

Great Lakes Community Resilience Index:

A vulnerability self-assessment checklist

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Presentation Outline

- What is New York Sea Grant
 - Resilience
- Project overview
 - Community Resilience Index (CRI)
- CRI - overview
- How you can get involved



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



NYSG Extension Focus Areas

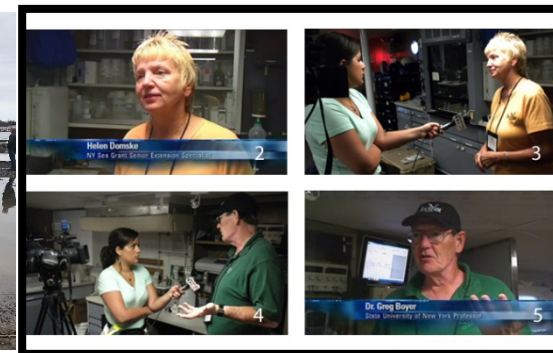
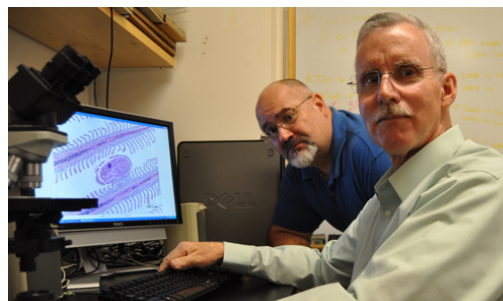
- Healthy Coastal Ecosystems
- Sustainable Fisheries & Safe and Sustainable Seafood Businesses
- Environmental Literacy & Workforce Development
- Resilient Communities & Economies



Photos: NYSG & NOAA

Resilience & NYSG's Role

- Academic research
- Stakeholder-driven outreach
- Assistance in emerging issues
- Unique structure and positioning
- PARTNERSHIPS



Photos: NYSG

- Coastal Community Development Program

➤ *Climate Change Capacity Building Initiative*



Uncertainties of Climate Change

<http://www.kleinisd.net/default.aspx?name=cimath.hs>

$$\frac{dx}{\sqrt[3]{x}} = \frac{dx}{\frac{1}{6}\sqrt[3]{x^3} + \frac{1}{2}\sqrt[3]{x^2}} = \left[\begin{array}{l} \sqrt[6]{x} = E \\ x = E^6 \\ dx = 6E^5 dt \end{array} \right] = \frac{6t^5}{t^3 + 1} dt =$$

$$\frac{6t^5}{t^3 + 1} = 6 \left(\frac{t^3 + 1}{t^3 + 1} - \frac{1}{t^3 + 1} \right) dt = 6 \left(t^2 - t + 1 - \frac{1}{t^3 + 1} \right) dt$$

$$6 \left[\frac{t^3}{3} - \frac{t^2}{2} + t - \ln |E^6 + 1| \right] + C =$$

$$= 2 \left[\frac{(\sqrt[3]{x})^3}{3} + \sqrt[3]{x} \cdot \ln |\sqrt[6]{x} + 1| \right] + C$$

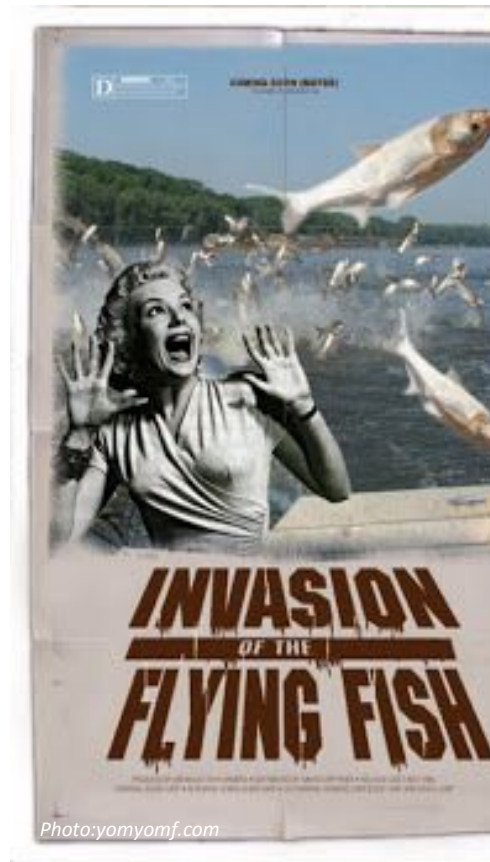
Potential Impacts of Climate Change: *New York*



- Rising temperatures
 - Heat waves/less freezing
- Changing precipitation patterns
 - Intense rains/flood
- Infrastructure

Potential Impacts of Climate Change: *New York*

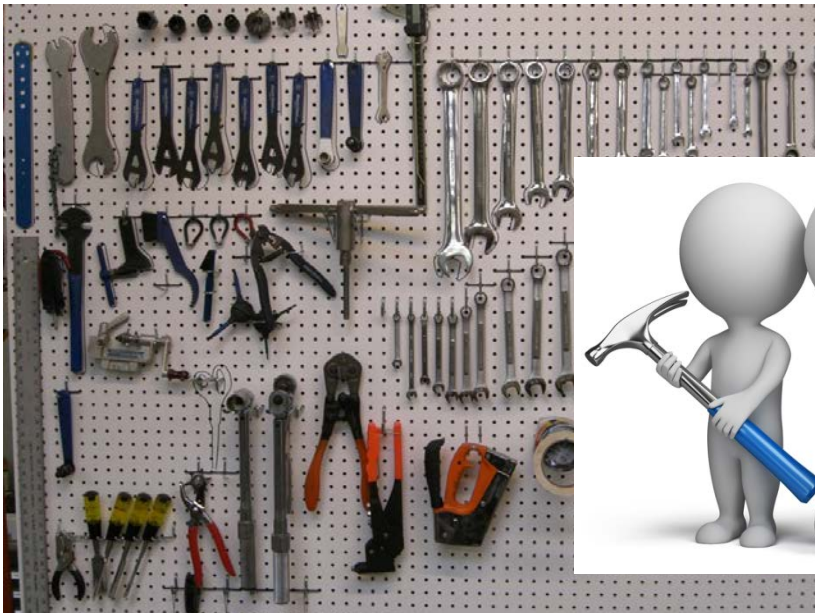
- Ecosystems
- Agricultural
- Human health



Now What???



Photos: pinterest and 360factors



Available Tools: *The Rabbit Hole...*



Front-End Tools

-
- 1 Step 1: Identify the Problem
 - 2 Step 2: Determine Vulnerabilities
 - 3 Step 3: Investigate Options
 - 4 Step 4: Evaluate Risks & Costs
 - 5 Step 5: Take Action

Image: ustoolkit.gov

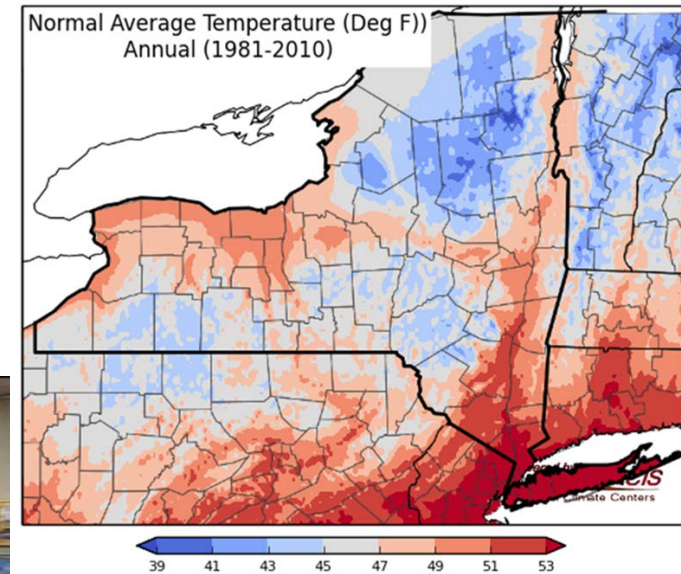
Climate Change Capacity Building Initiative

- Funding source
- 2/2015 – 1/2018
- Audience
- Process
- Current phase & timeline
 - *Great Lakes Community Resilience Index: a self-assessment checklist*

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

Graphics: NNYSG



Great Lakes Community Resilience Index (CRI)

- Advisory team
- Purpose
 - Audience
- Uses
 - What it will do
 - What it will NOT do
- Other initiatives

“I am a new local government planner, and I need baseline data to determine where current vulnerabilities are in my community.”

“I am a department of works manager and I need to be able to justify to my mayor/supervisor why I need funds for certain mitigation projects.”

“I work for the county and am interested in working with municipalities on a inter-municipal coastal recreation and tourism trail and need to know more about vulnerabilities prior to trial development.”

Gulf Region CRI: *Model for the **Great Lakes CRI***

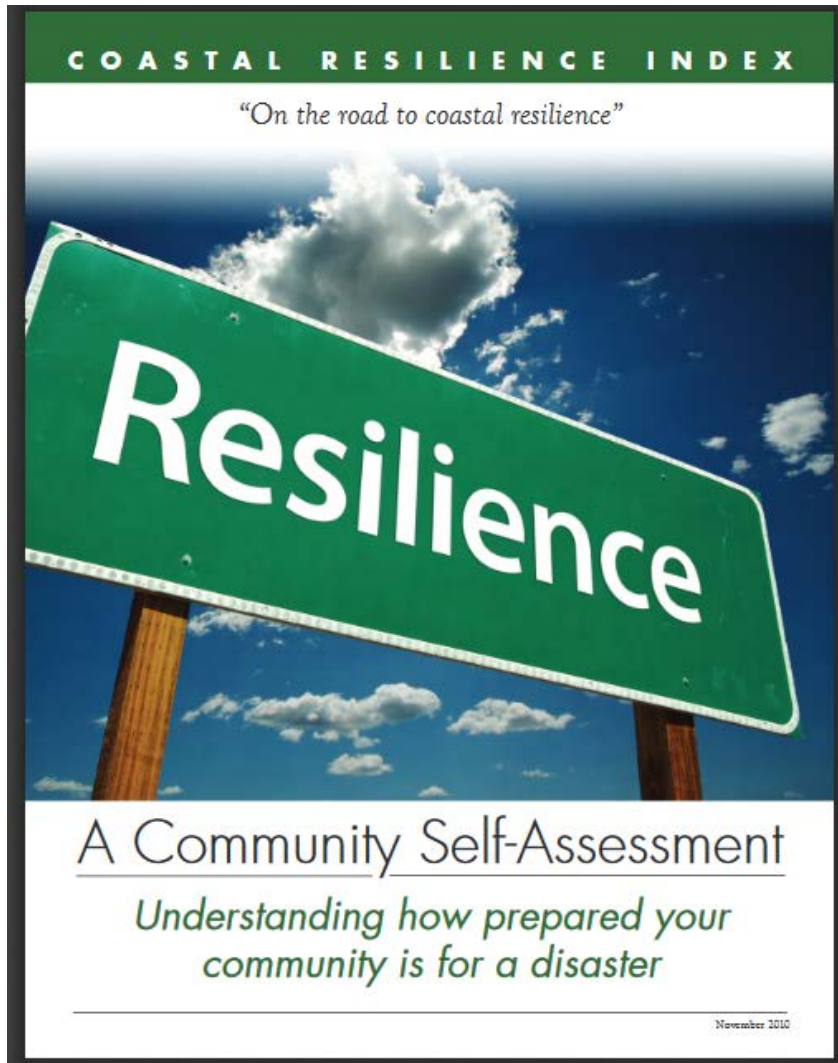


Photo: researchevaluationconsulting.com

Gulf CRI:

http://masgc.org/assets/uploads/publications/662/coastal_community_resilience_index.pdf



CRI: *Building Weather Scenarios*

GULF REGION

Variables	Bad Storm (benchmark) Scenario 1 Name:	Future Storm (greater intensity) Scenario 2 Name:
Wind speed at landfall (mph)		
Rain (total/24hours)		
Storm Surge (height in feet)		
Direction		
Speed of Movement		
Duration		
Tidal Influence (high or low)		
Landfall Location		

GREAT LAKES

- Blizzard
- Flash Flood (intense rain)
- Flash Flood (quick thaw)
- Ice Storm
- Wind Storm

Benchmark vs. Credible Worst Case Scenario

CRI: *Key Indicators of the Community*

GULF REGION

TABLE OF CONTENTS

Introduction.....	
Results Overview.....	
Build Your Scenarios	
Critical Infrastructure and Facilities.....	
Transportation Issues.....	
Community Plans and Agreements.....	
Mitigation Measures	
Business Plans	
Social Systems	
Determining Your Resilience Index	
Interpreting Resilience Index Results.....	
Next Steps	
Acknowledgments	
References	

GREAT LAKES

- Critical Infrastructure & Facilities
- Transportation Issues
- Plans & Community Agreements
- Current Mitigation Measures
- Business Plans (Large Businesses)
- Social Systems/Resilience
- *Public Outreach & Education*
- *Disaster Preparedness & Recovery*
- *Hazard Mitigation*
- *Recreation & Tourism*
- *Natural Resources/Habitat/Ecosystems/Water Resources*
- *Agriculture*
- *Other (for community-specifics)*

Gulf Region CRI:

Example of Attributes for Key Indicators

2. Assuming Scenario 1, if any of the following affect your transportation/evacuation route(s), will your community regain a pre-storm level of service within one week? Check Yes or No.

Transportation issue*	Yes	No
<i>Example: Will flood-prone areas (tunnels, roads in low-lying areas) be operational within one week?</i>	✓	
Will primary bridge(s) be out for less than one week?		
Will roads blocked by storm debris (trees, wrack) be cleared in less than one week?		
Will washouts (roads) be passable in less than one week?		
Will flood-prone areas (tunnels, roads in low-lying areas) be operational within one week?		
Is public transportation available to assist evacuation of residents unable to evacuate on their own?		
Is there more than one evacuation route?		
Is there a plan for post-storm traffic management?		
Total number of Yes answers and No answers:		

Gulf Region CRI:

Example for Determining Your Resilience Index

- Users use scores they assigned in previous sections, to populate tables.
- Points are determined for each table

Use the box labeled “Total number of Yes answers” from Sections 2-6 to complete the following chart.

Sections 2-6	Number of Yes answers	Translate number of Yes answers to Resilience Index	Resilience Index	Comments
(Example) Section 2: Transportation issues	1	2 or fewer (LOW) 3 to 4 (MEDIUM) 5 or more (HIGH)	LOW	A road construction project will create an additional evacuation route within a year. Also, we are in talks with the local public transportation provider about a program to assist evacuation.
Section 2: Transportation Issues		2 or fewer (LOW) 3 to 5 (MEDIUM) 6 or more (HIGH)		
Section 3: Community Plans and Agreements		4 or fewer (LOW) 5 to 8 (MEDIUM) 9 or more (HIGH)		
Section 4: Mitigation Measures		4 or fewer (LOW) 5 to 8 (MEDIUM) 9 or more		

Gulf Region CRI:

Example for Interpreting Your Resilience Index Results

- Resilience Index: an indicator of community's ability to reach acceptable level of function and structure post-weather event.

LOW Resilience Index:

- Needs attention
- Critical infrastructure:
> 18 months

MEDIUM Resilience Index:

- Could improve
- Critical infrastructure:
< 2 months

HIGH Resilience Index:

- Good to go
- Critical infrastructure:
probably no to minimal impacts

Gulf Region CRI: *Using Your Results*

- Learn & investigate weaknesses identified
 - Planning and zoning considerations
 - Ecosystem services
 - Prioritization of vulnerabilities
 - Further analyses
 - Funding for improvement projects

GREAT LAKES CRI:

How YOU Can Get Involved

- Timeline
- Reviewers
- Test communities
- Formatted
- Distributed
 - Hardcopy to attendees
 - URL: <http://seagrantsunysb.edu/articles/r/2149>

WANTED:

Reviewers & Test Communities

I am interested in more information about reviewing the Great Lakes CRI Content.

Name: _____

Phone: _____

Email: _____

Comments:

I am interested in more information about being a Great Lakes CRI test community.

Name: _____

Phone: _____

Email: _____

Comments:

Summary & Questions

- Tools for baseline analysis
- Great Lakes CRI will be an option
 - **Reviewers & test communities**
- Reach out to partners and experts as a first step
- Thank you!



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