

**NASBLA Engineering, Reporting & Analysis Committee
Special Risks Subcommittee**

Interim Report on 2008 Charges

- **Analysis of High Risk Vessel Type Accidents**
- **Analysis of Injuries & Fatalities, with Emphasis on Children and Youth**

Charge 1

Analyze high-risk vessel type accident and fatality rates in states. Assess the possible correlations between those rates and safety awareness campaigns. Identify and recommend best practices that states can implement to minimize risk to participants.

Charge 2:

Analyze boating accident data to identify factors specific to injuries and fatalities among high-risk boater populations with a special focus on children and youth ages 17 and under. Consider frequency and severity of injuries, accident scenarios, roles of participants, exposure hours (when data becomes available) and other variables.

This interim report of the Special Risks Subcommittee – which includes a discussion of both of charges -- focuses on the work accomplished to date, the challenges of undertaking the analyses, and initial findings.

It will serve as the basis for continuing discussions among members of the Subcommittee and as a foundation for additional work to complete the charges.

Report Contents:

- Introduction (page 2)
- Charge 1 – An Analysis of High-Risk Vessel Type Accidents (page 2)
 - The Research Charge (page 2)
 - The Data Focus (page 2)
 - Significant Research Issues and Challenges (page 4)
 - Next Steps (page 5)
 - Interim Observations (Table 1, Table 2) (page 5)
- Charge 2 – An Analysis of Injuries and Fatalities, with an Emphasis on Children and Youth (page 9)
 - The Research Charge (page 9)
 - The Data Focus (page 9)
 - Significant Research Issues and Challenges (page 9)
 - Interim Observations (Table 1, Table 4 (others in Addendum) (page 10)
 - Next Steps (page 11)
- Addendum 1 (Charge 1) (page 13)
- Addendum 2 (Charge 2) (page 17)

ERAC Special Risks Subcommittee Interim Report on 2008 Research Charges *

The work of the ERAC Special Risks Subcommittee represents an expansion of the topics and safety issues covered by its predecessor, NASBLA's Paddlesports Committee (2005-07).[†] In 2008, this new Subcommittee was assigned two major charges – one, a more comprehensive version of a 2007 charge carried over from Paddlesports; the second, a new research assignment.

The Subcommittee was divided into two workgroups to complete its work, although members spent time together talking through the research questions that needed to be resolved, the approaches, and the types of data most appropriate for each charge.[‡] The charges are presented in separate sections of this interim report -- each section describing the basic methodology being used to address the charge; the significant research issues and challenges the Subcommittee has encountered so far; interim observations; and the next steps in the work. More detail on the charges, workgroup members, methodology and the data analyses to date for each charge appear in Addenda 1 and 2, respectively.

Charge 1 - An Analysis of High-Risk Vessel Type Accidents

The Research Charge

The Subcommittee was charged with analyzing "high-risk" vessel type fatality and injury rates in states to assess possible correlations between those rates and safety awareness campaigns. The Subcommittee also was asked to identify and recommend best practices that states could implement to minimize risk to participants.

To address the charge, the Subcommittee had to find a meaningful way to get at the concept of "high risk," and determine what data would be assembled and how it would be assembled for member review.

The Data Focus

The focus was placed on the accident information contained in the USCG Boating Accident Report Database (BARD) as submitted by the 56 jurisdictions for the calendar years 1998-2007, with primary emphasis on the last five years worth of data. USCG staff has prepared and is continuing to prepare the workgroup's data requests for this charge (see Addendum 1).

* Consolidated interim report prepared by Eleanor Mariani, Subcommittee Chair, with assistance from Deborah Gona, ERAC staff. Charge 1 report prepared by Eleanor Mariani, and Charge 2 report prepared by Pamela Dillon. Both serve as charge leaders for their respective workgroups.

† The Paddlesports Committee originated as a subcommittee, first under the NASBLA Boats and Associated Equipment Committee (2003) and then under the Education Committee (2004).

‡ Full Subcommittee conference calls conducted Jan. 14 and Feb. 4, 2008, and an in-person session conducted March 14, 2008.

Running fatalities and injuries by vessel type, in the absence of exposure hours data, was likely to paint an inaccurate picture of "risk" (given the sheer numbers of some vessel types). The workgroup settled instead on separating accident types into categories that might be addressed through direct education and safety awareness initiatives.

All "Accident Type 1" data, the first descriptor to classify an accident (e.g., collision with a vessel, capsizing, etc.), were placed within a framework of five "Education Categories" (see table below). The Education Categories include factors that can be addressed in boating safety classes in an effort to reduce fatal accidents. They include: Stability, Navigation Rules, Strikes and Impact Related, Vessel Related, and Departed the Vessel. The charge workgroup hopes that grouping the Accident Type data by these Education Topics will facilitate an understanding of what boating safety concepts (or "best management practices") might need to be updated to reduce boating fatalities.

The USCG staff assisting in this effort agreed to use the five-year increments 1998-2002 and 2003-2007; perform the analyses by state; and base the analyses upon the Education Categories. Additional analyses will look at Operation at the time of accident, Vessel Length, Boat Type, Activity, Accident Causes (i.e., contributing factors – including alcohol consumption), Life Jacket Wearage by victim, and Age of victim (grouped by under age 17 or over age 17). As practical, the analyses will be related to geographic regions -- grouping state data according to the states affiliated with the regional associations: Northern Association of Boating Administrators (NABA), Southern States Boating Law Administrators Association (SSBLAA), and the Western States Boating Administrators Association (WSBAA) (see **Addendum 1**, beginning page 13).

Education Categories	Accident Type 1
Departed the Vessel	Departed Vessel
	Departed Vessel - Assistance
	Departed Vessel - Jumped Overboard
	Departed Vessel - Render Assistance
	Departed Vessel - Repairs
	Departed Vessel - Retrieval
	Departed Vessel - Swimming
Strikes and Impact Related	Skier Mishap
	Struck by Boat
	Struck by Motor/Propeller
	Struck by Propeller
Navigation Rules	Collision with Fixed Object
	Collision with Floating Object
	Collision with Vessel
	Ejected from Vessel
	Grounding
	Person Ejected*
	Struck Submerged Object

Stability	Capsizing
	Fall in Boat
	Falls Overboard
	Falls Within Boat
	Flooding/Swamping
Uncategorized	Other
	Unknown
Vessel Related	Carbon Monoxide
	Carbon Monoxide Exposure
	Carbon Monoxide Poisoning
	Electrocution
	Fire/Explosion (Fuel)
	Fire/Explosion (Other than Fuel)
	Sinking

* Persons Ejected was placed under Navigation Rules rather than Stability or Vessel Related because it was found that most fatal accidents where a person was ejected was related to turning fast or issues of speed.

Significant Research Issues and Challenges:

In this inaugural year for ERAC and this Subcommittee, with the new focus on data analyses, the group faced some challenges. These challenges were associated not only with Committee and Subcommittee logistics, but also with the data that are available and that can be meaningfully applied to the analyses. Among the challenges and issues were:

- The charge itself was broad, and the term “high-risk vessel” proved difficult to define. While the concept of “small unstable craft” as a working definition for “high-risk” initially seemed fitting, the group decided that its use might skew the results – not only was it unclear which craft should be termed “unstable,” but it also was possible that a “high-risk vessel” would not necessarily be “small” (for example, large cigarette boats might be considered “high-risk” by some). Ultimately, the group decided to let the accident and fatality data dictate which craft would be categorized as “high-risk” for purposes of answering the research question.
- Other, related aspects of the charge were similarly problematic. For example, subcommittee members grappled with what it means to “minimize risk,” knowing that some activities are inherently “risky.” The group determined that its focus would be on identifying the best practices among awareness campaigns and raising the levels of awareness among the participating public.
- The research is tempered by the absence of exposure data. The amount of time (hours) a particular vessel type is typically in operation upon the water is necessary to more fully understand the accidents attributed to a Vessel Type. In

one example, more accidents might be expected to happen in open motorboats because there are more of them.. In another example, the number of accidents attributed to PWCs might appear to be high, but that might be because the exposure hours for this type of vessel are great, compared to that of another vessel type, such as a cabin cruiser, which might have lesser exposure hours, or hours of actual use on the water.

- Data gaps in the BARD data may lead to erroneous conclusions. For example, for the years 1998-2002, the “activity” was "unknown" or blank 73 percent of the time regarding fatal accidents related to navigation rule errors and 74 percent for the years 2003-2007.
- It is questionable if the sample size for the state data is large enough to address the research question.

Next Steps

While some preliminary observations have been made from initial data analyses (see **Interim Observations** below), the Subcommittee workgroup's efforts will continue as data are made available by the USCG staff. At the time of this report, the USCG data runs for fatal accidents are almost complete; data runs for accidents with injuries are forthcoming. It is significant to note that the data runs are large, with about 3,500 records for each five-year increment run for multiple data sets for fatalities, and about 20,000 records per five-year increment run for multiple data sets for accidents with injuries. It is expected that the runs will be completed by August 15, 2008, and that the analysis of the data will be complete by the 2008 NASBLA Annual Conference in September. However, this **charge will need to be carried over** to complete the task of tying findings to state safety awareness campaigns and identifying best management practices.

Interim Observations

The following observations are based on an initial analysis of the USCG BARD Data on Recreational Boating Deaths and Injuries for the years 1998 through 2007 (Tables 1 and 2).

Table 1. Boating Related Deaths over five-year increments categorized by Education Topics.

Deaths from 1998 through 2002

Education Categories	Number of Deaths	Percentage of Deaths
Departed the Vessel	48	1.30%
Strikes and Impact Related	115	3.12%
Navigation Rules	818	22.22%
Stability	2392	64.98%
Uncategorized	159	4.32%
Vessel Related	149	4.05%
Grand Total	3681	

Deaths from 2003 through 2007

Education Categories	Number of Deaths	Percentage of Deaths
Departed the Vessel	183	5.27%
Strikes and Impact Related	109	3.14%
Navigation Rules	733	21.12%
Stability	2241	64.56%
Uncategorized	96	2.77%
Vessel Related	109	3.14%
Grand Total	3471	

Fatalities in the past ten years were overwhelmingly linked to "Stability"-related issues, followed by "Navigation Rules" related problems. Stability issues accounted for 65 percent of the fatal boating accidents in both five-year periods, followed by Navigation Rules, which remained stable over the two increments at 22 percent and 21 percent, respectively. These two Categories accounted for 86 percent of the fatalities between 1998 and 2002 and 85 percent of those between 2003 and 2007. Deaths that fell within others of the "Education Categories" varied between the two periods, but accounted for a significantly smaller proportion of the fatalities. Of particular note, deaths associated with "Departing the Vessel" increased four-fold from the five-year intervals.

The fatalities in the "Uncategorized" level dropped by almost half for the 2003-2007 period, this due in large part to the diligence of the USCG, working hard for the 2007 statistics to get states to fill in the blanks. The percentage of "unknowns" for fatal boating accidents is anticipated to continue dropping.

Interim Observations continue on page 8.

INTERIM REPORT ON SRS CHARGES – JULY 2008

Table 2. Highest Rankings that Characterize Boating Fatalities with Regard to Boat Type, Size of Boat, Activity at Time of Accident and Operation at Time of Accident by Education Categories.

Education Category	Boat Type	Size of Boat (ft.)	Activity	Operation	
Departed the Vessel	98 - 02	Open Motorboat	20 - 26	Swimming/Diving	Drifting
		Pontoon	16 - 20	-	Cruising
		Cabin Motorboat	10 - 16/26 - 40*	Fishing	At Anchor
	03 - 07	Open Motorboat	20 - 26	-	Drifting
		Pontoon	16 - 20	Swimming/Diving	Cruising
		Cabin Motorboat	-	Fishing	At Anchor
Strikes and Impact Related	98 - 02	Open Motorboat	16 - 20	Waterskiing/Tubing	Cruising
		PWC	-	-	Changing Direction
		Cabin Motorboat	Under 10	Swimming/Diving	Other
	03 - 07	Open Motorboat	20 - 26	Waterskiing/Tubing	Cruising
		PWC	16 - 20	-	Changing Direction
		Cabin Motorboat/ Pontoon*	10 - 16	Swimming/Diving	-
Navigation Rules	98 - 02	Open Motorboat	10 - 16	-	Cruising
		PWC	16 - 20	Fishing	Changing Direction
		Cabin Motorboat	20 - 26	Other	Drifting
	03 - 07	Open Motorboat	10 - 16	-	Cruising
		PWC	16 - 20	Fishing	Changing Direction
		Cabin Motorboat	20 - 26	Other	Drifting
Stability	98 - 02	Open Motorboat	10 - 16	-	Cruising
		Canoe/Kayak	16 - 20	Fishing	Drifting
		Rowboat	-	Whitewater	Rowing/Paddling
	03 - 07	Open Motorboat	10 - 16	-	Cruising
		Canoe/Kayak	16 - 20	Fishing	Drifting
		Rowboat	-	Other	Rowing/Paddling
Vessel Related	98 - 02	Open Motorboat	10 - 16	-	Cruising
		Cabin Motorboat	16 - 20	Fishing	Drifting
		Rowboat	26 - 40	Swimming/Diving	At Anchor
	03 - 07	Open Motorboat	20 - 26	-	Cruising
		Cabin Motorboat	26 - 40	Fishing	At Anchor
		Aux. Sail	10 - 16	Making Repairs	Docked/Moored

* = tie in ranking order
 - = Blank/Unknown data

Interim Observations (continued)

- A preliminary analysis of Boat Type, Size of Vessel, Activity at the time of the fatal accident and Operation at the time of the fatal accident revealed that with respect to Stability issues Open Motorboats, Canoes/Kayaks and Rowboats were used in 80 percent of the fatal accidents during the first time period and 77 percent in the second (see also, Addendum 1, Table 2). While fatalities in Open Motorboats decreased (from 54 to 48 percent), Canoes/Kayaks and Rowboats showed a slight increase (from 18 percent to 20 percent and 8 percent to 9 percent, respectively). Cabin Motorboats ranked 4th in both year segments (4 percent and 6 percent, respectively) and PWCs ranked 5th (4 percent for intervals).
- For Boat Types where Navigation Rules were a factor in the accident, Open Motorboats, PWCs, and Cabin Motorboats accounted for 90 percent and 89 percent, respectively during the time frames.
- Open Motorboats, Pontoon Boats and Cabin Motorboats accounted for 76 percent of the fatal accidents that involved people Departing the Vessel during both time frames.
- With regard to the Size of the Vessel, in Stability Related accidents, the majority of the vessels were 10–16 feet, followed by 16-20 feet (accounting for 69 percent of the accidents. For Navigation Rules related fatal accidents, vessel sizes were 10–16, 16–20 and 20–26 feet, which size classes accounted for 75 percent of the fatal accidents. For Strikes and Impact Related accidents, vessels were 16–20, 20–26 and smaller craft under 10 feet to 16 feet. Those Departing the Vessel did so from 20 – 26 foot vessels, followed by 16 – 20 foot, 10 – 16 and 26 – 40 foot. In Vessel Related accidents, sizes were smaller in the first five years under study, and increased in the second five years from 10–16 to 20–26 feet.
- At the time of a fatal accident more often than not, no information was entered over all cells related to the "Education Categories". However, over the 10-year period, most people were either involved in Fishing or Whitewater activities when they had Stability-related issues that lead to a fatal accident; Fishing or some Other activity, for Navigation Rules-related accidents; Waterskiing/Tubing or Swimming/Diving, when they had Strikes and Impact Related accidents; Swimming/Diving or Fishing when they Departed the Vessel; and Fishing, Swimming/Diving or Making Repairs when they had Vessel Related accidents.
- With regard to the Operation of the boat at the time of the accident, the data indicate that boaters were Cruising, Drifting or Rowing/Paddling when they had Stability related accidents; Cruising, Changing Direction or Drifting when they had Navigation Rules related accidents; Cruising or Changing Direction when they had Strikes and Impact Related accidents; Drifting, Cruising or At Anchor when they Departed the Vessel; and Cruising, Drifting, At Anchor or Docked/Moored when they had Vessel Related accidents.

While exposure data would be very helpful for interpretation, from an education perspective, these data reveal important information. Based on the preliminary data, it appears that regardless of the number of vessels in each Boat Type, Open Motorboats and Paddlecraft (that is, Canoes/Kayaks/Rowboats) rank the highest in terms of boats used when a fatal accident occurs. Also, the fatal accidents are taking place on small (10

– 20 foot) boats. Therefore, it would appear that the education standards need to do an even better job in helping boaters 1) select the proper craft for their activity, and 2) understand better how to move around in a small boat, especially when fishing. The Subcommittee workgroup looks forward to getting the additional data for this charge, and hopes that it will help to substantiate areas for improvement in the NASBLA education standards.

Charge 2 - An Analysis of Injuries and Fatalities, with an Emphasis on Children and Youth

The Research Charge

The Subcommittee was charged with analyzing boating accident data to begin identifying factors specific to injuries and fatalities among high-risk boater populations, especially children and youth ages 17 and under. Among the variables the Subcommittee was asked to consider were the frequency and severity of injuries, accident scenarios, roles of participants, and, when data become available, exposure hours.

To address the charge, the Subcommittee – by way of a subgroup -- identified the basic data needs, research questions, and strategy for conducting the analysis. During the in-person Subcommittee session on March 14, 2008, the group had an opportunity to review initial data runs prepared by USCG staff and to begin discussing preliminary findings. This interim report represents work conducted through June 2008.

The Data Focus

The focus was placed on the accident information contained in the USCG Boating Accident Report Database (BARD), as submitted by the 56 jurisdictions for the calendar years 2002 through 2006.

Significant Research Issues and Challenges

In this inaugural year for ERAC and this Subcommittee, with the new focus on data analyses, the group faced some challenges. These challenges were associated not only with Committee and Subcommittee logistics, but also with the data that are available and can be meaningfully applied to the analyses. Among the challenges and issues:

- Ability to break out the age data in a way that addresses research interests -- in this case, breaking down a broader children/youth category into ages 12 years and under and 13-17 years. As the group learned, identifying significance and drawing conclusions is difficult when there is a relatively small “N” on the age-specific data, especially with regard to fatalities.
- Primary reliance on data from BARD. Identifying other good data sources (apart from the USCG boating accident data) that would allow for comparisons or that would enhance the analysis, has been problematic.

- High numbers of data entries tagged as “unknown.” For example, in the analysis, approximately 53 percent of the “Activity” categories in boating fatalities were classified as “Unknown.”
- Difficulty of developing research questions, categorizing data and analyzing via conference calls and a single in-person meeting.

Interim Observations (see Addendum 2 for additional detail)

The following observations are based on an initial analysis of the USCG BARD Data on Recreational Boating Deaths and Injuries for the years 2002 through 2006

Table 1. ALL BOATING DEATHS, ALL AGE GROUPS:

Age of Deceased	Number of Deaths	Percentage of Deaths
Over 17	3106	87.86%
13-17	174	4.92%
Under 13	119	3.37%
Unknown	136	3.85%

During the five-year period that served as the focus for this analysis, and with regard to age, most of the reported recreational boating deaths (nearly 88 percent) were in the over 17 age group.

In **Addendum 2** (beginning page 17), Table 2 illustrates a breakdown of type of vessel involved, length of the vessel, and the age of the victim. Based on these data, the following preliminary observations can be made:

- During period under analysis, just over half (1,828 or 51.71 percent) of all fatalities occurred in **open motorboats**. Of the 125 deaths of youth age 17 or less on open motorboats, 115 of them occurred on boats less than 26 feet in length.
- 440 fatalities (or 12.45 percent) occurred in Canoes and Kayaks. These included 37 deaths for youth age 17 and under.
- 318 fatalities (nearly 9 percent) occurred from PWCs including 57 fatalities of youth age 17 and under. This represents the highest proportion of youth fatalities for a single type of boat.

Also in Addendum 2, Table 3 illustrates a breakdown of data based on activity and age of the victim. A large proportion (56.27 percent) of this data set lists the activity type as “other” or “unknown.” This renders this particular set of data as suspicious for drawing conclusions. Nevertheless, based on the data provided, these general statements can be considered:

- Fishing appears to be single activity most youth were engaged in at the time of their death.
- A disproportionate number of youth deaths age 17 and under appear to involve Waterskiing or Tubing.
- Whitewater and Hunting activities are activities of interest for further statistical review for children age 17 and under.

Table 4. ALL INJURIES: With regard to age, most recreational boating injuries, as was the case with deaths, continue to be in the Over 17 age group:

Age of Victim	Number of Injuries	Percentage of All Injuries
Over 17	12891	70.68%
13-17	2287	12.54%
Under 13	1242	6.81%
Unknown	1818	9.97%

With that stated, it should be noted that the total percentage of injuries in the 13-17 and the under-13 age groups are higher than the corresponding percentage of deaths in the correlating analysis. This difference could be due, in part, to the larger percentage of injuries where the age of the injured victim is unknown (unknown age deaths equal 3.85 percent of all deaths; unknown age injuries equal 9.87 percent of all injuries).

Table 5 in Addendum 2 illustrates a breakdown of the type of vessel, length of the vessel, and the age of the victim involved in an injury accident. Based on this data, the following preliminary observations can be made:

- During this period, just over half (9,137 or 50.10 percent) of all injuries occurred in **open motorboats**. Of the 1,549 injuries of youth age 17 or less on open motorboats, 1,408 of these injuries occurred on boats less than 26 feet in length.
- 307 injuries (1.68 percent) occurred in Canoe and Kayaks. These included 43 injuries for boaters age 17 and under.
- 5,468 injuries (29.98%) occurred from PWCs including 1,528 injuries of youth age 17 and under. This represents the highest proportion of youth injury for a single type of boat.

Finally, Table 6 in Addendum 2 illustrates a breakdown of data based on activity and age of the victim. A large proportion (nearly 70 percent) of this data set lists the activity type as “other” or “unknown.” This renders this set of data as suspicious for drawing conclusions. However, based on the data that can be analyzed, this general statement can be considered:

- A disproportionate number of youth injuries (age 17 and under) appear to occur while engaged in Waterskiing or Tubing.

Next Steps

For this charge, the Subcommittee has completed the initial steps to gather and analyze boating accident data to identify factors specific to injuries and fatalities among high-risk boater populations with a special focus on children and youth ages 17 and under. With the high amount of “unknown” data categories, and the relatively low numbers of reports in the high-risk age group of youth under the age of 17, it is anticipated that data will point to inconclusive results.

However, several areas of interest have been identified and include Fishing, Waterskiing/Tubing, PWC usage, Whitewater activities and Hunting. These data should

be further evaluated by obtaining narratives of accidents from the targeted activities and age groups.

A review of accident narratives also should provide insight, albeit anecdotal, on the severity of injuries, accident scenarios, roles of participants, and other variables. Of special interest to the Subcommittee workgroup assigned to this charge is the role that the adult supervisor, parent, or guardian played in the event leading to the death or injury. This further analysis, coupled with the experience and insight of the various members of the full Subcommittee, should provide a basis of recommendations and future guidance for NASBLA and its members during the 2009 Annual Conference.

ADDENDUM 1

Charge 1

Analyze high-risk vessel type accident and fatality rates in states. Assess the possible correlations between those rates and safety awareness campaigns. Identify and recommend best practices that states can implement to minimize risk to participants. (Expansion of carryover charge from 2007). NASBLA Objectives 1.4, 2.3; RBS Performance Goal and Objective 2

This charge is related to:

- NASBLA Objective 1.4 (conduct research and analysis that supports policy positions and informs decision makers)
- NASBLA Objective 2.3 (identify effective program innovations and best practices and establish methods for disseminating to members)
- National RBS Performance Goal (To reduce casualties) and Objective 2 (awareness of safe boating practices).

The Special Risks Subcommittee members initially assigned to Charge #1 during the organizing conference call were: Eleanor Mariani, (Connecticut) charge leader; Randy Edwards (Iowa); Alex Cascione (USCG Aux); Dave Harris (Utah); Ted Sensenbrenner (Boat/US); Cindy Squires (NMMA); and Chris Neal (PWIA). Staff assistance was provided by Dr. Deb Gona (NASBLA Staff). Harry Hogan was assigned by the USCG Office of Boating Safety.

Methodology

Two conference calls were conducted in January and February to develop methodology to approach the charge, to determine what papers/resource materials would be gathered, and to decide on the time period for analysis of data. Since it was determined, after a review of data collected from the USCG, that selecting accident types pertaining to stability issues would potentially skew the results, the charge leader looked to categorize the primary accident type by education topics – this, since the end result of the charge was to relate results to safety awareness campaigns in order to recommend best management practices for the states. Primary Accident Type (or Accident Type 1) is what the investigating officer considered to be the first reason for the accident.

With special thanks to Dr. Deb Gona (NASBLA), Susan Tomczuk (USCG), and Greg Ulkus (Data Analysis – CT), preliminary USCG BARD data were analyzed by the full Subcommittee members during the March 14-15 meeting. Comments were translated to USCG staff Harry Hogan and the Accident Type 1 by Education Category data request template was finalized. Special thanks go to Harry and the USCG for preparing the numerous data runs necessary to conduct these analyses.

NASBLA Regional Member States

NABA – Northern Association of Boating Administrators

Member States: Connecticut, Delaware, Illinois, Indiana, Iowa, Kansas, Maine, Massachusetts, Michigan, Minnesota, Nebraska, New Hampshire, New Jersey, New York, North Dakota, Ohio, Ontario, Pennsylvania, Rhode Island, South Dakota, Vermont, Wisconsin

SSBLAA – Southern States Boating Law Administrators Association

Member States: Alabama, Arkansas, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, Missouri, North Carolina, Oklahoma, Puerto Rico, South Carolina, Tennessee, Texas, Virgin Islands, Virginia, West Virginia.

WSBAA – Western States Boating Administrators Association

Member States: Alaska, American Samoa, Arizona, California, Colorado, Guam, Hawaii, Idaho, Montana, Nevada, New Mexico, N. Mariana Islands, Oregon, Washington, Wyoming.

Interim analyses based on analysis of USCG BARD Data 1998-2007 of Recreational Boating Deaths and Injuries

Deaths from 1998 through 2002

Education Categories	Accident Type 1	Total
Departed the Vessel	Departed Vessel	5
	Departed Vessel - Assistance	1
	Departed Vessel - Jumped Overboard	2
	Departed Vessel - Render Assistance	1
	Departed Vessel - Repairs	1
	Departed Vessel - Retrieval	3
	Departed Vessel - Swimming	35
Departed the Vessel Total		48
Strikes and Impact Related	Skier Mishap	54
	Struck by Boat	32
	Struck by Motor/Propeller	28
	Struck by Propeller	1
Strikes and Impact Related Total		115
Navigation Rules	Collision with Fixed Object	248
	Collision with Floating Object	33
	Collision with Vessel	433
	Ejected from Vessel	24
	Grounding	52
	Person Ejected	1
	Struck Submerged Object	27
Navigation Rules Total		818
Stability	Capsizing	1109
	Fall in Boat	17
	Falls Overboard	1012
	Falls Within Boat	7
	Flooding/Swamping	247
Stability Total		2392
Uncategorized	Other	113
	Unknown	46
Uncategorized Total		159
Vessel Related	Carbon Monoxide	3
	Carbon Monoxide Exposure	5
	Carbon Monoxide Poisoning	7
	Electrocution	4
	Fire/Explosion (Fuel)	14
	Fire/Explosion (Other than Fuel)	13
	Sinking	103
Vessel Related Total		149
Grand Total		3681

INTERIM REPORT ON SRS CHARGES – JULY 2008

Deaths from 2003 through 2007

Education Categories	Accident Type 1	Total
Departed the Vessel	Departed Vessel	60
	DEPARTED VESSEL - DIVING	1
	DEPARTED VESSEL -- MAKING REPAIRS	2
	DEPARTED VESSEL - OUT OF GAS	1
	DEPARTED VESSEL - RENDER ASSISTANCE	1
	DEPARTED VESSEL - REPAIRS	4
	DEPARTED VESSEL - RETRIEVAL	9
	DEPARTED VESSEL -- RETRIEVAL	5
	Departed Vessel - Swimming	79
	DEPARTED VESSEL -- SWIMMING	20
	DEPARTED VESSEL - TOW	1
Departed the Vessel Total		183
Strikes and Impact Related	Skier Mishap	46
	Struck by Boat	31
	Struck by Motor/Propeller	23
	Struck by Propeller	1
	Struck by Propeller/Propulsion Unit	8
Strikes and Impact Related Total		109
Navigation Rules	Collision with Fixed Object	219
	Collision with Floating Object	33
	Collision with Vessel	358
	Ejected from vessel	59
	Grounding	43
	Struck Submerged Object	21
Navigation Rules Total		733
Stability	Capsizing	1008
	FALL / IMPACT ON BOAT	1
	Fall in Boat	18
	Fall on Boat	1
	FALL ON PWC	1
	Fall on Vessel	2
	Fall Overboard	213
	Falls Overboard	810
	Flooding/Swamping	187
Stability Total		2241
Uncategorized	NOT REPORTED	20
	Other	37
	UNKNOWN	39
Uncategorized Total		96
Vessel Related	Carbon Monoxide Exposure	28
	Carbon Monoxide Poisoning	10
	Electrocution	3
	Fire/Explosion (Fuel)	15
	Fire/Explosion (Other than Fuel)	4
	Sinking	49
Vessel Related Total		109
Grand Total		3471

INTERIM REPORT ON SRS CHARGES – JULY 2008

Table 2. Analysis of Fatalities by Boat Type, Size of Vessel, Activity, and Operation

Departed the Vessel										
Fatalities:		#1	#1 (n)	#1 %	#2	#2 (n)	#2 %	#3	#3 (n)	#3%
48	Boat Type	Opn Mtrbt	22	45.83%	Pontoon	8	16.67%	Cabin Mtrbt	6	12.50%
48	Size	20ft. - 26ft.	16	33.33%	16ft. - 20ft.	15	31.25%	10-16 & 26-40*	4	8.33%
48	Activity	Swim/Dive	22	45.83%	blank	19	39.58%	Fishing	4	8.33%
48	Operation	Drifting	28	58.33%	Cruising	8	16.67%	At Anchor	3	6.25%
183	Boat Type	Opn Mtrbt	102	55.74%	Pontoon	29	15.85%	Cabin Mtrbt	23	12.57%
183	Size	20ft. - 26ft.	62	33.88%	16ft. - 20ft.	55	30.05%	blank	26	14.21%
183	Activity	blank	66	36.07%	Swim/Dive	65	35.52%	Fishing	20	10.93%
183	Operation	Drifting	110	60.11%	Cruising	29	15.85%	At Anchor	6	3.28%
Strikes and Impact Related										
		#1	#1 (n)	#1 %	#2	#2 (n)	#2 %	#3	#3 (n)	#3%
115	Boat Type	Opn Mtrbt	77	66.96%	PWC	20	17.39%	Cabin Mtrbt	10	8.70%
115	Size	16ft. - 20ft.	53	46.09%	20ft. - 26ft.	17	14.78%	Under 10ft	14	12.17%
115	Activity	Wtr Ski/Tube	56	48.70%	blank/unk	49	42.61%	Swim/Dive	4	3.48%
115	Operation	Cruising	49	42.61%	Chng. Direct.	20	17.39%	Other	15	13.04%
108	Boat Type	Opn Mtrbt	73	67.59%	PWC	15	13.89%	Cab. & Pontoon*	7	6.48%
108	Size	20ft. - 26ft.	39	36.11%	16ft. - 20ft.	34	31.48%	10ft. -16ft.	13	12.04%
108	Activity	Wtr Ski/Tube	52	48.15%	blank/unk	35	32.41%	Swim/Dive	7	6.48%
108	Operation	Cruising	39	36.11%	Chng. Direct.	19	17.59%	Blank	14	12.96%
Navigation Rules										
		#1	#1 (n)	#1 %	#2	#2 (n)	#2 %	#3	#3 (n)	#3%
818	Boat Type	Opn Mtrbt	426	52.08%	PWC	225	27.51%	Cabin Mtrbt	83	10.15%
818	Size	10ft. - 16ft.	223	27.26%	16ft. - 20ft.	216	26.41%	20ft. - 26ft.	135	16.50%
818	Activity	blank/unk	600	73.35%	Fishing	108	13.20%	Other	51	6.23%
818	Operation	Cruising	531	64.91%	Chng. Direct.	71	8.68%	Drifting	63	7.70%
732	Boat Type	Opn Mtrbt	387	52.87%	PWC	196	26.78%	Cabin Mtrbt	69	9.43%
732	Size	10ft. - 16ft.	207	28.28%	16ft. - 20ft.	198	27.05%	20ft. - 26ft.	146	19.95%
732	Activity	blank/unk	541	73.91%	Fishing	98	13.39%	Other	30	4.10%
732	Operation	Cruising	464	63.39%	Chng. Direct.	65	8.88%	Drifting	61	8.33%
Stability										
		#1	#1 (n)	#1 %	#2	#2 (n)	#2 %	#3	#3 (n)	#3%
2369	Boat Type	Opn Mtrbt	1291	54.50%	Canoe/Kayak	435	18.36%	Rowboat	198	8.36%
2369	Size	10ft. - 16ft.	1034	43.65%	16ft. - 20ft.	591	24.95%	blank	284	11.99%
2369	Activity	blank	1120	47.28%	Fishing	920	38.83%	Whitewater	200	8.44%
2369	Operation	Cruising	671	28.32%	Drifting	488	20.60%	Row/Paddling	334	14.10%
2222	Boat Type	Opn Mtrbt	1073	48.29%	Canoe/Kayak	434	19.53%	Rowboat	205	9.23%
2222	Size	10ft. - 16ft.	879	39.56%	16ft. - 20ft.	535	24.08%	blank	307	13.82%
2222	Activity	blank	1062	47.79%	Fishing	830	37.35%	Other	95	4.28%
2222	Operation	Cruising	582	26.19%	Drifting	426	19.17%	Row/Paddling	339	15.26%
Vessel Related										
		#1	#1 (n)	#1 %	#2	#2 (n)	#2 %	#3	#3 (n)	#3%
149	Boat Type	Opn Mtrbt	83	55.70%	Cabin Mtrbt.	28	18.79%	Rowboat	9	6.04%
149	Size	10ft. - 16ft.	47	31.54%	16ft. - 20ft.	30	20.13%	26ft. - 40ft.	24	16.11%
149	Activity	blank	76	51.01%	Fishing	48	32.21%	Swim/Dive	7	4.70%
149	Operation	Cruising	44	29.53%	Drifting	27	18.12%	At Anchor	21	14.09%
107	Boat Type	Opn Mtrbt	57	53.27%	Cabin Mtrbt	33	30.84%	Aux. Sail	3	2.80%
107	Size	20ft. - 26ft.	26	24.30%	26ft. - 40ft.	24	22.43%	10ft. -16ft.	22	20.56%
107	Activity	blank	58	54.21%	Fishing	31	28.97%	Making Repairs	6	5.61%
107	Operation	Cruising	28	26.17%	At Anchor	21	19.63%	Dock/Moored	14	13.08%

*Same Value (Tied)

ADDENDUM 2

Charge 2

Analyze boating accident data to identify factors specific to injuries and fatalities among high-risk boater populations with a special focus on children and youth ages 17 and under. Consider frequency and severity of injuries, accident scenarios, roles of participants, exposure hours (when data becomes available) and other variables. Develop an issue brief on findings.

This charge is related to:

- NASBLA Objective 1.4 (conduct research and analysis that supports policy positions and informs decision makers)
- NASBLA Objective 2.3 (identify effective program innovations and best practices and establish methods for disseminating to members)
- National RBS Performance Goal – To Reduce Casualties and Objective 4 (life jacket wear) and Strategy 4.2.1 (identify and prioritize at-risk populations using a variety of sources including drowning data captured by the BARD system).

The Special Risks Subcommittee members initially assigned to Charge #2 were: Pamela Dillon (Ohio) - charge leader; Kim Jackson (Idaho); John Adey (American Boat and Yacht Council); Karen Steely (Aaron Foundation); Chris Manthos (American Watercraft Association); Maureen Healey (Personal Watercraft Industry Association); Dick Snyder (Mercury Marine); NASBLA Staff: Dr. Deb Gona

Methodology

Charge 2 participants discussed data and reference needs during a conference call in January 2008. Work began by identifying data needs from the USCG. Additional materials were collected and distributed in preparation for an in-person Subcommittee meeting in March.

With special thanks to Dr. Deb Gona (NASBLA), Susan Tomczuk (USCG), and Tamara Terry, (Data Analysis – Ohio), and Special Risks Subcommittee Chair Eleanor Mariani, USCG BARD data was analyzed by Charge 2 subcommittee members during the March 14-15, 2008 meeting.

The following data sets and reference materials were reviewed by the Charge 2 sub-committee:

From Boating Accident Report Database (BARD) - Staff support from Susan Tomczuk:

- 1A. Death Summary Tables by state, year, vessel, activity, age.
- 1B. Injury Summary Tables by state, year, vessel, activity, age.
- 2A. Death by activity, state, year, age, vessel type.
- 2B. Injury by activity, state, year, age, vessel type.
- 3A. Cabin motorboat deaths by state, year, length, age.
- 3B. Cabin motorboat injuries by state, year, length, age.
- 4A. Open motorboat deaths by state, year, length, age.
- 4B. Open motorboat injuries by state, year, length, age.
- 5A. Canoe and kayak deaths by state, year, age.
- 5B. Canoe and kayak injuries by state, year, age.
- 6A. PWC deaths by state, year, age.
- 6B. PWC injuries by state, year, age.

Additional Background Materials and Reference include:

- Materials provided by the Greater Coalition for Boating Safety (with appreciation to Nita Boles)

Six tables follow.

Interim analyses based on analysis of USCG BARD Data 1998-2007 of Recreational Boating Deaths and Injuries

Table 1. ALL DEATHS:

Age of Deceased	Number of Deaths	Percentage of Deaths
Over 17	3106	87.86%
13-17	174	4.92%
Under 13	119	3.37%
Unknown	136	3.85%

Table 2. DEATHS – Vessel Type and Age (see observations on next page (10))

Type of Vessel	Length of Vessel	<13 # of Deaths on this type and length of vessel	<13 % of Deaths on this type and length of vessel	13-17 # of Deaths on this type and length of vessel	13-17 % of Deaths on this type and length of vessel	>17 # of Deaths on this type and length of vessel	>17 % of Deaths on this type and length of vessel	Unknown # of Deaths on this type and length of vessel	Unknown % of Deaths on this type and length of vessel	Total deaths on this type and length of vessel
Open Motorboat	<16	17	2.54%	27	4.03%	609	90.90%	17	2.54%	670
	16 - <26	37	3.71%	34	3.41%	891	89.28%	36	3.61%	998
	26 - <40	1	3.13%	1	3.13%	29	90.63%	1	3.13%	32
	40 - <65	0	0.00%	0	0.00%	3	100.00%	0	0.00%	3
	Unknown	5	4.00%	3	2.40%	107	85.60%	10	8.00%	125
Cabin Motorboat	<16	0	0.00%	0	0.00%	4	100.00%	0	0.00%	4
	16 - <26	6	4.29%	5	3.57%	122	87.14%	7	5.00%	140
	26 - <40	2	1.98%	2	1.98%	94	93.07%	3	2.97%	101
	40 - <65	0	0.00%	0	0.00%	15	100.00%	0	0.00%	15
	>=65	0	0.00%	0	0.00%	2	100.00%	0	0.00%	2
Unknown	0	0.00%	0	0.00%	6	100.00%	0	0.00%	6	
Canoes/ Kayaks	All Lengths	13	2.95%	24	5.45%	386	87.73%	17	3.86%	440
PWCs	All Lengths	15	4.72%	42	13.21%	252	79.25%	9	2.83%	318

2.1 Open Motorboats (1828 total fatalities; 51.71% of all fatalities)

- Most of the fatalities in this vessel type are confirmed as Over age 17 (1639 – 89.66%), with no statistical difference in fatality rate amongst the different lengths of these vessels.
- Within the 13-17 age group, which consists of 65 of the reported fatalities for this vessel type (3.56%), 61 (93.85%) of these fatalities were on vessels less than 26 feet in length.
- As in the prior note, when looking at the Under 13 age group, which consists of 60 fatalities for this vessel type (3.28%), 54 (90%) of these fatalities were on vessels less than 26 feet in length

2.2 Cabin Motorboats (268 total fatalities; 7.58% of all fatalities)

- Most of the fatalities in this vessel type are confirmed as Over 17 (243 – 90.67%), with only a minor statistical difference in the fatality rates between the different lengths of these vessels
- In the 13-17 age group, which consists of only 7 fatalities for this vessel type (2.61%), the largest number of deaths occurred in vessels between 16 and 26 feet (5 – 71.43%)
- In the Under 13 age group, there were only 8 fatalities for this vessel type (2.99%); again, the largest number of deaths occurred on vessels between 16 and 26 feet (6 – 75%)

2.3 Canoes/Kayaks (440 total fatalities; 12.45% of all fatalities)

- As with motorboats, most of the fatalities for this vessel type occurred in the Over 17 age group, however the number is lower by comparison with the other age groups in this case (386 – 87.73%)
- In the canoe/kayak group, we see that the 13-17 age group makes up 24 (5.45%) of the reported fatalities for this type of vessel, a significant increase over similar numbers for motorboats
- The number of fatalities in the Under 13 age group is similar to motorboats when compared to other age groups for the same vessel (13 fatalities; 2.95%)

2.4 PWCs (318 total fatalities; 8.99% of all fatalities)

- In the Over 17 age group for this vessel type, we see that the number of fatalities drops significantly from the other vessel types with 252 fatalities (79.25% of all fatalities in this vessel type)
- The percentage of fatalities in the 13-17 age group for this vessel type increases dramatically as compared to the other vessel types (42 fatalities; 13.21% of all fatalities for this vessel type)
- The number of fatalities in the Under 13 age group is also increased as compared with other vessel types with 15 total fatalities within this vessel type (4.72%)

Table 3. DEATHS – Activity and Age:

Activity	<13 # of Deaths for this type of activity	<13 % of Deaths for this type of activity	13-17 # of Deaths for this type of activity	13-17 % of Deaths for this type of activity	>17 # of Deaths for this type of activity	>17 % of Deaths for this type of activity	Unknown # of Deaths for this type of activity	Unknown % of Deaths for this type of activity	Total deaths for this type of activity	Total % of deaths for this type of activity
Fishing	19	1.79%	24	2.26%	987	92.85%	33	3.10%	1063	30.07%
Hunting	3	4.17%	8	11.11%	61	84.72%	0	0.00%	72	2.04%
Repairs	0	0.00%	1	3.33%	29	96.67%	0	0.00%	30	0.85%
Commercial Activity	0	0.00%	0	0.00%	10	100.00 %	0	0.00%	10	0.28%
Fueling	0	0.00%	0	0.00%	3	75.00%	1	25.00%	4	0.11%
Swim/ Snorkel	2	2.04%	3	3.06%	90	91.84%	3	3.06%	98	2.77%
Starting Engine	0	0.00%	1	9.09%	9	81.82%	1	9.09%	11	0.31%
Waterski/ Tubing	10	8.93%	22	19.64%	0	0.00%	80	71.43%	112	3.17%
White Water	8	6.50%	3	2.44%	107	86.99%	5	4.07%	123	3.48%
Racing	0	0.00%	0	0.00%	21	91.30%	2	8.70%	23	0.65%
Unknown/Other	77	3.87%	112	5.63%	1789	89.94%	11	0.55%	1989	56.27%

****Note: The large proportion of this breakdown that is made up of “Other” or “Unknown” activities (1989 fatalities – 56.27%) makes the data set incomplete and to some extent suspect for trying to extrapolate to larger groups.***

3.1 Fishing

Fishing was the primary activity at the time of 30.07% of all fatalities (excluding others and unknowns and including all ages), making it the deadliest activity for all boaters (regardless of age) based on statistics. The breakdown within this group is as follows:

- Over 17 – 987 (92.85%)
- 13-17 – 24 (2.26%)
- Under 13 – 19 (1.79%)

Although the percentages for the Under 13 and 13-17 age groups were relatively small within this activity group, the total number of fatalities in these age groups during these activities placed fishing as the most deadly activity for both of these age groups.

3.2 Waterskiing/Tubing

Waterskiing/Tubing was ranked third in terms of the primary activity at the time of the fatality when looking at all fatalities regardless of age (112 fatalities; 3.17% of all fatalities by activity); however, we see that there is a disproportionate number of deaths in the 13-17 age group (22-19.64%) and the Under 13 age group (10-8.93%) which, when combined, amount to more than 1/4 of all deaths during these activities. Based on the fact that there is no data to show any deaths in this category for Over 17, this data should probably be checked to ensure integrity, and it might be assumed that the death rate for those 17 and under may be higher than calculated if many of the unknowns are within these age groups. Even before any potential data corrections, the total numbers of reported deaths for this activity based on age make it the second deadliest activity for victims 17 and under.

3.3 Whitewater

The whitewater category of activities ranked second in terms of total fatalities (for all ages) by activity. Although the predominant ages for these fatalities were again in the Over 17 age group, there were 8 fatalities in the Under 13 group (6.5% of fatalities by this activity) and 3 fatalities in the 13-17 age group (2.44% by this activity), making this category of activity the third highest cause of death by activity for victims 17 and under.

3.4 Hunting

Although the hunting category has relatively low total fatality numbers (72 total fatalities; 2.04% of all fatalities), 11 of these fatalities were in the 17 and under age groups (15.2%) making this a significant risk factor for fatalities in the Under 13 and 13-17 age groups. This activity, hunting, tied with whitewater as the third deadliest activity for the 17 and under group.

3.5 Swimming Snorkeling

This activity category accounted for 98 (2.77%) of all recreational boating fatalities (regardless of age) and includes 5 fatalities (5.10%) in the 17 and Under age group; however, as a whole, this activity does not appear to be statistically significant in relation to the fatality rate for the 17 and Under age groups.

3.6 Other Activity Categories (Repairs/Commercial Activity/Fueling/Starting Engine/Racing)

Although these activities combined account for 72 (2.04%) of the total fatalities (regardless of age), the number of reported fatalities in the 17 and under age groups (2 – 0.06%) for these activities does not appear to make them substantial contributors to fatalities in this group.

Table 4. ALL INJURIES:

Age of Victim	Number of Injuries	Percentage of All Injuries
Over 17	12891	70.68%
13-17	2287	12.54%
Under 13	1242	6.81%
Unknown	1818	9.97%

Table 5. INJURIES – VESSEL TYPE AND AGE:

Type of Vessel	Length of Vessel	<13 # of Injuries on this type and length of vessel	<13 % of Injuries on this type and length of vessel	13-17 # of Injuries on this type and length of vessel	13-17 % of Injuries on this type and length of vessel	>17 # of Injuries on this type and length of vessel	>17 % of Injuries on this type and length of vessel	Unknown # of Injuries on this type and length of vessel	Unknown % of Injuries on this type and length of vessel	Total Injuries on this type and length of vessel
Open Motorboat	<16	76	6.90%	89	8.08%	819	74.32%	118	10.70%	1102
	16 - <26	512	7.37%	731	10.52%	5020	72.24%	686	9.87%	6949
	26 - <40	20	4.61%	27	6.22%	349	80.41%	38	8.76%	434
	40 -<65	0	0.00%	0	0.00%	8	88.89%	1	11.11%	9
	Unknown	42	6.53%	52	8.09%	403	62.67%	146	22.71%	643
Cabin Motorboat	<16	0	0.00%	0	0.00%	6	100.00%	0	0.00%	6
	16 - <26	49	6.27%	52	6.65%	598	76.47%	83	10.61%	782
	26 - <40	27	4.02%	25	3.72%	543	80.80%	77	11.46%	672
	40 -<65	4	2.70%	18	12.16%	101	68.24%	25	16.90%	148
	>=65	0	0.00%	0	0.00%	4	80.00%	1	20.00%	5
Unknown	7	8.64%	2	2.47%	49	60.49%	23	28.40%	81	
Canoes/ Kayaks	All Lengths	12	3.91%	31	10.10%	216	70.36%	48	15.63%	307
PWCs	All Lengths	396	7.24%	1132	20.70%	3597	65.78%	343	6.28%	5468

5.1 Open Motorboats (9137 total injuries; 50.10% of all injuries)

- As with fatalities, most of the injuries on open motorboats are suffered by those Over 17 (6599 – 72.22%). Higher percentages of injury in this group are seen in those vessels greater than 26 feet.
- With regard to the 13-17 age group, which consists of 899 of the reported injuries for this vessel type (9.84%), 820 (91.21%) of these injuries were on vessels less than 26 feet in length.

- As in the prior note, with regard to the Under 13 age group, consisting of 650 of the reported injuries for this vessel type (7.11%), 588 (90.46%) of these injuries were on vessels less than 26 feet in length.

5.2 Cabin Motorboats (1694 total injuries; 9.29% of all injuries)

- Most of the injuries for this vessel type are in the Over 17 age group (1301 – 76.80%). There is no clear pattern with regard to the most dangerous vessel lengths for this group.
- In the 13-17 group, consisting of 97 of the injuries for this vessel type (5.73%), the largest number of injuries occurred in vessels between 16 and 26 feet in length (77 - 79.38%)
- In the Under 13 group there were a total of 87 injuries for this vessel type (5.14%); again, the largest number of injuries were reported on vessels between 16 and 26 feet in length (76 – 87.36%).

5.3 Canoes/Kayaks (307 total injuries; 1.68% of all injuries)

- Once again, the largest group of injuries for this vessel type is within the Over 17 age bracket, although to a lesser degree than was true of the motorboat categories.
- In this vessel type, the 13-17 age group makes up 31 (10.10%) of all reported injuries on canoes/kayaks. This is a percentage increase from both of the previous motorized categories, although the total number of injuries on this vessel type makes the actual number of injuries relatively low.
- The number of injuries on this vessel type for the Under 13 age group is actually lower by number and percentage as compared to the motorboat groups at 12 (3.91%)

5.4 PWCs (5468 total injuries; 29.98% of all injuries)

- As was the case with fatalities, the percentage of reported injuries in this vessel type for the Over 17 age group is significantly lower than in other vessel types at 3597 (65.78%)
- The percentage of injuries in the 13-17 age group increases dramatically as compared to the other vessel types (1132 injuries; 20.70% of all injuries for this vessel type).
- The percentage of injuries for the under 13 age group is also high for this vessel type, with only Open Motorboats 16-<26 feet actually higher in percentage of injuries by vessel type (excluding unknowns).

INTERIM REPORT ON SRS CHARGES – JULY 2008

Table 6. INJURIES – ACTIVITY AND AGE: Here is a break down of the data by activity and the age of the victim. See the notes following for preliminary analysis:

Activity	<13 # of Injuries for this type of activity	<13 % of Injuries for this type of activity	13-17 # of Injuries for this type of activity	13-17 % of Injuries for this type of activity	>17 # of Injuries for this type of activity	>17 % of Injuries for this type of activity	Unknown # of Injuries for this type of activity	Unknown % of Injuries for this type of activity	Total Injuries for this type of activity	Total % of Injuries for this type of activity
Fishing	54	4.11%	59	4.49%	1074	81.74%	127	9.66%	1314	7.20%
Hunting	1	1.14%	5	5.68%	62	70.45%	20	22.73%	88	0.48%
Repairs	6	6.45%	6	6.45%	77	82.80%	4	4.30%	93	0.51%
Commercial Activity	1	1.15%	5	5.75%	64	73.56%	17	19.54%	87	0.48%
Fueling	6	8.45%	4	5.63%	52	73.24%	9	12.68%	71	0.39%
Swim/ Snorkel	28	14.14%	19	9.60%	135	68.18%	16	8.08%	198	1.09%
Starting Engine	10	7.30%	10	7.30%	104	75.91%	13	9.49%	137	0.75%
Water ski/ Tubing	308	9.70%	637	20.06%	1922	60.54%	308	9.70%	3175	17.41%
White Water	7	3.50%	30	15.00%	130	65.00%	33	16.50%	200	1.10%
Racing	4	3.60%	15	13.51%	79	71.17%	13	11.72%	111	0.61%
Unknown/ Other	817	6.40%	1497	11.73%	9192	72.02%	1258	9.85%	12764	69.98%

****Note: As with the fatality numbers, the large proportion of this breakdown that is made up of "Other" or "Unknown" activities (12764 injuries – 69.99%) makes the data set incomplete. Not knowing where this "missing data" might actually fall could significantly change these calculations.***

6.1 Waterskiing/Tubing

Waterskiing/Tubing was the primary activity at the time of 17.41% of all injuries (excluding others and unknowns and including all ages), making it the most dangerous activity for all boaters (regardless of age) based on statistics. The breakdown by age group is as follows:

- Over 17 – 1922 (60.54%)
- 13-17 – 637 (20.06%)
- Under 13 – 308 (9.07%)

The total number and percentage of injuries for the Under 13 and 13-17 age groups make this activity far and away the most dangerous activity for both of these age groups, which, when combined, make up approximately one third of all injuries for this activity.

6.2 Fishing

Fishing was ranked second in overall injuries (for all age groups, and excluding others/unknowns). This activity ranked 5th with regard to the percentage of injuries in the Under 13 age group; it ranked last with regard to injuries by percentage for the 13-17 age group (both rankings exclude other/unknown).

6.3 Swimming/Snorkeling

Although overall this activity ranked fairly low when considering all age groups, the combined injuries in the Under 13 and 13-17 age groups account for approximately one quarter of all the injuries for this activity.

6.4 Whitewater

As with swimming/snorkeling, this activity as a whole (considering all age groups) ranked fairly low in injury numbers and percentage; however, the Under 13 and 13-17 age groups combined make up almost one-fifth of all injuries for this activity.

6.5 Other Activity Categories (Hunting/Repairs/Commercial Activity/Fueling/Starting Engine/Racing)

Combined, these activities make up only 587 (3.22%) of all injuries. Of these total injuries, 28 involved injuries to persons under 13 (4.7%) and 45 involved injuries to persons between 13 and 17 years of age (7.67%).