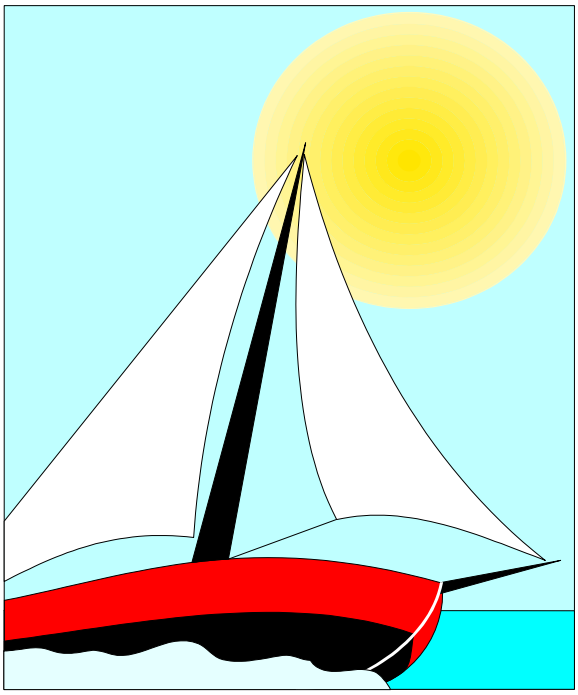
Clean Boating Bibliography, Annotated



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UCSGEP-SD 95-9 November 1995

Clean Boating Bibiliography, Annotated

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References described in this bibliography were reviewed during preparation of an educational program on preventing pollution from marinas and recreational boating. The bibliography was initiated to assist the authors in selecting the references for publications that were developed during the educational program. These publications include:

- ✦ Marina Pollution Prevention Manual
- ✦ Clean Boating Tips
- ✦ Underwater Hull Cleaner Best Management Practices
- ✦ Clean Boating Guide
- ✦ Selecting Underwater and Topside Maintenance Services for Your Boat
- ✦ Selecting a Hull Paint for Your Boat
- ✦ Boating Pollution Economics & Impacts

To request copies of the **above** publications, contact::

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5555 Overland Avenue, Bldg. 4
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FAX (619) 694-2849

Although many of the references included in the bibliography were not cited in the above publications, they may be useful to others who are writing or want to learn more about this field. We would enjoy hearing if the bibliography has been helpful to you! **We regret that we cannot provide copies of the materials referenced in the bibliography.**

Please contact the sources directly regarding availability and pricing of their publications. Please respect their constraints if they are unable to accommodate requests. We encourage you to utilize inter-library loan services where possible.

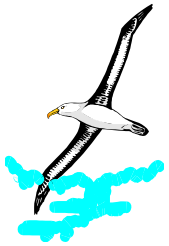
The following organizations may be able to provide catalogs or referrals to additional and newer publications:

California Clean Boating Network
c/o California Coastal Commission
(916) 445-6096 (until Fall, 1996)

National Sea Grant Depository
c/o University of Rhode Island
(401) 792-6114

International Marina Institute
Narragansett, Rhode Island
(401) 294-9558

Good Reading!



1. 48° North, The Sailing Magazine (1993) *Soundwatch, An Environmental Guide For Boaters,* 48° North, The Sailing Magazine, Seattle, Washington.
Source: 48° North, The Sailing Magazine, 6327 Seaview Ave. N.W., Seattle, WA 98107, (206) 789-7350.

This publication comprehensively and tactfully addresses boater responsibilities, communication, costs, changing habits and attitudes, disposal of used oil, antifreeze, bilge water, fuel and transmission fluid. The chapter, "Zen & the Art of Boat Maintenance" cites Washington State law governing boater practices and provides acceptable methods of boat maintenance. Chapter 7. suggests best management practices (BMPs) for marinas and boatyards and provides charts of Puget Sound. Chapter 8. has a map of marina locations.

2. Al Larson Boat Shop (undated) *Water Pollution Control Plan*, Los Angeles Regional Water Quality Control Board, Los Angeles, California.
Source: California Regional Water Quality Control Board, Los Angeles Region, 101 Centre City Plaza, Monterey Park, California 91754, (213) 266-7617.

This Water Pollution Control Plan (WPC) identifies practices to prevent potential pollutants from entering Fish Harbor. It contains lists of pollutant sources and methods to reduce pollution from these sources. Specific protocols are given to manage open work areas, accidental spills, oil and grease removal and disposal, cooling water and marine railway cleaning. The WPC specifies which employee will supervise and troubleshoot drydocks, piers, open work areas, accidental spills, oil & grease, cooling water and marine railways.

3. Alliance for the Chesapeake Bay and the Chesapeake Bay Commission (1993) *Baybook,* Alliance for the Chesapeake Bay, Baltimore, Maryland.
Source: Alliance for the Chesapeake Bay, Inc., 6600 York Road, Baltimore Maryland 21212, (410) 377-6270.

The *Baybook* serves as a guide to pollution prevention at home and educates residents of Chesapeake Bay on their role in the bay ecosystem. The book covers erosion control measures, soil cleanliness and conservation, stormwater drainage, septic systems, the role of pavement in runoff, landscaping, lawn care, gardening, pesticide and household chemical use. *Baybook* also discusses water conservation, recreational enjoyment of clean water and community action. A resource list is included and gives information on where to dispose of wastes.

4. Amaral, Mark (1993) *Rhode Island Marina Nonpoint Source Pollution Project*, Rhode Island Sea Grant, Narragansett, Rhode Island.
Source: Mark Amaral, Rhode Island Sea Grant Coastal Resources Center, University of Rhode Island, Narragansett, RI 02882-1197, (401) 792-6224.

This letter summarizes Rhode Island Sea Grant's nonpoint source (NPS) pollution abatement project at recreational boating facilities. Project objectives included preparing a Marina Operations & Maintenance Plan that identifies appropriate best management practices (BMPs) to reduce nonpoint source pollution and conducting demonstrations at two model marinas. The resulting document will describe practices and technologies for spill prevention, mitigation, collection treatment of bilge and hull washing, disposal of toxic products, routine maintenance practices and collection of boat sewage at marinas,

boatyards, yacht clubs and mooring fields.

5. Amaral, Mark, and Virginia Lee (1993) *Environmental Guide for Marinas: Controlling Nonpoint Source & Stormwater Pollution in Rhode Island*, Rhode Island Sea Grant, Narragansett, Rhode Island.
Source: Rhode Island Sea Grant Coastal Resources Center, University of Rhode Island, Narragansett, RI 02882-1197, (401) 792-6224.

This document includes descriptions of practices and technologies for spill prevention and mitigation, disposal of toxic products, proper maintenance practices and the collection of boat sewage based on experience gained from working with two model marinas

6. America's Cup Committee & the San Diego Unified Port District (1992) *1991 World Championship, Boating and Spectator Guide*, San Diego Unified Port District and the America's Cup Committee, San Diego, California.
Source: America's Cup '95, 2727 Shelter Island Drive, San Diego, CA 92106-2730, (619) 221-1995.

Provides a map of pumpout facilities on San Diego Bay, race schedules, rules and where to find information on using San Diego Bay.

7. Andrews, Larry S. and Robert Snyder (1991) "Toxic effects of solvents & vapors" in *Casarett and Doull's Toxicology: The Basic Science of Poisons 4th Edition*. Amdur, Mary, John Doull and Curtis Klaassen, eds.
Source: Library

Casarett and Doull's Toxicology is a comprehensive guide to the effects of pollutants on people, including effects from occupational exposures. It is an excellent reference for toxic effects from short and long term exposure, to discover the atoms or molecules of chemicals that cause toxicity response and for the mechanisms of their toxic action. The focus is primarily on the human response to chemicals. If information is available for animals, it is also discussed.

8. Augerot, Xanthippe (1988) "Plastics in the ocean: What are we doing to clean it up?" Washington Sea Grant, Seattle, Washington.
Source: Washington Sea Grant Communications Office, University of WA, 3716 Brooklyn Ave. N. E., Seattle, WA 98105-6716.

This booklet addresses problems associated with plastics dropped or dumped into the ocean, such as adverse effects on marine life and the visual degradation of oceans and beaches. Includes techniques and suggestions for reducing the amount of plastics that enter the ocean.

9. Barclays California Code of Regulations (1993) Register 93, Number 2, 1-8-93, Sections 6488, 6489, & 6674.
Source: Library

The California Code of Regulations contains the criteria for using hull paints that contain TBT, among other issues. This regulation is relevant for boaters, because TBT is permitted in California for use on some boats to prevent fouling growth while in the water.

10. Bear, David N. (1989) "Letter to the San Diego Unified Port District: Regarding Best Management Practices for Underwater Hull Cleaning," Bear Underwater Service, Inc., San Diego,

California.
Source: Bear Underwater Services, Inc, 3427 Channel Island Way, San Diego, CA 92110-5104, (619) 226-7827.

This letter contains Best Management Practices (BMPs) and recommendations for underwater hull cleaners to minimize paint toxicants from entering the water. Recommendations cover the use of several paints, their costs and some problems associated with frequent haul outs vs. underwater hull cleaning and the relative contribution of hull paints to overall levels of pollution in the water & sediments are discussed. The BMPs and suggestions come from an underwater hull cleaner in business.

11. Berg, Dave (1994) "The Corrosion Theory and Cathodic Protection," *48° North, The Sailing Magazine* 13(8).
Source: 48° North, The Sailing Magazine, 6327 Seaview Ave. N.W., Seattle, WA 98107, (206) 789-7350.

This article describes cathodic corrosion processes and the different electrochemical potentials of different metals in sea water. It also examines cathodic protection to assess the actual amount of protection the vessel receives from the use of sacrificial metals. Charts and diagrams augment the information.

12. Buller, Pat (1995) C*lean Marina+Clean Boating+Clean Water Partnership: A Resource Manual for Pollution in Marinas,* Puget Soundkeeper Alliance, Seattle, Washington.
Source: Puget Soundkeeper Alliance, 1415 W Dravis St., Seattle, WA 98119, (206) 286-1309.

This manual serves as a workbook for marina owners and operators. It includes: reasons marina owners should protect water quality and reduce pollution, current regulations that affect their businesses, how to reduce pollution, alternative products, boater education and a list of resources for marina operators. Its goal is to help marina operators help their tenants reduce pollution.

13. California Coastal Commission (1995) "Legal Framework for Marina and Boater Water Quality Management," *California Clean Boating Network Action Plan, Appendix I* (in preparation), California Coastal Commission, Sacramento, California.
Source: California Coastal Commission, 921 Eleventh St., Room #1200, Sacramento, CA 95814, (916) 445-6096.

This is a summary of laws pertinent to the jurisdictions of the California Regional Water Quality Control Board, Department of Fish and Game, United States Coast Guard and California Department of Toxic Substances Control. These laws include, sewage discharge, debris/solid waste discharge, oil & fuel disposal, bottom paint & hull cleaning material use and disposal, hazardous waste disposal and stormwater runoff.

14. California Department of Fish and Game (1990) "Report of Fish Caught by the California Commercial Passenger Fishing Boat Fleet, Annual, 1989," *Bulletin Tables*.
Source: Department of Fish and Game, Marine Resources Division, 330 Golden Shore, Ste. 50, Long Beach, CA 90802, (310) 590-5148.

These tables, complied by the California Department of Fish and Game, contain statistics on the poundage and landing value for commercially caught fish for ports in California during 1989.

15. California Department of Fish and Game (1989) "Table 21: Poundage and

Value of Landings by Port, San Diego Area, 1988," *Bulletin Tables*.
Source: Department of Fish and Game, Marine Resources Division, 330 Golden Shore, Ste. 50, Long Beach, CA 90802, (310) 590-5148.

These tables, complied by the California Department of Fish and Game, contain statistics on the poundage and landing values for commercially caught fish for ports in California during 1988.

16. California Department of Toxic Substances Control, Alternative Technology Division (1992) "Waste Minimization can Work for You!", Sacramento, California.
Source: Department of Toxic Substances Control Office of Pollution Prevention and Technology Development, PO Box 806, Sacramento, CA 95812-0806, (916) 322-3670.

Describes methods to minimize the amount of wastes, hazardous and nonhazardous, from most operations where they might occur. Suggests & recommends changes in habits and buying methods.

17. Camp Dresser & McKee, *et. al.* (1993) *California Stormwater Best Management Practice Handbook, Industrial/Commercial*, Volume 2.
Source: State Water Resources Control Board, Nonpoint Source Control Program, 901 'P' St., Sacramento, CA 95814, (916) 657-0522.

Provides guidance for developing and implementing best management practices (BMPs) to improve stormwater quality at industrial sites. Both source and treatment BMPs are covered. BMPs were developed based on the requirements of the stormwater program in section 402 (p) of the Clean Water Act. Use of this handbook does not ensure compliance, but it is a useful reference for selecting appropriate BMPs.

18. Camp Dresser & McKee, *et. al.* (1993) *California Stormwater Best Management Practice Handbook, Municipal*, Volume 1.
Source: State Water Resources Control Board, Nonpoint Source Control Program, 901 'P' St., Sacramento, CA 95814, (916) 657-0522.

Federal guidelines require municipalities to develop stormwater management programs to improve stormwater quality. This manual provides guidance for developing and implementing best management practices (BMPs) for municipal stormwater management programs by identifying problem pollutants, how to select BMPs and how to implement them.

19. CDTEP (undated) "Boat Marinas," Undated memorandum issued by Connecticut Department of Environmental Protection, Hartford, Connecticut.
Source: *No address or phone number available.*

Discusses the effects of marina pollutants on marine ecology.

20. City of Santa Monica, Department of General Services (1993) *Working for a Cleaner Bay,* City of Santa Monica, Department of General Services, Santa Monica, California.
Source: Heal the Bay, 2701 Ocean Park, Ste. 150, Santa Monica, CA 90405, (310) 581-4188

The City of Santa Monica passed an ordinance to reduce the amount of pollution entering the storm drain system by 20%. The ordinance specifies guidelines for new and existing properties

and new construction sites. The document contains charts depicting the "maximum allowable imperviousness" for surfaces in new development and construction. Design requirements are included as well as diagrams of runoff mitigation measures. Requirements for existing properties to reduce urban runoff include good housekeeping measures and equipment maintenance guides. The document details penalties for non-compliance and provides a phone list information and assistance.

21. City of Santa Rosa, Public Works Department, Piner High School Center for Technology, Environment and Communication, Lescure Engineers & California State Water Resources Control Board (1994) *Reduction of Urban Runoff Pollutants By Public Education Through Implementation of Demonstration Projects at Piner High School*, Santa Rosa, California.
Source: City of Santa Rosa Public Works Department, 69 Stony Circle, Santa Rosa, CA 95401, (707) 543-3800.

Project goals were to demonstrate the significant contribution of urban runoff to environmental degradation and that structural best management practices (BMPs) improve the quality of urban runoff. Students from Piner High School, in cooperation with the City of Santa Rosa and Lescure Engineers, tested a stormwater interceptor and grassed swale to determine the amount of pollutants removed by the systems alone and together. They determined that the systems removed pollutants from the stormwater.

The Piner High School project included an extensive public and elementary school education program. The objective to the public education program was to increase the understanding of citizens of sources of nonpoint pollution, provide the public with the information needed to implement pollution reduction in the community and to improve public understanding of the role of the Regional Board in water quality improvement. Examples of the fliers distributed in water utility bills, educational curricula for elementary schools, television commercials, articles and presentations are included.

22. Clean Water Network (1994) “Action Letter: Reauthorization of the Clean Water Act Senate Bill S1114.”
Source: Local congressional representative

The Action Letter itemizes the concerns of the Clean Water Network for the reauthorization of the Clean Water Act (CWA). This letter contains information about the stance of Clean Water Network, a Washington D. C. based environmental advocacy group. Good source for identifying concerns regarding aspects of the reauthorization of CWA.

23. Clifton, Clay B. & Leigh Taylor Johnson (1995) *Clean Boating Tips*, University of California Sea Grant Extension Program, Cooperative Extension, County of San Diego Farm & Home Advisor Dept., San Diego, California, UCSGEP-SD 95-7.
Source: University of California Sea Grant Extension Program, Cooperative Extension, 5555 Overland Ave., Building 4, San Diego, CA 92123, (619) 694-2845.

A one page brochure that tells the basics of boating pollution prevention. Covers the main marina pollution sources; oil and fueling activities, marina and vessel cleaning, painting & maintenance, garbage and plastics and sewage.

24. Clifton, Clay B., McCoy, Erika J. A. & Leigh Taylor Johnson (1995) *Marina*

Pollution Prevention Manual, University of California Sea Grant Extension Program, Cooperative Extension, County of San Diego Farm & Home Advisor Dept., San Diego, California, UCSGEP-SD 95-5.
Source: University of California Sea Grant Extension Program, Cooperative Extension, 5555 Overland Ave., Building 4, San Diego, CA 92123, (619) 694-2845.

Pollution prevention manual designed to help marina managers train staff, manage hazardous waste, define boat maintenance in the slip, how to talk to boaters & staff & to develop a pollution prevention plan for their marina. The manual is modular, appropriate materials may be added as needed. Included are several Sea Grant Publications that describe pollutant fate and effects in the environment, underwater hull cleaning best management practices, pollution prevention, topside and underwater hull cleaner service provider selection and a one page brochure for boaters on clean boating.

25. Clifton, Clay B. & Leigh Taylor Johnson (1995) *Clean Boating Guide*, University of California Sea Grant Extension Program, Cooperative Extension, County of San Diego Farm & Home Advisor Dept., San Diego, California, UCSGEP-SD 95-6.
Source: University of California Sea Grant Extension Program, Cooperative Extension, 5555 Overland Ave., Building 4, San Diego, CA 92123, (619) 694-2845.

Excellent, comprehensive guide to pollution prevention for boaters maintaining their boats in the marina. Many vessel cleaning and maintenance products used in marinas, including leftover paints, solvents, and engine cleaners are toxic to marine life in the water and sediments and must be disposed as hazardous waste. The last page of this pamphlet contains collection and disposal information for such products. It also includes pollution prevention tips for contaminated bilge water, do-it-yourself maintenance, spill cleanup and prevention, marine debris, boat cleaning and maintenance in the slip, painting & cleaning a boat.

26. Coastal Resource Center (1992) *Launching a Recycling Program at Your Marina*, California Department of Conservation, Division of Recycling & the Planning & Conservation League Foundation.
Source: Coastal Resources Center, World Trade Center, Ste 250-L , San Francisco, CA 94111, (415) 788-6150.

The Marine Plastic Pollution Research Control Act of 1989 (MARPOL Annex V) that reduced the amount of plastics dumped at sea, increased the amount of plastics brought to shore. This became a new challenge. The CRC studied the economic possibility of recycling at marinas beginning with set up, operation & start up costs, publicity, signage and maintenance. Coastal Resource Center piloted this project at Pillar Point Harbor.

27. Connell, Des W. and Gregory J Miller (1984) *Chemistry and Ecotoxicology of Pollution*, John Wiley & Sons, NY.
Source: Library

Excellent, comprehensive and detailed book of the environmental fate and the effects of atmospheric, domestic, industrial and agricultural wastes on complex ecosystems. Pollution comes from substances created from human and sometimes nonhuman activities that, when added to the environment, cause detrimental alterations to physical, chemical, biological or aesthetic characteristics of the environment. This book outlines the sequence of interactions

and effects controlled by a pollutants particular chemical and physical properties including dispersal, degradation, chemical alteration, etc. and the effects on marine and freshwater animals.

28. Conway, J. B. & Loren P. Locke (1994) *A Final Report On: Marine Fouling and Underwater Hull Cleaning in San Diego Bay*, Prepared for the Regional Water Quality Control Board, San Diego Region.
Source: San Diego Regional Water Quality Control Board, 9771 Clairemont Mesa Blvd., Ste 8, San Diego, CA 92124, (619) 467-2976.

Assess the environmental impacts of underwater hull cleaning practices. Primary objectives included, estimating how much underwater cleaning is performed, who performs the cleaning, what techniques are being used and to determine the perceived benefits and impacts of underwater cleaning. Other objectives were to determine how often vessels were cleaned in water versus at haul out, how often were boats painted, and whether concerned groups agreed on the scope and practice of underwater hull cleaning in San Diego Bay.

29. Daniels, Scott (1992) *Development and Implementation of a Boat Waste Control Program*, Kitsap County Boat Waste Control Program Water Quality Monitoring Report for the Washington Department of Ecology Centennial Clean Water Fund Grant #TAX-91021.
Source: Bremerton-Kitsap County Health District, 109 Austin Dr., Bremerton, WA 98312, (206) 478-5235.

The study was to determined the presence & extent of water quality contamination in Kitsap County. Four marinas were surveyed see if water quality changes outside of the marina. Results suggested increased levels of coliform bacteria found inside a marina mean illegal sewage discharges have occurred inside the marina.

30. Daniels, Scott (1992) *Development and Implementation of a Boat Waste Control Program*, Kitsap County Boat Waste Control Program Corrective Action Strategy Report for the Washington Department of Ecology Centennial Clean Water Fund Grant #TAX-91021.
Source: Bremerton-Kitsap County Health District, 109 Austin Dr., Bremerton, WA 98312, (206) 478-5235.

Water quality violations usually result from several nonpoint pollution sources, for example, discharge from boats in small bays and inlets may contribute bacteria and other pathogens affecting shellfish harvesting and consumption, swimming and other beneficial uses. Local governments, citizens, commercial shellfish harvesters and boaters agreed on the need for nonpoint source pollution control through regulatory and educational efforts like those outlined in this project as a means to improve water quality.

31. Dawe, Clyde J (1990) "Implications of aquatic animal health for human health," *Environmental Health Perspectives* 86:245-255.
Source: Library

This paper discusses the relationship between human health and aquatic animal health. Aquatic animals contribute nutritional protein, lipid and vitamin requirements to humans but also carry and transmit many infectious and parasitic diseases. Aquatic animals can indicate toxic & carcinogenic substances partially conveyed from aquatic environments to man and other terrestrial animals. The last century

shows that human activities, especially over-harvesting of aquatic animals and chemical degradation of their habitats, can quickly lead to drastic shifts of aquatic ecosystems toward low productivity and limited function as one of earths's vital organs.

32. Edwards, Larry (1989) "In-the-water Boat Maintenance Could be Illegal." *San Diego Log*, October 27.
Source: San Diego Log, 1025 Rosecrans, San Diego, CA, (619) 226-1608

This article covers a presentation by the San Diego Hazardous Waste Task Force that enforces the Clean Water Act in navigable waters such as San Diego Bay. The Task Force addressed discharge issues & NPDES permits at a Dockmasters' Group meeting at Southwestern Yacht Club. In general, the article discusses the fate of underwater hull cleaners and guidelines for what constitutes legal and illegal behavior (e.g. if only marine growth is cleaned off a hull, this may not be a violation, if paint chips enter the water, this is a violation).

33. Environmental Health Services (1990) *San Diego Bay Health Risk Study*, San Diego County Department of Health Services, San Diego, California.
Source: San Diego County Department of Health Services Environmental Health Services, P.O. Box 85261, San Diego, CA 92138-5261, (619) 338-2222

The purpose of this health risk study was to estimate the potential risk to human health from consuming fish caught from San Diego Bay. An initial screen used muscle & liver tissue samples from the stingray (*Urolophus halleri*) and barred sand bass (*Paralabrax nubulifer*) which were analyzed for U.S. Environmental Protection Agency (EPA) Priority Pollutant chemicals, 301(b) pesticides, organotins and radionuclides. A concurrent angular survey followed 369 anglers for one year to identify common fish caught, angler demographics & to determine fish eating patterns of anglers and others who eat the fish. The survey identified the population at risk and performed a risk assessment using the data.

34. Faris, Jeannie & Kathy Hart (undated) *Sea of Debris: A Summary of the Third International Conference on Marine Debris 1994*, North Carolina Sea Grant College Program & the National Oceanic & Atmospheric Administration.
Source: Alaska Fisheries Science Center, NOAA/NMFS, 7600 Sand Point Way NE, Seattle, WA 98115-0070.

Summary of a conference held in Miami, Florida to discuss problems of and solutions to marine debris. Attendees included resource manages, industrial leaders, coastal cleanup organizers, waste management officials, scientists, conservationists and leaders of international organizations. The ideas and solutions contained in this summary range from drafting simple educational messages to development of new technologies all directed to reducing debris.

35. Ford, Richard F. Ph.D. (1994) *Habitat Requirements and Seasonal Patterns of Distribution and Abundance for Fishes of Inner San Diego Bay,* Prepared for San Diego Regional Water Quality Control Board and Teledyne Research Assistance Program.
Source: San Diego Regional Water Quality Control Board, 9771 Clairemont Mesa Blvd., Ste 8, San Diego, CA 92124, (619) 467-2976.

The purpose of this research was to make detailed analyses of existing data on the marine fishes of inner San Diego Bay in order to better understand their habitat requirements and size specific seasonal patterns of distribution and abundance. The report provides fold out maps

of the habitat areas for the various fish studied. Preliminary studies made clear to the researchers that inner San Diego Bay is an important environment for marine fishes. A variety of fish habitats serve as nurseries for the young of several important species. Nursery habitat maintains the fish fauna of the entire bay and contribute to oceanic populations.

36. Ford, Richard F. Ph.D. (1994) *Marine Habitats of San Diego Bay: the Changes that have Produced their Present Condition and their Vulnerability to Effects of Pollution and Disturbance,* Prepared for the San Diego Regional Water Quality Control Board and Teledyne Research Assistance Program, Teledyne Ryan Aeronautical.
Source: San Diego Regional Water Quality Control Board, 9771 Clairemont Mesa Blvd., Ste 8, San Diego, CA 92124, (619) 467-2976.

The objective of this report is to provide the San Diego Regional Water Quality Control Board and others who enjoy using the bay with detailed descriptions of both natural and modified marine habitats and their vulnerability to human activities. This document shows where specific marine habitats are located within the bay, how they have changed and how vulnerable they are to specific pollution and disturbance effects.

37. Fugro McClelland (1992) *Best Management Practices for Coastal Marinas,* written for Connecticut Department of Environmental Protection, Office of Long Island Sound Programs and Bureau of Water Management.
Source: *No address or phone number available*

This report provides an overview of potential impacts from marina facilities, identifies operational and structural practices for addressing those potential impacts and suggests ways to implement these practices. The main objective of this document is to establish a program of best management practices (BMPs) under Section 319 of the Clean Water Act and Section 6217 of the Federal Coastal Zone Management Act.

Section 2.0 of this document lists potential impacts for marina and marina-like activities. Section 3.0 provides specific BMPs for routine operations and activities such as, boat maintenance and repair, cleaning, scraping and sandblasting, painting, hazardous material disposal and stormwater runoff management. Section 4.0 covers structural BMPs to physically control nonpoint source pollution in all marinas.

Section 5.0 identifies regulatory and non-regulatory institutional mechanisms to implement and enforce BMPs. It discusses a three tiered approach for applying BMPs to existing facilities, proposed improvements and new marinas. This approach might reduce associated costs by calibrating the implementation speed.

38. Fuzetron, Inc. Specialty Coatings (undated) "Barnacle Buster B-53 Boat Bottom Coating," Fuzetron, Inc., La Mesa, California.
Source: Fuzetron, Inc., Specialty Coatings 10303 Centinella Drive. La Mesa, CA 91941-7055, (619) 670-4574.

Describes the environmental compliance aspects of the product. The product is a non-toxic, non-polluting bottom coating containing no pesticides or volatile organic compounds (VOCs). This article describes the non-toxic and non-polluting aspects of the product, the polymerization process of the coating, application, maintenance, preparation, storage and handling information.

39. Fuzetron, Inc. Specialty Coatings (undated) "Material Safety Data Sheet, Fuzetron Product B-53," Fuzetron, Inc., La Mesa, California.
Source: Fuzetron, Inc., Specialty Coatings 10303 Centinella Drive. La Mesa, CA 91941-7055, (619) 670-4574.

Includes technical data for the product B-53. Provides a description of the hazardous components, physical data such as boiling point, weight per gallon, fire and explosion information, health hazard data including toxicity threshold levels, reactivity, spill or leak procedures, handling and use information and special precautions.

40. Fuzetron, Inc. Specialty Coatings (undated) "Product Information, Fuzetron B-53," Fuzetron, Inc., La Mesa, California.
Source: Fuzetron, Inc., Specialty Coatings 10303 Centinella Drive. La Mesa, CA 91941-7055, (619) 670-4574.

This document describes the product itself. Fuzetron is a low cleaning/fouling release hull coating with no VOCs. The coating does not ablate over time, lasting for several years in marine and freshwater environments. Fuzetron B-53 is a polymer coating designed to perform electrical and mechanical functions of corrosion resistant coatings. B-53 on test boats in San Diego Bay prevented fouling growth for 9 months including summer months. The article discusses safety and health issues related to use. Fuzetron, Inc included test results from the B-53 product, packaging instructions and typical properties.

41. Gilmore Research Group. (1989) *The 1988 Puget Sound Recreational Boaters Survey and Executive Summary,* for the Washington Public Ports Association and Parks and Recreation Commission, Washington.
Source: *No address or phone number available*

The Gilmore Research Group surveyed 3,144 Puget Sound recreational boaters to study their waste disposal practices and equipment, the relationship between boater demographics and waste disposal practices and boater perceptions of water pollution in Puget Sound. The Economic Impact Section studied the retail spending of 568 boaters & profiled their spending patterns. The Environmental Impact Section describes demographic characteristics of recreational boating in the Puget Sound area, assesses types of toilet equipment carried by recreational boaters on Puget Sound. It also assesses boater awareness of water quality issues and informs boaters on environmental effects of boating on Puget Sound.

42. Gorke, Roger; Bower, Aimée (1993) *Heal the Bay's State of the Marina Report, Marina del Rey*, Heal the Bay, Santa Monica, California.
Source: Heal the Bay, 2701 Ocean Park, Suite 150, Santa Monica, CA 90405, (310) 581-4195.

This study provides a historical background on the establishment and pollution problems of Marina del Rey. The Impacts on Marine Life section discusses the effects of pollutants on bottom ecology & on its nursery capacities. The section devoted to water quality provides information on the amount of dissolved oxygen (DO), nutrients, and bacteria in Marina del Rey. It also covers dredging activities. Graphs give locations of toxic hot spots for DDT, Chlordane, copper and lead. General recommendations from Heal the Bay on pollution prevention also cover best management practices for boat cleaning.

43. Goyer, Robert A. (1991) "Toxic effects of metals," *Casarett and Doull's Toxicology: The Basic Science of Poisons 4th Edition*, Amdur, Mary, Doull, John & Klaassen, Curtis eds.
Source: Library

Discusses the effects of arsenic, beryllium, cadmium, chromium, lead, mercury, nickel, cobalt, copper, iron, mercury and zinc among others. Focus is on human health and animal health effects for exposures under several conditions. Body storage, biological interactions reproductive effects, etc. are presented as well. Excellent reference for toxicological effects of metals and other toxicants and toxins.

44. Heal the Bay (1994) *Urban Runoff: A Pollution Abatement Program*, Developed for the Cities of Los Angeles County by Heal The Bay, Santa Monica, California.
Source: Heal the Bay, 2701 Ocean Park, Suite 150, Santa Monica, CA 90405, (310) 581-4195.

Provides guidance for installing an urban runoff abatement and education program. The stencil created by Heal the Bay for this project is included along with costs of materials and names of stencil companies. Also provides information on how to set up a gutter patrol group, best management practices (BMPs) for various land uses and a list of City ordinances encompassing urban stormwater minimization. The BMPs suggested in this manual were gleaned from several local and national sources.

45. Hollin, Dewayne & Steven R. Wind (1981) *Cutting Fuel Costs, Alternatives for Commercial Fishermen*, Texas A & M University Sea Grant College Program, College Station, Texas.
Source: Texas A & M University Sea Grant College Program, 1716 Briarcrest Drive, Ste. 702, Bryan, TX 77802, (409) 845-3857.

Provides long and short term guidelines to maintain fuel efficiency on a boat. Includes information on the characteristics of several hull paints & their effects on fuel consumption.

46. Ignelze, R. J. (1994) "Building a case against unlicensed contractors," *The San Diego Union-Tribune,* Monday, October 10.
Source: The San Diego Union Tribune, 350 Camino Del La Reina, San Diego, CA 92108, (619) 293-1211 or (800) 533-8830.

Details how to choose a contractor, what to be aware of, where to get information on contractors' license numbers and how to protect yourself.

47. Interlux (1994) *Boater's Painting Guide to Bottom Paints, Topside Enamels, Varnishes, Stains & Fillers and Interprotect*, Courtaulds Coatings Inc., San Diego, California.
Source: Courtaulds Coatings Inc. 8297 Whelan Drive, San Diego, CA 92119, (619) 466-2125.

This brochure details the prices and paints available from Interlux. Contains information on application, hull preparation and other considerations a boater might need when selecting a hull paint.

48. Jayne, Deborah S. (1992) *Staff report on petitions to downgrade threat to water quality and complexity ratings for Campbell Industries, Southwest Marine and National Steel and Shipbuilding Company shipyards*, California Regional Water Quality Control Board, San Diego Region.
Source: San Diego Regional Water Quality Control Board, 9771 Clairemont Mesa Blvd., Ste 8, San Diego, CA 92124, (619) 467-2972.

Three companies applied for NPDES rating downgrade, this report researches the present classification and determines why ratings stand as they are. Contains information on the toxicity of copper, zinc and TBT as well as the constituents of typical paints at a boatyard as well as the toxicants in thinners.

49. Johnson, Chris (1993) *A Hazardous Waste Resource Manual for the Marine Service Industry*, Puget Sound Alliance.
Source: Puget Sound Alliance, 130 Nickerson, Ste. 107, Seattle, WA 98109, (206) 286-1309.

Describes best management practices (BMPs) to reduce pollution, pollution prevention planning, and pollution prevention opportunities in case studies of 4 boatyards and one shipyard (summarized in Chapter 5). Chapter 6 discusses the environmental regulations. The last chapter contains phone numbers of State and Federal organizations, services for waste oil recycling, hazardous materials disposal, materials exchange services,

products (e.g. water based paints, alternative degreasers, and alternative paint strippers). Appendix A contains an essay, "Best Management Practices for Ship and Boat Building and Repair Yards (1989)". Appendix B includes samples of do-it-yourself and employee BMPs from boatyards and shipyards.

50. Kramer, Sharon H. (1990) "Distribution and Abundance of Juvenile California Halibut, *Paralichthys californicus*, in Shallow Waters of San Diego County," In: Haugen, Charles W., (1990), *The California Halibut*, Paralichthys californicus, *Resource and Fisheries*, California Department of Fish and Game, *Fish Bulletin* 174: 99-126.

Contains data on the distribution & abundance of juvenile California Halibut, *Paralichthys californicus*, as determined for bay and open coast habitats over 2 years. Kramer found that juveniles between 60 & 100 mm lived in the bays and eventually settled on the open coast or died. Juvenile halibut were primarily found in the bays, especially shallow shoreline habitats (depth $\leq$ 1 m). Larger juveniles (140 mm) occurred on the open coast. Results suggest that bays are likely essential habitats for juvenile fish growth and survival.

51. Leet, William S., Dewees, Christopher M. and Charles W. Haugen, eds. (1992) *California's Living Marine Resources and Their Utilization*, Sea Grant Extension, Davis, California.
Source: Sea Grant Extension Program, Department of Wildlife and Fisheries Biology, University of California, Davis, CA 95616-8751.

This book was originally prepared for the California legislature. It is an invaluable resource for California's economically important marine species. Fisheries, the fishing industry, and educators will find this book useful since increased concern about marine environmental issues means a greater need for this type of information. Fulfilling its main purpose, this book provides baseline information for those concerned with living marine resource management in California.

52. Lewis, Michael A. (1992) "The effects of mixtures and other environmental modifying factors on the toxicities of surfactants on freshwater and marine life, " *Water Resources* 26: 1013-1023.

Discusses the toxicities of surfactants in the environment. For example, how they are effected by several interacting physical, chemical and biological factors. The paper suggests that water conditions have a significant effect on toxicity. Environmental factors studied were; chemical and surfactant mixtures, dissolved oxygen, salinity, season, suspended solids, dissolved organic substances and temperature.

53. Long Beach Marine Bureau (1986) *Long Beach Marina Rules & Regulations*, Long Beach Marine Bureau, Long Beach, California
Source: Long Beach Marine Bureau, 450 East Shoreline Dr., Long Beach, CA 90802, (213) 437-0375.

This brochure describes the laws, required permits, fees, rates, charges and regulations governing activities in Long Beach marinas. It also talks about how the Long Beach Municipal Code affects marina tenants and boat owners including general dock storage requirements, stairs and walkways, rowboat or yacht tenders, dogs, swimming, fishing, signs, etc. The last section discusses laws and ordinances enforceable by designated marine bureau employees such as the California Harbors and Navigation Code Section, California Administrative Code, California Vehicle Code

Sections, Long Beach Municipal Code Sections and California Penal Code Sections.

54. Long Beach Parks, Recreation & Marine (1993) "Changes are on the Way," *Marina Reader*, Long Beach Parks, Recreation, and Marine, Long Beach, California.
Source: Long Beach Parks, Recreation and Marine, Alamitos Bay Marina, 205 Marina Drive, Long Beach, CA 90803, (310) 594-0951.

This newsletter describes new environmental policies to comply with regulations that will become federal law. Several articles explain the new rules to make them easier to follow. The Marina Environmental Policies section discusses rules for self-employed workers, boaters working on boats in the marinas, best management practices for engines and bilges, painting and varnishing, surface preparation, sewage, solid waste disposal, chemical storage and environmentally sound cleaning practices. The newsletter urges boaters to be responsible for their actions and provides a number of practices to do so.

55. Longmore, Jeff (1981) "Anti-fouling bottom paints and fishing vessel fuel efficiency," *SNAME/NOAA Fishing Industry Energy Conservation Conference in Seattle Washington*, California Energy Extension Service, University of California, Sea Grant Extension.
Source: Society of Naval Architects and Marine Engineers, Seattle, WA, One World Trade Center, Suite 1369, New York, NY 10048.

Describes several antifouling paints; soft sloughing, ablative, and conventional paints. Contains information on the relative price (inexpensive or expensive), mechanism of antifouling, and texture of the paint. Useful for getting a general idea of the different paints available an their effects on fuel consumption.

56. Los Angeles County (1993) Municipal Stormwater Permit for Los Angeles County, Attachment 1, Page 4, Los Angeles, California.
Source: Los Angels Regional Water Quality Control Board, 101 Centre City Plaza Dr., Monterey Park, CA 91754-2156, (213) 266-7598.

These are the minimum best management practices (BMPs) for stormwater management in Santa Monica Bay watershed. 13 BMPs cover an area wide stenciling program, increasing cleaning frequency of impervious surfaces, encouraging recycling of waste oil, antifreeze and other materials to prevent their introduction into the storm drains. Must have these BMPs in place before the LA Regional Water Quality Control Board will issue a Municipal Stormwater Permit.

57. Losson Appraisal Company (1993) *Boat Slip Rental Survey, Santa Barbara to San Diego, January, 1993*, County of Los Angeles Department of Beaches & Harbors, Los Angeles, California.
Source: Department of Beaches & Harbors, County of Los Angeles, 13837 Fiji Way, Marina del Rey, CA 90292, (310) 305-9533.

This survey provides information on the nature of boating in Southern California. The survey documents the number of slips, average size of slips and average rental rates for each marina from Santa Barbara to San Diego.

58. Lucas, Elizabeth (1991) *Baywatch, A Guide for Boaters*, Environmental Health Coalition, San Diego, California.
Source: Environmental Health Coalition, 1717 Kettner Blvd., Ste 100, San Diego, CA 92101-2532, (619) 235-0281.

Discusses pollution problems in San Diego Bay and provides a "10 Step Solution" to reduce pollution during boat care. *Baywatch* covers best management practices to control pollution from oil, fuel, VOCs, paints, batteries, engines and appliances. The guide also presents options for anti-fouling techniques, care of teak

components and marine sanitation devices. There is a spill reporting guide and a list of numbers to call for various problems from recycling to spills to the weather. *Baywatch* also contains a map of fuel docks and pump out facilities.

59. Maher, Eileen (1994) "Dredging Projects in San Diego Bay," abstract: Sea Grant Workshop, San Diego Port District, San Diego, California.
Source: Environmental Management Department, San Diego Unified Port District, P. O. Box 488, San Diego, CA 92112, (619) 686-6254.

The San Diego Unified Port District participated in a Sea Grant Workshop on Environmental Applications of Marine Biotechnologies which discussed sediment contamination in San Diego Bay. Contains a list of dredging projects, their costs and the amount of sediment dredged.

60. Mallon, Michael H. & Edward Kolbe (1979) *Cathodic protection for boats in saltwater*, Oregon State Sea Grant Extension Marine Advisory Program A Land Grant & Sea Grant Cooperative, SG 46.
Source: Oregon State Sea Grant Communication Office, Administration Services A402 Oregon State University, Corvallis, Oregon 97331-2134.

Cathodic protection is important for boats stored in water since uncontained electricity can decrease antifouling paint effectiveness in addition to speeding up corrosion of metals on a boat. This guide has information on how to protect paints, metals and other important components of a boat from electric current and corrosion.

61. Mann, H (1964) "Effects on the flavor of fishes by oils and phenols," *Symp. Pollt. Mar. Micro-org. Prod. Petrol. Monaco* 1964: 371-374
Source: Library

Discusses how oils affects fish flavor when introduced into the marine environment.

62. Marin County Office of Waste Management (1993) *Pollution Prevention at Marinas*, Marin County Office of Waste Management, Marin, California.
Source: Marin County Office of Waste Management, 10 N. San Pedro Rd., Room 1022, San Rafael, CA 94903, (415) 499-6647.

This guide addresses pollution prevention measures for marinas that use education & cooperation between marinas & boaters to achieve pollution prevention. The guide considers many options for best management practices for waste and oil spills, pump out facilities, boat cleaning & maintenance and hazardous waste disposal. The concluding chapter lists tips for boaters to prevent pollution from these sources and phone numbers to call for recycling or disposal of hazardous wastes such as oil and antifreeze.

63. McCain, Bruce B. *et. al*. (1992) "Chemical contamination and associated fish diseases in San Diego Bay," *Environmental Science and Technology* 26(4): 725-733.
Source: Library

This study looked at chemical pollution at sites in or near San Diego Bay between 1984 and 1988. Results suggest that sediment pollutant levels of polychlorinated biphenyls (PCBs), metals (copper & lead) and aromatic hydrocarbons from sites in the bay were much higher than in sediment from nearby nonurban sites. Concentrations of PCBs in liver tissue and of selected aromatic compounds and their metabolites in bile were also significantly higher in white croaker (*Genyonemus lineatus*), barred sand bass (*Paralabrax nebulifer*) and black croaker (*Cheilotrema saturnum*) from one or more sites within the bay compared to those from the nonurban sites. In addition, fin erosion and liver cancers were more common in fish living in more

contaminated sites that were near urban areas than in fish from nonurban areas.

64. McCoy, Erika J. A. & Leigh Taylor Johnson (1995) *Boating Pollution, Economics and Impacts*, University of California Sea Grant Extension Program, Cooperative Extension, County of San Diego Farm and Home Advisor Department, San Diego, California, UCSGEP-SD 95-8.
Source: University of California Sea Grant Extension Program, Cooperative Extension, 5555 Overland Ave., Building 4, San Diego, CA 92123, (619) 694-2845.

This fold out table style publication describes the impacts of boating pollutants like soaps, oils, fuels, metals (in hull paints, sacrificial metals and those in boating products) and other boating and marina related pollutants. Contains a section on the economic impacts of boating pollution such as increased dredging costs, which can lead to increased slip rental rates, and decreased commercial fish hauls.

65. McCoy, Erika J. A. & Leigh Taylor Johnson (1995) *Selecting a Hull Paint for Your Boat*, University of California Sea Grant Extension Program, Cooperative Extension, County of San Diego Farm and Home Advisor Department, San Diego, California, UCSGEP-SD 95-4.
Source: University of California Sea Grant Extension Program, Cooperative Extension, 5555 Overland Ave., Building 4, San Diego, CA 92123, (619) 694-2845.

This is a summary guide to selecting a bottom paint for boats in sea or fresh water. Aimed at boaters, this publication contains sections dealing with environmental and cost selection factors and notes on hull cleaning, hull preparation and paint application. Each type of paint has detailed information on cost, antifouling method, environmental considerations, fuel conservation performance and how long each paint lasts.

66. McCoy, Erika J. A. & Leigh Taylor Johnson (1995) *Selecting Underwater & Topside Maintenance Services for Your Boat*, University of California Sea Grant Extension Program, Cooperative Extension, County of San Diego Farm and Home Advisor Department, San Diego, California, UCSGEP-SD 95-2.
Source: University of California Sea Grant Extension Program, Cooperative Extension, 5555 Overland Ave., Building 4, San Diego, CA 92123, (619) 694-2845.

This guide teaches boaters how to protect themselves and the environment by choosing a service provider who follows best management practices. It gives details on what to look for in a professional underwater hull cleaner, painter, sander, topside cleaner and for service providers who care for teak deck or trim. In addition, this publication suggests environmentally sound alternatives and practices to protect the marine waters.

67. McCoy, Erika J. A. & Leigh Taylor Johnson (1995) *Underwater Hull Cleaner Best Management Practices*, University of California Sea Grant Extension Program, Cooperative Extension, County of San Diego Farm and Home Advisor Department, San Diego, California, UCSGEP-SD 95-2.
Source: University of California Sea Grant Extension Program, Cooperative Extension, 5555 Overland Ave., Building 4, San Diego, CA 92123, (619) 694-2845.

This wallet sized publication is directed towards underwater hull cleaners. The best management practices outlined in this publication helps underwater hull cleaners protect the environment and better serve their clients. David Bear, a local underwater hull cleaner, developed these practices. This brochure also provides information to aid in

advising clients.

68. McMahon (1989) "The impacts of marinas on water quality," *Water Science and Technology* 21(2): 39-43.
Source: Library

Discusses the impacts marinas have on the marine environment including the effects of various pollutants on the sediment and water quality.

69. McPherson, Tim N. and Grieg B. Peters (1995) *The Effects of Copper-based Antifouling Paints on Water Quality in Recreational Boat Marinas in San Diego and Mission Bays*, California Regional Water Quality Control Board San Diego, California.
Source: San Diego Regional Water Quality Control Board, 9771 Clairemont Mesa Blvd., Ste 8, San Diego, CA 92124, (619) 467-2976.

Study objectives were to determine the amount of copper and paint released during underwater hull cleaning using best management practices in a recreational marina. The toxicity associated with in water maintenance as well as with ambient concentrations of copper were assessed. They also evaluated the effect of tidal cycle on ambient copper concentrations in a San Diego Bay yacht harbor.

70. Metro (1991) *Boatyard Wastewater Treatment Guidelines*, Municipality of Metropolitan Seattle Water Pollution Control Department, Industrial Waste Section; Seattle, Washington.
Source: Municipality of Metropolitan Seattle, Water Pollution Control Department, Industrial Waste Section, 130 Nickerson St., Ste. 200, Seattle, WA 98109-1658, (206) 689-3000.

This guide covers regulations associated with the marine repair business such as, selecting a discharge route for waste water, collecting and treating pressure washing wastewater, obtaining permits, preparing a discharge treatment system and maintaining a compliance checklist. The guide also provides succinct explanations of the different possibilities, the differences between treatment systems, choosing an appropriate treatment system and their costs.

71. Michael, Pete (1994) Memo regarding the differences between the Agriculture Code and the Water Code, Regional Water Quality Control Board, San Diego, California.
Source: San Diego Regional Water Quality Control Board, 9771 Clairemont Mesa Blvd., Ste 8, San Diego, CA 92124, (619) 467-2976.

Internal memo explaining the difference between the Agriculture Code and the Water Code regarding cuprous oxide and TBT anti-fouling paints. This includes regulation for application, in water use and release into the marine environment.

72. Michael, Peter (1990) "Memorandum Re: America's Cup Environmental Committee Meeting," Regional Water Quality Control Board, San Diego, California.
Source: San Diego Regional Water Quality Control Board, 9771 Clairemont Mesa Blvd., Ste. 8, San Diego, CA 92124, (619) 467-2990.

Contains ideas to avoid environmental problems associated with the America's Cup competition. Good set of ideas for BMPs to handle competitions like the America's Cup. Suggestions are in response to a letter from the chairman of the America's Cup Environmental Committee to the Regional Water Board.

73. Milliken, Andrew S. and Virginia Lee (1990) *Pollution Impacts From Recreational Boating*, Rhode Island Sea Grant, Narragansett, Rhode Island.
Source: University of Rhode Island, Graduate School of Oceanography, South Ferry Road,

Narragansett, RI 02882-1197, (401) 792-6224.

This document provides a bibliography and summary review of topics such as, boat sewage, engine pollution, anti-fouling paints and plastic debris. Appendix II contains policies and formulas to determine the appropriate number of boats in harbors.

74. Mission Bay Marina (1994) *Environmental Protection Best Management Practices Mission Bay Marina*, Mission Bay Marina, San Diego, California.
Source: Mission Bay Marina, 1500 Quivira Way, San Diego, CA (619) 223-5191.

Best management plan for Mission Bay Marina. Establishes responsibilities & actions of staff, management & tenants to prevent pollution including security, safety training and inspection reports and tables.

75. Mitchell, Senator (1994) "Draft of Eighth Amendment to the Clean Water Act Reauthorization."
Source: Local representative.

Senator Mitchell proposed stronger language to protect coastal resources under the Federal Clean Water Act. The suggested language modifies Section 801 (National Estuary Program), Section 802 (Marine Water Quality Criteria and Standards), Section 803 (National Marine Water Quality Education Program), Section 804 (Marine Sanitation Devices), Section 805 (Ocean Discharge Criteria), Section 806 (Combined Sewer Overflow Control Assistance), Section 807 (Coastal Beach Water Quality Monitoring), Section 809 (Definitions) and Section 810 (Pollution from Ships).

76. Murchelano, Robert A (1990) "Fish health and environmental health," *Environmental Health Perspectives* 86: 257-259.
Source: Library

These surveys were conducted to evaluate the health of marine-bottom fishes in eastern and western North Atlantic over 15 years. Fish health was evaluated using certain skin & skeletal lesions and anomalies as markers of poor health. This and other monitoring programs found that fish living next to urban areas had higher instances of disease and that sediments and marine animals had higher levels of contaminants.

77. National Marine Manufacturers Association (undated) *Water Watch: What Boaters Can Do To Be Environmentally Friendly*, National Marine Manufacturers Association, Chicago, Illinois.
Source: National Marine Manufacturers Association, 401 N. Michigan Ave. #1150, Chicago, IL 60611.

Short summary of best management practices to control boat sewage, antifouling pollution, cleaning agents, fueling, engine maintenance and environmentally friendly fishing practices. Comprehensively covers several issues facing boaters when trying to be environmentally conscious.

78. Neff, J. M. (1979) *Polycyclic Aromatic Hydrocarbons in the Aquatic Environment*, Applied Science Publishers, London.
Source: Library

Provided information on the fate and effects of aromatic hydrocarbons in the marine environment.

79. Nelson-Smith, A. (1973) *Oil Pollution and Marine Ecology*, Plenum Press, N.Y.
Source: Library

Discusses the environmental fate and impact of oil pollution. One section talks about how surfactants disperse oil spills, their environmental fate, effects and impacts in

marine waters. Excellent technical reference for understanding how surfactants are toxic to marine environments as well as what happens to the oil once it is dispersed.

80. Nemerow, Nelson L. (1991) *Stream, Lake, Estuary and Ocean Pollution, 2nd Edition*, Van Nostrand Reinhold, New York.
Source: Library

This book provides methods for analyzing water quality. Information is balanced between how biological, hydrological and biochemical aspects of stream analysis interrelate. Chapter twelve in particular discusses coastal area characteristics and pollution sources. Also addressed is the diffusion of pollutants over a broad area in the ocean, the purity of ocean water and the effect on long marine food chains.

81. Nielsen Beaumont Marine, Inc. (1994) *Best Management Plan*. San Diego, California.
Source: Nielsen Beaumont Marine, Inc. 2420 Shelter Island Drive, San Diego, CA 92106, (619) 222-4255.

The *Best Management Plan* for Nielsen Beaumont Marine, Inc. contains a description of the facility, a statement of the best management practice (BMP) policy and the objectives of the program and describes the duties of the BMP committee. The document also covers risk assessment and identification, reporting procedure for BMP incidents, materials compatibility, good housekeeping measures and preventative maintenance to prevent runoff from exiting the site. Also discusses inspections, record keeping methods, security measures and employee training procedure.

82. Nitta, T., *et. al*. (1965) “Studies on the problems of offensive odors in fish caused by wastes from petroleum industries (in Japanese with English summary). Bull. Tokay Region. Fish Res Lab. 42, 23.
Source: Library

Studied fish living around petroleum industries and the foul odor associated with them. Results indicate that living near the petroleum industries may have caused the distinct odor of the fish.

83. Office of Pollution Prevention and Technology Development (1993) *Hazardous Waste Minimization Checklist and Assessment Manual for Marine Ship and Pleasure Vessel Boatyards*, California Department of Toxic Substances Control, Sacramento, California..
Source: Department of Toxic Substances Control, Pollution Prevention, Public and Regulatory Assistance Program, P.O. Box 806, Sacramento, CA 95812-0806, (619) 322-3670.

The checklist format helps identify effective hazardous waste reduction measures for the marine industry. Marine repair and service yards provide highly diversified services and products generating wastes such as chemicals, petroleum products, paint and coating dusts. Section 2 ranks hazardous waste reduction possibilities. Section 3 has worksheets to determine costs and rates of return for waste reduction measures technically feasible for the yard.

84. Office of Pollution Prevention and Technology Development (1993) "Used Oil: Handling, Storage and Transport for Recycling," California Department of Toxic Substances Control, Sacramento, California.
Source: Department of Toxic Substances Control, Pollution Prevention, Public and Regulatory Assistance Program, P.O. Box 806, Sacramento, CA 95812-0806, (916) 322-3670.

Outlines the general requirements for the management of used oil by businesses in California. Provides definitions of used oil & recycled oil. Weather resistant labeling, fees, identification numbers and manifest systems are discussed for handling, transport and storage of used oil.

85. Office of Pollution Prevention and Technology Development (1993) "Used Oil Filters: Handling, Storage and Transport for Recycling," California Department of Toxic Substances Control.
Source: Department of Toxic Substances Control, Pollution Prevention, Public and Regulatory Assistance Program, P.O. Box 806, Sacramento, CA 95812-0806, (916) 322-3670.

Outlines the general requirements for management of used oil filters including handling, transport, draining of filters, containers, container labeling, storage and bills of loading.

86. Pettit Paint (1989) *Product Information Handbook*, Pettit Paint, Garden Grove, California
Source: Pettit paint, 10832 Blake Street, Garden Grove, CA 92643, (714) 537-4203.

Comprehensive binder style guide to the paints Pettit produces. Contains extensive information on hull preparation for each paint as well as ideal water conditions, toxicant levels, application procedures and antifouling performance.

87. Practical Sailor (1994) "Bottom Anti-foulants: Round 3 Produces Three Promising Paints," *Practical Sailor*, Greenwich, Connecticut.
Source: Practical Sailor Back Issues, 75 Holly Hill Lane, Greenwich, CT 06836, (203) 661-6111.

Practical Sailor regularly conducts tests of antifouling paints including their performance, costs, application and other information. They provide contact addresses for the paint companies involved in the study.

88. Practical Sailor (1994) "Peel Away Prevails in Safe Stripper Shoot-Out," *Practical Sailor* , Greenwich, Connecticut.
Source: Practical Sailor Back Issues, 75 Holly Hill Lane, Greenwich, CT 06836, (203) 661-6111.

Tests were conducted by Practical Sailor on safe paint strippers to determine their performance, costs and other information for use and selection of paint strippers.

89. Practical Sailor (1993) "Anti-fouling Alternatives: Beware Electronic Resonators!" *Practical Sailor* , Greenwich, Connecticut.
Source: Practical Sailor Back Issues, 75 Holly Hill Lane, Greenwich, CT 06836, (203) 661-6111.

Practical Sailor compared alternatives to antifouling paints and presented their results for boater information. In this case, Practical Sailor was especially unimpressed with electronic resonators as antifouling devices. Includes contact information for companies that make alternative antifouling products & recommendations for their use and selection.

90. Practical Sailor (1995) "Antifouling ‘95" *Practical Sailor*, Greenwich, Connecticut.
Source: Practical Sailor Back Issues, 75 Holly Hill Lane, Greenwich, CT 06836, (203) 661-6111.

1995 test of antifouling paints for performance, costs and application procedures. This article contains the results of current test and compares results with 1994 tests. Includes contact information for paint companies and recommendations for use and selection of hull paints.

91. Proline Paint Company (1994) *Bottom Coating Guide*, Proline Paint Company, San Diego, California.
Source: Proline paint Company, 2646 Main Street, San Diego, CA 92113-3697, (619) 231-2313.

This booklet covers the wide range of antifouling bottom paints produced by Proline

Paints. In addition it has information on hull preparation, application procedures and antifouling performance information according to water conditions.

92. Portland Ship Repair Yard (1992) *Environmental Best Management Practices (BMPs)*, Los Angeles, California.
Source: Los Angeles Regional Water Quality Control Board, 101 Centre City Plaza, Monterey Park, CA 91754, (213) 266-7617.

Contain best management practices (BMPs) to reduce pollution from Portland Ship Repair Yard. Discusses ethics, laws, economics, education of facility users, facility layout and schedule of maintenance activities. Also discusses the BMP Committee, disciplinary authority and actions for violations. An implementation schedule delineates the programs and practices with their key elements, implementation methods and responsible parties. Section 5.0 provides guidelines to assess the performance of BMPs and methods to rate effectiveness of BMPs.

93. Pyzoha, David S. (1994) I*mplementing a Stormwater Management Program*, CRC Press, Florida.
Source: Library

The purpose of this book is to assist public officials, lay people etc. in developing programs that address stormwater issues. Contains guidelines to develop a waste water management programs. In addition, it provides tips for developing ordinances, operation and maintenance programs, describes several legal aspects and some hints for success - organization.

94. Robbins, Gary (1991) "Scrapings From Boat Hulls Might be Fouling Newport Bay." *The Orange County Register*, Metro Section, July 9, page one.
Source: Environmental Health Coalition, 1717 Kettner, Ste. 100, San Diego, CA 92101, (619) 235-0821.

A study by the State found substantial amounts of copper and zinc were released into Newport Bay during underwater hull cleaning of a test boat. The California Regional Water Quality Control Board recommended further studies of the impact of these metals on marine bottom ecology. The study indicated estimated amounts of copper and zinc released into Bay waters from underwater hull cleaning greatly exceeded those released in shipyards.

95. San Diego Regional Water Quality Control Board (1994) *Basin Plan for the San Diego Region*, San Diego Regional Water Quality Control Board, San Diego, California.
Source: San Diego Regional Water Quality Control Board, 9771 Clairemont Mesa Blvd,. Ste. B, San Diego, CA 92124, (619) 467-2952.

This document discusses implementation of the National Pollutant Discharge Elimination System (NPDES) to control discharges into navigable waters. The Regional Water Quality Control Board regulates the quality and quantity of discharges to protect beneficial uses of California waters.

96. San Diego Unified Port District and the America's Cup Committee (1992) *1991 World Championship, Boating and Spectator Guide*, San Diego Unified Port District and the America's Cup Committee, San Diego, California.
Source: San Diego Unified Port District, P.O. Box 488, San Diego, CA 92112, (619) 686-6254.

Besides racing information, this brochure also provides a description of the laws and regulations governing garbage and plastics disposal, sewage disposal, special boating safety zones and oil spill protocols. Phone numbers are provided for the various cities, companies and agencies to troubleshoot problems. The lifeguard publication details

areas for waterskiing, sailing, swimming, fishing and a map of the designated location.

97. San Diego Unified Port District (1994) *San Diego Bay Boating Guide*, San Diego Unified Port District, San Diego, California.
Source: San Diego Unified Port District, P.O. Box 488, San Diego, CA 92112, (619) 686-6254.

This brochure gives tips on vessel safety, operation, equipment and basic rules for general safety. Launching ramp protocol and anchorage information is provided along with a map disclosing locations of launching ramps, pump out stations, Harbor Police, U.S. Customs, public fishing pier, fuel docks and small craft anchorages. There is also a list of pertinent phone numbers, weather display key to signals, description of channel buoys and a section on boater courtesy.

98. San Francisco Chronicle (1992) "Dow Discovery Could Clean up: Anti-graffiti Coating Called Great," *San Francisco Chronicle*, Tuesday, April 7.
Source: *No address or phone number available*

Dow Chemical Company created a water-based coating that nothing will stick to. The paint is transparent, kind to the environment and easy to apply. The non-stick coating, although still in the testing stages, might be used as an anti-graffiti paint or as a hull anti-fouling paint.

99. Santa Clara Valley Nonpoint Source Pollution Control Program (1994) *Draft EPA Parking Lot BMP Study*, Santa Clara, California.
Source: Santa Clara Valley Nonpoint Source Pollution Control Program, 5750 Almaden Expressway, San Jose, CA 95118, (408) 265-2600.

Describes a project to evaluate best management practices to control runoff from parking lots. Included are site selection criteria and best management practices to be tested. The material has an extensive reference list and could be useful for further research.

100. Santa Cruz Port District (1994)"Three Ways You Can Save Yourself Money," *Anchor Watch*, Santa Cruz Port District.
Source: Santa Cruz Port District, 135 Fifth Avenue, Santa Cruz, CA 95062, (408) 462-2830.

This article suggests ways to decrease costs associated with dredging toxic sediments. It emphasizes the dramatic cost increases to dispose toxic dredge material versus clean material. For example, it costs $5 to dredge and dispose of clean sediment and $40 for toxic sediments. Dredging is necessary to maintain Santa Cruz harbor, so dredging and disposal costs are part of slip rental rates. Here are their three ways to keep slip prices low by keeping pollution out of the water; use only legal paints, avoid rapid sloughing "soft" copper-based bottom paints and communicate directly with your hull cleaner.

101. SCS Engineers (1989) *Hazardous Waste Minimization Audit Study of Marineyards for Maintenance and Repair*, Prepared for California Department of Health Services, Alternative Technology and Policy Development Section, Sacramento, California.
Source: SCS Engineers, 3711 Long Beach Blvd., Ninth Floor, Long Beach, CA 90807, (310) 426-9544 or California Department of Health Services, Alternative Technology and Policy Development Section, Policy Development Section, 714/744 P Street, Sacramento, CA 95814, File No. 188057.00

This study focused on types and quantities of hazardous wastes generated by marineyard operations. Waste minimization studies looked at three marineyards that do ship and boat maintenance and repair. They concentrated on source reduction, those changes in processes that reduce the amount of wastes created in the first place. Some suggestions were, waste

segregation, waste reuse, inventory control, better housekeeping and, in some cases, in house recycling.

102. Soule, Dorothy F. *et.al.* (1993) *The Marine Environment of Marina Del Rey, Marine Studies of San Pedro Bay Part 21*, Department of Beaches and Harbors, County of Los Angeles, Harbors Environmental Projects, University of Southern California, Los Angeles, California.
Source: University of Southern California, Harbors Environmental Projects, Allan Hancock Foundation 139, Los Angeles, CA 90089-0371, (213) 740-5152.

This study was performed to answer the question, "...why, sometimes, a kid on the end of a dock can't catch a fish with his hook and line." It describes Marina del Rey, it's long term environmental studies and their results. The document discusses the physical water quality of Marina del Rey including the temperature, salinity, rainfall, DO, BOD, pH, water color and transparency, nutrient levels, sediment composition and contamination (metals, pesticides and chlorinated hydrocarbons). The bacteriology of the marina waters were discussed, especially in relation to public health. Benthic fauna and fish fauna were also studied.

103. Southwest Research Associates, Inc. (1994) *Draft Environmental Assessment Report for the 1994 International Americas' Cup World Championship*, Prepared for the United States Coast Guard and Americas' Cup 1995.
Source: Southwest Research Associates Inc., 2006 Palomar Airport Road, Ste 207, Carlsbad, CA 92008, (619) 431-5640.

Contains a list of environmental impacts that may result with increased use of San Diego and Mission Bays and the open ocean due to the America's Cup competition. Maps of the race areas show available pumpout stations, launch ramps and boatyards in San Diego and Mission Bays. The document describes the environmental setting of the bays and open ocean such as least tern and snowy plover habitat, eel grass beds and other sensitive habitats or endangered species. In addition, each discussion of an area of the race includes a list of agencies, institutions or groups that have jurisdiction over the race areas. Mitigation measures to reduce environmental impacts are also included.

An appendix contains a Yacht Club/Marina/ Boatyard Anchorage Annual Survey produced by the San Diego Unified Port District and the Harbor Police. This information includes the amount of slips available, slip rental rates, available pumpout facilities and more.

104. State Water Resources Control Board, Nonpoint Source Control Program (1994) *Final Report of the Marina and Recreational Boating Technical Advisory Committee*
Source: Pablo Guitierrez, State Water Resources Control Board, Nonpoint Source Control Program, 901 'P' St. Sacramento, CA 95814, (916) 657-0522.

The final report of the findings, recommendations and adjustments to update the Nonpoint Source Pollution Management Plan pursuant to the 1990 Coastal Zone Act Reauthorization Amendments for marinas and recreational boating. The technical advisory committee consisted of federal, state, and local agency personnel, marina owners and operators, businesses, marina and boating community educators and environmental groups. These additions revise the *Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters*.

105. State of California Regional Water Quality Control Board, San Diego Region (1990) "Clean up and Abatement Orders 88-79, 89-31, 89-18, 88-78, 89-32, 88-86 & 88-70," San Diego, California.
Source: San Diego Regional Water Quality Control Board, 9771 Clairemont Mesa Blvd.,

Ste B, San Diego, CA 92124, (619) 467-2952.

Seven boatyards were issued clean up and abatement orders from the Regional Water Quality Control Board in San Diego. Discharges from their facilities allegedly elevated concentrations of copper, mercury and tributyltin and violated NPDES permits. Clean up & abatement orders required each boatyard to prepare a remedial action alternatives analysis report (RAAAR) to evaluate sediment cleanup levels and recommend clean up alternatives. The results of the RAAAR reports are contained in this document.

106. State Water Resources Control Board, State of California, Protection and Toxic Cleanup Program (1993) *Status of the Bay Protection and Toxic Cleanup Program*, State Water Resources Control Board, State of California: Sacramento, California.
Source: State Water Resources Control Board, Nonpoint Source Control Program, 901 'P' St. Sacramento, CA 95814,
(916) 657-0522

The California Water Code Division 7, Chapter 5.6 established a comprehensive program to maintain existing and future beneficial uses of California bays and estuaries. This program protects bays and estuaries, determines and characterizes toxic hot spots (according to State Water Code Section 13393.5) and plans clean up, and prevention of further pollution. State law requires sediment quality objectives to provide adequate safety margins to protect the beneficial uses of the water. Objectives and requirements for clean up of toxic sediments are listed as well as the recommendations of the Bay Protection and Toxic Clean Up Program.

107. Tefft, Roger (1991) "In-water Hull Cleaning Pollutes Bay Water, Study Says," *The Log*, July 26, San Diego, California.
Source: San Diego Log, 1025 Rosecrans, San Diego, CA (619) 226-1608

This article discusses a study of increased concentrations of copper and zinc from underwater hull cleaning. Using a polyethylene hull liner, the data show that underwater hull cleaning increases levels of copper (0.02 mg/L before cleaning; 0.52 & 1.55 mg/L after cleaning) and zinc (0.27 mg/L before cleaning & 0.89 to 2.67 mg/L post cleaning) in the water.

108. Thomson, Cynthia J. and Stephen J. Crooke (1991) *Results of the Southern California Sportfish Economic Survey*, National Marine Fisheries Service, NOAA Technical Memorandum NOAA-TM-NMFS-SWFSC.
Source: National Technical Information Service, 5285 Port Royal Road, Springfield, VA 55167.

Comprehensive survey of the marine recreational fishery in southern California that provides information on fishing participation and related socioeconomic variables on a county by county basis. The survey targeted recreational anglers living in 8 counties (San Luis Obispo to San Diego) who had gone saltwater fishing in southern California in the last 12 months and persons living outside these coastal counties who fished in southern California in the last twelve months. This includes beach and pier fishing and fishing trips on commercial passenger fishing vessels.

109. Tobiasson, Bruce O., P. E. and Ronald C. Kollmeyer, Ph. D. (1991) *Marinas and Small Craft Harbors*, Van Nostrand Reinhold, New York, New York.
Source: Van Nostrand Reinhold 115 5th Ave, New York, New York.

This book defines marina planning, design & construction. Marina planning requires knowledge of several disciplines; financial issues, regulatory constraints, site selection criteria, civil works, climatic effects, environmental effects, protection considerations, vessel characteristics, layout parameters, construction materials etc. It

provides general and specific information and "rules of thumb" for several design concepts as well as information resources for specific areas of interest. This book can be used as a bridge between the unknown and that first step on the unexplored island of marina development.

110. United States Environmental Protection Agency (1993) *Guidance Specifying Management Measures For Sources of Nonpoint Pollution in Coastal Waters*, United States Environmental Protection Agency, Washington D.C.
Source: Environmental Protection Agency, 401 M Street, SW, Washington DC 20460, Doc # 840-B-92-002

Chapter Five of this document specifically addresses reducing pollution from marinas and recreational boating. Management measures are, economically achievable, broad categories of what sources of pollution need to be and can be reduced to the greatest degree. Management practices, on the other hand, are specific technologies or habits one can take to reduce pollution. Management practices are only included for illustrative purposes. This chapter describes 15 management measures grouped under two broad headings: (1) siting and design and (2) operation and maintenance. Each section provides a description of the purpose of the management measure including, the basis for selection, information on suitable management practices, information on the effectiveness of the management measure and the practices to achieve the measure and information concerning the costs of the measure and/or the practices to achieve those measures.

111. United States Environmental Protection Agency (1994) "Model "Bad Actor" Legislation Developed by the National Association of Conservation Grants," Washington D.C..
Source: USEPA, Water Quality Branch, 75 Hawthorne St., Sacramento, CA, (415) 744-2011.

The model "Bad actor" law was developed under a cooperative agreement with the EPA to help implement nonpoint source programs under Clean Water Act Reauthorization Amendments of 1990. Since some people may not participate in a voluntary program (bad-actors), a number of initiatives have been designed to kick in when voluntary approaches to reduce nonpoint source pollution fail to achieve compliance. This legislation is only one component of a comprehensive state water quality program.

112. United States Environmental Protection Agency, Office of Water (1993) *Stormwater Sampling Guidance Manual*, C.K. Smoley, CRC Press, Florida.
Source: *No address or phone number available*

This book serves as a manual for operators of facilities discharging stormwater or industrial effluent. Basic sampling methods are described to meet NPDES requirements for the associated permit. The book offers guidance on how to conduct sampling. This document was issued in support of EPA regulations and policy initiatives involving development and implementation of a national stormwater program. This document primarily for agency guidance.

113. United States Fish and Wildlife Service & the Department of the Interior (1994) "Digest of Federal Resource Laws of Interest to the US Fish and Wildlife Service."
Source: United States Fish and Wildlife Service, 2730 Loker Ave., Carlsbad, CA 92009, (619) 431-9440.

This reference summarizes the federal laws governing natural resources of interest to the USFWS. Authorized by 101 FW1 this directory is a component of the FWS directories system. It also includes administrative laws, treaties, interstate compacts, executive orders and memoranda of agreement relating to wetlands.

114. United States Fish and Wildlife Service & the Department of the Interior (undated) "Matrix of Coastal Authorities & Programs."
Source: United States Fish and Wildlife Service, 2730 Loker Ave., Carlsbad, CA 92009, (619) 431-9440.

The coastal matrix provides information on various service authorities, operational activities and funding capabilities that are directed to the conservation of coastal living resources. The matrix tells the purpose of each authority, its program type, location, available funding, typical projects and applications of projects. Useful to determine what agencies are involved in what types of projects.

115. United States Fish and Wildlife Service & the Department of the Interior (undated) "Meeting Coastal Challenges"
Source: United States Fish and Wildlife Service, 2730 Loker Ave., Carlsbad, CA 92009, (619) 431-9440.

Describes the USFWS role in protection of coastal resources in America. Also gives information on what activities have impacts, the effects of increased population in coastal areas and statistics on the importance of coastal wetlands. For example, coastal areas support about 50% of North America's migratory song birds of concern. More than 66% of fish harvested world-wide depend upon estuarine ecosystems for some part of their life cycle.

116. United States Fish and Wildlife Service & the Department of the Interior (undated) "Pesticide Use and Endangered Species"
Source: United States Fish and Wildlife Service, 2730 Loker Ave., Carlsbad, CA 92009, (619) 431-9440.

Briefly describes the requirements of the Endangered Species Act, why it is important to protect endangered species. The brochure also includes information on whether pesticides are actually affecting endangered species, the assumptions they need to make to progress and opportunities and actions people can take to provide input to federal programs.

117. United States Fish and Wildlife Service & the Department of the Interior (1977) "The US Fish and Who?," US Government Printing Office, Washington DC.
Source: United States Fish and Wildlife Service, 2730 Loker Ave., Carlsbad, CA 92009, (619) 431-9440.

Describes USFWS requirements to approve a coastal project. They provide a summary of their general and specific project guidelines for docks, moorages, platform structures, marinas and pair facilities, bulkheads and seawalls, jetties, channels and irrigation intakes, etc.

118. United States Fish and Wildlife Service & the Department of the Interior (1993) "Zinc Hazards to Fish, Wildlife and Vertebrates, A Synoptic Review," *Contaminant Hazard Reviews*, Report 26, Biological Report 10.
Source: United States Fish and Wildlife Service, 2730 Loker Ave., Carlsbad, CA 92009, (619) 431-9440.

Technical report describing the effects of zinc contamination on trust resources.

119. Urbonas, Ben and Peter Stahre (1993) *Stormwater Best Management Practices and Detention for Water Quality, Drainage and CSO Management*, PTR Prentice-Hall, Inc., New Jersey.
Source: Library

Contains discussion of structural and non-structural methods for stormwater detention and management. Provides technical basis for predicting the design's performance and how it will affect its long term operation. An evaluation of the best management practices is made in chapter 25, this is very useful for selecting BMPs.

120. Van Rhyn, Jon, and Ron Gauthier (1993)

"Copper Anti-Fouling Paint Monitoring"; U.S. Department of the Navy, Naval Command, Control and Ocean Surveillance Center.
Source: Marine Environmental Support Office, Naval Command, Control and Ocean Surveillance Center (NCCOSC) RDT&E Division, Code 522, San Diego, CA 92152-5000.

Evaluates the environmental risks from the use of anti-fouling paints. The study concentrates on two primary hull cleaning by-products, dissolved copper and particulate copper. The program has three objectives, 1) define loading and mass balance of copper in typical Navy harbors and evaluate the magnitude and fate of copper from in water hull cleaning, 2) examine toxicity of hull cleaning by-products of ablative copper coatings and identify the biological effects of these wastes and, 3) recommend strategies for prevention and remediation of impacts.

121. VanderWeele, Dave and Richard F. Ford Ph.D. (1994) *The Effects of Copper on the Bivalve Mollusc, Mytilus edulis and the Amphipod Crustacean Grandidierella japonica in Shelter Island Yacht Basin, San Diego Bay, California*, Prepared for the San Diego Regional Water Quality Control Board and Teledyne Research Assistance Program, Teledyne Ryan Aeronautical.
Source: San Diego Regional Water Quality Control Board, 9771 Clairemont Mesa Blvd., Ste B, San Diego, CA 92124, (619) 467-2952.

Studies the effects of copper contaminated sediments in Commercial Basin, 24th ST Marine Terminal Pier and the Shelter Island Yacht Basin on the marine bivalve *Mytilus edulis* and the amphipod *Grandiderella japonica.* Copper naturally comes from leaching and wearing of copper bearing rocks in streams & rivers. Anthropogenic sources are sewage and copper-based anti-fouling paints used on commercial, naval, and recreational vessels. This on-going study uses these indicator organisms to monitor environmental levels of copper over time.

122. Waddell, David (1992) *The Detergent and Soap Toxicity Assessment*, Municipality of Metropolitan Seattle (METRO) Hazardous Waste Management, Seattle, Washington.
Source: Municipality of Metropolitan Seattle (METRO) Hazardous Waste Management, 130 Nickerson St., Suite 100, Seattle, WA 98109-1658.

This report describes the aquatic toxicity and emulsification properties of several commercial and industrial detergents. Eleven cleaners underwent toxicity assessment using rainbow trout. Soaps were chosen because they are commonly used in homes and businesses near Haller and Bitter Lakes in Seattle. Results are reported in LC_{50} s, (the concentration of a substance in water that kills 50% of the animals exposed, a lethal concentration). These tests are not exhaustive nor recommend the least hazardous or best performing detergent available, the information can be used to evaluate appropriate detergents for a given application.

123. Washington State Parks and Recreation Commission (1992) *Boater's Guide*, Outdoor Empire Publishing, Inc.
Source: Washington State Parks and Recreation Commission 7150 Cleanwater Lane, Olympia, WA 98504-2654, (206) 586-2166.

This booklet provides details on useful boating services in Washington State. It includes a foldout map of the pumpout stations and other information such as, places to call for boat registration, boating safety regulations, safety equipment, rules of the road, trailering and launching. Boating related environmental impacts are reviewed along with ways to reduce those impacts. Also discusses hazardous waste disposal, alternative materials, anti-fouling paints with TBT and copper and impacts in the marine environment.

124. West Marine (1995) *West Marine Master*

Catalog, West Marine, San Diego, California.
Source: West Marine, 1250 Rosecrans Street, San Diego, CA 92106 (619) 225-8970.

Comprehensive guide to products sold by West Marine. Contains a section on maintaining, selecting, applying and preparing hulls for bottom paints. West Marine has an extensive selection of bottom paints, enamels, topside cleaners and other boat products.

125. Windward Yacht & Repair, Inc. (undated) *Water Pollution Control Plan*, Los Angeles Regional Water Quality Control Board, Los Angeles, California.
Source: Los Angeles Regional Water Quality Control Board, 101 Centre City Plaza, Monterey Park, CA 91754, (213) 266-7617.

Describes Windward Yacht and Repair facility and their management practices for controlling polluted runoff. The Water Pollution Control plan discusses their high pressure water system for washing down boats, sandblasting protocol, broom cleaning, collection of runoff & disposal of sanitary wastes. All paints, thinners and other liquid products are from one gallon containers to minimize the possibility of accidental spills.