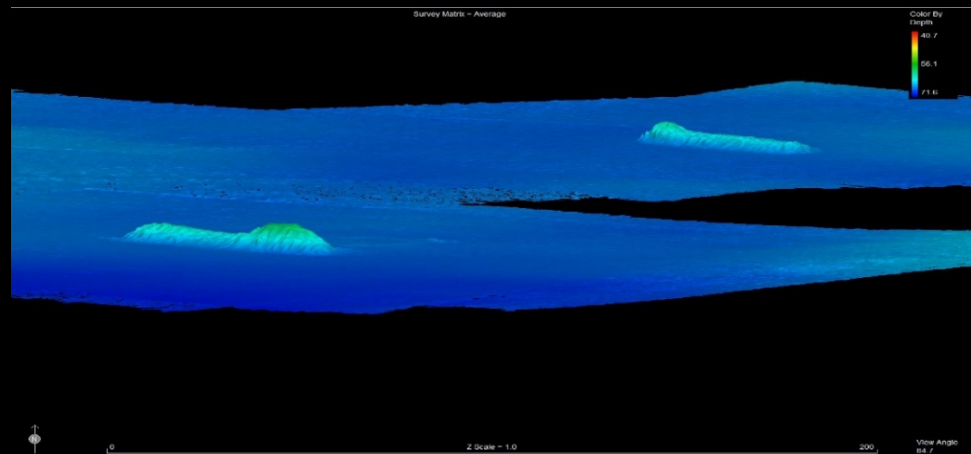


Using GIS to Support Mooring Buoys To Protect Historic Shipwrecks in Lake Huron



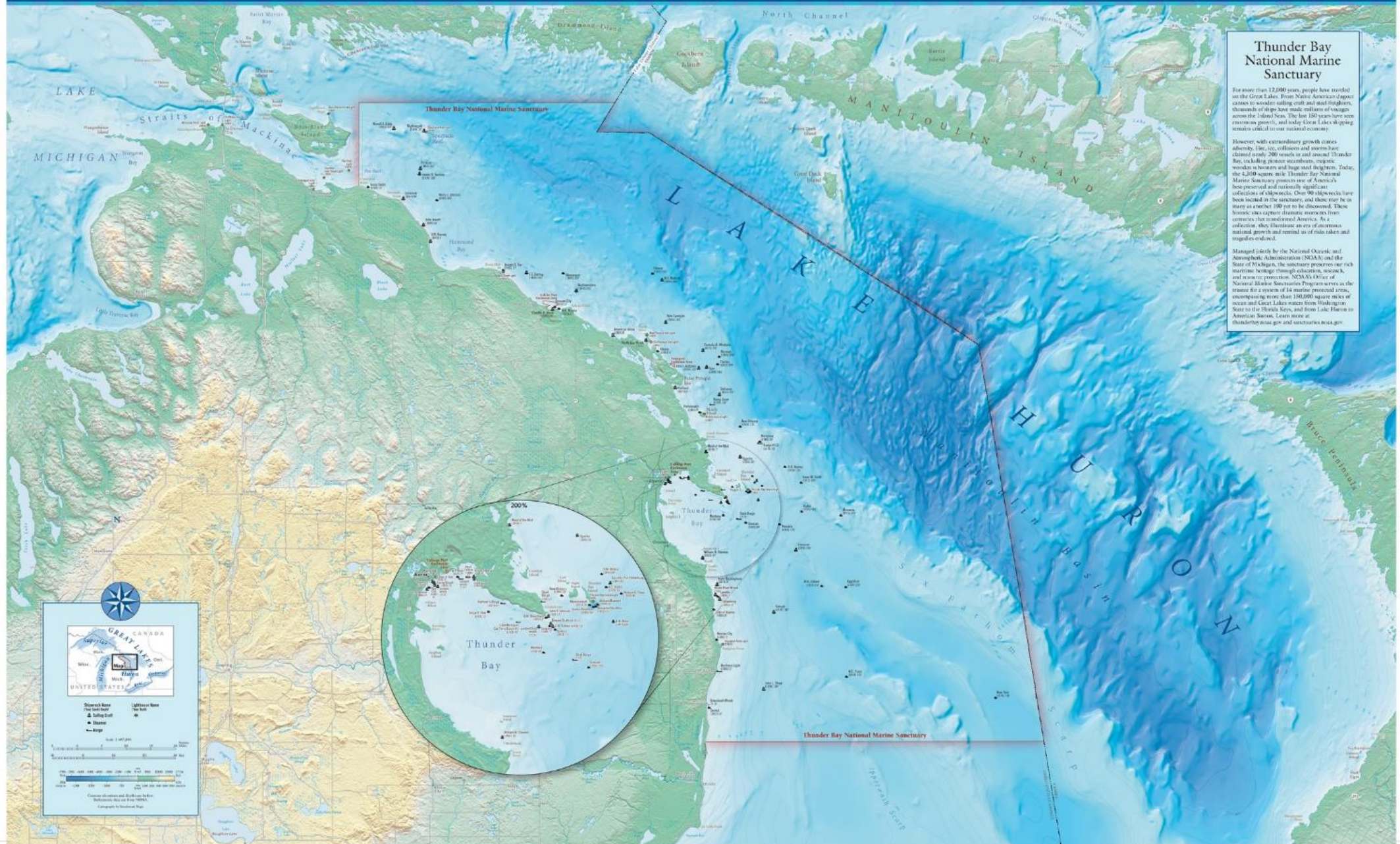
THUNDER BAY NATIONAL MARINE SANCTUARY



THUNDER BAY NATIONAL MARINE SANCTUARY



Secretary's Office &
Great Lakes Maritime Heritage Center
500 West Beaver
Alpena, Michigan 49717
616-356-1841
www.thunderbay.nmss.gov



Thunder Bay National Marine Sanctuary

For more than 12,000 years, people have traveled on the Great Lakes. From Native American dugout canoes to wooden sailing craft and steel freighters, thousands of ships have made millions of voyages across the inland seas. The last 150 years have seen tremendous growth, and today Great Lakes shipping remains critical to our national economy.

However, with extraordinary growth comes adversity. Ice, ice, collisions and storms have claimed nearly 200 vessels and around Thunder Bay, including passenger steamships, massive wooden icebreakers and huge steel freighters. Today, the 4,200 square mile Thunder Bay National Marine Sanctuary protects one of America's best preserved and culturally significant collections of shipwrecks. Over 90 shipwrecks have been located in the sanctuary, and there may be as many as another 100 yet to be discovered. These historic sea captains' dramatic voyages from continents that transformed America. As a collection, they illustrate an era of American national growth and remind us of risks taken and dangers avoided.

Managed jointly by the National Oceanic and Atmospheric Administration (NOAA) and the State of Michigan, the sanctuary protects our rich maritime heritage through education, research, and resource protection. NOAA's Office of National Black & Sanctuary Programs serves as the trustee for a system of 14 marine protected areas, encompassing more than 150,000 square miles of ocean and Great Lakes waters from Washington State to the Florida Keys, and from Lake Huron to American Samoa. Learn more at thunderbay.nmss.gov and sanctuaries.noaa.gov

Scale: 1:500,000

Source: NOAA and USGS

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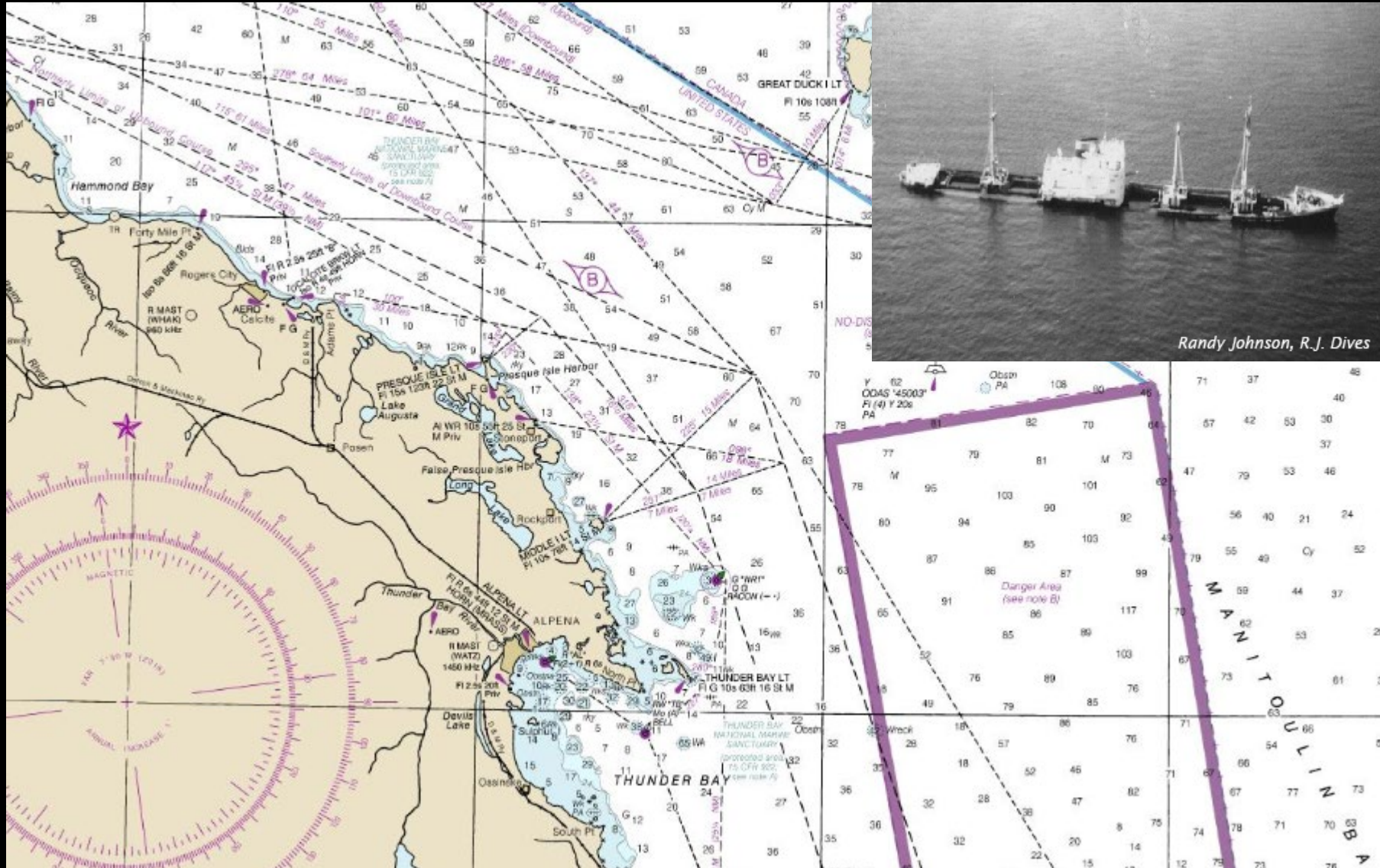
THUNDER BAY NATIONAL MARINE SANCTUARY



Lake Huron Chart 1860 – NOAA's Office of Coast Survey



THUNDER BAY NATIONAL MARINE SANCTUARY

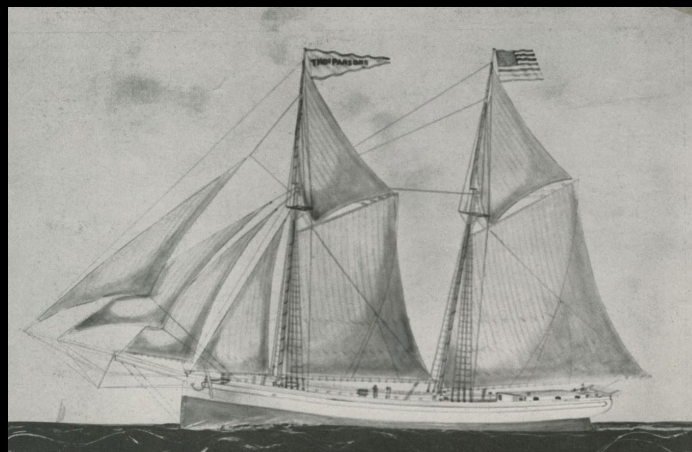
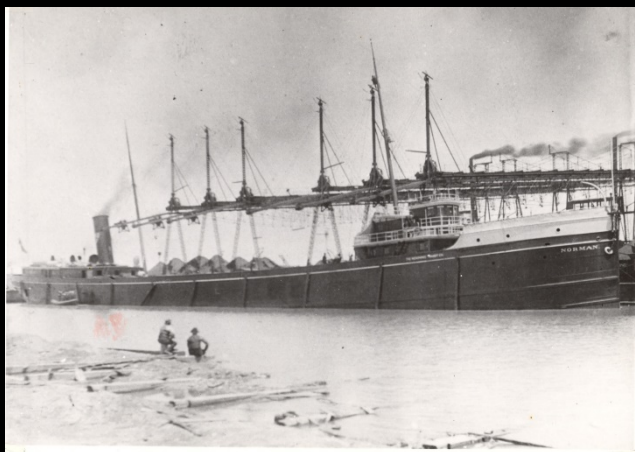


Lake Huron Chart 2016 – NOAA's Office of Coast Survey



THUNDER BAY NATIONAL MARINE SANCTUARY

Thunder Bay NMS at a Glance...



4,300 Square Miles

140 Miles of Shorelines

4 Counties

104 Known Shipwrecks

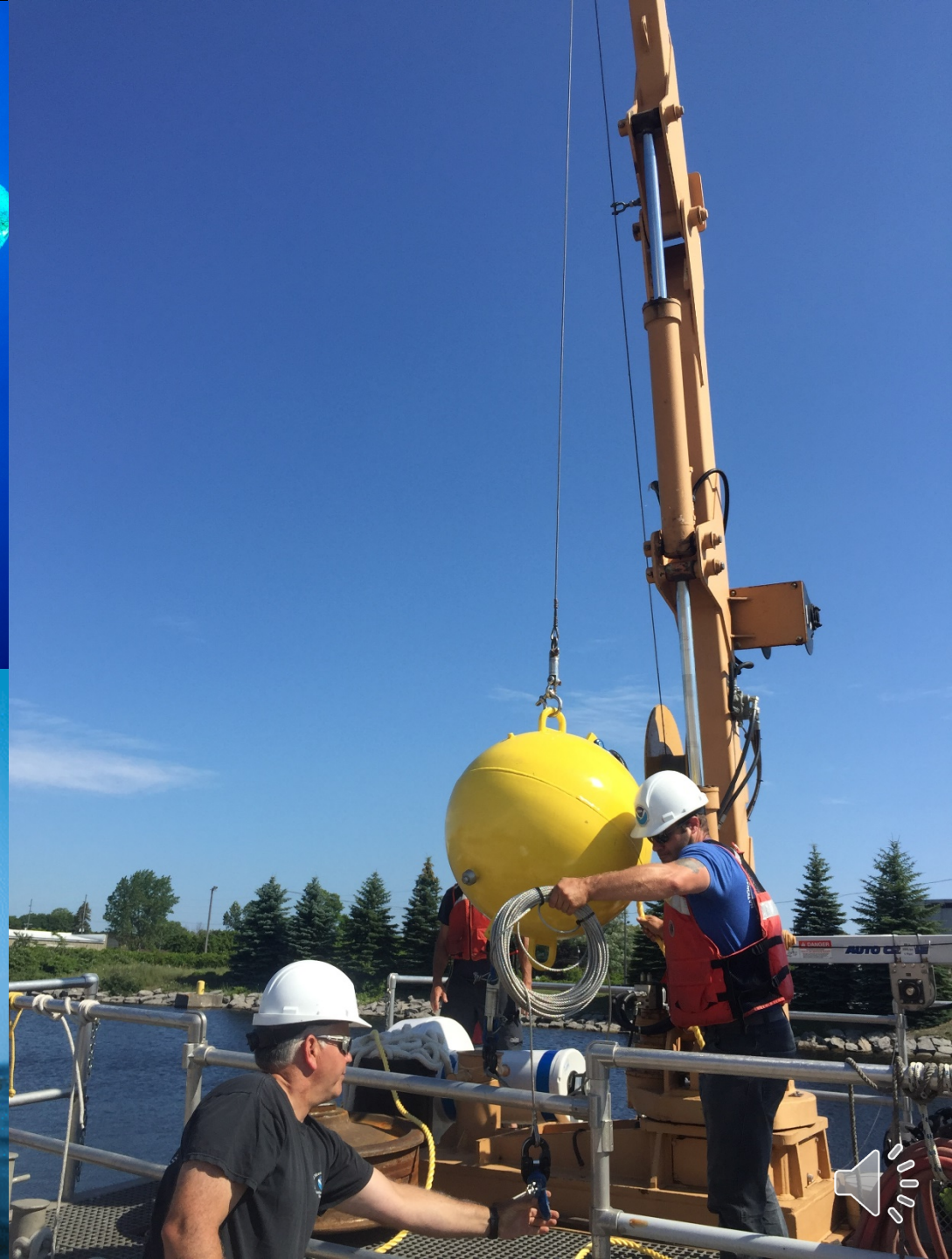
100+ Yet to Be Discovered

How do we protect these
fragile resources while
encouraging access?



The Thunder Bay NMS Mooring Buoy Program

- Anchor Damage Protection
- Ascent/Descent Lines for divers
- Secure mooring for boaters
- Highlights site location for sanctuary users





The Thunder Bay NMS Mooring Buoy Program

42 Mooring Systems

38 Shipwrecks

1 Sinkhole

5 – 165' Water Depth

Dive, Kayak, Snorkel, Fish, Sail

How Do We Share These Sites?



CSV with wreck coordinates,
description, image, and a method
of visualizing buoys that are in-
and out of the lake



Feature Layer from CSV in AGOL



Web Map



Shortlist Web Map Application



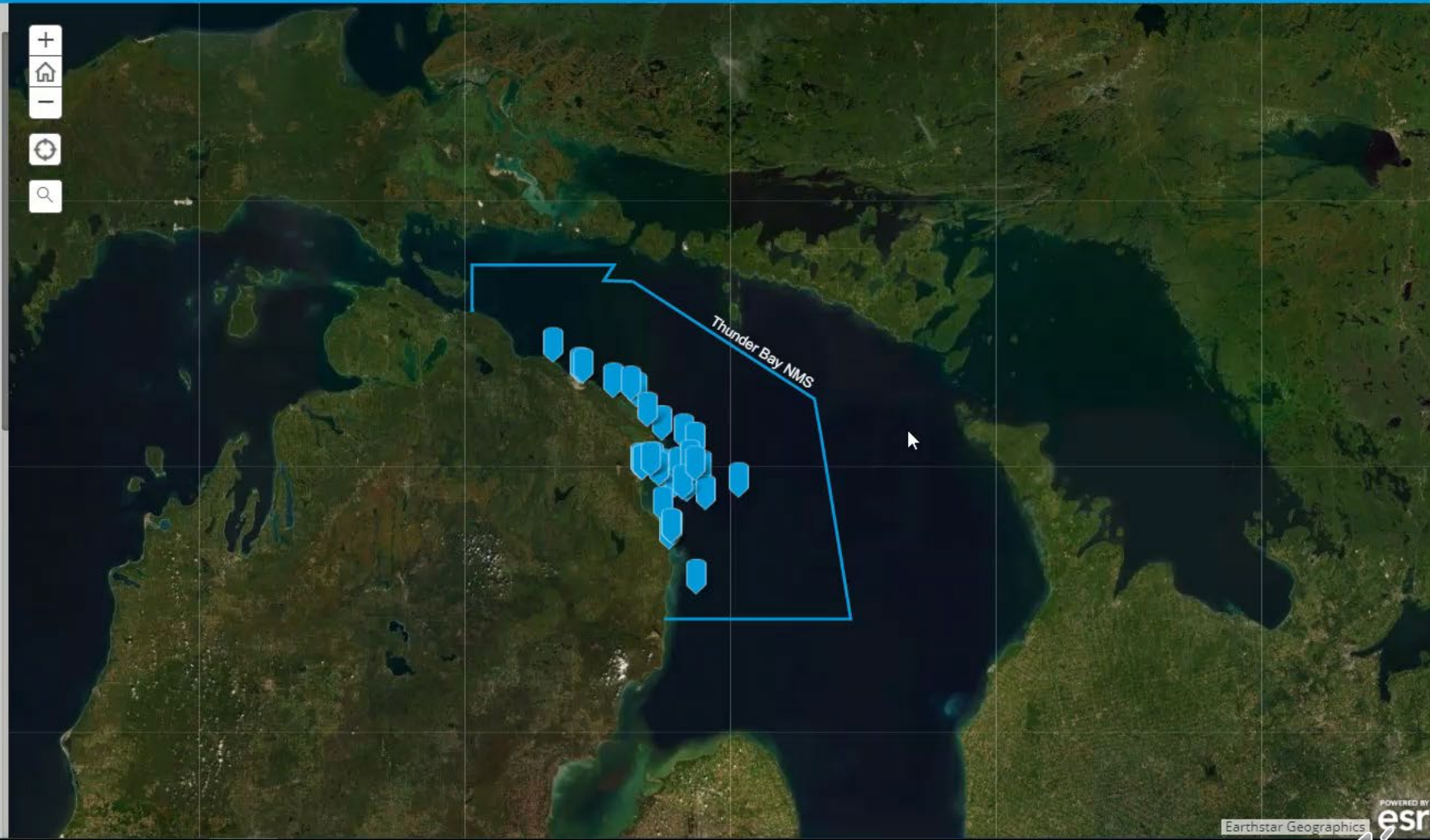
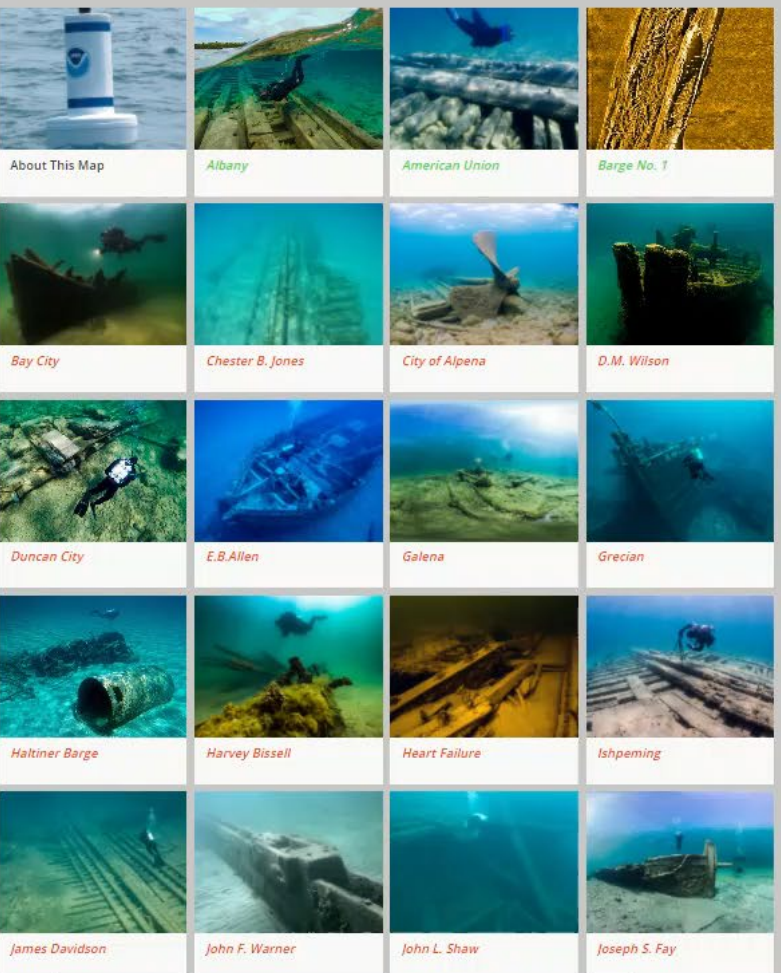
Along the Shore and Underwater: Experience Thunder Bay National Marine Sanctuary

Share This Map!   



This Story Map introduces you to over 100 shipwrecks within the 4,300 square mile **Thunder Bay National Marine Sanctuary** and to the diving, snorkeling, and kayak opportunities here. But you don't have to get wet to appreciate our national maritime heritage. Explore over 100 points of interest along the Great Lakes Maritime Heritage Trail to make your own connection to history.

- Shipwrecks with Moorings
- Thunder Bay NMS Shipwrecks
- Great Lakes Maritime Heritage Trail
- Destinations



Earthstar Geographics



Questions?

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