

THUNDER BAY NATIONAL MARINE SANCTUARY



2006

STATE OF THE SANCTUARY REPORT





NATIONAL MARINE
SANCTUARIES

THUNDER BAY



National Marine Sanctuary Program

The National Marine Sanctuary Program (NMSP) 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. The National Oceanic and Atmospheric Administration's (NOAA) National Ocean Service (NOS) manages the national marine sanctuaries through the authority of the National Marine Sanctuaries Act of 1972.

Our marine sanctuaries contain deep ocean gardens, coastal coral reefs, whale migration corridors, deep-sea canyons, and historically-significant shipwrecks and other underwater archaeological sites. They range in size from one-quarter square mile in Fagatele Bay, American Samoa, to more than 134,000 square miles at the Northwestern Hawaiian Islands Marine National Monument, the largest marine protected area in the world.

The NMSP fosters public awareness of marine resources and maritime heritage through scientific research, monitoring, exploration, education, and outreach, and works cooperatively with its many partners and the public to protect and manage sanctuaries. The NMSP is a world leader in effective marine management, protecting living marine creatures, environmental quality, and maritime heritage resources while maintaining recreational and commercial activities that are sustainable and compatible with long-term preservation.



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Thunder Bay National Marine Sanctuary

Thunder Bay National Marine Sanctuary

Located in northwestern Lake Huron, Thunder Bay is adjacent to one of the most treacherous stretches of water within the Great Lakes system. Unpredictable weather, murky fog banks, sudden gales, and rocky shoals earned the area the name “Shipwreck Alley.” Today, the 448-square-mile Thunder Bay National Marine Sanctuary (NMS) protects one of America’s best-preserved and historically-significant collections of shipwrecks.

Historical research suggests that more than 200 shipwrecks lie in and around the sanctuary. To date, more than 50 shipwrecks have been discovered within the sanctuary, and an additional 30 wrecks have been located outside of the sanctuary boundaries. Although the sheer number of shipwrecks is impressive, it is the range of vessel types located in the sanctuary that makes the collection nationally significant. From an 1844 sidewheel steamer, to a modern 500-foot-long German freighter, the shipwrecks of Thunder Bay represent a microcosm of maritime commerce and travel on the Great Lakes. These are unique sites that have tremendous historical, archaeological, and recreational value. Each of these shipwrecks offer insights to the past by illuminating the role of vessels in the nation’s economy and acquainting us with the ordinary men and women, builders, sailors, and longshoremen who were the lifeblood of the shipping industry.

In addition to shipwrecks, the sanctuary protects and interprets the remains of commercial fishing sites, historic docks, and other underwater archaeological sites. Geological and archaeological evidence suggests a high probability of prehistoric archaeological sites resting below sanctuary waters. Whether examined as individual sites, or read as a complex maritime landscape, the maritime heritage resources of the Thunder Bay NMS are of national and international significance. Collectively, the sanctuary encompasses and protects the remains of a complex and evolving maritime landscape shaped by thousands of years of human use of the Great Lakes.

Michigan’s Department of History, Arts and Libraries

The sanctuary is managed jointly by NOAA and the State of Michigan. The Michigan Historical Center represents the State in managing the sanctuary. Tracing its history to Public Act 271 of 1913, the Center comprises the State’s history museum system and *Michigan History* magazine, as well as its archaeological, archival records management, and historic preservation programs. The Center is one of five agencies in the Department of History, Arts and Libraries (HAL). Created in 2001, HAL enriches the quality of life and strengthens the economy for Michigan residents by providing access to information, preserving and promoting Michigan heritage, and fostering cultural creativity.

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**“After five years, I can’t
conceive of an Alpena without
the Thunder Bay National
Marine Sanctuary.”**

**-Judi Stillion, Director
Alpena County Library**

About The State of the Sanctuary Report

This State of the Sanctuary Report provides an overview of the current status of the Thunder Bay NMS and discusses the management activities and accomplishments since the sanctuary’s designation in October 2000. This report is the first step in a comprehensive review of the Thunder Bay NMS management plan. All national marine sanctuaries have management plans. They describe regulations, boundaries, resources, resource protection, research, and education programs. Each management plan is tailored for individual sanctuaries through a rigorous public process that connects the regulatory mandates of federal law with the unique combination of resources, missions, communities, and constituencies found at each sanctuary. This is Thunder Bay NMS’s first management plan review. The information in this document will help you assess how the sanctuary has served you, your community, and the State; and it will help you contribute to charting the sanctuary’s future course.

Bold Beginnings

In 2000, NOAA designated Thunder Bay as the nation’s thirteenth national marine sanctuary. Jointly managed by NOAA and the State of Michigan, the Thunder Bay NMS protects a nationally-significant collection of shipwrecks and other maritime heritage resources through exploration, research, education, and resource protection. By fostering an understanding that our past connections to the Great Lakes and oceans are critical to our future, the sanctuary works to ensure that future generations will continue to experience and value Thunder Bay’s irreplaceable underwater treasures.

Much has been achieved in the first six years since the sanctuary’s designation. World renowned explorers—Dr. Robert Ballard, discoverer of the *Titanic*, and Jean-Michel Cousteau, the son of underwater pioneer Jacques Cousteau—have helped put Thunder Bay and Great Lakes shipwrecks on the national map. Scientists, archaeologists, and students have come to Alpena from all over the state and the nation to study Thunder Bay and its many resources. Documentaries on the National Geographic Channel, The Discovery Channel, The History Channel, and public television have transported millions of people to northeastern Michigan. Thousands of students have experienced the shipwrecks in real-time via cutting-edge Internet broadcasts.

First housed in cramped federal building offices, the sanctuary headquarters moved in 2005 to a 20,000-square-foot state-of-the-art visitor center and research facility, the Great Lakes Maritime Heritage Center. The new environmentally-friendly facility is located in a renovated building within Alpena's historic Fletcher Paper Mill complex. The Great Lakes Maritime Heritage Center is the cornerstone of an ambitious program of riverfront redevelopment aimed at positioning the sanctuary, the City of Alpena, and the State of Michigan as premier heritage tourism and leisure destinations.

Partnerships with the local community are the key to many of the sanctuary's accomplishments. For example, strong ties with the Alpena County George N. Fletcher Library made possible the donation of one of the nation's premier Great Lakes maritime archival collections to the sanctuary. Local citizens contribute to the sanctuary's accomplishments in many ways. Volunteers work at festivals and outreach events, serve on the sanctuary advisory council, help digitize the Thunder Bay Sanctuary Research Collection, and support the sanctuary's community boat-building program.

Recognizing that people value experiences that affect their own lives in meaningful ways, the sanctuary fosters strong personal connections to Thunder Bay's shipwrecks. Simply put, people protect what they value. From a leisurely stroll through exhibits at the Great Lakes Maritime Heritage Center, to a day of snorkeling or diving at an historic shipwreck site, the sanctuary offers many opportunities for the public to connect with the past. By developing education programs, promoting regional economic growth, and adding to community cultural offerings, the sanctuary is contributing to an enhanced quality of life for people in northeastern Michigan and beyond.

Historic shipwrecks are the reason for the Thunder Bay NMS's creation. Protecting these irreplaceable and often fragile resources is the sanctuary's primary responsibility. What has changed dramatically since the sanctuary's designation is the overall understanding of how shipwrecks and maritime heritage can enhance people's lives. Thunder Bay's shipwrecks have long been determined historically significant; what is now being demonstrated is their significance to the present. The management plan review will foster conversations that will help determine the best means of preserving the sanctuary's maritime heritage resources.



The sanctuary and local development company Alpena Marc, LLC are continuing to develop the Great Lakes Maritime Heritage Center campus. Once used for coating paper products (above), the center is now the cornerstone of redevelopment within the 29 acre historic Fletcher Paper Mill complex, located along the Thunder Bay River.





Lost while under tow in 1906, the 300-foot steamer *Greician* rests in 90 feet of water in the Thunder Bay NMS. The popular dive site is marked with two sanctuary-maintained mooring buoys.

What is a Management Plan? What is a Management Plan Review?

Management plans are sanctuary-specific planning and management documents used by all national marine sanctuaries. They identify immediate, mid-range, and long-term challenges and opportunities, and develop a dedicated course for the future. A management plan describes regulations, boundaries, resource protection, research, and education programs that guide sanctuary operations. It specifies how a sanctuary should go about conserving, protecting, and enhancing its resources. The management plan is a blueprint for protecting a sanctuary's resources. The plan is created by managers, scientists, educators, the sanctuary advisory council, sanctuary users, and members of the public.

New challenges and opportunities emerge with time. For this reason, federal law requires periodic updating of sanctuary management plans. The current Thunder Bay NMS management plan was written as part of the sanctuary designation process and published in the Final Environmental Impact Statement (1999). Since then, as this document will outline, the sanctuary has achieved many significant milestones.

The Thunder Bay NMS management plan review will take place through a well-proven community-based process that guarantees regular opportunities for the public and government agencies to share their knowledge, voice their opinions, and directly participate as active stewards of America's marine sanctuaries. Ultimately, this review will ensure that the Thunder Bay NMS will emerge better able to protect and use its maritime heritage resources for the benefit of current and future generations.

The original management plan is available on the sanctuary's web site.

What is the Review Process and How Do I Get Involved?

Public participation is vital to the management plan review process. The review begins with a scoping period where important issues and opportunities facing the sanctuary are identified. These issues and opportunities provide the framework for reviewing the existing management plan. During the scoping period, the sanctuary will accept comments at a series of public meetings in September 2006. Written comments are also encouraged via mail, fax, e-mail, and on-line. At the conclusion of the public comment period, the Thunder Bay NMS and the advisory council, with assistance from the community and other experts, will prepare a new Draft Management Plan. The Draft Plan will then be circulated to the public and Draft Management Plan hearings will be held to gather further public comments and suggestions. Public meetings will be advertised through various media outlets, including local newspapers and the sanctuary web site. After considering public comments, the sanctuary will complete the Final Management Plan, and that plan will be approved by both NOAA and the State of Michigan.

A Federal/State Partnership

Before Thunder Bay's designation as a national marine sanctuary on October 7, 2000, the State of Michigan managed the Thunder Bay Underwater Preserve, a 290-square-mile area designated in 1981. The 448-square-mile area of Lake Huron is now both a national marine sanctuary and part of Michigan's Underwater Preserve system. It is jointly managed by NOAA and the State through the Michigan Department of History, Arts and Libraries (HAL). The NOAA sanctuary superintendent manages the day-to-day operations and activities of the site. A Joint Management Committee, consisting of the director of the National Marine Sanctuary Program and a state member (appointed by the director of HAL), makes major policy, budget, and management decisions. In addition, the advisory council provides advice to the sanctuary superintendent.

While most other national marine sanctuaries regulate natural resources, the Thunder Bay NMS manages only maritime heritage resources. As outlined in the sanctuary's designation document, and reinforced in a Memorandum of Agreement between NOAA and the State of Michigan, the sanctuary does not regulate fishing and other natural resources.

Public Input Opportunities

- Public scoping meetings
- Sanctuary advisory council meetings
- Public workshops
- Written comments via mail, fax, or e-mail
- On-line comment form
- Draft Management Plan hearings

For updates on Thunder Bay NMS's Management Plan review process call, (989) 356-8805 or visit www.thunderbay.noaa.gov.



Michigan Governor Jennifer Granholm speaks with Thunder Bay NMS superintendent Jeff Gray (middle) and historian Patrick Labadie during an exhibit opening.



Sanctuary Operations

The Thunder Bay NMS was established to preserve the area's rich but fragile maritime heritage resources. Protecting 448 square miles requires appropriate facilities, trained personnel, a wide range of partnerships, and an extensive array of specialized equipment—in short, an extensive infrastructure. Developing an effective and sustainable infrastructure has been a major focus of the sanctuary during its initial six years of operation. At the time of designation, the Thunder Bay NMS consisted of two staff members (an acting manager located in Ann Arbor and an education coordinator in Alpena), and a small headquarters in Alpena's federal building. There were no dedicated research vessels and little equipment dedicated to support sanctuary research and education programs.

The sanctuary has developed an impressive infrastructure for preserving maritime heritage resources. Thunder Bay NMS is headquartered in the 20,000-square-foot Great Lakes Maritime Heritage Center. The sanctuary operates three research vessels, including the 41-foot RV *Huron Explorer*, the first petroleum-free vessel in the nation. These vessels are critical to the sanctuary's efforts to manage its resources. The greatest strength of the sanctuary, however, is the staff. In the fall of 2006, the sanctuary's mission is supported by the equivalent of 11 full-time staff (eight federally-funded and three funded by the State of Michigan) and a growing cadre of volunteers.

The sanctuary benefits immensely from partnerships within NOAA and with a variety of state and federal agencies, universities, community groups, and private citizens. With their collaborative focus on supporting the sanctuary's mission, these groups and individuals impart energy, expertise, and equipment to the sanctuary and its operations. Collaborative projects and resource sharing play a vital role in developing the sanctuary's infrastructure.

Great Lakes Maritime Heritage Center

On September 17, 2005, the Thunder Bay NMS dedicated the new Great Lakes Maritime Heritage Center. Located in a renovated building that once housed parts of Alpena's historic Fletcher Paper mill, the Great Lakes Maritime Heritage Center embodies the sanctuary's preservation mission and ethic of environmental responsibility. The state-of-the-art building features a 93-seat theater, 9,000-square-feet of exhibit space, distance learning capabilities, an artifact conservation lab, visible curatorial space, a technologically-enhanced education room, a researchers' field station, and administrative offices.

Located along the Thunder Bay River, the Great Lakes Maritime Heritage Center campus is well-suited to innovative outdoor programming and community-focused enhancements. Currently under development are a large water tank used for remotely-operated vehicle (ROV) and dive training and demonstrations, picnic areas, and a facility for the sanctuary's community boat-building program. Additional planned improvements include deepwater dockage for research vessels, visiting tall ships, and the Alpena Youth Sailing Club, as well as the development of the Great Lakes Maritime Heritage Trail. The Trail and the Great Lakes Maritime Heritage Center are cornerstones in an ambitious program of riverfront development spearheaded by the sanctuary, the City of Alpena, Alpena Marc, LLC, and the State of Michigan that will position the area as a premier heritage tourism and leisure destination.

Leadership in Energy and Environmental Design



The Great Lakes Maritime Heritage Center is on track to becoming a Gold Certified Leadership in Energy and Environmental Design (LEED) building. Sponsored by the U.S. Green Building Council, the LEED Green Building Rating System is a voluntary, consensus-based national standard for developing high-performance, sustainable buildings. The Great Lakes Maritime Heritage Center's systems, fixtures, flooring, furniture, and landscaping demonstrate NOAA's commitment to an environmentally-sustainable future. Energy and water consumption are greatly reduced through efficient design, including a geo-thermal heating and cooling system and low-volume and waterless toilets. The Great



The National Marine Sanctuary Foundation presented U.S. Senator Carl Levin with the foundation's Stewardship Award during the Great Lakes Maritime Heritage Center grand opening. Also in attendance were U.S. Representatives Bart Stupak and Thaddeus McCotter.



“The sanctuary and its heritage center have not only met initial expectations... but have far exceeded those expectations.”

**-Bill Speer, Editor
The Alpena News**



The RV *Huron Explorer*

Sanctuary Resources

Sanctuary regulations define sanctuary resources as:

- Any sunken watercraft, including a ship, boat, canoe, skiff, raft, and barge that sank on or before the date of sanctuary designation.
- The rigging, gear, fittings, trappings, and equipment, the personal property of the officers, crew, and passengers, and the cargo of any sunken watercraft located within the sanctuary.
- Any historic remnant of docks or piers or associated materials, and materials resulting from activities of historic or prehistoric Native Americans, located within the sanctuary.

Lakes Maritime Heritage Center was recently awarded the U.S. Department of Energy's *You Have the Power Award*. The *You Have the Power* campaign helps federal agencies reach their energy-saving goals by raising awareness about energy efficiency at federal facilities.

The RV *Huron Explorer*: An American First

In 2005, the sanctuary acquired the *Huron Explorer*. The 41-foot utility vessel served the U.S. Coast Guard for 30 years before NOAA's Great Lakes Environmental Research Laboratory retrofitted it for sanctuary research. Like its new berth at the Great Lakes Maritime Heritage Center, the *Huron Explorer* has undergone a dramatic transformation. The vessel is the first in the nation to operate without any petroleum products. The vessel uses rapeseed hydraulic oil for its deck crane, winches and marine gear, 100% soy biodiesel for engine fuel, and canola motor oil. A working demonstration of the merits of bio-products in the marine environment, the *Huron Explorer*, like the Great Lakes Maritime Heritage Center, was recently awarded the U.S. Department of Energy's *You Have the Power Award*. Through research and educational cruises, the vessel serves two important missions: preserving the sanctuary's maritime heritage and protecting the environment. The sanctuary's goal is to make its entire fleet environmentally friendly and economical to operate. The two smaller boats are scheduled to have their outboard engines retrofitted to run on 100% ethanol and bio-based engine oil.



Resource Protection

Natural and human processes can threaten the long-term sustainability of Thunder Bay's maritime heritage resources. The Thunder Bay NMS regulations protect these resources. To enforce these regulations, the sanctuary partners with local, state, and federal authorities. It also relies heavily on observations from recreational divers and other members of the community. In addition, the sanctuary is investing in mooring buoys that are designed to improve safety and access to resources while reducing unintentional or illegal human impacts. Ice, waves, and aquatic invasive species such as zebra and quagga mussels all have the potential for harming underwater archaeological resources. The sanctuary is working with university and NOAA scientists to develop long-term monitoring programs to better understand how the chemical, biological, and physical conditions found around Thunder Bay's shipwrecks are affecting the corrosion and deterioration of these irreplaceable archaeological sites.

Enforcement

NOAA has developed partnerships with NOAA's Office of Law Enforcement (OLE), the U.S. Coast Guard (USCG), the Michigan Department of Natural Resources (MDNR), the Alpena County Sheriff, and Michigan State Police to enforce sanctuary regulations. In the spring of 2006, the sanctuary established the Thunder Bay Law Enforcement Task Force to better coordinate enforcement efforts in the sanctuary. The task force focuses on improving public education and providing additional on-water and dockside patrols of the sanctuary. NOAA and the MDNR are developing a Joint Enforcement Agreement that will further enable the MDNR to conduct dedicated enforcement activities in the sanctuary.

Mooring Buoys

The Thunder Bay NMS encourages recreational divers, snorkelers, and kayakers to responsibly visit the sanctuary's shipwrecks. Mooring buoys serve recreational users by making shipwrecks easier to locate, while greatly reducing the likelihood of anchor damage to the often fragile sites. They also improve diver safety by providing continuous down and ascent lines.

Regulations

The following activities are prohibited in the sanctuary without a permit:

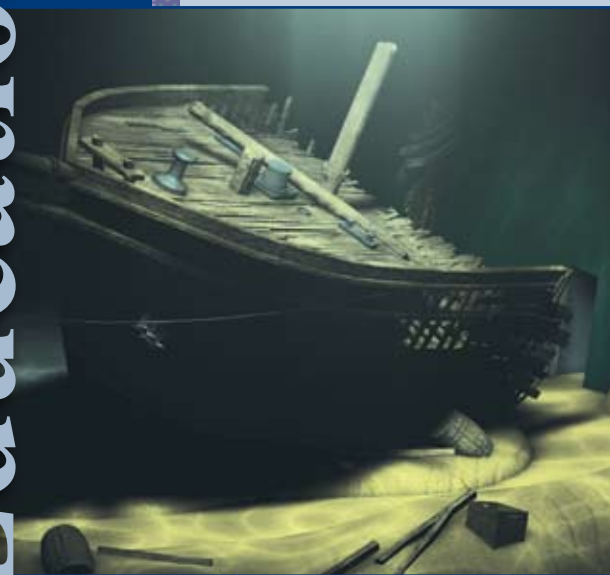
- Recovering, altering, destroying, or possessing underwater cultural resources.
- Drilling into, dredging, or otherwise altering the lake bottom.
- Using grappling hooks or other anchoring devices if a mooring buoy exists.



The sanctuary received its first mooring permit in 2003 and installed a permanent system that same year. In 2005, the sanctuary maintained 12 shipwreck moorings and applied for, and received, a permit from the USCG and U.S. Army Corps of Engineers for 10 additional buoys. The sanctuary is planning to install the remaining buoys in 2006-2007. Mooring buoys are installed and recovered seasonally to avoid ice and storm damage during winter months.

“This sanctuary is paramount to the safeguarding of Michigan history and cultural heritage.”

**-Michigan Senator
Tony Stamas &
State Representative
Matthew Gillard**



Education and Outreach

The sanctuary's education and outreach programs help people of all ages and backgrounds enrich their lives while learning about, physically experiencing, and working to preserve the Great Lakes and their maritime heritage. Because people preserve what they value, and value what they understand, the Thunder Bay NMS embraces education as the most powerful resource preservation tool.

Sanctuary education comes in many forms. Structured programs for teachers and students, imaginative exhibits, community boat-building, distance learning, telepresence expeditions, summer reading programs, college courses, remotely-operated vehicle competitions, lectures, and curricula are some of the many activities taking place in association with the sanctuary. Although preservation is the central message, the sanctuary and its many partners promote learning across the curriculum, including history, reading, environmental literacy, science, math, and technology. Appealing to mind, hand, and imagination, education programs provide a variety of mechanisms for people to grow in personally meaningful ways and to become invested in preserving the sanctuary's resources. The sections below describe some of these activities and the sanctuary's education program in more detail.

Exhibits

The Thunder Bay NMS uses exhibits to foster appreciation and preservation of the Great Lakes and their maritime heritage. By exploring exhibits about the shipwrecks of Thunder Bay, visitors can embrace maritime heritage resources that relatively few people will actually touch. In the summer of 2004, the sanctuary opened a 1,000-square-foot exhibit at the Federal Building in Alpena. More than 15,000 visitors saw this small exhibit, which centered on the re-creation of a section of the steamer *Pewabic*. In the fall of 2005, the sanctuary relocated the exhibit to the Great Lakes Maritime Heritage Center, along with several new exhibits and a visible artifact storage area. The sanctuary store, managed by the Michigan Historical Museum, gives visitors the opportunity to continue their educational experiences after their visit to the Center. Profits from the store support the work of the sanctuary.

Science on a Sphere

In February 2006, the sanctuary received \$100,000 from NOAA's Office of Education to install *Science on a Sphere* at the Great Lakes Maritime Heritage Center. Developed by NOAA's Earth System Research Laboratory Global Systems Division in Boulder, Colorado, *Science on a Sphere* is a visualization system that uses video projectors and a six-foot-diameter sphere to animate data about the earth's atmosphere, oceans, and land. It connects educators, students, researchers, and visitors to NOAA's global research. In the future, the sanctuary will develop programming for *Science on a Sphere* that focuses on the Great Lakes and maritime heritage.

"Exploring the Shipwreck Century"

In the spring of 2006, the sanctuary began developing innovative, permanent exhibits for the 9,000-square-foot exhibit area at the Great Lakes Maritime Heritage Center. Entitled *Exploring the Shipwreck Century*, the exhibits will help visitors appreciate the role of the Great Lakes in American history, and foster public awareness and appreciation for Great Lakes shipwrecks. Designed to be informative and fun for visitors of all ages and interests, the exhibits will allow both divers and non-divers to discover Thunder Bay's nationally-significant collection of shipwrecks. The exhibits are expected to be completed in late 2007.

Reaching Out to Students and Teachers

Providing educational opportunities for students and educators from around the region is a high priority for the sanctuary. To reach as many students as possible, the sanctuary provides curriculum and training opportunities to regional educators. The sanctuary partners with Alpena Public Schools, the Alpena-Montmorency-Alcona Educational Service District, and other school districts to train teachers and provide programs for students in the classroom and at the Great Lakes Maritime Heritage Center. In 2005, for example, one group of teachers received training aboard the tall ship *Denis Sullivan*, and another group designed and assembled remotely-operated vehicles. Educators also participated in education roundtable meetings to design future educational opportunities at the Great Lakes Maritime Heritage Center.



Science on a Sphere



A group of educators don survival suits during educational training aboard the schooner *Denis Sullivan*.



The *Denis Sullivan*



Shipboard education on the *Denis Sullivan*

In 2007, a new curriculum featuring Great Lakes shipping and shipwrecks will be published. Written in partnership with the Michigan Department of History, Arts and Libraries and the Wisconsin Historical Society, this comprehensive book and companion activity guide, targeted at fourth through eighth grade, will be a regional resource on Great Lakes maritime studies. The curriculum uses examples of Thunder Bay shipwrecks to relate to the larger story of Great Lakes maritime history. Tentatively titled *Shipwreck Century*, it will tie in directly with the exhibits and programming at the Great Lakes Maritime Heritage Center.

Education at Sea

The most exciting way to learn about the sanctuary is to experience it firsthand. Thunder Bay NMS actively embraces shipboard education. For example, half-day programs conducted with Discovery World at Pier Wisconsin on the schooner *Denis Sullivan*, have carried more than 1,500 students through Thunder Bay on educational sailing trips. Public sails on other tall ships including the brig *Niagara*, HMS *Bounty*, *Windy II*, *Appledore*, *Madeline*, and *Friends Good Will* have exposed hundreds of northeastern Michigan residents to the maritime history and shipwrecks of Thunder Bay. Additionally, the sanctuary has worked with NOAA's Great Lakes Environmental Research Laboratory to bring students aboard NOAA research vessels, including Thunder Bay's *Huron Explorer*. Students and teachers see first hand how scientists are working to protect the Great Lakes and their maritime history.

With the opening of the Great Lakes Maritime Heritage Center and ongoing development of deepwater docking and shore-side support facilities, the sanctuary is cultivating relationships with numerous shipboard education organizations such as Discovery World at Pier Wisconsin, the Michigan Maritime Museum, the Inland Seas Education Association, and the Noble Odyssey Foundation to bring more tall ships and research vessels to northeastern Michigan.

MATE International ROV Building Competition

Exploration inspires educational achievement. This is clearly demonstrated in the Marine Advanced Technology Education (MATE) Center's International Remotely Operated Vehicle Building Competition for high school students, which inspires high school students to pursue careers in marine technology, science, and archaeology. Since sponsoring its first local team in 2001, the sanctuary has provided teacher training workshops to allow regional educators to mentor students who wish to build remotely operated vehicles (ROV) for the competition. In 2005, through its involvement with MATE, the sanctuary brought a regional ROV building competition to Alpena. The team competed for a qualifying spot in the international MATE competition. In addition to Alpena High School, the 2nd annual regional competition in 2006 included teams from Traverse City Central High School and Monroe Middle School.

Live Dives

The sanctuary has developed a number of innovative ways to allow non-divers to visit Thunder Bay's extraordinary shipwrecks without getting wet. In 2001, the Thunder Bay NMS began working with the University of Connecticut's National Undersea Research Center to develop a live webcast of video from a sanctuary shipwreck using an ROV. In 2002 and 2003 the team, working with NOAA's Great Lakes Environmental Research Laboratory and the University of Michigan, successfully conducted a live Internet broadcast from the shipwreck *Montana*. Students interacted with underwater archaeologists as an ROV provided video of the dive team exploring the shipwreck.

Since then, the sanctuary has worked to develop more opportunities to connect research vessels and tall ships operating in Thunder Bay to classrooms. These broadcasts allow students, divers, and shipboard educators to communicate in real time. Combining the excitement of exploration and discovery with carefully developed curriculum, they are educationally effective and extremely popular programs. In 2005, the sanctuary partnered with Discovery World at Pier Wisconsin for a Live Dive broadcast from the deck of the schooner *Denis Sullivan* in Thunder Bay. This one-day broadcast reached more than 600 students in classrooms around Michigan and Wisconsin. The Great Lakes



The 2005 Alpena High School ROV team





In 2005-2006, the sanctuary brought 25 live broadcasts into the GLMHC theater, including Dr. Robert Ballard's explorations in the Aegean Sea and expeditions at the *Monitor* and Stellwagen Bank National Marine Sanctuaries. The sanctuary is now connected to Internet 2, a high bandwidth connection dedicated to research and education. This was made possible by the expertise of the Alpena Regional Fiber Consortium, Alpena Community College, and Merit Network.

Maritime Heritage Center is now equipped with Internet 2 capability, enabling sanctuary educators to reach more classrooms with a greater variety of content, taking distance-learning to new levels.

Telepresence

The National Marine Sanctuary Program has established an innovative education and technological framework to bring the excitement of the nation's oceans and Great Lakes to the public by linking oceanographic monitoring programs with interactive telepresence technology. Developed in conjunction with the JASON Project, Mystic Aquarium, and the Institute for Exploration, telepresence technology allows individuals to experience the wonders of special marine areas without getting their feet wet. With underwater cameras and remotely-operated vehicles, telepresence supports distance learning programs, exhibits in aquaria and visitor centers, and web-based learning tools.

Since 2002, telepresence has enabled audiences to remotely control an underwater vehicle tethered in 50 feet of water in the Monterey Bay National Marine Sanctuary. This technology has also allowed audiences and students to interact with scuba divers exploring the underwater kelp forest of Monterey Bay and a coral reef ecosystem in Hawaii. Since 2005, Thunder Bay NMS had been sharing these programs with students and visitors at the Great Lakes Maritime Heritage Center.

Telepresence broadcasts take many forms including permanent installations that offer users access to a particular site using underwater cameras and ROVs, Live Dive programming, expeditionary-based programming, and broadcasts from the decks of working research vessels at sea. As Thunder Bay NMS receives and delivers this programming, telepresence will not only bring the wonders of Thunder Bay NMS to people around the nation, it will also bring the wonders of the nation's other marine sanctuaries to Michigan.



Documentaries

Film and video offer exceptional opportunities to make Thunder Bay accessible to broad audiences. The Thunder Bay NMS has participated in the production of several documentaries, including the Thunder Bay NMS film, *Tragedies in the Mist*. Produced by NOAA in 2003, the 25-minute high-definition documentary explores the history and archaeology of the Thunder Bay NMS, and documents Dr. Robert Ballard's 2002 expedition in the sanctuary. The sanctuary also participated in independent productions of The Science Channel's *Great Lakes Shipwrecks*, The History Channel's *Deep Sea Detectives* episode on the schooner *Cornelia B. Windiate*, and Jean-Michel Cousteau's Ocean Futures Society public television documentary *America's Underwater Treasures*. Collectively, these programs are exposing millions of Americans to the Thunder Bay National Marine Sanctuary.

Thunder Bay Maritime Festival

The Great Lakes once governed community life in northeastern Michigan coastal towns and villages. In order to reconnect with this living heritage, the sanctuary began hosting the Thunder Bay Maritime Festival in 2001 (then called the Thunder Bay Tall Ships Festival). Early festivals attracted an estimated 2,000 visitors and featured tall ships, family boat-building, maritime entertainment, kids' activities, and demonstrations. When the festival moved to the new Great Lakes Maritime Heritage Center in 2006, it attracted nearly 10,000 visitors. In addition to the activities from previous years, the 2006 festival included educational workshops, diving and ROV demonstrations, and tours of the new Great Lakes Maritime Heritage Center. The sanctuary will continue to host the festival to share with children and adults the maritime history that makes Thunder Bay a local, state, and national treasure.



DID YOU KNOW...

Sanctuary staff have presented their preservation message to local, state, national, and international audiences to help promote the sanctuary, northeastern Michigan and the National Marine Sanctuary Program. In 2005 alone, staff gave over 65 presentations around the community and state, reaching out to nearly 5,000 people.



The National Marine Sanctuary Foundation (NMSF) supports the National Marine Sanctuary Program with education and outreach programs designed to preserve, protect, and promote the nation's marine sanctuaries. The NMSF has been the Thunder Bay NMS's principle partner in the Thunder Bay Maritime Festival, and has led the fundraising efforts that make the festival possible. The NMSF also has supported many of the sanctuary's fundraising activities. For more information, see www.nmsfocean.org.

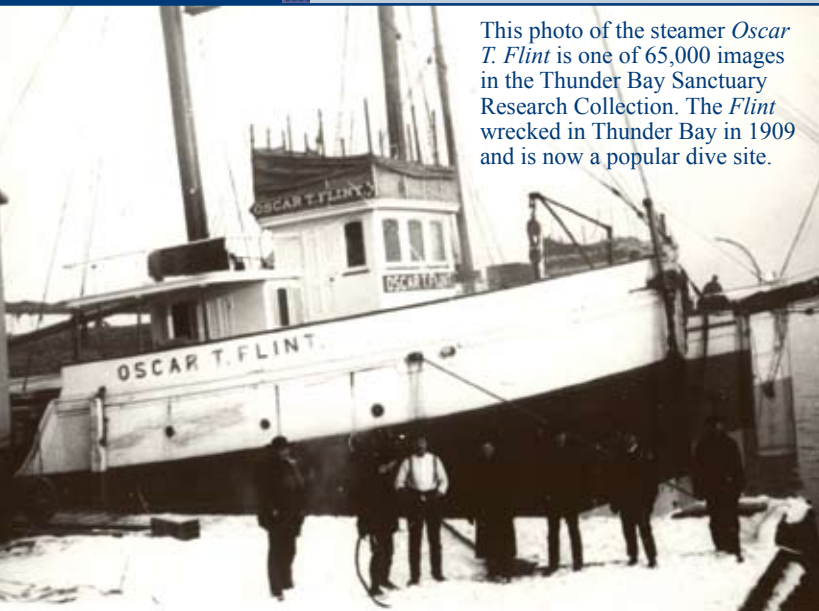




The Thunder Bay Sanctuary Research Collection includes:

- 1,000 published works
- 65,000 photographs
- 56 linear feet of vertical files
- 40 feet of periodicals
- 60,000 data cards
- 100 navigation charts
- 350 shipbuilding plans
- manuscripts and ephemera

This photo of the steamer *Oscar T. Flint* is one of 65,000 images in the Thunder Bay Sanctuary Research Collection. The *Flint* wrecked in Thunder Bay in 1909 and is now a popular dive site.



Sanctuary Research

The Thunder Bay NMS conducts, supports, promotes, and coordinates scientific research and monitoring of its maritime heritage resources to ensure their long-term protection. Archaeological and historical research conducted by the sanctuary and its partners is fundamental to better understanding the region's historic shipwrecks. This knowledge is essential for addressing management issues and enhancing resource protection. Archaeological and historical research is also at the heart of the sanctuary's exhibits, education initiatives, and public programming.

History

Historical research undertaken by the sanctuary and its partners indicates that more than 200 vessels wrecked in the Thunder Bay region. Using documents such as historic newspapers, lifesaving station logs, and more recent published works, the sanctuary has developed an inventory of sunken vessels that are believed to be located in and around the sanctuary. These files are being incorporated into a powerful Geographic Information System (GIS) that will allow researchers to better relate historical information with the actual disposition of shipwrecks and other archaeological sites. Remote-sensing data, satellite imagery, historic and modern maps, and other historical, archaeological, and scientific data are being incorporated into the GIS and will enable better management, interpretation, and public understanding of the sanctuary's maritime landscape.

Thunder Bay Sanctuary Research Collection

The sanctuary is developing an extensive archival resource for studying Great Lakes ships and shipwrecks. Donations to the Thunder Bay Sanctuary Research Collection and the partnership established between NOAA and the Alpena County George N. Fletcher Library have led to the creation of a nationally-significant body of records.

The foundation of the collection, donated to the sanctuary in 2003 by Mr. and Mrs. C. Patrick Labadie, was amassed over a period of more than 40 years and focused on

shipbuilding technology and nineteenth-century Great Lakes shipping. However, it also includes information about Great Lakes ports and waterways, docks, cargoes, machinery and rigging, shipbuilders, owners and fleets, notable maritime personalities, shipwrecks, and underwater archaeology. A special feature of the collection is a card index listing virtually all of the commercial and governmental ships of the Great Lakes before the turn of the twentieth century. This roster of some 20,000 vessels includes descriptive data and highlights of the ships' careers and their ultimate losses. The sanctuary continues to receive donations from various collectors, including Ken Thro, Robert Geno, Peter Vander Linden, and Steve Tongue, greatly expanding the collection's scope.

The Thunder Bay Sanctuary Research Collection is open to the public, providing a valuable tool for studying Great Lakes maritime heritage and further exploring the Lakes' vital role in our nation's development. During 2004 and 2005, staff archivists fielded more than 200 inquiries from scholars, journalists, historians, media personnel, and genealogists. In 2005, the sanctuary and the Alpena County Library received a \$235,000 Library of Michigan Digitization for Preservation and Access Grant to create an on-line database of Great Lakes ships, and to digitize the collection's photographs. In the project's first eight months, volunteers contributed nearly 2,000 hours toward the effort. The project is expected to be completed by the end of 2007. Also in 2005, a \$25,000 grant from NOAA's Climate Database Modernization Program was awarded to the sanctuary to digitize more than 30,000 historic ship negatives from the University of Wisconsin-Superior's Ken Thro collection. Digitization will accelerate the pace of historic research, foster greater public to access the collection, and aid in the preservation of fragile documents by reducing the need for physical handling.

Sanctuary Characterization

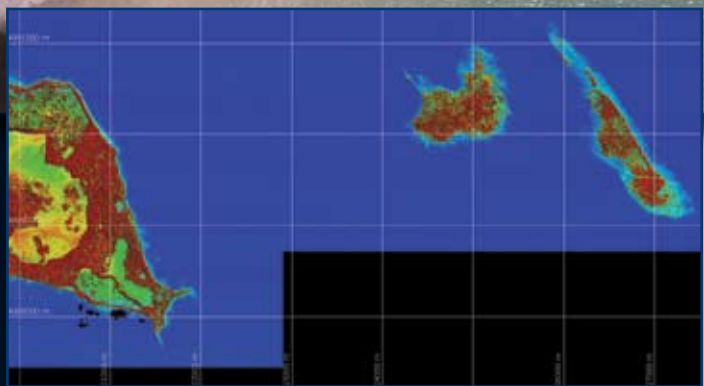
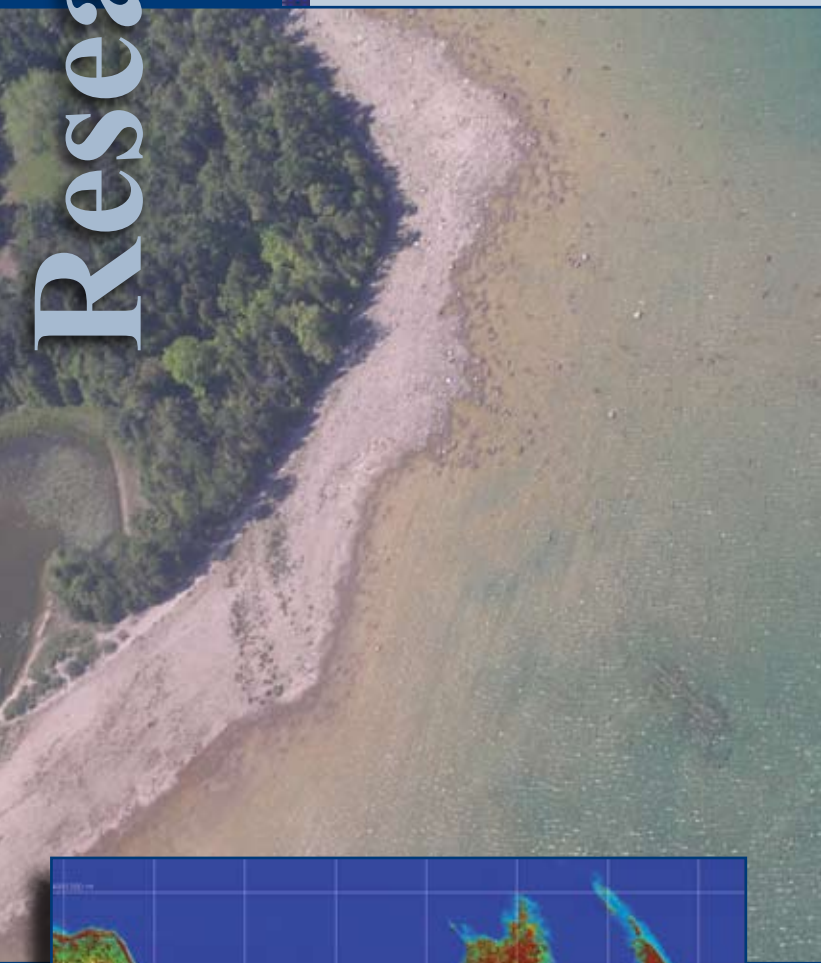
Characterization is the process through which sanctuary resources are discovered, inventoried, archaeologically documented, and ultimately analyzed within a broader historical context. Characterization begins with locating the physical remains of maritime heritage resources, including complete shipwrecks, scattered remains of shipwrecks, docks, cribs, and other remnants of past maritime activity. At Thunder Bay NMS, much effort has focused on locating and documenting shipwrecks and related archaeological

DID YOU KNOW...

Thunder Bay NMS with NOAA's Great Lakes Environmental Research Laboratory, the Cooperative Institute for Limnology and Ecosystems Research have offered fellowships for undergraduates and graduate students at the sanctuary since 2003. This fellowship program provides students with an exciting opportunity to conduct research in the Great Lakes region under the mentorship of sanctuary staff. As of 2006, the sanctuary has hosted fellows from Kalamazoo College, Western Michigan University, University of Michigan, and East Carolina University.



This aerial image (note the shipwreck in the lower right corner) was taken during a 2006 LIDAR survey in the sanctuary. LIDAR is a remote sensing system that uses light pulses from an aircraft to illuminate terrain below (inset). This type of data is being used to update existing shoreline information and to locate and document maritime heritage resources in the shallow and shoreline areas of the sanctuary.



resources. Several sonar-based surveys have been undertaken within the sanctuary and surrounding waters with assistance from NOAA's Office of Coast Survey and NOAA's Great Lakes Environmental Research Laboratory. The sanctuary has also worked with a variety of other partners in its efforts to characterize the sanctuary, including a 2001 sonar survey conducted by the Institute for Exploration (IFE). This survey focused primarily on the sanctuary's deeper waters.

In 2005 and 2006, the sanctuary and the University of Rhode Island's (URI) Institute for Archaeological Oceanography conducted graduate and undergraduate field schools within the sanctuary's shallower waters. These projects focused on conducting side-scan sonar surveys around North Point and Thunder Bay Island. Hundreds of targets were detected in the survey areas. The sanctuary's remote sensing data will be incorporated into its Geographic Information System (GIS) program to better enable resource management, interpretation, and information dissemination.

In 2006, with funding support from NOAA's Office of Ocean Exploration, Thunder Bay NMS worked with NOAA's National Geodetic Survey, Remote Sensing Division, to conduct LIDAR (Light Detection and Ranging) and high-resolution aerial photogrammetry surveys of the sanctuary and surrounding area's shoreline. The locations of several shallow-water shipwreck sites were confirmed using this technique. This remote sensing data, which will bridge the survey gap between the marine and terrestrial environments, complements the sanctuary's on-going deep and shallow-water sonar surveys. The resulting datasets will provide the basis for a comprehensive assessment of the quantity and distribution of sanctuary resources.

Shipwreck Documentation

Once located, archaeological sites must be carefully documented. This critical step is necessary for establishing and evaluating management practices, interpreting sites, and gauging and anticipating the effects of environmental and human impacts to sites. Through documentation, archaeologists reveal the secrets and stories preserved in Thunder Bay's nationally-significant collection of shipwrecks. Archaeological documentation also informs us about current states of preservation, and can identify threats to shipwreck

sites, such as zebra mussels, ice and anchor damage, looting, and other intentional and unintentional human impacts. Documentation provides new information for historians, archaeologists, and scientists, and helps the sanctuary staff create innovative ways for divers and non-divers to connect with shipwrecks.

Many sanctuary projects focus on collecting detailed data about individual wreck sites. In 2002, IFE returned to Thunder Bay to assist sanctuary researchers in documenting deep wrecks. During this expedition, archaeologists used the ROVs *Little Hercules* and *Argus* to capture dozens of hours of high-definition video of shipwrecks. The following year the sanctuary established a partnership with the University of Michigan's Marine Hydrodynamics Lab that enabled the long-term use of ROV technology in the sanctuary. The sanctuary has used the Lab's 500-pound *M-ROVER* on multiple occasions for research cruises and outreach events. In 2004, the sanctuary and the Marine Hydrodynamics Lab jointly purchased a SeaBotix mini-ROV. Weighing just 28 pounds, this specialized ROV is equipped with two high-resolution cameras, a low-light video camera, a manipulator arm, scanning image sonar, and external lighting. The ROV is used by the sanctuary for research and outreach events.

Diving is the primary way that sanctuary archaeologists access shipwreck sites. In 2004 and 2005, with funding from NOAA's Office of Ocean Exploration, sanctuary archaeologists led expeditions aimed at documenting deepwater shipwrecks within the sanctuary. The expeditions focused primarily on four sites: an unidentified two-masted schooner located by IFE in 2001, the 200-foot wooden passenger steamer *Pewabic*, and the three-masted canal schooners *Cornelia B. Windiate* and *E. B. Allen*. The sites rest in water depths ranging from 100 to 190 feet. Using mixed gas diving techniques the team created detailed, high-resolution photomosaics of each site and obtained hundreds of accompanying measurements. Mosaics are an efficient, repeatable way to capture a wreck site's current state of preservation and help archaeologists develop strategies for further investigation. The data is also essential for evaluating shipwreck sites that are becoming increasingly popular for "technical divers" who venture beyond the recreational depth limit of 130 feet. Equally important, the dramatic visual products from these expeditions are used for exhibits that allow non-divers to explore these remarkable historic sites.



Above, a team from the Institute for Exploration prepare to deploy *Argus*, the ROV that provided lighting during the 2002 filming of the sanctuary documentary *Tragedies in the Mist*. Below, a snorkeling adventure on one of Thunder Bay's many shallow shipwrecks.

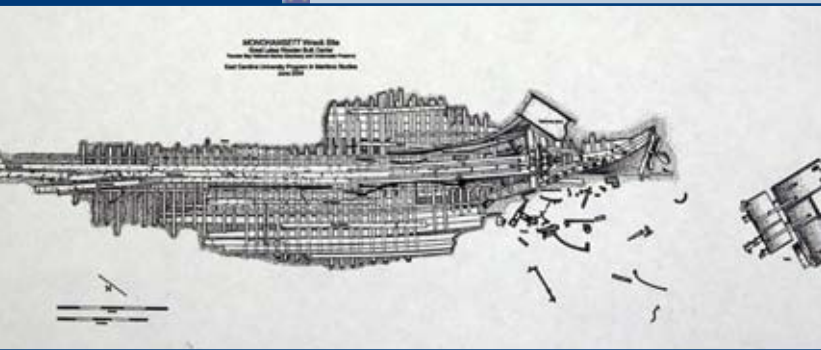


Research

Sanctuary archaeologists use a variety of tools to access and document shipwrecks. Here, a technical diver prepares to dive on the wreck of the *Pewabic* using a blend of helium, nitrogen, and oxygen as breathing gas.



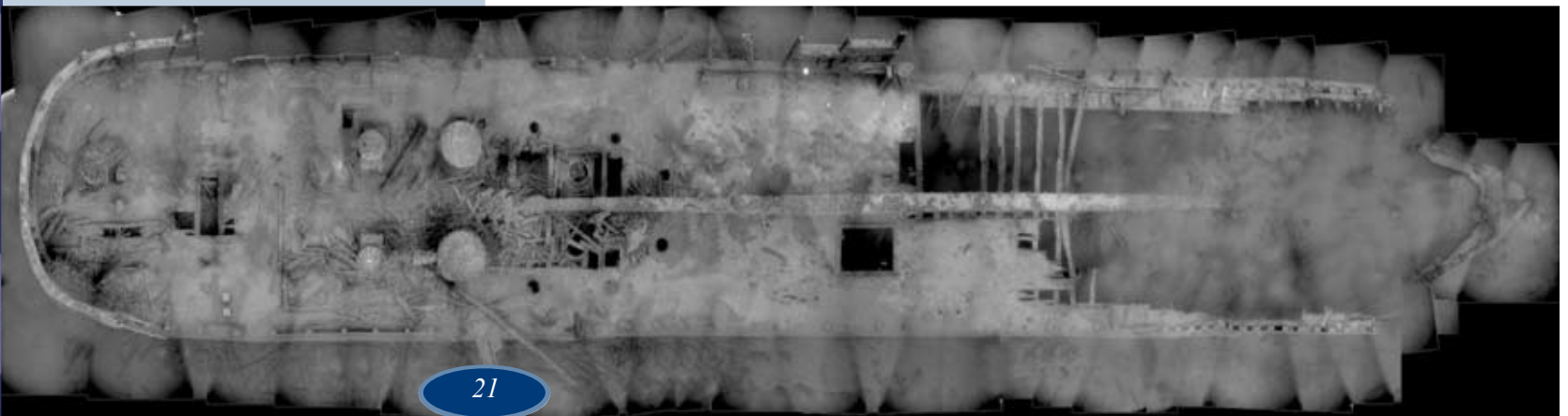
Students from East Carolina University's Program in Maritime Studies created this site plan of the 165-foot steamer *Monohansett* in 2004. The team manually recorded the site with precise measured drawings. With its wide range of shipwreck types and locations, the sanctuary offers an excellent training ground for students.



Technical diving expeditions require extensive planning, support, and personnel. To this end, Thunder Bay NMS is fortunate to have formed partnerships with NOAA's Maritime Heritage Program, NOAA's Diving Program, East Carolina University's Diving and Water Safety Program, the National Undersea Research Center at UNC-Wilmington, and the University of Connecticut.

Most shipwreck documentation is done with divers manually mapping wreck sites using tape measures, drawing slates, still photographs, and video. Manual documentation is conducted on many shipwrecks throughout the sanctuary and is highly accurate and extremely cost-effective, especially in shallower waters. In 2001, the Center for Maritime and Underwater Resource Management (CMURM) conducted preliminary documentation on the sidewheel steamer *New Orleans*, the sanctuary's oldest known shipwreck. CMURM's *Preliminary Archaeological Site Report, Historic Shipwreck New Orleans, Site Number 20UH209* provided the basis for follow-up fieldwork in 2006 by NOAA archaeologists. Similar fieldwork has been carried out at the steamer *Shamrock* and schooner *Maid of the Mist* sites. In 2002, the *Maid of the Mist* site served as training ground for avocational archaeologists attending the sanctuary-sponsored Nautical Archaeology Society's Avocational Underwater Archaeology and Maritime Historical Research Workshop. In 2004, ten graduate students from East Carolina University's Program in Maritime Studies spent two weeks in the sanctuary documenting the remains of the wooden bulk freighter *Monohansett*. Sanctuary archaeologists continued to gather data from dozens of shallow-water shipwreck sites near North Point, Whitefish Point, Isaccson Bay, and Black River. Data collected from shallow shipwreck sites will be used to develop guides for visitors who want to explore shipwrecks by snorkel or kayak.

Resting in 165 feet of water, the Civil War era steamer *Pewabic* is a popular site for advanced divers. To assess the shipwreck's current state of preservation, NOAA archaeologists created this photomosaic in 2005.



Terrestrial Archaeological Projects

The sanctuary has conducted a number of terrestrial projects including the study of a beached wreck, investigations of Alpena's Island Mill and Middle Island, and a land-use survey of the Thunder Bay River. In 2006, students from the University of Michigan and Michigan State University documented the wreckage of the 216-foot *Joseph S. Fay*. Wrecked at 40 Mile Point in 1905, the steamer's remains lay in very shallow water, with a large section of the starboard side located on shore.

Thunder Bay NMS and the Jesse Besser Museum co-instructed a terrestrial archaeology field school on Island Mill for Alpena Community College. Located on the Thunder Bay River, the sawmill was constructed in 1860. During the field school project, five students from Alpena Community College excavated test units, traced original mill foundations, and documented dock and pier foundations surrounding the former industrial site.

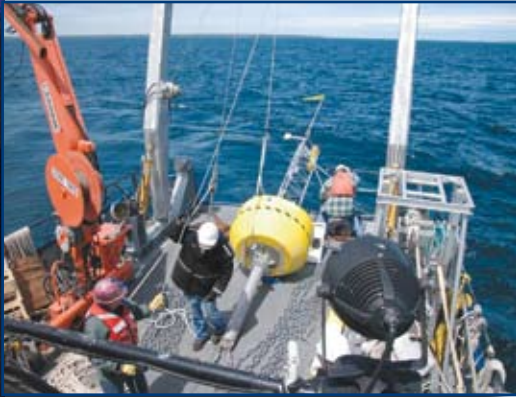
In 2005, the sanctuary worked with a graduate student from East Carolina University to conduct a historical and archaeological survey of the Middle Island Lifesaving Station. This station served the area from 1880 to the mid twentieth century. The survey included blueprint development of buildings at the site.

The land-use survey of Alpena's Thunder Bay River was conducted in preparation for redevelopment projects taking place along the river. Historical research of industrial development on the River from 1860 through the twentieth century focused primarily on the Fletcher Paper Mill and Island Mill.

Understanding the Great Lakes

Protecting sanctuary resources also depends on understanding physical, chemical, and biological processes that characterize the Thunder Bay region. Cold fresh water, oxygen levels, currents, waves, ice action, and the biological conditions are a few of the many natural variables that contribute to the preservation or deterioration of maritime heritage resources. The sanctuary works with NOAA's Great Lakes Environmental Research Laboratory and university partners to characterize factors that affect shipwreck





Preparing to deploy a real-time weather buoy at the site of the steamer *Montana*.

Divers place an underwater camera at the wreck of the steamer *Montana*. The camera transmits live images from the site to the public via the internet.



deterioration. For example, investigators from the University of Rhode Island's Graduate School of Oceanography have placed fresh pieces of wood from species once used to construct ships on monitoring sites within the sanctuary. This will help researchers track the rate of biological infestation and identify bio-chemical processes that affect site preservation.

Acquiring Meteorological Data

In 2004, the Thunder Bay NMS and NOAA's Great Lakes Environmental Research Lab (GLERL) placed an Integrated Coastal Observing System buoy in the sanctuary at the shipwreck *Montana*, nine miles from shore. The buoy is equipped with a host of sensors that provide real-time meteorological data, such as air temperature, wave height and direction, wind speed and direction, and temperatures throughout the water column. In 2006, an underwater video camera was added to the buoy to allow archaeologists to monitor the shipwreck's environmental conditions and provide real-time shipwreck imagery for visitors at the Great Lakes Maritime Heritage Center.

The sanctuary and GLERL also mounted a meteorological station at the entrance to the Thunder Bay River. This station provides real-time weather data, and has a camera that continuously generates three real-time views of Thunder Bay. Thunder Bay NMS and GLERL are developing a long-range plan for additional observation buoys and several shore-based metrological stations.

Sinkholes

Several submerged sinkholes occur within the sanctuary. Sinkholes are large collapsed formations in the limestone bedrock. Thunder Bay's underwater sinkholes were exposed during the last ice age when the waters of Lake Huron were more than 100 meters below the present level. Because of this, the sinkholes could contain human cultural materials, potentially well-preserved in the lake's protective environment.

Despite their significance, little is known regarding the hydrology, biology, and geochemistry of the sinkholes in large lakes of the world. The sanctuary has partnered

with the Institute for Exploration, NOAA's Great Lakes Environmental Research Laboratory, the University of Michigan, Grand Valley State University, the University of Wisconsin-Stout, the Michigan Department of Environmental Quality, the Noble Odyssey Foundation, and Wayne State University to conduct an interdisciplinary investigation of this unique benthic habitat. The study is working to provide the first detailed picture of the diversity of life and hydrologic processes in a range of sinkhole ecosystems found in the sanctuary.

Artifact Stewardship: Conservation and Curation

The Michigan Department of History, Arts and Libraries Office of the State Archaeologist has custody of more than 800 objects recovered from shipwrecks in Michigan waters. In 2005, the process of moving this collection to the Great Lakes Maritime Heritage Center began with the transportation of dozens of *Pewabic* artifacts. These artifacts will be displayed in the Great Lakes Maritime Heritage Center's visible artifact storage exhibit, while others are being prepared for conservation. The Great Lakes Maritime Heritage Center boasts a well-equipped conservation lab where artifacts of all sizes and conditions can be treated prior to display, or stabilized for long-term storage. The conservation laboratory's public viewing window has generated excitement about the science of conserving artifacts.

The sanctuary also receives artifact donations from private collections throughout Alpena and northeast Michigan. Private owners have donated or transferred more than two dozen recovered shipwreck artifacts, objects of regional maritime history, and family heirlooms to the sanctuary, assuring that these items remain in the community. Artifacts that are accepted are accessioned into the State's collection and assessed for conservation needs. Artifacts will be used in exhibits at the Great Lakes Maritime Heritage Center, displayed in the visible storage area, and loaned to other museums throughout the region. Though the sanctuary and Michigan law prohibit the recovery of new artifacts without a permit, they provide a mechanism for previously-recovered artifacts to return to public ownership.



A safe recovered long ago from the steamer *Pewabic* is now on display at the Great Lakes Maritime Heritage Center. The artifact was conserved by sanctuary experts.



Thunder Bay National Marine Sanctuary Advisory Council 2006

Don Beem
Dennis Bodem
Ronald Chatfield
R. Eric Cline
David Dekett
Bill Estlack
Gerald Fournier
Kenneth Gauthier
Art Gillespie
Mayor John Gilmet
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Ken Kolasa
Stephen Kroll
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Jerome Meek
Deb Pardike
Ed Retherford
Carol Shafto
Joe Sobczak
Karen Tetzlaff
Marie Twite
Lynda Van Dusen
Kim Wallis-Burke
Charles Wiesen



2006 Thunder Bay Sanctuary Advisory Council Chair Steve Kroll and Vice-Chair Ed Retherford.

Community Involvement and Partnerships

Community involvement and partnerships are essential to the sanctuary's success. With its ever-expanding outreach efforts, the sanctuary has become a resource for a wide range of user groups, including divers, teachers, historians, archaeologists, and other researchers. The sanctuary's presence has sparked several public and private heritage tourism endeavors, and the sanctuary works closely with local communities to further develop its potential as a heritage tourism destination. The sanctuary seeks partners with innovative ideas and welcomes new opportunities for collaborations.

Sanctuary Advisory Council

The sanctuary's commitment to the local community and the community's commitment to the sanctuary are best evidenced by the Thunder Bay Sanctuary Advisory Council. This 28-member council provides advice and recommendations for sanctuary management. Members represent the community's different interests, including government, education, research, recreational fishing, diving, tourism, economic development, and the community-at-large. Council members serve as liaisons between their constituents and the sanctuary, keeping sanctuary staff informed of issues and concerns. The council forms working groups that develop recommendations for outreach, education, and a volunteer action plans. Council members also perform outreach to their respective constituents on the sanctuary's behalf. In 2005, council members took on major volunteer roles in events such as Thunder Bay Maritime Festival, the opening of the Great Lakes Maritime Heritage Center, and the Thunder Bay NMS Fifth Anniversary Gala.

Preserve America Community



In 2005, in collaboration with the City of Alpena, the sanctuary led a successful effort to nominate Alpena as a Preserve America community. Spearheaded by First Lady, Laura Bush, the Preserve America initiative recognized Alpena for protecting and celebrating its heritage, for using its historic assets for economic development and community revitalization, and for encouraging people to experience and appreciate Alpena's historic resources through education and heritage tourism programs. The designation makes

the City of Alpena eligible for grant funds from Preserve America initiatives lead by NOAA and National Park Service. In 2006, the sanctuary and the Alpena County Library received a grant from NOAA's Preserve America mini-grant initiative to purchase equipment for digitizing the Thunder Bay Sanctuary Research Collection.

Alpena's Cool Cities Projects

The sanctuary continues to contribute to the City of Alpena's Cool Cities projects. A State of Michigan initiative, the Cool Cities program provides funding to qualified cities for revitalization efforts. By improving urban areas, the program encourages people to live, work, and shop in these revitalized "cool cities." In 2004, the City of Alpena received a \$100,000 pilot grant from the State of Michigan to revitalize South Riverfront Park, located along the Thunder Bay River. The project funded a new boardwalk, pavilions, seating, and historically accurate street lighting along the river. To complement the project, three full-color historical interpretive panels on aspects of Alpena's maritime heritage were installed at the park. The panels were produced jointly by the Thunder Bay NMS and the City of Alpena with funding from the NOAA's Maritime Heritage Program.

The City of Alpena, Alpena Marc, LLC, Michigan Department of Transportation (MDOT), and the sanctuary have partnered on a MDOT administered federal transportation enhancement grant entitled the Great Lakes Maritime Heritage Trail. The \$3.4 million grant will fund improvements along 2,800 feet of the Thunder Bay River behind the Great Lakes Maritime Heritage Center and the historic Fletcher Paper Mill complex. New community and heritage tourism focused amenities include dockage for visiting tall ships, a boardwalk, a pedestrian bridge, acres of new landscaping, historically themed lighting, and 12 interpretive panels. Developed by the sanctuary, the panels will interpret shipwrecks, Great Lakes shipping, lumber mills, dock remnants, and historic waterfront buildings to create a broader maritime heritage context for the sanctuary's shipwrecks. The panels are also an excellent way to bring the sanctuary's preservation message to the public.



The tall ship HMS *Bounty* visited Alpena in 2004, welcoming over 3,000 visitors in two days. New dockage and amenities near the Great Lakes Maritime Heritage Center will allow an even greater number of tall ships and research vessels to visit the city.





Sponsored by the sanctuary, the Thunder Bay Community Boat Building Program gives people of all abilities an opportunity to learn new skills and interact with other members of the community.

Thunder Bay Community Boat Building Program

The sanctuary's Thunder Bay Community Boat Building Program is a volunteer-driven program that offers several opportunities for individuals of all experience levels to participate in small boat-building. Since 2002, during the Thunder Bay Maritime Festival, the sanctuary has sponsored a Family Boat Building Weekend. The fun and educational three-day event allows families to build their own 8-foot wooden boats. An identical boat was built by the sanctuary's all-volunteer team in 2005 and was raffled off to generate funds for sanctuary education initiatives. In the winter of 2005, the program began building two 16-foot cedar-strip canoes as part of a community program aimed at attracting builders with little or no boat-building experience. In only six months, the volunteer team contributed an impressive 1,500 hours to the project. The sanctuary is working to develop a permanent boat-building facility at the Great Lakes Maritime Heritage Center, where the public can watch and participate in year-round activities.

Sanctuary Volunteer Program

With the creation of a volunteer coordinator staff position in late 2005, the sanctuary's volunteer program is underway in earnest. The sanctuary is implementing formal training, recruiting, recognition, and retention program for volunteers. Volunteers are used in nearly every facet of the sanctuary, including the community boat-building program, greeters and guides at the Great Lakes Maritime Heritage Center, archival digitization assistants in the Thunder Bay Sanctuary Research Collection, educators, research assistants, and special events volunteers. In 2005, 45 volunteers contributed nearly 1,900 hours to numerous sanctuary programs and events, such as the Thunder Bay Maritime Festival, Alpena Holiday Parade, Family Boat-Building Weekend, Friday Nights Downtown, Thunder Bay Sanctuary Research Collection, and activities at the Great Lakes Maritime Heritage Center. In the first seven months of 2006, nearly 100 volunteers have contributed more than 5,400 volunteer hours.



Former Sanctuary Advisory Council Chair Carol Shafto (left) congratulates Betty Krueger, recipient of the 2005 National Marine Sanctuary Foundation Stewardship Award.

Tourism

The Thunder Bay National Marine Sanctuary is working with local, regional, and state partners to foster northeastern Michigan's identity as an exciting destination for heritage and eco-tourism. In addition to promoting the sanctuary through education and outreach, the sanctuary is a partner in several initiatives to interpret and promote the region's rich maritime landscape and extraordinary natural resources. The sanctuary is a key destination in the State of Michigan's Maritime Heritage Destination Tour. In addition, Thunder Bay NMS is a key player in Michigan Sea Grant's Integrated Assessment, a multi-disciplinary study that is exploring how northeastern Michigan can stimulate economic development through tourism, while maintaining the integrity of the area's cultural and natural resources.

Improving Community Safety

The sanctuary works consistently with its community partners to improve public safety on and below the water. In 2003 and 2004, the sanctuary participated in diving and boating accident drills designed to test emergency responses from several agencies, including the U.S. Coast Guard, Alpena Combat Readiness Training Center, Alpena Central Dispatch, Alpena County Sheriff Department, Michigan Department of Natural Resources (DNR), the Alpena Regional Medical Center, and the Alpena Fire Department. In addition to supplying local DNR vessels with emergency oxygen kits to aid in dive accidents, the sanctuary has also established a partnership with the Alpena Regional Medical Center to jointly fund a hyperbaric chamber in Alpena to treat diving-related injuries, and for innovative non-diving medical treatments.

With other NOAA partners, the Thunder Bay NMS is working to improve marine safety by providing the public with access to accurate and up-to-date weather conditions. By providing near-real-time data from the sanctuary's shore-based meteorological stations and data buoys, NOAA is improving the National Weather Service's marine forecasts for Thunder Bay. The information is also available on the sanctuary's web site and will ultimately be accessible from shore-side kiosks.



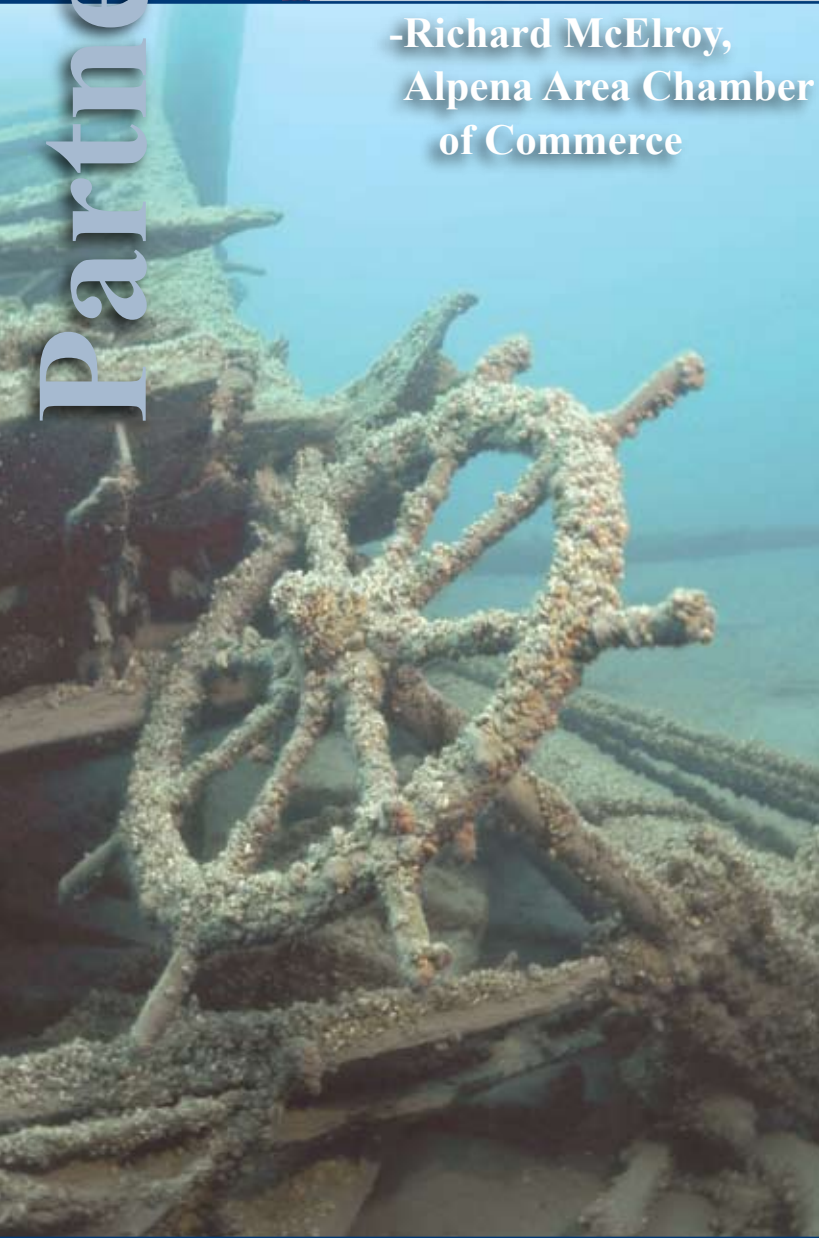
The sanctuary has developed several interpretive and marketing displays, including a traveling display for dive shows and community events, shore-side historical markers on the Thunder Bay River, and displays at the Alpena County Regional Airport and several local businesses. Developed in partnership with the Alpena Area Chamber of Commerce, large "Welcome to Alpena" signs that feature the sanctuary greet motorists as they enter the City of Alpena.



The successful diving and boating accident exercises helped improve coordination between local response agencies to ensure on-water safety and emergency response in the sanctuary.

“The sanctuary acts as a true partner in every meaning of the word.”

-Richard McElroy,
Alpena Area Chamber
of Commerce



Sanctuary Partners

The sanctuary relies heavily on the work of others to carry out its mission. Partners in the form of private businesses, nongovernmental organizations, educational and cultural institutions, and local, state, and federal agencies provide expertise for scientific research and exploration, resources and capacities for site monitoring and enforcement, and support for educational and outreach programs.

As indicated throughout this report, the Thunder Bay NMS's many partnerships have been, and will continue to be, critical to the success of the sanctuary.



The sanctuary continues to develop programming with the U.S. Naval Sea Cadet Corps, Great Lakes Division. The Sea Cadet program is dedicated to helping American youth realize personal success and achievement through a maritime training program. During the summer 2005 cruises aboard the 80-foot training vessel, *Pride of Michigan*, the cadets logged 444 dives, nearly half of which were in the sanctuary. The *Pride of Michigan* served as a dive platform for Jean-Michel Cousteau's Ocean Futures Society camera team while they filmed a segment for the PBS special *America's Underwater Treasures*. The cadet's unforgettable experience was made possible by this unique sanctuary partnership.

Shipwrecks of the Thunder Bay National Marine Sanctuary

Historical research indicates that more than 200 shipwrecks lie below the waters of Lake Huron, in and around Thunder Bay. The sheer number of shipwrecks is impressive. However, it is their excellent state of preservation and what they represent—a century and a half of maritime commerce and travel on the Great Lakes—that elevate them to national and international significance deserving of an extraordinary level of protection, study, and public interpretation. The list below includes both shipwrecks that have been located, and those that await discovery. Each is a unique and fragile element in the history that the Thunder Bay National Marine Sanctuary is dedicated to protecting.

<i>Acme</i> 1893	<i>Caledonia</i> 1860	<i>E.B. Palmer</i> 1892	<i>Harwich</i> 1858
<i>Acontias</i> 1887	<i>Carbide Barge</i> unknown	<i>Edward U. Demmer</i> 1923	<i>Havre</i> 1845
<i>Adriatic</i> 1863	<i>Cascade</i> 1900	<i>Effort</i> 1901	<i>Henry Hagar</i> unknown
<i>Agate</i> 1857	<i>Charles C. Ryan</i> 1890	<i>Egyptian</i> 1897	<i>Henry Hubbard</i> 1845
<i>Aimee</i> 1880	<i>Choctaw</i> 1915	<i>Emerald</i> 1909	<i>Invincible</i> 1869
<i>Albany</i> 1853	<i>City of Alpena</i> 1880	<i>Empire State</i> 1877	<i>Ironton</i> 1894
<i>Alpena Marina Barge</i> 1970	<i>Clifton</i> 1924	<i>Equator</i> 1880	<i>Isaac M. Scott</i> 1913
<i>Alvin Buckingham</i> 1870	<i>Coast Guard Barge</i> 1937	<i>Etruria</i> 1905	<i>Ishpeming</i> 1903
<i>American Union</i> 1894	<i>Colonel Hathaway</i> 1881	<i>Excelsior</i> 1871	<i>J.B. Martin</i> 1869
<i>Anna Smith</i> 1889	<i>Commodore Foot</i> 1867	<i>Exile</i> 1916	<i>J.E. Rumbell</i> 1907
<i>Annie C. Raynor</i> 1863	<i>Congress</i> 1868	<i>F.T. Barney</i> 1868	<i>J.H. Magruder</i> 1895
<i>Arnoline</i> 1842	<i>Cornelia B. Windiate</i> 1875	<i>Fame</i> 1887	<i>J.H. Stevens</i> 1927
<i>Avon</i> 1869	<i>Corsair</i> 1872	<i>Florida</i> 1897	<i>J.N. Dewey</i> 1920
<i>B.H. Becker, B.H.</i> 1937	<i>Corsican</i> 1893	<i>Francis Berriman</i> 1877	<i>James Atkinson</i> 1884
<i>B.W. Blanchard</i> 1904	<i>Czar</i> 1875	<i>Frank Lafarge</i> 1901	<i>James Davidson</i> 1883
<i>Barge No. 083</i> 1941	<i>D.M. Wilson</i> 1894	<i>Fred A. Morse</i> 1892	<i>James H. Hall</i> 1916
<i>Barge No. 105</i> 1934	<i>D.R. Braman</i> 1870	<i>G.W. Wesley</i> 1901	<i>James Mowatt</i> 1919
<i>Bay City</i> 1902	<i>D.R. Hanna</i> 1919	<i>Galena</i> 1872	<i>Jay Ochs</i> 1905
<i>Beau Grand</i> 1970	<i>Darien</i> 1870	<i>Glad Tidings</i> 1898	<i>Jeka</i> 1930
<i>Belle Wilson</i> 1888	<i>Defiance</i> 1854	<i>Gold Hunter</i> 1879	<i>John C. Liken</i> 1890
<i>Benjamin Franklin</i> 1850	<i>Detroit</i> 1872	<i>Great Lakes Barge Unlimited</i> 1976	<i>John F. Warner</i> 1890
<i>Bentley, James R.</i> 1878	<i>Don Quixote</i> 1836	<i>Grecian</i> 1906	<i>John J. Audubon</i> 1854
<i>Bernice D.</i> 1981	<i>Dottie</i> 1921	<i>Guillotine</i> 1881	<i>John Jewett</i> 1898
<i>Bertha May</i> 1930	<i>Dump Scow</i> 1930	<i>H.P. Bridge</i> 1869	<i>John T. Johnson</i> 1904
<i>Bull of the Woods</i> 1885	<i>Duncan City</i> 1923	<i>Harvest Queen</i> 1880	<i>Joseph S. Fay</i> 1905
<i>C.K. Dixon</i> 1877	<i>E.B. Allen</i> 1871	<i>Harvey Bissell</i> 1905	<i>Julia Larson</i> 1912

Jupiter 1901
Kaliyuga 1905
Kate L. Bruce 1877
Kate Moffatt 1885
Knight Templar 1903
Kyle Spangler 1860
L.M. Mason 1861
Lady Franklin 1895
Lake Michigan Car Ferry Barge No. 1 1918
Light Guard 1903
Loretta 1896
Lucinda Van Valkenburg 1887
Lucy Raab 1862
M.F. Merrick 1889
Mackinaw 1890
Maid of the Mist 1878
Marine City 1880
Marion Egan 1875
Mary Woolson 1920
Messenger 1890
Miami 1924
Millard Fillmore 1891
Monohansett 1907
Monrovia 1959
Montana 1914
Murray Company Dredge Heart Failure 1906
Nellie Brampton 1875
Nellie Gardner 1883
Neshota 1872
New Hampshire 1884
New Orleans 1906
New Orleans 1849
New York 1910

Newell A. Eddy 1893
Nina 1875
Nonpareil 1866
Nordmeer 1966
Nordmeer Salvage Barge 1975
Norman 1895
Northampton 1854
Northern Light 1880
Northwestern 1850
O.E. Parks 1929
Ogarita 1905
Ohio 1894
Oscar T. Flint 1909
Oswegatchie 1891
P.H. Birkhead 1905
Perseverance 1864
Persian 1868
Pewabic 1865
Philo S. Bemis 1872
Portland 1877
Portsmouth 1867
R.G. Coburn 1871
Racer 1869
Ralph 1920
Red Bottom 1876
Reindeer 1895
Roanoke 1866
Russian 1908
S.H. Lathrop 1902
Sampson 1916
Scanlon's Barge unknown
Shamrock 1905
Snow Drop 1892

Stephen Chase 1933
Syracuse 1863
Thousand Islander 1928
Thunder Bay Island Lifeboat
Topaz VII 1941
Tu Jax I 1913
Tu Jax II 1915
Typo 1899
Utica 1837
Venus 1887
Viator 1935
Vienna 1906
W.C. Franz 1934
W.G. Mason 1924

W.H. Gilbert 1914
W.H. Rounds 1905
W.S. Carkin 1887
W.S. Nelson 1861
Wanderer 1924
Wavertree 1867
West Side 1906
William A. Young 1911
William H. Simons 1933
William H. Stevens 1863
William Maxwell 1908
William P. Rend 1917
William Peter Thew 1909



Thunder Bay National Marine Sanctuary

