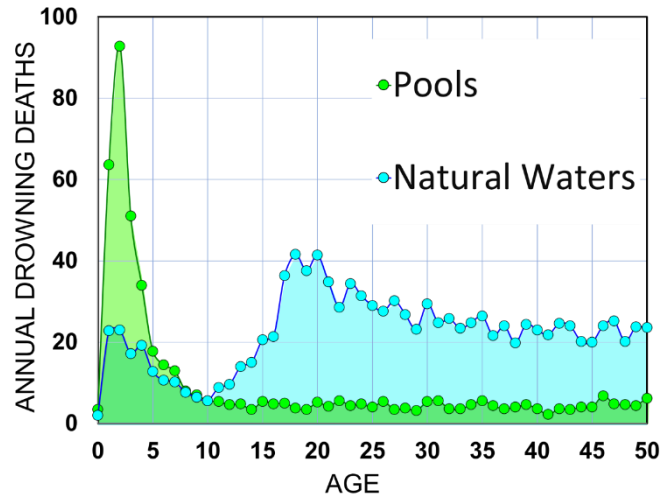


## Swim Area Safety (#SwimAreaSafety)

### Swim Area Safety

In the United States, swimming is the fourth most popular recreational activity. It ranks first in popularity among children and teens ages 7-17. With over ten million residential pools, a quarter million public pools, five thousand miles of beaches, and thousands of public and private river and lakefront campgrounds and recreational areas, it is no surprise that there are hundreds of millions of yearly dips into pools, oceans, lakes, and rivers. <sup>(1,2,3)</sup>

Unfortunately, water activities result in roughly four thousand deaths per year from drowning. Drowning is the leading cause of unintentional injury death among children ages 1-4 years. For that group, there are three times more deaths in pools than in natural waters. Drowning is the second leading cause of unintentional injury death among children 5-9 years. For that group, the number of deaths in pools and natural waters are about equal. For ages 10-65, there are five times as many drowning deaths in natural waters as in pools. <sup>(4)</sup>

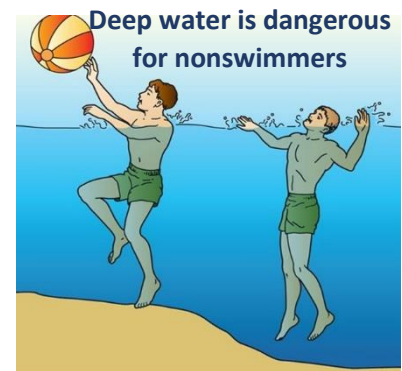


Different groups & locations have different risks

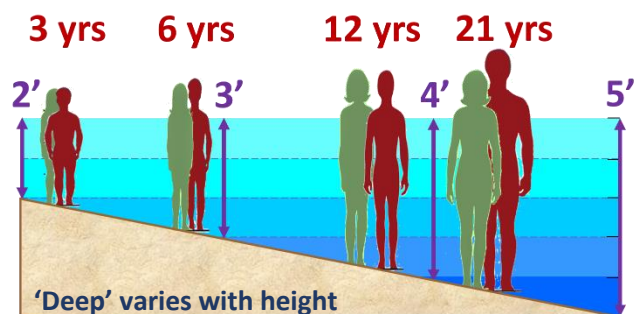
Drowning tragedies can be prevented. This article focuses on how to recognize and respond to water hazards at locations where you swim. When picking a location, factors to consider include water depth, underwater hazards, water quality, water clarity, water temperature, and water movement. Choosing to swim in a designated swim area can help ensure safe conditions.

### Water Depth

Water depth is an important safety consideration for all swimming locations, including pools and natural bodies of water. The hazard posed by deep water is closely tied to swimming ability, and the definition of deep depends on a person's height. Nonswimmers of all ages entering water over head height will immediately begin the drowning process, will be unable to move even a few feet to safety, will not be able to call for help, and, if unaided, will likely submerge in 20 to 60 seconds. <sup>(5)</sup>



It is important to choose a swimming area where poor swimmers will not unexpectedly enter deep water. Not all pools and natural bodies of water have gently sloping bottoms. If there are buoy lines indicating depth ranges, use them to pick the right depth for you and your family. Young children should be closely supervised in all swimming environments, including pools, lakes, rivers, and oceans, with or without lifeguards.



- A study by the Redwoods Insurance group of pool drowning incidents involving submersion and unconsciousness indicates that 69% occurred in water depths less than 5 feet and that 90% were in water depths beyond head height. <sup>(6)</sup>
- Other studies estimate that over 20% of the US population do not know how to swim, with percentages for children in high-risk groups approaching 80%. Roughly 90% of those with no or low ability participate in swimming activities. <sup>(7)</sup>
- In addition, people tend to overestimate their swimming ability and that of their children. In one study, only 56% of those who stated they could swim were able to perform basic water safety skills. <sup>(8)</sup>

U.S. Coast Guard approved, properly fitted life jackets add an extra layer of protection, particularly for weak or non-swimmers who might not be able to avoid deep water, such as swimming from boats or small children who are not tall enough to stand in the shallow end of a pool. To be effective, life jackets must be properly sized and correctly fastened. Check labels for details.

Do not rely on floats such as tubes, air mattresses, or “floaties” for protection. A nonswimmer knocked off a float will be unable to reach for it. You should never use floats where you can’t swim or easily stand.

### Underwater Hazards

A sudden change in water depth that is only a mild surprise for good swimmers can be fatal for nonswimmers. Holes can occur in lakes, quarries can have underwater ledges, rivers have channels, and ocean beaches can have low tide shelves, inshore holes, or deep throughs.

Unexpected shallow areas can also be dangerous. Diving into an underwater object such as a sandbar, rock, log, or stump can result in serious or fatal injury. Never enter the water by diving or jumping without first checking the water depth over the entire area. Limit the height from which you enter the water.

Underwater trees, weeds, trash, and other debris can cause you to become stuck or trapped and unable to swim back to shore. Look out for those when checking water depths and move to a different location if a clear area is not available. You can avoid the need to check for underwater hazards if you swim in designated swim areas constructed and maintained in recreational areas.

Make sure that you have easy, safe areas to enter and exit the water. Muddy shores and bottoms can be dangerous as well as uncomfortable if your feet sink up to ankle depth. Areas with steep banks, such as some quarries, may be difficult to get out of. The best swim areas in natural waters have sandy beaches that are free from vegetation, and gently slope into the water.

### Life jackets add protection



Other floats are unreliable



Observe warning signs



Assess area prior to use

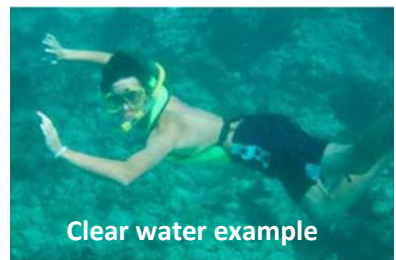
In some areas, wildlife, including snakes, sharks, alligators, and jellyfish, can also be hazardous. Pay attention to all posted warning signs. Seek out local knowledge if visiting unfamiliar environments. Park rangers and lifeguards are good sources of information.

### Water Quality, Clarity, and Temperature

Water can be polluted with many kinds of dangerous substances, including disease causing organisms, sewage, medical waste, or chemicals from industrial spills. Pollution in water may not be visible to the eye. Always follow all water quality warning signs. Avoid bodies of water with foam, scum, or algae blooms. Also avoid places where animal feces are present, such as near flocks of waterfowl or livestock drinking areas.



Water in swimming pools should be clear, with the bottom easily visible. Avoid pools with cloudy or green water, both of which indicate maintenance problems and improper sanitation.



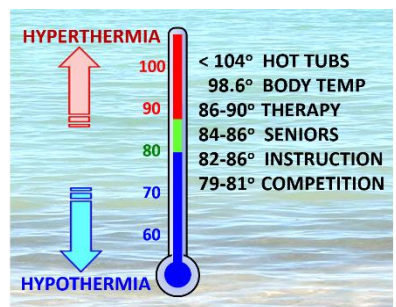
Clear water example

Visibility in natural waters can range from clear, where you can easily see the bottom in several feet of water, to none, where you can't see your hand in front of your face when underwater. Cloudy water varies between those two end points, and visibility can change if swimmers disturb bottom sediments. If the water is too cloudy, swimmers will be unable to see underwater hazards that could lead to drowning. Cloudy water also impedes rescue for drowning victims who are underwater. Even a trained lifeguard team will be challenged to find persons in deep water that is very cloudy. Therefore, it is important for everyone to wear life jackets in deep, cloudy water regardless of swimming ability.



Cloudy water example

Comfortable water temperature for swimming is around 80°F. Exercise caution whenever the water feels cold. Activity in water at 70°F or less should be of limited duration and closely monitored for signs of heat loss, such as shivering. Swimming in cool water can quickly affect your ability to swim. Anyone swimming in cool water should understand symptoms and treatment for cold-water shock and hypothermia. Consult the references at the end of this article for details.



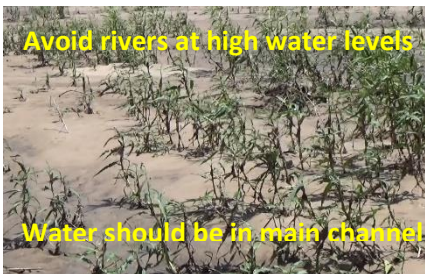
### Moving Water

Moving water is very powerful. The faster the water is, the more energy it has to move you and other objects. For example, water moving at 3 miles per hour, a slow walking speed, has the same energy as an 80-mph wind in a Cat 1 hurricane. <sup>(9)</sup> Large waves can easily lift a person up and then slam them into the bottom. It is very difficult for excellent swimmers to swim against even a mild current without becoming exhausted. A good approach to get back to shore is to remain calm, go with the flow, and swim across the current.



## Rivers

Rivers move rainwater and snow melt from higher elevations to the oceans. The strength of the current depends on how rapidly the elevation changes, the shape of the river, and how much water is involved. Rivers flow faster in mountains than the plains, and when flooding occurs. Other changes in a river can cause the disturbed flow of whitewater rapids. Water movement is obvious in whitewater rapids. In wide, deep rivers flow may not be as visible to the eye but can still be hazardous. Just because you can easily swim a hundred feet or more in a pool, don't assume that you can swim a similar distance directly across a moving river.



Swimmers should avoid rivers at high water levels. Water in grass and bushes at the river's edge often indicates water levels higher than normal. Swimmers should also avoid whitewater rapids. River rapids are very different from the artificial ones created as amusement park rides. Rapids carry risks regardless of swimming ability and life jacket use. American Whitewater reports that more rafters die from "flush" drowning after being ejected from a raft than from entrapments.<sup>(10)</sup> That is, from being pushed up, down, and around in the turbulent flow during a long swim rather than pushed or trapped against rocks or other obstacles.

River flow varies as the shape of the river changes. On the inside of a river bend, the current is slower and the water shallower. Gravel, sand, and silt settle out on the inside of the bend and form beaches favored by swimmers. However, both the current and depth increase moving toward the outside of the bend, which is often steep and therefore not a good place for swimmers to enter.

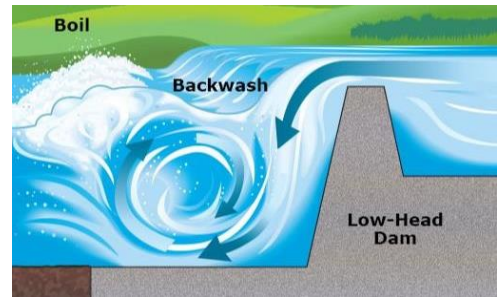


Anyone swimming in rivers should understand how the depth and current vary away from the entry point. Properly worn U.S. Coast Guard approved life jackets provide an extra layer of protection and should be considered for those of all swimming abilities, particularly for poor swimmers or for everyone in a noticeably current.



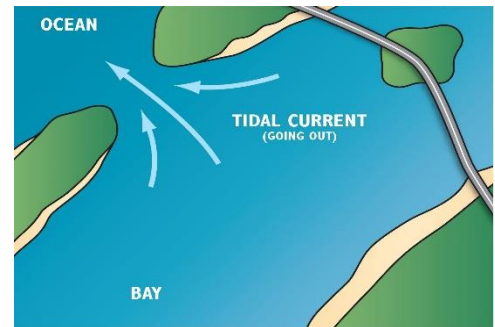
Anyone being swept downstream by a current should remain calm and swim toward the side rather than try to swim against the flow. They may be carried long distances downstream prior to reaching safety.

Some rivers have small dams that may provide swimming areas at family and public campgrounds. However, be very careful of “low head” dams that span a river at a uniform height and discharge water over their entire width. Such structures are known as drowning machines due to their ability to trap swimmers in a recirculating flow, similar to a front-loading washing machine, known as a hydraulic. Stay well away regardless of your swimming ability, even if wearing a life jacket.



### Ocean Currents

The cycle of high and low tides in oceans causes tidal currents. In some coastal areas, the main shoreline is separated from the open ocean by a series of barrier bars and islands enclosing shallow bays. The current in tidal channels between the islands can be strong enough to wash human powered boats or swimmers out to sea. Avoid swimming in such areas and be alert to changes in the strength and direction of currents as tides wax and wane.



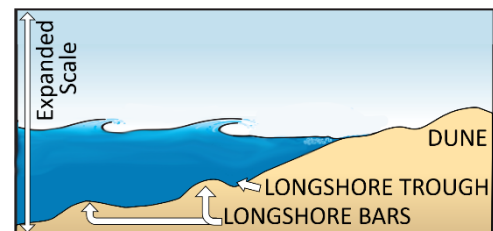
Tidal currents flow to & from open ocean

Longshore currents, also known as littoral currents, move parallel to shore. They will not carry swimmers out to sea but can wash unwary persons toward areas of potential danger such as pilings or rip currents. If you find yourself drifting, move toward shore and wade or walk back to your group.



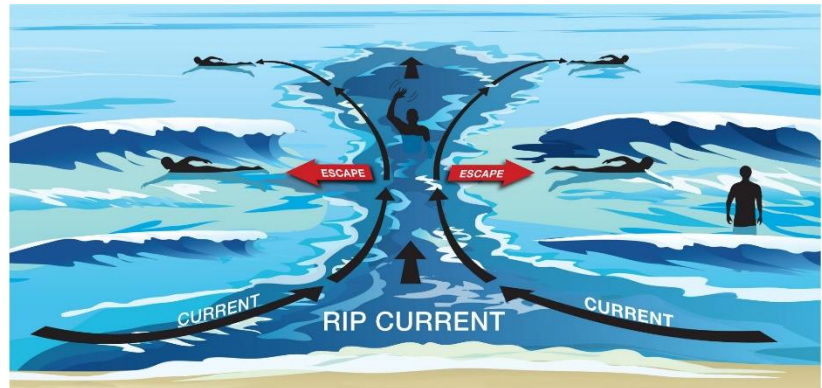
Longshore currents flow parallel to shore

In some cases, drift currents run in a “gutter” or trough inside the surf line between the beach and a shallow sandbar. Such changes in depth can present a danger to poor swimmers, particularly shorter children. Even though the beach near the shoreline may appear to be gently sloping, coastal beaches can have abrupt changes in depth due to gutters, sandbars, low tide shelves, and waves.



Depth profiles at beaches are not uniform

Water cast upon a beach by waves must eventually return seaward. In some cases, that return flow occurs in strong, isolated currents known as rip currents. Rip currents typically form at breaks in sandbars and also near structures such as jetties and piers. They are common on all surf beaches, including the Great Lakes. Some are fixed in location; others change as sandbars shift. Intense temporary rips may appear quickly in response to changing conditions, such as a surge from a storm moving toward land.



**Rip currents are powerful currents of water moving away from shore. They can sweep even the strongest swimmer away from shore. If at all possible, swim near a lifeguard. If caught in a rip current, relax and swim out of the current, not against it, and then to shore.**

Rip currents can sweep even the strongest swimmers away from shore. They account for more than 80% of rescues performed by surf beach lifeguards <sup>(11)</sup>. Anyone swimming at a surf beach should learn about rip currents and how to avoid them. Consult lifeguards at supervised beaches. Many beaches have signs providing information on rip currents, times lifeguards are on duty, and flag systems that indicate safety zones and hazards. Swimmers should study and obey posted instructions. For more information, consult [this link](#) and others in the resource section.

If caught in a rip current, relax, and don't swim against the current. Instead, you may be able to escape by swimming out of the current in a direction following the shoreline, or toward breaking waves, then at an angle toward the beach. You may also be able to escape by floating or treading water if the current circulates back toward shore. If you need help, yell and wave for assistance. Never go in after someone caught in a rip without proper equipment and training. Get the attention of a lifeguard if possible, or call 911.

## Surf

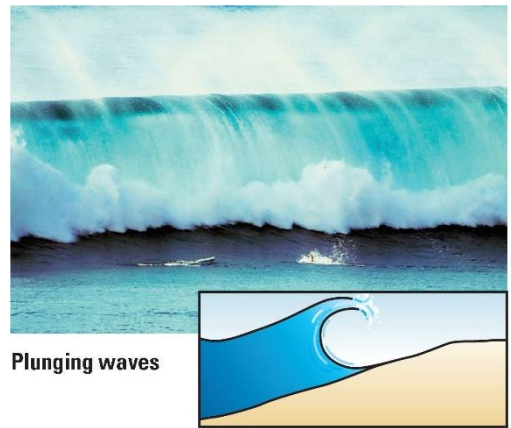
Waves approaching a beach travel as swells formed mainly by offshore winds. If the water remains deep, energy is released as swells hit rocks, jetties, fishing piers, or other structures. Such surging waves can push swimmers violently against such objects and should be avoided.



Surging waves



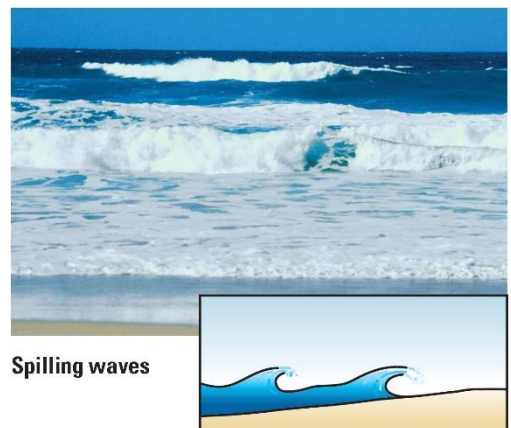
If the shoreline consists of a steep beach, swells will become higher as they approach shore. Plunging waves topple over the wave front with a large, sudden release of energy. Such waves are favored by expert surfers but are hazardous for swimmers.



Plunging waves

## IF IN DOUBT, DON'T GO OUT

If the slope of the shore is gentle, then waves will not get as high and energy is released when the top of the wave tumbles, or spills, down, the wave front. Small spilling waves can be enjoyed by good swimmers who understand how they behave. Poor swimmers should avoid any waves in which they cannot easily retain their footing and remain upright. Small children, regardless of swimming ability, should be closely supervised at all times, limited to near shore activities, and kept within arm's reach. Properly fitted, U.S. Coast Guard approved life jackets add an extra layer of protection.



Spilling waves

Swimmers should face the waves and be alert to water movement. Swimmers should be cautious when ducking into waves. Head first dives into the bottom can result in serious spinal injuries, including paralysis or death.



Closely supervise young children



Be alert to water movement



Avoid diving into the bottom

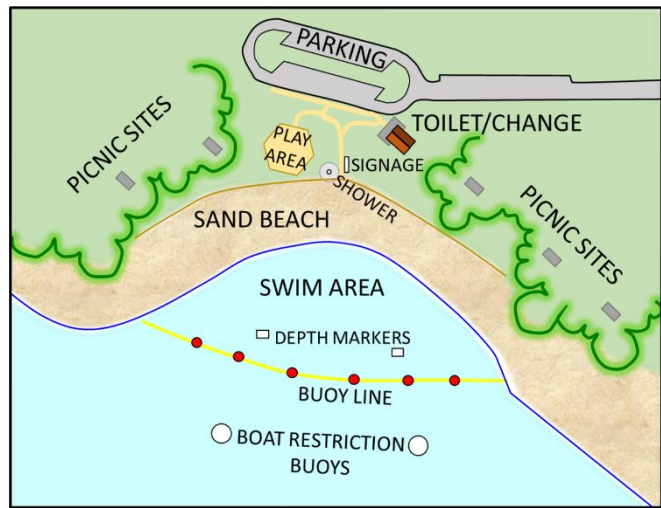


Life jackets and lifeguards provide additional protection

## Designated Swim Areas

Public and private campgrounds and recreational areas often have purposely built and maintained designated swim areas that make it easier to judge swim area safety. They typically have gently sloping sand bottoms and buoy lines indicating depth. Some have safety information signage, rescue equipment, and/or lifeguards. A few have free life jacket loaner stations. These areas often provide amenities such as changing areas, showers, and restrooms that add to swimmer comfort and enjoyment.

Since there are many items to consider when evaluating a swimming area, and those vary by location, choosing a designated swim area is a good choice for anyone regardless of swimming ability. The U.S. Army Corps of Engineers, which manages over 400 lake and river projects, reports five times the number of swimmer fatalities at undesignated versus designated swim areas, or seven times if swimming from boats is included. <sup>(12)</sup>



## Swimming Ability and Environments (click [HERE](#) for previous safety message)

The American Red Cross defines water competency as possessing the basic, minimum skills needed for water safety and survival. <sup>(13)</sup> They describe those skills as the ability to:

- Enter the water and completely submerge
- Recover to the surface and remain there for at least 1 minute
- Turn 360° and orient to the exit
- Level off and propel oneself on the front or the back through the water for at least 25 yards
- Exit the water

### Basic skills for swimming in pools:



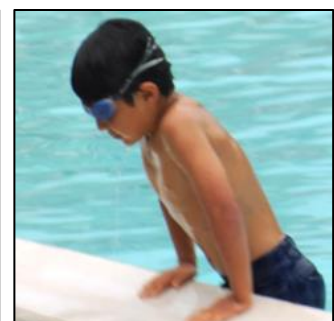
Enter deep water



Turn 360° on the surface



Move at least 25 yards



Exit the water



Other organizations use similar requirements to gauge water competency and may have additional ratings beyond a minimum standard. There is of course a difference between becoming exhausted after swimming 25 yards and being able to continue a relaxed swim after 250 yards. The first may be adequate for swimming in the deep end of a backyard or public pool. The second would be more appropriate for swimming in moving water.

Those swimming in areas involving extended distances or moving water will be well served if they have the skills to switch among a variety of swimming strokes depending on need. A relaxed front crawl with rhythmic breathing (that is, face down) is a common expectation for a “good” swimmer. However, restful strokes such as the breaststroke, sidestroke, and elementary backstroke should allow a person to swim long distances without being a conditioned athlete. A breaststroke, modified to keep the head up, is a good choice for swimming in swells. (Note: competitive breaststroke technique with minimal glide and shoulders thrust upward is less efficient than the restful horizontal version, that is, it takes more energy to cover the same distance.)

**Additional skills useful for safe swimming in natural waters:**



**Relaxed, rhythmic crawl**



**Restful breaststroke**



**Sidestroke**

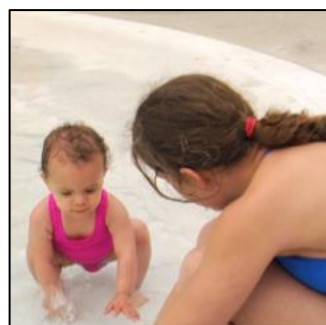


**Elementary backstroke**

**Risk Assessment and Supervision** (click [HERE](#) for previous safety message)

This discussion of swim area safety has considered evaluating and avoiding various risks based on environments. Young children should always be closely supervised by others responsible for their safety and kept within arm’s reach. Close supervision does not include reading, checking email, talking on the phone, cooking, or other distractions.

**Never swim alone. Someone in the group should be able to recognize, prevent, & respond to dangers.**



**Young children need close supervision**



**Swimming near lifeguards is a prudent precaution**



Even excellent swimmers should never swim alone in any environment. Such persons can drown in any swim area at any water depth due to medical complications. Those swimming in natural waters may overestimate their ability to handle adverse water conditions, such as cold or moving water, and their ability to swim long distances.

Ideally, swimming groups should include those knowledgeable and skilled in recognizing, preventing, and responding to drowning situations. If your group lacks those skills, take time to learn them and swim where professionally trained lifeguards are on duty. That assessment also depends on environment. Those confident in their ability to recover a toddler from a pool only five feet deep may not be prepared to perform a safe ocean surf rescue.

## Resources

There are numerous resources on multiple aspects of water safety from various organizations, including printed material, digital files, and videos. A few examples addressing swim area safety include:

- The American Red Cross webpage on [water safety](#) has a variety of resources in both English and Spanish.
- The United States Lifesaving Association provides [safety resources](#) relative to beaches in English, Spanish, and Portuguese.
- The Safe Kids Worldwide research [report](#) *Hidden Hazards: An Exploration of Open Water Drowning and Risks for Children* is available for free download.
- The Boys Scouts of America [manual](#) *Aquatics Supervision: A Leader's Guide to Youth Swimming and Boating Activities* is available for free download.

Please note: digital links valid 4/22/2021 are subject to change. Also, detailed guidance and programs of specific Water Safety USA member organizations may not be endorsed by all members.

## References

1. [Publications, Data, & Statistics | Healthy Swimming | Healthy Water | CDC](#)
2. <https://www.liveabout.com/facts-about-pools-spas-swimming-safety-2737127>
3. [https://ofmpub.epa.gov/apex/beamcon2/f?p=BEACON2:12:0::NO::P12\\_YEARS:Current](https://ofmpub.epa.gov/apex/beamcon2/f?p=BEACON2:12:0::NO::P12_YEARS:Current)
4. Analysis of 2014-2018 data from CDC WONDER [database](#) on Detailed Mortality
5. [Video: Instinctive Drowning Response \(boat-ed.com\)](#)
6. <http://redwoodsgroup.com/resources/test-mark-protect/>
7. <https://www.prnewswire.com/news-releases/usa-swimming-foundation-announces-5-10-increase-in-swimming-ability-among-us-children-300463644.html>
8. <https://www.redcross.org/content/dam/redcross/enterprise-assets/pdfs/Water-Safety-Poll-2014.pdf>
9. <https://vimeo.com/342035469>
10. [American Whitewater](#)
11. [Rip Currents - United States Lifesaving Association \(usla.org\)](#)
12. <https://usace.contentdm.oclc.org/utills/getfile/collection/p16021coll11/id/4622>
13. [Infographic-Water-Safety-Skills.pdf \(redcross.org\)](#)



[www.watersafetyusa](http://www.watersafetyusa)