

## **Technical Appendix: Knowledge, Attitudes and Perceptions of Management Strategies and Regulations of the Gray's Reef National Marine Sanctuary by Users and Non-users of the Sanctuary: Version 2**

**U.S. Department of Commerce**  
National Oceanic and Atmospheric Administration  
National Ocean Service  
Office of Ocean and Coastal Resource Management  
**Office of National Marine Sanctuaries**



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# **Technical Appendix: Knowledge, Attitudes and Perceptions of Management Strategies and Regulations of the Gray's Reef National Marine Sanctuary by Users and Non-users of the Sanctuary: Version 2**

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## **COVER**

Diver, Atlantic spadefish and “live bottom” at Gray’s Reef. Photo by Greg McFall.

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## ABSTRACT

This research is part of the Socioeconomic Research & Monitoring Program for the NOAA Office of National Marine Sanctuaries. In 2010, a baseline study of users and non-users of Gray's Reef National Marine Sanctuary (GRNMS) was initiated. Mail surveys were designed in 2010 and implemented in 2011 and 2012.

The study provides baseline data on the knowledge, attitudes and perceptions of users and non-users of GRNMS in regard to management strategies and regulations. It also provides information on socioeconomic/demographic profiles, activity participation and use of coastal and ocean waters off the Georgia coast both inside and outside GRNMS. The surveys collected data on sources of public information on GRNMS used and the trust of sources used, familiarity with GRNMS rules and regulations, and attitudes about selected management strategies for coastal and ocean resources both inside and outside GRNMS. For users of GRNMS, perceptions of resource conditions were also addressed.

For users and non-users, two versions of the surveys were designed to address all the issues above. Both versions of the survey were implemented for separate samples of non-users of GRNMS in 2011. For users, Version 1 of the survey was implemented in 2011 and Version 2, which obtains information about attitudes on selected management strategies for coastal and ocean resources both inside and outside GRNMS was implemented in 2012.

The technical appendix for users version 1 and non-users versions 1 and 2 are reported in Leeworthy (2012b), while this report is the "Technical Appendix" for users version 2 as found in Leeworthy (2013) and documents the statistical tests that were done for comparing users version 1 and 2 surveys and the statistical tests for differences between the responses by users and non-users to version 2 survey questions on various policy/management strategies included in version 2 surveys.

### Key Findings:

- Results of the surveys of users were not sensitive to response rates as version 1 had a 50% response rate, while version 2 had a 25% response rate and there were very few statistically significant differences in responses, except for sources of information used and trust of the information sources used.
- **Sources of Information Used:** There were only two significant differences between respondents of versions 1 and 2 of the surveys. Version 2 respondents used Georgia Sea Grant and IGFA more than version 1 respondents.
- **Trust of Sources of Information:** There were only two significant differences between respondents of version 1 and 2 of the surveys. Version 2 respondents had less trust for information from GRNMS staff and from the GRNMS Web site.

## **KEY WORDS**

Socioeconomic monitoring, knowledge, attitudes, perceptions, management strategies, regulations, users, non-users, activity participation, resource conditions, socioeconomic/demographic profiles and statistical tests.

# Table of Contents

	Page Number
<b>Introduction</b> .....	1
<b>Chapter 1: Surveys of Users and Non-users of GRNMS</b> .....	1
Sampling Frames.....	1
Response Rates.....	3
Non-response Bias/Sample Weighting.....	4
Statistical Tests.....	4
<b>Chapter 2: Users Version 1 Compared to Users Version 2</b>	
Socioeconomic/Demographic Profiles.....	5
Comparisons of All respondents to each Survey Version.....	5
Comparisons of Respondents to both Survey Versions.....	5
Activity Participation in Coastal and Ocean Areas in and around Georgia Outside GRNMS.....	10
Comparisons of All respondents to each Survey Version.....	10
Comparisons of Respondents to both Survey Versions.....	10
Activity Participation in Coastal and Ocean Areas in GRNMS.....	10
Comparisons of All respondents to each Survey Version.....	10
Comparisons of Respondents to both Survey Versions.....	10
Average or Mean Person-days by Activity in the Coastal & Ocean Areas in and around Georgia Outside GRNMS.....	12
Comparisons of All Respondents to each Survey Version.....	12
Comparisons of Respondents to both Survey Versions.....	13
Average or Mean Person-days by Activity in the Coastal & Ocean Areas in GRNMS.....	15
Comparisons of All Respondents to each Survey Version.....	15
Comparisons of Respondents to both Survey Versions.....	15
Sources of Information Used.....	17
Comparisons of All Respondents to each Survey Version.....	17
Comparisons of Respondents to both Survey Versions.....	17
Level of Trust of Information Sources Used.....	20
Comparisons of All Respondents to each Survey Version.....	21
Comparisons of Respondents to both Survey Versions.....	21
How Users prefer to receive information .....	23
Comparisons of All Respondents to each Survey Version.....	23
Comparisons of Respondents to both Survey Versions.....	23
Familiarity with GRNMS Regulations.....	24
Comparisons of All Respondents to each Survey Version.....	24
Comparisons of Respondents to both Survey Versions.....	24
Perceptions of the Conditions of Resources in GRNMS.....	25
Comparisons of All Respondents to each Survey Version.....	25
Comparisons of Respondents to both Survey Versions.....	25

	Page Number
Factors that influenced the Choice of Going to GRNMS to do Activities.....	28
Comparisons of All Respondents to each Survey Version.....	28
Comparisons of Respondents to both Survey Versions.....	28
<b>Chapter 3: Users Version 1 compared to Pooled Version 1 &amp; 2 Samples.....</b>	<b>31</b>
Socioeconomic/Demographic Profiles.....	31
Activity Participation in Coastal & Ocean Areas in and around Georgia Outside GRNMS.....	34
Activity Participation in coastal & Ocean Areas in GRNMS.....	35
Average of Mean Person-days by Activity in the Coastal & Ocean Areas in and around Georgia Outside GRNMS.....	35
Average or Mean person-days by Activity in the Coastal & Ocean Areas in GRNMS.....	36
Sources of Information Used.....	36
Level of Trust of Information Sources Used.....	38
How Users prefer to receive information.....	40
User’s Familiarity with GRNMS Regulations.....	40
User’s Perceptions of Resource Conditions in GRNMS.....	41
Factors that influenced User Choice of going to GRNMS to do Activities.....	43
Conclusions.....	43
<b>Chapter 4: Comparisons of Users and Non-users for Version 2 Survey Responses</b>	<b>45</b>
Socioeconomic/Demographic Profiles.....	45
Activity Participation in Coastal and Ocean Areas in and around Georgia Outside GRNMS.....	48
Average or Mean Number of Person-days of Activity in Coastal and Ocean Areas in and around Georgia Outside GRNMS.....	49
Concern about the Health of Coastal & Ocean Areas in and around Georgia Outside GRNMS.....	49
Concern about the Health of Coastal & Ocean Areas in GRNMS.....	51
Ways Users and Non-users Value Coastal & Ocean Resources/Marine Environment.....	53
Activities of Actions Users and Non-users would do to ensure that coastal and Ocean resources are used sustainably and available for future generations to enjoy.....	55
Support for various Coastal & Ocean Resource Protection Strategies.....	57
<b>References.....</b>	<b>62</b>
<b>Appendix A: User and Non-user Version 2 Questionnaires.....</b>	<b>64</b>

## List of Tables

<b>Table Number</b>		<b>Page Number</b>
A.1.1	Information included by Version of Survey by User Group and where Reported and Technical details can be found.....	2
A.1.2	Sample Sizes and Response Rates for the Surveys of Users and Non-users of GRNMS.....	4
A.2.1a	Tests for Differences between Users Version 1 and Version 2: Demographic Profiles.....	6
A.2.1b	Tests for Differences between Users who responded to Both Versions 1 and 2: Demographic Profiles.....	8
A.2.2a	Tests for Differences between Users Version 1 and Versions 2: Demographic Means.....	9
A.2.2b	Tests for Differences between Users who Responded to both Versions 1 and 2: Demographic Means.....	10
A.2.3a	Tests for Differences between Users Version 1 and Versions 2 : Activity Participation in Coastal and Ocean Areas in and around Georgia Outside GRNMS.....	11
A.2.3b	Tests for Differences between Users who Responded to both Versions 1 and 2 : Activity Participation in Coastal and Ocean Areas in and around Georgia Outside GRNMS.....	12
A.2.4a	Tests for Differences between Users Version 1 and Versions 2: Activity Participation in Coastal and Ocean Areas in GRNMS.....	14
A.2.4b	Tests for Differences between Users who responded to both Versions 1 and 2: Activity Participation in Coastal and Ocean Areas in GRNMS.....	15
A.2.5a	Tests for Differences between Users Version 1 and Versions 2: Mean Person-days by Activity in Coastal and Ocean Areas in and around Georgia Outside GRNMS.....	16
A.2.5b	Tests for Differences between Users who Responded to both Versions 1 and 2: Mean Person-days by Activity in Coastal and Ocean Areas in and around Georgia Outside GRNMS.....	16
A.2.6a	Tests for Differences between Users Version 1 and Versions 2: Mean Person-days by Activity in Coastal and Ocean Areas in GRNMS.....	17
A.2.6b	Tests for Differences between Users who Responded to both Versions 1 and 2: Mean Person-days by Activity in Coastal and Ocean Areas in GRNMS.....	17
A.2.7a	Tests for Differences between Users Version 1 and Versions 2: Sources of Information Used.....	19

## List of Tables

<b>Table Number</b>		<b>Page Number</b>
A.2.7b	Tests for Differences between Users who Responded to both Versions 1 and 2: Sources of Information Used.....	20
A.2.8a	Tests for Differences between Users Version 1 and Versions 2: Trust Level of Information Sources Used Most.....	22
A.2.9a	Tests for Differences between Users Version 1 and Versions 2: How they Prefer to Receive Information about GRNMS.....	23
A.2.9b	Tests for Differences between Users who responded to both Versions 1 and 2: How they Prefer to Receive Information about GRNMS.....	24
A.2.10a	Tests for Differences between Users Version 1 and Versions 2: Familiarity with GRNMS Regulations.....	24
A.2.10b	Tests for Differences between Users who Responded to both Versions 1 and 2: Familiarity with GRNMS Regulations.....	25
A.2.11a	Perceptions of Conditions of Resources in GRNMS: Users Version 1 and Versions 2.....	26
A.2.11b	Perceptions of Conditions of Resources in GRNMS: Users who responded to both Versions 1 and 2.....	27
A.2.12a	Factors that influenced the Choice of Going to GRNMS to Do Activities: Users Version 1 and Versions 2.....	29
A.2.12b	Factors that influenced the Choice of Going to GRNMS to Do Activities: Users who Responded to both Versions 1 and 2.....	30
A.3.1	Tests for Differences between Users Version 1 and Pooled Users Versions 1 & 2: Demographic Profiles.....	32
A.3.2	Tests for Differences between Users Version 1 and Versions 1 & 2 Pooled: Demographic Means.....	33
A.3.3	Tests for Differences between Users Version 1 and Versions 1 & 2 Pooled: Activity Participation in Coastal and Ocean Areas in and around Georgia Outside GRNMS.....	34
A.3.4	Tests for Differences between Users Version 1 and Versions 1 & 2 Pooled: Activity Participation in Coastal and Ocean Areas in GRNMS.....	35
A.3.5	Tests for Differences between Users Version 1 and Versions 1 & 2 Pooled: Mean Person-days by Activity in Coastal and Ocean Areas in and around Georgia Outside GRNMS.....	36
A.3.6	Tests for Differences between Users Version 1 and Versions 1 & 2 Pooled: Mean Person-days by Activity in Coastal and Ocean Areas in GRNMS...	36

## List of Tables

<b>Table Number</b>		<b>Page Number</b>
A.3.7	Tests for Differences between Users Version 1 and Versions 1 & 2 Pooled: Sources of Information Used.....	37
A.3.8	Tests for Differences between Users Version 1 and Versions 1 & 2 Pooled: Trust Level of Information Sources Used Most.....	39
A.3.9	Tests for Differences between Users Version 1 and Versions 1 & 2 Pooled: How they Prefer to Receive Information about GRNMS.....	40
A.3.10	Tests for Differences between Users Version 1 and Versions 1 & 2 Pooled: Familiarity with GRNMS Regulations.....	41
A.3.11	Perceptions of Conditions of Resources in GRNMS: Users Version 1 and Versions 1 & 2 Pooled.....	42
A.3.12	Factors that influenced the Choice of Going to GRNMS to Do Activities: Users Version 1 and Versions 1 & 2 Pooled.....	44
A.4.1	Tests for Differences between Users and Non-users Version 2: Demographic Profiles.....	46
A.4.2	Tests for Differences between Users and Non-users Version 2: Demographic Means.....	47
A.4.3	Tests for Differences between Users and Nonusers Version 2: Activity Participation in Coastal and Ocean Areas in and around Georgia Outside GRNMS.....	48
A.4.4	Tests for Differences between Users and Non-users Version 2: Mean Person-days by Activity in Coastal and Ocean Areas in and around Georgia Outside GRNMS.....	49
A.4.5	Concern about the Health of Coastal & Ocean Areas in and around Georgia Outside of GRNMS: Users vs Non-users Version 2 Surveys.....	50
A.4.6	Concern about the Health of Coastal & Ocean Areas inside GRNMS: Users vs Non-users Version 2 Surveys.....	52
A.4.7	Ways Users versus Non-users of GRNMS Value Coastal & Ocean Resources/Marine Environment Version 2 Surveys.....	54
A.4.8	Activities or Actions Users versus Non-users of GRNMS Would Do to ensure that coastal and ocean resources are used sustainably and available for future generations to enjoy Version 2 Surveys.....	56
A.4.9	Comparisons of Users and Non-users of GRNMS on Support for Various Coastal & Ocean Resource Protection Strategies Version 2 Surveys.....	58
A.4.10	Comparisons of Users and Non-users of GRNMS on Support for Marine Zoning: Version 2 Surveys.....	59

## List of Tables

<b>Table Number</b>		<b>Page Number</b>
A.4.11	Maximum Acceptable Percent Impact on Various Activities from Marine Reserves in GRNMS: Users versus Non-users Version 2 Surveys.....	60
A.4.12	Maximum Acceptable Percent Impact on Various Activities from Research Only Areas in GRNMS: Users versus Non-users Version 2 Surveys.....	61

## **Introduction**

In 2010, a baseline study of users and non-users of Gray's Reef National Marine Sanctuary (GRNMS) was initiated. Mail surveys were designed in 2010 and implemented in 2011 for users and non-users and again in 2012 for users.

The study provides baseline data on the knowledge, attitudes and perceptions of users and non-users of GRNMS in regard to management strategies and regulations. It also provides information on socioeconomic/demographic profiles, activity participation and use of coastal and ocean waters off the Georgia coast both inside and outside GRNMS. Table A.1.1 shows the types of information obtained by version of the survey for each user group (e.g. users of GRNMS versus non-users of GRNMS) and where one can find the summaries of survey results and the technical details on analyses of the survey data.

This is the technical appendix to the main report (Leeworthy 2013) and documents how the work was conducted and provides details of the statistical tests performed.

### **Chapter 1: Surveys of Users and Non-users of GRNMS**

Separate surveys of users and non-users of GRNMS were conducted. Non-users were limited to the people living in households of the State of Georgia. The surveys collected data on 16 major types of information (Table A.1.1).

For users and non-users, two versions of the surveys were designed to address all the issues found in Table A.1.1. Both versions of the survey were implemented for separate samples of non-users of GRNMS in 2011. For users, Version 1 of the survey was implemented in 2011. Version 2, which obtains information about attitudes on selected management strategies for coastal and ocean resources both inside and outside GRNMS was implemented in 2012. This report provides the results of implementing Version 2 of the User Surveys and provides comparisons with non-users on key coastal and ocean resource management/policy strategies.

**Sampling Frames.** For users, the sampling frame was from a list of users observed in the GRNMS by the Georgia Department of Natural Resources (GADNR). GADNR randomly either boards boats or writes down the boat registration number of the boats observed in the GRNMS. The random boarding is not related to enforcement actions. For boats boarded, name and address of the boat owner/operator is obtained. GRNMS staff received a list containing 249 names and addresses and/or boat registration numbers. Boat registration files were used to obtain names and addresses for the boat registration numbers. In subsequent efforts, GADNR added 21 names and addresses that were used for the 2012 Version 2 survey.

For non-users, two samples of households were purchased from INFO USA, Inc., which maintains databases of households for survey research. Each sample consisted of the names and addresses for 500 households and was stratified by coastal and non-coastal counties. Unlike most states, Georgia has very few households living in coastal counties because of the terrain, so we over-sampled coastal counties.

Table A.1.1. Information included by Version of Survey by User Group and where Reported and Technical details can be found

Information type/User Group	Information Included in:		
	Both Versions	Version 1	Version 2
<hr/>			
1. Demographics (e.g. age, sex, race/ethnicity, educational attainment, household income, employment status, household size, household type, boat ownership, boat length, number of people aboard boat, membership in organizations, participation in fishing tournaments) <sup>1,2</sup>			
Users of GRNMS	x	x	x
Non-users	x	x	x
2. Participation and Use by Activity in and around coastal & ocean waters off Georgia outside GRNMS. <sup>1,2</sup>			
Users of GRNMS	x	x	x
Non-users	x	x	x
3. Participation and Use by Activity in coastal & ocean waters in GRNMS			
Users of GRNMS <sup>1,2</sup>	x	x	x
Non-users			
4. Sources of Information Used <sup>1,2</sup>			
Users of GRNMS	x	x	x
Non-users	x	x	x
5. Level of Trust of Sources of Information Used <sup>1,2</sup>			
Users of GRNMS	x	x	x
Non-users	x	x	x
6. Ways like to receive information <sup>1,2</sup>			
Users of GRNMS	x	x	x
Non-users	x	x	x
7. Familiarity with GRNMS Regulations <sup>1,2</sup>			
Users of GRNMS	x	x	x
Non-users	x	x	x
8. Factors that influenced the choice of GRNMS to do activities			
Users of GRNMS <sup>1,2</sup>	x	x	x
Non-users			
9. Attitudes about Management Strategies & Regulations in GRNMS <sup>1</sup>			
Users of GRNMS		x	
Non-users		x	
10. Perceptions of the Status of Conditions of Resources in GRNMS			
Users of GRNMS <sup>1,2</sup>	x	x	x
Non-users			

1. Results found in Leeworthy (2012a) and technical details in Leeworthy (2012b).

2. Results found in Leeworthy (2013) and technical details in this report.

Table A.1.1. Information included by Version of Survey by User Group and where Reported and Technical details can be found  
(continued)

Information type/User Group	Information Included in:		
	Both Versions	Version 1	Version 2
11. Concern for the Health of Coastal & Ocean Resources in the Coastal and Ocean Areas in and around Georgia outside GRNMS <sup>2</sup>			
Users of GRNMS			x
Non-users			x
12. Concern for the Health of Coastal & Ocean Resources in GRNMS <sup>2</sup>			
Users of GRNMS			x
Non-users			x
13. Ways Value Ocean & Coastal Resources/Marine Environment <sup>2</sup>			
Users of GRNMS			x
Non-users			x
14. Activities or Actions Would Do to ensure that ocean or coastal resources are used sustainably and available for future generations to enjoy <sup>2</sup>			
Users of GRNMS			x
Non-users			x
15. Support for various management strategies in the coastal & ocean areas in and around Georgia outside GRNMS <sup>2</sup>			
Users of GRNMS			x
Non-users			x
16. Support for various management strategies in the coastal & ocean areas in GRNMS <sup>2</sup>			
Users of GRNMS			x
Non-users			x

1. Results found in Leeworthy (2012a) and technical details in Leeworthy (2012b).

2. Results found in Leeworthy (2013) and technical details in this report.

**Response Rates.** For both users and non-users the Dillman Method (Dillman 1978) of mail surveys was used. A full survey was sent out, and if not returned within two weeks, a post card reminder was sent. If a completed survey was not received after an additional two weeks, a full survey package was sent. In version 1 of the user surveys, there were 249 names and addresses of which 94 were undeliverable resulting in 155 net eligible respondents. Of these respondents 79 or 50.97% responded (Table A.1.2). In version 2 of the user survey, 21 new names and addresses for users received from GADNR were added to the 155 net eligible respondents obtained from implementing version 1 for a total of 176 net eligible respondents. Of these 176 eligible respondents, 44 completed questionnaires were returned for a response rate of 25% (Table A.1.2).

For non-users Version 1, 500 surveys were mailed out with 44 undeliverable addresses resulting in 456 net eligible respondents. Of these respondents, 83 or 18.2% responded. For non-users Version 2, 500 surveys were mailed out with 54 undeliverable addresses resulting in 446 net eligible respondents. Of these respondents 60 or 13.45% responded (Table A.1.2).

Table A.1.2. Sample Sizes and Response Rates for the Surveys of Users and Non-users of GRNMS

	Users Version 1	Users Version 2	Non-users Version 1	Non-users Version 2
Original Mailing List	249	155	500	500
Undeliverable Addresses	94	0	44	54
New Additions to List Version 2	N/A	21	N/A	N/A
Net Eligible Respondents	155	176	456	446
Responded	79	44	83	60
Net Response Rate	50.97%	25.00%	18.20%	13.45%

***Non-response Bias/Sample Weighting.*** Given the low response rates for non-users, non-response bias analysis was conducted and sample weights created to adjust for non-response bias (For details see Technical Appendix, Leeworthy 2012b). People of Hispanic ethnicity had very low response rates, too low for sample weighting to be effective, so Hispanic people are not represented in the non-user surveys. Both version samples respondents were significantly different from the general Georgia population for demographic factors, sex, age, race/ethnicity, educational attainment and household income. However, for non-response bias to exist requires that these factors are also related to the answers to the survey questions. There were only a few questions for which there were any statistically significant different responses by these demographic factors, so there is some non-response bias, but it is small and was adjusted for by sample weighting. Again for details of the non-response bias analysis and the sample weighting see the Technical Appendix (Leeworthy 2012b).

### Statistical Tests

When the terms “significant difference” or “statistically significant difference” are used, it means that formal statistical tests were conducted. For categorical variable distributions, Chi-Square and Jonckheere-Terpstra (JT) tests in SAS (Statistical Analysis System Version 9.1) tests were conducted. The JT test is a non-parametric test for ordered differences among classes. Both one-sided and two-sided test were conducted, but for applications here, the two-sided tests are appropriate. For scores using 5-point Likert scales or continuous variables such as person-days or age of respondents, tests of sample means were conducted using t-tests (Proc t-test in SAS). Level of significance for all tests was at the .05 level of significance or the 95 percent confidence level.

## Chapter 2: Users Version 1 Compared to Users Version 2

In this chapter users that responded to version 1 of the survey are compared to users of version 2 of the survey. Comparisons are done for those questions that were common to both versions (see Table A.1.1 in Chapter 1). Two set of comparisons were conducted: 1) a comparison of all respondents to each version of the survey (N=77 for version 1 and N=44 for version 2) and 2) a comparison of those who responded to both versions (N=33). In this latter comparison, the tests are for statistically different answers to the same questions one year later. The results of these tests were used to make the decision of using version 2 answers when pooling the data across versions.

The results of the statistical tests of the two sets of comparisons are presented here. Tables labeled with an “a” suffix are the comparisons of all respondents to each version of the survey, while tables with a “b” suffix are the comparisons for those who responded to both versions of the survey. For distributions of variables, Chi-square and Jonckheere-Terpstra (JT) tests in SAS (Statistical Analysis System Version 9.1, Proc Freq) were used, and for sample means a t-test in SAS (Proc T-test) was used. The JT test is a nonparametric test for ordered differences in classes. Both one-side and two-sided tests were performed and reported, but for application to the data here, the two-sided tests are appropriate.

### Socioeconomic/Demographic Profiles

*Comparisons of All respondents to each Survey Version.* There was only one statistically significant difference for any of the socioeconomic/demographic factors between respondents to the two versions of the survey and this was for the mean age of the respondent. This would be expected since every respondent is one year older, but the mean age difference was more than one year (Table A.2.1a and Table 2.2a). Although a weak test of the existence of non-response bias, there was only one difference despite the fact that the response rate to version 1 was over 50%, while the response rate to version 2 was only 25% (Table A.1.2, Chapter 1).

*Comparisons of Respondents to both Survey Versions.* There were no statistically significant differences for any of the socioeconomic/demographic factors for responses to version 1 and 2 surveys (Table A.2.1b and Table A.2.2b). These are the same 33 respondents, so we wouldn't expect too much change for these households, so the results here are not surprising.

Table A.2.1a. Tests for Differences between Users Version 1 and Version 2: Demographic Profiles

Demographic Factor	Users V1 (percent)	Users V2 (percent)	Chi-square Significance <sup>1</sup>	JT Test Significance <sup>2</sup>
<b>Age</b>			0.5953	0.0666/0.1331
18 - 24	1.33	0.00		
25 - 34	2.67	2.27		
35 - 49	29.33	18.18		
50 - 64	52.00	59.09		
65 and over	14.67	20.45		
<b>Sex</b>			1.00	1.00/1.00
Male	100.00	100.00		
Female	0.00	0.00		
<b>Race</b>			1.00	1.00/1.00
White	100.00	100.00		
Black or African American	0.00	0.00		
Asian	0.00	0.00		
Native Hawaiian or Pacific Islander	0.00	0.00		
<b>Educational Attainment</b>			0.8897	0.4525/0.9051
8th grade or less	3.95	2.33		
9th to 11th grade	1.32	4.65		
High School Grad or Equivalent	25.00	23.26		
Some College	31.58	27.91		
Associates degree	2.63	6.98		
Bachelors degree	21.05	18.60		
Masters degree	6.58	6.98		
Professional degree	3.95	6.98		
Doctors degree	3.95	2.33		
<b>Household Income (Before taxes)</b>			0.655	0.3753/0.7506
Less than \$5,000	0.00	0.00		
\$5,000 - \$9,999	0.00	2.44		
\$10,000 - \$14,999	0.00	0.00		
\$15,000 - \$19,999	1.39	0.00		
\$20,000 - \$24,999	0.00	2.44		
\$25,000 - \$29,999	1.39	0.00		
\$30,000 - \$34,999	1.39	0.00		
\$35,000 - \$39,999	2.78	0.00		
\$40,000 - \$44,999	1.39	2.44		
\$45,000 - \$49,999	4.17	2.44		
\$50,000 - \$59,999	4.17	4.88		
\$60,000 - \$74,999	12.50	9.76		
\$75,000 - \$99,999	19.44	24.39		
\$100,000 - \$149,999	23.61	34.15		
\$150,000 or more	27.78	17.07		
<b>Employment Status (% yes)</b>				
unemployed	0.00	0.00	1.00	1.00/1.00
employed full-time	75.00	68.18	0.4202	0.2111/0.4221
employed part-time	7.89	2.27	0.2054	0.1617/0.2073
retired	17.11	25.00	0.2975	0.1497/0.2995
student	1.32	0.00	0.4448	0.2234/0.4467
homemaker	0.00	2.27	0.1869	0.0944/0.1888

Table A.2.1a. Tests for Differences between Users Version 1 and Version 2: Demographic Profiles (continued)

Demographic Factor	Users V1 (percent)	Users V2 (percent)	Chi-square Significance <sup>1</sup>	JT Test Significance <sup>2</sup>
<b>Household Type</b>			0.0779	0.2727/0.5454
Single adult with no children under 18	15.79	2.33		
Single adult with children under 18	1.32	0		
Two adults with no children under 18	43.42	65.12		
Two adults with children under 18	25	13.95		
More than two adults with no children under 18	9.21	9.30		
More than two adults with children under 18	5.26	9.30		
<b>Boat Ownership (% Yes)</b>	97.37	97.67	0.9185	0.4594/0.9189
<b>Membership in Organizations (% Yes)</b>				
Fishing	42.86	54.55	0.2153	0.1086/0.2172
Diving	2.60	2.27	0.912	0.4562/0.9124
Environmental	15.58	6.82	0.1592	0.0805/0.1610
Chamber of Commerce	11.69	13.64	0.7544	0.3777/0.7554
1. A value less than (<) 0.05 is statistically significant with 95 percent confidence or higher.				
2. The Jonckheere-Terpstra (JT) test is a nonparametric test for ordered differences among classes (here users version 1 and versions 2). It tests the null hypothesis that the distributions of the response variable does differ among classes. The number for significance on the left side is the one-tailed test, while the second number for significance is a two-tailed test. A value of less than (<) 0.05 is statistically significant with 95 percent confidence or higher.				

Table A.2.1b. Tests for Differences between Users who ReSponded to Both Versions 1 and 2: Demographic Profiles

Demographic Factor	Users V1 (percent)	Users V2 (percent)	Chi-square Significance <sup>1</sup>	JT Test Significance <sup>2</sup>
<b>Age</b>			0.7097	0.2087/0.4175
18 - 24	0.00	0.00		
25 - 34	0.00	0.00		
35 - 49	24.24	18.18		
50 - 64	63.64	63.64		
65 and over	12.12	18.18		
<b>Sex</b>			1.00	0.50/1.00
Male	100.00	100.00		
Female	0.00	0.00		
<b>Race</b>			1.00	0.50/1.00
White	100.00	100.00		
Black or African American	0.00	0.00		
Asian	0.00	0.00		
Native Hawaiian or Pacific Islander	0.00	0.00		
<b>Educational Attainment</b>			0.5623	0.4187/0.8373
8th grade or less	6.06	3.13		
9th to 11th grade	0.00	6.25		
High School Grad or Equivalent	2.27	28.13		
Some College	45.45	31.25		
Associates degree	3.03	6.25		
Bachelors degree	12.12	15.63		
Masters degree	3.03	0.00		
Professional degree	0.00	6.25		
Doctors degree	3.03	3.13		
<b>Household Income (Before taxes)</b>			0.5798	0.4490/0.8981
Less than \$5,000	0.00	0.00		
\$5,000 - \$9,999	0.00	3.33		
\$10,000 - \$14,999	0.00	0.00		
\$15,000 - \$19,999	0.00	0.00		
\$20,000 - \$24,999	0.00	3.33		
\$25,000 - \$29,999	3.23	0.00		
\$30,000 - \$34,999	0.00	0.00		
\$35,000 - \$39,999	0.00	0.00		
\$40,000 - \$44,999	0.00	3.33		
\$45,000 - \$49,999	6.45	0.00		
\$50,000 - \$59,999	3.23	0.00		
\$60,000 - \$74,999	6.45	6.67		
\$75,000 - \$99,999	25.81	26.67		
\$100,000 - \$149,999	35.48	43.33		
\$150,000 or more	19.35	13.33		
<b>Employment Status (% yes)</b>				
unemployed	0.00	0.00	1.00	0.50/1.00
employed full-time	78.79	69.70	0.3984	0.2010/0.4020
employed part-time	6.06	3.03	0.5546	0.2788/0.5576
retired	21.21	21.21	1.00	0.50/1.00
student	0.00	0.00	1.00	0.50/1.00
homemaker	0.00	3.03	0.3136	0.1587/0.3173

Table A.2.1b. Tests for Differences between Users who Responded to both Versions 1 and 2: Demographic Profiles (continued)

Demographic Factor	Users V1 (percent)	Users V2 (percent)	Chi-square Significance <sup>1</sup>	JT Test Significance <sup>2</sup>
<b>Household Type</b>			0.6512	0.4568/0.9136
Single adult with no children under 18	12.12	3.13		
Single adult with children under 18	0	0		
Two adults with no children under 18	48.48	62.5		
Two adults with children under 18	18.18	15.63		
More than two adults with no children under 18	12.12	9.38		
More than two adults with children under 18	9.09	9.38		
<b>Boat Ownership (% Yes)</b>	96.97	96.88	0.9824	0.4913/0.9825
<b>Membership in Organizations (% Yes)</b>				
Fishing	54.55	51.52	0.8052	0.4033/0.8066
Diving	6.06	0.00	0.151	0.2462/0.4923
Environmental	24.24	9.09	0.0986	0.0506/0.1012
Chamber of Commerce	15.15	12.12	0.7198	0.3609/0.7219
1. A value less than (<) 0.05 is statistically significant with 95 percent confidence or higher.				
2. The Jonckheere-Terpstra (JT) test is a nonparametric test for ordered differences among classes (version 1 versus versions 2 responses). It tests the null hypothesis that the distributions of the response variable does differ among classes. The number for significance on the left side is the one-tailed test, while the second number for significance is a two-tailed test. A value of less than (<) 0.05 is statistically significant with 95 percent confidence or higher.				

Table A.2.2a. Tests for Differences between Users Version 1 and Versions 2: Demographic Means

Demographic Factor	Users V1 (mean)	Users V2 (mean)	T-test Significance <sup>1</sup>
Age	52.55	56.59	<b>0.0409</b>
Household Size	2.54	2.56	0.9230
Number in Household 18 or over	2.04	2.12	0.6020
Number in Household less than 18	0.51	0.39	0.5025
Boat Size (length in feet)	24.57	24.07	0.5964
Number of People aboard the boat	3.09	3.10	0.9760
1. A value less than (<) 0.05 is statistically significant with 95 percent confidence or higher.			

Table A.2.2b. Tests for Differences between Users who Responded to both Versions 1 and 2:

Demographic Means			
Demographic Factor	Users V1 (mean)	Users V2 (mean)	T-test Significance <sup>1</sup>
Age	54.88	56.88	0.3775
Household Size	2.51	2.67	0.6039
Number in Household 18 or over	2.15	2.12	0.8876
Number in Household less than 18	0.36	0.47	0.6570
Boat Size (length in feet)	24.18	24.17	0.9916
Number of People aboard the boat	3.09	2.97	0.5714

1. A value less than (<) 0.05 is statistically significant with 95 percent confidence or higher.

## Activity Participation in Coastal and Ocean Areas in and around Georgia Outside GRNMS

*Comparisons of All respondents to each Survey Version.* There were no statistically significant differences for participation in any of the recreation activities (Table A.2.3a). Again, even though a weak test for non-response bias, for key survey parameters estimated there are no differences. So estimates are robust to survey response rates.

*Comparisons of Respondents to both Survey Versions.* Again, there are no statistically significant differences for participation for any of the recreation activities (Table A.2.3b).

## Activity Participation in Coastal and Ocean Areas in GRNMS

*Comparisons of All respondents to each Survey Version.* There were no statistically significant differences for participation in any of the recreation activities (Table A.2.4a). Again estimates are robust to survey response rates.

*Comparisons of Respondents to both Survey Versions.* Again, there were no statistically significant differences for participation in any recreation activities (Table A.2.4b).

Table A.2.3a. Tests for Differences between Users Version 1 and Versions 2 : Activity Participation  
in Coastal and Ocean Areas in and around Georgia Outside GRNMS

Activity	Users V1 (percent)	Users V2 (percent)	Chi-square Significance <sup>1</sup>	JT Test Significance <sup>2</sup>
Recreational bottom fishing	92.11	90.91	0.8193	0.4100/0.8200
Recreational fishing - trolling or drifting in mid or top water	90.79	93.18	0.6477	0.3245/0.6491
Recreational spear fishing with power heads	7.89	6.82	0.8292	0.4149/0.8299
Recreational spear fishing without power heads	13.16	13.64	0.9408	0.4705/0.9410
SCUBA diving (taking things)	10.53	6.82	0.4975	0.2497/0.4993
SCUBA diving (don't take things)	14.47	15.91	0.8319	0.4163/0.8326
Whale watching or other wildlife viewing activities	38.16	38.64	0.9586	0.4794/0.9587
Sailing	6.58	4.55	0.6469	0.3242/0.6483
Beach Activities	76.32	81.82	0.4808	0.2413/0.4826
Surfing	9.21	11.36	0.7048	0.3530/0.7060
Wind Surfing/Kite boarding	5.26	11.36	0.2215	0.1117/0.2234
Personal Watercraft Use	21.05	13.64	0.3116	0.1568/0.3137
Shorebird Watching	32.89	34.09	0.8934	0.4469/0.8939
<b>Aggregate Activities</b>				
Any Fishing	96.10	93.18	0.4763	0.2391/0.4781
Any Spear Fishing	12.99	13.64	0.9192	0.4598/0.9195
Any SCUBA Diving	16.88	18.18	0.8560	0.4283/0.8566
Any Consumptive	96.10	93.18	0.4763	0.2391/0.4781
Any Nonconsumptive	44.16	45.45	0.8900	0.4453/0.8905
Only Consumptive	53.25	47.73	0.5590	0.2803/0.5606
Only Nonconsumptive	1.30	0.00	0.4478	0.2248/0.4497

1. A value less than (<) 0.05 is statistically significant with 95 percent confidence or higher.
2. The Jonckheere-Terpstra (JT) test is a nonparametric test for ordered differences among classes (here users version 1 and versions 2). It tests the null hypothesis that the distributions of the response variable does differ among classes. The number for significance on the left side is the one-tailed test, while the second number for significance is a two-tailed test. A value of less than (<) 0.05 is statistically significant with 95 percent confidence or higher.

Table A.2.3b. Tests for Differences between Users who Responded to both Versions 1 and 2 : Activity Participation in Coastal and Ocean Areas in and around Georgia Outside GRNMS

Activity	Users V1 (percent)	Users V2 (percent)	Chi-square Significance <sup>1</sup>	JT Test Significance <sup>2</sup>
Recreational bottom fishing	87.88	93.94	0.3918	0.1977/0.3954
Recreational fishing - trolling or drifting in mid or top water	87.88	93.94	0.3918	0.1977/0.3954
Recreational spear fishing with power heads	6.06	3.03	0.5546	0.2788/0.5576
Recreational spear fishing without power heads	12.12	12.12	1.0000	0.50/1.00
SCUBA diving (taking things)	9.09	9.09	1.0000	0.50/1.00
SCUBA diving (don't take things)	18.18	12.12	0.4923	0.2478/0.4956
Whale watching or other wildlife viewing activities	42.42	45.45	0.8041	0.4028/0.8056
Sailing	6.06	6.06	1.0000	0.50/1.00
Beach Activities	72.73	81.82	0.3782	0.1909/0.3819
Surfing	6.06	12.12	0.3918	0.1977/0.3954
Wind Surfing/Kite boarding	6.06	12.12	0.3918	0.1977/0.3955
Personal Watercraft Use	18.18	15.15	0.7412	0.3715/0.7431
Shorebird Watching	36.36	42.42	0.6144	0.3085/0.6171
<b>Aggregate Activities</b>				
Any Fishing	93.94	93.94	1.0000	0.50/1.00
Any Spear Fishing	12.12	12.12	1.0000	0.50/1.00
Any SCUBA Diving	18.18	15.15	0.7412	0.3715/0.7431
Any Consumptive	93.94	93.94	1.0000	0.50/1.00
Any Nonconsumptive	45.45	48.48	0.8052	0.4033/0.8066
Only Consumptive	51.52	45.45	0.6223	0.3125/0.6250
Only Nonconsumptive	3.03	0.00	0.3136	0.1587/0.3173
1. A value less than (<) 0.05 is statistically significant with 95 percent confidence or higher.				
2. The Jonckheere-Terpstra (JT) test is a nonparametric test for ordered differences among classes (here version 1 versus versions 2 responses). It tests the null hypothesis that the distributions of the response variable does differ among classes. The number for significance on the left side is the one-tailed test, while the second number for significance is a two-tailed test. A value of less than (<) 0.05 is statistically significant with 95 percent confidence or higher.				

## Average or Mean Person-days by Activity in the Coastal & Ocean Areas in and around Georgia Outside GRNMS

**Comparisons of All respondents to each Survey Version.** There was only one statistically significant difference and that was for “Recreational fishing – trolling or drifting in mid or top water”. Version 2 respondents spent significantly more days doing this activity than version 1 respondents (Table A.2.5a). Version 2 respondents also did more days of “Recreational bottom fishing”, but this difference was not statistically significant. Small sample sizes for days of activity can result in higher variations in estimates because days can range from 1 to 365 days

per year (outliers were eliminated, see Leeworthy 2012b), so what appear to be relatively large differences do not translate into statistically significant differences. Pooling the data across versions of the data can increase sample sizes and reduce variations in the estimates. This is done in Chapter 3.

***Comparisons of Respondents to both Survey Versions.*** There were no statistically significant differences for any of the estimates of mean person-days of activity between the samples of the two survey versions despite what appear to be somewhat large differences (Table A.2.5b). Again, this is due to relatively small sample sizes and higher variations. Again, pooling the data across versions can reduce variation and produce more robust estimates of person-days of activity (Chapter 3).

Table A.2.4a. Tests for Differences between Users Version 1 and Versions 2: Activity Participation in Coastal and Ocean Areas in GRNMS				
Activity	Users V1 (percent)	Users V2 (percent)	Chi-square Significance <sup>1</sup>	JT Test Significance <sup>2</sup>
Recreational bottom fishing	81.58	79.55	0.7851	0.3930/0.7859
Recreational fishing - trolling or drifting in mid or top water	89.47	86.36	0.6091	0.3053/0.6106
Recreational spear fishing with power heads	2.63	0.00	0.2779	0.1399/0.2799
Recreational spear fishing without power heads	3.95	6.82	0.4868	0.2443/0.4887
SCUBA diving (taking things)	1.32	4.55	0.2748	0.1384/0.2768
SCUBA diving (don't take things)	9.21	9.09	0.9825	0.4913/0.9826
Whale watching or other wildlife viewing activities	21.05	34.09	0.1159	0.0587/0.1174
Sailing	2.63	2.27	0.9034	0.4519/0.9038
<b>Aggregate Activities</b>				
Any Fishing	94.81	93.18	0.7129	0.3570/0.7141
Any Spear Fishing	5.19	9.09	0.4067	0.2043/0.4087
Any SCUBA Diving	9.09	11.36	0.6874	0.3443/0.6887
Any Consumptive	94.81	93.18	0.7129	0.3570/0.7141
Any Nonconsumptive	27.27	36.36	0.2965	0.1492/0.2985
Only Consumptive	68.83	56.82	0.1841	0.0930/0.1860
Only Nonconsumptive	1.30	0.00	0.4478	0.2248/0.4497
1. A value less than (<) 0.05 is statistically significant with 95 percent confidence or higher.				
2. The Jonckheere-Terpstra (JT) test is a nonparametric test for ordered differences among classes (here users version 1 and versions 2). It tests the null hypothesis that the distributions of the response variable does differ among classes. The number for significance on the left side is the one-tailed test, while the second number for significance is a two-tailed test. A value of less than (<) 0.05 is statistically significant with 95 percent confidence or higher.				

Activity	Users V1 (percent)	Users V2 (percent)	Chi-square Significance <sup>1</sup>	JT Test Significance <sup>2</sup>
Recreational bottom fishing	87.88	84.45	0.7198	0.3609/0.7219
Recreational fishing - trolling or drifting in mid or top water	93.94	84.85	0.2304	0.1170/0.2340
Recreational spear fishing with power heads	3.03	0.00	0.3136	0.1587/0.3173
Recreational spear fishing without power heads	6.06	6.06	1.0000	0.50/1.00
SCUBA diving (taking things)	3.03	6.06	0.5546	0.2788/0.5576
SCUBA diving (don't take things)	15.15	9.09	0.4507	0.2271/0.4541
Whale watching or other wildlife viewing activities	27.27	42.42	0.1965	0.1000/0.1999
Sailing	0.00	3.03	0.3136	0.1587/0.3173
<b>Aggregate Activities</b>				
Any Fishing	96.97	93.94	0.5546	0.2788/0.5576
Any Spear Fishing	9.09	9.09	1.0000	0.50/1.00
Any SCUBA Diving	15.15	12.12	0.7198	0.3609/0.7219
Any Consumptive	96.97	93.94	0.5546	0.2788/0.5576
Any Nonconsumptive	33.33	42.42	0.4465	0.2250/0.4500
Only Consumptive	63.64	51.52	0.3191	0.1614/0.3228
Only Nonconsumptive	0.00	0.00	1.0000	0.50/1.00
1. A value less than (<) 0.05 is statistically significant with 95 percent confidence or higher.				
2. The Jonckheere-Terpstra (JT) test is a nonparametric test for ordered differences among classes (here version 1 versus versions 2 responses). It tests the null hypothesis that the distributions of the response variable does differ among classes. The number for significance on the left side is the one-tailed test, while the second number for significance is a two-tailed test. A value of less than (<) 0.05 is statistically significant with 95 percent confidence or higher.				

## Average or Mean Person-days by Activity in the Coastal & Ocean Areas in GRNMS

**Comparisons of All respondents to each Survey Version.** There was only one statistically significant difference and that was for “recreational bottom fishing”. Users in version 2 did over twice as many days of this activity than those who responded to version 1 of the survey (Table A.2.6a).

**Comparisons of Respondents to both Survey Versions.** There were no statistically significant differences (Table A.2.6b). These same 33 users did not significantly change the number of days they did any of the activities in GRNMS between the two years. The difference in the estimates for “recreational bottom fishing” is quite large, but again variation in the number of days is affected by relatively small sample sizes.

Table A.2.5a. Tests for Differences between Users Version 1 and Versions 2: Mean Person-days by Activity in Coastal and Ocean Areas in and around Georgia Outside GRNMS

User Group/Activity	Users V1 (mean)	Users V2 (mean)	T-test Significance <sup>1</sup>
Recreational bottom fishing	21.81	29.14	0.1992
Recreational fishing - trolling or drifting in mid or top water	<b>13.86</b>	<b>21.95</b>	<b>0.0328</b>
Recreational spear fishing with power heads	0.28	0.09	0.4038
Recreational spear fishing without power heads	0.42	0.22	0.4557
SCUBA diving (taking things)	0.13	0.14	0.9201
SCUBA diving (don't take things)	0.38	0.52	0.6381
Whale watching or other wildlife viewing activities	5.10	2.20	0.1400

1. A value less than (<) 0.05 is statistically significant with 95 percent confidence or higher.

Table A.2.5b. Tests for Differences between Users who Responded to both Versions 1 and 2: Mean Person-days by Activity in Coastal and Ocean Areas in and around Georgia Outside GRNMS

User Group/Activity	Users V1 (mean)	Users V2 (mean)	T-test Significance <sup>1</sup>
Recreational bottom fishing	21.81	30.69	0.1883
Recreational fishing - trolling or drifting in mid or top water	14.07	19.39	0.3311
Recreational spear fishing with power heads	0.06	0.00	0.3212
Recreational spear fishing without power heads	0.26	0.07	0.3782
SCUBA diving (taking things)	0.25	0.19	0.8383
SCUBA diving (don't take things)	0.61	0.45	0.7385
Whale watching or other wildlife viewing activities	5.31	2.79	0.3489

1. A value less than (<) 0.05 is statistically significant with 95 percent confidence or higher.

User Group/Activity	Users V1 (mean)	Users Pooled (mean)	T-test Significance <sup>1</sup>
Recreational bottom fishing	<b>6.64</b>	<b>13.45</b>	<b>0.0275</b>
Recreational fishing - trolling or drifting in mid or top water	7.19	10.38	0.2092
Recreational spear fishing with power heads	0.11	0.00	0.4461
Recreational spear fishing without power heads	0.00	0.12	0.0695
SCUBA diving (taking things)	0.00	0.14	0.1878
SCUBA diving (don't take things)	0.27	0.23	0.8800
Whale watching or other wildlife viewing activities	0.96	1.75	0.3005

1. A value less than (<) 0.05 is statistically significant with 95 percent confidence or higher.

User Group/Activity	Users V1 (mean)	Users V2 (mean)	T-test Significance <sup>1</sup>
Recreational bottom fishing	8.38	15.59	0.1658
Recreational fishing - trolling or drifting in mid or top water	8.71	9.75	0.7953
Recreational spear fishing with power heads	0.24	0.00	0.3211
Recreational spear fishing without power heads	0.00	0.06	0.3290
SCUBA diving (taking things)	0.00	0.19	0.3212
SCUBA diving (don't take things)	0.59	0.25	0.4275
Whale watching or other wildlife viewing activities	0.70	2.24	0.1356

1. A value less than (<) 0.05 is statistically significant with 95 percent confidence or higher.

## Sources of Information Used

**Comparisons of All respondents to each Survey Version.** Out of the 22 sources of information for which tests were conducted, there were five statistically significant differences. Version 2 respondents had higher rates of use of information from the “Atlantic States Marine Fisheries Commission”, the “Atlantic Fishery Management Council”, “Georgia Sea Grant”, the “International Game and Fish Association” and the “Southern Kingfish Association” (Table A.2.7a). Thus, there appears to be some support for non-response bias for sources of information used. Pooling the data across samples may provide better estimates (Chapter 3).

**Comparisons of Respondents to both Survey Versions.** Out of the 22 sources of information for which tests were conducted, there were only two statistically significant differences in responses to version 1 and 2 survey versions for the same 33 respondents. In the version 2 survey, these 33

respondents increased their use of “Georgia Sea Grant” and the “International Game and Fish Association” (Table A.2.7b). It is possible these respondents learned of these sources of information from the version 1 survey. So part of the explanation of the differences in responses to version 1 and 2 survey is not non-response bias, but a result of learning.

Table A.2.7a. Tests for Differences between Users Version 1 and Versions 2: Sources of Information Used

Source of Information	Users V1 (Percent)	Users V2 (Percent)	Chi-Square Significance <sup>1</sup>	JT Test Significance <sup>2</sup>
Grays Reef National Marine Sanctuary Advisory Council	17.11	23.26	0.4144	0.2082/0.4163
Grays Reef National Marine Sanctuary Staff	14.47	23.26	0.2273	0.1147/0.2293
Grays Reef National Marine Sanctuary Web site	59.21	51.16	0.3952	0.1986/0.3972
NOAA's National Marine Fisheries Service	50.00	46.51	0.7146	0.3579/0.7157
Atlantic States Marine Fisheries Commission	6.58	18.60	<b>0.0434</b>	<b>0.0221/0.0442</b>
Atlantic Fishery Management Council	6.58	18.60	<b>0.0434</b>	<b>0.0221/0.0442</b>
Georgia Department of Natural Resources	71.05	67.44	0.6804	0.3408/0.6817
Georgia Sea Grant	1.32	11.63	<b>0.0135</b>	<b>0.0070/0.0139</b>
Georgia's Coastal Conservation Association (CCA)	34.21	25.58	0.3286	0.1653/0.3306
Recreational Fishing Alliance (RFA)	31.58	34.88	0.7122	0.3567/0.7133
American Sportfishing Association (ASA)	17.11	25.58	0.2683	0.1352/0.2703
National Coalition for Marine Conservation (NCMC)	1.32	9.30	<b>0.0370</b>	<b>0.0189/0.0378</b>
International Game and Fish Association (IGFA)	13.16	32.56	<b>0.0113</b>	<b>0.0058/0.0116</b>
Southern Kingfish Association (SKA)	44.74	46.51	0.8518	0.4262/0.8524
Fishing Magazines/Newsletters	50.00	55.81	0.5419	0.2718/0.5436
SCUBA diving magazines/Newsletters	11.84	23.26	0.1025	0.0520/0.1039
Newspapers	42.11	53.49	0.2315	0.1167/0.2335
Radio	26.32	27.91	0.8508	0.4257/0.8514
Television	36.84	46.51	0.3016	0.1518/0.3037
Internet	61.84	60.47	0.8822	0.4413/0.8827
Social Media (Twitter, You tube, Facebook, etc.)	8.11	16.28	0.1751	0.0885/0.1770
Word of mouth	59.21	62.79	0.7011	0.3512/0.7023
1. A value less than (<) 0.05 is statistically significant with 95 percent confidence or higher.				
2. The Jonckheere-Terpstra (JT) test is a nonparametric test for ordered differences among classes (here users version 1 and versions 2). It tests the null hypothesis that the distributions of the response variable does differ among classes. The number for significance on the left side is the one-tailed test, while the second number for significance is a two-tailed test. A value of less than (<) 0.05 is statistically significant with 95 percent confidence or higher.				

Table A.2.7b. Tests for Differences between Users who Responded to both Versions 1 and 2: Sources of Information Used

Source of Information	Users V1 (Percent)	Users V2 (Percent)	Chi-Square Significance <sup>1</sup>	JT Test Significance <sup>2</sup>
Grays Reef National Marine Sanctuary Advisory Council	30.30	21.88	0.4395	0.2215/0.4431
Grays Reef National Marine Sanctuary Staff	21.21	21.88	0.9482	0.4743/0.9486
Grays Reef National Marine Sanctuary Web site	63.64	46.88	0.1741	0.0887/0.1775
NOAA's National Marine Fisheries Service	48.48	46.88	0.8966	0.4487/0.8974
Atlantic States Marine Fisheries Commission	9.09	21.88	0.1532	0.1026/0.1850
Atlantic Fishery Management Council	9.09	21.88	0.1532	0.1026/0.1851
Georgia Department of Natural Resources	75.76	65.63	0.3692	0.1865/0.3729
Georgia Sea Grant	0.00	12.50	<b>0.0360</b>	<b>0.0187/0.0375</b>
Georgia's Coastal Conservation Association (CCA)	42.42	28.13	0.2281	0.1158/0.2317
Recreational Fishing Alliance (RFA)	42.42	34.38	0.5049	0.2541/0.5081
American Sportfishing Association (ASA)	15.15	21.88	0.4849	0.2441/0.4883
National Coalition for Marine Conservation (NCMC)	3.03	9.38	0.2873	0.2418/0.2910
International Game and Fish Association (IGFA)	9.09	28.13	<b>0.0480</b>	<b>0.0249/0.0497</b>
Southern Kingfish Association (SKA)	54.55	43.75	0.3841	0.1939/0.3878
Fishing Magazines/Newsletters	54.55	53.18	0.9086	0.4546/0.9093
SCUBA diving magazines/Newsletters	12.12	15.63	0.6826	0.3425/0.6850
Newspapers	48.48	53.13	0.7083	0.3552/0.7105
Radio	27.27	31.25	0.7245	0.3633/0.7265
Television	45.45	43.75	0.8901	0.4455/0.8909
Internet	54.55	53.13	0.9086	0.4546/0.9093
Social Media (Twitter, You tube, Facebook, etc.)	9.09	15.63	0.4227	0.2132/0.4263
Word of mouth	63.64	62.50	0.9244	0.4625/0.9250
1. A value less than (<) 0.05 is statistically significant with 95 percent confidence or higher.				
2. The Jonckheere-Terpstra (JT) test is a nonparametric test for ordered differences among classes (here version 1 versus versions 2 responses). It tests the null hypothesis that the distributions of the response variable does differ among classes. The number for significance on the left side is the one-tailed test, while the second number for significance is a two-tailed test. A value of less than (<) 0.05 is statistically significant with 95 percent confidence or higher.				

## Level of Trust of Information Sources Used

Tests for differences in the level of trust of sources of information used are constrained by the number of respondents that used the source of information. The tests were conducted for only those information sources for which both samples had at least 25 respondents that used the source of information. This restricted the tests to nine of the 22 sources of information. Tests for the distribution of scores and the mean scores were conducted. Level of trust was measured using a five-point Likert scale where 1="no trust at all", 2="very little trust", 3="neutral", 4="trust very much" and 5="completely trust". The Chi-square and JT tests were used for tests

on the differences in distributions, while the T-test was used for testing differences in mean scores.

***Comparisons of All respondents to each Survey Version.*** Of the nine sources of information for which level of trust was estimated, there were three statistically significant differences in both the distributions and mean scores. Version 1 respondents had higher levels of trusts for the “GRNMS web site”, “NOAA’s National Marine Fisheries Service”, and “Newspapers” than version 2 respondents (Table A.2.8a). So there does appear to be some potential for non-response bias for level of trust of information sources which suggests pooling the data across versions might provide better estimates (Chapter 3).

***Comparisons of Respondents to both Survey Versions.*** None of the sources of information used had sample sizes 25 or above, so no tests could be performed for these 33 respondents.

Table A.2.8a Tests for Differences between Users Version 1 and Versions 2: Trust Level of Information Sources Used Most

Selected Source/User Group <sup>1</sup>	No Trust At All	Very Little Trust	Neutral	Trust Very Much	Completely Trust	Mean	Chi-Square Significance <sup>2</sup>	JT Test Significance <sup>3</sup>	T-test Significance <sup>4</sup>
<b>GRNMS Web site</b>							0.0976	<b>0.0063/0.0127</b>	<b>0.0081</b>
Users Version 1	0.00	6.98	18.60	46.51	27.91	<b>3.95</b>			
Users Versions 2	4.76	19.05	23.81	47.62	4.76	<b>3.29</b>			
<b>NOAA's National Marine Fisheries Service</b>							0.0542	0.0268/0.0536	<b>0.0218</b>
Users Version 1	0.00	8.82	26.47	35.29	29.41	<b>3.85</b>			
Users Versions 2	21.05	5.26	26.32	36.84	10.53	<b>3.11</b>			
<b>Georgia Department of Natural Resources</b>							0.9289	0.2879/0.5759	0.5895
Users Version 1	4.17	6.25	20.83	39.58	29.17	3.83			
Users Versions 2	3.85	11.54	19.23	42.31	23.08	3.69			
<b>Southern Kingfish Association</b>							0.3191	0.2380/0.4760	0.4274
Users Version 1	0.00	6.45	22.58	35.48	35.48	4.00			
Users Versions 2	0.00	5.00	5.00	55.00	35.00	4.20			
<b>Fishing Magazines/Newsletters</b>							0.1451	0.2702/0.5404	0.4181
Users Version 1	0.00	2.94	35.29	44.12	17.65	3.76			
Users Versions 2	0.00	4.35	30.43	65.22	0.00	3.61			
<b>Newspapers</b>							0.1627	<b>0.0167/0.0335</b>	<b>0.0432</b>
Users Version 1	0.00	3.57	35.71	46.43	14.29	<b>3.71</b>			
Users Versions 2	0.00	4.76	66.67	23.81	4.76	<b>3.29</b>			
<b>Television</b>							0.4053	0.0477/0.0954	0.1045
Users Version 1	0.00	3.70	40.74	44.44	11.11	3.63			
Users Versions 2	0.00	10.53	57.89	26.32	5.26	3.26			
<b>Internet</b>							0.2778	0.1322/0.2644	0.3409
Users Version 1	0.00	9.09	47.73	36.36	6.82	3.41			
Users Versions 2	0.00	4.00	72.00	20.00	4.00	3.24			
<b>Word of mouth</b>							0.6096	0.3321/0.6642	0.8434
Users Version 1	2.38	14.29	42.86	26.19	7.14	3.43			
Users Versions 2	0.00	8.00	48.00	32.00	12.00	3.48			

1. Selected Sources are those with at least 25 observations per user group to support statistical tests between user groups.
2. A value less than (<) 0.05 is statistically significant with 95 percent confidence or higher.
3. The Jonckheere-Terpstra (JT) test is a nonparametric test for ordered differences among classes. It tests the null hypothesis that the distributions among the classes are different. The test on the left side is a one-sided test, while the test on the right is a two-sided test.
4. T-test for differences in means. A value of (0.05) or less (<) is significant at the 95 percent confidence level or higher.

## How Users Prefer to Receive Information

**Comparisons of All respondents to each Survey Version.** There were no statistically significant differences between the respondents to versions 1 and 2 (Table A.2.9a). So these responses seem to be robust to survey response rates.

**Comparisons of Respondents to both Survey Versions.** Again, there were no statistically significant differences by the 33 respondents to both survey versions for these survey items (Table A.2.9b).

Table A.2.9a. Tests for Differences between Users Version 1 and Versions 2: How they Prefer to Receive Information about GRNMS

Source of Information	Uses V1 (Percent Yes)	UsersV2 (Percent Yes)	Chi-square Significance <sup>1</sup>	JT Test Significance <sup>2</sup>
GRNMS Web site	53.95	47.73	0.5111	0.2565/0.5129
E-mail from GRNMS Staff	27.63	36.36	0.3182	0.1601/0.3202
E-mail List Serve	49.33	45.45	0.6826	0.3419/0.6839
Newsletter via U.S. Postal Service	50.00	47.73	0.8103	0.4056/0.8111
Telephone Call from GRNMS Staff	6.67	13.64	0.2051	0.1035/0.2070

1. A value less than (<) 0.05 is statistically significant with 95 percent confidence or higher.
2. The Jonckheere-Terpstra (JT) test is a nonparametric test for ordered differences among classes (here users version 1 and versions 2). It tests the null hypothesis that the distributions of the response variable does differ among classes. The number for significance on the left side is the one-tailed test, while the second number for significance is a two-tailed test. A value of less than (<) 0.05 is statistically significant with 95 percent confidence or higher.

Table A.2.9b. Tests for Differences between Users who Responded to both Versions 1 and 2: How they Prefer to Receive Information about GRNMS

Source of Information	Uses V1 (Percent Yes)	UsersV2 (Percent Yes)	Chi-square Significance <sup>1</sup>	JT Test Significance <sup>2</sup>
GRNMS Web site	42.42	39.39	0.8023	0.4019/0.8038
E-mail from GRNMS Staff	33.33	36.36	0.7962	0.3988/0.7977
E-mail List Serve	48.48	45.45	0.8052	0.4033/0.8066
Newsletter via U.S. Postal Service	51.52	51.52	1.000	0.50/1.00
Telephone Call from GRNMS Staff	9.09	15.15	0.4507	0.2271/0.4541

1. A value less than (<) 0.05 is statistically significant with 95 percent confidence or higher.
2. The Jonckheere-Terpstra (JT) test is a nonparametric test for ordered differences among classes (here version 1 versus versions 2 responses). It tests the null hypothesis that the distributions of the response variable does differ among classes. The number for significance on the left side is the one-tailed test, while the second number for significance is a two-tailed test. A value of less than (<) 0.05 is statistically significant with 95 percent confidence or higher.

## Familiarity with GRNMS Regulations

**Comparisons of All respondents to each Survey Version.** There wasn't a statistically significant difference between the respondents to versions 1 and 2 (Table A.2.10a). So the response to this survey item seem to be robust to survey response rates.

**Comparisons of Respondents to both Survey Versions.** Again, there wasn't a statistically significant difference by the 33 respondents to both survey versions for this survey item (Table A.2.10b).

Table A.2.10a. Tests for Differences between Users Version 1 and Versions 2: Familiarity with GRNMS Regulations

Rank of Familiarity	Users V1 (Percent)	Users V2 (Percent)	Chi-square Significance <sup>1</sup>	JT Test Significance <sup>2</sup>
Very Familiar	16.00	36.36	0.0311	0.0045/0.0090
Somewhat Familiar	77.33	61.36		
Not at All Familiar	6.67	2.27		

1. A value less than (<) 0.05 is statistically significant with 95 percent confidence or higher.
2. The Jonckheere-Terpstra (JT) test is a nonparametric test for ordered differences among classes (here users version 1 and versions 2). It tests the null hypothesis that the distributions of the response variable does differ among classes. The number for significance on the left side is the one-tailed test, while the second number for significance is a two-tailed test. A value of less than (<) 0.05 is statistically significant with 95 percent confidence or higher.

Table A.2.10b. Tests for Differences between Users who Responded to both Versions 1 and 2: Familiarity with GRNMS Regulations

Rank of Familiarity	Users V1 (Percent)	Users V2 (Percent)	Chi-square Significance <sup>1</sup>	JT Test Significance <sup>2</sup>
Very Familiar	31.25	30.30	0.6111	0.3981/0.7962
Somewhat Familiar	68.75	66.67		
Not at All Familiar	0.00	3.03		

1. A value less than (<) 0.05 is statistically significant with 95 percent confidence or higher.
2. The Jonckheere-Terpstra (JT) test is a nonparametric test for ordered differences among classes (here version 1 versus versions 2 responses). It tests the null hypothesis that the distributions of the response variable does differ among classes. The number for significance on the left side is the one-tailed test, while second number for significance is a two-tailed test. A value of less than (<) 0.05 is statistically significant with 95 percent confidence or higher.

## Perceptions of the Conditions of Resources in GRNMS

Tests were conducted for differences in responses to perceptions of resource conditions for 11 items included in the surveys. Differences in distributions were tested using Chi-square and JT tests, while differences in mean scores were tested using a T-test. Perceptions of conditions were measured using a five-point Likert scale where 1=“getting a lot better”, 2=“getting somewhat better”, 3=“same”, 4=“getting somewhat worse” and 5=“getting a lot worse”. So a higher mean score means perceptions were that things were getting worse. A “Don’t Know” response was also allowed for here and a high percent of respondents gave the “Don’t Know” response. The “Don’t Know” responses were retained for testing differences in the distributions of answers, but were dropped for testing differences in mean scores.

**Comparisons of All respondents to each Survey Version.** There were no statistically significant difference between the respondents to versions 1 and 2 (Table A.2.11a). So the response to these survey items seems to be robust to survey response rates.

**Comparisons of Respondents to both Survey Versions.** For the 33 respondents that answered both version of the survey, they significantly changed their responses to only one of the 11 items and that was for “Sea-based pollution (discharge from boats)” (Table A.2.10b). The overall distributions were not significantly different, but a higher percent moved from “Don’t Know” in their version 1 responses to providing scores. Version 2 mean scores were significantly lower than version 1 mean scores indicating that perceptions were that things were getting better ( a lower mean score means things were getting better).

Table 2.11a. Perceptions of Conditions of Resources in GRNMS: Users Version 1 and Versions 2

Resource	Getting a Lot Better	Getting Somewhat Better	Same	Getting Somewhat Worse	Getting a Lot Worse	Don't Know	Mean	Chi-Square Significance <sup>1</sup>	JT Test Significance <sup>2</sup>	T-test Significance <sup>3</sup>
<b>Live bottom habitat</b>								0.1612	0.0668/0.1334	0.1055
Users Version 1	10.81	24.32	25.68	1.35	0.00	37.84	3.69			
Users Versions 2	18.18	25.00	27.27	6.82	2.27	20.45	3.11			
<b>Other bottom habitat</b>								0.0736	0.0381/0.0761	0.0619
Users Version 1	8.00	20.00	33.33	1.33	0.00	37.33	3.77			
Users Versions 2	15.91	25.00	29.55	9.09	0.00	20.45	3.14			
<b>Fish populations (bottom fish)</b>								0.7029	0.1663/0.3326	0.2579
Users Version 1	18.92	22.97	24.32	8.11	0.00	25.68	3.24			
Users Versions 2	18.18	31.82	27.27	6.82	0.00	15.91	2.86			
<b>Fish populations (pelagic species)</b>								0.814	0.1859/0.3717	0.2829
Users Version 1	14.67	18.67	34.67	8.00	2.67	21.33	3.29	0.4684	0.1408/0.2816	0.1819
Users Versions 2	18.18	22.73	31.82	15.91	2.27	9.90	2.89			
<b>Other Sea life (abundance species)</b>								0.2463	0.0517/0.1034	0.0809
Users Version 1	6.67	26.67	30.67	2.67	0.00	33.33	3.63			
Users Versions 2	15.91	25.00	36.36	2.27	2.27	18.18	3.05			
<b>Water quality</b>								0.2963	0.0782/0.1564	0.0855
Users Version 1	6.76	25.68	32.43	1.35	0.00	33.78	3.63			
Users Versions 2	13.64	22.73	43.18	2.27	0.00	18.18	3.07			
<b>Invasive species (such as lionfish)</b>								0.1647	0.4447/0.8894	0.8607
Users Version 1	10.67	18.67	44.00	1.33	0.00	25.33	3.37			
Users Versions 2	13.64	13.64	40.91	11.36	0.00	20.45	3.32			
<b>Marine debris (plastics, other trash boats)</b>								0.2694	0.2677/0.5354	0.6834
Users Version 1	1.33	4.00	21.33	16.00	9.33	48.00	4.72			
Users Versions 2	2.27	0.00	20.45	22.73	20.45	34.09	4.61			
<b>Marine debris (plastics, other trash boats)</b>								0.7071	0.3661/0.7322	0.6674
Users Version 1	9.33	16.00	33.33	14.67	1.33	25.33	3.59			
Users Versions 2	9.09	20.45	27.27	20.45	4.55	18.18	3.45			
<b>boats)</b>								0.1732	0.0453/0.0906	0.0531
Users Version 1	10.67	13.33	30.67	6.67	2.67	36.00	3.85			
Users Versions 2	11.36	13.64	47.73	9.09	4.55	13.64	3.23			

1. A value less than (<) 0.05 is statistically significant with 95 percent confidence or higher.
2. The Jonckheere-Terpstra (JT) test is a nonparametric test for ordered differences among classes. It tests the null hypothesis that the distributions among the classes are different. The test on the left side is a one-sided test, while the test on the right is a two-sided test.
3. T-test for differences in means. A value of (0.05) or less (<) is significant at the 95 percent confidence level or higher.

Table 2.11b. Perceptions of Conditions of Resources in GRNMS: Users who Responded to both Versions 1 and 2

Resource	Getting a Lot Better	Getting Somewhat Better	Same	Getting Somewhat Worse	Getting a Lot Worse	Don't Know	Mean	Chi-Square Significance <sup>1</sup>	JT Test Significance <sup>2</sup>	T-test Significance <sup>3</sup>
<b>Live bottom habitat</b>								0.3232	0.4285/0.8565	0.5770
Users Version 1 Response	19.35	29.03	16.13	0.00	0.00	17.19	3.39			
Users Version 2 Response	15.15	30.30	24.24	9.09	0.00	21.21	3.12			
<b>Other bottom habitat</b>								0.3297	0.2364/0.4728	0.3416
Users Version 1 Response	15.63	21.88	25.00	0.00	0.00	37.50	3.59			
Users Version 2 Response	15.15	27.27	27.27	9.09	0.00	21.21	3.15			
<b>Fish populations (bottom fish)</b>								0.7108	0.2918/0.5836	0.8814
Users Version 1 Response	31.25	25.00	18.75	3.13	0.00	21.88	2.81			
Users Version 2 Response	181.80	33.33	27.27	3.03	0.00	18.18	2.88			
<b>Fish populations (pelagic species)</b>								0.4471	0.0969/0.1938	0.4253
Users Version 1 Response	25.00	25.00	28.13	6.25	0.00	15.63	2.78	0.5515	0.2499/0.4998	0.7991
Users Version 2 Response	18.18	21.21	33.33	18.18	0.00	9.09	2.88			
<b>Other Sea life (abundance species)</b>								0.7353	0.4673/0.9346	0.9928
Users Version 1 Response	9.38	34.38	34.38	0.00	0.00	21.88	3.12			
Users Version 2 Response	15.15	24.24	36.36	3.03	0.00	21.21	3.12			
<b>Water quality</b>								0.8214	0.4289/0.8578	0.9302
Users Version 1 Response	12.50	28.13	34.38	0.00	0.00	25.00	3.21			
Users Version 2 Response	12.12	21.21	45.45	0.00	0.00	21.21	3.18			
<b>Invasive species (such as lionfish)</b>								0.3199	0.1124/0.2248	0.4188
Users Version 1 Response	18.75	18.75	40.63	0.00	0.00	21.88	3.09			
Users Version 2 Response	9.09	12.12	48.48	9.09	0.00	21.21	3.42			
<b>Marine debris (plastics, other trash boats)</b>								0.3991	0.2927/0.5854	0.7408
Users Version 1 Response	3.13	3.13	21.88	18.75	9.38	43.75	4.59			
Users Version 2 Response	0.00	0.00	24.24	30.30	18.18	27.27	4.48			
<b>Marine debris (plastics, other trash boats)</b>								0.4403	0.1709/0.3418	0.3829
Users Version 1 Response	15.63	18.75	37.50	12.50	0.00	15.63	3.09			
Users Version 2 Response	6.06	24.24	27.27	21.21	6.06	15.15	3.42			
<b>boats)</b>								<b>0.0262</b>	0.1852/0.3704	0.2349
Users Version 1 Response	18.75	9.38	28.13	3.13	0.00	40.63	3.78			
Users Version 2 Response	6.06	18.18	48.48	9.09	6.06	12.12	3.27			

1. A value less than (<) 0.05 is statistically significant with 95 percent confidence or higher.
2. The Jonckheere-Terpstra (JT) test is a nonparametric test for ordered differences among classes. It tests the null hypothesis that the distributions among the classes are different. The test on the left side is a one-sided test, while the test on the right is a two-sided test.
3. T-test for differences in means. A value of (0.05) or less (<) is significant at the 95 percent confidence level or higher.

## **Factors that Influenced the Choice of Going to GRNMS to do Activities**

Tests were conducted on the differences for 10 factors that influenced the choice of selecting GRNMS to do activities. Responses were coded as 1="Yes", 2="Somewhat" and 3="Not at All". The Chi-square and JT tests were used to test for differences in the distributions of the answers to these factors.

*Comparisons of All respondents to each Survey Version.* There were no statistically significant difference between the respondents to versions 1 and 2 (Table A.2.12a). So the response to these survey items seems to be robust to survey response rates.

*Comparisons of Respondents to both Survey Versions.* For the 33 respondents that answered both version of the survey, there were no statistically significant in their responses to these items (Table A.2.11b).

Table A.2.12a. Factors that influenced the Choice of Going to GRNMS to Do Activities:  
Users Version 1 and Versions 2

Factor	Yes (percent)	Somewhat (percent)	Not at All (percent)	Chi-Square Significance <sup>1</sup>	JT Test Significance <sup>2</sup>
<b>Weather</b>				0.1979	0.2271/0.4541
Users Version 1	75.00	18.06	6.94		
Users Version 2	66.67	30.95	2.38		
<b>Fish species preference</b>				0.913	0.4135/0.8269
Users Version 1	80.56	13.89	5.56		
Users Version 2	78.57	16.67	4.76		
<b>Time of Day</b>				0.0413	0.0073/0.0147
Users Version 1	37.31	28.36	34.33		
Users Version 2	57.89	28.95	13.16		
<b>Seasonal patterns</b>				0.2193	0.3252/0.6505
Users Version 1	67.14	25.71	7.14		
Users Version 2	69.23	30.77	0.00		
<b>Word of mouth/radio talk</b>				0.5225	0.3384/0.6768
Users Version 1	36.36	33.33	30.30		
Users Version 2	35.14	43.24	21.62		
<b>Boat Captain's choice</b>				0.013	0.0218/0.0436
Users Version 1	27.69	26.15	46.15		
Users Version 2	55.88	8.82	35.29		
<b>Sea Conditions</b>				0.5652	0.2825/0.5650
Users Version 1	74.65	18.31	7.04		
Users Version 2	78.57	19.05	2.38		
<b>Distance to GRNMS</b>				0.9913	0.4663/0.9327
Users Version 1	60.56	25.35	14.08		
Users Version 2	60.00	25.00	15.00		
<b>Better fishing</b>				0.7188	0.2781/0.5562
Users Version 1	52.78	41.67	5.56		
Users Version 2	57.50	40.00	2.50		
<b>Better diving for things to see</b>				0.7614	0.2535/0.5070
Users Version 1	14.29	12.24	73.47		
Users Version 2	11.54	7.69	80.77		

1. A value less than (<) 0.05 is statistically significant with 95 percent confidence or higher.
2. The Jonckheere-Terpstra (JT) test is a nonparametric test for ordered differences among classes (here users version 1 and version 2). It tests the null hypothesis that the distributions of the response variable does differ among classes. The number for significance on the left side is the one-tailed test, while the second number for significance is a two-tailed test. A value of less than (<) 0.05 is statistically significant with 95 percent confidence or higher.

Table A.2.12b. Factors that influenced the Choice of Going to GRNMS to Do Activities:  
Users who Responded to both Versions 1 and 2

Factor	Yes (percent)	Somewhat (percent)	Not at All (percent)	Chi-Square Significance <sup>1</sup>	JT Test Significance <sup>2</sup>
<b>Weather</b>				0.1998	0.2252/0.4504
Users Version 1 Response	67.74	22.58	9.68		
Users Version 2 Response	54.84	41.94	3.23		
<b>Fish species preference</b>				0.2794	0.1417/.2834
Users Version 1 Response	90.32	9.68	0.00		
Users Version 2 Response	80.65	19.35	0.00		
<b>Time of Day</b>				0.2146	0.0413/0.0826
Users Version 1 Response	34.48	34.48	31.03		
Users Version 2 Response	55.56	29.63	14.81		
<b>Seasonal patterns</b>				0.6234	0.4539/0.9079
Users Version 1 Response	70.97	25.81	3.23		
Users Version 2 Response	71.43	28.57	0.00		
<b>Word of mouth/radio talk</b>				0.7347	0.2300/0.4599
Users Version 1 Response	28.57	42.86	28.57		
Users Version 2 Response	38.46	38.46	23.08		
<b>Boat Captain's choice</b>				0.1077	0.2073/0.4146
Users Version 1 Response	35.71	32.14	32.14		
Users Version 2 Response	56.52	8.70	34.78		
<b>Sea Conditions</b>				0.4828	0.1162/0.2324
Users Version 1 Response	60.00	33.33	6.67		
Users Version 2 Response	74.19	22.58	3.23		
<b>Distance to GRNMS</b>				0.6777	0.3183/0.6366
Users Version 1 Response	61.29	22.58	16.13		
Users Version 2 Response	68.97	13.79	17.24		
<b>Better fishing</b>				0.7727	0.3873/0.7745
Users Version 1 Response	65.63	34.38	0.00		
Users Version 2 Response	62.07	37.93	0.00		
<b>Better diving for things to see</b>				0.9388	0.4091/0.8181
Users Version 1 Response	15.79	10.53	73.68		
Users Version 2 Response	11.76	11.76	76.47		

1. A value less than (<) 0.05 is statistically significant with 95 percent confidence or higher.
2. The Jonckheere-Terpstra (JT) test is a nonparametric test for ordered differences among classes (here version 1 versus version 2 responses). It tests the null hypothesis that the distributions of the response variable does differ among classes. The number for significance on the left side is the one-tailed test, while the second number for significance is a two-tailed test. A value of less than (<) 0.05 is statistically significant with 95 percent confidence or higher.

### **Chapter 3: Users Version 1 Compared to Pooled Version 1 & 2 Samples**

In this chapter, the responses to the version 1 survey of users are compared with the responses of the pooled data across versions 1 and 2. This will inform as to what are the best results to use for users. The pooled results are based on larger sample sizes and for certain measures such as levels of trust of sources of information used and person-days of activity are likely to be more sensitive to sample sizes than other measurements in the surveys. So it is expected that the pooled results will provide better estimates than version 1 survey results for the questions that were asked in both versions of the survey.

#### **Socioeconomic/Demographic Profiles**

There were no statistically significant differences between the results for any socioeconomic/demographic factor in the version 1 survey and the pooled results across survey versions (Table A.3.1 and Table A.3.2). So the surveys seem to be robust for estimates on socioeconomic/demographic profile information.

Table A.3.1. Tests for Differences between Users Version 1 and Pooled Users Versions 1 & 2: Demographic Profi

Demographic Factor	Users V1 (percent)	Users Pooled (percent)	Chi-square Significance <sup>1</sup>	JT Test Significance <sup>2</sup>
<b>Age</b>			0.9539	0.2774/0.5548
18 - 24	1.33	1.16		
25 - 34	2.67	3.49		
35 - 49	29.33	25.58		
50 - 64	52.00	51.16		
65 and over	14.67	18.60		
<b>Sex</b>			1.00	1.00/1.00
Male	100.00	100.00		
Female	0.00	0.00		
<b>Race</b>			1.00	1.00/1.00
White	100.00	100.00		
Black or African American	0.00	0.00		
Asian	0.00	0.00		
Native Hawaiian or Pacific Islander	0.00	0.00		
<b>Educational Attainment</b>			0.9166	0.2378/0.4756
8th grade or less	3.95	2.33		
9th to 11th grade	1.32	3.49		
High School Grad or Equivalent	25.00	23.26		
Some College	31.58	24.42		
Associates degree	2.63	4.65		
Bachelors degree	21.05	23.26		
Masters degree	6.58	8.14		
Professional degree	3.95	6.98		
Doctors degree	3.95	3.49		
<b>Household Income (Before taxes)</b>			0.989	0.3971/0.7942
Less than \$5,000	0.00	0.00		
\$5,000 - \$9,999	0.00	1.22		
\$10,000 - \$14,999	0.00	0.00		
\$15,000 - \$19,999	1.39	1.22		
\$20,000 - \$24,999	0.00	1.22		
\$25,000 - \$29,999	1.39	0.00		
\$30,000 - \$34,999	1.39	1.22		
\$35,000 - \$39,999	2.78	2.44		
\$40,000 - \$44,999	1.39	2.44		
\$45,000 - \$49,999	4.17	2.44		
\$50,000 - \$59,999	4.17	4.88		
\$60,000 - \$74,999	12.50	13.41		
\$75,000 - \$99,999	19.44	19.51		
\$100,000 - \$149,999	23.61	24.39		
\$150,000 or more	27.78	25.61		
<b>Employment Status (% yes)</b>				
unemployed	0.00	0.00	1.00	1.00/1.00
employed full-time	75.00	70.11	0.4865	0.2439/0.4878
employed part-time	7.89	5.75	0.5856	0.2934/0.5867
retired	17.11	19.54	0.689	0.3450/0.6899
student	1.32	1.15	0.9233	0.4618/0.9236
homemaker	0.00	1.15	0.3485	0.1750/0.3500

Table A.3.1. Tests for Differences between Users Version 1 and Pooled Versions 1 & 2: Demographic Profiles (continued)

Demographic Factor	Users V1 (percent)	Users Pooled (percent)	Chi-square Significance <sup>1</sup>	JT Test Significance <sup>2</sup>
<b>Household Type</b>			0.8793	0.4571/0.9142
Single adult with no children under 18	15.79	10.47		
Single adult with children under 18	1.32	1.16		
Two adults with no children under 18	43.42	52.33		
Two adults with children under 18	25	22.09		
More than two adults with no children under 18	9.21	8.14		
More than two adults with children under 18	5.26	5.81		
<b>Boat Ownership (% Yes)</b>	97.37	97.67	0.9003	0.4503/0.9006
<b>Membership in Organizations (% Yes)</b>				
Fishing	42.68	44.32	0.8503	0.4254/0.8507
Diving	2.60	1.14	0.4834	0.2424/0.4848
Environmental	15.58	7.95	0.1256	0.0634/0.1267
Chamber of Commerce	11.69	11.36	0.948	0.4741/0.9482

1. A value less than (<) 0.05 is statistically significant with 95 percent confidence or higher.
2. The Jonckheere-Terpstra (JT) test is a nonparametric test for ordered differences among classes (here users version 1 and versions 1 & 2 pooled). It tests the null hypothesis that the distributions of the response variable does differ among classes. The number for significance on the left side is the one-tailed test, while the second number for significance is a two-tailed test. A value of less than (<) 0.05 is statistically significant with 95 percent confidence or higher.

Table A.3.2. Tests for Differences between Users Version 1 and Versions 1 & 2 Pooled: Demographic Means

Demographic Factor	Users V1 (mean)	Users Pooled (mean)	T-test Significance <sup>1</sup>
Age	52.55	53.72	0.4941
Household Size	2.54	2.56	0.9138
Number in Household 18 or over	2.04	2.03	0.9703
Number in Household less than 18	0.51	0.51	0.9964
Boat Size (length in feet)	24.57	24.48	0.9070
Number of People aboard boat	3.09	3.09	0.9836

1. A value less than (<) 0.05 is statistically significant with 95 percent confidence or higher.

## Activity Participation in Coastal & Ocean Areas in and around Georgia Outside GRNMS

There were no statistically significant differences between the results for any recreation activity (Table A.3.3). So the survey results seem to be robust for estimates of activity participation in Georgia coastal and ocean waters outside GRNMS.

Table A.3.3. Tests for Differences between Users Version 1 and Versions 1 & 2 Pooled: Activity Participation in Coastal and Ocean Areas in and around Georgia Outside GRNMS

Activity	Users V1 (percent)	Users Pooled (percent)	Chi-square Significance <sup>1</sup>	JT Test Significance <sup>2</sup>
Recreational bottom fishing	92.11	93.10	0.8077	0.4041/0.8082
Recreational fishing - trolling or drifting in mid or top water	90.79	93.10	0.5864	0.2938/0.5876
Recreational spear fishing with power	7.89	8.05	0.9716	0.4859/0.9717
Recreational spear fishing without power heads	13.16	13.79	0.9057	0.4530/0.9060
SCUBA diving (taking things)	10.53	9.20	0.7757	0.3882/0.7764
SCUBA diving (don't take things)	14.47	13.79	0.9009	0.4506/0.9012
Whale watching or other wildlife viewing activities	38.16	36.78	0.8563	0.4283/0.8567
Sailing	6.58	5.75	0.8253	0.4129/0.8258
Beach Activities	76.32	80.46	0.5204	0.2608/0.5217
Surfing	9.21	11.49	0.6342	0.3176/0.6352
Wind Surfing/Kite boarding	5.26	8.05	0.4799	0.2406/0.4812
Personal Watercraft Use	21.05	18.39	0.6695	0.3352/0.6705
Shorebird Watching	32.89	32.18	0.923	0.4616/0.9232
<b>Aggregate Activities</b>				
Any Fishing	96.10	95.45	0.8364	0.4185/0.8369
Any Spear Fishing	12.99	13.64	0.9026	0.4514/0.9029
Any SCUBA Diving	16.88	17.05	0.9779	0.4890/0.9780
Any Consumptive	96.10	95.45	0.8364	0.4185/0.8369
Any Nonconsumptive	44.16	44.32	0.9833	0.4917/0.9833
Only Consumptive	53.25	51.14	0.7866	0.3936/0.7872
Only Nonconsumptive	1.30	0.00	0.2836	0.1425/0.2850

1. A value less than (<) 0.05 is statistically significant with 95 percent confidence or higher.
2. The Jonckheere-Terpstra (JT) test is a nonparametric test for ordered differences among classes (here users version 1 and versions 1 & 2 pooled). It tests the null hypothesis that the distributions of the response variable does differ among classes. The number for significance on the left side is the one-tailed test, while the second number for significance is a two-tailed test. A value of less than (<) 0.05 is statistically significant with 95 percent confidence or higher.

## Activity Participation in coastal & Ocean Areas in GRNMS

There were no statistically significant differences between the results for any recreation activity (Table A.3.4). So the survey results seem to be robust for estimates of activity participation in GRNMS.

Table A.3.4. Tests for Differences between Users Version 1 and Versions 1 & 2 Pooled: Activity Participation in Coastal and Ocean Areas in GRNMS

Activity	Users V1 (percent)	Users Pooled (percent)	Chi-square Significance <sup>1</sup>	JT Test Significance <sup>2</sup>
Recreational bottom fishing	81.58	78.16	0.588	0.2946/0.5891
water	89.47	86.21	0.526	0.2636/0.5272
Recreational spear fishing with power heads	2.63	1.15	0.4825	0.2419/0.4838
Recreational spear fishing without power heads	3.95	4.60	0.8381	0.4193/0.8386
SCUBA diving (taking things)	1.32	2.30	0.6413	0.3212/0.6424
SCUBA diving (don't take things)	9.21	6.90	0.5864	0.2938/0.5876
Whale watching or other wildlife viewing activities	21.05	25.29	0.5236	0.2624/0.5248
Sailing	2.63	3.45	0.7629	0.3818/0.7636
<b>Aggregate Activities</b>				
Any Fishing	94.81	93.18	0.6628	0.3319/0.6638
Any Spear Fishing	5.19	5.68	0.8907	0.4455/0.8910
Any SCUBA Diving	9.09	7.95	0.7938	0.3972/0.7944
Any Viewing	42.86	40.17	0.6731	0.3368/0.6735
Any Consumptive	94.81	93.18	0.6628	0.3319/0.6638
Any Nonconsumptive	27.27	29.55	0.7469	0.3738/0.7477
Only Consumptive	68.83	64.77	0.5811	0.2911/0.5823
Only Nonconsumptive	1.30	1.14	0.9243	0.4622/0.9245

1. A value less than (<) 0.05 is statistically significant with 95 percent confidence or higher.

2. The Jonckheere-Terpstra (JT) test is a nonparametric test for ordered differences among classes (here users version 1 and versions 1 & 2 pooled). It tests the null hypothesis that the distributions of the response variable does differ among classes. The number for significance on the left side is the one-tailed test, while the second number for significance is a two-tailed test. A value of less than (<) 0.05 is statistically significant with 95 percent confidence or higher.

## Average or Mean Person-days by Activity in the Coastal & Ocean Areas in and around Georgia Outside GRNMS

There were no statistically significant differences between version 1 estimates and the estimates obtained by pooling the data across the two versions of the survey (Table A.3.5). So the survey results seem to be robust for estimates of person-days of activity outside GRNMS.

Table A.3.5. Tests for Differences between Users Version 1 and Versions 1 & 2 Pooled: Mean Person-days by Activity in Coastal and Ocean Areas in and around Georgia Outside GRNMS

User Group/Activity	Users V1 (mean)	Users Pooled (mean)	T-test Significance <sup>1</sup>
Recreational bottom fishing	21.81	25.52	0.4501
Recreational fishing - trolling or drifting in mid or top water	13.86	17.93	0.1602
Recreational spear fishing with power heads	0.28	0.27	0.9634
Recreational spear fishing without power heads	0.42	0.39	0.8765
SCUBA diving (taking things)	0.13	0.09	0.7283
SCUBA diving (don't take things)	0.38	0.37	0.9502
Whale watching or other wildlife viewing activities	5.10	3.58	0.3586

1. A value less than (<) 0.05 is statistically significant with 95 percent confidence or higher.

## Average or Mean person-days by Activity in the Coastal & Ocean Areas in GRNMS

There were no statistically significant differences between version 1 estimates and the estimates obtained by pooling the data across the two versions of the survey (Table A.3.6). So the survey results seem to be robust for estimates of person-days of activity in GRNMS.

Table A.3.5. Tests for Differences between Users Version 1 and Versions 1 & 2 Pooled: Mean Person-days by Activity in Coastal and Ocean Areas in GRNMS

User Group/Activity	Users V1 (mean)	Users Pooled (mean)	T-test Significance <sup>1</sup>
Recreational bottom fishing	6.64	9.51	0.2111
Recreational fishing - trolling or drifting in mid or top water	8.29	7.19	0.5696
Recreational spear fishing with power heads	0.11	0.00	0.2856
Recreational spear fishing without power heads	0.00	0.06	0.1984
SCUBA diving (taking things)	0.00	0.07	0.3520
SCUBA diving (don't take things)	0.27	0.13	0.4292
Whale watching or other wildlife viewing activities	0.96	1.45	0.4438

1. A value less than (<) 0.05 is statistically significant with 95 percent confidence or higher.

## Sources of Information Used

There were no statistically significant differences between version 1 estimates and the estimates obtained by pooling the data across the two versions of the survey (Table A.3.7). So the survey results seem robust for estimates of sources of information used.

Table A.3.7. Tests for Differences between Users Version 1 and Versions 1 & 2 Pooled: Sources of Information Used

Source of Information	Users V1 (Percent)	Users Pooled (Percent)	Chi-Square Significance <sup>1</sup>	JT Test Significance <sup>2</sup>
Grays Reef National Marine Sanctuary				
Advisory Council	17.11	15.12	0.7307	0.3658/0.7315
Grays Reef National Marine Sanctuary Staff	14.47	16.28	0.7509	0.3758/0.7517
Grays Reef National Marine Sanctuary Web site	59.21	53.49	0.4638	0.2326/0.4652
NOAA's National Marine Fisheries Service	50.00	48.84	0.8826	0.4415/0.8829
Atlantic States Marine Fisheries Commission	6.58	11.63	0.2686	0.1350/0.2700
Atlantic Fishery Management Council	6.58	11.63	0.2686	0.1350/0.2700
Georgia Department of Natural Resources	71.05	67.44	0.6195	0.3103/0.6206
Georgia Sea Grant	1.32	6.98	0.0770	0.0390/0.0779
Georgia's Coastal Conservation Association	34.21	26.74	0.3018	0.1517/0.3033
Recreational Fishing Alliance (RFA)	31.58	29.07	0.7286	0.3647/0.7294
American Sportfishing Association (ASA)	17.11	22.09	0.4262	0.2138/0.4276
National Coalition for Marine Conservation (NCMC)	1.32	4.65	0.2206	0.1110/0.2220
International Game and Fish Association (IGFA)	13.16	24.42	0.0690	0.0349/0.0699
Southern Kingfish Association (SKA)	44.74	41.86	0.7123	0.3566/0.7131
Fishing Magazines/Newsletters	50.00	51.16	0.8826	0.4415/0.8829
SCUBA diving magazines/Newsletters	11.84	17.44	0.3167	0.1591/0.3182
Newspapers	42.11	45.35	0.6780	0.3395/0.6789
Radio	26.32	26.74	0.9509	0.4755/0.9510
Television	36.84	38.37	0.8410	0.4208/0.8415
Internet	61.84	63.95	0.7812	0.3909/0.7819
Social Media (Twitter, You tube, Facebook, etc.)	8.11	11.90	0.4299	0.2157/0.4314
Word of mouth	59.21	59.30	0.9905	0.4953/0.9906

1. A value less than (<) 0.05 is statistically significant with 95 percent confidence or higher.
2. The Jonckheere-Terpstra (JT) test is a nonparametric test for ordered differences among classes (here users version 1 and versions 1 & 2 pooled). It tests the null hypothesis that the distributions of the response variable does differ among classes. The number for significance on the left side is the one-tailed test, while the second number for significance is a two-tailed test. A value of less than (<) 0.05 is statistically significant with 95 percent confidence or higher.

## **Level of Trust of Sources of Information Used**

Tests for differences in the level of trust of sources of information used are constrained by the number of respondents that used the source of information. The tests were conducted for only those information sources for which both samples had at least 25 respondents that used the source of information. This restricted the tests to nine of the 22 sources of information. Tests for the distribution of scores and the mean scores were conducted. Level of trust was measured using a five-point Likert scale where 1="no trust at all", 2="very little trust", 3="neutral", 4="trust very much" and 5="completely trust". The Chi-square and JT tests were used for tests on the differences in distributions, while the T-test was used for testing differences in mean scores.

There were no statistically significant differences between version 1 estimates and the estimates obtained by pooling the data across the two versions of the survey (Table A.3.8). So the survey results seem robust for estimates on the level of trust of information sources used.

Table A.3.8 Tests for Differences between Users Version 1 and Versions 1 & 2 Pooled: Trust Level of Information Sources Used Most

Selected Source/User Group <sup>1</sup>	No Trust At All	Very Little Trust	Neutral	Trust Very Much	Completely Trust	Mean	Chi-Square Significance <sup>2</sup>	JT Test Significance <sup>3</sup>	T-test Significance <sup>4</sup>
<b>GRNMS Web site</b>							0.3281	0.0359/0.0717	0.0550
Users Version 1	0.00	6.98	18.60	46.51	27.91	3.95			
Users Versions 1 & 2 Pooled	2.33	16.28	18.60	48.84	13.95	3.56			
<b>NOAA's National Marine Fisheries Service</b>							0.2857	0.2154/0.4308	0.2667
Users Version 1	0.00	8.82	26.47	35.29	29.41	3.85			
Users Versions 1 & 2 Pooled	10.26	7.69	17.95	43.59	20.51	3.56			
<b>Georgia Department of Natural Resources</b>							0.9688	0.3374/0.6748	0.6817
Users Version 1	4.17	6.25	20.83	39.58	29.17	3.83			
Users Versions 1 & 2 Pooled	3.92	9.80	19.61	41.18	25.49	3.74			
<b>Southern Kingfish Association</b>							0.2154	0.3070/0.6139	0.4724
Users Version 1	0.00	6.45	22.58	35.48	35.48	4.00			
Users Versions 1 & 2 Pooled	0.00	2.94	8.82	58.82	29.41	4.15			
<b>Fishing Magazines/Newsletters</b>							0.1517	0.1736/0.3472	0.2532
Users Version 1	0.00	2.94	35.29	44.12	17.65	3.76			
Users Versions 1 & 2 Pooled	0.00	5.00	35.00	57.50	2.50	3.57			
<b>Newspapers</b>							0.4417	0.0580/0.1160	0.1380
Users Version 1	0.00	3.57	35.71	46.43	14.29	3.71			
Users Versions 1 & 2 Pooled	0.00	5.71	54.29	31.43	8.57	3.43			
<b>Television</b>							0.6323	0.1502/0.3005	0.2621
Users Version 1	0.00	3.70	40.74	44.44	11.11	3.63			
Users Versions 1 & 2 Pooled	0.00	6.45	48.39	41.94	3.23	3.42			
<b>Internet</b>							0.6825	0.1916/0.3833	0.4086
Users Version 1	0.00	9.09	47.73	36.36	6.82	3.41			
Users Versions 1 & 2 Pooled	0.00	7.69	59.62	28.85	3.85	3.29			
<b>Word of mouth</b>							0.7573	0.2316/0.4633	0.5694
Users Version 1	2.38	14.29	42.86	26.19	7.14	3.43			
Users Versions 1 & 2 Pooled	0.00	8.51	44.68	34.04	8.51	3.55			

1. Selected Sources are those with at least 25 observations per user group to support statistical tests between user groups.
2. A value less than (<) 0.05 is statistically significant with 95 percent confidence or higher.
3. The Jonckheere-Terpstra (JT) test is a nonparametric test for ordered differences among classes. It tests the null hypothesis that the distributions among the classes are different. The test on the left side is a one-sided test, while the test on the right is a two-sided test.
4. T-test for differences in means. A value of (0.05) or less (<) is significant at the 95 percent confidence level or higher.

## How Users Prefer to Receive Information

There were no statistically significant differences between version1 estimates and the estimates obtained by pooling the data across the two versions of the survey (Table A.3.9). So the survey results seem robust for estimates on how users prefer to receive information.

Table A.3.9. Tests for Differences between Users Version 1 and Versions 1 & 2 Pooled: How they Prefer to Receive Information about GRNMS

Source of Information	Uses V1 (Percent Yes)	Users Pooled (Percent Yes)	Chi-square Significance <sup>1</sup>	JT Test Significance <sup>2</sup>
GRNMS Web site	53.95	55.17	0.8755	0.4379/0.8759
E-mail from GRNMS Staff	27.63	29.89	0.7514	0.3761/0.7521
E-mail List Serve	49.33	47.67	0.8336	0.4170/0.8341
Newsletter via U.S. Postal Service	50.00	48.28	0.8261	0.4133/0.8267
Telephone Call from GRNMS Staff	6.67	9.30	0.5403	0.2708/0.5416

1. A value less than (<) 0.05 is statistically significant with 95 percent confidence or higher.
2. The Jonckheere-Terpstra (JT) test is a nonparametric test for ordered differences among classes (here users version 1 and versions 1 & 2 pooled). It tests the null hypothesis that the distributions of the response var does differ among classes. The number for significance on the left side is the one-tailed test, while the second number for significance is a two-tailed test. A value of less than (<) 0.05 is statistically significant with 95 percent confidence or higher.

## Users Familiarity with GRNMS Regulations

There wasn't a statistically significant difference between the version 1 estimate and the estimate obtained by pooling the data across the two versions of the survey (Table A.3.10). So the survey results seem robust for estimates on how familiar users are about GRNMS regulations.

Table A.3.9. Tests for Differences between Users Version 1 and Versions 1 & 2 Pooled: Familiarity with GRNM Regulations

Rank of Familiarity	Users V1 (Percent)	Users Pooled (Percent)	Chi-square Significance <sup>1</sup>	JT Test Significance <sup>2</sup>
Very Familiar	16.00	20.69	0.7364	0.2730/0.5460
Somewhat Familiar	77.33	72.41		
Not at All Familiar	6.67	6.90		

1. A value less than (<) 0.05 is statistically significant with 95 percent confidence or higher.
2. The Jonckheere-Terpstra (JT) test is a nonparametric test for ordered differences among classes (here users verwsion 1 and versions 1 & 2 Pooled). It tests the null hypothesis that the distributions of the resp variable does differ among classes. The number for signficance on the left side is the one-tailed test, while the second number for significance is a two-tailed test. A value of less than (<) 0.05 is statistically significant with 95 percent confidence or higher.

## User’s Perceptions of Resource Conditions in GRNMS

Tests were conducted for differences in responses to perceptions of resource conditions for 11 items included in the surveys. Differences in distributions were tested using Chi-square and JT tests, while differences in mean scores were tested using a T-test. Perceptions of conditions were measured using a five-point Likert scale where 1=’getting a lot better”, 2=’getting somewhat better”, 3=’same”, 4=’getting somewhat worse” and 5=’getting a lot worse”. So a higher mean score means perceptions were that things were getting worse. A “Don’t Know” response was also allowed for here and a high percent of respondents gave the “Don’t Know” response. The “Don’t Know” responses were retained for testing differences in the distributions of answers, but were dropped for testing differences in mean scores.

There were no statistically significant differences between version1 estimates and the estimates obtained by pooling the data across the two versions of the survey (Table A.3.11). So the survey results seem robust for estimates on user’s perceptions of resource conditions in GRNMS.

Table 3.11. Perceptions of Conditions of Resources in GRNMS: Users Version 1 and Versions 1 & 2 Pooled

Resource	Getting a Lot Better	Getting Somewhat Better	Getting Same	Getting Somewhat Worse	Getting a Lot Worse	Don't Know	Mean	Chi-Square Significance <sup>1</sup>	JT Test Significance <sup>2</sup>	T-test Significance <sup>3</sup>
<b>Live bottom habitat</b>								0.6597	0.3259/0.6518	0.5328
Users Version 1	10.81	24.32	25.68	1.35	0.00	37.84	3.69			
Users Versions 1 & 2 Pooled	11.49	22.99	29.89	4.60	1.15	29.89	3.51			
<b>Other bottom habitat</b>								0.5288	.2205/.4411	0.3616
Users Version 1	8.00	20.00	33.33	1.33	0.00	37.33	3.77			
Users Versions 1 & 2 Pooled	9.20	21.84	34.48	5.75	0.00	28.74	3.52			
<b>Fish populations (bottom fish)</b>								0.8607	.4706/.9412	0.9036
Users Version 1	18.92	22.97	24.32	8.11	0.00	25.68	3.24			
Users Versions 1 & 2 Pooled	13.95	26.74	27.91	9.30	0.00	22.09	3.21			
<b>Fish populations (pelagic species)</b>								0.8929	0.3328/0.6656	0.8544
Users Version 1	14.67	18.67	34.67	8.00	2.67	21.33	3.29	0.925	0.4490/0.898	0.9456
Users Versions 1 & 2 Pooled	12.64	18.39	35.63	12.64	3.45	17.24	3.28			
<b>Other Sea life (abundance species)</b>								0.8526	0.3685/0.7370	0.6982
Users Version 1	6.67	26.67	30.67	2.67	0.00	33.33	3.63			
Users Versions 1 & 2 Pooled	10.34	22.99	32.18	3.45	1.15	29.89	3.52			
<b>Water quality</b>								0.9187	0.3762/0.7524	0.6286
Users Version 1	6.76	25.68	32.43	1.35	0.00	33.78	3.63			
Users Versions 1 & 2 Pooled	8.14	23.26	37.21	2.33	0.00	29.07	3.50			
<b>Invasive species (such as lionfish)</b>								0.5327	0.2959/0.5918	0.7724
Users Version 1	10.67	18.67	44.00	1.33	0.00	25.33	3.37			
Users Versions 1 & 2 Pooled	9.20	16.09	43.68	6.90	0.00	24.14	3.45			
<b>Marine debris (plastics, other trash boats)</b>								0.8729	0.4232/0.8464	0.9729
Users Version 1	1.33	4.00	21.33	16.00	9.33	48.00	4.72			
Users Versions 1 & 2 Pooled	1.15	2.30	20.69	18.39	14.94	42.53	4.71			
<b>Marine debris (plastics, other trash boats)</b>								0.8919	0.3136/0.6272	0.6554
Users Version 1	9.33	16.00	33.33	14.67	1.33	25.33	3.59			
Users Versions 1 & 2 Pooled	6.90	17.24	28.74	18.39	3.45	25.29	3.70			
<b>boats)</b>								0.4828	0.1756/0.3512	0.2796
Users Version 1	10.67	13.33	30.67	6.67	2.67	36.00	3.85			
Users Versions 1 & 2 Pooled	8.05	14.94	40.23	9.20	4.60	22.99	3.56			

1. A value less than (<) 0.05 is statistically significant with 95 percent confidence or higher.
2. The Jonckheere-Terpstra (JT) test is a nonparametric test for ordered differences among classes. It tests the null hypothesis that the distributions among the classes are different. The test on the left side is a one-sided test, while the test on the right is a two-sided test.
3. T-test for differences in means. A value of (0.05) or less (<) is significant at the 95 percent confidence level or higher.

## **Factors that Influenced Users Choice of Going to GRNMS to do Activities**

Tests were conducted on the differences for 10 factors that influenced the choice of selecting GRNMS to do activities. Responses were coded as 1="Yes", 2="Somewhat" and 3="Not at All". The Chi-square and JT tests were used to test for differences in the distributions of the answers to these factors.

There were no statistically significant differences between version1 estimates and the estimates obtained by pooling the data across the two versions of the survey (Table A.3.12). So the survey results seem robust for estimates on the factors that influenced user's choices of going to GRNMS to do their activities.

## **Conclusions**

No statistically significant differences were found for any survey item between version 1 of the survey of users and the pooled data across the two versions of the survey. So the estimates provide in Leeworthy (2012a) for users of GRNMS can be considered reliable estimates.

Table A.3.12. Factors that influenced the Choice of Going to GRNMS to Do Activities:  
Users Version 1 and Versions 1 & 2 Pooled

Factor	Yes (percent)	Somewhat (percent)	Not at All (percent)	Chi-Square Significance <sup>1</sup>	JT Test Significance <sup>2</sup>
<b>Weather</b>				0.5281	0.4682/0.9363
Users Version 1	75.00	18.06	6.94		
Users Versions 1 & 2 Pooled	73.49	22.89	3.61		
<b>Fish species preference</b>				0.7807	0.2416/0.4831
Users Version 1	80.56	13.89	5.56		
Users Versions 1 & 2 Pooled	75.90	16.87	7.23		
<b>Time of Day</b>				0.3377	0.0711/0.1421
Users Version 1	37.31	28.36	34.33		
Users Versions 1 & 2 Pooled	48.68	26.32	25.00		
<b>Seasonal patterns</b>				0.847	0.4889/0.9777
Users Version 1	67.14	25.71	7.14		
Users Versions 1 & 2 Pooled	66.67	28.21	5.13		
<b>Word of mouth/radio talk</b>				0.8907	0.3350/0.6700
Users Version 1	36.36	33.33	30.30		
Users Versions 1 & 2 Pooled	38.67	34.67	26.67		
<b>Boat Captain's choice</b>				0.2265	0.2812/0.5624
Users Version 1	27.69	26.15	46.15		
Users Versions 1 & 2 Pooled	38.03	15.49	46.48		
<b>Sea Conditions</b>				0.5462	0.1367/0.2734
Users Version 1	74.65	18.31	7.04		
Users Versions 1 & 2 Pooled	81.93	13.25	4.82		
<b>Distance to GRNMS</b>				0.9917	0.4830/0.9659
Users Version 1	60.56	25.35	14.08		
Users Versions 1 & 2 Pooled	60.00	26.25	13.75		
<b>Better fishing</b>				0.9388	0.3618/0.7236
Users Version 1	52.78	41.67	5.56		
Users Versions 1 & 2 Pooled	50.00	43.75	6.25		
<b>Better diving for things to see</b>				0.9258	0.3494/0.6988
Users Version 1	14.29	12.24	73.47		
Users Versions 1 & 2 Pooled	12.50	10.71	76.79		

1. A value less than (<) 0.05 is statistically significant with 95 percent confidence or higher.
2. The Jonckheere-Terpstra (JT) test is a nonparametric test for ordered differences among classes (here users version 1 and version 1 & 2 Pooled). It tests the null hypothesis that the distributions the response variable does differ among classes. The number for significance on the left side is the one-tailed test, while the second number for significance is a two-tailed test. A value of less than (<) 0.05 is statistically significant with 95 percent confidence or higher.

## **Chapter 4: Comparisons of Users and Non-users for Version 2 Survey Responses**

In this chapter, comparisons are made between the responses that users and non-users of GRNMS provided to version 2 survey questions. Users and Non-users all provided socioeconomic/demographic profile information. Differences found here may explain differences in responses to other survey questions. Other survey questions incorporated in version 2 surveys for users and non-users include; activity participation and use in coastal and ocean areas in and around Georgia outside GRNMS; concern about the health of coastal and ocean areas in and around Georgia both outside and inside GRNMS; ways users and non-users value coastal and ocean resources/marine environment; activities or actions users and non-users would do to ensure that coastal and ocean resources are used sustainably and available for future generations to enjoy; and support for various management strategies.

### **Socioeconomic/Demographic Profiles**

As explained in chapters 2 and 3, comparisons for distributions of responses were conducted using Chi-square and JT tests, while for continuous variables differences in means were tested using T-tests.

There were many statistically significant differences between users and non-users of GRNMS for socioeconomic/demographic factors. Users were on average older than non-users with higher concentration in the ages 50-64, while non-users were more concentrated in the less than 34 age group. For sex and race, 100% of users were white males, while non-users were close to the Georgia-wide population. Users had higher household incomes than non-users with users more concentrated in the income categories \$50,000 and higher, while non-users more concentrated in the less than \$5,000. This correlates with employment status as users had higher concentration in the full-time employment category, while zero users were unemployed versus more than 34% of non-users. Household sizes were not significantly different, but the make-up or household type was. Non-users were more concentrated in households headed by single adults and in households without children. Users were much more likely to be boat owners and for those who were boat owners, users owned large boats. For membership in organizations, the only significant difference was that users were more likely to be a member of an organization related to fishing (Table A.4.1 and Table A.4.2).

Table A.4.1. Tests for Differences between Users and Non-users Version 2: Demographic Profiles

Demographic Factor	Users V2 (percent)	Non-users V2 (percent)	Chi-square Significance <sup>1</sup>	JT Test Significance <sup>2</sup>
<b>Age</b>			<b>&lt;0.0001</b>	<b>&lt;0.001/&lt;0.0001</b>
18 - 24	0.00	20.01		
25 - 34	2.27	21.54		
35 - 49	18.18	22.40		
50 - 64	59.09	17.92		
65 and over	20.45	20.45		
<b>Sex</b>			<b>&lt;0.0001</b>	<b>&lt;0.001/&lt;0.0001</b>
Male	100.00	40.45		
Female	0.00	59.55		
<b>Race</b>			<b>&lt;0.0001</b>	<b>&lt;0.001/&lt;0.0001</b>
White	100.00	54.86		
Black or African American	0.00	43.22		
Asian	0.00	0.00		
Native Hawaiian or Pacific Islander	0.00	1.93		
<b>Educational Attainment</b>			0.089	0.1756/0.3512
8th grade or less	2.33	1.51		
9th to 11th grade	4.65	4.18		
High School Grad or Equivalent	23.26	25.15		
Some College	27.91	14.62		
Associates degree	6.98	0.47		
Bachelors degree	18.60	33.80		
Masters degree	6.98	16.06		
Professional degree	6.98	3.00		
Doctors degree	2.33	1.21		
<b>Household Income (Before taxes)</b>			<b>&lt;0.0001</b>	<b>&lt;0.001/&lt;0.0001</b>
Less than \$5,000	0.00	34.11		
\$5,000 - \$9,999	2.44	1.69		
\$10,000 - \$14,999	0.00	5.13		
\$15,000 - \$19,999	0.00	9.26		
\$20,000 - \$24,999	2.44	0.87		
\$25,000 - \$29,999	0.00	0.47		
\$30,000 - \$34,999	0.00	5.49		
\$35,000 - \$39,999	0.00	2.68		
\$40,000 - \$44,999	2.44	2.59		
\$45,000 - \$49,999	2.44	0.76		
\$50,000 - \$59,999	4.88	1.21		
\$60,000 - \$74,999	9.76	7.60		
\$75,000 - \$99,999	24.39	12.50		
\$100,000 - \$149,999	34.15	12.19		
\$150,000 or more	17.07	3.46		
<b>Employment Status (% yes)</b>				
unemployed	0.00	35.19	<b>&lt;0.0001</b>	<b>&lt;0.001/&lt;0.0001</b>
employed full-time	68.18	41.74	<b>0.0036</b>	<b>0.0018/0.0037</b>
employed part-time	2.27	3.60	0.6781	0.3396/0.6791
retired	25.00	17.99	0.3361	0.1689/0.3378
student	0.00	0.00	1.0000	0.50/1.00
homemaker	2.27	3.01	0.8056	0.4031/0.8063

Table A.4.1. Tests for Differences between Users and Non-users Versions 2: Demographic Profiles (continued)

Demographic Factor	Users V2 (percent)	Non-users V2 (percent)	Significance <sup>1</sup>	JT Test Significance <sup>2</sup>
<b>Household Type</b>			<b>0.0024</b>	0.0317/0.0634
Single adult with no children under 18	2.33	12.65		
Single adult with children under 18	0.00	14.10		
Two adults with no children under 18	65.12	40.01		
Two adults with children under 18	13.95	24.54		
More than two adults with no children under 18	9.30	2.36		
More than two adults with children under 18	9.30	6.34		
<b>Boat Ownership (% Yes)</b>	97.67	14.36	<b>&lt;0.0001</b>	<b>&lt;0.0001/&lt;0.0001</b>
<b>Membership in Organizations (% Yes)</b>				
Fishing	54.55	3.79	<b>&lt;0.0001</b>	<b>&lt;0.0001/&lt;0.0001</b>
Diving	2.27	4.10	0.5851	0.2932/0.5864
Environmental	6.82	11.37	0.4023	0.2020/0.4040
Chamber of Commerce	13.64	7.92	0.2872	0.1444/0.2889

1. A value less than (<) 0.05 is statistically significant with 95 percent confidence or higher.
2. The Jonckheere-Terpstra (JT) test is a nonparametric test for ordered differences among classes (here users version 2 and non-users version 2). It tests the null hypothesis that the distributions of the response variable does differ among classes. The number for significance on the left side is the one-tailed test, while the second number for significance is a two-tailed test. A value of less than (<) 0.05 is statistically significant with 95 percent confidence or higher.

Table A.4.2. Tests for Differences between Users and Non-users Version 2: Demographic M

Demographic Factor	Users V2 (mean)	Non-users V2 (mean)	T-test Significance <sup>1</sup>
Age	56.59	42.67	<b>0.0001</b>
Household Size	2.56	2.82	0.379
Number in Household 18 or over	2.12	2.10	0.9284
Number in Household less than 18	0.39	0.70	0.179
Boat Size (length in feet)	24.07	17.34	<b>&lt;0.0001</b>

1. A value less than (<) 0.05 is statistically significant with 95 percent confidence or higher.

## Activity Participation in Coastal and Ocean Areas in and around Georgia Outside GRNMS

There were several statistically significant differences here. Users were much more likely to participate in fishing and beach activities, and generally users were more likely to participate in consumptive related activities (Table A.4.3).

Table A.4.3. Tests for Differences between Users and Nonusers Version 2: Activity Participation in Coastal and Ocean Areas in and around Georgia Outside GRNMS

Activity	Users V2 (percent)	Non-users V2 (percent)	Chi-square Significance <sup>1</sup>	JT Test Significance <sup>2</sup>
Recreational bottom fishing	90.91	21.72	< <b>0.0001</b>	< <b>0.0001</b> / <b>&lt;0.0001</b>
Recreational fishing - trolling or drifting in mid or top water	93.18	23.72	< <b>0.0001</b>	< <b>0.0001</b> / <b>&lt;0.0001</b>
Recreational spear fishing with power	6.82	1.76	0.1206	0.0610/0.1219
Recreational spear fishing without power heads	13.64	5.41	0.0939	0.0476/0.0951
SCUBA diving (taking things)	6.82	0.76	<b>0.0376</b>	<b>0.0192/0.0383</b>
SCUBA diving (don't take things)	15.91	10.11	0.3238	0.1627/0.3255
Whale watching or other wildlife viewing activities	38.64	23.72	0.0683	0.0346/0.0693
Sailing	4.55	13.74	0.1039	0.0526/0.1051
Beach Activities	81.82	52.34	<b>0.0008</b>	<b>0.0004/0.0009</b>
Surfing	11.36	13.10	0.7729	0.3869/0.7737
Wind Surfing/Kite boarding	11.36	7.77	0.4867	0.2441/0.4883
Personal Watercraft Use	13.64	11.44	0.7109	0.3560/0.7119
Shorebird Watching	34.09	28.69	0.5173	0.2594/0.5188
<b>Aggregate Activities</b>				
Any Fishing	93.18	27.49	< <b>0.0001</b>	< <b>0.0001</b> / <b>&lt;0.0001</b>
Any Spear Fishing	13.64	5.41	0.0939	0.0476/0.0951
Any SCUBA Diving	18.18	10.87	0.2333	0.1175/0.2350
Any Consumptive	93.18	27.49	< <b>0.0001</b>	< <b>0.0001</b> / <b>&lt;0.0001</b>
Any Nonconsumptive	45.45	56.44	0.2251	0.1134/0.2268
Only Consumptive	47.73	0.88	< <b>0.0001</b>	< <b>0.0001</b> / <b>&lt;0.0001</b>
Only Nonconsumptive	0.00	29.84	< <b>0.0001</b>	< <b>0.0001</b> / <b>&lt;0.0001</b>

1. A value less than (<) 0.05 is statistically significant with 95 percent confidence or higher.
2. The Jonckheere-Terpstra (JT) test is a nonparametric test for ordered differences among classes (here users version 2 and Non-users version 2). It tests the null hypothesis that the distributions of the response variable does differ among classes. The number for significance on the left side is the one-tailed test, while the second number for significance is a two-tailed test. A value of less than (<) 0.05 is statistically significant with 95 percent confidence or higher.

## Average or Mean Number of Person-days of Activity in coastal and Ocean Areas in and around Georgia Outside GRNMS

Here the differences in mean number of person-days per year were tested. Only two statistically significant differences were found and they were for both fishing activities with users having much higher mean numbers of person-days of fishing activity (Table A.4.4).

Table A4.4. Tests for Differences between Users and Non-users Version 2: Mean Person-days by Activity in Coastal and Ocean Areas in and around Georgia Outside GRNMS

User Group/Activity	Users V2 (mean)	Non-users V2 (mean)	T-test Significance <sup>1</sup>
Recreational bottom fishing	29.14	2.77	< <b>0.0001</b>
Recreational fishing - trolling or drifting in mid or top water	21.95	2.98	< <b>0.0001</b>
Recreational spear fishing with power heads	0.09	0.22	0.7589
Recreational spear fishing without power heads	0.22	0.40	0.6798
SCUBA diving (taking things)	0.14	0.00	0.2216
SCUBA diving (don't take things)	0.52	0.89	0.8167
Whale watching or other wildlife viewing activities	2.20	2.26	0.9618

1. A value less than (<) 0.05 is statistically significant with 95 percent confidence or higher.

## Concern about the Health of Coastal & Ocean Areas in and around Georgia Outside GRNMS

There were 14 items included in the survey. Tests for differences in the in the level of concern about the health of coastal and ocean areas for the distribution of scores and the mean scores were conducted. Level of concern was measured using a five-point Likert scale where 1="no concern at all", 2="not very concerned", 3="neutral", 4="somewhat concerned" and 5="extremely concerned". The Chi-square and JT tests were used for tests on the differences in distributions, while the T-test was used for testing differences in mean scores.

Using the Chi-square statistic, there were statically significant differences between users and non-users for all 14 items. However, using the more powerful JT test, two of the items there is not a statistically significant difference and that was concern for "Mining of minerals (including sand)" and "Habitat loss from coastal development" (Table A.4.5).

Using the t-test for differences in mean scores there were statistically significant differences for 12 or the 14 items. The two items where there wasn't a statistically significant difference were concern for "Coral reef health or other live bottom habitat" and "Mining of minerals (including sand)" (Table A.4.5).

Table 4.5. Concern about the Health of Coastal & Ocean Areas in and around Georgia Outside of GRNMS: Users vs Non-users Version 2 Surveys

Issue	No Concerned at all	Not Very Concerned	Neutral	Somewhat Concerned	Extremely Concerned	Mean	Chi-square Significance <sup>1</sup>	JT Test Significance <sup>2</sup>	T-test Significance <sup>3</sup>
1. Ocean acidification							<b>0.0014</b>	<b>0.0032/0.0065</b>	<b>0.0429</b>
User	9.52	14.29	33.33	33.33	9.52	3.19			
Non-user	2.97	19.75	11.30	31.54	34.43	3.74			
2. Climate change							<b>&lt;0.0001</b>	<b>&lt;0.0001/&lt;0.0001</b>	<b>&lt;0.0001</b>
User	23.81	16.67	26.19	30.95	2.38	2.71			
Non-user	7.51	5.60	18.90	13.85	54.13	4.01			
3. Sea level rise							<b>&lt;0.0001</b>	<b>&lt;0.0001/&lt;0.0001</b>	<b>&lt;0.0001</b>
User	23.81	19.05	26.19	28.57	2.38	2.67			
Non-user	5.88	7.89	18.50	13.79	53.94	4.02			
4. Over fishing (catching more than can be replaced)							<b>0.0046</b>	<b>0.0037/0.0075</b>	<b>0.0275</b>
User	19.51	9.76	14.63	29.27	26.83	3.34			
Non-user	3.61	14.86	5.68	28.67	47.19	4.01			
5. Coral reef health or other live bottom habitat							<b>0.0165</b>	<b>0.0179/0.0358</b>	0.1273
User	4.76	7.14	14.29	38.10	35.71	3.93			
Non-user	4.04	4.16	1.08	40.35	50.38	4.29			
6. Marine animal's health							<b>0.0008</b>	<b>&lt;0.0001/&lt;0.0001</b>	<b>0.0012</b>
User	7.14	4.76	16.67	52.38	19.05	3.71			
Non-user	1.77	2.27	4.40	36.68	54.88	4.41			
7. Shipping (marine transportation)							<b>0.0023</b>	<b>0.0094/0.0188</b>	<b>0.0317</b>
User	11.90	21.43	30.95	23.81	11.90	3.02			
Non-user	2.20	5.17	42.79	40.24	9.59	3.50			
8. Dredging/Offshore dredge disposal							<b>0.0205</b>	<b>0.0006/0.0012</b>	<b>0.011</b>
User	7.14	19.05	19.05	35.71	19.05	3.40			
Non-user	3.31	6.73	15.12	28.74	46.10	4.08			
9. Beach renourishment							<b>0.0022</b>	<b>&lt;0.0001/&lt;0.0001</b>	<b>0.0012</b>
User	7.14	19.05	35.71	28.57	9.52	3.14			
Non-user	1.89	5.47	20.49	46.79	25.35	3.88			
10 Energy production (oil & gas)							<b>&lt;0.0001</b>	<b>&lt;0.0001/&lt;0.0001</b>	<b>&lt;0.0001</b>
User	23.81	21.43	21.43	16.67	16.67	2.81			
Non-user	4.93	2.68	5.91	24.90	61.58	4.36			
11. Alternative energy production (wind, tidal, and wave)							<b>&lt;0.0001</b>	<b>&lt;0.0001/&lt;0.0001</b>	<b>&lt;0.0001</b>
User	21.43	23.81	28.57	19.05	7.14	2.67			
Non-user	5.57	4.31	22.71	20.38	47.03	3.99			

1. A value less than (<) 0.05 is statistically significant with 95 percent confidence or higher.

2. The Jonckheere-Terpstra (JT) test is a nonparametric test for ordered differences among classes (here users version 2 and Non-users version 2). It tests the null hypothesis that the distributions of the response variable does differ among classes. The number for significance on the left side is the one-tailed test, while the second number for significance is a two-tailed test. A value of less than (<) 0.05 is statistically significant with 95 percent confidence or higher.

3. A value less than (<) 0.05 is statistically significant with 95 percent confidence or higher.

Table 4.5. Concern about the Health of Coastal & Ocean Areas in and around Georgia Outside of GRNMS: Users vs Non-users (continued)

Issue	No Concerned at all	Not Very Concerned	Neutral	Somewhat Concerned	Extremely Concerned	Mean	Chi-square Significance <sup>1</sup>	JT Test Significance <sup>2</sup>	T-test Significance <sup>3</sup>
12. Mining of minerals (including sand)							<b>0.0013</b>	0.4361/0.8722	0.7037
User	11.90	21.43	16.67	28.57	21.43	3.26			
Non-user	4.48	7.26	52.28	19.98	16.00	3.36			
13. Habitat loss from coastal development							<b>0.0072</b>	0.0592/0.1183	<b>0.0500</b>
User	2.38	16.67	4.76	40.48	35.71	3.90			
Non-user	0.69	1.09	7.71	48.49	42.01	4.30			
14. Pollution (contaminants such as mercury, PCBs, sewage, pesticides)							<b>0.0247</b>	<b>0.0043/0.0087</b>	<b>0.0238</b>
User	2.38	2.38	11.90	28.57	54.76	4.31			
Non-user	0.69	1.08	1.08	22.36	74.79	4.69			

1. A value less than (<) 0.05 is statistically significant with 95 percent confidence or higher.

2. The Jonckheere-Terpstra (JT) test is a nonparametric test for ordered differences among classes (here users version 2 and Non-users version 2). It tests the null hypothesis that the distributions of the response variable does differ among classes. The number for significance on the left side is the one-tailed test, while the second number for significance is a two-tailed test. A value of less than (<) 0.05 is statistically significant with 95 percent confidence or higher.

## Concern about the Health of Coastal & Ocean Areas in GRNMS

There were 14 items included in the survey. Tests for differences in the in the level of concern about the health of coastal and ocean areas for the distribution of scores and the mean scores were conducted. Level of concern was measured using a five-point Likert scale where 1="no concern at all", 2="not very concerned", 3="neutral", 4="somewhat concerned" and 5="extremely concerned". The Chi-square and JT tests were used for tests on the differences in distributions, while the T-test was used for testing differences in mean scores.

Using the Chi-square statistic, there were statically significant differences between users and non-users for 13 of the 14 items. Using the more powerful JT test, again 13 of the 14 items had statistically significant differences, but the 13 items were not the same. For the Chi-square test, the item not significantly different was concern for "Dredging Offshore dredge disposal" , and for the JT test, the only item not significantly different was concern for "Mining of minerals (including sand)" (Table A.4.6).

Using the t-test for differences in mean scores there were statistically significant differences for 11 or the 14 items. The three items where there wasn't a statistically significant difference were concern for "Ocean Acidification", "Coral reef health or other live bottom", and "Mining of minerals (including sand)" (Table A.4.6).

Table 4.6. Concern about the Health of Coastal & Ocean Areas inside GRNMS: Users vs Non-users Version 2 Surveys

Issue	No Concerned at all	Not Very Concerned	Neutral	Somewhat Concerned	Extremely Concerned	Mean	Chi-square Significance <sup>1</sup>	JT Test Significance <sup>2</sup>	T-test Significance <sup>3</sup>
1. Ocean acidification							<b>&lt;0.0001</b>	<b>0.0032/0.0064</b>	0.0572
User	11.90	9.52	30.95	33.33	14.29	3.29			
Non-user	4.13	19.27	5.93	30.19	40.48	3.84			
2. Climate change							<b>&lt;0.0001</b>	<b>&lt;0.0001/&lt;0.0001</b>	<b>&lt;0.0001</b>
User	24.39	14.63	26.83	26.83	7.32	2.78			
Non-user	7.25	5.70	18.03	11.53	57.48	4.06			
3. Sea level rise							<b>&lt;0.0001</b>	<b>&lt;0.0001/&lt;0.0001</b>	<b>&lt;0.0001</b>
User	26.19	19.05	28.57	21.43	4.76	2.59			
Non-user	6.44	8.04	22.03	7.04	56.45	3.99			
4. Over fishing (catching more than can be replaced)							<b>&lt;0.0001</b>	<b>&lt;0.0001/&lt;0.0001</b>	<b>&lt;0.0001</b>
User	28.57	7.14	14.29	28.57	21.43	3.07			
Non-user	1.77	3.64	6.85	39.78	47.96	4.29			
5. Coral reef health or other live bottom habitat							<b>0.0086</b>	<b>0.0157/0.0314</b>	0.1873
User	4.76	7.14	11.90	42.86	33.33	3.93			
Non-user	3.28	3.64	16.90	16.60	59.59	4.26			
6. Marine animal's health							<b>0.0031</b>	<b>0.0003/0.0006</b>	<b>0.0128</b>
User	4.76	7.14	26.19	42.86	19.05	3.64			
Non-user	1.77	4.39	17.66	21.30	54.88	4.23			
7. Shipping (marine transportation)							<b>0.0015</b>	<b>0.0020/0.0040</b>	<b>0.0145</b>
User	7.14	21.43	38.10	19.05	14.29	3.12			
Non-user	1.45	4.09	36.71	43.88	13.88	3.65			
8. Dredging/Offshore dredge disposal							0.0628	<b>0.0045/0.0089</b>	<b>0.0289</b>
User	4.65	18.60	16.28	32.56	27.91	3.60			
Non-user	2.96	5.17	12.22	33.30	46.36	4.15			
9. Beach renourishment							<b>&lt;0.0001</b>	<b>&lt;0.0001/&lt;0.0001</b>	<b>0.0002</b>
User	9.30	18.60	34.88	23.26	13.95	3.14			
Non-user	1.89	4.84	13.95	50.25	29.06	4.00			
10. Energy production (oil & gas)							<b>&lt;0.0001</b>	<b>&lt;0.0001/&lt;0.0001</b>	<b>&lt;0.0001</b>
User	23.26	23.26	18.60	11.63	23.26	2.88			
Non-user	4.18	0.76	6.35	25.56	63.15	4.43			
11. Alternative energy production (wind, tidal, and wave)							<b>&lt;0.0001</b>	<b>&lt;0.0001/&lt;0.0001</b>	<b>&lt;0.0001</b>
User	20.93	25.58	30.23	11.63	11.63	2.67			
Non-user	3.72	5.32	8.53	31.50	50.94	4.21			

1. A value less than (<) 0.05 is statistically significant with 95 percent confidence or higher.
2. The Jonckheere-Terpstra (JT) test is a nonparametric test for ordered differences among classes (here users version 2 and Non-users version 2). It tests the null hypothesis that the distributions of the response variable does differ among classes. The number for significance on the left side is the one-tailed test, while the second number for significance is a two-tailed test. A value of less than (<) 0.05 is statistically significant with 95 percent confidence or higher.
3. A value less than (<) 0.05 is statistically significant with 95 percent confidence or higher.

Table 4.6. Concern about the Health of Coastal & Ocean Areas inside GRNMS: Users vs Non-users (continued)

Issue	No	Not	Somewhat	Extremely	Mean	Chi-square Significance <sup>1</sup>	JT Test Significance <sup>2</sup>	T-test Significance <sup>3</sup>
	Concerned at all	Very Concerned						
12. Mining of minerals (including sand)						<b>0.0002</b>	0.3113/0.6226	0.4465
User	13.95	18.60	16.28	23.26	27.91	3.33		
Non-user	2.66	4.91	51.13	20.26	21.05	3.52		
13. Habitat loss from coastal development						<b>0.0039</b>	<b>0.0046/0.0091</b>	<b>0.0169</b>
User	2.33	16.28	18.60	30.23	32.56	3.74		
Non-user	0.69	1.08	20.26	25.90	52.07	4.28		
14. Pollution (contaminants such as mercury, PCBs, sewage, pesticides)						<b>0.0024</b>	<b>&lt;0.0001/0.0001</b>	<b>0.0045</b>
User	0.00	4.65	13.95	32.56	48.84	4.26		
Non-user	0.69	1.08	3.35	14.17	80.71	4.73		

1. A value less than (<) 0.05 is statistically significant with 95 percent confidence or higher.
2. The Jonckheere-Terpstra (JT) test is a nonparametric test for ordered differences among classes (here users version 2 and Non-users version 2). It tests the null hypothesis that the distributions of the response variable does differ among classes. The number for significance on the left side is the one-tailed test, while the second number for significance is a two-tailed test. A value of less than (<) 0.05 is statistically significant with 95 percent confidence or higher.
3. A value less than (<) 0.05 is statistically significant with 95 percent confidence or higher.

## Ways Users and Non-users Value Coastal & Ocean Resources/Marine Environment

There were 10 goods or services that people get from coastal and ocean resources/marine environment that were evaluated in the survey. Measures of value used a five-point Likert scale where 1="no value", 2="low value", 3="medium value", 4="high value" and 5="extremely high value". As with other measures, the Chi-square and JT tests were used for differences in distributions of responses, while the t-test was used for differences in mean scores.

There were statistically significant differences between users and non-users for all 10 goods and services included in the survey for all statistical tests. Non-users had higher value for all goods and services than users for all goods and services, except "Support for recreation activities" for which users had higher value (Table A.4.7). Not surprising since all users are engaged in some form of recreation activity.

Table 4.7. Ways Users versus Non-users of GRNMS Value Coastal & Ocean Resources/Marine Environment Version 2 Surveys

Good or Service	No Value	Low Value	Medium Value	Extremely		Mean	Chi-square Significance <sup>1</sup>	JT Test Significance <sup>2</sup>	T-test Significance <sup>3</sup>
				High Value	High Value				
a. Support for recreation activities							<b>0.0253</b>	<b>0.0012/0.0024</b>	<b>0.0315</b>
User	2.38	2.38	9.52	45.24	40.48	4.19			
Non-user	2.99	1.92	33.27	41.66	20.16	3.74			
b. Seafood purchased at local stores and restaurants							<b>&lt;0.0001</b>	<b>&lt;0.0001/&lt;0.0001</b>	<b>0.0007</b>
User	4.65	18.60	27.91	25.58	23.26	3.44			
Non-user	3.75	1.08	8.33	40.28	46.56	4.25			
c. Seafood purchased at non local stores & restaurants							<b>0.0001</b>	<b>&lt;0.0001/&lt;0.0001</b>	<b>0.0003</b>
User	26.19	26.19	35.71	7.14	4.76	2.38			
Non-user	4.58	16.40	35.64	32.73	10.65	3.28			
d. Support for Scientific Research							<b>0.0027</b>	<b>0.0058/0.0115</b>	<b>0.0512</b>
User	6.82	9.09	40.91	27.27	15.91	3.36			
Non-user	1.45	15.93	17.05	25.92	39.65	3.86			
e. Support for education							<b>0.0002</b>	<b>&lt;0.0001/&lt;0.0001</b>	<b>0.0009</b>
User	6.82	2.27	31.82	34.09	25.00	3.68			
Non-user	1.45	2.92	12.30	17.90	65.43	4.43			
f. Supply of mineral resources through mining							<b>&lt;0.0001</b>	<b>&lt;0.0001/&lt;0.0001</b>	<b>0.0002</b>
User	29.55	27.27	34.09	6.82	2.27	2.25			
Non-user	2.50	29.71	26.63	32.81	8.34	3.14			
g. Supply of oil & gas							<b>0.0134</b>	<b>0.0015/0.0030</b>	<b>0.0156</b>
User	16.28	9.30	34.88	13.95	25.58	3.23			
Non-user	5.87	9.44	16.27	20.62	47.79	3.95			
h. Supply of alternative energy (wind, wave, tidal)							<b>&lt;0.0001</b>	<b>0.0003/0.0006</b>	<b>0.0046</b>
User	15.91	13.64	36.36	18.18	15.91	3.04			
Non-user	2.53	18.72	12.64	22.56	43.54	3.86			
i. Supply of pharmaceutical products through mining or harvest of resources							<b>&lt;0.0001</b>	<b>&lt;0.0001/0.0002</b>	<b>0.0012</b>
User	20.45	27.27	25.00	18.18	9.09	2.68			
Non-user	1.45	22.66	15.07	42.97	17.85	3.53			
j. Protection of resources even though I never intend to visit or directly use them							<b>&lt;0.0001</b>	<b>&lt;0.0001/&lt;0.0001</b>	<b>0.0017</b>
User	11.36	11.36	34.09	25.00	18.18	3.27			
Non-user	1.45	14.10	8.65	22.54	53.27	4.12			

1. A value less than (<) 0.05 is statistically significant with 95 percent confidence or higher.

2. The Jonckheere-Terpstra (JT) test is a nonparametric test for ordered differences among classes (here users version 2 and Non-users version 2). It tests the null hypothesis that the distributions of the response variable does differ among classes. The number for significance on the left side is the one-tailed test, while the second number for significance is a two-tailed test. A value of less than (<) 0.05 is statistically significant with 95 percent confidence or higher.

3. A value less than (<) 0.05 is statistically significant with 95 percent confidence or higher.

## **Activities or Actions Users and Non-users would do to ensure that coastal and ocean resources are used sustainably and available for future generations to enjoy**

There were nine activities or actions included in the survey. The extent of what users and non-users would do was measured using a five-point Likert scale where 1="would not do", 2="would do very little", 3="would do some", 4="would do a lot", and 5="would do the maximum". As with other measures, the Chi-square and JT tests were conducted for testing differences in the distribution of responses, while the T-test was used for testing differences in mean scores.

For distributions of responses using the Chi-square and JT tests, statistically significant differences were found between users and non-users for six of the nine activities or actions. The three activities or actions where there was not a statistically significant difference was for "volunteer time", "donate to groups representing diving interests", and "avoid/boycott certain seafood products". The same differences were found for the same six activities or actions using tests for differences in mean scores (Table A.4.8).

Users were less willing than non-users to do activities or actions related to paying more for user fees, prices or taxes. Consistent with other findings on fishing participation, use, and value, users were more willing to donate to organizations representing fishing interests. Non-users were more willing to "recycle" and "use less energy".

Table 4.8. Activities or Actions Users versus Non-users of GRNMS Would Do to ensure that coastal and ocean resources are used sustainably and available for future generations to enjoy Version 2 Surveys

Activity or Action	Would Not Do	Would do Very Little	Would Do Some	Would Do a Lot	Would do the Maximum	Mean	Chi-square Significance <sup>1</sup>	JT Test Significance <sup>2</sup>	T-test Significance <sup>3</sup>
a. Volunter time									
User	7.50	25.00	50.00	15.00	2.50	2.80	0.2029	0.0774/0.1548	0.3662
Non-user	10.50	34.10	45.41	4.42	5.57	2.60			
b. Pay higher taxes for resource protection and restoration							<b>0.0363</b>	<b>0.0069/0.0138</b>	0.0891
User	46.51	25.58	20.93	2.33	4.65	1.93			
Non-user	23.12	31.76	36.30	7.23	1.58	2.32			
c. Pay higher prices for goods and services due to costs to businesses in complying with regulations that protect ocean & coastal resources or require restoration of areas damaged							<b>&lt;0.0001</b>	<b>0.0002/0.0003</b>	<b>0.0051</b>
User	31.82	25.00	25.00	6.82	11.36	2.41			
Non-user	3.76	15.20	58.65	14.80	7.59	3.07			
d. Pay user fees like fishing licenses or diving access fees or additional boat registration fees							<b>0.0012</b>	<b>0.0002/0.0003</b>	<b>0.004</b>
User	38.64	27.27	27.27	4.55	2.27	2.04			
Non-user	13.46	22.01	48.44	16.09	0.00	2.67			
e. Donate to groups respresenting recreational fishing interests							<b>&lt;0.0001</b>	<b>&lt;0.0001/&lt;0.0001</b>	<b>0.0007</b>
User	11.63	9.30	51.16	20.93	6.98	3.02			
Non-user	21.39	31.97	42.92	2.96	0.76	2.30			
f. Donate to groups representing diving interests							0.2272	0.3805/0.7610	0.7255
User	42.86	19.05	26.19	9.52	2.38	2.09			
Non-user	45.81	11.83	38.64	2.96	0.76	2.01			
g. Recycle							<b>0.0167</b>	<b>0.0005/0.0010</b>	<b>0.0103</b>
User	4.65	6.98	32.56	32.56	23.26	3.63			
Non-user	1.89	2.38	20.78	21.06	53.88	4.23			
h. Use less energy							<b>0.0031</b>	<b>&lt;0.0001/0.0002</b>	<b>0.0016</b>
User	6.98	16.28	41.86	16.28	18.60	3.23			
Non-user	1.89	3.36	29.91	21.13	43.71	4.01			
i. Avoid/boycott certain seafood products							0.383	0.1546/0.3092	0.4249
User	25.00	15.91	29.55	11.36	18.18	2.82			
Non-user	21.37	6.68	39.02	9.34	23.59	3.07			

1. A value less than (<) 0.05 is statistically significant with 95 percent confidence or higher.

2. The Jonckheere-Terpstra (JT) test is a nonparametric test for ordered differences among classes (here users version 2 and Non-users version 2). It tests the null hypothesis that the distributions of the response variable does differ among classes. The number for signficance on the left side is the one-tailed test, while the second number for significance is a two-tailed test. A value of less than (<) 0.05 is statistically significant with 95 percent confidence or higher.

3. A value less than (<) 0.05 is statistically significant with 95 percent confidence or higher.

## **Support for various Coastal & Ocean Resource Protection Strategies**

The survey asked about support for several coastal and ocean resource protection management strategies that are being employed around the world or are being considered by managers. For five strategies the level of support was measured using a five-point Likert scale where 1="no support at all", 2="somewhat against", 3="neutral", 4="somewhat support", and 5="strongly support". For marine zoning, a simple yes/no response was provided.

Two marine zoning strategies were evaluated; support for marine reserves (no-take areas) and the more restrictive type of zone "research only areas" where only science and education activities are allowed. For these two zoning strategies, respondents were also asked to provide an estimate of what the maximum acceptable percent displacement of activity of different uses they would support.

As with other survey questions, the Chi-square and JT tests were used to test for differences in question response distributions, while differences in mean scores were tested using T-tests. For the percents of maximum acceptable impacts, differences in mean percents were tested using a T-test.

Non-users were more supportive of all the strategies evaluated in the survey across all statistical tests (Table A.4.9 and Table A.4.10).

Maximum acceptable impacts were evaluated for 10 consumptive activities that would be displaced by marine reserves (no-take areas). Non-users were more willing to accept greater impacts on all groups, but statistically significant differences existed for eight of the 10 activities. The two activities that were not statistically significant were "recreational bottom fishing" and "recreational spear fishing with power heads" (Table A.4.11).

Maximum acceptable impacts were also evaluated for 10 consumptive activities that would be displaced by research only areas. There was only one statistically significant difference here with non-users willing to accept greater impacts on "SCUBA diving (taking things) (Table A.4.12).

Table 4.9. Comparisons of Users and Non-users of GRNMS on Support for Various Coastal & Ocean Resource Protection Strategies Version 2

Statement	No					Mean	Chi-square Significance <sup>1</sup>	JT Test Significance <sup>2</sup>	T-test Significance <sup>3</sup>
	Support at All	Somewhat Against	Neutral	Somewhat Support	Strongly Support				
<b>1. Support for Protection of Coastal &amp; Ocean Resources</b>									
a. Protection Outside GRNMS							<0.0001	<0.0001/<0.0001	<0.0001
User	9.52	28.57	7.14	33.33	21.43	3.29			
Non-user	0.69	1.08	3.21	60.35	34.66	4.27			
b. Protection Inside GRNMS							<0.0001	<0.0001/<0.0001	<0.0001
User	11.63	16.28	9.3	37.21	25.58	3.49			
Non-user	0.69	1.08	9.42	26.68	62.13	4.49			
<b>2. Support for Marine Reserves</b>									
a. In GA Outside GRNMS							<0.0001	<0.0001/<0.0001	<0.0001
User	73.81	4.76	2.38	14.29	4.76	1.71			
Non-user	5.96	7.80	4.35	26.03	55.85	4.18			
b. Inside GRNMS							<0.0001	<0.0001/<0.0001	<0.0001
User	69.05	9.52	4.76	11.9	4.76	1.88			
Non-user	4.99	2.50	11.77	27.11	53.63	4.45			
<b>3. Support for Research Only Areas</b>									
a. In GA Outside GRNMS							<0.0001	<0.0001/<0.0001	<0.0001
User	70.73	7.32	7.32	4.88	9.76	1.76			
Non-user	6.95	0.57	12.09	69.36	11.02	3.77			
b. Inside GRNMS							<0.0001	<0.0001/<0.0001	<0.0001
User	69.05	9.52	4.76	11.90	4.76	1.74			
Non-user	4.99	2.50	11.77	27.11	53.63	4.22			
<b>4 Support for Multi-species Management</b>									
User	27.27	11.36	27.27	27.27	6.82	2.75	<0.0001	0.0008/0.0015	0.0012
Non-user	0.69	6.93	52.86	14.07	25.45	3.57			
<b>5. Support for Ecosystem-based Management</b>									
User	38.64	15.91	25.00	13.64	6.82	2.34	<0.0001	<0.0001/<0.0001	<0.0001
Non-user	2.98	1.52	26.44	44.95	24.11	3.86			

1. A value less than (<) 0.05 is statistically significant with 95 percent confidence or higher.

2. The Jonckheere-Terpstra (JT) test is a nonparametric test for ordered differences among classes (here users version 2 and Non-users version 2). It tests the null hypothesis that the distributions of the response variable does differ among classes. The number for significance on the left side is the one-tailed test, while the second number for significance is a two-tailed test. A value of less than (<) 0.05 is statistically significant with 95 percent confidence or higher.

3. A value less than (<) 0.05 is statistically significant with 95 percent confidence or higher.

Table 4.10. Comparisons of Users and Non-users of GRNMS on Support for Marine Zoning: Version 2 Surveys

User Group	Percent Yes	Chi-square Sigificance <sup>1</sup>	JT Test Significance <sup>2</sup>
Users	39.53	<b>&lt;0.0001</b>	<b>&lt;0.0001/&lt;0.0001</b>
Non-users	75.78		

1. A value less than (<) 0.05 is statistically significant with 95 percent confidence or higher.
2. The Jonckheere-Terpstra (JT) test is a nonparametric test for ordered differences among classes (here users version 2 and Non-users version 2). It tests the null hypothesis that the distributions of the response variable does differ among class. The number for significance on the left side is the one-tailed test while the second number for significance is a two-tailed test. A value of less than (<) 0.05 is statistically significant with 95 percent confidence or higher.

Table 4.11. Maximum Acceptable Percent Impact on Various Activities from Marine Reserves in G Users versus Non-users Version 2 Surveys

Activity	User Group	Mean	T-test Significance <sup>1</sup>
Recreational bottom fishing	User	25.71	0.1202
	Non-user	37.04	
Recreational fishing - trolling or drifting in mid or top water	User	22.50	< <b>0.0001</b>
	Non-user	54.99	
Recreational spear fishing without power heads	User	14.40	< <b>0.0001</b>
	Non-user	49.87	
Recreational spear fishing with power heads	User	40.71	0.4073
	Non-user	50.05	
Commercial bottom fishing	User	13.10	<b>0.0025</b>
	Non-user	37.95	
Commercial fishing - trolling or drifting mid or top water	User	13.69	<b>0.0267</b>
	Non-user	36.88	
Commercial spear fishing with power heads	User	12.38	<b>0.0021</b>
	Non-user	38.87	
Commercial spear fishing without power heads	User	12.38	<b>0.0007</b>
	Non-user	40.24	
SCUBA diving (taking things)	User	13.81	<b>0.0004</b>
	Non-user	38.50	

1. A value less than (<) 0.05 is statistically significant with 95 percent confidence or higher.

Table 4.12. Maximum Acceptable Percent Impact on Various Activities from Research Only Areas in GRNMS: Users versus Non-users Version 2 Surveys

Activity	User Group	Mean	T-test Significance <sup>1</sup>
Recreational bottom fishing	User	23.90	0.2574
	Non-user	34.14	
Recreational fishing - trolling or drifting in mid or top	User	22.62	0.2448
	Non-user	32.92	
Recreational spear fishing without power heads	User	16.31	0.1084
	Non-user	30.79	
Recreational spear fishing with power heads	User	18.81	0.2473
	Non-user	28.92	
Commercial bottom fishing	User	16.79	0.2016
	Non-user	28.02	
Commercial fishing - trolling or drifting mid or top water	User	16.79	0.2426
	Non-user	26.78	
Commercial spear fishing with power heads	User	16.07	0.3548
	Non-user	24.14	
Commercial spear fishing without power heads	User	16.07	0.5630
	Non-user	20.86	
SCUBA diving (taking things)	User	16.07	<b>0.0556</b>
	Non-user	32.44	

1. A value less than (<) 0.05 is statistically significant with 95 percent confidence or higher.

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## **APPENDIX A: USER AND NON-USER VERSION 2 QUESTIONNAIRES**

# SURVEY FOR COASTAL & OCEAN GEORGIA AND GRAY'S REEF NATIONAL MARINE SANCTUARY

Managers of Gray's Reef National Marine Sanctuary (GRNMS) would like to know how you feel about ocean and coastal resources management off the Georgia coast and in GRNMS. More specifically, GRNMS managers would like to know about your uses of these ocean and coastal resources and your opinions about different management strategies and regulations. This survey is intended for **those who visit or use** Gray's Reef National Marine Sanctuary (GRNMS).

For statistical sampling purposes, we need **a person in the household who is 18 years of age or older to fill out the questionnaire.**

Your participation is voluntary. Any information that identifies you (name, address and telephone number) will be destroyed at the end of the information collection. Only statistical summaries of information across all survey respondents will be released publicly or made available to GRNMS managers. Results of this survey will be posted on the Office of National Marine Sanctuaries web site.

Should you have any questions, please feel free to contact me.

Lindsay Williamson  
GRNMS Survey Technician  
912-598-2382  
Lindsay.Williamson@NOAA.gov

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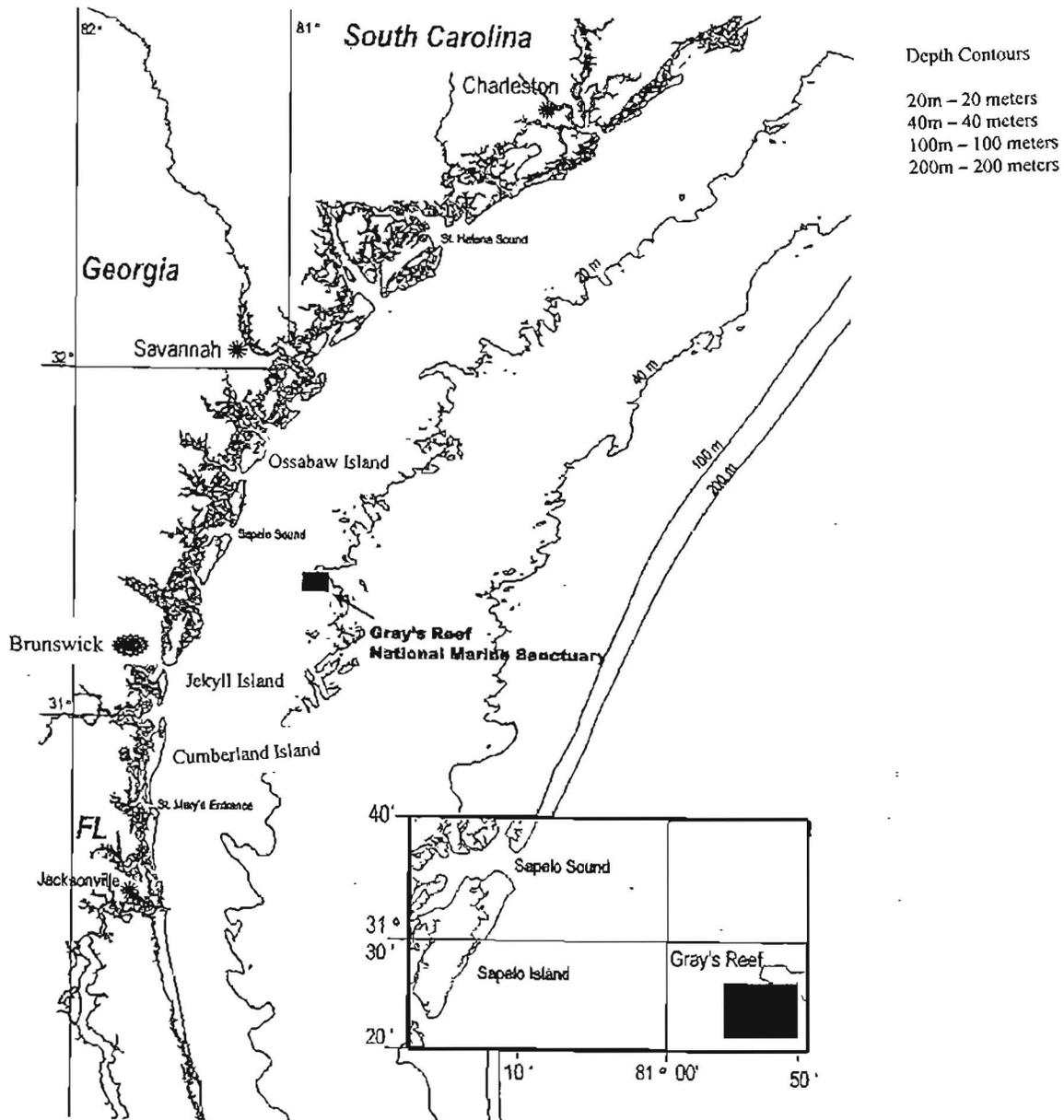
*Public reporting burden for this collection of information is estimated to average about one half hour per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing burden, to Dr. Vernon R. (Bob) Leeworthy, Chief Economist, National Ocean Service, Office of National Marine Sanctuaries, 1305 East West Highway, SSMC 4, 11th floor, Silver Spring, MD 20910. (Reference OMB Control Number 0648-0625, Expiration Date: 02/28/2014.)*

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*Definition. Ocean areas include the Atlantic Ocean and coastal areas include inland bays, estuaries and tidally influenced portions of rivers where fresh and saltwater mix.*

### Map of Coastal & Ocean Georgia and GRNMS



- Grays Reef National Marine Sanctuary (GRNMS) is located 16 miles offshore of Sapelo Island, Georgia.
- GRNMS is 22-square miles and contains rocky ledges and sandy flats.
- GRNMS is a popular recreational fishing site with some diving.
- No commercial fishing currently takes place in GRNMS, but it is not prohibited.

# SECTION 1

## Opinions About Ocean & Coastal Resources Protection and Management

1. On a scale of 1 to 5, where 1 means No Concern at All and 5 means Extremely Concerned, to what extent are you concerned about the health of ocean & coastal areas around Georgia outside the Grays Reef National Marine Sanctuary (GRNMS)?

**Please circle the number for each item.**

	No Concern at All	Not Very Concerned	Neutral	Somewhat Concerned	Extremely Concerned
a. Ocean acidification	1	2	3	4	5
b. Climate change	1	2	3	4	5
c. Sea level rise	1	2	3	4	5
d. Over fishing (catching more than can be replaced)	1	2	3	4	5
e. Coral reef health or other live bottom habitat	1	2	3	4	5
f. Marine animal's health	1	2	3	4	5
g. Shipping (marine transportation)	1	2	3	4	5
h. Dredging/Offshore dredge disposal	1	2	3	4	5
i. Beach renourishment	1	2	3	4	5
j. Energy production (oil & gas)	1	2	3	4	5
k. Alternative Energy production (wind, tidal, wave)	1	2	3	4	5
l. Mining of minerals (including sand)	1	2	3	4	5
m. Habitat loss from coastal development	1	2	3	4	5
n. Pollution (contaminants such as mercury, PCBs, sewage, pesticides)	1	2	3	4	5

2. On a scale of 1 to 5, where 1 means No Concern at all and 5 means Extremely Concerned, to what extent are you concerned about the health of ocean areas in the Grays Reef National Marine Sanctuary (GRNMS)?

**Please circle the number for each item.**

	No Concern at All	Not Very Concerned	Neutral	Somewhat Concerned	Extremely Concerned
a. Ocean acidification	1	2	3	4	5
b. Climate change	1	2	3	4	5
c. Sea level rise	1	2	3	4	5
d. Over fishing (catching more than can be replaced)	1	2	3	4	5
e. Coral reef health or other live bottom habitat	1	2	3	4	5
f. Marine animal's health	1	2	3	4	5
g. Shipping (marine transportation)	1	2	3	4	5

Please circle the number for each item.

	No Concern at All	Not Very Concerned	Neutral	Somewhat Concerned	Extremely Concerned
h. Dredging/Offshore dredge disposal	1	2	3	4	5
i. Beach renourishment	1	2	3	4	5
j. Energy production (oil & gas)	1	2	3	4	5
k. Alternative Energy production (wind, tidal, wave)	1	2	3	4	5
l. Mining of minerals (including sand)	1	2	3	4	5
m. Habitat loss from coastal development	1	2	3	4	5
n. Pollution (contaminants such as mercury, PCBs, sewage, pesticides)	1	2	3	4	5

3. On a scale from 1 to 5, where 1 means No Support at All and 5 means Strongly Support, to what extent do you support the protection of ocean & coastal resources in and around Georgia outside GRNMS?

Please circle the number for your answer.

	No Support at All	Somewhat Against	Neutral	Somewhat Support	Strongly Support
Protection in Georgia <u>outside</u> GRNMS	1	2	3	4	5

4. On a scale from 1 to 5, where 1 means No Support at All and 5 means Strongly Support, to what extent do you support the protection of ocean resources inside GRNMS?

Please circle the number for your answer.

	No Support at All	Somewhat Against	Neutral	Somewhat Support	Strongly Support
Protection <u>inside</u> GRNMS	1	2	3	4	5

- Sometimes an area's use grows to the extent that it cannot accommodate all uses without conflict among users.
- Marine zoning is often used to resolve conflicts by separating uses in different zones, very similar to what is done on land.

5. Do you support the use of marine zoning in ocean & coastal areas off the coast of Georgia? (Check one)

Yes (go to question 6)       No (skip to question 12 on page 5)

**Some Facts for Questions 6 through 8**

- Marine reserves are a specific kind of marine zoning in which nothing is allowed to be taken (removed).
- All activities that take or remove natural resources are prohibited, so fishing would be prohibited inside these types of zones.
- All other activities that do not involve taking things are allowed.
- This management strategy is often used to resolve conflicts between those taking things and those who don't take things (fishing versus diving).
- Size of the areas is important since generally the larger the area the more users that will be affected.
- This prohibition on taking activities may lead to social and economic impacts.

6. On a scale from 1 to 5, where 1 means No Support at All and 5 means Strongly Support, to what extent do you support protection of resources in ocean and coastal waters in and around Georgia outside GRNMS with the use of marine reserves?

**Please circle the number for your answer.**

	1	2	3	4	5	
		No Support at All	Somewhat Against	Neutral	Somewhat Support	Strongly Support

Marine Reserves in Georgia outside GRNMS

7. On a scale from 1 to 5, where 1 means No Support at All and 5 means Strongly Support, to what extent do you support protection of resources in ocean and coastal waters inside GRNMS with the use of marine reserves?

**Please circle the number for your answer.**

	1	2	3	4	5	
		No Support at All	Somewhat Against	Neutral	Somewhat Support	Strongly Support

Marine Reserves inside GRNMS

8. What is the maximum amount of impact on the percent of each activity that you would find acceptable for each type of Activity, if marine reserves were used?

ACTIVITY	Percent (0 to 100)
a. Recreational bottom fishing	_____
b. Recreational fishing – trolling or drifting in mid or top water	_____
c. Recreational spear fishing with power heads	_____
d. Recreational spear fishing without power heads	_____
e. Commercial bottom fishing	_____
f. Commercial fishing – trolling or drifting in mid or top water	_____
g. Commercial spear fishing with power heads	_____
h. Commercial spear fishing without power heads	_____
i. SCUBA diving (taking things)	_____

**Some Facts for Questions 9 through 11**

- **Research Only Areas** are a specific type of marine zoning where the only activity allowed is scientific research or education.
- The scientific research is used to test the impacts of various uses on natural and cultural resources.
- Size of the areas is important since generally the larger the area the more users that will be impacted.
- This may lead to social and economic impacts

9. On a scale of 1 to 5, where 1 means No Support at All and 5 means Strongly Support, to what extent do you support protection of ocean & coastal resources in and around Georgia outside GRNMS with the use of “Research Only Areas”?

**Please circle your answer.**

	No Support at All	Somewhat Against	Neutral	Somewhat Support	Strongly Support
	1	2	3	4	5
Research Only Areas in Georgia <u>outside</u> GRNMS					

10. On a scale of 1 to 5, where 1 means No Support at All and 5 means Strongly Support, to what extent do you support protection of ocean & coastal resources inside GRNMS with the use of “Research Only Areas”?

**Please circle your answer.**

	No Support at All	Somewhat Against	Neutral	Somewhat Support	Strongly Support
	1	2	3	4	5
Research Only Areas <u>inside</u> GRNMS					

11. What is the maximum amount of impact you would find acceptable for each type of Activity, if Research Only Areas were used? Please provide the maximum percent of impact on each activity.

ACTIVITY	Percent (0 to 100)
a. Recreational bottom fishing	_____
b. Recreational fishing – trolling or drifting in mid or top water	_____
c. Recreational spear fishing with power heads	_____
d. Recreational spear fishing without power heads	_____
e. Commercial bottom fishing	_____
f. Commercial fishing – trolling or drifting in mid or top water	_____
g. Commercial spear fishing with power heads	_____
h. Commercial spear fishing without power heads	_____
i. SCUBA diving (taking things)	_____
j. SCUBA diving (don't take anything)	_____
k. Whale watching of other wildlife viewing activities	_____

**Some Facts for Question 12**

- **Historically fishery managers or managers of marine mammals have managed on a species by species basis.**
- **Recent trends are to expand this species specific approach to what is being called multiple species management.**
- **In fisheries management, the approach involves looking at the various inter-relationships between species such as predator-prey relationship (big fish eat little fish).**

12. On a scale from 1 to 5, where 1 means No Support at All and 5 means Strongly Support, to what extent do you support moving from species specific fishery management to an multiple species approach that looks at all species and their inter-relationships?

**Please circle your answer.**

	No Support at All	Somewhat Against	Neutral	Somewhat Support	Strongly Support
Change to <u>multiple species</u> management	1	2	3	4	5

**Some Facts for Question 13**

- **Another more comprehensive approach goes beyond fishery management.**
- **In a full ecosystem-based approach, all human uses and values are recognized.**
- **Management attempts to achieve a balance across many different uses and values.**

13. On a scale from 1 to 5, where 1 means No Support at All and 5 means Strongly Support, to what extent do you support moving from species specific or multiple species management to full ecosystem-based management?

**Please circle your answer.**

	No Support at All	Somewhat Against	Neutral	Somewhat Support	Strongly Support
Change to full <u>ecosystem-based</u> management	1	2	3	4	5

## SECTION 2

### Sources of Information on Ocean & Coastal Resources and GRNMS

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In this section, we want to learn what are the best ways GRNMS can communicate with you by understanding the sources of information which you use, and which sources of information you trust.

14. Sources of Information Used (**Please check all sources you use**).

- a.  Grays Reef National Marine Sanctuary Advisory Council
  - b.  Grays Reef National Marine Sanctuary Staff
  - c.  Grays Reef National Marine Sanctuary Web site
  - d.  NOAA's National Marine Fisheries Service
  - e.  Atlantic States Marine Fisheries Commission
  - f.  Atlantic Fishery Management Council
  - g.  Georgia Department of Natural Resources
  - h.  Georgia Sea Grant
  - i.  Georgia's Coastal Conservation Association (CCA)
  - j.  Recreational Fishing Alliance (RFA)
  - k.  American Sportfishing Association (ASA)
  - l.  National Coalition for Marine Conservation
  - m.  International Game and Fish Association (IGFA)
  - n.  Southern Kingfish Association (SKA)
  - o.  Fishing Magazines/Newsletters
  - p.  SCUBA diving magazines/Newsletters
  - q.  Newspapers
  - r.  Radio
  - s.  Television
  - t.  Internet
  - u.  Social Media (Twitter, You Tube, Facebook, etc.)
  - v.  Word of Mouth
  - x.  Others (please specify, include people like a marina manager, other anglers or divers, local community leader, family member, friend, etc.)
- 
-

15. For the sources of information you said you used in question 14, on a scale of 1 to 5, where 1 means No Trust at All and 5 means Completely Trust, to what extent do you trust each source of information?

**Please circle your answer.**  
**If the source was not used, circle NA (Not Applicable).**

SOURCES	No Trust at All	Very Little Trust	Neutral	Trust Very Much	Completely Trust	NA
a. Grays Reef National Marine Sanctuary Advisory Council	1	2	3	4	5	NA
b. Grays Reef National Marine Sanctuary Staff	1	2	3	4	5	NA
c. Grays Reef National Marine Sanctuary Web site	1	2	3	4	5	NA
d. NOAA's National Marine Fisheries Service	1	2	3	4	5	NA
e. Atlantic States Marine Fisheries Commission	1	2	3	4	5	NA
f. Atlantic Fishery Management Council	1	2	3	4	5	NA
g. Georgia Department of Natural Resources	1	2	3	4	5	NA
h. Georgia Sea Grant	1	2	3	4	5	NA
i. Georgia's Coastal Conservation Association (CCA)	1	2	3	4	5	NA
j. Recreational Fishing Alliance (RFA)	1	2	3	4	5	NA
k. American Sportfishing Association (ASA)	1	2	3	4	5	NA
l. National Coalition for Marine Conservation	1	2	3	4	5	NA
m. International Game and Fish Association (IGFA)	1	2	3	4	5	NA
n. Southern Kingfish Association (SKA)	1	2	3	4	5	NA
o. Fishing Magazines/Newsletters	1	2	3	4	5	NA
p. SCUBA diving magazines/Newsletters	1	2	3	4	5	NA
q. Newspapers	1	2	3	4	5	NA
r. Radio	1	2	3	4	5	NA
s. Television	1	2	3	4	5	NA
t. Internet	1	2	3	4	5	NA
u. Social Media (Twitter, You Tube, Facebook, etc)	1	2	3	4	5	NA
v. Word of Mouth	1	2	3	4	5	NA
x. Others (please specify, include people like a marina manager, other anglers or divers, local community leader, family member, friend, etc.)						
_____	1	2	3	4	5	NA
_____	1	2	3	4	5	NA

## Information From GRNMS

16. How do you like to receive information? **(Please check all that apply).**

- a.  Web site
- b.  E-mail list serve
- c.  Newsletter by delivered by U.S. Post Office
- d.  Telephone call from Staff
- e.  E-mail from staff

17. Do you know who sets policy/management for National Marine Sanctuaries and for fisheries in ocean and coastal areas?

Name of Agency

- a. For National Marine Sanctuaries \_\_\_\_\_
- b. For Ocean areas of Georgia \_\_\_\_\_
- c. For Coastal areas in and around Georgia \_\_\_\_\_

18. How would you rank your familiarity with the rules and regulations in place at GRNMS?

**(Please check one)**

- Very familiar
- Somewhat Familiar
- I am not familiar with any of the rules or regulations

# SECTION 3

## Status and Conditions of the Resources in GRNMS

In this section, we would like your opinion on the status of the condition of the resources in GRNMS.

19. On a scale of 1 to 5, where 1 means Getting a lot Better and 5 means Getting a lot Worse, please rate how you think the status/condition of each of the following resources has been changing since implementation of the GRNMS (1981).

**Please circle the number corresponding to the status of the condition. If you don't know the status or don't have an opinion, circle DK.**

RESOURCE	Getting a Lot Better	Getting Some-what Better	Same	Getting Some-what Worse	Getting a Lot worse	Don't Know
a. Live bottom habitat	1	2	3	4	5	DK
b. Other bottom habitat	1	2	3	4	5	DK
c. Fish populations (bottom fish)	1	2	3	4	5	DK
d. Fish populations (pelagic)	1	2	3	4	5	DK
e. Fish populations (diversity or number of species)	1	2	3	4	5	DK
f. Other Sea life (abundance)	1	2	3	4	5	DK
g. Other Sea life (diversity or number of species)	1	2	3	4	5	DK
h. Water quality	1	2	3	4	5	DK
i. Invasive species (such as lionfish)	1	2	3	4	5	DK
j. Marine debris (plastics, other trash)	1	2	3	4	5	DK
k. Sea based pollution (discharges from boats)	1	2	3	4	5	DK

# SECTION 4

## Activities in Ocean & Coastal Areas in and Around Georgia and in the GRNMS

In this section, we want to learn about your recreation activities in the ocean & coastal areas both in the areas in and around Georgia and the portion of those activities in GRNMS.

20. Which activities do you do in ocean & coastal areas both in and around Georgia and inside GRNMS?

**Please check all that apply.**

ACTIVITY	Georgia	GRNMS
Recreational bottom fishing	<input type="checkbox"/>	<input type="checkbox"/>
Recreational fishing – trolling or drifting in mid or top water	<input type="checkbox"/>	<input type="checkbox"/>
Recreational spear fishing with power heads	<input type="checkbox"/>	<input type="checkbox"/>
Recreational spear fishing without power heads	<input type="checkbox"/>	<input type="checkbox"/>
SCUBA diving (taking things)	<input type="checkbox"/>	<input type="checkbox"/>
SCUBA diving (don't take anything)	<input type="checkbox"/>	<input type="checkbox"/>
Whale watching of other wildlife viewing activities	<input type="checkbox"/>	<input type="checkbox"/>
Sailing	<input type="checkbox"/>	<input type="checkbox"/>

### Some Activities that do not take place in GRNMS

	Georgia
Beach Activities	<input type="checkbox"/>
Surfing	<input type="checkbox"/>
Windsurfing or Kite boarding	<input type="checkbox"/>
Personal Watercraft Use (jet skis, wave runners, etc.)	<input type="checkbox"/>
Shorebird Watching	<input type="checkbox"/>

21. For those activities you did in 2010, please provide how many days you did the activity in Georgia and how many of those days were in GRNMS. **(If all your days were in GRNMS, then code all your days in Georgia and GRNMS). Count any part of a day as a whole day.**

ACTIVITY	Days In Georgia	Days in GRNMS
Recreational bottom fishing	_____	_____
Recreational fishing – trolling or drifting in mid or top water	_____	_____
Recreational spear fishing with power heads	_____	_____
Recreational spear fishing without power heads	_____	_____
SCUBA diving (taking things)	_____	_____
SCUBA diving (don't take anything)	_____	_____
Whale watching of other wildlife viewing activities	_____	_____

22. For the days you did activities in GRNMS in **2010**, please provide the **number of days** by each type of boat access.

- **Private boats would be your boat or a boat owned by family or friend but not for hire.**
- **Charter and party boats are boats that take people out for a fee.**
- **Charter boats usually limit their number of passengers, but charge for the boat for a day.**
- **Party boats usually carry large numbers of people and charge by the head or person and are some times called head-boats.**

ACTIVITY	Days Private Boat	Days Charter Boat	Days Party Boat
Recreational bottom fishing	_____	_____	_____
Recreational fishing – trolling or drifting in mid or top water	_____	_____	_____
Recreational spear fishing with power heads	_____	_____	_____
Recreational spear fishing without power heads	_____	_____	_____
SCUBA diving (taking things)	_____	_____	_____
SCUBA diving (don't take anything)	_____	_____	_____
Whale watching of other wildlife viewing activities	_____	_____	_____

23. When doing your activities from a **private boat**, how many other people are usually with you on the boat? \_\_\_\_\_ (number of other people)

24. Do you participate in fishing tournaments in GRNMS?

- Yes  
 No  
 Don't fish

25. What factors influenced your choice of going to GRNMS to do your activities?

**For each factor circle the appropriate answer.**

a. Weather	YES	SOMEWHAT	NOT AT ALL
b. Fish species preference	YES	SOMEWHAT	NOT AT ALL
c. Time of Day	YES	SOMEWHAT	NOT AT ALL
d. Seasonal patterns	YES	SOMEWHAT	NOT AT ALL
e. Word of mouth/radio talk	YES	SOMEWHAT	NOT AT ALL
f. Boat Captain's choice	YES	SOMEWHAT	NOT AT ALL
g. Sea conditions	YES	SOMEWHAT	NOT AT ALL
h. Distance to GRNMS	YES	SOMEWHAT	NOT AT ALL
i. Better fishing	YES	SOMEWHAT	NOT AT ALL
j. Better diving for things to see	YES	SOMEWHAT	NOT AT ALL

# SECTION 5

## Activity Specialization

---

In this section, we are interested in learning about your main or primary recreation activity that you participate in ocean & coastal areas off the Georgia coast including activities in GRNMS.

26. Of the list of activities in questions 20 and 21, which one of these is your main or primary activity in the ocean & coastal areas of Georgia, including GRNMS? \_\_\_\_\_

**For the next four questions, please place a check mark next to the answer that best fits you for each question.**

27. When I participate in my main or primary activity, I feel like: **(Check one)**

- a beginner. I don't really feel like I am part of the activity scene.
- an occasional or irregular participant. Sometimes it is fun, entertaining or rewarding to do my activity.
- a habitual and regular participant in the activity
- an insider to the sport. The activity is an important part of who I am.

28. During my activity, I can be best described as: **(Check one)**

- having very little understanding of the activity. I am often unsure about how to do certain things when I go.
- having some understanding of the activity, but still in the process of learning more about the sport.
- I am becoming more familiar and comfortable with the activity.
- being comfortable with the sport. I have a good understanding of what I can do, and how to do it. a knowledgeable expert in the sport. I encourage, teach and enhance opportunities for others who are interested in the activity.

29. My relationships with others who do the activity are: **(Check one)**

- not established. I really don't know any other people who do the activity.
- very limited. I know some others in the activity by sight and sometimes talk with them, but I don't know their names.
- one of familiarity. I know the names of others who do the activity, and often speak with them.
- close. I have personal and close relationships with others in the activity. These friendships often revolve around the activity.

30. My commitment to the activity is: **(Check one)**

- very slight. I have very little connection to the activity. I may or may not continue to participate in the sport in the future.
- moderate. I will continue to do it as it is entertaining and provides the benefits I want.
- fairly strong. I have a sense of being a member of the activity, and it is likely that I will continue to do it for a long time.
- very strong. I am totally committed to the activity. I encourage other to participate in the sport and seek to ensure the activity continues in the future.

31. If you had to replace all of the equipment that you currently own for your primary activity with similar equipment, how much would it cost to replace?

\$ \_\_\_\_\_ AMOUNT TO REPLACE PRIMARY ACTIVITY EQUIPMENT

32. On a scale of 1 to 5, where 1 means No Use and 5 means A Lot of Use, to what extent do you make use of the following for current information about your primary activity?

**Please circle the number for your answer.**

	No Use	Almost No Use	A Little Use	Moderate Use	A Lot of Use
a. Information Source Used	1	2	3	4	5
b. Talking with others who participate in the activity	1	2	3	4	5
c. Magazines	1	2	3	4	5
d. Government agency publications	1	2	3	4	5
e. Conservation organization publications	1	2	3	4	5
f. Newspapers	1	2	3	4	5
g. Diving shops/companies	1	2	3	4	5
h. Club meetings/newsletters	1	2	3	4	5
i. Television	1	2	3	4	5
j. Radio	1	2	3	4	5
k. Internet	1	2	3	4	5

33. Below is a list of reasons why people engage in recreation activities. On a scale of 1 to 5, where 1 means Not at All Important and 5 means Extremely Important, how important is each of the reasons for your primary activity?

**Please circle the number for your answer.**

	Not at All Important	Slightly Important	Moderately Important	Very Important	Extremely Important
a. Reason for engaging in primary activity	1	2	3	4	5
b. To be outdoors	1	2	3	4	5
c. For family recreation	1	2	3	4	5
d. To experience new and different things	1	2	3	4	5
e. For relaxation	1	2	3	4	5
f. To be close to the water	1	2	3	4	5
g. To get away from the demands of other people	1	2	3	4	5
h. To be with friends	1	2	3	4	5
i. To develop my skills	1	2	3	4	5
j. To get away from the regular routine	1	2	3	4	5
k. To experience adventure and excitement	1	2	3	4	5
l. To experience natural surroundings	1	2	3	4	5

# SECTION 6

## Ways You Value Ocean & Coastal Resources/Marine Environment

In this section, we want to learn about the ways you value the many products and services that are derived from ocean & coastal resources and the things you would do to help ensure their sustainability for the future.

34. Below is a list of goods or services that people get from ocean & coastal resources. On a scale of 1 to 5, where 1 means **No Value** and 5 means **Extremely High Value**, to what extent do you value each good or service?

**Please circle the number for your answer.**

GOOD OR SERVICE

	No Value	Low Value	Medium Value	High Value	Extremely High Value
a. Support for recreation activities	1	2	3	4	5
b. Seafood purchased at <u>local</u> stores and restaurants	1	2	3	4	5
c. Seafood purchased at <u>non local</u> stores and restaurants	1	2	3	4	5
d. Support for Scientific Research	1	2	3	4	5
e. Support for education	1	2	3	4	5
f. Supply of mineral resources through mining	1	2	3	4	5
g. Supply of oil & gas	1	2	3	4	5
h. Supply of alternative energy (wind, wave, tidal)	1	2	3	4	5
i. Supply of pharmaceutical products through mining or harvest of resources	1	2	3	4	5
j. Protection of resources even though I never intend to visit or directly use them	1	2	3	4	5

35. On a scale of 1 to 5, where 1 means Would Not Do and 5 means Would Do the Maximum, to what extent would you undertake the activities or actions to ensure that ocean & coastal resources are used sustainability an available for future generations to enjoy?

**Please circle the number for your answer.**

ACTIVITY OR ACTION	1	2	3	4	5
a. Volunteer time	1	2	3	4	5
b. Pay higher taxes for resource protection and restoration	1	2	3	4	5
c. Pay higher prices for goods and services due to costs to businesses in complying with regulations that protect ocean & coastal resources or require restoration of areas damaged	1	2	3	4	5
d. Pay user fees like fishing licenses or diving access fees or additional boat registration fees	1	2	3	4	5
e. Donate to groups representing recreational fishing interests	1	2	3	4	5
f. Donate to groups representing diving interests	1	2	3	4	5
g. Recycle	1	2	3	4	5
h. Use less energy	1	2	3	4	5
i. Avoid/boycott certain seafood products	1	2	3	4	5
j. Other (please specify) _____	1	2	3	4	5

## SECTION 7

### Information About Yourself

In this last section, we need information about you to help classify and analyze your responses to ensure the scientific validity of this information. Any information that can connect this information with you personally will be protected and not given out to anyone.

36.  Male  Female

37. Year born \_\_\_\_\_

38. Are you Hispanic or Latino?  Yes  No

39. What is your race? (Check one or more)

- White
- Black or African American
- American Indian or Alaskan Native
- Asian
- Native Hawaiian or Other Pacific Islander

40. How many people age 18 or older live in your household? \_\_\_\_\_ (number of people)

41. How many people under age 18 live in your household? \_\_\_\_\_ (number in household)

42. What type below best describes your household? **(Check one)**

- Single adult with no children 18 or under
- Single adult with children under 18
- Two adults with no children 18 or under
- Two adults with children under 18
- More than two adults with no children under 18
- More than two adults with children 18 or under

43. What is the highest level of education completed? **(Check one)**

- 8<sup>th</sup> grade or less
- 9<sup>th</sup> – 12<sup>th</sup> grade, no diploma
- 12<sup>th</sup> grade High School Grad or equivalent (GED or alternative credential)
- Some College, 1 or more years, no degree
- Associate's degree (for example: AA, AS)
- Bachelor's degree (for example: BA, BS)
- Master's degree (for example: MA, MS, MEng, Med, MSW, MBA)
- Professional School degree (for example: MD, DDS, DVM, LLB, JD)
- Doctor's degree (for example: PhD, EdD)

44. What is your employment status? **(Check all that apply)**

- unemployed
- employed full time
- employed part time
- retired
- student
- homemaker
- none of the above

45. Which category below best describes your annual household income before taxes in 2010?  
**(Check one)**

- |   |   |
|---|---|
| <input type="checkbox"/> Less than \$5,000    | <input type="checkbox"/> \$40,000 to \$44,999   |
| <input type="checkbox"/> \$5,000 to \$9,999   | <input type="checkbox"/> \$45,000 to \$49,999   |
| <input type="checkbox"/> \$10,000 to \$14,999 | <input type="checkbox"/> \$50,000 to \$59,999   |
| <input type="checkbox"/> \$15,000 to \$19,999 | <input type="checkbox"/> \$60,000 to \$74,999   |
| <input type="checkbox"/> \$20,000 to \$24,999 | <input type="checkbox"/> \$75,000 to \$99,999   |
| <input type="checkbox"/> \$25,000 to \$29,999 | <input type="checkbox"/> \$100,000 to \$149,999 |
| <input type="checkbox"/> \$30,000 to \$34,999 | <input type="checkbox"/> \$150,000 or more      |
| <input type="checkbox"/> \$35,000 to \$39,999 |   |

46. Do you own a boat?

Yes (**Go to Question 47**)

No (**Skip to Question 48**)

47. What is the length of your boat \_\_\_\_\_ (feet)

48. Do you have memberships in any groups or clubs? (**Check all that apply**)

Fishing groups, clubs or organizations

Diving groups, clubs or organizations

Environmental groups, clubs or organizations

Chambers of Commerce

Other (specify type) \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

That completes the survey. **THANK YOU.** Please put in the return self-addressed envelope and return to us.

# SURVEY FOR COASTAL & OCEAN GEORGIA AND GRAY'S REEF NATIONAL MARINE SANCTUARY

Managers of Gray's Reef National Marine Sanctuary (GRNMS) would like to know how you feel about ocean and coastal resources management off the Georgia coast and in GRNMS. More specifically, GRNMS managers would like to know about your uses of these ocean and coastal resources and your opinions about different management strategies and regulations. This survey is intended for **those who do not use or visit** GRNMS.

For statistical sampling purposes, we need **a person in the household who is 18 years of age or older to fill out the questionnaire.**

Your participation is voluntary. Any information that identifies you (name, address and telephone number) will be destroyed at the end of the information collection. Only statistical summaries of information across all survey respondents will be released publicly or made available to GRNMS managers. Results of this survey will be posted on the Office of National Marine Sanctuaries web site.

Should you have any questions, please feel free to contact me.

Lindsay Williamson  
GRNMS Survey Technician  
912-598-2382  
Lindsay.Williamson@NOAA.gov

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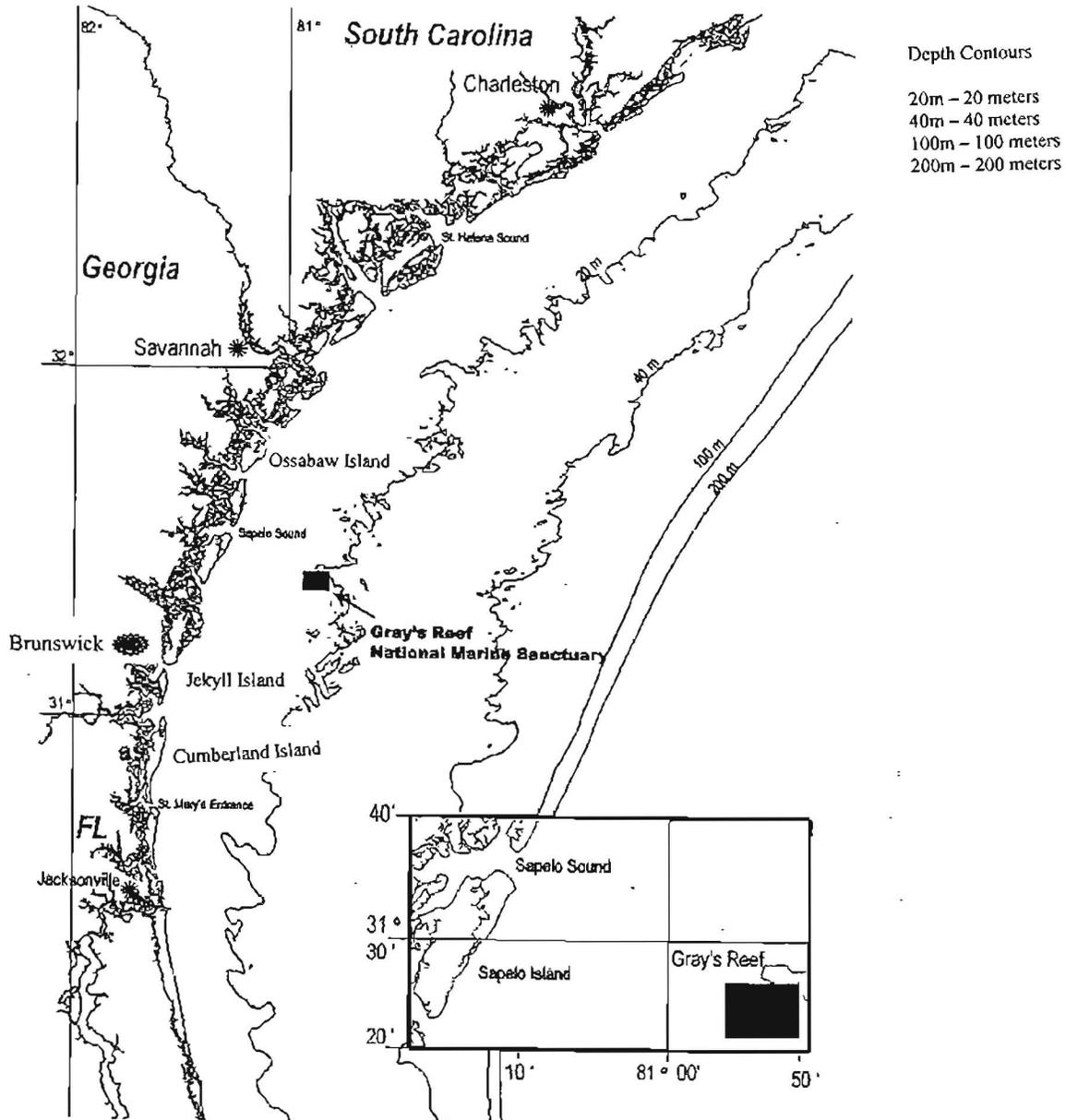
*Public reporting burden for this collection of information is estimated to average about one half hour per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing burden, to Dr. Vernon R. (Bob) Leeworthy, Chief Economist, National Ocean Service, Office of National Marine Sanctuaries, 1305 East West Highway, SSMC 4, 11th floor, Silver Spring, MD 20910. (Reference OMB Control Number 0648-0625, Expiration Date: 02/28/2014.)*

*Notwithstanding any other provision of the law, no person is required to respond to, nor shall any person be subject to a penalty for failure to comply with, a collection of information subject to the requirements of the Paperwork Reduction Act, unless the collection of information displays a currently valid OMB Control Number.*



*Definition. Ocean areas include the Atlantic Ocean and coastal areas include inland bays, estuaries and tidally influenced portions of rivers where fresh and saltwater mix.*

### Map of Coastal & Ocean Georgia and GRNMS



- Grays Reef National Marine Sanctuary (GRNMS) is located 16 miles offshore of Sapelo Island, Georgia.
- GRNMS is 22-square miles and contains rocky ledges and sandy flats.
- GRNMS is a popular recreational fishing site with some diving.
- No commercial fishing currently takes place in GRNMS, but it is not prohibited.

# SECTION 1

## Opinions About Ocean & Coastal Resources Protection and Management

1. On a scale of 1 to 5, where 1 means No Concern at All and 5 means Extremely Concerned, to what extent are you concerned about the health of ocean & coastal areas around Georgia outside the Grays Reef National Marine Sanctuary (GRNMS)?

Please circle the number for each item.

	No Concern at All	Not Very Concerned	Neutral	Somewhat Concerned	Extremely Concerned
a. Ocean acidification	1	2	3	4	5
b. Climate change	1	2	3	4	5
c. Sea level rise	1	2	3	4	5
d. Over fishing (catching more than can be replaced)	1	2	3	4	5
e. Coral reef health or other live bottom habitat	1	2	3	4	5
f. Marine animal's health	1	2	3	4	5
g. Shipping (marine transportation)	1	2	3	4	5
h. Dredging/Offshore dredge disposal	1	2	3	4	5
i. Beach renourishment	1	2	3	4	5
j. Energy production (oil & gas)	1	2	3	4	5
k. Alternative Energy production (wind, tidal, wave)	1	2	3	4	5
l. Mining of minerals (including sand)	1	2	3	4	5
m. Habitat loss from coastal development	1	2	3	4	5
n. Pollution (contaminants such as mercury, PCBs, sewage, pesticides)	1	2	3	4	5

2. On a scale of 1 to 5, where 1 means No Concern at all and 5 means Extremely Concerned, to what extent are you concerned about the health of ocean areas in the Grays Reef National Marine Sanctuary (GRNMS)?

Please circle the number for each item.

	No Concern at All	Not Very Concerned	Neutral	Somewhat Concerned	Extremely Concerned
a. Ocean acidification	1	2	3	4	5
b. Climate change	1	2	3	4	5
c. Sea level rise	1	2	3	4	5
d. Over fishing (catching more than can be replaced)	1	2	3	4	5
e. Coral reef health or other live bottom habitat	1	2	3	4	5
f. Marine animal's health	1	2	3	4	5
g. Shipping (marine transportation)	1	2	3	4	5

Please circle the number for each item.

	No Concern at All	Not Very Concerned	Neutral	Somewhat Concerned	Extremely Concerned
h. Dredging/Offshore dredge disposal	1	2	3	4	5
i. Beach renourishment	1	2	3	4	5
j. Energy production (oil & gas)	1	2	3	4	5
k. Alternative Energy production (wind, tidal, wave)	1	2	3	4	5
l. Mining of minerals (including sand)	1	2	3	4	5
m. Habitat loss from coastal development	1	2	3	4	5
n. Pollution (contaminants such as mercury, PCBs, sewage, pesticides)	1	2	3	4	5

3. On a scale from 1 to 5, where 1 means No Support at All and 5 means Strongly Support, to what extent do you support the protection of ocean & coastal resources in and around Georgia outside GRNMS?

Please circle the number for your answer.

	No Support at All	Somewhat Against	Neutral	Somewhat Support	Strongly Support
Protection in Georgia <u>outside</u> GRNMS	1	2	3	4	5

4. On a scale from 1 to 5, where 1 means No Support at All and 5 means Strongly Support, to what extent do you support the protection of ocean resources inside GRNMS?

Please circle the number for your answer.

	No Support at All	Somewhat Against	Neutral	Somewhat Support	Strongly Support
Protection <u>inside</u> GRNMS	1	2	3	4	5

- Sometimes an area's use grows to the extent that it cannot accommodate all uses without conflict among users.
- Marine zoning is often used to resolve conflicts by separating uses in different zones, very similar to what is done on land.

5. Do you support the use of marine zoning in ocean & coastal areas off the coast of Georgia? (Check one)

Yes (go to question 6)       No (skip to question 12 on page 5)

**Some Facts for Questions 6 through 8**

- Marine reserves are a specific kind of marine zoning in which nothing is allowed to be taken (removed).
- All activities that take or remove natural resources are prohibited, so fishing would be prohibited inside these types of zones.
- All other activities that do not involve taking things are allowed.
- This management strategy is often used to resolve conflicts between those taking things and those who don't take things (fishing versus diving).
- Size of the areas is important since generally the larger the area the more users that will be affected.
- This prohibition on taking activities may lead to social and economic impacts.

6. On a scale from 1 to 5, where 1 means No Support at All and 5 means Strongly Support, to what extent do you support protection of resources in ocean and coastal waters in and around Georgia outside GRNMS with the use of marine reserves?

**Please circle the number for your answer.**

	No Support at All	Somewhat Against	Neutral	Somewhat Support	Strongly Support
Marine Reserves in Georgia <u>outside</u> GRNMS	1	2	3	4	5

7. On a scale from 1 to 5, where 1 means No Support at All and 5 means Strongly Support, to what extent do you support protection of resources in ocean and coastal waters inside GRNMS with the use of marine reserves?

**Please circle the number for your answer.**

	No Support at All	Somewhat Against	Neutral	Somewhat Support	Strongly Support
Marine Reserves <u>inside</u> GRNMS	1	2	3	4	5

8. What is the maximum amount of impact on the percent of each activity that you would find acceptable for each type of Activity, if marine reserves were used?

ACTIVITY	Percent (0 to 100)
a. Recreational bottom fishing	_____
b. Recreational fishing – trolling or drifting in mid or top water	_____
c. Recreational spear fishing with power heads	_____
d. Recreational spear fishing without power heads	_____
e. Commercial bottom fishing	_____
f. Commercial fishing – trolling or drifting in mid or top water	_____
g. Commercial spear fishing with power heads	_____
h. Commercial spear fishing without power heads	_____
i. SCUBA diving (taking things)	_____

**Some Facts for Questions 9 through 11**

- **Research Only Areas** are a specific type of marine zoning where the only activity allowed is scientific research or education.
- The scientific research is used to test the impacts of various uses on natural and cultural resources.
- Size of the areas is important since generally the larger the area the more users that will be impacted.
- This may lead to social and economic impacts

9. On a scale of 1 to 5, where 1 means No Support at All and 5 means Strongly Support, to what extent do you support protection of ocean & coastal resources in and around Georgia outside GRNMS with the use of “Research Only Areas”?

**Please circle your answer.**

	No Support at All	Somewhat Against	Neutral	Somewhat Support	Strongly Support
	1	2	3	4	5
Research Only Areas in Georgia <u>outside</u> GRNMS					

10. On a scale of 1 to 5, where 1 means No Support at All and 5 means Strongly Support, to what extent do you support protection of ocean & coastal resources inside GRNMS with the use of “Research Only Areas”?

**Please circle your answer.**

	No Support at All	Somewhat Against	Neutral	Somewhat Support	Strongly Support
	1	2	3	4	5
Research Only Areas <u>inside</u> GRNMS					

11. What is the maximum amount of impact you would find acceptable for each type of Activity, if Research Only Areas were used? Please provide the maximum percent of impact on each activity.

ACTIVITY	Percent (0 to 100)
a. Recreational bottom fishing	_____
b. Recreational fishing – trolling or drifting in mid or top water	_____
c. Recreational spear fishing with power heads	_____
d. Recreational spear fishing without power heads	_____
e. Commercial bottom fishing	_____
f. Commercial fishing – trolling or drifting in mid or top water	_____
g. Commercial spear fishing with power heads	_____
h. Commercial spear fishing without power heads	_____
i. SCUBA diving (taking things)	_____
j. SCUBA diving (don't take anything)	_____
k. Whale watching of other wildlife viewing activities	_____

**Some Facts for Question 12**

- **Historically fishery managers or managers of marine mammals have managed on a species by species basis.**
- **Recent trends are to expand this species specific approach to what is being called multiple species management.**
- **In fisheries management, the approach involves looking at the various inter-relationships between species such as predator-prey relationship (big fish eat little fish).**

12. On a scale from 1 to 5, where 1 means No Support at All and 5 means Strongly Support, to what extent do you support moving from species specific fishery management to an multiple species approach that looks at all species and their inter-relationships?

**Please circle your answer.**

	No Support at All	Somewhat Against	Neutral	Somewhat Support	Strongly Support
Change to <u>multiple species</u> management	1	2	3	4	5

**Some Facts for Question 13**

- **Another more comprehensive approach goes beyond fishery management.**
- **In a full ecosystem-based approach, all human uses and values are recognized.**
- **Management attempts to achieve a balance across many different uses and values.**

13. On a scale from 1 to 5, where 1 means No Support at All and 5 means Strongly Support, to what extent do you support moving from species specific or multiple species management to full ecosystem-based management?

**Please circle your answer.**

	No Support at All	Somewhat Against	Neutral	Somewhat Support	Strongly Support
Change to full <u>ecosystem-based</u> management	1	2	3	4	5

## SECTION 2

### Sources of Information on Ocean & Coastal Resources and GRNMS

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In this section, we want to learn what are the best ways GRNMS can communicate with you by understanding the sources of information which you use, and which sources of information you trust.

14. Sources of Information Used (**Please check all sources you use**).

- a.  Grays Reef National Marine Sanctuary Advisory Council
  - b.  Grays Reef National Marine Sanctuary Staff
  - c.  Grays Reef National Marine Sanctuary Web site
  - d.  NOAA's National Marine Fisheries Service
  - e.  Atlantic States Marine Fisheries Commission
  - f.  Atlantic Fishery Management Council
  - g.  Georgia Department of Natural Resources
  - h.  Georgia Sea Grant
  - i.  Georgia's Coastal Conservation Association (CCA)
  - j.  Recreational Fishing Alliance (RFA)
  - k.  American Sportfishing Association (ASA)
  - l.  National Coalition for Marine Conservation
  - m.  International Game and Fish Association (IGFA)
  - n.  Southern Kingfish Association (SKA)
  - o.  Fishing Magazines/Newsletters
  - p.  SCUBA diving magazines/Newsletters
  - q.  Newspapers
  - r.  Radio
  - s.  Television
  - t.  Internet
  - u.  Social Media (Twitter, You Tube, Facebook, etc.)
  - v.  Word of Mouth
  - x.  Others (please specify, include people like a marina manager, other anglers or divers, local community leader, family member, friend, etc.)
- 
-

15. For the sources of information you said you used in question 14, on a scale of 1 to 5, where 1 means No Trust at All and 5 means Completely Trust, to what extent do you trust each source of information?

**Please circle your answer.**  
**If the source was not used, circle NA (Not Applicable).**

**SOURCES**

	No Trust at All	Very Little Trust	Neutral	Trust Very Much	Completely Trust	NA
a. Grays Reef National Marine Sanctuary Advisory Council	1	2	3	4	5	NA
b. Grays Reef National Marine Sanctuary Staff	1	2	3	4	5	NA
c. Grays Reef National Marine Sanctuary Web site	1	2	3	4	5	NA
d. NOAA's National Marine Fisheries Service	1	2	3	4	5	NA
e. Atlantic States Marine Fisheries Commission	1	2	3	4	5	NA
f. Atlantic Fishery Management Council	1	2	3	4	5	NA
g. Georgia Department of Natural Resources	1	2	3	4	5	NA
h. Georgia Sea Grant	1	2	3	4	5	NA
i. Georgia's Coastal Conservation Association (CCA)	1	2	3	4	5	NA
j. Recreational Fishing Alliance (RFA)	1	2	3	4	5	NA
k. American Sportfishing Association (ASA)	1	2	3	4	5	NA
l. National Coalition for Marine Conservation	1	2	3	4	5	NA
m. International Game and Fish Association (IGFA)	1	2	3	4	5	NA
n. Southern Kingfish Association (SKA)	1	2	3	4	5	NA
o. Fishing Magazines/Newsletters	1	2	3	4	5	NA
p. SCUBA diving magazines/Newsletters	1	2	3	4	5	NA
q. Newspapers	1	2	3	4	5	NA
r. Radio	1	2	3	4	5	NA
s. Television	1	2	3	4	5	NA
t. Internet	1	2	3	4	5	NA
u. Social Media (Twitter, You Tube, Facebook, etc)	1	2	3	4	5	NA
v. Word of Mouth	1	2	3	4	5	NA
x. Others (please specify, include people like a marina manager, other anglers or divers, local community leader, family member, friend, etc.)						
_____	1	2	3	4	5	NA
_____	1	2	3	4	5	NA

## Information From GRNMS

16. How do you like to receive information? **(Please check all that apply).**

- a.  Web site
- b.  E-mail list serve
- c.  Newsletter by delivered by U.S. Post Office
- d.  Telephone call from Staff
- e.  E-mail from staff

17. Do you know who sets policy/management for National Marine Sanctuaries and for fisheries in ocean and coastal areas?

Name of Agency

- a. For National Marine Sanctuaries
- b. For Ocean areas of Georgia
- c. For Coastal areas in and around Georgia

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18. How would you rank your familiarity with the rules and regulations in place at GRNMS?

**(Please check one)**

- Very familiar
- Somewhat Familiar
- I am not familiar with any of the rules or regulations

# SECTION 3

## Activities in Ocean & Coastal Areas in and Around Georgia

---

In this section, we want to learn about your recreation activities in the ocean & coastal areas in and around Georgia.

19. Which activities do you do in ocean & coastal areas both in and around Georgia?

**Please check all that apply.**

ACTIVITY	Georgia
Recreational bottom fishing	<input type="checkbox"/>
Recreational fishing – trolling or drifting in mid or top water	<input type="checkbox"/>
Recreational spear fishing with power heads	<input type="checkbox"/>
Recreational spear fishing without power heads	<input type="checkbox"/>
SCUBA diving (taking things)	<input type="checkbox"/>
SCUBA diving (don't take anything)	<input type="checkbox"/>
Whale watching of other wildlife viewing activities	<input type="checkbox"/>
Sailing	<input type="checkbox"/>
Beach Activities	<input type="checkbox"/>
Surfing	<input type="checkbox"/>
Windsurfing or Kite boarding	<input type="checkbox"/>
Personal Watercraft Use (jet skis, wave runners, etc.)	<input type="checkbox"/>
Shorebird Watching	<input type="checkbox"/>

20. For those activities you did in 2010, please provide how many days you did the activity in Georgia?

**Count any part of a day as a whole day.**

ACTIVITY	Days In Georgia
Recreational bottom fishing	_____
Recreational fishing – trolling or drifting in mid or top water	_____
Recreational spear fishing with power heads	_____
Recreational spear fishing without power heads	_____
SCUBA diving (taking things)	_____
SCUBA diving (don't take anything)	_____
Whale watching of other wildlife viewing activities	_____

# SECTION 4

## Ways You Value Ocean & Coastal Resources/Marine Environment

In this section, we want to learn about the ways you value the many products and services that are derived from ocean & coastal resources and the things you would do to help ensure their sustainability for the future.

21. Below is a list of goods or services that people get from ocean & coastal resources. On a scale of 1 to 5, where 1 means No Value and 5 means Extremely High Value, to what extent do you value each good or service?

**Please circle the number for your answer.**

GOOD OR SERVICE

	No Value	Low Value	Medium Value	High Value	Extremely High Value
a. Support for recreation activities	1	2	3	4	5
b. Seafood purchased at <u>local</u> stores and restaurants	1	2	3	4	5
c. Seafood purchased at <u>non local</u> stores and restaurants	1	2	3	4	5
d. Support for Scientific Research	1	2	3	4	5
e. Support for education	1	2	3	4	5
f. Supply of mineral resources through mining	1	2	3	4	5
g. Supply of oil & gas	1	2	3	4	5
h. Supply of alternative energy (wind, wave, tidal)	1	2	3	4	5
i. Supply of pharmaceutical products through mining or harvest of resources	1	2	3	4	5
j. Protection of resources even though I never intend to visit or directly use them	1	2	3	4	5

22. On a scale of 1 to 5, where 1 means Would Not Do and 5 means Would Do the Maximum, to what extent would you undertake the activities or actions to ensure that ocean & coastal resources are used sustainability an available for future generations to enjoy?

Please circle the number for your answer.

ACTIVITY OR ACTION	1	2	3	4	5
a. Volunteer time	1	2	3	4	5
b. Pay higher taxes for resource protection and restoration	1	2	3	4	5
c. Pay higher prices for goods and services due to costs to businesses in complying with regulations that protect ocean & coastal resources or require restoration of areas damaged	1	2	3	4	5
d. Pay user fees like fishing licenses or diving access fees or additional boat registration fees	1	2	3	4	5
e. Donate to groups representing recreational fishing interests	1	2	3	4	5
f. Donate to groups representing diving interests	1	2	3	4	5
g. Recycle	1	2	3	4	5
h. Use less energy	1	2	3	4	5
i. Avoid/boycott certain seafood products	1	2	3	4	5
j. Other (please specify)	1	2	3	4	5

## SECTION 5

### Information About Yourself

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In this last section, we need information about you to help classify and analyze your responses to ensure the scientific validity of this information. Any information that can connect this information with you personally will be protected and not given out to anyone.

23.  Male  Female

24. Year born \_\_\_\_\_

25. Are you Hispanic or Latino?  Yes  No

26. What is your race? (Check one or more)

- White
- Black or African American
- American Indian or Alaskan Native
- Asian
- Native Hawaiian or Other Pacific Islander

27. How many people age 18 or older live in your household? \_\_\_\_\_ (number of people)

28. How many people under age 18 live in your household? \_\_\_\_\_ (number in household)

29. What type below best describes your household? **(Check one)**

- Single adult with no children 18 or under
- Single adult with children under 18
- Two adults with no children 18 or under
- Two adults with children under 18
- More than two adults with no children under 18
- More than two adults with children 18 or under

30. What is the highest level of education completed? **(Check one)**

- 8<sup>th</sup> grade or less
- 9<sup>th</sup> – 12<sup>th</sup> grade, no diploma
- 12<sup>th</sup> grade High School Grad or equivalent (GED or alternative credential)
- Some College, 1 or more years, no degree
- Associate's degree (for example: AA, AS)
- Bachelor's degree (for example: BA, BS)
- Master's degree (for example: MA, MS, MEng, Med, MSW, MBA)
- Professional School degree (for example: MD, DDS, DVM, LLB, JD)
- Doctor's degree (for example: PhD, EdD)

31. What is your employment status? **(Check all that apply)**

- unemployed
- employed full time
- employed part time
- retired
- student
- homemaker
- none of the above

32. Which category below best describes your annual household income before taxes in 2010?  
**(Check one)**

- |   |   |
|---|---|
| <input type="checkbox"/> Less than \$5,000    | <input type="checkbox"/> \$40,000 to \$44,999   |
| <input type="checkbox"/> \$5,000 to \$9,999   | <input type="checkbox"/> \$45,000 to \$49,999   |
| <input type="checkbox"/> \$10,000 to \$14,999 | <input type="checkbox"/> \$50,000 to \$59,999   |
| <input type="checkbox"/> \$15,000 to \$19,999 | <input type="checkbox"/> \$60,000 to \$74,999   |
| <input type="checkbox"/> \$20,000 to \$24,999 | <input type="checkbox"/> \$75,000 to \$99,999   |
| <input type="checkbox"/> \$25,000 to \$29,999 | <input type="checkbox"/> \$100,000 to \$149,999 |
| <input type="checkbox"/> \$30,000 to \$34,999 | <input type="checkbox"/> \$150,000 or more      |
| <input type="checkbox"/> \$35,000 to \$39,999 |   |

33. Do you own a boat?

Yes (**Go to Question 34**)

No (**Skip to Question 35**)

34. What is the length of your boat \_\_\_\_\_ (feet)

35. Do you have memberships in any groups or clubs? (**Check all that apply**)

Fishing groups, clubs or organizations

Diving groups, clubs or organizations

Environmental groups, clubs or organizations

Chambers of Commerce

Other (specify type) \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

That completes the survey. **THANK YOU.** Please put in the return self-addressed envelope and return to us.