THE COMMUNITIES OF THE UPPER SUSQUEHANNA

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TOPICS

How well do you know your community?

Climate change risk

Climate change vulnerability

Climate change resilience

Summing up

Credit:

HOW WELL DO YOU KNOW YOUR COMMUNITY?

"A sustainable community is the aggregate of functionally and socially connected individuals and organizations that share collective resources in such a way that engages members in self-determination governance processes resulting in the equitable provisioning of the health, educational, and material well-being among its residents while not negatively affecting future generations or other communities' uses of these resources" (Mischen et al., 2019)
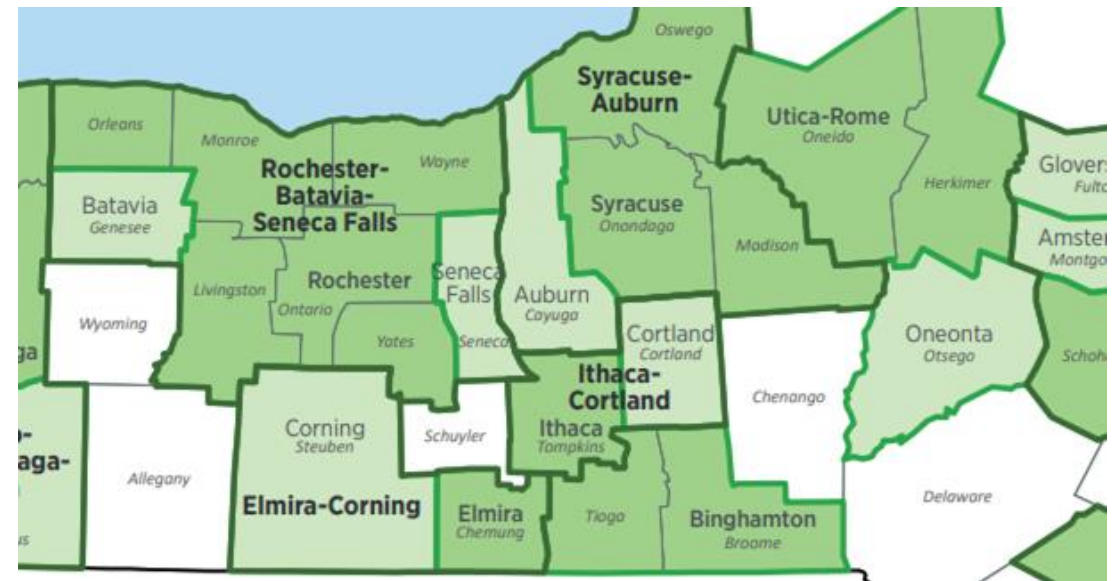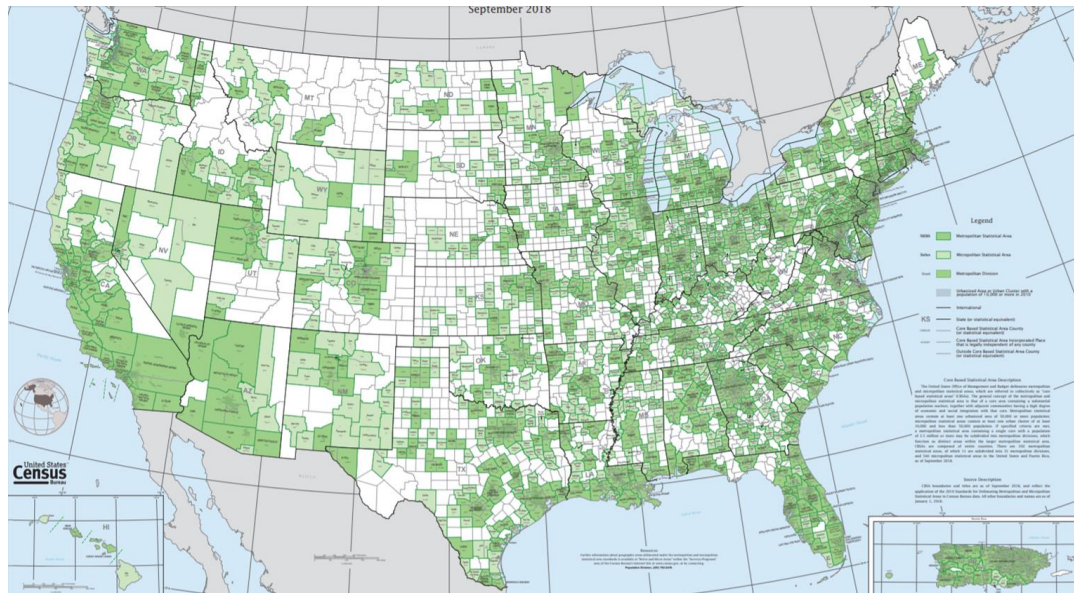
COMMUNITY FROM AN ENVIRONMENTAL PERSPECTIVE

Watershed and ecoregions don't follow human geographic boundaries

The dominant ecoregion is Allegheny Highlands
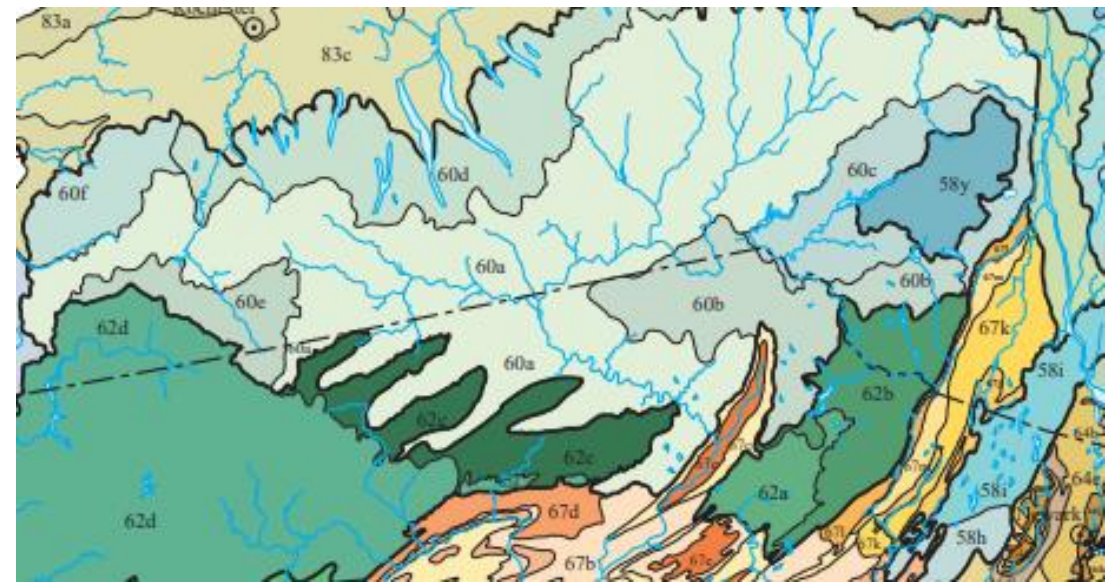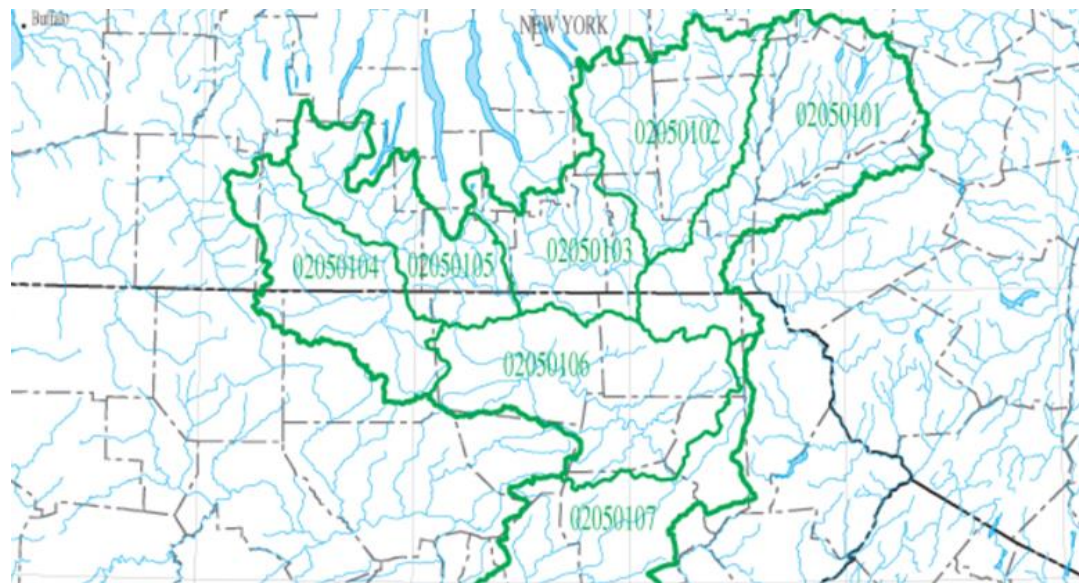
SUSTAINABILITY OUTCOMES

POVERTY
UNEMPLOYMENT
EDUCATIONAL ATTAINMENT
FOOD INSECURITY
FAIR/POOR HEALTH
SEVERE HOUSING PROBLEMS
CRIME RATE
INCOME INEQUALITY
BLACK SEGREGATION
BROADBAND ACCESS
AIR QUALITY
WATER QUALITY
WATER STRESS
NATURAL LAND COVER
GREENHOUSE GAS EMISSIONS PER CAPITA

https://www.futurelearn.com/info/courses/sustainability-society-and-you/0/steps/4618

SOCIAL/ECONOMIC SUSTAINABILITY INDICATORS

Indicator	Binghamton	Cortland	Oneonta	Elmira	Corning	US
Poverty	10.3%	6.7%	8.2%	10.3%	8.1%	8.9%
Unemployment	7.2%	5.9%	5.7%	6.2%	6.3%	5.5%
Food Insecurity	14%/10%	12%	11%	13%	12%	12%
Fair/poor health	12.7%/11.4%	11.9%	11.2%	13%	12%	12%
Educational attainment	28.3%	28.1%	33.4%	23.9%	25.5%	33.7%
>30% Rent	47.2%	40.1%	40.5%	49.2%	37.8%	46.0%
Crime rate	232.6/12.4	8.5	32.2	13.0	21.2	139.1
Income inequality	0.47	0.42	0.45	0.46	0.45	0.48
Black segregation	58%	61%	64%	51%	48%	63%
Broadband access	85%/87%	81%	83%	84%	84%	87%

ENVIRONMENTAL SUSTAINABILITY INDICATORS

Indicator	Binghamton	Cortland	Oneonta	Elmira	Steuben	US
Air quality	7.2	6.7	6.5	6.9	6.1	7.4
Water quality	23.74%	24.76%	24.19%	24.76%	29.4%	(>)
Water stress	0.06	0.05	0.05	0.05	0.04	(<)
GHG emissions/person	8.46	10.11	18.92	9.4	13.72	(<)
Natural land cover	53.99%	53.99%	41.93%	53.99%	53.99%	(>)

CLIMATE CHANGE RISK, RESILIENCE, AND VULNERABILITY DATA

FEMA– National Risk Index (https://hazards.fema.gov/nri/map)

Expected Annual Loss x Social Vulnerability ÷ Community Resilience

US Climate Resilience Map – Adrienne Arsht-Rockefeller Foundation Resilience Center (https://mappingresilience.onebillionresilient.org/explore?indicator=31)

Climate Risk (Riverine Flood, Coastal Flood, Extreme Heat, Extreme Precipitation, Drought Risk, Wildfires)

Vulnerability (Socioeconomic Status, Household Composition and Disability, Minority Status and Language, Housing Type and Transportation)

NY Times-- https://www.nytimes.com/interactive/2020/09/18/opinion/wildfire-hurricane-climate.html

(Heat stress, water stress, extreme rainfall risk, hurricane risk, wildfire risk, sea level rise risk)

Climate Mapping for Resilience and Adaptation (https://resilience.climate.gov/#assessment-tool)

Actual projections related to extreme heat, drought, wildfire, flooding, and coastal inundation

CLIMATE RISKS

County	FEMA Risk (Annual expected losses)	USCR Riverine	USCR Heat/ NYT Heat	USCR Extreme precip	USCR Drought	USCR Wildfire/ NYT Wildfire	NYT Water stress	NYT Hurricane
Broome	Relatively moderate	Low-Med	Med/Low	High	Low-Med	Low/Med	High	Low
Tioga	Relatively low	Low-Med	Low-Med/Low	High	Low-Med	Low/Med	Med	Med
Otsego	Relatively low	Low-Med	Med/Low	High	Low-Med	Low/Low	Med	Med
Steuben	Relatively low	Low-Med	Med/Low	High	Low-Med	Low/Low	Med	Med
Chemung	Very low	Low-Med	Low/Low	High	Low-Med	Low/Med	Med	Low
Cortland	Very low	Low-Med	Low/Low	High	Low-Med	Low/Low	Med	Med

CLIMATE PROJECTIONS FOR MID-CENTURY (2035-2064)

County	>90° days Low	>90° days High	High Temp Low	High Temp High	Precip (in) Low	Precip (in) High	>1" days Low	>1" days High
Broome	16.0 (+13.2)	21.7 (+18.9)	97.1 (+5.5)	98.8 (+7.2)	42.4 (+2.3)	43.1 (+3.1)	3.9 (+0.8)	4.2 (+1.1)
Tioga	17.9 (+14.0)	24.2 (+20.3)	97.6 (+5.4)	99.2 (+7.0)	40.6 (+2.2)	41.3 (+2.9)	3.5 (+0.8)	3.9 (+1.1)
Chemung	21.2 (+15.4)	27.9 (+22.0)	98.4 (+5.1)	100.0 (+6.7)	38.0 (+2.1)	38.9 (+3.0)	3.3 (+0.7)	3.6 (+1.0)
Steuben	15.8 (+13.1)	21.8 (+19.1)	96.7 (+5.4)	98.3 (+7.0)	37.1 (+2.1)	37.8 (+2.7)	2.7 (+0.6)	3.0 (+0.9)
Cortland	11.9 (+9.8)	17.0 (+14.9)	95.9 (+4.9)	97.6 (+6.7)	44.4 (+2.2)	45.1 (+2.9)	2.9 (+0.7)	3.2 (+1.0)
Otsego	12.4 (+10.8)	18.1 (+16.5)	95.8 (+5.5)	97.6 (+7.2)	43.3 (+2.2)	43.9 (+2.8)	3.0 (+0.7)	3.3 (+1.0)

CLIMATE PROJECTIONS FOR LATE-CENTURY (2070 - 2099)

UNDER LOW AND HIGH EMISSIONS SCENARIOS

County	>90° days Low	>90° days High	High Temp Low	High Temp High	Precip (in) Low	Precip (in) High	>1" days Low	>1" days High
Broome	22.5 (+19.6)	50.3 (+47.5)	98.8 (+7.2)	104.0 (+12.4)	43.2 (+3.1)	44.9 (+4.8)	4.3 (+1.2)	5.1 (+2.0)
Tioga	25.0 (+21.2)	53.7 (+49.9)	99.3 (+7.1)	104.5 (+12.3)	41.3 (+2.9)	42.9 (+4.4)	3.9 (+1.1)	4.6 (+1.9)
Chemung	28.7 (+22.8)	57.6 (+51.8)	99.9 (+6.6)	105.0 (+11.7)	38.8 (+2.9)	40.4 (+4.4)	3.6 (+1.1)	4.3 (+1.7)
Steuben	22.5 (+19.8)	50.2 (+47.5)	98.3 (+6.9)	103.3 (+12.0)	37.7 (+2.7)	39.3 (+4.3)	3.0 (+0.9)	3.8 (+1.7)
Cortland	17.5 (+15.3)	41.6 (+39.5)	97.5 (+6.6)	102.4 (+11.5)	45.0 (+2.8)	46.5 (+4.3)	3.2 (+1.0)	4.0 (+1.8)
Otsego	18.5 (+16.9)	44.9 (+43.4)	97.7 (+7.3)	102.7 (+12.4)	44.0 (+2.9)	45.6 (+4.5)	3.4 (+1.1)	4.2 (+1.9)

CLIMATE CHANGE VULNERABILITY

County	FEMA Social Vulnerability	USCR Socio-economic status	USCR Household Composition and Disability	USCR Minority Status and Language	USCR Housing Type and Transportation
Broome	Relatively High	Med	Low-Med	Med-High	High
Tioga	Very Low	Low-Med	Low-Med	Low	Low-Med
Chemung	Very Low	Low-Med	Med-High	Low-Med	Med-High
Steuben	Relatively Low	Med	Med-High	Low-Med	Med-High
Cortland	Very Low	Low-Med	Low	Low-Med	Med-High
Otsego	Relatively Low	Med	Low	Low-Med	High

CLIMATE CHANGE RESILIENCE

County	Resilience
Broome	Very High
Tioga	Relatively High
Otsego	Relatively High
Steuben	Relatively High
Chemung	Very High
Cortland	Very High
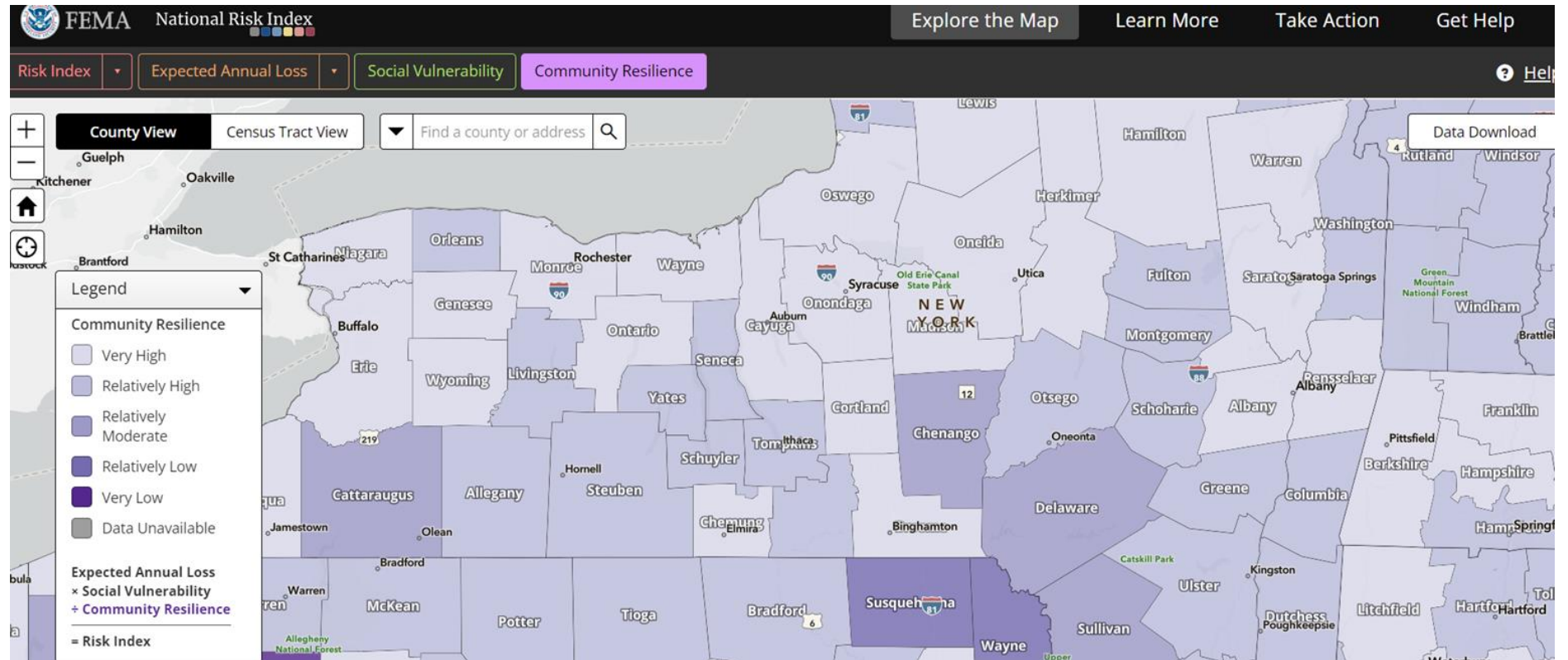
SOUNDS LIKE WE'RE IN OK SHAPE, RIGHT?

Greatest risk is extreme precipitation events (2 – 5 days with more than 1" of precipitation)

It's going to get considerably warmer (but we're not in a dangerous wet bulb area)

Flooding, despite our history, is still a low-med risk

Vulnerability is generally low (except Broome County)

Resilience is high to very high

SO, WHAT'S THERE TO WORRY ABOUT?
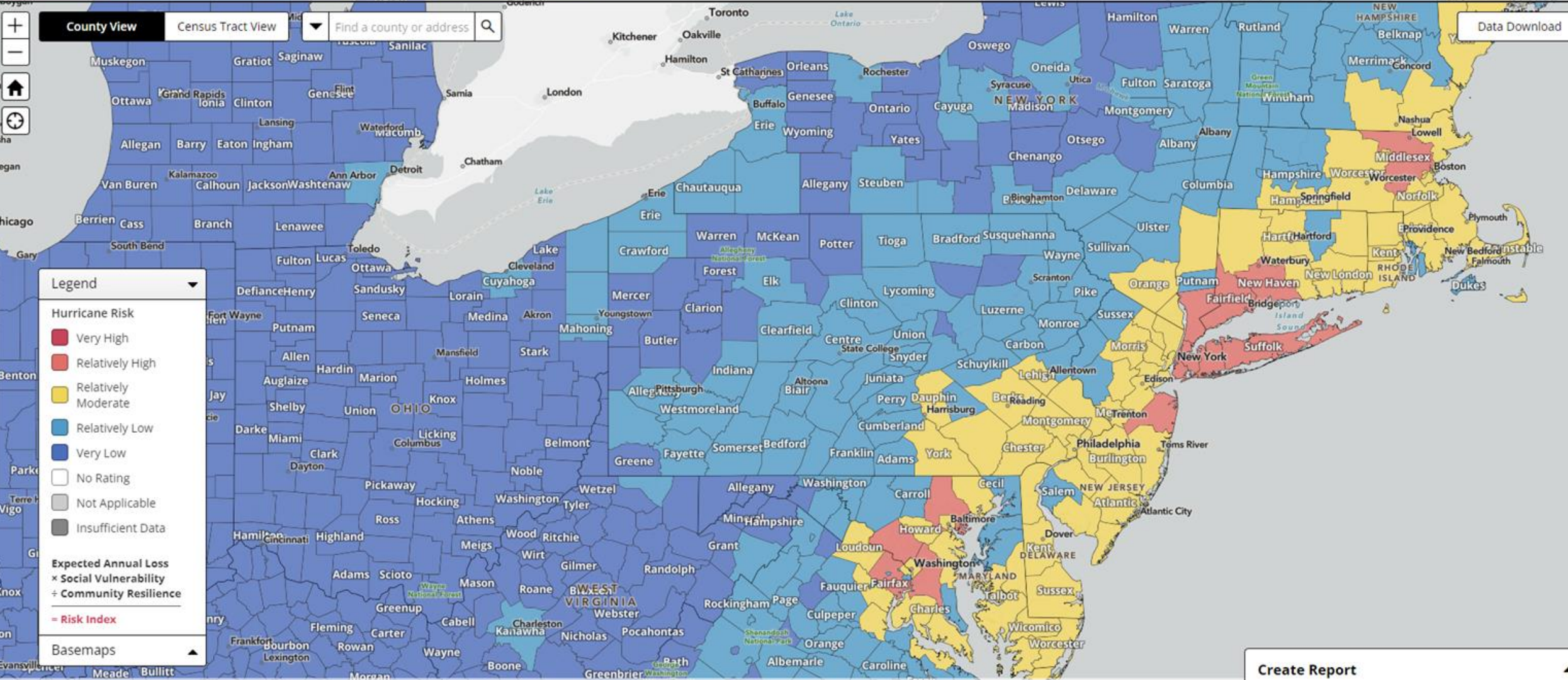
POSSIBLE FUTURES

Migration (increased pressure on housing stocks)

Food Shortages and Demand for Increased Food Production in NYS

Increased Energy Needs

Competition for Land

https://www.britannica.com/topic/human-migration

Credit: hpgruesen Pixabay

60% of US fruit consumption and 38% of vegetable consumption is imported

Crop	% Domestic Production in NYS
Apples	5%
Potatoes	1.3%
Wheat	<1%
Pork	<1%
Snap Beans	11%
Broccoli	<1%
Carrots	1.5%
Celery	<1%
Cucumbers	1%
Lettuce	<1%
Onions	4%
Tomatoes	<1%
Fruits and Nuts	4%
Dairy	7%

SUMMING UP

With increased heavy precipitation events, we need to prepare for more runoff, sewage releases

With increased demand for food, we need to plan for more agriculture

With an increase in population due to migration, we need to plan for the social issues that will arise (and possibly displace other concerns)

THANK YOU

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