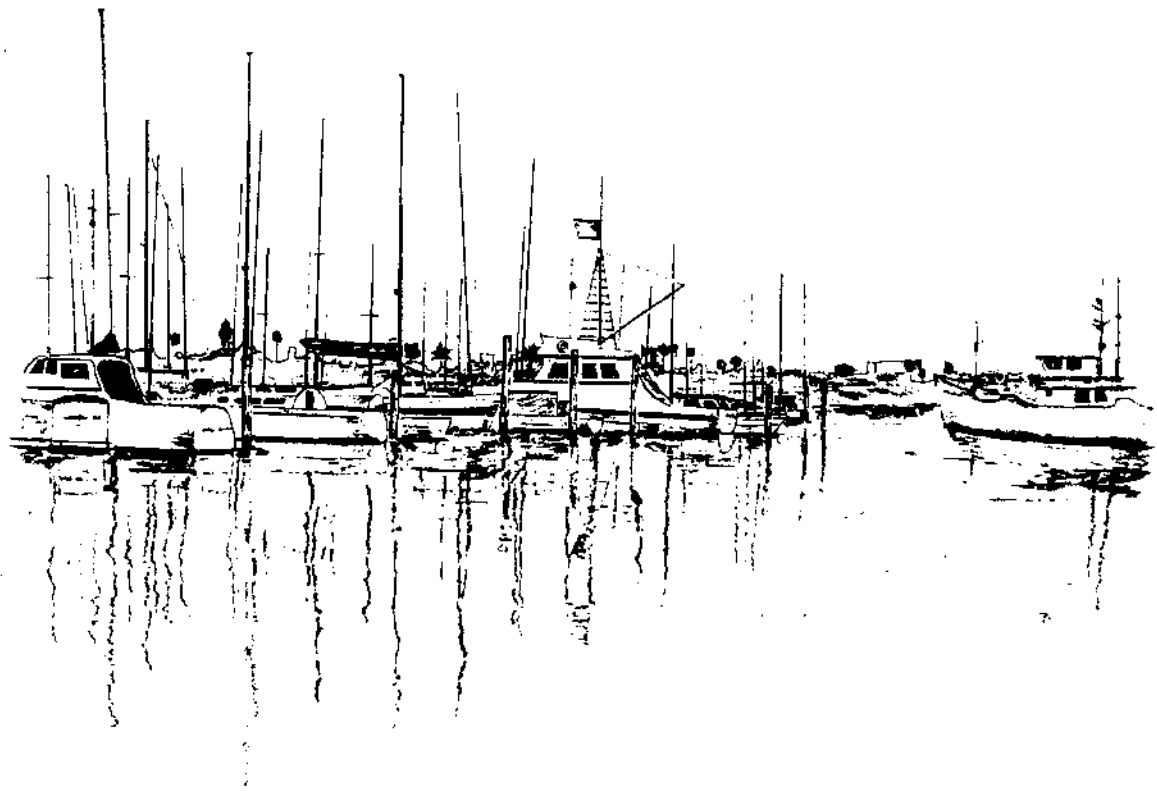


Marina Pollution Prevention Manual



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County of San Diego Farm & Home Advisor Department
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Cover illustration:

View of Commercial Basin, 1988*
in San Diego Bay
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Cooperative Extension

*** now designated America's Cup Harbor**



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Enclosed Publications:

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

* I. Introduction

This manual is intended to assist California marina managers, dockmasters and harbor masters in designing custom pollution prevention plans for their facilities. Each marina is unique; the number of slips and staff, types of boats moored, climate, tidal flushing, runoff from the land and local regulations vary widely.



Preventing pollution will promote abundant marine life and a healthy boating environment. A well designed pollution prevention program can assist boating facilities clubs in demonstrating compliance with regulations and managing liability for spills and wastes.

Pollution sources addressed include:

- ★ Oil and fuel
- ★ Sewage
- ★ Marine debris (garbage & plastics)
- ★ Marina & vessel cleaning & maintenance

The general objectives of the policies and procedures suggested in this manual are:

Promote good marina water & sediment quality, abundant marine life and a clean boating environment

Minimize pollutants entering marina water and sediments

Encourage tenants, staff and contractors to use best management practices to prevent pollution

In developing a Pollution Prevention Plan for your marina, develop policies and procedures for each type of marina pollution. Consider how you will communicate them to staff, tenants and maintenance contractors. Plan actions to be taken with regard to tenants or contractors who repeatedly ignore your policies & procedures.

The information in the manual & enclosed publications is provided on an educational basis to assist marina managers in reducing pollution. Adapt it to suit your situation. Do not use it as a stand alone guide. Ask your Regional Water Quality Control Board, other regulators and tidelands leasing agency to meet with you and review your plan for adequacy in meeting their specific requirements.



* POLLUTANTS & REGULATORS

The following list is provided as a general summary of agencies that regulate pollution generated in marinas. It is not intended to be an exhaustive list; there may be other agencies that regulate marina pollution. Contact the agencies for specific requirements and penalties. Pollution discharges may result in civil or criminal penalties.

● **Responsible local agencies may vary.**

Petroleum / Hazardous Waste Spills & Clean Up

US Coast Guard,
California Dept. of Fish & Game
Harbor Police ●

Hazardous Wastes

California Dept. of Toxic
Substances Control
County Dept. of Environmental
Health, Waste Management, etc. ●

Marine Debris (garbage & plastics)

Harbor Police ●
US Coast Guard

Boat Sewage

Harbor Police ●

Hull Paints (containing copper or TBT)

California Dept. of Pesticide
Regulation
County Dept. of Agriculture,
Weights, and Measures

* **Non Point Source Pollution**
(broad range of pollutants)
Regional Water Quality Control
Board
California Coastal Commission
Local governments

The nonpoint source pollution program was mandated by Congress in 1990. Federal guidelines provide an initial voluntary period for marinas, boaters & maintenance contractors to implement best management practices for preventing pollution. In essence, the program covers all forms of pollution generated by marinas & recreational boating. The California nonpoint source pollution plan was still under development in August, 1995. Contact your Regional Water Quality Control Board & Coastal Commission offices for information on status & requirements of this program. ^{22, 23}

Information in the manual & enclosed publications was drawn from & requested by marina managers, harbor & dock masters, boating association leaders, boatyard operators, underwater hull cleaners, government agency staff, environmentalists, scientists, paint manufacturers, boating supply dealers, boating pollution prevention guides & discussions of the California Technical Advisory Committee on Pollution from Marinas & Recreational Boating. The enclosed publications are intended to be used with the manual & distributed to staff, boaters & contractors.

* **MANUAL CONTENTS**

Section II. Marina Pollution Sources & Solutions lists pollution sources, pollution prevention planning considerations and practices to prevent, reduce and control pollution. Suggestions should be modified to suit the the marina & its tenants.

Section III. Hazardous Waste Management & Spill Response discusses considerations for hazardous waste disposal & spill first response.

Section IV. Marina Staff Procedures & Training contains ideas for developing procedures and training staff.

Section V. Local Agency & Service

Contacts provides contact information for selected regulatory agencies and marina services in San Diego County. If you are located in another area, use it as a guide for developing a contact list for your region.

References Cited lists specific information sources used in preparing this manual.

For More Information... lists publications that address some topics in depth & sources of current publications.

Also enclosed are publications that may assist you in educating boaters, staff and contractors. You are welcome to copy them or request camera ready masters (see form). Most have space for your logo and organization name.

◆ **Clean Boating Tips**

2-page summary of wastes to contain, pollution prevention tips, pollutants, regulators and spill reporting information for boaters, marina managers and maintenance workers

◆ **Underwater Hull Cleaner Best Management Practices**

Pocket guide to environmentally friendly underwater hull cleaning practices

◆ **Clean Boating Guide**

4-page boater's pollution prevention guide

◆ **Selecting Underwater and Topside Maintenance Services for Your Boat**

2-page boater's guide to communicating with in-slip maintenance contractors about environmentally friendly practices

◆ **Selecting a Hull Paint for Your Boat**

4-page guide to hull paint characteristics, environmental considerations & relative costs

◆ **Boating Pollution Economics & Impacts**

4-page guide to economic & environmental benefits of preventing boating pollution



II. Marina Pollution Sources and Solutions

WHERE TO BEGIN?

Dealing with all the possible pollution sources in your marina can seem daunting. A good way to begin is by reviewing your existing policies & procedures. You are probably already doing a lot to prevent, reduce & control pollution.



Answering a few questions will help you get started on some of the major pollution management issues:

1. How are you handling the following potential sources of pollution:
 - a. Fuel docks
 - b. Plastics and garbage
 - c. Vessel sewage & bilge water
 - d. Marina maintenance
 - e. Vessel maintenance
2. Are your fuel docks supervised by staff? Do they know how to prevent spills? Are materials handy and staff ready for first response to spills?
3. Regarding vessel maintenance:
 - a. What types and how much work do you allow to be done in the slips?
 - b. How are you handling vessel maintenance contractors?
4. How are you handling hazardous wastes produced by staff, tenants and contractors?
5. How are you educating about pollution prevention and communicating about problems with staff, tenants & contractors?
6. What information is included on signs? Are they located for best effect?
7. Do you and your staff look for potential pollution problems as you walk the docks? Do you prohibit people from leaving things on the docks?



A QUICK LOOK

Here is a summary of pollution sources & solutions to be discussed in this section:

1. OIL and FUEL POLLUTION

Spills - Clean up, if staff are certified; Prevent, contain and report spills from:
Fueling stations - supervise stations
Oil changes - use clean practices; dispose waste properly
Bilge water - provide pumpout facilities; dispose waste properly;
Engine repair - use clean practices and oil change services; dispose waste properly

2. SEWAGE POLLUTION

Direct discharge - use shoreside restrooms, holding tanks & pumpout services

3. MARINE DEBRIS (Garbage and Plastics)



Plastics, trash, garbage - use shoreside containers

4. BOAT CLEANING and MAINTENANCE IN THE SLIP

Sanding - contain sanding chips and dust
Painting - prevent spills, dispose leftover paints and solvents appropriately.
Cleaning - prevent spills, dispose products appropriately and use "greener" alternatives
Exterior teak and trim - use best cleaning practices; use less caustic products
Underwater hull cleaning - select less toxic paint at haulout; use best cleaning practices

5. MARINA MAINTENANCE

Marina maintenance produces many of the pollutants listed above, so it is not covered in a separate section. Adapt the information presented to develop policies and procedures for marina maintenance.

PREVENT, REDUCE AND CONTROL

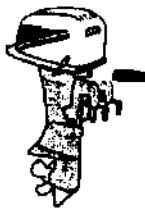
1. OIL and FUEL POLLUTION

► Engine Work

Engine oil is one of the most toxic compounds boaters can introduce to the marine environment. Engine repair can release oil into marine waters, affecting marine larvae and plankton living in the top layer of water. A single pint can cover an acre of the marina's surface.²⁰

Consider requiring contractors to sign a clean worker contract and show proof of business license & insurance.^{9,13,14}

If your marina does not have waste oil receptacles inform tenants that it is illegal to dispose oil and filters anywhere except at a permitted recycler or hazardous waste disposal facility. This includes leaving them in or by the dumpster or pouring oil into storm drains or marine waters.



Require that engine parts be washed over a container or in a parts washer, not over the water or ground. Dispose wash water as a hazardous material.¹²

► Fuel Dock Operation & Maintenance

Have an employee supervise the fuel dock.¹³

Keep fuel nozzles with automatic back pressure shut-off in good condition. If you do not have automatic shut-off, do not use holding clips to keep fuel flowing freely.³

Ask or require boaters to install "whistles" to warn when fuel tank is nearly full.³ Ask them not to "top off" tanks.⁷

Oil haulers and recyclers pick up fuel for recycling. Ask the local fire department for fire code requirements. See **Section V. Local Agency & Service Contacts.**

► Fuel and Oil Spills

Fuel and oil spills that reach the water must be reported to the US Coast Guard.

**Clearly post the phone number for staff, boaters and visitors:
1(800) 424-8802**

Keep a containment boom and absorbent pads in a locker near the fuel dock for first response to spills.⁴

► Bilge Water Discharge

Inform staff, tenants and contractors that discharging bilge water contaminated with oil, fuel, or other regulated contaminants is illegal. Post location of the nearest bilge pumpout service, if your marina does not have one.

Keep oil absorbent pads available for tenants to remove oil from bilge water. Dispose the pads as hazardous waste once they are saturated.²

Collect oil contaminated by water, fuel, or engine fluids for proper disposal. If your marina does not collect waste oil, post the location of the nearest collection facility.

► Waste Disposal

Careless engine maintenance, poor fueling habits and improper disposal of oil and contaminated bilge water release more oil into marine water each year than the Exxon Valdez spill.²⁰



Recycle or dispose waste oil, fuel, contaminated bilge water and products for their clean up as hazardous waste. See **Section III. Hazardous Waste Management and Spill Response.**

2. SEWAGE POLLUTION



Post signs prohibiting the discharge of head waste and pet waste from boats. Inform boaters that it is illegal to dump untreated sewage inside the 3 mile territorial limit of the United States.²⁰

Consider requiring new liveaboard tenants to have adequate holding tanks, not just portable toilets.¹⁰

Provide maps of pumpout stations and restrooms. Provide referrals to mobile pumpout services. See **Section V. Local Agency and Service Contacts**.

Encourage boaters to use marina restrooms, not boat heads.

Educate boaters via billing inserts, signs, newsletters and handouts to use pumpout stations and not to discharge head waste

If your marina has a pumpout station, post its location, hours, clear instructions, pump type (centrifugal, diaphragm, vacuum) and where to call for service if it is out of order.

Well maintained pumpout stations are important in preventing sewage discharges to marina waters. Regularly inspect, log inspections and promptly arrange repair of marina pumpout stations.

Here is a simple test for pumpout station efficiency: Every week, time how long the pumpout station takes to empty a 5-gallon bucket of water; 30-35 seconds is OK, 45 seconds is not.⁷



Report sewage spills to the Harbor Police or similar agency. See **Section V. Local Agency and Service Contacts**.

3. MARINE DEBRIS (Garbage & Plastics)

► MARPOL Treaty

Educate staff, boaters and contractors via billing inserts, newsletters, signs, handouts and personal contacts that the MARPOL Treaty prohibits discharging garbage, trash and plastics into marine waters.



● The MARPOL Treaty prohibits dumping any of the following within 3 nautical miles of the U.S. coastline:¹⁵

- garbage (food wastes)
- plastics
- trash (non-plastic)
- packaging
- line
- nets
- fish cleaning wastes

Advise boaters that:

▣ all boats over 26 feet long **must** display the MARPOL placard in a visible location.

▣ all boats over 40 feet long **must** display the placard **and** have a written Waste Management Plan on board.²⁰

► Waste Disposal

Trash, food, fish cleaning wastes, packaging materials, lines and nets should be disposed onshore.

If your marina recycles, have boaters recycle green, brown and clear glass, newspapers, plastic and aluminum in proper containers.



Report illegal discharges to the U.S. Coast Guard **1(800) 424-8802** or local harbor police.

4. BOAT MAINTENANCE and CLEANING IN THE SLIP

► Things That Make You Go Gray!

Dock and vessel maintenance and cleaning are loaded with potential for washdowns, spills, overspray, dusts, chips, scrapings, hull paint plumes, etc. to release pollution. Boaters ask why they have to worry about small amounts of pollution. This "miscellaneous" pollution can be reduced to manageable limits with a few, broad policies and simple rules.

**Have everyone follow 3 simple rules:
NOTHING IS LEFT ON THE DOCK
NOTHING GOES IN THE WATER
NEVER SPRAY PAINT^{4,7}**

The managers who use these rules explain:

- ▣ If nothing is on the dock, nothing can be knocked or blown over or off of the dock!
- ▣ Everyone (managers, staff, tenants and contractors) can remember a few rules!

► Marina or Boatyard?

Another way to simplify the task of controlling pollution is to decide what type and how much maintenance and cleaning you will permit in the slip. Some marinas limit projects to less than 10% of the boat surface; some allow up to 25%. Educate boaters, staff and contractors on this policy. Require boaters to take larger projects to an onshore service with proper equipment and pollution controls.^{6,10,20}

► Who Can Work in Your Marina?

If you provide referrals to underwater hull cleaners, topside maintenance and other services, ensure they are known to be professional and responsible for their work.

Consider requiring service companies to sign a "Clean Worker" contract and keep it on file. Some marinas report that requiring contractors to have a business license and insurance results in fewer problems.^{9,13,14}



Consider whether to permit only maintenance services that use best management practices for preventing pollution.

Some underwater hull cleaners use best management practices to reduce pollution release and hull damage. Some are setting up certification programs & providing lists of certified hull cleaners to marinas and harbors. See the enclosed **Underwater Hull Cleaner Best Management Practices**.

► What to Use?¹¹

"Environmentally friendly" products can reduce the potential for pollution if spills occur or if paint is rubbed off the hull. Require staff and encourage others to use cleaning products that are less caustic or toxic. Encourage boaters to consider less toxic antifouling paints at haulouts. Post information on cleaning products, such as:

- Avoid products that contain ammonia, lye, bleach or petroleum distillates.
- Use phosphate free and biodegradable soaps & less caustic cleaners.



► For the Details

Design policies, procedures and education programs for staff, boaters and contractors. Be ready to answer questions on the benefits of preventing pollution. Information in the enclosed publications will help you design policies, procedures and an education program. You may copy and distribute them or request camera ready masters. Most have space for your logo & organization name.

III. Hazardous Waste Management & Spill Response

LIABILITY

Marina and vessel maintenance and cleaning activities produce some hazardous wastes. Be aware of the laws and your liability for hazardous wastes and spills. Contact your local Environmental Health Department's Hazardous Materials Management Division, Office of Waste Management or similar agency for information on responsibility for waste management, disposal methods, collection stations, etc.. See **Section V. Local Agency and Service Contacts.**

PRIMARY WASTE SOURCES

- ▶ **Oil and fueling activities**
- ▶ **Boat cleaning, painting, and maintenance activities**

Hazardous wastes foul marina waters and harm marine life. (See the enclosed **Boating Pollution Economics and Impacts**). Waste types common to marinas include:¹⁹

- Oil & fuel spills
- Oils & grease from engine repair
- Bilge & wash waters
- Paint & varnish dust & chips
- Paint residue containing antifouling toxicants, such as cuprous oxide or tributyl tin)
- Caustic paint strippers & alkaline or acidic cleaners
- Organic solvents, such as paint thinner, chemical strippers & parts cleaners

BENEFITS of REDUCING HAZARDOUS WASTES

Reducing hazardous waste cuts operating costs and liability by:

- ▶ lowering the chances that wastes will be improperly disposed & require costly cleanup

- ▶ protecting staff, tenant and contractor health & safety by reducing exposure to toxic & caustic substances.

HOW TO REDUCE HAZARDOUS WASTE



▶ **Best Management Practices**

Consider establishing best management practices to reduce, recycle and reuse hazardous materials in your marina. See suggestions in manual **Sections II. & IV.** and the enclosed **Clean Boating Guide.**

Encourage staff, tenants and contractors to follow the "LC" principle for cleaning activities:

**Use: Less toxic or caustic and Less of it
Contain and Clean up**

▶ **Encourage Recycling**

Reusing or recycling hazardous materials can reduce the amount of waste produced in your marina.¹⁹



Uncontaminated and unmixed waste solvents, thinners, oils and fuels are recyclable. Materials contaminated by solvent, water, paint, thinner or nonhazardous material may not be recycled and are more expensive to dispose. Ask boaters to place hazardous wastes in separate, labeled containers to prevent contamination and take them to collection centers.

Also, encourage boaters to exchange excess paints, thinners, varnishes, etc. or donate them to schools, community theaters, etc..¹¹



HAZARDOUS MATERIAL STORAGE AND DISPOSAL

Marina managers need to determine:

- whether government agencies or private companies can provide hazardous material collection and spill clean up (**Option I**)
- or whether the marina must undertake collection, storage and disposal of hazardous wastes generated by tenants (**Option II**).



Marinas that choose Option II must obtain permits, build special storage facilities, maintain records, obtain specialized training for their staff and incur liability.^{7,9,14} Ask authorities for requirements!

OPTION I.

Many marinas place responsibilities on tenants for disposing of hazardous wastes. If this is your policy, post signs and tell boaters often that they must dispose hazardous materials at licensed collection centers. Explain that waste oil, used oil filters, batteries, paints, solvents, anti-freeze, etc. are hazardous wastes. Ask your county Environmental Health Department, Office of Waste Management or similar agency for a complete list of materials that are considered hazardous wastes. Refer boaters to:

1) County Environmental Health Department, Office of Waste Management Office or similar agency for information on household hazardous materials collection stations or events that accept small amounts of such wastes from individuals.



2) Local automotive shops that accept used oil and batteries. See **Part V, Local Agency and Service Contacts**. Tell boaters not to

mix waste oil with any other products. Many waste oil collection centers do **not** accept contaminated oil.

Work with other marinas and local authorities to develop a convenient and effective system for collecting hazardous wastes from boaters and marinas. For example, consider arranging a weekly pickup at several marinas. Have staff & tenants bring wastes they generate each week to the pickup site at the appointed time.^{4,9,10,13,14}



OPTION II.

Following are some considerations for marinas that decide to store hazardous waste and clean up spills. Check with authorities for specific requirements.^{6,17}

► HAZWOPER Training For Staff

Staff that handle, store, dispose and clean up hazardous wastes must be certified under the HAZWOPER training program.

Call University Extension at the University of California, Davis (916) 757-8609 for information on Hazardous Waste Operations and Emergency Response (HAZWOPER) training and certification for marina staff.

► Evaluate Your Storage Facility¹⁷

If your marina stores hazardous wastes, review the following questions in evaluating the storage area. Also check with regulatory agencies to ensure your storage area meets their requirements.

Are hazardous materials stored properly, i.e., segregated by content, covered, labeled with sufficient space for visual inspection, and on pallets? Pallets raise containers off the floor and prevent corrosion of containers by moisture on the concrete.

Are there separate, clearly labeled containers for used antifreeze, paints cans, and solvents?

Does the storage area have a concrete floor and berm to contain spills?



Is there an assigned, periodic inspection routine?

Consider using larger containers for waste storage. Alternatives to 55 gallon drums include polyethylene containers enclosed in a rigid wire mesh. These containers have a larger capacity, are portable, reusable, and can be outfitted for top or bottom discharge, cleaning access, and locking.

Oil filters must be drained for 24 hours into a pan. This oil may be recycled.

> Are the facility and the staff prepared to handle a hazardous waste spill ?

Develop an oil spill response plan that includes:¹⁷

Who - Clearly identify who is responsible for taking action



What - What action should be taken during an oil spill event and what equipment and supplies should be deployed

Where - Where spill response equipment and supplies are located in the facility

How - Instructions for the use and disposal of this equipment and supplies

Have employees been trained in the proper procedures for handling hazardous wastes?

Keep spill clean up materials in a cabinet or locker next to prime spill areas. Use lockers for storing booms, pads, fire extinguishers and copies of your spill contingency plans.

Avoid improper disposal by providing waste oil receptacles. Tell boaters that waste oil must not be mixed with other wastes or water and to cover it to protect it from rainfall.

Post signs telling boaters to report spills to:

1-800-OILS-911 and
U.S. Coast Guard National
Response Center:
1-800-424-8802.



Tell staff:⁵

- ✓ Clean spills and leaks immediately. Do not hose down.
- ✓ If an oil spill reaches the water, deploy oil containment booms. (K)
- ✓ Use dry clean up methods, such as oil absorbent pads. Do not use straw (K).
- ✓ Location of booms and oil absorbent pads.
- ✓ Absorbent pads can be used again. Dispose used pads as hazardous waste.

PRIMARY SPILL RESPONSE

Reduce the chance of a spill by establishing the policy, "Nothing goes on the docks."⁷

Even marinas without a formal spill clean up program need to be able to contain spills while awaiting assistance from the Coast Guard or other clean up agency.

Modify the guidelines in Option II to suit your situation.

Fuel or oil spills that reach the water must be reported to the US Coast Guard. Clearly post the phone number for marina staff, tenants and contractors: **1(800) 424-8802**



Keep a containment boom and absorbent pads in a locker near the fuel dock for first response to spills.⁴

Do not apply soap or detergents to spilled oil. When oil enters the water, it can be soaked up with oil absorbent pads.



Oil absorbent pads can be used many times. To reuse the pad, wring it thoroughly and dispose the liquid as hazardous waste. When the pad will no longer absorb oil, wring it out and dispose it as hazardous waste.⁵

DOCKMASTER CHECKLIST FOR WASTE REDUCTION¹⁷

The following questions can help you evaluate your capability to reduce hazardous wastes and the attendant costs and liability:

Does your marina have an established waste reduction program? Is a specific employee assigned to oversee its success? Does the program have a set goal?

Is management fully aware of current local, state, and federal regulations relating to hazardous waste material disposal, treatment and recycling?



Do you conduct or send employees to education programs on how to avoid excessive waste generation? Are there employee incentive programs?

Follow the motto:⁷

**Educate
Communicate
Contain
Clean Up**

Are marina staff, tenants and contractors aware that the following should **not** be thrown in the dumpster:

- engine oil, new or used
- antifreeze
- paints
- solvents
- varnishes
- pesticides, etc.

Do marina tenants know the location of hazardous waste collection sites or recycling centers (for used oil)?

Refer them to your county Environmental Health Department, Office of Waste Management or similar agency for this information on dates and locations of Household Hazardous Waste collection events. See **Section V. Local Agency and Service Contacts.**



HAZARDOUS WASTE MANAGEMENT PLANNING ASSISTANCE

Some counties may provide a list of general hazardous waste requirements or a sample hazardous materials business plan. Inquire whether your county Environmental Health Department, Office of Waste Management or similar agency can provide such assistance. See **Section V. Local Agency and Service Contacts.**

Some insurance companies provide hazardous waste management information in safety planning documents for their clients. Some may have specific safety planning guidelines for marinas.

IV. Marina Staff Procedures & Training

Training helps employees to recognize and understand pollution sources, related problems & best management practices (BMPs) for solving or preventing problems. Remember to incorporate employee and tenant feedback into training manuals & sessions.⁵

This section includes training suggestions common to all areas of marina pollution, as well as some specialized suggestions for specific sources of pollution. Use or adapt them in developing procedures and training suitable for your facility.

GENERAL STAFF TRAINING

Develop a training schedule appropriate to your situation. Consider current staff expertise, turnover rate, numbers of staff and tenants, recent experience with pollution incidents, etc..¹⁰



Consider organizing regional training for managers and staff on pollution prevention and other topics, to promote consistency and avoid duplication of effort.¹³

Train staff on:

- Marina BMPs and policies regarding pollution prevention.
- How to recognize activities and practices of boaters and boat service companies that create or discharge pollution.



- How to communicate with boaters regarding pollution creating activities and how to inform them of best management practices

•What is required of and how to monitor vessel service companies working in the marina.

•How to report pollution problems needing staff or management attention. Consider posting a pollution report clipboard that successive shifts can use to check the status and actions needed to resolve problems.¹⁰ A sample pollution report form is included in this section.

1. OIL and FUEL POLLUTION

See **Section III. Waste Management & Spill Response, Option II** for staff training suggestions if your staff has undergone the Hazardous Waste Operations and Emergency Response training certification ("HAZWOPER").

Post information telling boaters how to report spills. Call **1-800-OILS-911** and the U.S. Coast Guard National Response Center **1-800-424-8802**.

2. SEWAGE POLLUTION

Instruct staff how to inspect & repair pumpout equipment and maintain a monthly schedule.

Tell staff to:

- ✓ Post signs telling boaters to inform the dockmaster immediately when the pump breaks down and how to make such reports.
- ✓ Inform boaters of the closest pumpout station location if there is not one at the marina.

3. MARINE DEBRIS (Garbage & Plastics)

Teach staff to tell boaters:

- where trash can be disposed
- that overboard trash disposal is illegal under the MARPOL Treaty.¹⁵

4. BOAT CLEANING and MAINTENANCE IN THE SLIP

Instruct staff how to recognize cleaning and maintenance practices of boaters and boat service companies that create or discharge pollution.



Tell Staff to watch for:

- ✓ Colored plume in the water when a vessel is being cleaned underwater. Colored "plumes" or clouds should **not** occur; they indicate paint has been rubbed off the hull.
- ✓ Bilge water discharged with a sheen.
- ✓ Sanding, painting, varnishing, cleaning **without tarps** or other methods to prevent drips, dust, wash water, etc. from reaching the water.
- ✓ Recognize environmentally harmful cleaners. Tactfully ask tenants and contractors to use environmentally friendly or biodegradable cleaners. Recognize, look for and tactfully tell boaters when too much cleaner is being rinsed into the water.

Also see Sections II. and III. of this manual and the enclosed **Clean Boating Tips and Clean Boating Guide**.



5. Marina Maintenance

Marina maintenance employees must follow the same guidelines and best management practices as boaters to avoid polluting marina waters.

Train marina staff to recognize situations with the potential for pollution (spills, overspray, wind blown dusts, etc.) as part of their regular duties.⁶

Guidelines for maintenance employees can be summarized as follows:

All marina & vessel maintenance workers must follow three rules:

- ✓ **Nothing** is left on the dock (so nothing can spill or blow over or off the dock)⁷
- ✓ **Nothing** (paint chips, sawdust, sanding dust, cleaning solvents, concrete dust, etc.) goes into the water⁴
- ✓ **No spray painting** allowed under any conditions⁴

Also see Sections II. and III. of this manual and the enclosed **Clean Boating Tips and Clean Boating Guide**.

SPEAKING WITH BOATERS

Teach staff tactful methods to communicate rules and regulations of your marina. Boaters may not see their actions as polluting. Boater education techniques used by various marinas include:

- Signs at appropriate locations; concentrated at fuel docks, pumpout stations, and dumpsters.
- Newsletters
- Boater BMPs in rental contract
- Marina bulletin board
- Informal contacts & warnings
- Warning letters
- Charging tenants for clean up and disposal



When problems develop with a particular tenant, some marinas use variations on this procedure^{6,7}:

1. Bring the problem to the boater's attention and provide information on better practices.



2. Mail the tenant a written notice. A letter reduces confrontation between staff and tenants. Log the mailing.

3. Talk to the boater if the problem persists. Explain why their actions are a problem, e.g., safety hazard, unsightly, etc.

4. Remove the problem from the dock and charge the boater for removal or clean up costs.

5. Ask the tenant to leave if the problem continues.

SPEAKING with CONTRACTORS

Determine a policy that is appropriate for your marina. Some marinas require contractors to have a business license and insurance.

If they notice a contractor using practices that are creating pollution or have the potential to pollute, they ask to see the contractor's license and insurance. Those without these documents may be asked to leave. If they have them, they are issued one warning and asked to leave if the problem continues.

Consider whether you would use such a policy. Also consider whether you would prefer staff to communicate directly with contractors or whether they should apprise you of the situation, so that you can handle it directly.



Train staff according to your policy and procedures.



TRAINING LOGS

Maintain records of staff training workshops, classes, etc., conducted to educate marina staff on best management practices for boaters and the marina itself.

Training logs should include training dates, topics, participating employees, instructor(s), manuals or other materials provided. A sample training log is included in this section.

MARINA STAFF CHECKLISTS

Following are examples of items you may wish to include on checklists for monitoring the docks. The Marina and Recreation Association has developed a comprehensive set of sample checklists. See **Section V. Local Agency and Service Contacts**.

Is the fueling dock supervised?

- ✓ For fuel nozzles without automatic shut-off on, hold dispenser by hand; **do not** insert a clip to keep flowing freely.³
- ✓ Clean up spills and leaks immediately. **Do not** hose down spills or leaks.

Are boaters, marina maintenance workers, and contractors using best management practices to avoid pollution?

- ✓ Watch for boaters discharging bilge water with a sheen. This indicates the bilge water is contaminated with oil and should not be discharged. Report oil sheens from vessels to the U.S. Coast Guard.

✓ Watch to be sure boaters and maintenance contractors are not washing cleaning debris (paint chips, sanding dust, soap, etc.) into the water.

✓ Watch for boat cleaning projects to be sure they are using tarps and vacuums to collect cleaning debris.

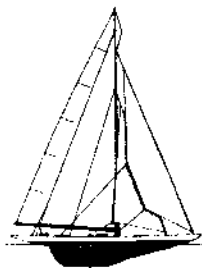
✓ Watch for sewage discharge from boat heads and in the marina. Sewage discharges are illegal and should be reported to the Harbor Police or U.S. Coast Guard.

✓ Regularly inspect supplies of booms and oil absorbent pads for first response to spills.

✓ Watch for underwater hull cleaning that discharges colored clouds or “plumes” into the water. Colored plumes should **not** occur; they indicate paint has been rubbed off the hull.

Are marina staff aware of current laws and regulations pertaining to water pollution?

A number of agencies regulate pollution generated in marinas. See the list in **Section I. Introduction** and contact information in **Section V. Local Agency and Service Contacts**. Contact these agencies if you have specific questions regarding water pollution regulations. Pollution discharges may result in civil or criminal penalties.



POLLUTION REPORTS & ACTIONS LOG

FACILITY NAME: _____

REPORT DATE	STAFF REPORTING	PROBLEM DESCRIPTION	ACTION TAKEN	ACTION DATE	STAFF HANDLING

FILE COMPLETED PAGES: _____

OTHER INSTRUCTIONS: _____

STAFF TRAINING LOG

FACILITY NAME: _____

TRAINING DATE	TRAINING TOPICS	TRAINING MATERIALS USED	STAFF TRAINED	COMMENTS

TRAINING ROSTERS ATTACHED FOR (DATES): _____

TRAINING MATERIALS ATTACHED FOR (DATES): _____

V. Local Agency and Service Contacts

This information pertains to San Diego County. If you live in another area, use this section as a guide to preparing a local contact list. Marina managers and dockmasters can aid their tenants in reducing marina pollution by providing basic information such as locations of pumpout stations, and numbers to call regarding hazardous waste disposal/collection events, as listed below. This list is not exhaustive; it includes only those agencies and services which have come to our attention during the preparation of this publication. Update and expand this list as needed.

SEWAGE PUMPOUT STATIONS

Table V-1. San Diego Bay ²¹

FACILITY	LOCATION	PHONE (619)
Harbor Control Dock (Harbor Police Station)	1401 Shelter Island Dr., S.D.	291-3900. 24 hrs. Free
Pearson's Marine Service	2435 Shelter Island Dr., S.D.	222-7084. 7:30-7pm. Free with fuel or small fee without
Marina Cortez Fuel Dock	1880 Harbor Island Dr., S.D.	296-2331. 8am - 6pm. Free with fuel or small fee without
Harbor Island West Fuel Dock	2040 Harbor Island Dr., S.D.	291-6443. 7am - 7pm. \$5.
Loew's Crown Island Marina (portable within this marina, call to set appointment)	4000 Coronado Bay Road, Coronado	575-SAIL. By appointment. \$10
Glorietta Bay Marina	1715 Strand Way, Coronado	435-5203. 9am - 4:30pm. \$5. Call ahead.
California Yacht Marina (for tenants only)	640 Marina Parkway, Chula Vista	422-2595. Tenants have key.
Marriott Marina Boat Side Services (portable, call to set appointment)	385 West Harbor Drive, S.D.	523-1167. Call ahead
Chula Vista Marina (for tenants only)	550 Marina Parkway, Chula Vista	691-1860. 9am-4pm. No fee. Call ahead
Sunroad Marina (for tenants only)	955 Harbor Island Dr., S.D.	574-0736. Tenants have key.
Sheraton East Hotel (for tenants only)	1380 Harbor Island Dr., S.D.	692-2249. Call ahead

Table V-2. Mission Bay

FACILITY	LOCATION	PHONE (619)
Marina Village	1842 Quivira Way, S.D.	224-3125. Free. 24 hrs.
Islandia Hotel Marina	1441 Quivira Road, Pacific Beach	224-1234. \$5. 5am - 6pm

Table V-3. Oceanside Harbor

FACILITY	LOCATION	PHONE (619)
US Coast Guard	1310 N. Pacific, Oceanside. (north side of harbor)	722-3838. Free. 24 hrs.
US Coast Guard	1310 N. Pacific, Oceanside. (south side of harbor)	722-3838. Free. 24 hrs.

OIL & BATTERY RECYCLING

San Diego Oil Recycling Hotline 235-2105

Selected stores of the following automotive businesses:

Kragen Auto Parts, Chief Auto Parts, Firestone, and Pep Boys, including the following
(Contact the business to confirm they are recycling oil and batteries):

Chula Vista	Otay Buyback	421-9494
El Cajon	Chief Auto Parts	444-3397
Imperial Beach	Kragen Auto Parts	429-1302
National City	Kragen Auto Parts	474-3312
Pacific Beach	Kragen Auto Parts	270-2520
Point Loma	Marine Services	222-7084
San Diego	Pep Boys	239-8833
San Diego	Discount Battery	280-2572

Information provided by the San Diego Regional Household Hazardous Materials Program (HHMP)

References Cited

The following sources provided information that is incorporated variously in this document, as well as where specifically noted. Some material was found in multiple sources, not necessarily noted.

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4. Callaghan, Cal. San Diego Yacht Club. Personal communication.
5. Camp, Dresser & McKee, et al (1993) *California Storm Water Best Management Practices Handbook*, Municipal, Volume 1.
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9. Kolb, Ruth. San Diego Unified Port District, Environmental Management Department. Personal communication.
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20. "Soundwatch, An Environmental Guide For Boaters" (1993) *48° North, The Sailing Magazine*. Seattle, WA.
21. Southwest Research Associates (1994) *Draft Environmental Assessment Report for the 1995 America's Cup Match*. San Diego, CA.
22. United States Environmental Protection Agency (1993) *Coastal Nonpoint Pollution Program – Program Development and Approval Guidance*. Washington, DC.
23. United States Environmental Protection Agency (1993) *Guidance Specifying Management Measures For Sources of Nonpoint Pollution in Coastal Waters*. Washington D.C.

FOR MORE INFORMATION...

The following sources contain detailed information on preventing pollution from marinas and recreational boating. Inclusion on this list does not constitute or imply endorsement. Contact the suggested sources for lists of additional & newer publications.

Baywatch, A Guide for Boaters (1991)
Author: Libby Lucas

Source:
Environmental Health Coalition
1717 Kettner Blvd. Suite 100
San Diego, CA 92101-2532
(619) 235-0281

Clean Marina+Clean Boating+Clean Water Partnership: A Resource Manual for Pollution in Marinas (1995)
Author: Pat Buller

Source:
Puget Soundkeeper Alliance
1415 West Dravus Street
Seattle, WA 98119
(206) 286-1309

Environmental Guide for Marinas: Controlling Nonpoint Source and Storm Water Pollution in Rhode Island (1993)
Authors: Mark Amaral and Virginia Lee

Source: Order # P1374
Rhode Island Sea Grant
Communications Office
University of Rhode Island
Narragansett, RI 02882-1197
(401) 792-6224

Practical Sailor magazine

Source: Boating book & supply stores

Soundwatch, An Environmental Guide For Boaters (1993)

Source:
48° North, The Northwest
Sailing Magazine
6327 Seaview Ave. NW
Seattle, WA 98107
(206) 789-7350



Clean Boating Bibliography, Annotated (1995) Authors: Erika McCoy, Leigh Johnson

Source:
Sea Grant Extension Program
5555 Overland Ave., Bldg. 4
San Diego, CA 92123-1219
(619) 694-2845

Final Report of the California Marinas and Recreational Boating Technical Advisory Committee on Nonpoint Source Pollution (1994)

Source:
Pablo Gutierrez
State Water Resources Control Board
901 P Street
Sacramento, CA 95826.
(916) 657-0793

Guidance Specifying Management Measures For Sources of Nonpoint Pollution in Coastal Waters (1993)

Source:
Environmental Protection Agency
401 M Street, SW
Washington DC 20460
Doc # 840-B-92-002

Contact the following for current lists of publications on pollution prevention for marinas & recreational boating:

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

HAZARDOUS MATERIALS CONTACTS BY TOPIC

Waste Disposal

For information regarding the next San Diego Regional Household Hazardous Material collection date call: **San Diego County Hazardous Waste Hotline** (800)246-1233 or 235-2111

Fire Safety

City of San Diego Fire Department Hazardous Materials Management 533-4477

Reporting Sewage Spills

Harbor Police 686-6595
Port District Environmental Management 686-6254

Reporting Hazardous Waste Spills or Discharges

U.S. Coast Guard (Fuel/oil, hazardous waste spills, or plastics) 1-800-424-8802
HAZMAT/ County Environmental Health Department (fuel and other hazardous substances) 338-2284

For more information on Hazardous Waste Management

The following publications are available to the public from the San Diego County Environmental Health Services, Hazardous Materials Management Division: 338-2231

General Hazardous Waste Requirements and Hazardous Materials Business Plan

HAZARDOUS MATERIALS CONTACTS BY ORGANIZATION NAME

STATE AND FEDERAL AGENCIES

NPS Program Requirements

California Coastal Commission (916) 445-6067
Regional Water Quality Control Board (619) 467-2952

Hazardous Materials Regulation

Department of Toxic Substances Control (800)-698-6942

Spill Clean Up

US Coast Guard (800) 424-8802
Department of Fish & Game,
Oil Spill Prevention and Response Office (916) 327-9948

SAN DIEGO COUNTY AGENCIES

Hazardous Materials Generation and Storage

Department of Environmental Health Services 338-2231

A. Hazardous Materials Management Program:
hazardous material generation and storage

B. Site Assessment & Mitigation: storage tank regulation

Copper based and TBT Hull Paints
Department of Agriculture, Weights & Measures

945-4048

Household Hazardous Waste

Waste Management Department, Refuse Disposal
San Diego County Hazardous Waste Hotline
San Diego County Hazardous Materials Management Program

573-1412
1-800-246-1233
338-2284

MARINE RELATED ORGANIZATIONS

San Diego Unified Port District
Sea Grant Extension Program
San Diego Clean Water Program Hotline
Marina and Recreation Association
California Clean Boating Network (c/o California Coastal Commission)

686-6272
694-2845
533-5288
(209) 334-0661
(916) 445-6096



SELECTING A HULL PAINT FOR YOUR BOAT

Introduction

Are you planning a haul out and new paint for your recreational boat? You will need to select a paint to protect the hull and maintain its smooth surface for maximum performance. The paint should be durable and cost effective. You must consider how the boat will be used, how it will be stored and factors that affect hull paints (see back page). This guide can help you choose a hull paint or other strategy to prevent fouling growth.

A common strategy is to use hull paints with heavy metals, such as copper or tributyl tin (TBT). These toxicants leach out of the paint and inhibit spores and larvae of fouling growth. TBT is only allowed in California on boats over 82 feet long, aluminum hulls, outboard motors & lower drive units.¹

Environmental and Cost Factors

Hull paint toxicants are released over time, especially during underwater hull cleaning.⁷ They may be absorbed by mussels, worms, etc. and passed up the food chain to fish, birds and humans, posing health risks.

Heavy metals accumulate in marina sediments. Contaminated sediments are more expensive to dispose after dredging, because they must be treated as hazardous wastes. This raises costs for marinas and their tenants.

Disposal costs for leftover paints and solvents are high, because they are hazardous wastes. They may also release air pollutants during application.

Making a Choice

Boaters can help underwater hull cleaners, marinas and boatyards control costs, promote a healthy boating environment and encourage abundant marine life by considering environmental factors when selecting an antifouling strategy. More information is available in our publication, "Boating Pollution Economics & Impacts."

These tips may reduce environmental impacts:

- Go boating often to slow fouling growth.
- Hire an underwater hull cleaner who uses best management practices. (See our publication, "Selecting Underwater & Topside Maintenance Services for Your Boat.")
- Clean hull often to prevent hard growth and reduce scrubbing and toxicant release.
- Select a paint that does not require caustic solvents and releases little or no pollutants.
- Use a hard, less toxic or non-toxic paint and wipe hull often to remove soft growth.

Some boaters use the methods below. There may be drawbacks. Ask marine suppliers, regulatory agencies, other boaters and your marina about cost, availability, effectiveness and regulations.¹⁰

- Store your boat on land.
- Store your boat on a floating hoist or surround it in the water with a boat liner or bath. Note: hoists and liners may foul.

The table inside will help you find a paint that meets your requirements. Consult your boatyard, paint dealer and other boaters before deciding.

Erika J. A. McCoy, Program Representative & Leigh Taylor Johnson, Marine Advisor
University of California Cooperative Extension, Bldg 4, 5555 Overland Ave, San Diego, CA 92123 (619) 694-2845



UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION
SEA GRANT EXTENSION PROGRAM
COUNTY OF SAN DIEGO FARM & HOME ADVISOR DEPARTMENT
UCSGEP-SD 95-4 ☆ July, 1995

Hull Paint

Paint Type & Price Range	Antifouling Method	Environmental Considerations	Fuel Consumption ⁵
Soft Sloughing \$75-125/gal ^{11, 14}	Free leaching & soft. Paint erodes until completely disintegrated. 20-50% copper ¹⁶	Potential to release much toxicant due to uncontrolled sloughing ⁵	Uneven sloughing increases drag & fuel consumption
Epoxy Ester, Conventional \$155-180/gal ^{11, 14}	Hard, smooth finish. ² Releases toxicant by leaching. Up to 76% copper ^{11, 14}	Initial high release of toxicant, replaced by even copper leaching ⁵	Rough surface left by toxicant release increases drag & fuel consumption
Vinyl, Conventional \$160-170/gal ^{2, 14}	Hard, smooth finish. Releases toxicant by leaching. 49-67% copper ¹²	Better controlled release rate of copper vs. epoxy ester paint ^{2, 5}	Rough surface left by toxicant release increases drag & fuel consumption
Vinyl, Thin Film Teflon \$136/gal ¹⁵	Hard, smooth finish. Releases copper by leaching. 42% copper ¹⁵	Controlled leach rate of copper. Very hard finish ¹⁵	Slick surface decreases drag & fuel consumption
Copolymer, Ablative \$200-235/gal ^{2, 14}	Continuously sheds outer layer to release toxicant ⁹ 46-58% copper ¹⁶	Boat use & underwater cleaning release toxicant ⁵	Surface smooths with boat use; decreases drag & fuel consumption
Water-based, Ablative \$160-192/gal ^{2, 14}	Continuously sheds outer layer to release toxicant Up to 64% copper ^{9, 12, 14}	Boat use & underwater cleaning release toxicant ^{5, ✓}	Surface smooths with boat use; decreases drag & fuel consumption
Polyurethane, Biocide free \$78-180/gal ^{14, 11}	Topside paint. Hard, smooth finish deters fouling. May blister after 72 hours in water ^{2, 9, 14, *}	Primarily a topside paint. No toxicant to prevent fouling ^{11, 12, 14}	Smooth surface, if not blistered decreases drag & fuel consumption
Silicone, Biocide free \$600-650/gal ¹⁴	Deters fouling by creating slick surface when wet ^{2, 14}	No toxicant to prevent fouling ¹⁴	Slick surface decreases drag & fuel consumption

✓ Water-based ablative paints release fewer volatile pollutants (VOCs) than do solvent-based paints.

* Most polyurethane paints are used for cosmetic purposes on hulls; some are more water resistant. Ask your boatyard.

⊙ **Durability Notes:** Controlled copper leach rate makes hull paints last longer.

➤ **Standard Hull Cleaning Notes:** Clean hull regularly to keep paint clean for releasing toxicant (except sloughing and ablative paints) and to avoid accumulation of hard fouling growth. Ask your underwater hull cleaner to use a soft carpet or diaper for cleaning and rub gently. Regular cleaning also avoids the need for abrasive pads and forceful scrubbing that release more toxicant. For more information, see our publication, "Underwater Hull Cleaner Best Management Practices."

Selection Factors

Durability °	Special Hull Cleaning Factors °	Special Hull Preparation *	Special Paint Application *	Examples *
1 year or less ⁵	Soft paint may release much toxicant with underwater cleaning ⁵	Can apply to rough surfaces ^{5, 11}	Launch 8-48 hours after painting ^{5, 11}	Pettit Yacht Copper, Interlux BottomKote (outside Calif.)
~ 2 years ²	Harder surfaces release less toxicant with underwater cleaning.		Dry 8 or more hours before launching ^{8, 13}	Pettit Trinidad, Interlux UltraKote, Unepoxy Plus
~ 2 years ²	Harder surfaces release less toxicant with underwater cleaning		Launch 4 to 16hrs after painting ^{8, 13}	Proline 1088, Interlux Super Vinyl-lux, Pettit Vinylcide
1-1.5 years ¹⁵	Harder surfaces release less toxicant during underwater cleaning	Do not apply over ablative paints ¹⁵	Thin film may need frequent recoat ¹⁵	Extensor VC Offshore
~ 2 years ^{5, 9} Does not oxidize in air ¹²	Moderate potential for toxicant release with underwater cleaning		Do not overcoat with nonablative paints ^{9, 12}	Proline Y1044, Interlux Micron CSC, Pettit ACP-50
~ 2 years ^{5, 9}	Moderate potential for toxicant release with underwater cleaning	Very clean hull, wet sand or 4000 psi hydrowash ²	Use fresh water for thinning ¹²	Proline 888, Pettit AquaClean, Woolsey Neptune II
Durable topside paint. ³ May blister after 72 hrs in water. ¹⁴	Wipe down often ² , if boat is in water long periods ^{9, 14}	Remove old coats ¹⁴		Interlux Interthane Plus, Pettit DuraThane (2 Part), Proline Deepgloss
2 to 3 years or more ¹⁴	No toxicant release with underwater cleaning.	Remove old coats ¹⁴	Slippery! Special handling for safety. ^{13, 14, 15}	Interlux Veridian 2000, Proline Paints

✱ **Standard Hull Preparation Notes:** Read all directions, thinner, catalyst or solvent requirements for each product. If old paint is in poor condition or consists of more than 4-5 old coats, boatyards can remove old paint and properly dispose of paint chips. ¹² Make sure the hull is free of contamination, such as grease, wax, or sanding residue, so paint adheres properly. De-wax new fiberglass hulls. ^{3, 10}

* **Standard Paint Application Notes:** Use solvent resistant, quality application equipment. ¹¹ Note that paint solvents are caustic, except for water-based paints. Apply at least two coats; a third coat gives protection to leading edges of keel, rudder and through-hull fitting. ^{2, 12} Consult boatyard for wet mil thickness of paint coats.

☆ **Regulations vary; ask your boatyard what paints are permitted locally. ☆**
Inquire about new paints that have reduced or no toxicant.

Factors Affecting Antifouling Paints ¹¹

Extreme high or low water temperature & salinity, acidic or alkaline waters, fouling growth, waxes, over-spray, dust, silt and chemicals in runoff can clog pores or change paint chemistry and impair antifouling properties. ¹³



Regular underwater hull cleaning removes slime build up & contaminants and increases antifouling ability of hull paint. ^{4,13} Infrequent use allows hard growth to form, requiring forceful hull scrubbing.

Low water allows the hull to hit bottom, scraping the antifouling paint or clogging pores.

Poor surface preparation prevents paint from adhering properly. Proper thickness of epoxy barrier coats beneath antifouling paint prevents blistering. ¹³

Immersing the boat too soon or too long after painting, applying too little paint or coats that are too thin reduces paint's life span. ^{2,13}

Faulty or inadequate wiring on boats or in shore power connections may cause stray currents that contribute to corrosion of underwater metals ^{7,13} or (rarely) neutralize antifouling paint. ¹¹

Choose your boatyard with care; get supervision if doing the work yourself. ⁴

Educational Use, Only

This information is provided on an educational basis to assist you in working with your boatyard or maintenance service. Examples and prices were current in Spring, 1995 and are provided for illustrative purposes; no recommendation is intended or implied. Ask your boatyard, marine supply dealer or regulatory agency about availability, prices and regulations.

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3. Interlux (1994) Boaters' Painting Guide to Bottom Paints, Topside Enamels, Varnishes, Stains & Fillers and Interprotect.
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16. West Marine (1995) "West Marine Master Catalog"



Selecting Underwater & Topside Maintenance Services for Your Boat

Selecting a Service Provider

→ The following tips can help you select a professional maintenance service that will protect your boat and the marine environment.

Ask your boat maintenance services to follow marina requirements and use best management practices (BMPs) to avoid damaging boats or releasing pollutants into marina waters.

Ask your marina manager or harbor master for a list of service providers. Some marinas may not be able to provide business referrals.

Hire a professional. Ask to see the service's current business license & liability insurance. Some maintenance services may belong to a professional association that uses BMP's.

Ask for a copy of the maintenance service's or association's BMPs or standard procedures.

Get three local references from a prospective maintenance service or other boaters who know their work. Ask if they were satisfied and try to see the completed work.

Obtain and verify the service's business address and telephone number. You may need to contact them in case of incomplete work, an illegal discharge or improper waste disposal.

Explain Your Expectations

Be direct. Let the contractor know what you need and how it should be performed. The guidelines below will help you specify practices to protect your boat and the environment.

Underwater Hull Cleaning

Wait 90 days after applying fresh hull paint before having the hull cleaned underwater.

Avoid underwater cleaning of vessels with soft, rapid sloughing or ablative hull paints.

Regular cleaning prevents hard growth from forming.

Consider combining low copper or non-toxic, hard or slick hull paints & regular underwater hull cleaning **instead of high copper content paints.** For more details, see our publication, "Selecting a Hull Paint for Your Boat."

Colored "plumes" or clouds in the water near underwater cleaning activity **should not occur;** they indicate paint has been rubbed off your hull.

Ask your hull cleaner to...



✧ Use only soft sponges or pieces of "carpet" to clean marine growth.

✧ Use stainless steel pads or brushes **only** on unpainted metal areas, never on bottom paint.

✧ Return zinc anodes to shore for recycling or proper disposal.



University of California
Cooperative Extension
County of San Diego

Sea Grant Extension Program
Farm & Home Advisor Department
UCSGEP-SD 95-3 ☆ July 1995

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And for the Toppide...

Marina or Boatyard? Limit work done in the marina to minor maintenance. Take larger projects to an onshore service with proper equipment and pollution controls.

Ask your service provider to...

Use **biodegradable & environmentally friendly products**. Read labels & ask your maintenance service for more information.

Reuse leftovers such as paints & varnishes for touchups or share with other boaters whenever possible.

Painting. Ask your service provider to...

☼ Cover water between boat & dock with visquine (plastic sheet) or tarp. Clean, dry & reuse visquine & tarps. Reverse boat in slip to work on other side.

☼ Mix only the amount of paint needed for the job. Mix paint on land, not on the dock; avoid dripping paint on dock.



☼ Use drip pans & containment trays to catch drips and spills. Have absorbent pads & thinner ready to clean up spills. Clean brushes on land.

☼ Seal containers tightly when not in use.

☼ Don't paint in a heavy breeze.

Sanding. Ask your service provider to...

☼ Cover the water between boat and dock with visquine or tarps. Clean, dry & reuse visquine & tarps. Reverse boat in slip to work on other side.

☼ Use a dust containment bag with sanding equipment. Sweep or vacuum all residual sanding dust and put it in the trash.

☼ Don't sand with steel wool; dust makes rust spots on other boats, docks or equipment.

☼ Plug scuppers to contain dust and debris.

☼ Don't sand underwater or in a heavy breeze.

Cleaning. Ask your service provider to...

☼ Avoid products with lye, ammonia, sodium hypochlorite, petroleum or chlorine.



☼ Use soap in moderation. More soap doesn't mean more clean.

Exterior Teak Decks and Trim.

Allow teak to fade to gray. Rinse it as needed with fresh or salt water to remove dirt. This reduces wear and tear from particles under foot.

Teak trim requires different care than teak decks. Varnished exterior teak lasts longer and provides more protection than an oil finish. Sand and varnish teak trim as needed.

Ask your service provider to....

☼ Use teak cleaners and soaps sparingly. Solvents in cleaners eat away at the soft grain of teak and damage seam compounds.

☼ Caustic cleaners and varnishes should not be introduced to marine waters. Dispose of extras as hazardous waste.

☼ For the look of freshly sanded teak that is easy on the environment, scrub teak decks with clean salt water and let the sun bleach them.

Educational Use, Only...

This information is provided on an educational basis to assist you in choosing a marine service provider. Ask your boatyard, marine supply dealer, experienced boaters and government for local policies, regulations, referrals and any special conditions or practices.

REFERENCES AND ACKNOWLEDGMENTS: Soundwatch, *An Environmental Guide for Boaters* (48° North); Rhode Island Marina Nonpoint Source Pollution Project (Rhode Island Sea Grant); Baywatch, *A Guide for Boaters* (Environmental Health Coalition); Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters (US Environmental Protection Agency); "Building a Case Against Unlicensed Contractors" (San Diego Union-Tribune); Underwater Hull Cleaning Best Management Practices (Bear Underwater Services); "Three Ways You Can Save Yourself Money" (Anchorwatch); Jim Haussener (California Marine Parks & Harbors Association); Members of the Steering Committee for San Diego County Boating & Nonpoint Source Pollution Education Program. Printed on recycled paper.



Clean Boating Guide



Pollution Prevention Practices

Preventing pollution can be as simple as using good maintenance practices and less caustic or toxic products. It's a way to keep your boating environment clean, promote healthy fish & shellfish and cut environmental cleanup costs (see our publication **Boating Pollution Economics and Impacts**).

This pamphlet suggests ways to reduce pollution in your marina. In deciding what practices to use, consider whether you will hire someone or do the work yourself. Ask about your marina's pollution prevention policies.

Many vessel cleaning and maintenance products, such as paint residue, solvents, and engine cleaners, are toxic to marine life in the water and sediments. These products and their leftovers should be disposed as hazardous waste. The last page of this pamphlet has information on the collection & disposal of these products.

OIL and FUEL POLLUTION

▶ ENGINE MAINTENANCE

✧ Ask your marina manager what types of maintenance projects are allowed in the slip. Also ask about rules for do-it-yourself work or contractors working in the marina.

✧ Keep engines well tuned & efficient.

✧ Keep oil absorbent pads in the bilge and a containment pan or tray under the engine.



✧ Regularly inspect and fix small leaks.

✧ Inspect lines and hoses for deterioration; prevent lines from chafing.

✧ Don't wash parts over the water. Wash over a bucket or in a parts washer. ⁶

▶ BILGE WATER

Bilge water becomes a problem if the engine leaks oil into the bilge. Do not pump water contaminated with oil overboard.

✧ Prevent oil from entering the bilge. The engine maintenance practices described above can help prevent bilge contamination.

✧ If you notice fuel or lubricant in your bilge, turn off the bilge pump immediately, so contaminants don't enter the water. ⁶

✧ Soak up oil that enters the bilge with special absorbent pads. To reuse the pad, wring it thoroughly and dispose the liquid as hazardous waste. When the pad will no longer absorb oil, wring it out and dispose it as hazardous waste. ⁴ Ask your marina manager for information on hazardous waste collection facilities.

▶ SPILL PREVENTION AND CLEAN UP

✧ If fuel nozzles do not have automatic shut-off, hold the dispenser by hand; do not insert a clip to keep flowing freely. ²

✧ Install a "whistle" in the line to warn when fuel tank is nearly full; do not top off.

✧ Stop the source of the spill. Contain spilled liquids. ⁴

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- ✧ Use dry clean up methods such as oil absorbent pads. Do not use straw. ⁴
- ✧ Clean up spills and leaks immediately. Do not hose down spills or leaks.
- ✧ If an oil spill reaches the water report it to the Coast Guard at **1-800-424-8802**.
- ✧ Do not apply soap or detergents to an oil spill in the water.

►DISPOSAL

✧ New or used engine oil and oil filters are hazardous wastes. Every marina designs its own policies for the collection and disposal of these materials. Ask about your marina's policy on hazardous waste disposal.

✧ Some automotive shops accept used oil, oil filters and batteries for recycling. Oil filters must be drained into a pan for 24 hours before they can be recycled. Ask your marina manager to refer you to shops that collect these materials, or to the local hazardous waste collection facility.

✧ Never contaminate used oil with another toxic substance such as engine cleaner, gasoline, diesel or transmission fluid. Contaminated oil is more expensive to dispose. ³

✧ Oil absorbent pads should be disposed as hazardous waste.



SEWAGE POLLUTION

- ✧ Do not discharge sewage in marina waters.
- ✧ Store sewage in holding tanks. Dispose regularly at pumpout stations, or hire a mobile pumpout out service.
- ✧ Ensure MSD Type II systems work properly and discharge only when underway and a sufficient distance offshore. Ask the Coast Guard for rules on offshore discharge. MSDs should **not** be discharged in the marina.
- ✧ Use shore-side restrooms rather than boat heads, whenever possible. ²

MARINE DEBRIS (Garbage & Plastics)



✧ Boaters can remember two simple rules to prevent overboard disposal:

- "Pack it in, pack it out". Everything that is not eaten should be returned to shore for disposal.
- If you wouldn't swim in it, don't put it in the water.

BOAT CLEANING AND MAINTENANCE IN THE SLIP

Follow these procedures for small to moderate-sized projects (ask your marina manager what is allowed in the slip). Take larger projects to a boatyard.

If you hire a maintenance service, they must follow marina rules. Because you may be responsible for the actions of your contractor, ask them to use environmentally protective methods such as those described in this pamphlet and our leaflet **Selecting Underwater and Topside Maintenance Services for Your Boat**.

► SANDING

- ✧ Wipe down small amounts of sanding dust with a damp rag.
- ✧ Cover the area between the boat and the dock with visquine or a tarp to catch debris. Reverse the boat in the slip to work on the other side. Reuse visquine or tarp after cleaning and allowing it to dry. ⁷
- ✧ Use sanding equipment with a dust containment bag. Sweep or vacuum all residual sanding dust and put it in the trash.
- ✧ Plug scuppers to contain dust and debris.
- ✧ Don't sand underwater or in a heavy breeze.

► PAINTING

✧ Cover the area between the boat and the dock with visquine or a tarp to catch drips. Reverse the boat in the slip to work on the other side. Reuse visquine after cleaning and allowing it to dry.

✧ Mix only enough paint for the job. Mix paints on land, not on the dock. Avoid spills and drips as you walk along the dock.



✧ Use drip pans and containment trays to catch drips and spills. Keep absorbent pads and thinner on hand to clean up spills.

✧ Seal containers tightly when not in use. Don't paint in a heavy breeze.⁷

✧ If you do accidentally spill paint or varnish into the water, it must be treated as a hazardous waste spill. Reporting the incident and clean-up procedures are the same as for a fuel or oil spill.^{6,7} Call the Coast Guard at **1-800-424-8802**.

✧ Reuse paints, varnishes and solvents whenever possible. Toxic products must be disposed at a hazardous waste collection event or permanent collection facility.



✧ Donate leftover paints and varnishes to fellow boaters or to a local theater group, church or school.⁵

✧ Pour only as much thinner as needed into a smaller container and use it up. This will avoid contaminating the rest.

✧ Reuse thinner and solvents. Let contaminants in the solvent settle, decant clear solvent into a new container for reuse. Dispose sludge as hazardous waste.

► CLEANING

✧ Use or ask your topside maintenance services to use environmentally friendly cleaning products. Avoid those containing ammonia, lye, sodium hypochlorite, chlorine or petroleum products.

✧ Use only phosphate free and biodegradable soaps. Even these soaps

may be harmful to the environment; carefully read labels on products. Also ask marine supply dealers for more information.

✧ Use soap in moderation. More soap doesn't mean more clean.

► EXTERIOR TEAK and TRIM

✧ Allow teak to fade to gray. Rinse it occasionally with fresh or salt water to remove dirt. This reduces wear and tear from particles under foot.

✧ Use teak cleaners and soaps sparingly. Solvents in the cleaners eat away at the soft grain of the teak and damage seam compounds.

✧ Keep caustic cleaners and varnishes out of marina waters. Dispose them as hazardous waste.



✧ For the look of freshly sanded teak, scrub teak decks with clean salt water and let the sun bleach them.⁵

✧ Teak trim requires different care than teak decks. Varnished exterior teak lasts longer and provides more protection than an oil finish. Sand and varnish teak trim as needed.

✧ If you oil your teak trim, minimize or eliminate the use of caustic cleaners before applying the oil.

✧ Put sanding dust into the trash.

► UNDERWATER HULL CLEANING

✧ Wait 90 days after applying fresh hull paint before having the hull cleaned underwater, due to high initial release of toxicants.¹

✧ Vessels with soft, rapid sloughing or ablative hull paints should not be cleaned underwater.¹

✧ Consider using hull paints that are non-toxic or have a lower copper content and a hard or slick surface. This will reduce the release of toxicant into the water. Regular underwater hull cleaning using best

management practices will help to control fouling growth between haulouts.⁵



✧ Use a sponge, soft cloth, or piece of carpet to wipe off soft marine growth. Regular cleaning can prevent hard growth from forming.¹

✧ Use stainless steel pads or brushes only on unpainted metal areas, never on bottom paint.¹

✧ Colored "plumes" or clouds should **not** occur in the water near underwater hull cleaning activity. They indicate paint has been rubbed off your hull.¹

✧ Return zinc anodes to shore¹ and recycle.

HAZARDOUS WASTE DISPOSAL

✧ Check your marina lease agreement for boater responsibilities regarding hazardous waste recycling and disposal.



✧ Ask your marina manager where to call regarding local hazardous waste collection and automotive shops that accept used oil, oil filters, and batteries for recycling.

✧ **Report spills** to your marina manager and to the Coast Guard at **1-800-424-8802**.

✧ In San Diego County, call the Hazardous Waste Hotline **1-800-246-1233** or **235-2111** for information on the next household hazardous material collection date.

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Educational Use, Only

This information is provided on an educational basis to assist you in reducing pollution in marina waters. It should not be used as a stand alone guide. Ask your marina manager or your local regulatory agencies about marina policies and specific pollution control program requirements.

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Boating Pollution Economics & Impacts

WHAT HAPPENS WHEN A LITTLE TRASH, some oil, fuel, cleaning agents or sewage go overboard from your boat? Does it matter which hull paint you choose? Can preventing pollution save money? This leaflet will answer your questions on the benefits of preventing boating pollution.

Even small amounts of pollution become a problem when they accumulate over time. Manufacturing, using and disposing boating products and equipment all contribute to the environmental impacts and costs of pollutants.



Boating pollutants in the water and sediment affect marine life and human health (see table inside). They may reduce the availability of quality seafood, raise health care & dredging costs and affect industries that need clean water, like tourism, fishing & water sports.

Environmental Health, Human Health and Economics

Some pollutants change water chemistry, so sediment contaminants are easily absorbed by marine life.⁸ Pollution makes marine animals less able to survive other stresses. This may affect fishing & other water uses.⁹

Studies of San Diego Bay & similar bays found fish living in polluted, urban water had more liver tumors and fin rot than fish in clean water.^{9, 20, 22}



In 1989 anglers in southern California spent \$536 million on saltwater sportfishing.²⁷ Of nearly 3 million fish caught by anglers on ocean charter boats

in 1989⁵, 5 species, or 27% spend significant periods in bays.^{10, 12, 16} There are also substantial landings from private boats & fishing piers.^{10, 27} A decline in these fish could cost millions of dollars.

Quality seafood depends on clean water & sediment.⁹ The commercial value of halibut and white seabass for California in 1988 was \$2.7 million.⁶ These fish live in bays when young.^{12, 16}

Several viral, bacterial & parasitic diseases are shared between aquatic animals & humans.⁹ Sediment contaminants accumulate in some fish that live in bays and may be passed to people who consume them often.¹⁰

Pollution, Dredging & Haulout Costs

Hull paint toxicants accumulate in the sediment of some harbors, such as San Diego Bay.^{15, 28}



Harbors need regular dredging to maintain water depth. Clean sediments are much cheaper to dredge & dispose. Costs may seem modest per cubic yard, but thousands of cubic yards are removed when a typical boat basin is dredged. (see table below)

These costs may pass to marina tenants. Santa Cruz Port District calculated that if the 10,000 cubic yards dredged per year were disposed as hazardous waste, slip rental rates would rise by \$1.50/foot.²⁶ Because toxicants from hull paints and maintenance products contaminate harbor sediment,^{8, 28} preventing pollution can save you money.

How fast toxicant leaches from hull paint depends on local conditions, paint chosen & hull cleaning practices. The longer toxicant stays on a hull, the less goes to the sediment and the less you spend on haulouts.




For more information, see our leaflets:




- ★ **Selecting a Hull Paint for Your Boat**
- ★ **Selecting Underwater & Topside Maintenance Services for Your Boat**
- ★ **Clean Boating Guide**
- ★ **Clean Boating Tips**

Dredge and Disposal Type	Cost/Cu.Yd.	Cost for 25,000 cu. yd.
Dredge / dispose on beach or in ocean ^{1, 18, 26}	\$5 - \$10	\$125,000 - \$250,000
Dredge / dispose as contaminated waste, e.g. construction fill ¹	\$17.50 - \$35	\$437,500 - \$875,000
Dredge / dispose as hazardous waste ^{1, 18, 26}	\$40 - \$60	\$1,000,000 - \$1,500,000

Environmental Impacts of Boating Pollutants

(Unless otherwise stated, material is from Connell and Miller 1984)

Pollutant	Sources and Characteristics	Environmental Activity	Environmental or Human Health Effects
Detergents	<ul style="list-style-type: none"> * Most cleaning agents, detergents and soaps * Oil spill dispersants²⁹ * Breaks down oils and greases on boats¹⁷ * Dissolves according to water conditions 	<ul style="list-style-type: none"> * Accumulates in sediments * Broken down by microorganisms 	<ul style="list-style-type: none"> * Toxic to marine plants and animals * Impairs breathing in fish¹⁷ * Reduces amounts of oxygen in affected waters * Produces unsightly foam on the water surface
Marine debris	<ul style="list-style-type: none"> * Commercial and recreational boating¹¹ * Plastics, food wastes, packaging, lines, nets, fish cleaning wastes³ * Plastics degrade very slowly. * Some wastes become nutrients (see "Nutrients") 	<ul style="list-style-type: none"> * Persistent in the environment 	<ul style="list-style-type: none"> * Can choke / strangle sea animals^{3, 11} * Ghosts nets, and traps endanger divers³ * Can transport harmful non native species¹¹ * Snagged by props and engines³ * Ruins recreational beaches¹¹
Acidic & Alkalis Substances	<ul style="list-style-type: none"> * Battery acid, lye and other strong acids or bases in vessel cleaning products¹³ * Dissolves easily in water 	<ul style="list-style-type: none"> * Increases natural acidity or alkalinity of water by decreasing or increasing pH respectively. 	<ul style="list-style-type: none"> * Toxic to marine plants and animals * Increases the toxicity of other toxic substances, metals, other pollutants and chemicals * Can irritate or damage skin
Metals	<ul style="list-style-type: none"> * Paint particles from hydro washing, metal shavings from engine wear, and consumer products containing metals * Dissolves according to water conditions 	<ul style="list-style-type: none"> * Accumulates in sediments, marine plants, and animals * Persistent in the environment * Some metals broken down by microorganisms 	<ul style="list-style-type: none"> * Toxic to marine plants and animals. * Changes the food web in the marine environment by eliminating certain species 
Copper (Cu)	<ul style="list-style-type: none"> * Used as a toxic agent in antifouling paints. * Dissolves according to water conditions 	<ul style="list-style-type: none"> * Accumulates in sediments, marine plants, and animals * Persistent in the environment 	<ul style="list-style-type: none"> * Very toxic to fish when combined with zinc sulfates¹⁵ * Long term toxicity to marine plants and animals
Tributlytin (TBT)	<ul style="list-style-type: none"> * Still used as a toxic agent in antifouling paint on aluminum hulls, outboard motors & lower drive units^{4, 15} 	<ul style="list-style-type: none"> * Accumulates in sediments, marine plants, and animals¹⁵ * Persistent in the environment 	<ul style="list-style-type: none"> * Toxic even in small amounts to marine plants and animals, especially bottom feeders¹⁵ * TBT contaminated shellfish are dangerous to human health¹⁵

<p>Zinc (Zn)</p>	<ul style="list-style-type: none"> * Anticorrosive zincs and paint pigments * Dissolves according to water conditions, which can make Zn more available to marine organisms ¹⁵ 	<ul style="list-style-type: none"> * Accumulates in sediments, marine plants & animals * Persistent in the environment 	<ul style="list-style-type: none"> * Toxic to marine plants and animals, even small amounts ¹⁴ 
<p>Oil / Fuel</p> 	<ul style="list-style-type: none"> * Normal boat operation, fueling, engine maintenance, spills, runoff, and bilge discharge * Dissolves slowly in water, clings to particles and sediments in marine environments 	<ul style="list-style-type: none"> * Fuels evaporate in air. * Broken down by sediment microorganisms²¹ * Accumulates in sediments, marine plants, and animals * High accumulation in estuaries and intertidal areas 	<ul style="list-style-type: none"> * Some components toxic to marine plants and animals even at low concentrations ²⁵ * Some components cause cancer, mutations and / or birth defects. * Behavioral changes in shellfish and fish ²³ * Discoloring and bad taste in flesh of fish ^{19, 24, 25}
<p>Dusts and sediments</p>	<ul style="list-style-type: none"> * Vessel scraping and sanding, erosion during construction and urban runoff * Heavy metals, nutrients, hydrocarbons, etc. adhere to dusts and sediments 	<ul style="list-style-type: none"> * Accumulate in sediments near the discharge to water * Sediment bound contaminants released to water if disturbed 	<ul style="list-style-type: none"> * May reduce amounts of oxygen in affected waters * General lowering of water quality * Burial of habitat, food and / or organisms * Increased turbidity can clog gills of fish
<p>Nutrients</p>	<ul style="list-style-type: none"> * Runoff, sewage, erosion, garbage & detergents containing (P)hosphorous or (N)itrogen * P binds easily to water particles 	<ul style="list-style-type: none"> * Used by marine plants and organisms for food (P,N). * Accumulates in sediment (P). 	<ul style="list-style-type: none"> * Increase in algae growth which decreases light and oxygen in the water (eutrophication) * (N) can be toxic in higher concentrations
<p>Solvents</p>	<ul style="list-style-type: none"> * Vessel maintenance & repair activities * Paints, varnishes, paint removers and lacquers as well as degreasing agents * Does not dissolve in water ¹³ 	<ul style="list-style-type: none"> * Sink in water until they reach an impervious surface. * Acetone lingers in air and is transported to sediment & water 	<ul style="list-style-type: none"> * Many solvents can cause cancer. * Large amounts can cause dizziness, disorientation and unconsciousness in the user ²
<p>Anti-freeze</p>	<ul style="list-style-type: none"> * Used as engine coolant and freeze prevention during winter storage. Improper use & storage creates leaks or spills ¹³ 	<ul style="list-style-type: none"> * Fate similar to solvents ¹³ 	<ul style="list-style-type: none"> * Ethylene glycol is deadly to humans, pets & marine organisms in low doses ² * Propylene glycol (orange/pink color) is less toxic than ethylene glycol (blue/green color) and is preferred for use in boats ⁷

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**UNIVERSITY OF CALIFORNIA
COOPERATIVE EXTENSION
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FARM & HOME ADVISOR DEPT.
SEA GRANT EXTENSION PROGRAM**



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ORDER FORM

MARINA POLLUTION PREVENTION MANUAL AND RELATED PUBLICATIONS

Marina Pollution Prevention Manual (\$5.00)

30-page guide to developing a pollution prevention plan for marina managers, dock masters and harbor masters. Manual focuses on concepts and ideas that will be helpful in designing a custom pollution prevention plan for a recreational boating facility and advises working with regulatory authorities to ensure the plan meets their specific requirements. Manual includes the following sections: Introduction to manual purpose and list of pollutants and regulators; Marina pollution sources & solutions; Hazardous waste management and spill response; Marina staff procedures and training; Local agency and service contacts (developed for San Diego County; use as a guide to preparing a list, if from a different area); References cited and sources of additional information; and also includes the publications listed below, except for the bibliography. Manual comes ready to be placed in a 3-ring binder.

Clean Boating Tips (single copy free)

2-page summary of wastes to contain, pollution prevention tips, pollutants, regulators and spill reporting information for boaters, marina managers and maintenance workers

Underwater Hull Cleaner Best Management Practices (single copy free)

Pocket guide to underwater hull cleaning practices that are easy on the environment and the hull of the boat

Clean Boating Guide (single copy free)

4-page boater's pollution prevention guide

Selecting Underwater and Topside Maintenance Services for Your Boat (single copy free)

2-page boater's guide to communicating with in-slip maintenance contractors about pollution prevention

Selecting a Hull Paint for Your Boat (single copy free)

4-page guide to hull paint characteristics, environmental considerations & relative costs

Boating Pollution Economics & Impacts (single copy free)

4-page guide to economic & environmental benefits of preventing boating pollution

Clean Boating Bibliography, Annotated (\$3.00)

30-page list of over 125 references reviewed in developing the above publications. Each entry includes a short description of the reference and a source for obtaining it. Materials cover such diverse topics as marina pollution prevention and design, pertinent economic data and technical data on pollution impacts, marine biology, vessel fuel conservation and hull paints.

Set of camera-ready masters for the smaller publications (\$3.00)

Please inquire about availability and pricing for multiple copies.

Mail this order form (and your check, payable to **UC Regents**, if ordering a priced publication) to:

**Sea Grant Extension Program, University of California
5555 Overland Avenue, Building 4, San Diego, CA 92123**

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Underwater Hull Cleaner's Best Management Practices

Underwater hull cleaners can lower operation costs, assist their industry, clients and the marine environment by using best management practices (BMPs) to reduce pollution and extend the life of hull paints.

Objectives for BMP Use

- Prevent paints, especially those with copper, from entering the water and sediments.
- Keep paint intact on the hull and remove fouling growth to reduce drag & fuel use.

HULL CLEANER BMPs*

Wait 90 days after applying new paint. Paints release more toxicant when new.

Soft sloughing or abrasive paints release toxicant & paint to water when cleaned. On these boats clean only running gear and zinc anodes



Use only a "carpet", sponge & other soft materials to clean the hull.

Use soft nylon or similar material on rotary brush machines.

Use stainless steel brushes & pads on non-painted metal areas *only*.

Use more rigorous cleaning pads *only* as needed to remove hard marine growth.

Do not sand or strip hull paint underwater.

Bring zinc anodes back to shore; recycle or dispose properly.

Clean gently to avoid creating a plume or cloud of paint in the water.

Information provided for educational purposes. Ask agencies about regulations in your area.

We wish to thank David Bear and the many other advisors & reviewers!

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UCSGEP-SD 95-2 & July, 1995

ADVISING BOAT OWNERS

The following information may be useful to answer client questions on hull protection & maintenance.

Maintaining the Hull and Paint

Properly applied and maintained paints protect the hull from fouling organisms & improve performance of the boat.

Correct application also extends paint life by reducing amount lost to harbor.

Allow 90 days after applying new bottom paint before cleaning underwater.

Regularly scheduled hull cleaning and maintenance reduces hard marine growth and hull drag.

Repair paint bonding problems at haul out to avoid further chipping and flaking of paint into the water.

Protection from Fouling Growth

Toxicants in some hull paints limit cleaning options & increase toxicant amounts in marine waters. The following may be helpful to clients in choosing antifouling strategies.

- "Soft" sloughing and ablative (self polishing) hull paints release copper when cleaned underwater. Refrain from underwater cleaning.

- Hard finish, conventional anti-fouling paints release less toxicant with underwater cleaning.

- Polyurethane and silicone paints contain no toxicant & do not rub

off during cleaning. Don't leave most polyurethane painted hulls in water over 72 hours.

- Store infrequently used boats on land. Check local requirements & facilities for storage locations.

- Floating hoist systems hold the boat out of the water in the slip.

- ✓ Ask a repair facility if your hull paint remains effective after boat is stored out of the water.

- For more information on hull paints, ask experienced boaters & boatyard owners and see our publication, "Selecting a Hull Paint For Your Boat." Write to:

Cooperative Extension - Sea Grant
5555 Overland Avenue, Building 4
San Diego, California 92123

References

1. "Anti-fouling Bottom Paints and Fishing Vessel Efficiency" (Jeff Longmore)
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3. "Cutting Fuel Costs: Alternatives for the Commercial Fisherman" (Dewayne Hollins et. al.)
4. Soundwatch, An Environmental Guide for Boaters (48 North)
5. Underwater Hull Cleaning Best Management Practices (Bear Underwater Services).



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Clean Boating Tips



A water pollution prevention
guide for:

Boaters

Marina Managers

**Marina and Boat
Maintenance Workers**

Marina Pollution Sources

- Oil & fueling activities
- Marina & vessel cleaning, painting & maintenance
- Garbage & plastics
- Sewage



Keep marina and boating waters clean and healthy. Contain and dispose these wastes: ★

Saw dust or concrete dust

Sanding dust containing paint or varnish particles

Caustic paint strippers

Alkaline or acidic cleaners
(For example, 2 part teak cleaners)

Engine oil, gas and grease

Waste waters or bilge water

Hull paint residue containing cuprous oxide (copper) or TBT

Organic solvents including paint thinner, chemical strippers, and parts cleaners

The bottom line is: DO NOT ALLOW ANYTHING TO FALL IN THE WATER



Basic "Do's and Don'ts":

- Do not top off fuel tanks.
- Report spills.
- Ask your Dockmaster what kinds of vessel maintenance are allowed
- Wipe off small amounts of sanding dust with a damp cloth.
- Drape vessel with tarps to catch wastes from small to medium sized maintenance projects.
- Take larger projects to a boatyard
- Collect or vacuum all boat and dock cleaning and sanding wastes
- Do not spray paint in the marina
- Use a hard, less toxic or non-toxic hull paint
- Gently wipe hull often with soft cloth to remove soft growth
- Hulls with ablative or sloughing paints should not be cleaned underwater
- Use shore side trash cans
- Use holding tank pumpout stations
- Share leftover paint, varnish, cleansers, etc. with other boaters
- Dispose of waste oil, batteries, paints & cleansers at hazardous materials collection stations ★

Pollutants and Regulators

The following list is provided as a general summary of agencies that regulate pollution from boating. Contact agencies for specific requirements and penalties. Pollution discharges may result in civil or criminal penalties.

Petroleum / Hazardous Waste Spills & Clean Up

US Coast Guard
California Dept. of Fish & Game
Harbor Police ☉

Hazardous Wastes

California Dept. of Toxic
Substances Control,
County Dept. of Environmental
Health, Waste Management, etc. ☉



Marine Debris (garbage & plastics)

Harbor Police ☉
US Coast Guard

Boat Sewage

Harbor Police ☉

Hull Paints (with copper or TBT)

California Dept. of Pesticide
Regulation
County Dept. of Agriculture,
Weights, and Measures

Non Point Source Pollution

(broad range of pollutants)
Regional Water Quality Control
Board
California Coastal Commission
Local governments

☉ Responsible local agencies may vary

★ See back page

To report oil spills, call:
1(800) OILS-911 or the
U.S. Coast Guard National Response
Center **1(800) 424-8802**.

★For information on collection stations for hazardous materials such as used oil, paint, solvents, anti-freeze, or batteries, call your County Environmental Health Department, Office of Waste Management, or similar agency:

Also ask automotive supply and repair shops if they provide used oil and battery disposal service.

In San Diego County, boat owners may call the Household Hazardous Materials Hotline at 1(800) 246-1233 or (619) 235-2111, and marina employees may call the County Environmental Health Dept. at (619) 338-2231.

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For more information on preventing pollution see our publications:

- Selecting A Hull Paint For Your Boat
- Selecting Underwater and Topside Maintenance Services For Your Boat
- Clean Boating Guide
- Boating Pollution Economics and Impacts
- Marina Pollution Prevention Manual

We wish to thank Cal Callaghan, the San Diego Dockmasters Group, and the many advisors and reviewers for their assistance. References for this leaflet are cited in the above publications.

This publication is provided for educational purposes. Contact marina managers and agencies for specific requirements.

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