

## CAPSIZING AND FALLS OVERBOARD



The golden rule if a boat capsizes is for everyone to stay with the boat.

**SWAMPING AND CAPSIZING:** Stay calm. If the boat can be righted, bail out as much water as possible, get in and paddle towards shore. If your boat capsizes or you fall overboard in moving water such as a river, get in the self-rescue position with your feet pointed downstream and near the surface to avoid potential head injury and foot entrapment.

**FALLS OVERBOARD:** Falls overboard are dangerous situations. People fall overboard even when wind and seas are calm. The shock of falling into the water—especially cold water, can be life-threatening. Wearing a life jacket can be your only source of survival. The best means of survival is to already have a life jacket on and stay with the boat.

**PREVENTION:** When getting into or moving around in a small boat, always maintain three points of contact, keeping your weight low and close to the centerline. Don't overload your boat.

- Do not allow passengers to stand in small boats or sit on foredecks, gunwales, engine boxes, seat backs or transoms.
- Watch crew members and frequently check that everyone is aboard.
- Wear deck-gripping shoes (bare feet have poor traction).
- Avoid rough water and weather conditions whenever possible.

*Keeping a sharp lookout is the best defense against an irresponsible boater. Report apparent violations to a waterways conservation officer.*



## WEAR IT!

Personal flotation devices (PFDs, life jackets, life preservers and life vests) are the most important piece of equipment on a boat; they are the best defense against drowning. **Each person in the boat must have a wearable, USCG-approved life jacket, NO EXCEPTIONS!**

Since boating conditions can change quickly and without warning (increasing your chance of unexpectedly falling into the water), boating without wearing a properly fitted life jacket is dangerous.



Produced under a grant from the Sport Fish Restoration and Boating Trust Fund, administered by the U.S. Coast Guard.



12/2010

# HAZARDS on the Water

Hazards to boaters appear in many forms—dams, submerged objects, cold water, fast-changing weather, sun stroke and current. Boaters need to recognize these dangers and be ready to avoid them at all times.



LOW-HEAD DAM

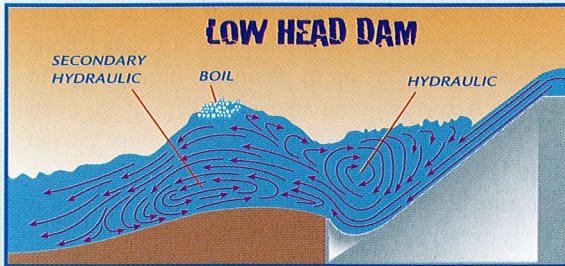
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## DAMS

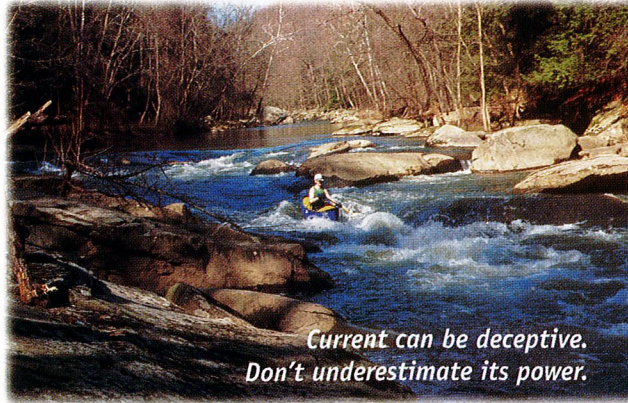


**Boaters must stay clear of dams.** Failure to do so often results in tragedy. Dangerous currents above the structure can draw boats into water going over or through a dam. Boaters should immediately deploy an anchor if they find themselves in an emergency situation upstream of a dam. Areas below dams are also hazardous because of strong recirculating currents and turbulent water. Many small dams are not marked. Sometimes dams can be spotted by looking downriver for a discernible horizontal line going across the water, but this is difficult and not always evident. Boaters should know the locations of all dams on the waterway before they launch a boat.

The most dangerous hazard on a river is a low-head dam. There are more than 2,000 such dams on rivers and streams throughout Pennsylvania, and they are true "drowning machines." Water going over a dam creates a back current, or undertow, that can pull a boat into the turbulence and capsize it. This hydraulic can often trap and hold a person or a boat.



Even small dams with a shallow drop create a dangerous backwash. During periods of high water and heavy rain, backwash currents often become stronger, extending farther downstream. A small low-head dam that may have appeared harmless at very low water can become a monstrous death trap when the water level rises. Boaters must become familiar with a river's worst danger and know the waters they plan to visit.



## CURRENT



**Safety on the water depends on developing respect for the power of water.** Current can be deceptive, and boaters should never underestimate its power. Even a moderate current can exert a force of several tons on a capsized canoe, pinning it against a rock. Boaters venturing out in strong current must stay within their abilities and skill levels, especially in unpowered boats.

A strainer is an obstruction, like a tree or fence in the water, that allows water to pass through but holds and traps boats and boaters. Boaters in current need to keep a safe distance from strainers that they could be pinned against.

When anchoring in current, boat operators should always anchor from the bow. This allows the boat to ride up and over oncoming waves. Anchoring from the stern can cause water to rise over the transom and flood or even capsize the boat.



## WAVES



**Large waterways such as oceans and Lake Erie provide different challenges and dangers than moving water.** 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 big water often develop quickly and can endanger small craft. Boaters should not venture out on large waters such as Lake Erie in small inland boats. Even smaller lakes can be hazardous to small craft when wind and waves combine to create dangerous conditions.

## WEATHER



**Weather affects the condition of open water and can change suddenly.** Factors that determine weather include temperature, barometric pressure and wind. Smart boaters check the local forecast the night before going boating and again in the morning. The National Weather Service (NWS) issues a new marine forecast at least every six hours on designated VHF radio channels, or boaters can visit the NWS website at [www.weather.gov](http://www.weather.gov).

**Be alert to weather you can see. Signs that the weather may worsen include:**

- Clouds gathering, darkening and increasing in size.
- Sudden temperature drop.
- Rapid wind shift or change in speed.
- Static on the AM radio, which might indicate an approaching thunderstorm.
- Drop in barometric pressure (check a barometer).

## IF A STORM IS NEAR



In a small boat, everyone should wear a life jacket. The operator should head for the nearest shore and beach the boat, if necessary. It is best to find a shore on the downwind (leeward) side of the land.

In a large boat, after making certain everyone is wearing a life jacket, the operator should start the engine or secure the sails (whichever is applicable). All unnecessary gear should be stowed or secured, and the running lights should be turned on. After the boat is closed up, the operator must decide what to do. If land is near, it is best to head for it. If not, it may be necessary to ride out the storm. If forced to do so, the operator should keep the bow headed into the waves, wind and/or current. If the motor fails, a sea anchor on a line from the bow will keep the boat into the waves. A bucket will work as a sea anchor in an emergency.

### Lightning is a dangerous part of bad weather.

At the first sign of lightning, boaters should place fishing rods flat on the deck and lower or remove antennas. If possible, get to a safe harbor. Being on open water during a lightning storm can be a terrifying and dangerous experience.

## COLD WATER SHOCK



Cold water shock is a major factor in boating fatalities. It happens when someone is suddenly immersed in cold water. The water does not have to be freezing; cold water shock often occurs in water temperatures above 50°F.

The body's first response to cold water shock is usually an involuntary gasp (torso reflex). Hyperventilation (rapid breathing) and breathlessness follow. The person may feel claustrophobic, panicked and confused. Cold water greatly reduces the victim's ability to hold his breath, control breathing and impairs the ability to swim.

## HYPOTHERMIA



Hypothermia is the lowering of the body's core temperature. It is a factor in many fatal boating accidents. Cold water robs the body of heat much faster than cold air of the same temperature.

*Extremities are the first areas of heat loss.*



Hypothermia begins with shivering and a loss of feeling in the extremities. Cold, blue skin, decreased mental skills and slurred speech are common symptoms. Unconsciousness can be followed by death. Warm layered clothing, a life jacket and eating high-energy foods will help prevent hypothermia.

### FOUR STAGES OF COLD WATER IMMERSION

Cold water shock is a rapid development of a number of shock responses caused by cold water immersion that can result in sudden drowning.

#### 1. Initial cold shock (first 3-5 minutes).

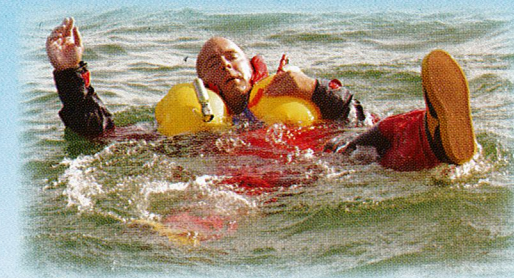
Sudden immersion in cold water causes the gasp reflex, this can result in water inhalation, hyperventilation, changes in heart rate and rhythm and blood pressure, and panic. All of these reactions may result in death, especially for those with pre-existing heart conditions.

#### 2. Short term swim failure (3-30 minutes).

Cold water saps energy and arms and legs become weak. Movement is difficult and slow. Death can occur by drowning, as the victim can no longer stay afloat.

#### 3. Long term hypothermia (30+ minutes).

The body loses heat to cold water 25 times faster than cold air. The body becomes hypothermic when it loses heat at a rate faster than it can generate heat. Continued exposure leads to unconsciousness and death. At this stage death may occur without drowning.



**4. Post immersion collapse.** The stage occurs during or after rescue. The body is still hypothermic and death may occur due to complications from inhaling water or lowered body temperature.

### FIRST AID FOR HYPOTHERMIA

1. Get the person out of the water or weather as quickly as possible.
2. Replace wet clothing with dry. Wrap the person in blankets to warm them slowly.
3. Handle hypothermia victims gently and do not give anything by mouth if they are unconscious. Never give alcohol to a hypothermia victim.
4. Get medical help as soon as possible.

### COLD WATER SURVIVAL

- Wear a life jacket. Flotation coats also offer insulation from the cold.
- Wear clothing that still insulates when wet such as wool, fleece or other synthetics.
- If you know you are about to fall into cold water, cover your mouth and nose with your hands, so you don't inhale water.
- Do not remove your clothing.
- Get back into or climb on top of the boat.
- If you can't get out of the water and shore is too far, get into the Heat Escape Lessening Posture (HELP) or the HUDDLE position if you're in a group.



## OVERHEATING AND SUNBURN



Just as hypothermia can be fatal, so too can hyperthermia. Hyperthermia is an increase in the body's temperature. The body normally cools itself through the evaporation of perspiration. On hot days, continuous fluid replacement is required to avoid dehydration and keep the body supplied so it can sweat. High humidity on hot days makes sweating less efficient as a means of cooling. On the water, boaters are in a more humid environment than when on dry land. Persons suffering from heat illness often feel faint or nauseous. They may have a rapid heart rate, and/or a headache. The young and elderly are usually more easily overcome by heat. A well-rested person who has recently had something to eat is better able to cope with the stress of excessive heat.

Treatment requires stopping any exercise and moving to a cooler environment. It is important to get out of the sun and heat. Drinking fluids is also important, although carbonated beverages and alcoholic beverages should be avoided. If untreated, mild heat stress can progress quickly to severe heat stroke, which can be life-threatening. Persons suffering from heat stroke usually have a deterioration in mental function and coordination, as well as the above symptoms. It is important to begin cooling and get medical treatment immediately.

Sunburn is another danger that everyone, especially boaters, must never forget. Even when wearing a hat or in the shade of a boat's awning, ultraviolet rays are reflected from the water to a boater's skin.

The key to avoiding sunburn is to cover the skin. A hat and light protective clothing create a protective barrier to the sun's rays. Sunscreen with an SPF (sun protection factor) of 30 are effective when applied at regular intervals. Sunglasses are also a very good idea. They protect the eyes from damaging ultraviolet rays, as well as lessen eye fatigue from constant squinting.

Prevention is the best approach to dealing with heat and the sun. Important ideas to remember are:

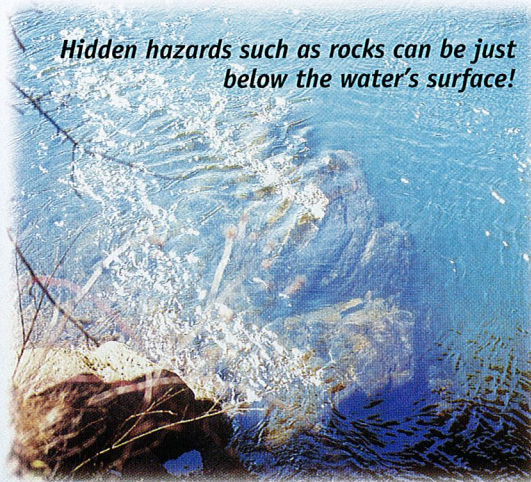
- Wear light clothing and a hat.
- Drink fluids regularly.
- Reduce physical activity.
- Apply sun block at regular intervals.
- Wear sunglasses.

Boaters must understand that the effects of a day on the water exposed to bright sunshine and high humidity will have a cumulative, possibly dangerous effect. This could affect a boater's judgment and the ability to keep a proper lookout, thereby increasing the possibility of an accident.

## SUBMERGED OBJECTS



A submerged object in the water can be a hazard to an unwary boat operator. Rocks, stumps, logs and other objects can greatly damage a boat's hull or motor, sometimes resulting in injury or death to people on board.



*Hidden hazards such as rocks can be just below the water's surface!*

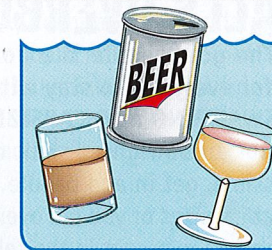
Water levels vary on almost every waterway in the state. Even a few inches difference in depth can make the difference between "smooth sailing" and an abrupt end to the boating day. Running aground at high speed can result in people being ejected from the boat. Boaters can protect themselves by keeping a sharp lookout for objects in the water

and changing bottom structure. A depth finder or fathometer can keep a boater informed of the depth of the water. **Operators who are not sure of the bottom should reduce speed.**

## ALCOHOL AND BOATING



Alcohol is a hazard to boaters. When on a boat, the effects of alcohol are magnified. Combined with stresses from wind, motion and heat, your ability to think and perform basic tasks needed to safely operate your boat may become impaired. It is illegal to operate a boat while under the influence of alcohol or a controlled substance. Alcohol is prohibited on land and water at all state parks and at most U.S. Army Corps of Engineer projects. Pre-arrest breath tests can be used by officers to determine the probability that a boat operator is under the influence. A blood alcohol content of 0.08% or more is considered to be over the legal limit (0.02% blood alcohol content for minors). **Penalties include loss of boating privileges, significant fines and imprisonment.**



## OTHER BOATERS



One of the least expected hazards on our waters is other boaters. Even an experienced, competent boater may be involved in an accident because of another boater's mistake or irresponsible action. Whenever possible, boaters should steer clear of other boaters. Report boating violations to a waterways conservation officer and stay alert. Keeping a sharp lookout while boating is the best defense against an irresponsible operator on the water.

For more information on hazards on the water, take a boating course and visit the Commission's website at [www.fishandboat.com](http://www.fishandboat.com).