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## EXECUTIVE SUMMARY

In 2012, the Georgia Sea Grant Program and the Marine Extension Service (MAREX) of the University of Georgia (UGA) began their scheduled five-year strategic planning process. Simultaneously, the Coastal Management Program (CMP) of the Georgia Department of Natural Resources Coastal Resources Division and the Sapelo Island National Estuarine Research Reserve (SINERR) also initiated a stakeholder needs assessment and a “market inventory” of training needs among stakeholders in coastal Georgia. Working with the Carl Vinson Institute of Government (CVIOG) at the University of Georgia, all four agencies (hereafter referred to as “the four partners”) collaborated in developing and launching a web-based survey of key stakeholder groups. Designed by the Government Services and Research Division of CVIOG, this survey sought to identify: 1) the main environmental management concerns of coastal stakeholders; 2) stakeholders’ familiarity with the four partners; 3) areas in which the four partners could fill specific needs that would benefit coastal stakeholders; and 4) specific areas where coastal stakeholders are in need of additional training and education.

Teams from each partnering agency identified survey topics and posed specific questions, based on five focal areas identified as strategic planning priorities by the National Sea Grant Program. Those five focal areas are: 1) safe and sustainable seafood supply; 2) education; 3) sustainable coastal development; 4) healthy coastal ecosystems; and 5) resilient coastal communities. Discussions were held with all four partnering agencies to ensure their respective information needs would be met by the questions selected. Initially, survey questions were delineated by Sea Grant/MAREX focal areas and the specific areas of interest identified by CRD and SINERR. However, after working closely with CVIOG faculty and staff, the four partners agreed to a survey format that consisted of a general survey section (with questions relevant to all stakeholders), and four sector-based satellite surveys targeting: a) local government officials; b) educators; c) government agency regulators (resource managers, environmental protection personnel and environmental health professionals); and d) a combination of environmental non-profit organizations, scientists, and other coastal stakeholders. This format allowed information relevant to the Sea Grant/MAREX focal areas and the specific information needs of CRD and SINERR to be obtained without duplicating questions or generating an un-necessarily long survey. Each survey respondent who completed the general survey section was directed to the appropriate satellite survey based on the professional affiliation they selected at the end of the general survey.

The four partnering agencies and CVIOG compiled names and e-mail addresses of prospective participants. Those contacts were grouped into the following categories: 1) city officials; 2) county officials, 3) teachers; 4) “trainers”, *i.e.*, individuals affiliated with non-governmental or environmental organizations whose jobs include outreach and education but who are not pre-K or K-12 teachers; 5) public water system operators; 6) local government employees responsible for erosion and sedimentation control and enforcement; 7) state government employees; 8) representatives of businesses such as developers and tourism operators; and 9) research scientists actively engaged in studies of coastal Georgia. Of the 1350 individuals invited to take the on-line survey, 162 individuals responded, providing a response rate of 12%. Educators represented the largest proportion of respondents (44%), followed by government agency employees, local government elected and appointed officials, business representatives, and trainers from non-governmental or environmental

organizations. Because the number of coastal professionals in any one field is not evenly distributed, it was not possible to guarantee equal representation across professional sectors. Results of the general survey may thus be skewed towards those sectors which had the greater number of respondents.

## Key survey findings

### General Survey

- 1) The general prioritization of issues considered most important to the future of coastal resource management in Georgia are (Figs. 3-8)
  - a) Water resources protection
  - b) Natural habitats
  - c) Growth and development
  - d) Coastal hazards
  - e) Community issues
  - f) Coastal economy
- 2) The most important reason survey respondents contact any organization for assistance is the technical expertise of the staff, followed by whether that stakeholder has a personal relationship with the staff or the organization. (Fig. 24)

### Local Government Officials and Regulators

- 1) A majority of local government and regulatory agency satellite survey respondents agree that there are economic benefits to sustainable land use practices, and both groups agree on the usefulness of a range of such practices in promoting sustainability. Furthermore, the biggest impediments to implementation of sustainable land use practices include the lack of funding, staff, training, and local government standards. Survey participants also identify lack of interest and lack of managerial support as the two *least* significant challenges for local governments in implementing sustainable land use practices. (Figs. 38-40)
- 2) Overall, a strong majority of local government respondents either somewhat or strongly agree that their city or county would consider adopting sustainable development and land use ordinances. When asked about the barriers to implementing land use and sustainability ordinances, most officials indicate lack of training and expertise as the biggest barrier, followed by lack of staff or personnel and lack of funding. Although these responses indicate a significant interest in adoption of sustainability and land use ordinances, 87% of local government respondents believe that environmental quality would improve or stay the same if existing land use practices were left in place. (Figs. 49 and 50)
- 3) Habitat destruction is identified as having the greatest adverse environmental impact. Construction in environmentally sensitive areas, storm water runoff, lack of stream or marsh

buffers, and contamination from pesticides, herbicides, and fertilizers are also perceived as significant threats to the coastal environment. (Fig. 61)

### Educators

- 1) Educators find it important to teach about ecosystem and environmental issues, but lack of instructional time and the importance of other curriculum requirements are the largest obstacles to using ocean-related curriculum. While funding shortages also pose an impediment, lack of educator interest and administrative support are identified as insignificant challenges. (Fig. 67)
- 2) A large majority (80%) of teachers surveyed have taken students on a coastal field trip. The most popular field trip destination is the MAREX Marine Education Center and Aquarium on Skidaway Island, followed by the Skidaway Institute of Oceanography. Almost half of the respondents visited a site because of the educational opportunities it afforded students. Educators identify costs, reputation, and proximity as less important considerations. (Figs. 70 – 73)

### Training opportunities for partnering agencies

- 1) Agencies could be most effective by providing additional training and education to coastal stakeholders on matters regarding:
  - a) Wetlands and waterways protection
  - b) Coastal and estuarine ecosystems
  - c) Marsh protection
  - d) Environmental aspects of land use
  - e) Non-point source pollution
- 2) Partners should also consider providing education and training opportunities in topics associated with:
  - a) Freshwater availability
  - b) Water conservation
  - c) Groundwater contamination
  - d) Saltwater intrusion

### **Challenges for the four partnering agencies**

Although stakeholders expressed a desire for additional training and education in some areas, the four partners face some significant challenges in being recognized as authoritative sources of information and accepted by the stakeholders as appropriate providers of training and education programs.



1. Although stakeholders are most familiar with the Georgia Department of Natural Resources (DNR) and the Coastal Resources Division of DNR, familiarity of the individual environmental programs managed by DNR is low.
2. The educational facilities on Skidaway Island are well known and very well visited. However, general knowledge about the University of Georgia's role in those facilities and other UGA coastal resources-related activities and expertise is low. Similarly, SINERR also has a low level of recognition among survey respondents
3. Shrinking state and federal budgets affect the ability of all agencies to perform their duties. Additionally, educators, local government staff, and government agency survey respondents identify lack of funding and cost concerns as being significant challenges to implementing a wide range of technologies, activities, and management practices.

## INTRODUCTION

In 2012, the Georgia Sea Grant Program and the Marine Extension Service (MAREX) of the University of Georgia began their scheduled five-year strategic planning process. Simultaneously, the Coastal Management Program (CMP) of the Georgia Department of Natural Resources, Coastal Resources Division and the Sapelo Island National Estuarine Research Reserve (SINERR) also initiated a stakeholder needs assessment and a “market inventory” of training needs among stakeholders in coastal Georgia. Previous strategic planning initiatives and needs assessments by all agencies in 2008 were accompanied, and significantly driven, by on-line surveys of attitudes and opinions of coastal stakeholders. Sea Grant and MAREX relied on the South Atlantic Regional Research Project Stakeholder Survey (hosted on Survey Monkey), which measured attitudes among coastal stakeholders in Florida, Georgia, and South Carolina. The CMP and SINERR used the results from a larger survey executed by the private research firm, Responsive Management, which surveyed stakeholders in Georgia only.

The previous surveys provided a rich source of data about attitudes, education and training needs, and concerns related to a broad range of environmental issues. As a result, all four partners independently expressed a desire to do another survey as part of their 2012 strategic planning initiative. However, upon advice from faculty and staff at the Carl Vinson Institute of Government (CVIOG), a Public Service and Outreach unit of the University of Georgia, the agencies agreed to cooperate in the development of a single new survey that would meet their information needs. This minimizes duplication of effort, reduces stakeholder confusion, allows the four agencies to identify where and how they could best fulfill their individual missions on the coast, and allows the agencies to identify areas of collaboration where their combined efforts and resources could be most efficiently and effectively used.

While this report briefly summarizes selected key findings from the 2008 surveys, it presents and discusses the results of the 2012 survey. Additionally, the report points out information and knowledge gaps among survey respondents, and identifies opportunities to provide training and education to address those gaps.

A note about the layout of the report: the sequence of the survey questions was established by the four partners and the Survey Research Program at CVIOG. To improve the narrative presentation, survey results are not always presented in the same order as the questions were posed to survey recipients.

### Highlights of previous surveys

The 2008 survey done for CMP and SINERR by the private research firm Responsive Management consisted of two parts: a needs assessment to identify areas in which coastal decision makers need more training and education, and a market inventory of education and training activities that were being offered to coastal stakeholders. The market inventory section also assessed activities and opinions of individuals providing training and education to coastal stakeholders. The 2008 survey contained more than 100 questions and investigated the attitudes of local government officials, educators,

environmental specialists, government employees, and other coastal stakeholders regarding coastal environmental matters, training and education needs. Several patterns emerged from the survey results.

First, local government officials clearly expressed a desire to receive additional training from state and academic experts. At that time, those officials were receiving most of their technical information from government planners, scientists, and engineers. The 2008 survey respondents recognized the Georgia Department of Natural Resources (DNR) as the most authoritative source of information on coastal-related environmental matters. Respondents rated University of Georgia (UGA) programs low as authoritative sources or as sources from which information was typically sought.

Coastal decision makers emphasized the need for more education and training on subjects such as managing growth to protect the quality of life, as opposed to protecting biodiversity, reducing nutrient enrichment, or employing beach nourishment. Whereas a plurality of survey respondents (43%) believed that stream and marsh buffers encroach on private property rights, one-third (33%) did not; however, they strongly agreed that what is done on land impacts nearby bodies of water. A large majority of respondents (75%) believed that, environmentally, conditions on the coast had gotten better or stayed the same as a result of then-current management practices.

Respondents to the market inventory section of the 2008 survey, *i.e.*, those individuals who provide education and training to stakeholders, held significantly different views from decision makers. For example, decision makers and trainers' perceptions differed as to the trend in regional environmental quality. While 73% of the trainers perceived worsening conditions as a result of then-current management practices, only 21% of decision makers responded in the same manner. While 55% of trainers have "lots of expertise" in science, only 39% reported expertise in resource management and policy making, and only 27% identified themselves as having expertise in water quality matters. This difference in professional backgrounds may account for the divergence of perceptions on the state of coastal environmental quality and the effectiveness of then-existing policies in improving or maintaining that state. In addition, the expertise of trainers may be poorly aligned with the identified needs of local decision makers for more training and education in growth management matters.

Local decision makers and coastal trainers identified the need to address growth management issues as the highest priority. Indeed, all trainers indicated that adverse impacts associated with human disturbances on the coastal environment is the highest priority issue facing coastal Georgia.

## **Design and launching of the current survey**

Faculty and staff from the Government Services and Research Division of the Carl Vinson Institute of Government (CVIOG) at the University of Georgia used results obtained and questions asked from the 2008 on-line survey as starting points for the current survey. Questions with disproportionate results in which a strong majority expressed an opinion (such as 87% of decision makers agreeing that activities causing land disturbances affect nearby bodies of water) were not repeated in the current survey. Topics that generated contradictory responses within groups, or divergence between groups, were

investigated further in the 2012 survey. In some cases, questions from the 2008 survey were repeated, but are re-worded slightly.

Teams and staff from each partnering agency identified survey topics and created specific questions, based on five focal areas identified as strategic planning priorities by the National Sea Grant Program. Those five focal areas are: 1) safe and sustainable sea food supply; 2) education; 3) sustainable coastal development; 4) healthy coastal ecosystems; and 5) resilient coastal communities. The CVIOG faculty and staff held discussions with each partnering agency to ensure that agency information needs would be met. Initially, survey questions were divided into sections, those delineated by Sea Grant/MAREX focal areas and questions about the specific areas of interest identified by CRD and SINERR. However, working closely with faculty and staff of CVIOG, the four partners ultimately developed a survey that consisted of a general survey section (with questions relevant to all stakeholders), and four satellite surveys targeted to: a) local government officials, b) educators, c) government agency staff (“regulators”), and d) a combination of environmental non-profit organizations, scientists, and other coastal stakeholders. In this way, information relevant to the Sea Grant/MAREX focal areas and the specific information needs of CRD and SINERR would be obtained without duplicating questions or generating an un-necessarily long survey. Each survey respondent who completed the general survey section was directed to the appropriate satellite survey based on the professional affiliation they selected at the end of the general survey.

The four partnering agencies and CVIOG compiled names of prospective recipients and e-mail addresses. The survey did not target the general population; rather, because the survey sought to obtain information from individuals who were professionally involved in environmental issues in coastal Georgia, the four partnering agencies and CVIOG used contact information from existing mailing lists, organization and agency email lists and staff directories, professional association members, attendance lists for workshops and education summer camps, and other involved stakeholders. Therefore, results of this survey do not represent the opinions and attitudes of the general population. They do, however, represent the opinions and attitudes of individuals professionally affiliated with coastal Georgia in some capacity. Because the number of coastal professionals in any one field is not evenly distributed, it was not possible to guarantee equal representation across professional sectors. Results of the general survey may thus be skewed towards those sectors which had the greater number of respondents.

Most of the individuals identified by CVIOG were obtained from the 1) the Georgia Association of Water Professionals, which provided contact information for water system operators and managers, 2) the Georgia Municipal Association, which provided contact information for elected and non-elected city officials such as mayors, city council members, city managers, and public works directors, and 3) the Association County Commissioners of Georgia, which provided contact information for elected and non-elected county officials similar to those for cities. The four partners provided extensive lists of educators, trainers, state government staff, non-governmental organization staff, and representatives of other stakeholder groups. Prospective survey recipients were stratified into the following categories: 1) city officials; 2) county officials; 3) educators; 4) “trainers,” *i.e.*, individuals whose jobs include outreach and education, but who are not pre-K or K-12 teachers; 5) public water system operators; 6) local government employees responsible for erosion and sedimentation control and enforcement; 7) state

government employees; 8) developers and tourism operators; and 9) research scientists actively engaged in studies of coastal Georgia. The largest group of survey recipients was educators, and they were also the largest group of respondents.

A total of 1350 individuals identified by the four partnering agencies and CVIOG were contacted and invited to take the on-line survey. The survey was launched on May 25, 2012, and closed on July 13, 2012. Survey recipients were sent weekly reminders by email. For the 2012 survey, 156 recipients responded for a response rate of 12%. This level of participation is comparable to the response rate of the 2008 survey conducted for CRD and SINERR. Since only 8 individuals responded to the market inventory satellite survey, no results from the on-line market inventory survey are presented graphically, but the tabular results of the satellite survey are found in Appendix A.

An attempt was made to do several focus groups in order to obtain more detailed information about training and outreach needs in coastal Georgia. These efforts were unsuccessful; instead, eight individuals volunteered to participate in telephone interviews.

## PART I: GENERAL SURVEY

### RESULTS OF THE GENERAL SURVEY

#### *Geographic distribution of respondents*

Of the 156 respondents, 40% report living in Chatham County and almost one-quarter identify as being from outside the 11-county coastal region. This latter category represented educators from districts outside the coastal counties, and scientists from campuses or offices outside the coastal counties. Because one-quarter of respondents to the general survey report not being coastal residents, results from that portion may have limited applicability. As such, those respondents from outside the coastal counties may not be familiar with specific environmental issues that affect coastal residents and local governments. Thus, an important challenge to interpreting survey results is assessing the views and opinions of those most familiar with day-to-day life and environmental issues (*i.e.*, local government and government agency respondents to the satellite surveys) in an attempt to ensure that the partnering agencies receive the most effective recommendations. Table 1 provides a complete geographic distribution of respondents.

**Table 1: Distribution of respondents by county**

County	Number	Percent
Brantley	1	0.6
Bryan	3	1.9
Camden	7	4.5
Charlton	4	2.6
Chatham	63	40.4
Effingham	5	3.2
Glynn	18	11.5
Liberty	5	3.2
Long	0	0.0
McIntosh	6	4.0
Wayne	2	1.3
None of the above	38	24.4
Missing responses <sup>1</sup>	4	2.6
TOTAL	156	100.0

#### *Professional affiliations of the survey respondents*

Educators represent almost half of the respondents with representatives of non-governmental environmental organizations comprising the smallest percentage of respondents. Figure 1 provides a detailed distribution.

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<sup>1</sup> "Missing responses" indicate those survey respondents who completed the survey but did not respond to a particular question; in this case, their county of residence

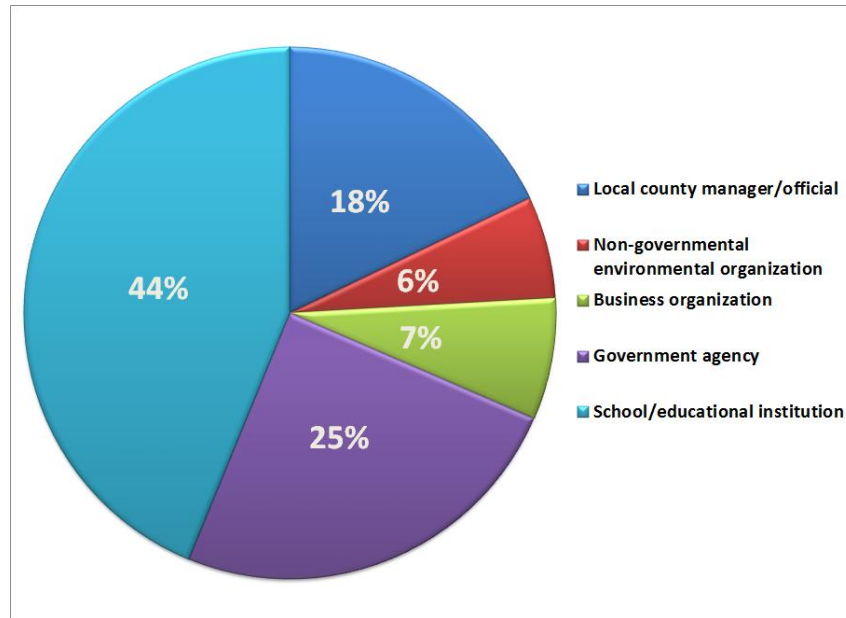


Figure 1: Professional affiliation of survey respondents

### *Most important issues for the future of coastal resource management in Georgia*

The first major section of the general survey asked recipients to consider a wide range of coastal environmental topics and specific issues and to rate those issues as very important, moderately important, not very important, or unsure of the level of importance. The broad topic areas, selected by the four partners, include: a) **growth and development**; b) **water resource protection**; c) **the coastal economy**; d) **community**; e) **natural habitats**; f) **coastal hazards**; and g) **other issues**. Within those topic areas, survey recipients were asked to rate, using the same index, the importance of 35 specific issues to the future of coastal resource management.

For all questions a large majority of respondents rated the issues as either “very important” or “moderately important”- i.e., only a minimal number of “not very important” or “unsure” responses were recorded. Because of this distribution, the results for this section are ordered and discussed based upon the percentage of survey respondents rating each issue as “very important,” or the highest level of concern. Although it is important to again note that respondents generally indicated significant concern for all issues, the survey results do suggest trends toward higher levels of overall concern on certain issue classes. Taken further, these results suggest several priority areas that might be considered by the four partners.

- Of the top ten issues rated as very important, nine relate directly to water resources and aquatic habitats. Those priority issues are: freshwater availability, stream and marsh buffers, marshes, coastal and estuarine ecosystems, wetlands and waterways, water quality, groundwater contamination, saltwater intrusion, and water conservation.

- Of the next ten most important issues, seven relate directly to land management, including land use, planning and zoning, non-point source pollution, green spaces, residential development, sustainable development, and dune protection.
- Although economic issues, with the exception of shipping and ports, fell in the lower 50 percentile of issues rated as “very important”, nearly two-thirds of respondents (62%) rated them as being very important. Private docks and piers, and boat and marina management were the lowest ranked economic issues.
- Sea level rise, increased seasonal flooding, historical and cultural resources, and citizen monitoring programs were issues that were viewed as “very important” by less than 20% of survey respondents.

The following trends will generally continue throughout the remainder of the survey responses: 1) water resource protection and aquatic habitat protection are the resource management issues given the highest ratings by survey respondents; 2) economic issues are important but generally rated lower than environmental issues; 3) although land use is generally of moderate to high importance, the connection between land use and water quality is not consistently reflected by survey responses; and 4) sea level rise and increased seasonal coastal flooding are given very low ratings.



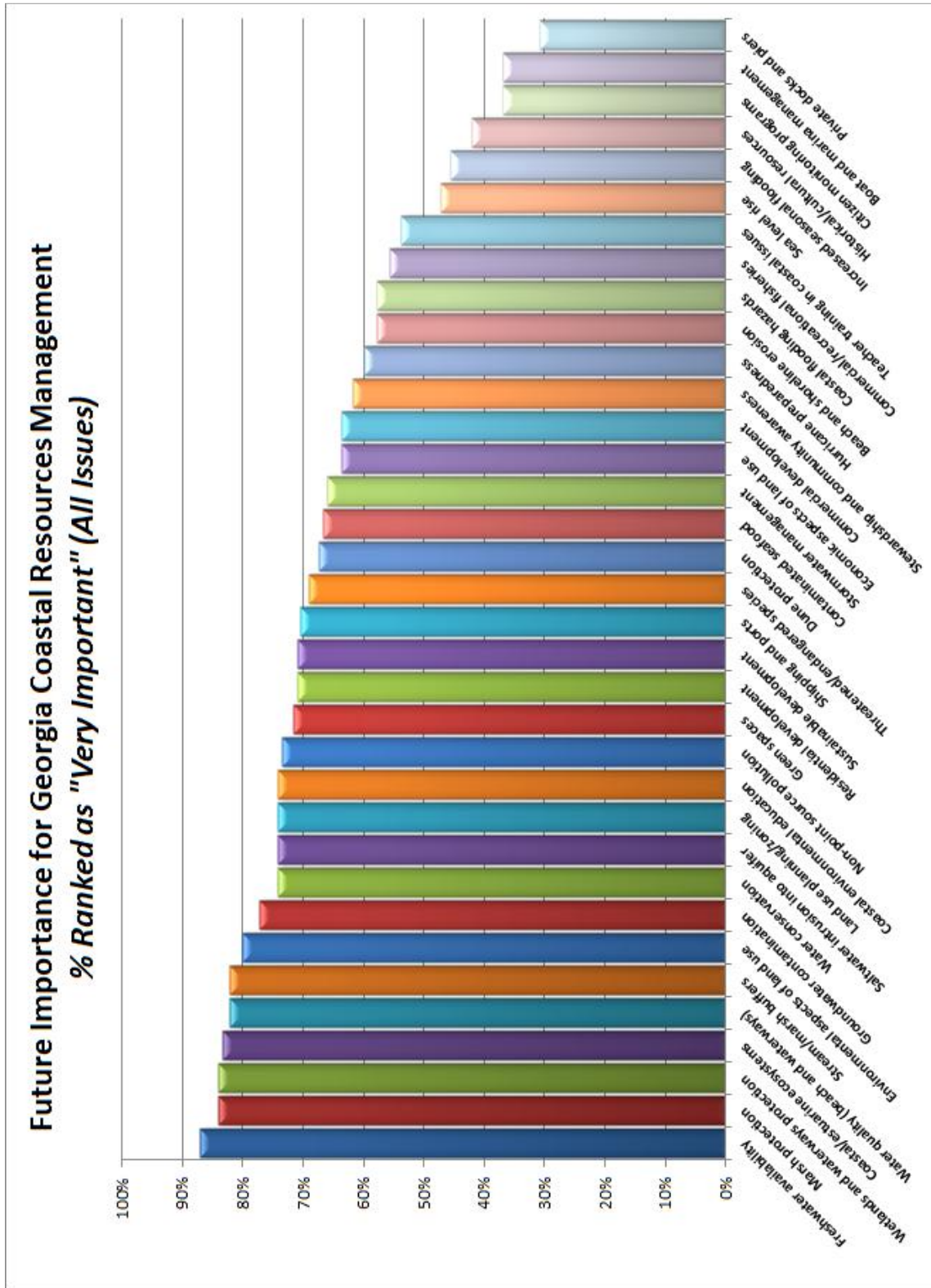


Figure 2: Future resource management issues ranked as "very important" by survey respondents (all)

### *Importance of environmental management issues in the future of coastal Georgia*

Figure 3 depicts responses received regarding the importance assigned to “**growth and development issues.**” More than 80% of respondents consider issues associated with stream and marsh buffers and the environmental aspects of land use planning as very important to future coastal resources management. Three-quarters of the participants also acknowledge land use planning and zoning as very important. Overall, more than 60% of those surveyed rate all specific issues in this topic area as very important to future management, thus indicating that managing environmental impacts of growth continues to be a paramount concern among coastal stakeholders. In contrast, fewer respondents rate the economic aspects of land use and commercial development as very important.

Individuals surveyed also recognize the importance of “**water resource protection issues**” to the future of coastal resources management, as reflected in their attitudes regarding freshwater availability, marsh protection, and other water issues (Fig. 4). The significant difference between valuing coastal water quality protection and storm water management suggests a potential gap in stakeholders’ understanding of the potential adverse environmental impacts of non-point source pollution, including storm water runoff, and thus presents a possible training opportunity for storm water management experts. However, as demonstrated in responses in the satellite surveys, this difference in the understanding the connection between water quality and storm water management is smaller for local government and state agency respondents.

Fewer individuals completing the survey perceive “**economic issues**” as very important to the future of coastal resources management (Fig. 5). Shipping and ports were identified as the most important economic issues. Boats, marinas, docks, and piers received the lowest number of responses for “very important”.

In some cases, survey respondents do not perceive some “**community-related issues**” (Fig. 6) as very important to the future of coastal resources management. More than one-half of those responding identify coastal environmental education, community awareness, and teacher training as very important community issues. It is noteworthy that about one-third of the respondents rated citizen monitoring programs as very important.

Eighty-four percent of the respondents identified wetlands and waterways and coastal/estuarine ecosystems among “**habitat issues**” as very important to future resources management (Fig. 7). As mentioned, the importance of habitat issues and water resources protection is a consistent theme that will persist, especially for educators who responded to the survey.

For the sake of brevity, and because some topics overlap, issues associated with “**coastal hazards**” are combined with “**other**” resource management issues. Saltwater intrusion into the aquifer is rated as being the issue of greatest importance (Fig. 8). Concerns regarding saltwater intrusion have existed for decades, especially in areas of Chatham and Glynn counties. Note the comparatively low percentage of responders rating coastal flooding hazards, sea level rise, and increased seasonal flooding as very important issues. Survey designers used the latter phrase as a proxy for sea level rise to qualitatively determine if a bias exists solely against the use of the phrase “sea level rise”. However, attitudes in both cases are almost identical. Notably, more than 10% of individuals responding perceive that sea level rise and increased seasonal flooding are either not significant issues or they are unsure of their

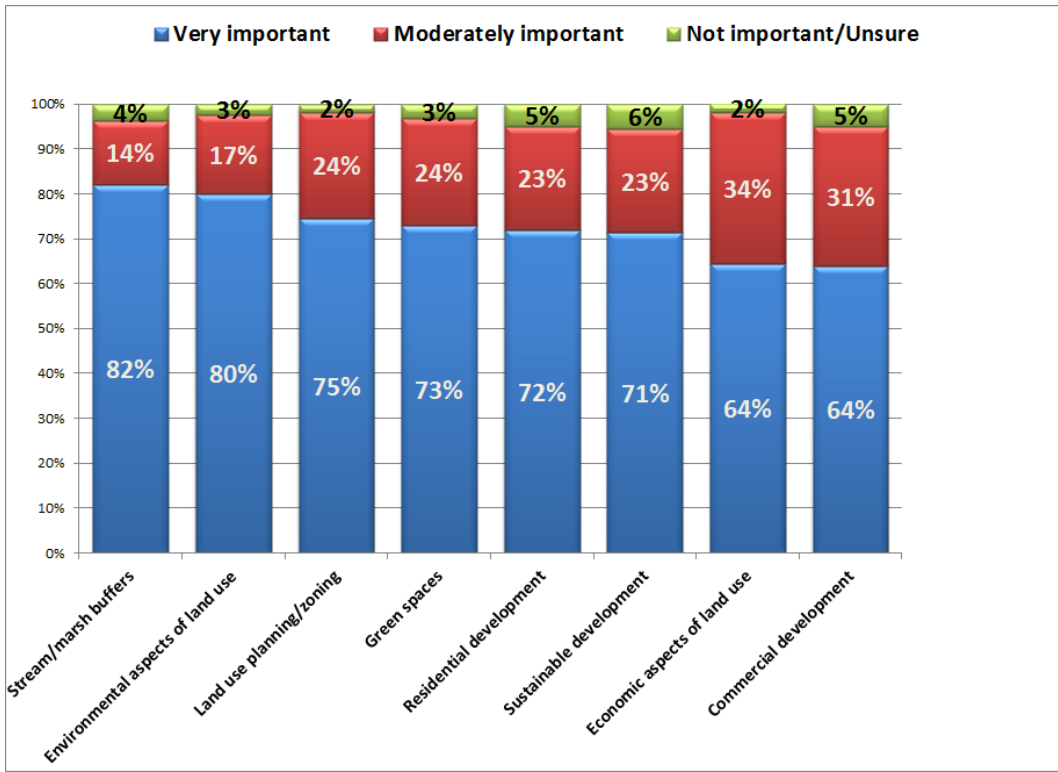


Figure 3: Importance of future growth and development issues

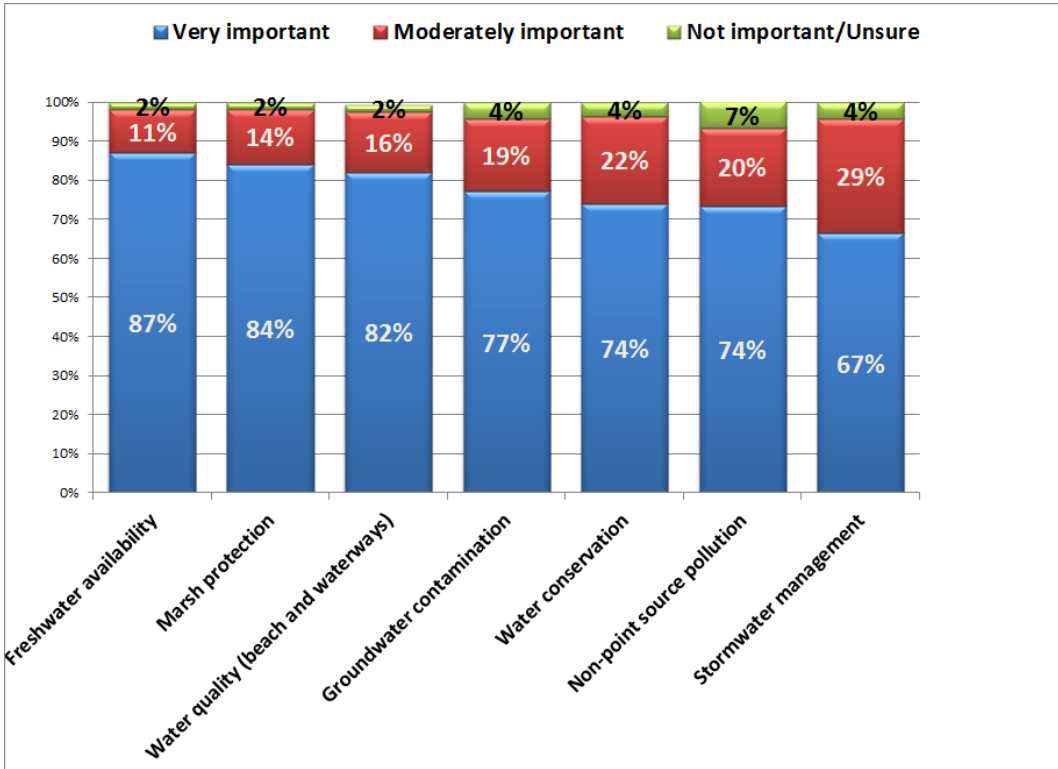


Figure 4: Importance of future water resources issues

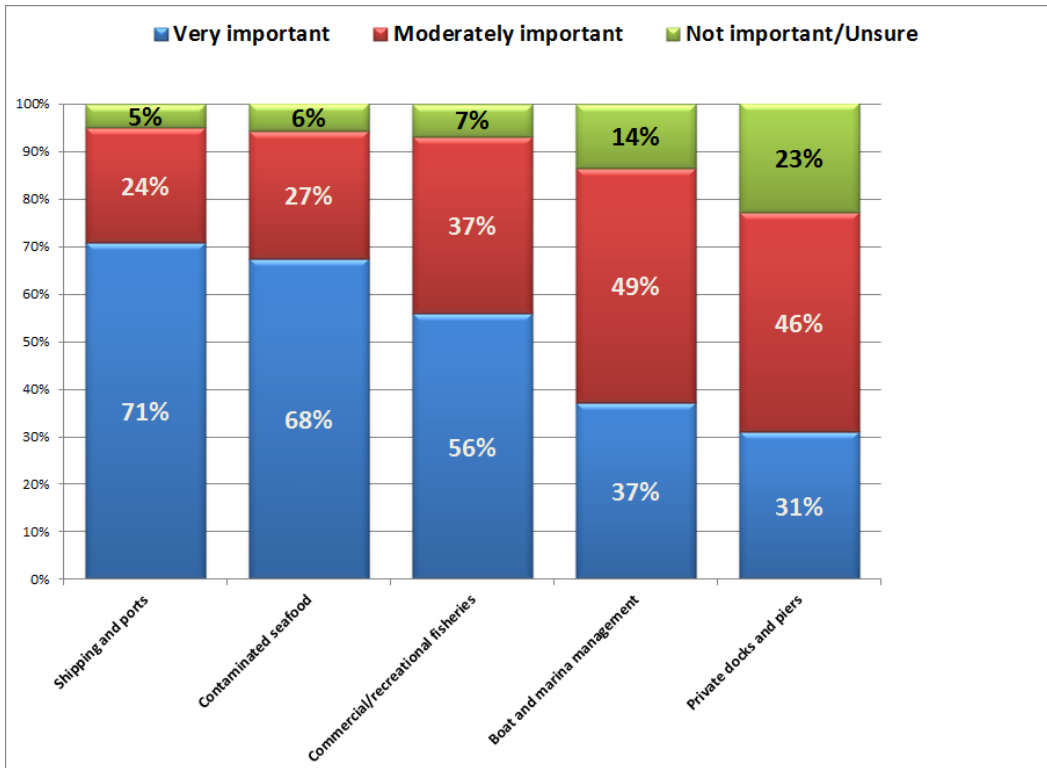


Figure 5: Importance of future economic issues

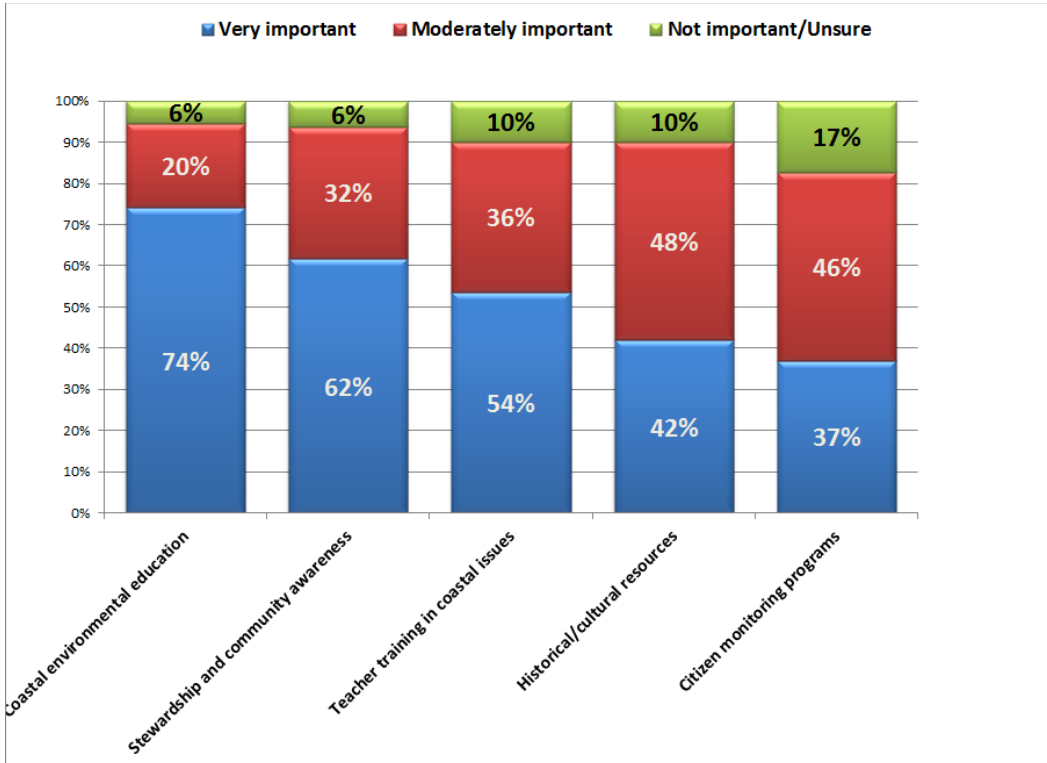


Figure 6: Importance of future community issues

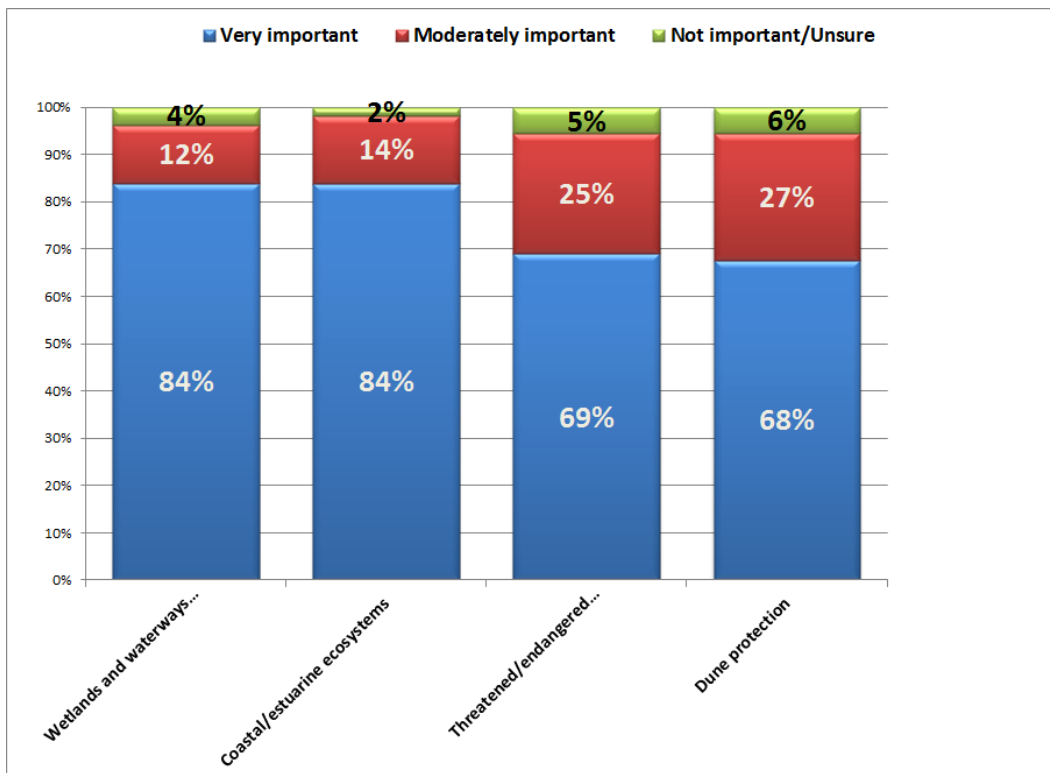


Figure 7: Importance of future natural habitat issues

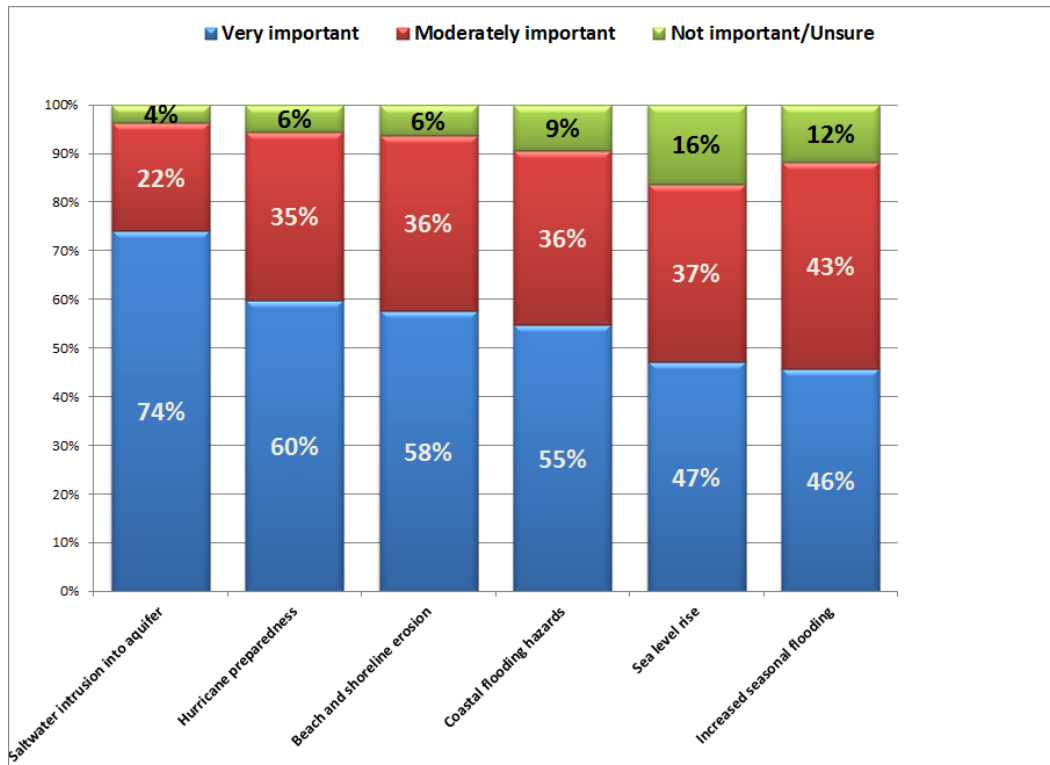


Figure 8: Importance of future natural hazards

### *How much would organizations benefit from training?*

A significant purpose of this survey of coastal stakeholders is to identify groups or individuals who need or want additional education or training in coastal environmental issues. The 2008 needs assessment and market inventory surveys suggested a very strong desire on the part of survey respondents to receive additional education and training. The results of this survey confirm that the desire for education and training continues to be strong, but the support for that additional education and training varies depending on the specific issue(s). In order to compare training and education needs with the issues that stakeholders find to be most important, the broad topic areas used in the previous section of this survey are carried forward in this section.

Figure 9 shows the ranking of those issues in which respondents indicated they would benefit “a lot” from additional training. As in the previous section, results are ordered based upon the percentage of survey respondents rating each issue as very important, and that prioritized list is used for the presentation of the following results. Similar trends appear as for the issues deemed to be most important. Specifically, issues relating to the quality of coastal waters are in the top third of all 35 issues listed. The lowest rated issues, those that fall into the bottom third of those rated very important, are mostly economic issues.

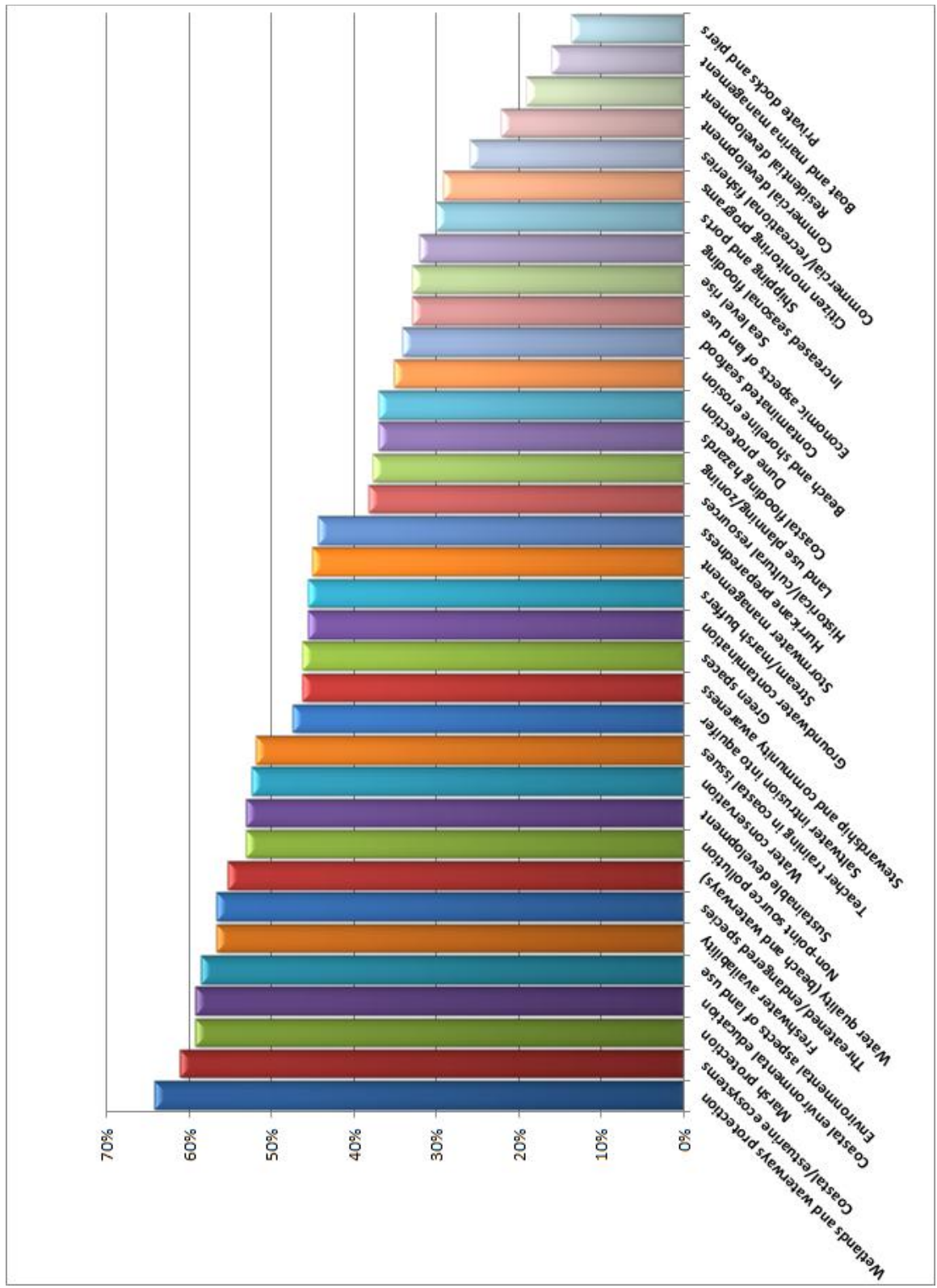


Figure 9: Issues for which respondents would benefit from additional training (all)

Among the issues related to “**growth and development**”, a majority of survey respondents indicate that they or their organization would benefit a lot from additional training and education in environmental aspects of land use and sustainable development (Fig. 10). In fact, more than 80% indicated that they or their organization would benefit either a lot or some from additional training and education in those issues plus the issues associated with green spaces, buffers, and the economic aspects of land use.

Consistent with previous survey responses, more than 80% of respondents would benefit a lot or some from additional training and education in all “**water resource protection**” issues (Fig. 11). Additional education and training could be helpful in topics associated with marsh protection, freshwater availability, water quality, non-point source pollution, and water conservation. The expressed desires for education and training in water resource protection issues is consistent with respondents’ rating of water resource protection issues as significant to the future management of coastal resources.

Much fewer respondents report that more education and training in “**coastal economic issues**” would benefit them a lot or some (Fig. 12). Between one-quarter and one-third of those responding believe they would benefit a lot from further education and training in issues regarding contaminated seafood, shipping and ports, and commercial and recreational fisheries. Little support exists for more training in matters associated with boat and marina management and docks and piers.

Compared to coastal economic issues, respondents show a greater interest in additional education and training related to “**community issues**” (Fig. 13). Specifically, majorities of respondents indicate that they would benefit a lot from more assistance in coastal environmental education and teacher training in coastal issues. Levels of support for these topics may reflect the over-representation of teachers and educators among those responding to the survey. However, more than three-quarters of individuals responding indicate they would benefit a lot or some from additional education and training on all issues in this category. As community-related issues represent program strengths for the four partners, the agencies should consider opportunities to provide education and training on these matters.

Under the topic of “**natural habitats**”, respondents identify three issues, wetlands and waterways protection, coastal and estuarine ecosystems, and threatened or endangered species, where they could benefit greatly from further education and training (Fig. 14). Notably, almost one-third of those responding see little or no benefit in more training on dune protection issues.

In the category combining issues associated with “**coastal hazards**” and “**other**” resources management matters, more than 70% of respondents report they would benefit a lot or some from more training and education in the six issues. The greatest support exists for further training on saltwater intrusion issues, while the least support is provided for more education on matters regarding sea level rise and increased seasonal flooding (the proxy for sea level rise).



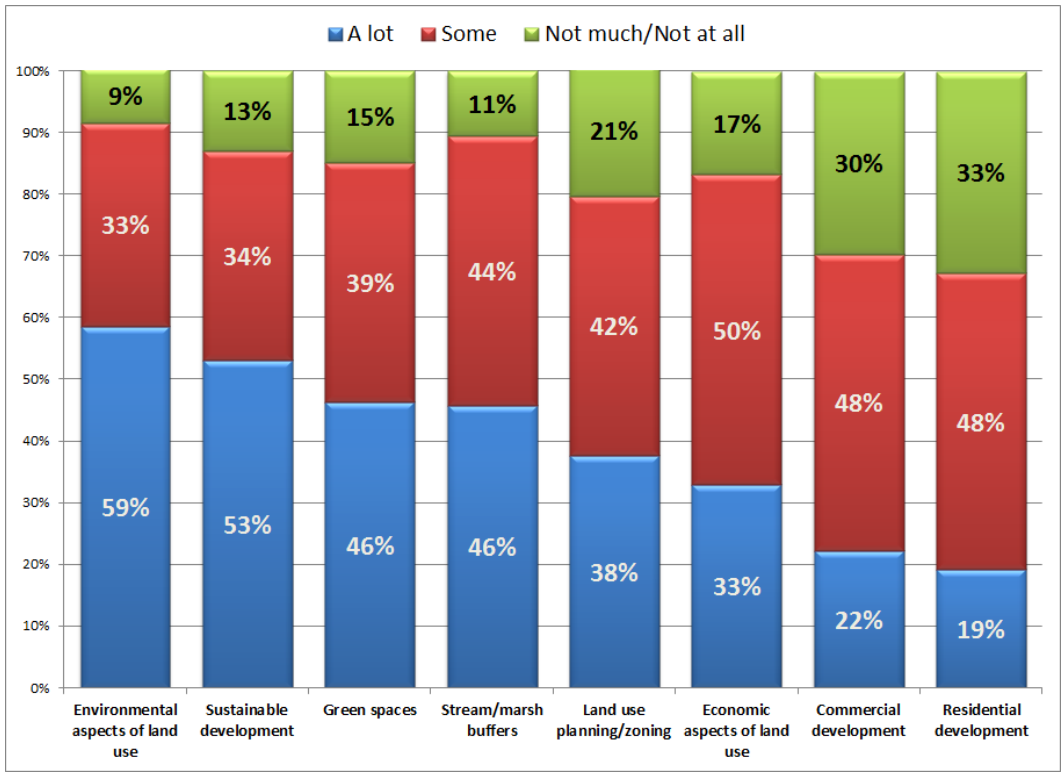


Figure 10: Growth and development issues: respondents would benefit from additional training.

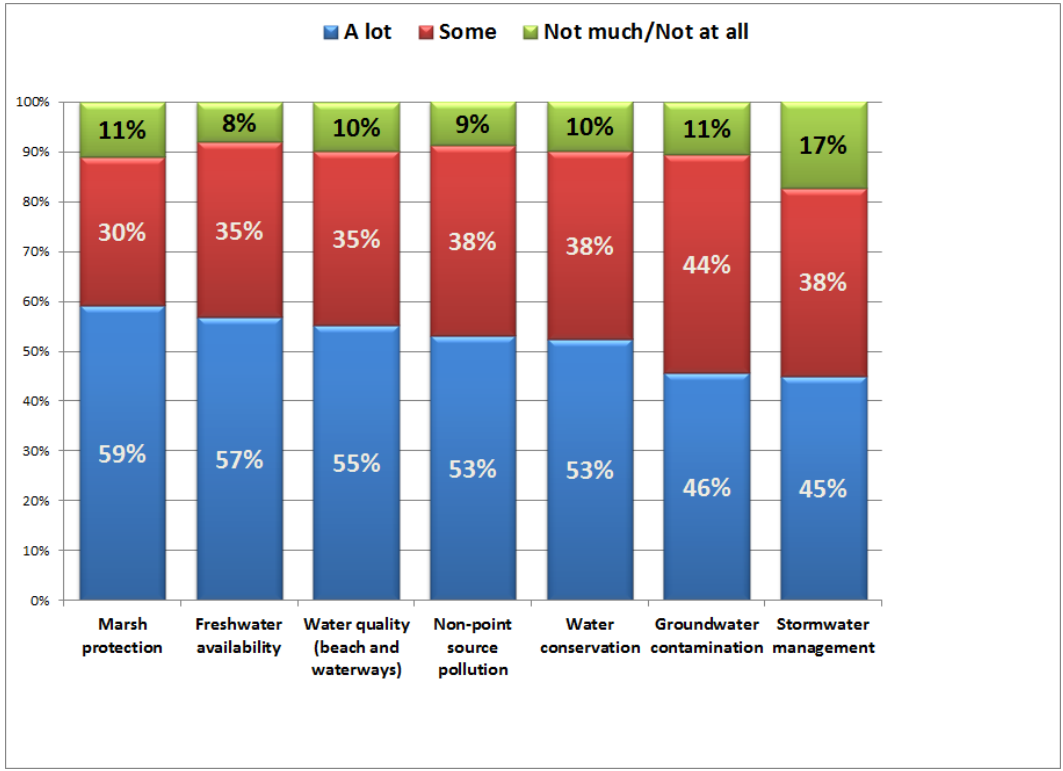


Figure 11: Water resources issues: respondents would benefit from additional training

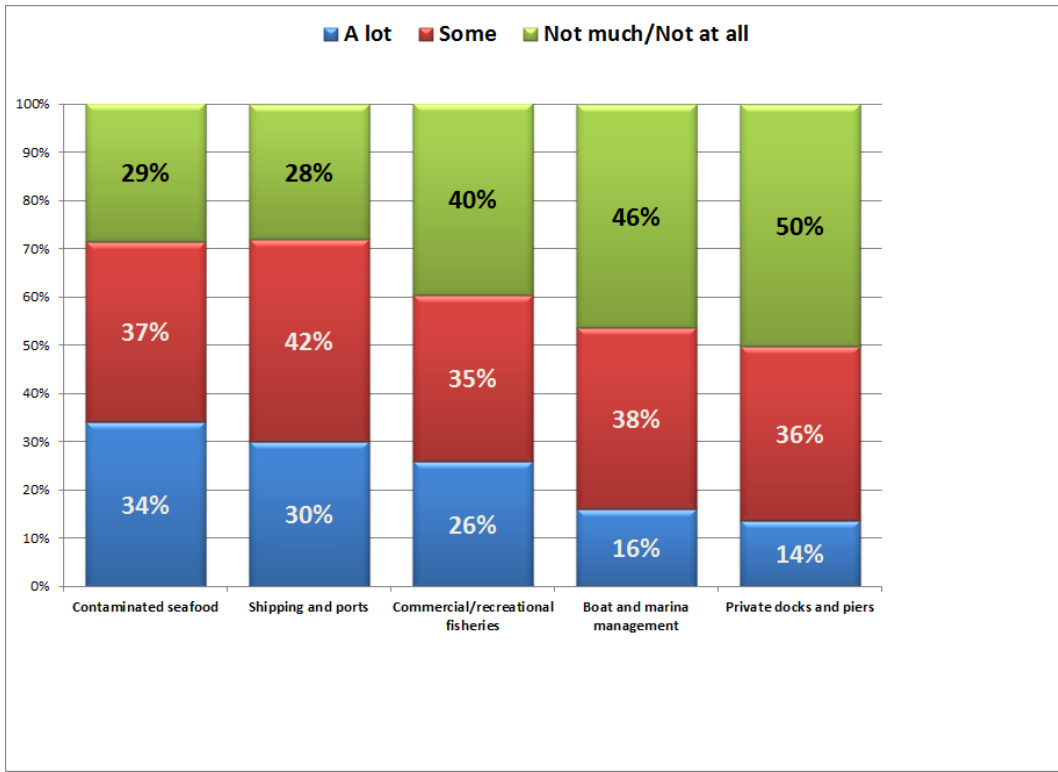


Figure 12: Economic issues: respondents would benefit from additional training

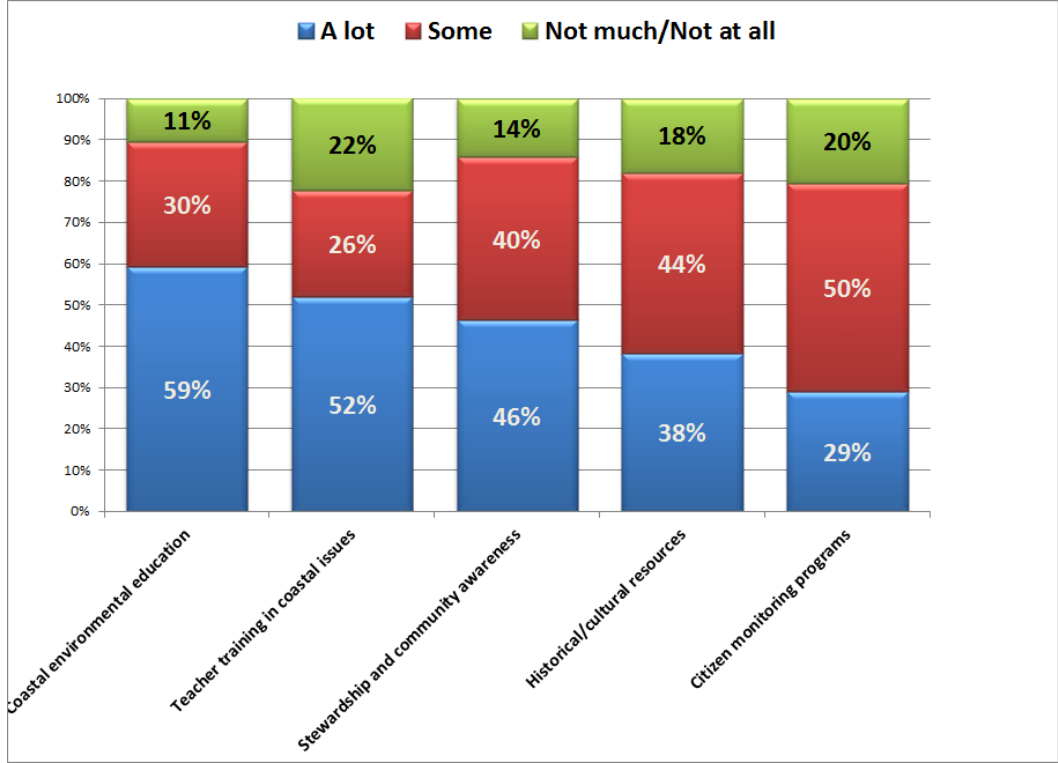


Figure 13: Community issues: respondents would benefit from additional training

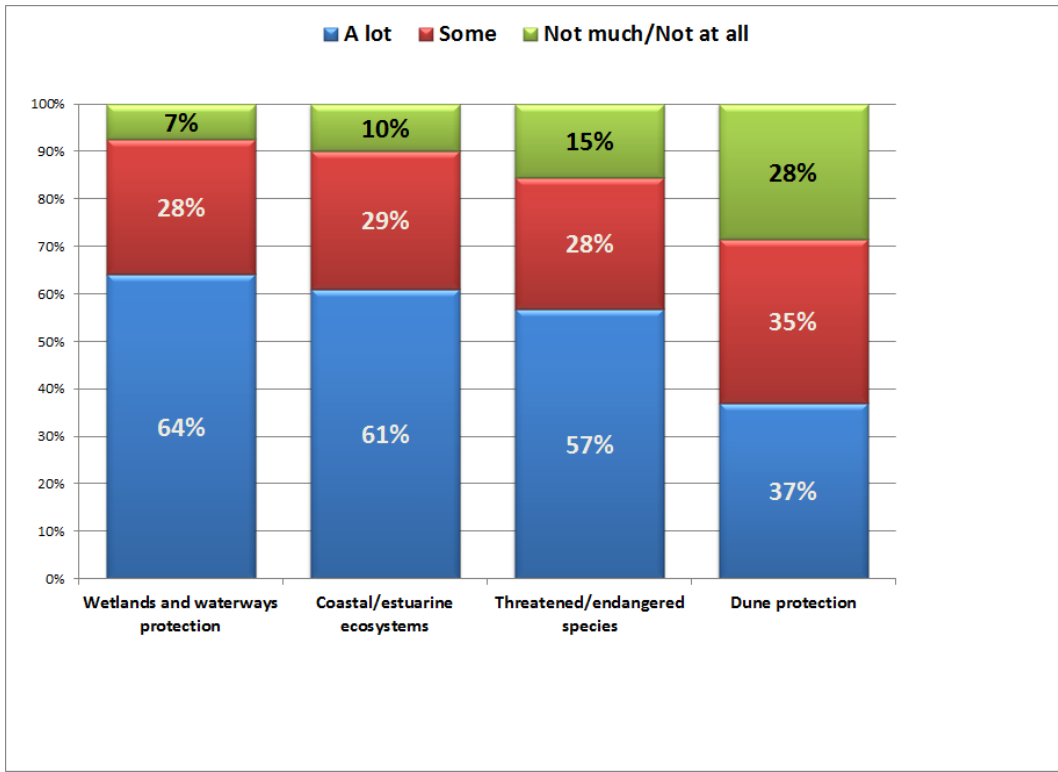


Figure 14: Natural habitat issues: respondents would benefit from additional training

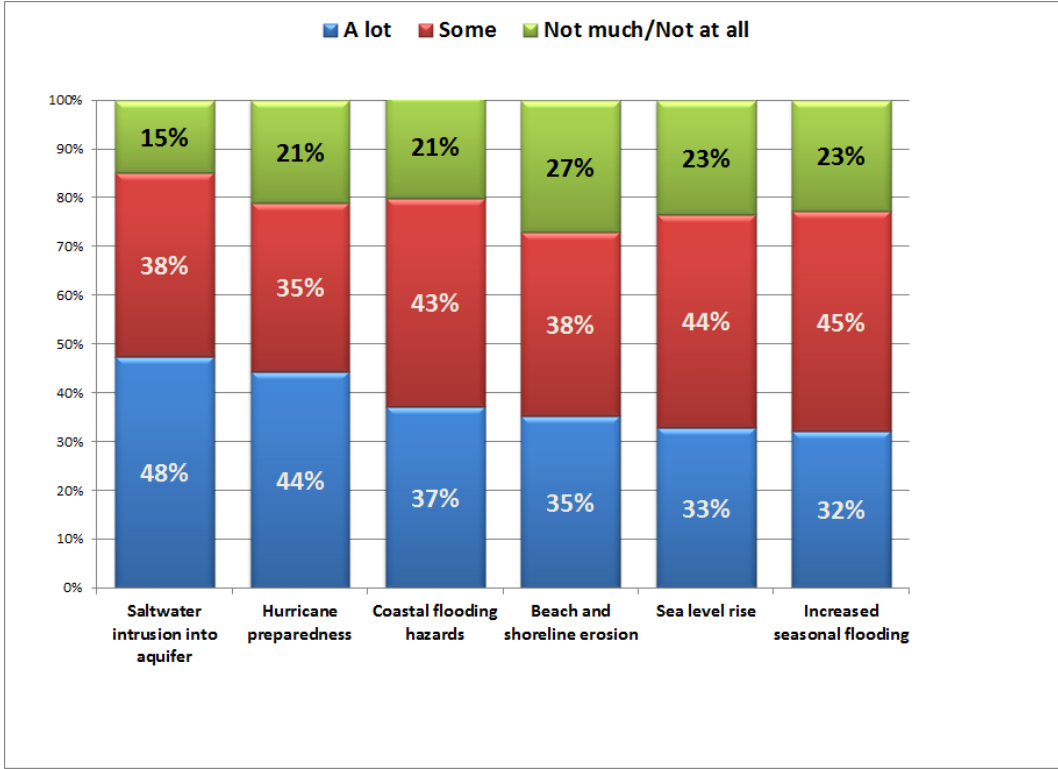


Figure 15: Natural hazard issues: respondents would benefit from additional training

### *Areas in which stakeholders did not receive enough training in last 12 months*

Survey recipients were asked about coastal management issues in which they did not receive enough education or training in the past year. Trends observed in previous questions continue in responses to this question for all topic areas.

For example, in the area of **growth and development** (Fig. 17), the largest number of respondents report receiving insufficient training in issues associated with buffers, environmental aspects of land use, sustainable development, land use planning and zoning, and green spaces.

Responses from a higher percentage of stakeholders considering issues related to **water resources protection** indicate they did not receive enough training on matters regarding groundwater contamination, groundwater protection, and non-point source pollution (Fig. 18). More than one-third of individuals responding note they received insufficient training on water conservation issues.

More than 40% of survey respondents indicate insufficient training on topics related to contaminated seafood, shipping and ports, and commercial and recreational fisheries in the past year (Fig. 19).

Among community-related issues, almost one-half of the respondents report receiving insufficient training on issues associated with coastal environmental education and more than 40% indicate they lack teacher training in coastal issues (Fig. 20). These results may be significant given the high percentage of educators among the respondents. Other community-related topics where training shortages are noted include issues involving historic and cultural resources and stewardship.

More than one-half of the respondents indicate a lack of training in wetlands and waterways protection issues. Training shortages are also noted in other natural habitat-related topics such as coastal ecosystems and threatened or endangered species (Fig. 21). Notably, training deficiencies on wetlands and waterways protection issues are identified as the second greatest percentage of responders among all 35 issues.

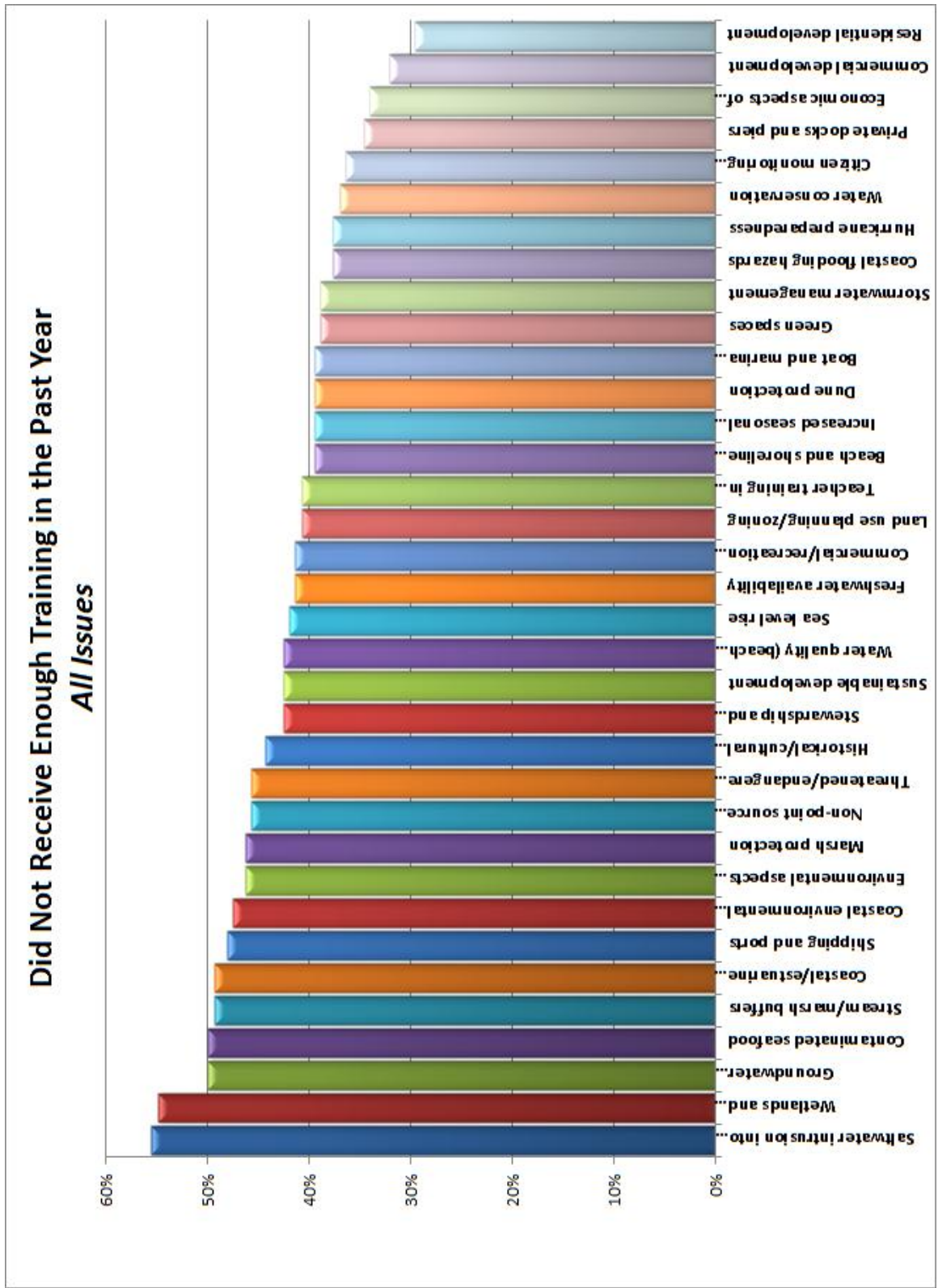
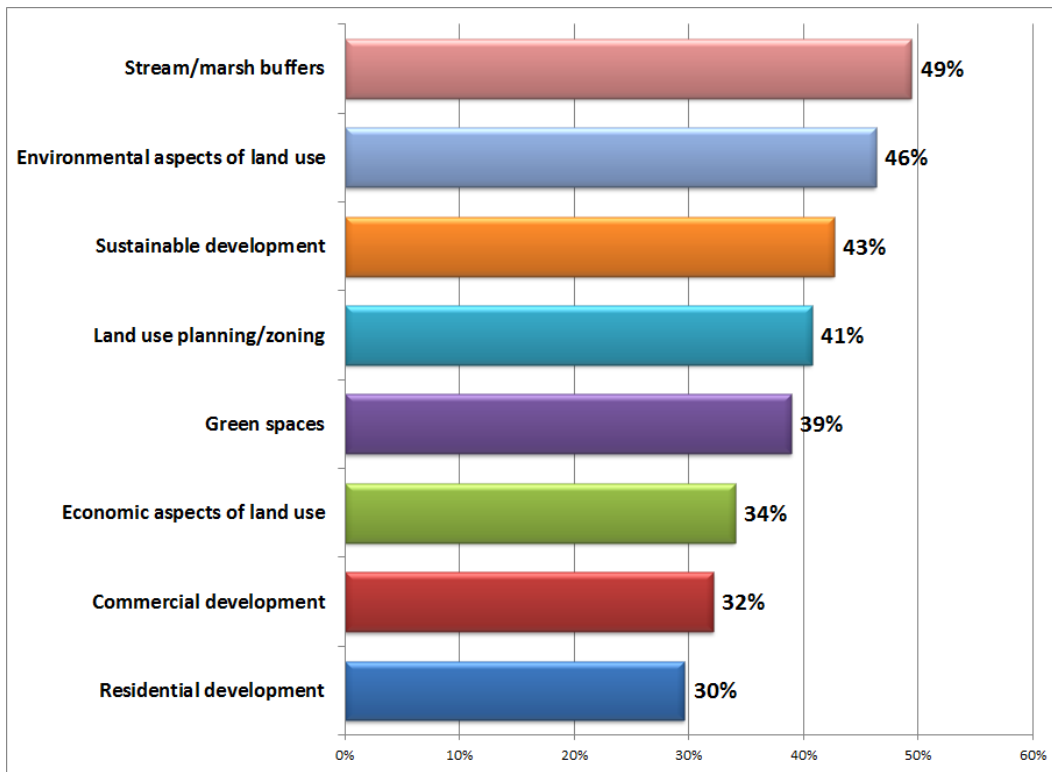


Figure 16: Issues for which respondents did not receive enough training in the past 12 months (all)

The greatest percentage of respondents on this survey question report receiving insufficient training on matters regarding saltwater intrusion into aquifers (Fig. 22). In addition, 40% or more of those responding also note lack of training in coastal hazards such as sea level rise, increased seasonal flooding (the proxy for sea level rise), and beach and shoreline erosion.



**Figure 17: Growth and development issues: respondents did not receive enough training in the past year.**

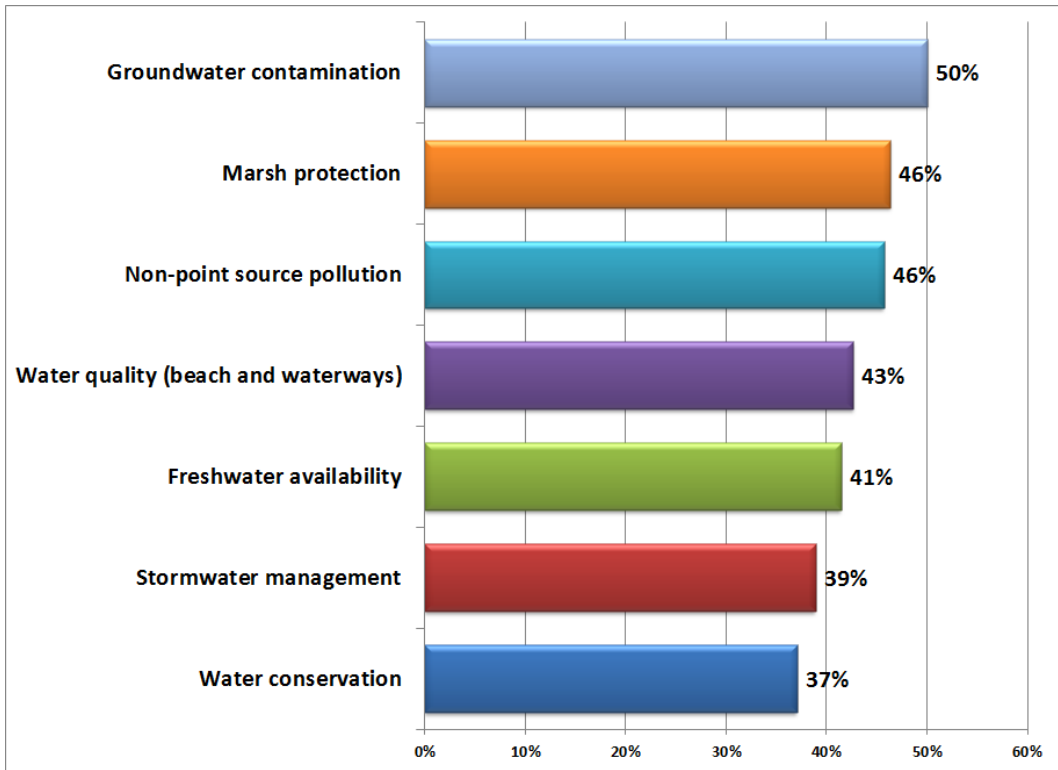


Figure 18: Water resources issues: respondents did not receive enough training in the past year

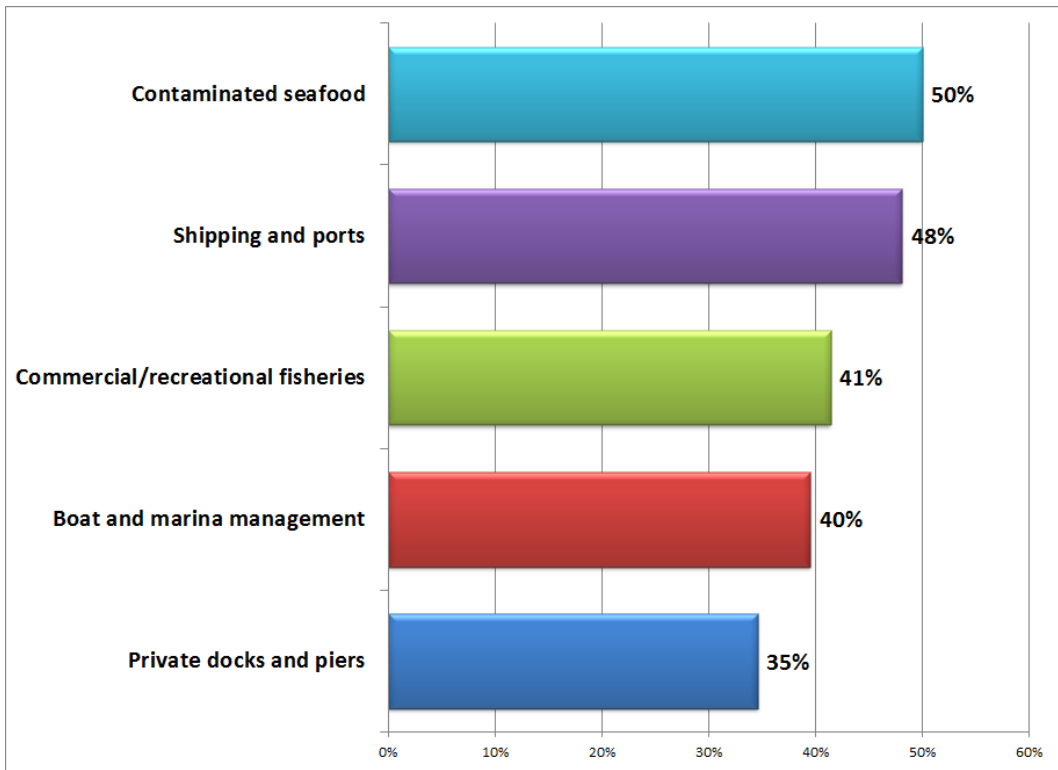


Figure 19: Economic issues: respondents did not receive enough training in the past year

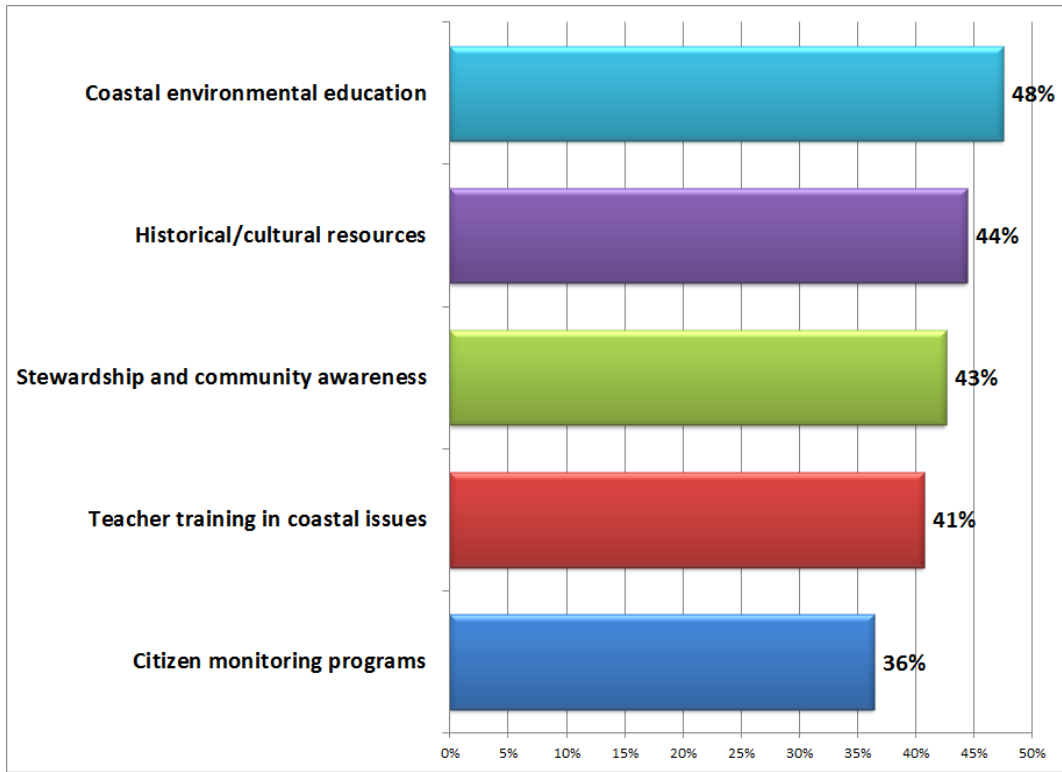


Figure 20: Community issues: respondents did not receive enough training in the past year

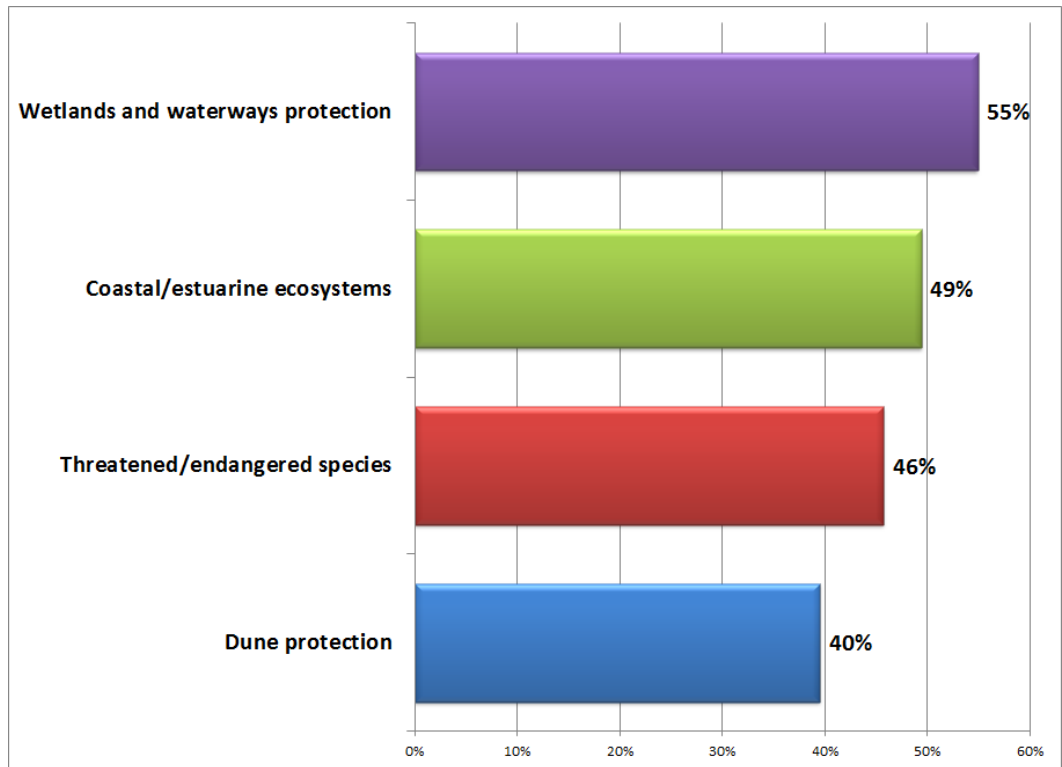
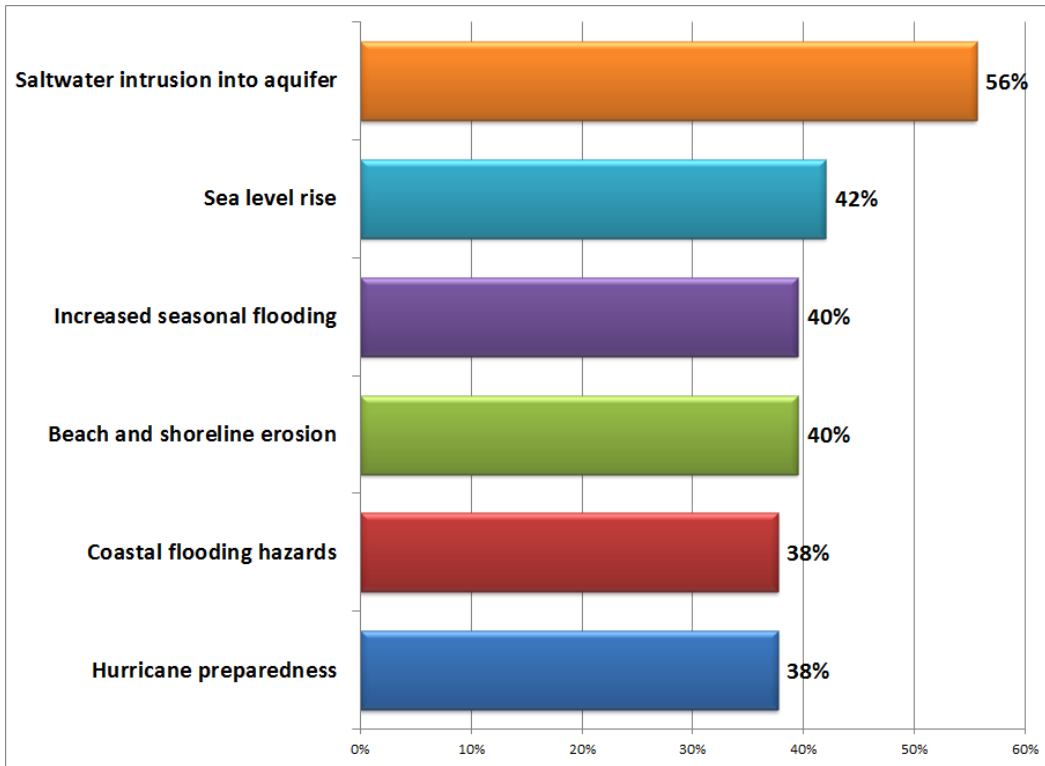


Figure 21: Natural habitat issues: respondents did not receive enough training in the past year





**Figure 22: Coastal hazard issues: respondents did not receive enough training in the past year**

***Preferred methods of outreach***

Survey respondents were asked by which methods of outreach they prefer to receive training. As presented in Figure 23, more than three-quarters of those surveyed indicate a preference for workshops. Strong support also exists for the use of web-based tools and demonstration sites. Printed materials were not viewed highly. Multi-day conferences addressing a wide range of general issues were not ranked high by survey respondents. Only six percent of respondents identify individual office visits as a preferred method, which represents a striking difference from the 2008 CRD/SINERR survey results recognizing one-on-one training as a preferred means.

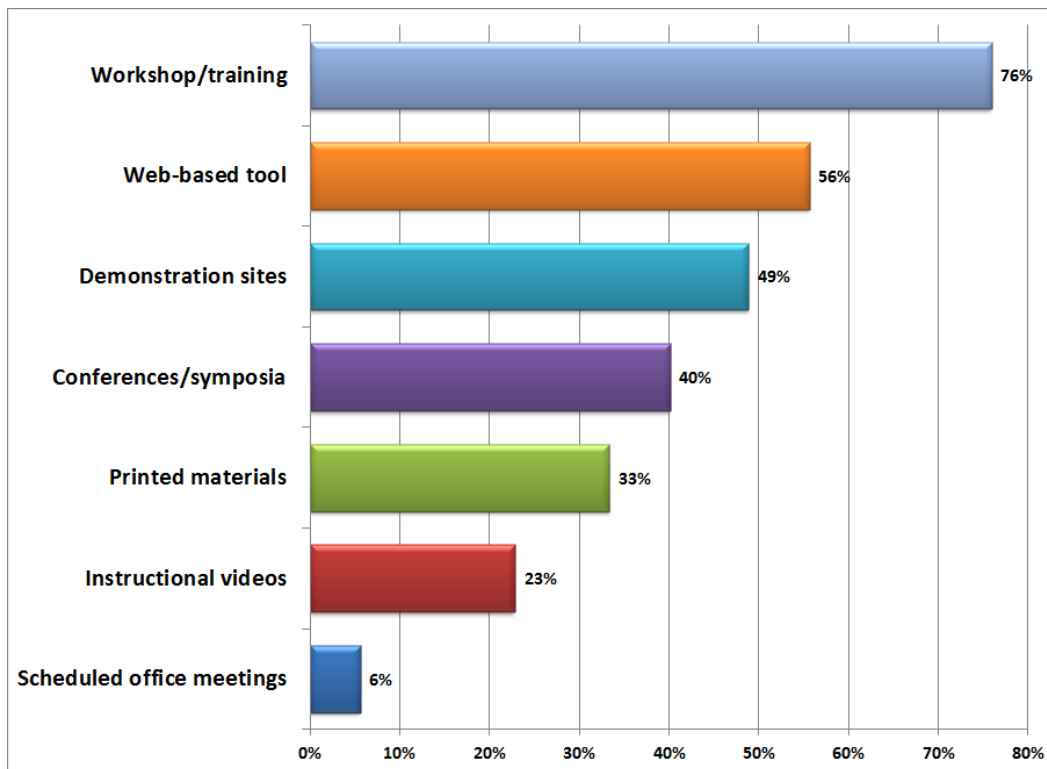


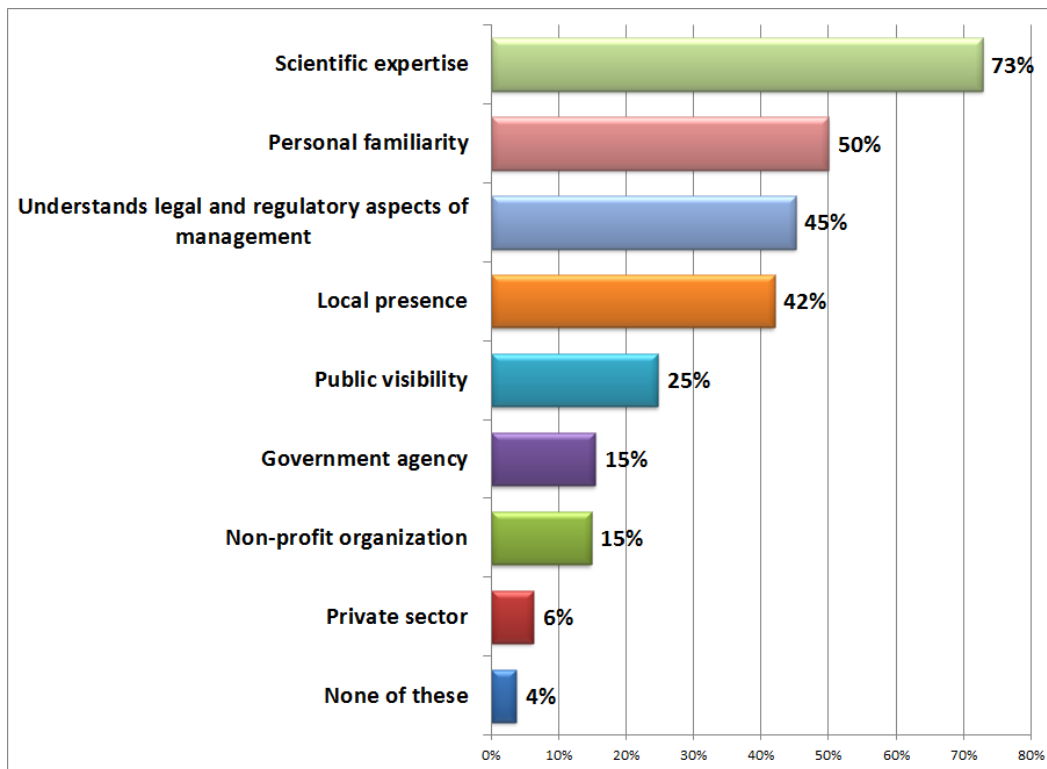
Figure 23: Preferred methods of outreach

***Features of an organization that make stakeholders more likely to contact them***

Stakeholders in coastal Georgia seek information, technical assistance, and regulatory guidance for a wide variety of reasons to address a diverse array of issues. Almost three-quarters of the survey respondents indicate that the most important reason they contact any organization is the technical expertise of the staff. Half of those seeking information report they select organizations based on the existence of a personal relationship with the staff or the organization. Other significant reasons, as shown in Figure 24, include whether the organization understands the legal and regulatory aspects of resource management, and whether an organization has a local presence. It is noteworthy that the type of organization (private, public, or non-governmental) appears to have little influence on stakeholders’ selections.

***Familiarity with state organizations and programs***

A critical aspect of this survey was to help the four partnering agencies understand the level of familiarity coastal stakeholders have regarding their agency missions, regulations enforced or resources monitored, and state and federal programs administered. Survey recipients were asked to rate their level of familiarity with the University of Georgia and its programs; the Georgia DNR’s Coastal Resources Division and SINERR; other coastal organizations and agencies; and some specific objectives central to the mission of the partners, such as endangered species protection programs. Results from those questions are presented in Figures 25 to 28.



**Figure 24: Features of an organization that make stakeholders likely to contact them for information**

Respondents report being either very familiar or somewhat familiar with the four partnering agencies in the following order: the DNR Coastal Resources Division, MAREX, Sea Grant, and SINERR. Notably, the level of familiarity for all stakeholders was very low for Sea Grant and SINERR, with a majority (55%) responding that they are either not at familiar, or not very familiar, with Georgia Sea Grant. Slightly more are familiar with SINERR (45%) Significantly, 72% of respondents are very familiar or somewhat familiar with the Skidaway Institute of Oceanography, which is an institution of the University System of Georgia, but at the time of the survey *not* an administrative component of UGA. In contrast to the Skidaway Institute, the Skidaway Marine Science Center, operated by MAREX, provides teacher workshops, summer camps, and a variety of student programs, and receives thousands of student visitors every year. It is possible that survey respondents mistook the Skidaway Institute for the Marine Science Center aquarium on Skidaway Island.

Although these results suggest that stakeholder familiarity with DNR is high, awareness of specific programs administered by the Coastal Resources Division of DNR is low, with less than half of the respondents reporting they are very familiar or somewhat familiar with the programs. This contrast could result from: 1) lack of familiarity with individual federal programs implemented by the state; 2) the small percentage of stakeholders contacting DNR principally for information or action on a particular “niche” issue; 3) general name recognition associated with the Coastal Resources Division; or 4) an overrepresentation of educators among respondents who would have little reason to contact a regulatory agency.

When asked which organizations they are most likely to contact for information on a wide range of issues, most respondents identified the DNR coastal management program as the primary source. However, a significant percentage of respondents report contacting the Skidaway Institute of Oceanography for information on sea level rise and climate variability. The Marine Extension Service is primarily contacted about education and stewardship matters, while the Georgia Sea Grant Program is mostly contacted about seafood contamination issues. In many cases, more than 10% of respondents did not identify any organization. Overall, responding individuals appear least likely to contact the Georgia Sea Grant program, the Sapelo Island National Estuarine Research Reserve, and the Sapelo Marine Institute for information about coastal management issues (Fig. 28).

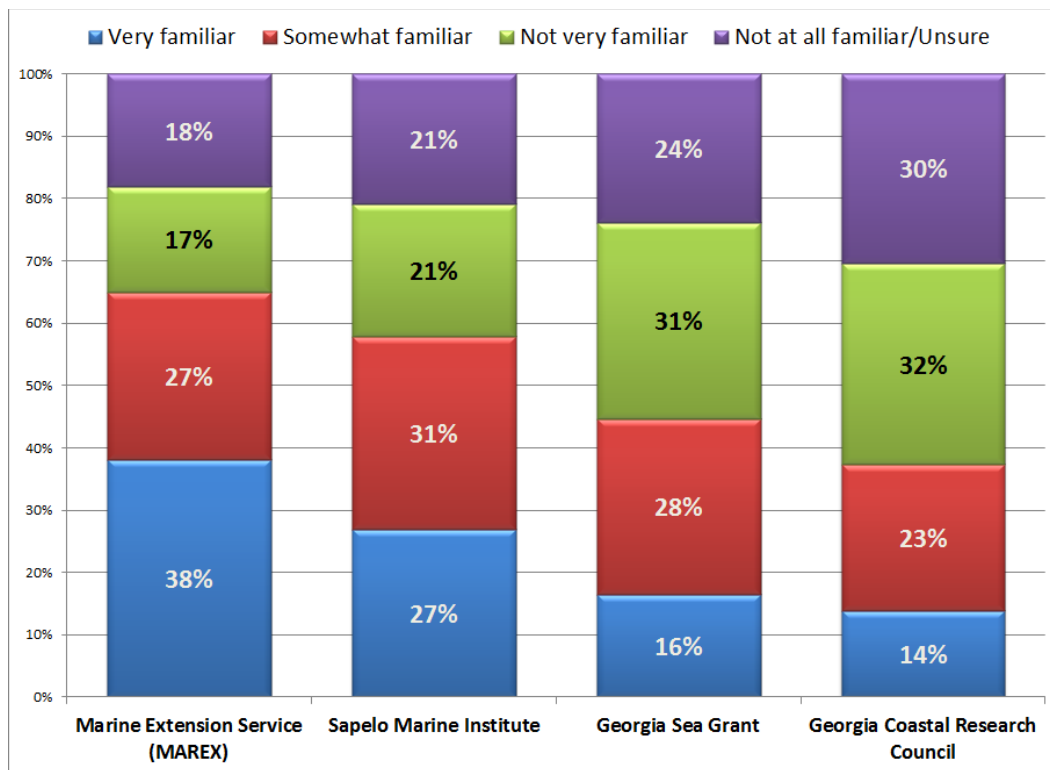


Figure 25: Familiarity of survey respondents with UGA coastal environmental organizations

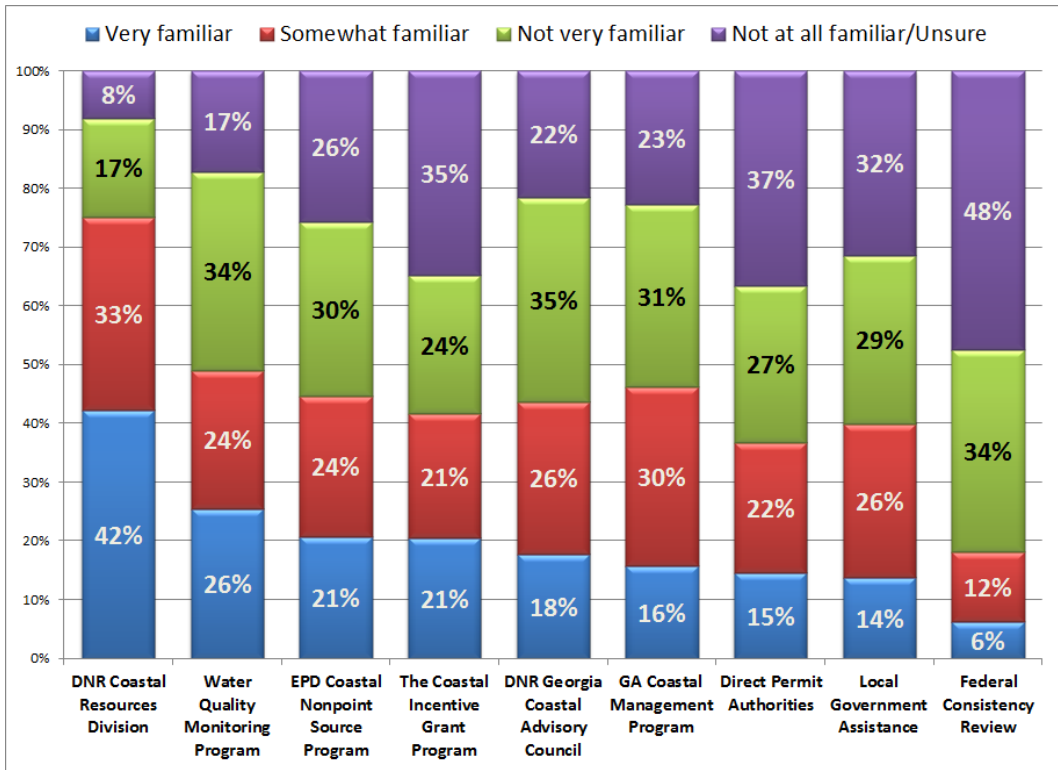


Figure 26: Familiarity of survey respondents with DNR coastal management programs

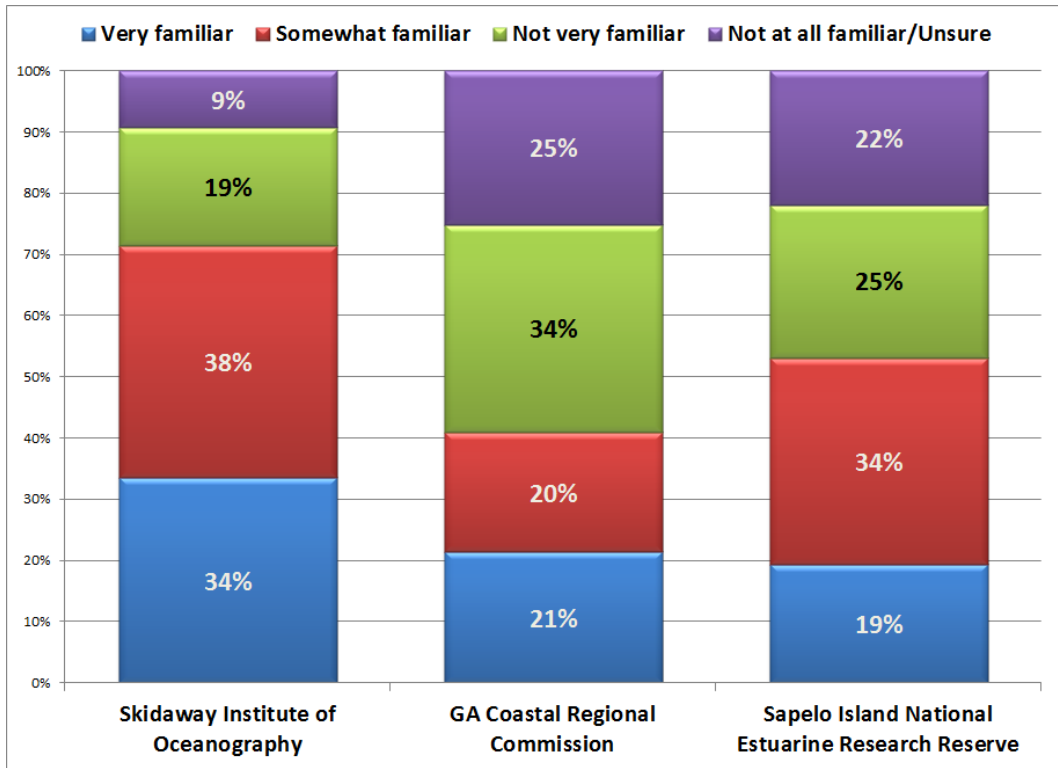


Figure 27: Familiarity with other coastal organizations

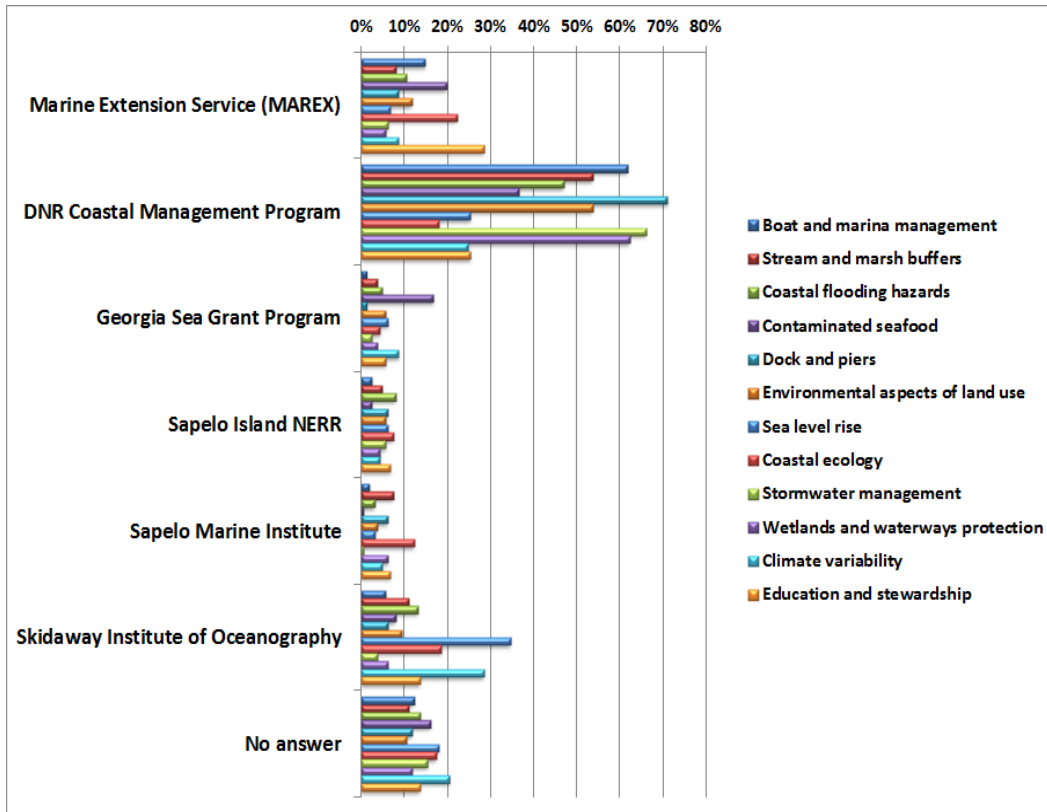


Figure 28: Organizations stakeholders would most likely contact for information in specific areas

### *Familiarity with federal, state, and local environmental regulations*

As all four partners are involved to some extent with implementing local, state, and federal regulations, and monitoring, studying, or providing information about native and invasive species, stakeholders were asked about their familiarity with these topics. Shown in Figure 29, more than one-third of the respondents are not familiar with any regulations; however, those reporting some familiarity are more aware of state and local regulations.

### *Familiarity with coastal plant and animal species*

While almost one-fifth of the survey respondents claim to be very familiar with native, endangered, or invasive coastal species (Fig. 30), about 50% more report being somewhat familiar with those species. These results suggest that stakeholders may need more information about coastal flora and fauna from the four partners. It should be noted, however, that more respondents identified a need for additional training on issues regarding threatened and endangered species, rather than invasive species.

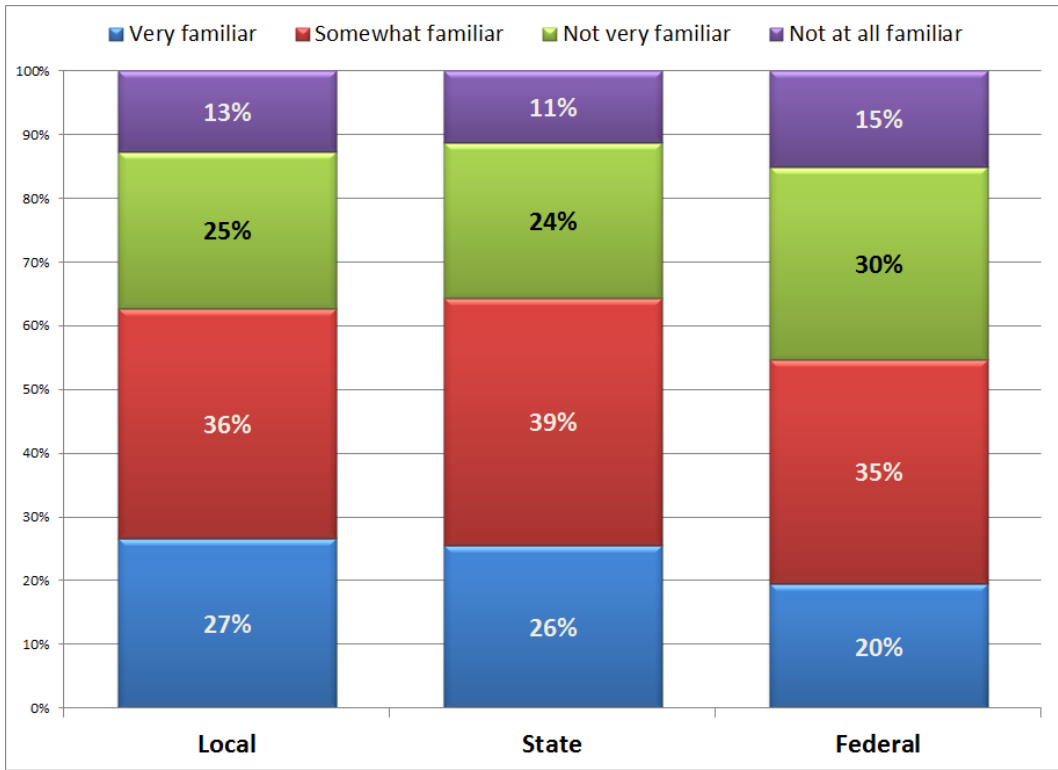


Figure 29: Familiarity of survey respondents with local, state, and federal regulations

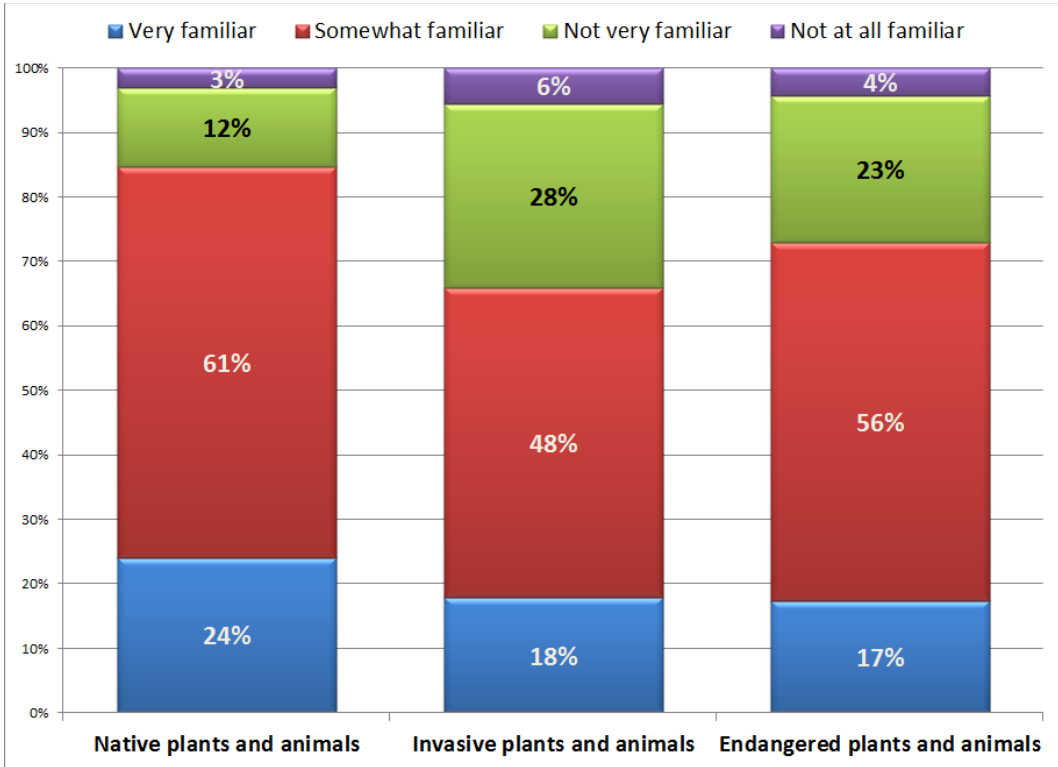


Figure 30: Familiarity of survey respondents with native, invasive, and endangered species

## PART II: SATELLITE SURVEYS

### DESCRIPTION

In order to gain a more focused understanding of how specific groups of stakeholders view coastal issues and the four partners, and to gain a clearer picture of the needs of those stakeholder groups, four satellite surveys were added to the general survey section. Survey respondents were asked to identify a professional affiliation at the end of the general survey and, depending on their response, were automatically directed to answer a single satellite survey unique to that affiliation. The satellite surveys were available for the following groups: 1) local government officials; 2) federal and state government agency staff (regulators); 3) educators; and 4) scientists and staff of non-profit and non-governmental organizations, who were asked to complete the satellite survey which served as the “market inventory”. The partnering agencies defined and delineated the stakeholder groupings and identified the relevant questions for each group. Of the 156 respondents completing the general survey section, 142 responded to a satellite survey. Response totals for the satellite surveys was: 1) local government = 29 respondents; 2) education satellite = 69; 3) government agency/regulators = 36; 4) market inventory = 8. Because only eight individuals responded to the market inventory satellite survey, results of that survey are not presented graphically. Tabular results of the market inventory satellite survey are found in Appendix A. Results of telephone interviews held with individuals designed to supplement the satellite surveys are discussed in the section entitled “Market inventory and results of individual interviews.” Due to similarities between their missions and responsibilities, questions related to use of technology and specific issues associated with implementing their responsibilities, the same questions regarding those matters were used in the satellite surveys for local government officials and representatives of government agencies (“regulators”). Results of those questions by both stakeholder groups are presented in the same graph.

### Local government and government agency responses to joint questions

#### *Familiarity with, and accessibility to, GIS technology*

The first questions for local government and government agency respondents relating to technology referred to geographic information systems (GIS), which are widely used computer-based mapping systems for presenting spatial information, such as the location of property lines, infrastructure, elevations, hydrography, and other features. Increasingly, many local and state government agencies have GIS departments or programs. However, proficiency in the use of these systems requires extensive training and experience, and the software and hardware requirements for a robust GIS program can be formidable. Almost 60% of regulatory agency officials report at least periodic use of this technology; however, only 40% of local government representatives indicate the same level of activity (Fig. 31). In identifying obstacles to adopting and using the GIS technology, participants from both groups identify cost and training as the biggest barriers (Fig. 32). Less than one-fifth of the respondents in both groups perceive lack of managerial support as an obstacle.

#### *Familiarity with, and accessibility to, LiDAR technology*

In contrast to GIS, use of, and familiarity with, Light Detection and Ranging (LIDAR) technology is significantly lower. LIDAR is principally used for extremely high-resolution topographic mapping, which



has many applications such as precise elevation mapping and identification of flood-prone areas. However, because the data are obtained from sources such as aerial flyovers and require extensive processing and storage of extraordinarily large files, generation and management of the data are extremely expensive, much more so than GIS data.

Less than one-quarter of respondents in either satellite survey report using LIDAR data sometimes (Fig. 33). It is noteworthy that more than twice as many local government respondents report using LIDAR data. That result may reflect recent LIDAR mapping that has been done for all 11 coastal counties, including three counties which funded the mapping themselves, with funding for mapping in the other counties coming from several federal agencies. Since most respondents report having little, if any, knowledge of LIDAR, it is not unexpected that they are unsure about the barriers to adopting it (Fig. 34). While participants in both groups identify lack of training as an obstacle, almost one-quarter of local government officials responded that there are no barriers to adopting the technology.

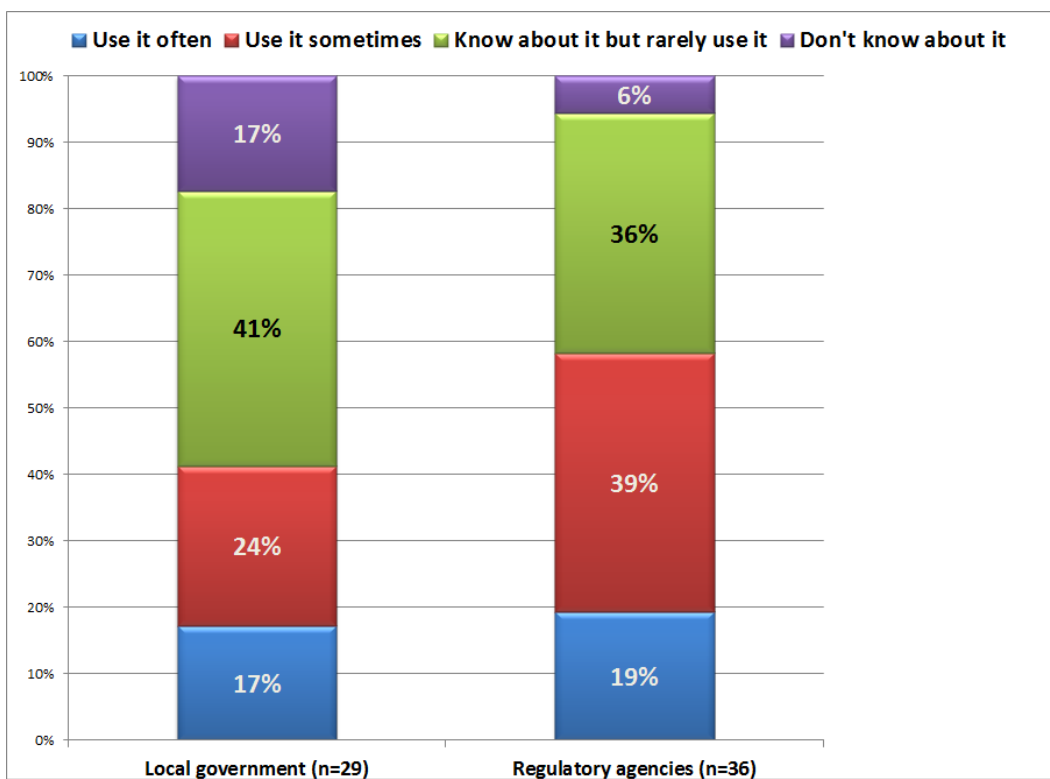


Figure 31: Familiarity of local government staff and regulators with GIS technology

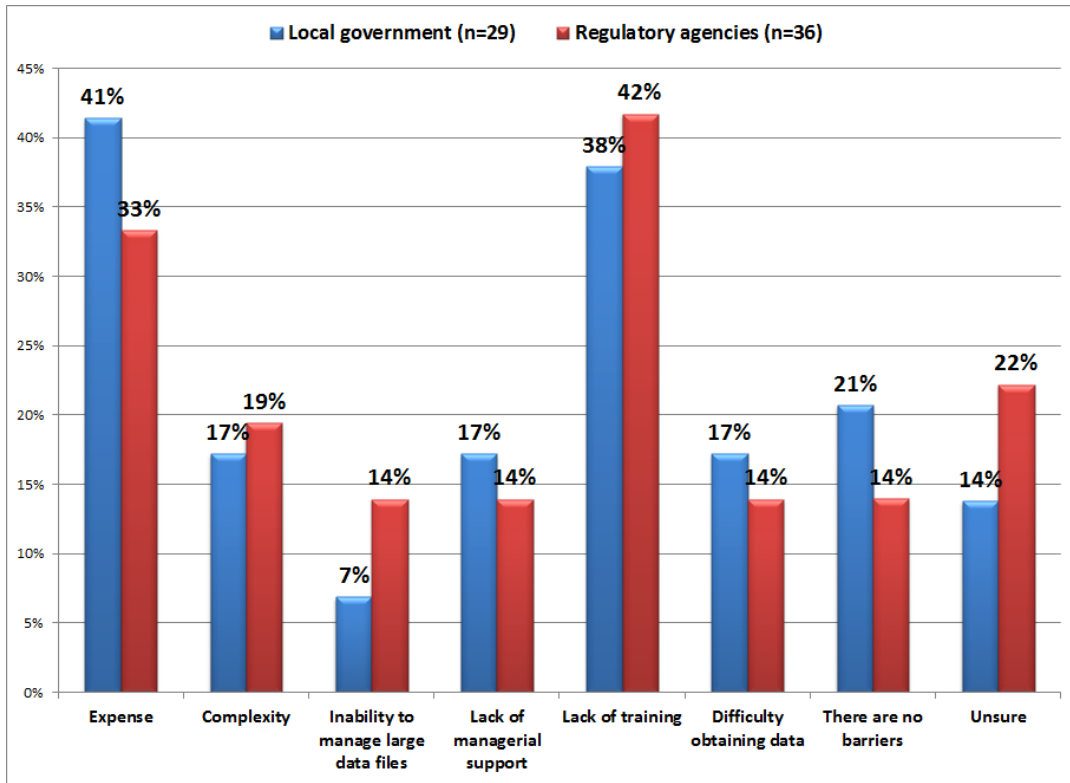


Figure 32: Barriers to local government staff and regulators using GIS technology

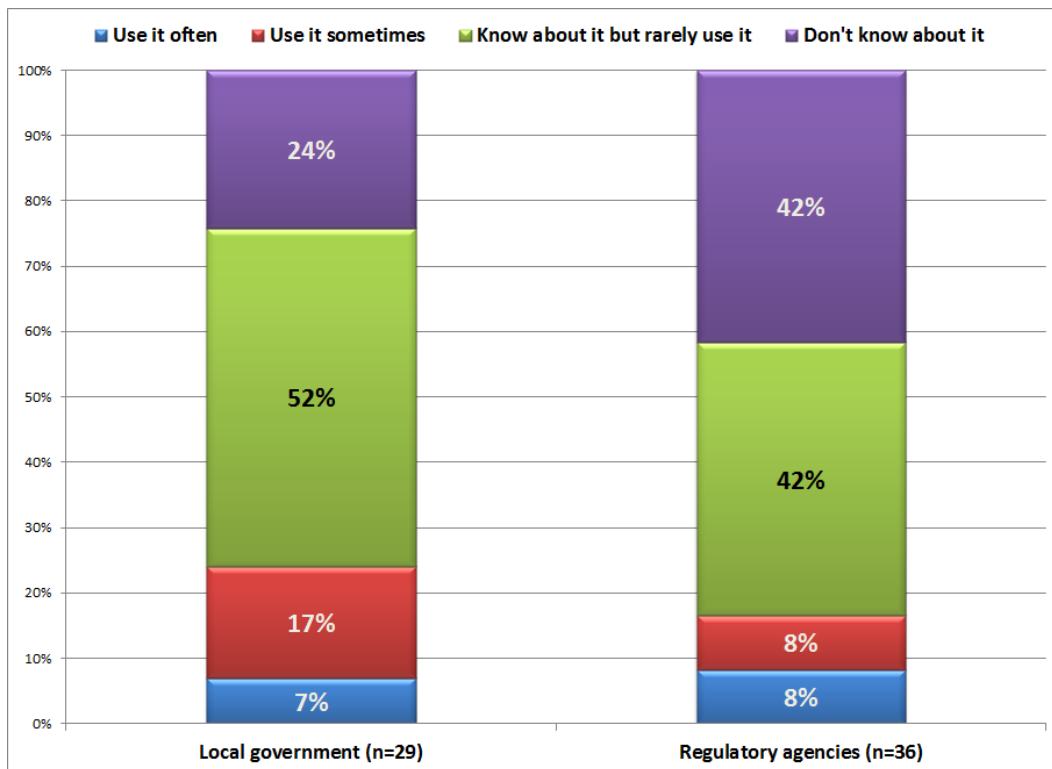


Figure 33: Familiarity of local government staff and regulators with LIDAR technology

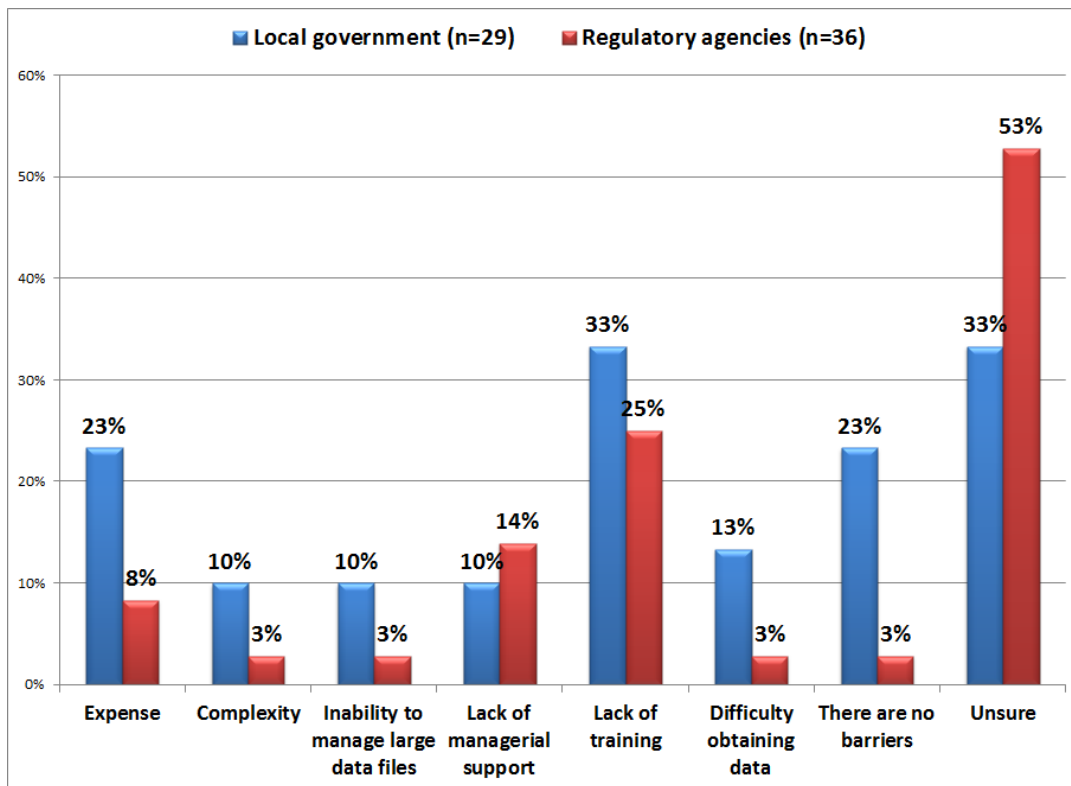


Figure 34: Barriers to local government staff and regulators using LIDAR technology

### *Natural hazards most likely to affect their community or work area*

Significant differences between local government respondents and those from regulatory agencies are evident when both groups were asked which natural hazards are most likely to affect their community or work area (Fig. 35). (“Work area” was used to accommodate those state or federal employees whose job duties cover multiple communities or counties). More than 50% of respondents in both groups perceive wind damage from hurricanes and other storms as the hazard most likely to cause an adverse impact to local communities. Local government respondents view wind damage as significantly more likely to affect their communities as is freshwater flooding caused by extreme rainfall, inability of emergency workers to reach parts of the community, or shoreline erosion. It is possible that these issues were more important to local government respondents as they reflect the more urgent matters local governments face and are responsible for. In addition to wind damage, regulators also report being significantly concerned with saltwater flooding from hurricanes, water shortages due to drought, and water shortages due to saltwater intrusion into the aquifer.

While significantly more regulators perceive inundation from sea level rise as having a potential adverse impact on the local community (Fig. 35), about one-half of the respondents in both surveys acknowledge that their community or work area is very to moderately vulnerable to sea level rise (Fig. 36). However, notably, almost one-third of the local government respondents indicate that their community is not vulnerable to sea level rise. These survey results appear to suggest the need for additional analysis in assessing risks from sea level rise.

### *Participation in habitat restoration programs*

Another significant difference between local government respondents and regulators is the degree to which officials in each group report participating in habitat restoration programs (Fig. 37). The number of regulatory agency respondents indicating they participate in such programs is almost twice that of the local government respondents. More specifically, 80% of local government respondents claim they do not participate in habitat restoration programs. In this case, greater participation by regulators is almost certainly due to federal funding programs designed specifically to encourage and support habitat restoration.

### *Benefits to sustainable land use practices*

While more than two-thirds of those responding in both groups strongly or somewhat agree that there are economic benefits from sustainable land use practices (Fig. 38), a notable 92% of government agency respondents agree or somewhat agree. In contrast, 27% of local government respondents disagree either strongly or somewhat on the emergence of benefits from sustainable land use practices, as opposed to only 6% of the government agency respondents.

When asked to assess the value of specific practices (Fig. 39), representatives of regulatory agencies show stronger support for a broader range of practices. At least 50% of the respondents in both groups rated the following practices as useful:

- Water conservation;
- Tree preservation and plantings;
- Green infrastructure storm water management; and
- Sustainable site selection, planning, and design.

In addition, at least one-half of the regulatory respondents rated non-point source pollution and habitat protection and linkage as useful. The six most useful practices (selected by at least 50% of respondents) identified by government agency respondents were, in descending order:

- Green infrastructure stormwater management
- Water conservation
- Nonpoint source pollution
- Tree preservation and plantings
- Sustainable site selection, planning, and design, and
- Habitat protection and linkage

In summary, both groups agree that economic benefits to sustainable land use practices exist, and both groups agree on the usefulness of several land use practices that promote sustainability. Furthermore, the groups agree that four obstacles (the lack of funding, staff, training, and local government standards) are the biggest impediments to implementation of sustainable land use practices (Fig. 40). While not specifically aligning with the views of regulatory respondents in many cases, local government officials indicate that a lack of interest and lack of managerial support are the two *least* significant challenges being faced in implementing sustainable land use practices. As far more regulatory agency respondents were able to attend a workshop or training event in the past 12 months (Fig. 41), the four partnering agencies should assess support for additional training among local government officials.

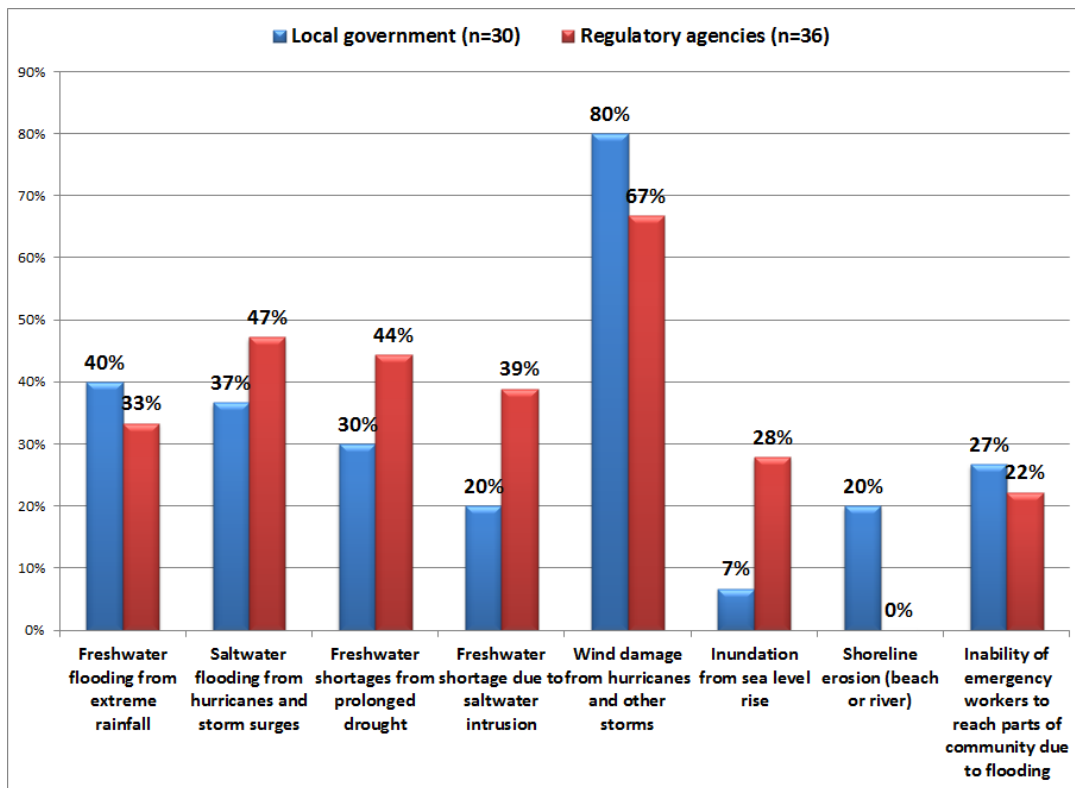


Figure 35: Natural hazards survey respondents feel are most likely to affect coastal areas

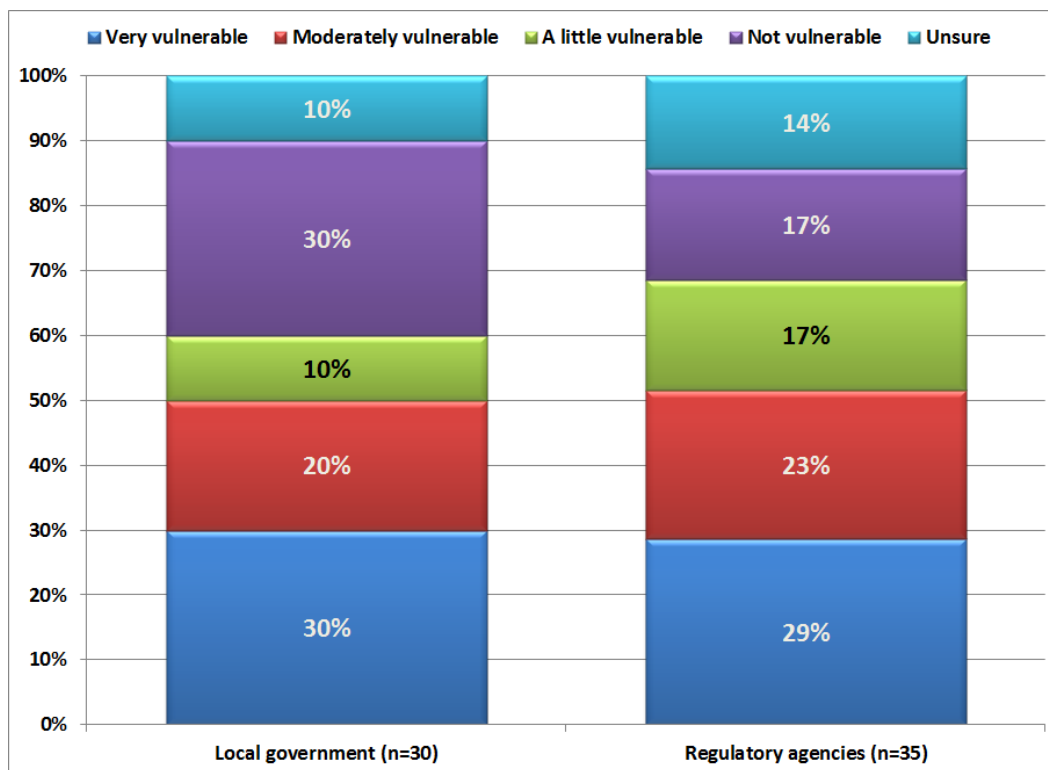


Figure 36: Survey respondents' perceived vulnerability to sea level rise

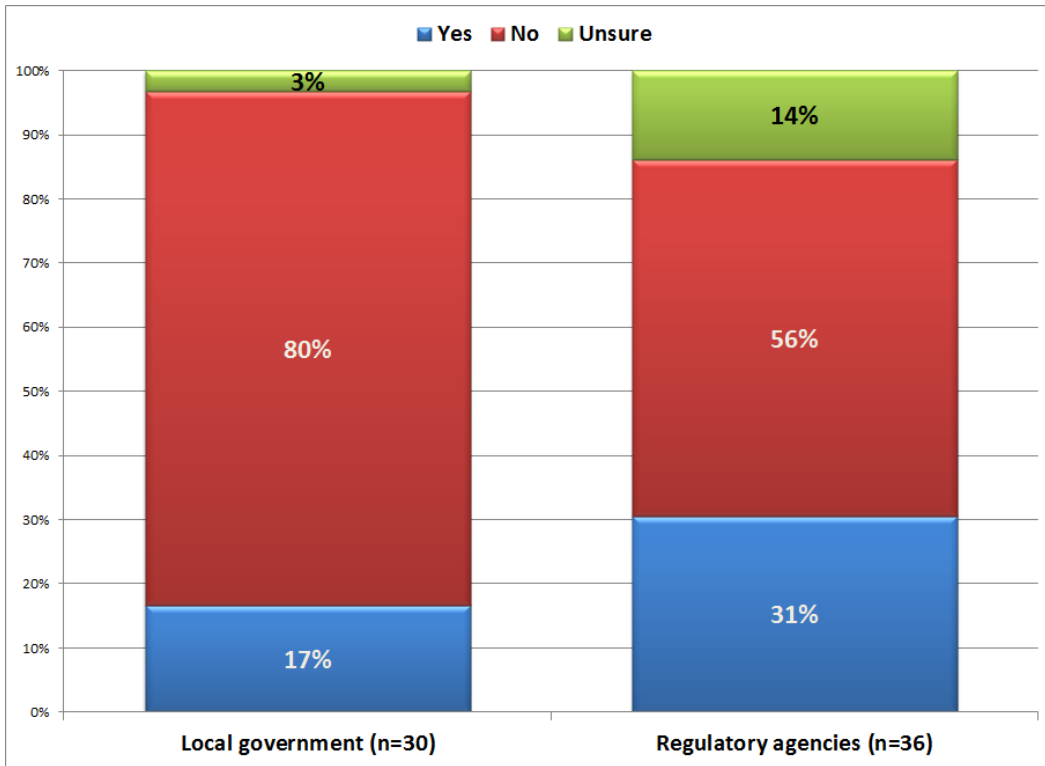


Figure 37: Participation in habitat restoration projects

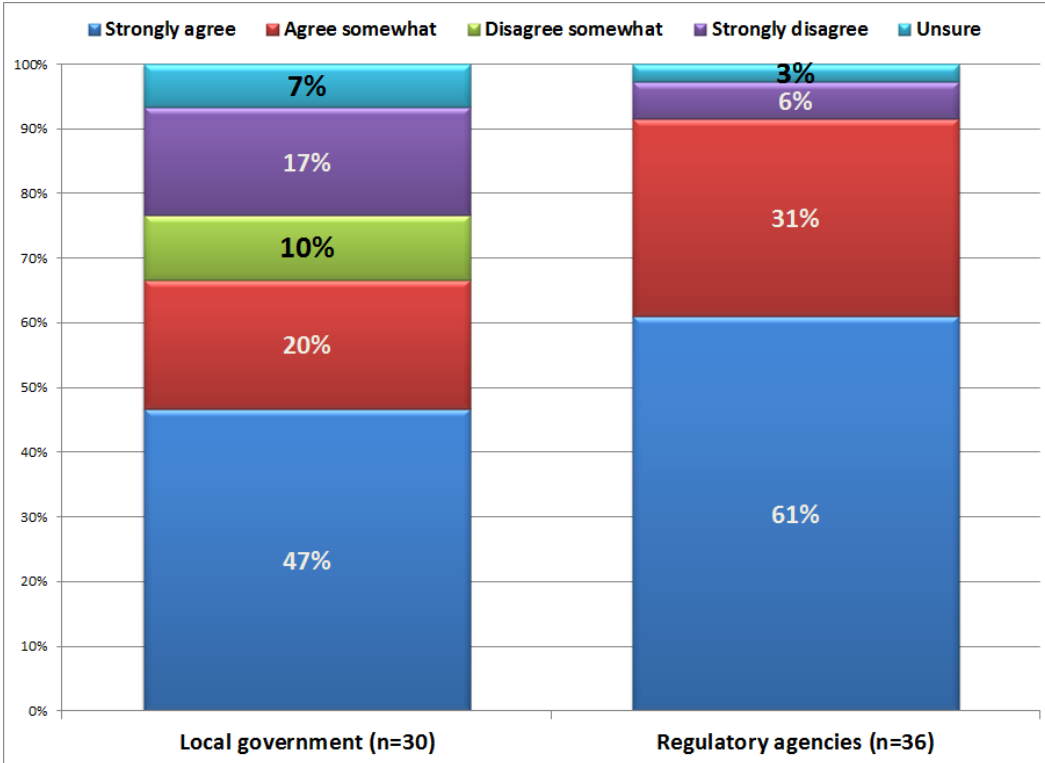


Figure 38: Economic benefits to sustainable land use practices

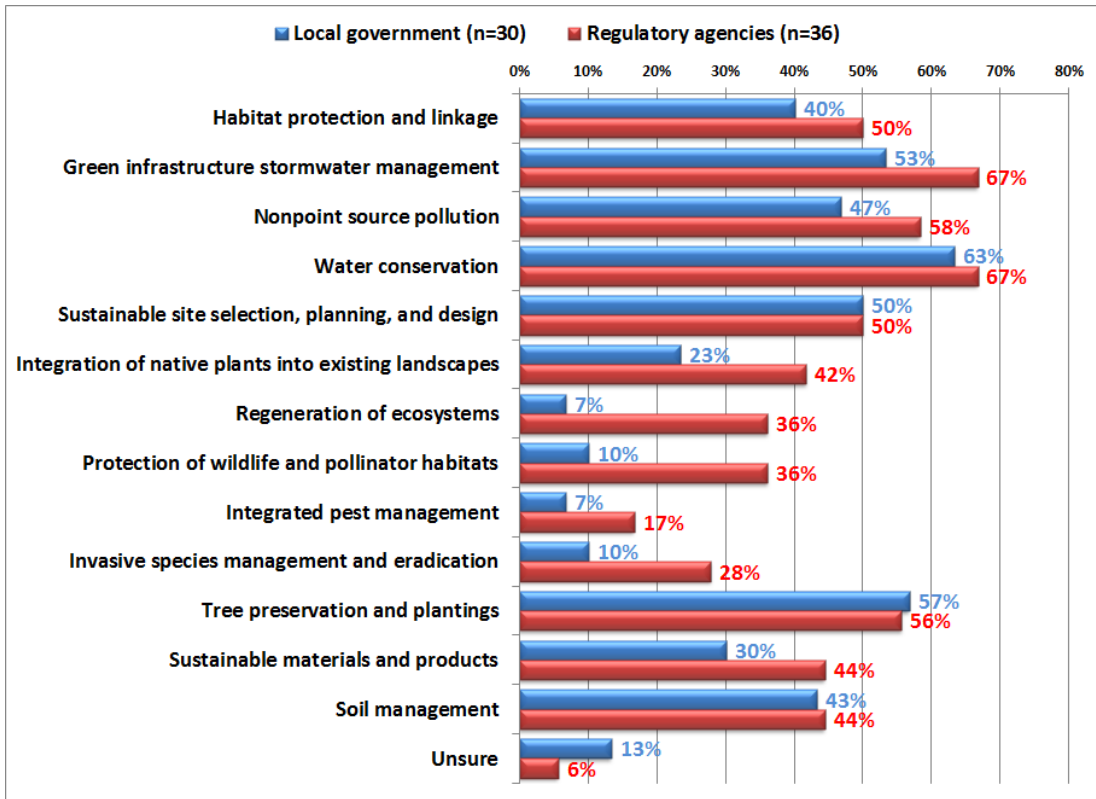


Figure 39: Perceived usefulness of various land use practices

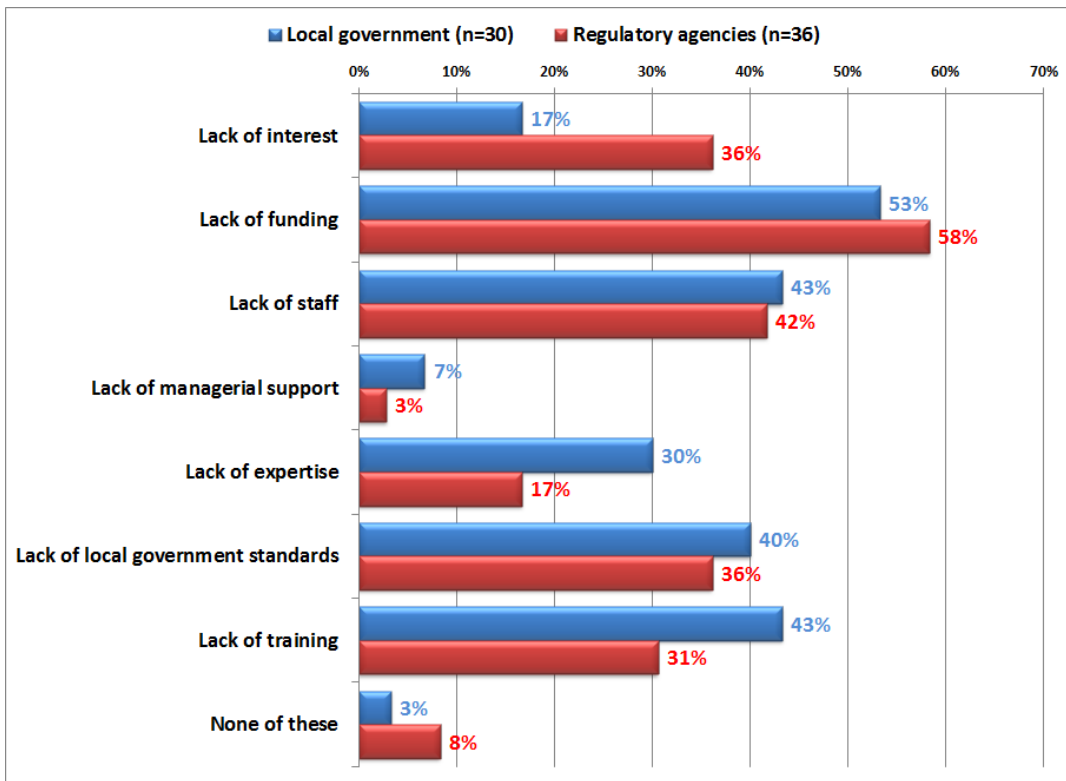
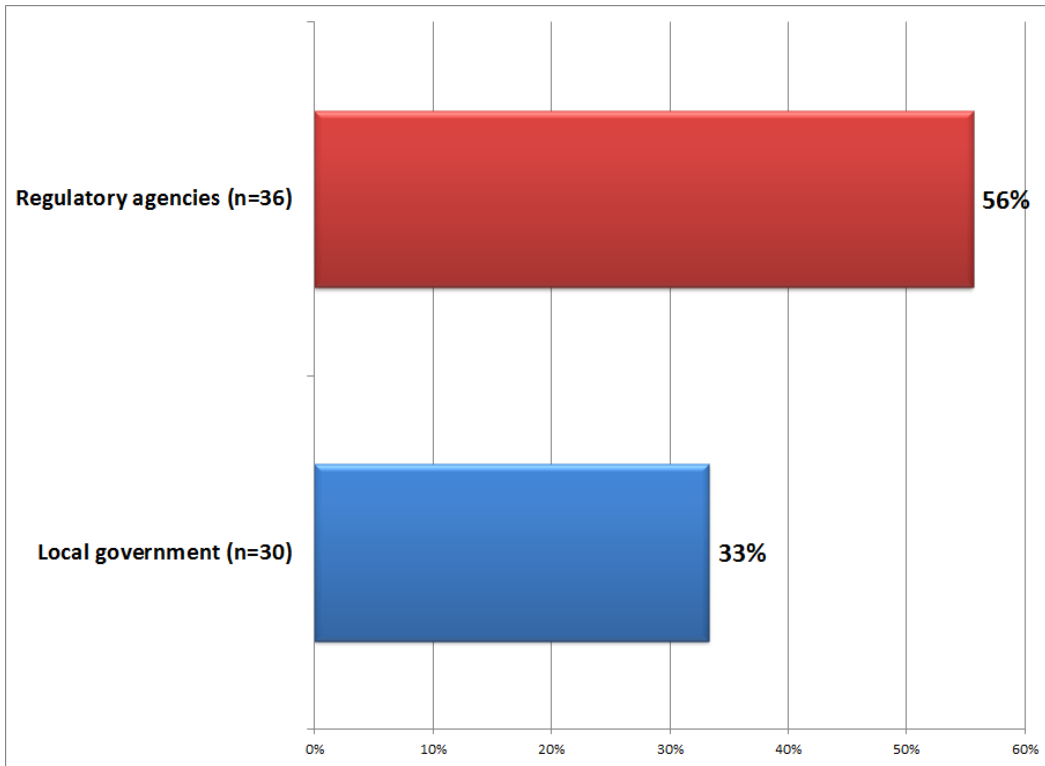


Figure 40: Barriers to implementation of land use practices



**Figure 41: Percent of survey respondents who have attended training in past year**

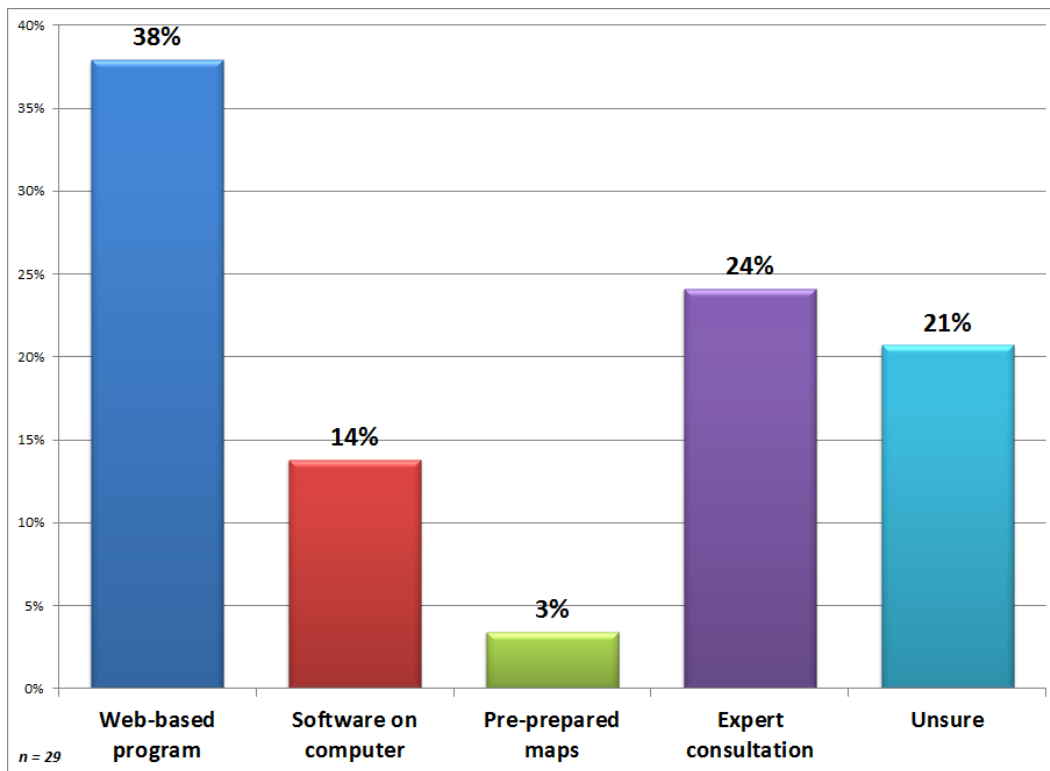
### **Local government satellite survey**

Of those survey respondents who completed the general survey section, 30 answered the local government satellite survey. Local government respondents were approximately evenly divided between elected local government officials (such as mayors and council members) and local government staff (such as city engineers, city managers, and others). Questions posed to all local government respondents addressed the practical aspects of their job duties and community needs.

#### ***Preferred methods of receiving information***

This question asked respondents how they prefer to receive or obtain critical information and assistance in planning, zoning, and infrastructure decisions. As shown in Figure 42, the most preferred method is web-based information, followed by expert consultations. More than one-fifth of those responding are unsure. The use of maps and software are identified as the least preferred methods.





**Figure 42: Local government preferences for receiving information on planning/zoning**

### *Reliability of information about consequences of flooding to infrastructure*

Infrastructure information needs are of significant concern to communities most at risk of flooding from seasonal high tides and storms, as the impact of those rising waters on infrastructure may be acute. Fresh water wellheads, wastewater outfalls, storm water drainage lines, underground utilities, and street surfaces may be inundated during spring tides or storm surges. A majority of respondents rate the information they have about those consequences as very reliable or somewhat reliable (Fig. 43). However, 20% of respondents indicate that the information they have is either not very reliable or not at all reliable with the remaining 20% indicating they are unsure of its reliability. This level of uncertainty is, perhaps, consistent with a similar level of unfamiliarity with GIS technology among local government respondents (17%). As zoning, planning, and infrastructure information is critical to local government operations, and considering the consequences of not having that information during a storm surge or spring tide, the four partnering agencies should consider assisting local government officials with obtaining reliable information and understanding how to most effectively use that information.

### *Sea-level rise concerns*

As presented in Figure 36, 40% of local government respondents indicate their communities are either not vulnerable or slightly vulnerable to sea level rise. An additional 10% are unsure of their community vulnerability. To probe these views further, several additional questions were asked relating to sea level rise. A majority (56%) are either very concerned or moderately concerned that sea level rise would contaminate their aquifers with salt water (Fig. 44).

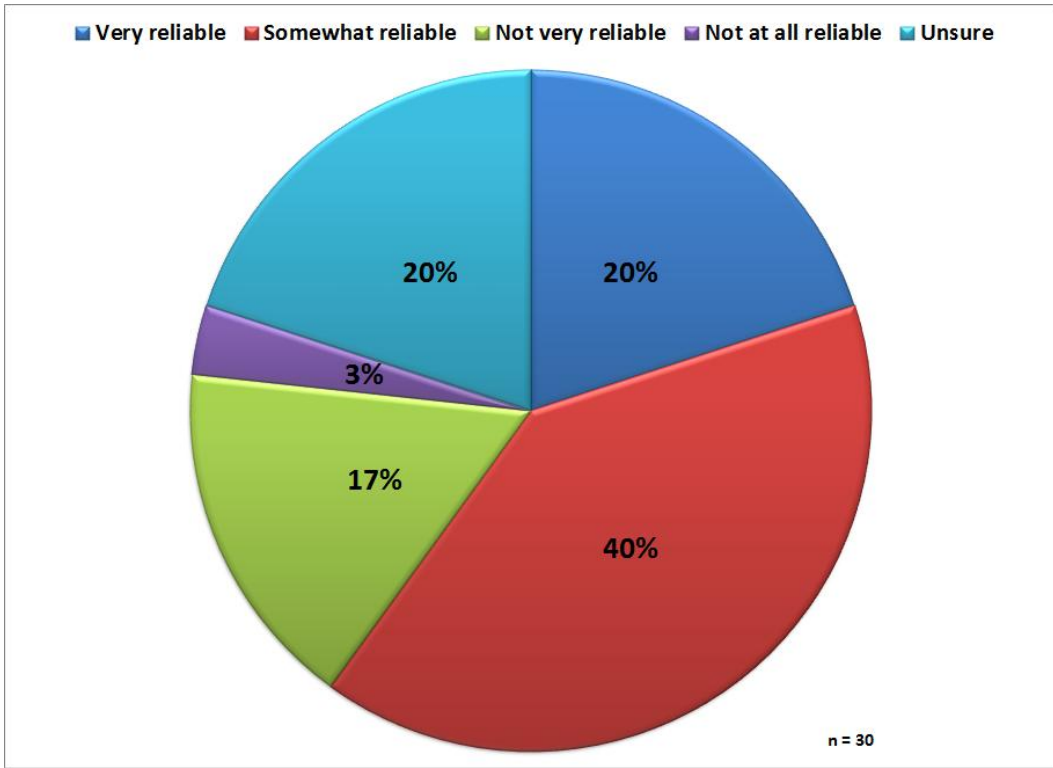


Figure 43: Local gov't. confidence in reliability of information about flooding and infrastructure

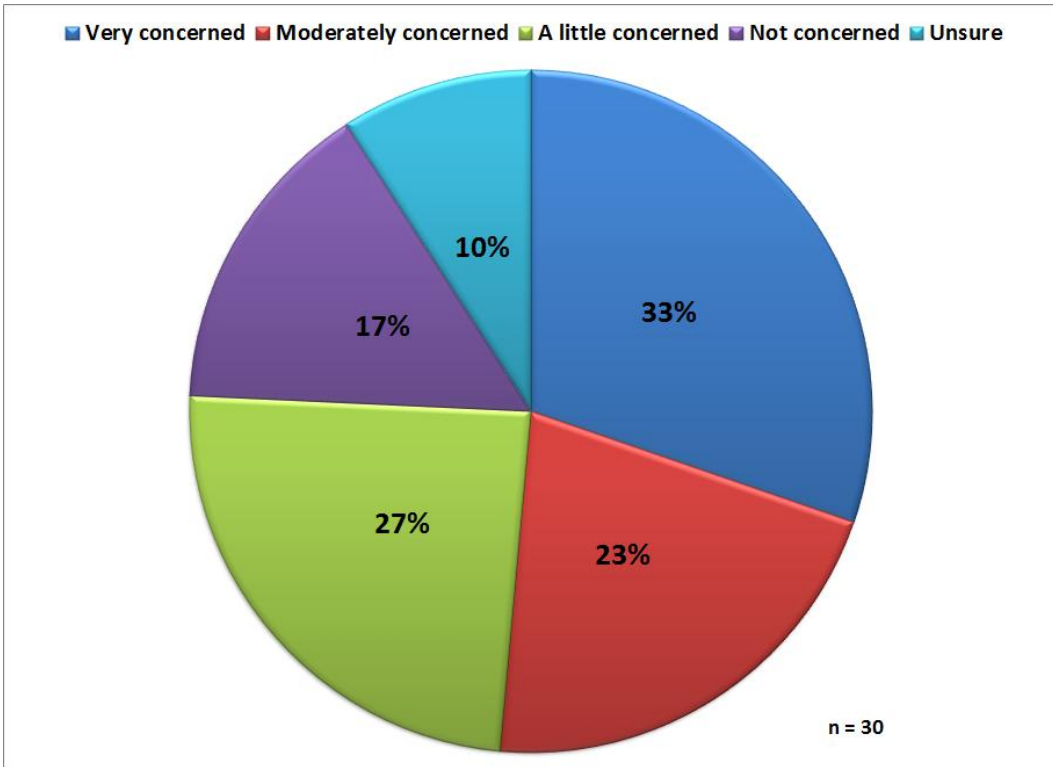


Figure 44: Level of concern about saltwater intrusion into aquifers from sea level rise

These views appear to be inconsistent with previous local government responses that fresh water shortages due to salt water intrusion and inundation from sea level rise *were less* likely to adversely affect local communities, as shown in Figure 35. This divergence in response may result from the fact that salt water intrusion into the Floridan aquifer in coastal Georgia has historically been caused by local and regional ground water pumping in Georgia and South Carolina; therefore, stakeholders do not normally consider saltwater intrusion in the context of salt water *flooding*. Also, when presented with options, respondents ranked sea level rise and consequent saltwater intrusion lower than the more immediate threats posed by weather-related hazards. Given the growth and development in some coastal areas, local governments are periodically faced with the need to provide additional infrastructure and accommodate that growth. In planning to meet these needs, almost three-fourths of local officials indicate they do not consider sea level rise at all or only a little in planning for infrastructure and growth (Fig. 45). Only 10% report they include significant consideration of sea level rise and its potential impacts.

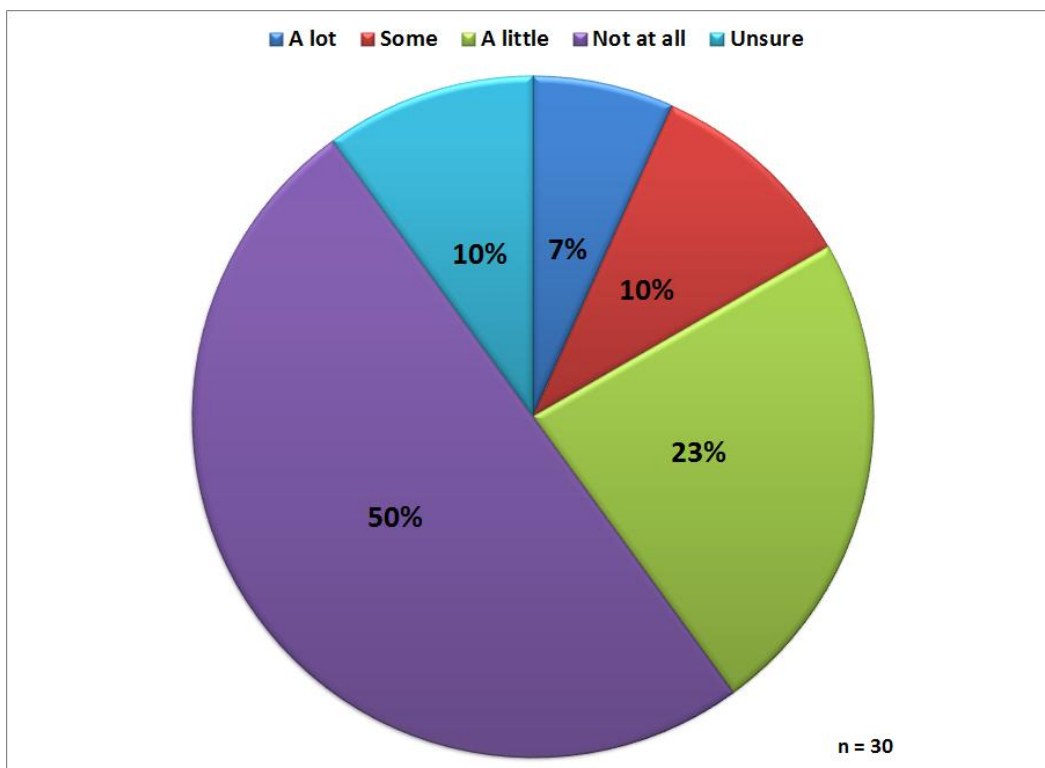


Figure 45: Extent to which sea level rise is considered in infrastructure and growth planning

### *Shoreline erosion*

Issues regarding shoreline erosion in coastal Georgia vary in importance, depending on the community. In some areas, erosion poses significant problems, but in most of coastal Georgia, that is not the case. Erosion may not be a problem because so much of the coast is undeveloped, or because so much of the population lives in areas not affected by coastal erosion. The response of local government representatives regarding whether more accurate projections of shoreline erosion would help them in their jobs reflects these conditions, as more than one-third of respondents say that shoreline erosion is

not relevant to their duties (Fig. 46). Another 27% indicate that more accurate projections would either not help much or not at all. Another third indicate accurate projections would help some or a lot.

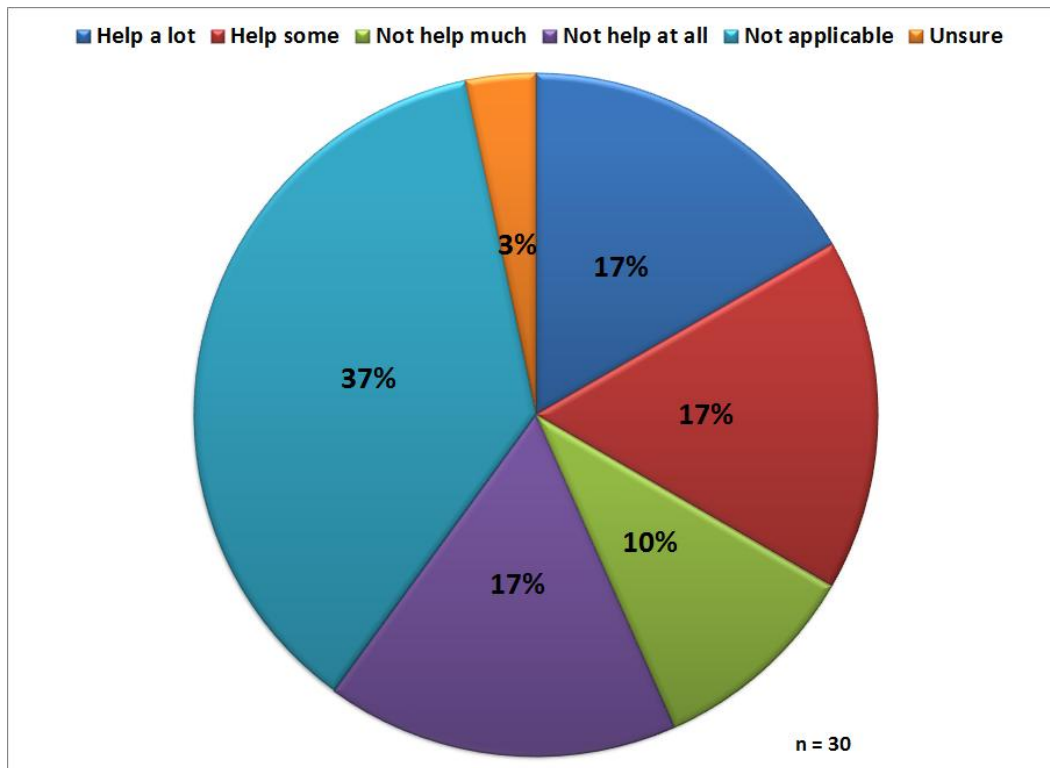


Figure 46: Extent to which projections of shoreline erosion are helpful

### *WelStrom usage and familiarity*

As previously mentioned, the general topic of coastal water quality was a consistently important one for all survey respondents. One possible cause of water quality degradation in some coastal communities is improperly sited or installed or malfunctioning septic systems. Well and Septic Tank Referencing and Online Mapping (WelSTROM) is a GIS-based mapping tool that can help local governments locate septic systems that could pose a threat to water quality. However, among the local government satellite survey respondents, a majority (60%) had never heard of this tool (Fig. 47). While the remaining 40% are aware of it, only 7% use it. This lack of awareness may reflect the fact that septic systems are regulated by county health departments, and elected officials and county or city planning and engineering staff may not be familiar with the details of that regulatory program. When asked if they would like their staff to receive training in the use of the WelSTROM software, results were rather evenly distributed, with marginally more than one-third either supporting or remaining unsure about training (Fig. 48). Slightly more than one-quarter of respondents expressed no interest in obtaining training in WelSTROM. These results suggest the possibility of another training opportunity for the four partnering agencies, perhaps as a web-based training module.

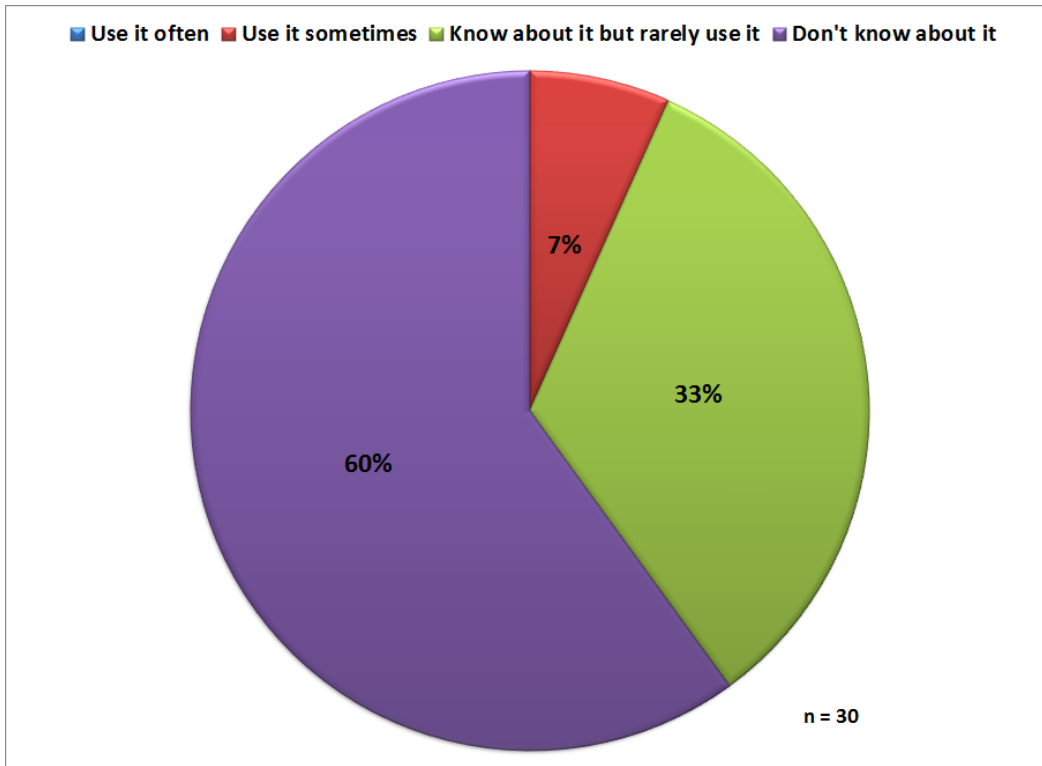


Figure 47: Familiarity with WelSTROM database

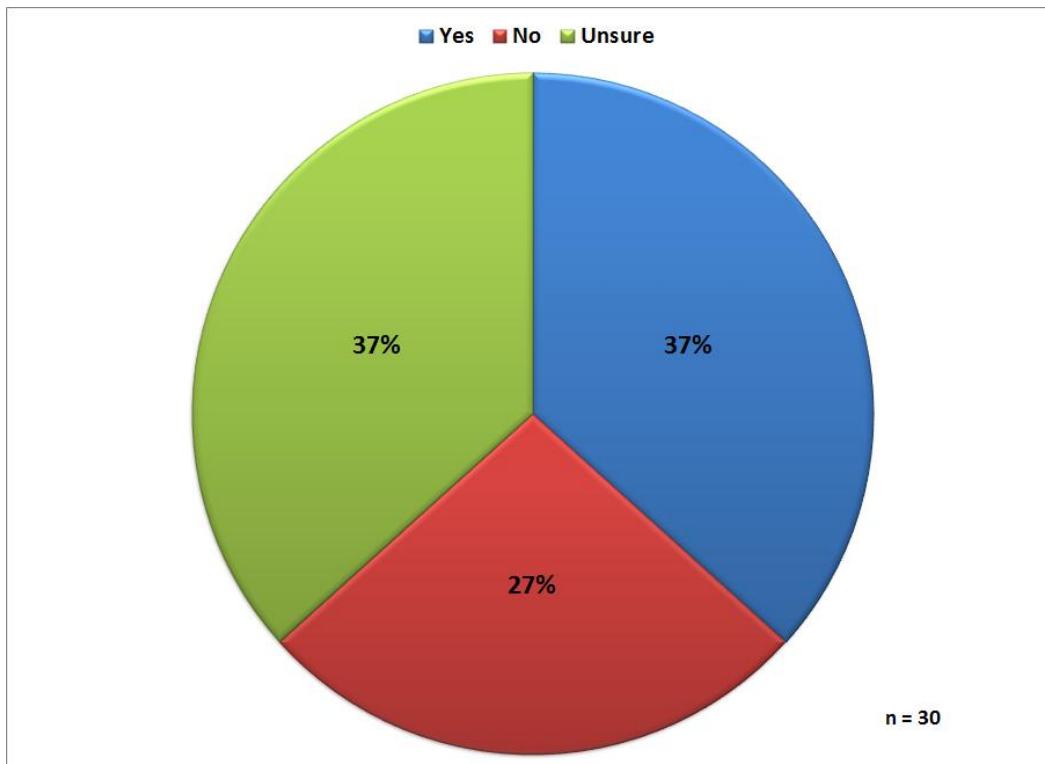
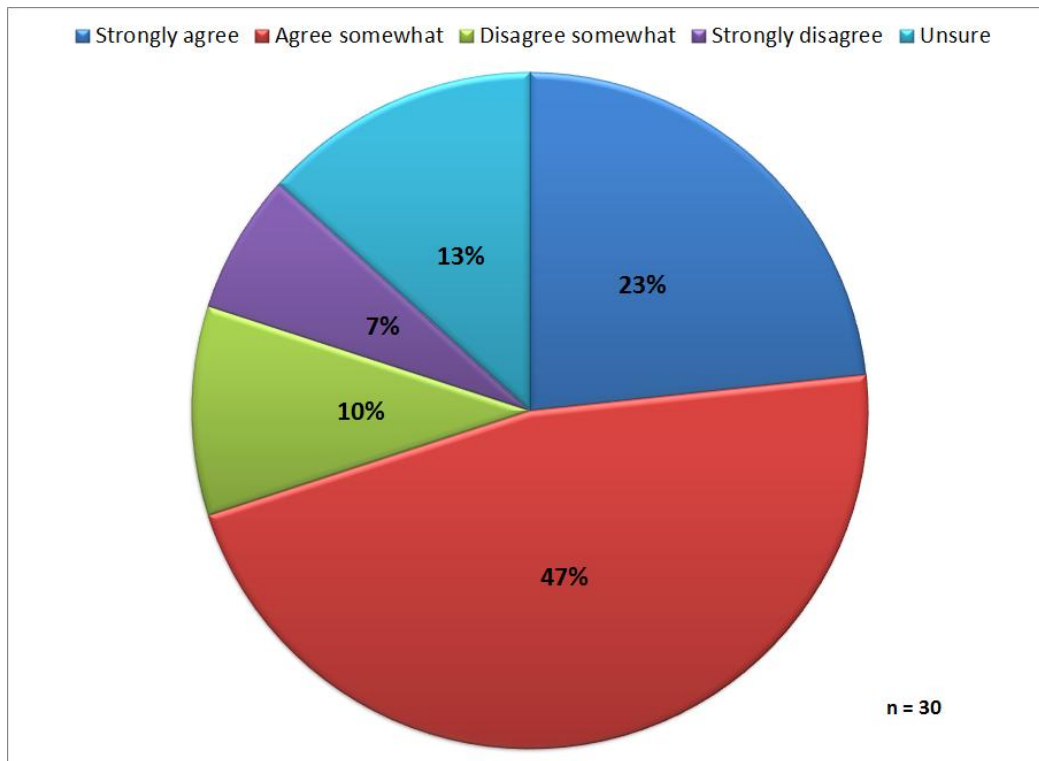


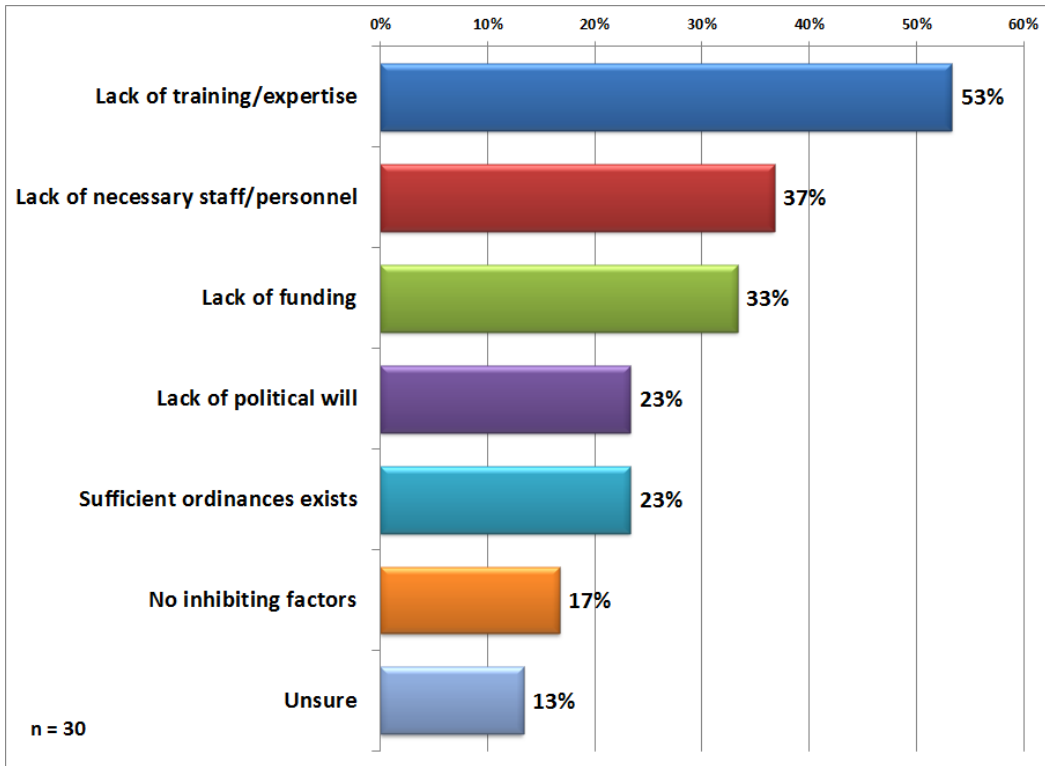
Figure 48: Local government interest in WelSTROM training

### *Land use ordinances and sustainable development*

The general survey revealed that land use planning and zoning, and sustainable development fell within the upper 50 percentile of issues deemed to be “very important” by all survey respondents. Also, 70% of local government respondents indicate that they somewhat agree or strongly agree that their city or county would consider adopting sustainable development and land use ordinances (Fig. 49). These opinions appear consistent with the very high rating associated with environmental aspects of land use in the future importance to management of coastal resources. Only 7% strongly disagree that such ordinances would be considered by their local government. When asked about the barriers to implementing land use and sustainability ordinances, slightly more than one-half say that lack of training and expertise is the biggest barrier, followed by lack of staff or personnel and lack of funding (Fig. 50). Critically, only 23% identify lack of political will as being a major inhibiting factor, the same percentage who indicates that sufficient ordinances already exist. Although these responses reveal a relatively strong interest supporting the adoption of sustainability and land use ordinances exists, a very strong majority (87%) of local government respondents perceive that environmental quality would improve or stay the same if existing land use practices were left in place.



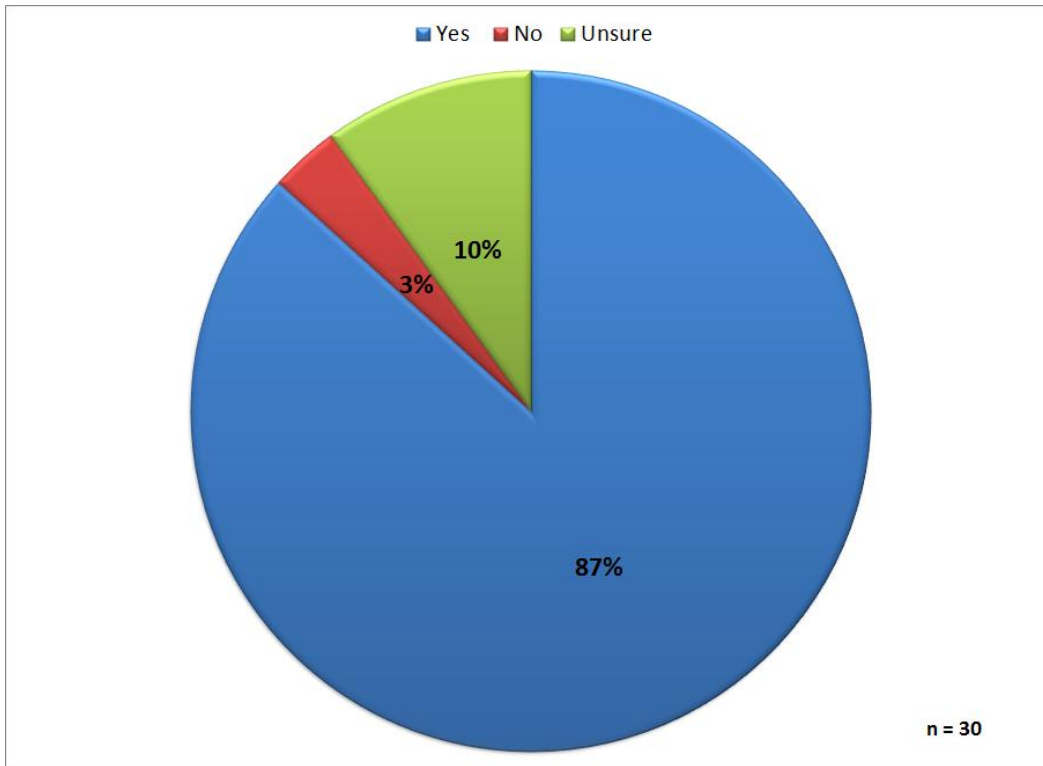
**Figure 49: Percent of local government respondents who would consider adopting land use practices**



**Figure 50: Barriers to adopting sustainable land use ordinances**

***Lack of training***

Lack of training may be a significant hindrance in several topical areas, and specific opportunities have been identified in which the four partners should consider the need for additional training opportunities. The percentage of local government respondents who have attended training in the past year is significantly less than those responding from regulatory agencies (Fig. 41), suggesting an opportunity for additional training. In responding to a question on offering continuing education credits as a means to induce local officials to participate in training programs, a large majority (87%) of local government respondents state they would be willing to attend training courses regardless of whether continuing education credits are provided (Fig. 51). This indicates a strong desire on the part of local government staff and officials to receive training and education about a wide range of environmental issues.



**Figure 51: Percent of local government respondents willing to attend training without CEU credits offered**

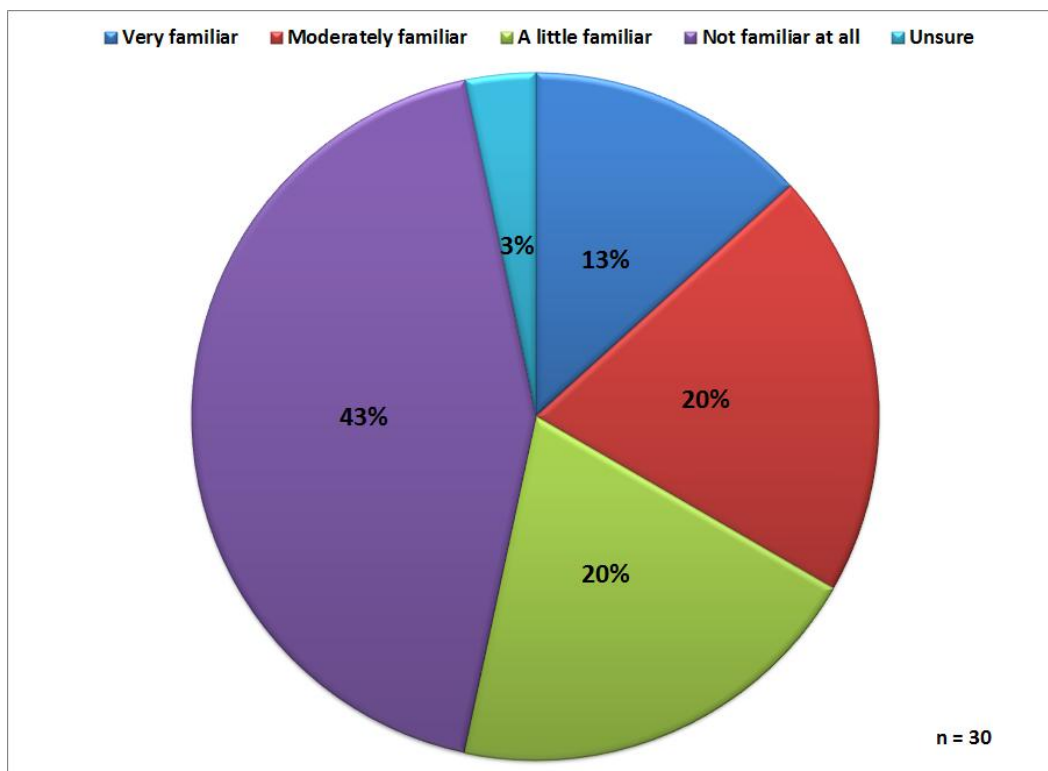
***Familiarity with and use of Community Rating System***

Coastal hazards were generally rated comparatively low in importance in the general survey, and coastal flooding was in the lowest quartile of the “very important” category among all respondents. Local government respondents rated wind damage from hurricanes and storms much higher than hurricane-related flooding as natural hazards likely to adversely affect local communities (Fig. 35), and freshwater flooding from rainfall slightly higher than hurricane-related saltwater flooding. Although coastal Georgia has not experienced a major tropical storm since Hurricane David in 1979, any low-lying area along the coast is at risk of flooding. So, it is noteworthy that almost two-thirds of local government respondents are either unfamiliar with, or only a little familiar with, the National Flood Insurance Program's Community Rating System (CRS) (Fig. 52). This system, a voluntary incentive program, recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. As a result, property owners receive discounted flood insurance premium rates to reflect the reduced flood risk resulting from the community actions meeting the goals of the CRS.

***Access to waterways***

Of concern to many coastal stakeholders is whether the general public has sufficient access to waterways. While almost three-fourths of those local government respondents agree strongly or agree somewhat that such access is available, 20% strongly disagree (Fig. 53).





**Figure 52: Familiarity with Community Rating System (CRS)**

***Preserving land in conservation trust***

An issue of great environmental and economic significance is the amount of land in the coastal counties of Georgia, including Sapelo, Cumberland, and St. Catherines islands, that is preserved by governments or private trusts. Significant commercial development in these areas is prohibited. Protection of this land serves critical environmental purposes and provides ecological services, as well as preserving the aesthetics and character of coastal Georgia. About two-thirds of local government respondents either agree strongly or agree somewhat that land should be preserved by private trusts or the state and federal governments (Fig. 54). Slightly less than one-quarter of respondents strongly or somewhat disagree with this proposition.

***Interest in grant funding***

The final question in this satellite survey asked about interest in grant funding for a variety of activities. More than two-thirds of the respondents indicate a significant interest in receiving grants for construction and enhancement of public access facilities (Fig. 55). These projects would include facilities providing beach access, roads, and public docks. Approximately on-half of those responding support grant funding to enhance planning for sustainable growth and planning for coastal hazards. Respondents rate support for grant money for planning of public access as low, along with planning for sea level rise, a coastal hazard.

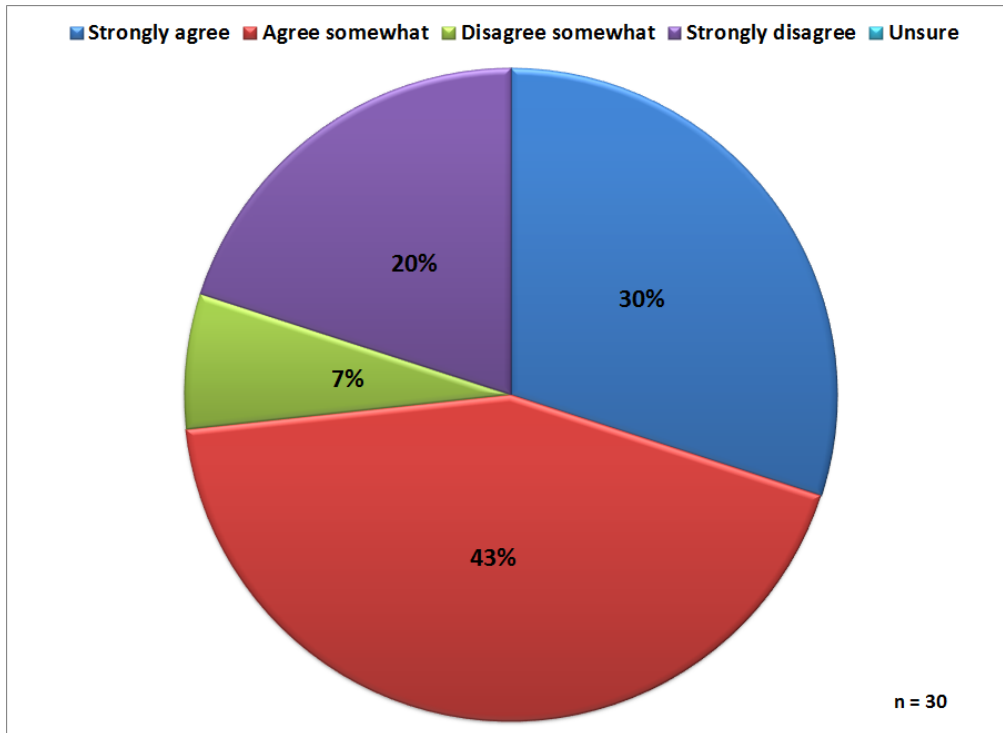


Figure 53: Local government respondents who agree their community has sufficient access to waterways

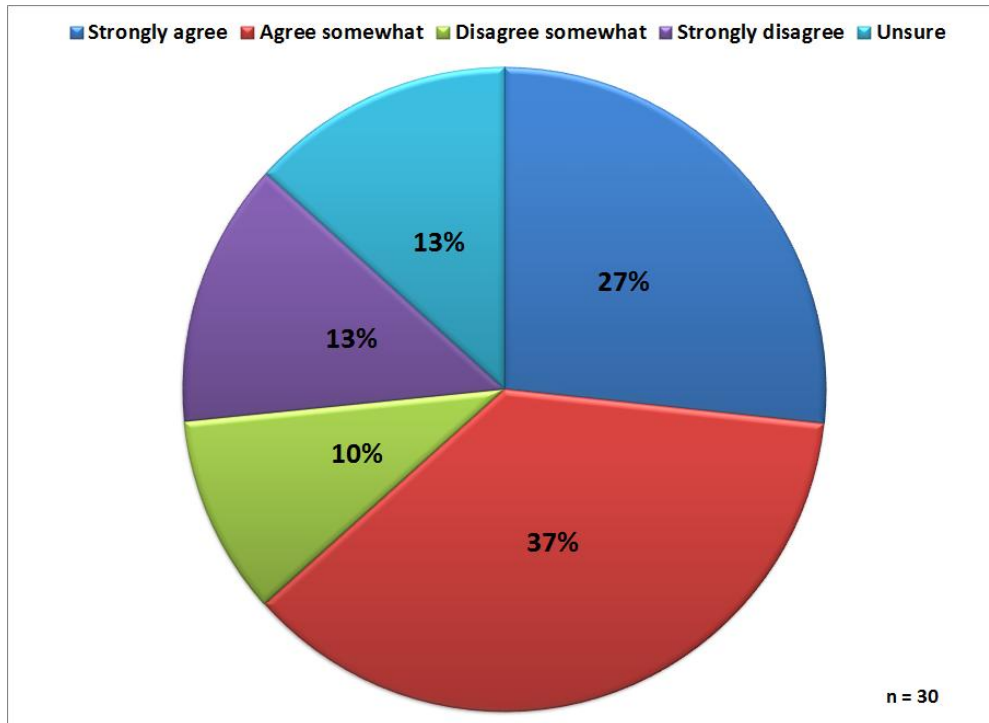


Figure 54: Local government response that keeping private land in trust benefits the local economy

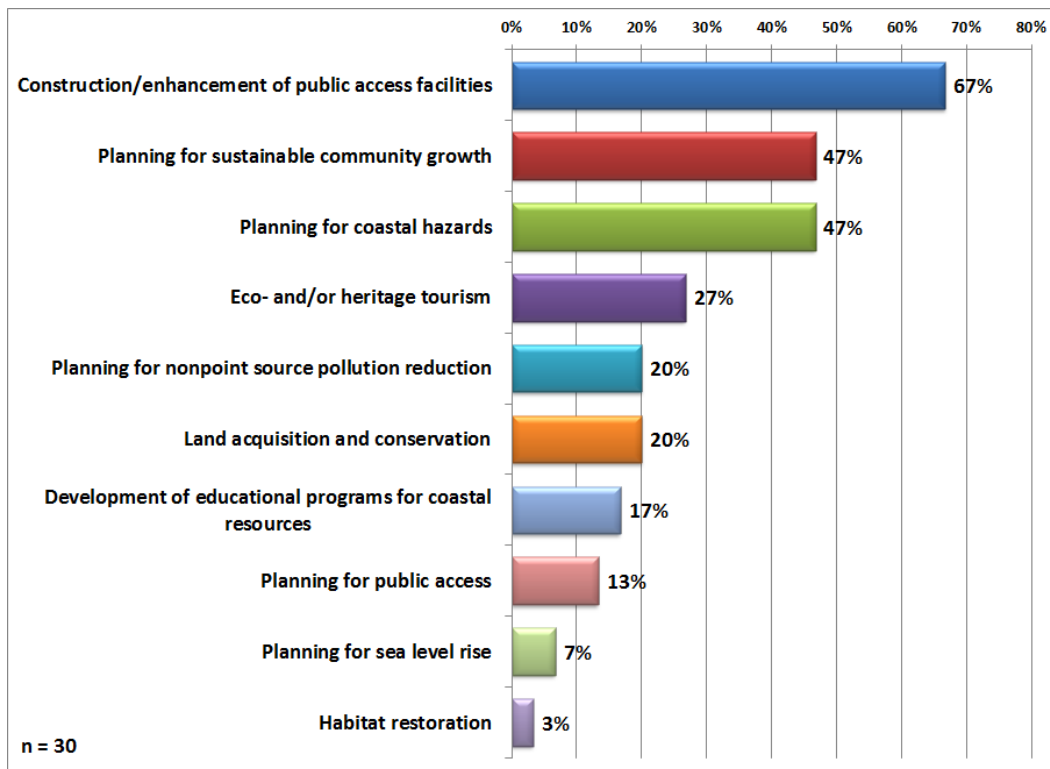


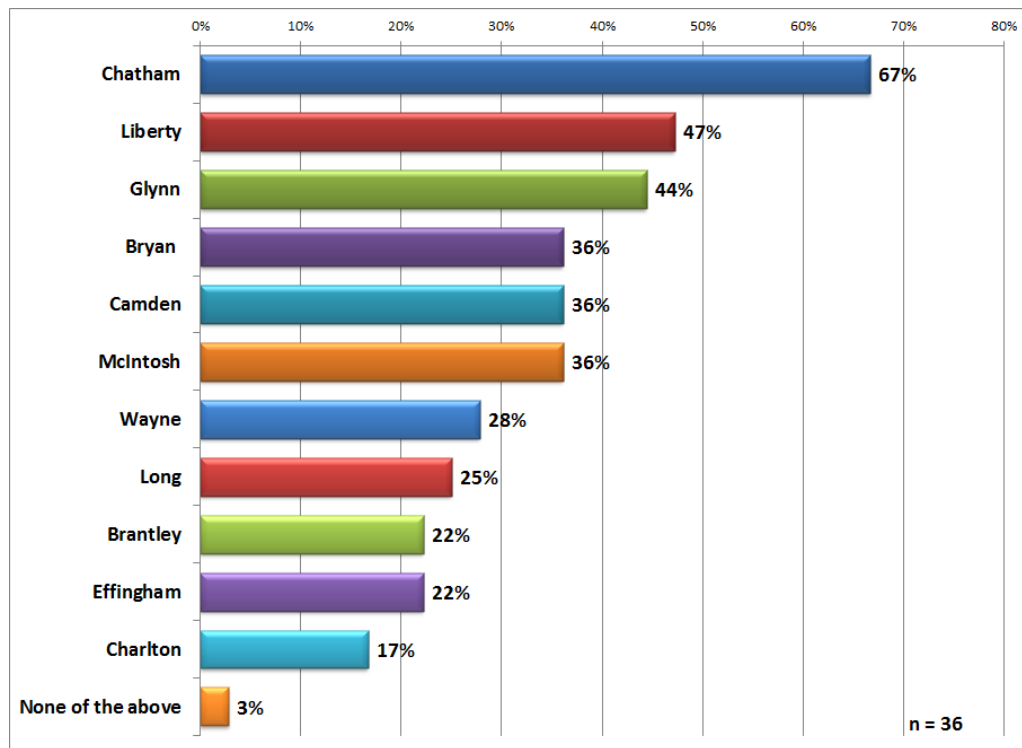
Figure 55: Local government interest in receiving grant funding

### Government agency (regulators) satellite survey

Of those survey respondents who completed the general survey section, 36 completed the government agency satellite survey. The general survey directed respondents who were federal marine resource managers; state marine resource managers; federal environmental protection personnel; state or local environmental protection personnel; or state environmental health officials to proceed to the government agency satellite survey. The distribution of respondents completing this satellite survey is as follows: state or local environmental protection personnel (30); state marine resource managers (6); and state environmental health officials (1). Not all respondents answered all questions, so  $n = 36$  for most questions. Of those, one-half of respondents work for state agencies (18), and one-half work for local government agencies (16) or other organizations (2). Responding individuals work in a wide range of fields, including wildlife management, waste- and storm water management, zoning and land use, and public water supply.

### Geographic distribution of respondents

Respondents were asked to identify the county or counties where they mostly worked. A significant majority report primarily working in Chatham County, consistent with the first question in the general survey about the general geographic distribution of respondents (Fig. 56). Liberty County is the second-most reported location (47%) with Glynn County following closely. In other words, government agency respondents work mostly in the more highly populated counties in coastal Georgia. The fewest respondents indicate they do not work in a coastal county, which is very different from the 24% of the general survey respondents, who answer “none of the above” regarding where they live.



**Figure 56: Counties where government agency respondents do most of their work**

### *Training preferences*

The survey asked government agency participants to provide their opinion on which groups needed additional training and education. Of the nine possible groups, more than one-half of the respondents identify the following groups: 1) the general public; 2) elected officials; 3) non-elected government officials; 4) commercial or residential developers; 5) K-12 teachers; and 6) landscapers and nursery operators (Fig. 57). Based on their response that tourists and visitors are not high priorities for training, respondents are undoubtedly referring to local residents as that portion of the general public needing training. The economic value and environmental importance of sustainable land use has been previously identified as being of significance in the general survey. When asked about the methods for providing training, government agency respondents prefer using workshops and direct training (Fig. 58). Conferences and symposia, followed by web-based resources, are ranked second and third, respectively. Respondents provide no strong preference for using a particular day of the week; however, they prefer engaging in a half-day morning workshop (Figs. 59 and 60).

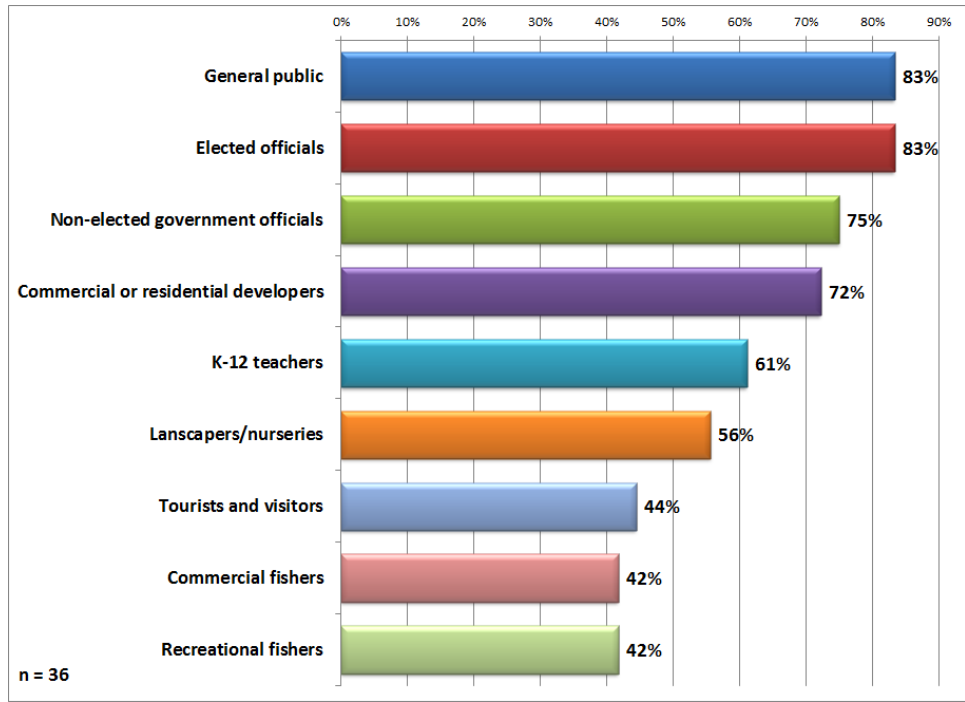


Figure 57: Groups that government agency regulators believe need more training

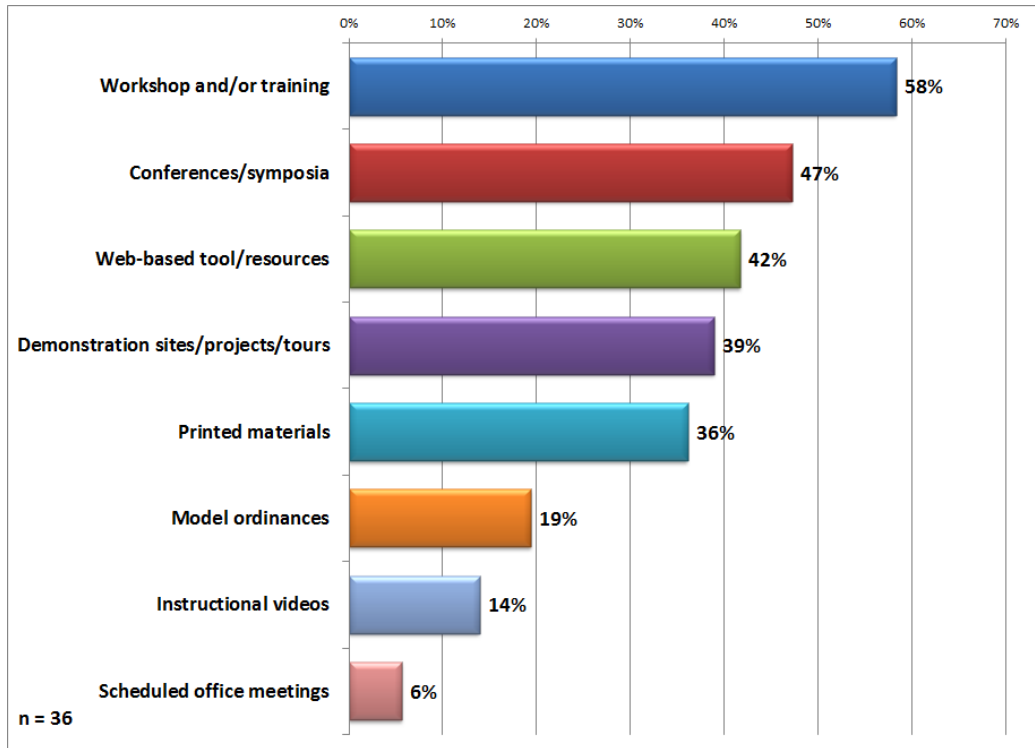


Figure 58: Regulators' preferred method of outreach for sustainable land use practices

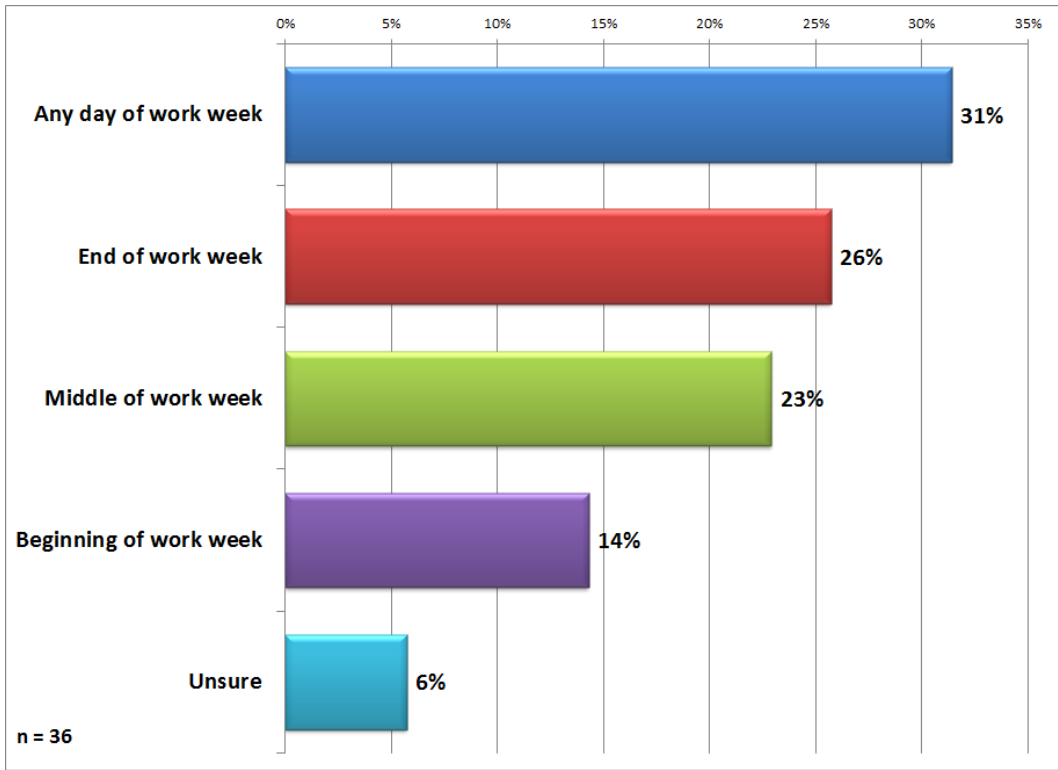


Figure 59: Preferred days to receive training

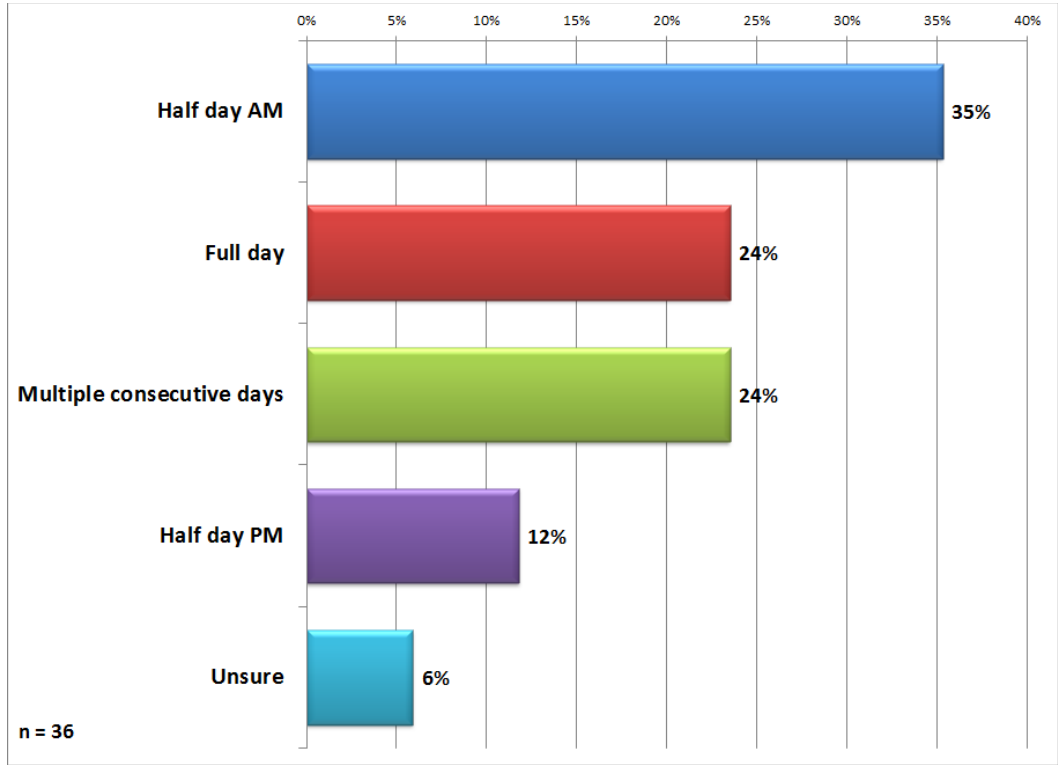
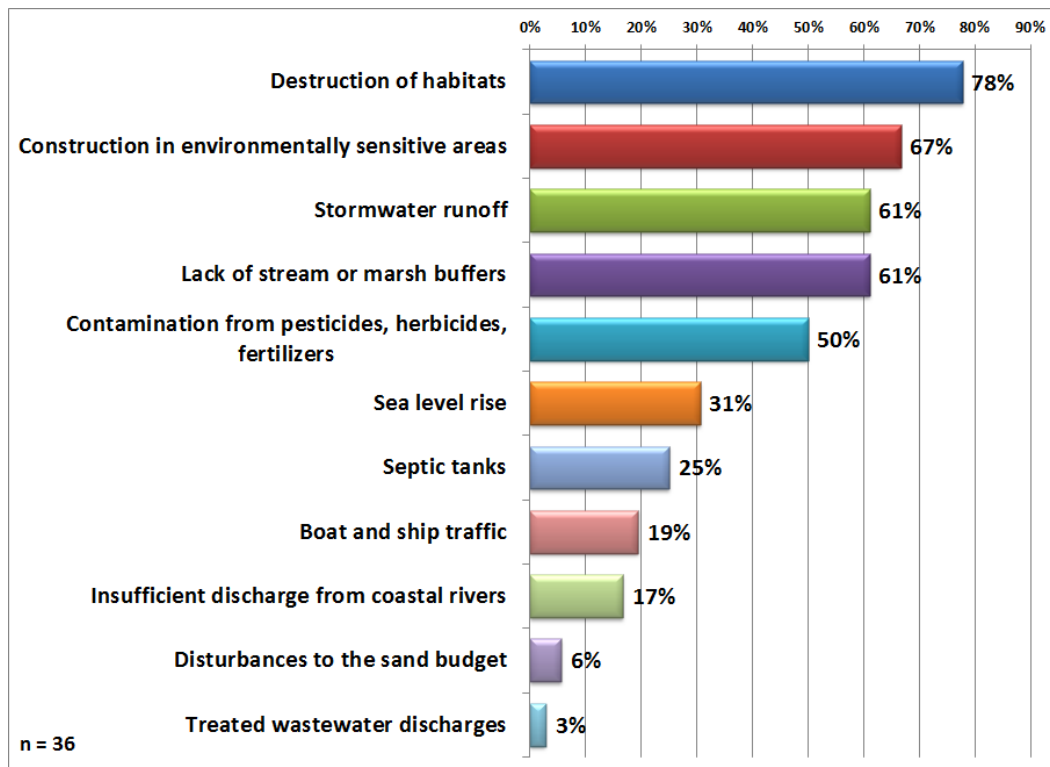


Figure 60: Preferred length of workshops and training

### ***Greatest impacts on coastal environments***

Regulators' identification of the top five issues with the greatest impact on coastal environments is generally consistent with views expressed in response to other survey questions, especially in the general survey and local government section satellite survey (Fig. 61). Specifically, more than three-quarters of government agency respondents identify habitat destruction as having the greatest impact. Fifty percent or more of the respondents also specify construction in environmentally sensitive areas, (67%), storm water runoff, (61%), lack of stream or marsh buffers, (61%), and contamination from pesticides, herbicides, and fertilizers (50%) as potentially posing significant adverse impacts. As with other survey sections and stakeholder groups, these responses are consistent with the general perception that activities associated with land use can have significant impacts on coastal waters.



**Figure 61: Issues regulators identify as having the greatest impact on the coastal environment**

### ***Educators' satellite survey***

Approximately one-half of survey respondents identified themselves as being educators and completed the satellite survey for educators. Again, not all satellite survey respondents answered each question. As shown in Figure 62, the 75 educators completing this portion of the survey were well distributed across the grade levels with a slightly higher participation by high school teachers. More than 80% of all respondents have been teaching for more than 10 years (Fig. 63).

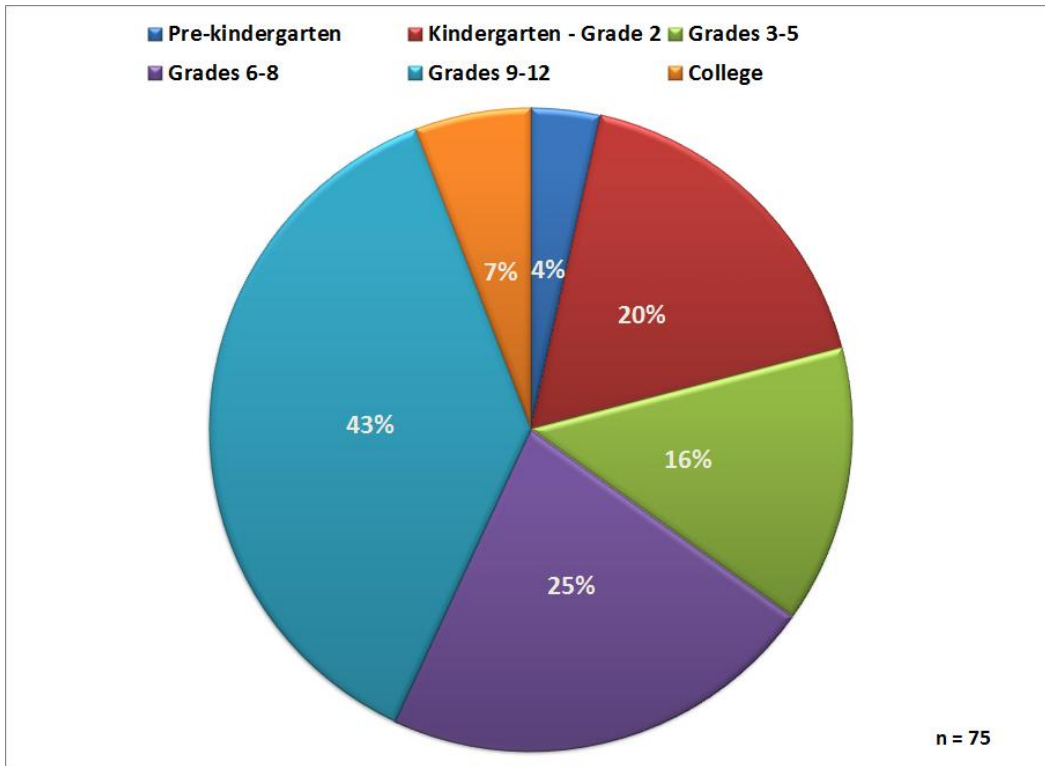


Figure 62: Grade levels taught by educators

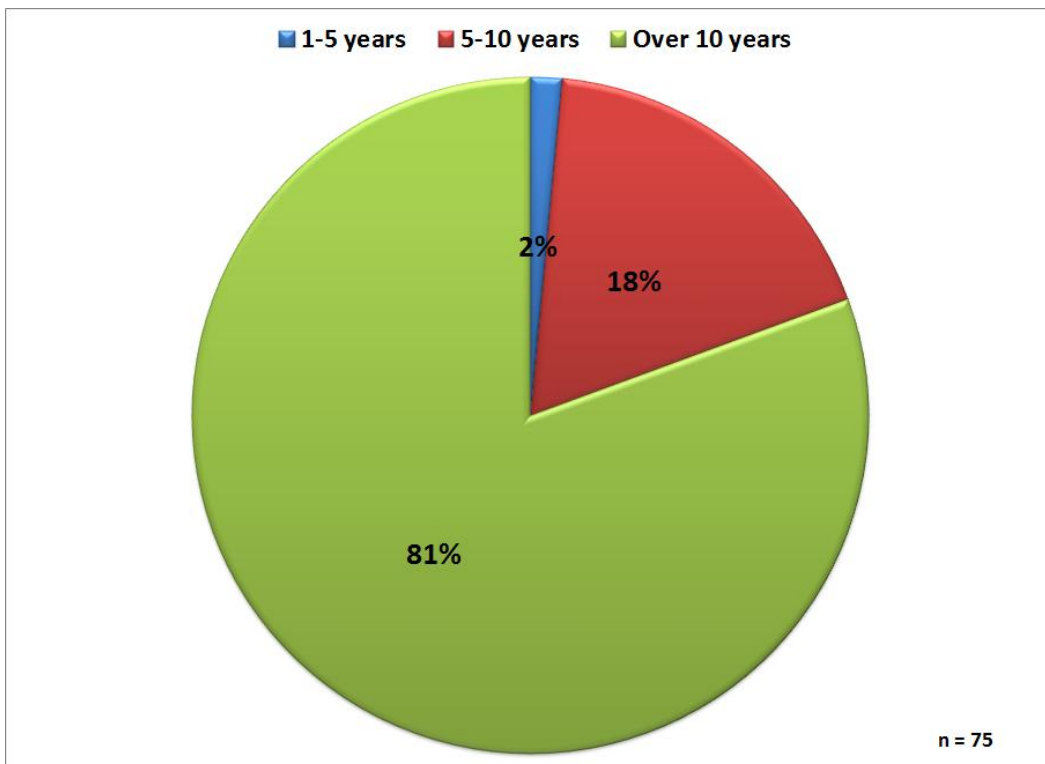


Figure 63: Years of teaching experience of survey respondents



### Subjects taught and their importance

More than one-half of the responding educators report providing instruction on ocean and coastal ecosystems and related environmental issues. However, more than one-third of the educators who indicate that they did not provide instruction in those areas or on the physical and chemical processes of the coast and ocean (Fig. 64). Recognizing that the title “educator” includes biology teachers, chemistry teachers, math teachers, geography teachers, *et cetera*, responses to this question may reflect the subjects normally taught by the educators who responded. About 90% of the respondents perceive providing instruction on ocean and coastal ecosystem and related environmental issues as being very important, fewer educators view instruction on the physical and chemical processes as very important (Fig. 65). In contrast to their strong support for providing instruction on these topic areas, only 63% use ocean-related curricula in their classrooms (Fig. 66). (One-half of the educators identify the lack of instructional time and the importance of other curriculum requirements as significant impediments to using ocean-related curriculum. Lack of funding was the third most-cited obstacle (Fig. 67)). It is noteworthy that lack of interest, lack of administrative support, and parental opposition are not generally posing significant challenges. Educators focus on three benefits of using ocean-related curricula: It generates awareness of environmental issues, generates interest in students, and provides tangible examples of concepts (Fig. 68). However, almost three-quarters of educators do not use National Ocean Literacy Principles in the classroom (Fig. 69).

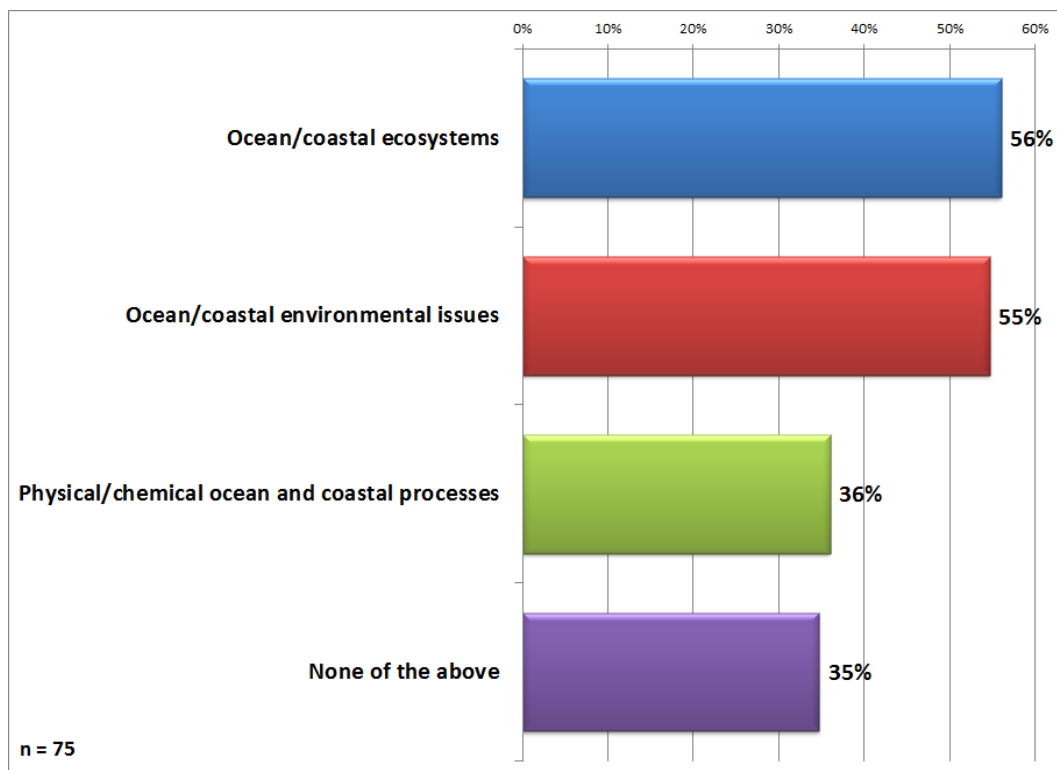


Figure 64: Coastal subjects taught in the classroom by survey respondents

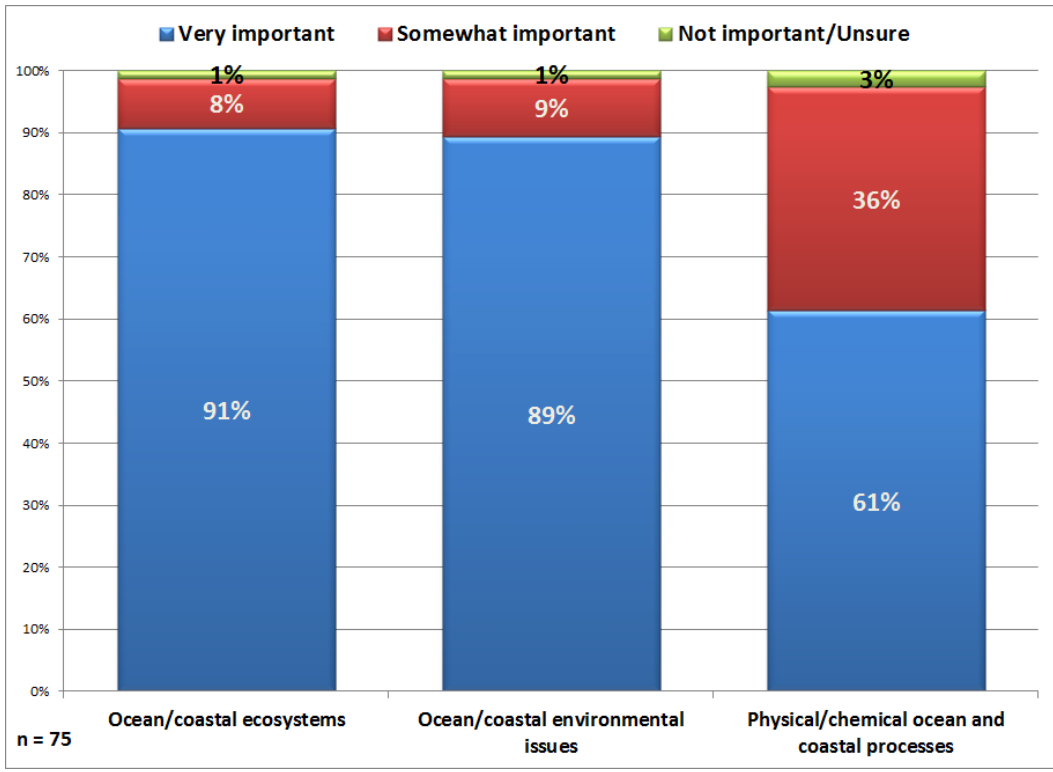


Figure 65: Importance of teaching specific coastal subjects

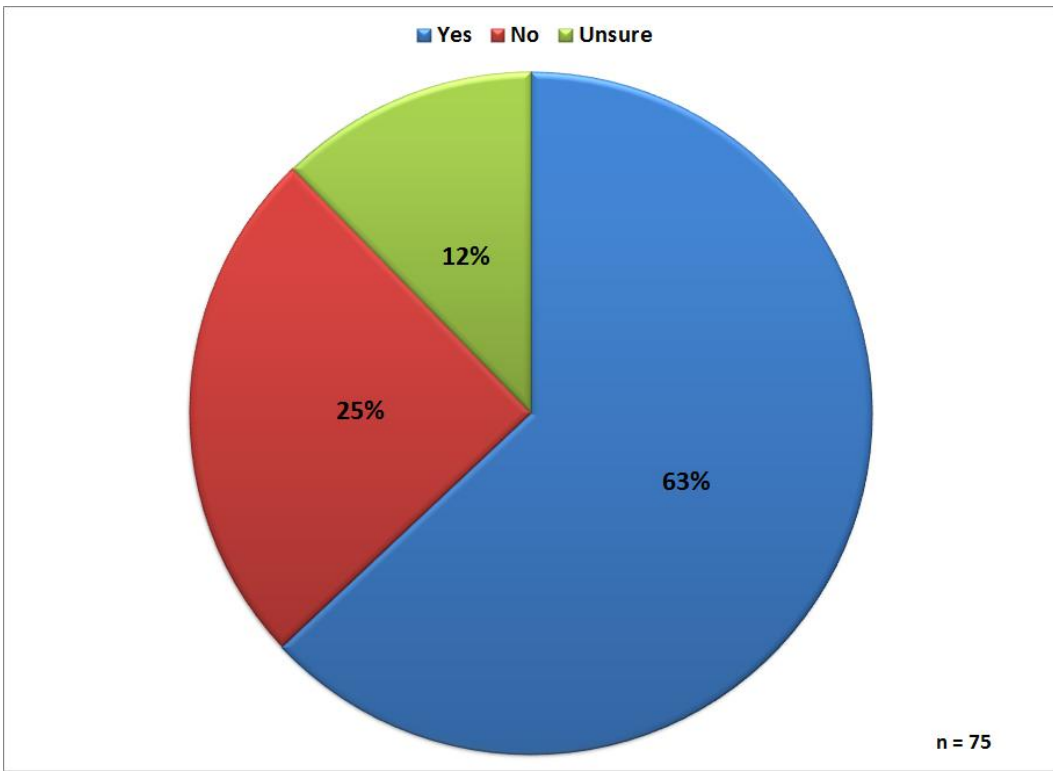


Figure 66: Percent of educators who use ocean/coastal education curricula in the classroom

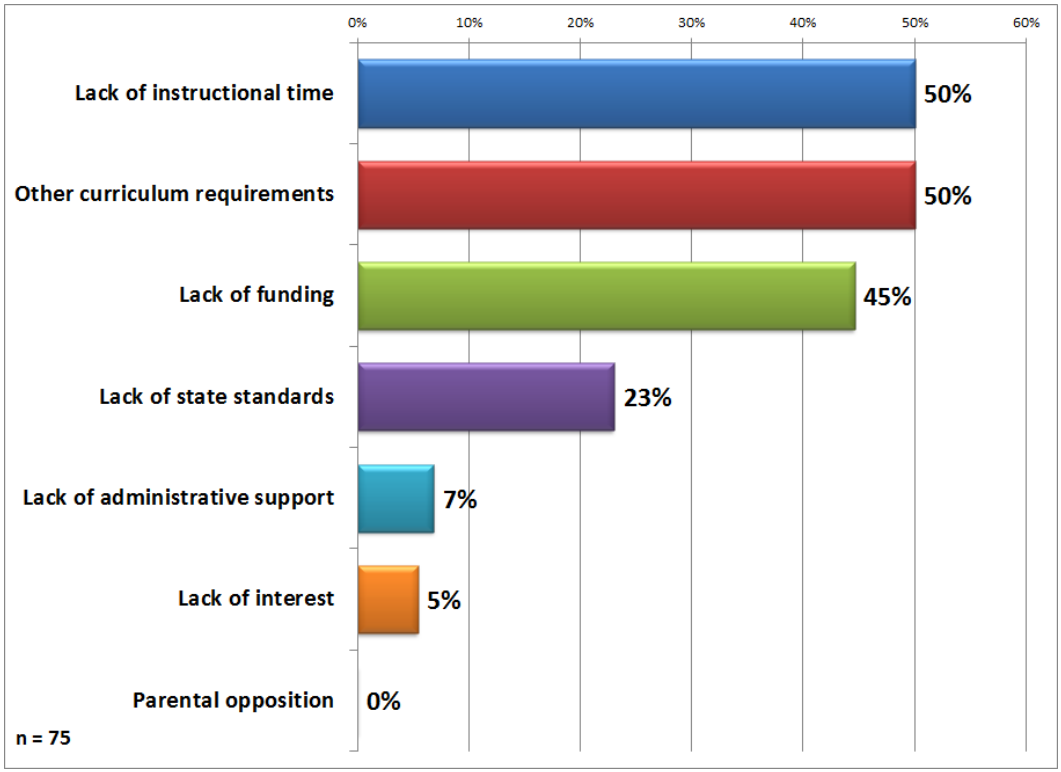


Figure 67: Challenges to using ocean/coastal curriculum in the classroom

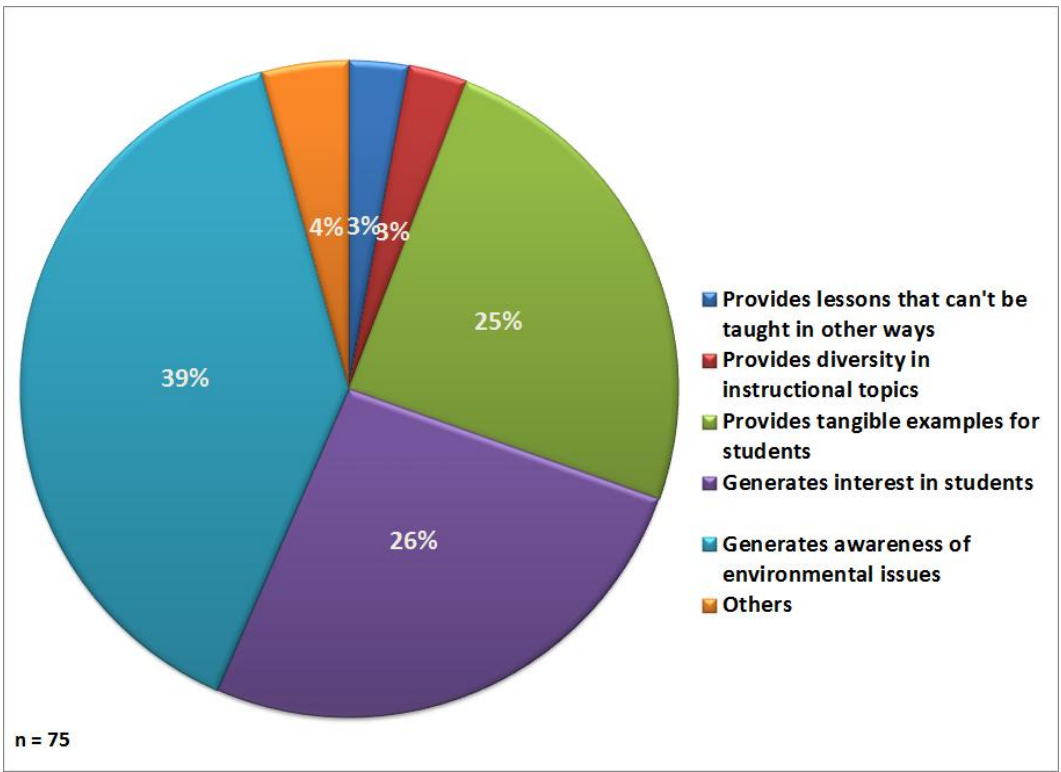
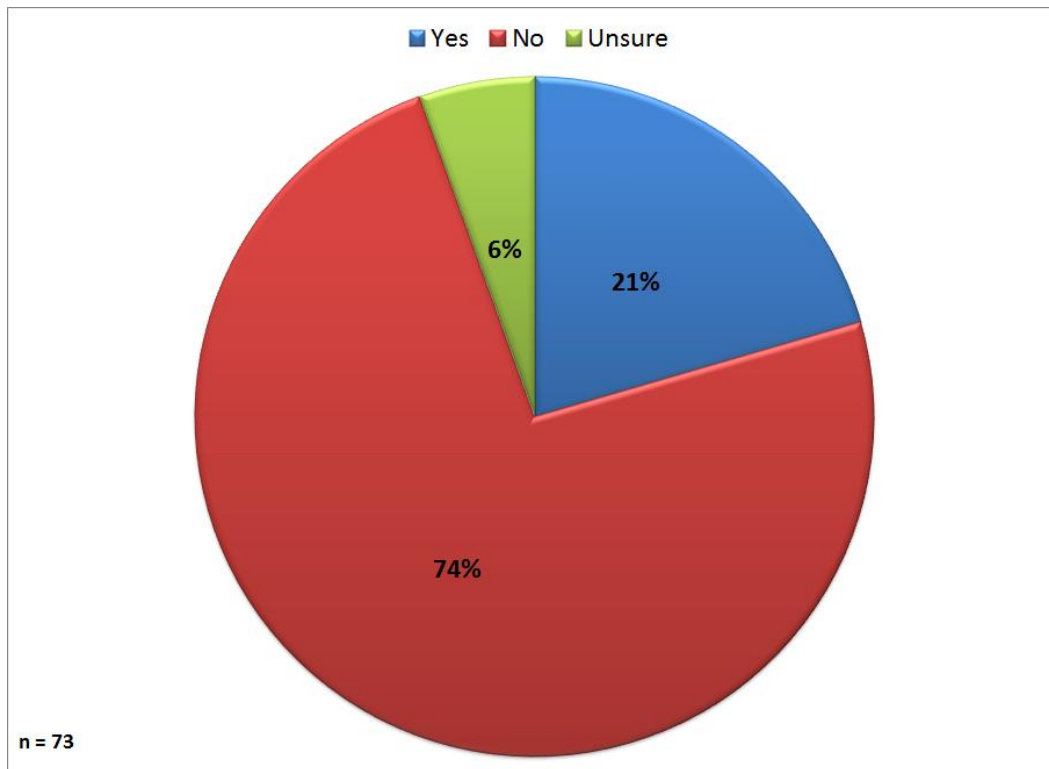


Figure 68: Perceived benefits to using ocean/coastal related curricula in the classroom



**Figure 69: Percent of respondents who use national ocean literacy principles in the classroom**

### *Coastal field trips, locations, and impediments*

Field trips often provide unique opportunities for hands-on learning and practical applications of instructional concepts. Eighty percent of responding educators have planned and/or participated in a field trip to a coastal area (Fig. 70). Respondents indicated the primary reasons for those educational trips are because they correlate with state or national standards or provide a field trip opportunity for students (Fig. 71). The most popular field trip destination is the Marine Education Center operated by MAREX and located on Skidaway Island, (65%), followed by the Skidaway Institute of Oceanography (Fig. 72). Less than one-quarter of the educators report visiting the Sapelo Island Marine Institute operated by UGA or the Sapelo Island National Estuarine Research Reserve (SINERR). Almost half of respondents (49%) visit sites because of the educational opportunities it affords students. Limitations imposed by the admission cost to an individual facility are identified as the least significant reason (Fig. 73). Other reasons for selecting a location include reputation and proximity.

Although 80% of educators have taken students on a field trip to the Georgia coast, more than three-quarters of respondents view lack of funding for field trips as the greatest planning challenge (Fig. 74). Lack of transportation was the second largest challenge (37%). Administrative support, lack of student interest, and parental opposition are noted as minor challenges.

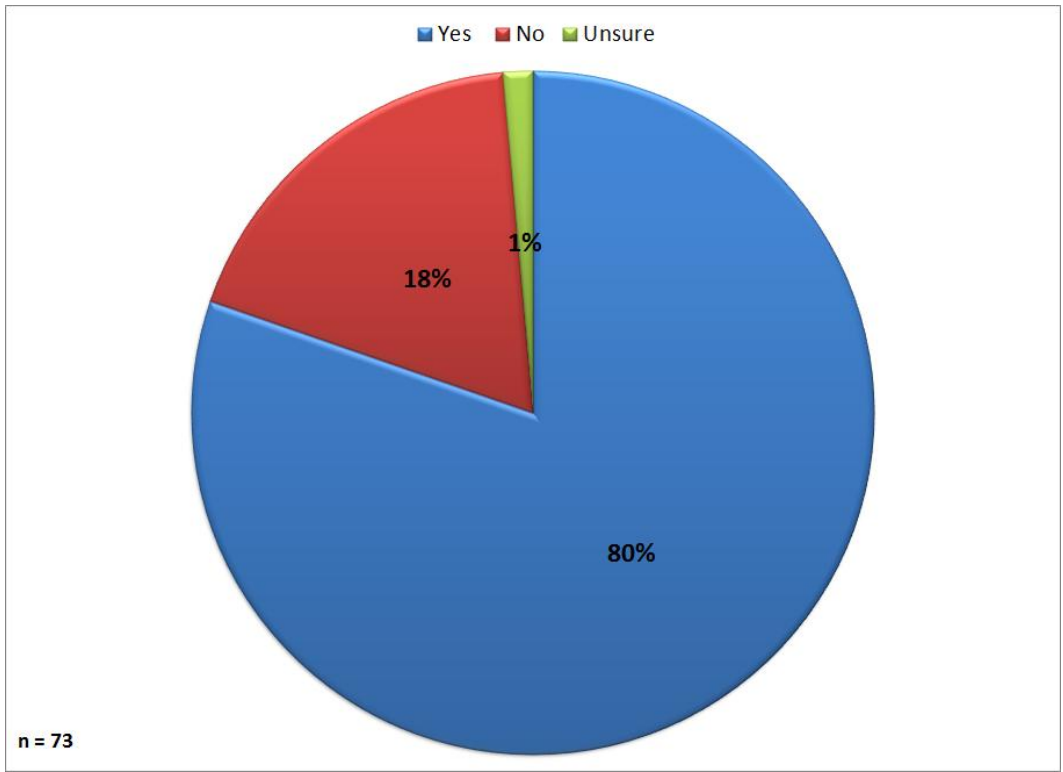


Figure 70: Percent of respondents who have participated in a coastal field trip

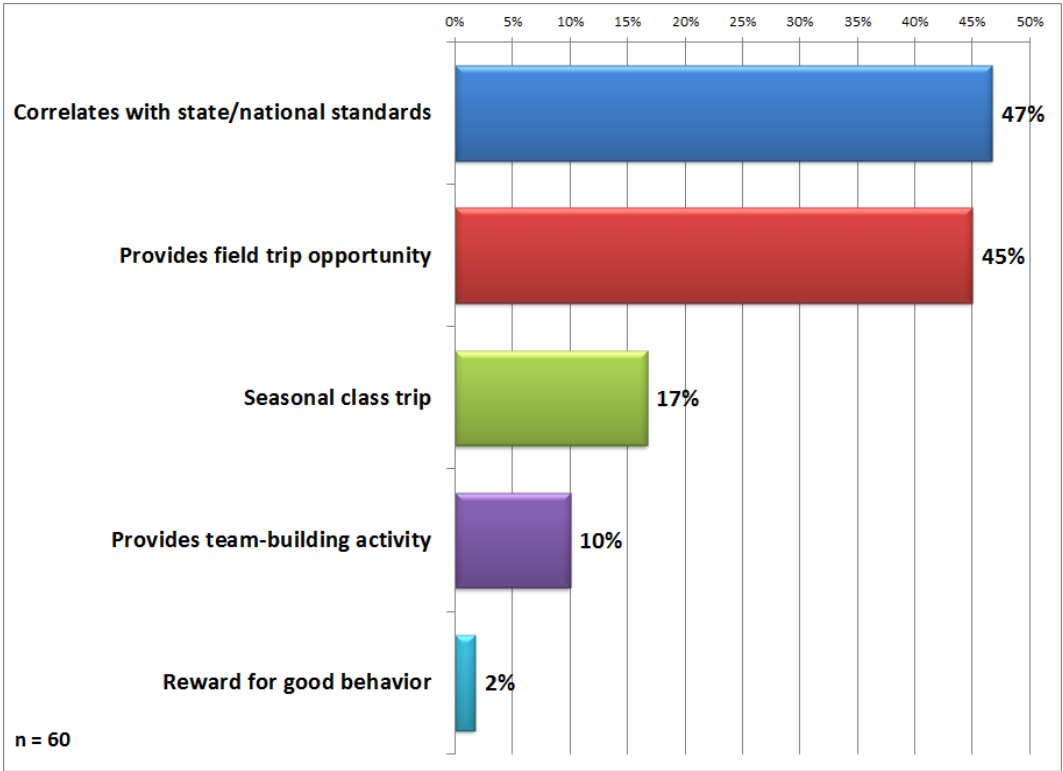


Figure 71: Reasons why educators took classes to the coast

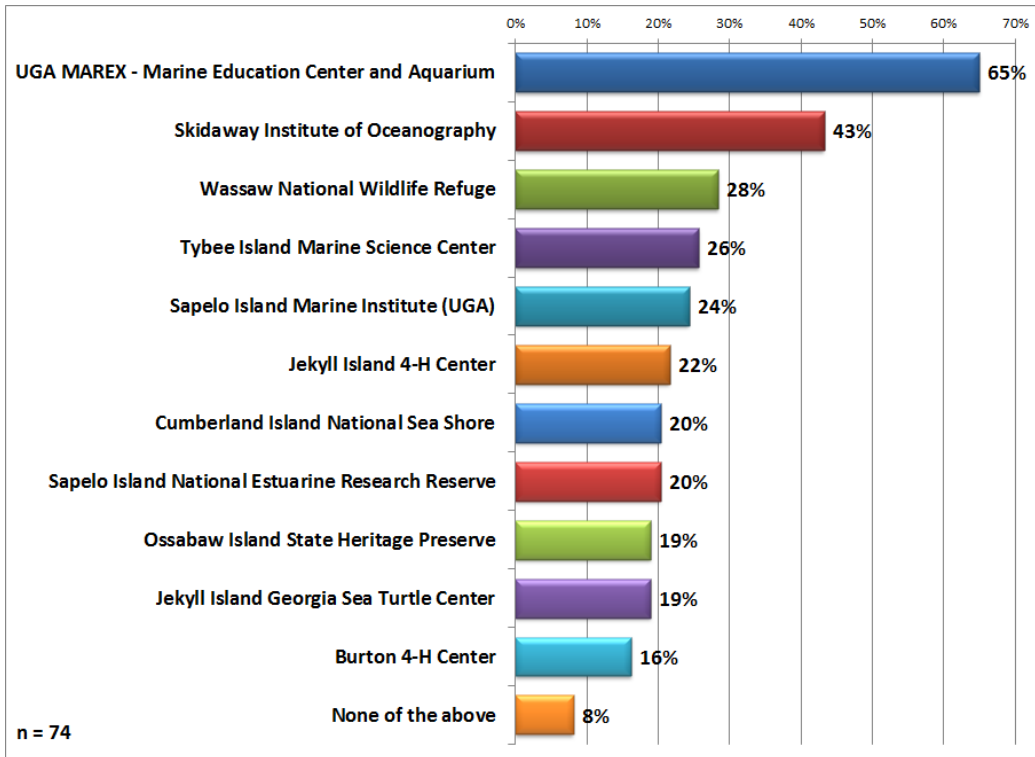


Figure 72: Destinations selected by educators for coastal field trips

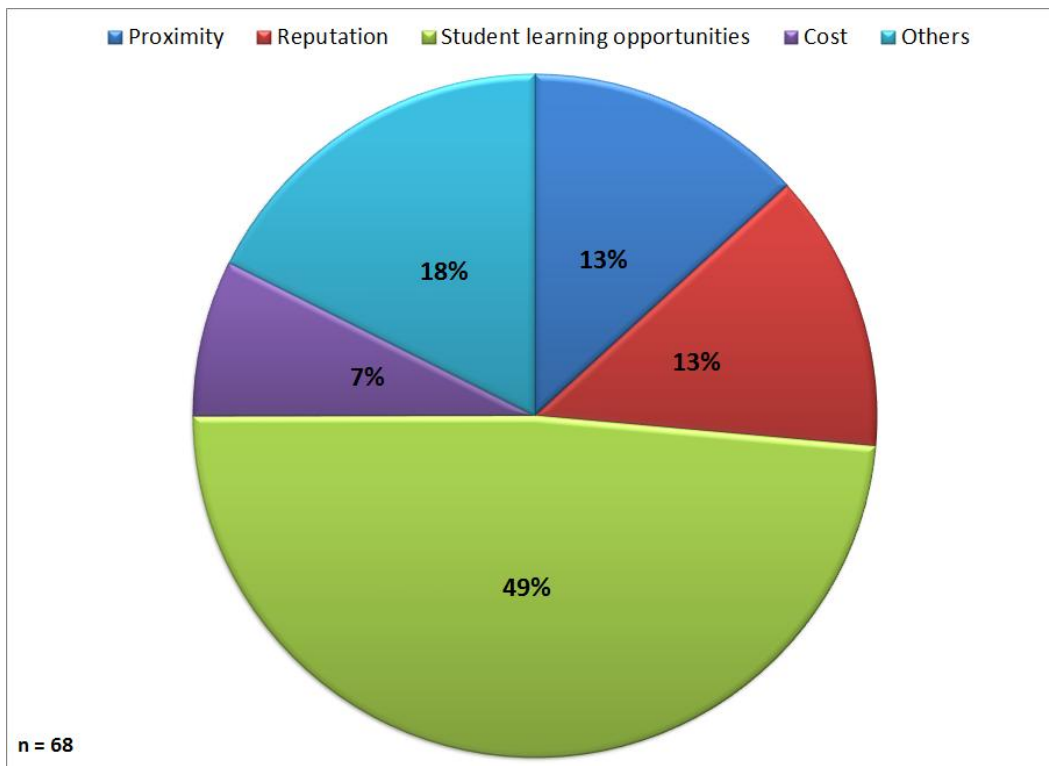
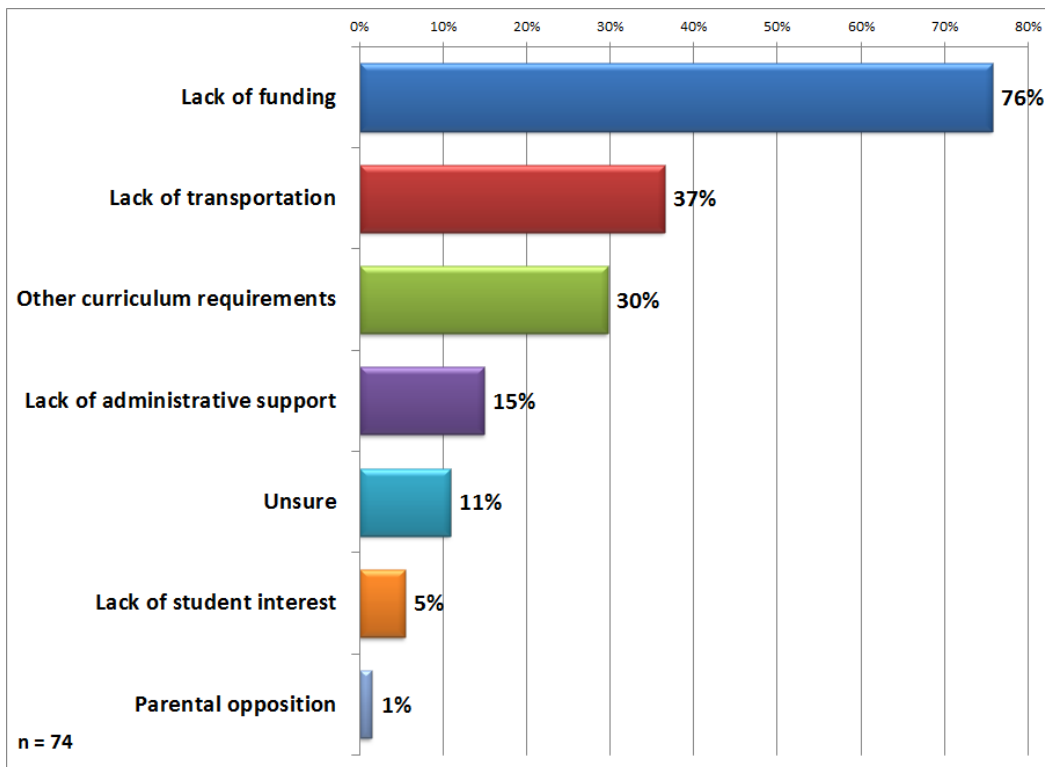


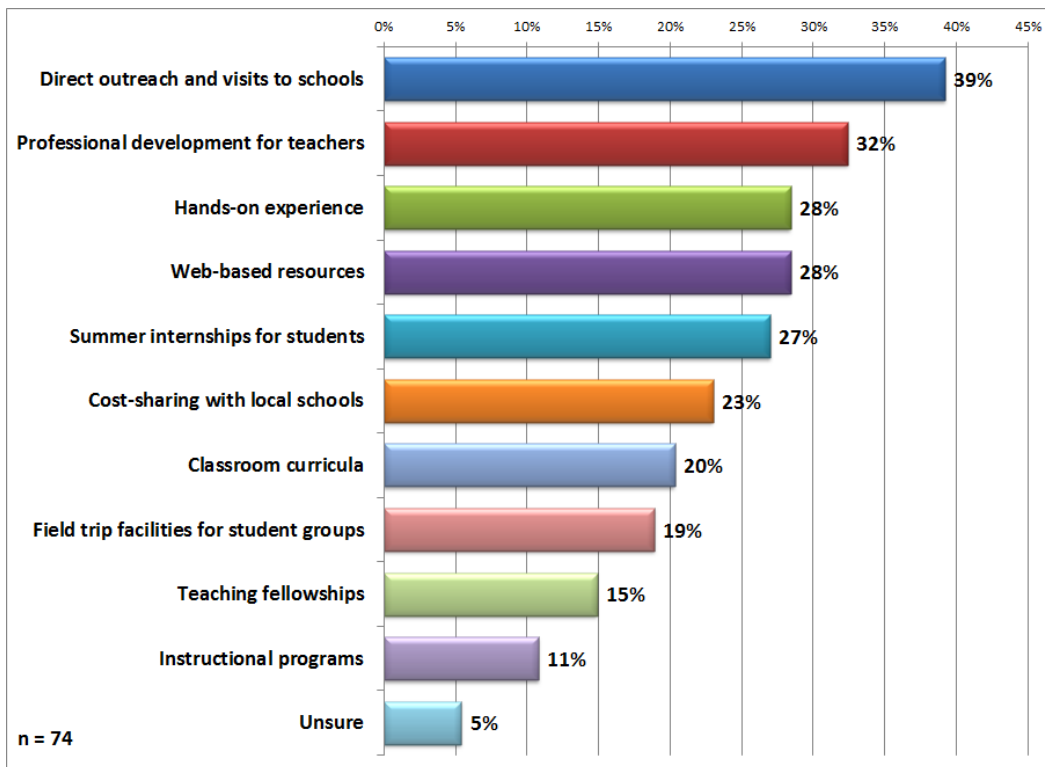
Figure 73: Reasons why field trip destinations were chosen by educators



**Figure 74: Greatest challenges for field trip planning by educators**

### *Role of partners in assisting educators*

Educators were asked how the four partners could improve or increase their role in ocean and coastal education. Survey respondents prefer direct outreach and visits to schools (Fig. 75). However, they also indicate that providing professional development opportunities for teachers would be helpful (32%), followed by provision of hands on experiences, web-based resources, and internships for students. About one-quarter of respondents perceive cost sharing with local schools (e.g. in getting students to field trip sites) as a way in which the partners could increase or improve their role in providing opportunities for coastal/ ocean science education. Figure 75 graph presents some interesting apparent contrasts. It seems to indicate good support for hand-on experiences provided by the four partners, but poor support for field trip facilities, despite responses to previous questions showing strong support for field trips. This can be interpreted as reflecting the fact that educators already have a number of field trip destinations available to them, but they would prefer more hands-on experiences separate from those field trip destinations. Similarly, the results indicate high support for direct visits to schools by the four partners, some support for classroom curricula, but almost no support for instructional programs. This is harder to interpret, and may imply that teachers are seeking scientific information from the four partners but wish to teach it to the students themselves. However, if this is the case, the lack of support for teaching fellowships; *i.e.* teachers doing a fellowship at an agency or facility, is contradictory. The results of this survey questions strongly suggest that there needs to be more follow-up discussions between educators and the four partners to clarify the needs of the former.



**Figure 75: Ways in which the four partnering agencies could assist educators**

### Market inventory and results of individual interviews

As previously mentioned, one of the reasons that the Coastal Management Program of CRD and SINERR participated in this survey was to conduct a “market inventory” of training, education, and outreach among scientific and regulatory experts in coastal Georgia. The purpose of this market inventory was to determine what type of training the targeted experts are providing to coastal stakeholders. Unfortunately, no more than eight individuals responded to the market inventory, and some questions were answered by only six respondents. This low number is undoubtedly the result of the survey design, which directed potential respondents to other satellite surveys, such as the government agency/regulators survey. Because only eight individuals responded to the market inventory satellite survey, results of that survey are not presented graphically. However, the raw tabular results are found in Appendix A.

An effort to conduct focus groups with stakeholders representing local governments and trainers was also unsuccessful due to a low response rate to e-mailed invitations. Consequently, telephone interviews were conducted with eight individuals. These interviews were designed to supplement the local government and market inventory satellite surveys, and are discussed in this section. It is unknown whether the eight individuals who were interviewed by phone are the same eight individuals who answered the market inventory satellite survey.



The eight individuals who were interviewed by phone represented a mix of developers, un-elected local government officials, and government agency regulators. The questions asked of local government officials and developers, and their pooled responses, are shown below.

1) *Where do you currently receive the information you need for making coastal resource management decisions?*

- CRD. Look to DNR and EPD before we try to make decisions.
- There is actually a plethora of resources out there. Our city manager uses city's consulting engineer, and planning staff, but also relies a lot on CRD. We occasionally consult trade journals and periodicals. Our city also has a professional relationship with large engineering firm, which built city wastewater facilities and other infrastructure.
- Typically consult local ordinances, CRD, and EPD. We use the Green Book (Field Manual for Erosion and Sediment Control in Georgia), the Blue Book (Georgia Stormwater Management Manual), the Coastal Stormwater Supplement to the Blue Book, and web sites on line.

2) *What can the DNR Coastal Resources Division and the GA Coastal Management Program specifically do to help your community?*

- The four partners do a pretty good job, especially in last few years, as they have embraced sustainable development in all their programs, looking at green infrastructure and effects of development on the environment. The problem is that they need to break out of their bubble; *i.e.* they communicate well between themselves but not so well with outsiders. The populace is not science-oriented, but the partners still have to take the message to them and make it meaningful, and tell the public what it is that affects them. This will hopefully make the public understand and agree with land use ordinances and planning.
- Specifically, I would love to know what type of activities CRD would allow, such as waterfront development. In order to have waterfront enhancement in our community, we need to attract more boaters but we also need to provide benefits, eg. anchoring instead of tying up to floating dock. We want to be able to have things like pump-out facilities, boat storage, docking facilities, and fueling stations. These will all require a larger waterfront presence, but the relevant environmental regulations are extremely heavy and CRD and EPD typically don't approve of these things. If those agencies could find a way to protect the river and allow us to do some sort of riverfront enhancement, that would be great.
- People at CRD and DNR are always as helpful as they can be. On a staff level there is a strong desire to help communities. This is an improvement over years past, when they were more inflexible about rules and regulations. Today's staff don't have that mindset, but they are hampered by regulations.
- Can't think of anything. The staff from both agencies does real good job with the resources they have, and do a good job engaging the Coastal Advisory Council.

- They help us out with so much already! Only additional thing I would ask for would be a uniform handout that could be passed out to citizens, developers, etc. so they can understand the basic issues of environmental management. Developers and the general public only see state regulatory interference, and they don't understand the real impact of what's happening along the coast by not protecting it.
- It is hard to figure out who does what among the four partners and others. It would be nice if there were a clearinghouse or a directory where you could go and find specific information about which agencies and groups do what. There are personal relationships among experts in the partnering agencies, but an outside can't figure those relationships out. So, the partners should work with some of the groups who are doing sustainable development. Make a resource guide for them, have a representative of the partners become a member of Savannah US GBC (Green Building Council), and attend "lunch and learn"-type talks. This would connect the partners with architects, who are a great entrée to developers lacking the science background. (Architects and engineers are already oriented towards sustainability). On the coast, there is a close knit group of folks doing research and such into sustainability, so they all know each other. So, get the relevant scientific and regulatory information all together and go out into the development community.

3) *What coastal resource information skills training does your agency/organization not currently receive that you would like to receive in the future?*

- Our problem is not a lack of training. But we have a small staff in our city. If training sessions or meetings are held anywhere outside of our county, it gets too costly. Maybe if the four partners could come to our town and do a training meeting there, our city staff would probably do it. Webinars are better than nothing, but being in room with trainer is best. More handouts from the partners would be helpful.
- Training sessions are lacking in keeping the policy makers informed. That is the toughest thing to do. If CRD, MAREX, or anyone could provide training for them, the skill set of policy makers having working knowledge of land management decisions and their impacts would be great.
- LIAs used to meet quarterly in Brunswick and talk about what's working and what's not working, and where state could help, but budgets and personnel cuts have stopped that. Those meetings worked really well due to broad representation from the Army Corps, MAREX, EPD, local government folks.
- Communication has gotten better between agencies, but still have silos. Until you learn who does what, it can be confusing and frustrating. Have to check with different folks to get the correct answer.

- It would be good to know what the partners do outside of their home-base counties; *i.e.*, basic level, fyi-type outreach, like SINERR. We have no idea what they can or can't do for our county.

4) *Lack of funding for staff training and management practices implementation seems to be a common issue. CRD has a grant program and does a lot to get local governments to apply for projects, but participation remains low. For your community, is it lack of matching funds from the state or federal governments, a lack of staff to write a grant, or the need for Technical Assistance from CRD to figure out an appropriate project?*

- Tapping into the CRD grant program is not a problem for us. We have gotten CIG grants. If someone isn't taking advantage of that program, it's probably due to a lack of funding for grant writers. Everyone should have grant writers. It could also possibly be a lack of knowledge about the CIG program.
- We have applied twice, but haven't recently identified a project that fits within intent of CIG program.
- Lack of funding for printed materials is a problem, such as field manuals for the Green Book, and many local entities can't afford to print out materials that are available online. Training, securing locations for training, and getting funds to do these is a challenge. However, we have also tried several times to do level 1A and 1B E&S Inspector Certification, but no one shows up to take it up due to local budgets being so tight for training and travel. As a result, we are trying things like GoToMeeting and webinars. I'm surprised EPD and DNR haven't done more of that. Digital meetings are better than nothing. It also puts people in contact with each other. If you got the right people involved, it would work well. National Weather Service in JAX does webinars and it is very effective.

5) *Which audience in your community do you think has the highest need for outreach and/or training on environmental management issues?*

- Elected officials, because they rotate in and out. For example, some of our recent elected officials adamantly opposed any regulations for the river. They would not allow any language in our comprehensive plan saying that river was impacted. However, a new group of councilmen is more open to regulations, but they need to learn about them. Council and mayors and commissioners in general could use all the training they can get but have to get them to the table first. If it is not in their own city they just won't go. Lack of time for travel is always a hassle.
- There is probably a lot of training needed by elected folks and the planning commission. Our professional staff has more access to it, but the elected folks do not. They are the policy makers that need to be fully aware, and have a real strong understanding of the

consequences of their decisions regarding land use and development. Elected officials and planning and zoning folks have required training when they start, but the environmental issues not stressed. Other topics are important but so are environmental issues.

- One of the top groups [that need training] would be realtors, brokers, and real estate companies because they are misleading or not fully informing buyers (for example) of large properties that buyer wants to subdivide but can't. Next would be developers, local contractors, especially smaller guys...the guys with a backhoe, and a dump truck.
- There needs to be a standard common knowledge between DNR, GA Forestry Commission, LIAs, and EPD so they are all on same page regarding buffers. This was tried before, but it fizzled. There are so many buffer and land clearing exemptions for silvaculture. However, the cleared and developed property is worth more than the timber, so loggers have been coming through and clear cutting, but doing so through wetlands and buffers. GA Forestry Commission could enforce that, but they don't. Timber companies know this, and are in and out as fast as they can.
- Developers: some will be completely resistant to environmental outreach, and others who listen because of regulations, but others who do it because they are genuinely interested. I can't think of a good way to reach them. It may be more effective going through local government and encourage local government to do ordinances and environmental impact fees. Anything that can be incentivized for them would help. They often respond well to things like conservation easements and other incentives, but make sure that whatever is messaged to them is translated into dollars...for example the may have "less of a gross return, but more a net return".
- In rural counties, the developers and builders are often related to local gov't officials, so it will be the local government folks who need the higher level of understanding. Many of them don't understand the why of the regulation, just the fact that it is an onerous government regulation. They need to understand the long term downfall of water quality, land use, marine environment, etc. The best outreach would be to be to tie land use [and its impacts] into end users such as the fishing industry, or shellfish production. They can see the impacts, and someone like Charlie Philips has higher level of credibility to speak to local government folks about it.
- Insurance companies: a driving factor for any development is the ability to get funding, contingent upon it being insurable. That would be a good opportunity for outreach (to insurance industry). If you could get insurance companies to buy in, or some recognition of good construction, awarded with a "seal of approval" of some kind, the financial reward could be a reduction in premiums or some other incentive. Currently, insurers see no differentiating factors between properties. Also, there should be support among insurers for spending resources for restoring natural systems that reduce storm surge and other land use impacts.

The questions asked of government agency regulators and coastal researchers, and their pooled responses, are shown below.

1) *What is your organization's principal mission?*

- Conserve land and water through a variety of initiatives both public and private. Engage in advocacy, look for funding to buy land or working with private folks on conservation easements. Also work on sustainability encouraging best use of land while protecting environment.
- Research into marine sciences, estuaries; have mandate to do research and some teaching.
- Address the impacts of nonpoint source pollution on coastal water quality, and provide mechanisms to improve coordination among state agencies, local govt, and appointed officials, permitting, and enforcement. Supposed to bring in other agencies WRD, EPD, State public health and safety, including federal agencies...any activity that affects coastal water quality.
- Assist local governments with technical assistance and financing.

2) *Who is your target audience for training and outreach?*

- Government officials, elected officials, and private landowners, to make sure they know about options that are available to them to conserve land. We have a broad audience but we can make our message specific to the audience.
- Anyone who's interested. We have a speakers' bureau to handle requests. We do a lot of outreach to civic groups and K12 groups, a lot of teacher training in conjunction with MAREX, and of course outreach to other scientists in the region.
- Federal, state, local governments, NGOs, public, and landowners in coastal region
- Local governments. We provide information to citizens also, and some private companies, especially regarding solid waste. From finance side, we finance local community development and federal funding for low income housing.

3) *What are your barriers in providing more outreach?*

- Funding is always a barrier, and we struggle with how to reach people effectively (e.g. e-mail, postcards, etc.). Lack of communication between agencies and groups. Given the funding predicament, we see more agencies and groups becoming territorial. It should be people joining forces.

- No one pays us to do outreach. In other words, we have no funding for outreach unless it is in one of our grants specifically. We don't have a problem overlapping with the four partners, but that's because we have a good relationship with them.
- Redundancy, lack of cooperation and coordination between divisions in DNR and other state agencies is a problem. This is not good as our program is designed more widely, but at times we get no agency support. Multiple agency "bosses", fragmentation of offices, effort, and cooperation are barriers.
- Not having the right mechanism to communicate about projects and finding ways to work together and leveraging those scarce funds. Not a good understanding of where agency missions cross and what they are. We never take the time to carve out specific niches where they absolutely overlap.
- Funding. Staffing. We are now trying to broker relationships with NGOs that we can assist and who can assist us. All of government and how we leverage funding will be important. For example, we are working with EPD who often needs help from us to help communities and permittees get into compliance with environmental regulations.

4) *Do you work closely with any of the four agency partners?*

- We work very closely with CRD.
- We work with all of them. Each program has their own peculiarities. Sea Grant is not as eager to work with people, same with SINERR. They make up their minds as what they want to do and go and do it. Not as collaborative. DNR is very eager to identify and discuss areas of collaboration. MAREX is all about finding partners. MAREX has weak funding, which hampers them.
- We should be working more closely with CZM. Have worked with Coastal Training Program at SINERR. MAREX is a strong strong partner, especially the Brunswick office.
- Yes, with the Coastal Management Program of CRD. We currently have a Coastal Incentive Grant starting in. An education and marketing plan is part of the CIG. A problem in working with the partners (and other agencies) is resistance from everyone to put their territorial feelings aside. It is hard to get feedback from partners. This is very frustrating, and gets worse as pools of funding shrink. But it doesn't have to be this way.

5) *If any, what coastal resource information topics/skills training does your agency/organization not currently utilize that you would like to offer in your coastal resource training program?*

- Not much. Maybe policy updates and such. Not so much weedy technical details.
- Additional outreach would require a change in mission.
- GIS, Negotiation, Green Infrastructure, Various land use topics and water quality and wildlife. We need tie in to training program of Vinson Institute for all local government folks.
- A more holistic approach is needed.

- We mainly cannot offer enough of the training programs we have because of funding. For example, a major effort targeting newly elected officials to give them an overall picture of water resources to provide guidance on funding and regulations will be discontinued because of funding cuts. We also provide ordinance and policy reviews to local governments to see if they're in line with existing regulations, conservation requirements, etc., but this program has been cut because of funding.

## OPPORTUNITIES FOR ADDITIONAL TRAINING

A key purpose of this survey is to identify areas in which coastal stakeholders perceive a need for additional training and education from the four partners. Many of the individual issues considered in this survey may serve as training opportunities, but respondents have been generally consistent in identifying the topics and areas that are most important to them and in which they could benefit from additional education and training.

Broadly speaking, respondents are most concerned about maintaining the quality of coastal waters, including groundwater, wetlands, and estuaries. Issues that affect coastal water quality also provide opportunities for additional training. Consistently, survey respondents seem to demonstrate less interest in economic-related issues, which may reflect the low participation of survey respondents representing business interests, the survey's stated focus on environmental issues, or that economic issues do not lend themselves to training, education, and outreach.

This survey contained several questions to elicit opinions on topics where the four partnering agencies should consider providing additional education and training activities. To that end, participants were asked to identify issues they perceive as very important for the future of coastal environmental management; issues on which they received insufficient training in the past year; and issues on which they believe that additional training could be beneficial. As with the list of 35 issues rated as very important, matters relating to water resources protection dominate stakeholder responses about training, whether the questions involved insufficient training opportunities or issues where responders could benefit from future training.

To identify priorities for the four partners to consider in providing additional education and training opportunities, a correlation was made between the results in the following three areas of this survey: issues rated as very important to the future of coastal resources management in the general survey (Fig. 2), matters for which respondents indicate they did not receive enough training during the past year (Fig. 16) *and* issues in which they perceive a lot of benefit could result from additional education and training (Fig. 9). Issues occurring in the top one-third of ordered responses in each figure are identified as "first tier" training opportunities or needs.

First tier training opportunities include issues associated with:

- Wetlands and waterways;

- Coastal and estuarine ecosystems;
- Marsh protection;
- Environmental aspects of land use; and
- Non-point source pollution.

Some issues occur in the top one-third of two areas (*i.e.* an issue of future importance, an issue in which the respondents did receive not enough recent training, or an issue in which they would benefit from more training). Those issues which were prioritized in two of those areas are identified as “second tier” potential education and training opportunities.

Second tier training opportunities include issues associated with:

- Freshwater availability
- Water conservation
- Groundwater contamination
- Saltwater intrusion

First tier opportunities can be further consolidated into three categories: land use, the impacts of land use on water quality, and the impact of water quality on ecosystems. Second tier opportunities all fall under the category of water supply. Thus, the four partnering agencies may find significant stakeholder interest in training opportunities focused on land use practices that minimize impact to coastal surface water quality, and secondarily on water supply.

In identifying specific issues where little interest in additional training appears to exist, a similar method was used. These issues include:

- Citizen monitoring programs
- Boat and marina management
- Private docks and piers

Issues that survey respondents considered to be of low future importance with a low desire for additional training were:

- Commercial and recreational fisheries
- Sea level rise
- Increased seasonal flooding

Additionally, at least 60% of respondents indicated that beach and shoreline erosion, land use and zoning, dune protection, and beach erosion were topics for which there was little need for additional training. These topics fell within the lowest third of issues rated as “very important” future topics.

Issues that that respondents felt were of comparatively low future importance (ranked within the lowest on-third of responses) and for which they did not indicate insufficient training in the previous year were:

- Coastal flooding hazards
- Beach and shoreline erosion



- Increased seasonal flooding

## CHALLENGES FACED BY THE FOUR PARTNERING AGENCIES

Awareness of the principal environmental issues is high among survey respondents. Although they expressed a desire for additional training and education in some areas, the four partners face some significant challenges in being recognized as authoritative sources of information and accepted by the stakeholders as appropriate providers of training and education programs.

1. Although stakeholders are most familiar with DNR, awareness of the individual environmental programs managed by DNR is low. DNR should increase public awareness of these programs and their benefits to coastal residents and communities.
2. The educational facilities on Skidaway Island are well known and very well visited. However, general knowledge about the University of Georgia's role in those facilities and other UGA coastal resources-related activities and expertise is very low. Those responding to the survey identify scientific expertise as the most critical reason they contact organizations for assistance. Since faculty and staff at the Georgia Sea Grant Program and MAREX possess a wide range of expertise, these two partners should prioritize activities that increase their visibility in the coastal counties and thus increase public awareness of their capabilities.
3. Similarly, SINERR also has a low level of recognition among survey respondents. Considering its mission and the importance that those responding ascribe to estuarine ecosystems and protection of waterways, SINERR apparently has an opportunity to increase its visibility and further its objectives of effectively administering the reserve, restoring the integrity of the natural processes of the estuary, and increasing awareness of estuarine systems.
4. Shrinking state and federal budgets affect the ability of all agencies to perform their duties. Additionally, educators, local government staff, and government agency survey respondents identify lack of funding and cost concerns as being significant challenges to implementing a wide range of technologies, activities, and management practices. Rather than compete for shrinking resources, the four partners should attempt to optimize and share those resources by collaborating whenever and wherever possible. Therefore, each agency should place a high priority on identifying potential areas for cooperation, not just to avoid stakeholder confusion or program overlap, but to maximize the capacity of all four partners to protect the coastal environment and its ecosystems.

## Appendix A: Tabular results of market inventory survey

<b>Which of the following best describes your organization?</b>					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid					
	Non-profit organization	8	5.1	100	100
Missing	System	148	94.9		
Total		156	100		
<b>What is the primary mission of your organization?</b>					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Outreach and education	1	0.6	12.5	12.5
	Advocacy/lobbying	2	1.3	25	37.5
	Conservation of land/habitat	4	2.6	50	87.5
	None of the above	1	0.6	12.5	100
	Total	8	5.1	100	
Missing	System	148	94.9		
Total		156	100		

<b>What are your organization's specific areas of expertise regarding coastal resource training or information? (Select all that apply)</b>					
<i>Biology, botany, ecology, natural sciences</i>					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Unchecked	5	3.2	62.5	62.5
	Checked	3	1.9	37.5	100
	Total	8	5.1	100	
Missing	System	148	94.9		
Total		156	100		
<i>Resource management/policies</i>					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Unchecked	3	1.9	37.5	37.5
	Checked	5	3.2	62.5	100
	Total	8	5.1	100	
Missing	System	148	94.9		

Total		156	100		
<i>Data acquisition/research</i>					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Unchecked	7	4.5	87.5	87.5
	Checked	1	0.6	12.5	100
	Total	8	5.1	100	
Missing	System	148	94.9		
Total		156	100		
<i>Water quality</i>					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Unchecked	5	3.2	62.5	62.5
	Checked	3	1.9	37.5	100
	Total	8	5.1	100	
Missing	System	148	94.9		
Total		156	100		
<i>Planning</i>					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Unchecked	7	4.5	87.5	87.5
	Checked	1	0.6	12.5	100
	Total	8	5.1	100	
Missing	System	148	94.9		
Total		156	100		
<i>Land and water conservation</i>					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Unchecked	3	1.9	37.5	37.5
	Checked	5	3.2	62.5	100
	Total	8	5.1	100	
Missing	System	148	94.9		
Total		156	100		
<i>Training/education</i>					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Unchecked	7	4.5	87.5	87.5
	Checked	1	0.6	12.5	100
	Total	8	5.1	100	
Missing	System	148	94.9		
Total		156	100		
<i>Geological sciences</i>					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Unchecked	8	5.1	100	100

Missing	System	148	94.9		
Total		156	100		
<i>Hydrology</i>					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Unchecked	8	5.1	100	100
Missing	System	148	94.9		
Total		156	100		
<i>Beaches</i>					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Unchecked	8	5.1	100	100
Missing	System	148	94.9		
Total		156	100		
<i>Other (please specify)</i>					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Unchecked	8	5.1	100	100
Missing	System	148	94.9		
Total		156	100		
<i>Other (please specify)</i>					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		156	100	100	100

<b>What is your organization's total staff size?</b>					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	16 or more people	2	1.3	25	25
	11-15 people	1	0.6	12.5	37.5
	4 people	1	0.6	12.5	50
	3 people	2	1.3	25	75
	2 people	1	0.6	12.5	87.5
	1 person	1	0.6	12.5	100
	Total	8	5.1	100	
Missing	System	148	94.9		
Total		156	100		

<b>Do you participate in coastal resource training?</b>					
		Frequency	Percent	Valid	Cumulative

				Percent	Percent
Valid	Yes	7	4.5	87.5	87.5
	No	1	0.6	12.5	100
	Total	8	5.1	100	
Missing	System	148	94.9		
Total		156	100		

<b>Relative to your agency/organization's mission, how important is providing coastal resource training or information?</b>					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very important	4	2.6	57.1	57.1
	Somewhat important	3	1.9	42.9	100.0
	Total	7	4.5	100.0	100.0
Missing	System	149	95.5		
Total		156	100		

<b>How many FTEs (full-time staff positions) does your organization dedicate specifically to coastal resource training or information?</b>					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	3 FTEs	1	0.6	14.3	14.3
	2 FTEs	1	0.6	14.3	28.6
	1 FTE	2	1.3	28.6	57.1
	None	3	1.9	42.9	100
	Total	7	4.5	100	
Missing	System	149	95.5		
Total		156	100		

<b>What specific outcomes is your agency/organization trying to achieve with training or information sessions? (Select all that apply)</b>					
<i>Educate public about coastal resources</i>					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Unchecked	3	1.9	42.9	42.9
	Checked	4	2.6	57.1	100
	Total	7	4.5	100	

Missing	System	149	95.5		
Total		156	100		
<i>Influence public opinion/advocacy/lobbying</i>					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Checked	7	4.5	100	100
Missing	System	149	95.5		
Total		156	100		
<i>Technical assistance</i>					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Unchecked	4	2.6	57.1	57.1
	Checked	3	1.9	42.9	100
	Total	7	4.5	100	
Missing	System	149	95.5		
Total		156	100		
<i>Work for better coastal resources management</i>					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Unchecked	2	1.3	28.6	28.6
	Checked	5	3.2	71.4	100
	Total	7	4.5	100	
Missing	System	149	95.5		
Total		156	100		
<i>Facilitate cooperation among entities, including municipalities and research organizations</i>					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Unchecked	3	1.9	42.9	42.9
	Checked	4	2.6	57.1	100
	Total	7	4.5	100	
Missing	System	149	95.5		
Total		156	100		
<i>Educate public officials about coastal resources</i>					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Unchecked	3	1.9	42.9	42.9
	Checked	4	2.6	57.1	100
	Total	7	4.5	100	
Missing	System	149	95.5		
Total		156	100		
<i>Species/habitat protection/restoration/land conservation</i>					
		Frequency	Percent	Valid Percent	Cumulative Percent

Valid	Unchecked	3	1.9	42.9	42.9
	Checked	4	2.6	57.1	100
	Total	7	4.5	100	
Missing	System	149	95.5		
Total		156	100		
<i>Other (please specify)</i>					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Unchecked	6	3.8	85.7	85.7
	Checked	1	0.6	14.3	100
	Total	7	4.5	100	
Missing	System	149	95.5		
Total		156	100		
<i>Other (please specify)</i>					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		155	99.4	99.4	99.4
	systemic aspects of policy	1	0.6	0.6	100
	Total	156	100	100	

<b>How many different coastal resource training programs does your organization, agency department, or division conduct?</b>					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	6 or more programs	1	0.6	16.7	16.7
	3 programs	2	1.3	33.3	50
	2 programs	1	0.6	16.7	66.7
	1 program	2	1.3	33.3	100
	Total	6	3.8	100	
Missing	System	150	96.2		
Total		156	100		
<b>How many coastal resource training programs or information sessions did your organization, agency department, or division conduct in the past year?</b>					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	11 or more programs / sessions	2	1.3	28.6	28.6
	6 to 10 programs / sessions	1	0.6	14.3	42.9
	3 to 5 programs / sessions	1	0.6	14.3	57.1
	1 to 2 programs / sessions	3	1.9	42.9	100
	Total	7	4.5	100	
Missing	System	149	95.5		
Total		156	100		

**How many documents of training materials (including multimedia items) related to coastal resource training or information did your organization, agency, department, or division produce last year?**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	6 or more	1	.6	14.3	14.3
	1-2	3	1.9	42.9	57.1
	None	3	1.9	42.9	100.0
	Total	7	4.5	100.0	
Missing	System	149	95.5		
Total		156	100		

**For approximately how many people did your organization, agency, department, or division provide coastal resource training or information in the past year?**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	501 or more	1	.6	14.3	14.3
	101 to 500	1	.6	14.3	28.6
	51 to 100	3	1.9	42.9	71.4
	1-50	2	1.3	28.6	100.0
	Total	7	4.5	100.0	
Missing	System	149	95.5		
Total		156	100		

**What is the average length of a typical coastal resource training event?**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	One hour or less	1	.6	14.3	14.3
	One hour to a half-day	4	2.6	57.1	71.4
	Half-day to day long	1	.6	14.3	85.7
	2 days or more	1	.6	14.3	100.0
	Total	7	4.5	100.0	
Missing	System	149	95.5		
Total		156	100		



**What is the average cost, per participant, for your organization, agency department, or division to develop and provide coastal resource training or information?**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	\$1 to \$100	2	1.3	28.6	28.6
	Free	5	3.2	71.4	100
	Total	7	4.5	100	
Missing	System	149	95.5		
Total		156	100		

**What is the average cost or registration fee for a participant to receive coastal resource training or information from your organization, agency department, or division?**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	\$1 to \$100	1	0.6	14.3	14.3
	Free	6	3.8	85.7	100
	Total	7	4.5	100	
Missing	System	149	95.5		
Total		156	100		

**Does your organization, agency department, or division have an evaluation component as part of its coastal resource training programs?**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	3	1.9	42.9	42.9
	No	4	2.6	57.1	100
	Total	7	4.5	100	
Missing	System	149	95.5		
Total		156	100		