



## BY THE NUMBERS

FIGURES FROM FEBRUARY 2023–JANUARY 2024

**\$8,733,463**

Economic benefits derived from Michigan Sea Grant activities.

**399**

K-12 educators who participated in MISG education programs.

**88**

Resource managers who used ecosystem-based approaches to protect coastal areas as a result of MISG activities.

**8,921**

K-12 students reached through MISG-trained educators or MISG education programs.

**15,892**

People engaged in MISG informal education programs.

**80**

Number of fishermen and seafood processing and aquaculture personnel who changed their practices based on sustainability and safety knowledge from MISG.

**28**

Michigan marinas certified or recertified in the Michigan Clean Marina Program.

**228**

Acres of coastal habitat protected, enhanced, or restored as a result of Michigan Sea Grant activities.

**122**

Local, regional, and state partners MISG collaborated with to protect the Great Lakes.

[michiganseagrant.org](http://michiganseagrant.org)



# What is Michigan Sea Grant?



Michigan Sea Grant uses research, outreach, and education to protect the Great Lakes and ensure sustainable use of these critical resources. We fund research projects, graduate fellowships, and undergraduate internships that investigate pressing challenges affecting coastal ecosystems and communities.

We bring together regulators, scientists, policymakers, and community members to develop science-based solutions to environmental issues. We also help K-12 students and their educators connect with the Great Lakes through classroom activities, workshops, lectures, camps, and field trips.

Michigan Sea Grant is a cooperative program of the University of Michigan, Michigan State University, and the National Oceanic and Atmospheric Administration (NOAA). With offices in Lansing, Ann Arbor, and coastal communities around the state, we work with a network of partners at federal, state, local, and individual levels to achieve our goals.

## MAKING A DIFFERENCE

Here are a few ways MISG is making a difference in the Great Lakes



### MICHIGAN FRESH FISH

Produced the Mi Fresh Fish Project to educate consumers about the value and availability of fish harvested, farmed, and processed in Michigan and connected aquaculture farmers and commercial fish producers/processors directly to consumers.



### CENTER FOR GREAT LAKES LITERACY

Created interactive online courses that teach educators about specific Great Lakes topics and make it easy for them to share information and knowledge with their students on everything from aquatic species to marine debris.



### INTERNS AND FELLOWS

Coordinated and funded undergraduate and graduate students working on environmental research projects, preparing the next generation of scientists, resource managers, and others who want to protect the Great Lakes.



### NONINDIGENOUS SPECIES

Continued to grow the Great Lakes Aquatic Nonindigenous Species Information System (GLANSIS), which provides information about aquatic invasive species to managers and the public.



### MICHIGAN CLEAN MARINAS

Helped administer a state grant program that allows public and private marinas to reduce pollution from boats by providing funds for new or upgraded pumpout stations and waste reception facilities.



### REGIONAL FISHERY WORKSHOPS

Hosted annual fishery workshops to provide recreational anglers and commercial fisheries with regionally tailored information and community science opportunities.

# 2024-2027 Research Projects

## ASSESSING BLUE GENTRIFICATION IN MICHIGAN'S COASTAL COMMUNITIES

Blue gentrification poses a significant challenge for coastal communities in Michigan and the Great Lakes region. This emerging issue involves the displacement of long-term residents near water bodies due to physical and cultural changes. This project aims to assess the extent of blue gentrification from 2006 to 2020, identify its driving forces, and develop policy and strategies to address the issue. By combining geospatial analysis, surveys, and interviews, the project team will evaluate the effects of waterfront revitalization projects and vacation rentals on gentrification. Outputs from this work will include an interactive tool, webinars, a policy brief, and local activities. A team of researchers, NGO experts, and educators will seek to promote sustainable blue economies along Michigan's coastline, addressing residential displacement.

Lead Principal Investigator: *Joshua P. Newell, University of Michigan*

## AN ECOSYSTEM-SCALE APPROACH TO UNDERSTANDING CHANGING WINTERS IN THE GREAT LAKES

The Laurentian Great Lakes are the world's largest reservoir of freshwater; unfortunately, this valuable resource is being affected by multiple interacting stressors, many of which are related to climate change. Winter limnology represents a major gap in our understanding of the lakes' responses to a changing climate, hampering our ability to manage these systems for resiliency. This research will use a networked science approach to conduct synchronous, standardized sampling across the Great Lakes and Lake St. Clair to assess chemical, physical, and biological limnological aspects of these systems during winter. Using a networked approach will allow the team to achieve broad spatial coverage to put winter conditions and ecology in context and facilitate predictions of future ecosystem responses to climate change.

Lead Principal Investigator: *Trista J. Vick-Majors, Michigan Technological University*

## A NOVEL ASSESSMENT OF LAKE TROUT GROWTH SENSITIVITY TO WINTER AND SPRING CLIMATE AND POSSIBLE INTERACTIONS WITH DECLINING PREY ABUNDANCE IN LAKE SUPERIOR

Rapid warming and ice cover loss have modified the growth of lake trout in Lake Superior. This research will use a new approach that looks at year-to-year variation in the growth of fish ear bones. Scientists can use the width of these bones to measure the growth of a fish in a given year and compare it with climatic variation in that same year to determine, over decades, how climate variables regulate growth. Because lake trout are a long-lived species, growth climate sensitivity can be assessed over decades; researchers will look at data from 1980 to 2022. Results from this research will improve understanding of lake trout population dynamics and provide valuable information to fisheries managers, helping to boost the economy and culture of coastal towns and communities they support.

Lead Principal Investigator: *Steven Voelker, Michigan Technological University*

## MICHIGAN THE BEAUTIFUL: GREAT LAKES

Using input from a multi-sector advisory group and robust Tribal engagement, researchers will assess how Michigan's coastal and Great Lakes waters can contribute to the United Nations "30x30 goal" of ensuring 30% percent of Earth's land, coast, and open waters are under effective conservation and management by 2030. The project team will analyze the current status of Michigan's coastal and open Great Lakes waters to determine what areas are and are not protected; identify and evaluate management and policy options to reach the 30x30 goal; and develop tools and information to guide implementation of identified management and policy options.

Lead Principal Investigator: *Jennifer Read, University of Michigan Water Center*

## DETERMINING GREAT LAKES INVASIVE CARP SPECIES SUSCEPTIBILITY TO EMERGING VIRAL INFECTIONS

Introduced aquatic species, particularly invasive carp, threaten Great Lakes ecosystems and regional economies. These carp, including Silver, Bighead, Grass, and Black Carp, have already infiltrated water bodies near the Great Lakes, primarily through connections between the Mississippi River basin and Lake Michigan. Their establishment poses a severe challenge because they are difficult to control and eradicate and can cause ecosystem damage. This research will explore the susceptibility of invasive carp species to new and emerging fish viruses circulating in the Great Lakes. These findings will inform management approaches to maintain healthy Great Lakes ecosystems and may contribute to international efforts against aquatic invasive species.

Graduate Student Fellow: *Santosh Lamichhane, Michigan State University*

## COMMUNITY DYNAMICS OF CYANOBACTERIA IN LAKE ERIE: TESTING ENVIRONMENTAL DRIVERS OF BLOOM SUCCESSION

This project will investigate how environmental factors influence the shifting array of algae species in Lake Erie's harmful algal blooms. In particular, cyanobacterial harmful algal blooms (cHABs) pose significant threats to water quality, ecosystems, human health, and coastal communities, in Lake Erie. It's important to understand how environmental drivers such as water column stratification, nutrient concentrations, and temperature affect which species develop. This study aims to refine forecasting models and aid in the mitigation of cHABs, contributing to broader efforts by federal agencies to manage cHABs in the Great Lakes and assess the impact of environmental policies.

Graduate Student Fellow: *Carol Waldmann Rosenbaum, Michigan State University*

# MICHIGAN SEA GRANT OFFICE LOCATIONS

## EXTENSION EDUCATORS

- **Tyler Augst**  
Educator, Government & Community Vitality, Paw Paw  
(269) 657-8213  
augsttyl@msu.edu
- **Mark Brederland**  
Northwest District, Traverse City  
(231) 922-4628  
brederl@msu.edu
- **Erica Clites**  
Southeast District, Detroit  
(313) 494-4678  
clitesel@msu.edu
- **Meaghan Gass**  
Saginaw Bay District, Bay City  
(989) 895-4026  
Standish (989) 846-4111  
gassmeag@msu.edu
- **Lauren Jescovitch**  
Upper Peninsula, Houghton and Hancock  
(906) 482-5830  
jescovit@msu.edu
- **Elliot Nelson**  
Eastern Upper Peninsula, Sault Ste. Marie  
(906) 322-0353  
elliottne@msu.edu
- **Dan O'Keefe**  
Southwest District, West Olive  
(616) 994-4572  
okeefed@msu.edu
- **Angela Scapini**  
Southeast District, Clinton Twp.  
(313) 912-6128  
scapinia@msu.edu

■ **Brandon Schroeder**  
Northeast District, Alpena  
(989) 354-9885  
schroe45@msu.edu

## EAST LANSING OFFICE

**Michigan State University Extension**  
(517) 353-9748

**Heather Triezenberg**  
Associate Director and Program Leader  
vanden64@msu.edu

**Katelyn Brolick**  
Research Administrator  
brolickk@msu.edu

**Cindy Hudson**  
Extension Program Communications Manager  
hudsoncy@msu.edu

## ANN ARBOR OFFICE

**University of Michigan**  
(734) 647-9730

**Silvia Newell**  
Director  
senewell@umich.edu

**Geneva Langeland**  
Communications Editor  
genlang@umich.edu

**Todd Marsee**  
Multimedia Designer  
marsee@umich.edu

**Hali Motley**  
Administrative Project Coordinator  
hmotley@umich.edu

**Lauren Mullenbach**  
Research Program Manager  
lemullen@umich.edu

**Mike Shriberg**  
Director of Engagement  
mshriber@umich.edu

**Elizabeth Striano**  
Communications Lead  
estriano@umich.edu

**Brandon Uckele**  
Program Manager, Fiscal Officer  
buckele@umich.edu

## ANN ARBOR NOAA

**Great Lakes Environmental Research Laboratory & Great Lakes Aquatic Nonindigenous Species Information System (GLANSIS)**  
(734) 741-2235

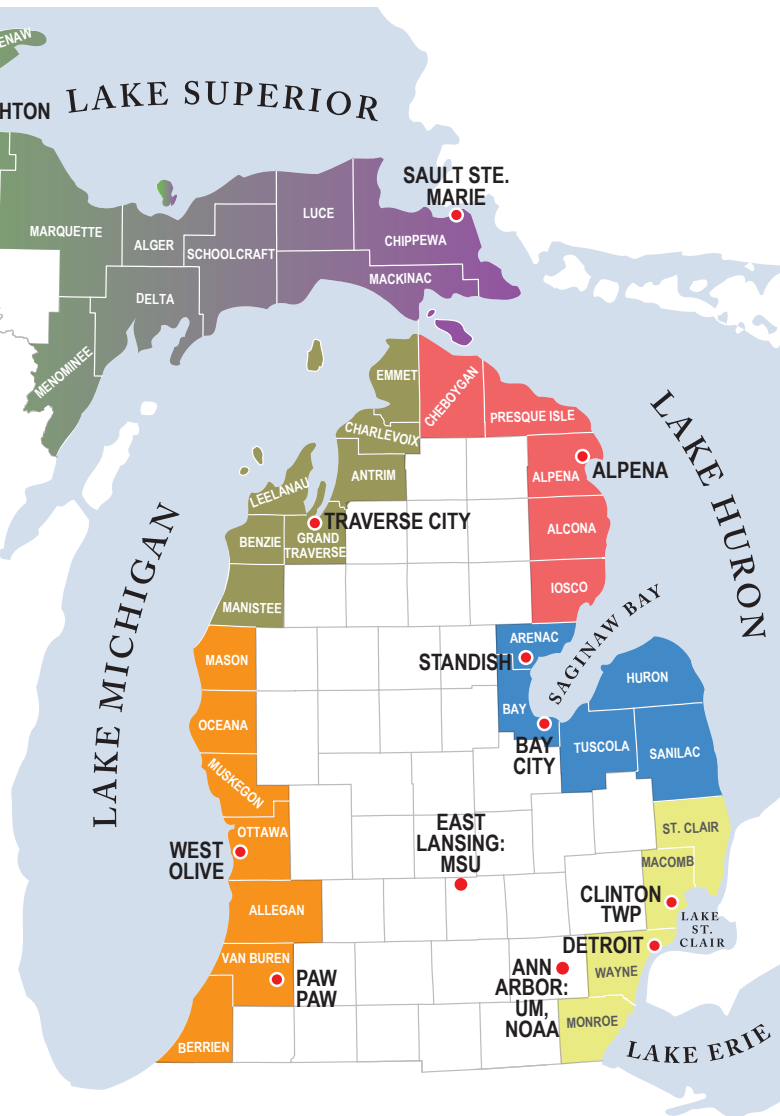
**Kat Cameron**  
Great Lakes Sea Grant - NOAA GLERL Liaison  
kat.cameron@noaa.gov

**El Lower**  
GLANSIS Research Associate  
elower@umich.edu

**Rebecca Nielsen**  
GLANSIS Education Specialist  
nielsenb@umich.edu

**Connor Shelly**  
GLANSIS GIS Specialist  
connor.shelly@noaa.gov

**Rochelle Sturtevant**  
GLANSIS Program Manager  
Rochelle.Sturtevant@noaa.gov



Michigan Sea Grant is a collaborative effort of the University of Michigan and Michigan State University and part of the NOAA-National Sea Grant network of 34 university-based programs.

Michigan Sea Grant helps to foster economic growth and protect Michigan's coastal, Great Lakes resources through education, research, and outreach.

[miseagrant@umich.edu](mailto:miseagrant@umich.edu) | [michiganseagrant.org](http://michiganseagrant.org)



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