

FIFTH EDITION

# New York Safe Boating

A Course on the Safe Operation  
of Boats and Personal Watercraft



Parks, Recreation  
and Historic Preservation



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[parks.ny.gov](http://parks.ny.gov)



## Dear Boater,

New York State is blessed with hundreds of miles of navigable waterways, varied enough to suit every taste and every imaginable waterborne activity. Whether you're enjoying the roaring surf of the Atlantic Ocean, the whitewater thrills of the Adirondacks, the pristine waters of the Finger Lakes or the historic New York State Canal, fun boating begins with safe boating.

To ensure that our world class waterways remain safe and enjoyable, we proudly sponsor safe boating courses across the state, and encourage every boater to participate in completing a course. Let this manual guide you to become a safer and more courteous boater on New York's magnificent waterways.

Under Brianna's law, which goes into effect January 1, 2020, all operators of motorized vessels will be required to complete a boating safety course by January 1, 2025. In addition, New York State Law requires a boating safety course for the operation of personal watercraft (PWC). This New York Safe Boating Manual is designed to assist you with that course.

I hope you enjoy the great waterways of our Empire State and remember that safe boating is each boater's responsibility!

**A New York safe boating certificate may be obtained by completing the New York Safe Boating Course. The course is designed as a comprehensive boating course, teaching the fundamentals of safe boating operation. This course requires a minimum of eight (8) hours of classroom instruction.**



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*This text is provided free of charge by the state of New York for certified boating safety courses.*

*If you have any questions, comments or recommendations regarding this program please contact the New York State Office of Parks, Recreation and Historic Preservation, Bureau of Marine Services, at (518) 474-0445*

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*Course approved by the National Association of State Boating Law Administrators and recognized by the U.S. Coast Guard*

## History of the New York Safe Boating Course

Since 1959, the law in New York State has required young mariners to complete the New York Safe Boating Course. Originally known as “Make Sure, Make Shore,” the course taught youngsters between the ages of 10 and 14 the principles of safe boating. Beginning in 2000, the New York Safe Boating Course has been open to both youths and adults across New York State to teach the same principles of safe boating.

### The goals of the program are to:

- Teach the basic boating skills necessary for safe and enjoyable boating.
- Instill in each student a sense of responsibility when operating a boat.
- Develop an understanding of the consequences of careless boating.
- Encourage common sense and courtesy towards other waterway users.
- Prompt students to invest the time and effort to learn more about boating.

## New York Safe Boating Course

- National Association of Boating Law Administrators (NASBLA) approved
- 8 Hour classroom course
- Closed book exam with a minimum passing score of 76%
- Must be at least ten years of age at start of course

## Legal Requirements

### Acceptable Certificates

Successful completion of this boating course will qualify you for a boating safety certificate issued by the Commissioner of the New York State Office of Parks, Recreation and Historic Preservation. You may also earn a boating safety certificate from other legally authorized organizations. Boating safety certificates issued by the following organizations are legal in New York State:

- the America’s Boating Club
- the US Coast Guard Auxiliary
- US Sailing- Power Boating

A boating safety certificate issued to a resident of another state or country is also acceptable, but the boater must carry the certificate while operating a boat in New York State. Please note the certificate must be issued pursuant to the laws of the operating home state.

## Persons Required to Complete a Safety Course

The law in New York requires the following people to have a boating safety certificate:

- Operators of a motorboat must be at least 10 years of age and get a boating safety certificate by 2025. Starting in 2020, the phase-in period for this requirement is as follows:

<b>If you were born on or after:</b>	<b>You will need a boating safety certificate when operating a motorized vessel in:</b>
January 1, 1993	2020
January 1, 1988	2022
January 1, 1983	2023
January 1, 1978	2024

**All operators of motorized vessels, regardless of age, will need a boating safety certificate by January 1, 2025**

- PWC operators must be at least 14 years of age and either hold a boating safety certificate or be accompanied by someone over 18 years of age who is the holder of a boating safety certificate.

You don't need to obtain a boating safety certificate if you are:

- A certified NY Safe Boating Course Instructor
- A holder of a valid New York State Public Vessel Operator License
- A member of the America’s Boating Club or US Coast Guard Auxiliary
- Licensed to operate boats by the US or Canadian Coast Guard
- A police officer, fire personnel, rescue personnel, or lifeguard while carrying out their official duties

Exemptions must be carried at all times that a certificate is required.

**Everyone is welcome to attend a New York Safe Boating Course! The course can improve the skills of even the seasoned boater. Plus, taking the course sets a good example for kids. Completing the boating safety course may lead to a reduction in your boater’s insurance premium.**

# New York Safe Boating Certificates

## Permanent Certificate

It is issued by New York State Parks and does not expire. Students under the age of 18 will receive theirs in the mail following completion of the course. If you are over 18 you will need to submit the application (yellow form) along with a check or money order made out to NYS Parks for the \$10 processing fee before a permanent certificate will be issued. Please keep in mind that it may take as long as 90 days from the date of your course to process your permanent certificate. Your temporary certificate is valid for those 90 days.

## Adventure License

You now have the option to elect to have your boating safety certificate placed on your driver's license or non-driver ID issued by the Department of Motor Vehicles in addition to receiving your permanent certificate. If you elect to do so a small anchor will be placed on your DMV document and will remain each time the document is renewed. If you elect to opt into this program you have to complete the back of the application (yellow form, 18 and over only) or the New York State Safe Boating Optional Credentialing of Your DMV Document Form available at [parks.ny.gov/recreation/boating/education.aspx](http://parks.ny.gov/recreation/boating/education.aspx).

You will then have two options. The first option is to wait until your next renewal. There is no fee for this. The other option is to have it placed on your DMV document now. If you choose this option a new DMV document will be issued to you in the mail with the anchor icon. There is a charge of \$12.50 for a driver's license and \$5.00 for a non-driver ID. Please keep in mind that the adventure license gets processed at the same time as the permanent certificate and may take as long as 90 days from the date of the course.

## Replacement Certificates

Please note that temporary certificates cannot be replaced. If you lose your temporary certificate you must wait for your permanent certificate to arrive. If you lose your permanent certificate you may obtain a replacement by going to [www.parks.ny.gov](http://www.parks.ny.gov) and filling out the Application for a Replacement Boating Safety Certificate or by making a request in writing. All requests must also include a check or money order made out to NYS Parks for the \$10 processing fee.

## Fees

Permanent Certificate	Adventure License – At Renewal	Adventure License – Now	Total Fees
18+ Years Old - \$10.00			\$10.00
18+ Years Old - \$10.00	Driver's License - Free		\$10.00
18+ Years Old - \$10.00	Non-Driver ID - Free		\$10.00
18+ Years Old - \$10.00		Driver's License - \$12.50	\$22.50
18+ Years Old - \$10.00		Non-Driver ID - \$5.00	\$15.00
Under 18 - Free			Free
Under 18 - Free	Driver's License - Free		Free
Under 18 - Free	Non-Driver ID - Free		Free
Under 18 - Free		Driver's License - \$12.50	\$12.50
Under 18 - Free		Non-Driver ID - \$5.00	\$5.00

**All fees should be paid by mailing a check or money order made out to NYS Parks. Instructors do not collect money for these fees.**

# Continuing Your Boating Safety Education

If you plan to boat frequently, it is highly recommended that you take more advanced boating safety and education courses.

The US Coast Guard Auxiliary and the United States Power Squadrons promote safety afloat through education, and you do not need to be a member to participate. There are other organizations that offer boating safety courses. You can find these organizations on the internet, in your local telephone directory, or ask your local marina about classes in your area.

There are courses to suit a variety of needs and interests. You may want to consider a specialized course in:

- Aids to navigation
- Rules of the road
- Charts and compasses
- Boating regulations
- Marlinespike seamanship
- Motorboat handling and trailering practices.

# Out of State Operations

Many New Yorkers take advantage of the beautiful waterways in surrounding States. However, before you operate a boat in another state, find out the state's requirements for operation of boats on their waters. See below for a list of boater education, safety requirements and contact information for surrounding states.

If you have questions about required or recommended equipment, or Rules of the Road, call New York State Parks, Bureau of Marine Services at (518) 474-0445. For a free safety check, call the US Coast Guard Customer Information Line at 1 (800) 368-5647.

## Contact Information

State	Website
Connecticut	<a href="http://www.ct.gov/dep">www.ct.gov/dep</a>
Pennsylvania	<a href="http://www.fishandboat.com">www.fishandboat.com</a>
Vermont	<a href="http://dps.vermont.gov">dps.vermont.gov</a>
New Jersey	<a href="http://njsp.org/marine-services">njsp.org/marine-services</a>
Canada	<a href="http://www.tc.gc.ca/boatingsafety">www.tc.gc.ca/boatingsafety</a>
All Other States Contact information Available through NASBLA	<a href="http://www.nasbla.org">www.nasbla.org</a>



## Boat Terminology

If you're new to boating, there are many new terms, procedures, and rules to learn. This lesson will help you become familiar with the words and terms that describe parts of the boat and directions on the boat. Many of these are critical to safety. We will discuss a few of the most important terms in this lesson.

## Boat Measurements

**Length or Length Overall (LOA)** – the distance from one end of the boat to the other end. It does not include outboard motors, brackets, or other attachments.

**Beam** – the width of the boat at its widest point.

**Displacement**—the weight of water that the boat must push out of the way to float. As you add gear or passengers, the boat's displacement increases and the boat sinks lower into the water.

**Draft** – the vertical distance from the bottom of the underside (the keel) to the water line. The draft determines the minimum depth of water in which your boat can operate—the larger the draft, the deeper the water must be for the boat to operate without running aground.

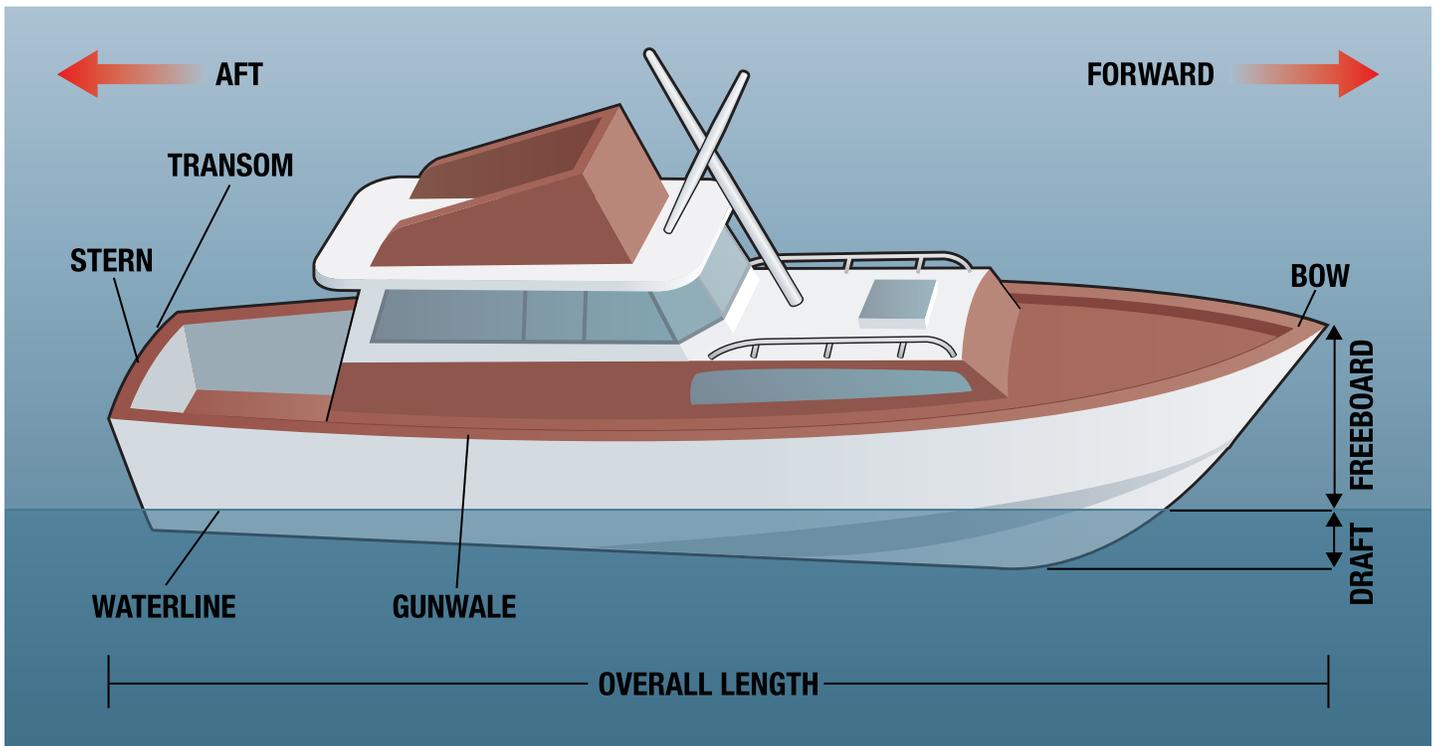
**Freeboard** – the vertical distance from the waterline to the upper edge of the boat's sides. Boats with low freeboard may take on water in rough conditions or when crossing another boat's wake.

**Centerline** – an imaginary line drawn from the bow to the center of the stern along the middle of the boat.

**Waterline length** – the length of the boat from end to end when it is in the water

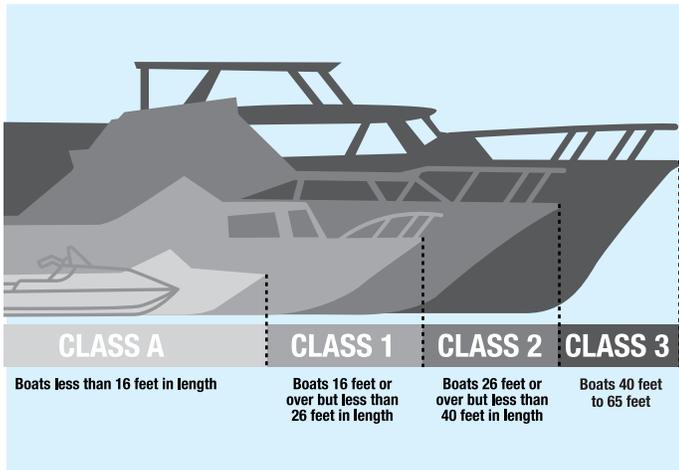
**Trim** – The angle at which a boat rides in the water. A boat may be trimmed so it rides even, down at the stern, or down at the bow.

**Knot** – a measurement of speed on the water equal to one nautical mile per hour (1.15 mph).



## Boat Classification

Boats are classified based on their length and whether or not they carry a motor. The classification of the boat determines what safety equipment you must carry. Your boat's length will also determine the registration fee.



Boats that move through the water by manual effort or sail—such as canoes, kayaks, rowboats and sailboats without a motor onboard—are classified as non-motorized boats. Any boat equipped with “propulsion machinery”—an inboard or outboard motor fueled by gasoline, diesel, electricity or steam — is a motorboat and fits into one of five classes:

- |                                |         |
|--------------------------------|---------|
| ▪ Less than 16 feet            | Class A |
| ▪ 16 feet to less than 26 feet | Class 1 |
| ▪ 26 feet to less than 40 feet | Class 2 |
| ▪ 40 feet to 65 feet           | Class 3 |
| ▪ More than 65 feet            | Class 4 |

## WHAT MAKES A GOOD OPERATOR

The first duty of a good operator is the safety of the boat and its passengers.

### Good Operators:

- are always in control of their craft and themselves.
- know the laws and rules and obey them.
- know their job, their boat and its equipment.
- continue to improve their seamanship and add to their boat handling skills.
- keep a checklist on safety equipment and goes over it each time before casting off.
- are thoughtful of other boats and people.
- are always alert to danger.
- do not take chances or run risks.
- aids others in danger or distress.
- keeps their craft clean and in shape.
- keeps a log.

## Parts of a Boat

**Hull**—the basic structural shell of a boat.

**Bow**—the forward (front) part of a boat.

**Stern**—the after (back) part of a boat.

**Keel**—the backbone of the boat running from the bow to the stern along the underside of the boat along the center line.

**Transom**—vertical surface at the back of the stern which extends across the stern from one side to the other. Outboard motors are mounted on the transom.

**Gunwale**—upper edge of a boat's sides (rails).

**Bilge**—the area beneath the floorboards, or the lowest point of hull in a boat without floorboards.

**Cabin**—an enclosed portion of the hull.

**Helm**—the operating station where the operator controls the direction and speed of the boat.

**Cockpit**—a recessed area in the after deck where the controls of the boat are located.

**Rudder**—steering device on the stern of the boat.

**Throttle**—a means of controlling the speed of the boat's engine.

**Deck**—the name of the floor on a boat.

**Propeller**—a device with two or more twisted blades that is designed to move a boat through the water. The propeller is connected to the engine by a shaft.

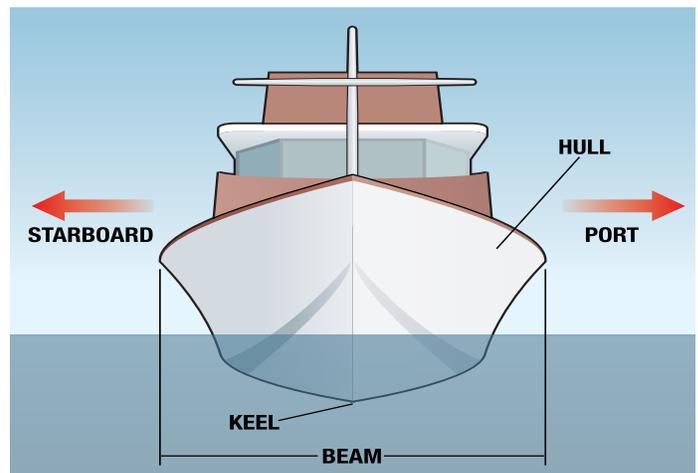
**Boat Plug**—a device used to close the drain hole in the bottom of the boat.

**Shear Pin**—a steel pin that fits the propeller to the shaft and is designed to break to protect the propeller.

**Winch**—a hand or mechanical device used to pull in a rope or a chain.

**Hatch**—an opening in the boat's deck or hull that allows people or equipment to pass through.

**Vent**—an opening that allows air to pass through the hull.



## Directional Terms

(Assume you are sitting in the boat facing the bow or front of the boat)

**Forward**— towards the bow of a boat.

**Aft**— towards the stern of a boat.

**Starboard**— the right side of boat.

**Port**—the left side of boat.

**Ahead**— in front of the boat or to move forward through the water.

**Astern**— behind the boat, or to move backwards.

**Abaft**— behind or toward the stern in the boat.

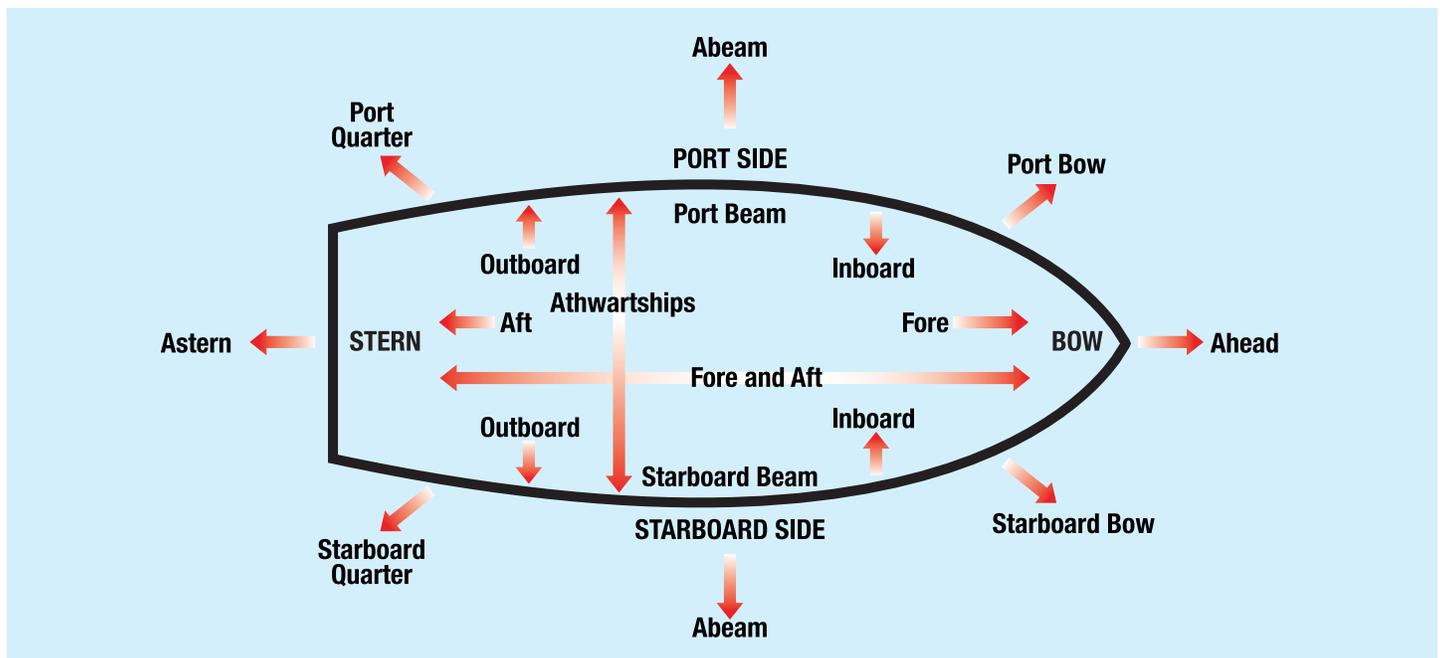
**Abeam**— off the port or starboard side of the boat, at 90 degrees to the keel of a boat.

**Athwartship**— across the boat at a right angle to the keel.

**Beam**— at the sides of a boat.

**Broaching**— the turning of a vessel to expose its side to the oncoming waves.

**Roll**— to rock from side to side.



## Boat Design and Hull Types

### Hull Shapes

There are two basic types of hulls: displacement hulls and planing hulls. Each type has its own distinct features and characteristics. A third type, semi-displacement, shares some of the features of both planing and displacement hulls.

All boats are displacement boats when at rest because the boat displaces water in order to float. It is what happens to the hull when power is applied that ultimately determines its type. In addition, each hull type is associated with some basic shapes.

The shape of the hull may also determine the wake that a boat creates. A wake is the moving waves that a boat generates when moving through the water. A displacement hull may have a larger wake due to the box shape of the hull. A boat that is on plane may have a smaller wake when on plane because a good portion of the hull is above or near the top of the water surface.

### Displacement Hull

A displacement hull displaces a volume of water equal to the weight of the hull and its load whether the boat is underway or at rest. As the boat cuts through the water, the displacement hull creates its own wave system with two wave crests (one at the bow and one at the stern) and a long unbroken trough amidships.

The hull essentially is trapped within these crests. The wave system created cannot exceed the waterline length of the boat. Therefore, the waterline length determines the displacement hull's top speed. The longer the waterline is, the greater the potential top speed.

Displacement hulls require less power to move through the water than planing hulls, and generally have a slower top speed. This type of hull provides a very smooth and comfortable ride.

The most common shape for displacement hulls is the round bottom. Examples include large cruisers, trawlers, houseboats, canal boats and sailboats. Most multi-hull craft, such as catamarans, trimarans, and pontoon boats also have displacement hulls.

## Planing Hull

At rest and slow speeds, the planing hull operates just as a displacement hull does—it displaces a weight of water equal to the weight of the boat and its load. But as power increases, the shape of the planing hull provides lift that enables the boat to ride upon the bow wave. This is called being “on plane.”

When the boat is on plane it escapes the wave system that limits the speed of boats with displacement hulls. Less of the hull is actually in contact with the water, so there is less water resistance.

The amount of power available determines the top speed of a planing hull, not the waterline length. While it takes a considerable amount of power to get the boat on plane, less power is needed to maintain plane or even to rapidly increase speed once on plane. There are several shapes used in planing hulls, including flat bottom, deep-V, and semi-V hulls.

**The flat-bottomed boat** has a shallow draft and is relatively stable. It requires the least amount of power to get on plane because its flat surface provides excellent lift. This hull shape gives a rough ride and tends to pound (slap up and

down) in choppy water. It also tends to “slide” when turning, which makes it difficult to maneuver at high speed. Common examples of this hull type may be found in small fishing boats (jon boats), rowboats, and houseboats.

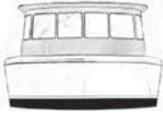
**Round bottom hulls** move easily through the water at slow speeds, but they may roll or capsize in high seas. Sailboats and trawlers often have round hulls.

**The deep-V hull** has a steep angle (>20 degrees) at the bow that carries all the way to the stern of the boat. This hull shape performs very well at high speed and in rough water because its bow slices through the waves rather than crashing into them. The deep-V requires more power than the other shapes to get on plane but is faster and more stable once there. The main disadvantages of this hull shape are that it requires a deeper draft and it tends to roll more at rest. The deep-V is best for ocean racing, sport fishing, and any other application where high speed may be required in rough water.

**The semi-V hull** has a wider angle at the bow than the deep-V hull, and the hull flattens toward the stern. In comparison to the flat-bottom, the V shape of the bow cuts the waves and provides a better ride in choppy water and reduces the tendency for the hull to “slide” in a turn.

Compared to the deep-V hull, the flat stern section of the semi-V hull provides excellent lift allowing the hull to get on plane quickly using less power. It also tends to roll less at rest. The key disadvantages become evident as the seas increase. At higher speeds, this hull shape pounds almost as badly as the flat-bottomed hull. The flat stern also increases the possibility of broaching from a large wave astern.

**Multi-hulls** are seen on catamarans and trimarans. These are very stable boats because their beams are wide, giving a smooth, stable ride. Twin hull design produces less drag so it requires less horsepower and has better fuel efficiency. The dual engines make the boat much easier to handle.

Types of Hulls	Advantages	Disadvantages	Comments
<b>Flat Bottom Hull</b> 	The flat bottom offers the best planing hull and has a shallow draft.	Flat bottoms tend to pound excessively at planing speeds or in choppy water.	Examples of flat bottom hulls are skiffs or jon boats.
<b>Round Bottom Hull</b> 	A round bottom hull offers the best displacement hull. It will move easily through the water at slow speeds.	Round bottom hulls have a tendency to roll without a deep keel or stabilizers. They are more prone to capsizing than other hull types.	Trawlers and many sailboats have round bottoms.
<b>Vee Hulls</b> 	Vee bottom boats are planing hulls. They offer a smoother ride in choppy water.	Vee hulls require more power to move through the water at the same speeds than flat bottom boats.	Some small utility boats and some runabouts have vee hulls.
<b>Deep Vee Hulls</b> 	Deep vee bottom boats have a sharper entry into water and are smoother riding than a vee hull.	The deep vee requires more power than a vee hull at the same speed	Most runabouts have this hull shape.
<b>Multi-Hulls</b> 	A catamaran, or multi-hull, has two or more hulls connected. It is a very stable type of boat because of the wide beam.	Narrow dock slips are a problem. Less popular than conventional hulls.	Examples include pontoon boats and Hobie Cats.

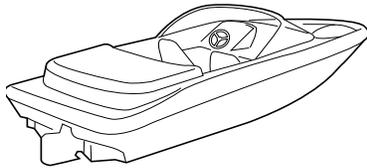
# Common Types of Watercraft

**Utility boats** are small watercraft that were traditionally used as work boats. This category includes:

- **Rowboats.** These are small typically human-powered boats that sometimes have an outboard motor. Rowers sit backward, looking opposite the direction the boat is travelling, so it is important for the rower to be alert when rowing. Rowers should look around often to avoid oncoming traffic or other hazards.
- **Prams and dinghies.** These boats are designed to work as tenders for larger boats. There are various styles of prams and dinghies. They may have rigid fiberglass hulls, or at the other extreme, they may have inflatable hulls.
- **Skiffs and jon boats.** These flat-bottomed boats are long and narrow with straight sides and a blunt bow. Jon boats are the boat of choice for hunters and fishermen because they are quite stable and easy to maintain.

None of these small boats are safe boats for larger bodies of water. Their gunwales are low to the water, so they are susceptible to taking on water in a choppy sea.

**Runabouts** are small, sporty versatile watercraft that may be used for day cruising, fishing, and water-skiing. They are generally more seaworthy and more stable than utility boats. Popular styles of this craft are:



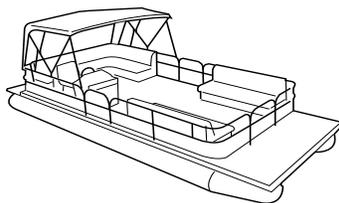
- bowriders, which are fun and useful for water-skiing.
- center console boats, which fishermen like because they offer a good platform all around the helm from which to fish.
- cuddy cabins, which are runabouts with an enclosed cabin area that is suitable for sleeping.

**Cruisers** are a generally larger and more comfortable craft. They have a galley, head (toilet), sink and shower. It is more suitable than a cuddy cabin for extended voyages or for living aboard. More seaworthy than runabouts, some cruisers are suitable for open waters. A



houseboat is a variation on a cruiser. A houseboat is large and stable, with most of the comforts of home. Houseboats sacrifice seaworthiness for comfort, but they are suitable for sailing on sheltered waters.

**Pontoon Boats** resemble a floating porch or deck powered by an outboard motor. They have a shallow

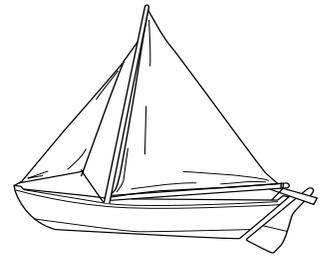


draft and are suitable for inland waters, lakes, and rivers. They are considered a “fair-weather boat.” Newer styles may have cabins and inboard engines.

**Personal Watercraft** are fast, highly maneuverable boats that accommodate one or more people. They can be thought of as the motorcycle of the waterways. A personal watercraft uses water jet propulsion and the operator sits, stands or kneels on the craft instead of in it.



**Sailboats** use the wind as the primary means of propulsion. Usually there is a single mast to carry the sails. The term sailboat applies to many different looking (and performing) boats. Sailboats can have a single hull (mono-hull), two hulls (catamaran), or three hulls (trimaran). The keel can have different shapes, depending on whether the sailboat is built for sport, racing, or just cruising.

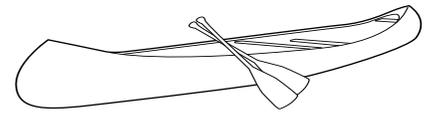


The size of sailboats ranges widely. At the smaller end there are sailboats meant for one person (solo craft):

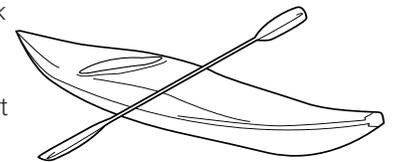
- sailboards,
- windsurfers, and
- dinghies.

When any sailboat uses a motor—whether gas, diesel or battery— it is considered a motorboat.

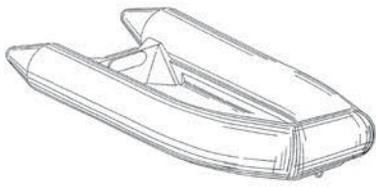
**Canoes** are relatively small boats, typically human-powered, but they also may carry an outboard motor or sail. Canoes are pointed at both ends and usually open on top. The canoe is propelled by the use of paddles, and the size of the canoe determines the number of paddlers. Canoe paddlers either sit on seats in the hull, or kneel on the hull. Either way, they face in the direction of travel while paddling. This differs from rowing, because rowers face away from the direction of travel.



**Kayaks** are small, sleek human-powered boats. A kayak typically has a covered deck, and a skirt covered cockpit. Usually kayakers accommodate one or two paddlers. Paddlers sit in the cockpit facing forward, and use a double-bladed paddle to propel the boat forward. Modern kayakers come in a wide variety of designs and materials for specialized purposes. Kayak varieties include cockpit style or a sit-on-top style. The sit-on-top style accommodates a paddler who doesn't want to be confined in an enclosed cockpit.



**Inflatable Boats** are lightweight collapsible boats with inflatable sides and bow. Some may have a rigid bottom and are powered either by oars or a small outboard motor.



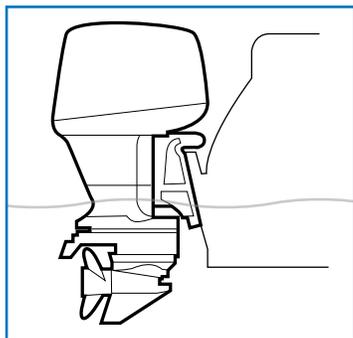
Inflatable boats are designed to be folded and packed into in a small compact container, for ease of storage. Inflatables come in many designs from the standard

U shape to kayaks, canoes and even pontoon platforms. An inflatable boat is a good option for people who live in an apartment and have no place to store a regular boat.

## Propulsion Engines

### Outboard Engines

The standard outboard engine is a complete propulsion unit. Boats that use outboard engines don't have rudders, so the boat turns in response to operator's turning of the outboard engine.



Most outboard engines are mounted on the transom of the boat.

The outboard engine has many advantages. In general, outboards have an excellent power to weight ratio—so the operator can get a lot of power and speed out of a small engine. These

engines are easy to service and replace. They don't take up space in the boat, leaving more room for passengers and gear. On the downside, they are not as efficient or economical to operate as other types of engines.

Outboards come in many different designs, and may use gas, diesel fuel or electric power. Gas engines can produce a lot of power compared to diesel or electric engines. Diesel engines burn less fuel and are more economical to run. Electric power is useful for trolling motors or for people who want a quiet ride.

There are four processes a combustion engine must complete to propel a boat:

- 1) intake of the fuel,
- 2) compression of the fuel,
- 3) transform the fuel into power, and
- 4) release the exhaust (the waste products of the transformation).

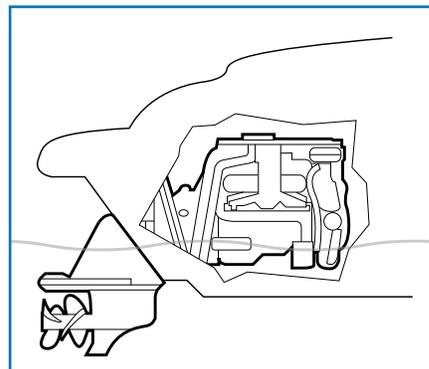
Movement of pistons in the engines drive these four processes, and engines may be either two-stroke or four-stroke engines—meaning that the pistons must complete either two or four strokes to complete the four necessary processes.

Traditionally, outboard motors have been two-stroke engines. Two-stroke engines are simpler and lighter than four-stroke engines, and they produce about twice as much power. Four-stroke engines are extremely quiet and fuel efficient, and are rapidly gaining in popularity despite a slightly higher cost.

Two-stroke engines often have a simple lubrication system in which a special two-stroke oil is mixed with the fuel. Depending on the design of the engine system, the oil can be mixed with the fuel manually each time fuel is added, or an oil pump can automatically mix fuel and oil from separate tanks. Oil leaks through the exhaust port each time a new charge of air/fuel is loaded into the combustion chamber, so oil pollution is generally greater with two-stroke engines. Newer designs are reducing the amount of oil getting into the environment.

### Stern Drive Engines

Stern drive engines are also referred to as inboard-outboard (I-O) engines. The engine portion is inside the boat, while the drive unit is mounted on the transom.



The drive unit turns and steers the boat, while the engine itself remains stationary. Boats with these engines don't have rudders.

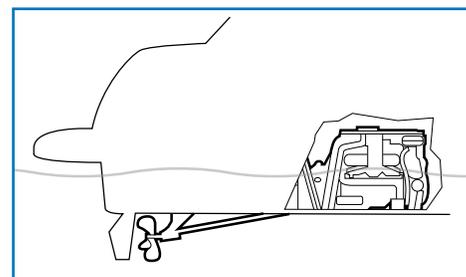
Stern drive engines are generally more efficient, quieter and longer lasting than outboard

engines. One disadvantage of stern drive engines is that they take up space in the boat. More importantly, there is a risk of explosion because vapors may gather around the enclosed engine.

### Inboard Engines

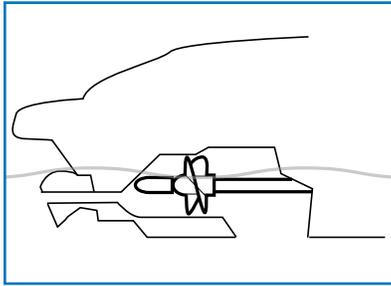
Inboard engines and transmissions are mounted entirely within the boat, with only the shaft going through the bottom of the hull. They don't have a complicated lower unit, like the stern drive engines do. Inboards require a rudder for steering the boat. Since the shaft and propeller extend below the hull, these boats usually have a greater draft, and so may be more likely to ground in shallow water.

These types of boats also require more skill to maneuver in reverse than boats equipped with outboard or stern drive motors. They commonly have an engine cover that may take up considerable deck space.



## Water Jet Pump Engines

The water jet pump engine is basic— just a small propeller (sometimes referred to as an impeller) inside of a casing or housing, connected to an inboard engine by a shaft that passes through a watertight opening in hull. While these engines are traditionally used in personal watercraft, an increasing number



of boats have jet pump engines.

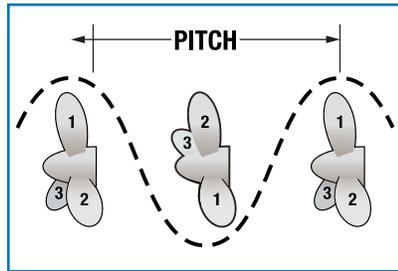
A nozzle directs water flow from the pump to provide directional control of the boat. There is no neutral. Boats with jet pump engines require power to turn and are not

responsive at idle speed. They can operate in shallow water and are highly maneuverable and responsive; however the pump can clog easily.

## Propellers

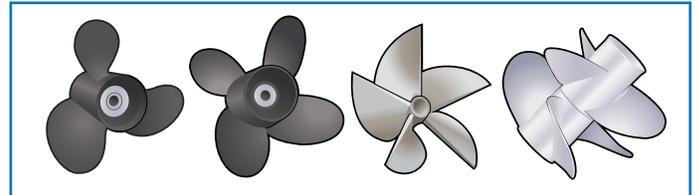
No discussion of propulsion would be complete without a discussion of propellers, or “props.” Selecting the right propeller is critical. The right prop for your boat and its engine will mean your boat will handle well; the wrong prop may make your boat difficult to maneuver or cause it to perform poorly or unpredictably.

Props operate by rotating and drawing water from forward and around its blades, and forcing the water into a stream away from the stern. This creates a dynamic pressure which moves the boat. The flow of water caused by the prop is called “screw current.”



## Propeller Performance

There are several factors that will affect the way a prop performs. One factor is the propeller’s pitch— the distance a propeller would travel in one revolution. Pitch is affected by slip, which is the difference between the distance a propeller should move in one revolution through a solid medium and the actual distance it moves through water, a yielding substance. Picture a bicycle wheel moving over the pavement. Now picture it riding through a muddy field. The bicycle will move farther over pavement than it will through the mud—how much farther it moves is the slip.



Cavitation is a condition in which the prop revolves faster without an increased speed (thrust), which causes a loss of power and reduced speed. This happens when a vacuum is created around the prop. Cavitation is usually caused by one of two problems:

- If the wrong size prop is on the boat the engine may turn the prop faster than the prop should be turned. The prop is spinning but the boat is not moving as fast as it should. You must replace the prop.
- The prop may sit too near the surface of the water. You must trim your boat so the stern is sitting deeper in the water.

Be aware of the risk of grounding and damaging your prop when you move from deep water into shallow water. A rapid reduction in speed can cause the stern to drop and the bow to rise, creating a bow wake. As the bow continues to rise, the stern continues to squat (to sink lower), which may lead to your boat grounding.

## Review Questions

1. What are the nautical terms for the right and left side of the boat when facing the bow? \_\_\_\_\_  
\_\_\_\_\_
2. Why is it important to know the length of your boat? \_\_\_\_\_  
\_\_\_\_\_
3. What is the unique propulsion system on a personal watercraft? \_\_\_\_\_  
\_\_\_\_\_

Answers on page 82

There is a nationally recognized system for identifying boats, much as there is for automobiles. The Federal Numbering Act of 1918 instituted a system for the federal government to number all boats that were not documented by the US Coast Guard, which at that time, documented only large commercial boats.

The Federal Safe Boating Act of 1958 transferred this responsibility to the states, and requires the states to number all the motorboats within their borders and maintain ownership records for the boats. Registration information assists authorities in identifying a boat that has been abandoned, stolen, recovered, or involved in an accident. Boat registration information also provides statistics about how people boat, who boats, why they boat and where they boat. This is useful information which helps New York State to allocate resources to preserve and protect our waterways and ensure that boaters have access to them.

## Boats Subject to Registration Requirement

Every type of motorized craft that is capable of being used as a means of transportation on the water must be registered whether the purpose is recreational or commercial. Motorized boat tenders—boats that are used to ferry people or supplies between boats or between a larger boat and the shore—must be registered.

Watercraft without a motor need not be registered. However, if you use a motor (electric or fuel-driven), no matter how small the craft or the motor, you must register your boat.

There are only very limited exceptions to the registration requirement. Boats that have a US Coast Guard document and that are being used as tugboats, ferries, steamships, or for other commercial purposes need not have a New York State registration. Similarly, boats used only for racing need not be registered in New York. If a boat is registered in another state and will not be in New York for more than 90 consecutive days, it need not be registered in New York. A boat owner from a foreign country who is using New York waterways temporarily need not register the boat. A boat that is owned by a government agency or subdivision of a government agency is exempt from New York State registration. Finally, lifeboats need not be registered.

## Registration Procedure

The New York State Department of Motor Vehicles (DMV) issues boat registrations. You must submit a completed Form MV-82B, "Application For Boat Registration," at your local DMV office. Be sure to have proof of identity and a bill of sale for the boat and proof of payment of sales tax. Boat

registrations are currently valid for three years. Before your registration expires, the DMV will send a notice in the mail indicating that it is time to renew the registration.

Fees for boat registration depend on the size of the boat. In addition, there is a surcharge to develop a fund for enhancing boating access across New York. The amount of the surcharge also will vary with the size of the boat.

Boat Length	Fee	Surcharge
Less than 16'	\$22.50	\$3.75
16' to less than 26'	\$45.00	\$12.50
More than 26'	\$75.00	\$18.75

You can find office locations, registration information, and contact information for DMV in your area at [www.dmv.ny.gov](http://www.dmv.ny.gov).

Once you've registered your boat federal law requires you to keep the original registration on the boat, in the event you must produce it at the request of a law enforcement officer. A photocopy is not acceptable.

Your boat's registration will be a series of numbers and letters. You must display your boat's registration properly so that it is visible on the forward part of the port and starboard sides of the boat when read left to right. The registration must be at least three inches in height, so that it is visible at 100 ft, and it must be a color that contrasts with the hull color to enhance visibility. There should be a space or dash between the letters and numbers: NY 1234 XY or NY-1234-XY.



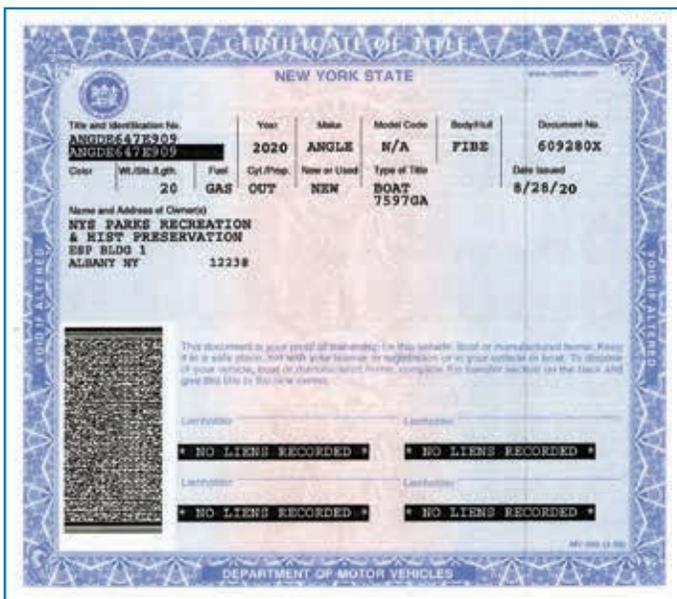
When you register your boat or renew a registration, you will receive validation stickers. Like the registration certificate, the stickers are valid for three years. They are color coded by year and similar to your vehicle inspection sticker, the month of expiration is punched out. This allows a police officer to know at a glance if the boat is currently registered. Place the decal toward the stern of the registration numbers on both sides of the boat.

## Getting a Title for Your Boat

New York, like many states, issues titles to boats. Not all boats get a title: only boats 14 feet and longer, that were manufactured in model year 1987 and later, will be issued a title. Keep in mind that there is a big difference between a boat registration and a title. A boat registration shows only that a fee has been paid to secure and register the boat's identification number. A registration is not proof of ownership, so it does not protect the purchaser from buying a stolen boat or a boat that has a lien on its title.

The title will show the name of the owner, give a description of the boat and list any liens or lenders that have an interest in the boat. The seller signs the title over to the purchaser when selling a boat. The purchaser will receive a title in his/her name after they register the boat.

The seller must provide a signed bill of sale. The boat's registration becomes invalid upon the sale of the boat, so the seller should remove the registration validation sticker before turning over the boat to the new owner. This will force the new owner to register the boat before it can be used.

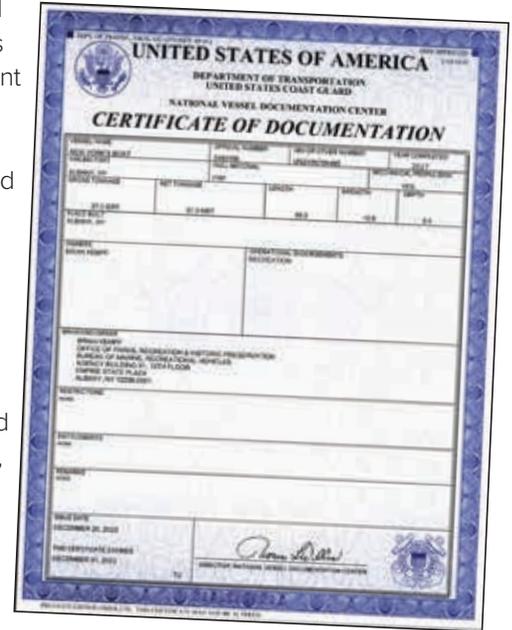


Do not keep the title in your boat, rather put it in a safe place at home or a safe deposit box.

**WHEN BUYING A BOAT BEWARE OF DEALS THAT ARE 'TOO GOOD TO BE TRUE.' CHECK ALL PAPERWORK AND BE SURE THAT THE SELLER ACTUALLY HOLDS LEGAL TITLE TO THE BOAT.**

## US Coast Guard Boat Documentation

US Coast Guard boat documentation is a national form of registration that provides conclusive evidence of nationality for international purposes. Less than one percent of boats in the United States are documented with the US Coast Guard. Originally, only large commercial boats needed US Coast Guard documentation, but it is now being used for yachts and other smaller, but expensive, pleasure boats. If you are financing your boat purchase, some lenders may require you to document your boat because US Coast Guard documentation provides added security.



There are two types of federal documentation: commercial and recreational. If your boat is commercially documented, you need not get a New York State registration. If your boat has US Coast Guard documentation as a recreational boat, you must register your boat with DMV. US Coast Guard documented recreational boats need not display New York State registration numbers, but must display the validation sticker.

Compared to registration, the US Coast Guard documentation procedure is a complicated process and requires numerous forms and documents. You can get more information from the National Vessel Documentation Center in Falling Rivers, West Virginia. You can visit their website at [www.uscg.mil/nvdc](http://www.uscg.mil/nvdc).

# Hull Identification Number (HIN)

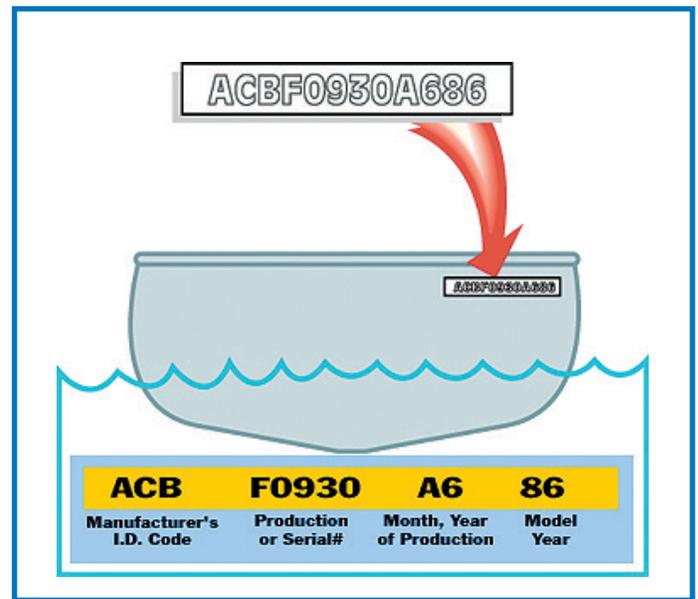
A hull identification number is a unique serial number to each boat consisting of 12 characters in three parts. The HIN is affixed on the upper starboard side of the transom on the outside. It was designed for product recall by the US Coast Guard and is not designed for identifying a boat. However, law enforcement officers use it to confirm boat registrations and to aid in identifying recovered boats.

The US Coast Guard issues each manufacturer a Manufacturer's Identification Code to be used on all boats made by that company. The manufacturer assigns a serial number and a month of certification. The serial number must be unique to each boat and the date of certification shows the month and year the boat was built. The Manufacturer's Identification Code, the serial number and the certification date make up the HIN.

If your boat doesn't have a HIN, you must obtain one. Use form OPS 420, "Application for a Hull Identification Number." You can download it from the New York State Parks website at <https://parks.ny.gov/recreation/boating/documents/UpdatedHINops4202019.pdf>. This form is also available through the DMV. Follow the directions on the form and mail it to New York State Parks at the address listed. New York State Parks processes the form and sends it to a local

law enforcement agency. After receiving the form, a law enforcement representative will make an appointment to inscribe a HIN on your boat.

When buying a boat make sure that the HIN on the boat matches the HIN printed on the title and registration certificate.



## Review Questions:

1. Which boats need to be registered in NYS? \_\_\_\_\_  
\_\_\_\_\_
2. Which agency registers boats in NYS? \_\_\_\_\_  
\_\_\_\_\_
3. How are the registrations numbers displayed on the boat? \_\_\_\_\_  
\_\_\_\_\_
4. Where are the validation stickers displayed? \_\_\_\_\_  
\_\_\_\_\_
5. What is the purpose of the Hull Identification Number? \_\_\_\_\_  
\_\_\_\_\_

Answers on page 82

To protect yourself and your passengers, there is certain safety equipment that the law requires you to carry on your boat. The equipment we will discuss will satisfy both state and federal safety requirements for boats. But more importantly, having the equipment we cover in this section, and using it properly, may be vital to survival in an emergency. See the checklist on page 83 to find out what you need to carry on your boat.

## US Coast Guard Approval

Throughout this chapter we will reference safety equipment that is “US Coast Guard Approved”. The purpose of approval is to confirm that the safety equipment has been tested and been found to meet the regulatory requirements relating to performance, construction and materials used at the time of manufacture. Each approved device will be marked by a label, or a stamp. This mark must be visible and readable in order for the piece to be considered US Coast Guard Approved.



It is no longer required to use type coding on a PFD. Current PFD that have Type I-IV on their labels will be legal to sell and wear for the useful life of the jacket. New labels are based on an internationally accepted standard and use a combination of text and graphics.



## Personal Flotation Device (PFD)

Buoyancy is the force that counteracts the gravitational forces on a person in water. Most of us don't have enough natural buoyancy to keep afloat, so if we fall in the water, we'll sink. In order to stay afloat, we need a personal flotation device, or PFD. PFDs provide additional buoyancy and used correctly, can keep a person afloat for hours. The person using a properly sized PFD will be able to keep their head above water to breathe without the exertion of treading water. This can be the difference between life and death in an emergency. Life jackets, life vests, and throwable flotation devices are all versions of PFDs.



## Carriage Requirements

Every pleasure boat floating or sailing in New York State waters must carry at least one wearable US Coast Guard Approved PFD, for each person on board. This applies to all boats, including canoes, kayaks and rowboats. In addition, boats 16 feet and greater in length also must carry a Type IV throwable PFD.

### Types of Personal Flotation Devices

#### Off-Shore Life Jacket (Type I PFD)

Effective for all waters, this type of PFD provides the most buoyancy. They are designed to turn unconscious wearers in the water to a face-up position. There are two sizes: adult, with 22 lbs of buoyancy; and the children's size with 11 lbs of buoyancy. If you are going boating in areas where rescue may be delayed, this is the PFD to have.



#### Near-Shore Buoyant Vest (Type II PFD)

The near-shore buoyant vest is intended for calm, inland water, where there is a good chance of a quick rescue. This type of PFD may turn some wearers over to a face-up position, but the turning action is not as pronounced nor as effective as the Type I device. The adult vest provides 15.5 lbs. of buoyancy, and the child's vest 7 lbs.



#### Flotation Aid (Type III PFD)

Good for calm, inland water, where there is a good chance for immediate rescue. These are designed for special recreational activities such as water skiing. The Type III provides the same buoyancy as the Type II, but without any turning ability, so wearers must place themselves in the face up position. They come in many colors and styles, and in general, are the most comfortable type of PFDs available. There are PFD specifically designed for various activities such as waterskiing, fishing and hunting.



#### Throwable Devices (Type IV Flotation Devices)

These PFDs are designed to be thrown to a person in the water, and grasped and held until rescued. These devices



are not intended to be worn. These usually take the shape of a boat cushion, ring buoy, or horseshoe device. These devices must be readily accessible during boat operation.

## Special Use or Hybrid Device (Type V PFD)

A special use device that is designed for a specific activity. A work vest, an inflatable PFD and immersion suits are included in this category. The PFD must be worn and used only under the conditions noted on the label. A Type V PFD may be rated as a Type I, II or III if they have the required minimum buoyancy. If the label says “for commercial use only” then the PFD is not intended to be used on a pleasure boat.



A Hybrid Device is a Type V PFD that uses inflation in addition to the some type of buoyant flotation material found in traditional PFDs. To be acceptable for use on recreational craft, the hybrid Type V PFD must be worn.

While the US Coast Guard is now approving inflatable PFDs for use on recreational boats, please keep in mind that while they are comfortable and lightweight, they are not suitable for non-swimmers, waterskiers, youths under the age of 16 and riders of personal watercraft.

Inflatable PFDs must have a full cylinder and all status indicators on the inflator must be green or the device does NOT satisfy the requirement to carry PFDs. If you are using a Type V (inflatable) PFD, you must wear it at all times in order to meet the PFD requirements.

**IT IS MUCH EASIER TO ALWAYS WEAR A PFD THAN TO PUT ONE ON IN THE WATER WHILE UNDER DISTRESS!**

## General Information About PFD

To be in compliance with the law—and as a matter of basic safety—you must keep your PFD in good condition and readily (easily) accessible. Check your PFDs *every time you go boating* to ensure that they are free of rot, tears, and punctures. Make sure all the straps are functional. Don't stow your PFDs in closed plastic bags, or locked in your boat's storage compartment. Keep them near at hand so that you can reach them quickly in an emergency, and make sure all your passengers know where they are located.

### What's wrong with this picture?



Make sure that every passenger has a PFD that fits. An adult PFD is not appropriate for most children, and a child's PFD is not appropriate for most adults. Children's PFDs are rated by weight of the wearer, and are safe only for children weighing 90 pounds or less. Children who weigh more than 90 pounds should wear an appropriately sized adult PFD. Adult PFDs are rated by chest size.

When shopping for any PFD always look for and read the US Coast Guard label. This label, along with the provided informational brochure, will tell you everything you need to know about the device you are about to buy: the type, size, amount of buoyancy, intended use and its proper care.

Read the PFD label carefully. Some PFDs are not approved for personal watercraft, water skiing and similar towed activities. Look for a PFD that is marked for the intended use. For example, if it is not labeled “water ski” or “PWC” find one that is.

For a PFD to be considered “Approved”, the PFD must be readily available, the proper size for the person, properly fastened if being worn, free of rips and tears and used in activities not prohibited on the label.

**THE BEST PFD IS THE PFD YOU WEAR!**

## Caring for PFDs

A PFD that is in poor condition will not work properly. PFDs will last many years given reasonable care. Follow a few simple steps to preserve the useful life of your PFDs.

**Store PFDs properly.** If you store your PFDs in your boat in the summer months, don't leave them where they're exposed to direct sunlight. Exposure to the sun may cause the shell fabric to weaken, which might cause it to tear when worn. Keep PFDs out of direct sunlight when they're not in use. Remove the PFDs from the boat during the winter and store them in a dry, well-ventilated place. Never store PFDs near oil or grease since these substances can cause deterioration of the materials, impair buoyancy and reduce performance.

**Use, don't abuse.** Use your PFD for its intended purpose. Exposing it to excessive friction or force may damage it or render it useless. Your PFD is your primary piece of lifesaving equipment; treat it as such and it may someday save your life. Never use your PFD as a boat fender; doing so may cause tears or ruptures. Don't sit on your PFD. Many Type I and II PFDs consist of several “kapok” bags sewn into the device. Each bag must be airtight or else water may seep into the bag causing the kapok to lose buoyancy. Sitting on kapok devices may rupture them.

**Test regularly.** A damaged PFD may not have sufficient buoyancy to keep a person afloat. Check your PFDs often to make sure they are in good condition. Inspect PFDs carefully to make sure all the straps are securely attached and all the buckles and zippers work. A PFD will not work properly unless you are properly strapped into it. Look carefully for tears in the fabric; buoyant material may fall out of a tear and a torn device may become water-logged. Discard torn or ripped devices.

If you are using a fully inflatable PFD, check the cylinder and lanyard before each use. You should also review the manufacturer's instructions for establishing a maintenance schedule.

Periodically, at least once in the beginning of the season and once at the end, test a PFD in shallow water. To determine whether it has sufficient buoyancy to keep you safely afloat, keep arms and legs below the water's surface and assume a relaxed position. Your head and chin should be above the water's surface. If the device cannot keep you in this position, replace it.

## Wear Requirements for Personal Flotation Devices

Although every boat must have a PFD for every passenger on board, not everyone is required to wear a PFD all the time. Some people are required to wear a PFD at all times. If a person is required to wear a PFD, it must be the proper size and all straps, zippers, and buckles must be fastened in order to meet that requirement.

### Here are the legal requirements for wearing PFDs:

**Children under the age of twelve** must wear a USCG approved PFD onboard a pleasure boat under 65 feet, rowboat, canoe, or kayak while underway unless they are in a fully enclosed cabin. The PFD must be the appropriate size for the child.

**Anyone operating or riding on a personal watercraft** (Jet Ski, Wave Runner, or similar craft) must wear a USCG approved PFD.

**Anyone being towed** behind a boat, such as water skiers, tubers, parasailers, etc., must wear a PFD. If you are in a disabled boat being towed by another boat, it is a good idea for everyone on board to wear their PFD (although in this case it is not a legal requirement).

**Everyone on board** any vessel of less than 21 feet, including rowboats, canoes and kayaks, between November first and May first must wear a USCG approved PFD while underway.

### Best Practices for Personal Flotation Devices

Consider wearing your PFD whenever you're on or near the water. A PFD is a lifesaver. Just because you don't have to wear your PFD in a certain situation doesn't mean you shouldn't. There are many times that it makes good safety sense to put on your PFD. For example, it's always best to wear your PFD if:

- You want to set a good example for children
- You're loading or unloading from a dock
- You're boating in rain, fog, sleet, snow, darkness, or experiencing high winds or rough waters

- You're boating when air or water temperatures are colder than 60°F
- You're boating in a congested area
- You're proceeding at high speed
- You're boating alone
- You're tired or sleepy or returning at the end of the day
- You're swimming off your boat or entering the water for any reason
- You're standing in a small boat for any reason
- You're a non-swimmer

### Infants and PFD

The US Coast Guard recommends that infants should not be on board watercraft until they are of a size that they can wear an appropriate PFD. While there are several vest-type PFDs approved for infants, they may not be suitable for very small infants. Because of varying body types, and individual temperament and comfort in the water, it is difficult to make a PFD that is satisfactory for all infants. An infant PFD should be tested on the child in a pool before boarding a boat. If an infant is on board, an adult with a PFD on, ready to assist, should also be aboard. In the event of an emergency, there may not be time for an adult to get and put on a PFD while taking care of an infant.

**REMEMBER, ANYTIME IS THE RIGHT TIME TO WEAR YOUR PFD!**

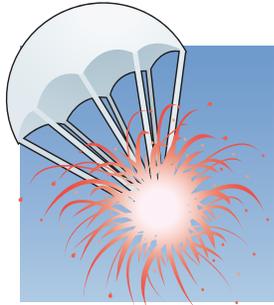
## Visual Distress Signals (VDS)

You need to be properly prepared for an emergency, which means you must know how to get help, and when to offer help. All boaters should learn to how to signal others when they are in trouble on the water, and should know how to recognize the visual distress signals of others. When boaters use visual distress signals properly, searchers can locate a boat in difficulty more quickly, reducing the possibility of a minor emergency becoming a tragedy. NEVER display visual distress signals on the water under any circumstances except when you need assistance to prevent immediate or potential danger to persons on board. Some examples are your boat is disabled, a medical emergency on board, taking on water, or a fire.

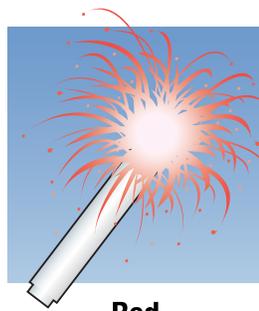
Visual Distress Signals are classified in two categories "day signals" and "night signals." Some VDS are approved for both. The signals must be in serviceable condition and readily accessible onboard the boat. The visual distress signals must comply with US Coast Guard requirements. Some visual distress signals become less effective over time; any devices that are marked with a service life must not have expired.

Visual distress signals may be either pyrotechnic or non-pyrotechnic. Pyrotechnic means a device that burns with colored flames. Non-pyrotechnic visual distress signals do not burn. Each type of distress signal has distinct advantages and disadvantages, and no single device is ideal under all conditions or suitable for all purposes.

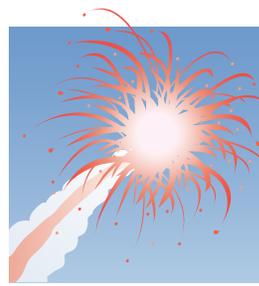
# Visual Distress Signals (VDS)



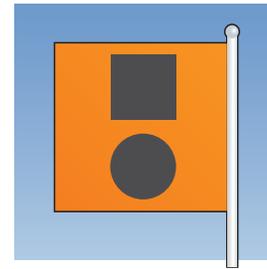
**Red Parachute Flare**



**Red Hand-Held Flare**



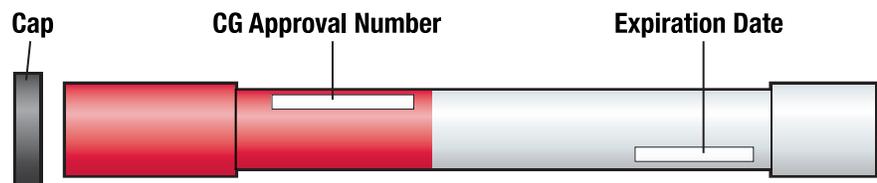
**Red Meteor Flare**



**3' X 3' Distress Flag**



**Orange Hand-Held Smoke Signal**



**Hand-Held Flare**

**Pyrotechnic devices** include meteor or parachute flares (which are launched into the air), hand-held flares, and hand-held and floating devices that produce smoke. Pyrotechnic devices are excellent distress signals because they are visible from a distance and easy to recognize. However, they produce a very hot flame and can cause burns and ignite flammable materials, so you must exercise caution when using and storing them. These devices generate hot slag as they burn, so when you use hand-held devices you must hold them well overboard to prevent the boat from catching fire.

Pyrotechnic devices are not right for every boater. Some of these devices have similarities to firearms and must be handled accordingly. New York State does not consider a pistol style launcher for pyrotechnic distress signals a firearm. When travelling to another state or country find out if boaters are allowed to have pistol style launchers on board. Never leave a pyrotechnic shell in the launcher. A curious person may get hurt.

Pyrotechnic devices carry an expiration date, and if your devices are expired, they don't count toward the minimum carry requirement discussed below. When buying pyrotechnic visual distress equipment always check the expiration date. Store your pyrotechnic devices in a cool, dry location. We suggest a watertight container painted red or orange and clearly marked "DISTRESS SIGNALS" or "FLARES."

**Non-Pyrotechnic Devices** include flags and electric distress lights. These must be US Coast Guard Approved. For daytime, the distress signal is a 3 foot by 3 foot flag with a black square and ball on an orange background. For nighttime, an electric distress light automatically flashes the international distress signal-SOS.

## Carriage requirements

Who has to carry VDS? During the daytime, regardless of the distance from shore, any pleasure boat 16 feet or longer, except sailboats less than 26 feet not equipped with mechanical power, must carry day and night signals. PWC are required to carry a fluorescent-orange distress flag which shall be a minimum of one foot square or other appropriate USCG approved daytime VDS. All boats, except rowboats, canoes, and kayaks, regardless of size must have nighttime signals between sunset and sunrise. The signal requirements do not apply if the boat is participating in an organized race, parade or regatta.

If you use only pyrotechnic signals, you must have at least three that are approved for day and three that are approved for night. You may use a combination of devices approved for both day and night to meet this requirement.

**NEVER USE ROAD FLARES ON YOUR BOAT!  
ROAD FLARES DON'T HAVE A HAND GRIP, AND  
MAY CAUSE FIRES OR INJURY! ROAD FLARES  
ARE NOT USCG APPROVED.**

## Fire Extinguishers

US Coast Guard Approved fire extinguishers are required on boats where a fire hazard could be expected from the motors or the fuel system. Non-mechanically propelled boats are not required to carry a fire extinguisher, nor are personal watercraft.

To be approved it must be mounted, such as near the helm where it is easily accessible to the operator, in a marine-type mounting bracket designed for the extinguisher. Fire extinguishers that do not satisfy the requirements or that have been partially discharged are not compliant with the law. You must replace a partially discharged extinguisher or take it to a qualified fire extinguisher servicing company for recharge.

**BECOME FAMILIAR WITH THE EXTINGUISHER AND LEARN HOW TO USE IT BEFORE YOU NEED IT. READ THE LABEL AND INSTRUCTIONS CAREFULLY!**

Boats with inboard engines are more susceptible to fires because the engine space is enclosed. The operator may not see fuel leaks or recognize other potentially explosive conditions as they develop, and it's possible for a fire to take hold without the operator being aware of it. Operators of gasoline inboard powered boats should consider installing an automatic fixed extinguishing system in order to reduce the danger of fire. Don't forget to ventilate the engine space. Blow out any flammable vapors out of the bilge by running the blower a minimum of four minutes before starting the engine.



Some boats are fitted with a fixed US COAST GUARD APPROVED fire extinguishing system that protects the engine compartment. These boats may not need to carry as many portable fire extinguishers as shown on the chart below.

Minimum number of hand portable fire extinguishers required		
Boat Length	No Fixed System	With approved Fixed Systems
Less than 26'	1 B-I	0
26' to less than 40'	2 B-I or 1 B-II	1 B-I
40' to 65'	3 B-I or 1 B-II & 1 B-1	2 B-I or 1 B-II
Outboards Less Than 26' and of Open Construction *	NA	NA

\*Open construction is a boat built with no closed compartments or compartments under seats where portable fuel tanks may be stored and no deck under which vapors can accumulate.

## Types of extinguishers

The two most common types of fire extinguishers are dry chemical and carbon dioxide (CO<sub>2</sub>). Dry chemical and carbon dioxide extinguishers can be effective on fires caused by common combustibles (Class A), such as wood and paper, flammable liquids (Class B), such as fuel or grease and electrical fires (class C). Never use water on class B or C fires. For common combustibles (class A) both dry chemical and carbon dioxide may be used but should be followed up with water to help prevent re-flash.

Extinguisher labels can be confusing. Fire extinguishers are classified by a symbol that is comprised of a letter and a Roman numeral. The letter indicates the type of fire the extinguisher is approved for, and the Roman numeral indicates the size of the extinguisher. Look for the part of the label that says "Marine Type US COAST GUARD APPROVED." Most portable extinguishers will be either size I or II. Size III and larger are too big for use on most recreational boats.

## Fire extinguisher maintenance

Devote some time to caring for your fire extinguishers properly, and they can last many years. To be sure that your fire extinguisher will work properly when you need it, inspect your extinguishers monthly. Make sure that:

- Seals and tamper indicators are not broken or missing
- Pressure gauges or indicators read in the operable range (Note: CO<sub>2</sub> extinguishers do not have gauges.)
- There is no visual damage such as cracked or broken hoses, rust, corrosion, leakage or clogged nozzles

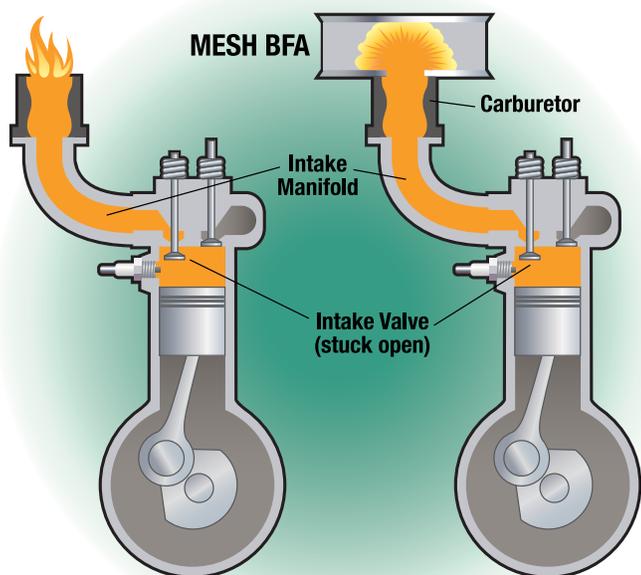
There will be a minimum weight on the extinguisher label, and you need to assure that your extinguisher remains at the minimum weight. Make sure of this by weighing your extinguishers every year.

If you have doubts about your fire extinguisher, never test it to see if it works. Instead, have it inspected by a professional to determine if it is reliable and in good working order.

## Backfire Flame Arrestor

All gasoline engines with carburetors tend to vent fuel vapor after shutdown. This vapor goes into the engine compartment and will linger for a while. The vapor does no harm as long as there is no source of ignition in the compartment. Sources of ignition can be electric such as a spark, or a backfire in the engine intake system when you start an engine. On a boat, flames spouting out of a carburetor can ignite fuel vapor in an engine compartment.

A backfire flame arrestor prevents the heat and flames of an engine backfire from igniting any flammable vapors that may be present in the engine compartment. A backfire flame arrestor is required on all inboard gasoline engines,



and must be attached to the air intake, usually on top of the carburetor. The device must be US Coast Guard approved.

A backfire flame arrestor may look like an air filter but this is not its primary function. The operating principle of the flame arrestor is to cool and quench the flame, by forcing it between closely spaced metal vanes or screens. This cools the flame so it will not exit the carburetor.

Check your arrestor periodically to ensure that it fits snugly against the air intake. The arrestor should be removed and cleaned each season with de-greaser or soap and water to ensure that air flows into the engine properly. A damaged flame arrestor should be replaced, not repaired.

## Sound Signaling Devices

All boats must carry some sort of sound signaling device. Keep in mind that it may be fun to toot at your friends on the water, but remember that your boat horn or whistle is an important piece of safety equipment.

Navigation rules require boats to produce sound signals, toots of the whistle or horn, in certain circumstances. You must sound your horn or whistle when meeting, crossing and/or overtaking another boat, in times of danger (not distress), and during periods of restricted visibility. See pages 45-46 for more information on sound signals.



## Whistle or Horn

On boats less than 12 meters (39 ft.) in length, a mouth whistle may be used. All boats 12 meters (39 ft.) and greater in length must carry a sound producing mechanical appliance. Whether your boat has a horn or a whistle, it must be audible to at least one-half mile.

If your boat came with a horn, test it regularly. Over time, oxidation build-up inside the horn can diminish the sound level. Consider keeping a portable air horn on your boat, as well as the mechanical horn or mouth whistle. The air horn provides a back-up in case the mechanical horn fails to work properly. If your boat is small and carries a whistle, the air horn may be a better option in some circumstances. For example, the air horn will be easier to hear on a crowded lake or in foggy conditions

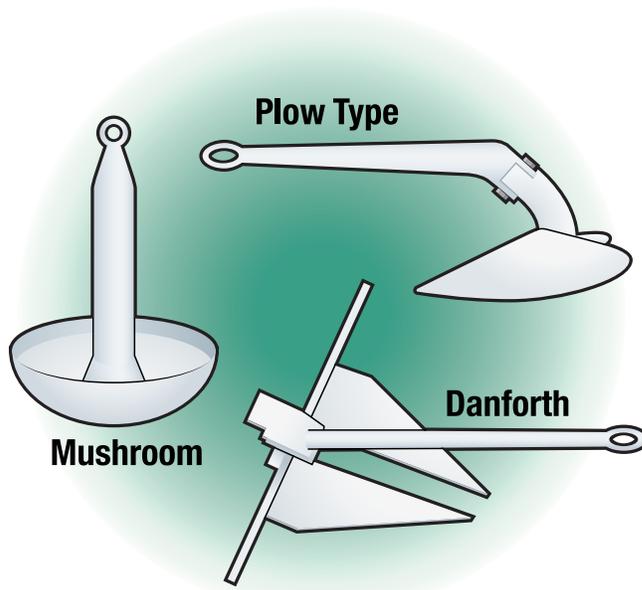
## Bell

All boats 20 meters (65 ft.) and greater in length must have a bell. The bell signals the location of the anchored or grounded boat to others during periods of reduced visibility.

## Anchor & Line

All motorized boats must carry an anchor and line of sufficient weight and strength to provide the boat with safe anchorage. Though the law applies only to motorized craft, all boats should carry an anchor in case of an emergency on

## Types of Anchors



the water. Select an anchor that is appropriate for the types of waters in which you'll be operating. An anchor that will hold a boat in a lake may not hold the same boat in a river with a strong current. We will talk more about anchoring later.

## Muffler System

All motorized boats will create a certain amount of noise—that's unavoidable. However, the people residing along the shore, and the wildlife that live on the waterways and surrounding areas, are entitled to protection from excessive noise.

Boats that are too noisy are not just annoying, they're safety hazards. The operator of a loud boat may find his or her senses dulled by the noise and vibration, and be less responsive to environmental and operating conditions. In addition, a boat that is too loud may drown out the sound signals of other boats nearby.

New York has established maximum noise levels for recreational boats. New York State Parks trains boat noise enforcement officers to ensure that all pleasure boats operating on New York State waters comply with the noise limits. If these officers suspect a boat is exceeding the legal noise limit, they may order the operator to submit to noise testing. If a boat fails the noise test, the officer can order the boat to dock until it is in compliance. Failure to comply with a noise officer's directive is a violation and can lead to a fine of up to \$250.00.

Boat manufacturers have made strides in producing quieter boats over the years, and that progress is likely to continue. But the noise a boat generates isn't just a matter of the manufacturing process: the way the operator handles and maintains the boat has an impact too. All power boats must be equipped with a muffler system designed to reduce engine exhaust noise. Most stock boats come from the manufacturer with systems designed to meet New York's standards.

**IT IS ILLEGAL TO REMOVE, MODIFY OR ALTER A BOAT'S MUFFLER OR EXHAUST SYSTEM TO EXCEED THE STATE'S MAXIMUM LIMITS!**

## Installed Flotation

Since 1972 all manufacturers of boats less than 20 feet in length have been required to install built-in flotation. Those built since 1978 have sufficient flotation to float the boat and its occupants, even when flooded with water. This feature is also found on some larger boats. Because of this built-in feature, your boat can also double as a self-rescue platform in the event of an accident. Should a boat with installed flotation swamp, flood, or otherwise partially sink in the water, don't abandon it. First, try to climb back in and maneuver the boat to shore. Even if you can't maneuver it, remember that the shoreline is usually further away than it looks and it is harder to find a person swimming than a person in a boat. If you stay with a boat that continues to float, you increase your visibility and your chance of rescue.

If you decide to build your own boat, the US Coast Guard has a free book for you called "Safety Standards for Backyard Boat Builders," (COMTD PUB P16761.3B). This is a simplified explanation of federal recreational boat construction requirements and is intended for the use of the non-professional individual builder. If you would like more

information or a copy of this pamphlet, please contact the USCG Office of Boating Safety.

**THE FOLLOWING EQUIPMENT IS NOT REQUIRED BY LAW, BUT IS USEFUL IN AN EMERGENCY**

## First Aid Kit

The first duty of an operator is the safety of the crew and passengers, so keep a first aid kit on your boat with enough supplies to handle every kind of minor accident. Include supplies to take care of cuts and scrapes, sunburns and other burns, and bug bites and stings. Keep analgesics, seasick medication or any other kind of medication that you or your passenger may require in an emergency on board in your first aid kit. You also should consider including materials that you can fashion into a splint if someone breaks a bone.

Keep in mind that a good first aid kit doesn't help much if no one onboard knows first aid. A responsible boat operator will take at least a basic first aid course to learn how to use the contents of the first aid kit, and how to recognize medical emergencies that require professional intervention. The American Red Cross, the YMCA/YWCA, fire departments and other organizations offer first aid courses.

## Bilge Pump/Bailer

It's good to have a bilge pump on board, even though the law doesn't require you to have one. Virtually all boats end up with unwanted water in the bilge (the area beneath the floorboards, or the lowest point of hull in a boat without floorboards). This can occur from rain, rough seas or another boat's wake. You need to remove the water for your boat to handle properly, and a bilge pump is easier and faster than trying to bail the water manually.

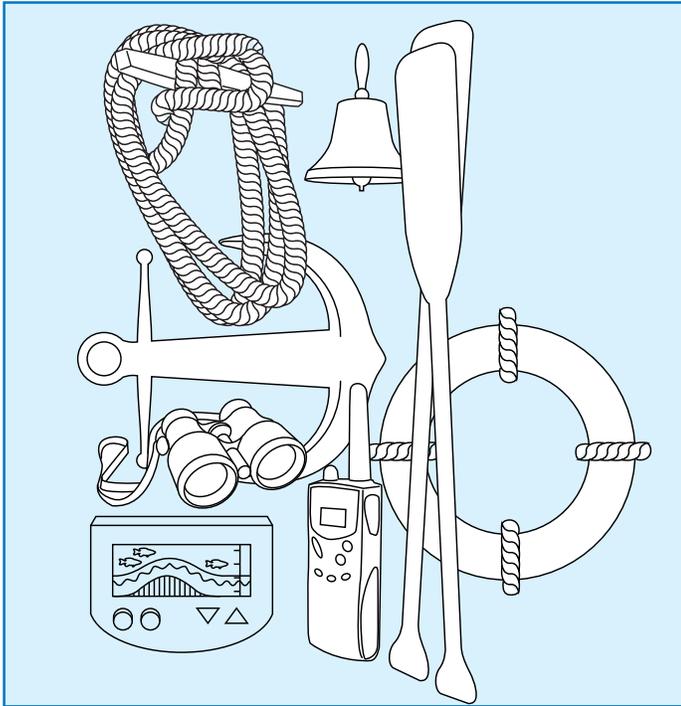
Besides making bail easier, bilge pumps can be useful in an emergency. Even though they aren't large or powerful enough to keep up with a leak caused by hull damage, if your boat is damaged and taking on water, a bilge pump may buy you time to put on a PFD, send a distress signal and try to get to a shallow area before your boat sinks.

On small boats, such as hand propelled boats, unwanted water can be removed by using a device as simple as a portable piston pump or bucket. Boats such as runabouts and ski boats use a single submersible electric pump in the stern or in the lowest point in the bilge. Small cruising and racing sailboats can use one large diaphragm bilge pump mounted in the cockpit. Coastal and offshore boats will generally have automatic electric bilge pumps located in each compartment (bilge area) that can hold water, and a large manual pump for backup.

Test the bilge pump frequently to ensure that it remains in working order. Turn the switch from the automatic to the manual position to make sure the pump responds as it should. You should also check the automatic float switch by manually raising it to make sure that it turns on the pump. If this switch fails the pump won't turn on and your boat could take on sufficient water over time to do serious

damage. Debris can get stuck in the mechanism and keep the float switch from operating properly, so check for debris frequently and keep the area clean. Be aware that a bilge pump will distribute spilled fuel into the water.

**DON'T RELY ON A BILGE PUMP IF YOUR BOAT HAS A LEAK!**



## Boat Hook

Boat hooks are useful items. The main use of a boat hook is to fend a boat off a dock or another boat. A boat hook can make it easier to pass lines to a dock and you can use a boat hook to retrieve something you drop overboard.

## Oar/Paddle

Carrying at least one oar or paddle is a good practice if you operate a small motor boat. You can use the oar or paddle to row to shore if you have engine trouble. It may not be possible to propel a larger boat this way, so oars and paddles are less practical for operators of larger boats.

## Depth Sounder/Fish Finder

If you often operate in shallow inland waters, grounding your boat and perhaps damaging it is a risk. In that case an instrument to help you navigate shallows may be a good investment.

A depth sounder will display the water's depth on the steering console, so you can avoid areas that are too shallow for your boat. Depth sounders transmit a burst of energy down to the bottom of the body of water, and measure the time that the energy takes to return (the echo). The depth sounder translates this information into water depth.

Fish finders display a representation of what is below the boat, including the bottom, fish, vegetation and structures, to help you locate fish and navigate safely. Unlike depth sounders, which show you only a number to indicate the depth of the water, fish finders show you a picture of the bottom.

## GPS

Modern electronic positioning devices can be life-savers. If you sail long distances or far from shore, consider installing a GPS on your boat. Not only can these devices keep you heading in the right direction, but also in the event you ever need emergency assistance, the device will allow you to direct searchers to your exact location.

## Extra Lines

Always keep extra line aboard. You never know when you will need to be towed in, or when you may need to tow someone else. Lines are inexpensive and they don't take up a lot of space. Don't let the lack of a line turn a small problem into a serious emergency.

## Compass

Even if you have an electronic navigation aid, keep a compass on board and learn to use it. In an emergency, your electronic devices may fail, and the compass may be your only means of determining how to get back to shore.

It's difficult to read a hand-held compass on a boat, and they can easily drop and break or go overboard, so consider a model that you mount near the steering console. Mount your compass away from iron, magnets or electrical wiring and equipment. Get comfortable steering by your compass in good weather before you have to rely on it in darkness or in fog. Learning to sail with your compass, together with your charts, is an excellent piloting skill to develop and enables you to have more fun on the water.

## Marine Radio-VHF

A marine radio is a wise investment for the recreational boater planning to venture any distance from shore or to any area where there are not a lot of other boaters in the immediate vicinity. Should you need to request help during your voyage, your marine radio will allow you to broadcast a mayday message to request assistance. Rescue units and other boats listen in on marine radio frequencies, so your chances of getting quick assistance are much better if you have a marine radio.

## Cell Phones

Many recreational boaters rely on cell phones as their primary means of marine communication. This is a dangerous practice! Cell phones can be useful in many situations, but a cell phone cannot replace your marine (VHF) radio. In emergency situations your cell phone call

to 911 may be misdirected to shore-based police or fire departments, thus delaying rescue. Rescue boats and aircraft cannot answer your cell phone call. If you must rely exclusively on a cell phone, be certain to enter the US Coast Guard and marine police phone numbers in your phone before you sail. When placing a distress call, give your position, your cell phone number, the nature of the emergency and the number of people on board.

**USE YOUR CELL PHONE TO SUPPLEMENT YOUR MARINE RADIO, NOT REPLACE IT!**

## EPIRB

EPIRB stands for Emergency Position Indicator Radio Beacon, a type of signaling device. These devices are required equipment on some commercial boats and are recommended for offshore recreational boaters. If the boat needs assistance, the EPIRB is activated and sends out a signal to a satellite, which transfers the signal back to a transponder on land. The signal is relayed to search and rescue teams and gives them the location within one square mile. If you plan to travel offshore for more than a day or two, an EPIRB is a good investment for safety.

## Toolkit

Keep a toolkit on your boat and in your vehicle to handle small repairs. Your kit should include standard tools like pliers, a ratchet set, screwdrivers, etc, and some important spare parts (spark plugs, drive belt, shear pins). If your boat uses a trailer, the toolbox should also keep trailer specific items (bearing grease, electrical tape, scissors, tire pressure gauge) and replacement parts (bearings, pins, light bulbs, boat plug, etc).

## Safety requires proper parts

To reduce the danger of explosion aboard boats, many marine engine components are required to be ignition-protected. Your boat must have appropriate ignition protection to minimize the risk of explosions, so it's critical to always use marine parts in your boat. You may be tempted to replace a failed part with an automobile part, because marine engine parts may be more expensive. However, there are major differences especially when it comes to ignition protection. Using auto parts may reduce or eliminate the ignition protection available in your boat, and increase the chances of an explosion or fire.

**NEVER USE AUTO PARTS IN A BOAT!**

### Marine Parts

Alternators have sealed electrical contacts to prevent igniting vapors

Distributors: ignition-protected and vent has a flame arrestor to prevent fire causing sparks.

Carburetors: vented to allow overflow to be consumed by engine

Fuel pumps: will not leak if the primary fuel pump diaphragm fails

Fuel tank: must meet the US Coast Guard fuel system standard

Fuel hose must meet UGSG standards

### Auto Parts

Alternators have exposed contacts

Distributors: create internal high energy sparks

Carburetors: leak gas into engine spaces if fuel pump diaphragm fails

Fuel pumps: overflow goes into engine space

Fuel tank: doesn't meet US Coast Guard fuel system standards

Fuel hose: not meant for enclosed spaces.

Be cautious when selecting a battery for your boat. Maintenance free batteries can be used with some outboard motors, but don't use them with outboards equipped with unregulated or partially regulated alternators. Before you shop for a battery, talk to the person who will service your boat to find out what sort of battery is best for you.

## Review Questions

1. What are the requirements for a PFD? \_\_\_\_\_  
\_\_\_\_\_
2. Who is required to wear a PFD? \_\_\_\_\_  
\_\_\_\_\_
3. Where should a fire extinguisher be kept? \_\_\_\_\_
4. What are the carriage requirements for visual distress signals? \_\_\_\_\_  
\_\_\_\_\_
5. What are required sound signaling devices on a motorboat over 12 meters (39 ft.)? \_\_\_\_\_  
\_\_\_\_\_

Answers on page 82

Fueling your boat can be dangerous—improper fueling practices are the cause of most fires aboard boats. Gasoline vapor is heavier than air, so it will always seek the lowest location in the boat: the bilge. The bilge area usually runs through the engine space, so this means that gasoline vapor can gather around the engine. Fuel vapors quickly reach explosive levels when trapped in a boat's engine compartment, and any ignition, even the smallest spark, can create an explosion.

## Proper Fueling Practices

You can greatly reduce the risk of explosion by always following proper fueling practices.

### Take the following steps whenever you fuel your boat:

- Moor the boat securely to the dock.
- Remove all passengers.
- Extinguish all galley fires including pilot lights.
- Don't smoke.
- Shut off engines and electrical equipment including blower
- Close all hatches and ports.
- Fill portable tanks on the dock, *not in the boat*.
- Keep fuel nozzle in contact with fill opening to minimize the risk of a static spark.
- Replace fuel fill cap tightly.

- Wipe up any spilled fuel.
- Check bilges for leakage.
- Run blower for four minutes

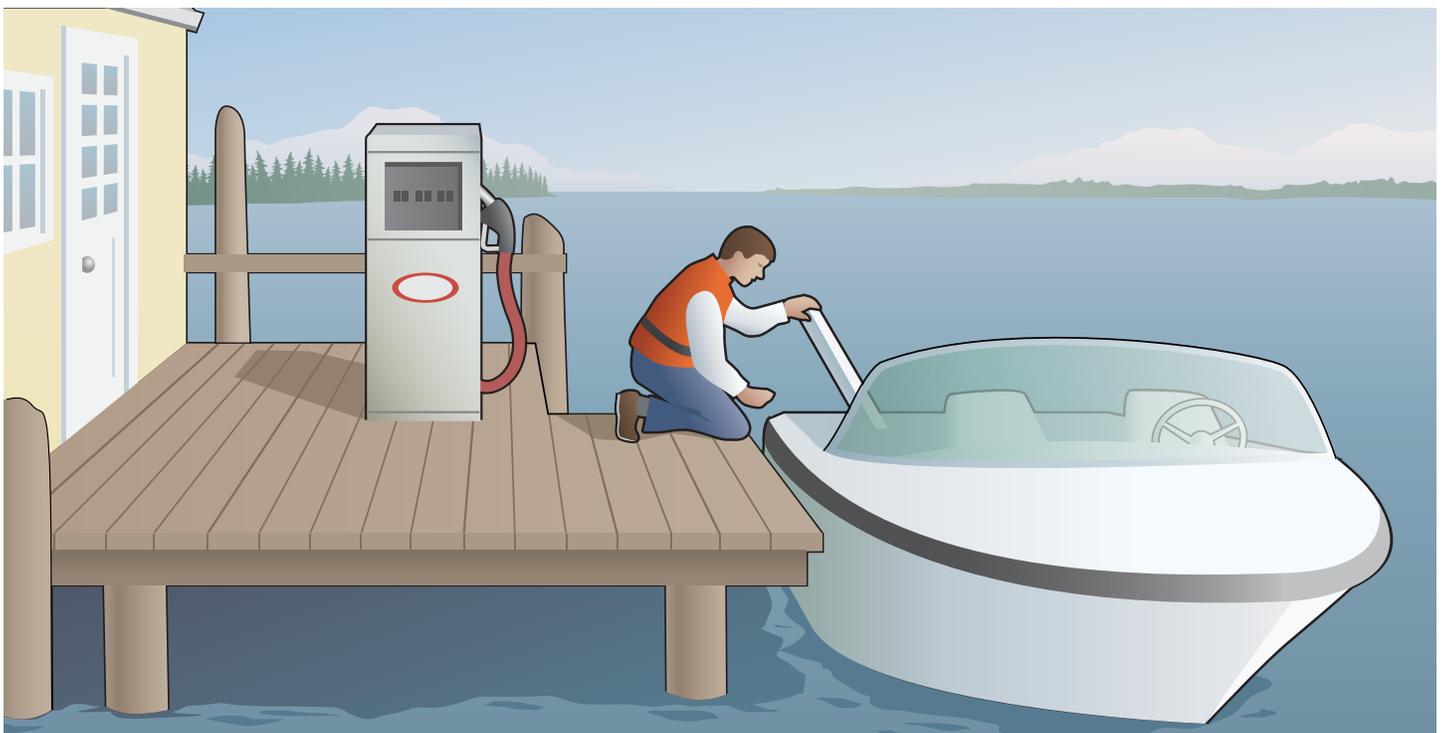
Keep the fuel nozzle in contact with the fill opening to keep static electricity from building up and causing a spark.

Don't overfill your tank! The tank will overflow and the spilled fuel will pose a fire hazard. Once you've filled the tank, open up all hatches. On an inboard boat, run the blower for at least 4 minutes to rid the boat of stray vapors.

After fueling and running the blower, sniff the engine space before you start the engine. If you can smell gasoline, wait a few more minutes before you start the engine. Be sure to always secure your portable fuel tanks before you leave the dock.

### NEVER STORE PORTABLE FUEL TANKS IN AN INTERIOR COMPARTMENT!

**NOTE:** Some alcohol blended fuels may accelerate the deterioration of fuel hoses. Some blends make hoses brittle, which may cause cracking, while others can make hoses soft and spongy, which allows vapors to permeate the hose. This happens most often when boats sit for long periods of time. Contact your dealer/major manufacturer concerning possible problems regarding alcohol blended gasoline. "An ounce of prevention is worth a pound of cure" is especially true when it comes to your fuel system. Some marinas may carry non-ethanol gasoline.



With the advent of ethanol blended fuels, boaters are finding one of the unfortunate properties of ethanol is its tendency to attract and absorb water. Ethanol can become water saturated when it sits for long periods and the combined ethanol and water becomes heavier than the gasoline. In other words, the ethanol separates from the gasoline and sinks to the bottom of the tank. This is called phase separation and it's bad news for the engine, which won't run on the (water-soaked) ethanol solution. In addition, the separated ethanol is highly corrosive and may damage your fuel tank. So use your boat frequently during the season so that gasoline doesn't go stale in the tank and don't leave the boat's tanks partially filled.

If your boat will go unused for long periods over the summer, or will be laid up for the winter with fuel in its tanks, take some precautions—especially if the fuel is an ethanol blend. Add stabilizer to extend the life of the fuel, and top off the

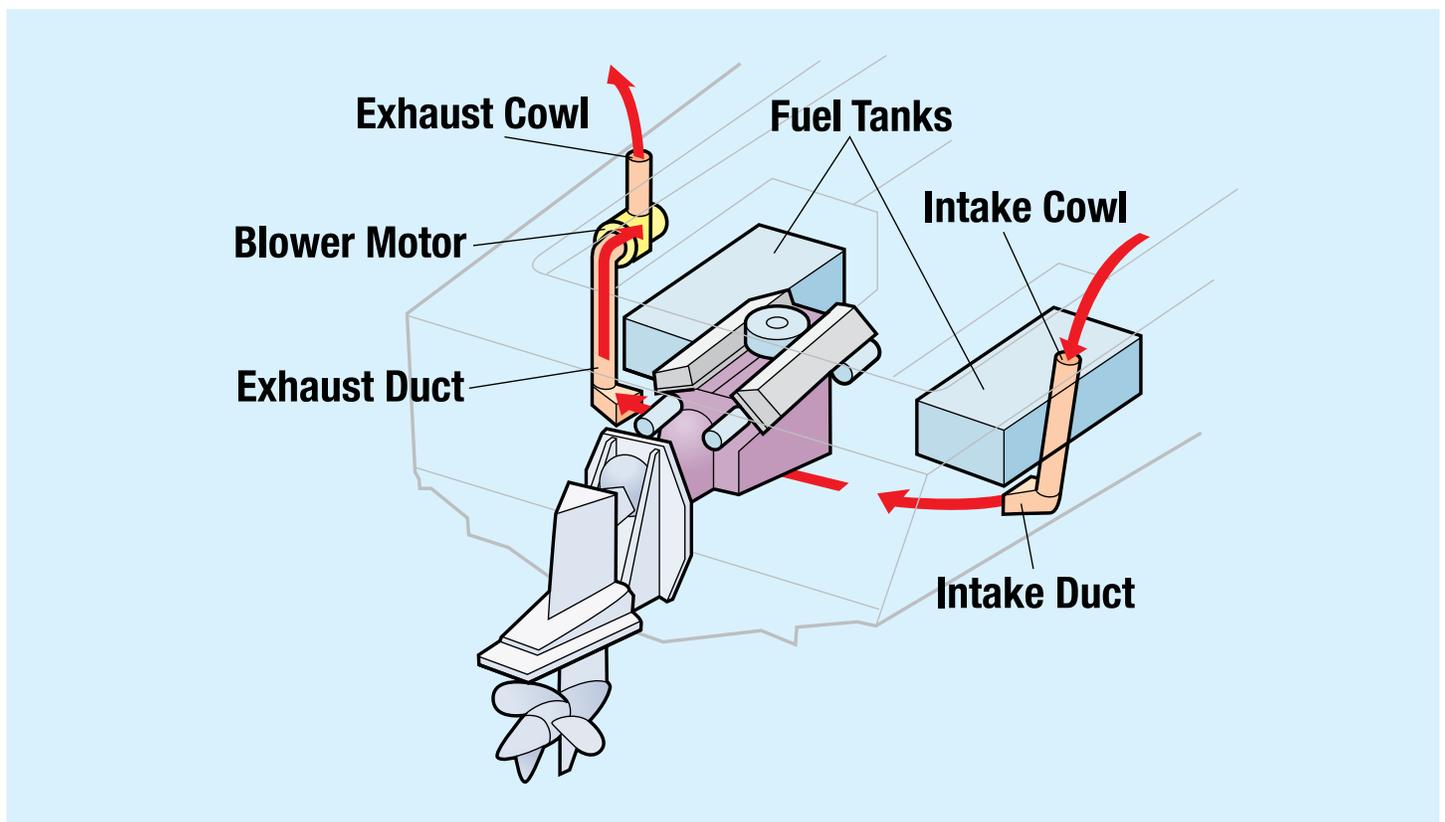
compartment, or if it seems you're using more fuel than you would expect, get a professional to check. Fuel leaking into your bilge is an explosion waiting to happen.

## Ventilation

Gasoline vapor is heavier than air, so fuel fumes will settle into the lower compartments and bilges of boats. Unless there is a flow of air to push those vapors out, the vapors remain trapped. A spark can ignite the gasoline vapors and cause a fire or explosion.

## Natural Ventilation

A natural ventilation system moves the air surrounding the boat through the bilge or area surrounding the engine compartment. The components of a natural ventilation



tank to 95% full (to allow for expansion) before you store your boat. Tanks left half full or less are more prone to phase separation.

## Fuel Tanks

Foamed-in aluminum fuel tanks can crack and may develop leaks over time. Because it's difficult to access the fuel tanks on many of today's recreational boats, it's not easy to detect a fuel tank leak. So be "nosy". Check the engine compartment frequently for the smell of fuel. Keep track of how much fuel you're using. If you smell fuel in the engine

system include an intake to pull in the air supply, and an exhaust to expel it. The natural ventilation system brings fresh air through intake ducts to the area around the fuel and engine compartments, which allows fuel vapors and air to mix. Then the exhaust directs the air/fuel vapor mix overboard. The boat must be moving for natural ventilation to be effective. The intake is a cowling or opening located on the exterior of the boat. It faces forward and is placed above the normal depth of bilge water. The exhaust is attached to a hose or duct that extends to the lower third of the protected space, but it must also be above the normal accumulation of bilge water. The exhaust must empty

either into the atmosphere outside the boat or into another ventilated space near an opening or cowling. The exhaust faces aft near the stern of the boat.

In New York State, natural ventilation isn't required on boats of open construction having no enclosed spaces or compartments. Natural ventilation is required for any compartment on a boat that contains:

- a gasoline engine including generators,
- a fuel tank that vents to that compartment (i.e. a portable tank), or
- a permanently installed fuel tank and any electrical component that is not ignition protected.

### Mechanical Blower

A mechanical blower removes vapors from bilges and enclosed compartments and exhausts them overboard. Federal construction standards require a permanently installed mechanical blower (power ventilation system) in each compartment on a boat that was built after August 1, 1980 that contains a permanently installed gasoline engine with a cranking motor or starter. A mechanical blower is not needed if compartments are of open construction or open to the atmosphere.

The components of a mechanical blower utilize an exhaust fan mounted within the exhaust ducting of a natural ventilation system and a switch located at the steering or helm station. A powered ventilation system is significantly more effective than natural ventilation, especially when the boat is not moving. All boats with mechanical blowers must have the following warning label next to the switch:

**WARNING: Gasoline vapors can explode. Before starting engine operate blower for 4 minutes and check engine compartment bilge for gasoline vapors.**

The law didn't require boats built prior to 1980 to have a powered ventilation system; however, some boats that were manufactured then had powered ventilation. The US Coast Guard Ventilation Standard, a manufacturer requirement, applies to all boats built on or after August 1, 1980. So if your boat was built on or after August 1, 1980 and if your boat bears a label containing the words "This boat complies with US Coast Guard safety standards," etc., you can assume that the design of your boat's ventilation system meets applicable regulations.

Boat owners are responsible for keeping their boat's ventilation systems in operating condition. Check frequently to make sure that openings are free of obstructions, ducts are not blocked or torn, and blowers operate properly. Replace worn components with equivalent marine type equipment.

## Review Questions

1. List several safe fueling practices \_\_\_\_\_  
\_\_\_\_\_
2. Why should you keep the nozzle of the fill hose in contact with the tank or fill opening? \_\_\_\_\_  
\_\_\_\_\_
3. Explain several safety practices for after fueling your boat \_\_\_\_\_  
\_\_\_\_\_
4. How long should the blower run before starting an inboard engine? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

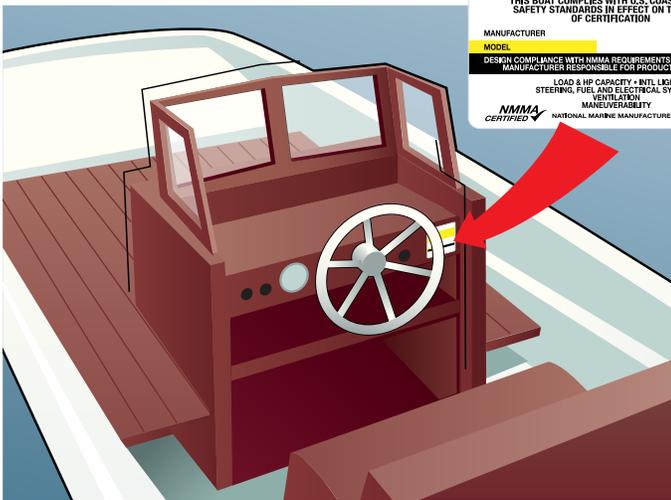
Answers on page 82

Most fatal boating accidents occur when someone ends up in the water unexpectedly. All too often, these accidents occur because operators try to carry more passengers and gear than their boat can safely handle. Boats will become unstable, and the risk of an accident will increase, if you fail to follow some simple safety precautions when boarding, loading, or powering. It is especially important to follow safe loading and powering practices when handling small boats.

The safe loading regulations were developed to provide guidance to boat operators about their boats' safe loading capacities. These regulations address two different load capacities of your boat: 1) its maximum person capacity (expressed in both the pounds and the number of persons); and 2) its maximum weight capacity.

## The Capacity Plate

Federal law requires manufacturers to install a capacity plate on all single hull motorboats less than 20 feet in length.



The capacity plate must be located where it is visible to the operator and should provide the following information:

Maximum number of persons and total passenger weight, or

Maximum weight capacity of people, gear, and motor, and

Maximum engine horsepower on boats designed for outboard motors.

Manufacturers of sailboats, canoes, kayaks, PWC, and inflatable boats are not required to attach a capacity plate, but many do. If your small boat does not have a capacity plate, you should consult your owner's manual, contact the boat manufacturer or visit the USCG Boating Safety Resource Center website at [www.uscgboating.org](http://www.uscgboating.org).

## Other Factors to Consider

A capacity plate provides the maximum limits for loading and powering a boat. But these are the limits under normal conditions; you must consider other factors that affect the capacity and stability of a boat in order to make a prudent decision about your boat's capacity for the prevailing conditions. They include:

- State of the sea: If the weather or water conditions are rough, you should carry less weight. This allows the boat to ride higher in the water, thus reducing the chances of water entering the boat.
- Activity planned: If you plan an activity that requires equipment and movement in the boat, like fishing or water-skiing, you need to balance the number of passengers with the amount of equipment. If there is a lot of equipment and a lot of passengers, you run the risk that someone may trip and be injured.
- Other Gear: If you are carrying gear of any substantial weight, you will not be able to carry as many people safely. Consider the total pounds capacity, including persons, gear, supplies, etc. As a general rule you should remove one person from the boat's rated capacity for each 150 lbs. you carry.

## Safe Loading

All of the gear, equipment and passengers that are aboard your boat count toward its capacity and affect the way the boat handles. If heavy objects aren't stowed properly, they may



shift and that movement can affect your boat's handling, as well as, stability. In addition, moving objects on your boat can cause injury. To be sure that your boat handles properly when loaded, follow four simple rules:

- 1) Distribute the load evenly
- 2) Keep weight low, especially heavy objects
- 3) Don't exceed the limits on the capacity plate
- 4) Secure objects from shifting, especially larger items like a full cooler

Failure to observe these rules may cause your boat to capsize, swamp or sink.

If a marine patrol officer believes a boat is overloaded (which is considered reckless operation), the officer has the authority to send the boat back to shore. Overloading can lead to disaster, and it can certainly ruin a pleasant day on the water. Abide by your boat's capacity rating.

## Safe Boarding

You're responsible for making sure that your passengers board your boat safely, so teach them how to do it. On small boats step directly into the center of the boat, and stay low as you



do so. Hold onto the sides to move once inside the boat. Caution—don't catch your fingers between the boat and the dock or another boat! Keep your fingers inside the boat.

If more than one person is boarding your boat, the operator should get in the boat first, and then help your guests aboard. Whenever possible, keep your hands free. Bring your passengers on board first, and then load your gear from the dock. Be sure to secure it in the manner outlined in the previous section.

Everyone should stay seated once the boat gets underway. Bring the boat to a complete stop before people change positions. The action of people moving on the boat can be enough to throw off the boat's stability, especially if there are waves or the water is choppy. Furthermore, an unseated

passenger may take a tumble or be tossed overboard during a turn. So be safe; ask your passengers to be still while the boat is moving.

## Safe Powering

It's very important to select the appropriate outboard motor for your boat. Your boat's capacity plate will tell you the maximum recommended horsepower of a motor for the boat. Never exceed the maximum recommended horsepower! A motor that is too big will weigh down the stern—transoms can collapse if they must hold a motor that is too heavy. A motor with too much horsepower will reduce the boat's stability and make the boat susceptible to swamping and capsizing. Also, if your steering mechanism can't handle the extra power, you may lose control at higher speeds. On the other hand, a motor that is too small won't perform well—and won't last long—because it will have to work too hard to power the boat. Find a motor suitable for your boat.



While it may not be a violation of state or federal regulations to install or use an engine larger than specified on the capacity label, if your over-powered engine affects your boat's seaworthiness, a marine patrol officer may cite you for reckless operation. Your insurance company may refuse to cover you if your boat motor's horsepower exceeds the boat's capacity.

## Review Questions

1. What information can be found on a capacity plate? \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
2. How do you safely load a small boat? \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
3. Name some tips for safely boarding a small boat \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Answers on page 82

As the operator, you are responsible for the safety of all your passengers. It's crucial to have a plan, and to be prepared for emergencies. Remember that you can't walk away from an accident on your boat. Consider how you will respond to any problem or emergency before you set sail. Inform a reliable person of your plans so that someone can sound the alarm if you don't return when expected.

## Before you get underway...

### Float Plan

Before venturing out aboard your boat, prepare a float plan and leave it with a reliable adult, such as a parent or other relative, a friend, or the operator of the marina. The float plan tells how long you expect your voyage to last so that someone on shore will know when to expect you back—and when to start the search if you don't arrive as scheduled. The float plan also gives searchers or rescuers information that will help them locate you if you don't return as planned.

Of course, if you adhere to safe boating practices and exercise good judgment on the water, you'll usually return from your voyage on time, safe and sound. When you get back onshore, notify the person with whom you filed your float plan. Every time you take to the water, complete a new float plan.

#### Your float plan should include the following information:

- The names of everyone on board;
- A description of the boat;
- Your proposed route, including where you plan to embark and your final destination, and any stops you plan to make along the way;
- When you plan to leave; and
- When you plan to return.

The more information you can provide the better. A thorough float plan increases the chances that search units will be able to locate you if you need assistance. Should your plans change during your trip, be certain to notify the individual with whom you've filed your float plan.

### The Float Plan

*Bernadette and Carol worked hard in their boating safety class, and it paid off—they got the highest grades in their class. This was exciting, because their parents had promised that if they did well in the class, they could take the family boat out for the afternoon at the end of the summer.*

*Finally, the day arrived. The girls went through their checklist twice: "Let see ... PFDs next to our seats, check. Visual distress signals in the glove compartment, check ... Fire extinguisher, tool kit, extra line..."*

*Meanwhile, Dad filled the tank and ran the blower, and then he supervised the sisters as they checked out the engine compartment. Finally satisfied, he was about to push the girls off when Bernadette said, "Dad, wait! We forgot to give you our float plan—here it is."*

*After a lovely voyage they arrived at Gills Bay and tied the boat to the family's camp dock. The water was still summer warm so they went swimming and launched themselves on the rope hanging from the old maple tree. There weren't other people around, so they cranked up the tunes and danced. The two sisters enjoyed an afternoon to remember.*

*Around five o'clock the girls started to pack up. They stowed their gear, checked that their PFDs were next to their seat, and ran the blower. Carol turned the key—CLICK. She tried it again—CLICK.*

*"That's strange" she said, "the gas gauge shows that we have plenty of gas. Bernie, check the battery and see if the cables are still connected, and I'll check the fuses." But everything looked fine.*

*Bernie figured it out. "Oh no, we ran the battery down playing music all afternoon! Let's think, what should we do?" They tried to call Dad on their cell phone, but they couldn't get a strong signal. They hadn't seen another boat in hours, and they weren't near a town or a road, so the distress signals wouldn't help. But just in case, they decided to hang their distress flag high up a tree.*

*An hour passed. The shadows were lengthening, the sun was almost down, and it was getting chilly. The girls were trying to be brave, but it was getting hard not to be scared. Finally they heard the low rumble of a boat engine.*

*"That's a boat!" said Carol, "We have to light a flare." But before they could get the flare lit, the boat started to veer and head in their direction. It looked familiar...it was Mr. Shapiro's boat, and Dad was on it!*

*"Dad, how did you find us? We thought we would have to spend the night out here!" Very happy and relieved, Dad asked, "What did you give me before you left the dock?"*

*The girls cried out in unison "Our float plan!"*

## FLOAT PLAN

### 1. Name of person making this plan

\_\_\_\_\_

Telephone number \_\_\_\_\_

### 2. Description of boat.

Type \_\_\_\_\_ Color \_\_\_\_\_ Trim \_\_\_\_\_

Registration No. \_\_\_\_\_ Length \_\_\_\_\_

Name \_\_\_\_\_ Make \_\_\_\_\_ Other Info. \_\_\_\_\_

### 3. Engine type \_\_\_\_\_ H.P. \_\_\_\_\_

No. of engines \_\_\_\_\_ Fuel capacity \_\_\_\_\_

### 4. Survival equipment: (Check as appropriate)

PFDs     Flares     Mirror

Smoke Signals     Flashlight     Food

Paddles     Water     Others

Anchor     Raft or Dinghy     EPIRB

### 5. Radio yes no Type \_\_\_\_\_ Freqs. \_\_\_\_\_

### 6. Automobile license Plate \_\_\_\_\_

Type \_\_\_\_\_ Trailer license \_\_\_\_\_

Color \_\_\_\_\_ and make of auto \_\_\_\_\_

Where parked \_\_\_\_\_

### 7. Persons aboard \_\_\_\_\_

Name    Age    Address & Telephone No.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

### 8. Do any of these persons aboard have a medical problem?

yes  no If yes, what? \_\_\_\_\_

### 9. Trip Expectations: Leave at \_\_\_\_\_

From \_\_\_\_\_ Going to \_\_\_\_\_

Expect to return by \_\_\_\_\_ (Time) and not later than \_\_\_\_\_

### 10. Any other pertinent info. \_\_\_\_\_

### 11. If not returned by \_\_\_\_\_ (Time) call

the US COAST GUARD, or (Local authority) \_\_\_\_\_

### 12. Telephone numbers \_\_\_\_\_

\_\_\_\_\_

## Planning your trip...

Your time on the water will be much more enjoyable if you spend some time planning before you launch. First, think about your boat and how you want to spend your day. If you plan to water ski, you'll need a place that offers enough space to ski safely without any hazards that might endanger the skier. If you're a sailor, you'll need a waterway with enough distance between opposite shores for you to sail comfortably.

Once you've determined which waterway you'll be cruising, you will need to get familiar with the local rules and hazards. So how do you get that information? Other boaters who use the waterway and the staff at the marina are great sources of information. And you'll find a lot of the information you need on a nautical map, which is commonly called a chart. Even if you are familiar with a waterway, it's a good practice to carry a chart of the waterway you're using.

The United States Geological Survey (USGS) or National Oceanic and Atmospheric Association (NOAA) have surveyed most larger bodies of water in the United States. USGS or NOAA charts can tell you about the shoreline and the depths. Areas of different water depth (contours) are marked on these charts, as are dangers such as submerged rocks, sunken boats, dams, overhead and underwater cables, bridges and other hazards.

Smaller waterways also have hazards, but USGS and NOAA charts aren't always available for smaller bodies of water. However, many have unofficial charts or navigation guides. Purchase a guide to the waterway you will be boating on if one is available. Many smaller canals, rivers and lakes have organizations devoted to their proper use and preservation. Many of these organizations have pamphlets or books about the waterway, its navigation and points of interest along the way.

**CONSIDER YOUR SKILL LEVEL AND BOAT'S RANGE WHEN PLANNING A TRIP ESPECIALLY IN ROUGH WEATHER OR CONDITIONS.**

## Hazards

What hazards might you encounter on the water? Hazards to boaters appear in many forms: dams, waves, submerged objects, sand bars, strong or swirling currents, cold water, and fast-changing weather. These hazards aren't always obvious. Boaters need to recognize these dangers and be prepared to avoid them at all times. Talking with people at the bait shop, the launch ramp, or the marina will help you find out the information that you won't get on a chart. Information such as how the current is running after a rainstorm, whether the water level is unusually low because of drought, or areas with unusual or strong currents, etc.

## Water depth

On almost every waterway, water levels vary with the season and the weather. A few inches difference in depth can make the difference between "smooth sailing" and an abrupt end

to the boating day if you ground your boat and damage the prop. Boaters must keep a sharp lookout for objects in the water and learn how to recognize changing water depth and bottom structure. You can use a depth finder or fathometer to tell you the depth of the water. If you're not sure of your depth or familiar with potential hazards on the bottom, you should reduce speed and go slowly.

## Waves

Waves are a hazard found on large waterways such as oceans and the Great Lakes. Wind acts on the surface of the



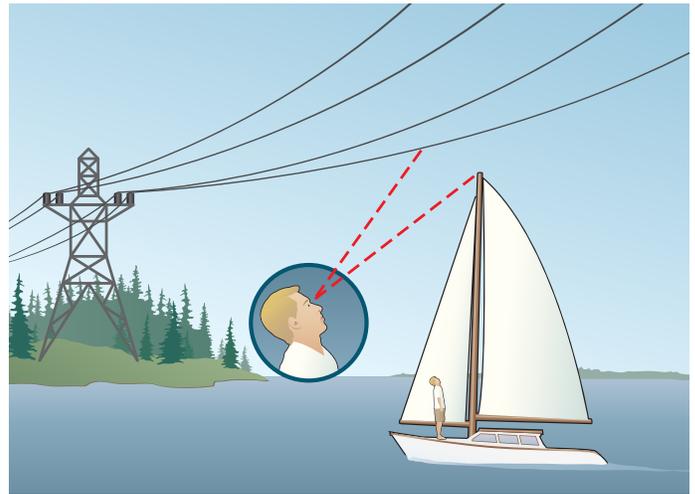
water creating waves. The greater the force of the wind and the deeper and larger the waterway, the bigger the waves can be. Large waves in large bodies of water often develop quickly and can endanger small craft. Boaters should not venture out on large bodies of water such as Lake Erie or Lake Ontario in small inland boats. Even smaller lakes can be hazardous to small craft when wind and waves combine to create dangerous conditions.

## Bridges

Bridges present some special challenges, especially for larger boats and sailboats. Nautical charts will give you the location of the bridge and its horizontal clearance (width) and vertical clearance (height). Consult cruising guides for the area you will be traveling and make notes of the bridges you will be encountering, including the name of the drawbridge, its hours of operation, and the recommended method of contacting the drawbridge operator. Even if you can navigate under the bridge with plenty of clearance, always do so at idle speed. You may not be able to see other boats that may be waiting on the other side, so you should reduce speed and be prepared to avoid any waiting boats.

## Rivers

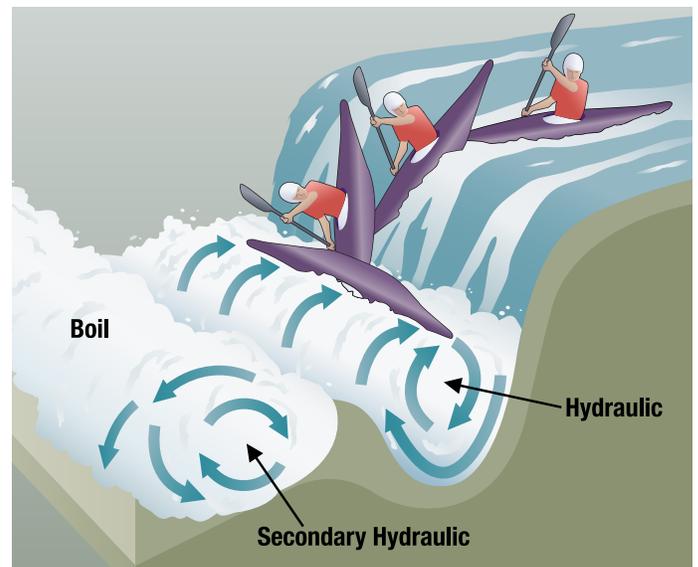
Rivers also can offer many different challenges to boaters. For example, there may be low bridges, overhead cables or power lines, dams, locks, traffic, and unpredictable currents. Every river has different hazards, and so you must learn as much as you can about the river before leaving shore. Large rivers may have commercial traffic, and these large vessels



provide the greatest challenges to recreational boating; you must stay out of their way, as they are often too cumbersome to stay out of yours, not to mention the sizable wake that they leave behind. Be especially careful when approaching a river bend, because often you won't be able to see what's around the bend. Stay as near to the outside of the channel as possible, while remaining in deeper water. This will allow you to see oncoming traffic earlier. Boats following the current have right of way over boats going against the current.

## Low Head Dams

Low head dams are found on several rivers in New York. These are man-made structures that generally have a smooth, uninterrupted flow of water over them. The change in river level from above to below the dam is often 5 to 8 feet. As the water drops over the dam it rushes to the bottom of the river, and then heads downstream. As it rises up, some of the water flows back toward the face of the dam, while some heads downstream. A boater who goes over one of these dams, or approaches too close from downriver, can get pulled into the face of the dam, pushed down, brought back up, and pushed again into the face. There is little chance of escape, and that's why low head dams are often referred to as "drowning machines."



These dams are very difficult to see from upstream, making knowledge of the river all the more important before operating on it. Check your chart and pay attention to any buoys or markers that may be in the water. You should never approach one of these dams and must be especially careful to stay well clear of the “boil line.” This is the area that marks the separation of water flowing back into the dam and downstream. It looks, literally, like the water is boiling in this spot. Stay away!

Conventional larger dams—and any other type of water impoundment—also can be extremely dangerous. Dangerous currents, large vertical drops, and steep spillways are just a few of the many potential hazards that can be found at these sites. You will often find overhead power lines at power generation dams—these overhead lines can pose hazards as well. Usually a dam is marked with warnings or exclusionary buoys. Stay well outside these markers.

**NEVER LET YOUR BOAT DRIFT INTO THE HAZARDOUS AREAS IN AND AROUND DAMS!**

## Nighttime Operation

It's more challenging to operate a boat after dark than during the day, and safety must be your first concern. Be sure to

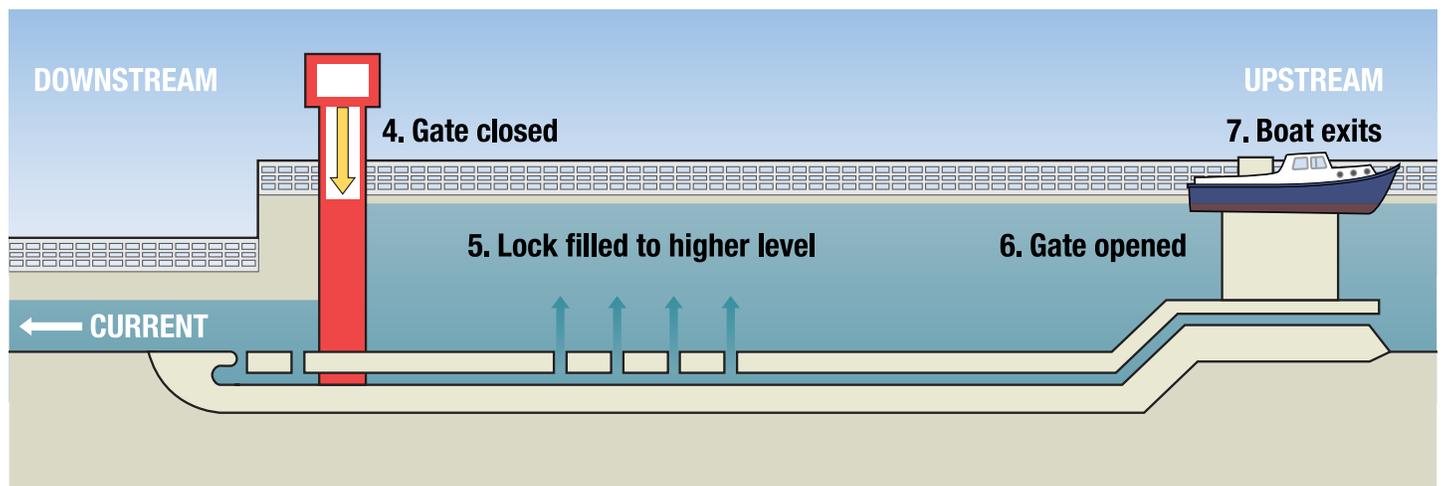
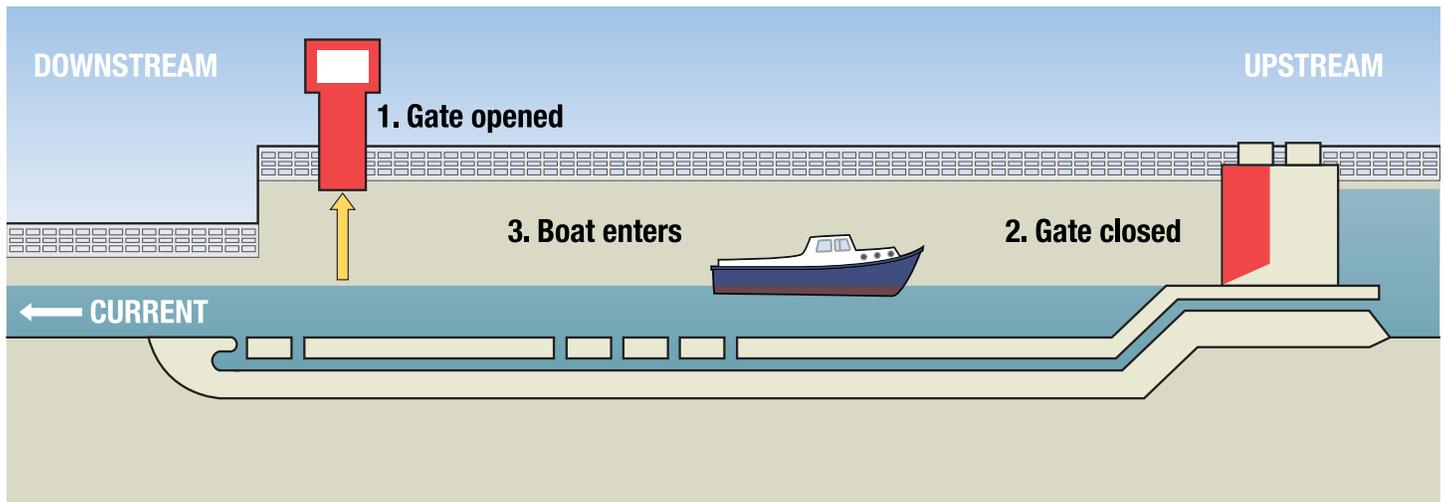
go slowly and keep your navigation lights on. Learn how to recognize the navigation lights of other boats. Make sure you can differentiate between a masthead light, a stern light, and lights on shore. If you can correctly recognize other boats' navigation lights, they will tell you the direction the other boats are traveling. That will help you avoid accidents in the dark.

The water isn't marked like a road, and your boat has no headlights to illuminate the water in front of you. It's hard to see a floating log or debris in the dark, so be on the lookout for hazards in the water and pay attention to the lights on the waterway's navigation markers—these mark the path of the good, navigable water.

## Locks

The New York State Canal system is comprised of four main canals, the Erie, Champlain, Cayuga-Seneca, and Oswego. These canals connect hundreds of miles of lakes and rivers stretching across New York's heartland, gliding past lush farmland, famous historic battlefields, scenic port towns and thriving wildlife preserves. There are 57 locks along these canals and almost 300 miles of lakes and rivers accessible from the canals.

Navigation locks raise and lower boats from one water level to another, allowing boats to travel up and down stream.



These locks were built, along with a series of dams, to bypass rapids, waterfalls, and otherwise unnavigable areas.

Enter locks with caution, and always follow the direction of the lock operator. If you enter a lock with a larger boat, be aware of the boats' prop turbulence and wake—these can destabilize your boat. Many large commercial boats will occupy the entire space within a lock, so never try to squeeze into a lock chamber with a larger boat unless the lock operator directs you to do so. The operator will determine the order in which boats enter a lock to operate the lock most efficiently.

The lock operator uses light signals or horns to control boat traffic through the lock. All canal locks and lift bridges monitor VHF channel 13.

Keep the following tips and suggestions in mind to ensure your safe and enjoyable trip along the canal and through the locks.

**When approaching the lock**, boaters should stop at a safe distance from the lock and give three distinct blasts on the horn, whistle, or other signaling device. Lock operators will respond to your sound signals with lights:

- Green light means that the lock is ready and you may advance.
- Red light means the lock is not ready, and you must hold your position and wait.
- If the lock operator does not respond to your signal, tie up your boat to the approach wall.
- If you see six flashes of red or green, remain stopped and await instructions.

Be patient if lock staff are not ready to lock you through immediately, as they may have other water management duties.

Be aware of the wake your boat creates. Excessive wake can erode the shoreline, destabilize other boats, and damage docked boats as well as the lock itself. Keep the channel near the lock gates clear and allow boats departing or entering the lock a safe and easy passage.

**Upon entering the lock chamber**, proceed under control at a safe and reduced speed. Make sure your boat is equipped with adequate mooring lines or fenders. Lock operators are not required to handle or furnish lines. As you near the walls of the lock chamber, your crew must be ready to loop lines around snubbing posts, lock wall ladders, and tie lines. Be sure to loop your lines, not tie them! Otherwise, your boat may be left hanging and be damaged as the water level changes. Be alert to other boats entering the chamber and move ahead if necessary. Never use your hands or feet to fend a boat off the chamber wall—serious injury may result! Use a boat hook, oar, or paddle. All crew handling lines should wear PFDs. Passengers not involved in the locking process should remain seated and out of the way.

**Once you're in the lock chamber** and safely positioned against the chamber wall with lines looped, turn off the engine but leave your blower running. Never smoke or operate flame appliances. Never leave your boat unattended in the lock.

**Cast off all lines** when the gates in front of you open. This will happen when the water in the lock chamber reaches the desired level. Proceed at reduced speed to exit the chamber in order. Remember to observe posted speed limits and stay clear of dams in lock areas.

For more information about the New York State Canal System check out the website at [www.canals.ny.gov](http://www.canals.ny.gov).

**ALWAYS FOLLOW THE DIRECTIONS OF THE LOCK OPERATOR!**

## Weather

There are three elements of weather that concern the boater: temperature, precipitation, and wind. Be alert to any changes in these weather conditions, and head to shore if bad weather is brewing.

### Temperature

When warm air meets cold air in the atmosphere, severe weather conditions result. South winds often bring warm, moist air into a region. If the weather has been cool the warm moist air flows over much colder land or water and dense fog often forms. With light winds, the fog near the ground can become thick and reduce visibility to zero.

### Lightning

Lightning is a serious hazard to boaters. At the first sign of lightning or even the distant rumble of thunder boaters should lay fishing rods flat on the deck and lower or remove antennas. If possible get to a safe harbor or off the water. Being on open water during a lightning storm can be a terrifying and dangerous experience.

### Precipitation

Precipitation may take the form of rain, hail or snow. Although boating in the rain or snow isn't necessarily pleasant, the main danger is that precipitation can reduce visibility.

### Wind

Wind is probably the key element of weather affecting boaters. Wind creates waves that can affect your ability to steer a course, and affects your ability to maneuver, anchor and dock your boat. If the wind or waves are strong enough they can capsize your boat.

### Weather Safety

Always check the weather before getting underway. Use the local TV news, the Weather Channel, the Internet, radio, or newspaper. Check your VHF radio or portable AM/FM radio during your voyage to stay up-to-date while underway. Be especially alert for Small Craft Advisories. These indicate conditions like strong winds of up to 33 knots (38 miles per hour) and/or sea conditions dangerous to nearly all recreational boats regardless of size.

Once you're on the water, always keep an eye to the sky. Watch for worsening weather conditions, like increasing or shifting winds, or increasing or darkening clouds. If a storm is developing, make sure that everyone is wearing a PFD. Stow or secure all unnecessary gear and turn on the running lights.

If a storm catches you on the water, you have two choices—make for the nearest shore or try to weather the storm on the water. The best course of action is to head for safety on shore, if possible. If the shore is too far away and you're forced to ride out the storm on the water, keep the boat's bow headed into the waves and wind.

## Current

Most bodies of water have a current, and current can affect the way your boat handles. Current will have an impact on most boats' ability to maintain course or speed, and may limit maneuverability during docking or anchoring. A current is the flow of water moving continuously in a certain direction. A simple example is the moving water in a stream. When moving downstream the current adds to the boat's speed, making the shore pass by more quickly. When going upstream, the boat's speed will be decreased by the current.

## Tides

In coastal waters there are normally four tides each day. Tides are movement of water that will affect the depth of the water and the height of the waterline. Tides will create currents in ocean inlets and in rivers that empty into an ocean. The downstream flow of rivers creates a natural current. As you approach the ocean on a river, the ocean tide can create either a positive or negative effect on the downstream current. Many rivers have unique changes in conditions and unpredictable currents. If you are new to a river, check with people who may have knowledge of any possible hazards and the changing conditions. Keep in mind that the Hudson River up as far as Albany and the waters in and around New York City and Long Island Sound are subject to tides.

Inland waters are “non-tidal,” but currents can exist. Wind-driven waves over an extended period of time on a lake can create a temporary current which can be very evident when a boater comes along side a dock or is traversing shallow water.

When traveling a long distance on open water you need to be aware of the “set” and “drift” of a current. Set is the direction the water is flowing and is measured in compass degrees. Drift is the speed of movement of the water and is measured in knots. Over time, if you don't take account of the set and drift, a current will force your boat to fall off course. You will arrive sooner or later than expected or you may arrive someplace you didn't intend to go!

## Getting Ready to Launch...

### Boating Checklists

A simple checklist can help you ensure that you have all of the proper equipment and supplies you need on board. It's a reminder to confirm that all of your mechanical and electrical equipment is functioning properly. It's all about minimizing the risk. If you're well-prepared, you're more likely to have a safe, enjoyable boating trip and you'll be ready to respond to an emergency, breakdown, or other problem. Help is not always readily available on the water. A good operator should be prepared to help themselves.

### Supplies and Equipment

Create your own checklist taking into consideration how you plan to spend your time on the water (such as fishing, water skiing, cruising), the conditions you expect to face (check the weather forecast), and the expected length of your voyage (hours, all day, overnight). At a minimum, your list should include all the safety equipment and back-up mechanical equipment that your boat requires. In addition, your checklist should include the operations you must complete before setting out on the water:

- Are the fuel tank(s) and hoses in good condition?
- Do you have enough fuel? (Use the one third rule; one third out; one third to return; and one third in reserve)
- Is the oil level OK?
- Are there any leaks apparent in the bilges?
- Did you check the local marine weather forecast?
- Is the electronic equipment (VHF, Radar, G.P.S., etc.) working properly?
- Are the battery, lights, horn, motor, blower and bilge pump all in good working order?
- Is the propeller and/or outdrive in good condition and free of weeds and debris?
- Is the boat plug in? (Remarkably, but people forget to check the boat plug all the time!)
- Is gear properly stowed and secure?
- Do you have the correct number and type of PFDs for all of your passengers? Are they serviceable and accessible?
- Are all your passengers seated?
- Have you informed all your passengers about basic emergency procedures?

Make a thorough list and check it twice. If you do, you'll have a great time on the water, and will be able to handle most problems that may arise.

## Your Passengers

Good communication with your passengers is critical, and letting your passengers know your rules, including how to behave in an emergency, can help prevent some accidents from occurring. Before you allow your passengers on your boat, explain what they can do, and what they shouldn't do, during your cruise. Before you leave the dock, let them know:

- Where safety equipment is located including PFD, Visual distress signals, fire extinguishers and first aid kit if carried
- How to wear a PFD
- How to operate a fire extinguisher
- Anchoring and line handling procedures
- How to operate a radio in an emergency situation
- Man overboard and rough weather procedures

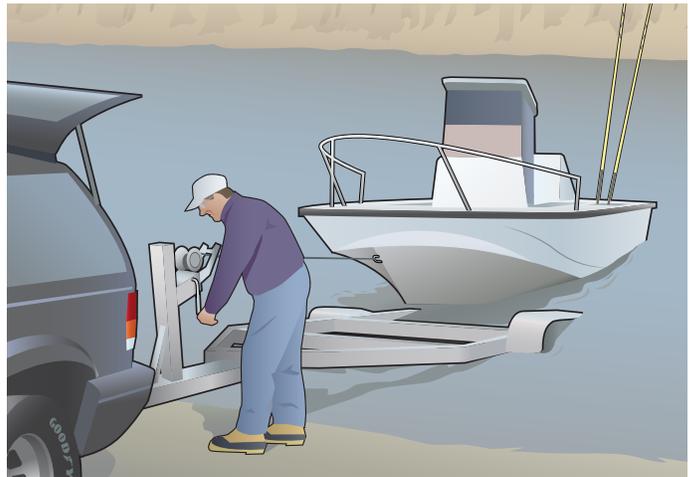
Well informed passengers make for a safer voyage and can be the first line of defense in an emergency.

**NEVER ALLOW PASSENGERS TO RIDE ON THE BOW, SEAT BACKS OR GUNWALES. PASSENGERS DOING SO RISK FALLING OVERBOARD AND BEING HIT BY THE PROPELLER. OPERATORS WHO ALLOW IT MAY BE CITED FOR RECKLESS OPERATION!**

## Operator's Duties

As the operator, you are responsible for the safety and well-being of your passengers, and for the safe operation of your boat. You can uphold your responsibilities by adhering to this Top Ten List of Operator's Duties:

1. Know and abide by the rules of the road.
2. Exercise courtesy and common sense.
3. Be prudent with fuel, always keep 1/3 of your fuel in reserve.
4. Know how your boat handles. Be aware of your stopping distance, turning radius, and optimal cruising speed.
5. Know your boat's position and course.
6. Know the meaning of all buoys or other navigation markers.
7. Listen to local weather broadcasts and watch for changing weather conditions.
8. Know the location of the nearest safe harbor—be prepared to head there if conditions change.
9. Never take unnecessary risks that may endanger life, limb or property.
10. Supervise your passengers! Require them to remain seated with arms and legs in the boat while it is in motion. Encourage everyone to wear a PFD, especially in rough conditions, and be sure that children and non-swimmers do so.



## Trailer

There is an incredible array of boating options in New York State, and if you have a boat trailer, you can experience all of them. New York State has developed over 500 launch sites at many lakes, state parks, canals, and other waterways. Using a trailer to haul your boat to different waterways offers opportunities for new adventure and exploration.

## Choosing the Right Trailer

When trailering your boat you must think about how it will affect the tow vehicle's handling. Towing requires a new awareness of combined vehicle length, trailer width, braking distance, and turning characteristics. Maintaining extended following distances is one of the most important towing related driving habits. The added weight a trailer provides means that it takes significantly more distance to stop, even if your trailer is equipped with brakes. In New York State trailers of 1,000 pounds or more of gross weight are required to be equipped with brakes. It is also important to make lane changes carefully and slowly and to allow extended distances for passing.

While tow vehicle and trailer brakes are sufficient for most situations, care is needed to avoid overheating. When traveling down a steep hill shift into a lower gear that is sufficiently low enough to retard the engine to a speed that only requires occasional or minimal braking. This way enough braking performance is reserved to make an emergency stop. When braking on a grade is required, apply the brakes intermittently with modest pressure and release the pedal to allow the brakes to cool.

At higher rates of speed a trailer may begin to sway back and forth. If this occurs gradually press the brake pedal and reduce your speed. Equipping your trailer with a sway control device can greatly reduce this.

All trailers require more space for turns. The trailer will track in a tighter turn than the tow vehicle necessitating the need to swing wider. Backing up a trailer can be a

bit of a learning curve. Longer trailers are easier to back than shorter ones because they do not react to changes in steering input as much. Once in reverse the first thing you will notice is that getting a trailer to go to the left means steering to the right. The best way to get a feel for backing a trailer is to practice over and over.

## Registration Requirements

New York State requires all trailers operated on public highways to be registered, insured, and inspected. Trailers with an unladen weight of 999 lbs. or less and all non-commercial trailers are exempt from the Insurance ID Card requirement. You must provide the Department of Motor Vehicles with the following items in order to receive a valid registration document for your trailer:

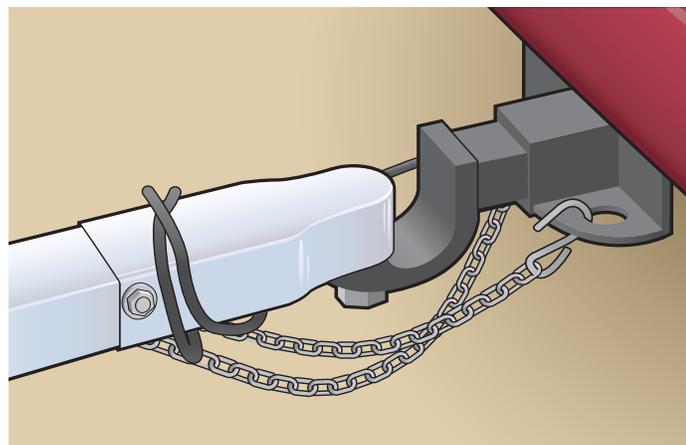
- a completed Application for Vehicle Registration (MV-82)
- proof of ownership (either a signed Title document for 1973 or newer models, or a signed transferable registration for earlier models)
- proof of payment of sales tax (tax may be paid at any Department of Motor Vehicle office)
- proof of vehicle inspection
- proof of identity
- a credit card or a check for the correct fee made out to the “Commissioner of Motor Vehicles”

You can find office locations, registration information, and contact information for DMV in your area at [www.dmv.ny.gov](http://www.dmv.ny.gov).

## Preparing to tow

Just as you go through a checklist before launching your boat to ensure safety, you should go through a checklist before towing to ensure a safe tow. Do the following before departing to ensure a safe and proper tow:

- Ensure that the boat is properly loaded and balanced on the trailer.
- Ensure that tie downs are in place and are tight.
- Ensure that the outboard or outdrive is secured.
- Distribute the weight of gear in the boat evenly over the axle(s).



- Place the heavier gear down low and secure it to prevent shifting.
- Ensure the hitch is the right weight class for the boat and trailer.
- Ensure that the hitch ball diameter matches the trailer coupler.
- Hitch the trailer to the tow vehicle.
- Ensure that the coupler is properly engaged and secured.
- Ensure that safety chains of proper size are attached and crisscross under the coupler.
- Plug in the electrical connector and test all lights.
- Check tires for wear and correct pressure. Trailer tires take a beating at ramps, over the road at highway speeds, and just sitting around the yard exposed to ultraviolet light. Don't forget to take along a spare as well.
- Check your wheel bearings to see whether they need fresh grease.
- Test the brakes.

## Launching

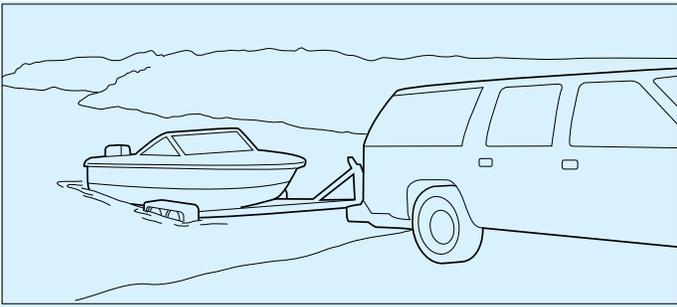
Launching a boat takes skill, and like all skills, it comes with time and practice. Don't expect to learn at the local ramp on a busy weekend. The concrete is not very forgiving and you'll inconvenience your fellow boaters who may not be patient with you. Instead, practice backing up a trailer in a vacant parking lot. This will give you a fair idea of how the trailer will respond to the tow vehicle when backing. You can use traffic cones or similar props to simulate the launch ramp limits. Practice with them until you feel confident.

## Ramp Courtesy

Everyone wants to get on the water as soon as possible and begin their boating excursion, and that impatience can cause aggravation and friction between boaters at busy launch ramps. Proper etiquette can prevent most problems at the ramp, and like all rules of etiquette, they're based on common courtesy and common sense:

- Prepare your boat for launching in the parking area before pulling into the ramp area. Load as much of your gear as possible at home or in the parking lot before you launch your boat.
- Clear the ramp as quickly as possible when launching or retrieving your boat so the next boater can approach.
- Be careful not to block others from launching if the ramp is designed to launch more than one boat at a time.
- If there is a line, wait your turn.
- Offer to help the boater ahead of you if it appears they need and want the help.

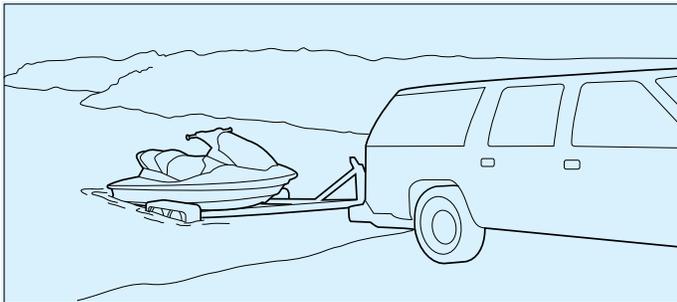
## Before you approach the ramp:



- Remove all tie-downs.
- Unplug the electrical connection if you don't have electric brakes.
- Make sure the boat plug is in and secure.
- Attach a line to the bow.
- Stow your gear on the boat.
- If you have an inboard or inboard/outboard motor, check the engine compartment for vapors and start the blower.

## When you launch the boat

- Ensure the ramp area is clear.
- Raise your outdrive.
- Back vehicle down as close to the water as possible.
- Put the transmission in "Park" and set the parking brake. If necessary, put chocks behind the rear



wheels of the vehicle.

- With one person on the boat and one at the winch, start releasing the winch.
- Lower the engine or outdrive.
- Once the blower has been running for at least 4 minutes, double check for vapors and start the engine.
- Ensure that water is passing through the cooling system.
- Continue releasing the winch and let the boat roll off the trailer into the water.
- Secure the boat to the dock.
- Clear your vehicle from the ramp as soon as the boat is secure.

## Loading & Boarding

Follow the procedures outlined in the safe loading lesson on page 27. Clear the dock as soon as you can especially if others are waiting.

## Retrieval

When your voyage is at an end and you return to the ramp, follow the launch process in reverse.

- Come alongside the wall or dock and tie up.
- Discharge passengers
- Have someone get the tow vehicle from the parking lot and get in line for retrieval. When your turn arrives, line up your boat with your trailer (which should be waiting for you on the ramp). The trailer should be in about the same position as it was for launching.

Keep in mind that wind and current can effect the movement of the boat as you attempt to reload the boat on the trailer. This process may be difficult and may require more than one attempt. Once the boat is properly loaded on the trailer bunks or rollers, secure the winch and carefully exit the ramp. Return to the parking area to complete the tie down process, secure the boat, and clean up.

## Before you launch or leave the ramp area:

- Remove and dispose of all weeds hanging from the boat or trailer.
- Remove the drain plug to release bilge water.
- Drain all bait and live wells and wash the hull if you have time.

These few simple steps will help prevent the spread of aquatic invasive species.

## Maintenance & Storage

### Preventative Maintenance

Developing sound preventative maintenance practices will reduce the likelihood of problems or emergencies while underway. A conscientious boater will keep the boat in good condition by following manufacturer recommended maintenance schedules and by checking the engine, trailer, and electronics on a regular basis. In this way you can spot and correct potential problems before they cut short a day out on the water. Your marine dealer or mechanic can help customize this schedule to your particular boat's needs.

As we've emphasized throughout this text, checklists help establish thorough preparation and a reliable routine. Three check-off lists will suffice for most boaters: one to use before each trip; one to use at the beginning of the boating season; and a post-season check-off list to refer to before the boat goes into storage for the winter. Use your checklists consistently and correct problems when you find them. It's no fun to break down when you're boating, and if you need a tow ashore, the price can be steep.

Some items need attention before every trip. We've already discussed most of these in earlier chapters, but they're so important they bear repeating:

- Make sure there is a boat plug and a back-up, and that the plugs are watertight.
- Before launching or fueling your boat, check hoses, clamps, and belts.
- Check the engine cutoff device if the boat is installed with one.
- Check fluid levels and look for leakage of oil or water in the bilge.
- Inspect the backfire flame arrester and ventilation hoses.
- Check electrical equipment such as the bilge pump, ventilation blower, navigation lights, horn, and marine radio.
- Raise and lower the outdrive.
- Check through hull fittings.
- Check all safety equipment making sure you've got the required PFDs and signaling devices for the waters on which you'll be boating.
- Check the expiration date on visual distress signals and replace if needed.
- Check the charge indicator on the fire extinguisher and re-charge or replace if necessary.
- Inventory the on-board tool kit and make sure all tools are included and that they are in good working order.
- Check to make sure you have replacement fuses in the correct sizes, extra spark plugs and drain plugs, and spare bulbs for running lights.
- Before trailering your boat, check the trailer's tire pressure, brakes, turning and back-up lights, tie-downs, and chains. Be sure the hitch is the proper size for the hitch ball.

Once you've developed and started using your list, you'll find more things to add. Although checking all of these items before every trip may seem tedious, in the end doing so will help you get on the water faster and keep you safe so you can make the most of your time on the water.

## Emergency Repairs

Good preventative maintenance and proper planning will greatly reduce but can never eliminate emergency repairs. Learn how to do some small repair jobs yourself so that you can get back to shore and out of danger if there is a problem. Carry a basic tool kit (wrenches, pliers, screw drivers, duct tape) and some important spare parts (spark plugs, drive belt, shear pins) and learn how to handle:

- broken drive belts
- broken pipes or hoses
- broken shear pins
- oil leaks
- taking on water

## Storage

You'll reduce the chance of damage to your boat, motor, and trailer if you store the boat and trailer properly at the end of the season. Good storage practices also will save time and trouble at the beginning of the next boating season when it is time to get your boat ready for the water. Proper storage helps prevent rust and dry rot; protects your engine, fuel and cooling systems; and protects and preserves your electronic equipment.

Follow these simple steps for dry storage of your boat during the off-season:

- Remove the drain plug.
- If using a cover, allow an opening where fresh air can circulate through the boat.
- Re-pack wheel bearings on the trailer.
- Leave your fuel tank full to prevent the build-up of water condensation inside the tank.
- If your boat has a closed cooling system, fill with antifreeze during winter storage.
- If your boat has an open cooling system (outboards and stern drives), flush with fresh water and make sure it is completely drained before storing.

If you'll be storing your boat on the water for any length of time, adjust your mooring lines taking into account the range of tides. Cover your lines (chafing gear—such as a piece of canvas, leather, rope or plastic tubing) where they rub against hard objects or other lines to protect your mooring lines from chafing. Leave the battery on for your bilge pump. Consider providing a periodic heat source or an exhaust fan inside the cabin to reduce the accumulation of moisture. Always be aware of the weather forecast, and protect your boat by securing its moorings if there is large storm coming.

## Boat Theft & Security

Protect your boat and its contents as you protect your car and your home. Don't be an easy target for thieves; prevention is the key.

### Here are some simple steps to follow:

- Lock all compartments and take the keys and your ignition keys, with you.
- Keep your boat's ignition keys, cabin keys and car keys separate.
- Don't leave anything loose in the cockpit or on deck—affix anything that's not secure.
- Never leave anything valuable visible when you leave the boat.
- Make a list of your equipment with serial numbers, and mark the equipment with your initials and driver's license number.
- Photograph your boat.

- Don't leave important papers (title and registration) on your boat.
- Personalize your boat so it's easy to recognize.
- Properly insure your boat.
- Lock the boat trailer to the towing vehicle.
- If storing a boat on a trailer, park it in a secured area, or chain it to a tree, or if you must leave it in an unsecured area, remove a wheel.

If your boat, trailer or gear is stolen, contact the police immediately. Provide them with a list of everything that was stolen, including the additional information you've gathered, like serial numbers, photos, and registration and title. Once you've reported the theft to the police, contact your insurance company.

Be a good neighbor; get to know other boat-owners in your marina and work together to keep the marina secure. Report any strangers at the marina to the marina owner. If your marina is gated, don't give your marina access card or key to other people. Keep the marina gate closed at all times.

Deter theft by keeping everything locked. You can purchase trailer locks that you can attach to the coupler and spare tire, as well as large models for the hub of your trailer wheels. For the boat, there are locks to secure outboard motors and propellers. Motor units cover the transom mounting clamps. To secure your propeller, you can purchase a specialty lock that replaces the prop nut and washer, allowing the unit to operate when locked. The other option is a larger prop lock, which connects the propeller to the out drive, or lower unit. This style of lock must be removed for the motor to work.

## Review Questions

1. Why should you file a float plan before leaving on a boat trip? \_\_\_\_\_  
\_\_\_\_\_
2. What precautions should you take if you are out in rough weather? \_\_\_\_\_  
\_\_\_\_\_
3. What should passengers know before a boat trip begins? \_\_\_\_\_  
\_\_\_\_\_
4. Why should you practice good preventative maintenance on your vessel? \_\_\_\_\_  
\_\_\_\_\_
5. What is your primary responsibility as the operator of the boat? \_\_\_\_\_  
\_\_\_\_\_
6. What are some safety practices when hitching a boat trailer to your car? \_\_\_\_\_  
\_\_\_\_\_
7. When trailering your boat, what are some of the pre-launch preparations that can be made before approaching the launch ramp? \_\_\_\_\_  
\_\_\_\_\_

Answers on page 82

Protecting the environment should be second nature to all of us. Your “green” practices ashore should continue aboard. On the water, every action that you take impacts others sharing the waterway: your neighbors who live along the shore, your fellow boaters, the fish and aquatic plants that live in the water, and the animals that depend on the shoreline for their habitat. As in any aspect of boating, common sense and common courtesy should guide your behavior. There are some special steps you can and should take to preserve our waterways. Marine sanitation devices, bottom painting, engine maintenance and proper trash disposal habits can all have an impact on the quality of the water in which we boat.

## Oil Pollution

Huge, sea-going oil tankers aren’t the only boats that can befoul our waters and shores with oil spills and oil pollution. Some of the pollution in our waterways is caused by recreational boats. There are steps you can take to reduce the amount of pollution your boat causes. A poorly maintained engine will leak more oil into the water, so keep up with the manufacturer suggested maintenance schedule. Don’t pump oily bilge water over the side; collect it and dispose of it properly on shore. Check your hoses frequently for leaks and replace them if necessary. If you spill oil in the boat, wipe it up right away. Use an oil absorbent pad or “sock” in your bilge when you’re traveling.

New York State Navigation Law prohibits the discharge of oil in New York waterways. If your boat spills oil, no matter how small the spill, contact the NYSDEC within 2 hours of the oil spill at (800) 457 7362.

The federal Water Pollution Control Act bars the discharge of oil into waters under federal jurisdiction. It also requires boats 26 ft and greater in length on waters of federal jurisdiction to display a 5 X 8 inch placard in the engine space stating the requirements of the law. If your boat discharges oil while sailing in federal waters, report the discharge to the US Coast Guard at (800) 424-8802.

## Littering

Bring your trash back to shore and dispose of it properly! Plastics, especially fishing line, nets, and six-pack wrappers can be deadly to fish and mammals that live in or near the water. All litter, even so-called biodegradable litter, sullies the beauty of our waterways. Bring a garbage bag with you and use it for non-recyclable trash. Keep recyclables separate and place them in recycling bins at the marina, or bring them home to recycle. Pick up other people’s litter and return it to shore with your trash and recyclables. If something flies out of your boat, stop and retrieve it. (Pretend it’s a person and practice a man overboard drill!)

Littering isn’t just disgusting and discourteous, it’s illegal. New York State law prohibits dumping of trash or any garbage into the waters of the state. Conviction of this offense is a violation punishable by up to a \$250 fine and/or up to 60 days in jail.

Dumping trash is also a federal offense. The United States has adopted the International Marine Pollution Agreement (MARPOL), and Annex V of MARPOL sets minimum distances from shore for discharge of various types of garbage. It also prohibits the discharge of plastics anywhere due to the danger plastics pose to marine life. Boats of 26 feet or longer boating on waters of federal jurisdiction must prominently display a durable placard at least 8 inches wide by 5 inches high notifying the crew and passengers of the discharge restrictions.

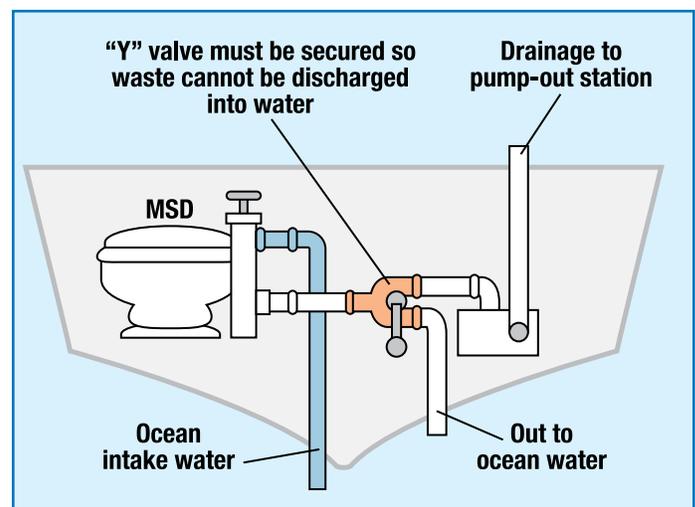
## Marine Sanitation Devices

Boats are not required to be equipped with a toilet or marine head. But if your boat has a head, it must be equipped with an operable Marine Sanitation Device (MSD) that is certified by the US COAST GUARD to meet Environmental Protection Agency standards.

### There are three types of approved MSDs:

- Type I MSD treats sewage by various means, and then discharges the waste matter into the water.
- Type II MSD is similar to the Type I but meets a higher level of sewage treatment.
- Type III MSD doesn’t treat sewage, but holds sewage on board until you reach a pump out station.

**Note:** A portable toilet— one that you can easily remove from your boat— is not considered a MSD.



Marine pump out facilities are to be used for disposal of on board sewage rather than releasing it into a waterway.

The discharge of sewage from the head of your boat can ruin the recreational value of the waterway for beach bathing, swimming, water skiing and snorkeling. Sewage discharge will also contribute to the degradation of the marine environment by introducing disease-causing microorganisms into the waterways. Sewage released in the vicinity of shellfish beds also poses a public health problem. Ingesting contaminated shellfish can lead to diseases such as dysentery, infectious hepatitis, and typhoid fever.

Different waterways have different rules regarding the type of MSD allowed. All heads that discharge sewage overboard are illegal on every waterway in New York State. The discharge of gray water—wastewater from showers or sinks—is also prohibited on some lakes. Consult with local officials in the area where you boat.

If the body of water you're boating prohibits the discharge of treated or untreated sewage, you must disable the MSD in a manner that prevents any discharge. Some acceptable methods are:

- padlocking overboard discharge valves in the closed position;
- using a nonreleasable wire tie to hold overboard discharge valves in the closed position;
- closing overboard discharge valves and removing the handle; and
- locking the entrance to the space enclosing the toilets.

## Aquatic Invasive Species

Aquatic invasive species (AIS) are non-native, harmful aquatic plants, animals, insects or diseases that negatively impact the environment, economy or human health. They can be spread from one waterbody to another via clothing, fishing gear, boats, and any other items used in the water by boaters. When traveling to another body of water, these aquatic hitchhikers may be accidentally introduced as they like to hide in places such as the hull, live well, prop or trailer. If AIS take up residence, they can cause or contribute to habitat degradation and loss, as well as the the loss of native fish, native wildlife, recreational opportunities and reduce property values.

Zebra mussels are a familiar aquatic invasive species to many people in the northeast. These freshwater mussels were originally brought over to the Great Lakes via ballast water from ships in the 1980s, but are now spread by all types of watercraft and recreational gear. The larvae are so small that they can be transported to new bodies of water via bait buckets and live wells without ever being seen. Zebra mussels have quite a big impact as they outcompete native mussels, alter food webs, clog pipes, foul beaches, degrade water quality and much more.

To help protect our waters, New York State has enacted regulations to combat the spread of invasive species. The regulations require that anyone launching or retrieving

	<p><b>To find the nearest pump out service, check out the following website:</b></p> <p><b>NYS Environmental Facilities Corporation: <a href="http://www.efc.ny.gov">www.efc.ny.gov</a></b></p>
<p><b>Any land locked lake located completely within the borders of New York, State Canal System</b></p>	<p>No discharge of any sewage is permitted. All marine sewage must be kept onboard the boat in a Type III MSD and pumped ashore at a marine pump out facility.</p>
<p><b>The waters of Canandaigua Lake, Skaneateles Lake, Greenwood Lake (Orange County), or Lake George</b></p>	<p>Any boat equipped with a toilet, sink, tub, etc. which results in the drainage of any waste water whatsoever must have all such material drain into a holding tank. The holding tank must be drained ashore at a marine pump out facility. Any overboard lines from such a system must be either sealed or removed.</p>
<p><b>The Great Lakes, Long Island Sound or any tidal water</b></p>	<p>Boats may discharge sewage overboard only after it has been treated in a US COAST GUARD certified Type I or II MSD. A Type I MSD may not be used on boats over 65 feet in length.</p>
<p><b>Hudson River up to Albany, many bays and inlets on Long Island</b></p>	<p>Localities located in tidal areas may adopt a No-discharge zone provided they follow the requirements of both federal and state law. Consult with local officials in these areas.</p>
<p><b>Lake Champlain</b></p>	<p>Boaters may not discharge sewage. All marine sewage must be kept onboard the boat in a Type III MSD and pumped ashore at a marine pump out facility. All overboard discharge valves have to be secured and any overboard lines must be disconnected and removed and any overboard opening sealed shut.</p>

watercraft or floating docks must be able to demonstrate that they have taken reasonable precautions against the spread of aquatic invasive species.

Always Clean, Drain, Dry your watercraft and floating docks when you launch or retrieve to prevent the spread of aquatic invasive species.

**CLEAN** Inspect your boat, trailer, motor and anything else that has been in the water for plant and animal material, and remove and dispose of any that you find.

**DRAIN** Drain all water from boat, engine, live wells, bait buckets, and equipment. Rinse all boat and trailer parts with tap water—hot, high-pressure spray is best.

**DRY** Dry the boat and trailer completely or air dry for at least 5-7 days before trailering to another body of water.

In addition, please remember to dispose of unused bait in a proper receptacle and dump bait bucket water on dry land.



### Anti-fouling Paints

Keeping your hull free and clean of marine growth allows your boat to maintain higher speed and conserve fuel. Anti-fouling paint works by releasing toxic chemicals into the surrounding water to discourage marine growth. Unfortunately, the paints developed in the past were extremely toxic to fish and shellfish. Federal and state laws now regulate what type of bottom paints can be used and who can apply them. For more information on bottom paint, contact your local marina or boatyard. They will know what is appropriate and most effective for your area.

## Review Questions

1. If you have an oil spill from your boat who do you contact? \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
2. In a no-discharge zone or in sole state waters, what are the requirements for the marine sanitary device? \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
3. In NYS waters, can garbage be disposed of by dumping it overboard from your boat? \_\_\_\_\_
4. If you trailer your boat, what can you do to prevent the spread of aquatic invasive species from one body of water into another? \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Answers on page 82

The “Rules of the Road” are a set of internationally accepted standards that govern the way all mariners should operate their boats when on the water. The rules require that every operator conduct his/her boat in a prudent manner, at a safe speed, while constantly using all means available to maintain a proper lookout. They also establish rules for navigation and actions to avoid collisions between boats. To be a safe and courteous boater, you must learn the Rules of the Road!

## Definitions

**The Rules of the Road incorporate the following definitions:**

**Boat**— includes every description of watercraft, including non-displacement craft and seaplanes, used or capable of being used as a means of transportation on water (any water craft that can float and be directed from point A to point B).

**Power Driven Boat**— a boat that uses mechanical force to propel it through the water.

**Sailboat**— a boat that uses wind force in sails to propel it through the water. When a motor is used to move a sailboat, outboard or inboard, it is considered a power driven boat.

**Stand-On Boat**— the boat that is required to maintain course or speed when it encounters another boat.

**Give-Way Boat**— the boat that must change course and/or speed when it encounters the Stand-On boat.

**Underway**— a boat that is not at anchor, or made fast to the shore, or aground. A boat is considered underway even if it is just floating and not under propulsion.

**Western Rivers** — the Mississippi River and its tributaries.

**Great Lakes**— Lakes Superior, Michigan, Huron, Erie and Ontario, and their connecting and tributary waters including the Saint Lawrence River.

## Safe Speed

Every boat must proceed at a safe speed at all times so that the boat can take proper and effective action to avoid a collision. In determining what speed is a safe speed, consider the following factors:

- visibility;
- traffic density;
- the maneuverability of the boat in the prevailing conditions;
- weather conditions, including the speed and direction of the wind and the state of the sea;
- the speed, strength and direction of the current;
- the proximity of navigational hazards; and
- the depth of water.

## Maintain Proper Lookout

Collisions are the most common type of boating accident. The first and most effective step in preventing a collision is watching the water. Maintaining a proper lookout is the key to avoiding a collision. Who is out there? What are they doing? What direction are they going? Every boat must maintain a proper lookout at all times.

Proper lookout consists of using sight, hearing, and all other available means to be aware of your surroundings. Look all around frequently and be aware of what other boats are doing. At night and in the fog you may hear another boat before you can see it. If the weather is foggy, or traffic is heavy, have a friend help you keep a lookout. If you have radar, use it along with sight and sound. Pay attention to radio traffic!

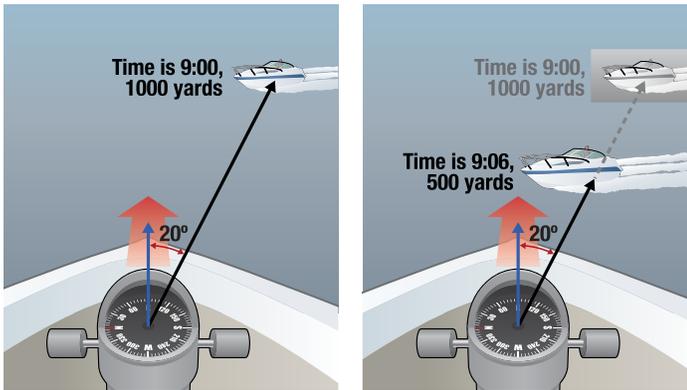
Be aware that even the best operator will be a less effective lookout as the day wears on. Fatigue tends to narrow a lookout's vision, hampering or even destroying his or her effectiveness. To combat fatigue, use a scanning method. Cover the horizon in a series of steps and cover the water from the bow out to the horizon in similar steps. Look all around the horizon and recognize what boats may be coming up behind you. To reduce the effects of glare, wear top quality sunglasses and apply non-reflective finishes on the forward portions of your boat. Also, don't hesitate to ask someone else to keep an eye out, or steer, particularly in confined water. A second set of eyes will help spot things you may have missed.

The requirements for a proper lookout are stated in the Rules of the Road: “Every boat shall at all times maintain a proper lookout by sight and hearing as well as by all available means appropriate in the prevailing circumstances and conditions so as to make a full appraisal of the situation and of the risk of collision.”

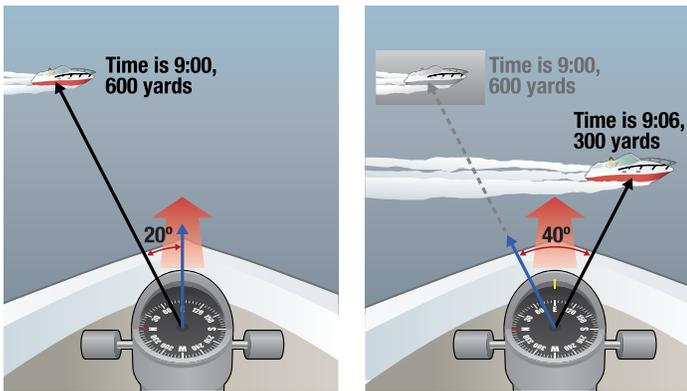
## How do You Recognize the Risk of Collision?

When you see another boat, watch its path of movement over time. If the bearing (angle between you and the other boat) does not appear to change and the range (the distance between you and another object—in this case another boat) decreases there is a risk of collision. This is called Constant Bearing, Decreasing Range or CBDR for short. CBDR is easily recognized when you meet another boat head on or when you approach a boat from behind. When a boat is crossing your direction of travel you need to pay attention to what the other boat is doing until it is passed and clear. If the bearing between you and another boat decreases, the other boat will pass ahead of you. If the bearing between you and another boat increases, the other boat it will pass behind you. Risk of collision may sometimes exist even

## CONSTANT BEARING - DECREASING RANGE



## CHANGE IN BEARING - DECREASING RANGE



when an appreciable bearing change is evident, particularly when approaching a very large vessel or tow, or when approaching a vessel at close range.

## Action to Avoid Collision

All operators must use their best efforts to avoid collisions. Hopefully the other operator also sees that a collision is possible, so he or she will be trying to avoid collision too. Any action you take must be readily apparent so that the other boater can see that you have taken action. In practical terms, this means you should:

- Allow ample time;
- Back off quickly on the throttles;
- Make a large turn; and
- Use good seamanship (pass far enough away, watch out for other traffic and maintain your actions until you are well past and clear of the other boat.

## Give-Way Boat's Actions

If you are operating the give-way boat, take early and substantial action to keep well clear. In most cases you will have several options to avoid collision: you can turn, reduce speed, stop, or reverse engines. If you find that you are the give-way boat, you must take action significant enough so that the other boater knows that you have taken action. You must take the action in ample time and follow good seamanship. That means moving away from the other boat and maintaining that course until you are well past and clear.

## Action by Stand-on Boat

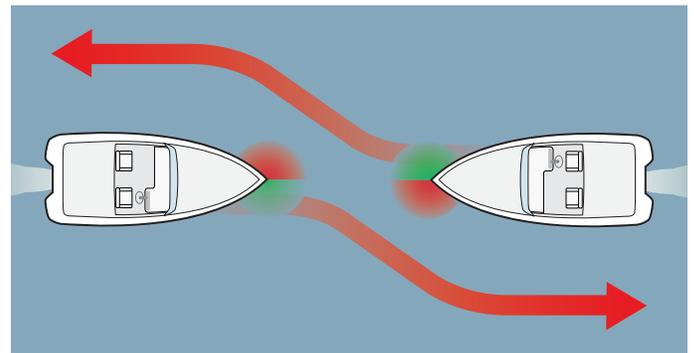
If you are the stand-on boat you aren't required to take evasive action, that is, you must maintain your course and speed. However, when it becomes clear that the other boat is not giving way as it should, you must take action to avoid a collision. In that case, take evasive action and sound the danger signal. See the discussion of sound signals, below.

## Traffic Situations

There are three types of traffic situations that can lead to collisions: head on, crossing, and overtaking. There are rules for each; knowing how to handle your boat, and being able to anticipate how the other boat will react, reduces the possibility that the boats will collide.

The traffic rules apply when two motor boats are in sight of each other, meaning that one boat can observe the other with the naked eye.

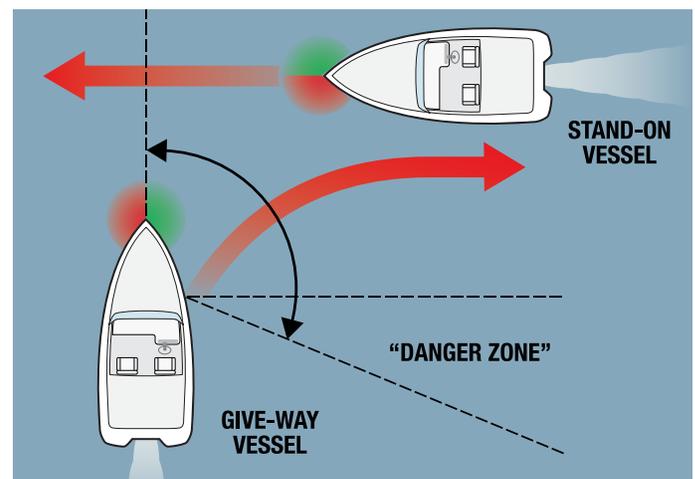
## Meeting Situation



If two boats are proceeding straight or nearly straight towards each other, they are "meeting." In this situation each boat must give way to the other. In other words, they are both give-way boats. Both boats should alter course to starboard (right). At night, you will see the other boat's sidelights and the masthead light(s).

## Crossing Situation

If the path of the boats will cross each other without a change of course, the boat that has another on its starboard



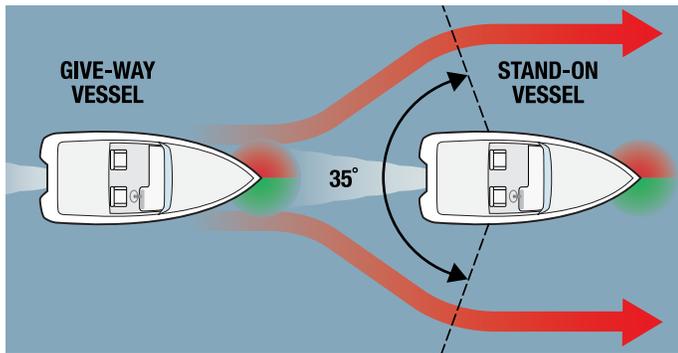
(right) side is the give-way boat. The boat to starboard is the stand-on boat. The stand-on boat should maintain course and speed. The give-way vessel must take evasive action and should do so by turning to starboard (right), reducing speed or stopping. If the give-way boat turns to port it will be turning into the path of the stand-on boat. If the give-way boat speeds up, it will probably just hasten the collision.

At night the give-way boat will see the other boat's port (red) sidelight and the stand-on boat will see the starboard (green) light of the other boat.

**IF YOU SEE A RED LIGHT, STOP!**  
**IF YOU SEE GREEN, PROCEED!**

## Overtaking

When one boat comes up behind another boat, we say the passing boat is overtaking the other. The overtaking boat is the give-way boat. The boat being passed is the stand-on boat. The stand-on boat maintains course and speed while the give-way boat must take action by turning either to



starboard or port. The give-way boat must also stay out of the stand-on boat's way until well past and clear.

At night, if you are the give-way boat you will see the other boat's stern (white) light. If you are the stand-on boat, you will see the other boat's masthead (white) light and the sidelights.

## Maneuvering Sound Signals

Safe and competent boaters learn the language of sound signals. Sound signals let boats within sight know how they intend to maneuver, and warn other boats that can't see them, that they are there. You can also use sound signals to declare danger or distress. If the path of your boat will lead you into close quarters with another boat, you must exchange sound signals.

Sound signals are either short blasts or prolonged blasts. Short blasts are one second in duration, and prolonged blasts are four to six seconds. You must learn how to give and recognize the following sound signals which let other boaters know how you intend to maneuver:

**One short blast** means: "I intend to leave you on my port side." I will alter my course to starboard (right).

**Two short blasts** means: "I intend to leave you on my starboard side." I will alter my course to port (left).

**Three short blasts** means: "I am operating astern propulsion." Or, in other words, I have put the vessel in reverse, also known as "backing down."

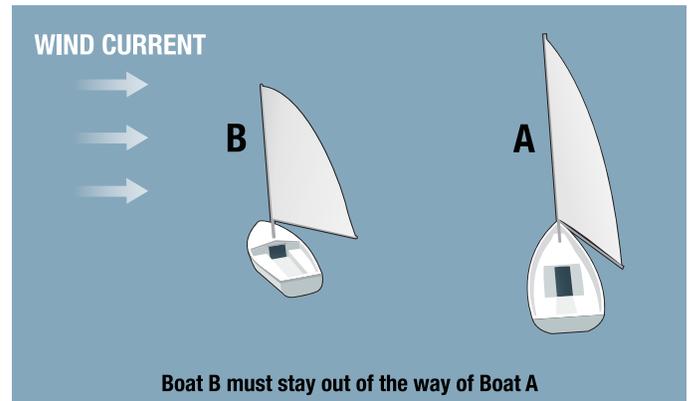
**Five or more short blasts** is the danger signal. Use it when you doubt that enough action is being taken to avoid collision.

**One prolonged blast** means that a boat is leaving its slip. You may also use this signal to indicate your presence when coming around a bend in a river or channel.

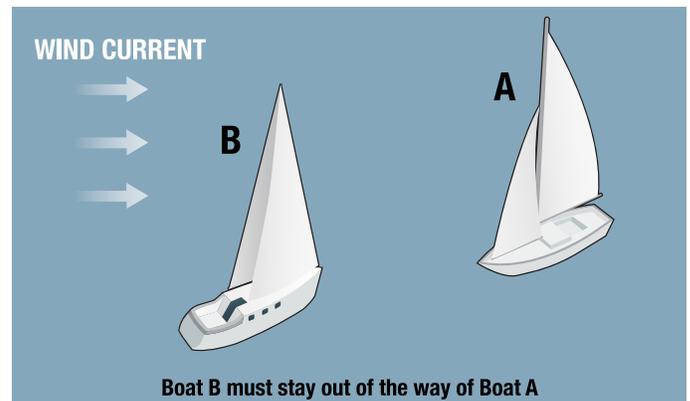
## Sailing Rules

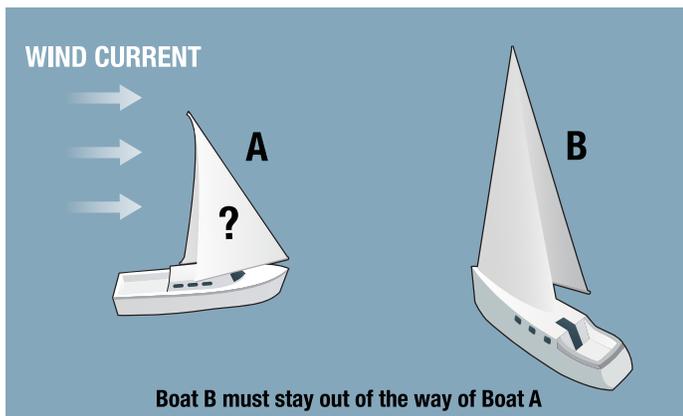
Avoiding collision gets more complicated when two sailing boats are approaching one another. If two sailboats are risk of collision, one of them must get out of the way of the other as follows:

**Both have the wind on the same side.** The boat which is to windward\* shall keep out of the way of the boat which is to leeward;\*\*



**Each has the wind on a different side.** The boat which has the wind on the port side shall keep out of the way of the other;





**Unable to determine.** If a boat with the wind on the port side sees a boat to windward\* and cannot determine whether the wind is on the other boat’s port or leeward\*\* side, the leeward boat shall keep out of the way of the other.

\*the windward side shall be deemed to be the side opposite on which the mainsail is carried.

\*\*the leeward side shall be deemed to be the side on which the mainsail is carried

## Responsibility Between Vessels

Whether or not you must get your boat out of the way of another depends on where your boat fits with in the hierarchy of boats. In general, boats that are more maneuverable have the responsibility to keep out of the way of less maneuverable boats.

### Who has the responsibility to move out of the way?

Boats with a lower priority must keep out of the way of boats with a higher priority unless being overtaken.

#### Highest Priority

- a. A boat not under command (unable to maneuver)
- b. A boat restricted in its ability to maneuver\*\*
- c. A boat engaged in fishing\*
- d. A sailing boat
- e. A power driven boat
- f. Sea plane

#### Lowest Priority

In an overtaking situation the overtaking boat is the give-way boat regardless of the hierarchy of boats.

A seaplane on the water shall, in general, keep well clear of all boats and avoid impeding their navigation. However, in the circumstances where risk of collision exists, a seaplane shall comply with the Rules of the Road.

\*A boat engaged in fishing usually means a commercial fishing boat. It doesn’t mean sport fishing with rod and reel, trolling lines

or other apparatus that doesn’t limit or restrict the maneuverability of the boat.

\*\*A power driven vessel pulling a water skier, tuber etc. is not considered restricted in its ability to maneuver. It is still considered a power driven vessel.

Many on-water situations will involve more than two boats operating under less than ideal conditions. All mariners should exercise good seamanship and operate at a safe speed. If you are ever in doubt as to the intentions of another boat, immediately sound the danger signal, reduce your speed, stop, or reverse the engines until the risk of collision passes.

If you are the stand-on boat in any situation you must hold course and speed—until it becomes apparent to you that the action of the give-way boat alone cannot avoid a collision. Don’t be stubborn! Even if you are entitled to maintain your course and speed, be prepared to yield. Remember that your fellow boaters may not know these rules as well as you do and may not know the correct action to take.

The Rules of the Road don’t address kayaks, canoes or other manually propelled craft. Good seamanship, common courtesy and consideration of any special circumstances should dictate which boat gives way when a sailing or motor boat encounters a manually propelled craft.

### Restricted Visibility

Restricted visibility means any condition in which fog, mist, falling snow, heavy rainstorms, sand storms, or any other similar circumstance limits your ability to see your surroundings clearly. Boats not in sight of one another when navigating in or near an area of restricted visibility must travel at a speed that is safe in the prevailing conditions. If you are operating a power-driven boat in restricted visibility conditions, have the engines ready for immediate maneuver in case you suddenly see another boat or a hazard. If your radar detects another object, indicating there is a risk of collision, you must take action to avoid the collision in ample time.

If you hear another boat’s fog signal and it seems to be coming from forward of your beam, reduce your speed. Keep going as slowly as you are able while staying on course, and navigate with extreme caution until the risk of collision has passed.

### Sound Signals in Restricted Visibility

If you’re operating in conditions of restricted visibility, such as fog, heavy rain, snow, etc., all motor boats making way must sound a prolonged blast (4-6 seconds duration) on the horn or whistle once every two minutes. Sailboats in conditions of restricted visibility must sound one prolonged blast followed by two short blasts. Boats less than 12 meters (39ft.) in length that can’t give this signal must make some other efficient sound signal once every two minutes.

If you are at anchor in restricted visibility you must ring the ship’s bell rapidly for a period of five seconds at least every minute. Boats that can’t give this signal must make some other efficient sound signal at intervals of at least two minutes.

A boat under 20 meters (65 ft.) anchored in an approved special anchorage is not required to sound signals.

**IF OPERATING IN REDUCED VISIBILITY, NAVIGATE WITH EXTREME CAUTION, PROCEED AT A SAFE SPEED, AND KEEP A SHARP LOOKOUT FOR LIGHTS AND A SHARP EAR OUT FOR SOUND SIGNALS!**

## Navigation Lights

Navigation lights are not to help you see where you are going, but rather to help other boats see you, and determine your direction, length, or activity. All boats underway (not tied to the dock or at anchor) must display their navigation lights at all times between sunset and sunrise, and during periods of restricted visibility.

Type of Light	Characteristics	Visible From:
<b>Masthead</b>	White light	Dead ahead to 112.5 degrees on either side for a total of 225 degrees.
<b>Side lights</b>	Green on starboard side, Red on port side*	Dead ahead to 112.5 degrees on respective side.
<b>Stern</b>	White light	Dead astern to 67.5 degrees on either side.
<b>All-round</b>	Red, White, Yellow or Green	Visible 360 degrees around the horizon.

\* Some people use the phrase 'port wine is always red' to help remember that the port sidelight is red, and the starboard sidelight is green.

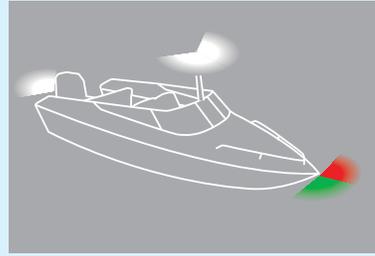
The type of lights your boat must have depends on the size and type of the boat. Power boats must have a masthead light, side lights, and stern light. If the boat is less than 12 meters (39 ft.) in length, the masthead and stern light may be combined into one light.

Power boats that are longer than 50 meters (164ft.) must carry a second masthead light that is aft of and higher than the first. Smaller power boats may carry the second masthead light but are not required to do so.

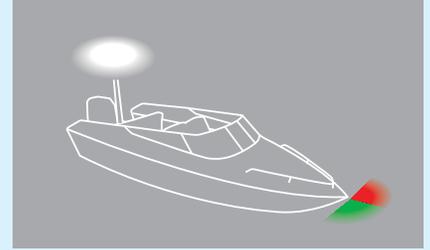
Sail boats must have side lights and stern lights. They do not have a masthead light. Sail boats less than 20 meters (65 ft.) may combine the side lights and stern light into one lantern carried at or near the top of the mast where it can best be seen. Sail boats, in addition to the side lights and stern light, may exhibit at or near the top of the mast two all-

### Power Boats

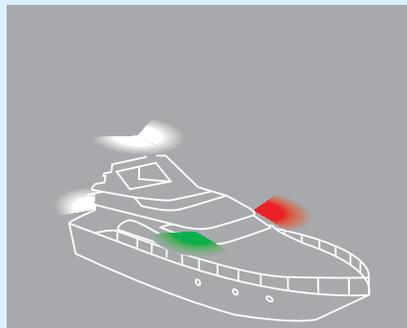
Power-driven boat under 12 meters



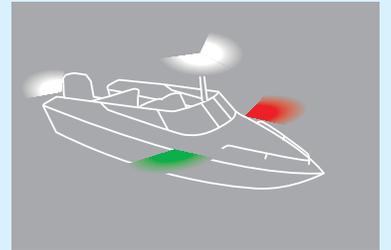
Power-driven boat under 12 meters, with alternative display of masthead and stern lights



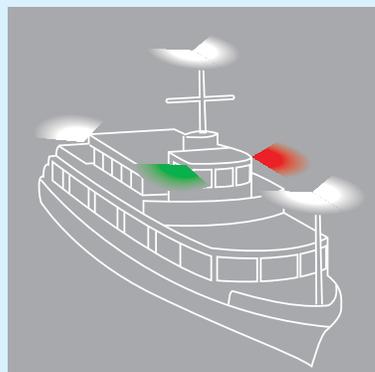
Power-driven boat less than 50 meters



Power-driven boat under 12 meters, with alternative display of stern and side lights



Power-driven boat over 50 meters



round lights the upper being red and the lower being green. This optional display may not be done in conjunction with a combined lantern. Sail boats less than 7 meters (23ft.) when not practicable to display side lights and a stern light shall have ready at hand a flashlight or lantern, showing a white light, which shall be exhibited in sufficient time to prevent collision.

Manually propelled boats may display side lights and a stern light or carry ready at hand a flashlight or lantern, showing a white light, which shall be exhibited in sufficient time to prevent collision.



### Sea Planes

A seaplane's lights should be the same as the lights of a power boat of the same size, and as closely similar in position as possible.

### Anchor lights

Boats less than 50 meters (164ft.), when at anchor are required to show an all-round white light where it can best be seen at night or in times of restricted visibility. Boats less than 7 meters (23 ft.), when at anchor, not in or near a narrow channel, fairway, anchorage, or where other vessels normally navigate are not required to display an anchor light.

### Tow Lights

A yellow light is used for many purposes:

- A boat that is towing a barge or another vessel will have a yellow light on it's stern above the white stern light.
- When a boat is pushing a barge, the white stern light is replaced by two yellow lights.

### Sail Boats

**Sailboat**

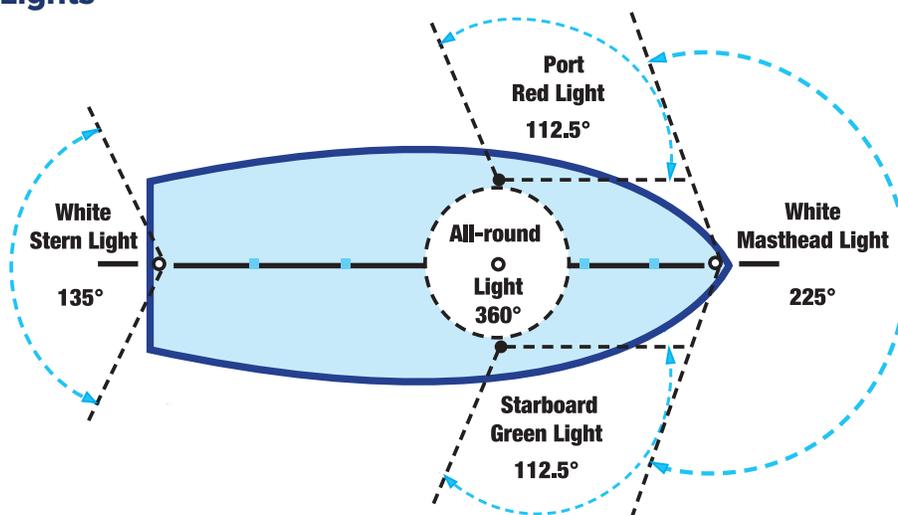
**Sailboat less than 7 meters, alternative display when it's not practical to show the required lights.**

**Sailboat less than 20 meters, alternative display**

**Sailboat any length, with optional display**

- On a towed barge or boat the lights that will be shown are the red and green side lights and the white stern light.
- A barge that is being pushed will show the red and green side lights, the white stern light (if pushed alongside), and a special flashing yellow light at a rate of 50 to 70 flashes a minute on the bow.

### Navigational Lights



## Special Lights

When police boats are engaged in law enforcement or public safety activities such as boat stops, pursuits, and emergencies, or when towing, they'll show flashing blue lights. Only boats operated by law enforcement agencies may use flashing blue lights.

Boats engaged in government sanctioned public safety activities can show alternating yellow and red flashing lights. Public safety activities include safety patrols for marine regattas, fire boats, as well as search and rescue boats. This light does not give the boat any special privileges.

## Operating Near Commercial Boats

### Narrow Channels

If you will be plying the waters of New York's harbors and rivers, you need to be aware of the maneuvering characteristics and limitations of large commercial vessels. Because these large vessels aren't able to change course quickly, you need to try to stay out of their way, particularly in congested areas. When meeting any large vessel on the water, a little courtesy goes a long way.

As a general rule, avoid hampering the progress of any large commercial vessel even if you believe you have to maintain your course and speed. Large commercial vessels are restricted to the deeper navigable channels whereas your boat may safely operate in relatively shallow water. If

you feel that you must stay within the marked channel due to your draft, always observe good seamanship and keep as



far to the starboard (right) side of the channel as is safe and practical for your boat.

Larger, deeply laden vessels can also take up to a half mile or more to come to a complete stop. Never put yourself in a position where a boat needs to execute an emergency maneuver in order to avoid running you down.

Never haul or launch your boat at a ramp when these larger commercial vessels are transiting. The large amounts of water they displace may cause a surge in the water level. Also remember that large vessels generally throw large wakes as they displace water. This can not only damage your boat, but also can sweep you into the water, endangering your life. For the same reasons, if you are swimming and you see a large vessel approaching, get out of the water. Otherwise, the suction effect caused by these large vessels may pull you way

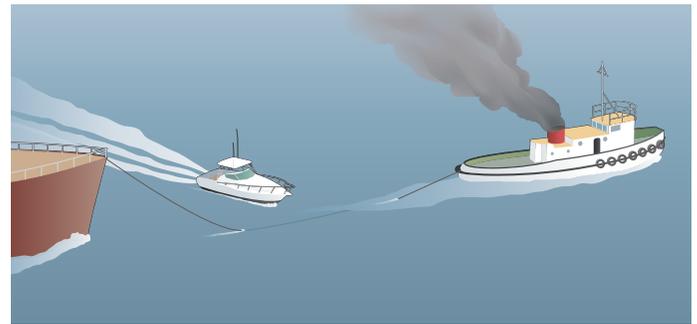
out into the river, perhaps too far out for you to swim back.

When operating a power-driven boat in a narrow channel on the Great Lakes or Western Rivers, if you are proceeding downstream with a following current you shall have the right-of-way over any upbound boat. The stand-on boat shall initiate the appropriate maneuvering signals. If you are the upbound boat, going against the current, you will hold as necessary to permit safe passage.

If you are trying to cross a narrow channel, you must not impede the passage of a boat that can only safely navigate within the channel.

### Towing

Absolutely never attempt to pass between a tug and its tow. Even if the tow line isn't visible, it may be just below the surface and become taut at any time. If it does become taut,



the force of a cable is easily capable of flipping or splitting your boat. Learn the signals tugs display and stay well clear of them, their tows and any cables.

## Navigation Rules of the Road

The Navigation Rules of the Road contained in this course summarize basic navigation rules for which a boat operator is responsible. Additional and more in-depth rules apply regarding various types of waterways and operation in relation to commercial boats and other watercraft. It is the responsibility of a boat operator to know and follow all the navigation rules.

For a complete listing of the navigation rules, refer to the document "Navigation Rules of the Road" published by the U.S. US Coast Guard (COMDTINST 16672.2 Series) and available through the U.S. Government printing office or on the web at [www.navcen.uscg.gov](http://www.navcen.uscg.gov)

For State specific navigation requirements, refer to the state laws where you intend to boat.

## Night Lights

*It was getting dark as Stephen steered his 40 foot sport fisherman out of the harbor. Stephen had enjoyed taking his friends on this voyage to attend their 25<sup>th</sup> college reunion. They'd had a great weekend, and everyone but Stephen and Vinnie were "sleeping it off" on the voyage home.*

*Feeling drowsy himself and needing a nap, Stephen called down to Vinnie to take over the helm. "Hey Vinnie, can you spell me at the wheel for a while? It's easy, the helm is on auto pilot, and you don't have to do a thing. The radar is on; just watch out for other boats and their lights—boats have red lights on their left side (port), green lights on their right side (starboard) and white lights on back and on top. I just want to lie down for a few minutes."*

*Some time later, Stephen woke with a start. Vinnie was shouting his name from the bridge. When Stephen got up, Vinnie explained. "You told me about red and green lights and also to look for white lights, but what's a yellow one?"*

*"A yellow light means a boat is towing a barge," Stephen explained. "Why?"*

*"Well, one just passed us on the left," Vinnie replied.*

*Stephen pushed Vinnie away from the helm, switched off the auto pilot, and turned to see a tall dark black shape with a faint red and green light on top of it—astern of them. Stephen hit the throttles and turned the rudder hard to starboard, and yelled to Vinnie to wake their friends and get everyone to don their lifejackets.*

*After a few tense moments Stephen looked over his shoulder—all was clear. He took a deep breath, slacked off on the wheel and backed off on the throttles a bit. He'd managed to get his boat out of danger, just in the nick of time.*

*His friends arrived back on the bridge, PFDs in hand, obviously confused about what had just happened. "We were between a tug and the barge it was towing," Stephen explained, "and the barge almost ran us down."*

### Review Questions

1. What factors should be considered when determining the safe speed of the boat? \_\_\_\_\_  
\_\_\_\_\_
2. When is an operator required to maintain a proper lookout? \_\_\_\_\_  
\_\_\_\_\_
3. What is the primary indicator that risk of collision exists between two vessels? \_\_\_\_\_  
\_\_\_\_\_
4. When must navigation lights be displayed? \_\_\_\_\_  
\_\_\_\_\_
5. What actions should the give way and stand on boat each take? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
6. What are the important sound signals a boater should know and what do they mean? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Answers on page 82

## Laws Relating to the Operation of a Boat

Just as there are laws you must follow when operating a motor vehicle, there are also laws to follow when operating a boat. Every boater must make safety the first priority and demonstrate courtesy toward other waterway users. To prevent an unpleasant encounter with marine law enforcement, make sure you know and obey the laws relating to the operation of boats.

### Speeding

New York State Law requires that all boats not exceed a speed of 5 miles per hour when within 100 feet of the



shore, a dock, pier, raft, float or an anchored or moored boat. Exception to this is when the boat is enabling a skier to take off and land. On some specific bodies of water the 5 mph limit has been extended to 200 feet, and on several lakes there are daytime and nighttime speed limits. Local ordinances may further regulate the speed of boats operated within specific areas. Check with authorities regarding local regulations.

All boats must proceed at a safe speed for the conditions of weather, traffic, proximity to shore, operator experience, and boat handling characteristics. When no speed limit is posted, operate your boat safely so as not to endanger others. You must be able to stop your boat safely within the clear space ahead.

Always be aware of your wake. Reduce speed when passing marinas, docks or other boats, to minimize any disruption.

### Reckless Operation

Reckless operation of a boat can be a misdemeanor. Operators are required to operate a boat in a careful and prudent manner in such a way as not to interfere with the

free and proper use of the navigable waters or endanger any boat or person. Reckless operation may be the result of operator ignorance, inattention, indifference or carelessness. Some examples of reckless operation include:

- operating at a high speed in a congested boating area or in restricted visibility,
- following another boat too closely,
- operating too closely to swimmers or divers,
- towing skiers in an unsafe or crowded area,
- operating near dams,
- cutting through a regatta or marine parade,
- overloading a boat, and
- allowing passengers to ride on the bow, gunwale, or transom while making way.

### Bow Riding

Bow riding means that passengers are seated on the boat's bow, gunwale, transom, or any area not intended to accommodate

passengers while the boat is underway. Bow riding is extremely dangerous. If the boat hits a large wake or wave, or makes a sudden, sharp turn, the person riding the bow may be thrown overboard.



Operators must insist that their passengers take a seat, and stay in that seat, while the boat is underway.

### WHY IS RIDING ON THE BOW OR GUNWALE DANGEROUS?

A person who is bow riding is in danger of falling overboard and being injured by the boat or the boat prop even if the boat is moving at slow speed. A boat in a no wake zone moves about six miles per hour which means it will proceed about nine feet in a second. At low speed, your powerboat's bow will ride high, obstructing your view. It will take at least two seconds for the helmsman to react if a person falls into the water from the bow—assuming that the helmsman saw the accident and can react immediately. In that time, the boat will move forward 18 feet and it will take another second or two for a propeller to actually stop turning. So in the best case scenario, the person falling overboard will be in danger of being injured by the moving prop for at least five seconds after falling overboard—and in those five seconds, the person is unlikely to be able to move far enough away from the prop to avoid the danger.

Even if the person who falls overboard manages to avoid the prop, he or she risks injury and/or drowning. For example, a person may strike his or her head on the underside of the boat and be rendered unconscious. It may take a few moments to turn the boat around to pick up the person overboard. All these risks are magnified if the boat is moving quickly.

## Boating While Intoxicated

Boating while under the influence of alcohol or drugs is illegal and dangerous. Their effects intensify on the water and even small amounts can greatly impair function. Alcohol affects three critical areas: balance coordination and judgment. Environmental stressors such as glare, heat, vibration and engine noise can magnify these affects.



Alcohol can induce recklessness because it depresses the ability to process information from various sources. You may develop a “tunnel vision” perspective blocking out critical visual information. In addition, your ability to judge speed and distance becomes impaired which limits your ability to track objects. It also reduces your night vision. You can lose the ability to differentiate between red and green. An intoxicated operator is a dangerous operator.

A large portion of boating fatalities, over 60% in New York between 2005 and 2013, are a result of drowning. A boat is an unstable platform rocking in the winds and waves. Simple tasks such as climbing a ladder or even reaching for your sunglasses may become challenging if you are impaired. Drinking also affects your ability to act quickly should you fall overboard. Falling into the water can cause disorientation and it can make it more significantly more difficult to put on a PFD.

Different drugs affect your body in different ways. Even over the counter drugs can cause impairment. It is important to understand how a particular drug will affect you and not to operate while your ability is impaired in anyway by any drug.

It is illegal in New York State to operate a boat while your ability is impaired by the use of alcohol or drugs. A person with a blood alcohol level (BAC) of 0.08 percent or greater is considered to be intoxicated. The penalties for intoxication and impairment, whether by alcohol or drugs, have penalties that mirror that of DWI. The penalties are severe. They include fines and imprisonment. Additionally if you are stopped for suspicion of impaired operation and refuse to volunteer to submit to a breath test, your privilege to operate a boat will be immediately suspended pending a hearing.

## Underage Drinking While Boating

You risk more severe consequences if you drink alcohol while boating and you are under 21. If your blood alcohol content (BAC) is between 0.02 and 0.07 and you are under 21, penalties can include a loss of operating privileges for 6 months and a fine of \$125 for the first offense. If you commit a second offense, you may suffer a loss of operating privileges for one year or until age 21, whichever is longer. If your BAC is greater than 0.07 you are subject to prosecution under the BWI statutes.

## Local Laws

New York State Law allows cities, towns, and villages to regulate speed and boat operations out to 1500 feet from shore. To find out what the local laws are in your area, contact the local marine patrol or local government.

## Law Enforcement

Several different law enforcement agencies enforce the federal and state navigation laws. The US Coast Guard patrols the joint jurisdictional waters while enforcing federal laws. The State Park Police, State Police, Department of Environmental Conservation, as well as county and local agencies work together to ensure compliance with state and local laws. Violations of state and federal statutes carry fines and/or imprisonment.

All 50 states are presently cooperating in an attempt to develop uniform boating laws. Ideally, as you travel from state to state by water, you will encounter the same laws as you go. New York State has entered into a conformity agreement with the federal government which means that local enforcement officers can enforce state law on all waters of the state, including those waters in New York that are classified as navigable waters of the United States.

Navigable waters of the United States are those that allow a boat traveling them to go from one state to another, or to the high seas. For example, traveling on the New York State Barge Canal a boater can reach Ohio from Montauk without leaving the water. Federal law enforcement officers, usually the US Coast Guard, are responsible for enforcing federal



law on waters classified as navigable waters of the United States. Local enforcement officers will cite an offender in violation of a state and/or local boating law. In most respects the federal boating laws and the state boating laws are similar.

## Termination of Voyage

Law enforcement officers may terminate the voyage of any boat, including a rowboat or canoe, if they find an imminently hazardous condition aboard the boat. If continued operation of the boat will likely cause an accident or physical injury, an imminently hazardous condition exists. The officer will direct the operator of the boat to stop and proceed immediately to dock at the nearest available safe anchorage, dock or mooring. The imminently hazardous condition must be corrected before the boat may proceed.

The following are examples of conditions that a law enforcement officer may consider imminently hazardous:

- insufficient PFDs.
- overloaded boat.
- operating a boat while intoxicated.
- fuel in the bilge.

## Marine Radio Procedures

The FCC does not require operators of recreational boats less than 20 meters (65 ft.) in length to carry a radio or to have an individual license to operate VHF marine radios. However, if you are operating a VHF marine radio, you must follow the procedures and courtesies that are required of licensed operators specified in FCC Rules. You may use the name or registration number of your boat to identify your ship station (your boat).



## Radio Listening Watch

Boats that voluntarily carry a radio must maintain a watch on Channel 16 whenever the radio is operating and not being used to communicate. Channel 16 is the frequency to use when you wish to call other boats or make a distress call.

<b>DISTRESS SAFETY AND CALLING</b> – Use this channel to get the attention of another station (calling) or in emergencies (distress and safety).	16
<b>INTERSHIP SAFETY</b> – Use these channels for ship-to-ship safety messages and for search and rescue messages to ships and aircraft of the US Coast Guard. A good mariner will maintain a listening watch on channel 13, since that channel is used by most ships.	6, 13
<b>US COAST GUARD LIAISON</b> –Use this channel to talk to the US Coast Guard (but first make contact on Channel 16).	22A
<b>NONCOMMERCIAL</b> – Working channels for recreational boats. Messages must be about the needs of the ship. Typical uses include fishing reports, rendezvous, scheduling repairs and berthing information. Use Channel 72 for ship-to-ship messages between noncommercial vessels.	9, 68, 69, 71, 78A, 79A, 80A 67, 72 for ship-to-ship only
<b>COMMERCIAL</b> – Working channels for working ships only. Messages must be about business or the needs of the ship. Use channels 8, 67, and 88A for ship-to-ship messages.	1A, 7A, 9, 10, 11, 18A, 19A, 63A, 79A, 80A 8, 67, 88A for ship-to-ship
<b>PUBLIC CORRESPONDENCE (MARINE OPERATOR)</b> –Use these channels to call the marine operator at a public coast station. By contacting a public coast station, you can make and receive calls from telephones on shore. Except for distress calls, public coast stations usually charge for this service.	24, 25, 26, 27, 28, 84, 85, 86, 87
<b>WEATHER</b> – On these channels you may receive weather broadcasts of the National Oceanic and Atmospheric Administration. These channels are only for receiving. You cannot transmit on them.	Wx-1 162.55 MHz Wx-2 162.4 MHz Wx-3 162.475 MHz

## Distress Call Procedures

If you run into mechanical trouble on your boat, or if you have a medical emergency, you can call for help on your VHF marine radio. Giving the universally recognized distress call will speed help to you.

Make sure the radio is on and tuned to Channel 16. Press or hold the transmit button and clearly say "MAYDAY MAYDAY MAYDAY." Next, provide the following information:

- boat name and description,
- position and/or location, and
- nature of emergency and number of people aboard.

**IT IS ILLEGAL TO INTENTIONALLY TRANSMIT A FALSE DISTRESS ALERT, OR TO UNINTENTIONALLY TRANSMIT A FALSE DISTRESS ALERT WITHOUT TAKING STEPS TO CANCEL THAT ALERT.**

## For Further Information:

**FCC — Toll free telephone: 1-888-CALL-FCC**

**World Wide Web: [wireless.fcc.gov](http://wireless.fcc.gov)**

For a complete listing of VHF Channels and Frequencies visit the US COAST GUARD Navigation Center web site: [www.navcen.uscg.gov](http://www.navcen.uscg.gov)

**Dept. of Homeland Security Tip Hotline:**

NY State: 1 (866) 723-3697

NYC: 1 (888) 692-7233

## Review Questions

1. What is the state speed limit within 100 feet of the shore, a dock, pier, raft, float or an anchored boat?

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2. What kinds of operations are considered reckless? \_\_\_\_\_

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3. What effects can drinking alcohol have on a person? \_\_\_\_\_

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4. In New York State, what is the blood alcohol level content (BAC) to be considered legally intoxicated?

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**Answers on page 82**

## Boat Handling and Maneuvering

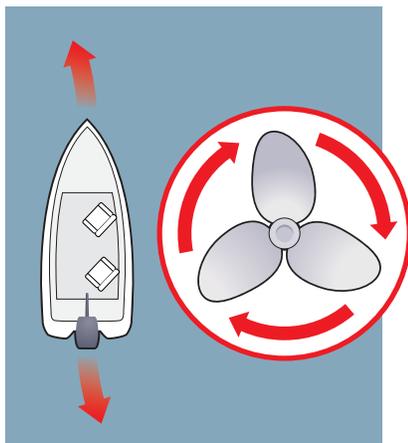
### Steering

Mechanically propelled boats are turned or steered by changing the direction of the thrust of the propeller. Outboards steer by turning the whole motor with a tiller or a wheel. When you turn the wheel on an I/O drive boat you are moving the out drive, which houses the propeller. On boats with an inboard motor, the motor and the propeller are stationary. You turn the rudder with a wheel and the rudder moves to direct the propeller thrust either to port or to starboard, rather than the propeller itself turning.



When you use a steering wheel, the boat's bow will move in the same direction as the steering wheel turns. If you are in a sailboat or small outboard boat, the boat may have a "tiller" instead of a steering wheel. The tiller is a handle that the operator uses to turn the outboard or rudder. The movement of the tiller is the opposite of using a wheel. So if you move the tiller to port, the boat will move to starboard, and vice versa.

A boat's movement is similar to that of a car, but cars and boats pivot at the opposite ends. A car pivots on its rear wheels; a boat will pivot around a point near the bow. You may not notice in open water, but you will notice when you are near a dock. If you are traveling faster the turning response will be quicker. Always remember that a boat doesn't have brakes. Slow down before turning!

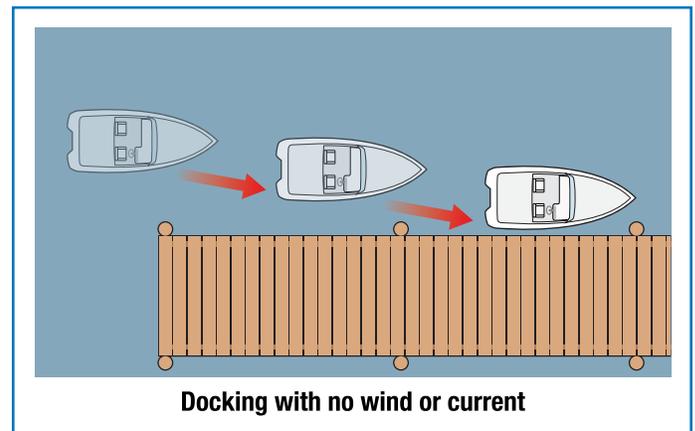


### Boat Response to Prop and Rudder

In most boats, the propellers turn in a clockwise motion when the boat is moving forward. This is called right handed turning. When you are moving forward at a low speed, the stern of your boat will swing toward the starboard, and you will notice your bow swinging to port. When you are going astern (backwards) the opposite happens: the stern of a boat will back to port, and you will notice the bow tend to go to starboard. As you increase your speed you will notice this movement less.

## Docking

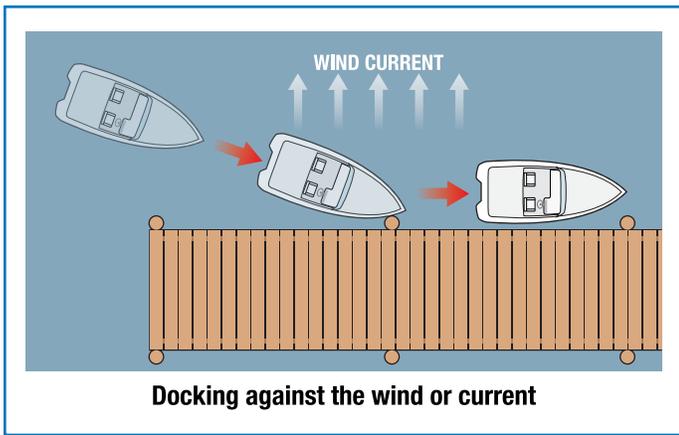
Docking a boat smoothly and safely requires practice so try it in open water first to become familiar with the procedures and your boat's handling characteristics. Different types of boats as well as the size of the boat can affect how you dock. Boats with a large keel or dagger board, such as many sail boats, are less affected by winds and may allow for a shallower approach to the dock. Larger boats, which have a large amount of freeboard, can be more susceptible to the wind. The location and configuration of the marina may also affect how you dock. Marinas are often heavily congested areas and require maneuvering in tightly confined areas. As you approach a dock go slowly and have your fenders and lines ready.



Try to take advantage of current and wind when docking or mooring. Try to approach against the wind and current; motoring into the wind or current is always easier than having it push you from behind. If you have a choice and the wind is greater than the current choose going into the wind.

### Docking with no wind or current

Approach the dock at an angle of 10 to 20 degrees. You should be headed for a spot slightly forward of the position where you intend to tie up. When you are within about one

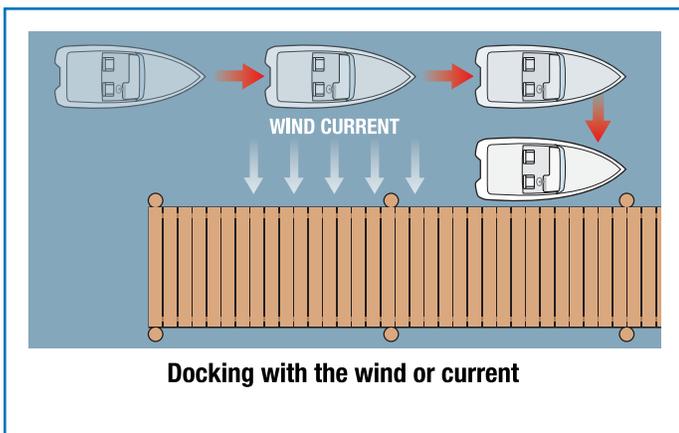


**Docking against the wind or current**

and one-half boat lengths from the dock, turn the steering wheel away from the dock to angle the boat away from the dock, bringing your boat parallel to the dock. Reverse engine just long enough to stop headway. When the bow is alongside the dock, secure the bow line to a cleat.

### Docking against the wind or current

Approach the dock at an angle of approximately 45 degrees heading for a spot slightly forward of the position where you intend to tie up. When you are about one and one-half boat lengths from the dock, make a tight turn with the steering wheel away from the dock. This will bring your boat parallel to the dock. Reverse engine long enough to stop headway. As soon as the bow is alongside the dock, quickly secure the bow line to a cleat and turn the steering wheel away all the way over from the dock. Kick the engine ahead to bring the stern alongside the dock. This will help pull the stern alongside the dock.



**Docking with the wind or current**

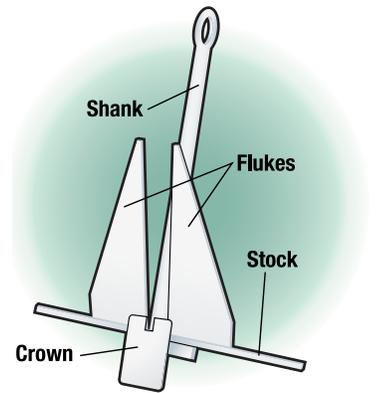
### Docking with wind or current behind you

This approach to the dock is similar to approaching the dock with no wind or current. In some case you may not have to angle into the dock since the forces of nature, the wind and the current, will take you there. Bring your boat parallel to the dock. You may have to turn your wheel to keep your bow from tipping into the dock too fast and reverse your engines to keep you from overshooting your berth (place where your boat is tied up to the dock).

If you don't make it the first time, back off and try again. The more you practice, the better you will become at docking your boat. Remember to use the wind and current to your advantage. Go slow but be ready with your engines to pull away if your landing is not going the way you planned it.

## Anchoring

There are different types of anchors, and the anchor you choose will depend on your boat and the way you plan to use it. Many small boats use a Danforth type anchor. It's lightweight, has very good holding power, and buries itself as tension is placed on the line. A Danforth anchor digs in as you put a strain on it. It is designed to hold for a long time. It's best for boats that will anchor primarily for safety reasons; for example, if your engine fails, or you need to stay outside of a harbor for a long period of time, or if you have to weather a storm.



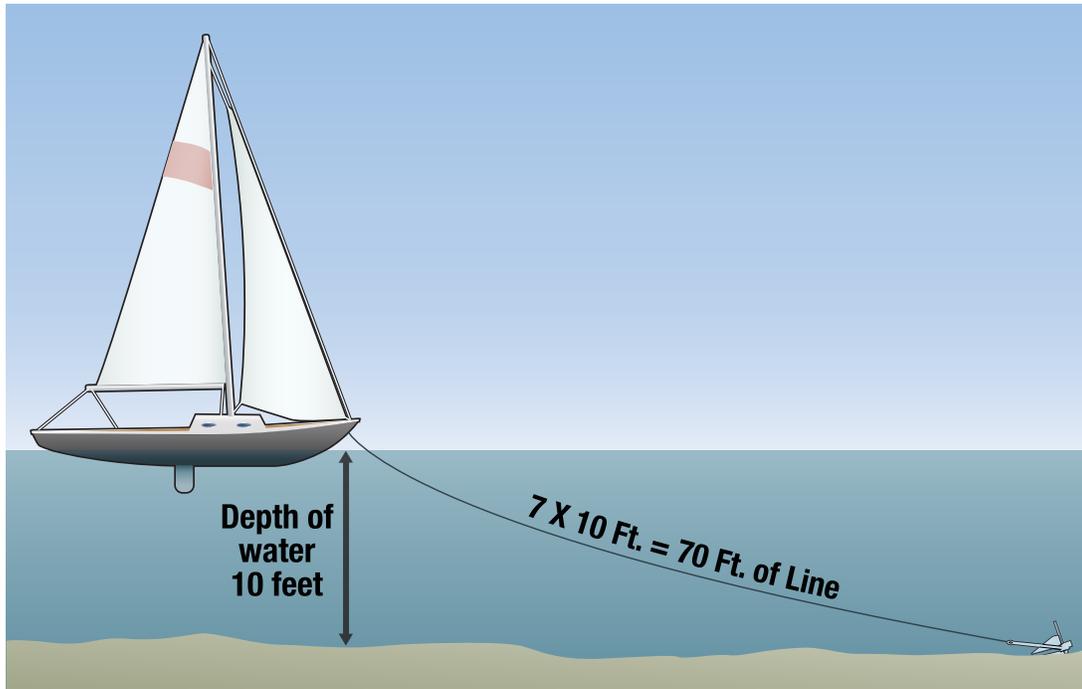
**Anchor rode.** The connection between the anchor and the boat is called the anchor "rode." Many boaters use nothing but line for their anchor rode. That's fine for the temporary anchoring of small, lightweight boats such as a canoe or rowboat, but for larger boats or rougher water, line alone does not offer sufficient weight to set an anchor properly. Also, line can chafe on a rough bottom. An anchor rode of all chain would have plenty of weight to firmly set the anchor; however, it may be too heavy for most recreational boats and most boaters to handle manually. A combination of both line and chain is generally best. Using 6 to 8 feet of galvanized chain shackled to the anchor will provide sufficient weight to properly set the anchor and will prevent chafing, and it won't be too heavy for most boaters. A nylon line with pre-made hard eye splice connected to the chain with a swivel is relatively lightweight and easy to handle. The nylon also stretches to absorb the shock or tension of the boat riding the waves and the swivel allows the anchor line to spin freely.

**Scope.** "Scope" describes the length of anchor rode you need to use to properly anchor your boat. The rule of thumb is that your scope should be 5 to 7 times the depth of the water in calm or moderate seas. In heavy weather, increase to 7 to 10 times the water depth.

It's best to anchor in shallow water. Consult your chart if you are using one. Mud or sand works better than rocks, as the anchor will have a chance to dig into the softer bottom and provide better holding power. Your boat may swing in a complete circle around the anchor, be certain that there is room around your selected site for your boat to make a full 360 degree swing.

When preparing to anchor, steer the boat into the wind or current, whichever is stronger. Approach at low throttle and

# SCOPE OF 7 TO 1



use the wind or current as a brake to slow you down. If the wind or current is on your stern, it will swing your boat around before your anchor has a chance to set. It is best to lower the anchor over the bow slowly, rather than heaving it. As you lower the anchor the wind or current should be backing your boat slowly away. When the anchor touches bottom, the crown will help the flukes take hold in the bottom. Ensure that your anchor has taken a good hold of the bottom, and that it isn't dragging. Secure the anchor line to a bow cleat.

**YOU SHOULD NEVER ANCHOR BY THE STERN BECAUSE THE TRANSOM OF A BOAT IS NOT DESIGNED TO CUT THROUGH THE WATER. WATER WILL WASH OVER THE STERN AND SWAMP THE BOAT.**

## Mooring

Using a mooring buoy is an alternative to anchoring or docking a boat. Mooring buoys are white with a blue horizontal stripe and are spherical in shape. Mooring buoys are permanently anchored to the bottom. Yacht clubs and marinas may have large mooring fields or a home owner may even have a single mooring for their own personal boat.

As with docking and anchoring, learning to use a mooring buoy is a skill that needs to be practiced. The buoy should be approached slowly into the prevailing wind or current.

A person on the bow should use a boat hook to reach the line, called a pennant, trailing from the eye at the top of the buoy, pull it up and attach it to a cleat at the bow of the boat. Leaving the mooring is the reverse. Remove the pennant from the cleat and allow the wind and/or current to move the boat clear of the mooring buoy, using reverse if needed.

## Courtesy

It is important to show courtesy towards other boaters. Avoid close quarter situations and give fishing boats, sailboats, and manually propelled boats a wide berth. Stay well clear of swim areas, boats towing people on water skis or similar devices, and away from diver flags. Don't create excessive wakes or spray other boaters. Don't fish in channels. Lending assistance to fellow boaters also shows courtesy and respect to others on the water. Courtesy toward shoreline residents can be shown by observing "no wake" speeds near docks, moored boats or swim platforms and avoiding high speed operation within close proximity to the shore and congested areas. Keeping radios and other noise low when anchored close to shore and engine noise reduced or muffled (particularly in the early morning or late at night) also shows courtesy to those who live close to the water.

## The Operator's Standing Orders

<b>Courtesy</b>	Use it.
<b>Observe</b>	Follow the Rules of the Road. Keep a constant, watchful lookout.
<b>Understanding</b>	Be patient. The other boater may be a novice as you once were.
<b>Responsibility</b>	A operator is responsible for his/her actions and for rendering assistance to other boats or persons in distress.
<b>Take your time</b>	Your speed can rock the boat
<b>Education</b>	Take a boating course, either for the first time or as a refresher.
<b>Sober</b>	A drink on the rocks may mean your boat ends up on the rocks.
<b>Yield</b>	Even though you know you're right, don't be foolish and be DEAD right.

## Review Questions

- When approaching the dock, what should you take in to consideration? \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
- How fast should you approach the dock? \_\_\_\_\_  
 \_\_\_\_\_
- Why is an anchor an important piece of safety equipment? \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
- Where should an anchor NOT be secured? \_\_\_\_\_  
 \_\_\_\_\_

Answers on page 82

Learning all aspects of navigation is beyond the scope of this course. However, all boaters need some basic knowledge about finding their way on the water. This section will introduce you to the basic features of a nautical chart and navigation aids and discusses how weather pertains to navigation. Boaters can learn more about charts and enhance their navigation abilities by attending courses through the US Coast Guard Auxiliary, US Power Squadron, US Sailing or commercial courses specifically aimed at the subject.

## Introduction to Charts

The art and science of navigation is an ancient skill. For thousands of years, sailors navigated by using the stars as their guide. The art of navigation has expanded from using the stars and planets (celestial navigation) to sophisticated satellite navigation systems. You won't enjoy boating, and you won't be a safe boater, if you don't have at least basic navigation knowledge.

The nautical chart is one of the mariner's most useful and most widely used navigational aids. Navigational charts contain a wealth of information to you as a boat operator. They show channels, depth of water, buoys, lights, lighthouses, prominent landmarks, rocks, reefs, sandbars, and much more useful information for the safe piloting of your boat. The chart is the most essential part of all

navigation equipment.

Navigational charts feature coastline characteristics, points of interest, rocks, wrecks and obstructions, and describe the type of bottom. Not all waterways have been charted, but if a chart exists, you can find it at the Office of Coast Survey of the National Oceanic and Atmospheric Administration, or NOAA. The web address is: <http://nauticalcharts.noaa.gov/>.

## Compass Rose

Charts are oriented with True North at the top. Nautical charts usually have one or more compass roses printed on them. These are similar in appearance to the face of the compass. Directions on the chart are measured by using the compass rose.

## Soundings

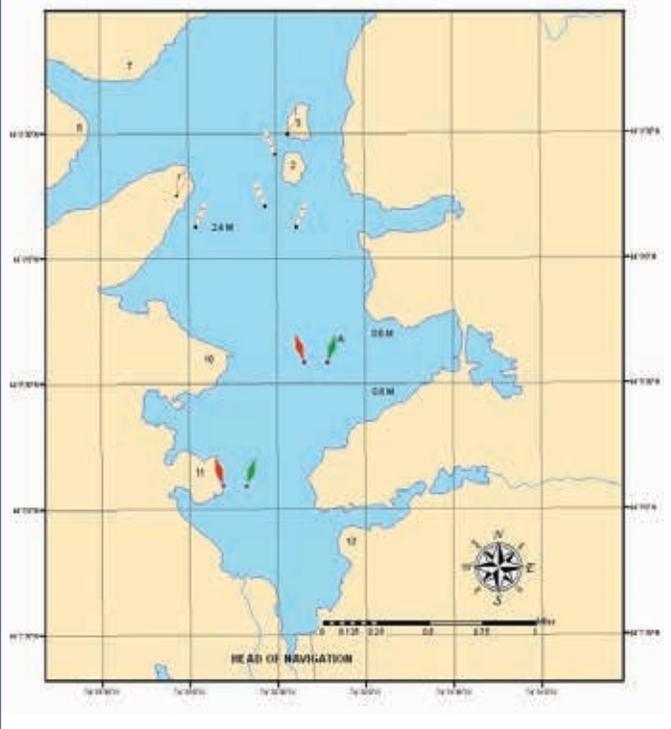
Nautical charts describe the characteristics of the bottom of a body of water, information that is vital to a boat operator. The chart uses combinations of numbers, color codes, and underwater contour lines to mark channels, hazards and other bottom characteristics. The numbers on the chart represent "soundings," or measurements of the depth of the water at average low tide. Since the greatest danger to navigation is during low tide, a number of the depths of low tide are averaged to produce the average low tide.

Contour lines (also called fathom curves) connect points of roughly equal depth and provide a profile of the bottom. These lines are either numbered or coded according to depth using particular combinations of dots and dashes. Generally, the shallow water is tinted darker blue on a chart, while deeper water is tinted light blue or white. Depth of water may either be in feet, meters or fathoms (a fathom equals six feet). The chart legend will indicate which unit (feet, meters or fathoms) is used.

## Symbols for Buoys

The basic symbol for a buoy, which is an aid to navigation and is discussed in depth in the next section, is a diamond and small circle. The small circle denotes the approximate position of the buoy mooring. The diamond is used to draw attention to the position of the circle and to the description of the aid. The initials "N" or "C" will indicate the shape of the buoy: (N) Nun Buoys, and (C) Can Buoys. If the buoy is painted red, the diamond will usually be indicated in red on the chart; if the buoy is painted green, the diamond will be green and so on. Other markings by the buoy symbol may indicate a buoy identifier, a sound signal, or note that it is a lighted buoy.

### Navigation Chart



# Aids to Navigation

Waterways, just as roads, are marked to provide direction, advise caution and to point out specific hazards. Understanding the waterway marking systems is important as these markers will assist in navigation, mark safe waters, and convey important information to the skipper. Aids to Navigation systems use red and green markers to indicate the right and left sides of the channel.

## Navigational or Channel Marker

Buoy systems link the source of the body of water, or the farthest upstream point that a boat can safely navigate (called the “head of navigation”) with the outlet of the body of water. The location of the head of navigation is the key to the placement and use of channel markers, because the head of navigation determines which side of the channel the navigational aids are placed. On a lake, the inlet is considered the head of navigation, and if the lake has more than one inlet, the larger or major inlet is considered the head of navigation. As you move towards the head of navigation, numbers on the buoys will increase. As you move away from the head of navigation, the numbers on the buoys will decrease.

The outlet is the place where the body of water empties: on a river it might be the ocean or a lake, and on a lake it might be a river. When entering a harbor (on a lake or the ocean) the landward end of a channel is used as the head of navigation only for the placement of buoys on that channel.

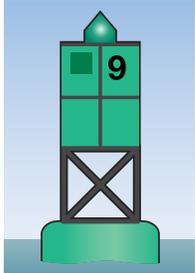
There are three buoy shapes. A “can” buoy is cylindrical in shape, like an oil drum. It is green in color and if marked will have an odd number. A “nun” buoy has a blunted conical shape. It is red in color and if marked will have an even number. If either a can or a nun buoy is lighted, the color of the light will be the same as the color of the buoy, green for a can buoy and red for a nun buoy. “Spar” buoys are slender with a tapering shape. They are narrower and rounded at top and much smaller than a can or nun. Spars are never lighted. They may be used in place of a can or nun or as winter replacements. Spars are used on state marked waters only. An easy way to remember the shapes, color and number of buoys is this silly little sentence: Even Red Nuns carry Odd Green Cans.

A channel may split to direct boats around an obstruction in the water. To mark the channel to take, a preferred channel buoy may be used. These buoys are colored with red and green stripes, but the upper color denotes the direction of the preferred channel.

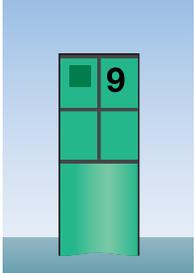
When in a channel proceeding toward the head of navigation (upstream), the red buoys lie on the boat’s starboard (right) side while the green buoys lie on the port (left) side. A commonly used memory device to remember this is Red Right Returning. This means that the RED buoys will lie to your RIGHT (starboard) side when returning to port. Always remember to pass between the red and green buoys. This will ensure that you stay in safe water that is deep enough to permit navigation.

### WHEN GOING UPSTREAM

#### Port Side Odd-Numbered Aids



**Lighted Buoy**

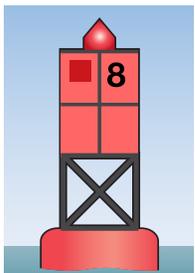


**Can Buoy**

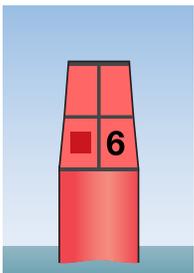


**Day Beacon**

#### Starboard Side Even-Numbered Aids



**Lighted Buoy**



**Nun Buoy**

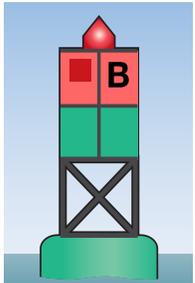


**Day Beacon**

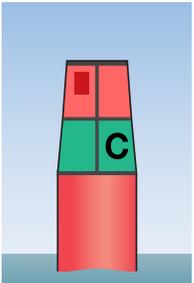
#### Lateral System

*(As Seen Entering From Seaward)*

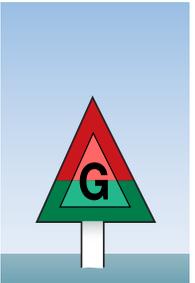
##### Preferred Channel to Port - Topmost Band Red



**Red Light Only**

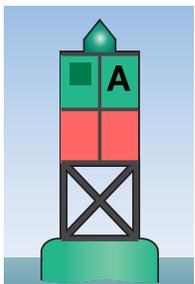


**Nun Buoy**

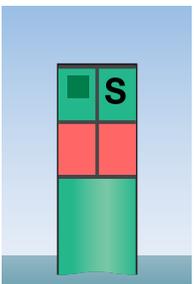


**Day Beacon**

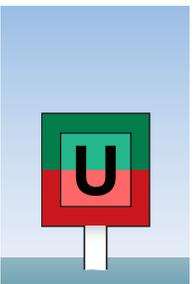
##### Preferred Channel to Starboard - Topmost Band Green



**Green Light Only**



**Can Buoy**

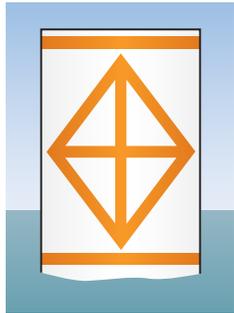


**Day Beacon**

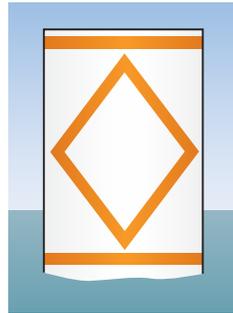
## Special Markers

Special marker buoys are can-shaped or spar-shaped buoys colored white with orange marking. These special markers convey important information that all boaters must recognize. If the buoy is a can buoy it may have a white light; the spars don't have lights.

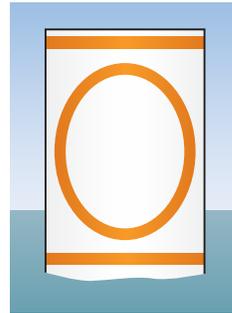
### Information & Regulatory Markers



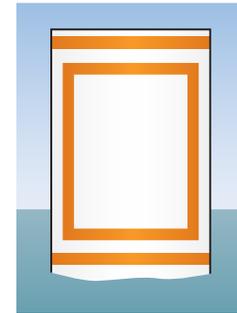
**EXCLUSIONARY**



**DANGER!**



**REGULATORY**



**INFORMATION**

Exclusion buoys are used to mark areas that boats are not allowed to operate in. These are typically used to mark swim areas and dams. Danger buoys are used to warn of shallow water or other obstructions. They do not prevent you from operating beyond them if you choose to do so. Regulatory buoys are used to inform boaters of rules and regulations.

These are used primarily to inform boaters of speed limits around harbors and bridges. Informational buoys are used to convey information. They can indicate the presence of marinas, restaurants, and other points of interest. They are also used to indicate the end of a marked channel.

### Review Questions

1. What types of information are found on a chart? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
2. What colors are channel markers? \_\_\_\_\_
3. What is the "head of navigation" and why is it important in navigating? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
4. What are the four symbols on the Information & Regulatory Markers and what do they mean? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Answers on page 82

Personal watercraft (PWC) have become a popular choice for New York boat owners in recent years. PWC are fast, turn on a dime when underway, and put the operator right next to the water. In other words, they're a blast, and it's easy to see why they're so popular. Because of their speediness and responsive handling, they're like the motorcycles of the waterways.

Although PWC offer excitement and thrills, PWC and their operators have come under fire for several reasons:

- Operating a PWC requires skill, and inexperienced operators often run into trouble. At one time PWC comprised less than 10% of the state's registered boats but were involved in more than 20% of all accidents on the water.
- PWC operators have acquired reputations as thrill-seeking nuisances because they may operate their craft in a reckless manner such as jumping another boat's wake too closely.
- PWC operators are sometimes discourteous or show a lack of respect for other users of the waterways by creating wakes in the presence of small boats, or operating too close to swimmers.
- PWC are appealing to young people because they are so quick and maneuverable, but youthful operators may lack the strength and coordination to control the machine, and may lack the experience to exercise good judgment in stressful situations.

Most of these problems stem from lack of boating knowledge and inexperience with boats or PWC. This course is meant to provide students with the knowledge to handle PWC properly, safely, responsibly and courteously. It is important for the PWC community to operate legally, safely, and with courtesy towards all, or PWC operators may find fewer and fewer waterways where they will be allowed to ride their craft. Towns, villages and cities have the authority to regulate PWC operation within 1500 feet of shore, and they can ban PWC entirely if they choose to do so.

**THE PROBLEM IS NOT THE MACHINE, IT'S THE OPERATOR!**

## General Information about Personal Watercraft

A personal watercraft is classified as an "inboard motorboat." That means that the same rules and requirements (with the exception of certain on-board equipment) that apply to similar sized motorboats also apply to PWC, including:

- Registration
- Rules of the Road
- Boating While Intoxicated
- Speed limits
- Reckless Operation
- Persons being towed behind—skiing, tubing, etc.\*
- Pollution
- Noise
- Capacity information found in owner's manual

\*Note that if a PWC tows a skier or tube, it must be rated for at least three persons—operator, observer and skier—and that the observer must sit facing the skier. PWC owners can purchase a device that allows the observer to hold on securely and balance while sitting backwards.

There are also a few operating restrictions placed on PWC that don't exist for other boats. We'll discuss those later in this chapter.

## Personal Watercraft Defined

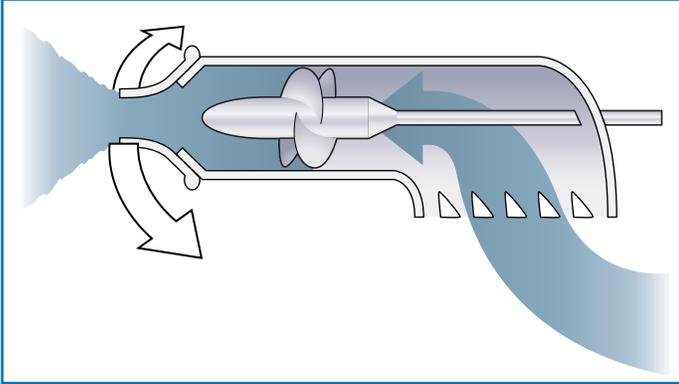
The New York State Navigation Law defines a personal watercraft as "a boat which uses an inboard motor powering a water jet pump as its primary source of motive power and which is designed to be operated by a person sitting, standing, or kneeling on, or being towed behind the boat rather than in the conventional manner of sitting or standing inside the boat."

The two key elements that distinguish a PWC from other boats are its water jet pump propulsion, and the fact that the operator sits or stands on the machine rather than in the machine.

## Propulsion System

The water jet drive is located on the bottom of the hull. Water enters the drive unit through a grate which keeps debris from being sucked into the impellers. (This grate can become clogged, especially if the PWC is operating in shallow, weedy water).

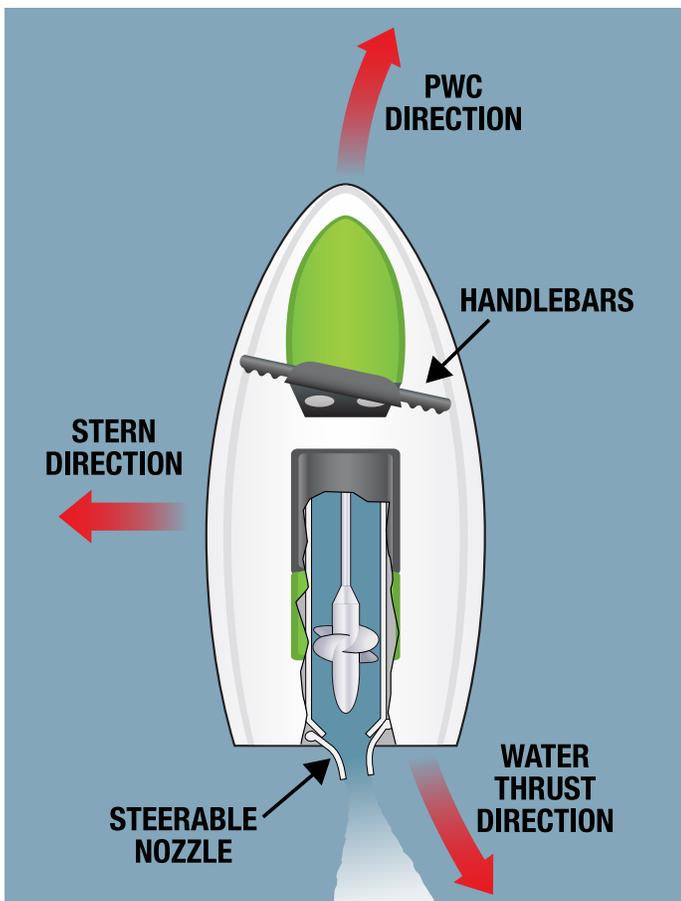
The impeller draws the water in through the grate and adds pressure, or thrust, to the water. This causes the water to



shoot out of the machine in a jet. A steering mechanism, connected to the handlebars or steering wheel, directs the water as it exits from the machine. Some water jet systems are designed with a clamshell mechanism that allows the PWC to operate in reverse. The clamshell lowers behind the water jet, and directs the water forward rather than back. This effect is very limited and should not be used as a brake!

## Steering

As discussed above, the handlebars or steering wheel are connected to the jet pump nozzle, and as the handlebars turn, so does the water jet. The thrust from the water pushes the stern in the opposite direction, turning the machine in the desired direction. This is effective at all speeds except

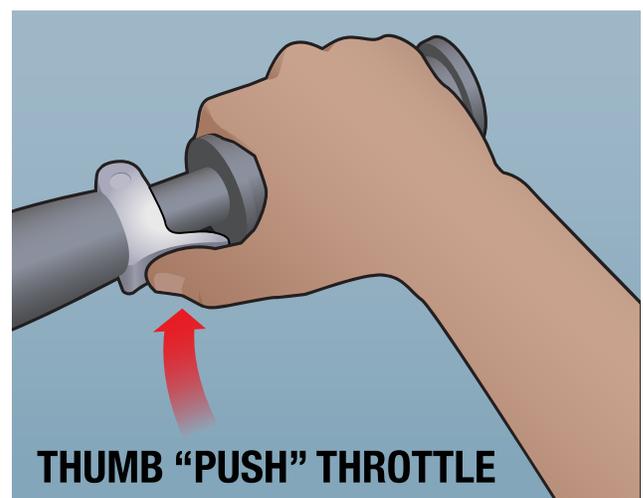
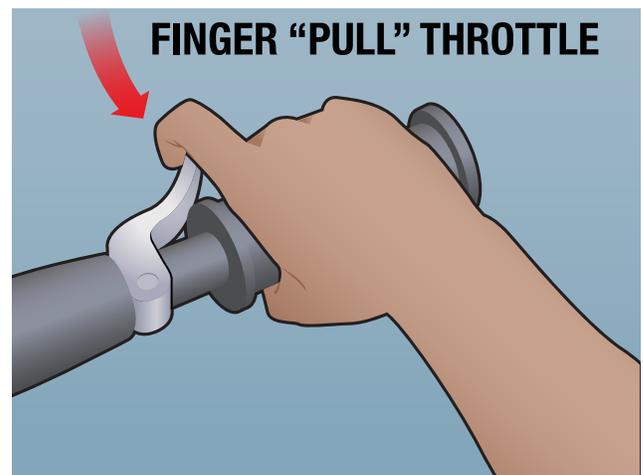


idle. At higher speeds, you can steer by shifting your weight to one side or the other, which causes the craft to turn in the desired direction, as the stern slides in the opposite direction. Using the handlebars and moving your body will help you make very sharp, quick turns. However, the turn can be too quick or sharp, and you can easily lose control and be thrown from your machine. Be cautious!

A PWC will not respond to handlebar movements when you release the throttle. Unlike a traditional boat, a PWC needs thrust to turn the craft. A PWC has no rudder, and will continue in the direction it was headed when the throttle was released.

## Speed

You control speed on a PWC with a finger or thumb control on the handlebar. This is usually a spring loaded mechanism, and it will return to idle when you release it. The harder you squeeze, the faster your machine will go. You must remember that your PWC will not respond to handlebar movements once you release the throttle; when there is no water moving through the jet, you lose steering control. There is no prop, rudder or any other component extending beneath the hull of a PWC to control direction. If you release the throttle at high speed you will continue in the direction in which you are heading, crashing into anything in your path.



## Things to Consider Before Trying PWC

PWC can operate in ways that traditional boats cannot. The water jet drive, combined with a relatively large horsepower to weight ratio, makes the PWC highly maneuverable, responsive, fast, and a “thrill ride.” That’s why people think of PWC as water-borne motorcycles or ATVs.

However, there is a price for all that excitement. Think carefully about the following before operating a PWC:

**Not readily visible.** PWC are low to the water which makes it difficult for the operator to see and be seen. This is a real danger, especially if the operator falls off his or her PWC in an area where other PWCs or boats are operating. It’s important for the operator to keep a sharp lookout at all times and to watch out for debris—and people—floating in the water.

**You’ll get wet.** Capsizing isn’t uncommon, and falling off a PWC is part of learning to ride. PWC give off a lot of spray, which causes the footboards to become wet and slippery. If you like to stay neat and dry, a PWC is probably not for you.

**Shallow draft.** PWC can operate in as little as 2 feet of water, which makes them versatile. But when operating in the shallows, the intake grate may become clogged with vegetation. It’s important to know how to clear the blockage. Another potential problem is that there may be obstructions or rocks just below the surface, so the operator should know the area in which he or she is riding.

## Basic Precautions

If you’ve decided you’re up for the potential for fun a PWC offers, then be prepared before you launch. You should read the owner’s manual and pay close attention to all safety precautions. Learn the location and operation of all controls and be familiar with any unique characteristics of your machine. Check the passenger capacity and be sure not to overload your machine! Remember that skiers are considered passengers, so your capacity must be at least three (the driver, the observer and the skier) if you tow anyone behind your machine.

Know how to fuel your craft properly and how the reserve position on the fuel switch works. Know the location of the oil reservoir and how to check the level. Read about the correct procedures for righting your overturned PWC, and how to re-board. Then practice a lot in shallow water, and away from swimmers and other boat and PWC traffic. Find an experienced operator to help you learn and even ride with you the first few times, if you can.

## Operating Requirements for PWC

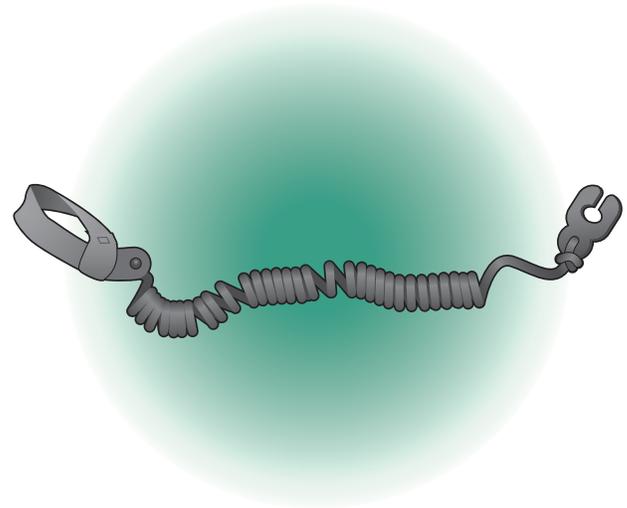
### Required Equipment

PWC are not subject to the same equipment carry requirements as other boats, but there is some required equipment you must carry and it will be provided by the manufacturer. This includes a backfire flame arrestor, natural ventilation (the US COAST GUARD rules exempt PWC from having an engine compartment blower), and a muffled exhaust system. All new PWC should come from the manufacturer in compliance with all equipment regulations. The operator is responsible for maintaining the equipment in a way that assures continued compliance.

The operator must provide one US COAST GUARD approved personal flotation device (PFD) of the proper size that is to be worn by each person on board or towed. It is in your best interest to wear a PFD that is designed specifically for PWC operation when you’re riding. The PFD is constructed of stronger fabric, stitching and may have more straps across the chest. Remember that an inflatable PFD is not acceptable when operating or riding on a PWC.

### Lanyard & Kill Switch

Most new boats and PWC come from the manufacturer with an engine cut-off switch that you can attach to your PFD with a lanyard. This will turn the engine “Off” whenever



you move far enough away from the operator’s position to activate the switch. If you fall off the PWC, it will stop, rather than proceeding on without a rider. This will allow you to right the craft and re-mount. Before you leave the launch area, pull on the lanyard to make sure the engine stops. Then make sure you attach it to your PFD securely before you leave the launch area.

If the machine is equipped with a lanyard engine cut-off system, the lanyard must be attached to the operator and the shut off button. Many manufacturers of outboard engines and boats are adding cut-off systems as standard equipment.

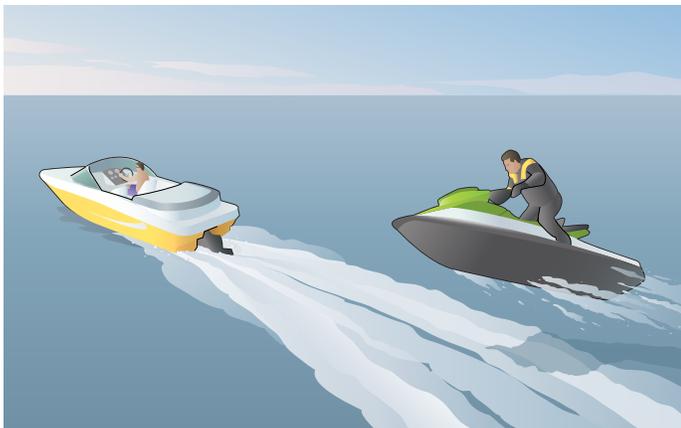
## The operator also must carry:

- a sound producing device, such as a horn or whistle that is audible for at least one-half mile and capable of sounding for a duration of two or more seconds; and
- a fluorescent orange flag (1 square foot minimum) or any US COAST GUARD approved visual distress signal.

New York State law does not require you to carry a fire extinguisher, but federal law (and the law of surrounding states) requires a fire extinguisher on all motorized boats, including PWC's. So if you ride in tidal waters or the major rivers in the state, you must carry a fire extinguisher. Because it is the safest and easiest course of action, State Parks recommends that you carry a fire extinguisher on board your PWC at all times.

Once you gather all of the required equipment for your PWC, consider other gear that can make your outing more enjoyable. This includes footwear, goggles or sunglasses, a wet suit, and gloves.

## Operating Restrictions



You may not operate your PWC between the hours of sunset and sunrise. Adding lights to the machine does not permit nighttime operation. It's the machine's low profile in the water that makes it unsafe to operate after dark. Remember that sunset occurs 20-30 minutes before dark, so be sure to leave enough time to get back to the launch site before sunset.

If you're operating a PWC, the same laws regarding reckless operation that apply to all boats apply to you, too. In addition, New York State law specifically defines three actions as reckless operation of a PWC:

- weaving through congested traffic;
- jumping the wake of another boat at an unreasonably or unnecessarily close distance or when visibility around the other boat is obstructed; and
- swerving at the last possible moment to avoid collision (playing "chicken").

PWC are prohibited within 500 feet of a swimming area unless the opposite shore is less than 500 feet away, or when launching or returning to the launch. If you are riding a PWC within 500 feet of a marked swimming area under one of these exceptions, you must keep your speed under 10 miles per hour. Remember that ALL boats must follow the 5 MPH speed limit when within 100 feet of shore.

## All PWC operators must be:

- At least 14 years of age and show proof of completing a New York Safe Boating Course or other approved boating safety course; or
- have someone over 18 riding on the same machine with them who has a boating safety certificate.

## PWC Rental

You must be at least 16 years old to rent a PWC, and must have identification and proof of age. If you are less than the age of 18, you must have an approved boating safety certificate in order to rent a PWC. If you are over 18 and do not have a boating safety certificate, you may rent a PWC, but you must remain within 2500 feet of the rental office, or if the rental office provides a guide, within 500 feet of the guide. The rental operator must also demonstrate correct operating procedures and the proper use of safety equipment.

It is recommended that no person be permitted to ride a personal watercraft if he or she cannot hold on to the person in front (or handholds) or whose feet cannot reach the deck in order to maintain balance during operation. It is also recommended that no passengers sit in front of the operator onboard a PWC.

### The Close Call

*It was the end of the first camp out of the year at the family's favorite lake side campsite. All weekend long they had been watching other campers enjoying their personal watercraft on the lake, so when neighboring campers offered to let them borrow their PWC, the family jumped at the chance.*

*Dad, Mom, and 10 year old Corey put on borrowed life jackets before heading out for what they thought would be a quick turn around the bay. But once the family was away from shore, they found that the wind had kicked up three foot waves. Suddenly, Dad capsized as a huge wave hit him broadside. It threw him off the machine and into the cold water.*

*He had difficulty holding on because his hands were so cold, and his arms began to ache with the effort of trying to turn the PWC upright again in the choppy water. To make matters much worse, his borrowed life jacket didn't fit properly and kept riding higher and higher above his shoulders. Instead of being able to float in the water, he was struggling to keep his mouth and nose free of the life jacket.*

*Dad called to Mom and Corey on the second PWC to come help him. As they sped to the rescue, their PWC also capsized, tossing Mom and Corey into the cold, roiling water.*

*The family was very lucky. Some people on shore saw them, recognized they needed immediate help, and launched their motorboat to rescue the family. They also called 911 for an ambulance. Mom and Corey warmed up quickly after returning to shore, but Dad had to be treated for hypothermia at a local hospital.*

*Dad recognizes what a close call they all had. He's grateful to the watchful campers who rescued him, and he credits the life jackets, too, for helping them stay afloat until rescue arrived. Dad vowed that the whole family is going to take a boating safety course and buy PFDs that fit before going out on the water again.*

your surroundings. Never play “chicken” on a PWC. Never jump wakes close to other boats! Give fellow boaters and PWC operators a safety buffer in order to avoid potential collisions. Avoid loitering in the area of boat ramps, marinas and channels. Refrain from forcing larger craft to maneuver unnecessarily or excessively.

**YOU CAN OPERATE YOUR PWC RESPONSIBLY AND STILL HAVE FUN!**

**RECKLESSLY OPERATING YOUR PWC IS NOT ONLY DANGEROUS, IT IS ILLEGAL!**

## Operating Rules for PWC Operators

### Respect the Environment

Personal watercraft can go into shallow waters, but can damage the environment when doing so. The wake of a PWC can erode the shoreline, and operating PWC in shallows and marshes can disturb wildlife. Avoid riding your PWC in or near environmentally sensitive areas or disturbing wildlife.

If you must operate in areas like these, go slowly!

### Be Courteous

Personal watercraft aren't particularly loud, but they're not silent either. Constant PWC noise, especially from several in the same area, can be annoying because of the quality of the sound. The noise from your PWC may also annoy shore-side residents, especially if you start riding too early in the morning. Be considerate of the people on the shoreline. Operating alone or in a group continuously in the same area for long periods of time will cause more annoyance the longer you are there. Be especially mindful when riding close to shore, near anchored or moored boats, or around boaters trying to fish. Also be careful around water skiers. You can ruin a water skier's ride if the tow boat must power down or turn suddenly because your PWC came too close.

Remember, while you may be seeking a thrilling day, others around you may just want to have a quiet day on or near the water. With a whole lake or river available, the personal watercraft operator does not need to restrict his or her operation to one area, so move on.

### Operate Safely

Stay away from trouble—that means, keep well away from other boats, other PWC, and swimmers. Remember that the sun and glare off the water can cause your vision to narrow and you may miss something in the water that is not directly in front of you. Keep a constant lookout and be aware of

## Be Aware of Cold Water

Getting wet is part of the fun of riding a PWC, but remember that cold water kills, and New York has plenty of cold (below 60°) water. If you're riding a PWC in the spring, early in the summer or fall, consider purchasing a wet suit; you'll be more comfortable, and you'll be much safer if you fall in.

### Avoiding Hazards

Remember, it's not possible to steer a PWC when you release the throttle, and that fact can create dangerous situations. When facing a potential collision hazard, you may attempt to slow and turn the craft by releasing the throttle and turning the handlebars away from the hazard. But, because PWC have no rudder, turning the craft requires engine power. If you slow down too much, the craft continues on a straight course directly towards the hazard, regardless of the way you're trying to steer it.

Slowing down and trying to turn is instinctual; you must overcome the urge to do this and learn proper evasive maneuvers. When approaching a hazard, continue engaging the throttle and execute a turn away from the danger. You must practice this in order for it to become a second nature.

### Stopping

PWC have no braking mechanism. Simply put, if you wish to stop your PWC you must either execute a sharp turn or allow the craft to glide to a stop. At 60 M.P.H. it will take a PWC nearly 300 feet to glide to a stop, depending on the operator's weight and other factors. Practice stopping to get a clear idea of how long it takes you to stop on your machine. Slow down well in advance when you are nearing shore or a dock. Some newer PWC have added safety features. These may include off throttle steering and braking.

## Troubleshooting/Emergencies

### Reserve Fuel Tank

Remember the rule of thumb for fuel allocation from the previous lesson on trip planning? It applies to PWC too. Use one-third of the tank going out, one-third for returning and keep one-third in reserve. Many PWC are equipped with a fuel reserve switch (newer models may have a fuel gauge).

This allows a margin of safety when you run low on fuel. If you run out of fuel, switching to reserve provides fuel to get back to shore. Don't take chances when you're operating on reserve, and don't plan on using the reserve tank as the last 1/3 of a tank you set aside in your pre-trip planning because reserves are often much smaller than that.

**REMEMBER TO RESET THE RESERVE SWITCH ONCE YOU'VE FILLED UP AGAIN!**

## Righting and Reboarding

When you capsize, you need to set your craft upright and re-mount. The PWC should have stopped if you were wearing the engine cut-off lanyard. Never attempt to right the PWC while it is running.



To determine the correct way to right your PWC consult the owner's manual or look at the transom of the craft. Some have a sticker indicating the correct direction that is readable when the craft is upside down. Proper rotation keeps water from being forced into the engine. Be careful to keep your fingers out of the intake grate! You can break fingers if you place them in the intake grate while turning the craft over.

## Engine Overheat/Clogged Impeller Intake

If you experience a sudden decrease in power while you're operating your PWC, the most likely problem is an overheated engine caused by a clogged impeller intake. To clear the intake, turn off the engine, stand and straddle the seat facing forward, and try to roll the craft from side to side. This should release or rinse out any debris or sand from the intake grate. If that doesn't work, disconnect the engine cut-off lanyard and dismount the craft safely. Then, reach underneath and remove any debris from the intake grate. If this procedure doesn't relieve the problem, go to shore. Have someone tow you to the nearest shore, or restart the PWC and proceed at minimal speed to avoid damaging the PWC. Don't put the engine in reverse to clear the debris. It won't work!

## Flooded Engine Compartment

If you attempt to start the engine and it briefly runs, but then stops, it is likely there is water in the cylinders of the engine, especially if you've been capsized for awhile. If this happens, make no further attempts to start the engine or you can do serious damage to it. Get a tow to the nearest shore or ramp and onto your trailer if possible.

## Fire

If your PWC catches fire, the safest course of action is to jump off and swim clear of the machine. If the fire is small enough and your fire extinguisher is readily obtainable, you may try to put the fire out. However, fighting a fire is very dangerous and it is not worth risking injury or your life for your machine.

## Review Questions

1. What is the definition of a personal watercraft? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
2. What are the requirements for a person to legally operate a PWC? \_\_\_\_\_  
\_\_\_\_\_
3. What happens when the throttle is released and an operator attempts to steer the PWC? \_\_\_\_\_  
\_\_\_\_\_
4. What time of day is operation of a PWC restricted? \_\_\_\_\_
5. What are the three specifically defined reckless operations on a PWC? \_\_\_\_\_  
\_\_\_\_\_
6. What piece of equipment must be used if the PWC is so equipped? \_\_\_\_\_  
\_\_\_\_\_
7. What are the operating restrictions for a PWC near a swim area? \_\_\_\_\_  
\_\_\_\_\_

Answers on page 82

## Water Skiing & Other Towed Activities

Water skiing on a hot day is the essence of summer fun. Wake boarding, tubing and parasailing are other forms of water skiing that are quickly growing in popularity on New York’s waterways. The New York State Navigation Law considers all of these activities “Towing of Persons.” You must follow a few simple rules when participating in these sporting activities to be legal, and more importantly, safe!

When engaging in towing water sports, there must be a minimum of three people aboard: the operator of the craft, an observer to keep a lookout for the person being towed, and the skier or other person being towed behind the boat. These three must work together as a team.



**The operator** is responsible for handling the boat, avoiding other boats, and providing a smooth, steady ride for the person being towed.

**The observer** must be at least 10-years-old and is responsible for watching the skier or tuber and relaying the status of the person being towed to the operator. The observer should know the hand signals the person being towed might use.

**The person being towed** is responsible for their wellbeing and should act responsibly. The person should have established hand signals with the observer so that they can communicate with each other. If the person being towed is a skier, he or she must ski safely within their abilities. Keep in mind that a skier can be charged with reckless operation!

### Always remember:

No recreational towing activities are permitted between sunset and sunrise.

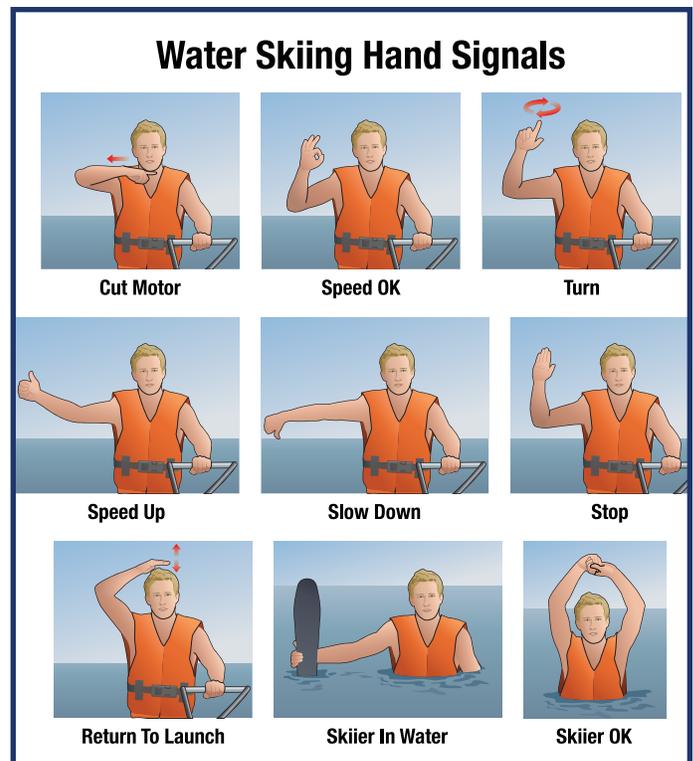
Anyone being towed behind a boat must wear a securely fastened US COAST GUARD approved PFD. Type III PFD’s that are strength tested for water skiing are the best for these activities.

A boat engaged in towing a person(s) receives no special consideration under the Rules of the Road. They must give-way to other boats, or stand-on as the circumstances require. As always when boating, stay clear of the shore, docks, swimmers and other boats.

The person being towed is considered a passenger on the boat and, accordingly, you must have a seat available on your boat for that person or persons. This is not only the law, but it is common sense: If a person being towed becomes tired, sick or injured and can no longer be towed safely, he or she must be able to come aboard. This is a crucial consideration when determining your carrying capacity. And remember, as noted earlier, if you plan to tow a tube or skier with your personal watercraft, it must be rated for at least three persons: the operator, an observer, and the skier.

The operator should always give the person being towed a smooth easy ride. Let the person being towed signal what they want to do rather than try to think for them. Avoid sharp, sudden turns and keep the person being towed well away from potential hazards.

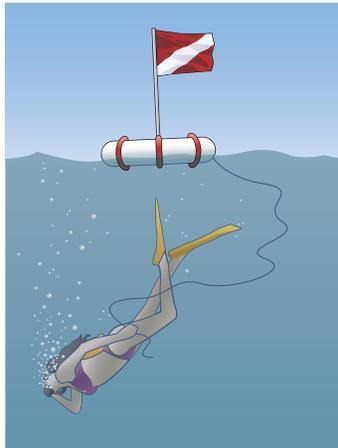
Always use a tow length of at least 75 feet. Keep the person being towed at least double the length of the tow line away from the shore, moored boats, docks and the like. If a skier or tuber falls, circle around slowly, trying to position the towline or tube for another run. If the person being towed is ready to get into the boat, make certain that the motor is turned off so that the propeller isn’t turning before helping the person aboard.



## Diving

All boat operators should be aware of the two flags which indicate the presence of divers in the water.

Always be on the look-out for the “diver down” flag, which is red with a white diagonal stripe, as shown to the near right. It will be attached to a float or a boat. This flag indicates that there is a diver in the vicinity, and that boats should keep at least 100 feet away. Be aware that while the diver should be within 100 feet of the flag, divers can drift with the current and they may be further away. Pass these flags as widely as possible, and be on the lookout for air bubbles indicating the divers’ position.



You may also see the blue and white “alpha flag,” which is required to be flown by the operator of a dive boat when conducting dive operations. Boats flying this flag have restricted maneuverability.

Other boats must keep at least 100 feet away from either flag unless the boat is actively servicing divers on the surface or below. It is the diver’s responsibility to stay within the 100 foot buffer zone of the divers flag. Boaters must give a wide berth to boats displaying the alpha flag. If it is necessary that you must come within the safety area, approach the flag or boat with caution and communicate with anyone you see.

## Fishing and Hunting

Fishermen and hunters generally consider themselves sportsmen rather than boaters. However, if they are using a boat to hunt or fish, all boating laws apply. For many people, the only reason they own a boat is to get to the out of the way fishing spots. There are boats designed and built specifically for the sportsman, from bass boats to boats specially equipped for trolling.

Be courteous if you see someone fishing from their boat by staying well clear of them. They may have lines or nets in the water that you might damage if you come too close. Your wake may also swamp or flip their boat, pull



their anchor loose from the bottom, or dump one of the occupants in the water. Remember, you are responsible for any damage caused by your wake when passing other boats, docks or swimmers.

Duck hunting from a boat is popular in the autumn. Hunters also use boats to set decoys or to travel to remote hunting areas. New York State Environmental Conservation Law allows a boater to carry a legally registered and New York State licensed handgun on a boat. The law also permits boaters to carry long guns, rifles or shotguns, but these must not be loaded when the boat is underway. The hunter may load or discharge the firearm only when the boat is not underway (moored or anchored).

Cold water is a serious hazard for sportsmen. Hypothermia and death can result if a boat capsizes and its occupants are immersed in the cold water. The risk is greatest in spring and fall when there are fewer boaters and marine patrols on the water, increasing the response time. Because the hunting and fishing seasons tend to open when the weather is colder, the risk of exposure is especially high for sportsmen.

If you are fishing or hunting from your boat, stay out of the main boating channels so that you do not have to move to avoid other boating traffic. Be constantly aware of wakes from other boats as you move about your boat. Most importantly, remember that cold water kills. File a float plan, don’t overload your boat, and wear your PFD! You must wear your PFD between November 1st and May 1st on boats less than 21 feet in length.

## Swimming

In the heat of summer nothing cools and refreshes like a dip in the water. If you plan on swimming from your boat in the middle of a lake or other waterway, remember these important safety considerations:

- Always securely anchor or moor your boat before swimming. A boat adrift may float away from the swimmer.
- Consider wearing a PFD, especially if you are swimming in cold water and/or swimming in a strong current.
- Stay near your boat since other boats may not see you in the water.
- Always swim with a buddy.
- Before anyone enters the water from your boat, shut off the boat engine to eliminate the chance of a propeller injury to swimmers entering and exiting the water at the stern of the boat.
- When picking up swimmers, remember to shut your engine OFF and make sure it is out of gear.
- While swimming at a dock or at anchor, shut off the boat engine and gasoline powered generators with transom exhaust outlets. This will eliminate the chance of carbon monoxide (CO) poisoning which can result in death. CO related deaths are often mistaken as drownings.

## River Running

River running can provide extreme thrills, but may also provide extreme danger. In the Northeast, there are several fatalities among river kayakers and canoeists each year



because they underestimated the power of moving water. After the snow melts and the ice thaws, or after strong rains, the rivers swell with water and the speed of the current increases. Debris is flushed

into the water as well, causing hazards that normally aren't present. Take a few safety precautions to ensure that your river running trip is safe and enjoyable.

Remember that fast water is often cold water, so be prepared. Always wear a PFD and do not overload your boat. Know the river before you go on it; walk along the bank to scout rapids before attempting to run them. Know where there are possible dangers. Beware of submerged and overhanging branches (called "strainers"), submerged rocks, and floating debris. Plan your route, know where the larger drops are, and if necessary, portage around them.

Never boat alone; a three boat team is best. If you fall in moving water, stay on the upstream side of the boat if possible. Don't try to stand—your foot may become trapped in a rock, and the rushing water could force you under. Instead, float facing downriver in a sitting position with your feet up. Use your arms and legs to swim out of the current and into slower moving water and try to move toward shore.

## Kayaking

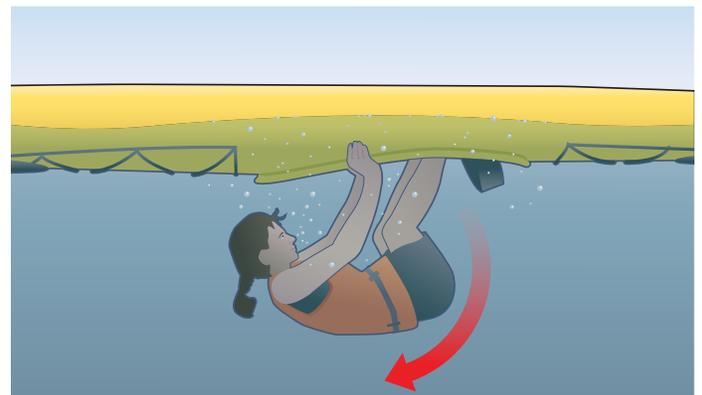
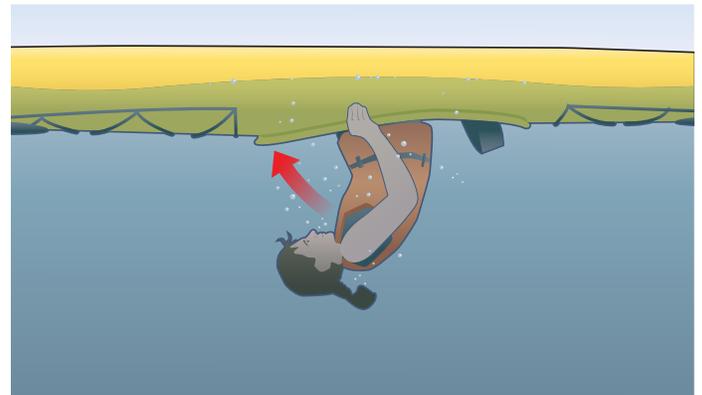
If your boating goal is to see wildlife in the waters close to home, or just to get a little fresh air and exercise on a sunny afternoon, the fast-growing sport of kayaking might be for you.



Kayaks can handle the wind and waves on open waters from rivers to fresh water lakes to the sea coast. Kayaking can be quiet and serene, or quite challenging. All kayaking requires proper training and good judgment.

There are kayak symposiums and kayaking schools across the state. Dealers or local clubs sometimes offer kayaking instruction, including intensive instruction from experts on all aspects of paddling. Take a beginning whitewater kayaking course to learn basic boat handling skills. Most paddling skills are easy to learn, but kayaking requires you to be in good health and good physical condition—and be able to swim.

Capsizes are relatively uncommon, but all paddlers must learn how to turn over and get out of the boat (referred to as a "wet exit"). In a pool or near shore with a friend, enter your boat, and turn the boat over. While upside down under water, tuck and reach forward and, with legs straight, push off of the kayak with your hands as if removing a pair of pants. Repeat



this maneuver until you are comfortable with it. Most kayaking deaths result from capsizing in cold water. If you kayak in cold water, wear a wetsuit or drysuit, and a PFD.

When paddling, keep your arms and elbows down and relaxed as much as possible. Keep the paddle shaft close to the deck. Avoid letting the returning blade get high in the air where the wind can grab it. Reduce your fatigue by using many muscle groups—rotate your shoulders and upper body at each stroke. Keep your eye on the blade as you pull it (pushing with the off-side hand) through the water. Lean over on the paddle slightly.

While paddling it is recommended that you wear your PFD. You are required to have a whistle or other efficient sound producing device. At night you are required to have a flashlight or lantern to show in sufficient time to prevent collision. It is also recommended you carry a hand pump or bailing device and a spare paddle for emergencies. You should also place bow and stern lines for assistance in emergencies.

In hot weather, paddle at an easy pace and drink plenty of liquids during the day. Lassitude, a lack of will to carry on at a modest pace, is an early sign of overheating. If this happens to you, take a break, drink more fluids, take a swim from the boat, sit in the water by the shore or pour some water over yourself. Wearing a hat will also help to reduce your body temperature.

Stick with your group. If you want to take a few people away from the group, discuss it first with the entire group. Establish group horn signals (to gather up, boat over, etc.) Groups always spread out, so identify a few waiting points along your course. Each time you stop, clearly indicate the next rest point. Always paddle at a speed to accommodate the weakest paddlers in the group.

Kayaks and canoes are hard to see and are not picked up by radar, so larger boats may not be able to see you. Cross boating channels at right angles to traffic after oncoming boats have passed. Groups should cross together, not one by one.

### Mike's Last Paddle

*It was a warm April and I just couldn't wait to try out my new kayak. My friends Mike, Hank, Linda and I piled into Dan's pickup with our kayaks and canoes and headed to the fishing access site on the other side of town. Dan was the designated driver for the day; he was going to check in with us at certain spots along our route, and pick us up at the end of our journey.*

*We put our boats in the water and off we went. A week's worth of rain and the winter snowmelt meant that water was high, fast and rough; but we're experienced river runners and we looked forward to an exciting ride. We were having an exhilarating trip when we went under the first bridge. Dan had driven there as planned and we waved to him as we passed underneath. As we turned a bend, we came upon a fallen tree across the river. I was on the outside of the group so I was able to stay clear of the tree, but my friends couldn't.*

*Meanwhile, Dan had stopped at his next checkpoint—a clearing along the river where he could see us go by. A few moments after arriving, he saw two canoes floating by, upside down. "It was the scariest thing I'd ever seen," Dan said. He called 911 on his cell phone and started running upstream. After about half a mile he found me, Hank, and Linda.*

*Hank and Linda were in the water, hanging onto the tree. Mike's canoe was wrapped around the base of the tree. When I saw the canoes run into trouble I grounded my kayak and ran back toward the bend to try to help. I kept Hank and Linda within sight while I looked for a safe way to reach them. When I saw Dan, I sent him to scout the riverbanks for signs of Mike. About that time a fireboat showed up for the rescue.*

*"Our motor boat had difficulty taking those two out of that tree, the water was high and moving fast, and branches keep pushing the boat away," the fire chief acknowledged. "The couple we rescued was suffering from hypothermia—the ambulance transported them to the hospital."*

*Dan and I, with the firemen and other rescuers, scouted the river for hours. The only sign of Mike was his PFD, caught in another strainer further down the river. Days later, when the river flow was down, police divers found Mike's body under the first tree.*

## Racing/Regattas

A regatta is an organized event and often attracts public interest. There will be more boat traffic in the area of the regatta, and there will likely be observers on shore as well. When travelling in an area where there is a regatta, always wait for an escort boat to guide you through safely. If the event doesn't provide escort boats, proceed at a safe, no wake speed and don't cut through the event.

Any race or regatta requires a permit issued by New York State Parks, New York State DEC or the US Coast Guard. Before issuing a permit, New York State Parks, DEC, or the US Coast Guard will consider:

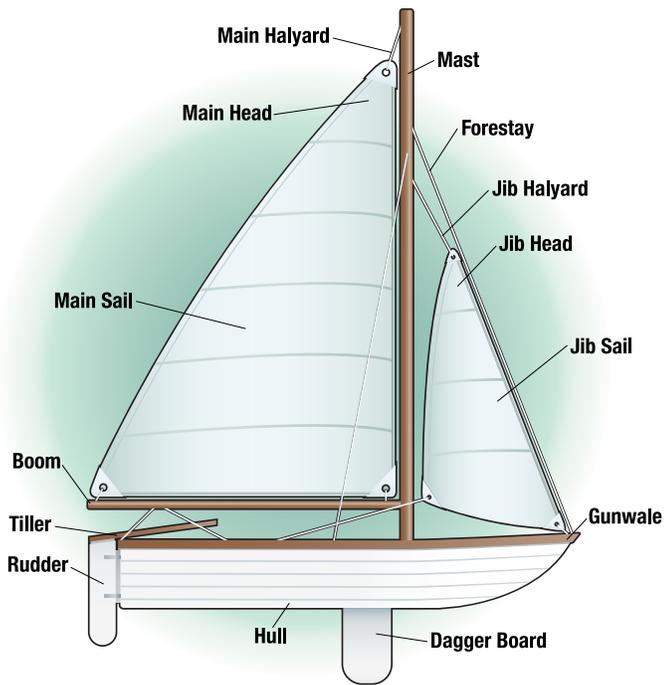
- How many safety patrols will the event require?
- Will a portion of the waterway be shut down?
- How will other boaters transit that area?
- Are there laws that may have to be suspended? If so, what laws?
- Will the event create noise? If so, at what time of day?
- Is the event near an area that is a preserve or where endangered species may live?

If you are organizing a race or regatta, start your paperwork early so that you will receive your permit in time for the event.

## Sailing

Sailing is a challenging sport, much more so than power boating. With a good instructor, you can learn the fundamentals of sailing in just a day or two and, the more you sail, the better your skills will become.

There are four components to a sail boat: the hull, the sails, the daggerboard (or keel) and the rudder. The hull carries the crew and supports the mast and rigging. Sails provide motive force. The wind fills the sails and pushes the boat according to how the sails are aligned. The centerboard (or keel), keeps the boat from being pushed sideways and provides stability. The rudder steers the boat and may be turned by either a wheel or a tiller.



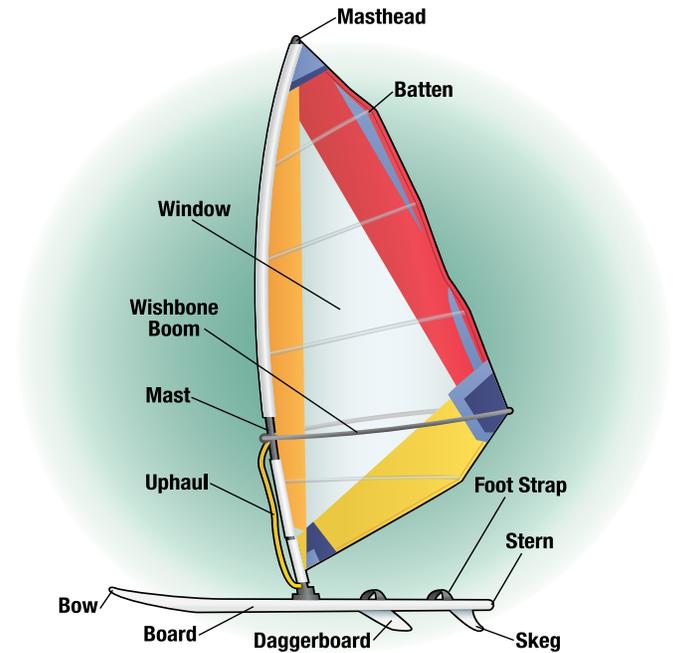
You'll make mistakes as you learn to sail, so try to keep to uncongested areas at first, and try out your skills in light winds. Learn to respect your boom. It can knock you or your passengers off the boat, and can cause serious injuries! If you have a smaller sailboat, practice capsizing on a hot day so you are not surprised the first time it accidentally happens to you.

## Wind Surfing

Windsurfing (or boardsailing) is a sport that combines sailing and surfing and uses a one-person craft called a sailboard. The basic sailboard is composed of a board and a sail rig attached together by a universal joint. The universal joint allows full manual movement of the sail through the use of a wishbone boom. By standing on the rudderless board and maneuvering the sail, the windsurfer harnesses the wind and waves to glide across the water. Sail boards are capable of moderately high speeds and are usually used on lakes, or close to shore on the ocean, sometimes within the surf zone.

Wind surfers can travel over flat water as long as there is enough wind. They can also cut into breaking waves and perform spectacular stunts. Different variations of wind surfing include speed sailing, slalom course racing, and freestyle. Novice windsurfers can take lessons and most will be able to sail, steer and turn the craft after just a few hours of instruction.

Different sails are used for different purposes. Wave sails are reinforced to survive in the surf. Freestyle sails are designed for low-end power to allow for quick acceleration. Free-ride sails are for all around use and are easy to use and appropriate for the recreational sailboarder. Racing sails provide speed, but sacrifice maneuverability and comfort.



If you plan to take up windsurfing, you may consider the following additional equipment which will offer a safer and more comfortable experience:

- Harness
- Wet/Dry Suit
- Footwear
- Helmet
- PFD— a sailboard is considered a boat in New York State and must carry a PFD (as well as other equipment required by New York State law). The best place to stow the PFD is on your body!

**IF YOU SAIL, WEAR YOUR PFD AND LEARN TO SWIM!**

## Boat Rental

You don't have to own a boat to be a boater. All across the state there are boat liveries that rent boats to the public. Liveries can even rent to someone without a boating safety certificate who is at least 18 years of age even when the boat is a rental. Inspect the boat before renting it. Review the capacity plate before you leave the dock. Never exceed the capacity plate of the boat: Don't carry too many passengers and check that the motor doesn't exceed the rated horsepower on the capacity plate. Be sure to check these other things during your inspection:

- Make sure that all fuel hose and electrical wires are in good condition and not cracked, kinked or damaged.
- Inspect gas tanks to make sure they are full. Remember gauges may read inaccurately.

- Check the engine oil. Look over the engine, making sure that it is not leaking oil.
- Check the bilges. They should have little to no water and be relatively clean.
- Make sure that all navigation lights are working.
- Have the agent of the rental company show you how everything works aboard the boat, even if you think you know how it works.
- Have the agent show you where all required equipment is located such as PFD, visual distress signals and fire extinguishers (see required equipment check list).
- Inspect all the safety equipment aboard with the agent and ask the agent to replace anything you find unsatisfactory.

**IF THE BOAT ISN'T SAFE OR SEAWORTHY, DON'T RENT THE BOAT!**

## Stand Up Paddleboards (SUPs)

Stand up paddleboarding is one of the fastest growing watersports. The SUP is reminiscent of a surf board and is propelled by a paddler standing up. Different SUP styles allow for paddling on flat water, moving or whitewater, in the surf and even for fishing and yoga. Recreational/ touring boards are good for beginners as they are long and wide offering excellent stability. SUPs for surfing are narrower, shorter and lighter in weight. Racing SUPs are long and narrow; built for speed and are less stable when not moving fast. Inflatable SUPs are not as rigid as fiberglass or plastic SUPs, but have the advantage of being easily transported and stored when uninflated. They are favored

for river running because they bounce off rocks and do not dent. Specialized SUPs are being developed for fishing and yoga. They are longer and wider. Fishing SUPs have special features such as attachments for fishing poles, tackle, and coolers. Yoga SUPs have soft decks, and an attachment point for an anchor to keep from drifting.

Stand up paddleboarding is easy to learn, a great work out especially for your abdominals, and doesn't require much gear to get started.

A SUP is considered a vessel when it is used outside of a surf or swim area and a life jacket is required for each person on board as well as a sound signaling device. A mouth whistle is acceptable and is easily attached to the life jacket. It is highly recommended that the life jacket is worn. Inflatable belt pack life jackets are compact and can be inflated on demand and many inherently buoyant life jackets are stylish, and comfortable. The exception to wearing a life jacket is when paddling in the ocean surf zone as the life jacket may restrict the ability to swim under the waves.

In addition to the required life jacket and whistle, a leash is a recommended piece of safety equipment. Leashes come in three different types: straight, coiled and hybrid (combination of coiled and straight). Coiled or hybrid leashes are recommended for flat water and open ocean and can be worn either on the ankle or calf. They are helpful in retrieving the board after falling off. Straight leashes are recommended for the ocean surf zone. The straight leash has no elastic recoil which could cause injury by springing back the SUP at a fallen paddler. Quick release coiled leashes are recommended for moving or whitewater. The leash is worn on the waist and must be reachable by either hand. Helmets and elbow and knee pads are also recommended.

### Review Questions

1. Who comprises a water ski team and what are their roles? \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
2. If a boater sees red and white divers down flag, what actions should he take? \_\_\_\_\_  
 \_\_\_\_\_
3. Sportsman often boat at times when there are cold water hazards. What are some things they can do to stay safe? \_\_\_\_\_  
 \_\_\_\_\_

Answers on page 82

If most people had to guess, they'd say that boating fatalities occur during violent collisions involving large boats far off shore. The truth is that the vast majority of fatalities occur either when a small boat capsizes or when a passenger falls into the water.

In 1980, 61 people died in boating accidents on New York's waterways, a staggering rate of more than 19 deaths per 100,000 registered boats. Those numbers have decreased over the years, reaching a low in 2006 of only 14 deaths, or less than 3 per 100,000 registered boats. Although the decline is good news, of those 14 deaths, perhaps half of them could have been avoided through the simple use of a PFD. It cannot be emphasized enough: If you fall into cold water (and New York's waters are cold for most of the year) and immediate rescue is not at hand, your chances of survival are not good. You can improve your odds by wearing your PFD whenever you're on the water, especially when the water is cold!

A collision between two or more boats is still the most common type of boating accident and often results in traumatic injuries. You must adjust your boat's speed when the waterways are crowded, and you must be constantly aware of what is happening around you. Never drink alcohol while boating. It can be lethal. Although alcohol does not appear to be a significant factor in most accidents, there is a high percentage of fatal incidents that involve alcohol. In other words, you may get into an accident sober, but you're far more likely to die in an accident if alcohol is involved.

Accidents will happen, and it is impossible to eliminate all accidents and fatalities. However, we should strive to make the waterways as safe as possible for everyone, and using courtesy toward other boaters is a good start. Boating education classes help, but you—and all the other boaters on the waterways—must be willing to apply the knowledge you gained in class. Tougher laws can help by making it possible to remove some of the more obvious dangerous boaters from our waterways, but marine law enforcement is limited in its ability to cover all waters at all times. Education and enforcement must be combined with, and complemented by enforceable laws.

## Accident Reporting

Just as there are laws and rules about reporting automobile accidents, there are laws and rules about reporting boating accidents too. If you are involved in an accident involving a boat, including canoes and kayaks, where damage to any vessel or property occurs, the operator shall exhibit his certificate of registration and give his name, address and identification of his vessel in writing to any person injured and to the owner of any vessel or property damaged. If the person sustaining vessel or property damage or injury cannot be located or if the operator involved in an accident

leaves the scene then the accident shall be reported to the nearest law enforcement as soon as possible.

If you as an owner or operator of a boat involved in a boating accident in which there was an injury, death, or disappearance of a person, or if property damage exceeding \$1,000 to any one party has occurred, you must report the matter in writing to New York State Parks within 5 days of the accident. Failure to report an accident is a violation under NYS Law. You can download an accident reporting form from the Safe Operation section of the State Parks web site: <https://parks.ny.gov/recreation/boating/>

Recreational boats operating in a commercial capacity are not exempt from any of these provisions.

## Rendering Assistance (Good Samaritan Law)

### According to Section 41.3 of the Navigation Law:

"It shall be the duty of every master or pilot of any boat to render such assistance as he can possibly give to any other boat coming under his observation and being in distress on account of accident, collision or otherwise."



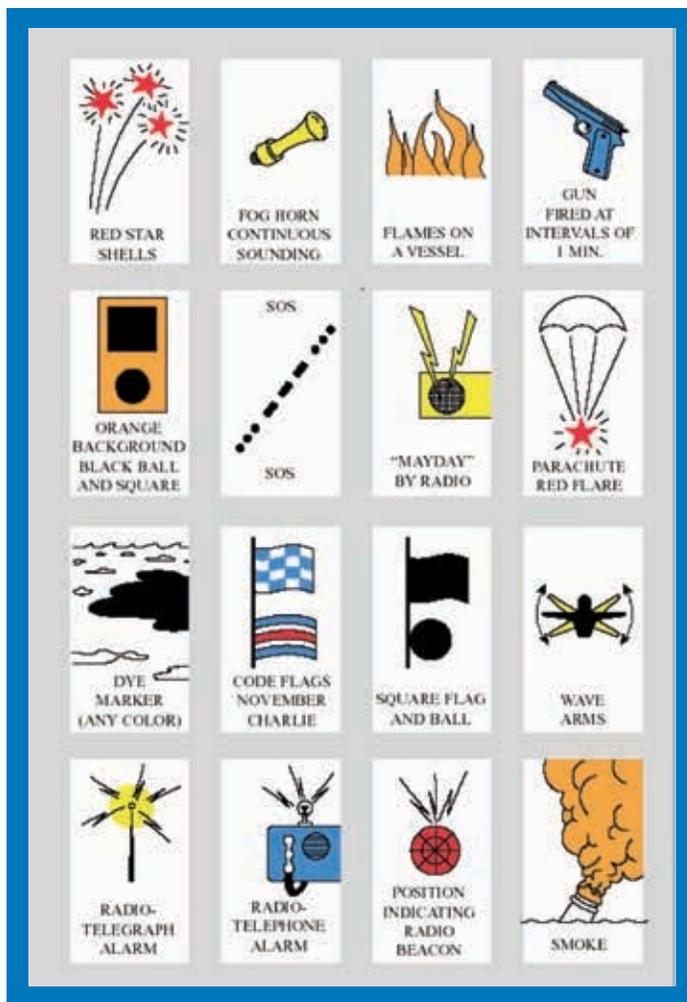
That means that if you come across another boat that is in distress, the law requires you to assist that boat to the best of your abilities. You are excused from this duty only if rendering assistance would:

- endanger your boat;
- endanger your passengers;
- interfere with other rescue efforts or law enforcement; or
- cause further or more extensive damage.

You should know how to recognize a boat in distress. Keep in mind that the operator of a boat in distress may have exhausted his supply of visual distress signals, and may be trying other means to get your attention.

Even if you don't see something that looks like a distress signal, be aware of how other boats on the water with you are sailing and how their passengers are behaving. You may observe that a boat has a severe list (leaning over), or

## International Distress Signals

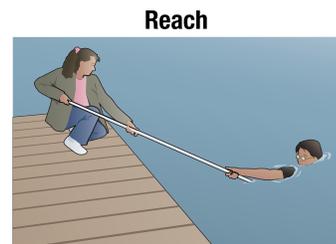


is sitting unusually low in the water. A sailboat may have its mast or boom down. Perhaps there are people jumping up and down, waving their arms or towels, clothing, PFDs, or bed sheets. Passengers may be yelling to attract attention. Sail closer to investigate any behavior that seems unusual to determine whether the other boat needs help.

### Man Overboard Rescue Sequence

If you ever need to help someone in the water, whether you're in a boat or on shore, remember this rescue sequence: Reach, Throw, Row, Go. The idea behind the rescue sequence is to keep the rescuers out of the water if possible because once another person enters the water, the situation becomes much more dangerous. Not only is another person exposed to potentially dangerous currents, waves, and boat traffic, but the victim may panic and prevent the rescuer from helping him or her. Sometimes victims accidentally drown their rescuers! Always try other methods before entering the water to attempt a rescue.

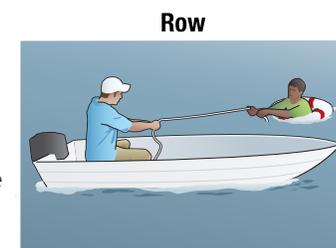
**REACH**— If the victim is able and is close enough to shore or your boat, try to guide him or her to swim to safety. When the person is near enough, try to reach him or her with a pole, ladder, stick or other long item. Reaching for the victim keeps you out of the water and out of harm's way.



**THROW**— Using the throw method, you attempt to rescue the victim from shore or your boat by throwing a line or floating object. After safely anchoring yourself, you can pull the victim to safety without ever having to enter the water yourself.



**ROW**— In this method you use a boat to approach the victim and help him or her out of the water. Be careful, or the victim may capsize your boat! The victim may be tired and probably will need help getting on board your boat. If you're thinking about a row rescue, consider your boat's capacity—don't overload your boat and put yourself at risk!



**GO**— This is the most dangerous method, and you should only attempt it if there is absolutely no other choice, or if you are a trained lifeguard. Enter the water wearing your PFD and a flotation device for the victim to hang onto. Be aware that when you make personal contact with the victim, he or she may panic, grasp at you, and drag you under the water. Be prepared for this. Push the PFD toward the person, tell them to grasp it and tow the person in.



Don't underestimate the effort that swimming to safety with the victim will require. If you're unsure that you'll be able to make it, don't attempt it!

### Accidents—Prevention and Response

You can prevent many accidents if you communicate with your passengers. Before you allow passengers on your boat, explain your rules. Before you cast off, show them where you keep your safety equipment, and make sure they know how to use it. Find out if any of your passengers have any knowledge of first aid procedures. Well informed and well-behaved passengers help ensure a safe voyage.

However, not all accidents can be avoided. The following section discusses different types of accidents and the appropriate response for each.

## Fires

Fires on board can be terrifying, can do a lot of damage to your boat, and most important, can be deadly. The best way to fight a fire is to prevent it from happening in the first place. Check your fuel lines, clamps, and the tank itself for leaks. Observe safe fueling practices. Place portable tanks ashore when filling. Run the blower before starting your engine, and use your nose to sniff out fumes. Clean up fuel spills immediately and leave the oily rags on shore. Practice good housekeeping and keep your boat clean! Don't allow smoking near the fuel (or better yet ban all smoking on your boat). Use extreme caution if you cook on board.

### Types of Fires

**Class A fires** are fires of organic materials that leave an ash, like wood, paper, cloth, fiber rope, etc. You can fight this type of fire using any type of extinguisher. Always follow up by dousing the burning material with water to prevent re-ignition.

**Class B fires** are burning liquids, like fuel and oil, and generally occur in the bilge. Carbon dioxide or dry chemical extinguishers work best on these fires. You should never use water; dousing a class B fire with water will spread the fire rather than extinguish it.

**Class C fires** carry a current; they happen when live, energized electrical wiring or equipment ignites. Using a carbon dioxide extinguisher is best, as it will cause the least damage to the energized electrical gear. Dry chemical is effective for extinguishing these fires, but leaves a residue. You should never use water around electrical equipment; it will conduct electricity and can electrocute you and your passengers.

### Fire Extinguishers

Fire extinguishers pose the first, and sometimes only, line of defense against fires on most recreational boats. As discussed earlier, you must carry a fire extinguisher as required by law, and carrying more than one so that you have a spare extinguisher is always a wise decision. Make sure your equipment is in working order and maintained according to the manufacturer's instructions. Check your extinguishers frequently to ensure they carry a full charge and that the nozzle is clear of debris. Mount fire extinguishers in a readily accessible location, ideally near the operator.



## Responding to Fires

If you have a fire on your boat, follow these steps in order:

Don your PFD immediately if you're not wearing them already. They may not be accessible later, and they increase your chance of survival if you must abandon the boat. Try to position the boat so that the wind blows the fire away from the boat. Meanwhile, radio or call for help, and use your visual distress signals. If it's safe and possible to do so, use your extinguisher to fight the fire using the PASS method:

- Pull the safety pin,
- Aim the nozzle at the base of the flames,
- Squeeze the handle in short (½ second) bursts, and
- Sweep the nozzle from side to side.

If the fire is out of control, abandon the boat. Get clear of the fire, but stay in the vicinity as it will help rescuers locate you.



## Capsizing and Falling Overboard

Approximately 75% of all boating deaths are the result of a boat capsizing or someone falling overboard. In almost all of these cases, that person's life may have been saved if only he or she were wearing a PFD. When the water is cold, a PFD is often the only chance you'll have for survival because the shock of the cold water makes swimming or holding your head up above the surface very difficult.

Overloading your boat may lead to capsizing. Adhere to the limits on your boat's capacity plate, and use common sense. The risk of capsizing increases when the weather is rough or the current is hazardous, so be particularly cautious in difficult conditions. You also increase the risk of capsizing if you allow passengers to move around while underway, or permit someone to ride on the bow or gunwale. That can shift the weight of your boat off center, especially if you have a smaller boat. Also, avoid sharp turns at high speeds which can throw a person out of a boat.

**DON'T EVER STAND UP IN SMALL BOAT!  
MAINTAIN THREE POINTS OF CONTACT WITH THE BOAT.**

## Responding to a capsized

If you're in a boat that capsizes, grab a PFD immediately if you're not already wearing one. If your PFDs aren't by your side (readily accessible), grab something that floats, such as a seat cushion or a cooler. Take a head count to see who else is in the water with you, and note how many people are wearing their PFDs. Try to help anyone who doesn't have a PFD find something that floats to hang onto. Stay with the boat; the shore is probably farther away from you than it looks. If you can, climb into or onto the boat—this is where rescuers expect to find you. Wait until help arrives. If you have a workable radio, send out a distress message. Save your pyrotechnic distress signals until you see other boats in your area.

## Responding to a Person Falling Overboard

If a passenger falls overboard, toss a PFD to them, that's why boats over 16 feet are required to carry a Type IV PFD. Assign someone to keep an eye on the victim and continuously point to the victim's location. Approach the victim from downwind so the wind blows the victim to you, rather than blowing your boat over the victim.\* Turn off the engine, and ensure that the propeller isn't spinning. If possible, assist the person back aboard the boat, preferably at the stern. Be careful, a panicking victim may capsize your boat while climbing in.

\*If the weather is bad, try to approach the victim on the windward side to shelter the victim from the wind. This will also decrease the size of the seas. This will make it easier for the victim to approach the boat and will assist the rescuers doing the recovery.

## Cold Water Immersion and Hypothermia

Cold water is deadly. A body immersed in water with a temperature of less than 70°F will become incapacitated quickly. If the water is cold, 50°F or less, an average adult has only a 50% chance of surviving a 50 yard swim. The problem is not just hypothermia. Cold water can kill in any one of four stages:

**Stage 1 is Cold Shock.** This stage occurs immediately upon entering the water, and can last from 30 seconds to 5 minutes. Cold shock affects breathing. It causes uncontrollable intakes of breath, increased breathing rate, reduced ability to hold your breath, and an increase in heart rate and blood pressure. This inability to control breathing can cause drowning and is the primary reason that wearing a PFD when the water is cold is critical. The PFD will keep the head above water and allow the victim time to regain control over breathing.

**Stage 2 is Swimming Failure.** This happens after a person has been in cold water for 5 to 30 minutes. Even excellent swimmers can go into swimming failure. A person in swimming failure loses manual dexterity, cannot coordinate breathing and swimming strokes, and suffers a loss of muscle coordination. This will result in difficulty

holding the head above water, which can lead to drowning. Perform most important functions first, including situational assessment, decision making and self-rescue activities.

**Stage 3 is Hypothermia.** Cold water cools a body about 25 times faster than cold air does. Being immersed in cold water is much worse than being out in freezing air without a coat. Immersion in cold water will cool the body's core temperature, which affects the brain, heart, and internal organs. It usually takes about 30 minutes for hypothermia to set in fully. A person suffering from hypothermia will shiver intensely and suffer reduced blood flow to the extremities and skin. In later stages of hypothermia, the sufferer experiences loss of consciousness and heart failure. Focus on slowing body core heat loss and be prepared to signal rescuers.

**Stage 4 is Post-rescue Collapse.** People rescued from cold water often may not survive the experience. Cold exposure may create significant changes in the body's physiology leading to dangerous heart rhythms which may cause death. Exposure to cold water is a critical medical emergency; call trained rescue personnel immediately!

## Treatment of victims

If you are involved in a rescue of a person who has been exposed to cold water, lay the victim on his or her back. Handle the victim gently, remove wet clothing, and wrap the victim in warmed, dry blankets if possible. Bring the victim indoors, or into a warm vehicle, or if you're in a boat, into an area that is as protected from the elements as possible. If the victim is alert and responsive, and hot packs are available, apply them to the neck, armpits and groin area. You may give the victim a warm drink, but nothing with alcohol or caffeine as these may induce erratic heart rhythms. If the victim is unconscious, incoherent or unresponsive, do not use hot packs, (you could burn their skin). And don't give the victim anything to drink.

If you cannot protect the victim from the elements and you have no warm blankets or clothes to wrap the victim, share your body heat by lying full length next to the victim. Do not rub the victim's skin and don't let the victim walk or exercise. Make the victim stay still; you need to protect the victim from developing potentially dangerous heart rhythms. As noted above, never allow the victim to have alcohol!

## Surviving immersion

A PFD is critical to your survival, so wear one whenever you're boating on cold water. If you fall into the water, don't shed your clothes unless they're causing you to sink; clothing will help your body retain its warmth in the water. Try to be still in the water because movement will cause faster



heat loss. Get out of the water as soon as possible, but don't try to swim to shore; it's usually farther away than it looks. Climb on top of an overturned boat or any other floating debris, and try to get the attention of the nearest boat.



If you're stuck in the water with nothing to climb onto, adopt the "HELP" position: Heat Escape Lessening Position. Wearing your PFD, curl into the fetal position to the extent possible while keeping your nose and mouth out of the water. This will help slow the body's heat loss.

If you are unable to get out of the water, and someone else is in the water with you, you can work together to retain body heat by huddling together. Again, this is most effective if you are wearing your PFD.

## Running Aground

Grounding your boat can damage it and injure you and your passengers. Pay attention to the buoys and channel markers; they are there to show you the areas of safe passage for your boat. Be as familiar as you can with the waters that you are sailing. If a navigation chart for the waterway is available, get one and use it. If you have a depth sounder or fish finder, these also can help you to avoid hazards on the bottom.

If you ground your boat, first make sure you did not put a hole in your hull. If your hull is intact, remove extra weight from the boat in order to refloat it. Pull the boat gently away from the obstruction, but do not try to back it out under power. You might damage the hull. If you're in an area where there are tides, wait for a high tide to float your boat. If you cannot re-float your boat yourself, call for assistance or use your visual distress signals to alert other boats of your accident.

## Collisions

Collisions are the number one cause of boating accidents and result in millions of dollars in property damage, dozens of deaths and an untold number of injuries every year. Collisions are preventable; you can avoid collisions by knowing and following the Rules of the Road, and maintaining a proper lookout. Your responsibility as operator of a boat is to:

- operate safely,
- at reasonable speed, and
- keep a lookout for other boats or obstructions in the water.

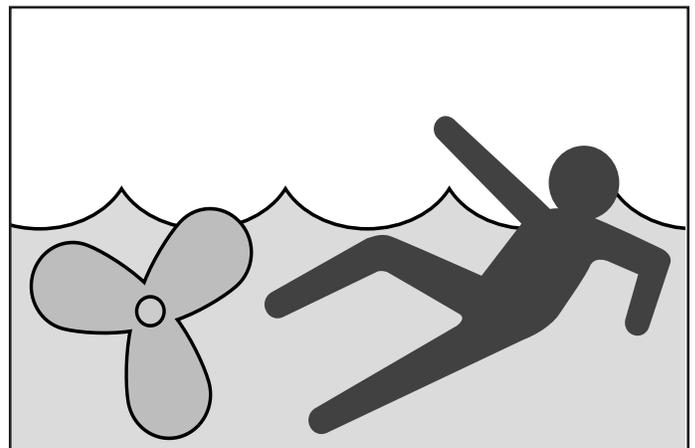
Make sure that you use your navigation lights at night and during times of restricted visibility; your navigation lights ensure that other boats can see your boat.

If you have a collision, put on your PFDs and call for help or use visual distress signals. Check passengers on your boat and the other boat for injuries. Common collision injuries are propeller cuts, broken bones, and head, neck and spinal injuries. Check whether there has been damage to fuel lines or a fuel spill. If so, try to repair the lines and do what you can to clean up any spilled fuel. Do your best to avoid creating any sparks that might ignite spilled fuel.

## Propeller Strikes

Propeller strikes can cause terrible, damaging injuries. A typical recreational boat propeller can travel from head to toe on an average person in less than one tenth of a second. With care, you can avoid propeller injuries.

- If your boat has an engine cut-off switch lanyard, wear it at ALL times. If the lanyard is removed from the switch, the engine will shut off, reducing the risk of injury.
- Be very careful to ensure that water skiers are away from the stern before starting the boat's engine. Assign someone to keep track of the skier's location and make sure the skier is well away from the boat before giving the operator the signal to start.
- Consider installing a propeller guard, a safety device that surrounds the propeller for your boat.
- Check over the stern before starting your boat to make sure there's no one in the water. This is especially important if you're in a slip in a marina.
- Keep a constant lookout for swimmers in the water.
- Never let anyone exit or board your boat if the key is in the ignition. Even when idling, the prop can spin.



# Carbon Monoxide

Carbon monoxide (CO) is created by the combustion process in engines, gas stoves and space heaters, and is emitted in exhaust. CO is odorless and tasteless, and very toxic because it interferes with the body's ability to take in and use oxygen. CO is heavier than air, so it will collect near a boat's exhaust on the surface of the water. Swimming near the stern of a boat while the motor is running is extremely dangerous and may have fatal consequences. Swimmers will inhale CO fumes and may lapse into unconsciousness, and slip under the water. CO related deaths are often mistaken as a drowning.

Symptoms of CO poisoning include dizziness, ringing in ears, headache, nausea, lethargy and ultimately, unconsciousness and death. Treat complaints of any of these symptoms seriously. To treat CO poisoning, get the victim fresh air, administer mouth to mouth resuscitation if necessary, and seek medical assistance.

Never allow anyone to hold on to the swim platform while the boat is in motion! This practice, called "teak surfing" or "platform dragging," puts the person at risk for CO poisoning, propeller injury, and drowning.

# Stray Current /Electrical Shock Drowning

Stray current is electricity leaking into water commonly caused from improper electrical connections on boats and piers. Stray current can damage boats and equipment. It can also seek out swimmers as a conductive path which can lead to electric shock drowning.

Electric shock drowning occurs when swimmers are exposed to electric currents in the water. These can be stray currents or currents from a natural source, such as lightning near or over the water. In some cases the shock itself can be fatal, often causing paralysis in the swimmer, leading them to drown. This tends to occur most often in fresh water because dissolved minerals and impurities make it more conductive.

Unfortunately, you cannot tell if water is electrified just by looking at it. If the electrical current is substantial, swimmers may feel tingling and numbing sensations and should immediately get out of the water. Never allow passengers to swim in and around marinas as a precaution.

## Review Questions

1. When must you report a boating accident to New York State Parks? \_\_\_\_\_  
\_\_\_\_\_
2. When are you required to assist another boater in distress? \_\_\_\_\_  
\_\_\_\_\_
3. What should you do if someone falls overboard? \_\_\_\_\_  
\_\_\_\_\_
4. What should you do if fire breaks out on your boat? \_\_\_\_\_  
\_\_\_\_\_
5. How can you avoid capsizing or swamping? \_\_\_\_\_  
\_\_\_\_\_
6. What should you do if your boat becomes unexpectedly grounded? \_\_\_\_\_  
\_\_\_\_\_

Answers on page 82

# FREQUENTLY ASKED QUESTIONS 16

## Q: Can I use my NY safety certificate in other states?

**A:** Yes. The New York Safe Boating Course is NASBLA approved and is accepted in other states and Canada.

## Q: I lost my safety certificate. How can I get a replacement? What if I lost my temporary certificate?



**A:** You can download an application for a replacement certificate from the New York State Parks website at <https://parks.ny.gov/recreation/boating/education.aspx> and mail it along with a check or money order made out to NYS Parks for the \$10 processing fee to:

New York State Parks  
Marine Services Bureau  
Albany, NY 12238

If you lost your temporary certificate you have to wait until your permanent certificate is issued. Temporary certificates cannot be replaced.

## Q: How do I get my permanent certificate?

**A:** Students under the age of 18 will receive theirs in the mail following completion of the course. If you are over 18 you will need to submit the application (yellow form) along with a check or money order made out to NYS Parks for the \$10 processing fee before a permanent certificate will be issued. Please keep in mind that it may take as long as 90 days from the date of your course to process your permanent certificate. Your temporary certificate is valid for those 90 days. In all cases, State Parks issues the permanent certificate.

NEW YORK STATE OF OFFICERS Parks, Recreation and Historic Preservation NYS Office of Parks, Recreation and Historic Preservation			
A Temporary Boating Safety Certificate is issued to:			
Name of Applicant (Please Print)			
Address (Mailing)			
City	State	Zip code	
DOB (Required)	Gender <input type="checkbox"/> Male <input type="checkbox"/> Female	Eye color	Area code/Phone number
If under 18, Name of Parent or Guardian		Relationship	
<i>This temporary certificate is valid 90 days from date of issuance.</i>			
If you have any questions or concerns about the Boating Safety Course you took, call the Marine Services Bureau at 518-474-0445.			
 The National Association of Boating Law Administrators has approved the course of instruction successfully completed. The holder of this certificate has passed a closed book proctored exam covering the 8 hour classroom instruction in safe boating, including personal watercraft operation. Students must be 10 years of age on the date this course began.			
The following is to be completed by the instructor:			
Date Course Began: _____		Date Completed: _____	
Location: _____		County: _____	
I hereby certify, under penalty of law, that _____, known to me as the person described above, attended all sessions and received 8 hours of certified instruction, completed the required workbook, and received a passing grade on an examination as set forth in the policy and procedure manual. I further certify that the person described above received a temporary certificate on the day of _____, 20____.			
Instructor signature _____		ID code _____	
Applicant's copy		No.: D	

## Q: How old do I need to be to take the course?

**A:** You must be at least ten years of age on the day of the start of the course.

## Q: Why haven't I received my safety certificate yet?

**A:** There are several possible reasons. Certificates are issued in the date order that the courses were taught. During the summer months when there are many boating courses offered it may take up to 90 days to process your request. If you are over 18 years of age at the completion of the course make sure you mail in your application (yellow form) and fee. You will not be issued a permanent certificate unless you have done so.

## Q: How can I become an instructor?

**A:** You can download an application off the NYS Parks website at [parks.ny.gov/recreation/boating/education.aspx](https://parks.ny.gov/recreation/boating/education.aspx)

## Q: I earned a state safety certificate when I was young. Does that count?

**A:** Yes, Provided you still have a copy of your original certificate, and you were under the age of 18 at the time. Many records do not exist for courses taught prior to the late 1990's. If you have your original certificate, send a copy to New York State parks along with a check or money order made out to NYS Parks for the \$10 processing fee. You will receive a new permanent certificate in the mail.

# NYS Pleasure Boat Required Equipment Checklist

	PWC	Motorboat Less than 16 feet	Motorboat 16 feet to less than 26 feet	Rowboat, Canoe, Kayak, Stand Up Paddleboard	Sailboat +
Boat Registration Certificate	Required	Required	Required	Not Required	Not Required
Validation Sticker Display	Required	Required	Required	Not Required	Not Required
Personal Flotation Device	Must Be Worn	1 per person onboard*	1 per person onboard*	1 per person onboard*	1 per person onboard*
Type IV PFD	Not Required	Not Required	Required	Not Required	Required ≥ 16 ft.
Fire Extinguisher, Type B-1	Not Required	Required, with exceptions●	Required, with exceptions●	Not Required	Not Required
Ignition Safety Switch	Lanyard attached to operator, if so equipped	Not Required	Not Required	Not Required	Not Required
Backfire Flame Arrestor	Required	Gas inboard and I/O engines	Gas inboard and I/O engines	Not Required	Not Required
Ventilation	Required	May be required	May be required	Not Required	Not Required
Muffled Exhaust	Required	Required	Required	Not Required	Not Required
Horn or Whistle	Mouth whistle is acceptable	Mouth whistle is acceptable	Mouth whistle is acceptable	Mouth whistle is acceptable if < 39ft.	Mouth whistle is acceptable if < 39ft.
Daytime Visual Distress Signals	Required	Not Required	Required	Not Required	Required ≥ 16 ft, with exception¥
Nighttime Visual Distress Signals	No nighttime operation	Required at night	Required at night	Not Required	Required at night
Navigation Lights	No nighttime operation	Required at night & Restricted visibility	Required at night & Restricted visibility	Required at night & Restricted visibility	Required at night & Restricted visibility
Anchor	Not Required	Required	Required	Not Required	Not Required

\* PFD must be worn between November 1st and May 1st on any pleasure boat under 21 feet, including sailboats, canoes and kayaks

PFD must be worn by anyone under 12 years of age, unless in an enclosed cabin, if onboard a motorboat under 65 feet or any other pleasure boat including sailboats, canoes, and kayaks

PFD must be worn by anyone who is being towed by a pleasure boat

● Motorboats less than 26 feet in length are required to carry one type B-1 USCG approved fire extinguisher unless they are of open construction and powered by outboard motors. Motorboats with a fixed fire extinguishing system are required to carry one less type B-1 fire extinguisher.

Motorboats which use fuel having a flash point of 110°F or less, which includes gasoline, are required to have at least two ventilators unless the bilges under the engine and fuel tank are exposed to the natural atmosphere.

+ Requirements apply to sailboats using wind power. When using mechanical power, requirements for motorboats apply.

¥ Open sailboats less than 26 feet in length not equipped with mechanical power are not required to carry daytime visual distress.

# ANSWERS TO REVIEW QUESTIONS 17

## Chapter 2

1. Right is starboard, left is port
2. For determining what safety equipment to carry, and the registration fee
3. Inboard engine with a water jet pump

## Chapter 3

1. All motorized boats
2. NYS Department of Motor Vehicles
3. NY 1234 AB or NY-1234-AB reading from left to right on each side of the boat
4. Aft (toward the stern) of the registration numbers on each side of the boat
5. Assist the USCG with product recall, and law enforcement in identifying stolen boats

## Chapter 4

1. One USCG approved, in serviceable condition, readily accessible, and properly sized for each person on a boat
2. Children under the age of twelve onboard a pleasure boat under 65 feet, rowboat, canoe, or kayak while underway unless they are in a fully enclosed cabin, anyone on a personal watercraft, anyone being towed, and anyone on a boat less than 21 feet between November 1st and May 1st
3. Mounted near the helm and most importantly serviceable and readily accessible
4. During the daytime, regardless of the distance from shore, any pleasure boat 16 feet or longer, except sailboats less than 26 feet not equipped with mechanical power, must carry day and night signals. PWC are required to carry an orange distress flag or other appropriate USCG approved daytime VDS. All boats, except rowboats, canoes, and kayaks, regardless of size must have nighttime signals between sunset and sunrise. The signal requirements do not apply if the boat is participating in an organized race, parade or regatta.
5. A horn or whistle capable of producing a blast that can be heard for at least a half mile

## Chapter 5

1. Moor the boat securely to the dock, remove all passengers, extinguish all galley fires, don't smoke, shut off engines and electrical equipment, close all hatches and ports, fill portable tanks on the dock, keep fuel nozzle in contact with fill opening, replace fuel fill cap tightly, wipe up any spilled fuel, check bilges for leakage
2. To keep static electricity from building up and causing a spark which could cause an explosion
3. Wipe up any spills, open any hatches, ports, or windows, run the mechanical blower for at least 4 minutes, use your nose to sniff for vapors

4. At least 4 minute

## Chapter 6

1. Maximum engine horsepower, maximum weight of people, gear, and engine, maximum number of persons
2. Distribute weight of gear and people evenly, keep weight low, especially heavy objects, secure heavy objects from shifting, and don't exceed capacity limits
3. Operator boards first and helps passengers in, step into the center of the boat, stay low, load gear from the dock after boarding, stay seated once you are moving

## Chapter 7

1. To insure that someone will contact help should you become overdue
2. Head for the safety of shore if possible. Keep the bow of the boat heading into the waves and wind. If you see lightning place fishing rods on the deck and lower or remove antennas where possible.
3. Let them know where the safety equipment is located. They should know how to wear a PFD, and how to operate a fire extinguisher and radio. They should know the location of visual distress signals and what to do an emergency including anchoring and line handling as well as what to do in a man overboard or rough weather situation.
4. To reduce the likelihood of having problems or an emergency while out on the water
5. The Safety and wellbeing of the passengers
6. The ball and hitch should be the same size, hitch the safety chain in an X pattern, check lights, and brakes if so equipped, check tire pressure and that the bearings have been greased
7. Load gear into the boat, insert the drain plug, remove the tie downs, but not the attachment to the bow, and run through a pre-trip checklist

## Chapter 8

1. Federal waterways – US Coast Guard, NYS waters – NYSDEC
2. Can be used as a holding tank only, Y valve must be locked, wired shut or the handle removed.
3. No
4. Before launching or leaving the launch ramp, always CLEAN, DRAIN, DRY your watercraft and trailer. Remove plants, animals and other debris by hand or with hot soapy water. Make sure to drain the bilge, live wells, and the engine. Dispose of unused bait in proper receptacles and dump bucket water on dry land. Never release plants, fish, or animals, from one body of water into another.

## Chapter 9

1. Visibility, traffic density, maneuverability of the boat, weather conditions, speed of current, proximity of navigational hazards and the depth of the water
2. At all times
3. Constant bearing, decreasing range
4. From sunset to sunrise and times of restricted visibility
5. The stand on boat maintains course and speed unless it becomes clear the other boat is not giving way. The give way boat should turn, reduce speed, stop or reverse engines to avoid collision. All actions should be early and obvious to the other boat.
6. One short blast – “I intend to leave you on my port side” – turning to starboard  
Two short blast – “I intend to leave you on my starboard side” – turning to port  
Three short blast – Reversing engines  
Five or more short blast – Danger signal  
One prolonged blast – Boat is leaving a slip or rounding a

## Chapter 10

1. 5 miles per hour when within 100 feet of the shore, a dock, pier, raft, float or an anchored or moored boat
2. High speed in congested areas, high speed in restricted visibility, playing chicken, following too closely, operating near dams, towing skier in an unsafe area, overloading, bow riding, operating near divers or swimmer
3. Impair judgment, balance, coordination, vision, susceptibility to hypothermia
4. BAC of 0.08 or greater

## Chapter 11

1. Current and wind
2. Very slowly
3. It will keep the boat from drifting into danger if the engine fails
4. The stern

## Chapter 12

1. Water depths, buoys, landmarks, rocks, reefs, lighthouses
2. Red and green
3. It is the point furthest point upstream that a boat can travel, key to the placement of aids to navigation, red buoys to the right when returning upstream
4. Square – information, circle – regulatory, diamond – danger, and diamond with a cross in the center – exclusion

## Chapter 13

1. A boat which uses an inboard motor powering a water jet pump as its primary source of motive power and which

- is designed to be operated by a person sitting, standing, or kneeling on, or being towed behind the boat rather than in the conventional manner of sitting or standing inside a boat
2. PWC operators must be at least 14 years of age and either hold a boating safety certificate or be accompanied by someone over 18 years of age who is the holder of a boating safety certificate
  3. When the throttle is released the operator loses the ability to steer
  4. From sunset to sunrise
  5. Playing “chicken”, weaving in and out of traffic, and wake jumping
  6. A lanyard engine cut-off switch
  7. PWC are prohibited within 500 feet of a swim area, unless the opposite shore is less than 500 feet away or when launching or returning to the launch. If riding within the 500 feet the speed is limited to 10 miles per hour.

## Chapter 14

1. The operator controls the boat, the observer relays communications from the skier to the operator, and the skier skis in a safe manner.
2. Boaters must stay at least 100 feet away from the flag
3. Wear a life jacket, it's the law from Nov. 1 to May1, leave a float plan, don't overload the boat, watch the weather, use caution if standing, dress for the water temperature, not the air temperature

## Chapter 15

1. If you as an owner or operator of a boat involved in a boating accident in which there was an injury, death, or disappearance of a person, or if property damage exceeding \$1,000 to any one party has occurred.
2. At all times except if rendering assistance would endanger your boat or passengers, interfere with other rescue efforts or cause further damage
3. Toss them a life jacket or throwable device, have another passenger continually spot them while the boat circles around to pick them up with the boat downwind, turn off the engine before bringing the passenger on to the boat from the stern.
4. Have everyone put on life jackets in case they need to abandon the boat, orient the boat with the fire downwind if possible, call for help or use VDS, and fight the fire using the PASS technique if safe to do so.
5. Balance loads, avoid adverse water or weather conditions, keep passengers from moving around when underway, do not ride on the gunwales or bow, avoid sharp turns at high speed.
6. Check if the hull is intact, remove extra weight to refloat, pull the boat gently away from the obstruction, but not with the engines, wait for the tide to come in, use VDS for help, consider calling for professional assistance.

# Your Role In Keeping Our Waterways Safe and Secure.

## WARNING!

Keep at least 100 yards away from all military, cruise-line, or commercial shipping. Approaching certain commercial boats may result in an immediate boarding.

Slow to minimum speed within 500 yards of any U.S. naval boat, including any U.S. military or military supply boat and proceed as directed by the Commanding Officer or the official patrol. Violations of the Naval Boat Protection Zone are a felony offense, punishable by up to 6 years in prison and/or up to \$250,000 in fines.

If you need to pass within 100 yards of a U.S. naval boat in order to ensure a safe passage in accordance with the Navigation Rules, you must contact the U.S. naval boat or the US Coast Guard escort boat on VHF-FM channel 16.

Observe and avoid all security zones. Avoid commercial port operation areas, especially military, cruise-line or petroleum facilities. Observe and avoid other restricted areas near dams, power plants, etc. Do not stop or anchor beneath bridges or in the channel. Violators will be perceived as a threat, and will face a quick, determined and severe response.

Be observant, and report all activities that seem suspicious to the local authorities, the US Coast Guard, or the port or

marina security. Do not approach or challenge those acting in a suspicious manner. Report:

- Suspicious persons near bridges or high security areas on or near the water.
- Individuals establishing roadside stands near marinas or other waterfront facilities.
- Unknown persons photographing or creating diagrams of such things as the underside of bridges, the area around nuclear power plants, and waterfront facilities near what might be high-risk boats.
- Unknown or suspicious persons loitering for extended periods of time in waterfront areas. Suspicious persons renting or attempting to procure or "borrow" watercraft.
- Suspicious vendors attempting to sell/deliver merchandise or drop off packages in waterfront areas.



If you observe suspicious behavior on or near the waterfront, contact local law enforcement or the US Coast Guard immediately! For more information on how you can help, go to [www.uscgboating.org](http://www.uscgboating.org) today.

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[parks.ny.gov](http://parks.ny.gov)