

SAFE SURVIVAL

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Weather

Most commercial radio and television stations give marine weather broadcasts during the boating season, with updates several times a day. Other sources include NOAA, the National Weather Service, and other government agencies. Make a habit of listening to your local broadcast beginning the night before you plan to go boating.

Get the most current forecast just before you set out.

You may want to purchase a small, inexpensive battery-operated weather radio, available at many retail electronics outlets.

Underway

Scan the airwaves and the horizon

On the water, the best way to receive timely weather information is by radio. NOAA Weather Radio provides continuous weather programming for most boating a reason your VHF radio. For other weather broadcasts and their frequencies, see the chart below.

Although sportsmen may have better luck on cloudy or windy days, being out in a boat in bad weather can be very risky. High winds, rough water and thunderstorms can suddenly turn a pleasant outing into a frightening experience. When you go out on your boat, you should know the current forecast, and have a way to receive warnings and weather advisories while underway. Making boating safety your first priority is the best way to ensure you will be back again next sporting season.

Even with today's high-tech weather forecasts and radios, there's no substitute for the time-honored practice of scanning the horizon for changes in the wind, waves, water, and sky that signal developing weather patterns.

Thunderstorms

Thunderstorms are created when warm, moist air rises, cools and condenses. It swells into mounds of thick, billowy cumulous clouds that quickly darken into the towering

ominous-looking cumulonimbus clouds characteristic of thunderstorms.

Consider the formation of this thick, dark cloud an unmistakable thunderstorm warning, and head immediately for a safe anchorage. The transition from a small cloud into a turbulent, electrified storm front can occur in as little as 30 minutes. Strong, gusty winds and heavy rains with thunder and lightning will soon follow. Fortunately, few squalls last more than an hour. The sharper, darker and lower the front edge of the cloud, the more severe the storm. The anvil-shaped top of the storm cloud points in the direction that the storm is traveling.

In summer, afternoon thunderstorms are likely to occur over water when the humidity and temperature ashore are high. Hot air radiates upward from land surfaces heated by the sun.

Moisture from a nearby body of water is absorbed by the warm air, which rises to begin the formation of thunderheads. They usually appear as swift-moving black clouds, often approaching from the northwest southwest, south or west at speeds of 25-35 knots. You can determine the distance of an approaching thunderstorm by counting the number of seconds between the lightning flash and the thunder clap, and dividing by five. That will give you the distance in miles you are from the storm. For example, if the time lapse between the lightning flash and the thunder clap is 10 seconds, divide by 5. The storm is approximately 2 miles away from you.

- If you are caught in a Thunderstorm... Make sure everyone aboard is wearing a life jacket. Secure all loose gear, hatches or ports.
- Determine your location and the best course back to shelter.
- Keep a sharp lookout for the other boats and obstructions.
- Once the Storm Hits... Try to take the first (and heaviest) gusts of wind on the bow, not abeam. Heading into the wind is the most seaworthy position for most small boats.
- Approach waves at a 45° angle to keep the propeller underwater, to reduce pounding, and to provide a safer and more comfortable ride.
- If there is lightning, unplug radios and all electrical equipment
- Stay low. Don't make yourself the tallest target.
- Keep away from metal objects that aren't grounded to the boat's protection system.

Lightning Strikes!

The best protection against lightning is avoidance. Lightning is random, unpredictable and very dangerous. Here are some tips to help you avoid Lightning while on the water!

- The best protection against lightning is avoidance.
- Head into shore well ahead of the turbulence.
- Lightning can lash out for miles in front of a storm, and it can strike after a storm seems to have passed.
- Look for tall clouds that have an anvil shaped top (cumulonimbus) These clouds can be VERY large, reaching several miles high and several miles in circumference. Squall lines preceding cold fronts also produce thunderstorms
- Listen to NOAA weather reports for storm reports. These reports are available on

your VHF radio, and also on some marine stereo systems. If you see lightning, you can determine the distance from you by timing how long it takes for you to hear the thunder. Every five seconds of time equals one mile of distance. If it takes 20 seconds to hear thunder after you see lightning, then the storm is four miles away.

- Thunderstorms usually occur where air masses of dissimilar temperatures meet such as over mountains, over inland or coastal waters, or preceding a cold front.
- Air must have a high moisture content (high humidity and a dew point over 60 degrees) and be warm near the ground, such as on a typical summer day.
- When warm ground air rises and meets colder air, it condenses and forms water droplets. Condensing releases energy, which charges the atmosphere, and when the dissimilar charge between the negatively charged surface air and the positively charged highest parts of the cloud gets large enough, an explosion of lightning is created, with up to 30,000,000 volts of electricity!
- Thunderstorms generally move in an Easterly direction, so if you see a storm to the South or Southeast of you, by and large you can rest easy. If you see a storm to the West or Northwest of you, LOOKOUT!
- Turn off as much of your electronic equipment as you can, (unplugging equipment is even better) and try and stay in your boat's cabin if possible.
- Weather Information Broadcasts NOAA Weather Radio operates continuously on the following frequencies: 162.400 MHz (channel 1), 162.475 MHz (channel 2), 162.550 MHz (channel 3) Your ability to tune in to any particular station depends on your position. NOAA transmitters are placed in frequency order--your ability to receive a weather broadcast for a particular area depends on your location relative to the transmitter. A broad, average range for frequency reception is 20 to 40 miles.

NOAA broadcasts current weather conditions such as temperature, humidity, wave conditions, dew point, barometric pressure, wind speed and direction, and other weather information. For more severe weather, NOAA uses the following descriptions:

- Small Craft Advisory: Observed or forecast winds of 18 to 33 knots--Small Craft Advisories may also be issued for hazardous sea conditions or lower wind speeds that may affect small craft operations. (note: There is no legal definition of the term "small craft".)
- Gale Warning: Observed or forecast winds of 34 to 47 knots.
- Storm Warning: Observed or forecast winds of 48 knots or greater.
- Tropical Storm Warning: Observed or forecast winds of 34 to 64 knots or higher associated with a tropical storm.
- Hurricane Warning: Observed or forecast winds of 64 knots or higher associated with a hurricane.
- Special Marine Warning: Observed or forecast winds of 34 knots or more associated with a squall or thunderstorm and expected to last for two hours or less.

For boating safety weather rules, see Safe Boating Weather Tips (NOAA PA 94058) at <http://www.nws.noaa.gov/om/nwspub.htm>.

For information on lightning protection, call the
Coast Guard Info Line at 1-800-368-5647, or contact:
National Lightning Safety Institute
891 North Hoover Ave.
PO Box 778
Louisville, CO 80027-0778
Phone (303) 666-8817
Fax (303) 666-8786

Hypothermia: Cold Water Kills!

Safety experts estimate that half of all drowning victims actually die from the fatal effects of cold water, or hypothermia, and not from water-filled lungs. Loss of body heat is one of the greatest hazards to survival when you fall overboard, capsize, or jump into the water. Cold water robs the body of heat 25-30 times faster than air. When you lose enough body heat to make your temperature subnormal, you become hypothermic. Sudden immersion in cold water cools your skin and outer tissues very quickly. Within 10 or 15 minutes, your core body temperature (brain, spinal cord, heart, and lungs) begins to drop. Your arms and legs become numb and completely useless. You may lose consciousness and drown before your core body temperature drops low enough to cause death.

Body Hot Spots Certain areas of your body are "hot spots" and lose large amounts of body heat faster than other areas and need special protection to prevent hypothermia. The head and neck are the most critical areas. The sides of the chest, where there is little fat or muscle, are major areas of heat loss from the warm chest cavity. The groin also loses large amounts of heat because major blood vessels are near the surface.

- How cold is cold water?
Cold water does not have to be icy...it just has to be colder than you are to cause hypothermia. The rate of body heat loss depends on water temperature, the protective clothing worn, percent body fat, other physical factors like alcohol in the blood, and most importantly, the way you behave in the water.
- Different activities in the water consume varying amounts of body heat. The more energy (heat) you expend, the quicker your body temperature drops, reducing your survival time. Wearing a life jacket (PFD) adds hours to your survival time.
- Surviving in Cold Water...

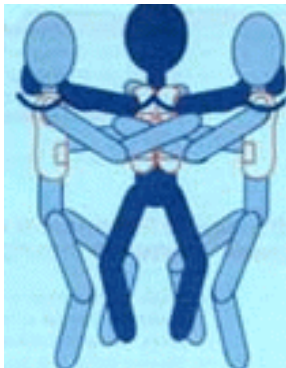
If you suddenly find yourself in the water, don't panic! Calmly follow the procedure below to increase your survival time. Minimize body heat loss. This is the single most important thing you should do. Take the following steps:

- a. Do not remove your clothing, despite what you may have been told. Instead, button, buckle, zip and tighten collars, cuffs, shoes and hoods.
- b. Cover your head if possible. A layer of water trapped inside your clothing will be warmed by your body and help insulate you. Put on a Personal
- c. Floatation Device (PFD) if available.

- d. Devote all your efforts to getting out of the water. Act quickly before you lose full use of your hands. Board a boat, raft, or anything floating. Right a capsized boat and climb in. Most boats will support you even when full of water. If you cannot right the boat, climb on top of it.
- e. Do not try to swim unless it is to reach a nearby boat, another person, or a floating object on which you can climb or lean. Swimming "pumps" out warm water between your body and your clothing, and pumps warm blood to your extremities, where it cools quickly and reduces your survival time by as much as 50%.
- f. Remain as still as possible, however painful. Intense shivering and severe pain in cold water are natural body reflexes, which will not kill you, but heat loss will!

Huddle: Huddling together with two or more people will extend survival time 50% longer than swimming or treading water.

HELP (Heat Escape Lessening Position)... Hold knees to chest to protect trunk of body from heat loss. Hold arms to sides and clasp hand. With certain life jackets and body types, it may be necessary to lower the thighs to achieve a good balanced position in order to remain still in the water.



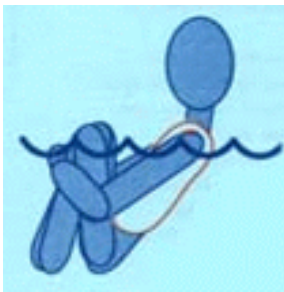
Float in waders...Assume a sitting position to stay afloat with air trapped in waders. Cover head and neck if possible.

First Aid for Hypothermia

Any person pulled from cold water should be treated for hypothermia.

Symptoms include intense shivering, loss of coordination, mental confusion, cold and blue (cyanotic) skin, weak pulse, irregular heartbeat, and enlarged pupils. Once shivering stops, core body temperature begins to drop critically.

Try to prevent further body cooling and take the victim to a medical facility immediately.



What to do...

- Gently move the victim to warm shelter
 - Check breathing and heartbeat. Start CPR (cardiopulmonary resuscitation) if necessary.
 - Remove victim's clothes with minimum body movement; cut them away if necessary.
 - Lay victim in a level, face-up position with a blanket or other insulation underneath.
- Wrap victim in a blanket or other warm cloth.

If medical treatment is delayed, use these gentle re warming techniques

- Apply heating pads or hot water bottles under the blanket to head, neck, chest and groin. Be careful not to burn victim's skin.
- Do not apply heat to arms, and legs. This forces cold blood in arms and legs back towards the heart, lungs and brain, lowering core body temperature and causing "after drop", which can be fatal.
- Do not massage or give hot baths. Rough handling may cause cardiac arrest.
- Apply your own body warmth by direct body-to-body contact. Wrap a blanket around you and the victim.
- Do not give food or milk to unconscious victims.
- Never give alcohol to a hypothermia victim.

Capsizing

A boat is "capsized" when it is knocked down so it lies on its side in the water or turns over - a frequent occurrence among small sailboats that are especially sensitive to sudden changes in the wind. Most small boats will remain in that position, unless righted, and will float enough to support you.

Having capsized or swamped, it is important to remain calm and conserve energy. The general rule is to ensure that all crew members are wearing PFDs and that they stay with the boat; there may be possibilities of righting it, and rescuers will be able to find you more easily. Leave the boat only if it is headed toward a hazard. If the capsized boat is a small centerboard sailboat, improve your chances of recovery by trying to keep it from turning over. Get into the water immediately and stand on the centerboard, providing lever action; this is a technique taught in most basic sailing courses. If possible, have a crew member attach a life jacket or other flotation device to the end of the mast. If you can, remove all sails before attempting to right the boat.

Take precautions against swamping and capsizing: Watch that loaded items do not shift from side to side; guard against too much power or speed on turns, and the wash of large boats. Take waves head on, or fine on the bow, at low speeds, giving the hull a chance to ride over rather than dive into them. Do not broach.

Crew Overboard (COB) "Man Overboard"

Crew-overboard victims face a number of dangers, including panic, injury during the fall and hypothermia. For those aboard the boat, quick thinking and coordinated action are essential to an effective rescue. Control of the situation is most likely to be maintained by those who have prepared themselves with regular drills. However, not many people ever consider how to handle this situation, let alone actually practice MOB procedures with the crew. Before you even leave the dock there are several things you can do to increase the chances of you or your crew should someone fall overboard even without practicing

MOB procedures.

Have lifejackets equipped with whistles and waterproof flashlights. For less than ten dollars you can increase someone's chances of quick pick up (especially at night). Better yet, wear your life jacket! In cold or heavy weather and at night, you are much better off wearing your life jacket.

Practice throwing a life ring or cushion. They are quite a bit harder to throw than you might think! You can easily practice on your dock to check your range and accuracy-you will probably be very surprised by the results.

- Show everyone where life saving gear is located, and how to use it.
- Knowing how to use equipment will save valuable time when it counts.
- While on the water your first priority is to not panic. The best way to do that is by practicing your MOB procedure regularly. Pick a rescue technique such as the "quick-stop" or "figure eight" (described in great detail in many seamanship books).
- Acting on instinct and acting immediately will save time and reduce panic for you and your crew.

Here are some quick tips!

- Stop the boat's forward progress! Every second that you move away from the MOB will make it harder for you to get back to them.
- Assign roles to crewmembers, such as having a lookout, to keep people involved in the rescue.
- Get floatation to the person. Items such as a Life line will help keep the swimmer afloat and help you get them into the boat.
- Get the boat next to the MOB. Placing your boat between the swimmer and the wind (upwind) will give a lee to the person and will give them flatter seas, but you run the risk of floating over them, which will take away your ability to steer due to the danger of the propeller. The better way is to have the swimmer between the boat and the wind by approaching the swimmer from downwind. This will increase your ability to maneuver, and will take less time to get the person to the boat.
- Get the person on the boat. This can be very difficult, especially if the person is hurt, weak, or unconscious. Life lines, swim platforms, ladders, and brute strength are all methods of bringing someone on board.
- Practice all and pick the best one for your boat and crew. For further reading on COB rescue equipment, check out Foundation Findings articles.
- Never have anyone go into the water- they will just be another person that needs to be rescued. If someone needs to go over to help a weak or injured person, make sure they have floatation and a lifeline secured to them.

Preventing COB accidents

Slipping and falling.

Even in calm, dry weather, decks can be slippery- salt incrustations attract moisture. Plastic decks can be especially dangerous because they are smooth and do not absorb moisture; the molded anti-skid pattern traps evaporated salt in the indentations. In

contrast, unfinished teak absorbs moisture and presents one of the best non-skid surfaces, wet or dry. A number of aggressive non-skid patterns and coatings are uncomfortable for bare feet, remember one rule of thumb of the careful boater: Wear deck shoes at all times, especially when underway.

Safety equipment failure.

When equipment is undersized, old or worn, it can be worse than no equipment at all: It provides a false sense of security. Lifelines, harness tethers, fittings and snaps should be inspected regularly for wear and corrosion, as well as proof-tested for 3,000 pounds- the shock load of a crew member projected in the lifelines, falling overboard and dragging in water.

Relieving over the side.

One of the most common causes of COB and subsequently drowning is a crew member relieving himself over the side of the boat in a standing position. Avoid this disaster; go below and use the head.

The importance of COB drills.

Unfortunately, despite all preventive efforts, accidents can still occur. The need for crew-overboard drills cannot be emphasized enough. Your entire crew should practice the maneuver until recovery is second nature. Practice often first with a floating cushion, then with a swimmer and another boat standing by. These drills can often make the difference between a tragedy and a mishap on the water.

With practice and the right equipment, you can safely and quickly recover someone who has fallen overboard. Man-Over-Board procedures should be practiced at the beginning of every boating season and from time to time over the course of the boating season. Doing so may save someone's life- even your own!

For further reading on these topics and other boating information, The BOAT/U.S. Foundation recommends any of the following:

All of these can be found through your local BOAT/U.S. Marine Center, the BOAT/U.S. Catalog or the New Online Store! (www.boatus.com)

Chapman's Piloting by: Elbert S. Maloney

Chapman's Hands-On Powerboating CD ROM

The Annapolis Book of Seamanship by: John Rousmaniere

US Power Squadron Booklets (Knots, Sailing, GPS, Radar, etc.)

US Coast Guard Auxiliary's Skipper's Safe Boating Course