Flood Risk Project

Seneca Nation of Indians Cattaraugus Territory

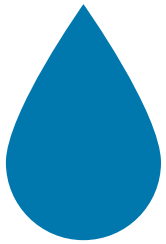
Hydrology Review Meeting

September 22, 2021

FEMA

Agenda

Recap/Refresh

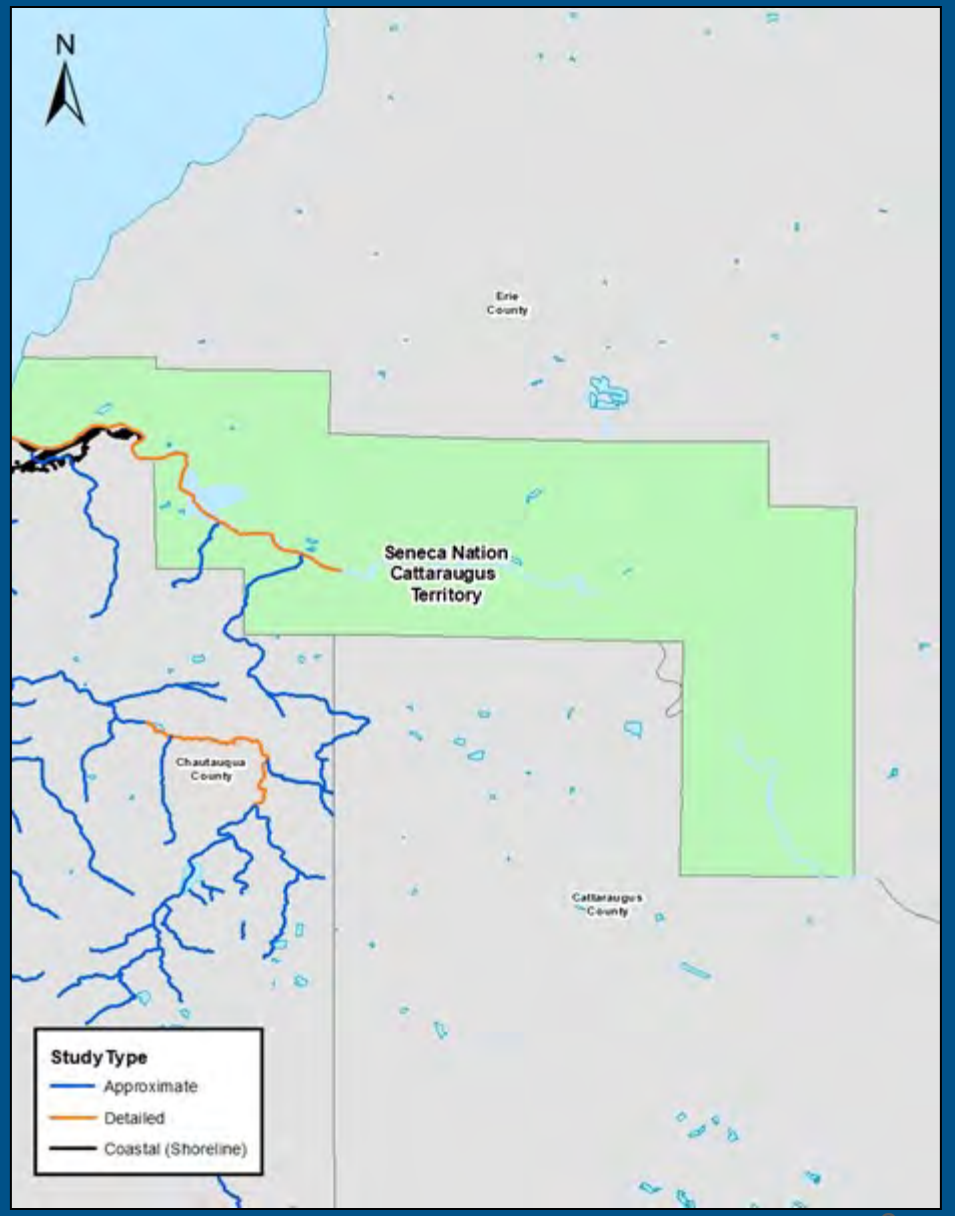


Hydrology Analysis Review

Path Forward

Project Recap

- **Current Study Progress**
  - Engineering models notification: March 4, 2021
  - Kickoff meeting: Held virtually March 22, 2021
  - Field survey kickoff meeting: Held virtually June 16, 2021
  - Field survey: Summer 2021
  - Hydrologic analysis: Spring 2021 – Present



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Project Scope

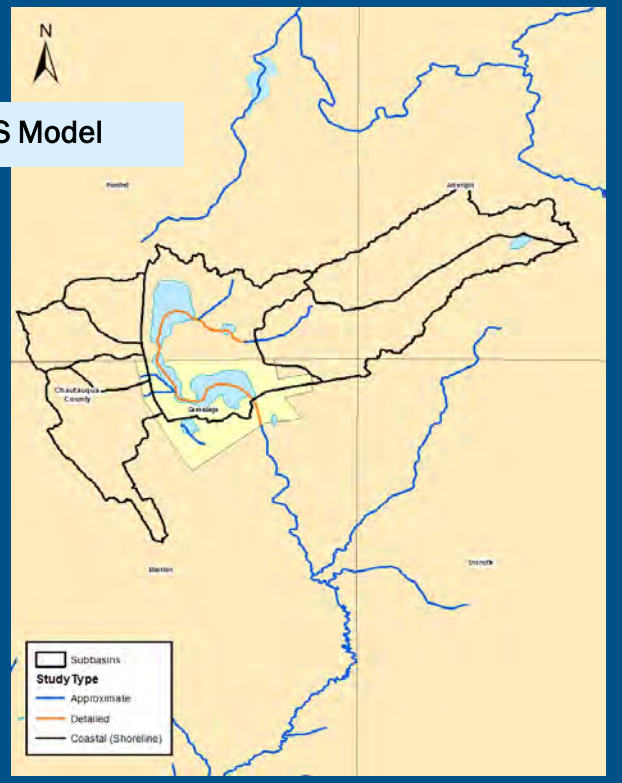
- First time digital mapping products
- Flooding sources analyzed
  - Detailed riverine studies (AE)
    - Cattaraugus Creek – 6 miles
  - Approximate studies (A)
    - Tributaries to Cattaraugus Creek
- Review Meetings
  - Hydrology Meeting
  - Hydraulics Meeting
  - Flood Risk Review Meeting

FEMA

Hydrologic Analysis Methods

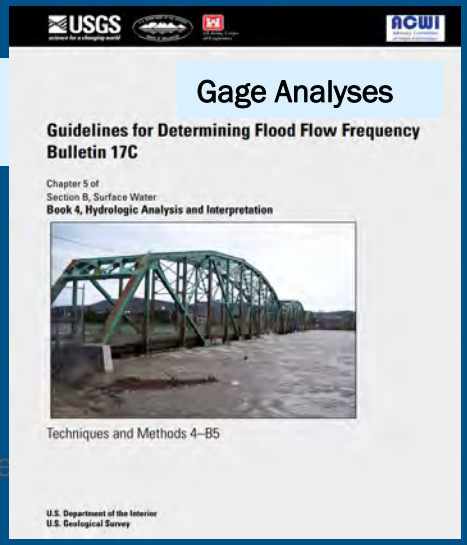
- Typical Methods FEMA utilizes
  - Statistical Gage Analyses
  - Regression Analyses
  - Rainfall Runoff Modeling
- Gage/Regression analyses are based on stream gage data
- Rainfall-Runoff modeling based on estimated hydrologic parameters
- Discharges developed for
  - 10%, 4%, 2%, 1%, 1%+, 1%-, 0.2%
  - Inputs for hydraulic analyses

HEC-HMS Model



Regression Report

Gage Analyses



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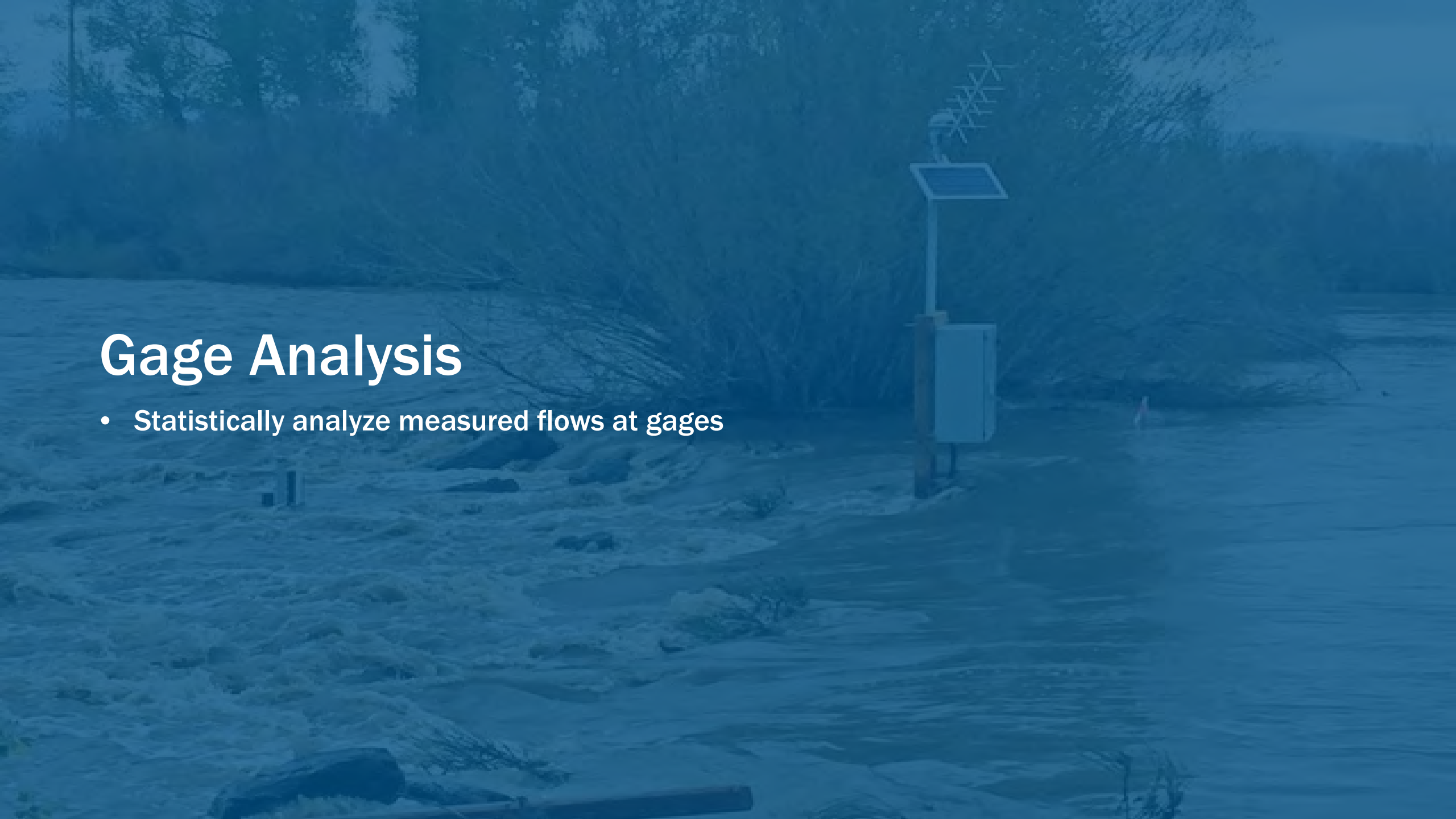


Gage Analysis

- Statistically analyze measured flows at gages

Hydrology – Gage Analysis

Stream Gage Number	Stream Name	Stream Gage Name	Drainage Area (mi^2)	Number of Systematic Peaks	Period of Record (Years)
04213500	Cattaraugus Creek	Cattaraugus Creek at Gowanda, NY	436	79	1940 – 2020

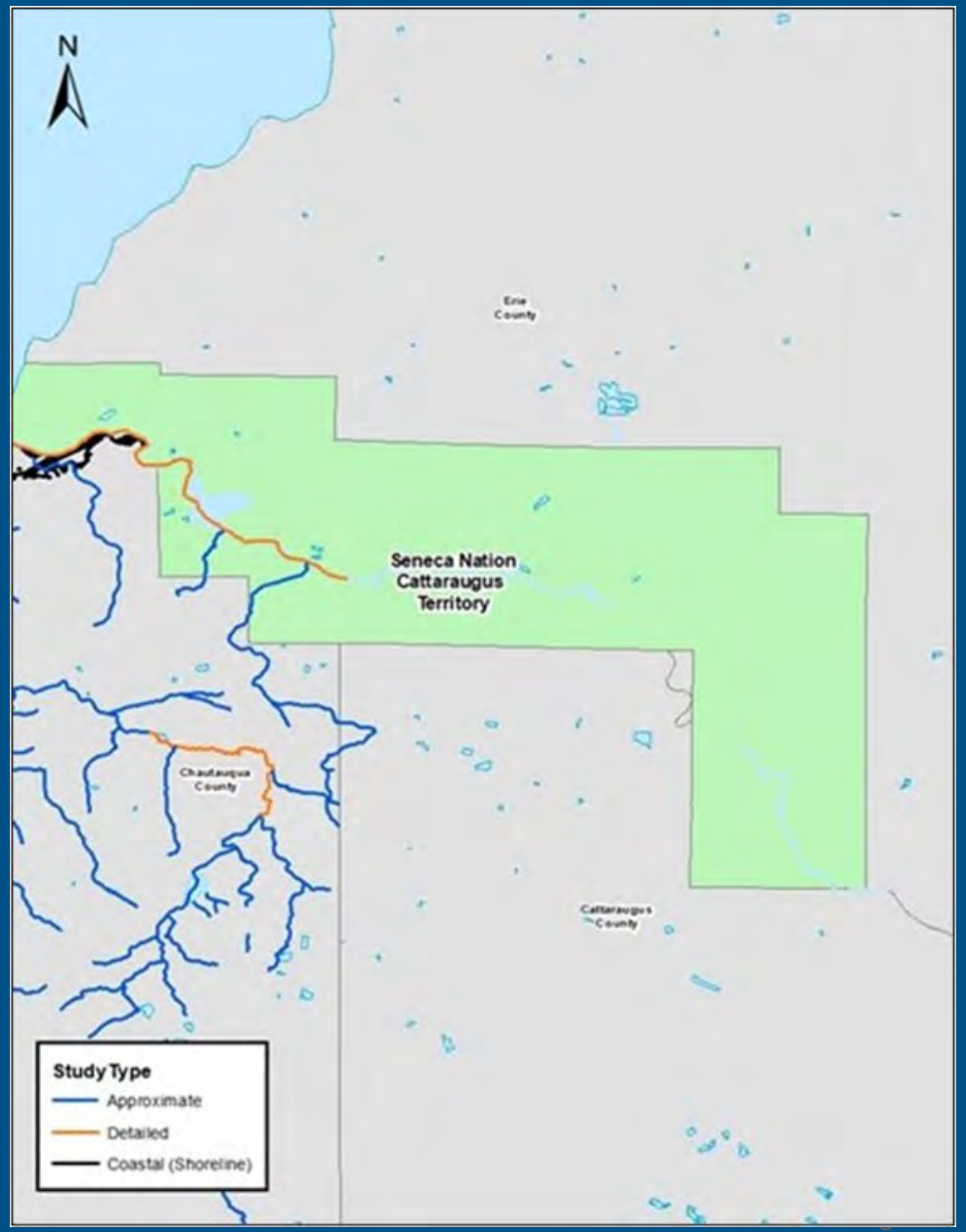
- Bulletin 17C methodology

Regression Analysis

- USGS Stream Stats Discharges
- Relationships between peak flows and watershed characteristics
- Regional Regression Equations
- Gage Weighting

Hydrology – Regression Analysis

- Regression Analysis = 9 miles (A Zone)



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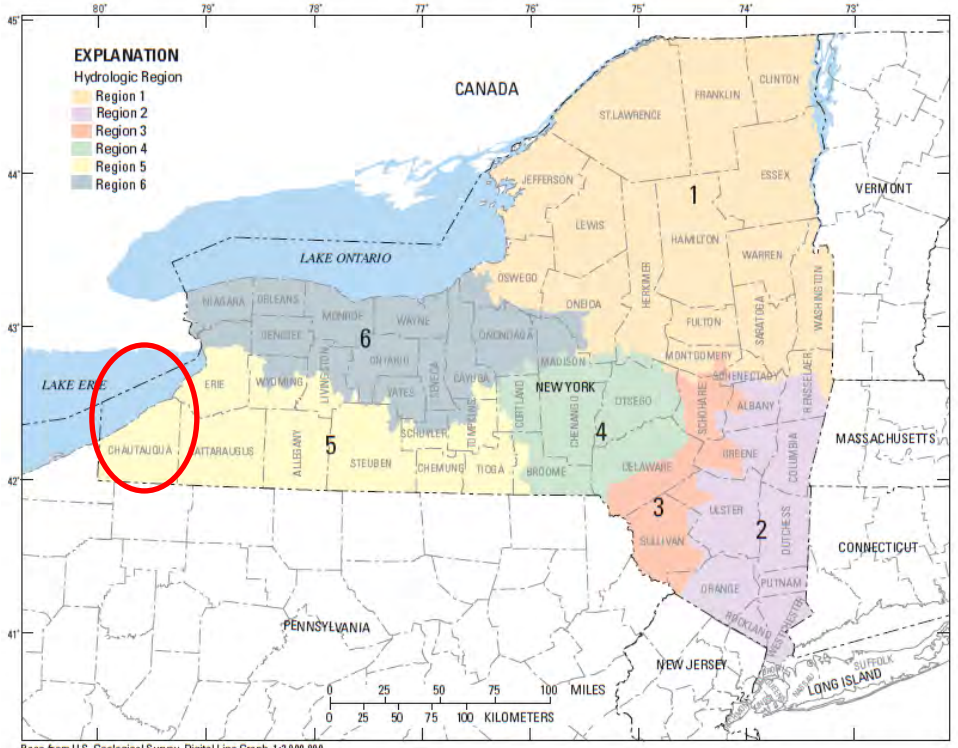
Hydrology – Regression Analysis

- USGS New York regression equations
  - SIR 2006-5112
- Study area falls within USGS NY regression Region 5
- Method for Zone A streams



Base from U.S. Geological Survey, Digital Line Graph, 1:2,000,000
Universal Transverse Mercator projections, zone 18, NAD83

Figure 2. Six hydrologic regions of New York and locations of 388 streamflow-gaging stations represented in this study. (Map numbers refer to streamflow-gaging stations shown in tables 7 and 8.)

Summary of Regression Equations

Factors Considered

- Drainage area (square miles)
- Mean annual precipitation (inches per year)
- Main channel slope (feet/mile)

Model Validation / Results

- Check computed flows against results from Effective FIS

Gage Analysis

Gage Analysis results – Comparison with FIS values

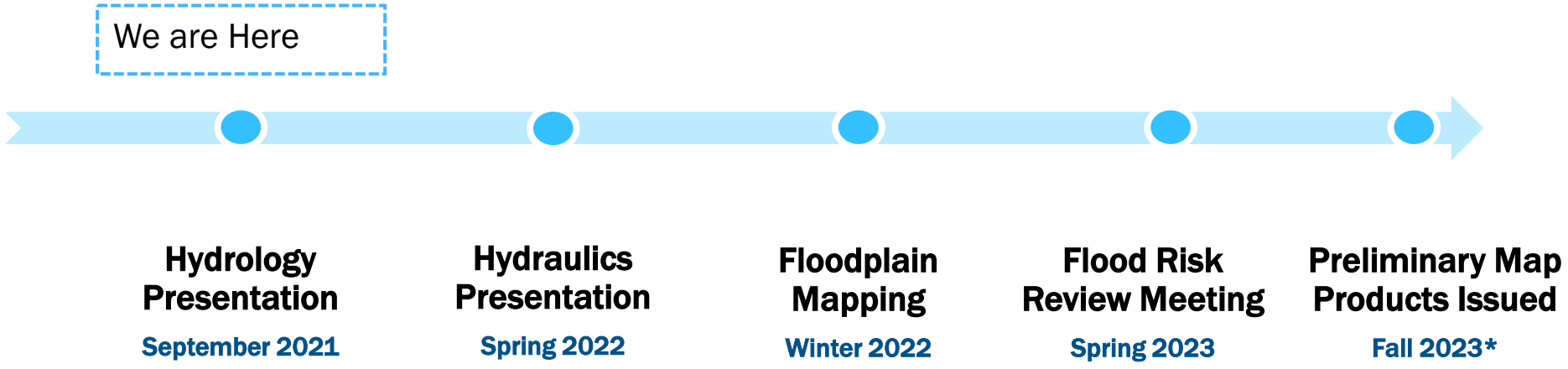
Stream Name	Drainage Area (mi^2)	Effective Discharge (cfs)		Restudied Discharge (cfs)		Difference	
		1-Pct	0.2-Pct	1-Pct	0.2-Pct	(%)	(%)
Cattaraugus Creek	561.6	45,150	57,000	48,800	64,300	8%	13%

Seneca Nation Next Steps

Seneca Nation Next Steps

- Hydraulic analysis
  - Hydraulic modeling/report/submittal
  - Hydraulic analysis webinar
- Floodplain Mapping
- Flood Risk Review meeting
  - Comment period for communities

Project Timeline towards Preliminary Issuance



*Current timeline could be impacted by Flood Risk Review Comments

Graphic Above Not to Scale

Seneca Nation Next Steps

- Upcoming Projects
  - Updated flood studies of territories
  - Kickoff meeting in Fall/Winter 2021

Contacts

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Thank you!

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