



# **Weather and Social Data to Inform Participatory Planning Initiatives**

April 17, 2020

**Materials will be available at:**      [www.eesi.org/041720data](http://www.eesi.org/041720data)

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# EESI

Environmental and  
Energy Study Institute

- Founded in **1984** by a **bipartisan** Congressional caucus.
- Now an **independent**, bipartisan **nonprofit** with no Congressional funding.
- We provide **fact-based information** on **energy** and **environmental** policy for Congress and other policymakers.
- We focus on **win-win solutions** to make our energy, buildings, and transportation sectors **sustainable** and **resilient**.

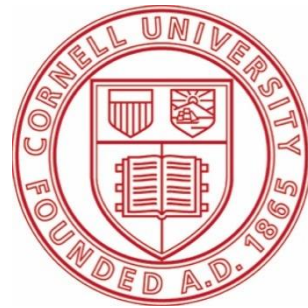
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# Using Weather & Social Data to Inform Participatory Planning Initiatives



*Mary Austerman, Coastal Community Development Specialist  
New York Sea Grant, Cornell University  
Environmental and Energy Study Institute's  
Climate Adaptation Data Briefing Week  
April 17, 2020*



# What is New York Sea Grant (NYSG)?

- 33 Sea Grant programs in US
- NYSG founded in 1971
- State-wide network of integrated research, education, & extension services promoting:
  - Coastal economic vitality
  - Environmental sustainability
  - Citizen awareness & understanding about NY's marine & Great Lakes resources



Photo: NYSG



Lake Ontario

Oswego

Newark

Buffalo

Ithaca

Kingston

Stony Brook

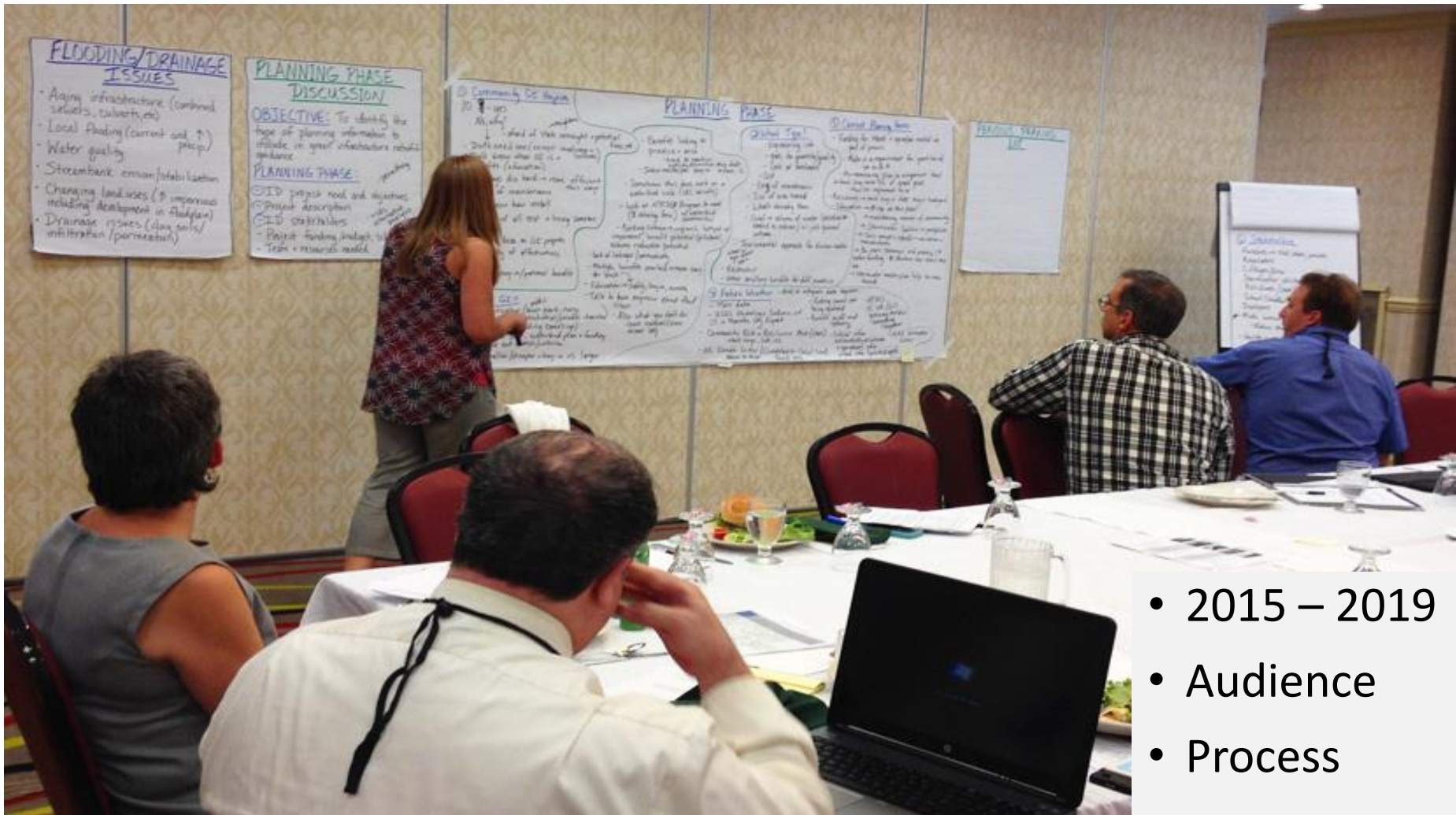
Long Island Sound

NYC

Lake Erie



# Climate Adaptation Tool Development

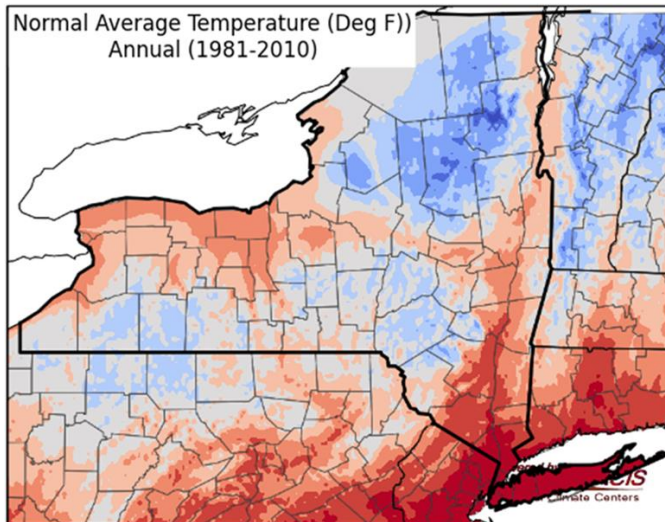


- 2015 – 2019
- Audience
- Process

*Funding: National Oceanic & Atmospheric Administration's Climate Change Capacity Building Initiative*

Annual Temperature in the  
Great Lakes Climate Division  
Annual Average by Decade (degrees F)

1895-1899	45.84
1900-1909	45.08
1910-1919	45.05
1920-1929	45.06
1930-1939	46.13
1940-1949	45.99
1950-1959	46.28
1960-1969	45.29
1970-1979	45.57
1980-1989	46.03
1990-1999	46.81
2000-2009	47.08
2010-2014	47.79



COASTAL RESILIENCE INDEX

*"On the road to coastal resilience"*

Resilience

A Community Self-Assessment

*Understanding how prepared your community is for a disaster*

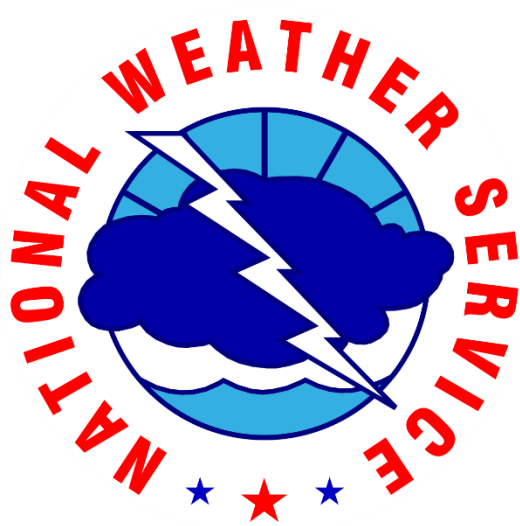
November 2010



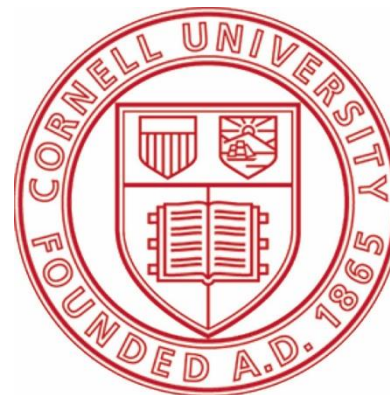


Integrating Social & Physical Sciences





Department  
of State



Department of  
Environmental  
Conservation



Northeast Regional  
Climate Center

# New York's Great Lakes Coastal Resilience Index



## A Community Self-Assessment

*Understanding how prepared your community is for coastal-flooding and weather disasters*



New York Sea Grant  
Wayne County Cooperative Extension  
1581 Route 88 North  
Newark, NY 14513-9739  
(315) 331-8415

New York's Sea Grant Extension Program provides Equal Program and Equal Employment Opportunities in association with Cornell Cooperative Extension, U.S. Department of Agriculture and U.S. Department of Commerce and cooperating County Cooperative Extension Associations.

New York's Great Lakes Coastal Resilience Index

[www.nyseagrant.org](http://www.nyseagrant.org)

To access the NY GL CRI visit: <https://seagrant.sunysb.edu/coastalcomm/pdfs/CCD-CoastalResiliencyIndex.pdf>



**Benchmark:** July 12, 2006

**Location:** Wayne County

**Benchmark Conditions:** Over 5 inches of rain fell over a 3–6 hour period. This rainfall total has a one percent probability of occurring in a given year, making this a 100-year rainfall event.

**Credible Worst-Case Scenario Conditions:** A 500-year event would result in 10 inches of rain over 3-6 hours. Islip, NY experienced 9 inches of rain over 2 hours in 2014.

### Flash Flood from Heavy Precipitation

Variables	Benchmark: July 12, 2006	Worst-Case Scenario
Rain (inch)	5+ inches over 3-6 hours	10 inches over 3–6 hours (9" occurred in 2 hours in Islip, NY in 2014 )
X Year Event	100 year rain event; 25 year rain event at Macedon (Wayne County)	500 year rain events
Event Duration	One Day	
River Crest Height	Crest heights are not representative because the flood waters weren't on gaged streams	
Injuries	None reported	There is no way to estimate, but more likely to occur with a 500 year event.
Death Toll	None reported	There is no way to estimate, but more likely to occur with a 500 year event.
Number of People Evacuated	6 homes in Wayne County	Dependent on the population density of the impacted area; you could use the benchmark figure as the minimum
Damage	6 homes destroyed; roads washed away; thousands of cars damaged; crops (squash, potatoes, corn, etc.) ruined	Dependent on impacted area; similar to damages that occurred during the benchmark; likely more intense and widespread damages
Other Impacts*		Water supply and quality issues; community isolation; human health (mold, insects, etc).
State of Emergency	Wolcott (Wayne County)	

\*Economic loss can be considered; agricultural damages can be for multiple years following the disaster; could impact tourism.

### Damage (figures based on value of the dollar from the year of the event)

County	Property Damage (\$)	Crop Damage (\$)
Orleans County	200K	500K
Monroe County	500K	0
Wayne County	1.5M	200K
Cayuga County	300K	150K

Note: If a benchmark has state of emergency, assume that will happen for Credible Worst-Case Scenario.

**Benchmark:** May 13–14, 2014

**Location:** Seneca and Yates counties

**Benchmark Conditions:** Several weather factors came together that resulted in 4–5 inches of rain in less than 2 hours, devastating parts of Penn Yan, New York, and nearby areas. This rainfall total has a one percent probability of occurring in a given year, making this a 100-year rainfall event.

**Credible Worst-Case Scenario Conditions:** A 500-year event would result in 10 inches of rain over 3–6 hours. Islip, NY experienced 9 inches of rain over 2 hours in 2014.

Several clusters of thunderstorms moved across the Finger Lakes region from May 13–14, 2014. A narrow band of 4 to 5 inches of rain occurred in less than 2-hours over the central portion of Yates and Seneca counties. Rainfall resulted in devastating **flash flooding** in Penn Yan, NY that destroyed roads and buildings. Total public damages are estimated between 10 and 12 million dollars. The following impacts are from the National Oceanic and Atmospheric Administration/National Weather Service's Storm Event Database:

Throughout Yates County, creeks overtopped their banks, homes flooded, and roads were washed out or impassable. Water rescues took place around Italy, NY and Keuka Park, including one motorist that was trapped in their vehicle. In Penn Yan, catastrophic flash flooding occurred in the downtown area of the Village. The hardest hit areas were in the vicinity of Elm Street and Champlin Avenue where roads buckled, parking lots caved in, and the Owl's Nest Community Center collapsed. Tractor-trailer container boxes were seen floating down the streets, where they collided into the Wagner Restaurant causing significant structural damage. The foundations of several homes were washed away during the flood.

**A flash flood** is a rapid and extreme flow of high water into a normally dry area, or a rapid water level rise in a stream or creek above a predetermined flood level, beginning within six hours of the causative event (e.g., intense rainfall, dam failure, ice jam).



*East Valley Road, north of Branchport, NY. Floodwaters were beyond the capacity of existing ditches and culverts. Many area roads were damaged from the velocity and volume of the floodwater. Photo: Courtesy of Dave Enty (NWS Binghamton).*



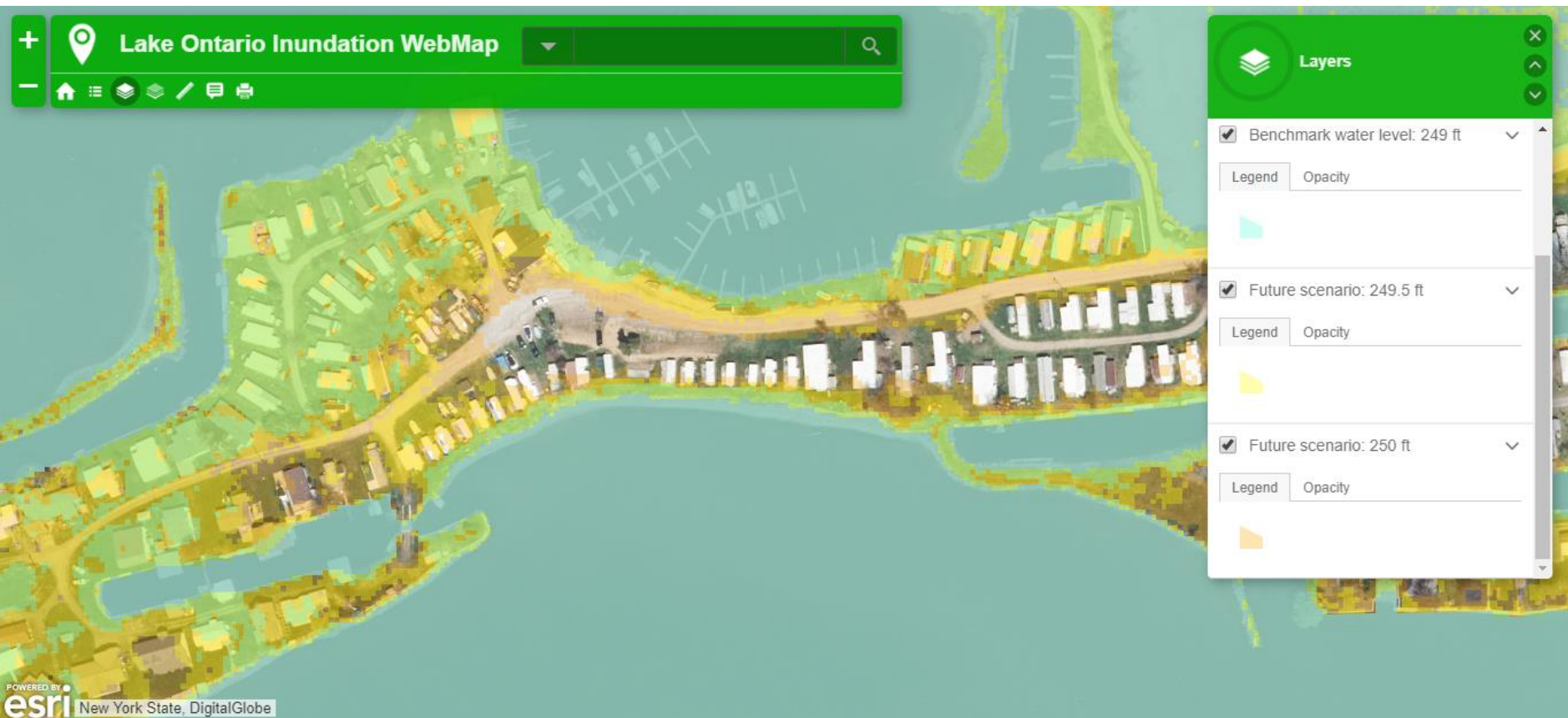
*As floodwater travels across the land, it picks up debris. This house was nearly surrounded by debris that was left from receding floodwater. Photo: Mary Austerman, New York Sea Grant.*



*Floodwaters carry sediments as well. After the floodwaters receded, dirt, silt, and rocks covered much of this lawn. Photo: Mary Austerman, New York Sea Grant.*



# Lake Ontario Inundation Mapping Tool: *Coastal Flood Risk*



<http://ccegeomaps.maps.arcgis.com/home/item.html?id=e58acb1db2a24a21b9e5fe1d069a7a63>

# 2017 Lake Ontario Record-High Water Level Impact Survey



Flood survey story map:

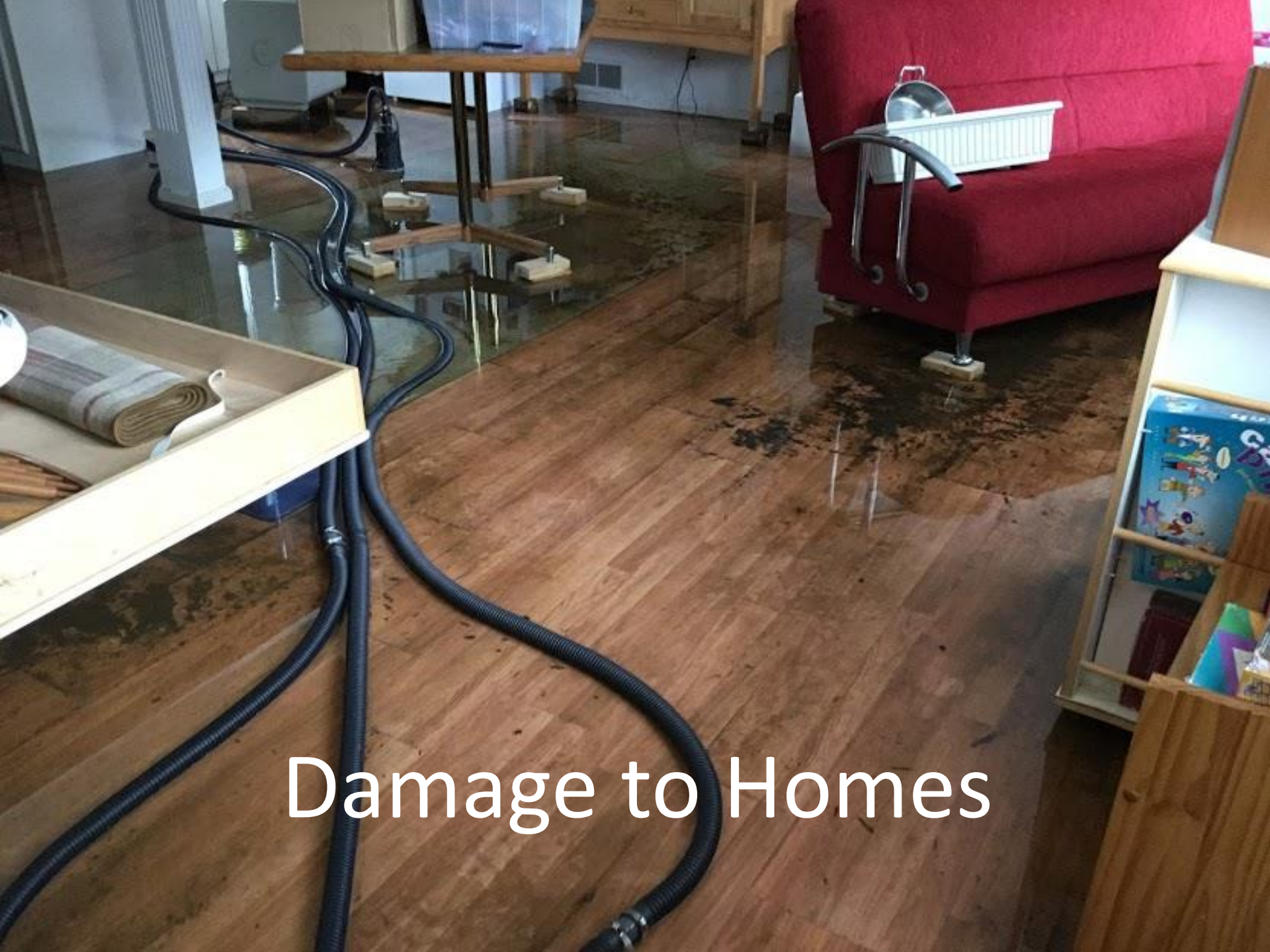
<https://ccegeomaps.maps.arcgis.com/apps/Cascade/index.html?appid=76d4abac6f2d4cf5811bb18a6e119a6e>





Inundation

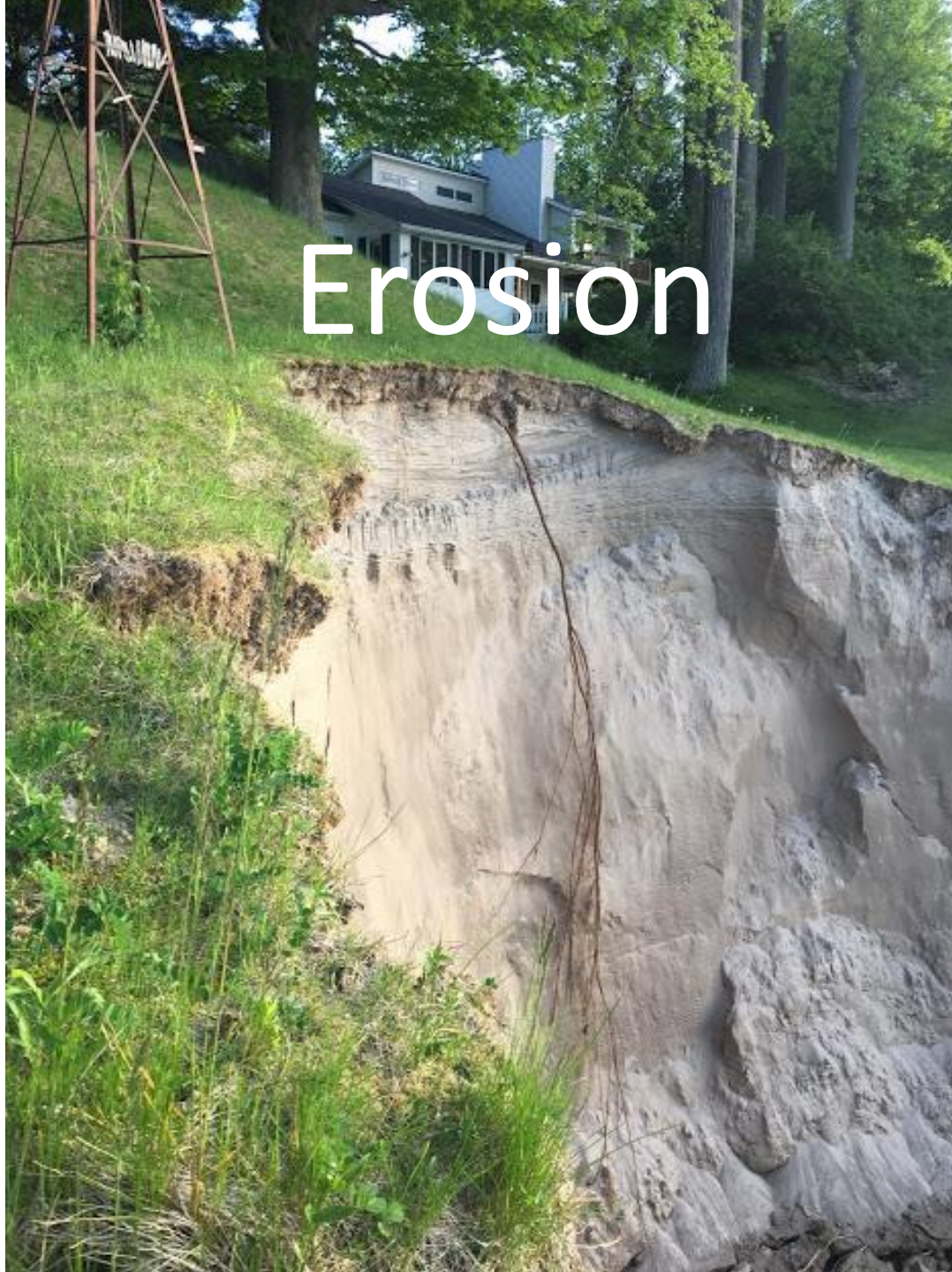




Damage to Homes



# Erosion





# Shoreline Management Structure Damage

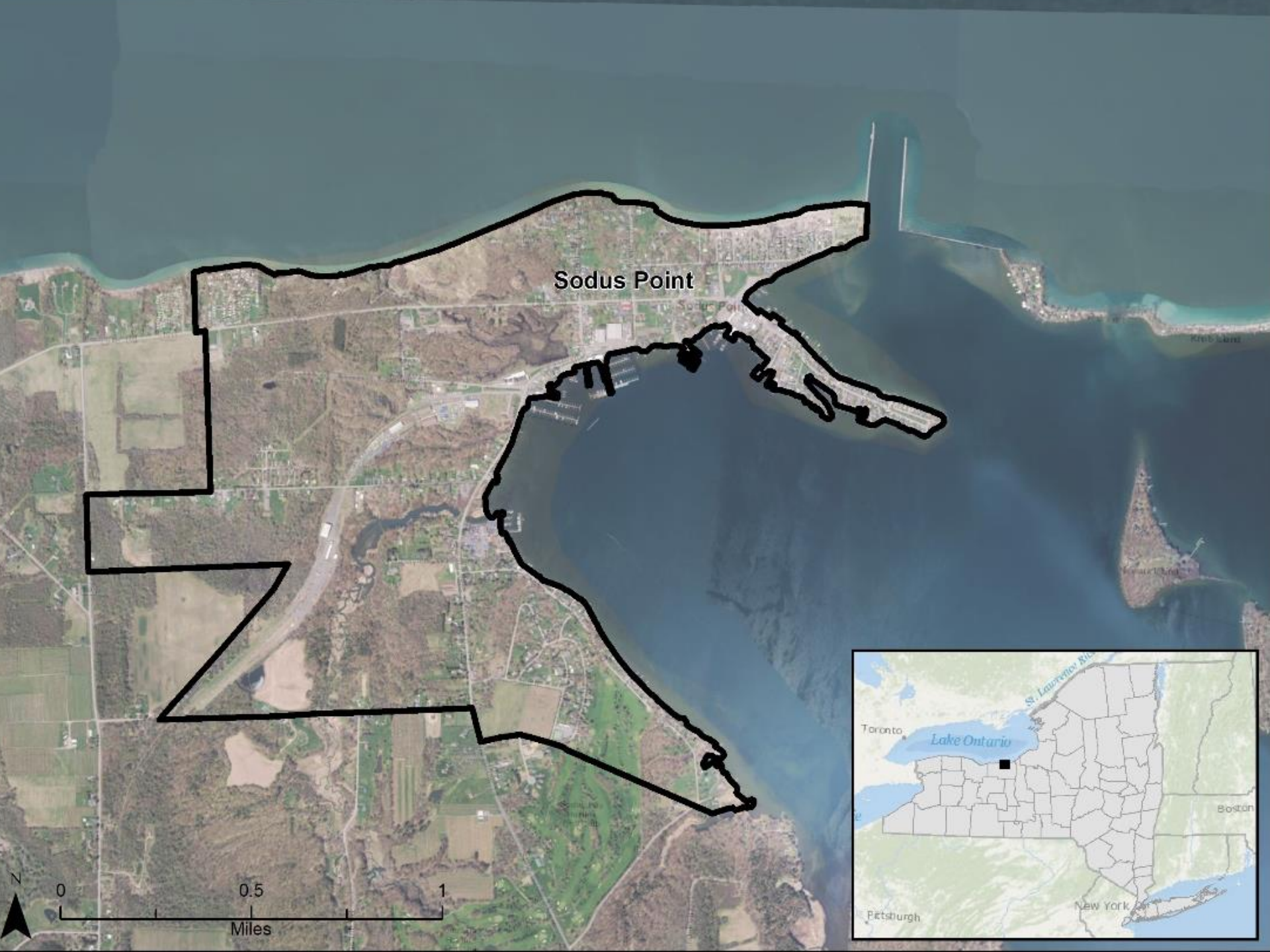




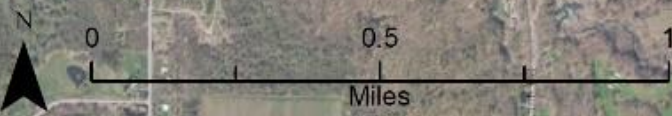


Case Study:  
*Post Flood Recovery Visioning with the Village of  
Sodus Point, NY*

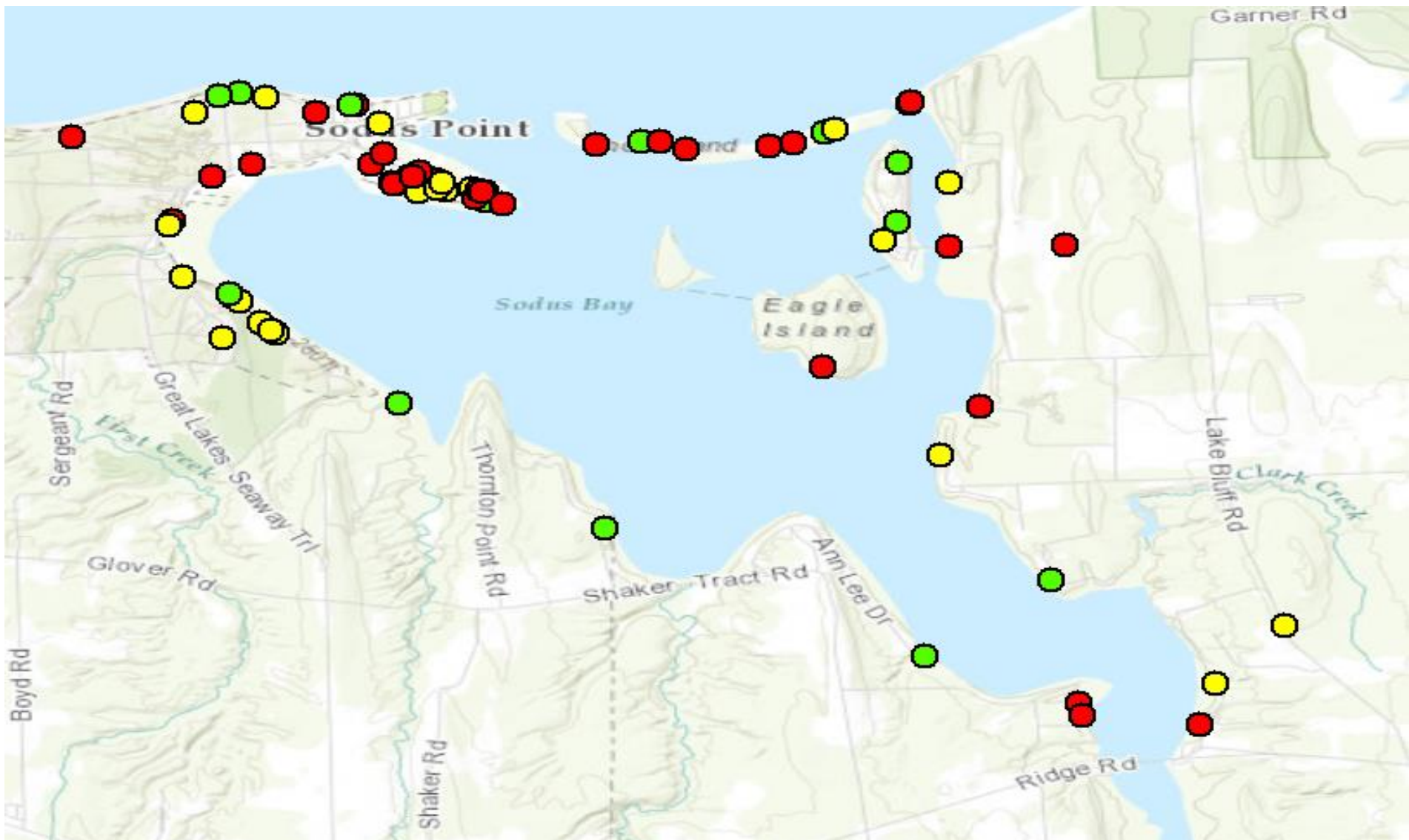




Sodus Point



# Overall Impact Sodus Bay, Wayne County


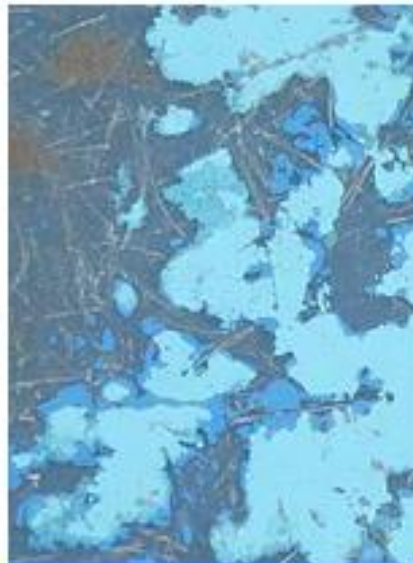


Critical Infrastructure and Facilities	Benchmark	Credible Worst-Case Scenario 1	Credible Worst-Case Scenario 2	Infrastructure/facility functions after disaster*
<i>Water Level (feet):</i>	249	249.5	250	
<i>Weather Disaster (list):</i>				
<i>Example: Power grid</i>	✓			✓
<b>Section B: Critical Facilities*</b>				
Municipal Hall				
Municipal Department of Public Works				
Critical record storage				
Other government building(s) (list):				
Fuel (i.e., diesel, gas) stations for disaster response operations				
Police station or other law enforcement building(s)				
Jail				
Fire station(s)/Emergency Medical Service				
Communications main office or substations				
Emergency operation center				
Access to areas suitable for disaster response staging				
Access to points of distribution (staging areas for necessities for residents)				
Evacuation shelter(s)				
Hospital(s)				
Vulnerable populations (i.e., mobility impaired, daycare, group homes, people likely to refuse mandatory evacuation, etc.)				



	Benchmark	Credible Worst Case Scenario	Infrastructure or facility functions after disaster	Notes:
<b>Critical Facilities</b>				
<i>Water level (feet)</i>	249'	249.5'		
<i>Example: power grid</i>	x		x	
<b>Section B: Critical Facilities*</b>				
Municipal Hall			x	
Municipal Department of Public Works			x	
Critical record storage	x	x		
Other government building(s) (list):			x	
Policy station or other law enforcement building(s)			x	
Fire station(s)			x	
Communications (phone, Internet, etc.) main office or substations	x	x		This is a need; during the event: Sat AM meetings; 2 meetings/day; website and e-blasts
Emergency operation center			x	Highway barn; County OEM; Sherrif substation (on-site)
Evacuation shelter(s)			x	High school gym
Hospital(s)			x	
Vulnerable populations (i.e. daycares, group homes, etc.)			x	Village doesn't know of any; sand bagging is an issue because of aging population and seasonal homes (need legislature that gives the Village the ability to do it
Hazardous materials facilities (gas stations, marinas with fuel or other hazard materials, etc.)	x	x		Marinas
Abandoned, deteriorated, or underused sites and buildings	x	x		All mapped by the Village (2 commercial; 3 residential); hoping they are demolished in fall 2018
<b>Total check marks for Section B:</b>		<b>2</b>	<b>9</b>	

Get on the right path to resilience today...



Guide



Coaching



Origins



Reports



Community Resilience Building is a unique, “anywhere at any scale”, community-driven process, rich with information, experience, and dialogue, where participants identify top hazards, current challenges, strengths, and priority actions to improve community resilience to all hazards today, and in the future.

[www.CommunityResilienceBuilding.org](http://www.CommunityResilienceBuilding.org)

...follow the action on





# Visioning Workshop: *setting the stage*





# Visioning Workshop: *breakout groups*





# Prioritization of actions



**Odus Point Post-Flood Recovery Workshop**  
 October 3, 2018  
 V = Vulnerability; S = Strength; B = Both

**Community Sector:** *Economic Development / Tourism*

**Hazard:** Lake Ontario Flooding

Feature/Asset/Procedure	Location	Ownership	V, S, or B*	Action	Comments
Lighthouse Museum	①	Historical Society	\$ S	Improve messaging & communication	
Communication / Media / Messaging	②	Private County Town	B V	Form "chamber of commerce" group; Coordinated comm strategy; Consistent & frequent messaging; designate 2 potential comms partners; Learn to be learned from County; Partnerships; Source of info; Working with voice & food; Bridging	ownership over messaging; differential regional areas; strengthen internal communication
Marinas / Docks	③	Private - yacht	B	Drainage/Physical Improvements	Low water concerns
Private, semi-private Clubs (yacht, boating)	④	Semi-private → Golf Club	B S	Improved messaging & communication; Runoff from Golf Club - Reduced/BMP	
Captain Jacks / Restaurants	⑤	Private	S	Physical Improvements: Amps, flood diversion structure, etc. Identify Funding Structure	
Youth Programs (sail, swim, etc)	⑥	Not for Profit - In-School Town + County - swim Village	S	ID Funding	
4th of July Fireworks + Events	⑦	Village Lighthouse NAEP	S	Make More Competitive; Increase Budget - Raise \$ from Private entities; 4th AND Labour Day	
Public safety vs. Business Revenue	⑧	First responders Specific Elected officials to Harbour Master Home owners State County Town, Village	V	Establish working groups; ID procedures; Unified comms	Aggressive policing on water; Harbormaster
Home Values / Personal Expense	⑨	Home owners State County Town, Village	V	Low interest loans; Grants for improvements NOT tied to income; Buy - local Campaign	
Reacting to Events - Collective/Individual	⑩	Mayor/NAEP County Emergency Management	V	Form "chamber of commerce" group/business group	
Sensitivity to future flood events / Stigma	⑪	? / Community	V	Control the messaging; Positive messages; Transparency	
Vacation Rentals	⑫	Property owners Business owners	S	ID Funds to Support Businesses	
Municipal Expenses	⑬	Village & Board Mayor/NAEP Town, County, State	V	Reconfigure Sewers - ID Funds	
Parking / Navigation	⑭	Village Business owners	V	CDP plan / GTC	
Beaches (erosion)	⑮	County State USACE	S	Relocate Beach	



# Resiliency Actions:

## *Communication strategy*

<b>Outreach Action – #1</b>	<b>Develop a formal local marketing and communications strategy.</b>
<b>Lead Department</b>	Village of Sodus Point
<b>Partners</b>	Christopher Communications
<b>Cost</b>	Medium
<b>Funding Sources</b>	Village Budget
<b>Narrative</b>	Christopher Communications has been hired to create a communications approach that relays credible, timely information to business owners and craft ready-to-use messaging to be disseminated by key Village representatives and community partners.
<b>Implementation Schedule</b>	Current (as of August 2019)

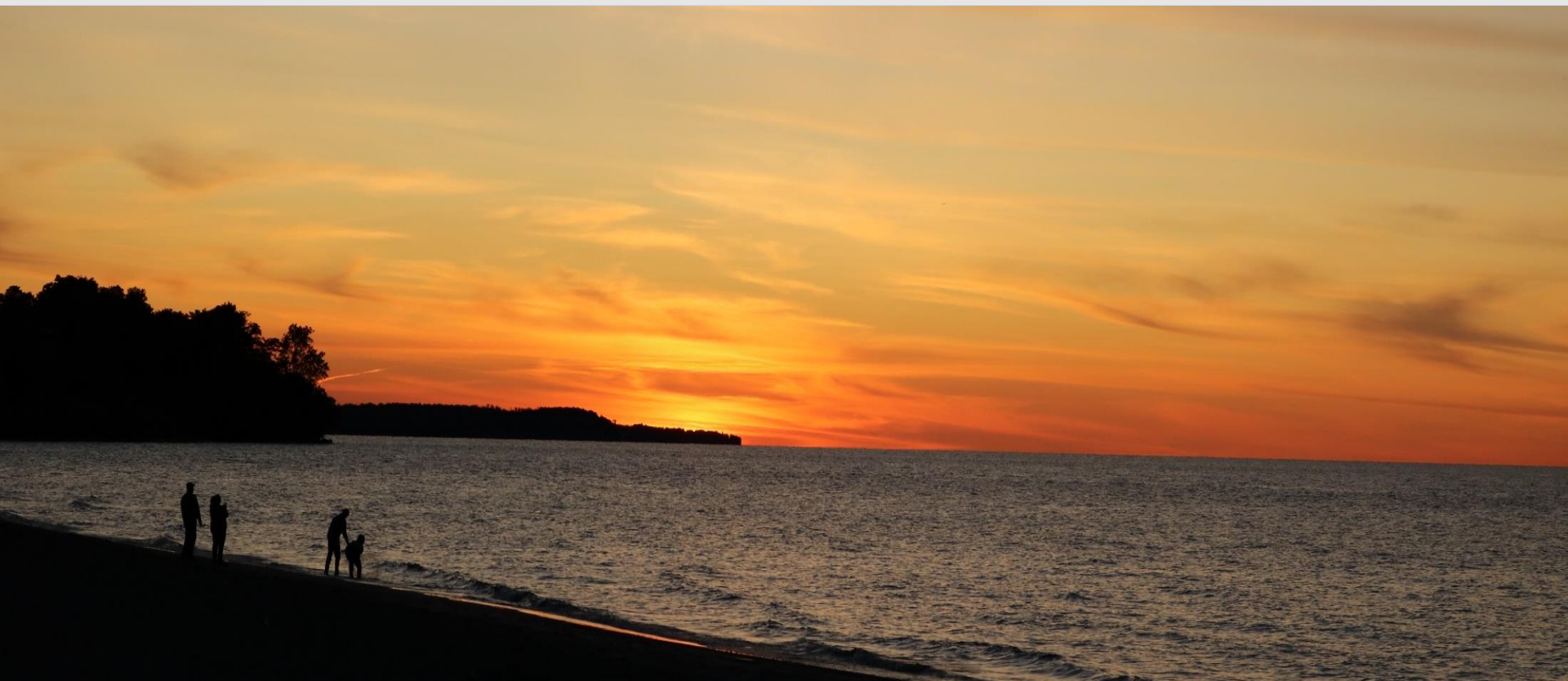
<b>Shoreline Management Action – #1</b>	<b>Seek Coastal Erosion Hazard Area (CEHA) designation.</b>
<b>Lead Department</b>	Village of Sodus Point
<b>Partners</b>	G/FLRPC, NYSG
<b>Cost</b>	Medium
<b>Funding Sources</b>	Grant Funding
<b>Narrative</b>	G/FLRPC, along with NYSG and the lab at the Department of Biological and Environmental Engineering, Cornell University, submitted an application to the Great Lakes Research Consortium (GLRC) Small Grants Program 2019 RFP to investigate how the Coastal Erosion Management Permit Program is administered in select communities along the Lake Ontario shoreline within the Genesee-Finger Lakes Region. The proposal was not selected for funding. However, G/FLRPC and NYSG approached the National Sea Grant Law Center to provide research regarding the <a href="#">New York Coastal Erosion Hazard Area (CEHA) Permit Program</a> . Monroe County Department of Planning & Development’s Land Use Decision-Making Training Program is hosting training for Fall 2019 on <i>Managing Regulatory Challenges and Tools for Great Lakes Shorelines</i> .
<b>Implementation Schedule</b>	Not Active





- Research
- Collaborate
- Integrate
- Customize
- Adapt
- Transfer

# Lessons Learned



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*315-331-8415*





## **Weather and Social Data to Inform Participatory Planning Initiatives**

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