

Fall–Winter 2016

# Recreational Boating Safety

*Boat responsibly*





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## *Assistant Commandant's Perspective*

by REAR ADMIRAL PAUL F. THOMAS  
*Assistant Commandant for Prevention Policy  
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The Coast Guard remains focused on ensuring the safety, security, and environmental stewardship of our nation's waterways. This *Proceedings* issue focuses on the efforts and activities of those who frequently get underway in what is the largest segment of waterway users—73 million recreational boaters.

The Federal Boat Safety Act of 1971 provides the Coast Guard's statutory authority as the chief steward of the national recreational boating safety program. Based upon the most recently available statistics, the national recreational boating safety program has achieved unprecedented results. The record low number of fatalities and casualties over the past four years are attributable to the vibrant collaboration between the National Boating Safety Advisory Council (NBSAC), the United States Coast Guard, industry, state authorities, the boating public, and nonprofit entities.

NBSAC's strategic planning efforts have helped identify and target federal, state, and nonprofit entity resourcing opportunities, which have helped dramatically reduce fatal boating mishaps, personnel injuries, and boating-related property losses. Through these efforts, we also share data and critical operational information and perform focused outreach to increase boater and regulator awareness regarding technological innovations.

Further, the recreational boating safety mission force-multiplying efforts of our volunteer organizations—including the U.S. Coast Guard Auxiliary and the U.S. Power Squadrons—continue to yield unparalleled boating safety achievements.

On the federal front, the Fixing America's Surface Transportation Act passed in 2015, and reauthorized the Sport Fish Restoration and Boating Trust Fund, which stabilized funding for the national recreational boating safety program for the next five years. We can now move forward with greater certainty, and will continue to focus our efforts on providing relevant and responsive policy initiatives.

Even so, much worthwhile work remains to be completed. We will continue to strive to build national awareness of state and local best practices for more targeted federal resource deployment. We will also focus efforts on initiatives that speak to the boating public's interest, as engaging recreational boaters will help us instill a safe boating mindset and safety culture, which are vital to the national recreational boating experience.



# Champion's Point of View



by CAPT F. THOMAS BOROSS  
Chief

U.S. Coast Guard Office of Auxiliary and Boating Safety

Chances are, if you picked up this issue, you are a boater or water enthusiast who cares about recreational boaters, the recreational boating experience, and the waterways environment. Thank you for your interest, and for being a motivated boater or water enthusiast, and for caring enough about our craft and our waterways environment to seek additional information.

You will find good information and hopefully inspiration as well in these pages. We highlight great collaborations occurring at the federal, state, and local levels by authorities, organizations, and members of the boating public who are directly involved in the recreational boating community. But make no mistake: We need you, too! We are issuing the call to action to each of you to help your Coast Guard proliferate safe boating behaviors.

Recreational boating, relatively speaking, is among the safest means of recreating. As safe and enjoyable as recreational boating can be, however, in an instant, a wonderful day on the water can turn tragic.

Oftentimes, tragic outcomes result directly from unsafe boating behaviors. Since 2010, when *Proceedings* last published an issue focused on recreational boating safety, 26,000 boating accident reports were filed in the U.S. On average, 12 reportable incidents occur each and every day, and a substantial number of these incidents occurred because of unsafe boating behaviors.

So what can we do to promote safe boating behaviors? We must first acknowledge and define unsafe boating behaviors, including: boating while intoxicated or under chemical influence; boating without life jackets; boating at high rates of speed in no wake zones or in close proximity to standing structures, high density traffic waterways, or near persons in the water; boating at high rates of speed at night or with reduced weather visibility; boating without minimum safety equipment; boating without knowledge of current or forecasted weather conditions; boating without proper equipment to protect from cold water immersion and lack of awareness of cold water temperatures; boating while fatigued or without proper visual lookout; boating without navigational rules knowledge; boating without good operator practices (including providing passenger briefings) and good crew coordination; and boating without knowledge of a boat's handling characteristics and performance capabilities.

This issue targets many of these unsafe behaviors and articulates ways stakeholders are working collaboratively to address these issues to dramatically increase safe boating behaviors.

It has been a profound pleasure to work with each of the contributing authors, and to get to know the organizations they represent. I want to thank each author as well as the organizations they represent for their willingness to lead at the national level and for contributing their time and talent to speak to recreational boaters' interests. Working together, we will continue to encourage safe boating behaviors to make our waterways safer for all of us!

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# Structuring a Strategic RBS Plan

What we know and what we don't.

by DR. L. DANIEL MAXIM  
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In 1960 there were 819 reported recreational boating fatalities. The number of fatalities more than doubled to 1,754 in 1973 before decreasing to 610 fatalities in 2014. Many actions taken by the U.S. Coast Guard, states, and other boating safety partners contributed to the decline in fatalities. Among these were:

- **USCG boat manufacturing standards:** These include standards related to the display of capacity information, safe loading, safe powering, flotation, electrical, fuel, and ventilation.
- **The Coast Guard and the states enacted new intoxicated boating (boating under the influence) laws** beginning in the late 1980s, and new enforcement techniques and programs were implemented to effectively reduce impaired boating.
- **Mandatory education requirements:** Most states passed regulations requiring boat operators to take a safe boating course in order to operate various classes of recreational boats.
- **Outreach program development:** Several outreach programs designed to increase life jacket wear rates and enhance the safety culture of recreational boaters were developed.
- **Mandatory life jacket wear requirements for certain boat types (e.g., personal watercraft) and for children of designated ages** were put in place.



Photo by Alena Stalmashonak / Shutterstock.com.

Over this same time period, the number of boaters increased substantially. In 1960 there were only about 2.45 million registered boats.

By 2014, the number of registered boats increased five-fold to nearly 12 million. The fatality rate per 100,000 registered boats decreased 84 percent, from 33.4 percent in 1960 to 5.2 percent in 2014—an average decrease of 4.1 percent per year over this period, which was also the result of the USCG/state/boating safety partner actions already described.

Though this improvement is noteworthy, there is no justification for complacency. Nearly all boating accidents and fatalities are ultimately preventable, so there is much room for improvement.

## The Knowns and Unknowns

Stakeholders are now drafting the 2017–2021 National Recreational Boating Safety Program strategic plan and operational annex. Therefore, it is appropriate to review our progress in enhancing boating safety, defining relevant strategic initiatives, and identifying any data/knowledge

gaps. In short, it is time to review what we know (the “knowns”) and what we don’t (the “known unknowns”). Of course there are things we don’t know that we don’t know (the “unknown unknowns”), but the plan is sufficiently flexible to discover these and make timely, appropriate course corrections.

The plan uses an evidence-based decision making process. Major steps in the process include:

- surveillance and problem definition,
- identifying risk factors,
- evaluating various intervention alternatives (including voluntary and regulatory options), and
- plan development to achieve these objectives based on solid evidence of what is likely to work.

### Step 1: Surveillance and Problem Definition

Measures of plan success include analyzing the annual number of accidents, fatalities, injuries, and property damage. Fatalities are a key measure because they are the most severe of outcomes, known with high (99 percent) accuracy, and, because of their severity, trained state/federal personnel typically investigate them.

Boating accidents must be reported if they meet certain conditions, but earlier studies have shown that not all otherwise reportable accidents are included in the Boating Accident Report Database (BARD)—particularly those that involve property damage only—which means that the social cost of boating accidents is understated (a “known unknown”).<sup>1</sup>



### Step 2: Identifying Risk Factors

We examine risk factors by reviewing elements such as cause of death, accident types, and the types of boats involved in accidents.

#### Cause of Death

People die in boating accidents from several causes, including drowning, trauma, cardiac arrest, hypothermia, and carbon monoxide exposure. Drownings accounted for the majority (70 percent) of all boating fatalities over the period from 1960 through 2014. This statistic is particularly relevant, as the data also shows that most drowning victims (86 percent) in the same period were not wearing a life jacket.

#### Accident Types

Knowing the frequency of each accident type is important because it helps to develop appropriate intervention strategies, informs outreach material design, and helps us formulate boating safety course content. Over the most recent five

years, seven accident types accounted for nearly 80 percent of fatalities. In descending order, these are:

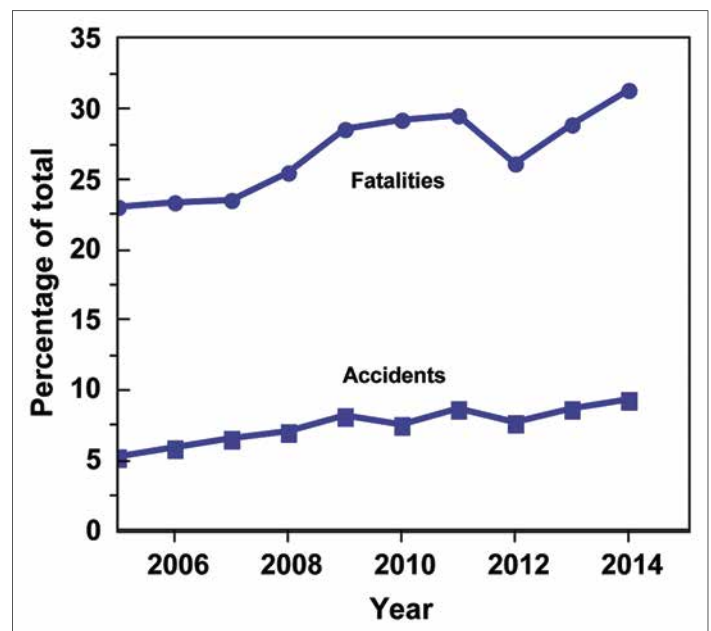
- falls overboard (26.8 percent);
- capsizing (22.5 percent);
- flooding/swamping (11.3 percent);
- allisions [collision with a fixed object] (7.9 percent);
- collisions (7 percent);
- skier mishaps (2.1 percent); and
- groundings (2.1 percent).

#### Type of Boat

The recreational boating fleet includes human-powered, wind-powered, and motorized boats. There are obvious similarities among these boat types, but there are also important differences that impact intervention strategy design, including boat stability, typical speeds, types of water, and operator demographic characteristics.

For the year 2014, open motorboats accounted for the largest share (47 percent) of boating fatalities, followed by canoes (12.6 percent), kayaks (8.8 percent), cabin motorboats (6.6 percent), and personal watercraft (5.7 percent). The large share of fatalities accounted for by open motorboats reflects the number in use and also the fact that measured life jacket wear rates are quite low for occupants of these craft.

**Figure 1.** Percentages of accidents and fatalities accounted for by non-powered craft 2005 to 2014. Graphic courtesy of authors, using Boating Accident Report Database data.





# The National Recreational Boating Survey

Data helps us identify relevant risk factors. It also identifies gaps or weaknesses, such as possible accident underreporting, the need for improved descriptors for human factors involvement, the need to better understand accidents of non-motorized craft, and the need for further study of alcohol or drug involvement in boating accidents.

Another important data issue relates to collecting and analyzing boating exposure data. Boating risks are best characterized by measures based on actual exposure rather than surrogates, such as the number of registered boats. Recognizing this limitation, the Coast Guard sponsored a series of surveys designed to estimate exposure. The most recent and comprehensive of these surveys — the National Recreational Boating Survey (NRBS) — provided exposure estimates for 2012.

## A Point of Comparison

NRBS data allows us to normalize boating fatality rate data by exposure hours. Results can be used to compare boating risks with those of other activities. For example, expressed in terms of boat hours of exposure, the average fatality rate for all types of boats under all conditions in 2012 was approximately 0.44 fatalities per million exposure hours.

This fatality rate is approximately the same as all motor vehicle fatality rates; substantially less than fatality rates for motorcycles, general aviation, and extreme sports, such as BASE jumping; but greater than risks associated with being a passenger on a train or bus.

The data gathered as part of the 2012 National Recreational Boating Survey is important and useful, but we need to develop a time series of the data. This is not a “one and done” effort. Designing, conducting, and analyzing results from the NRBS is a substantial and expensive activity. The strategic plan envisions that the data will become available, and work is underway to optimize the design of the survey so that new data will be available every two or three years.

These percentages have changed over time (see Figure 1). The percentages of accidents and fatalities associated with all non-motorized craft (such as canoes, kayaks, rowboats, non-motorized sailboats, and stand-up paddleboards) have increased in recent years. Moreover, for non-motorized craft, the percentage of fatalities is greater than the percentage of accidents. This might indicate that accidents involving non-motorized craft are more likely to result in fatalities or, alternatively, that non-fatal accidents are less likely to be reported because they fail to meet reporting criteria.

Whichever explanation is correct, it is appropriate to learn more about paddle craft accidents and participant demographics. Demographic participant surveys suggest that, among other things, there are differences in the age distributions of users of these craft compared to that for power boaters, which may inform the best intervention strategy.

## Major Causes and Contributing Factors

The BARD contains 30 fields that identify the major causes or primary contributing factors for boating accidents, fatalities, and injuries as determined by accident investigations. It is convenient to aggregate these categories into four broad groups:

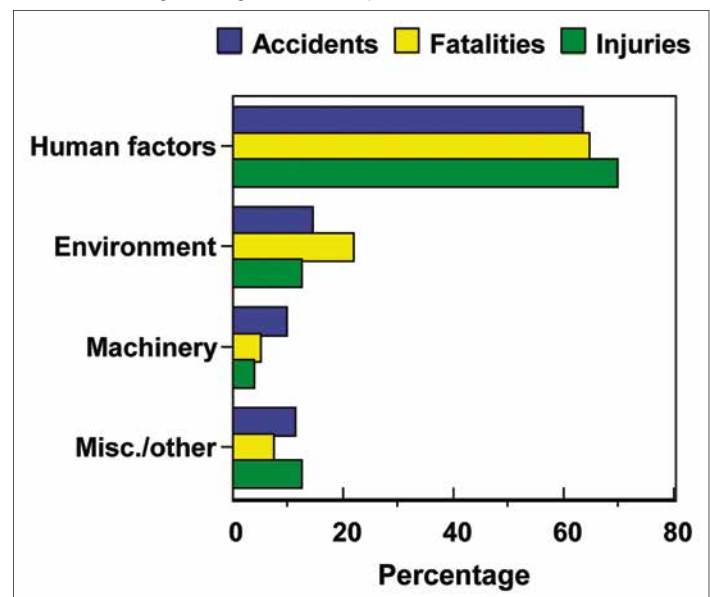
- human factors (vessel operation and passenger or gear loading);
- equipment factors;
- environmental factors; and
- a miscellaneous “other” or “unknown” category.

### Human Factors

Human (operator controllable) factors accounted for approximately 64 percent of the accidents, 65 percent of the fatalities, and 70 percent of the injuries. Arguably these percentages understate the importance of human error, as some of the accidents included in the environmental factors group might reflect decision or risk management errors on the part of the boat operator.

The information summarized in Figure 2 highlights the importance of human factors in boating accidents, but more needs to be done to get a better understanding of these factors. For example, the data fields were developed many years

**Figure 2.** Percentages of accidents, fatalities, and injuries associated with primary contributing factors to boating accidents in 2014. Graphic courtesy of authors, using Boating Accident Report Database data.





ago—well before cell phones or other such distractive devices. Also, other potentially important human factors, such as fatigue, were not considered, so there was no data field to capture the importance of fatigue as a possible cause or contributing factor in boating accidents.

To gain better insight, the Engineering, Reporting, and Analysis Committee of the National Association of State Boating Law Administrators is working with the Coast Guard and other subject matter experts to develop an improved set of data fields and definitions applicable to human factors in recreational boating accidents. The approach now being investigated is a simplified modification of the Human Factors Analysis and Classification System used throughout the Department of Defense to study the contribution of human factors in mishap investigations.<sup>2</sup>

#### **Drugs and Alcohol**

One of the most striking findings in a review of accident statistics is the importance of alcohol or drugs as a primary factor. In 2014, alcohol or drugs (principally alcohol) accounted for approximately 19 percent of all boating fatalities—the largest single factor. Moreover, this percentage is likely to be understated, because not all operators or passengers are tested (or able to be tested), even for fatal accidents.

Authoritative epidemiological studies of fatal boating accidents have shown that the adjusted odds ratio of a boating fatality rises with the increasing blood alcohol concentration (BAC) of the operator, and, moreover, is significantly elevated, even at BAC levels well beneath present regulatory limits.<sup>3</sup>

#### **Environmental Factors**

The entries in the BARD related to environment are useful for understanding the components and relative significance of this risk factor. This information reveals some obvious results, but also some surprises.

#### **Season**

Among the expected results, fatality rates vary with season. There are proportionally fewer boating accidents in the winter months compared to the summer months; July is typically a peak month for boating accidents.

Despite the summer peak in accidents, boating risks are higher in the fall, winter, and early spring months. Over the five-year period from 2010 through 2014, approximately 10 percent of accidents occurring in July involved fatalities, whereas approximately 20 percent of reported accidents



Studies show that if more boaters would wear life jackets, such as those in this picture, drowning deaths would decrease dramatically. U.S. Coast Guard photo.

occurring in December, March, or April resulted in fatalities. These findings are in accord with intuition—the winter and shoulder seasons are typically colder (hence more risk of hypothermia resulting from immersion and a lower chance for self-rescue), fewer boats are on the water (hence less chance of prompt rescue from good Samaritans), and there are fewer daylight hours in the winter and shoulder seasons (night boating is riskier).

Recognizing the risks of boating during shoulder and winter seasons, five states (Connecticut, Maine, Massachusetts, New York, and Pennsylvania) have mandated seasonal life jacket wear requirements. Studying drowning rates before and after these seasonal life jacket wear requirements will allow us to assess the efficacy of these measures.

#### **Time of Day**

Most accidents occur in the early afternoon hours, when most boating activity occurs, but the percentages of fatal accidents are highest in the late evening or early morning hours. Possible reasons why fatalities are more likely in late evening or early morning hours include reduced visibility, less boating traffic (and therefore, less chance of being promptly rescued), and perhaps greater likelihood of alcohol involvement.

**Most boating accidents occur in calm weather.**

One of the more surprising findings is that most boating accidents and most fatalities occur under relatively benign environmental conditions. Books and movies that cover



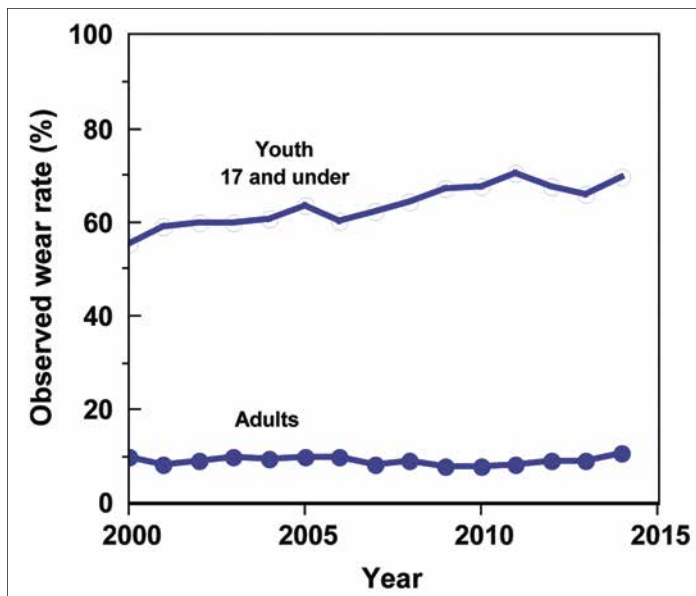
marine mishaps like *The Perfect Storm* or, more recently, *The Finest Hours* generally contain vivid depictions and images of severe environmental conditions.

It's tempting to believe that drownings or other fatalities on recreational boats are likely to occur only during severe environmental conditions, and, indeed, those who advocate selective use of life jackets implicitly make the assumption that these conditions can be identified and forecast in sufficient time for the prudent boater to don a life jacket. The reality, however, is quite different. Although hazardous water and adverse weather figure into some accidents, most recreational boating fatalities occur in relatively calm circumstances.

With respect to drownings, specifically over the years from 2008 to 2013:

- Nearly 50 percent of drownings occurred on lakes, ponds, reservoirs, dams, and gravel pits. Only 8 percent occurred on the Gulf, Great Lakes, or oceans.
- When water conditions were known, 75 percent of drownings occurred on waters with wave heights less than two feet—50 percent with wave heights less than six inches.
- When wind conditions were known, 58 percent of drownings occurred with wind conditions described as “none” or “light” (less than 6 mph).
- When visibilities were known, 82 percent of drownings occurred under conditions described as “good visibility.”

**Figure 3.** Nationwide wear rates among adults and youths for all boats (excluding personal watercraft) from 2000 to 2014. Graphic courtesy of authors, using data found in this report: <https://uscgboating.org/library/national-life-jacket-wear-study/2015-life-jacket-wear-rate-observation-study-report.pdf>.



- When water temperatures were known, 61 percent of drownings occurred at water temperatures greater than 60 degrees Fahrenheit and 45 percent when the temperature was 70 degrees or more; only 2.7 percent occurred when the water temperature was less than 39 degrees.

### Step 3: Intervention Evaluation — What Works?

The third step in the process is to identify initiatives that are likely to prove successful, such as education, outreach, standards development, and regulation. The two most important and difficult challenges are finding ways to increase life jacket wear and reduce alcohol use.

#### Increasing Life Jacket Wear

Although the likelihood of an accident doesn't decrease when wearing a life jacket, wearing one substantially reduces the probability that any person involved in an accident will drown.

Several studies have concluded that increasing life jacket wear rates from present levels to approximately 70 percent or more would reduce drownings (70 percent of total boating fatalities) by as much as half. These conclusions are backed up by actual “before” and “after” data in countries and areas where mandatory life jacket wear regulations were put into place. Collectively, the available evidence pointing to reduced boating fatalities when life jacket wear rates increase is compelling.<sup>4</sup> This leaves a key question: *How can this be done?*

To date, efforts to increase life jacket wear have included mandatory requirements for children, for some boat types, for certain lakes, and as seasonal requirements. For adults, efforts to increase life jacket wear in the United States have largely been limited to voluntary approaches, such as offering life jacket loaner programs, and educational efforts such as the National Safe Boating Council's “Wear It” program.

Studies attempting to measure the success of efforts to increase life jacket wear fall into two categories:

- those that measure knowledge and awareness among boaters, and
- those that measure actual boater behavior.

#### Boater Behavior

Awareness is important because it is a precursor to behavioral change, but behavioral change is the end objective. Unfortunately, studies measuring boater behavior provide a less optimistic picture. A series of annual studies on life jacket wear rates has been conducted since 1999 on a nationwide basis by JSI, a Boston-based firm. The ongoing JSI

# Improved Boater Education

Education is a valuable tool to develop a more robust safety culture among boaters. Accident data shows that the majority of fatalities occur in accidents where the operator has not had boating instruction. In 2014, for example, among cases where the instruction status of the operator was known, 77 percent of fatalities resulted from accidents where the boat operator had no boating instruction.

## Education Requirements

At present, 45 out of 50 states have some form of mandatory boating education requirements, but not all boat operators are required to complete an approved course (because they were born before a certain date or other exception). A USCG Office of Auxiliary and Boating Safety study indicated that, on a nationwide basis, approximately 27.5 percent of boat operators were subject to education requirements in 2014.

Assuming no change in present regulations, this percentage will increase over time and is projected to reach 48 percent by the year 2024, 63.2 percent by 2039, 75.6 percent by 2054, and 82.9 percent by 2078.

There are explicit content standards for boating safety courses to satisfy mandatory education requirements. These are revised and updated periodically based on input from subject matter experts and through accident data analysis. At present, mandatory education requirements are limited to successful completion of in-class or internet courses (in some states) that test boater knowledge.

## On-Water Instruction

Several commercial schools and non-governmental organizations also provide on-the-water instruction designed to teach boat handling skills, but these programs are not uniform. The Coast Guard awarded a grant to U.S. Sailing to develop the National On-Water Standards project to develop explicit, consistent, and objective standards. A team of subject matter experts from several national boating organizations, Coast Guard personnel, and the American Boat and Yacht Council are developing separate sets of standards for power-, sail-, and human-powered craft.

## Simulations

The Coast Guard has also awarded grants to develop desktop computer simulation programs as a supplement to knowledge-based courses or as a partial alternative to on-water skills-based courses. The United States Power Squadrons and Virtual Driver Interactive are working on a joint project with partner organizations, including the National Safe Boating Council, the BoatUS Foundation, Brunswick Marine, Mercury Marine, and Boston Whaler to develop a realistic training simulator.

Initial reception has been enthusiastic, and developments are continuing to increase simulator realism and reduce acquisition costs.

studies use a stratified random sample of sites in 30 states, typically pulling from four sites in each state. The data includes whether or not each person was wearing a life jacket; the type of life jacket; the type and length of boat; the number, genders, and apparent ages of the boat occupants; and ancillary data like weather conditions.

Figure 3 shows a time series of nationwide wear rates for all boats (excluding personal watercraft, or PWC) measured in the JSI studies over the period from 2000 through 2014. Personal watercraft aren't included in this graph because life jacket use is mandated for these craft in various states; consequently, wear rates for these craft are high (90+ percent). Interestingly, in 2014 the fraction of total deaths resulting from drowning among PWC occupants was 35 percent, compared to 69 percent for all boats.

The two data series plotted in Figure 3 are those for adults and those for youths 17 years of age or younger. State laws typically require that children wear life jackets, and wear rates are substantially higher for youths than for adults, reflecting compliance with mandatory wear requirements. The data shows that compliance with these requirements is quite high—for 2014, approximately 95 percent of children aged 0–5 years and 87.3 percent of those aged 6–12 years were observed wearing life jackets. In contrast, wear rates were only 41.6 percent for those aged 13–17 years, an age range not subject to mandatory wear requirements. Despite outreach efforts intended to increase life jacket wear, the rates for adults (excluding those on PWC) remained constant at about 10 percent over this period.

### Our two most important challenges:

- ▶ increasing life jacket wear,
- ▶ reducing alcohol use.

There are some encouraging results of the wear rate study for recent years, though: According to JSI, the data show an increasing trend for adult power boaters on boats less than 16 feet in length—presumably those with a greater likelihood of falls overboard or capsizing.

Based on a review of the available evidence, the National Boating Safety Advisory Council passed a resolution in 2011 recommending that the Coast Guard initiate regulatory efforts to mandate life jacket wear for certain classes of boats: human-powered craft and small open motorboats.





The strategic plan includes numerous alternatives to develop the most efficient approach. Studies and information from focus groups in Canada and the United Kingdom have shown that adult boaters are reluctant to wear life jackets for several reasons: Boaters believe that life jackets are uncomfortable, restrict movement, might not function properly (a surprise), are unattractive, and are unlikely to be needed because boating risks are thought to be low.<sup>5</sup> Moreover, many boaters erroneously believe that it will be possible to identify circumstances where life jacket wear is prudent.

#### Boater Awareness

To address the boaters' concerns and beliefs, work is underway to develop life jackets that are effective, yet more comfortable and attractive to wear. To spur these efforts, the BoatUS Foundation, along with the Personal Flotation Device Manufacturers Association and the National Marine Manufacturers Association, have teamed up to sponsor a competition to develop novel technologies and design ideas with an annual "Innovation in Life Jacket Design" competition.

Additionally, new outreach materials need to be developed that provide accurate information on the benefits of wearing life jackets and correct some of the myths that life jackets can always be donned promptly when needed.

Although many of the approaches to increase life jacket wear have merit, efforts must continue to find more effective means to increase wear rates. This is a major "known unknown" at present.



Petty Officer Michael Christensen, boarding officer with U.S. Coast Guard Station Seattle, fills out paperwork while local law enforcement gives a field sobriety test to a woman who was not wearing a life jacket while operating a jet ski. Christensen brought her in because she was suspected of boating under the influence. U.S. Coast Guard photo by Petty Officer Zac Crawford.

### Reducing Alcohol-Involved Accidents

The available data show that alcohol involvement is a major cause or contributing factor in boating fatalities. Alcohol impairs judgment, reaction time, vision, and balance. Boaters who've had alcohol—even those with BACs beneath present regulatory thresholds—are more likely to have an accident and less likely to take suitable precautions (such as wearing a life jacket) to mitigate the consequences of an accident.

As with life jacket wear, we continue to search for initiatives that work—another "known unknown." Presumably this involves a combination of outreach activities, continued enforcement and displays of enforcement, such as Operation Dry Water, and perhaps reducing the threshold BAC level.

#### Step 4: Implementation

The final step in the process is to develop an efficient action plan for the next five years. The Coast Guard has the statutory authority and responsibility to coordinate the National RBS Program. This coordination requires a substantial effort involving numerous partners such as various federal agencies, states and territories, commercial firms, and numerous non-governmental organizations.

The available data, or the "knowns," enable us to develop a solid understanding of accident causes. We also understand the limits of our knowledge and necessary improvements to accident data—particularly the need to learn more about:

- human factors,
- the significance of alcohol as a cause or contributing factor,
  - how to develop a more efficient design of the National Recreational Boating Survey to ensure ongoing data on exposure,
  - the need to learn more about possibly unique characteristics of accidents on human-powered craft, and
  - ways to reduce the incidence of the underreporting of injuries and property damage to provide more accurate estimates of the true social costs of boating accidents.

The importance of increasing life jacket wear rates and reducing the incidence of alcohol use while boating is clear, but we are less certain about what strategies/tactics will be most successful and feasible to implement ("known unknowns").

The percentage of boat operators with some formal boating safety training will increase in the future because,

under the phase-in schedules of mandatory education requirements, more and more boaters will be subject to such requirements. We are making progress in developing and testing alternative educational approaches, such as developing standards for on-water skills-based training and simulation alternatives. We do not know whether and to what extent these new ideas will prove successful, but they will be evaluated as more data becomes available.

Finally, the strategic plan is designed to be flexible so that if “unknown unknowns” appear, we can make necessary modifications.

#### **About the authors:**

*Dr. L. Daniel Maxim is the president of Everest Consulting Associates, a firm that conducts research on environmental, health, and safety issues. He is the chairman of the National Boating Safety Advisory Council and has been an active member of the U.S. Coast Guard Auxiliary, where he served as a former assistant national commodore of recreational boating safety.*

*Ms. Susan Weber is a statistician in the Office of Auxiliary and Boating Safety at Coast Guard headquarters. She coordinates recreational boating accident data collection, reports on data, and provides policy guidance on accident reporting. Her analyses are reflected in the annual publication Recreational Boating Statistics.*

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## National Boating Safety Advisory Council

Have you thought about applying for membership on the National Boating Safety Advisory Council? The council seeks applications each spring for appointments to begin the following calendar year.

Submit your application via email, and include a letter of interest as well as a résumé listing your home address, phone number, and information regarding your recreational boating experience. Please check the vacancy announcement found at the National Boating Safety Advisory Council website for specifics as well as the email address to send your information to.

**Who:** National Boating Safety Advisory Council

**What:** A 21-member federal advisory committee Congress established to advise the U.S. Coast Guard on matters related to recreational boating safety. The membership is divided equally among three categories:

- ♦ state officials responsible for state boating safety programs;
- ♦ recreational vessel manufacturers and associated equipment manufacturers; and
- ♦ national recreational boating organizations and the general public.

**Where:** Typically meets twice a year, with some committee work via email, webinars, or conference calls.

**When:** Meetings usually take place in the spring and fall. The Coast Guard reimburses members for travel expenses.

**Why:** The Coast Guard values input from its partners in the National Recreational Boating Safety Program, and this advisory committee allows the Coast Guard to receive advice from those valued partners in a transparent manner.

For more information, please visit the National Boating Safety Advisory Council website at <http://homeport.uscg.mil/NBSAC>.

### **For more information:**

Statistics from the U.S. Coast Guard Office of Auxiliary and Boating Safety. Visit the website at: [www.uscgboating.org/](http://www.uscgboating.org/).



# Recreational Boating Safety in a Changing Environment

## The Coast Guard Auxiliary's role.

by COMO MARK SIMONI  
*National Commodore*  
*U.S. Coast Guard Auxiliary*

Recreational boating safety (RBS) may be broadly characterized as the united efforts of various organizations to help the boating public have a safe and enjoyable recreational experience on the water. To do this, we implement programs designed to minimize the loss of life, personal injury, and property damage. We also educate recreational boaters on environmental concerns and national security efforts.

Since its inception in 1939 as the U.S. Coast Guard Reserves, the Coast Guard Auxiliary has focused on safety of life at sea as well as fostering wider knowledge of—and compliance with—the laws, rules, and regulations pertaining to recreational boats.

### **RBS in the Mid 20th Century**

The Motorboat Act of 1940 was enacted to cover safety requirements for recreational boats and other vessels not more than 65 feet in length propelled by machinery. In 1945, the Coast Guard refined auxiliary missions to include, among other things, providing continuous liaison between the Coast Guard and the small craft community. Key to this mission was encouraging safe and courteous vessel operation by sharing prudent marine practices and setting a good example.

Two cornerstone Coast Guard Auxiliary activities—vessel examination and public education—were established in 1947. These programs provided auxiliarists the means to interact with the boating public face to face and to spread the boating safety message. They remain core elements of the auxiliary's RBS missions to this day.

As the popularity of boating grew, so did the number of injuries and fatalities. In 1971, 1,582 boating fatalities were recorded. Partially in response to the accident trends, the Federal Boat Safety Act of 1971 was passed, providing new requirements for safety equipment as well as expanding the

Coast Guard's role in supervising boating on inland waters. This legislation also opened the door for auxiliary support to the states when requested.

### **Auxiliary Efforts at the Turn of the Century**

The Coast Guard Authorization Act of 1996 increased the range of activities in the Coast Guard Auxiliary mission set by permitting auxiliary personnel to perform almost every Coast Guard mission, with the exception of direct law enforcement and military activities.

However, this authorization resulted in “mission creep” and a somewhat lessened focus on the traditional RBS mission set, as auxiliarists now had additional areas in which to serve. The events of September 11, 2001, and the subsequent increase in maritime security measures also contributed to a shift in auxiliary activities.

### **Auxiliary RBS Efforts Today**

Today, the auxiliary performs an even wider array of missions, but with a renewed effort in the RBS arena. In fact, the first mission mentioned in the Commandant's auxiliary policy statement, published in 2014, is “To promote and improve Recreational Boating Safety.” The auxiliary takes this mission very seriously.

Along with its RBS partners, the Coast Guard Auxiliary is succeeding at its primary mission. Recreational boating fatalities continue to hover near historic lows even though more and more nontraditional boaters have taken to the water.

While the number of registered boats in the U.S. declined by 700,000 over the last 10 years, the number of Americans participating in nontraditional boating activities, such as paddle sports, grew by more than three million people in just the last five years. More than 21 million people are now



paddlers—a number that includes 13 million kayakers as well as the nearly three million Americans who use stand-up paddleboards to enjoy the water.

Even though the number of overall fatalities for boaters stands at a record low, fatalities surrounding these human-powered craft show a rising trend. Clearly there is a role for the Coast Guard Auxiliary in this area.

### The View Ahead

Future growth areas for recreational boating safety involvement may include such programs as on-water training and new methods to deliver other types of skills-based, hands-on training.

Looking ahead, it's hard to imagine a world where the Coast Guard Auxiliary does not play a pivotal role in promoting and improving recreational boating safety. It is in our organizational DNA, and will continue to be a big part of our future.

#### About the author:

*Commodore Mark Simoni is the 32<sup>nd</sup> National Commodore of the United States Coast Guard Auxiliary. He joined the auxiliary in 1991 and oversees the activities of 28,000 auxiliaries. In 2012, he completed a term as Deputy National Commodore—Operations and Atlantic Area—West. In 2013–2014 he served as Vice National Commodore.*

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Auxiliary Paddlecraft Program.

### For more information:

#### Modern Marine Navigation Online Course

[www.boatus.org/navigation/](http://www.boatus.org/navigation/)

#### Basic Boat Handling Enhanced eBook:

<http://bookstore.kalkomey.com/products/basic-boat-handling-us-coast-guard-auxiliary>

**Seamanship Seminar eBooks:** Search for these USCG Auxiliary titles at <https://www.bookshout.com/>:

*Your Boat's Radio*

*Inland Boating*

*Weather and Boating*

# Strategic Plan

The Coast Guard Auxiliary Strategic Plan 2014–2020 incorporates numerous initiatives that expand the auxiliary's efforts in water safety. Some of these activities have been completed; the rest are well underway.

These initiatives include:

- increasing auxiliary presence and relevance in the paddlecraft community;
- expanding existing programs to provide outreach to the paddlecraft community, including vessel safety checks, RBS program visitation, public education, and an aggressive outreach to outfitters and sales outlets;
- expanding recruiting efforts in the paddlecraft community;
- developing trained paddlecraft vessel examiners;
- growing the auxiliary paddlecraft program in multiple districts;
- creating a new paddlecraft public education course and developing "train the trainer" materials to teach it;
- analyzing paddlecraft fatalities to identify key causes and contributing factors, using the results of this analysis to revise key safety messages;
- using social media (Facebook, Twitter, Flickr, Vimeo, live blogs, etc.) to deliver these messages in nontraditional ways.

### Nontraditional Methods

Recognizing that members of the boating public gather information in different ways, and that many people prefer to learn at their own pace, the auxiliary has created a suite of eBooks that comprise a complete seminar series. There is also an enhanced eBook on boat handling with embedded video and narration, as well as a world-class online eCourse on marine navigation.

Another nontraditional recreational boating safety mission for the auxiliary is participation in an ongoing life jacket wear rate study. Data from this study will help the Coast Guard to develop programs designed to increase life jacket wear rates.



# Recreational Boating Education Reformation

Including situational awareness in training.

by DR. ERNEST MARSHBURN  
*United States Power Squadrons*

MR. MICHAEL WIEDEL  
*United States Power Squadrons*

In 1980 there were 8.5 million registered recreational vessels in the U.S. — a number that increased to 11.9 million in 2013. This 40 percent increase in the number of registered boats illustrates the increasing popularity of recreational boating in recent decades. Unfortunately, this increased participation has been accompanied by higher numbers of boating accidents, as well, resulting in increased property damage, personal injury, and death. An annual average of 4,810 recreational boating accidents occurred from 2002 to 2014, characterizing recreational boating as a leading cause of transportation accidents (second only to automotive transportation).<sup>1</sup>

Over the years, extensive federal, state, and organizational resources have been invested in efforts to reduce the number of recreational boating accidents and injuries, using educational measures to improve boat operator safety practices as a critically important element of such efforts. As a result, an increasing majority of recreational boaters generally do practice safe boating.

Simply being a member of a boating organization or constraining one's boating to protected waters does not guarantee that a recreational boat operator will exhibit safe boating behaviors or, more importantly, make appropriate decisions when placed in higher-risk situations.<sup>2</sup> Some government officials have suggested that present laws and programs have brought down the number of deaths to a level where they cannot be further reduced without enacting new laws and employing additional programs that could be costly, controversial, or difficult to implement.<sup>3</sup>

History suggests that three factors play critical roles when it comes to avoiding or mitigating boating accidents: human awareness, understanding the environment in which the

operator is boating, and the critical decisions that follow. Therefore, we can't expect to capture the full complexity of the recreational boating environment by considering human factors alone; we must consider human, technological, and environmental factors associated with these risks to better understand the highly integrative and complex nature of recreational boating accidents. We need to take this bigger picture into account while identifying cost-effective, non-controversial, simple means to further reduce boating accidents and also consider recreational boating education reform issues, such as how situational awareness training might be integrated into all classroom and on-water boat operator training.

## **Power Squadron Training**

Since the mid-1940s, the United States Power Squadrons have offered boat operator education programs and courses ranging from basic boating skills through increasingly complex subjects such as advanced piloting and navigation. These courses have promoted skill and knowledge within a classroom setting as well as via on-water practice and instruction.

Whether taught in the classroom or on water, the basic boat operator training formula of skill and knowledge building has remained unchanged. Nonetheless, accident data continues to show that the major causes and/or contributing factors to most boating accidents relate to human factors (awareness), understanding the operating environment, and critical decision making.

## **The Human Factor**

This consideration is not unique to recreational boating. Analyses of mishaps in medicine, aviation, marine transportation, motor vehicles, nuclear power, chemical and

petrochemical industries, law enforcement, firefighting, and emergency management show similar patterns.<sup>4</sup>

Human factor specialists and accident investigators working in these (and other) fields have developed useful approaches to such risk management. Although known by different names (such as “crew resource management” in aviation and “bridge team management” in commercial shipping), these approaches identify critical human performance skills necessary to ensure safe operations. In broad terms, these critical human performance skills are defined as “situational awareness (SA).”

Situational awareness is a learned skill that is accessible to everyone, albeit with appropriate levels of SA training. As an augmentation of current basic and advanced boating education, SA has a clear role and a distinctive purpose. Rather than simply focusing on the skills permitting a boat operator to operate a vessel safely and efficiently, as current recreational boat operator instruction is now structured, it expands boat operator educational theory to include situational awareness training.

This type of training helps develop a skill set that can help boat operators to utilize all of their senses to perceive what is abnormal within their environment and develop an action plan before the threat or risk event occurs.

### The Case for Situational Awareness

Situational awareness is, simply put, knowing and understanding what is happening around you. To put this in perspective, a recent maritime operations accident analysis report<sup>5</sup> noted that 71 percent of human errors were situational awareness-related problems.

Of the situational awareness errors:

- 58.5 percent were level 1 SA errors,
- 32.7 percent were level 2, and
- 8.8 percent were level 3.

Level 1 SA is the most basic level, which relates to environmental status, attributes, and dynamics. Put simply: perception. This includes observing multiple situational elements such as objects, events, people, systems, and environmental factors and their current states: location, condition, mode, and action. Level 2 involves synthesizing multiple sensory input through pattern recognition, interpretation, and evaluation, then developing a comprehensive picture of the environment. Level 3 is the highest level, which involves the ability to project a future course of action in response to the threat or accident risk elements perceived within the environment.<sup>6</sup>

## Barriers to Maintaining Situational Awareness

- ▶ **Familiarity:** Actions based on past experiences. When something looks similar to what we are familiar with, we may act as if it were the same.
- ▶ **Expectations:** Interpreting information in ways that reaffirm a planned action. In other words, we change or ignore information to match our expectations of a threat or risk.
- ▶ **Focus block:** Filtering out sensory information that doesn't match our mental picture of normality. This frequently happens with those immersed in a smart phone, GPS, or chart plotter to such a degree that they overlook the presence of a rock jetty guarding an inlet. Technology can rob us of our awareness in the times and places it's needed most.
- ▶ **Complacency:** Assuming normality when motions are slow, tasks are repetitive, and/or when objectives are met.
- ▶ **Stress:** High-risk situations can cause distraction and/or fixation.
- ▶ **Fatigue:** Physical, mental, and emotional fatigue affects alertness, vigilance, and endurance.
- ▶ **Excessive motivation:** “Get home-itis,” or an exaggerated sense of destination importance.

Modified from U.S. Coast Guard, “Team Coordination Training: Situational Awareness,” Team Coordination Training 2015, available at: <https://www.uscg.mil/auxiliary/training/tct/chap5.pdf>.

From the perspective of a recreational boat operator, situational awareness involves understanding where to focus your attention. For example, the operator must note nearby boat operator patterns, behaviors, and/or environmental warning signs that suggest imminent threat. As noted, situational awareness requires:

- understanding what is “normal” with respect to a particular environment,
- focusing on what is “abnormal” with respect to that environment, and
- mentally preparing a plan of action depending on those observations.

Attempting to focus on everything at once leads to sensory and mental overload, which makes situational awareness difficult, if not impossible. The human mind can only process so much information at any given time. Thus, in the domain of personal safety, where incidents can unfold in seconds, how we direct our attention can mean the difference between injury, life, or death.

### Achieving Situational Awareness

So how can a boat operator become more situationally aware? Furthermore, how should boat operators orient themselves to observe those few critical details and simultaneously





# Nine Progressive Steps to Improving Situational Awareness

- 1 Plan**— Think ahead and predetermine crew roles. Assign responsibilities or duty stations for handling problems or unexpected distractions that may occur during the trip.
- 2 Visualize Actions**— Planning is more than having a fuel and float plan; consider the human, technological, and environmental threats surrounding you to develop appropriate mitigation strategies.
- 3 Scan**— Perceive the environment. Become aware of the important elements in your environment. Actively seek information from available sources and senses. Clarify anything that seems ambiguous or not normal.
- 4 Pay Attention**— Avoid fixating on any one problem. While it is important to focus on details, don't forget to scan the big picture— there may be other threats surrounding you.
- 5 Evaluate**— Continuously evaluate your observational focus as well as the environment to ensure your focus remains sharp. Consider rotating helm responsibilities periodically to avoid "zoning out."
- 6 Anticipate**— Consider the possibility of something going wrong, then ask yourself "What if?" Develop contingency plans for such responsibilities so that emergencies are better managed instead of merely reacted to.
- 7 Remind**— Manage interruptions and distractions. Set reminders for routine tasks that may be overlooked or interrupted.
- 8 Communicate**— Know all tasks for all phases of your boat operations as related to handling problems or unexpected distractions, assign crew responsibilities, and watch for signs that situational awareness is breaking down.
- 9 Evaluate**— During and after the cruise, assess your crew performance to identify areas of uncertainty or confusion. Develop responsive procedures for those incidents in case of reoccurrence.

Adapted from D. Edwards, J. Douglas, and G. Edkins, "Situation Awareness: Techniques to make sure that you don't lose sight of the big picture," Flight Safety Australia, 1998.

understand their context? These questions serve to highlight a primary situational awareness concept. That is, while most of us tend to observe primarily with our eyes, we must learn to use all of our senses (including hearing, smell, and touch) to be fully situationally aware.

Therefore, boat operator training should include a 360-degree perspective rather than focusing on a GPS, chart plotter, or cell phone. In other words, the boat operator should calmly and continuously scan the environment to observe as much

as possible about the surroundings and to be in an unobstructed position to observe potential threats from any direction.

It is also important to understand that it isn't sufficient to simply be more observant. You have to know what you're looking for and then put that information into context that has meaning and is actionable. When boating, be alert and turn off distractions like your stereo so you can hear the sounds of approaching boats. Have someone else monitor your cell phone—or turn it off altogether. Feel any changes in the normal rhythm of your boat. Situational awareness is a mindset that must be cultivated until it's something a boat operator does rather than thinks about. In short, it is a developed skill that must be practiced regularly.

## Understanding the Baseline

Developing situational awareness involves understanding what is normal and variations of normality. Normal, or "baseline," is what your senses should perceive when there are no perceived threats and when the environment around the boat appears to be normal. By some measure, this is a sense of the noise and activity level during routine boating operations.

For example, in the morning, boating activities may normally be fairly quiet (a flat baseline). Later in the day, that baseline typically changes as fishermen and hunters are returning, day boaters are out, and, most importantly, boat diversity and density level is higher. While there is an increase in noise and activity, the baseline still seems normal; however, if personal watercraft suddenly appear, everyone reacts, the noise level increases, and it radiates from a point source.

To be situationally aware, the boat operator must recognize normal or baseline abnormalities and recognize if those disturbances represent a specific threat. In other words—and in addition to environmental changes—a boat operator should recognize abnormal boat operator behavior patterns. For example, an aware person will notice boat operator characteristics that others miss, such as youths in close proximity whose boat movements seem to mimic your own.

## Where the Vessel Meets the Water

To help students and members in United States Power Squadrons classes develop a better understanding of situational awareness principles, our organization is embarking on a program to take students out of the classroom and onto the water. That's why many of our public education classes now end with a cruise on a licensed commercial vessel—the classroom lessons on how to use a chart, identifying aids to navigation, and observational skills are brought out of the book and into real-life situations.



The cruise begins by explaining situational awareness principles, then asking students to describe objects, persons, events, and environmental factors around them. The students are then asked to verbalize what they perceive to be the baseline. As the cruise progresses, participants maintain a running dialogue as to what they are seeing, hearing, and feeling; what (if any) threats are perceived or anticipated; and what action they would take to avoid the threat.

To illustrate how the situation changes during the transition from day to night, we repeat the exercise as the sun sets. Participants are asked to determine the different types of vessels as well as those vessels' intentions by observing navigation lights. Students also get practice identifying navigational aids by reading their lighting characteristics. Finally, students get important experience taking in the situational difficulty commercial vessel operators have in seeing smaller vessels, especially at night.

For members of our organization, the United States Power Squadrons offers a program of on-water instruction. In one such offering, members can choose to participate in an on-water certification program that evaluates on-water skills in boat handling, emergency preparedness, navigation skills, and voyage planning in a choice of one of three levels—inland, coastal, and offshore.

In our navigation and electronics courses, United States Power Squadrons instructors continue to stress the need for paper charts, logs, and backup plans, since GPS devices, electronic chart plotters, Automatic Identification System, and other electronic tools available to the navigator may lull us into a false sense of security. Additionally, these devices can—and *do*—malfunction. We also impress upon our students to look up from their electronic devices, look out the windscreen, and maintain their stance as a competent observer.

### Transition to Practice

In the 103-year history of the United States Power Squadrons, our educational offerings have been committed to providing the best boating safety instruction available to our students. Today, in keeping with this tradition, our course offerings continue to evolve in response to changing legal requirements, demographics, educational research, and changing technology.

This evolutionary path is more critical today than at any time in the history of recreational vessel education programs. As manufacturers continue to develop an increasingly diverse stable of commercial, recreational, personal watercraft, human-powered craft, and other types of non-traditional watercraft, our waterways are becoming increasingly congested. It is therefore vitally important that vessel operators have the skills to identify what threats surround their vessels, and to be able to quickly develop a plan to avoid the danger.

### About the authors:

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*Mr. Michael S. Wiedel is a project manager with Tyco Integrated Security, Brookfield, Wisconsin. He is the chair of the United States Power Squadrons Recreational Boating Safety Committee. Mr. Wiedel teaches recreational boating safety classes and seminars and is a member of the International Shipmasters, a member of the United States Coast Guard Auxiliary, and chairman of the Milwaukee Harbor Safety Committee.*

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# Kids Don't Float

Adapting the public health approach to develop, test, and evaluate potential recreational boating safety interventions.

by MR. JEFFREY S. JOHNSON  
*Boating Law Administrator  
Alaska Office of Boating Safety*

On a June day in 1998, 12-year-old Pamela Smith was playing along the water's edge in Kotzebue, Alaska, with some friends when she suddenly slipped into deep water. While she knew how to swim, she was having difficulty doing so in the current and with such cold water. As she struggled to keep her head above the water, she yelled out for help. Fortunately, 10-year-old George "Radar" Lambert was also there that day, and he saw her go under the water while being taken out by the current.

Radar—a non-swimmer—quickly donned a nearby "Kids Don't Float" loaner life jacket and dog-paddled out to Pamela, who by then had gone under a second time and was too cold and out of breath to speak. He grabbed her around her neck and started back to land, later recalling, "I used every muscle in my body to get to shore."

When asked what he was thinking as he went out to Pamela, Radar shrugged his shoulders and said, "She's my friend. I have to help her." His was the first of at least 28 "Kids Don't Float" program saves in Alaska.



Radar Lambert shortly after the event in Kotzebue. Photo by Tom Fazzini. Photo courtesy of the Alaska Office of Boating Safety.

Kids Don't Float began in 1996 in the coastal town of Homer, Alaska, in response to the high incidence of childhood drowning in Alaska. A local fire chief came up with the idea after attending an injury prevention conference where he learned about the "Children Can't Fly" campaign, a highly successful injury prevention program created in response to deaths from window falls in New York City.

The Kids Don't Float program started with a handful of life jacket loaner stations in communities around Kachemak Bay. It quickly expanded and is now in action thanks to communities, organizations, and individuals statewide. It has been embraced in other parts of the nation more recently.

With 624 life jacket loaner stations in place in Alaska, it has been hailed as one of the best examples of what a successful injury prevention program looks like.

## First-Hand Experience

Like many involved in boating safety, my career began in the field. I was on the "response" side of boating accident and drowning cases as a park ranger responsible for law enforcement and emergency medical care. In Alaska, the emergency medical services unit is tied to the "prevention" side of the Department of Health, and I was first introduced to the concept of the public health approach to injury prevention as an emergency medical technician.



# Public Health Approach to Injury Prevention

The public health approach to injury prevention is a proven model that could greatly benefit recreational boating safety programs for many reasons:

- It uses a wide range of proven sciences and disciplines.
- It is already widely understood and used by many federal agencies, state agencies, and injury prevention organizations.
- In some disciplines (e.g., modern social marketing’s application to injury prevention-related behavioral issues), it has already been integrated into professional “best practices.”<sup>1</sup>
- It targets resources on the highest priorities.
- It focuses on preventive interventions that have been tested with the target population before implementation.

- It is highly accountable. Performance measurements are meaningful because they are tied to objectives and carefully built in at the front end during the design phase — not after the fact.
- It is collaborative. Proven effectiveness encourages and secures high levels of voluntary engagement at the grass-roots level.
- It is transformative, encouraging continuous improvement.
- It is nimble — highly responsive to evidence, evaluation, and any changes in environment or culture over time.

**Endnote:**

<sup>1</sup> Hong Cheng, Philip Kotler, and Nancy R. Lee, “Social Marketing for Public Health,” Jones and Bartlett, 2011.

Later, as we worked to get legislation passed and to establish a boating safety program in Alaska, some members of Alaska’s professional injury prevention community participated as part of our first citizens’ advisory council. We followed what some other states had put forth, including some early public education projects such as a boater’s handbook, some TV and radio spots, posters, and print ads.

As I reported on these and other early accomplishments to the council, members would often ask, “Those look great, but how do you know if you’re accomplishing anything?”

At first I was defensive, but over time I came to understand and appreciate the question. The truth was that we really didn’t know the answer.

**Public Health**

The term “public health” generally refers to organized societal measures to prevent disease, promote health, and prolong life. For more than a century, the scientifically proven public health approach has achieved tremendous successes in preventing or reducing infectious disease worldwide and, more recently, preventable illnesses and injury.<sup>1</sup>

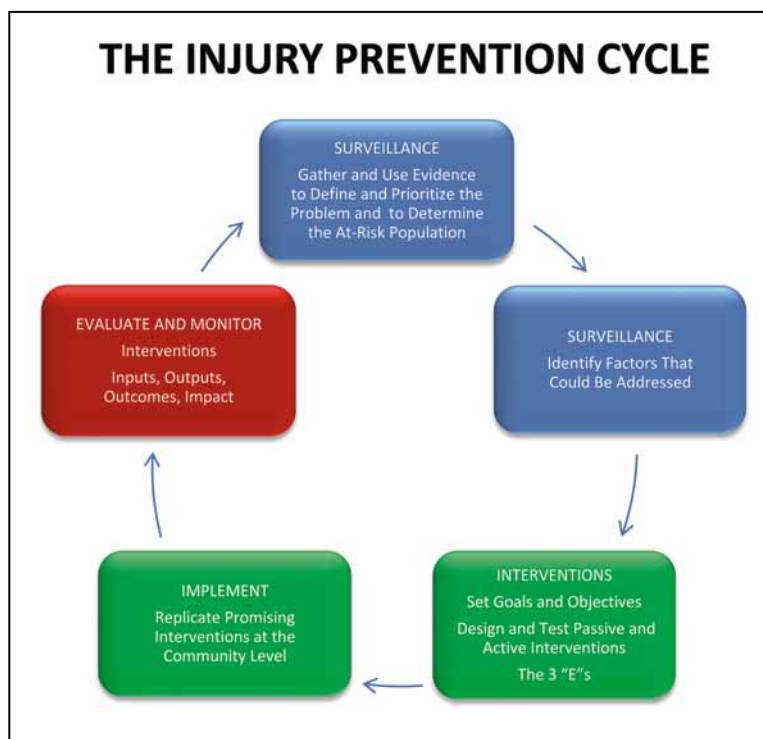
Injury prevention, an increasingly important field within public health, is an adaptation of the public health approach the World Health Organization, federal agencies (such as the Centers for Disease Control and Prevention), nonprofits (such as the Safe States Alliance), state health departments, and many others utilize. The injury prevention field uses evidence to identify and define a public health problem, the population at risk, and causal factors that might be influenced. We develop and test potential interventions to find out what might work, then replicate promising interventions

(ideally at the grass-roots level) and carefully evaluate and monitor results throughout the process.

We gather quantitative and qualitative evidence to define a problem as well as when, where, how, and to whom it occurs. We then prioritize the problem against other identified problems, considering frequency, severity, and/or cost to society. We then identify factors that may respond to intervention.

**The Three Es**

Interventions are designed specifically for a target population in at least one



of (but ideally, a mix of) the classic “three Es” of injury prevention:

- education,
- engineering/environment, and
- enforcement.

Education helps us to persuade and alter attitudes, which in turn alters behaviors. Engineering/environment is another strong area of intervention. Boating safety examples include passive interventions, such as built-in supplemental flotation and powerboat engine cut-off devices, and active interventions like carriage requirements. Finally, public policy enactment and enforcement are strong agents in achieving rapid social change. Examples of enactment and enforcement strategies include boating while intoxicated laws and mandatory life jacket wear.

### Implementation

We test potential interventions on the target population and evaluate them to find out what works. We implement interventions that have first been tested with the target population, then we use their experience to identify and address the barriers and benefits to change (as perceived by the target population).

Promising interventions are implemented and widely replicated, ideally at the community level, where injury prevention programs are most effective. The best injury prevention programs have high levels of engagement from partners and stakeholders at the local level; they can clearly see the benefit of participating and want to be a part of it.

### Evaluate and Monitor

Evaluation is a key step throughout the process. We assess interventions beginning with the design phase, during implementation, and then we evaluate the outcome following the intervention. This includes short-term, mid-term, and long-term outcomes and, to a lesser extent, any impact to public health. If interventions are successful, they continue to be replicated and monitored over time. If not, we adjust or terminate them, and the cycle begins again.

### Where the Keel Meets the Water

While recreational boating safety has seen some vast improvements over the years, challenges remain. We must be willing to know whether our program activities are effective, need to be improved, or are not effective. The only real failure would be to continue to commit resources to (or

expand) the implementation of measures we’re not really sure are working or not. In other words, we risk doing the wrong thing “righter,” making it even “wronger.” Instead, we must discover what is and *isn’t* working, committing our resources and efforts to only the interventions that have the greatest potential effect.

In Alaska, we have found it easiest to apply the approach first to discretionary programs (those not required by public policy or formal agreement), such as social marketing. Over the years, we have applied this approach to build several of our programs. Along the journey, we have identified some successes, as well as initiatives that required revision or replacement. Overall, Alaska’s boating safety program has been better for it.

To replicate this in your area, start small. Learn about it and give it a try. Following the process does not necessarily have to be expensive or time-consuming. In some cases, it may be possible to go back and incorporate missing pieces of the model into existing programs. In other cases, it might be better to start at the beginning.

In the end, if done right, programs can become even more successful, and more lives will be saved—just ask Radar and Pamela.

#### *About the author:*

*Mr. Jeff Johnson has served as Alaska’s boating law administrator since 1998. He has experience as a former president of the National Association of State Boating Law Administrators, president of the Western States Boating Administrators Association, and chair of the National Boating Education Standards Panel. He currently serves on the National Boating Safety Advisory Council.*

#### Endnote:

<sup>1</sup> Tom Christoffel and Susan Scavo Gallagher, “Injury Prevention and Public Health,” Aspen Publishers, 1999.

#### **For more information:**

Narrative and statistics courtesy of the Alaska Office of Boating Safety. For more information, visit the website: <http://dnr.alaska.gov/parks/boating/index>.



# Once Burned

## Changing boater behavior.

by MR. W. VANN BURGESS  
*Senior Recreational Boating Safety Specialist*  
*U.S. Coast Guard Boating Safety Division*

In the world of recreational boating safety (RBS), we boating safety professionals talk about training, education, outreach, and enforcement in the hopes of changing boaters' behaviors to prevent deaths and serious injuries resulting from recreational boating accidents. The key is to develop a workable strategy that will actually have enough impact to positively change a boater's behavior.

While it can be argued that some human behaviors are instinctual, most behaviors are learned. Consider this case: A young child sees a candle burning and thinks the flame is pretty, so he reaches out to touch it, quickly discovering that the flame is hot and burns. As a result, the desire to touch the flame is—shall we say—“extinguished,” and the child modifies his behavior, thereby reducing the risk of further injury.

This sort of cause and effect is evident in recreational boating. The problem is, while the child in the example has the opportunity to learn from his mistake, errors in boating often lead to serious, life-altering injury or even death. Therefore, learning safe boating behaviors must be relegated to learning as an act of prevention as opposed to learning by trial and error.

### Contributing Factors

So what are the safe boating behaviors we're talking about? Let's first look at some facts. The top five contributing factors in recreational vessel accidents are:

- operator inattention,
- improper lookout,
- operator inexperience,
- excessive speed, and
- alcohol use.

The behaviors most often associated with these problems are:

- distracted operation;
- failure to properly apply the navigation rules in meeting, crossing, and overtaking situations;

- failure to gain sufficient on-water boat handling expertise;
- failure to properly identify risks and take mitigating actions in the operating environment; and
- failure to abstain from intoxicants.

Operating a boat is an exercise in multi-tasking. As an operator, one must steer, operate a throttle, watch for oncoming traffic from quite literally all directions at once, and pay attention to what the other people aboard are doing. Since an operator is already pretty busy, it doesn't take much to create further distraction. Eating, drinking, loud music, and using a cell phone are just a few of the things that can overwhelm an operator's ability to remain observant.

### The Reality

Those facts lead to the next question: How do you limit distractions and get the operator to remain vigilant? Will a boating safety class do it? Will an outreach campaign persuade operators to focus and change their behavior? Improper lookout falls into this same arena. The navigation rules require the operator to maintain a proper lookout at all times when underway.

Stepping past the operator inexperience for the moment, what about the problem with excessive speed? In general, where boating accidents involve excessive speed, this usually means a vessel is traveling too fast for the prevailing conditions (wind, seas, visibility) or traveling too fast when approaching another vessel or fixed object, such as a dock. Operators may often draw upon their experiences driving a car, not taking into account that, unlike cars, boats don't have brakes (with the exception of at least one personal watercraft manufacturer). Additionally, as it takes to a turn, a boat will continue in the original direction of travel for some distance.



Photo by Dmitry Kaminsky/Shutterstock.com.



So how do we reinforce the mindset that a boat is not simply a car on water? Will an eight-hour boating safety class do that? Can an outreach campaign provoke a behavioral change?

Everyone knows drinking and driving is a bad idea and that it is strictly prohibited. Not too many of us will climb into a car with an open container of alcohol. But take that same person who wouldn't think of drinking a beer behind the wheel of a car, place him or her in a boat, and suddenly that beer seems OK. When folks load their boat for a beautiful day out on the water, often the first thing aboard is the cooler, filled with a healthy supply of their favorite adult beverage.

While ads on TV about the dangers and costs of drinking and driving are ubiquitous, the behavior continues; nearly one-third of all traffic-related fatalities are attributed to alcohol.<sup>1</sup> Boating isn't much better, with nearly one-fifth of all boating fatalities attributed to alcohol.<sup>2</sup>

### Interventions

In the end, does this all come down to operator inexperience? Is it really only trial and error that will create an opportunity for change? We know that boating safety classes, along with targeted outreach and enforcement, have an impact. We think taking education to the next step by placing boat operators on the water with professional instructors increases their skill level. What we also know, unfortunately, is that the current effort does not reach a significant portion of the boating population.

In the past 10 years, in an effort primarily led by the states with assistance from dedicated nonprofit groups and the commercial sector, only 10 percent of the boating population has been reached through direct education. A much smaller percentage has actually experienced on-water skills instruction. Law enforcement—again, with the states leading the way—contact approximately 1.7 million boaters each year, but that represents only two percent of the boating population.<sup>3</sup> Are these efforts enough? What else can we do?

Some say the Coast Guard should mandate that all boaters undergo boat operator training. Unfortunately, we don't have the statutory authority, but the states are certainly trying. Many states have instituted mandatory education requirements. Several have quick phase-in laws that may

take five to seven years to reach all of their boaters, but many have a "born after" date attached, so it may take upwards of 20 years to affect the majority of their boaters. Additionally, states face a lot of pressure when it comes to regulating recreational activities, especially when doing so could impact tourist dollars.

### We're All in This Together

Professional mariners are well aware of the behaviors recreational boaters exhibit on the water. As a professional mariner, what could you do to help create safety awareness among boaters? For one thing, you can certainly demonstrate professionalism and a safety culture in the way you operate your own vessel each day. The fact that there are relatively few incidents between recreational vessels and the commercial fleet are a testament to the skill and experience of professional mariners.<sup>4</sup>

How can you communicate your view of safety to the boating public? What can you do to support a national safe boating campaign and spread the message? How can you assist the states in their efforts to reach the boater where it counts on the water? What would it take to pass your basic knowledge and skills on to the beginning boater? Can professional mariners, as a community, help change the behaviors of recreational boaters to make for a safer and more enjoyable experience on the water for everyone?

Think about these questions—we would be very interested to hear your ideas. Send them to: Commandant (CG-BSX-22), U.S. Coast Guard Stop 7501, 2703 Martin Luther King Jr Ave SE, Washington, DC 20593-7501.

We are all in this together. Together, maybe we can find a better way.

### About the author:

*Mr. Burgess serves as the senior recreational boating safety specialist for the U.S. Coast Guard, where he oversees the programmatic operation of the State RBS Grant Program provided under the USCG-administered Sport Fish Restoration and Boating Trust Fund.*

### Endnotes:

- <sup>1</sup> National Highway Traffic Safety Administration, 2014 Traffic Safety Fact Sheet, Alcohol Impaired Driving.
- <sup>2</sup> U.S. Coast Guard 2014 Recreational Boating Statistics, COMDTPUB P16754.28.
- <sup>3</sup> U.S. Coast Guard, State RBS Grant Program Performance Report, Part II, 2006-2015.
- <sup>4</sup> U.S. Coast Guard Boating Accident Report Database.



# #Safety

## Influencing recreational boater behavior through social media.

by MR. PETE CHISHOLM  
*Product Safety Manager, Mercury Marine*  
*U.S. Coast Guard National Boating Safety Advisory Council*

Whether it's Facebook, Twitter, or Instagram, more and more people are using some form of social media as part of their daily lives. Besides seeing the latest events in your friends' lives, you can check the news, look up a tasty recipe for dinner, get updates on your favorite sports team, and even report crimes to the police. It seems like all generations, including baby boomers, are carrying a smart phone with the ability to link to social media. Even my 85-year-old father has a Facebook account!

How often are we invited to learn more by going to a social media site? We see these social media buttons more and more in our everyday lives, so it comes as no surprise to learn that many schools, companies, and organizations are turning to this low-cost platform to communicate.

### Join 'Em

In keeping with the trend, the U.S. Coast Guard National Boating Safety Advisory Council (NBSAC) created a strategic plan to provide guidance for the National Recreational Boating Safety Program to reduce fatalities and injuries via various objectives and strategies—one of which recommends leveraging social media.<sup>1</sup>

As the National Marine Manufacturers' Association (NMMA) already had a robust marketing outreach campaign using social media to promote boating, safety professionals in the recreational boating industry were interested in expanding this method of outreach to include safety education.

The NMMA formed a subcommittee to explore the initiative, its goal to educate boaters about safe boating practices. The social media committee members—chair John Jost (Ken Cook Company), Dave Marlow (Brunswick), Christina Paul (K&L Gates), Clarke Smith (Norman-Spencer Agency), and myself (Mercury Marine)—initially worked to determine

what messages could possibly have an actual impact on boaters' behaviors.

While it has been common to use "shock messaging" in public service announcements over the years to promote various ideas and behaviors, we decided to stay away from this approach and instead portray recreational boating in a more positive light. Committee members developed a collection of messages to be sent as tweets, using the NMMA Twitter feed, with date-specific messaging. For example, before the busy Fourth of July boating weekend, one tweet encouraged boaters to avoid collisions by practicing the "rules of the road."



Photo by Steve Heap/Shutterstock.com.

## Time-Targeted Messaging

Occasion	Theme	Takeaway
Early Spring	Drinking While Boating	BWI enforcement, passenger safety.
Early Spring	Driving Skills	Practice makes perfect, review the rules of the road.
Early Spring — northern climate	Hypothermia	Check water temperature before diving.
Memorial Day	Veterans	Freedom to boat. Message: As you get ready to start your boating season this Memorial Day weekend, let's not forget our veterans. Take a veteran out on the water this season.
Wear Your Life Jacket to Work Day	Life Jackets	Promote the comfortable and versatile options when it comes to life jackets.
National Safe Boating Week	PFDs	Play it safe! Insist that everyone wears a life jacket in and around the water!
Early Summer Fathers' Day	Prop Strikes	Promise Dad you'll never have the engine running when near someone in the water!
Independence Day	Rules of the Road	Ahoy, matey! Next week is usually the busiest on the water — know the rules to avoid accidents.
Labor Day	Stray Current	Electrifying event! Make sure your boat's AC power is safe for you and others.
Hunting Season	Onboard Accidents	Falls due to lack of stability on water, accidental gun discharge, drowning.

NMMA Twitter message themes. Courtesy of NMMA.

We also analyzed accident data from the U.S. Coast Guard and used our findings to coordinate message timing. For example, Coast Guard accident statistics showed a high percentage of paddle craft drownings early in the season, so that's when we sent out a message about cold water immersion and the importance of wearing a life jacket.

### @discoverboating, @therealnmma

The NMMA manages two Twitter feeds: @discoverboating, which is an industry national marketing campaign that targets the general boating population; and @therealnmma, which features industry policy updates and news direct from the trade association. By February 2016, the "discover boating" feed had 35,500 followers, and the policy channel had 7,407.<sup>2</sup> Starting with the 2014 boating season, we posted messages to both Twitter feeds, totaling 13 specific messages. We upped the ante during the 2015 season with a series of 42 messages.

### NMMA Social Media Metrics

Time Period	Tweets	Number of Impressions	Total Engagements
2014 Season	13	21,154	326
2015 Season	42	75,123	1,163

Graphic courtesy of NMMA.

Measurement metrics show the number of times each message was viewed (impressions) and a favorable indication if it was acknowledged or shared ("re-tweeted"). Based on a review of the messages from the past two seasons, our committee made some changes for the 2016 boating season.<sup>3</sup>

### Other Outreach

In other efforts, Brunswick's marine divisions developed a series of graphics featuring short, upbeat messages targeted for distribution ahead of three popular summer boating dates: Memorial Day weekend, the Fourth of July, and Labor Day weekend. Brunswick boat brands consist of 19 companies, including Sea Ray, Bayliner, Lund, Harris, Crestliner, Boston Whaler, and Princecraft, and the messages were posted on each brand's website and Facebook page.

Each participating Brunswick marine brand also featured a sweepstakes on its social media site to underscore the safety



During National Boating Safety Week, social media campaigns encouraged people to enter a contest for a safety kit. Graphic courtesy of Brunswick.



messaging and provide a fun way for consumers to interact. Winners received a safety kit that featured important boating safety items, including two inflatable personal flotation devices.

In addition, Mercury Marine produced several short messages on its YouTube channel featuring several different anglers, such as Gary Parsons (host of “The Next Bite”) and Bill Dance (host of “Bill Dance Outdoors”). In the videos, the fishermen discuss the importance of safety practices such as life jacket wear and the kill switch lanyard. Gary’s video has been viewed more than 1,700 times;<sup>4</sup> you can search YouTube for “Mercury Marine Boat Safety Tips to Keep Your Kids Safe” to see for yourself. Mercury currently has four safety-oriented videos on the channel, including one in Spanish that discusses the ignition kill switch.

### Looking Ahead

The NMMA subcommittee’s goal was to gauge the effectiveness of the education put forth by asking whether or not it was actually changing behavior. When a person picks up a power tool, do they think about “safety” as a result of using it? What about recreational boating? What will prompt

boaters to think for a few minutes about their own safety as well as that of their passengers?

The true measure of effectiveness is a reduction in accidents and fatalities, which is a complex metric, not easily filtered. Will reading social media messages prompt users to take action? Unfortunately, this question is unanswered for now. However, the group feels strongly that social media could be an integral part of a boating education package, and is looking forward to providing continued value-added messaging for the boating community.

#### About the author:

*Mr. Peter Chisholm has been a part of the Mercury Marine engineering department for more than 36 years. He is active in several boating safety organizations, including the Coast Guard National Boating Safety Advisory Council, the American Boat & Yacht Council Technical Board, and the NAS-BLA Engineering Reporting and Analysis Committee.*

#### Endnotes:

- <sup>1</sup> Executive summary report on Strategic Plan of the National Recreational Boating Safety Program 2012–2016.
- <sup>2</sup> Data from the National Marine Manufacturers Association.
- <sup>3</sup> Ibid.
- <sup>4</sup> Data from Mercury Marine.



# All Recreational Boating Safety is Local

Implementing safety messages at the deckplate.

by MR. STEPHEN ELLERIN  
*Director, National Recreational Boating Safety Outreach  
U.S. Coast Guard Auxiliary*

Since 9/11, the U.S. Coast Guard's risk portfolio has grown, but recent federal budget challenges have extended USCG resources. Because its active duty members cannot do it alone, the Coast Guard has increasingly tapped recreational boating organizations, such as the Coast Guard Auxiliary and the United States Power Squadrons (USPS), among others, as force multipliers.

## Engagement

Though this multiplied effort is better, it's still not enough. BoatUS estimates that, in any given year, only three percent of the boating public takes a safety class from any recreational boating safety (RBS) organization, and 85 percent of the boating public doesn't even know that most of us exist. Although many RBS organizations like to think of themselves as "the" go-to civilian RBS agency, the sad truth is that all of us are falling short of our common goal—reaching the boating public. Clearly, we can all use a force multiplier.

Fortunately, we have each other.

This has been the auxiliary's national message for several years. We need to reach out and engage our partners. Our national leaders increasingly encourage this concept. However, as we know, virtually all services are delivered at the "deckplate" (or local) level, where all too often our formal or logical partners are perceived as "the competition."

When you consider that 97 percent of the boating public passes up our offerings, clearly an "us against them" outreach paradigm won't work—especially when attempting to reach the boaters who need us more than they know. It is time to change our paradigm and find ways to engage our national partners locally.

Just as the Coast Guard looks to us, the auxiliary, to be its force multipliers in the field of recreational boating safety, so we can enlist our recreational boating safety community partners to be *our* force multipliers—to help us extend the Coast Guard's reach and effectiveness to spread our common recreational boating safety message.

## Best Practices

So how do we spread the word to our members that there are advantages to cooperating with our logical RBS partners? One approach is to consider appointing an RBS partnership liaison at every relevant level of our organizations to work with local partners—those with whom we may already have a formal relationship as well as those whose potential we have yet to tap.



Photo by docstockmedia/Shutterstock.com.

### **With Whom Should They Work?**

In your operational area, there might be one or more effective recreational boating safety organizations. If so, you probably already know who they are. The Coast Guard Auxiliary maintains a list of current national partners on the RBS Outreach Directorate website (<http://bdept.cgaux.org/wp/>), and there is a corresponding advantage to any prospective RBS partner organization: the chance to work more closely with the U.S. Coast Guard through the USCG Auxiliary.

Your recreational boating safety partnership liaison could be charged with reaching out to any of the relevant partners in each operational area. For example, in many operational areas, there are certainly organizations with which the auxiliary doesn't (yet) have such an arrangement. If your organization's mission is recreational boating safety, and your organization does not yet have a working agreement with the auxiliary at the national level, I invite you to contact me at [stephen.ellerin@cgauxnet.us](mailto:stephen.ellerin@cgauxnet.us) to discuss whether there might be mutual benefits to establishing one.

While not every discussion will lead to the conclusion that our interests, goals, and methods coincide, some certainly will. At the very least, we can develop an awareness of, and appreciation for, each other's mission and presence.

### **Are There More?**

To think symbiotically, each of us reaches a specific boating constituency with our directed message. When we share related activities with a recreational boating safety partner, we can potentially bring our message to a new (yet related) constituency. Collectively, we can reach a much broader range of boating constituencies than if we continue to each go it alone—perhaps, eventually, reaching *all* recreational boaters.

In short, if each of us designates a dedicated recreational boating safety partnership liaison in each local community, together we can extend our effectiveness to boaters in every community.

### **Ultimately, It's All Local**

Pick up the phone and call that local partner, making an offer to work together. Invite your local auxiliary or the

nearest squadron of your local USPS to perform vessel safety checks at a member function (currently, only the auxiliary and the United States Power Squadrons can field certified vessel safety examiners). A vessel safety check "blitz" at your local office might draw boaters we normally don't meet at the launch ramp or the yacht club. Similarly, an auxiliary presence at your event might draw prospective members you don't normally meet. A joint social function dedicated to disseminating recreational boating safety literature at a local charity or radio station might do the same.

Let's harness our creativity and forge (or strengthen) new partnerships in new places. The boating public is counting on us—whether they know it or not. As I've said often, when we sail together, we leave a more visible wake. If it's true that all services are delivered locally, then it's up to you ... and the boating public is counting on you.

In summary, increased cooperation and collaboration with our recreational boating safety partners at the local level can multiply our force effectiveness much more effectively than any of us can accomplish at the national level. Better local partnerships can extend our reach to those not currently touched by our current efforts.

When the majority of the recreational boating public doesn't even know that we exist, clearly we can do better—and we need each other's help to make a greater impact.

#### **About the author:**

*Mr. Stephen Ellerin is the national director for recreational boating safety outreach at the U.S. Coast Guard Auxiliary. He is certified as a recreational boating safety public education instructor, a recreational boating vessel safety examiner, and a marine facility "ambassador." He currently sits on the board of directors of the United Safe Boating Institute. Now retired, he has taught at the University of Maryland as well as the University of Connecticut. He also directs the Great American Publishing Society (GRAMPS), an electronic publisher of primarily academic and educationally related material.*

#### **For more information:**

Visit the U.S. Coast Guard Auxiliary's Recreational Boating Safety Outreach Directorate at <http://bdept.cgaux.org/wp/>.





# Coast Guard Auxiliary Service

## Maritime professionals needed.

by MR. STEVE MINUTOLO  
*Administration Branch Chief, Auxiliary Division  
U.S. Coast Guard Office of Auxiliary and Boating Safety*

Although the Coast Guard Auxiliary's reputation as the world's premier maritime volunteer organization is squarely founded on its advancement of the Coast Guard's recreational boating safety mission, it is also a vital part of the Coast Guard's tool box when it comes to promoting commercial vessel safety, as well.

For example, auxiliaries work and train closely with regional Coast Guard sector offices, and they perform about 2,300 safety examinations on commercial fishing vessels, uninspected passenger vessels, and uninspected towing vessels each year.

### The Need

As there are more than 100,000 commercial vessels in the United States, auxiliary support in this important mission becomes obvious. Many more auxiliary commercial fishing and uninspected vessel examiners are needed to meet the increasing need for these vessel safety examinations, and



An auxiliariist greets boaters as they dock for a vessel safety check. U.S. Coast Guard photo.

professional mariners and members of maritime industries are ideally suited to perform such service.

Commercial vessel safety is just one of many auxiliary program venues that can greatly benefit from the expertise that maritime professionals can bring. Since the nature of auxiliary programs requires extensive interaction with the public, familiarity with specific maritime communities like commercial fishermen or tug and passenger vessel operators is just part of the special skill set that maritime professionals can ideally apply in the auxiliary. When coupled with the targeted training the Coast Guard provides to auxiliaries, a professional mariner's familiarity with such vessels and their operations make them ideal candidates for helping promote vessel safety among commercial operators.

### Public Education

The auxiliary's public education program is another excellent venue to leverage maritime professionals' expertise. The "from the bridge" perspective maritime professionals provide to recreational boaters is just another benefit that the auxiliary can use to enrich its boating safety outreach. There is also an auxiliary instructor development program that provides comprehensive training to prepare and hone instructors' teaching skills and enables them to effectively translate their skills and expertise to students.

Sharing personal experience to make boaters safer on the water is a richly rewarding avocation that is tailor-made for maritime professionals.

If you're interested in auxiliary membership, visit the Coast Guard Auxiliary website: <http://join.cgaux.org/index.php>.

### About the author:

Mr. Steve Minutolo has served as the chief of administration for the Coast Guard Auxiliary program since 2004. He is a 1981 graduate of the Coast Guard Academy, and he earned a Master of Public Administration from the University of Rhode Island in 1991. He is also an active vessel examiner and instructor, having joined the Coast Guard Auxiliary in 2001.

# Harbor Safety Committees and the Recreational Boater

Proactive partnering enhances awareness, coordination, transparency.

by LCDR TREVOR PARRA

*Supervisor, Marine Inspection Detachment Singapore  
U.S. Coast Guard*

CDR JUSTIN JACOBS

*Staff Officer, Office of Waterways and Oceans Policy  
U.S. Coast Guard*

Historically, the U.S. Coast Guard has partnered with local community stakeholders to ensure the safety, security, mobility, and environmental protection of America's ports and waterways. Today, many of these stakeholders belong to harbor safety committees (HSCs), whose responsibilities include recommending actions to improve port and waterway security, mobility, and environmental protection. HSCs typically include various stakeholders from all levels of government, business, industry, environmental protection groups, historical preservation groups, and concerned citizens.

Harbor safety committees provide a venue for local industry leaders, government officials, and citizens to discuss common port issues like shared waterway use, navigational safety, and event coordination. Further, the Coast Guard captain of the port (COTP) may use HSCs as platforms to address shared waterway use, to announce changes to the operating parameters of a waterway, and as a sounding board for any additional issues. Coordinating and mitigating issues through one committee has proven extremely efficient and ensures that everyone has a voice.

Recently the Coast Guard has found it imperative to include recreational watercraft user groups in their HSCs to educate them on the hazards of operating in congested waters, as there has been a marked increase in the number of people taking to the water on small, self-propelled personal watercraft like kayaks, paddleboards, and kite boards. As a result of such inclusion, recreational users are able to communicate their parties' intentions and can better formulate plans to integrate their activities into the existing port operations and activities.

These waterway users are often new to these types of activities, and are also unfamiliar with the dangers present on the water. For instance, many recreational waterway users aren't aware of the dangers of deep draft vessels (such as their size, speed, turning radius, and thruster configurations), and many more do not know or follow the navigational rules of the road.

HSCs have been successful at encouraging more participation from the local recreational boating communities and organizations in their ports. To share this information and to provide valuable feedback regarding best practices and lessons learned, we interviewed three individuals who have successfully integrated recreational boating organizations into their HSCs.

## **CAPT Ryan Manning**

CAPT Ryan Manning is the former commanding officer of Marine Safety Unit Chicago. He and his crew were challenged with a dramatic increase in commercial and recreational traffic on the waterways surrounding Chicago. In 2013, they created the Chicago Harbor Safety Committee to manage the waterways and reduce risk associated with the increase in waterway users, all the while aiming to ensure maximum participation, communication, and management for the increased traffic.



**How many agencies and organizations are members of the HSC?**





Significant numbers of recreational boaters and commercial excursion vessels can make it difficult for commercial vessels to transit and maneuver. Photo courtesy of Mr. Jared Magyar, Director of Operations and Facilities for the Cleveland Cuyahoga County Port Authority (Port of Cleveland).

There are nine stakeholder sectors (or subcommittees) represented by directors appointed for a one-year term:

- bareboat charter operators;
- civic, neighborhood, and environmental advocacy organizations;
- commercial vessel, barge, and towing vessel operators;
- commercial vessel operators for 49 passengers or less;
- commercial vessel operators for 50 or more passengers;
- human-powered craft organizations (paddling and rowing);
- merchant mariners and passenger vessel, barge, and towing vessel operators;
- recreational boating organizations (powerboat and sailing);
- shoreline facility operators, business owners, developers.

**Are there currently recreational boat (powerboats as well as self-propelled watercraft such as kayaks, paddleboards, kite boards, etc.) groups or organizations that are part of the HSC?**

Yes, stakeholder sectors representing recreational boating organizations in addition to human-powered craft organizations (paddling and rowers). The bareboat charter operations sector also provides for a venue to touch the recreational boater through training or pre-rental orientation that those companies may provide.

**How long have the recreational users been part of the HSC?**

Since the inception.

**Was there a specific incident or issue that led the recreational groups to join?**

Not specifically:

- In March of 2012, we held a ports and waterways safety assessment workshop for the Port of Chicago. Attendees included waterway users, regulatory authorities, and stakeholders with an interest in the safe and efficient use of Chicago waterways from the commercial and recreational perspectives.
- Participants discussed the various types of vessels operating on the Chicago River system, challenges vessel operators faced

when navigating within the narrow confines of the Chicago River, and the risks associated with navigation through the numerous highway and railroad bridges.

- We also discussed and evaluated existing risk mitigation strategies and considered new, collaborative risk reduction efforts and risk intervention strategies. All of this paved the way to establish a Chicago Harbor Safety Committee.

**How were the recreational groups accepted?**

I've found that all of the industry sectors represented in the harbor safety committee are very welcoming to participation, as they all have a desired end state of a safe and vibrant waterway.

**Was there positive impact and change as a result of the recreational groups participating?**

I'm not certain that impact is measurable this early in the process, but I certainly believe that creating the harbor safety committee has had a very positive impact across the maritime industry here in Chicago. It has created yet another venue for our waterways management staff to share information about activities affecting all maritime transportation system users.

**What are some lessons learned and best practices that you can share with other ports and HSCs to garner participation from recreational groups and other waterway users not currently participating in the HSCs?**

This is all about education and outreach. Certainly all waterway users want nothing but to have a safe and enjoyable time on the water, but if they don't know such a venue exists, it is tough to fault them for non-participation.

**Is there anything you would do differently when looking back at your partnerships with recreational groups?**

I'm a firm believer that there isn't such a thing as too much outreach, but with limited resources, it is a matter of focusing that effort to achieve maximum results. For the Chicago River, our passenger vessel operators stress time and time again that the rental boat operators are their biggest problem. While there are representatives from some of the rental boat fleets very involved in the committee, there are just as many that have probably never been to a meeting; those are the folks that we need to continue to outreach with and educate on the benefits of their involvement.

**LCDR Mickey Dougherty**

LCDR Mickey Dougherty is the commanding officer of Marine Safety Unit Cleveland. He and his crew have been extremely successful partnering with the Cuyahoga River Safety Task Force, which was first established in 1987 as an advisory group when the captain of the port was establishing safety zones along the Cuyahoga





River. The group was formalized in 2002, and regular meetings began. Increased communication with stakeholders, port partners, and recreational waterway users has greatly enhanced awareness and transparency.

**Are there currently recreational boat (powerboats as well as self-propelled watercraft such as kayaks, paddleboards, kite boards, etc.) groups or organizations that are part of the group?**

*We have done our best to reach out to all local stakeholders, including those companies that rent kayaks and paddleboards, in addition to teaming with the Cleveland metro area parks and local yacht and boating clubs to convey safety information.*

**How long have the recreational users been part of the group?**

*Recreational boaters have always been a part of the group, even as far back as the late 1980s, when conflict existed between recreational and industrial vessels. Representatives from various recreational entities have participated in most of the major meetings and have become more common as recreational boating is increasing on the Cuyahoga River.*

**Was there a specific incident or issue that led the recreational groups to join?**

*The group as a whole was founded due to numerous accidents between recreational and commercial vessels on the Cuyahoga River. The group formed to establish a common approach for everyone to use the waterway safely. Recreational boating in Cleveland has gone through highs and lows, and currently Cleveland is in the midst of developing its waterfront to be more attractive to recreational boaters. Rowing has become a popular pastime, and new man-powered watercraft rental companies are growing. We are seeing a rise in all types of recreational boating these past few years.*

**How were the recreational groups accepted?**

*As with any new member to a group, there was a time when they received a little pushback from the established membership. While conflict did exist in the early days of the group, these days all members work under the precept that everyone has a right to the waterway.*

**Was there positive impact and change as a result of the recreational groups participating?**

*Including the recreational users helped the commercial users understand their unique concerns. We have also facilitated recreational group representatives taking ship rides up the Cuyahoga on the largest vessels we have transiting a river, for them to learn as well.*



Recreational boats operating above “no wake” speeds create unsafe conditions for all users in an extremely narrow waterway with little air draft for bridge clearance. Many recreational boaters are unaware of the dangers and pass too close and at unsafe speeds. Photo courtesy of Mr. Scott Tish.

**What are some lessons learned and best practices that you can share with other ports and HSCs/task forces to garner participation from recreational groups and other waterway users not currently participating in the group?**

*We have really focused on a holistic view of the waterway and giving weight to all stakeholder opinions and ideas. Changing law and policy can take years, so we endeavored to rely on the community to make changes that could be implemented locally that would directly increase safety for all users.*

**Did you implement any new or special programs to incorporate the recreational groups?**

*We have sought out all available means to get our safety message out to the public. The Cuyahoga River Safety Task Force gave safety presentations at the local boat shows and yacht clubs and teamed with the Cleveland Metroparks via their large local social media presence to preach our safety message. We are trying to be as creative as possible to reach all recreational users.*

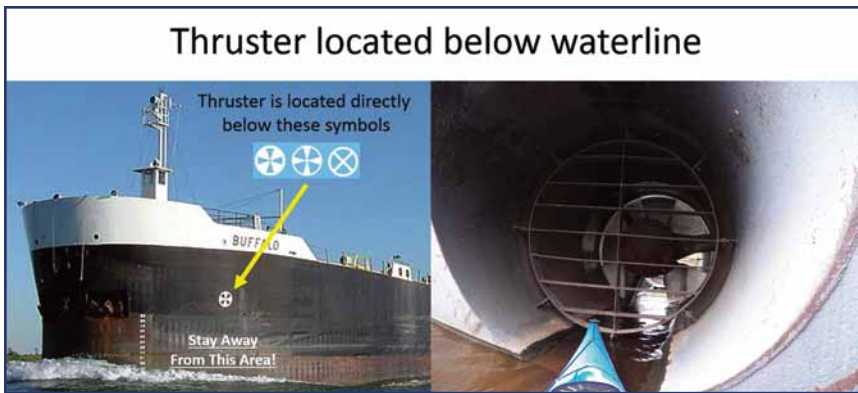
**Is there anything further you would like to add or a message you want to send to the readers?**

*These groups are only as successful as the membership. It is vital that the group represents all stakeholders and embraces all opinions. The rulemaking progress is long and arduous, and most often results after there has already been a tragedy. The goal of these task forces is to pool ideas and decrease risk.*

**Mr. Sam Insalaco**

Mr. Sam Insalaco is a member of the Cuyahoga River Safety Task Force and is one of the primary drivers behind its success. He has made great strides in garnering collaboration among waterway users and ensuring the communities in Cleveland Harbor and the Cuyahoga River are





Thruster awareness illustration showing the possible dangers and hazards. Graphic courtesy of the Lake Carriers Association.

communicating and working together to educate the public with safe boating practices. The task force recently created a recreational boating education program including pamphlets, a website, a smart phone application, videos, public outreach events, and courses to inform and educate recreational boaters on safe navigation practices and sharing the waterways.

**How many agencies and organizations are members of the group?**

Currently, we consist of approximately 75 agencies and organizations and are still growing.

**Are there currently recreational boat (powerboats as well as self-propelled watercraft such as kayaks, paddleboards, kite boards, etc.) groups or organizations that are part of the group?**

Yes, our group includes the American Canoe Association, Cleveland Metroparks, the Cleveland Rowing Foundation, Great Lakes Watersports, the Lake Erie Marine Trades Association, Nalu SUP, and the United States Power Squadrons, to name a few, in addition to the U.S. Coast Guard Auxiliary, whose members are typically comprised of recreational boaters.

**How long have the recreational users been part of the group?**

I think in earnest it began in the mid-1980s as environmental conditions improved in the "Burning River" and the popularity of the Cleveland "flats" area grew significantly as a waterfront dining and entertainment venue.

**Was there a specific incident or issue that led the recreational groups to join?**

The river is a very unique waterway (less than 140 feet wide in spots), essentially rendering the entire waterway a federal navigation channel with no aids to navigation. In a typical day we could expect to see three excursion vessels and three to five commercial ships up to 700 feet in length using thrusters or towboats to "sweep" across the river when negotiating its six major bends. Within the four-nautical-mile reach to Lake Erie, there are 11 bridge crossings

(fixed and draw) that frequently require these ships to hold position during their traverse.

During the initial 1980s flats area growth period, we had significant safety challenges (including several fatalities) from unsafe recreational boating practices and ship allisions with recreational venues/docked pleasure craft. By the late 1990s, much of this area had retracted economically and the problems somewhat subsided. Then, about 10 years ago, a second renaissance ensued through continued redevelopment of the Lake Erie waterfront, extension of the Cuyahoga River towpath trail, reinvigoration of rowing clubs, and the boom of relatively inexpensive paddle craft (kayaks and SUPs). These factors greatly increased the presence of recreational boaters in this area, along with associated organizational stakeholders.

**How were the recreational groups accepted?**

Initially, the reception was cold and somewhat confrontational; at that time there were no paddle craft to deal with, just recreational boaters docking on walls and developing safety zones. Commercial shipping had operated unhindered for years and felt recreational boaters did not belong in this area, citing concerns for collision with disoriented/uninformed boaters jeopardizing their livelihood, lack of visibility of small paddle craft, the need to maintain delivery schedules, and conflicts with organized harbor closures for recreational boating events. Recreational boating countered with concerns for the right to access all waterways, ever-increasing regulatory requirements, boater freedom to operate recreational boating enterprises near commercial areas, and loss of recreational on-water traditions.

**Was there positive impact and change as a result of the recreational groups participating?**

Absolutely. I think the breakthrough came with our mutual awareness of the benefits to addressing our concerns and accomplishing



Recreational boats impede a towing operation due to unsafe proximity. Further, the size of the vessels impedes use by smaller recreational and self-propelled vessels. Photo courtesy of Mr. Scott Tish.



our goals as a group. Commercial and recreational boating together support the economy, provide jobs, and are essential to the development, prosperity, and sustainability of the Great Lakes region. We discovered that moving together as a unified team better promotes and coordinates waterfront development initiatives, supports regional commerce and economic growth, and encourages public participation while minimizing potential overregulation.

**What are some lessons learned and best practices that you can share with other ports and HSCs/task forces to garner participation from recreational groups and other waterway users not currently participating in the group?**

- *There are various groups within the recreational boating community – reach out to all you can. Diversity is the strength of robust operating plans.*
- *Similarly, engage the businesses that support recreational boating (boat rental enterprises, marinas, yacht clubs, boating trades, etc.), as these groups have a vested interest in the long-term sustainability of recreational boating in these harbors and typically will support safety efforts enthusiastically.*
- *Large committees are not very productive in concept and plan development, but their ideas and feedback are essential. As the HSC sponsor, the USCG must take a leadership role in engaging, aligning, and holding the stakeholders responsible.*
- *Delegate the work within committee groups. Our commercial representatives developed ship data, maneuverability patterns and frequency, photos and video, and future shipping trends. The recreational representatives developed recreational traffic patterns; passing areas; and interfaces with the public, social media, and other awareness mechanisms. Finally, the agency representatives developed the safety zones, provided project oversight to compliance, and program balance (usage neutrality).*
- *Continually push stakeholders to step up within their roles. For example, in the first flats growth era, the entertainment venues took the initiative to provide dockhand training to respond in docking recreational vessels based on the schedule of inbound vessel notices. This provided a key measure of assurance to shipping companies to help alleviate the potential for collisions. We also had a bridge clock on the main rail line so boaters would know when the next lift would occur, and there were significant law enforcement patrols on the river every night that let users know there were rules to be followed and to assist, if needed.*

**Did you implement any new or special programs to incorporate the recreational groups?**

*Many recreational boating groups are not familiar with the local HSCs, nor their interest in participating. However, recreational*



Recreational boat operating in unsafe proximity to the bow thruster and crossing too close to the bow while the vessel is underway. Photo courtesy of the Lake Carriers Association.

*boaters are a close community, and we found that some government and commercial stakeholders (e.g., Cleveland Metroparks, Lake Erie Marine Trades Association, Ohio Department of Natural Resources Division of Watercraft) could reach out to key individuals within these other recreational boating groups. Social media was another great tool for getting the word out to potential stakeholders.*

**Is there anything you would do differently when looking back at your partnerships with recreational groups?**

*Find ways to ensure long-term continuity of issue awareness and the solutions to mitigate them. As the flats fell into a depression in the 1990s, only a few industries remained. The task force, while taken back by the USCG, was hampered by turnover in USCG personnel, causing the corporate memory of what had happened/ what been accomplished in the past history to be lost. This new revival shows the importance of keeping communications and committees together to maintain continuity to address and solve future problems.*

**Is there anything further you would like to add or a message you want to send to the readers?**

*The HSCs must guard against complacency and be unending, working together in stakeholder alignment and teaming, as we don't know when the next challenge may present itself. For example, this year we have a request for a six-person, human-pedaled, beer sampling excursion vessel operating within the commercial area. While the vessel is manned by a non-drinking captain and the beer volume is controlled to small amounts per cruise, it's unclear how (or if) patrons would be screened in advance of the cruise. What happens if the crew (tired or unruly) decides not to pedal and the vessel loses propulsion with a freighter passing? Or the weather is inviting and passengers decide to go for a swim? Also does the lack of a head on board present issues with the ability of the vessel*







The planned race course for this waterway event was interrupted by two deep draft vessels that moored the evening before the race.

to meet environmental regulations? This will be an interesting challenge to address.

### Looking Ahead

HSCs and local task forces have a proven track record of increasing the safety, security, efficiency, and environmental protection of our marine transportation system and its intermodal connections. As new and inexperienced users begin sharing the congested waterways, they must be aware of the hazards present and risks associated with activities on the water.

Participation in HSCs provides an opportunity to educate and deconflict issues before there is an in-extremis situation.

Proactive efforts to include recreational watercraft groups will save lives, decrease property damage, and ensure the continued efficiency of the waterway.

#### About the authors and interviewees:

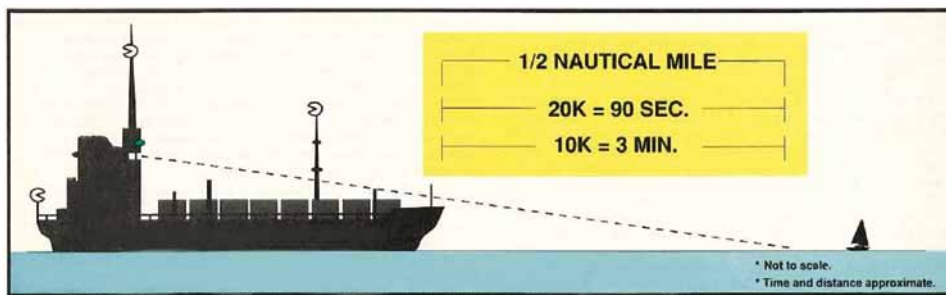
*LCDR Trevor Parra is the supervisor of Marine Inspection Detachment Singapore. Most recently he was the waterways management program manager at Coast Guard headquarters after he earned a master's degree in marine and environmental affairs from the University of Washington. He has served in the Coast Guard for 20 years in a variety of national and international assignments.*

*CDR Justin Jacobs is a graduate of Texas A&M University at Galveston and Texas Maritime Academy. He is a staff officer in the Office of Waterways and Oceans Policy. His marine safety experience includes vessel inspections, international port security, and waterways management. He holds master's degrees in homeland security from American Military University and in transportation policy, operations, and logistics from George Mason University.*

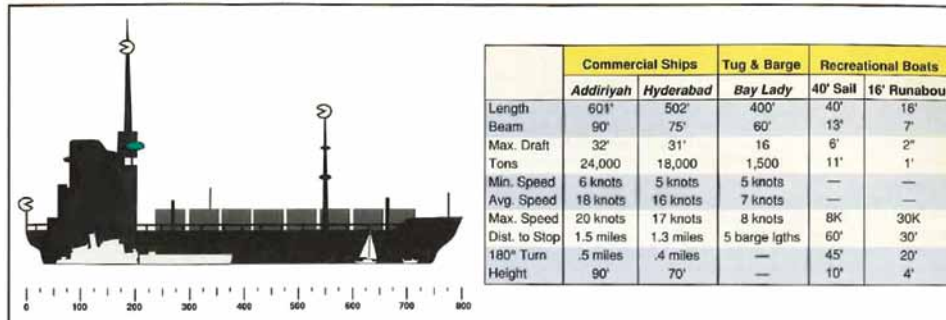
*CAPT Ryan Manning was the commanding officer of Marine Safety Unit Chicago at the time of this interview. Now the chief of the Office of Port and Facility Compliance, he has served in the Coast Guard for 22 years in a variety of prevention assignments. He is a registered professional engineer in mechanical engineering, and holds M.S. degrees in mechanical engineering and joint campaign planning and strategy.*

*LCDR Dougherty currently serves as the commanding officer at Marine Safety Unit Cleveland after tours at Marine Safety Unit Houma, Coast Guard Activities Far East, and Marine Safety Unit Morgan City.*

*Mr. Sam Insalaco is an engineering professional, 100 GRT Master, and certified boating safety instructor for the American Canoe Association and United States Power Squadrons serving as Ohio Liaison for Government and Partner Relations. He is a member of the Cuyahoga River Safety Task Force, Lake Erie Marine Trades Association, and Regional Area Maritime Security Subcommittees for the Ports of Cleveland and Toledo, Ohio.*



At a speed of 20 knots a ship travels 34 feet per second. It will take only three minutes to cover one nautical mile.



Ship size, speed, and visibility illustration highlights commercial vessel operating parameters. Courtesy of BoatUS.

# Sharing the Waterways

Raising the bar for safety through education and outreach.

by Ms. JEN WILK  
*Director, Public Affairs and Development*  
*Passenger Vessel Association*

Commercial passenger vessel operators are committed to safety. Operators who are members of the Passenger Vessel Association (PVA) will tell you that they are proud of their industry's enviable safety record. We are encouraged by the health and growth of the commercial and recreational marine industries over the past few years, and, through our work at PVA, we have been able to tackle challenges that impact vessel operations nationwide.

With such growth, our members have encountered increasing congestion and dangerous "close calls" from all manner of recreational craft. Faced with this growing concern, the Passenger Vessel Association and its members are working to elevate this issue. We have attended National Boating Safety Advisory Committee meetings, briefed U.S. Coast Guard and National Transportation Safety Board (NTSB) senior leadership, submitted comments on the Coast Guard's Boating Safety Strategic Plan, led local harbor safety committees in developing operational best practices, and reached out to local marinas and rental facilities. These outreach activities are designed to raise the bar for safety through education and identifying areas for improvement.

## Congested Waterways

Commercial vessel operators know that everyone has the right to use and enjoy the country's navigable waterways. However, along with that right, there exists a great responsibility to use those waterways safely. In particular, PVA members have become increasingly alarmed by interactions between commercial passenger vessels and some recreational craft operators.

With greater frequency, commercial vessel operators are encountering persons in craft such as stand-up paddleboards, kayaks, and rental boats

who seem unaware of the risks of operating close to larger commercial vessels, and who are also not familiar with their responsibilities to comply with the navigational rules of the road. In particular, the situation appears to be prevalent regarding rental boat customers, who don't have to receive mandatory training to operate those boats.

## Education and Outreach Efforts

PVA vessel operators joined together through PVA's Safety and Security Committee to create a plan for improving communications and waterways management with all users. PVA representatives attended meetings of the Boating Safety Advisory Committee and spoke to committee members regarding commercial mariners' concerns. Specifically, PVA urged that the next round of boating safety grants include language to address the issue of interaction between commercial passenger vessels and recreational craft (including rental craft) in congested waterways.



Vessels operating on the Chicago River. Photo by Steve Dahlman. All photos courtesy of the Passenger Vessel Association.





Recreational boaters closely travel alongside a commercial passenger vessel on the Chicago River. Photo by Larry Dostal.

In addition, the Passenger Vessel Association submitted comments on the Coast Guard's proposed Strategic Plan of the National Recreational Boating Safety Program 2017–2021. In its comments, PVA supported the plan's courses of action focusing on increased compliance with navigation rules and improved enforcement of boating under the influence laws. PVA again urged expanding the priority areas of boating safety education and outreach grant programs to include the issue of interaction between commercial passenger vessels and recreational craft, particularly in congested waterways.

PVA members have also engaged and started conversations with senior Coast Guard marine safety leadership at our semi-annual Coast Guard quality partnership meetings. These conversations continued as PVA members met with



Recreational boaters alongside a commercial passenger vessel on the Chicago River. Photo by Larry Dostal.

representatives from the Coast Guard's Office of Boating Safety and Office of Waterways Management to talk about working together on this issue of education and outreach. Further, at PVA's regional meetings in the fall of 2015, Coast Guard boating safety specialists continued the dialogue with PVA operators around the country, discussed local initiative case studies, shared best practices, and motivated further outreach.

To elevate awareness of the potential negative impact on transportation safety, the Passenger Vessel Association also briefed the National Transportation Safety Board and spoke with its chairman, Christopher Hart, to encourage the board's involvement, as well. As a result, the NTSB has undertaken a study of navigation safety in increasingly congested waterways. We look forward to the results of that study.

Additionally, Passenger Vessel Association representatives attended Canocopia, a trade show for kayak, canoe, paddleboard, and water sports enthusiasts. While there, PVA representatives talked with leaders in the recreational boating community to engage this important segment of stakeholders and learn more about their concerns.

While national engagement drives policy decisions, local engagement with waterways users often results in a better understanding of each other's operations and quicker nonregulatory solutions to identified concerns. PVA member companies have reached out to their local waterway users across the country in an effort to improve safety on the nation's waterways.

### Case Study: Chicago Waterway Users

In Chicago, vessel operators have worked to create solutions to unique operational challenges. Initially, Passenger Vessel Association member companies met with several kayak rental operators to increase awareness and educate each other on navigation and training practices. At the urging of industry groups, the local Coast Guard sponsored a port and waterway safety assessment in 2012, identifying high-traffic areas on the Chicago River.

Based on the assessment's recommendations, the Chicago Harbor Safety Committee was formed in the summer of 2013, bringing together all key users, including local commercial passenger vessel and barge operators as well as recreational boating organizations (for more info see harbor safety committee article). This allowed for open communication



among the various member segments that made up the committee to develop strategies for safe boating education and awareness.

The committee's first initiatives involved installing directional signage and identifying crossing locations for human-powered craft and rental boats.

In April 2016, the Chicago Harbor Safety Committee board of directors released its final safety recommendations and guide to rules and regulations. These recommendations are identified as agreed-upon best marine practices and include some official rules and regulations (local, state, and federal) for operating in and around the Chicago River while also incorporating non-regulatory standards of care.

### **In Sum**

PVA operators are professionals who understand the importance of safety on our busy waterways. We want to continue to develop solutions that facilitate marine transportation and commerce while enhancing safety for all users. The Passenger Vessel Association is committed to safety, and we stand ready to work with all stakeholders toward a safe and enjoyable boating environment for all.

#### ***About the author:***

*Ms. Jen Wilk is the director of public affairs and development for the Passenger Vessel Association in Alexandria, Virginia, and has been with PVA since 2007. Ms. Wilk serves on the board of directors for the Propeller Club of Washington, D.C., and is an active member of the Women's International Shipping and Trading Association. She earned her bachelor's degree in political science as well as her MBA from American University.*

### **For more information:**

#### **The Passenger Vessel Association**

The Passenger Vessel Association is the national association representing the interests of owners and operators of dinner cruise vessels, sightseeing and excursion vessels, car and passenger ferries, gaming vessels, private charter boats, whale-watching and eco-tour vessels, day sailors and windjammer sailing vessels, overnight cruise ships, and amphibious vessels. PVA members operate U.S. Coast Guard-certificated, Canadian Coast Guard-certificated, or state-inspected vessels. The passenger vessel industry carries more than 200 million passengers each year.

Visit the website at:  
[www.passengervessel.com](http://www.passengervessel.com).



# Developing a Safety Culture

The people and the process.

by MR. K. BRIAN DORVAL  
*President*  
*Think First Serve*

Since 1971, when the U.S. Congress authorized the National Recreational Boating Safety Program, the estimated number of recreational vessels has more than doubled while the number of boating casualties more than halved.<sup>1</sup> While this trend is impressive, accidents continue to happen. Property is damaged, people injured, and lives are lost. More can be done.

If we are going to make a significant impact, everyone involved in recreational boating—from those who build boats, to those who train people on how to use boats, to the boat operators and passengers—will need to be part of the solution.

## The New Recreational Boating Culture

The existing culture of recreational boating is one where engaging in safe recreational practices is essentially optional; this needs to transition to a culture where safe recreational practices happen consistently. This new culture of safety is one where everyone associated with recreational boating takes proactive initiative to ensure safe and enjoyable experiences on the water for all.

Safety must become a self-perpetuating attitude in which recreational boaters fundamentally behave responsibly and encourage others to share in that mindset. Operators and passengers alike must understand the relationship between being safe and enjoying themselves on the water, and boaters young and old, new to boating, or new to a particular kind of boat must pursue opportunities to engage in appropriate training and preparation because they want to—not because they have to.

A culture of safety is also one where recreational boating instructors advocate and demonstrate safe practices, building those practices into their instruction. Businesses and organizations that enable recreational boating should model and reinforce the importance of safety in all they do. Similarly, law enforcement officials must continue to model and

encourage a proactive safety mindset as they enforce appropriate behavior on our nation's waterways.

## Shifting Culture

Shifting culture is a journey, not an event. Culture is made up of values, beliefs, history, and traditions that reflect, in this case, the deeper foundations of the recreational boating world. Ultimately, culture is about what those steeped within the community believe about recreational boating. Beliefs take time to form, as they are the result of what people have learned from their multiple experiences with recreational boating. Since the culture is long-standing and deeply rooted, it takes time to change.

To start the process of culture change, we need first to change the patterns of experience that characterize the world of recreational boating. We need to put new patterns into place, and then, the longer and more consistently they are in operation, the more people will learn from them—and the greater these new patterns can impact their mindset. These patterns must become the norm and “expected” before people's beliefs about safety will change.

There are several ways to establish patterns to promote recreational boating safety.

**First, safety practices must be pervasive.** Safety needs to be present in every interaction people have with recreational boating. Every touch point needs to teach boaters something about the value of safety, whether explicitly or implicitly. Valuing safety should be modeled when someone purchases a boat, learns how to operate the boat, buys boating equipment, and goes out on the water as well as in conversation with others, in TV commercials, and in magazine articles.

**Second, safety practices must be consistent over time.** For example, one interaction may indicate it is, indeed, important to wear a life jacket, while another may give the impression it's unnecessary. What should people believe? If people experience consistent and complementary messages over

**Figure 1.** Injury, accident, and fatality numbers over the past few years have remained fairly steady. U.S. Coast Guard chart.

DEATHS, INJURIES, & ACCIDENTS BY YEAR, 1997–2014			
Year	Deaths	Injuries	Accidents
1997	821	4555	8047
1998	815	4612	8061
1999	734	4315	7931
2000	701	4355	7740
2001*	681	4274	6419
2002	750	4062	5705
2003	703	3888	5438
2004	676	3363	4904
2005	697	3451	4969
2006	710	3474	4967
2007	685	3673	5191
2008	709	3331	4789
2009	736	3358	4730
2010	672	3153	4604
2011	758	3081	4588
2012	651	3000	4515
2013	560	2620	4062
2014	610	2678	4064

\*On July 2, 2001, the federal threshold of property damage for reports on accidents involving recreational vessels changed from \$500 to \$2000.

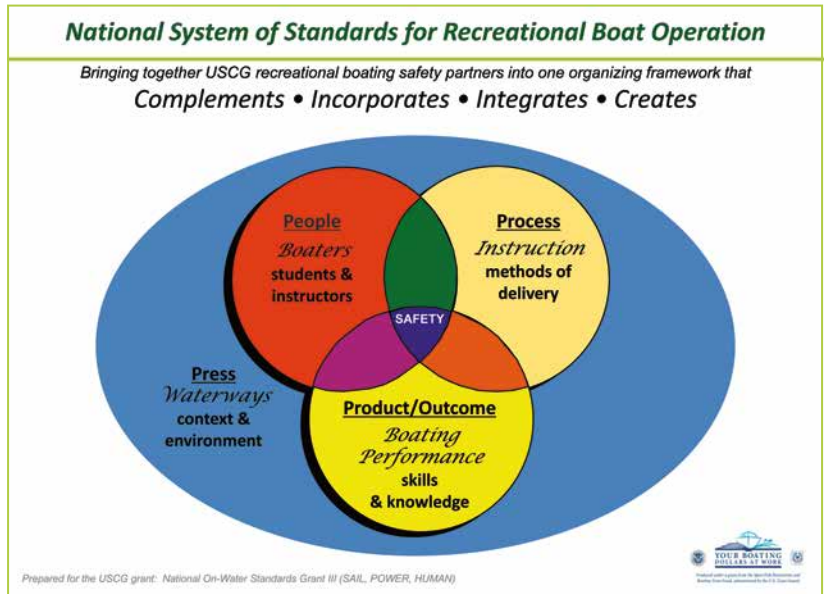
time, they are more likely to trust and embrace what they hear and see.

**Third, messages around safety need to stimulate a positive and proactive desire to engage in safe boating behavior.** Messaging needs to promote attitudes and feelings where boaters want to engage in safe boating as a means to enjoyable recreation. Choosing something desirable is more motivating than choosing to avoid something undesirable. Messages should help people move toward being safe rather than away from being unsafe.

The more frequently boaters experience strong, clear, consistent messaging about safety, the more these patterns will shape boaters’ mindsets and attitudes, and the behaviors they engage in as a result. When safety as a way to enjoyment becomes normal and expected, it means the culture is shifting.

Although the U.S. Coast Guard has a long history of promoting safe vessel operation, no single recreational boating entity is going to be able to establish this new culture on its own. It will take a collaborative, cooperative, comprehensive effort on the part of all recreational boating safety influencers to establish and reinforce patterns that teach a new mindset and shape the culture. Working together, boating

**Figure 2:** The U.S. Coast Guard’s national system of standards for recreational boat operation. All graphics courtesy of the National On-Water Standards Project.



**Figure 3:** Categories of standards organized by the national system of standards.

People Standards (students/instructors)	Process Standards (methods of delivery)	Press Standards (context/environment)	Product Standards (outcomes: knowledge/skill)
<ul style="list-style-type: none"> <li>Students (incoming level of skills and experience)</li> <li>Instructors (qualifications, experiences, credentials)</li> <li>Master trainers (qualifications, experiences, credentials)</li> <li>Evaluation &amp; development</li> </ul>	<ul style="list-style-type: none"> <li>Curriculum strategy and design</li> <li>Course design (goals &amp; objectives)</li> <li>Instructional design and activities</li> <li>Evaluation &amp; development</li> </ul>	<ul style="list-style-type: none"> <li>Location</li> <li>Conditions (weather, waves, etc.)</li> <li>Equipment and resources</li> <li>Evaluation &amp; development</li> </ul>	<ul style="list-style-type: none"> <li>Knowledge and understanding</li> <li>Skills able to be performed</li> <li>Behaviors to be demonstrated</li> <li>Evaluation &amp; development</li> </ul>

**Safety Standards**

safety partners across the community have the ability to impact boaters’ perceptions from every direction and from every perspective of their interaction with boating.

Channeling that power and influence at a national level to create a fundamental shift in culture is the reason the Coast Guard initiated the National System of Standards for Recreational Boat Operation.

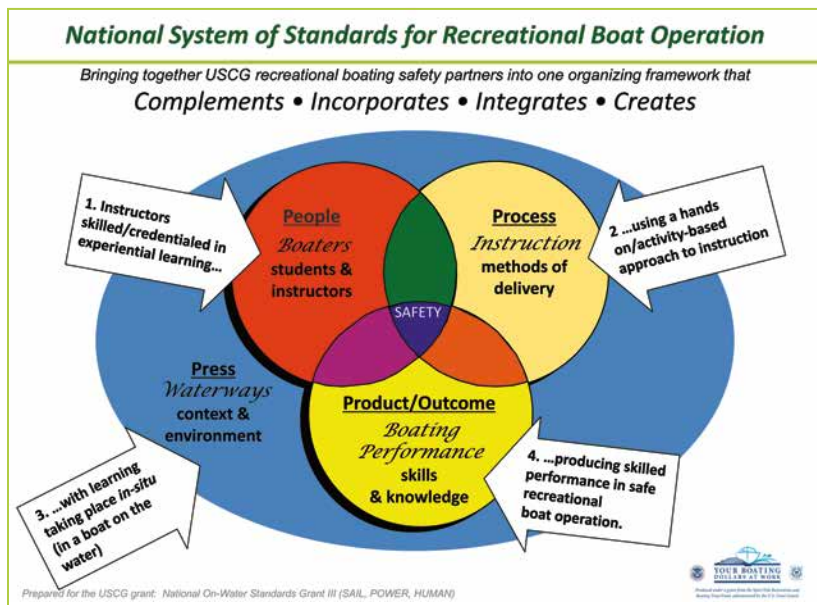
**The National System of Standards for Recreational Boat Operation**

Many people and organizations have been working independently on a wide range of activities, all designed to increase boating safety. However, stimulating a pervasive culture shift that impacts millions of boaters will require these independent pockets of activity to operate with a new level of coordinated focus, more tightly aligned toward common objectives.





Figure 4: Aligning recreational boating standards.



The National System of Standards for Recreational Boat Operation is a high-level framework that identifies the different parts of the system associated with boaters learning about recreational boating. The framework shows how the parts of the learning system are connected and interrelated. As a result, the system helps organize the information, people, and activities associated with learning recreational boating and forming the culture.

### Organizing Information

At the heart of the information are standards, which are documents used to help ensure there is consistency, alignment, or standardization across the different people and methods associated with preparing people to engage in recreational boat operation.<sup>2</sup> Thus, standards help set the foundation for the beliefs, attitudes, and behaviors people experience during recreational boating.

The framework organizes the standards for all the parts of the system associated with what and how people learn. In particular:

- **The people involved in learning recreational boat operation:** These standards focus on instructor qualifications, experiences, and credentials, as well as the skill level and experiences of incoming students. They may also include qualifications or credentials for administrators managing organizations or programs in recreational boating education and training.
- **The process used to facilitate learning how to operate a recreational boat:** These standards focus on methods of teaching and training used to deliver instructional programming. They may pertain to curriculum strategy, course design, and instructional planning.

- **The press in which learning recreational boat operation takes place:** These are standards associated with the context or environment in which learning takes place. The word “press” more accurately reflects the pressure or influence that the learning environment has on the nature and quality of learning that takes place. Different environments (for example, in a classroom, on the water, or at home) create different kinds of press(ure). Standards in this area set appropriate conditions for facilitating optimal learning.
- **The product or outcome of the learning in recreational boat operation:** Standards in this part of the system identify the targeted or desired results of the instructional programming learning method. They may include knowledge and understanding acquired as well as skills and behaviors demonstrated. They may focus on feelings experienced or beliefs formed as a result of engaging in a learning process. Standards may also focus on the level of outcome (beginner, intermediate, or advanced).

There are two important points of clarification:

- First, the standards are not courses. They do not provide specific course outlines, curriculum, or instructional designs. Instead, they are source documents that education providers can use in preparing high-quality learning opportunities in recreational boat operation.
- Second, the system does not prescribe any order or sequence for using the standards organized within it, nor does it identify what standards need to be used. Rather, the system organizes standards into a menu that course providers can choose from to help design high-quality approaches to learning.

### Organizing People and Activities

Ultimately, the people involved in recreational boating will create the new culture of safety. The system of standards enables everyone involved to:

- understand how different initiatives, projects, or activities complement each other;
- incorporate others’ work to stimulate synergy and productively use diverse expertise;
- integrate existing work to create longer-term impact;
- create new collaborative opportunities to develop integrated solutions to shift the culture.

The national system increases each pocket of activity’s potential for impact by organizing the many projects and initiatives underway into one coordinated effort to develop

a culture of safety. We can use it to identify and fill gaps in our efforts and address any potential project redundancies to streamline our work. We can also better coordinate who does what to ensure the best and most effective use of limited resources, and design how best to integrate new people and organizations in synergistic ways to get the greatest leverage from the increased capacity they provide.

### Using a System of Standards

All parts of a system interact with each other, and maximizing any system requires attention to all of them. Getting the most from the national system requires a simultaneous focus on all four parts of the system—people, process, press, product—while avoiding compartmentalizing or over- or underemphasizing any one part. It also requires the understanding that working on any one part will likely have an impact (intended or unintended) on the other parts of the system.

One example of this is the National On-Water Standards Project.<sup>3</sup> Initiated in 2011 as part of the U.S. Coast Guard's grant program, the National On-Water Standards Project was designed to develop a national consensus of subject matter experts on the fundamental skills that entry-level recreational boat operators should be able to demonstrate as a safe beginner in sail-, power-, or human-propelled recreational boat operation. The project was a direct result of the USCG's 2012 strategic plan—specifically to increase the overall quality and availability of on-water, skills-based training in recreational boat operation.

The On-Water Standards Project focuses on one part of the national system—the product. Regardless of how boat operators learned their skills (through formal recreational boating training or informal experience), the standards identify the skills they can actually demonstrate in a boat on the water to be considered safe.

Additionally, building standards within the product part of the system enables us to build more effective standards in other parts of the system. That is to say, standards that clearly define instructional product (such as demonstrable skills and knowledge) will impact standards associated with:

- the process used to develop those skills,
- the qualities of the people involved in delivering instruction, and
- the press in which skills development takes place.

### One Recreational Boating Constituency

The recreational boating constituency is made up of a large and diverse body of people, groups, and organizations who

share their involvement in—and passion for—recreational boating. This includes members of the general public who engage in recreational boating, people and organizations that actively support or enable recreational boating, and those who reinforce its occurrence. Every member of the constituency has the potential to influence the mindset, beliefs, and ultimately the behaviors that people take on during recreational boating activities.

Therefore, one of the most important implications with regard to establishing the National System of Standards is the opportunity to change the tenor of collaboration across the recreational boating community. Using one single system facilitates a mindset where we are all part of something greater than ourselves—a broad-based and inclusive recreational boating constituency in which all of us work together, pull in the same direction, and have more power and impact than any one of us could ever have working on our own.

Culture change will come when all members are pulling in the same direction—when safety becomes pervasive and permeates every touch point in recreational boating. People model it. Instructors train it. Organizations reflect it. It is this collective power from a constituency of thousands of people and organizations making daily decisions that will change the mindsets and behaviors of millions of boaters across the country.

### Change the Culture, Grow Recreational Boating

With greater and more frequent experiences of safety linked to enjoyment, more and more people will stay involved in recreational boating longer, creating more demand for related products and services. As a result, the constituency as well as the culture shift it stimulates will be the springboard to grow the entire recreational marine industry. This means there will be more boaters engaging in safe and enjoyable recreational boating experiences long-term, reducing injuries and accidents, and most importantly, saving lives on our nation's waterways.

#### About the author:

*Mr. K. Brian Dorval is the national on-water standards facilitator for the National On-Water Standards Project. He implements the process to create national subject matter expert consensus regarding the skills associated with safe, entry-level recreational power-, sail-, and human-propelled recreational boat operation.*

#### Endnotes:

- <sup>1</sup> National Recreational Boating Safety 2017-2021 Strategic Plan, found at [www.uscgboating.org/content/strategic-plan.php](http://www.uscgboating.org/content/strategic-plan.php).
- <sup>2</sup> For more information about standards, visit the American National Standards Institute website at [www.ansi.org](http://www.ansi.org).
- <sup>3</sup> For more information about the On-Water Standards Project, visit [www.onwaterstandards.org](http://www.onwaterstandards.org).



# Making Boating Safer

Grass-roots efforts make a difference.

by Ms. RACHEL JOHNSON, CAE  
*Executive Director*  
*National Safe Boating Council*

Using the adjective “grass-roots” has become quite the trend in recent years, and rightfully so. Things like grass-roots marketing and grass-roots political campaigns have made an impact in today’s society, and the recreational boating safety community is no exception to this trend.

The National Safe Boating Council (NSBC), a national non-profit organization, is just one of many nonprofits utilizing key methods and techniques in implementing grass-roots efforts nationwide—and it’s seeing a real behavior change in recreational boaters because of it.

## **A Simple Mission**

The NSBC will celebrate its 60<sup>th</sup> anniversary in 2018. In its history, it has often catered its mission—safer boating through education, outreach, and training—to address recreational boaters on a localized level. Its training program, designed to educate professionals so that they, in turn, can educate the recreational boating public in classrooms as well as on the water, is designed to address its students’ needs.

While the NSBC’s training program curriculum is standard across the board, it’s important to also acknowledge that each boating community has unique needs. A course taught in Maryland (inflatable life jacket—check!) may have subtle differences from how a course is taught in Alaska (everyone have their float coats ready to go?)

The NSBC’s outreach programs, designed to reach the recreational boater, also effectively address that grass-roots efforts have a high success rate in delivering key messaging to boaters that will ultimately change their behavior. In its years working closely with the U.S. Coast Guard, the NSBC has developed programs and initiatives intended to offer a national approach to deliver messaging as well as elements that address the need for grass-roots efforts.

## **A Partnership and Its Impact**

In support of the National Recreational Boating Safety Strategic Plan, the U.S. Coast Guard has turned to its implementing partners to develop and deliver programs through

grant support from the Sports Fish Restoration and Boating Trust Fund. The Coast Guard administers this trust fund and determines which programs and initiatives will have a direct impact on recreational boaters, potentially reducing boating casualties nationwide.

The NSBC, a proud implementing partner of the strategic plan, has received multiple grants addressing important topics and trends currently affecting recreational boaters, such as:

- enhancing its training programs;
- offering training to underrepresented communities throughout the nation;
- educating recreational boaters on how environmental stressors like sun and wind can affect their day on the water and be amplified by boating under the influence; and
- introducing and educating recreational boaters about the importance of required and key boating safety equipment like life jackets, emergency position indicating radio beacons, and personal locator beacons.

Together, the U.S. Coast Guard and the NSBC, along with supporting collaborators like other nonprofit organizations, retailers, manufacturers, and grass-roots volunteers, are addressing recreational boaters’ need to know more. According to U.S. Coast Guard 2014 Recreational Boating Accident Statistics, only 12 percent of deaths occurred on vessels where the operator had received a nationally approved boating safety education certificate.<sup>1</sup>

What does this have to do with grass-roots efforts? To put it simply—everything.

## **Working Together with a Common Goal**

The partnership between the U.S. Coast Guard and the National Safe Boating Council, coupled with coordination efforts with others nationwide, allows the NSBC to develop key programs and initiatives to meet recreational boaters’ growing demands and successfully reach them with the



right messaging. Collaboration is essential for any grass-roots effort to work.

For example, the NSBC's "point of sale" program brought together the Marine Retailers Association of the Americas and the Association of Marina Industries with the goal of educating sales professionals on the contents of a U.S. Coast Guard safety kit as well as how they can help recreational boaters make the right decisions about buying safety equipment. These professionals, in turn, can now educate the boaters coming into their store or marina with consistent, clear messaging.

Grass-roots efforts can take on many forms. While a sales associate or marina owner has the opportunity to reach recreational boaters directly at the point of sale, there are still other ways that boaters are hearing and receiving boating safety messaging, and a need for that consistent messaging is necessary. The NSBC has identified that the news media is another key part of the puzzle that fits into reaching recreational boaters through grass-roots efforts.

Unfortunately, approximately 600 lives are lost each year in recreational boating accidents, and about 3,000 injuries result from accidents nationwide.<sup>2</sup> When these accidents are reported, they are mostly reported through local news. The National Safe Boating Council, working with the National Association of State Boating Law Administrators, has begun developing a boating safety media toolbox, available online, to address best practices and approaches for local media to report on boating accidents so that they may make the most of the opportunity to introduce boating safety tips at the same time.

Every day, news media around the nation report on recreational boating stories, but sometimes the articles and headlines only tell half the story. If there's a story about drowning, there is often a missed opportunity to talk about the importance of wearing a life jacket at all times while boating. If there's a story about carbon monoxide poisoning, not all media considers offering practical solutions to prevent this from happening to other boaters, likely because they don't have the tools readily available to know the latest statistic or what questions they should be asking to complete the story by sharing an awareness message with their audience.

The media toolbox will introduce methods and strategies to assist entities in carrying out media and other awareness campaigns related to pertinent boating safety messaging. Once more, when news media pick up on these methods outlined in the media toolbox, one thing consistently begins to happen: Regardless of the details of the boating accident, the safety messaging included when reaching out to



The U.S. Coast Guard Boating Safety Division participates in the inaugural "Ready, Set, Wear It!" Life Jacket World Record Day, 2010, in which participants in cities around the globe first gathered to set a world record for the most life jackets worn and inflatable life jackets inflated. This event last set a world record in 2015 with 10,917 participants from 11 countries. U.S. Coast Guard photo by Petty Officer Adam Eggers.

recreational boaters will be consistent no matter where the message is being delivered nationwide.

### **Wear It! Case Studies**

When looking at the history of recreational boating safety grass-roots efforts in the United States, one campaign stands out: Wear It! Since 1958, the National Safe Boating Council has been the leading organization to spearhead National Safe Boating Week, working with partners and local volunteers to host events, promote safe boating messaging, and educate boaters. Over the past decade, to educate recreational boaters about the importance of choosing to wear a life jacket at all times while boating, the NSBC has promoted one message: Wear It!

Drowning statistics haven't seen a substantial change in recent years. In 2014, of drowning victims where life jacket usage was reported, 84 percent were not wearing a life jacket.<sup>3</sup> The National Safe Boating Council, keeping this statistic in mind, has developed a year-round concentrated effort to target specific boater market segments. It is promoted on a national and grass-roots level and addresses key recreational boating safety topics—specifically, life jacket wear. The Wear It! life jacket campaign targets adults and families and utilizes several methods for message delivery, including national media outreach; partnerships; collaboration efforts with state agencies, organizations, and local volunteers; new media outreach through social media; and grass-roots campaigns.

**Wear It California!:** The NSBC increased its grass-roots campaign efforts in 2007 by developing a targeted campaign in California. The "Wear It California!" initiative was a pilot program designed to utilize targeted marketing efforts to increase life jacket wear rates among recreational boaters in





The “Wear It California!” grass-roots campaign resulted in increased life jacket wear in the targeted community. Photo courtesy of the National Safe Boating Council.

the Sacramento/San Joaquin area. Driven by the U.S. Coast Guard, the initiative brought together key partners to collaborate on the effort: the California Department of Boating and Waterways, BoatUS, and the NSBC.

The region selected—one of the nation’s hottest recreational boating destinations—was chosen for this pilot campaign, in part, due to its fairly significant contribution to the state’s overall boating accident statistics. A total of 10 percent of all California boating accidents occurred in the Sacramento/San Joaquin delta alone at the start of the targeted campaign.<sup>4</sup>

After implementing multiple campaign components (including a local press conference, multiple events with a wrapped “Wear It California!” boat, inflatable life jacket giveaways, and regional advertising), the results were analyzed at the end of the recreational boating season to see whether the targeted grass-roots campaign had an impact on life jacket wear.

Between 2007 and 2008, with the increased grass-roots efforts, the California delta region did see encouraging results related to increased life jacket wear:

- In the outskirts of the delta, for adults there was a slight upward trend in overall wear rates (no personal watercraft riders and no waterskiers): from 4.7 percent in 2006 to 5.3 percent in 2007 and 7.6 percent in 2008).
- In the central delta region, for adults there were significant changes in overall wear rates: from 2006 to 2007 wear rates increased from 8.6 to 12.1 percent, but then dropped in 2008 to 9.6 percent, which was still slightly higher than the baseline data.
- These overall general results were consistent with the intensity and geographic locations for the campaign which were concentrated in the central delta region, and were more intense in 2007 than they were in 2008.<sup>5</sup>

**Tennessee and Michigan:** The NSBC also partnered with the Tennessee Wildlife Resources agency in 2008 and added a partnership with the Michigan Department of Natural Resources in 2009 to do similar grass-roots campaigns in targeted locations in each state.

While neither state showed increases in overall wear rates for adults, both states demonstrated increases for teens and youth under 13. In addition, Michigan saw its wear rate on 16–21 foot boats go from 2.7 to 5.5 percent in 2009. Tennessee saw an increase in wear rates among those fishing or intending to fish, which was similar to observations in the delta region of California.<sup>6</sup>

The NSBC, taking a cue from the success of the three targeted state grass-roots efforts, implemented a “grass-roots support” campaign element in 2012. The Wear It! Grass-Roots Support Initiative was intended to help state agencies, organizations, and other groups promote the campaign in their communities.

Since 2012, the NSBC has awarded more than \$80,000 in grass-roots support, funding 10 to 15 groups annually. Each recipient is asked to provide the NSBC with a midterm and final report to document success in implementing their grass-roots campaigns. Overall, the results support the premise that the Wear It! message is making a difference in their communities. Some have even documented increased life jacket wear rates in their areas as a result of their outreach efforts.

### Making a Difference

The boating safety community has collectively celebrated an unprecedented achievement in recreational boating: a 36-month record low in recorded fatalities since the U.S. Coast Guard started collecting boating accident data. Recreational boating accidents note a record low year of 2013, and the series of years from 2012 to 2014 collectively set record lows for accidents, deaths, and injuries.<sup>7</sup>

Since 2013, the NSBC implemented a new method with which to measure the effectiveness of the Wear It! campaign, created specifically to determine and quantify the impact of the campaign on life jacket wear, attitudes, and behaviors on safety measures. Leveraging a team of volunteers at rivers, lakes, bays, and other bodies of water, we collected on-site surveys throughout the summer. Based on their level of Wear It! campaign activity, the locations were classified as areas of “no,” “medium,” or “high” activity. The “no activity” designation includes locations that have no or low levels of campaign activity. All surveys were self-administered (completed by boaters, not interviewers).

The most recent study, conducted in 2015, provided the following results: The Wear It! campaign continued to have a positive impact on boaters’ behavior regarding safety. The research was consistent with the 2013 research results, with



campaign/logo awareness levels increasing with the level of campaign activity. In 2015, almost all of the “no campaign” activity locations were first-time survey sites (i.e., no prior surveying influence as in 2014).

Those aware of the campaign were significantly more likely to wear life jackets “always or most of the time” compared to those unaware of the campaign. Participants from high campaign activity locations were more likely to wear their life jackets “always or most of the time” versus those from no campaign activity locations (significant at a 90 percent confidence level).

The Wear It! campaign continued to have a positive impact on boaters’ behaviors and attitudes regarding safety. Significantly more boaters who were aware of the campaign agreed with the safety statements versus those who were unaware. Boaters who were aware of the campaign were significantly more likely to wear a life jacket because they “feel safest when wearing a life jacket/it’s a safe practice” and “have heard of situations where a life jacket has saved a life.”

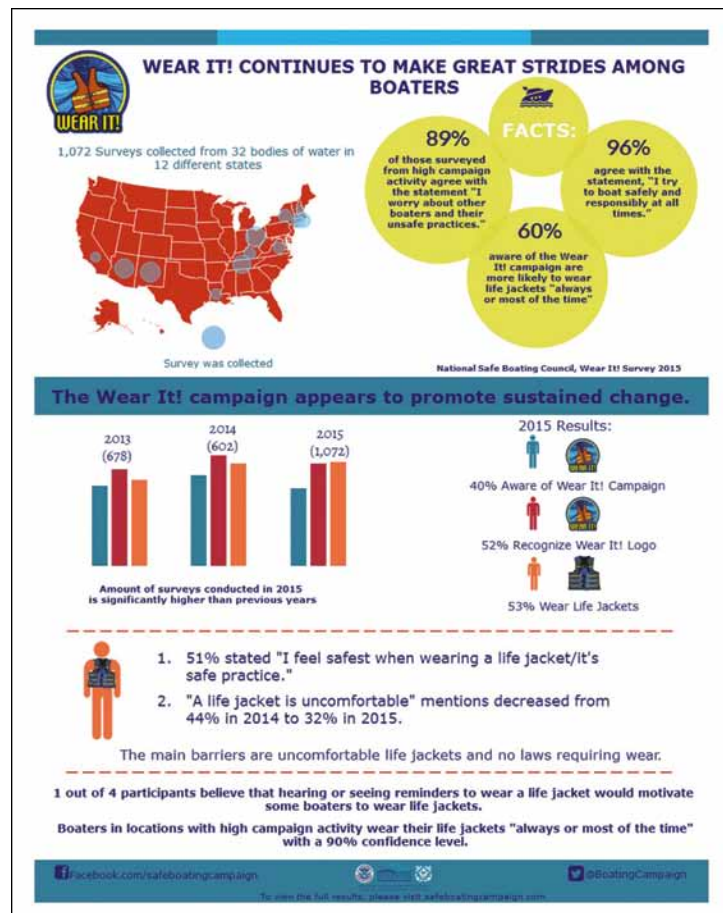
The Wear It! campaign appeared to promote sustained change. Gains recognized from 2013 to 2014 have remained strong (e.g., most participants aware of the campaign “believe the Wear It! pledge is an effective way to increase use of life jackets”). Boaters at high campaign activity locations were significantly more likely than other boaters to recall elements of the Wear It! campaign.<sup>8</sup>

### Why Are Grass-roots Efforts Important?

There’s no doubt that a comprehensive outreach and education initiative must include multiple components; one cannot dismiss the strength behind social media campaigns and the social media movement in our nation. What better way to deliver a message than through free social media outlets? With a compelling message, a Facebook post or a tweet can have a great impact on reaching your key demographic as well as outliers who may also become influencers.

In addition, the true value of a grass-roots effort can be measured not only by the success of delivering the message itself, but also by the impact it has within the community. Whatever the measure of success may be, whether it’s increased life jacket wear or confirmation that a message has a lasting effect on a community, that outreach is achieved through grass-roots efforts.

The National Safe Boating Council, through its partnership with the U.S. Coast Guard and other boating safety partners and volunteers nationwide, has demonstrated how successful a grass-roots effort can be, and how effective this approach is. Keep in mind, this approach can be translated



The “Wear It!” campaign continues to have a positive impact on boaters’ behaviors and attitudes regarding safety.

within and outside the recreational boating safety community. The same methodology and techniques may be implemented to achieve great success to reach a targeted audience, and they can ultimately help achieve great success of an identified goal.

### About the author:

Ms. Rachel Johnson, CAE, is the executive director of the National Safe Boating Council. She was recently appointed as a member of the National Boating Safety Advisory Council, has done extensive committee work with the National Association of State Boating Law Administrators as a subcommittee chair and committee member, and is the chair of the Life Jacket Wear Rate Tiger Team. She graduated magna cum laude with a B.A. in communication studies and a B.S. in recreation and parks management from Frostburg State University.

### Endnotes:

1. U.S. Coast Guard 2014 Recreational Boating Statistics, found at [www.uscgboating.org/library/accident-statistics/Recreational-Boating-Statistics-2014.pdf](http://www.uscgboating.org/library/accident-statistics/Recreational-Boating-Statistics-2014.pdf).
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# It Only Works If You Use It

## Promoting engine cutoff switch use.

by MR. ANTHONY VIGGIANO  
*Autotether, LLC*

It was 1989, and I had just purchased a 22-foot, center console Hydrasport with a 90-horsepower outboard. While preparing to get underway on her maiden voyage with my children (then 10 and 12 years old) and wife, trying to be a responsible captain while also setting a good example for my children, I actually wore the engine cutoff switch (ECS) lanyard.

Just as I was leaving the marina, I accidentally twisted the wrong way and inadvertently shut off the engine. After looking around to ensure that no one noticed, I removed the engine cutoff switch lanyard, never again giving consideration to wearing it.

Boating education was just becoming mandatory in Connecticut and was more focused on the rules of the road as opposed to other hazardous conditions associated with boating. You just did your best to stay safe, and many people paid a very high price for what they didn't know.

### **Why Are Engine Cutoff Switches Important?**

In the event of a man overboard, the boat continues in a circle without the operator, in many cases resulting in blunt trauma and propeller injury. This is often referred to as the "circle of death."

According to 2014 USCG boating statistics, there were 4,064 accidents resulting in 2,678 casualties, of which 610 were fatal. Of these 4,064 accidents, 51 percent were in an open motorboat. Statistics also show that collisions, swamping, flooding, and grounding represented 54 percent of all the accidents whereby the vessel does not sink. For these events, it is important that the motor is shut down and the vessel is rendered immobile, preventing further injury.

### **Why Are Boaters Reluctant?**

When I worked boat shows with my company, we would poll the people who came up to our booth on their current use of the ECS lanyard. Of the more than 3,000 people polled, 98 percent said that they don't wear the lanyard, or that they only may have less than 2 or 3 times when they were alone. Some even asked what it was.

When asked if they believed that the lanyard, by shutting off the boat's motor in a man overboard situation, could potentially save their life, they agreed and acknowledged the real possibility of this happening. When asked why they didn't wear the lanyard, it came down to a very simple answer: It was inconvenient. This seems to be a common theme for not using safety equipment.

Other than our Autotether polls, I am unaware of any statistics supporting how the use of an ECS could have saved someone from injury or death. In 2015, PropellerSafety.com issued a report noting data from the U.S. Coast Guard Boating Accident Report Database (BARD). Mr. Gary Polson attempted to estimate the ECS wear rate during these accidents. The final estimate was adjusted to 3 percent—close to the Autotether poll.<sup>1</sup>

In the Autotether poll, 22 people communicated to us that they fell overboard and that having the motor shut off prevented them from further injury. In one case, the operator had just refueled his boat and started the motor. He jumped off to untie the vessel, and while he was on the dock, his 10-year-old daughter reached over and opened the throttle. Fortunately, he was able to shut off the boat remotely with his Autotether fob.

### **Getting the Message Out**

Safety awareness is spreading rapidly through boating education (which is mandatory in many states) combined with the U.S. Coast Guard's long-term strategic plan stressing safety through awareness. The internet and social media also give us the ability to take our message directly to the boaters—and it's working!

There are several demographic changes driving this awareness and resultant improvement in safety. For one: The average age of the U.S. population has been trending upward along with the average age of a U.S. boat owner. Female participation in boating has also increased. These two segments could have an impact on safety trends, as women and older people in general tend to be more safety conscious.

# Time for Another Boating Law?

The March 2011 Recreational Boating and Fishing Foundation report stated that 23 percent of all boaters in 2011 were women, and the trend was growing as women's income grew, allowing for more boat ownership.

According to the Insurance Institute for Highway Safety, the safest drivers were between the ages of 35 to 69, with a downward trend in fatal highway accidents from 1974 to 2014, going from 20.6 percent to 11.4 percent of all accidents as the median shift in age moved toward 69.<sup>2</sup>

## Technology

Newer technology is working to address the issue of inconvenience with more ergonomic and convenient ECS lanyards. Today there are several manufacturers for wireless lanyards and engine cutoff switches. You simply have a small fob that attaches to your life jacket, and if you fall overboard, it shuts off the motor. A system can have multiple fobs for passengers and pets that will sound an alarm if they go overboard, and some have remote shutoff buttons on the fobs for emergencies. The cost for these systems range from \$150 to \$600. Installation, depending on the manufacturer, can be completed in minutes and requires no tools or wiring.

The next generation will incorporate location services on the fob, where if you fall overboard or the boat gets into an accident, the motor and boat will be immobilized and the system will send a location of the accident or a "man overboard" alert to a third party.

## In Closing

Boating safety can be a difficult sell, as everyone only wants it as long as it's cheap and convenient. We see this with regard to the effort to increase life jacket wear. Even with new lightweight inflatable technology and millions of dollars spent to get people to wear a life jacket when boating, the wear rate increases only marginally every year.

We face a similar plight when getting boaters to voluntarily wear their engine cutoff switches. We may not be able to change behavior overnight, but suffering the embarrassment of accidentally shutting off your engine is nothing compared to the lifetime of pain and remorse you will suffer if you injure yourself or others because you didn't wear an engine cutoff switch.

The U.S. Coast Guard is the lead when it comes to enforcing boating laws. The 56 states and territories also have their own bodies that advise legislation on a state level and enforce the law. In addition, there are various professional groups that help in identifying and quantifying issues that can make boating on state and federal waters safer and more enjoyable.

The USCG has not made any definitive statements that it would be in favor of a law requiring mandatory engine cutoff switch (ECS) use, though in literature and promotional material on safe boating, the Coast Guard does advocate wearing engine cutoff switches.<sup>1</sup> If this were to become law, the Coast Guard would be required to provide testing and approval ratings for the ECS manufacturers and enforce state compliance.

The National Marine Manufacturers Association (NMMA) is the major manufacturer association when it comes to the marine industry in the United States. Between August 4 and August 22, 2011, it surveyed members that manufactured vessels regarding their position on including an ECS. At that point, 80 percent were already including them on all vessels under 27 feet in length. On September 6, 2011, the NMMA submitted a position letter to the chief of the USCG Boating Safety Division to note that the NMMA and its members were in favor of legislation making ECS installation and use mandatory.<sup>2</sup>

While the legislative process can be time-consuming, it is hoped that the objective and results will be well worth the effort.

### Endnotes:

- <sup>1</sup> By advocacy, when the USCG boards a boat and/or conducts an inspection, the ECS is not checked to see if it is operational or highlighted as a priority safety item to be utilized, as with a PFD.
- <sup>2</sup> The Boating Safety Division of the USCG acknowledged the letter, although no action has been taken to date on ECS use.

### About the author:

Mr. Anthony Viggiano is the managing partner for Autotether, LLC of East Hartford, Connecticut. Prior to Autotether, he was cofounder and president of Component Technologies of Newington, Connecticut, and Hinesville, Georgia. Mr. Viggiano is a 1971 graduate of the University of Connecticut with a degree in chemistry. He holds several patents and is a lifetime career member of the American Electroplating and Surface Finishing Society.

### Endnotes:

- <sup>1</sup> The Autotether boat show poll referenced reported a 2% ECS wear rate, which was close to the BARD estimate of 3%.
- <sup>2</sup> See [www.iihs.org/iihs/topics#fatalityfacts](http://www.iihs.org/iihs/topics#fatalityfacts).



# Inland Recreational Boating Safety

Grant funding and local partnership.

by MR. DAVE DAHMS

*Boating Program Manager and Boating Law Administrator  
Idaho Department of Parks and Recreation*

The Idaho Department of Parks and Recreation is home to the state boating program. During the many public outreach events that we attend, occasionally someone will ask about the funding sources for various activities. We get a peculiar look when we tell folks the bulk of our program money comes from the United States Coast Guard, making them wonder, “What does the Coast Guard have to do with landlocked Idaho?”

***“The state boating program is a tremendous resource for the counties. Most county programs would not be able to function as effectively as they do without the financial and logistical support that the state offers. We all stand together as one to save lives in Idaho.”***

**—Sgt. Jason Speer  
Valley County Sheriff’s Office**

Fund to 56 states, territories, and the District of Columbia. In many areas, this recreational boating safety (RBS) grant money is used to pay for marine law enforcement and boat safety education programs. In this endeavor, Idaho is the same as the other 55 grant recipients. Where Idaho differs from most of the others, however, is in funds distribution. While most other states provide enforcement and education programs, in Idaho, a majority of the state RBS

The Coast Guard Boating Safety Division provides funding annually from the Sport Fish Restoration and Boating Trust

grant money is sub-granted to county sheriff offices because the statutory authority for marine law enforcement lies with the county sheriffs, not the state.



A student (wearing the yellow PFD) completes a basic boat safety inspection with assistance from an instructor as part of the Idaho Department of Parks and Recreation’s on-the-water contacts portion of the annual marine law enforcement academy. Note all participants are wearing PFDs (person in the red coat has a belt pack). All photos courtesy of the Idaho Department of Parks and Recreation.

## State Boating Program

RBS grant money is used to fund the state’s boating program, which consists of four full-time and one seasonal position. It also funds annual expenses such as boating safety outreach, educational materials, boater handbooks, and other associated equipment and operating expenses. The remainder of the grant money is allocated to the counties for their respective local programs.

As part of the annual grant agreement with the state, counties are required to have an active program that:

- reports monthly activities into a web-based database,
- requires the county to have an active boat safety education program,



- mandates that all officers wear a life jacket while performing on-the-water activities, and
- requires investigation and reporting of all reportable boating accidents.

### Pay Where You Play

In addition to the Coast Guard RBS grant money, Idaho counties have boat registration dollars available as another financial resource. Eighty-five percent of registration dollars are distributed locally to counties for their respective marine programs and placed into county vessel accounts. The state retains the remaining 15 percent for program administrative expenses.

Idaho has a unique user designation system that allows boaters to select the county or counties where they want their registration money sent. The state encourages all boaters to “pay where they play” so the counties where favorite waterways are located can make improvements to boating facilities and pay marine deputy salaries to keep people safe. Boating dollars must be used for boating-related projects in Idaho, and county expenditures are audited annually to ensure that boat registration dollars are used appropriately.

To help stretch boat registration dollars, many counties use their boat registration money to leverage additional grant money for budget items such as boat ramp improvement projects, new docks, parking lot and restroom upgrades, boat safety patrols, and boat safety education programs.

### Training the Workforce

The boating program coordinates training for new boat safety education instructors as well as a comprehensive marine law enforcement training program. The marine law enforcement program is rather unique in structure, as it funds attendance for county marine deputies at various training evolutions, such as boating accident investigation and operating under the influence (OUI) training. The counties, in turn, free up these officers to help teach at various training courses for other county marine deputies in the state.

These marine deputy instructors are experts in every sense of the word, and through this cooperative partnership, new and veteran marine deputies from around the state are trained to the national standard.

The marine law enforcement academy, where new officers learn the basic duties of a marine officer, includes a pool session and OUI training, including an active wet lab. Highlights of the course also include a re-boarding exercise that takes place in a cold water environment as well as scenario-based, on-water operations, complete with a dispatcher and numerous volunteer boats.



A student performs a rescue of another student as part of an exercise during the Idaho Department of Parks and Recreation's annual marine law enforcement academy's personal watercraft training.



This picture from an annual marine law enforcement academy shows our cold water re-boarding practical exercise. The water temperature is approximately 45 degrees. The students jump in the water, submerge themselves, then swim across to the slip and re-board a docked boat using a swim ladder.

Depending on funding levels and county needs, the program and county instructors also provide personal watercraft training, advanced training with tactically based on-water scenarios, and river navigation training for jet boats on the Snake River. Another popular course is the basic water rescue class, which highlights the dangers of water-based environments for first responders and requires students to actually perform a cold-water immersion in a controlled environment.

The state also hosts a biennial meeting with all the counties to provide program updates and specific training. Popular topics have been the dangers of skin cancer for marine law enforcement officers and the effects of carbon monoxide poisoning.



# Changing Behaviors

Combined state and county activities in Idaho amount to approximately 140 outreach events each year, such as boat shows, sportsman shows, safety fairs, and other similar events. In addition, Idaho annually reports approximately 1,400 students who successfully complete a boat safety course.

One of our top priorities continues to be developing, producing, and disseminating public service announcements promoting life jacket wear. A coordinated statewide promotion effort has not been undertaken in a number of years in Idaho, and we have confidence that this strategy would change the behavior of boaters by reinforcing the importance of wearing life jackets through education and social marketing.

## Interventions Make a Difference

One of the major investments the state boating program has made over the past five years is in life jacket loaner stations. A loaner station consists of a kiosk, instructions on how to properly fit a life jacket, and a variety of life jackets ranging in size from infant to adult extra-large. Life jackets at these loaner stations are provided free of charge for the public for short-term use. Stations are installed adjacent to boat launch facilities so they are easily accessible to the boating public.



Life jacket loaner station installed in July 2015 with the assistance of the Fremont County Sheriff's Office (one of our county partners) and the Fremont County Parks & Waterways Department.

***“The life jacket loaner station program started in Idaho in 2010 with a few stations at state park facilities in Northern Idaho and has expanded all over the state.”*** —Juelie Traska  
boating education safety coordinator  
Idaho Department of Parks and Recreation

A recent survey indicates that the stations are well used and that the loaner program as a whole has helped make boaters safe. With the installation of 13 stations in calendar year 2015 and another 13 in calendar year 2016, Idaho now has 95 life jacket loaner stations in place all over the state. Additional language has been recently added to the signage to include Spanish messaging. This project would not be possible without the Coast Guard RBS grant.

## Challenges Remain

While Idaho can point to many success stories, there are also challenges for the state boating program, including the explosion of stand-up paddleboards around the state. With the Coast Guard determination that a stand-up paddleboard is a vessel when used outside a designated surfing, swimming, or bathing area, it has been a struggle to determine how to reach users to make them aware of legal requirements and explain safe boating behaviors. The state boating program has developed various handouts to distribute, issued press releases, and has prioritized outreach events in an attempt to reach this user group. Another challenge is the prevalence of accidents associated with rental personal watercraft.

***“Occasionally boaters forget to bring extra life jackets for friends, or sometimes life jackets are lost while trailering a boat. Having these loaner stations at popular boat ramps allows these people to borrow a life jacket for the day.”***

—Lt. Kevin Horak  
Cassia County Sheriff's Office

We can't do it alone, and our county partners are certainly not the only resource available for boating safety promotion. The Coast Guard Auxiliary works to educate boaters and provide on-the-water support. The state boating program also works closely with several boating organizations to facilitate unified messaging and activities. These groups have provided volunteers and boats for some of the water-based training highlighted earlier. In addition, we continue to include our rental liveries in the discussion by providing materials and education in an attempt to prevent boating accidents.

### *About the author:*

*Mr. Dahms has served as the state boating law administrator in Idaho for the past 10 years and is a current member of the National Boating Safety Advisory Council.*



# Spirit of America Foundation Youth Boating Education

Preparing youth to safely share our waterways.

by Ms. CECILIA DUER  
*Executive Director*  
*Spirit of America Foundation*

As a national nonprofit service organization in Lake County, Ohio, Spirit of America (SOA) Foundation programs were created with one mission—to establish credit curriculum in a new, nontraditional classroom on the water, serving our youth in grades five through eight. Long before the recent emphasis on science, technology, engineering, and math (STEM) programs, we successfully placed young people in a hands-on environment so that they would learn and better retain the material.

Our curriculum includes instruction on sail-, power-, and human-powered vessels and is directly tied to what we know today as “national education standards,” providing infinite components to utilize in science, technology, engineering, and math programs, rapidly growing STEM specialty schools, and universities. Spirit of America has an official presence in schools, providing curriculum materials to utilize year round, including national physical education standards and Next Generation Science Standards. Our curriculum has also been used for English proficiency and physical education credits.

The influence and impact of our objective-based curriculum has infinite reach, and we can adapt the curriculum to meet the needs of our facilitating organizations such as the Boy and Girl Scouts of America, the YMCA, 4-H, private providers of recreational boating education specializing in disabilities, state and local parks systems, and universities and private colleges. As we provide education about the lifelong enjoyment possibilities of boating and water-based recreational activities, our programs also extend to students’ families and communities, providing a sustainable resource for education and recreation for all generations.

## **A Nontraditional Classroom**

We combine the resources of traditional and nontraditional education with water-based recreational activities

to provide a way for our young people to learn, react, and develop lifelong learning skills. We empower our youth to dare to dream, to develop confidence and self-esteem, and to practice teamwork through safe boating.

Students must pass state boating education courses, a drowning prevention and equipment awareness class, and hands-on training in the disciplines of sail, paddle, and power watercraft. The drowning prevention and equipment awareness portion of our curriculum provides an opportunity for young people to understand the importance of a properly fitted life jacket, and we train in self-rescue by capsizing and righting equipment in a pool setting.

Our curriculum also provides for additional time in our “water competency” component, with special programs designed for minority groups who are drowning in record numbers, according to a 2015 Centers for Disease Control and Prevention (CDC) report. Graduate students go on to provide this water safety competency instruction in their own communities.



Our young students take the helm of power-, sail-, and human-powered vessels. All photos are courtesy of the Spirit of America Foundation.





Our motto: "Let the kids do it!"



Hands-on personal watercraft instruction provides safety education for future use.

**Petty Officer 2<sup>nd</sup> Class Andrew Aryiss, U.S. Coast Guard**

**In Lorain, Ohio, we recently learned that a young man on the crew instructing the students in the class of 2014 was a graduate of the Spirit of America program and is now a member of the Coast Guard. He said, "I am happy to have the opportunity to return to Coast Guard Station Lorain Harbor and give something back to my community."**

**On-Water Competence**

Students spend, at minimum, five hours in each of the on-water, skills-based portions of the program curriculum. These experiences include instruction regarding sail craft; powered watercraft; canoes, kayaks, stand-up paddleboards, and rowboats; personal watercraft; and a large vessel educational hands-on experience with the U.S. Coast Guard, state or local law enforcement, or specialty teams like dive rescue units. The students are at the helm of the vessels and learn firsthand.

All students take part in graduation, when they share their newfound independence with their parents and families. Our students take their families boating!

**Measuring Success**

Additionally, instructors, students, and their families provide program course evaluations, which afford us the opportunity to examine each program every year and make necessary modifications. This has always led to our parents and guardians asking us, "What else have you got?" This gives our facilitating organizations opportunities to promote their community education opportunities.

These programs may be fee-based, utilizing SOA equipment, allowing for greater sustainability for the local programs. Given the locations where Spirit of America is presented, we anticipate that nearly 1,600 children will spend close to 66,000 hours on the water in the traditional curriculum alone during each season.

**Beyond the Classroom**

In addition to traditional programs, we offer many tailored programs to encourage family and community boating

education and recreational programs. We have never turned away a young person, and we have opportunities for virtually every young person wishing to participate in water-based activities, which their families can join in on, as well.

**Safe Harbor:** We created the "Safe Harbor" program for young people between two and 10 years old and/or family members, where we share components of the traditional program with youngsters who are unable to participate in the traditional Spirit of America program.

They are encouraged to experience education in and on the water all through the year in their schools, parks, camps, and community programs. These pieces of the curriculum, depending on the students' ages, include an introduction to the life jacket, swimming, drowning prevention through self-rescue, radio/emergency communications, and some hands-on boat work.

**Dustin Majewski, Spirit of America Class of 1995 (inaugural class)**

**Dustin grew up around the northeast Ohio area on Lake Erie and became involved with the Spirit of America boating program, which led to a summer job with Lake Metroparks' boating programs. He has since spent his career in water-related positions, including eight years as a state watercraft officer.**

**Says Dustin, "My career opportunities all started with the opportunities provided to me in my youth. These opportunities for career choices continue to this day, with my current career as a marine patrol program deputy sheriff."**

**Mentorship:** Our mentorship program is directed toward young people between the ages of 15 and 18. After successfully completing a Spirit of America program, these young people will embark on a 30-hour mentorship/training program for the Spirit of America Foundation, and can then serve as youth leaders for SOA programs across the country.

**Golden Eagle:** Our "Golden Eagle" program permits all persons of all abilities to participate in the entire SOA curriculum at their own pace and level. These students may



This day on the water included a Spirit of America graduate, USCG Petty Officer 2<sup>nd</sup> Class Andrew Aryiss, providing the instruction and tour for the next generation of graduates.

From the Atlantic Ocean to the Pacific, we are growing a new generation of SAFE-SMART boaters.

experience the entire curriculum and receive a certificate of graduation from the Spirit of America Foundation Golden Eagle program.

**Passport Program:** Our “passport program” allows any young person between the ages of 10 and 17 to work on the traditional SOA curriculum at his or her own pace and in many locations around the country. A student starts by taking the state boating education course in his or her home state. Once they have successfully completed their state boating education course, they send us a copy of that certificate of successful completion, which will allow them to then continue on with the balance of the program.

**SeaWorthy Project:** Our newest and most exciting partnership with our host location, Shake A Leg Miami, is the national “SeaWorthy” project. With a mission to use the marine environment to improve the well-being, independence, and employability of persons with disabilities, the partnership provides the curriculum, facility, and experts to train, educate, provide internships for, and successfully place our young disabled adults into vocational opportunities.

As these students travel with family or on vacation, they can participate in any portion of the curriculum under the guidance of a facilitating organization approved to host SOA curriculum components. Students turn their completed workbooks in to the Spirit of America Foundation office and receive certificates of completion in return.

The SeaWorthy vision includes making available nontraditional, hands-on curriculum; providing standardized educational components in a healthy, social environment; and granting a certificate of proficient successful completion. The curriculum includes valuable educational experiences, which permit the students to grow and become confident, competent, independent, employable young adults.

**Moms in the Marina Program:** This program is intended for moms and all women interested in becoming comfortable near, in, and on the water. We find that when the women involved in a young person’s life are not comfortable near water or are fearful of it, they tend to not allow (or only very reluctantly allow) their young charges access to water-based recreational programs.

**U.S. Coast Guard and Marine Industry Connection**

As our young graduates move through their school years, perhaps returning to lead SOA programs in their local communities and gaining new experiences as leaders and instructors, we have seen a number of graduates choose careers in the U.S. Coast Guard, U.S. Navy, in parks and recreation, and as boating and recreational specialists.

By overcoming their personal fears in a comfortable, nurturing environment, it is much easier for them to allow their youngsters access to these programs. In many cases, we gain new volunteers and instructors from this base of women. They also become role models for many of the young women taking part in our programs.

A further nexus includes our integral program, which includes as key components meeting the guidelines of the USCG’s National Recreational Boating Safety Strategic Plan

**Dads on the Docks Program:** Many fathers are also looking for opportunities for outdoor recreational water-based activities to share with their kids. Spirit of America provides this program—an accelerated version of our traditional program for youth—so that dads feel confident and are then able to safely enjoy water-based recreational boating activities with their children.



All students take part in hands-on education directly tied to the STEM curriculum associated with the national education standards of each school.





# Additional Outreach

## Take Our Youth Boating

In the second week of July 2014, the Spirit of America Foundation hosted its inaugural "Take Our Youth Boating Week" campaign. This campaign asks recreational boaters to take youth (under the age of 18) boating and submit pictures and a 30-second video of their boating experience. Prizes are awarded in several categories.

The photos should depict a safe and fun boating experience that adheres to federal and state regulations. For example, the foundation mandates that all people in the photos/videos must wear life jackets, and that the adult at the helm has passed an approved state boating education course.

## National Registry

Spirit of America is also developing the Spirit of America National Registry of Youth Boating. The U.S. Coast Guard and universities have limited access to the database, which includes SOA graduates' academic information.

This registry leads to the opportunity for these young people to become members of a prestigious Spirit of America National Youth Boating Hall of Fame, which will be open to any young person up to the age of 21. Spirit of America inducted its first hall of fame members in 2016.

for public awareness, safe boating practices, classroom/on-water education, and increased life jacket wear.

The Spirit of America Foundation programs have also been sponsored in part by the United States Coast Guard's Sport Fish Restoration and Boating Trust Fund, for which we are very grateful. Further, through this important and unique youth program, many of our students have chosen careers in the marine industry.

### BM2 Roseann Garam, United States Coast Guard Spirit of America Class of 2000

*"Growing up in Ohio, I was surrounded by the water. I grew up sailing, waterskiing, wakeboarding, and Jet Skiing on Lake Erie. If it was summertime, I was on the water. But it wasn't until I went through Spirit of America that I got a full understanding of the importance of boating safety. Spirit of America was my first stepping stone into the Coast Guard."*

## The Future

It's been 22 years since we opened our first Spirit of America Foundation program, and we recognize that many opportunities still remain. We must embrace and promote opportunities while facing and resolving challenges to help ensure that each new generation of boaters adopts safe boating behaviors.

While we focus on the traditional SOA curriculum for our preteens and teens, we continue to prove that the likelihood of advancing community boating in the areas where Spirit of America programs are located is extremely high, spurring other beneficial actions within their own communities, being an ultimate force multiplier, and continuing to provide a resource for American communities and the future of our industry.

Our newest program, "Spirited Outreach: Boating it Forward" provides an exciting youth outreach program to benefit communities where our graduates are located. Unique compared to any other program in the U.S., our young graduates will reach out to their family, friends, and neighbors to introduce the importance of boating and water safety education, ultimately assisting in saving lives.

SOA graduates will present opportunities to improve the well-being of their home areas across America. Our graduates will "pay it forward," creating future generations of "SAFE-SMART" boaters. Presenters will deliver basic safety instruction focusing on the following components: life jackets, carriage requirements, overloading; swamping and capsizing; education and age/vessel restrictions; Rules of the Road; aids to navigation; float plans; and cold water immersion prevention. Presentations will be made in schools, scouting programs, community retail establishments as a "point of sale" educational tool, sport team meetings, and family and other social gatherings.

Our national programs also provide benefits to the marine industry economically and by providing leadership personnel, and the marine industry has stated that Spirit of America programs provide what they need and want for their future well-being. It's simple: future boaters = future business!

### About the author:

*Ms. Cecilia Duer has been the executive director of the Spirit of America Foundation since its inception and also serves as its CEO and president. She is certified to instruct state boating education, cold water immersion prevention/rescue, and personal watercraft basic education courses. She has also served on the National Boating Safety Advisory Council for three terms. She has received several United States Coast Guard commendations as well as the USCG Pillar of Support award.*

### For more information:

Visit the Spirit of America website at <http://spiritofamerica95.org>, where you can also find links to our Facebook and Twitter accounts.



# A Focus on Boater Safety

## Using feedback to plot the campaign.

by Ms. RACHEL GARREN  
*Special Programs Director*  
*The Corps Foundation*

Every year, thousands of people in the United States mourn the loss of loved ones who could have survived a water-related accident, had they worn a life jacket. That's why the Corps Foundation developed a campaign with the slogan "Life Jackets Worn ... Nobody Mourns." This campaign was made possible through a grant to the Corps Foundation from the Sport Fish Restoration and Boating Trust Fund, which the U.S. Coast Guard (USCG) administers.

The Corps of Engineers Natural Resources Education Foundation, doing business as the Corps Foundation, is a nonprofit educational foundation incorporated in 2006. It operates in a cooperative relationship with the U.S. Army Corps of Engineers (USACE), the nation's leading provider of water-based recreation, to support the more than 400 lakes and waterway sites it manages. Approximately one out of every 10 Americans visits these special places annually. The Corps Foundation strives to foster contributions and partnerships to support its mission of engaging the public to ensure the environmental health and recreational enjoyment of our nation's USACE-administered lakes, lands, and waterways.

### The Statistics

The life jacket campaign targets adult males because, in the last 10 years, 88 percent of all USACE public water-related fatalities were men, and 63 percent were between the ages of 20 and 60. Also, 84 percent of all public water-related

USACE 10-year Average Drowning Demographics	
•	88 percent male
•	84 percent no life jacket worn
•	63 percent between ages 20-60
•	27 percent boating falls



Park ranger and kids. Photo courtesy USACE.

fatalities were people not wearing life jackets, and 27 percent of boating fatalities were from falls overboard.<sup>1</sup>

In addition to those figures, USCG boating fatality statistics in 2014 show that eight of 10 boaters who drown are using vessels less than 21 feet in length, and only 12 percent of deaths occurred on vessels where the operator had received a nationally approved boating safety education certificate. Also, alcohol was a leading factor in 21 percent of boating deaths where the primary cause was known.<sup>2</sup>

### Focus Groups

The Corps Foundation, cooperating with the USACE National Water Safety Program, conducted five focus group sessions with 39 adult male boaters between the ages of 20 and 60 at three different locations. Participants were asked 10 questions to get their initial perceptions about wearing life jackets and their use of alcohol while boating. Their opinions regarding life jackets can be summarized by saying they're uncomfortable, they're hot, and it isn't "macho" to wear one.

Most considered themselves boating experts, and they did not perceive recreational boating or having a few drinks





Men wearing life jackets. Photo courtesy USACE.

while boating as risky. Those who wore life jackets typically only did so when required to by law or they perceived a risk was associated with their on-water activity, such as knee boarding, skiing, tubing, severe weather, riding personal watercraft, and sometimes while using paddle craft (kayaks, canoes). Participants generally expressed more interest in their wives, friends, partners, and children wearing life jackets.

**Feedback**

After the participants’ initial feedback, survey conductors showed them the most recent life jacket styles and answered their questions about life jackets. Many participants were not aware of how comfortable life jackets could be—particularly inflatable life jackets, fishing vests, and float coats.

Once participants were made aware of the inflatable belt pack-style life jacket, it became the most popular option, but the perception of high cost caused some of them concern. In group discussion, however, participants pointed out to each other that life jacket costs weren’t much compared to what they had spent on their boat, fishing, or hunting gear. One focus group participant even said to another, “How much is your life worth?”

Further, focus group participants were given a brief introduction to boating and water safety. This included some of the primary causal factors that lead to drowning, such as life jackets not being worn, falls overboard, overestimating swimming ability, and being under the influence of alcohol and drugs. In addition, they were provided specific USCG and USACE water-related fatality statistics (as described previously) to support the findings.

**How We Drown**

Key factors related to drowning were discussed with participants to convey the importance of always wearing a life jacket. For example, they were informed that a fall into cold water less than body temperature causes an involuntary gasp reflex that could cause someone to drown—even if that person is a good swimmer. They learned how carbon monoxide (CO) poisoning can kill people swimming around boats because the CO lays on the water’s surface. Other factors discussed included the fact that swimming ability will likely decrease with age, and that regardless of your swimming ability, you could have to fight for your life due to conditions such as waves, current, or exhaustion.

Many people drown attempting to retrieve an inflatable toy or trying to reach out to a boat drifting away because they can’t swim as far as they think they can. Also, most people don’t have the strength or skill to get back into a small boat after falling into the water. Alcohol makes any scenario even

**Life Jackets Worn...  
Nobody Mourns  
PleaseWearIt.com**

The advertisement features a central image of a man in a yellow life jacket being pulled up by another man in the water. A circular logo with a life jacket icon and the text 'Life Jackets Worn...Nobody Mourns PleaseWearIt.com' is overlaid on the image. At the bottom, there are logos for 'US Army Corps of Engineers', a QR code, and 'THE CORPS FOUNDATION OFFICIAL NONPROFIT OF AMERICA'S LAKES AND WATERWAYS'.

Campaign print advertisement sample. Photo courtesy of USACE.

worse, as it does more than just slow reaction time. Being underwater while under the influence creates an inner ear imbalance that makes it difficult to know which way is up, so swimmers may drown by swimming deeper downward instead of up toward the surface.

Boaters can also develop “boater’s hypnosis,” a condition in which the boater experiences fatigue and slowed reaction time (much like the effects of alcohol) in response to sun, wind, noise, vibration, and motion. Combining this condition with alcohol or drugs further reduces coordination, judgment, and reaction time.

All of the above are reasons why it’s critical to wear a properly fitted life jacket while boating or swimming in any body of water.

**Are PSAs Effective?**

The focus group participants were shown 10 public service announcements (PSAs) and provided feedback on which types of messages might possibly change their behavior. We found that the most effective PSAs were the ones that were realistic and caused an emotional connection with the viewers.

Focus Group PSA Lessons Learned	
Like	Dislike
Realistic	Bad acting
Testimonial-true	Spokespersons
Humor-some	Corny, cheesy
Statistics-proof	Law enforcement
Emotional	Sexy distracts
Positive	Negative

There was a remarkable shift in the focus group’s attitude about the importance of wearing life jackets as a result of being educated on why adults drown and being asked to review and analyze the PSAs. This reinforces the premise that when the public is better informed about why adults drown, they think differently. However, many studies show that knowledge does not necessarily change behavior. A change of behavior usually involves something more—some type of emotional appeal, which is why we used that in our “Life Jackets Worn ... Nobody Mourns” campaign.

**Focus Group Feedback Informs Efforts**

We evaluated all of the focus group participant feedback to identify and create effective messages to reach adult men. We then contracted with a production group to develop the campaign materials, which include a logo, four television-quality video PSAs, three radio-quality audio PSAs, two posters, and a mobile game app called “Lake Guard.” The USACE also developed additional campaign materials to complement the production group materials, such as artwork for billboards, tailgate wraps, and social media graphics.

The campaign slogan “Life Jackets Worn ... Nobody Mourns” is used to reinforce the common theme that lost lives *can* be prevented. The logo, which is used on campaign materials, includes the slogan and the PleaseWearIt.com website, where all campaign materials may be viewed and downloaded for free.

We hope this campaign will help increase life jacket wear rates and further reduce the number of recreational boating and other water-related fatalities. Wearing life jackets—and encouraging others to do so—will help to ensure that in the future, nobody will have to mourn losing someone they care about to a water-related incident.

*About the author:*

*Ms. Rachel Garren retired after 31 years of working with the U.S. Army Corps of Engineers as the National Water Safety Program assistant manager and as a natural resources specialist. She is a certified interpretive trainer with the National Association of Interpretation and works for the Corps Foundation as its special programs director.*

**Endnotes:**

- <sup>1</sup> Department of Defense, U.S. Army Corps of Engineers, National Operations Center for Water Safety, Public Water-Related Fatality Statistics, 2006–2015.
- <sup>2</sup> U.S. Department of Homeland Security, U.S. Coast Guard, Office of Auxiliary and Boating Safety, Recreational Boating Statistics 2014, COMDT PUB P16754.28.

**For more information:**

Visit the U.S. Army Corps of Engineers website at [www.usace.army.mil](http://www.usace.army.mil).

Learn more about the Corps Foundation at [www.CorpsFoundation.org](http://www.CorpsFoundation.org).

For more information on the life jacket safety campaign and to download free campaign materials, visit [www.PleaseWearIt.com](http://www.PleaseWearIt.com).





# Boating Under the Influence

Meeting enforcement challenges with partnership, equipment, and training innovations.

by MR. JOSEPH CARRO  
*Recreational Boating Safety Specialist*  
*U.S. Coast Guard Boating Safety Division*

Statistics continue to indicate that alcohol use is the leading known contributing factor in fatal recreational boating accidents where a primary cause is known. According to the U.S. Coast Guard 2015 Recreational Boating Statistics, alcohol was listed as the leading factor in 17 percent of deaths and was the primary contributing factor in 260 accidents, resulting in 91 deaths and 228 injuries.

## Challenges

As far as enforcement is concerned, we have some challenges. While technology and individual testing procedures have made detection and identifying the presence of drugs more commonplace, part of the problem for enforcement officers has been determining exactly what drug a boater could be under the influence of, how much was used, and to what level of impairment.

Still another challenge is increased drug or alcohol misuse in the commercial maritime sector. According to U.S. Coast Guard Drug and Alcohol Prevention Investigation Program statistics, positive random drug test results indicating the presence of illegal drug or alcohol use have increased. This presents still another challenge for enforcement officers: How can we help?

Detecting illegal alcohol use following a marine casualty is a challenge for the marine employer as well as the U.S. Coast Guard. Per 46 CFR Part 16, alcohol testing of the persons involved must be completed within two hours of the casualty. However, logistical factors such as distance to the casualty site, the weather conditions, or transporting the test collector to the casualty site may very well exceed two hours. Accurate, timely notification of law enforcement officials who can quickly arrive on scene to a marine casualty or boating accident is essential. If state or Coast Guard first responders who arrive on site are capable of conducting evidentiary alcohol testing, they can serve as force multipliers to determine if alcohol misuse is a contributing factor.

## Training

We continue to improve our enforcement efforts in the area of training. Boating under the influence (BUI) training opportunities, including drug recognition expert and advanced roadside impaired driving enforcement programs, provide standardized training for law enforcement officers from around the country. This standardized training is critical, resulting in all trained officers conducting the same, consistent BUI law enforcement techniques.

Education and awareness efforts also continue within the judicial system. Part of the BUI training program includes segments on courtroom procedures and increasing the background and



Operating a vessel under the influence of alcohol, as staged in this photo, is against the law. All photos courtesy of the U.S. Coast Guard.

knowledge base of prosecutors and judges. This is an extremely important part of our national BUI enforcement efforts, as boating while consuming alcoholic beverages is unfortunately still commonplace in some areas.

We also continue to implement and conduct innovative law enforcement operations and techniques, including never-before-seen interagency operations. This is extremely important, taking into account the rapidly changing drug laws in many states; our enforcement efforts must change and adapt to the challenges presented in these individual states. The primary concern is that because recreational marijuana use and possession is treated as non-criminal in many of these jurisdictions, little to no enforcement action is taken. This is not the case in federal enforcement applications, in which case boating under the influence of alcohol or a dangerous drug is criminal and will be prosecuted.

### Enforcement

A great example of this law enforcement posture is being conducted at Coast Guard Station Miami Beach. The station procured a specific chemical breath testing instrument that is the only device recognized by the state of Florida to provide evidentiary findings. The station's boarding officers attended the breath test operator's course, deeming them state certified to conduct testing.

Because of this equipment and certification, a state or local maritime officer can now bring a subject directly to Coast Guard Station Miami Beach for testing with no delays, no transportation concerns, and no necessity to search for a qualified breath test operator.

Still another element in our continued BUI enforcement efforts is using federally recognized standardized drug test equipment in a pilot program that began at the same Miami Coast Guard station. Fifteen crewmembers have received training, and the equipment is now at the station, at the



A woman is arrested for boating under the influence.

ready. The enforcement program is continuing in California, with implementation in Sectors Los Angeles and San Francisco. Again, the result is that an enforcement officer can now bring an individual to the local Coast Guard station to collect a sample for analysis in possible prosecution.

Success continues with Operation Dry Water (see next article for more information). This national boating under the influence awareness and enforcement campaign is an annual event scheduled for the weekend just prior to national celebration of the 4<sup>th</sup> of July.

While BUI enforcement continues to be a challenge, we are fortunately equipped with new tools, new techniques, and new enforcement priorities to keep us engaged, now and into the future.

#### *About the author:*

*Mr. Carro retired from his position as a regulations subject matter specialist for the U.S. Coast Guard in 2002, after serving more than 24 years on active duty. He currently serves as the program and operations analyst as well as a boating safety specialist for the Programs Operations Branch, Boating Safety Division in the Office of Auxiliary and Boating Safety at USCG headquarters.*

# Operation Dry Water

Attacking boating under the influence.

by MRS. HANNAH HELSBY  
Project Manager

National Association of State Boating Law Administrators

Operation Dry Water is a year-round boating under the influence (BUI) awareness and enforcement campaign. Its mission: to reduce the number of alcohol- and drug-related recreational boating accidents and fatalities by increasing boater awareness and fostering a stronger, more visible deterrent to alcohol use on the water.

The National Association of State Boating Law Administrators (NASBLA) launched Operation Dry Water in 2009 after receiving U.S. Coast Guard nonprofit grant funding for the initiative. Since then, the campaign has grown exponentially and is currently coordinating a successful year-round outreach and awareness campaign along with a specially targeted three-day nationwide enforcement crackdown on boating under the influence just before the Fourth of July in every U.S. state and territory.



According to the most recent U.S. Coast Guard statistics available, 17 percent of all boating fatalities listed alcohol use as the primary contributing factor, making alcohol use the leading known contributing factor in recreational boating fatalities in the United States.<sup>1</sup> Injuries stemming from accidents involving alcohol or drug use while boating only adds to these national statistics. These facts highlight the necessity of a year-round campaign that addresses this

issue at the local, state, and federal levels.

Each state is focused on doing what it can to decrease the number of injuries and deaths associated with these preventable accidents. Participating in Operation Dry Water is one way law enforcement agencies work to address the problem. Since its launch in 2009, the number of boating accidents and fatalities with alcohol named as the leading contributing factor has decreased by 18 percent in the United States.<sup>2</sup>

As drug use is also included in boating under the influence laws and regulations, the need for education, outreach, and enforcement targeting boating under the influence of drugs (legal, illegal, or controlled) continues to grow, especially as drugs such as marijuana are legalized in the United States.

### Public Outreach and Awareness

Operation Dry Water focuses on public awareness and outreach throughout the year, with an increase in communications and coverage leading up to the heightened enforcement weekend and throughout the July 4<sup>th</sup> weekend. NASBLA coordinates media and public outreach on a national level while participating agencies and recreational boating safety partners simultaneously work diligently to spread the Operation Dry Water message in their areas of coverage.



The CBS News Inside Edition crew rides along with USCG Station Jones Beach during their Operation Dry Water patrols. All photos courtesy of NASBLA.



Law enforcement agencies participate in the outreach and awareness component of the campaign by working with their local media, providing press releases, setting up press conferences and ride-a-longs, and sending their messaging out through multiple channels of print, radio, television, and social media.

NASBLA works intensely and strategically with state recreational boating authorities, other law enforcement agencies, boating safety organizations, and the U.S. Coast Guard to develop and execute the Operation Dry Water campaign. Through these combined media relations and outreach efforts, the campaign generates a wide range of news coverage and publicity for increased awareness of the dangers of boating under the influence of drugs or alcohol, in addition to other boating safety issues such as boater education and life jacket wear.

### **Nationwide Enforcement Efforts**

In coordination with the campaign's year-round outreach, Operation Dry Water coordinates the saturation of thousands of local, state, and federal marine law enforcement officers on the water during the annual three-day heightened enforcement weekend.

Between 2009 (the inception of the Operation Dry Water campaign) and the end of 2015, law enforcement officers made contact with more than 729,000 boaters during the heightened enforcement weekend, spreading awareness about the dangers of boating under the influence and facilitating heightened boating under the influence enforcement. Additionally, law enforcement has removed 2,153 BUI operators from U.S. waterways during the nationwide crackdown.

The campaign, now in its ninth year, continues to see impressive growth and participation from local, state, and federal law enforcement agencies. From 2009 to 2015, the campaign has seen a 170 percent increase in law enforcement officer participation. The increase in law enforcement participation has led not only to more enforcement presence on the water, deterring the number of impaired vessel operators, but it has also led to a positive increase in recreational boater outreach.

The goal of Operation Dry Water and those who participate is not only to remove impaired boaters from the water; equally important is the goal of raising awareness throughout the year among recreational boaters about the dangers that come with the decision to operate a vessel while under the influence of drugs or alcohol. One of the greatest benefits of this campaign is that it gives law enforcement agencies across the country the opportunity to participate in a nationally coordinated effort to simultaneously keep the water safe by identifying and removing impaired boaters



The CBS News *Inside Edition* crew rides along with USCG Station Jones Beach during their Operation Dry Water patrols.

while also providing an additional opportunity to educate the boating public.

In 2015, 582 local, state, and federal agencies conducted Operation Dry Water campaigns in all 56 U.S. states and territories. During the 2015 three-day weekend, the agencies reported the following results:

- 6,605 law enforcement officers deployed,
- 125,087 recreational boaters contacted,
- 278 BUI arrests for drugs and/or alcohol,
- 17,942 citations and safety warnings issued,
- 57,402 vessel contacts made.

### **Seated Battery of Standardized Field Sobriety Testing**

An additional element of the campaign's targeted outreach focuses on the enforcement and judicial communities, including prosecutors, judges, and hearing officers. With NASBLA developing the seated battery of standardized field sobriety tests (SFSTs), and through NASBLA's BUI training, it is important for Operation Dry Water to make a special effort to connect with officers of the court so they may assist law enforcement officers who have BUI cases using the new seated SFSTs coming before the courts.

This judicial outreach is available on the Operation Dry Water website and includes:

- an eight-minute video explaining the seated battery;
- a letter to judges, prosecutors, and hearing officers;
- scholarly articles; and
- other information to better inform judicial officers who will be adjudicating BUI cases.

The seated battery of standardized field sobriety tests was developed to address a number of issues faced by marine patrol officers, including having a suspect perform balance-related tests after being on the water for all or part of the day as well as transporting suspects on the water to find a suitable testing location. Additionally, when weight, age,





An officer makes an arrest after conducting the seated battery of standardized field sobriety testing on a boater.

or mobility become an issue when performing the standing battery of SFSTs, the seated battery gives law enforcement officers another option to determine if an individual is under the influence. In these instances, the seated battery of SFSTs becomes useful for highway patrol officers, as well. If you have not already begun seeing cases involving this type of testing in your state, know that it is just a matter of time until you do.

#### **The Forward View**

Through the national Operation Dry Water campaign and the year-round efforts of the hundreds of agencies that participate, thousands of recreational boaters are contacted and educated at the local and national levels about the dangers and implications of boating under the influence.

Additionally, we are seeing hundreds of impaired operators removed from our nation's waterways at a time that is known for increased accidents and boater fatalities due to impairment. There are also an untold number of boaters who are choosing not to boat impaired in the first place because of the impact and education resulting from the Operation Dry Water campaign.

The strong law enforcement participation and increase in media coverage has led to more opportunities for boaters to receive information about boating under the influence and

safe boating practices, raising their education and awareness levels.

#### **About the author:**

*Mrs. Hannah Helsby is a project manager with the National Association of State Boating Law Administrators and the coordinator for the Operation Dry Water campaign. She has been with NASBLA since 2012 and works with law enforcement and boating educators to inform the boating public about the dangers of boating under the influence and remove impaired operators from our nation's waterways.*

#### **Endnotes:**

<sup>1</sup> 2015 Recreational Boating Statistics, United States Coast Guard.

<sup>2</sup> Recreational Boating Statistics, United States Coast Guard, 2009–2015.

### **For more information:**

#### **About NASBLA**

Operation Dry Water statistics courtesy of the National Association of State Boating Law Administrators (NASBLA), a national non-profit organization comprised of state and territorial recreational boating authorities. NASBLA's mission is to strengthen the ability of the state and territorial boating authorities to reduce death, injury, and property damage associated with recreational boating and to ensure a safe, secure, and enjoyable boating environment.

NASBLA fosters partnerships among and between the states, the U.S. Coast Guard, and others, crafting model boating laws, maintaining national education and training standards, providing members with critical knowledge and skills, assisting with homeland security challenges on our waterways, and advocating the needs of the state boating programs before Congress and federal agencies.

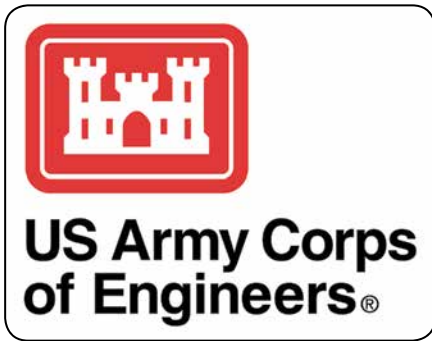
Visit NASBLA at [www.nasbla.org](http://www.nasbla.org).

For more information on Operation Dry Water, visit [www.operationdrywater.org](http://www.operationdrywater.org).

# One Life Lost Is Too Many

Saving lives using education and enforcement.

by Ms. PAM DOTY  
U.S. Army Corps of Engineers  
National Water Safety Program Manager



The U.S. Army Corps of Engineers (USACE) is the leading provider of water-based outdoor recreation in the nation, hosting more than 370 million visitors per year. It manages more than 400 lake

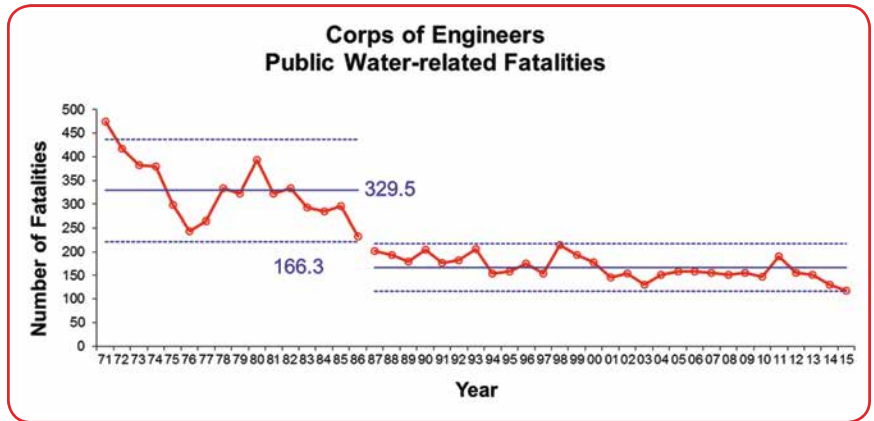
and river projects in 43 states that provide a diverse range of recreational opportunities, so visitors of all ages may enjoy outdoor activities like boating, swimming, fishing, hiking, wildlife viewing, camping, and hunting.

managers are on the front line interacting with the millions of visitors who use USACE services and resources. Part of their duties include promoting water safety and enforcing rules and regulations governing public use of USACE water resources development projects, so insight from this committee proves very beneficial in creating initiatives and promotional products that can be utilized nationwide to prevent fatalities.

While all of these efforts have had a dramatic effect on reducing the numbers of fatalities over the years, they still average 166 each year on USACE waterways.<sup>1</sup> That average needs to be lower, so the USACE will stay persistent, build partnerships, and continue to strengthen its water safety program—because even just one life lost is too many.

### Structured to Serve

The USACE National Water Safety Program traces back to 1986, when the USACE Operations Division became a proponent for a centralized program for product development to improve the professional quality of products and assure that materials and initiatives were made available unilaterally throughout the USACE. The figure on this page shows a comparison of the number of USACE public water-related fatalities before and after this program was implemented.



USACE public water-related fatalities, 1971–2015. The top portion shows statistics before the USACE National Water Safety Program was implemented; the bottom portion shows statistics after its implementation. All graphics and photos courtesy of the U.S. Army Corps of Engineers.

In 1994, the USACE established the National Operations Center (NOC) for Water Safety to take over product development and program oversight. This was a move that created an opportunity to maintain the centralized program while allowing more grass-roots-level involvement. A year later, the USACE created the National Water Safety Products Advisory Committee to provide input into the program and improve field-level involvement.

The grass-roots approach to the advisory committee is key; employees such as USACE park rangers and lower-level

### Statistical Analysis

While everyone needs to wear a life jacket when on or around the water, statistics support that the messaging focus needs to be on adult men. The USACE NOC for Water Safety has been tracking public water-related fatality trends on USACE waterways since 1998.

Trends analyzed from 2006 to 2015 show that the typical victim is male (88 percent), not wearing a life jacket (84 percent),





## “Life Jackets Worn ... Nobody Mourns” Campaign

In 2015, the U.S. Army Corps of Engineers National Operations Center for Water Safety, in cooperation with the Corps of Engineers Natural Resources Education Foundation, worked together to launch the “Life Jackets Worn ... Nobody Mourns” campaign. The campaign, which targeted adult men, was made possible by a grant from the U.S. Coast Guard-administered Sport Fish Restoration and Boating Trust Fund. The goal: to reduce water-related fatalities on our nation’s waterways.

Since the target audience was adult males, creators sought input from focus groups of adult males from the ages of 20 to 60 to develop this campaign. This input identified how to more effectively communicate and attract the attention of adult males.

During the focus group sessions, it became apparent that these men valued the lives of loved ones (including their wives, partners, children, friends, and dogs) more than they valued their own life. Therefore, developers wrote the slogan “Life Jackets Worn ... Nobody Mourns” to get men to think of those they might leave behind. In addition, the campaign materials all focus on creating an emotional connection in men to encourage them to wear life jackets.

Developers also created a free mobile game app, “Lake Guard,” to complement this campaign. The game is highly competitive and fun to play, designed to test a player’s speed, reflexes, and boating safety knowledge. Players are tasked with guarding a lake overrun with unprepared boaters, with the goal of saving as many as possible. Players can share game scores with friends and others around the world.

Additionally, campaign promotional products include a campaign logo, video public service announcements, audio public service announcements, and posters. All are downloadable at [www.PleaseWearIt.com](http://www.PleaseWearIt.com).



swimming (44 percent), boating (45 percent), and between 20 and 60 years old (63 percent).<sup>2</sup> So, while there is certainly no hard-and-fast rule regarding who will suffer water-related tragedies, the numbers do point to the statistical trends.

### Mandatory Life Jacket Wear

In focus groups conducted with adult males, one prevalent comment that came up was the suggestion to make wearing life jackets a law or regulation for adults. However, many boating safety professionals perceive this type of requirement as something that would not be well received by the recreational boating community.

To test the theory, in 2009 the USACE Vicksburg District volunteered to be part of a three-year study in which it established a mandatory life jacket wear policy at four lakes in Mississippi (Arkabutla, Enid, Grenada, and Sardis Lakes).

For one entire year prior to implementation of the life jacket policy, the USACE Vicksburg District implemented a communication plan that involved informing the public, business owners, congressmen, and stakeholders about the policy, addressing their concerns along the way. This one-year communication period was critical to minimizing negative and erroneous responses.

The implemented policy required wearing a U.S. Coast Guard-approved life jacket on vessels 16 feet to 26 feet while the vessel was under power by the main propulsion unit; on powered vessels under 16 feet; on non-powered vessels, regardless of length; at all times while skiing or being pulled by a vessel; and while swimming outside of designated swimming areas.

### The Results

The adult life jacket wear rate in the baseline year prior to implementing the life jacket policy at the four Mississippi Lakes was 13.5 percent. During the first recreation season of the test policy, wear rates peaked at almost 80 percent. During the second and third years of the test, wear rates on the four lakes held steady in the 70 percent range.<sup>3</sup>

Additionally, drowning fatalities at the four lakes dropped from a total of seven deaths in the three years prior to policy implementation to one death during each of the three years of the test. Of the three water-related fatalities that occurred during the test period (one boating, two swimming), only the boating incident involved a victim who was not in compliance with the life jacket wear policy. The other incidents either occurred within a designated swimming area or resulted from a medical event.



A U.S. Army Corps of Engineers park ranger conducts a courtesy vessel safety equipment check. Photo courtesy of USACE.

Labor hours and boat patrols did not change significantly to implement and enforce the mandatory wear policy, and water safety messaging changed from solely educational to a combination of educational and enforcement. Despite much speculation from industry and concessionaires, implementing a mandatory life jacket wear policy on USACE waters did not result in a loss of recreational use of the lakes, nor did it impact local commerce in a negative way.

Further, we documented several testimonials where victims attested that they would have drowned had it not been for the life jacket policy, and after the three-year study was complete, the Vicksburg District commander directed to keep the policy in place indefinitely at the four Mississippi lakes.

### Education and Enforcement

There is value to educational and enforcement efforts when it comes to saving lives on our nation's waterways. When educational efforts and enforcement are combined and used effectively, they have the potential to make the greatest impact in reducing drowning.



A fisherman plays it safe by wearing a life jacket. Photo courtesy of USACE.

### About the author:

*Ms. Pam Doty is the manager of the U.S. Army Corps of Engineers National Operations Center for Water Safety. She serves as a key subject matter expert on recreational safety and as a USACE liaison to the National Safe Boating Council Board, National Park Service Drowning Prevention Advisory Board, and the Interagency Working Group for Visitor Safety on Federal Lands and Waterways.*

### Endnotes:

- <sup>1</sup> U.S. Army Corps of Engineers Public Water-Related Fatalities Statistics 1971–2015.
- <sup>2</sup> U.S. Army Corps of Engineers Public Recreation Fatalities Summary 2006–2015.
- <sup>3</sup> JSI Research & Training Institute, Inc., 2012 Life Jacket Wear Rate Observation Study; and U.S. Army Corps of Engineers Life Jacket Policy Study Report, 15 Jan 2012.



# Mandatory Operator Education

Successfully lowering fatality rates.

by MR. HARRY HOGAN  
Contract Staff

U.S. Coast Guard Office of Auxiliary and Boating Safety

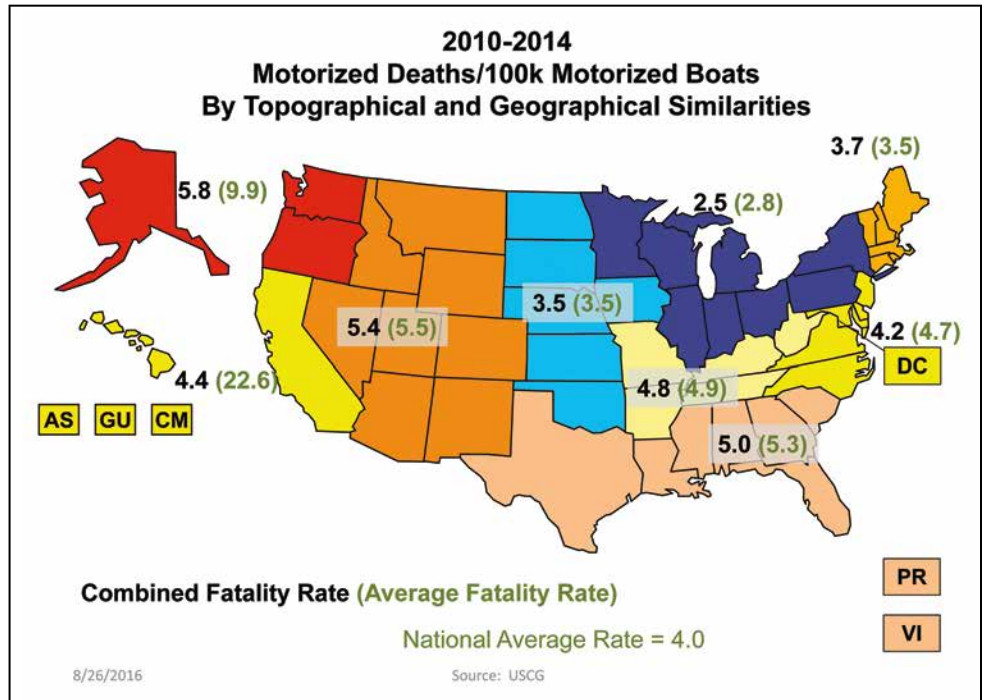
Three states in the U.S. (New Hampshire, New Jersey, and Oregon) enacted new boater education requirements for motorized boat operators in the first decade of the 21<sup>st</sup> century.<sup>1</sup> Every state has unique requirements, and no state has requirements as rigorous as automobile driver education, particularly because behind-the-wheel and hands-on testing are not part of the mandated process. Instead, the courses are classroom or online learning sessions followed by a multiple choice final exam. New Hampshire, New Jersey, and Oregon completed “short-term” phase-in for all their state motorized boat operators. This is in contrast to states that only require youths to complete courses or those that slowly phase in a requirement by born-after date.

Five-Year Average of Motorized Deaths per 100,000 Motorized Boats					
New England 2010–2014		Middle Atlantic 2010–2014		Pacific Northwest 2010–2014	
New Hampshire	0.9	Delaware	2.1	Oregon	3.2
Vermont	2.1	New Jersey	2.5	Washington	4.1
Connecticut	2.9	North Carolina	4.3	Alaska	22.4
Maine	4.3	Virginia	4.6		
Rhode Island	4.7	Maryland	5.6		
Massachusetts	5.9	District of Columbia	8.9		

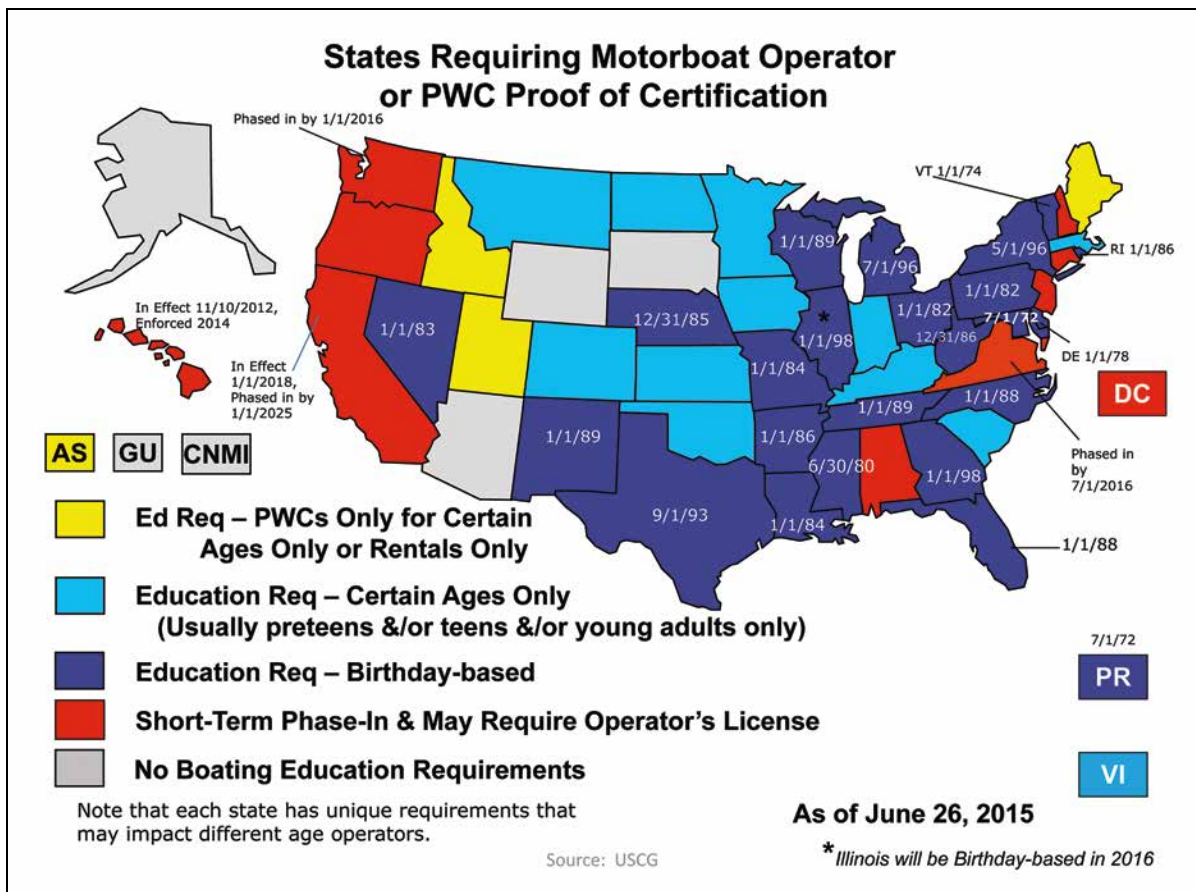
All graphics and charts by U.S. Coast Guard.

Further, New Hampshire required proof of course completions for all age groups by January 1, 2008. Oregon and New Jersey required all ages of operators to have completed a course by January 1, 2009, and June 1, 2009, respectively.

When comparing the boating safety records of New Hampshire, New Jersey, and Oregon to other states in their regions, the overall numbers of recreational boating deaths were often the first component examined when differentiating boating safety success. We normalized overall numbers of deaths prior to comparison by dividing total deaths by the number of registered boats, which established a boating fatality rate for that state. Additionally, education requirements were only for boat operators, so only







motorized boat-related deaths and motorized registered boats were considered in the fatality rates we developed for this comparison.

#### The Report

To compile a report on our analysis of these statistics, we grouped Oregon with two other Pacific Northwestern states—Alaska and Washington. New Hampshire was grouped with Maine, Vermont, Massachusetts, Rhode Island, and Connecticut; and New Jersey was grouped with Delaware, Maryland, Virginia, North Carolina, and the District of Columbia.

The results: New Hampshire and Oregon had the lowest motorized fatality states in their respective boating regions for the years 2010–2014. New Jersey had the second-lowest average motorized fatality rate in its boating region from 2010–2014.

The main conclusion drawn by comparing these three states to other states in their boating regions was that they had a favorable boating safety record during the years following their mandatory education requirements.

#### About the author:

Mr. Hogan conducts research and analysis of recreational boating accident data for the Boating Safety Division of the Office of Auxiliary and Boating Safety. He holds an M.S. in public health from San Diego State University.

#### Endnote:

- <sup>1</sup> Boater education requirements can be found for these states at their respective websites:  
 New Hampshire: [www.nh.gov/safety/divisions/nhsp/fob/marine-patrol/boating-education/](http://www.nh.gov/safety/divisions/nhsp/fob/marine-patrol/boating-education/)  
 New Jersey: [www.state.nj.us/njsp/marine-services/boating-safety-certificate.shtml](http://www.state.nj.us/njsp/marine-services/boating-safety-certificate.shtml)  
 Oregon: [www.oregon.gov/OSMB/boater-info/Pages/Motorized-Mandatory-Education.aspx](http://www.oregon.gov/OSMB/boater-info/Pages/Motorized-Mandatory-Education.aspx)



# Online Revolution

## Evolving online boating safety education.

by MR. KERRY MOHER  
*Vice President, Business Development*  
*Fresh Air Educators*

On January 1, 2015, California's boater education bill became law. Under the law, by 2025 anyone operating a boat with a motor in that state will need to pass a boating education course and carry a vessel operator card. With these requirements being phased in between 2018 and 2025, this means that upwards of two million Californians will need to take boating education within a few short years.

The main challenge will be to ensure that Californians have the information and resources they need to easily meet the law's requirements. The main opportunity is to show what online boating education can really do in this situation in service of creating safer boaters.

Fortunately, over the past 20 years, the internet and mobile communications have revolutionized almost every part of our lives, and education is no exception. Not long ago, few of us would have imagined being able to take an interactive, online course while riding the bus to work, yet today, almost half of our students use mobile technology to take our online boating courses.

The challenge now is to dream big enough to keep up with that rapidly advancing technology, all the while working together to leverage those advances to generate better learning outcomes along with more engaging and flexible learning experiences.

### The History

While required boater education has been around for a long time (New York, Michigan, Wisconsin, North Dakota, Minnesota, and Illinois have had requirements for more than 30 years), today 49 states and territories have some form of boater education requirement.

One of the reasons there has been such impressive growth in mandatory education is that we know it works. In 2006, the National Association of State Boating Law Administrators (NASBLA) conducted a study of best practices in boating education and found that states with the longest record of education also had the lowest fatality rates.

For example, states with the longest record of mandatory education, like New York and Michigan, had a fatality rate of less than 4 per 100,000 registered boats. States with more recently enacted boating education requirements had a fatality rate of 6.68 per 100,000 registered boats. States with no education requirement had a fatality rate of 12.28 per 100,000—almost twice the rate of states with recent boating education laws, and three times higher than those with a long record of education.

### Online Education

So why has it taken some states so long to enact legislation? Bill Gossard, the National Transportation Safety Board expert who works with Fresh Air Educators on policy issues, says that one of the big reasons is the perceived burden that such requirements put on boaters.

That's why we believe that online education is such a key force for moving the needle on boating education. Online education, especially when provided by NASBLA-approved private courses like BOATERexam.com, massively reduces the burden on state agencies and boaters.

**As Emily King, a NASBLA Education Committee member said about the study:**

**“Those of us who have worked in the boating education field for years have known intuitively that there is a correlation between education and lower fatalities, but now we have the data to prove it.”**

With classroom courses, state agencies must locate space, train instructors, and coordinate reporting. Students must schedule hours out of work and school, travel to training locations that may not be close to home, and pay course fees.

*continued on page 72*

# Online Education Evolution

BOATERexam.com was first launched in Canada in 1999 in response to national boating educational requirements. In the early 2000s, we launched BOATERexam.com in the United States, first in Virginia. Today, it is approved in 43 states.

Over the years, we have continued to evolve the features of BOATERexam.com along with advances in technology as well as our own research and development.

## First Generation – Text-Focused

**First Generation**  
Average Score 77%

Basic Illustrations (+30)

The first generation of our online boating course was largely text-based, compiled almost completely from the boating standards that would be tested in the exam. The course had basic illustrations and no interactivity. Quizzes and exams were text-only, similar to those you would take in a written exam.

Still, even with that basic configuration, the results of online education were impressive. Students passed with average test scores of 77 percent.

## Second Generation – Illustration-Focused



**Second Generation**  
Average Score 78%

Detailed Illustrations (+150)

In the second generation, we added more detailed illustrations. The course became far more visual, and we started thinking more specifically about the user experience — not just teaching boating standards.

While we greatly improved the visual experience, average test scores did not improve much, only increasing to 78 percent.

## Third Generation – Visual Testing



**Third Generation**  
Average Score 79%

Visual Exam Questions

In our third generation of online courseware, we again took the student experience and visual engagement up a notch. This time, we added visuals to exam questions, which was the start of what

has become a long-term commitment to helping students with different learning styles.

By adding visual cues to what were previously text-only exam questions, we improved engagement while still maintaining testing integrity. But again, we only saw a small increase in average test scores, notching up to 79 percent.

## Fourth Generation – Animations



**Fourth Generation**  
Average Score 79%

Animations (+100)

The fourth generation of our courseware saw the beginning of what has become another new standard for BOATERexam.com — fully animated content. By bringing our illustrated approach to life, we were

able to show step-by-step boater actions. Animations also allowed us to increase the “fun quotient” of the material, something that has become a hallmark of our boating courses.

This time average scores did not budge, staying at 79 percent. While student surveys told us that satisfaction with the course material increased, the reality was that these various improvements didn’t move the needle much when it came to student performance.

## Fifth Generation – Required Study



**Fifth Generation**  
Average Score 90%

Required Study (Timers)

From 2011-2014, I was part of NASBLA’s National Education Standards Committee. During that time, one of the issues we looked at was how to assure our

government partners that online education was an effective means to learn boating safety.

To that end, I advocated for adopting “timed” courses, which would require students to spend a minimum amount of time with the course material before proceeding to the next page or chapter. BOATERexam.com implemented them in 2010, and they became a NASBLA standard in 2011.

By implementing “page timers,” we saw average test scores jump to more than 90 percent. Finally, we had found an innovation that seemed to help students better retain information. However, with page timers, student satisfaction also took a nosedive, particularly among more experienced boaters who felt they should not have to sit through basic material that they had learned over decades on the water.

**NOTE:** The information on this page is provided solely as an example in the discussion of the evolution of web-based boater education.

The U.S. Coast Guard does not endorse Boaterexam.com, nor any other boater education course, and there are other Coast Guard-approved, web-based boater education products available, which can be found at [www.uscgboating.org/recreational-boaters/boating-safety-courses.php](http://www.uscgboating.org/recreational-boaters/boating-safety-courses.php).



With online courses, third parties develop course material that professional boating experts have verified. Further, the material is distributed in a consistent and easily accessible format, which means students can take courses whenever they want, studying as much or little as they want in one sitting.

For students, online courses are convenient, affordable, and fun. For agencies, online courses are convenient, affordable, and consistent. What this has resulted in is huge participation in online courses, especially in states with mandatory boating education laws. Our data shows that in states with recently phased-in boating education laws, such as Oregon and Washington, more than 90 percent of boating education is being done online.

As another NASBLA study has shown, there is little difference between online and classroom courses in terms of long-term student retention. Furthermore, in a survey of 5,000 of our online students, 26 percent said that they wouldn't have complied with the law if an online course had not been available.

#### **The Next Generation: Continuous Assessment**

Today, BOATERexam.com is fully animated and narrated, and course material is chunked into the smallest pieces possible to encourage retention.

"With attention spans reducing and greater participation in mobile learning (which encourages shorter learning sessions), it makes sense to focus on short, quick hits of content—something we call 'learning snacks,'" says Chapin Brinegar, an instructional design consultant who's helping us design the next generation of our courseware.

The move to mobile and tablet learning is part of a larger move to shorten courses into smaller modules, with 30-minute modules being optimal.

Where page timers will fit in the next generation of courses is also up for debate. While we have seen positive impact from using such timers, there is research that shows they can actually discourage participation. This matches up to our reviews; while students generally love the convenience and engagement provided by BOATERexam.com, if there is one criticism, it is the timers.

What we are working on now is creating an interactive experience where the learner has control of their navigation

through the course, and where testing is used to access new levels. This will allow different levels of the boater or students learning at different speeds, allowing them to get the right amount of information they need to be the most engaged and successful.

According to Chapin, this interactivity is also where we will see great improvement in scores and retention, as the goal is to pair things like animation and interactivity with application-based learning, which involves creating scenarios that require boaters to apply judgment.

Our first scenario-based assessment tools are now being tested. As we gather feedback on this next generation of online learning, we will be able to apply that knowledge and technology into our boating courses.

#### **The Next Wave of Online Boating Education**

With mandatory boater education being phased in between 2018 and 2025 in California, we have an amazing opportunity, and we must make sure we provide the best possible online boating education for the millions of boaters who will seek certification.

We know from our experiences in Oregon and Washington that more than 90

percent of boaters will look online for training and certification. We also know that while study time increases overall test scores, the minimum required study time provides a barrier for more experienced boaters, of which there will be a large number in California.

The opportunity for us over the next three to four years is to work with NASBLA and our state partners to design the next generation of online boating education. Our goal is to provide a solution that boaters of any experience level can learn what they need to know to become safe, confident boaters.

#### **About the author:**

*For more than a decade, Kerry Moher has worked to increase the number of boaters completing a boating safety course. He has accomplished this as a passionate advocate for mandatory boating education and as the original author of the leading NASBLA-approved online boating safety course, BOATERexam.com.*

#### **Bibliography:**

"Boating Education Requirements Do Make a Difference," National Association of State Boating Law Administrators, 2007.

"Assessing Knowledge Retention for Online and Classroom Boating Safety Courses," National Association of State Boating Law Administrators, 2012.

**"There is a political risk to asking people to jump through hoops, and then, of course, there is also the cost to implement such requirements."**

**—Bill Gossard**

**National Transportation Safety Board**

# Stand-Up Paddleboards

What every user needs to know.

by MR. CHRISTOPHER STEC  
*Chief Operating Officer, ACA | Canoe-Kayak-SUP-Raft-Rescue  
Instructor Trainer Educator*

With just under three million people in the United States trying stand-up paddleboarding (SUP) in 2015, paddlers have integrated SUP into literally all of our nation's waterways.<sup>1</sup> From paddleboarding miles off shore in the open ocean; to surfing a local beach break; to paddling in bays, lakes, ponds, and even on class III whitewater rivers; materials and skills are constantly evolving to meet the desire of an adventurous society.

As one of the fastest-growing outdoor recreational activities, there is a significant opportunity to educate a wide range of waterway users about this diverse craft that bridges the board sport and paddle sport communities.

## Carriage Requirement

In a letter dated October 3, 2008, U.S. Coast Guard (USCG) officials, at the request of the Oregon State Marine Board, made a legal determination on the vessel status of paddleboards. In the memorandum, the officials determined that when it is beyond the narrow limits of a swimming, surfing, or bathing area, a paddleboard is considered a "vessel" under 46 U.S.C. §2101, and is subject to USCG regulations, unless specifically exempted.<sup>2</sup>

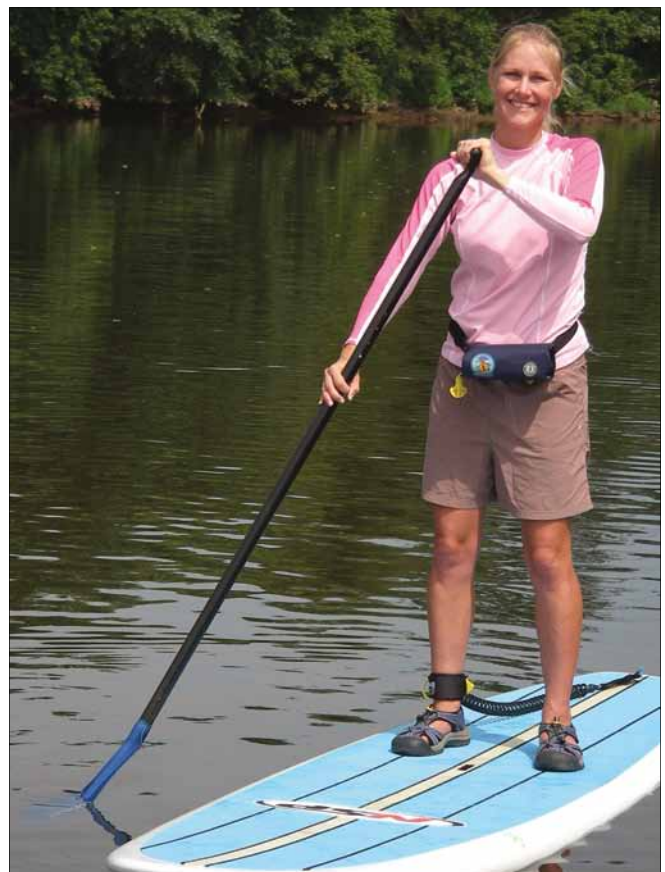
Since stand-up paddleboarding is a relatively new activity and has been given a vessel classification, it now must meet federal carriage requirements. However, Title 33: Navigation and Navigable Waters, Part 175—Equipment Requirements, Subpart B—Personal Flotation Devices in the Code of Federal Regulations does not adequately address carriage requirements specifically for SUP with regard to life jacket or leash wear.<sup>3</sup>

For example, imagine that when paddling on your local lake, you can meet one of the federal carriage requirements if you simply place a life jacket on your board. However, when you fall off, if you're not wearing an appropriate leash, you're in the water without any flotation device or connection to your board. Unlike a canoe or kayak that fills up with water when capsized, a SUP will just keep drifting away. If there

is even a little wind or a slight current, you might not be able to swim back to your board. Hence, wearing a life jacket and an appropriate leash would be beneficial.

That said, there are two challenges with regard to life jacket and leash wear for SUPs. It can actually be dangerous to wear a life jacket in surf, and wearing a leash in moving water or a swift-flowing tidal river could also be extremely hazardous.

*continued on page 75*



Proper equipment for a stand-up paddleboard, including an inflatable life jacket, a whistle, and a coiled leash. American Canoe Association photo by Christopher Stec.

# Regulation Review

## National Boating Safety Advisory Council

Through its Prevention Through People Subcommittee, the National Boating Safety Advisory Council (NBSAC) reviewed the CFR in 2013–2014 as to how it relates to stand-up paddleboards and other manually propelled vessels. As a result, NBSAC passed Resolution Number 2014-91-2: Safety Equipment Carriage Requirements: Manually Propelled Vessels and gave it to the U.S. Coast Guard.<sup>1</sup> Although this resolution did not definitively address every issue, it provided recommendations to the USCG on a range of topics for stand-up paddleboards and other manually propelled vessels.

1. Insert a definition of ‘paddlecraft’ into [CFR 175.3 Definitions] and then replace ‘racing canoe’ and ‘racing kayak’ with ‘racing paddlecraft.’
2. Replace ‘(b) Operating a canoe or kayak;’ with ‘(b) Operating a paddlecraft or raft;’ in [CFR 175.5 Exemption from preemption].
3. Exempt paddleboards and rafts of all lengths from carriage of an additional ‘Type IV’ ‘throwable’ PFD in [CFR 175.17(b) Exemptions].
4. Clarify the wording and intent of CFR 175.17(c) to clearly describe that this exemption only applies to racing shells, rowing sculls, and racing paddlecraft when competing in an organized or sanctioned race or training program approved by a national or international body, or by appropriate permit, and where adequate safety precautions are in place.
5. Continue to exempt stand-up paddleboards while surfing on a lake or on the ocean from the carriage requirements in 33 CFR 175.15 by adding the following language to 175.17: “Stand-up paddleboards, while in the surf zone of a lake or the surf zone of an ocean, are exempted from the requirements for the carriage of any type PFD required by 175.15.”
6. Structure the wording of these regulatory changes in such a way that future styles and types of manually powered vessels and craft would be included.

Since SUPs paddle on a wide range of waterways, they can also fall under the oversight of other agencies that do not necessarily have the same regulations as the USCG.

## U.S. Army Corps of Engineers

For example, besides its military role, the U.S. Army Corps of Engineers is the nation’s largest provider of water-based recreation on public lands, and it has implemented mandatory

life jacket wear for all vessels at four lakes in Mississippi (for more information, see USACE article).

The following life jacket rule is one of several enforced at all four of the Vicksburg District-North Mississippi lakes of Arkabutla, Sardis, Enid, and Grenada:

“All persons must wear a U.S. Coast Guard-approved life jacket at all times on powered vessels less than 16 feet in length or on non-powered vessels regardless of length.”<sup>2</sup>

## New Mexico

Now, consider this regulation from the state of New Mexico’s Energy, Minerals, and Natural Resources Department:

“Mandatory to be worn on all lakes and rivers statewide is a life jacket or PFD, a sound-producing device such as a whistle or horn, and a white light for shining at other boats at night.”<sup>3</sup>

The actual New Mexico regulation can be found in Title 18 Transportation and Highways, Chapter 17 Navigation and Boating, Part 2 Boating Operation and Safety, 18.17.2.9 Equipment Required to Operate a Vessel:

“... Persons engaged in boating on a river or in boat races or persons using ice sailboats, personal watercraft, kayaks, canoes, *paddleboards* and rubber rafts *on any waters of this state shall wear* a U.S. Coast Guard-approved wearable personal flotation device.”<sup>4</sup>

For more information on appropriate leash and life jacket wear for SUP, view the American Canoe Association information at [www.americancanoe.org](http://www.americancanoe.org).

### Endnotes:

- <sup>1</sup> NBSAC Resolution 2014-92-02: Safety Equipment Carriage Requirements: Manually Propelled Vessels.
- <sup>2</sup> U.S. Army Corps of Engineers, Mississippi Lake District Boating Regulations, [www.mvk.usace.army.mil/Missions/Recreation/EnidLake.aspx](http://www.mvk.usace.army.mil/Missions/Recreation/EnidLake.aspx).
- <sup>3</sup> New Mexico’s Energy, Minerals, and Natural Resources Department (EMNRD), Stand-Up Paddleboarding website, [www.emnrd.state.nm.us/SPD/BOATINGWeb/Paddle\\_Craft.html](http://www.emnrd.state.nm.us/SPD/BOATINGWeb/Paddle_Craft.html).
- <sup>4</sup> New Mexico regulation, Title 18 Transportation and Highways, Chapter 17 Navigation and Boating, Part 2 Boating Operation and Safety, 18.17.2.9 Equipment Required to Operate a Vessel, <http://164.64.110.239/nmac/parts/title18/18.017.0002.pdf>.







A paddleboarder navigates the rapids on the Rappahannock River in Virginia without a leash. American Canoe Association photo by Christopher Stec.



Whitewater surfing with a quick-release leash. American Canoe Association photo by Claudette Stec.

carriage requirements while in a surfing area. However, Minnesota guidelines have created issues near Duluth and the Lester River and Park Point surf breaks. From the Minnesota Department of Natural Resources Boating Guide:

*“A readily accessible and wearable life jacket is required for each person onboard a boat, this includes canoes, kayaks, stand-up paddleboards and waterfowl boats.”*

### Challenges Associated with Life Jackets and Leashes

According to the 2014 USCG Recreational Boating Statistics report, where the cause of death was known, 78 percent of fatal boating accident victims drowned. Of those drowning victims, 84 percent were not wearing a life jacket.

Arguably, wearing a life jacket is a wise decision while stand-up paddleboarding in almost all water venues. However, if you can swim (and I sincerely hope that those who paddleboard can swim), and if you’re actively surfing in the ocean, then wearing a life jacket would not allow you to dive underneath waves once you’ve fallen off your board. In addition, a life jacket would keep your head on the surface—right next to the board’s sharp fins and hard rails.

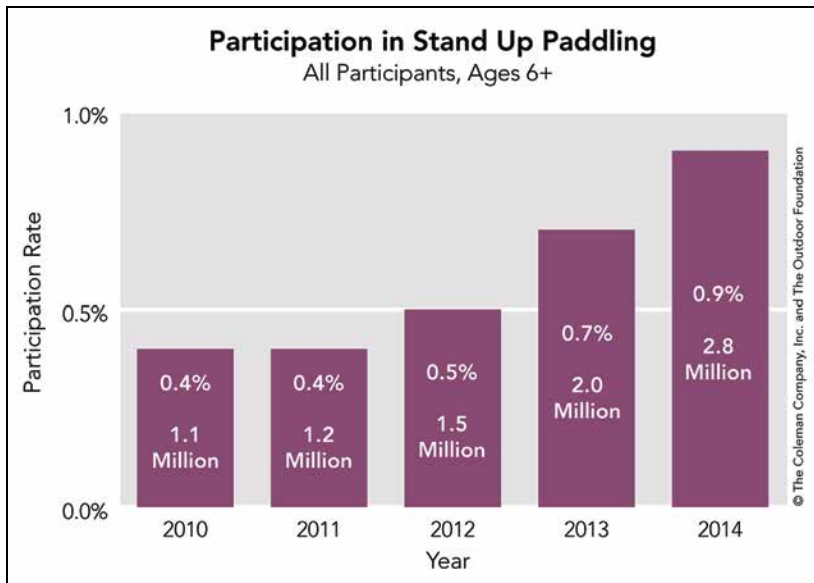
The 2008 USCG vessel determination for SUPs appropriately addresses this, as SUPs are exempt from life jacket



Paddleboarding in the ocean with a straight leash. BIC SUP photo courtesy of Ben Thouard.

So, according to Minnesota regulations, stand-up paddleboarders would need to either wear or have a life jacket on their boards while surfing in these areas in Lake Superior, whereas the 2008 USCG vessel determination letter for SUP states they would be exempt from the life jacket carriage requirement in this type of venue.





Since 2010, stand-up paddleboarding has experienced participation growth each year. Graphic courtesy of the Coleman Company, Inc.

Next, let's contemplate the complexities associated with leash wear for SUPs. Although leashes are extremely important in most venues, it would not be prudent to simply make a blanket statement to mandate leash wear in the CFR carriage requirement section.

It is a widely accepted practice that SUPs use coiled leashes on lakes and straight leashes in the ocean. A more challenging scenario is presented in tidal and inland rivers with swift-moving water: Imagine falling off your board. The board goes around a dock piling on one side while you go around the other, or the leash snags on a branch along a river. Wearing a leash in those situations could be extremely dangerous.

In another scenario, a stand-up paddleboarder starts out paddling in one lake, wearing a coiled leash, but then must paddle through a narrow, meandering river to get to the next lake. That individual would need to know that a coiled leash is appropriate for the lake, but would need to either remove the leash or wear a quick-release leash for the moving water river section to avoid potential entrapment hazards.

Even though there are a range of quick-release leashes that attach to your torso area, they too should only be worn in certain water venues. For example, if a river is shallow or rocky, or if there are a lot of potential snagging hazards from trees or debris, it is not generally recommended to wear any type of leash. However, if the river is deep, fast-flowing, and free from obstructions, a quick-release leash attached to your torso area might be prudent. If you fall into that river or tidal environment, you could quickly be separated from your board and have a long swim. However, even in that

environment, there are still risks associated with wearing a leash.

To summarize, in most venues, an appropriate leash is an extremely important piece of equipment. What's important is for individuals to be educated on when to wear a leash as well as what type is appropriate for the venue they'll be paddling on.

### Next Steps for SUP

Due to the complexities associated with life jacket and leash wear, as well as the various regulations applied to SUP, education is key. Local, state, and federal regulators need accurate information prior to crafting rules and guidelines that affect stand-up paddleboarding.

Additionally, businesses that rent stand-up paddleboards should truly weigh the benefits of having customers wear a life jacket and an appropriate leash for the venue. Retailers should increase the sales staff's knowledge base with regard to the appropriate life jacket, leash, or leashes necessary for each board sale. Even law enforcement officers might consider how to best approach a SUP on the water. Ideally, they would approach at idle speed and ask the paddler to kneel down on their board well in advance of making contact in the patrol boat. Even the smallest wave or wake can cause a paddler to fall.

The most crucial step in reducing future fatalities for SUPs is to educate the public. If people don't know what they don't know, they cannot make an informed decision about which leash to wear in which venue, or about the importance of life jacket wear in almost all venues.

We encourage the entire recreational boating community to continue to partner to provide education to all groups associated with SUPs, that they may reduce the possibility of fatalities occurring while enjoying our nation's waterways on a stand-up paddleboard.

### About the author:

*Mr. Christopher Stec is the chief operating officer of the ACA | Canoe-Kayak-SUP-Raft-Rescue, the oldest nonprofit paddlesports organization in the United States, focusing on education, stewardship, recreation, and competition. He holds numerous instructor certifications and enjoys spending time on the water with his family, whether it's racing canoes, kayak fishing, or surfing SUPs in the ocean.*

### Endnotes:

1. 2015 Special Report on Paddlesports, Outdoor Industry Association, Boulder, Colorado.
2. U.S. Coast Guard letter to Oregon State Marine Board, 2008.
3. U.S. Government Publishing Office, online at [www.gpo.gov](http://www.gpo.gov).



# Improving Seamanship Through Education

Reducing user conflict and improving accident prevention.

by MR. JEFF DECKER  
*Recreational Boating Safety Specialist*  
*U.S. Coast Guard Boating Safety Division*

More recreational boat operators are educated in the basics of the sport than ever before. An estimated 27.5 percent of the nation's boat operators have completed a nationally approved boater education course to legally operate a powerboat or personal watercraft.

However, with nearly 12 million registered recreational power boats plying the nation's waterways each year; and untold millions of nonregistered boats like kayaks, canoes, and stand-up paddleboards; our waterways are more congested than they have ever been. Moreover, boaters of every type are now vying for the same waters commercial traffic traverses. The commercial vessel operator must be constantly on guard when navigating our nation's harbors and within narrow channels.

On the other hand, recreational boaters are looking for a place to have fun on the water, regardless of where that may take them. They would just as soon not have to encounter large commercial vessels, but often do. Knowing boating safety basics is paramount to reducing user conflict and improving accident prevention.

## Meeting Conflict with Education

When recreational boaters—especially paddlers—take to waters normally used by commercial vessels, there can be increased apprehension on everyone's part. Whether perceived or real, there tends to be a feeling of increased conflict among these very different boater groups, and increased discussion about who has what "rights."

The good news is that over the past 15 years, millions of recreational boaters have received some instruction on the basics of power boating. While the typical recreational boater will rarely attain the same level of training as the

professional mariner, it's encouraging that they are getting educated to a higher degree than those who boated recreationally just a decade and a half ago.

## Mandatory Training

As keepers of the National Recreational Boating Safety Program, the U.S. Coast Guard continually strives to increase recreational boaters' knowledge, skills, and abilities by promoting boating safety education in a multitude of public awareness campaigns.

But the reason so many recreational boaters are taking an education course isn't so much because they want to—it's because they have to. Many states have enacted some form of mandatory boater education law over the past 15 years (see mandatory operator education article). There are two basic categories of boater education laws:

- those that require boat operators born on or after a certain date to obtain a boater education certificate;
- those that utilize a "phase in by age group" approach, wherein all recreational boaters are required to obtain a boating education certificate within a certain time frame.

Since 1998, all recreational boater education courses have had to meet strict guidelines, including making certain the courses contain the national standards, which include equipment requirements, operator compliance laws, age and education requirements, anchoring, and the navigation rules.

Not only are boaters getting formal education on the basics of recreational boating safety, they are also much less likely to see incorrect boating behaviors exhibited in television and print ads for boating products. Editors of major boating





# Boating Safety Course Standards

Here is a sample of the navigation rules material that must be covered in a course:

- **Rule 2 — Responsibility**

- Nothing in these rules exonerates any skipper from the consequences of any neglect to comply with these rules or of the neglect of any precaution that may be required by the ordinary practice of seamen, or by the special circumstances of the case.

In construing and complying with these rules, due regard shall be had to all dangers of navigation and collision and to any special circumstances, including the limitations of the vessels involved, which may make a departure from these rules necessary to avoid immediate danger.

- **Rule 5 — Lookout — Responsibility**

- Every vessel shall at all times maintain a proper look-out by sight and hearing as well as by all available means appropriate in the prevailing circumstances and conditions so as to make a full appraisal of the situation and of the risk of collision.

- **Rule 6 — Safe Speed**

- Every vessel shall at all times proceed at a safe speed so that she can take proper and effective action to avoid collision and be stopped within a distance appropriate to the prevailing circumstances and conditions.
- In determining a safe speed, the following factors shall be among those taken into account:
  - (i) The state of visibility.
  - (ii) The traffic density including concentration of fishing vessels or any other vessels.
  - (iii) The maneuverability of the vessel with special reference to stopping distance and turning ability in the prevailing conditions.

- **Rule 8 — Action to Avoid Collision**

- Rules 7(a), 7(d), 7(d)(i), 7(d)(ii), Rule 8, Rules 13(a), 13(b), Rule 16, Rule 17, Rule 18 (a-d), Inland Rules 14(a), 14(b), 14(c), Rule 15(a), and Restricted visibility – Rules 19(a) through (e).

publications are aware of promoting safe boating practices. The old days of showing adults without life jackets engaged in risky behaviors on a recreational boat are quickly becoming passé.

## The Contrast

A professional mariner's livelihood depends on being able to navigate from point A to point B without incident, and violating navigation rules can lead to mariner license suspension or revocation. Colliding with a recreational boat can end a career.

In contrast, recreational boaters are on the water to have a good time, and if they lose the privilege to operate, they do not lose their livelihoods. Recreational boaters are not "licensed" (except for inland water operation in the states of Alabama and New Jersey). Instead, in states where they are required to obtain education, recreational boaters must pass a nationally approved course, showing proof when law enforcement officers request it.

While a recreational boater cannot lose his or her education certificate, many states have laws that give the courts the legal authority to suspend a person's boating privileges. For example, in the Commonwealth of Virginia, a recreational boater can lose his or her privilege to operate a boat upon conviction of reckless operation or abuse of alcohol.<sup>1</sup>

## Safely Sharing Waterways

One big dilemma for the modern navigator is the huge increase of non-powered boats using the open waters. By all accounts, there are many more non-powered boats on the water than there are powered boats, and this means they can quickly crowd a waterway. Additionally, non-powered boaters are not required to take a boating course in any state, making it less likely that these operators know enough about the navigation rules to keep them out of harm's way.

For years, there has been talk about regulating the waterways and banning certain boats from operating in certain waters. But this hasn't happened yet, and probably won't—at least not anytime soon. So how can the professionally navigated commercial vessel and the recreationally operated vessel maneuver on the same body of water without creating conflicts? The guide to navigation collision avoidance is, of course, the navigation rules. So let's take a look at the rules and see how we can help avoid a collision by applying them to a power-driven vessel encountering a non-powered vessel.

## Applying the Rules

In this hypothetical encounter, a large commercial power-driven vessel and a group of six kayakers are operating in an open waterway on a clear day during daylight hours. The power-driven vessel is not restricted in her ability to maneuver and is under command. The commercial vessel is

# The Exam

To test students' knowledge, each end-of-course exam contains questions written to specific standards. Each question is referenced to a professional source.

Here are three navigation rules sample test questions the recreational boater may see on a recreational boating safety course final competency exam:

1. According to the navigation rules, and when not in narrow channels or a traffic separation scheme, which of the following vessels is the "give-way" vessel?
  - a. a vessel at anchor in a designated anchorage area
  - b. a power-driven vessel crossing the path of a sailing vessel
  - c. a power-driven vessel being overtaken by a power-driven vessel
  - d. a sailing vessel being overtaken by a power-driven vessel

Ref: Navigation Rules, Rule 18

2. According to the navigation rules, which one of the following vessels, so far as possible, is required to take early and substantial action to keep well clear?

- a. vessel anchored
- b. stand-on vessel
- c. give-way vessel
- d. vessel not under command

Ref: Navigation Rules, Rule 16

3. According to the navigation rules, any action taken to avoid collision shall, if the circumstances of the situation permit, be positive, made in ample time, and with due regard to what?

- a. licensing requirements
- b. rule of gross tonnage
- c. the radar images of all contacts
- d. observance of good seamanship

Ref: Navigation Rules, Rule 8

Answers: 1(b), 2(c), and 3(d)

on a course of 000 degrees true making 10 knots. The group of kayakers are off the starboard bow at a range of 200 yards. The kayakers are steering a course of 270 degrees true, and making 5 knots. Due to constant bearing and decreasing range, a risk of collision exists. What action(s) do these boaters take?

First, let's start by eliminating the rules that don't apply in this scenario: This isn't an overtaking situation, so that eliminates Rule 13. Rules 14 and 15 speak specifically to two power-driven vessels involved in either head-on or crossing situations, so we can eliminate those two rules (since we are dealing with a power-driven vessel and six non-power-driven vessels), and the kayaks are not sailing vessels, so we can eliminate any rule(s) dealing with sailing vessels.

So, what is left? I suggest this scenario is governed by Rules 2, 5, 6, and 8, whereas everybody needs to:

- maintain a proper lookout,
- operate at a safe speed,
- slow down so as to be stopped within a distance to the prevailing circumstances, and
- act in accordance with the rules to avoid collision.

Most importantly, all boaters need to know that nothing in the rules exonerates any skipper from the consequences

of any neglect to comply with these rules or to neglect any precaution that may be required by the ordinary practice of seamen, or by the special circumstances of the case.

It is the ordinary practice of good seamanship that gives us clarity in situations not succinctly covered by other rules. Good seamanship suggests that operators of small-profile paddlecraft should know the limitations of the vessels involved to avoid immediate danger, which may make a departure from these rules necessary and may require them to stay well clear of other vessels.

In conclusion, it should be ordinary practice for all recreational boat operators, powered and non-powered, to take a boating safety education course, obey the navigation rules, and be ever mindful of good seamanship at all times while on our waters.

#### **About the author:**

*Mr. Decker has served 22 years with the U.S. Coast Guard. He was the boating education supervisor for the Commonwealth of Virginia, has authored two boating safety manuals, and is a court-certified expert witness for recreational boating.*

#### **Endnote:**

<sup>1</sup> Virginia courts can order a boater not to operate a watercraft or motorboat upon the waters of the commonwealth for a period of 12 months from the date of a first conviction or for a period of three years from the date of a second or subsequent conviction within 10 years of a first conviction.



# Rethinking the Process

## Who can — or should — teach recreational boating safety?

by Ms. PAMELA DILLON, CAE  
*Education and Standards Director*  
*National Association of State Boating Law Administrators*

National recreational boating organization stakeholders and the U.S. Coast Guard developed the National Recreational Boating Safety Program Strategic Plan (RBS strategic plan) to promote and advance recreational boating safety and to reduce accidents, casualties, and associated health care



On-water competency training should be based on two American National Standards Institute-approved standards: “ANSI/NASBLA 103-2016: Basic Boating Knowledge—Power” and “EDU-1 On-Water Power Standard.” All photos by U.S. Coast Guard.

costs. One of the plan’s objectives addresses skill-based on-water and advanced training.

In partnership with the USCG’s Boating Safety Division, stakeholders have developed a system of voluntary, consent-based standards to measure competency in providing entry-level on-water skill training (see related article “Developing a Safety Culture” in this edition by Mr. Brian Dorval). These standards—with accompanying instructor certification qualifications, procedures, program reporting requirements, risk assessment and reduction approaches, and safety procedures—fill a vital gap in the toolbox for boat operator proficiency training.

### So What’s the Problem?

While sailing and paddling instruction have been widely offered for decades, powerboat instruction has been limited, due in part to somewhat onerous federal regulations requiring USCG merchant mariner credentials in most, but not all, locations where instruction is offered for a fee.

While programs can be successfully launched in the limited venues where USCG merchant mariner credentials are not required, to fully implement skill-based training programs as envisioned by the RBS strategic plan, these courses must become readily available throughout the United States.

Most powerboat instruction programs, even those that national nonprofit volunteer organizations administer, require the student to pay for course-related expenses and to sustain the program. Most nonprofit organizations—which now train, certify, and equip the vast majority of recreational powerboat instructors—receive reimbursement for program expenses such as gas and/or a stipend for their instruction services. Any level of remuneration triggers full application of Title 46 Part 10—Merchant Mariner Credential, specifically requiring either an OUPV (operator of an uninspected passenger vessel) credential or a limited OUPV credential.



But is the captain's license requirement for recreational powerboat operation paid instructors holding us back? The current system for merchant mariner credentials have been developed with the offshore merchant vessel mariner in mind to verify that the credential holder is competent and is not a threat to national security. This rigorous system was not originally developed to certify recreational boating safety skills instructors. That this regulation applies only to individuals who receive reimbursement, and not to these same individuals who might volunteer and receive no reimbursement or other consideration, seems to indicate that this requirement is primarily about revenue and commerce, which are outside the goals of the RBS Strategic Plan.

Ironically, if an interested instructor candidate receives an OUPV credential, the credential does not authorize (nor does it fully prepare) that candidate to teach a course of instruction under the most current systems of national curricula or recognized best practices. The instructor candidate must further complete a defined course of on-water skill performance assessment; obtain certifying organization instructor eligibility requirements; and demonstrate mastery of teaching skills, including student coaching, evaluation, and skill assessment. Once this instructor candidate is fully recognized as a recreational boating safety skills instructor, he or she may teach without an OUPV credential, so long as they remain unpaid.

### **The Financial Barrier**

If obtaining the operator of an uninspected passenger vessel credential to teach paid recreational boating safety courses were a simple, inexpensive, straightforward process, this would not be viewed as an adverse requirement. However, the process takes several months and involves completing multiple steps, forms, and requirements—often at considerable expense (from \$400 to more than \$2,000 when travel is required).<sup>1</sup> OUPV requirements may also include waiting periods and personal visits to locations outside a person's home area to complete background checks and medical testing. Further, OUPV credentials can be denied or delayed based on certain medical findings.

### **Developing a Safety Culture**

The strategic plan of the National Recreational Boating Safety Program 2012–2016 provides a number of strategies that help the boating community reduce fatalities and injuries. One foundation concept is developing a robust safety culture among the boating community.

The challenge for safety professionals is not what needs to be done, but how to translate these concepts into a program's culture. According to noted safety culture author James



Using American national standards (with accompanying instructor certification qualifications/procedures, program reporting requirements, risk assessment/reduction approaches, and safety procedures) will fill a vital gap in boat operator proficiency training.

Reason, a program's culture does not spring up ready-made: *"Organizations, like organisms, adapt. Safety cultures evolve gradually in response to local conditions, past events, the character of the leadership, and the mood of the workforce."*<sup>2</sup>

According to James Reason, training is a universal feature in creating and advancing any safety culture. Just as in boating activities where it is possible to recognize typical accident patterns, it may be possible to recognize, predict, and provide program interventions in areas with historically high fatality rates through a thorough review of cultural factors. Based on this cultural review, targeting on-water skill training in areas of historically high recreational casualties could plant, nurture, and cross-pollinate the seed needed to improve the area's boating safety culture.

On the other hand, a less-than-adequate safety culture can result from a failure to understand the full range of challenges in a program's implementation. This is perhaps why formalized operator training has never been the norm within the recreational boating culture. Reason indicates, *"A poor safety culture is likely to increase the number of defensive weaknesses due to active failures."*<sup>3</sup> Transposing this perspective to the boating safety program, defensive weaknesses include concepts that are readily correctable with the right mix of targeted program intervention. In other words, a poorly developed safety culture will encourage an atmosphere of underperformance, allowing continued predictable and preventable accidents.

Reason further theorizes that a safety culture can be socially engineered. Information is a key component, in that members at all levels must fully understand and respect the challenges facing their program and remain alert to the many ways the program's safety goals can be suppressed. This begs the question: Has the OUPV requirement been suppressing the availability of operator training for the





The RBS community wants to improve boat operator knowledge and competence. The challenge is not what needs to be done, but how to translate these concepts into a program's culture.

recreational boat operator? Would elimination or revision of the OUPV requirement result in improvements to boating safety overall by enhancing the opportunity to receive training from a certified instructor at a reasonable cost? The goal for program dissemination is to lower the accident rate to too few negative outcomes (accidents) to guide additional safety management. With more than 500 annual recreational boating fatalities, the community has a long way to go to improve its safety record. It is time to rethink and reset our approach.

### What is Being Done to Address the Issue?

At the 92<sup>nd</sup> meeting of the National Boating Safety Advisory Council (NBSAC), the members recommended creating an OUPV exclusively for on-water safety instructors for non-profit and for-profit instruction. The requirements to obtain the credential include:

- a TWIC, which is a Department of Homeland Security requirement;
- a drug test and physical exam;
- first aid and CPR courses;
- an on-water requirement to demonstrate proficiency.

NBSAC feedback included:

- That the Coast Guard make it possible for the instructor-candidate to qualify through a course provided by an organization rather than sit for a merchant mariner's examination. Furthermore, as a pre-condition for accepting the course, emphasis should be placed on the individual organization's protocols, which may include emergency and lifesaving procedures that could be incorporated into the class, depending on the type of boating and the conditions for which the instructor was being qualified. The organization's curriculum would

be offered to the USCG's National Maritime Center for approval.

- Alternatives to the final exam to consider using American National Standards Institute national standards for recreational boating on any testing for the program.
- This would be a restricted, portable credential that would adhere to each officer in charge, marine inspection's (OCMI's) geographical limitations.
- Negotiating the possibility of interchangeability to allow an instructor to work in multiple OCMI areas of responsibilities so long as they remain within the geographical limitation set by the local OCMI.
- That it will be crafted around the current OUPV statute rather than creating a new class of license.
- That the credential be all-encompassing, to include current training courses for trainers if proficiency is proven through sea time and passing an approved course.
- That the credential acknowledge any special letter of exemption for sailing due to provisions under the Amateur Sports Act and any other exemptions in existence.
- That because of Department of Homeland Security requirements, there is no remedy for the TWIC card application requirement.

At the conclusion of the meeting, the future direction of this program was placed in the Coast Guard's hands. Members of the RBS community stand willing to assist in any way possible. The concept has been specifically drafted into the 2017–2021 RBS Strategic Plan in hopes that transparency in going forward will help achieve the goal.

### About the author:

*Ms. Pamela Dillon, Certified Association Executive, is the director of education and standards for the National Association of State Boating Law Administrators, where she works to guide and articulate NASBLA's national role as an ANSI-accredited standards developer organization. She served as a boating law administrator for the Ohio Department of Natural Resources, Division of Watercraft and also served two terms as a public member of the National Boating Safety Advisory Council.*

### Endnotes:

<sup>1</sup> USCG requirements to obtain an OUPV:

- Submit an application.
- Apply for a Transportation Workers Identification Card (TWIC): [www.tsa.gov/what\\_we\\_do/layers/twic/index.shtm](http://www.tsa.gov/what_we_do/layers/twic/index.shtm) (Note: Up to a 4-month applicant backlog).
- Get a medical physical using the 719-K form: [www.uscg.mil/nmc/medical/default.asp](http://www.uscg.mil/nmc/medical/default.asp) (Note: Certain medical conditions require additional testing).
- Get a drug test from an approved facility or be enrolled in an approved drug testing program: [www.uscg.mil/nmc/drug\\_testing/default.asp](http://www.uscg.mil/nmc/drug_testing/default.asp) (Note: Approved facilities are not available in all parts of the U.S.).
- Get three letters of recommendation.
- Take an oath (Note: Oath is written for merchant mariners).

<sup>2</sup> James T. Reason, *Managing the Risks of Organizational Accidents*, Ashgate Publishing Limited, Hampshire, England, 1997.

<sup>3</sup> Ibid.



# Hands-on Skills Training

Industry tested, regulatory approved.

by MR. CARL BLACKWELL  
*President, Discover Boating*  
*Chief Marketing Officer*  
*National Marine Manufacturers Association*

For years, it seemed that the regulatory community and the recreational boating industry came from two different schools of thought regarding boating safety. While the regulatory community saw the boating industry as focused solely on lifestyle and fun, the boating industry at times deemed regulatory bodies as severe and overbearing.

However, both groups have a lot of common ground, and one important shared goal—making recreational boating a safe and enjoyable family activity. One of the most successful joint efforts toward that goal is a simple notion: that putting boaters on deck and at the helm for hands-on safety courses is one of the most effective ways to promote safety, education, and enjoyment.

## On-Water Skills

The National Marine Manufacturers Association manages the Foundation for Recreational Boating Safety and Education, which firmly believes that together we must re-examine how we focus on education efforts and make a change to the status quo, which focuses largely on safety messaging outreach and knowledge-based training. While these two elements are important, incorporating a third—on-water skills—is critical.

For example, when analyzing U.S. Coast Guard (USCG) boating accidents statistics, foundation members noted that the top factors in boating accidents consistently involved issues of boater inattention, lack of a proper lookout, unsafe speed, and operator inexperience<sup>1</sup>—in other words, operator-controllable factors.

The Strategic Plan for the National Recreational Boating Safety Program 2012–2016 also acknowledges the need for hands-on training.<sup>2</sup> In support of this objective, the USCG worked with the recreational boating safety community to develop national standards for on-water powerboat skills training.

## Hands-on Skills Training

Based on that concept, the Discover Boating brand—the largest industry campaign focused on getting boaters out on the water—developed the hands-on skills training (HOST) program. Each year, working cooperatively, we continue to learn more about how to best engage boaters in educational and safety efforts.

Training, of course, provides important safety knowledge by preventing accidents and injury, and educated boaters are confident boaters, which adds to their enjoyment of on-water activities. Put simply, a foundational knowledge base regarding boating safety can be an important piece of the puzzle to ensure boater participation, saving time, resources, and lives.

The hands-on skills training program for power boaters teaches fundamental knowledge and skills essential to all



Discover Boating's hands-on skills training program gives boaters and would-be boaters an opportunity to learn proper boat handling and rules of the water from a licensed captain. Here they learn about anchoring. All photos courtesy of Discover Boating.



# Hands-on Training Availability

While the need for expanded access to hands-on training is clear, the current delivery network of on-water training for power boating is virtually non-existent. Even though a few power boater training organizations have increased the number of completion certificates issued for skills training, there are just a handful of providers offering on-water skills training consistently and conveniently for recreational boaters.<sup>1</sup> A focused and sustained effort to fill this void is necessary if the recreational boating community is to strategically address the long-term challenges of reducing accidents and injuries on the water.

It is not only the capacity to deliver that is important, but also the opportunity to deliver. Progress has been made in developing closer working relationships with a number of boating safety organizations and stakeholders. Due to the high level of visibility and success of the HOST program at boat shows, closer working relationships have been developed among safety organizations, stakeholders, and marine businesses. This new level of collaboration could energize the safety community and produce even better results.

Further, education and outreach programs are essential to reducing recreational boating accidents and injuries. However, past grant funding was limited in developing a national capacity to conduct a skills training program. Grant funding must be expanded to include on-water skills training.

## Industry Support

To develop boater skills training programs, we must also directly involve the marine industry business community. These stakeholders have the infrastructure (including boats, slips, and equipment needed) for training as well as direct relationships with boaters. And since we know that on-water skills training not only makes a safer boater, but also makes good business sense, these partners are a natural fit.

Of course a collaborative relationship between the boating safety community and the boating industry remains key. While business benefits exist, training is not a core business purpose. The safety community provides the national reach to implement and sustain skills training, and the Foundation for Recreational Boating Safety and Education is well positioned to bridge any gaps between the industry and the safety community. Through a collaborative approach, the foundation can serve to align those needs and achieve the efficiency and effectiveness of aligned business and safety goals.

### Endnote:

<sup>1</sup> These providers include the Recreational Power Boating Association, US Power Boating, the United States Power Squadron, and a few other power boat schools and "privateers" scattered across the country.

powerboat operators. It is designed for skippers and crew who are new to boating as well as seasoned boaters who have had no formal training, preparing them to handle a boat safely and enhance their skills. HOST is designed as a practical, hands-on, skills-building companion to NASBLA- and state-approved boating safety programs that are typically taught in a classroom setting or online. Working as a natural supplement to these more traditional courses, the hands-on skills training includes themes such as handling, docking, control, anchoring, and essential safety.

The foundation has had great success with the program and credits that success to the step-by-step nature of the training. Too often a boater feels that he or she must master all of the skills in a single course. In contrast, a modular approach like HOST gives boaters a chance to address any insecurity quickly, driving them to complete additional training.

## Industry Response

On the industry side, the recreational community worked with the Foundation for Recreational Boating Safety and Education to use the hands-on skills training program. The foundation, with grants from the USCG, then implemented the HOST program at various boat shows around the country, putting hands-on education directly into the consumer marketplace. The benefits were two-fold: HOST has not only served to change boater's behaviors, but it was also a benefit to business.

For example, upon hands-on skills training program completion, boaters typically improved their attitudes regarding boating safety and the use/need for safety gear, demonstrating they were more open and responsive to these messages and to taking action by using safety gear like personal flotation devices.<sup>3</sup>

HOST also seemed to change the operational behavior of boaters. In surveys conducted of boaters who experienced the hands-on skills training program, findings indicated that they were more aware of their activities and became more defensive boat operators. Furthermore, the surveys indicated that these changes were creating a culture of safety among boaters who had participated in the skills training.<sup>4</sup>

Some additional highlights from the HOST participants' survey include:

- 83 percent believed HOST increased their boating skills.
- 60 percent have sought to share skills gained from the course.

- 70 percent believed the training has helped them to avoid an accident or unsafe situation.
- 36 percent have taken additional training.
- 15 percent have increased their wear rate for life jackets.

When boaters have a higher confidence level in their boating skills, they are more likely to engage other boaters, creating a safe and responsible community. This engagement helps develop the skills of other boaters and provides a multiplier effect from the skills training. Additionally, boaters who've already engaged in skills training are more likely to seek out additional skills training.

In addition to these clear public safety benefits, HOST has also proved to be of great benefit to the recreational boating industry. The surveys showed that, beyond instilling a mind for safety in boaters, the program provided three key business benefits:

- improved boater confidence,
- increased boat usage, and
- increased boat ownership.

For instance, hands-on training works by getting new boaters started on the right foot. Boaters who have skills training show confidence in their ability to operate the vessel, creating a capable boater who is less likely to leave boating because of a bad experience. We also know that boat owners with skills training are found to use their boats more. This overall increase of boating enjoyment also applied to non-owner skills training participants who engage more frequently in boating activities and are therefore more likely to become future boat owners, which benefits the industry's bottom line.

### A Path Forward

While it's clear that the HOST program works, access and availability must be expanded for further impact. The U.S. Coast Guard, in collaboration with many invested stakeholders, is working to standardize knowledge and skills training for the powerboating and other recreational boating communities. Making powerboat skills training readily and conveniently available nationally should be a priority, but there continue to be challenges. Looking on the bright side, these same challenges also offer opportunities for growth and recommendations toward continued development.

As we continue on a path toward making powerboat skills training readily and conveniently available nationally, it will



A licensed captain teaches participants how to dock by coaching them through the process, building their confidence and know-how.

require us to develop a national network of skills training providers, which will in turn require a collaborative, committed effort on the part of the business and safety communities alike. The HOST program provides a proven platform that can be scaled to provide such a national on-water skills training program. Working together as a recreational boating community, and leveraging the marketing and outreach efforts of industry's Discover Boating campaign, we can continue a focused and sustained effort toward our shared goal: ensuring that time spent on the water is safer and more enjoyable for all boaters.

### About the author:

*Mr. Carl Blackwell joined the National Marine Manufacturers Association as chief marketing officer in September of 2003. He oversees all association and boat show marketing and communication efforts. In July 2011, he was appointed president of Grow Boating, Inc., which produces the industry-funded Discover Boating campaign. Prior to joining NMMA, Mr. Blackwell spent eight years with the National Cattlemen's Beef Association, and he has also worked for General Mills, Little Caesars, and Dean Foods in various marketing capacities.*

### Endnotes:

- <sup>1</sup> According to USCG Boating Statistics–1999, nearly 70 percent of all reported accidents involve operator-controllable factors.
- <sup>2</sup> See [www.uscgboating.org](http://www.uscgboating.org).
- <sup>3</sup> The Foundation for Recreational Boating Safety, Education, and Environmental Awareness conducted two surveys of the participants of the Discover Boating HOST program. The first survey was shortly after the training, and a second survey was conducted a year later. These surveys sought to better understand the short- and longer-term effects of HOST training on boaters and boating safety. The initial survey data indicated that 71% of the respondents believed the training had increased their level of safety, and over 80% would take additional training if it were offered. The results of the one-year follow-on survey indicated that 54% of the respondents had an increased awareness of safety; over 61% had shared skills gained from the training; 61% believed the training helped them avoid an accident or unsafe situation; and 18% reported an increase in their life jacket wear rate.
- <sup>4</sup> Ibid.



# LEDs on the Horizon

## Electronic alternatives in the field of VDS.

by MR. MARTIN JACKSON  
Staff Engineer

U.S. Coast Guard Lifesaving and Fire Safety Division

As the Coast Guard considers advanced technology applications for boats and equipment, mariners may neglect certain elements of required safety equipment until vitally needed. One example of a commonly neglected element is the visual distress signal, or VDS. While pyrotechnic smoke markers and flares have been mainstays for VDS requirements, they expire after 42 months and have few disposal options. Eliminating the hazards as well as the storage and disposal issues associated with using pyrotechnic flares is often cited in support of developing electronic alternatives.

### An Alternative

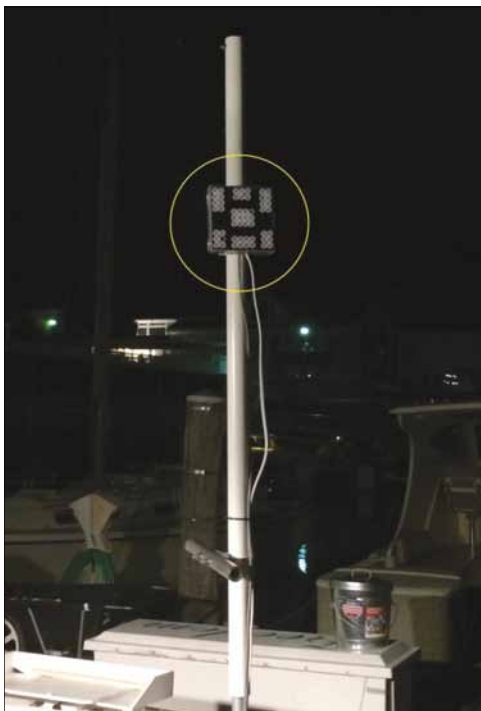
For these reasons, U.S. Coast Guard Research & Development Center personnel are investing significant time and effort on some promising new developments in electronic VDS devices (eVDSDs) that can provide potential safety benefits while also

possibly reducing or eliminating dependence on smoke markers and flares.

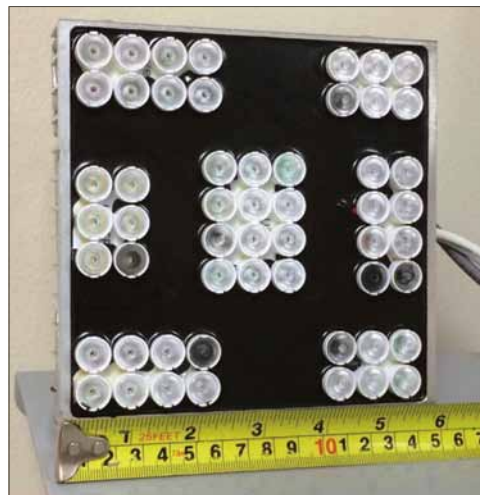
USCG safety regulations currently permit a battery-powered electric VDS device known as an electric distress light for boats on recreational vessels and certain uninspected commercial vessels.<sup>1</sup> It is manufacturer-certified to minimal performance requirements in accordance with USCG regulations. These devices are restricted for nighttime use only as an alternative to pyrotechnic VDSs. When carrying this electric distress light, the mariner must also have an acceptable daytime signal, which may be an orange distress flag, approved smoke signals, or flares.

### Specifications

Future electronic VDS devices are being considered, primarily focusing on a high-performing light-emitting diode (LED)-type of distress signal with multiple color and near-infrared LEDs. Coast Guard studies<sup>2</sup> indicate that certain LED characteristics (flash/color/intensity) will offer a suitable alternative to the USCG-approved handheld red flare. Based on actual field tests, eVDSD detection was found to be greater than the red handheld flare, even though the electronic VDS device has considerably lower intensity.



Signal head mounted on stern of signal vessel. U.S. Coast Guard photo.



Signal generator signal head. U.S. Coast Guard photo.

The conspicuity measure (the ability to quickly and properly identify the distress signal) of these electronic VDS devices was found to be greater than a handheld flare, particularly when coupled with the eVDSD duration time of hours, which far exceeds the short duration time of a flare.

The new distress signal characteristic incorporates a four-Hz flash group of four cyan and three red-orange LED flashes in a timed repeating sequence. While the timing between flashes and color groups is well specified, the intensity can be varied. However, the signal intensity must meet a minimum measured effective



intensity based on a combination of the actual intensity and the flash duration. To enhance night vision detection, a near-infrared (IR) LED flash signal is also incorporated to match the visible LED flash timing characteristic.<sup>3</sup>

### Future Focus

The Coast Guard has received many suggestions to consider laser-based directional devices as acceptable VDSs. U.S. Coast Guard, U.S. Navy, Federal Aviation Administration, and professional rescuers have thoroughly reviewed current laser-based devices, and the consensus is that lasers have limited sightline directionality along with personnel and operational safety considerations that diminish any potential benefit of the long-range detection.<sup>4</sup>

As new electronic VDS devices become available, commercial mariners, recreational boaters, and rescuers alike will need to be able to recognize the call for help with these signaling characteristics that are vastly different from the current VDSs. As a result, once a new eVDSD specification is final, the Coast Guard will be working on revisions to current boating safety and mariner education programs and will consider regulations to promote smooth and effective implementation.

### About the author:

Mr. Martin Jackson is a staff engineer in the U.S. Coast Guard Lifesaving and Fire Safety Division. In addition to other significant lifesaving equipment issues, for the last 10 years he has been involved with the safety and environmental concerns associated with pyrotechnic visual distress signals, and the current initiative for LED eVDSD alternatives.

### Endnotes:

1. "A Boater's Guide to the Federal Requirements for Boats," found at [www.uscgboating.org/assets/1/AssetManager/Boaters-Guide-to-Federal-Requirements-for-Recreational-Boats.pdf](http://www.uscgboating.org/assets/1/AssetManager/Boaters-Guide-to-Federal-Requirements-for-Recreational-Boats.pdf), pages 17-19.
2. U.S. Coast Guard Research & Development Center, "Alternatives to Pyrotechnic Distress Signals; Laboratory and Field Studies," found at [www.dtic.mil/get-tr-doc/pdf?AD=ADA614755](http://www.dtic.mil/get-tr-doc/pdf?AD=ADA614755), Mar. 2015.
3. U.S. Coast Guard Research & Development Center, "Alternatives to Pyrotechnic Distress Signals; Supplemental Report," found at [www.dtic.mil/get-tr-doc/pdf?AD=ADA626626](http://www.dtic.mil/get-tr-doc/pdf?AD=ADA626626), Aug. 2015.
4. U.S. Coast Guard Research & Development Center, "Alternatives to Pyrotechnic Distress Signals; Laboratory and Field Studies," found at [www.dtic.mil/get-tr-doc/pdf?AD=ADA614755](http://www.dtic.mil/get-tr-doc/pdf?AD=ADA614755), page 10, Mar. 2015.

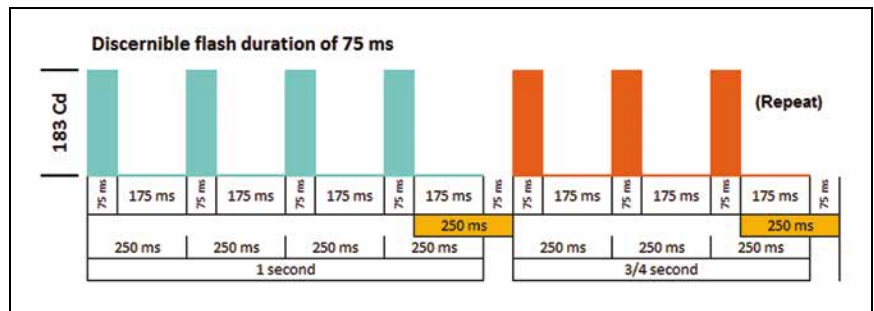
Equipment and devices that are acceptable for carriage requirements come in two categories: manufacturer certified or USCG type-approved.

### Manufacturer Certified

A manufacturer's certified device is typically tested by a laboratory to verify required performance to the applicable Coast Guard regulations. There is currently no formal product quality monitoring other than notifying the Coast Guard once every five years, stating that the device is still being produced. No USCG certificate of approval is required, and none is issued.

### USCG Type-Approved

All pyrotechnic visual distress signals are grouped under the second category, requiring USCG type approval, which requires the manufacturer to hold a USCG certificate of approval. The certificate of approval is valid for five years, and the product is listed in the USCG approved equipment database. This process also includes regulatory requirements for a more formal test process through a USCG-listed laboratory and requires a production quality assurance program during production that is subject to USCG monitoring.



New characteristic LED distress signal at four flashes per second (four cyan followed by three red-orange, repeating). USCG graphic.

### For more information:

For more information on acceptable visual distress signals, refer to the boating safety regulations in 33 CFR 175.130 and the boating safety website at [www.uscgboating.org](http://www.uscgboating.org). For approved devices, visit <http://cgmix.uscg.mil/Equipment/>.

# The National Recreational Boating Safety Program

Reducing casualties, increasing enjoyment.

by MR. JEFF HOEDT  
*Chief, Boating Safety Division*  
*U.S. Coast Guard Office of Auxiliary and Boating Safety*

Recreational boating safety has a long history in the United States. In fact, the first federal boat safety laws were enacted during the first Congress. That's not to say that there were huge numbers of recreational boats back then, but personally owned and operated vessels have been here for centuries.

## **The History**

Moving ahead in time, when outboard motors were invented in the early 1900s, our nation witnessed fast-paced growth in recreational boats. We also witnessed a concerning growth in accidents and casualties, leading to the enactment of the 1910 Motorboat Act, which established the first safety equipment carriage requirements for recreational boats.

Congress has enacted many laws since 1910 regarding boating safety, but only a few have had significant impacts on the National Recreational Boating Safety Program. Those of note include the 1940 Motorboat Act, the Federal Boating Act of 1958, the Federal Boat Safety Act of 1971, and the 1984 Deficit Reduction Act. Each of these either established new boating safety programs or significantly enhanced the boating laws in effect at the time.

## **Federal Funding**

Since 1971, very few federal statutes have been enacted regarding boating safety requirements (vessel numbering, casualty reporting, operational laws, or carriage requirements). Rather, the numerous statutes that have been enacted since then are primarily focused on the federal funding provided to the National Recreational Boating Safety Program. This is the funding that provides the federal financial support to the U.S. Coast Guard, the states, and many national nonprofit organizations relative to their boating safety efforts.

The federal financial assistance (grants) program first established in the 1971 act has evolved tremendously over

the years. At first, the grant program was intended to be time-limited, whereby grants would be provided only for a handful of years as seed money. It was hoped that the grant recipients would continue their boating safety programs without this federal financial assistance. Also, the funding required annual appropriation, but the amount of funding authorized was never fully appropriated. Rather, just a portion of the authorized amount was appropriated each year. And lastly, the federal funding was general tax dollars, not user fees. Perhaps that, and the fact that any appropriation to this program was scored against the U.S. Coast Guard's budget, is why Congress didn't appropriate a full authorized amount during those years.<sup>1</sup>

When the authorization for the initial 1971 act expired, Congress quickly extended the authorization, but still used general tax dollars to support the program, limiting the amount of funding appropriated. In fact, over a three-year period in the early 1980s, Congress did not appropriate any money for the program, as available general tax dollars were very limited and the competition for such funding was great.

## **Trust Fund Evolution**

Then, in 1984, the program took a great turn regarding funding. Congress enacted the Deficit Reduction Act, which included significant changes to the funding provided to the National Recreational Boating Safety Program and created the Aquatic Resources Trust Fund. So, for the first time (especially relative to the boating community), special federal taxes users paid for their boating activity would go into a trust fund to support boating safety efforts.

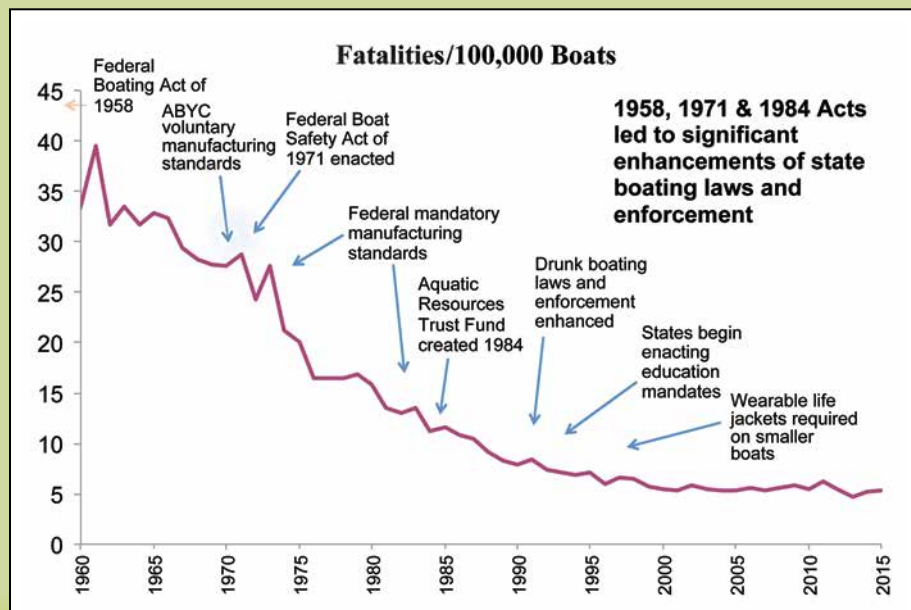
Stakeholders still expressed concerns, however, with how the funding was provided to boating safety, as it still required an appropriation—and Congress still did not appropriate the full authorized amount in any year. That's

# The Stats

For 13 years (from 1999 to 2011), the number of recreational boating fatalities basically plateaued, bouncing between 672 to 758 per year. Also during this time, the number of registered boats descended as the economy took a downturn and fuel prices were high. We had begun to wonder if our efforts to improve safety had been maximized.

Then, beginning in 2012, the program experienced a much-desired, evolutionary decrease in the number of recreational

boating deaths. The number dropped to a record low of 651 that year, and then to another record low of 560 in 2013. We began to wonder if this was an oddity or if a new trend was occurring. In 2014, we experienced 610 deaths. In 2015, we experienced 626 deaths; and, for 2016, it appears that the final number will again be below those experienced between 1999 and 2011. Now, with five years in a row of lower numbers, we believe that a new trend has been established and that boating continues to be safer.



U.S. Coast Guard graphic.

What is also impressive about these lowering fatality numbers is that boating is growing again. While the number of registered boats (primarily motorboats) did drop over the course of a decade, it has leveled off, and it even grew slightly in 2015.

More impressive, though, is the large growth in the number of paddlecraft (primarily kayaks and paddleboards, which are typically not required to be registered). We don't have actual figures for the number of these vessels sold, but the manufacturers indicated that their sales in the past year were in the range of hundreds of thousands.

So that means we have an increasing number of watercraft and decreasing fatalities. While no death is acceptable, this trend gives us encouragement that our efforts are working.

why various entities worked with Congress over the following three decades to evolve the funding method to what it is today.

In 2005, Congress repealed the Aquatic Resources Trust Fund and replaced it with the Sport Fish Restoration and Boating Trust Fund. With this new trust fund, all of its revenues were included in the Department of Interior's budget, which is not scored by the addition of trust fund/grant monies to its budget. That agency then transfers the boating safety portion of this trust fund to the Coast Guard, circumventing any scoring issue.

Under the current statutes, the special taxes all motorboaters, fishers, and small gasoline-powered engine owners pay support the Sport Fish Restoration and Boating Trust Fund. Under this paradigm, Congress no longer makes an annual appropriation. Instead, revenues collected in a previous year automatically become the following year's appropriation.

## Reauthorization

What isn't automatic or permanent is the authorization for the program to continue, or for some tax dollars to be transferred to the trust fund. Rather, such authorization is time limited. For a couple of decades, Congress enacted five-year reauthorizations. Then it got more complicated. The reauthorizations needed for this trust fund and program got connected to the Highway Bill,<sup>2</sup> and for several years, Congress opted to enact only short-term reauthorizations ranging from just a few weeks to up to about a year and a half. These short-term reauthorizations created significant hardships for the recreational boating safety program, as the grant recipients would only receive partial funding during the year, inhibiting their ability to implement their programs on an annual basis and creating an additional workload and delays for the federal agencies administering these funds.

During these years, many entities encouraged Congress to enact a longer-term reauthorization, noting that since the



1971 act, the number of recreational boats had more than doubled, yet the number of boating-related deaths was cut to less than one half. This is an incredible accomplishment that could only have been reached with federal financial support and coordination among the federal government, states, and organizational stakeholders.

### Continuing Efforts

According to our 2012 National Recreational Boating Survey, there are more than 21 million recreational boats in the United States. When the next survey is completed (hopefully in 2017–2018), we'll be anxious to see just how many more boats are in our country, following impressive sales estimates.

With the continuing high participation in recreational boating, and with the need to bring casualty numbers down (as any loss of a boater's life is a loss to our community), it will take continuing resolve from the boating safety community to implement and continue effective safety efforts. Of course, continued federal resources that have been the backbone of the program are necessary in conjunction with the impressive resources of the many states, volunteer organizations, the boating industry, and the many nonprofit organizations that make up this community.

On the federal resource side, late 2015 proved to be a great time for our program, as the Sport Fish Restoration and Boating Trust Fund was reauthorized for an extended period, with sections being extended through 2020, 2021, and 2022. Now, with this longer-term reauthorization, the many stakeholders within the community can make annual plans and implement annual programs without hesitation regarding resource availability.

So, what is the current state of the National Recreational Boating Safety Program here in the United States? It's great—and getting even better:

- The numbers of boats and boaters are growing, where more Americans are enjoying incredible experiences on our nation's diverse and spectacular waterways.
- Federal financial assistance is basically locked in for the next 4 to 5 years.
- The ultimate goal of reducing casualties while enhancing enjoyment is being fulfilled.

This is truly a success story—one that needs to go on. So please join with us in this effort to help America's boating community. Together, we make an incredible difference that enhances our quality of life, economy, and safety.

### About the author:

*Mr. Jeff Hoedt is the chief of the Boating Safety Division within the Coast Guard's Office of Auxiliary and Boating Safety. He manages the Coast Guard's programs related to recreational boating safety, including legislative and regulatory efforts, data collection and analysis, strategic planning, budgeting, grants, operations, and product assurance.*

### Endnotes:

<sup>1</sup> The scoring issue, which is a situation where an agency's general revenue (discretionary) budget is reduced by the same amount as the grant funds that are added to its budget, was resolved when Congress amended the program in 2005.

Now, all of the grant funds are included in another agency's budget that grows by the amount of grant funds added to their appropriation. That other agency then transfers the boating safety grant funds to the Coast Guard, as according to current statute.

<sup>2</sup> The Transportation Bill is commonly referred to as the "Highway Bill." This is typically a massive bill that addresses highway funding, along with a myriad of other transportation issues. The reason for attaching the Sport Fish Restoration and Boating Trust Fund reauthorizations to the Highway Bill is due to the fact that the majority of revenues to the Sport Fish Restoration and Boating Trust Fund are motorboat fuel tax dollars and small engine fuel tax dollars. These fuel taxes are initially deposited in the Highway Trust Fund and then transferred from there to the Sport Fish Restoration and Boating Trust Fund.

### For more information:

History and statistics courtesy of the U.S. Coast Guard Office of Auxiliary and Boating Safety. Visit the website at [www.uscgboating.org](http://www.uscgboating.org).

# Understanding Lithium-ion Batteries

by LT MARGARET WOODBRIDGE  
*Mechanical Engineer  
Marine Safety Center  
U.S. Coast Guard*

## What are they?

Lightweight and versatile, lithium-ion (Li-ion) batteries are found in consumer electronics, medical devices, electric vehicles, and industrial equipment. In addition, Li-ion batteries are now being used in large-scale power applications, including electric and hybrid ship propulsion systems and as components of land-based electric grids.

Li-ion refers to a large family of batteries in which lithium ions move between a cathode and an anode (typically lithium metal oxide and lithiated carbon, respectively) while charging and discharging, taking advantage of the high chemical potential and lightweight nature of lithium metal.

## Risk Factors

### ► *Fire or Explosion Concerns*

The same high-energy density that makes Li-ion batteries useful also gives them the potential to fail catastrophically in an event known as thermal runaway—an uncontrolled exothermic chemical reaction with the potential to cause battery overheating, module rupture with release of toxic or flammable chemicals or vapors, or even explosion. Thermal runaway may occur as a result of manufacturing defects; external heating; or mechanical or electrical abuse, including repeated operation of the battery outside of its design limits.

### ► *Spill and Health Concerns*

Li-ion batteries may contain electrolytes that cause chemical burns or produce toxic or flammable vapors. Use caution if liquid is leaking from a battery module. The material safety data sheet and other manufacturer documentation contains detailed information on specific chemical hazards.

### ► *Shipping Concerns*

Title 49 of the Code of Federal Regulations contains packaging, marking, and shipping requirements, and specifies that batteries must be subjected to a number of durability

tests before transport. Several safety devices are required to minimize the risk of thermal runaway, including a venting device and an effective means of preventing external short circuits.

### ► *Other Concerns: Charging/Discharging Onboard Vessels*

An increased risk of thermal runaway exists if large Li-ion battery packs are electrically charged or discharged aboard a vessel, or are used as part of a power system. There should be monitoring and protection circuits, and the location of the battery pack should be carefully considered. Mitigating factors include physical separation of the battery compartment from passenger spaces or hazardous areas, ventilation of discharged gases to a safe area, and fire detection and suppression in the battery compartment.

## What is the Coast Guard doing about it?

Li-ion batteries present a very unique set of safety concerns. While proper transport is addressed in regulation, owners and designers interested in installing Li-ion batteries in a shipboard power system should contact their local officer in charge, marine inspection and the Marine Safety Center to determine if the proposed installation configuration and operating procedures can be accepted as an alternative to existing regulatory standards.

### *About the author:*

*LT Margaret Woodbridge is a mechanical engineer at the U.S. Coast Guard Marine Safety Center, where she reviews engineering plans for U.S.-flagged commercial vessels.*

### **References:**

- 49 Code of Federal Regulations 172.101, 172.102, and 173.185 (2016).
- The Fire Protection Research Foundation “Lithium-Ion Batteries Hazard and Use Assessment: Final Report” (2011).
- UL “Safety Issues for Lithium-Ion Batteries” (2012).
- NAVSEA S9310-AQ-SAF-010, “Navy lithium battery safety program responsibilities and procedures,” Rev. 2 (2010).

# Nautical Engineering Queries

Prepared by NMC Engineering  
Examination Team

# Q

uestions

- 1. An autotransformer is equipped with a 50 percent tap, a 65 percent tap, and an 80 percent tap. Which of the following statements is true concerning a load connected to the 50 percent tap?**
  - A. The load is receiving one-half of line voltage and drawing one-half of line current.
  - B. The load is receiving one-half of line voltage and drawing two times line current.
  - C. The load is receiving two times line voltage and drawing one-half of line current.
  - D. The load is receiving two times line voltage and drawing two times line current.

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- 2. If passive recovery is used on a small appliance fitted with a capillary tube as a metering device with a non-operating compressor, the recovery should be made through what means?**
  - A. recovery from the high side only
  - B. recovery from the low side only
  - C. recovery from both the high and low sides
  - D. by venting to the atmosphere, as the refrigerant cannot be recovered

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- 3. As a general rule, what would be the recommended operating jacket water outlet temperature range from the engine for medium-speed marine diesels set up with a closed, treated, freshwater cooling system and fitted with vented expansion tanks?**
  - A. 105° to 120° F
  - B. 135° to 150° F
  - C. 165° to 180° F
  - D. 195° to 215° F

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- 4. The stamped full weight of a 100-lb. CO<sub>2</sub> cylinder is 314 lbs. What is the total minimum weight of the cylinder before it must be recharged?**
  - A. 282 lbs.
  - B. 294 lbs.
  - C. 300 lbs.
  - D. 304 lbs.



The banner features a background of nautical equipment including a sextant on the left and coiled ropes on the right. The title 'Nautical Deck Queries' is written in a large, white, stylized font. To the right, a large white letter 'Q' is followed by the word 'uestions' in a smaller, italicized font.

# Nautical Deck Queries

Prepared by NMC Deck Examination Team

# Q

uestions

1. **INTERNATIONAL ONLY:** In a narrow channel, an overtaking vessel intends to PASS on the other vessel's port side. This overtaking action can only take place if the vessel to be overtaken takes action to permit safe passing. Which signal would the overtaking vessel sound?
  - A. one prolonged blast followed by two short blasts
  - B. one short blast
  - C. two prolonged blasts followed by two short blasts
  - D. two short blasts

---
2. **Sweat damage in a hatch full of canned goods in cartons will occur when which conditions exist?**
  - A. when the air temperature is higher than the temperature of the cargo
  - B. when the air temperature is lower than the temperature of the cargo
  - C. when the dew point is higher than the temperature of the cargo
  - D. when the dew point is lower than the temperature of the cargo

---
3. **What U.S. agency is responsible for NAVAREA warnings?**
  - A. Coast Guard
  - B. National Oceanic and Atmospheric Administration
  - C. National Ocean Service
  - D. National Geospatial-Intelligence Agency

---
4. **"Thermal protective aids" are required for what percentage of the persons a survival craft is equipped to carry?**
  - A. 10 percent
  - B. 50 percent
  - C. 75 percent
  - D. 100 percent

1. Note: Conventional voltage transformers and auto-transformers obey the law of the conservation of energy, which states that energy can neither be created nor destroyed, only altered in form. Expressed mathematically:  $(P)(in) = (P)(out)$  thus,  $(V)(in) * (I)(in) = (V)(out) * (I)(out)$
- A. The load is receiving one-half of line voltage and drawing one-half of line current. Incorrect answer. This represents a situation where the output power is one-fourth the input power, which is in violation of the law of the conservation of energy.
- B. The load is receiving one-half of line voltage and drawing two times line current. **Correct answer.** This represents a situation in which the transformer is configured as a step-down transformer. Connecting a load to the 50 percent tap of the transformer results in the output power equaling the input power, in accordance with the law of the conservation of energy.  $(P)(in) = (P)(out)$  thus,  $(V)(in) * (I)(in) = (V)(out) * (I)(out)$
- C. The load is receiving two times line voltage and drawing one-half of line current. Incorrect answer. Although this represents a situation where the output power is equal to the input power, the transformer would need to be configured as a step-up transformer for the load to receive twice the line voltage. This is not possible when a load is connected to the 50 percent tap of the transformer.
- D. The load is receiving two times line voltage and drawing two times line current. Incorrect answer. This represents a situation where the output power is four times the input power, which is in violation of the law of the conservation of energy.
- 
2. Note: Passive recovery is a recovery method that utilizes the refrigeration system's internal pressure and/or compressor to remove refrigerant from the system. This method of recovery can only be used with appliances that contain 15 lbs. or less of refrigerant.
- A. recovery from the high side only. Incorrect answer. Choice "C" is the only correct answer.
- B. recovery from the low side only. Incorrect answer. Choice "C" is the only correct answer.
- C. recovery from both the high and low sides. **Correct answer.** If the compressor of a small appliance fitted with a capillary tube metering device fails, the system pressure will equalize across the low- and high-pressure sides. To speed the recovery process as well as achieve the required recovery efficiency requirements, recovery should be made from both the low and high sides.
- D. by venting to the atmosphere, as the refrigerant cannot be recovered. Incorrect answer. As long as there is evidence of a refrigerant charge remaining in the system, the technician is obligated to properly recover the refrigerant to the levels required by law. Venting the refrigerant to the atmosphere is prohibited under the Clean Air Act rules.
- 
3. Note: As a general rule, closed treated freshwater cooling systems are maintained at a temperature as high as practical for thermal efficiency purposes while minimizing the risk for boil-over.
- A. 105° to 120° F. Incorrect answer. Although very unlikely to boil over, this temperature would produce comparatively very low thermal efficiency.
- B. 135° to 150° F. Incorrect answer. Although unlikely to boil over, this temperature would produce comparatively low thermal efficiency.
- C. 165° to 180° F. **Correct answer.** This temperature would produce comparatively high thermal efficiency and is unlikely to boil over.
- D. 195° to 215° F. Incorrect answer. Although this temperature would produce comparatively very high thermal efficiency, it is very likely to boil over.
- 
4. Note: If the stamped full weight of a 100-lb. CO<sub>2</sub> cylinder is 314 lbs., 314 lbs. represents the gross weight of the cylinder (cylinder plus contents). 100 lbs. represents the net weight (contents), and the difference is the tare weight (empty cylinder), which in this case is 214 lbs. The CO<sub>2</sub> cylinder is required to be recharged when inspection reveals that 10 percent of the charge weight has been lost. 10 percent of 100 lbs. is 10 lbs. 314 lbs. minus 10 lbs. equals 304 lbs. Therefore, 304 lbs. is the minimum weight of the cylinder before it must be recharged.
- A. 282 lbs. Incorrect answer. 282 lbs. minus 214 lbs. equals 68 lbs., which means 32 percent of the original 100-lb. charge weight has been lost.
- B. 294 lbs. Incorrect answer. 294 lbs. minus 214 lbs. equals 80 lbs., which means 20 percent of the original 100-lb. charge weight has been lost.
- C. 300 lbs. Incorrect answer. 300 lbs. minus 214 lbs. equals 86 lbs., which means 14 percent of the original 100-lb. charge weight has been lost.
- D. 304 lbs. **Correct answer.** 304 lbs. minus 214 lbs. equals 90 lbs., which means 10 percent of the original 100-lb. charge weight has been lost. This represents the minimum total (gross) weight of the cylinder before recharging is required.

1. A. one prolonged blast followed by two short blasts  
B. one short blast  
C. two prolonged blasts followed by two short blasts

Incorrect answer.

Incorrect answer.

**Correct answer.** Reference: International Rule 34(c)(i).

Rule 34(c)(i) states: "(c) When in sight of one another in a narrow channel or fairway: (i) a vessel intending to overtake another shall in compliance with Rule 9(e)(i) indicate her intention by the following signals on her whistle:

– two prolonged blasts followed by one short blast to mean "I intend to overtake you on your starboard side";

– two prolonged blasts followed by two short blasts to mean "I intend to overtake you on your port side."

- D. two short blasts

Incorrect answer.

- 
2. A. when the air temperature is higher than the temperature of the cargo  
B. when the air temperature is lower than the temperature of the cargo  
C. when the dew point is higher than the temperature of the cargo

Incorrect answer.

Incorrect answer.

**Correct answer.** Reference: Cargo Notes, Dhananjay Swadi, 2<sup>nd</sup> Edition, page 15.

In such a case, ventilation should be restricted until the temperature of the cargo is above the dew point temperature of the outside air.

- D. when the dew point is lower than the temperature of the cargo

Incorrect answer.

- 
3. A. Coast Guard  
B. National Oceanic and Atmospheric Administration  
C. National Ocean Service  
D. National Geospatial-Intelligence Agency

Incorrect answer.

Incorrect answer.

Incorrect answer.

**Correct answer.** Reference: Pub. 117, Radio Navigational Aids, 2005, page 3-3.

The National Geospatial-Intelligence Agency is the area coordinator for both NAVAREA IV and XII. As the area coordinator, it assimilates information from the U.S. Coast Guard, who acts as the U.S. national coordinator.

- 
4. A. 10 percent

**Correct answer.** Reference: 46 CFR Table 199.175 states that lifeboats, rigid life rafts, and rescue boats on international voyages and short international voyages shall be equipped with thermal protective aids to accommodate 10 percent of the persons the survival craft is equipped to carry, but not less than two.

- B. 50 percent

Incorrect answer.

- C. 75 percent

Incorrect answer.

- D. 100 percent

Incorrect answer.



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