

FACT SHEET: Cold-water immersion

Boaters who unexpectedly fall into cold water are at risk for more than hypothermia. Accidental cold-water immersion can kill a person within minutes. These are the four stages of risk associated with cold-water immersion:

- **Stage 1: Initial cold shock** occurs in the first three to five minutes. People can experience immediate involuntary gasping, hyperventilation, vertigo and panic — all of which can result in water inhalation. Immersion in cold water may also cause sudden changes in blood pressure, heart rate and heart rhythm, which can result in death. Death occurs by drowning.
- **Stage 2: Short-term immersion swim failure** occurs three to 30 minutes following cold-water immersion. The muscles and nerves in the arms and legs cool quickly. Manual dexterity, handgrip strength and speed of movement can drop by 60 to 80 percent. Even strong swimmers can lose the strength necessary to pull themselves out of the water or even keep their head above water. Death occurs by drowning.
- **Stage 3: Long-term immersion hypothermia** may set in after 30 minutes, depending on water temperature, clothing, body type and behavior in the water. Hypothermia occurs when the body loses heat faster than it produces, cooling vital organs. Cold water robs the body of heat 25 times faster than cold air. Hypothermia can eventually lead to loss of consciousness and death, with or without drowning.
- **Stage 4: Post immersion circum-rescue collapse** occurs during or after rescue. Once rescued, people are still in danger of cardiac arrest. In addition, inhaled water can damage lungs, and heart problems can develop as cold blood from arms and legs is released into the body's core.



Photo credit: U.S. Coast Guard

Experts urge caution with water colder than 60 degrees Fahrenheit. Water at that temperature is life-threatening when accidental immersion occurs – and many Washington waterways stay below 60 degrees Fahrenheit year-round.

Data from Washington's 2017 recreational boating accident report:

- The most common vessel types involved in fatal accidents were kayaks (31 percent), open motorboat (25 percent) and cabin motorboat (19 percent).
- Most fatal boating accidents involved boats less than 21-feet long (66 percent).
- Falling overboard was the leading type of accident in boating fatalities (50 percent); capsizing and being ejected from a vessel were second and third.



- Operator inattention (23 percent), operation inexperience (15 percent) and alcohol and/or drug use (9 percent) are the top three primary causes of boating accidents.
- Between 2012 and 2017, most boating fatalities happened on inland waters (38 percent on lakes and 30 percent on rivers).
- Between 2013 and 2017, where cause of death was known, 85 percent of fatal boating accident victims drowned. Of those, when life jacket use was reported, 70 percent were not wearing a life jacket.

The U.S. Coast Guard estimates 80 percent of boating fatalities could have been prevented if boaters wore their life jackets. (bit.ly/USCG_12tips).

State Parks Boating Program recommends...

Boaters need to be aware and prepared — any type of boating can put a person in a situation where they may unexpectedly fall into lethally cold water.

- Make sure everyone wears a properly fitted life jacket, including experienced swimmers.
- Avoid alcohol, marijuana and prescription drugs — all of which decrease alertness.
- File a float plan with someone trusted. The plan should include details about the trip, launch area, marina, boat, passengers, towing or trailer vehicle, communication equipment and emergency contacts. Download a free float plan template at floatplancentral.org.
- Know the weather forecast before you set out (warnings, winds, waves, tides, currents, etc.). Wind is a crucial factor as it contributes to capsizing and swamping.
- Dress properly for the air and water temperatures, always wearing layers made of synthetic fabrics and bring an extra set of clothes stored in a dry bag. Avoid cotton clothing.
- Don't panic if you have fallen into the water. Stay afloat with the help of a life jacket, regain control of breathing and try to self-rescue or keep head above water in view of rescuers.
- Carry two forms of emergency communications equipment that will work while wet (whistle, VHF radio, person locator beacon, flares or waterproof cellphone).
- Look for ways to increase buoyancy. If you are in the water with others, huddle together with everyone facing inward to help all stay afloat and keep warm.
- Don't apply heat to extremities such as arms and legs of a rescued victim. This sudden change in temperature could cause cardiac arrest.

Need more information?

- National Center for Cold Water Safety at www.coldwatersafety.org
- Boat U.S. Foundation at <http://www.boatus.org/cold-water-boating/hypothermia/>
- National Water Safety Congress at <https://nationalwatersafetycongress.wildapricot.org/Cold-Water-Facts>

Sources: Frank Golden and Michael Tipton, cold-water survival experts.