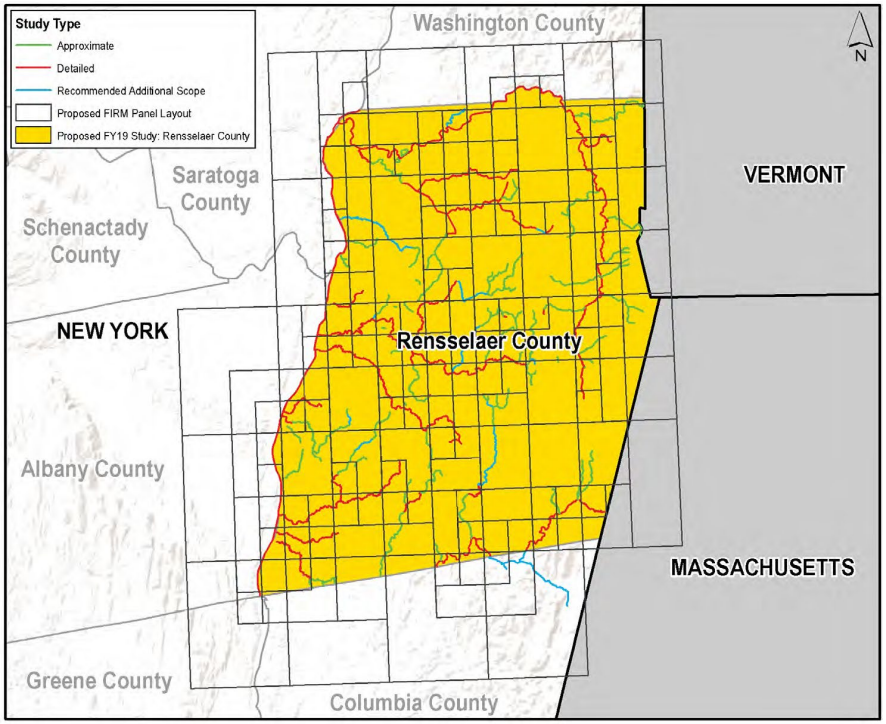
RiskMAP
Increasing Resilience Together

Flood Risk Project

Rensselaer County, NY
Project Kick Off Meeting

May 4, 2020

FEMA



Please Introduce Yourself

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

Also, what do Rensselaer communities aspire to accomplish using today's meeting?

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

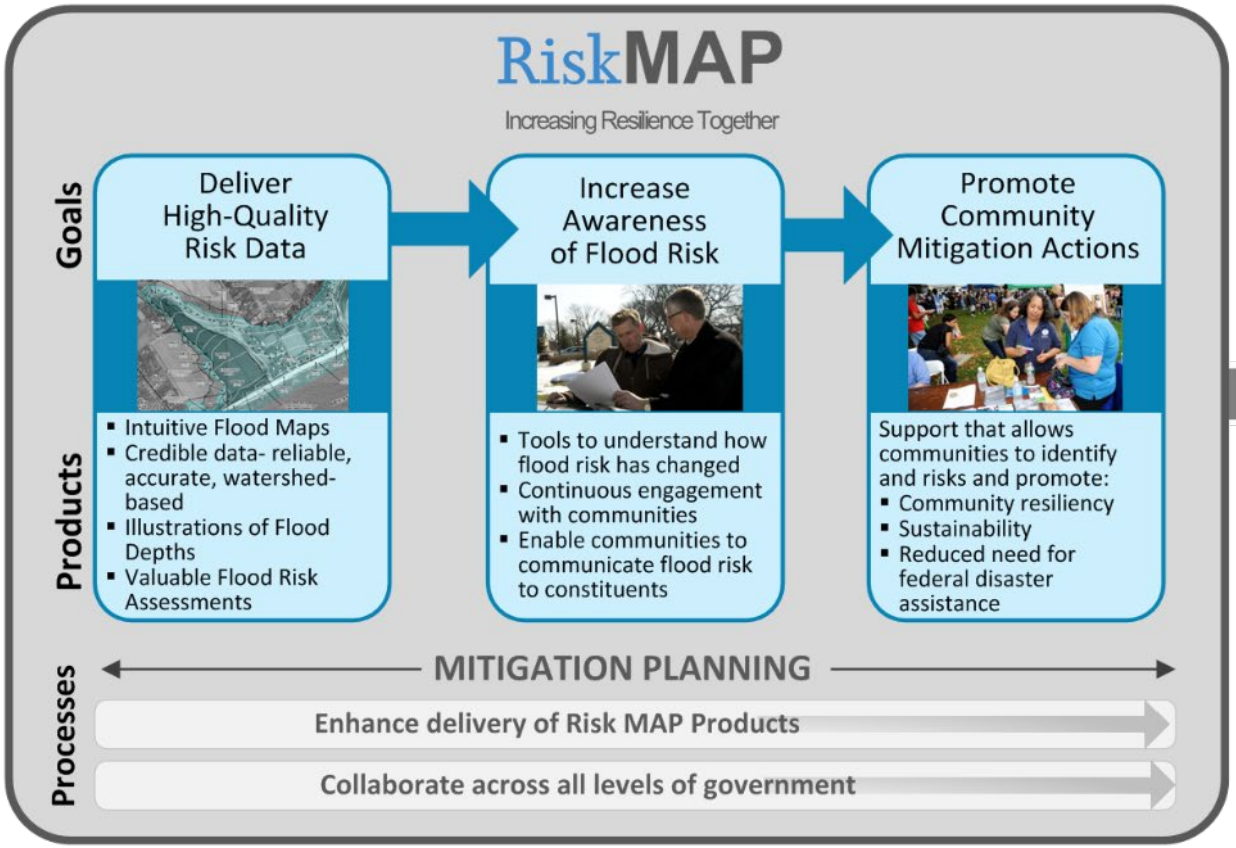
Today's Goals

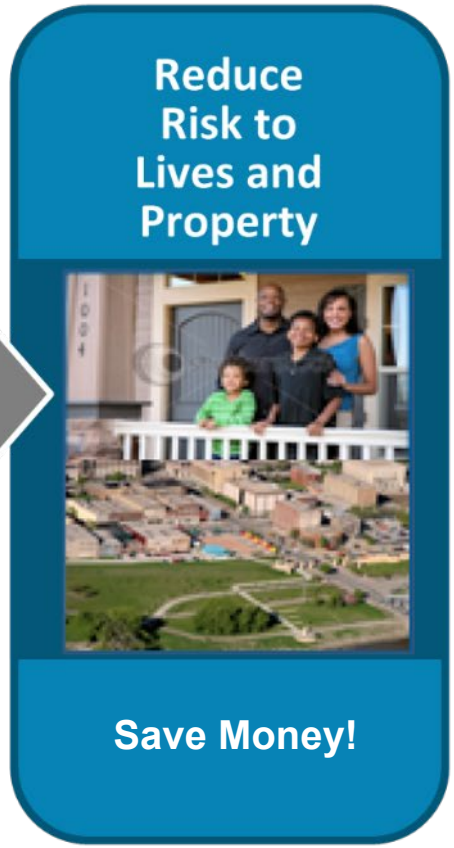
1	2	3
The value of updated flood maps for your community	Recap of Flood Risk Study history, including Discovery and Hudson-Hoosic Watershed study	Review county-wide study scope, products and outreach process

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 we are here

We want to help communities understand flood risk and take action to reduce it because…

Risk changes over time

- All floods are different. Nature and communities change.

Flooding happens

- Communities may face flooding. Is your community active or reactive to flood risk?.

Mitigation is Possible

- Proactive communities plan to reduce flood impacts and other hazards.

Why Update Flood Maps?

The Federal Emergency Management Agency (FEMA) manages the National Flood Insurance Program (NFIP)

NFIP Policies for Rensselaer	NFIP Claims for affected communities	FEMA Insurance Claims Paid in affected communities	Hazard Mitigation Plan
914	528	$7,200,318	October 2019

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How did we get here?
Review past activities

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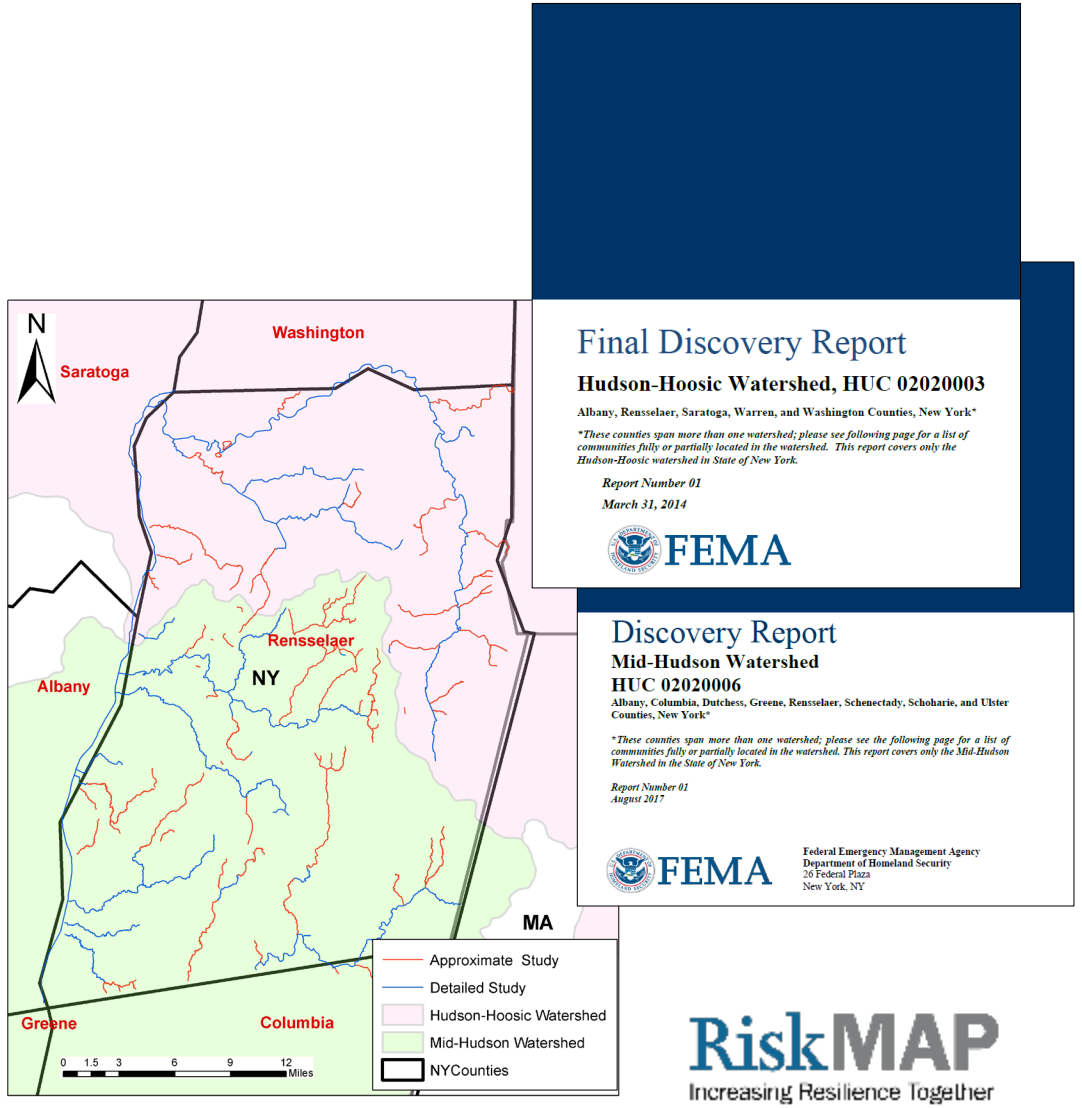
Discovery/Post-Discovery Progress
Recap

- Two separate HUC8 watershed level efforts
- Hudson-Hoosic Watershed
  - Meetings - October 2012
  - Completion – March 2014
- Mid-Hudson Watershed
  - Meetings - October 2016
  - Completion – April 2017
- Community input guided FEMA priorities



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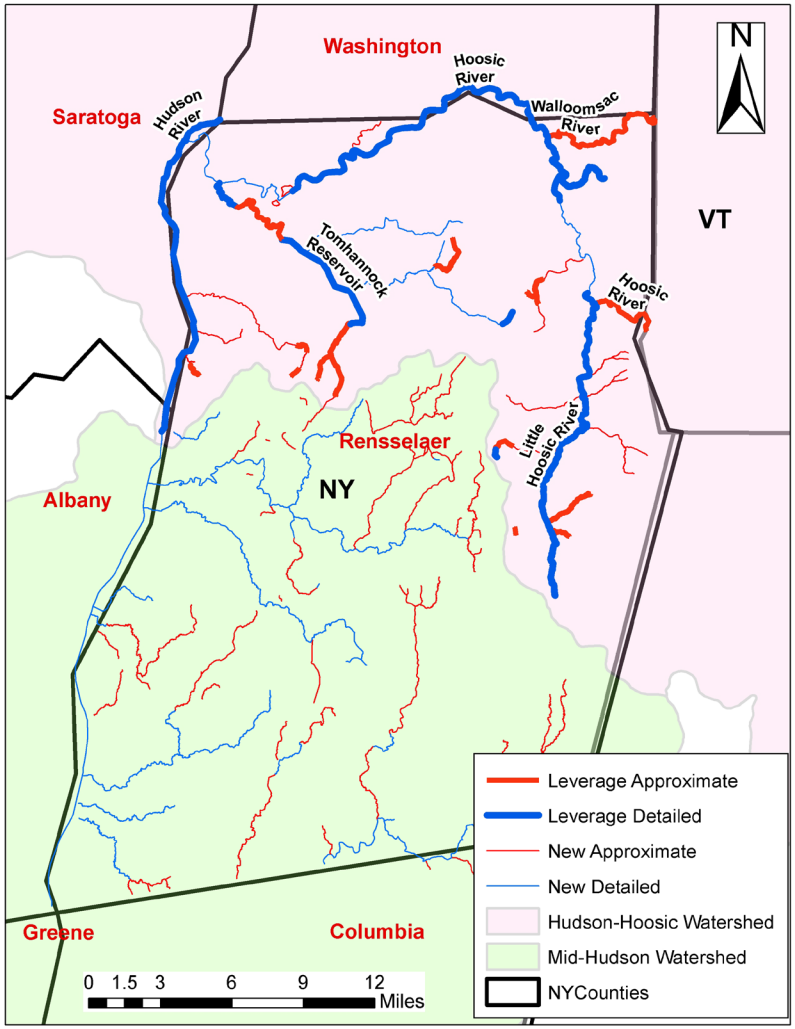
Leveraged Data
Recap

- Hudson-Hoosic Watershed Study
  - Initial flood hazard analyses completed 2016
  - Additional analyses completed in 2018
  - Hudson River above Troy Dam – 15 miles
  - Walloomsac River – 7.3 miles
- 2016 Partial Countywide Study
  - Hoosic River – 20 miles (model updated)
  - Woods Brook – 3.1 miles
  - Tomhannock Creek/Reservoir – 14.3 miles
  - Tribs to Little Hoosic River – 5.4 miles
  - Other Tribs – 9 miles
- 2019 Hoosick Falls Levee Discovery Study
- Any local flood studies that FEMA should be aware off?



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What is being studied now?
Discuss scope of new study

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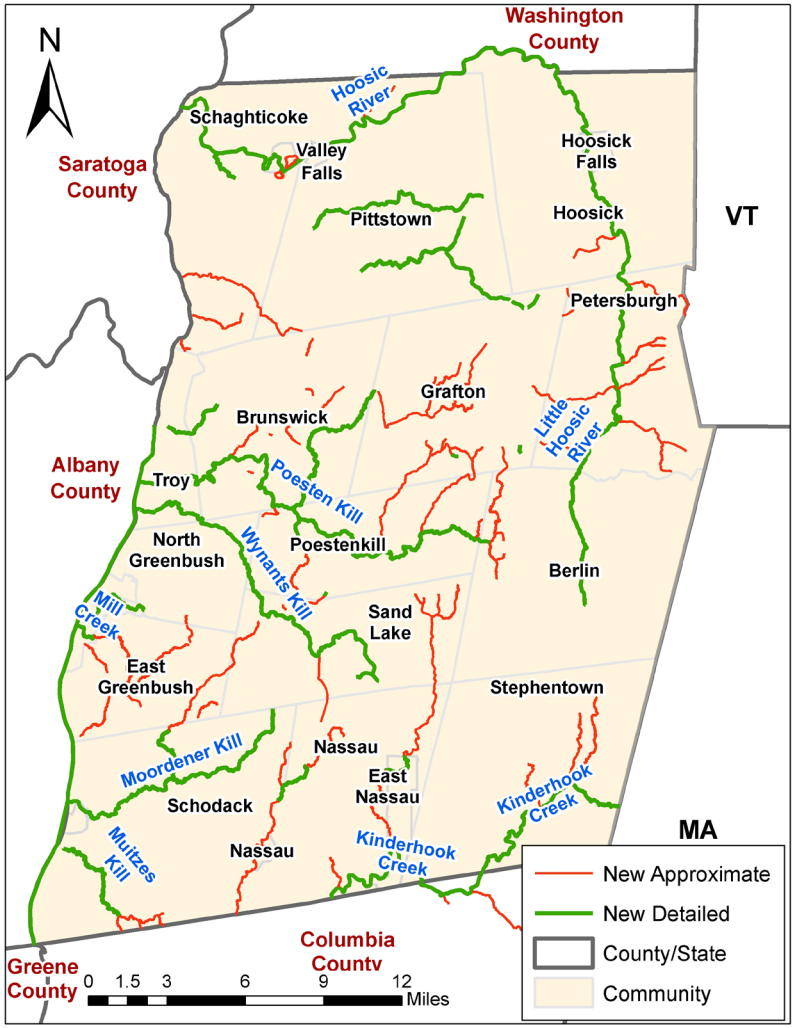
Rensselaer County, Countywide Flood Risk Study Scope

- **First time digital maps**
- **Additional flooding sources analyzed**
  - Detailed riverine studies (AE Zone) – 21 streams, 198 miles
  - Detailed lake studies (AE) – 8 lakes, 5 miles
  - Approximate (A Zone) studies – multiple streams, 170 miles
  - Redelineation (AE) – 1 stream, 6 miles
- **22 updated communities**
- **Review meetings**
  - Hydrology Meeting
  - Hydraulics Meeting
  - Flood Risk Review Meeting



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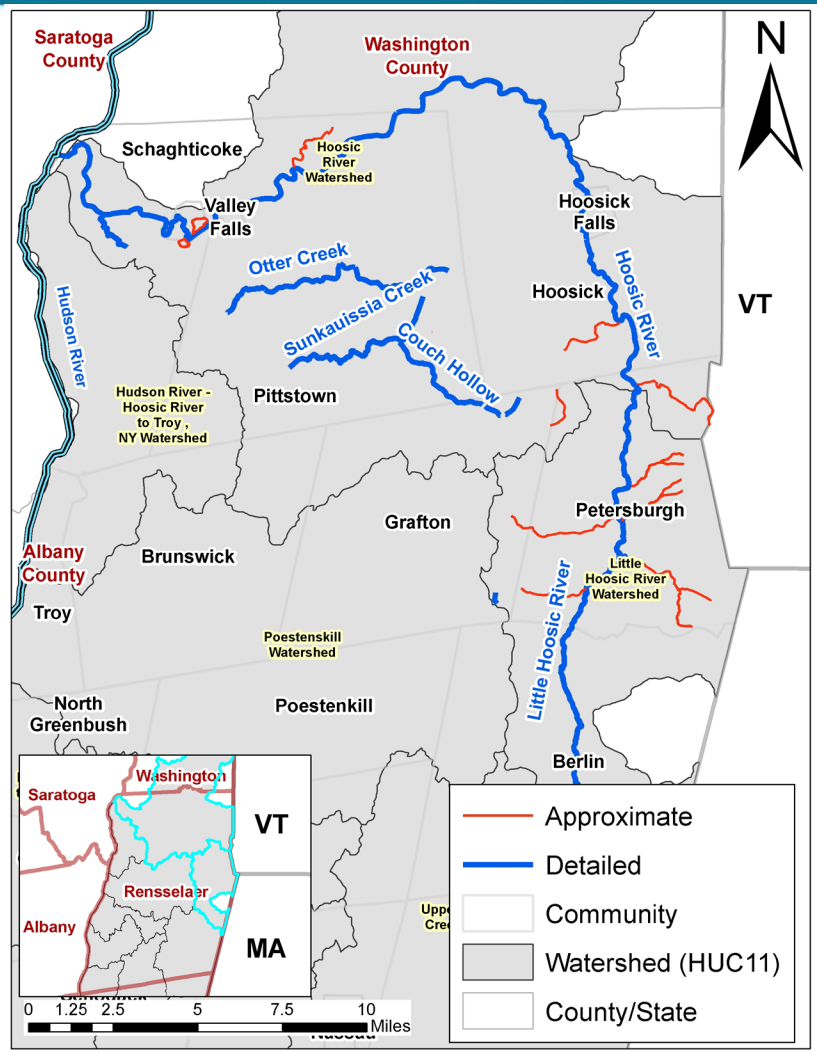
Scope: Hoosic River/Little Hoosic River Watershed

- **6 Detailed (AE) Study Streams – 56 miles**
  - Hoosic River - 34.3 miles*
  - Little Hoosic River - 16.2 miles
  - Otter Creek - 8.5 miles
  - Sunkauissia Creek - 6.7 miles
  - Couch Hollow - 4.1 miles
  - Tomhannock Creek - 1.7 miles
  - Babcock Lake - 0.7 miles
  - Taconic Lake - 0.3 miles
- **10 Approximate (A) Study Streams – 30 Miles**

Leverage 2016 study, updated engineering

In the legend, HUC 11 refer to 11-digit watershed boundaries from Cornell University Geospatial Information Repository (CUGIR)



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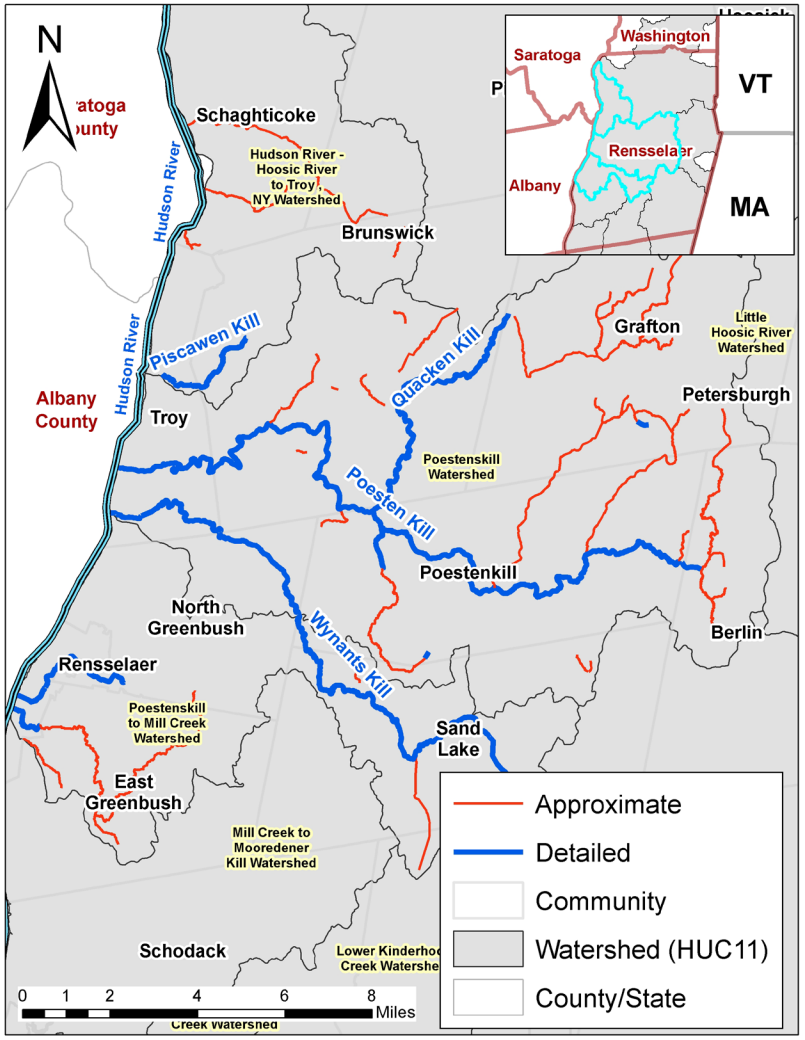
Scope: Poesten Kill/Piscawen Kill/Mill Creek Watershed

- **7 Detailed (AE) Study Streams – 49 miles**
  - Piscawen Kill - 3.2 miles
  - Newfoundland Creek - 1.1 miles
  - Poesten Kill - 23.4 miles
  - Quacken Kill - 8.3 miles
  - Wynants Kill - 18.3 miles
  - Mill Creek - 1.2 miles
  - Quackenderry Creek - 3.7 miles
- **4 Detailed (AE) Study Lakes – 2 miles**
  - Crooked Lake - 1.1 miles
  - Forest Lake - 0.3 miles
  - Ida Lake - 0.4 miles
  - Vosburg Pond - 0.2 miles
- **13 Approximate (A) Streams – 79 Miles**



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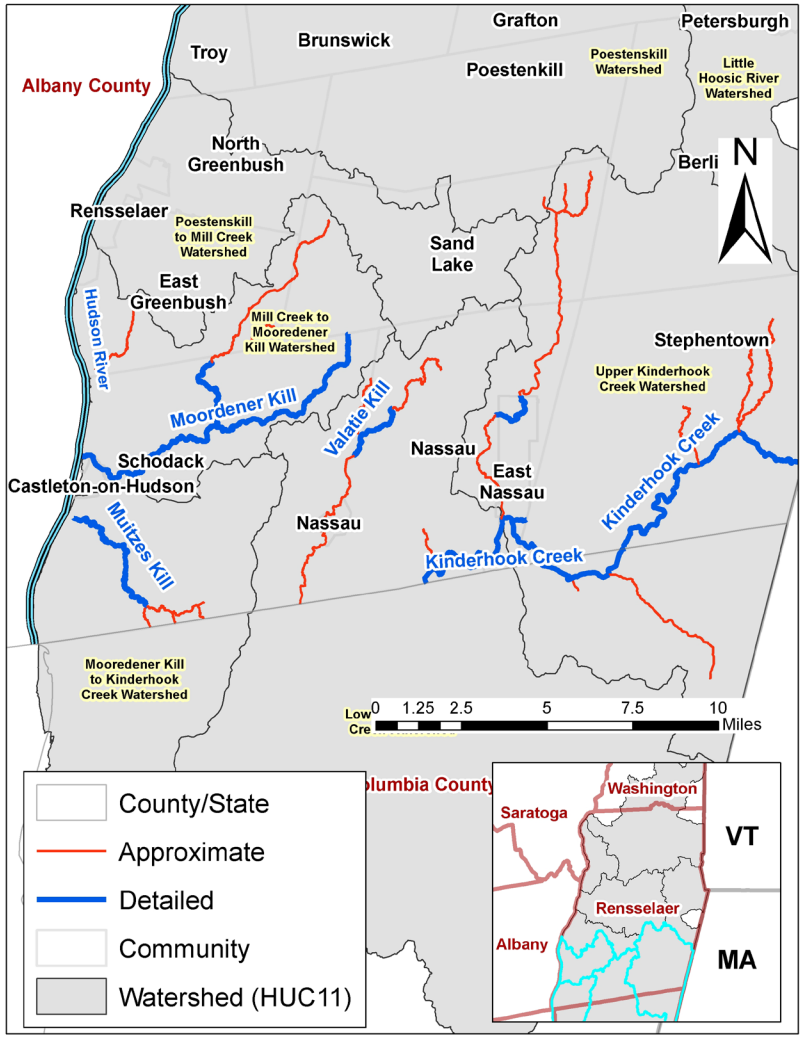
Scope: Kinderhook/Moordener Watershed & Hudson River

- **7 Detailed (AE) Study Streams – 48 miles**
  - Kinderhook Creek - 5.8 miles
  - Valatie Kill - 2.5 miles
  - Moordener Kill - 14 miles
  - North Branch Moordener Kill - 3.2 miles
  - Muitzes Kill - 5.6 miles
  - Black Brook - 0.5 miles
  - Kinderhook Creek - 14.3 miles
  - Tsatsawassa Creek - 1.9 miles
- **Detailed (AE) Study for Hudson River (Below Troy Dam) – 21.2 miles**
- **13 Approximate (A) Streams – 62 Miles**



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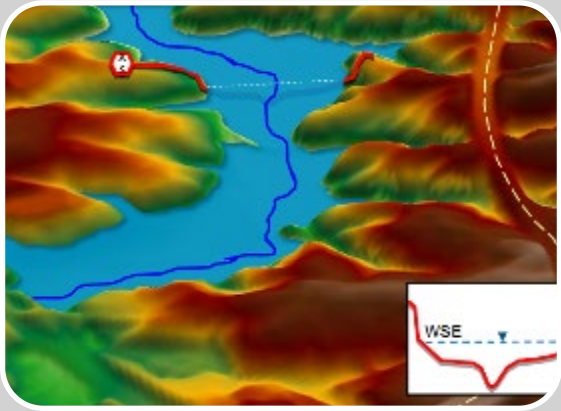
Flood Hazard Analyses



Hydrology

Volume of water?

Peak Flows?

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

Hydraulics

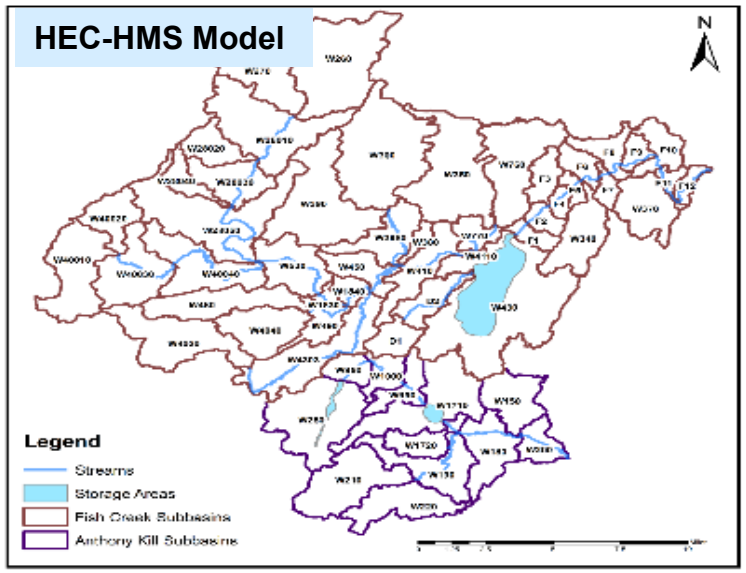
Will the stream in question be able to convey all storm water or runoff that arrives?

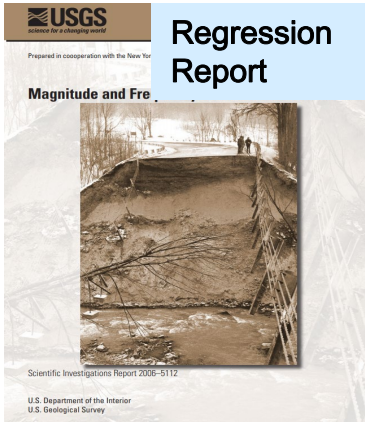
Floodplain Mapping

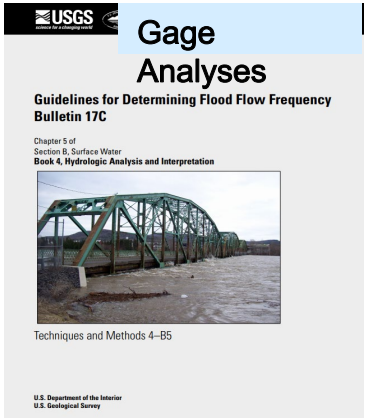
What areas of a community will be inundated based on engineering analysis?

Engineering Methods - Hydrologic Analysis

- **Typical Methods FEMA utilizes**
  - Regression Analyses
  - Statistical Gage Analyses
  - Rainfall Runoff Modeling
- **Gage/Regression are based on availability of stream gage data**
  - Most study streams use regression only
  - Limited Gage Data (4 USGS gages)
- **Rainfall-Runoff physical modeling chosen due to limited gage data**
  - Limited use for lakes and some streams
- **Discharges developed for**
  - 10%, 4%, 2%, 1%, 1%+, 1%-, 0.2%
  - Inputs for hydraulic analyses







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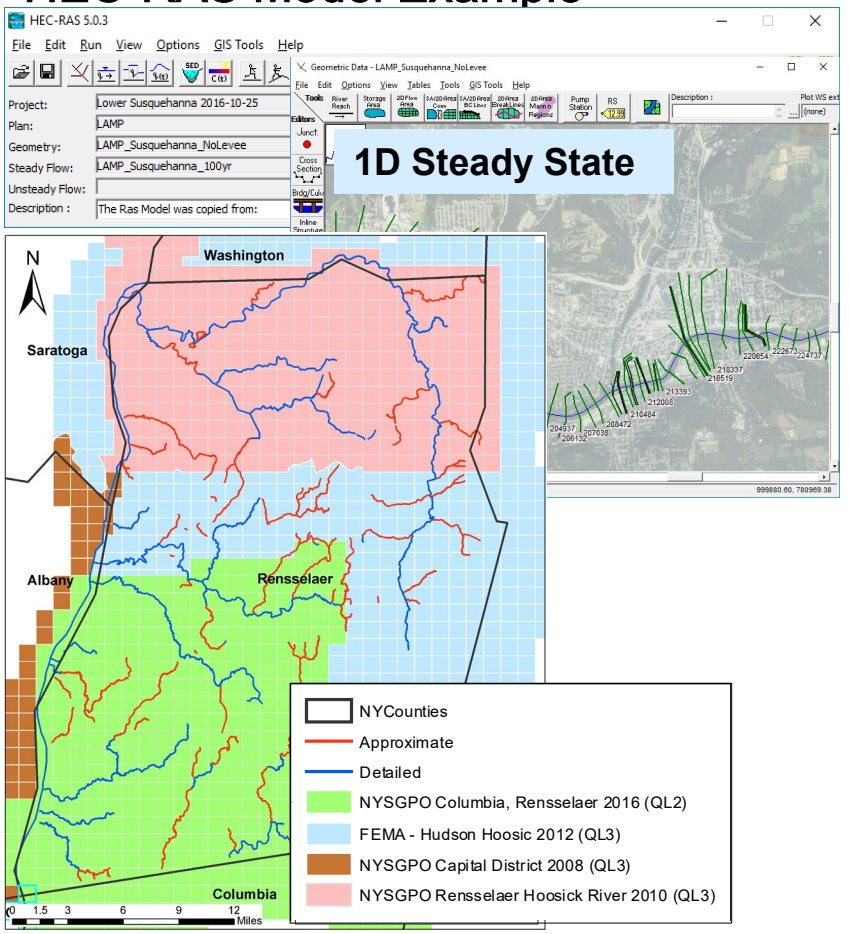
Engineering Methods - Hydraulic Analysis

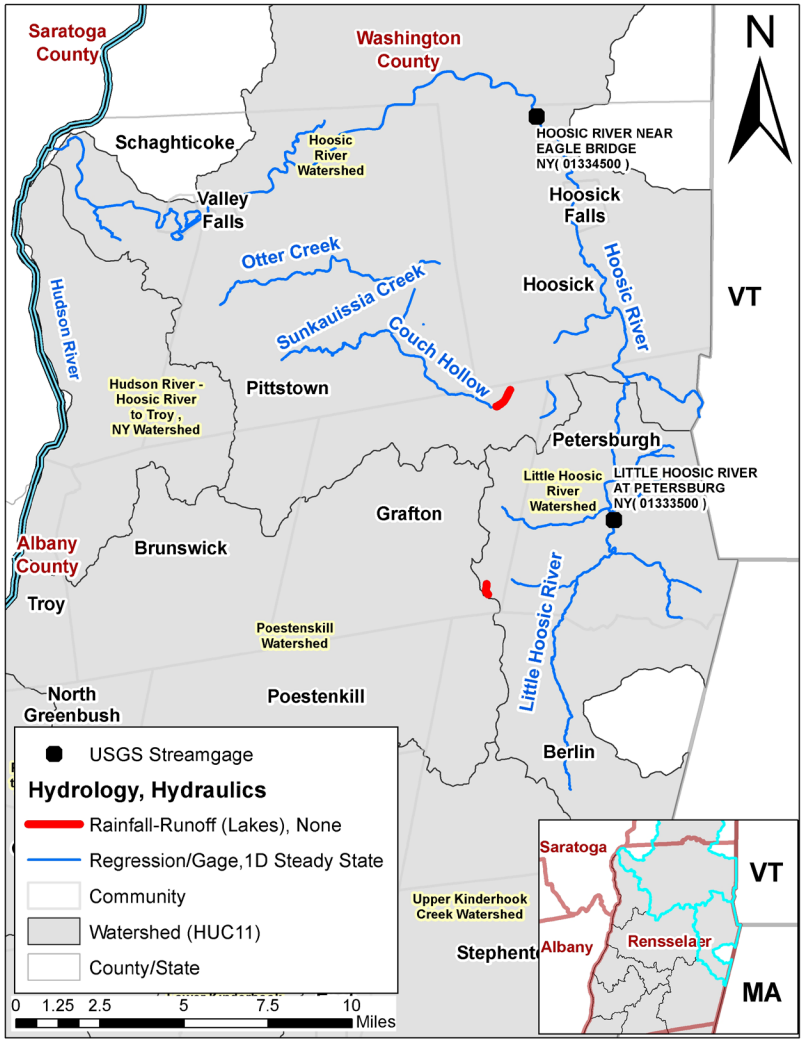
- **Types of Analyses**
  - One Dimensional (1D) Steady State
  - Two Dimensional (2D) Unsteady State
- **Modeling developed using USACE's HEC-RAS Program**
- **Terrain Data – Multiple Sources**
  - Provides topographic elevation information
  - Supplemented by field survey
- **Field Survey for Detailed Study**
  - Collection underway: 245 structures and 1100+ under water channel sections
- **Flood Hazard Data Generated**
  - Elevations: 10%, 4%, 2%, 1%, 1%+, 1%-, 0.2%
  - Floodplain extents: 10%, 1%, 0.2%, Floodway

HEC-RAS Model Example



Engineering Methods - Hoosic River/Little Hoosic River Watershed

- **Hydrologic Method: USGS Regression Analyses Only**
  - All study reaches
- **Hydrologic Method: USGS Regression Analyses/Gage Analyses**
  - Hoosic River
  - Little Hoosic River
- **Hydrologic Method: Rainfall-Runoff Analyses**
  - Babcock Lake
  - Taconic Lake
- **Hydraulic Method: HEC-RAS, 1D steady state hydraulic model**
  - All study stream reaches
  - Hoosic River – Update 2016 Analyses



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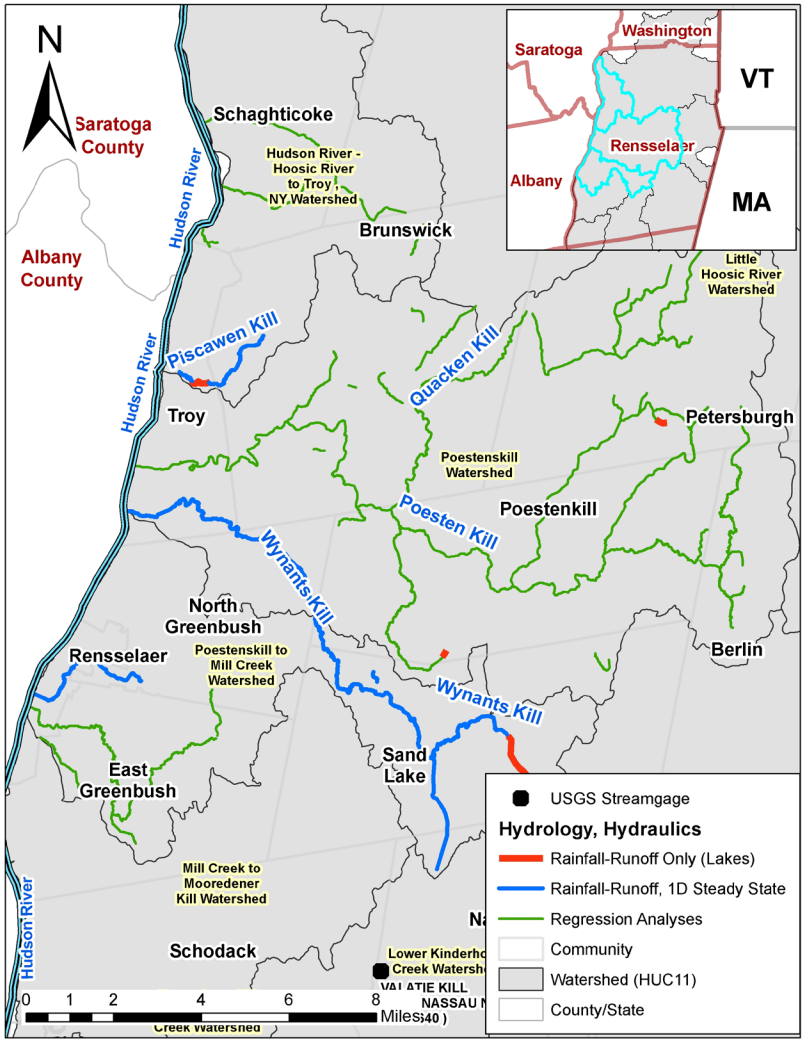
Engineering Methods - Poesten Kill/Piscawen Kill/Mill Creek Watershed

- **Hydrologic Method: USGS Regression Analyses**
  - Newfoundland Creek
  - Poesten Kill
  - Quacken Kill
  - Mill Creek
  - All approximate study reaches
- **Hydrologic Method: Rainfall-Runoff Analyses**
  - Piscawen Kill
  - Wynants Kill
  - Quackenderry Creek
  - All Lakes
- **Hydraulic Method: HEC-RAS, 1D steady state hydraulic model**
  - All study stream reaches



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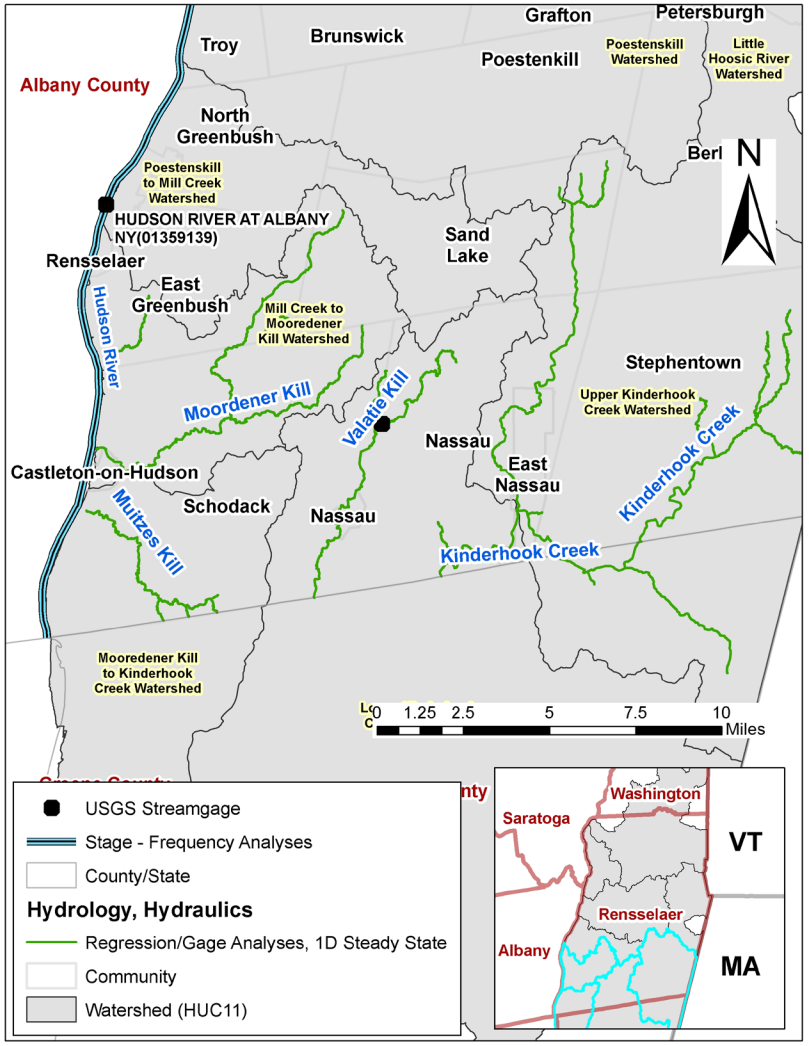
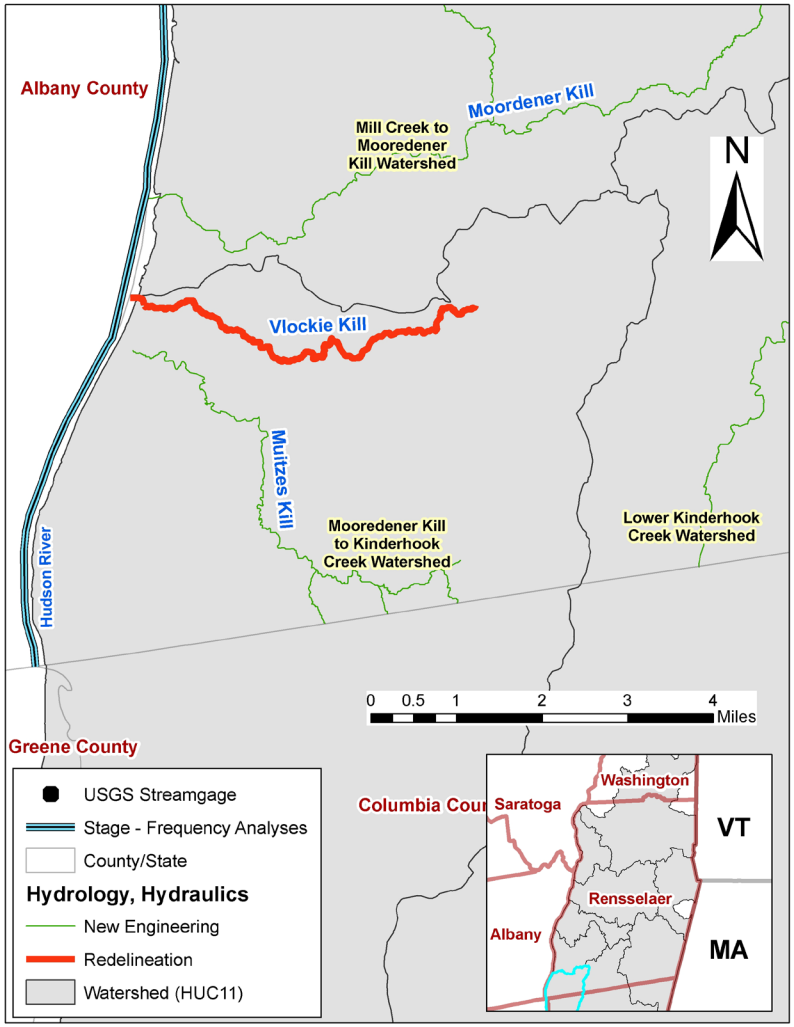
Engineering Methods - Kinderhook/Moordener Watershed & Hudson River

- **Hydrologic Method: USGS Regression Analyses Only**
  - All study reaches
- **Hydrologic Method: USGS Regression Analyses/Gage Analyses**
  - Valatie Kill
- **Hydrologic Method: Stage-Frequency Analyses**
  - Hudson River
- **Hydraulic Method: HEC-RAS, 1D steady state hydraulic model**
  - All study stream reaches



Redelineated Streams

- Vlockie Kill – 6.2 miles
- No hydrology or hydraulic analyses conducted
- Flood extents are re-delineated using latest LiDAR topographic data
- Vertical Datum Conversion conducted
- Existing flood elevations converted from NGVD29 to NAVD88 datum



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Where are we now and what is next?

Discuss next steps

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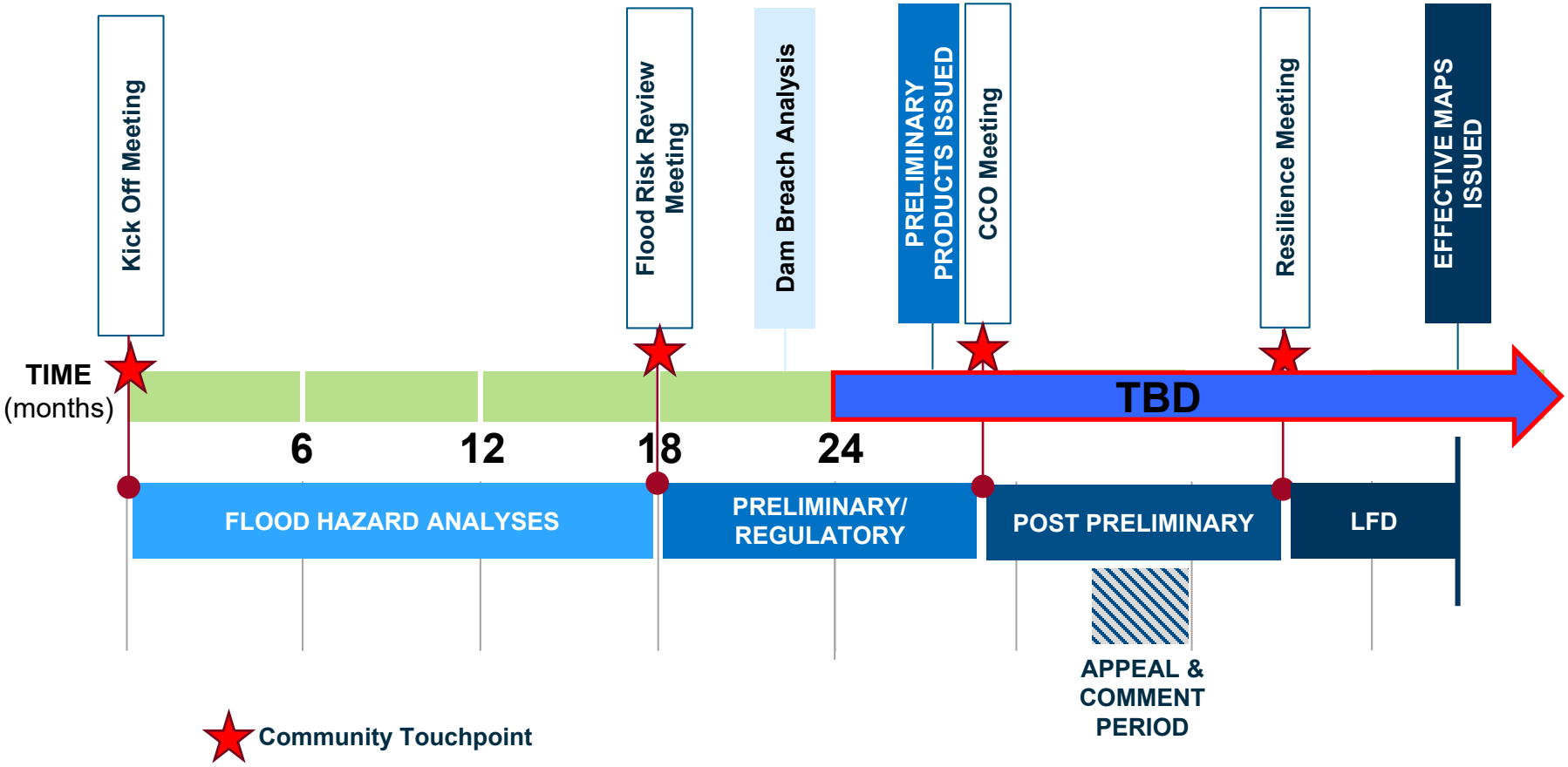
Overall Flood Risk Project Timeline



Major Study Milestones

- **Data Development (October 2021)**
  - Terrain processing
  - Engineering Methods Concurrence (620 letters)
  - Field reconnaissance and survey
  - Hydrologic modeling
  - Hydraulic modeling
  - Floodplain mapping (workmaps)
- **Flood Risk Review Meeting (December 2021)**
  - Review work map products with communities

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What will communities receive?

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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

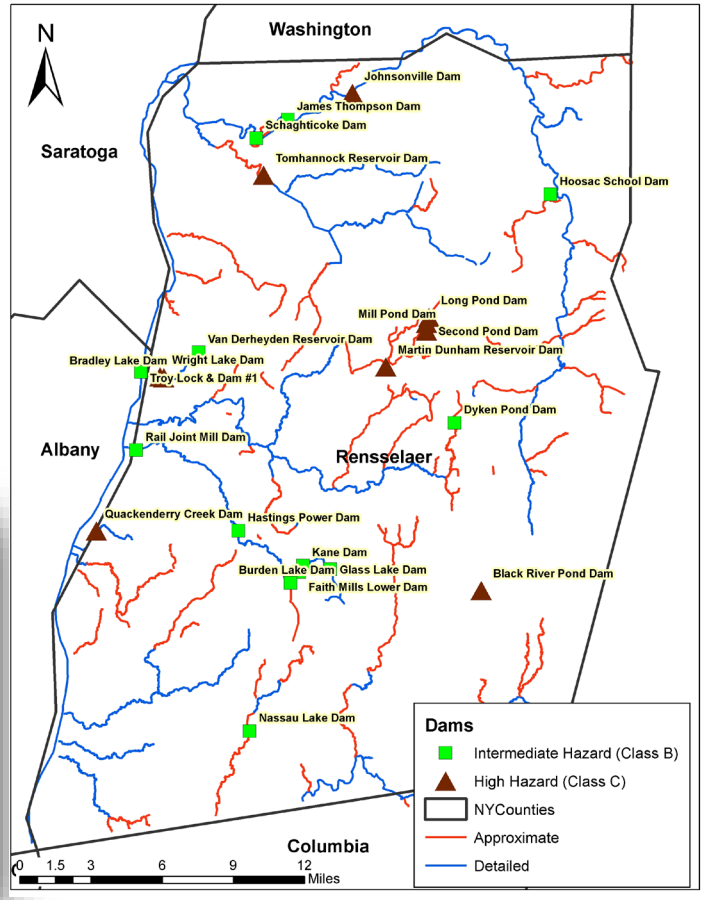
Knowing the Risk

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.

Dam Breach Analysis

- Up to 5 Medium/High Hazard Dams analyzed
  - 13 Intermediate hazard class (B)
  - 10 High hazard class (C)
- Engineering analyses developed for FIRM will be leveraged
- EAP analyses could be leveraged
  - 16 out of 23 (Class B and C)
- Flood Inundation Maps will be developed



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Questions? Comments?

Thank you!

FEMA