

Fathoming Our Past



Historical Contexts of the National Marine Sanctuaries



FATHOMING OUR PAST

HISTORICAL CONTEXTS OF THE NATIONAL MARINE SANCTUARIES

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NOAA National Marine Sanctuary Program

1995, 2007

SSMC IV

1305 East West Highway

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ISBN 978-1-4243-4417-8

LCCN 2007924975

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ACKNOWLEDGMENTS

I wish to extend thanks to all of the folks in the National Marine Sanctuary Program whose contributions and patience made this second edition possible. In particular, I would like to thank Charly Alexander, Daniel J. Basta, Walt Bonora, John Broadwater, Angela Calos, Matthew Dozier, Matthew Lawrence, Wayne Lusardi, Deborah Marx, Robert Schwemmer, Robert Steelquist, Matt Stout, Sharon Sirkis and Hans Van Tilburg.

I would also like to thank Sandra Nitchie, Auralea Krieger and Kelly Royall.

- Bruce G. Terrell

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FOREWARD

“Americans today have no past. They live in the moment, think in the moment, and hence have no sense of the future. Without a past there is no future.” ~*Studs Terkel (Radio broadcast, National Public Radio, 2006)*

The volume you hold in your hands provides an instrument for considering the meaning of our nation’s maritime heritage as viewed through the lens of our nation’s national marine sanctuaries. Although only a glimpse, it allows us to consider the past and the future of the mosaic of American culture. “Fathoming Our Past” helps us define why our maritime heritage is important to us as a community and a nation. It also tells us about who we are and why it is worth our efforts to preserve and interpret heritage resources for future generations.

At the National Marine Sanctuary Program we use a focus on heritage resources as a tool to encourage a way of thinking. “Fathoming Our Past” presents the compelling role of the ocean in humanity’s journey. We want to engage society’s attention and to excite the mind by telling stories that bring all Americans to look seaward. By refocusing our vision, we see the interconnectedness of the heritage and natural resources of the ocean.

In this way NOAA’s National Marine Sanctuary Program strives to propel the evolution of the discipline of maritime archaeology as a “means to an end” to help all Americans engage in behaviors that conserve our oceans.



Daniel J. Basta
Director
NOAA’s National Marine Sanctuary Program

PREFACE

The publication of *Fathoming our Past: Historical Contexts of the National Marine Sanctuaries* in 1994 was a significant milestone for NOAA's National Marine Sanctuary Program in the development of a comprehensive, system-wide maritime heritage resource management strategy. This concise, but thorough, historical study also provided sanctuary program management with a framework from which to develop maritime heritage goals for their site management plans.

Even as the book was in publication, the program was growing. Since the first printing, three sanctuaries have been added. As this second edition goes to press, President Bush has dedicated the Northwestern Hawaiian Islands Marine National Monument as the fourteenth managed area in the program. With the addition of the Northwestern Hawaiian Islands, NOAA will be responsible for managing as large an area of federal lands as the National Park Service—only NOAA's lands all are submerged. This revised edition of *Fathoming our Past* includes the new sanctuaries as well as updated information on the original 10.

Although the first national marine sanctuary was a shipwreck, little program-wide emphasis was placed on maritime heritage resources during the first two decades of the program's existence. During the late 1980s, however, a maritime archaeologist and in 1991 a maritime historian, were hired at the national program level. In 1992, a maritime archaeologist was hired to manage USS *Monitor* National Marine Sanctuary. With the publication of *Fathoming our Past* the National Marine Sanctuary Program formally defined its comprehensive program for identifying, protecting, and interpreting maritime resources within the sanctuaries. The designation of the Thunder Bay National Marine Sanctuary and Underwater Preserve in 2000 and the hiring of additional maritime specialists at several sanctuaries bolstered the nascent heritage program. In 2001, the NMSP Maritime Heritage Program was established, with an acting program manager and a "working group" composed of key personnel at headquarters and a maritime heritage coordinator designated for each sanctuary. In 2004, the Maritime Heritage Program was fully implemented, with a program manager, a council charter and a Maritime Heritage Program working group.

The Maritime Heritage Program's mission is to *provide, promote and explore our maritime heritage through a national program embracing heritage resources in our evolving coastal and marine stewardship*. The major goals are to:

- Promote maritime heritage to reveal broader knowledge of historical and cultural resources.
- Promote and coordinate the location, inventory, and assessment of maritime heritage resources throughout the National Marine Sanctuary System and out to the U.S. Exclusive Economic Zone.
- Promote and coordinate the protection and preservation of maritime heritage resources throughout the National Marine Sanctuary System and out to the U.S. Exclusive Economic Zone.
- Promote a better understanding of and appreciation for maritime heritage resources through a comprehensive education and outreach program.
- Promote, coordinate and conduct archaeological research directed at maritime heritage resources throughout the National Marine Sanctuary System out to the U.S. Exclusive Economic Zone.

The national marine sanctuaries also coordinate with NOAA's Preserve America Initiative. Preserve America is a White House initiative that seeks to encourage preservation of the country's historical and natural heritage and to encourage contemporary uses including heritage tourism. Several of the national marine sanctuaries have Preserve America communities that adjoin their maritime boundaries.

This revised and expanded edition of *Fathoming Our Past* primarily focuses on the first goal, although it is relevant to the other four as well. NOAA invites you to read this book with an eye toward assisting us with our goals or to implementing a similar program elsewhere. We encourage your comments on this publication as well as on our Maritime Heritage Program.

John D. Broadwater, Program Manager
NOAA's Maritime Heritage Program

EDITOR'S PREFACE TO SECOND EDITION

Humans have a place in the sea. We work on it, play in it and our activities affect its health. The sea has given us sustenance and has made possible economics and societies. It has been a source of adventure and a venue for nations to settle their scores. Many of the people engaged in working on the sea were non-literate and left no record of their lives. Fortunately, the seabed can still tell the stories of humankind's life on the ocean.

Past cultures have left traces of their presence on the seabed. Early prehistoric peoples harvesting resources along their coastlines retreated to the uplands as melting polar ice caps forced the sea level to rise. The evidence of their endeavors is now buried in mud and sand beneath the water. The remains of centuries of seafaring, too, rest on the sea floor. While fragmented and fragile, careful study is presently unlocking many previous mysteries.

As the "ocean agency," NOAA is committed to protecting the subset of the submerged human past that is in the national marine sanctuaries. This publication places these important heritage resources in context with their time, place and contemporary historical background. The National

Marine Sanctuary Program uses the concept of "maritime heritage" as the umbrella term that covers our discussions of man in the sea. **Historical resources** are those objects which remain in place to remind us of historic activities such as lighthouses, navigation markers, or historic wharves, docks and piers. **Archaeological resources** are the remnants of humankind's quest, whether it be prehistoric trash middens buried under meters of sediment or a shipwreck collapsed upon itself on the seabed. Some of these resources await the systematic uncovering and examination that can unlock questions about past ways of life and historic or legendary events. Others are there for all to visit and to experience wonder at the drama of maritime tragedy. Traditional stories and practices and living remnants of ancient and often indigenous populations are discussed as **Cultural heritage resources**.

Taken together, these things tell us about humankind's adventure on the earth and on the sea. NOAA's National Marine Sanctuary Program embraces the responsibility to both unlock these stories and to protect their physical remains for the benefit of the American people.

INTRODUCTION

Much of the American story has evolved around water. Historically, waterways were our main travel routes. Most European settlements in colonial America developed on navigable waterways. Protected harbors enabled ship-borne economic exchange. Port towns accumulated warehouses, stores and taverns. Populations grew as trade expanded. Settlement marched inland, giving way to more towns. Diverse ports such as Boston, New York and San Francisco became destinations for ships of commerce and war.

A predictable by-product of such human endeavor is the deposition of waste. Building foundations, human remains, and discarded and lost items — from tools and household utensils to personal items — usually found repose in the ground. Modern researchers now illuminate many aspects of our predecessors' lives through careful excavation and analysis of such remains. Archaeological sites are sealed time capsules that provide windows to the past, allowing us to glimpse the lives of earlier peoples and wonder how they lived, worked, played, and died.

Our waters, likewise, preserve important evidence of our ancestors' past. The river and ocean floors preserve remnants of sites where people lived and of the vessels with which they conducted trade and fought wars. Ships, boats, wharves, lighthouses, prehistoric sites, and a myriad of other maritime treasures lie covered by water, sand, and time.

In 1966 Congress passed the National Historic Preservation Act that established the responsibility of federal agencies to protect the historic resources on public lands within their aegis. This act and several others form the foundation of the heritage resource management programs of federal agencies. Under the guidance of the National Park Service, these laws form part of the Federal Archaeological Program. Other acts that compose the program include the Archaeological and Historical Preservation Act of 1974, the Archaeological Resources Protection Act of 1979, the Abandoned Shipwreck Act of 1988 and the Sunken Military Craft Act of 2005.

NOAA's commitment to the protection and preservation of heritage resources is also stated in the Marine Protection, Research, and Sanctuaries Act of 1972. National Marine Sanctuary Program regulations emphasize that NOAA will manage these resources consistent with the Federal Archaeological Program.

While only two of the national marine sanctuaries focus exclusively on maritime heritage resources, nearly all the sanctuaries contain historical shipwrecks or other maritime heritage resources. One of the sanctuary program's goal is to locate and inventory the maritime archaeological resources within the sanctuaries as well as documenting events that have taken place in the past. In response to Section 110 of the National Historic Preservation Act, the sanctuary program is mandated to survey, identify, and inventory each sanctuary's maritime heritage resources. These include all properties and sites possessing historical, cultural or archaeological paleontological significance.

The 1994 publication of *Fathoming our Past* was a significant milestone in the development of a comprehensive, system-wide maritime heritage resource management program. As with the original, the intent of this revised and updated edition is to educate sanctuary personnel and visitors to the sanctuaries about historical events that took place in those regions. This study also identifies potential areas in which further archaeological research should be conducted.

This document is also, in part, a response to the Secretary of the Interior's recommendations that agencies managing public lands should produce a historical contexts study. Historical context studies break the past down into themes and historical eras. This enables readers to compare events in different places that occurred at the same time. They are also useful for developing archaeological survey strategies, and save time and money needed to locate sites. Once a shipwreck site has been found, contextual studies help to identify vessels and cargo.

Section I of ***Fathoming Our Past*** offers a broad chronology of American maritime history as it relates to national marine sanctuaries. Each chronological context contains an overview of regional economic activities, historic and regional watercraft, and regional naval activities and battles. The contexts are:

Native Peoples (Approximately 20,000 years before present to 18th century)

This section includes both prehistoric people and the native peoples later encountered by European explorers. Since pre-contact native peoples had no written language, our understanding of their past is based on other sources. Our primary information comes from archaeological excavations. Traditional stories (and language itself) retold from generation to generation also often provide genealogical and social information. Finally, chronicles of European and American travelers describe native peoples' ways of life through Western eyes.

European Colonial Period (16th to 19th century)

The dates of early European presence in various regions of the United States vary. The Spanish and Portuguese were the earliest maritime explorers in 15th and 16th century America, while the British became active by the end of the 16th century. Other European countries also undertook New World adventures during these centuries. The European Colonial context covers European exploration and colonization in North America. Its endpoint varies as each geographic region was incorporated into the United States.

American Period (18th to early 20th century)

This period begins at a region's inclusion into the United States and extends into the 20th century. One of the criteria for eligibility to the National Register for Historic Places requires that a property be at least 50 years old to be considered for inclusion. Therefore, discussions of historical contexts will extend through World War II.

Section II applies these historical contexts to each sanctuary in the National Marine Sanctuary System. Each sanctuary overview concludes with a discussion of known and potential archaeological resources, and recommends future resource management needs.

A priority level of high, moderate, or low is assigned to each sanctuary to indicate the level of attention that should be devoted to that sanctuary's heritage resources. Factors that establish the assigned priority level include the probable number and type of archaeological resources and potential threats to the resources.

Prehistoric and historic archaeological materials comprise perhaps the most vulnerable of our submerged assets. Unlike living resources, they are non-renewable. While a damaged reef or organism may be replenished, a damaged archaeological resource becomes a blank page in the historic record. The relationships in which groups of artifacts are found teach us how people lived and how they used the objects around them. When we disturb this crucial relationship, we destroy critical information about our past. Protection and management of the heritage resources within our national marine sanctuaries preserves these important chapters in our national story for now and for future generations.

PART I

HISTORICAL CONTEXTS





Native Peoples

The Pleistocene Epoch, which began about 2 million years ago, was a climatologically dramatic period of successive ice ages, the last occurring between 10,000 and 20,000 years ago. During that time, sea levels are thought to have been much lower than they are today. The time between the last ice age and the present is known as the Holocene Epoch.

During the ice ages, much of the Earth's water was held in vast ice sheets that extended from the planet's polar and alpine regions towards the equator. In North America, a large glacial ice cap covered the Great Lakes, the upper Midwest, and New England, while a second ice cap extended over much of western North America.

The concentration of water into glaciers caused a significant drop in the planetary sea level, revealing the bridge of land between Eastern Asia and North America known as the Bering Land Bridge. During the Late Pleistocene glacial peak, the sea level was

approximately 300-400 feet lower than it is today. Modern researchers believe that archaeological evidence of human activity may exist at this now-inundated area on the Outer Continental Shelf.

Concurrent with Pleistocene glaciations, early people spread throughout the Americas, adapting to regional environments and developing unique cultures. Some of these people settled near the sea. As the ice age ended and the glaciers melted, a corresponding rise in sea level would have forced humans and animals to migrate further inland and to confront different ecosystems. Depending on the effects of the rising sea level, the physical record of a people's early coastal existence could now exist off the modern coastline. Archaeological study of sites located on these submerged coastlines may make it possible to gain new insight into the subsistence and culture of these earliest Americans.

The first groups to enter the American continent during the Holocene belonged to the Paleo-Indian cultural stage. While debate is ongoing, prehistoric humans are known to have entered the New World at least 12,000 years ago. Some scientists believe that they hunted and followed the migrating herds of such prehistoric mammals as mammoth and giant bison.

About 8,000 years ago a cultural and climatological shift ushered in the Archaic cultural stage. This is a period in North American pre-history characterized by the use of flaked stone tools, similar to the Mesolithic period in Europe. The Archaic stage occurred at different times in different regions of the continent. During the final retreat of the glaciers, circa 8,000 to 7,000 years ago, ancient tree lines reached their highest latitudes and temperate climates extended far into Canada and the sub-Polar regions. These people had a more sophisticated stone tool-making technology than did the Paleo-Indians and in some regions developed the capability to make pottery and specialized basketry. They became more sophisticated in their means of hunting, gathering,

and processing food. These people also made greater use of the resources of their riverine and coastal environments.

During this period, the sea level continued to rise to about the level it is today. Later cultural stages, variously called Formative, Woodland, or Ceramic stages evolved between approximately 3,000 years ago and contact with Europeans and saw the development of sophisticated economies, technologies, cultural patterns, and tribal divisions.

The aboriginal peoples of America suffered a harsh and lasting effect from their European "discovery." Many Indian groups attempted to maintain traditional affiliations and lifeways after contact with the Spanish, English, and French. But whether gradual or immediate, they were all changed by contact with the newcomers.

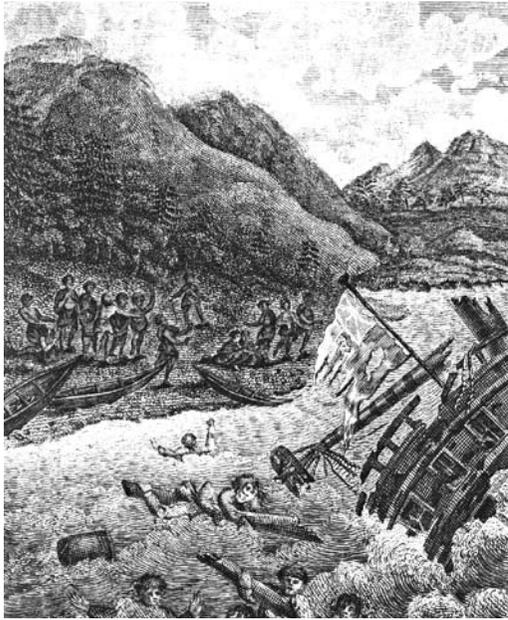
Early European visitors recorded what they witnessed of native cultures. Their logs, diaries, drawings, and letters often contain our only historic record of the appearance and cultural practices of these people before their cultures were affected. Even before the American Revolution, native populations, already decimated by European diseases, began to be pushed out of their lands. War and forced resettlement crowded tribes together into often unfamiliar places causing cultural stresses that radically altered traditional practices.

The Europeans affected Native American material culture and practices. Iron tools replaced stone, bone and antler implements whose use and design had evolved for millennia. Many tribes adapted horses, which were introduced by Spanish conquistadores. Coastal tribes, who subsisted by fishing, changed their techniques and technology by adapting iron hooks and harpoon heads. Some groups used European-type boats in preference to their traditional watercraft.

Archaeological study of submerged prehistoric archaeological sites may provide information on early human migrations and settlement across Paleo-coastal land masses into the Americas.

(Library of Congress)





Shipwreck was an inevitability as Europeans navigated uncharted American waters in increasing numbers. (Library of Congress)

European Colonial Period

In the 15th century many European states commissioned maritime expeditions to seek alternate trade routes to the Orient. Sweeping advances in maritime technology and a better understanding of navigation and ocean currents enabled Europe's maritime nations to send explorers toward the Orient and the Americas to find new trade routes and to establish bases from which to secure a larger share of the wealth of trade.

Spanish – Columbus' Spanish-sponsored voyages to the Caribbean Islands and South America at the turn of the 16th century were an early indication that an undiscovered frontier (as the Europeans saw it) existed across the Atlantic Ocean. The Spanish exploration and colonization of America was essentially a by-product of an effort to improve trade with the Orient. Soon, the European sea powers were

competing with each other to establish colonies and to exploit the various regional resources.

While the French sought furs and the English sought fishing grounds and timber, the Spanish quested for gold, silver, and Christian souls. Between the 16th and 18th centuries, the Spanish shipped their New World-mined gold and silver in yearly flotas (fleets) to Spain to finance their European wars.

The Native American peoples could not compete militarily with the more technologically sophisticated Europeans who sought either to assimilate or conquer them. Even the most advanced civilizations of the Americas—the Aztecs and Incas—fell shortly after their initial contact with the Spanish.

The Spanish were the earliest Europeans to attempt colonization in North America. Within a few years of Columbus' first voyage in 1492, numerous Spanish vessels were exploring and mapping the Americas. From their bases in Mexico, the Caribbean, and Central and South America, such 16th-century explorers as Juan Ponce de León and Hernando de Soto investigated American coastal waters and shores in the Atlantic, while Ferdinand Magellan explored the Pacific Ocean.

Spanish settlers came as soldiers, religious missionaries, and administrators. Their intention was to educate and organize the native populations and to live off the fruits of their labor. Produce raised and exported by native labor included tobacco and products from cattle such as hides and tallow. In 16th-century North America, the Spanish settled primarily along the southeastern Atlantic and southern Gulf of Mexico coasts. After 1769 they settled throughout central and southern California, establishing political presidios and Catholic missions. The great northern arc of the Gulf of Mexico west of Pensacola was left largely unexplored until the coming of the French in the late 17th century, after which Spanish colonists moved north of the Rio

Grande. By the 18th century Spanish political power had waned and they gradually gave up territory to the English, French, and Americans.

British – England first sent vessels westward into the North Atlantic in the 15th century, first establishing fisheries at Iceland and Greenland. English fishing craft eventually moved westward to the productive fishing grounds off Labrador and New England. John Cabot, a Venetian sailing for England, stepped onto the shores of the New World in the early 16th century.

Sir Francis Drake's circumnavigation of the world and his attacks on Spanish shipping in 1579 signaled the beginning of the challenge of Protestant Europeans to the colonial hegemony of Catholic Spain and Portugal. Elizabethan England became a world economic power at the turn of the 17th century as private companies were formed to carry on maritime trade with the Orient. It was in this atmosphere that Queen Elizabeth I sanctioned early expeditions to settle the New World.

After several false starts such as the ill-fated "Lost Colony" at Roanoke Island in 1587, English settlements took root along the North American seaboard at such places as Jamestown in 1607 and Plymouth in 1620. Even at this early time, the Native Americans they encountered had already been depopulated by European disease and their culture affected by earlier Spanish visits.

The European-wide advances in navigation and ship design enabled the Spanish to explore a world here-to-fore unknown to them. Following the brief decades of exploration the Europeans conquered native peoples and extended their European empires into the Americas and East Indies. (Library of Congress)



The English colonies of the 17th century provided an economic benefit for the crown through the production of tobacco, sugar, ship stores, and other agricultural produce. Additionally, the colonies provided an export market for English goods. The colonies were also the focus of an extensive slave trade. Enslaved Africans, already subject to an established slave trade by the South American Spanish and Portuguese, were forced to work the large plantations in harsh environments where the English yeoman class could not be coaxed to work. To protect its new found wealth, Britain expanded its military strength. By the 1700s it possessed the most powerful navy in the world.

In the 18th century, the ports of Boston and New York were important economic centers for the British colonies in America. Commercial networks were developed in which the agricultural produce of the colonies was transported from inland rivers and bays to coastal port cities and thence to England. English goods found their way into the American hinterlands by the same routes.

Sixteenth-century English sea captains challenged Spanish and Portuguese hegemony in the New World. (Library of Congress)



Other European Colonies – In the 17th and 18th centuries other European powers such as France, Holland, and Russia challenged the English and Spanish colonial presence in North America. Like England, France established colonies along the Atlantic coast and in the West Indies. Beginning with the Sieur de La Salle in 1685, French settlers and fur traders filled the void left by the Spanish along the northern Gulf of Mexico coast. By 1710 the French had established forts at Matagorda Bay and Mobile.

The early French interest in the great fishing banks off Nova Scotia led to a series of settlements in Canada. An extensive fur trade was established inland at Quebec along the banks of the St. Lawrence River. There, the native tribes exchanged furs trapped in the interior for French iron tools, weapons, and trinkets.

French explorer Samuel de Champlain learned of the existence of the Great Lakes from the Indians with whom he traded, and by 1630, had traveled to Lakes Ontario and Erie developing a profitable fur trade. French fur traders and Jesuit missionaries had soon explored most of the Great Lakes region. They built forts and trading posts along the Mississippi River, encroaching upon the boundaries of Spanish influence around the Gulf of Mexico. The tendrils of European presence now entangled various Native American tribes in an extension of European conflicts on American soil. The prize was the North American continent and its vast resources.

Through the last quarter of the 18th century, the European colonies in the New World pursued their various interests. Whether for economic, religious, or military reasons, most of their travel through the country was on water. The relationship of landscape to waterways determined the placement of settlements and forts. The bays and rivers were the Europeans' highways.



Ship technology adapted to economic needs as smaller merchant craft were needed to trade with inland river ports. Two-masted snows were mainstays of 18th-century coastal shipping. (Library of Congress)

American Period

The American Revolution re-shuffled the roles and territorial holdings of the European powers in North America. The British colonies had become powerful enough, economically and politically, to challenge the English crown. Aided by French military and naval assistance, American colonists fought for and achieved, their independence. Much of the Revolution's conflicts involved naval activities. Naval battles raged on the Great Lakes, the Atlantic seaboard's coastal harbors and rivers, and in the Caribbean Islands.

The United States grew rapidly in the 19th century. As the interior regions were settled, many earlier peoples and their political influences were pushed out. The Native Americans were divided and pushed on to reservations or to less desirable lands. Spain and France were pressured to part with their colonial territories. The French possessions in the Trans-Mississippi West were sold to the United States in the Louisiana Purchase of 1803. In the Southeast,

Southwest, and Far West the Spanish also lost their lands through political and military conflicts with the United States and revolutions in Mexico. What had been Spanish Florida was made a U.S. territory in 1821. Texas was acquired in 1845 and California and the Arizona/New Mexico territories in the 1850s. The Civil War subsequently confirmed the role of the United States as a naval power. Throughout the last half of the 19th century and into the 20th, the U.S. exerted its economic and military influence in the Pacific realm and much of the rest of the world.

Regional Economic Activities

Economic growth, stimulated by waterborne trade, influenced America's national expansion in the 18th and 19th centuries. Prosperity encouraged a rapid population influx from Europe and also stimulated technological innovation such as steam-powered engines, the cotton gin, and factory production, which further fueled economic development.

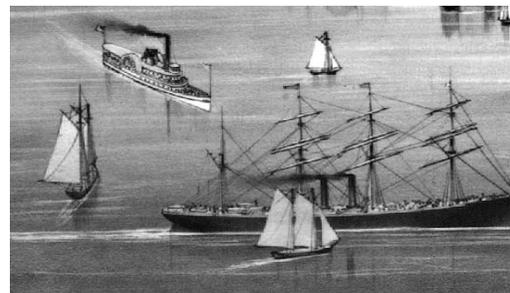
Growth was reliant upon the relationship between the coastal seaports and the inland estuarine waterways. Watercraft transported raw agricultural produce from inland regions by rivers and canals to manufacturing centers and port cities on the coast. Tobacco, wheat, corn, rum, indigo, rice, and hemp were among the main agricultural exports. Raw materials including coal, iron-ore, stone, and lumber were shipped to manufacturing centers where they were converted into usable industrial materials and manufactured articles.

In return for raw exports, merchants and planters imported manufactured goods from the eastern ports and from Europe. Iron tools, glass, and bricks allowed them to build fine homes and commercial buildings. Luxury items including fabrics, dishes, and wines were essential to the new social elite in the coastal port cities. These goods also made life in the hinterlands more bearable, contributing to the creation of a backwoods upper class.

To sustain high agricultural productivity, many early American planters, particularly those in the South, relied on cheap slave labor. A colonial trade network was established in the 1600s by the English who traded iron, silver, Indian textiles, and beads to African kings in return for slaves, either captured in raids against enemy tribes or who were from their own tribes. Chained and crowded into dank ship holds, nearly two million souls died of disease and unsanitary conditions as they were transported to America for a life of forced labor. Slave importation was banned by the U.S. government by 1808. Even after the prohibition on slave trade, many thousands continued to be smuggled into the southern ports, primarily at Charleston and New Orleans.

A diverse range of resources were harvested and exported throughout the history of American maritime commerce. As it grew, America required a greater network of commerce to sustain and propel itself. Fishing was one of the earliest American industries. America's abundant waters fed the coastal populations and provided lucrative exports. The bounty of life that makes many of the banks and reefs subjects of today's national marine sanctuaries made the same banks desirable as fishing grounds. Many of those grounds were known to local fishermen centuries before they were actually surveyed.

The American fur trade spanned from the 17th to the 20th century. In the 17th century, English and



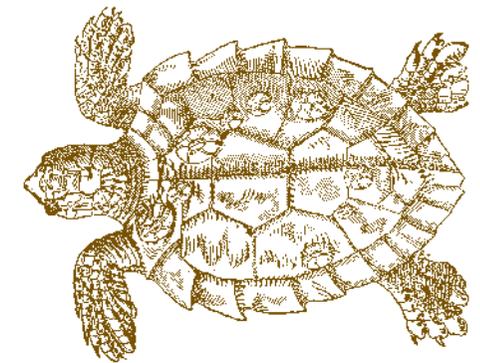
Steam power reduced shippers' dependence on prevailing currents and winds, opening up new trade routes. (Library of Congress)

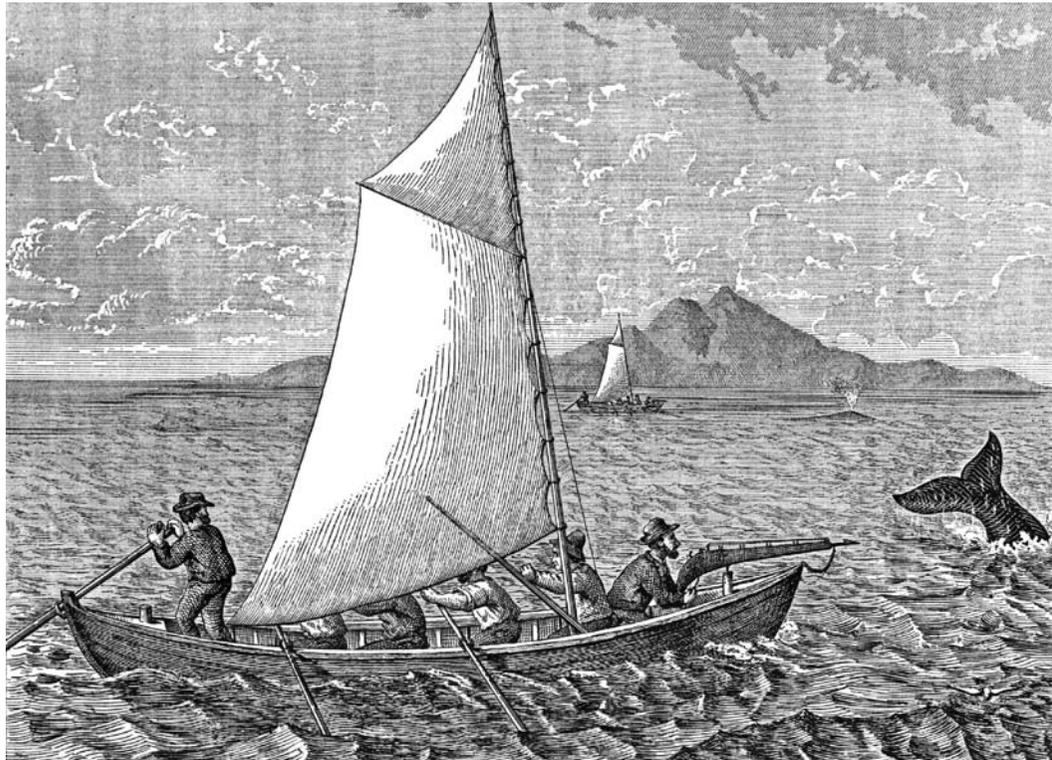


Coastal schooners carried bulk goods between small ports and commercial centers. (Library of Congress)

French traders exported furs from the interior regions of the Northeast. Throughout the 18th and 19th centuries, traders (mostly French) traversed the Great Lakes and Ohio River Valley regions in search of furs while the English and Russians exploited the Pacific Northwest's resources. 18th century New England-Yankee merchants saw the fur trade as a way to recoup their financial losses incurred during the Revolution.

After hunters decimated the fur seals in the South Atlantic, New England-based vessels sailed around Cape Horn and hunted Pacific coast otters and seals. News of a Chinese market for furs in the late-18th century caused New England ship owners to intensify the hunt for fur-bearing sea mammals in the Pacific. A triangular trade between the American East Coast port cities, the West Coast, and China developed in which Pacific fur pelts were often traded to the Chinese for tea and silks. These, in turn, were sold or traded in western markets in Europe and America. For most of the 18th century, sealers obliterated countless communities of sea otters and seals.





Yankee whalers were largely responsible for informing the western world of the existence of the vast Pacific island groups. (Library of Congress)

Whaling, like the seal trade, was primarily a Yankee trade. Americans began systematically hunting whales in the 17th century in the near-shore waters off Massachusetts' coast. The whale populations were soon over-hunted and the whalers rapidly fanned out into the North and South Atlantic waters. By the late 18th century, whalers had already moved into Pacific waters and were largely responsible for informing the Western world of the existence of the vast Pacific island groups.

Whalers settled many of the South Pacific islands in the early 1800s as way-stations for supplies and for hiring native man-power. The Sandwich (Hawaiian) Islands were among the most frequented of the supply stops.

Missionaries soon arrived in the whalers' wake to Christianize the native peoples and to introduce them to the "benefits" of Western civilization. New England whalers often stayed away from their home ports for

several years at a time as they ranged between the Bering Sea, Japanese waters, and the South Pacific. Initially they hunted Sperm and Blue whales, but after those populations were depleted they hunted many other species, including sea elephants and walrus.

The requirements of the many American maritime industries produced numerous specialized watercraft. Unique American vessel types evolved from the largest merchant ship to the smallest fishing boat. Many of the ships and boats that were initially used in American waters in the 17th and 18th centuries were of European origin and design. Such vessels as Spanish galleons and English frigates carried on commerce and warfare in the Atlantic, Gulf, and Pacific waters. Smaller shallops, sloops, and galleys provided transportation, commerce, and fishing platforms in the coastal and inland waters.

American watercraft types were also influenced by Native American and Chinese boats. Native American dugout log canoes influenced many regional American small craft such as Louisiana's pirogue and the Chesapeake Bay region's pungy and bugeye schooners.

By the 19th century distinctive American packets, clippers, and other large multi-masted ships carried ocean-going commerce. Smaller specialized vessels such as sloops, schooners, barks, snows, and brigs undertook coastal trade, fishing, and whaling activities. By the end of the century, many of these vessels had supplemented their sail power with steam engines, and new ship designs soon evolved around new forms of combustion engines.

American Naval History

An inevitable consequence of national intentions to enforce policies with navies is the destruction and loss of ships. Throughout American military history, there has been no shortage of either confrontations or



Multi-masted schooners came into use in the 1880s in the American coastal trade. (Library of Congress)

sinkings. Many of America's continental wars involved conflicts in home coastal and inland waters.

Naval forces of many colonial powers were present in 17th- and 18th-century American waters. Conflicts that originated on the far-off European continent were often played out in the waters of the New World. Seventeenth century English privateers raided Spanish treasure flotillas in the Caribbean and Pacific. The perennial wars between England and France saw several eras of conflict in American coastal waters, and Dutch naval squadrons raided and captured English ports and ships between New York and the Chesapeake Bay region.

During the American Revolution naval operations took place in the Caribbean, Gulf of Mexico, the Great Lakes and Lake Champlain. The British navy tried to strangle the colonies economically by blockading ports, raiding American shipping, and supporting its army's field campaigns.

The initial efforts to form an American navy met with spotty success. A small American naval force was initially formed by George Washington in 1775 for the purpose of capturing British supply ships. The Continental Navy, which was created by Congress to defend the colonies, languished due to inept administration among other factors. Perhaps the most successful American naval enterprise was credited

to Benedict Arnold in 1776 on Lake Champlain. His victory over the British at the Battle of Valcour Island encouraged the French to enter the war as an American ally.

In addition to the Continental Navy, many of the colonies formed state navies. Using small, shallow-draft sail-galleys, these *mosquito navies* harassed British naval operations and helped defend inland and coastal regions. Many were sunk; not in battle, but by their own crews who scuttled them when their capture seemed imminent.

Citizen boat owners also recruited crews and engaged in commerce raiding and smuggling. Armed with letters of marque, these vessels probably struck the most effective blows against the English, capturing more than 2,000 British merchant ships.

French and Spanish naval support also aided the American cause. The Spanish victory at Pensacola in 1781 ended an effective British naval presence in the Gulf region. More significantly, the French navy in the Caribbean occupied the English navy while the Compté de Grasse's blockade of the Chesapeake and subsequent victory at the Battle of the Capes ensured the American land victory at Yorktown, Virginia.

Continued French-British naval aggressions after the Revolution proved detrimental to U.S. commerce in the late 1700s. Because of the U.S. refusal to cooperate with French trade sanctions against England, many American commercial ships conducting trade between the Caribbean Islands and England were harassed and confiscated by French commerce raiders. The United States built several frigates, including the USS *Constitution*, to confront openly the French revolutionary government's attempts to extort tribute money. This undeclared naval war was known as the "Quasi-War" with France.

The War of 1812 erupted as a result of unresolved trade and land disputes between the British and

Americans. Another cause was American resentment of England's forced impressment of sailors from American ships in the Atlantic. Several ship-to-ship battles took place that while resulting in a host of American naval heroes, had no serious tactical effect. By 1813 the British navy had imposed a blockade of American ports which rendered the American navy ineffective.

As in the Revolution, American privateering was an important weapon against English shipping. Various fast schooners and sloops were employed to run the English blockade of ports and to harass shipping. The Americans also employed shallow-draft, armed galleys to defend inland rivers and coastal regions and to support land operations.

Lakes Champlain and Erie were again sites of conflict between fleets of inland sailing ships. Oliver Perry's victory over the British on Lake Erie in 1813 and MacDonough's victory at Lake Champlain in 1814 gave control of the Northwest Territories to the United States and opened the Great Lakes to American trade.

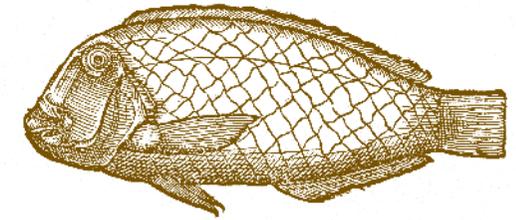
Pirates threatened American coastal commerce in the decades following the War of 1812. Bands of internationally feared criminals were based on coastal barrier islands from Louisiana to Florida and the Caribbean islands. All along the Atlantic coastal waters of the Americas, pirates terrorized ships of commerce with murder, pillage, and sinkings. The U.S. Navy's West Indian Squadron hunted them for three years and by 1825 had either destroyed or dispersed the pirates from both the Florida Keys and the Gulf Coast barrier islands.

A circumstance that enabled the piratical activities was the presence of numerous revolutionary governments in former Spanish colonies in Central and South America. As the pirates were dispatched, the U.S. Navy continued to protect commercial interests that had developed because of the new security on the seas. Naval protection permitted the development

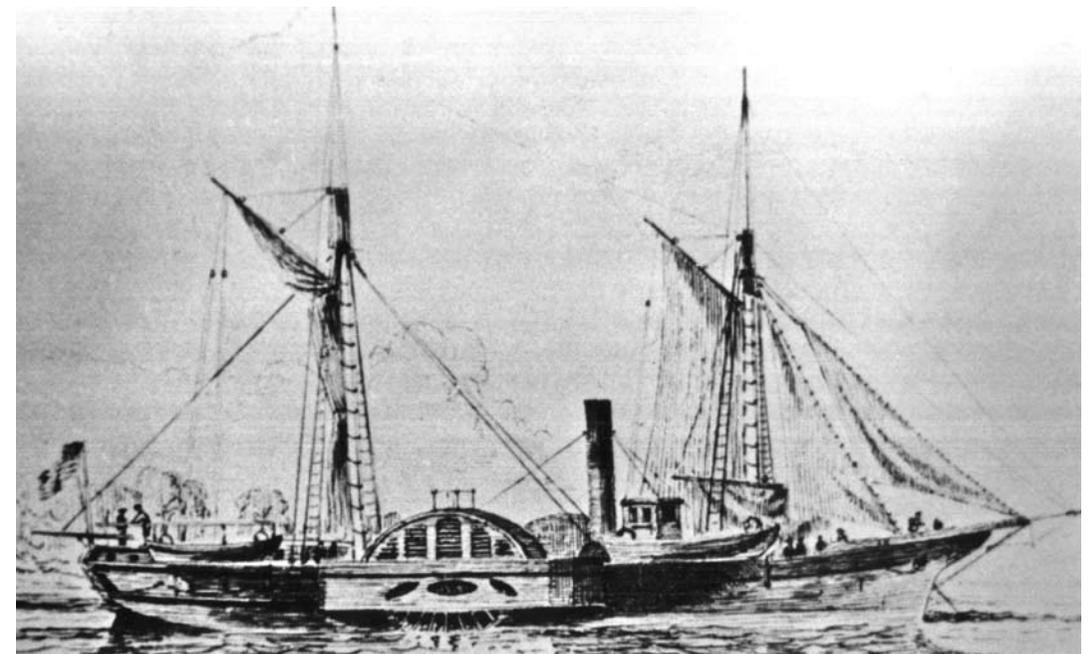
of such industries as whaling, fishing, the seal and otter fur trade, and inter-coastal commerce. During the first half of the 19th century the Navy halted the illegal importation of African slaves, supported military operations against the Seminoles in Florida in the 1830s and 1840s, and supported the army in the Mexican War in the 1840s.

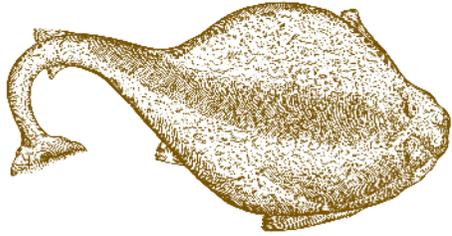
The U.S. Navy also conducted peacetime activities in the decades before the Civil War. The expansion of American commerce created a need for accurate charts of American and foreign coasts to ensure safer travel and trade. President Thomas Jefferson first initiated the task of mapping the United States' coast by creating the Survey of the Coast in 1807. The U.S. Exploring Expedition was organized to map the Antarctic and Pacific American coastlines in 1832.

The U.S. Exploring Expedition used small naval sloops to chart the Pacific coast and the Antarctic, as crews of sailors and scientists braved ice, gales, and hostile native peoples to record coastlines, currents, natural phenomena, and meteorological information. The Coast and Geodetic Survey that



The U.S. Coast Survey Ship *Bibb* exhibited a transitional technology as wooden sailing ships incorporated steam power for propulsion. Initially built as a revenue cutter in 1847, *Bibb* was transferred to the Coast Survey (the predecessor of NOAA). The ship continued surveying for the U.S. Navy during the Civil War. (Library of Congress)





Nineteenth-century American men-of-war patrolled the world's oceans protecting American commercial and political interests. (Library of Congress)

was later created to conduct surveys and to study the oceans was the forerunner of the modern National Oceanic and Atmospheric Administration. Eleven of these important surveys took place in the 25 years before the Civil War. Much of what was learned from these expeditions now forms the foundations of our modern ocean science.

The American Civil War was one of the most formative events in the nation's history. The Union and Confederate navies played an important role in the strategic plans of both sides and ultimately affected the outcome of that war. Naval conflicts took place throughout the nation's coastal and inland waters.

Naval and maritime activities took place on several levels during the Civil War. The Union navy adopted a policy to blockade southern ports known as the "Anaconda Plan." In response to the blockade, Southern naval and independent merchants relied on fast, steam-

powered blockade runners to smuggle much-needed arms and supplies into Southern ports.

Another Southern response was the development of steam-powered, ironclad rams, based on the CSS *Virginia* (formerly USS *Merrimack*). Designed to ram enemy ships after they had disabled them with their cannons, they were of a simple, box-like design that could be built by carpenters rather than the more skilled (and scarce) shipwrights. They were intended for the protection of strategic southern ports located on coastal and inland waterways.

The Union navy countered by developing armored riverboats and turreted gunboats, of which the USS *Monitor* was the seminal model. Utilizing the revolutionary design conceived by Swedish inventor John Ericsson, iron monitors challenged Confederate rams and shore fortifications.

The Confederate government also revived the reliable practice of privateering. Using government-issued letters of marque, Southern commerce raiders hunted out and captured Northern merchant vessels in an economic war against the Union. Commerce-raiding was possibly the most successful Confederate naval tactic. Numerous specially designed steam-powered sailing ships were constructed in Europe and clandestinely sold to the Confederates. Such commerce raiders as the CSS *Alabama*, CSS *Florida* and the CSS *Shenandoah* were responsible for the near-total destruction of the U.S. whaling industry and the merchant marine—a blow from which the country did not recover until the early 20th century.

To compensate for its relative lack of ships, the Confederacy developed such innovative weapons as torpedo boats, submarines, and floating mines. These visionary weapons of the Civil War formed the basis for many of the naval technologies used by 20th century powers.

The post-Civil War American Navy lapsed into a state of torpor as a result of economic problems, antiquated attitudes, and petty personality conflicts. The ships that had been considered technologically advanced during that war became obsolete and outmoded in comparison to the European navies' steel warships. Not until the last decade of the 19th century did the U.S. Navy develop the advanced steel battleships that would make it the muscle behind 20th century American diplomacy.

At the end of the 19th century, the antagonism that had simmered for most of the century between Spain, her Caribbean territories, and the United States, now boiled over. The United States, its citizens angered by the explosion of the battleship USS *Maine* in Havana harbor and the passionate imperialistic rhetoric of publisher William Randolph Hearst's "yellow" press, invaded Cuba in 1898.

Even though the naval actions of the Spanish-American War were fought in foreign waters (Manila Bay in May 1898 and Santiago, Cuba in July 1898), the war's impact at home was seen in the renovation of numerous U.S. coastal fortifications, many of which had been built as defense against the British in the Revolution and the War of 1812. With each subsequent war, the fortifications were reinforced and armed with increasingly modern artillery.

Although Spain's centuries-old imperial hold on Cuba, Puerto Rico, and the Philippines was broken, America now embarked upon its own empire-building adventure. Caribbean and Pacific islands were annexed from the vanquished Spanish to make naval bases and coaling stations.

The years between the Spanish-American War and World War I saw many technological advances in naval ship design. Benefiting from new advances in iron and steel manufacturing, American and European navies developed specialized warships like dreadnought battleships, torpedo destroyers, and submarines.



Although their maritime commerce had been curtailed by the Allied command of the seas, the German Navy remained a threat. The submarine or U-boat was Germany's most potent naval weapon in the First World War, hunting the supply and troop convoys that were regularly shipped from America's eastern coastal ports. In 1918, five U-boats crossed the Atlantic and harassed American shipping by laying mines and sinking several ships.

Between the world wars, the U.S. Navy experimented with a number of aviation technologies including aircraft carriers and rigid lighter-than-air craft. Based on WWI German zeppelins, large dirigibles were developed that could launch and retrieve small airplanes. Four of these "aerial aircraft carriers" were used in the 1920s and '30s. They were, however, found to be impractical as fleet support and unsafe in all but the most placid weather. Most of the U.S. Naval dirigible fleet, including the USS *Akron*, USS *Shenandoah* and USS *Macon* were eventually lost in fatal accidents.

Foreign aggression was brought to America's shores in World War II when Japanese planes attacked Pearl Harbor on December 7, 1941. By the battle's end, most of the U.S. Pacific fleet was destroyed. In addition, five Japanese midget submarines and numerous aircraft littered the seabed of Oahu's waters.

Japanese attacks on the mainland West Coast were few. A Japanese submarine shelled a shore-side refinery near Santa Barbara, California. Also, high altitude bombs were launched with the intention of dropping them into the western American interior to start fires. These efforts were, for the most part, ineffective and caused few casualties.

A more serious threat arose from the Japanese occupation of two islands in the Alaskan Aleutian Island chain. The U.S. Army and Navy expended much effort to remove a Japanese force from Kiska and Attu Islands between 1942 and 1943.

On the east coast, German U-boats had stalked English and Allied shipping off the Atlantic and Gulf of Mexico since the European war began in 1939. German submarines also preyed on U.S. shipping in what became known as the Battle of the Atlantic.

The U-boats, sank nearly 400 unprotected merchant vessels within sight of the American coastline. This commercial disaster was due in part to time-wasting disagreements within the naval high command, lack of appropriate warships, lack of convoy tactics, and failure to institute blackouts at coastal communities. By 1943, a concerted cooperative effort between U.S. and Canadian navies, and the Coast Guard's aircraft and ships broke the back of the German U-boat campaign in the Atlantic.

The preceding overview of American maritime history presents a perspective of events that took place in the regions of the modern national marine sanctuaries. In the course of these events, many ships were sunk. Each of those shipwrecks potentially contains a record of our predecessors' ways of life. Likewise, the rising prehistoric Holocene sea levels that covered the sites of the earliest Native American's existence may also hold keys to the unknown past. These submerged remains bear mute witness to past lives; stories that may be given voice by the archaeologist and historian—only if these sites are protected for future generations.



The study of maritime history coupled with underwater archaeology provides insight into maritime societies and their extended cultures. (*Library of Congress*)

PART II

NATIONAL MARINE SANCTUARIES





Northeast Region

Thunder Bay National Marine Sanctuary

Written by Wayne R. Lusardi

Designated to protect a historically significant collection of shipwrecks and other submerged cultural resources, Thunder Bay National Marine Sanctuary in northeast Michigan was built upon one of 11 preexisting state underwater shipwreck preserves. It is the first national marine sanctuary located in a freshwater environment, and only the second, after USS *Monitor*, expressly created for the protection of cultural resources. Located on Michigan's Lower Peninsula, Thunder Bay contains 448 square nautical miles of Lake Huron bottomlands. The sanctuary's office is located in Alpena, a Preserve America Community. Resources are submerged in depths of up to 195 feet of water, and though none have restricted access, all are protected by state and federal legislation.

The nearly 200 shipwrecks in and around Thunder Bay have long been recognized as one of the most significant such clusters in American waters. They represent virtually every type of watercraft used on the Great Lakes since the era of settlement and westward expansion commenced in the 1830s. The popularization of scuba diving in the 1960s made these shipwrecks available for exploration, but also facilitated unchecked looting. The state of Michigan, consequently, recognized the need to preserve submerged cultural resources in the four bordering Great Lakes and established a system of underwater preserves in the early 1980s (Thompson and Lusardi 2004). Thunder Bay was further designated a national marine sanctuary in October 2000, with the mission not only to protect the resources, but to promote the development of visitor and interpretive

facilities, educational programs, and outreach events that increase knowledge and appreciation for Thunder Bay's shipwrecks and their connection to regional and national maritime heritage (NOAA 1999).

Native Peoples

Humans have occupied Michigan's Lower Peninsula since the last glacial retreat, some 11,000 years ago (Shott and Wright 1999). Prehistoric peoples, however, probably did not arrive in the areas surrounding Thunder Bay until the Late Archaic period (5,000 to 2,500 before present). Although Great Lakes' water levels were considerably lower than seen today, native peoples hunted and camped along the shorelines, near river mouths, and around sinkholes to take advantage of the abundant natural resources including fresh water, berries, nuts, game, birds, fish, and shellfish (Pott 1999). Archaic fishing equipment found in upper Great Lakes archaeological sites includes bone and copper fishhooks, gorges and spears, and notched pebble net sinkers (Cleland 1982). Large-scale fishing and lake travel began during the Woodland Period when indigenous peoples recognized the value of water transportation, and their technologies and traditions often reflect this maritime connection. Michigan's first mariners navigated small open boats, particularly dugout and bark canoes, that provided an effective means for trade and communication as well as platforms for hunting, fishing, and gathering aquatic resources from the region's biologically rich wetlands (Pott 1999).

Native mariners considered Thunder Bay a potential hazard centuries before European contact. Archaeologists recovered nearly 300 shale discs from several Late Woodland sites near the mouth of Thunder Bay River in Alpena, and 53 discs were incised with

symbols recognizable in Algonquian ideography and mythology. The figure of Me-she-pe-shiw is well represented. A mythical panther that lived beneath the waters of Lake Huron, it was believed to cause storms with immense and deadly waves by thrashing its long tail through the water. Native travelers were mindful to sacrifice dogs or tobacco to appease Me-she-pe-shiw before beginning long voyages across Thunder Bay (Cleland et al. 1984).

The place name of Thunder Bay also has its roots in native mythology. According to oral tradition, the daughter of an Ottawa chief and her suitor while canoeing across Thunder Bay were killed by a jealous brave, much to the dislike of the Manitou, or Great Spirit. A roar of thunder and flash of lightning followed, and the tribes knew the Great Spirit was mightily offended. Nevermore would they trust themselves on the waters of what, from then on, was known as the Bay of Thunder, or Thunder Bay (Haltiner 2002).

European Colonial Period

Jean Nicolet, the first European to enter what is today Michigan, traveled by canoe through the Straits of Mackinac by way of the Ottawa and French Rivers in 1634. French Jesuits established the Raymbault mission at Sault Ste. Marie in 1641, but relocated to St. Ignace 30 years later after realizing the strategic importance of the straits (Heldman 1999). Adrien Joliet was likely the first European to see Thunder Bay during his paddle along the eastern shore of Lake Huron in 1669 (Tongue 2004). In August 1679, Father René-Robert Cavalier La Salle constructed the 45-ton *Griffin* at the Niagara River above the falls to explore and colonize the upper lakes. On his upward journey, La Salle became perhaps the first European to experience the wrath of Thunder Bay. According to Father Louis Hennepin's journal, a violent storm

was encountered there and all took to their knees in prayer, save the pilot, who instead “did nothing all that while but curse and swear against M. La Salle, who as he said had brought him thither to make him perish in a nasty lake, and lose the glory he had acquired by his long and happy navigations on the ocean (Hemming 1992, Quaife 1944).” *Griffin* was lost in northern Lake Michigan the following month, becoming the first of thousands of historic craft to go down in the Great Lakes.

Seafaring traders, trappers, and missionaries followed in *Griffin's* wake, adopting or exchanging Native American technologies, often using bark canoes and dugouts (Feltner and Feltner 1991, Halsey 1990). When English explorers began entering French territories and tensions between nations heightened, both flags scrambled to construct fortifications and outposts at strategic locations throughout the Great Lakes. The Straits of Mackinac, only 90 miles northwest of Thunder Bay, saw extensive colonial activity, and Fort de Buade was established at St. Ignace in the 1680s to discourage English fur traders from the north. The French abandoned the outpost in 1705, but established Fort Michilimackinac on the southern shore of the straits in 1715 (Heldman 1999). The fort survived the French and Indian War (1754-1761), though was ultimately surrendered to the British in September 1761 (Pilling and Anderson 1999). The British remained at the straits until the signing of the Jay Treaty in 1796 following the close of the American Revolution when all territories were ceded to the newly established United States (Feltner, and Feltner 1991, Tongue 2004).

Although French and English travelers passed by Thunder Bay throughout the Colonial Period, no vessels are reported lost in the immediate area. Fur traders also visited Thunder Bay, though no historic terrestrial sites predating the 1830s have been discovered in Alpena County. The earliest colonial vessels lost in the vicinity of Thunder Bay occurred

when the British sloop *Welcome* from Fort Mackinac was lost in the straits in 1781 (Feltner and Feltner 1991), and the warship HMS *Hope* stranded on the south shore of Drummond Island in 1804, some 65 miles north of Alpena. The earliest reported wrecks in the actual waters that would become Thunder Bay National Marine Sanctuary and Underwater Preserve were during the American Period.

American Period

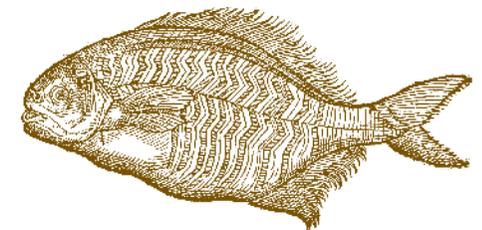
The Great Lakes provided a natural corridor for the exploration, colonization, and development of both the United States and Canada, connecting the Atlantic Ocean with the heartland of North America. The areas surrounding northeast Michigan and the Upper Peninsula were interconnected by sea-lanes long before a system of roadways and railroads were effectively established. Abundant natural resources, inexpensive land, and a non-hostile national border encouraged the development of lakefront communities early in the 19th century. Transient fishermen first inhabited the islands near Thunder Bay in the 1830s, after which traders and lumbermen established the town of Alpena on the mainland (Boulton 1876). Inhabitants used the Thunder Bay River and Lake Huron to transport raw materials and finished products, and altered the coastal landscape to accommodate their trade.

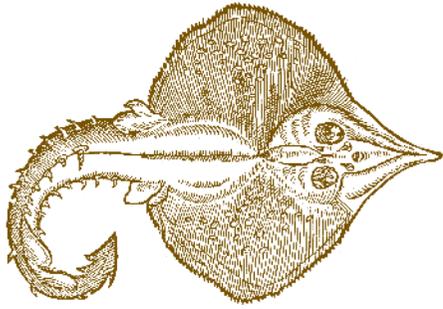
The first lighthouse on Thunder Bay Island was erected in 1831, though it collapsed before completion, and a new light was erected the following year (Tongue 2004). Alpena County was first surveyed in 1840, the same year a lighthouse was established at Presque Isle. The region has always had an extensive maritime heritage, relying on vessels for commerce, communication, and transportation. Thousands of schooners, steamers, and other vessels plied the freshwater seas carrying immigrants and finished goods westward, and returning to American industrial



Alpena Harbor birdseye view, 1880.
(Michigan State Library.)

centers like Detroit, Toledo, Cleveland, and Buffalo with raw materials including copper, iron ore, coal, and grains. Fish, then lumber, and ultimately cement were extracted, processed, and shipped from Alpena. Lighthouses and lifesaving stations were established on Middle and Thunder Bay islands, Sturgeon Point, and Presque Isle to protect and rescue mariners in distress. Countless ships, nonetheless, never reached their destinations, and foundered in heavy seas, collided with other vessels in fog, were crushed by ice formation, were stranded ashore, burned and sank, or were intentionally abandoned along shorelines at the end of their careers.





Maritime Heritage Resources Inventory

Shipwrecks are perhaps the most dramatic symbols of Thunder Bay's maritime heritage. Analogous to living museums preserved beneath the waves, they can reveal much about a people's culture, technology, economic, and social heritage. A time capsule from an exact point in history is produced because shipwrecks are usually the result of a single catastrophic event. Materials such as rope, wood, ceramics, and steel are remarkably preserved over long periods of time, especially in the cold, fresh waters of Lake Huron. Several 19th century sailing craft are virtually intact, with masts still standing, rigging still in the masts, and artifacts located exactly as they were the day the vessels sank. Other sites are considerably more disturbed as a result of the initial wrecking process, subsequent salvage efforts, natural processes and erosion, and modern looting. The materials from a wrecked vessel can be extensive, and strewn about the lake bottom over vast areas. Sites located in shallow, dynamic environments are particularly

Sanctuary archaeologist documents wreck of *Maid of the Mist*, wrecked 1878. (TBNMS)



susceptible to movement and degradation, and are consequently more difficult to identify or interpret, though are no less important than their deepwater counterparts (O'Shea 2004).

The earliest shipwreck found in Thunder Bay is the paddle wheel steamer *New Orleans*. Built in 1838 on the hull of the burned steamer *Vermillion*, *New Orleans* ran aground west of Sugar Island on June 15, 1849. Fishermen from Thunder Bay and Sugar Islands rescued the passengers and crew, and most of the cargo and machinery was later recovered. The primary section of bilge was archaeologically documented in 2002 (Vrana 2004), though the majority of the vessel has not yet been located and is presumably dispersed along the reefs between Sugar Island and North Point.

Early steam paddle wheelers are prime examples of the transition from sail to steam. Most were designed to carry large cargoes in their holds, while the upper works were elaborately decorated and furnished to accommodate ticketed passengers. In addition to *New Orleans*, two other paddle wheelers, *Benjamin Franklin* (1850) and *Albany* (1853), met their demises on Thunder Bay Island and Presque Isle respectively. All three vessels were extensively salvaged and little remains but the lower hull structure, though Franklin's shafts, boilers, and machinery remain on the lake bottom.

Large two- and three-masted wooden schooners are well represented in the sanctuary's shipwreck assemblage. The quintessential workhorse of the day, thousands of schooners sailed the lakes in the late 19th century, and dozens were lost around Thunder Bay. Known as canalers, the sail boats were designed with dimensions specifically to allow passage through the Welland Canal connecting Lakes Erie and Ontario. The hulls configured as nearly as possible to the locks' dimensions, and even the bowsprits were hinged to allow maximum hull length, and thus, carrying capacity. Smaller schooners, usually

involved in more local endeavors, are also found at Thunder Bay. *Maid of the Mist* (1878), for example, was contracted to haul cedar posts from Alpena County to Detroit when it washed ashore in a gale at Huron Beach. The 15-year-old vessel was involved in a dozen mishaps before its ultimate demise, and evidence of large-scale repair is preserved in the archaeological record.

Steamers and their tows are also well represented in the sanctuary, particularly on North Point, a geologic feature that extends over a mile from shore and rises to depths as shallow as five feet. *Galena* (built in 1857) went ashore on North Point carrying a cargo of lumber on September 24, 1872, and quickly broke apart. Much of the machinery, furniture, bedding, and crew's possessions were removed from the wreck, and the engine was later salvaged for use in another vessel. Wreckage tentatively identified as having originated from *Galena* lies intermingled with materials from later lost ships, including the wooden lumber steamer *B.W. Blanchard* and its tow, the wooden schooner barge *John T. Johnson* that went aground on North Point during a blinding snowstorm on November 28, 1904.

Perhaps the most tragic accident to have occurred in Thunder Bay happened in August 1865 when the passenger freighter *Pewabic* was run into and sunk by its sister vessel *Meteor* with loss of life estimated between 30 and 125 people. No explanation for the collision has ever been revealed. Weather conditions were favorable and the vessels were in sight of one another for several miles before impact. Though injured, *Meteor* was able to continue to Sault Ste. Marie after rescuing many passengers from the water. *Pewabic* went down with several hundred tons of valuable copper and iron ore in its hold. Search and salvage efforts began almost immediately, though the wreck was not discovered until June 1897. Much of the cargo was recovered using armored divers, submersible bells with manipulator arms, and bucket

cranes, though at great cost as several divers perished on the wreck from drowning or decompression illnesses. Located in 180 feet of water, *Pewabic* today is visited only by technical divers or remotely operated vehicles.

Even with more accurate charts and advanced positioning and lifesaving equipment, modern freighters still occasionally sink in Lake Huron. *Isaac M. Scott* went down with all hands during the infamous storm of 1913 when eight vessels and 194 seamen perished in Lake Huron alone. *Scott* sits upside down like many of its contemporaries and is currently not penetrable (Hemming 1992). *D.R. Hanna* (1919), *W.C. Franz* (1934), *Viator* (1935), and *Monrovia* (1959) all went down resulting from collisions in the busy shipping lanes off Thunder Bay. The German freighter *Nordmeer*, Thunder Bay's most recent large shipwreck, ran upon a shoal and stuck fast in 1966. Attempts to free the vessel failed, and in a few harsh winter seasons, ice all but destroyed the steel vessel.

Shipwrecks are not the only submerged cultural resources located in Thunder Bay. Structural features and cultural landscape alterations are also evident on the lake bottom. Cribs, docks, pier footings, pilings, and structural features are located near the Alpena waterfront, off North Point, and around the many islands in the bay. Fishing net stakes, lost navigational aids, refuse, and sunken log booms also occur within sanctuary boundaries. Additionally, dozens of vessels that became stranded on various shoals were eventually recovered, but not without leaving behind jettisoned cargo, lost salvage equipment, dredged channels and other scars on the lake bottom.

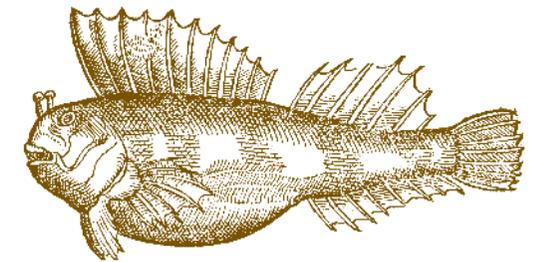
Potential Archaeological Resources

Prehistoric: Submerged prehistoric sites have not yet been located in Thunder Bay, though they undoubtedly exist along currently inundated shorelines or adjacent to submerged sinkholes and forests. In partnership with NOAA, the Institute For Exploration conducted extensive side-scan sonar surveys of portions of the sanctuary in 2001 and 2002, followed by remotely operated vehicle investigations of several submerged sinkholes with the hope of locating prehistoric cultural remains. The sinkholes, now submerged, were once exposed along the shores of glacial Lake Stanley, predecessor to Lake Huron, from 10,000-8,000 years before present and would have provided both shelter and habitable areas for late Pleistocene mammals and perhaps Paleo-Indians (Coleman 2001). Though no cultural remains were identified, further investigations are warranted.

Historic: Of the nearly 200 historic craft reported lost in and around Thunder Bay, only 50 have been located and identified. Only a small percentage of the sanctuary has been systematically surveyed, and areas such as Thunder Bay and Sugar Islands, Middle Island, and North Point likely contain large numbers of shipwrecks awaiting discovery. Perhaps the most historically significant vessel known to have been lost in Thunder Bay is the steamer *Congress*. Built in 1861 and used as a Civil War troop transport, a newly introduced mode of creating steam by petroleum oil was tested in the ship in 1868 just a few months before it was wrecked on North Point on October 26. *Congress* is the only veteran of military service known to be lost in Thunder Bay and it likely represents a technological innovation that has not been identified in the archaeological record of the Great Lakes.

The small paddle wheel steamer *Don Quixote* foundered on Lake Huron in October 1836 (Mansfield 1899), though precisely where remains a mystery. If within the sanctuary, *Don Quixote* would predate the earliest discovered wreck there by 13 years. The whaleback *Clifton* and straight-back *Choctaw*, both built in 1892, are two vessels lost off Thunder Bay that represent a type of craft unique to the Great Lakes. Whalebacks, invented in 1888 by Captain Alexander McDougall, were steel-hulled bulk carriers with rounded decks and long, snout-like bows resembling the hulls of early submarines (and whales). Only 41 were constructed, most before 1893 when it was realized the design of their rounded decks and narrow hatches made unloading cargo from the hold difficult (Devendorf 1996). Similar to whalebacks, straight-backs featured more vertical sides and fuller bows. *Clifton* foundered with all hands southeast of Thunder Bay in 1924, while *Choctaw* went down following a collision in 1915 off Presque Isle. Locating one or both vessels would not only reveal a great deal of historic information, but would generate a considerable amount of media attention and public outreach.

Vernacular craft were locally built, owned, and operated, and were generally too small to require enrollments. Little is known regarding their build, operation, or loss. These vessels were indeed one of a kind, and their discovery would contribute greatly to the understanding of local shipbuilding technologies.





Gerry E. Studds Stellwagen Bank National Marine Sanctuary

Written by Deborah Marx and Matthew Lawrence

Gerry E. Studds Stellwagen Bank National Marine Sanctuary is located at the mouth of Massachusetts Bay, 25 miles east of Boston, three miles south-east of Cape Ann, and three miles north of Provincetown, Massachusetts. Congress designated the 842 square-mile area encompassing Stellwagen Bank and Basin, Tillies Bank and Basin, and the southern portion of Jeffries Ledge a national marine sanctuary in 1992. The sanctuary's most prominent feature is The Stellwagen Bank, a glacially deposited sandbank created by the retreating Laurentide Ice Sheet that covered much of New England during the last period of glaciation. The Stellwagen Bank National Marine

Many types of merchant and naval ships crowded colonial Boston's harbor. (Library of Congress)



Sanctuary lies astride the maritime routes connecting the historic ports of Gloucester (a Preserve America Community), Salem, Boston, and Plymouth to the Atlantic Ocean. A rich collection of maritime heritage resources rest on the sanctuary's seafloor in the form of historic shipwrecks.

Native Peoples

Around 12,000 years ago, groups of migratory humans known as Paleo-Indians, inhabited southern New England. The retreat of the Ice Age glaciers 21,000 to 16,000 years ago allowed these people access to Stellwagen Bank, which rose above the surrounding ocean as a result of lower sea levels and the rebound of the Earth's crust after the recession of the heavy ice sheets.

The area's environment was similar to present day Cape Cod with lakes, swamps, marshes, beaches and sea cliffs. Spruce and poplar trees as well as grasses likely covered Stellwagen Bank and supported grazing mammals that ranged in size from small deer to giant woolly mammoths and mastodons. These animals provided the Paleo-Indians with food and raw materials for clothing, shelter, and tools.

Stellwagen Bank remained accessible to the Paleo-Indians for approximately 1,000 years. During this time, people likely utilized the bank for hunting land and marine mammals, fishing, and gathering shellfish and vegetation. The Paleo-Indians may have established seasonal camps to support these activities. It is unclear whether the Paleo-Indians crossed to Stellwagen Bank on foot via the tip of Cape Cod or made use of early watercraft such as dugout or skin canoes.

Roughly 10,000 years ago, the retreating ice sheet raised sea levels further inundating Stellwagen Bank. As water slowly covered the bank, wind, currents, and waves continued reshaping the bank's

glacial deposits through erosion and re-deposition. The rising sea levels prevented the late Paleo-Indian and Archaic peoples from gathering resources in the sanctuary; instead they turned to the productive marine ecosystems rimming Massachusetts Bay. The abundance of the marine environment supported a growing population, which added agriculture to its developing set of skills.

Native Americans developed complex societies in New England during the approximately 12,000 years of human habitation prior to the arrival of Europeans. At the time of European contact Penobscot, Abenaki, Pequot, Massachusett, Narragansett, Wampanoag, and Confederated River tribes inhabited the region surrounding Massachusetts Bay. These coastal tribes utilized the marine environment as their ancestors had, but it is unlikely that they ventured into the sanctuary's waters considering the wealth of resources close to shore. While not in direct contact with the first colonizing Europeans, Native American populations in New England suffered heavily from the introduction of European diseases. The foreign diseases weakened the native populations, ultimately preventing large-scale resistance against encroaching European colonists.

European Colonial Period

Europeans first entered into the maritime history of Massachusetts Bay in the 16th century when fishing fleets from France, England, and Portugal sheltered behind Cape Ann or Cape Cod after being blown off the Grand Banks. After discovering the bounty of New England's waters, fishermen began visiting the fishing grounds off New England every spring and summer. Fishermen established small seasonal outposts on land to process their catch and repair their vessels. At the season's end, ships filled with mackerel, cod, and salmon returned home with a valuable commodity for sale in Catholic Europe.

At the beginning of the 17th century, Europeans looked to New England as a source for wealth, either in the form of precious metals or other natural resources. Exploration revealed little gold or silver, but emphasized the wealth that came from products from New England's forests. In particular, the English, hampered by Spain's power in the Caribbean arena, established a foothold in New England to exploit these resources with more permanent settlements. Colonists could work year-round to stockpile fish, furs, and timber for seasonal export. The new settlements also created markets for manufactured English goods thereby generating further profits for the mother country.

English settlement in North America during the 17th century focused on two areas, tidewater Virginia and coastal New England. Colonists successfully settled in Virginia in 1607, but attempts to colonize New England in 1602 and 1607 failed. Ultimately, the 1620 arrival of the *Mayflower* with its cargo of English Puritans succeeded. Once the Puritans saw the feasibility of the colonial enterprise, more religious exiles set out for Massachusetts. Following the initial Puritan migration, non-secular English colonists began arriving in Massachusetts, and by 1640 settlements existed around Massachusetts Bay at Newbury, Ipswich, Gloucester, Salem, Marblehead, and Plymouth. Each of these locations depended upon the sea for its survival. Increasingly hostile Indians along with dense forests and poor soil prevented the colonists from pursuing agriculture inland.

Most of the enterprising Englishmen and women who settled New England had little knowledge of the sea prior to their arrival in North America. Faced with the reality of their situation, colonists acquired fishing and shipbuilding skills for survival. America's rich maritime tradition was born out of necessity and its roots soon became deeply buried in the waters of Massachusetts Bay. Early colonists supported themselves and the colony as fisherman

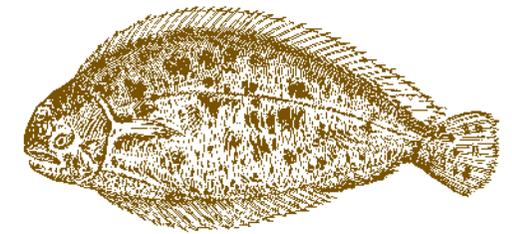
and subsistence farmers. The abundance of cod and herring in Massachusetts Bay allowed the settlers to fish relatively close to shore from small sailing vessels such as pinks and shallops. Hard work and determination kept the colonists alive during the harsh winters as they slowly pushed back the North American wilderness.

Unrest in Europe created opportunities for colonial trade between New England and the other English colonies in the New World. Colonists stepped into trading niches left open by the English Revolution and Dutch wars. However, trading with the far-flung English colonies required larger ships. Shipbuilding gradually grew from its small open fishing boat origins to vessels of 100 to 300 tons with up to three masts. Massachusetts rivers and sheltered harbors provided the necessary geographic assistance for the construction of these larger vessels. In particular, Boston became the prominent port in New England because of its location at the mouth of Charles River, which afforded access to the interior forests for shipbuilding timber and other forest products. Merchants congregated around the shipbuilding enterprises on the Charles River forming a nucleus of transportation and trade at Boston.

By the beginning of the 18th century, Boston and its surrounding communities became the focus of the "Great Migration" as European settlers escaped economic, religious, and political persecution in their homeland. As the population expanded, new settlements sprouting from the landscape relied on waterborne transportation and trade as the basis for economic prosperity. Most New Englanders were involved with maritime life either directly or indirectly. The processing of fish and lumber for export to the Caribbean colonies provided employment for colonists inhabiting population centers, while farmers in the hinterlands raised livestock for shipment to the Southern plantation colonies. New England's trading fleet exchanged

its homegrown commodities for molasses, rum, tobacco, and sugar, which were frequently traded to England for manufactured goods.

The European Colonial period, from approximately 1602-1760 was characterized by exploration and growth that began on the shores of Massachusetts Bay and radiated outward to the rest of New England. The early settlers who migrated to New England to escape homeland hardships developed the region into a vital trading center. The foundation of these trading ventures was the initial struggle to survive the harsh and foreign wilderness the colonists confronted by reaping the bounty of Massachusetts Bay.

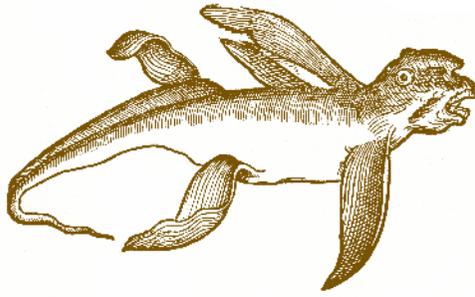


Small sloops and dories were used in the Massachusetts Bay and Stellwagen Bank fisheries. (Smithsonian Institution)

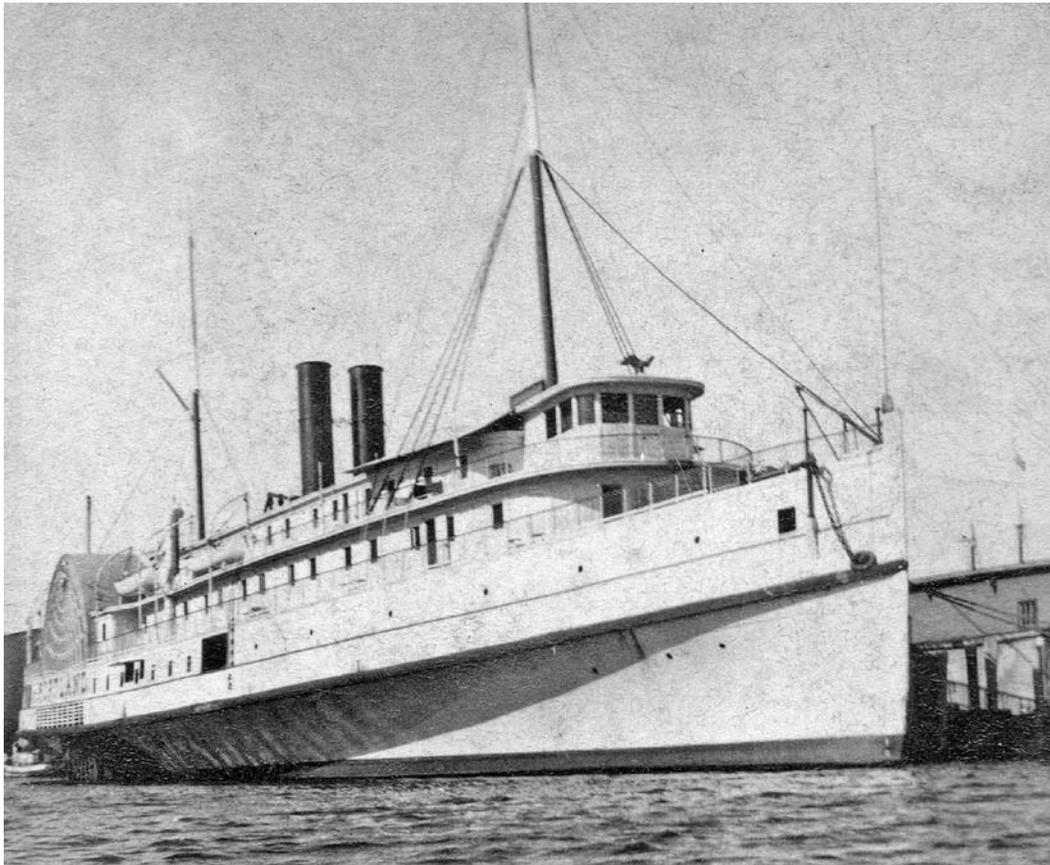


American Period

The advent of hostilities between Great Britain and the North American colonies in the 1770s changed Massachusetts Bay from a prosperous fishing ground to a place of conflict during the American Revolutionary War. The strength of the Royal Navy allowed the British Army to occupy Boston unopposed from the sea, but General George Washington saw an opportunity to take advantage of the supplies inbound to the British troops. He chartered a small fleet of commerce raiders who sortied out of surrounding ports to capture British prizes and seize their supplies for the Continental Army. Throughout the war, smuggling and privateering augmented normal maritime commerce over Stellwagen Bank. Vessels that had previously engaged in fishing and trading raided British shipping to supply the



The Steamship *Portland* was lost with all hands in 1898. (LARC)



beleaguered revolutionaries. American shipping did not go unmolested, either: the Royal Navy attempted to blockade Boston and its neighboring ports, but small American sloops and schooners regularly smuggled goods with great success. The many small anchorages around Massachusetts Bay made it impossible for the British to close off trade.

After the war's end in 1783, merchants and shipbuilders shifted their priorities away from the speedy privateers, to more beamy vessels with greater carrying capacity. Fishing fleets returned to the offshore banks in search of their quarry, while merchants pursued commerce with the freedom to trade anywhere in the world. America's neutrality on the high seas suffered from the continued hostilities between Britain and France. Infuriated by the seizure of American ships and seamen, Congress passed the Embargo Act in 1807, which prevented merchants from trading with other foreign countries. The embargo decimated Massachusetts' blossoming maritime trade, forcing some merchants to return to smuggling. Continued hostilities between America and Great Britain led Congress to ratify President Madison's declaration of war in 1812. Unwilling to miss out on an opportunity to revive their declining fortunes, Boston and Salem fielded several dozen privateers to intercept British shipping.

Massachusetts' merchants and sea captains not only participated in the trade of the Atlantic world, but also mounted long trading missions to bring home the products of the Far East during the 19th century. These voyages often required multiple stops to acquire trade goods desired by Indian and Chinese merchants. On the way to the Orient, ship captains traded cargoes of dried or salted fish and timber products loaded in Boston or Salem for sugar, coffee, steel, and even opium. After several years away from a Massachusetts port, a successful venture would return with fine porcelain, tea, and spices much desired by the American market.

Massachusetts' mariners were not solely concerned with the profit at the end of the voyage, many were also interested in the ocean they sailed upon. During the early to mid-19th century men such as Nathaniel Bowditch of Salem, refined the art of navigation and made practical observations on wind and currents that aided mariners everywhere. Another like-minded mariner, hydrographer Henry S. Stellwagen of the United States Office of Coast Survey, furthered the knowledge of the ocean realm. In 1854, Stellwagen charted the undersea bank in the middle of Massachusetts Bay, known by fishermen for centuries, with a sounding lead and careful navigation. Along with Edward Cordell, the men mapped the bank between Cape Cod and Cape Ann and named it Stellwagen Bank.

Boston reached its shipbuilding apex during the mid-19th century, as the city's shipyards turned out some of the world's fleetest sailing vessels, the clipper ships. These vessels traveled great distances across the oceans carrying passengers to the Pacific gold fields and returning with hides and exotic woods. Ultimately, economies of scale embodied by the oceanic windjammers and coastal schooners pushed the clipper ship from the scene. The infiltration of railroads into the Northeast further changed the nature of the region's maritime activities. Water-borne transportation of cargo increasingly focused on the shipment of bulk cargoes such as coal, lumber, granite, and ice. Multi-masted schooners soon dominated the sailing vessel traffic over Stellwagen Bank.

The maritime dependence of Massachusetts slowly eroded during the 19th century as the Industrial Revolution changed America's landscape. Many of the wealthiest merchants began investing in the increasingly mechanized production of iron, clothing, and shoes. Early on, Massachusetts' many glacially created rivers turned waterwheels that provided the mechanical power for increased production.

The development of the steam engine further expanded New England's manufacturing power, developing Boston into a manufacturing center as well as a seaport. Steam engines also greatly affected maritime transportation in and out of the Boston region. Once steam engines became capable of handling the difficult conditions of oceanic navigation, Boston served as the coastal and oceanic steamship hub of New England. Passenger steamships left Boston daily, connecting the growing metropolis with New York, Maine, and Europe. Ultimately, steam tugs towing barges forced the great sailing schooners out of the coastal bulk cargo trade by providing greater carrying capacity and speed.

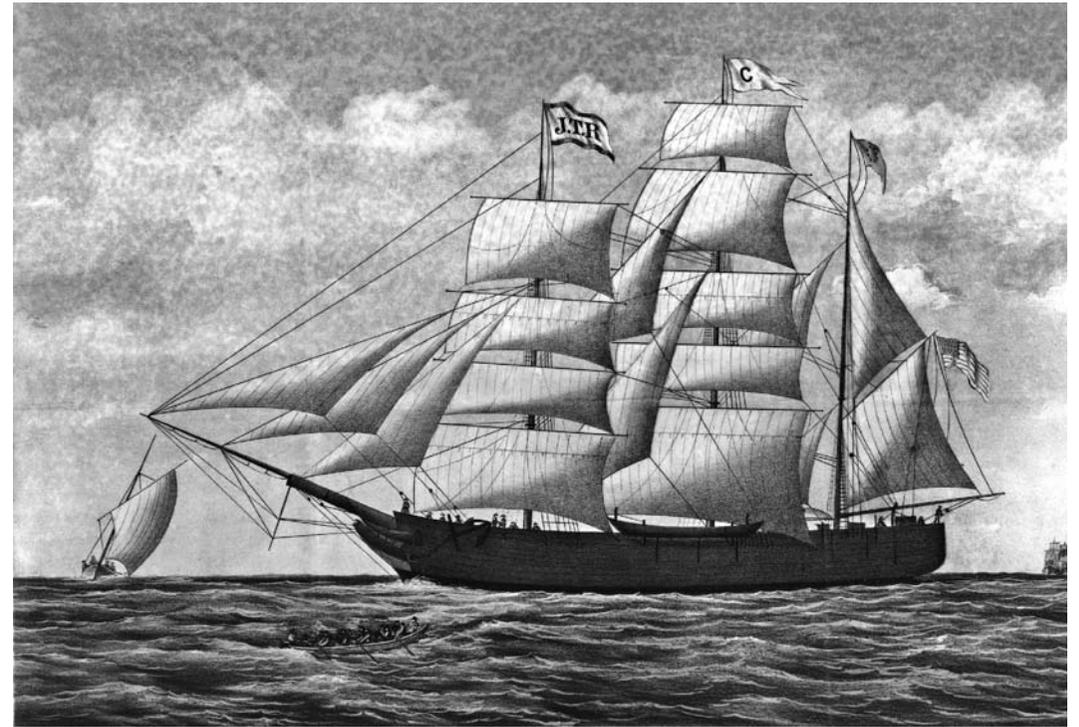
Fishing has been one of the principal activities of the people living around Massachusetts Bay since the last Ice Age. Indians gathered shellfish and caught fish with spears, hooks, and weirs. Native tribes even engaged in shore-based whaling when the circumstances were right. Europe's awareness of the New England fishery extends back to the 16th century, prior to the first North American colonies. The first Massachusetts colonists readily exploited the fishery resources offshore of their settlements for both sustenance and trade. Along with timber and furs, dried fish became one of the chief exports of the Massachusetts colonies. Initially, fishermen stayed close to land exploiting the fish stocks in areas such as Jeffries Ledge and Stellwagen Bank. Coinciding with the construction of the larger trading vessels and the peopling of North America, colonial fishermen began building their own larger sloops and schooners to give them access to the fishing grounds farther out to sea. Fishing vessels returned to port laden with cod, which were then split and dried. The curing process created a durable foodstuff that was in high demand in Continental Europe and the Caribbean Islands.

As Massachusetts' trade network expanded in the 18th and 19th centuries by supplying increasing quantities of fish to the world markets, New England's fishing craft developed to exploit the incredibly rich

fishing grounds on the Georges and Newfoundland Banks. Increasingly speedy schooners raced the short fishing season to secure as many trips to the fishing banks as possible. Racing to the fishing grounds ultimately led to the heroic fishermen's races out of Gloucester that pitted American schooners against Canadian schooners for boasting rights and national prestige. This focus on speed under sail led to construction of glorious vessels capable of carrying mountains of sail.

The penetration of railroads into New England and the use of ice for refrigeration at the end of the 19th century brought about changes in regional fishing practices. Rail transportation's speed allowed American consumers inland to enjoy fresh ocean fish for the first time. Fishermen began returning to the near shore Massachusetts Bay fishing grounds to harvest a wider variety of fresh fish including haddock, halibut, and flounder. Smaller fishing schooners made day or overnight trips to Stellwagen Bank, bringing the fish back to port before it spoiled. Additional technological changes in vessel design, propulsion, and fishing methods also changed the New England fishery. Fishermen outfitted their schooners with auxiliary diesel engines initiating a transition to solely engine-driven trawlers. These vessels also utilized improved net technology to capture the dwindling fish stocks in the bay.

In addition to fishing, whaling provided New Englanders with a valuable export commodity. Initially, large pods of humpback and right whales inhabited the waters surrounding Stellwagen Bank. The animals' seasonal proximity to shore allowed fishermen to hunt them using rowed small boats. The fishery's success during the colonial period made Boston the center of the whale oil and baleen market. As the inshore fishery over-exploited the local whale population, whalers sailed further out into the Atlantic to hunt their quarry. Adapting to the challenges of the open ocean, whalers increased the size of their vessels to extend their range. During the



18th and 19th centuries, whaling activities moved further offshore where large ships pursued whales all the way into the vast reaches of the Pacific Ocean. Oftentimes these extended voyages took two or more years, but when the hold was full of whale oil the ship would return to one of the many ports around Massachusetts Bay and sell its hard-earned cargo to Boston merchants for export.

Connected directly to the first colonists' dependence upon maritime transportation, shipbuilding has always been a major regional economic activity in New England. Shipbuilding centers surrounding the sanctuary first concentrated at Newbury, Salem, Essex, and Boston during the colonial period, but nearly every other small port on Massachusetts Bay launched two or three vessels a year. Shipbuilding represented America's first manufacturing industry. Shipwrights transformed the raw materials from Massachusetts' forests into the most complex machines of the time period. As the fishing industry and commercial export trade increased so did the

Massachusetts-built ships, such as the bark *Catalpa* of New Bedford, carried much of America's maritime trade in the 19th century. (Library of Congress)



The distinctively-bowed Gloucester fishing schooner was popular in Massachusetts Bay fishing communities in the early 20th century. (Library of Congress)

demand for more and larger ships. Even conflicts such as the American Revolution spurred on New England's shipbuilding business.

By the 18th century, New England-built vessels made up twenty percent of all registered vessels in America. During the mid 19th century, Boston shipbuilding reached its peak while in competition against the shipyards on New York's East River to build the fastest clipper ships. However, by the end of the 19th century, shipbuilding in Boston had slowed considerably from its pre-Civil War high. Higher labor costs prevented Boston's shipyards from successfully competing against the Maine yards to construct the large multi-masted wooden schooners in demand. North of Boston in the Essex County shipyards, shipbuilding on a smaller scale continued to expand into the 20th century. These yards were responsible for building the Massachusetts' fishing fleet. At the start of the 20th century, Massachusetts' shipyards in the Boston area transitioned into steel construction.

Shipbuilding in New England continued to prosper through World War II with naval shipyards operating in Quincy and around Boston. From small wooden-hulled dories to steel-hulled destroyers, New England adapted to changing technology and produced some of the finest vessels afloat.

Maritime Heritage Resources Inventory

Uncounted prehistoric and historic archaeological sites lie within the *Gerry E. Studds* Stellwagen Bank National Marine Sanctuary. Ancient geologic and glacial processes once exposed the sanctuary's seafloor to the sun, allowing it to support flora and fauna utilized by the Paleo-Indian peoples. Rising sea levels covered the sanctuary within several millennia of its exposure, moving Native American habitation to the shores around Massachusetts Bay. The arrival of Europeans in the New World dramatically amplified the quantity of maritime traffic on Massachusetts Bay. The sanctuary's position at the mouth of Massachusetts Bay places it astride the historic shipping lanes and fishing grounds for such ports as Gloucester, Salem, Boston, Plymouth, and Provincetown. These ports have been centers of maritime activity in New England for over 300 years. As a result, the sanctuary is a repository for this nation's maritime heritage resources in the form of shipwrecks.

Since the sanctuary began investigating its maritime heritage resources, archaeologists have located over a dozen shipwreck sites. Historical records indicate that several hundred vessels likely sank within the sanctuary's vicinity ranging from wooden-hulled multi-masted schooners to modern day steel-hulled fishing vessels. Past research expeditions have used remote sensing technology such as side scan sonar, remotely operated vehicle (ROV), and autonomous underwater vehicle (AUV) to locate and identify

shipwreck sites. Archaeologists have also used SCUBA to investigate shallower shipwreck sites such as the five-masted coal schooner *Paul Palmer* that caught fire and sank off Provincetown in 1913.

In 2002, a team of NOAA scientists confirmed that a shipwreck in the sanctuary was the side paddle wheel passenger steamship *Portland*. The steamer, built in 1889 by the New England Shipbuilding Company of Bath, Maine for the Portland Steam Packet Company, ran between Portland, Maine and Boston, Massachusetts from 1890 to 1898. At 280 feet long, the steamship was one of the largest and best-appointed vessels afloat in New England during the 1890s. The steamship was lost with all hands on November 27, 1898 during a fierce storm.

Remains of the *Portland* include its intact wooden hull, which has survived from the main deck level down to the keel, along with machinery features such as portions of both paddle wheels, its steam engine, walking beam, and wooden A-frame. Smaller cultural artifacts such as plates and cups lie scattered inside and outside the hull. The *Portland's* hull is festooned with red and white anemones and is home to schools of cod and pollock. In 2005 the *Portland* became the first shipwreck in Stellwagen Bank National Marine Sanctuary listed on the National Register of Historic Places.

Another visually spectacular site contains the wrecks of the 274-foot-long four-masted schooner *Frank A. Palmer* and 267-foot-long five-masted schooner *Louise B. Crary*, which sit upright on the seafloor connected at their bows after a collision in 1902. Both vessels were built around 1900 in Bath, Maine for the coal trade between the Chesapeake Bay and New England. The *Frank A. Palmer* and *Louise B. Crary* collided on December 17, 1902 in Massachusetts Bay en-route to Boston from Newport News, Virginia with full cargos of coal. Eleven of the 21 sailors onboard the schooners perished during the accident or from exposure while awaiting rescue in a lifeboat.

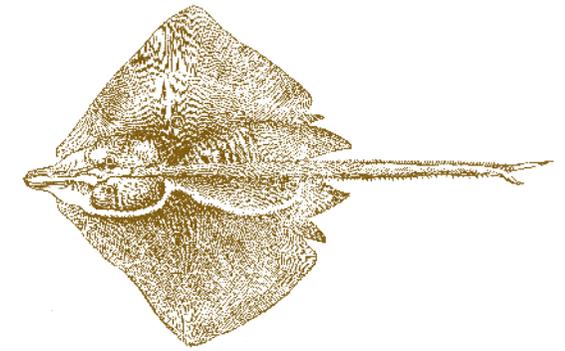
In 2006 the shipwreck of the *Frank A. Palmer* and *Louise B. Crary* joined the *Portland* on the National Register of Historic Places.

The sanctuary plans to continue its efforts to inventory and assess its maritime heritage sites using side scan and multibeam sonar, magnetometers, remotely operated vehicles, and autonomous underwater vehicles. These high-tech tools allow the archaeologists to interpret for the public the sanctuary's beautiful and dramatic shipwrecks that document New England's maritime history.

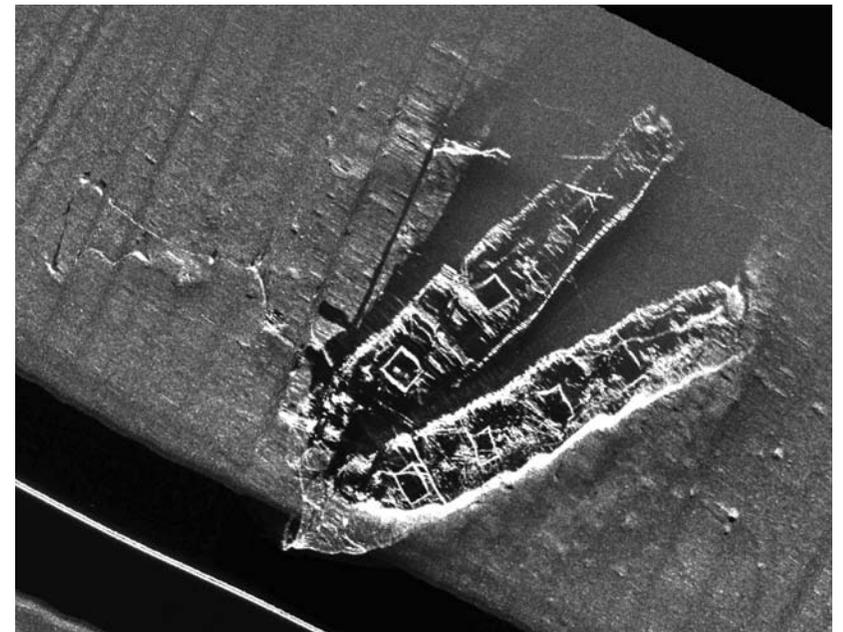
Potential Archaeological Resources

Prehistoric - Paleo-Indian cultural remains have not been located to date on Stellwagen Bank. The area had the potential to support habitation and use of Stellwagen Bank before its inundation of seawater 10,000 years ago. The likelihood is high that human or animal remains might be located in the future. The possibility of finding Paleo-Indian cultural items on Stellwagen Bank is enhanced by the report of the recovery of mastodon skeletal remains by local fishermen. Further geologic study, site modeling, and sampling will be conducted on Stellwagen Bank to determine the potential for locating prehistoric cultural remains in the sanctuary.

Historic - Archival research will likely expand the number of reported vessel losses in Massachusetts Bay. Additionally, local fishermen hold a wealth of knowledge about wrecks their nets have encountered over the years. Combining these two research techniques with remote sensing surveys will undoubtedly reveal further shipwreck sites. Most of the shipwrecks located in the sanctuary date from the mid-19th century to the present, but sanctuary archaeologists believe that wrecks from earlier periods are also likely to be found as they make a thorough investigation of its seabed.



Side scan sonar image the collided schooners *Frank A. Palmer* and *Louise B. Crary*.
(NOAA/SBNMS and NURC NA&GL)





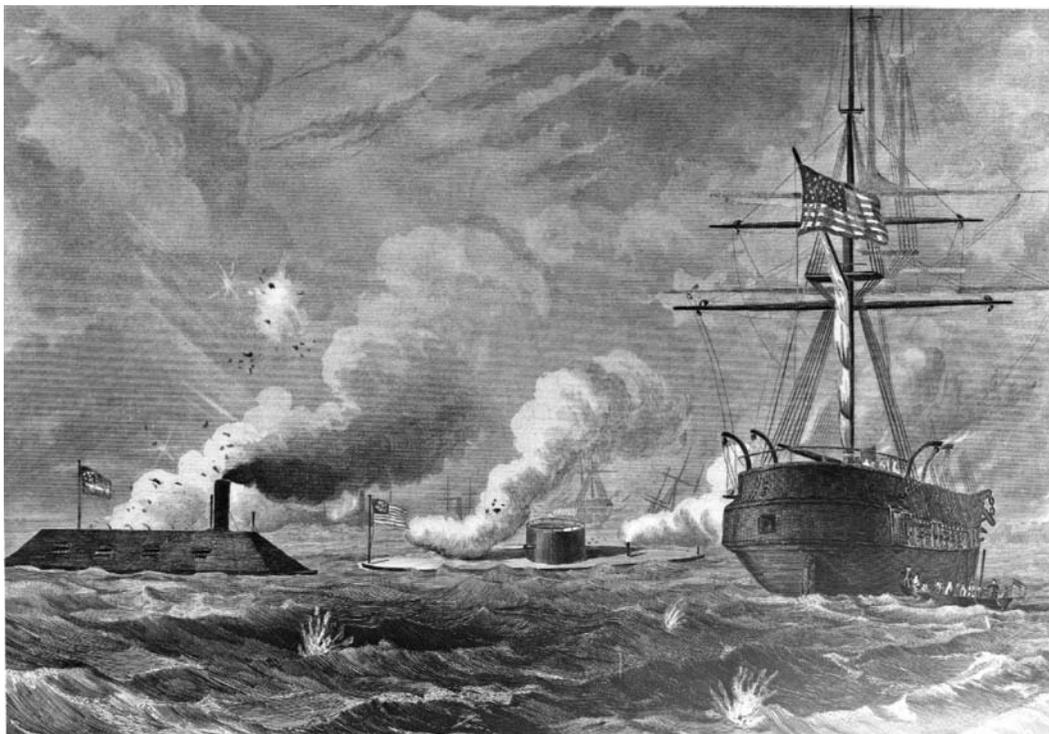
Monitor National Marine Sanctuary

Written by John Broadwater

The site of the sunken Civil War ironclad warship USS *Monitor* was designated in 1975 as America's first national marine sanctuary. The sanctuary consists of a circular area one nautical mile in diameter, centered on the *Monitor's* remains, approximately 16 nautical miles south-southeast of Cape Hatteras, North Carolina. This area is often referred to as the "Graveyard of the Atlantic" because literally hundreds of vessels have been lost there due to storms, human error, and acts of war.

Cape Hatteras is the easternmost point of land along the Atlantic coast, a characteristic that makes the area, even today, a hazard to coastal navigation. At Hatteras, the warm, northward-flowing Gulf Stream collides with the cool, southerly Labrador

The clash between the ironclads USS *Monitor* and CSS *Virginia* alerted European sea power nations to the effectiveness of the new iron and steam warship technology. (Library of Congress)



Current, creating confused seas as the currents mix and form eddies. These sea conditions contribute to the frequent formation of sudden and often furious storms that can catch mariners unaware. Even after the development of accurate navigational instruments, countless sailing ships foundered or were driven aground by fierce Hatteras storms.

The seabed in the *Monitor* National Marine Sanctuary is sandy and relatively flat and featureless, with sparse areas of exposed rock. The *Monitor's* hull, with its mantle of corals and sponges, is an active artificial reef supporting numerous animal and plant species.

American Period

The *Monitor* lies so far offshore that no known prehistoric or early colonial activities are associated with the sanctuary. The predominant human activities in the area were coastal vessel traffic and fishing, which is still true today. Site surveys indicate that the wreck of the USS *Monitor* is the only archaeological resource within the sanctuary.

The *Monitor* was the first of a series of designs by Swedish inventor John Ericsson for shallow-draft, turreted, ironclad warships built for the Union Navy. The "monitors," as they were collectively known, were intended to operate in shallow bays, sounds, and rivers against fortifications and ships guarding entrances to Southern ports.

On March 6, 1862, the *Monitor* was towed from the Brooklyn Navy Yard to Hampton Roads, Virginia. The Federals intended to challenge the Confederate shore batteries protecting the vast anchorage at Hampton Roads and Norfolk. They were also aware that the Confederate ironclad CSS *Virginia* (formerly USS *Merrimack*) was being completed near Norfolk. The *Monitor* arrived on the evening of March 8, just in time to witness the results of the *Virginia's* destructive maiden voyage. The Union Navy's James River Flotilla was in ruins and disarray. The sailing frigate USS

Cumberland was sunk, the USS *Congress* was burning, and the steam frigate USS *Minnesota* was hard aground. This first day of the Battle of Hampton Roads shocked Washington and the Northern public much as would Pearl Harbor, some 80 years later.

As the *Virginia* sailed out to finish the *Minnesota* on the morning of March 9, the crew was startled to see the odd "cheese box on a raft" profile of the *Monitor*, lying in wait to protect the stranded ship. The two lumbering, smoke-belching ironclads tangled in a battle that would change the future of naval warfare. After four hours of pounding, often at point-blank range, the vessels retired, virtually undamaged. Although there was no clear victor, the *Monitor* had succeeded in preventing further destruction to the Federal navy's blockade ships.

The *Monitor* and *Virginia* were prototypes of a new age of iron and steam, presaging the inevitable future of naval technology. Rolled-iron armor plates and rifled cannon firing high-velocity exploding shells soon rendered wooden-hulled warships obsolete. Sail power was slow and ineffective compared to steam-powered screw propellers as steam power provided more speed and maneuverability, and was not dependent upon the direction or velocity of the wind. The *Monitor* ably demonstrated the advantages of the armored, rotating gun turret, which provided protection for its gun crews while allowing the *Monitor* to train its guns on a foe without having to maneuver into precise firing position.

Both vessels succumbed within the year to causes unrelated to battle. The *Virginia* was scuttled by its crew as the Confederates abandoned Norfolk in May, 1862. The ship was not sufficiently seaworthy to head south for a friendly port and it drew too much water to navigate up the James River to Richmond. The *Monitor*, too, was vulnerable to heavy seas. While under tow to Charleston, South Carolina, the ironclad sank during a storm off the North Carolina coast on December 31, 1862.

The sanctuary's offshore location virtually precludes any possibility of prehistoric or early historic resources. The *Monitor's* hull was the only object located during a survey of the entire sanctuary utilizing side scan sonar and magnetometer.

When discovered in 1973, the *Monitor* posed an immediate problem for concerned resource managers. Lying 16 miles off the coast of North Carolina, *Monitor* was well outside the three-mile territorial seas within which federal antiquities legislation could be invoked to protect an historic wreck. The *Monitor* was quickly listed on the National Register of Historic Places while numerous organizations and individuals sought a means of protecting the warship from looting or salvage. Fortunately, the Marine Protection, Research, and Sanctuaries Act, passed the year before the *Monitor's* discovery, contained the required jurisdictional language. Under the authority of the act, on January 30, 1975, the Secretary of Commerce designated the *Monitor* a national marine sanctuary, to be protected and managed by the National Oceanic and Atmospheric Administration. The *Monitor* later received the distinction of becoming a National Historic Landmark.

A photomosaic of the site, prepared by the U.S. Navy in 1974, showed the *Monitor* lying upside down in 235 feet of water, resting on its famous armored gun turret, which separated from the hull during sinking. The iron hull was in a deteriorated state as a result of natural processes and possible human-induced events. During World War II the U.S. Navy may have mistaken the *Monitor* wreckage for a German U-boat and depth charged it. Nearly 50 years later, in 1990, the hull suffered structural damage when an anchor from a sport fishing vessel was dragged through the site.

Since its discovery and designation, dozens of scientific and private expeditions have been conducted to the *Monitor* under permits issued by NOAA. The initial management plan for the sanctuary

called for ongoing archaeological assessment of the *Monitor* and the reinforcement and protection of its fragile remains. In the early 1990s, however, NOAA determined that the *Monitor's* hull was disintegrating at a higher rate than expected rate due in part to the anchoring incident but also to weakening and collapse of key hull structural components. As a result, the National Marine Sanctuary Program increased its efforts to document changes to the site and began investigating engineering and management options for the wreck. In 1998 NOAA submitted to Congress a long-range, comprehensive preservation plan entitled, "Charting a New Course for the *Monitor*". This plan called for stabilization of the inverted hull and selective removal of key components for long-term conservation and exhibition.

Beginning in 1998 NOAA, in partnership with the U.S. Navy, The Mariners' Museum, and other organizations, conducted a series of recovery expeditions, following the recommendations of the long-range plan. In 1998 the *Monitor's* four-bladed iron propeller was recovered and transported for treatment to The Mariners' Museum, NOAA's principal museum for all documents and artifacts concerning the *Monitor*. In 2001 the 35-ton Ericsson steam engine was recovered, followed in 2002 by the successful recovery of the *Monitor's* famous gun turret, which weighed a massive 236 tons.

Shortly after recovery of the propeller, The Mariners' Museum announced plans to design and build the USS *Monitor* Center. This \$30-million center, which opened in 2007 interprets the USS *Monitor* and CSS *Virginia* within the contexts of the American Civil War and 19th-century naval technology. The center also includes a conservation laboratory where *Monitor* artifacts are treated, some requiring an estimated 10-15 years of conservation.

A new management plan is in development for *Monitor* National Marine Sanctuary. This plan will take into account the current condition of the wreck,

the need for additional research, the desire for public access, and other factors that are part of the National Marine Sanctuary Program's strategic goals.



Recovery of gun turret of USS *Monitor*, August 2002. (MNMS)



Southeast Region

Gray's Reef National Marine Sanctuary

Written by Bruce G. Terrell

Gray's Reef National Marine Sanctuary is situated approximately 17.5 nautical miles east of Sapelo Island, Georgia, at a depth between 50 and 70 feet. The 17 square nautical mile "live bottom" reef was historically known by local fishermen as the Sapelo Ground, but has been renamed for Dr. Milton B. Gray, a prominent zoologist who conducted studies in coastal Georgia.

Native Peoples

Archaeological studies of coastal Georgia suggest that Paleo-Indians lived here about 12,000 years ago. Coastal island sites also indicate the presence of Archaic peoples about 8,000 years ago. The technological sophistication of the region's Archaic culture is seen in its use of fiber-tempered pottery 2,000 years before it was used by other southeastern groups. This culture, which subsisted primarily on fishing, is thought to be related to a "parent culture" in the Caribbean (Forbis 1975).

The earliest 16th century Spanish missionaries encountered the native Guale people. Georgia's coastal region is still sometimes known as the Guale coast. Hostile to the Spaniard's attempts to enslave them, the Guales were poor candidates for the Spanish Jesuit Christian missions. The tribe was driven out after the 1670s and replaced by the Yamassee tribes who supported the British incursions into the area from the Carolinas. The coastal tribes were accomplished canoe builders and fishermen who subsisted on the resources of the inland waters. By the mid-18th century, disease and English aggression had virtually

exterminated the Yamassee people (Gibson 1980). The Creek tribe had replaced the Yamassee in the coastal region by the early 18th century. James Oglethorpe, who encountered them in 1733 developed a good relationship with the Creek and was permitted to build the trading town Savannah. In the 1830s, the American government evicted the Creek in order to open western Georgia to American settlement.

European Colonial Period

Spanish—The Georgia coast was initially included in Spain's claim to Florida. After failed attempts to settle the area in the early-16th century, Governor Pedro Menendez de Aviles built a series of coastal forts to serve as bases to protect Spain-bound treasure fleets (or flotas) that traveled up the Florida Straits towards the Gulf Stream off Cape Hatteras. Other missions built on various coastal islands met marginal success trying to Christianize and manage the local Indian populations.

The southeastern coastal region was an arena of conflict between the Spanish and English through the mid-18th century as both European powers sought to control the coast. Although their skirmishes were usually played out on land, ships and other coastal watercraft supported both sides.

English—During its several centuries of conflict with Spain, Britain encroached on the Spanish claim to coastal Georgia. Oglethorpe's settlement at Savannah, near the mouth of the Savannah River, provided England with a deepwater port that provided access to the pine forests of the interior. The forests provided naval stores such as timber and pitch for the ships of the English navy.

Warships supported the conflicts between the British and Spanish during the late-17th and early-

18th centuries. During the English Colonial Period, sailing periaugers of the provincial navy patrolled the waterways between Port Royal, South Carolina, and St. Augustine, Florida, looking for runaway slaves. Periaugers were shallow draft sailing vessels unique to the southeastern Atlantic coast and the Caribbean islands. The name referred both to dugout canoes and to shallow-draft planked boats.

Until the American Revolution, settlement in Georgia occurred primarily in the coastal region. Rice, indigo, lumber products, and naval stores were the economic mainstays and were all exported by ship. Savannah was the main colonial port for coastal Georgia and most trade took place between that port and the British colonies at Charleston and Barbados. A large portion of early Georgia's population was composed of freed indentured servants from Barbados and the British Caribbean.

American Period

As with coastal commerce, naval activities associated with the Georgia coast brought watercraft traversing across the Gray's Reef sanctuary region. During the 18th and 19th centuries, Savannah was considered a strategic port and various attempts were made to blockade and capture it.

During most of the American Revolution, Savannah was in British hands. The only direct confrontation with the English came in 1779 during an unsuccessful French attempt to blockade the mouth of the Savannah River off Tybee Island in which the French fleet was dispersed by a sudden gale.

Small-scale naval conflicts often occurred as small, fast American privateers raided English shipping in both the sounds and coastal waters. Privateering was a favorite tactic among nations with extensive seacoasts and small naval forces. Under

government-issued letters of marque, privately-owned ships were used to hurt the enemy by waging a war on commerce. Privateering was essentially government-sanctioned piracy. This pattern of naval warfare was again conducted against the British in the War of 1812.

Georgia's coastal settlement continued after the Revolution. As the native tribes were pushed to the west, inland settlers stimulated trade. Towns grew up the Savannah River at Augusta and Petersburg on the Georgia side and Hamburg on the South Carolina side. Raw upland produce such as tobacco, cotton, and lumber were shipped downriver to Savannah and thence to larger, regional commercial centers such as Charleston, Boston, and the West Indies.

In the 19th century, new port towns developed at Brunswick on St. Simon's Sound and Darien on the Altamaha River. Darien became a large national lumber supplier. Most coastal vessels carrying produce in and out of Georgian ports passed through or near the Gray's Reef area.

Much of Georgia's maritime commerce was sustained by black labor. Many slaves and some free black sailors worked on inland vessels and aboard coastal schooners and fishing boats. Following the Civil War, black fishermen manned much of coastal Georgia's regional commercial fishery, as was the pattern in much of the South (Goode 1887).

The vessels used in the 18th and 19th century coastal commerce were primarily small sloops and schooners. Cotton and rice were the main coastal exports while naval stores such as pitch, timber, and spars were valuable inland exports.

Most early-19th century fishing was relegated to the local Savannah and Charleston markets. The post-war improvement in steam and rail service made it possible to ship fish to northern markets in winter months. The principal offshore species that were caught on the Sapelo Ground were black sea bass,

flounder, red snapper and various jacks. Until the late-19th century, fish were usually caught on hand lines and were kept in live wells built into the boat's deck. Seine nets were introduced in the 20th century. An influx of northern fishermen encroached on the area in the 1880s, after the northern grounds were overfished. By the 1880s, Savannah was the primary market for Georgia and northeast Florida's fisheries (Goode 1887).

Many distinctive boat types evolved on the coastal southeast. The sinuous rivers and sounds of the inland coastal regions demanded shallow draft vessels that could serve as passenger transport or bulk cargo carriers. Boats were propelled by all means available including poling, rowing and sailing.

Vessels such as dugout canoes, periaugers (multi-log canoes), and flat-bottomed bateaux were modified to fit their required tasks. Small sloops and schooners were used for the offshore fisheries and the coastal trade. These were often little more than open boats with short foredecks and a single fore and aft gaff-sail (Fleetwood 1982).

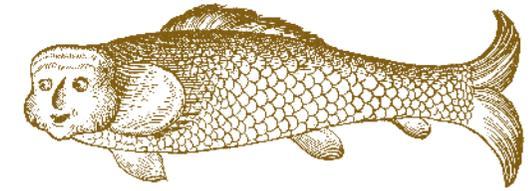
The regional coastal trade saw the introduction of the finely crafted single-mast Bermuda sloops that originated in the West Indies in the 18th and early-19th centuries. In the late 1880s, numerous northern "smack" schooners infiltrated the area, as New England fishermen came south to fish for black bass during their own slack seasons (Chapelle 1951).

By the early 1800s Savannah was a regional shipbuilding center constructing numerous two and three-masted schooners, brigs, and ships for local use. Locally built vessels were used in 19th-century coastal trade between Charleston, Savannah, and smaller coastal towns such as Darien, Brunswick, and Fernandina in Florida.

Coastal Georgia's steamboat heritage is, perhaps, best known by its association with the construction of the first transoceanic steamship, SS *Savannah* in

1819. Many small inland steamers were also used at Savannah to navigate the numerous rivers and sounds. Larger coastal steamboats were used to carry passenger traffic between Savannah and other southern coastal cities. While steamboats moved much southern passenger traffic, sailing vessels tended to carry bulk goods. The introduction of the railroad in the mid-1800s usurped much of the passenger traffic and carriage of perishable goods.

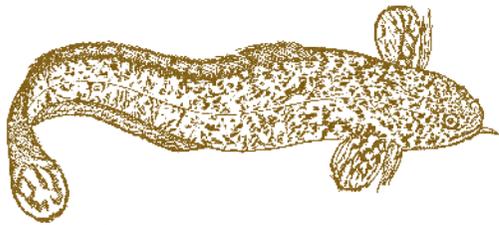
Savannah was an important southern port during the Civil War and was blockaded by the Union Navy early in the conflict. While the Confederate navy maintained a strong squadron of gunboats and ironclads at the city, they never confronted the Union blockaders at the river's mouth or offshore. Union patrol vessels prevented blockade runners from entering the river to re-supply the Confederates.



Sixteenth-century Spanish sailors met with marginal success in the Christianization and enslavement of the coastal Guale Indians.

(Library of Congress)





The Georgia coast again became a focus of naval activities during World War II. The southeastern U.S. coastal waters were part of the battleground for the Battle of the Atlantic. In 1941 and 1942 several German U-boats sank Allied merchant vessels near the present sanctuary's boundaries. In April 1942, three merchant vessels were sunk in waters adjacent to Gray's Reef, immediately off St. Simons Island.

Maritime Heritage Resource Inventory

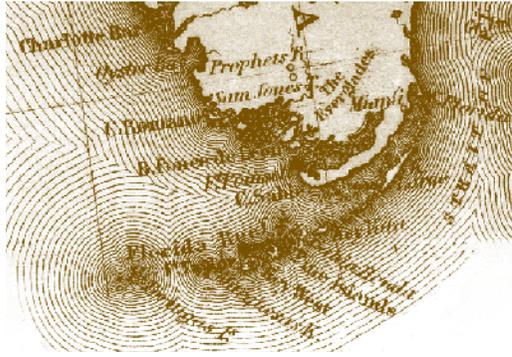
There are scant reports of human cultural remains at the the Gray's Reef National Marine Sanctuary. Recreational divers and scientific researchers have not yet reported the presence of historic shipwreck-related objects. Commercial fishermen have periodically reported recovering skeletal remnants of prehistoric American camel in their nets. Since there is the possibility of human populations existing at the time of such Paleo-era fauna, archaeologists from University of Georgia are studying the hard-bottom reef for evidence of Paleolithic human remains. Search results have, thus far, been inconclusive.

Potential Archaeological Resources

Prehistoric—During the last glacial stage of the Pleistocene, Georgia's coast extended approximately 59 to 66 miles farther out into the ocean than it does today and the region of Gray's Reef existed as an exposed land form. Recent geomorphological studies reveal that the sanctuary's submerged land forms include river valleys, submerged terraces, and hard-bottom outcrops, all of which are potential prehistoric activity sites.

Based on findings from nearby land sites, prehistoric cultural remains in the sanctuary could include shell middens (refuse piles) which could contain Paleo-Indian and Archaic stage food and botanical remains. Additionally, cultural materials such as stone tools, flakes, and ceramics from the Archaic Period could also remain. Habitation and camp sites may also be preserved beneath the submerged substratum.

Historic—The potential for historic cultural remains is slim but not negligible. Previous NOAA surveys of the small sanctuary have revealed no obvious historic shipwrecks (personal comment Mark Frieze 1992). Additionally, few hazards exist within the sanctuary that would threaten navigation such as shallow reefs, unusual weather patterns, currents, or proximity to land forms. Fishing vessels wrecked by storms or accidents are perhaps the most likely historical resources to be found within the sanctuary.



Florida Keys National Marine Sanctuary

Written by Bruce G. Terrell

Florida Keys National Marine Sanctuary, designated in 1990, contains 2800 square nautical miles of state and federal waters and bottomlands. Created to protect threatened marine life, habitats, and corals, this sanctuary incorporates the already established Key Largo and Looe Key national marine sanctuaries and protects all of the waters surrounding the Keys except for those already protected by other state and federal programs. NOAA and the State of Florida work together to manage both the natural and maritime heritage resources of the sanctuary. The sanctuary's educational interpretive center, the Dr. Nancy Foster Environmental Complex is located in Key West, which is a Preserve America Community.

Native Peoples

The Florida Keys consists of a series of coral reefs, which are separated from the Bahama Banks by the Florida Straits and the Bahama Channel. The reefs cap Pleistocene-era limestone islands.

Scientists debate the earliest Late-Pleistocene and Holocene sea levels in the region because of a lack of data about Paleo-Indian and Archaic cultural periodsites before about 8,000 years ago. They are in better agreement concerning more recent events.

The sea was at its lowest level (100 meters) by 15,000 years ago. By the time of man's probable appearance in the region around 12,000 to 10,000 years ago, melting glaciers had caused sea levels to rise. At this time the exposed land was hard bedrock that would later provide the foundation for coral reefs. Fresh water springs (or seeps) may have been exposed at this time. By 8,000 years ago, the sea level was approximately 8.5 meters below present and the shoreline extended between three and seven kilometers from today's shoreline. The sea level had risen to its current levels by 2,000 years ago (Murphy 1990).

The earliest Paleo-Indian people are thought to have arrived in South Florida around 12,000 years ago. Since most of the area of their supposed habitation is now under the sea, little is known about their material culture.

The Early Archaic cultural period is represented between about 9,000 to 7,000 years ago. This area of habitation, too, is mostly submerged. Archaeological evidence of human occupation in South Florida emerges at about 7,000 to 4,000 years ago. At this period there is no archaeological evidence of the use of ceramics, a marker used to identify a cultural shift. During the Archaic period, Florida Bay and Biscayne Bay are thought to have been freshwater lakes, around which native settlement would have occurred. The sea level rise between 4,000 and 2,000 years ago would have inundated this environment (Minerals Management Service 1990b).

As a result of global warming and sea level rise, the Keys were islands by about 4,000 years ago. The Calusa culture appears in the archaeological record in the southern Florida region at about the same time. Their subsistence was based on hunting and gathering resources from the estuarine and marine environments. They used dugout canoes for transportation over large geographical areas and for fishing and hunting.

The variety of natural resources and the temperate climate permitted the Calusa people to develop a complex socio-political network. They traded with other native groups, some as faraway as the Antilles and Cuba. They also dug an extensive network of canals on the South Florida mainland for navigation and irrigation. Contact with the Spanish in the 16th and 17th centuries devastated the Calusas who eventually died from European disease, warfare, and slave raids.

The Seminoles moved south into the region in the 19th century. First living in the swampy tangles of North and Central Florida in the early 19th century, they were composed primarily of refugee Creek Indians and runaway Negro slaves. Known for their canoe craftsmanship, Seminole traders descended the rivers to Spanish coastal and island posts where they exchanged skins, furs, dried fish, beeswax, honey, and other articles for European manufactured goods, fabrics, and liquor. They sometimes navigated as far as the Bahamas and Cuba.

Florida and Caribbean natives initially saw contact with the Spanish as an opportunity to trade for exotic goods. (Library of Congress)





Key West's 19th-century economy was built upon such maritime industries as ship chandlery, shipwreck salvage, and fishing. (Library of Congress)

In the late 18th century, the Spanish sent small sloops to the southwest Florida coast to trade with the natives for seals. They used seal fat to coat the bottoms of their ships hulls to keep the ever-present shipworm from devouring the hulls in the tropical waters.

Forced towards Florida's southern extremities by the pressure of American settlement, the Seminoles attacked white coastal settlements in the 1830s. They often singled out crews manning lighthouses and even attacked the lightship anchored on Carysfort Reef from their canoes. In 1834, the US embarked on the second of the Seminole Wars to open the Florida coast to American settlement. One of the most prolonged of American wars, this guerilla conflict resulted in over 1500 deaths and lasted more than 10 years.

European Colonial Period

The Florida Keys were originally named *Los Martires* by the Spanish explorer Juan Ponce de Leon who first noted them during his 1513 exploration of the Gulf of Mexico. The gnarled rocky islands appeared as suffering martyrs from the distance.

Over the next two centuries the islands continued to be noted by the Spanish, but as navigational hazards rather than potential colonization sites. As the gold flotas left Mexico and Havana on their yearly voyages to Spain, they sought the northerly current of the Florida Straights and Bahama Channel. This route connected the fleets with the prevailing westerly trade winds off the Carolinas that blew them home. The seemingly placid Caribbean weather often turned vicious and many treasure-laden ships were dashed on the reefs and shoals in violent hurricanes such as that of 1622 which wrecked some 10 galleons along the Florida Keys reefs.

In the 1700s, English men-of-war in their global conflict with Spain began passing through the straights of Florida from their bases in the Caribbean islands. Many English ships were lost in this area such as the frigate HMS *Looe*, which was lost in 1744 in a storm near Big Pine Key—now the site of the Looe Key section of the the Florida Keys National Marine Sanctuary.

In the 1770s, Key West (originally Cayo Hueso) was a watering stop for ships transiting the Gulf and Atlantic. Significant island settlement did not occur until after the War of 1812.

American Period

From the end of the American Revolution in the 1780s until the 1830s, the islands of coastal Florida and the Caribbean were a haven for remnants of divided native tribes, white renegades, and pirates.

Bahamian shipwreck salvagers, black spongers, and Spanish fishermen settled in small communities on the Keys to exploit the western side of the Straits. After the United States took possession of Florida in 1821, Key West was made an official wrecking and salvage station and became the economic and federal governmental center for the region. Essentially a frontier town, Key West was known as a rough, lawless place for much of the 19th century.

The Florida Keys' historic economy was primarily focused around maritime activities. In the 18th century, Spanish-Cuban fishermen fished the flats around the Keys and made temporary camps on the various islands. Key West was the main 19th century market town for the Keys' fisheries. Most of the produce was then sent across the Straits to Havana, the economic center for the region. In addition to fish, watermen also caught sea turtles and harvested sponges. The sponge grounds extended the length of the Keys from Biscayne to the Tortugas (Goode 1887).

The regional antebellum fisheries were considered unique among other American fisheries in that there were many black fishermen and boat owners. Most were Bahamians who recognized the more favorable business conditions on the American side of the Straits. Also present were West Indies Blacks, Spanish Cubans, Bahamians of English descent, and expatriates of various European nationalities who had been shipwrecked or jumped ship.

A distinct boat type developed around the Key fisheries. The Key West smack (or smackee) was a small sloop-rigged fishing boat used almost exclusively by the Keys fishermen and it was known throughout the northern Gulf of Mexico. It was characterized by its

open cockpit, internal live fish well, full hull and fixed keel. The design of the Key West smack was reputedly of Bahamian origin (Goode, 1887).

Another significant industry in the Florida Keys was shipwreck salvage. The earliest European inhabitants of the Florida Keys were 19th century wreckers from the Bahamas. When the U.S. government sought to regulate and earn revenue on salvaged wrecks in the early 1800s, many Bahamians settled in the Keys and became the ancestors of today's "Conchs."

The Keys provided a constant source of income for the wreckers. In the 18th and 19th centuries, the Florida Straits were the primary route used by vessels leaving America's New England ports to trade with French and British islands in the West Indies and Antilles. After New Orleans became a major 19th-century American port, coastal trade also passed through the Straits enroute to the Gulf of Mexico. The poor navigation skills of coastal boatmen, poor knowledge of shoals, and unpredictable hurricanes provided conditions ripe for shipwrecks.

Wreckers made their fortunes on recently grounded or sunken vessels. They were obligated to save crews and to assist distressed vessels. When salvaging ships, the wreckers received a percentage of the value of the rescued cargo.

Wrecking was so lucrative that a US wrecking station and customs house was established in Key West in 1821. A community soon grew on the island to accommodate the wrecking industry in spite of the lack of freshwater. Other stations and communities were established at Cape Florida on Key Biscayne and on Tavernier Key. Because a combination of storm direction and treacherous reefs caused numerous wrecks between Careysfort and Alligator reefs, Indian Key became a popular community for wreckers as well.

In 1826, three lighthouses were erected in the Keys to reduce the hazard to navigation. Lights were built at Cape Florida, Sand Key, and Key West and later Garden Key in the Dry Tortugas. A light ship was also anchored at Carysfort Reef. The light keepers were prevented from participating in salvage to ensure that they did their duty and did not "accidentally" mislead vessels onto reefs. The duty was hazardous with threats from weather and Indian attacks often imperiling the keepers. Lights so improved navigation that by the second half of the 19th century the wrecking industry had faded.

The Florida Keys were first considered to have militarily strategic significance in the 1820s. Pirates in the Gulf and Caribbean hid among the coastal islands and Key West became a base for American naval patrols against the pirate bases. During one such patrol, the schooner USS *Alligator* was lost near Key Largo. Following the elimination of the pirates, the Navy abandoned Key West. It was later reoccupied in the 1830s during the Seminole Wars. In the Seminole Wars the Navy used steam warships and open launches for early amphibious attacks on the natives and renegades. The Seminoles were so embedded in the thick tangle of mangroves and everglades that the campaign was reduced to guerrilla warfare. Following the wars the Navy established a coaling station at Key West.

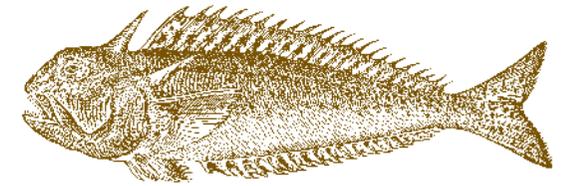
The Keys' military value was made even more apparent during the Civil War. Fort Taylor at Key West and Fort Jefferson at Dry Tortuga were essential to the Union naval blockade of the Southern ports. The forts served as coaling stations and bases from which to harass and capture Confederacy-bound blockade-runners coming out of Havana.

Key West was again used as a naval-supply base during the Spanish-American War in 1898. The island was a principal depot for the shipment of men and supplies in support of the Cuban campaign. Key West

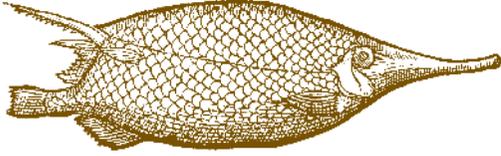
and the Dry Tortuga Islands were both used as naval coaling stations in that campaign.

In the 20th century, the U.S. Navy recognized the strategic value of Key West in the protection of the Panama Canal. America's role as a two-ocean naval power was reliant upon the canal for quick movement between the Atlantic and Pacific oceans. During World War I, Key West became a submarine and naval aviation training base.

The base was expanded during World War II for training and to accommodate blimps and aircraft. Blimps were used successfully as mine layers, ship escorts, and other anti-submarine roles. They scouted for German U-boats that preyed on allied shipping in the Gulf Stream. German submarines sank many tankers and freighters in and near Florida Keys National Marine Sanctuary.



Maritime Heritage Resource Inventory



Florida Keys National Marine Sanctuary has documented numerous sites which are interpreted for community education and outreach. The Shipwreck Trail Project, a joint NOAA/State of Florida initiative, provided interpretive dive slates and brochures to inform both diving and non-diving visitors about the maritime heritage of the Florida Keys' waters. Shipwrecks on the trail include the 1733 wreck of the *San Pedro*, the late-19th century SS *City of Washington* (present at Havana Harbor during the destruction of the USS *Maine*) and the remains of the WWII destroyer escort USS *Amesbury* (DE066).

The sanctuary has several other historic shipwrecks of special interest. One of the richest salvaged shipwrecks found in US waters is the site of the 1622 Spanish galleon wreck *Nuestra Senora de Atocha* which has been salvaged by the late Mel Fisher and his family since the 1980s. Another wreck that was

archaeologically documented by a Fisher family enterprise is the remains of the *Henrietta Marie*, lost in 1700, which is one of the few slave ships ever excavated. Across the length of the Keys are the remains of at least twelve ships of the "New Spain Fleet" that sank in July 1733. Florida's Bureau of Archaeological Research has published a booklet describing the history and archaeological remains of these ships (Florida Division of Historical Resources, 2005). A shipwreck representing the Keys' modern historical period is the *Queen of Nassau* located in over 200 feet of water

off Islamorada. This ship was originally built in 1904 as the Canadian Fisheries Commission patrol vessel HMS *Canada*. It later became the fledgling Canadian Navy's first school ship. The HMS *Canada* was later renamed the *Queen of Nassau* and was sold to a commercial company, but it sank while being towed to a refitting yard in 1926.

Potential Archaeological Resources

Prehistoric—Most potential coastal Paleo-Indian sites in the Florida Keys are likely to be submerged (MMS, 1990b). Little archaeological investigation has been conducted in the Keys thus far to identify submerged prehistoric sites. An extreme Holocene shoreline that coincides with the earliest period of possible Paleo-Indian habitation (approximately 12,000 years ago) is expected to exist at the 50-meter bathymetric contour off the Florida Keys. Early Archaic sites, from around 8,000 years ago, are also thought to be submerged and may exist at about the 8.5-meter contour. If cultural remains are present, they are likely to be covered by about 10 meters of sand (MMS, 1990b). Late Archaic sites after 2,000 years ago and historic-era Native American cultural remains may also exist in the shallow-water regions and mangrove areas of the sanctuary. A sinkhole uncovered in nearby southern Dade County known as the Cutler Fossil site, contains 5000- to 10,000-year-old remains of extinct animals in association with human cultural artifacts. This suggests that human cultural remains could exist farther offshore. The discovery of Paleo-Indian or Archaic cultural remains in South Florida would be very significant to the study of the Paleo-ecology, human adaptation, and early native culture of the region.

Historic—Because of the high frequency of Spanish treasure wrecks in the waters of the Florida Keys, much attention has been paid to the history of shipwrecks

in the sanctuary region. While many of these wrecks have been located, few have been archaeologically documented. Although the potential resource base has been diminished by treasure salvage in the 1960s as well as numerous hurricanes, archaeological studies may still reveal important information about maritime history of the Florida Keys. Studies of remaining 16th and 17th century Spanish flota shipwrecks would be significant to our knowledge of the era of Spanish exploration and colonization. They could provide data on 16th- through 18th-century ship construction and supply insight into the lives of European sailors and the early Spanish economy in America. Shipwrecks of the 18th and 19th centuries may also contain important cultural information about the growth of American commerce, economy and material culture.

The ease of access to shallow water shipwrecks and the excellent visibility make the sanctuary an excellent location to educate people about the maritime heritage of the area. It is a premier "classroom in the sea."

State of Florida marine archaeologists
map shipwreck in Florida Keys National
Marine Sanctuary. (Florida Bureau of
Archaeological Research)





Flower Garden Banks National Marine Sanctuary

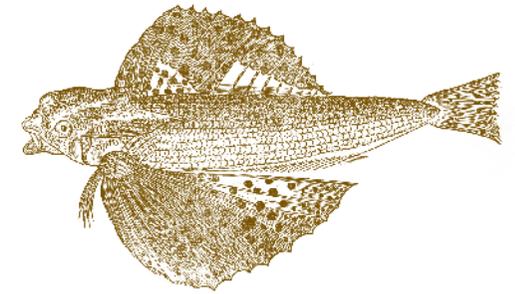
Written by Bruce G. Terrell

Flower Garden Banks National Marine Sanctuary is the only sanctuary located in the Gulf of Mexico (the Florida Keys sanctuary borders on the Gulf). It contains the northern-most living coral reef on the United States' Continental Shelf. Composed of two separate reefs, the combined area covered by the reef formations totals 41.7 square nautical miles. Both East and West Flower Garden Banks are approximately 120 miles off the coast of Texas and Louisiana.

Potential Archaeological Resources

Previously accepted projections of human habitation in the New World have suggested that there would be little probability for prehistoric archaeological sites in the Flower Garden Banks. The area was seaward of the Holocene shoreline and was inundated by the presumed period of human habitation at 13,000 years ago (Flower Garden Banks Final Environmental Impact Statement 1991). As more evidence is considered that pushes New World human populations back beyond that date, a re-evaluation of the banks sea-level history may change assumptions about the area's prehistoric characterization.

The lack of shallow reefs or obstructions that could threaten ships results in a lessened probability of historic shipwrecks. The primary historical activity at the Flower Garden Banks has been fishing. The banks were fished for snapper and grouper beginning in the 1880s by commercial hook-and-line-fishermen. Cultural remains and/or historic shipwrecks associated with late 19th- or early 20th-century maritime activity could possibly exist at Flower Garden Banks, but have not yet been reported by divers.





West Coast Region Olympic Coast NMS

Written by Bruce G. Terrell

Olympic Coast National Marine Sanctuary is located along the northwest coast of Washington state. Its landward boundaries extend from Koitlah Point on the Strait of Juan de Fuca, around Cape Flattery and south to the southern tip of Copalis National Wildlife Refuge north of Gray's Harbor. The sanctuary extends westward to the 100-fathom isobath and contains nearly 2,605 square nautical miles. The sanctuary is adjacent to the Makah, Quileute, Quinault and Hoh Indian Reservations landward and the boundary of Canadian and US waters to the north. An area of relatively undeveloped and pristine beauty, the sanctuary was designated to provide protection for a vast array of living and non-living biological resources that includes habitats for whales, otter, fish stocks and seabirds. The sanctuary is also host to centuries of distinctive Native American culture and is the site of over 180 recorded historic ship losses.

Native Peoples

The sanctuary's western boundaries extend 25 to 40 miles offshore and include most of the Continental Shelf. Two of three submarine canyons were likely Pleistocene river systems and the third is a relict of the Strait of Juan de Fuca. The seaward portion of the shelf consists of a smooth slope while the near-shore area is characterized by rocky shore-cliffs, islands, sea stacks, and submerged pinnacles resulting from headland erosion. The erosion is brought on primarily by severe winter storms which can create waves up to eight meters high near the shore (Wesson, 2003).

The sea level 20,000 years ago was about 120 meters lower than present. Glacial melt caused a rapid rise so that the sea level was only approximately 20

meters below present by 8,000 years ago and reached modern levels about 2,000 years ago. Researchers believe that between 8,000 and 2,000 years ago the regional sea levels actually may have been at least four meters above modern sea level. This is also supported by Indian oral tradition (Wesson, 2003).

Human migration across the Bering land bridge into the New World is believed to have occurred anywhere between 12,000 and 30,000 years ago. Some researchers suggest that an additional maritime-based culture hugged the land bridge shore and entered the Americas using watercraft during this period as well (Wesson, 2003). Such populations would certainly have navigated along the Olympic Peninsula's shoreline establishing camps onshore. Archaeological research along the terrestrial boundaries of the sanctuary is inconclusive about the earliest human habitation. The oldest known sites appear around 4,000 to 8,000 years ago.

The distribution of historically known Native American tribes along the coastal Olympic Peninsula includes the Makah tribe to the northwest and the Quileute, Hoh and Quinault tribes in succession to the South.

Linguistic studies suggest that the Salishan language speaking Quinault and the Chimakuan-speaking Quileute and Hoh groups were the original inhabitants of the Olympic Peninsula. There are culturally-based suggestions that the Makah were a relatively late arrival to the Olympic Peninsula. The Wakashan-speaking Makah are closely related to the Nootkan culture and language that originates across the Strait of Juan de Fuca on Vancouver Island. Both the Makah and the Quileute have traditions that speak of bitter fighting. The Makah are a traditional maritime culture that derived most of their sustenance from whaling and sealing. The other tribes may have hunted whales to a lesser degree and depended more on other resources including inland fishing. They also had different cultural traditions than the Makah (Renker, 1989). These things suggest a different cultural origin

of the Makah than of the surrounding tribes.

All of the Northwest tribes are renowned for their expert utilization of locally abundant wood for tools, shelter and watercraft. They created elaborate decorative and cultural motifs. Much has been learned about Makah craftsmanship from archaeological remains of the Ozette village site at Cape Alava that date from about 500 years ago. The region's tribes were known for their ocean-going dugout canoes. The Makah, in particular, were able to voyage for days out of sight of land to hunt whales.

Contact with foreign cultures may have occurred quite early for these coastal tribes. Traditional stories and archaeological remains of iron and steel implements suggest early incidental contact with Japan. This is supported by an account of three Japanese sailors whose ship was washed ashore near Point Grenville, Washington in 1834. The rest of their crew dead, they had drifted for a year before wrecking upon the coast. The Quileute who found them helped get them to British sanctuary at Fort Vancouver on the Columbia River (Brooks, 1875, Gibbs, 1968, Keddie, n.d.).

Spanish sailors Bruno Heceta and Don Juan Francisco encountered local Native Americans during a 1775 expedition to the region. Other ship-bound Europeans and Americans followed as westerners spread out along the western North American coastline to hunt seals, otters and whales. American contact was disastrous for the Indians, resulting in the decimation of Indian populations from disease. By 1855 most of the tribes were consigned to reservations by the U.S. government.

European Colonial Period

The Spanish first explored the Pacific coast in the 16th century. After his 1592 expedition to the region, Juan de Fuca's name became associated with the strait that separates Canada and the US. However, it is unclear whether he ever saw the body of water

Makah whaler Lighthouse Joe. c.1910
(Library of Congress, USZ62-109749)



himself. The Spanish did not attempt to exert influence over the area until the late 18th century. In fear of Russian and English fur traders' incursions into their claimed territories, the Spanish belatedly sought to secure their own claims on Western North America. In 1792 they briefly established outposts at Nootkah Bay on Vancouver Island and at Neah Bay at Cape Flattery. They were, however, too late. (Weber 1992)

During Captain James Cook's 1778 expedition to the region, sailors traded cheap trinkets to the natives in exchange for otter pelts. Accounts of vast profits made selling the pelts to the Chinese at Canton (later in their voyage) tipped off European and American business interests that there was a potential value to exploiting that trade. Merchant ships from the east quickly converged on the Northwest Coast.

Spain negotiated to share the Northwest with Great Britain and attempted to set a boundary by placing a settlement at Neah Bay. The Spanish, however, did not have sufficient strength to maintain the region against mounting foreign incursions. The Spanish, after only six months, abandoned the Neah Bay settlement. American traders swarmed into the area to challenge Britain's perceived hegemony and to trade with the tribes for otter pelts (Caruthers 1973). As the English established a permanent presence on the north shore of the strait in British Columbia, the Americans claimed primacy south of the strait.

American Period

The United States and Britain continued to quibble over the Northwest Oregon Territory through much of the early 19th century. Finally, the land that would become Oregon and Washington states became U.S. territory in 1846 with the 49th Parallel Compromise. The "Great Migration" along the Oregon Trail funneled many settlers to the Northwest. Settlements grew around Puget Sound as lumber

became a moneymaking industry. The California Gold Rush attracted thousands of miners to California and sparked a need for Puget Sound timber. After Washington became a state in 1853, the pressure from American settlers moving into the area led to the placement of the tribes onto reservations. As commerce intensified in and out of the Puget Sound, the government erected lighthouses at critical near-shore shoals to improve navigation. The light at Cape Flattery's Tatoosh Island was built in 1855 on Makah lands and was supplied from the Makah village at nearby Neah Bay.

During the last half of the 19th century, increased shipping to and from Puget Sound resulted in increased incidents of shipwrecks along the Olympic Coast. The area is notorious for fog and rain, and winter storms are savage in their intensity. Ships having the misfortune to be caught near the shore risked destruction on the many uncharted submerged pinnacles. Many of the ships that wrecked along the Olympic Peninsula coast at this time were wooden sailing vessels. Ship-rigged "Down-easter" barks and multi-masted schooners entering and leaving the straits were frequently wrecked near the coast.

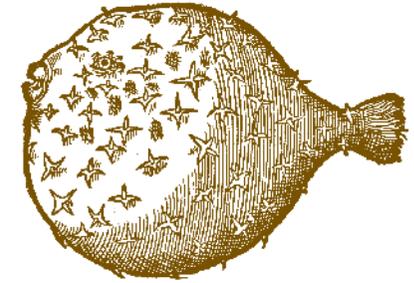
As the regional economy expanded at the turn of the century and communities evolved, other types of vessels appeared in the coastal waters. Steam-powered ships brought trade from around the Pacific Rim countries. Iron-hulled ships were slow to enter use in this region due to the paucity of iron manufacturing on the Pacific coast. Timber was so plentiful and cheap that iron shipbuilding could not compete. Puget Sound shipyards such as the Hall Brothers, built ships of local timber to carry the lumber trade to the rest of the Pacific Rim.

Smaller craft such as California coastal steamers and sail traders as well as wooden fishing boats plied the Northwest Coast waters. Many of these smaller craft based themselves at regional ports like those at

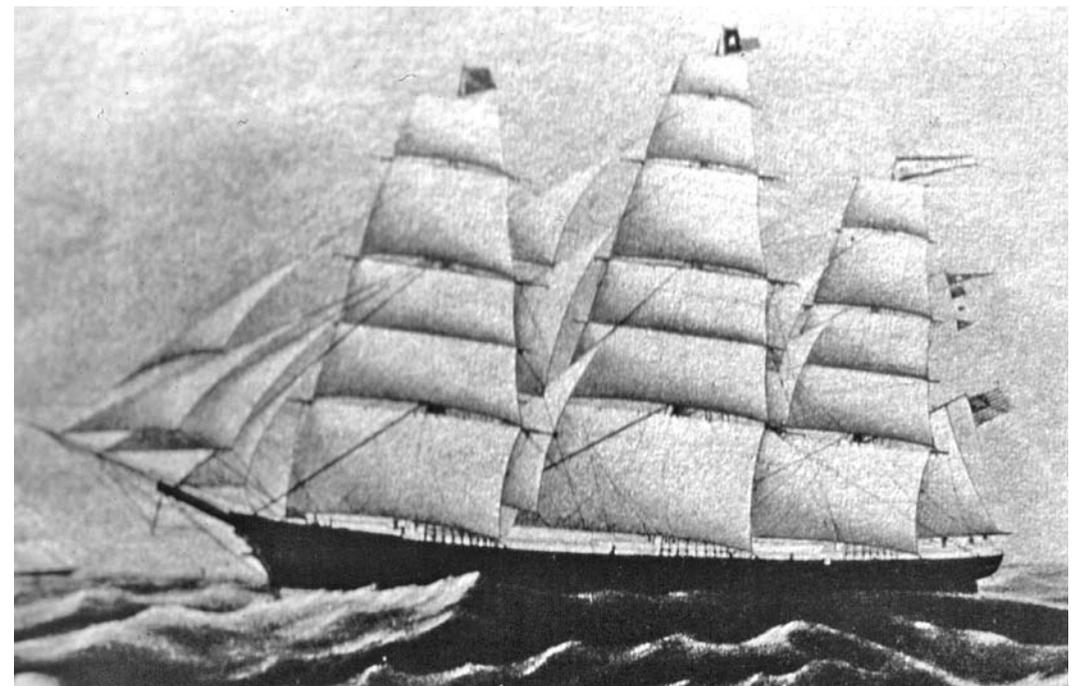
Neah Bay and La Push and were sometimes owned by Native Americans.

In 1888 three Gloucester schooners from Massachusetts were brought in to fish for halibut at the mouth of the Strait of Juan de Fuca influencing local fishing boat designs. The introduction of gas engines gave rise to Northwest Coast purse seiners. Regional fisheries, whalers and sealers also made use of locally produced boats, seeking popular game fish like salmon and steelhead trout (Chason 1981).

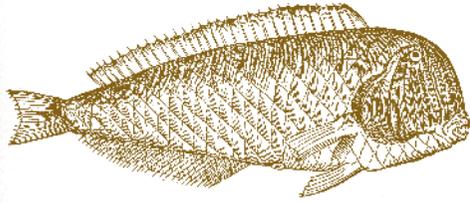
By the early 20th century Norwegian immigrants and their fleets of wooden, diesel-powered purse seiners based in the Puget Sound dominated salmon and halibut fisheries. Sport fishing also became more prominent when private citizens from the cities were able to afford their own powered boats. Salmon and steelhead trout were popular game fish (Chason 1981).



*Bark Austria, lost at Ozette beach, 1887.
(Bath Maritime Museum)*



Maritime Heritage Resource Inventory

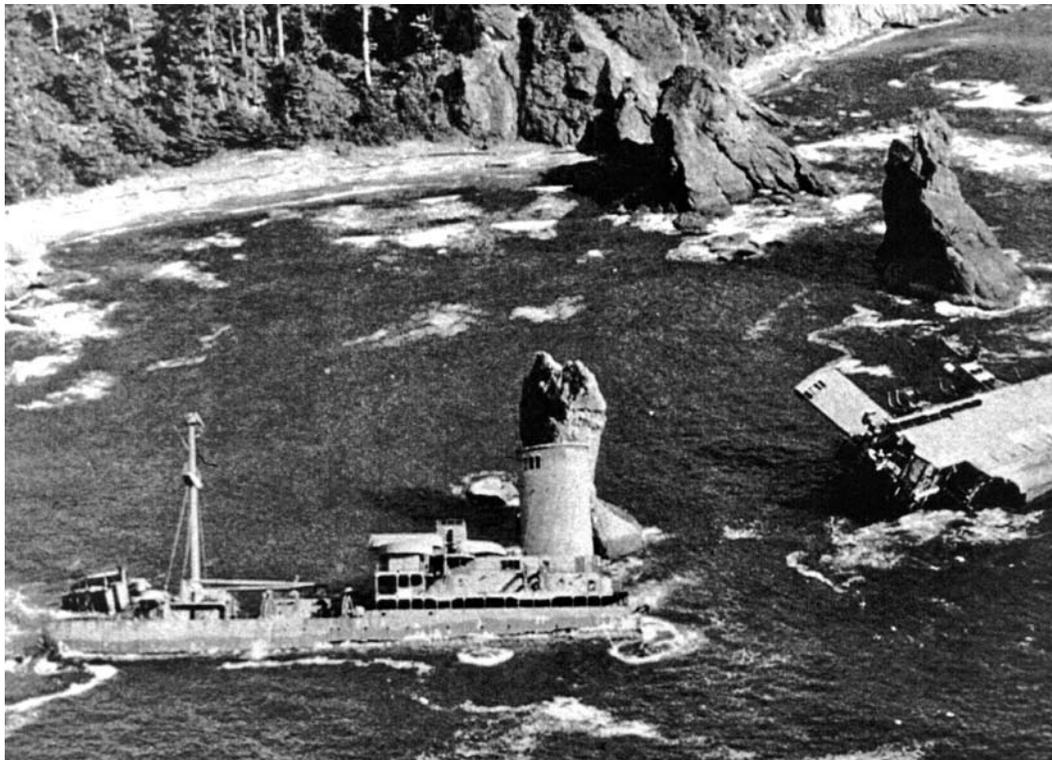


The known ship losses of the Olympic Coast reflect a sample of the watercraft types in use at various times throughout the history of the Northwest Coast. The national marine sanctuary archaeological site database indicates more than 180 historic ships were lost in the vicinity of the Olympic Coast National Marine Sanctuary. Wreck environments range from shallow, near-shore regions along the Olympic Peninsula to the deep waters at the far western boundaries of the sanctuary. Historic shipwreck reports include 19th century square rigged ships, side-wheel steamers, coastal schooners, tugs, barges and both sail and engine-powered sealers and fishing boats.

The causes of loss are many. As with other such nexus of shipping lanes, Cape Flattery has claimed many ships from collision. Navigational error and storms have led some ships onto the rocky coast. Others have simply

“The WW II-era troopship *General M.C. Meigs* wrecked on the beach at Portage Head in January, 1972.”

(OCNMS)



vanished once leaving sight of Tatoosh Light at Cape Flattery. The earliest known wreck is the *St. Nicholas*, a Russian brig stranded on the beach north of La Push in 1808. Several significant shipwrecks are believed to have taken place within sanctuary waters including the *St. Nicholas* (1808), *Lord Raglan* (1854), *Southerner* (1854), *Pacific* (1875), *Commodore* (1877), *HMS Condor* (1901), *Prince Arthur* (a.k.a. the “Norwegian Wreck”) (1903) and the *W.J. Pirrie* (a.k.a. the “Chilean wreck”) (1920).

The sanctuary has initiated several surveys to locate and document historic shipwrecks within its boundaries. A multi-year initiative to inventory historic shipwrecks within the nearshore area from Koitlah Point (in the Strait of Juan de Fuca), around Tatoosh Island and Cape Flattery, and south to Klaloch and Destruction Island located the physical remains of only four out of 10 historically reported shipwrecks. These surveys underscored the effects of the fierce winter storms in the region. Shallow water wrecks in this area were apparently demolished by wind and waves or covered in sand. Ships identified in these surveys included:

General M.C. Meigs – A WWII-era troop transport lost in 1972 on Rialto Beach.

Emily Farnum – Only the railroad tie cargo of the wooden ship was located at the south end of Destruction Island.

Lamut – This 1919 U.S.-built freighter was owned by Soviet Russia when it sank during WWII at Teawit Head.

Temple Bar – Built in 1929, the *Temple Bar* was bound for Japan with a load of scrap metal in 1939 when it grounded near Quillayute Needles.

Ellen Foster – Built in 1854 as a three-masted clipper, the *Foster* was carrying a load of railroad iron when it sank at the south end of Destruction Island in 1875.

Austria – The bark *Austria* was traveling in ballast to Tacoma when it grounded at Cape Alava. In order to save the crew the captain ran it almost up to shore at the base of the Makah tribes village at Ozette.

The sanctuary has also initiated a search for potential submerged prehistoric and Native American archaeological resources. A sanctuary-sponsored assessment of the submerged geology of the sanctuary submerged bottomland indicates that Paleo-era shorelines may not be favorable for harboring archaeological remains. However, due to the possible sea level rise in this area prehistoric remains could be extant on the land areas adjacent to the sanctuary (Wesson 2003).

Potential Archaeological Resources

Prehistoric – Characterization of the Paleo-environment of the region suggests that sea levels may have been up to four meters higher than modern levels. The sanctuary partners with regional researchers to conduct terrestrial archaeological surveys to characterize the prehistoric habitation of the region. The Olympic Coast’s proximity to the supposed migration routes of the Bering landbridge makes it a critical area to search for evidence of early Asian migration into the New World.

Historic – Following the rise of the late 18th century fur industry, the Northwest Pacific Coast saw a rapid increase of European and American maritime commerce, especially in the 19th and 20th centuries. Archaeological survey suggests that environmental conditions are not conducive to preservation in the shallow nearshore environments of the Olympic Peninsula. However, there is excellent potential for preservation in the sanctuary’s deep waters where historical records suggest that numerous ships were lost. Olympic Coast National Marine Sanctuary may concentrate on an archaeological survey here in future years.



Gulf of the Farallones and Cordell Bank National Marine Sanctuaries

Written by Bruce G. Terrell

Gulf of the Farallones National Marine Sanctuary encompasses 948 square nautical miles of nearshore and offshore waters and seabed of the eastern Pacific. Located just a few miles from cosmopolitan San Francisco, it is north of and contiguous with Monterey Bay National Marine Sanctuary in Central California. The name “Farallones” is Spanish for “small rocky islands” referring to the islands of that name. The Gulf of the Farallones, averaging 26 meters in depth, constitutes the largest portion of the sanctuary. It lies over a wide part of the continental shelf that extends almost 30 nautical miles into the Pacific Ocean. The submerged granite ridge that forms the Farallon Islands interrupts the western edge of the gulf approximately 26 miles west of San Francisco. The sanctuary contains a wide range of environments, including nearshore wetlands, subtidal reefs and deep water. The bays and wetlands within the sanctuary include Bodega Bay, Estero de Americano, Estero San Antonia, Tomales Bay and Bolinas Lagoon.

The continental shelf in the region of the Gulf of the Farallones sanctuary differs from Monterey Bay’s narrow shelf. Here, the shelf widens from six miles to almost 31 miles offshore before narrowing to less than one mile off Monterey.

About 18,000 to 19,000 years ago, the Pleistocene sea level was at its lowest level of 125 meters below modern sea level leaving much of the region exposed. By 15,000 years ago melting glaciers caused a relatively rapid, but fluctuating sea level rise until it stabilized at about 20 meters below modern levels. Cordell Bank was, by then, submerged. The shoreline of this period, like Monterey Bay, was within 1½ miles west of the modern shoreline. The shore was marked by bays and estuaries along the coasts at the river valleys (MMS 1990c).

Cordell Bank National Marine Sanctuary is a submerged seamount discovered by George Davidson of the U.S. Coast Survey in 1853. It was named for Edward Cordell, also part of the U.S. Coast Survey, who mapped it in 1869. Cordell had assisted Henry Stollwagen with mapping Stollwagen Bank off of Massachusetts in 1854. The granite formation, which is located about 18 miles west of Point Reyes ranges from 50 to 200 meters in depth and covers about 397 square nautical miles. During the lowest Pleistocene sea level, Cordell Bank shared the same sea level history as the nearby Gulf of the Farallones.

Native Peoples

As with the Monterey region, little is known and much is speculated about the Paleo-Indian people who inhabited the Central California coast in the late-Pleistocene/Holocene Epoch. The coastal region was inhabited about 11,000 years ago. Any nearshore sites would have been inundated by the rising sea levels. This event would have forced humans and animals to retreat inland. The people probably harvested a diversity of resources, hunting birds like

cormorant, pelican, and goose mammals such as bear, mountain lion, deer and rabbit and sea mammals including sea otter, harbor seal and sea lion. They also likely harvested shellfish and caught fish in the lagoons and estuaries.

By about 8,000 years ago, the Archaic cultural shift occurred in which the people seemed less migratory and more sedentary in established villages. Terrestrial archaeological evidence indicates that some coastal groups relied more on the resources of the lagoons and marine environments, although the hunting of marine mammals declined in importance. Between 5,500 and 1,000 years ago intense harvesting and processing of shellfish became more important as a food-gathering activity. As the Indians subsistence techniques changed, their stone tools became more refined (MMS 1990c).

The indigenous people who lived in the Marin County region by about 4,000 years ago were of the Penutian linguistic group, as were the coastal people of the Monterey Bay region. The Penutian-speakers were related to the Inland Miwok. The Coastal Miwok, like most other Central California groups, were a smaller tribe than their inland relatives. Their range extended from the coast of San Francisco Bay in Marin County to about five miles north of Bodega Bay. They lived in a temperate environment, subsisting on the tanbark oak’s acorns in addition to other seeds and roots.

The Russian American Fur Company brought native Aleut otter hunters from Alaska. They netted, speared, and clubbed animals from their skin-covered kayaks, called baidarkas by the Russians. (Library of Congress)



They supplemented their plant diets with surf fish caught in dip nets and bay fish caught in woven-tule seines. They also hunted deer, elk, bear and numerous small mammals and rodents.

The Miwok lived near the coast and along the lagoons in conical, thatched huts that could hold nearly 10 people. The Spanish encountered the Miwok in the 1700s noting that — like the Ohlone groups around Monterey Bay — they used canoes made of bound tule rushes. These boats were gathered into cigar-shaped bundles and made into rafts and canoes. The natives used the craft for transportation and fishing in sloughs and bays.

The 18th century encroachment of the Spanish into the region radically changed the native peoples' culture. The Spanish immediately set up missions to Christianize the natives. The Europeans benefited from native neophyte labor in the mission fields and compounds. At first the natives came voluntarily, drawn by novelty, gifts and trade but after their experience with the harsh mission life they became harder to attract and many ran away or died.

European Colonial Period

Spanish – The Spanish first explored Central California's coast in 1542. Subsequent voyages of exploration probed northward along the California coast past the Farallones before turning west toward the Orient.

Thirty-seven years after the initial Spanish exploration, England's Sir Francis Drake challenged Spanish hegemony in the Pacific as he raided Spanish possessions and explored the California coast. He stopped to careen his ship, *Golden Hind*, on the beach of what is now known as Drake's Bay. The natives greeted the scurvy-ridden crew with gifts of salmon, sturgeon and mussels. Before leaving the area, Drake's crew visited the Farallon Islands, or

Islands of Saint James as he called them, to gather seal meat and bird eggs.

Spanish explorers missed finding the San Francisco Bay because of an optical illusion that made the hills extending across the East Bay appear as a single continuous land mass. While their navigators frequently used the Farallones and Point Reyes as reckoning landmarks, they failed to notice the bay until the later part of the latter 18th century.

The Spanish gradually realized the importance of occupying California by the 1770s as several European countries began to show a presence in the Pacific. Early in that decade they established a presidio and three missions around San Francisco Bay including Mission San Francisco. Mission-related settlements soon spread about the San Francisco Bay region. In 1775 Lt. Francisco de La Bodega found and named Bodega and Tomales Bays. In 1817 Father Junipero Serra built a hospital mission across the bay in Marin County to serve sick Indians and the brothers of Mission Dolores. The rangelands of the hospital mission, San Rafael Arcangel, extended to the tip of Tomales Bay.

The Russians provided the greatest immediate threat to the Spanish empire in California. Hunting otter for furs in Alaska in the early 1700s, they gradually worked their way down the Northwest Coast, and by 1783 they established a permanent base north of San Francisco.

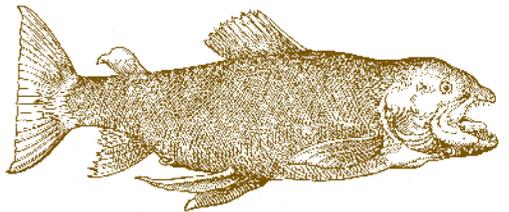
European and American desires for a piece of the fur trade were accelerated in 1776 when an English crewman from Captain James Cook's expedition to the Pacific reported the lucrative trade of California's otter pelts in China. Although the Spanish government succeeded, temporarily, in suppressing the trade, the potential profits were too big. European, Yankee and Russian traders all shipped California pelts to China.

By the early 1800s, the Russian-American Fur Company was firmly entrenched north of San Francisco at Romanzov on Bodega Bay. In 1812, as a result of Spanish harassment, the Russians established Fort Ross north of Bodega Bay. This self-contained Russian community became the base for the Russian fur trade.

The Russians regularly transported native Aleut hunters from Alaska to California's central coast and islands to set up temporary stations from which to hunt seals and otters. These expert hunters, transported to the sites on Russian ships, hunted from their native baidarkas. So named by the Russians, *baidarkas* were wooden-framed, hide-covered kayaks, which the Aleuts handled with much skill and efficiency. Their Russian masters, however, failed to adequately supply them, and many, like one encampment in the Farallon Islands in 1819, were abandoned. Due to their own inefficient supply network across Siberia, the Russians quit their settlements by the 1820s. The western fur trade in California ended by the 1830s when the seal and otter populations were hunted to near-extinction.

Like the Russians, the Spanish settlements were dependent upon imported foodstuffs that arrived by sea only sporadically. Invasive European animal and crop species coupled with Native American land use practices upset the local ecology. This resulted in a famine that nearly wiped out most of the mission Indians by the early 1800s.

Mexican – Mexico's independence from Spain, won in 1821, altered California's social and economic systems. While many Spanish and Mexicans settled into the privileged life of ranch owners (*rancheros*), many foreigners — especially Yankee traders and American expatriates — settled in the community that formed in Yerba Buena, a port town on the bay that became known as San Francisco. The Mexican government temporarily opened California's ports to



foreign vessels in hopes of generating revenues from import duties and foreign fur traders were soon joined by hide and tallow traders and whalers.

San Francisco Bay soon became a melting pot of different cultures. The door, once opened, could not be shut. The Mexican government frowned upon the permanent residence of foreign nationals but was unable to halt it. The people living in California during the 1830s and 1840s combined a mixture of Old World practices and New World influences to form their own unique culture. Colonists were joined by traders, seamen, trappers and merchants from around the world as Mexican rule became less enforceable.

Mexico tried to reinforce its hold on the land by bestowing land grants to nationalists and foreigners willing to convert to Catholicism and become Mexican citizens. Mexican officials permitted the sale of former Russian lands to Americans like John A. Sutter and Stephen Smith in the early 1840s. In this manner much of California fell to the Yankee traders long before the first shots of the Mexican-American War were even fired.

As the fur trade was waning in the 1820s, the hide and tallow trade rejuvenated California's economy. Yankee and European ships picked up cargos of cattle hides and barrels of rendered tallow from production sites at ranchos and smaller ports. These vessels often used San Francisco as a supply port and for storage until they made their trips around Cape Horn to the East Coast or to Europe.

San Francisco became a preferred base for whaling ships. The *Orion* was the first documented whaler to arrive in San Francisco Bay in 1822, but others followed within weeks. By the 1830s dozens of whaling ships were plying the Pacific, using San Francisco Bay as a provision and rest stop.

The whalers also stopped at the Farallon Islands to obtain fresh water and wood. It is also probable that the islands served as the whalers' base for smuggling

and illegal trade. The abuse of trading privileges prompted the Mexican officials to reinstate trade restrictions in the 1830s and threaten more vigorous enforcement during the 1840s. By that time whalers comprised 21 percent of the United States merchant fleet and the Atlantic whale populations were already decimated. Their desire for a Pacific port-of-call was a primary motive for the annexation of California.

American Period

The acquisition of California's ports was, by the 1830s and 1840s, deemed essential to the domination of the Pacific basin. The United States was not the only nation interested in San Francisco Bay — the English and French also sent navigators to map the coast and to observe political and maritime activities. All three governments sent emissaries to Mexico to negotiate a purchase. When President Andrew Jackson's offer was rejected, Washington encouraged more Americans to move west and the U.S. Navy increased patrols in the region.

American interest in California was made more obvious when U.S. Navy Lieutenant Charles Wilkes of the United States Exploring Expedition charted San Francisco Bay and the nearby coastline in 1841. A large American force remained in California until early 1843, and warships visited the Bay area between 1844 and 1845.

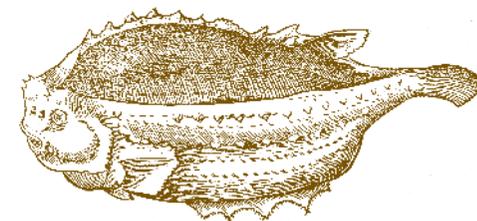
During America's war with Mexico in 1846, Commodore John B. Montgomery of the USS *Portsmouth* captured San Francisco in a bloodless conquest. The U.S. Navy installed a blockade that disrupted trade but was never challenged by Mexico. As a result of the war, the U.S. Navy established a base at Mare Island in San Pablo Bay.

Immediately after California gained independence from Mexico in 1846, merchants and politicians took action to recruit additional settlers to speed the Americanization process. In the spring of 1847, three

military transports carrying nearly 600 volunteers passed through the Golden Gate to colonize the new territory. Several companies of soldiers were also sent to strengthen the fort at San Francisco.

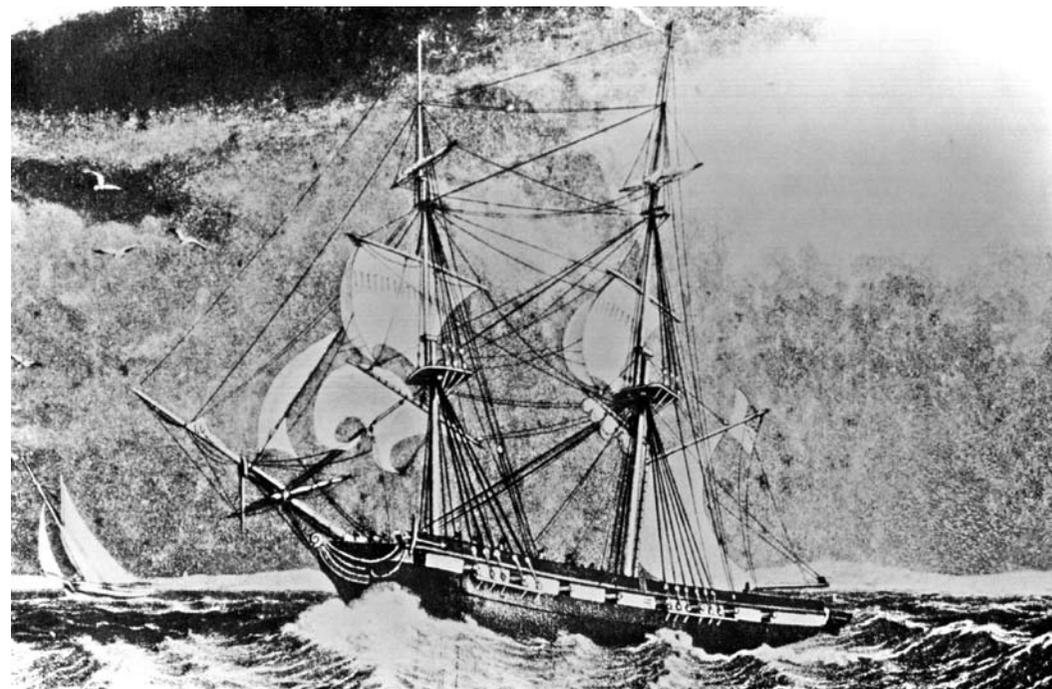
The new American territory did not have to wait long for the population to grow. Following news of the gold strike at Sutter's Mill on the American River, thousands arrived to seek their fortune in the gold fields. San Francisco Bay was truly the "Golden Gate" to the Sacramento Valley and the riches that the gold veins promised. The resulting gold rush was the single most formative event in California's history, as well as a defining moment in American history.

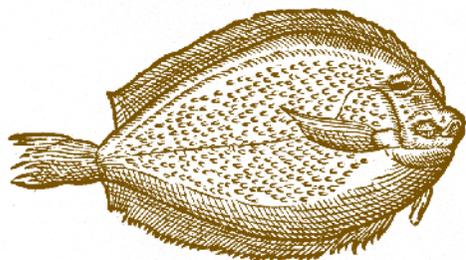
After the 1848 gold strike, hundreds of vessels of varying size, rig and registry sailed or steamed into San Francisco Bay. Besides being a safe haven, the bay provided easy access to the rivers piercing the gold-laden Sierra foothills. Both raw and manufactured goods arrived by ship to support the burgeoning civilization. Lumber, bricks, food, machinery and labor all came in the holds of ships.



The USS *Dolphin*, a navy brigantine research ship, surveyed parts of the California coast for Lieutenant Charles Wilkes' U.S. Exploring Expedition in 1838. The fast hull design also made *Dolphin* useful in the suppression of the slave trade off Africa in the 1840s and in hunting pirates in the Caribbean and coastal American waters.

(Library of Congress)





Many immigrant people brought their indigenous watercraft styles to the United States. The San Francisco Bay region's Italian fishermen used their native feluccas. (Smithsonian Institution)



They brought everything to erect a civilization in the bucolic landscape. Many ships were abandoned as their entire crew jumped ship to work the gold fields.

Passengers to California came by several routes. Some arrangements included overland treks through the jungles and deserts of Panama, Nicaragua or Mexico connecting the water routes between New York and San Francisco. These overland routes saved money and time but the journey was difficult and hazardous. The surest route was to sail the 18,000 miles from New York to San Francisco via stormy Cape Horn, a voyage that usually took five months. Those that could afford to do so sailed around the Horn on the fast clipper ships, making the trip in less than 100 days. Speed was important in order to reap the benefits of the boom in San Francisco, and passenger and cargo space commanded a hefty price.

Steamships also carried the California-bound immigrants. The beginning of the westward rush coincided with the initiation of monthly runs by the Pacific mail steamers. The first to depart New York was the *California*, a 1,050-ton side-wheel steamer with accommodations for 60 salon passengers plus 150 in the steerage. With the establishment of the Panama and Nicaragua routes, steamers could sometimes cut travel time from New York to just half as long as it took a clipper to sail around South America's Cape Horn.

The increased population provided a new market for locally produced consumer goods in California. Before the advent of the transcontinental railroad in the 1850s and 1860s, most of the region's food was brought by ship. Staples like butter, flour, fruit and vegetables came from the East Coast, Hawaii, Oregon and South America. Ice was transported from Alaska and coal made its way down the coast from Oregon and British Columbia, everything destined for San Francisco.

After the initial turmoil of the Gold Rush and statehood, San Francisco again became an active homeport for whalers. During the 1870s, steam whaling ships operated out of the San Francisco city, initiating a new

era in American whaling and making San Francisco the world's principal whaling center. By the 1930s, the whaling industry entered a decline and businessmen turned to more lucrative industries like petroleum.

As San Francisco grew, an Inter-coastal trade grew between the bay communities and other coastal regions such as Bodega and Tomales bays and Reyes Point. Dairy ranches replaced the Mexican ranchos north of San Francisco, while privately-owned ranches on Tomales Point and Point Reyes produced butter and hogs for San Francisco's population. Farmers provided cheese, butter, hogs, calves and lambs shipped by coastal schooners. In return they imported feed, grain and finery that entered through the city's wharves. Schooners with names like *Fourth of July*, *Frances Valentine* and *Alviso* sailed a circuit between Point Reyes and San Francisco. The port of Bodega shipped locally grown potatoes, while Point Bonita at the tip of the Marin Peninsula remained isolated.

Although they were generally considered too far away and in too hostile of an environment to support farming, the Farallon Islands still contributed to the local economy. Entrepreneurs attempted to make money by collecting gull and murre eggs on the islands and selling them in San Francisco for \$1 apiece. A violent conflict erupted over the practice of some egg collectors who crushed existing eggs on their first visit to ensure the freshness of eggs gathered on future trips. Returning gatherers found that competitors had already smashed newly laid eggs for the same reasons and arguments led to open fighting and bloodshed. Eventually the Farallon Egg Company won a monopoly on the industry but the smashing of so many eggs nearly destroyed the native bird population.

Several other economic activities developed in the wake of the Gold Rush. During the Native American, Spanish and Mexican periods, fishing was small-scale and usually conducted by Indians for personal consumption. Following the Gold Rush, the industry grew rapidly along the coast in order to feed the

thousands of new mouths. The Chinese were the first people to become involved in an intensive fishing industry.

Fishing primarily for shrimp, Chinese fishing villages and camps grew at Point San Pedro and Tomales Bay. Their fishing junks were common offshore sights in the 1850s and 1860s. Of varying sizes and designs, the junks commonly exhibited steep sheer, high sterns, a broad beam and shallow draft. Their tall, matting sails, called "balanced lugs," were easy to maneuver and permitted small crews. The Chinese fishermen also utilized small, flat-bottomed sampans built of redwood for inshore fishing. While sometimes propelled by sail, they were more commonly moved by sculling-oars.

By the end of the 19th century, Genovese fishermen from San Francisco regularly fished at Drake's Bay. They fished commercially for herring, oysters, salmon, crab, perch, striped bass, rock cod, tuna and sardines (Goode 1887).

Other immigrant fishermen from the Mediterranean Sea who fished out of the San Francisco region included Italians, Greeks and Yugoslavians. They all used the distinctive Mediterranean *felucca* individually manned boats that were plumb sterned with shallow-draft bottoms and a single, triangular lateen sail. The colorfully painted vessels used oars and sail, and were capable of sailing in the offshore waters.

By about 1912, the *felucca* was replaced by the Monterey clipper, a slower but larger and more durable boat with a clipper bow. These sail- and later gas-powered boats had the capability for extended fishing expeditions and remained the standard small-fishing craft until the 1960s.

Wood was the primary construction material of the 19th century and the local supply was quickly depleted by the needs of the rapid population growth of the Gold Rush. A high value was, therefore, placed on imported lumber. Virtually the only way to transport wood in the 19th century was by ship.

During the Mexican period in 1834, the northern missions had cut local stands of redwood, utilizing American J.B.R. Cooper's water-powered sawmill on the Russian River. It is ironic that while a nearly unlimited supply of lumber grew near San Francisco in the 1840s, local settlers persisted in importing their lumber from the Hawaiian Islands. Several local mills operated in the region such as one built by Stephen Smith in 1843 in the redwoods east of Bodega. Other sawmills were soon established along the coast and bay shores with lumbering operations centered in the area between San Francisco and Humboldt Bay. In the Gold Rush days, lumber in San Francisco could cost \$500 per thousand feet while it was only \$10 from the mills along the Columbia River. Vessels also brought milled lumber from Santa Cruz (MMS 1990c).

Loading the lumber presented logistical problems since most lumber ports were at inlets along the coast rather than in protected harbors. Schooners tacked into deep draws and coves as close as breakers permitted. Called "dog holes," these anchorages could only accommodate the smallest ships. When moored at the bow and stern, they remained at the mercy of sudden gales.

Sometimes when inlets were too small or shores were too rocky, "sea-wagons" were moored under high cliffs to receive cargos. The lumber was lowered down onto these vessels via a wooden slide. Other times, the cargo was loaded directly into the vessels. Later a wire cable was sometimes stretched between the cliff and anchored on the seabed. The ships, lying underneath the cable, received materials from slings.

In the late-19th century, lumber cut along the banks of the Columbia River was sometimes towed to San Francisco in great rafts of wood up to 600 feet long, 60 feet across and 26 feet deep, containing as much as 4 million board feet.

The discovery of fossil fuels led to commercial exploitation of oil in California in 1865. By 1901

Standard Oil of New Jersey had developed a large oil refinery on the shores of San Francisco Bay. The company brought scores of new vessels carrying crude oil along the coast to San Francisco. During the 1920s, numerous oil, gasoline and kerosene tankers navigated the Pacific Coast.

Rum running also became a commercial venture at Point Reyes during Prohibition. Ships that carried contraband from Canada and Mexico remained offshore while cases of liquor were shuttled through the breakers. The beaches along Point Reyes became the most popular landing spots. Waiting trucks or small sailboats transported the liquor from the point to Tomales Bay to the north. Less visible, black-painted motor launches eventually made numerous secret crossings to Tomales Bay and local residents regularly frustrated attempts by federal agents to block the illegal trade. The business flourished until the repeal of the 18th Amendment in 1933.

Navigation Improvements - With no navigational aids along the rugged coastline and islands, shipwrecks occurred with great frequency. On the recommendation of a U.S. Coast Survey report, construction on the Southeast Farallon Island lighthouse was begun in 1852. Building supplies were carried to the island by ship and hauled 300 feet up crumbling slopes to the site. The lighthouse was completed on January 1, 1856.

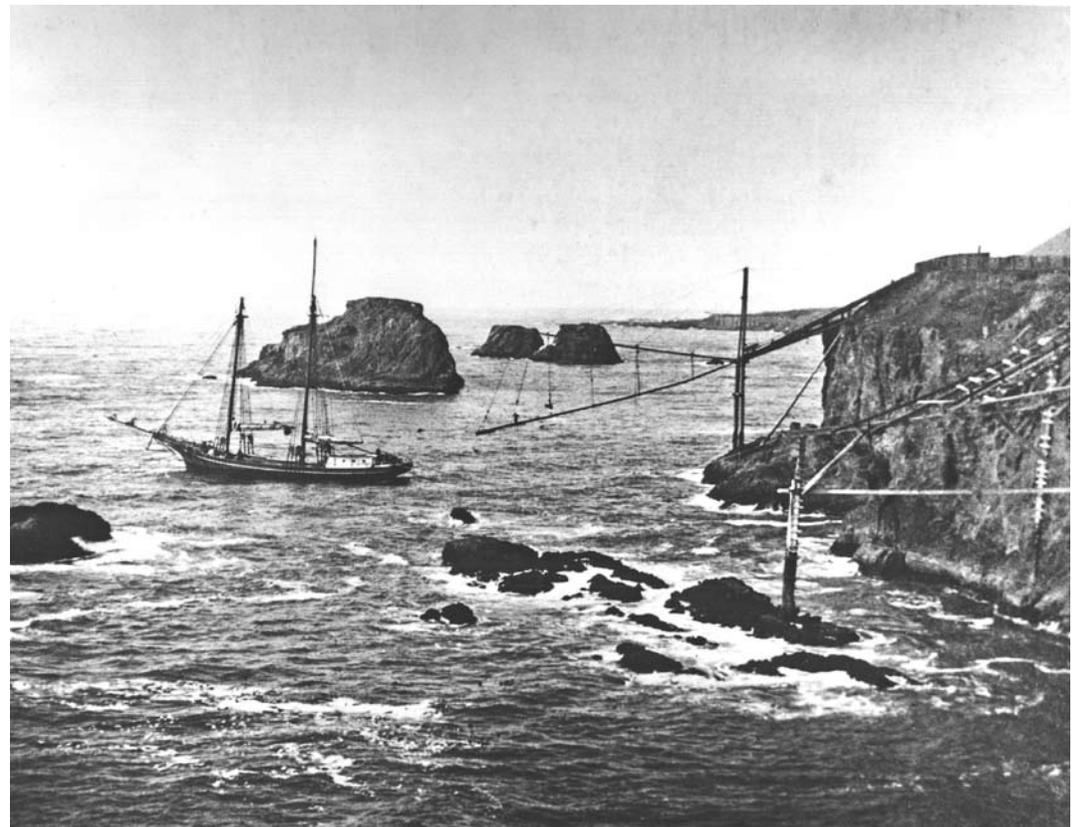
Point Reyes was reputed to be the foggiest and windiest place on the California coast, but a planned lighthouse for the point was delayed due to the landowner's excessive requested price. During the period of negotiations, 14 ships wrecked in the area. Construction began after the price dropped and the lamp was finally lit in December 1870.

World War II - During World War II, the Mare Island Navy Yard's dry docks were used to repair ships damaged in battle with the Japanese. The port facilities, spread throughout San Francisco Bay, made an ideal staging area for men and supplies needed

in the Pacific. Although anticipated Japanese attacks never materialized, the threat of submarine attack prompted defensive actions throughout the region. The Navy maintained offshore patrols, the Coast Guard patrolled the shores. Army training camps and gun installations on Point Reyes guarded the beaches, and the Army Air Corps used other beaches for target practice. Submerged wire anti-submarine nets were also strung across the mouth of the bay.

A war-related sinking occurred within the waters of the Gulf of the Farallones sanctuary when the Liberty-ship transport *Henry Bergh* rammed South-east Farallon Island in 1944 loaded with 1,000 returning, battle-weary veterans. Fortunately, everyone aboard made it to the island in landing craft although the ship was lost.

Milled lumber was passed from the high bluffs north of San Francisco Bay to waiting coastal schooners moored in tight "dog holes."
(Courtesy San Francisco Maritime NMP, photo # E11.18,751, May Groaper Coon Collection.)



Maritime Heritage Resource Inventory

Several inventories have been published of the historical shipwrecks in the Gulf of the Farallones region. The National Park Service has reported 136 wrecks in the Gulf of Farallones sanctuary waters. Several wreck sites in the intertidal zone have been located and inventoried by the National Park Service including the steamer SS *Tennessee* (actually within the Monterey Bay sanctuary), clipper *King Philip* and schooner *Neptune* (outside of sanctuary boundaries) (Murphy 1982 and Delgado 1989). Minerals Management Services has also documented reports of numerous shipwrecks off the Central California coast, some within the sanctuary boundaries (MMS 1990). The California State Lands Commission has created a shipwreck database that includes an inventory of this region as well (<http://shipwrecks.slc.ca.gov/>). These works provide the foundation for an inventory of the submerged cultural resources in both Gulf of the Farallones and Monterey Bay national marine sanctuaries.

In 2002 a shipwreck in the Gulf of the Farallones sanctuary was found to be the source of periodic oil discharge from its aging bunker fuel tanks. The C-3 freighter *Jacob Luckenbach*, originally the WWII era troop transport *Sea Robin*, collided with another ship and sank off the Golden Gate in nearly 200 feet of wa-

ter. For years, periodic episodes of oil soiled beaches and seabirds were reported but no source could be identified. Following the discovery of its source, an intense 10-month oil recovery project removed approximately 100,000 gallons of oil.

The Joint Management Plan review process between Cordell Bank, Gulf of the Farallones and Monterey Bay sanctuaries identifies maritime heritage as a priority. Emphasis has been placed on developing a maritime heritage capacity that includes the ability to inventory and document maritime heritage that include archaeological and historical properties as well as specific cultural heritage associated with the sanctuary.

Potential Archaeological Resources

Native American – Little is known about the Paleo-Indians of coastal Central California. By 11,000 years ago, the generally accepted date of earliest human habitation, the sea level was already rising. The Paleo-Coastal people may have either lived in the nearshore environment or lived inland and traveled to the shore to hunt marine mammals.

In order to learn the nature of Paleo-Coastal habitation on the exposed late-Pleistocene/Holocene Continental Shelf, geophysical studies and prehistoric site modeling should be developed based on previously published regional archaeological assessments. Site prediction and sediment sampling would establish previous shorelines and relict landforms. Any prehistoric cultural material would be of extreme significance.

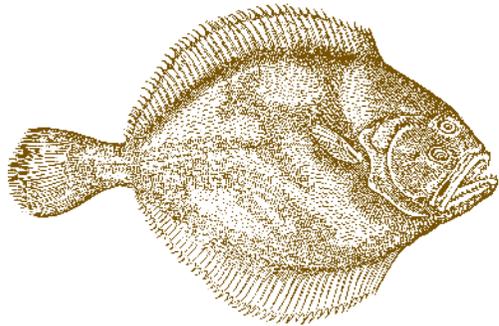
Cordell Bank is also a candidate for testing for prehistoric cultural material. An island existed here at the presently understood time of human habitation in coastal California. It is within the realm of possibility that maritime populations could have visited in Tule-rush canoes or other watercraft.

Historic – Historically, the Farallon Islands and the mainland coast north of the Golden Gate have presented hazardous navigational obstacles to shipping. Today we are reminded of past shipwrecks in the place names. Such places as Franconia Bay, Noonday Rock, Duxbury Point and Duxbury Reef, are all named for shipwrecks.

Year-round fog and dangerous winds and storms often led ships onto rocks and beaches to be pounded by the Pacific swells. Fierce currents have always swept in and out of the entrance to the Golden Gate. Ships were most vulnerable when trying to approach San Francisco or when trading along the coast seeking the shallow anchorages at Bodega, Tomales, Drake's Bay and Bolinas Bay. Until the 20th century, existing charts were incomplete and sometimes misleading. Lighthouses, buoys and other navigational aids were nonexistent until the 1850s. Many known shipwrecks litter the ocean floor of the Gulf of the Farallones sanctuary and they may also be found in Cordell Bank National Marine Sanctuary although no known historic wrecks have been discovered to date.

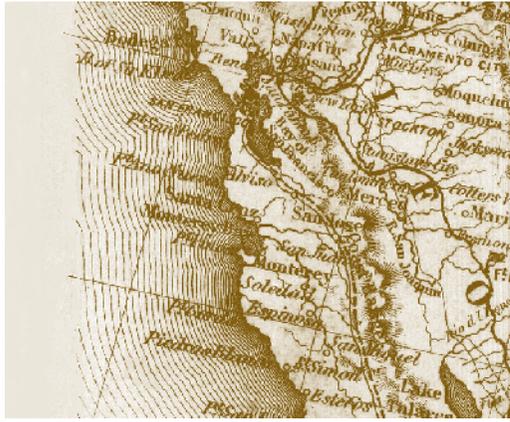
The earliest recorded wreck in the sanctuary area was a Spanish Manila galleon, *San Agustin*, which sank in a gale while anchored in Drake's Bay in 1595. Several archaeological surveys have yet to provide conclusive evidence of the ship's remains. Another loss, the *Ayacucho*, was a brig that was engaged in the coastal trade that was described by Richard Henry Dana in his book, *Two Years Before the Mast*. Reportedly wrecked within Drake's Bay in 1841, she sank with a cargo of silks, brandy and other manufactured items.

Remnants of fishing stations, wharves and makeshift landings may also exist within the sanctuary. While little probably remains of the coastal lumber shoots that were built on the rocks, wrecked lumber schooners and equipment may exist at lumber operation dog holes.



The sampan was the utility boat of choice for the Chinese fisheries along the central California Coast. (Library of Congress)





Monterey Bay National Marine Sanctuary

Written by Bruce G. Terrell

Monterey Bay National Marine Sanctuary covers approximately 5,300 square nautical miles of seabed. It encompasses the bay and the adjacent coastline from Rocky Point above the mouth of the San Francisco Bay in the north to Cambria at the southern boundary. Its submarine canyon equals the size of the Grand Canyon and divides the bay into northern and southern halves. Although the sanctuary now extends across the mouth of the San Francisco Bay, the Gulf of the Farallones chapter addresses the history of that region. The sanctuary headquarters are located in Monterey, which is a Preserve America Community.

Native Peoples

Archaeological evidence of the Paleo-coastal cultural period in the Monterey Bay region between 10,000 and 7,500 years ago is scarce. During this period, the shoreline rapidly receded from about six miles to about one mile beyond the present shoreline (MMS 1990c). The rapid sea-level rise would have had a dramatic effect on the lives of the native populations, who would have been repeatedly uprooted and forced to move inland.

It is thought that during this time a seasonal settlement pattern with more dependable subsistence practices caused an accompanying cultural adaptation. These Indian people lived around the lagoons and marshes of the coastal region and probably did not hunt large game as did their contemporaries in other regions of the continent. Instead, they likely hunted smaller game, fished and gathered shellfish and other food from the estuarine environments (MMS 1990c).

A new and distinctive pattern emerged at about 2,000 years ago in which the earlier, probably Hokan-speaking group, were replaced or absorbed by a Coastanoan language-speaking people. These people, the probable ancestors of the Spanish contact-era people, are thought to have had a more sedentary economy and society that may have included labor specializations. Activities most likely focused on collecting and processing marine resources at stations and transporting them further inland to permanent villages, and specialized tools were developed as processing stations became more efficient.

The various Native American groups who lived in the Monterey Bay area at the time of Spanish contact did not consider themselves to be related nor to have any political unity. They were lumped together as Coastanoans (coastal dwellers) by the Spanish who had little understanding of the native peoples' cultures. Today, the fifty-odd groups are generally referred to as the Ohlone, a word similar to the Miwok word-Alchone or Olchone-meaning "people in the west."

These people lived in the Monterey Bay region for over 4,000 years before the arrival of the Spanish in the 1700s. In addition to collecting acorns and shellfish, they hunted birds, fish, small mammals, seals, and sea lions. Their rich and stable environment permitted the native peoples to develop organized societies. They made clamshell disk beads and used them for currency in trading with other tribes, much like the

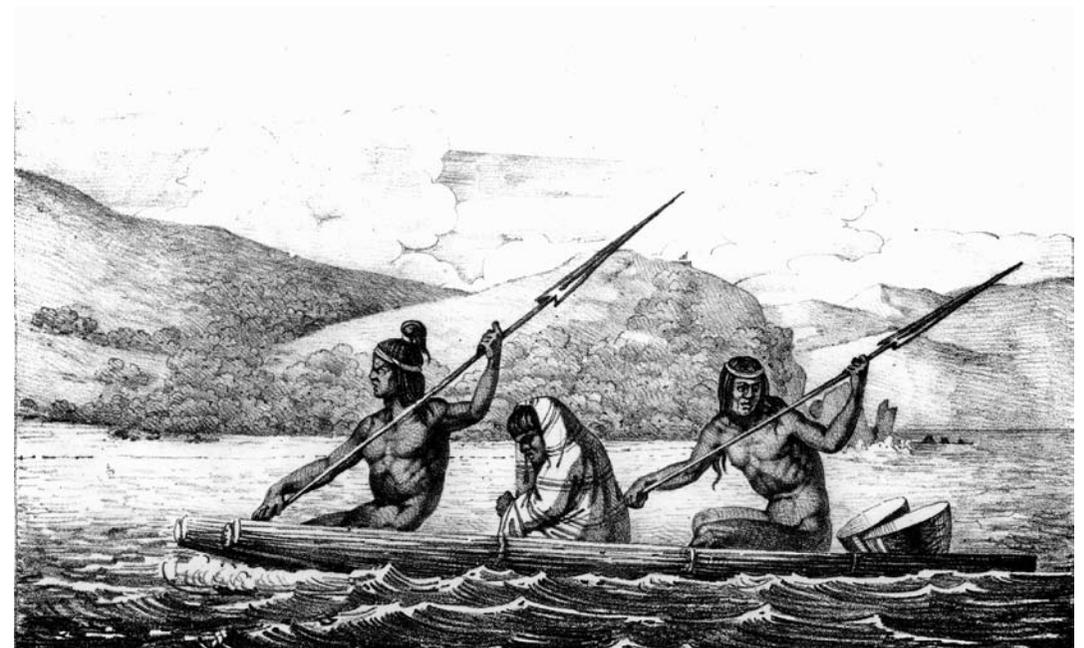
Chumash to the south. They also traded other types of shell beads, obsidian, pine nuts and cinnabar.

Spanish explorers described the boats used by the Ohlone people living around Monterey Bay. The Coast Miwok and Ohlone used canoes made from bundles of lashed tule rushes to fish and travel in the esteros or estuaries and sheltered bays.

By 1810, Spanish influence had destroyed the social organization of the Ohlone. In their zeal to "civilize" the native people, they built missions at Santa Cruz, Monterey and Carmel to Christianize the natives and to turn them into farmers. The native farmers were referred to as "neophytes." An attempt to transfer lands into the neophyte farmers failed and by 1830 they were reduced to ranch hands or, in some cases were virtual slaves to wealthy rancheros.

The Ohlone people of Central California used tule reed bundles to construct rafts and canoes for travel and fishing in the esteros and nearshore waters.

(courtesy of San Francisco Maritime NHP, photo #A7.19,417)



European Colonial Period

Spanish – Although the Spanish first sighted California in 1542, it was only intermittently investigated until the close of the 17th century. In 1603, Sebastian Viscaïno explored Monterey Bay in search of a suitable place for the Manila galleons to refit and find fresh food and waters after their long voyage across the Pacific. The bay was named in honor of Viscaïno’s viceroy, the Conde de Monterey. For about two centuries thereafter the Central California coast received few foreign visitors.

Renewed fear of the growing presence of English and Russian powers on the Pacific American coast prompted Spanish attempts to colonize the coast in the 18th century. Plans were made to find Viscaïno’s harbor and to establish a religious and civil settlement there. Gaspar de Portola and Juan Crespi reached Monterey Bay by land in June 1770, and Father Junipero Serra followed several days later in the *San Antonio* to found the mission at Monterey.

Early mission life was difficult. Monterey was months away from the nearest supply base in New Spain. The missionaries frequently ran short of supplies because their supply ships (under 200 tons) were

too small to carry more than a few months’ rations in their holds.

Several satellite missions were built after the founding of Monterey. In order to pursue more fertile lands and to keep the soldiers away from the native women, the Mission San Carlos Borromeo de Carmelo was moved five miles away from the Monterey presidio to a new site on the Carmel River.

Mission Santa Cruz was founded in 1791 on the north shore of Monterey Bay. Prospects for that mission looked good until 1797 when nine convicts and their families, known as “undesirables,” arrived from Mexico and established an unsavory pueblo known as Branciforte. The Brancifortians encroached upon the mission lands, usurping pastures and corrupting many of the mission’s neophytes.

The small Spanish settlement at Monterey became the capital of California in 1777. Since a presidio was located here, it was the center of regional government, and for a time, maritime trade.

The missions at Monterey Bay were sustained by Indian labor. There was no industrial base apart from the soap-making, leather-working, weaving, milling and blacksmithing that was done primarily by the native neophyte laborers. The Spanish were dependent upon shipments of supplies and manufactured goods from Mexico that arrived sporadically by sea and generally in insufficient quantities.

The isolated settlers welcomed opportunities to trade with vessels, and the most desired trade items were California otter pelts. In the 1780s, Monterey was one of California’s primary trade centers. The missionaries acquired otter and seal pelts through barter with the local tribes.

The natives hunted otters from their tule rush canoes at the rookeries at Pillar Point, Point Ano Nuevo and Santa Cruz Point, but the animals often stayed offshore in the kelp in the southern areas of Point Sur

and Cooper’s Point. The natives spread nets on the kelp beds and also used snares and clubs to hunt the otters. The Indians were the main otter and seal hunters until the Russians brought in Aleut Indian hunters during the Mexican Era.

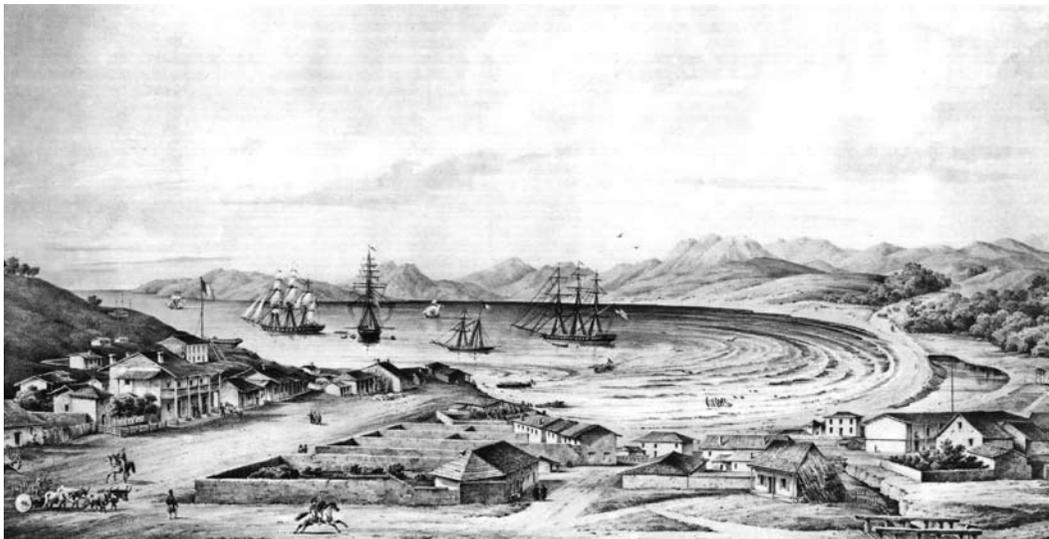
Spanish government frigates loaded pelts at Monterey and transported them to San Blas via Santa Barbara or San Diego. The skins were then sent overland to Mexico City to be dressed and stored until they could be transported to China by Manila galleons. In China the furs were often exchanged for quicksilver, which was needed in Mexico’s silver mines to help extract the metal.

After English Captain James Cook’s voyage in 1776, illegal foreign trade with the local Californians increased. The Russian-American Company hired skilled fur-hunting natives of the Alaskan Aleutian Islands to hunt between San Francisco and Monterey in 1808. The Aleut otter hunters used kayaks, called *baidarkas* by the Russians, which used a light frame constructed of thin strips of wood or whalebone and fastened together with skin sinews. Seal or sea lion skins were then stretched over the frame, the seams were sewn, and the skin surface was smeared with oil to make it waterproof. The boatmen, clothed in skin, fastened the lower edge of their jackets to rings around the vessel’s openings to keep the interior dry.

As a result of the fur trade, California was brought into the rapidly developing network of Pacific trade routes. From Yankee and European perspectives, a circular route between California, Hawaii and China was advantageous since it kept their cargo holds full of trade items.

Mexican – After gaining independence from Spain in 1821, Mexico temporarily relaxed the trade restrictions set by Spain, primarily because the new government in Mexico City had no way to provide for its citizens. The settlers were instructed to rely upon their own resources, but the decree was of little

Monterey was Central California’s governmental and economic center during the Spanish and Mexican Periods. (*Library of Congress*)



consequence because foreign traders were already exhibiting and increasing their presence.

The secularization of church properties in 1833 ushered in the rancho period. Qualified citizens who could prove their ability to support their holdings were granted between one and 11 league rancho (or Spanish) grants. These ranchos became virtual principalities since the Indian labor was cheap and cattle proliferated in the climate. The owners, called *Californios*, prospered and reportedly led lives of relative ease.

As otters were over-hunted, cattle hide and tallow products took over as the main economic export. The cattle were rendered to produce tallow used in candle and soap production. The hides, first soaked in seawater, were sun-dried before they were shipped to the East Coast or to Britain to be made into boots and shoes. The hide trade was chronicled in Richard Henry Dana's classic book, *Two Years Before the Mast*, which was significant because it informed Eastern readers for the first time about the lucrative resources of the California coast.

In 1833 the missions still controlled the best lands, and their cattle herds provided the bulk of the hides used for export. The privatization and redistribution of mission lands improved the production and trade process. Ships, such as the *Alert*, were said to have collected as many as 40,000 hides each. The hide trade flourished until 1846 when the U.S. blockade of Mexican-controlled ports brought the trade to a halt.

American Period

Yankee Traders – The era of the Yankee traders on the West Coast spanned from the Spanish-Mexican periods to the American era. In spite of the Mexicans' desire to remain insulated from the rest of the world, persistent American and European opportunists pressed their desire to trade. Traders from Boston and New Bedford inserted themselves into the trade network by introducing manufactured items to the Californios and Indians

who developed a dependency on them. The rancheros often paid in hides, which became known as "California banknotes."

The introduction of foreign visitors to the region had a great impact. American, English, French and Russian vessels carried crews that became intimately familiar with the coast. Many sailors followed the example of Thomas Doak, who in 1816 was the first U.S. citizen to settle in Monterey. Foreigners such as J.B.R. Cooper married into Californio families, became Mexican citizens, and received land grants allowing them to participate in the Mexican hide-and-tallow trade boom. Irish, Danish, Scottish, Italian, Portuguese, Chilean and Greek immigrants also settled near Monterey.

At the outbreak of the Mexican-American War in 1846, the United States blockaded the Mexican ports in California and brought a swift halt to trade. Many merchants went out of business when the profits from the hide and tallow



Small coastal whaling stations existed along California's bay shores. Near-shore kills were "tried-out" at the beach stations. (courtesy of San Francisco Maritime NHP, photo #K11.19,440, *Harpers Weekly*)

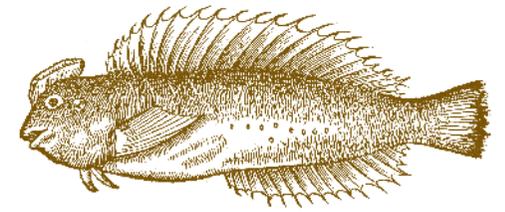
trade diminished. A few merchants, such as Thomas O. Larkin (who was also, not coincidentally, the American consulate in Monterey and had extensive contacts with East Coast business concerns), prospered during the war by provisioning troops and residents cut off from their regular means of supply.

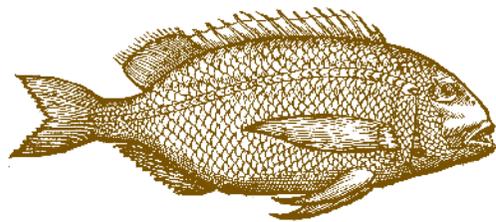
The towns of Monterey and Santa Cruz illustrate the dichotomy between the rancho economy and the Yankee trade economies. In terms of economy, style and way of life, Monterey remained a Mexican town after the war until the early 1850s. Prominent Spanish families held Spanish land grants limiting the availability of lands to newcomers after the war. Having lost much of its population to the Gold Rush, Monterey remained a bucolic town throughout the rest of the century although it continued to be an import economics and political center. Santa Cruz, on the other hand, was transformed into the West Coast of New England by 1848. The mission and presidio had failed earlier and by 1849 more Yankees and foreigners lived in or near the North Bay than anywhere else in California. (Rowland 1980)

Whaling – Although the California coast became a major 19th century reprovisioning stop, Monterey was a minor whaling port. Occasional whaling ships put into Monterey for supplies while San Francisco flourished due to the superior nature of its harbors. Also, since most captains were engaged in illegal trade, they tended to avoid the intense government scrutiny to be found at Monterey, the capital.

Some merchants tried to lure the whaling industry to Monterey. Larkin, the Yankee merchant in Monterey, hoped to capitalize on the hunters and attempted to induce whalers to the bay by advertising in New England newspapers. Despite Larkin's efforts, however, the whalers preferred San Francisco.

Whales were sometimes hunted within Monterey Bay when on their migratory runs but were not systematically pursued there. Small local shore whaling stations existed around the bay. Observers spotted whales from the cliffs and dispatched rowed whaleboats after the quarry.





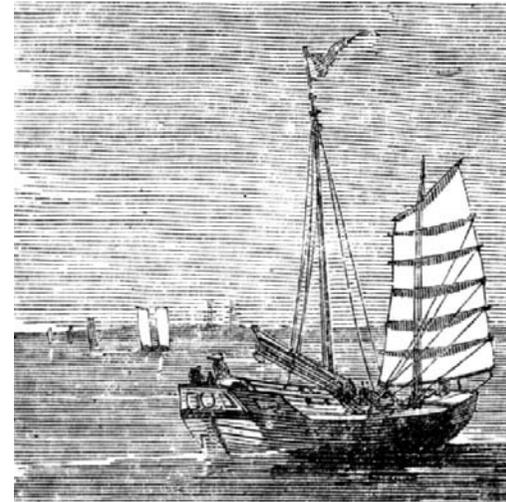
The near shore kills were towed to trying stations on the beaches where the blubber was flensed and melted down. One such station was located at the mouth of Elkhorn Slough.

American Acquisition – As noted earlier, England, France and the United States each recognized the importance of California's ports as potential bases from which to conduct trade with the rest of the Pacific basin. All three governments sent emissaries to Mexico to negotiate a purchase. When President Andrew Jackson's offer was rejected, Washington encouraged more Americans to move west.

While the Mexican government in California frowned on the permanent residence of foreigners during the 1830s and 1840s, they were too distant to control the practice. Traders, seamen and trappers joined colonists and merchants from around the world as Mexican rule eroded.

In 1835, President Jackson instructed his *charge d'affaires* in Mexico to begin negotiations "with the great object of securing the Bay of San Francisco" through the purchase of Northern California (Billington, 1982). When Mexico rejected the negotiations, Washington responded by sending the first naval vessel, the sloop of war *Peacock* to Monterey on the pretense of protecting American and Hawaiian maritime commerce at the request of Hawaiian merchants. Thereafter the United States' Pacific Fleet became increasingly visible along the California coast, often in such guises as the U.S. Exploring Expedition, which made numerous observations around Monterey Bay in 1841.

In October 1842, the *California*, the lone Mexican naval vessel in Monterey, was nearly put out of commission by the U.S. Navy. Commodore Thomas Ap Catesby Jones, commander of the Pacific Squadron, hearing rumors of war between the United States and Mexico, anchored off Monterey and demanded the surrender of the province. On October 20, Jones seized Monterey, raised the US flag, and boarded the captured *California*. As the Americans paraded through town with bands



Nineteenth-century Chinese fishermen brought their indigenous watercraft styles to California. Flat-bottomed junks were maneuverable and required few crew. (Library of Congress)

playing, correspondence arrived from the East that made no mention of war. Two days later, a sheepish Jones returned to Monterey apologetically as the Mexican flag was restored to its rightful position.

In the 1846 war with Mexico, the United States took California without a single naval battle, yet the Navy's presence was pivotal. At the outbreak of the war, the United States Pacific Squadron was eight ships strong. A landing party from the USS *Savannah*, USS *Cyane*, and USS *Levant* seized Monterey on July 7. Two days later the crew of the *Portsmouth* took Yerba Buena (San Francisco) in a bloodless conquest. The show of the naval force at the principal port-towns, along with the use of sailors and marines as foot soldiers, was instrumental in securing California for the United States.

Gold Rush and Coastal Trade – The Gold Rush, which began at Sutter's Mill in 1848, had a profound effect on all of coastal California. Initially, much of Monterey's population disappeared as people left to make a quick fortune in the gold fields. Eventually, many industries evolved to capitalize on the needs of the growing population of miners.

A maritime coastal trade was spurred by the Gold Rush in the 1850s. The needs of the rapidly expanding population were met by exploiting the abundant resources of the Pacific coast. Columbia River lumber, Monterey's Chinese fisheries and the Yankee traders' manufactured goods all fed San Francisco's insatiable appetite. Due to the southerly California current, it was difficult for ships to sail to the northwest to conduct trade, so it was only after the introduction of steamships in the 1850s that trade began to travel northward.

After the Gold Rush, Central California's main exports were grains. Monterey, essentially a hinterland, produced San Francisco's wheat. Farmers in the nearby inland valleys transported grain and produce to the mouths of the esteros in flat-bottomed boats. From there, the produce was transferred to coastal schooners for transport to San Francisco. Moss Landing at Elkhorn Slough was typical of the regional trading communities that evolved at the juncture of the esteros and the West Coast bays.

During the early days of the Gold Rush, lumber was at a premium in San Francisco and was sought everywhere along the West Coast. The resistance of redwood to fire and decay made it popular for buildings and railroad ties. Northern missions used local redwood during the Mexican period. Enterprising Americans followed the example of J.B.R. Cooper who prospered by building a water-powered sawmill in Santa Cruz in 1841.

Monterey, which had been the seat of California's government since 1777, remained the capital throughout the war with Mexico (except for a brief period between 1845 and 1846). During the Gold Rush, the shortest route to the California mines was to bypass Monterey and sail directly through the Golden Gate. When the American provisional military governor moved his headquarters to San Francisco to be closer to the center of activity, the importance of Monterey's port was further diminished.

Fisheries - Chinese fishermen had an important impact on the development of California's commercial fishery industry. Prior to the Gold Rush, few commercial opportunities existed to attract Chinese immigrants

to Monterey. Trade restrictions confined commercial opportunities, while local Native Americans filled the labor force. Political unrest in the 1840s in China's Kwangtung Province, which caused many people to flee to California, coincided with the Gold Rush. The first of the Chinese immigrant wave to arrive in California were *Tanka*, or boat people. They came directly to Monterey to work the commercial fisheries that fed the exploding Gold Rush population (Lydon 1985).

The cultural changes in coastal California's human populations in the 1830s had a profound effect on its animal populations. The regional native tribes' effect on the marine resources along the coast diminished as their numbers dwindled. That waning influence, coupled with the slaughter of the otters, permitted the abalone population to explode – the otter and natives being the abalone's main predators. Westerners were ignorant of abalone's value, but Chinese fishermen knew how to harvest, prepare, dry and cook the valuable delicacy. The export between San Francisco and China resulted in the growth of Chinese colonies around Monterey. A market for abalone shell developed as well in New York, Europe and China where they were turned into buttons and jewelry or used for inlay.

During the 1850s and 1860s the Chinese expanded their venture to include commercial fishing, although San Francisco proved too distant to transport the unrefrigerated catch. Local markets absorbed a small portion while the bulk was dried in the open air and shipped north. The Chinese in Monterey Bay also harvested seaweed and dried it on the ground before shipping it in bundles through San Francisco to China.

The Chinese fishing monopoly thrived until 1867 when a small group of Italian fishermen moved into the Monterey Bay area from the north. A new railroad between Monterey and the market at San Francisco enabled the rapid transportation of the catch. Within a year, Italian fishermen, who capitalized on the railway, controlled the bay waters and the Chinese

were eventually pushed to the North Bay and Carmel. A conflict arose between the Italian and Chinese fishermen over the Chinese's supposedly destructive fishing techniques. The Italians were fearful that the Chinese were permanently destroying abalone and fish populations by over-fishing.

The Italian and other southern European fishermen who settled in the region brought their indigenous watercraft styles with them. Their feluccas were shallow, double-ended craft with upright stems and sternposts that used a single, distinctively shaped triangular lateen sail. These vessels, common to the Mediterranean Sea, were usually only about 30 feet long, holding only two or three crew. The felucca became the model for a 20th century powered vessel known as the Monterey boat. This fishing vessel, used in the coastal fisheries, also had a double-ended form with a "canoe" stern.

Monterey's commercial sardine fisheries began in the early 1900s. The native tribes originally caught the small fish using woven baskets and cured them with smoke. Twentieth-century fishermen harvested them with seine nets. Sardines rapidly became the most important fishery in California and many canneries were built along Monterey's waterfront, but the industry faded after the collapse of the sardine population in the 1940s due to over-fishing and climatic change.

Maritime Heritage Resource Inventory

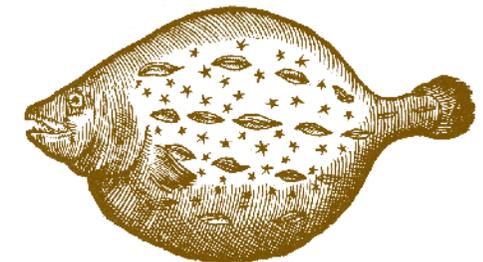
Monterey continues to show vestiges of its rich maritime heritage today. It is a tourist destination that capitalizes on its Spanish and Mexican heritage as well as its historic fisheries. Each year, many thousands of people visit Cannery Row and Fisherman's Wharf and witness a continuation of the region's cultural heritage through the active fisheries.

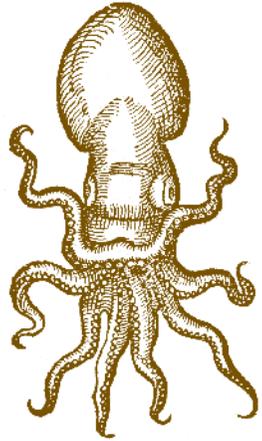
Monterey Bay National Marine Sanctuary funded a Submerged Cultural Resources Study (Smith 2003) in 2003 that documents historic ship losses and known shipwreck sites in the sanctuary. The assessment lists approximately 445 historic ship losses within the sanctuary dating primarily between 1831 and 1919.

The Joint Management Plan Review for Cordell Bank, Gulf of the Farallones and Monterey Bay national marine sanctuaries has identified maritime heritage as a priority. Emphasis has been placed on developing a maritime heritage program to protect and promote archaeological and historical resources of the sanctuary and surrounding region.

The scattered remains of the wooden side-wheel steamer *Tennessee* are buried offshore of Tennessee Cove near Marin City. The Gold Rush passenger steamship was built in 1848 in New York and wrecked in 1853 while attempting to enter the Golden Gate in fog. The site was recorded by the National Park Service in the late 1970s and was listed on the National Register of Historic Places in 1981.

Monterey Bay has a unique heritage resource in the remains of the dirigible USS *Macon*. This U.S. Navy airship was one of a small fleet of "flying aircraft carriers" developed to serve as scout ships for the Navy in the 1920s and 1930s. It crashed off Point Sur in 1935 carrying four of its small Curtiss F9C-2 Sparrowhawk biplanes. Discovered in 1989, it is a subject of documentation and study by Monterey Bay National Marine Sanctuary which incorporated the study into its education and outreach activities.





Potential Archaeological Resources

Native American - Prehistoric sites have been found on land at most substantial drainages and shorelines between Morro Bay and Monterey (MMS 1990c). Since sites dated prior to 8,000 years ago are rarer in this area, and are likely to be found offshore, any submerged offshore archaeological sites in this area would be extremely significant.

Geophysical conditions may have created a favorable environment for preservation of cultural material. The sea level rise between 10,000 and 7,500 years ago was relatively rapid, which may have precluded high-impact wave destruction (MMS 1990c). The area is also preserved under particularly deep Holocene sediments of up to 60 meters in some areas. The abundance and size of terrestrial archaeological sites suggests that the coastal area was densely populated during the Holocene Epoch. This is further reinforced by 19th-

century travel logs, which reported hundreds of shell middens eroding on the beaches. All of this suggests the likelihood that submerged archaeological sites also exist on the bottomlands of Monterey Bay.

Historic - The shallow, rocky areas of Point Lobos, Cypress Point, Point Pinos and Santa Cruz have had the highest known frequency of recorded shipwrecks on the California coast. The vicinity of Monterey and Moss Landing may also have a strong potential for unrecorded shipwrecks (MMS 1990c).

A ship of local significance may still reside near the shore in Monterey. The *Natalia*, erroneously believed to have been the ship that carried Napoleon Bonaparte to the island of Elba in 1815, was nonetheless a Mexican coastal trader that grounded near the beach in 1834. The vessel's bare frames appeared in 19th-century paintings and prints and it has been uncovered periodically by storms over the years. What remains of the ship is unknown and it awaits rediscovery and documentation.

Of the approximately 445 shipwreck losses recorded in Monterey Bay National Marine Sanctuary, most are undiscovered (Smith 2003 and MMS 1990c). The collection of historic shipwrecks along the coast of the sanctuary may reveal much about the heritage of this historic part of maritime California.

The USS *Macon* and its Curtis F9C-2 Sparrowhawk aircraft are a significant archaeological resource within the Monterey Bay National Marine Sanctuary. (US Naval Historical Center)





Channel Islands National Marine Sanctuary

Written by Bruce G. Terrell

Channel Islands National Marine Sanctuary is located about 22 miles off the coast of Santa Barbara, California. It includes 1,252 square nautical miles of ocean and sea bottom. The sanctuary's boundaries extend in a six-nautical mile radius outward from the islands of Anacapa, Santa Cruz, Santa Rosa, San Miguel, and Santa Barbara. The islands, except for a portion of Santa Cruz, form Channel Islands National Park. The combination of warm and cool water currents in the region creates a fertile environment that supports a diverse array of unique plant and animal life. The sanctuary headquarters is located in Santa Barbara, which is a Preserve America Community.

Native Peoples

The Ice Age sea level reached its lowest levels in California between 18,000 and 19,000 years ago. At that time, the sea level was about 400 feet lower than today. The northern Channel Islands then composed one large island known to geologists as

Santarosae. By 8,000 years ago the rising sea level isolated the modern Channel Islands.

It is unknown how the earliest Paleo-Indians arrived in coastal California. Some researchers claim that they migrated southward along the coast during periods of low sea level. Many other scholars, however, believe that they originated east of the mountains and adapted to the marine environment along the coast (MMS 1990c).

While there is ample evidence that the California mainland was inhabited by humans about 10,000 years ago, the dates of habitation for the northern Channel Islands are less clear. Daisy Cave on San Miguel Island contains the earliest documented coastal shell midden in North America (Erlandson 1996). This rock shelter cave was occupied sequentially by Paleo-Indian, Archaic and more recent maritime-oriented people. Initial human occupation of the cave has been radiocarbon dated to about 11,600 years ago (Rick 2001). Bones from the Arlington Springs woman, recovered from Santa Rosa Island in 1959, were recently dated to approximately 13,000 years ago, making these the oldest known human remains in North America (Johnson 2002).

Evidence indicates that the earliest Paleo-Coastal people were living along the Santa Barbara area coast by about 8,500 years ago (MMS 1987). These people collected shellfish, fished and harvested marine life from tidal pools and lagoons. They subsisted on land animals, birds and plants. Archaeological remains show that they used flaked-stone knives, points and scrapers as well as other tools made from bone and shell.

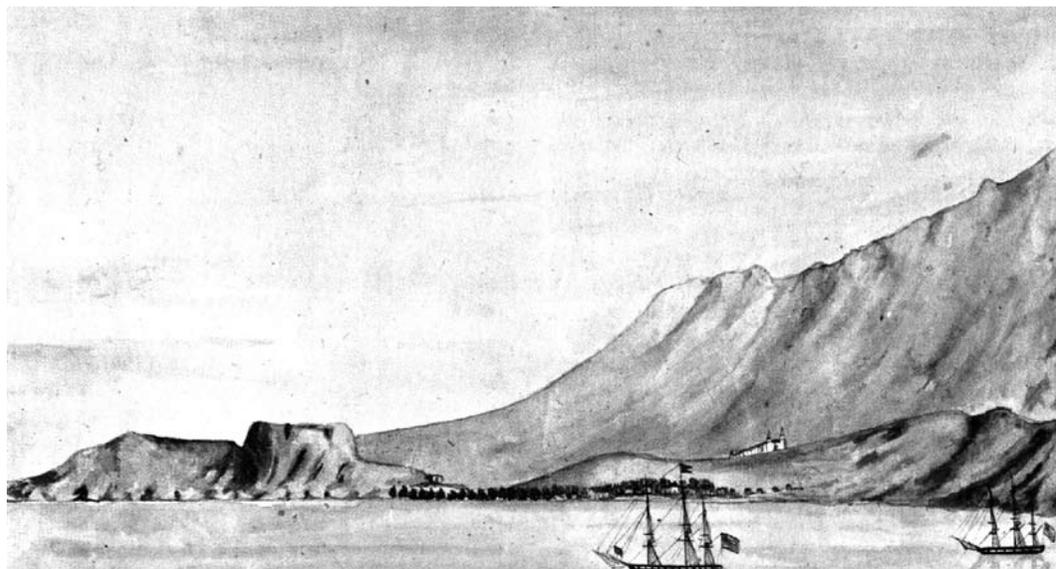
Global warming brought a sea level rise and forced the early inhabitants of the region to adapt to their changing environment. Artifacts such as milling stones indicate that mainland nomadic people of the Santa Barbara area became more sedentary as they began to cultivate grains.

Archaeologists have suggested that the northern Channel Islands were inhabited during this period by people who used boats for hunting marine mammals and for trading with the mainland people. Unlike the mainland people, the islanders kept many of their ancient subsistence practices relying on harvesting resources from the sea. Archaeological remains of deepwater pelagic fish found at both mainland and island sites indicate that the Indians had access to mid-channel fisheries by at least 1,500 years ago (Bernard 2001).

The prehistoric inhabitants of the islands and coastal regions were likely the ancestors of the Chumash people who were known by the earliest Spanish explorers to inhabit these same regions in the 16th century. Archaeological evidence indicates that all of the northern Channel Islands' prehistoric inhabitants were of the Chumash culture. Historic Spanish documents show that the southern islands of San Nicolas, San Clemente and Santa Catalina were taken over or assimilated by Shoshonean peoples in the last few centuries.

Early Spanish and American sailors recorded descriptions of the native Chumash sewn-plank tomols. Modern-built reoplicas help us understand these people's historic woodcraft traditions and trade economy.
(Robert Schwemmer)





The U.S. Pacific Naval Squadron was a frequent sight before Santa Barbara during the Mexican Period in the 1840s. (Robert Schwemmer Maritime Library)

All of the native island populations shared similar cultural traits as evidenced by their material remains. Because each island had different resources, the people developed an organized inter-island trade network using watercraft. By banding together and combining resources, the Island Chumash composed a single unique culture. Most of the islanders shared mortuary customs and made similar items such as shellfish hooks and beads. However, the southern islanders had some specialized tools and decorative items that differed from the northern island traditions on Anacapa, Santa Cruz and Santa Rosa.

The Chumash trade network gave the unique resources of each island strong value within the overall society. Steatite, a soft mineralized stone available primarily from Santa Catalina, was made into functional items like cooking pots and arrow straighteners, and ceremonial objects such as pipes and animal effigies. The mainland people desired shell beads, dried fish and sea otter skins from the islands. In return the island people obtained goods that were only available on the mainland such as chert and obsidian for blades, reeds and sedges for basket-making and other items like deer hides, bones and wooden arrow shafts.

Chumash settlement of and trade with the Channel Islands was made possible by the use of a unique planked boat called the tomol. Whereas most of America's aboriginal peoples had some form of reed, skin or dugout canoe, the tomol was the only known Native American boat made with planks. In prehistoric Europe and Asia plank construction had only been made possible after the invention of iron tools while tomol planks were fashioned using whalebone wedges and stone drills. Drift redwood was split into planks and sewn together using red milkweed and the vessel was sealed with local naturally occurring asphalt.

The Chumash culture, which flourished for centuries, was eradicated after a few short decades of contact with the Europeans. The Spanish mission system, which resettled the peaceful island Chumash people on the mainland, disrupted the delicate balance of trade and exchange. The effects of Spanish colonial dominance destroyed much of the Chumash culture by the mid-19th century.

European Colonial Period

Spanish – By 1542 the Spanish had visited the California coast as they explored the Pacific route between their bases in Manila and Mexico. Ships sailing east across the Pacific Ocean proceeded southward through the Santa Barbara Channel and on to their main port at Acapulco. As with the Spanish trade enterprise in the Caribbean, they also suffered numerous ship losses in the Pacific due to storms and navigational errors.

The Spanish did not attempt to settle California until 1769. Soldiers, ranchers and Jesuit and Franciscan missionaries were sent north along the California coast to establish missions to convert and control the native people. Fortified presidios were established to defend the region against English and Russian incursions. Santa Barbara, established in 1792, was

one of four governing presidios that included San Francisco, Monterey and San Diego.

Mexican – As a result of the Mexican Revolution in 1821, California became part of the Republic of Mexico, although this made little difference to the far-removed Californian. The missions, which remained at the center of community organization, were insular from Mexico. Their well-tended fields and large herds of sheep and cattle, made possible by the labor of the missions' native neophyte farmers, gave them economic independence. Numerous plantation-like ranchos were established after the secularization of the mission in 1833. As the *neophytes* raised and processed cattle for the hide and tallow trade, the Mexican owners reputedly enjoyed lives of leisure and indulgence (Billington 1982).

One of the main industries of the rancho period was the hide and tallow trade. Mexican cowhides, known as "California banknotes," were needed to provide footwear for the growing population in the east and cow fat, which was rendered into tallow for candles was in high demand in the Peruvian silver mines. Both the barrels of tallow and the cured hides were transported from the beaches to waiting ships and carried to eastern ports to be made into manufactured objects. Yankee traders developed a substantial hide and tallow trade with the cattle-raising ranchos although it was reported that Santa Barbara only conducted a fraction of the business done in Monterey (Dana 1840). Profits from the hide and fur trades turned both Boston and New York into world trade and banking centers.

At the same time that Mexican California was under the rancho system, the American nation was growing rapidly from a combination of entrepreneurship and a strong mercantile and maritime trade. The Pacific fur trade soon lured New England's Yankee traders around Cape Horn in search of new profits. Since the late 1700s, companies from Russia, England and the United States had hunted sea otters throughout

the Pacific. The otter pelts were in great demand by the Chinese who traded silks and tea for them. The Western tendency toward wholesale killing quickly decimated the otter population by the 1820s.

Between 1803 and the 1840s the Channel Islands were often inhabited by Alaskan Aleut Indians who were hired by Russian and American fur companies to hunt seals and otters. They camped on the islands for months at a time and hunted the animals from their native *baidarka* watercraft. These craft were developed specifically for the Aleuts' native environment in the sub-Arctic region and consisted of stitched waterproof skins stretched over hull-frames of wood or bone.

Yankee whalers first visited the Channel Islands in the early 1800s. While the industry was less prominent along the California coast than the Japanese and Pacific Northwest whaling grounds, it was still a strong industry around the islands. American-owned ships carried mostly international crews that also included Native Americans from New England and Polynesians from the Pacific islands.

Many of these ships, which originated from the Massachusetts coast, stayed in the Pacific for several years before they returned to their homeports. After statehood smaller regional whaling industries were based along the California coast.

In the 19th century natural resources were often exhausted when exploited by industrial societies. Not surprisingly, the whale populations, too, were indiscriminately over-hunted to near extinction. Whalers soon moved on to more productive regions in the Arctic and off Japan's coast.

American Period

California entered the Union in 1850, several years after the 1846 Mexican War. Santa Barbara's regional economy, like much of California's, was sluggish and



Santa Barbara was a small but significant central California port in the late 19th century. Passenger and cargo ships called at Stearns Wharf. (Library of Congress)

the population sparse except for port cities and the presidios. Dramatic changes in both the regional population and the economy occurred after the discovery of gold at Sutter's Mill in 1849.

While the main sea lanes were to the southwest of the islands, steam and sailing ships of all descriptions also passed through the Santa Barbara Channel on their way to San Francisco, the gateway to the gold fields.

California's ports became international hubs for trade and ship re-supply. The early-19th century saw American and European ships rapidly fanning out across the Pacific. Western economies raced to exploit natural resources ranging from seals and whales to exotic tropical hardwoods and handcrafted items. By mid-century San Francisco and Monterey were the favored whaling ports, and Monterey, Santa Barbara and San Diego were frequented by the hide and tallow traders.

The increased shipping traffic brought on by the Gold Rush meant a corresponding increase in shipwrecks, especially at the rocky islands and mainland points. One shipwreck that received a great deal of notoriety in the 19th century was that of the SS *Winfield Scott*, a wooden side-wheel steamer. Built in New York in 1850, the *Scott* entered the goldfield trade in 1852 carrying

cargo, passengers and miners between San Francisco and Panama. In December 1853 the *Winfield Scott* wrecked at Anacapa Island while carrying passengers and mail from San Francisco to Panama, one of the few ships that wrecked on its way from the goldfield.

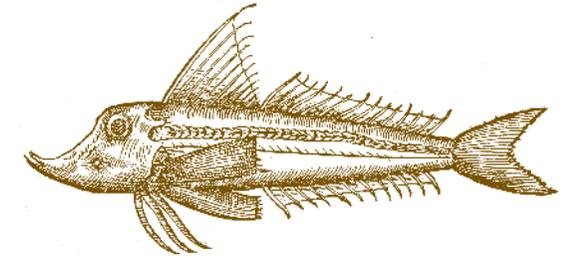
During prohibition in the early 20th century, the Channel Islands and surrounding waters were the site of considerable rum running and smuggling. Canadian and Scottish liquors were off loaded at the islands and then transported into Santa Barbara and Ventura on moonless nights in fast powerboats.

In 1923, the Pacific Mail Steamship Company's passenger-cargo steamer *Cuba* went ashore in fog on San Miguel Island. The *Cuba*, like the *Winfield Scott* was owned by the same steamship company and was employed on the same trade route between San Francisco and Panama when lost. *Cuba*, built in Hamburg, Germany in 1897 as the *Coblentz*, was a steel-hulled steamer.

Modern commercial fishing first developed along the California coast in the 1850s to feed the exploding Gold Rush population. Chinese immigrants initially manned the commercial fisheries living on the islands during the abalone harvesting season and fishing from locally built junks and sampans. Chinese shipwrights built the junks using traditional methods unique to their watercraft. The junks that worked in the Channel Islands typically were rigged with multiple masts for the long-distance voyage from the mainland.

The late-19th century also saw Japanese fishermen catching lobster in the Channel Islands for canning operations. Genoese fishermen from San Francisco also fished the islands as well and a commercial fishing industry still thrives in the Santa Barbara Channel to this day.

Various European watercraft, emblematic of California's cultural mix, were represented in the regional fishing fleet. New England whaleboats and dories, Chinese junks and sampans and Mediterranean feluccas

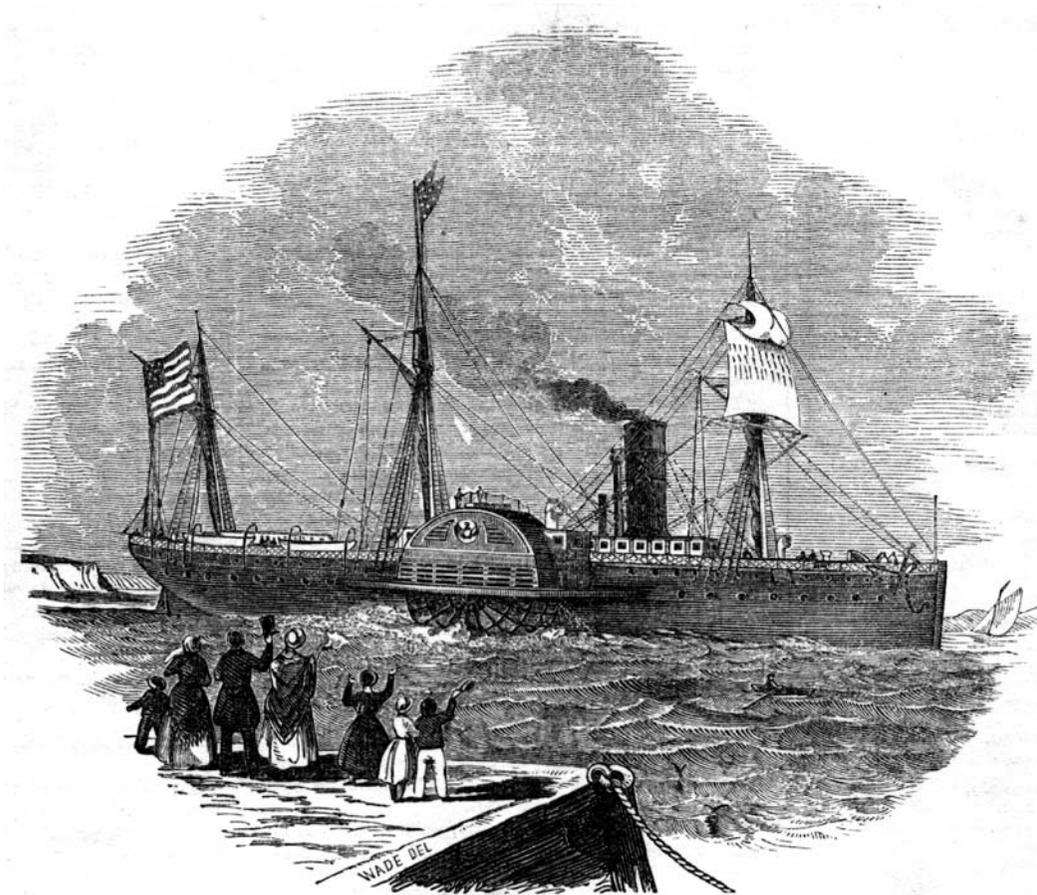


could all have been found in the waters around the Channel Islands during the late 19th century.

Little naval conflict occurred in the region in the 18th or 19th centuries, although navies from many Western nations visited the California coast. During the war with Mexico, the U.S. Navy blockaded the Pacific coastal ports and American warships often visited Santa Barbara. The Navy also patrolled for pirates and smugglers following California's admission to statehood and it later maintained a strong presence in the state while the Civil War raged in the eastern half of the country.

Several significant naval events occurred in the region's waters in the 20th century. The US Navy suffered a catastrophe at Point Pedernales at the western end of the Santa Barbara Channel (and just

The steamer *Windfield Scott* was carrying passengers from the California gold fields to Panama when it sank off Anacapa Island in 1853. (Library of Congress)



Shipwrecks in the tidal zone of the Channel Islands are jointly managed by NOAA and the National Park Service. The lumber schooner *Comet* grounded at San Miguel Island in 1911. (Courtesy Don Morris, NPS)

outside of the sanctuary boundaries) in September 1923. During maneuvers, seven US Navy destroyers were lost on the rocks as a result of navigation error in the midst of the same fog that claimed the steamer *Cuba* on that very day. In the early months of World War II, the war came to Santa Barbara's doorstep when a Japanese submarine shelled an oil refinery just west of the city. Although the shelling caused much fear and confusion, the real damage was slight.

Maritime Heritage Resource Inventory

A comprehensive inventory of maritime heritage resources began at the time of the sanctuary's designation in 1980 in collaboration with the Channel Islands National Park. These resources include the archaeological remains of shipwrecks, aircraft wrecks

and material associated with wharves, piers and landings. To date, 30 of the 140 known historic sites in the sanctuary have been studied. Of those, the SS *Winfield Scott* is prominent, having been placed on the National Register of Historic Places. A Shipwreck Reconnaissance Program provides year-round monitoring of the submerged sites in partnership with the Channel Islands National Park and the Coastal Maritime Archaeology Resources group, and maps have been developed of several of the archaeological sites that are within recreational diving depths.

In recent years, regional museum exhibits highlighting the sanctuary's cultural and historical resources have been developed for the public. The steamer *Cuba* is now the subject of an interpretive display at the Santa Barbara Maritime Museum. The sanctuary's Maritime Heritage Program website features an overview of selected shipwreck information and Chumash history. The website promoting understanding of, appreciation for, and involvement in the protection and stewardship of maritime heritage resources to a wide spectrum of the public, including students, educators, researchers and sport divers.

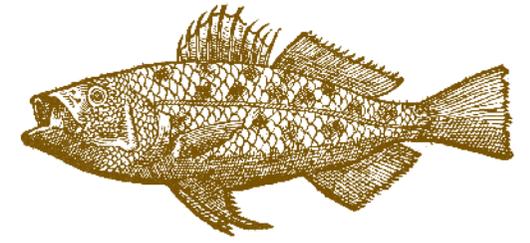
Potential Archaeological Resources

Prehistoric - Material cultural remains within the sanctuary may represent as much as 13,000 years of human history. These resources consist of Native American artifacts and paleontological remains. There is a strong probability that submerged remains of prehistoric peoples exist on the Continental Shelf off the California coast and the Channel Islands. Geological studies suggest the presence of submerged Pleistocene landforms and preliminary surveys have been conducted in anticipation of identifying areas of habitation (MMS 1987). Artifacts have been found on the seabed at various islands where land sites have eroded into the ocean (Hudson

1985). Any submerged prehistoric or Chumash-related sites would be very significant and would be useful in defining the early settlement process in coastal California.

Historic – The shipwreck remains of the Channel Islands reflect the diverse range of the activities and nationalities that traversed the Santa Barbara Channel. Chinese junks, Russian and Mexican sailing ships, American coastal traders, and Gold Rush-era steam ships have all sunk in these waters. Each has a story to tell about the history, technology and society of earlier times.

There are many known historical shipwreck losses in the waters of Channel Islands National Marine Sanctuary that have yet to be located. Many unrecorded small watercraft potentially exist in these waters as well. The sanctuary supports a program to locate, document and interpret its submerged archaeological resources. A staff maritime heritage resources coordinator plans and coordinates these activities. Historic archaeological resources within the sanctuary are inventoried during yearly sanctuary and park-sponsored expeditions.



pacific islands Region

Hawaiian Islands Humpback Whale National Marine Sanctuary

Written by Hans Van Tilburg and Joylynn Oliveira

Hawaiian Islands Humpback Whale National Marine Sanctuary was designated in 1992 to protect humpback whales and their habitat. While the sanctuary does not have a mandate to protect the archaeological resources on the seabed, it does have initiatives to facilitate Native Hawaiian traditional uses of the sanctuary's resources relating to traditional subsistence, cultural, and religious purposes.

Rebuilding a portion of a historic stone fishpond adjacent to the Hawaiian Islands Humpback Whale National Marine Sanctuary headquarters in Kihei, Maui. (HIHWNMS)



Native Peoples

Native Hawaiians have always been closely linked to the land and sea. To this day, Hawaiian culture embraces practices and traditions that use precious natural resources within the natural limits of the islands' unique ecology. In keeping with a rich maritime heritage, many Hawaiians continue cultural relationships with the humpback whale *kohola* and its ocean habitat.

During the winter, Hawaii's waters take on a new energy as the whales return to their breeding and calving grounds. Natives acknowledge their presence through legendary place names throughout the islands. For example, Koholalele meaning "leaping whale," is located along the Hamakua coast of Hawaii and at Lihue, Kauai. Laeonakohola on Kahoolawe refers to the "cape of whales." Puukohola Heiau, one of Hawaii's largest *heiau* (temples), was built on the "whale hill." This heiau played an important role in Hawaiian history as it began Kamehameha's journey of becoming the ruler of all Hawaii.

Centuries ago Hawaii's ancestors voyaged vast distances across the Pacific resulting in the development of a unique culture. Voyagers were masters of their natural surroundings, the clouds, winds, stars, and currents that guided them safely to their destination. Voyaging between islands and across the Pacific allowed Hawaiians to explore, trade and transport materials. Today, new generations explore their ancestral culture as traditional canoes set sail in remembrance of Hawaii's voyagers.

For centuries, many families devoted their entire lives to mastering the art of fishing for survival. Ancient Hawaiian fishing traditions are still seen today as fishermen use hooks, lines, and spears to fish in the day, and torches to fish at night. Seaweed and other resources are also gathered along the shorelines.

To promote the abundance of fish, the men would pray to the deity of fishermen, Ku'ula. They would then seek profitable fishing grounds in the deep sea using piles of rocks called *kuula* as landmarks. While at sea, the *lawia* would align several *kuula* so their intersection marked the location of the grounds.

A significant part of ancient Hawaiian culture was based on a land division system known as the *ahupuaa*. From the mountains to the sea, the *ahupuaa* enabled many practices such as trading, farming, fishing, and maintenance of resources to flourish under the supervision of a chief. By caring, respecting and showing reverence for the land and sea, Hawaiians understood that these resources would in turn, care for the people.

The islands' shorelines were once decorated by a lacework of rock-walled fishponds. These ponds evolved from an earlier form of Polynesian aquaculture into the unique Hawaiian style. Encompassing shallow coastal waters up to the shoreline, the rock wall enclosed an area of water in which Hawaiians could manage and raise fish. A sluice gate allowed small fish to enter and prevented larger fish from escaping.

Besides the humpback, Hawaii also has toothed whales that occasionally swim through the waters. It is believed that when the carcass of a toothed whale, such as the sperm whale, washed ashore, it became taboo and was reserved only for the *alii* or chief class. From this carcass, the tooth (*nihō*) was extracted, carved and made into a whale tooth necklace known as the *lei nihō palaoa*. This *lei*, rare in form and structure, was an intricately woven necklace of human hair with the carved whale's tooth hanging as a pendant.

When Hawaiians gazed upon the sea, they viewed all forms of sea life as *ia*. Many *ia* were sacred considered *aumakua*. An *aumakua* is believed to be the spirit of a family ancestor that assumed the shape of an

animal such as the octopus, turtles, and others. These *aumakua* protected the families, who in turn, cared for the animal. *Aumakua* are still honored today by many Hawaiian families as they continue to pass on the knowledge, practices and traditions of their elders.

European Colonial Period

The period that most closely corresponds to the mainland Colonial Era for Hawaii covers the century of European and American commercial activity within the sovereign Kingdom of Hawaii between 1778 and 1893. The post-European and American, or Western, contact history of the Hawaiian Islands Humpback Whale sanctuary, comprised of several distinct areas within the main Hawaiian Islands, is intertwined with the general history of the islands.

Changes initiated by the Western discovery of Hawaii began with Captain James Cook's encounter in 1778. Beginning in 1785, Western ships slowly began to capitalize on the abundance of otter furs in the Pacific Northwest and stop regularly at Hawaii on their way to Canton, China. During that time period, Kamehamehal, a chief from the island of Hawaii, was the first to unite all the Hawaiian Islands, forming an internationally recognized sovereign nation shortly after the turn of the 19th century. In addition to the local schooners, sloops and canoes plying island waters, Kamehamehal promoted the purchase and construction of Western-style vessels, adding more than 30 Western ships to his inventory.

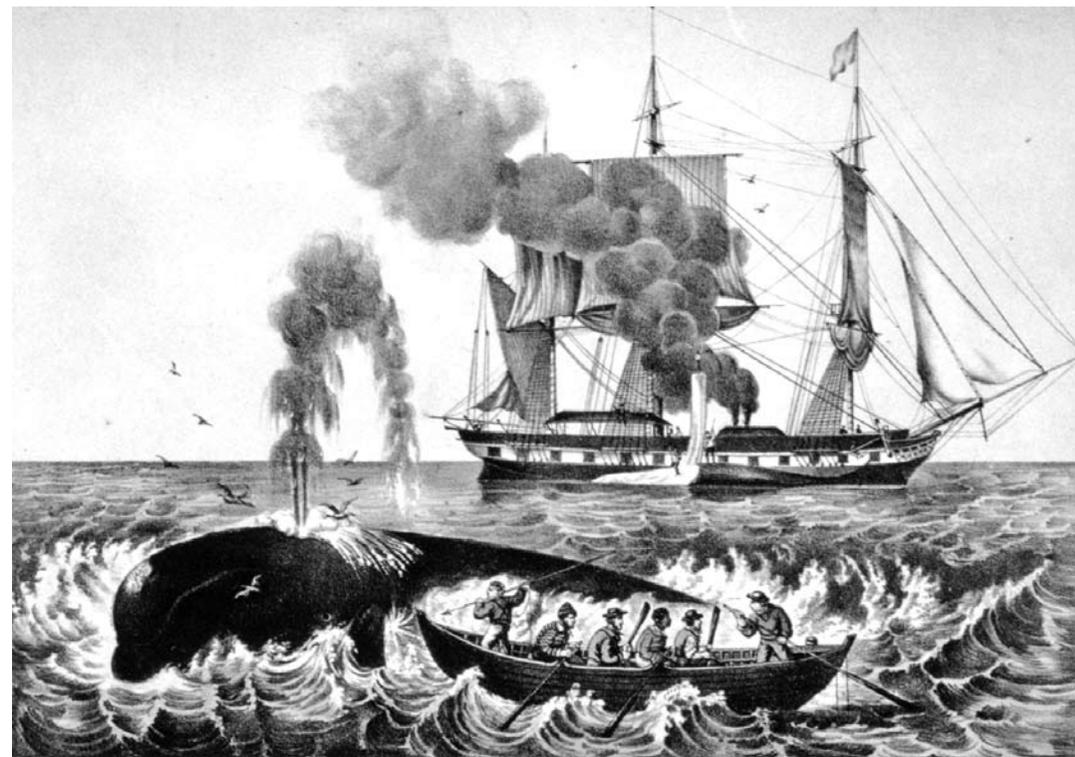
Although Euro-American culture became more pronounced about the islands in the 19th century, Western vessels never completely supplanted Hawaiian canoes. In ancient times large Koa, wood double-hulled voyaging canoes, were built and launched in the islands, used on open ocean Pacific passages to and from distant archipelagos such as Tahiti, the Marquesas, and the Northwestern Hawaiian Islands. These featured triangular "crab claw" oceanic sails, and were

navigated by the stars, swells, and clues from seabirds, clouds, and a whole range of similar observations often missed by modern sailors. Smaller single-outrigger sailing canoes were built as well, plying the waters between the Hawaiian Islands. By the time of Western contact long-distance voyaging had ceased, but island canoes continued to be found in multiple roles.

Provisioning became a major activity for ships in Hawaii, increasing inter-island commercial trade. Chiefs made profits from the shipment of pigs, fruits and vegetables, and salt (for curing seal pelts), while Western merchants, attempting to address the trade deficit at Canton, soon began seeking out sources of fragrant sandalwood. Some of the Hawaiian chiefs themselves fitted out their own sandalwood voyages to the Hong merchants in Canton. Much of the profit was turned into an expanding inter-island fleet as chiefs purchased or had built scores of Western sailing vessels for their own uses. Several of these vessels have been lost within the sanctuary.

One of those vessels has been the subject of close scrutiny. In 1995 Paul F. Johnston, curator of maritime history at the Museum of American History at the Smithsonian Institution, began work in Kauai's Hanalei Bay within the sanctuary, searching for the remains of *Cleopatra's Barge*, an American brig built as a luxury yacht by George Crowninshield in 1816. The ship, 100 feet long on deck and lavishly fitted out, was eventually sold to Kamehameha II in 1820 for 8,000 piculs of sandalwood and renamed *Haaheo o Hawaii* or *Pride of Hawaii*. In 1824 she wrecked on a shallow reef. After four seasons of field work, the artifacts collected from the wreckage are currently being preserved at mainland facilities.

The maritime scene in Hawaii quickly became very culturally mixed, as Hawaiian men found employment on board a wide variety of European and American vessels. Western ships purchased by Hawaiians sailed between islands, and missionaries and whalers and sandalwood hunters increasingly altered local society.



At one point, Hawaiian and other Polynesian sailors comprised 1/5 of the American whaling fleet. The artifact types from Johnston's work bear evidence to the multicultural use of island vessels.

Though many species of marine mammal, decimated by decades of intensive hunting have yet to fully recover, the whaling industry in the Pacific was crucial to European and particularly American commercial and industrial development. In the first half of the 19th century, whaling operations spread north into the Pacific basin, progressively seeking out lucrative whaling grounds off South America, Australia, Japan, and finally the Gulf of Alaska and the Bering Sea.

During the Historical Period, Hawaiian waters were not as much a celebrated whaling ground as they were a familiar rest and reprovisioning point for whaling vessels working in less hospitable locations, such as the high arctic seas. American vessels more and more dominated Pacific whaling grounds and particularly the sperm whale fishery in the mid 19th century.

American and European whaling ships used Hawaii as a base in the 19th century. The presence of Western sailors forever changed the Native Hawaiian culture. (Library of Congress)

While 60 whalers had called at the Hawaiian Islands in 1822, almost 600 were annually making port by 1845, many within what is now the Hawaiian Islands Humpback Whale National Marine Sanctuary. Civil War losses, hazards inherent in high-latitude whaling such as ice damage, and the discovery and refinement of petroleum in Pennsylvania soon led to a decline of sail-age whaling. Today, the sanctuary and partner agencies including the Bishop Museum in Hawaii and the New Bedford Whaling Museum in Massachusetts are working together to illuminate whaling history and our current protections for these valued species.

In the 1840s a robust species of sugar cane was first produced for profit on the island of Kauai and planters began to make plans for the first sugar cane plantations. Plantation economies needed land and a large pliant labor force, demands that would contribute to both the loss of sovereign territory for the Kingdom of Hawaii and the introduction of Asian and Pacific contract laborers and the creation of an even more multicultural society.

Transport in the islands remained dominated by sailing schooners, given the expense, relative inefficiencies, and general lack of coal available for the steam vessels. It was not until later in the plantation boom in the second half of the 19th century that the economic foundation for the transition to steam navigation among the islands was firmly established. Small steamships soon became the backbone of inter-island plantations.

Whether sailing schooner or steamship, inter-island vessels operated in a trade hazardous to both life and property. With the exceptions of Honolulu on Oahu, Hilo on Hawaii, and Kahului on Maui, there were no true wharves where ships could lie in safety in all weather. Open roadsteads and narrow passages between fringing reefs were the usual condition, and often the skillful use of surfboats or elaborate moorings and overhead wire systems were the only way to transport both passengers and products. Documentary survey

of the hundreds of shipwrecks in Hawaii's past reveals clusters of such wrecks at the landing locations, many within the sanctuary. The significance of inter-island navigation and the landings and shipwrecks, therefore, is closely linked to the plantation economy and plantation culture of the islands of Hawaii for a large portion of the 19th century.

American Period

The Kingdom of Hawaii came under the control of American commercial interests following an illegal coup on January 16th, 1893. This included the U.S. Navy when marines of the USS *Boston* moved ashore and invaded the sovereign Hawaiian nation. Though recognized as an action unsupported by the U.S. government, little attempt was made to restore sovereignty to Queen Liliuokalani and the citizens of the Hawaiian Kingdom. This lack of redress was succeeded by official annexation by the U.S. in 1898, following the outbreak of the Spanish American War and the full recognition of Hawaii's strategic location.

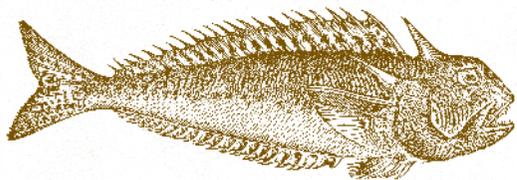
U.S. naval activities in Hawaii have evolved through a number of distinct phases. Beginning with early goodwill visits in the 1820s, interest in surveys of Pearl Harbor and establishing a permanent presence was relatively slow to emerge. Following the overthrow of the Hawaiian government in 1893, the role of Hawaii as a naval base developed directly alongside American expansion in the Pacific. Activities and development increased in response to the growing perceived need for military capability across the wide ocean.

The military construction boom and transfer of forces to the Islands accelerated in the 1930s. With World War II on the horizon, Hawaii became home to the U.S. Pacific Fleet, and numerous naval stations popped up throughout the Hawaiian archipelago, both within and outside the sanctuary. Naval air stations and amphibious training operations resulted in a relatively large number of planes and landing craft being left

on the sea bottom. Many Japanese-designed, locally built fishing sampans were confiscated by the Navy and put to use as inshore patrol vessels both before and during the war.

Within the marine sanctuary's boundaries, the waters off Molokai's east end were a dedicated target zone. Maui featured the Combat Demolition Training Center on Maalea Bay, where teams were trained in surveying and destroying undersea obstructions and in reconnaissance techniques for shore invasions. Maui had two naval air stations, NAS Puunene and NAS Kahului, busy supporting naval aircraft squadron operations over local waters. Several spots on Kauai, including Hanalei Bay, became areas for amphibious training. The sanctuary's boundaries even include a "Pearl Harbor survivor," the utilitarian harbor oiler *YO-21* aground on Lanai Island's north shore. World War II in the Pacific brought with it drastic military, social, and economic change, forever altering the nature of civilian and naval societies in the Islands.

Today approximately 90 percent of all goods used in the islands arrive via containers from the mainland. The sugar and pineapple industries faced stiff competition from foreign sources, and tourism soon outstripped them as Hawaii's number one industry. Tourism, which began as passenger business on steamships between the islands and to the mainland, is now a major industry highlighting the need for the protection of marine resources like marine mammals and their habitats. Where once the whaling ships re-provisioned in order to carry out their oceanic hunt, whales are now protected and valued as magnificent living creatures. The waters of the sanctuary have been witness to both extremes of this activity, as well as numerous other phases of maritime history.



Maritime Heritage Resource Inventory

Hawaiian Islands Humpback Whale National Marine Sanctuary was established for the purpose of protecting humpback whales and their habitats. The goals of the sanctuary take into account the identification of marine resources and ecosystems of national significance for possible inclusion in the sanctuary. Though historic maritime heritage per se is not currently included in the sanctuary's management plan, Native Hawaiian cultural resources are emphasized. The sanctuary works to affirm the unique relationships between the Hawaiian people and the humpback whale through special public education outreach activities. By doing this, it strives to enhance the survival of North Pacific humpback whales and the ocean-based conservation-oriented culture of native Hawaiians.

Cultural resource enhancement in the sanctuary features facilitating all public and private uses of the sanctuary emphasizing Hawaiian customary and traditional uses for subsistence, cultural, and religious purposes. The management plan also contains strategies to increase public understanding of Native Hawaiian culture and practices highlighting the cultural significance of whales in ancient Hawaii. Evidence such as petroglyphs, legends, place names, and artifacts indicate that Hawaiians culture was heavily linked to the humpback whales.

The remains of ancient stone fishponds make up a significant portion of prehistoric heritage resources within the sanctuary. Many were built over 500 years ago, and some still exist today. Different types of fishponds are found throughout Polynesia, but Hawaiians in particular enhanced the design of the common fish traps and created a rock wall with sluice gates. An excellent example of an ancient Hawaiian fish pond stretches into the ocean directly in front of the sanctuary's headquarters site of the sanctuary in Kalepolepo, Kihei, Maui. The sanctuary supports

nonprofit organizations, such as the Association of the Fishponds of Maui, that seek to preserve, restore, and revitalize this both ancient and yet advanced technology.

For several years the University of Hawaii's Marine Option Program featured a graduate program in maritime archaeology and history. Field schools and surveys conducted by this program took place throughout the Hawaiian Islands, many within the boundaries of the sanctuary. The program conducted two surveys featuring ancient Hawaiian resources within the sanctuary. In 1996, students mapped the distribution of basalt fishing tools located offshore from Waikiki Beach as part of the 1996 Maritime Archaeology Survey Techniques course. The majority of these tools consisted of bread loaf-shaped basalt sinkers, once used as parts of octopus lures. And in 1997, during a survey of several sites along the Kona Coast of the Island of Hawaii, students mapped the outlines of the fishtrap at Kaloko Honokohau, a national park (Van Tilburg 1997).

The sanctuary's boundaries also include "Shipwreck Beach" on the north shore of Lanai Island. During the 19th and early 20th centuries the Navy and inter-island navigation companies used Shipwreck Beach as an area for the intentional abandonment of vessels known as the "rotten row." Several of these sites have been surveyed (Van Tilburg 2001), but many other wrecks along the eight mile stretch have yet to be identified. Surveys have also documented other sites such as several ancient Hawaiian fishing villages, and stone artifacts submerged along the eight-mile shore. Shipwreck Beach is also a location of a Hawaiian battleground – seeking to strike against the political satellite of Maui, Kalaniopuu, a war chief from the island of Hawaii landed his warriors along the north shore and raided Lanai in 1778.

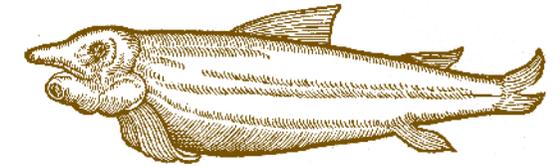
In 2002 the University of Hawaii's Marine Option Program, funded by a grant from the Naval Historical Center, completed a documentary inventory of Navy

shipwrecks. A number of these vessels were lost within the sanctuary. At present there are a total of almost 80 U.S. Navy ships and submarines, and over 1,400 naval aircraft, reported lost in the general vicinity of the Hawaiian Islands (Van Tilburg 2002).

Potential Archaeological Resources

Prehistoric - Yoshi Sinoto, noted anthropologist associated with Hawaii's Bishop Museum, is the only researcher to have recovered components of ancient Polynesian voyaging canoes in an archaeological context. These were discovered in the 1970s on the French Polynesian island of Huahine. Hundreds of years ago a habitation and canoe construction site was inundated by a tsunami or "tidal wave," burying adzes, scrapers, hull strakes, steering oars, and other artifacts. Sinoto has emphasized the improbability of discovering double hulled or outrigger oceanic canoes, vessels laden neither with ballast nor relatively heavy cargo, in any submerged setting since these advanced craft did not easily sink.

Historic - The large number of potential and known sites within the sanctuary serve as an exciting window into specific elements of the maritime past in the main Hawaiian islands. For both the sanctuary and the Maritime Heritage Program, these are opportunities for education and outreach.





Papahānaumokuākea Marine National Monument

Written by Hans Van Tilburg and Kekuena Kikiloi

The Papahānaumokuākea Marine National Monument was formerly known as the Northwestern Hawaiian Islands Marine National Monument. The Native Hawaiian name reflects the ancient Hawaiian tradition that relates to the birth or formation of the Hawaiian Islands as is personified by the earth. At almost 140,000 square miles, it is the largest marine protected area in the world. It contains the waters surrounding the chain of islands that stretches from Ni'ihau northwestward to Kure Atoll.

Native Hawaiians were the first discoverers of the Hawaiian Archipelago and continued to inhabit these islands for thousands of years prior to Western contact. During this time, Native Hawaiians developed complex resource management systems and a specialized set of skills to survive on these remote islands with limited resources. Native Hawaiians continue to maintain their strong cultural

ties to the land and sea and continue to understand the importance of managing the islands and waters as inextricably connected to one another (Beckwith 1951; Lili'uokalani 1978).

More specifically, the ocean played an important role to Native Hawaiians as it was used for resources and physical and spiritual sustenance in their everyday lives. Poetically referred to as *ke kai popolohua mea a Kane* (the deep dark ocean of Kane), the ocean was divided into numerous smaller divisions and categories beginning from the nearshore to the deeper pelagic waters (Malo 1951). Likewise, channels between islands were also given names and served as connections between islands, as well as a reminder to their larger oceanic history and identity.

In Hawaiian traditions, the Northwestern Hawaiian Islands are considered a sacred place, a region of primordial darkness from which life springs and spirits return after death (Kikiloi 2006). Much of the information about the NWHI has been passed down in oral and written histories, genealogies, songs, dance, and archaeological resources. Through these sources, Native Hawaiians are able to recount the travels of seafaring ancestors between the Northwestern Hawaiian Islands and the main Hawaiian Islands. Hawaiian language archival resources have played an important role in providing this documentation, through a large body of information published over a hundred years ago in local newspapers (e.g., Kaunamano 1862 in *Hoku o ka Pakipika*; Manu 1899 in *Ka Loea Kalai'aina*; Wise 1924 in *Nupepa Kuoko'a*). More recent ethnological studies (Maly 2003) highlight the continuity of Native Hawaiian traditional practices and histories in the Northwestern Hawaiian Islands. Only a fraction of these have been recorded, and many more exist in the memories and life histories of kupuna.

Archaeological surveys done on Nihoa and Mokumanamana have shown that there are numerous archaeological sites and cultural material located on these

small islands (Emory 1928; Cleghorn 1988; Ziegler 1990; Graves and Kikiloi 2006). Both Nihoa and Mokumanamana are recognized as culturally and historically significant and are listed on the National and State Register of Historic Places and protected by the U.S. Fish and Wildlife Service in accordance with the National Wildlife Refuge System Administration Act of 1966, as amended. On Nihoa Island, where there is significant soil development, there are at least 88 cultural sites including ceremonial, residential, as well as agricultural features. On Mokumanamana, there are 52 cultural sites, including ceremonial and temporary habitation features. Several archaeological surveys have collected a significant number of cultural artifacts from both of these islands, which are now stored in the Bernice Pauahi Bishop Museum and the University of Hawai'i Archaeological Laboratory. The range in types of cultural artifacts stored in these collections is testimony to the various uses these islands and the surrounding oceans served for Native Hawaiians in pre-contact times.

By the time of Western European contact with the Hawaiian Islands, little was collectively known by the majority population about the Northwestern Hawaiian Islands as few had traveled to these remote islands and seen them with their own eyes. Within the next century, a number of expeditions were initiated by Hawaiian ali'i to visit these islands and bring them under Hawaiian political control and ownership. The accounts of these historical expeditions were published in great detail in the newspapers from 1857 through 1894, as they related to each visit.

The sovereignty, life (ea), and responsibility (kuleana) for the entire Hawaiian Archipelago continues to exist in the hearts and minds of many Native Hawaiians. This position was recognized by the "Apology Bill" (U.S. Public Law 103-150), a joint resolution of Congress signed by the President in 1993. The Apology Bill acknowledges the wrongful role of United States' officers in the overthrow of the Kingdom of Hawai'i

Native Hawaiians keep their traditions alive through such activities as traditional voyaging practices on the Hokule'a voyaging canoe. (Courtesy of Papahānaumokuākea Marine National Monument)



and “apologizes to Native Hawaiians on behalf of the people of the United States” for the unlawful overthrow and the “deprivation of the rights of Native Hawaiians to self-determination.” It also recognizes that “the health and well-being of the Native Hawaiian people is intrinsically tied to their deep feelings and attachment to the land.”

European Colonial Period

Between 1778 and 1893, European and American commercial activity within the sovereign Kingdom of Hawaii went from initial brief encounters to full scale marine industry. Following Captain James Cook’s encounter with Hawaii, the presence of European and American vessels at the main Hawaiian Islands slowly began to increase. By 1825 Honolulu had become a critical provisioning port of the Pacific. The islands’ strategic position played an important role in Pacific navigation and the global movement of commodities. Following their discovery by the West, the islands became subject to commercial exploitation and extractive activities. These eventually included whaling, sealing, harvesting of birds and feathers, fishing, and the collection of guano for fertilizer.

Early European voyages of discovery included several encounters in the islands. Exploits of British explorers such as Cook and Vancouver have been fairly well documented, yet they had little contact with the islands. The French navigator La Perouse, Cook’s contemporary, made brief surveys of Mokumanamana (Necker) and French Frigate Shoals in 1787. Russian navigators such as Lisianski conducted surveying expeditions in the Pacific in 1805. In the mid-19th century, American surveying efforts by N.C. Brooks (1859), Lieutenant John Brooke (1859), and Captain William Reynolds (1867) added to the growing body of knowledge on the islands.

Exploration, however, did not rest solely with explorers. American and British whalers, in their early search for

productive areas, encountered the low and uncharted atolls on their passages westward from Honolulu and Lahaina to the seas off Japan. Several of the islands, therefore, received their western names from early landings and/or ship wrecks of Pacific whalers. Midway was originally sighted by Captain Daggett of the New Bedford whaler *Oscar* in 1839. Laysan was reportedly discovered by the American whaleship *Lyra* prior to 1828. Pearl and Hermes Reef is named for the twin wrecks of the British whalers *Pearl* and *Hermes* in 1822. Gardner Pinnacles was named by Captain Allen on the Nantucket whaler *Maro* in 1820, the same year the ship came across Maro Reef. Whaling, which decimated marine mammal populations worldwide, carried with it major ramifications in terms of oceanic discovery, cultural contact, economic development, and political expansion. There are 10 known whaling shipwrecks in the islands.

The U.S. Guano Act of 1856, which enabled commercial claims to many remote and uninhabited islands in the Pacific, heralded the hunt for mineral resources. Private guano extraction companies leased several of the islands. Development of facilities supporting these activities was most significant on Laysan Island, where a small community existed in the 1890s. Guano works in the islands necessitated supply ships and passage for contract laborers, increasing vessel traffic in the region. These vessels, also, left traces of their operations on the sea floor.

The U.S. Navy’s interest in Midway makes it something of an exception. Originally claimed under the Guano Act (though no guano mining ever took place), Captain William Reynolds of the USS *Lackawanna* took formal possession for the U.S. in August 1867, making Midway the first land annexed outside continental borders. The harbor was described as similar to Honolulu, both roomy and safe, and the low Sand and Eastern Islands as “productive for agriculture.” These were unrealistic claims at the time, but early in the age of steam navigation, the U.S. needed transpacific coaling

stations, and sought the establishment of commercial links to East Asia. The effort was not without a cost, as the USS *Saginaw*, supporting improvement efforts at Midway, was lost at nearby Kure Atoll in 1870. The Midway Islands were the first fruits of Secretary of State William Seward’s expansionist policies, the first island territory claimed beyond the western edge of the continental mainland.

The islands were not the only focus of activity. Commercial fishing in the waters surrounding the Northwestern Hawaiian Islands began with the arrival of large sailing vessels that hailed from ports around the world. These vessels left the reefs and shoals with cargos of shark meat, fins and oil, turtle shells and oil, and beche-de-mer (sea cucumber). Commercial harvesting of tuna, bottom fish, lobsters, and other marine animals in the islands continued through the twentieth century. The commercial use of marine resources remains an important issue to the preservation and health of the region.

Throughout this period the low and poorly charted nature of the islands presented significant hazards to shipping. Fortunately, the frequent proximity of sandy “desert” islands, not barren at all but rich in terms of marine mammals, seabirds, and ocean resources, granted castaways the opportunity for survival. Many tales of shipwrecks in the islands present similar themes: unexpected groundings on low coral atolls, difficult survival on turtles, seals, fish and bird eggs, and construction of craft from debris for rescue voyages eastwards back to the main Hawaiian Islands. Also not surprisingly, several commercial outfits in the main Hawaiian Islands sent local schooners on “wrecking” or salvage cruises to the islands. Robert Louis Stevenson’s story *The Wrecker* captures a fictional account of this little-documented activity. In 1915 the Reverend J.M. Lydgate summarized the navigational hazards of the islands:

The islands and reefs to the northwest of Hawaii have been a veritable graveyard of marine disaster. The two sufficient reasons for this have been, first,

the low, inconspicuous character of the island and, second, the faulty or insufficient location of them on the marine charts. The menace of the iceberg is the fact that it lies seven-eighths underwater, and you strike some submerged, protruding spur of it before you dream of danger. In a much more disastrous way the same thing is true of many of these islands (Lydgate 1915).

American Period

The Kingdom of Hawaii came under the control of American commercial interests following the coup of 1893. This was succeeded by official annexation by the US in 1898. Claims substantiated by the former kingdom of Hawaii to the Northwest Hawaiian Islands (except Midway) were transferred to the Territory of Hawaii. Statehood for the Territory came about in 1954, following World War II and large scale social, political, and economic transformations in the Pacific.

Hawaii and the islands played a crucial role in global communications. In 1903 the transpacific submarine cable was completed via Honolulu, Midway, and Guam. At Midway, the establishment of the cable station forever altered Sand Island. Tons of imported soil and numerous introduced plants significantly altered the landscape, and cable station supply shipwrecks were added to the resource inventory. Residence at Midway also meant an increasing interest in the islands by the American government. Illegal poaching in the remote archipelago prompted the first US Marines presence at Midway, and President Theodore Roosevelt eventually declared the whole area (with the exceptions of Midway and Kure) the Hawaiian Islands National Wildlife Refuge, for the protection of seabirds.

In 1935, a different type of “seabird” appeared. Pan American Airways initiated flying “clipper” seaplanes service across the Pacific, a five-day island-hopping

passage. The US Navy’s interest in the strategic location of Midway centered on its use as a seaplane base, and in 1940 construction of the naval air facility at Midway was begun.

World War II had an intense impact on the region. Tern Island, in French Frigate Shoals, was initially developed as a naval air facility for staging aircraft from the main Hawaiian Islands. The Navy built a base at Midway Atoll, dredging the reef to form a channel and harbor creating a major submarine refit and repairs base. Eastern Island had the main airfield in the early days of the war, while submarine and seaplane support operations were concentrated on Sand Island. Together, these areas comprised a vital center for submarine, surface fleet, and aviation operations. In fact, the United States Hawaiian Sea Frontier forces stationed patrol vessels at most of the islands and atolls.

The Northwestern Hawaiian Islands were the focus of one of the most important naval battles in the Pacific. In June 1942, the Japanese Imperial Navy attempted the invasion of Midway Atoll. Ultimately, four Japanese aircraft carriers and one American carrier were sunk, and hundreds of aircraft were shot down. The Imperial Japanese Navy was forced to withdraw. This was a watershed moment in the Pacific; had the invasion succeeded, America’s line of defense would have retreated to the West Coast, for most of the American fleet still lay in ruins at Pearl Harbor. The majority of the sea battle took place between 100 to 200 miles to the north, but an intense air fight was waged directly over and around the atoll itself. Numerous Japanese and American planes splashed down into Midway waters. Many of these sites are war graves. Training exercises before and after the battle also took their toll. At least 67 naval aircraft are recorded as being lost in the vicinity of the islands.

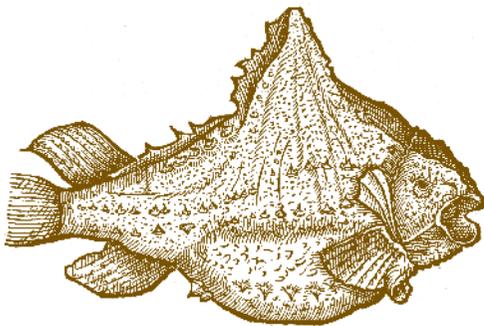
This battle proved to be the most decisive U.S. victory and was the turning point of World War II in the Pacific. Midway Atoll today is designated as a National

Memorial to the Battle of Midway and ensures that those who fought and died in this battle on both sides will always be remembered for their sacrifices. Nine defensive structures related to the Battle of Midway were designated as National Historic Landmarks in 1986. Others are eligible for placement on the National Register of Historic Places.

Maritime Heritage Resource Inventory

Today, Native Hawaiians remain deeply connected to the Northwestern Hawaiian Islands on genealogical, cultural, and spiritual levels. Kaua’i and Ni’ihau families voyaged to these islands indicating that they played a role in a larger network for subsistence practices into the 20th century (Tava and Keale 1989; Maly 2003). In recent years, Native Hawaiian cultural practitioners voyaged to the Northwestern Hawaiian Islands to honor their ancestors and perpetuate traditional practices. In 1997, *Hui Malama i Na Kupuna o Hawai’i Nei* repatriated sets of human remains to Nihoa and Mokumanana that were collected by archaeologists in the 1924-25 Bishop Museum Tanager Expeditions (Ayau and Tengan 2002). In 2003, a cultural protocol group, *Na Kup’eu Paemoku*, traveled to Nihoa on the voyaging canoe Hokule’a to conduct traditional ceremonies. In 2004, Hokule’a sailed over 1,200 miles to the most distant end of the island chain to visit Kure Atoll as part of a statewide educational initiative called “Navigating Change.” In 2005, *Na Kup’eu Paemoku* sailed to Mokumanamana to conduct protocol ceremonies on the longest day of the year, June 21- the Summer Solstice.

There is little doubt that the islands possess some of the most unspoiled reef systems in the North Pacific Ocean. These islands and atolls, due to their isolation, are natural reserves for ecosystem diversity, and their intelligent management is of critical concern. There is also little doubt that the islands possess a rich



maritime history and abundant maritime heritage resources. A variety of Hawaiian and Pacific vessels, such as naval ships and aircraft, guano camp supply ships, fishing vessels, cable station ships, Japanese junks and local sampans, transpacific colliers, and the local wreckers or salvage company vessels from the main Hawaiian Islands all transited the islands.

Currently, there are over 60 known ship losses and/or confirmed sites in the area, the earliest dating back to 1818. This, combined with 67 known aircraft crashes, gives a total of over 120 potential maritime heritage resource sites. Some of these may represent environmental threats. Some may consist chiefly of marine debris of little specific value. But many of these sites are of historical and national significance. They are the physical record of past activities in the region, and embody unique aspects of Pacific island and American history.

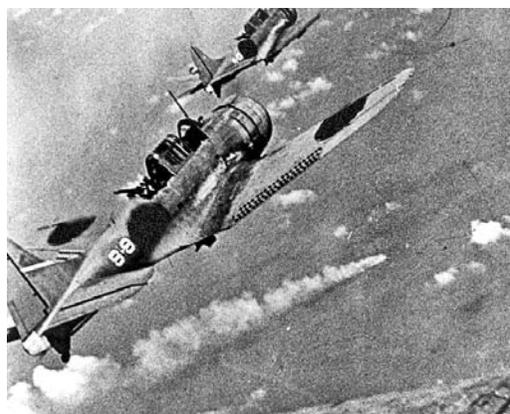
In September and October 2002, the Northwestern Hawaiian Island Coral Reef Ecosystem Reserve sponsored a multi-agency research expedition to the islands. The project provided an opportunity for a small team of maritime archaeologists to conduct the first systematic survey of maritime cultural resources in the distant archipelago. The study area encompassed the islands and atolls stretching from Nihoa in the south to Kure in the north. The researchers worked alongside a larger team of biologists, zoologists, and management personnel, on this multidisciplinary expedition. During the expedition, the team documented ten known vessels as well as five previously unrecorded wrecks. In addition, numerous 19th and 20th century anchors and other material were recorded and two US Navy aircraft surveyed. Subsequent archival work has continued to add to the inventory begun with this report.

Maritime archaeologists conducted a maritime heritage survey of selected sites at Kure and Midway Atolls in the Northwestern Hawaiian Islands in 2003. The team discovered the wreck site of the USS *Saginaw* (lost in 1870) at Kure Atoll. The suspected

site of a whaling ship was also investigated, the remains corresponding to the American vessel *Parker* (lost in 1842). At Midway the wreck of the American bark *Carrollton* (lost in 1906) was documented, and the sunken Navy salvage ship USS *Macaw* (lost 1944) was also documented.

Potential Archaeological Resources

Prehistoric – Archaeological surveys from the 1920s and 1930s first documented the remains of Hawaiian structures on both Nihoa and Mokumanamana Islands at the eastern end of the reserve, closest to the main Hawaiian Islands. Scholars, such as Ben Finney at the University of Hawaii, point out the high probability of Hawaiian fishing voyages at least as far west as French Frigate Shoals, and Native Hawaiian oral traditions indicate contact with numerous islands in the region. Many of the low atoll islands further to the west can be completely washed over during storm events in the northern Pacific, though, and physical remains there have yet to be found. The discovery of basalt artifacts such as canoe anchors or stone tools in the distant islands, a coral ecosystem where

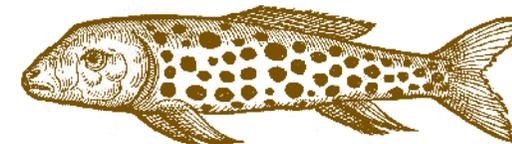


The battle of Midway, which took place near the Northwestern Hawaiian Islands, resulted in the loss of numerous aircraft and ships. (Source courtesy of the National Archives)

there is no immediate source of basalt rock, remains a distinct possibility.

Historic – NOAA's maritime heritage efforts face a special challenge in the Pacific Islands Region. Hundreds of historic shipwrecks and other types of submerged archaeological sites are scattered over a vast area of ocean. These include traditional voyaging and fishing craft, aquaculture sites, copra traders, whaling ships, Japanese sampans, and transpacific colliers. In addition, there are over 80 US Navy ships and submarines and over 1,500 navy aircraft lost in Hawaiian waters alone. Many of these vessel and aircraft losses are US naval property and war graves associated with major historic events, or are sites older than 100 years and of historic and archaeological interest.

Until recently, wreck sites in remote locations like the Northwestern Hawaiian Islands remained uninvestigated because of distance and logistical challenges facing work around isolated atolls. Appreciation of shipwrecks as heritage resources is a relatively new consideration in the Pacific. In collaboration with agency partners, the Pacific Islands region maritime heritage program has begun the important process of identifying, documenting and protecting these rare sites in the area. Goals include the development of a thorough inventory of submerged historic sites in the Hawaiian archipelago and American Samoa. Regional efforts also serve as an example of maritime heritage management for states and territories. Proper management and protection of these sites allows for greater public understanding and appreciation, preserving heritage for generations to come.





Fagatele Bay National Marine Sanctuary

Written by Hans Van Tilburg and Julie Taomia

Comprising only a quarter square nautical mile, Fagatele Bay lies along the southernmost shore of Tutuila, the largest and most populated of the seven islands comprising the US Territory of American Samoa. Located approximately 1,000 miles south of the equator, American Samoa constitutes the eastern portion of the Samoan archipelago. The islands of Savai'i and Upolu to the west form the independent nation of Samoa. American Samoa is the only U.S. Territory south of the equator and comprises five volcanic islands (Tutuila, Aunuu, Ofu, Olosega, and Tau) and two small remote coral atolls (Rose Atoll and Swains Island). Contained within an extinct volcano, Fagatele Bay is a spectacular setting for one of the most remote of the National Marine Sanctuaries.

Native Peoples

Archeological evidence suggests the islands of Samoa have been inhabited since at least 1300 BC. While trade and social interactions with Tonga and the other islands of the Pacific occurred over the subsequent 2,000 years, a distinctly Samoan society existed in the islands by the time of European arrival in the late 1700s. The wave of human migration from S.E. Asia may have paused for an extended period in Samoa, before subsequent voyages of colonization continued to the Marquesas, Tahiti, and the distant islands of Polynesia (including Hawaii). As a result, many elements of Polynesian culture are considered to have their roots in the Samoa area of the Pacific.

Although the economy, government and religion have changed since European contact, traditional Samoan culture remains central to life in American

Samoa. The society is based on a system of *matais*, or chiefs, with varying levels of rank. This system is formed around extended families, or *aigas*, with a common allegiance to a high-ranking village *matai*. The *matai* regulates his village's activities. Ownership and control of land is extremely important, and village ownership of off-shore areas is observed in principle. However, while traditional cultural relationships with the land remain strong, much of the traditional relationships to the sea have faded in recent years. Less dependency on offshore resources to sustain the economy and rapid ways to travel between islands has severed many of the connections to the sea the people of American Samoa once embraced.

Perhaps more than any other Polynesian cultures, Samoans have maintained an awareness and observation of traditional ways in the face of historic changes following western contact. *Fa'asamoa* is often heard in American Samoa. It means the Samoan Way and includes the traditional structure of Samoan society. The culture of Samoa is over 3,000 years old. *Fa'asamoa* has kept Samoans strongly nationalistic and cautious about changes that might threaten the traditional structure of their way of life. However, *fa'asamoa* has an inherent flexibility that allows culture to withstand and absorb the ways of foreign traders, missionaries, and military forces; it is a dynamic cultural force. One aspect of *fa'asamoa* is the ancient concept of *tapu*. Samoans restricted use on areas that became overstressed in order to protect their resources.

Fagatele Bay National Marine Sanctuary adds a new dimension to local awareness of the treasures of the marine environment and the need to protect and preserve it. By equating the sanctuary with the concept of *tapu*, a fresh understanding of resource protection and management emerges, one that can have vital cultural and environmental significance. The sanctuary was designated to preserve and example

of a pristine tropical marina habitat and coral reef terrace ecosystem.

The sanctuary makes a special effort to work with the American Samoan community with outreach programs for all ages. The sanctuary co-sponsors summer environmental education programs like the Enviro-Discovery Program, which allows 9- to 12-year-old children to explore the marine life in the bay, learn ways to protect the resources there, and create art using materials from the sea. Samoan cultural events and general community outreach and education programs are also run year-round.

European Colonial Period

Increasing contact with Western vessels following Jacob Roggeveen's visit in 1722 came in the form of explorers, whaling vessels, merchant ships and missionary efforts in the Pacific. Samoa, located 2,300 miles southwest of Hawaii and 1,600 miles northeast of Aoteroa (New Zealand), formed a strategic midpoint on early sailing and steamer routes. In the late 19th century, British, German, and American governments all recognized the Kingdom of Samoa. The Treaty of Berlin, signed in 1889, confirmed this, placing Europeans as advisors under the Samoan leader. The prevalence of expansionist plans throughout the Pacific during this period, though, along with the outbreak of violence and civil war, put enormous pressure on the kingdom nonetheless. In December 1899 the Tripartite Treaty replaced the previous agreement, and Western Samoa passed into German control, while the United States gained what is now known as American Samoa.

Polynesian watercraft could be rowed or sailed and often had outriggers to stabilize the narrow hulls.

(Library of Congress)



American Period

Tutuila became a territory of the United States with the signing of the Deed of Cession in 1900. The islands of Manu`a in American Samoa followed with their own agreement in 1904. The Pago Pago Harbor area was chosen initially as the site of the coaling station, and soon after became a US naval base. With its strategic location, naval presence in American Samoa provided logistical support to pre-World War II and wartime American operations against forces of the Imperial Japanese Navy. In 1940, Pago Pago on Tutuila became a training and staging area for the U.S. Marine Corps engaged in amphibious operations, critical to the island-hopping strategy. During this intensive period, the United States built roads, airstrips, docks and medical facilities, introducing change into numerous areas of island life. Many American Samoans enlisted in the U.S. Marines, and a home guard unit was established. In 1945, the Marines left the island territory to resume its peaceful lifestyle. In 1951, the naval administration of Tutuila and the rest of American Samoa was changed to a civil form of government by approval of the Congress of the United States. Civil administration of American Samoa came under the U.S. Department of the Interior.

Maritime Heritage Resource Inventory

Fagatele Bay National Marine Sanctuary is an important position to preserve the cultural links the Samoan people have with their surrounding ocean. A prehistoric village site has been mapped on the shore of Fagatele Bay and shows how early residents of the area were dependent on the bay's resources for their subsistence and livelihood. The nearby village of Vaitogi has kept alive the legend of how early residents sheltered those that came from the sea and is symbolized by their "call" of the turtle

and shark, which arrive when a special song is sung. These cultural assets, as well as the Samoan way of respect for cultural traditions in their embrace of new concepts of governance and religion, provides the sanctuary's management a unique opportunity to incorporate traditional practices into modern strategies of marine protected area stewardship.

Samoan villages have a daily period of quiet called *sa*, when people stop to reflect upon their place in the family, society and the environment. During this short period each day, the village *aumaga* (untitled men) stand along the roadside to show their village's respect for this tradition. Fagatele Bay National Marine Sanctuary is a similar kind of *sa* and respect, symbolizing how the people of American Samoa relate to the seas. As a partnership with the Samoan people, the sanctuary is promoting and preserving a unique heritage of marine resource management that may serve as a model for other marine protected areas of the world.

Since it has been used continuously from at least the late Prehistoric Period until the present, the Fagatele Bay archaeological site can contribute to our knowledge of Samoan prehistory in general and the history of Tutuila and American Samoa as well. The ancient village at Fagatele Bay is one of the archaeological treasures associated with the National Marine Sanctuary System, possibly holding clues to our past maritime activities and the unique cultures of the Pacific.

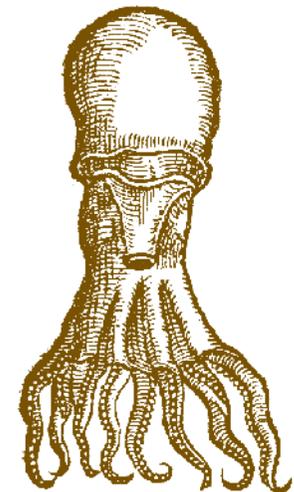
Potential Archaeological Resources

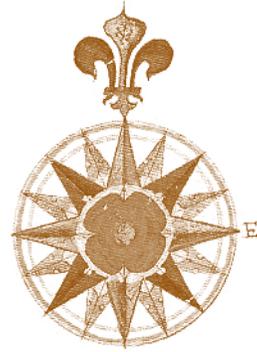
Prehistoric – The presence of a Samoan habitation site dating between prehistoric to historic eras presents a possibility that related material culture may exist in the bay. Deposition could be related either to erosion of terrestrial sites or maritime activities related to the living site.

Historic – While no historic archaeological resources are believed to exist within the sanctuary, significant historic heritage resources exist beyond the sanctuary boundaries. In 2000 the sanctuary supported collaboration with the Division of Marine Wildlife and Resources to conduct bathymetric surveys near Tutuila island. During the project the sonar picked up a large vessel lying within Pago Pago Harbor itself. Subsequently the American Samoa Historic Preservation Office contracted with a local diver to investigate the wreck and collect video footage. The vessel turned out to be the 300 foot long 1,850 ton USS *Chehalis*, lost in 1949.

The USS *Chehalis* AOG-48 was a World War II Patapsco-class gasoline tanker. Commissioned in 1944, the *Chehalis* conducted fueling operations in Leyte Gulf and Okinawa. Between 1945 and 1948 she served among the Hawaiian Islands, and among the scattered Pacific islands to the west. On October 7th 1949, while at anchor at Pago Pago, American Samoa, the ship exploded and sank in the harbor.

There are a number of other wrecks and heritage resources in American Samoa. Submerged Samoan grinding stones have been reported in Leone Bay. Though an initial inventory has not been completed, references do hint at a variety of commercial barques and whaling vessels lost in the vicinity. Furthermore, a US Marine Corps airstrip was built on the Tafuna Plain and used during World War II. The likelihood of submerged aviation resources is high. Since Pago Pago is a major tuna port, the wrecks of modern fishing vessels can be seen against the rocks of Tutuila island. All of these kinds of sites are pieces of a puzzle, the material record of past maritime activity. With future archaeological study, a more complete picture of maritime heritage resources in American Samoa, its whalers and barks, Samoan habitation sites and tools, Navy vessels and aircraft, and other yet unknown sites, is only a matter of time.





POSTSCRIPT

A review of the historical contexts of the national marine sanctuaries confirms that these special places do not exist independently from each other. Maritime heritage study can be a lens through which to view the inter-relationship of communities and cultures.

We have seen that Massachusetts's Yankee Traders were linked by the fur trade to the native tribes of the Washington coast as well as to the Mexican Californios of Monterey through ship-borne hide and tallow trade. The Northwest Coast lumber trade linked

Washington's loggers with California's Forty-niners and the nineteenth century settlers around San Francisco Bay. New England was linked to Hawaii by the whaling ships that re-supplied in Honolulu and which would recruit Native Hawaiians as crew members.

Hawaii's native people were linked to Samoa's native populations by the Polynesian voyaging canoes. The links may all be viewed through the archaeological, historical and cultural heritage of the national marine sanctuaries.



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