Citizen Rule Petition to Amend OAR 205-0100-0100 and OAR 254-010-0154

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1. Summary

This petition is submitted to the Oregon State Marine Board (OSMB) pursuant to ORS 183.390 and OAR 137-001-0070 and requests that it amend its current rules regarding personal floatation devices (PFDs) to require that all persons on paddlecraft wear PFDs during the periods before June 1 and after September 15. The proposed amendments consist of adding a definition of “paddlecraft” to OAR 250-010-0010 and amending OAR 250-010-0154(5) by adding text pertaining to PFDs. The proposed amendments are set forth as follows:

(12) “Paddlecraft” means a vessel designed to be primarily powered by its occupants, using a single or double bladed paddle as a lever without the aid of a fulcrum provided by oarlocks, thole pins, crutches, or similar arrangements. Canoes, kayaks, and paddleboards that can be optionally operated by pedals, detachable motors, or a sail are “paddlecraft” under this definition.

(5) A person must not operate a paddlecraft on the waters of this state before June 1 or after September 15 unless all persons on the paddlecraft are wearing a U.S. Coast Guard approved personal flotation device, of the appropriate size, while the paddlecraft is underway. For the purpose of ORS 830.215, a personal flotation device shall not be considered “readily accessible” unless the device is worn while the paddlecraft is underway. Canoes and kayaks 16 feet in length and over are exempted from the requirements for carriage of the additional Type IV PFD.

2. Names, addresses, telephone numbers, and email addresses of persons interested in the petition.

Mike Fields
Executive Director
National Water Safety Congress
Frankfort Ky 40604

Gordon Giesbrecht, PhD
Director, Laboratory for Exercise and Environmental Medicine
University of Manitoba
Winnipeg, MB R3T 2N2


The full text of the existing rules are presented below with the new language indicated by underlining and the removed language indicated by strike-out. A notice of rulemaking is
currently pending that is anticipated to change the manner of describing the classifications of PFDs. These changes will not affect the substance of the proposed amendments requested in this petition.

250-010-0010
Definitions

As used in OAR Chapter 250, unless otherwise required by context:

(1) "Aquatic Invasive Species Prevention Permit" is an authorization issued by the Oregon State Marine Board or through designated agents that certifies payment to the Aquatic Invasive Species Prevention Fund.

(2) "Black Waste" means human body wastes including feces, urine, other substances of bodily origin, and toilet paper.

(3) "Board" means the Oregon State Marine Board.

(4) "Boat Livery" means a person, persons, or a business establishment engaged in renting or hiring out boats for profit.

(5) "Eleemosynary" means an organization supported by gifts or charity which is operated primarily as a part of organized activities for the purpose of teaching youth’s scout craft, camping, seamanship, self-reliance, patriotism, courage and kindred virtues.

(6) "Float Tube" means a manufactured floating device constructed of canvas, nylon or other similar material encasing an inner tube capable of supporting one person sitting inside with their legs dangling below the vessel, used as a means of transportation on the water. Single float tubes are boats as defined in ORS 830.005(2) and if powered by machinery, single float tubes are motorboats as defined in ORS 830.005(5) and subject to numbering according to OAR 250-010-0040.

(7) "Non-motorized boat" means any watercraft as defined in ORS 830.005(2), but not a motorboat as defined in 830.005(6).

(8) "Operator" means the person who operates or who has charge of the navigation or use of a boat.

(9) "Person" means an individual, partnership, firm, corporation, association, or other entity.

(10) "Person on Board" means every person being carried on board or being towed by a vessel.

(11) “Portable Toilet” means all types of portable containers, hand carried potties, buckets or similar devices used to collect black waste into a small receptacle.

(12) “Paddlecraft” means a vessel designed to be primarily powered by its occupants, using a single or double bladed paddle as a lever without the aid of a fulcrum provided by oarlocks, thole pins, crutches, or similar arrangements. Canoes, kayaks, and paddleboards that can be optionally operated by pedals, detachable motors, or a sail are “paddlecraft” under this definition.

(13) "Propel" means but is not limited to floating, rowing, paddling, sailing or otherwise operating a boat (as defined in ORS 830.005), a vessel or ship.

(14) "Sewage" means water-carried human and animal wastes and may include but is not solely kitchen, bath, and laundry wastes from residences, buildings, boats or other places.
"Ship's Lifeboats" means lifeboats used solely for lifesaving purposes and does not include dinghies, tenders, speedboats, or other types of craft carried aboard a vessel and used for other than lifesaving purposes.

"Slow-No Wake" means operating a boat at the slowest speed necessary to maintain steerage and that reduces or eliminates waves that appear as white water behind the boat.

"Type I Marine Sanitation Device" means a device installed on board a boat that is designed to receive, retain, treat, or discharge sewage or black waste, which produces an effluent having a fecal coliform bacteria count not greater than 1,000 per 100 ml and no visible floating solids.

"Type II Marine Sanitation Device" means a device installed on board a boat that is designed to receive, retain, treat, or discharge sewage or black waste, which produces an effluent having a fecal coliform bacteria count not greater than 200 per 100 ml and suspended solids not greater than 150 mg/L.

"Type III Marine Sanitation Device" means a device installed on board a boat that is designed to receive, retain, treat, or discharge sewage or black waste, which is designed to prevent the overboard discharge of treated or untreated sewage or any waste derived from sewage. These include but are not limited to a holding tank with a means of pumping the sewage into a land based Oregon Department of Environmental Quality approved wastewater treatment system.

"Undocumented Vessel" means any vessel which is not required to have, or does not have, a valid marine document issued by the U.S. Coast Guard.

"Underway" means when a boat is not at anchor, or moored, or made fast to the shore, or aground.

"Wakeboarding" means the activity of towing a person who is attached with two foot bindings on equipment similar to a short surfboard or snowboard. Equipment used in this activity may include but is not limited to wake boards.

"Wake surfing" means the activity of propelling a person, on equipment similar to a surfboard, forward with a boat’s wake. The person may be holding a rope or free riding. Equipment used in this activity may include but is not limited to wake surf boards, wake boards, stand up paddleboards, and hydrofoils.

"Waterway Access Permit" is an authorization issued by the Oregon State Marine Board or through designated agents that certifies payment to the Waterway Access Fund.

Personal Flotation Devices

(1) No person shall operate a boat on the waters of this state unless at least one Personal Flotation Device (PFD) of the following types is on board for each person:

(a) Type I PFD;
(b) Type II PFD;
(c) Type III PFD.

(2) No person shall operate a boat 16 feet or more in length unless one Type IV PFD is on board in addition to the total number of PFD's required in section (1) of this rule.

(3) No person shall operate a boat on the waters of this state with a child age 12 and under, unless the child is wearing a U.S. Coast Guard approved personal flotation device, of the appropriate size, while the boat is...
underway. For the purpose of ORS 830.215, a personal flotation device shall not be considered "readily accessible" for children age 12 and under unless the device is worn while the boat is underway. The PFD must be worn at all times by a child age 12 and under whenever the boat is underway and the child is on an open deck or open cockpit of the vessel. The following circumstances are excepted:

(a) While the child is below deck, or in the cabin of a boat with enclosed cabin.

(b) While a child is on a sailboat and tethered by means of a lifeline or harness attached to the sailboat.

(c) While a child is on a U.S. Coast Guard inspected passenger-carrying vessel operating on the navigable waters of the United States.

(4) A Type V PFD may be carried in lieu of any PFD required in section (1) of this rule provided:

(a) The approval label on the Type V PFD indicates that it is approved for the activity in which the vessel is being used, or that it is approved as a substitute for a PFD of the Type required on the vessel in use;

(b) The PFD is used in accordance with any requirements on the approval label; and

(c) The PFD is used in accordance with requirements in its owner's manual, if the approval label makes reference to such a manual.

(5) A person must not operate a paddlecraft on the waters of this state before June 1 or after September 15 unless all persons on the paddlecraft are wearing a U.S. Coast Guard approved personal flotation device, of the appropriate size, while the paddlecraft is underway. For the purpose of ORS 830.215, a personal flotation device shall not be considered “readily accessible” unless the device is worn while the paddlecraft is underway. Canoes and kayaks 16 feet in length and over are exempted from the requirements for carriage of the additional Type IV throwable PFD.

(6) Racing shells, rowing sculls, racing canoes and racing kayaks are exempted from the requirements for carriage of any Type PFD. Racing shells, rowing sculls, racing canoes, and racing kayaks are manually propelled vessels that are recognized by national or international racing associations for use in competitive racing an in which all occupants row, scull, or paddle, with the exception of a coxswain, if one is provided, and are not designed to carry and do not carry any equipment not solely for competitive racing.

(7) PFD is defined as follows:

(a) Type I — A Type I PFD is an approved device designed to turn an unconscious person in the water from a face downward position to a vertical or slightly backward position, and to have more than 20 pounds of buoyancy;

(b) Type II — A Type II PFD is an approved device designed to turn an unconscious person in the water from a face downward position to a vertical or slightly backward position and to have at least 15.5 pounds of buoyancy;

(c) Type III — A Type III PFD is an approved device designed to keep a conscious person in a vertical or slightly backward position and to have at least 15.5 pounds of buoyancy;

(d) Type IV — A Type IV PFD is an approved device designed to be thrown to a person in the water and not worn. It is designed to have at least 16.5 pounds of buoyancy;

(e) Type V — A Type V PFD is an approved device for restricted use. A Type V PFD may be carried in lieu of any PFD, but only if that Type V PFD is approved for that activity in which the recreational boat is
(8) No person shall operate a personal watercraft, as defined in OAR 250-021-0020, unless each person operating or riding on the vessel is wearing an inherently buoyant Coast Guard approved Type I, II or III PFD, (see 250-021-00030(1)).

(9) Exemptions:

(a) Sailboards are exempted from the requirements for carriage of any Type PFD.

(b) Float tubes as defined in OAR 250-010-0010 are exempted from the requirements for carriage of any Type PFD.

(10) Personal Flotation Device Requirements for Class III or Higher Water:

(a) A properly secured personal flotation device must be worn by persons in a boat while navigating sections of river with a commonly accepted scale of river difficulty rated Class III or higher.

(b) The personal flotation devices worn by boaters must:

(A) Be approved by the U.S. Coast Guard as a Type I, III, or V personal flotation device.

(B) Not have a limitation or restriction on its approval that would prevent its use on whitewater rivers.

(C) Not be an inflatable personal flotation device regardless of rating type.

4. Legal Authority for the Proposed Amendments

The Board has the statutory authority to adopt the proposed amendments pursuant to ORS 830.110. In addition, the proposed amendments are fully consistent with ORS 830.100 which sets forth the intent of the Oregon State Legislature that the policy of the State is to promote safety for persons and property in and connected with the use, operation and equipment of boats.

5. Reasons for and the Effects of Adoption of the Proposed Amendments.

A. Cold water shock and incapacitation endanger persons who are not wearing PFDs.

When water temperatures are less than 60° F, cold water shock and incapacitation are major factors in boating fatalities. Cold water shock causes an involuntary gasp that frequently results in aspiration of water, hyperventilation, and mental impairments such as panic, confused thinking, and the inability to evaluate options. If the mouth is submerged during a capsize or fall, the gasping reflex can suddenly fill the paddler’s lungs with water, which results in immediate drowning if the person is not wearing floatation. Similarly, it is extremely difficult to swim when hyperventilating and impaired mental processes can prevent persons from taking appropriate action to save themselves.

Cold water incapacitation occurs within a few minutes after immersion in cold water because the body decreases blood flow to the extremities in order to maintain its core temperature. The reduction of blood flow to the arms and legs greatly impairs the functioning of muscles and nerves, which first causes hands and feet to go completely numb and then renders the person
unable to use their arms and legs. Numb hands prevent persons from holding on to objects and the loss of arm and leg movement makes it impossible to swim. Persons experiencing cold water incapacitation will drown if they are not wearing a floatation device.

Although the phenomena of cold water shock and incapacitation are well understood by experts, many members of the general population are oblivious to its dangers. For example, many people believe that hypothermia is the major risk presented by cold water. However, as marine safety expert Mario Vittoni has noted, the vast majority of persons who die in cold water do so because they become incapacitated within a few minutes and drown unless wearing floatation. Exhibit A. Another aspect of misunderstanding the danger of cold water is that few people can realistically comprehend what it is like to be immersed in very cold water without actually going through the experience. In fact, many people greatly overestimate their ability to avoid the gasp reflex and to be able to think clearly when unexpectedly immersed in cold water.¹

**B. Paddlecraft are highly vulnerable to unanticipated capsizes and falls.**

The majority of capsizes and falls from paddlecraft are sudden and unexpected events which result in complete immersion of the paddler. Capsizes of canoes and kayaks typically involve the craft rotating along its longitudinal axis, which deposits the paddlers either horizontally or upside down beneath the water surface. River rafts typically capsize by pivoting on an outer tube which flips the raft upside down and throws the paddlers beneath the raft. Falls from paddleboards most frequently result in paddlers landing horizontally and impelling the board several feet away from them. Most unintentional capsizes or falls result in immersion of the paddler’s head during the event.

Should a paddler become separated from a capsized craft in the presence of even modest wind or current, the craft will be carried away from the paddler. In such cases, it is impossible for even a fast swimmer to reach the craft. If the paddler’s PFD is attached to the boat, it will be carried off as the boat drifts away. Even when unworn PFDs are within reach following a capsize, they can be very difficult to put on while in the water. In addition, self-rescue procedures for righting, draining and reentering canoes, kayaks, and rafts generally require prior training and practice to implement under real-world conditions. When conditions are rough, even experienced paddlers can find it difficult to perform a self-rescue. Inexperienced paddlers are unlikely to figure out such techniques on their own, especially when experiencing cold water shock and incapacitation.

Recent fatalities of paddlers in Oregon indicate that a mandatory wear requirement would save lives. A twenty-seven year-old man drowned within minutes on April 16, 2020 after his kayak capsized while paddling near Elk Rock Island on the Willamette River. Exhibit B. A canoeist drowned the previous day after his canoe capsized on the Columbia River near Jantzen Beach. Exhibit C. On May 1, 2016, a twenty-nine year-old woman drowned on the Columbia River near Sauvie Island after falling off a paddleboard. Exhibit D. In each instance, the paddler was not wearing a PFD and the water temperature was in the mid-fifties.

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¹ Anyone who wants to test their ability to avoid gasping upon sudden exposure to cold water can do so by standing beneath a shower and then turning on the cold water. Absent holding one’s nose, it is nearly impossible for most people to avoid an initial deep inhalation when the water hits them.
The recreational boating accidents statistics maintained by the OSMB further support that a mandatory wear requirement would save lives. Although the individual incident reports are not open to public review and the statistics do not include deaths that are commercial in nature or occur after a person has purposefully left the vessel, the statistical summaries from 2014 to 2019 indicate that paddlers constitute about half of fatalities and that most victims would not have died had they been wearing PFDs.

C. It is reasonable to expect that water temperatures will be less than 60° F during the periods before June 1 and after September 15.

To determine an appropriate period to require the wearing of PFDs on paddlecraft, historic water temperature data maintained by the U.S. Geologic Service (USGS) were evaluated for several rivers and lakes across Oregon to determine when on average the water temperature is expected to be 60° F or lower. The data consist of the daily mean values as opposed to minimum historical values, and encompass all the temperature data available on the USGS website for the rivers or lakes described below. It should be noted that the use of daily mean values does not reflect the exact dates on which water temperatures begin or cease to exceed 60° F, because these dates will vary by one or two weeks for each water body in any given year.

The results of the evaluation are set forth as follows for specific rivers and lakes.

Alsea River near Tidewater: May 29 through September 22
Clackamas River at Estacada: July 2 through September 6
Clackamas River at Oregon City: June 23 through September 17
Columbia River at Hood River: June 8 through October 20
Columbia River at Vancouver: June 1 through October 20
Columbia near Quincy Oregon: June 1 through October 15
Deschutes River at Madras: never
Deschutes River near Biggs: May 23 through September 16
Detroit Lake (1 ft below surface): June 1 through October 10
Donner & Blitzen River: June 27 through September 10
John Day River near Galena: June 24 through September 10
Klamath River at Keno: May 14 to September 30
Malhuer Lake: May 26 to September 15
McKenzie River near Belnap Springs: never
McKenzie River near Leaberg: never
McKenzie River at Springfield: July 2 through August 22
Minam River at Minam: July 17 through September 9
Nehalem River near Foss: June 24 through September 22
North Santiam River at Niagara: never
Rogue River at Grants Pass: June 19 through September 15
Rogue River near Agness: May 25 through October 3
Santiam River at Jefferson: June 8 through September 8
Tualatin River at West Linn: May 25 through October 9
Snake River at Nyssa: May 13 through October 4
Umpqua River near Elkton: May 19 through October 10

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Willamette River at Harrisburg: June 19 through September 20
Willamette at Salem: May 26 through September 12
Willamette River at Portland: June 1 through October 6
Wilson River at Tillamook: June 30 to September 24

Although there is variance among the commencement and cessation dates among the water bodies in the state, setting June 1 as the commencement date for when water temperatures exceed June 1 works encompasses an appropriate date for most water bodies, considering that the commencement dates can reasonably be expected to arrive up to two weeks earlier during some years. The same can be said for selecting September 15 as the cessation date after which water temperatures will likely be lower than 60° F. Although the water temperatures in some water bodies, including coastal waters, rarely exceed 60° F, setting June 1 and September 15 as statewide dates is justified for practical reasons including the fact that these dates are easy to remember and encompass the majority of waters within Oregon. To the extent that the OSMB believes that a discrepancy between dates and water temperatures for an individual river or lake warrants a departure from the June 1 and September 15 dates, it has the authority to promulgate local and special rules to address such waters. However, this petition is not seeking to amend local or special rules.

D. The proposed rule amendments would significantly foster the protection of paddlers and other persons.

Requiring the wearing of PFDs by paddlers before June 1 and after September 15 would significantly reduce fatalities among paddlers because water temperatures in most parts of Oregon during those periods are cold enough to shock and incapacitate persons who unexpectedly plunge into cold water. In addition, such a requirement would likely reduce the risks faced by search and rescue teams and good Samaritan rescuers by extending the time in which a rescue can successfully be made. Adoption of the proposed amendments could also reduce the time search and rescue teams spend searching for paddlers following a capsize or fall, because a successful rescue negates the need to engage in body recovery operations.

Research indicates that mandatory wear laws are effective in increasing wear rates. For example, a study by the University of Washington in 2014 found that although many boaters reject the wearing of PFDs because they perceive wearing them as a hallmark of the inexperienced boater or persons having poor swimming ability, most boaters reported that they would wear their PFDs if there were laws that required such practices. Exhibit E. This finding is further supported by an evaluation by the U.S. Army Corps of Engineers that showed that PFD wear rates increased from 8.8 percent to over 70 percent at four lakes in Mississippi after it implemented a policy that required the wearing of PFDs on all boats 16 feet to 26 feet when under power, on all powered boats having less that 16 feet, and on all non-powered vessels. Exhibit F.

An interesting aspect of the Army Corps of Engineers experience at the Mississippi lakes is that the high wear rate was achieved without expending additional resources for enforcement and with minimum reliance on punitive measures. For the most part, enforcement was directed at issuing verbal and written warnings, with citations issued primarily to persons who repeatedly disregarded the PFD rules. It should be further noted that decades of educational outreach

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emphasizing the importance of wearing PFDs had been largely ineffective at increasing wear rates prior to the wear requirements being implemented. However, educational efforts directed at informing the boating public about the wear requirements were an important contributor to the success of the program.

It should be noted that the OSMB has previously adopted rules requiring the wearing of PFDs by children age 12 and under, by persons operating or riding on personal watercraft, and by persons navigating rivers rated as Class III or higher. OAR 250-11-0154 & 250-21-0030. Extending the PFD wear requirement to paddlers during cold water periods would be a natural extension of these rules. Not only would the law benefit inexperienced paddlers who underestimate the dangers of cold water, it would largely mitigate the stigma that the wearing of PFDs signifies inexperience or the inability to swim.

Other states have adopted statutes or rules that mandate the wearing of PFDs during periods of cold water. Connecticut has a rule that requires all persons aboard a manually propelled vessel to wear a PFD during the period from October 1 through May 31. Conn. Agencies Regs. § 15-121-A17. The rule in Massachusetts requires canoeists and kayakers to wear PFDs from September 15 to May 15. 323 CMR § 2.07(10). New York has a statute that requires owners or operators of pleasure vessels less than twenty-one feet, including rowboats, canoes, and kayaks to ensure that each person on board wears a PFD between November 1 and May 1 when the vessel is underway. N.Y. Nav. Law § 40. The Pennsylvania rule requires that all persons wear a PFD when on boats less than 16 feet in length or on all canoes and kayaks during the period from November 1 to April 30. 58 Pa. Code § 97.1.

**E. Changes in technology, economic conditions, or other factors since the previous substantive amendments to OAR 250-010-0154 favor amending the rule.**

Changes in the design of Type III PFDs have largely negated the validity of the historical complaint that PFDs are uncomfortable to wear. At present, over a dozen manufacturers offer a wide variety of Type III PFDs that are designed specifically for men, women, and children. The ever-evolving designs of PFDs, including the trend of adding features such as pockets and ventilating mesh, have further enhanced the appeal of wearing them. In addition, Type V inflatable PFDs are widely available to those who object to wearing Type III PFDs. It should be further noted that the existing rules that require the wearing of PFDs have generally been accepted by the affected communities.

The increasing popularity of paddlecraft further warrants adopting a PFD wear requirement because there are now large numbers of novice and casual participants who have been recently introduced to paddling activities. One reason for the increase is that the cost of entry is very low with respect to paddleboarding, recreational kayaking, and kayak fishing. For example, it is possible to purchase paddlecraft for such activities at big box stores for under $300. However, the retail environments in which such paddlecraft are sold are not conducive to ensuring that purchasers understand how to safely engage in paddling. This is especially true for paddleboarding, which is often promoted in the general media as an accessible and affordable physical fitness activity. Unfortunately, these promotional efforts frequently downplay the importance of wearing PFDs. For example, an Internet search of paddleboarding images will
typically yield search results in which over 90 percent of the images show paddlers in swimwear and without PFDs.

**F. The amendments will not create adverse economic effects for businesses or boaters.**

ORS 830.215 and OAR 250-010-0154 currently require that all boats carry at least one PFD for each person on board. The proposed amendments will not impose economic burdens on individuals or businesses, because no affected person will be required to purchase anything that is not already required under existing law.

**G. The proposed amendments are consistent with existing rules.**

The proposed amendments will not alter the requirements of the existing rules, which should remain in place because they foster boating safety and are not complex. Likewise, the proposed amendments will not conflict with other federal, state, or local rules. Other states have successfully adopted rules similar to the proposed amendments and federal law permits the states to regulate the carrying and use of marine safety articles to meet circumstances within the state.

The proposed amendments are easy to comprehend and provide clear guidance regarding the requirements that paddlers are to follow; namely that they wear a PFD during the periods before June 1 and after September 15. Compliance with the proposed amendments would likely have prevented the fatalities described in subsection 5 B. Adoption of the proposed amendments will no doubt prevent future deaths.

Dated: May 4, 2020

s/ Bert P. Krages II
Bert P. Krages II
The Truth About Cold Water

April 12, 2013 by Mario Vittone

Note: With the spring boating season upon us, the U.S. Coast Guard warned today that although the air temperatures are warmer, the water is still cold and presents a significant danger to those looking to cool off. This article was first published to gCaptain.com in 2010, and we are reposting today (April 12, 2013) to help you stay safe while out on the water this season. A link to a follow-up article, titled “The Truth About Cold Water Recovery”, can be found at the bottom of this page.

![Boat on the water](image.png)

Image (c) Shutterstock

By Mario Vittone

I’m going to come right out and tell you something that almost no one in the maritime industry understands. That includes mariners, executives, managers, insurers, dock workers, for certain – fisherman, and even many (most) rescue professionals:

**It is impossible to die from hypothermia in cold water unless you are wearing flotation, because without flotation – you won’t live long enough to become hypothermic.**

Despite the research, the experience, and all the data, I still hear “experts” – touting as wisdom – completely false information about cold water and what happens to people who get in it. With
another season of really cold water approaching, I feel compelled to get these points across in a way that will change the way mariners behave out there on (or near) the water.

What follows is the truth about cold water and cold water immersion. I know that you think you know all there is to know about hypothermia already (and maybe you do), but read ahead and see if you aren’t surprised by something.

When the water is cold (say under 50 degrees F) there are significant physiological reactions that occur, in order, almost always.

You Can’t Breathe:

The first is phase of cold water immersion is called the cold shock response. It is a stage of increased heart rate and blood pressure, uncontrolled gasping, and sometimes uncontrolled movement. Lasting anywhere from 30 seconds to a couple of minutes depending on a number of factors, the cold shock response can be deadly all by itself. In fact, of all the people who die in cold water, it is estimated that 20% die in the first two minutes. They drown, they panic; they take on water in that first uncontrolled gasp, if they have heart problems – the cold shock may trigger a heart attack. Surviving this stage is about getting your breathing under control, realizing that the stage will pass, and staying calm.

You Can’t Swim:

One of the primary reasons given by recreational boaters when asked why they don’t wear a life jacket, is that they can swim. Listen up, Tarzan; I swam for a living for the better part of my adult life, and when the water is cold – none of us can swim for very long. The second stage of cold water immersion is called cold incapacitation. Lacking adequate insulation your body will make its own. Long before your core temperature drops a degree, the veins in your extremities (those things you swim with) will constrict, you will lose your ability control your hands, and the muscles in your arms and legs will just flat out quit working well enough to keep you above water. Without some form of flotation, and in not more than 30 minutes, the best swimmer among us will drown – definitely – no way around it. Without ever experiencing a drop in core temperature (at all) over 50% of the people who die in cold water, die from drowning perpetuated by cold incapacitation.

You Last Longer than You Think:

If you have ever heard the phrase, “That water is so cold, you will die from hypothermia within
ten minutes." then you have been lied to about hypothermia. For that matter you can replace ten minutes with twenty, or thirty, or even an hour, and you’ve still been lied to. In most cases, in water of say 40 degrees (all variables to one side), it typically takes a full hour to approach unconsciousness from hypothermia, the third stage of cold water immersion. But remember, you must be wearing flotation to get this far.

We are all different in this regard, but I once spent an hour in 44 degree water wearing street clothes and my core temperature was only down by less than two degrees (I was not clinically hypothermic). It was uncomfortable to be sure, and I wouldn’t recommend finding your own limit, but it probably would have taken another hour to lose consciousness, and an hour after that to cool my core to the point of no return. The bodies efforts to keep the core warm – vasoconstriction and shivering – are surprisingly effective. The shivering and blood shunting to the core are so effective, that twenty minutes after jumping in (twice the "you’ll be dead in ten minutes" time), I had a fever of 100.2.

Rescue Professionals Think You Live Longer:

There is a good side to the misconceptions about hypothermia. Should you ever be in the water in need of rescue, you can be certain that the Coast Guard is going to give you the benefit of every possible doubt. When developing search criteria – search and rescue coordinators use something called the Cold Exposure Survival Model (CESM): It is a program wherein they enter all the available data about the victim (age, weight, estimated body fat, clothing, etc.) and about the environment (water temp, sea state, air temp, wind) and the software spits them out a number that represents the longest possible time you can survive under those conditions. I plugged my own information into it once and it said I could survive for over 4 hours in 38 degree water wearing nothing but a t-shirt and jeans and no flotation. I can tell you from experience that the CESM is full of it – I’d give me 35 minutes tops – but the error is comforting. If the program that determines how long I might live is going to be wrong – I want it to be wrong in that direction.

Out of the Water is Not Out of Trouble:

I lost count of the number of survivors I annoyed in the back of the helicopter because I wouldn’t let them move. I had a rule – if they came from a cold water environment – they laid down and stayed down until the doctors in the E.R. said they could stand. It didn’t matter to me how good they felt or how warm they thought they were. Because the final killer of cold water immersion is post-rescue collapse. Hypothermia does things besides making everything
colder. Victims are physiologically different for awhile. One of the things that changes is called heart-rate variability. The hearts ability to speed up and slow down has been effected. Getting up and moving around requires your heart to pump more blood, being upright and out of the water is also taxing, then any number of other factors collide and the heart starts to flutter instead of pump – and down you go. Victims of immersion hypothermia are two things; lucky to be alive, and fragile. Until everything is warmed back up – out of the water and dry is good enough – mobility comes later.

**Did You Learn Anything?:**

If you did, then hopefully you’ll use it to make good decisions when it comes to being safe on and around cold water; good decisions like these:

1. When working on deck, wear flotation. This includes, especially, all fisherman in Alaska. I couldn’t find more recent research, but the 31 Alaskan “fell overboard” casualties in 2005 died from drowning, not cold water. Not one of them was wearing flotation. Many couldn’t stay above water long enough for their own boats to make a turn and pick them up.....over a life jacket.
2. If you witness a man overboard – getting the life ring directly to them is critical (vital – step one – must do it). Make certain that all-important piece of safety gear is not just on your vessel, but readily available and not tied to the cradle.
3. When working on deck – wear flotation. I said that already? Well, when I quit reading search reports that end with “experienced” mariners dying because they thought they understood cold water – I’ll come up with better advice.

For more advice about how to handle an accidental immersion into cold water – please watch **Cold Water Boot Camp** – it is one of the best 10 minutes on immersion hypothermia ever produced. For even more advice, ask me a question on the discussion boards.
Clackamas County

Man presumed drowned in Milwaukie was an MMA fighter with strong family ties

Updated Apr 22, 2020; Posted Apr 22, 2020

A memorial has grown on the shoreline where Saul Gallegos Ruiz was last seen.

The 27-year-old mixed martial arts fighter from Happy Valley had flipped his kayak and was struggling Thursday afternoon in the waters of the Willamette River, just north of Elk Rock Island in Milwaukie. He is presumed drowned, though Clackamas County search and rescue teams have been unable to find his body.
So every day, his family and friends hold vigil. They bring roses, sunflowers, candles and rosaries. The memorial grows, and the questions linger.

Why wasn’t this fit, young swimmer able to survive?

Shortly after noon on Tuesday, seven family members walked down to the water’s edge. They carried a homemade wooden cross, etched with Gallegos Ruiz’s name, down the switchback trail to the shoreline.

“He was a fighter, in and out,” said Leo Olmos, who used a rock to drive the cross into the damp sand.

Everardo Gallegos Ruiz stands at the memorial for his brother, who is presumed drowned.

Throughout the afternoon, people continued to come in waves. They carried chairs, food and another cross. Friends and family – including his younger brother and parents – trickled in until more than 60 people had gathered near Elk Rock Island to mourn.

His mother dropped to her knees, crying, at the sight of the new crosses.

Grief does not stop for a pandemic.

Family said Gallegos Ruiz was a 2013 graduate of Sandy High School who worked in sales at McLoughlin Chevrolet.

“Family was important,” said his cousin, Fabian Rodriguez Ruiz. Gallegos Ruiz wanted to help buy his parents a house, and he drove out to visit them in Welches every other day. “He always talked about his family. Yeah, Exhibit B
but he always wanted to make his mom and dad’s life, and his little brother’s life, a lot better.”

He was athletic. Growing up in Welches, he liked mountain biking.

“He didn’t believe in hitting the brakes,” added another cousin, Angel Rodriguez Ruiz.

Gallegos Ruiz was a mixed martial arts and jiu-jitsu fighter.

“He was the hardest working kid in the room, but he was also the most polite kid in the room,” said Nick Gilardi, his trainer at Impact Jiu Jitsu. “You could never get him to quit. He was the first one there and the last one to go. I’ve known him for eight years. He’s one of the best athletes I’ve ever coached.”

Last year, Gallegos Ruiz had his first pro MMA fight.

“He knocked the guy out in 11 seconds,” Gilardi said. “He was well on his way to do whatever he wanted to in the sport.”

Alicia Hamilton stands on the bank of the Willamette River in Milwaukie.

Alicia Hamilton lives next door to the memorial and the public access point to the river. She was on a Zoom call about 4:20 p.m. Thursday when her 18-year-old daughter ran up to her. Someone was in the water and needed help.

Hamilton ran to her backyard, facing the river, and grabbed her paddle board. In the distance, she could see someone struggling, yelling and flailing his arms.

“It was so windy and I was not making the progress I wanted
to,” she said. “It probably took me 10 minutes to get to him.”

She got close enough to reach out her paddle to him.

“As I was getting closer, I could see him go down a little bit longer, and by the time I got to him ... his eyes will haunt me forever. I literally could touch him with my paddle,” she said. “He turned around and looked at me and went under.”

He never came back up.

Hamilton wonders how things would be different if she’d been on her back porch. What if she’d been just a few seconds faster?

She visits and adds to the memorial daily.

“I go to bed every night and think, he’s alone out there somewhere,” she said.

Saul Gallegos Ruiz was a 2013 graduate of Sandy High School.

Gallegos Ruiz’s last Snapchat story was about 4 p.m. Thursday, his cousins said, when he posted about having gotten in his day’s workout on the river. About 20 minutes later, he was seen struggling in the water after being tossed from his kayak.

Yes, the water was cold. No, he was not wearing a life jacket.

But it still didn’t seem right.

“This didn’t make any sense,” said Gilardi, who lives in Salem. “So I just drove out right away and I think I was out here by 9:30 a.m. Friday morning, just put it all together like
everybody else. We’ve been out here every day, all day."

Gilardi knows the grim reality – how long it might take a body to surface, if it ever does. Still, he’s here, continuing the search, for the sake of Gallegos Ruiz’s mother.

“If it’s going to make her feel better to have us out here searching, I’ll be out here searching,” he said.

Gilardi saw Gallegos Ruiz press on through cuts, bruises and broken fingers. The fighter never gave up.

Neither will he.

Friends, family and neighbors are organizing another search for Gallegos Ruiz’s body at 4 p.m. Friday. Anyone with a paddle board, kayak or boat is welcome to join the search, starting from the Milwaukie Bay Park boat dock.

The family would like to shed any light on what happened in the moments before he went into the water. They’ve put up posters around the river, asking anyone who saw something, or who might have video surveillance from Thursday in that area, to contact the Clackamas County Sheriff’s Office at 503-655-8211.

-- Samantha Swindler; sswindler@oregonian.com; @editorswindler

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Crews recover body of man who drowned in Columbia River off Jantzen Beach

PORTLAND, OR (KPTV) – Crews have recovered the body of a man who drowned in the Columbia River off Jantzen Beach Wednesday evening.

The call came in at about 5:43 p.m.

According to the Multnomah County Sheriff's Office, two people in a canoe were paddling from shore to a boat on the river.

That's when the canoe tipped and the two people – a man and a woman – fell into the water.

Officials say the woman made it out of the water, while the man did not.

The sheriff's office Marine Unit, Portland Fire & Rescue and the U.S. Coast Guard responded to search for him.

At about 7:10 p.m., PF&R crews were able to find the man's body. The sheriff's office says he was not wearing a life jacket.

The man's identity is being withheld pending next of kin notifications.

No further information was released.

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Body found in Chinook was Portland woman

By Natalie St. John
EO Media Group    Apr 26, 2017    0

LONG BEACH, Wash. — A body that washed ashore in Chinook in early March belonged to Ha Khuong Vo Dang, a 28-year-old Portland woman.

Vo Dang, who went by “Kay,” disappeared on May 1, 2016, while paddleboarding at a beach in Columbia County. Search and rescue workers presumed Vo Dang drowned, but were never able to recover her body. A peninsula man discovered her body in March while walking on a small beach near Third Street in Chinook.

The Pacific County Sheriff’s Office confirmed her identity and notified her family earlier this month, Chief Criminal Deputy Pat Matlock said.

“We were very happy to finally bring a resolution to Vo Dang’s family,” Matlock said.

Vo Dang lived on the East Coast after immigrating to the U.S. from Vietnam, according to her social media profiles. She earned a nursing degree in Connecticut and then worked in North Dakota. She moved to Oregon to take a job at a Salem hospital. Profile photos show a petite, smiling young woman who enjoyed being outdoors.

With a high of 81 degrees, May 1 was one of the first truly warm days of the year in the Portland area. Vo Dang spent the afternoon on a first date with a Portland man. After renting paddleboarding gear, she and the man drove to Collins Beach, a popular spot on Sauvie Island. The island is in the Columbia River, about 10 miles northwest of Portland.
According to a Columbia County investigation report, Vo Dang and her friend sunbathed and shared a six-pack of beer. The man continued to doze, while Vo Dang went paddleboarding. She was not wearing a lifejacket, deputies said.

Around 4 p.m., a woman approached Vo Dang’s friend. She told him Vo Dang had fallen off of her paddleboard and appeared to be struggling in the water. Around the same time, another man called 911. He said he had seen a woman fall in the water, and she had not come out.

“The wind was strong. It was blowing the board away. She tired herself out swimming after it, obviously,” witness Nathaniel Harrack told news channel KGW.

Columbia County deputies searched for her from land. They also brought in a boat.

“But by the time they arrived, she was gone,” Matlock said. “She was about halfway across the river.”
Low Life Jacket Use among Adult Recreational Boaters: A Qualitative Study of Risk Perception and Behavior Factors

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Abstract

Background—Life jackets may prevent one in two drowning deaths, however, 85% of recreational boating-related drowning victims in the United States in 2012 did not wear a life jacket. This study explored behavioral factors and strategies to encourage consistent life jacket use among adult recreational boaters.

Methods—We conducted a qualitative study among boat owners who boat regularly, and explored factors associated with life jacket use by adults and child or adolescent passengers. Sixteen boaters participated in four focus groups.

Results—Most boaters reported inconsistent use of life jackets, using them only when conditions were poor. Each described episodes of unpredictable boating risk which occurred despite favorable conditions. Most required younger child passengers to wear a life jacket, but reported resistance among older children. Barriers to consistent life jacket use included discomfort and the belief that life jacket use indicated inexperience or poor swimming ability. Participants stated that laws requiring life jacket use would change behavior especially for children. The only demonstrated behavior change among group members was associated with use of inflatable life jacket devices.

Conclusions—Boating risk is inherently unpredictable; therefore interventions should focus on strategies for increasing consistent use of life jackets. Passage and enforcement of life jacket legislation for older children and adults is likely a promising approach for behavior change.
Designing more comfortable, better-fitting, more appealing life jackets will be paramount to encouraging consistent use.

Keywords

Drowning; Qualitative Research; Risk Assessment; Swimming/*Education; Boats/*Recreation; Personal Flotation Devices

1. INTRODUCTION

Open-water drowning is an important public health problem in the US and around the world as the fourth leading cause of global burden of disease among injuries (Laosee et al. 2012, Lozano et al. 2012) In the US in 2012, the United States Coast Guard (USCG) reported that 459 people drowned in 4,515 recreational boating incidents. Only 15% of drowning victims were known to have been wearing a personal flotation device (life jacket) (USCG 2013) Personal flotation devices may reduce the risk of drowning by 50% (Cummins et al. 2011) and US federal law requires all recreational boats to carry a life jacket for each passenger (USCG 2005)

As with seat belts and bicycle helmets, the existence of a highly effective intervention alone does not necessarily lead to increased implementation of that intervention. Life jackets are rarely used by most adults on motorboats. The national prevalence of observed life jacket use among US adult recreational boaters on open motorboats (e.g., power boats without a cabin, skiffs, and motorized rafts) was 5.3% in 2010 (USCG and JSI 2011) a level generally consistent since 1998 (Mangione and Rangel 2004, Mangione et al. 2012) Observed life jacket use is higher for children and adolescents (USCG and JSI 2011) Observational studies of life jacket use report that adult life jacket use is highly predictive of child life jacket use, suggesting the importance of adults modeling consistent safety behaviors while boating (Quan et al. 1998, Chung et al. 2013)

There are limited data and few peer-reviewed published studies regarding behavioral factors associated with life jacket use by recreational boaters. Most of what is known on behavioral factors of adult recreational boaters and life jacket use comes from non-peer reviewed reports sponsored by the US Coast Guard or government agencies (Responsive Management 2001, Groff and Ghadiali 2003, USCG 2003, Center for Social Marketing 2010, Isaacs and Lavergne 2010) These studies have reported the most common reasons for non-use are that life jackets are bulky, uncomfortable and needed only by children and weak swimmers. Peer reviewed studies of commercial fishermen and other recreational water users found similar reasons for life jacket non-use, including the belief that life jackets may not work or may be irrelevant due to cold water conditions (Nguyen et al. 2002, Baker et al. 2009, Lucas et al. 2012) These studies have not addressed or investigated the underlying reasons for these views or what might contribute to changing life jacket use behaviors. A better understanding of how recreational boaters view life jackets is needed to increase life jacket uptake and consistent use. Consistent life jacket use is important because just as a driver cannot anticipate when seatbelt use is critical, adverse boating circumstances may arise suddenly and unpredictably when life jacket use is most necessary. We wished to understand risk
perception and to identify factors associated with consistent life jacket use among adult recreational boaters.

We qualitatively evaluated how such attitudes relate to risk perceptions about boating and consistent life jacket use. We were particularly interested in identifying concepts that associated with possible behavior change to guide future interventions. We also present several potential behavioral messages based on our findings.

2. MATERIAL AND METHODS

We conducted a focus group study of recreational boat owners. We recruited participants at an annual regional boat show that draws boat enthusiasts from the Northwest US in 2008. Attendees were approached by research staff as they entered the exposition center and were invited to attend a focus group about boating. To recruit boat show attendees we approached them as they neared the entrance to the exposition center hosting the show. Due to the high volume of attendees and limited staff we were unable to track of how many people were invited to participate. We recruited adults (18 years or older) who usually used a boat less than 19 feet long and who reported low or no life jacket use (“never,” “rarely,” or “occasional”). In this study the term “life jacket” refers to US Coast Guard approved life jackets (also known as Personal Flotation Devices, PFDs). The boat length criteria was selected because 80% of drownings occur among boaters on boats in this size range. (USCG 2013) If screening guidelines were met, four scheduled times were offered for participation. If a participant was accompanied by a partner or friend, the companion was also invited to participate, even if he or she did not meet the screening guideline of inconsistent life jacket use. Our recruitment goal was to conduct four focus groups with 8–10 participants in each group. Nineteen boaters agreed to participate in our focus groups; four of these were boating companions of a participant who had infrequent life jacket use. Among the 19 individuals, 16 attended their scheduled focus group. Focus groups were conducted on the boat show premises during the boat show in an enclosed room.

We developed a focus group guide using a semi-structured, exploratory approach. The moderator (DAQ) reviewed the study with participants and obtained informed consent. Participants completed a brief demographic survey and answered a short questionnaire about boating activities and life jacket use. The moderator followed the focus group guide in a discursive manner. The discussion topics were structured around general water safety knowledge and risk perception, attitudes towards life jacket use, knowledge about life jackets, and what messages could be effective for promoting life jacket use. A copy of the focus group script is attached as Appendix 1." Following the open discussion, participants were shown examples of different life jackets and asked for their perceptions and comments. A member of the research team (EB) served as a note taker for key themes. Each participant received a gift card for $20 and a waterproof boater duffel bag to thank them for their time. All groups lasted approximately one hour.

Focus group discussions were audio-recorded and transcribed. Selections of the transcriptions were checked for accuracy by a second member of the research staff (DAQ). Key themes were identified from independent coding by three authors (DAQ, EB, and
A grounded theory approach was taken to code the focus groups. (Bernard 2011) Grounded theory is useful when the researcher wishes to explore and discover new hypotheses. This method allows the researcher to inductively generate themes and theories based on the data collected; themes are organized as more is understood about the subject, thus “grounding” analysis in the data. This study was approved by the University of Washington Institutional Review Board.

3. RESULTS

We recruited 16 boaters to participate in four focus groups. Most participants were male (88%) and were between 27 and 68 years old (Table 1). Most (69%) reported having boated with a child during the previous 12 months, and one-quarter had at least one child less than 18 years old living at home. The most common boating activity was fishing (88%), followed by motoring for pleasure (56%). Most owned a motor boat (69%), and 50% of the motorboats owned were less than 19 feet long (though in screening participants stated they usually used a boat <19 feet long). Participants reported owning other watercraft, including personal watercraft (Jet Ski, WaveRunner, etc.), canoes, and pontoon boats. Most participants (63%) reported wearing a life jacket less than 50% of the time while boating. Several companions of recruited participants reported high life jacket use.

Table 2 describes the key behavioral factors which guided life jacket use, and includes illustrative quotations from participants. Participants placed high value on developing expertise and gaining experience with boating. They described a learning process where you “follow somebody who knows what they’re doing,” and gain specialized knowledge by learning “tricks of the trade.” This learning experience purportedly builds confidence and skill. Increased experience, however, does not lead to increased life jacket use. Rather, the participants agreed that the typical person who wore a life jacket was an inexperienced boater: “People who wear [life jackets] all the time are people who don’t boat often.”

Experienced participants viewed inexperience as a liability and the leading contributor to perceived boating risk. As one participant related,

“I think more than anything [risk results from] … inexperience. Several years ago a boat sunk out there and [another boat] hit it [and it] killed one of them. It was at night. You hit a boat hard enough and kill a person and throw everybody else out into the water at night: the pilot is the one basically at fault. It could have been a log, it could have been a stump, it could have been anything. It wasn’t [the fault of] the derelict boat; it had been there for months. You’re out there in the water at night; you gotta’ know what you’re doing.”

While participants did not believe experienced boaters use life jackets regularly, they agreed that a boater should have them onboard for themselves or for passengers, especially children. Before setting off, they said the captain should check if there is a life jacket for each passenger. Life jackets should be in good shape, fit people on the boat and be easily accessible. Checking life jackets before an outing was seen as part of a typical boat safety routine: “I always have a master list I check before we go.” These routines included
checking the vessel for things such as sufficient fuel and oil, checking other safety equipment, and making sure there were sufficient batteries for electronic devices.

Participants were strongly in favor of children using life jackets and had rules requiring them to use a life jacket: “When we take the grandkids out, they don’t get into the boat without one on. If they take it off they stay home.” Making sure children wear a life jacket was one of the most important preparation steps for one participant: “I’m [concerned] about safety…so, the only real thing I have to check for is if I’m bringing the kids then I tell them to bring their life jackets.” Participants shared that teaching children about boating and wearing life jackets “when they’re young” was an essential part of boating education. Part of this education for one participant was demonstrating the importance of preparedness by making “sure they [kids] put on their life jacket, even if they’re older where they’re not required to wear them, have them try them on. If they’re in a large boat, have them put them on once or twice, because to put it on when you need it is too late.” One participant also suggested that teaching children from a young age may help them to proactively use life jackets when boating.

The desire to be well prepared for boating was related to a recurring theme: “expect the unexpected.” Participants shared numerous stories of unanticipated “risky” situations such as falling overboard unexpectedly in what had been perceived as benign conditions. Although boaters articulated that bad weather or choppy water were the most serious risk factors for drowning, their responses indicated otherwise. As one boater noted, “Usually you don’t have time to put one on when something’s really wrong.” All participants recounted experiences describing the unpredictable nature of water conditions, though these encounters with risk were not associated with consistent life jacket use. Even though several participants recited both personal and friends’ stories of having one or more “close calls” in which they wished they had been wearing a life jacket, these types of experiences did not convince them to wear a life jacket subsequently. One participant acknowledged a conflict between unexpected risk and inconsistent life jacket use:

“I’ve had cases where I’ve said, Oops, I should have put on my life jacket sooner.’ I didn’t have an accident, I didn’t fall over. Nothing happened. But I thought about it after I got the lifejacket on. I probably should have put it on sooner. I probably should have put it on even before I got in the water.”

The participants had a wide range of opinions regarding life jackets and their use. Many believed that those who regularly used life jackets were inexperienced boaters, boaters who were poor swimmers, children, and the elderly. Participants disliked the appearance and fit of life jackets, which were widely viewed as “cumbersome,” “restrictive,” and “bulky.” Most participants routinely went fishing, hunting and crabbing and thought a bulky life jacket interfered with these activities.

Overall, participants had negative views of life jackets; however, they had positive perceptions of newer inflatable life jackets. Participants described inflatables as lightweight, not bulky, practical, and comfortable. “Finally they’ve come out with lifejackets… that are automatic inflation, but they’re $200. Well, I bought one. This is the way to go.” Another participant stated “I’d be more apt to wear that [inflatable life jacket] all the time.” They
identified several drawbacks of inflatable life jackets: higher cost, more frequent maintenance (replacing CO₂ cartridges), fear of malfunction, and the need to wear on top of outer clothing layers: “I’d be afraid it wouldn’t work. I don’t think it would be good enough for me.”

We asked boaters to consider approaches to increase life jacket use. Several educational solutions were suggested, including sharing life jacket information at boat sales locations and educating schoolchildren. They also suggested improvements to the design of non-inflatable life jackets, suggesting changes to their appearance, comfort and functionality, such as reducing the bulk and making them look “cool” for younger boaters. Finally, participants repeatedly emphasized that making life jacket use mandatory through legislation and enforcement would be the only way to get more people to use them, even when they did not support the idea of legislation. “People don’t want to wear them. So unless you tell me I have to wear that lifejacket, I’m not going to.”

4. DISCUSSION

Our motivation for this study was to identify key behavioral factors which might be good targets for community-based drowning prevention efforts, (Committee on Injury Violence and Poison Prevention 2010) similar to campaigns promoting seat belts (Hanfling et al. 2000) and booster seats. (Ebel et al. 2003, Lee et al. 2003, Johnston et al. 2009) Our participants’ observations about life jacket use were similar some previous findings on life jacket use, such as comfort, fit and characteristics of typically life jacket users. We also heard perspectives on several themes that have not been reported in previously published literature, including the important role of parents modeling and ensuring life jacket use among children, the importance of preparedness, perceptions towards inflatable life jackets and perceptions towards potential interventions such as legislation mandating life jacket use. It is also important to note that this is the first study to qualitatively report on attitudes towards life jacket use by adult recreational boaters in the US.

Focus group participants agreed that risks while boating were inherently unpredictable, and shared glorious and detailed narratives highlighting “close calls” which arose “out of the blue”. It was abundantly clear that risks arose without warning, and there was simply no time to don a life jacket if one had not been worn. Though life jackets were reportedly always present in boats, they were rarely used, and participants associated regular life jacket use with inexperience and lack of skill. We were therefore particularly interested in behavioral factors associated with consistent use of life jackets, as most open water drownings occur on boats where a life jacket was available but was not being used. (USCG 2013)

Behavioral factors were analyzed according to the Theory of Planned Behavior model of behavior change, (Ajzen and Fishbein 1980, Fishbein et al. 2001) exploring the impact of attitudes and subjective norms on intent and reported use of life jackets. Key factors influencing attitudes included comfort and ease of use, as well as perceived likelihood of coast guard enforcement for life jacket laws. Factors influencing subjective norms included...
self-standards of preparedness in other aspects of boating, and near universal beliefs that bulky life jackets were worn by novice boaters who were inexperienced swimmers.

Social marketing provided the structure for proposing candidate intervention messages, (Glanz et al. 1997) based on key behavioral factors. Boaters in our study were methodical about safety, and valued preparedness, but consistent use of life jackets was not one of their habitual safety behaviors. Consequently, messages emphasized consistent safety behaviors, and opportunities to role-model safety behaviors while introducing children and teens to the enjoyment of open water boating. Following the “check list” approach to safety used by boaters in these focus groups, we propose several potential intervention messages that build on the ideas of making life jacket use a part of the boating routine (“Check it off”) and showing children how to boat (“Show your child how it’s done”) (Table 3).

Boaters clearly drew parallels to seat belt use, and every group stated that increases in life jacket use were likely only with legislation and enforcement. Consistent life jacket use was reported for users of inflatable life jackets, which were perceived as comfortable, without the stigma of bulky vests. In response, we proposed messages encouraging adults to be consistent life jacket users with inflatable life jackets (“Promote ‘every trip every time’ adult inflatable life jacket use during active boating”), and reminding adults that children are required to always use a life jacket (“It’s the law”) and the consequences of not using one.

Life jacket characteristics such as bulkiness and poor fit were mentioned as barriers to use, as others have noted. (Responsive Management 2001, USCG 2003, Lucas et al. 2012) Several participants, however, described interest in inflatable life jackets. Regardless of the drawbacks participants mentioned about inflatable life jackets, all expressed interest and even enthusiasm about this type of life jacket. According to our participants, if prices for inflatables were lower and the maintenance was reduced, they would most likely buy and use them. Although inflatable life jackets have the potential to increase adult use, it is important to note that they are not intended for use by children and youth less than 16 years old. Encouraging life jacket manufacturers to improve comfort and fit will be a necessary step for improving consistent use. Conversely, legislation requiring life jacket use may encourage improvements in product design and appeal.

Paradoxically, while participants reported using life jackets only when risk was anticipated (e.g., stormy conditions), they shared numerous stories of unanticipated events in which they or their passengers ended up in the water. Most boat-related drowning deaths, like most boating trips, occur in good weather (60% in May to August) and in daylight hours (59% from 8:30 AM to 6:30 PM). (USCG 2013) A recent study in Washington State showed that most fatal and nonfatal boating incidents occurred when waters were calm. (Stempski et al.)

Our participants valued experience, but perceived life jacket use as a hallmark of the novice and/or inexperienced boater. Changing these perceptions will likely be important to increase life jacket use, even if inflatable life jackets become more accessible and laws mandating use are implemented. This could be addressed, according to our participants, by highlighting life jacket usage on recreational fishing television shows and at boat shows. Although such activities could help make life jacket use more acceptable, the primary solution to increase
life jacket use among adult boaters may ultimately be legislation mandating use. Mandating life jacket use for all boaters on crafts less than 20 feet could potentially prevent most drownings among recreational boaters. Social marketing campaigns communicating the benefit of wearing a life jacket may help improve the public perception of life jackets to make the passage of such legislation possible. (Morrison et al. 2003, Salzberg and Moffat 2004, Houston and Richardson 2005)

This study has several limitations; the study was small and all respondents were recreational boaters in the Puget Sound area of Washington State. Due to the qualitative nature of this study and its small size, the results may not be generalizable to all recreational boaters. It should also be noted that our sample had higher reported life jacket use compared to national surveys of recreational boaters. These use rates do, however, reflect the higher observed life jacket use rates in the Pacific Northwest. (Quan et al. 2011) We were encouraged to note that several observations gleaned from the focus groups echo previous research in other study populations about life jacket design and fit, (Responsive Management 2001, Nguyen et al. 2002, Lucas et al. 2012, Lucas et al. 2013) as well as the lack of an effect of near-death experiences or “close calls” on life jacket use. (Responsive Management 2001) Other researchers have observed that participants cited concerns that life jackets were not effective at preventing drowning as a reason for non-use. (Baker et al. 2009, Lucas et al. 2012) In contrast, all of our participants accepted that a life jacket could save them from drowning if they went overboard. These differences could be due to study-specific factors such as having been conducted in locations where cold-water submersion (e.g., Alaska and northern Canada) were more common. A majority of their participants believed it might be less significant than the risk of hypothermia. It is worth noting that recent research suggests that wearing a life jacket reduced the risk of drowning by 49%, controlling for the impact of water temperature. (Cummings et al. 2011)

Our findings identify the value of considering legislation mandating life jacket use by recreational boaters in small boats, and the expansion of legislation governing child life jacket use. Strategies to prevent open-water drownings can come from qualitative research and the success of promoting behaviors such as consistent seat belt use. (Simsekoglu and Lajunen 2008) Designing better fitting and more comfortable life jackets could also help increase life jacket use. Future studies on this topic should measure specific factors related to life jacket use, including those that we observed in our study, in order to better understand how widespread these beliefs are and how demographic factors and other factors such as boating activity, type of boat, season, or weather relate to life jacket use. These results will help inform the design of effective strategies to promote consistent life jacket use through a combination of several modalities, potentially including targeted education, legislating use for high risk groups, enforcement, engineering more comfortable life jacket designs, and increasing the availability of inflatable life jackets.

Acknowledgments

We would like to thank Dr. Beth Mueller for administering and planning this study. We also thank O’Loughlin Trade Shows for allowing us to recruit and conduct the focus groups at the annual boat show.

FUNDING
This study was funded by the Centers for Disease Control and Prevention grant 3R49CE00197. The sponsor of this research had no involvement in the study design, data collection, data analysis, manuscript development or decision to submit for publication.

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**Focus Group Script - Boating Safety Study**

Bolded text is what can be read

Text in italics is optional

*Accid Anal Prev. Author manuscript; available in PMC 2015 January 01.*
I. Participant Sign-In & Welcome (10 MINUTES)

Supplies: Sign in Sheet, Name Badges, consent forms, pens

A. HAVE PARTICIPANTS SIGN-IN AND CREATE A NAME TAG WITH ONLY THEIR FIRST NAME OR NAME THEY WANT TO USE

B. INVITE PARTICIPANTS TO EAT PROVIDED FOOD

C. GIVE PARTICIPANTS THE CONSENT FORM TO READ THROUGH

D. AFTER ALL PARTICIPANTS HAVE ARRIVED

a. I’d like to welcome you all to this discussion about boating. My name is MODERATOR and I work for the University of Washington. I will be facilitating the discussion today to help us make sure we cover the topics we are interested in. I will be asking you all questions related to our topic and will be making sure we stay on topic. This is my assistant, ASSISTANT(S). She will be taking notes for us today.

b. The goal of this discussion is to discuss several aspects of boating and boating safety. We hope to develop strategies to improve boating safety. Everyone’s opinion and experiences are important, thus there are no right or wrong answers. We would like to hear everyone’s thoughts and ideas and we expect you to all have a variety of views that can help inform the group. Additionally, since we value each person’s opinions, please try not to speak over each other or attack another person’s ideas. If you feel uncomfortable answering a question you may refuse to answer or comment.

E. REVIEW CONSENT FORM

a. Has everyone had a chance to read through the consent form you were given when you first came in?

i. IF NO: Let’s take a few minutes then to allow you to finish reading through it.

ii. IF YES: Great. Let’s take a minute to review it to make sure you understand your rights as a participant in a research study.

b. REVIEW THE MAJOR POINTS OF THE CONSENT FORM

i. Does anyone have any questions?

ii. ANSWER ANY QUESTIONS

c. If you agree to the terms and conditions, then please sign the form to give your consent to participate in this discussion.
F. COLLECT THE CONSENT FORMS AFTER THEY HAVE BEEN SIGNED

Supplies: File folders

G. PARTICIPANT INTRODUCTIONS

a. Let’s take a moment now to introduce ourselves. As stated in the forms you have just signed, we will only use your first names during the discussion, and only those here in the group and on our research team will know your names. We would ask each of you to not share the names of those that participated today in the group to help maintain everyone’s privacy.

b. HAVE EVERYONE INTRODUCE THEMSELVES

H. PARTICIPANT SURVEY

Supplies: Participant survey

a. As mentioned when we asked you to participate, the entire session will last about one hour and a half hours. At the end of the discussion you will be given $20 for participating. To get started, we would like you fill out a brief survey that tells us a little bit about yourself. As with the discussion questions, you may refuse to answer any of the questions in this survey.

b. HAND OUT SURVEY

c. COLLECT SURVEYS ONCE COMPLETED

Supplies: File folder

I. START RECORDER

Supplies: tape deck, extension cord

II. Establish Rapport (5 MINUTES)

a. Okay, does anyone have any questions before we get started?

b. ANSWER ANY QUESTIONS

A. BOAT ROUTINE

a. All right, let’s get started. First, please describe your normal routine before going out on the water.

b. PROMPTS

Supplies: Flip chart, markers

i. Are there different things you do depending on how far or how long you will be out?

ii. What about if the weather looks bad?
B. ASK EACH PARTICIPANT TO RESPOND TO THESE QUESTIONS

III. General Water Safety Knowledge (10 MINUTES)

A. ASSESS KNOWLEDGE OF RISK IN DIFFERENT WATER EXPOSURE SITUATIONS

a. What are some of the risky situations you’ve had when you’ve been out in a boat?
   i. PROMPTS IF NEEDED: big waves, someone stood up and boat tipped over, etc.

b. RELATIONSHIP BETWEEN DROWNING AND BOAT
   i. When do you think there are risks for drowning when you’re out in a boat
   ii. Why do you think that is a risk?
   iii. What do you do to minimize the risk of drowning?

c. RELATIONSHIP BETWEEN DROWNING AND ALCOHOL
   i. Are there ever alcoholic beverages on board the boat?
   ii. Do you feel safe when there is alcohol aboard? Why or why not?

d. ABILITY TO CALCULATE THE LIKELIHOOD OF CAPSIZING/FALLING OVERBOARD AND THE PROBABILITY OF SURVIVAL
   i. How likely is it that you could capsize or fall overboard when you’re out in a boat under 19 feet?
   ii. Describe the last time you capsized or fell in the water by accident.

IV. Attitudes towards lifejacket use (15 MINUTES)

A. EXAMINE THE ATTITUDES AND BEHAVIOR SURROUNDING LIFEJACKET USE OR THE LACK THEREOF

Now we are going to take a moment to do a little exercise before we move on to the next part of our discussion. First, please write your name at the top of the note cards we are handing out. Now, we would like you to think of every word that comes to mind about life jackets. By life jackets we mean personal flotation devices, life preservers, or life vests. Use the note cards to write down every word that comes to mine when you think of life jackets. We will give you a couple of minutes to do this.

Supplies: Note cards

1. What do you associate with life jackets?
2. What types of people wear life jackets all the time?
3. What types of people never wear life jackets?

B. Situations that prompt an increase or decrease in lifejacket usage.
1. When do you feel comfortable not wearing a lifejacket?
2. What are the benefits of not wearing a life jacket?
   i. PROBE: peer pressure, cost, access, comfort, appearance, fit, reliability, how others perceive you
3. ASK ONLY IN THE NON-USER GROUPS
   i. Are there times when you wore a lifejacket?
4. Are there times when you didn’t have a life jacket on but thought about or wished you were wearing one?
5. How does swimming ability affect your life jacket use?
6. What are some reasons people should wear lifejackets?
7. Are there any reasons why someone should always be wearing a lifejacket on a boat?

V. Lifejacket knowledge (15 MINUTES)

A. LIFEJACKET LAWS
   a. Are you aware of any laws about boating safety or life jackets?
   b. Describe how you learned about any laws regarding boating safety.

B. THE DIFFERENCES BETWEEN TYPES OF LIFEJACKETS
   a. SHOW DIFFERENT TYPES OF LIFE JACKETS
      i. What are your impressions of each of these life jackets?

Supplies: Flip chart, masking tape

C. WHERE TO BUY OR RECEIVE LIFEJACKETS
   a. Where did you go the last time you bought a life jacket?
   b. Where would you go next time you wanted to buy one?

VI. Look at the most effective ways of distributing messages about water safety and PFD use. (15 MINUTES)

A. OBSERVED LIFEJACKET ADVERTISEMENTS
   a. Has anyone seen any form of advertising for water safety?
   b. Where else have you noticed people wearing life jackets?
      i. PROMPT: TV, magazines, internet, news etc.
c. What sort of advertising would you pay attention to regarding lifejacket use?
   i. PROMPT: TV, bulletin boards at parks, internet, etc.

B. EFFECTIVE METHODS OF DISTRIBUTION

a. What type of approach would you pay the most attention to?
   i. Fear (e.g., someone drowning)
   ii. Humor (e.g. poking fun at how bulky old fashioned life jackets were in comparison to new ones)
   iii. Facts/Information (e.g., how life jackets have saved xxx lives in the past year)
   iv. True Stories (e.g., someone’s life saved because the wore a life jacket)
   v. Laws (e.g., legal requirements)

   Supplies: flip chart with words prewritten (include other)

b. What do you think of the following role models in promoting life jacket use?
   i. Parents
   ii. Athletes
   iii. Anglers/hunters on TV
   iv. TV/Movie celebrities
   v. Political Leaders
   vi. Friends

   Supplies: Flip chart with words prewritten

VII. Closing (5 MINUTES)

A. LAST THOUGHTS

a. Is there anything else you’d like to share with us about water safety and life jackets?

   Supplies: note cards

B. END FOCUS GROUP

a. Thank you. That concludes our discussion. We really appreciate your feedback. You can collect your stipend on the way out. There is also a handout on water safety and life jackets.

   Supplies: envelopes and gift cards
Highlights

• We qualitatively explored adult boater attitudes towards life jacket use
• Boaters do not often have a life jacket on in situations of high drowning risk
• Parents play an important role teaching children to use life jackets
• The adoption of inflatable life jackets may lead to increased adult life jacket use
• Laws and enforcement may be effective approaches to increase life jacket use
Table 1
Demographic characteristics of focus groups participants (n=16)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>N=16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age in years (mean)</td>
<td>49 (13)</td>
</tr>
<tr>
<td><strong>Children &lt;18 at home</strong></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>75%</td>
</tr>
<tr>
<td>Yes</td>
<td>25%</td>
</tr>
<tr>
<td><strong>Boated with a child in the past year</strong></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>31%</td>
</tr>
<tr>
<td>Yes</td>
<td>69%</td>
</tr>
<tr>
<td><strong>Reported % of Time life jacket Used while boating</strong></td>
<td></td>
</tr>
<tr>
<td>0%</td>
<td>19%</td>
</tr>
<tr>
<td>1–50%</td>
<td>44%</td>
</tr>
<tr>
<td>51–99%</td>
<td>12%</td>
</tr>
<tr>
<td>100%</td>
<td>25%</td>
</tr>
<tr>
<td><strong>Own any boat</strong></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>31%</td>
</tr>
<tr>
<td>Yes</td>
<td>69%</td>
</tr>
<tr>
<td><strong>Type of Boats Owned</strong></td>
<td></td>
</tr>
<tr>
<td>Motorboat &lt;19 feet long</td>
<td>50%</td>
</tr>
<tr>
<td>Motorboat &gt;19 feet long</td>
<td>25%</td>
</tr>
<tr>
<td>Personal Watercraft</td>
<td>0%</td>
</tr>
<tr>
<td>Non-motorized raft</td>
<td>19%</td>
</tr>
<tr>
<td>Canoe or Kayak</td>
<td>19%</td>
</tr>
<tr>
<td>Pontoon</td>
<td>13%</td>
</tr>
<tr>
<td><strong>Regular Boating Activities</strong></td>
<td></td>
</tr>
<tr>
<td>Fishing</td>
<td>88%</td>
</tr>
<tr>
<td>Motoring</td>
<td>50%</td>
</tr>
<tr>
<td>Waterskiing</td>
<td>31%</td>
</tr>
<tr>
<td>Paddling</td>
<td>19%</td>
</tr>
<tr>
<td>Hunting</td>
<td>19%</td>
</tr>
</tbody>
</table>
### Table 2

Behavioral Factors and Key Quotations Guiding life jacket Use

<table>
<thead>
<tr>
<th>Behavioral Factor</th>
<th>Key Quotes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Facilitators</strong></td>
<td></td>
</tr>
<tr>
<td>Boaters use and like routines</td>
<td>“The one time we needed the compass, we had it.” <strong>Boating is inherently risky and unpredictable</strong></td>
</tr>
<tr>
<td></td>
<td>“I always go through the whole list because everything safety wise and everything we are ever going to need is on that list.”</td>
</tr>
<tr>
<td></td>
<td>“Once out of Westport we went north for 2 1/2 hours, fished for 15 minutes, and a big storm blew in. It took us 5 1/2 hours to get back, so that wasn’t a fun trip. The weather changes so fast.”</td>
</tr>
<tr>
<td></td>
<td>“We get out there and we’re pulling crab pots and he can’t start the engine. And, he’s got two little paddles... we thought we had plenty of life vests in the boat, right? Well one of them would fit me, but the other one wouldn’t even begin to go around him because it was his son’s... And so he’s got the life vest but he doesn’t have it.”</td>
</tr>
<tr>
<td></td>
<td>“If you are not paying attention while trying to land a fish or something, and catch a wave from the water and [you are] not wearing a life jacket, it could be a serious situation.”</td>
</tr>
<tr>
<td></td>
<td>“Usually you don’t have time to put one on when something’s really wrong.”</td>
</tr>
<tr>
<td>Boaters understand and follow boating rules</td>
<td>“I always bring my fishing license... and [make sure] my boat is registered and all that stuff.”</td>
</tr>
<tr>
<td></td>
<td>“There’re just certain things that are done in my boat and that’s just the way it is and if you don’t like it, go with someone else.”</td>
</tr>
<tr>
<td>Distracted by inexperience, being unprepared or lacking knowledge</td>
<td>“With boating, more than anything else, there are so many things that you really do have to pay attention to if you go out on a boat. If you don’t, you can have some serious consequences.”</td>
</tr>
<tr>
<td></td>
<td>“You really need to have some knowledge of your boat.”</td>
</tr>
<tr>
<td><strong>General Barriers</strong></td>
<td></td>
</tr>
<tr>
<td>Alcohol use is prevalent</td>
<td>“They had an ice chest full of crab and they had another ice chest full of beer and they had 4 crab pots. The whole boat went over... it could have been much, much worse for them”</td>
</tr>
<tr>
<td></td>
<td>“When you’re drinking, there’s a greater chance of doing something stupid.”</td>
</tr>
<tr>
<td></td>
<td>“With a power boat, you know, you’re sitting up there at the helm with the wheel and there isn’t as much to do... you are just steering. There’s a galley there and there’s always somebody pouring drinks.”</td>
</tr>
<tr>
<td>Close calls “do not change behavior”</td>
<td>“We just about drowned. We were swimming in the ocean and I jumped in when I shouldn’t and I had to get rescued.”</td>
</tr>
<tr>
<td></td>
<td>“Quite a few years ago, we were fishing... and coming back in they had 40-60 foot swells going back across the bow and nobody had a life jacket on. They had 5 Coast Guard boats out pulling people back across the water, so that was pretty hairy. You’re down in the water and you see nothing but walls of green water and when you’re on top of a wave you can see everything.”</td>
</tr>
<tr>
<td>Inexperience may lead to overconfidence or poor preparation</td>
<td>“Are there things that make it more likely that drowning could occur? I think more than anything it really is inexperience. I mean, I’m old and I still make mistakes. But sometimes younger people... you know, there’s no real thought there.”</td>
</tr>
<tr>
<td></td>
<td>“It’s pretty amazing that people go out so ill prepared, you know.”</td>
</tr>
<tr>
<td></td>
<td>“You know, you’re out there in the water at night; you get to know what you’re doing.”</td>
</tr>
<tr>
<td>Life jacket use is perceived as being weak, incompetent or inexperienced</td>
<td>What kind of person wears a life jacket every time? “a geek! Tell-tale sign! Pocket protector.”</td>
</tr>
<tr>
<td></td>
<td>“People who wear them [life jackets] all the time are people who don’t boat often.”</td>
</tr>
<tr>
<td><strong>Intervention Recommendations</strong></td>
<td></td>
</tr>
<tr>
<td>Inflatable life jackets may increase consistent use</td>
<td>“But, finally, I think they’ve come out with life jackets... like the inflatable ones, that are automatic inflation, but they’re $200. Well, I bought one. This is the way to go.”</td>
</tr>
<tr>
<td></td>
<td>“I’d be more apt to wear that [inflatable life jacket] all the time.”</td>
</tr>
<tr>
<td></td>
<td>“Well, some of them can be real cumbersome, but the new ones are great! They just drape around and you know kind of a tie in back just to keep it on.”</td>
</tr>
<tr>
<td></td>
<td>“The older you get the more stubborn you get, you know... I’m not wearing that damn thing... and it doesn’t fit me... and so I think that’s where the fit and the ease of getting it on and all the little issues that go with that.”</td>
</tr>
<tr>
<td>Behavioral Factor</td>
<td>Key Quotes</td>
</tr>
<tr>
<td>----------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Changing the laws</td>
<td>“I think they should just pass laws that anybody under a certain age has to wear one. That accomplishes it.”</td>
</tr>
<tr>
<td></td>
<td>“What’s going to make people wear life jackets… pretty much create a law like seat belts. Probably will reach 90%.”</td>
</tr>
<tr>
<td>Encourage boaters to establish</td>
<td>[QUESTION] “So, when the kids get older, you just kind of give them a choice to wear them?”</td>
</tr>
<tr>
<td>immutable rules for their boats</td>
<td>[ANSWER] “No. It’s my boat.”</td>
</tr>
<tr>
<td>Change the cost of inflatable life</td>
<td>“They’re [INFLATABLE life jackets] very expensive so most people don’t have them. People don’t want to spend the money.”</td>
</tr>
<tr>
<td>jackets</td>
<td>“When a boat that gets sold that has to have all this [INFLATABLE life jackets AND SAFETY EQUIPMENT] in it… because it’s a lot easier to include them into financing a boat over 5, 6, 10 years versus having to dish out $500–$600.”</td>
</tr>
</tbody>
</table>
Table 3

Behavioral Factors and Candidate Intervention Messages.

<table>
<thead>
<tr>
<th>Key Message</th>
<th>Illustrative Quote</th>
<th>Intervention Message</th>
<th>Illustration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experienced boaters see themselves as organized and prepared</td>
<td>“We call [the safety check list] our ‘camp rules’. I always go through the whole list because everything safety-wise and everything we are ever going to need is on that list.”</td>
<td>Check it off. Incorporate life jacket use into boating safety check behaviors</td>
<td>Equipment Checklist</td>
</tr>
<tr>
<td>Boaters want to teach their children to enjoy water recreation safely</td>
<td>“Especially with kids, make sure they put the ‘life jacket on. Because to put it on when you need it is too late”</td>
<td>Show your child how it’s done (tying a knot, catching a fish, buckling up the life jacket)</td>
<td>Photo Credit: US Coast Guard</td>
</tr>
<tr>
<td>Illustration</td>
<td>Intervention Message</td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------</td>
<td>----------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>[Image of life jacket use on a boat]</td>
<td>It's the law giving ticket to boater with child passenger</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Illustrative Quote**

- I think they should just pass laws that the boat has to wear one. That accomplishes it. What's going to make people wear life jackets. Pretty much create a law like that. 

**Key Message**

- Life jacket use must be enforced by law for children
Vicksburg District
Mississippi Lakes Project
Baseline 2008
Test Years 2009-2011

Policy lakes:
Arkabutla Lake
Sardis Lake
Enid Lake
Grenada Lake

Control lakes:
Bay Springs Reservoir
Ross Barnett Reservoir
Measurements:

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Baseline 2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Man hours for policy (boat patrol)</td>
<td>++</td>
<td>1248</td>
<td>1199</td>
<td>1291</td>
</tr>
<tr>
<td>Wear Rates (Overall Average)</td>
<td>8.8%</td>
<td>74%</td>
<td>71%</td>
<td>70.6%</td>
</tr>
<tr>
<td>Congressional Inquiries</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Public Letters/emails/phone calls*</td>
<td>-</td>
<td>34</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Water-related Fatalities</td>
<td>4</td>
<td>1-Boating</td>
<td>1-Swimming</td>
<td>1-Swimming</td>
</tr>
<tr>
<td>Visitation</td>
<td>5,565,443</td>
<td>5,271,841</td>
<td>5,238,368</td>
<td>4,883,321</td>
</tr>
<tr>
<td>Warnings Issued</td>
<td>-</td>
<td>876</td>
<td>1488</td>
<td>945</td>
</tr>
<tr>
<td>Citations Issued</td>
<td>-</td>
<td>0</td>
<td>3</td>
<td>120</td>
</tr>
<tr>
<td>News Articles/Radio/Television</td>
<td>104</td>
<td>26</td>
<td>50</td>
<td>22</td>
</tr>
</tbody>
</table>

*These totals include all types of contacts fielded by the Project Office along with emails and letters received by Lake Resource Managers. The lake offices did not track telephone calls individually; they were included in the weekly contact numbers.

++ Estimated in the Interim Report: 12 boat hours per week Corps and 8 per week other agency during recreational boating season.

Project Description:

Vicksburg District was the first district to voluntarily agree to test policy for the Life Jacket Policy Study. Testing occurred only on the four lakes located in North Mississippi: Arkabutla, Sardis, Enid, and Grenada lakes. Each lake is an independent organization with a Resource Manager, ranger staff and O&M personnel. All four lakes are under the direct management of the Mississippi Project Management Office. These four lakes were formed by dams constructed as part of the comprehensive flood control plan known as the Mississippi River and Tributaries Project. They were built between the late 1930s and the mid-1950s. Vicksburg District made a wise decision to conduct policy testing only on the waters of the Mississippi Projects to minimize public confusion over Corps policy. Although the district manages lakes in the state of Arkansas, they were not included in the study due to their close proximity to Little Rock District lake projects. Staff realized that testing on Arkansas waters might confuse visitors in that Little Rock District lakes would not be involved in the test and therefore would not have life jacket policies in place. The state of Mississippi is split between the Vicksburg and Mobile districts; however, lake projects in the Mobile District are not located close to the North Mississippi lakes and it was determined they would not be impacted by the life jacket policy. Additionally, Mississippi lakes’ management was confident the distance was great enough to Mobile projects to prevent visitors from leaving the Mississippi lakes due to the new policy.
The four Mississippi lakes have proven to be popular recreation destinations for local residents and regional visitors once they were made accessible in the early 1940’s. By 1970, a significant number of recreational fatalities had been documented by lake managers, leading district leadership to hire staff park rangers to monitor recreational activities of lake visitors and provide educational outreach on associated risks. At Sardis Lake alone, a total of 160 lives were lost due to drowning since the project became operational in 1940. In the 1990s, when it was noted that a significant number of drownings involved alcohol consumption, lake managers acted to adopt alcohol restrictions and bans. Each of these initiatives proved to be effective, resulting in a reduction of public fatalities by nearly 50% between 1972 and present day. Review of the public fatalities that have been documented since 1998 shows that 92% of drowning victims were not wearing a life jacket; this trend was a key motivator for district leadership to agree to participate in the HQUSACE Life Jacket Policy Study when it was announced in 2007.

Vicksburg District’s participation in the Life Jacket Policy Study provided the Corps with the opportunity to study the effects of policy introduction, including visitor compliance and management impacts. Most valuable to the study was the ability to document findings at several lakes within the same region. It was significant that the four lakes were the primary recreational waters of that region, each attracted large numbers of visitors, offered year-round recreation and hosted a variety of recreational activities.

Study Methodology:

Since Vicksburg District did not have established life jacket policies, such as those in place in Pittsburgh District, their first step in prepping for participation in the Life Jacket Policy Study was to determine what policies would be tested. Vicksburg’s managers determined early on that the established Pittsburgh District policy which required life jackets be worn on vessels under 16 feet in length would not adequately address recreational risks found on their own waters. Through careful review of their fatality records, staff determined that to seriously be effective in fatality reduction, testing would have to encompass larger sized vessels, and all paddlecraft. Additionally, with nearly half of their fatalities involving swimming in non-designated waters, staff opted to include a life jacket policy for swimmers outside of designated beach areas. A “swimmer” for this policy was defined as an individual in waters outside of a designated swim area who was unable to touch lake bottom; the policy did not apply to waders and excluded activities such as hand grabbling or noodling for fish.

Policies were specifically set to achieve the maximum possible impact by reaching the majority of visitors involved in water-based recreational activities. Internal review identified boaters in small classes of vessels (< 26’) and swimmers in non-designated areas as Vicksburg District’s greatest recreation risk groups. In addition to review of recreation fatality records, staff closely examined State life jacket laws, determining that current Mississippi law requires life jackets be carried for each person on board all vessels <26’ in length; however, actual wear is only required by boaters less than 13 years old while the vessel is underway. Life jacket wear is currently
mandatory in Mississippi under state law for users of personal watercraft. Beyond activities already covered under State laws, Vicksburg staff determined that their greatest risk groups were boaters in smallcraft actively fishing, hunting and/or generally boating. Under further review, staff explored fishing tournament regulations that set life jacket standards for boating anglers participating in local events held on Mississippi Lakes Project waters and discovered a successful level of compliance among participants; it was believed that adopting similar policies for their test might result in greater compliance overall from boaters from the region. In final, Vicksburg determined that their test policies would include requirements for:

- All boaters on vessels 16’-26’ to wear a U.S. Coast Guard-approved life jacket while the vessel is under power by the main propulsion unit. Boaters on this class of vessel are permitted to remove their life jacket while the primary power source of the vessel is not running. Boat operators are required to ensure that all occupants of the vessel are in compliance with regulations.

- All boaters on powered vessels <16’ and non-powered vessels, regardless of length, are required to wear a U.S. Coast Guard-approved life jacket at all times. Boat operators are required to ensure that all occupants of the vessel are in compliance with regulations.

- All swimmers outside of non-designated areas to wear a U.S. Coast Guard-approved life jacket.

Study Outreach:

Project staff took exceptional care in prepping for test implementation once their participation was determined. Using a slow and methodical approach, they initiated regional awareness by first advising local Congressional offices, state and local law enforcement agencies, and Federal Magistrates, before making their announcements to local media, public user groups, and onsite visitors. Interpretive and posted restriction signage was developed and installed at access points around the lakes. Although actual policy implementation and enforcement did not begin until 22 May 2009, district and project staff were actively engaged in community relations and education on the planned changes as early as the previous fall. In the interim, existing State life jacket requirements continue to be enforced through 36 CFR 327.3 (e) Vessels; once test policy went into effect, it was enforced under Title 36 CFR 327.12 (a) Posted Restrictions. Test policy was reviewed and approval by HQUSACE Office of Counsel before program implementation. Staff also continued routine educational outreach with water safety messaging, making small revisions to information shared to inform on the new life jacket requirements established at the lakes, for instance park rangers placed more than 40,000 information flyers on vehicles in project parking lot as one method of making park visitors aware of the new policies. Although implementation did initially add to man hours of certain staff members, it did not interfere with normal project operations. Outreach was a standard activity for the purposes of this test; however its focus was on policy rather than water safety in general. The project’s Operations Project Manager
concluded that he felt no impact or extended effort was required of him or his staff in order to implement the test policies and that staff effort would have increased due to other initiatives even had the project not participated in the Life Jacket Policy Study.

**Enforcement Efforts:**

The Mississippi Lakes park ranger staffs enforced the life jacket policies under Title 36, Code of Federal Regulations, Chapter 111, Part 327, Section 12(a), which states, “The District Commander may establish and post a schedule of visiting hours and/or restrictions on the public use of a project or portion of a project. The District Commander may close or restrict the use of a project or portion of a project when necessitated by reason of public health, public safety, maintenance, resource protection or other reasons in the public interest. Entering or using a project in a manner which is contrary to the schedule of visiting hours, closures or restrictions is prohibited.” Rangers were instructed to enforce the regulation to the best of their ability utilizing existing resources while continuing to balance all other agency missions. The ranger staff was also instructed to follow the USACE Visitor Assistance philosophy of attempting to gain compliance at the lowest level.

Mississippi Lakes Project did not experience staffing challenges, with an average of 20 park rangers per lake available for visitor assistance duties to include temporary rangers. Prior to implementation of test policy on the lakes, typically 400 routine patrols occurred for public safety in any given week during recreation season, with patrolling rangers making one-on-one contact with all visitors including on-the-water boaters and swimmers. During the recreation seasons of the test period, managers made little or no change to boat patrol with the exception of message. Whereas, prior to policy implementation, educational contacts advised on the importance of life jackets for safety along with conducting equipment safety checks, once the policies were in place, rangers used these patrols for policy education and/or enforcement contacts. Man hours dedicated to boat patrols and other visitor assistance patrols did not increase significantly as a result of participation in the Life Jacket Policy Study.

Local and state boat patrolling officers were unable to assist in enforcement of the Corps policy but were instrumental in aiding park rangers through notifications to boaters not in compliance. This type of assistance came from one state agency that routinely patrolled all four lakes.

During the test period, Mississippi Lakes Project park rangers logged approximately 800 man hours of boat patrol annually, as demonstrated in the following chart:

<table>
<thead>
<tr>
<th>Lake</th>
<th>Baseline 2008*</th>
<th>Test Year 2009*</th>
<th>Test Year 2010</th>
<th>Test Year 2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arkabutla</td>
<td>288</td>
<td>300</td>
<td>311</td>
<td>295</td>
</tr>
<tr>
<td>Enid</td>
<td>288</td>
<td>250</td>
<td>247</td>
<td>290</td>
</tr>
</tbody>
</table>
Rangers used a gradual increase of enforcement throughout the three recreation seasons of the study, allowing for an education-first approach particularly during the first year of enforcement. This approach matches the Corps’ visitor assistance philosophy of using the lowest level of enforcement required for gaining compliance. During the baseline year, 12,502 direct contacts were made by park rangers working the four Mississippi Lakes, informing visitors of the life jacket policies that would go into effect in May 2009. Beginning May 2009, park rangers utilized a database to track vessels that were either issued a verbal warning, written warning or citation. Park rangers were instructed to follow Corps policy to gain compliance at the lowest level of enforcement. The database was shared by the four lakes in order to track users in the event they moved from lake to lake. There was also a management decision to instruct park rangers to primarily issue verbal warnings during the first year of enforcement unless they had same-day repeat violators. Based on the data gathered during the first year of enforcement, management deduced each lake’s clientele was fairly loyal and did not travel from lake to lake. The database became non-functional after the first year when the District upgraded computer systems. Park rangers then relied on internal logs kept by each lake’s boat operators. During the second year of enforcement, park rangers were instructed to move to the next level of enforcement and primarily issue written warnings. During the third and final year of the test, managers were instructed to have park rangers increase their level of enforcement by issuing citations to visitors who frequented their lakes and repeatedly disregarded the life jacket rules. Enforcement data was tracked by lake and that data clearly shows the level of buy-in from each lake’s management to issue citations for non-compliance. Overall, during the three-year study period over 3,000 verbal warnings were given, 145 written warnings and 123 citations were issued for non-compliance. By analyzing the number of contacts, it is evident that attempts to gain compliance at the lowest level were successful.
Other Water Safety Efforts:

<table>
<thead>
<tr>
<th>TYPE OF SIGN</th>
<th>NUMBER Installed/Replaced</th>
<th>ESTIMATED COSTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regulatory</td>
<td>150*</td>
<td>$8,500.00</td>
</tr>
<tr>
<td>Interpretive (Billboards)</td>
<td>9</td>
<td>Approximately $300 per billboard</td>
</tr>
<tr>
<td>Other (Describe)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bulletin Boards (Posters) &amp;</td>
<td>100</td>
<td>Approximately $7,200.00 for all four lakes</td>
</tr>
<tr>
<td>Banners</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*As with the beginning of any new program that requires signage, a bulk order of signs had to be purchased. The total of 150 signs was purchased for all four lakes which would break down to approximately $2,000 per lake. In addition to signage, lake managers purchased banners, posters and billboard wraps which increased the expense to approximately $5,000 per lake.

Visitation:

Key Recreation Activities at the Mississippi Lakes Project:

- Day Use – Picnicking, swimming, hiking, cycling, sightseeing, fishing (from bank and boat)
- Camping
- Boating – Recreational boating and fishing

Description of Usage by Lake:

- Arkabutla – Large camping crowd, fishing, and sailing
- Enid – Very large camping crowd, fishing, and boating
- Sardis – Very large day use crowds, heavy boating (fishing and recreational use)
- Grenada – Mainly day use crowds, numerous fishing tournaments, many large special events, and fairly large group of recreational boaters

Visitation at most of the Mississippi lakes overall did not show significant loss due to implementation of life jacket policy; Sardis Lake may be the exception, although with other regional impacts it is difficult to say. Annual pass sales at Sardis Lake did decrease, but not significantly. Although the lakes’ visitation numbers mostly held steady or showed slight increases, some fluctuations in numbers did occur, due largely to inclement weather, economic impacts, gas prices, lake levels and whether sport fishing conditions were favorable or not.

In 2011, Arkabutla experienced high water conditions during the recreation season. Also, July and August were extremely hot and humid months for all four lakes.
Sardis Lake mainly has large summer day use crowds which includes boating. The drop in visitation may be due to the life jacket policy; however, we don’t have enough data to confirm. Annual pass sales at Sardis and Arkabutla lakes have decreased, but increased noticeably at Enid and Grenada lakes.
Conclusions:

Prior to implementation of life jacket policies for the Life Jacket Policy Study testing, adult wear rates at the Mississippi Lakes were close to nationwide averages for voluntary wear rates of just over 8 percent. During the first recreation season of test policy, wear rates peaked at nearly 80 percent. During the second and third years of the test, wear rates on the four Vicksburg District lakes held steady in the 70 percentile range. Drowning fatalities at the Mississippi Lakes dropped from a total of seven deaths in the three years prior to policy implementation to one death during each of the 3 years of the test; of the three drownings that occurred during the actual test period (one boating, two swimming), only the one boating incident involved a victim who was not in compliance with the posted restrictions. The other incidents either occurred within a designated swimming area or resulted from a medical event.

As a result of the study implementation and the efforts of Mississippi Project Management Office personnel, mandatory life jacket testing at the Mississippi Lakes Project has been deemed a success by Vicksburg District leadership. Not only have adult wear rates significantly increased, fatality reduction has been realized and lives have been saved. Testimonials from lake visitors were received during this study period credited the imposed life jacket policies with saving their lives. By example, within the first weeks of enforcement, four fishermen were rescued following lengthy periods of time in the water before being reported as missing. All four testified they were wearing their life jackets only because of the policy at the lake. Publicity stemming from these “near misses” has been instrumental in raising life jacket awareness among adult user groups of the region. District and the Mississippi test lakes staffs affirm that they knew from the beginning that the decision to participate in the study would have challenges, but they also knew without doubt that the Mississippi lakes and the US Army Corps of Engineers had an opportunity to significantly impact national policy.

Based on the broad success of the Vicksburg District three-year policy testing, District Commander Colonel Jeffrey Eckstein recently approved continuation of all tested policies for an indefinite period.