

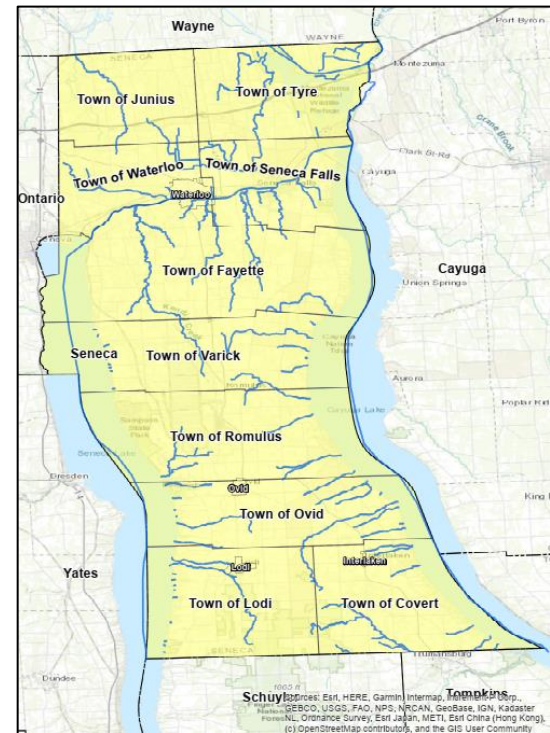
Flood Risk Project

Seneca County, New York
Project Kick Off Meeting

May 5, 2020



FEMA



Please Introduce Yourself



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

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

What do Seneca County communities aspire to accomplish using today's meeting?



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Today's Goals

1

The value of updated flood maps for your community

2

Recap of Flood Risk Study history, including Discovery and Seneca Watershed study

3

Review county-wide study scope, products and outreach process



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Federal Emergency Management Agency (FEMA) Mitigation Division

FEMA administers the National Flood Insurance Program (NFIP) through the Federal Insurance and Mitigation Administration (FIMA)

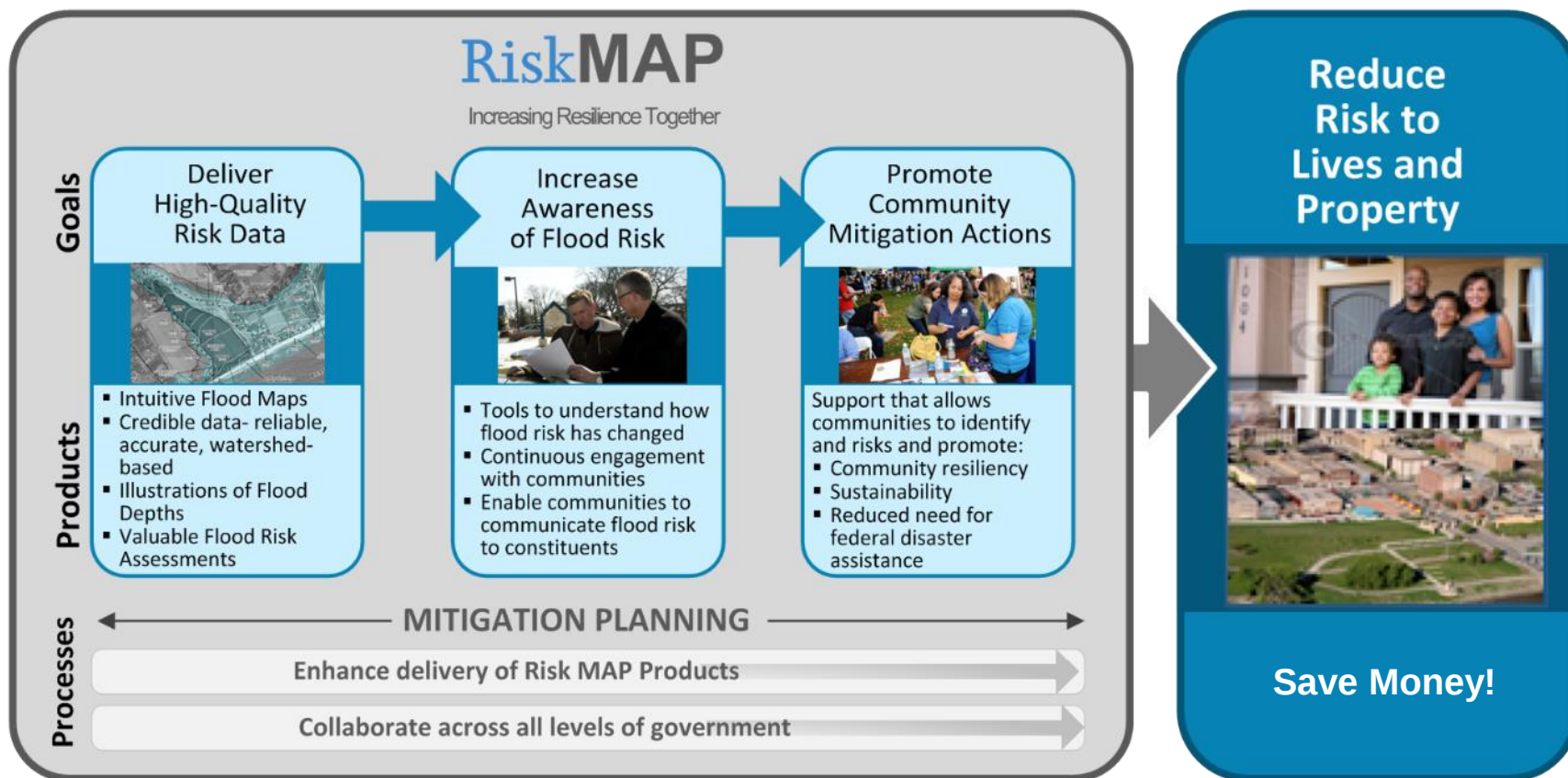
Risk Analysis Branch (RAB) – Identifies Flood Risks using RiskMAP – Mapping, Assessment and Planning

Floodplain Management and Insurance Branch (FM&I) – Assists communities and policy holders

Hazard Mitigation Grants Branch (HMA) – Provides funding to states to reduce flood risk

FEMA Mitigation

Goal: Stronger - Safer Communities



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The Value of Updated Flood Maps for Local Communities

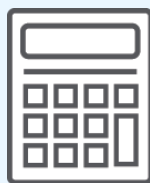


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Flood Maps Guide Progress By:



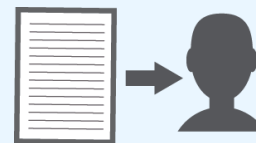
**Identifying
and
Assessing
Flood Risk**



**Establishing
Flood
Insurance
Rates**



**Determining
Local Land
Use**



**Informing
Engineers
and
Developers**



**Equipping
Emergency
Managers**



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Why Update Flood Maps?

NFIP Policies for Seneca communities	NFIP Claims for Seneca communities	NFIP Claims Paid in Seneca communities	Hazard Mitigation Plan
161	107	\$920,366	2018 Seneca County All Hazards Mitigation Plan



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The road to NOW

Review past activities



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Discovery/Post-Discovery Progress *Recap*

➤ Meetings held - May 2014 for Seneca Watershed counties

- **Seneca**, Livingston, Steuben, Yates, Cortland, Tioga, Tompkins, Chemung, Schuyler, Onondaga, Monroe, Wayne, Cayuga, Ontario

➤ Discovery project completed in June 2015

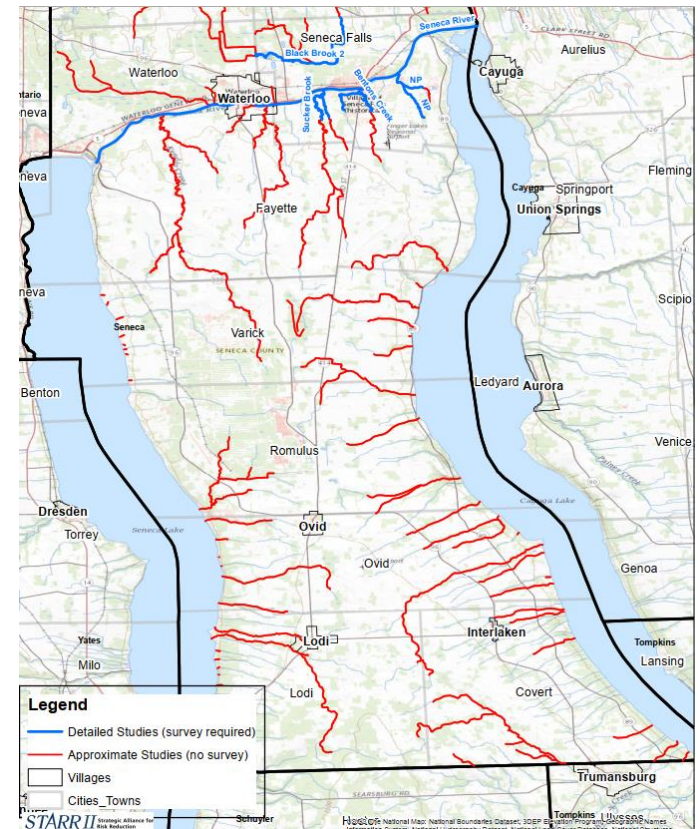
- Community input guided FEMA and State priorities



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Leveraged Data from Seneca Watershed Study - *Recap*

- Flood hazard analyses completed in February 2018
- Lakes scoped in Seneca County
 - Cayuga Lake: 38 miles
 - Seneca Lake: 35 miles
- Flood Risk Review meeting conducted in April 2018
- Work map products shared with the communities





What is being studied now?

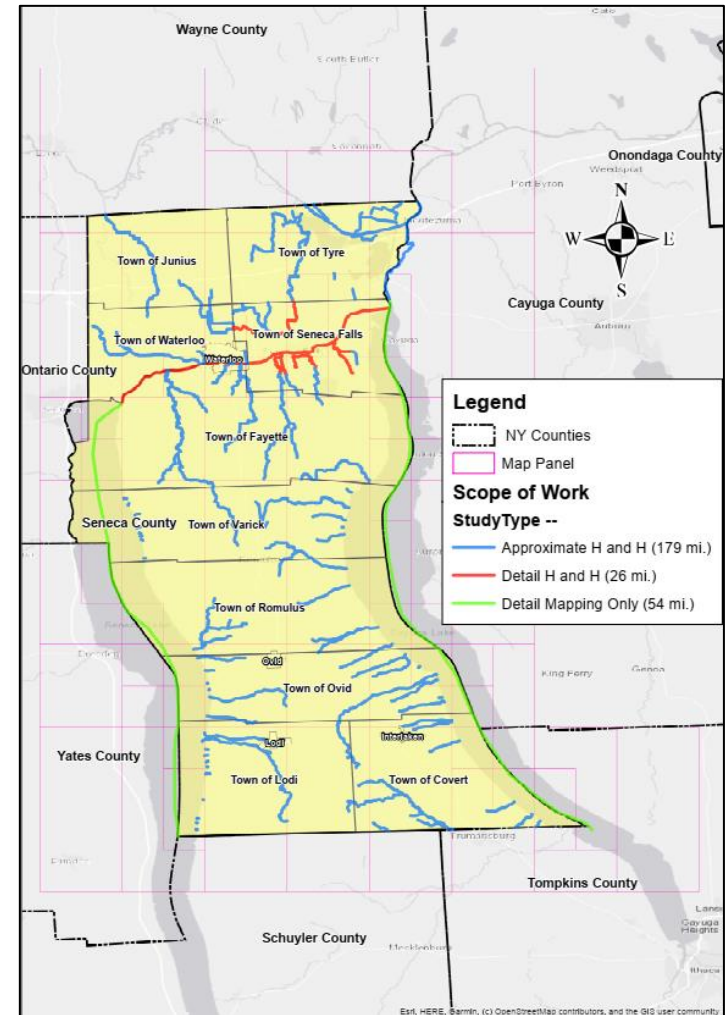
Discuss scope of new study



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Seneca County, Countywide Flood Risk Study - Scope

- **First time digital maps**
- **Flooding sources analyzed**
 - 26 miles - Detailed (AE Zone) streams
 - 179 miles - Approximate (A Zone) streams
 - 54 miles - Detailed Lake Mapping
- **Includes Seneca Watershed study data**
- **16 updated communities**
- **96 map panels**

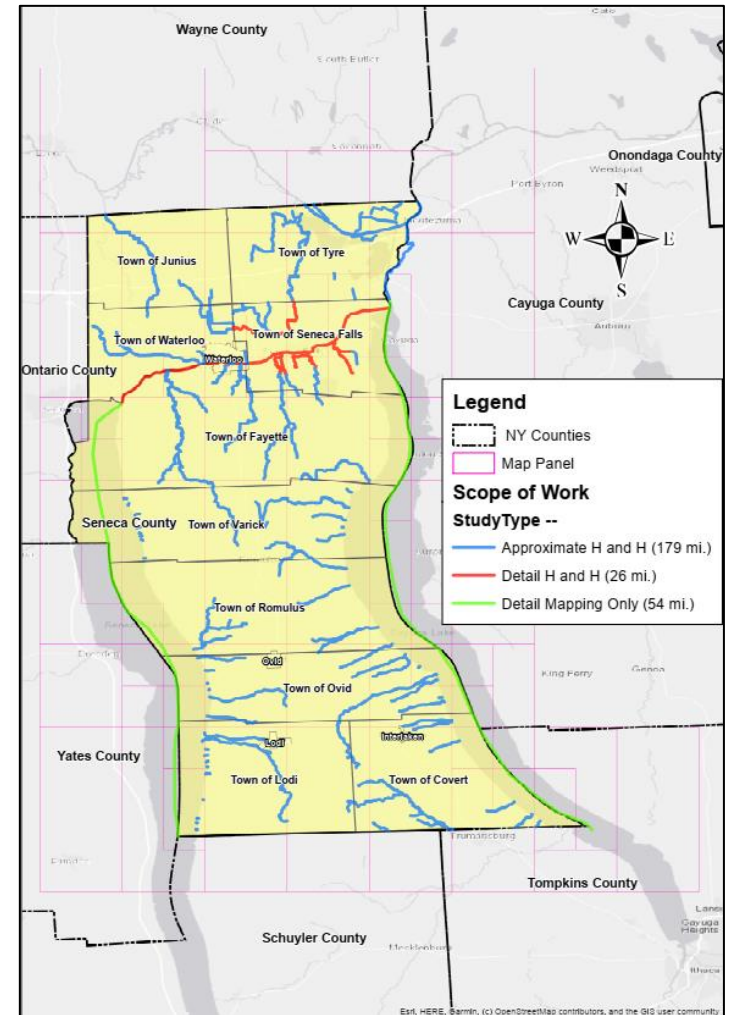


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Seneca County, Countywide Flood Risk Study - Outreach

➤ Multiple review meetings

- Kickoff Meeting → (This one)
- Hydrology Meeting
- Hydraulics Meeting
- Flood Review Meeting
- Other Meetings as needed



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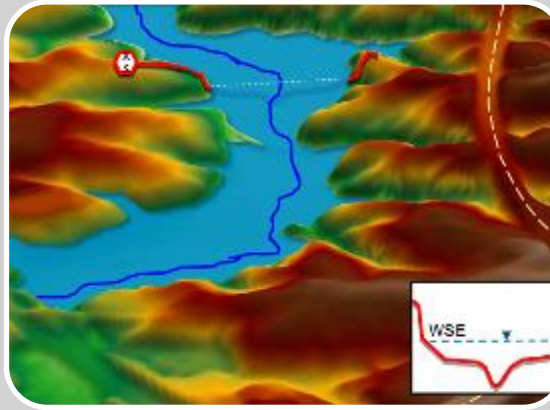
Flood Hazard Analysis



Hydrology

Volume of water?
Peak Flows?

When will storm
runoff make it to
the stream?



Hydraulics

How do stream
channels carry
floods?

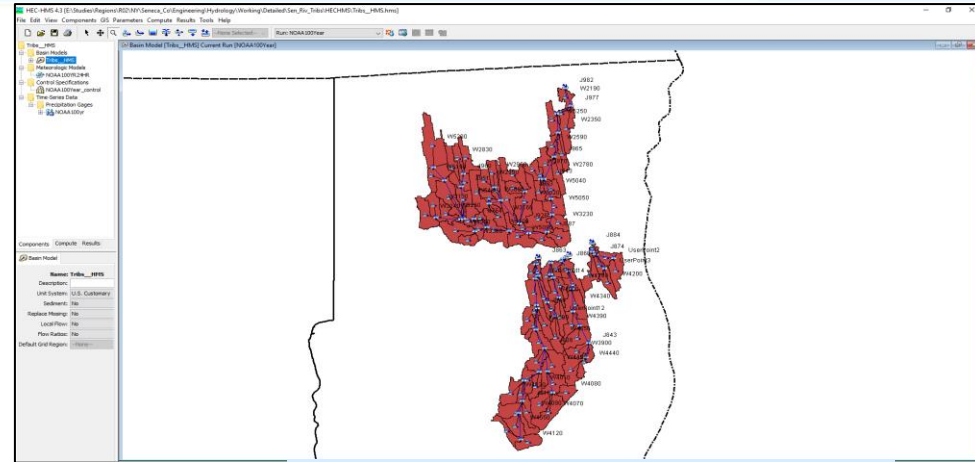


Floodplain Mapping

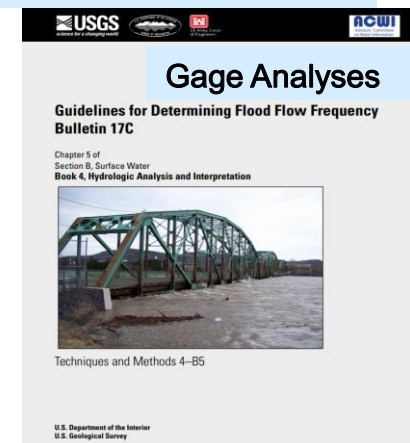
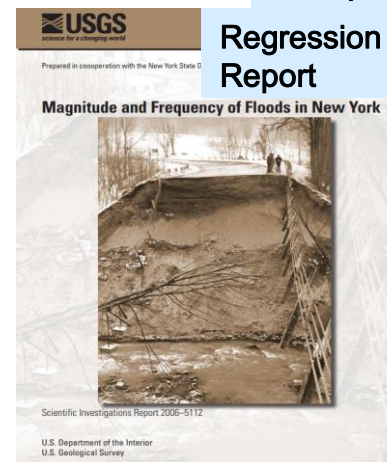
What areas of a
community will
flood based on
engineering
analysis?

Hydrologic Analysis

- Typical FEMA Methods Statistical Gage Analyses
 - Regression Analyses
 - Rainfall Runoff Modeling
- Gage/Regression are based on availability of stream gage data
- Rainfall-Runoff physical modeling chosen when gage data limited
 - Using USACE's HEC-HMS Program

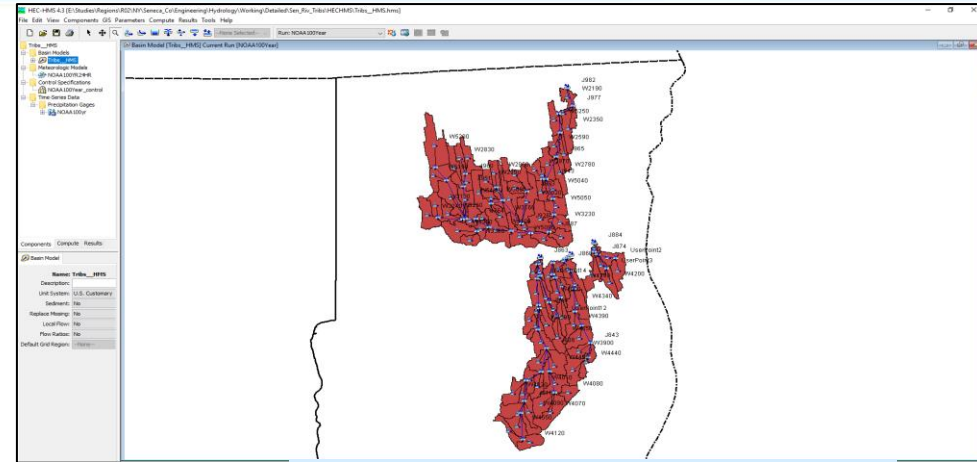


Sample Schematic – HEC-HMS Model

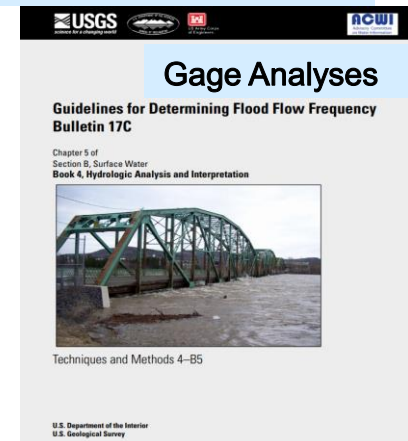
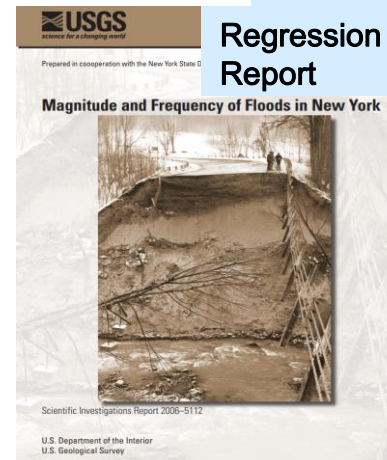


Hydrologic Analysis

- Special Case: Frequency-Stage-Discharge relationship for Seneca and Cayuga lakes Outlet
- Discharges developed for
 - 10%, 4%, 2%, 1%, 1%+, 1%-, 0.2%
 - Inputs for hydraulic analyses



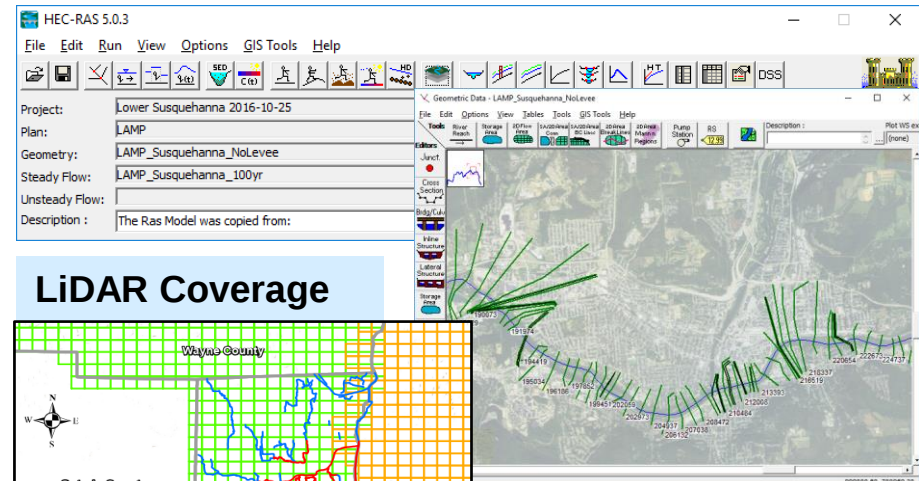
Sample Schematic – HEC-HMS Model



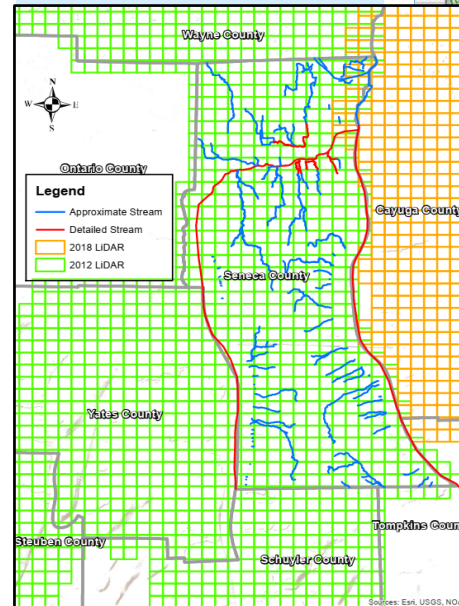
Hydraulic Analysis

- Type of Analyses
 - One Dimensional (1D) Steady State
- Modeling developed using USACE's HEC-RAS Program.
- Terrain Data – (2012-2014 Seneca NY Watershed LiDAR and 2018 Cayuga County, NY LiDAR)
 - Provides topographic elevation information
 - Supplemented by field survey

Sample River – HEC-RAS Models



LiDAR Coverage

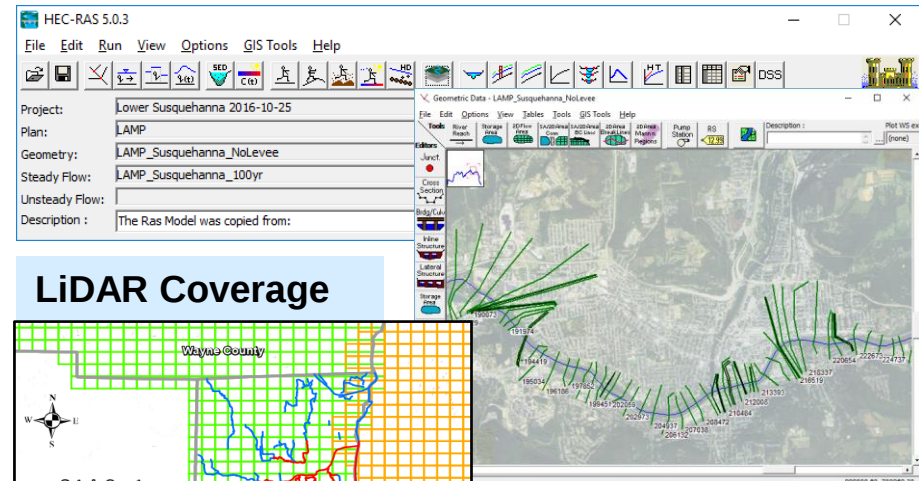


1D Steady State

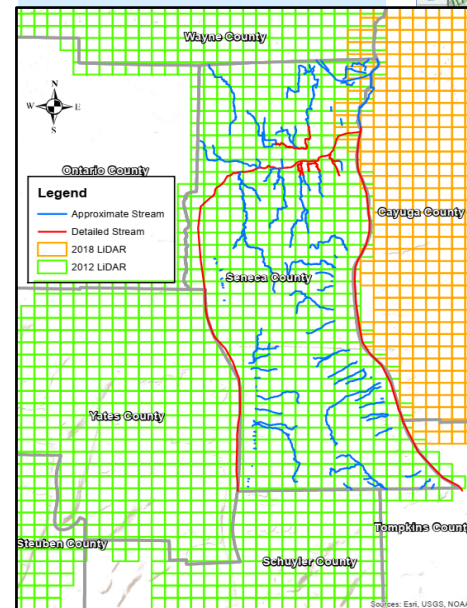
Hydraulic Analysis

- 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%

Sample River – HEC-RAS Models



LiDAR Coverage



1D Steady State

Detailed Streams *Hydrologic Analysis*

➤ 8 Flooding Sources – 26 Miles

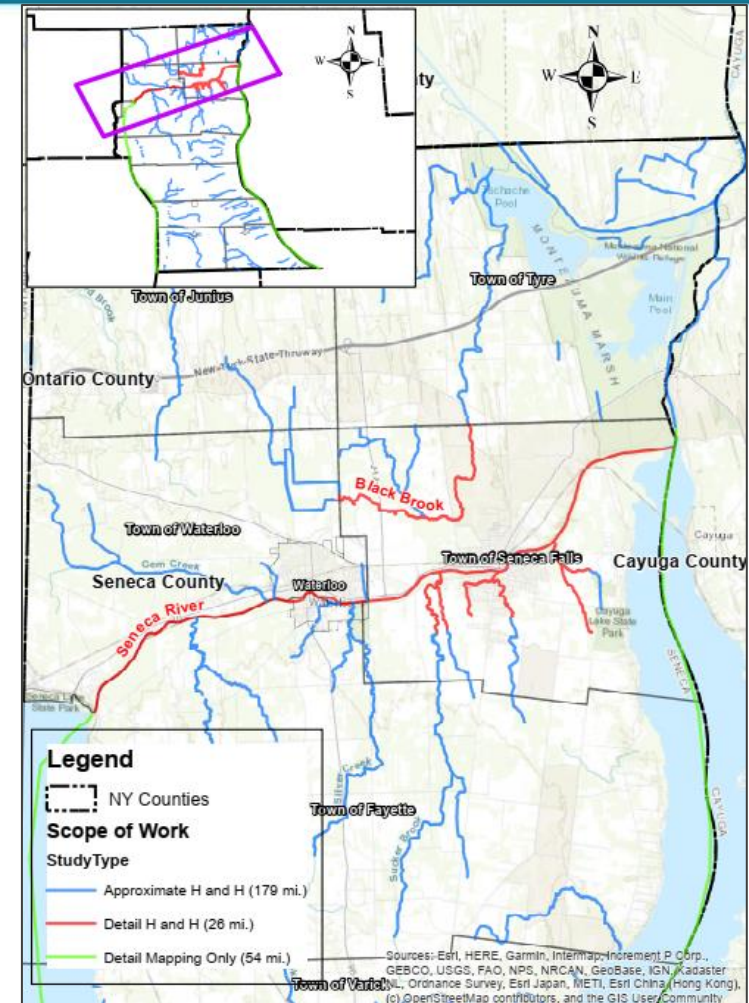
- Bentons Creek – 1.1 miles
- Black Brook – 5.1 miles
- Sampson Creek – 1.4 miles
- Seneca River – 13.0 miles
- Sucker Brook – 1.8 miles
- Sucker Brook Tributary – 0.9 mile
- Unnamed Tributary to Sucker Brook Tributary – 2.0 miles
- Unnamed Tributary 1 to Sucker Brook Tributary – 0.6 mile



Detailed Streams *Hydrologic Analysis*

➤ Hydrologic Methods

- Rainfall-Runoff modeling for 4 additional streams
 - USACE's HEC-HMS Program
- Discharges developed for
 - 10%, 4%, 2%, 1%, 1%+, 1%-, 0.2%



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Detailed Streams

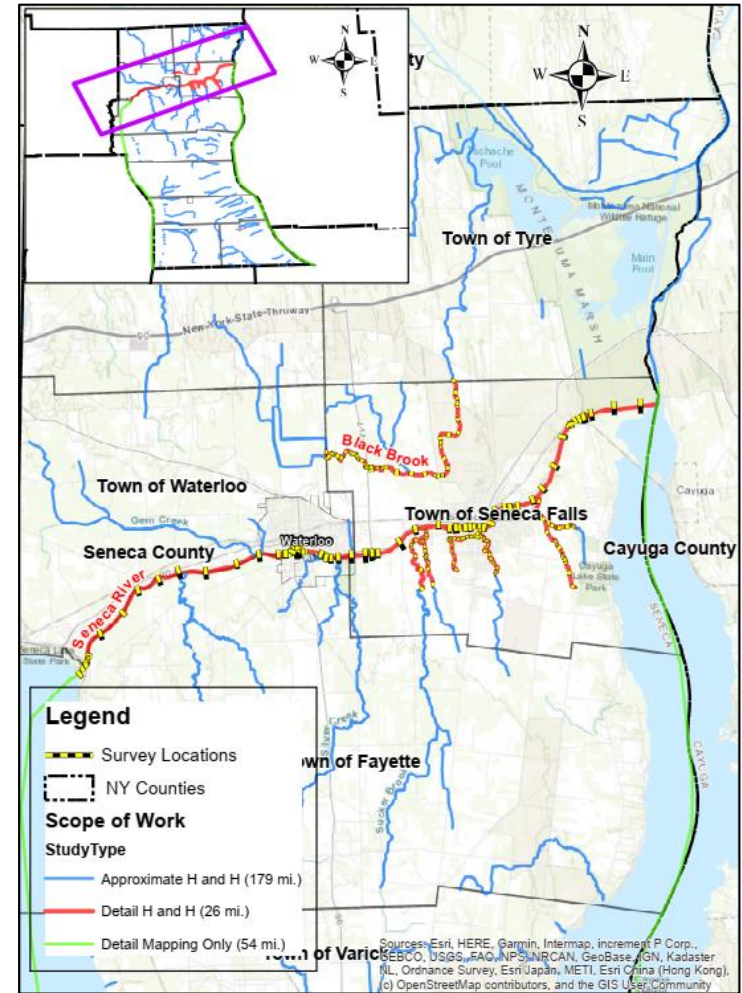
Hydraulic Analysis / Mapping

➤ Terrain

- 2012-2014 Seneca NY Watershed LiDAR (supplemented with 2018 Cayuga County, NY LiDAR where available)

➤ Field Survey for Detailed Only

- Collection underway: 55 Crossings / 69 Natural Sections



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Detailed Streams

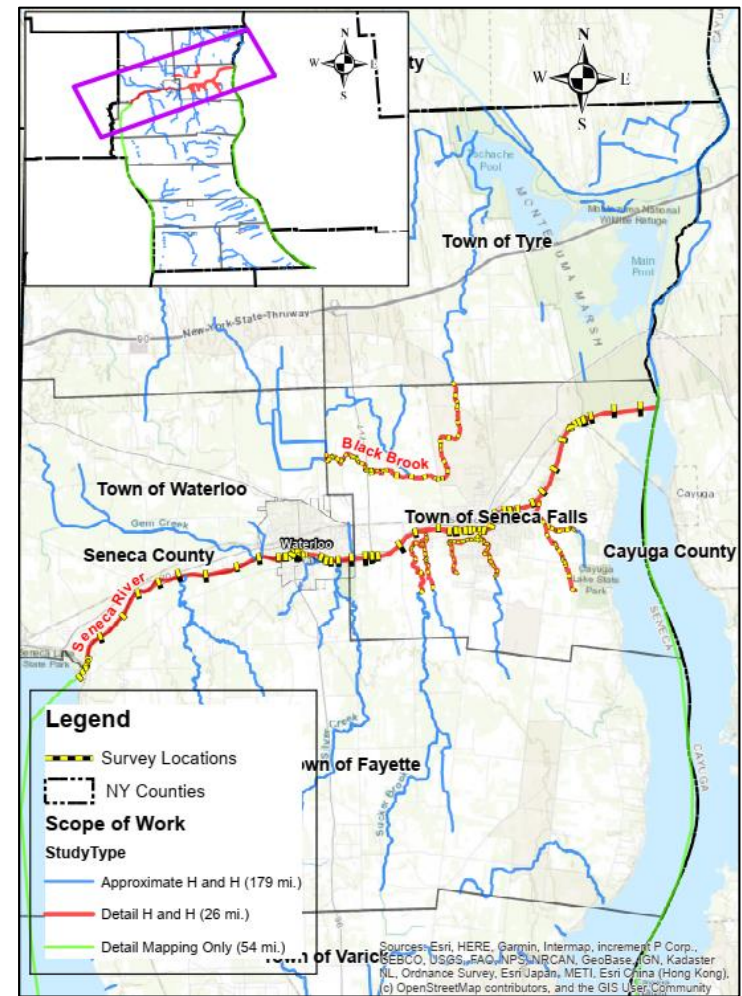
Hydraulic Analysis / Mapping

➤ Hydraulic Analyses

- USACE's HEC-RAS Program
- One-dimensional steady state analyses
- Water surface profiles developed for
 - 10%, 4%, 2%, 1%, 1%+, 1%-, 0.2%

➤ Mapping

- Floodplain extents for 1% and 0.2%, including floodway



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Approximate Streams

- **Total Mileage – 179 miles**
- **Hydrologic Analyses**
 - Regression Equations using the USGS StreamStats web application
 - Discharges developed for
 - 10%, 4%, 2%, 1%, 1%+, 1%-, 0.2%



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Approximate Streams

➤ Terrain

- 2012-2014 Seneca NY Watershed LiDAR (supplemented with 2018 Cayuga County, NY LiDAR where available)

➤ No field survey conducted

➤ Hydraulic Analyses

- USACE's HEC-RAS Program
- Automated one-dimensional steady state analyses

➤ Floodplain extents for 1% shown on FIRM



Detailed Lake Mapping

➤ Total Mileage –

- 54 miles (Seneca Lake and Cayuga Lake)

➤ Engineering Analyses

- Seneca Lake - completed previously under a Seneca River Watershed Study (17-02-0290S)
- Cayuga Lake - completed previously under Tompkins Countywide study (19-02-0019S)
- Water Surface Elevations (WSELs) developed for
 - 10%, 4%, 2%, 1%, 1%+, 1%-, 0.2%



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Detailed Lake Mapping

➤ Terrain

- 2012-2014 Seneca NY Watershed LiDAR (supplemented with 2018 Cayuga County, NY LiDAR where available)

➤ Floodplain extents for 1% and 0.2%



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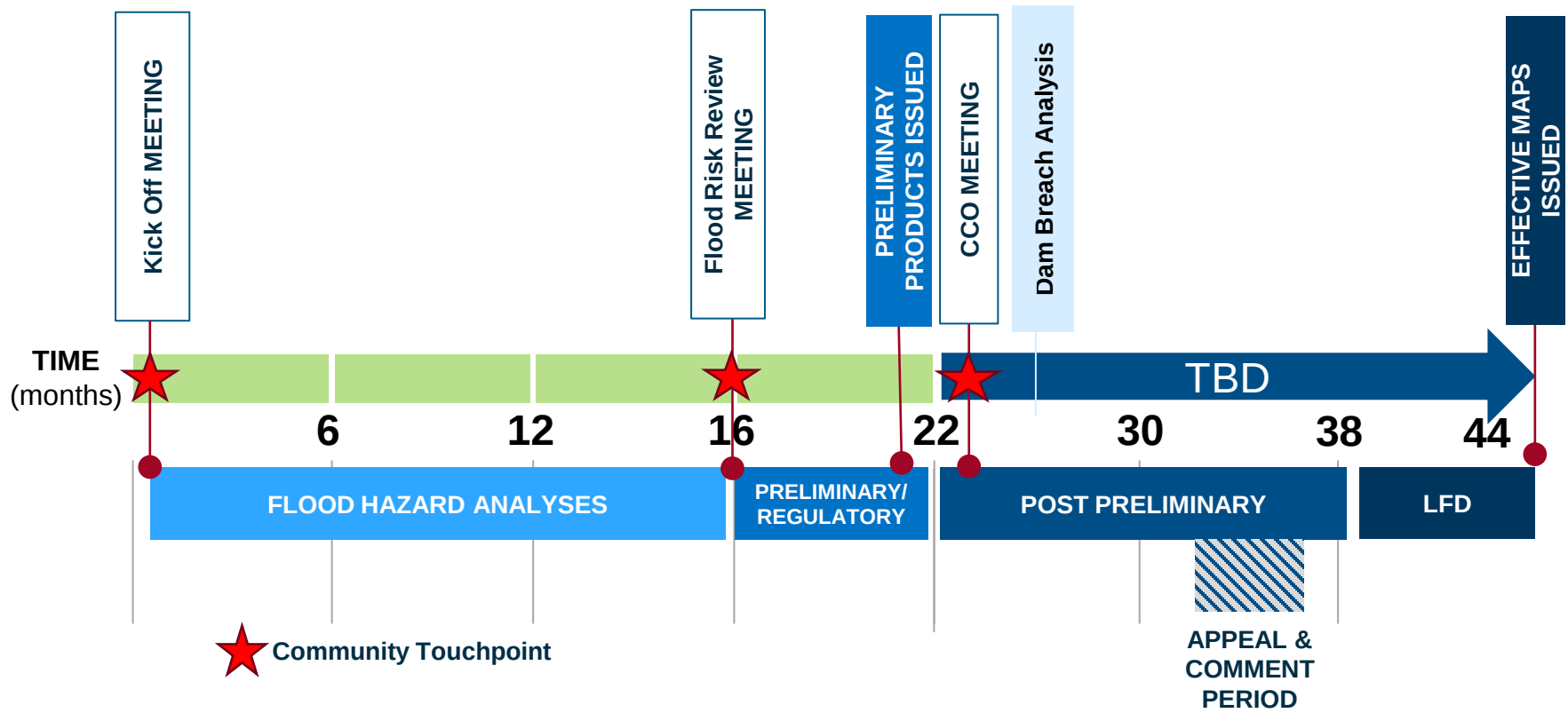
Where are we now and what is next?
Discuss next steps



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Timeline – Today to Regulatory

- Community data submission requested as soon as possible



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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 (16 months)

➤ **Regulatory Product Update (FIRM & FIS)**

- Preliminary issuance (22 months)



What will communities receive?

Preliminary Products



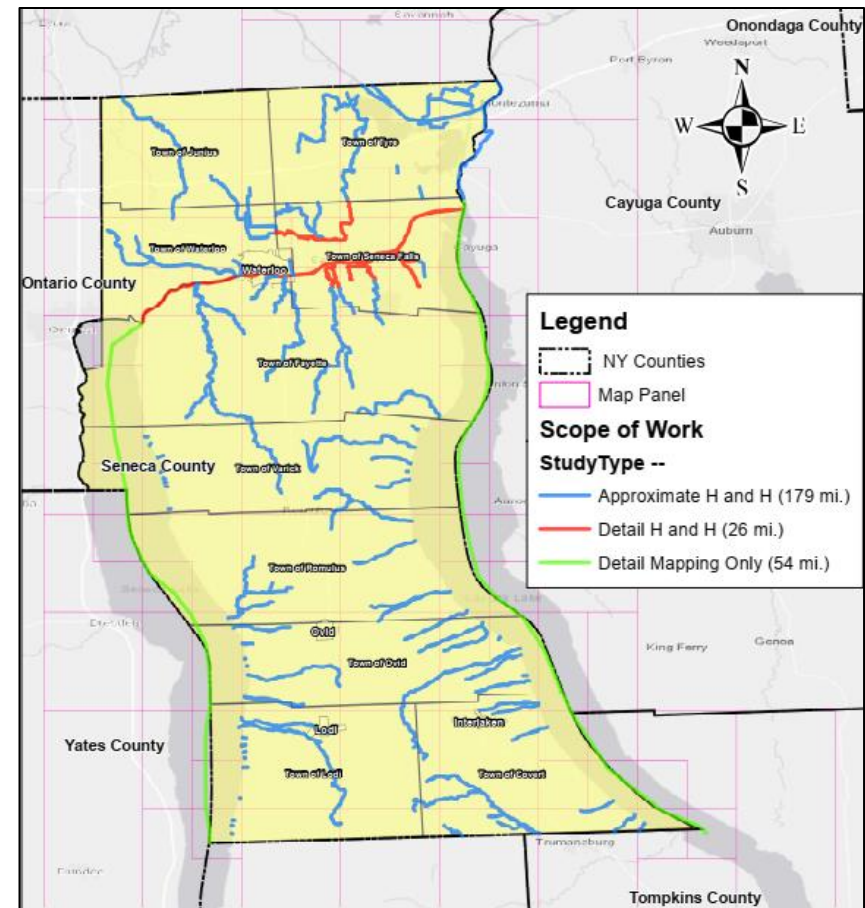
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Work Maps

- **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

Preliminary Products

- Regulatory product development begins after work map comment period
- Seneca Countywide Study
- Digital Flood Insurance Rate Map (DFIRM) Database
- 96 FIRM Panels
- Flood Insurance Study (FIS) Report



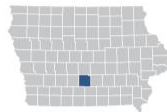
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Flood Insurance Rate Map (FIRM) Example

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_Tnsp_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

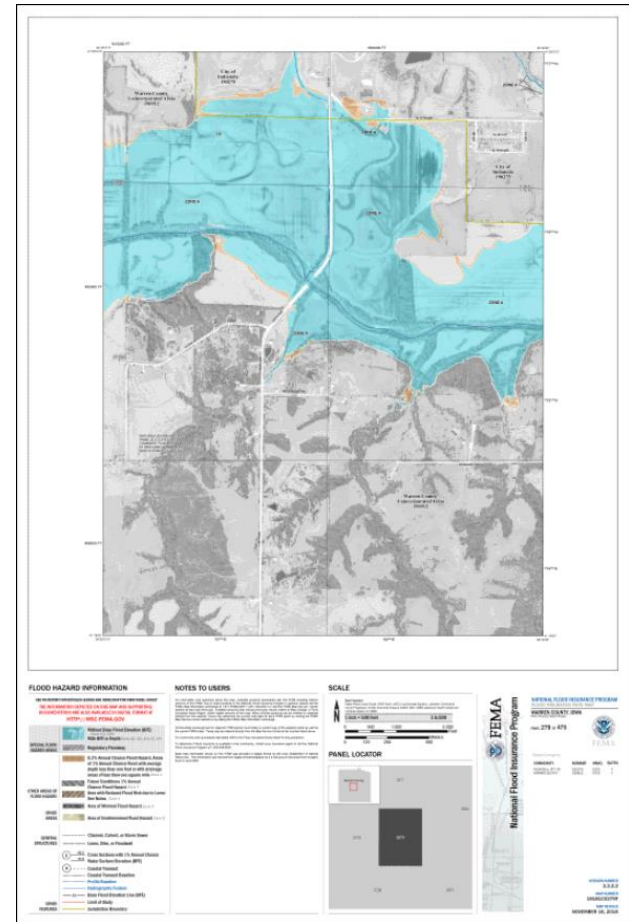
COMMUNITY NAME	COMMUNITY NUMBER
ACKWORTH, CITY OF	190945
BEVINGTON, CITY OF	190273
CARLISLE, CITY OF	190274
CUMMING, CITY OF	190946
DES MOINES, CITY OF	190227
HARTFORD, CITY OF	190589
INDIANOLA, CITY OF	190275
LACONA, CITY OF	190752
MARTENSDALE, CITY OF	190524
MILLO, CITY OF ¹	190618
NEW VIRGINIA, CITY 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

¹No Special Flood Hazard Areas Identified

REVISED:
NOVEMBER 16, 2018
FLOOD INSURANCE STUDY NUMBER
19181CV000C
Version Number 2.3.3.2



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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 will struggle to....

- Effectively plan resource use for natural hazards and potential disasters
- Effectively regulate current and future development without increasing risk
- Effectively communicate about natural hazards to residents regarding risk reduction projects to reduce lower long-term risk
- Implement effective hazard mitigation projects



Dam Breach Analysis (as part of the Non-Regulatory Products)

- Up to 5 Medium/High Hazard Dams analyzed
 - 3 High hazard class (C)
- Engineering analyses developed for FIRM will be leveraged
- EAP analyses could be leveraged
- Flood Inundation Maps will be developed



Contacts

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- Hilary.Kendro@atkinsglobal.com

➤ **STARR II Regional Support Center Lead**

- Curtis Smith
- 646-490-3929
- curtis.smith@stantec.com



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Questions? Comments?



Thank you!



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