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ANALYSIS OF THE 2007 CALIFORNIA SURVEY OF OUTBOARD AND SAILBOAT OWNERS REGARDING USE OF PORTABLE OUTBOARD MARINE TANKS

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Prepared for the California Air Resources Board
by the Institute for Social Research at
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Section 1: Methodology

The Institute for Social Research (ISR) at California State University, Sacramento conducted a telephone survey of registered outboard and sailboat owners in order to provide the California Air Resources Board (ARB) with information about statewide use of portable outboard marine tanks (OMTs). The ARB provided the ISR with DMV registration records from the California Energy Commission (CEC) for January through April 2006. This database included all registrations (454,061) for outboard, sail only, and auxiliary and sail vessels. Table 1 describes the criteria used to define the study population from within this file. There were 289,133 registrations meeting these criteria (see Table 2). The study population includes current "household" registrations for outboard boats and for sailboats under 20 feet in length. Only vessels registered and located in California are included in the study population.

The logic for excluding registrations from the study population falls into two basic categories. Some registrations were excluded because the vessels are not likely to be in use in California and/or not likely to use OMTs. These include registrations that are not current, registrations for vessels located outside California, and registrations for sailboats over 20 feet in length.[1] Other registrations were excluded for methodological—rather than substantive—reasons. For example, including vessels located in California but registered out-of-state would have decreased the efficiency of the phone matches. In addition, including commercial and public agency registrations (many of which are registered owners of multiple boats) would have required a significantly different interviewing strategy than was used to contact households. This distinction becomes important when using survey data to estimate the number of portable outboard marine tanks used by vessels in California.

Table 1. Definition of the Study Population[a]

Field #	Field Name	Eligible Codes	Vessels Registrations Included in Study Population	Vessel Registrations Excluded from Study Population
1	R/O County Code	1-58	Vessels registered in California	Vessels registered in an unknown county or out-of-state
12	Status Code	C	Currently registered vessels (expiration = 12/31/07)	Vessels with expired registrations
44	Type License Code	V1	Pleasure vessels	Livery, commercial and exempt vessels
70	Person/Entity Code	Not equal to C	Vessels registered to a household	Vessels registered to a school, business or club
92	Vessel Propulsion Code	O, S or A	Vessels registered as outboard, sail only, auxiliary and sail	Vessels registered as hand propelled, inboard, jet, inboard/outboard, other or unknown
93	Vessel Length in Feet	Any, if vessel propulsion = O Less than or equal to 20, if vessel propulsion = S or A	All outboards, regardless of length Sail and auxiliary and sail vessels 20 feet or less in length	Sail and auxiliary and sail vessels more than 20 feet in length
95	Situs County Code	1-58	Vessels located in California	Vessels located in an unknown county or out-of-state

[a] Energy Commission output record fields and codes

[1] Of the 131,014 "non-current" registrations, 113,077 were coded as not currently registered, 17,928 were coded as pending status, and nine were coded as prior history. Further investigation regarding the application of these codes is warranted. Vessels with registrations that are not current but may be in use could have expected OMT-use patterns comparable to the study population.

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Table 2. Number of Registrations Included in and Excluded from the Study Population

		Outboard	Sail Only	Auxiliary and Sail	Total
All registrations for outboard, sail only, and auxiliary and sail vessels		393,305	38,980	21,776	454,061
Excluded from study population	Registrations that are not current	113,277	12,047	5,690	131,014
	Sailboats over 20 feet	0	5,740	14,074	19,814
	Vessels not registered and located in California	1,899	169	18	2,086
	Livery, commercial and exempt registrations	5,099	879	18	5,996
	Vessels registered to agencies, schools, businesses or clubs	5,244	724	50	6,018
Study population		267,786	19,421	1,926	289,133

Registration records contain the name and address of the registered owner, but do not contain a phone number. In order to conduct a household telephone survey, Scientific Telephone Samples (STS) matched the DMV registration data against an STS database and appended phone numbers for matching records. This was a new strategy, and lieu of information about the kind of match rate the database would yield, a larger-than-normal random sample of 65,000 records was drawn from the study population. The phone match rate was 38 percent, which produced 25,000 registration records with phone numbers.

It is not unusual for more than one boat to be registered to the same owner. Of the 25,000 registrations matched to phone numbers, 1,651 (or 6.6 percent) were matched to the same phone number. For these "multiple-boat" households, one boat was randomly selected for inclusion in the sample. This produced a sample of 24,148 records.[2] Because the primary unit of analysis for this study is the registered vessel—not the registered owner—respondents were directed to answer only in terms of the specific vessel selected for the study.

The analysis in this report is based on 1,683 telephone interviews conducted between January 25, 2007 and February 7, 2007. The survey response rate was 64% (see Table 3). Most interviews (97%) were conducted with the registered owner of the boat. Three percent of the interviews were conducted with another person who uses the boat. Eighteen respondents who were not sure whether the boat uses an OMT were dropped from the analysis.

Table 3. Survey Response Rate

	Percent	Number of cases
Complete interview	64.2%	1,701
Partial interview	1.3%	35
Refusal	34.5%	914
Total	100.0%	2,650

Outboard boats were slightly under-represented among the survey respondents. The smallest and largest outboard boats were also somewhat under-represented. In order to adjust for any potential response bias, survey responses were weighted to adjust for these difference. Table 5 summarizes computation of weighting variable values.

Section 2 of this summary describes responses to survey questions. Section 3 provides estimates of the number of OMTs used with boats in the study population. A copy of the questionnaire is included at the end of this document.

[2] In order to complete the desired number of interviews (a minimum of 1500) a random sample of approximately 30% (7,224 out of 24,148) were contacted.

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Table 4. Distribution of Study Population and Survey Respondents by Vessel Propulsion and County

County where vessel is registered	Study Population								Survey Respondents							
	Outboard		Sail Only		Auxiliary and Sail		Total		Outboard		Sail Only		Auxiliary and Sail		Total	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Alameda	7,825	2.9%	799	4.1%	74	3.8%	8,698	3.0%	37	2.4%	12	8.1%	0	.0%	49	2.9%
Alpine	57	.0%	11	.1%	0	.0%	68	.0%	0	--	0	--	0	--	0	--
Amador	1,396	.5%	58	.3%	5	.3%	1,459	.5%	8	.5%	0	--	0	--	8	.5%
Butte	7,175	2.7%	290	1.5%	25	1.3%	7,490	2.6%	67	4.4%	3	2.0%	0	--	70	4.2%
Calaveras	2,284	.9%	100	.5%	10	.5%	2,394	.8%	7	.5%	1	.7%	0	--	8	.5%
Colusa	677	.3%	25	.1%	4	.2%	706	.2%	1	.1%	0	.0%	0	--	1	.1%
Contra Costa	9,912	3.7%	827	4.3%	71	3.7%	10,810	3.7%	68	4.5%	5	3.4%	0	--	73	4.3%
Del Norte	620	.2%	21	.1%	7	.4%	648	.2%	6	.4%	0	--	0	--	6	.4%
El Dorado	4,828	1.8%	358	1.8%	35	1.8%	5,221	1.8%	33	2.2%	5	3.4%	1	10.0%	39	2.3%
Fresno	8,635	3.2%	396	2.0%	33	1.7%	9,064	3.1%	49	3.2%	3	2.0%	0	--	52	3.1%
Glenn	947	.4%	30	.2%	1	.1%	978	.3%	2	.1%	0	--	0	--	2	.1%
Humboldt	3,763	1.4%	224	1.2%	25	1.3%	4,012	1.4%	34	2.2%	1	.7%	0	--	35	2.1%
Imperial	785	.3%	20	.1%	1	.1%	806	.3%	2	.1%	0	--	0	--	2	.1%
Inyo	448	.2%	21	.1%	2	.1%	471	.2%	5	.3%	0	--	0	--	5	.3%
Kern	5,025	1.9%	352	1.8%	23	1.2%	5,400	1.9%	36	2.4%	4	2.7%	0	--	40	2.4%
Kings	1,101	.4%	24	.1%	2	.1%	1,127	.4%	10	.7%	1	.7%	0	--	11	.7%
Lake	3,016	1.1%	247	1.3%	24	1.2%	3,287	1.1%	22	1.4%	2	1.3%	0	--	24	1.4%
Lassen	1,439	.5%	50	.3%	4	.2%	1,493	.5%	8	.5%	0	--	0	--	8	.5%
Los Angeles	25,968	9.7%	2,259	11.6%	260	13.5%	28,487	9.9%	101	6.6%	17	11.4%	1	10.0%	119	7.1%
Madera	2,405	.9%	82	.4%	6	.3%	2,493	.9%	17	1.1%	0	--	0	--	17	1.0%
Marin	2,822	1.1%	422	2.2%	54	2.8%	3,298	1.1%	19	1.2%	4	2.7%	0	--	23	1.4%
Mariposa	635	.2%	29	.1%	4	.2%	668	.2%	7	.5%	0	--	0	--	7	.4%
Mendocino	2,097	.8%	164	.8%	15	.8%	2,276	.8%	19	1.2%	1	.7%	1	10.0%	21	1.2%
Merced	2,679	1.0%	82	.4%	9	.5%	2,770	1.0%	20	1.3%	1	.7%	0	--	21	1.2%
Modoc	459	.2%	8	.0%	2	.1%	469	.2%	3	.2%	0	--	0	--	3	.2%
Mono	351	.1%	27	.1%	6	.3%	384	.1%	1	.1%	0	--	0	--	1	.1%
Monterey	2,585	1.0%	182	.9%	13	.7%	2,780	1.0%	19	1.2%	0	--	0	--	19	1.1%
Napa	2,315	.9%	169	.9%	13	.7%	2,497	.9%	14	.9%	1	.7%	1	10.0%	16	1.0%
Nevada	3,751	1.4%	372	1.9%	30	1.6%	4,153	1.4%	30	2.0%	2	1.3%	0	--	32	1.9%
Orange	15,076	5.6%	1,363	7.0%	173	9.0%	16,612	5.7%	64	4.2%	6	4.0%	0	--	70	4.2%
Placer	6,953	2.6%	384	2.0%	38	2.0%	7,375	2.6%	44	2.9%	2	1.3%	0	--	46	2.7%
Plumas	1,367	.5%	72	.4%	7	.4%	1,446	.5%	5	.3%	0	--	0	--	5	.3%
Riverside	9,845	3.7%	514	2.6%	57	3.0%	10,416	3.6%	31	2.0%	5	3.4%	1	10.0%	37	2.2%
Sacramento	16,690	6.2%	822	4.2%	82	4.3%	17,594	6.1%	95	6.2%	6	4.0%	0	--	101	6.0%
San Benito	602	.2%	25	.1%	5	.3%	632	.2%	4	.3%	0	--	0	--	4	.2%
San Bernardino	9,072	3.4%	599	3.1%	69	3.6%	9,740	3.4%	29	1.9%	2	1.3%	0	--	31	1.8%
San Diego	19,501	7.3%	2,141	11.0%	177	9.2%	21,819	7.5%	81	5.3%	13	8.7%	0	--	94	5.6%
San Francisco	1,283	.5%	156	.8%	23	1.2%	1,462	.5%	6	.4%	1	.7%	0	--	7	.4%
San Joaquin	8,734	3.3%	292	1.5%	33	1.7%	9,059	3.1%	36	2.4%	3	2.0%	0	--	39	2.3%
San Luis Obispo	4,010	1.5%	447	2.3%	48	2.5%	4,505	1.6%	30	2.0%	4	2.7%	1	10.0%	35	2.1%
San Mateo	3,872	1.4%	487	2.5%	41	2.1%	4,400	1.5%	28	1.8%	6	4.0%	0	--	34	2.0%
Santa Barbara	3,012	1.1%	357	1.8%	26	1.3%	3,395	1.2%	14	.9%	1	.7%	0	--	15	.9%
Santa Clara	8,508	3.2%	1,183	6.1%	97	5.0%	9,788	3.4%	49	3.2%	9	6.0%	1	10.0%	59	3.5%
Santa Cruz	2,647	1.0%	357	1.8%	31	1.6%	3,035	1.0%	17	1.1%	3	2.0%	0	--	20	1.2%
Shasta	7,852	2.9%	233	1.2%	29	1.5%	8,114	2.8%	69	4.5%	2	1.3%	1	10.0%	72	4.3%
Sierra	144	.1%	4	.0%	1	.1%	149	.1%	0	--	0	--	0	--	0	--
Siskiyou	2,346	.9%	82	.4%	8	.4%	2,436	.8%	16	1.0%	0	--	0	--	16	1.0%
Solano	4,808	1.8%	181	.9%	24	1.2%	5,013	1.7%	36	2.4%	4	2.7%	0	--	40	2.4%
Sonoma	6,809	2.5%	586	3.0%	63	3.3%	7,458	2.6%	61	4.0%	7	4.7%	1	10.0%	69	4.1%
Stanislaus	7,397	2.8%	297	1.5%	22	1.1%	7,716	2.7%	41	2.7%	3	2.0%	0	--	44	2.6%
Sutter	2,523	.9%	64	.3%	4	.2%	2,591	.9%	14	.9%	0	--	0	--	14	.8%
Tehama	2,015	.8%	39	.2%	9	.5%	2,063	.7%	18	1.2%	0	--	1	10.0%	19	1.1%
Trinity	840	.3%	27	.1%	5	.3%	872	.3%	5	.3%	0	--	0	--	5	.3%
Tulare	3,313	1.2%	138	.7%	10	.5%	3,461	1.2%	18	1.2%	1	.7%	0	--	19	1.1%
Tuolumne	2,263	.8%	154	.8%	7	.4%	2,424	.8%	7	.5%	2	1.3%	0	--	9	.5%
Ventura	5,933	2.2%	588	3.0%	61	3.2%	6,582	2.3%	29	1.9%	3	2.0%	0	--	32	1.9%
Yolo	2,395	.9%	158	.8%	14	.7%	2,567	.9%	18	1.2%	3	2.0%	0	--	21	1.2%
Yuba	1,976	.7%	22	.1%	4	.2%	2,002	.7%	14	.9%	0	--	0	--	14	.8%
Total	267,786	100.0%	19,421	100.0%	1,926	100.0%	289,133	100.0%	1,524	100.0%	149	100.0%	10	100.0%	1,683	100.0%

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Table 5. Computation of Weights to Adjust for Vessel Propulsion and Length

Propulsion	Length	Study Population		Unweighted Survey Responses		Difference[a]	Weight	Weighted Survey Responses	
		Number	Percent	Number	Percent			Number	Percent
Outboard	Under 12 feet	36,284	12.5%	153	9.1%	-3.5%	1.3804	211.2	12.5%
	12 feet	41,593	14.4%	264	15.7%	1.3%	.9170	242.1	14.4%
	13 feet	17,223	6.0%	113	6.7%	.8%	.8876	100.3	6.0%
	14 feet	35,903	12.4%	229	13.6%	1.2%	.9127	209.0	12.4%
	15 feet	25,879	9.0%	150	8.9%	.0%	1.0040	150.6	8.9%
	16 feet	30,105	10.4%	167	9.9%	-.5%	1.0491	175.2	10.4%
	17 feet	24,220	8.4%	155	9.2%	.8%	.9097	141.0	8.4%
	18 feet	17,720	6.1%	99	5.9%	-.2%	1.0414	103.1	6.1%
	19-20 feet	20,090	6.9%	90	5.3%	-1.6%	1.2989	116.9	6.9%
	Over 20 feet	18,769	6.5%	104	6.2%	-.3%	1.0510	109.3	6.5%
Sail only	20 feet or less	19,421	6.7%	149	8.9%	2.1%	.7584	113.0	6.7%
Auxiliary & Sail	20 feet or less	1,926	.7%	10	.6%	-.1%	1.1200	11.2	.7%
Total		289,133	100.0%	1,683	100.0%	n/a	n/a	1,682.9	100.0%

[a] Difference between percent distribution for unweighted responses and study population.

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Section 2: Summary of Survey Responses

Table 6. Type of Engine by Vessel Propulsion Categories

	Percent				Number of cases[a]			
	Out-board	Sail Only	Auxil-iary & Sail	Total	Out-board	Sail Only	Auxil-iary & Sail	Total
One or more outboard engines[b]	88.4%	8.0%	72.7%	82.9%	1,378	9	8	1,395
Non-outboard engine[c]	3.2%	4.4%	--	3.3%	50	5	0	55
Electric outboard engine[d]	1.0%	1.8%	--	1.1%	16	2	0	18
No engine	7.4%	85.8%	27.3%	12.8%	115	97	3	215
Total	100.0%	100.0%	100.0%	100.0%	1,559	113	11	1,683

[a] All tables in the remainder of this report summarize data weighted to adjust for vessel propulsion and vessel length. The weighting process produces fractions of cases. Due to rounding, the number of cases may not sum exactly to the total.

[b] Boats that use other types of engines in addition to an outboard engine are also counted in this category.

[c] For example, inboard, stern-drive, or jet engine.

[d] For this analysis, "outboard engine" does not include electric outboard engines.

Table 7. Summary of Responses for Outboard Engine Powered Boats by Vessel Propulsion Categories

		Percent				Number of cases			
		Out-board	Sail Only	Auxil-iary & Sail	Total	Out-board	Sail Only	Auxil-iary & Sail	Total
Number of outboard engines used with boat	One	95.0%	100.0%	100.0%	95.1%	1,309	9	8	1,326
	Two	4.9%	--	--	4.8%	67	0	0	67
	Three	.1%	--	--	.1%	2	0	0	2
	Total	100.0%	100.0%	100.0%	100.0%	1,378	9	8	1,395
Horsepower for all outboard engines used with boat	1-6 HP	13.9%	70.0%	75.0%	14.6%	202	7	6	215
	7-15 HP	25.0%	20.0%	12.5%	24.9%	363	2	1	366
	16-40 HP	15.4%	--	--	15.2%	223	0	0	223
	More than 40 HP	40.6%	--	--	40.1%	589	0	0	589
	Don't know	5.0%	10.0%	12.5%	5.1%	73	1	1	75
	Total	100.0%	100.0%	100.0%	100.0%	1,450	10	8	1,468
Do 1-6 HP engines have built-in fuel tanks?	Yes	43.3%	71.4%	20.0%	43.7%	88	5	1	94
	No	56.7%	28.6%	80.0%	56.3%	115	2	4	121
	Total	100.0%	100.0%	100.0%	100.0%	203	7	5	215
Does boat use a factory installed tank that is integrated into the vessel?	Yes	35.5%	37.5%	12.5%	35.3%	485	3	1	489
	No	63.0%	62.5%	87.5%	63.2%	862	5	7	874
	Don't know	1.5%	--	--	1.5%	21	0	0	21
	Total	100.0%	100.0%	100.0%	100.0%	1,368	8	8	1,384

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Table 8. Portable Outboard Marine Tank Use for Outboard Engine Powered Boats by Vessel Propulsion Categories

		Percent				Number of cases			
		Out-board	Sail Only	Auxil-iary & Sail	Total	Out-board	Sail Only	Auxil-iary & Sail	Total
Does boat use a portable outboard marine tank (OMT)?	Yes	64.4%	55.6%	87.5%	64.4%	887	5	7	899
	No	35.6%	44.4%	12.5%	35.6%	491	4	1	496
	Total	100.0%	100.0%	100.0%	100.0%	1,378	9	8	1,395
Number of boats OMT is used with	One	93.8%	83.3%	100.0%	93.8%	829	5	7	841
	Two	4.5%	--	--	4.5%	40	0	0	40
	Three	1.5%	--	--	1.4%	13	0	0	13
	Four or more	.2%	16.7%	--	.3%	2	1	0	3
	Total	100.0%	100.0%	100.0%	100.0%	884	6	7	897
Is OMT used with any other type of equipment?	Yes	2.6%	16.7%	--	2.7%	23	1	0	24
	No	97.4%	83.3%	100.0%	97.3%	858	5	7	870
	Total	100.0%	100.0%	100.0%	100.0%	881	6	7	894
Number of OMTs used with boat	One	73.4%	66.7%	100.0%	73.5%	647	4	7	658
	Two	23.5%	--	--	23.1%	207	0	0	207
	Three	2.6%	33.3%	--	2.8%	23	2	0	25
	Four	.6%	--	--	.6%	5	0	0	5
	Total	100.0%	100.0%	100.0%	100.0%	882	6	7	895

Table 9. Material Type and Capacity for All Portable Outboard Marine Tanks Used with Boat

		Percent	Number of OMTs[a]
Material type for all OMTs used with boat	Metal	55.0%	585
	Plastic	45.0%	479
	Total	100.0%	1,064
Capacity for all OMTs used with boat	1-5 gallon	49.4%	525
	6 gallon	40.5%	430
	7-10 gallon	5.7%	60
	11-15 gallon	2.9%	31
	More than 15 gallons	1.6%	17
	Total	100.0%	1,064

[a] The unit of analysis for this table is OMTs (rather than boats). Information from respondents who were not sure about the OMT material type or capacity was excluded from this table.

Table 10. Capacity within Material Type for All Portable Outboard Marine Tanks Used with Boat

		Percent	Number of OMTs[a]
All metal OMTs used with boat	1-5 gallon	28.0%	298
	6 gallon	22.7%	242
	7-10 gallon	2.7%	28
	11-15 gallon	.8%	9
	More than 15 gallons	.7%	8
All plastic OMTs used with boat	1-5 gallon	21.4%	227
	6 gallon	17.7%	188
	7-10 gallon	3.0%	32
	11-15 gallon	2.0%	22
	More than 15 gallon	.9%	9
Total		100.0%	1,064

[a] The unit of analysis for this table is OMTs (rather than boats)

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Table 11. Outboard Engine and Portable Outboard Marine Tank Use for Outboard Boats by Vessel Length

	Is boat powered by one or more outboard engines?			Does this boat use a portable fuel tank? (Asked only if boat is powered by outboard engine)			Percent of boats:	
	Yes	No	Total	Yes	No	Total	Powered by outboard engines	Using OMTs[a]
Under 12 feet	159	52	211	95	63	158	75.4%	45.0%
12 feet	205	37	242	187	18	205	84.7%	77.3%
13 feet	93	7	100	84	9	93	93.0%	84.0%
14 feet	193	16	209	182	11	193	92.3%	87.1%
15 feet	138	13	151	116	21	137	91.4%	76.8%
16 feet	168	7	175	99	69	168	96.0%	56.6%
17 feet	128	13	141	55	73	128	90.8%	39.0%
18 feet	94	9	103	22	72	94	91.3%	21.4%
19-20 feet	110	6	116	21	90	111	94.8%	18.1%
Over 20 feet	90	19	109	25	65	90	82.6%	22.9%
Total	1,378	179	1,557	886	491	1,377	88.5%	56.9%

[a] Please note that these percentages describe the percent of *all* outboard boats that use OMTs—regardless of whether or not they are powered by an outboard engine. This differs from the percentages for outboard boats shown in Table 8, which describe the percent of outboard boats powered by an outboard engine that use OMTs.

Figure 1. Percent of Outboard Boats Using Portable Outboard Marine Tanks by Vessel Length

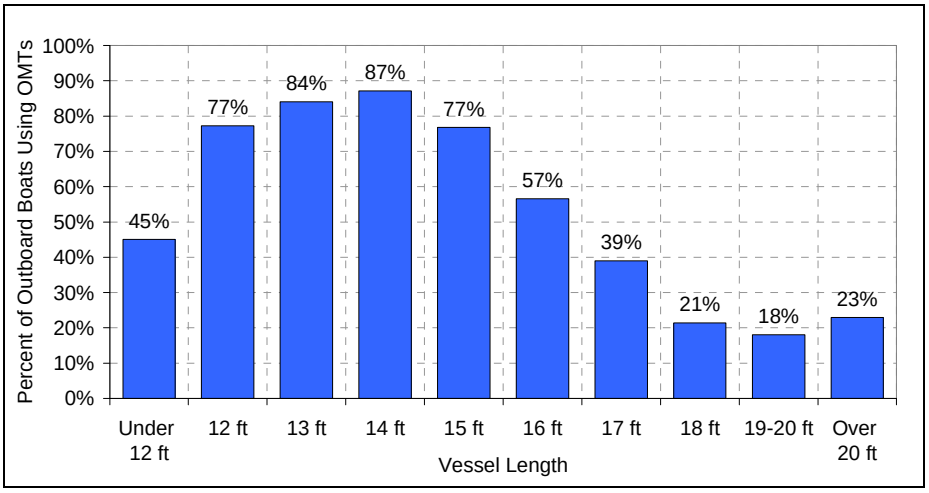

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Table 12. Portable Outboard Marine Tank and Fuel Hose Replacement

		Percent	Number of cases
OMT replacement	Have not replaced tank since owned boat	82.8%	730
	Replaced every one to five years	6.1%	54
	Replaced every six to ten years	4.0%	36
	Replaced every 11 to 15 years	2.7%	24
	Replaced less frequently than every 15 years	4.3%	38
	Total	100.0%	882
OMT fuel hose replacement	Have not replaced fuel hose since owned boat	53.9%	467
	Replaced every one to five years	18.3%	159
	Replaced every six to ten years	9.2%	80
	Replaced every 11 to 15 years	8.2%	71
	Replaced less frequently than every 15 years	10.3%	89
	Total	100.0%	866

Table 13. Portable Outboard Marine Tank Storage Characteristics

		Percent	Number of cases
Is the tank usually stored with fuel in it?	Yes	56.7%	504
	No	41.2%	366
	Don't know	2.0%	18
	Total	100.0%	888
Do you close the vent when the tank is stored?	Yes	67.0%	594
	No	22.4%	198
	Don't know	8.2%	72
	Other[a]	2.5%	22
	Total	100.0%	886

[a] Most respondents in the “other” category reported that the tank does not have a vent. Six respondents said they close the vent “sometimes” and one respondent had not used the tank yet.

Table 14. Portable Outboard Marine Tank Venting for Tanks Stored With and Without Fuel

Do you close the vent when the tank is stored?	Is the tank usually stored with fuel in it?		
	Yes	No	Don't know
Yes	70.6%	63.4%	33.3%
No	23.1%	22.4%	5.6%
Don't know	3.2%	13.1%	50.0%
Other	3.2%	1.1%	11.1%
Total	100.0%	100.0%	100.0%
Number of cases	504	366	18

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Table 15. Location of Boat and Portable Outboard Marine Tank Storage During Last Twelve Months

		Percent	Number of cases
Boat storage	Boat was stored in the same county in which it is registered for all of the last 12 months	93.0%	823
	Boat was stored an another location for some or all of the last 12 months	7.0%	62
	Total	100.0%	884
OMT storage	OMT was stored in the same county as boat	98.7%	870
	OMT was not stored in the same county as boat	1.3%	11
	Total	100.0%	881

Table 16. Respondent Age and Gender by Vessel Propulsion Categories

		Percent			Number of cases		
		Outboard	Sail[a]	Total	Outboard	Sail[a]	Total
Age	Under 18	.4%	.8%	.4%	6	1	7
	18 to 24	.8%	1.6%	.8%	12	2	14
	25 to 44	11.1%	8.8%	10.9%	171	11	182
	45 to 64	48.9%	53.6%	49.3%	754	67	821
	65 and older	37.5%	31.2%	37.0%	578	39	617
	Declined	1.4%	4.0%	1.6%	21	5	26
	Total	100.0%	100.0%	100.0%	1,542	125	1,667
Gender	Male	84.9%	75.8%	84.2%	1,308	94	1,402
	Female	15.1%	24.2%	15.8%	233	30	263
	Total	100.0%	100.0%	100.0%	1,541	124	1,665

[a] Includes sail only and auxiliary and sail.

Table 17. Number of Years Respondent Has Owned Boat by Vessel Propulsion Categories[a]

	Percent			Number of cases		
	Outboard	Sail[b]	Total	Outboard	Sail[b]	Total
3 years or less	27.4%	23.4%	27.1%	361	22	383
4-5 years	14.6%	16.0%	14.7%	192	15	207
6-10 years	18.9%	19.1%	18.9%	249	18	267
11-15 years	18.1%	16.0%	18.0%	239	15	254
More than 15 years	21.0%	25.5%	21.3%	276	24	300
Total	100.0%	100.0%	100.0%	1,317	94	1,411

[a] From DMV database (some registrations were missing this information).

[b] Includes sail only and auxiliary and sail.

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Section 3: Estimates

Table 18. Mean Number of Portable Outboard Marine Tanks per Registered Vessel (N=1,623)

		Metal	Plastic	Total
Mean	1-5 gallon	.184	.140	.324
	6 gallon	.149	.116	.265
	7-10 gallon	.017	.020	.037
	11-15 gallon	.005	.013	.019
	Over 15 gallons	.005	.006	.011
	Total	.360	.295	.655
Standard Deviation	1-5 gallon	.465	.385	.571
	6 gallon	.452	.381	.580
	7-10 gallon	.149	.156	.214
	11-15 gallon	.081	.146	.167
	Over 15 gallons	.076	.084	.113
	Total	.627	.558	.736

Table 19. Confidence Intervals[a] for Mean Number of Portable Outboard Marine Tanks Per Registered Vessel

	Metal	Plastic	Total
1-5 gallon	.161 - .206	.121 - .159	.296 - .351
6 gallon	.126 - .170	.098 - .135	.236 - .293
7-10 gallon	.010 - .025	.012 - .027	.027 - .048
11-15 gallon	.001 - .009	.006 - .021	.011 - .027
Over 15 gallons	.001 - .008	.002 - .010	.005 - .016
Total	.329 - .390	.268 - .322	.619 - .691

[a] 95 percent confidence interval for mean.

Table 20. Estimated Number of Portable Outboard Marine Tanks Used with Vessels in Study Population

	Metal	Plastic	Total
1-5 gallon	53,200	40,479	93,679
6 gallon	42,792	33,539	76,331
7-10 gallon	4,915	5,783	10,698
11-15 gallon	1,446	3,759	5,494
Over 15 gallons	1,446	1,735	3,180
Total	104,088	85,294	189,382

Table 21. Confidence Intervals for Estimated Number of Portable Outboard Marine Tanks Used with Vessels in Study Population

	Metal	Plastic	Total
1-5 gallon	46,550 - 59,561	34,985 - 45,972	85,583 - 101,486
6 gallon	36,431 - 49,153	28,335 - 39,033	68,235 - 84,716
7-10 gallon	2,891 - 7,228	3,470 - 7,807	7,807 - 13,878
11-15 gallon	289 - 2,602	1,735 - 6,072	3,180 - 7,807
Over 15 gallons	289 - 2,313	578 - 2,891	1,446 - 4,626
Total	95,125 - 112,762	77,488 - 93,101	178,973 - 199,791

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Table 22. Estimated Portable Outboard Marine Tank Use for Study Population Vessels and Excluded Comparable Registrations

		Outboard	Sail Only	Auxiliary and Sail	Total
Survey respondents	Percent using OMTs	64.4%	55.6%	87.5%	64.4%
	Mean number of OMTs per vessel	.699	.074	.556	.655
Vessels in study population		267,786	19,421	1,926	289,133
Excluded "comparable" vessel registrations[a]	Registered outside California, but located inside California	1,206	123	12	1,341
	Livery vessel registrations	2,632	147	3	2,782
	Commercial vessel registrations	740	2	0	742
	Exempt (Youth Group) registrations	169	230	11	410
	Exempt (Government) registrations	1,558	500	4	2,062
	Vessels registered to agencies, schools, businesses or clubs	5,244	724	50	6,018
	Subtotal	11,549	1,726	80	13,355
Estimated number of vessels using OMTs	Study population	172,454	10,798	1,685	186,202
	Excluded comparable registrations	7,438	960	70	8,601
	Total	179,892	11,758	1,755	194,803
Estimated number of OMTs used with vessels	Study population	187,182	1,437	1,071	189,382
	Excluded comparable registrations	8,073	128	44	8,748
	Total	195,255	1,565	1,115	198,130

[a] Vessels excluded from study population with expected OMT usage comparable to study population. Non-household-vessel OMT use may be greater than household-vessel OMT use; assuming equal OMT use rates produces a conservative estimate of overall use.

APPENDIX E

Telephone Survey Regarding Portable Outboard Marine Tank (OMT) Usage

Section 1: Introduction & Eligibility

Hello, my name is _____, and I'm calling from California State University, Sacramento. We are conducting a survey about outboard boats for the California Air Resources Board. I am calling about a <vessel length, builder and boat type> registered to <name of registered owner>.

Q1. Do you or someone in your household own or use this boat?
1 Yes
2 Yes, but this is not a good time to do the interview
3 No, do not have boat anymore (sold, gave away, etc)
4 No, owner has moved
5 No, wrong number, don't know anything about this boat
6 No, phone number was not residential
7 No boat owner/user is deceased
8 No, but they provide boat-owner's phone number

Q2. May I speak with the registered owner or person who would be most familiar with this boat?
1 Registered owner of boat is available and agrees to be interviewed
2 Another household member who also uses the boat is available and agrees to be interviewed
3 The appropriate person is not available

Q3. Is this boat powered by one or more outboard engines? (Interviewer note: Before recording "no" please be absolutely sure that this boat is never used with any outboard engines. An outboard engine is a detachable engine that hangs off the back of the boat and includes the engine, transmission and propeller.)
1 Yes *(skip to Q4)*
2 No

Q3a. Does the boat have any kind of engine? Interviewer: record category that best describes boat:
1 Yes, it actually does have an outboard engine
2 Yes, it has an engine, but not an outboard engine *(skip to Q26)*
3 No, it's a sailboat and does not have any engine at all *(skip to Q26)*
4 No, it's another kind of boat (not a sailboat) and does not have any engine *(skip to Q26)*
5 Other, describe: _____ *(skip to Q26)*

Q4. How many outboard engines do you use with this boat? _____ *(if 0, skip to Q26, interviewer note: be sure to probe to include secondary motors for low speed trolling or fishing.)*

Q5. What horsepower is the engine?[3]
1 1-6
2 7-15 *(skip to Q7)*
3 16-40 *(skip to Q7)*
4 More than 40 *(skip to Q7)*
5 Don't know *(skip to Q7)*

Q6. Does this engine have its own built-in fuel tank?[3]
1 Yes
2 No

Q6a. Does the boat use a factory installed tank that is integrated into the vessel?
1 Yes
2 No
3 Don't know

[3] Q5 and Q6 are repeated for up to five engines in the 1-6 HP category.

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Section 2: Portable Outboard Marine Tank (OMT) Usage

We are collecting information about portable outboard fuel tanks. The portable tanks connect to the engine with a rubber fuel line and may be removed from the boat for refueling or storage.

Q7. Does this boat use a portable fuel tank?
1 Yes
2 No *(skip to Q26)*
3 Don't know *(skip to Q19)*

(Interviewer note: if a respondent is not sure whether the boat uses an OMT – or if they say no and you think they may be uncertain or may have misunderstood the question – you need to rephrase the question, including a description of the tanks: the tanks are red in color ("all red and all small") and made of plastic or metal. The tank connects to the engine with a fuel line that has a hand pump used to prime the engine.)

Q8. Do you also use this tank with another boat or boats?
1 Yes
2 No *(skip to Q9)*
3 Don't know *(skip to Q9)*

Q8a. How many? _____

Q9. Do you also use this tank with any other type of equipment?
1 Yes
2 No
3 Don't know

Q10. How many portable tanks do you use with this boat?
1 1 portable tank
2 2 portable tanks
3 3 portable tanks
4 4 portable tanks
5 5 or more portable tanks

Q11. Is the tank made of metal or plastic?[4]
1 Metal
2 Plastic
3 Don't know

Q12. What size would you classify the tank?[4]
1 1-5 gallon
2 6 gallon
3 7-10 gallon
4 11-15 gallon
5 16+ gallon
6 Don't know
7 Other, please describe _____

Q13. Since you have owned the boat, have you ever had to replace the tank? *(Interviewer note: by replace we mean buy a new tank.)*
1 Yes
2 No *(skip to Q15)*
3 Don't know *(skip to Q15)*

[4] Q11 and Q12 are repeated for up to five tanks.

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Q14. How many times have you replaced the tank?
____ times since you owned the boat

Q15. Since you have owned the boat, have you ever had to replace the fuel hose?
1 Yes
2 No *(skip to Q17)*
3 Don't know *(skip to Q17)*

Q16. How many times have you replaced the fuel hose?
___ times since owned the boat

Q17. Is the tank usually stored with fuel in it?
1 Yes
2 No
3 Don't know

Q18. Do you close the vent when the tank is stored?
1 Yes
2 No
3 Don't know
4 Other, please describe _____

Section 3: Storage

Q19. My records show this boat is registered in <county name>. Is this correct?
1 Yes *(skip to Q21)*
2 No
3 Don't know what county boat is registered in *(skip to Q21)*

Q20. What county is the boat currently registered in?

1 Alameda	21 Marin	41 San Mateo
2 Alpine	22 Mariposa	42 Santa Barbara
3 Amador	23 Mendocino	43 Santa Clara
4 Butte	24 Merced	44 Santa Cruz
5 Calaveras	25 Modoc	45 Shasta
6 Colusa	26 Mono	46 Sierra
7 Contra Costa	27 Monterey	47 Siskiyou
8 Del Norte	28 Napa	48 Solano
9 El Dorado	29 Nevada	49 Sonoma
10 Fresno	30 Orange	50 Stanislaus
11 Glenn	31 Placer	51 Sutter
12 Humboldt	32 Plumas	52 Tehama
13 Imperial	33 Riverside	53 Trinity
14 Inyo	34 Sacramento	54 Tulare
15 Kern	35 San Benito	55 Tuolumne
16 Kings	36 San Bernardino	56 Ventura
17 Lake	37 San Diego	57 Yolo
18 Lassen	38 San Francisco	58 Yuba
19 Los Angeles	39 San Joaquin	59 Don't know county
20 Madera	40 San Luis Obispo	60 Out of State

Interviewer note: if respondent does not know county, ask for and record another other geographic identifier, including town, marina, or waterway (lake or river); if a river is provided as an identifier, probe to get something more specific because rivers may cross multiple county borders.

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Q21. During the last 12 months, when the boat was not in use, was the boat stored in <county name>?
1 Yes, above county for all of the last 12 months *(skip to Q24)*
2 Yes, for some of the time
3 No, different county or counties *(skip to Q23)*
4 Don't know county name *(Interviewer note: Probe to determine nearest city, town or Marina. Rivers and sometimes lakes—cross county boundaries.)*

Q22. How many months did you store the boat in <county name>?
____Months

Q23. What (other) counties was the boat stored in during the last 12 months?
County 1:_____ How many months did you store the boat in this location?_____
County 2:_____ How many months did you store the boat in this location?_____
County 3:_____ How many months did you store the boat in this location?_____

Q24. When not in use, is the portable fuel tank stored in the same county as the boat?
1 Yes *(skip to Q26)*
2 No
3 Don't know if the tank is stored with the boat *(skip to Q26)*

Q25. What counties was the portable fuel tank stored in during the last 12 months?
County 1:_____ How many months did you store the tank in this location?_____
County 2:_____ How many months did you store the tank in this location?_____
County 3:_____ How many months did you store the tank in this location?_____

Section 4: Demographics

Now I just have to ask two more questions that will be used to make sure we have representative information.

Q26. Which age bracket includes you?
1 Under 18
2 18 to 24
3 25 to 44
4 45 to 64
5 65 and older
6 Refused

Q27. What is your gender?
1 Male
2 Female

That is all the questions I have for you. Thank you for your time. If you are interested, you can visit the Air Resources Board online at:www.arb.ca.gov