# Lakebed 2030

# A Comprehensive Approach to Mapping the Great Lakes

Hans W. Van Sumeren
Northwestern Michigan College

2021 Freshwater Summit

The ocean covers
~71+ % of our planet

*~20% has been mapped at High Resolution*

*Less has been explored*

*The Great Lakes only …*

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# Current Modern Methods Coverage

<15%

For the entire Great Lakes

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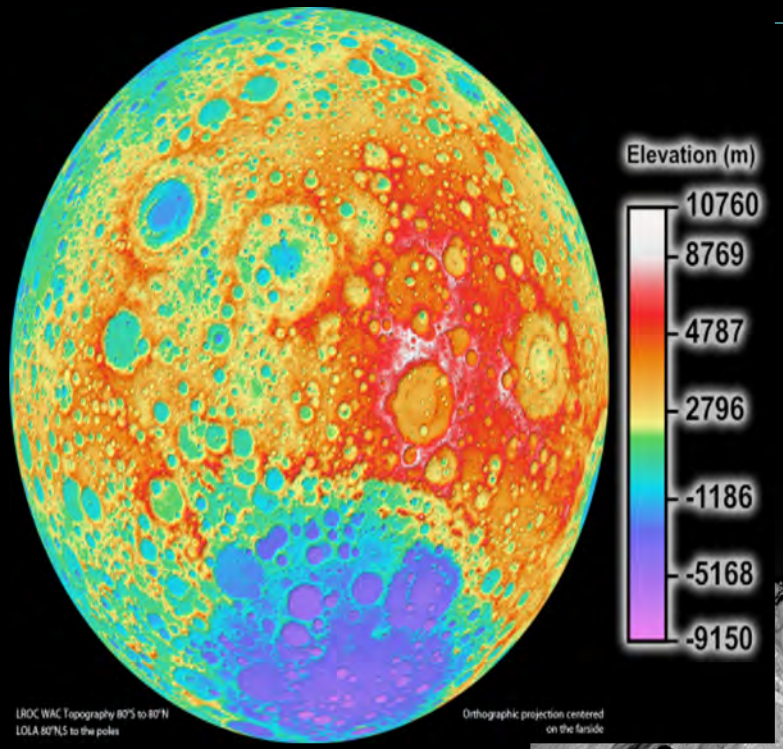
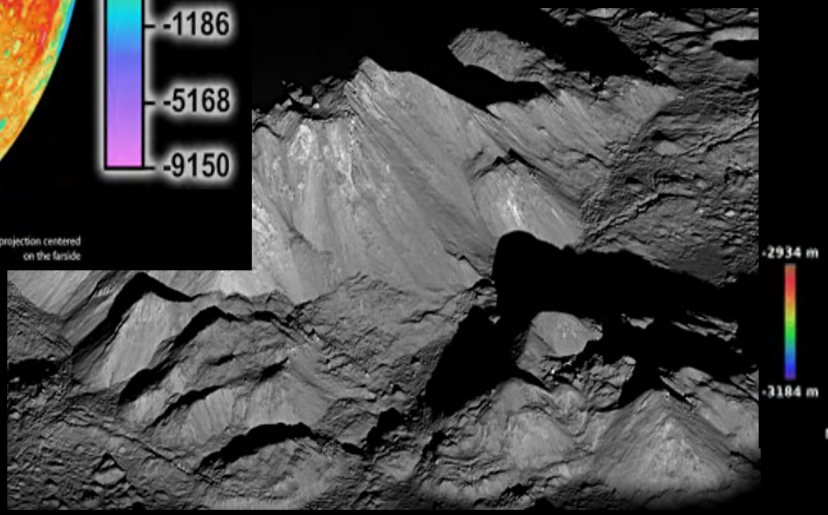
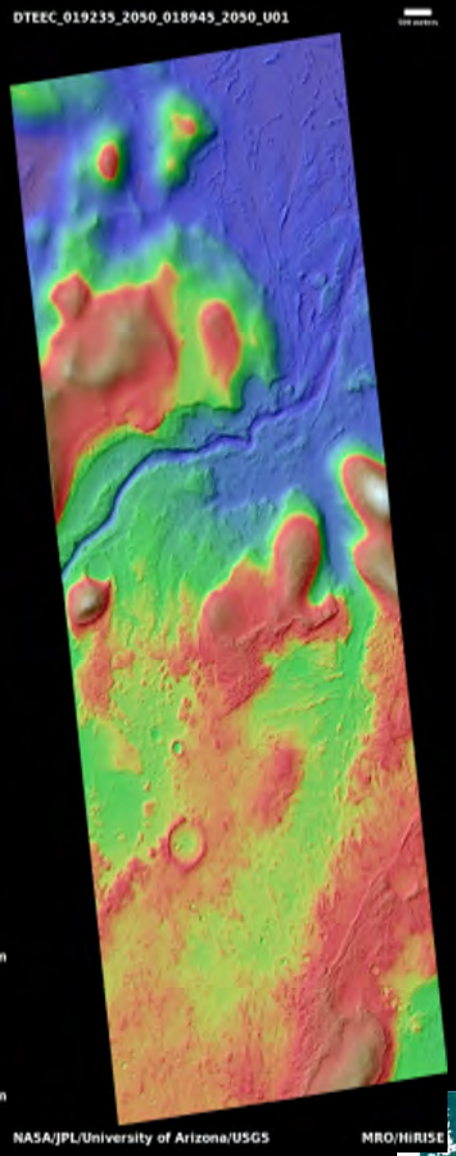
The truth is we know more about the surface of the Moon, Mars and Venus than we do our oceans




Mars – 6 meter
Moon – 100 meter
Venus – 100 meter
World's Oceans – 5 km
Chicago would be 2-3 data points in Lake Michigan

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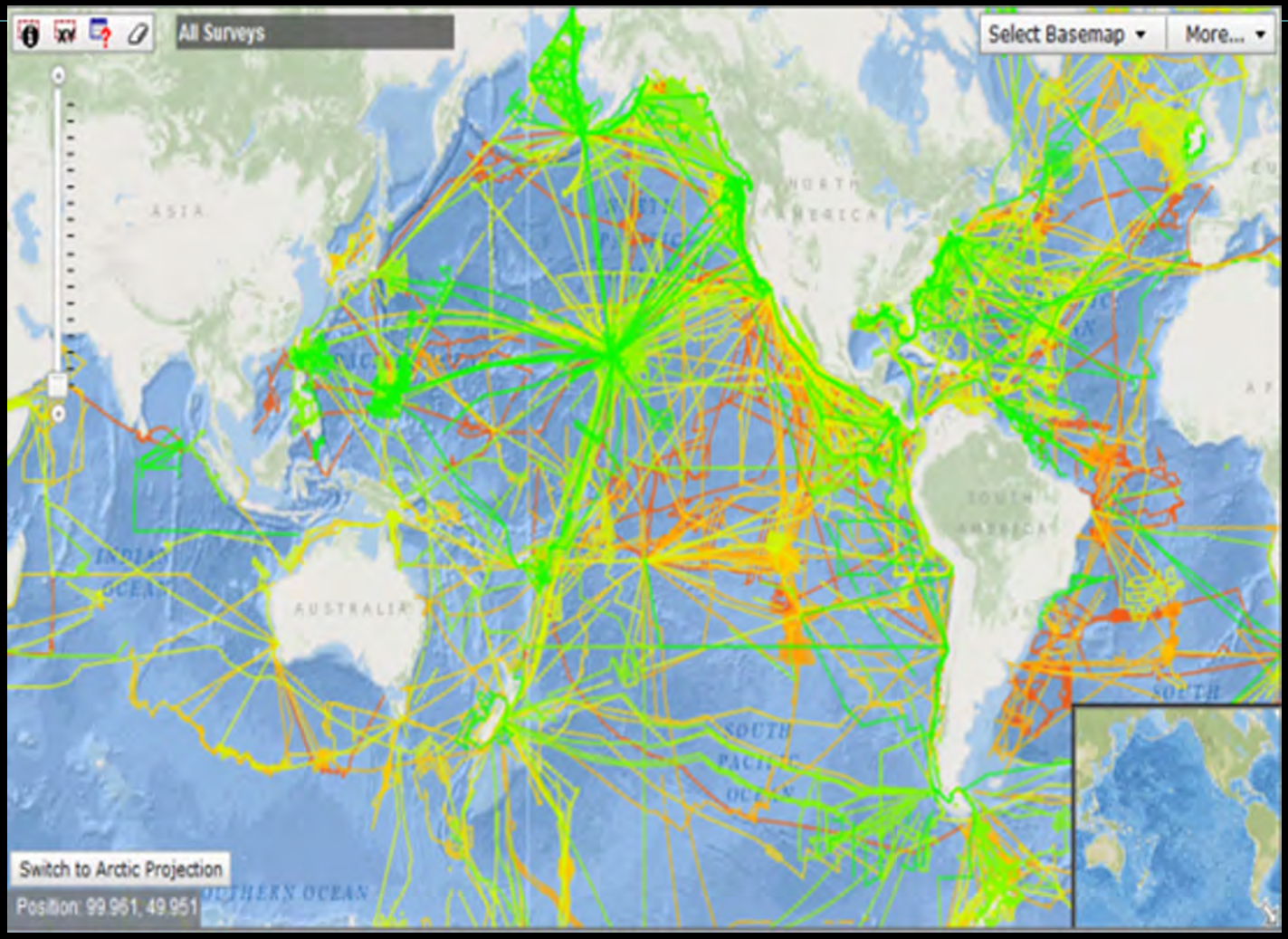
# Globally

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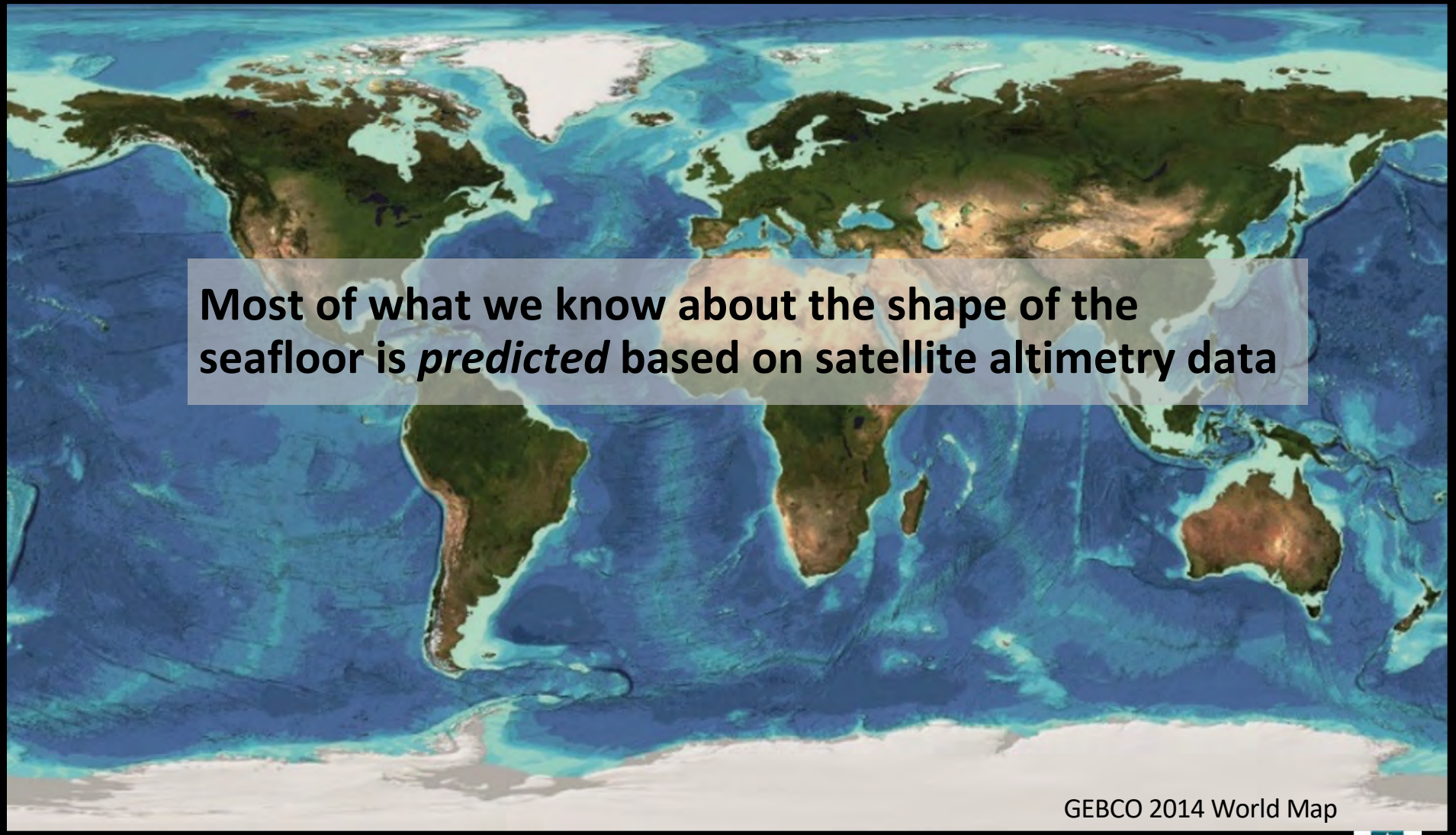


GEBCO 2014 World Map

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# Where it began - Seabed 2030

A collaborative project between The Nippon Foundation and GEBCO to inspire the complete mapping of the world's ocean by 2030 and to compile all bathymetric data into the freely-available GEBCO Ocean Map

United Nations Educational, Scientific and Cultural Organization

Intergovernmental Oceanographic Commission

*-The **Nippon Foundation** is a private Japanese-based, non-profit grant-making organization with a mission based around philanthropic activities to pursue global maritime development and assistance for humanitarian work.*

*-The **General Bathymetric Chart of the Oceans (GEBCO)** organization operates under the joint auspices of the International Hydrographic Organization (IHO) and the Intergovernmental Oceanographic Commission (IOC) of UNESCO*

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Empower the world to ***make policy decisions, use the ocean sustainably***, and ***undertake scientific research*** that is informed by a detailed understanding of the global ocean floor.

Empower the Great Lakes community to ***make policy decisions, use the Great Lakes sustainably***, and ***undertake scientific research*** that is informed by a detailed understanding of the Great Lakes lakefloor.

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# How has it grown?

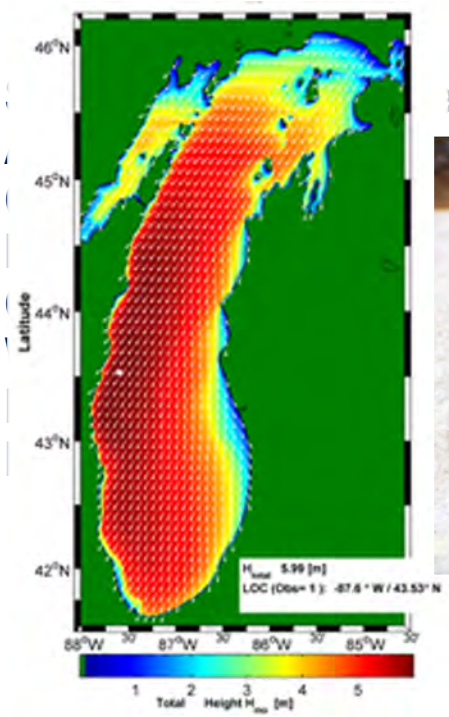
- International exposure through multiple professional societies and annual conferences convening key stakeholders
  - Lakebed Conferences
  - US-Canadian partnerships
  - Bottom Mapping Workgroup
  - THSOA
  - Oceans Conference
- Multiple new mapping initiatives
- Several new organizations and working groups supporting the comprehensive need
- New technologies and new applications of technology
- Map once – Use many times!

# WHY the GREAT LAKES?

- 6 trillion dollar GDP ( US and Cananda)
- 40 million + people drink the water
- 7 billion dollar annual fisheries market
- 1.3 million jobs
- Largest surface freshwater body in the world - ~21%
- Over 7000 km of coastline

# How will we use this?

- Nautical charts
- Fisheries Management
- Renewable Energy
- Coastal hazard assessment
- Underwater cables
- Habitat mapping
- Ecosystem management
- Emergency response

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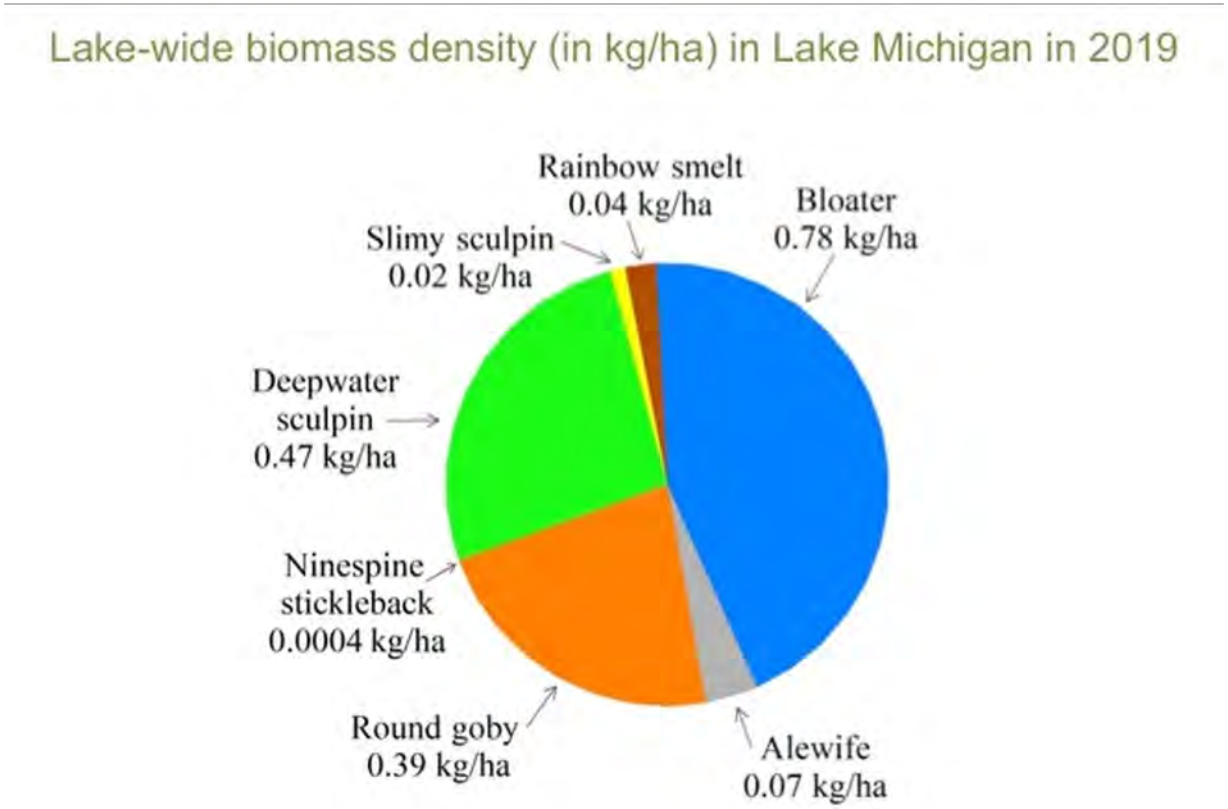
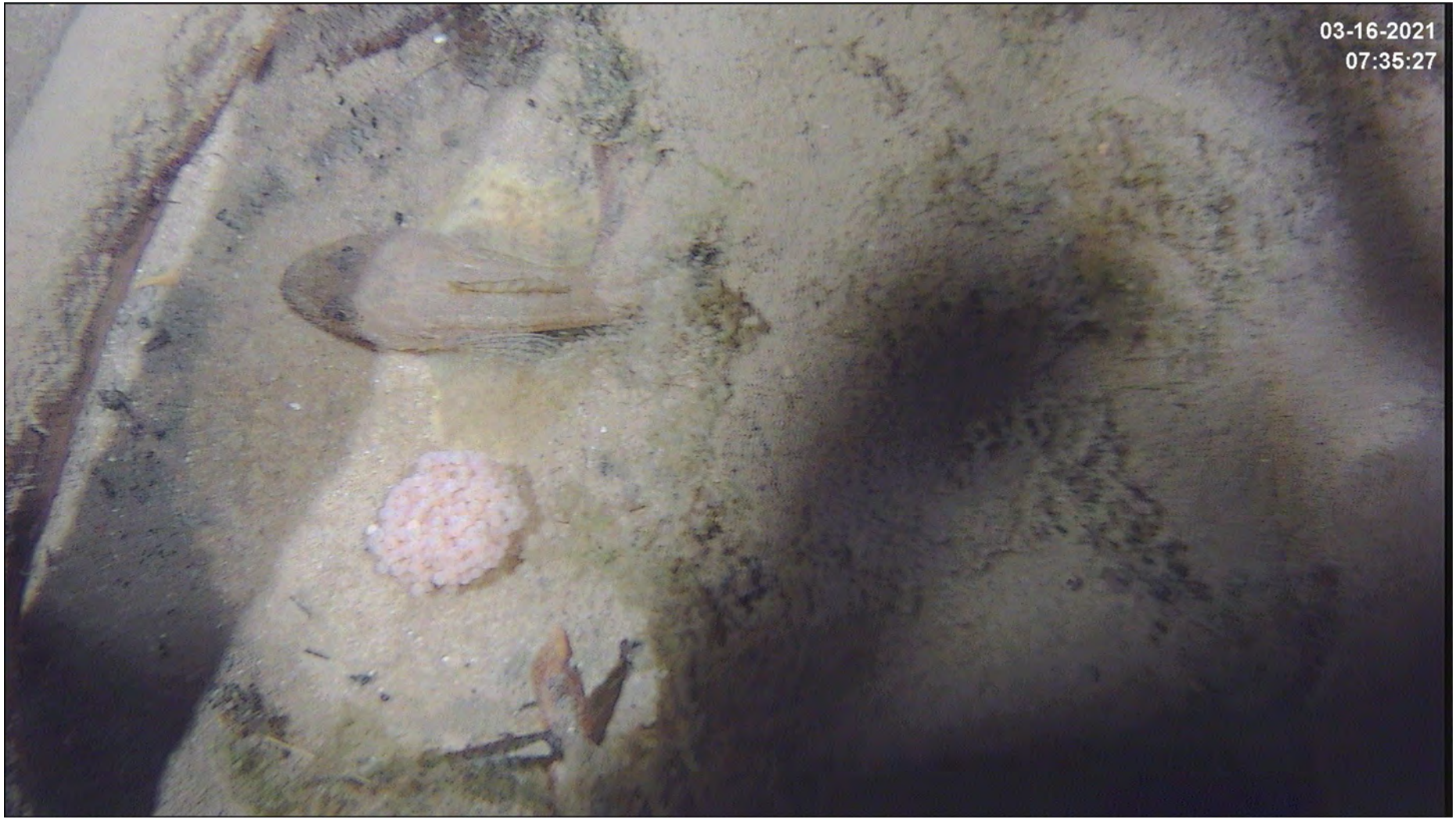
# Lakefloor Detail Needed for Accurate Data

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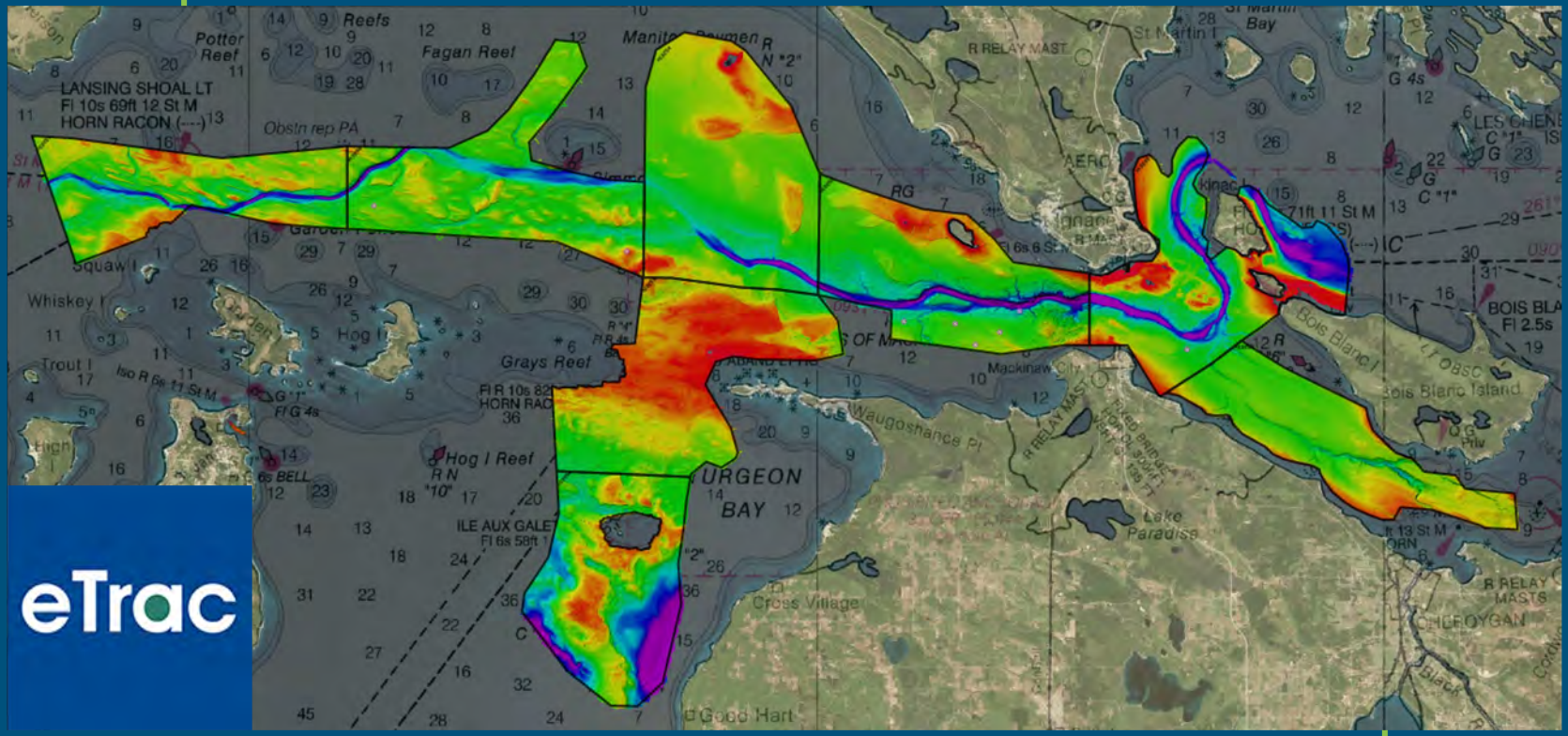
# Modern Nautical Charting in The Straits of Mackinac

## How Technology is Making a Difference




David Neff - eTrac Inc.

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# Historical Findings

This is directly in the shipping lane

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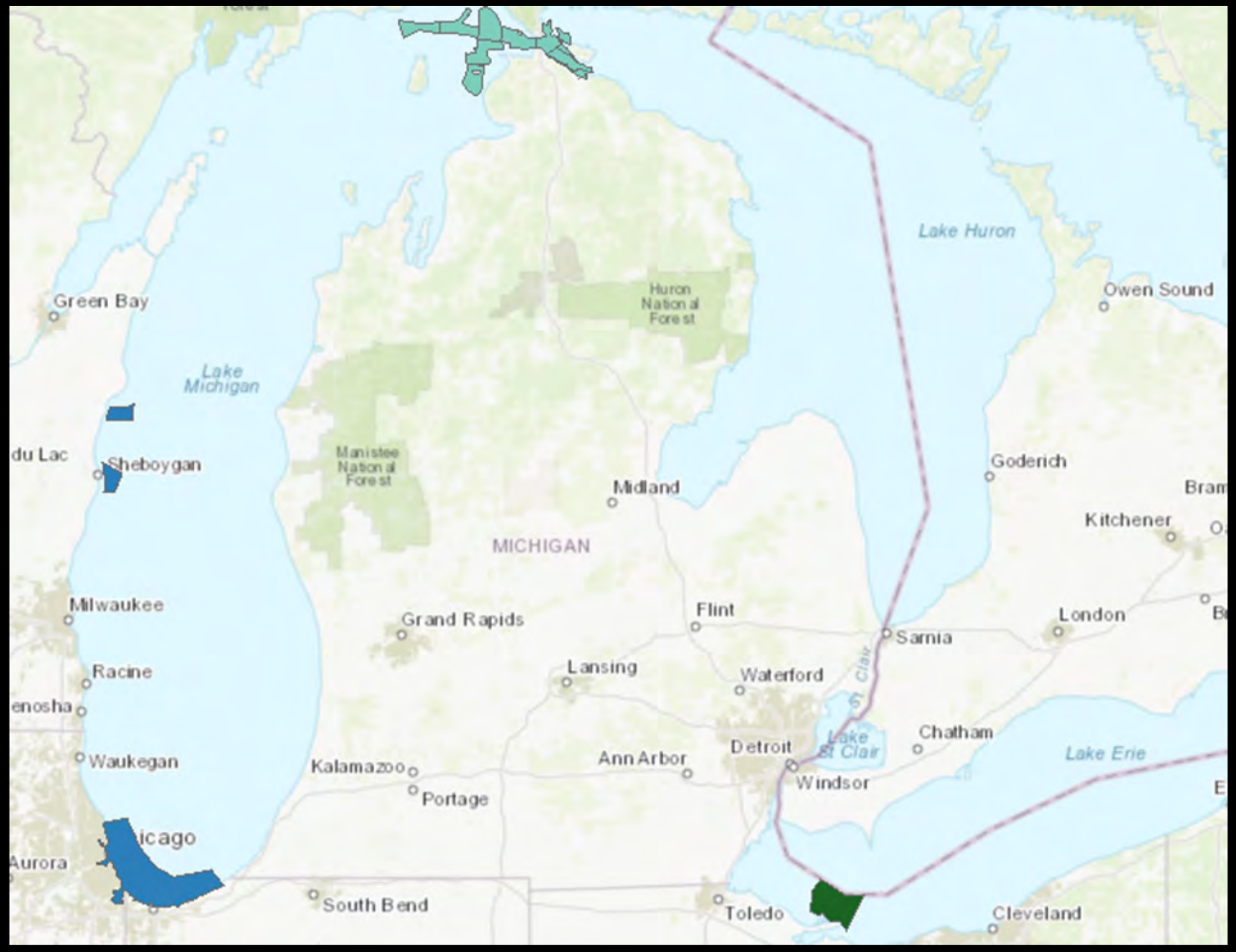
# Archaeology

# Nautical Charting and Smart Ships

- Smart ship routes
  - Better observations provide real time navigation response
- Short Sea (lakes) shipping routes
  - Reduction in carbon footprint
  - Reduction in highway congestion and needed infrastructure
- Smart Ships Coalition
  - Global coalition supporting smart, autonomous maritime trade
  - Marine Autonomous Research Site

# What is Planned?
# NOAA Hydrographic Survey Projects 2019-2021

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# How Can We Get There Faster? Power of the Crowd

- Government
  - Survey Vessels
- Academic
  - Research Vessels
- Industry
  - Survey Vessels
  - Cruise Ships
  - Cargo Ships
  - Fishing Boats
- Public
  - Private Boats and Yachts


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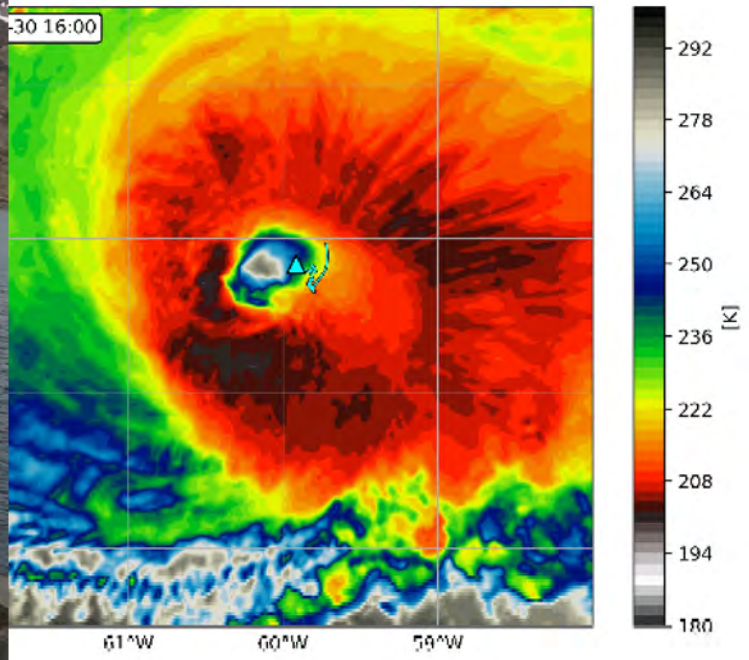
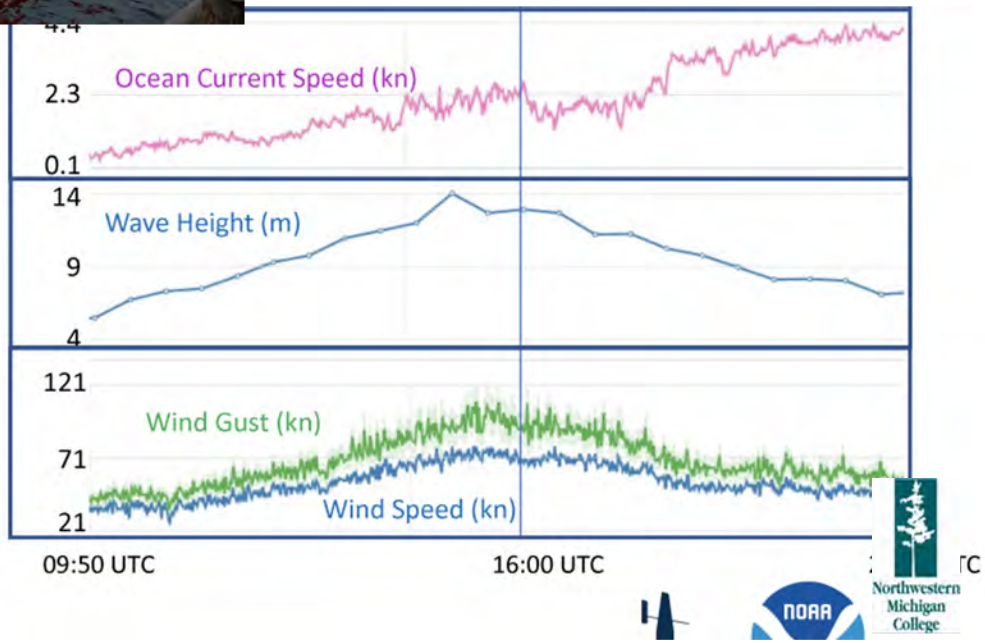



# Saildrone and other Autonomous Systems



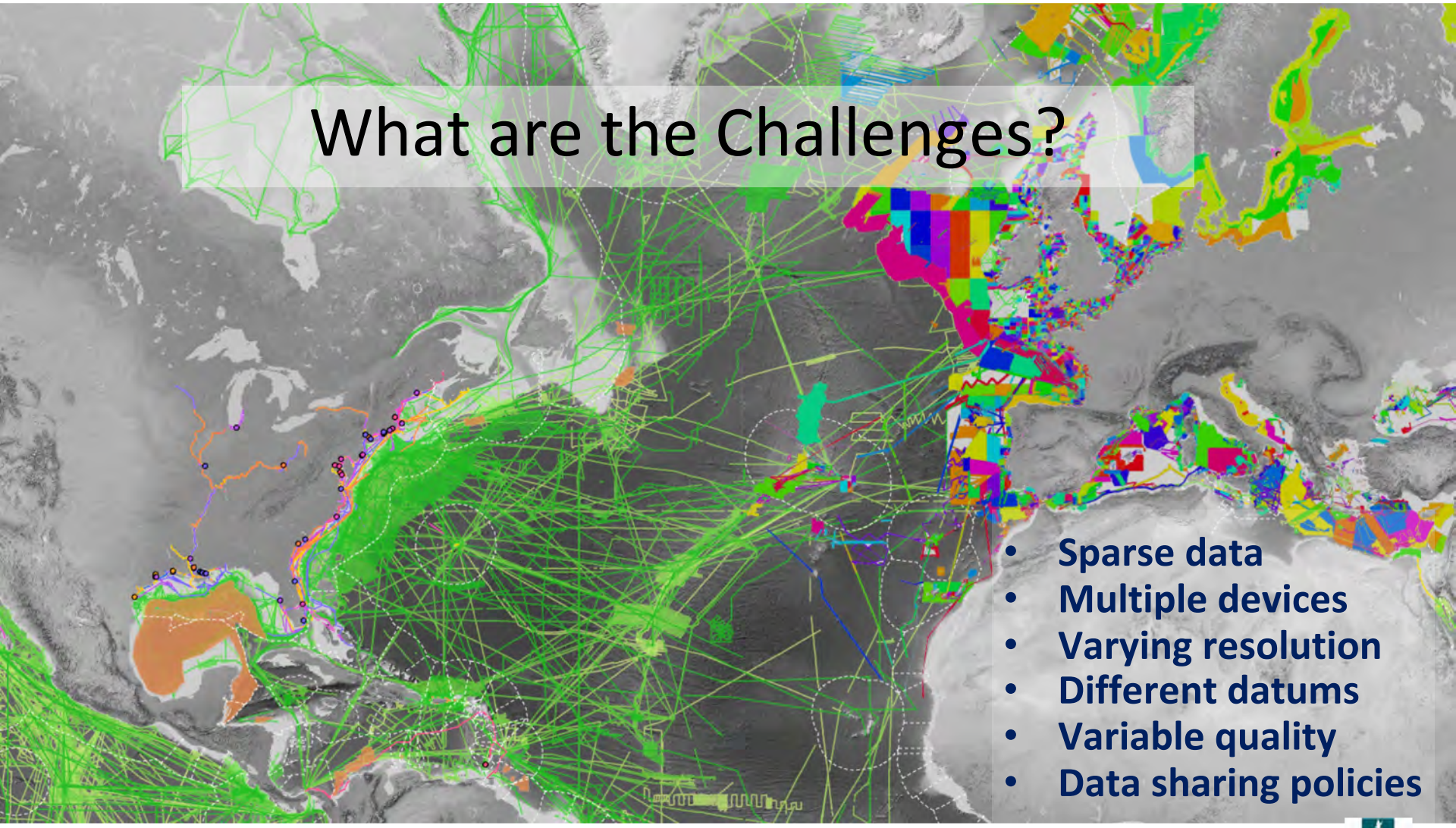
# Saildrone by the numbers

- 59 day mission
- 51,000 square kilometers of high resolution data
- 400 liters of fuel

- 24/7 Mapping Capabilities

- Area of Lake Michgan - ~ 60,000 square kilometers

# What are the Challenges?



- Sparse data
- Multiple devices
- Varying resolution
- Different datums
- Variable quality
- Data sharing policies

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# What are the Opportunities?

- Building a sustainable Great Lakes for future generations
- Michigan and the Great Lakes becoming a leader in the New Blue Economy
- Job creation and technology development
- Building the workforce of today and tomorrow

# Lakebed 2030 – from Vision to Reality

- Great Lakes mapping and observation data is limited across all the lakes
- There is no cohesive network for sharing information
- New technological developments will be key
- Commercial and recreational vessel traffic are both an artifact of need and a opportunity for new
- Critical for decision making processes and validating scientific models

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# The Science We Need for the Great Lakes We Want

Thank you

Hans W. Van Sumeren
hvansumeren@nmc.edu
231-995-1793

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