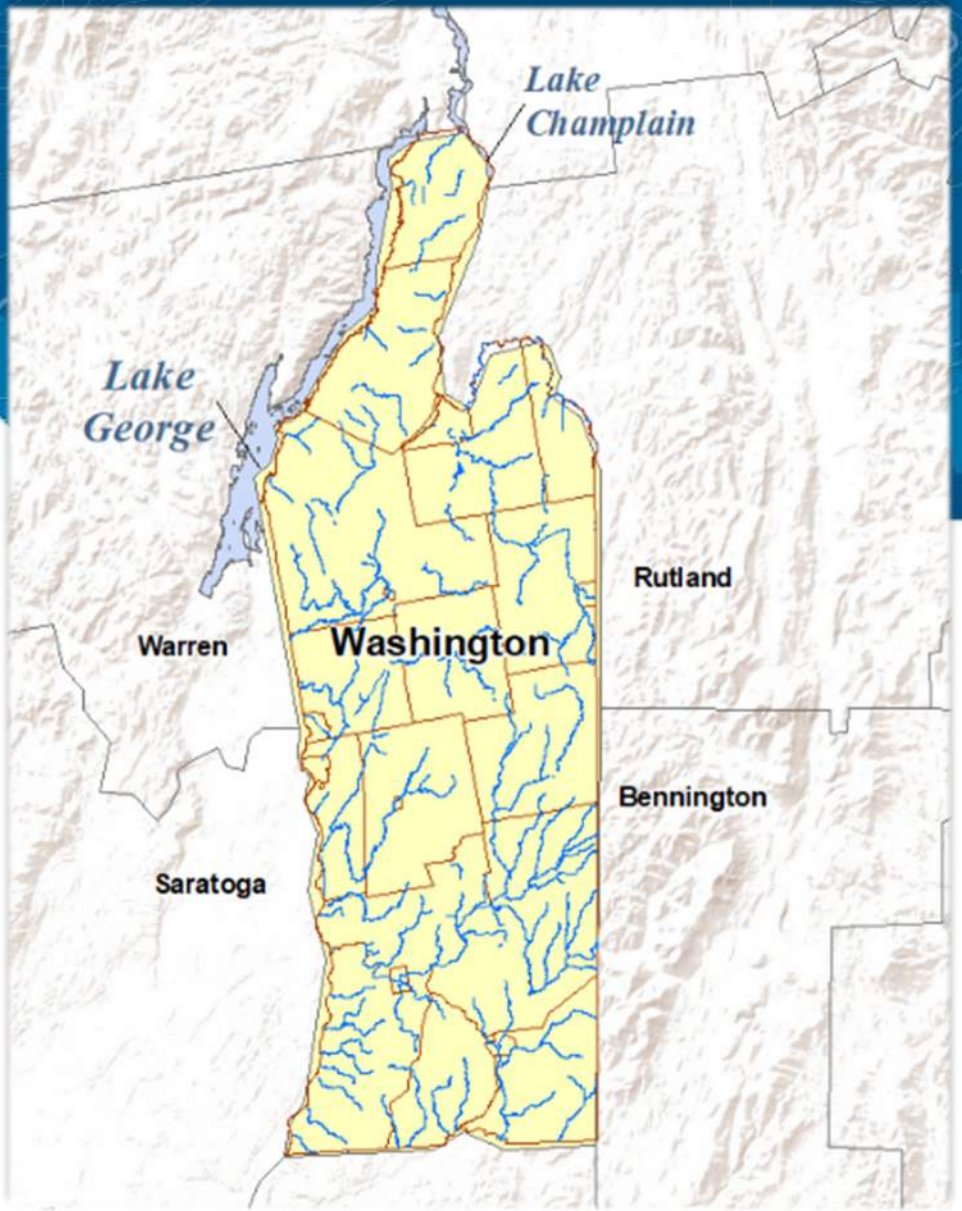
RiskMAP
Increasing Resilience Together

Flood Risk Project

Washington County, NY
Project Kick Off Meeting

March 6, 2019

FEMA



Please Introduce Yourself

- **Name**
- **Role**
- **Organization**

Also, what do you hope to gain from our meeting today?

As partners with FEMA, it's important we create dialogue about your needs for flood risk information.

Please sign in!

Today's Goals

1	2	3
The value of updated flood maps for your community	Recap of Flood Risk Study history, including Discovery and Ongoing Studies	Review county-wide study scope, products and outreach process

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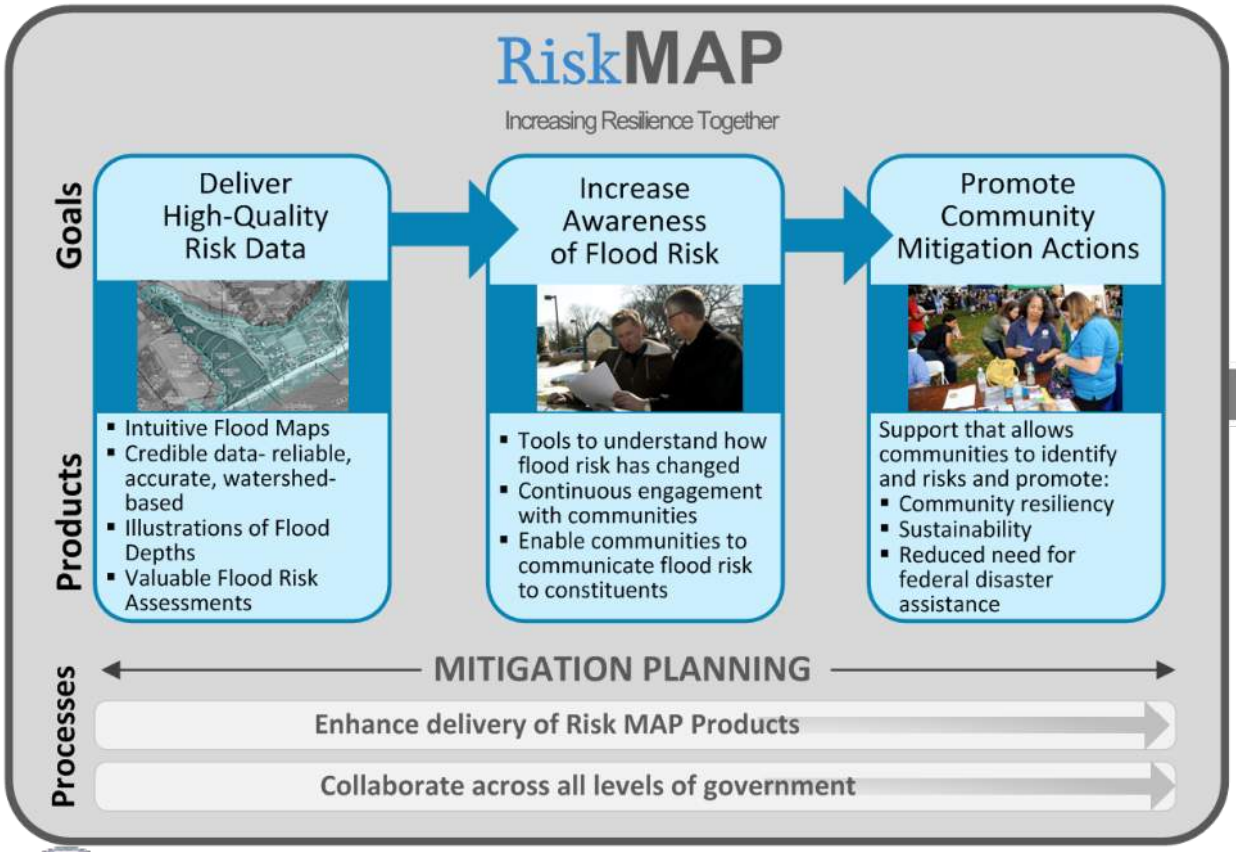
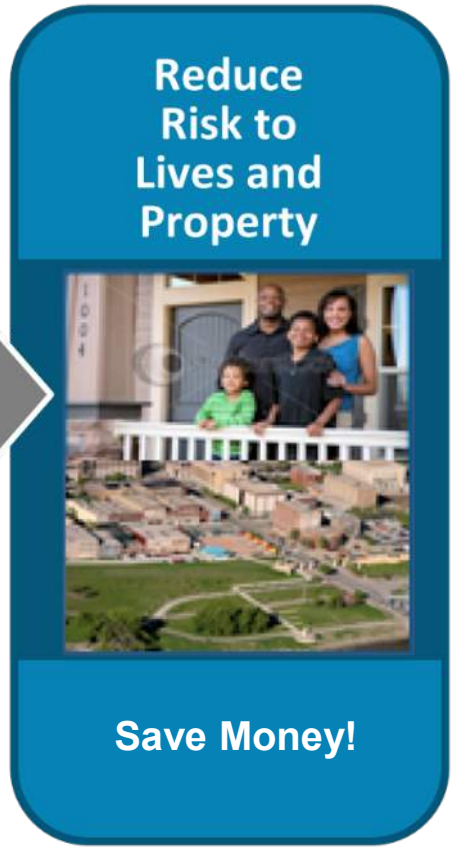
FEMA Mitigation Division

Risk Analysis Branch

Goal: Stronger and Safer Communities





The Value of Updated Flood Maps for Local Communities

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Flood Maps Guide Progress By:

Identifying and Assessing Flood Risk

Establishing Flood Insurance Rates

Determining Local Land Use

Informing Engineers and Developers

Equipping Emergency Managers

Why Update Flood Maps?

NFIP Policies for affected communities	NFIP Claims for affected communities	FEMA Insurance Claims Paid in affected communities	Hazard Mitigation Plan
81	144	$29,116,900	Released in August 2018

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How did we get here?
Review past activities

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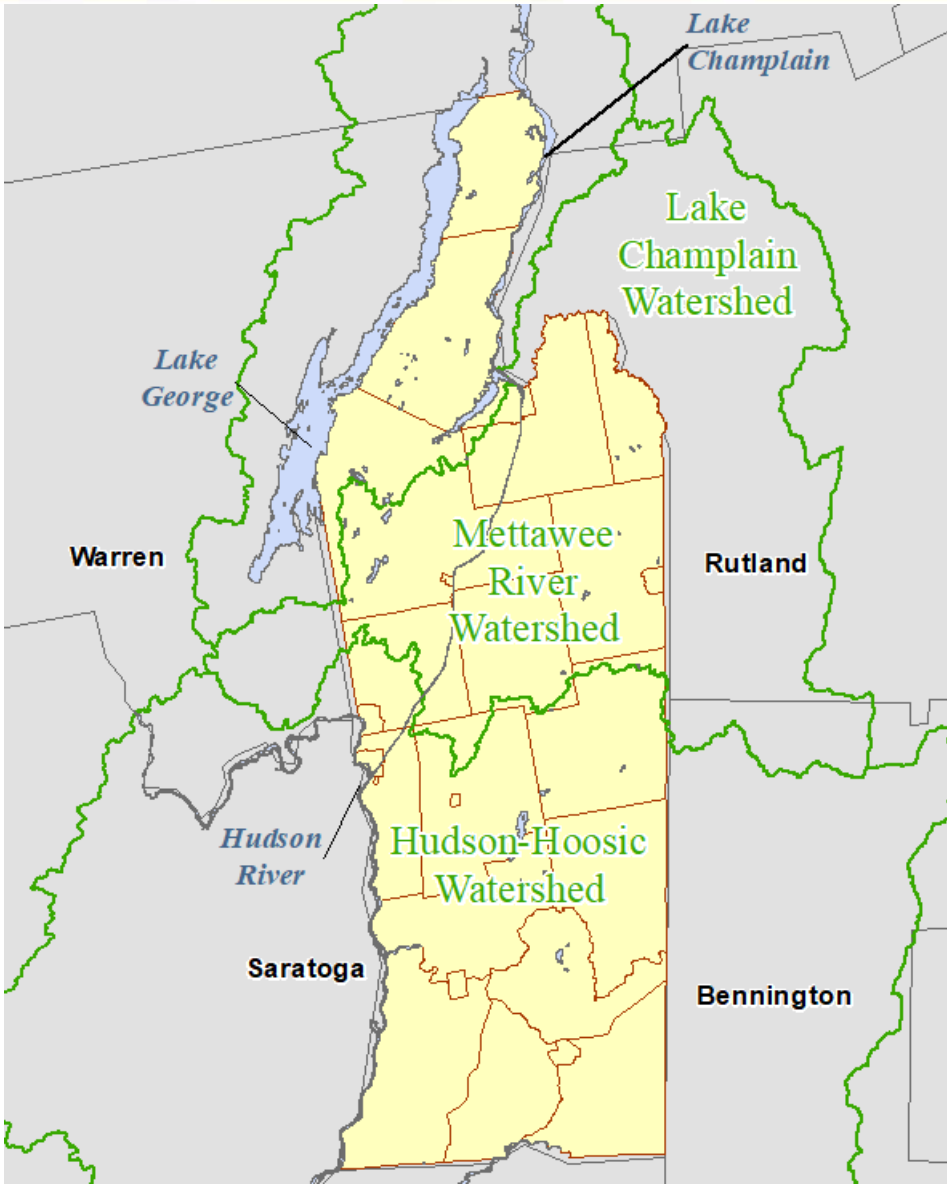
Discovery/Post-Discovery Progress
Recap

- Risk MAP Discovery meetings held June 2016 (Lake Champlain Watershed) and October 2012 (Hudson-Hoosic Watershed)
- FEMA reviewed community input to determine priorities



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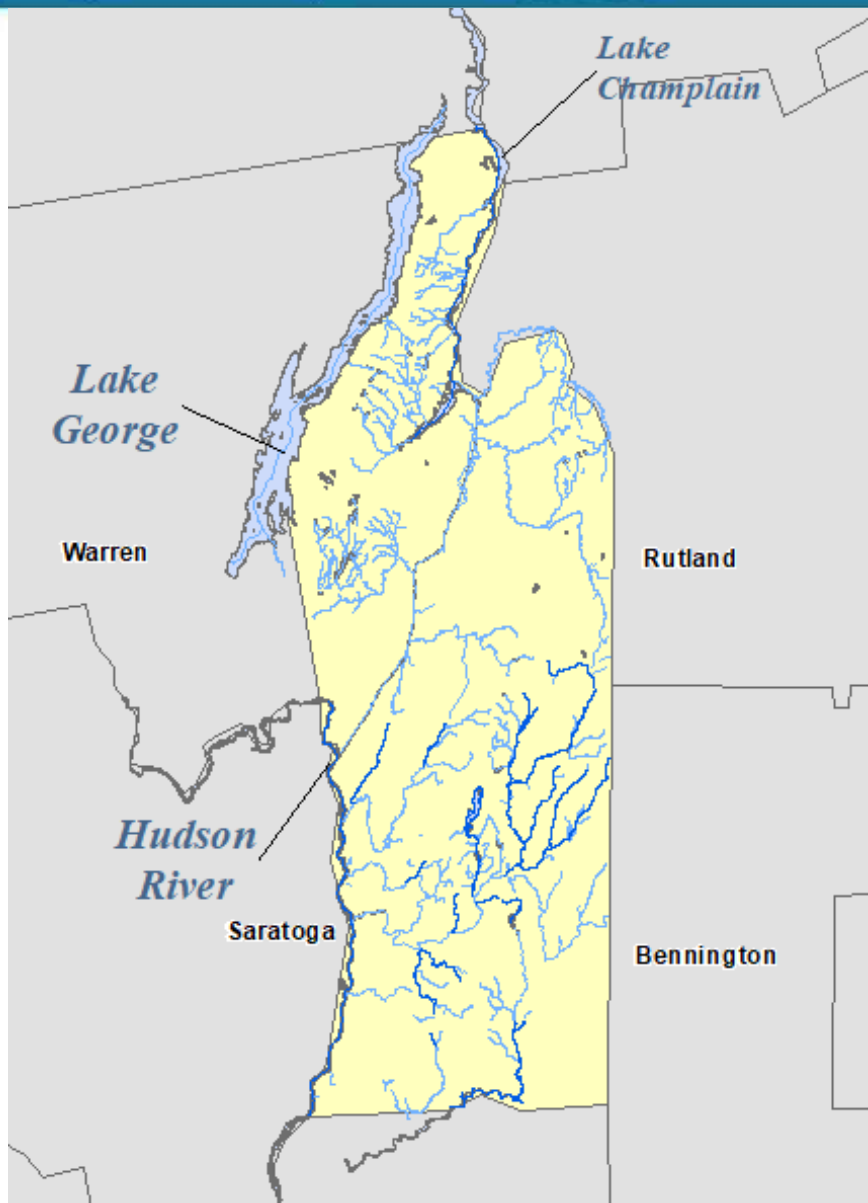
Ongoing Study Project
Recap

- FY 2012 Study
  - Flood Risk Review Meetings 11/14/2016-11/15/2016
- FY2016 Study
  - Flood Risk Review Meetings 4/16/2018-4/17-2018
- Whitehall Levees Along Champlain Canal and Wood Creek:
  - Local Levee Partnership Team Meeting 09/25/2018
  - Natural Valley Letters sent 1/17/2018



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What is being studied now?
Discuss scope of new study

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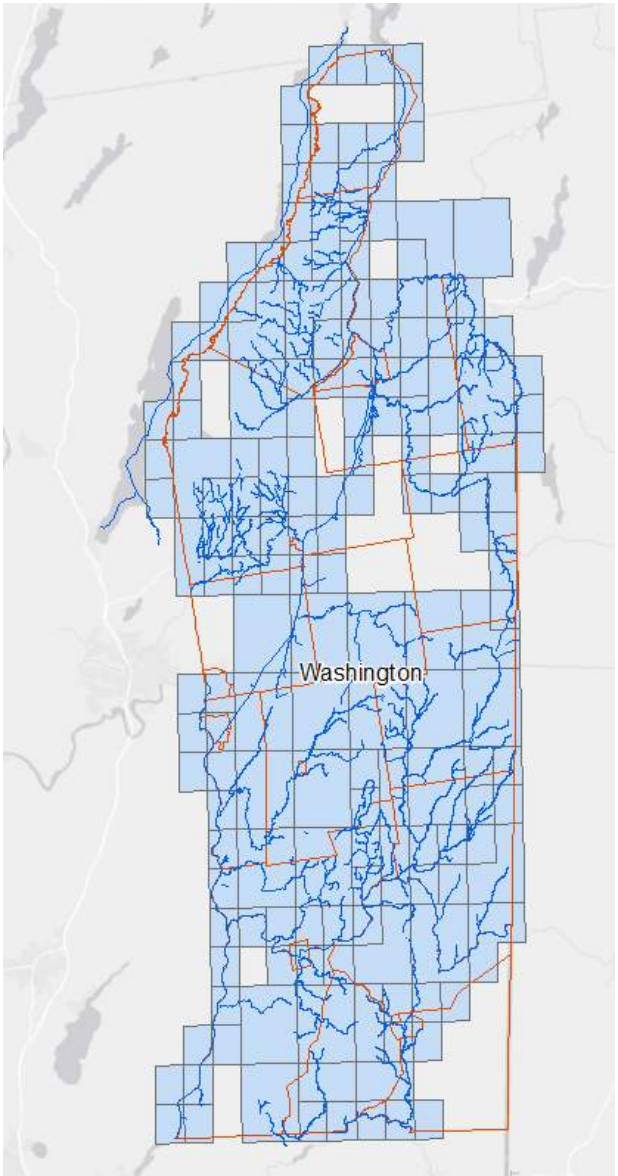
Washington Co., Countywide Flood Risk Study
Scope

- **First time digital countywide maps**
- **Additional flooding sources analyzed**
  - 101 miles - Detailed (AE) streams and lakes
  - 459 miles – Approximate (A) streams and lakes
- **Includes Lake Champlain and Hudson-Hoosic Watershed study**
- **25 affected communities**
- **174 map panels**
- **Multiple touchpoints**



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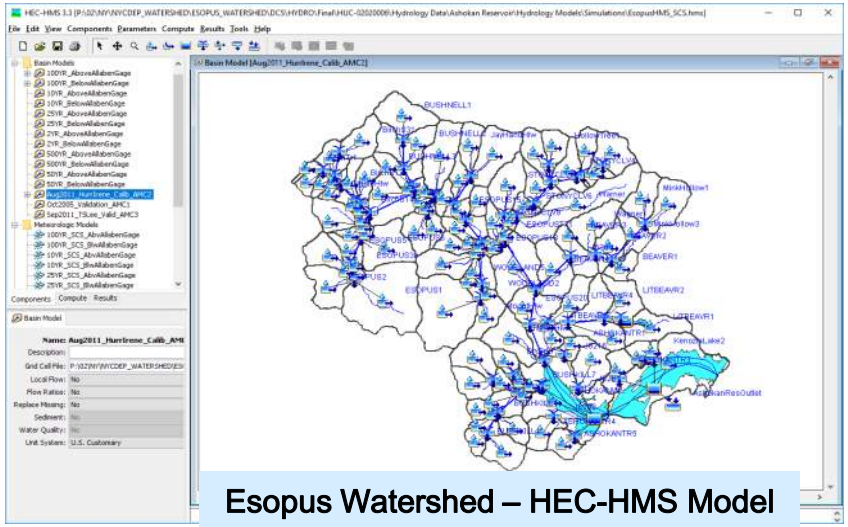
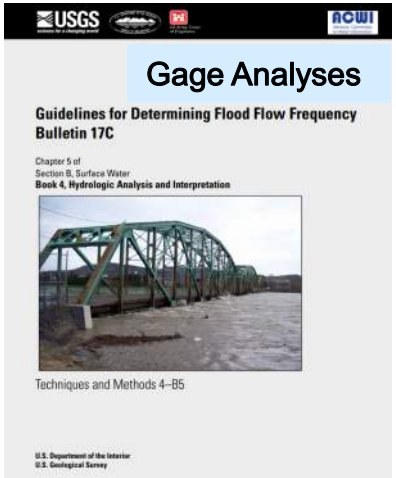
Hydrologic Analysis

- Typical Methods FEMA utilizes
  - Statistical Gage Analyses
  - Regression Analyses
  - Rainfall Runoff Modeling
- Gage/Regression are based on availability stream gage data
- Rainfall-Runoff physical modeling chosen due to limited gage data
  - Using USACE's HEC-HMS Program
- Special Case: Gage/ Dam Operations Analysis for Lake George Stillwater level
- Discharges developed for
  - 10%, 4%, 2%, 1%, 1%+, 1%-, 0.2%
  - Inputs for hydraulic analyses



Esopus Watershed – HEC-HMS Model

Regression Report



Gage Analyses

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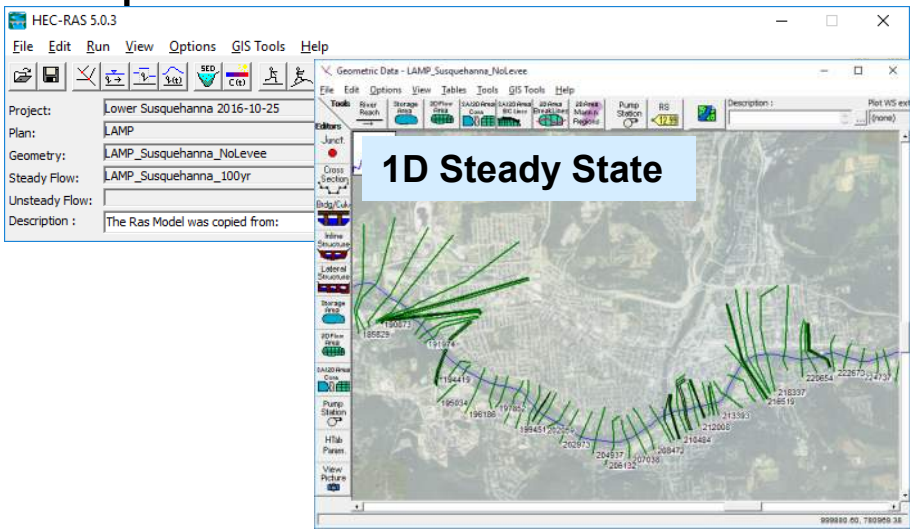
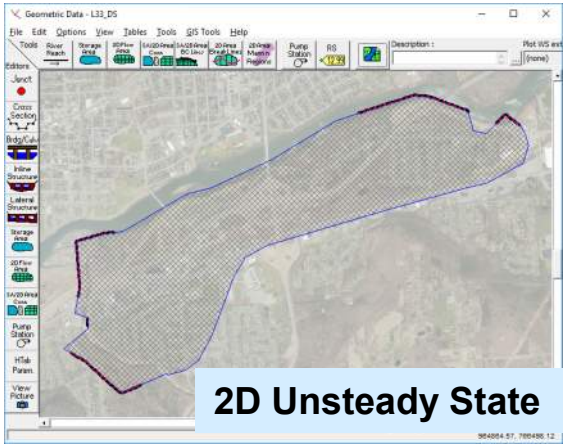
Hydraulic Analysis

- Types of Analyses
  - One-Dimensional (1D) Steady State
  - One-Dimensional (1D) Unsteady State
  - Two-Dimensional (2D) Unsteady State
- Modeling developed using USACE's HEC-RAS Program.
- Terrain Data – 2012 LiDAR (FEMA 2-m), 2013 (NY 2-m) and 2015 (NY 1-m)
  - Provides topographic elevation information
  - Supplemented by field survey
- Field Survey for Detailed only
- Flood Hazard Data Generated
  - Elevations: 10%, 4%, 2%, 1%, 1%+, 1%-, 0.2%
  - Floodplain extents: 1%, 0.2%

Susquehanna River – HEC-RAS Models





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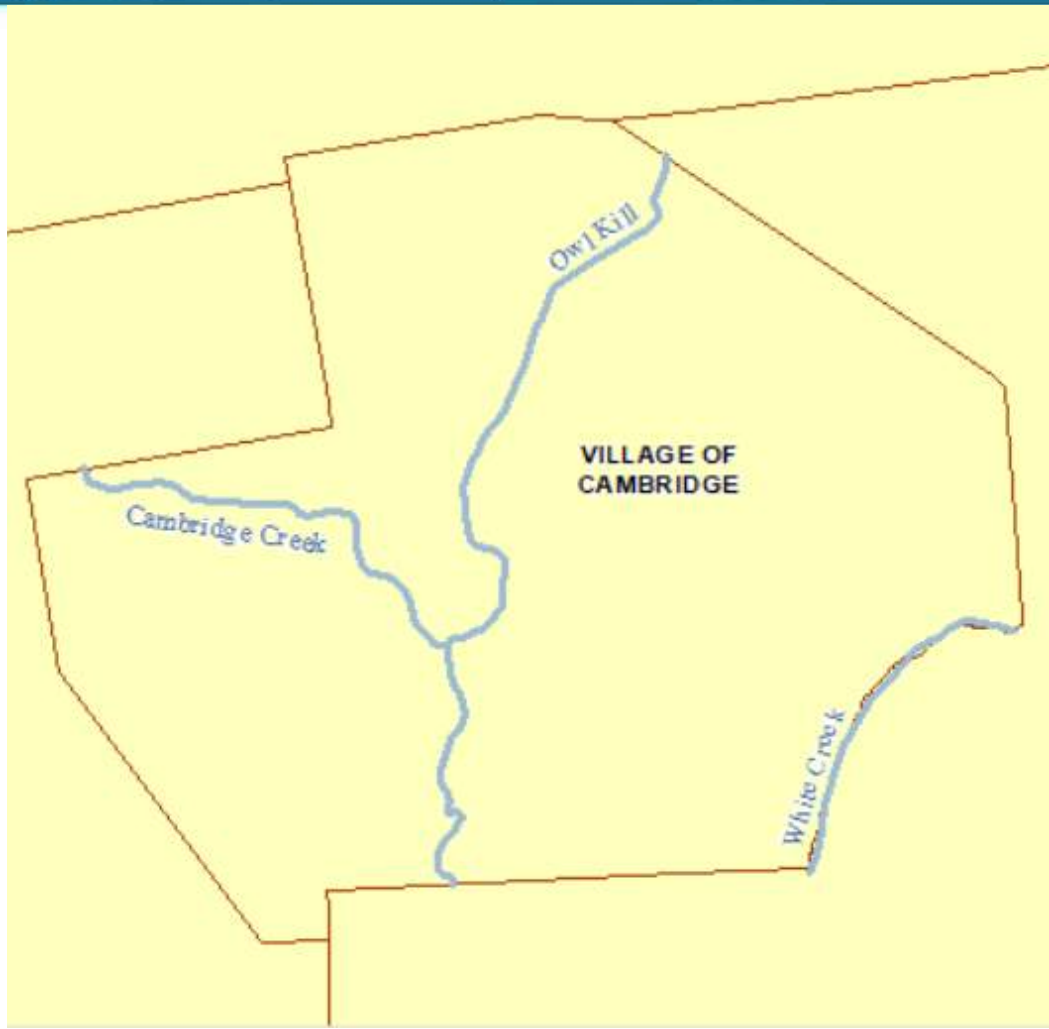
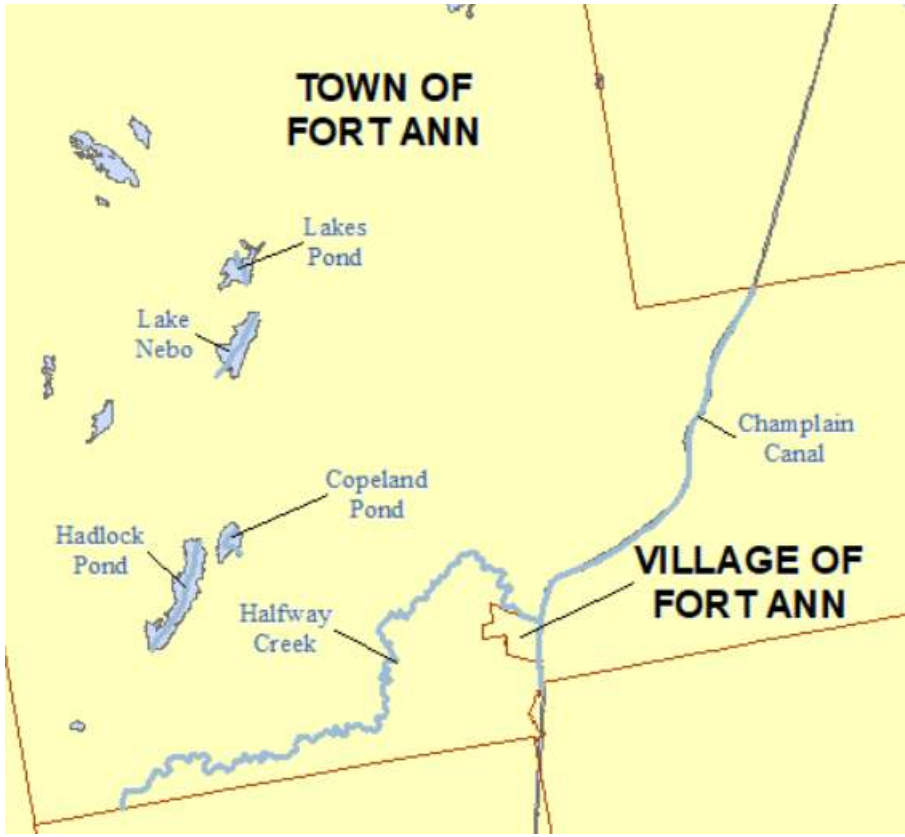
Village of Cambridge – New AE Studies

- **Total Mileage: 3.1 miles**
  - Owl Kill (1.6mi)
  - Cambridge Creek (0.9 mi)
  - White Creek (0.7 mi)
- **Detailed Restudy:**
  - Affects the Village of Cambridge and the Town of White Creek
  - 1D modeling for entire study reach



Town/Village of Fort Ann– New or Restudied AE

- **Total Mileage: 20.1 miles**
  - Champlain Canal (6.0 mi)
  - Halfway Creek (10.7 mi)
  - Copeland pond (0.5 mi)
  - Hadlock Pond (1.5 miles)
  - Lake Nebo (0.9 mi)
  - Lakes Pond (0.5 mi)
- **Detailed Methods:**
  - Affects the Village of Fort Ann and the Town of Fort Ann
  - 1D unsteady-state for Champlain Canal
  - 1D steady-state for Halfway Creek
  - Ponds/Reservoirs modeled by hydrologic routing through the reservoir

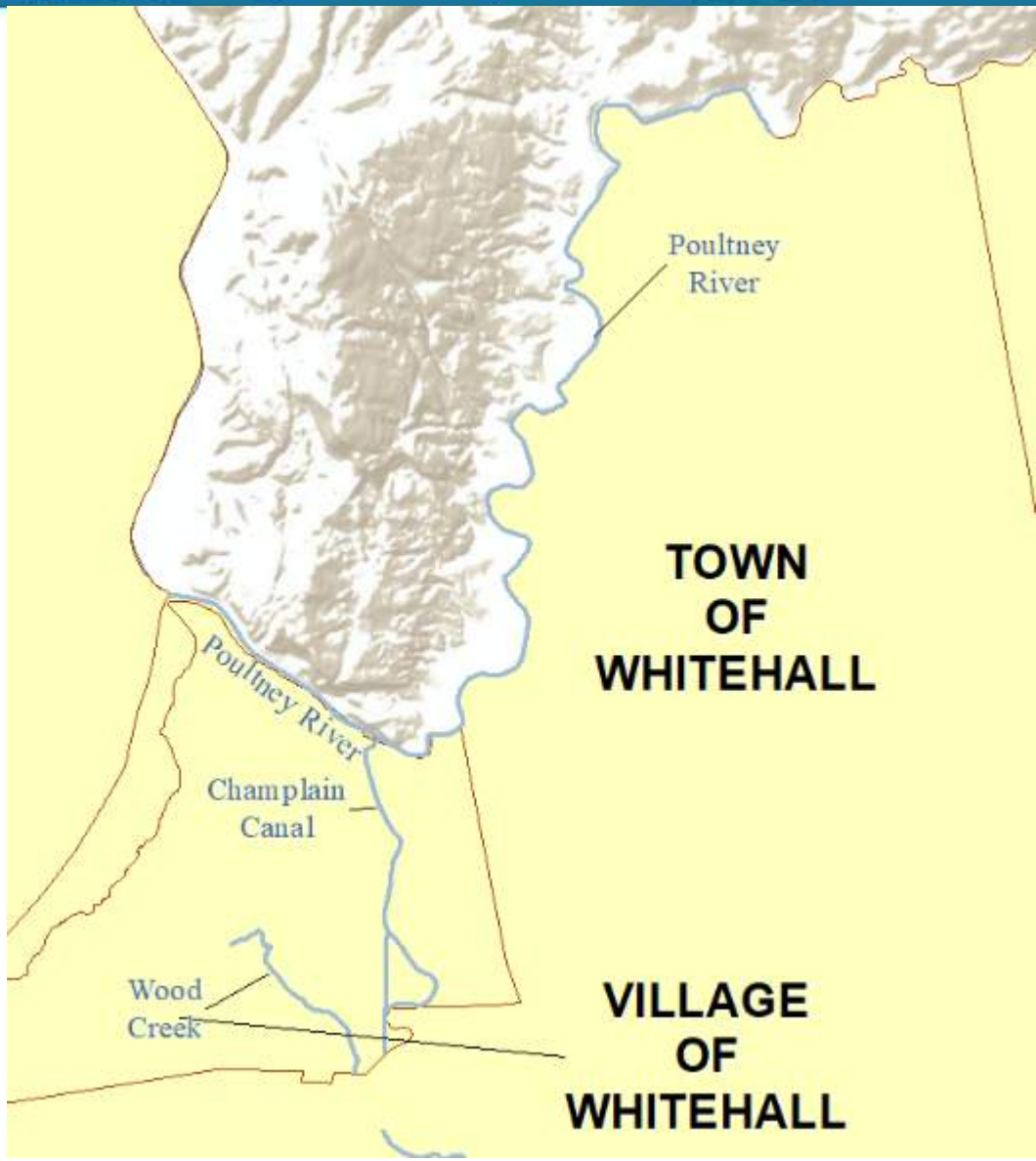


Mettawee River/ Indian River - New Detailed AE

- **Total Mileage: 27.6 miles**
  - Indian River (7.0 miles)
  - Mettawee River (20.6 miles)
- **Detailed Methods:**
  - Communities affected: Town of Whitehall, Town of Granville, Village of Granville, and Town of Hebron
  - 1D steady-state models for both streams

Village of Whitehall- New Detailed AE

- **Total Mileage: 13.1 miles**
  - Champlain Canal and Overflow (2.9 miles)
  - Poultney River (8.9 miles)
  - Wood Creek (1.4 miles)
- **Detailed Methods:**
  - Poultney River and Wood Creek will be 1D Steady-State models
  - Champlain Canal will be 1D Unsteady-State



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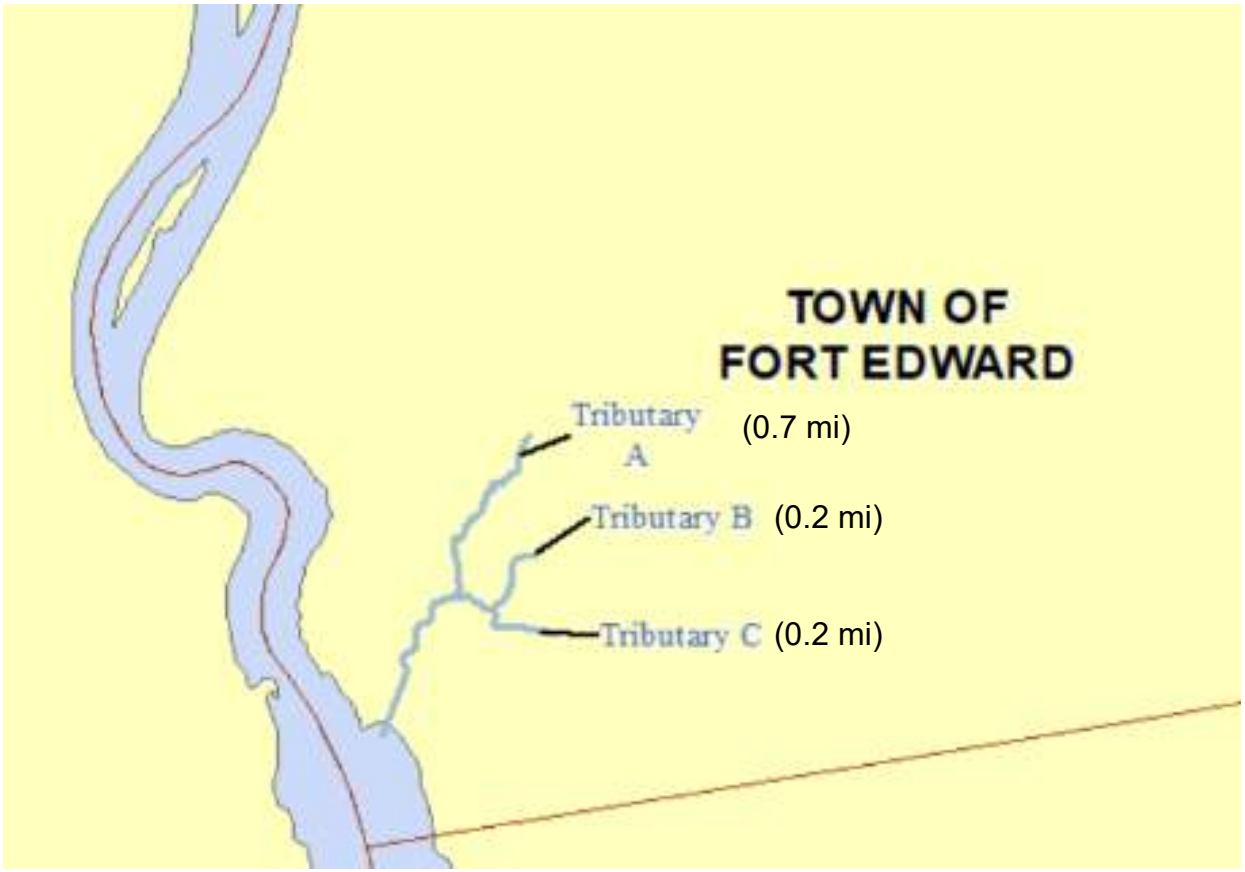
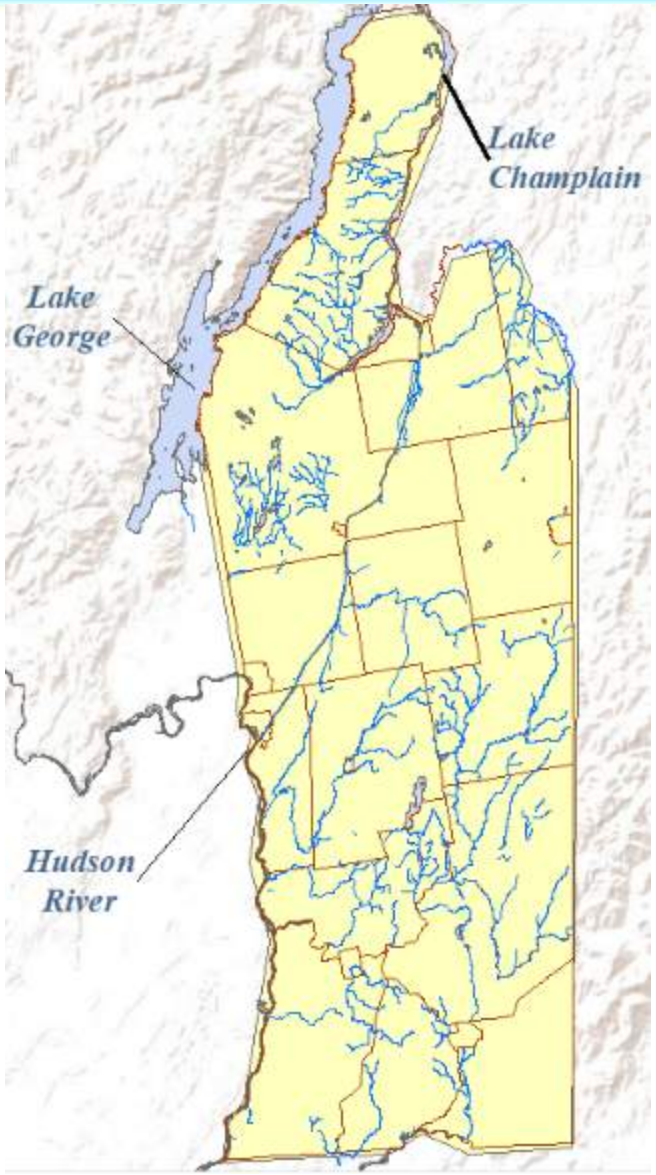
Town of Fort Edward - AE Restudies

- **Total Mileage: 1.1 miles**
- **Detailed Methods:**
  - 1D Steady-State Methods



Approximate Streams

- **Total mileage =459 miles**
- **1D Steady State Except for:**
  - Ponding area = volumetric calculation
  - Unsteady modeling will be used for portions of Champlain Canal, Wood Creek, and Unnamed Stream 17
- **Structures will be added with available data or approximated**
- **Floodplain extents for 1% and 0.2%**



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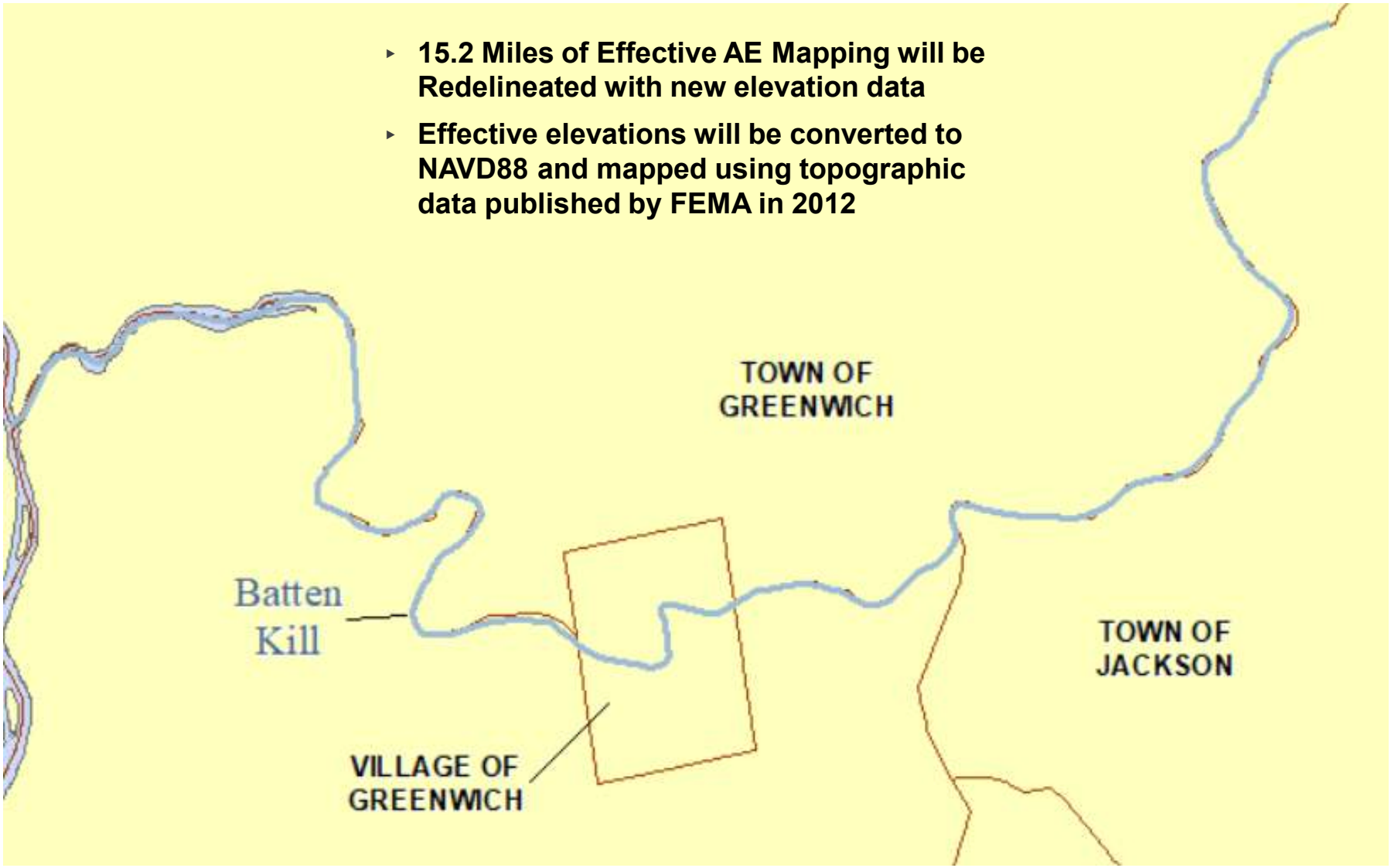
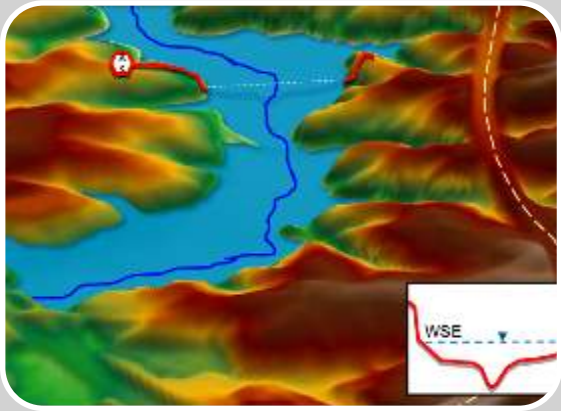
Redelineation

- 15.2 Miles of Effective AE Mapping will be Redelineated with new elevation data
- Effective elevations will be converted to NAVD88 and mapped using topographic data published by FEMA in 2012



Flood Hazard Analysis



Hydrology

Volume of water?

Peak Flows?

When will storm water or runoff make it to the stream?

Hydraulics

Will the stream in question be able to convey all storm water or runoff that arrives?

Floodplain Mapping

What areas of a community will be inundated based on engineering analysis?

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Where are we now and what is next?
Discuss next steps

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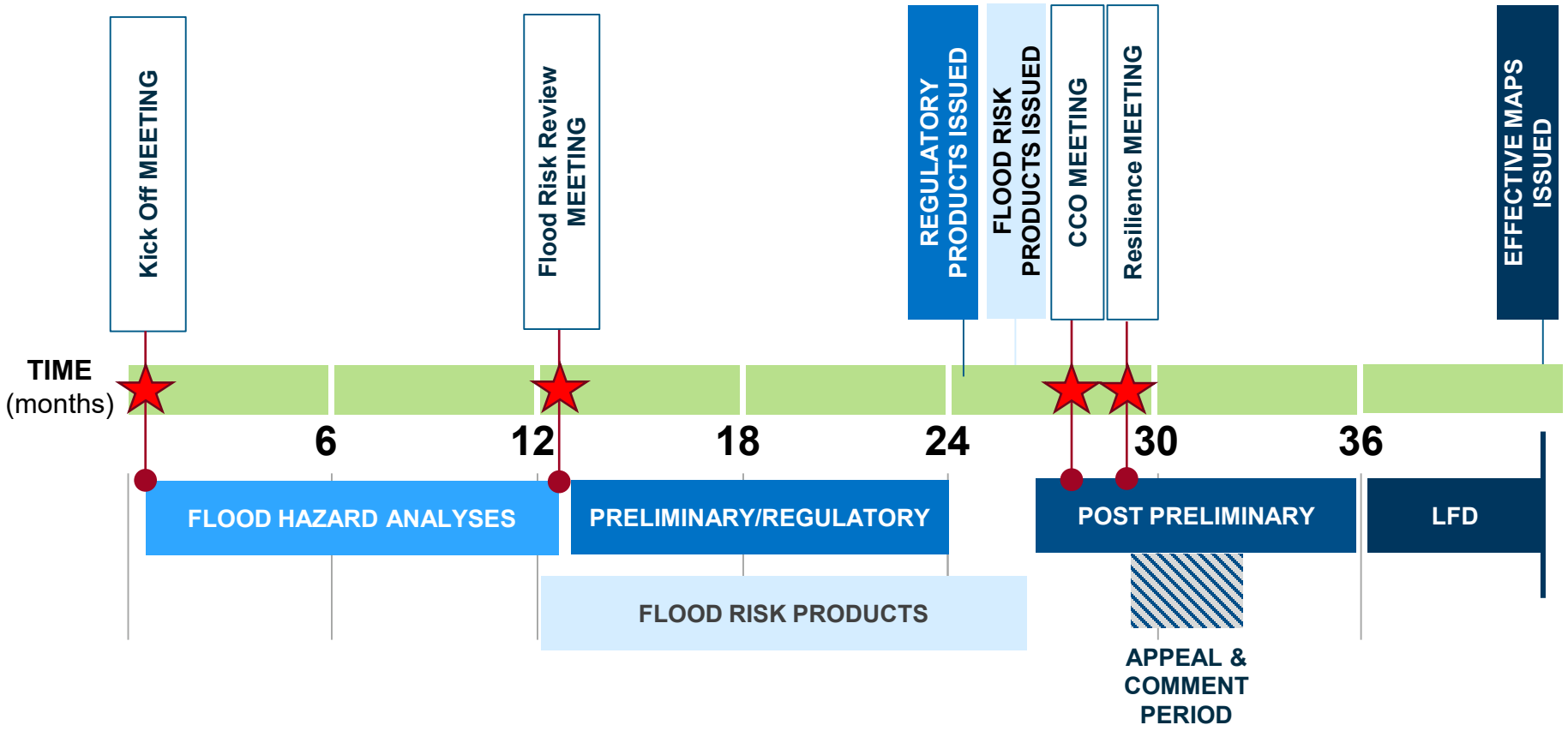
Overall Flood Risk Project Timeline



Major Study Milestones

- **Data Development (12 months)**
  - Terrain processing
  - Field reconnaissance and survey
  - Hydrologic modeling (620 letters)
  - Hydraulic modeling (620 letters)
  - Floodplain mapping (workmaps)
- **Flood Risk Review Meeting**
  - Work map products (14 months)
- **Regulatory Product Update (FIRM & FIS)**
  - Preliminary issuance (25 months)
- **Resilience Meeting**
  - Flood risk products (28 months)

What will communities receive?
Regulatory Products

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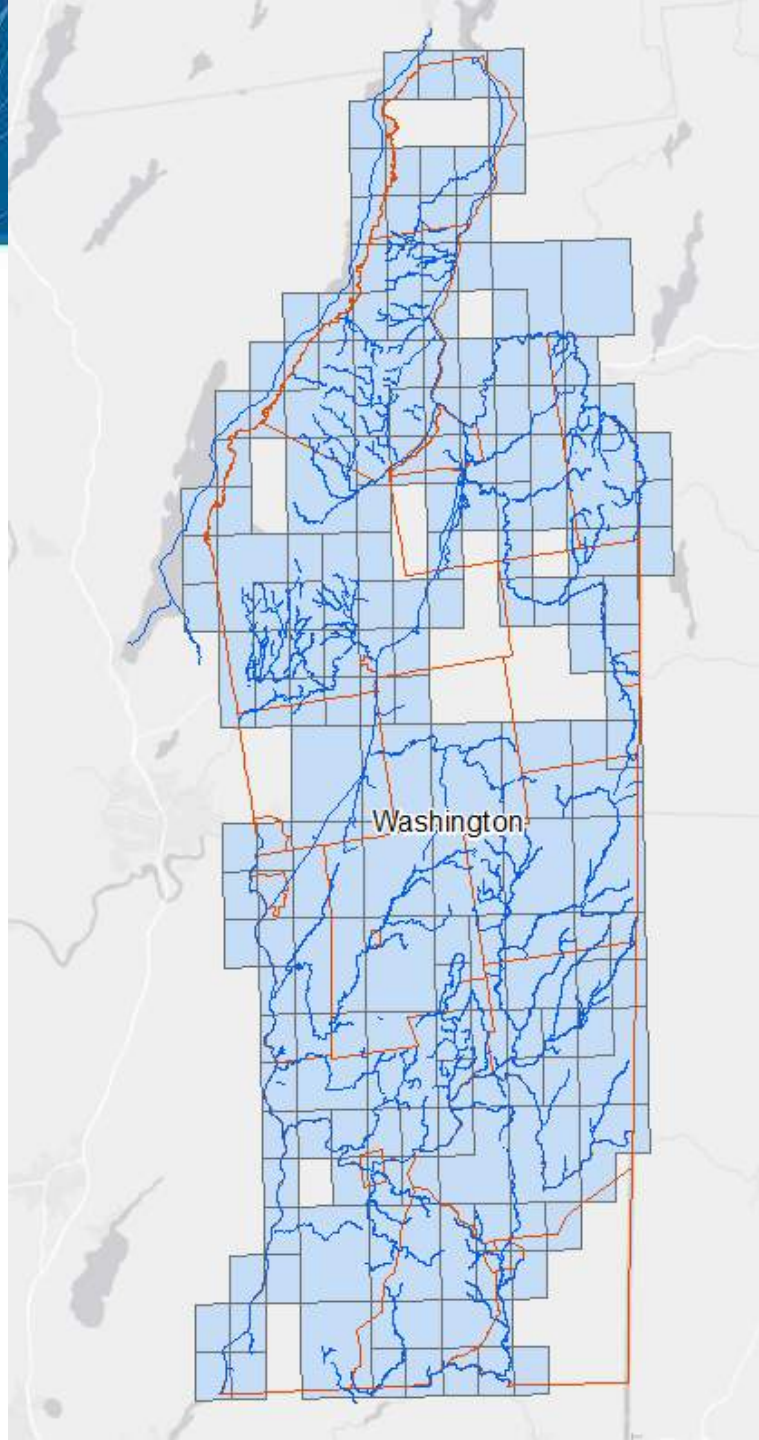
Work Maps

- **Draft floodplain mapping shared using work maps**
- **Flood Risk Review meeting provides a review of the new engineering analysis results, allowing communities to:**
  - Identify potential updates for Hazard Mitigation Plans
  - Provide insight and input on hydrology and hydraulic results in updated study area
  - Seek local buy-in and review possible use of analysis
  - Identify areas of large changes and potential opportunities for risk reduction
  - Identify risk communications needs and options

Regulatory Products

- **Regulatory product development commences after work map comment period**
- **Seamless countywide mapping produced**
  - Ongoing Studies
  - This Countywide Study
  - Incorporate LOMRs
- **Digital Flood Insurance Rate Map (DFIRM) Database**
- **174 FIRM Panels**
- **Flood Insurance Study (FIS) Report**



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Flood Insurance Rate Map (FIRM) *Example*

19181C_PRELIM_metadata.xml	XML Document
L_Comm_Info.dbf	dBASE Table
L_Comm_Revis.dbf	dBASE Table
L_ManningsN.dbf	dBASE Table
L_Meetings.dbf	dBASE Table
L_Mtg_POC.dbf	dBASE Table
L_Pol_FHBM.dbf	dBASE Table
L_Source_Cit.dbf	dBASE Table
L_Summary_Discharges.dbf	dBASE Table
L_XS_Elev.dbf	dBASE Table
L_XS_Struct.dbf	dBASE Table
S_Base_Index.shp	Shapefile
S_BFE.shp	Shapefile
S_FIRM_Pan.shp	Shapefile
S_Fld_Haz_Ar.shp	Shapefile
S_Fld_Haz_Ln.shp	Shapefile
S_Gen_Struct.shp	Shapefile
S_Hydro_Reach.shp	Shapefile
S_Label_Ld.shp	Shapefile
S_Label_Pt.shp	Shapefile
S_Nodes.shp	Shapefile
S_PLSS_Ar.shp	Shapefile
S_Pol_Ar.shp	Shapefile
S_Profil_Basln.shp	Shapefile
S_Stn_Start.shp	Shapefile
S_Subbasins.shp	Shapefile
S_Submittal_Info.shp	Shapefile
S_Trnsport_Ln.shp	Shapefile
S_Wtr_Ln.shp	Shapefile
S_XS.shp	Shapefile
Study_Info.dbf	dBASE Table

FLOOD INSURANCE STUDY

FEDERAL EMERGENCY MANAGEMENT AGENCY

VOLUME 1 OF 1

WARREN COUNTY, IOWA

AND INCORPORATED AREAS

COMMUNITY NAME	COMMUNITY NUMBER
ACKWORTH, CITY OF	190945
BEVINGTON, CITY OF	190273
CARLISLE, CITY OF	190274
CUMMING, CITY OF	190946
DES MOINES, CITY OF	190227
HARTFORD, CITY OF	190589
INDIANOLA, CITY OF	190275
LACONA, CITY OF	190752
MARTENSDALE, CITY OF	190524
MILO, CITY OF [1]	190618
NEW VIRGINIA, CITY OF [1]	190787
NORWALK, CITY OF	190631
SANDYVILLE, CITY OF [1]	190947
SPRING HILL, CITY OF	190949
ST. MARYS, CITY OF [1]	190948
WARREN COUNTY, UNINCORPORATED AREAS	190912

[1]No Special Flood Hazard Areas Identified

REVISED:
NOVEMBER 16, 2018

FLOOD INSURANCE STUDY NUMBER
19181CV000C
Version Number 2.3.3.2

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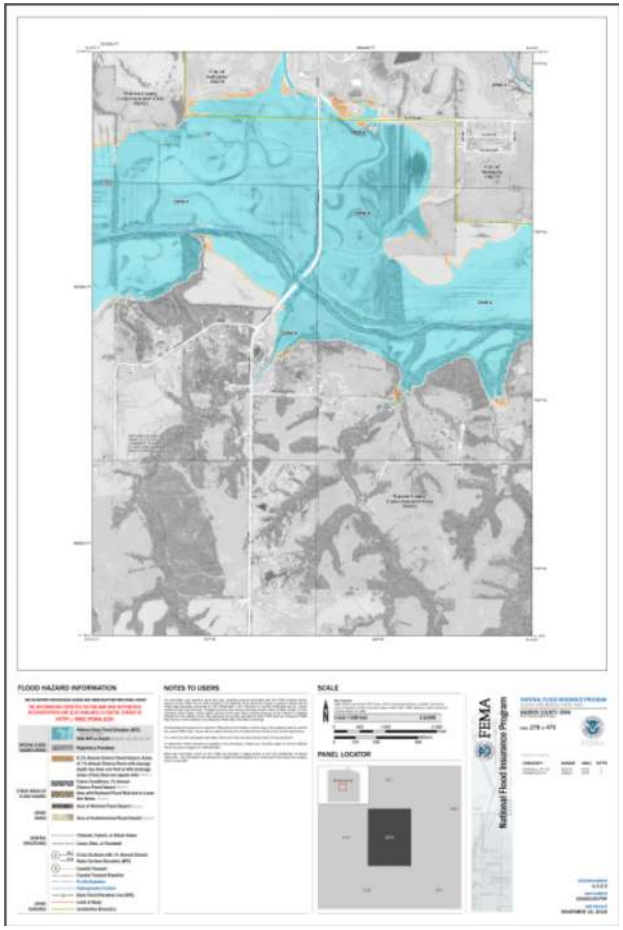

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What will communities receive?
Flood Risk Products

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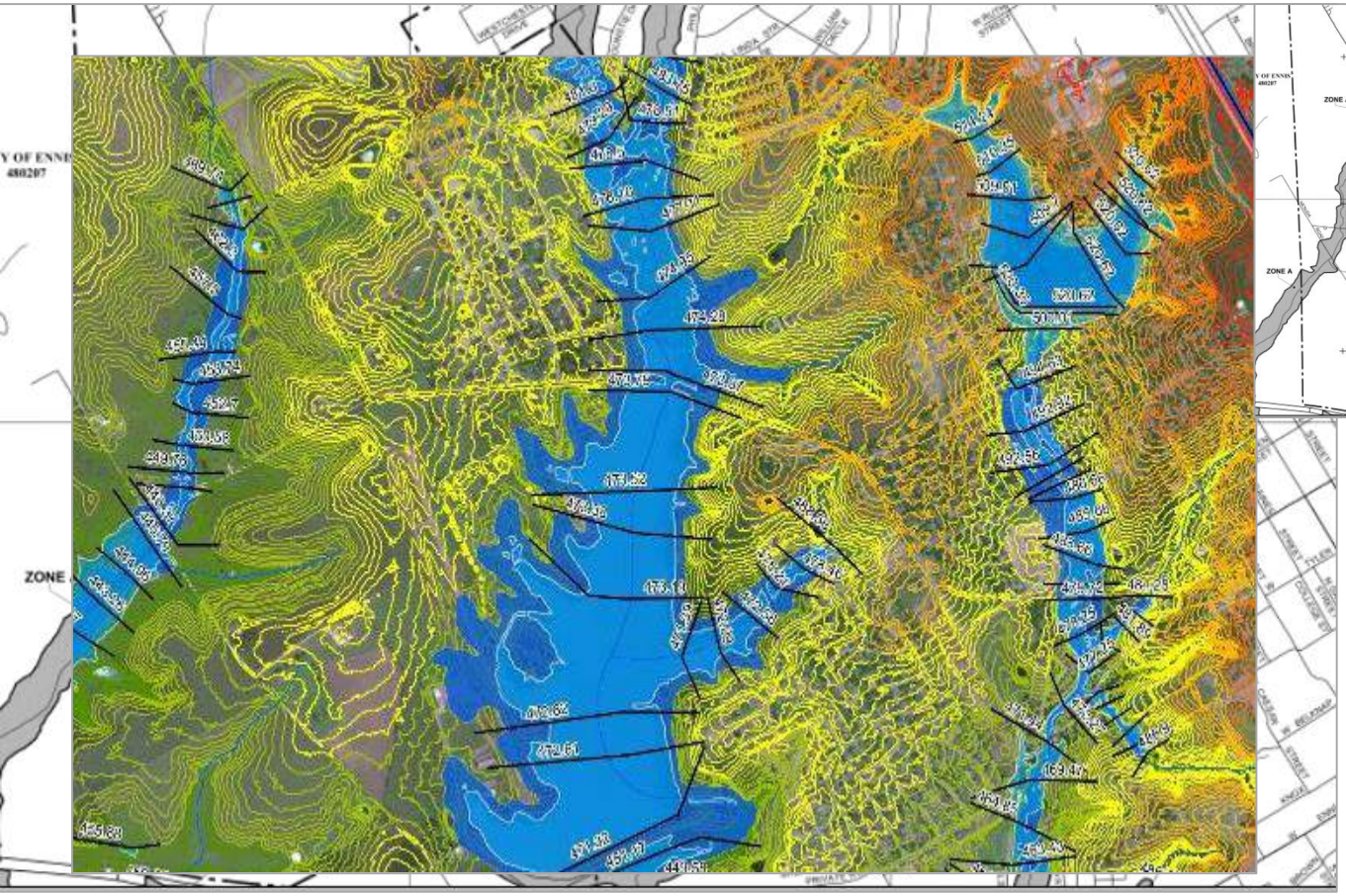
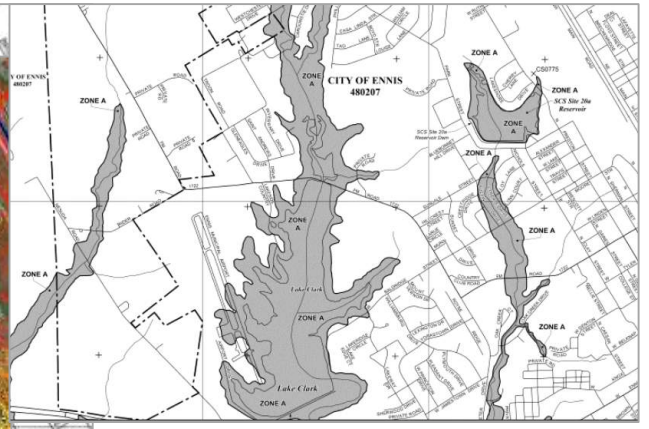
Knowing the Risk

If a community does not know or understand their risk, they may struggle to:

- Effectively plan use of resources for natural hazards and potential disasters;
- Implement effective hazard mitigation projects;
- Effectively regulate current and future development without increasing risk; and/or
- Effectively communicate about natural hazards to its residents about personal and community mitigation projects that can reduce long-term risk.

Flood Risk Datasets

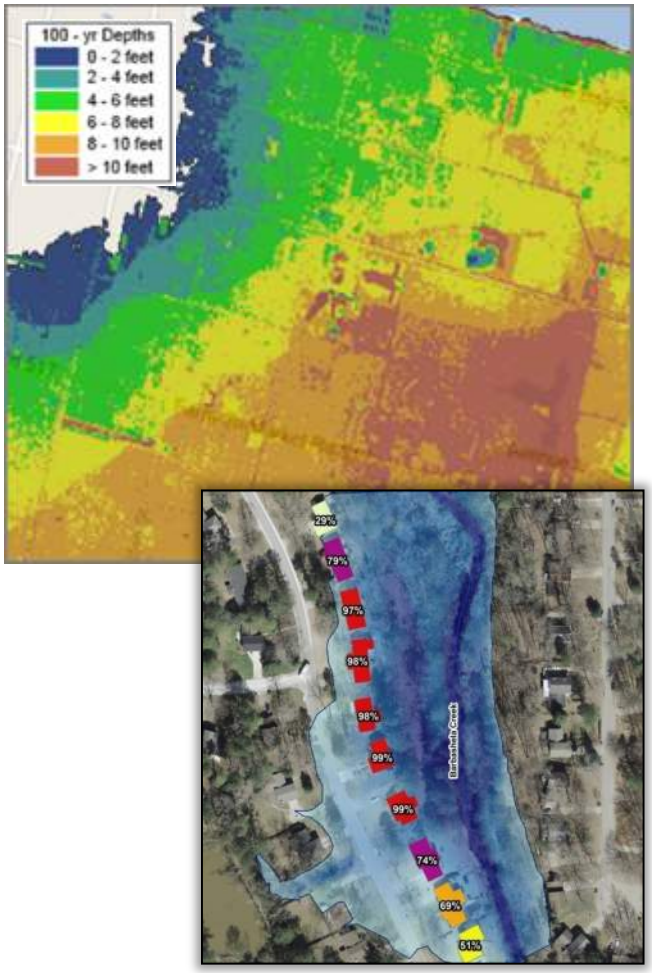




- Water Surface Elevation (WSEL) Grids
- Flood Depth Grids
- Freeboard WSEL Grids
- Annual Percent Chance Grids
- 30 Year Percent Grids
- Flood Risk Assessment

Products & Delivery Items:
Flood Depth and Analysis Grids

- **Flood hazard data provide the inputs to develop these products**
- **Flood Depth and Water Surface Grids**
  - Frequencies: 10%, 4%, 2%, 1% and 0.2%
- **Percentage annual chance of flooding Grid**
- **Chance of flooding over the average mortgage (30-year) time period grid**
- **Flood Risk Assessment Analysis (HAZUS)**
- **Areas of Mitigation Interest (AOMI)**



Flood Risk Database

- Flood risk products are stored and delivered in GIS format - Geodatabase
- Includes spatial & tabular data
- Facilitates infusion into local GIS systems and analyses

	Total Inventory		Estimated Potential Losses for Flood Event Scenarios									
			10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized ($/yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]
Residential Building and Contents Losses	$422,000,000	71%	$2,500,000	1%	$3,800,000	1%	$4,500,000	1%	$6,200,000	1%	$300,000	N/A
Commercial Building and Contents Losses	$122,800,000	21%	$2,300,000	2%	$3,700,000	3%	$4,200,000	3%	$5,600,000	5%	$300,000	N/A
Other Building and Contents Losses	$45,500,000	8%	$70,000	N/A	$100,000	N/A	$200,000	N/A	$200,000	N/A	$10,000	N/A
Total Building and Contents Losses[3]	$590,300,000	100%	$4,800,000	1%	$7,600,000	1%	$8,800,000	1%	$12,100,000	2%	$700,000	N/A
Business Disruption[4]	$0	N/A	$200,000	N/A	$200,000	N/A	$200,000	N/A	$200,000	N/A	$20,000	N/A
TOTAL[5]	$590,300,000	N/A	$4,900,000	1%	$7,700,000	1%	$8,900,000	2%	$12,100,000	2%	$700,000	N/A

Dam Breach Analysis

- Up to 5 Medium/High Hazard Dams analyzed
- Engineering analyses developed for FIRM will be leveraged
- Flood Inundation Maps will be developed

Contacts

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Questions? Comments?

Thank you!

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