Sea Grant Florida
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Florida Sea Grant

Coastal & Marine Issues Survey

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Every four years Florida Sea Grant updates its strategic plan, which sets goals and objectives that in turn are used to prioritize and guide research, education and outreach programming. The newest strategic plan will encompass the 2009 – 2013 period and will involve an alignment with a new National Sea Grant strategic plan[1] that focuses on four national priority areas: 1) safe and sustainable seafood supply; 2) healthy coastal ecosystems; 3) sustainable coastal development; and 4) hazard resilience in coastal communities.

Florida Sea Grant's strategic planning process involves the identification and prioritization of coastal issues and desired outcomes from program stakeholders and Florida's citizens via a mail survey. Those priority issues and outcomes will be used to develop broad programmatic goals and objectives consistent with National Sea Grant Office focus areas. A workshop that brings together Sea Grant management, extension faculty, statewide specialists, and research experts will be convened to identify research, education and outreach priorities within each defined focus area.

This report describes the development and results of a mail survey conducted prior to the workshop that was distributed to individuals that either have a stake in the program (Sea Grant extension agent advisory committee members, campus coordinators), or are familiar with Florida's coastal issues (graduates of the University of Florida's Natural Resource Leadership Institute, and Florida Master Naturalist coastal module programs). We are pleased to share our findings about issues of paramount importance to our stakeholders and Florida's citizens.

Karl Havens, Director
Florida Sea Grant

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Online copies of Coastal and Marine Issues Survey, along with other program-related documents, including the 2007 Progress Report (TP 161), the 2008 Work Plan (TP 162), and the 2008-10 Program Directory (SGEF 167) are available at the Florida Sea Grant Web site, www.flseagrant.org. Additional print copies are available by contacting:

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[1] NOAA National Sea Grant College Program Strategic Plan 2009 – 2013: Meeting the Challenge

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Coastal and Marine Issues Survey

Questionnaire Development

Florida Sea Grant management and extension specialists developed a questionnaire to solicit information regarding the recipient's county of residence, occupation, and primary coastal activities. Survey recipients were also asked to select from a list the top five marine-related topics that defined prior strategic plan themes (i.e., marine bio-technology, fisheries, aquaculture, seafood safety, coastal communities, ecosystem health, coastal hazards, and marine education). In addition, questionnaire recipients were asked to evaluate (on a scale of one to five) the importance of a series of listed outcomes that characterize priority planning themes. Last, survey recipients identified up to three priority themes and outcomes that they felt were particularly important and in need of resolution (See Appendix B for the survey instrument).

Questionnaire Evaluation and Beta-Test

The questionnaire was first evaluated by a focus group that consisted of 20 members of the Florida Natural Resource Leadership Institute's (FNRLI) 2008 class (May 15, 2008). Class members were provided with a brief overview of the Florida Sea Grant College Program and the strategic planning process, including an explanation regarding how a stakeholder survey was being conducted to identify focus areas for the program in 2009-2013. They first completed the questionnaire, then broke into 5 groups of 3-4 persons. Each group was asked to identify the 'Top 5' issues from a list of 62 coastal and marine issues in the survey. These were written onto separate Post-it notes and placed on the wall of the conference room. The participants then were asked to organize the issues into logical groups. Table 1 reflects the outcome of this exercise.

Four of the five focus groups agreed that improving water quality was a top priority. This was followed by preserving critical habitats and preserving land and open space, which were identified by 3 of 5 groups. Public engagement in planning was selected by 2 of 5 groups. The other issues/outcomes listed in the table were identified once. Focus groups identified 14 issues/outcomes associated with the "Healthy Coastal and Marine Ecosystems" theme; 8 issues/outcomes associated with the "Sustainable and Hazard-Resilient Coastal Communities" theme; and 3 issues/outcomes that characterize the "Seafood Production and Safety" theme.

Comments from focus group participants were used to streamline the survey instrument. For example, the number of issues/outcomes listed in Question 7 of the questionnaire was reduced from 62 to 34.

Table 1. Focus group results.

General Theme	Specific Issue/Outcome	Number of Times Issues/Outcomes Were Indentified
Healthy Coastal and Marine Ecosystems	Improve water quality	4
	Preserve critical habitats	3
	Preserve land and open space	3
	Reduce shore and beach erosion	1
	Provide public access	1
	Reduce spread of invasive spp.	1
	Red tide	1
Total outcomes identified by groups		14
Sustainable & Hazard-Resilient Coastal Communities	Public engagement in planning	2
	Eco-friendly shoreline protection	1
	Develop existing communities	1
	Coordinated permitting / planning	1
	Multi-lingual marine education	1
	Planning hazard resiliency	1
	Strategic actions re. sea level rise	1
Total outcomes identified by groups		8
Seafood Production and Safety	Science-based fishing regulations	1
	Sustainable fisheries	1
	Fresh local sea food	1
Total outcomes identified by groups		3

Surveys Mailed and Returned

The Florida Sea Grant management team and extension specialists determined that the questionnaire should target stakeholders that had good knowledge of Florida Sea Grant and/or citizens who were knowledgeable of Florida's coastal issues. In keeping with this, the questionnaire was distributed in May of 2008 to 1,912 members among three groups: (1) Florida Sea Grant extension agent advisory committee FSGEAC members - (n = 200); (2) graduates of the University of Florida Natural Resources Leadership Institute program - FNRLI (n = 129); and (3) graduates of the University of the Florida Master Naturalist Program coastal module - FMNP (n = 1,583). The three target groups were considered to reflect a regional representation and contain a cross-section of citizens with diverse employment backgrounds and affiliations with the coast. Note that the mailing/sampling process was not random, as the Coastal & Marine Issues Survey was targeted specifically to individuals identified as program stakeholders or knowledgeable of coastal/marine issues. Hence, the survey results are likely to best reflect the group (or groups) that is (are) most prominently represented in the survey.

A sample of n=785 questionnaires were returned by July 3rd, 2008, representing an overall return rate of 41.1 percent (48% for FSGEAC; 52% for FNRLI; and 39% for FMNP). A breakdown of surveys mailed and returned by group affiliation is shown in Table 2.

Approximately 79% of the survey respondents were Florida Master Naturalist Program coastal module graduates. Florida Sea Grant Extension Advisory Committee members accounted for roughly 12% of the survey respondents, and Florida Natural Resource Leadership Institute graduates for approximately 9% of the returned surveys.

Table 2. Breakdown of surveys mailed and returned by group.

Survey Population	Mailed	Returned	% Returned of Group	% Returned of Total Returns
FSGEAC	200	96	48.0	12.2
FNRLI	129	67	51.9	8.5
FMNP	1,583	622	39.3	79.2
TOTAL	1,912	785	overall return rate of 41.1%	

FSGEAC – Florida Sea Grant Extension Advisory Committee Member
FNRLI – Florida Natural Resource Leadership Institute Graduate
FMNP – Florida Master Naturalist Program Graduate

Survey Results

Entire Sample

The first several survey questions captured demographic information including regional and employment affiliation, and activities that defined a respondent's relationship with Florida's coast. In Question 2 of the survey, respondents were asked to identify the coastal county in Florida with which they had the "greatest familiarity." Survey counts of respondent familiarity summarized in Table 3 were classified based on a delineation of Florida's coastal counties into eight distinct regions: East (E), Northeast (NE), Northwest (NW), Panhandle (P), South (S), Southeast (SE), Southwest (SW), and West (W).

Of the 781 responses to Question 2 of the survey, approximately one-half indicated a familiarity with either the Northeast or the Southwest Florida coast. The Panhandle, East, and Southeast regions each accounted for roughly 10% of the survey participants, with the Northwest region accounting for about 9%. The least represented regions in terms of survey respondent familiarity were the West Coast (7%) and the South Coast (with less than 3%).

Table 3. Survey counts by region of greatest familiarity.

Region	Code	Count (n)	Percent %
East	E	75	9.60
Northeast	NE	208	26.63
Northwest	NW	71	9.09
Panhandle	P	78	9.98
South	S	21	2.68
Southeast	SE	76	9.73
Southwest	SW	197	25.22
West	W	55	7.04
		Total = 781	

Question 3 of the survey instrument was used to obtain information on participant employment affiliation. Thirteen general categories were listed (see Table 4 below) and an additional category indicated "Other." Note that in numerous instances, respondents chose multiple/dual categories to describe their employment or affiliation. The results of the responses to Question 3 are highlighted in Table 4.

Table 4. Employment/affiliation of survey respondents (entire sample).

Employment/Affiliation	Count (n)	% of Total*
Higher education	90	10.50
K-12 education	56	6.53
Government agency	122	14.24
Nonprofit organization	66	7.70
Private consulting firm	26	3.03
Marine or coastal industry	29	3.38
Elected official	4	0.47
Retired	252	29.41
Business owner	37	4.32
Self-employed	70	8.17
Law enforcement	1	0.01
Service organization	9	1.05
Appointed board member	11	1.28
Other	84	9.80
Total =	857 affiliations identified by n=781 respondents	

* Note: percentages sum to 99.89% due to truncation of values

Roughly 30% of survey participants were retired. Government agency employees accounted for the second-largest group, accounting for approximately 14%, with the categories of Higher Education and "Other" each accounting for approximately 10% of survey responses to Question 3.

In Question 4, survey respondents were asked to describe their relationship with their respective coastal areas as defined by various activities. Sixteen categories of activities were listed and respondents identified their "Top-3 choices" in terms of what best described the coastal activities in which they engage in (1 = top choice, 2 = second choice, and 3 = third choice). Frequency counts for survey respondents' top-choice by category are shown in Table 5, along with a ranking of the leading activities.

A large number of survey participants, 182 total or roughly 22%, described themselves as engaging in ecosystem preservation. As a close second, 160 respondents or approximately 20% categorized themselves as Bird and/or Wildlife Observers. Recreational Users of Beaches ranked third overall, with 128 participants indicating that that activity best described their relationship with the coast. Rounding out the top-five were Marine Educators (4^{th} with a count of 76) and Property Owners (5^{th} with a count of 58). Coming in 6^{th} and 7^{th} were Recreational Boaters and Recreational Fishers (with counts of 50 and 56, respectively).

Table 5. Frequency count of top-choice activities.

Relationship activity	Count (n)	(%)	Rank
Recreational user of beaches	128	15.2	3
Bird and/or wildlife observer	160	19.0	2
Diver and/or snorkeler	14	1.6	
Recreational fisher	56	6.7	6
Commercial fisher	15	1.8	
Aquaculture industry	9	1.0	
Recreational boater	50	5.9	7
Shipping/commerce	1	0.1	
Coastal development/real estate	6	0.7	
Marine industries	11	1.3	
Marine educator	76	9.0	4
Biotech researcher/entrepreneur	5	0.6	
Ecosystem preservation	182	21.6	1
Human use resources/protector	28	3.3	
Property owner	58	6.9	5
Other	42	5.0	
	841*		

*total count exceeds sample size as some respondents indicated several top choices

Table 6. Frequency counts (and percentages) of the top-three coastal rated topics by category.

Category	Top-Rated	2nd-Rated	3rd-Rated	Total count (%)	Overall rank
Marine biotechnology	11 (1.4)	14 (1.8)	53 (6.9)	78	
Fisheries	49 (6.3)	64 (8.3)	32 (17.1)	245	
Aquaculture	12 (1.5)	19 (2.4)	32 (4.1)	63	
Seafood safety	16 (2.1)	32 (4.1)	85 (11.0)	133	
Coastal communities	**98 (12.7)**	**139 (18.0)**	**158 (20.4)**	**395 (17.0)**	**3**
Ecosystem health	**471 (60.7)**	**161 (20.8)**	**56 (7.2)**	**688 (29.6)**	**1**
Coastal hazards	10 (1.3)	58 (7.5)	114 (14.8)	182	
Marine education	**108 (13.9)**	**287 (37.1)**	**143 (18.5)**	**538 (23.2)**	**2**

Question 5 of the survey asked participants to select the top-three marine topics identified in prior Florida Sea Grant strategic planning and stakeholder dialogs. The results in Table 6 suggest that the topics of Ecosystem Health, Coastal Communities, and Marine Education are of paramount importance to survey participants.

Question 7 of the survey instrument asked participants to rate 34 potential coastal-related outcomes in terms of their relative importance. For each outcome, possible scores ranged from a maximum of 5 (indicating an outcome that was “very important”) to 1 (indicating an outcome that was “less important”). The results of the ratings for all survey respondents are summarized

in Table 7, presented as a series of descriptive statistics – mean response/rating, standard deviation, median response/rating, and lower limit of confidence interval for the median.

The descriptive statistics generated for each outcome in Question 7 were then used to determine the "relative importance" of the outcomes as rated by all survey respondents. A hierarchical cluster analysis was employed to classify outcomes into characterization categories of descending importance--highest importance, high importance, and moderate importance (see Appendix A for details). Table 7 summaries the results of the cluster analysis, highlighting the characterization of outcomes, where outcomes of **highest importance** are shown in **bold print**, outcomes of high importance are shown in a normal font, and outcomes of *lowest importance* are shown in *italics*). Thus, the outcomes shown in bold and normal print suggest priority outcomes that Florida Sea Grant programming may address. The six outcomes found to be of highest importance were the following numbers from the outcome column in Table 7.

7. Environmentally sustainable behaviors and choices;
8. Understand inter-species and habitat/species relationships, habitat distribution/ abundance;
14. Smart Growth (mixed uses, higher density development, shoreline setbacks, preserve natural coastline/open land;
23. Reduce water quality impacts due to development, run-off or industrial discharge;
30. Identification and protection of critical marine habitats (coral reefs, seagrass, essential fish habitat);
31. Improved water quality and water monitoring efforts.

Table 7. Summary statistics of respondent ratings for 34 potential outcomes (Question 7).

#	Outcome	Mean	s	Median	LLCM
1.	Availability of fresh local fish products	3.82	1.092	4	4
2.	Science-based recreational fisheries management	4.03	2.047	4	4
3.	Fewer beach closures due to water quality issues	3.74	1.182	4	4
4.	Sustainable sources of ocean-derived energy/power	3.57	1.215	4	4
5.	Informed decisions about artificial reef deployment	3.59	1.039	4	4
6.	Accurate predictions of hurricane storm surge	3.85	1.123	4	4
7.	**Environmentally sustainable behaviors and choices**	**4.52**	**0.801**	**5**	**5**
8.	**Understand inter-species and habitat/species relationships, habitat distribution/abundance**	**4.28**	**0.902**	**5**	**4**
9.	*Safe and courteous boating behaviors*	*3.56*	*1.162*	*4*	*3*
10.	Effective waterway maintenance and management	3.67	1.039	4	4
11.	Reduced impacts of harmful algae blooms (red tide)	3.99	1.029	4	4
12.	*Better public access to waterfronts/waterways/beaches*	*3.19*	*1.256*	*3*	*3*
13.	*Availability of fresh local aquaculture products(clams, oysters)*	*3.30*	*1.184*	*3*	*3*
14.	**Smart Growth (mixed uses, higher density development shoreline setbacks, preserve natural coastline/open land)**	**4.47**	**0.858**	**5**	**5**
15.	Better navigation and waterway information	2.95	1.116	3	3
16.	Marine/Coastal curriculum for K-12 education	4.09	0.993	4	4
17.	Discovery of marine-derived products to enhance ecosystems (e.g., eco-friendly boat paint additives)	3.65	1.053	4	4
18.	*Understand sources and processes of ocean-related risks to human health and safety (natural hazards)*	*3.39*	*1.046*	*3*	*3*
19.	Safe seafood products for consumption	3.92	1.041	4	4
20.	Improved building codes, materials and designs to mitigate storm damage	3.62	1.137	4	4
21.	Reduced prevalence of invasive aquatic species	4.21	0.888	4	4
22.	*Fair and justified boating regulations*	*3.21*	*1.142*	*3*	*3*
23.	**Reduce water quality impacts due to development runoff or industrial discharge**	**4.64**	**0.672**	**5**	**5**
24.	Actively engaged public in decision-making/planning	3.90	0.965	4	4
25.	Coastal/Marine learning/volunteering opportunities for communities (e.g., dune restoration, beach clean-ups)	4.07	0.931	4	4
26.	Understand human-use patterns and behaviors that may influence resource stability and sustainability	3.89	0.982	4	4
27.	Science-based commercial fisheries management	3.89	1.020	4	4
28.	Understand the impact of climate variability and change on marine resources such as fisheries/coral reefs	3.83	0.986	4	4
29.	Discovery of marine-derived bio-medical products to enhance human life (e.g., cancer-fighting drugs)	3.53	1.137	4	4
30.	**Identification and protection of critical marine habitats(coral reefs, seagrass, essential fish habitat)**	**4.64**	**0.675**	**5**	**5**
31.	**Improved water quality and water monitoring efforts**	**4.45**	**0.763**	**5**	**5**
32.	Accurate information and adaptive measures for sea level rise due to climate change	3.56	1.159	4	4
33.	Reduction of illegally harvested marine products	4.13	0.946	4	4
34.	*Hazard risk models to forecast community vulnerability*	*3.27*	*1.081*	*3*	*3*

Note: s=standard deviation; LLCM is the lower limit of confidence interval for median.
Outcomes – **Highest Importance** (in Bold); High Importance (Normal); *Lowest Importance* (in Italics)
LLCM – Lower Limit of the Confidence interval Median response

Cluster analysis results for the entire sample identified the following four groupings:

Group 1 – composed of a single anomalous outcome variable 2 – an outcome variable that is distant and dissimilar from other outcome variables given its large mean and a relatively large standard deviation (and therefore represents a stand-alone outcome variable)—an outcome of high importance, yet high response variability. The upper-limit of 95% confidence interval for the mean of this outcome variable exceeds 4.0, and its lower limit of 3.89 exceeds 3.83 (the weighted average value for all outcomes). Thus, outcome 2 may be characterized as ***an outcome of high relative importance***.

Group 2 – composed of outcome variables 7, 8, 14, 23, 30, and 31 representing a cluster of six outcome variables with large mean values and relatively small standard deviations—CLUSTER 1—***outcomes of the highest relative importance***.

Group 3 – comprised of outcome variables 1, 3, 4, 5, 6, 10, 11, 16, 17, 19, 20, 21, 24, 25, 26, 27, 28, 29, 32 and 33, representing a large cluster of 21 outcome variables with sizeable means and moderate standard deviations—CLUSTER 2—***outcomes of high relative importance***.

Group 4 – composed of outcome variables 9, 12, 13, 15, 18, 22 and 34, representing a cluster of seven outcome variables with relatively small mean values and relatively large standard deviations—CLUSTER 3—***outcomes of the lowest relative importance***.

The distribution of ratings for each of the outcomes listed in Question 7 was found to be non-normal, precluding equality of means testing. As an alternative, a series of non-parametric test procedures were employed to test for equality of the median response of survey respondents. In particular, a Kruskal-Wallis (KW) Analysis of Variance test, as well as KW multiple-comparison and Bonferroni z-tests were carried out to evaluate the null hypothesis of equality of medians. In each of the six cases examined (i.e., for each of the outcomes labeled as most important), test results showed that, at the 95% confidence level, there was statistical evidence that the median response of outcome ratings differed across regions and topical sub-groups (e.g., coastal activities, employment affiliation). This suggests that significant differences in the ratings of outcome importance may exist among various respondent sub-groups particularly given that a large proportion of the sample is comprised of FMNP graduates, a group that tended to score ecosystem and environmental-related outcomes (such as 7, 8, 30, and 31) higher than their counterparts from FSGEAC or FNRLI.

Sub-group differences in the rating of outcomes is confirmed by equality of medians test runs on the median outcome ratings of FMNP, FSGEAC, and FNRLI survey respondents, highlighted in Table 8. For 23 of the 34 outcomes (approx. 68% of the cases examined), the null hypothesis of equality of median was rejected, indicating that median response ratings for many outcomes in Question 7 are different among the three groups sampled.

Table 8. Summary statistics of respondent ratings for 34 potential outcomes (Question 7).

Outcomes	---------- mean (median) ----------			KW-ANOVA Chi-square (prob.)	Reject equality of medians?
{Question 7}	FMNP	FSGEAC	FNRLI		
1	3.76 (4)	4.18 (5)	3.78 (4)	14.75 (.0006)	**Yes**
2	3.99 (4)	4.10 (5)	4.33 (4)	13.98 (.0009)	**Yes**
3	3.74 (4)	3.73 (4)	3.77 (4)	0.17 (.9154)	No
4	3.63 (4)	3.21 (3)	3.54 (4)	9.79 (.0074)	**Yes**
5	3.61 (4)	3.69 (4)	3.31 (3)	6.72 (.0347)	**Yes**
6	3.86 (4)	3.94 (4)	3.62 (4)	5.09 (.0780)	No
7	4.54 (5)	4.25 (5)	4.56 (5)	12.09 (.0023)	**Yes**
8	4.34 (5)	3.94 (4)	4.13 (4)	14.96 (.0005)	**Yes**
9	3.60 (4)	3.55 (4)	3.22 (3)	6.38 (.0410)	**Yes**
10	3.70 (4)	3.73 (4)	3.36 (3)	7.44 (.0242)	**Yes**
11	4.01 (4)	4.01 (4)	3.81 (4)	2.96 (.2282)	No
12	3.13 (3)	3.54 (4)	3.31 (3)	8.83 (.0121)	**Yes**
13	3.24 (3)	3.58 (4)	3.43 (3)	8.08 (.0175)	**Yes**
14	4.48 (5)	4.29 (5)	4.52 (5)	5.75 (.0563)	No
15	2.92 (3)	3.21 (3)	2.87 (3)	5.43 (.0660)	No
16	4.16 (4)	3.97 (4)	3.61 (4)	22.67 (.00001)	**Yes**
17	3.73 (4)	3.34 (3)	3.41 (3)	14.58 (.0006)	**Yes**
18	3.45 (3)	3.21 (3)	3.09 (3)	10.96 (.0041)	**Yes**
19	3.91 (4)	4.05 (4)	3.76 (4)	3.15 (.2067)	No
20	3.68 (4)	3.44 (3)	3.30 (3)	12.34 (.0021)	**Yes**
21	4.29 (4)	3.77 (4)	4.10 (4)	26.63 (.00001)	**Yes**
22	3.20 (3)	3.46 (3)	3.00 (3)	5.73 (.0573)	No
23	4.67 (5)	4.40 (5)	4.68 (5)	14.03 (.0008)	**Yes**
24	3.88 (4)	3.88 (4)	4.07 (4)	2.70 (.2589)	No
25	4.21 (4)	3.55 (4)	3.52 (4)	58.38 (.00000)	**Yes**
26	3.93 (4)	3.64 (4)	3.92 (4)	4.78 (.0912)	No
27	3.83 (4)	4.07 (4)	4.20 (4)	14.05 (.0008)	**Yes**
28	3.84 (4)	3.69 (4)	3.95 (4)	2.26 (.3228)	No
29	3.58 (4)	3.41 (4)	3.17 (3)	8.48 (.0143)	**Yes**
30	4.71 (5)	4.27 (5)	4.49 (5)	30.16 (.00000)	**Yes**
31	4.51 (5)	4.18 (4)	4.31 (5)	20.72 (.00003)	**Yes**
32	3.60 (4)	3.27 (3)	3.62 (4)	6.34 (.0419)	Yes
33	4.23 (4)	3.81 (4)	3.77 (4)	26.73 (.00002)	**Yes**
34	3.30 (3)	3.09 (3)	3.21 (3)	3.56 (.1679)	No

Note: Descriptions of outcomes are listed by number in Table 7. KW-ANOVA test results (Null hypothesis: Equality of Median) are stated at 95% Confidence Level (based on Sum of Ranks, adjusting for the number of ties).

Yes in bold type indicates the KW-ANOVA chi-square and the Bonferroni Test result for the KW Multiple-Comparison test led to same conclusion at the 95% confidence level.

Note that a rejection of the null hypothesis is possible when the observed medians calculated from the sample are equal given that the KW test results are based on the sum of ranked values and the mean sum of ranks for each group.

Florida Sea Grant Extension Agent Advisory Committee Sub-Sample

To address the potential issues related to sub-group differences in the rating of outcomes, and the large FMNP sub-sample, which was statistically associated with an "Ecosystem Preservation" affiliation, the results were also compiled for the n=96 (48% return rate) Florida Sea Grant Extension Advisory Committee (FSGEAC) members who participated in the survey. FSGEAC members represent the most significant stakeholder group for the program.

A breakdown of the employment/affiliation of FSGEAC respondents is shown in Table 9. The top-five groups of respondents from this sub-group account for 83.7% of the FSGEAC sub-sample. Roughly 20% of FSGEAC survey participants are affiliated with a Government Agency, approximately 16% are Business Owners, and about 12% are associated with a Marine or Coastal Industry. Roughly 10% of survey respondents from the FSGEAC sub-sample are either Retired or from Higher Education, with 8% from a Non-Profit Organization and 8% Self-Employed.

There is a relatively well balanced distribution of FSGEAC survey respondents from each of the primary employment categories. Note that few of the n=200 FSGEAC members that comprise the statistical population from which the sample was drawn are Elected Officials, Law Enforcement agents, K-12 Educators, Board Members, or Private Consultants. Nevertheless, the sub-sample of the n=96 survey respondents is large (with roughly 50% of the members having participated in the survey), and provides a more balanced employment/affiliation cross-section than the FMNP.

Table 9. Employment/affiliation of FSGEAC respondents.

Employment/Affiliation	Count (n)	% of Total*
Higher education	11	10.50
K-12 education	3	6.53
Government agency	22	14.24
Nonprofit organization	9	7.70
Private consulting firm	2	3.03
Marine or coastal industry	13	3.38
Elected official	3	0.47
Retired	11	29.41
Business owner	18	4.32
Self-employed	9	8.17
Law enforcement	1	0.01
Service organization	0	1.05
Appointed board member	2	1.28
Other	7	9.80
Total =	111 affiliations identified by n=96 respondents as some respondents seleced more than 1 affiliation.	

† Note: percentages sum to 99.9% due to truncation of values; * indicates a tie in rank

Table 10 highlights the frequency counts of top-choice coastal activities of the FSGEAC survey participants. Consistent with the results of the entire sample, ecosystem preservation is the top coastal related activity of the FSGEAC members who participated in the survey. This association is followed by recreational and commercial fishing, and marine education and marine industry affiliations. The results indicate that the sample includes a relatively good cross-sectional representation of coastal relationship activities.

Table 10. Frequency count of coastal relationship activities by FSGEAC respondents.

Relationship activity	Count (n)	(%)	Rank
Recreational user of beaches	4	3.7	7
Bird and/or wildlife observer	3	2.8	
Diver and/or snorkeler	3	2.8	
Recreational fisher	11	10.3	3
Commercial fisher	13	12.2	2
Aquaculture industry	6	5.6	6*
Recreational boater	6	5.6	6*
Shipping/commerce	1	0.9	
Coastal development/real estate	1	0.9	
Marine industries	10	9.4	4*
Marine educator	10	9.4	4*
Biotech researcher/entrepreneur	1	0.9	
Ecosystem preservation	20	18.8	1
Human use resources/protector	2	1.8	
Property owner	6	5.6	6*
Other	9	8.4	5
Total =	106[†]		

[†] total count exceeds sample size as some respondents indicated several top choices
* indicates tie in rank

Table 11 highlights the frequency counts and percentage breakdowns of the top-three rated traditional Sea Grant focus areas as identified in Question 5 of the survey by FSGEAC members. The top-ranked categories for this sub-sample were mostly consistent with the results from the overall sample that included FMNP and FNRLI graduates. For the FSGEAC sub-sample, the top-three topics were Ecosystem Health (1st), Marine Education and Fisheries (tied for second place), and Coastal Communities (3rd). Consistent with the results from the overall sample, Ecosystem Health was identified as the leading coastal topic by FSGEAC survey participants, Marine Education was ranked number two, and Coastal Communities was identified as the third-rated priority topic. Fisheries, however, emerged as a top coastal-related topic (ranked second in a tie with Marine Education) among FSGEAC respondents.

Table 11. Frequency counts (and percentages) of the top-three rated coastal topics by category for FSGEAC respondents.

Category	Top-Rated		2nd-Rated		3rd-Rated		Total count (%)		Overall rank
Marine biotechnology	2	(2.1)	2	(2.1)	6	(6.2)	10	(3.5)	
Fisheries	**17**	**(18.1)***	**16**	**(17.0)**	**19**	**(21.1)**	**52**	**(18.4)**	**2**
Aquaculture	7	(7.4)	6	(6.63)	8	(6.2)	21	(7.4)	
Seafood safety	5	(5.3)	7	(7.4)	14	(12.4)	26	(9.2)	
Coastal communities	**14**	**(14.9)**	**15**	**(15.9)**	**10**	**(13.0)**	**39**	**(13.8)**	**3**
Ecosystem health	**30**	**(31.9)**	**23**	**(24.4)**	**13**	**(11.8)**	**66**	**(23.4)**	**1**
Coastal hazards	2	(2.1)	4	(4.2)	9	(9.9)	15	(5.3)	
Marine education	**17**	**(18.1)***	**21**		**15**	**(19.3)**	**53**	**(18.8)**	**2**

* indicates tie

Table 12 provides summary statistics for the responses to Question 7 by FSGEAC members. The mean response, the standard deviation, the median response, the lower-limit of the confidence band for the median response, and a dichotomous variable to indicate whether a mean response was greater than the average weighted mean response of 3.74, were used as input to a hierarchical cluster analysis. The cluster analysis identified three groups of outcomes: **highest importance** shown in **bold print**, high importance shown in a normal font, and *lowest importance* shown in *italics*. The six outcomes found to be of highest importance to FSGEAC respondents were:

7. Environmentally sustainable behaviors and choices;
14. Smart Growth (mixed uses, higher-density development, shoreline setbacks, preserve natural coastline/open land;
19. Safe seafood products for consumption;
23. Reduce water quality impacts due to development run-off or industrial discharge;
30. Identification and protection of critical marine habitats (coral reefs, seagrass, essential fish habitat);
31. Improved water quality and water monitoring efforts.

Table 12. Summary statistics of respondent ratings for 34 potential outcomes from FSGEAC survey participants (Question 7).

#	Outcome	Mean	s	Median	LLCM
1.	Availability of fresh local fish products	4.18*	1.087	5**	4
2.	Science-based recreational fisheries management	4.11*	1.207	5**	4
3.	*Fewer beach closures due to water quality issues*	*3.73*	*1.103*	*4*	*3*
4.	*Sustainable sources of ocean-derived energy/power*	*3.21*	*1.252*	*3*	*3*
5.	Informed decisions about artificial reef deployment	3.69	1.168	4	4
6.	Accurate predictions of hurricane storm surge	3.94	1.206	4	4
7.	**Environmentally sustainable behaviors and choices**	**4.25**	**0.972**	**5****	**4**
8.	Understand inter-species and habitat/species relationships, habitat distribution/abundance	3.94	1.116	4	4
9.	*Safe and courteous boating behaviors*	*3.55*	*1.200*	*4*	*3*
10.	*Effective waterway maintenance and management*	*3.57*	*0.996*	*4*	*3*
11.	Reduced impacts of harmful algae blooms (red tide)	4.01	0.999	4	4
12.	Better public access to waterfronts/waterways/beaches	3.53*	1.244	4	3
13.	*Availability of fresh local aquaculture products(clams, oysters)*	*3.58**	*1.315*	*4***	*3*
14.	**Smart Growth (mixed uses, higher density development shoreline setbacks, preserve natural coastline/open land)**	**4.29**	**0.996**	**5**	**4**
15.	*Better navigation and waterway information*	*3.21**	*1.050*	*3*	*3*
16.	Marine/Coastal curriculum for K-12 education	3.97	1.010	4	4
17.	*Discovery of marine-derived products to enhance ecosystems (e.g., eco-friendly boat paint additives)*	*3.34*	*1.137*	*3****	*3*
18.	*Understand sources and processes of ocean-related risks to human health and safety (natural hazards)*	*3.21*	*1.090*	*3*	*3*
19.	**Safe seafood products for consumption**	**4.05**	**0.903**	**4**	**4**
20.	*Improved building codes, materials and designs to mitigate storm damage*	*3.44*	*1.069*	*3****	*3*
21.	*Reduced prevalence of invasive aquatic species*	*3.77*	*1.028*	*4*	*3*
22.	*Fair and justified boating regulations*	*3.46*	*1.146*	*3*	*3*
23.	**Reduce water quality impacts due to development runoff or industrial discharge**	**4.40**	**0.817**	**5**	**4**
24.	Actively engaged public in decision-making/planning	3.85	1.009	4	4
25.	*Coastal/Marine learning/volunteering opportunities for communities (e.g., dune restoration, beach clean-ups)*	*3.55*	*1.093*	*4*	*3*
26.	*Understand human-use patterns and behaviors that may influence resource stability and sustainability*	*3.64*	*1.151*	*4*	*3*
27.	Science-based commercial fisheries management	4.07*	1.084	4	4
28.	Understand the impact of climate variability and change on marine resources such as fisheries/coral reefs	3.69	1.072	4	4
29.	*Discovery of marine-derived bio-medical products to enhance human life (e.g., cancer-fighting drugs)*	*3.41*	*1.239*	*3****	*3*
30.	**Identification and protection of critical marine habitats(coral reefs, seagrass, essential fish habitat)**	**4.27**	**0.966**	**5**	**4**
31.	**Improved water quality and water monitoring efforts**	**4.18**	**0.816**	**4*****	**4**
32.	*Accurate information and adaptive measures for sea level rise due to climate change*	*3.27*	*1.241*	*3*	*3*
33.	Reduction of illegally harvested marine products	3.81	1.044	4	4
34.	*Hazard risk models to forecast community vulnerability*	*3.09*	*1.149*	*3*	*3*

Note: *mean response is higher than for entire sample, ** (***) significantly higher (lower) median.
Outcomes – **Highest Importance** (in Bold); High Importance (Normal); *Lowest Importance* (in Italics)
LLCM – Lower Limit of the Confidence interval Median response

The groupings of outcomes for the FSGEAC sample are as follows:

Group 1 – composed of outcome variables 7, 14, 19, 23, 30, and 31 representing a cluster of six outcome variables with large mean values and relatively small standard deviations—CLUSTER 1—***outcomes of the highest relative importance***.

Group 2 – comprised of outcome variables 1, 2, 5, 6, 8, 11, 16, 24, 27, 28, and 33, representing a large cluster of eleven outcome variables with sizeable means and moderate standard deviations—CLUSTER 2—***outcomes of high relative importance***. Note that the list of outcomes that fall into this category has decreased from twenty for the entire sample to eleven for the FSGEAC sub-sample.

Group 3 – composed of outcome variables 3, 4, 9, 10, 12, 13, 15, 17, 18, 20, 21, 22, 25, 26, 29, 32, and 34, representing a cluster of 17 outcome variables with small mean values and relatively large standard deviations—CLUSTER 3—***outcomes of the lowest relative importance***. Note that 10 new outcomes have been added to the list of outcomes of lowest importance in comparison to the number of outcomes from the entire sample that fall into this category. A pattern of outcome importance was clearly visible, as there were 10 responses where the mean response was 4.0 or greater, with six identified as outcomes of highest importance.

The top-10 rated outcomes for FSGEAC members are listed in Table 13 (in descending order of importance, as based on the descriptive statistics in Table 12). Note that five of the top-six most important outcomes (namely, 7, 14, 23, 30, and 31) are the same as found using the entire sample (for FSGEAC, FMNP, and FNRLI affiliates). Given that roughly 23% of the respondents in the FSGEAC sub-sample indicated that they primarily engage in activities related to recreational or commercial fisheries, several fishing related outcomes were among the top-ten listed – outcomes 1, 2,11, 19, and 27. There is strong empirical evidence that the most-important outcomes as indicated by survey respondents across the various sub-samples examined (FSGEAC, FNRLI, FMNP) are consistent, with the exception of the fishery related outcomes identified as important by FSGEAC members.

Table 13. Top-10 outcomes based on the results of the FSGEAC sub-sample analysis (shown in descending order of importance).

ID	Outcome	Rating			
		Rank	LLCM	Mean	s
23	Reduce water quality impacts due to development, runoff or industrial change	1	5 (4)	4.40	.81
14	Smart Growth (mixed uses, higher density development, shoreline setbacks, preserve natural coastline/open land)	2	5 (4)	4.29	.99
30	Identification and protection of critical marine habitats(coral reefs, seagrass, essential fish habitat)	3	5 (4)	4.27	.96
7	Environmentally sustainable behaviors and choices	4	5 (4)	4.25	.97
31	Improve water quality and water monitoring efforts	5	4 (4)	4.18	.82
19	Safe seafood products for consumption	6	4 (4)	4.05	.90
1	Availability of fresh local fish products	7	5 (4)	4.18	1.09
2	Science-based recreational fisheries management	8	5 (4)	4.11	1.20
27	Science-based commercial fisheries management	9	4 (4)	4.07	1.08
11	Reduce impacts of harmful algae blooms (red tide)	10	4 (4)	4.0	1.99

LLCM – Lower Limit of the Confidence interval Median response

Primary Topics and Issues

Summary of All Survey Responses

This section summarizes responses to survey questions that asked respondents to identify additional important issues that Florida Sea Grant should consider (Questions 6 and 8). A typology of primary topics and associated specific issues was developed through a content analysis of responses to these open-ended questions. Responses with shared general themes were grouped into primary categories (topics). In most cases, a primary category encompassed one or more sub-categories (specific issues), identified and extracted with as few as 1 or as many as 84 shared-theme responses. Every effort was made to capture the intended meaning of a given response and to maintain consistency in its assignment to a particular primary category/sub-category. Many respondents provided multiple answers to the questions and others chose not to answer, so that the total number of responses does not equal the returned survey count. Certain responses were excluded (placed in an “other “category) as not being amenable to categorization or to Florida Sea Grant intervention, such as concerns related to “escalating property taxes” or “encouraging cultural programs.” All written responses are first summarized, followed by FSGEAC responses.

Table 14 lists six primary categories (planning topics) derived from survey responses. Each primary category is further defined by its composite subcategories. The leading primary category, accounting for 39.8% of all responses was **healthy coastal and marine ecosystems.** Within this category**, water resource quality** concerns were cited most commonly by respondents (37.1% of group; 14.8% of total responses), and more specifically, concerns about nutrient loading and pollution runoff/discharge (61.3% of group; 9.1% of total responses). Other important water resource considerations included the protection of upland watersheds (17.5% of group; 2.6% of total responses), and the overconsumption and transfer of water resources to population centers in south Florida (13.9% of group; 2.1% of total responses).

Identifying and **protecting essential shoreline and marine habitats** together accounted for 31.1% of the category and 12.5% of the total responses. Primary topics of concern included the protection of natural beaches and dune systems, wetlands, seagrass and other essential fish habitat. A related topic, accounting for 14.6% of category and 5.8% of total responses, involved **species protection** – most notably, turtles and turtle nesting beaches, birds and rookeries, mammals (manatees and dolphins), and sharks. In addition, **habitat restoration** (dunes, mangroves, seagrass, and reefs) garnered 9.8% of the group and 3.9% of total responses. This sub-category included a number of responses that were opposed to beach renourishment. Issues related to **aquatic invasive species** (4.3% of category; 1.7% of total responses) and the further study of the impacts of beach renourishment (3.0% of category; 1.2% of total responses) rounded out the issues related to the protection of shoreline and marine habitats.

Factors related to **sustainable hazard-resilient communities** comprised the second leading category (29.9.9% of total responses). This category was dominated by responses related to the need to restrict or stop **shorefront development,** which received 30.0% of group; 9.0% of the total responses. **Boater impacts**—education, safety, licensing, enforcement—(12.3% of group; 3.7% of total responses), **land acquisition and preservation** (11.9% of group; 3.6% of total responses), lack of **public access** (11.2% of group; 3.3% of total responses) to beaches and waterfronts, and **better laws and enforcement** of development codes and boating zones (5.8% of group; 1.7% of total responses) rounded out the top 5 issues related to sustainable communities.

Environmental education to promote awareness and appreciation of coastal environments and sustainable behaviors was the third ranked category garnering 12.3% of the total responses. The bulk of responses in this category addressed the needs to increase awareness and appreciation of the environment and reduce human impacts (e.g., littering, pollution, runoff, urban sprawl, shorefront development, etc.).

Priorities related to **seafood production and safety** ranked fourth, accounting for 6.4% of the total responses. Within this category, fisheries management issues including stock enhancement, by-catch reductions, and the establishment of fishing moratoriums and off-limit zones were cited most frequently as priorities to replenish depleted stocks and reduce fishing pressure.

Issues associated with **climate change** (e.g., global warming and its effects on coastal settlements and ecosystems) and **energy** (e.g., exploring new technologies and studying the impacts of new drilling) drew 5% and 4.3% of the total responses, respectively.

Table 14. Summary of all responses to open-ended questions that identified additional top priorities.

Seafood Production and Safety	Responses	% Group	% Total	Topic Rank	Issue Rank
A. Fisheries Management	35	59.3	3.8		8
B. Protect EFH and provide artificial reefs	10	16.9	1.1		
C. Offshore aquaculture/mariculture pollution/more regulations	10	16.9	1.1		
D. Seafood safety/consumer awareness	2	3.4	0.2		
E. Protect commercial fishers from over-regulation	2	3.4	0.2		
Group Total	**59**	**100.0**	**6.4**	**4**	
Environmental Education					
A. Environmental appreciation and awareness of human impacts	114	100.0	12.3	3	2
Sustainable Communities					
A. Restrict/stop shorefront development	83	30.0	9.0		3
B. Land acquisition and preservation	33	11.9	3.6		
C. Provide more public access	31	11.2	3.3		
D. Boater Impacts (education, safety, licensing, enforcement)	34	12.3	3.7		
E. Better laws and enforcement of speed zones/development	16	5.8	1.7		
F. Derelict vessels/crab traps and waterway maintenance	14	5.1	1.5		
G. Funding for management and enforcement of regulations	11	4.0	1.2		
H. Carrying capacity/population growth impacts	11	4.0	1.2		
I. Alternative energy (wind/wave)	10	3.6	1.1		
J. Sustainable tourism/recreation	7	2.5	0.8		
K. Preserve historic sites and working waterfronts	7	2.5	0.8		
L. Intergovernmental coordination incentives for smart growth	5	1.8	0.5		
M. Public engagement in action planning	7	2.5	0.8		
N. Hazard resilience better building codes	5	1.8	0.5		
O. Promote low density development	2	0.7	0.2		
P. Fewer boating regulations/manatee zones	1	0.4	0.1		
Group Total	**277**	**100.0**	**29.9**	**2**	
Healthy Ecosystems					
A. Water Resources Quality	137	37.1	14.8		1
Nutrients and pollution (runoff, sewage discharge, red tide)	84	61.3	9.1		
Protect upland watersheds and water quality	24	17.5	2.6		
Overconsumption/transfer/protection	19	13.9	2.1		
Freshwater outflows to estuaries and salinity issues	9	6.6	1.0		
Predictive models and water quality monitoring	1	0.7	0.1		
B. Identify/protect essential marine habitats	58	15.7	6.3		4
C. Protect natural beaches/shoreline ecosystems	57	15.4	6.2		5
D. Species protection	54	14.6	5.8		6
E. Habitat restoration (dunes, mangrove, seagrass, reefs)	36	9.8	3.9		7
F. Aquatic invasive species	16	4.3	1.7		
G. Study renourishment pros/cons (beaches, dunes, reefs)	11	3.0	1.2		
Group Total	**369**	**100.0**	**39.8**	**1**	
Climate					
A. Climate change	29	63.0	3.1		
B. Sea level rise	15	32.6	1.6		
C. Changing salinity	2	4.3	0.2		
Group Total	**46**	**100.0**	**5.0**	**5**	
Energy					
A. Explore/study commercial/industrial uses (more drilling)	15	71.4	1.6		
B. No drilling	6	28.6	0.6		
Group Total	**21**	**100.0**	**2.3**	**6**	
Other	40	100.0	4.3		
TOTAL	926				

Summary of FSGEAC Survey Responses

Table 15 lists six planning themes associated with topics/issues identified by survey respondents. As above, each topic is further defined by its composite subcategories. The leading primary category for FSGEAC members, accounting for 30.4% of all responses was **Healthy Coastal and Marine Ecosystems.** Within this category, **water resource quality** concerns were cited most frequently by respondents (35.3% of group; 10.7% of total responses), and more specifically, concerns about **nutrient loading and pollution** runoff/discharge (66.7% of group; 7.1% of total responses). Other important water resource considerations included the **protection of upland watersheds** (16.7% of group; 1.8% of total responses), the protection of water resources from **overconsumption and transfer** (8.3% of group; 0.9% of total responses, and the need for better **water quality monitoring and prediction** (8.3% of group; 0.9% of total responses). Identifying and **protecting essential shoreline and marine habitats** together accounted for 32.3% of the category and 9.9% of the total responses. Primary topics of concern included the protection of natural beaches and dune systems, wetlands, and seagrass and other essential fish habitat. **Habitat restoration** (dunes, mangroves, seagrass, and reefs) obtained 11.8% of the healthy ecosystem category and 3.6% of total responses). Issues related to **aquatic invasive species** (11.8% of category and 3.6% of total responses) and the further study of the environmental consequences of **beach renourishment** (8.8% of group; 2.7% of total responses) rounded out the top issues related to the healthy coastal and marine ecosystem category.

Sustainable communities was the second leading category garnering (25.9% of the total responses). Significant sub-categories comprised responses related to the need for more **public waterway access and moorings,** which received 27.6% of group and 7.1% of total responses. **Restricting or stopping shorefront development,** and **preserving historic sites and working waterfronts** tied for second with 13.8% of group and 3.6% of the total responses, respectively. **Boater impacts** (e.g., education, safety, licensing, enforcement) and **better laws and enforcement** to encourage safe boating, enhance species protection and foster responsible coastal development rounded out the top-ranked sustainable community sub-categories with 10.3% and 2.7% of total responses, respectively.

Priorities related to **seafood production and safety** ranked third among FSGEAC members, accounting for 19.6% of the total responses. The most cited issue within this category addressed the need for stock enhancement by protecting essential fish habitat and providing/deploying more artificial reefs (31.8% of group; 6.3% of total responses).

The need for **environmental education** (15.2% of total responses) to instill a greater appreciation for natural resources and a better awareness of human impacts on the environment was the fourth most cited category. As with the FMNP and FNRLI counterparts, FSGEAC responses focused on the general need for an increased awareness of how human settlement and development patterns impact the environment, and the need for an increased environmental ethic to protect and conserve coastal and marine resources.

Issues associated with **climate change** (e.g., global warming and its effects on coastal settlements and ecosystems) and **energy** (e.g., exploring new technologies and studying the impacts of new drilling) drew 6.3% and 0.9% of the total responses, respectively.

Table 15. Summary of FSGEAC responses to open-ended questions that identified additional top priorities.

Seafood Production and Safety	Responses	% Group	% Total	Topic Rank	Issue Rank
A. Fisheries Management	10	45.5	8.9		**3**
B. Protect EFH and provide artificial reefs	7	31.8	6.3		**5**
C. Offshore aquaculture/mariculture pollution/more regulations	4	18.2	3.6		**8 (tie)**
D. Seafood safety/consumer awareness	1	4.5	0.9		
E. Protect commercial fishers from over-regulation	0	0.0	0.0		
Group Total	**22**	**100.0**	**19.6**	**3**	**1**
Environmental Education					
A. Environmental appreciation and awareness of human impacts	17	100.0	15.2	**4**	
Sustainable Communities					
A. Restrict/stop shorefront development	4	13.8	3.6		**8 (tie)**
B. Land acquisition and preservation	0	0.0	0.0		
C. Provide more public access	8	27.6	7.1		**4**
D. Boater Impacts (education, safety, licensing, enforcement)	3	10.3	2.7		
E. Better laws and enforcement of speed zones/development	3	10.3	2.7		
F. Derelict vessels/crab traps and waterway maintenance	0	0.0	0.0		
G. Funding for management and enforcement of regulations	1	3.4	0.9		
H. Carrying capacity/population growth impacts	0	0.0	0.0		
I. Alternative energy (wind/wave)	1	3.4	0.9		
J. Sustainable tourism/recreation	0	0.0	0.0		
K. Preserve historic sites and working waterfronts	4	13.8	3.6		**8 (tie)**
L. Intergovernmental coordination incentives for smart growth	2	6.9	1.8		
M. Public engagement in action planning	1	3.4	0.9		
N. Hazard resilience better building codes	1	3.4	0.9		
O. Promote low density development	0	0.0	0.0		
P. Fewer boating regulations/manatee zones	1	3.4	0.9		
Group Total	**29**	**100.0**	**25.9**	**2**	
Healthy Ecosystems					
A. Water Resources Quality	12	35.3	10.7		**2**
Nutrients and pollution (runoff, sewage discharge, red tide)	8	66.7	7.1		
Protect upland watersheds and water quality	2	16.7	1.8		
Overconsumption/transfer/protection	1	8.3	0.9		
Freshwater outflows to estuaries and salinity issues	0	0.0	0.0		
Predictive models and water quality monitoring	1	8.3	0.9		
B. Identify/protect essential marine habitats	5	14.7	4.5		**7**
C. Protect natural beaches/shoreline ecosystems	6	17.6	5.4		**6**
D. Species protection	0	0.0	0.0		
E. Habitat restoration (dunes, mangrove, seagrass, reefs)	4	11.8	3.6		**8 (tie)**
F. Aquatic invasive species	4	11.8	3.6		**8 (tie)**
G. Study renourishment pros/cons (beaches, dunes, reefs)	3	8.8	2.7		
Group Total	**34**	**100.0**	**30.4**	**1**	
Climate					
A. Climate change	5	71.4	4.5		
B. Sea level rise	2	28.6	1.8		
C. Changing salinity	0	0.0	0.0		
Group Total	**7**	**100.0**	**6.3**	**5**	
Energy					
A. Explore/study commercial/industrial uses (more drilling)	1	100.0	0.9		
B. No drilling	0	0.0	0.0		
Group Total	**1**	**100.0**	**0.9**	**6**	
Other	3	100.0	2.7		
TOTAL	**112**				

Summary

A synthesis and ranking of important topics and issues identified by survey respondents in Questions 6 and 8 is provided in Table 16. A content analysis of those open-ended questions classified responses into a hierarchy of general topics (categories) and specific related issues (sub-categories). The summary for important topics reveals similarities between all respondents and FSGEAC-only rankings. The primary difference is a switching of the rankings of "environmental education and awareness" and "seafood production and safety" themes among FSGEAC and All respondent samples. The top-two cited specific issues (water resources quality and environmental appreciation and awareness of human impacts) received identical rankings among FSGEAC and All respondent groups. Furthermore, seven of the top eight issues identified by all respondents were also ranked as top issues by FSGEAC members. The issue of "species protection" did not make the top eight among FSGEAC respondents. In addition to those top issues common with all respondents, FSGEAC members identified the need for more public access, preservation of working waterfronts, protection of essential fish habitat and the provision of more artificial reefs, the eradication of aquatic invasive species, and the development of more offshore aquaculture and mariculture farms as important.

Table 16. Ranking of general topics and specific issues from open-ended questions.

Priority Topic and Issue Ranking Comparison	**Ranking**	
General Topics - Categories	**All Respondents**	**FSGEAC Only**
Healthy ecosystems	1	1
Sustainable communities	2	2
Environmental education	3	4
Seafood production & safety	4	3
Climate	5	5
Energy	6	6
Specific Issues – Sub-Categories		
Water resources	1	1
Environmental human impacts awareness	2	2
Restrict shorefront development	3	8 (tie)
Identify/protect essential marine habitats	4	7
Protect beaches/shorefront ecosystems	5	6
Species protection (manatees, dolphins, turtles, birds)	6	
Habitat restoration (dunes, mangrove, seagrass, reefs)	7	8 (tie)
Fisheries management: stock enhancement/limits/zones	8	3
Public access		4
Protect EFH/establish and monitor artificial reefs		5
Aquatic invasive species		8 (tie)
More clean offshore aquaculture/mariculture		8 (tie)
Preserve historic sites and working waterfronts		8 (tie)

As a first step in the 2009-2013 strategic planning process, Florida Sea Grant management and campus specialists reviewed the National Sea Grant and NOAA strategic plans, and considered existing research and extension activities to identify the following four areas of programmatic focus: 1) Healthy Coastal and Marine Ecosystems, 2) Sustainable and Hazard-Resilient Coastal Communities, 3) Seafood Production and Safety, and 4) Climate Change: Impacts and Adaptations.

Top outcomes identified by the hierarchical cluster analysis are summarized according to the new Florida Sea Grant focus areas in Table 17. The outcomes listed represent a composite of the top 10 rated outcomes identified for the entire sample (all groups combined) and for the FSGEAC sub-sample. The results show that five of the top 10 outcomes identified by all groups also made the top 10 for the FSGEAC sub-sample (i.e., outcomes 7, 14, 23, 30, and 31). Outcomes 8, 16, 21, 25, and 33 were top outcomes identified by the entire sample, and outcomes 1, 2, 11, 19, and 27 were identified by the FSGEAC sub-sample. Climate change represents a new planning area for Florida Sea Grant which will be addressed more fully in the upcoming strategic planning workshop (scheduled for September 2008). The strategic planning workshop will bring together research and extension experts and program advisors from around the State to participate in facilitated sessions devoted to each of the four Florida Sea Grant 2009 – 2013 strategic planning focus areas. The top outcomes identified by survey respondent groups (listed for each planning area in Table 17) will be required discussion topics.

Table 17. Summary of top outcomes identified for Florida Sea Grant priority planning themes.

Seafood Production and Safety	
19	Safe seafood products for consumption
1	Availability of fresh local fish products
2	Science-based recreational fisheries management
27	Science-based commercial fisheries management
33	Reduction of illegally harvested marine products
Sustainable and Hazard-Resilient Coastal Communities	
23	Reduce water quality impacts due to development, runoff or industrial discharge
14	Smart Growth (mixed uses, higher density development, shoreline setbacks, preserve natural coastline/open land
7	Environmentally sustainable behaviors and choices
Healthy Coastal and Marine Ecosystems	
30	Identification and protection of critical marine habitats (coral reefs, seagrass, essential fish habitat)
31	Improve water quality and water monitoring efforts
11	Reduce impacts of harmful algae blooms (red tide)
8	Understand inter-species and habitat/species relationships, habitat distribution/abundance
16	Marine/Coastal curriculum for K-12 education
21	Reduced prevalence of invasive aquatic species
25	Coastal/Marine learning/volunteering opportunities for communities (e.g., dune restoration, beach cleanups
Climate Change: Impacts and Adaptations	
No top outcomes identified	

In summary, the key findings are:

Floridians who participated in the strategic planning survey identified the following (all equally important) outcomes to be of the highest priority for Sea Grant programming:

1. The adoption of environmentally sustainable behaviors and living choices.
2. The declining quality of water resources and human induced impacts to water quality (e.g., development runoff, industrial discharge).
3. The identification and protection of shorefront ecosystems and critical marine habitats (including the imposition of restrictions/moratoriums on future shorefront development).
4. Safe seafood products for consumption.
5. Understanding inter-species and habitat-species relationships and habitat distribution and abundance.
6. Smart growth focusing on the protection/preservation of natural coastline and open lands.

FSGEAC members who participated in the strategic planning survey identified the following important priorities in addition to those mentioned above:

1. Fisheries management that includes stock enhancements, catch limits, the establishment of more no-take zones, and the identification and protection of essential fish habitat.
2. Declining public access to shorefronts and waterways.
3. The preservation of coastal historic sites including customary uses of waterfronts (e.g., working waterfronts).

A significant number of Floridians who participated in the survey also identified the priority need for environmental/marine education as a means of generating sustainable behaviors and instilling a greater respect of the natural environment and awareness of human-induced impacts to coastal and marine environments.

Appendix A. Cluster Analysis Interpretation

All Respondents

It is acknowledged that all 34 outcomes listed in Question 7 of the survey instrument represent important outcomes. Nevertheless, a measure of their relative importance was needed to identify those outcomes, based on the rankings of survey respondents, that would be deemed as most important, next important, or least important in a relative sense.

A cluster analysis was performed to identify groups of outcomes that are similar (or dissimilar) in terms of their relative importance based on statistical distance derived from descriptive statistics used as input variables. The cluster analysis relied solely on these statistics as measured from the ratings of outcomes by survey respondents to Question 7 of the survey instrument (Q7_1 through Q7_34). The results of the cluster analysis helped to differentiate the relative importance of rated outcomes by breaking the 34 outcomes into distinct and like groups as defined in terms of their relative importance. The input variables used in the clustering routine were the mean, standard deviation, median, lower confidence limit for the median, and a dichotomous variable (Yes) to indicate whether the observed mean value for a given outcome was above/equal or below the weighted mean for all 34 outcomes (a value of 3.83); where Yes=1 if above or equal, and Yes=0 if below.

Note that a hierarchical cluster method was used as the input variables differed in terms of their measurement levels (i.e., the input variables were a mixture of outcome variables measured at the nominal and interval scales). More specifically, a “Hierarchical Group-Average Clustering” routine was run (using the un-weighted pair-group option, Euclidean distance, and standard deviation for scaling).

The linkage section in Table A1 illustrates the coupling or clustering of outcomes in statistical space from linkage 1 through linkage 33. Linkage 1 shows that the outcomes 23 and 30 are most similar in terms of their values (i.e., both have relatively high and similar means and small and similar standard deviations).

A complete picture of the clustering procedure is illustrated by the dendrogram in Figure A1. Note that the cophenetic correlation coefficient for the cluster routine was 0.8735, indicating that the identified clusters provide a good and efficient fit as measured in terms of statistical distance and similarity/dissimilarity. The dendrogram in Figure A1 represents a graph of dissimilarity values; that when linked, form a cluster tree. At a dissimilarity index value of approximately 1.0, the dendrogram identifies four distinct groups of outcomes associated with the ratings of survey responses to Question 7. In descending order of cluster dissimilarity, the groups are listed as follows:

Group 1 – composed of a single anomalous outcome variable 2 – an outcome variable that is distant and dissimilar from other outcome variables given its large mean and a relatively large standard deviation (and therefore represents a stand-alone outcome variable)—an outcome of high importance, yet high variability. It is interesting to note that the upper-limit of 95% confidence interval for the mean of this outcome variable exceeds 4.0, and its lower limit of 3.89

exceeds 3.83 (the weighted average value for all outcomes). Thus, outcome 2 may be characterized as **an outcome of high relative importance.**

Group 2 – composed of outcome variables 7, 8, 14, 23, 30, and 31, representing a cluster of six outcome variables with large mean values and relatively small standard deviations—CLUSTER 1—**outcomes of the highest relative importance.**

Group 3 – composed of outcome variables 9, 12, 13, 15, 18, 22, and 34, representing a cluster of seven outcome variables with small mean values and relatively large standard deviations—CLUSTER 2—**outcomes of the lowest relative importance.**

Group 4 – comprised of outcome variables 1, 2, 3, 4, 5, 6, 10, 11, 16, 17, 19, 20, 21, 24, 25, 26, 27, 28, 29, 32, and 33, representing a large cluster of 20 outcome variables with sizeable means and moderate standard deviations—CLUSTER 3—**outcomes of high relative importance.**

Table A1. Linkages of outcomes and clusters derived from all survey responses to Question 7.

<table>
<tr><th colspan="5">Linkage Section (links 1 through 33) for Question 7 (outcomes 1 through 34)</th></tr>
<tr><th>Link</th><th>Number Clusters</th><th>Distance Value</th><th>Distance Bar</th><th>Rows Linked</th></tr>
<tr><td>33</td><td>1</td><td>2.188002</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIIIIIII</td><td>1,5,10,17,3,4,20,29,32,6,11,19,27,24,26,28,16,25 33,21,9,12,13,22,18,34,15,7,31,14,23,30,8,2</td></tr>
<tr><td>32</td><td>2</td><td>1.675344</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>1,5,10,17,3,4,20,29,32,6,11,19,27,24,26,28,16,25 33,21,9,12,13,22,18,34,15,7,31,14,23,30,8</td></tr>
<tr><td>31</td><td>3</td><td>1.258541</td><td>|IIIIIIIIIIIIIIIII</td><td>1,5,10,17,3,4,20,29,32,6,11,19,27,24,26,28,16,25 33,21,9,12,13,22,18,34,15</td></tr>
<tr><td>30</td><td>4</td><td>0.858875</td><td>|IIIIIIIIIIII</td><td>7,31,14,23,30,8 (Group 2)</td></tr>
<tr><td>29</td><td>5</td><td>0.844785</td><td>|IIIIIIIIIIII</td><td>9,12,13,22,18,34,15 (Group 3)</td></tr>
<tr><td>28</td><td>6</td><td>0.650389</td><td>|IIIIIIIII</td><td>1,5,10,17,3,4,20,29,32,6,11,19,27,24,26,28,16,25 33,21 (Group 4)</td></tr>
<tr><td>27</td><td>7</td><td>0.371386</td><td>|IIIII</td><td>12,13,22,18,34,15</td></tr>
<tr><td>26</td><td>8</td><td>0.315703</td><td>|IIII</td><td>7,31,14,23,30</td></tr>
<tr><td>25</td><td>9</td><td>0.303291</td><td>|IIII</td><td>6,11,19,27,24,26,28,16,25,33,21</td></tr>
<tr><td>24</td><td>10</td><td>0.284329</td><td>|IIII</td><td>12,13,22,18,34</td></tr>
<tr><td>23</td><td>11</td><td>0.262349</td><td>|IIII</td><td>1,5,10,17,3,4,20,29,32</td></tr>
<tr><td>22</td><td>12</td><td>0.246779</td><td>|III</td><td>6,11,19,27,24,26,28</td></tr>
<tr><td>21</td><td>13</td><td>0.214236</td><td>|III</td><td>1,5,10,17</td></tr>
<tr><td>20</td><td>14</td><td>0.203165</td><td>|III</td><td>12,13,22</td></tr>
<tr><td>19</td><td>15</td><td>0.192894</td><td>|III</td><td>3,4,20,29,32</td></tr>
<tr><td>18</td><td>16</td><td>0.183554</td><td>|III</td><td>16,25,33,21</td></tr>
<tr><td>17</td><td>17</td><td>0.155332</td><td>|II</td><td>7,31,14</td></tr>
<tr><td>16</td><td>18</td><td>0.143420</td><td>|II</td><td>4,20,29,32</td></tr>
<tr><td>15</td><td>19</td><td>0.142814</td><td>|II</td><td>18,34</td></tr>
<tr><td>14</td><td>20</td><td>0.130047</td><td>|II</td><td>11,19,27,24,26,28</td></tr>
<tr><td>13</td><td>21</td><td>0.124907</td><td>|II</td><td>13,22</td></tr>
<tr><td>12</td><td>22</td><td>0.112216</td><td>|II</td><td>16,25,33</td></tr>
<tr><td>11</td><td>23</td><td>0.104335</td><td>|I</td><td>7,31</td></tr>
<tr><td>10</td><td>24</td><td>0.091312</td><td>|I</td><td>11,19,27</td></tr>
<tr><td>9</td><td>25</td><td>0.084992</td><td>|I</td><td>20,29,32</td></tr>
<tr><td>8</td><td>26</td><td>0.075942</td><td>|I</td><td>5,10,17</td></tr>
<tr><td>7</td><td>27</td><td>0.073491</td><td>|I</td><td>24,26,28</td></tr>
<tr><td>6</td><td>28</td><td>0.069187</td><td>|I</td><td>25,33</td></tr>
<tr><td>5</td><td>29</td><td>0.053290</td><td>|I</td><td>29,32</td></tr>
<tr><td>4</td><td>30</td><td>0.051717</td><td>|I</td><td>19,27</td></tr>
<tr><td>3</td><td>31</td><td>0.034915</td><td>|</td><td>24,26</td></tr>
<tr><td>2</td><td>32</td><td>0.034478</td><td>|</td><td>10,17</td></tr>
<tr><td>1</td><td>33</td><td>0.005880</td><td>|</td><td>23,30</td></tr>
</table>

Cophenetic Correlation 0.8735

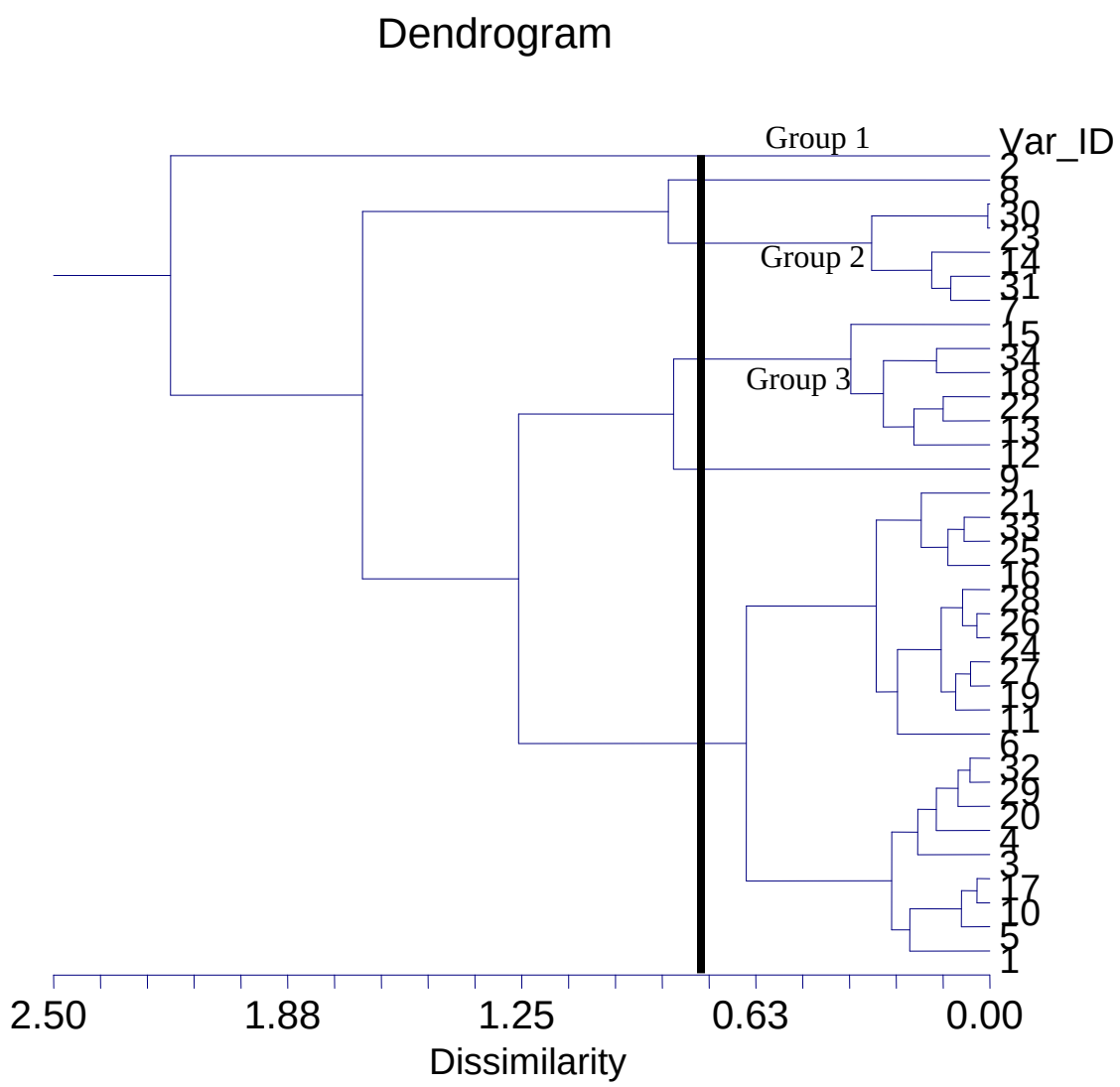

Figure A1. Dendrogram for hierarchical cluster analysis for all responses to Question 7.

FSGEAC Sub-Sample

A cluster analysis was also implemented for the FSGEAC sub-sample of responses (n = 96) to identify groupings of outcomes which can be compared to results obtained using the entire sample. The results of the hierarchical cluster analysis of FSGEAC responses to Question 7 are presented in Table A2 and Figure A2. Three groupings of outcomes were identified:

Group 1 – composed of outcome variables 7, 14, 19, 23, 30, and 31 representing a cluster of six outcome variables with large mean values and relatively small standard deviations—CLUSTER 1—**outcomes of the highest relative importance.** Note that five of the six outcomes listed are the same as those identified for the entire sample.

Group 2 – comprised of outcome variables 1, 2, 5, 6, 8, 11, 16, 24, 27, 28, and 33, representing a large cluster of eleven outcome variables with sizeable means and moderate standard deviations—CLUSTER 2—**outcomes of high relative importance.** Note that the list of outcomes that fall into this category has decreased from twenty for the entire sample to eleven for the FSGEAC sub-sample.

Group 3 – composed of outcome variables 3, 4, 9, 10, 12, 13, 15, 17, 18, 20, 21, 22, 25, 26, 29, 32, and 34, representing a cluster of 17 outcome variables with small mean values and relatively large standard deviations—CLUSTER 3—**outcomes of the lowest relative importance.** Note that 10 new outcomes have been added to the list of outcomes of lowest importance in comparison to the number of outcome from the entire sample that fall into this category.

Table A2. Linkages of outcomes and clusters derived from FSGEAC responses to Question 7.

<table>
<tr><th colspan="5">Linkage Section (links 1 through 33) for Question 7 (outcomes 1 through 34)</th></tr>
<tr><th>Link</th><th>Number Clusters</th><th>Distance Value</th><th>Distance Bar</th><th>Rows Linked</th></tr>
<tr><td>33</td><td>1</td><td>1.555597</td><td>|||||||||||||||||||||||||||||||</td><td>1,2,5,28,6,8,27,11,16,24,33,7,14,30,23,19,31,3
26,25,9,12,29,13,10,21,4,32,15,18,34,20,22,17</td></tr>
<tr><td>32</td><td>2</td><td>1.017212</td><td>|||||||||||||||||||||</td><td>1,2,5,28,6,8,27,11,16,24,33,7,14,30,23,19,31</td></tr>
<tr><td>31</td><td>3</td><td>0.989953</td><td>||||||||||||||||||||</td><td>3,26,25,9,12,29,13,10,21,4,32,15,18,34,20,22,17</td></tr>
<tr><td>30</td><td>4</td><td>0.941476</td><td>|||||||||||||||||||</td><td>4,32,15,18,34,20,22,17</td></tr>
<tr><td>29</td><td>5</td><td>0.900581</td><td>||||||||||||||||||</td><td>1,2,5,28,6,8,27,11,16,24,33</td></tr>
<tr><td>28</td><td>6</td><td>0.832797</td><td>|||||||||||||||||</td><td>7,14,30,23,19,31</td></tr>
<tr><td>27</td><td>7</td><td>0.804247</td><td>|||||||||||||||||</td><td>3,26,25,9,12,29,13,10,21</td></tr>
<tr><td>26</td><td>8</td><td>0.661075</td><td>||||||||||||||</td><td>5,28,6,8,27,11,16,24,33</td></tr>
<tr><td>25</td><td>9</td><td>0.617055</td><td>|||||||||||||</td><td>6,8,27,11,16,24,33</td></tr>
<tr><td>24</td><td>10</td><td>0.588180</td><td>||||||||||||</td><td>7,14,30,23</td></tr>
<tr><td>23</td><td>11</td><td>0.580823</td><td>||||||||||||</td><td>4,32,15,18,34,20,22</td></tr>
<tr><td>22</td><td>12</td><td>0.539302</td><td>|||||||||||</td><td>3,26,25,9,12,29,13</td></tr>
<tr><td>21</td><td>13</td><td>0.471913</td><td>||||||||||</td><td>10,21</td></tr>
<tr><td>20</td><td>14</td><td>0.458894</td><td>||||||||||</td><td>1,2</td></tr>
<tr><td>19</td><td>15</td><td>0.403428</td><td>|||||||||</td><td>15,18,34,20,22</td></tr>
<tr><td>18</td><td>16</td><td>0.363958</td><td>||||||||</td><td>8,27,11,16,24,33</td></tr>
<tr><td>17</td><td>17</td><td>0.363346</td><td>||||||||</td><td>19,31</td></tr>
<tr><td>16</td><td>18</td><td>0.359535</td><td>||||||||</td><td>5,28</td></tr>
<tr><td>15</td><td>19</td><td>0.339249</td><td>||||||||</td><td>9,12,29,13</td></tr>
<tr><td>14</td><td>20</td><td>0.332783</td><td>|||||||</td><td>15,18,34</td></tr>
<tr><td>13</td><td>21</td><td>0.289436</td><td>|||||||</td><td>20,22</td></tr>
<tr><td>12</td><td>22</td><td>0.242706</td><td>||||||</td><td>3,26,25</td></tr>
<tr><td>11</td><td>23</td><td>0.229959</td><td>|||||</td><td>11,16,24,33</td></tr>
<tr><td>10</td><td>24</td><td>0.214638</td><td>|||||</td><td>3,26</td></tr>
<tr><td>9</td><td>25</td><td>0.200547</td><td>|||||</td><td>8,27</td></tr>
<tr><td>8</td><td>26</td><td>0.196588</td><td>|||||</td><td>9,12,29</td></tr>
<tr><td>7</td><td>27</td><td>0.149806</td><td>||||</td><td>15,18</td></tr>
<tr><td>6</td><td>28</td><td>0.149606</td><td>||||</td><td>12,29</td></tr>
<tr><td>5</td><td>29</td><td>0.137878</td><td>||||</td><td>11,16,24</td></tr>
<tr><td>4</td><td>30</td><td>0.083129</td><td>|||</td><td>4,32</td></tr>
<tr><td>3</td><td>31</td><td>0.062280</td><td>||</td><td>11,16</td></tr>
<tr><td>2</td><td>32</td><td>0.043880</td><td>||</td><td>7,14,30</td></tr>
<tr><td>1</td><td>33</td><td>0.024738</td><td>|</td><td>14,30</td></tr>
<tr><td colspan="2">Cophenetic Correlation</td><td>0.786692</td><td></td><td></td></tr>
</table>

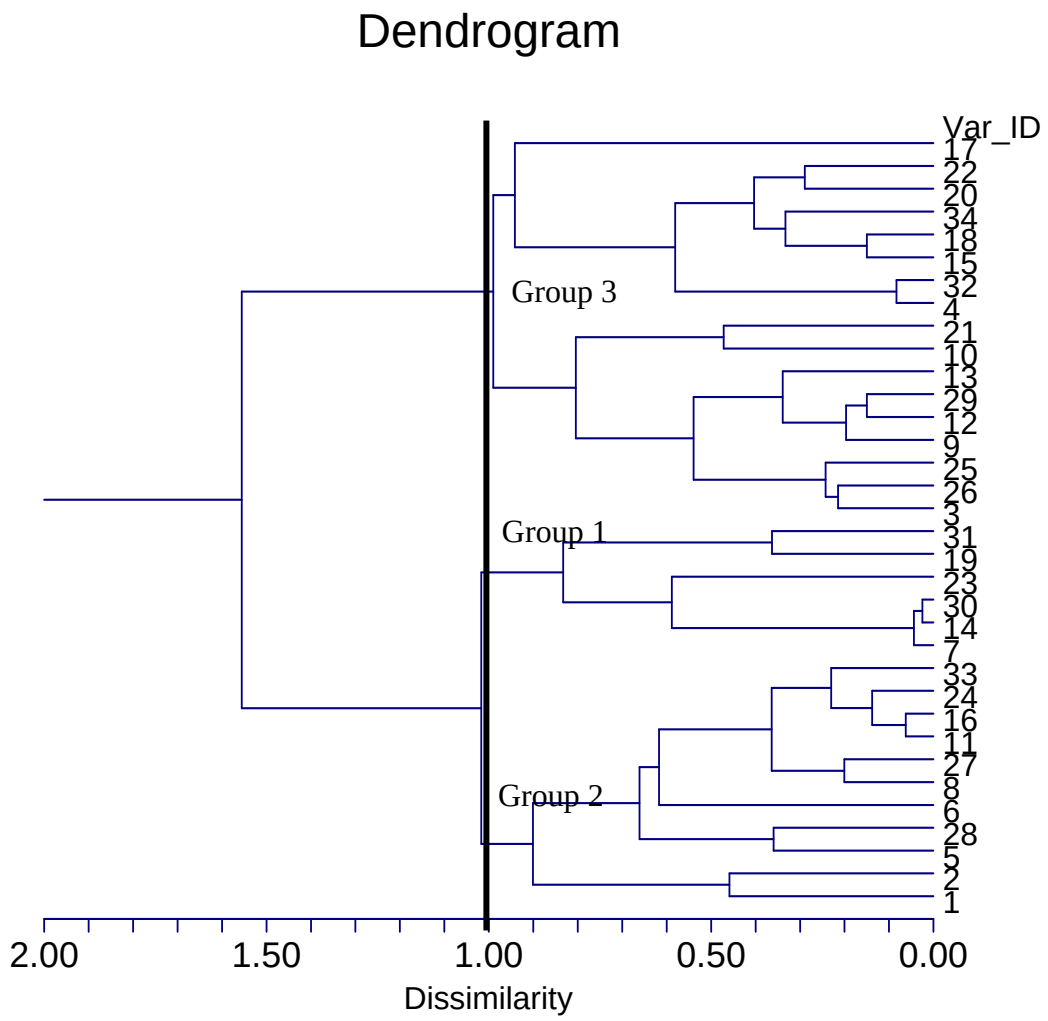

Figure A2. Dendrogram for hierarchical cluster analysis for FSGEAC responses to Question 7.

Appendix B. Survey Instrument

Sea Grant
Science Serving Florida's Coast

Florida Sea Grant

Coastal & Marine Issues

Question 1. In what Florida county do you reside? _____

Question 2. What Florida coastal county are you most familiar with in terms of having a vested interest, experience, or knowledge of coastal/marine issues? _____

Question 3. Please check the box to the right of the option that best describes your employment or affiliation. (*Select one only.*)

Higher Education	☐	Retired	☐
K-12 Education	☐	Business Owner	☐
Government Agency	☐	Self-Employed	☐
Non-Profit Organization	☐	Law Enforcement	☐
Private Consulting Firm	☐	Service Organization	☐
Marine or Coastal Industry	☐	Appointed Board Member	☐
Elected Official	☐	Other (*please specify in the space below*)	☐

Question 4. From the following list, please identify the **top three** activities that best describe your relationship with Florida's oceans and coasts (*1 = strongest, 2 = next strongest, 3 = third strongest.*) Leave the other boxes empty.

Recreational user of beaches	☐	Coastal development/real estate	☐
Bird and/or wildlife observer	☐	Marine industries	☐
Diver and/or snorkeler	☐	Marine educator	☐
Recreational fisher	☐	Biotechnology researcher/entrepreneur	☐
Commercial fisher	☐	Ecosystem preservation	☐
Aquaculture industry	☐	Protecting human use of resources	☐
Recreational boater	☐	Property owner	☐
Shipping/commerce	☐	Other (*please specify in the space below*)	☐

Question 5. We want your opinion about coastal and marine related topics identified in prior Florida Sea Grant strategic planning and stakeholder dialogues. Please select the top five coastal and marine related topics from the following list and rank them from higher to lower importance to you. **(Rank the 5 items that you select from 1 = higher importance to 5 = lower importance.)**

Coastal-Related Topics	Rank
Marine bio-technology: Development of marine-derived	☐
Fisheries: Devise and teach production and management	☐
Aquaculture: Develop the food and hobby segments of	☐
Seafood safety: Improve the quality and safety of	☐
Coastal communities: Foster sustainable community	☐
Ecosystem health: Protect, restore, and enhance living	☐
Coastal hazards: Respond to shoreline change and	☐
Marine education: Promote coastal/marine knowledge	☐

<u>Question 6</u>. Are there additional important emerging coastal/marine related topics that Florida Sea Grant should consider that are not listed in Question 5? (*Please list below.)*

1.
2.
3.

Question 7. For the following potential outcomes, please check the box that best describes how important you consider them to be to you, or how important they are to your coastal area. All of the outcomes on the list are important, but some may be very important and some may be less important to you. (*Please try to rate each outcome in terms of its relative importance to the other outcomes listed.*)

Outcome	Very Important ← → Less Important				
(1) Availability of fresh local fish products	☐	☐	☐	☐	☐
(2) Science-based recreational fisheries management	☐	☐	☐	☐	☐
(3) Fewer beach closures due to water quality issues	☐	☐	☐	☐	☐
(4) Sustainable sources of ocean-derived energy/power	☐	☐	☐	☐	☐
(5) Informed decisions about artificial reef deployment	☐	☐	☐	☐	☐
(6) Accurate predictions of hurricane storm surge	☐	☐	☐	☐	☐
(7) Environmentally sustainable behaviors and choices	☐	☐	☐	☐	☐
(8) Understand interspecies and habitat/species relationships, and habitat distribution/abundance	☐	☐	☐	☐	☐
(9) Safe and courteous boating behaviors	☐	☐	☐	☐	☐
(10) Effective waterway maintenance and management	☐	☐	☐	☐	☐
(11) Reduced impacts of harmful algal blooms (red tide)	☐	☐	☐	☐	☐
(12) Better public access to waterfronts/waterways/beaches	☐	☐	☐	☐	☐
(13) Availability of fresh local aquaculture products (clams, oysters)	☐	☐	☐	☐	☐
(14) Smart Growth (mixed uses, higher density development, shoreline setbacks, preserve natural coastline/open land)	☐	☐	☐	☐	☐
(15) Better navigation and waterway information	☐	☐	☐	☐	☐
(16) Marine/coastal curriculum for K-12 education	☐	☐	☐	☐	☐
(17) Discovery of marine-derived products to enhance ecosystems (eco-friendly boat paint additives)	☐	☐	☐	☐	☐
(18) Understand sources and processes of ocean-related risks to human health and safety (natural hazards)	☐	☐	☐	☐	☐
(19) Safe seafood products for consumption	☐	☐	☐	☐	☐
(20) Improved building codes, materials and designs to mitigate storm damage	☐	☐	☐	☐	☐
(21) Reduced prevalence of invasive aquatic species	☐	☐	☐	☐	☐
(22) Fair and justified boating regulations	☐	☐	☐	☐	☐
(23) Reduce water quality impacts due to development runoff or industrial discharge	☐	☐	☐	☐	☐
(24) Actively engaged public in decision-making/planning	☐	☐	☐	☐	☐
(25) Coastal/marine learning/volunteering opportunities for communities (dune restoration, beach clean-ups)	☐	☐	☐	☐	☐
(26) Understand human use patterns and behaviors that may influence resource stability and sustainability	☐	☐	☐	☐	☐
(27) Science based commercial fisheries management	☐	☐	☐	☐	☐
(28) Understand the impact of climate variability and change on marine resources such as fisheries/coral reefs	☐	☐	☐	☐	☐
(29) Discovery of marine-derived bio-medical products to enhance human life (cancer fighting drugs)	☐	☐	☐	☐	☐
(30) Identification and protection of critical marine habitats (coral reefs, seagrass, essential fish habitat)	☐	☐	☐	☐	☐
(31) Improved water quality and water monitoring efforts	☐	☐	☐	☐	☐
(32) Accurate information and adaptive measures for sea level rise due to climate change	☐	☐	☐	☐	☐
(33) Reduction of illegally harvested marine products	☐	☐	☐	☐	☐
(34) Hazard risk models to forecast community vulnerability	☐	☐	☐	☐	☐

Question 8. Are there any coastal and/or marine outcomes (in addition to items addressed in Question 7) that you consider to be particularly important and in need of resolution. (*Please list below*.)

1.
2.
3.