



Best Management Practices Manual for North Carolina Marinas

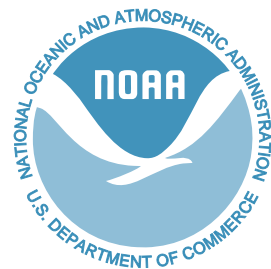
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This manual is intended as an educational tool for marina operators and boaters. It does not constitute a complete reference to State, Federal or local laws. This book may not be relied upon to create a right or benefit substantive or procedural, enforceable at law or in equity by any person.

For additional copies, contact the NC Division of Coastal Management, 1638 Mail Service Center, Raleigh NC 27699-1638. Phone: (919) 733-2293.



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INTRODUCTION

North Carolina's waterways attract boaters. Boaters need services and accommodations like any tourist traveling away from home. Marinas and boatyards fulfill this need, and in so doing generate tourism dollars and economic enhancement to this state. Boaters rely on clean waters for maximum enjoyment of swimming, fishing, and viewing the natural resources. Unfortunately, those who most want to benefit from clean water and air can be a direct cause of environmental degradation. Due to the proximity to waterways, the boating industry can contribute to the pollution of the waters and air if efforts are not made to minimize and control contaminants.

Marina operators are often the gatekeepers to the waters, and as such have a responsibility to minimize contaminants so that the waters remain clean.

This manual is to be used as a guide and reference by marina and boatyard operators as they promote and protect clean water and air; key components of successful marine businesses. It is also intended to highlight what encompasses the business of marinas and some of the issues and conflicts that marina operators face. This manual is not intended to be used as a regulatory document since it must be recognized that not every marina will be able to implement all the listed Best Management Practices due to cost, management structure, and facility design and function constrictions.

By adopting the best management practices outlined in this manual, you will show your commitment to protect the natural resources upon which we all depend. Your facility will be a safer, healthier place to work and will be more attractive to clients who care about a healthy environment.



SITING AND DESIGN CONSIDERATIONS FOR NEW AND EXPANDING MARINAS

PROBLEM:

Waterfronts are some of the most fragile ecological systems and also the most highly desired locations for marinas. The plant and animal communities of the coastal area have multiple benefits. Wetlands provide habitat for fish and other animals that support tourism, hunting and fishing. Wetlands also minimize the effects of erosion and act as a filter, preventing upland pollution from entering the water. This creates a difficult problem where development and environment have to co-exist. However, there are means to develop waterfronts without diminishing the viability of the coastal environment. Siting and design are the most important factors in aiming to limit the marina's impact on wetlands and water quality.



RULES AND REGULATIONS:

Marina siting and design is regulated by state and local authority. Since locations can vary significantly along the coastal region, there is not a one-size fits-all answer to how a marina should be laid out and constructed. The goal for any marina though, is to minimize environmental impact.

Federal:

Because individual states have varying topography and water frontage issues, there are few specific federal rules to guide marina siting and design. The exceptions are the Federal Endangered Species Act, Clean Water Act and Rivers and Harbors Appropriation Act. Under the first, construction cannot be permitted where it harms or interferes with endangered species. The second gives the US Army Corps of Engineers (ACE) the authority to regulate dredge and fill activity in navigable waters. Under section 10 of the Rivers and Harbors Act, the building of any wharfs, piers, jetties, and other structures is prohibited without Congressional approval, and excavation or fill within navigable waters requires the approval of the Chief of the ACE. As most marina development would require dredging, the ACE rules will play a role in the permit process.

State:

In North Carolina, the Coastal Resources Commission (CRC) establishes policies for the NC Coastal Management Program and adopts implementing rules for both the Coastal Area Management Act (CAMA) and the NC Dredge and Fill Act. Under state rule 15A NCAC 7H.0208(b)(5)(A), the CRC outlines where marinas should be sited to minimize or prevent impacts to the surrounding environments-Marinas shall be sited in non-wetland areas or in deep waters and shall not disturb valuable shallow water, submerged aquatic vegetation, and wetland habitats, except for dredging necessary for access to high ground sites. The following four alternatives for siting marinas are listed in order of preference for the least damaging alternative; marina projects shall be designed to have the highest of these four priorities that is deemed feasible by the permit letting agency:

- (i) an upland basin site requiring no alteration of wetland or estuarine habitat and providing adequate flushing by tidal or wind generated water circulation
- (ii) an upland basin site requiring dredging for access when the necessary dredging and operation of the marina will not result in the significant degradation of existing shellfish fishery, or wetland resources and the basin design shall provide adequate flushing by tidal or wind generated water circulation
- (iii) an open water site located outside a primary nursery area which utilizes piers or docks rather than channels or canals to reach deeper water; and
- (iv) an open water marina requiring excavation of no intertidal habitat and no dredging greater than the depth of the connecting channel.

In addition, state rules also limit the amount of public trust waters that can be covered by a residential marina (marina of 11 or more slips that serves a residential community and not the general public) to 27 square feet for every one linear foot of shoreline. Marinas that require other than maintenance dredging are also prohibited from being located in primary nursery areas, and marinas cannot be located in or near areas where shellfish harvesting is an existing use if the marina will cause the area to be closed to shellfishing.

BEST MANAGEMENT PRACTICES

When considering sites to build a marina, assess the water quality to find out if there are existing threats to human, plant, or animal life which the marina would compound, or if the area can sustain the development. Proper marina siting is valuable in determining how future construction and activities at the marina would affect water quality. It can also make future permitting issues less complicated.

On the Dock

The marina basin and entrance channel should not be deeper than the adjacent waters. This is to prevent “dead water” within the marina. That is, water with too little oxygen to support marine life.

Create as few segments as possible in the basin to allow for free circulation of water.

Design and locate entrance channels to promote flushing. Avoid waters designated by the Environmental Management Commission as Outstanding Resources Waters.

Avoid submerged aquatic vegetation and shellfish beds. Minimize disturbance of wetlands. Learn migration, nesting and spawning periods for native species to avoid working during these critical times.

Limit the number of covered slips since the covers block sunlight critical to bottom dwelling organisms.

For floating docks, use buoyant foams that have been coated or encapsulated



in plastic or wood to prevent buoyant debris which may be mistaken as food by birds or fish.

Use wave attenuators instead of fixed breakwaters to allow for flushing of the marina basin.

Design fixed breakwaters so they do not extend completely to the basin bottom, and no farther below the water's surface than necessary so adequate flushing of the marina is maintained.



In the Yard:

Expand storage capacity by creating drystack or other land storage rather than increasing the number of wet slips.

Locate buildings and workshops in upland areas to minimize impacts on wetlands and the water.

Locate parking and land storage in upland areas. Boat ramps tend to channel and drain water from large surfaces of the marina including parking lots, fuel storage and repair and maintenance areas. Any spill or accumulation of pollutants will often find its way directly to the water through the boat ramp.

Ensuring that the ramp rises to an elevation above the surrounding area and maintaining this elevation along its edges will prevent stormwater from carrying pollutants directly to the marina basin.

The typical practice of draining boat bilges once they are hauled up a boat ramp causes any accumulated bilge oil to run directly into the adjacent waterway. Post signs advising users not to drain their bilges until the boat is off the ramp. Consider providing an alternate inclined surface where bilge oil can be contained or channeled to an acceptable receiving location.

For More Information:

NC Division of Coastal Management 919/ 733-2293 or 888/ 4RCOAST.
The Division's website www.nccoastalmanagement.net, has downloadable permit applications, rules and policies.

States Organization for Boating Access. 1996. Design Handbook for Recreational Boating and Fishing Facilities. Washington, DC.
Available with further information on <http://www.soba.gen.dc.us>

STORMWATER MANAGEMENT

PROBLEM

Stormwater runoff is generated from hard impervious surfaces that prevent the absorption of rainwater into the ground. As the water runs across these surfaces, it picks up residue, litter and soil, all of which drain into surface waters either directly or through storm drains. At marinas this is a concern since oil, paint, pet waste, or other chemicals could be present and would likely be washed directly into the boat basin.



As more and more surfaces are paved, the volume of stormwater runoff increases, causing problems such as increased erosion, sedimentation, flooding, and loss of animal habitat. Due to their proximity to the shoreline, marinas can play an important role in reducing stormwater runoff and, therefore, protecting and helping to clean up our waterways.

RULES & REGULATIONS

The Clean Water Act is the federal law that sets the standards for handling waste waters and the introduction of stormwater into waterways. State and local governments interpret and implement the Clean Water Act to develop a regulatory program that fits the minimum EPA requirements and state needs.

Federal:

The Clean Water Act requires permits to be issued for projects where there will be a discharge of dredged or fill material into federal waters and wetlands. It also prohibits the discharge of oil or hazardous substances into navigable waters, and prohibits the use of soaps, detergents, surfactants and emulsifying agents to disperse fuel, oil or other chemicals. In addition, the Clean Water Act authorizes the National Pollutant Discharge Elimination System (NPDES) permit program.

NPDES permits are required for Boat Building and Repairing Facilities (SIC 373) and Marinas (SIC 4493) that discharge stormwater through a point source on their property directly into the water basin. For instance, a drainage pipe that leads to a basin would trigger the stormwater permit requirement.

State:

State rule 15A NCAC 2H.1000 dictates what permits and associated requirements must be met for facilities to comply with the Division of Water Quality's stormwater management program.

The first step in obtaining a stormwater permit is to submit a Notice Of Intent (NOI) to the state Division of Water Quality Stormwater Unit to get

coverage under General Permit NCG190000 to discharge stormwater under the National Pollutant Discharge Elimination System.

Specific permit requirements are as follows:

- Implement a Stormwater Pollution Prevention Plan;
- Yearly analytical testing by a certified lab of waters leaving all point sources;
- Semi-annual qualitative monitoring;
- Oil, grease and new motor oil usage monitoring for facilities that perform maintenance activities, including mechanical repairs, painting and fueling;
- Provide secondary containment for all bulk storage of liquid materials.

BEST MANAGEMENT PRACTICES

There are several types of BMPs that can be implemented to reduce stormwater pollution. The type of treatment that is chosen is dependent on the layout of the facility, the magnitude of the stormwater problem on site, and the financial capabilities of the marina.

In the Yard:

Control sediment during construction-

If any construction is occurring at the marina, filters can be used to capture sediments that are produced during the work. Silt fences or earthen dikes are some options.



Create vegetative buffers-

Grass, plants, and the soil that they grow in act as filters for stormwater, capturing the sediment and particulates. A buffer slows down the flow of stormwater, allowing for natural processes of evaporation, transpiration and vegetative uptake to occur. All of these reduce the total amount of runoff that reaches the waterways.

Move downspouts so they empty into vegetated areas. Avoid draining to concrete or asphalt.

Use grass swales to direct the flow of stormwater on your property. Grassed swales improve water quality by filtering out particulates, taking up nutrients and promoting infiltration.

Plant native vegetation along the edges of parking lots.

Limit the use of toxic pesticides and fertilizers and instead use environmentally friendly products. Use native plants, which are naturally resistant to pests.

Minimize paved areas-

Paved areas increase runoff. Minimize the number and the length of roadways. Plan future development around sensitive areas, and have as little impervious surface as possible.

Capture and filter stormwater-

Runoff from hard surfaces such as roofs and parking lots can be directed

towards a filtered drain system or a constructed stormwater wetland. The drainage area is comprised of material that filters sediments and other pollutants present in the runoff.

The following options for stormwater drainage structures generally require a design or engineered plan for the construction and maintenance of the systems. All systems require regular maintenance to function properly.

- Retention basins - where stormwater runoff is temporarily stored to allow sediments to settle out.
- Constructed wetlands - man made shallow pools planted with native wetland vegetation.
- Infiltration practices - basins, trenches, downspouts or porous pavement temporarily hold stormwater and discharge it through filtration into the surrounding soils.
- Bio-retention practices - depressions in the land underlain with an engineered soil mixture to help filter runoff into underlying natural soils or a subsurface drain system.
- Sand filters - underground facilities that capture, pretreat and filter stormwater runoff as it comes off a surface or through a point source.
- Grassed swales - vegetated channels lined with erosion-resistant and flood-tolerant grasses underlain by soil that facilitates runoff filtration and exfiltration into the underlying natural soils.
- Vegetated filter strips - a vegetated strip of land that is positioned to capture and filter sheet runoff.

Landscaping

Use plants that are insect and disease resistant to avoid having to use pesticides.

Do not use pesticides on windy or rainy days.

Keep lawns mowed to suppress weeds.

Boat Repair

Do hull maintenance and painting under a covered area.

Use tarps under boats that are being serviced, or do hull maintenance and painting over a cement pad where debris can be swept up or washed into a filter system. Clean the area frequently.

General Maintenance

Fix leaks and drips.

Equip water hoses with automatic shutoff nozzles.

Sweep parking lots regularly instead of hosing them off.

Store hazardous chemicals inside or under a covered area.



Education

Raise marina customer and public awareness about storm drains emptying into surface waters. Stencil storm drains with “Don’t Dump” and indicate what water system a particular drain empties into (Requires permission from the county or city department that maintains the storm drains).

For More Information:

NC DENR Division of Water Quality/ Water Quality Section,
919/733-9919 <http://h2o.enr.state.nc.us>

www.ces.ncsu.edu/resources/water/

NC Cooperative Extension Service website that highlights information on protecting water and best management practices

www.epa.gov/owow/nps/marinas.html

EPA’s Clean Marina website provides several BMP manuals for marinas as well as information on nonpoint source pollution

www.cwp.org

Center for Watershed Protection website that gives more specifics on stormwater management and controls

www.epa.gov/owow/nps

EPA website that highlights nonpoint source pollution prevention steps, problems and frequently asked questions

www.epa.gov/ebtpages/wgroundwater.html, and

www.epa.gov/ebtpages/wwastewater.html

EPA websites that give more specific regulations and guidance on how to treat wastewater and how wastewater affects the environment.

www.epa.gov/owow/nps/mmisp/index.html

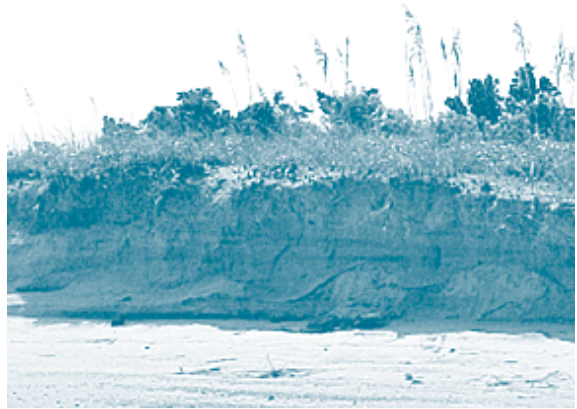
EPA website containing the document entitled National Management Measures to Control Nonpoint Source Pollution from Marinas and Recreational Boating.

SHORELINE STABILIZATION

PROBLEM:

Shoreline erosion can be a source of pollution because it increases the sediment and pollutants that enter the water. Increased sediment can smother shellfish and block out sunlight to aquatic vegetation. It can also increase the scale and frequency of dredging projects which increase marina maintenance costs and add to turbidity problems.

Shoreline erosion is often caused by boat wakes. There is a direct connection between rate of erosion and the type of boat, distance of the boat from the shoreline, water depth, channel width, shoreline soil condition, slope of the bank, and amount of shoreline vegetation. The closer the boat to shore, and the condition of the shore (unvegetated or already eroding), the more likely erosion will be a problem. Often the only waves to scour the shore of a marina come from boat wakes or reflection off of breakwaters. Even this limited wave action can cause erosion along the edges of breakwaters and bulkheads and under boat ramps. Where unvegetated shorelines are exposed to wave action, erosion will also occur. All of this can contribute to sediment accumulation in the marina basin.



RULES & REGULATIONS:

Shoreline stabilization activities are authorized under the NC CAMA, the NC Dredge and Fill law and federal requirements of the Army Corps of Engineers. However, only a CAMA permit application is required because these permits are processed jointly. In most cases, only one permit will be issued rather than a separate permit for each permitting agency. Shoreline stabilization and the NC Dredge and Fill Law and federal permit requirements of the Army Corps of Engineers for this activity may be met by state requirements. The Corps permit for this activity may be issued coincidentally with the NC CAMA permit. Essentially, when a CAMA general permit is issued for a development activity such as a bulkhead, an Army Corps of Engineers permit is issued at the same time, eliminating the need for a separate federal permit.

State:

Where a bulkhead is to be permitted, the state requires the following specific standards to be met, as codified in 15A NCAC 07H.0208(b)(7):

- A) Bulkheads shall be aligned with mean high water or normal water level.
- B) Bulkheads shall be constructed landward of significant marshland or marsh grass fringes.
- C) Bulkhead fill material shall be obtained from an approved upland source or from approved onsite excavation materials.
- D) Bulkheads shall be permitted below mean high water or normal water level when:
 - i) The property to be bulkheaded has an identifiable erosion problem which will cause the applicant unreasonable hardship;

- ii) The bulkhead alignment extends no further below mean high water or normal water level than necessary to allow recovery of the area eroded in the year prior to the date of application, to align with adjacent bulkheads;
- iii) The bulkhead alignment will not result in significant adverse impacts to public trust rights or to the property of adjacent riparian owners;
- iv) The need for a bulkhead below mean high water is documented in the Field Investigation Report; and
- v) The property to be bulkheaded is non-oceanfront.

BEST MANAGEMENT PRACTICES

Various methods can be used to prevent erosion at a marina. The type that is best suited for a facility is dependent on the rate of erosion, the slope of the shoreline, the severity of waves and tides, the amount of vegetation present and the type of soil being eroded. Below are suggested erosion control practices and methods.

In the Yard:

Retain nearby natural shoreline features during boat ramp construction to help prevent erosion around and under the boat ramp in the future.

Use vegetative planting instead of bulkheads where possible. These methods will work where there is low wave action and protection structures are not necessary. This dissipates wave action thus limiting erosion. The soil must be suitable for vegetation, allowing plants to establish themselves despite wave and current activity.

Where non-structural stabilization methods cannot be used, structural methods for shoreline stabilization including gabions (rock encased in wire mesh), riprap, sloping revetments, breakwaters, jetties, and bulkheads can be used.

Use riprap instead of a vertical hard bulkhead on sloping surfaces. Riprap provides habitat for shore animals and aquatic life. It is especially useful in basins where waves or surges would just be reflected back by a bulkhead. Riprap dissipates wave energy better than vertical structures by lessening the affect of scouring.

Education:

Educate boaters on damages caused by excessive wake. Inform them of no-wake zones in the area.

For More Information:

NC Sea Grant publication - *Shoreline Erosion Control Using Marsh Vegetation and Low Cost Structures*; UNC-SG-92-12

NC Sea Grant Extension Specialist 910/ 962-2491.

NC Division of Coastal Management 919/ 733-2293.

www.epa.gov/owow/nps/mmsp/Section-4-4.pdf

EPA's web site for the National Management Measures for Controlling Nonpoint Source Pollution, Chapter 4, contains specific options for shoreline and stream bank stabilization.



PETROLEUM and OIL HANDLING

PROBLEM:

Petroleum products are harmful when introduced to surface waters and can be fatal to aquatic life and predators of aquatic life. These products float on the water's surface, sink to the bottom, evaporate into the air and are suspended in the water column. These products have a low solubility and can attach to particulates in aquatic environments. The components of these products are toxic to plants and animals both in the water and near the water. Vegetation on shore can be affected as the pollutants are taken into their root systems. Predators of aquatic life are also in danger, as they consume contaminated plants and organisms. Marinas are most susceptible to spills during fueling operations and during the operation and maintenance of boat engines. Just one pint of oil can cover one acre of surface water.

RULES & REGULATIONS:

Oil spills and oil handling fall under federal law of both the Clean Water Act and the Oil Pollution Act of 1990. The Environmental Protection Agency develops the minimum requirements for states to comply with the federal laws. States adopt rules and add more specific requirements as needed.

Federal:

The Clean Water Act prohibits the discharge of oil or oily waste into or upon the navigable waters of the United States or the waters of the contiguous zone if the discharge causes a film or sheen upon the surface water, or causes a sludge or emulsion beneath the water surface. There is a penalty of \$5,000 for violators.

The Clean Water Act (33 CFR 153.305) prohibits the use of soaps or other dispersing agents to dissipate the oil on the water or in the bilge. These agents cause petroleum to sink and mix with bottom sediments, where it will persist for years. Soaps themselves are pollutants and fines of \$25,000 can be levied per incident of soap use.

Federal requirements for the reporting of spills specify that all spills that create a sheen must be reported to the US Coast Guard National Response Center (800) 424-8802.

Any facility with above-ground fuel tanks with a combined capacity of 1,320 gallons or more, or a single tank with a 660 gallon capacity or more, is required to file a Spill Prevention Control and Countermeasure plan with the NC Division of Groundwater. A combined underground fuel storage capacity of 42,000 gallons or more also triggers this requirement (see Appendix A).



State:

Above-Ground Storage Tanks -



Under NC General Statute 143-215.96, facilities storing 21,000 gallons or more of oil in an above-ground tank must register with the Division of Water Quality. An oil spill prevention plan, a map or sketch showing property lines and nearby water bodies or watercourses, the number of employees, and the name, address, and phone number of the facility owner and operator must be included with the registration.

Above-Ground Storage Tank construction standards can be obtained by contacting the NC Department of Insurance and/or local fire marshals and inspectors.

Underground Storage Tanks (USTs)-

The following are siting and secondary containment regulations for USTs that do not meet performance standards for corrosion protection, spill prevention, and overfill prevention. Note that if the UST was installed prior to January 1, 1991 and has met the performance standards, it is excluded from the siting and containment requirements.

- No UST system (including tank, piping and dispensers) may be installed within 100 feet of a public water supply well.
- Double-walled UST systems may be installed between 100 - 500 feet of a public water supply.
- No UST may be installed within 50 feet of a well used for human consumption.
- Double-walled UST systems may be installed between 50 -100 feet of a well used for human consumption.
- UST systems located within 500 feet of surface waters with the following classifications must be double walled with interstitial monitoring: High Quality Water (HQW), Outstanding Resource Water (ORW), Water Supply I (WS_I), Water Supply II (WS-II), and Shellfishing (SA)

As of May 1, 2000, all USTs and replacements must have secondary containment if they are located between 100-500 feet of a public water supply well, within 50-100 feet of any other well used for human consumption, or within 500 feet of specified surface waters.

Secondary containment must be installed by January 1 of the following years for the following items:

2005 - all steel or metal connecting piping and ancillary equipment;

2008 - all fiberglass or non-metal connecting piping and ancillary equipment;

2008 - all UST's installed on or before January 1, 1991;

2016 - all UST's installed after January 1, 1991.

Used Oil Recycling

Federal requirements regarding used oil recycling and its transportation can be found in 40 CFR 279.24 The regulations state that:

Generators must ensure that their used oil is transported only by transporters who have obtained EPA identification numbers

EXCEPT:

(a) Generators may transport, without EPA id number, used oil that is generated at the generator's site to a used oil collection center provided that:

- 1) The generator transports the used oil in a vehicle owned by the generator or owned by an employee of the generator;
- 2) The generator transports no more that 55 gallons at one time;
- 3) The generator transports the used oil to a used oil collection center that is registered, licensed, permitted or recognized by a state/county/municipal government to manage used oil.

BEST MANAGEMENT PRACTICES:

On the Dock:

Keep fuel spill equipment in a waterproof, easily identifiable locker or storage area. Locate it near fueling stations or near any location most likely to suffer a spill. The storage area should include enough spill-response equipment to contain the greatest potential spill at your facility, including a boom large enough to encircle the largest vessel at your facility based on three times the length of the vessel.

Give boaters oil-absorbent pads with the fuel nozzle so they can capture drips, vent-line overflow and backwash.

Require boaters and employees to stay with a boat that is being fueled.

Remove holding clips on fuel nozzles.
Use hard connect delivery nozzles.

In the Yard:

Sell or provide oil-absorbing materials for boaters to use in their bilges.

Provide an impervious area for filling fuel cans so any overflow can be easily captured.

Gasoline-soaked absorbents should be air-dried and reused.

Oil or diesel-soaked absorbents should be wrung out over a recycling container and reused. Or they can be double bagged and thrown into regular trash receptacles.

Place oil-absorbent pads and/or leak-proof drip pans under machinery.

Use non-soluble grease on travel lifts, forklifts, cranes and winches.

Inspect transfer equipment regularly for leaks.

Fuel tanks should have containment around them to hold the total capacity of the fuel tanks plus room for precipitation, or tanks should be double-walled.



Fuel tanks should be measured daily to monitor for excessive losses that would indicate a leak.

The daily level of condensate water should also be measured. Measurements should be logged.

Look for signs of discharge in the leak detection system on tanks once a month.

Education:

Provide pamphlets to your boaters about the effects of fuel spills and also on safe handling practices during fueling of boats.

Have a spill response plan in place and practice it regularly with all employees (see Appendix I).

Train employees to contain a spill.

For More Information:

NC Department of Insurance, 800-JIM LONG (800-546-5664)
NC Division of Pollution Prevention & Environmental Assistance provides local contact information for oil recycling at www.p2pays.org/dmrm.

UST information available on the NC DENR Division of Waste Management web site at www.ust.ehnr.state.nc.us or by calling at 919/ 571-4700.

Above ground storage tank information available from NC DENR Groundwater Section, 919/ 733-3221.

Call the NC DENR Water Quality Section to report oil spills at 800/ 858-0368.

www.epa.gov/ebtpages/eoilspills.html contains EPA guidance on what to do if there's an oil spill.

www.epa.gov/region5/defs/html/opa.htm contains a summary and text of the Oil Pollution Act of 1990.

HAZARDOUS WASTE HANDLING and REPORTING

PROBLEM:

Hazardous wastes common at marinas include the following:

- Ignitable parts cleaning solvents;
- Ignitable/toxic paint related solvents;
- Paint chips;
- Waste antifreeze;
- Mercury from bilge pump switches and fluorescent light bulbs;
- Old signal flares;
- Used batteries;
- Used fuel filters and waste gasoline.



Any of these products if not handled properly can pollute groundwater and adjacent surface waters and soils. They can be harmful to aquatic plants, fish, shellfish and birds.

RULES AND REGULATIONS:

States, local governments and private citizens want to be informed of what hazardous products are in their area and be made aware of potential dangers. Under the Community Right to Know initiative, businesses that store and use hazardous products have to be responsible for their safe handling, from the arrival of shipments to disposal of the associated waste products. Here again the federal government (EPA) is the guiding entity on regulations, with states adopting their own rules based on need.

Federal:

Title III of the Superfund Amendments and Reauthorization Act requires facilities to report hazardous chemicals present on site under EPA's Tier II Emergency and Hazardous Chemical Inventory. Any hazardous chemicals identified in the MSDS must be reported if they meet or exceed the EPA thresholds identified and updated yearly in the EPA List of Lists. Chemicals are not identified by brand names so you must know the contents. County emergency management representatives will have information on how to report any chemicals. They should be contacted since county rules can be stricter than EPA, but note that there is often a fee associated with county filing. Tier II reports must be filed with county emergency management and local fire departments.

The Federal Resource Conservation and Recovery Act provides guidance to improve the collection, transportation, separation, recovery and disposal of solid and hazardous waste.

Federal specific information on collection and storage rules for hazardous waste are found in Title 40 of the Code of Federal Regulations parts 260 to 299, which is summarized here:

Hazardous wastes can be accumulated on site for 90 days or less provided the waste is placed in containers, tanks or on drip pads, and management complies with the applicable requirements for each of these storage methods. A description of the removal and collection system for the drip pads and a record of each waste removal must be kept. Waste may also be stored in a containment building that has been engineer certified to handle such waste. Records of when accumulation begins and when wastes are removed must be kept. Each container must be clearly marked "hazardous waste." As much as 55 gallons of hazardous waste can be accumulated in containers near any point of generation.

BEST MANAGEMENT PRACTICES:



Disposal

Provide for the convenient disposal of hazardous wastes.

Recycle solvents.

Segregate incompatible wastes. Many waste haulers charge their highest fees for unknown hazardous mixtures.

Use an approved hazardous waste hauler.

Recycle used batteries and keep them stored with caps closed and on an impervious sheltered surface.

Recycle discarded fluorescent and HID lamps.

Properly dispose of old safety flares.

Collect, recycle or properly dispose of used antifreeze.

Empty and dry out paint cans before disposal.

Sell used paints to customers, donate to local non-profit groups or use on buildings and workboats.

Inventory stored chemicals every 6 months and dispose of outdated ones.

Put only waste oil into waste oil collection tanks to allow for easy recycling; adding anything else will greatly increase the cost and effort of recycling and may make it impossible.

Safe Practices

Use environmentally friendly products.

Keep emergency phone numbers posted by all phones.

Keep Material Safety Data Sheets (MSDS) in an easily accessible location.

Make sure all employees know the where MSDS are kept .

Use propylene glycol antifreeze which is less toxic than ethylene glycol antifreeze.

Storage

Provide a labeled closed container for ignitable paint waste.

Provide a fireproof container for solvent contaminated rags.

Make sure containers are properly labeled.

Waste storage containers and tanks should have curbed or bermed



structures around them and be in sheltered areas to prevent rainwater from entering the containment. The containment should be capable of holding 10% of the total volume of liquid material, and at a minimum, 110% of the volume of the largest storage container.

Keep storage units locked to prevent mixing of used and recyclable hazardous wastes.

Minimize chemical storage by ordering just what is needed for current projects.

Education:

Tell boaters about the recycling programs on site for used oil, antifreeze, batteries and lamps.

Post “no smoking” signs near ignitable products.

Tell boaters what hazardous wastes are and how they are handled at the marina.

For More Information:

NC DENR Division of Waste Management 919/ 733-2178
www.ncem.org/serc/downloads.htm. Web site for NC county and state Emergency Management contacts and further Tier II information; includes links to EPA

These EPA sites give further information on pollution prevention and hazardous waste handling

www.epa.gov/ebtpages/pollutionprevention.html

www.epa.gov/ebtpages/pollutants/html

This EPA site gives a summary and text of the Community Right to Know initiative www.epa.gov/region5/defs/html/epcra.htm

SEWAGE and WASTEWATER HANDLING

PROBLEM:

Untreated sewage dumped into waterways degrades water quality and is harmful to human health and aquatic life. Sewage decreases the amount of oxygen available for aquatic life and introduces excessive nutrients to the water which then increases algal growth. Excessive algae in the water limits the amount of sunlight that can penetrate the surface water and reach underwater vegetation. When algae dies it is decomposed by bacteria, which further reduces the amount of oxygen. Raw sewage can also introduce bacteria and viruses that can cause disease. People who swim in contaminated waters or eat contaminated shellfish can suffer from typhoid, hepatitis, cholera or gastroenteritis.



In addition to sewage, the direct discharge of waste water from showers and sinks (gray water) into surrounding waters also causes an increase in biological oxygen demand and nutrients, lowers dissolved oxygen and contributes to the creation of algal blooms.

RULES & REGULATIONS:

It is illegal to discharge raw sewage from a vessel into US territorial waters within three miles of the shore. The discharge of sewage is regulated by the federal government, in cooperation with the states, through federal rules developed for boat holding tanks.

Federal:

The federal Clean Water Act requires boats with installed toilets to be equipped with a certified Type I, Type II, or Type III marine sanitation device (MSD). These requirements do not apply to boats with portable toilets, which should be emptied on shore at approved dump stations or in restroom facilities where allowed. Vessels over 65 feet must have a Type II or Type III system. Vessels under 65 feet may use Type I, II, or III. Type I and II must display a certification label affixed by the manufacturer. Type I and II MSDs treat the sewage before it is discharged, Type III MSDs are holding tanks that need to be pumped out when full.

The Clean Vessel Act (CVA) of 1992 established a grant program administered by the US Fish and Wildlife Service to provide funding to states for the installation of pumpouts and dump stations at marinas and other boat docking facilities.

State:

The Division of Coastal Management established the NC Marine Sewage Pumpout and Dump Station Grant Program to distribute funds available under the 1992 Clean Vessel Act. The division has averaged five to six grant projects each year, with the grant covering 75% of the project and the recipient providing a 25% match. Contact the NC Division of Coastal Management for grant applications.

NC does not have a rule requiring marinas to install pumpouts because the conditions at marinas vary in terms of number of slips and the size of boats to which they cater. However, 15A NCAC 7H.0208(b)(5)(M) states that “Marinas shall post a notice prohibiting the discharge of any waste from boat toilets and explaining the availability of information on local pumpout services.” In addition, some marinas may have to install pumpouts as a condition of their CAMA permit when the marina is located adjacent to open shellfish waters, has more than 25 boats, can accommodate boats with holding tanks, and is not a commercial fish house or harbor of refuge.

BEST MANAGEMENT PRACTICES

On the Dock:

Install and maintain a pumpout. Inspect it regularly and establish a maintenance contract with a locally qualified contractor.

Install a dump station or a porta-potty wand attachment on your pumpout so those using portable toilets have a means of disposing of their sewage.

Use dye tablets in your patrons’ boats to ensure their holding tank y-valves are in the closed position.

Encourage boaters to conserve water and install water saving devices on their boats.

Provide gray water pumpouts.

If pumpout service is not provided, post signage indicating the location of the nearest pumpout facility.

In the Yard:

Provide clean, functional restrooms on shore and keep them open at all times.

Put up signs showing where your pumpout is or indicating where the nearest pumpout to your facility is located.

Post signs in restrooms asking patrons not to throw paper towels, tissues, cigarette butts, diapers or tampons in toilets and provide a receptacle for these items. This will help prevent septic failure, which can contaminate drinking water and/or shellfish.

Do not dump fats, solvents or pesticides into drains.

Education:

Put up signs stating that the marina basin is a no discharge area.

Post signs with directions on how to use the pumpout.

Have information available on pumpout use and why it’s important.

Include MSD requirements and no discharge laws in your contract with the boater, making sure they understand noncompliance will result in expulsion from the marina.



For More Information:

NC DENR Division of Water Quality Ground Water Section (919/ 733-3221) for wastewater disposal system and well questions. The web site address is http://gw.ehnr.state.nc.us/new_page_7.htm.

Division of Coastal Management www.nccoastalmanagement.net This site lists pumpouts in the state and current Clean Vessel Act grant information.

Contact the Division of Coastal Management (919/ 733-2293) for pumpout grant applications.

www.epa.gov/ebtpages/wwastewater.html EPA site for tips on handling wastewater, identification of the problems associated with wastewater, and rules guiding safe handling.

<http://fa.r9.fws.gov/cva/cva.html> gives pumpout information from the US Fish and Wildlife Service.

FISH CLEANING STATION

PROBLEM:

Excessive fish waste deposited directly into marina basins can produce foul odors and impair water quality through increased bacteria levels and decreased dissolved oxygen. It also causes an unsightly mess.

RULES & REGULATIONS:

There are no specific rules or regulations addressing fish cleaning stations, but the waste should be looked at as trash that is illegal to dump into waters. There may also be local ordinances that cover this form of solid waste and its disposal.

BEST MANAGEMENT PRACTICES:

On the Dock:

Post signs prohibiting the dumping of fish waste into the marina basin.

Provide fish cleaning stations with covered receptacles for disposal of waste.

Empty garbage containers regularly.

In the Yard:

Prohibit fish cleaning outside the designated area.

Compost fish waste.

Arrange for crabbers to take fish waste.

Grind fish waste into chum and sell it.

Education:

Have information available on the water quality hazards associated with fish waste.

Let boaters know that the ecologically best method is to dispose of fish waste out at sea.

Prohibit fish cleaning at the marina if proper facilities are not available.

For More Information:

Available through MN Sea Grant:

Composting Fish Waste by Thomas Halbach and Dale Baker.

<http://www.seagrants.mn.edu> or call 218/ 726-6191.

www.cleanboating.org gives information on handling fish waste from the Clean Boating campaign.



BOAT CLEANING PRACTICES

PROBLEM:

Work that is done on boats can release oils, grease, paint chips, paint liquids, detergents, copper, zinc, lead and a host of other contaminants into the waters. These products can pollute waters, kill marine life and limit the sunlight needed by aquatic plants for growth. Bottom dwelling creatures may ingest heavy metals, putting the contaminants into the food chain. Contaminants that settle into bottom sediments can increase the cost of dredging by making it more difficult to find a suitable disposal site for the dredged material.

Detergents and other cleaning products can contain toxic chemicals that can be corrosive or caustic. Even products labeled non-toxic can be harmful to aquatic life. Detergents, for example, destroy the natural oils on fish gills reducing their ability to breathe.

RULES & REGULATIONS

The Refuse Act of 1899 prohibits the dumping of any pollutants into US territorial waters. States have made this law more specific by regulating boat cleaning and maintenance operations to minimize pollutants that enter the waters through runoff or are released into the air.

State:

State rule T15A NCAC 7H.0208(b)(5)(N) guides the maintenance activities that take place in boatyards: "Boat maintenance areas shall be designed so that all scraping, sandblasting, and painting will be done over dry land with adequate containment devices to prevent entry of waste materials into adjacent waters."

BEST MANAGEMENT PRACTICES:

On the Dock:

Avoid underwater work where paints can be released into the waters.

Encourage the use of biodegradable cleansers.

Wash boat hulls above the waterline by hand, and prohibit pressure washing in or over the water.

Limit in water painting to small jobs.

Plug scuppers to contain dust and debris.

Prohibit sanding of exterior of vessel when in the water.

In the Yard:

Boat Cleaning

Sell biodegradable cleaning products.



Pressure wash over a bermed impermeable surface that allows wastewater to be captured and filtered.

Do not wash engine parts over bare ground.

Boat Maintenance

Use drip pans when handling any type of liquid.

Clean engine repair areas using dry clean-up such as capturing petroleum with absorbent pads.

Store engines and engine parts under cover on concrete or asphalt.

Use funnels to transfer liquids.

Add stabilizers to prevent fuel degradation. These products protect engines by preventing corrosion and the formation of sludge. It also eliminates the need to dispose of "stale" fuel.

Use anti-fouling paints with the minimum amount of toxins. Use water based paints where possible.

Mix paints, solvents and reducers far away from the water's edge.

Conduct spray painting in a spray booth or under a tarp.

Use dustless sanders.

Perform abrasive blasting within a structure or under a plastic tarp enclosure in a designated maintenance area.



Collect maintenance debris such as sandings, paint chips, fiberglass, and dispose of properly.

Perform all major repairs in a designated work area with impervious floor and a roof.

Use canvas or plastic tarps under boats if no designated work area is available.

Clearly mark maintenance areas.

Education:

Encourage boaters to use dustless sanders. Have them available for rent.

Ensure customers use designated work areas or tarps by posting signs on proper procedure and including rules in the contract.

Have information on clean boat maintenance practices available for boaters.

For More Information:

<http://wrrc.p2pays.org/industry/marina.htm>

This site gives a wealth of information on ways to prevent pollution at your marina

HURRICANE PREPARATION

PROBLEM:

As seen from recent history, NC is a prime target for hurricanes. The damages caused by hurricanes take many different forms and can be extremely costly to repair. Wind and water are the main factors to consider.

Wind can blow down trees, create projectiles of objects not securely fastened, blow off building roofs and canvas on boats. Water can result in flooding of buildings and yards from high waves and tides, and can damage docks, pilings and the boats attached to them. Either of these factors can also increase the likelihood of pollutants reaching the waters. Wind and water can sink boats, which can leak fuel, oil and other chemicals. Flooding of upland buildings and equipment can also cause these same pollutants to escape into the waters.

Hurricane preparation must be an ongoing activity at a marina and cannot just be considered when a storm is approaching. Both employees and customers should know well in advance what their responsibility is if a hurricane is approaching.

RULES & REGULATIONS:

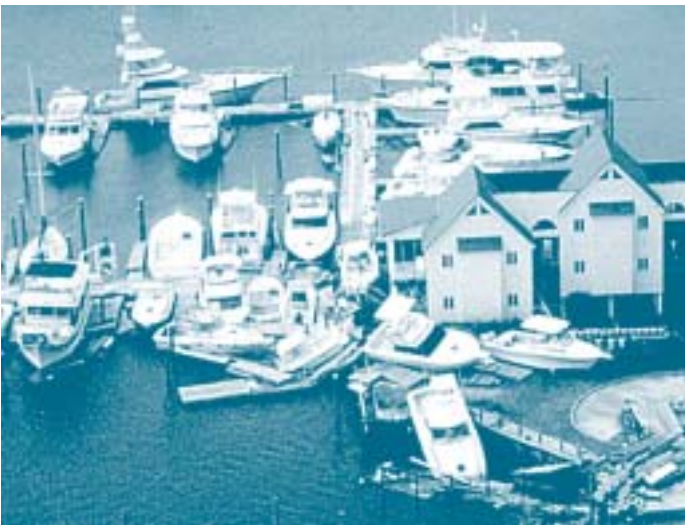
Since liability issues surround hurricane damage, there are no set state or federal rules on how marinas should operate before and during storms. In addition, every facility and every storm are unique, making it impossible for a one-size-fits-all standard. And while it is good practice to have a hurricane plan, the plan must be tailored to fit the needs of individual facilities, again making a regulated plan impractical.

BEST MANAGEMENT PRACTICES:

Have a hurricane preparation plan (see Appendix B).
Review plan yearly with employees.
State in your contract with customers what must or will be done with their boat if a storm is coming.
Protect yourself from liability by having an attorney review your contract.

Recycled fuel containers, dumpsters and trash cans should be emptied or otherwise covered and secured.

Paints and other chemicals in the shop should be secured or removed from the premises.



FIRE AND SAFETY MANAGEMENT

PROBLEM:

Due to the proximity of a marina to the water, the presence of chemicals and fuels, and the sheer number of boats, a marina is at high risk for potential accidents. Many situations can occur at a marina that will require immediate response, where waiting for 911 emergency personnel is a loss of valuable minutes. In order for quick response to work, the roles of employees must be well understood and practiced. Planning ahead for disaster is therefore, a crucial part of marina management.

Some Potential Emergencies:

Boat Fire, dock fire, facility fire, medical emergency, poisoning, drowning, boating accident or accident involving equipment

RULES & REGULATIONS:

Rules for fire and safety are commonly found under local fire and building codes. There are no state laws that cover all areas of the state, but rather local fire codes that vary by county and even city or town. To make sure you are in compliance, talk with the local fire marshal or building inspector.

The following are the standards for fire protection under the National Fire Protection Association (NFPA): NFPA 303, Fire Protection Standards for Marinas and Boatyards (May be referenced in local building codes); NFPA 30A, Automotive and Marine Service Station Code (Referenced in State Building Code); NFPA 307, Standard for the Construction and Fire Protection of Marine Terminals, Piers and Wharves (May be referenced in local building codes); and NFPA 33, Standard for Spray Application Using Flammable and Combustible Materials (Referenced in State Building Code) .

BEST MANAGEMENT PRACTICES:

On the Dock:

Place fire extinguishers on the dock. NFPA standards call for extinguishers listed for Class A, B and C fires to be installed at the pier/land intersection on a pier that exceeds 25' in length. Additional fire extinguishers should be placed such that the maximum travel distance to an extinguisher does not exceed 75 ft.

Have life buoys readily available on the dock.

Do not allow gas cans or other flammable liquid containers to be left on docks.

Ensure ready access for municipal fire fighting equipment.

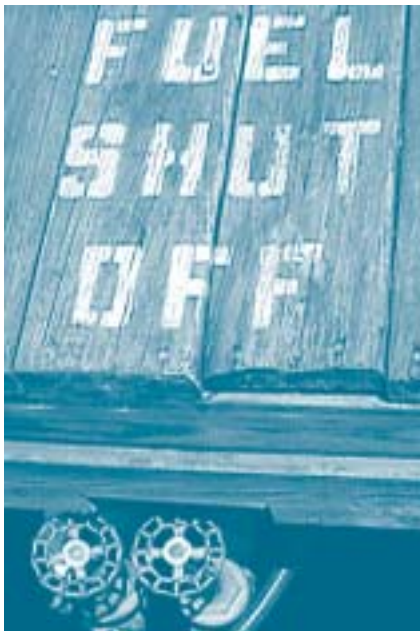
In the Yard:

Invite the local fire marshal to inspect the facility for fire hazards. Meet with the fire department to talk about the marina layout and special considerations (preplanning).



Establish procedures for the safe handling and storage of flammable liquids and gases.

Keep equipment operating safely through a preventative maintenance schedule including testing fire extinguishers yearly.



Prevent the accumulation of combustible materials, such as used rags, paintbrushes, and half filled containers of flammable liquids.

Place the appropriate class of fire extinguisher (A,B,C) in workshops, office buildings and in the yard.

Identify and mark all utility shutoffs.

Have first aid equipment on site, including a backboard and an eyewash station.

Install smoke detectors in buildings.
Be sure hydrants are accessible.

Education:

Consider all the possible emergency situations that can occur and put together a notebook or file with step-by-step directions on how to handle each emergency.

Review this notebook.

Train employees how to use fire extinguishers.

Ensure employees are familiar with all fire safety systems.

Establish a fire warning system. Have an alarm connect directly to the nearest fire station.

Have appropriate emergency numbers posted and/or readily accessible to all employees.

Have MSD sheets readily available because they list how to handle accidents involving the specific material.

For More Information:

Florida Sea Grant College Program-Panic Preventer File
<http://gnv.ifas.ufl.edu/~seaweb/homepage/fsg.htm>

NC Division of Emergency Management 919/ 733-3867 www.ncem.org

NC Department of Insurance, Office of State Fire Marshall www.ncdoi.com/OSFM/default.asp

RESOURCES

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APPENDICES

- I Sample Oil Spill Response Plan
- II NC Marine Trades Services-Hurricane Preparedness Plan
- III NC Clean Marina Program
- IV Alternative Cleaning Solutions

Appendix I

Sample-Oil Spill Response Plan

(The sections of this plan listed below in bold are required, but the information given under each section is an example of what a business could or should record.)

Facility Information:

Spill Emergency Contacts:

Local:

Fire Department
Police Department
NC DENR local office
Marina personnel in charge of spills
Emergency clean-up contractor

State & Federal:

USCG
National Response Center, Washington DC 800/424-8802
NC DENR 800/858-0368

The following information will be given to spill response departments:

Location of spill, land and water
Source of spill
Time of spill
Estimated volume of spill
Nature and potential danger of spilled material
Anticipated movement of spilled material
Responsible party name, address, phone number
Action already taken
Weather conditions at spill site

Spill Containment Procedures:

Upon discovering a spill the employees of this facility will make every effort to stop the source of the spill and contain the spilled materials. If any danger to the health and/or safety to employees exists from the spill only those methods which would allow for minimum contact with the spill site area will be undertaken. If the spill consists of gasoline, employees are not advised to contain the spill because of its explosion/flammability hazard. The gasoline should be allowed to dissipate and the US Coast Guard National Response Center (800) 424-8802 notified immediately.



Clean-up and removal of the spill will be done by the qualified contractor listed here:

Containment equipment on site:

Booms (size number) large enough to contain the volume of the largest tank on site
Pillows (number)
Pads (number)
Gloves
Goggles
Tyvek coveralls
Hazardous material disposal bags

Description of storage and areas where spills are most likely to occur:

Vent pipes from tanks
Loading areas
Off-loading areas
Piping to storage tanks
Fuel pumps
Boiler rooms
Sumps
Packaged oil storage areas

Spill History:

Description of spills occurring within the past year, corrective action taken, and prevention.

Potential Spills - Prediction:

1. Complete failure of full tank, #gallons released instantaneously, flow direction would be (N, S, E, or W) along lines of natural drainage.
2. Partial failure of a full tank, #gallons released gradually to instantaneously, flow direction would be (N, S, E, or W) along lines of natural drainage.
3. Tank overfill, #gallons (depending on capacity of fill truck), at a rate of #gallons per minute.
4. Leaking pipe or valve packing, several ounces to several gallons, up to 1 gallon per minute.

Controls:

Containment and diversionary structures and equipment on site to prevent spills from reaching navigable waters include:
Drainage from diked storage areas have valves or other positive means to prevent an oil spill. Valves are manual, open and closed design. Storm water from diked areas is inspected before drainage and records are maintained.
Catchment basins collect spills that do not occur in diked areas.

Storage tanks (above ground):

Storage tanks are made of (specify material). Secondary containment is provided for the largest tank, with an allowance for precipitation.

Inspections:

1. Tanks are inspected weekly for leaks and overall soundness.
2. Shell thickness will be tested every other year by an engineer.
3. Tank inventories will be taken daily using sounding stick and conversion table.
4. Above ground piping will be visually inspected every week.
5. Below ground piping will be inspected where the pipe breaks the ground weekly. Corrosion and deterioration of mastic coating will be monitored.
6. Valves, gaskets, flanges will be visually inspected weekly and monitored for leaks or stains.
7. Diked areas will be monitored daily. Accumulated water will be inspected for an oily sheen. Areas will be drained, recording date, time and approximate quantity discharged, noting no oily discharge has been released.
8. A visual inspection of the entire fenceline will be completed weekly and a verification that all lights in the yard are operable will also be completed weekly.
9. Spill prevention equipment will be inventoried monthly or after use and a list of items needing replacement will be submitted to purchasing.

See UST Guidelines (EPA)

Training:

Facility personnel are properly instructed in the operation and maintenance of all equipment used to prevent oil discharges, as well as the applicable spill prevention regulations. Spill prevention briefings for operations personnel are conducted monthly, with a quarterly meeting for all facility personnel, including sales and secretarial.

Employees are made aware of where spill response equipment is kept, where the list of contact names is kept and notification procedure, and how the spill response equipment is to be deployed.

Appendix II

**NC MARINE TRADES SERVICES
HURRICANE PREPARATION PLAN**

Operator Checklist

EQUIPMENT ON SITE

- lines
- chafing gear
- tarps
- screw anchor
- batteries
- first aid kit
- portable generator
- plywood
- cut/patch equipment
- duct tape
- submersible pump
- plastic sheeting
- camera/video equipment
- mobile radio/cellular phone
- spill containment gear
- minimum repair kit
- _____
- _____
- _____
- _____
- _____
- _____
- _____

INSPECT YEARLY

- docks have quick shut-off above the flood plain
- docks are attached to pilings that can sustain a 50-year storm surge and wind load
- there is enough storage space above the flood plain for boats and vehicles
- there is storage space above the flood plain for office records and equipment
- there is emergency power for winch operation, travel lift, pumps and communication
- cradles and jacks are stored and easily accessible
- moorings have been checked by a diver and set
- all employees are trained for hurricane plan actions
- all boaters have received checklists for hurricane planning
- all boaters have current insurance for their vessels
- _____

INSPECT MONTHLY

- building roofs, doors and windows
- fuel and sewer pumping lines
- fire fighting gear
- spill containment gear
- lifts and cranes
- electrical supplies
- debris is removed from open areas
- trees and shrubs are trimmed
- trash bins and dumpsters are secured in protected areas
- salvaged or abandoned hulls, equipment and parts are disposed of or secured
- dry storage areas and racks

CONTRACTORS FOR RECOVERY - identify and list with phone numbers

ACTIONS DURING STORM APPROACH

72-48 HOURS PRIOR TO PROJECTED STORM ARRIVAL

MANAGER (this job is the same throughout the preparation stage)

- monitor NOAA weather station and/or the internet weather reports
- assist where needed
- coordinate volunteers
- act as home base where employees can report jobs completed and where help is needed
- coordinate supplies, tools and labor

OFFICE

- notify customers that facility is on alert
- monitor NOAA weather station and/or internet weather reports
- process mail and all paperwork
- back up computer records
- delay orders of materials and stocks that are due to be shipped
- contact all contractors for post-storm clean-up
- contact volunteers to begin preparation work
- cover and tape windows

YARD

- remove or secure blowables (signs, tables, chairs, trash cans, etc.)
- fill fuel tanks
- remove or secure small drystorage boats (dinghies, kayaks, canoes, etc)

DOCKS

- begin hauling boats
- begin securing boats that have decided to remain at the docks
- allow boat owners to evacuate to an off-site location
- assist boaters in preparation

48-24 HOURS PRIOR TO PROJECTED STORM

OFFICE

- remove equipment and records to safe storage
- cover remaining equipment and furniture with plastic
- move items that could sustain water damage to tables or off the ground
- purchase extra batteries, food and water for emergency securing and recovery workers
- have a source of ready cash for recovery work
- confirm insurance coverage and secure policies
- establish an "outside the area" contact person for communication during evacuation

YARD

- move all vehicles upland
- secure the marina from non-essential traffic
- remove floating docks if possible and tie them down
- turn off water supply if it is public
- turn off fuel pumps and main electricity
- take pictures/video of the facility and preparation conditions
- _____
- _____

DOCKS

- continue securing vessels
- check boats to see that no occupants are remaining
- _____

24-0 HOURS PRIOR TO PROJECTED STORM

OFFICE

- lock doors and brace them against wind
- set up answering machine (have battery back-up installed)
- give instructions for post-storm activities
- give approximate time to return to the marina (to be confirmed by off-site contact)
- ensure everyone has the number of the off-site contact
- _____
- _____

YARD

- do a last patrol of the grounds
- secure all access points
- _____
- _____
- _____

DOCKS

- conduct a last patrol of the vessels, checking docklines and moorings
- ensure no one remains on their vessel; if they choose to remain have them sign a waiver of liability and give you the next of kin address and phone number
- _____

Send All Employees Home Unless A Skeleton Crew Is Needed To Remain For The Storm

DURING THE STORM

ON-SITE

- Monitor weather reports on radio, TV and/or internet
- Stay in a protected area
- Use extreme caution and stay off the docks
- Do not attempt to re-tie or board a loose vessel during the storm
- _____
- _____

OFF-SITE

- Monitor weather reports on radio, TV and/or computer
- Coordinate return of all employees
- Review recovery plan
- Review insurance policy
- _____
- _____

RECOVERY

Beware Of Snakes, Downed Electric Lines, Wet Electronic Equipment, Leaking Gas or Fuel

- contact employees regarding when they should return
- contact recovery crews
- contact insurance company to get an adjuster and surveyor to you
- set up security to prevent looting and for crowd control
- photograph/video everything
- complete a survey of the facility including equipment and inventory
- estimate damages and prepare a written assessment if possible
- if anything is stolen, file an incident report with local police
- set up an answering machine or volunteer to respond to customers' inquiries
- investigate to find a marina where your customers can berth temporarily
- begin clean-up efforts
- coordinate employees and contractors
- investigate boat repair facilities for customer referral
- control news media; no media exposure is usually better



- control conflicts between returning boat owners and recovery of damaged boats
- order repair supplies
- coordinate utility evaluation and reinstatement of service
- if your marina did not sustain damage, let other marinas know that you can take boats

CUSTOMER CHECKLIST

Equipment To Be Kept On Board:

- chafing gear
- fenders
- two sufficient anchors with 300' or more oversized line
- flashlight with spare batteries
- battery-operated radio

Check Monthly:

- exterior lights operable
- auto bilge pump operating (check battery)
- hatches are watertight
- power and electric gear operating
- engine battery charged
- flashlight battery charged
- radio batteries charged

To Do At A New Marina:

- learn marina approaches and basin
- learn the size and type of your mooring
- ensure mooring and lines are sufficient for all likely wind direction and velocity
- ensure mooring has enough weight and scope and is properly set
- learn your moorage lease and rental agreement responsibilities
- learn responsibilities for your boat's safety when a hurricane is approaching
- develop a plan for securing your vessel outside the marina if you plan to evacuate
- if evacuating, visit the site by boat and time the trip
- learn what possible delays you may encounter when evacuating (draw-bridges, boat traffic etc.)
- photograph your boat and surroundings
- keep a list of all equipment on board
- keep a list of all equipment that will be removed during storm preparations
- keep a complete set of records for your boat at home
- give the marina operator the name and number of your absentee skipper
- give the marina operator a description of your boat, registration number and location

DOCKED BOAT PREPARATIONS

- strip all removable items, including spare rigging
- clear self-bailing cockpit drains
- close all through-hull fittings

- set chafing gear where lines will rub (chocks, cross lines, deck edge, dock edge etc.)
- remove portable fuel and oil storage containers
- remove ship papers
- shut off fuel tanks
- leave anchor light on
- leave auto bilge pump on
- check openings to ensure boat is watertight
- set and check storm anchors
- consider attaching 3 sets of bow and stern spring lines
- consider attaching lines to cleats at a 45 degree angle
- consider tying your boat between two piers or along a pier and anchored off one side

MOORED BOAT PREPARATIONS

- Make Plans To Have Someone Pick You Up From Your Boat Before The Storm Arrives
- strip all removable items, including spare rigging
- clear self-bailing cockpit drains
- close all through hull fittings
- remove portable fuel and oil storage containers
- remove ship papers
- shut off fuel tanks
- leave anchor light on
- leave auto bilge pump on
- check openings to ensure boat is watertight
- use storm pennants to increase scope
- attach chains directly to pennants instead of swivels
- add an emergency catenary weight at the vessel end of the chain
- use double or triple chafe protection
- use chafing gear over entire length of pennants
- use two pennants
- if no permanent mooring is available, use two storm anchors at 45-degree angles

TRAILERABLE BOAT PREPARATIONS

Store in a garage:

- strip all removable items, including spare rigging
- clear self-bailing cockpit drains
- close all through-hull fittings
- remove portable fuel and oil storage containers
- remove ship papers
- shut off fuel tanks
- leave auto bilge pump on
- check openings to ensure boat is watertight
- _____
- _____
- _____

If no garage is available:

- secure trailer to a sturdy object
- let half the air out of the trailer tires
- put wood blocks between the frame and axle
- take out the drain plugs
- cover with tarp
- use tie-downs

ANCHORED BOAT PREPARATIONS

Make Plans To Have Someone Pick You Up From Your Boat Before The Storm Arrives

- strip all removable items, including spare rigging
- clear self-bailing cockpit drains
- close all through-hull fittings
- remove portable fuel and oil storage containers
- remove ship papers
- shut off fuel tanks
- leave auto bilge pump on
- check openings to ensure boat is watertight
- use 3 or 4 substantial anchors and good tie rope
- tie your boat high on the mainland to a substantial tree or similar structure
- do not tie parallel to the bank
- keep a navigable passage at your stern to allow other boats passage
- use enough line to allow for storm surge
- leave enough room between your boat and others to allow for swing
- take valuables off
- _____
- _____
- _____
- _____

Appendix III

NC CLEAN MARINA PROGRAM



SBTDC- Marine Trades Services
NC Division of Coastal Management
NC Big Sweep
NC Sea Grant
US Coast Guard Auxiliary

The purpose of the North Carolina Clean Marina program is to give marinas a chance to be recognized for their efforts towards environmental responsibility. It also gives boaters a way of identifying marinas that are promoting clean activities and following best management practices. The program is strictly voluntary, but it shows that your marina cares about clean water.

To participate in the Clean Marina Program, fill out the enclosed application identifying all the ways that a clean environment is promoted at your marina. There are several areas where your marina must be using best management practices (BMP) in order to be identified as a Clean Marina. If your facility qualifies on paper, a Clean Marina representative will visit your site to visually identify BMPs implemented at your facility. When it has been verified that your facility meets the Clean Marina criteria, you will be issued a Clean Marina flag, identified on the Clean Marina web site and you will be able to use the Clean Marina logo in all your publications. A yearly inspection of your facility by a Clean Marina representative is required to renew your standing.

Please send completed applications to Lori Davis; NC Coastal Reserve Program, 135 Duke Marine Lab Rd., Beaufort, NC 28516. For more information contact Lori Davis at (252) 728-2170 (e-mail: Lori.C.Davis@ncmail.net) or Mike Lopazanski at NC Division of Coastal Management, (919) 733-2293, ext 239 (e-mail: Mike.Lopazanski@ncmail.net).

NC CLEAN MARINA CHECKLIST

Please complete the following checklist as a self-assessment of the activities that occur at your marina. This form will also be used by NC Clean Marina representatives to verify the checklist. Also include a map of your entire facility highlighting items below (see example attached).

Clean Marina certification will be presented to those marinas that achieve a minimum score required in each section. While it is not necessary to implement all of the recommended practices, certain BMP's are required (marked with a star) to be recognized as a Clean Marina. Scoring will be based only on applicable items. A not applicable option (NA) is offered in order to indicate which items do not apply to your operation and will not be counted against you in the evaluation. If you do not provide fuel service for example, indicate this by "NA" in the appropriate sections. There is a space at the end of each section to explain why a particular BMP would not apply or if an alternative management strategy is being used. You can also use this space to clarify answers and offer additional information.

Name of Marina:

Mailing Address:

Phone:_____ **Fax:**_____

E-mail: _____ **Web site:**_____

Contact Person:_____

SEWAGE HANDLING

Yes/No/NA

- « Prohibit the discharge of sewage in the marina basin.
- Sign posted indicating the location of nearest/on-site pumpout facility, including other appropriate waste disposal information at the entrance and exit of main piers.
- Boaters are informed of the no-discharge policy for the marina basin.
- « Have a functioning and regularly maintained septic system.
- Have a pumpout (portable or stationary) (indicate on map).
- Have a dump station or wand attachment for portable toilets.
- Have a maintenance schedule for your pumpout.
- Have directions for pumpout use displayed near pumpout.
- Have clean, functioning restrooms (indicate on map).
- Address the sewage needs of live-aboards.
- Offer Marine Sanitation Device inspections and service.

Other:

For those not checked Yes, indicate alternative solutions or site-specific conditions precluding the need:

Category Score: _____ # of Yes Responses / Number of applicable items x 100 = _____%

BOAT MAINTENANCE ACTIVITIES

Yes/No/NA

- Allow in-water boat maintenance only when no debris will fall in the water.
- Have designated area for boat repair and maintenance, not allowing work to be done in any other location.
- Have a designated, impermeable surfaced, area for powerwash activities that includes filtered drainage.
- Hull maintenance areas are regularly cleared of trash, sandings, paint chips
- Require tarps under boats while they are being serviced on land.
- Abrasive blasting is done in spray booths or plastic tarp enclosures.
- Use vacuum sanders.
- Provide an oil/water separation service to filter bilge water.
- Sell biodegradable cleaners or other environmentally friendly products for boat maintenance.
- Provide educational materials on proper boat maintenance.
- « Subcontractors sign a contract stating that they must comply with maintenance policies.
- « Obtained stormwater permit for boat maintenance facilities with point source discharges.

Other:

For those not checked Yes, indicate alternative solutions or site-specific conditions precluding the need:

Category Score: _____ # of Yes Responses / Number of applicable items
x 100 = _____ %

SOLID WASTE MANAGEMENT

Yes/No/NA

- Have a designated fish cleaning area (indicate on map).
- Have written rules on fish-cleaning procedures and policies.
- Provide boaters with information on proper fish-cleaning practices.
- Provide trash cans, bins and dumpsters that are covered, well-marked and labeled.
- Conduct a daily trash pickup within the marina and along the shoreline.
- Have recycling containers for aluminum, plastic, newspaper with signs posted (indicate on map).

Other:

For those not checked Yes, indicate alternative solutions or site-specific conditions precluding the need:

Category Score: _____ # of Yes Responses / Number of applicable items x100 = _____ %

Safety & Emergency Planning

Yes/No/NA

- « Have a hurricane preparation plan in place for marina
- Have a hurricane preparation plan available for boaters.
- « Have spill containment equipment stored in a readily accessible location.
- Have adequate fire fighting equipment.
- Have first aid/lifesaving equipment readily available.
- Have regular emergency training for employees.
- Have adequate lighting for security and safety.
- « Maintain files on Material Safety Data Sheets as required by OSHA.
- Have theft prevention - identify type:

Other:

For those not checked Yes, indicate alternative solutions or site-specific conditions precluding the need:

Category Score: _____ # of Yes Responses / Number of applicable items x 100 = _____%

OIL AND OTHER HAZARDOUS WASTE HANDLING

Yes/No/NA

- « In compliance with petroleum storage requirements
- « Have a spill prevention plan
- « Have a spill response plan (required for 42,000 gal underground, single 660 gal. above ground or 32,000 gal combine above ground storage).
- « Have spill containment equipment on site (booms, absorbent pads etc.).
- « Have trained 50% of employees in spill response steps.
- « Have proper containment around fuel tanks.
- « Have removed all fueling clips.
- « Have proper storage for used oil if you accept it

- ___ « Have separate containers for all hazardous liquids with proper containment if you accept these wastes
- ___ « Ensure that subcontractors have adequate insurance for spill liability.
- ___ « Subcontractors sign a contract to adhere to marina hazardous waste handling policies.
- ___ Have oil recycling program in place.
- ___ Have trained employees to promote environmental & safety precautions while fueling
- ___ « Have all liquid hazardous waste and oil disposal containers clearly marked
- ___ Have scheduled inspection & repair of fuel transfer equipment.

Other:

For those not checked Yes, indicate alternative solutions or site-specific conditions precluding the need :

Category Score: _____# of Yes Responses / Number of applicable items x
100 = _____ %

SCORING

	Min. Score	Marina score
Oil & other hazardous waste handling	80%	%
Sewage Handling	80%	%
Boat maintenance activities	80%	%
Solid Waste Management	80%	%
Safety & Emergency Planning	80%	%

Appendix IV

ALTERNATIVE CLEANING SOLUTIONS

General Uses for Ordinary Items

Baking soda: cleans, deodorizes, softens water and acts as a scouring powder.

Washing soda (sodium carbonate): works as a germ remover and laundry soap booster.

Vinegar: cuts grease and deodorizes.

Lemon Juice: cuts stains and freshens smells.

Vegetable Oil-Based Liquid Soap: cleans almost any surface and acts as laundry booster.

All-Purpose Cleaner

4 T. baking soda + 1 qt. warm water: dissolve soda in water, apply with sponge and wipe clean.

1 t. vegetable-oil based soap + a squeeze of lemon + 1 qt. warm water: combine in small bucket, apply with sponge or rag and wipe clean.

1/8 c. washing soda + 1 T. vegetable-oil based soap + 1/4 c. vinegar + 2 gallons hot water: mix ingredients in pail, apply with mop or cloth and wipe clean.

3 T. washing soda + 1 qt. warm water: mix in pail, apply with sponge or rag and wipe clean.

Bathroom

Drain Cleaner: 3 T. salt + 1/2 c. vinegar + 1/4 c. baking soda: pour soda down drain followed by salt, then vinegar, let sit 10-15 minutes and flush with boiling water.

Mildew Remover: equal amounts of vinegar and salt.

Toilet Cleaner: 1/4 c. baking soda + warm water; equal amounts of baking soda and washing soda + warm water; 2 t. Borax + 1 qt. warm water; Pumice block for stubborn stains.

Lime Deposits: soak paper towels in vinegar and leave on deposits for one hour. Soak shower heads in vinegar.

Tub and Tile Cleaner: 1/2 t. washing soda + 1/4 to 1/2 t. vegetable- oil based soap + 3 T. vinegar + 2 c. hot water: mix ingredients into spray bottle, apply

and wipe clean; 1/4 c baking soda + warm water; baking soda + vinegar: sprinkle baking soda on sponge, add vinegar, apply and rinse; 2 t. Borax + 1 qt. warm water

Carpets

Deodorizer/Cleaner: baking soda or dry cornstarch: sprinkle over carpet, let sit overnight and vacuum.

Stain Remover: club soda: apply to stain and scrub; lemon juice: apply to stain and scrub; 1/4 c. vinegar + 1/4 t. water: mix, rub, and rinse with water.

Furniture

Wood: 1/8 c. linseed oil + 1/8 c. vinegar + 1/4 c. lemon juice: mix and apply with soft cloth; 1/4 c. olive oil or mineral oil + 1/8 c. lemon juice: mix and apply with cloth.

Leather: 1/4 c. olive oil + a few drops of lemon oil: mix and apply.

Vinyl: 1/4 c. vinegar + 1/4 t. vegetable-oil based soap + water, mix and apply.

Kitchen

Grease cutter (in dish detergent): 1/2 c. baking soda + usual amount of dish soap.

Grease cutter (all-purpose): 1/2 t. washing soda + 1/4 to 1/2 t. vegetable-oil based soap + 3 T. vinegar + 2 c. hot water: mix in spray bottle, spray, scrub and wipe clean; Borax on a damp cloth.

Garbage Disposal Deodorizer: cut up oranges or lemons, or baking soda: put in disposal, turn it on and rinse.

Linoleum Floor Cleaner: 1 c. white vinegar + 2 gallons water.

Oven Cleaner: small box of baking soda + water + vegetable-oil based soap + a mild abrasive pad (cellulose green scouring pads are the most effective): sprinkle water over bottom of oven, cover with baking soda, let sit overnight, wipe with pad, after bottom is clean put soap on sponge and wash sides and top.

Porcelain Stain Remover: rub area with moist salt or baking soda and rinse.

Coffee Pot Cleaner: brew full capacity of white vinegar followed by two cycles of full capacity water. Pour hot vinegar down drains to clean them.

Laundry

Detergent: soap flakes and 1/3 c. washing soda:
wash in pure washing soda before switching to remove detergent residues.

Bleach: 1/4 c. lemon juice; Borax; 1/2 c. vinegar.

Fabric Softener: 1 c. vinegar or 1/4 c. baking soda in final rinse.

Soap: any non-phosphate soap.

Starch: 1 T. cornstarch + 1 pint cold water: mix in spray bottle, shake to dissolve cornstarch and apply.

Whitening: Borax or baking soda.

Metal Cleaners and Polishes

Aluminum: 2 T. cream of tartar + vinegar (enough to make a paste): scrub and rinse.

Brass and Copper: half a lemon dipped in salt; flour (enough to make a paste) + 1/2 t. salt + 1/2 c. vinegar; 2 T. lemon juice + 1 T. vinegar; Worcestershire sauce.

Chrome: apple cider vinegar; baking soda + water.

Silver: 1 qt. warm water + 1 T. baking soda + 1 piece Aluminum foil + 1 T. salt: make sure silver is completely covered with water and heat; baking soda + water to form paste; toothpaste.

Stainless Steel Cleaner: baking soda + water; vinegar; olive oil; club soda.

Pests

Ants: squirt with 1 t. dishwashing soap; put chili powder, talc, chalk, Borax, chili pepper seeds, dried bay leaves, or lemon peels at the point of entry; put lemon juice in holes.

Fleas: sprinkle non iodized salt on carpets: it kills larvae, but wont hurt rugs.

Flies: well watered pot of basil; flypaper: make your own with yellow paper and honey; prompt trash removal.

Roaches: set out boric acid in small containers (KEEP OUT OF REACH OF CHILDREN); equal parts powdered sugar and baking soda in small containers; traps; Borax.

Miscellaneous

Car Battery Corrosion Removal: baking soda + water.

Glass Cleaner: 3 T. vinegar or more + warm water.

Hand Cleaner for Paint/Grease: baby oil or margarine.

Scouring Powder: 1 c. baking soda + 1/4 c. vinegar: apply with steel wool or soft brush.

Oil-Based Paints: use water based paints instead; use tung oil to remove oil-based paint stains; buy stains having natural pigment finishes.