



## Exploring the National Recreational Boating Safety Surveys (NRBSS)

A webinar of the  
National Association of State Boating Law Administrators  
Presented by the Engineering, Research & Analysis Committee

Thursday, May 12, 2022

Good afternoon and welcome to the Exploring the National Recreational Boating Safety Surveys (NRBSS) webinar.



**Welcome!**



I'm your host for today's webinar

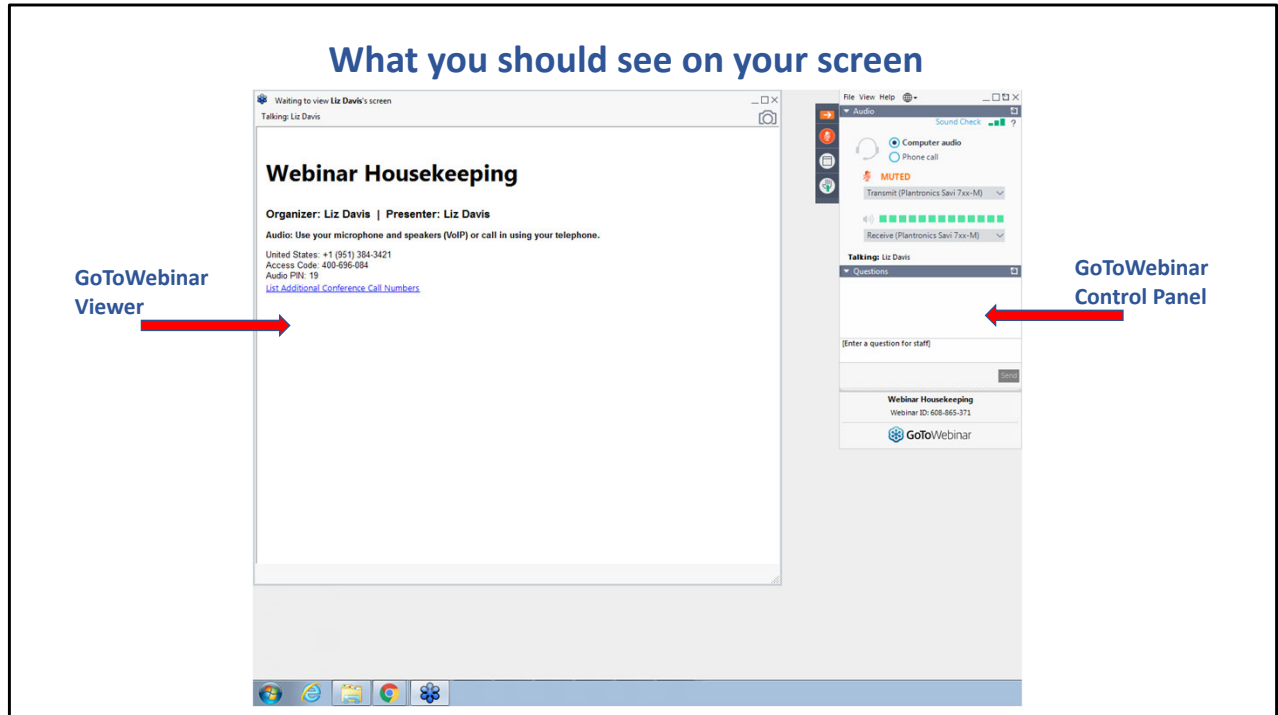
**Ron Sarver**

NASBLA's Chief of Knowledge & Learning Management  
ron@nasbla.org

I'm Ron Sarver, NASBLA Chief of Knowledge & Learning Management, and I am pleased to serve as today's host for this webinar.

First, I'd like to review a few of the logistics for this webinar.

## What you should see on your screen



On your screen.

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Choose Computer audio to use VOIP  
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The screenshot shows the GoToWebinar control panel. The top section is the 'Audio' panel, which includes a 'Sound Check' indicator, radio buttons for 'Computer audio' (selected) and 'Phone call', a 'MUTED' status, and dropdown menus for 'Transmit' and 'Receive' audio devices. The bottom section is the 'Questions' panel, which has a text input field with the placeholder '[Enter a question for staff]' and a 'Send' button. The bottom of the panel shows the webinar title 'Webinar Housekeeping', the ID 'Webinar ID: 608-865-371', and the GoToWebinar logo.

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To ask questions today:

- Submit your text questions using the Questions panel.

To respond to polls (multiple choice), you will be able to click choices on the screen or for open-ended questions, type in the Questions panel or “raise your hand” and talk when you are unmuted.



**Today's speakers are members of NASBLA's Engineering, Reporting & Analysis Committee (ERAC)**

- Seth Wagner, ERAC Chair, Florida
- Joanna Andrade, California
- Jonathan Hsieh, U.S. Coast Guard's Boating Safety Division
- Tamara Terry, ERAC Charge Team Leader, Ohio

Our speakers today are members of NASBLA's ERAC.

Seth Wagner is a lieutenant in the Boating & Waterways Section of the Florida Fish & Wildlife Conservation Commission (FWC). His primary duties include reviewing all incident reports that occur in Florida and entering that data into the Coast Guard's Boat Accident Report Database (BARD). Seth is responsible for creating an annual boating incident statistical report for his state and providing statistical data to multiple sections within FWC and other agencies for improving boating safety. He is currently Chair of ERAC.

Joanna Andrade with the California State Parks and Recreation, Division of Boating and Waterways, has served on the ERAC committee for 2.5 years. Joanna has been with the division in California for over 5 years. She currently oversees the recreational boating incident program for the division, among various other boating safety programs.

Jonathan Hsieh is a management and program analyst with the Coast Guard's Office of Auxiliary and Boating Safety's Division of Boating Safety. In this capacity, he is responsible for boating safety data analysis and research. He is also the Program Manager for the National Recreational Boating Safety Survey that we'll be talking about today.

Tammy Terry current serves as a Natural Resources Law Enforcement Program Manager for the Ohio Department of Natural Resources Division of Watercraft and has been employed with the Department since 1994. Tammy is also a past Chair and has led numerous charges for ERAC.

## FIRST QUICK POLL

Which of the following best describes you?

- State Boating Law Administrator/Designee or Other State Personnel --- **50%**
- U.S. Coast Guard / Other Federal Personnel --- **7%**
- Recreational Boating Organization/Nonprofit Representative --- **21%**
- Boating Industry Representative/Manufacturer --- **7%**
- Other --- **14%**



### An ERAC WELCOME from Seth Wagner, Chair

- ERAC has had a long-time interest in the NRBSS for the benefit of NASBLA's membership
- Getting into the 'guts' of the 2012 surveys was good preparation for reviewing the 2018 products
- Strong partnership with the CG-BSX survey specialists
- Given potential use of results for evaluating state-to-state program effectiveness, NASBLA-USCG Memorandum of Understanding 'codifies' the give-and-take on these survey efforts
- GOALS: benefit States and other key users by relaying important information AND help CG-BSX as it gauges the surveys' value and usage

I'd like to add my welcome on behalf of the members of ERAC and especially the charge team you'll be hearing from today.

ERAC has had a decade-long interest in the national boating surveys. The committee started exploring the surveys even before the 2011 and 2012 reports were released in 2014 and worked closely with Coast Guard Boating Safety Division statisticians to understand how those surveys were done, to learn whether exposure hours really could become the gold standard to replace the number of registered boats as denominators in fatality and casualty risk ratios, and whether the data could be mined and used by individual states.

But the interest went beyond using the data and assisting the states in understanding the ins and outs of the surveys to offering suggestions to the Coast Guard for future efforts based on ERAC's examinations of the survey methods and questionnaires. In fact, given the potential for the survey data to be used for evaluating state-to-state program effectiveness, the Memorandum of Understanding between the Coast Guard and NASBLA incorporates a provision assuring that the Coast Guard will receive and respond to NASBLA's recommendations regarding the surveys.

So, when the 2018 participation and exposure survey reports were released in late 2020, ERAC was on task, ready to dive into the methodology and findings of this latest iteration – with the intent of assisting states in getting a better handle on the survey mechanics and results. That's one of the purposes of today's webinar.

Once again, the work is being done in partnership with the Coast Guard's Boating Safety Division in the hope that we can benefit the states by relaying important information and at the same time assist the Coast Guard as it gauges the value of these surveys, who is using the results and how they're being used.

What you'll see on the next two slides are the two places on the internet where you're going to find the most information about the national boating surveys----

<https://uscgboating.org/statistics/national-recreational-boating-safety-survey.php>

**NATIONAL RECREATIONAL BOATING SURVEY (NRBS)**

**National Recreational Boating Safety Survey (NRBSS)**

The National Recreational Boating Safety Survey (NRBSS) – The NRBSS Information collection project enables the USCG to better identify safety priorities, coordinate and focus research efforts, and encourage consistency in the information that is collected as well as the applied analysis Methods.

The NRBSS data and estimates are used to (1) identify and analyze boating participation trends; (2) better understand the characteristics of at-risk boating populations; (3) more effectually design and efficiently target boating safety education and outreach campaigns; and (4) more objectively and consistently assess the performance of education, regulations, and enforcement intended to reduce boating accidents.

The NRBSS Web-based Data Access and Query System (DAQS) enables users to generate tables and charts from the 2018 survey data using predefined queries and filters. The DAQS is available at <https://boatingsurvey.org/>

The 2018 National Recreational Boating Safety Survey Methodology Report is available upon request via email to [RBSinfo@uscg.mil](mailto:RBSinfo@uscg.mil)

**Quick Links**

**SAFE/FLOAT**

**WEAR IT**

**OPERATION DRY WATER**

**Boating Safety Mobile App**

United States Coast Guard

In early December 2020, the **Coast Guard announced the release of the results** of the 2018 **participation** and **exposure hours** surveys. During the 2021-2022 committee cycle, ERAC is once again exploring and evaluating the survey findings and methodologies with an eye toward developing products that can assist the states in practical application of the data to their RBS programs.

One of those efforts--national webinars to be conducted **May 10, 2022 @ 11am Eastern and repeated May 12, 2022 @ 3pm Eastern**, will give background on the 2018 surveys.

**NATIONAL RECREATIONAL BOATING SURVEYS**

Recreational Boating Surveys  
Methods of how the participation  
Benefits of using exposure hours as  
of state-level data. Products  
Guard--are presented here.

**The NASBLA Lighthouse**  
*Guiding you through recreational boating data and research challenges ... Alerting you to issues affecting your work ... Shining a light on successful practices ...*

...the Coast Guard's Boating Safety Division webpage that includes links to current and past survey reports ...



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BOATING SAFETY PARTNERS

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<https://www.nasbla.org/nasblamain/lighthouse/get-equipped/boating-survey>

## NATIONAL RECREATIONAL BOATING SAFETY SURVEYS (NRBSS)

**National Recreational Boating Safety Survey (NRBSS)**

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The 2018 National Recreational Boating Safety Survey Methodology Report via email to [RBSInfo@uscg.mil](mailto:RBSInfo@uscg.mil)

In 2014, the results of the U.S. Coast Guard's 2012 National Recreational Boating Surveys were released. NASBLA/ERAC spent hours seeking explanations of how the participation and exposure hours data were generated, considering the merits of using exposure hours as the denominator in risk ratios, and developing compilations of state-level data. Products associated with those explorations—by ERAC and the Coast Guard—are presented here.

In early December 2020, the [Coast Guard announced the release of the results](#) of the 2018 [participation](#) and [exposure hours](#) surveys. During the 2021-2022 committee cycle, ERAC is once again exploring and evaluating the survey findings and methodologies with an eye toward developing products that can assist the states in practical application of the data to their RBS programs.

One of those efforts—national webinars to be conducted May 10, 2022 @ 11am Eastern

**The NASBLA Lighthouse**  
*Guiding you through recreational boating data and research challenges ... Alerting you to issues affecting your work ... Shining a light on successful practices ...*

... and ERAC's Lighthouse Get Equipped page that has ERAC's products resulting from the 2012 survey and will include products from the 2018 and beyond.

Let's get started ....

**National Recreational Boating Safety Survey**  
Exposure Survey Final Report

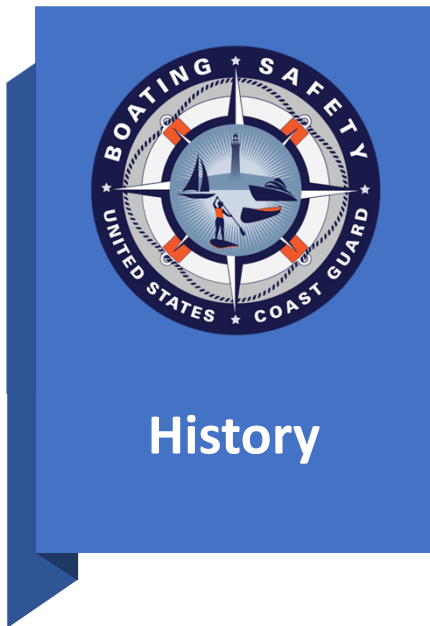
Prepared for  
United States Coast Guard  
Boating Safety Division  
(CG-BSX-21)  
2703 Martin Luther King, Jr. Ave. SE  
Washington, DC 20355-3801

Prepared by  
**RTI International**  
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[jonathan.c.hsieh2@uscg.mil](mailto:jonathan.c.hsieh2@uscg.mil)

## History and Purpose

Thanks Seth, and thank you all who've joined us to today to talk about the National Recreational Boating Safety Survey. I'm excited to give you some more information about these surveys, hope that you will take something away from this webinar, and hope for your continued engagement as we look to field a future Nationwide Survey.



- NRBSS is the U.S. Coast Guard's method for estimating the totality of recreational boating in the United States
- Surveys conducted in 2018, 2012, 2002, 1992, 1989, 1976 and 1973
- Public Law No: 117-58, the Infrastructure Investment and Jobs Act, authorizes the Coast Guard to conduct the NRBSS and spend \$1.5M/year
- NRBSS sets the foundation for going beyond the 'traditional' # accidents/100,000 registered boats measurement by using the entire population
- Gives the Coast Guard more ways to measure risk in order to achieve goals set in the National RBS Strategic Plan

These surveys are the method in which the U.S. Coast Guard gains a nationwide picture into boating. There are many gaps in recreational boating data for which a survey helps fill that gap. These are gaps such as estimating the unregistered boat population and determining overall usage (or what we call exposure) of boats – a figure needed to determine overall risk. The Coast Guard collects very good accident data, and the survey helps complement that. Survey data also helps us look at trends in boating and socioeconomic indicators so we can better understand who is going boating in the United States.

We've conducted seven of these surveys since the early 1970s. These range from phone surveys to a survey administered by the American Red Cross in the early 90s.

By law, we are authorized to spend up to \$1.5 million dollars a year to conduct a survey

In the Coast Guard's annual statistics publication, the traditional measurement of risk is fatalities/total vessel registration or per 100,000 registered vessels in a state. The usage or exposure data in the NRBSS allows us to go past that and measure these data a few different ways, basing it on usage and not registration numbers and also being able to compare metrics within a state – such as looking at motorized vessel or human-powered vessel risk.

These new methods of calculation allow us to measure risk more effectively and better inform our decision making toward the initiatives outlined in the National RBS Strategic Plan. Some goals and objectives in our strategic plan include: improving our overall calculation of risk, devising an evidence-based approach such as utilizing the public health approach to better the calculation of risk. We currently have a nonprofit grant with NASBLA and the Safe States Alliance to study just that.

## Why We're Having This Webinar Now

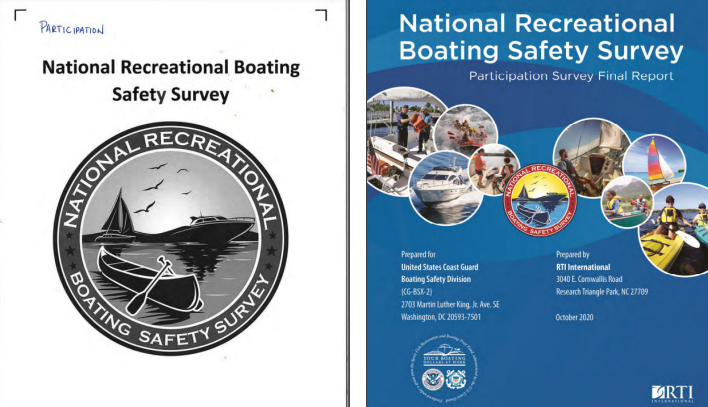
- **High staff turnover** – Many Coast Guard staff, State Boating Law Administrators and other State staff are newer to their boating safety positions → loss of previous, institutional knowledge of the NRBSS
- **Building the use case for a future NRBSS** – Coast Guard needs to know if and how our survey data are being used
- **General stakeholder outreach on the NRBSS** to increase awareness of the meaning, uses and potential impact of the survey results

So why are we doing these webinars now?

We have had many new faces, including myself, join our boating safety community in the last decade since the last survey was conducted 2012. All of the Coast Guard staff that had conducted the 2018 survey have since retired or moved on to new positions... so imagine the position of being the new guy in this role.

Therefore, we're trying to build a base of knowledge in which we can utilize the 2018 results effectively and build a use case for a future survey. The polling questions in this webinar are designed to help us determine if we're doing a good job marketing the survey. If not, consider this our entry into helping market our product better.

# 2018 Participation Survey

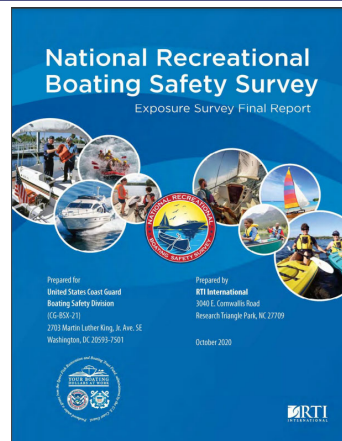
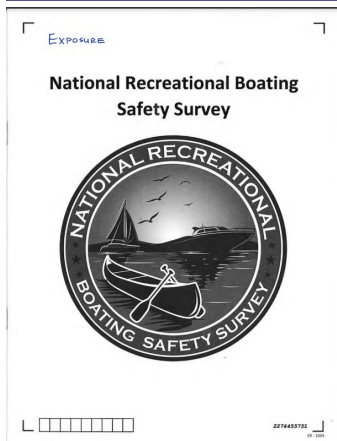


- **How Many Boaters?** – Produced reliable national and regional estimates of the number of recreational boaters in the U.S. population, including socioeconomic indicators
- **Activity and Ownership** – What does the population do out on the water? How are they doing it?
- **Boater Education** – What kinds of safety education do boaters have?

So what does the 2018 survey consist of?

It was actually two surveys. The first was the participation survey which calculated how many people went boating in the United States and their demographics. This focuses on the population vice boat owners and looks at things such as activity (what people did on the water) and what kind of education they had. The findings will be covered in later slides.

# 2018 Exposure Survey



- **Exposure-Based Risk Measures** – Produced different measures of recreational boating exposure hours to calculate risk
- **Boat Numbers and Types by State** – Estimated numbers of boat owning households and registered/unregistered boats by type for each state
- **Other Information by State and Boat Type** – Storage, trailering, safety equipment, socioeconomic characteristics

The exposure survey estimates, by state, many different metrics including person boat hours, person boat days, boat hours and boat days. There are at least 20 different state-specific metrics estimated. These metrics can then be applied to calculate relative risk in a state or among boat types or a combination of the two. Both number of accidents and number of people affected by accidents can be measured. These measures have a lot of potential and could potentially shift the paradigm of how we conduct data analysis. Another important aspect are unregistered boat numbers, by state, which complement current Coast Guard data collection efforts on state vessel registration. There are also other calculations in the survey, such as looking at storage and estimating the carriage of emergency equipment and engine cutoff switches by state as well.

## Audience Feedback



Were you aware of the NRBS before you registered for today's webinar?



Have you – or has anybody in your agency / organization – used any of the data / findings from the 2018 or previous NRBS surveys?



Does your state conduct – or has it conducted – similar boater surveys?

See next three slides for results of these Quick Polls.

## SECOND QUICK POLL

Were you aware of the NRBSS before you registered for today's webinar?

- Yes --- **87%**
- No, I don't *think* so --- **13%**



### THIRD QUICK POLL

Have you – or has anybody in your agency/organization – used any of the data / findings from the 2018 or previous NRBSS surveys?

- Yes --- 67%
- No --- 20%
- Not sure --- 13%

## FOURTH QUICK POLL

Does your state conduct – or has it conducted – similar boater surveys?

- Yes, periodically --- 8%
- Yes, but not recently --- 17%
- No, never have --- 33%
- Not sure --- 42%

## Audience Feedback



If you haven't used the data / findings from the NRBS, what obstacles or difficulties prevented you from doing so?

See next slide for results of this Quick Poll.

## FIFTH QUICK POLL

If you haven't used the data / findings from the NRBSS,  
what obstacles or difficulties prevented you from doing so? \*

- Getting access to the data in a usable form or format --- 33%
- No time to read through / interpret the written reports --- 44%
- Couldn't figure out how to apply to my state or organization --- 22%
- I'm just not a "data person" --- 22%
- Something else --- 44%

\*attendees could select more than one response

**National Recreational Boating Safety Survey**  
Exposure Survey Final Report

Prepared for  
United States Coast Guard  
Boating Safety Division  
(CG-BSX-21)  
2703 Martin Luther King, Jr. Ave. SE  
Washington, DC 20543-3801

Prepared by  
**RTI International**  
3040 E. Cornwallis Road  
Research Triangle Park, NC 27709

**Methodology –  
how were the 2018  
surveys done?**

**Tamara Terry**  
Ohio Department of Natural Resources  
Division of Parks & Watercraft  
Law Enforcement Section  
[tamara.terry@dnr.ohio.gov](mailto:tamara.terry@dnr.ohio.gov)

Let's take a moment to review the methodology and instruments used in the 2018 iteration of the National Recreational Boating Survey.

## Two parts to the 2018 NRBSS



### Participation Survey

- To estimate the number of persons who boated in 2018
- To collect **national- and regional-level** demographics on these boaters

### Exposure Survey

- To get **state-by-state** results on exposure boat hours and exposure person hours

In the pre-webinar survey, many of you mentioned wanting a deeper understanding of the two parts of the survey – and there are two parts, as mentioned by Jonathan in his portion of today’s presentation. So, let’s dive into that...

The 2018 National Recreational Boating Safety Survey employed two survey instruments to collect the data needed for analysis. Each of the two surveys serves a particular purpose and provides data at different levels of granularity.

The first instrument was the Participation Survey – this instrument was used primarily to estimate the total number of persons that boated in the United States in 2018; and to give us a better understanding of our overall nationwide boating participation rates. The Participation Survey also collected national-level and regional-level demographics on those boaters; in other words, expanding on how many of them there are, to getting to know WHO they are.

The second instrument was the Exposure Survey – this instrument gathered data to allow for the calculation of exposure boat hours and exposure person hours, which can be used as alternatives to the 100,000 registered boats that many of us are familiar with as a risk ratio denominator; we will explore that further in a moment. Of note, data collected by this instrument allowed for findings down to the state level in most cases, which makes the data useful within your respective states.

## 2018 Participation Survey

- ❖ “Boater” → someone who went out on the water on a recreational boat at least once in 2018.
- ❖ Participation on owned, co-owned and rented boats.
- ❖ 13-page survey instrument offered via web and paper; collected quarterly.
- ❖ 43,590 surveys sent out to get the national target of 5,000 responses. Ultimately, 5,851 responses received for 14.9% response rate.
- ❖ Collected data on:
  - Characteristics of boating participants and boating households
  - Socioeconomic characteristics of boaters
  - Reasons for not boating
  - Boating activities
  - Boat ownership
  - Boat operation and boat operators
  - Boating safety education



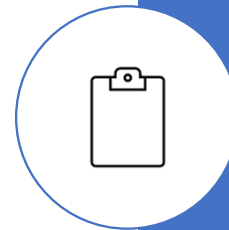
So with that basic overview of the two survey instruments, let's give you a little more detail on the logistics of the first survey instrument - the Participation Survey.

- First, let's discuss who this survey is targeted at... For the purposes of this survey, a 'boater' was defined as "someone who went out on the water on a recreational boat at least once in 2018."
  - Of note in this definition is that the outing must have been on a RECREATIONAL vessel -- nothing about the commercial side is included in this survey
  - And also of note, everyone who went out boating on these recreational vessels – for any number of days - or hours in a day - is included; even if it was only on one day for 5 minutes!
- Participation data was collected for owned, co-owned and rented vessels.
- The survey instrument itself was 13-pages in length and was completed quarterly, in both paper and web formats.
  - If you would like to look over that survey instrument yourself, you can find it in the appendix of the Participation Survey report.
- During the survey period, a total of 43,590 Participation Surveys were initiated, with a national target of 5,000 completed responses. The survey reached and exceeded the national target with 5,851 completed responses. The response rate was calculated by excluding undeliverable surveys, resulting in a final response rate of 14.9% for the 2018 Participation Survey.

**CONTINUES...**

## 2018 Participation Survey

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  - Boat operation and boat operators
  - Boating safety education



- As noted, the Participation Survey collected data on a variety of demographics related to boaters, including:

Characteristics of boating participants and boating households – this included the number of persons who boated or did not boat during 2018, as well as the number of households that boated or did not boat in that time period.

Socioeconomic characteristics of boaters – this data is especially important to targeting and evaluating boating safety-related communications to boaters; of note, data was collected on gender, age, household composition, race, ethnicity, and household income.

Reasons for not boating – knowing that someone did not boat in a given year is great, but knowing WHY they didn't boat is even better – this survey collected information to provide that feedback; also of note, the data collected on this topic is able to be broken down by the socioeconomic factors just mentioned as well.

Boating activities – The survey collected information on what activities boaters were participating in on the water; again, an important component in better understanding our boaters and how best to communicate with them.

Boat ownership – As noted, this survey collected information on owned, co-owned, and rented vessels, including those that are chartered as a bare boat with no hired captain. Information on the percentage and number of boaters participating via these various methods is included in the findings.

Boat operation and boat operators – Detailed data was collected to identify WHO our boaters are by gender, age, race and ethnicity – and this data can be assessed down to the Census Region level.

And finally, Boating safety education – this survey collected data to gain a better understanding of the number of boaters that have completed a boater safety class – again, broken down to the Census Region level.

- Those are the basic methodology details on the first survey; now let's move over the Exposure Survey details...



## 2018 Exposure Survey

- ❖ Focused on owned and co-owned boats to estimate exposure → # and types of boats; # days and times taken out on water; # persons on board; average outing hours.
- ❖ 14-page survey instrument offered via web and paper; collected monthly.
- ❖ 213,659 surveys sent out to get target of 30,000 responses for reliable national and state-level results. Ultimately, 31,733 responses received for 21.9% response rate.
- ❖ Along with other data, survey generated exposure estimates for use as denominators in risk ratios of boating deaths and injuries.



With general boating participation and associated demographics having been collected on the Participation Survey, the second survey instrument, the 2018 Exposure Survey, addresses the issue of finding a potential alternative denominator to our current risk ratios – specifically, a potential replacement for the 100,000 registered vessels denominator we use currently to compare boating fatality and injury between the states and territories.

- The Exposure Survey focused in on owned and co-owned vessels to collect various estimates on boating exposure – or the total time that boaters spend engaged in recreational boating. Based on the data collected, analysis can be made down to the state level in most cases.
  - This survey instrument collected specific data to be used in calculating exposure, including:
    - The number and types of boats in use
    - The number of days boats were used and the amount of time that these boats were taken out on the water during an average day
    - The number of persons on board these boats when in use on an average day
    - And the average hours spent in an outing on these vessels on an average day
  - Together, these four components can be used to calculate exposure, in most cases, down to the state level
- This 14-page survey instrument was administered monthly, also in both paper and web formats
  - Again, if you would like to review the survey questions themselves, you can look in the appendices to the Exposure Survey report

- **CONTINUES...**

## 2018 Exposure Survey

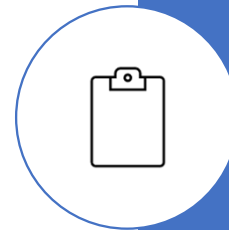
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- ❖ Along with other data, survey generated exposure estimates for use as denominators in risk ratios of boating deaths and injuries.



- The survey collection for this survey was significantly larger as compared to the Participation Survey. In total, 213,659 Exposure Surveys were initiated, with a national target of 30,000 completed responses. This level of collection was necessary to allow for reliable national-level and state-level statistics. In the end, a total of 31,733 completed responses were obtained from boat-owning households and, after exclusion of the undeliverable and ineligible surveys, the 2018 Exposure Survey received a 21.9% response rate.
- As mentioned, in addition to other data, the Exposure Survey generated estimates of exposure for use as denominators in risk ratios of both boating fatalities and boating injuries.
  - In other words, possible alternatives to comparing fatalities and injuries between states based on hours of exposure, rather than the total number of registered boats in a given state.
  - This is especially important given the variations in registration requirements between states, especially with regard to paddlecraft.
- So, let's dig a little deeper into how these new exposure estimates might be used as 'improved' risk ratio denominators...

## 2018 Exposure Survey Estimates Potential Risk Ratio Denominators

- ❖ Boat Days → Any day that a boat is used out on the water regardless of the amount of time that day it is used
- ❖ Boat Hours → The number of hours a boat is used out on the water during a given period of time (e.g., a day, month, year)
- ❖ Person Boat Days → An estimate of the number of persons on a boat on the day that it is used out on the water
- ❖ Person Boat Hours → The total number of hours persons are aboard a boat in use out on the water



*The “person boat hours” definition is most commonly used to mean “exposure” or “recreational boating exposure hours.”*

There are four primary boating exposure estimates that can be generated from the data collected in the 2018 Exposure Survey as noted here:

The first two exposure estimates focus on the exposure by vessel, rather than by person:

- The first of these – Boat Days – is an estimate of the number of DAYS that a recreational boat is used out on the water, regardless of the amount of time on that particular day that the boat is used.
  - This means that a boat that is used for an hour on a given day would be given the same exposure estimate as a boat that is used 6 hours on the water on a given day.
  - As you can see, this one is a little more broad in scope.
- The second of these – Boat Hours – is a little more specific, estimating the number of hours that a boat is used on the water during a given period of time (a day, a month, a year, etc.).
  - For this measure, exposure is greater for someone on the water longer in the given time period as compared to someone who spends less time on the water – perhaps a more accurate, or at least more granular, level of measurement.

**CONTINUES...**

## 2018 Exposure Survey Estimates Potential Risk Ratio Denominators

- ❖ Boat Days → Any day that a boat is used out on the water regardless of the amount of time that day it is used
- ❖ Boat Hours → The number of hours a boat is used out on the water during a given period of time (e.g., a day, month, year)
- ❖ Person Boat Days → An estimate of the number of persons on a boat on the day that it is used out on the water
- ❖ Person Boat Hours → The total number of hours persons are aboard a boat in use out on the water



*The “person boat hours” definition is most commonly used to mean “exposure” or “recreational boating exposure hours.”*

The second set of exposure estimates drill down to the exposure by person, rather than by vessel, with options here mirroring those for vessels to some extent.

- The first, Person Days, is an estimate of the number of persons on board the vessel on the day that it is used on the water.
  - Again, this one is a little more broad as it would equate someone’s Person Days the same regardless of whether they were on the boat for one hour or all day.
- The second – Person Hours – is again, more specific, estimating the total number of hours persons are aboard a boat in use out on the water.
  - Like Boat Hours, this alternative denominator is more granular and draws more distinction between those spending more time and less time on the water on any given day.

While any or all of these exposure estimates could be used as a denominator in risk ratios, and in theory some may be more recommended than others depending on the topic for which you are doing analysis, it should be recognized that the measure of ‘person boat hours’ is the one most commonly used to mean ‘exposure’ or ‘recreational boating exposure hours’.

## Keep in mind



---

Due to differences in the way the NRBSS was conducted over the years, comparisons between surveys are **NOT RECOMMENDED!**

So, I know that was a lot to take in in a very short period of time. Following today's session, I encourage you to take a look through both the 2018 NRBSS Participation Survey Final Report AND the 2018 NRBSS Exposure Survey Final Report. No doubt as you scan through these documents, you will identify additional questions, either regarding the generalities of the survey results, or specifically the results at your states' level. As you do, drop us a line and pose those questions – if you are asking it, it is likely that others are too and we can communicate those inquiries and the answers back out to the group as a whole.

I think you will find many interesting insights into our boaters, at both the national- and regional- level, as well as your particular state level. In a moment, Joanna will be walking you through some of the findings that we as a team have discovered in looking through the reports. Hopefully that will get your thoughts flowing on how best you might be able to use these findings if you are not already doing so. **HOWEVER**, we do want to leave you with an important word of caution if you decide you want to look at the various iterations of the survey over the years...

**CONTINUES...**

## Keep in mind



---

Due to differences in the way the NRBSS was conducted over the years, comparisons between surveys are **NOT RECOMMENDED!**

Due to differences in the way the NRBSS was conducted over those various years, it is NOT RECOMMENDED that a direct comparison be made between different years of the survey. The primary differences between them being:

- The way that the survey was administered (technology has come a long way and over the years various methods including phone, web, and paper have been used),
- Also, with those different administrations, some methodology details have been amended to line up with those changes, and, finally,
- Associated weighting is often different from one survey to another based on the conditions of the particular year of the survey and the survey methods used.

Other than that word of caution, we, again, highly encourage you to review the reports and draw your own conclusions on the data included therein. We hope that this brief look into the methodology gives you at least a cursory knowledge of the way the survey was structured to collect this information.

Before I hand over the 'virtual mic' to Joanna to discuss some of the survey findings, Ron is going to assist us in getting a little more feedback from you... especially with regard to whether you would like to learn more about the methodology, and, if you do, what might specifically be on your mind that we might be able to address in a follow-up 'deeper dive' session.

Ron, take it away...

## Audience Feedback



Would you like to learn more about how the 2018 NRBS was done?



If you are interested in learning more, what topics would you like to have covered in a 'Deep Dive' session on methodology?

See the next two slides for results of these Quick Polls.

## SIXTH QUICK POLL

Would you like to learn more about how the 2018 NRBSS was done?

- Yes, I'd like to learn more --- 57%
- No, but I know some colleagues that would --- 7%
- No, not at all ---7%
- Not sure --- 29%



## SEVENTH QUICK POLL

If you or a colleague might be interested in learning more,  
what topics would you like to see covered in a 'Deep Dive' session on methodology? \*

- More about the survey instruments / questions used --- 54%
- Everything about exposure and exposure hours! --- 54%
- How "deep" can we go into the state-level data? --- 77%
- How to 'read' and interpret specific tables in the reports --- 77%
- More about sampling methods and weighting --- 38%

\*attendees could select more than one response

# National Recreational Boating Safety Survey

Exposure Survey Final Report



Prepared for  
United States Coast Guard  
Boating Safety Division  
(CG-BSX-21)  
2703 Martin Luther King, Jr. Ave. SE  
Washington, DC 20543-3801

Prepared by  
RTI International  
3040 E. Cornwallis Road  
Research Triangle Park, NC 27709

## Findings – what did the 2018 surveys tell us?

**Joanna Andrade**  
California State Parks & Recreation  
Division of Boating & Waterways  
Boating Safety Unit

[Joanna.Andrade@parks.ca.gov](mailto:Joanna.Andrade@parks.ca.gov)

## Why should you care about the survey results?



- More information to add to your knowledge base about boaters in your state
- Paints a by-the-numbers picture of who they are, why they boat, how they behave
- Findings suggest need for ongoing evaluation and adjustment of safety strategies in response to a changing boater population

### Why should you care about these surveys and their results?

- Survey results can help you to better understand the boaters in your state; who they are demographically, what drives them to boat or continue boating.
- The findings suggest there is a need for the ongoing evaluation and adjustment of strategies in response to a changing boater population.

## Getting to know our boaters...

### Overview of boat ownership & outings

**Table 3-16. Number and Percentage of Operated Boats that Were Trailered/Transported at Least Once for the Purpose of Being Launched by State of Registration or Storage, 2018<sup>1,2,3</sup>**

State	Operated Boats					
	Trailered/Transported		Trailered		Transported	
	N (000)	%	N (000)	%	N (000)	%
Alabama	131	73.7	92	71.7	39	78.6
Alaska	30	68.5	19	77.2	11	57.4
Arizona	70	83.0	44	77.0	26	95.4
Arkansas	97	75.3	58	73.9	39	77.6
California	262	63.3	157	59.4	105	70.3
Colorado	123	80.6	38	77.2	85	82.2
Connecticut	62	66.8	22	50.7	40	80.8
Delaware	35	76.9	18	67.8	17	90.1
District of Columbia	32	39.3	14	22.7	18	92.3
Florida	546	60.4	334	56.8	212	67.1

*2018 National Recreational Boating Safety Survey  
Exposure Survey Final Report; p. 41*

- 25.2 million boats owned in 2018, with 93% of them in operating condition.
- About 94% were stored/kept in states where owners resided.
- Just over a third went out on the water at least once.
- Boats were out on the water an estimated 3.42 BILLION hours in 2018.
- Nearly 6 million were trailered or transported.
- Human-powered boats were transported and launched almost 64 million times.

### WHAT DID THE SURVEY TELL US ABOUT BOATERS? – IN THIS CASE, BOAT OWNERS AND HOW OFTEN THEY TOOK THEIR BOATS ON THE WATER

- Of the just over 25 million boats that were owned in 2018, about 93% were in operating condition, and about the same percentage were kept in states where the owner resided. Just over a third of the boats owned were taken out on the water at least once during 2018. The 9 million boats that were taken out on the water at least once in 2018 were out on the water almost 3 and a half billion hours. It is estimated that persons were out on the water in recreational boats 1.2 billion person hours nationwide.
- Were the boats trailered to their destinations or docked?
  - Over two-thirds, or nearly 6 million, of the boats that were operated in 2018 were trailered or transported for the purpose of launching them out on the water. This underscores the importance of educational efforts, regulations, and facilities specifically aimed at reducing the introduction of aquatic invasive species related to recreational boating.
  - Human-powered boats were transported and launched almost 64 million times in 2018.
  - These are national numbers, but as you can see from the table excerpt on this slide, the exposure survey report breaks down the data by state.
- Although a large percentage (42.9%) of persons that boated in 2018 went out on boats owned by their households, the data point toward increased use of rentals, shared ownership boats, and bareboat charters.

## Registered & Unregistered Boats Numbers and Implications

Table 3-1. Number and Percentage of U.S. Households that Owned or Co-owned Recreational Boats by Boat Type and by State of Residence, 2018<sup>1,2,3,4</sup>

State	Households Owning Any Boat <sup>1</sup>		Households Owning at Least One of the Following Boat Types																			
			Open Power Boats		Cabin Power Boats		Pontoon Boats		PWCs		Sailboats		Canoes		Kayaks		Paddleboards		Rowed Boats		Other Boat Types <sup>2</sup>	
	N (000)	%	N (000)	%	N (000)	%	N (000)	%	N (000)	%	N (000)	%	N (000)	%	N (000)	%	N (000)	%	N (000)	%	N (000)	%
Alabama	256	13.8	143	7.7	6	0.3	29	1.6	23	1.2	6	0.3	28	1.5	49	2.7	7	0.4	37	2.0	2	0.1
Alaska	82	32.2	24	9.4	16	6.2	3	1.1	2	0.9	1	0.5	14	5.3	32	12.6	3	1.1	17	6.8	4	1.7
Arizona	164	6.3	66	2.5	4	0.2	14	0.5	14	0.5	2	0.1	14	0.5	39	1.5	16	0.6	23	0.9	2	0.1
Arkansas	242	21.0	110	9.5	3	0.2	37	3.2	11	1.0	1	0.1	21	1.8	45	3.9	13	1.1	47	4.1	10	0.8
California	866	6.6	410	3.1	68	0.5	45	0.3	58	0.4	69	0.5	55	0.4	221	1.7	45	0.3	150	1.1	33	0.3
Colorado	243	11.2	55	2.5	11	0.5	3	0.1	10	0.4	6	0.3	65	3.0	78	3.6	55	2.5	35	1.6	34	1.6
Connecticut	169	12.2	45	3.3	16	1.2	3	0.2	6	0.5	14	1.0	31	2.3	82	5.9	7	0.5	24	1.7	7	0.5
Delaware	66	17.9	21	5.7	5	1.3	8	2.1	2	0.5	5	1.3	10	2.8	23	6.2	1	0.1	7	2.0	—	0.1
District of Columbia	293	1.0	122	0.4	24	0.1	12	0.0	9	0.0	49	0.2	64	0.2	153	0.5	20	0.1	24	0.1	5	0.0
Florida	1,082	13.9	508	6.5	93	1.2	62	0.8	51	0.6	47	0.6	125	1.6	295	3.8	50	0.6	100	1.3	27	0.3

2018 National Recreational Boating Safety Survey  
Exposure Survey Final Report; p. 17

- Open powerboats were the most owned **type**. BUT more households actually owned human-powered craft—kayaks, canoes, row boats, and paddleboards.
- About 4.24M households owned at least one kayak; about 2.14M owned canoes; another 2.37M, some type of boat that’s rowed.
- 42% of boat owning households owned boats not required to be registered by a state.
- 13.4M boats not required by law to be registered in the states where they were kept/stored
- Financial and management implications for boating safety and law enforcement
- Issues of Search and Rescue for adrift human-powered boats

- It’s estimated that about 25 million boats were owned by about 14 and a half million households in 2018. About 94% of the boats owned by these households were stored OR kept most of the time in the states of the owners’ permanent residence.
- While open powerboats continue to be the **most owned type** of boats, more households owned human powered boats consisting of kayaks, canoes, rowed boats, and paddleboards.
- About 4 million households owned one or more kayaks, and just over 2 million households were owners of canoes. Another 2.37 million households owned or jointly owned some type of boat that is rowed.
- 42% of boat owning households owned boats not required to be registered by a state and almost 11% owned both registered and unregistered boats.
- Of the 25 million boats owned, nearly 12 million were registered by a state. Furthermore, an estimated 13.4 million were not required by law to be registered in the states where they were kept/stored and operated. These were primarily, depending on the state, human-owned boats such as canoes, kayaks, paddleboards, and rowed boats.
- **These are national numbers, but as you can see from the table excerpt on this slide, the Exposure Survey report breaks down the data by state.**

CONTINUES ...

## Registered & Unregistered Boats Numbers and Implications

Table 3-1. Number and Percentage of U.S. Households that Owned or Co-owned Recreational Boats by Boat Type and by State of Residence, 2018<sup>1,2,3,4</sup>

State	Households Owning Any Boat <sup>1</sup>		Households Owning at Least One of the Following Boat Types																			
	Open Power Boats		Cabin Power Boats		Pontoon Boats		PWCs		Sailboats		Canoes		Kayaks		Paddleboards		Rowed Boats		Other Boat Types <sup>2</sup>			
	N (000)	%	N (000)	%	N (000)	%	N (000)	%	N (000)	%	N (000)	%	N (000)	%	N (000)	%	N (000)	%	N (000)	%		
Alabama	256	13.8	143	7.7	6	0.3	29	1.6	23	1.2	6	0.3	28	1.5	49	2.7	7	0.4	37	2.0	2	0.1
Alaska	82	32.2	24	9.4	16	6.2	3	1.1	2	0.9	1	0.5	14	5.3	32	12.6	3	1.1	17	6.8	4	1.7
Arizona	164	6.3	66	2.5	4	0.2	14	0.5	14	0.5	2	0.1	14	0.5	39	1.5	16	0.6	23	0.9	2	0.1
Arkansas	242	21.0	110	9.5	3	0.2	37	3.2	11	1.0	1	0.1	21	1.8	45	3.9	13	1.1	47	4.1	10	0.8
California	866	6.6	410	3.1	68	0.5	45	0.3	58	0.4	69	0.5	55	0.4	221	1.7	45	0.3	150	1.1	33	0.3
Colorado	243	11.2	55	2.5	11	0.5	3	0.1	10	0.4	6	0.3	65	3.0	78	3.6	55	2.5	35	1.6	34	1.6
Connecticut	169	12.2	45	3.3	16	1.2	3	0.2	6	0.5	14	1.0	31	2.3	82	5.9	7	0.5	24	1.7	7	0.5
Delaware	66	17.9	21	5.7	5	1.3	8	2.1	2	0.5	5	1.3	10	2.8	23	6.2	1	0.1	7	2.0	—	0.1
District of Columbia	293	1.0	122	0.4	24	0.1	12	0.0	9	0.0	49	0.2	64	0.2	153	0.5	20	0.1	24	0.1	5	0.0
Florida	1,082	13.9	508	6.5	93	1.2	62	0.8	51	0.6	47	0.6	125	1.6	295	3.8	50	0.6	100	1.3	27	0.3

2018 National Recreational Boating Safety Survey  
Exposure Survey Final Report; p. 17

- Open powerboats were the most owned **type**. BUT more households actually owned human-powered craft—kayaks, canoes, row boats, and paddleboards.
- About 4.24M households owned at least one kayak; about 2.14M owned canoes; another 2.37M, some type of boat that’s rowed.
- 42% of boat owning households owned boats not required to be registered by a state.
- 13.4M boats not required by law to be registered in the states where they were kept/stored
- Financial and management implications for boating safety and law enforcement
- Issues of Search and Rescue for adrift human-powered boats

### WHAT ARE SOME IMPLICATIONS OF THE INCREASED NUMBERS OF HUMAN-POWERED BOATS?

#### There are financial and management issues and difficulties for boating safety and law enforcement

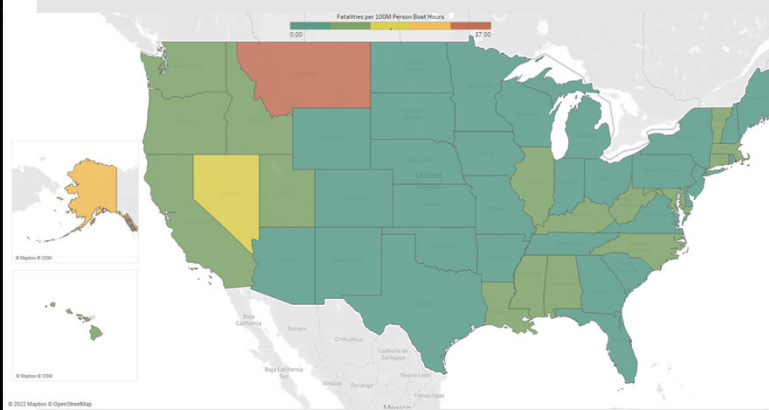
- The proportion of all boats that are unregistered is creating a number of financial and management issues and difficulties for boating safety and law enforcement agencies, as well as agencies that provide and manage boat access and infrastructure facilities. Foremost, owners of unregistered boats do not pay registration fees, and because most are human-powered boats, they don’t purchase fuel for these boats and therefore don’t pay fuel taxes, which support the development and maintenance of boating access and infrastructure as well as boating safety education and enforcement.
- A number of states are currently expanding registration requirements to include various types and sizes of human-powered craft. Persons and organizations, both in support and opposition to requiring registration of human-powered craft, contend that there is a significant need for realistic estimates of the number of human-powered watercraft that would meet the proposed registration requirements in order to estimate the financial impact on the owners of these boats. Without this information, there can be no clear estimate of the revenue potentially generated or impacted to the states’ residents. The NRBSS exposure survey produced estimates of the numbers of human-powered boats for all states.

#### Then there are the issues of Search and Rescue for adrift human-powered boats

- When canoes, kayaks, and rowed boats are found floating without anyone aboard, it often results in a search even when the boat just drifted away without anyone aboard. Because they are not registered often there is no way to identify and therefore contact the owners. The USCG is offering “If found” decals to be placed on small, human-powered watercraft through the operation paddle smart program. The information on the sticker helps response entities quickly identify the boat’s owner.

## What was the risk in 2018?

Fatalities per 100 Million Person Boat Hours for ALL RECREATIONAL BOATS



Source: 2018 National Recreational Boating Safety Survey Exposure Survey Final Report, Table 3-61

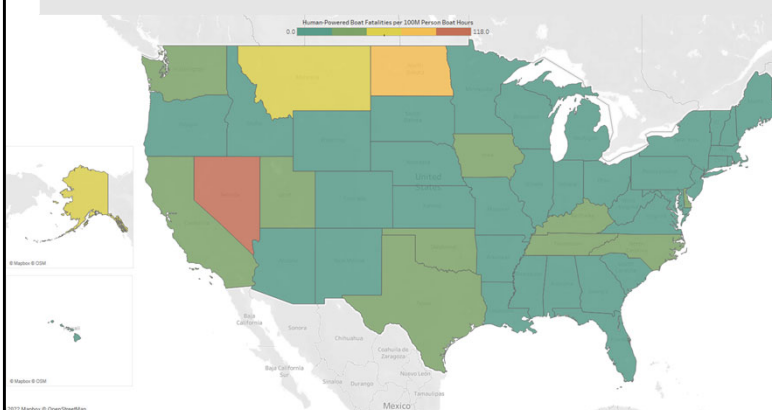
- Coast Guard reported 4,145 accidents and 633 deaths in the 2018 annual statistics.
- 2018 NRBSS estimates of **risk of incidents involving deaths was 17 per 100M boat hours** nationally.
- But 2018 NRBSS estimates of **risk of boating fatalities was 6 per 100M person boat hours** for all recreational boats nationally.
- **The map shows state variations in fatality risks.** The top end was **37 per 100M person hours.**

## What was the risk for accidents and fatalities in 2018?

- There were 4,145 reported boating accidents in 50 states, the District of Columbia, and territories in 2018 that resulted in 633 deaths, according to the Coast Guard's annual statistics report. That report still used rates based on 100,000 registered boats as the denominator for those fractions. Using the exposure hours measures, however, gives another picture of risk.
- The estimated **risk of having a boating accident involving fatalities** was 17 per 100 million boat hours nationwide in 2018. The **risk of being a fatality in a boating accident** was 6 per 100 million person hours of boating. These figures are for **all recreational boats** – nationally – but as you can see from the map, there is some variation in fatality risks across the states. The color coding and scale might be a bit difficult to read, but the scale runs from green (lower risk ratios) to yellow and orange (higher risk ratios). The top end of the fatality risks was 37 per 100 million person boat hours.

## What was the risk in 2018?

Fatalities per 100 Million Person Boat Hours for **ALL HUMAN-POWERED RECREATIONAL BOATS**



Source: 2018 National Recreational Boating Safety Survey Exposure Survey Final Report, Table 3-61

- Higher risk for human-powered craft in 2018—the 13 per 100M person boat hours was twice the national fatality risk ratio for all recreational boats.
- The map shows variations in fatalities between states. The top end was 118 per 100M person boat hours for human-powered boats.

The figures and map on the previous slide were for ALL recreational boats. What about human-powered craft?

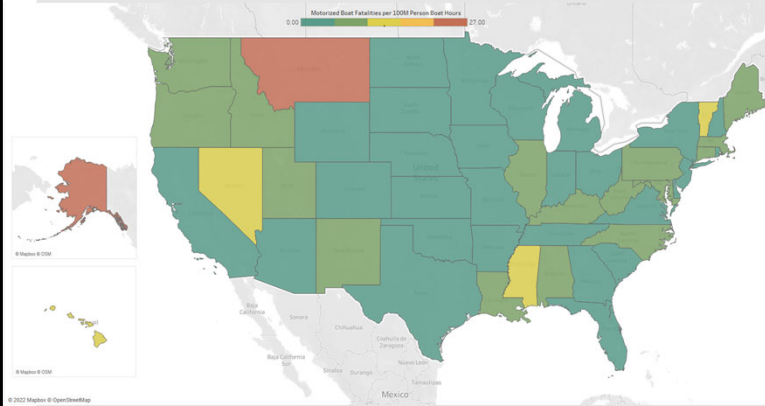
There was a higher risk for human-powered craft:

- The risk of boating fatalities for human-powered boats (13 per 100 million person hours) was **twice** the national risk rate in 2018 for **all** recreational boats.
- Again, that is a national rate. As the map shows, however, there is variation among the states. So while the national risk ratio was 13 per 100 million person hours, the highest ratio among state figures was 118 per 100 million person boat hours.
- This suggests that a greater proportion of boating safety efforts be forested at the owners and other persons who go out on the water aboard human-powered craft, including persons who rent them or are members of clubs that make their boats available to them.



## What was the risk in 2018?

### Fatalities per 100 Million Person Boat Hours for **ALL MOTORIZED RECREATIONAL BOATS**



Source: 2018 National Recreational Boating Safety Survey Exposure Survey Final Report, Table 3-61

- 2018 NRBSS estimates of **risk of fatalities involving all motorized boats** was **5 per 100M person boat hours** nationally.

- **The map shows variations between states.** The top end was 27 per 100M person boat hours for motorized boats.

### What about the risk ratios associated with motorized boats?

- The risk of boating fatalities for all motorized boats nationally was less than for human-powered boats – the figure was 5 per 100 million person boat hours.
- Again, that’s a national aggregate and as the map shows there is variation among the states with the top end coming in at 27 per 100 million person boat hours.

## Evidence of growing diversity

Table 3-9. Number and Percentage of U.S. Households that Owned Recreational Boats by Demographics and Boat Type<sup>1,2,3</sup>

Demographics	Households Owning Any Boat <sup>1</sup>		Households Owning at Least One of the Following Boat Types																			
	Open Power Boat		Cabin Power Boat		Pontoon Boat		PWC		Sailboat		Canoe		Kayak		Paddleboard		Rowed Boat		Any Other Boat <sup>2</sup>			
	N (000)	%	N (000)	%	N (000)	%	N (000)	%	N (000)	%	N (000)	%	N (000)	%	N (000)	%	N (000)	%	N (000)	%		
<b>Race</b>																						
White (all persons)	12,013	82.9	5,051	84.7	719	85.0	1,239	86.0	743	85.5	539	84.9	1,791	83.4	3,523	83.1	551	83.4	1,972	83.2	384	84.0
Black/A (all persons)	111	0.8	50	0.8	8	0.9	4	0.3	7	0.8	7	1.1	3	0.1	17	0.4	1	0.2	21	0.9	1	0.2
Other	2,362	16.3	862	14.5	119	14.1	198	13.7	119	13.7	89	14.0	352	16.5	700	16.5	109	16.5	377	15.9	72	15.8
<b>Ethnicity</b>																						
Hispanic/Latino (all persons)	220	1.5	93	1.6	21	2.5	15	1.0	19	2.2	4	0.6	14	0.7	31	0.7	15	2.3	32	1.4	13	2.8
Hispanic/Latino (some persons)	445	3.1	182	2.7	29	3.4	25	1.7	29	3.3	18	2.8	53	2.5	170	4.0	18	2.7	69	2.9	6	1.3
Other	13,821	95.4	5,708	95.7	796	94.1	1,401	97.2	821	94.5	613	96.5	2,099	96.9	4,039	95.3	628	95.0	2,269	95.7	438	95.8

2018 National Recreational Boating Safety Survey  
Exposure Survey Final Report; p. 33

- In 2018, an estimated 84.54M persons of different ages, races, and ethnicities in the U.S. participated in boating. This was 26.5% of the total U.S. population.
- 28.37M – almost a quarter (23.3%) – of U.S. households had at least one person who went recreational boating in 2018.
- More diversity than previously assumed, but still not representative of racial/ethnic distributions in the population.

### The findings also told us something about the changing demographics of boating and boaters:

- In 2018, an estimated 84.54 million recreational boaters of different ages, races, and ethnicities in the United States participated in boating, or 26.5% of the U.S. population. Almost a quarter, or 28.37 million, U.S. households had at least one person who went recreational boating.
- **There was more diversity than previously assumed, BUT...**
  - A vast majority of boats were still owned by white households. The findings indicate that boaters in 2018 were more racially and ethnically diverse than previously assumed, but they are still not representative of the racial and ethnic distribution of the country according to the most recent U.S. Census figures.
  - The survey found that not knowing anyone who owns a boat was a significant reason why more persons did not boat in 2018.

## Audience Feedback



What do you think would make the data and results more useful?

See the next slide for the results of this Quick Poll.

## EIGHTH QUICK POLL

What do you think would make the data and results more useful? \*

- Easier to 'digest' reports --- 79%
- Access to the raw data (files or some searchable format) --- 29%
- Videos highlighting findings --- 43%
- A report specifically presenting state-by-state data/findings --- 86%
- Briefs with examples of how states/organizations have applied / are applying the data --- 86%

\*attendees could select more than one response

## Audience Feedback



Do you have questions or comments about anything you heard today?



Besides a closer look into the survey's methodology, are there **other topics** you'd like to learn about in a deep dive session?



What questions or topics would you suggest for the **next iteration** of the NRBSS?

**Thank you for attending  
today's webinar.**

**The recording will be posted  
to NASBLA's eLearning  
Center.**

**Jonathan Hsieh**

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Ohio Department of Natural Resources, Ohio  
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