

Final Report

Analysis of Marine Recreational Angler Information Gathering and Sharing Habits and Opinions Regarding Fisheries Management and Data Collection

By

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Updated October 23, 2020 to clarify language on pages 2-3 describing total sample allocations.

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Overview

In January 2017, the National Academies of Sciences, Engineering, and Medicine (NASEM) released the findings of an independent assessment of NOAA Fisheries Marine Recreational Information Program (MRIP) including the current status of the program and its direction. The report included analysis of MRIP communication and outreach efforts geared toward marine recreational anglers. Although MRIP's data collection and analysis were deemed to have shown "impressive progress" since 2008, the report highlighted the need to further emphasize "interactive (two-way) communication" with anglers, due to wide variations in recreational angler trust in the program. In addition to the guidance provided by the NASEM review, MRIP's most recent five-year strategic (2017-2022) plan highlighted stakeholder engagement as one of six primary goals and included the strategy of focusing on "communication and education efforts on the key stakeholders most likely to pass information onto others and influence internal and external decision-makers."

This research project was developed and implemented to inform MRIP's efforts to improve stakeholder engagement and foster two-way communication between MRIP and recreational anglers. The objectives of this study were to examine: 1) where marine recreational anglers go to gather information on saltwater recreational fishing issues including fishing regulations and data collection issues, 2) angler trust levels associated with different sources of information on saltwater fishing regulations and data collection issues, 3) angler understanding of and confidence in saltwater recreational fisheries management, data collection, and data analysis, and 4) angler opinions and beliefs regarding the current state of saltwater recreational fisheries management and data collection. The results of this research can help MRIP focus its stakeholder engagement efforts on key information sharing outlets that reach the most anglers and/or are most trusted by anglers, and tailor outreach efforts to topical areas where anglers trust in the management and data collection process is weakest. In addition, QNS survey results were used to develop a survey instrument and plan for the social network analysis of saltwater recreational anglers in three coastal communities, a qualitative local survey (QLS), to further examine how these anglers communicate and share information¹.

Achieving the objectives of this research required conducting a regional mail survey of saltwater recreational anglers. The survey was administered to a sample of state licensed recreational anglers residing in coastal states from Maine to Mississippi.

The survey instrument gathered information on:

¹ How QNS survey results were used to inform the QLS social network analysis is discussed in the 'Analysis of Survey Results' section of the report.

- Fishing behavior, practices, and motivations;
- Knowledge of, and involvement in, the fisheries management and data collection process;
- Opinions regarding current management effectiveness, what the goals of management should be;
- Trust in management, opinions regarding the responsiveness of management to angler concerns and the values, opinions, and goals of fishery managers;
- What sources anglers use to gather information on saltwater recreational fishing and their trust in the information they receive from those sources; and
- The number of other anglers they discuss fishing issues with; and demographic data.

The remainder of this report is organized as follows:

- A review of survey design and implementation;
- Analysis of survey response rates by Management Council Regions (MCR) and state;
- Survey results by MCR;
- Further analysis of survey results across questions; and
- Concluding remarks.

Survey Design and Development

The mail survey, including the pre-notice mailing, survey instrument, reminder postcard, second survey mailing, and reminder/thank you postcard was developed in consultation with ECS and NOAA Fisheries staff and contractors. It was developed during the fourth quarter of 2018 and submitted for Office of Management and Budget (OMB) Paperwork Reduction Act approval on 1/29/2019. The survey instrument was pretested with seven recreational anglers by the Florida Survey Research Center on 1/12/2019. The data were collected via a mail survey administered by ECS staff over the summer and fall of 2019. An initial pre-notice mailing was distributed on 6/17/2019, with the initial survey package mailing a week later on 6/24/2019. A second questionnaire package was mailed on 8/12/2019 and a final mailing of thank you/reminder postcards was distributed on 8/26/2019.

No significant problems were encountered during the data collection and no changes were made once the data collection process began.

Sample Allocation and Survey Response Rates

Total Sample Allocations

The sample frame included resident licensed saltwater recreational anglers on NOAA Fisheries' National Saltwater Angler Registry (NSAR) between the ages of 16 and 99 along the Atlantic and Gulf coasts from Maine to Mississippi. As shown in Table 1, 10,000 licensed anglers were sampled; 20% (2,000) were drawn from NEFMC MCR states, 30% (3,000) were drawn from MAFMC MCR states, 25% (2,500) were drawn from SAFMC MCR states, and 25% (2,500) were drawn for GMFMC MCR states. Assuming a potential low response rate of 23.5%, 10,000 mailed

surveys divided among the MCRs in this manner provided for a 5% or better margin of error at a 95% confidence level for each MCR.

The distribution of the sample and the number of resident licensed anglers on the NSAR age 16 to 99 are presented in Table 1. Data are presented at MCR and state level. In all there are 17 strata (defined as unique combinations of MCR and state) in the survey design. Within each MCR, sample was allocated among states proportional to the number of resident licensed anglers with an adjustment for differential response rates among states covered by the MRIP Fishing Effort Survey (2016-2018). Adjusting sample allocations to reflect different response rates helped ensure that the numbers of completed responses among states is representative of the distribution of resident licensed anglers. The state of Florida is divided into two MCRs; Florida's West Coast sample was allocated to the GMFMC MCR, while Florida's East Coast sample was allocated to the SAFMC MCR. Base weights were calculated within each stratum as the total number of resident licensed anglers divided by the number of the resident licensed anglers sampled. The base weights were adjusted within each stratum to account for non-response, resulting in final weights. Specifically, the final weights were calculated at the stratum level as the total number of resident licensed anglers divided by the number of respondents.

Table 1. Distribution of sample and resident licensed anglers by MCR and State.

	Sample		Resident Licensed Anglers	
NEFMC	2,000	20.00%	376,254	7.70%
Connecticut	415	4.15%	96,944	1.98%
Maine	306	3.06%	57,632	1.18%
Massachusetts	839	8.39%	157,722	3.23%
New Hampshire	195	1.95%	27,266	0.56%
Rhode Island	245	2.45%	36,690	0.75%
MAFMC	3,000	30.00%	1,206,422	24.69%
Delaware	228	2.28%	51,444	1.05%
Maryland	555	5.55%	223,107	4.57%
New Jersey	275	2.75%	110,490	2.26%
New York	1,362	13.62%	587,848	12.03%
Virginia	580	5.80%	233,533	4.78%
SAFMC	2,500	25.00%	2,262,867	46.31%
Florida - East Coast	850	8.50%	769,597	15.75%
Georgia	272	2.72%	245,646	5.03%
North Carolina	858	8.58%	776,763	15.90%
South Carolina	520	5.20%	470,861	9.64%
GMFMC	2,500	25.00%	1,041,052	21.30%

Alabama	214	2.14%	89,064	1.82%
Florida - West Coast	2,065	20.65%	859,931	17.60%
Mississippi	221	2.21%	92,057	1.88%
TOTAL	10,000	100%	4,886,595	100%

Survey Response Rates by MCR and State

Unweighted and weighted survey response rates are presented in Table 2. The unweighted response rates are presented using standard definitions and guidelines of the American Association for Public Opinion Research (AAPOR) associated with mail surveys of specifically named persons (AAPOR, 2016). The survey instrument had 14 non-demographic questions, many with multiple parts. A respondent was deemed to have skipped a question if he or she did not respond to any part of the question and those respondents that skipped over half of the questions were designated as break-offs. Break-offs are respondents who started the survey and returned it but did not complete it. Those surveys returned with between 50% and 75% of the questions (seven to 10 responses) answered were deemed partially completed (AAPOR, 2016). Table 2 presents AAPOR defined Response Rate 1 (RR1, only completed surveys count as a response) and RR2 (completed and partially completed surveys count as responses). The weighted response rates are calculated using weights provided by ECS and NOAA Fisheries MRIP staff. The weights provided do not count for partial completes and breakoffs, so AAPOR defined rates can't be calculated.

Table 2. Unweighted and weighted survey response rates by MCR and State.

	Unweighted		Weighted
	Response Rate 1	Response Rate 2	Response Rate
NEFMC	33.40%	33.70%	33.75%
Connecticut	32.77%	33.49%	33.49%
Maine	28.76%	29.08%	30.07%
Massachusetts	34.68%	34.92%	34.92%
New Hampshire	41.03%	41.03%	41.03%
Rhode Island	29.80%	29.80%	29.80%
MAFMC	29.80%	30.00%	30.10%
Delaware	35.09%	35.09%	35.53%
Maryland	31.71%	31.71%	32.07%
New Jersey	48.36%	49.09%	49.09%
New York	22.69%	22.83%	23.49%
Virginia	33.79%	34.14%	34.66%

SAFMC	26.96%	27.28%	27.60%
Florida - East Coast	25.53%	25.65%	25.65%
Georgia	27.21%	27.21%	27.57%
North Carolina	27.27%	27.74%	28.32%
South Carolina	28.65%	29.23%	29.62%
GMFMC	25.44%	25.52%	25.68%
Alabama	29.91%	30.37%	30.37%
Florida - West Coast	24.31%	24.36%	24.55%
Mississippi	31.67%	31.67%	31.67%
TOTAL	28.72%	28.94%	28.28%

Final Disposition of Sample Units

The final disposition of sample units was accomplished using AAPOR codes for mail surveys of specifically named persons (AAPOR, 2016). Break-offs and partial responses were coded in the manner outlined in the previous section; respondents answering less than half of the 14 non-demographic questions were coded as break-offs and those answering between seven and 10 questions were coded as partial completes. Final dispositions by state, MCR, and overall are presented in Table 3.

Table 3. Final AAPOR disposition of the sample (AAPOR disposition code).

	Complete (1.1)	Partial (1.2)	Break -off (2.10)	Refusal (2.10)	Deceased (2.31)	Nothing Ever Returned (3.19)	Undelivered (3.25)	Total
NEFMC	668	6	3	18	2	1182	121	2000
Connecticut	136	3	-	10	2	245	19	415
Maine	88	1	3	2	-	195	17	306
Massachusetts	291	2	-	4	-	484	58	839
New Hampshire	80	-	-	2	-	105	8	195
Rhode Island	73	-	-	-	-	153	19	245
MAFMC	894	6	15	46	8	1808	223	3000
Delaware	80	-	1	5	1	121	20	228
Maryland	176	-	2	4	1	329	43	555
New Jersey	133	2	-	2	1	126	11	275
New York	309	2	9	28	3	921	90	1362
Virginia	196	2	3	7	2	311	59	580

SAFMC	674	8	8	34	23	1411	342	2500
Florida - East Coast	217	1	-	5	-	530	97	850
Georgia	74	-	1	2	-	171	24	272
North Carolina	234	4	5	11	19	439	146	858
South Carolina	149	3	2	16	4	271	75	520
GMFMC	636	2	4	13	7	1506	332	2500
Alabama	64	1	-	3	1	131	14	214
Florida - West Coast	502	1	4	10	5	1254	289	2065
Mississippi	70	-	-	-	1	121	29	221
TOTAL	2872	22	30	111	40	5907	1018	10000

Survey Results

This section provides survey response breakdowns for each question by MCR. In addition, Appendix A (QNS Report Address Type Tables) includes the tables, similarly numbered, with responses broken down by address type (urban, suburban, or rural) and Appendix B (QNS Report Unweighted Data Tables) includes the tables, similarly numbered, broken down by MCR using the unweighted data. The section also describes data errors associated with each question; however, explanations of error corrections used in the analysis section are described in the “Data Editing and Corrective Actions” section.

Saltwater Recreational Fishing Habits

Question 1 - Fishing Avidity

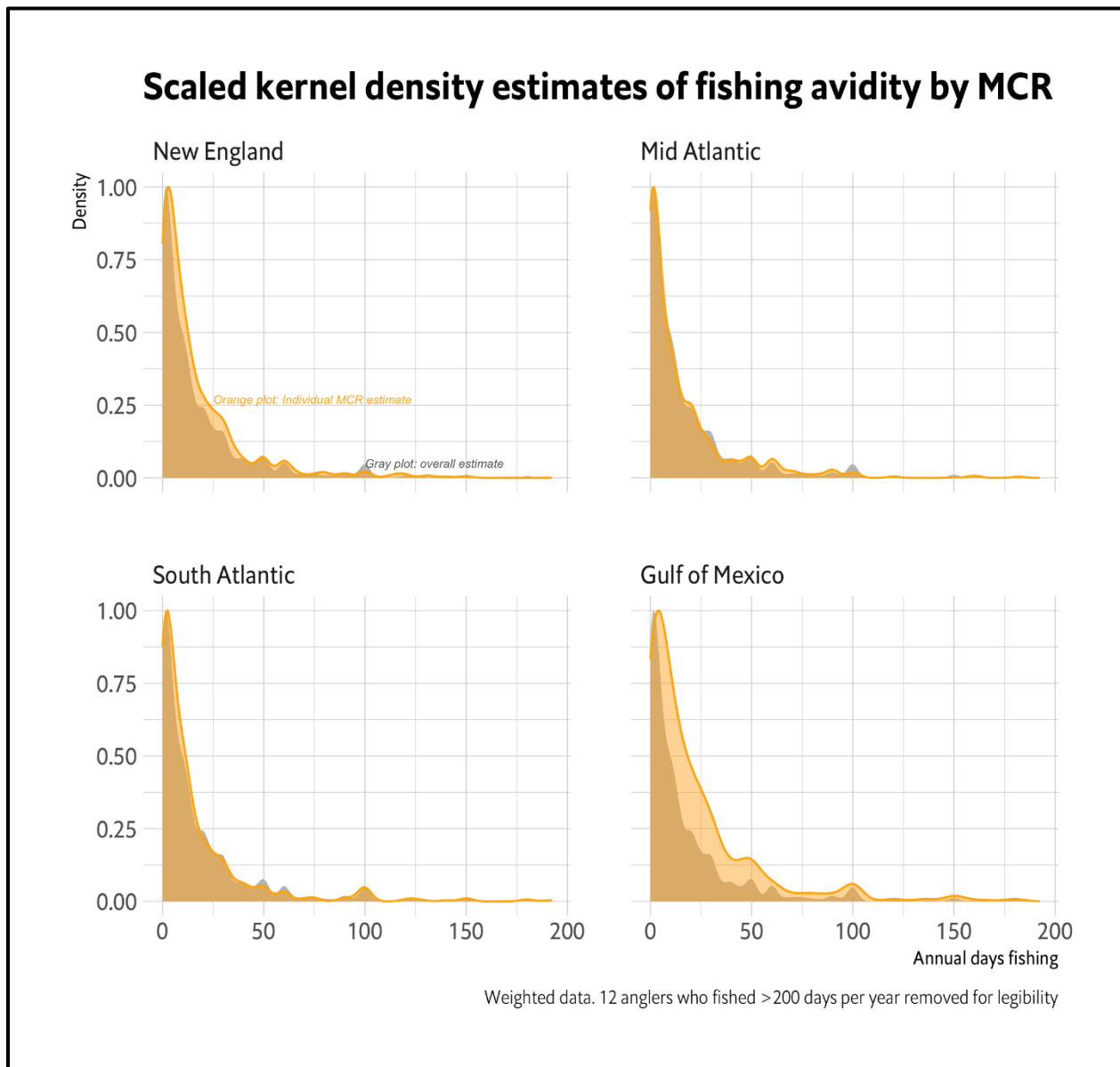
Question 1 asked respondents to provide a numerical value for how many days they spent saltwater recreational fishing during the past 12 months (fishing avidity). Respondents were instructed to count partial days as full and zero values are included in the calculation of means. Fishing avidity by MCR is presented in Table 4. The table displays the mean and standard deviation of fishing avidity (days spent marine fishing during the past 12 months) and fishing prevalence (percentage of respondents indicating some fishing in the last 12 months) with skips and response errors (answers >365) removed. In addition, scaled kernel density estimate, with skips and response errors removed, are presented in Figure 1.

Table 4. Fishing avidity by MCR.

MCR	Mean	Std. Dev.	Prevalence	Freq.	Skipped (Freq.)	Response Error (Freq.)
NEFMC	17.88	26.46	87.48%	373,854	2,400	0

MAFMC	17.11	28.73	77.49%	1,189,934	15,326	1,162
SAFMC	17.80	32.61	80.04%	2,210,610	52,257	0
GMFMC	24.75	39.33	88.81%	1,032,897	8,155	0
Total	19.13	32.98	81.87%	4,807,295	78,138	1,162

Figure 1. Fishing Avidity by MCR



Question 2 - Waters Fished

Question 2 asked respondents to identify where they go saltwater recreational fishing: state waters, federal waters, or if they were unsure of whether they fished in state or federal waters (waters fished). They were presented with a check box for each option and asked to check all that apply. Table 5 provides the weighted responses of Q2 (waters fished) by MCR. Fishing in state waters or a mix of state and federal waters was much more common among respondents than fishing solely in federal waters. In addition, approximately 20% of respondents were unsure of their fishing location (state or federal waters). The table also includes responses with data errors including those that indicated they were both unsure of their fishing location and fished in state and/or federal waters and those that skipped the question. A discussion of response inconsistencies and how they were treated in the analysis is included in the data editing and corrective actions section.

Table 5. Waters fished by MCR.

MCR	State	Federal	State & Federal	Unsure	State & Federal & Unsure	State & Unsure	Federal & Unsure	Skipped	Total
NEFMC	60.26	2.7	17.4	16.57	0.41	0.14	0.14	2.38	100
MAFMC	47.04	3.45	18.56	24.18	0.16	0.37	0	6.22	100
SAFMC	47.13	2.5	22.74	21.98	0.28	0.14	0	5.22	100
GMFMC	52.52	1.47	24.95	17.94	0	0.78	0	2.34	100
Total	49.27	2.53	21.77	21.25	0.2	0.33	0.01	4.64	100

Question 3 – Fishing Mode

Question 3 asked respondents to identify how often they go saltwater recreational fishing from the shore, a for-hire boat, and/or a private boat. Each category provided respondents with a definition of the mode and they were asked to select one of the following for each mode: never, rarely, sometimes, often, always. The data is broken up by fishing mode (shore, for-hire, and private boat) and MCR in Tables 6 through 8. A discussion of response inconsistencies within question 3 (responding always to one mode and also indicating some use of other modes) and with question 2 responses (indicating an incongruent mix of shore and federal waters fishing) is included in the data editing and corrective actions section.

Table 6. Tendency to fish from shore by MCR.

MCR	Never	Rarely	Sometimes	Often	Always	Skipped	Multiple Selections	Total
NEFMC	14.58	14.82	20.28	26.33	20.77	3.21	0	100
MAFMC	19.53	15.03	23.49	21.7	15.0	5.11	0.15	100
SAFMC	18.51	16.18	21.78	20.85	18.68	4.0	0	100
GMFMC	18.7	21.38	23.66	21.36	11.79	2.81	0.29	100

Total	18.5	16.9	22.49	21.59	16.47	3.96	0.1	100
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Table 7. Tendency to fish from for-hire vessels by MCR.

MCR	Never	Rarely	Sometimes	Often	Always	Skipped	Multiple Selections	Total
NEFMC	43.34	23.6	16.99	4.09	0.65	11.33	0	100
MAFMC	36.46	24.43	19.6	6.1	3.08	10.17	0.17	100
SAFMC	44.93	23.99	14.83	3.93	1.3	11.02	0	100
GMFMC	52.52	25.39	11.26	2.47	0.62	7.74	0	100
Total	44.33	24.36	15.42	4.17	1.54	10.14	0.04	100

Table 8. Tendency to fish from private boats by MCR.

MCR	Never	Rarely	Sometimes	Often	Always	Skipped	Multiple Selections	Total
NEFMC	19.96	15.24	19.01	21.00	19.69	5.09	0	100
MAFMC	26.59	12.77	18.11	18.84	15.68	8.00	0	100
SAFMC	22.86	10.42	18.17	20.50	21.91	5.83	0.30	100
GMFMC	13.59	10.31	17.99	24.78	30.21	2.80	0.33	100
Total	21.58	11.35	18.18	21.04	21.97	5.67	0.21	100

Question 4 – Reason for Fishing

Question 4 presented respondents with nine reasons they may go saltwater recreational fishing and asked them to indicate how important each reason was to them (not at all important, somewhat unimportant, neither important nor unimportant, somewhat important, extremely important). The nine possible fishing motivations given were: to catch fish to eat, to catch a record or trophy fish, for the fun of catching fish, for relaxation, to get away, for adventure and excitement, to spend time with my family and/or friends, to be with others who enjoy the same things I do, and to be close to nature. The fishing motivation data are presented by response option in Tables 9 through 17.

Table 9. 'Fishing to catch fish to eat' by MCR.

Importance:	NEFMC	MAFMC	SAFMC	GMFMC	Total
Not At All Important	22.06	16.23	12.78	10.59	13.88
Somewhat Unimportant	8.94	8.1	5.64	4.68	6.3
Neither Important Nor Unimportant	16.03	14.86	11.35	12.96	12.92
Somewhat Important	30.16	32.93	36.32	33.9	34.49
Extremely Important	20.92	24.28	31.23	36.66	29.88

Skipped	1.71	3.61	2.53	1.05	2.42
Multiple Selections	0.17	0	0.14	0.16	0.11
Total	100	100	100	100	100

Table 10. 'Fishing to catch a record or trophy fish' by MCR.

Importance:	NEFMC	MAFMC	SAFMC	GMFMC	Total
Not At All Important	44.83	42.59	51.08	46.71	47.57
Somewhat Unimportant	10.94	12.04	9.11	11.88	10.57
Neither Important Nor Unimportant	20.53	18.09	15.82	18.41	17.29
Somewhat Important	15.31	17.48	15.1	17.28	16.17
Extremely Important	5.51	4.63	4.26	3.97	4.38
Skipped	2.75	4.76	3.52	1.33	3.3
Multiple Selections	0.13	0.39	1.12	0.42	0.71
Total	100	100.00	100.00	100.00	100

Table 11. 'Fishing for the fun of catching fish' by MCR.

Importance:	NEFMC	MAFMC	SAFMC	GMFMC	Total
Not At All Important	2.27	3.49	3.69	2.38	3.25
Somewhat Unimportant	1.23	2.05	1.02	1.76	1.45
Neither Important Nor Unimportant	5.94	5.15	3.45	4.3	4.24
Somewhat Important	21.44	24.23	24.23	26.39	24.47
Extremely Important	67.51	61.64	64.94	63.87	64.09
Skipped	1.61	3.45	2.23	0.65	2.15
Multiple Selections	0	0	0.44	0.65	0.34
Total	100	100	100	100	100

Table 12. 'Fishing for relaxation' by MCR.

Importance:	NEFMC	MAFMC	SAFMC	GMFMC	Total
Not At All Important	1.86	3.23	3.42	1.63	2.87
Somewhat Unimportant	1.75	1.91	0.57	1.69	1.23
Neither Important Nor Unimportant	6.61	5.55	4.51	6.91	5.44
Somewhat Important	29.15	27.33	27.52	33.97	28.97
Extremely Important	58.98	58.55	61.75	54.7	59.24
Skipped	1.65	3.43	2.11	0.78	2.12
Multiple Selections	0	0	0.14	0.33	0.13
Total	100	100	100	100	100

Table 13. 'Fishing to get away' by MCR.

Importance:	NEFMC	MAFMC	SAFMC	GMFMC	Total
Not At All Important	6.72	5.37	4.43	3.74	4.69
Somewhat Unimportant	2.55	2.47	0.83	1.62	1.54
Neither Important Nor Unimportant	10.23	10.76	8.1	8.75	9.06
Somewhat Important	30.99	29.12	29.17	36.71	30.9
Extremely Important	47.3	47.68	54.8	48.2	51.06
Skipped	2.07	4.39	2.25	0.81	2.46
Multiple Selections	0.14	0.2	0.42	0.16	0.29
Total	100	100	100	100	100

Table 14. 'Fishing for adventure and excitement' by MCR.

Importance:	NEFMC	MAFMC	SAFMC	GMFMC	Total
Not At All Important	3.88	5.04	4.93	2.99	4.46
Somewhat Unimportant	2.75	2.72	1.11	2.25	1.87
Neither Important Nor Unimportant	11.25	11.77	8.66	11.48	10.22
Somewhat Important	34.47	32.74	32.58	36.76	33.66
Extremely Important	45.07	43.14	49.51	45.74	46.79
Skipped	2.03	4.53	2.94	0.78	2.8
Multiple Selections	0.56	0.05	0.29	0	0.19
Total	100	100	100	100	100

Table 15. 'Fishing to spend time with family and/or friends' by MCR.

Importance:	NEFMC	MAFMC	SAFMC	GMFMC	Total
Not At All Important	5.14	4.78	2.23	2.5	3.14
Somewhat Unimportant	2.91	2.29	1.85	1.24	1.91
Neither Important Nor Unimportant	8.07	8.98	4.92	7.03	6.61
Somewhat Important	32.67	31.34	31.06	29.93	31.01
Extremely Important	49.47	49.22	57.83	58.39	55.18
Skipped	1.61	3.38	1.96	0.62	2
Multiple Selections	0.13	0	0.16	0.29	0.14
Total	100	100	100	100	100

Table 16. 'Fishing to be with others who enjoy the same things I do' by MCR.

Importance:	NEFMC	MAFMC	SAFMC	GMFMC	Total
Not At All Important	6.27	5.96	5.25	5.43	5.54
Somewhat Unimportant	2.87	3.85	2.59	2.96	3
Neither Important Nor Unimportant	13.28	14.15	9.55	12.92	11.69
Somewhat Important	35.65	32.87	33.31	33.02	33.32
Extremely Important	39.57	38.8	46.63	44.76	43.76
Skipped	2.17	4.36	2.67	0.78	2.65
Multiple Selections	0.19	0	0	0.13	0.04
Total	100	100	100	100	100

Table 17. 'Fishing to be close to nature' by MCR.

Importance:	NEFMC	MAFMC	SAFMC	GMFMC	Total
Not At All Important	2.75	4.55	2.97	2.71	3.29
Somewhat Unimportant	2.57	2.78	2.55	1.56	2.4
Neither Important Nor Unimportant	8.94	11.99	6.56	11.33	9.1
Somewhat Important	36.26	33.68	33.45	32.74	33.57
Extremely Important	47.87	43.24	51.93	50.75	49.22
Skipped	1.61	3.76	2.53	0.78	2.39
Multiple Selections	0	0	0	0.13	0.03
Total	100	100	100	100	100

Table 18 provides the average value for each fishing reason category by MCR with skips and multiple selection responses. Response categories were coded from one to five (one representing not at all important and five representing extremely important). The data indicates that only fishing for food and fishing to catch a record or trophy fish were not

somewhat to extremely important to the average respondent. Variation across MCRs was relatively limited.

Table 18. Mean fishing reason response value by MCR.

	NEFMC		MAFMC		SAFMC		GMFMC		Total	
Variable	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
To catch fish to eat	3.19	1.45	3.42	1.39	3.69	1.33	3.82	1.28	3.62	1.35
To catch a record or trophy fish	2.24	1.33	2.26	1.32	2.08	1.32	2.18	1.30	2.16	1.32
For the fun of catching fish	4.53	0.85	4.43	0.96	4.50	0.92	4.50	0.86	4.48	0.91
For relaxation	4.44	0.85	4.41	0.94	4.47	0.89	4.40	0.83	4.44	0.89
To get away	4.12	1.14	4.17	1.09	4.33	0.99	4.25	0.96	4.26	1.02
For adventure and excitement	4.17	1.01	4.11	1.07	4.25	1.02	4.21	0.95	4.20	1.02
To spend time with family and/or friends	4.21	1.07	4.22	1.05	4.43	0.86	4.42	0.87	4.36	0.93
To be with others who enjoy the same things I do	4.02	1.11	3.99	1.13	4.17	1.07	4.10	1.09	4.10	1.09
To be close to nature	4.26	0.93	4.13	1.05	4.32	0.94	4.28	0.93	4.26	0.97

Saltwater Recreational Fisheries Management and Data Collection

Question 5 – Regulations Knowledge

Question 5 asked respondents how they would describe their knowledge of saltwater recreational fishing regulations that apply to how they fish. Respondents were asked to describe their knowledge as poor, fair, good, or excellent. The results are presented by MCR in Table 19.

Table 19. Regulations knowledge by MCR.

MCR	Poor	Fair	Good	Excellent	Skipped	Multiple Selections	Total
NEFMC	10.46	24.36	47.19	17.35	0.5	0.14	100
MAFMC	15.4	28.34	39.9	14.34	1.86	0.15	100
SAFMC	14.46	29.47	43.12	11.24	1.4	0.3	100
GMFMC	9.66	27.31	47.39	14.99	0.49	0.16	100
Total	13.36	28.34	43.55	13.27	1.25	0.22	100

Question 6 – Meeting Attendance

Question 6 asked respondents about their involvement in the fisheries management and/or fisheries data collection process. Specifically, respondents were asked if during the past three

years they attended a state or federal fisheries management public meeting or contacted a fisheries management or fisheries data collection agency to discuss fisheries issues. Meeting attendance was assumed to be a good proxy for involvement in the management process. The data is presented by MCR in Table 20.

Table 20. Fisheries management and data collection process involvement by MCR.

MCR	Yes	No	Skipped	Total
NEFMC	8.22	91.69	0.09	100
MAFMC	5.48	92.91	1.61	100
SAFMC	5.3	93.72	0.99	100
GMFMC	6.16	93.36	0.49	100
Total	5.75	93.29	0.96	100

Question 7 – Management Activities Understanding

Question 7 was intended to gauge respondents' opinions on their knowledge and understanding of saltwater recreational fisheries management, data collection, and data use. Specifically, respondents were asked to indicate their level of agreement with the following two statements: 1) I understand how fishery managers collect data on saltwater recreational fishing catch and effort, and 2) I understand how fishery managers use saltwater recreational fishing catch and effort data to set fishing rules and regulations. Response options included strongly disagree, somewhat disagree, neither agree nor disagree, somewhat agree, or strongly agree. Tables 21 and 22 present responses for each statement by MCR.

Table 21. 'Knowledge of how data is collected' by MCR.

Agreement:	NEFMC	MAFMC	SAFMC	GMFMC	Total
Strongly Disagree	10.88	13.29	15.37	16.41	14.73
Somewhat Disagree	14.81	15.45	13.67	14.95	14.47
Neither Agree Nor Disagree	28.05	30.14	29.09	24.43	28.27
Somewhat Agree	34.45	27.74	28.36	32.9	29.64
Strongly Agree	11.06	11.12	11	10.17	10.86
Skipped	0.75	2.26	2.23	0.98	1.86
Multiple Selections	0	0	0.28	0.16	0.16
Total	100	100	100	100	100

Table 22. 'Knowledge of how data is used' by MCR.

Agreement:	NEFMC	MAFMC	SAFMC	GMFMC	Total
Strongly Disagree	9.9	11.85	13.91	14.56	13.23
Somewhat Disagree	12.64	14.74	12.01	13.15	12.97
Neither Agree Nor Disagree	25	24.49	23.21	20.18	23.02
Somewhat Agree	35.52	31.3	31.55	37.74	33.11
Strongly Agree	16.19	15.38	16.82	13.39	15.68
Skipped	0.61	2.24	2.51	0.81	1.93
Multiple Selections	0.13	0	0	0.16	0.04
Total	100	100	100	100	100

Table 23 provides the average value for each knowledge statement by MCR with skips and multiple selection responses removed. Response categories were coded from one to five (one

representing strongly disagree and five representing strongly agree). While responses to both statements averaged between ‘neither agree nor disagree’ and ‘somewhat agree’, respondents, on average, believed they had a better understanding of how fishery management data is used relative to how it is collected. Providing more information on how data are collected could be a good area for improving communication with recreational anglers. All of the differences in means (for each MCR and overall) were statistically significant at the .01 level.

Table 23. Mean self-described knowledge of data collection and use by MCR.

	NEFMC		MAFMC		SAFMC		GMFMC		Total	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Knowledge of how data is collected	3.22	1.16	3.08	1.20	3.06	1.23	3.07	1.24	3.10	1.21
Knowledge of how data is used	3.38	1.19	3.23	1.24	3.26	1.28	3.24	1.26	3.27	1.24

Question 8 – Management Effectiveness

Question 8 provided respondents with a series of statements on the effectiveness of current recreational saltwater fisheries management rules with regards to potential management objectives and/or implementation (provide good opportunities to catch fish and protect fish populations, make certain that there will be good fishing opportunities for future generations, protect marine environments and biodiversity, are easy to understand and follow, and are well enforced). Response options included strongly disagree, somewhat disagree, neither agree nor disagree, somewhat agree, or strongly agree. Tables 24 through 28 present responses for each statement by MCR.

Table 24. ‘Current regulations provide good opportunities to catch fish and protect fish populations’ by MCR.

Importance:	NEFMC	MAFMC	SAFMC	GMFMC	Total
Strongly Disagree	3.04	2.62	3.07	3.97	3.15
Somewhat Disagree	6.33	6.37	6.05	4.74	5.87
Neither Agree Nor Disagree	15.79	18.91	15.48	16.05	16.47
Somewhat Agree	40.89	40.06	38.69	44.03	40.34
Strongly Agree	32.53	28.86	34.73	29.78	32.06
Skipped	1.28	2.77	1.69	1.27	1.84
Multiple Selections	0.14	0.41	0.29	0.16	0.28
Total	100	100	100	100	100

Table 25. ‘Current regulations make certain that there will be good fishing opportunities for future generations’ by MCR.

Importance:	NEFMC	MAFMC	SAFMC	GMFMC	Total
Strongly Disagree	2.83	2.6	2.44	2.3	2.48
Somewhat Disagree	6.97	4.73	5.01	5.37	5.17
Neither Agree Nor Disagree	12.47	16.23	14.52	13.07	14.47
Somewhat Agree	36.03	37.52	33.55	39.3	35.94
Strongly Agree	40.56	36.05	42.52	38.85	39.99
Skipped	1.14	2.72	1.82	1.11	1.84
Multiple Selections	0	0.15	0.14	0	0.1

Total	100	100	100	100	100
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Table 26. 'Current regulations protect marine environments and biodiversity' by MCR.

Importance:	NEFMC	MAFMC	SAFMC	GMFMC	Total
Strongly Disagree	1.43	1.77	2.63	2.38	2.27
Somewhat Disagree	4.66	3.42	2.91	3.34	3.26
Neither Agree Nor Disagree	17.15	18.23	15.72	15.8	16.47
Somewhat Agree	33.95	39.34	31	38.39	34.86
Strongly Agree	41.52	34.16	45.77	38.82	41.1
Skipped	1.14	2.93	1.97	1.11	1.96
Multiple Selections	0.14	0.15	0	0.16	0.08
Total	100	100	100	100	100

Table 27. 'Current regulations are easy to understand and follow' by MCR.

Importance:	NEFMC	MAFMC	SAFMC	GMFMC	Total
Strongly Disagree	3.25	3.28	3.76	4.09	3.68
Somewhat Disagree	9.42	9.44	9.83	11.68	10.09
Neither Agree Nor Disagree	27.25	29.21	25.3	27.95	26.98
Somewhat Agree	38.16	35.31	35.85	36.77	36.09
Strongly Agree	20.78	19.49	23.16	18.1	20.99
Skipped	1.14	3.12	2.11	1.24	2.1
Multiple Selections	0	0.15	0	0.16	0.07
Total	100	100	100	100	100

Table 28. 'Current regulations are well enforced' by MCR.

Importance:	NEFMC	MAFMC	SAFMC	GMFMC	Total
Strongly Disagree	7.22	4.63	3.57	3.67	4.14
Somewhat Disagree	17.49	8.76	5.9	9.34	8.23
Neither Agree Nor Disagree	30.04	34.63	28.82	28.37	30.25
Somewhat Agree	27.23	28.35	32.04	33.98	31.17
Strongly Agree	16.28	20.26	27.69	23.54	24.09
Skipped	1.74	3.22	1.98	1.11	2.08
Multiple Selections	0	0.15	0	0	0.04
Total	100	100	100	100	100

Table 29 provides the average value for each management effectiveness statement by MCR with skips and multiple selection responses removed. Response categories were coded from one to five (one representing strongly disagree and five representing strongly agree). On average, respondents thought current saltwater recreational fisheries management rules were more effective with regards to achieving potential management objectives (providing good opportunities to catch fish and protect fish populations, making certain that there will be good fishing opportunities for future generations, and protecting marine environments and biodiversity) than with regards to their implementation (are easy to follow and understand and are well enforced). The differences in means between statements from the two groups (management objective statements and implementation statements) were statistically significant at the .01 level.

Table 29. Mean management effectiveness statement values by MCR.

	NEFMC		MAFMC		SAFMC		GMFMC		Total	
Statement:	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Provide good opportunities to catch fish and protect fish populations	3.95	1.01	3.89	0.99	3.98	1.02	3.92	1.01	3.94	1.01
Make certain that there will be good fishing opportunities for future generations	4.06	1.04	4.03	0.99	4.11	1.00	4.08	0.97	4.08	0.99
Protect marine environments and biodiversity	4.11	0.95	4.04	0.92	4.17	0.98	4.09	0.95	4.12	0.96
Are easy to follow and understand	3.65	1.02	3.60	1.02	3.66	1.06	3.54	1.05	3.62	1.05
Are well enforced	3.28	1.15	3.53	1.07	3.76	1.04	3.65	1.06	3.64	1.07

Question 9 – Management Shared Values

Question 9 measured salient value similarity (SVS) using a five-item index adapted from previous literature. Respondents were presented with a series of statements regarding how the values, opinions, and goals of fishery managers coincide with their personal values, opinions, and goals regarding saltwater recreational fisheries management and asked respondents to indicate their level of agreement with each statement. The statements were as follows:

1. With respect to saltwater recreational fisheries management, I feel that fisheries managers ...
 - a. share similar values to me.
 - b. share similar opinions to me.
 - c. think in a similar way to me.
 - d. take similar actions as I would.
 - e. share similar goals to me.
 - f. listen to angler concerns.
 - g. respond to angler concerns.

Response options included strongly disagree, somewhat disagree, neither agree nor disagree, somewhat agree, or strongly agree. Tables 30 through 36 present responses for each statement by MCR.

Table 30. 'Fisheries managers share similar values to me' by MCR.

Agreement:	NEFMC	MAFMC	SAFMC	GMFMC	Total
Strongly Disagree	2.09	2.57	2.61	3.9	2.83
Somewhat Disagree	6.43	5.85	5.09	5.94	5.56
Neither Agree Nor Disagree	31.42	30.87	29.22	31.56	30.3

Somewhat Agree	37.46	39.51	39.24	39.92	39.32
Strongly Agree	21.17	17.75	21.73	17.12	19.72
Skipped	1.29	3.19	2.11	1.4	2.16
Multiple Selections	0.14	0.26	0	0.16	0.11
Total	100	100	100	100	100

Table 31. 'Fisheries managers share similar opinions to me' by MCR.

Agreement:	NEFMC	MAFMC	SAFMC	GMFMC	Total
Strongly Disagree	2.4	2.62	2.77	4.55	3.08
Somewhat Disagree	8.31	7.15	5.68	7.1	6.55
Neither Agree Nor Disagree	37.99	35.19	34.43	36.28	35.29
Somewhat Agree	35.21	38.53	37.14	36.78	37.26
Strongly Agree	14.52	13.26	17.87	13.73	15.59
Skipped	1.29	3.15	2.11	1.56	2.19
Multiple Selections	0.29	0.1	0	0	0.05
Total	100	100	100	100	100

Table 32. 'Fisheries managers think in a similar way to me' by MCR.

Agreement:	NEFMC	MAFMC	SAFMC	GMFMC	Total
Strongly Disagree	2.63	2.79	3.21	4.6	3.36
Somewhat Disagree	9.36	7.92	7	8.9	7.81
Neither Agree Nor Disagree	40.5	39.76	36.24	40.15	38.27
Somewhat Agree	31.3	32.8	34.58	30.9	33.11
Strongly Agree	14.77	13.62	16.85	13.27	15.13
Skipped	1.25	3.12	2.11	2.05	2.28
Multiple Selections	0.19	0	0	0.13	0.04
Total	100	100	100	100	100

Table 33. 'Fisheries managers take similar actions as I would' by MCR.

Agreement:	NEFMC	MAFMC	SAFMC	GMFMC	Total
Strongly Disagree	3.33	3.52	3.67	4.51	3.79
Somewhat Disagree	9.24	8.44	7.61	9.21	8.28
Neither Agree Nor Disagree	38.26	38.25	37.54	39.02	38.09
Somewhat Agree	31.16	32.63	31.13	29.7	31.2
Strongly Agree	16.41	14.02	17.8	15.71	16.31
Skipped	1.29	3.13	2.25	1.56	2.25
Multiple Selections	0.31	0	0	0.29	0.09
Total	100	100	100	100	100

Table 34. 'Fisheries managers share similar goals to me' by MCR.

Agreement:	NEFMC	MAFMC	SAFMC	GMFMC	Total
Strongly Disagree	2.15	2.43	3.02	3.24	2.86
Somewhat Disagree	5.55	5.29	5.96	6.92	5.97
Neither Agree Nor Disagree	33.8	34.94	30.95	34.58	32.93
Somewhat Agree	37.9	35.97	38.3	34.77	36.94
Strongly Agree	19.01	17.82	19.36	18.48	18.77
Skipped	1.43	3.45	2.11	1.89	2.34

Multiple Selections	0.17	0.1	0.29	0.13	0.2
Total	100	100	100	100	100

Table 35. 'Fisheries managers listen to angler concerns' by MCR.

Agreement:	NEFMC	MAFMC	SAFMC	GMFMC	Total
Strongly Disagree	6.2	4.96	6.1	6.07	5.82
Somewhat Disagree	9.99	10.24	10.22	11.88	10.56
Neither Agree Nor Disagree	36.5	36.99	34.35	39.04	36.17
Somewhat Agree	31.88	30.22	29.4	28.32	29.56
Strongly Agree	14.19	14.39	17.96	12.99	15.73
Skipped	1.1	3.2	1.97	1.69	2.15
Multiple Selections	0.14	0	0	0	0.01
Total	100	100	100	100	100

Table 36. 'Fisheries managers respond to angler concerns' by MCR.

Agreement:	NEFMC	MAFMC	SAFMC	GMFMC	Total
Strongly Disagree	5.9	5.1	6.51	6.52	6.12
Somewhat Disagree	10.96	10.64	10.32	11.99	10.8
Neither Agree Nor Disagree	41.37	41.63	37.11	42.84	39.78
Somewhat Agree	27.81	26.68	27.57	24.6	26.74
Strongly Agree	12.52	12.63	16.38	12.35	14.3
Skipped	1.43	3.33	2.11	1.69	2.27
Multiple Selections	0	0	0	0	0
Total	100	100	100	100	100

Table 37 provides the mean value for each management value, opinion, and goal statement by MCR with skips and multiple selection responses. Response categories were coded from one to five (one representing strongly disagree and five representing strongly agree). While there wasn't a great deal of variation across statements, the two statements outlining management interaction with anglers (listening and responding to) were the two lowest values for all MCRs and overall indicating recreational anglers are more concerned about their engagement in the data collection and management process as opposed to not seeing the world similarly to fishery managers.

Table 37. Mean shared values, opinions, and goals statement values by MCR.

Statement:	NEFMC		MAFMC		SAFMC		GMFMC		Total	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Share similar values to me	3.70	0.95	3.66	0.93	3.74	0.95	3.61	0.97	3.69	0.95
Share similar opinions to me	3.52	0.93	3.54	0.91	3.63	0.94	3.49	0.98	3.57	0.94
Think in a similar way to me	3.47	0.95	3.48	0.93	3.56	0.97	3.40	0.99	3.50	0.96

Take similar actions as I would	3.49	0.99	3.47	0.97	3.53	1.00	3.44	1.02	3.49	0.99
Share similar goals to me	3.67	0.92	3.64	0.93	3.67	0.96	3.60	0.98	3.64	0.96
Listen to angler concerns	3.38	1.05	3.40	1.03	3.44	1.09	3.31	1.04	3.40	1.06
Respond to angler concerns	3.31	1.02	3.32	1.01	3.38	1.09	3.25	1.04	3.33	1.05

Question 10 – Trust in Management

Question 10 provided respondents with a series of six statements regarding their personal trust in management to perform certain tasks and asked them to provide their level of agreement with each statement. The statements were as follows:

1. I trust fisheries managers to ...
 - a. collect accurate data on landings and fishing effort.
 - b. accurately estimate total landings and effort.
 - c. accurately measure the size of fish stocks.
 - d. use the best available data and science when proposing and implementing fisheries rules and regulations.
 - e. manage fisheries in a way that ensures healthy fish populations.
 - f. manage fisheries in a way that maximizes recreational fishing opportunities.

Response options included strongly disagree, somewhat disagree, neither agree nor disagree, somewhat agree, or strongly agree. Tables 38 through 43 present responses for each statement by MCR.

Table 38. 'Fisheries managers collect accurate data on landings and fishing effort' by MCR.

Agreement:	NEFMC	MAFMC	SAFMC	GMFMC	Total
Strongly Disagree	2.29	2.8	2.76	3.84	2.97
Somewhat Disagree	7.18	5.6	4	6.82	5.24
Neither Agree Nor Disagree	19.12	24.51	17.69	19.77	19.93
Somewhat Agree	44.37	38.65	42.21	43.6	41.79
Strongly Agree	25.93	25.88	30.67	24.52	27.81
Skipped	1.11	2.55	2.68	1.44	2.26
Multiple Selections	0	0	0	0	0
Total	100	100	100	100	100

Table 39. 'Fisheries managers accurately estimate total landings and effort' by MCR.

Agreement:	NEFMC	MAFMC	SAFMC	GMFMC	Total
Strongly Disagree	2.46	2.69	2.77	6.02	3.42
Somewhat Disagree	10.41	8.94	6.44	8.97	7.9
Neither Agree Nor Disagree	26.42	24.95	22.62	24.63	23.92
Somewhat Agree	37.67	38.05	39.72	38.23	38.83

Strongly Agree	21.79	22.67	25.51	20.71	23.5
Skipped	1.26	2.7	2.95	1.44	2.44
Multiple Selections	0	0	0	0	0
Total	100	100	100	100	100

Table 40. 'Fisheries managers accurately measure the size of fish stocks' by MCR.

Agreement:	NEFMC	MAFMC	SAFMC	GMFMC	Total
Strongly Disagree	2.84	3.14	3.62	5.37	3.82
Somewhat Disagree	9.66	7.93	5.29	10.26	7.34
Neither Agree Nor Disagree	24.37	26.4	23.49	23.54	24.29
Somewhat Agree	37.08	34.48	36.35	36.83	36.04
Strongly Agree	24.7	24.84	27.99	22.41	25.77
Skipped	1.35	3.11	3.11	1.6	2.65
Multiple Selections	0	0.1	0.14	0	0.09
Total	100	100	100	100	100

Table 41. 'Fisheries managers use the best available data and science when proposing and implementing fisheries rules and regulations' by MCR.

Agreement:	NEFMC	MAFMC	SAFMC	GMFMC	Total
Strongly Disagree	2.29	3.52	3.79	4.63	3.79
Somewhat Disagree	7.29	4.81	6.01	6.66	5.95
Neither Agree Nor Disagree	19.19	24.9	19.68	22.78	21.59
Somewhat Agree	38.6	35.29	35.65	35.51	35.76
Strongly Agree	31.52	28.67	32.06	29.16	30.57
Skipped	1.11	2.81	2.81	1.27	2.35
Multiple Selections	0	0	0	0	0
Total	100	100	100	100	100

Table 42. 'Fisheries managers manage fisheries in a way that ensures healthy fish populations' by MCR.

Agreement:	NEFMC	MAFMC	SAFMC	GMFMC	Total
Strongly Disagree	2.64	3.27	3.33	3.02	3.19
Somewhat Disagree	7.19	5.39	5.46	5.37	5.55
Neither Agree Nor Disagree	17.37	22.73	18.62	19.1	19.64
Somewhat Agree	38.02	34.97	34.44	39.41	35.9
Strongly Agree	33.67	30.75	35.63	31.53	33.4
Skipped	0.97	2.7	2.53	1.4	2.21
Multiple Selections	0.14	0.2	0	0.16	0.1
Total	100	100	100	100	100

Table 43. 'Fisheries managers manage fisheries in a way that maximizes recreational fishing opportunities' by MCR.

Agreement:	NEFMC	MAFMC	SAFMC	GMFMC	Total
Strongly Disagree	4.11	5.45	5.42	6.02	5.46
Somewhat Disagree	11.06	9.46	7.22	8.93	8.43
Neither Agree Nor Disagree	21.85	23.41	19.57	22.09	21.23
Somewhat Agree	33.82	30.67	32.77	35.16	32.84
Strongly Agree	27.76	28.45	32.35	26.39	29.77
Skipped	1.26	2.55	2.53	1.4	2.2

Multiple Selections	0.14	0	0.14	0	0.08
Total	100	100	100	100	100

Table 44 provides the mean value for each management trust statement by MCR with skips and multiple selection responses removed. Response categories were coded from one to five (one representing strongly disagree and five representing strongly agree). There was limited variation in average trust levels across statements and MCRs.

Table 44. Mean management trust statement values by MCR.

	NEFMC		MAFMC		SAFMC		GMFMC		Total	
Statement:	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Collect accurate data on landings and fishing effort	3.85	0.97	3.81	0.99	3.97	0.96	3.79	1.02	3.88	0.98
Accurately estimate total landings and effort	3.67	1.01	3.71	1.01	3.81	0.99	3.60	1.10	3.73	1.03
Accurately measure the size of fish stocks	3.72	1.04	3.72	1.04	3.82	1.03	3.62	1.11	3.75	1.05
Use the best available data and science when proposing and implementing fisheries rules and regulations	3.91	1.00	3.83	1.02	3.89	1.06	3.79	1.08	3.85	1.05
Manage fisheries in a way that ensures healthy fish populations	3.94	1.02	3.87	1.03	3.96	1.04	3.93	1.00	3.93	1.03
Manage fisheries in a way that maximizes recreational fishing opportunities	3.71	1.12	3.69	1.15	3.82	1.14	3.68	1.14	3.75	1.14

Question 11 – Management Goal Comparisons

Question 11 asked respondents to choose their most important saltwater recreational fisheries management focus area among three matched pairs (current recreational fishing opportunities vs. future recreational fishing opportunities, future recreational fishing opportunities vs. protecting marine ecosystems and fish populations, and protecting marine ecosystems vs. current recreational fishing opportunities). The data is presented in Table 45. Generally, respondents preferred protecting marine environments and fish populations, then providing future recreational fishing opportunities, and lastly providing current recreational fishing opportunities. The use of paired preference rankings led to some logical inconsistencies among respondents where a respondent indicated they preferred A to B, B to C, and C to A. These inconsistencies are addressed in the data editing and corrective actions section.

Table 45. Management goal choices by MCR.

Current Fishing Opportunities vs. Future Fishing Opportunities
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MCR	Current	Future	Skips	Multiple Selections	Total
NEFMC	30.81	62.2	5.39	1.59	100
MAFMC	30.44	59.99	7.98	1.59	100
SAFMC	31.13	60.29	6.28	2.3	100
GMFMC	32.46	60.3	5.71	1.52	100
Total	31.22	60.37	6.51	1.91	100
Future Fishing Opportunities vs. Protecting Marine Ecosystems and Fish Populations					
MCR	Future	Protecting	Skips	Multiple Selections	Total
NEFMC	21.31	71.83	5.19	1.66	100
MAFMC	20.82	70.17	8.21	0.8	100
SAFMC	22.46	68.82	5.59	3.14	100
GMFMC	22.57	70.74	5.82	0.88	100
Total	21.99	69.79	6.25	1.96	100
Protecting Marine Ecosystems and Fish Populations vs. Current Fishing Opportunities					
MCR	Protecting	Current	Skips	Multiple Selections	Total
NEFMC	74.51	19.26	5.22	1.01	100
MAFMC	72.96	18.75	7.09	1.2	100
SAFMC	73.94	18.09	5.64	2.32	100
GMFMC	71.61	20.89	6.42	1.08	100
Total	73.25	18.94	6.13	1.68	100

Sources for Saltwater Recreational Fishing Information

Question 12 – General Fishing Information Sources

Question 12 asked respondents how frequently they use a number of different sources (family members, friends, newspapers and fishing magazines, federal agency fishing websites and regulations, state agency fishing websites and regulations, fishing websites/blogs, online fishing message boards, fishing television and/or radio shows, bait and tackle shops/stands, recreational fishing organizations by way of newsletters, emails, or meetings, environmental advocacy groups, fishing guides/captains, social media – Facebook, Instagram, Twitter, Youtube, etc., fishing social media – Fishbrain, Fishidy, GoFree Hooked, etc., and fishing rule apps – Fish Rules, etc.). They were asked how often they used these sources to gather information on **general** saltwater recreational fishing matters (e.g., fishing regulations, fishing techniques, fishing hot spots, fishing stories). Response choices included never, rarely, sometimes, and frequently. Response data by MCR and overall are presented in Tables 46 through 50.

Table 46. Saltwater recreational fishing information sources for the NEFMC.

	Family	Friends	Newspapers /Fishing Magazines	Fed. Agency Website / Guide	St. Agency Website / Guide	Fishing Websites /Blogs	Fishing Message Board	Fishing TV/ Radio Shows	Bait & Tackle Shops	Rec. Fishing Orgs.	Env. Groups	Fishing Guides / Captains	Social Media	Fishing Social Media	Fishing Rules Apps
Never	27.22	7.45	17.01	24.2	17.61	26.84	38.14	35.58	13.28	40.96	56.43	31.64	47.69	60.61	48.2
Rarely	19.08	11.06	21.09	29.52	25.41	25.74	28.37	31.51	17.07	31.49	30.86	30.33	22.94	23.46	19.55
Sometimes	30.95	46.16	42.23	30.3	36.43	30.08	22.6	24.87	45.59	20.47	10.12	28.19	20.05	10.55	21.49
Frequently	21.3	33.89	18.37	13.98	18.82	15.66	9.03	5.64	22.06	5.59	0.58	7.64	7.73	3.79	8.91
Skipped	1.45	1.45	1.3	1.58	1.3	1.54	1.45	1.78	1.59	1.49	1.54	2.05	1.59	1.45	1.72
Multiple Selections	0	0	0	0.42	0.43	0.14	0.41	0.63	0.42	0	0.47	0.14	0	0.14	0.13
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

Table 47. Saltwater recreational fishing information sources for the MAFMC.

	Family	Friends	Newspapers /Fishing Magazines	Fed. Agency Website / Guide	St. Agency Website / Guide	Fishing Websites /Blogs	Fishing Message Board	Fishing TV/ Radio Shows	Bait & Tackle Shops	Rec. Fishing Orgs.	Env. Groups	Fishing Guides / Captains	Social Media	Fishing Social Media	Fishing Rules Apps
Never	25.06	8.78	18.31	24.98	20.51	28.16	39.71	37	16.66	43.62	60.65	30.26	43.41	56.29	49.2
Rarely	19.08	10.88	24.41	25.78	23.08	22.27	25.33	27.72	18.44	30.12	24.02	22.93	20.26	18.37	18.21
Sometimes	33.29	44.12	39.85	32.65	35.52	31.06	21.51	24.82	39.42	18.4	9.85	33.4	24.05	17.39	21.69
Frequently	19.42	33.21	14.71	13.18	17.74	15.39	10.01	7.25	22.55	4.74	2.16	10.14	9.01	5.02	7.7
Skipped	3.15	2.85	2.73	2.95	2.59	2.97	2.97	2.87	2.83	3.07	3.22	3.01	3.17	2.93	3.05
Multiple Selections	0	0.15	0	0.46	0.56	0.15	0.47	0.35	0.1	0.05	0.11	0.26	0.1	0	0.15
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

Table 48. Saltwater recreational fishing information sources for the SAFMC.

	Family	Friends	Newspapers /Fishing Magazines	Fed. Agency Website / Guide	St. Agency Website / Guide	Fishing Websites /Blogs	Fishing Message Board	Fishing TV/ Radio Shows	Bait & Tackle Shops	Rec. Fishing Orgs.	Env. Groups	Fishing Guides / Captains	Social Media	Fishing Social Media	Fishing Rules Apps
Never	17.92	7.77	21.24	20.95	17.22	26.53	37.96	27.9	13.5	41.49	55.07	31.69	40.13	55.64	38.89
Rarely	17.02	7.49	19.02	25.5	21.76	25.92	26.71	25.26	19.16	30.03	27.82	21.49	22.91	22.62	20.47
Sometimes	37.39	45.3	37.86	31.96	37.02	29.28	21.12	28.87	45.01	19.98	12.09	30.42	23.26	14.63	26.36
Frequently	24.53	36	18.45	18.28	20.99	15.27	10.34	14.67	19.19	4.94	2.03	12.68	9.82	3.84	11.71
Skipped	2.72	2.99	3.14	3.02	2.85	2.86	2.86	3	3	3.43	2.86	2.86	3.58	3.27	2.57
Multiple Selections	0.43	0.44	0.29	0.29	0.16	0.14	1.02	0.3	0.14	0.14	0.14	0.87	0.3	0	0
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

Table 49. Saltwater recreational fishing information sources for the GMFMC.

	Family	Friends	Newspapers /Fishing Magazines	Fed. Agency Website / Guide	St. Agency Website / Guide	Fishing Websites /Blogs	Fishing Message Board	Fishing TV/ Radio Shows	Bait & Tackle Shops	Rec. Fishing Orgs.	Env. Groups	Fishing Guides / Captains	Social Media	Fishing Social Media	Fishing Rules Apps
Never	20.88	5.63	19.8	20.67	16.41	30.41	42.52	27.09	13.18	46.49	63.4	29.42	40.83	54.57	40.76
Rarely	14.89	9.07	24.25	26.46	20.16	22.43	24.03	25.4	23.03	28.91	21.7	24.75	20.75	20.98	17.83
Sometimes	34.51	43.16	38.35	30.31	35.31	30.3	22.37	32.86	44.02	16.75	9.78	30.11	24.46	15.34	25.18
Frequently	27.96	40.25	15.39	20.63	26.23	14.78	9	12.85	17.56	5.15	2.41	13.21	11.9	7.03	14.14
Skipped	1.76	1.76	1.92	1.76	1.73	1.76	1.6	1.63	2.05	2.38	2.25	1.89	1.89	1.76	1.76
Multiple Selections	0	0.13	0.29	0.16	0.16	0.33	0.49	0.16	0.16	0.33	0.46	0.62	0.16	0.33	0.33
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

Table 50. Saltwater recreational fishing information sources for all respondents.

	Family	Friends	Newspapers/ Fishing Magazines	Fed. Agency Website /Guide	St. Agency Website /Guide	Fishing Websites /Blogs	Fishing Message Board	Fishing TV/ Radio Shows	Bait & Tackle Shops	Rec. Fishing Orgs.	Env. Groups	Fishing Guides/ Captains	Social Media	Fishing Social Media	Fishing Rules Apps
Never	21.03	7.54	19.88	22.14	17.89	27.78	39.38	30.57	14.2	43.04	58.32	30.85	41.67	55.96	42.55
Rarely	17.23	8.94	21.62	26.09	22.02	24.26	25.92	26.38	19.65	29.93	25.81	23.22	21.8	21.29	19.28
Sometimes	35.27	44.62	38.79	31.65	36.24	30	21.6	28.41	43.47	18.94	10.89	30.92	23.47	15.15	24.58
Frequently	23.75	36.06	16.87	17.19	21.14	15.23	9.87	11.76	19.89	4.98	2.03	11.78	9.9	4.81	11.02
Skipped	2.52	2.58	2.64	2.62	2.43	2.55	2.51	2.58	2.64	2.97	2.72	2.63	2.96	2.73	2.45
Multiple Selections	0.2	0.27	0.2	0.32	0.28	0.18	0.72	0.31	0.16	0.15	0.23	0.61	0.2	0.08	0.12
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

Tables 51 provides the mean information source use value for each MCR with skips and multiple selection responses removed. Response categories were coded from one to four (one representing never using the source and four representing frequently using the source).

Table 51. Mean information source use by MCR.

	NEFMC		MAFMC		SAFMC		GMFMC		Total	
Information Source	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Family Members	2.47	1.11	2.49	1.08	2.71	1.04	2.71	1.10	2.63	1.07
Friends	3.08	0.87	3.05	0.90	3.13	0.87	3.20	0.83	3.12	0.87
Newspapers and Fishing Magazines	2.63	0.98	2.52	0.96	2.55	1.03	2.50	0.99	2.54	1.00
Federal Agency Fishing Website or Guide	2.35	1.00	2.35	1.01	2.49	1.03	2.52	1.05	2.45	1.03
State Agency Fishing Website or Guide	2.57	0.99	2.52	1.02	2.64	1.01	2.73	1.03	2.62	1.02
Fishing Websites/Blogs	2.35	1.05	2.35	1.06	2.34	1.04	2.30	1.07	2.34	1.05
Online Fishing Message Board	2.03	0.99	2.02	1.02	2.04	1.02	1.98	1.02	2.02	1.02
Fishing TV and/or Radio Shows	2.01	0.92	2.02	0.97	2.31	1.05	2.32	1.02	2.22	1.02
Bait and Tackle Shops	2.78	0.95	2.70	1.01	2.72	0.94	2.67	0.92	2.71	0.95
Recreational Fishing Organization	1.91	0.92	1.84	0.90	1.88	0.91	1.80	0.91	1.85	0.91
Env. Advocacy Groups	1.54	0.70	1.52	0.77	1.60	0.78	1.50	0.77	1.55	0.77
Fishing Guides or Captains	2.12	0.95	2.24	1.01	2.25	1.05	2.28	1.04	2.24	1.03
Social Media	1.88	0.99	1.99	1.03	2.03	1.03	2.08	1.07	2.02	1.04
Fishing Social Media	1.57	0.83	1.70	0.94	1.66	0.88	1.74	0.97	1.68	0.91
Fishing Rule Apps	1.91	1.03	1.87	1.02	2.11	1.07	2.13	1.11	2.04	1.07

Question 13 – Information Source Trust (Management Issues)

Question 13 asked respondents how much they trust the information provided by the different saltwater recreational fishing sources from Question 12 (family members, friends, newspapers

and fishing magazines, federal agency fishing websites and regulations, state agency fishing websites and regulations, fishing websites/blogs, online fishing message boards, fishing television and/or radio shows, bait and tackle shops/stands, recreational fishing organizations by way of newsletters, emails, or meetings, environmental advocacy groups, fishing guides/captains, social media – Facebook, Instagram, Twitter, Youtube, etc., fishing social media – Fishbrain, Fishidy, GoFree Hooked, etc., and fishing rule apps – Fish Rules, etc.). Unlike Question 12 which asked how often they used sources to gather information on **general** saltwater recreational fishing matters (e.g., fishing regulations, fishing techniques, fishing hot spots, fishing stories); Question 13 asked **specifically about their trust regarding saltwater fishing regulations and data collection information** from those sources. This incongruence was intentional. There was a concern that a large majority of respondents might not use any sources for information on fisheries management and data collection issues. These might be topics they don't gather any information on which would have led to limited data on how information flows among recreational anglers. The broader focus of Question 12 ensured that some data on information gathering was collected and the narrower focus of Question 13 allowed us to analyze information source trustworthiness specifically regarding fisheries management and data collection issues. Response choices included do not use, no trust, somewhat distrust, neither trust nor distrust, somewhat trust, and complete trust. Data by MCR and overall are presented in Tables 52 through 56.

Table 52. Saltwater recreational fishing information source trust for NEFMC.

	Family	Friends	Newspapers/ Fishing Magazines	Fed. Agency Website /Guide	St. Agency Website/ Guide	Fishing Websites /Blogs	Fishing Message Board	Fishing TV/ Radio Shows	Bait & Tackle Shops	Rec. Fishing Orgs.	Env. Groups	Fishing Guides/ Captains	Social Media	Fishing Social Media	Fishing Rules Apps
Do Not Use	26.28	11.51	13.77	22.98	19.46	27.77	32.94	26	11.22	34.48	37.06	23.9	36.71	46.26	39.05
No Trust	4.67	1.58	2.75	3.82	2.94	4.57	8.11	8.05	2.16	4.33	11.03	2.61	13.56	12.94	8.05
Somewhat Distrust	8.78	7.54	8.86	8.23	8.57	14.04	15.44	13.62	6.58	9.54	11.54	6.67	15.01	12.2	8.62
Neither Trust Nor Distrust	18.77	28.31	28.68	18.6	17.05	28.32	24.58	25.62	23.31	22.33	17.74	16.39	18.83	14.91	15.78
Somewhat Trust	22.24	30.94	33.83	23.01	25.85	19.06	12.42	18.59	36.74	21.21	14.13	30.29	10.31	8.45	16.33
Complete Trust	15.84	17.24	9.48	19.95	23.09	3.28	3	4.37	16.69	4.86	5.13	16.83	2.42	1.81	8.86
Skipped Multiple Selections	2.32	2.59	2.49	2.55	2.12	2.4	2.43	2.45	2.4	2.73	2.73	2.71	2.59	2.58	2.88
	1.1	0.3	0.14	0.87	0.91	0.55	1.07	1.29	0.9	0.51	0.63	0.6	0.57	0.85	0.43
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

Table 53. Saltwater recreational fishing information source trust for MAFMC.

	Family	Friends	Newspapers/ Fishing Magazines	Fed. Agency Website /Guide	St. Agency Website/ Guide	Fishing Websites /Blogs	Fishing Message Board	Fishing TV/ Radio Shows	Bait & Tackle Shops	Rec. Fishing Orgs.	Env. Groups	Fishing Guides/ Captains	Social Media	Fishing Social Media	Fishing Rules Apps
Do Not Use	22.89	12.15	17.13	21.71	21.14	26.24	31.76	25.87	13.75	31.79	33.69	21.19	30.66	37.77	34.67
No Trust	5.47	2.58	2.96	3.11	2.9	6.2	8.21	7.01	2.01	4.49	11.73	3.21	12.81	12.82	10.31
Somewhat Distrust	8.12	6.57	7.79	7.17	6.64	11.83	13.33	12.46	5.87	9.4	12.51	6.05	14.33	13.46	9.81
Neither Trust Nor Distrust	19.01	24.48	29.36	18.66	19.58	27.4	25.14	27.32	21.06	22.29	20.06	18.01	22.78	18.54	18.77
Somewhat Trust	21.04	29.47	28.15	23.99	23.94	18.74	12.21	16.56	34.75	20.8	10.85	30.16	11.5	9.85	14.17
Complete Trust	19.53	20.91	10.25	21.28	21.64	5.73	4.59	5.65	18.39	6.95	6.59	17.47	3.78	3.51	8.85
Skipped Multiple Selections	3.27	3.28	3.98	3.78	3.95	3.6	4.05	3.87	4.17	3.79	3.87	3.65	4.05	3.8	3.41
	0.67	0.56	0.39	0.3	0.22	0.25	0.71	1.27	0	0.5	0.7	0.26	0.1	0.25	0
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

Table 54. Saltwater recreational fishing information source trust for SAFMC.

	Family	Friends	Newspapers/ Fishing Magazines	Fed. Agency Website /Guide	St. Agency Website/ Guide	Fishing Websites /Blogs	Fishing Message Board	Fishing TV/ Radio Shows	Bait & Tackle Shops	Rec. Fishing Orgs.	Env. Groups	Fishing Guides/ Captains	Social Media	Fishing Social Media	Fishing Rules Apps
Do Not Use	17.43	10.28	16.75	22.39	20.51	28.2	31.55	21.9	13.63	34.45	34.83	22.94	29.89	39.94	31.68
No Trust	3.87	3.01	3.54	3.7	3.7	5.25	8.3	5.58	2.7	4.23	13.14	3.25	12.65	11.83	6.57
Somewhat Distrust	7.68	4.64	7.17	3.39	2.62	10.95	12.71	10.46	5.56	7.42	10.21	4.72	14.18	11.69	8.21
Neither Trust Nor Distrust	19.28	25.3	27.93	17.5	17.45	24.16	20.18	25.92	23.68	22.43	18.49	17.47	23.35	19.47	17
Somewhat Trust	25.07	33.55	30.47	24.58	25.39	20.55	16.14	23.05	34.85	19.5	12	28.96	11.73	9.92	18.26
Complete Trust	22.23	18.34	9.22	24.12	25.55	6.57	6.2	8.79	15.53	7.63	7.12	18.74	4.02	3.12	13.97
Skipped Multiple Selections	4.03	4.18	4.2	4.03	4.03	3.88	4.04	3.88	3.76	4.19	3.76	3.47	3.74	3.47	4.18
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

Table 55. Saltwater recreational fishing information source trust for GMFMC.

	Family	Friends	Newspapers/ Fishing Magazines	Fed. Agency Website /Guide	St. Agency Website/ Guide	Fishing Websites /Blogs	Fishing Message Board	Fishing TV/ Radio Shows	Bait & Tackle Shops	Rec. Fishing Orgs.	Env. Groups	Fishing Guides/ Captains	Social Media	Fishing Social Media	Fishing Rules Apps
Do Not Use	18.87	9.86	15.38	19.25	17.46	28.33	34.85	20.73	11.98	34.86	36.26	19.07	29.6	39.82	32.75
No Trust	3.81	2.24	3.45	4.23	3.9	3.93	7.16	4.26	1.27	4.15	11.5	3.08	11.62	11.02	6.27
Somewhat Distrust	6.16	6.12	7.49	6.43	5.01	12.02	12.87	8.6	7.84	7.43	13.38	5.06	15.21	11.47	8.42
Neither Trust Nor Distrust	23.73	27.93	25.77	14.95	15.04	27.77	23.87	27.33	25.54	27.83	18.95	17.71	23.69	20.85	17.44
Somewhat Trust	23.7	34.87	33.73	24.58	25.81	19.39	14.2	27	36.52	17.43	11.02	31.9	12.87	10.64	17.46
Complete Trust	20.89	15.98	11.24	27.44	29.98	5.72	3.45	9.05	14.01	5.34	5.37	20.48	4.22	3.83	14.99
Skipped Multiple Selections	2.51	2.51	2.77	2.8	2.34	2.67	2.7	2.38	2.67	2.67	3.03	2.54	2.67	2.38	2.67
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

Table 56. Saltwater recreational fishing information source trust for all respondents.

	Family	Friends	Newspapers/ Fishing Magazines	Fed. Agency Website /Guide	St. Agency Website/ Guide	Fishing Websites /Blogs	Fishing Message Board	Fishing TV/ Radio Shows	Bait & Tackle Shops	Rec. Fishing Orgs.	Env. Groups	Fishing Guides/ Captains	Social Media	Fishing Social Media	Fishing Rules Apps
Do Not Use	19.77	10.75	16.32	21.6	19.94	27.71	32.41	22.95	13.12	33.88	35.03	21.76	30.54	39.87	33.21
No Trust	4.32	2.63	3.31	3.68	3.49	5.15	8.02	5.84	2.18	4.29	12.28	3.16	12.54	11.98	7.54
Somewhat Distrust	7.55	5.65	7.52	5.34	4.58	11.63	13.11	10.8	6.2	8.07	11.55	5.27	14.5	12.12	8.68
Neither Trust Nor Distrust	20.12	25.89	27.88	17.33	17.43	26.05	22.53	26.54	23.4	23.54	18.92	17.57	22.93	19.18	17.43
Somewhat Trust	23.56	32.62	30.85	24.31	25.16	19.74	14.47	21.95	35.33	19.51	11.67	29.99	11.81	9.95	16.93
Complete Trust	20.78	18.39	9.92	23.8	25.34	5.93	4.97	7.73	16	6.76	6.46	18.65	3.88	3.27	12.53
Skipped Multiple Selections	3.39	3.48	3.71	3.59	3.51	3.44	3.63	3.44	3.52	3.65	3.55	3.26	3.5	3.25	3.57
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

Table 57 provides the mean information source trust values for each MCR with do not use source, skips, and multiple selection responses removed. Response categories were coded from one to five (one representing no trust in the source and five representing complete trust in the source). Federal and state agency information sources and fishing guides/captains were the most trusted sources. Information sources that likely involve direct one-to-one interactions (family, friends, bait and tackle shops, for-hire fishing guides/captains) were more trusted than data gathered from online or broadcast sources (newspapers/fishing magazines, fishing websites/blogs, online fishing message boards, social media, and fishing social media).

Table 57. Mean information source trust by MCR.

Information Source	NEFMC		MAFMC		SAFMC		GMFMC		Total	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Family Members	3.51	1.16	3.56	1.21	3.69	1.13	3.66	1.10	3.64	1.15
Friends	3.64	0.96	3.71	1.02	3.70	0.98	3.65	0.94	3.69	0.98
Newspapers and Fishing Magazines	3.46	0.94	3.45	0.97	3.44	0.97	3.51	0.98	3.46	0.97
Federal Agency Fishing Website or Guide	3.64	1.14	3.72	1.11	3.85	1.09	3.83	1.16	3.80	1.11
State Agency Fishing Website or Guide	3.74	1.11	3.73	1.09	3.89	1.07	3.91	1.12	3.85	1.09
Fishing Websites/Blogs	3.04	0.97	3.09	1.06	3.18	1.07	3.16	1.00	3.14	1.04
Online Fishing Message Board	2.79	1.05	2.87	1.09	2.99	1.17	2.90	1.06	2.92	1.12
Fishing TV and/or Radio Shows	2.97	1.08	3.02	1.08	3.26	1.08	3.37	1.02	3.20	1.07
Bait and Tackle Shops	3.69	0.95	3.75	0.96	3.67	0.97	3.64	0.91	3.68	0.95
Recreational Fishing Organization	3.20	1.02	3.26	1.06	3.31	1.06	3.20	0.99	3.26	1.04
Env. Advocacy Groups	2.85	1.22	2.81	1.24	2.83	1.29	2.76	1.21	2.81	1.26
For-Hire Fishing Guides or Captains	3.72	1.03	3.70	1.05	3.75	1.05	3.79	1.03	3.75	1.04
Social Media	2.55	1.13	2.68	1.15	2.70	1.15	2.75	1.14	2.70	1.14
Fishing Social Media	2.48	1.15	2.62	1.17	2.66	1.16	2.74	1.16	2.65	1.16
Fishing Rule Apps	3.16	1.26	3.02	1.28	3.39	1.24	3.41	1.25	3.29	1.26

Question 14 – Angler Network Size

Question 14 asked respondents to identify the size of their saltwater recreational fishing information sharing network. Specifically, respondents were asked how many other anglers (including family members, friends, members of fishing groups you belong to, etc.) do you discuss saltwater recreational fishing (e.g., fishing techniques, fishing locations, fishing regulations, fisheries data collection). The response choices included: none, 1-5, 6-10, 11-15, and more than 15. The responses by MCR are presented in Table 58.

Table 58. Angler information network size by MCR.

	None	1 to 5	6 to 10	11 to 15	More than 15	Skipped	Multiple Selections	Total
NEFMC	10.51	52.09	22.73	5.49	7.0	2.19	0	100
MAFMC	13.03	52.62	19.59	4.88	7.25	2.52	0.10	100
SAFMC	11.19	50.91	23.14	3.10	8.51	2.86	0.29	100
GMFMC	7.84	50.14	25.70	5.92	8.49	1.92	0	100
Total	10.88	51.26	22.78	4.33	8.08	2.52	0.16	100

Demographics

Question 15 – Fishing License Status

Question 15 asked respondents if they were licensed to saltwater fish in more than one state. Results are presented in Table 59².

Table 59. Respondents with saltwater licenses in multiple states by MCR.

MCR	Yes	No	Skipped	Multiple Selections	Total
NEFMC	27.56	71.83	0.52	0.09	100
MAFMC	22.66	75.78	1.57	0	100
SAFMC	18.1	80.61	1.3	0	100
GMFMC	12.05	87.01	0.95	0	100
Total	18.66	80.1	1.23	0.01	100

Question 16 – Gender

Question 16 asked respondents their gender. The data are presented in Table 60.

² This data might not accurately represent the full extent of anglers fishing in multiple states due to varying license requirements by state and mode. For instance, for-hire anglers are seldom required to have a license and this form of fishing is likely common among non-residents (tourists) of some tourism-based economies (i.e., Florida). In addition, Florida, which has a large number of part-time residents that are retired doesn't require those 65 and older to have a fishing license. However, analysis of this data based on respondent age and/or fishing mode preferences did not find large changes in the percentage of multi-state license holders.

Table 60. Respondent gender by MCR.

MCR	Male	Female	Skipped	Total
NEFMC	85.44	13.57	1	100
MAFMC	82.33	15.57	2.1	100
SAFMC	75.99	23.42	0.58	100
GMFMC	73.08	25.82	1.1	100
Total	77.66	21.24	1.1	100

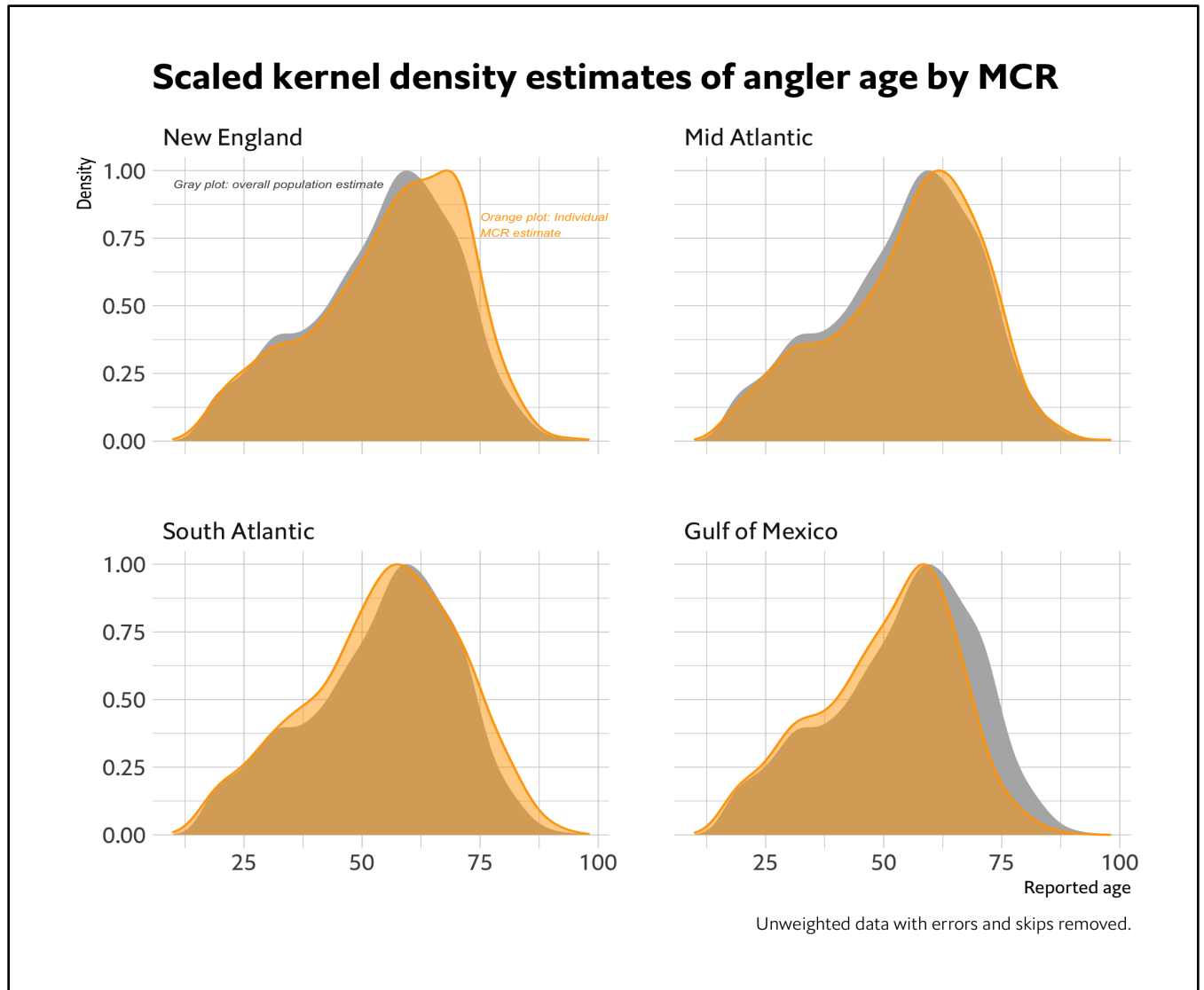
Question 17 – Age

Question 17 asked respondents to provide their age in years. Age by MCR is presented in Table 61. The table displays the mean and standard deviation of age with skips and response errors (answers >16) removed. In addition, histograms of age, with skips and response errors removed, are presented in Figure 2. Each bar in the histogram represents a year of age.

Table 61. Age by MCR.

MCR	Mean	Mean	Mean
NEFMC	56.07	56.07	56.07
MAFMC	54.37	54.37	54.37
SAFMC	54.25	54.25	54.25
GMFMC	50.49	50.49	50.49
Total	53.62	53.62	53.62

Figure 2. Age by MCR.



Question 18 – Origin

Question 18 asked respondents if they were of Hispanic, Latino, or Spanish origin. The responses are presented in Table 62.

Table 62. Respondent origin by MCR.

MCR	Yes	No	Skipped	Multiple Selections	Total
NEFMC	3.14	92.9	3.96	0	100
MAFMC	5.24	89.98	4.78	0	100
SAFMC	5.28	90.48	4.23	0	100
GMFMC	4.98	91.54	3.36	0.13	100
Total	5.04	90.77	4.16	0.03	100

Question 19 – Race

Question 19 asked respondents their race and provided six checkbox options (American Indian or Alaska Native, Asian, Black or African American, Native Hawaiian or Other Pacific Islander, White, or Other) and asked respondent to check all that applied. All respondents selected at least one race, there were no skips. Responses are provided in Table 63.

Table 63. Race by MCR.

MCR	American Indian or Alaska Native	Asian	Black or African American	Native Hawaiian or Other Pacific Islander	White	Other	Total
NEFMC	2.14	1.86	1.15	0.00	89.90	4.01	100.00
MAFMC	1.25	3.90	5.85	0.21	81.40	5.50	100.00
SAFMC	2.16	0.59	6.64	0.16	88.19	2.82	100.00
GMFMC	1.24	1.56	4.11	0.13	90.21	3.02	100.00
Total	1.74	1.71	5.48	0.15	87.08	3.62	100.00

Question 20 – Education

Question 20 asked respondents to identify the highest level of education they completed and provided five choice categories (12th Grade or Less, High School Graduate or GED, Associate or Technical School Degree, Bachelor's Degree, and Advanced, Professional, or Doctoral Degree or Coursework). Responses are provided in Table 64.

Table 64. Education by MCR.

MCR	12th Grade or Less	High School Graduate or GED	Associate or Technical School Degree	Bachelor's Degree	Advanced, Professional, or Doctoral Degree or Coursework	Skipped	Multiple Selections	Total
NEFMC	7.51	25.92	19.35	22.32	21.55	2.38	0.96	100
MAFMC	8.14	26.47	22.71	21.74	16.76	2.5	1.69	100
SAFMC	8.25	25.97	22.95	24.35	14.2	2.84	1.44	100
GMFMC	5.29	26.01	28.24	20.85	16.03	2.08	1.49	100
Total	7.54	26.1	23.74	22.8	15.79	2.56	1.47	100

Question 21 – Income

Question 21 asked respondents to describe which of eight potential income categories (Less than \$20,000, \$20,000 to \$39,999, \$40,000 to \$59,999, \$60,000 to \$79,999, \$80,000 to \$99,999, \$100,000 to \$149,999, \$150,000 to \$199,999, and \$200,000 or More) best described their household's 2018 total annual income before taxes. Responses are presented in Table 65.

Table 65. Income by MCR.

	NEFMC	MAFMC	SAFMC	GMFMC	Total
<\$20,000	5.94	5.89	7.08	7.77	6.85
\$20,000-\$39,999	10.13	9.33	12.34	10.67	11.07
\$40,000-\$59,999	12.19	12.7	14.4	12.25	13.35
\$60,000-\$79,999	11.28	12.44	11.49	13.11	12.05
\$80,000-\$99,999	14.07	13.17	11.85	14.27	12.87
\$100,000-\$149,999	17.27	17.72	16.87	16.47	17.03
\$150,000-\$199,999	9.88	9.77	7.94	7.65	8.48
>\$200,000	10.76	10.14	8.2	9.02	9.05
Multiple Selections	0.17	0.26	0	0.45	0.17
Skipped	8.31	8.58	9.82	8.34	9.08

Address Type

In addition to the demographic data gathered through survey questions, an analysis of the sample frame by address type (urban, suburban, rural) was also conducted. One object of the Qualitative Local Survey (QLS) portion of the project is to examine localized recreational angler social networks in three distinct communities. The QNS provided an opportunity to evaluate differences in angler attitudes regarding fisheries management and data collection, information sources on fisheries issues, and angler network size by angler residence type (urban, suburban, and rural) and use that data to inform the QLS social network analysis. ECS staff provided the 'state-county-tract FIPS code' for each address in the sample frame (<https://geomap.ffiec.gov/FFIECGeocMap/GeocodeMap1.aspx>). The census tract FIPS codes were then compared to the United States Department of Agriculture Economic Research Service 2010-Revised Rural-Urban Commuting Area (RUCA) Codes (<https://www.ers.usda.gov/data-products/rural-urban-commuting-area-codes/>).

Each census tract falls into one of 10 primary RUCA classification codes³. The RUCA codes are shown in Table 66 along with how each RUCA code was classified for this analysis. Recoding was based on population center type (metropolitan area, micropolitan area, small town, or rural area) and commuting patterns. Addresses were classified as urban if they were located in either a metropolitan or micropolitan area core with primary commuting flow within the area, meaning commuting away from the area was limited. Addresses were classified as suburban if they were located in a metropolitan or micropolitan area with a primary flow of at least 10% to either an urbanized area or a large urban cluster⁴. Addresses were classified as rural if they were located in census tract designated as either a small town or rural area regardless of commuting pattern. No RUCA codes with small towns designations involved commuting to an urbanized area or a large urban cluster. Address types by MCR are presented in Table 67.

³ Census tracts with zero population are not-coded.

⁴ Urbanized areas and urban clusters are urban areas with 50,000 or more people or 10,000 to 49,999 people, respectively (<https://www.census.gov/programs-surveys/geography/guidance/geo-areas/urban-rural/2010-urban-rural.html>). There is also a small urban cluster definition for areas with between 2,500 and 9,999 people.

Table 66. Reclassification of 2010 RUCA Codes.

RUCA Code	Classification
1. Metropolitan area core: primary flow within an urbanized area (UA)	Urban
2. Metropolitan area high commuting: primary flow 30% or more to a UA	Suburban
3. Metropolitan area low commuting: primary flow 10% to 30% to a UA	Suburban
4. Micropolitan area core: primary flow within a large urban cluster (UC) of 10,000 to 49,999	Urban
5. Micropolitan high commuting: primary flow 30% or more to a large UC	Suburban
6. Micropolitan low commuting: primary flow 10% to 30% to a large UC	Suburban
7. Small town core: primary flow within a small UC of 2,500 to 9,999	Rural
8. Small town high commuting: primary flow 30% or more to a small UC	Rural
9. Small town low commuting: primary flow 10% to 30% to a small UC	Rural
10. Rural areas: primary flow to a tract outside a UA or UC	Rural

Table 67. Address Type by MCR.

MCR	Urban	Suburban	Rural	Total
NEFMC	79.9	14.19	5.91	100
MAFMC	78.12	16.84	5.05	100
SAFMC	69.18	25.59	5.23	100
GMFMC	73.27	22	4.73	100
Total	73.08	21.79	5.13	100

Data Editing and Corrective Actions

Question 1 – Fishing Avidity

The fishing avidity question only had only one incompatible response – a single respondent indicated that they spent 460 days fishing in the previous 12 months. This was rectified by removing that observation from analysis involving fishing avidity.

Question 2 and 3 – Water Fished and Fishing Mode

There were three types of error responses related to questions 2 and 3 of the survey. The first error type involved anglers that indicated they fished State and/or Federal waters and were also unsure of their fishing location. These types of errors only represented 0.65% of all responses to question 2 and were removed from any analysis employing fishing mode employing waters fished. The second error type involved respondents to question 3 indicating that they “always” fish using one of the modes (from shore, for-hire, or private vessel) and not “never” for the other two categories. This error was made by 21% of respondents, due to the large portion of the sample that made this error, those responses were removed from analysis involving waters fished to explain key response variables. Lastly, some respondents indicated that they fished only in Federal waters and from shore or only in Federal waters and not using any boat. These responses were removed from any analysis of waters fished (where they indicated Federal waters fishing only) but were employed in analysis of fishing mode. It was

assumed that respondents likely knew where they fished from (shore or boat) but might not understand the delineation of State and Federal waters.

Question 11 – Management Goal Comparisons

The use of paired preference rankings on Question 11 led to some logical inconsistencies among respondents where a respondent indicated they preferred A to B, B to C, and C to A. An ordinal ranking question was considered but would likely have also led to response issues (misunderstanding the question and giving multiple options the same ranking). In addition, an ordinal ranking question would have been more time consuming and mentally taxing and could have led to survey fatigue and lower response rates. Approximately 22% of respondents made this error, these observations were removed from analysis using Question 11 responses.

Question 12 and 13 – Information Source Use and Trust

A number of errors were reported in the codebook accompanying the results related to questions 12 and 13. The major two errors were respondents indicated they did not use the source in Q12 but gave a level of trust for Q13 and they indicated they used the source in Q12 but indicated they did not use the source in Q13. Both of these errors were ignored in the analysis as they were deemed to be driven by differences in the questions.

We realized the first error (indicating they do not use the source in Q12 but providing a level of trust in Q13) was due to a potential inconsistency in Q13. Respondents were asked about their trust in each source regarding saltwater recreational fisheries data collection and fisheries management issues with a do not use option if they did not gather information from the source. However, just because a respondent does not use a source for information does not mean he or she does not have a level of trust in information from that source based on other factors. For instance, an angler might not use friends as an information source on fisheries management and data collection issues but would trust data from friends if it were provided.

The second issue (indicating they use the source in Q12 but not Q13) was not an error and was driven by difference in the two questions. Question 12 asked how often they used sources to gather information on **general** saltwater recreational fishing matters (e.g., fishing regulations, fishing techniques, fishing hot spots, fishing stories); Question 13 asked **specifically about their trust regarding saltwater fishing regulations and data collection information** from those sources. This incongruence was intentional and is explained in the Survey Results Section (Question 13). However, it was possible that they used a source for general fishing information **but did not** use the source for saltwater fishing regulation and data collection information.

Analysis of Survey Results

Avidity, Waters Fished, Fishing Mode, and Reason for Fishing

While the general objective of the saltwater recreational angler behavior questions was to use fishing behavior to explain attitudes and perceptions regarding fisheries management and data

collection issues and fishing source use and trust, the responses to these questions allowed for analysis of avidity across different angler types and what motivates different anglers to fish. We analyzed how waters fished, fishing mode, and fishing reason correlated with fishing avidity and how fishing mode correlated with reason for fishing with a goal of better understanding behaviors and motivations of different anglers.

Avidity Analysis

Tables 68-70 provide fishing avidity based on waters fished, fishing mode, and reason for fishing, respectively. Among those indicating they were fully aware of where they fished (State, Federal, and State & Federal), anglers that fished both state and federal waters were more avid fishers than those that indicated they only fished state waters or federal waters. Fidelity to a fishing mode, as measured by the frequency that the particular fishing mode is employed measured from one (never) to five (always), was weakly positively correlated with avidity for shore and private boat fishing and weakly negatively correlated with for-hire fishing. The finding related to for-hire fishing seems like it could be indicative of anglers that don't have access to other fishing modes. Reasons for fishing were measured from one (indicating the reason was not at all important to the respondent) to five (extremely important). While fishing avidity was positively correlated with all reasons for fishing the results presented in Table 70 indicate that fishing avidity is more highly correlated with fishing for excitement (to catch a trophy fish and for adventure and excitement) and to be close to nature than other motivations for fishing. Specifically, anglers that indicated fishing to catch a record or trophy fish was either somewhat or extremely important were, on average, the most avid anglers. This finding could indicate that targeting specific information source outlets geared towards trophy-focused anglers could allow fishery managers to target communication with these extremely avid anglers.

Table 68. Avidity by waters fished.

Waters Fished	Mean	Std. Dev.	Freq.
State	18.85	30.93	2,380,630
Federal	12.75	20.17	122,500
State & Federal	30.48	40.27	1,060,319
Unsure	12.38	29.59	1,024,628
State & Federal & Unsure	21.98	63.33	8,752
State & Unsure	13.76	18.61	15,513
Federal & Unsure	10.00	0	538

Skipped	0.69	2.71	194,413
Total	19.13	32.98	4,807,295

Table 69. Avidity by fishing mode.

Fishing Mode	Never	Rarely	Sometimes	Often	Always	Total	Correlation to Avidity
Shore	12.61	18.31	18.7	24.14	23.05	19.44	0.11
For-Hire	17.83	23.99	18.04	15.83	8.17	19.28	-0.01
Private Boat	12.03	16.00	18.38	23.84	24.87	19.37	0.15

Table 70. Avidity by reason for fishing.

Reason	Not At All Important	Somewhat Unimportant	Neither Important Nor Unimportant	Somewhat Important	Extremely Important	Total	Correlation to Avidity
Fishing to catch fish to eat	13.53	18.91	19.51	18.30	23.69	19.45	0.09
Fishing to catch a record or trophy fish	13.79	18.88	20.78	29.62	36.04	19.28	0.21
Fishing for the fun of catching fish	12.86	15.68	15.55	15.85	21.38	19.39	0.07
Fishing for relaxation	12.94	18.22	13.55	16.21	21.83	19.41	0.08
Fishing to get away	15.05	10.70	14.24	18.04	21.46	19.23	0.08
Fishing for adventure and excitement	5.59	14.23	15.04	17.57	22.74	19.20	0.13
Fishing to spend time with family and/or friends	13.14	18.65	21.31	19.05	19.73	19.40	0.02
Fishing to be with others who	12.61	22.67	17.39	17.28	22.30	19.45	0.07

enjoy the same things I do							
Fishing to be close to nature	7.04	18.33	14.35	17.30	22.30	19.23	0.11

Fishing Mode and Reason for Fishing Analysis

Correlation coefficients were calculated for the likert scale variables reason for fishing and fishing mode to examine how motivations changes relative to predominate fishing mode used. For this analysis a positive correlation coefficient indicates that importance of a reason for fishing generally increased as the tendency to use a fishing mode increases. The results presented in Table 71 seem to indicate that angler motivation for fishing varies across fishing modes. Increased tendency to fish from shore is associated with anglers motivated by being close to nature, relaxing, fishing for the fun of catching fish and getting away. For-hire anglers are motivated by catching a record or trophy fish and the fun of catching fish, while private boat anglers are motivated both by the social aspects of fishing (spending time with family and friends and being with others who enjoy the same things I do) and the opportunity to catch fish to eat. Interestingly, the reasons for fishing most important to private boat anglers are generally less important to shore anglers and vice versa.

Table 71. Correlation between reason for fishing and fishing mode.

	Fishing Mode		
Reason for Fishing	Shore Fishing	For-Hire Fishing	Private Boat Fishing
Fishing to catch fish to eat	-0.03	0.04	0.22
Fishing to catch a record or trophy fish	0.02	0.18	0.15
Fishing for the fun of catching fish	0.12	0.10	0.16
Fishing for relaxation	0.14	0.08	0.11
Fishing to get away	0.10	0.06	0.11
Fishing for adventure and excitement	0.07	0.09	0.19
Fishing to spend time with family and/or friends	0.06	0.05	0.20
Fishing to be with others who enjoy the same things I do	0.01	0.06	0.21
Fishing to be close to nature	0.13	0.01	0.16

Trust in Management, SVS, and Perceived Management Responsiveness

“Trust” is a multifaceted construct that can be measured several different ways. One way of measuring trust is to ask people directly whether or not they trust management. In this survey, we asked respondents to rate their trust in management across several different measures. Included in the analysis were indirect ways of analyzing trust, such as measuring things that are correlated with trust. One correlated measure is the extent to which stakeholders believe that managers share their topic-relevant values. This measure of *salient value similarity* (SVS) has been shown to directly influence stakeholder trust in several different studies (e.g., Vaske et al. 2007). One key finding of the analysis was that the respondents’ trust and SVS measures across the different statements were fairly similar. Tables 72 and 73 present the correlation coefficients for each set of statements in each category, responses were coded from one to five with one representing strongly disagree and five representing strongly agree. As the tables show the responses were highly correlated which allowed for the creation of both a salient value similarity index and trust in management index.

Table 72. Correlation coefficients of management trust statements.

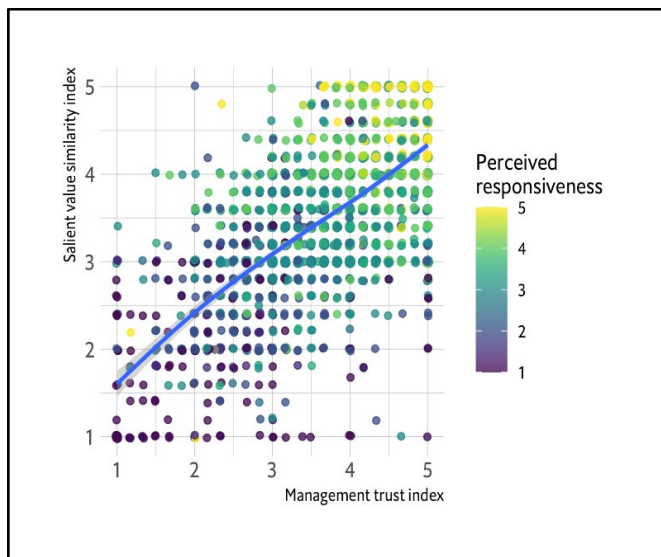
I trust fisheries managers to...	collect accurate data...	accurately estimate...	accurately measure...	use the best...	manage fisheries - healthy fish populations	manage fisheries - maximizes recreational fishing opportunities
collect accurate data on landings and fishing effort	1					
accurately estimate total landings and effort	0.85	1				
accurately measure the size of fish stocks	0.78	0.82	1			
use the best available data and science when proposing and implementing fisheries rules and regulations	0.70	0.71	0.77	1		
manage fisheries in a way that ensures healthy fish populations	0.70	0.71	0.75	0.78	1	
manage fisheries in a way that maximizes recreational fishing opportunities	0.65	0.68	0.73	0.75	0.82	1

Table 73. Correlation coefficients of salient value similarity statements.

With respect to saltwater recreational fisheries management, I feel that fisheries managers...	share similar values	share similar opinions	think in a similar way	take similar actions	share similar goals	listen to angler concerns	respond to angler concerns
share similar values to me	1						
share similar opinions to me	0.85	1					
think in a similar way to me	0.80	0.87	1				
take similar actions as I would	0.72	0.77	0.80	1			
share similar goals to me	0.77	0.77	0.78	0.77	1		
listen to angler concerns	0.63	0.68	0.68	0.71	0.67	1	
respond to angler concerns	0.64	0.68	0.69	0.72	0.67	0.90	1

As might be expected, the management trust, SVS, and perceived management responsiveness⁵ values were positively correlated – anglers that trusted management felt that managers shared similar values, opinions, and goals of their own. Figure 3 shows an almost one-to-one relationship between management trust, SVS, and perceived responsiveness. Although causality is hard to prove, this key finding and prior research strongly suggest that anglers who perceive managers as sharing their values and responding to their concerns are more likely to trust management. If fishery managers can communicate shared fishery-relevant values to stakeholders, they are likely to build or strengthen trust among those stakeholders.

Figure 3. Salient value similarity and management trust indices.



Co-variate Analysis of SVS, Management Trust, and Perceived Management Responsiveness

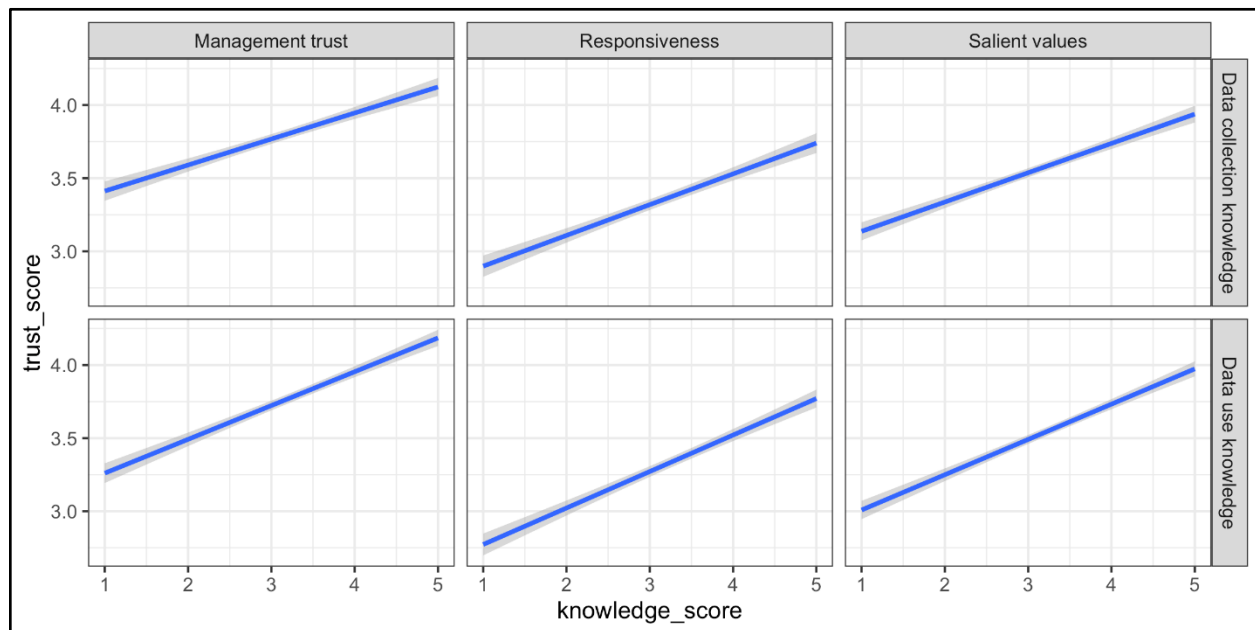
Surprisingly, demographic variables including age, gender, geographic location, education, and income did not seem to impact SVS and management trust. Similarly, respondent fishing characteristics such as avidity, fishing mode and waters fished were not correlated with management trust and SVS. Co-variate analysis indicated that respondent awareness of, attitudes toward, and involvement in the fisheries management process were highly correlated with salient value similarity and management trust variables.

Data collection and use self-reported knowledge

Figure 4 shows the relationship of each of the three indices relative to respondent self-reported knowledge of how fisheries data is collected and used. The positive correlation indicates that anglers that understand the fisheries management process generally have greater trust in management.

⁵ Two of the statements included in the SVS analysis (listen to angler concerns and respond to angler concerns) are not traditionally included in SVS analysis. Within the report, we refer to these as perceived responsiveness or perceived management responsiveness.

Figure 4. Management trust, responsiveness, and salient value similarities by fisheries data collection and use knowledge.



Opinions of current saltwater fisheries management

Table 74 provides the average of the three indices based on respondent agreement with statement regarding the effectiveness of current saltwater recreational fisheries management at achieving certain goals. The data shows a strong positive relationship between respondent opinions regarding the effectiveness of current management and their trust in fishery managers. This finding is not unexpected, it would seem reasonable that anglers that don't like the direction of current management would not have a lot of trust in fishery managers.

Table 74. Management trust, SVS, and responsiveness compared to perceived effectiveness of current management.

Current saltwater recreational fisheries management rules...	Response Category	Management Trust Index	SVS Index	Management Responsiveness Index
provide good opportunities to catch fish and protect fish populations.	Strongly Disagree	1.98	1.90	1.77
	Somewhat Disagree	2.86	2.69	2.25
	Neither Agree Nor Disagree	3.41	3.11	2.98
	Somewhat Agree	3.74	3.54	3.27
	Strongly Agree	4.46	4.18	4.02
	Total	3.81	3.58	3.36
make certain that there will be good fishing opportunities for future generations.	Strongly Disagree	2.03	1.71	1.71
	Somewhat Disagree	2.75	2.72	2.22
	Neither Agree Nor Disagree	3.32	3.07	2.93
	Somewhat Agree	3.68	3.44	3.20
	Strongly Agree	4.36	4.11	3.92
	Total	3.82	3.58	3.36

protect marine environments and biodiversity.	Strongly Disagree	1.97	1.70	1.73
	Somewhat Disagree	2.75	2.61	2.43
	Neither Agree Nor Disagree	3.26	3.08	2.86
	Somewhat Agree	3.69	3.46	3.20
	Strongly Agree	4.33	4.07	3.87
	Total	3.82	3.58	3.37
are easy to understand and follow.	Strongly Disagree	2.36	2.32	1.88
	Somewhat Disagree	3.22	3.08	2.60
	Neither Agree Nor Disagree	3.58	3.28	3.12
	Somewhat Agree	3.92	3.68	3.48
	Strongly Agree	4.48	4.26	4.09
	Total	3.82	3.58	3.36
are well enforced.	Strongly Disagree	2.83	2.74	2.75
	Somewhat Disagree	3.36	3.24	3.27
	Neither Agree Nor Disagree	3.56	3.29	3.29
	Somewhat Agree	3.92	3.67	3.67
	Strongly Agree	4.34	4.10	4.12
	Total	3.782	3.58	3.59

Opinions on fisheries management focus areas

We also examined the three indices based on angler ratings of the importance of different fishery management goals (Table 75). Generally, anglers preferred management focuses designed to protect resources (protecting marine ecosystems and fish populations was preferred to future fishing opportunities which was preferred to current fishing opportunities). On average, those respondents that felt resource protection and future fishing opportunities were more important than focusing on current fishing opportunities had greater trust in management and felt greater salient value similarities.

Table 75. Management trust, SVS, and responsiveness by management focus importance.

Focus Choices:	Management Trust Index	SVS Index	Management Responsiveness Index
Current Fishing Opportunities	3.91	3.37	3.12
Future Fishing Opportunities	3.93	3.66	3.44
Future Fishing Opportunities	3.91	3.32	3.02
Protecting Marine Ecosystems and Fish Populations	3.86	3.63	3.42
Protecting Marine Ecosystems and Fish Populations	3.95	3.66	3.45
Current Fishing Opportunities	3.88	3.16	2.86

Involvement in the fisheries management process

We also examined the average of the three indices relative to involvement in the fisheries management process as measured by attending a state or federal fisheries management meeting. We found that attendees, on average, had lower: trust in fisheries management and data collection and SVS, and felt that management was less responsive.

Table 76. Management trust, SVS, and responsiveness by meeting attendance.

	Management Trust	Salient Value Similarity	Management Responsiveness Index
Attendee	3.56	3.43	3.17
Non-Attendee	3.83	3.59	3.38

Sources for Saltwater Recreational Fishing Information

In addition to the basic survey results presented previously on angler information sources and trust (Question 12 and 13) we analyzed information source data relative to other data gathered in the survey to look for patterns in source use and trust. Figure 5 shows source use and trust by MCR. The data show that the “top tier” of broadly trusted and used sources includes friends, bait and tackle shops, state agency information, federal agency information, and family. Charter captains/fishing guides and newspapers/magazines are broadly trusted, but not as widely used as the top tier. The bottom tier of less-used, less-trusted information sources includes message boards, environmental groups, and social media (general and fishing-specific). Interestingly, information sources that likely involve direct one-to-one interactions (family, friends, bait and tackle shops, fishing guides and captains) were more trusted than data gathered from online or broadcast sources (newspapers/fishing magazines, fishing websites/blogs, online fishing message boards, and social media - both general and fishing-based). This finding suggests that the network analysis conducted as part of the QLS will be examining some of the most-trusted information pathways anglers use.

In addition, there is not a lot of variation across MCRs, with only trust/use of TV/radio shows and fishing rule apps showing substantial differences between MCRs. One question that is worth exploring in future work (potentially in the QLS) is what about those sources make them worth using and trusting? Is it convenience, perceived shared worldview, familiarity, or something else? Answering those questions might continue to inform an outreach strategy.

Figure 5. Source use and trust by MCR.

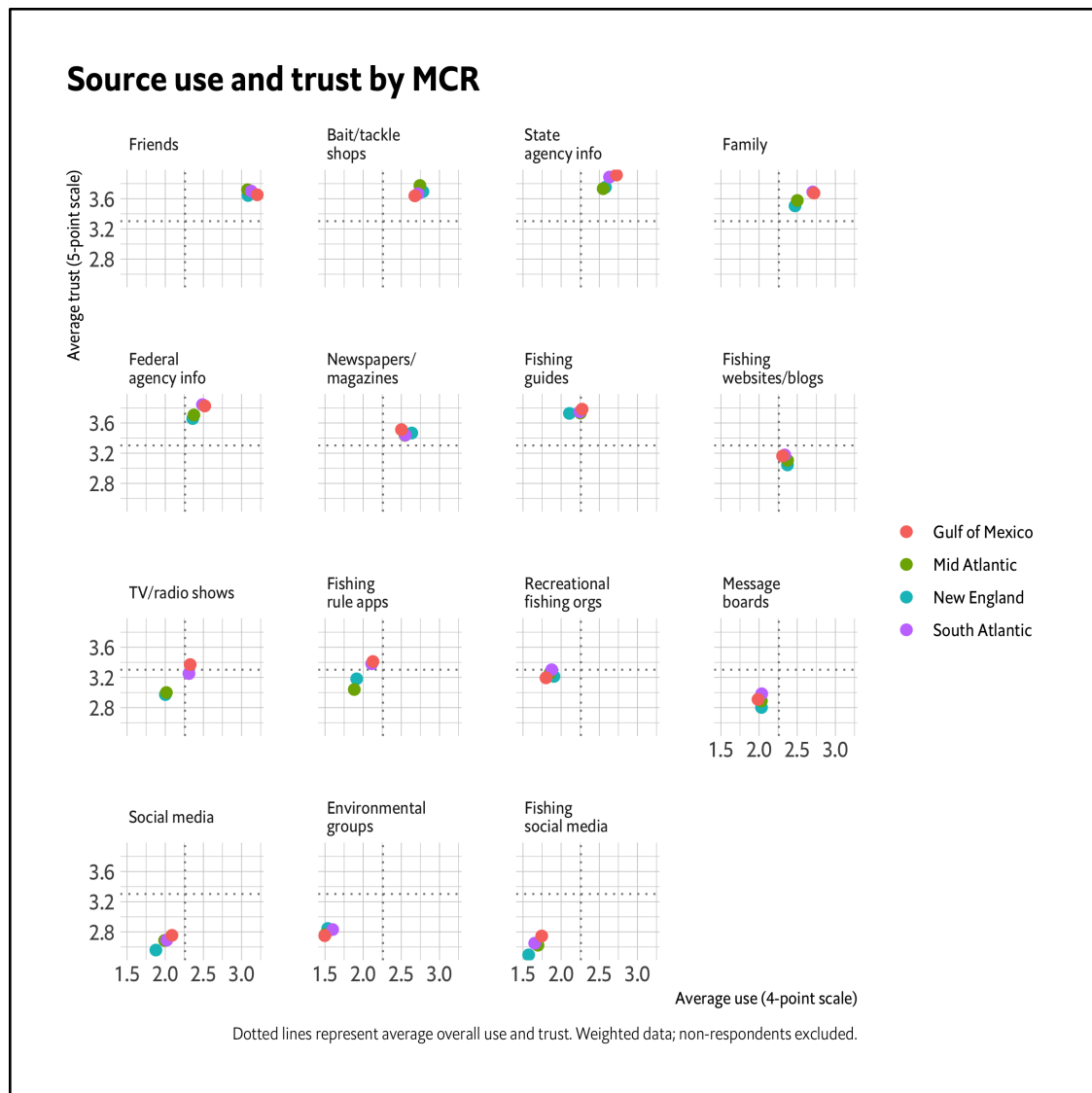


Figure 6. Source trust by information source usage.

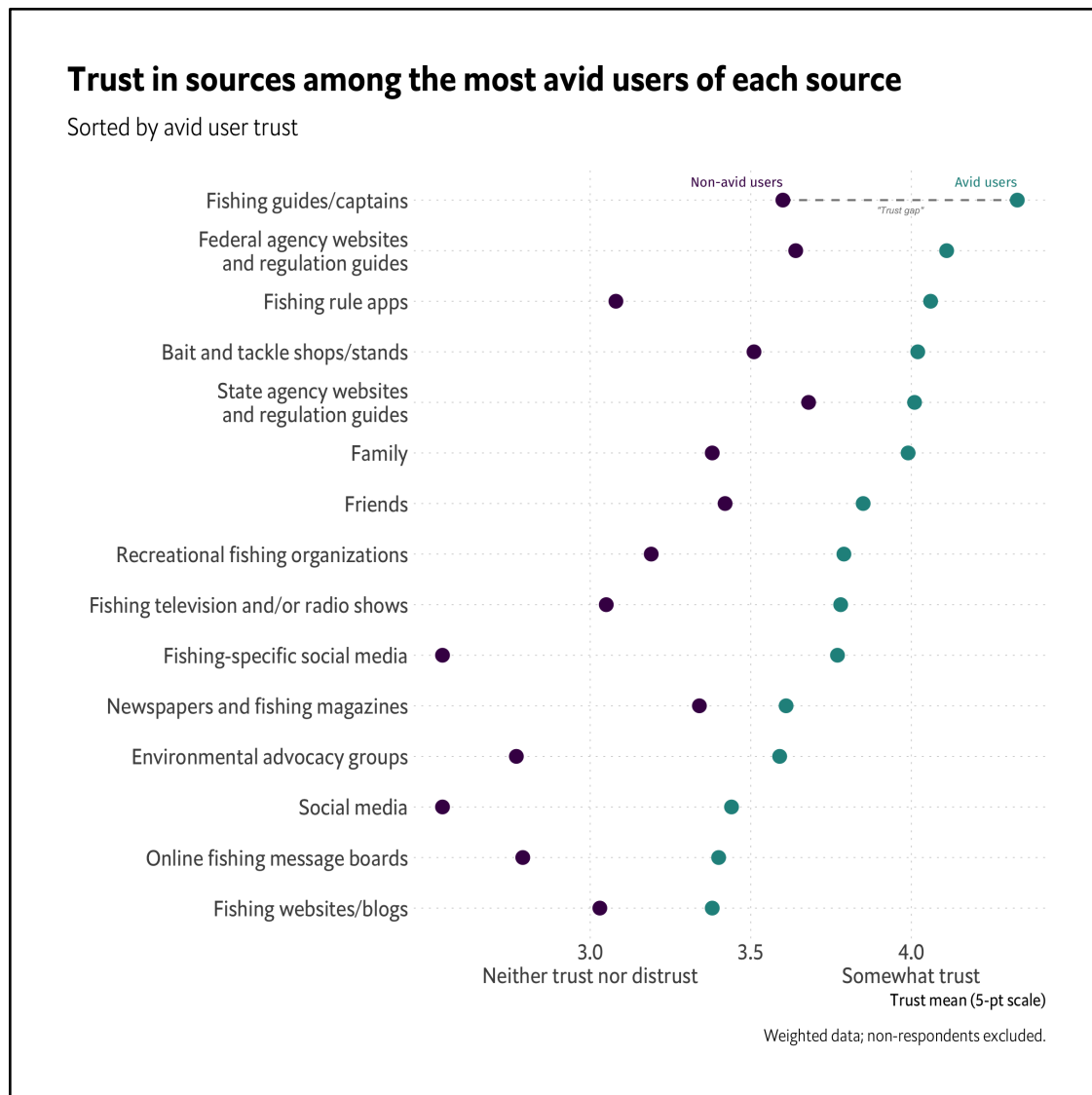


Figure 6 displays source trust by source usage. These charts reveal particularly large trust gaps between avid and non-avid users of social media (both general and fishing-specific), fishing rule apps, and environmental advocacy groups. These results imply that, even though overall trust is low across several of those sources, they are trusted by people who use them frequently. These sources might be worth using as communication channels to reach these narrow audiences, in particular with social media: anglers who use and trust social media tend to be younger and more likely to use fishing regulation guides than are non-heavy users of social media.

Even among sources with smaller trust gaps it is worth remembering that source use and trust are interrelated: people are more likely to use sources that they trust, whether it's because their familiarity with a source means anglers are more likely to trust it, because anglers are

more likely to use sources that seem trustworthy to them, or, most likely, some combination of the two.

Co-variate Analysis of Source Use and Trust

Do different types of anglers use and trust different sources? Is the use of different sources associated with higher or lower levels of trust in management? Answers to these questions can help to inform outreach strategies, either by suggesting different sources to reach different groups of anglers or by revealing which sources are most trusted among different angler groups.

In the following sections, we describe the relationship between source use/trust and fishing avidity, fishing location (state or federal waters), fishing mode (shore, private boat, for-hire), and trust in management. The relationship between source use/trust and other co-variables can be found in the Appendix.

Sources and fishing avidity

We analyzed the relationship between source use and fishing avidity, after filtering out a respondent who indicated that they fished 460 days in the past 12 months. Those data are presented in Figure 7. These data illustrate an unsurprising, but important point: people who are more avid anglers tend to consult a larger variety of sources more frequently than people who are less avid anglers. The most avid anglers tend to consult friends and bait and tackle stores the most frequently, which may imply that they've developed a network of trusted people to discuss fishing information.

Figure 7. Source use by fishing avidity.

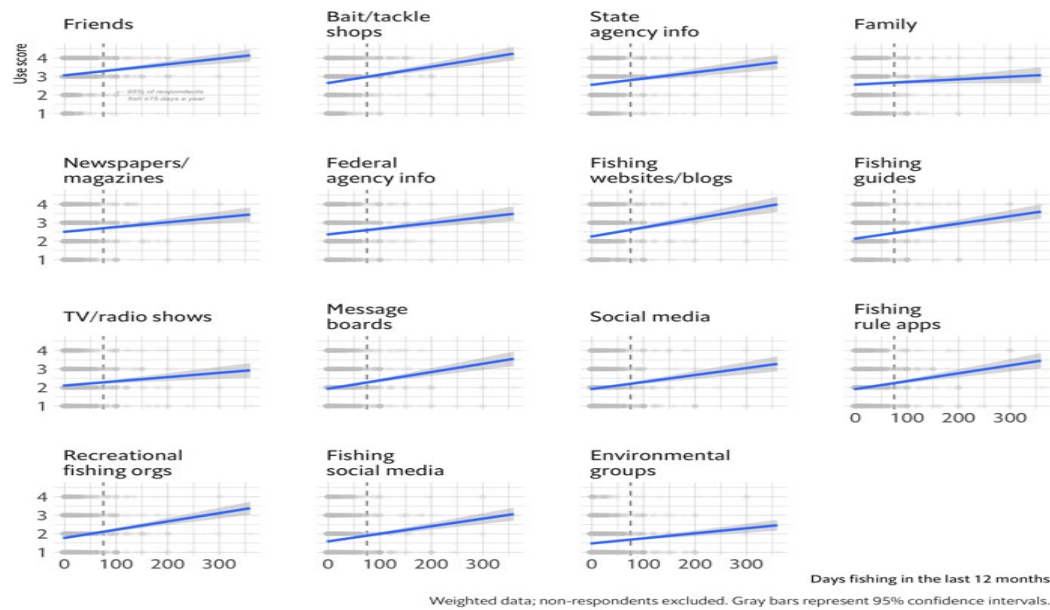
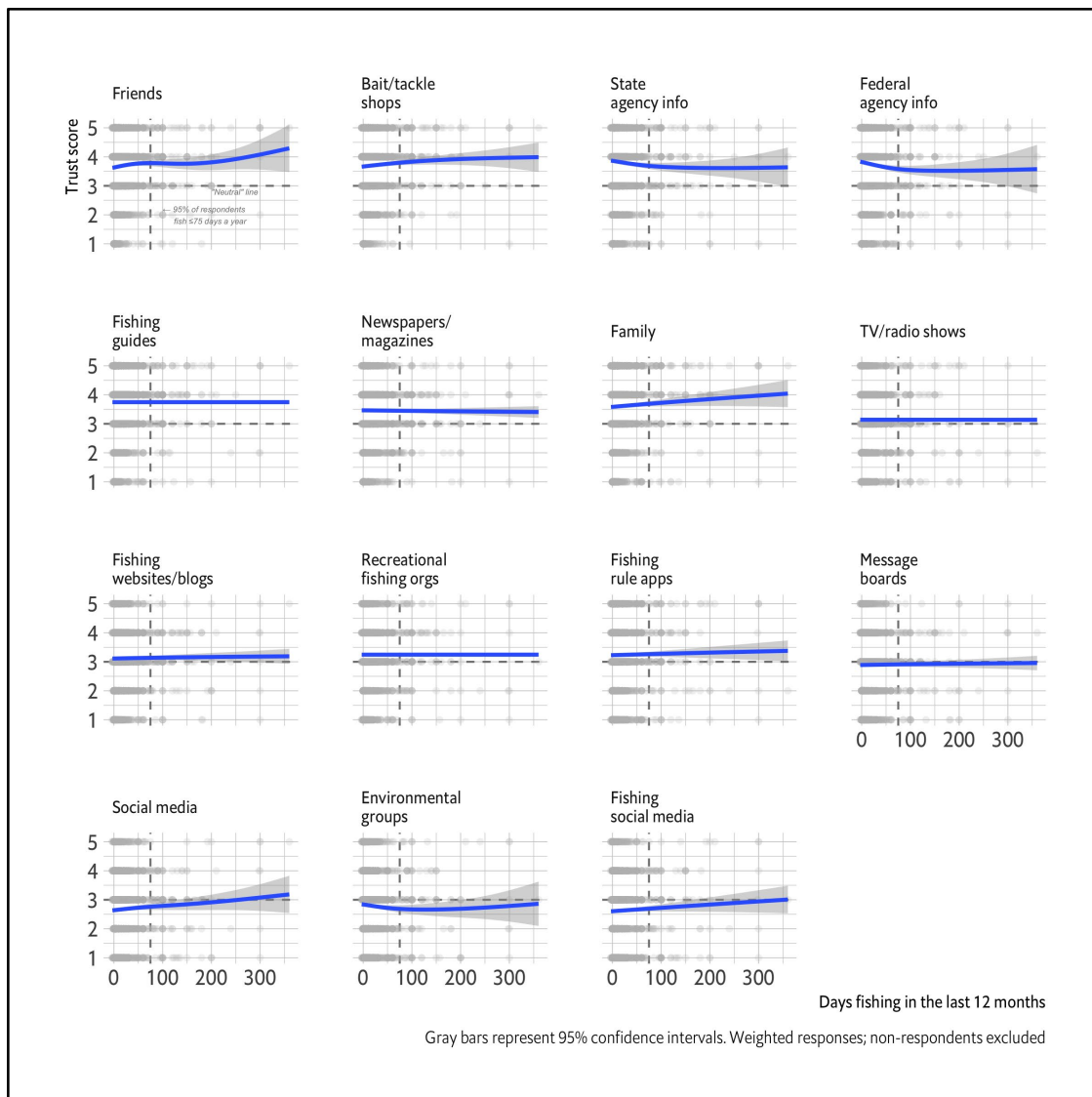


Figure 8 displays the relationship between source *trust* and fishing avidity. People who fish the very most tend to trust most of the sources that we asked about. High-avidity anglers have a slightly higher level of trust in bait shops, family, and friends compared to people who fish less. On the other hand, people who fish more are less likely to trust state and federal regulation guides for fisheries management information than people who fish less. One plausible explanation for this is that the most avid anglers tend to have more friends and associates who are also anglers and are therefore trusted sources of information. Conversely, less avid anglers may be more likely to turn to official sources because they don't have as developed of a network of fishing contacts. Regardless, the differences among avidity groups are relatively small, especially given the large confidence intervals at higher levels of avidity.

Figure 8. Source trust by fishing avidity.



Sources and fishing mode

We asked respondents to indicate their frequency of fishing via each of three modes: a private boat, a for-hire vessel, or from the shore. The relationship between respondents' use of the different fishing modes and source use is plotted in Figure 9 and the relationship between source trust and fishing mode is presented in Figure 10.

Figure 9. Source use by fishing mode frequency.

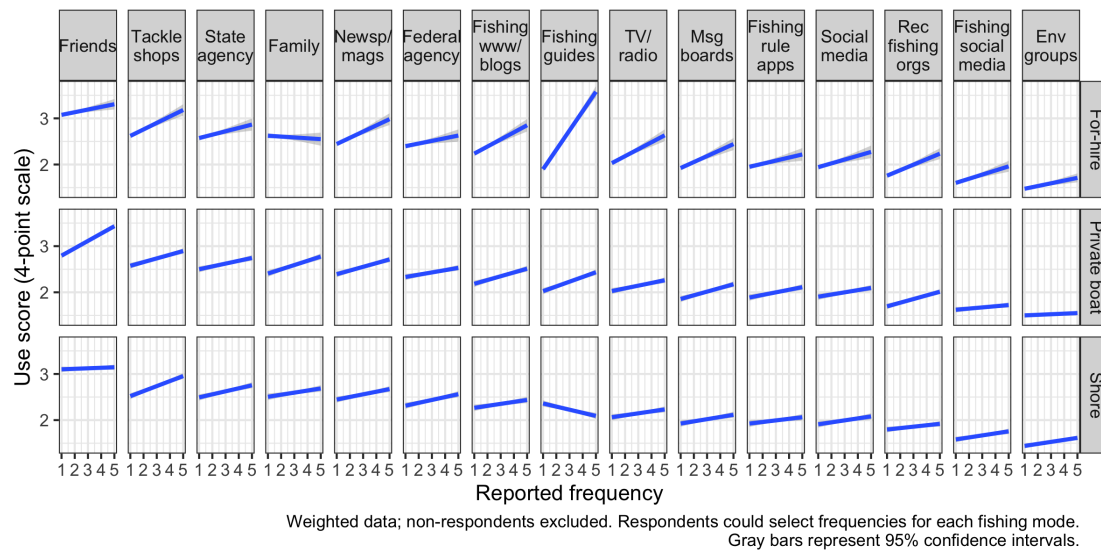
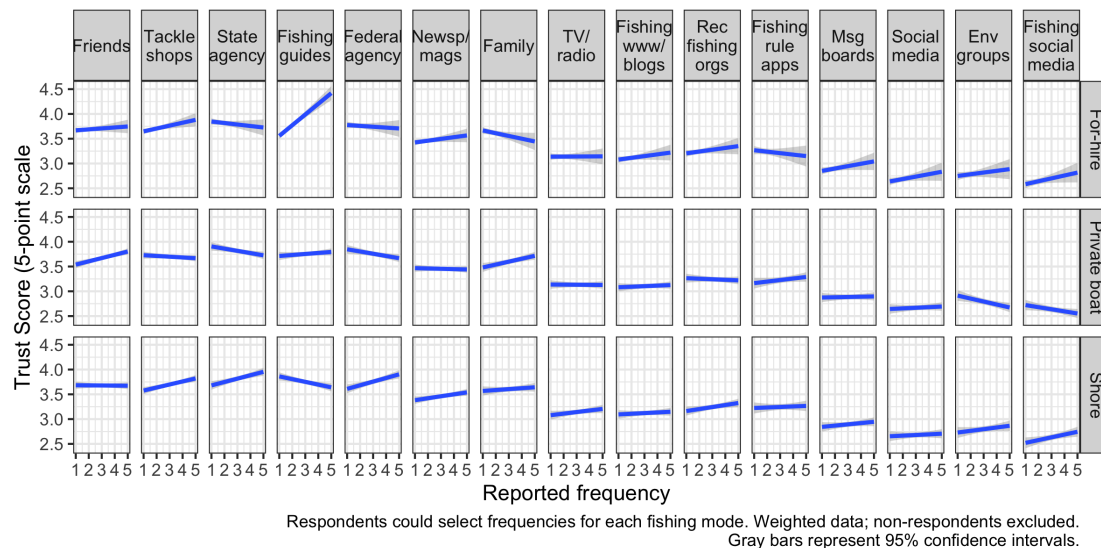


Figure 10. Source trust by fishing mode frequency.



There are minor differences in source use and trust across fishing modes that are interesting. First, shore-based anglers are more likely than other anglers to trust (though not necessarily use) state and federal fishing regulation guides and websites. It is not clear why exactly this is, and the overall trust in these sources across fishing modes is relatively high, but this relationship might be worth exploring in future work.

It's also interesting that use and trust in family as an information source tends to be lower among those who reported fishing on a for-hire boat more often. This suggests that people who frequently charter boats might not have a family that fishes or discusses fishing, though this is also a relationship that could be studied further.

A final difference across fishing modes is the use of —and trust in— fishing guides/captains as a source of information. Unsurprisingly, those without boats (i.e., people who fish using the shore or for-hire modes more frequently) are more likely to use fishing guides/captains as a source of information. This relationship *does not* hold for trust, however: using a private boat more frequently is positively associated with trust in fishing guides/captains. These results imply that fishing guides and charter captains hold a place of respect across angler types, even those who don't typically fish with guides/captains. Indeed, fishing guides and charter captains are among the most trusted sources across many of the variables we measured, indicating that they may be a key audience that can influence opinion across the fishery.

Trust in management

We also investigated the relationship between source use/trust and trust in management: are different sources associated with more or less trust in management? The results are presented in Figures 11 (use) and 12 (trust).

Figure 11. Source use and trust in management.

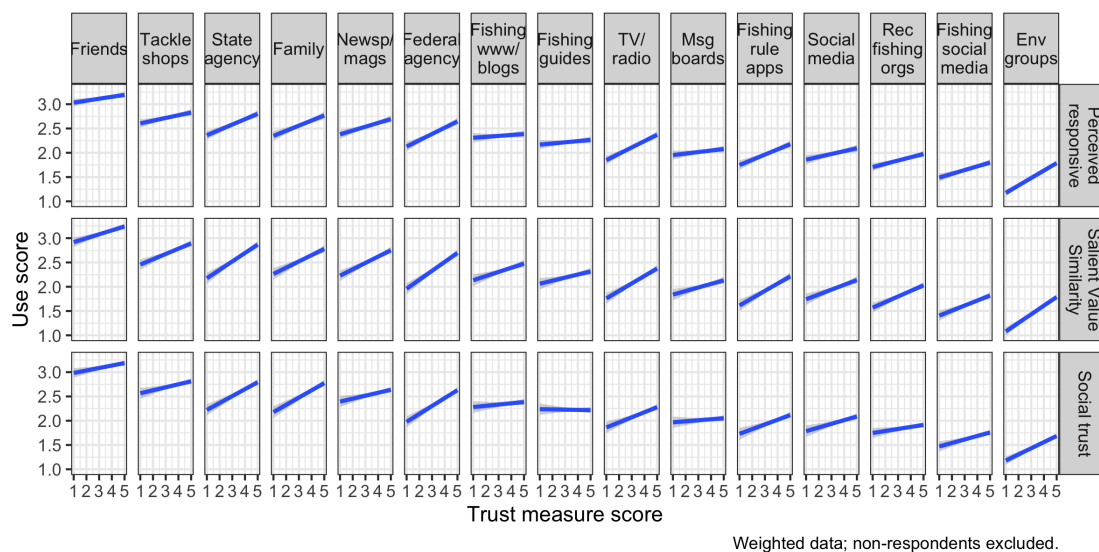
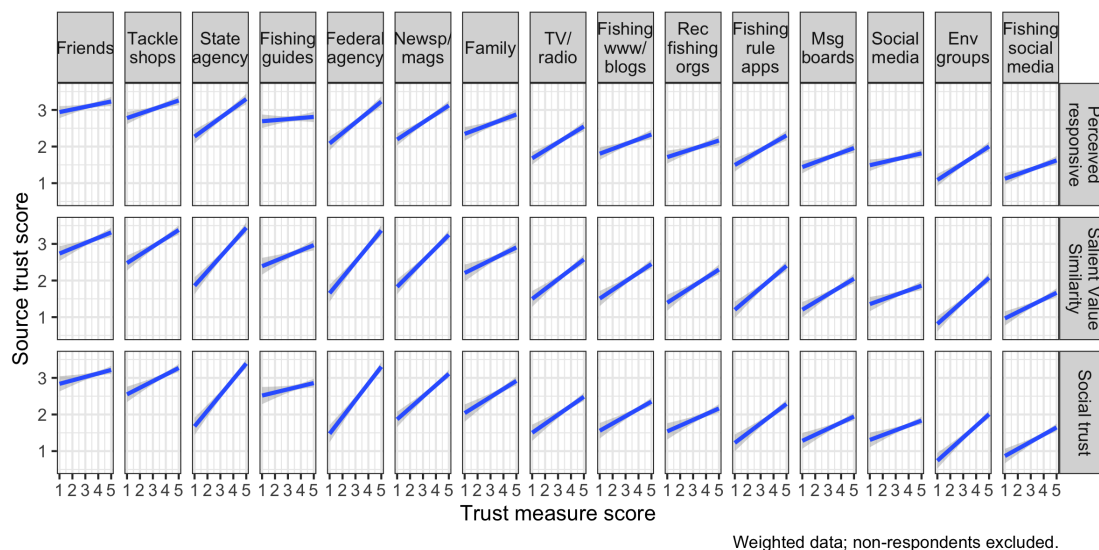


Figure 12. Source trust and trust in management.



These figures show that, in general, increases in use and trust of sources are positively associated with increases in trust in management. In other words, there don't appear to be any sources for which increased use of the source is associated with decreased trust in fisheries management. In addition, the most used and trusted sources remain friends, bait shops, and family, which is consistent across the co-variables that we measured.

Knowledge

Finally, we investigated the relationship between source use/trust and self-reported fishery knowledge. We did this by asking respondents three different knowledge questions:

- How would you describe your knowledge of the saltwater recreational fishing regulations that apply to how you fish? (4-point scale from poor to excellent)
- I understand how fishery managers collect data on saltwater recreational fishing catch and effort. (5-point scale from strongly disagree to strongly agree)
- I understand how fishery managers use saltwater recreational fishing catch and effort data to set fishing rules and regulations. (5-point scale from strongly disagree to strongly agree)

The relationships between use and trust for these questions are presented in Figures 13–16, below:

Figure 13. Source use and self reported management regulation knowledge (question 5).

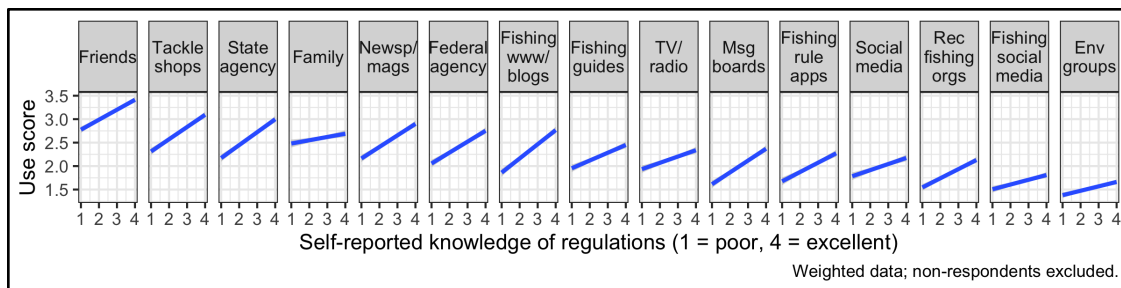


Figure 14. Source trust and self-reported management regulation knowledge (question 5).

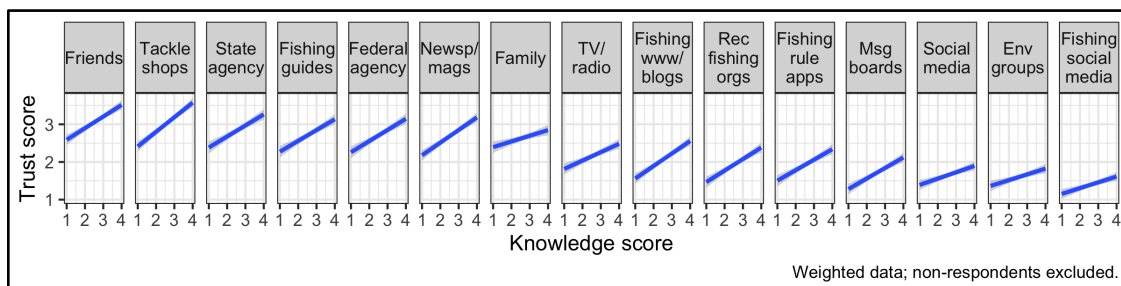


Figure 15. Source use and self-reported fisheries management data collection and use knowledge (question 7).

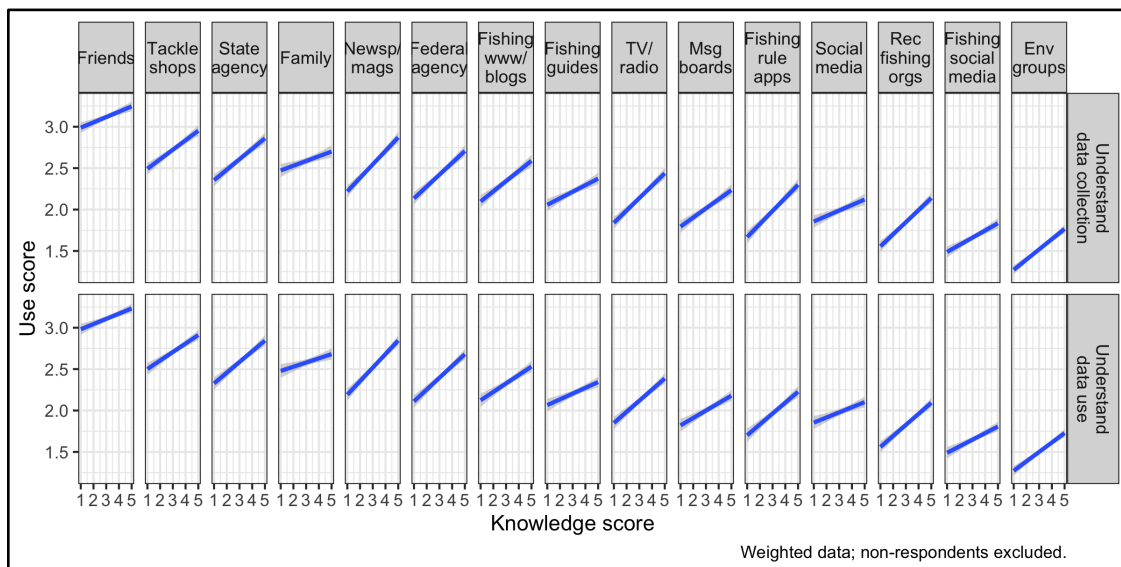
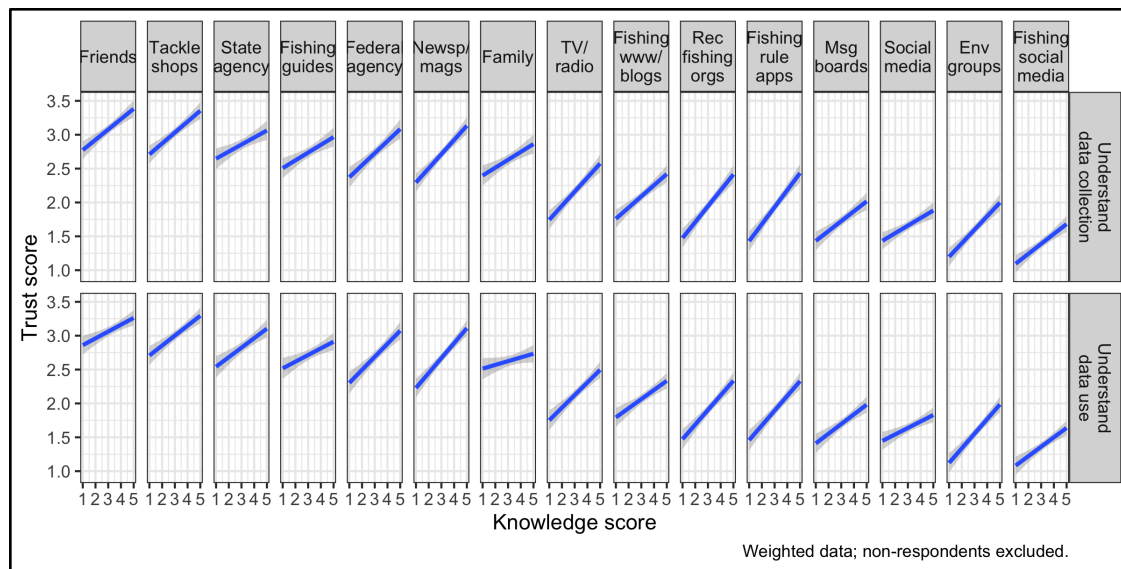


Figure 16. Source trust and self-reported fisheries management data collection and use knowledge (question 7).



These data show that anglers with higher levels of self-reported knowledge tend to use and trust each of the sources more than anglers with lower levels of self-reported knowledge and that the overall trends in use and trust (friends, bait shops, and state guides are among the most used and trusted, social media and environmental groups are among the least trusted) are similar to the other co-variables we investigated.

Age

Age is one area where we might expect there to be a considerable difference in source use and trust. The data, presented in Figures 17 and 18, bear this out:

Figure 17. Source use by age.

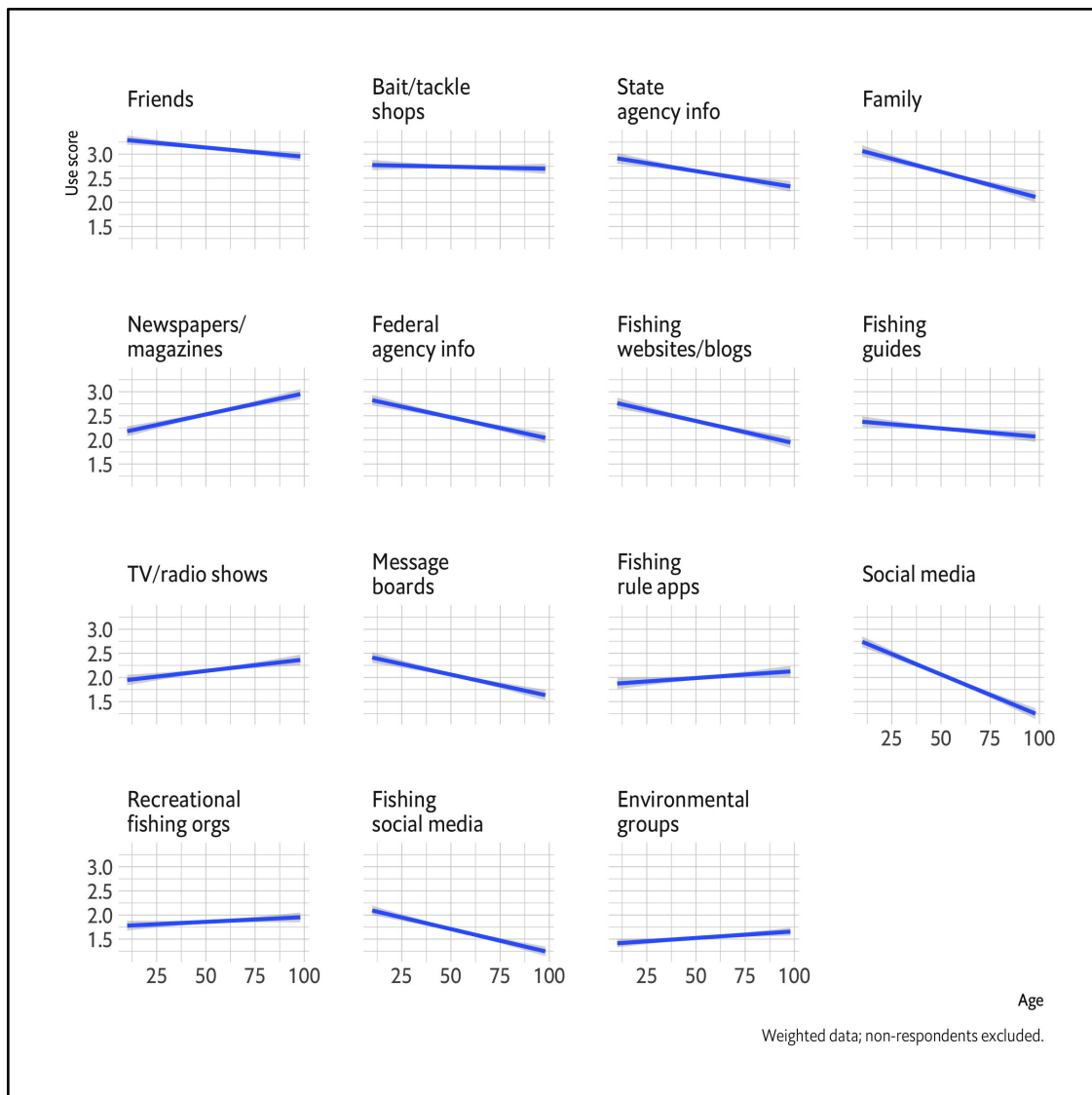
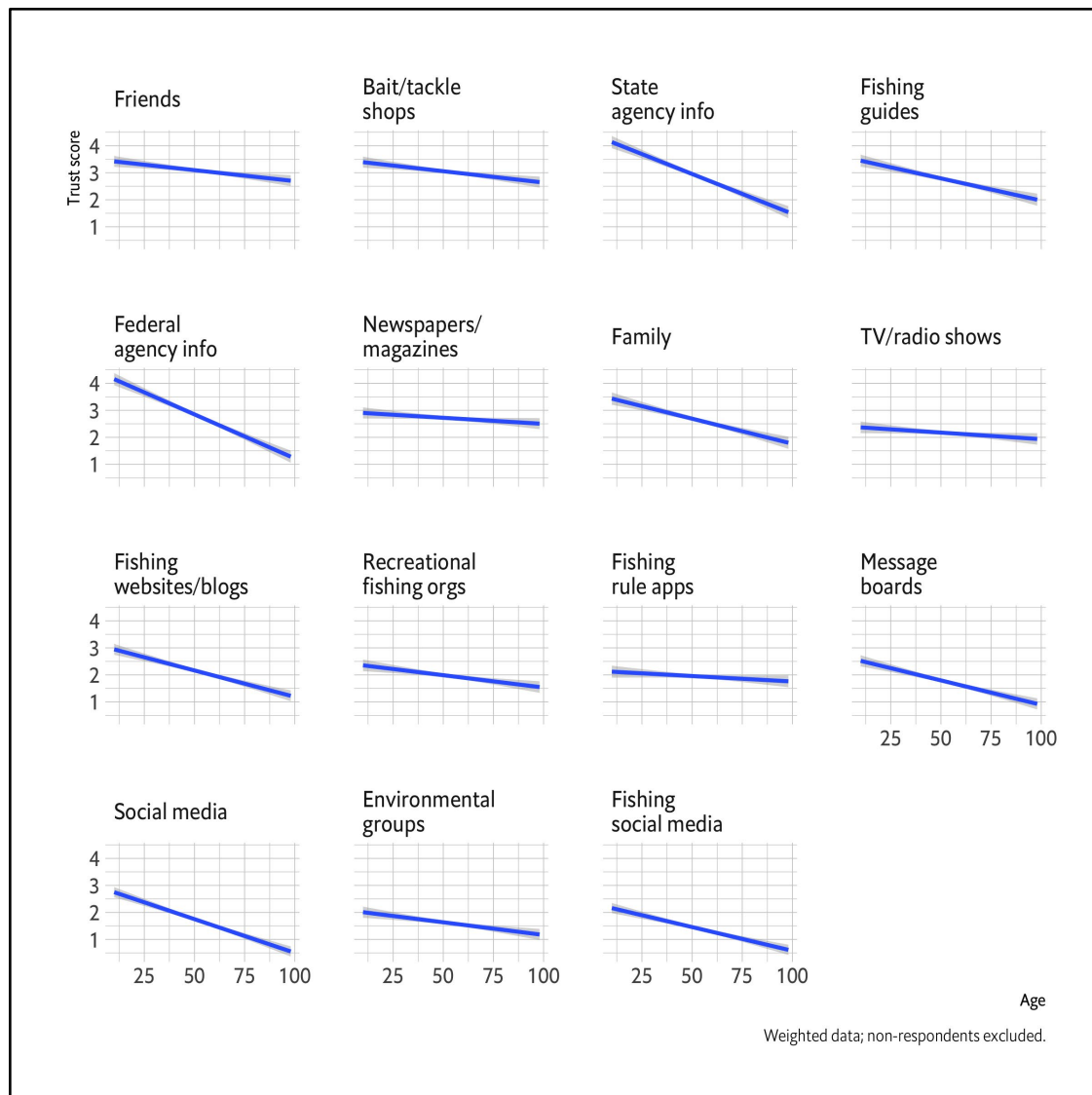


Figure 18. Source trust by age.



There is a consistent downward trend in source use and trust across nearly all sources with a few exceptions. The most important exception is newspapers and magazines, which are used by older respondents at a much higher rate than by younger respondents. Sixty-two percent of respondents age 45 and older indicated they sometimes or frequently use newspapers and magazines as information sources, while only 48% of those under 45 years old indicated the same. Respondents 45 and older were 48% more likely than those under 45 to indicate they frequently use newspapers and magazines as information sources. Notably, however, older respondents *did not* report trusting newspapers and magazines more than younger respondents.

These results are worth carefully considering if managers want to pursue demographically based messaging. Age, more than any of the other co-variates, seems to be a critical driver of source use and trust.

Angler Network Size

The angler network size question asked respondents to select from a series of ranges (none, 1-5, 6-10, 11-15, More than 15) how many others they discussed saltwater fishing issues with. Due to a lack of previous research on angler social network size, we had trouble determining how many contacts to ask for in the QLS instrument. The data from this QNS question was used to determine how many saltwater fishing contacts to ask about in the QLS instrument. Approximately 87% of respondents indicated their fishing network included 10 or less contacts. As such, we felt that limiting the QLS ego networks to 10 contacts would capture the entire network of most respondents.

To develop an average value that could be used for co-variate analysis, we developed a second variable that took the middle value of each range and the smallest value for the largest category. The ranges were transformed to the following single values – 0, 3, 8, 13, and 16⁶. The average values by MCR and by address type are presented in Table 73 below, skips and multiple value responses were removed.

Table 77. Network size by MCR and address type.

	Number of Contacts
NEFMC	5.33
MAFMC	5.07
SAFMC	5.31
GMFMC	5.80
Total	5.36
Urban	5.40
Suburban	5.17
Rural	5.54
Total	5.36

Co-variate Analysis of Angler Network Size

Co-variate analysis of angler network size indicated correlations related to fishing behavior, self-reported knowledge of fisheries regulation, involvement in the fisheries management

⁶ While this variable transformation might not be completely accurate due to the conversion of ranges to single values which might not be appropriate for all respondents (especially with respect to the open-ended highest value of 15 or more) it does convert to a definable measure (number of contacts).

process, sources used to gather information on saltwater fishing issues, and several demographic variables.

Avidity

Table 78 presents mean fishing avidity by reported network size using the ranges from the survey. Generally, more avid anglers appear to discuss saltwater recreational fishing with larger numbers of people. This finding seems reasonable, we would expect that more avid anglers tend to discuss fishing more frequently and gravitate toward others who share their interest in fishing. All of the differences in means were statistically significant at the 0.001 significance level. This finding could be significant to improving communication with recreational anglers. If the QLS study identifies avid anglers as network hubs improved communication within a community could be achieved through a small number of avid anglers serving as dissemination points.

Table 78. Avidity by angler network size.

# of Contacts:	Mean	Std. Dev.	Freq.
None	9.75	32.95	519,405
1 to 5	13.90	26.15	2,476,102
6 to 10	28.86	39.56	1,099,820
11 to 15	26.55	26.71	204,960
More than 15	36.63	43.13	388,840
Total	19.38	33.26	4,689,126

Self-reported regulations knowledge and involvement in the management process

Table 79 provides mean network size (measured in contacts) by response to the questions regarding knowledge of fisheries regulations and fisheries management meeting attendance. There is a positive correlation between self-reported regulation knowledge and meeting attendance and network size; all means are statistically significantly different at the 0.001 level. These correlations make sense given that both activities, learning regulations and attending meetings, show a heightened interest in saltwater recreational fishing issues. We would expect this interest to coincide with more conversing on the issues and seeking out like-minded people – both of which could increase angler network size. Similar to the avidity finding, this could point to a means of improving communication within a community of recreational anglers by focusing on a few key network actors; however, this is dependent on the QLS study. Also, it is important to note that avidity was highly correlated with self-reported regulations knowledge and involvement in the management process indicating that it might be one or the other that is impacting network size.

Table 79. Angler network size by self-reported regulations knowledge and involvement in the management process.

Self-Described Knowledge of Fisheries Regulations:	Mean Network Size
Poor	2.69
Fair	4.50

Good	5.94
Excellent	7.97
Total	5.37
Fisheries Meeting Attendance:	Mean Network Size
Attendee	7.39
Non-Attendee	5.25
Total	5.37

Source use

Several of the source use categories were highly positively correlated to network size, mean network size by response for those categories are presented in Table 76. Unsurprisingly, friends as a source of fishing information was the category most highly correlated with network size, we would expect anglers with large information sharing networks to get fishing information from friends often. One very interesting finding was the average network size of those frequently getting information from a recreational fishing organization. While recreational fishing organizations were not a commonly used source, it appears that those heavily involved (frequent users), generally have larger networks. The QLS could provide insights into angler subnetworks in the ranks of these organizations and their role in information sharing. For several of the source types that were highly correlated with network size, the reason for the correlation is indeterminable based on QNS data and points to the need for the QLS network survey.

Fishing websites/blogs, online fishing message boards, and social media could be highly correlated with network size because those are angler communication channels and they represent actual network connections or they could be positively correlated with general interest in fishing and represent very involved anglers investing their time in their fishing hobby. If the correlation represents a general interest in all things fishing, it would indicate these enthusiastic anglers simply have larger networks because fishing is a bigger part of their life and these online sources are not representative of direct connections to other anglers. The correlation between more frequent use of bait shops and for-hire fishing guides/captains as information sources and network size are likely related to angler enthusiasm, more enthusiastic anglers are likely to spend more time around fishing (at bait shops or marinas) and interact more frequently with these source; and as more involved anglers, we might expect them to talk about fishing more frequently and gravitate toward other anglers based on their shared interest.

Table 80. Network size by source use.

	Source Type:						
Source Use:	Friends	Fishing Website/Blogs	Online Fishing Message Board	Bait & Tackle Shop	Rec. Fishing Org.	Fishing Guide/Capt.	Social Media
Never	2.02	4.09	4.43	3.68	4.45	4.02	4.42

Rarely	3.73	5.54	5.56	4.83	5.62	5.65	5.87
Sometimes	5.15	5.85	6.12	5.58	6.49	6.01	5.90
Frequently	6.81	6.67	7.39	6.79	8.07	6.85	7.26
Total	5.40	5.40	5.41	5.40	5.39	5.39	5.39

Age and gender

To evaluate the correlation between age and network size, we used the basic age variable and a second age variable that subdivided the sample into 10-year age groups. Age was not strongly correlated with network size, but a closer look at the data does show a trend. Table 81 includes the mean network size by age group. There is generally a downward trend in network size with age.

Table 81. Mean network size by age group.

Age Group:	Mean Network Size	Std. Dev.	Freq.
16-25	4.82	4.05	238,581
26-35	5.87	4.22	442,966
36-45	5.72	4.71	566,390
46-55	5.56	4.46	925,530
56-65	5.68	4.50	1,281,740
66-75	4.90	4.38	911,538
76-85	3.88	3.90	266,401
>85	3.95	4.54	38,423
Total	5.37	4.44	4,671,569

On average, male respondents were found to have larger fishing networks than female anglers. While the difference was statistically significant at the 0.001 level the difference was only slightly more than one contact. The data are presented in Table 82.

Table 82. Network size by gender.

Gender:	Mean Network Size	Std. Dev.	Freq.
Male	5.60	4.54	3,706,830
Female	4.56	3.97	1,011,524
Total	5.37	4.45	4,718,354

Expenses Incurred

Expenses related to this survey and reporting were primarily in the form of salary for Dr. Ropicki and Dr. Carlton. Pursuant to the contract between the University of Florida and ECS Federal and the contract between Carlton Consultants and ECS Federal, the contractors have been providing periodic accounts of expenses incurred.

Conclusions

The objectives of this study were to examine: 1) where marine recreational anglers go to gather information on saltwater recreational fishing issues including fishing regulations and data collection issues, 2) anglers trust levels associated with different sources of information on saltwater fishing regulations and data collection issues, 3) angler understanding of and confidence in saltwater recreational fisheries management, data collection, and data analysis, and 4) angler opinions and beliefs regarding the current state of saltwater recreational fisheries management and data collection. The survey instrument gathered information on: fishing behavior, practices, and motivations; knowledge of, and involvement in, the fisheries management and data collection process; opinions regarding current management effectiveness, what the goals of management should be; trust in management, opinions regarding the responsiveness of management to angler concerns and the values, opinions, and goals of fishery managers; what sources anglers use to gather information on saltwater recreational fishing and their trust in the information they receive from those sources; the number of other anglers they discuss fishing issues with; and demographic data.

One of the most interesting findings of the survey was the general lack of variation in responses across MCRs and by address type (urban, suburban, rural). This lack of geographic variation is likely a positive as it might indicate that techniques to improve communication do not have to be tailored to specific regions or angler types. On average, respondents held positive views on the effectiveness of current fisheries management, were generally trusting of management in achieving fisheries management goals and objectives, and felt that fishery managers shared similar values, opinions, and beliefs regarding what fishery management should accomplish.

Management Trust, SVS, and Management Responsiveness

We investigated how demographic and survey response co-variables impacted trust in management, SVS and opinions on management responsiveness. The data supported the following conclusions.

- **Angler trust in management, SVS, and opinions of management responsiveness are all positively correlated with self-described knowledge of how fishery managers collect and use data.** These findings indicate that efforts to increase transparency and knowledge/awareness of the fisheries management process and the shared values that underline those processes could improve recreational angler trust in fisheries management.
- **Opinions regarding the effectiveness of current fisheries management are highly correlated with trust in management, SVS, and opinions of management responsiveness.** While this correlation was expected, the survey results serve as evidence of the relationship.
- **Beliefs regarding what fishery management goals should focus on are correlated with trust in management, SVS, and opinions of management responsiveness.** Generally, the survey found that anglers believe management should focus on conservation of marine ecosystems, fish habitats, and future fishing opportunities relative to near term fishing

opportunities. Respondents inclined toward conservation focused management had greater trust in management, SVS and opinions of management responsiveness.

Saltwater Fishing Information Sharing and Trust

We investigated the relationship between source use and trust and a number of co-variables. Perhaps surprisingly, the use and trust of various sources was largely consistent across the co-variables we measured. The data support the following conclusions and recommendations:

- **Friends, bait and tackle shops, state and federal agency websites and regulation guides, and family are the most broadly used and trusted information sources.** This finding was consistent across almost all of the co-variables that we measured. While fishery managers can't directly communicate through friends or family, information in federal and state websites and regulation guides is highly trusted; these should be considered premiere channels for communicating important fishery information.
- **Message boards, environmental groups, and social media (general and fishing-specific) are less broadly used and trusted, but may have specific users who value them highly.** This is especially the case with social media, which seem to be preferred by younger anglers. While 44% of anglers under 55 years of age indicated they sometimes or frequently use social media as an information source, only 26% of respondents 55 and older indicated sometimes or frequent use of social media for saltwater recreational fishing information. Additionally, those under 55 years of age also had greater trust in information obtained from social media sources.
- **Age appears to be an important determinant of source use and trust.** Older anglers are more likely to use traditional media and less likely to trust any sources.
- **The data imply that social networks are important for diffusion of information and, potentially, opinions about fishery management.** The important role of key people such as friends, bait shop employees, and family members, suggests that fishery information likely flows through social channels more frequently, or at least more saliently, than it does through official communication. Understanding this information flow is a critical part of understanding how information and attitudes disseminate through the fishing community. The QLS will help to answer some of these questions.

Angler Network Size

Angler network size was analyzed relative to a number of co-variables to evaluate what respondent characteristics impact how large an angler's information sharing network is. The data support the following conclusions and recommendations:

- **More avid anglers have larger angler networks and could serve as information pathways.** This finding will be explored in the QLS and should allow us to determine if avid anglers serve as network hubs that could be targeted by fishery managers to effectively disseminate important information.
- **Anglers already involved in the fisheries management process and knowledgeable of fisheries regulations have larger angler networks and could serve as information**

pathways. This finding could indicate that fishery managers can improve communication using anglers they already have connections with through their current interest and involvement in the fisheries management process. However, it is important to note that these already involved anglers had lower levels of trust in management, SVS scores, and management responsiveness index scores indicating that fishery managers might need to improve relations with this group to use them as information pathways. This finding will also be explored through the QLS.

- **Angler network size is positively correlated with usage of several fishing information sources.** Network size was positively correlated with use of friends, fishing websites/blogs, online fishing message boards, bait and tackle shops, recreational fishing organizations, for-hire fishing guides and captains, and social media to gather information on saltwater recreational fishing issues. For the online sources (fishing websites/blogs, online fishing message boards, and social media), this might indicate greater reach for these sources than was indicated solely by the source use question. The larger angler networks associated with users of these online sources might push information from these sources beyond the initial user. The QLS social network survey should provide insights on this possibility.

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