

# 2009 Life Jacket Wear Rate Observation Study

featuring

National Wear Rate Data from 1998 to 2009

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## I. INTRODUCTION

This report provides data and analysis on the 2009 National Life Jacket Wear Rate Observation Study with comparison information from the previous eleven year's studies (1998-2008). Tracking changes in life jacket wear rates over time provides important statistics for those individuals and groups responsible for educating the public about boating safety, improving boating safety programs, and for legislative efforts targeting safety improvements for recreational boating. The Boating Statistics 2008 report, published by the United States Coast Guard (USCG), shows that among the 510 drowning deaths in 2008, approximately 90% (459) of the individuals were not wearing a life jacket. These statistics make it essential to not only track the national life jacket wear rate among recreational boaters, but also to understand the circumstances and patterns in which life jackets are worn.

Calendar year 2009 marked the twelfth year of life jacket wear rate data collection efforts conducted by JSI. The twelve years of data allow for a higher level of analysis (i.e., controlling for the impact of influencing factors like age, weather, and boat type) in order to unmask potential trends and indicators of increased or decreased life jacket wear among different groups of recreational boaters (e.g., adult boaters or male boaters).

Most information in this report is presented separately for adults (18+ years old) and youth (0 to 17 years old). Over the 12 years of this study, the general distribution of ages, gender, boat types, boat characteristics and site characteristics have remained relatively stable. The appendix contains a detailed description of methods used and proportions of various boaters, boat and site characteristics are shown for the twelve years of data collection.

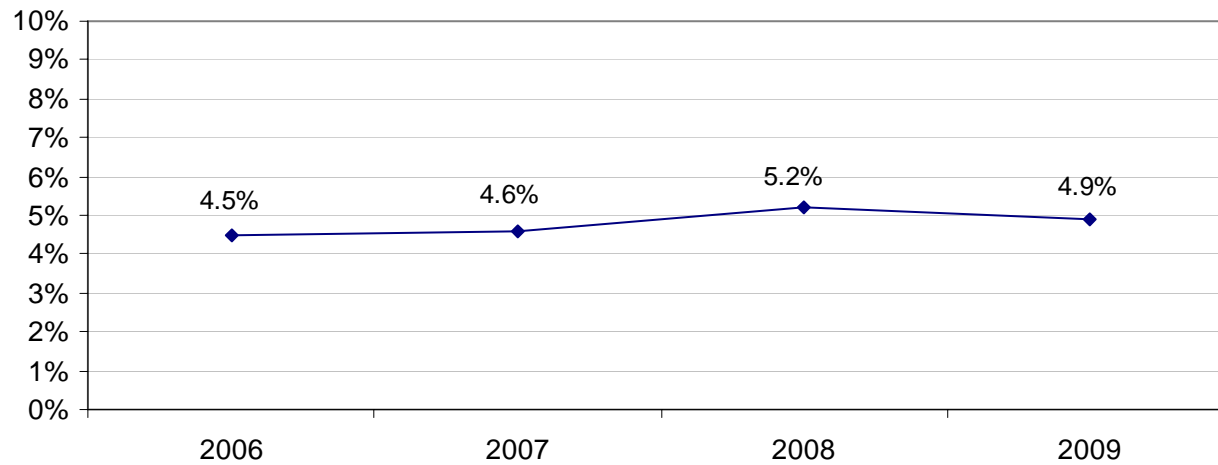
## **II. STRATEGIC PLAN OBJECTIVE**

### **Adult Life Jacket Wear on Open Motorboats 2006 to 2009**

The National Boating Safety Advisory Council (NBSAC) recommended the creation of a strategic plan for the National Recreation Boating Safety Program in 2005. The goals, objectives, and strategies in this Plan can help all partners in boating safety work together to reduce the incidents of preventable deaths, injuries, and property damage. One of the objectives of the Strategic Plan is to increase the observed life jacket wear rate of adults in open motorboats. For the purposes of this measurement, “open motorboats” are a combination of the Skiff/Utility and Runabout/Speedboat categories that are individually presented later in this report. This objective was put in place beginning in the year 2006.

To ensure that comparisons to 2006 are accurate, the proportion of skiffs to speedboats in each state for each subsequent year was set to mirror the proportions in 2006. For example, in 2006 the national proportion across all states of the number of skiffs to the number of speedboats was 22% versus 78%, but in 2009 the proportions were 34% to 66%. Similarly, the proportions are likely to be different in each state. If proportions of these boat categories were not adjusted, the 2009 wear rate would appear more positive simply because JSI observed more skiffs relative to speedboats this year than in 2006. Using the fixed proportions, however, the baseline wear rate for adults in open motorboats was 4.5% in 2006. In 2007 the wear rate was 4.7%; in 2008 the wear rate was 5.2%; and in 2009 the wear rate was 4.9%. The average wear rate for the last two years is a little higher than the average for the first two years of the strategic plan period. See Figure A on the opposite page for a chart showing these trends.

**Figure A – Adult Wear Rates on Open Motorboats\* 2006-2009  
(Weighted to 2006 Skiff-Speedboat Proportions for Each State)**



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\* The Open Motorboat category is created by grouping "Skiffs" and "Speedboat/Runabouts" together. Factors controlled for in this chart are Age (proportions of 18 to 64 and 65+ adults) and the proportion of Skiffs to Speedboat/Runabouts has been set in each year within each state to reflect the proportions observed in 2006, the year in which the Strategic Plan goals were first measured. In addition, each state's contribution to the national average is weighted to reflect the 2006 proportions.

### **III. RESULTS**

#### **National Life Jacket Wear Rates ALL Boaters 1998 to 2009**

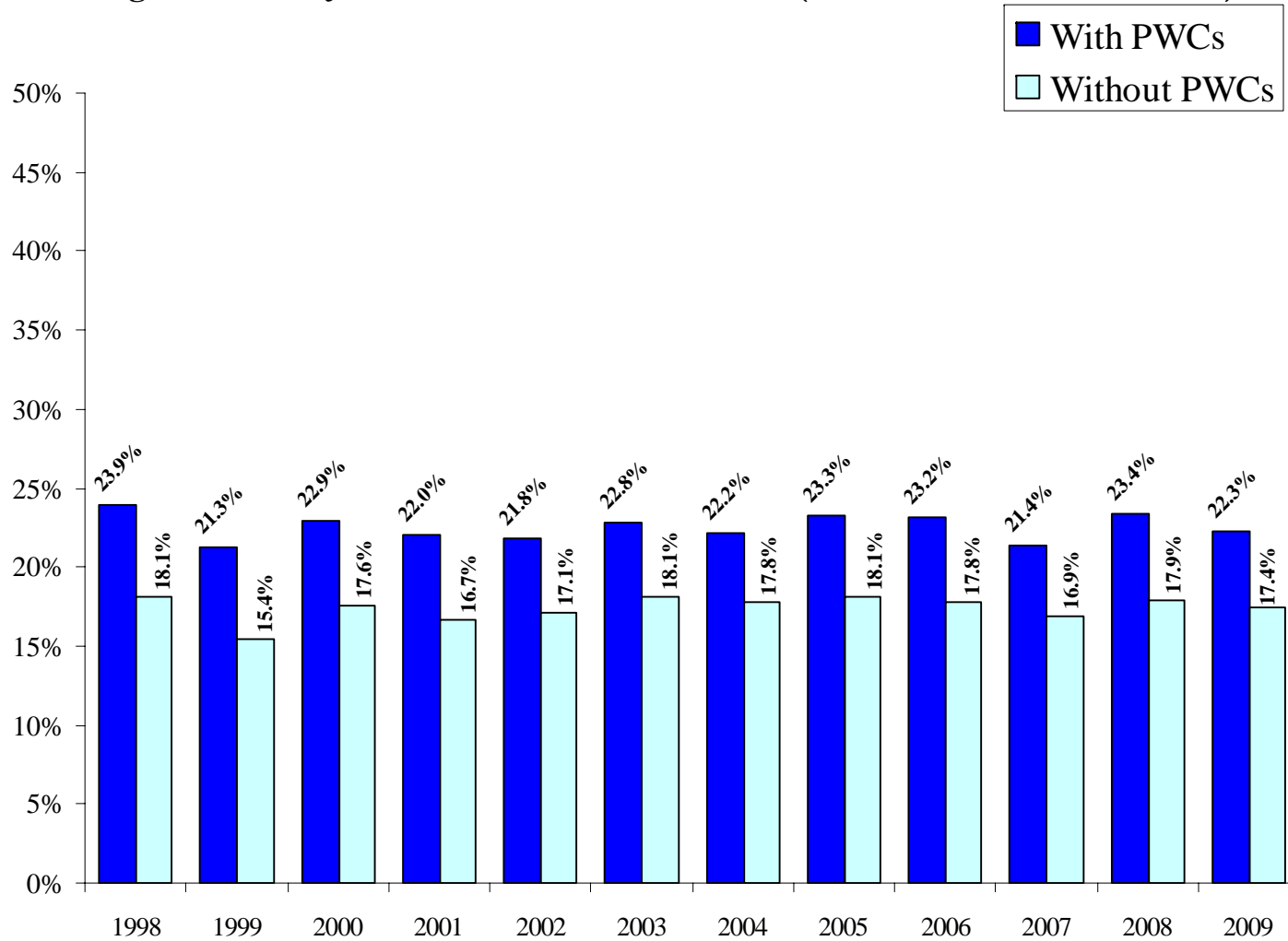
Figure B shows trends for national life jacket wear rates, which includes all groups of recreational boaters together (youth and adults) for all boats. The average life jacket wear rate for 2009 was 22.3%, down somewhat from 2008 in which the rate was 23.4%. Over the twelve year period, the lowest rates were 21.3% (1999) and 21.4% (2007). The highest wear rates observed were 23.9% (1998); 23.3% (2005), 23.2% (2006) and 23.4% (2008). However, focusing on this combined life jacket wear rate obscures the influence of age and boat type on life jacket wear.

Figure B also shows the impact of Personal Watercraft (PWC) wear rates on the national average wear rate for all boaters by presenting rates with PWCs removed. Life jacket wear is mandated on PWCs, therefore excluding them provides a more valid representation of voluntary wear rate trends.

In 2009 wear rates for adults and youth combined on all boats except PWCs was 17.4%, down slightly from the 2008 rate of 17.9%. There has been a slight national downward trend from a high of 18.1% in 2005.



**Figure B – Life Jacket Wear Rates ALL Boaters (Adults and Youth Combined)**

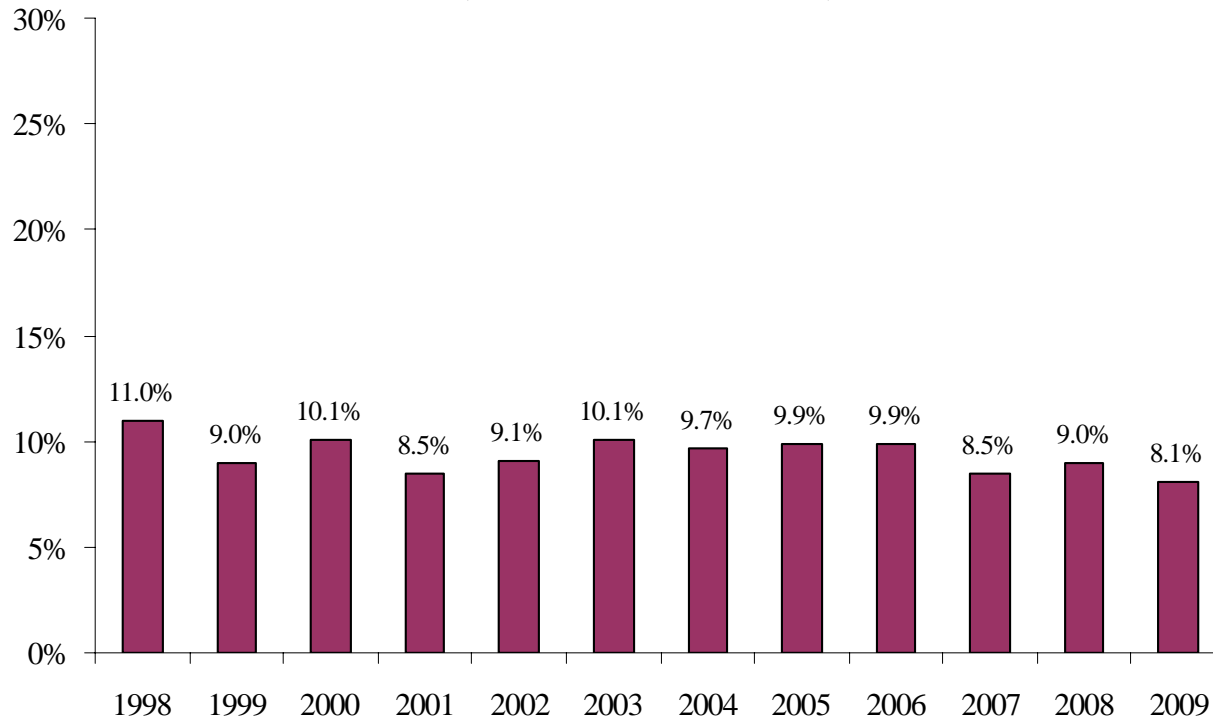


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## National Life Jacket Wear Rates for ADULTS excluding PWCs 1998 to 2009

The national average wear rate for all adults on all boats excluding PWCs in 2009 is 8.1%, down slightly from 2008 and at its lowest point in the twelve years of observations (see Figure C below).

**Figure C – Life Jacket Wear Among Adult Boaters (18 years or older)\*  
(All boats except PWCs)**

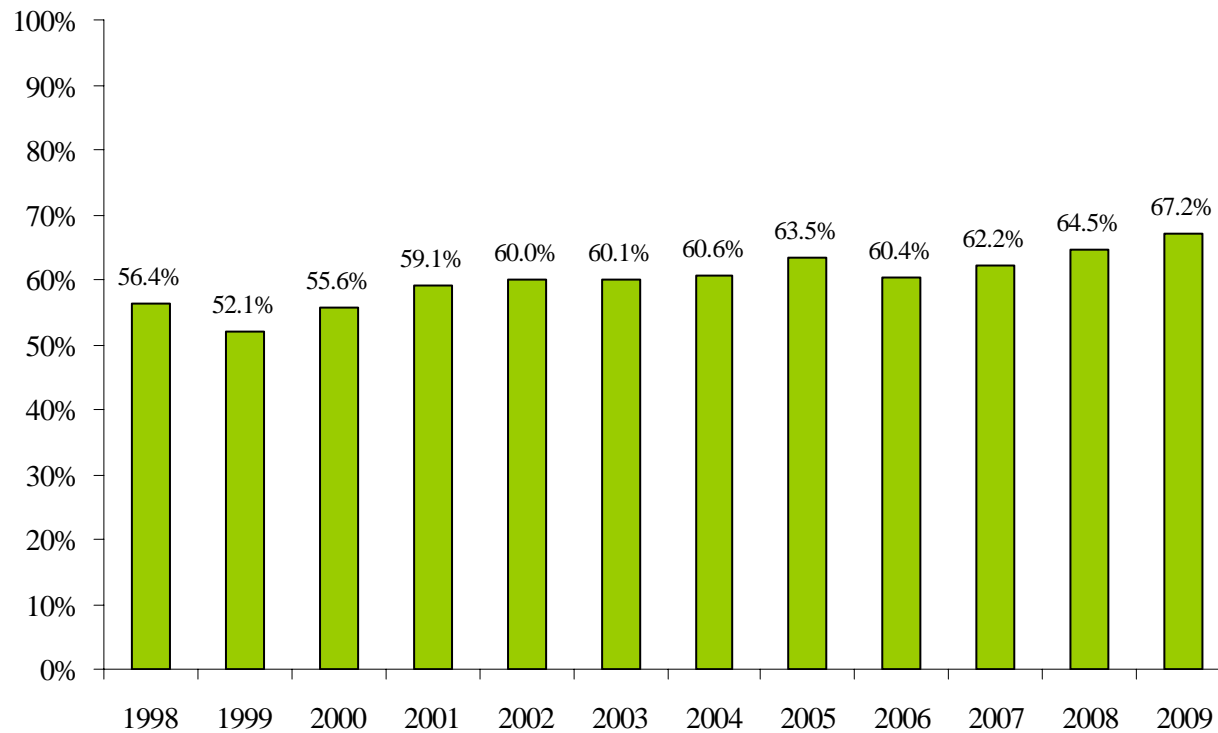


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\*Factors controlled for: Age & Boat Type.

## National Life Jacket Wear Rates for YOUTH excluding PWCs 1998 to 2009

Figure D shows the national wear rate trend for all youth (17 years or younger) on all boats except PWCs. These rates are relatively high across the twelve years of the study with a general upward trend. The rate for 2009 is 67.2%, the highest it has been since the beginning of the study, and approximately a 20% increase across the twelve years of observations.

**Figure D – Life Jacket Wear Among Youth Boaters (17 years or younger)\*  
(All boats except PWCs)**



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\*Factors controlled for: Age & Boat Type.

## **Life Jacket Wear Rates by Age Groupings 1998 to 2009**

Table 1 presents wear rates by the different age groupings used in the study. The trends in wear rates for children under 6 has remained very high - but relatively flat since 2004 - with the 2009 rate at 93.6%. For the 6 to 12 year olds there is a slight decrease from 87.3% last year to 86.5% in 2009. Teens (13 to 17 years old) show a small increasing trend since 1999 when teens were identified as a separate age category with the rate in 2009 being 38.9%, the highest that it has been since 1999.

As was mentioned earlier in the discussion for Figure D, all youth grouped together show a generally increasing trend with 2009 having the highest reading across the twelve years at 67.2%.

For adults ages 18 to 64 and 65+ there are no noticeable upward trends across the twelve years of data collection. In 2009 there was a decrease in national wear rates for the 18 to 64 years old group, from 9.1% in 2008 to 8.1% in 2009. For older boaters (65+) the wear rates went up from 6.1% in 2008 to a 2009 wear rate of 7.0%.

As indicated in Figure C shown earlier, and in Table 1, when both adult groups are combined (18+ yrs), there was a decline from 2008 to 2009 that mirrored the 18 to 64 age group, whose rates were 9.0% in 2008 and 8.1% in 2009, because this group has more boaters than the 65+ age group.

**Table 1 - Life Jacket Wear Rates by Age Excluding Boaters on PWCs\***

Age	1998 % (N's)	1999 % (N's)	2000 % (N's)	2001 % (N's)	2002 % (N's)	2003 % (N's)	2004 % (N's)	2005 % (N's)	2006 % (N's)	2007 % (N's)	2008 % (N's)	2009 % (N's)
0-5 yrs	81.4% (672)	80.6% (500)	89.1% (716)	91.7% (703)	90.1% (676)	90.3% (658)	94.9% (743)	93.1% (714)	94.4% (921)	92.2% (930)	93.5% (938)	93.6% (854)
6-12 yrs	** **	69.1% (2104)	72.1% (2696)	76.6% (3122)	79.2% (2752)	79.7% (2627)	81.6% (27411)	80.6% (2487)	79.1% (2403)	84.1% (2819)	87.3% (2579)	86.5% (2812)
13-17 yrs	** **	24.1% (2244)	30.5% (2725)	31.2% (2893)	32.4% (2575)	32.0% (2767)	29.8% (2572)	32.8% (2230)	33.5% (2403)	31.5% (2652)	33.2% (2507)	38.9% (2420)
<b>0-17 yrs (all youths)</b>	56.4% (4677)	52.1% (4624)	55.6% (6094)	59.1% (6695)	60.0% (5924)	60.1% (5970)	60.6% (5955)	63.5% (5414)	60.4% (5713)	62.2% (6401)	64.5% (6024)	67.2% (6086)
18-64 yrs	10.9% (25470)	8.8% (24321)	10.1% (27100)	8.5% (32528)	9.2% (31742)	10.1% (28551)	9.7% (33319)	9.9% (30176)	10.0% (29591)	8.4% (32108)	9.1% (30743)	8.1% (34632)
65+ yrs	13.6% (1203)	12.9% (1147)	9.9% (1040)	6.9% (1276)	6.8% (922)	9.4% (1106)	8.3% (1331)	11.0% (823)	8.3% (803)	11.7% (881)	6.1% (1190)	7.0% (1129)
<b>18+ yrs (all adults)</b>	11.0% (26673)	9.0% (25468)	10.1% (28140)	8.5% (33804)	9.1% (32664)	10.1% (29657)	9.7% (34650)	9.9% (30999)	9.9% (30394)	8.5% (32989)	9.0% (31933)	8.1% (35761)

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\*Factors controlled for: Age & Boat Type.

\*\*In 1998 observations were recorded as 6-17yrs and therefore cannot be subdivided.

## Power Boats for Adults (18 years or older).

Figure E and Table 2 present information for the various types of power boats for adults. Averaging across these types of boats (not including PWCs) for 2009, we see a decrease (3.9% in 2009 from 4.8% in 2008, see Figure E below). Comparing rates for individual types of power boats provides a better understanding of these results. Skiffs decreased substantially to 6.9% from 9.2% and runabouts decreased as well (4.1% down to 3.5%). These decreases are important because they encompass the two types of craft that adults are seen in most frequently. These decreases are also reflected in the open motorboat category which saw a small decline from 2008 levels of 5.2% to 4.9% in 2009. Cabin cruisers and pontoon boats continued to show very low wear rates. PWCs continued to have almost universal wear rates. Powered inflatables had a decrease from 17.6% to 11.9%, but it is based on a relatively small number of boaters.

**Figure E – Adult Wear Rates for ALL Power Boats Except PWCs\***



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\*Factors controlled for: Age & Boat Type.

**Table 2 - Life Jacket Wear Rates by Power Boats for Adults (18 years or older)\***

Boat Type	1998 % (N's)	1999 % (N's)	2000 % (N's)	2001 % (N's)	2002 % (N's)	2003 % (N's)	2004 % (N's)	2005 % (N's)	2006 % (N's)	2007 % (N's)	2008 % (N's)	2009 % (N's)
All Power Boats (no PWCs)	5.6% (20813)	4.4% (19894)	5.2% (22448)	4.2% (27864)	3.9% (26304)	4.9% (24190)	3.9% (28285)	4.4% (25741)	3.9% (25412)	4.3% (27623)	4.8% (27315)	3.9% (29924)
Skiff/Utility	13.2% (2032)	10.0% (1867)	10.3% (1903)	9.7% (2469)	5.9% (3177)	10.4% (4214)	7.9% (4429)	7.2% (5038)	7.3% (4091)	8.5% (5340)	9.2% (6633)	6.9% (7257)
Runabout/Speedboat	5.5% (13196)	4.2% (13195)	5.3% (14463)	4.5% (16985)	4.3% (14066)	4.6% (13057)	3.9% (16633)	4.7% (13643)	3.7% (14512)	3.6% (14414)	4.1% (13901)	3.5% (14635)
<b>Open Motorboats** (Skiff/Utility+ Runabout/Speedboat)</b>	7.2% (15228)	5.5% (15062)	6.4% (16366)	5.6% (19454)	4.7% (17243)	5.9% (17271)	4.8% (21052)	5.3% (18681)	4.5% (18603)	4.7% (19754)	5.2% (20534)	4.9% (21439)
Cabin Cruiser	1.3% (4012)	1.8% (3396)	1.6% (4391)	1.2% (6222)	1.9% (7111)	1.7% (5119)	1.0% (5242)	1.1% (5054)	1.7% (4280)	2.0% (5353)	1.4% (4430)	1.6% (5342)
Houseboat	0.8% (252)	0.0% (151)	0.0% (216)	0.6% (162)	0.8% (124)	0.0% (328)	5.6% (216)	0.4% (219)	0.0% (112)	0.0% (43)	0.0% (51)	0.0% (31)
Pontoon	4.7% (1359)	4.0% (1231)	6.2% (1458)	1.9% (1929)	2.7% (1796)	2.9% (1610)	2.9% (1770)	4.1% (1849)	2.4% (2276)	2.7% (2150)	1.1% (2051)	2.1% (2436)
PWC	96.5% (1959)	94.2% (1899)	97.4% (1761)	96.0% (2091)	95.8% (1798)	94.7% (1589)	95.5% (1721)	95.3% (1858)	97.1% (1962)	96.1% (1736)	97.6% (2009)	97.4% (2093)
Powered Inflatable/Raft	25.6% (214)	15.7% (205)	22.3% (233)	13.5% (259)	27.2% (154)	14.8% (190)	9.0% (211)	1.9% (157)	11.0% (253)	19.1% (366)	17.6% (228)	11.9% (254)

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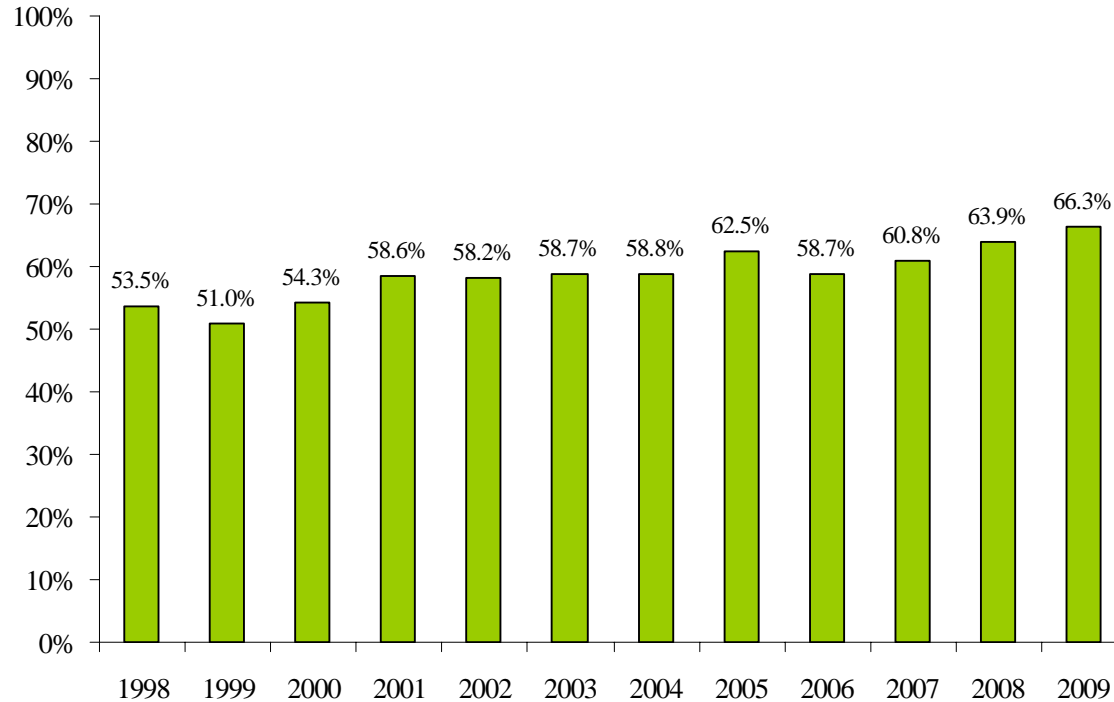
\*Factors controlled for: Age & Boat Type.

\*\* The Open Motorboat category is created by grouping "Skiffs" and "Speedboat/Runabouts" together. Factors controlled for in this chart are Age (proportions of 18 to 64 and 65+ adults) and the proportion of Skiffs to Speedboat/Runabouts has been set in each year within each state to reflect the proportions observed in 2006, the year in which the Strategic Plan goals were first measured. In addition, each state's contribution to the national average is weighted to reflect the 2006 proportions.

## Power Boats for Youth (17 years or younger).

Figure F and Table 3 present data for each type of power boat for the three age groups of youth combined (17 years or younger). For all youth on all power boats (excluding PWCs), we find an increase in 2009 (66.3%) from 2008 (63.9%, see Figure F below). Extrapolating from the age results reported in Table 1, this change is driven mostly by the increase in wear rates for the 13 to 17 year old group of boaters. The information for specific types of power boats shows gains among the most frequently used boats by this age group. For skiffs the increase is from 68.4% in 2008 to 70.4% in 2009. For speedboats/runabouts the wear rate moves from 64.6% in 2008 to 68.2% in 2009. These two boat types, which are the type of crafts youth are most frequently observed on, had their highest wear rates observed in 2009 compared to the previous years. As seen in previous years, PWC wear rates are extremely high.

**Figure F – Youth Wear Rates for ALL Power Boats Except PWCs\***



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\*Factors controlled for: Age & Boat Type.



**Table 3 - Life Jacket Wear Rates by Power Boats for Youth (17 years or younger)\***

Boat Type	1998 % (N's)	1999 % (N's)	2000 % (N's)	2001 % (N's)	2002 % (N's)	2003 % (N's)	2004 % (N's)	2005 % (N's)	2006 % (N's)	2007 % (N's)	2008 % (N's)	2009 % (N's)
All Power Boats (no PWCs)	53.5% (3857)	51.0% (3834)	54.3% (5179)	58.6% (5717)	58.2% (5162)	58.7% (5170)	58.8% (5191)	62.5% (4737)	58.7% (5043)	60.8% (5583)	63.9% (5257)	66.3% (5451)
Skiff/Utility	55.5% (373)	52.7% (338)	49.5% (369)	68.2% (441)	54.9% (557)	63.2% (768)	60.7% (641)	63.3% (781)	58.4% (661)	63.1% (947)	68.4% (988)	70.4% (1097)
Runabout/Speedboat	55.6% (2777)	51.6% (2744)	55.2% (3776)	58.8% (3987)	59.4% (3479)	60.0% (3369)	60.0% (3574)	63.5% (2966)	60.9% (3348)	61.7% (3517)	64.6% (3256)	68.2% (3133)
<b>Open Motorboats** (Skiff/Utility+ Runabout/Speedboat)</b>	55.6% (3150)	51.8% (3082)	54.3% (4145)	60.1% (4428)	58.7% (4036)	60.5% (4137)	60.1% (4215)	63.5% (3747)	60.5% (4009)	61.9% (4464)	65.2% (4244)	68.6% (4230)
Cabin Cruiser	42.2% (438)	42.6% (418)	48.2% (587)	48.3% (774)	50.7% (690)	45.3% (659)	49.6% (529)	54.6% (528)	50.7% (501)	52.0% (639)	51.0% (581)	51.2% (644)
Houseboat	20.5% (39)	8.7% (46)	12.7% (64)	25.7% (44)	30.3% (30)	17.8% (63)	24.7% (35)	12.9% (38)	28.2% (40)	37.6% (5)	0.0% (1)	25.8% (4)
Pontoon	61.6% (238)	38.3% (272)	46.3% (379)	54.8% (455)	55.6% (399)	51.8% (338)	48.5% (394)	64.6% (440)	50.3% (505)	64.1% (414)	65.9% (392)	66.2% (530)
PWC	98.0% (497)	96.0% (551)	99.1% (649)	99.1% (691)	98.8% (502)	98.0% (562)	98.5% (543)	98.3% (652)	99.2% (580)	98.7% (522)	99.4% (664)	98.6% (572)
Powered Inflatable/Raft	54.4% (31)	59.3% (62)	69.7% (68)	79.5% (60)	72.8% (37)	66.8% (36)	65.8% (53)	71.2% (22)	70.6% (28)	71.1% (66)	79.7% (39)	70.3% (47)

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\*Factors controlled for: Age & Boat Type.

\*\* The Open Motorboat category is created by grouping "Skiffs" and "Speedboat/Runabouts" together. The proportion of Skiffs to Speedboat/Runabouts has been set to reflect the national proportions observed in 2006, the year in which the Strategic Plan goals were first measured.

## All Paddle Craft for Adults (18 years or older).

Figure G and Table 4 present results for adults in paddle craft. All paddle craft rates stayed at moderate rates even though paddled inflatables showed a substantial dip. This dip was due to one site which historically sees a lot of inflatable participants and high wear rates but for 2009 observations were unable to be completed. Comparing the combined rates for the two types of craft that make up the bulk of the activity in this group (canoes and kayaks), there is an increase from 2008 in which the rate was 46.0% to 2009 when the rate went up to 49.1% (see Table 4). This is mirrored by the separate wear rate changes for canoes and kayaks, in which canoes went from 19.7% to 25.0% and kayaks increased from 65.5% to 72.6%. Rowboat/Dinghies increased from 23.0% to 35.3%, but this rate change was based on a relatively few number of these boaters observed. The data for inflatable/rafts was much lower in 2009 because observations could not be conducted at one of the main sites for observing inflatable rafts which are being paddled.

**Figure G – Adult Wear Rates for ALL Paddle Craft\***



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\*Factors controlled for: Age & Boat Type.

**Table 4 - Life Jacket Wear Rates by Paddle Craft for Adults (18 years or older)\***

Boat Type	1998 % (N's)	1999 % (N's)	2000 % (N's)	2001 % (N's)	2002 % (N's)	2003 % (N's)	2004 % (N's)	2005 % (N's)	2006 % (N's)	2007 % (N's)	2008 % (N's)	2009 % (N's)
All Paddle Craft	43.7% (2300)	46.2% (1676)	50.7% (1676)	51.9% (1816)	50.7% (1864)	55.4% (1672)	56.7% (1637)	47.0% (1616)	62.8% (1456)	40.1% (2065)	43.1% (1523)	41.4% (1939)
Paddled Inflatable/Raft	46.3% (456)	71.8% (174)	13.0% (198)	65.1% (250)	65.6% (307)	60.5% (290)	57.8% (283)	76.0% (225)	77.8% (308)	23.9% (526)	38.4% (311)	8.2% (340)
Rowboat/Dinghy	20.0% (50)	24.4% (82)	37.2% (118)	18.7% (119)	27.3% (193)	22.8% (117)	10.1% (38)	59.2% (71)	26.7% (78)	15.0% (92)	23.0% (65)	35.3% (51)
Canoe	** **	17.7% (809)	33.8% (714)	23.6% (750)	15.4% (701)	30.4% (607)	26.7% (622)	14.8% (679)	29.2% (364)	19.4% (764)	19.7% (481)	25.0% (758)
Kayak	** **	82.7% (611)	85.7% (646)	84.4% (697)	85.7% (663)	81.4% (658)	87.0% (694)	74.1% (675)	77.9% (706)	72.0% (683)	65.5% (648)	72.6% (790)
Canoe/Kayak Combined	44.2% (1794)	45.9% (1420)	58.6% (1360)	53.1% (1447)	49.7% (1364)	56.8% (1265)	58.6% (1316)	44.4% (1354)	61.2% (1070)	44.3% (1447)	46.0% (1129)	49.1% (1548)

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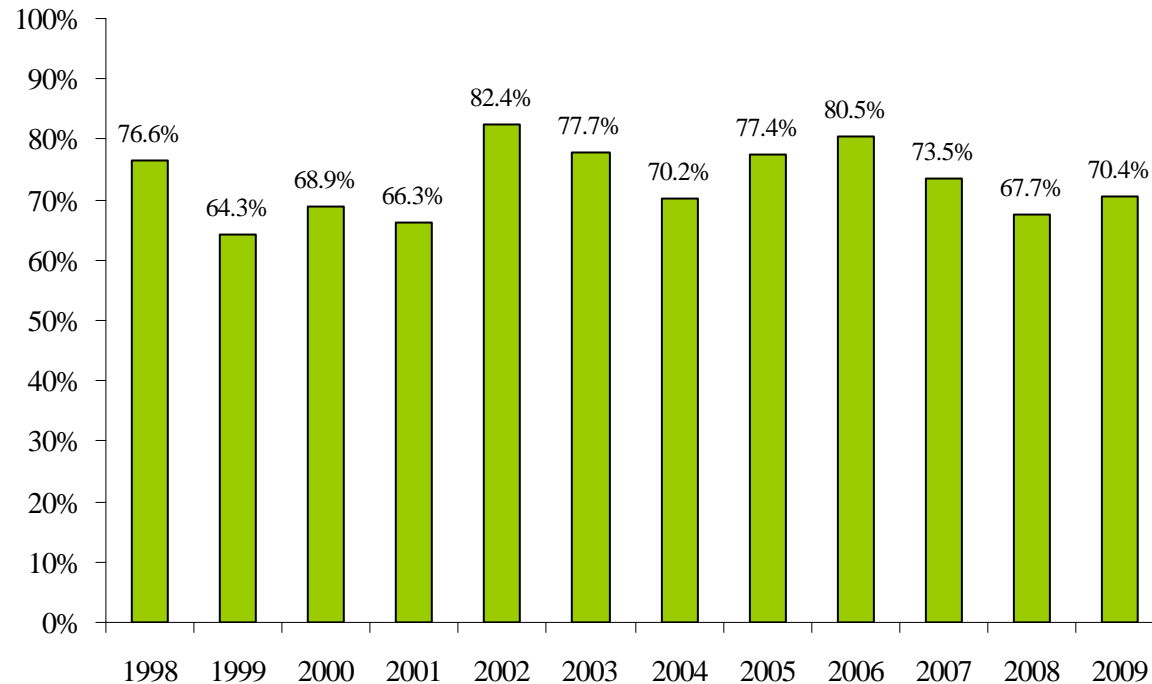
\*Factors controlled for: Age & Boat Type.

\*\*The 1998 observations were recorded as Canoe/Kayak and therefore cannot be subdivided.

## All Paddle Craft for Youth (17 years or younger).

Figure H and Table 5 present results for youth in paddle craft. Data in this table should be viewed cautiously because of the relatively small number of youth who use these types of craft. For all paddle craft combined wear rates have fluctuated across the years, but the rates went up slightly for 2009 to 70.4% compared to 67.7% in 2008. For the combined canoe/kayak category there is a small decline from 80.0% in 2008 to 76.0% in 2009 (see Table 5). This is a reflection of the drop in canoe wear rates to 70.6% in 2009 from 78.0% in 2008 compared to a small increase in kayak wear rates from 83.5% in 2008 to 85.3% in 2009. Wear rates for inflatable boats which were being paddled went up slightly from 55.6% to 59.0%, but again with a relatively small number of youth boaters.

**Figure H – Youth Wear Rates for ALL Paddle Craft\***



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\*Factors controlled for: Age & Boat Type.

**Table 5 - Life Jacket Wear Rates by Paddle Craft for Youth (17 years or younger)\***

Boat Type	1998 % (N's)	1999 % (N's)	2000 % (N's)	2001 % (N's)	2002 % (N's)	2003 % (N's)	2004 % (N's)	2005 % (N's)	2006 % (N's)	2007 % (N's)	2008 % (N's)	2009 % (N's)
All Paddle Craft	76.6% (446)	64.3% (317)	68.9% (457)	66.3% (457)	82.4% (312)	77.7% (372)	70.2% (360)	77.4% (281)	80.5% (225)	73.5% (520)	67.7% (492)	70.4% (319)
Paddled Inflatable/Raft	84.4% (149)	62.4% (82)	45.8% (124)	52.3% (153)	90.3% (136)	68.9% (113)	68.4% (118)	77.5% (79)	77.9% (87)	58.4% (244)	55.6% (218)	59.0% (76)
Rowboat/Dinghy	71.4% (14)	11.1% (9)	47.1% (15)	60.3% (32)	54.7% (31)	88.6% (21)	58.0% (11)	77.1% (17)	67.3% (26)	61.0% (21)	77.8% (25)	91.1% (9)
Canoe	** **	57.7% (142)	74.6% (222)	62.4% (181)	71.1% (98)	75.0% (130)	60.3% (146)	69.4% (101)	68.9% (49)	81.0% (123)	78.0% (158)	70.6% (132)
Kayak	** **	83.3% (84)	89.2% (96)	94.3% (91)	83.7% (47)	91.6% (108)	91.2% (85)	88.7% (94)	89.0% (63)	90.1% (132)	83.5% (86)	85.3% (102)
Canoe/Kayak Combined	72.1% (283)	67.3% (226)	78.9% (318)	73.1% (272)	74.5% (145)	82.9% (238)	71.3% (231)	79.6% (195)	82.2% (112)	85.7% (255)	80.0% (244)	76.0% (234)

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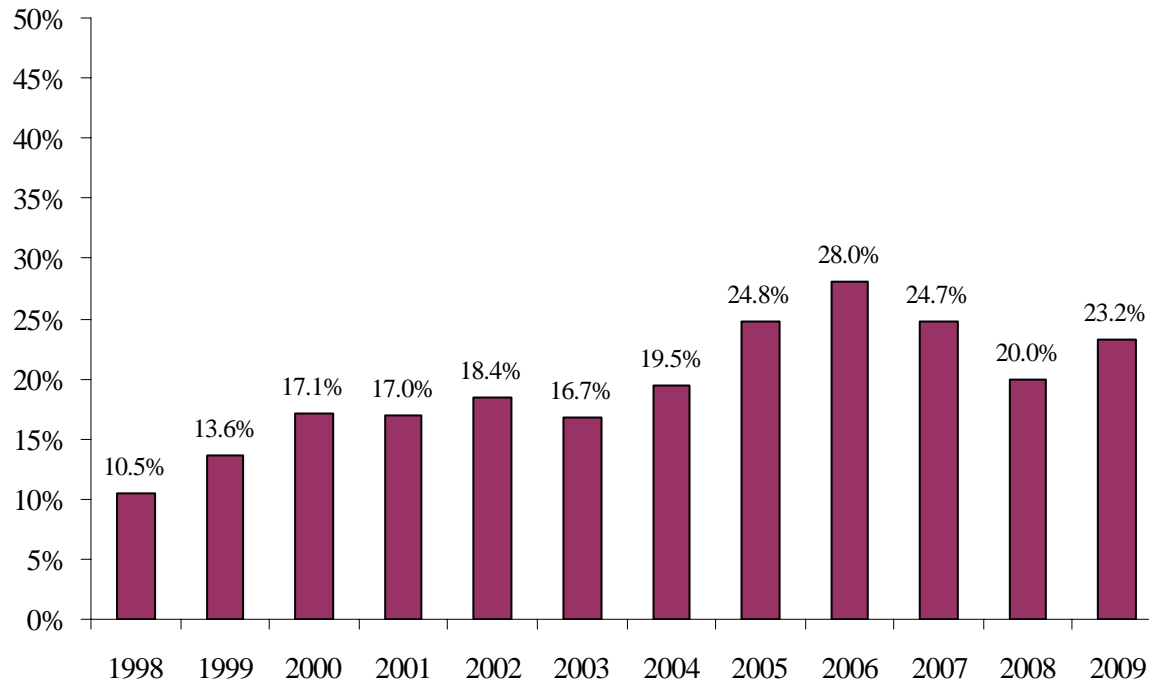
\*Factors controlled for: Age & Boat Type.

\*\*The 1998 observations were recorded as Canoe/Kayak and therefore cannot be subdivided.

## Sail Craft for Adults (18 years or older).

Figure I and Table 6 document results for adults in sail craft. For all sailing craft combined there was an increase in wear rates from the previous year of 20.0% in 2008 to 23.2% in 2009 (see Figure I below). From 2008 to 2009 there was an increase for day sailors (48.3% to 61.7%). Wear rates on day sailors increased more than 100% since 1998 (a baseline rate of 27.7%). In 2009 there was also a small increase for cabin sailboats (12.0% in 2008 to 13.0% in 2009). Cabin sailboats wear rates increased approximately 150% since 1998 in which the baseline wear rate was 5.6%.

**Figure I – Adult Wear Rates for ALL Sail Craft\***



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\*Factors controlled for: Age & Boat Type.

**Table 6 - Life Jacket Wear Rates by Sail Craft for Adults (18 years or older)\***

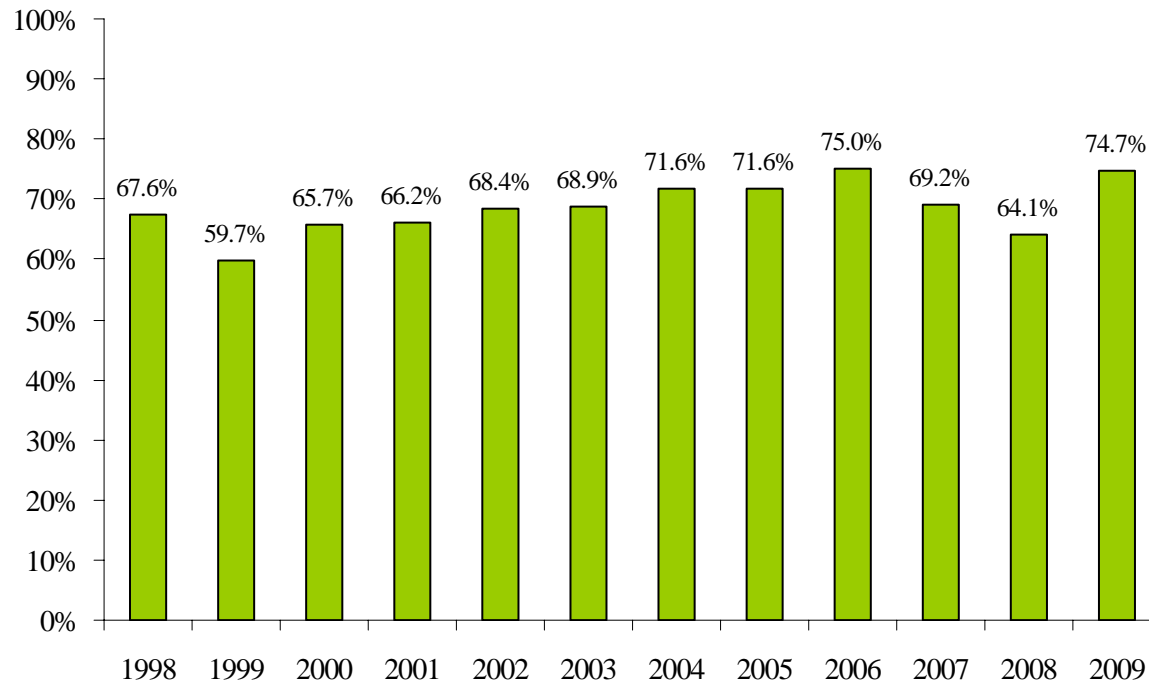
Boat Type	1998 % (N's)	1999 % (N's)	2000 % (N's)	2001 % (N's)	2002 % (N's)	2003 % (N's)	2004 % (N's)	2005 % (N's)	2006 % (N's)	2007 % (N's)	2008 % (N's)	2009 % (N's)
All Sail Craft	10.5% (2912)	13.6% (3420)	17.1% (3565)	17.0% (3843)	18.4% (4087)	16.7% (3149)	19.5% (4149)	24.8% (3084)	28.0% (3279)	24.7% (3217)	20.0% (3079)	23.2% (3733)
Sailboard	100% (55)	16.4% (46)	94.0% (30)	80.6% (15)	83.2% (55)	96.7% (27)	92.9% (40)	53.0% (20)	92.1% (12)	83.7% (18)	94.6% (17)	71.9% (7)
Day Sailor	27.7% (975)	30.7% (739)	35.6% (791)	37.9% (604)	46.7% (1124)	38.4% (815)	49.7% (984)	56.4% (736)	59.1% (607)	50.4% (397)	48.3% (649)	61.7% (652)
Cabin Sailboat	5.6% (1882)	9.1% (2635)	11.3% (2744)	10.2% (3224)	9.5% (2908)	10.2% (2307)	10.1% (3125)	15.4% (2328)	19.1% (2660)	17.1% (2802)	12.0% (2413)	13.0% (3074)

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 \*Factors controlled for: Age & Boat Type.

## Sail Craft for Youth (17 years or younger).

Figure J and Table 7 below show that the national average wear rates on all sailboats for youth increased from 64.1% in 2008 to 74.7% in 2009. However, relatively few youth are found on this type of craft and therefore fluctuations in rates should be interpreted cautiously.

**Figure J – Youth Wear Rates for ALL Sail Craft\***



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\*Factors controlled for: Age & Boat Type.



**Table 7 - Life Jacket Wear Rates by Sail Craft for Youth (17 years or younger)\***

Boat Type	1998 % (N's)	1999 % (N's)	2000 % (N's)	2001 % (N's)	2002 % (N's)	2003 % (N's)	2004 % (N's)	2005 % (N's)	2006 % (N's)	2007 % (N's)	2008 % (N's)	2009 % (N's)
All Sail Craft	67.6% (285)	59.7% (347)	65.7% (329)	66.2% (424)	68.4% (381)	68.9% (323)	71.6% (323)	71.6% (327)	75.0% (371)	69.2% (270)	64.1% (274)	74.7% (305)
Sailboard	100.0% (1)	0.0% (3)	100.0% (7)	66.7% (6)	75.0% (4)	n/a (0)	92.1% (48)	100% (1)	100% (4)	82.2% (8)	-- (0)	-- (0)
Day Sailor	80.3% (117)	71.1% (114)	81.6% (81)	92.0% (85)	82.1% (113)	84.3% (107)	87.5% (83)	73.4% (67)	93.2% (122)	86.5% (54)	88.0% (75)	92.5% (80)
Cabin Sailboat	64.1% (167)	58.3% (230)	61.5% (241)	58.2% (333)	63.5% (264)	60.6% (216)	68.3% (192)	69.4% (259)	65.7% (245)	62.4% (208)	56.4% (196)	66.4% (225)

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 \*Factors controlled for: Age & Boat Type

#### **IV. CONCLUSIONS FOR LIFE JACKET WEAR RATES - NATIONAL TREND DATA 1998 TO 2009**

This report includes observational data collected from 1998 to 2009. Trends in life jacket wear for types of boats and for various age groups were displayed. A summary of key findings are:

1. In 2009 adult day sailor wear rates increase to 61.7% which is more than a 100% increase since baseline rates of 27.7% in 1998.
2. The adult life jacket wear rate for all boats (excluding PWCs) is at its lowest point (8.1%) in twelve years of observations, continuing a general slight downward shift of wear rates since 1998.
3. National, adult wear rates continue to be high in boats that are perceived to be easier to capsize or for which there is mandated wear – PWCs, kayaks, inflatable/rafts, and day sailors.
4. Wear rates on PWCs for both adults and children are almost universal.
5. For all youth combined (17 years or younger), wear rates increased almost 20% over the twelve years of observations. In all likelihood this is both a reflection of changing legal mandates at the state and federal level as well as a demonstrated affect of targeted educational campaigns.
6. In 2009, increases for all youth were seen in skiffs and speedboats, the two most frequently used boats by youth.

## V. APPENDIX: METHODS & DESCRIPTIVE INFORMATION

To provide reliable and valid indicators of changes in life jacket wear rates, it was essential for observation procedures to remain as close as possible to those used in previous years. The same states were observed for each of the twelve years of data collection efforts, over the same period of time. The vast majority of the sites in each of 30 states observed have remained the same for all twelve years. The following is a detailing of the methods used in all twelve years of data collection.

**Time period** - Observations were conducted during the summer months of each year, beginning the weekend of July 4<sup>th</sup> and ending on Labor Day weekend.

**Site selection** - A total of 30 states were chosen in which to conduct observations. The states were originally selected by a stratified random sampling procedure. Approximately three-fourths of the coastal states (20 out of 26 states) were chosen, and approximately one-half of the inland states (10 out of 24) were selected. Four sites from each state were visited, except in California, where eight sites were observed due to the size of the state. The 124 sites represented a wide range of water venues including lakes, rivers, harbors and bays, and intra-coastal waterways. The sites were selected based on consultations with local offices of the USCG, members of the local Coast Guard Auxiliary or Power Squadron, and state boating or fishing law enforcement agencies. Sites were selected to roughly represent a variety of available boating venues in the state, as well as their proximity to one another to allow for relatively short travel time between sites. In addition, sites needed to have suitable shore-based viewing locations from which observations of life jacket wear could be made using high-powered binoculars.

**Observational procedures** - Observations were conducted for four-hour periods either in the morning or the afternoon of a Saturday or Sunday. The goal was to observe as many boats as possible during a four-hour time frame. Viewing locations were on shore at a narrowing, bridge, or near a marina to facilitate observations. Two-person teams observed boating activity. One team member made the observations using high-powered binoculars and called out the information, which was then recorded on observation forms by the second team member. Team members alternated responsibilities frequently to ward off fatigue. In addition to recording information on boating activity and life jacket wear, observers recorded data about the site. This included information on weather and water conditions. JSI project staff trained the observers during two half-day sessions. The first half-day training consisted of reviewing the observation manual, observation forms, and required equipment. The observation manual contained procedures, definitions, and pictures of various types of boats to facilitate consistent classification by the observers. The second half-day of training allowed observation team members an opportunity to practice using the required equipment and observation forms with the assistance and guidance of a JSI project staff member.

**Observation Forms** - There were two observation forms designed. The first was the boat observation form, which was intended to record information about the boat and people on the boat. The second form was the site form, which was designed to record information about the site, weather and water conditions. The forms have remained the same from year to year, with the exception of two changes made in 1999 and one change made in 2004. These changes are discussed in detail below.

**A) Boat Forms** - Observers recorded the observation time period in two hour blocks of time (7:59 or earlier, 8am – 9:59am, 10am -11:59pm, 12pm – 1:59pm, 2pm – 3:59pm, 4pm – 5:59pm, 6pm or later); the type of boat observed (skiff, speedboat/runabout, cabin cruiser, personal watercraft (PWC), pontoon boat, houseboat, sailboard, day sailor, cabin sailboat, rowboat, inflatable, canoe, kayak, and other); the type of propulsion (outboard engine, sterndrive/inboard engine, sail only, sail and auxiliary engine/motor, paddles/oars/manual, air thrust, and other); length of boat (under 16 feet, 16-20.9 feet, 21-25.9 feet, 26-45.9 and 46+ feet); type of operation (motoring, sailing, paddling, drifting, or at anchor); and activity engaged in (fishing, intent to fish, water-skiing, white-water, high speed racing, swimming, pleasure boating, and other). Observers also recorded operator/passenger status; gender (male, female, or unknown); age (under six, 6 - 12, 13 - 17, 18 - 64, 65 or older); life jacket wear (wearing or not wearing); life jacket type (traditional=old or inflatable=new). In addition, if the boat was involved in water-skiing, observers indicated which boaters were skiing at the time.

**B) Site Forms** - At each site, the observers recorded the beginning time and ending time of the observation period, water type (lake, river, harbor/bay, Great Lake, intra-coastal waterway) and water temperature. The following environmental factors

were measured by observers at each two hour time block during the observation period: air temperature; wind speed; wave height (less than six inches, six inches up to two feet, or over two feet); weather (sunny, partly cloudy, cloudy, raining, or stormy); and visibility (good, fair, or poor).

Over the past twelve years of observations only three categories of information have changed. In 1999, the original 6 to 17 year old age category was divided into a 6 to 12 year old group and a 13 to 17 year old group. Also in 1999, the boat category of canoes/kayaks was separated to record canoes and kayaks individually. In this report, life jacket wear rates are reported for both the combined and separated categories of age and canoes and kayaks. Finally, in 2004 the USCG requested that JSI breakout the boat size categories from three (under 16 feet, 16-25 feet and over 26 feet) to four categories (under 16 feet, 16-20 feet, 21-25 feet and over 26 feet). Observations made in 2004 - 2009 are the only years to record observations using the expanded boat size categories.

# 2009 Boat Form

**TIME:**    7:59 or earlier    8:00 - 9:59 am    10:00 - 11:59 am    12:00 - 1:59 pm    2:00 - 3:59 pm    4:00 - 5:59 pm    6:00 or later

POWER BOAT:		PADDLE:	SAIL:	OTHER:	GENDER			AGE(years)					PFD			WS
<input type="radio"/> Skiff/Utility <input type="radio"/> PWC		<input type="radio"/> Kayak	<input type="radio"/> Day sailor	<input type="radio"/> Inflatable/Raft	M	F	?	0-5	6-12	13-17	18-64	65+	Old	New	No	Yes
<input type="radio"/> Runabout/Speedboat <input type="radio"/> Pontoon		<input type="radio"/> Canoe	<input type="radio"/> Cabin sailboat	<input type="radio"/> Houseboat	OP	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
<input type="radio"/> Cabin cruiser		<input type="radio"/> Rowboat/Dinghy	<input type="radio"/> Sailboard	<input type="radio"/> Other	P1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
SIZE (ft):	PROPULSION:	OPERATION:	ACTIVITY:		P2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/> Under 16	<input type="radio"/> Outboard	<input type="radio"/> Cruising/Motoring	<input type="radio"/> Pleasure <input type="radio"/> Fishing		P3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/> 16 - 20.9	<input type="radio"/> Sterndrive/Inboard	<input type="radio"/> Sailing	<input type="radio"/> Water skiing <input type="radio"/> Intent to Fish		P4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/> 21 - 25.9	<input type="radio"/> Sail Only	<input type="radio"/> Rowing/Paddling	<input type="radio"/> White water <input type="radio"/> Swimming		P5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/> 26 - 45.9	<input type="radio"/> Sail and Motor	<input type="radio"/> Drifting	<input type="radio"/> Racing or <input type="radio"/> Other		P6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/> 46 +	<input type="radio"/> Paddles, Oars/Manual	<input type="radio"/> Anchored	<input type="radio"/> High Speed		P7	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	<input type="radio"/> Air Thrust				P8	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	<input type="radio"/> Other				P9	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

POWER BOAT:		PADDLE:	SAIL:	OTHER:	GENDER			AGE(years)					PFD			WS
<input type="radio"/> Skiff/Utility <input type="radio"/> PWC		<input type="radio"/> Kayak	<input type="radio"/> Day sailor	<input type="radio"/> Inflatable/Raft	M	F	?	0-5	6-12	13-17	18-64	65+	Old	New	No	Yes
<input type="radio"/> Runabout/Speedboat <input type="radio"/> Pontoon		<input type="radio"/> Canoe	<input type="radio"/> Cabin sailboat	<input type="radio"/> Houseboat	OP	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
<input type="radio"/> Cabin cruiser		<input type="radio"/> Rowboat/Dinghy	<input type="radio"/> Sailboard	<input type="radio"/> Other	P1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
SIZE (ft):	PROPULSION:	OPERATION:	ACTIVITY:		P2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/> Under 16	<input type="radio"/> Outboard	<input type="radio"/> Cruising/Motoring	<input type="radio"/> Pleasure <input type="radio"/> Fishing		P3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/> 16 - 20.9	<input type="radio"/> Sterndrive/Inboard	<input type="radio"/> Sailing	<input type="radio"/> Water skiing <input type="radio"/> Intent to Fish		P4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/> 21 - 25.9	<input type="radio"/> Sail Only	<input type="radio"/> Rowing/Paddling	<input type="radio"/> White water <input type="radio"/> Swimming		P5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/> 26 - 45.9	<input type="radio"/> Sail and Motor	<input type="radio"/> Drifting	<input type="radio"/> Racing or <input type="radio"/> Other		P6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/> 46 +	<input type="radio"/> Paddles, Oars/Manual	<input type="radio"/> Anchored	<input type="radio"/> High Speed		P7	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	<input type="radio"/> Air Thrust				P8	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	<input type="radio"/> Other				P9	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

POWER BOAT:		PADDLE:	SAIL:	OTHER:	GENDER			AGE(years)					PFD			WS
<input type="radio"/> Skiff/Utility <input type="radio"/> PWC		<input type="radio"/> Kayak	<input type="radio"/> Day sailor	<input type="radio"/> Inflatable/Raft	M	F	?	0-5	6-12	13-17	18-64	65+	Old	New	No	Yes
<input type="radio"/> Runabout/Speedboat <input type="radio"/> Pontoon		<input type="radio"/> Canoe	<input type="radio"/> Cabin sailboat	<input type="radio"/> Houseboat	OP	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
<input type="radio"/> Cabin cruiser		<input type="radio"/> Rowboat/Dinghy	<input type="radio"/> Sailboard	<input type="radio"/> Other	P1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
SIZE (ft):	PROPULSION:	OPERATION:	ACTIVITY:		P2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/> Under 16	<input type="radio"/> Outboard	<input type="radio"/> Cruising/Motoring	<input type="radio"/> Pleasure <input type="radio"/> Fishing		P3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/> 16 - 20.9	<input type="radio"/> Sterndrive/Inboard	<input type="radio"/> Sailing	<input type="radio"/> Water skiing <input type="radio"/> Intent to Fish		P4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/> 21 - 25.9	<input type="radio"/> Sail Only	<input type="radio"/> Rowing/Paddling	<input type="radio"/> White water <input type="radio"/> Swimming		P5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/> 26 - 45.9	<input type="radio"/> Sail and Motor	<input type="radio"/> Drifting	<input type="radio"/> Racing or <input type="radio"/> Other		P6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/> 46 +	<input type="radio"/> Paddles, Oars/Manual	<input type="radio"/> Anchored	<input type="radio"/> High Speed		P7	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	<input type="radio"/> Air Thrust				P8	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	<input type="radio"/> Other				P9	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

PFD Study 2009

CODE

State	Site	Block	Group	Phase	Page Number

42114



PFD Study 2009

# of Belt Pack PFD's

# of Boats Observed

ID

State

Site

Block

Group

Phase

**1. Site Information**

Observer Names: \_\_\_\_\_ City: \_\_\_\_\_

Site Name: \_\_\_\_\_ Water: \_\_\_\_\_

Date of Observation:   /   /   Day of the week:  Sat.  Sun.

Observation start time:   :    AM  PM Observation end time:   :    AM  PM

**2. Type of Body of Water**

- Bay, inlet or sound
- Harbor
- Intercoastal waterway
- River, stream, creek or canal
- Lake, pond, or reservoir (not Great Lakes)
- Great lake (not including tributaries)
- Other: \_\_\_\_\_

**3. Site Conditions**

Water temperature:   degrees F

**A. First Weather Observation (to be completed during 1st time block of boat observations)**

Time:

- 7:59 or before
- 8-9:59 AM
- 10-11:59 AM
- 12-1:59 PM
- 2-3:59 PM
- 4-5:59 PM
- 6 PM or later

<b>Air Temp.</b> <input type="text"/> <input type="text"/> <input type="text"/> F	<b>Water Conditions</b> <input type="radio"/> Calm (less than 6") <input type="radio"/> Choppy (6" to 2') <input type="radio"/> Rough (over 2')	<b>Current</b> <input type="radio"/> Strong <input type="radio"/> Moderate <input type="radio"/> Weak/None	<b>Visibility</b> <input type="radio"/> Good <input type="radio"/> Fair <input type="radio"/> Poor	<b>Weather Conditions</b> <input type="radio"/> Sunny <input type="radio"/> Raining <input type="radio"/> Partly Cloudy <input type="radio"/> Stormy <input type="radio"/> Cloudy
<b>Wind Speed</b> <input type="text"/> <input type="text"/> knots				

**\*\*Actual form provides 3 blocks to record Weather Observations across the 4 hours of data collection**

## **VI. INFORMATION ON BOATS AND PEOPLE OBSERVED**

To date, 171,976 boats and 477,345 boaters have been observed (Figure K). This year, 2009, 15,323 boats carrying 44,587 boaters were observed. Across the twelve years, the number of boats, and the number of boaters observed have increased. However, the proportions of the different types of boats, length of boats, operation and activity of boats, as well as the age and gender of the boaters observed has remained fairly consistent (see Figures L through R2). This indicates not only that the sites chosen yielded diversity in the boats and boaters observed each year, but that diversity has remained consistent across the years. These figures demonstrate that the degree of representativeness of the sample of recreational boaters and their boating habits remained constant across the twelve years.

Figures S through Y illustrate the weather and water conditions across the sites from year to year. Like the boat and boater data, across all of the sites the mixture of the weather and water conditions remained fairly constant over the years. Therefore, any changes reported in life jacket wear rates were not due to changes in types of boats or boaters observed from year to year, and most likely not due to fluctuations in weather or water condition changes across the sites.

Figure K – Number of Boats and People

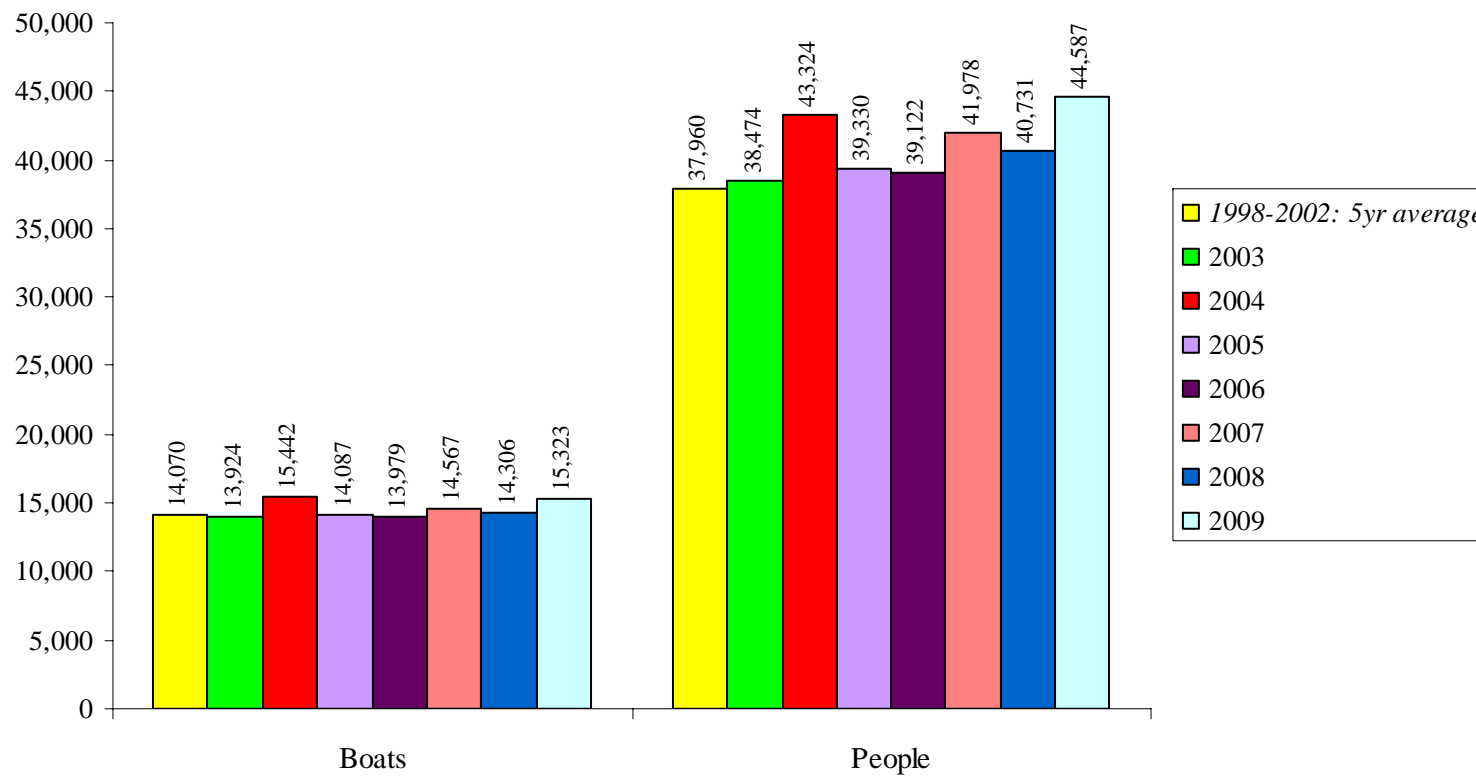




Figure L – Types of Boats

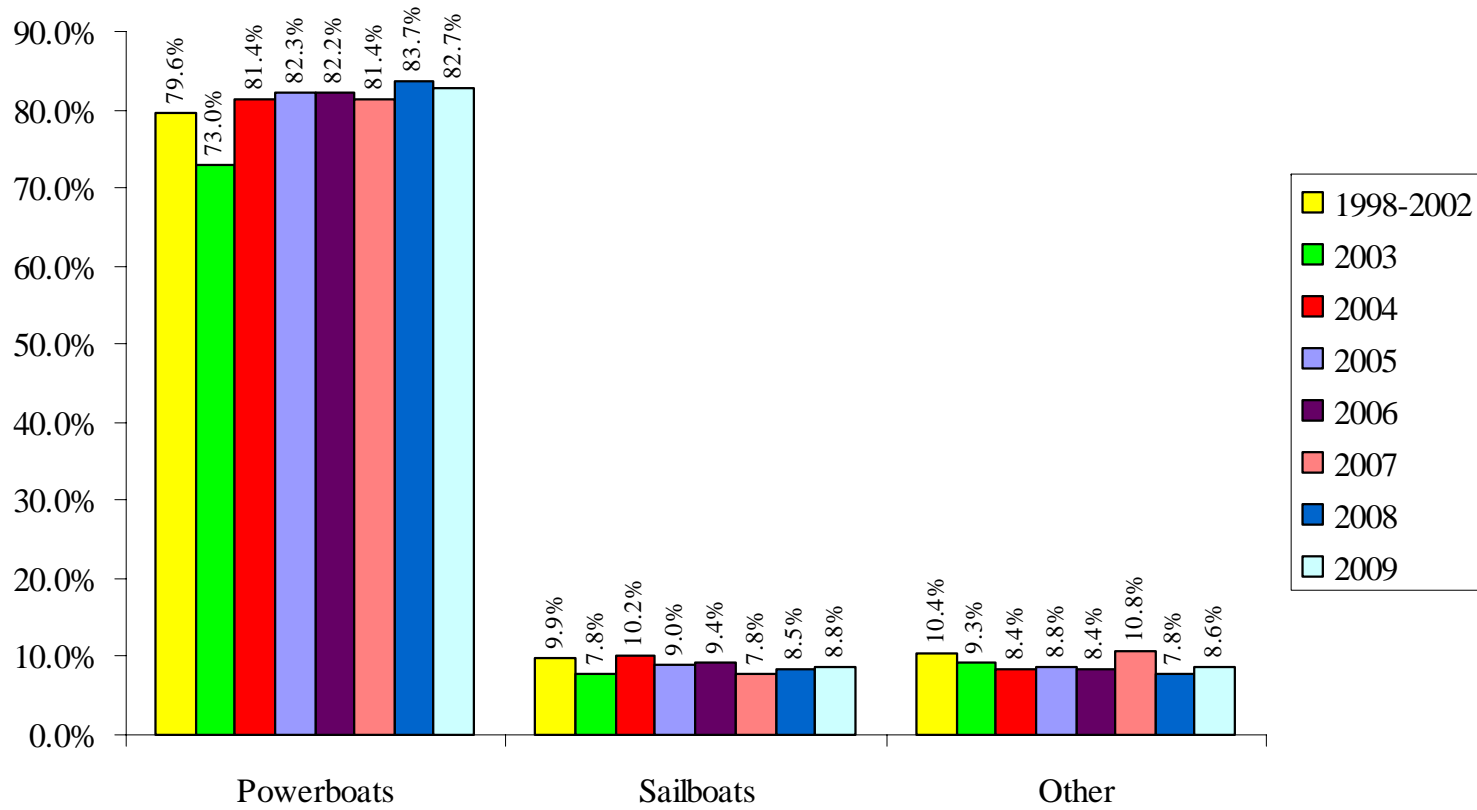


Figure M – Length of Boats

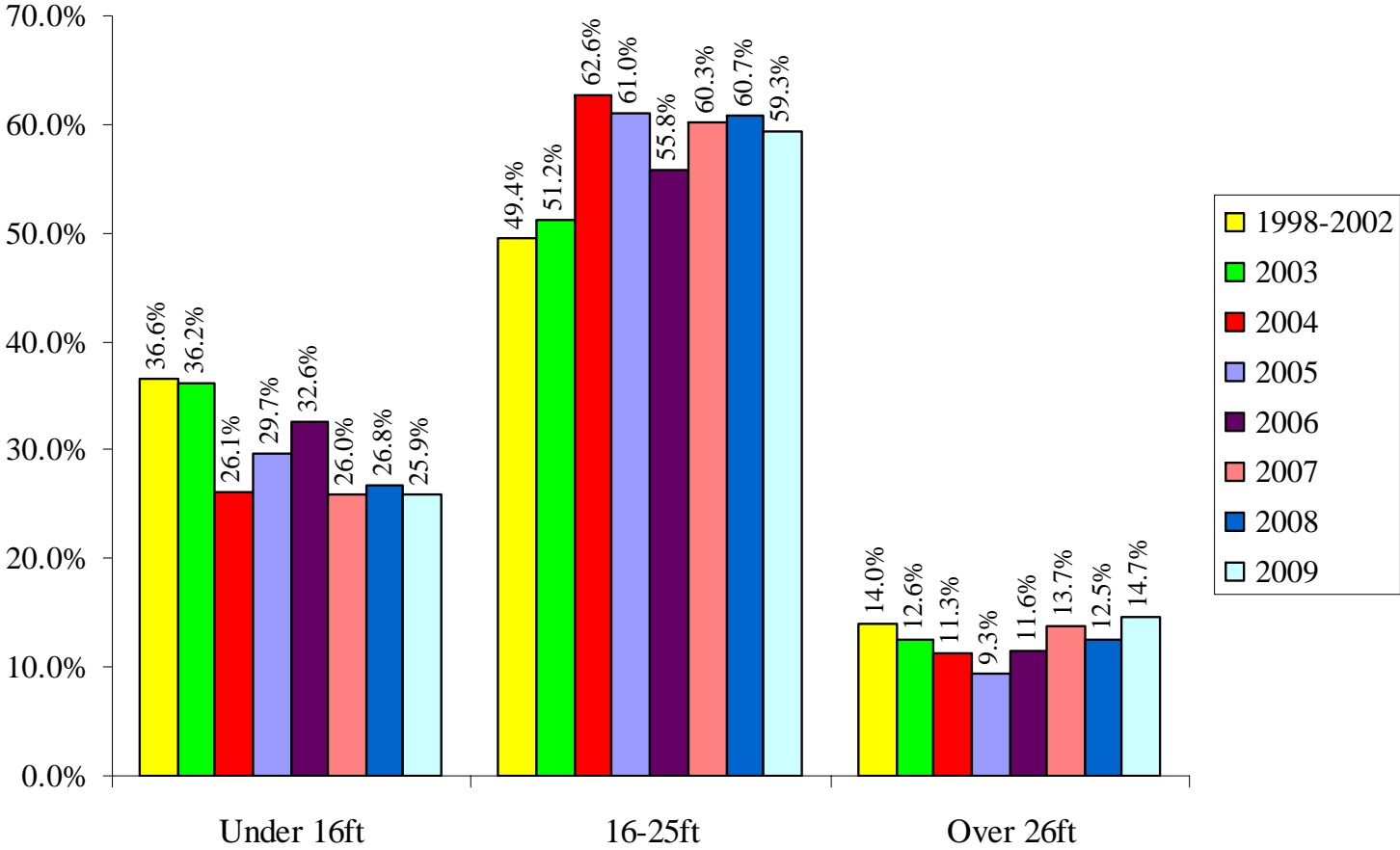


Figure N – Length of Boats 2004-2009 Data Only

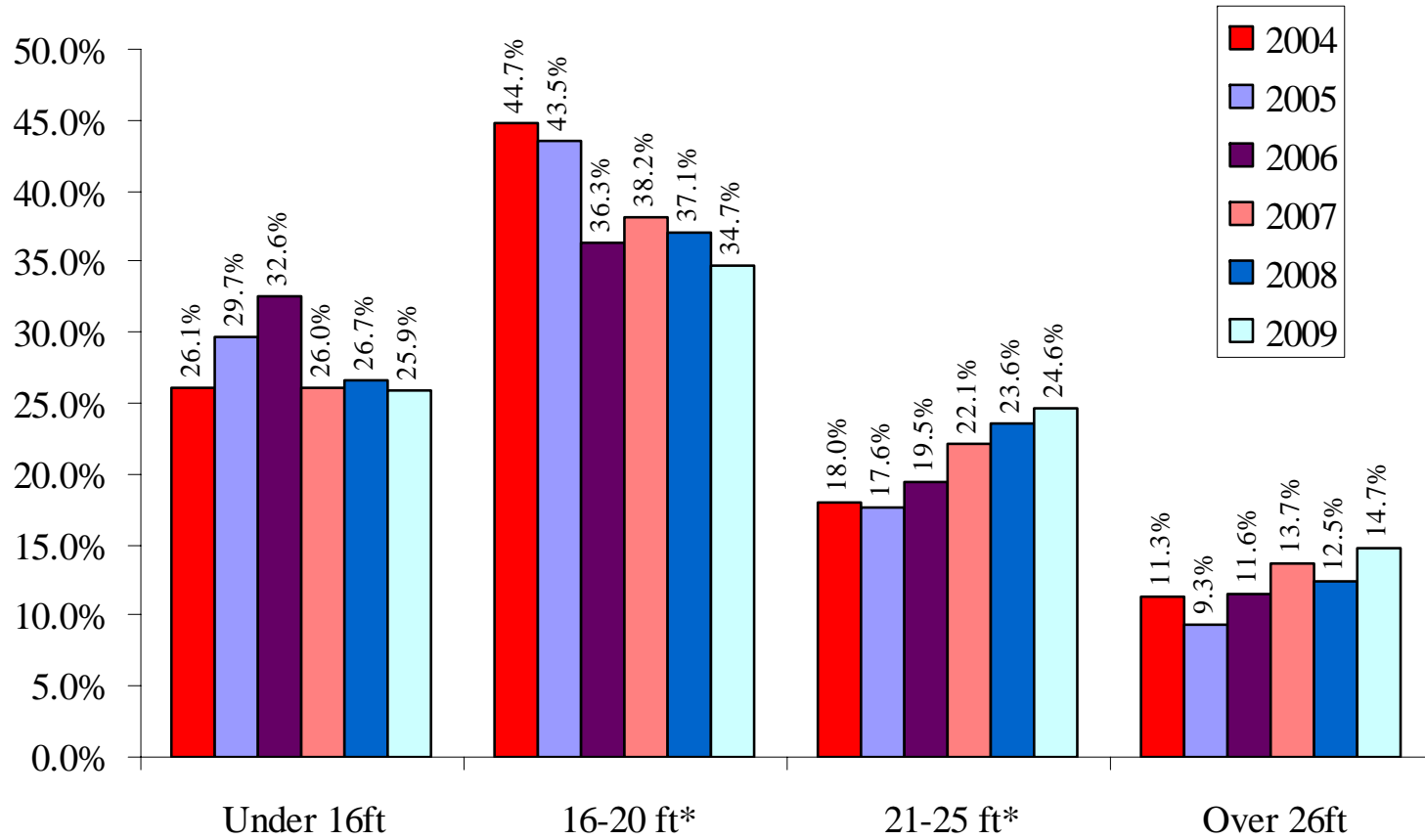


Figure O – Operation of Boats

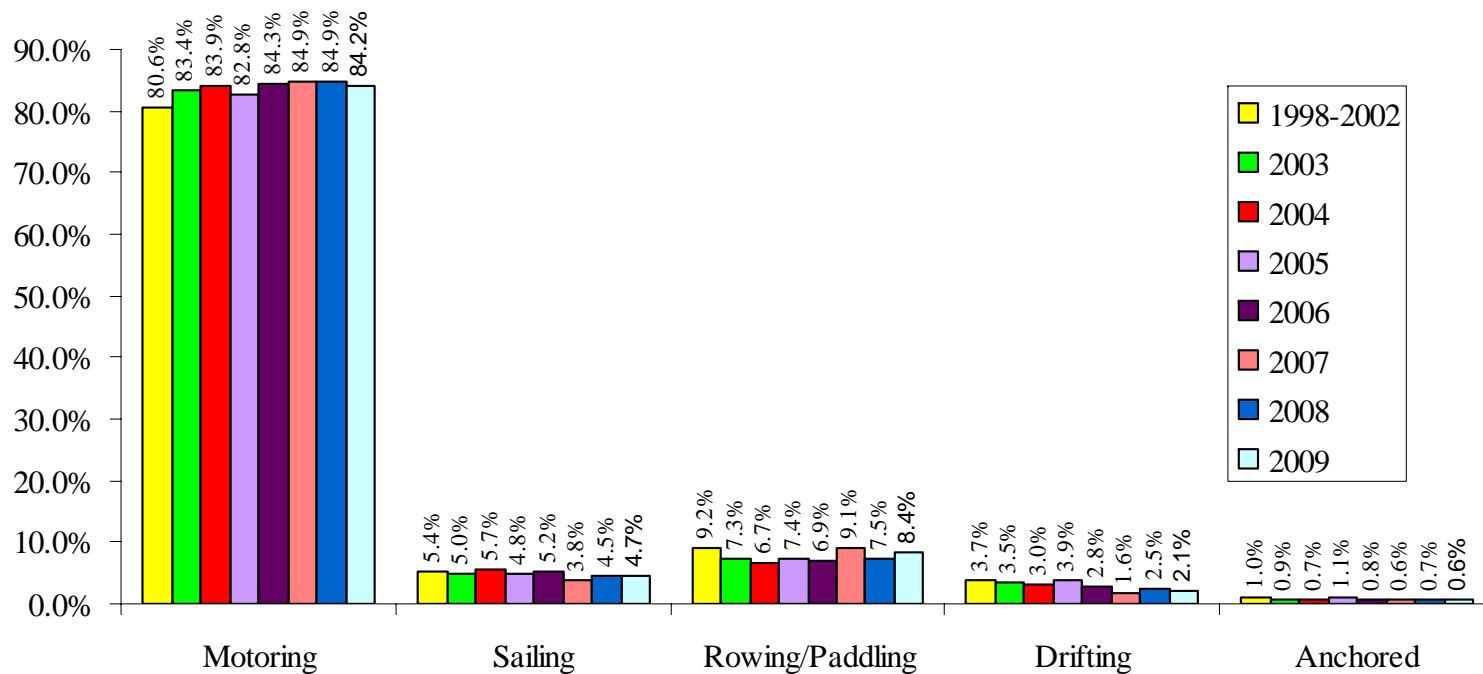
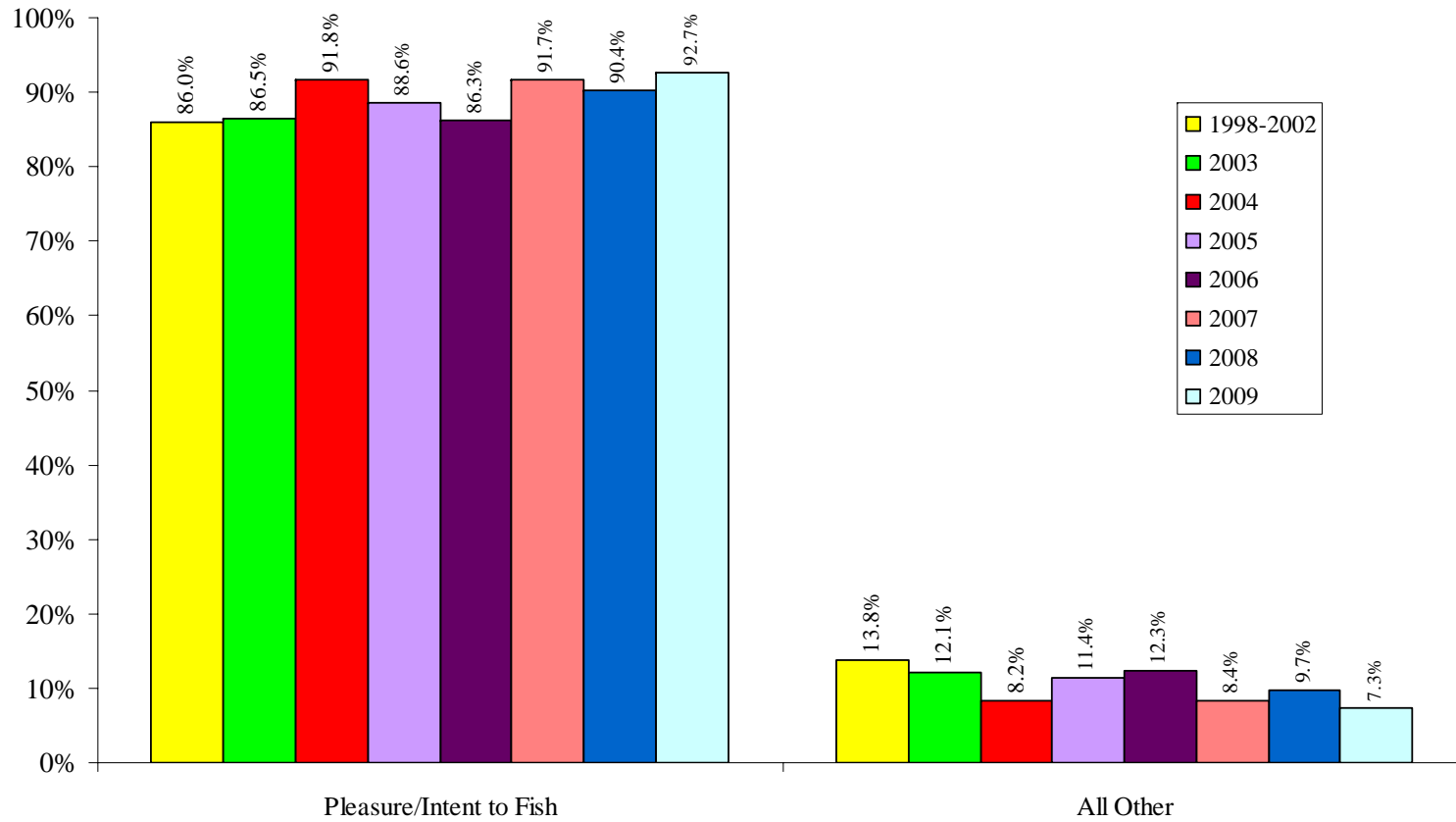
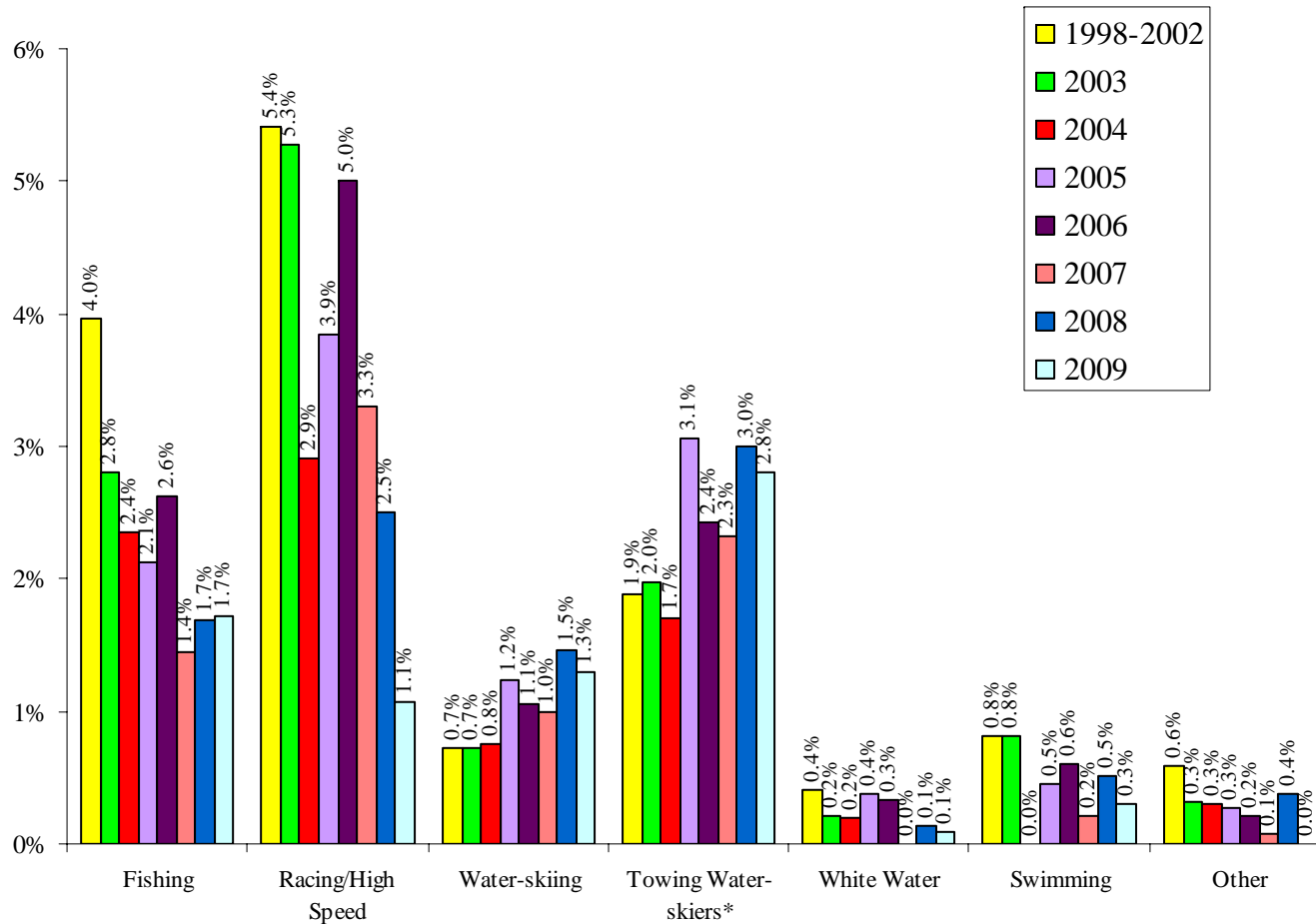


Figure P1 – Activity of Boaters—ALL YEARS\*



\*Prior to 2007, Intent to Fish & Pleasure were a combined category.

**Figure P2 – Activity of Boaters**  
**Detailed Breakdown of ALL OTHER Category from Figure P1**



\*The activity “Towing Water-skiers “ indicates that these boaters were passengers in a boat towing water-skiers or other towing activities. Likewise, “water-skiing” includes all towing sports. Label changed in April 2010.

Figure P3 – Activity of Boaters 2007-2009 Data

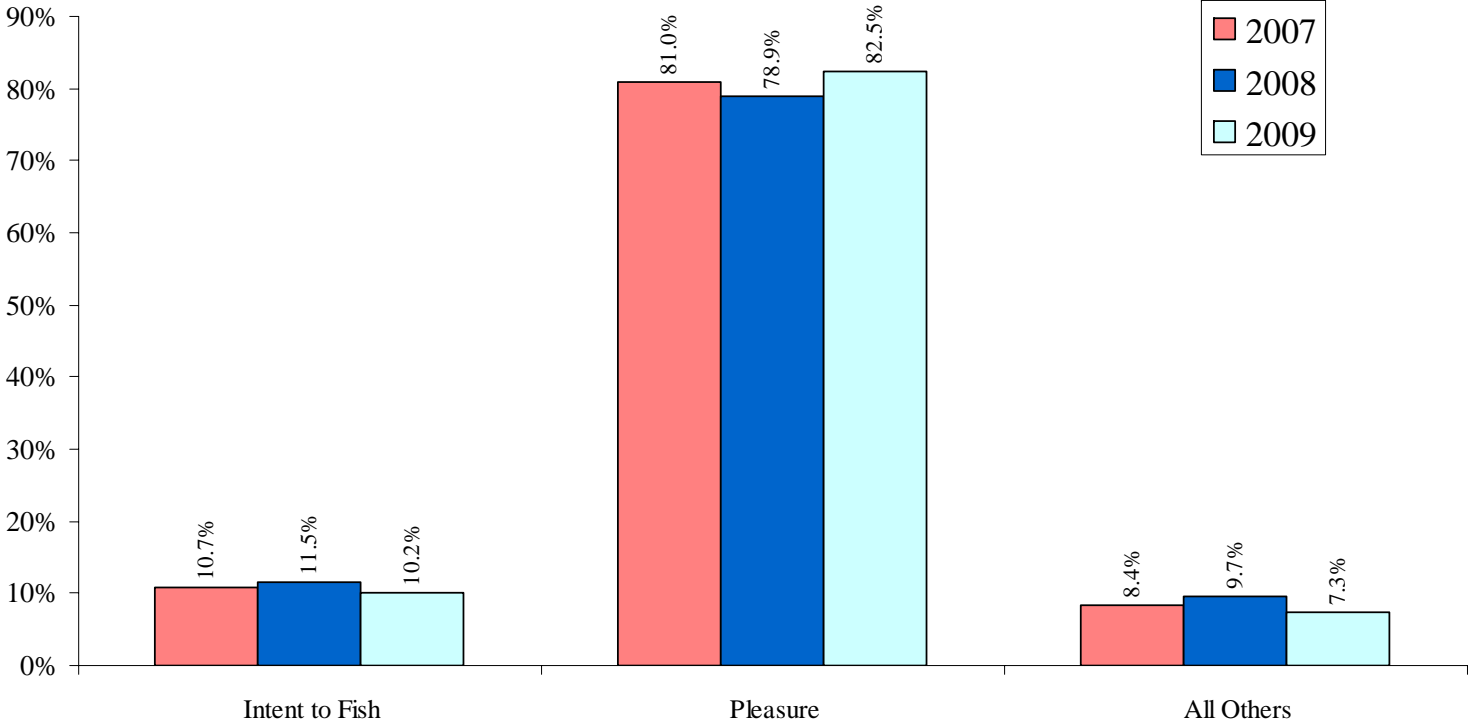


Figure Q – Gender of Boaters

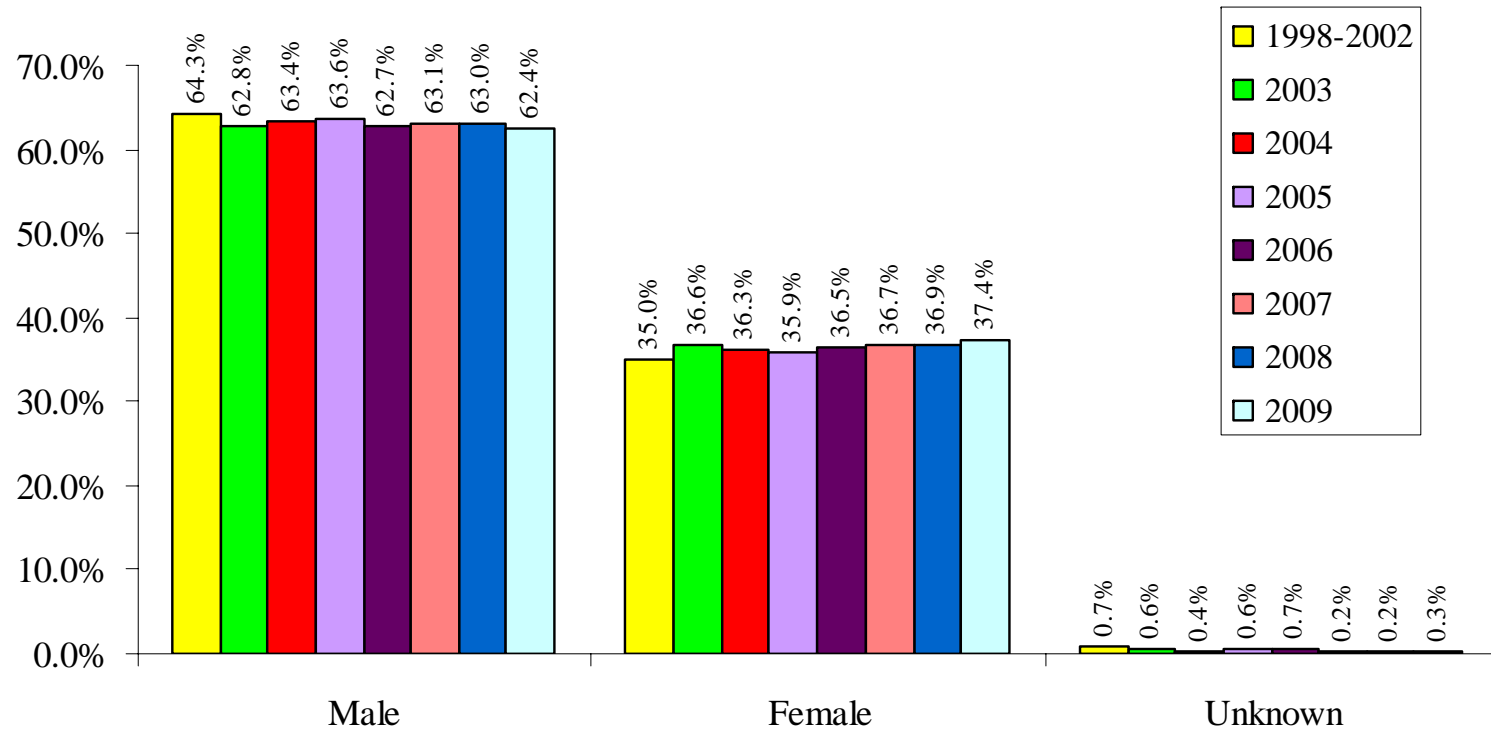




Figure R1 – Age of Boaters

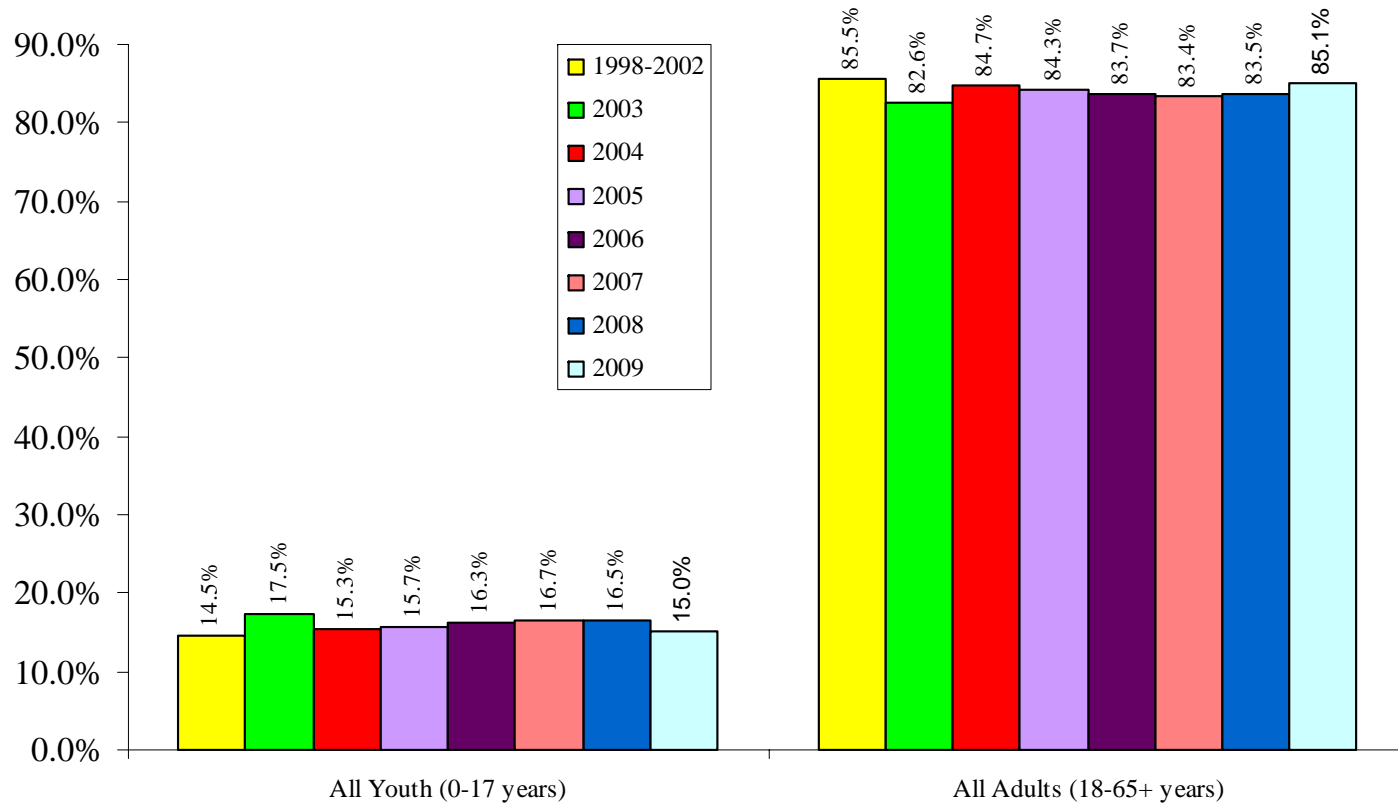


Figure R2 – Age of Youth Boaters

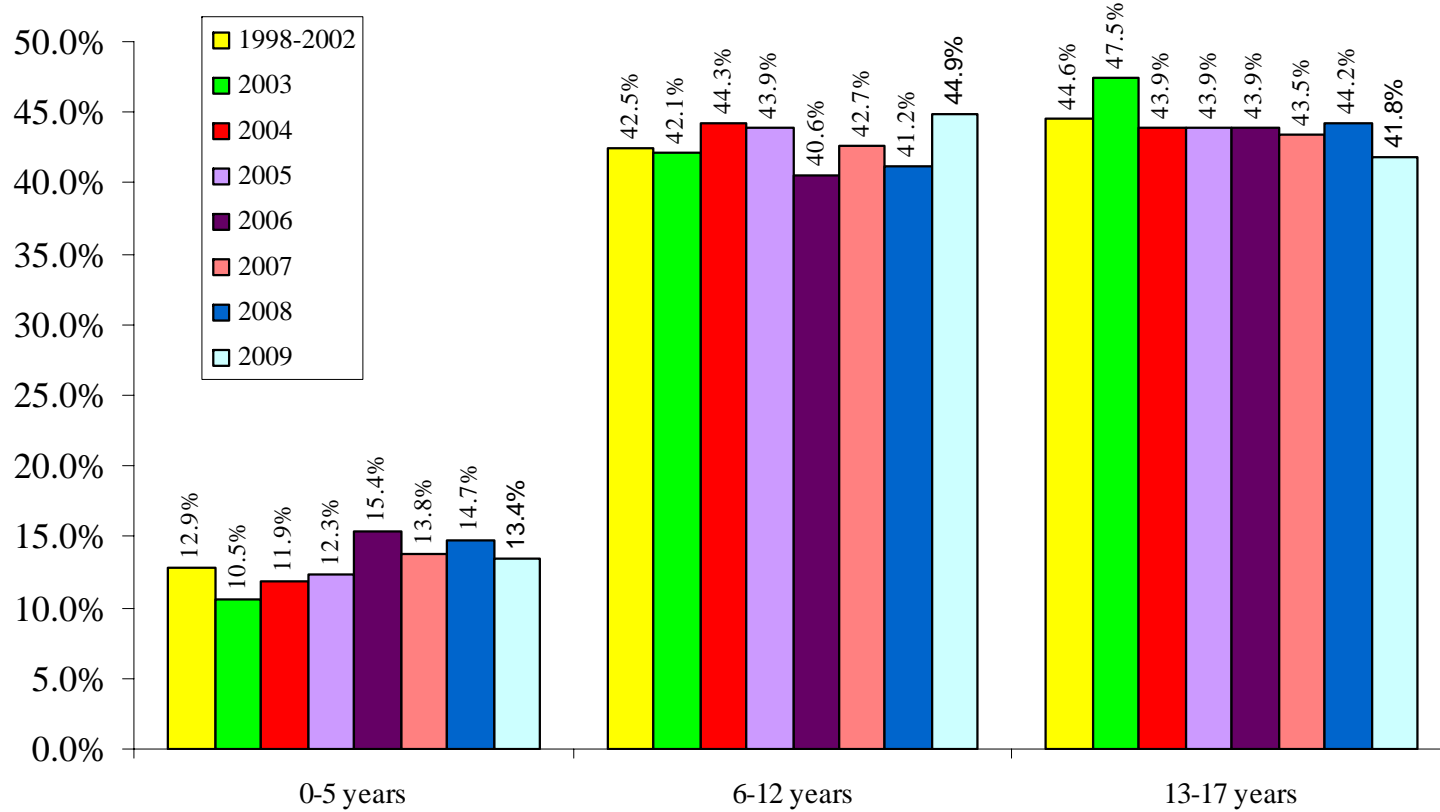


Figure S – Water Temperature in which all Boaters were Observed

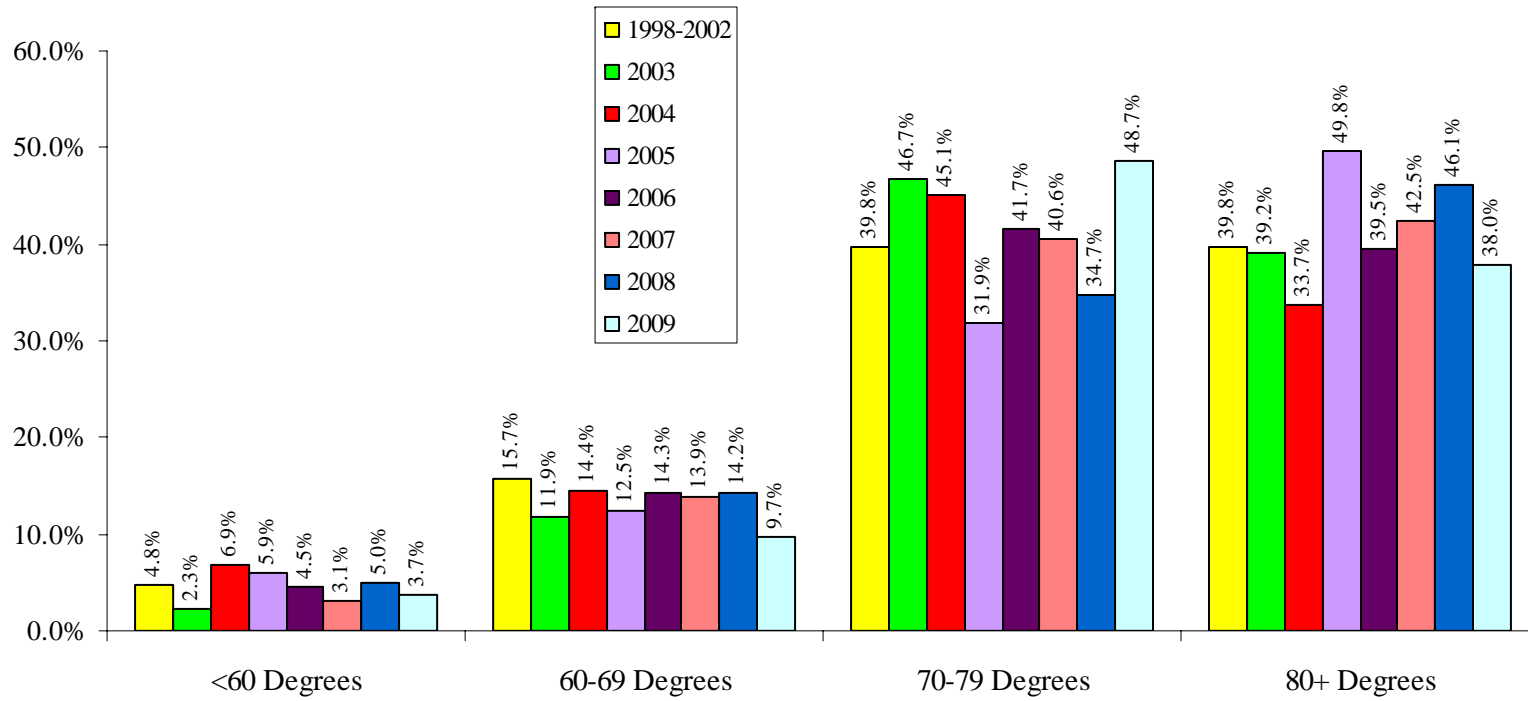


Figure T – Water Current in which all Boaters were Observed

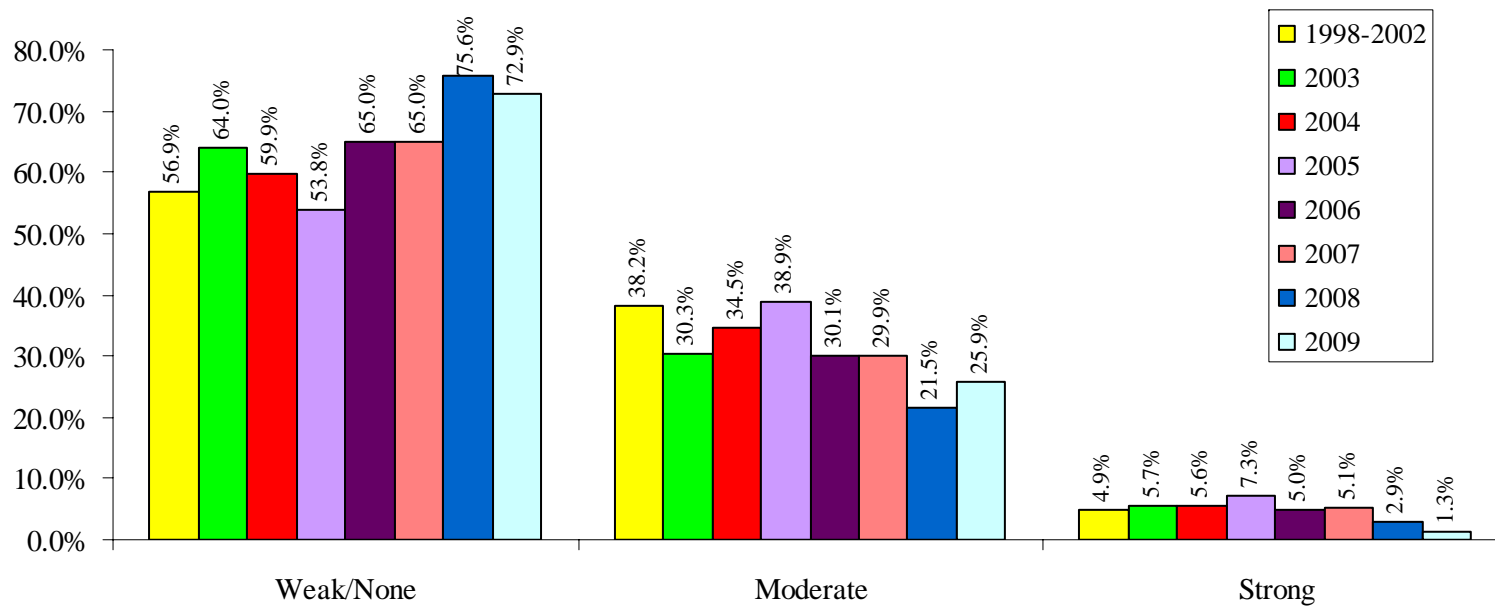


Figure U – Wave Height in which all Boaters were Observed

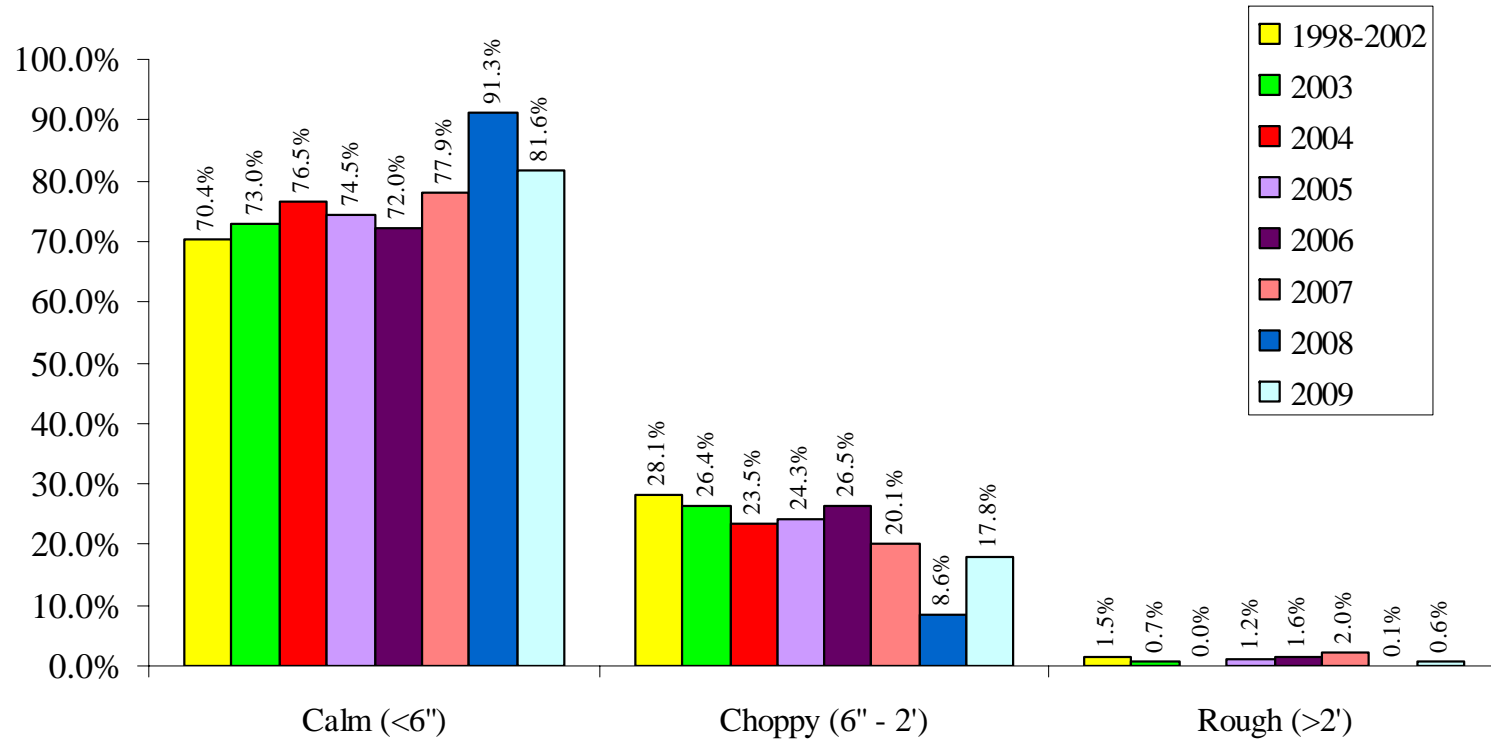


Figure V – Visibility in which all Boaters were Observed

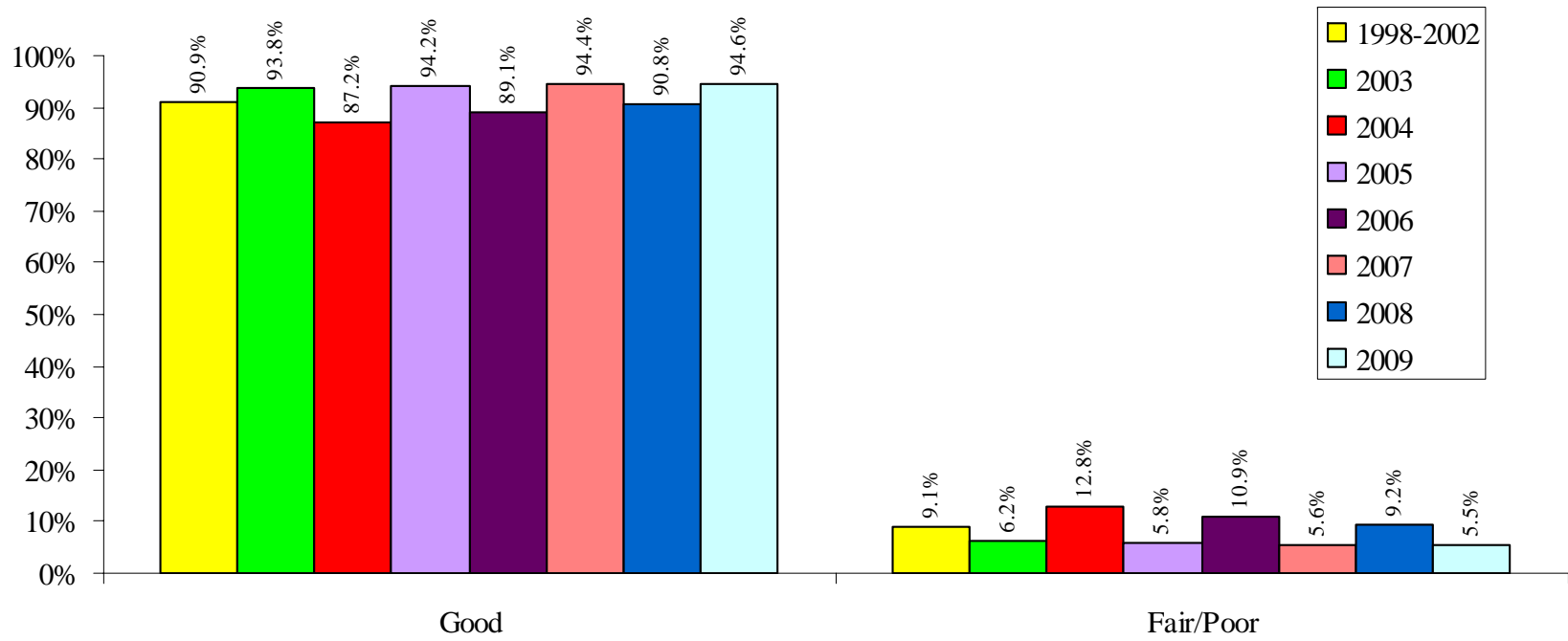


Figure W – Weather in which all Boaters were Observed

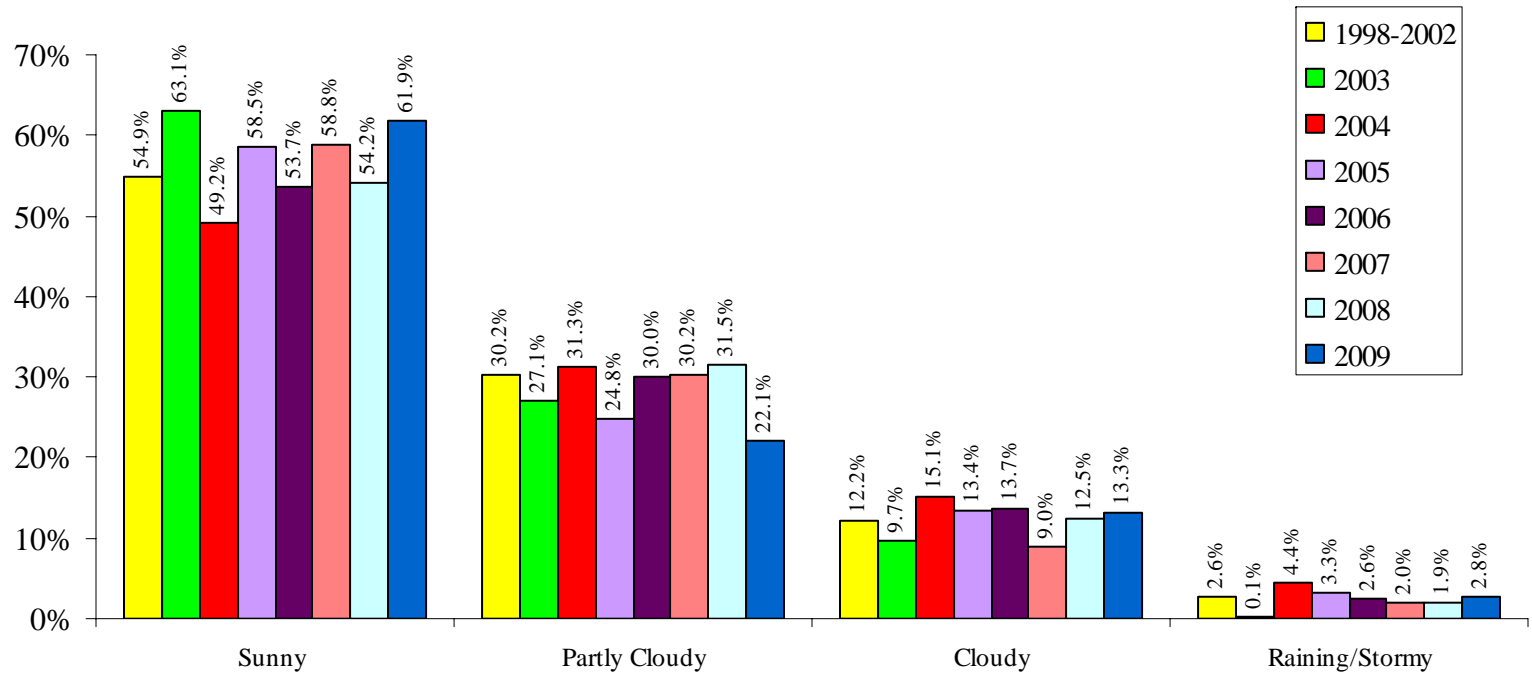


Figure X – Air Temperature in which all Boaters were Observed

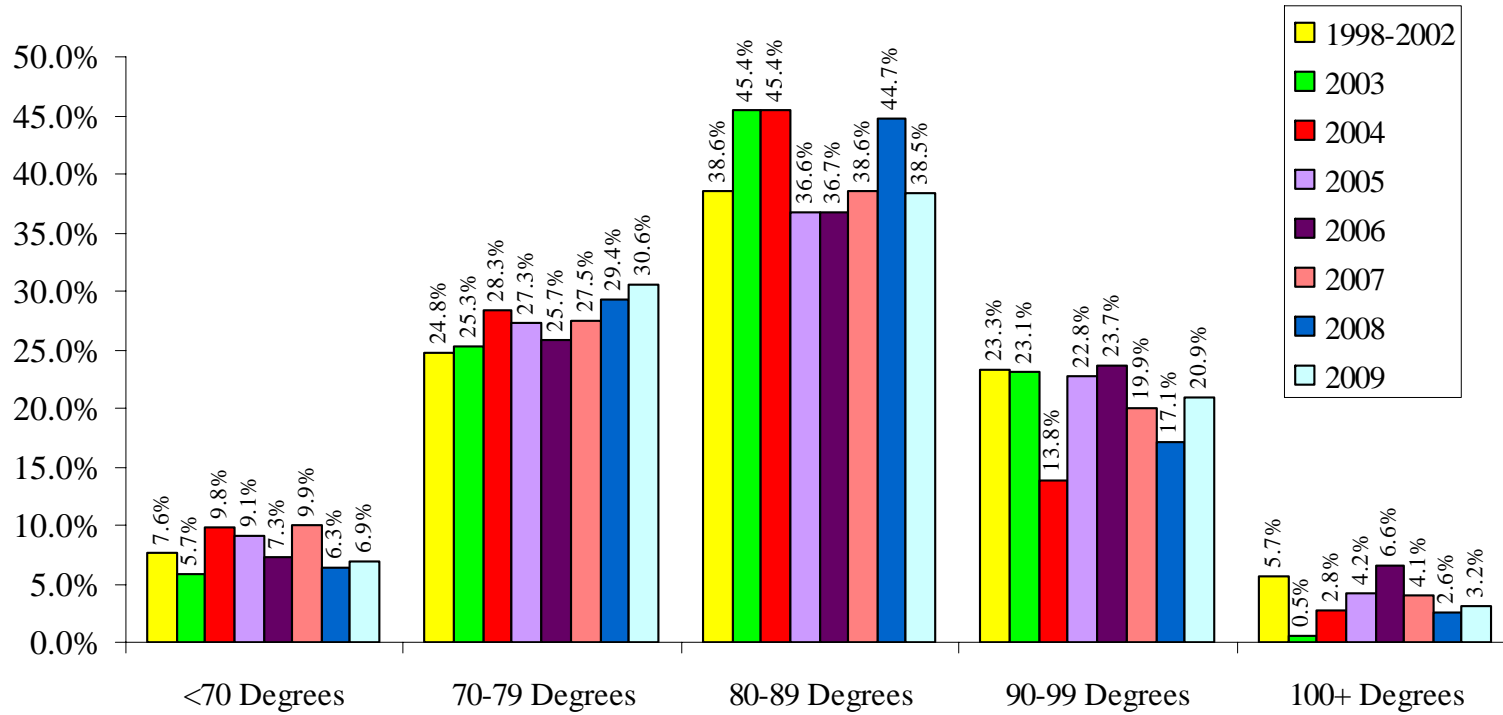




Figure Y – Wind Speed in which all Boaters were Observed

