



INTENTIONAL SCUTTling OF VESSELS AS A RESPONSE ALTERNATIVE

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Points to Make: Not a definitive review of the laws and regulations that are applicable to scuttling. Responders need to consult directly with the relevant state and federal agencies.

Not an endorsement of scuttling ships, except as a last resort

Scuttling vessels for pollution response

- The intentional scuttling of vessels is infrequently conducted as part of a pollution response.
- Notable cases include the *M/V New Carissa* in Oregon and the *T/B Morris J. Berman* in Puerto Rico.
- Generally the option of last resort



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On February 4, 1999, the *M/V New Carissa*, a 639-foot freighter, went hard aground near Coos Bay, Oregon. The vessel was unladen, but had 400,000 gallons of fuel oil onboard. On February 11, a Navy team used explosives to rupture and ignite the fuel tanks. The fire burned for 33 hours but left the vessel broken in two, with an estimated 130,000 gallons of fuel left in the bow.

On February 17, the Unified Command decided to tow the bow section to sea and scuttle it as the most effective way to prevent further discharge of oil. The scuttling process was designed to keep the bow section mostly intact in order to trap the oil inside the hull. The plan involved carefully placed explosive charges to slowly sink the section.

The *New Carissa* incident illustrates the complexity of vessel scuttling. On March 1, the bow section was towed offshore but the towline parted in heavy seas and the bow came ashore in Alsea Bay, Oregon, approximately 60 miles north of the initial grounding. The bow was refloated a week later and towed to the scuttling location 282 nautical miles off the Oregon coast. The demolition charges were ignited and the vessel began to slowly sink. The USCG, concerned about adverse weather, and safety risks associated with recapturing the bow section if it had not sunk by nightfall, decided to complete the sinking using a torpedo from the submarine *USS Bremerton*. At approximately 4 PM on March 11, 2000, the bow was sunk in 1,811 fathoms.

Topics for Today

- Today's Presentation will focus on environmental considerations and trade-offs, and illustrates several case histories
- The IOSC Paper addresses a range of additional issues including:
 - Regulatory requirements
 - Permit process
 - Towing and Site Selection
 - Vessel Preparation
 - Emergency and planned scuttling



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Trade-offs

- The decision to scuttle a vessel should be made only after thorough consideration of the environmental trade-offs.

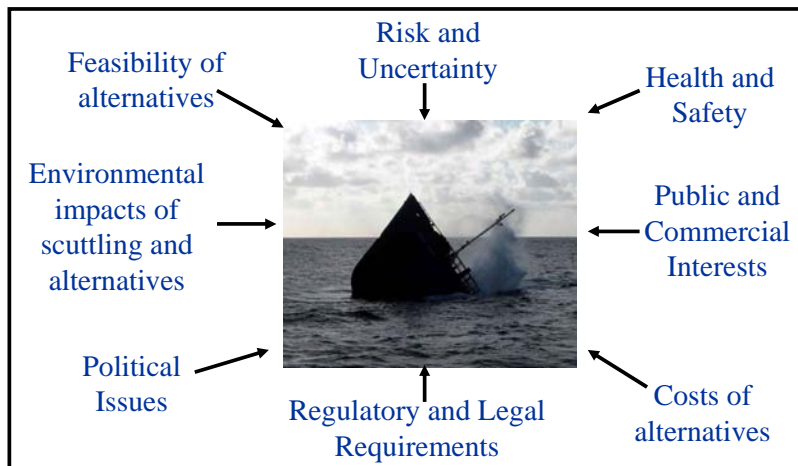


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Case-by-case evaluation needs to be done. Similar to dispersant usage- Making a reduce impacts to nearshore resources by taking a vessel offshore and sinking.

Ecological Risk Management Decision



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Ecological consequences are only one element of spill response planning.

ERA methods help ensure that ecological considerations are properly analyzed and presented.

The potential consequences still need to be integrated with other factors (social, economic, aesthetic, and legal) as illustrated in this figure.

The integration of these ecological consequences is the responsibility of risk managers (e.g., Federal or state On-Scene Coordinators, natural resource Trustees, industry emergency response managers).

Potential impacts from scuttled vessels

- Chronic pollution threat
- Entrapment hazard
- Smothering from vessel and debris
- Chronic source of flotsam
- Navigational obstruction
- Trawl obstruction and other commercial uses



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There are still environmental and safety trade-offs if the vessel is towed to a foreign country for shipbreaking, or the ship is cut apart and placed in a landfill.

Each of these threats can be reduced if the scuttling operation is planned and controlled. Of course there are uncontrollable factors like weather that may require action to be taken before all preparations are in place

Reducing risk from scuttled vessels

- Remove Pollutants
- Scuttle beyond sport diving depths
- Select location with low environmental sensitivity
- Remove floatable debris
- Avoid trawling areas and navigation lanes
- Remove rigging from vessel



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The picture is the Victoria M, a vessel scuttled offshore near the entrance of the Straits of Juan de Fuca, between Washington State and Vancouver Island, BC.

The scuttling was quite controversial after the fact, since the vessel was inadvertently scuttled on the Canadian side of the marine border

The removal or toppling of the rigging (literally unscrewing a few turnbuckles) would have taken a few minutes and would reduce the potential for entanglement of fishing trawls

Hypothetical Risk Evaluation

- Vessel stranded in intertidal zone
- Note that some risks are short-term and others are long-term

Salvage and Wreck Removal Options	Natural Resources				Public Uses			
	Upland Areas	Intertidal Resources	Nearshore Subtidal	Deep Sea Floor	Health and Safety	Commercial Fisheries	Navigation	Recreation
Do Nothing	Yellow	Red	Red	Green	Red	Yellow	Yellow	Red
Clean and leave in Place	Red	Red	Yellow	Green	Red	Yellow	Yellow	Red
Dismantle in Place	Red	Red	Yellow	Green	Red	Yellow	Yellow	Red
Partial Removal	Red	Red	Yellow	Green	Red	Yellow	Yellow	Red
Tow into Harbor and Break	Green	Yellow	Yellow	Green	Yellow	Yellow	Yellow	Yellow
Tow Offshore and Sink	Green	Yellow	Yellow	Red	Yellow	Yellow	Yellow	Yellow
Tow and Break elsewhere	Green	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
Key	Low Risk (Green)			Potential Risk (Yellow)		High Risk (Red)		



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Based on a matrix used in evaluating dispersant trade-offs. This is one example of how one might walk through an evaluation of the trade-offs.

All options have some risk. Tow and Break elsewhere may be risky to the local resources at the ship breaking yard.

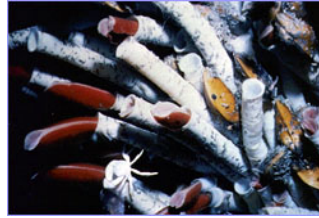
Health and safety implications are very critical. Decision to sink a vessel offshore, or leave some wrecks in intertidal or nearshore often based on risk to salvage divers and other salvage workers.

Might walk through an example.

Might point out that some decisions are reversible, and others are not. Scuttling in deep water not reversible.

Deep-Sea Habitats:

- Little is known about deep-sea environments, but clearly there is a lot more of it than intertidal and nearshore habitat.
- Critical Assumptions
 - Shallow water habitats are more productive biologically
 - Deepwater wrecks more stable
 - Oil becomes more viscous in cold, deep water

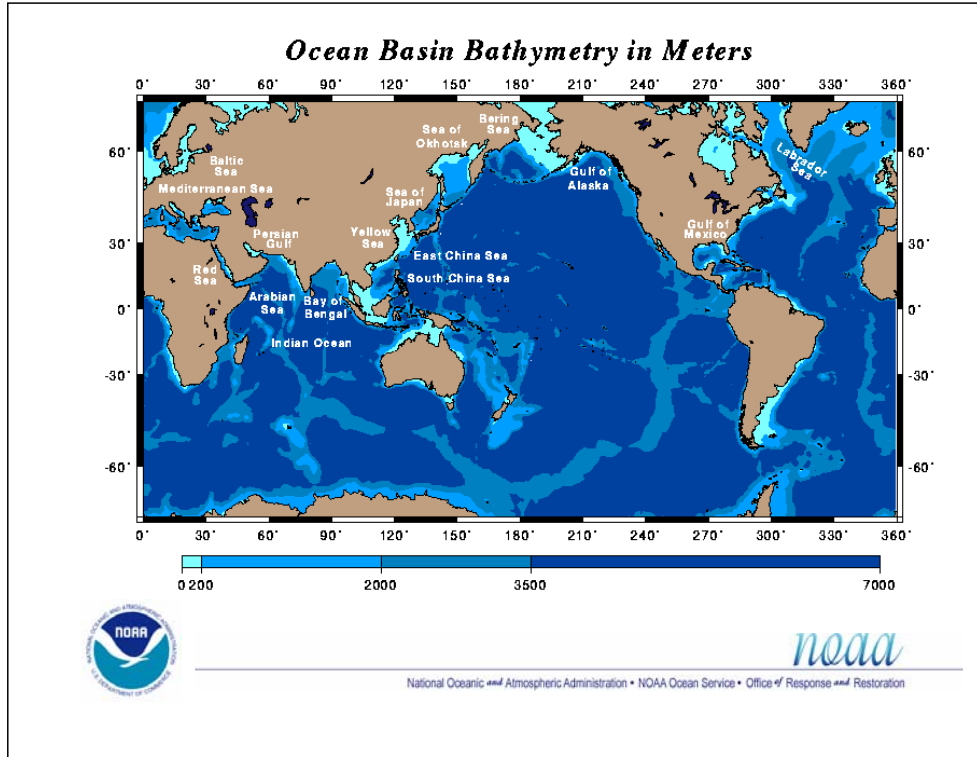


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Lots of assumptions here about sensitivity of habitats. Very few studies of the effects of shipwrecks on deep sea habitats.

Some biologists may reject these assumptions, but the time to study these is not when the USCG is trying to decide whether to bring in a sinking vessel into port or refuge, or take offshore. A decision will have to be made in hours.



Relative ocean depths- Light blue is less that 200 meters (about 600 feet)
 A lot more dark blue than light blue.

Windows for Scuttling Operations

- In non-emergency events, scheduling of operations should include weather and environmental considerations.
- Oceanographic conditions and short and long-term trajectories should also be evaluated if there is a potential for releases
- Environmental considerations might include avoidance of critical time periods such as marine mammal migrations, or adverse seasonal weather patterns.



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Might skip these slides if time running short. Point here is that if there is time to plan, might conduct the operation when predominant winds and currents would carry any contaminants away from shore.

Site Selection and Vessel Tow Path:

- Scuttling site selection and towpath are related since there is a risk that a vessel may sink enroute.
- Tow paths should avoid sensitive areas such as coral reefs, trawling grounds, aquaculture sites, historic sites, and right-of-ways (e.g., pipelines and telecommunication cables).
- A longer towpath may be preferable if it avoids transiting sensitive areas.
- The disposal site must avoid established shipping lanes, marine sanctuaries, and sites where the vessel might present a hazard
- The site should be located in a designated wreck disposal site, or be at least 12 miles offshore and greater than 300 feet deep.



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Need to think about the tow path. Don't want a vessel to sink and block the harbor or take out an underwater pipeline.

Case Histories

- The IOSC paper covers a number of scenarios.
- Today's presentation describes two:
 - Ehime Maru:
 - Morris J. Berman



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Ehime Maru

- On February 9, 2001, a US submarine collided with the *Ehime Maru*, approximately 9 miles south of Honolulu, HI.
- The US Navy transported the vessel to a shallow-water site to facilitate recovery of the bodies of the crew, and then sank the wreck in a deepwater site.



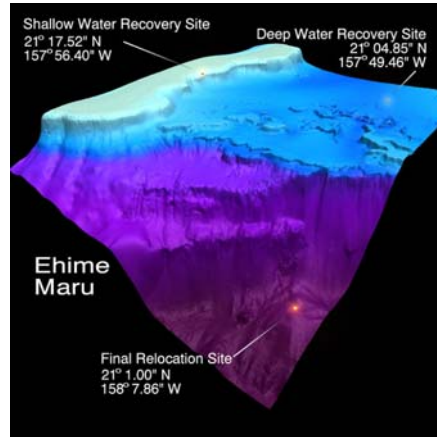
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On February 9, 2001, the submarine *USS Greeneville* collided with the *Ehime Maru*, a Japanese fisheries training vessel, approximately 9 miles south of Honolulu, HI. The *Ehime Maru* sank in 2000 feet of water, presumably trapping 9 crewmembers. The US Navy initiated an extensive salvage effort that involved lifting and transporting the vessel to a shallow-water site to facilitate recovery of the bodies of the crew, and then sinking the wreck in a deepwater site.

Environmental Considerations

- The Navy conducted an Environmental Assessment (EA) and carefully considered the environmental implications for multiple salvage alternatives.
- The primary issues were site selection for the recovery area, selection of the deepwater scuttling site, tow paths, and the potential release of oil pollution.



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Site selection and towpath routes were carefully considered. Several sites were evaluated and the Navy, in consultation with the resource agencies, scored each site based on environmental considerations and operational requirements. The temporary site had to be in reasonable dive depths to allow teams to work on the wreck. Potential sites and towpaths were surveyed to avoid shoals, seagrass beds, live corals, or critical habitats for fish and wildlife. The surveys also considered man-made structures such as pipelines and unexploded ordinance. Careful consideration was given to minimizing anchor damage from the salvage and support vessels, and a multipoint mooring system was designed to provide position control during diving and lifting operations. Ultimately, the Navy selected a site in 110 feet of water near the Honolulu airport for the recovery site, and an offshore site in 8500 feet of water for the final scuttling. Prior to scuttling, divers removed oil and over 79 miles of fishing long-line, cargo nets, hooks and two tons of floatable debris to reduce the potential for entrapment of marine life.

Lessons from the Ehime Maru

- The Ehime Maru operation highlights many of the environmental issues inherent in marine salvage operations
- Navy conducted very thoughtful analysis of trade-offs.
- Recovery operations resulted in only minor seafloor disturbance. Only minor sheening was observed



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A planned and well-funded effort to address the wreck and human remains.

Most incidents won't have the time or funding levels, but a good model of how to think through the issues and trade-offs

Morris J. Berman

- On January 7, 1994, the barge *Morris J. Berman* went aground near San Juan, Puerto Rico.
- Most of the oil was removed from the barge and on January 15, it was scuttled 20 miles offshore in 6,000 feet of water



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On January 7, 1994, the barge *Morris J. Berman*, loaded with 1.5 million gallons of heavy fuel oil, went aground in San Juan, Puerto Rico, after its towing cable parted. The cargo began spilling and impacted nearby shorelines and shallow intertidal habitats. The USCG Gulf Strike Team was brought on scene and began lightering operations, but the barge continued to leak fresh oil, re-oiling historical structures and prime tourist beaches. As time progressed, the oil on the barge became more viscous and difficult to pump making lightering ineffective. On January 15, with Regional Response Team (RRT) concurrence, the barge was refloated, towed to a scuttling site 20 miles offshore, and sunk in 6,000 feet of water

Morris J. Berman

- Sinking the barge helped cleanup at the grounding site to be completed.
- Further impacts to the reef, recreational beaches, and historic structures were reduced.
- However, the oil released during the tow and scuttling did result in broader geographic impacts to the north coast of Puerto Rico.



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This operation was carefully evaluated by the FOSC, U.S. Navy Supervisor of Salvage, the Gulf Strike Team, and NOAA. The Caribbean Regional Response Team (CRRT) was consulted and on-scene trustee representatives were given an opportunity to discuss the operation and voice their concerns. These groups agreed that the sinking of the barge represented the best alternative because continued re-oiling of the nearshore environment from the unrecoverable oil left on board was delaying cleanup and preventing resource recovery. Moreover, resource concerns offshore were minimal and it was believed that the small amount of residual oil left on the barge at the time of sinking would have little impact

The *Morris J. Berman* incident illustrates that some of the inherent trade-offs with vessel scuttling. The removal of the barge allowed the cleanup at the immediate grounding site to be completed. Further impacts to the reef, recreational beaches, historic structures, and other local resources were reduced. However, the oil released during the tow and scuttling did result in broader geographic impacts to the northeastern shoreline of Puerto Rico. This additional oiling does not mean that the alternatives would have been any better.

Discussion and Conclusions

- From an environmental perspective there is no best outcome, only the “least worst” outcome.

“Sinking a ship laden with oil in deep, cold waters where it should have negligible environmental impacts is ... a means to reduce the risk of a spill in highly productive shallow marine waters”



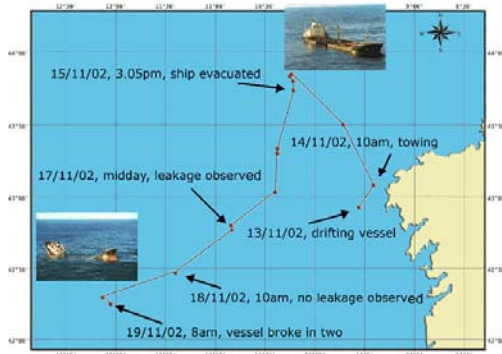
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Quote is from the FOOSC report for the M/V *New Carissa*

Scuttling and “places of refuge”

- Emergency scuttling should be considered as a component of refuge planning and may be a potential consequence if an appropriate place of refuge can't be found.



Tow path of the Prestige (CEDRE)



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Although the intent of a place of refuge is to provide a safe place for lightering and repair, intentional scuttling is closely related. Both are concerned with environmental trade-offs, and both hope to protect the marine environment and reduce the overall environmental impacts of an incident but both may result in increasing the risk of localized impacts. The environmental criteria for towing to either a refuge or scuttling site are identical: avoid sites and pathways that have sensitive resources/areas. Finally, both are controversial time-critical decisions that must be made by the USCG in consultation with other agencies and stakeholders. Emergency scuttling should be considered as a component of refuge planning. If places of refuge can't be found, it is conceivable that the next option may be emergency scuttling.

Map is the Prestige spill in Spain.

A hypothetical question to close would be whether, once it was clear that no safe refuge was politically feasible, whether a proactive decision to tow the tanker to a specific offshore scuttling site would have reduced environmental impacts

Maybe not... but the question will come up again in the future....Might be worth thinking about it now rather than waiting until incident happens