



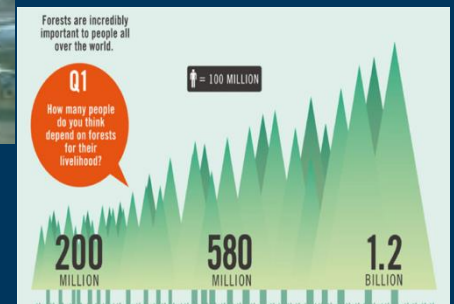
Coastal Climate Adaptation Planning: Case studies and tools for Great Lakes communities

Katie Kahl, PhD

March 11, 2015

The Nature Conservancy in the Great Lakes

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



Western Lake Erie Coastal Team



Dr. Doug Pearsall,
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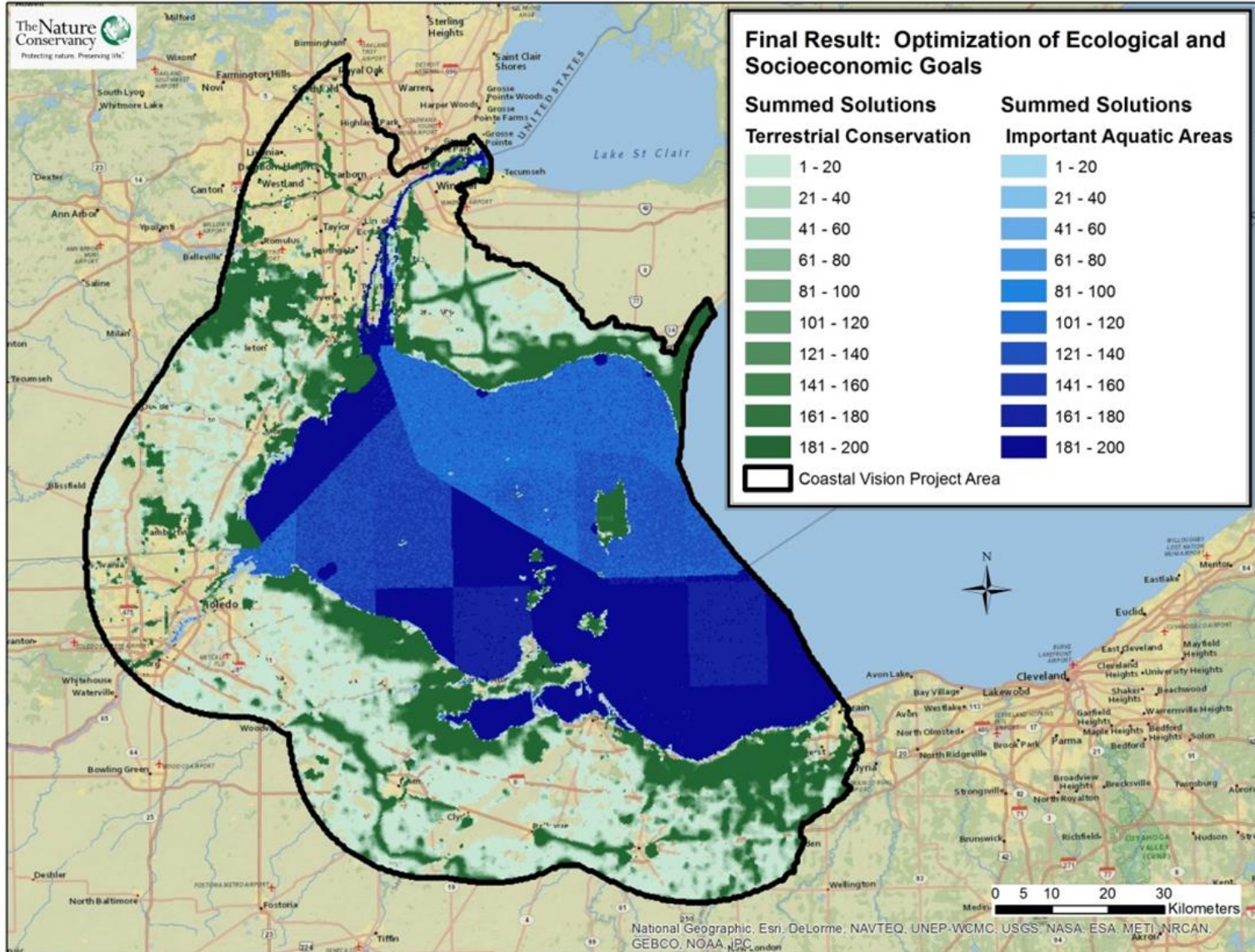


Bill Stanley,
Dir. Conservation



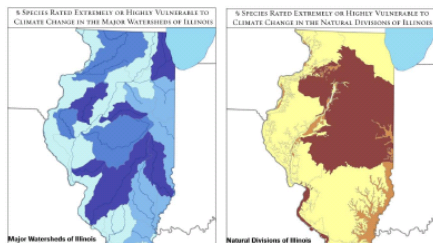
Western Lake Erie Coastal Conservation Visioning

<http://nature.ly/WLEcoastalvision>



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

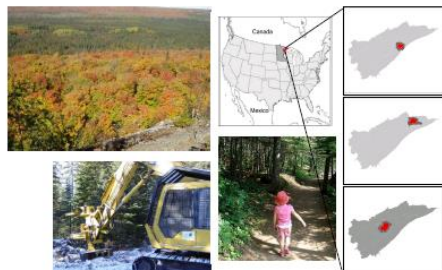
2012



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 Manitow 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.

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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.

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www.regions.noaa.gov/great-lakes



Minnesota-Dakota

ck J. Doran

Project

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

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Case Studies:

www.nature.org/greatlakesclimate



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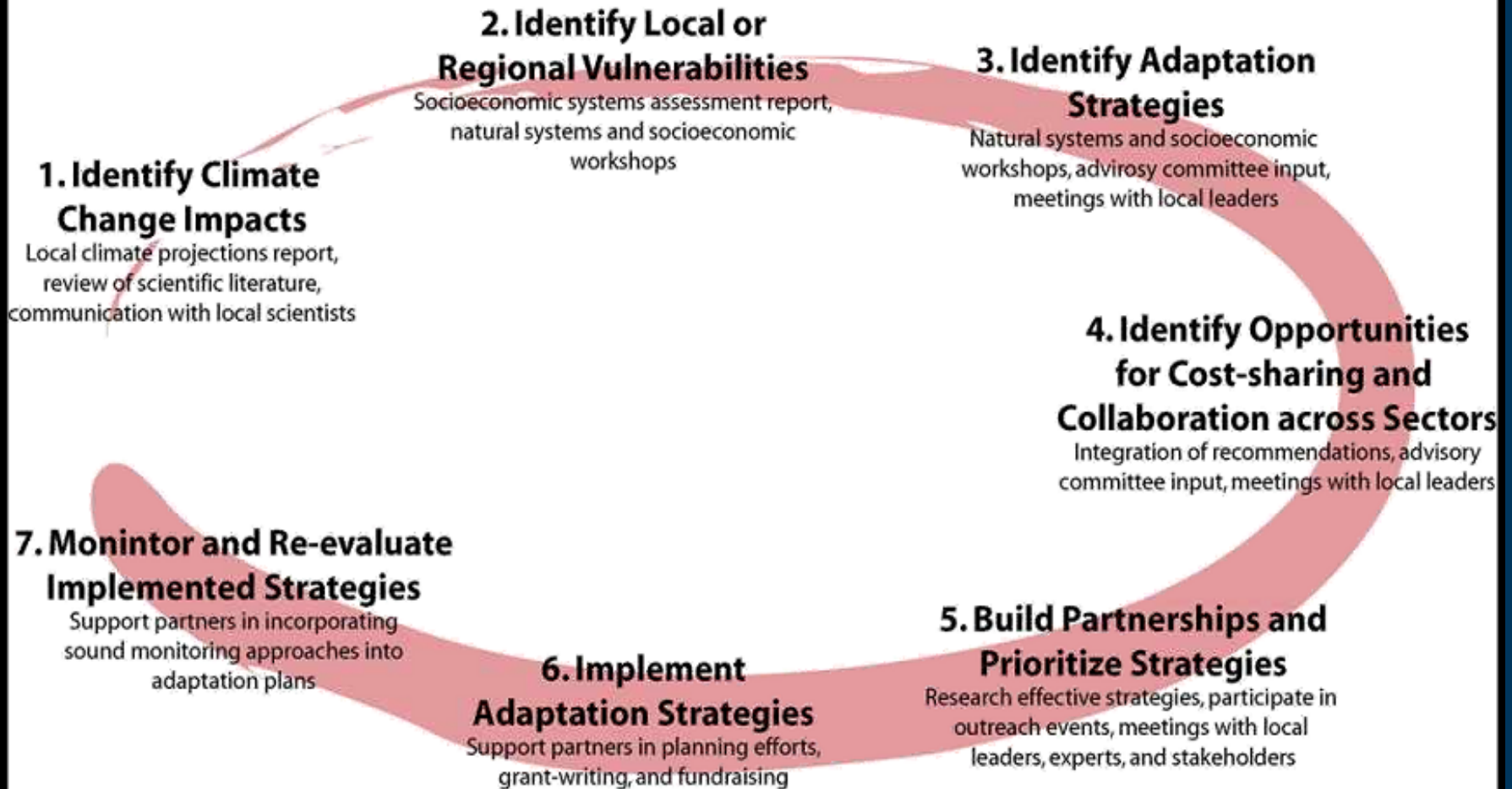
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- **Audience:** Great Lakes coastal community planners, elected officials, developers, conservation.
- **Goals:**
Provide context and clarify: lake level change research, key resources for planning & decision-making

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.

Climate Change Adaptation = Preparedness



Great Lakes Water Level Changes: Addressing Risks and Impacts on Coastal Assets (4 minutes)

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

Overview

Monitoring Network

Observations

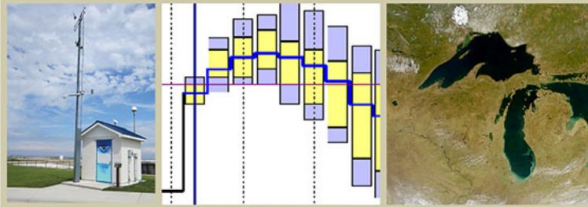
Forecasts

Great Lakes Water Levels

Great Lakes water levels are continuously monitored by U.S. and Canadian federal agencies in the binational partnership. NOAA-GLERL relies on this water level data to conduct research on the regional water budget and to improve predictive models. Water level monitoring stations are operated by the 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, and Environment Canada) play crucial roles in research, coordination of data and operational seasonal 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.

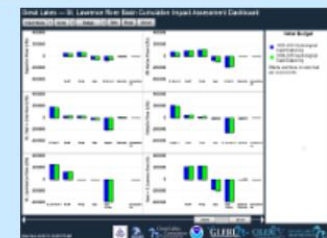


HYDRO-CLIMATE

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



GREAT LAKES DASHBOARD



GREAT LAKES — ST. LAWRENCE

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Analysis Area	Time Period	Map Options	Measurement	Resources
<input checked="" type="radio"/> United States <input type="radio"/> Global <div>United States</div>	<input type="radio"/> Past 50 Years <input type="radio"/> Mid Century (2050s) <input checked="" type="radio"/> End Century (2080s)	<input type="radio"/> Map of Average <input checked="" type="radio"/> Map of Change Compare & Animate Models	<input checked="" type="radio"/> Average Temperature <input type="radio"/> Precipitation <div>Annual</div>	Case Studies Documentation Developer Data and Map Image Download ClimateWizard Custom Analysis Printer Friendly Version

Future Climate Model

IPCC Fourth Assessment

Emission Scenario

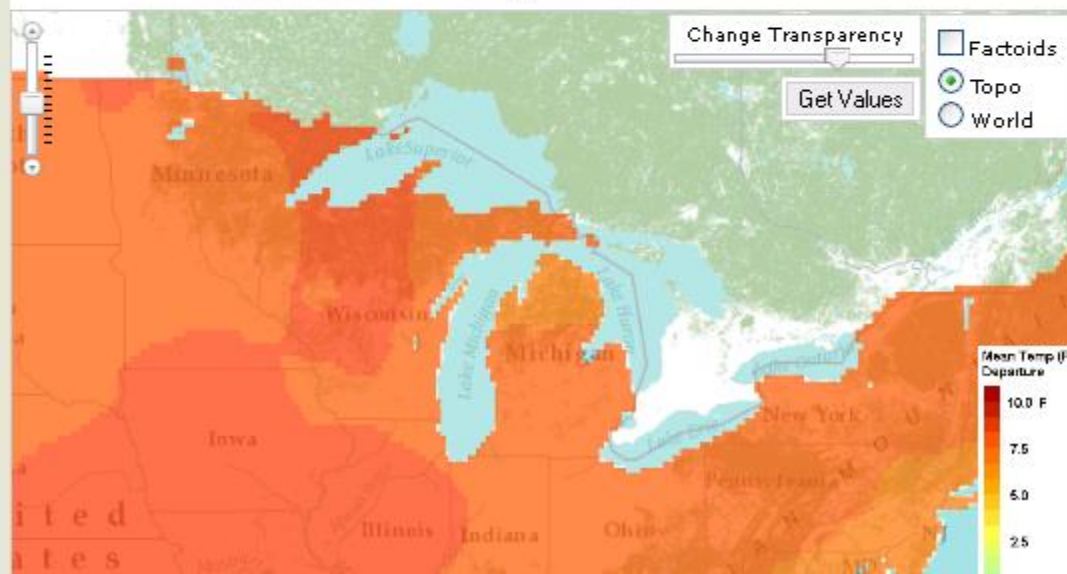
High A2

General Circulation Model

Ensemble Average

Change in Annual Temperature by the 2080s

Model: Ensemble Average, SRES emission scenario: A2





search...

0 New Message(s)

Katherine J Kahl (katiekahl19)

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Help! ?

Community Discussion

Ask a question or browse answers in our public forum

Ask now >

Welcome to the Adaptation Collaboratory!

This website is a resource for research, education, and collaboration in the area of adaptation and climate change. It is funded by the [National Science Foundation](#) and the [University of Notre Dame](#). Our team at Notre Dame, and our outreach partners at [The Nature Conservancy's Great Lakes Project](#), invite you to share your information needs, ideas, tools, and experiences in climate change adaptation. Click on a task in the slide show or choose an activity from the menus and start adapting!

If you are new to our site, you might start with our [Collaboratory Tutorial](#)

RESOURCES



Keyword or phrase:

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[Congress](#) [TNC](#) [Legislation](#) [Adaptive Management](#)

[Education](#) [IPCC](#) [great lakes](#) [Wildlife](#)

WHAT'S NEW IN RESOURCES

[Working Group I Contribution to the IPCC Fifth Assessment Report - Climate Change 2013: The Physical Science Basis \(2011\)](#)

in Publications, Jun 14, 2012

[Assessment of adaptation practices, options, constraints and capacity \(2007\)](#)

in Publications, Jun 14, 2012

[Air pollution impacts from carbon capture and storage \(CCS\) \(2011\)](#)

in Publications, Jun 14, 2012

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How to reach us

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



Great Lakes & St. Lawrence Cities Initiative
Alliance des villes des Grands Lacs et du Saint-Laurent

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Marcus Obal

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INITIATIVES

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THE VOICE OF MAYORS

REPRESENTING CITIES

RESOLUTIONS & STATEMENTS

ANNUAL MEETINGS

PUBLICATIONS

MUNICIPAL ADAPTATION AND RESILIENCY SERVICE

Quick Hits

[To register to the Community of Practice Portal, click here.](#)

[To download the Call to action form, click here.](#)

[To see other municipalities' Call to Action, click here.](#)



In This Guide...

Find hazards and climate change resources that Great Lakes counties and municipalities can use to communicate coastal issues and inform existing and future land use, infrastructure, and natural resource plans and policies to enhance community resiliency. Read more...

Hazard & Climate Case Studies

Read case studies to explore how local planners and practitioners are using data, tools, methods, and policies to help make their

Land Use & Zoning

Plan, Manage, Communicate

Habitat & Environment

Conserve, Restore, Protect

Infrastructure

Assess, Plan, Maintain



More Than Just Data

Dive into the Digital Coast to Get the Data,
Tools, and Training Communities Need to
Address Coastal Issues.

[DATA](#)[TOOLS](#)[TRAINING](#)[STORIES](#)[TOPICS](#)**NEW**

What is the Digital Coast?

This NOAA-sponsored website is focused on helping communities address coastal issues and has become one of the most-used resources in the coastal management community. The dynamic Digital Coast Partnership, whose members represent the website's primary user

Top: [Data](#) [Tools](#) [Training](#) [Stories](#)

1 [Coastal Lidar](#)



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.



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.



Survey Says. . .

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Coastal Resilience: community engagement

www.coastalresilience.org



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Coastal Resilience

OUR WORK OUR APPROACH RESOURCES PARTNERS & TEAM

LAUNCH MAPPING PORTAL

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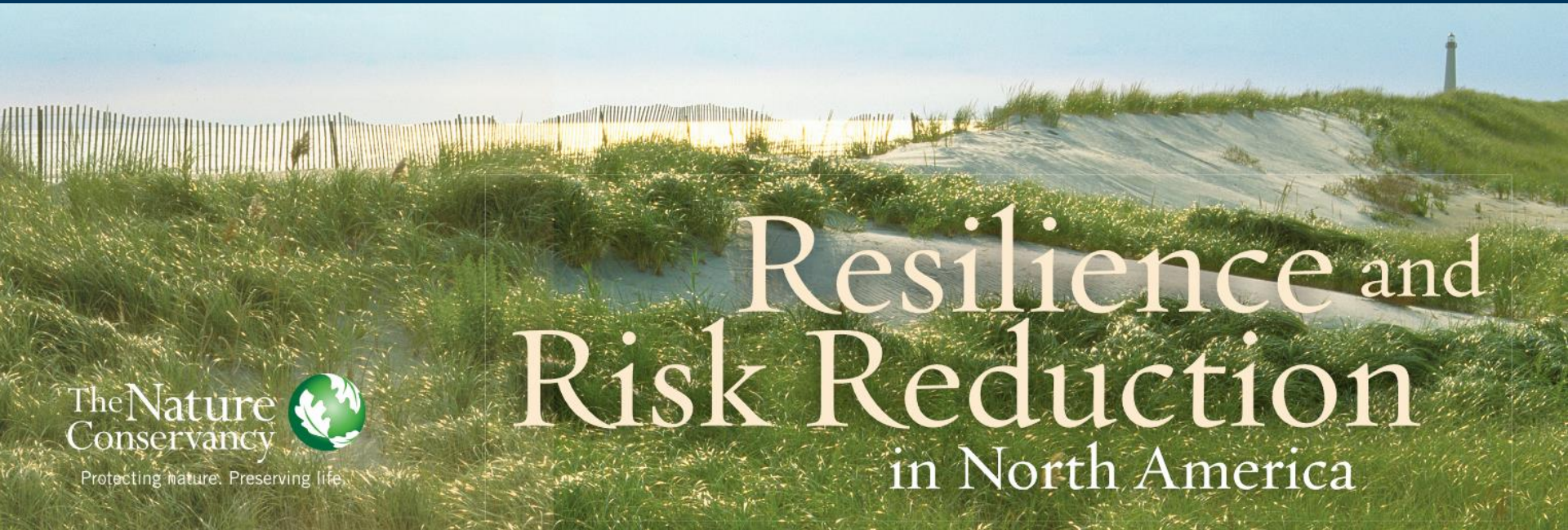
LAUNCH MAPPING PORTAL

Take
na

MEASURE EFFECTIVENESS

Measure Effectiveness to ensure that our efforts to reduce risk through restoration and adaptation are successful.

Learn More >



Resilience and Risk Reduction in North America

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

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:

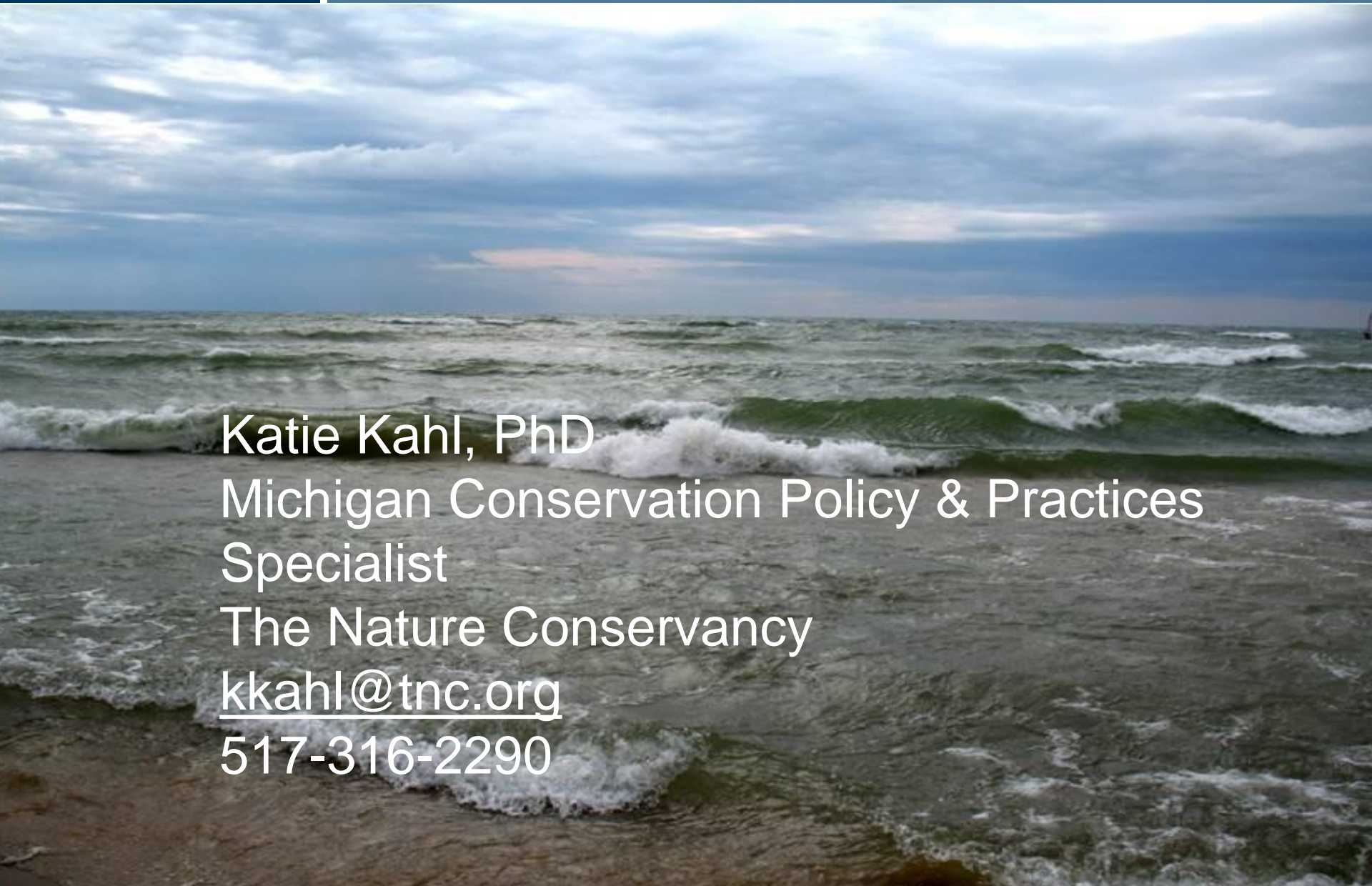
- Providing habitat for oyster larvae to settle and colonize
- serving as nursery habitat for commercially and recreationally important finfish and shellfish (shrimp, blue crab, speckled trout, reddrum, southern flounder, ladyfish and gray snapper)
- Dampening of wave energy and decreasing erosion
-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

How can we apply this thinking in the Great Lakes?

Science-based goal-setting framework benefitting people & nature



Thank you!



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