The Nature Conservancy
Protecting nature. Preserving life.™

Coastal Climate Adaptation Planning: Case studies and tools for Great Lakes communities

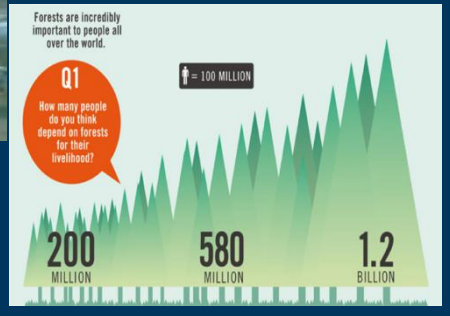
Katie Kahl, PhD

March 11, 2015

The Nature Conservancy
Protecting nature. Preserving life.™

The Nature Conservancy in the Great Lakes

- Aquatic Invasive Species
- Climate Change Adaptation
- Coastal Systems
- Native Fisheries
- Northern Forests
- Watersheds



The Nature Conservancy
Protecting nature. Preserving life.™

Western Lake Erie Coastal Team

Dr. Doug Pearsall, Senor Conservation Scientist

Gust Annis, Great Lakes Research Specialist

Tara Baranowski, Lake Erie Coasts & Islands Prj. Mgr

Chris May, Stewardship Dir.

Dr. Dave Ewert, Senor Conservation Scientist

Dr. Katie Kahl, Conservation Policy & Practices Specialist

Dr. Patrick Doran, Dir. Conservation

Kari Marciniak, Dir. Strategic Communications

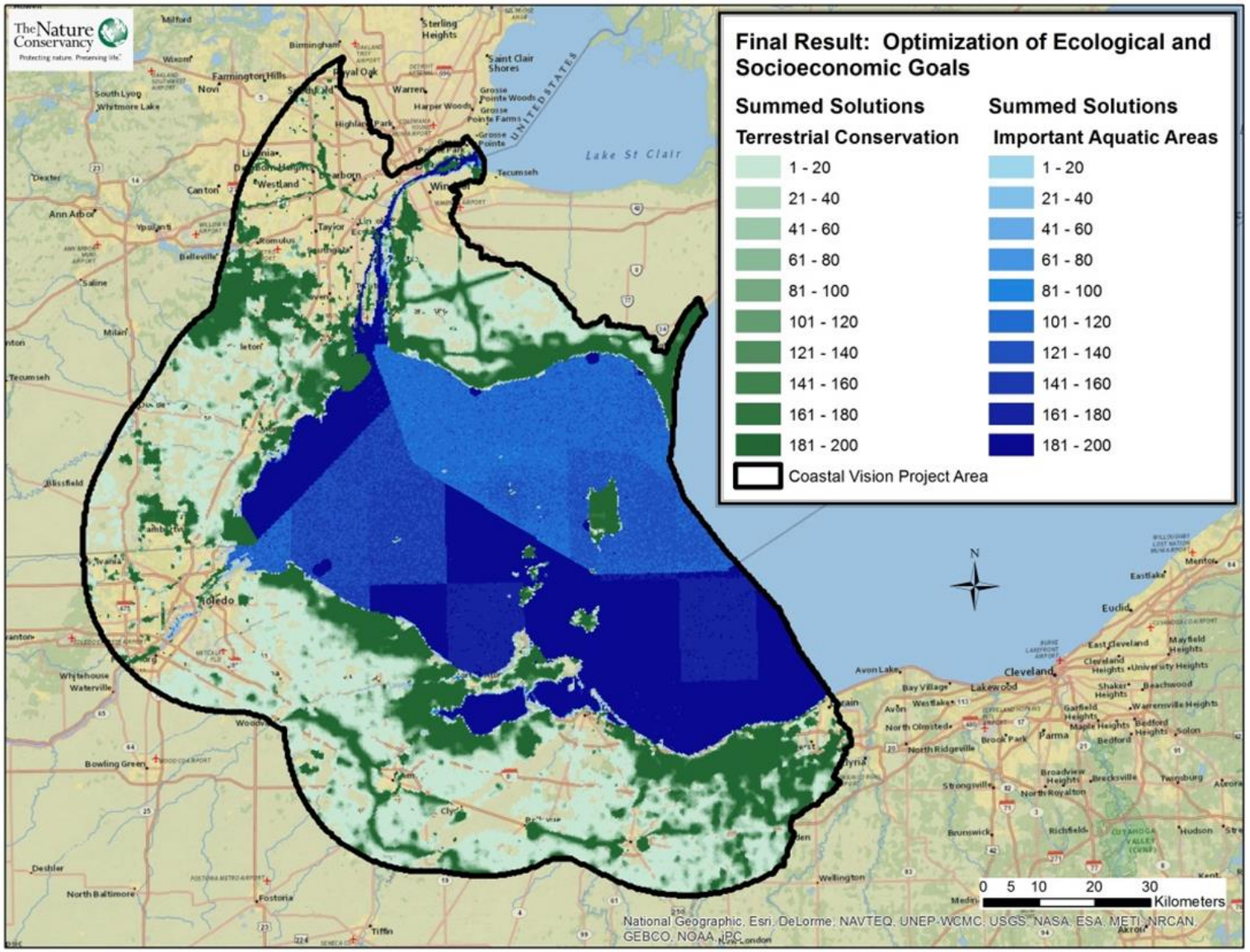
Amy Brennan, Lake Erie Conservation Dir.

Bill Stanley, Dir. Conservation

The Nature Conservancy
Protecting nature. Preserving life.™

Western Lake Erie Coastal Conservation Visioning

http://nature.ly/WLEcoastalvision



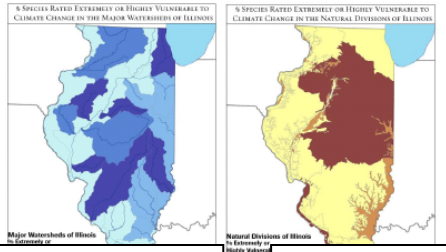
The Nature Conservancy
Protecting nature. Preserving life.™

Case Studies:
www.nature.org/greatlakesclimate

Climate Change Adaptation Case Study

Updating the Illinois Wildlife Action Plan: Using a vulnerability assessment to inform conservation priorities

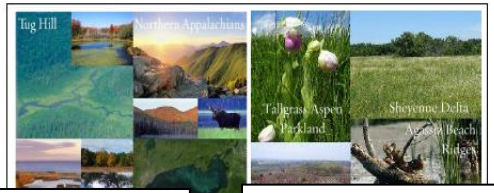
2011



Climate Change Adaptation Case Study:

Jump-Starting Climate Adaptation: Catalyzing conservation strategy updates through climate clinics in New York, Minnesota and the Dakotas

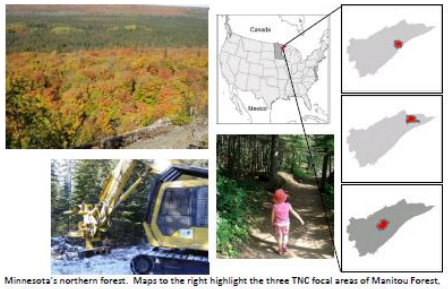
2012



Climate Change Adaptation Case Study

Planning for the Forests of the Future: Updating Northeast Minnesota's Forest Management Strategies

2011



Minnesota's northern forest. Maps to the right highlight the three TNC focal areas of Manitou Forest, the Border Lakes and Sand Lake-Seven Beavers respectively within a larger northeast Minnesota study area (Ravenscroft et al. 2010) highlighted in grey. Photos (L to R): MN North Shore Highlands@TNC Archives, Minnesota maps@ Minnesota TNC, forest harvest@TNC Archives, trail@TNC Archives.

Case study series contact:
Katherine J. Kahl , Kimberly R. Hall, Patrick Doran
kkahl@tnc.org (517)316-2290
kimberly.hall@tnc.org (517)316-2257
pdoran@tnc.org (517)316-2279
The Nature Conservancy's Great Lakes Project TNC Office
101 E. Grand River Ave.
Lansing, MI 48916

Minnesota TNC contact:
Mark White and Meredith Cornett
mark_white@tnc.org (218) 727-6119
mcornett@tnc.org (218)727-6119
Northeast Minnesota
394 Lake Avenue South
Duluth, MN 55802

What Could Changing Great Lakes Water Levels Mean for our Coastal Communities?

A case for climate-adapted planning approaches

A view of Grand Traverse Bay from Old Mission, Michigan. Photo by Jody Simoes.

Contact Information:
Dr. Katherine J. Kahl
The Nature Conservancy
Great Lakes Project
www.nature.org/greatlakesclimate

Heather Stirratt
National Oceanic and Atmospheric Administration
Great Lakes Regional Team
www.regions.noaa.gov/great-lakes

Survey Says. . . Great Lakes Coastal Communities Choose Climate Adaptation!

Gaining knowledge, skills and new decision-making frameworks

Sunset on Green Bay near Ephraim, Wisconsin . Photo by Claude Thérien

Contact Information:
Dr. Katherine J. Kahl
The Nature Conservancy
Great Lakes Project
kkahl@tnc.org
www.nature.org/greatlakesclimate

Heather Stirratt
National Oceanic and Atmospheric Administration
Great Lakes Regional Team
heather.stirratt@noaa.gov
www.regions.noaa.gov/great-lakes

The Nature Conservancy
Protecting nature. Preserving life.™

www.nature.org/greatlakesclimate

What Could Changing Great Lakes Water Levels Mean for our Coastal Communities?

A case for climate-adapted planning approaches

A view of Grand Traverse Bay from Old Mission, Michigan. Photo by Jody Simoes.

Contact Information:
Dr. Katherine J. Kahl
The Nature Conservancy
Great Lakes Project
www.nature.org/greatlakesclimate

Heather Stirratt
National Oceanic and Atmospheric Administration
Great Lakes Regional Team
www.regions.noaa.gov/great-lakes

Survey Says. . .
Great Lakes Coastal Communities Choose Climate Adaptation!

Gaining knowledge, skills and new decision-making frameworks

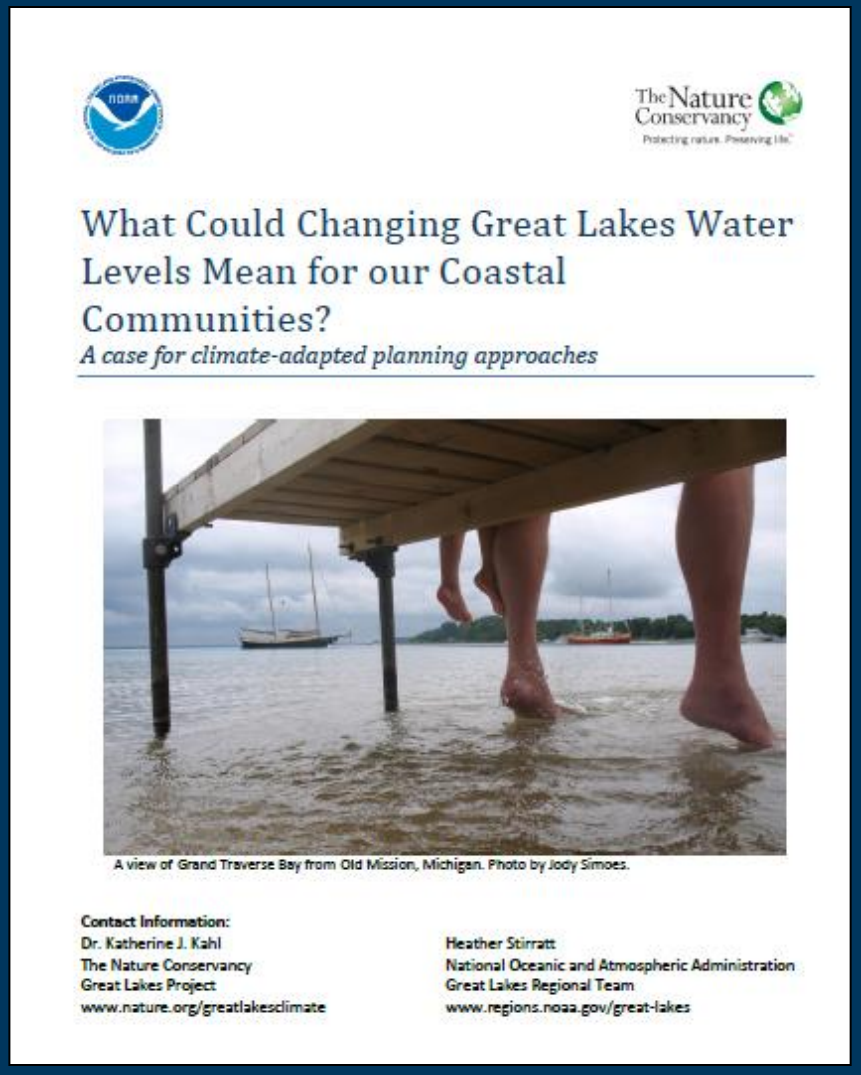
Sunset on Green Bay near Ephraim, Wisconsin . Photo by Claude Thérien

Contact Information:
Dr. Katherine J. Kahl
The Nature Conservancy
Great Lakes Project
kkahl@tnc.org
www.nature.org/greatlakesclimate

Heather Stirratt
National Oceanic and Atmospheric Administration
Great Lakes Regional Team
heather.stirratt@noaa.gov
www.regions.noaa.gov/great-lakes

The Nature Conservancy
Protecting nature. Preserving life.™

Case Studies:
www.nature.org/greatlakesclimate



What Could Changing Great Lakes Water Levels Mean for our Coastal Communities?

A case for climate-adapted planning approaches

A view of Grand Traverse Bay from Old Mission, Michigan. Photo by Jody Simoes.

Contact Information:
Dr. Katherine J. Kahl
The Nature Conservancy
Great Lakes Project
www.nature.org/greatlakesclimate

Heather Stirratt
National Oceanic and Atmospheric Administration
Great Lakes Regional Team
www.regions.noaa.gov/great-lakes

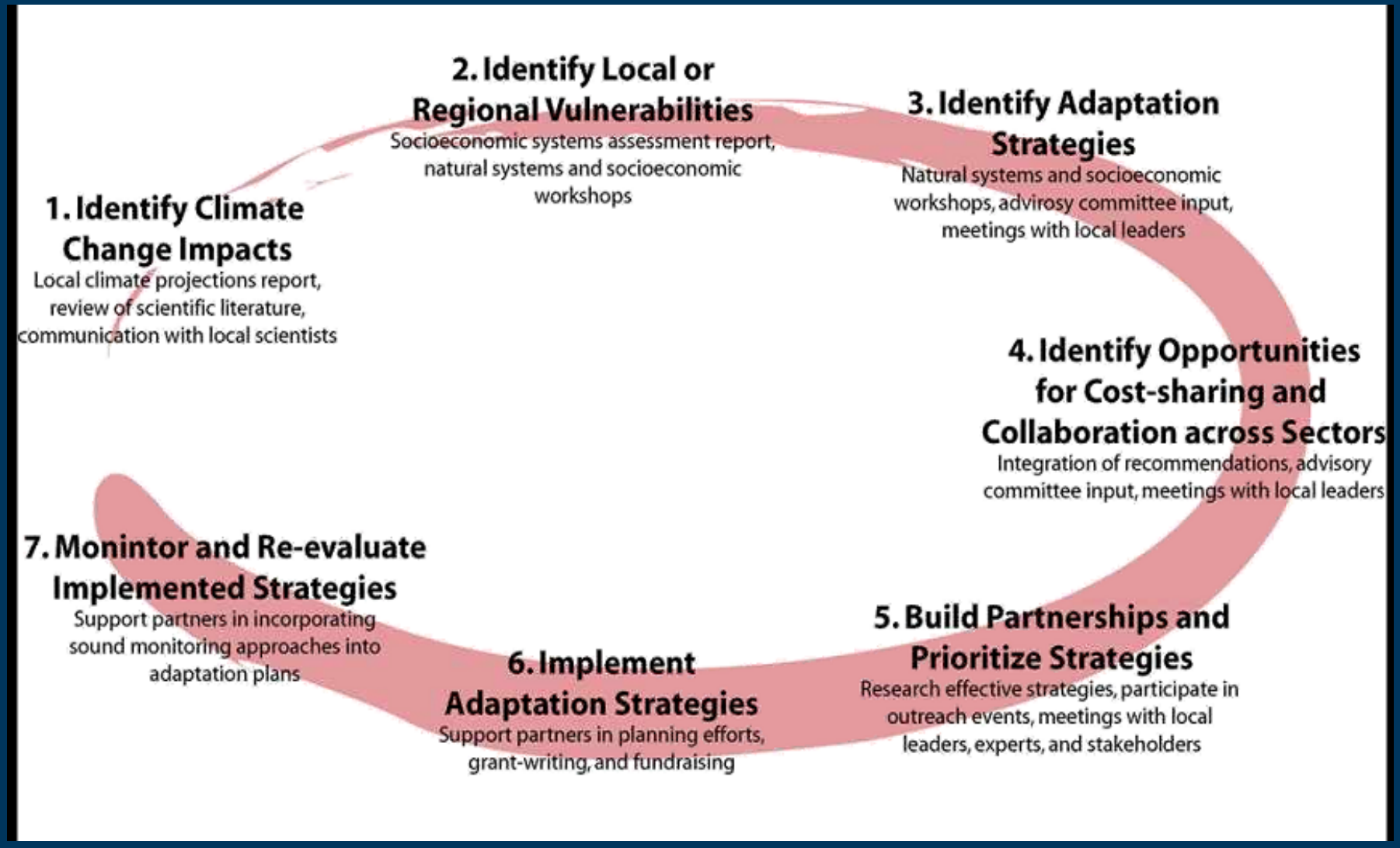
- **Audience**: Great Lakes coastal community planners, elected officials, developers, conservation.
- **Goals**:

  Provide context and clarify: lake level change research, key resources for planning & decision-making

  Provide examples:
  - IJC, Lake Superior water regulation
  - Northern Pike management using IJC decision-making framework
- Approach should incorporate a range of best- and worse- case scenarios re. potential impacts on community/regional assets.

The Nature Conservancy
Protecting nature. Preserving life.™

Climate Change Adaptation = Preparedness



The Nature Conservancy
Protecting nature. Preserving life.™

Video

Great Lakes Water Level Changes: Addressing Risks and Impacts on Coastal Assets

(4 minutes)

https://www.youtube.com/watch?v=lvqUzgWXCkY

The Nature Conservancy
Protecting nature. Preserving life.™

www.glerl.noaa.gov/data/now/wlevels/levels.html

National Oceanic and Atmospheric Administration
Great Lakes Environmental Research Laboratory

GLERL

Research Data Products & Services Outreach About GLERL News & Events

Research Programs
By Subject
By Researcher
Publications

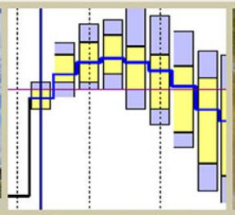
Overview | Monitoring Network | Observations | Forecasts

Great Lakes Water Levels

Great Lakes water levels are continuously monitored by U.S. and Canadian federal agencies in t
binational partnership. NOAA-GLERL relies on this water level data to conduct research on comp
regional water budget and to improve predictive models. Water level monitoring stations are oper
Center for Operational Oceanographic Products and Services (CO-OPS) and the Department of
Oceans' Canadian Hydrographic Service. The U.S. Army Corps of Engineers (Detroit, Chicago, B
Environment Canada play crucial roles in research, coordination of data and operational seasona
forecasts for the basin.

For more information on particular aspects of Great Lakes Water Levels, use the tabs above:

- **Monitoring Network:** learn how Great Lakes water levels are measured
- **Observations:** examine current and historical water level conditions
- **Forecasts:** seasonal and multi-decadal projections of Great Lakes water levels

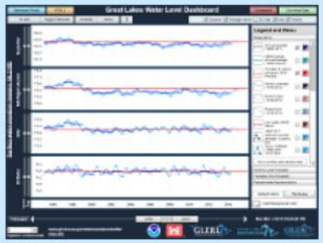




Featured Tools

Great Lakes Dashboard Project (GLDP)

A multi-agency gateway to long-term, basin-scale hydrological and climatological data for the Laurentian Great Lakes

Please ensure you read the GLERL's Disclaimer and Intellectual Property Notice before viewing the dashboards. Thank you!

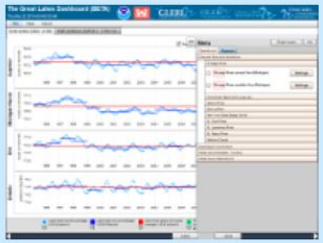


WATER LEVELS

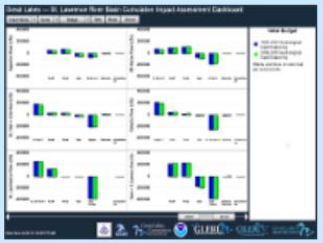
View current, historical, and projected water levels.

HYDRO-CLIMATE

View current, historical, projected water levels and data on drivers behind water level change.



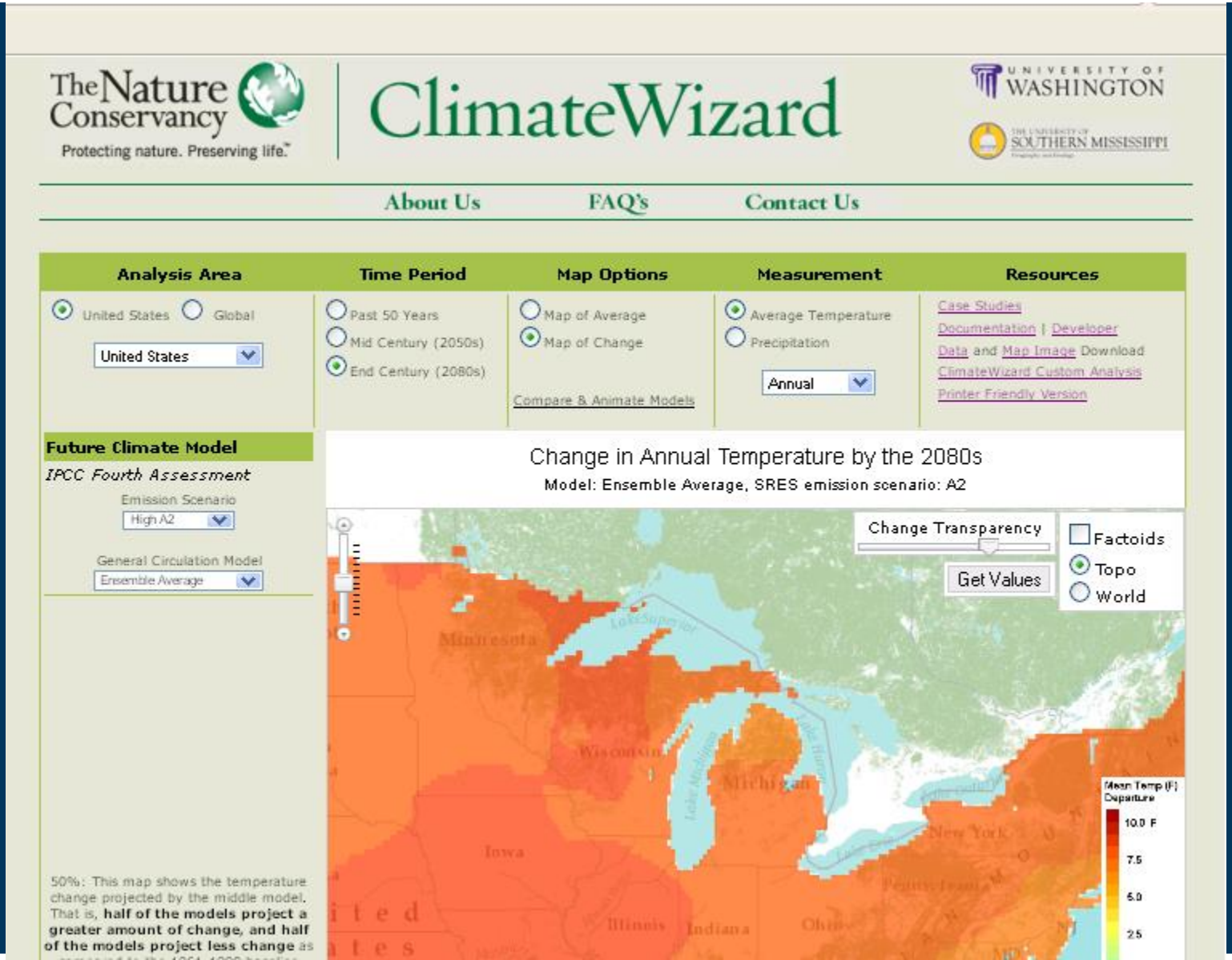
GREAT LAKES DASHBOARD



GREAT LAKES — ST. LAWRENCE

The Nature Conservancy
Protecting nature. Preserving life.™

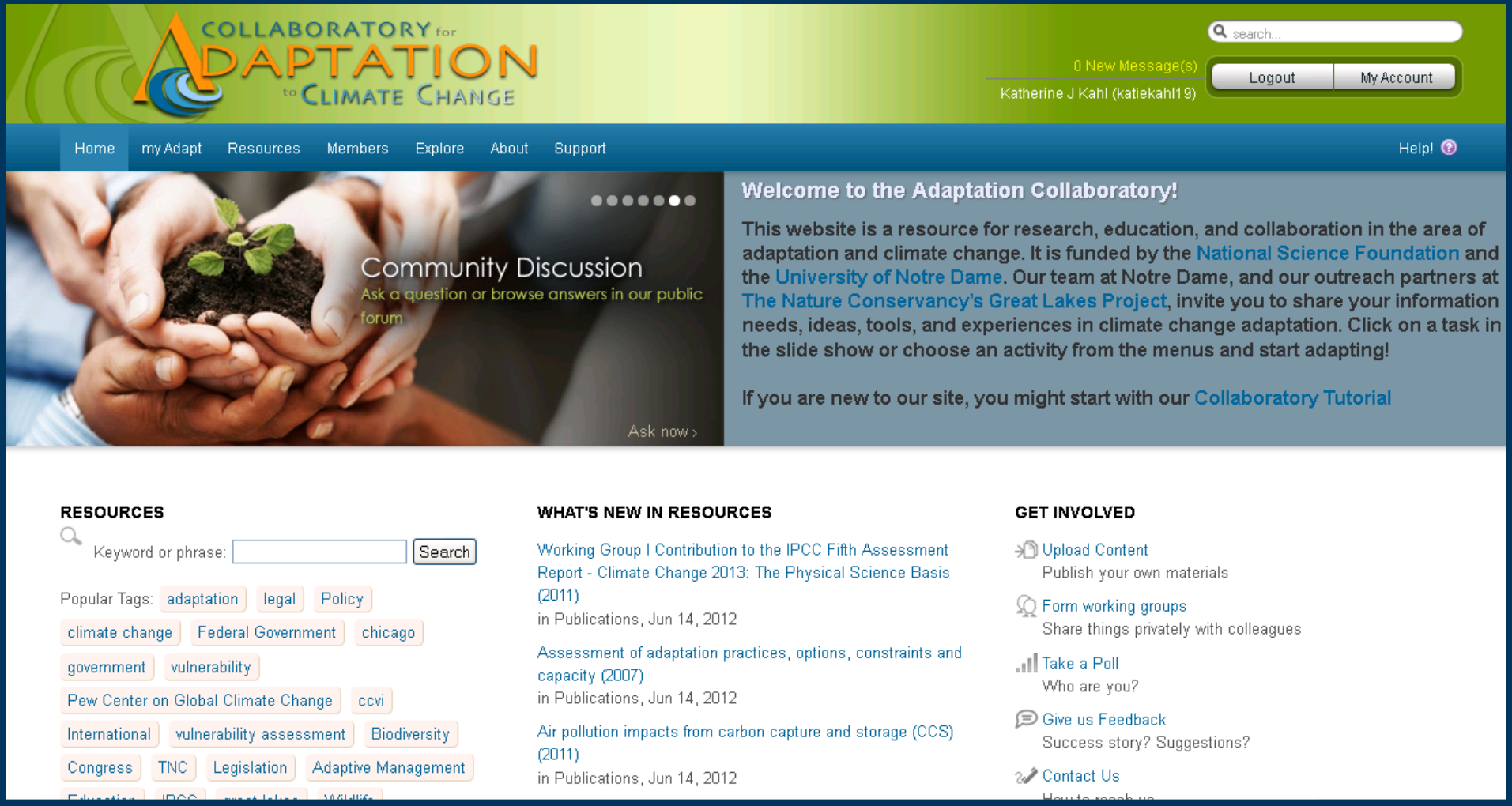
www.climatewizard.org



The Nature Conservancy
Protecting nature. Preserving life.™

adapt.nd.edu

University of Notre Dame

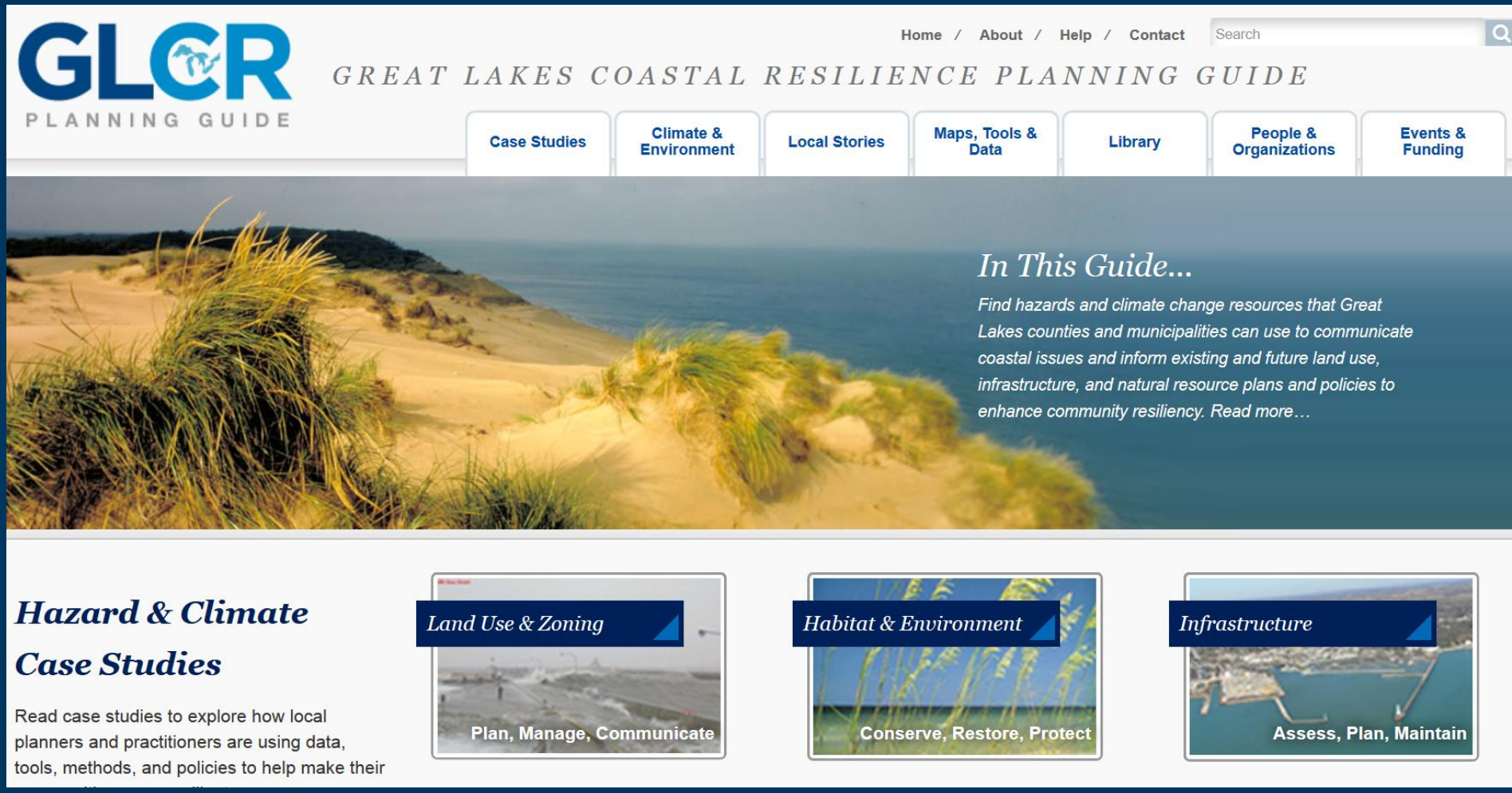


The Nature Conservancy
Protecting nature. Preserving life.™

Great Lakes and St. Lawrence Cities Initiative: Municipal Adaptation and Resiliency Service

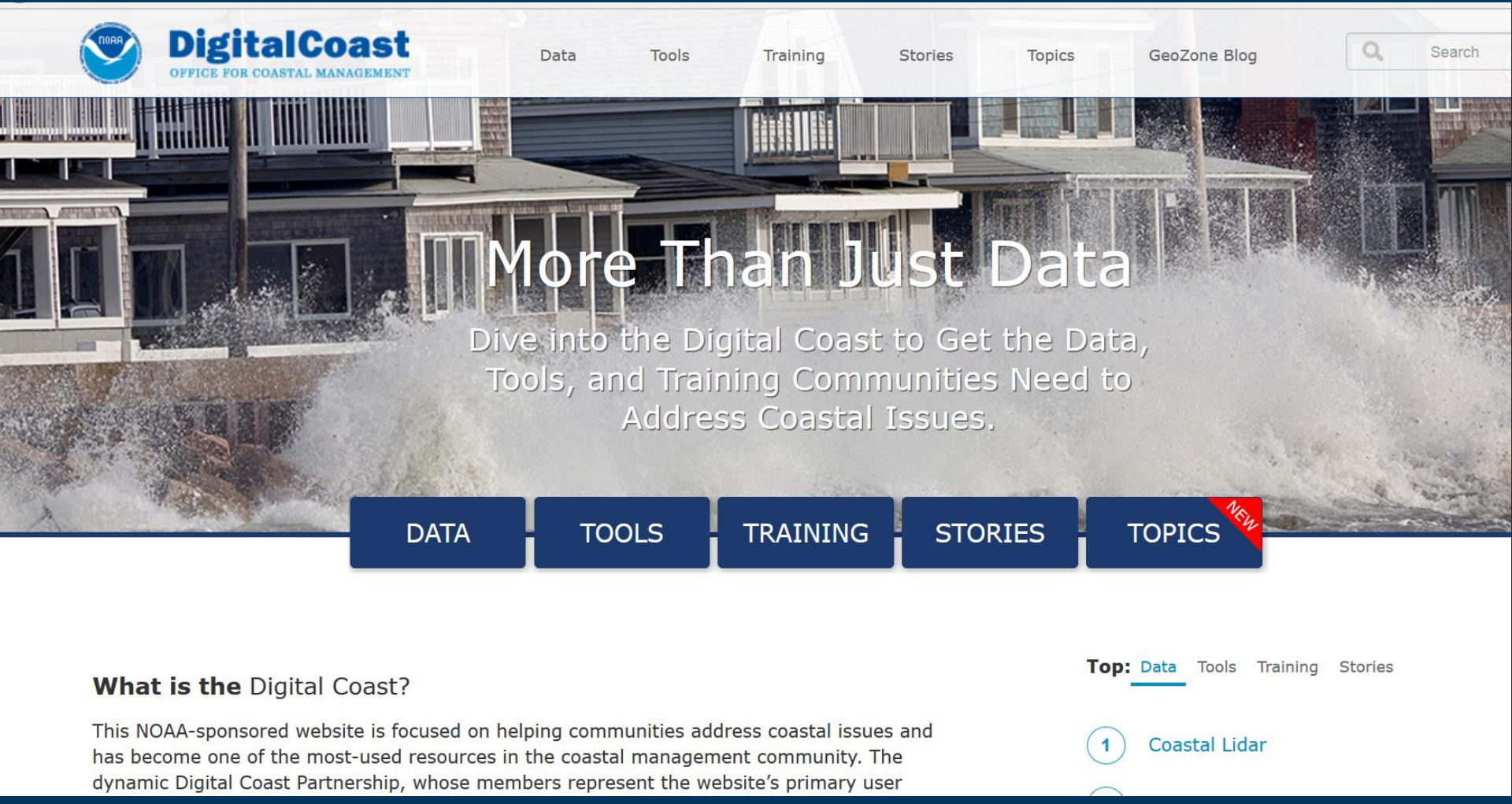
The Nature Conservancy
Protecting nature. Preserving life.™

http://greatlakesresilience.org



The Nature Conservancy
Protecting nature. Preserving life.™

http://coast.noaa.gov/digitalcoast/



The Nature Conservancy
Protecting nature. Preserving life.™

http://coast.noaa.gov/digitalcoast/tools/snapshots

DigitalCoast
OFFICE FOR COASTAL MANAGEMENT

Data Tools Training Stories Topics GeoZone Blog

Local officials can use the snapshots as a planning tool to assess their county's resilience to flooding and understand the benefits provided by natural resources. The handouts generated by the snapshots can be a helpful educational tool when working with governing bodies and citizen groups.

Features

- **Assesses** a county's exposure and resilience to flooding
- **Analyzes** a county's dependence on the ocean or Great Lakes for a healthy economy
- **Examines** the benefits a county receives from its wetlands
- **Compares** counties to each other or for regional analysis
- **Allows** users to download a PDF report for the snapshot of their choice

Current topics include:

- Flood exposure
- Wetland benefits
- Ocean and Great Lakes jobs

Tell us how your county uses the snapshots.

View a recorded webinar to learn more about the Coastal County Snapshots.

The Nature Conservancy
Protecting nature. Preserving life.™

Case Studies:
www.nature.org/greatlakesclimate

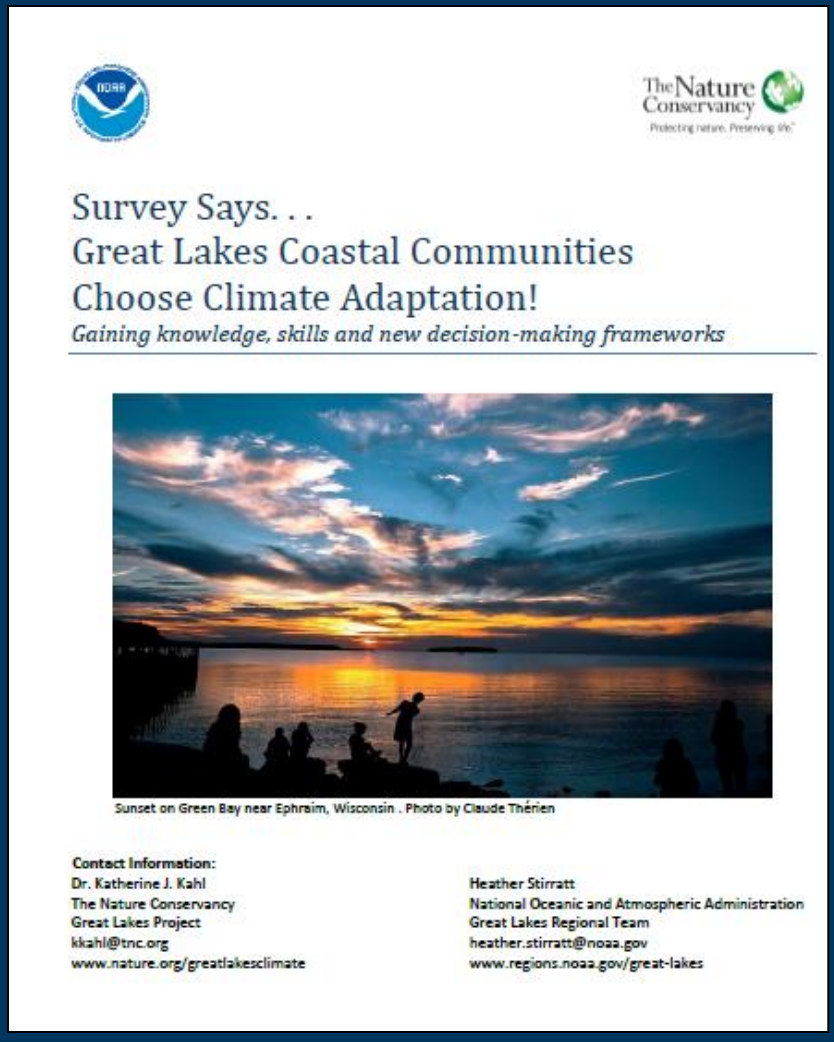
Audience: coastal communities

Goals:

- Describe community needs-driven climate engagement process
- Relay survey data on adaptation challenges and motivations

Take Home Messages:

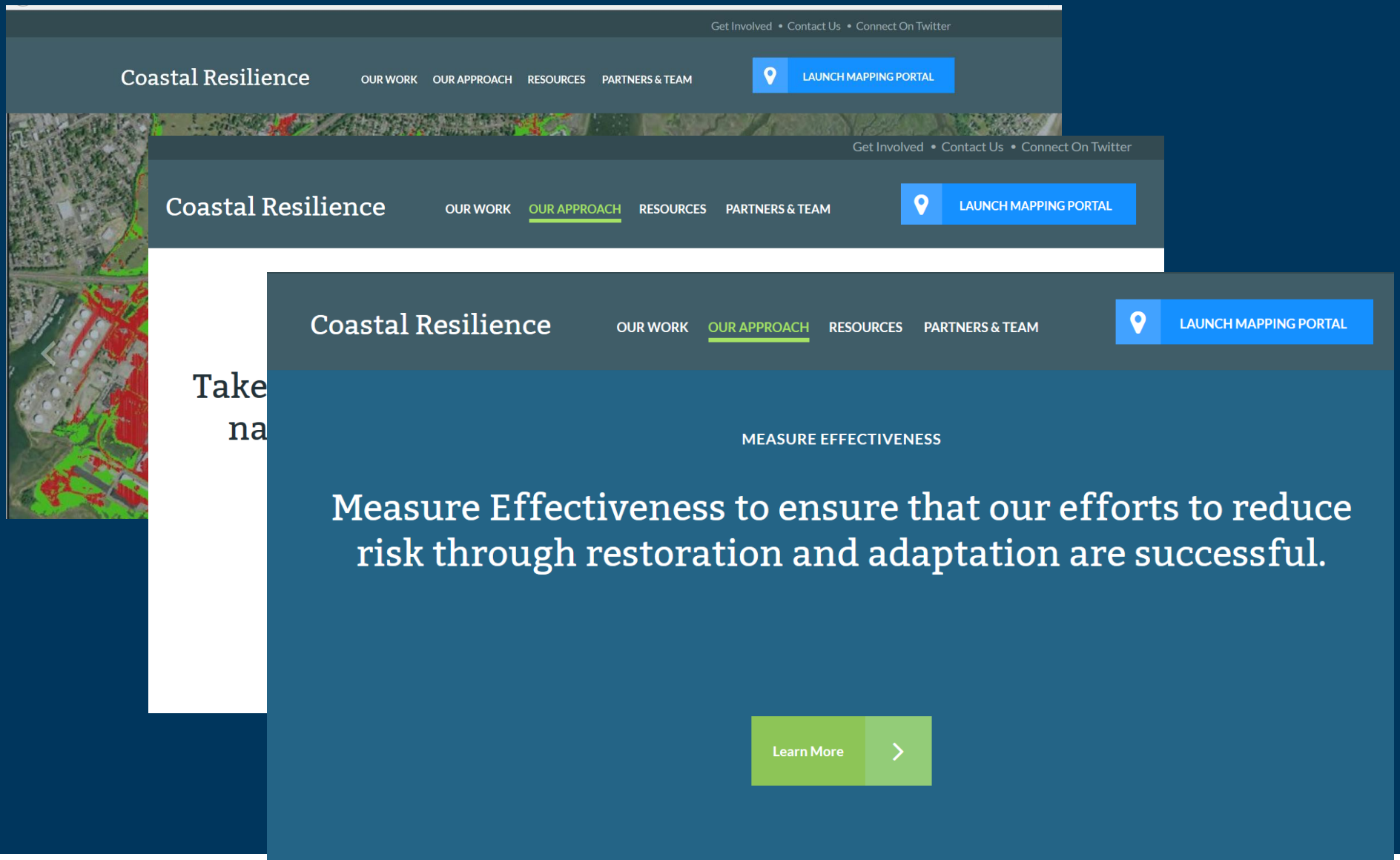
- Knowledge gain: workshops promoted awareness-building, started the learning process, created conditions for adaptation action
- Climate is one consideration, among many, that communities need to weigh as they plan for the future.



The Nature Conservancy
Protecting nature. Preserving life.™

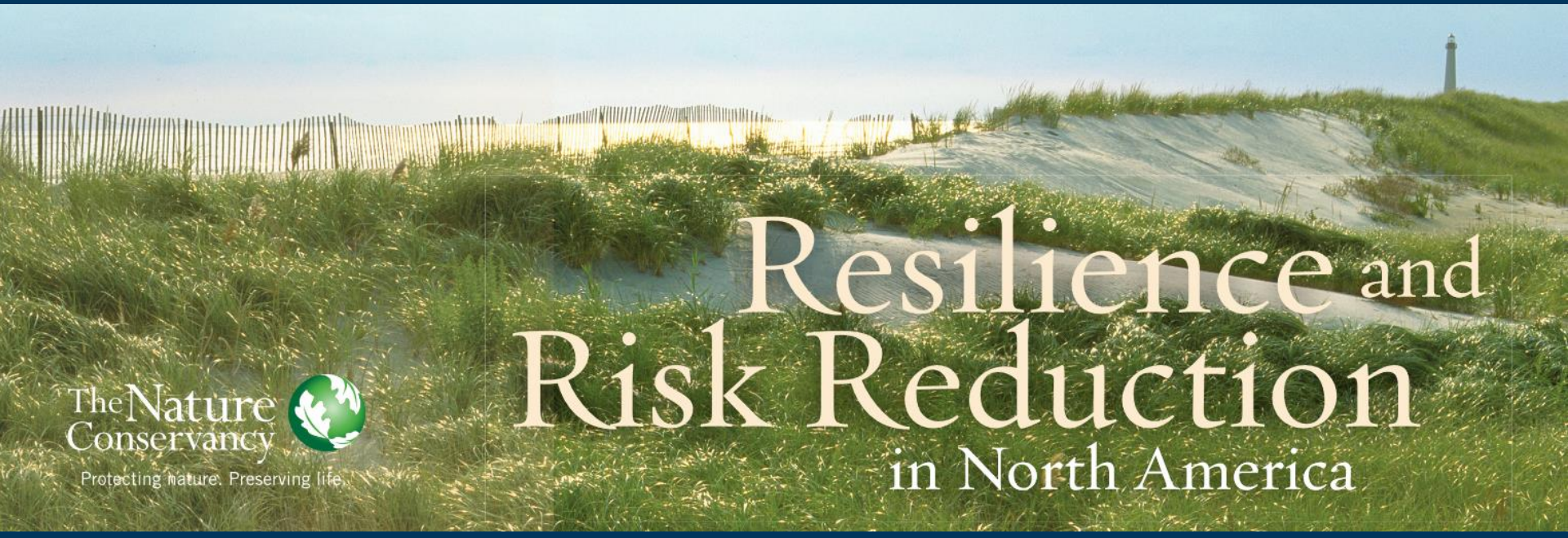
Coastal Resilience: community engagement

www.coastalresilience.org



The Nature Conservancy
Protecting nature. Preserving life.™

www.coastalresilience.org



The Nature Conservancy
Protecting nature. Preserving life.™

Coastal Resilience and Risk Reduction

www.coastalresilience.org

GOAL: demonstrate to the private sector, governments and the public that healthy habitats effectively reduce risk to people and property from storms and floods.
Specifically, the Conservancy is working to:

- Create public acceptance and appetite for natural infrastructure by showing results in real places
- Protect communities by advancing policies that make disaster preparation and response programs more effective and affordable
- Support private sector innovation by partnering with the insurance and engineering industries

The Nature Conservancy
Protecting nature. Preserving life.™

Example:
Coastal Resilience and Risk Reduction – A win-win for people and nature

By building 100 miles of oyster reefs, the 100-1000 coalition will create the conditions needed to plant, support and promote more than 1000 acres of coastal marsh and seagrass in Mobile Bay, AL to help restore the Gulf of Mexico:

- Providing habitat for oyster larvae to settle and colonize
- serving as nursery habitat for commercially and recreationally important finfish and shellfish (shrimp, blue crab, speckled trout, reddrum, southern flounder, ladyfish and gray snapper)
- Dampening of wave energy and decreasing erosion
- Stabilizing sediments and decreasing turbidity

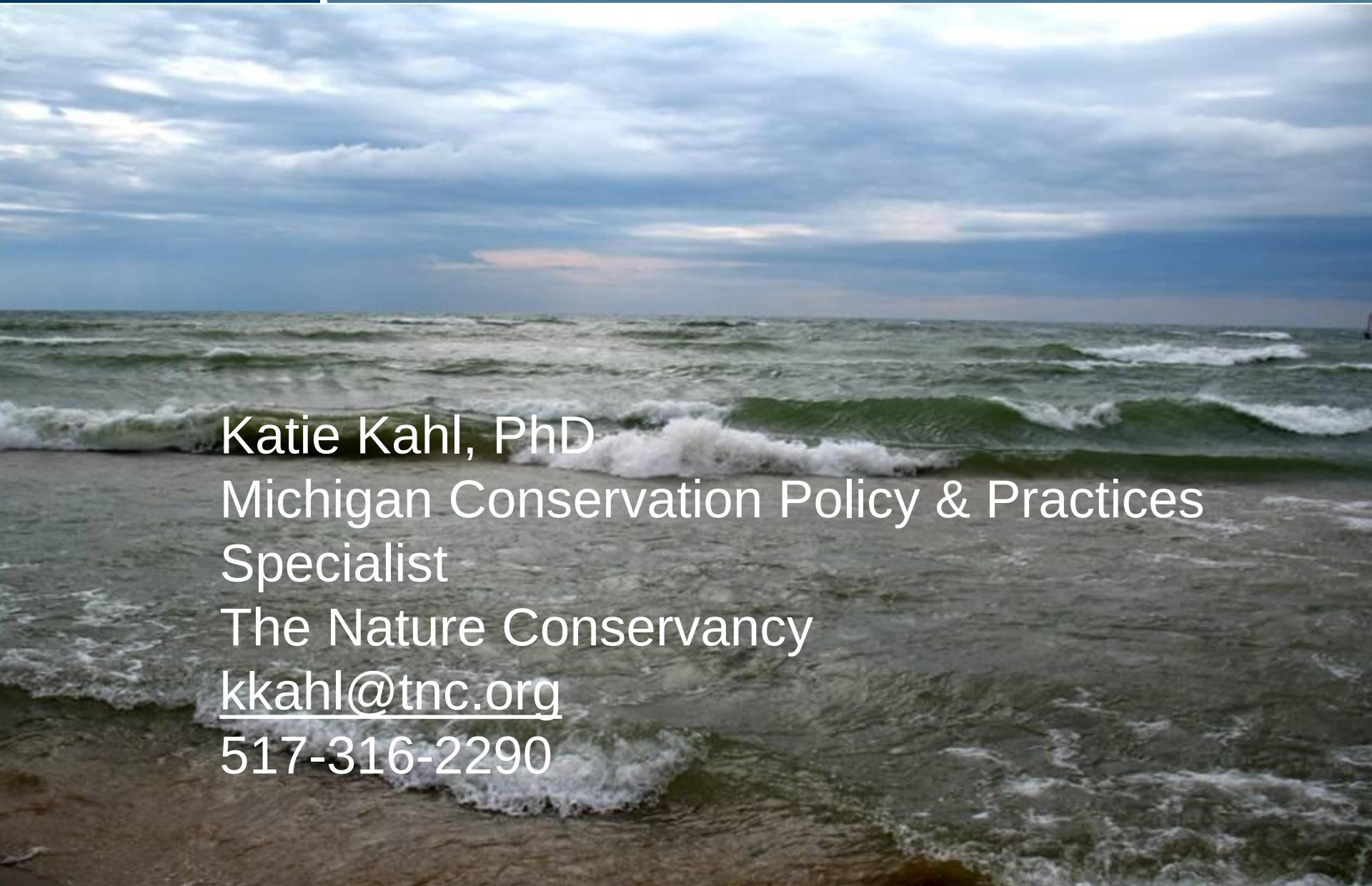
How can we apply this thinking in the Great Lakes?

The Nature Conservancy
Protecting nature. Preserving life.™

Science-based goal-setting framework benefitting people & nature

The Nature Conservancy
Protecting nature. Preserving life.™

Thank you!



Katie Kahl, PhD
Michigan Conservation Policy & Practices Specialist
The Nature Conservancy
kkahl@tnc.org
517-316-2290