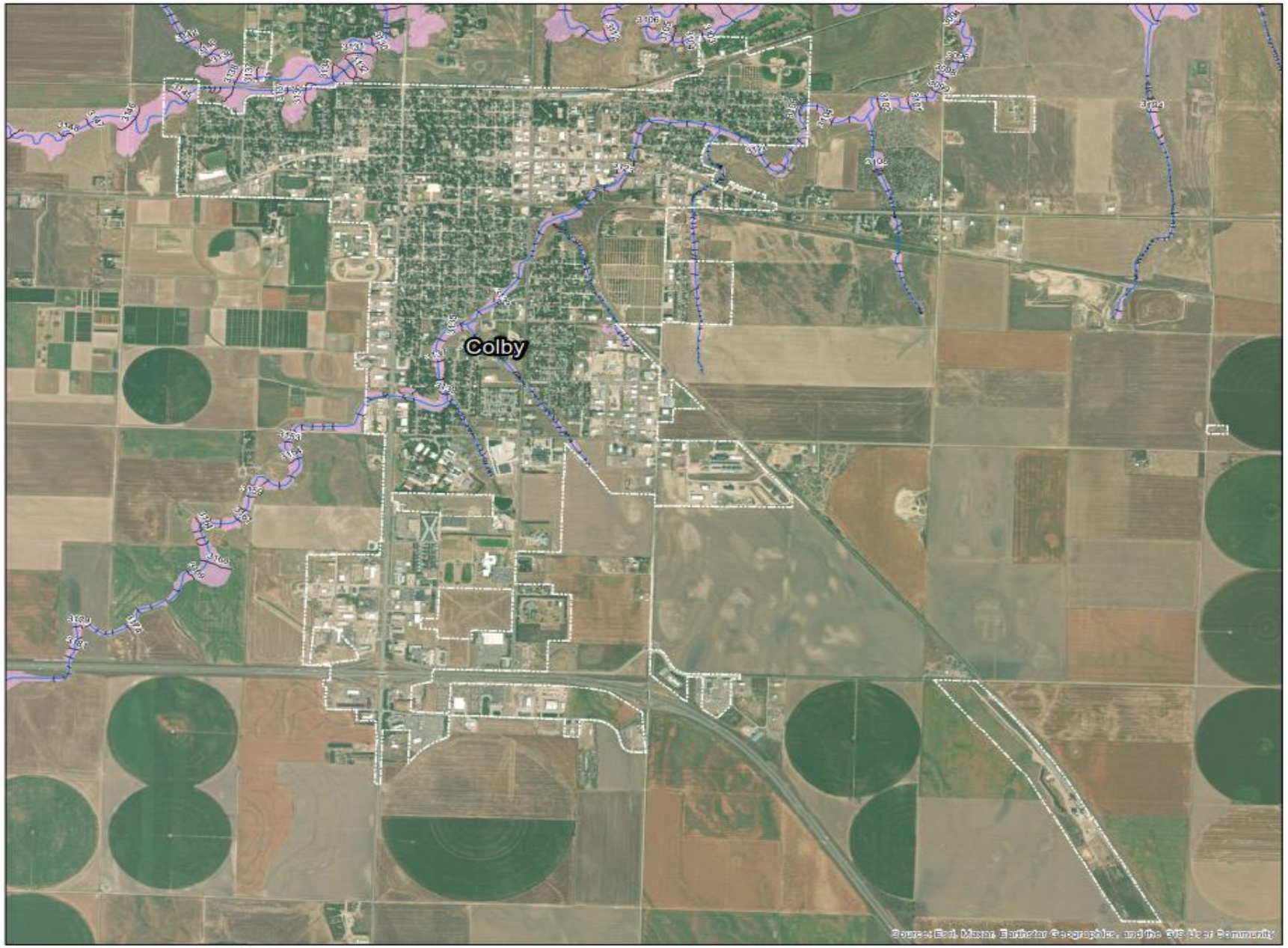
NAD 1983 StatePlane Kansas South FIPS 1502 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983
False Easting: 1,312,333.3333
False Northing: 1,312,333.3333
Central Meridian: -98.5000
Standard Parallel 1: 37.2667
Standard Parallel 2: 38.5667
Latitude Of Origin: 36.6667
Units: Foot US

N

1 inch = 2,027 feet

0 1,125 2,250 4,500 6,750 Feet

0 320 640 1,280 1,920 Meters



Changes Since Last Flood Insurance Rate Map (FIRM)

BLE Floodplain compared to Current Effective Floodplain

NATIONAL FLOOD INSURANCE PROGRAM

DISCOVERY 2D BLE CSLF WORKMAP

Colby, Kansas
Thomas County

FEMA

Kansas Department of Agriculture

MAP SYMBOLOGY

SPECIAL FLOOD HAZARD AREAS

- DECREASE
- INCREASE
- NO CHANGE

OTHER FEATURES

- Stream lines
- Municipal Boundary
- County Boundary

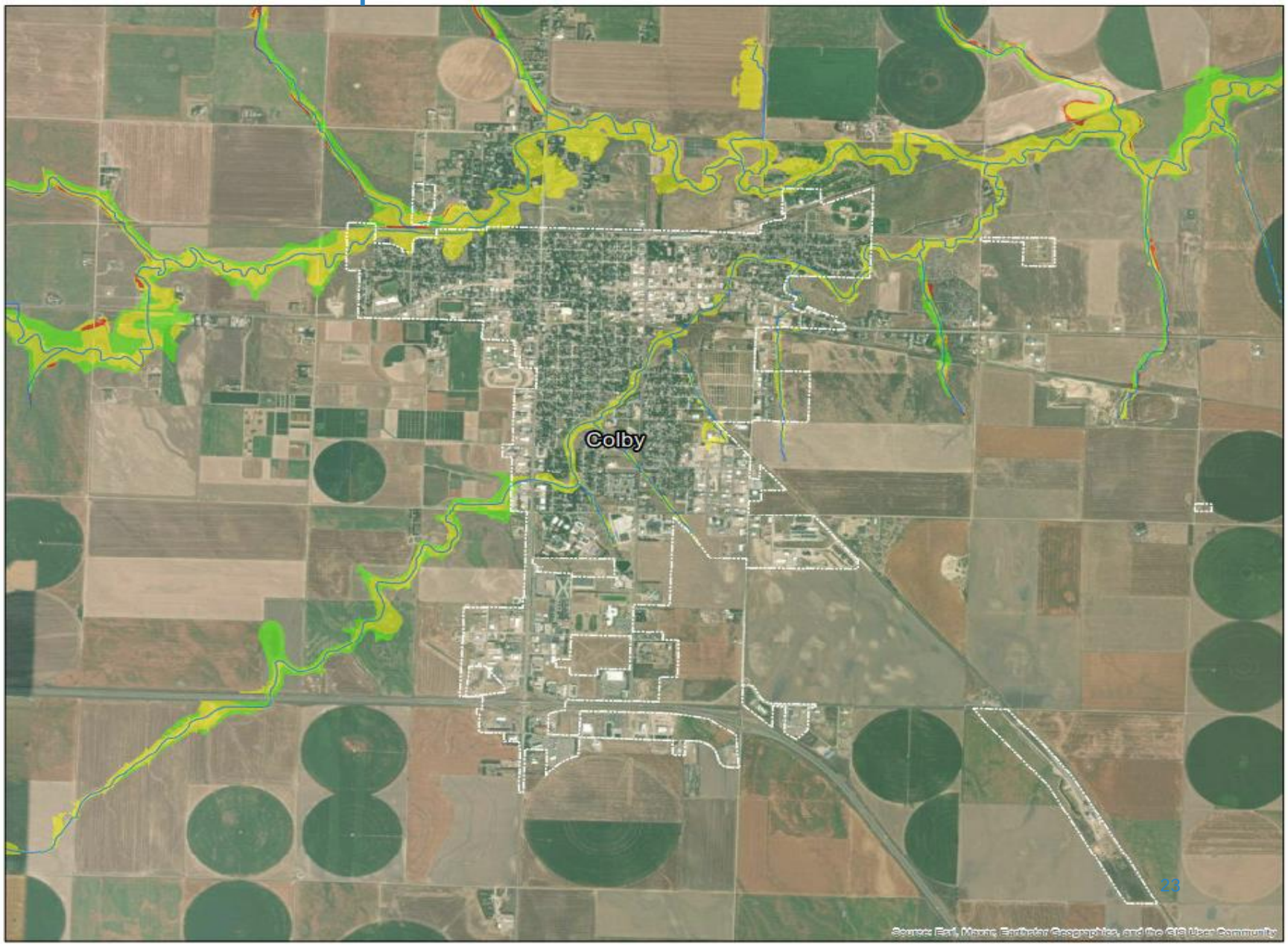
N

NAD 1983 StatePlane Kansas South FIPS 1502 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983
False Easting: 1,312,333.3333
False Northing: 1,312,333.3333
Central Meridian: -98.5000
Standard Parallel 1: 37.2667
Standard Parallel 2: 38.5667
Latitude Of Origin: 36.6667
Units: Foot US

1 inch = 2,500 feet

0 1,400 2,800 5,600 8,400 Feet

0 390 780 1,560 2,340 Meters



Changes Since Last Flood Insurance Rate Map (FIRM)

BLE Floodplain compared to Current Effective Floodplain

NATIONAL FLOOD INSURANCE PROGRAM

DISCOVERY 2D BLE CSLF WORKMAP

St. Francis, Kansas
Cheyenne County

FEMA

Kansas Department of Agriculture

MAP SYMBOLOGY

SPECIAL FLOOD HAZARD AREAS

- DECREASE
- INCREASE
- NO CHANGE

OTHER FEATURES

- Stream lines
- Municipal Boundary
- County Boundary

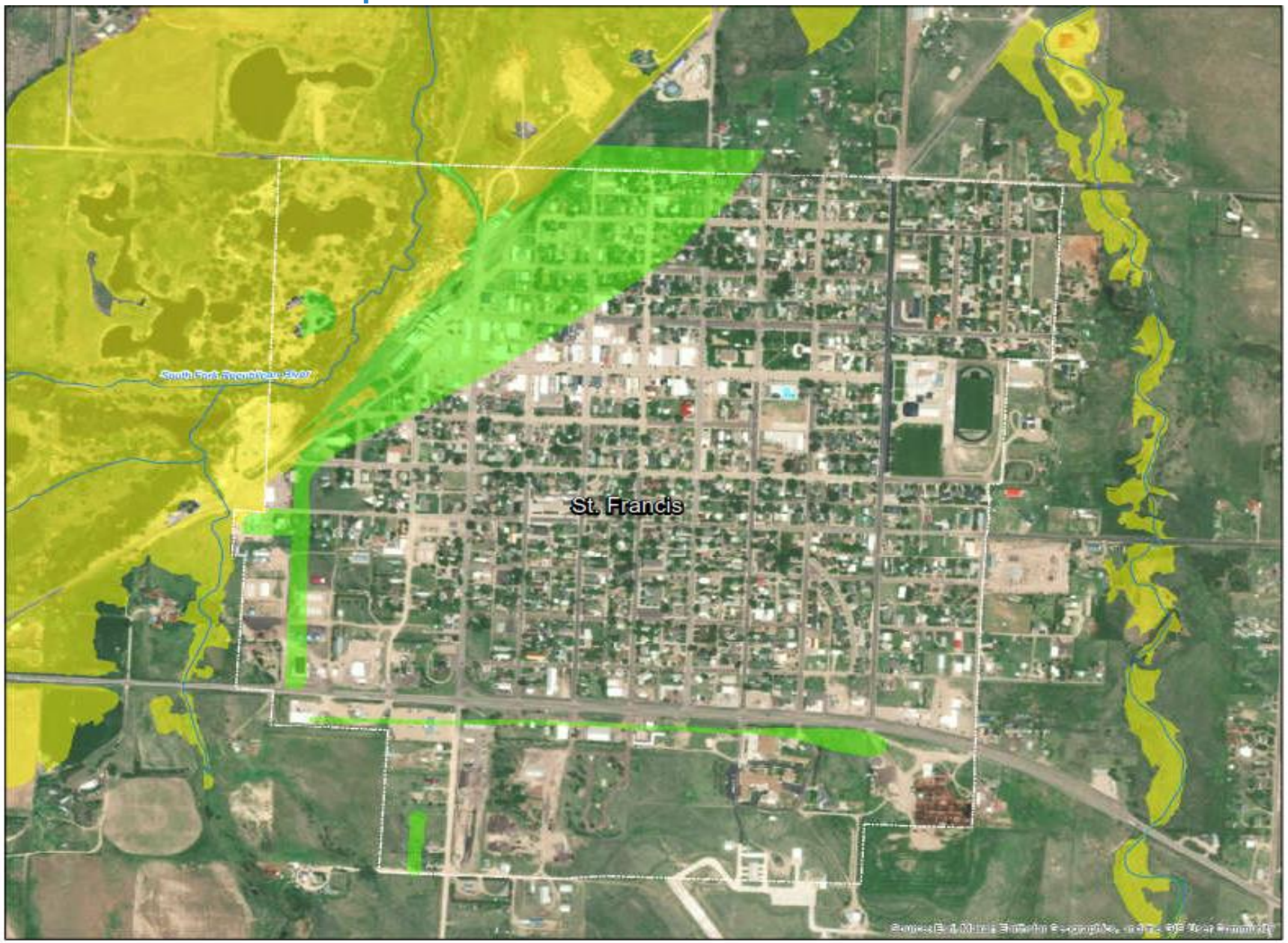
N

NAD 1983 StatePlane Kansas South FIPS 1502 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983
False Easting: 1,312,333.3333
False Northing: 1,312,333.3333
Central Meridian: -98.5000
Standard Parallel 1: 37.2667
Standard Parallel 2: 38.5667
Latitude Of Origin: 36.6667
Units: Foot US

1 inch = 667 feet

0 370 740 1,480 2,220 Feet

0 105 210 420 630 Meters



How We Can Help

"Mitigation Technical Assistance"

Some Ways We Can Help

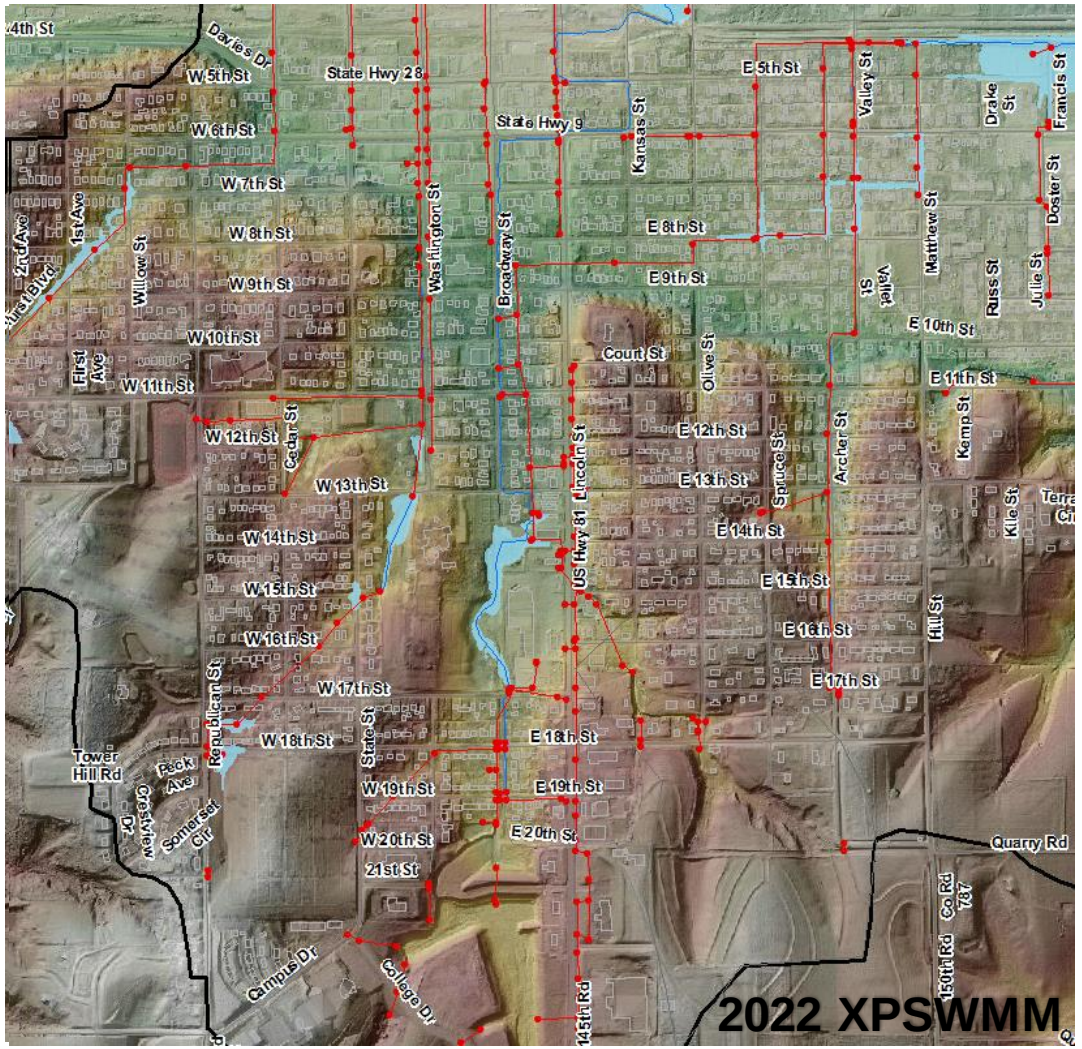
- Provide ideas on how to reduce flooding in trouble spots.
- Provide risk assessments for structures in your community, to help property owners understand the need for flood insurance, or to help you protect important public buildings.
- Use engineering analysis to show you what types of projects could reduce the impacts in floodprone areas.
- Assist with the Benefit-Cost Analysis if you are putting together a grant application.
- Support your participation in the Community Rating System.
- Help you explain flood risk and what it means to your community members.

You can visit the KDA website for more information, including a link to a fillable request form:

https://www.agriculture.ks.gov/divisions-programs/dwr/floodplain/mapping/technical-assistance

City of Concordia Technical Assistance Project
21st Dam and City Storm Sewer Model

Using XPSWM to model the City of Concordia sub-surface storm sewer system and 21st Street and Plum Road Dams resulted in lower water surface elevations compared to the 2D BLE study and the Effective FIRM.



Model Scenario	Structures in SFHA
2D BLE Zone A	248
XPSWMM 1D/2D (Depths Greater than 0.5 ft)	35

Kansas Department of Agriculture
Division of Water Resources

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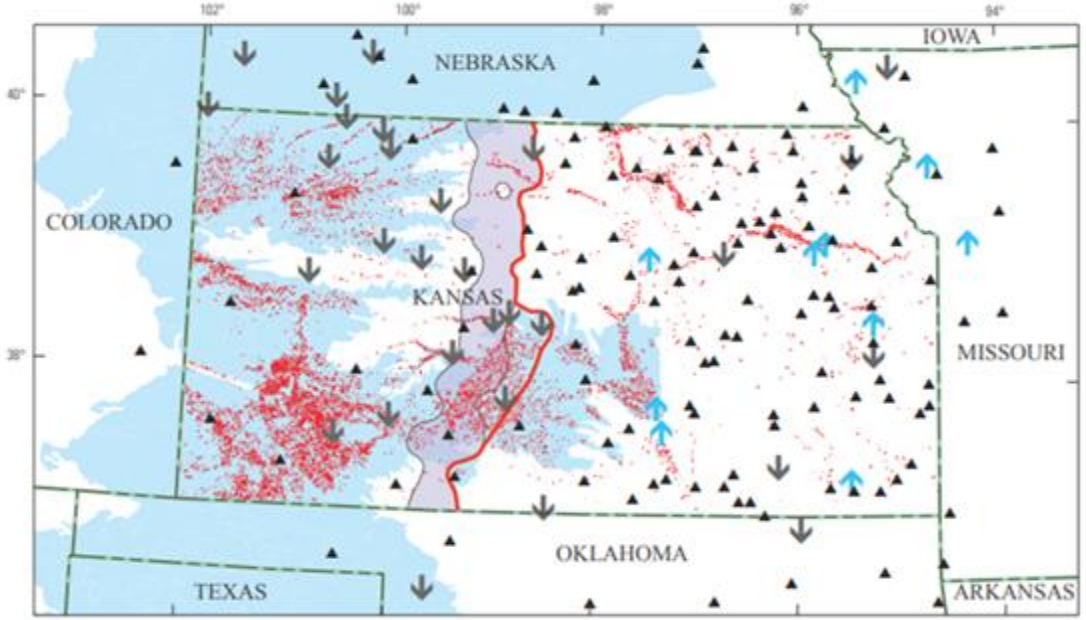
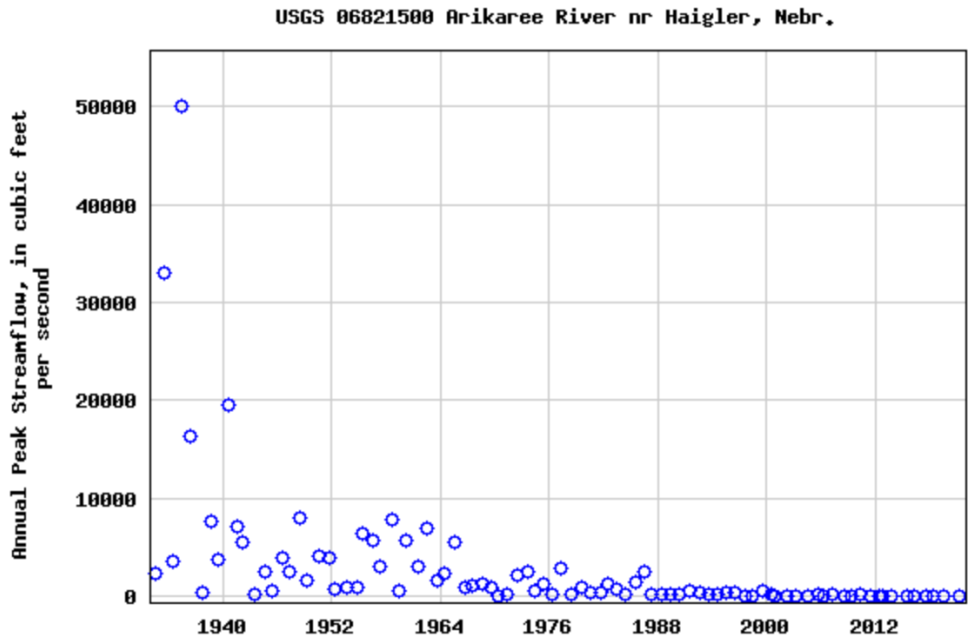
Technical Assistance Project:
Western Kansas Hydrology Pilot Study

- Groundwater Irrigation has caused streamflow to decline since 1978
- Challenges encountered due to discrepancies in Model Calibration Data
- Technical Assistance Study performed to analyze hydrology scenarios
  - Mixed Population Gage Analysis
  - Methodology updated to represent streamflow loss

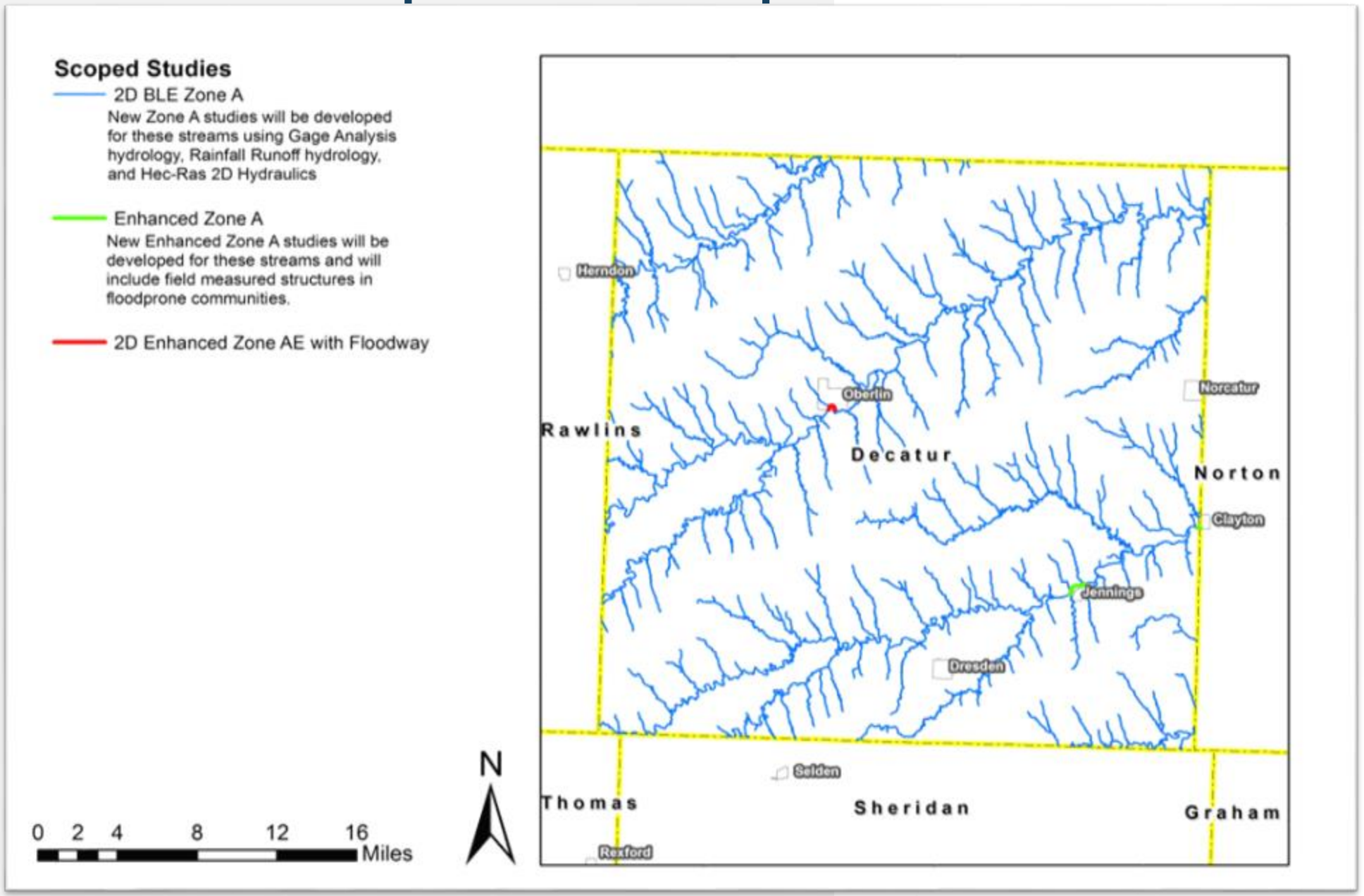




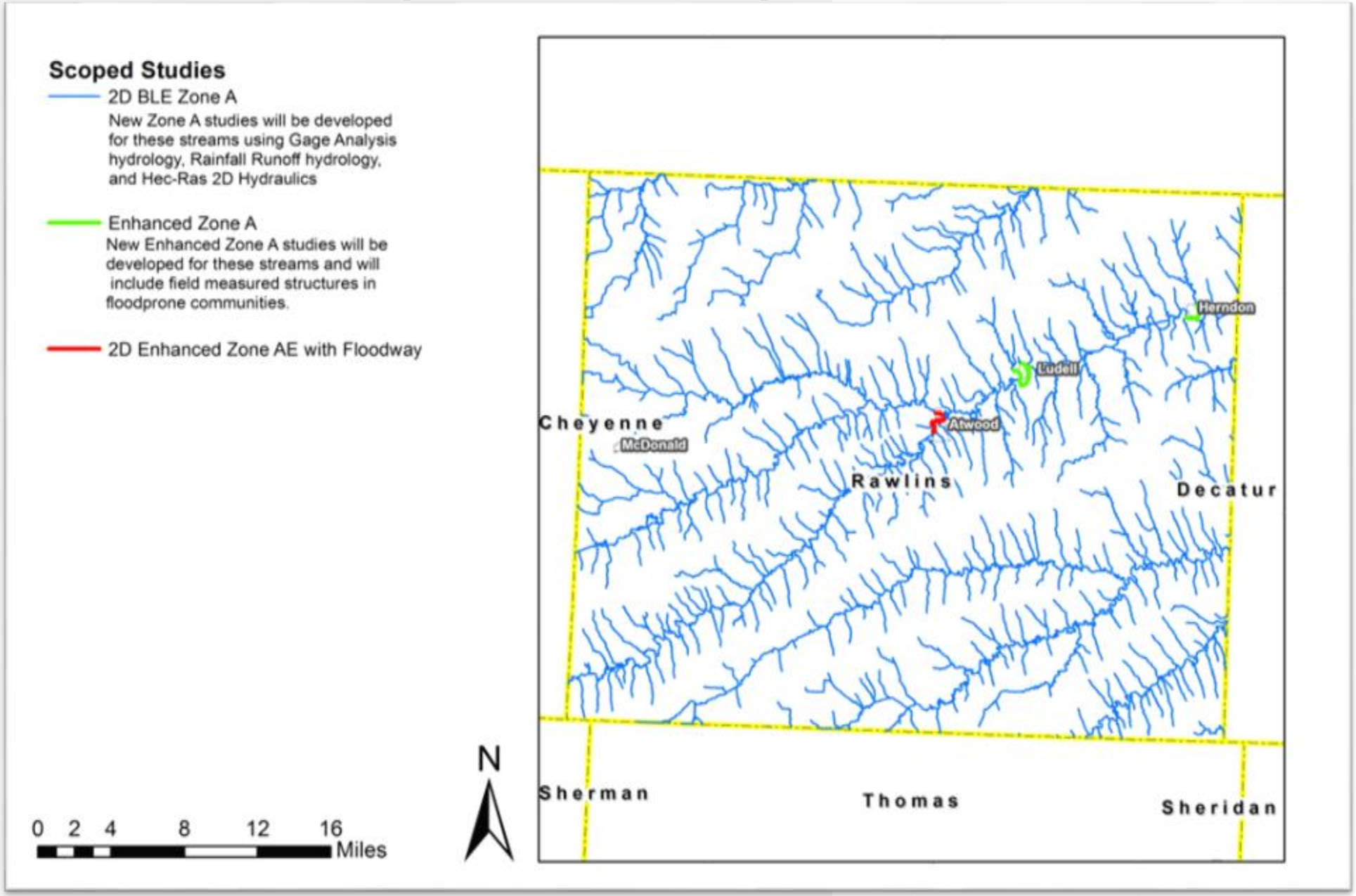
Preview of the Planned Work

Which We Call Our Data Development Scope

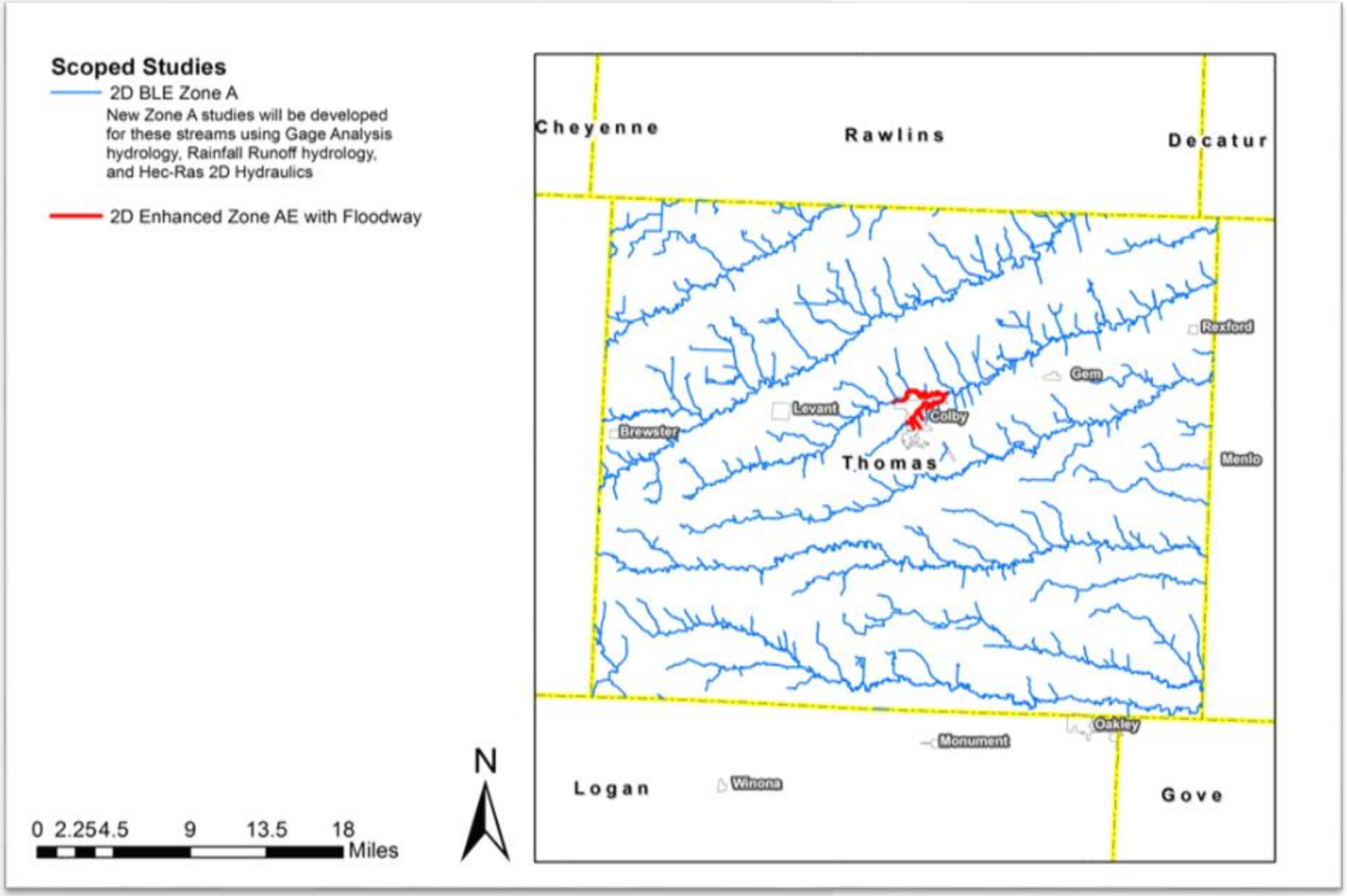
Where We Plan to Update Your Map



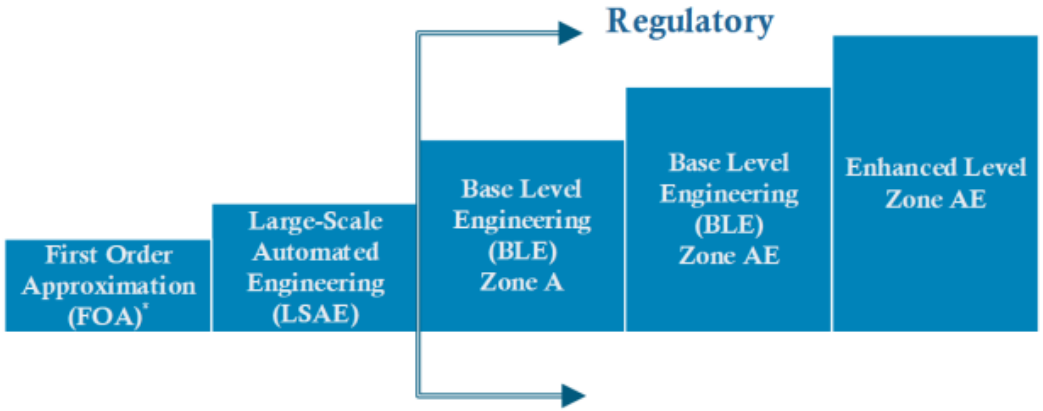
Where We Plan to Update Your Map



Where We Plan to Update Your Map

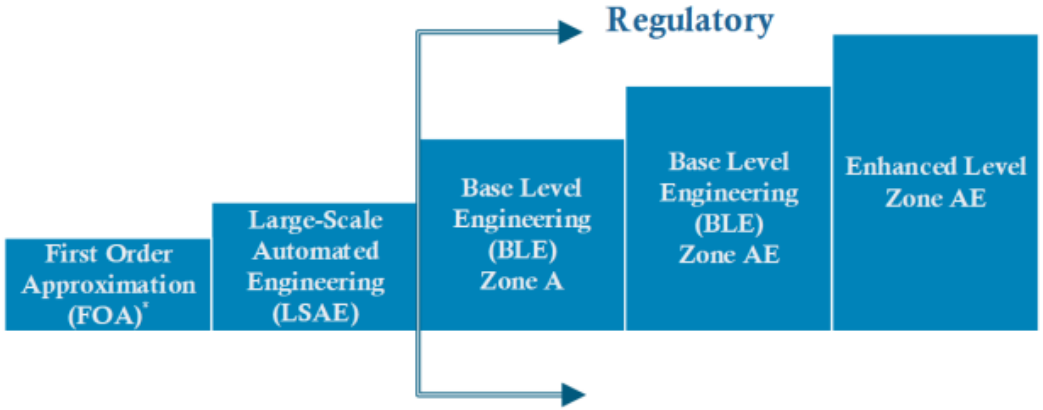


Data Development Scope



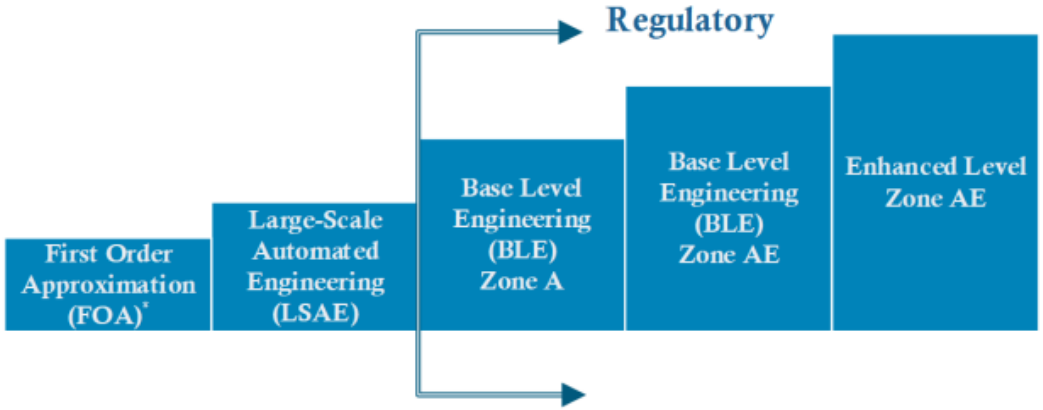
- **Zone A 2D BLE**
  - Additional Calibration to:
    - Gage Analysis for watershed
    - Rainfall-Runoff Modeling (HEC-HMS) in watershed
    - Historical Information
  - No Base Flood Elevations (BFEs) on the regulatory map, but available
  - Water Surface Elevation and Depth Grids generated
  - 2D Zone A BLE is easily scalable to enhanced Zone AE.

Data Development Scope



- **Zone AE**
  - Culvert and bridge openings are included in the modeling
  - Added detail to breaklines and land cover data in the modeling
  - Additional calibration to:
    - Gage Analysis
    - Rainfall-Runoff Modeling (HEC-HMS)
    - Historical Information
  - May have a floodway
  - Base Flood Elevations (BFEs) will be shown on the regulatory map
  - Water Surface Elevation and Depth Grids will be generated

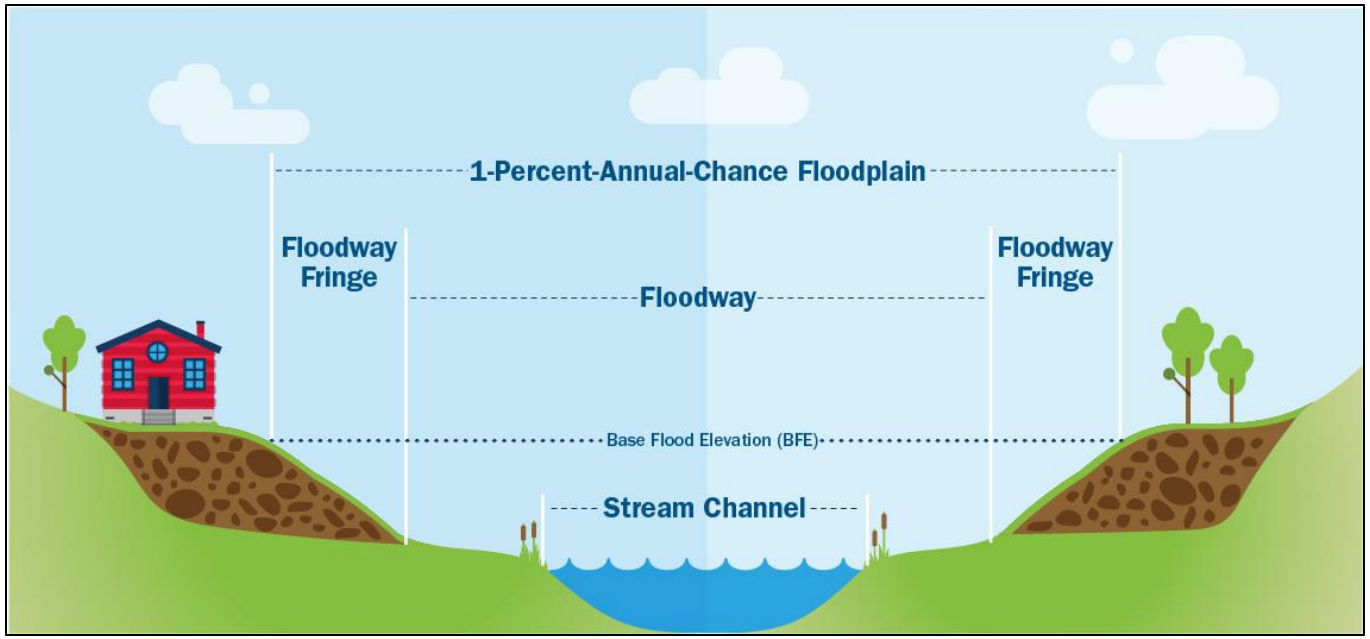
Data Development Scope

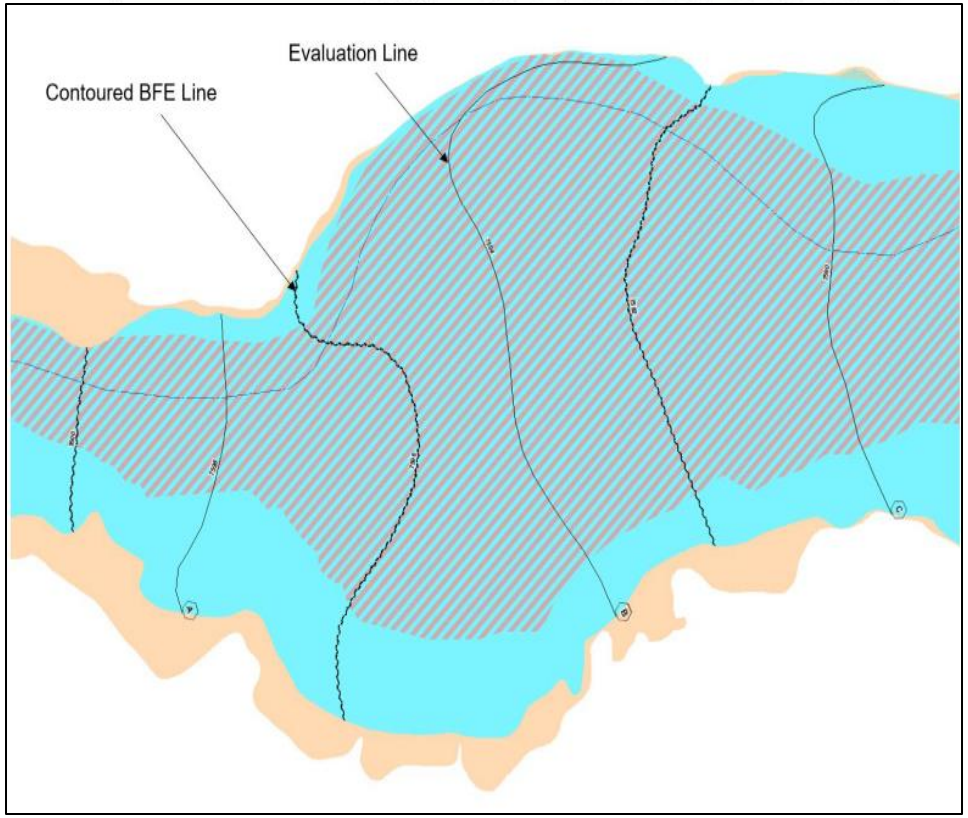


- **Static AE**
  - Static Elevations determined from:
    - Statistical Analysis of stage data
    - Rainfall-Runoff Modeling (HEC-HMS)
  - Base Flood Elevations (BFEs) will be shown on the regulatory map
  - Water Surface Elevation and Depth Grids will be generated

What is a Floodway?

- Zone AE: with or without a floodway
  - If there is a floodway on the current map, the new map must have a floodway
  - If there is not a current floodway, a floodway is optional





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Next Steps and Your Role in the Process

Project Timeline

Discovery Meeting: Today!

- *What data could contribute to making the map as accurate as possible?*
- *Revisit what flood risk reduction steps you are considering and how we can help!*
- *Provide feedback on data development scope, and mapping needs*

Data Development Work:

- *Rawlins County (~2024)*
- *Decatur County (~2024)*
- *Thomas County (~2024)*

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

Project Timeline, continued

Once **feedback is received,** there is a public review of the draft maps

- *We'll need your help in getting the word out to your residents*

Preliminary Map Products

Post-Preliminary Processing

Kansas Department of Agriculture Division of Water Resources

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STEP ONE: Provide Feedback on the BLE Maps

We want to incorporate your feedback into our work ahead.
This could include:

- Review BLE floodplains and comment
- Review stream extents and comment
- Provide information on community needs or areas of specific concern.
  - Intersections that often flood and stop traffic
  - Drainage problems
  - Parts of town where homes or businesses have flooded

How?

- Provide comments directly on the map (we'll show you how in a minute)
- Email this team
- Call one of us!

STEP TWO: Provide Insight and Data

Provide information that would be useful for our mapping team to be aware of.

- Are there areas of recent construction/development?
- Are there plans for new construction/development?
- Are there tricky areas that may require a closer look?
- Do you have projects underway, related to flooding, that we could help with?
- Do you have information you have about past flooding, such as high water marks?
- Do you have updated Aerial Imagery (We typically use the latest imagery from NAIP)?
- Do you have survey or as-built plan information (culverts, bridge openings, channel geometry)?
- Are there any revision approved for your previous map (Letters of Map Revision or Amendments)?

STEP THREE: Review Modeling Approach

Provide input on our proposed approach for the Data Development that will inform your regulatory map (also known as your Flood Insurance Rate Map, or FIRM)

- Comment period goes until 9/5/2022 (More time can be provided if needed)

Benefits of joining the NFIP!

- Property owners would be able to insure against flood losses
- Qualify for federal grants or loans for development
- Qualify for federal disaster assistance for damages caused by a flood
- Adoption of a floodplain management ordinance leads to smart development against flood risk

Key Takeaways

- This process is going to take time.
- Your involvement will help us produce better maps!
  - Get the word out and encourage participation in this project.
  - Review information as it becomes available.

DON'T HESITATE TO CALL; WE ARE AVAILABLE.

Stay Informed

- Email List
  - Get us names, addresses, and titles
  - Will be main source of project updates

- Project Updates
  - When important milestones are reached
  - When action is necessary (reminders)

- Meetings
  - Five planned meetings
    - **For BLE/Discovery:** Kickoff (**DONE**), Discovery Meeting (**Today!)**
    - **For Regulatory Updates:** Flood Risk Review, Open House, Post-Preliminary CCO meeting
  - Others, as needed

Resources and Contact Information

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/lists/mapping-projects/
- **Web Review Map**
  - Review of BLE data
  - https://gis2.kda.ks.gov/gis/upper_republican/
  - This link will not be public facing until the project has been through Data Development
- **Story Maps**
  - Project Info
  - "Floodplain Current:" Mapping Process 'Nuts and Bolts'

Base Flood Elevation Portal

For Zone A floodplains, you can request BFE data. Keep in mind, BLE data is subject to change.

https://maps.kgs.ku.edu/fpm_bfe/login.cfm

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Any Questions?

Interactive Map Review and Discussion

Web Map Link:
https://gis2.kda.ks.gov/gis/upper_republican/

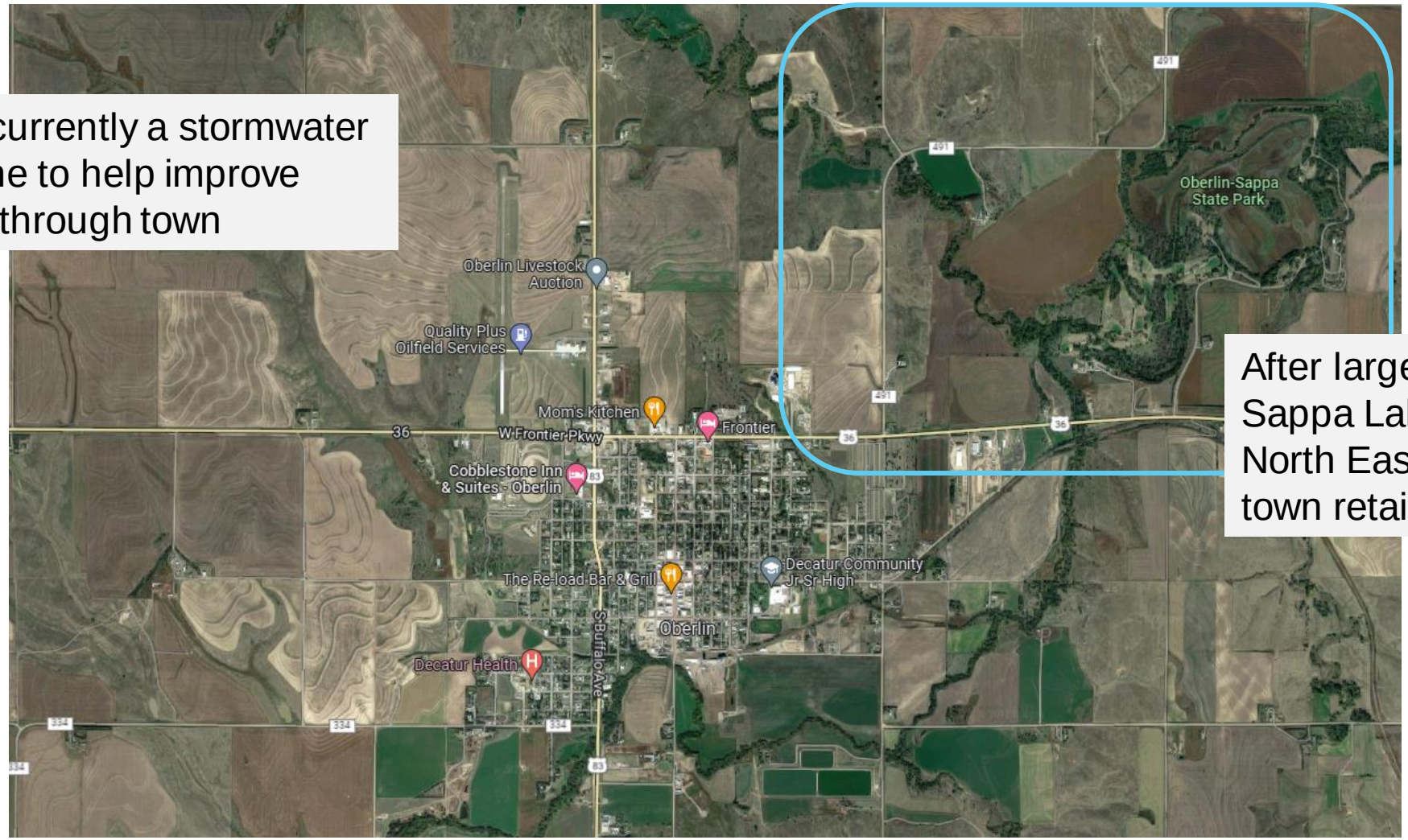
Community Identified Problems

- Communities that stated flooding as a concern were the Cities of Oberlin, Brewster, and Colby

- Stated Areas of concern:
  - City of Oberlin- Northeastern Side of town (Sappa Lake)
  - City of Brewster- Southwest Side of town
  - City of Colby- North edge of town (Prairie Dog Creek)

City of Oberlin

There is currently a stormwater study done to help improve drainage through town



After large storms, Sappa Lake and the North East side of town retain water

Kansas Department of Agriculture Division of Water Resources

AECOM

City of Brewster

There is a flooding issue on the southwest side of town near the railroad. The railroad has installed a 16-inch drainage pipe that has backed up causing issues

Kansas Department of Agriculture
Division of Water Resources

AECOM

City of Colby

There is flooding along North Range Avenue that could pose an issue for properties along the road