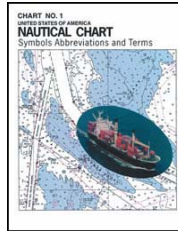


- Sunken, abandoned, and derelict vessels are a significant problem along the waterways, shores, and submerged lands of United States.
 - These vessels pose an array of threats, including the release of oil and other pollutants, dispersion of fishing gear and other debris, navigational obstructions, physical destruction of marine habitats, and an entanglement hazard for marine life.
 - Wrecks may be an attractive nuisance, creating entrapment and fall hazards for divers and trespassers. Wrecks may also be an visual eyesore and aesthetic nuisance and may become sites for illegal dumping of waste oil, garbage, and other pollutants.
 - At the same time, sunken vessels may have commercial, public, and historic values, provide habitat for marine organisms, and often create a recreational resource for divers and fishermen. Federal interests and concerns mirror these positive and negative values.
 - This presentation summarizes the potential scope of the problem, and the major federal concerns, authorities, and issues that may underlie decisions regarding wreck removal, focusing on NOAA's roles.
-
- What is the real threat
-
- Tanker Jessica- Galapagos Islands, Ecuador, January 2001
 - Substantial response to combat leaking oil, but ship left on reef
 - 5 years from now, it may be impossible to determine that a spill had occurred, but the ship and debris will persist for decades.

NOAA interests in shipwrecks

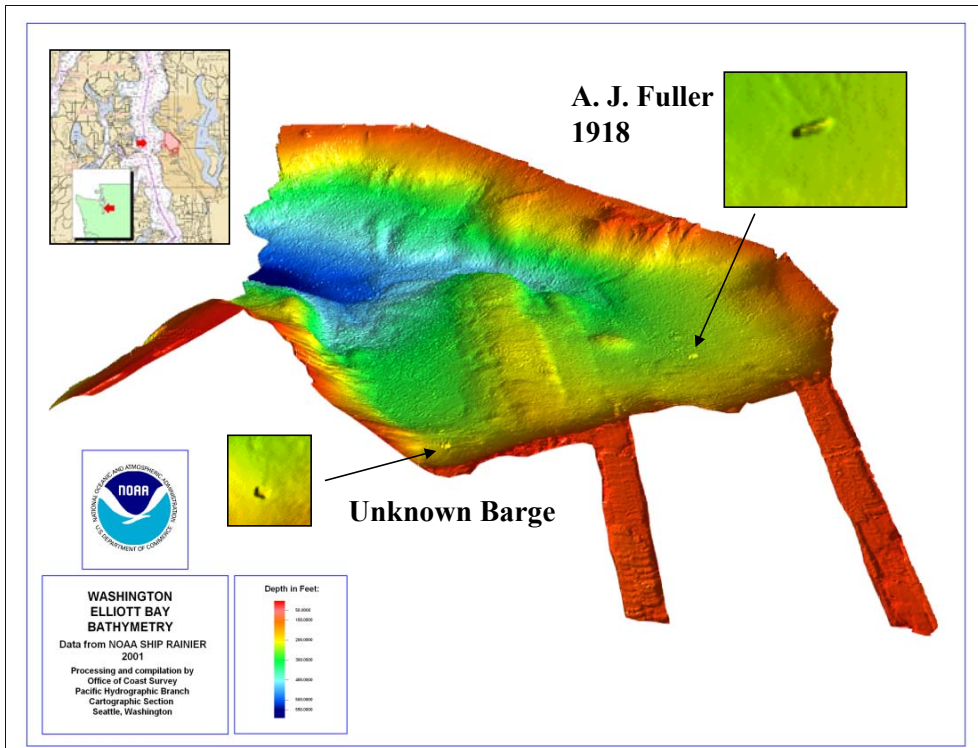
- National Marine Sanctuary Program
- Office of Coast Survey
- Office of Ocean Exploration
- Office of Response and Restoration



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Response and restoration for pollution threats
Threats to sanctuaries and NOAA trust resources
Protection of cultural and historic resources
Ocean Exploration
Charting and Safe Navigation
Fisheries and Coastal Management
Permitting and regulatory issues



NOAA Charts wrecks for navigation purposes



Monitor National Marine Sanctuary

National Oceanic and Atmospheric Administration

- Nation's first marine sanctuary in 1975

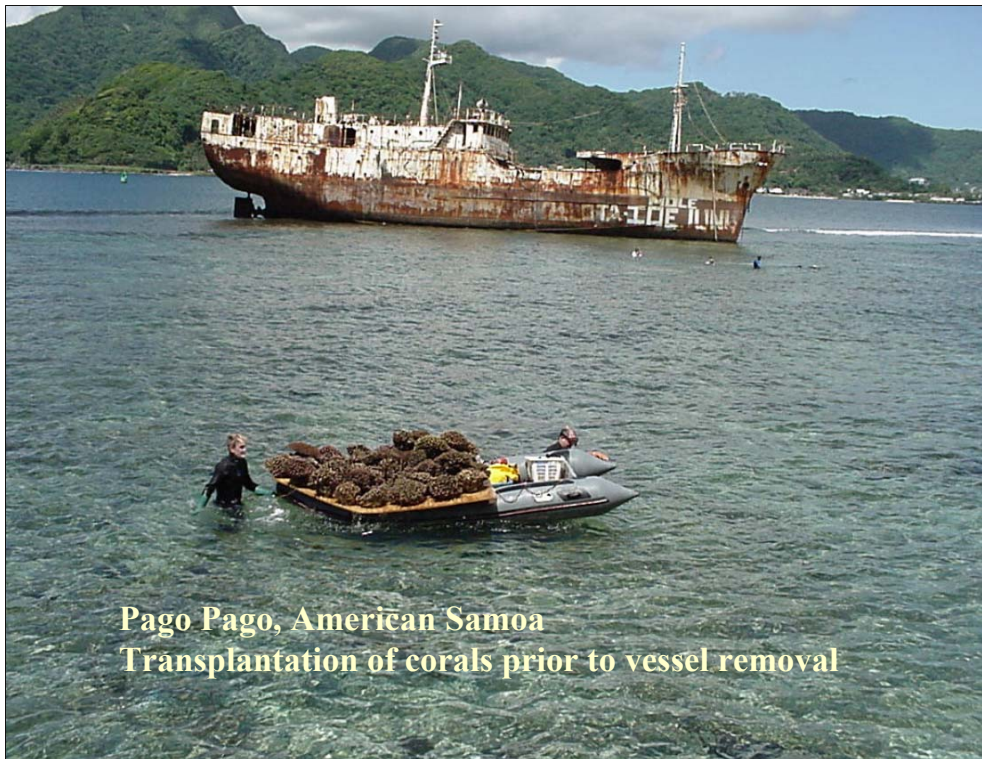


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The Monitor National Marine Sanctuary protects the wreck of the famed Civil War ironclad USS Monitor, best known for its battle with the Confederate ironclad Virginia in Hampton Roads, Va., on March 9, 1862.

Since its designation as our nation's first marine sanctuary in 1975, the Monitor has been the subject of intense investigation. Through underwater archaeology and state-of-the-art marine technology, the National Oceanic and Atmospheric Administration (NOAA) strives to preserve this significant part of our past for future generations.



Pago Pago, American Samoa
Transplantation of corals prior to vessel removal

Pago Pago, along with Luckenbach and Mississenawa was a trigger for new/increased interests in environmental aspects of wreck removal

PAGO PAGO HISTORY

In 1999, the US Coast Guard, NOAA, the Department of Interior and the government of American Samoa began a collaborative effort to address nine abandoned fishing vessels on a reef in Pago Pago, American Samoa. These vessels were a public nuisance and posed an array of threats, including pollution, public health, and physical crushing of coral habitats. Using the combined authorities of the agencies, the vessels were cleaned, cut apart, and removed from the reef, which was also restored. This experience, combined with increasing agency concerns about the decline of coral habitats from a variety of causes, led NOAA and others to question whether abandoned vessels may be causing significant harm to coral habitats elsewhere.

Categories of Shipwrecks

- Historic Wrecks
- Contemporary Wrecks
- Derelict Vessels



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Shipwrecks are difficult to categorize, but for the purposes of this paper, it is useful to keep in mind several classes of vessels: 1) Historic Wrecks, 2) Contemporary Wrecks, and 3) Derelict Vessels. The legal, technical, engineering, and cost-recovery challenges vary significantly depending on the type of vessel and the circumstances that led to the sinking or abandonment.

1953: The 468-foot freighter SS Jacob Luckenbach near entrance to Golden Gate, CA. Recent response efforts removed 85,000 gallons of bunker fuel.

M/V New Carissa, Coos Bay, Oregon

F/V Charito, Saipan Harbor

Scope of the Issue

- Currently, there is no single database that includes all shipwrecks in US Coastal waters. Some of the existing databases include:
 - U.S. Navy
 - US Department of the Interior
 - U.S Coast Guard
 - National Oceanic and Atmospheric Administration
 - South Pacific Regional Environmental Program
 - Private Databases



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Currently, there is no single database that includes all shipwrecks in US Coastal waters. Several agencies and programs have developed databases focusing on specific needs and mandates, and attempts are currently underway to compile the various databases to understand the extent to which there are gaps or double counting of vessels. However, enough data exists to place some bounds on the issue. Although there are no precise numbers, there are clearly tens of thousands of wrecks and derelicts in coastal waters, ranging from yachts and fishing vessels to large freighters, tankers, and military vessels. The existing databases provide some tantalizing information on the number of wrecks, but there are also many informational needs that would be essential to fully evaluate risks. These include better understanding on wreck locations, conditions of the wrecks, types of bunkers and cargo, and integrity of fuel tanks. Some of these databases are summarized below^[1]:

[1] A number of these databases contain proprietary or sensitive information (e.g., locations of historic wrecks), and access may be restricted.

US Navy

- Naval Historical Center Database:
- Lists over 3000 wrecks owned or managed by the U.S. Navy in U.S. or foreign waters
- World War II represents the largest number of wrecks (1,084), the second largest group, post WW-II present (740)



USS Arizona Memorial



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[1] This does not include Naval Aviation wrecks, which are the subject of a separate database. It is estimated that this database will eventually hold more than 25,000 aircraft wrecks

US Department of the Interior

- DOI's shipwreck databases focus on submerged cultural and archaeological resources.
- MMS lease surveys have identified over 400 ships sunk on the federal Outer Continental Shelf.



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U.S. Coast Guard Data

- Marine Safety Management Database has approximately 2100 grounding and 440 vessel sinkings annually
- The AVIS Database has approximately 1300 barges and vessels nationwide



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Under the Abandoned Barge Act of 1992, the USCG has responsibility for identifying and cataloguing abandoned barges and other vessels in each Coast Guard District. Under the Abandoned Vessel Inventory System (AVIS), vessels are categorized as a threat to pollution, navigation, or public health. The abandoned vessel database focuses on vessels over 100 gross tons and contains over 1300 vessels nationwide. The USCG also maintains a database and tracks all sorts of maritime incidents through the Marine Safety Management Database. Approximately 440 sinkings occur annually in U.S. waters, but many of these are small vessels that are refloated or removed.

NOAA Databases

- NOAA maintains several databases for archaeological, pollution, coral damage, and charting purposes:
 - NOAA Office of Coast Survey
 - NOAA Abandoned Vessel Program
 - Pacific Coast Maritime Archaeological Summary
 - NOAA National Marine Sanctuaries.
- NOAA is working to develop a national database



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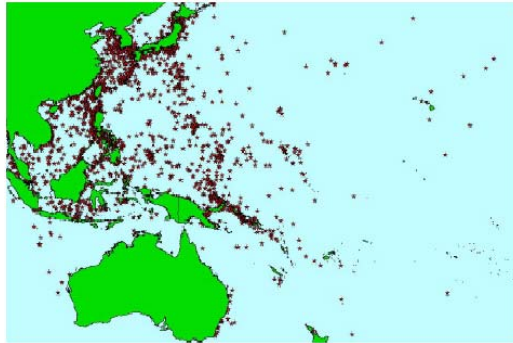
The Automated Wreck and Obstruction Information System (AWOIS) contains information on approximately 10,000 submerged wrecks and obstructions in the coastal waters of the United States. Information includes latitude and longitude of each feature along with brief historic and descriptive details.

Focuses primarily upon wrecks that are a threat to coral reef habitats. Includes over 1000 vessels and efforts are underway to ground truth the database and prioritize potential wreck removal activities.

Lists over 10,000 vessels along the Pacific Coast and Alaska. The Santa Barbara Maritime Museum and NOAA, working with other federal and state agencies and academic institutions, have attempted to compile all of the region's database into one single dataset. Over 240 vessels are characterized as potential pollution threats.

South Pacific Regional Environmental Programme

- SPREP has developed a database of 3852 WWII wrecks within the Pacific region



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The South Pacific Regional Environment Programme (SPREP) is a regional organization established by the governments and administrations of the Pacific region to look after its environment.

SPREP's members total 26, consisting of all 22 Pacific island countries and territories, and four developed countries with direct interests in the region: Australia, France, New Zealand and the United States of America.

US Government Concerns

Federal concerns regarding shipwrecks are diverse and include both threats and benefits of wrecks.

- Oil Pollution
- Federal Vessels
- Navigation Threats
- Federally Managed Lands
- Cargo Threats
- Habitat Threats
- Historic Preservation
- Public Safety
- Recreation
- Habitat



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Federal concerns regarding shipwrecks are diverse and include both threats from and threats to wrecks. These concerns may include direct oversight and operational capability, regulatory or enforcement responsibility, permitting, technical assistance, administration of coastal and submerged lands, or management of natural resources. Given the large number of agencies and interests, it should not be surprising that there is not a single federal perspective on this issue. It is also understandable that various agencies and programs within agencies may hold opposite viewpoints. Major federal concerns regarding shipwrecks and wreck removal include:

Federally Managed Lands

- A number of federal agencies own or manage coastal and submerged lands



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If no viable vessel owner can be found, the agency may be left with the disposal costs

Oil Pollution from Wrecks



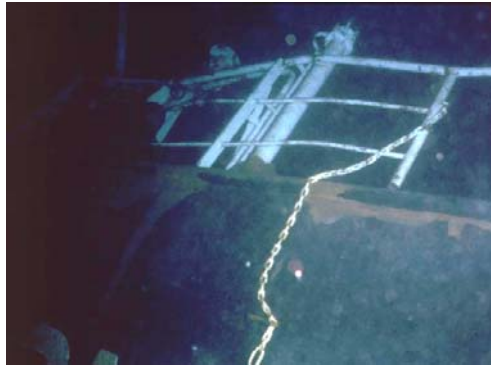
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Oil Pollution: The pollution threats from recent shipwrecks such as the Prestige and Erica may be obvious, but there is increasing concern regarding pollution from older wrecks.

Cargo Threats

- 1944: The M/V Empire Knight ran aground on Boon Island Ledge, ME. The vessel was carrying a mixed cargo, including mercury
- 1987: The Pac Baroness sank off Pt Conception, CA. The vessel was carrying 280,000 gallons of fuel and 21,000 tons of powdered copper concentrate



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Cargo Threats: Hazardous materials and unexploded ordinance are often a concern. An example is the *Pac Baroness* that sank off Pt. Conception, CA, in 1987, loaded with 280,000 gallons of fuel and 21,000 tons of powdered copper concentrate.

Some mercury and mercury-contaminated debris was recovered
An estimated 16,000 pounds of mercury remains unaccounted for



Habitat Threats

Habitat Threat: Sunken and grounded vessels may damage corals, seagrasses and other sensitive marine habitats. Salvage activities may inadvertently result in additional injury. Other threats include antifouling paints, introduced rodents or organisms in ballast waters, nutrient enrichment from rusting steel, and dispersion of fishing gear that may entangle marine life.

Threats to Navigation



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Navigation Threat: Shallow water wrecks may block or impede navigation. Smaller wrecks and derelicts may be mobilized during storm events and deposited in channels. Historical wrecks may be an issue in harbor and channel expansion projects.

Japanese fishing vessel “Genei Maru” drifts 1500 miles in 5 months and comes ashore on Kodiak Island, AK

Yacht, culebra harbor

Public Safety



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Public Safety: Wrecks may be an entrapment hazard for divers. Emergent wrecks and derelict vessels may be hazardous to boaters and could be an attractive nuisance and pose entrapment and slip and fall hazards to the public.

Recreational Resource



- USS Spiegel Grove

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Recreation: Ships may be scuttled to create dive sites. The *USS Spiegel Grove* was recently scuttled in the Florida Keys National Marine Sanctuary as an artificial reef. Federal permits are necessary to create such dive sites.

The USS Spiegel Grove is a Landing Ship Dock (LSD 32), which is now the largest vessel ever intentionally sunk as an artificial reef. The vessel is 510 feet in length, 84 feet wide

Marine Habitat

- 95-foot tug sunk in 1986 by the Broward County, Florida, artificial reef program.

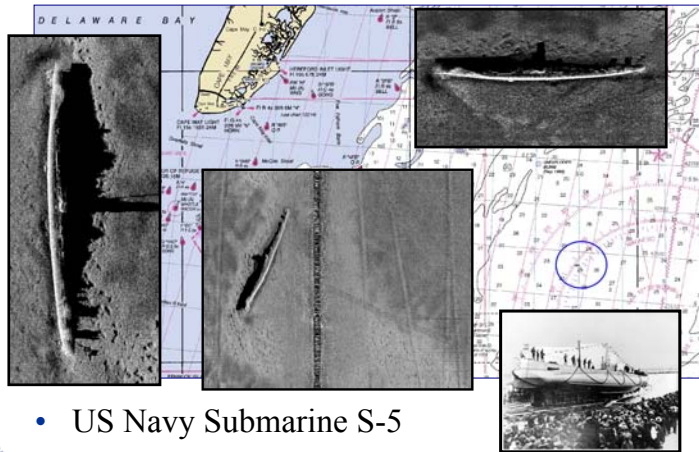


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Habitat: Wrecks provide habitat for a variety of marine organisms, and are often popular fishing sites. Some coastal states have active artificial reef programs. Federal permits are necessary to create such reefs.

Historic Preservation



- US Navy Submarine S-5



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The US Navy Sub S-5 sank off the coast of Cape May, NJ during a test dive in 1920. Battling low oxygen levels, deadly chlorine gas, and rising water levels, the crew were able to ballast the boat so that here stern section rose several feet out of the water. They drilled a small hole in through the hull, enabling them to flag down a passing freighter, who provided assistance. Miraculously all crew members survived.

Despite a salvage attempt by the Navy, the sub was lost, and her exact location remained a mystery until recently discovered by local divers. Many dives were made on the sub, and some items were taken, but the coordinates were not released.

In 2001 NOAA Ship WHITING and OE located the sub using Klein 5500 side scan sonar technology, and provided the US Submarine Museum with these images and exact location.

Aside from munitions that may still be on board, the wreck hold the same environmental impact as any other modern steel wreck, although these impacts have never been considered.

Response Options

- Do nothing
- Plug leaks
- Remove gear
- Remove fuel/cargo
- Mark obstruction
- Remove portions of wreck
- Scuttle wreck offshore
- Remove wreck
- Restore site



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Action does not necessarily imply wreck removal. Given the high cost of wreck removal and limited budgets, agencies may take other actions to reduce the threat, with wreck removal as the last alternative. For example, the Government may respond to contain the oil in place or remove oil from a wreck, but leave the wreck intact. The initial response to the *USS Mississinewa* was to plug leaks with epoxy. After several rounds of response efforts, it became evident that future spills were imminent and inevitable, and the preferred response effort became tapping and draining the hull (Gilbert et al. 2003). Similarly, a wreck that poses a navigation threat may be charted, or marked with buoys, but left on-site.

Funding Wreck Removal

- Vessel Owner:
 - As with pollution response in the US, the primary responsibility for wreck removal lies with the vessel owner or insurer
- United States Coast Guard
 - If there is a substantial pollution threat the USCG may use the Oil Spill Liability Trust Fund to respond, and if necessary remove wrecks and derelicts.
- U.S. Army Corps of Engineers
 - The Rivers and Harbors Act provides for removal of wrecks obstructing navigational channels, but does not provide a fund to pay for these activities.



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As with pollution response in the US, the primary responsibility for wreck removal lies with the vessel owner or insurer. While there are laws at every level of government against abandoning vessels, many vessel owners lack insurance or the financial resources for proper disposal and leave their vessels for someone else to remove.

Many state and federal laws have provisions whereby the government can seize the vessel and use the proceeds of the sale to offset the wreck removal costs. However, in most instances the proceedings to seize the vessel take time, during which the vessel may break apart and cause further impacts- and increase the ultimate cost of the salvage operation. Furthermore, it is almost axiomatic that cost of the wreck removal greatly exceeds the value of the wreck or derelict vessel- otherwise the vessel wouldn't have been abandoned.

If the owner fails to take action to remove their wreck or derelict vessel, there are two main triggers for federal action¹¹: 1) obstructing or threatening to obstruct navigation, or 2) threatening a pollution discharge.

Action does not necessarily imply wreck removal. Given the high cost of wreck removal and limited budgets, agencies may take other actions to reduce the threat, with wreck removal as the last alternative.

E/V Swordman I



- Pearl and Hermes Reef, NWHI
- June 5, 2000
- 10,000 gallons of diesel, 70 miles of longline gear
- Removed and scuttled in 6,000 feet of water

Wreck Removal and Historic Preservation

- Under the National Historic Preservation Act all federal agencies have an obligation to protect historic properties, including shipwrecks.
- Federal law generally defines historic site as those being at least fifty years old.



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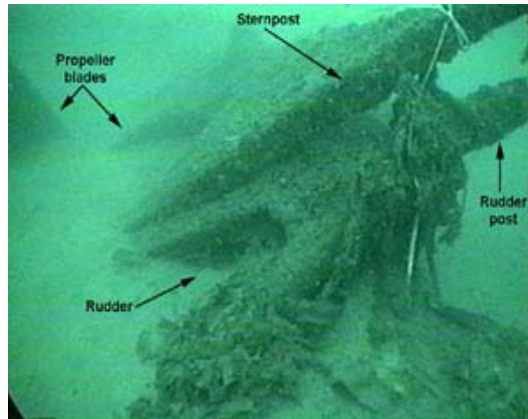
. Compliance is the lead agency's responsibility, not the commercial salvage firm's. Additionally, the requirement is for consideration. This means that historic preservation does not necessarily trump pollution or navigation concerns. Removal or disturbance of a vessel is allowed if there are no feasible alternatives to in-place preservation. The US Army Corps of Engineers has removed several historic vessels as part of harbor and channel improvement projects.

If a vessel is determined to be historic, the lead agency will need to consider preservation and mitigation alternatives. If the only necessary action is to tap into a hull and pump out oil, little additional work would likely be required to comply with the NHPA. However, if the salvage action requires significant disturbance or demolition of a vessel, the agency may be required to conduct historical research on the vessel, perform an archaeological investigation of the site, document any unique aspects of the wreck, and curate artifacts recovered from the site. These compliance activities can involve a significant amount of time and effort, but again are the responsibility of the lead agency, not the commercial salvage firm.

A historic property need not be listed in the National Register to receive NHPA protection; it need only meet the eligibility criteria for protection. Briefly, however, historical significance is based on age of the vessel, historical associations and context, associations with historical persons, distinctiveness of construction, and likelihood to contribute important historical information.

Historic Preservation Example

- The *Manuela* and *Cristobal Colón*
- § 106 compliance included:
 - Data Recovery
 - Archival Research
 - Recovery and Conservation of Artifacts
 - Final Disposition of Vessel



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Built in 1872 in Scotland, the *Manuela* was a 220-foot-long iron-hulled screw-steamer.

San Juan, PR. Both ships scuttled during the Spanish-American War in 1898 to block the channel. Vessels had to be removed as part of channel improvements.

Conclusions

- There is no single federal perspective on shipwrecks and wreck removal.
- There is no single agency with authority and funding
- Concerns vary among agencies and programs, ranging from archaeological protection to pollution response



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The Federal Government has long been aware of the problem of wrecks as pollution sources, but incidents have typically been dealt with in an ad-hoc manner. Wrecks have been viewed as an inevitable, but not necessarily imminent problem. Given agency budgets and other, more urgent problems, it is understandable that wreck removal and pro-active pollution response have not been a priority. However, as indicated by the recent removal operations on the *Mississinewa* and *Jacob Luckenback*, and increasing concerns over the *USS Arizona*, many of these older wrecks are deteriorating and starting to pose imminent environment threats. Given the rising cost of spill response in the US, responding to wrecks while the oil is still contained makes both environmental and economic sense. Furthermore, the technologies and capabilities developed in responding to these historic wrecks may be a good investment if and when an incident such as the *Prestige* occurs in US waters

An underwater photograph showing a diver in a dark wetsuit swimming in clear, turquoise water. The water is filled with many small, striped fish. The surface of the water is visible at the top, with light reflecting off the ripples. The overall scene is vibrant and clear.

Contacts

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<http://response.restoration.noaa.gov/dac/vessels>