NOAA Abandoned Vessel Program - Selected Reference List

1. Alaskan State Legislature. "Alaskan State Laws Regarding Abandoned Vessels."2004.
   Notes:: Sec. 30.30.130. Sale or disposition of vessel.
   When a vessel is abandoned, the owner of the vessel repair business, or the business owner's authorized representative, after one public advertisement in a newspaper of general circulation in the state, may negotiate a sale of the vessel or dispose of it. However, the vessel may not be sold or disposed of within less than five days after publication of the advertisement.
   Sec. 30.30.140. Disposition of proceeds.
   The authorized seller of the abandoned vessel is entitled to the proceeds of the sale to the extent that compensation is due to the seller for services rendered with respect to the vessel, including reasonable and customary charges for towing, handling, storage, and the cost of notices and advertising required by AS 30.30.130 . A lienholder shall receive priority of payment from the balance of the proceeds to the extent of the lien. Any remaining balance shall be forwarded to the registered owner of the vessel, if the registered owner can be found. If the registered owner cannot be found, the balance shall be deposited with the commissioner of administration and shall be paid out to the registered owner of the vessel if a proper claim is filed for it within one year from the execution of the sale agreement. If no claim is made within that year, the money shall escheat to the state.
   Sec. 30.30.150. Effect of transfer of title.
   The transfer of title and interest by sale under AS 30.30.140 is a transfer by operation of law. However, a bill of sale executed by an authorized seller is satisfactory evidence authorizing the transfer of the title or interest.

2. American Society of Naval Engineers, and JMS Naval Architects and Salvage Engineers. *Marine Casualty Response: Salvage Engineering.* Dubuque, Iowa: Kendall/Hunt Publishing Company, 1999.
   Notes:: Technical book on ship salvage. Significant amount of good information for novices as well but you have to sift through the more technical information.

   Chapters:
   - Naval architecture for the salvage engineers
   - Structural engineering
   - Environmental forces
   - Surveys and planning
   - Stranded ships
   - Sunken and capsized ships
   - Rigging systems
   - Recovering buoyancy
   - Weight
   - Explosives

   Appendices:
   - Intact ship information
   - Stability and construction standards
   - Basic engineering calculations
   - Engineering tables
   - Comprehensive example this looks interesting 8 page detailed example concerning a tanker grounding
   - Anchoring systems

   Bibliography/Glossary/Index

3. Antonini, G. A. Ryder R. Garretson C. *A Method for Siting and Prioritizing the Removal of Derelict Vessels in Florida Coastal Waters: Test Application in the Florida Keys*, IR-89-6. Florida Sea Grant, Gainsville, FL, 1989. PDF, Paper, Online.
   Notes:: Technical Paper #56
   - "3000 dismantled, abandoned, junked, wrecked, derelict vessels in Florida coastal waters, 240 are situated in the Florida Keys"
   - 19 characters used by Florida Marine Patrol to describe derelict vessels

- develops a prioritization scheme based on threats posed by the vessels and by the difficulty of removal. Vessels are ranked both in their threat and in their ease of removal. These indices are combined to determine the order of removal.

4. Barrett, Michael J. ""Time Bombs in the Pacific": The Environmental, Economic and Political Impact of World War II Ship Wrecks in the South Pacific Ocean."2004. PDF.
   Notes:: Barrett
   - Paper addresses the problem of WWII wrecks in the South Pacific
   - Spends most of the paper laying out the problem in what I thought were simplified and or overly drastic scenarios
   - Comes to a number of idealistic conclusions
   - References a couple sources we should have
   - Several connections to national security

   - Many comparisons to Exxon Valdez probably should have chosen a more appropriate case like the Tampa spill maybe
   - Poorly referenced
   - Poorly edited

5. Bell.W Frederick/Bonn, Mark A. Leeworth Dr. Vernon. "Economic Impact and Importance of Artificial Reefs in Northwest Florida.", 584. 1998.
   Notes:: Study explains the impact of artificial reefs for various counties in Florida. These impacts include both environmental and economic factors. Counties involved include; Bay county, Walton, Okaloosa, Santa Rose, Escambia, others. From an economic standpoint, the study attempted to measure the draw or economic benefits of artificial reefs in the various counties, this included surveys of the tourists themselves. People were asked about their activity in the county, what they did, did they know of the reefs, did they visit them, how long they stayed, where, etc. These counties are frequently visited by tourists, and the study was attempting to quantify the draw of the artificial reefs (both real and potential). For artificial reefs, demographic date was collected displaying who visited the reefs (race, origin, method or transportation), and how much. This report uses this data, combined with other figures for employment, wages, consumer spending, boating activity. This is an economic report, therefore, formulas were used for the analysis. This is rare, and a good example of how economic indicators may be used for cost benefit analysis of artificial reefs. In their conclusions they illustrate (graphically) that tourists do prefer artificial reefs due to there easy access, and the fishing that is attracted. Furthermore, in the various studies people in general felt that there were too few artificial reefs, citing conflict with other visitors.
   Example of date: for the year 1997 to 1998, artificial reef visitors were estimated to be worth 12 million dollars for Bay county alone. p.64 of study. In Walton county this figure was closer to 7.5 million. In Walton it was estimated (using total visitors, and how they spent their time) that visitors spent on average approx. 4.8 dollars a day on artificial reefs, and a willingness to pay of 5.8$. p. 144. Furthermore, bases on their calculations the authors determined that visitors would be willing to pay between 7 to 8 dollars per visit. p.102.
   Sponsored by the Florida Department of Environmental Protection, Marine Fisheries Division.

6. Bradford, James E. Russell Matthew A., Larry E. Murphy, and Timmothy G. Smith. *Yellowstone National Park Submerged Resources Survey*, National Parks Service, Santa Fe, NM, 2003. Paper.
   Notes:: This report provides a detailed survey of the submerged cultural resources of Yellowstone National Park. These resources include but are mostly vessel related.

7. Braley, John. "Shipwreck Management in Mississippi and Alabama."1997.
   Notes:: Brother Jonathan, La Belle
   - Review of Abandoned Shipwreck Act of 1987
   - Review of legal proceedings in Mississippi and Alabama
   - Gets into the MS Derelict Vessel Statute Miss. Code Ann. §§ 39-7-1 to -41 (1996)

8. Call, Carie L. "Lee Moves to Get Abandoned Boats Out of Water Fast." *News-Press.Com,* 17 May 2004.

Notes:: This article reviews the state of abandoned vessels in Lee County and then describes the new programs that the county has put in place.

It is pretty general but says that the new rules allow the county to take possession of the vessels quicker and to get tough on boat owners.

The state level funding for removals has dried up in the past 2 years.
The county now gets its funding from the West Coast Inland Navigation District.
They spend about 75K each year and have removed 400 vessels since 1990.

They emphasize speed since the longer the vessels sits the more costly it is to remove.

The county is planning on removing 4 vessels in Matanzas Pass this summer.
The city of Fort Myers Beach is also removing derelicts to put in a mooring field.

Navigation, pollution and sea grass impacts are sighted.

9. Campbell, Brad Kern Ed Horn Dean. *Impact of Oil Spillage From World War II Tanker Sinkings*, MITSG 77-4. MIT Sea Grant Program, Cambridge, MA, 1977. PDF.
   Notes:: Three main conclusions:
   1. 145 million gallons of oil were spilled during the first 6 months of 1942 within 50 miles of the US Atlantic Coast
   2. Minimal cleanup – incidental burning and cosmetic cleanup of tourist beaches
   3. Ecology of the regions survived this devastation although there may have been long term effects

   'results indicated that the effects of the oil spills …were negligible."

   - report addresses oil spilled during WWII – not oil that remains trapped in vessels. It is possible, I guess, that many of these vessels still contain some hazardous materials.

   - primary sites investigated were Cape Hatteras, NC and the New Jersey coast – where spills were concentrated.

   Sea Grant ID: MIT-T-77-001

10. Carrell, Toni Boyer Don Davis Marjorie G. Foster Kevin Lenihan Daniel J. Lotz David T. McGrath Thomas B. Miculka James E. Rock Tim. *Submerged Cultural Resources Assessment of Micronesia*, National Park Service, Santa Fe, NM, 1991. Paper.
    Notes:: Report goes through the submerged cultural resource of Micronesia in extreme detail. Vessels are covered in Guam and CNMI as well as across the Pacific.

11. Causey, Billy D. "Biological Assessments of Damage to Coral Reefs Following Physical Impacts Resulting From Various Sources, Including Boat and Ship Groundings.", 8.
    Notes:: Mr. Causey is the Sanctuary Manager for Looe Key national marine sanctuary in Big Pine Dey Florida.
    Title III of Marine Protection, Research, and Sanctuaries Act of 1972
    Sanctuary regulations ref-15 CFR, part 929 (KLNMS) and part 937 (LKNMS)
    Contacts-Ralph Lopez and Darlene Finch of Marine and Estuarine Management Division of NOAA

12. Chesapeake Bay Commission. "Abandoned and Derelict Vessels: An Assessment of Five State Programs."1999.
    Notes:: abandoned and derelict vessel removal act of 1997
    Digest of the Texas Water Safety Act
    good references in bibliography

13. Christie, Michael. "World War Two Wrecks Haunt Pacific With Oil Spills."2002.
    Notes:: General audience news article highlighting the WWII wrecks in the South Pacific.

- Mentions the Mississinewa in Micronesia
- 1080 wrecks in the region according to SPREP
- 3 million tonnes of warships under the Pacific: 23 carriers, 213 destroyers, 22 battleships, 50 tankers, plus subs
- Mentions that the problem has hit the Pacific first but it will be coming to CA and to the Mediterranean

14. Cowan, Dorian. *What Are the Powers of Local Governmental Authorities Under Florida Law to Dispose of Derelict and Abandoned Vessels Found in or Near Local Navigable Waters?*, No. 2. University of Miami Sea Grant Institutional Program, Miami, FL, 1973. PDF, Paper, Online.
Notes:: This paper is dated but provides and interesting look at the history of the abandoned vessel issue in Florida. This paper assesses the powers of local governments and the state to remove abandoned vessels.

Key points:
 Navigable waters are not by definition public property.
 The definition of "abandoned property" does not include vessels unless they are above MHW
 The state Oil Spill Prevention and Pollution Control Act of 1970 is where the true powers come from.
 The act makes it illegal to abandon vessels. It provides powers for the state to take possession and remove vessels. It does NOT provide powers to the local governments.
 The state claims rights to sunken and abandoned vessels.
 Dade county has their own ordinance under their "home rule" charter
 Additional legislation was passed in 1974 which strengthened the states powers to manage these vessels.

15. deBlas, Alexandra. "Oil Leaking Battleships."Radio National - ABC, 2003.
Notes:: This is a transcript of a radio show that addressed the issue of leaking WWII wrecks.
- USS Mississinewa example, eyewitness report
- emphasize oil, chemicals and unexploded ordinance
- locations: Federated States of Micronesia, Philippines, Solomon Islands, Papua-New Guinea, Indonesia
- 3 million tonnes of vessels sunk in the Pacific and 2MM of that is Japanese (75% by number of vessels).
- Nawadra says that the risk of a spill from these vessels is far greater than the risk presented by current shipping
- Discussion of the cost of simply assessing the Mississinewa
- Their database has more than 2000 vessels in it - WWII wrecks

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South Pacific Regional Environment Programme
Samoa
SefanaiaN@sprep.org.au

16. ———. "The World War II Time Bomb in Australia's Waters."ABC - Radio National, 2003.
Notes:: Transcript of a radio show
Guests:
Andrew Bartlett
Leader
The Australian Democrats

Sefa Nawadra
Marine Pollution Advisor
South Pacific Regional Environment Programme
Western Samoa

- 49 WWII vessels in Australia EEZ
- Mention the Neosho - a Tanker 200km from the GB Reef - the sister ship to the Mississinewa
- Follow up to the other radio show
- Focus on vessels that threaten Australia
- Mentions Japanese and American responsibility for these vessels since they still rightfully belong to us.

17. Elliot, James E. "Responding to Vessel Groundings and Oil Spills in National Parks and Marine Sanctuaries."*International Oil Spill Conference 2003*2003.
Notes:: "Vessels are often abandoned and remain aground, thereby emitting residual oil and physically damaging coral reefs and seagrass beds after the responders have removed the accessible oil."

"The effectiveness of oil spill response technology has not improved significantly since the passage of the FWPCA of 1972 and the Oil Pollution Act of 1990"

Series of short case studies, SS Cape Mohican, Captain Hung, Igloo Moon, Sergo Zakariadze, Jin Shiang Fa, Jessica

Conclusions:
- leaving a vessel in place is short sighted on only cheaper in the short run
- trustees are often too caught up in NRDA to focus on immediate threats
- the FOSC has broad authority and the final say as to what the appropriate response is
- USCG should provide written policy that vessels in national parks and marine sanctuaries should be removed

18. Environment Canada - Environmental Protection Branch. *Clean-Up Guidelines for Ocean Disposal of Vessels*, Environment Canada, 2001. Paper, PDF.
Notes:: Overview of considerations when disposing of a vessel at sea.

1. Using the Guideline and Standard
2. Suggestions for Planning Work
2.1 Gather Information About the Vessel
2.2 Develop a Work Plan to Reduce Costs
2.3 Maintain Security During Clean-Up
2.4 Prepare for Inspections
3. General **Notes:** on Salvage and Recycling
4. General **Notes:** on Personnel Safety During Clean-Up and Inspections
5. **Notes:** on Vessel Stability During Clean-Up and Transits
6. Tank Cleaning
7. Cleaning Compartments with Bilges
8. Dealing with Piping and Fittings
9. Cleaning Fitted Machinery
9.1 Combustion Engines
9.2 Gearboxes
9.3 Other Machinery
10. Suggestions on Handling Debris

10.1 Salvage
10.2 Waste and Debris

19. ———. *Clean-Up Standard for Disposal at Sea of Vessels*, Environment Canada, 2001. Paper, PDF.
Notes:: Specific standards for clean up of vessels to be disposed of at sea

1. BACKGROUND
1.1 Background: Development of this Standard
1.2 Interpretation and Definitions

2. SCOPE

3. OIL AND GREASE
3.1 Structural Tanks
3.2 Non-structural Tanks
3.3 Fuel and Oil Filling Points
3.4 Fuel and Oil Piping Including Manifolds
3.5 Fuel and Oil Piping Fittings
3.6 Bilge Piping
3.7 Gauges and Gauge Lines
3.8 Combustion Engines
3.9 Boilers
3.10 Non-combustion Engines, Shafting, Gearing and Stern Glands
3.11 Steering Gear
3.12 Auxiliary Machinery
3.13 Hydraulics
3.14 Grease
3.15 Bilge Areas
3.16 Decks and Floor Coverings
3.17 Bulkheads and Deckheads
3.18 Other Components and Structure

4. HAZARDOUS MATERIALS
4.1 Removal of Hazardous Material
4.2 Residues in Cargo Areas
4.3 Unknown Wastes
4.4 Antifreeze and Coolants
4.5 Batteries
4.6 Fire Extinguishing Systems
4.7 Halocarbons
4.8 Mercury
4.9 Zinc
4.10 Copper and Electrical Cabling
4.11 Lead
4.12 Cadmium
4.13 Other Metals
4.14 Poly Chlorinated Biphenyls (PCBs)
4.15 Black and Gray Water
4.16 Radioactive Materials
4.17 Plastics, Other Synthetic Materials and Soft Furnishings
4.18 Fitted Hazardous Materials and Products

5. DEBRIS
5.1 Introduced Material
5.2 Debris
5.3 Recyclable Metals

6. INSULATION
6.1 Asbestos Containing Material
6.2 Plastic Foam Insulation
6.3 Other Types of Insulation

7. PAINT
7.1 Anti-fouling Coatings
7.2 Above Waterline Exterior and Interior Paints

8. ADMINISTRATIVE REQUIREMENTS
8.1 Designated Inspector Qualifications
8.2 Requesting Inspections
8.3 Inspection Requirements
8.4 Reports

20. ———. *Disposal of Vessels: Applying for an Ocean Disposal Permit Under the Canadian Environmental Protection Act (1999)*, Environment Canada, 2001. Paper, PDF.
Notes:: Overview of permitting process for ocean disposal of a vessel in Canada

21. Fields, Scott. "The Environmental Pain of Pleasure Boating.", A216-A223. 2003.
Notes:: - 17 million boats in the United States (recreational vessels)
- 12 million engines power watercraft in the US
- many statistics on recreational boating industry to impacts
- anti fouling paint impacts

22. Gilbert, Trevor, Sefanaia Nawadra, Andy Tafileichig, and Leonard Yinug. "Response to an Oil Spill From a Sunken WWII Oil Tanker in Yap State, Micronesia."*2003 International Oil Spill Conference*2003.
Notes:: Article addresses both the USS Mississinewa spill on Yap (Federated States of Micronesia-FSM) and the overall issue of WWII vessels in the Pacific.
- More than 1000 WWII wrecks are scattered across the Pacific Ocean (1080)
23 aircraft carriers, 213 destroyers, 22 battleships, 50 oil tankers
- SPREP was brought in to assess the wreck and cleanup
- Summary of events and impacts

- Military vessels sunk in wartime are assumed to have significant structural damage
- Case for radar detection of petroleum products on the ocean
- In Chuuk Lagoon, Micronesia, there are dozens of WWII vessels
- They have the wrecks in a GIS
- 5 step strategy for dealing with the issue data collection, generic risk assessment, agree on interventions, site specific risk assessment, planning implementation

23. Government of American Samoa/ =U.S. Department of Interior/=National Oceanic & Atmospheric Administration. *Emergency Restoration Plan and Environmental Assessment: Pago Pago, American Samoa - September 1, 1999*, 1999. Paper.
Notes:: Detailed document describing the incident in American Samoa where 9 long liners went aground in Pago Pang Harbor.

Introduction
Purpose and Need for Action
Authorities and Legal Requirements
Affected Environments
Injury Assessment
Emergency Restoration Alternatives including proposed action
Scaling of Benefits from vessel removal
Project Costs for the Preferred Emergency Restoration Alternative
Management of the Emergency Restoration Alternative
Conclusions

24. Hampton, Steve, R. Glenn Ford, Harry R. Carter, Christine Abraham, and Diana Humple. "Chronic Oiling and Seabird Mortality From the Sunken Vessel S.S. Jacob Luckenbach in Central California.", 35-41. 2003.
Notes:: Article addresses impacts to birds from a series of oiling events from the SS Jacob Luckenbach. It also addresses mystery spills in general, and discusses cleanup and seabird restoration with respect to these incidents.

25. Helton, Doug Zelo Ian. "Developing Information and Support Necessary to Prioritize & Support Removal of Abandoned Vessels Impacting Coral Resources.", 5. 2003.
Notes:: Abandoned vessels are damaging to coral reef habitats (crushing and smothering). Abandoned vessels, although damaging, are commonly ignored or neglected because their removal is not mandated by federal law, unless they are an obstruction to navigation.
Provides history of NOAA's involvement with the studying of abandoned vessels, which was promoted by its involvement with the coral reef taskforce.
Purpose of program: 1)development of a data management system for abandoned vessels 2)review of existing legal authorities 3)field efforts including surveys, workshops, and vessel removal.
A summary of the programs present state, including the database, and several case studies exhibiting the programs actions.
Coral reefs: 25% of all marine life, supporting approx. 4,000 different fish species.

26. Helton, Douglas. "Grounded and Abandoned Vessels Impacting Coral Reefs: Discussion of the Challenges, Potential Solutions and Plan of Action."Seattle: NOAA Damage Assessment Center, 2002.
Notes:: "The White Paper"
- the paper version in our files has some attached comments from Cheryl Scannell and others
- this is the white paper prepared for the Coral Reef Task Force that was never delivered to them because of conflicts among sponsoring agencies.
- It is one of the 3 parts of the Abandoned Vessel Program - according to Andy smith's paper at least

Discusses
- issue definition
- types of abandoned vessels
- role of the USCRTF
- federal agency responsibilities
- strengths and weaknesses of existing federal laws
- marine insurance
- case histories Jin Shaing Fa, F/V Swordman, S/V Karma
- potential solutions
- next steps

COMMENTS:
I actually was expecting a more detailed review of authority more of the nitty-gritty of who what when etc. I guess if the document is meant for a more general audience then it is OK but there definitely seems like there is more work to be done here. The recommendations for changing the system are good. I would like to see a truly insightful analysis of how to force the system that we have now to work to its maximum potential. What loopholes are out there that we can exploit etc.? Which vessels do we have the most likelihood of getting pulled off sensitive habitats.

NOTES::
- Small vessel owners and small salvors often do not have the resources necessary to remove vessels

- Existing federal laws do not provide adequate authority or funding to deal with the problem and do not hold responsible parties accountable

Different types of abandoned vessels
- vessels ground as a result of accident may have residual value
- obsolete vessels that are abandoned intentionally because it is cheaper
- grounded as a result of illegal activity
- historic wrecks

USCRTF
- mention their concern and their proposed resolution from the Samoa meeting
- the resolution had the 4 potential solution that were discussed in the pacific island workshops in FY02

Agency Responsibilities
- reviews federal agency responsibility
USACE when vessels impair navigation
USCG when there is pollution threat or people are in danger
NOAA when vessels are in National Marine Sanctuaries
EPA ocean dumping and pollution or human health concerns
DOD manages habitat in bases and has extensive vessel removal capability
States often have removal programs that are very backlogged

STRENGTHS AND WEAKNESSES OF AUTHORITIES
- None provides for all three objectives:
1. authority to remove grounded or abandoned vessels that are not obstructing navigation
2. liability for physical injury to natural resources caused by vessel groundings
3. source of up-front funding other than agency appropriated funds to accomplish vessel removal or resource restoration

Only one federal law (OPA) provides up front funding to remove vessels and clean up the others require that the owner/operator be taken to court. OPA provides no $ for repairing damage caused by the actual grounding, however.

MARINE INSURANCE

- is not a complete solution
- may be detrimental to small operators
- does not deal with derelict owners intentionally insolvent etc.
- no state standards for small vessel insurance

CASE HISTORIES
Jin Shiang Fa, Rose Atoll, American Samoa
F/V Swordman I, Pearl and Hermes Atoll, Hawaii
S/V Karma, Fajardo, Puerto Rico

POTENTIAL SOLUTIONS
1) Increase Grounding Prevention Measures
2) Increase removal and restoration authorities
3) Identify Viable Sources of Dedicated Funding

APPENDICES
- Good summary table of the acts, the agencies responsible for them etc.

27. Hess, Ronald, Denis Rushworth, Michael V. Hynes, and John E. Peters. *Disposal Options for Ships*National Defense Research Institute, 2001.
Notes:: The objective of study was to identify and evaluate options for the disposal of U.S. Navy and U.S. Maritime administration vessels. The research was conducted by the Navy within the Acquisition and Technology Policy Center of RAND's National Defense Research Institute. The study focuses on the disposal options that will be necessary to address the Navy's ever expanding and ever aging fleet. Roughly 358 vessels will require some form of disposal over the next 20 years. A summary graph is given on XV and is used to explain the costs of the various solutions, including long-term storage, domestic recycling, overseas recycling, and reefing. Reefing is "a very promising ship disposal program" (XVIII). It is the least expensive, it builds reefs, marine life, commercial and recreational fishing, and diving. The baseline cost for reefing the 358 vessels, including towing and interim storage is $500

million undiscounted FY00 dollars. The biggest problem for reefing currently is that standards have not been set for its use. Most reefing projects have been done locally, using USCG, or Canadian standards. "A sound long-term reefing program requires new national standards for ship cleaning and a coordinated Navy-MARAD interagency program" (XVIII)

28. Hunter, Jack. "Heritage or Hazard: The Oil Tanker Montebello and Its Potentially Dangerous Cargo.".

29. Lentz, Sally A. "Salvage As an Untapped Resource in Spill Prevention.", 4-5. 2003.
Notes:: Publication of the American Salvage Association

The author describes what she calls the "salvage gap" which is the time between when a vessel is first in trouble and when a spill occurs. The paper advocates better planning for these emergency savage incidents. Specifically she says two things are needed:
1. ready and capable salvage capability
2. ports of refuge

1990-1999
Tankers spilled an average of 88,000 tonnes of oil per year into the ocean (i think this is a global statistic)

30. Lerman, David. "LN Fleet Casts Shadow on Ship-Breaking.", 2. 2004.
Notes:: Refers to the "ghost fleet" of Virginia, and the Navy's attempt to dispose of decommissioned vessels in foreign waters. The Navy had paid a scrapping company in England to take car of several vessels, however, the controversy occurred when that company had permitting problems in England. The English are opposed to the U.S. sending England its waste. The "ghost fleet" refers to numerous decommissioned vessels that are presently in Virginia waters. The vessels still remain because the United States has a shortage of domestic companies that are capable of disposing of large ships. Most of this "fleet" is anchored in Newport News, on the James river, and are thought to be an environmental hazard. Presently there are 130 backlogged vessels in the national fleet (90 on the James River), and congress has set a deadline of 2006 for their disposal.

31. Levy, Danya. "Sunken Japanese Warships in Pacific an Environmental Disaster." *Japan Today,* 4 March 2004.
Notes:: News article that talks about wrecks in the Pacific
Mentions the Mississinewa - but was written between the repair work and the actual removal exercise
- sunken tankers present the greatest risk
- Pacific island nations do not have the resources to clean up a major oil spill
- Ocean forum in Fiji - WWII wrecks were a topic
- Papua New Guinea has 180 wrecks - more than any other country
- Getting the US and Japan to accept more responsibility is mentioned also, as are some of the international legal problems that stand in the way.
- The Mississinewa action was the first time a government has taken responsibility for a wreck in foreign waters - but the US emphasized that this is not a precedent.

32. Lloyd's. "LLoyd's Standard Form of Salvage Agreement."2000.
Notes:: Lloyd's Salvage Council: 44(0)20 7327-5408

33. Lord-Boring, Christine, Ian J. Zelo, and J. Zachary Nixon. "Abandoned Vessels:Impacts to Coral Reefs, Seagrass, and Mangroves in the U.S. Caribbean and Pacific Territories With Implications for Removal."2004.

34. Lukens, Ronald Bell Mel Buchanan mike Culbertson Jan Dodrill jon Kasprzak Rick Tatum Walter. "Guidelines for Marine Artificial Reef Materials.", 123. 1997.
Notes:: The purpose of the paper was to provide state, fed, and private groups with information regarding artificial reefs. Regardless of material used, artificial reefs will only succeed if certain physical conditions are pre-existing, including salinity, currents, etc. In 1984 Congress enacted the National Fishing Enhancement Act, which called for the creation of a long term artificial reef program (under NMFS) and set out the following considerations: durability, stability, compatibility, availability.

After the initial introduction, commonly used reef materials are each given their own section of the report (wood, metal, fiberglass, etc.) Wood: environmentally safe, but ballast issues, short life span. Steel hulled vessels: most initial cases were done by the Navy in the 1970s (liberty ship program). In 1972 the Navy and MARAD were authorized to sink liberty ships in state waters (with approval) states that participated include Texas, Alabama, Virginia, and California. Statistics are provided regarding the total number of sites, and of those sites, which ones were steel hulled vessels.

The paper also covers considerations that should be made before a reef is created. Movement during hurricanes, PCBs in military vessels, for example. Drawbacks of scuttling vessels as reefs are also discussed.

35. *Proceedings of the International Marine Debris Conference - Derelict Fishing Gear and the Ocean Environment*Naomi Simonda Kitty Donohue Mary Brammer Christine Mason Susan Carbajal Samantha McIntosh2000.
Notes:: Publication deals with marine debris defined as derelict fishing gear. There is not much in here to address vessel debris etc.
Proceedings address: Scope of the Issue, Current efforts to address the problem, Recommendations for management.

Reviewed a number of papers - these two seem to be the most fitting for the AVP. One addresses ecological impacts and the other the economic impacts of marine debris. The parts about intervention in the second article are particularly interesting.

Ecological Impacts of Derelict Fishing Gear - p40-58
Fowler, Charles W.
- Set up: humans are cover more area and harvest orders of magnitude more food from the ocean than any other mammals their size.
- Plastics and the nets made from them are a major reason why we can so efficiently harvest fish AND are one of the major contributors to marine debris
- Northern fur seals had a major decline after a peak in juvenile entanglement (late 70's early 80's)
- Entanglement results in behavioral changes, increased energy expenditure and reduced weight, increased eventual mortality and overall population decline

DISCUSSION
- In this (and other cases) marine debris is NOT an excuse to ignore other causes of possible ecological harm. While it is certainly a contributor, it can not be a scapegoat for complex issues.
- Mention of the balance between the good that plastics do and the harm they inflict – does it come out more good?
- Also – the northern fur seals are an easy species to monitor, easy to get a sense of the problems because they return to the same breeding ground every year. If ALL the species affected by marine debris were as easily studied the magnitude and significance of the issue would be easier to establish and more widely recognized.

AVI APPLICABILITY
- In this case the marine debris is simply another parallel environmental impact with similar considerations to abandoned vessels.
- Like debris, if we could examine the full impact of vessels we would probably come to recognize the significance of the issue

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Economics of Lost Fishing Gear p59-66
Pooley, Samuel G.

- There is not a lot of information on the economic cost of marine debris – maybe because of the elusive nature of debris in a wide open ocean.
- Debris on beaches does reduce the prosperity of the community and the ecosystem

COSTS TO CONSIDER
- cost of replacement gear
- cost to recover gear
- cost of time spent recovering gear
- cost to public are more disperse and harder to calculate (beaches, fouled props, endangered spp impacts, etc)
- upfront costs that would decrease the likelihood of loss
- maintenance costs (training etc.

INTERVENTION
- where in the process is the most effective place to intervene?
- should intervention be at multiple points to make it more equitable?
  >Choice of gear – upfront costs
  >Maintenance of gear – skill and motivation issues
  >Conditions for use – weather, crew condition, other vessels' interference etc
  >On-board facilities for secure storage – storage of gear remnants, damaged gear etc. is not always the best (there may be a benefit to having it wash over the side – in terms of space or $)
  >Shore-based facilities for storage and disposal – incentive to bring gear (especially damaged or trash) back to shore and dispose of properly?
  >At-sea or on-land retrieval – when it is cost effective or likely that gear already drifting will be retrieved by a passing boat or on land?

MITIGATION
- It would be nice if the full social cost of gear were borne privately.
- This would be more likely to induce more cautious behavior
- Mechanisms
> incentive for gear choice
> cost for shore-side disposal
> regulatory climate
> incentives for appropriate disposal
> liability for gear damage
> insurance for gear removal

AVP APPLICABILITY
- I think there are some strong parallel considerations in the costs, the intervention sections and mechanisms for mitigation.
- Where should we try to fix the problem and with what mechanism

36. Michanczyk, Curt. "The Maritime Administration's Ship Disposal Program.", 3. 2001.
Notes:: A brief summary of MARAD's ship disposal program. The program is located out of Washington D.C., and works closely with the national reserve fleet, and the ready reserve force. At the time of this report MARAD had custody of 132 obsolete ships that were not scheduled for retention. MARAD is in charge of disposing of vessels larger than 1,500 gross tons. There are 4 primary locations for these vessels: James River, Suisun Bay (CA), Beaumont (TX), Mobile (AL).
Until 1994 the main method of disposal was foreign buyers and artificial reefs. Artificial reefs were emphasized primarily in the 70s and 80s. The program is now promoting the most cost effective means of disposal.
MARAD's artificial reef program was created in 1972, under public law 92-402. In the program the federal government was authorized to transfer obsolete vessels to the states "as is". The states were allowed to strip the vessel (paying for the vessels transport and sinking).
REEFEX is the Navy's artificial reef initiative, however, the report states that there are several studies being conducted that will analyze the best way to create artificial reefs, and further, attempt to devise a system that allows for more efficient permitting.
This report concludes that the Navy would like to create more artificial reefs using its old non-useable vessels, however, the extent of this will depend on the studies currently being conducted.

37. Michel, Jacqueline Helton Douglas. "Environmental Considerations During Wreck Removal and Scuttling." , 16-

18. 2003.
Notes:: Paper discussed a series of situations that may occur during a salvage operation and methods to prevent environmental harm. Discussion is separated into three categories: protection of seafloor habitats, protection of water-column hand water-surface resources and scuttling site issues.

Specific topics include: salvage vessel anchoring, towing systems, salvage vessel operations, modifications to grounded vessel, tow path, construction of access platforms, debris removal, release of aqueous solutions, planning for uncontrolled releases, environmental windows for salvage, invasive species and the fate of remaining fuel and cargo in scuttled vessels.

38. Naval Historical Center. "Department of the Navy policy regarding custody and management of sunken naval vessels and aircraft wreck sites." Web page, July 2000 [accessed 4 February 2004]. Available at http://www.history.navy.mil/faqs/faq28-1.htm.
Notes:: - general policy regarding custody of US Naval vessels
- common questions about ownership, diving on navy vessels, looting
- list of federal regulations that apply to submerged naval resources

39. Nawadra, Sefanaia Gilbert Trevor. "Risk of Marine Spills in the Pacific Islands Region and Its Evolving Response Arrangements."*Spillcon Conference*2002.
Notes:: This article addresses the risk of marine spills in the Pacific
- mostly it focuses on assessing the risk from groundings and collisions
- they use a GIS to look at shipping traffic, things ships could hit and, in a separate analysis, fishing activity.
- they mention several levels of risk assessment including general and site specific seems like there should be a tie in to RUST here
- there is also a good table that gives the stats for the PACPOL Countries, land areas, sea areas and population

WWII
- paper also addresses the WWII wreck issue. "Internationally there is currently no multi-lateral legal instrument governing the ownership of sunken warships or military aircraft."
- SPREP asked PACPOL to come up with a Regional Strategy to deal with the issues and a draft strategy was formulated. It recommends a 5 step approach to dealing with them:
1. data collection and analysis
2. generic risk assessment
3. agree on interventions for each level of risk
4. site specific assessments
5. planning implementation

40. New Jersey Artificial Reef Program. "New Jersey Reef News 2004.", 12. 2004.
Notes:: This publication is essentially a newsletter that is issued by the State of New Jersey. It contains a letter from the Commissioner of NJ's DEP program, and general information regarding the status and history of New Jersey's artificial reef program. In all, NJ has 14 reef sites, which have been created over the last 20 years. These sites do not consist of one vessel, or one object, but a multitude. Over 120 ships have been sunk, approx. 6 million tons of rock, and thousands of miscellaneous items. The program is run by NJ's Department of Environmental Protection's division of Fish and Wildlife.
This is a valuable document because it illustrates the history of the program's trial and error run projects. How sites were created, the species that were studied, how they were created, their design, etc. There studies have been fairly comprehensive, especially, regarding the affect of artificial reefs on marine organisms. Species counts, and population growth are included. The program's statistical history is displayed, as well as adopted sites not created by the program.
New Jersey's program is extensive, and they have definitely been diligent in their monitoring. A good example.

41. NOAA - National Ocean Service/=U.S. Coral Reef Task Force. *A National Coral Reef Action Strategy - Report to*

Congress, U.S. GPO, Silver Spring, MD, 2003. Paper, PDF.
Notes:: 6. CR ECOSYSTEMS AT RISK

B. Major Threats
- USCRTF identified 7 of particular importance and grounded vessels were one as are habitat destruction and pollution

C. Ranking on Major Threats
- Some threats are consistently ranked as having high to medium impact on reefs across most regions (e.g., coastal development and run-off; coastal pollution; fishing; ships, boats and groundings).
- Table 1 – Threats verses region - Groundings are High priority in FL, USVI and HI and Medium in Samoa, Guam and CNMI

7. NATIONAL ACTION STRATEGY
There are 13 goals and these are prioritized in tables 2-5 in terms of overall importance.

Table 2:
Vessel groundings are considered a high priority action to address 6 of the 13 goals including:
- Use of marine protected areas
- Reduce impacts of coastal uses
- Restore damaged reefs
- Improve Education and Outreach
- Reduce threats to international reefs
- Improve coordination and accountability

Table 3:
Breaks down the goals into specific objectives and then ranks them by area/region.
- There are 9 objectives that relate to us with the most relevant being: reduce impacts from ocean recreation, improve vessel management, improve response capabilities, increase awareness and improve coordination.
- Any of these can be used to support a selection of our various projects

Table 4:
Ranks issues for international reefs

D. Action Theme One – Understanding Reefs
Goal 1: Map all US Coral
Objective 1: Develop high-resolution benthic maps and coastline surveys of local and regional coral reef ecosystems using satellites, aircraft, and in situ surveys, with particular emphasis on MPAs, reefs at risk of degradation due to human activities, and other priority sites identified by the U.S. Islands representatives.
- This is probably more important than goal 2. Specific support for surveys of reefs at risk of degradation -
Goal 2: Assess and Monitor Coral Reef Health – Groundings are medium priority
- this supports more surveys I think, we need to know what the threats are.
Goal 4: Understanding Social and Economic Factors
- This is ranked low for vessel groundings and high for habitat destruction
- The workshops specifically said that this was something that was really needed – I would argue that he low for groundings is not correct.

E. Action Theme Two – Reduce Human Impacts
Goal 5: Improve MPA – lists groundings as high priority threat
- we would fit in by strengthening their ability to protect coral reef resources
Goal 7: Reduce impacts of Coastal Use – groundings are high priority
- very strong support for us – in 3 of the 6 objectives:
  one, develop informal guidance, technical assistance, protocols
  three, initiate action at national level to prevent groundings (education, aids etc.)

four, develop standard vessel grounding response, enforcement and injury assessment
Goal 9: Restore Damaged Reefs – groundings are high
Goal 10: Improve Outreach and Education – groundings high priority
Goal 11: Reduce Threats to International Reefs – groundings are high
Goal 13: Improve Coordination and Accountability – groundings are high
Objective 2: Coordinate planning and development of crosscutting initiatives, promote exchange of information on activities, needs and concerns, and facilitate resolution of issues related to coral reef conservation.

42. NOAA/NOS/Office of Ocean and Coastal Resource Management (Coastal Programs Division)-contributors include Nancy Foster, Terry D. Garcia D. James Baker and William M. Daley. "Marine Debris: State Enhancement Grant Assessments and Strategies.", 57. 1999.
Notes:: Report describes changes to state, territory and commonwealth coastal zone management programs to reduce amount of marine debris, for years 1992-1996. The report is broken down into four parts: First, state specific summaries by region, second, compiles efforts of all states (strategies, research, regulations), third, obstacles and needs and areas of improvement for all states, and fourth, a table that illustrates an overall distribution of marine debris projects by state and type. 35 states are covered, and each state report contains contact information regarding there programs: including coastal management programs, envir protection, marine coastal, watersheds, coastal planning, etc.- valuable in terms of establishing contacts among states.

43. O'Mara, Richard. "Salvaging a Ship - and History
Battle: The Graf Spee's Short Life Off the Coast of Uruguay Offers Lessons About a German Captain and World War II." *Baltimore Sun,* 8 May 2004.
Notes:: - The German pocket battleship Admiral Graf Spee was scuttled in Uruguay after the first naval engagement of WWII.
- The ship was sinking freighters off South America, engaged three British Cruisers, damages two of them, ran for the neutral harbor of Montevideo, was given 72 hours in port. The Captain was unable to restock ammunition or fix guns so he sunk the vessel after getting his crew off.
- The article mentions that they would like to raise the vessel and make it a museum but does not mention any environmental impacts etc.

"The affair of the Graf Spee, with its high drama and operatic outcome, had a number of benign effects. It was the first major victory for the Allies at the outset of what would be a long struggle. It deprived the Nazis of a powerful weapon of war. And, perhaps more importantly, through the character of Captain Langsdorff, it encouraged the world to believe that not all Germans were Nazis or sympathetic to their cause."

44. Precht, William F. "The Art and Science of Reef Restoration.", 16-20. 1998.
Notes:: - Overview of reef restoration and of restoration and the legal process in Florida in particular
- Most reef restoration tries to solve a geological problem through biological or engineering solutions
- Most reefs, if left alone will recover within 50 years
- Damage Assessment and Restoration Plans (DARP) for sites should be prepared immediately

- Emphasis on groundings in Florida
- 1994 550 grounding cases in the FKNMS
- FL study grounding sites are statistically more similar to hard ground habitat than to the spur and groove habitat that resembles the sites' original condition

"Ship groundings are among the most destructive chronic anthropogenic factors causing significant localized damage on coral reefs."

45. Precht, William F. Aronson Richard B. Swanson Dione W. "Improving Scientific Decision-Making in the Restoration of Ship-Grounding Sites on Coral Reefs.", 1001-12. 2001.
Notes:: Article that addresses how three dimensional reefs recover once they are leveled by vessel groundings. The basic premise is that they recover to a different habitat - more like flat hard bottom than reef

Resulting conclusion: that restoration will help reefs recover to a state similar to pre-damage.

"Restoration is an attempt to overcome through manipulation the factors that impede natural recovery.
- good reference list for coral restoration articles

Cases: MV Wellwood, MV Elpis

46. Preston, G. L. Gillett R. D. McCoy M. A. Murrell P. A. Lovel E. R. *Ship Groundings in the Pacific Islands Region: Issues and Guidelines*, South Pacific Regional Environment Programme, Apia, Western Samoa, 1997.
Notes:: ISBN - 982-04-0156-9
Detailed analysis of vessel traffic and vessel impacts to the natural environment.

1. Vessel traffic and ship groundings in the Pacific islands
2. Environmental consequences of ship groundings
3. Economic and social consequences of ship groundings
4. Liability and insurance
5. Oil spill prevention and mitigation
6. Operational responses to a ship grounding
7. Legal issues arising from a ship grounding
8. Government / administrative responses to a ship grounding
9. Recommendations

Annex 1 Useful contacts for dealing with ship groundings
Annex 2 Crude oil conversion factors
Annex 3 Listing of major ship grounding events involving vessels over 100 GRT in the Pacific islands region since 1976
Annex 4 Environmental impacts of selected ship grounding and related events
Annex 5 Case study: issues arising during a recent Pacific island ship grounding event
Annex 6 Bibliography and references

47. Reid, George H. "Marine Salvage: A Guide for Boaters and Divers.", 154. 1996.
Notes:: This is a general guide for marine salvage. The book attempts to inform the reader on a variety of salvage issues, types of incidents, and how to handle various types of cases. It is not extremely technical, but it is not too general either.
Types of salvage associated with vessels
Adrift, aground, beached, sunken, partially sunken, moored, capsized.
Refloating grounded vessels: making initial assessment, surveying the area. Actions will depend on location. far offshore, nearshore, in a marina, etc.. Perhaps most important factor is containment, or anchoring. make sure vessel is anchored or secure. Using an anchor, lines, or even a buoy. The vessel must be secured.
All operations will be easier under ideal weather conditions.
Use tide to advantage. Some cases are within the tide boundaries, and operations may be made easier. find the leak, if possible, and contain the leak using inflatable devises, official hull patches, etc. Book contains various diagrams displaying the types of materials that can be used to stop leaks, how to insert them, and how to locate the leak if not obvious.
Dewatering: done using a pump, by hand, or if a small vessel, may occur while the vessel is being raised. This will depend on the size of the leak, or whole, the depth, etc.
Raising occurs when the vessel is raised using a three primary methods. First, flotation devices, using straps, and floating equipment, the vessel is simply floated to the surface. The vessel may be towed to the surface, using an anchoring device, and a powerful towing vessel (that is properly secured, both on the sunken vessel and on the towing vessel)
Adrift vessels must be surveyed prior to towing or removal. If the vessel is afloat you must make sure that it is not leaking. Seal the leak, to protect ship. This factor will depend on location (out to sea), the vessel's size, weather.

Moving material underwater is difficult for obvious reasons (which is why raising is preferred), divers may be required, which will increase expense and compliance issues. Extremely taxing on towing vessel, and dangerous since the towing vessel will be attached to a submerged object. Must be properly assessed to estimate wait, and possible movement from waves, weather.

48. Rogers, Capt. Richard W. *Shipwrecks of Hawaii: A Maritime History of the Big Island*. Haleiwa, HI: Pilialoha Publishing , 1999.
Notes:: We only have the list of vessels from the introduction as well as the map / sketch of where the vessels are located
- Addresses the Big Island, not the state.

49. *Beached Shipwreck Archeology: Case Studies From Channel Islands National Park*, Matthew A. Russell. U.S. National Parks Service, Sante Fe, NM, 2005. Paper.

50. Russell, Matthew A. "Submerged Cultural Resources Site Report.", 76. 2004.
Notes:: Comet refers to a ship, a pacific coast lumber schooner, which had been sunk, but not exposed, since 1911. In 1999 the ship was exposed during a storm off the Channel islands. This report is based on the findings that where found during the survey of the site.
The study was carried by the National Park Service, and was organized by Archeologist Don Morris.
The purpose was to study the site, determine decomposition, deterioration, etc, and determine how NPS should manage the site.
During the project only 10% of the hull was observed, using divers, etc, since only a portion of the vessel was exposed.
The vessel offerred information regarding the shipbuilding practices of the late 19th century, as well as a history of how wooden vessels react over time.
Recommendations
site monitoring, to note future erosion, and possibly register the Comet as an historical landmark.
There are issues over ownership, as jurisdiction depends on the waterline, therefore the national park service may or may not have complete authority.

51. Saipan Tribune. "Derelict Vessel Sinks at Saipan Port.", 1. 2004.
Notes:: CNMI unified command and contingency plan were put into affect immediately. Vessel was removed, however, who, how, and for what was not stated.

52. Sifling, John. "American Samoa Longliner Response, Wreck Removal, and Restoration Project."2001.

53. Smith, L. D. Negri A. P. Philipp E. Webster N. S. Heyward A. J. "The Effects of Antifoulant-Paint-Contaminated Sediments on Coral Recruits and Branchlets.", 651-57. 2003.
Notes:: This article discusses the potential for antifoulant paint contamination at grounding sites to significantly impact the survival of newly settle coral as well as coral branchlets.

Good reference to support other impacts of grounded and abandoned vessels.

54. Smith, Newell D. "The laws of salvage." Web page, February 1994 [accessed 3 May 2004]. Available at http://www.mbwf.com/salvage.htm.
Notes:: - Article by a lawyer who specialized in Maritime Law - practicing in Seattle

Overview of the laws of international salvage.
- Conditions for a Salvage award: Marine peril, voluntary services (not under obligation from law or contract), at least partially successful, consent of the owner
- Salvors liability
- Calculation of salvage award
- Contract salvage
- Treasure salvage and abandoned property - the salvor gets the right to compensation but not to title - there is a difference between the law of salvage and the law of finds
- Life salvage there is no award there is US and international obligation to save lives
- Liability salvage typically liability that was avoided is not compensated for (eg. An award that

compensates for pollution prevention costs that the owner did not incur because of the efforts of the salvor). However, there seems to be some precedent for taking this into account.

- Brief description of Lloyd's Open Forum

55. South Pacific Regional Environment Programme. *A Regional Strategy to Address Marine Pollution From World War II Wrecks*, South Pacific Regional Environment Programme, Apia, Western Samoa, 2002. PDF.
Notes:: 1. INTRODUCTION
1.1 Background
1.2 World War II - The Legacy of the Pacific Theatre
1.3 The USS Mississinewa Catalyst for Calls for a Regional Strategy
1.4 Legal Mandate the SPREP Convention's Pollution Emergencies Protocol
1.5 Other Legal Instruments and Customary International Law

2. STRATEGY FRAMEWORK
2.1 Aims
2.2 Objectives
2.3 Underlying Principles
2.4 Technical Scope
2.5 Geographical Scope
2.6 Parties to the Strategy
2.7 Modalities for Implementation

3. STRATEGY IMPLEMENTATION
3.1 Preliminary Site and Hazard Identification
3.2 Environmental Impact Assessment
3.3 Risk Assessment
3.4 Treatment Options
3.5. Checklist of Activities to be undertaken at each Site
3.6. Cost Estimates

56. Stark, Pete. "Abandoned and Derelict Vessel Removal Act.".
Notes:: This bill was authored by Congressman Pete Stark in 1997. It defines abandoned. It prohibits the abandonment of vessels. It defines civil penalties for abandoning a vessel and makes owners liable for the cost or removal. It provides the power to remove abandoned vessels after owners have been properly notified. Removal would have been possible 30 days after notification.

The PDF also includes a press release and the transcrip of Stark announcing the bill to Congress.

57. TenBruggencate, Jan. "Northwest Islands Dotted With Wrecks of Old Vessels." *The Honolulu Advertiser,* 7 June 2004.
Notes:: This article is part of a special report chronicling the voyage of a ocean going canoe. This installment addresses the accumulation of vessls in the NWHI.

Hans Van Tilberg was interviewed and discussed the issue from a historical perspective.

The wreck and disappearance of the Navy oil tanker Mission San Miguel on Maro reef in 1957 is mentioned. This tanker wrecked, leaked in bad weather and then slipped into the deep before crews could return to it. It may have gone down with intact tanks. It's location is not know.

A couple other historic wrecks are mentioned.

58. Thomas, Warren D., and Peter S. Barracca. "The Salvor and the Prevention of Water Pollution by Marine Transportation.", 32. 1973.
Notes:: Foreword the role of the marine salvor
- From the perspective of a salvage company making the case that pollution control has always been a

top concern for salvage companies but some, controlled pollution may prevent catastrophic incidents.
- Review of a number of tanker salvage cases that were performed by Murphy Pacific
- Alkaid, Stolt Dagali, Sigdal, Fulfstag, Chelwood Beacon, Ocean Eagle, General Colocotronis, Mobil Apex, Algol, Oriental Challenger, Arrow, Kaiko Maru, Oilbar #4, Hess Hustler

59. Thorburn, Fiona Sarduy Rolando F. Beltran Gerardo G. Debrot A. O. Clark Athline M. Gulko Dave Gittings Steve Causer Billy. "Overview of Grounding Costs and Impacts - 1990's From Atlantic and Pacific."1999.
Notes:: I am not sure where this document came from or who assembled it.
- Detailed information about the cost of groundings. the cause of groundings, grounding locations etc.
- Summary of information provided from a number of sources.

60. Unknown. "Code of Practice Between International Salvage Union and International Group of P&I Clubs."1999.

61. Van Tilburg, Hans. "Lana'i Island Shipwreck Beach Maritime Cultural Resource Survey." University of Hawaii - Maritime Archeology and History Program, 1999. Paper.
Notes:: This report has assembled a "shipwreck map" for the Hawaiian Islands. The document addresses "historic" shipwrecks (>50 years old). The document consists mostly of a series of island maps showing the relative position of vessels in HI waters.
- The report is a admitted work in progress.

62. ———. "Lana'i Island Shipwreck Beach Maritime Cultural Resource Survey." University of Hawaii - Maritime Archeology and History Program, 2001. Paper.
Notes:: This report summarizes the findings of a survey of Shipwreck Beach performed by a group of graduate students at the U. of HI as part of a field survey course. The work builds on the preliminary work done by Van Tilburg et al. 1999. The work focuses on "some of the many historic remains on the north shore."

The survey was completed 6/18-7/4/2001

63. ———. "Shipwreck Beach Survey: Lana'i Island." University of Hawaii - Maritime Archeology and History Program, 1999. Paper.
Notes:: This report summarizes the findings of a survey of Shipwreck Beach by a group of volunteers from 6/1/1999 6/14/99. The survey was supported by the UH Marine Option program.

- 8 miles of beach and partial reef surveys were conducted
- lists 14 documented vessels
- adds 4 more vessels to this list

64. Voulgaris, Barbara. "The Navy's computerized shipwreck database inventory: unique concerns and issues in its development and use." Web page, May 2001 [accessed 4 February 2004]. Available at http://www.history.navy.mil/branches/org12-7c.htm.
Notes:: - 3000 naval wrecks as of 2001
- DB used for research and planning
- Criteria for inclusion, Nomenclature, Disclosure Policy, Research Priorities

65. Whitfield, Paula E. Fonseca Mark S. Kenworthy W. Judson. "Coral Damage Assessment and Restoration Tools for Small Vessel Groundings (Extension of Seagrass Mini-312 Program to Coral Reefs)."Beaufort, NC: NOAA, Center for Fisheries and Habitat Research, 2001.
Notes:: Paper discusses the work at the Beaufort lab on modeling recovery times while taking the geometry of an injury into account. SAS 7 and ArcINFO7 are both used. "The approach developed here should be directly applicable to virtually any sessile community under NOAA's stewardship."

A seagrass recovery model is discussed as is its adaptation to use with coral communities.

66. Wiggins, Melanie. *Torpedoes in the Gulf: Galveston and the U-Boats*. College Station, TX: Texas A&M University Press, 1995.

Notes:: Book on the U-boat attacks in the Gulf of Mexico during WWII. Several of the vessels surveyed in the Deep Wrecks survey in 2004 are detailed in the book.

67. Wilson, charles sickle virginia. "Louisiana Artificial Reef Plan.", 143. 1987.
Notes:: Sites the developement of the oil and gas industry as the most important factor in creating the Gulf of Mexico's artificial reef systems. Mining structures became havens for fish, and commercial and recreational fishers were attracted to these areas, subsequently, they began making their own artificial reefs. The studey deals primarily with oil structures. The industry, which is highly developed in the gulf, will invariably shift form platform to platform to move with the oil Therefore, platforms become out of date, and discarded. LA was concerned that if these structures were removed, then their fishing industry would suffer.
Funding for the program was derived from the LA fishing enhancement act of 1986. Which included an artificial reef program, and was placed under the jurisdiction of LA department of wildlife and fisheries. Reefs were created between 25 and 75 miles offshore, and at depths of 200-400 feet. These reefs were sizeable, comprised or multiple (2-6) oil rigs.
In order to ensure proper placement, and track the reefs, the MMS (nonproprietary geophysical, geologic, and cartographic data from LA), as well as the NGDC (geophysical and geologic date from Boulder CO.)
Fishers, and shrimpers, were interviewed and asked to take part in the programs design and reef placement. They prefered sites to be created near reefs that already were in place, and stated that they tended to trawl withing .25 miles of the reefs.
Reefs permitted by Coast Guard, and Army Corp. Good diagram illustrating process or permit approval.
p.33 bouy costs per year, estimated between 300 to 13,000 annually, average of 1000 a year.
On p.34 the regulations describing the types of bouys (size, color, spacing) that are required. These factors depend on the size, depth, and placement of the reef.

68. Wilson, Sarah. "Washington State's Derelict Vessel Program.", 3. 2004.

69. Woodruff, Matt. "Salvage: Who Is Responsible for What? The Roles of Hull, P&I and Pollution Underwriters in a Vessel Sinking."*Clean Gulf 2003*CleanGulf.org, 2003.
Notes:: This paper was written by Woodruff for the conference proceedings. We received it directly from him, however, and he mentioned that he "cleaned it up" so there may be minor differences between this and the official draft - which I was unable to secure from the conference planners.

This paper reviews the roles of the owner and the underwriters after a vessel sinks. The paper describes hull, protection and indemnity (P&I) and pollution insurance. It provides examples of what they cover and when they would be called on. It also addresses cases when there would be debate over which policy should cover costs.

Salvage: raising a sunken vessel that still has value
Wreck removal: raising a sunken vessel that has no value but whose removal is required by law (navigation hazard, fishing hazard etc)
Pollution abatement: raising a vessel solely to prevent pollution

- These definitions are not mutually exclusive. If we raise a vessel for salvage or wreck removal and the cost of the operation increases to reduce pollution threats then the operation falls under two categories. Salvage and wreck removal do not typically overlap. If the vessel is considered a “constructive total loss”, is lifted as a wreck removal but is then determined to have value after all, debate can occur.