Montour Falls
# Climate Projections and Vulnerable Assets

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Outline

- Background information
- Projections
  - Extreme rainfall
  - Temperature and precipitation variables
  - Future stream discharge for different storms
- Vulnerable assets
  - Population
  - Built infrastructure
  - Natural resources

How will the local climate change in the future?

- Temperature
- Rain
- Snow
- Storms & flooding
- Extremes
  - Heat
  - Cold
  - Rain

Normal Average Temperatures (Deg F) Annual (1971–2000). Northeast Regional Climate Center.
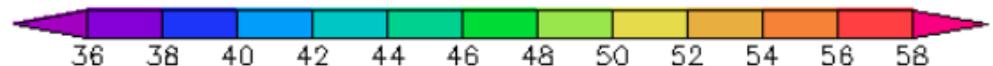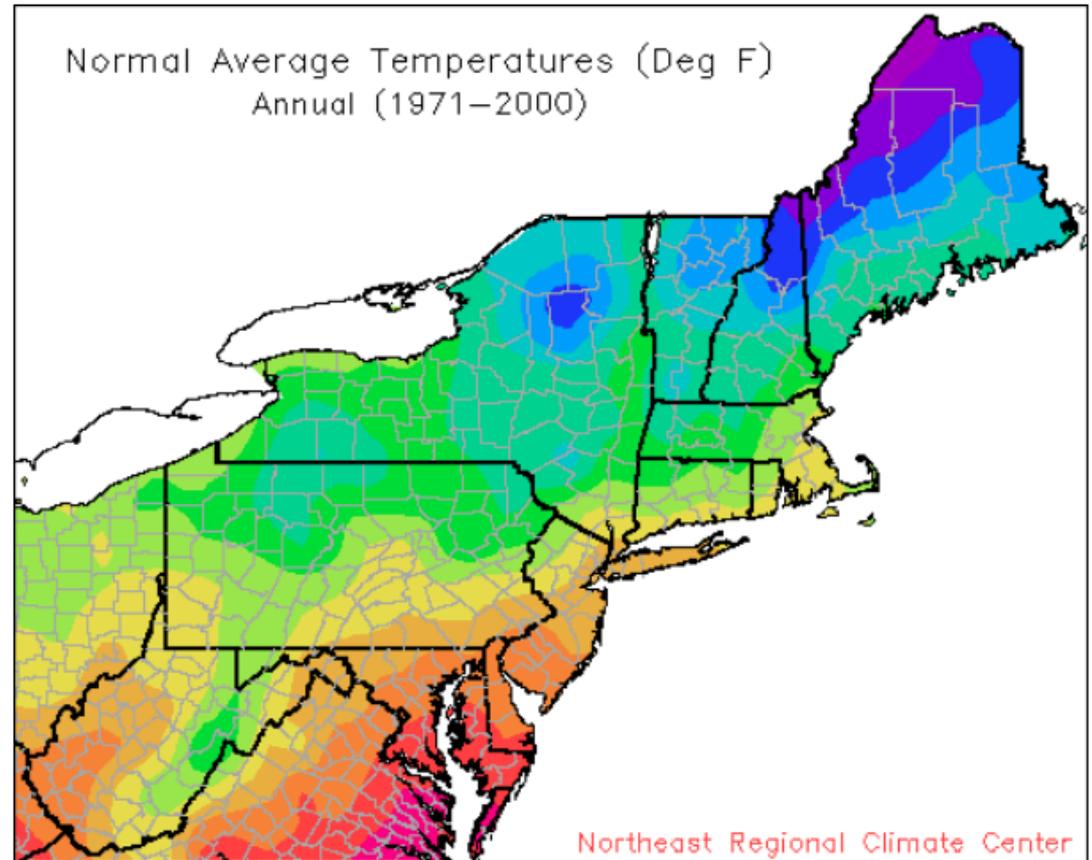
Future climate change depends on our choices

- Representative Concentration Pathways (RCPs) for carbon dioxide emissions
- Projections presented for two different RCPs

RCP 4.5
Low to medium emissions

Stabilization scenario: emissions peak around mid-21st century, then decline

RCP 8.5
High emissions

No reduction in emissions over time

Storm recurrence

Examples:

- 2, 5, 10, 50, 100, 500 year recurrences
- "100-year storm"

100-year storm = A storm with a 1 in a 100 (1%) chance of occurring within in a year

Extreme Rainfall Projections

Source: Intensity Duration Frequency Curves for New York State, Future Projections for a Changing Climate

Northeast Regional Climate Center, Cornell University

http://ny-idf-projections.nrcc.cornell.edu/idf_prob_finder.html

Nearest location for projections: Elmira, NY
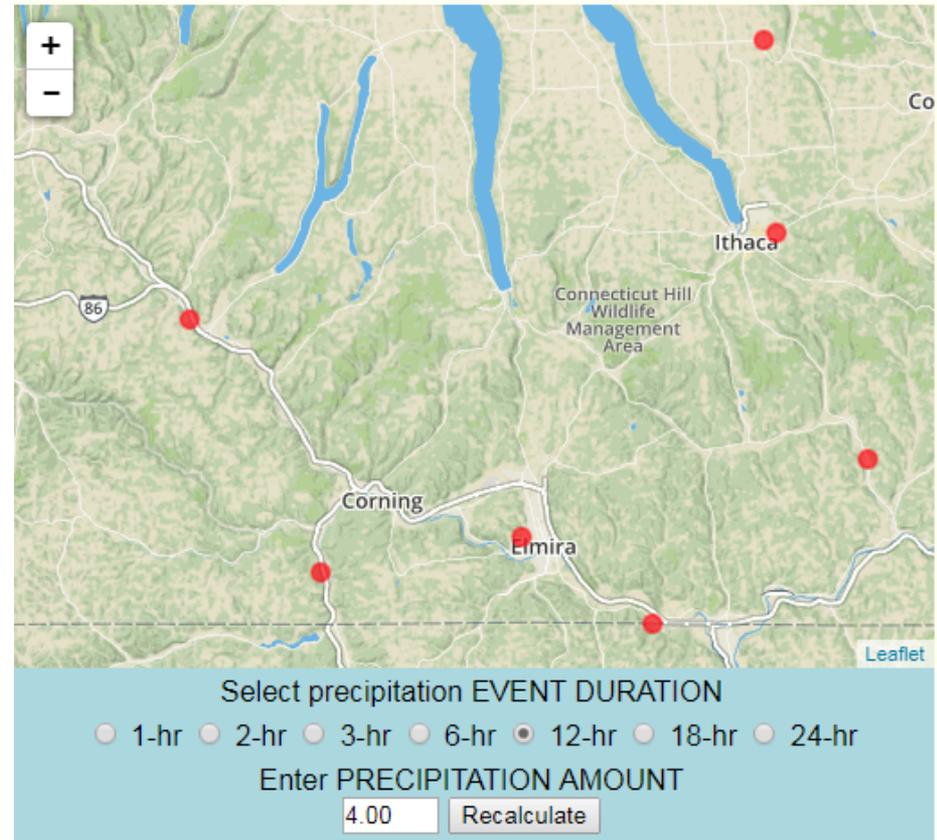
# Changes in storm recurrences

RCP 4.5
(low to med emissions)

RCP 8.5
(high emissions)

Time period:
2040-2069

Mean Future Return Periods: 1-day 50-year Rainfall Amounts
rcp45 Experiment (2040-2069 vs. 1970-1999)
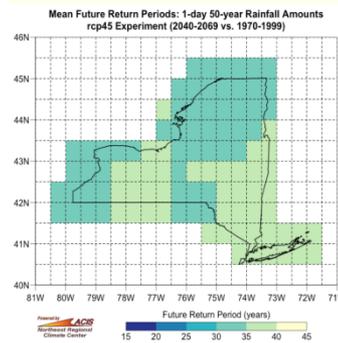
50-year storm becomes
35 to 40-year storm

Mean Future Return Periods: 1-day 50-year Rainfall Amounts
rcp85 Experiment (2040-2069 vs. 1970-1999)
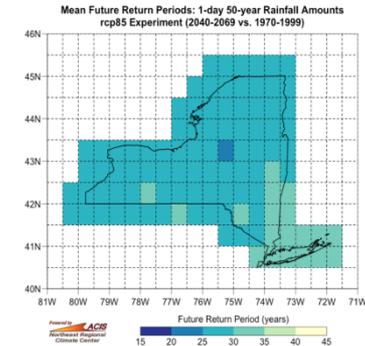
50-year storm becomes
25 to 30-year storm

Time period:
2070-2099

Mean Future Return Periods: 1-day 50-year Rainfall Amounts
rcp45 Experiment (2070-2099 vs. 1970-1999)
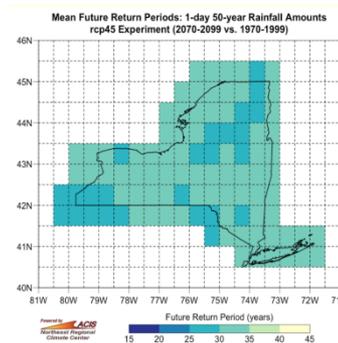
50-year storm becomes
30 to 35-year storm

Mean Future Return Periods: 1-day 50-year Rainfall Amounts
rcp85 Experiment (2070-2099 vs. 1970-1999)
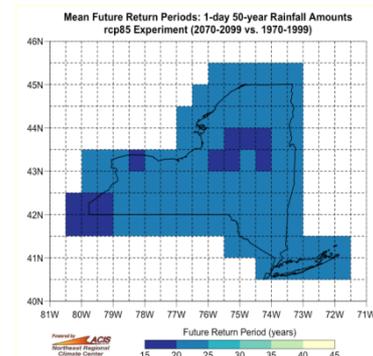
50-year storm becomes
20 to 25-year storm

Probability of Exceeding 4.00 Inches of Precipitation in 12 Hours at ELMIRA During Specified 30-Year Periods (%)
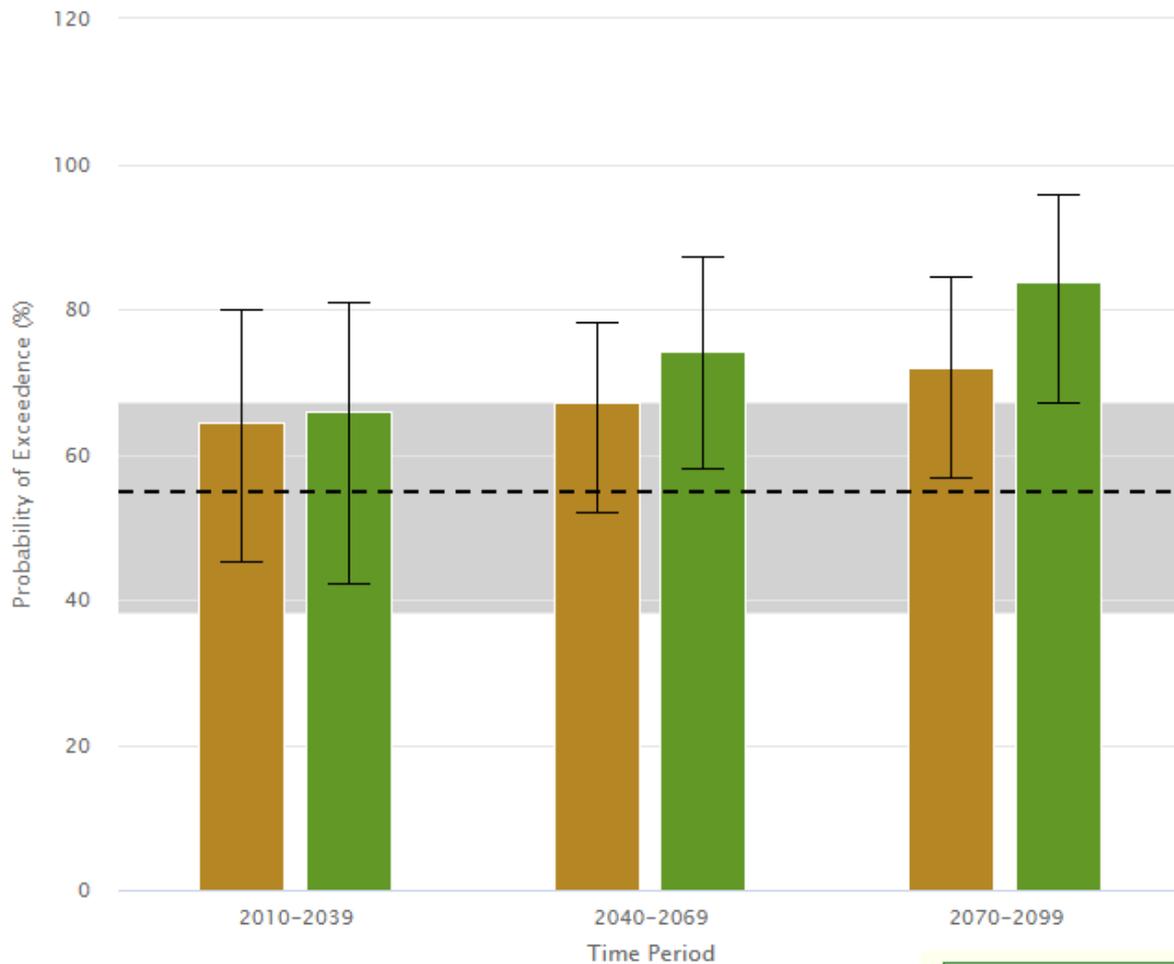
Future probability of extreme rainfalls

This example: 4 inches of rain in 12 hours

Mean probability For 1970-1999

Northeast Regional Climate

Probability of Exceeding 4.00 Inches of Precipitation in 12 Hours at ELMIRA During Specified 30-Year Periods (%)

	Observed (1970-1999)	Projected (2010-2039)		Projected (2040-2069)		Projected (2070-2099)	
		RCP 4.5	RCP 8.5	RCP 4.5	RCP 8.5	RCP 4.5	RCP 8.5
Mean	55	64	66	67	74	72	84
Lower Bound	38	45	42	52	58	57	67
Upper Bound	67	80	81	78	87	84	96

1983 FEMA Flood Insurance Rate Map

Future Flow Explorer
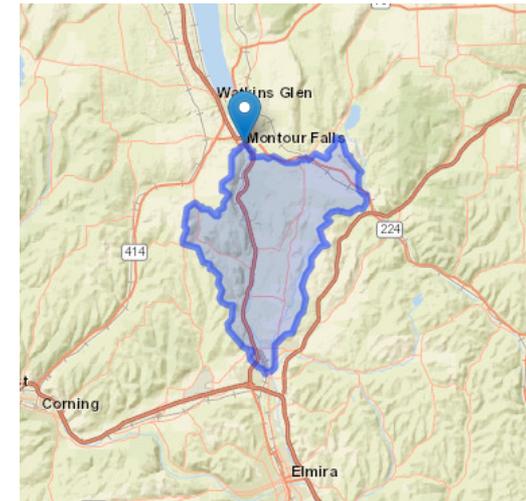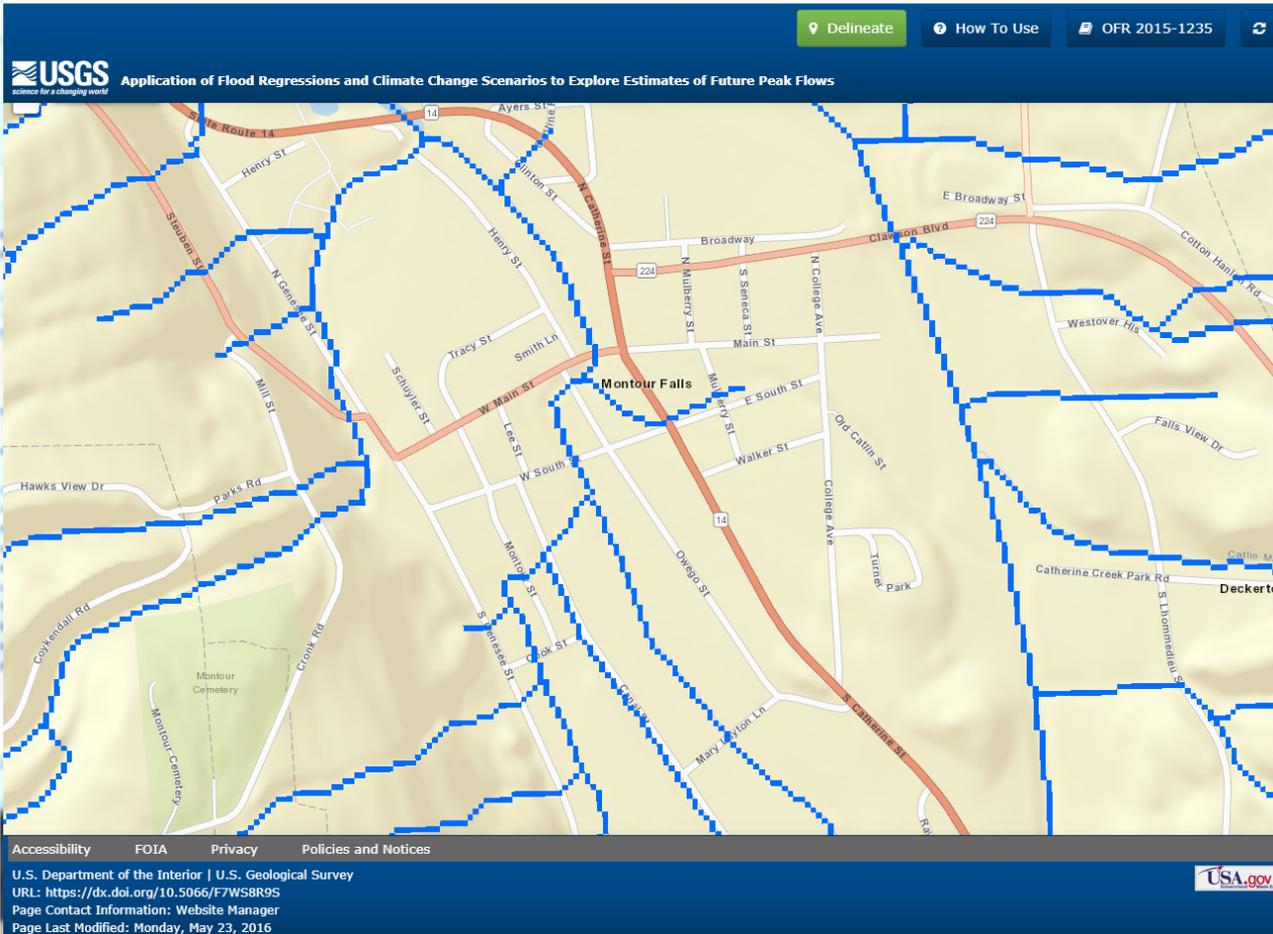
Source: U.S. Geological Survey
https://ny.water.usgs.gov/maps/floodfreq-climate/

Future time period: 2050-2074

Median percent change in future stream discharge
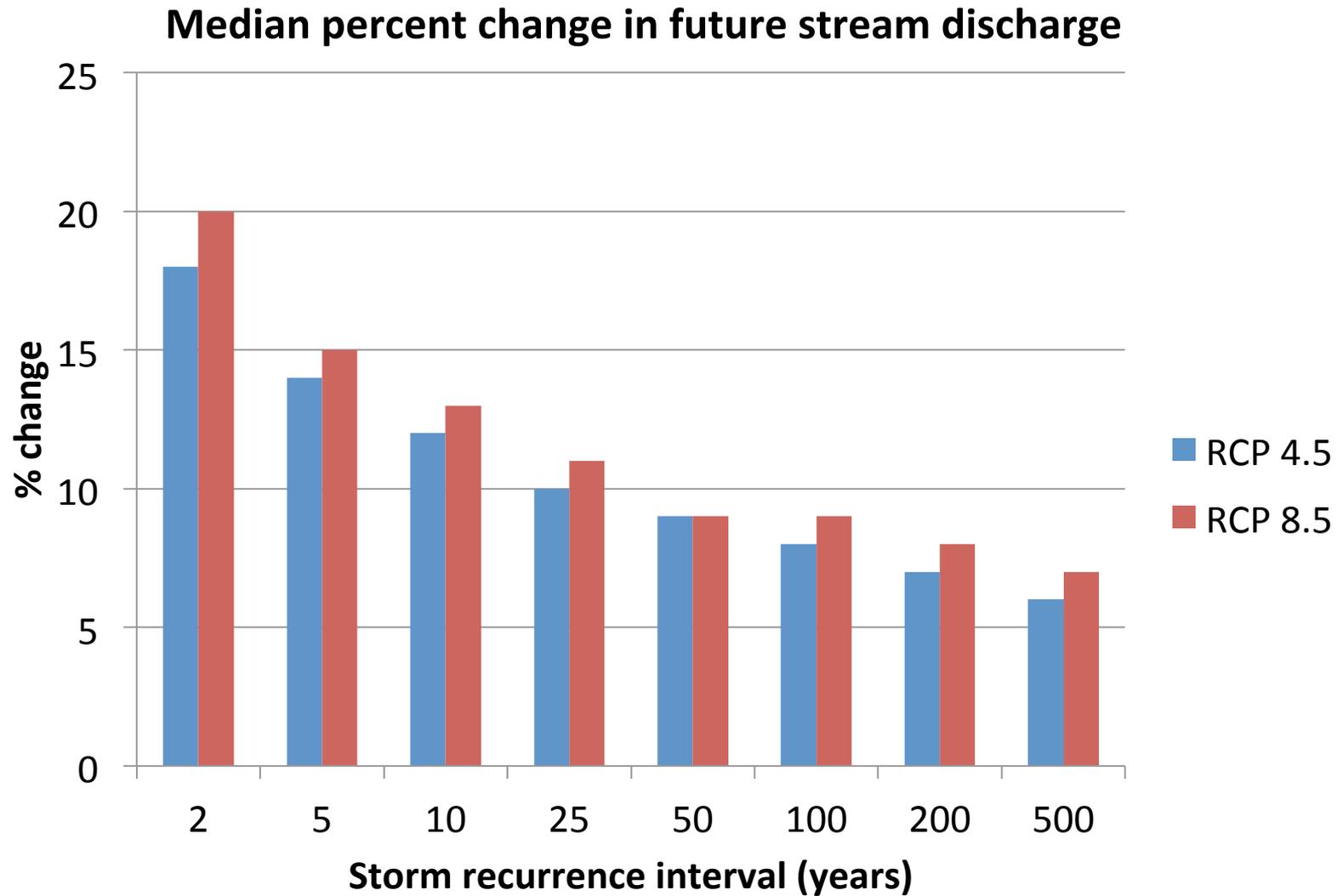
Temperature and Precipitation Projections

- Average temperature
- No. of days with maximum temperature above 95°F
- No. of days with minimum temperature below 32°F
- Total precipitation
- No. of days with precipitation > 1 inch

Source: New York Climate Change Science Clearinghouse

- https://nyclimatescience.org/
- Data for Schuyler County
- From Climate Data Grapher developed by the Northeast Regional Climate Center, Cornell University
- Observations: based on US National Weather Service Cooperative Observer Network
- Projections: General Circulation Model (GCM) projections from 32 Climate Model Intercomparison Project Phase 5 (CMIP5) models

Average temperature

RCP 4.5
(low to med emissions)

RCP 8.5
(high emissions)

Annual Average Temperature - Schuyler County
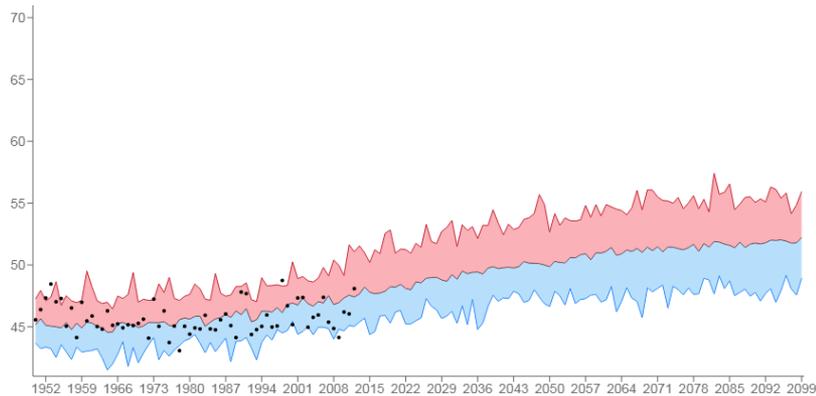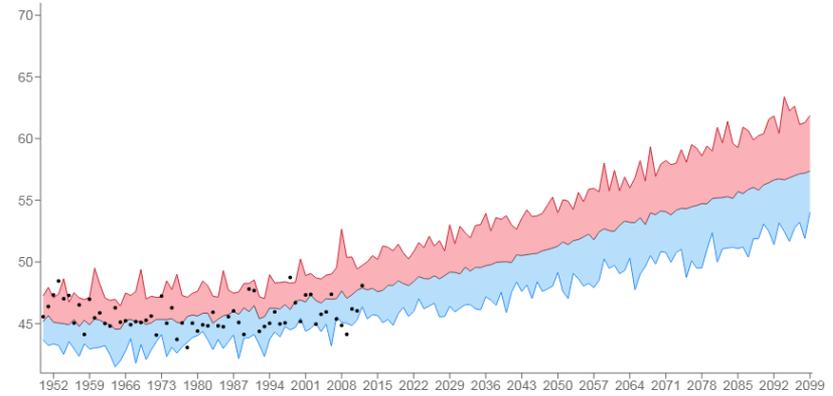
	Modeled ☑					
YEAR	MIN	MEAN	MAX	Δ min	Δ mean	Δ max
1983-2012	44.2	46.5	48.7	0.0	0.0	0.0
2009-2039	45.8	48.5	52	1.6	2.0	3.3
2039-2069	47.3	50.5	54.1	3.1	4.0	5.4
2069-2099	48	51.6	55.4	3.8	5.1	6.7

Annual Average Temperature - Schuyler County

	Modeled ☑					
YEAR	MIN	MEAN	MAX	Δ min	Δ mean	Δ max
1983-2012	44.2	46.5	48.7	0.0	0.0	0.0
2009-2039	46.1	48.7	51.6	1.9	2.2	2.9
2039-2069	48.5	51.9	55.4	4.3	5.4	6.7
2069-2099	51.4	55.6	60.1	7.2	9.1	11.4

Number of days with maximum temperature > 95°F

RCP 4.5
(low to med emissions)
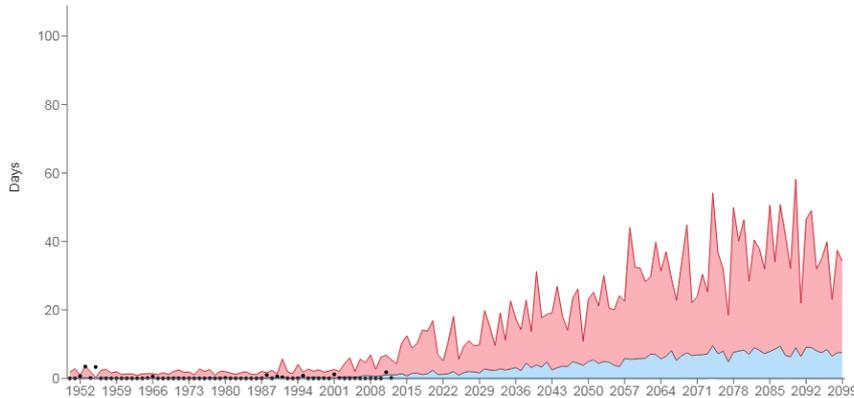
Annual Days with Maximum Temperature Above 95°F - Schuyler County
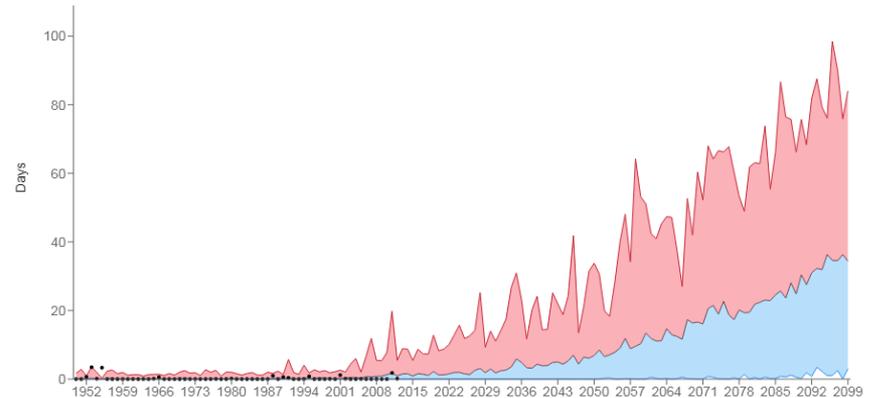
YEAR	MIN	MEAN	MAX	Δ min	Δ mean	Δ max
1983-2012	0	0.4	3.2	0.0	0.0	0.0
2009-2039	0	1.9	12	0.0	1.5	8.8
2039-2069	0	5.1	26.6	0.0	4.7	23.4
2069-2099	0	7.7	36.8	0.0	7.3	33.6

Modeled ☑

RCP 8.5
(high emissions)

Annual Days with Maximum Temperature Above 95°F - Schuyler County

YEAR	MIN	MEAN	MAX	Δ min	Δ mean	Δ max
1983-2012	0	0.4	4	0.0	0.0	0.0
2009-2039	0	2.3	13.8	0.0	1.9	9.8
2039-2069	0.1	9	34.4	0.1	8.6	30.4
2069-2099	0.8	25.3	70.5	0.8	24.9	66.5

Modeled ☑

Number of days with minimum temperature < 32°F

Total precipitation

Number of days with precipitation > 1"

Vulnerable Assets

Populations: statistics from US Census American Community Survey

2017 data

|		
Households with one or more people under 18	24.1%	±6.1%
Households with one or more people over 65	38.2%	±7.1%
Population with a disability (civilian, noninstitutionalized)	23.0%	±4.7%
Language other than English spoken at home	2.6%	±1.8%
Households with broadband internet subscription	61.1%	±7.3%

Populations

- Maps from NYS Department of Health
- Developed in context of heat vulnerability
- Vulnerabilities:
  - Low English-language fluency
  - Socioeconomic status
  - Elderly
  - Urban heat island effect

Language Vulnerability
Schuyler County

Seneca

Yates

Tompkins

Steuben

Schuyler

Chemung

Tioga

Low Vulnerability   High Vulnerability

County boundaries   Water boundaries

City/Town boundaries   Missing data
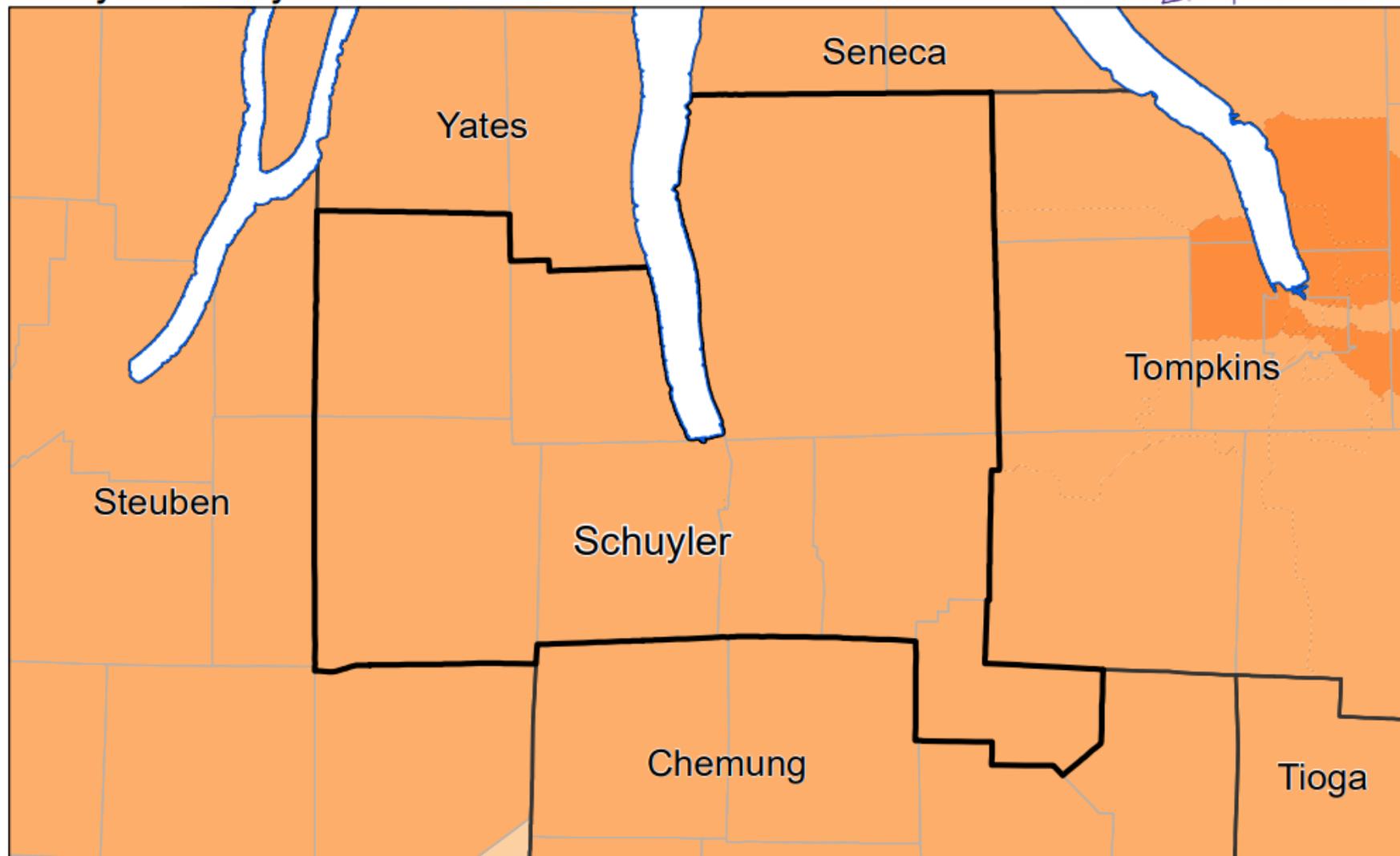
Data: 2010 US Census Bureau, 2011 National Land Cover Database

Socio-economic Vulnerability
Schuyler County
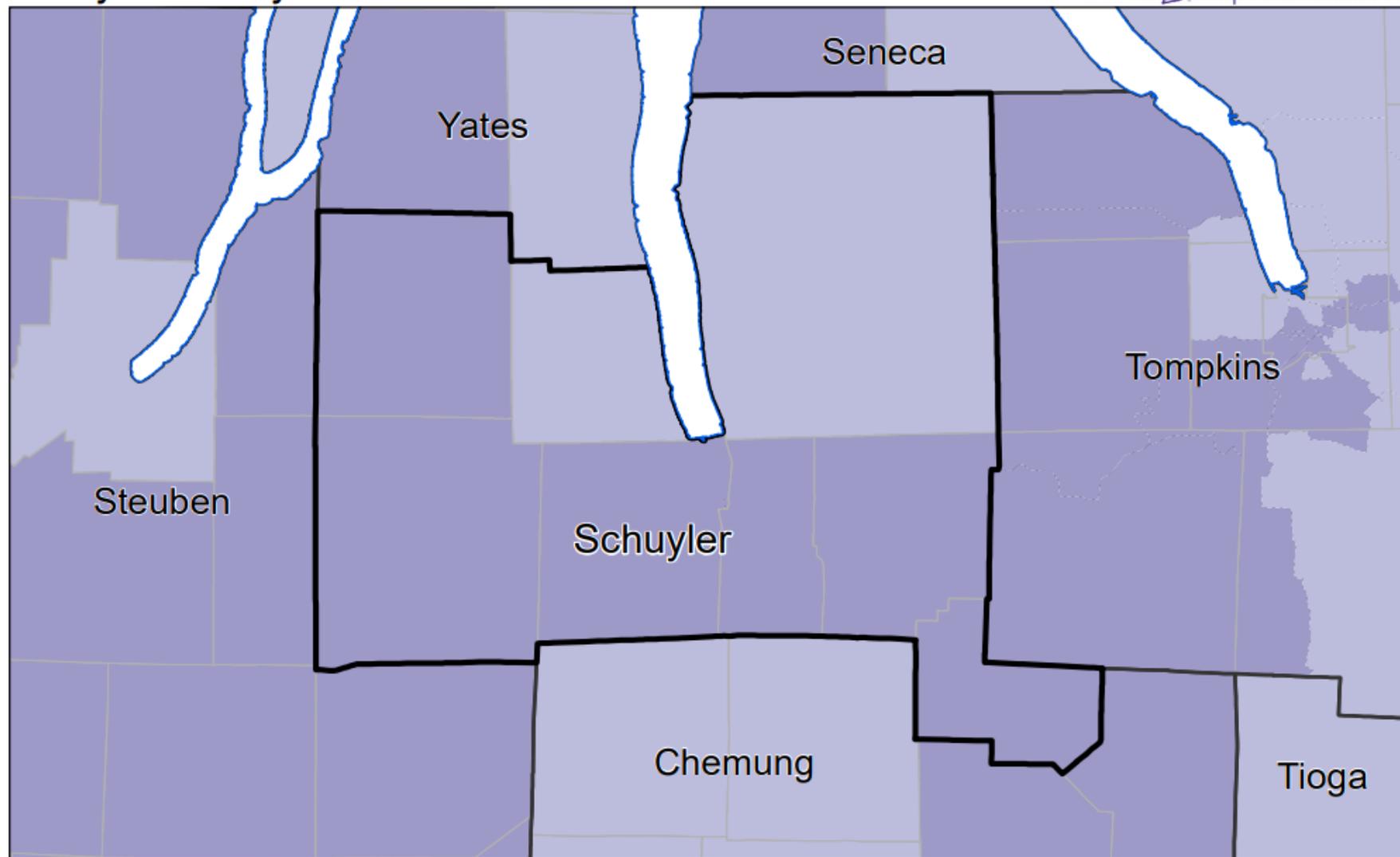
Seneca

Yates

Tompkins

Steuben

Schuyler

Chemung

Tioga

Low Vulnerability

High Vulnerability

County boundaries

Water boundaries

City/Town boundaries

Missing data

Data: 2010 US Census Bureau, 2011 National Land Cover Database

Elderly Isolation/Elderly Vulnerability
Schuyler County

Seneca

Yates

Steuben

Schuyler

Tompkins

Chemung

Tioga

Low Vulnerability High Vulnerability

County boundaries Water boundaries

City/Town boundaries Missing data

Data: 2010 US Census Bureau, 2011 National Land Cover Database

NEW YORK STATE | Department of Health
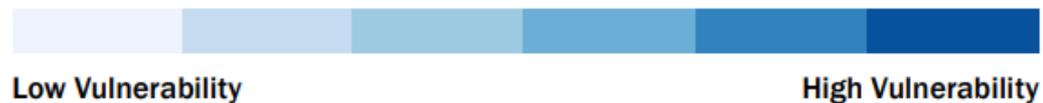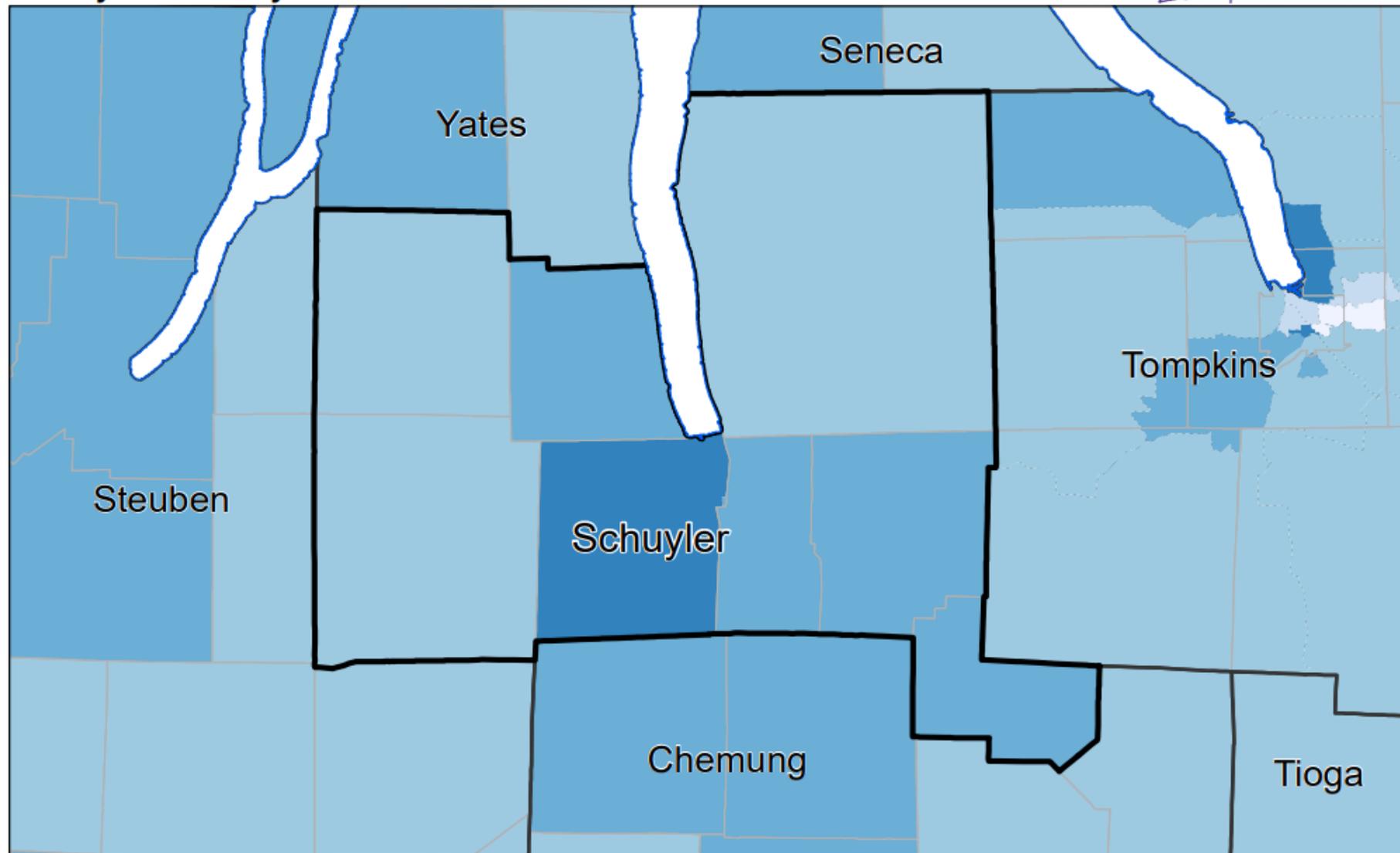
Environmental/Urban Vulnerability
Schuyler County
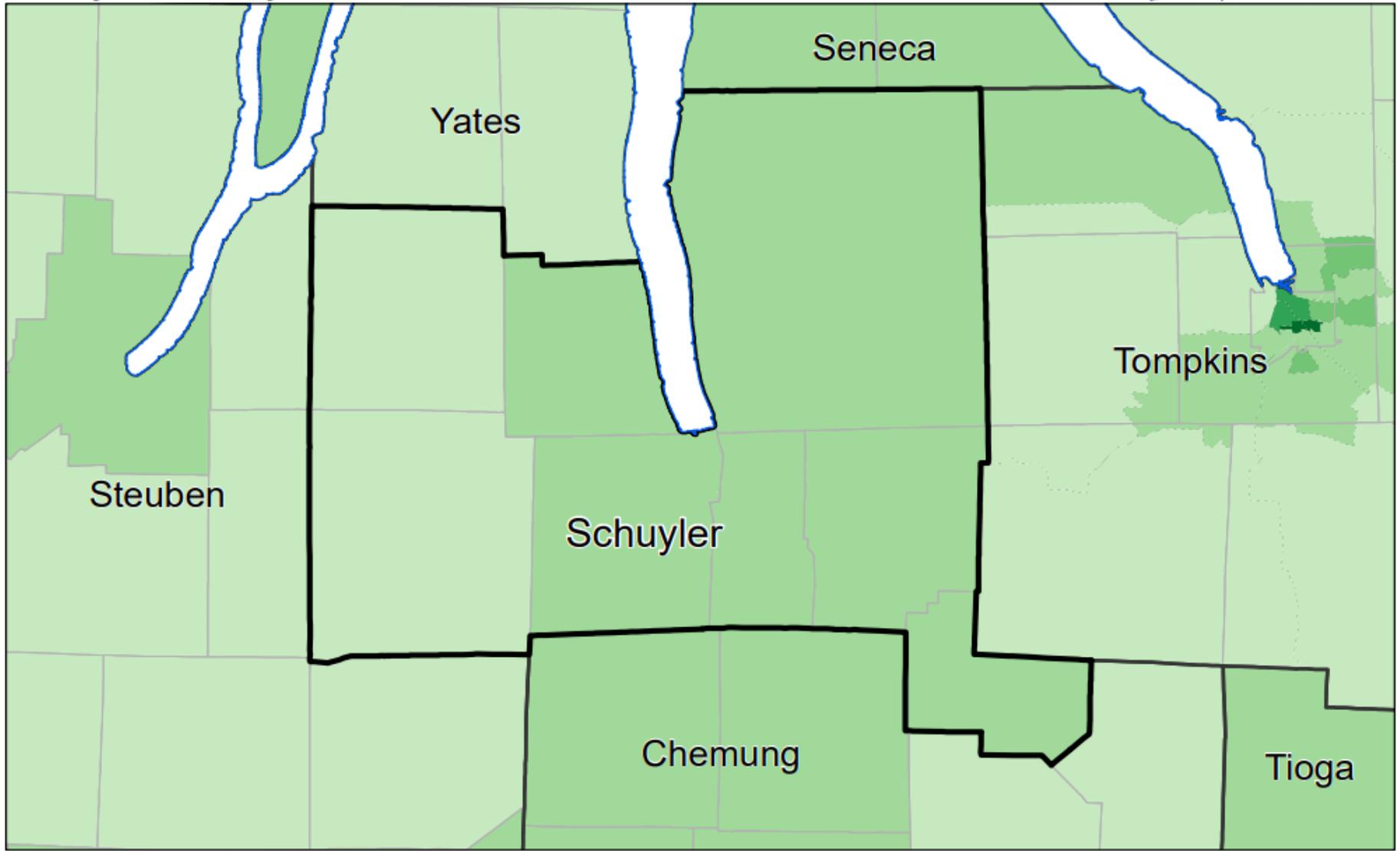
NEW YORK STATE | Department of Health

Seneca

Yates

Tompkins

Steuben

Schuyler

Chemung

Tioga

County boundaries | Water boundaries

Low Vulnerability

High Vulnerability

City/Town boundaries | Missing data

Data: 2010 US Census Bureau, 2011 National Land Cover Database

Heat Vulnerability Index
Schuyler County

NEW YORK STATE | Department of Health

Seneca

Yates

Tompkins

Steuben

Schuyler

Chemung

Tioga

Low Vulnerability · · · · · · · · High Vulnerability

County boundaries · · · · Water boundaries

City/Town boundaries · · · · Missing data
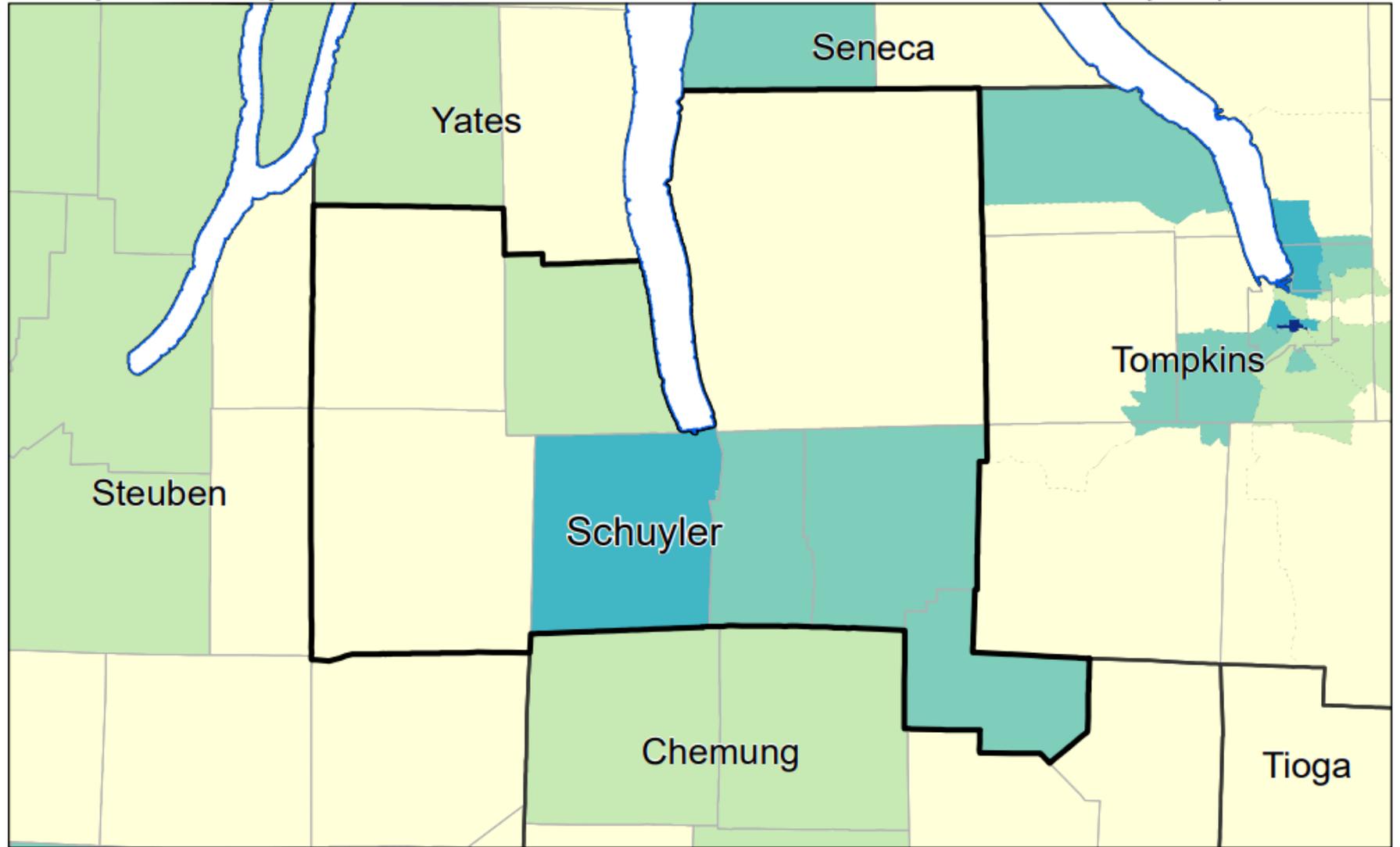
Data: 2010 US Census Bureau, 2011 National Land Cover Database

Built infrastructure

- Maps from US Army Corps of Engineers, New York Climate Change Science Clearinghouse

HOME   ADVANCED SEARCH   DASHBOARD   MAP   MORE ▾   SIGN IN

Levee Filter List
Find levees matching these criteria

ADD FILTERS   UPDATE RESULTS

☰   SYSTEMS   DETAILS   🔍 Start a new search   ⊙   DOWNLOAD DATA   ❓

Location 🗑
Applied

◉ By Geography   ○ By Proximity

Find levees that fall within predefined geographical boundaries

Geography Type

County State ▾

Schuyler, New York   ✕

ADD GEOGRAPHY

CLEAR ALL

System Name 🗑

Find levees with a System Name like

Authorization Category 🗑

Find levees with a Authorization Category like

☐ USACE Federally Constructed and USACE Federally Operated
☐ USACE Federally constructed, turned over to public sponsor operations and maintenance
☐ Locally Constructed, Locally Operated and Maintained
☐ Other Federal Agency

2 System(s) Found   HIDE LIST

Montour Falls, Catharine Creek, Left Bank
Location: Schuyler , New York

Montour Falls, Catharine Creek, Right Bank (Ring)
Location: Schuyler , New York

Categorize by ▾   ＋

Basemap: Street ▾   －

LEGEND ▾   ℹ

42.334153, -76.858568   ⊙ 18T UM 46883 88550

500 m
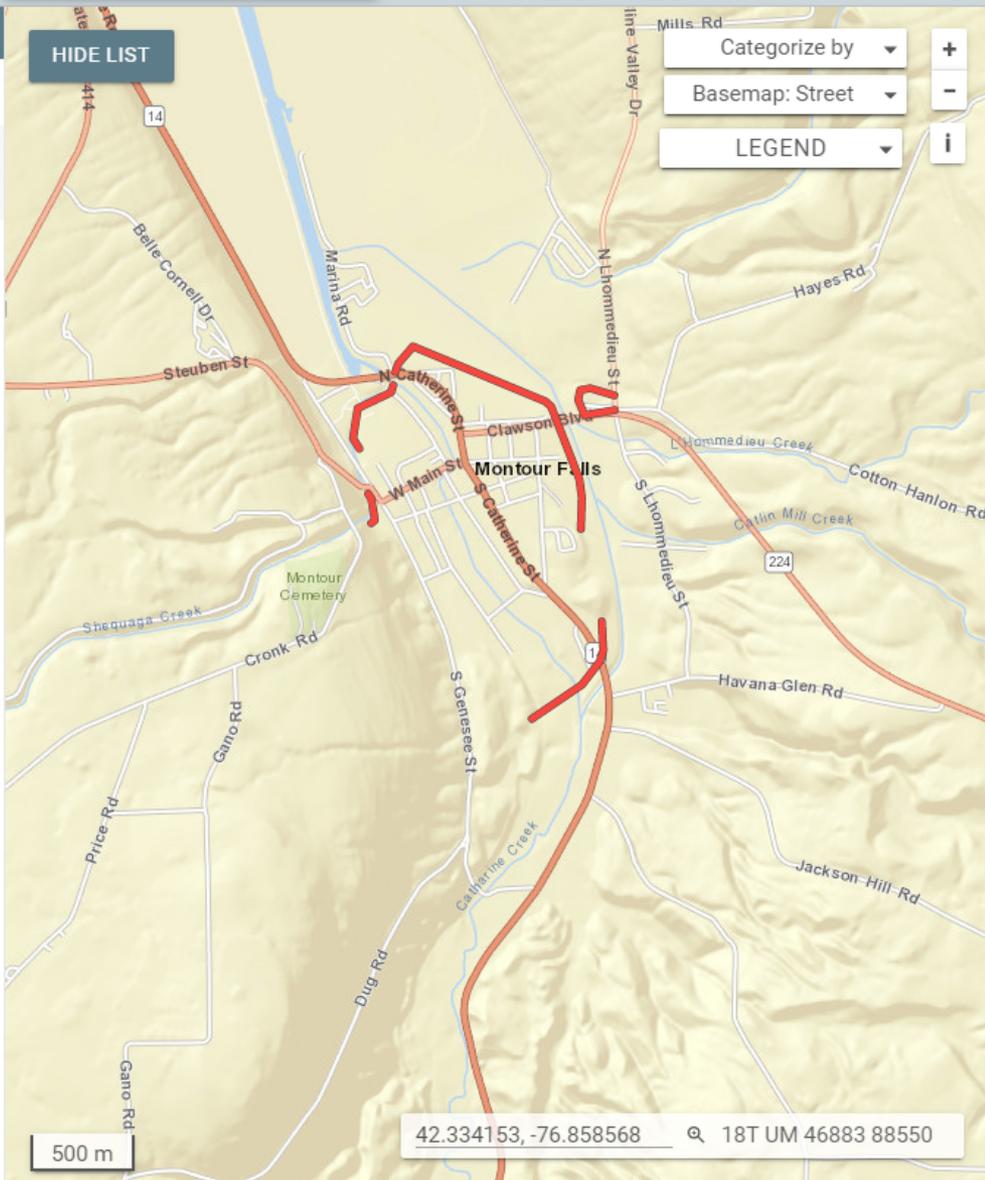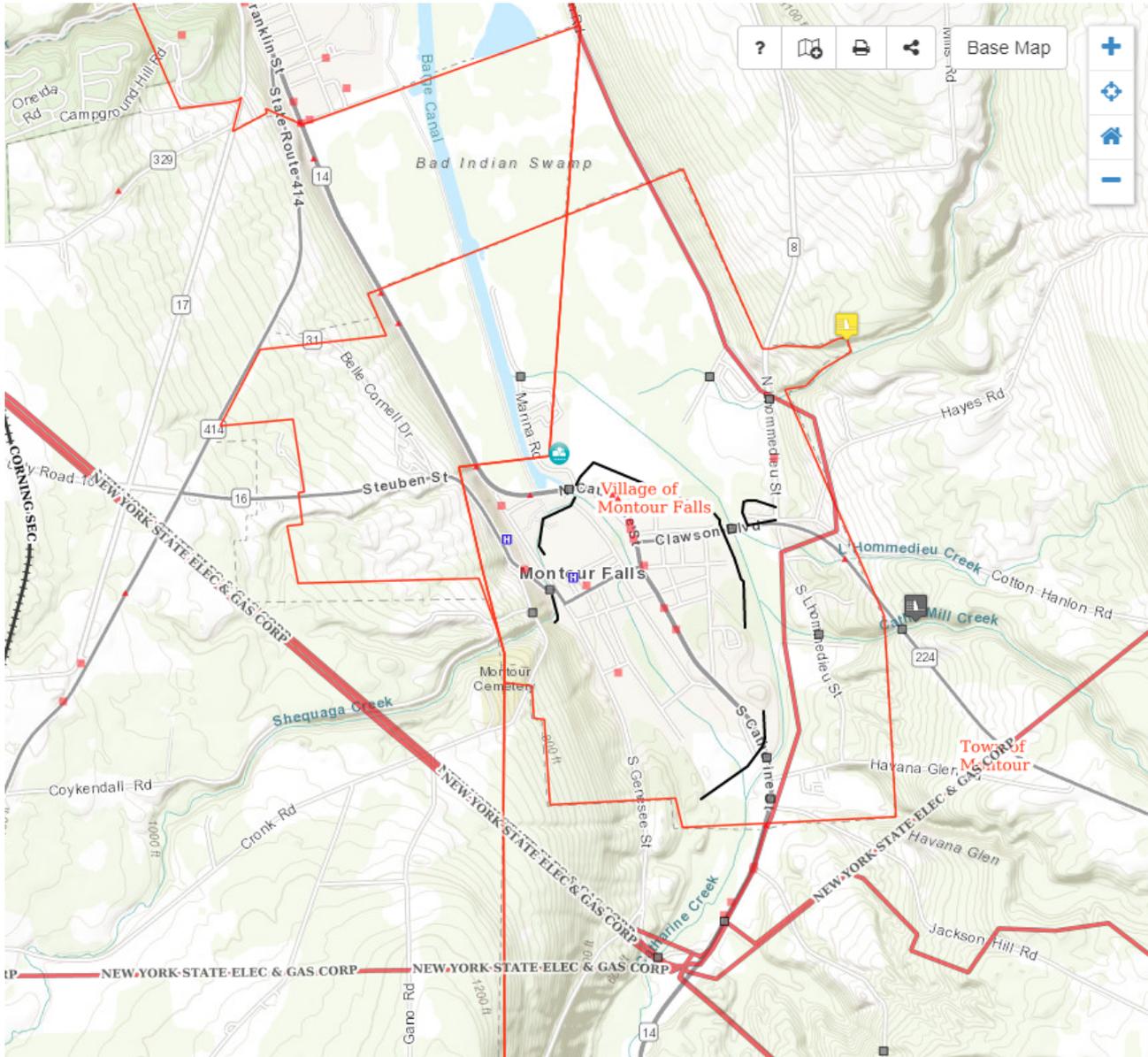
▼ Dams
Legend
Low Hazard
Intermediate Hazard
High Hazard
Unknown Hazard

▼ Hospitals
Legend
H
Click map icons for more info

▼ Waste Treatment Plants
Legend
1940   Number of water treatment facilities shown

▼ Railroads
Opacity: 100%
Zoomed in, w/labels
Zoomed out, no labels

▼ Large Culverts
Opacity: 90%

▼ Bridges
Opacity: 90%

▼ Electric Transmission Lines
Opacity: 100%
Electric Transmission Lines

▼ Bulk Storage Sites
Opacity: 70%

Base Map

Village of
Montour Falls

Montour Falls

Montour Cemetery

Town of Montour

Bad Indian Swamp

NEW YORK STATE ELEC & GAS CORP

Natural resources

- Maps from New York Climate Change Science Clearinghouse and NYS DEC Environmental Resource Mapper

Environmental Resource Mapper
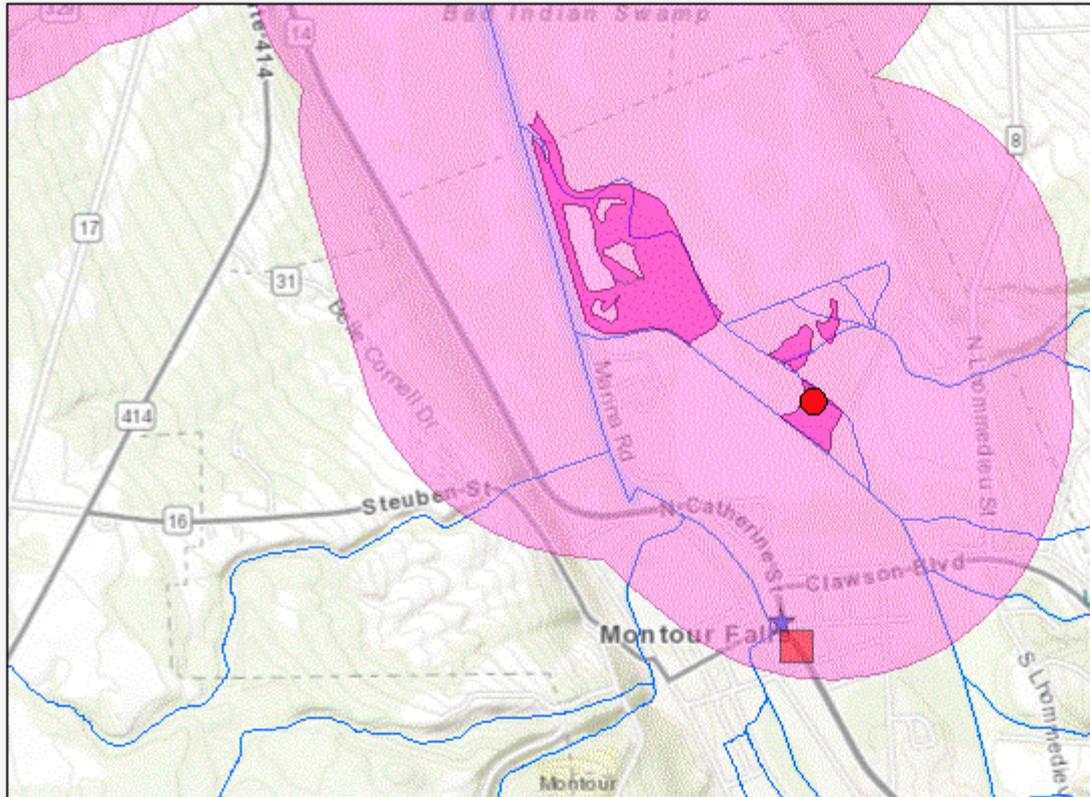
Waterbody Classifications for Rivers/Streams

Regulation: 898-421.1
Standard: C(TS)
Classification: C

State Regulated Freshwater Wetlands

ID: MF-1
Class: 1
Size (Acres): 754.8000000000001

Freshwater Wetlands Checkzone

This location is in the vicinity of one or more Regulated Freshwater Wetlands.

Significant Natural Communities

Natural Community Name: Silver maple-ash swamp
Location: Catharine Creek Wetlands
Ecological System: Freshwater Nontidal Wetlands

Natural Communities in the Vicinity

Natural Community Name: Silver maple-ash swamp
Location: Catharine Creek Wetlands
Ecological System: Freshwater Nontidal Wetlands

Natural Community Name: Floodplain forest
Location: Catharine Creek Wetlands
Ecological System: Freshwater Nontidal Wetlands

Old or Potential Records (Not displayed on the map)

Common Name: Leiberg's Panic Grass
**Scientific Name:** Dichanthelium leibergii
Date Last Documented: 1832
Location: Seneca Lake Head
NYS Protected: Endangered

Mapper

State Route 414

Bad Indian Swamp

329

14

17

31

8

Hayes Rd

Rare Plants and Rare Animals (1 of 2)   ▶ ▢ ✕

This location is in the vicinity of Rare Animals Listed as Special Concern by NYS

Zoom to

d 16

16

Steuben St

N Catherine St

Clawson-Blvd

N L'hommedieu St

L'Hommedieu Creek   Cotton-Hanlon Rd

Montour Falls

1200 ft

S L'hommedieu St

Catlin Mill Creek

224

1000 ft

Montour Cemetery

Shequaga Creek

800 ft

S Cath St

0   0.2   0.4mi

-76.878, 42.354
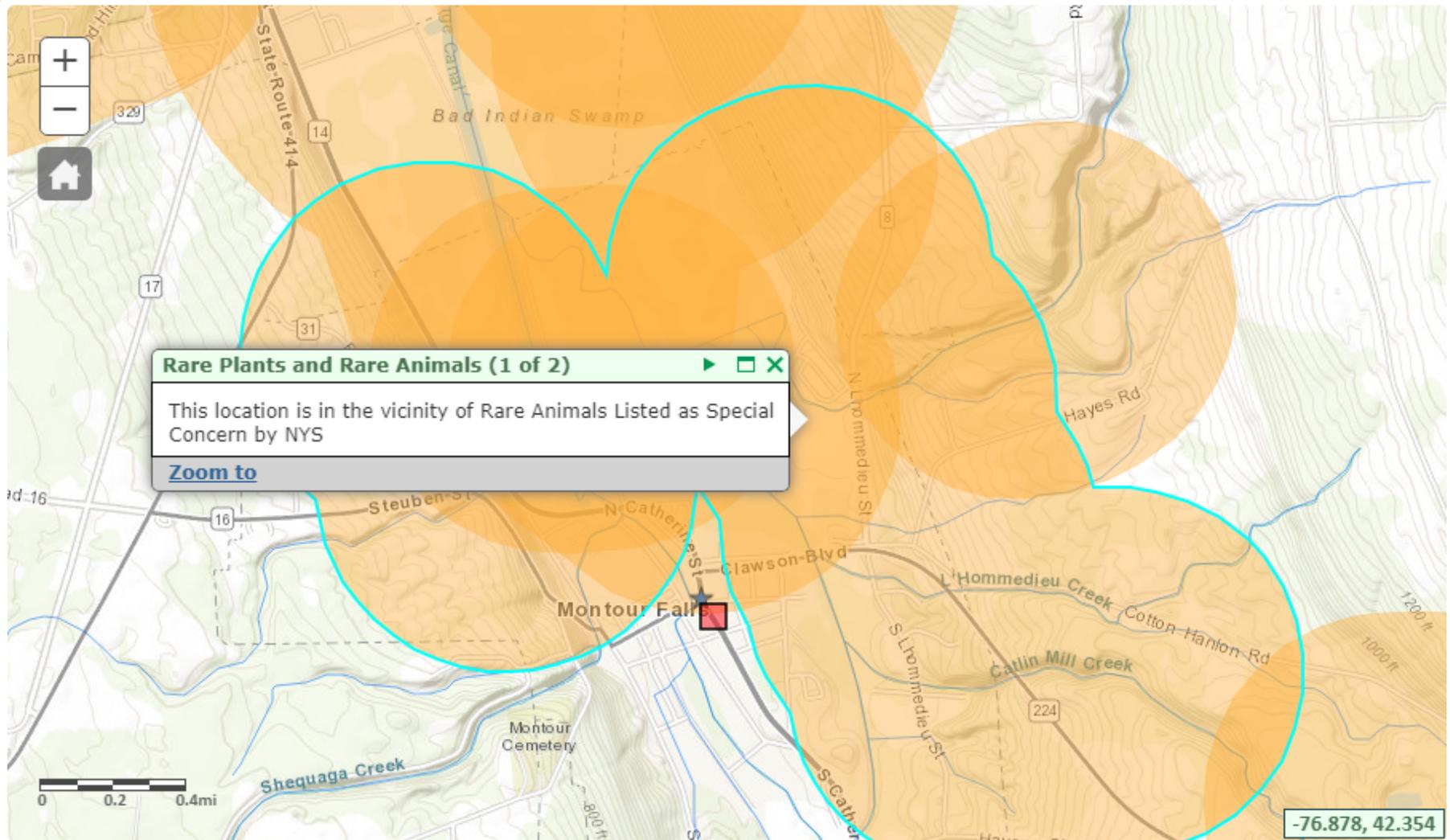
Designated Trout Streams