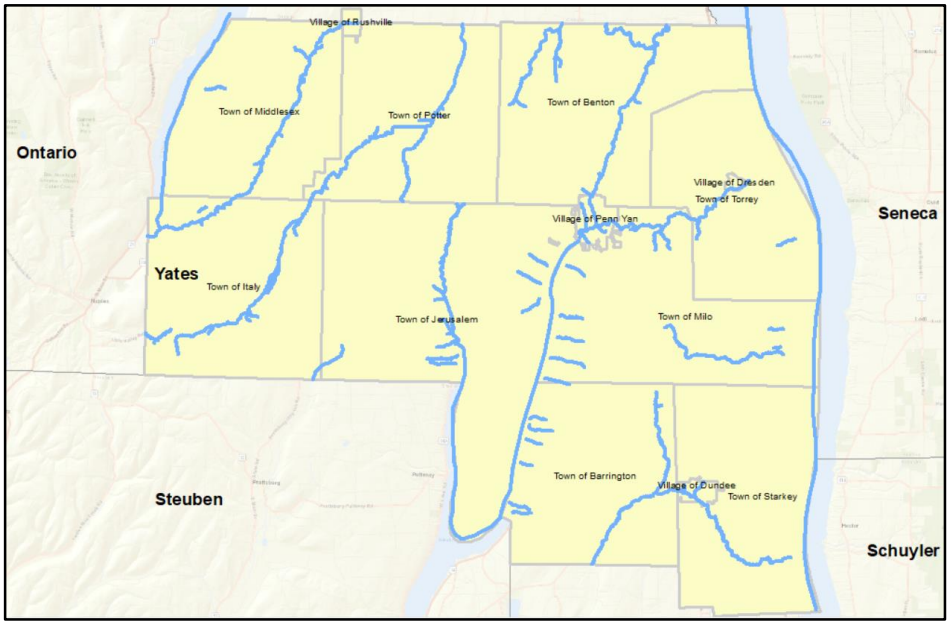
RiskMAP
Increasing Resilience Together

Flood Risk Project

Yates County, New York
Project Kick Off Meeting

March 7, 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!

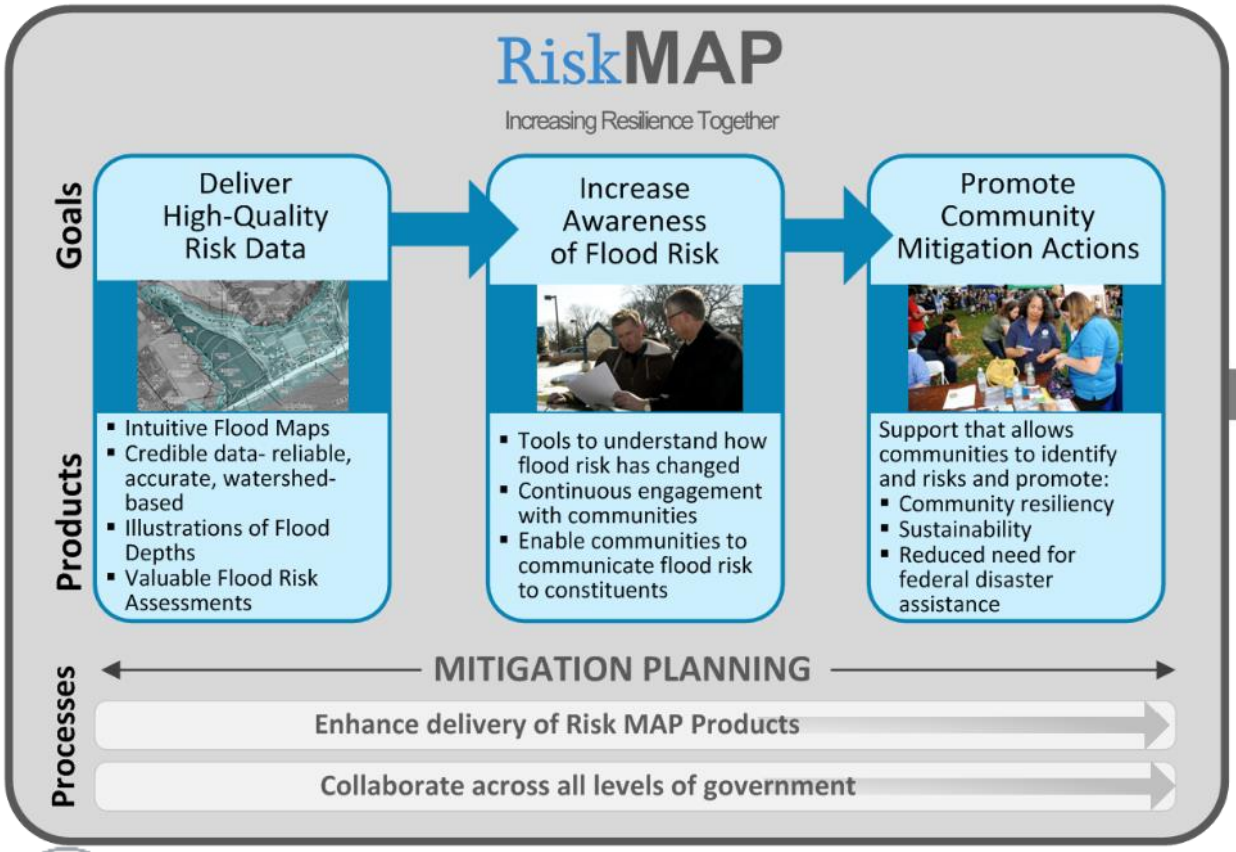
Today's Goals

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

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
285	129	$822,603	Expired 11/3/2016, Plan in Progress

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How did we get here?
Review past activities

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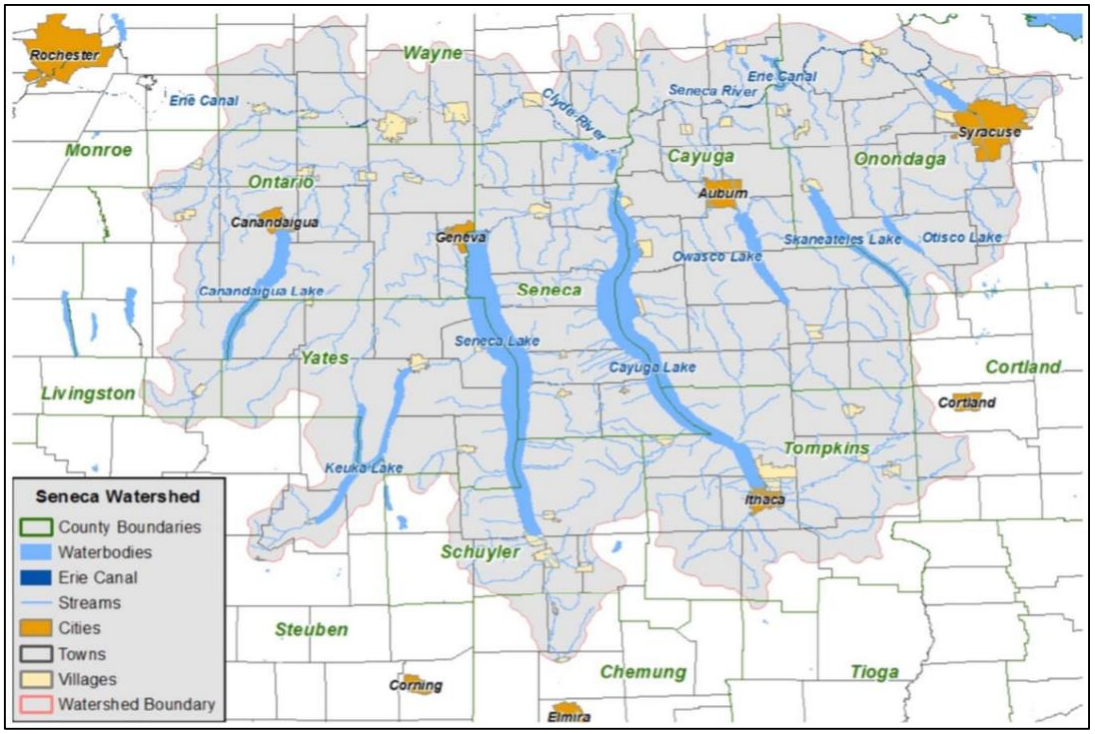
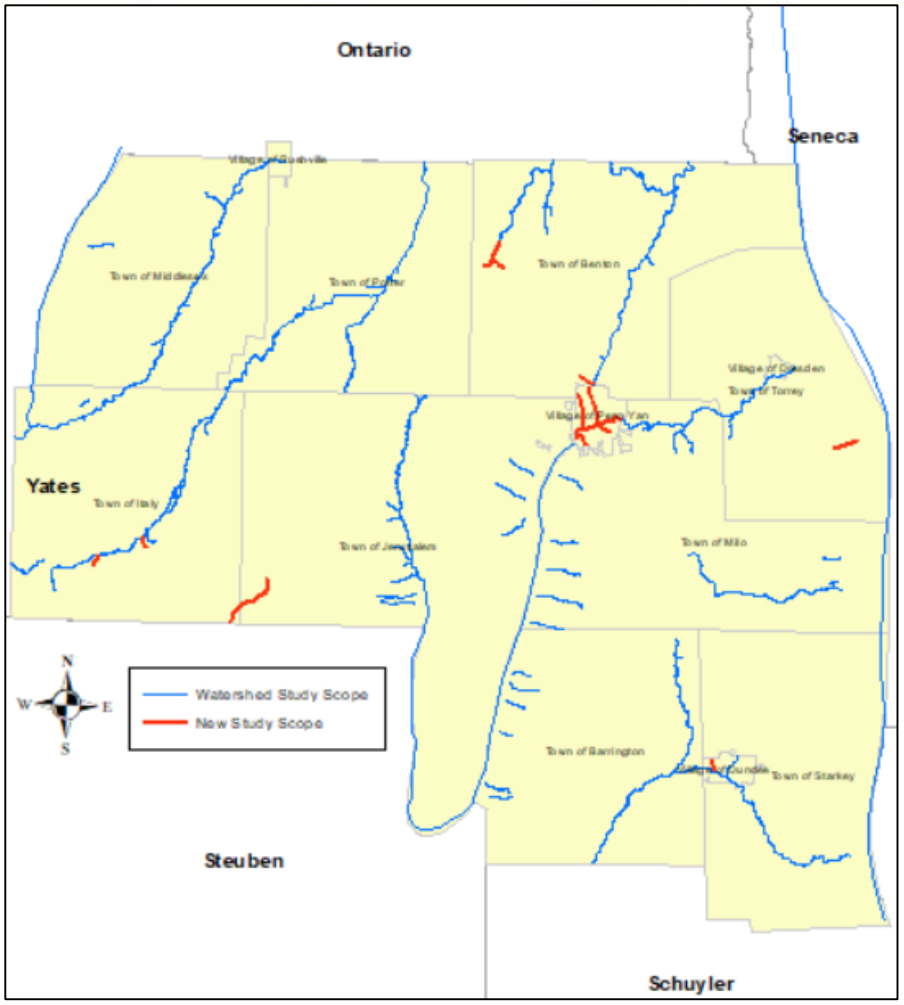
Discovery/Post-Discovery Progress
Recap

- Meetings held in May 2014
- Discovery project completed in 2015
- FEMA reviewed community input to determine priorities
- Penn Yan noted flooding sources



Seneca Watershed Study Project
Recap

- **Flood hazard analyses completed in Feb, 2018**
- **211 stream miles scoped in Yates**
  - 41.9 miles – Detailed
  - 164.0 miles – Approximate
  - 5.1 miles – Redelineation
- **Flood Risk Review meeting conducted in Apr, 2018**
- **Work map products shared with the communities**



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What is being studied now?
Discuss scope of new study

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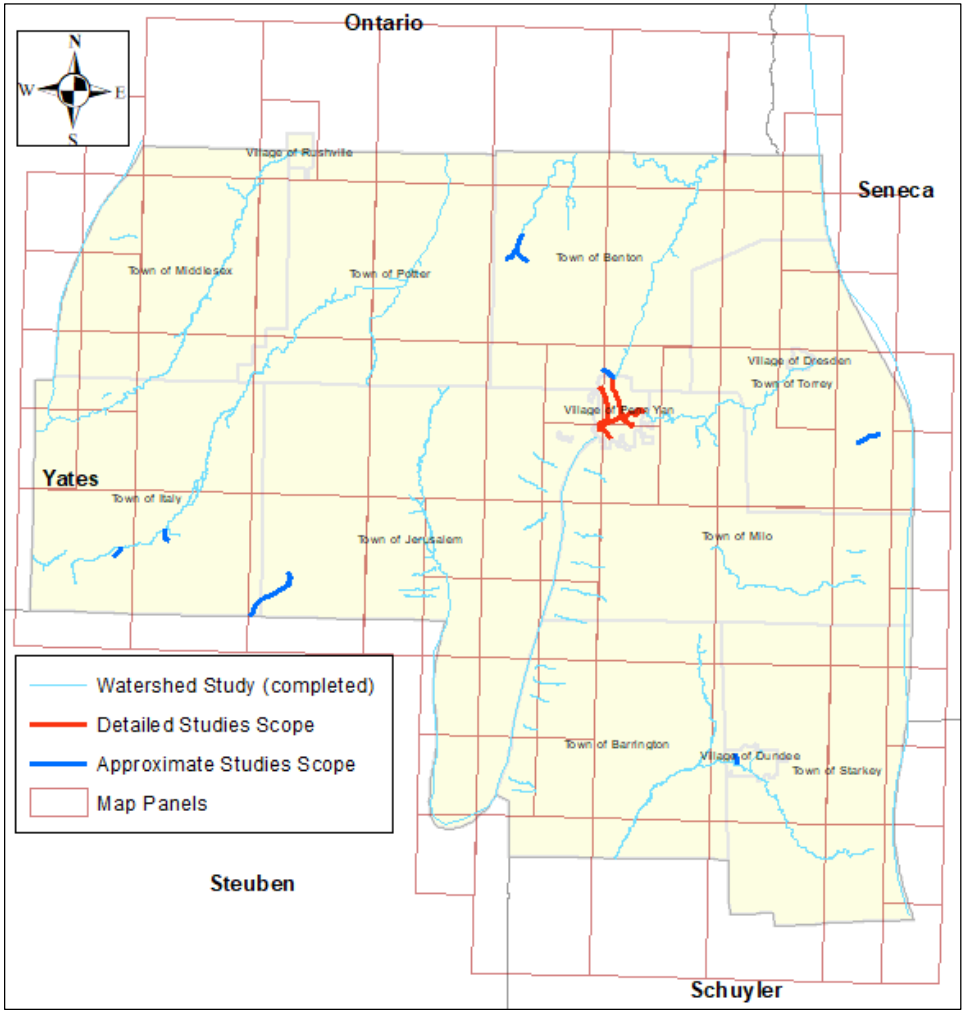
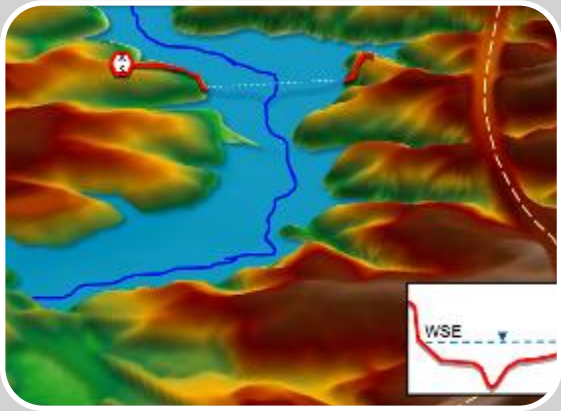
Yates County, Countywide Flood Risk Study
Scope

- **First time digital countywide maps**
- **Additional flooding sources analyzed**
  - 5.1 miles - Detailed (AE) streams
  - 5.4 miles – Approximate (A) streams
- **Includes Seneca Watershed study**
- **13 affected communities**
- **74 map panels**
- **Multiple touchpoints**



Flood Hazard Analysis



Hydrology

Volume of water?

Peak Flows?

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

Hydraulics

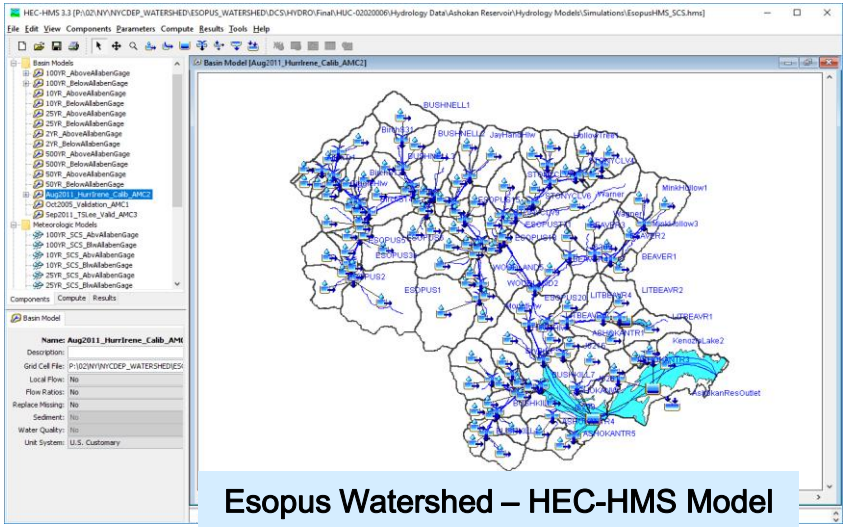
Will the stream in question be able to convey all storm water or runoff that arrives?

Floodplain Mapping

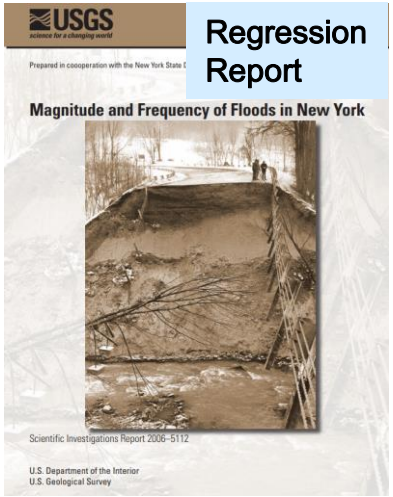
What areas of a community will be inundated based on engineering analysis?

Hydrologic Analysis

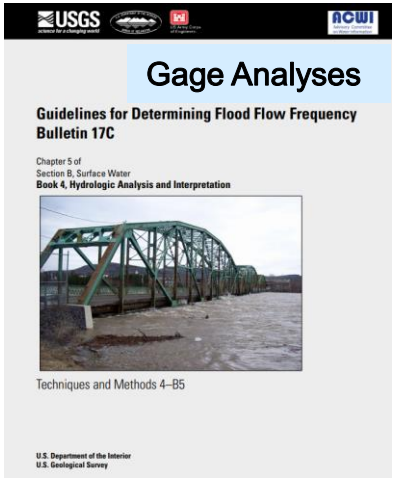
- Typical Methods FEMA utilizes
  - Statistical Gage Analyses
  - Regression Analyses
  - Rainfall Runoff Modeling
- Gage/Regression are based on availability stream gage data
- Rainfall-Runoff physical modeling chosen due to limited gage data
  - Using USACE's HEC-HMS Program
- Special Case: Stage-Discharge relationship for Keuka Lake Outlet
- 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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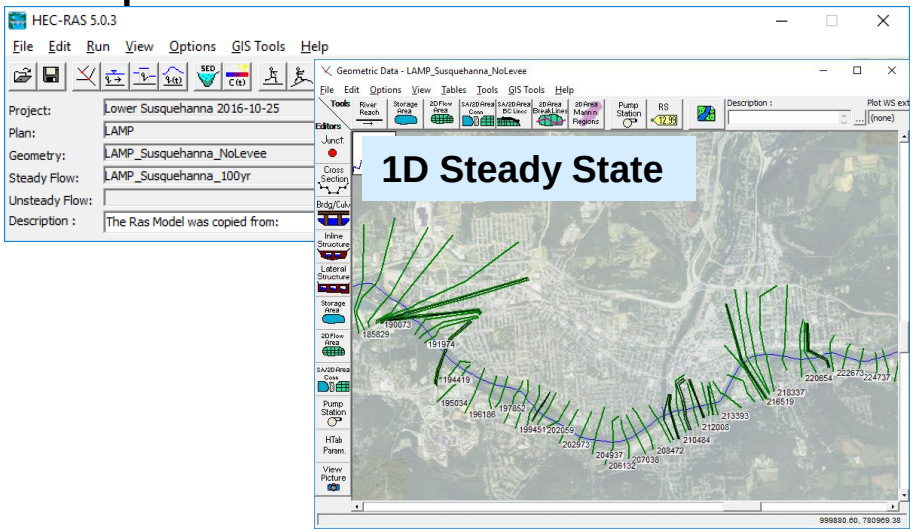
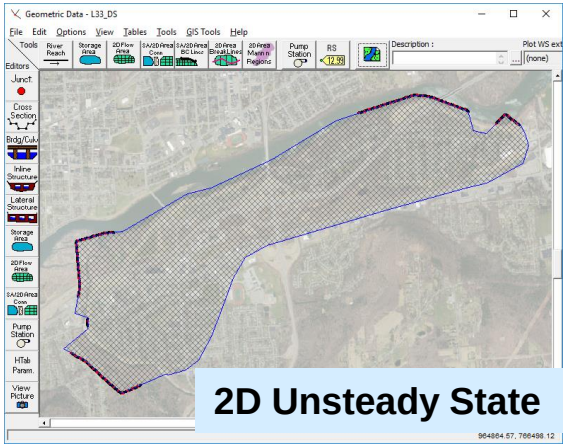
Hydraulic Analysis

- 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
  - Provides topographic elevation information
  - Supplemented by field survey
- Field Survey for Detailed only
  - Collection underway
- 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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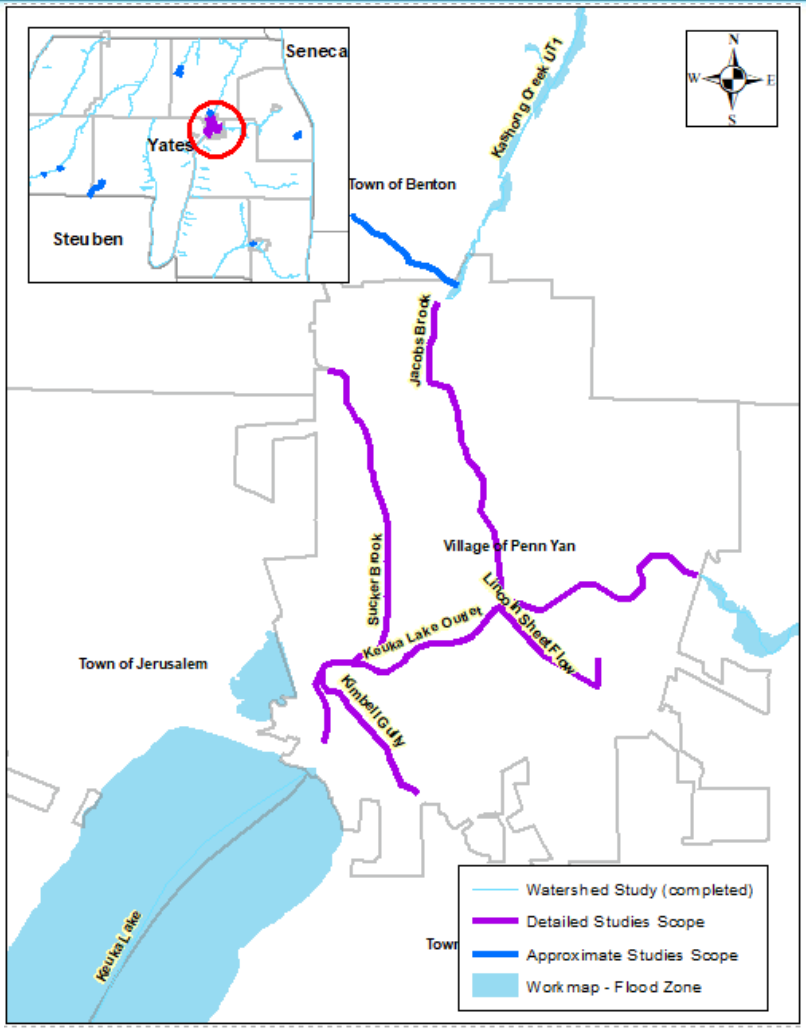
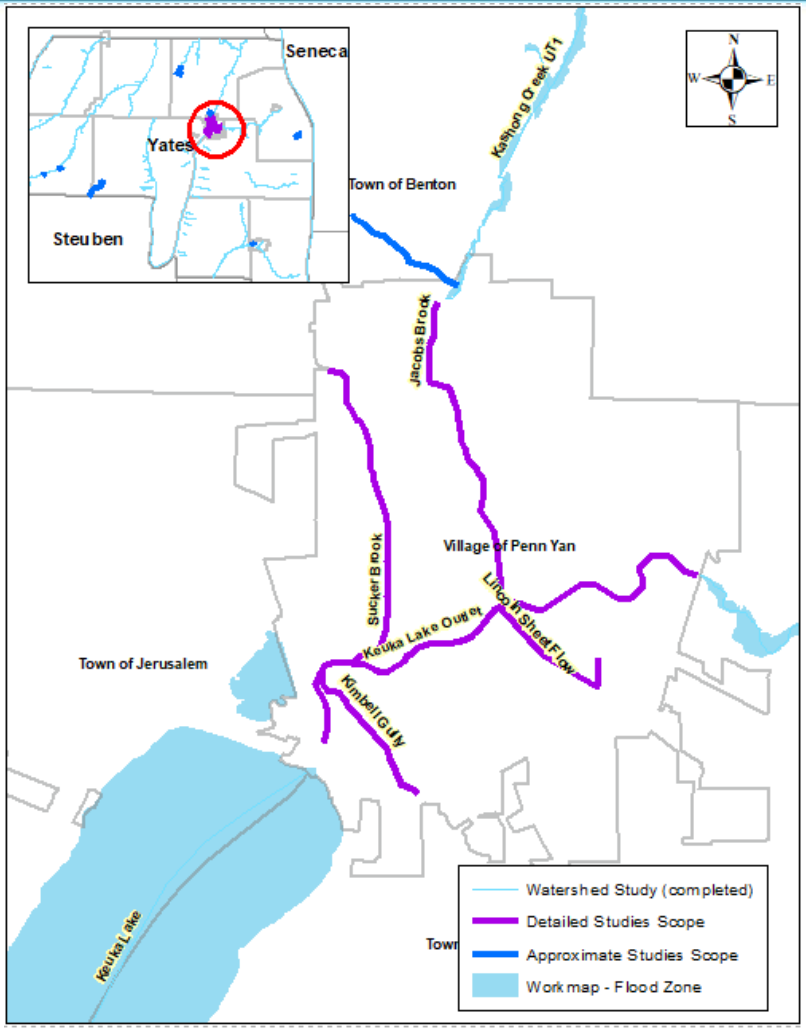
Detailed Streams
Hydrologic Analysis

- **5 Flooding Sources**
  - Keuka Lake Outlet -1.8 miles
  - Jacobs Brook -1.1 miles
  - Kimbell Gully - 0.6 miles
  - Lincoln Sheet Flow - 0.5 miles
  - Sucker Brook - 1.1 miles
- **Hydrologic Analyses**
  - Stage-Discharge relationship for Keuka Lake Outlet
  - Rainfall-Runoff modeling for other 4 streams
    - USACE's HEC-HMS Program
  - Discharges developed for
    - 10%, 4%, 2%, 1%, 1%+, 1%-, 0.2%



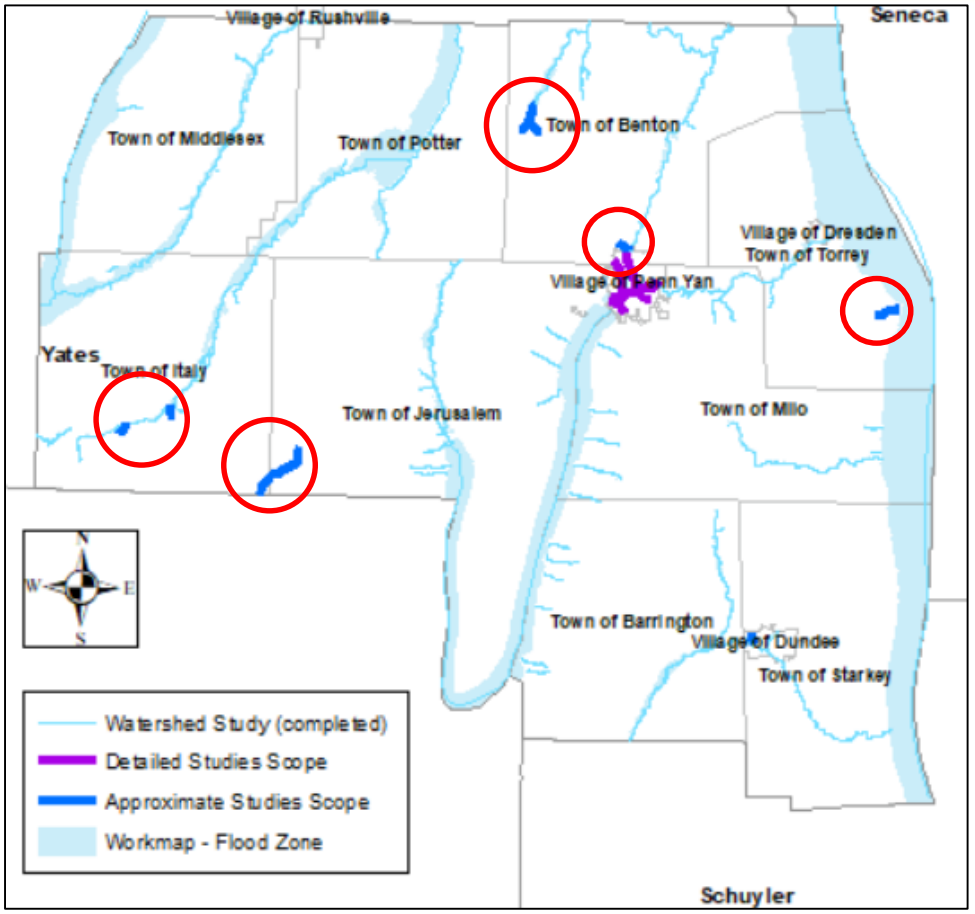
Detailed Streams
Hydraulic Analysis / Mapping

- **Terrain**
  - 2012 FEMA LiDAR Data
- **Field Survey for Detailed Only**
  - Collection underway: 21 Bridges/61 Natural Sections
- **Hydraulic Analyses**
  - USACE's HEC-RAS Program
  - One-dimensional steady state analyses
  - Two-dimensional unsteady state analyses for Lincoln sheet flow
  - Water surface profiles developed for
    - 10%, 4%, 2%, 1%, 1%+, 1%-, 0.2%
- **Mapping**
  - Floodplain extents for 1% and 0.2%, including floodway



Approximate Streams

- **9 streams, totaling 5.4 miles**
- **Hydrologic Analyses**
  - Regression Analyses using USGS StreamStats web application
  - Discharges developed for
    - 10%, 4%, 2%, 1%, 1%+, 1%-, 0.2%
- **Terrain**
  - 2012 FEMA LiDAR Data
- **No field survey conducted**
- **Hydraulic Analyses**
  - USACE's HEC-RAS Program
  - One-dimensional steady state analyses
- **Floodplain extents for 1% and 0.2%**



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

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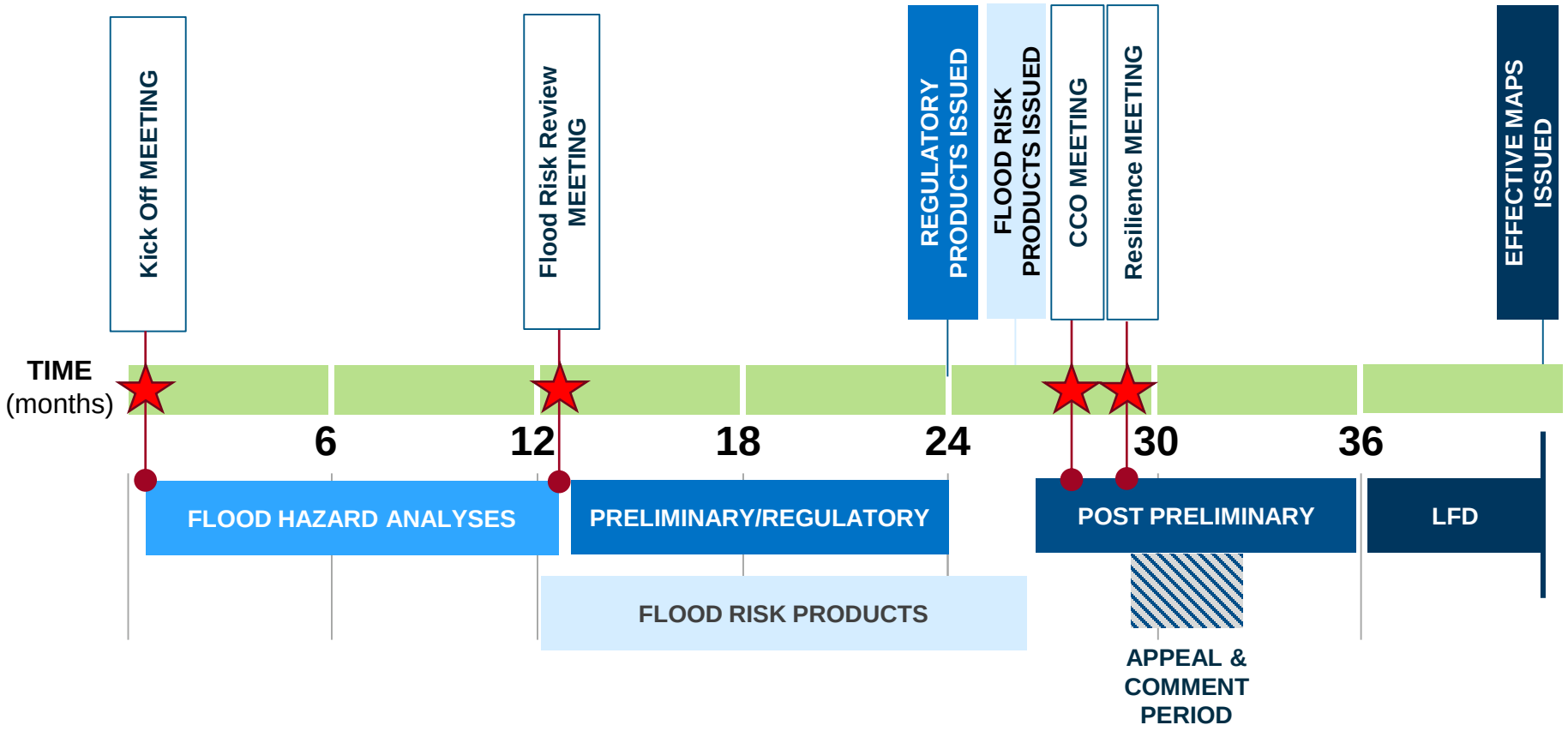
Overall Flood Risk Project Timeline



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 (24 months)
- **Resilience Meeting**
  - Flood risk products (28 months)

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What will communities receive?
Regulatory Products

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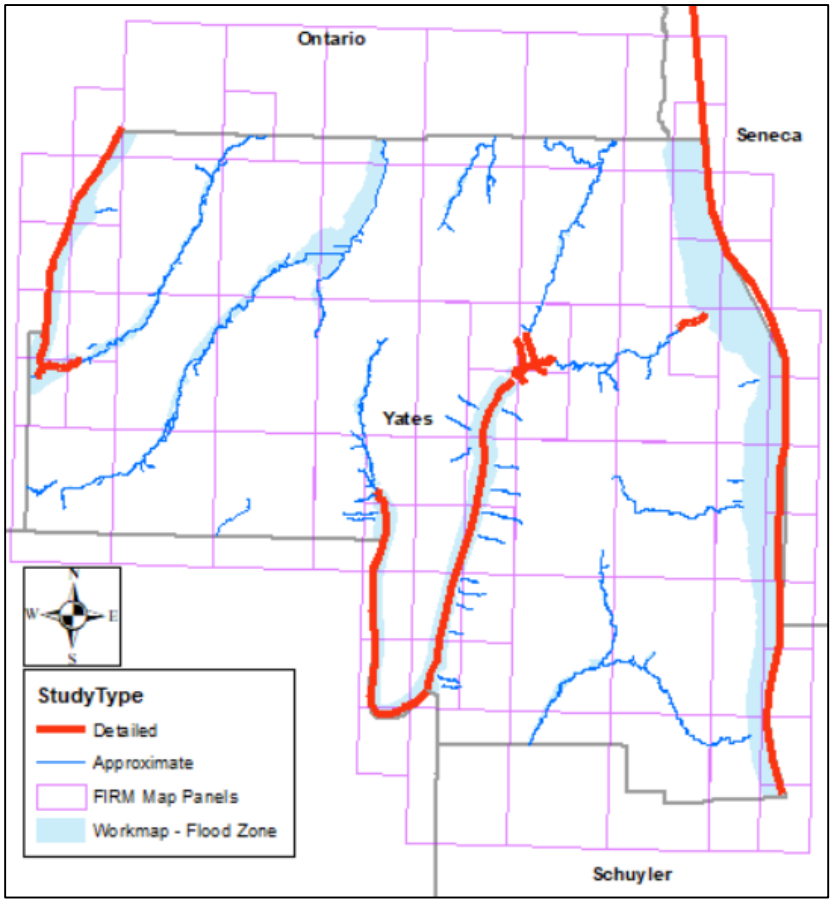
Work Maps

- **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**
  - Seneca Watershed Study
  - This Countywide Study
- **Digital Flood Insurance Rate Map (DFIRM) Database**
- **74 FIRM Panels**
- **Flood Insurance Study (FIS) Report**



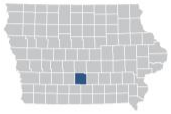
Flood Insurance Rate Map (FIRM)
Example

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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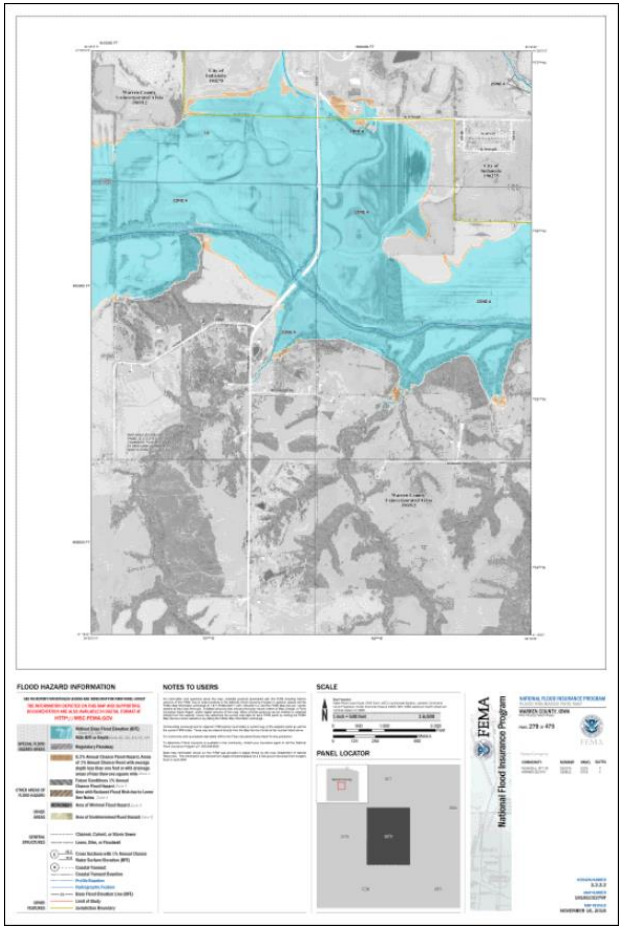

FLOOD HAZARD INFORMATION

NOTES TO USERS

SCALE

PANEL LOCATOR

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National Flood Insurance Program

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What will communities receive?
Flood Risk Products

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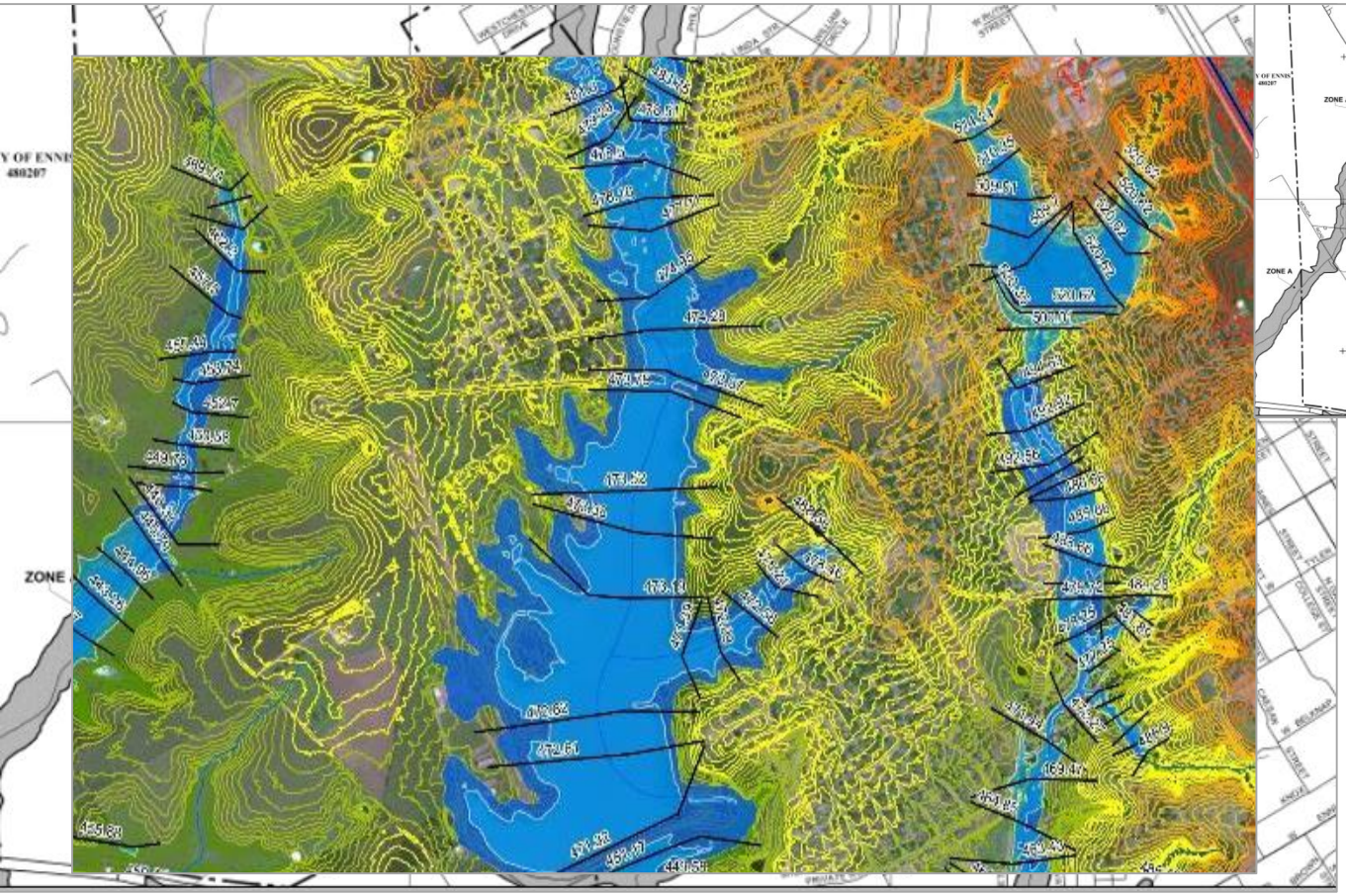
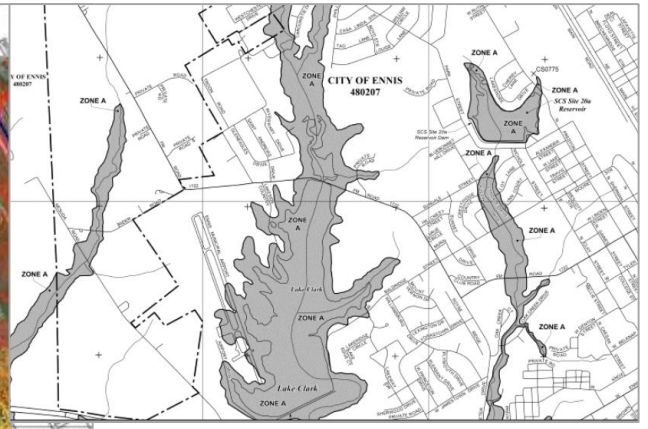
Knowing the Risk

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

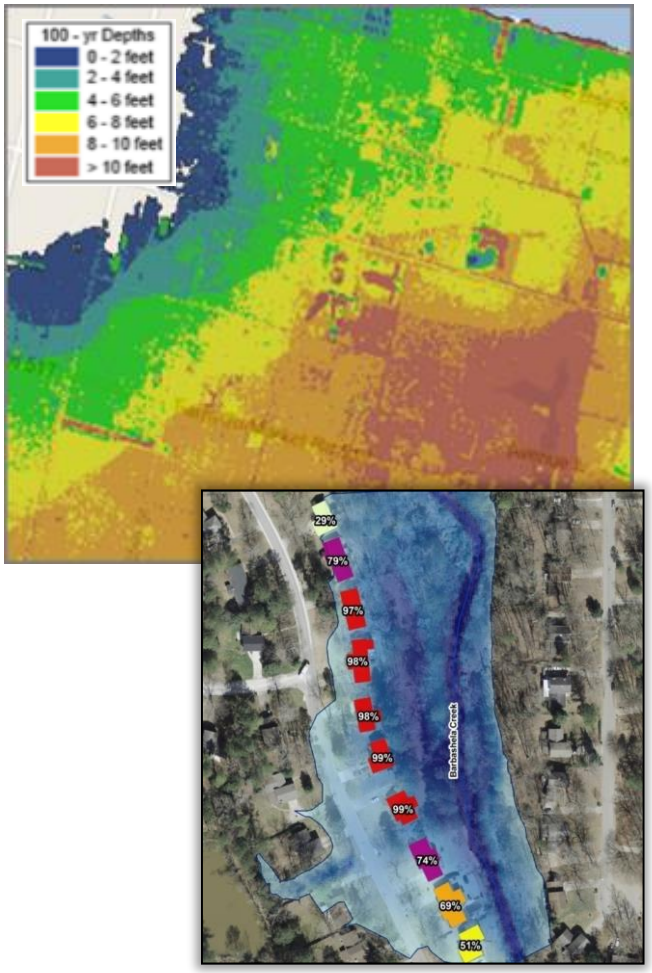




- Water Surface Elevation (WSEL) Grids
- Flood Depth Grids
- Freeboard WSEL Grids
- Annual Percent Chance Grids
- 30 Year Percent Grids
- Flood Risk Assessment

Products & Delivery Items:
Flood Depth and Analysis Grids

- **Flood hazard data backbone for these product development**
- **Flood Depth and Water Surface Grids**
  - Frequencies: 10%, 4%, 2%, 1% and 0.2%
- **Water Surface Freeboard Grids**
  - +1, +2 & + 3 feet over 1% water surface
- **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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  - curtis.smith@stantec.com

Questions? Comments?

Thank you!

FEMA