

# South Carolina Coastal Information Network

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## *“South Carolina’s Changing Shoreline: Implications for the Future”* Workshop Series

### **A. INTRODUCTION AND SUMMARY**

The South Carolina Coastal Information Network hosted a workshop series titled “South Carolina’s Changing Shoreline: Implications for the Future” during the fall of 2009. These workshops were held in each of the state’s coastal regions: the Lowcountry (Beaufort, Colleton, and Jasper Counties), the BCD (Berkeley-Charleston-Dorchester Counties), and the Waccamaw (Georgetown and Horry Counties). These events complemented the SC Department of Health and Environmental Control – Office of Ocean and Coastal Resource Management Community (DHEC-OCRM) Leaders’ Discussion Forums held earlier in the year.

The objective of the fall 2009 workshops was to provide coastal community representatives updated information on the physical, ecological, and socio-economic impacts of shoreline change in coastal South Carolina, while highlighting actions communities can take to address the associated risks. Additional objectives of the workshop included engaging community representatives through breakout sessions in order to identify information, and educational and training needs for addressing shoreline change issues at the community level in both the short and long term, as well as to provide insight related to efforts already being taken within their communities.

*South Carolina’s Changing Shoreline* workshops featured local scientists and resource managers who presented current information on the status of climate, sea level, and shoreline change in South Carolina. The information session set the stage for later discussion by participants on the perceived risks of shoreline change in South Carolina’s coastal communities. The workshops sought to obtain insight from participants on the concerns of community members related to this issue, and what actions they are most likely to support in order prepare for and react to the changing shoreline in their area. In his 1991 publication, “Risk Assessment and Environmental Crisis: Toward an Integration of Science and Participation”, Fischer suggests there is a social dimension to risk assessment, and therefore community participation in scientific research and risk identification is necessary. Fischer observed that the more a community participates in risk assessment, the more likely they will have a higher level of commitment to the conclusions made. Similarly, workshop planners felt gathering community input was equally important as providing information to participants.

Workshop attendees included local elected and appointed government officials, municipal and regional government staff, resource managers, public health managers, and other community leaders. This report is intended to summarize the results of the workshops. For more information regarding the Shoreline Change Workshop Series, please refer to the point of contact for each workshop in the appropriate sections of this report.

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## *A Note on Methods*

Workshops consisted of presentations by local experts followed by focus group discussions. These discussions centered on the identification of risks posed by shoreline change and the challenges/barriers to addressing these risks. Additionally, participants were asked two key questions: 1) Based on the information presented to you on the risks posed by shoreline change to your community, what actions can you take to address these risks? and 2) What kind of training, information or assistance do you need to address the challenges in your community? Each workshop was analyzed separately and independently. Risk and challenge/barrier themes were grouped according to similarity, and the perceived importance of individual risks, challenges, and barriers was determined by relative numbers of participant votes and also based on discussion notes. The summary of the workshop series is a combination of the analyses of the three individual workshop outcomes. For details on individual workshop analyses, please refer to the appropriate points of contact.

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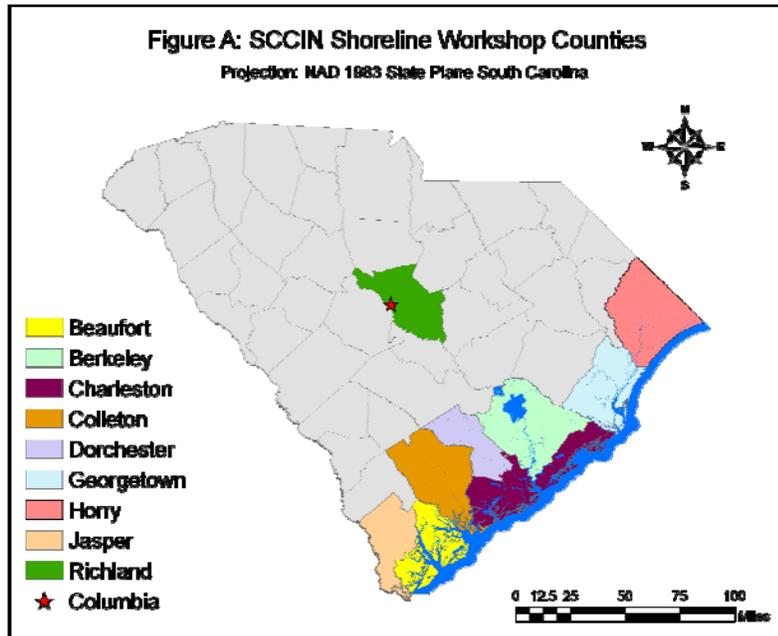
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## Workshop Series Target Audience

This section provides summary figures and tables from the three workshops, which characterize workshop attendance based on where participants are from, and what their professional roles are.

The South Carolina map below (figure A) highlights the eight coastal counties and one inland county that participated in the SCCIN Shoreline Change Workshops.



The Shoreline Change Workshop participant categories are listed below (table A1) along with the affiliations grouped within them. The list is exclusive of the workshop planning team representatives. The total number of workshop series attendees from each category is also given.

**Table A1: Shoreline Change Workshop Series Participants**

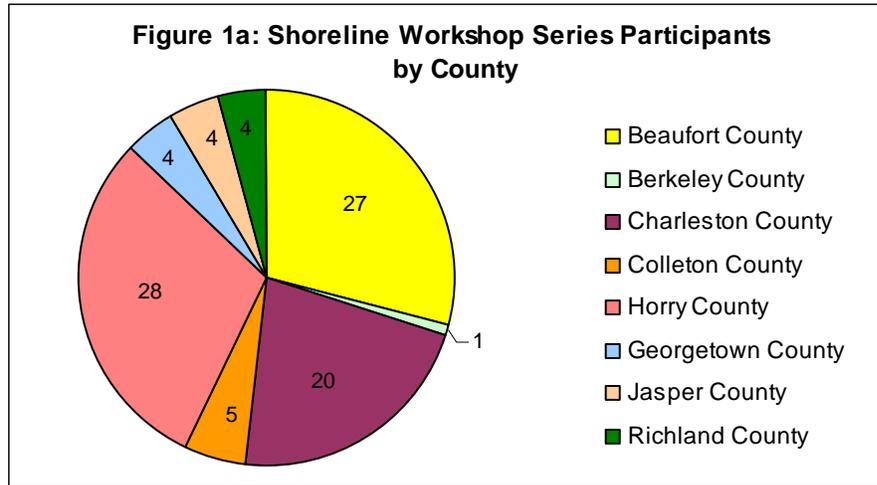
Category	Affiliations Included	# of Attendees
Elected/Appointed Officials	Town/County Councils, Commissions, and Boards, State House of Representatives	39
Planning/Zoning	Town/County/Regional Planners, Planning/Zoning Administrators, Natural Resources Managers, GIS Technicians	32
Public Works	Engineers, Stormwater Technicians, Stormwater Utility Managers	7
State Government	S.C. DHEC OCRM, S.C. DNR, S.C. Sea Grant Extension	4
Nonprofit	Coastal Conservation League, The Nature Conservancy	2
Sub-Government	Beaufort Conservation District	2
Private Sector	Landscape Architects, Property Owners Associations, Realtors	3
Academics	Clemson University, University of South Carolina	4
		<b>Total: 93</b>

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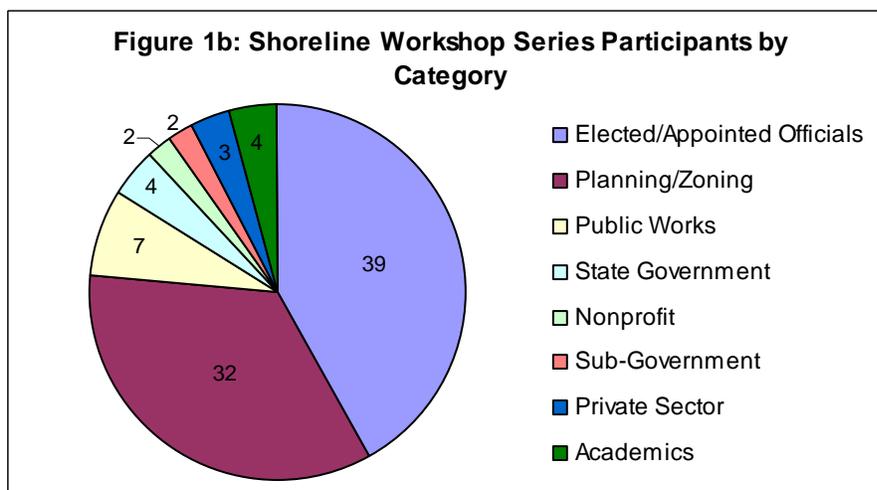
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## Workshop Series Attendance

The Shoreline Change Workshop Series participants are grouped by the county they represent (figure 1a). The majority of the participants live in Beaufort, Horry, or Charleston County, which are the regional hubs of the south, north, and central coasts respectively.



The participants of the Shoreline Change Workshop Series are grouped by job affiliation (figure 1b). The majority of the participants are either elected/appointed officials (42% of total participants) or work in a planning or zoning department or related field (34% of total participants). This demographics primarily targeted by the workshop were municipal, county, and state elected and appointed officials and staff, and this was reflected by the actual workshop participation.



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## *Workshop Series Outcomes*

After discussion of community shoreline change risks, participants were asked to vote on the risk or risks they felt were most important in their community. Participants were allowed three votes, and were able to cast all three votes for a single risk or distribute their votes as they saw fit. The risks voted on were grouped into themes for ease of making comparisons (table 1a).

**Table 1a: Prioritized Risk Themes from Participant Voting Exercise.**

<b>Risk Themes</b>	<b>Risks</b>
<b>Damage/loss of property/infrastructure</b>	Damage/loss of public/private property; loss of infrastructure; large scale destruction due to severe weather
<b>Economic impact</b>	Economic losses (loss of tax base, revenue, property values); insurance costs; increased economic costs (for flood control, repairing/maintaining infrastructure); loss of federally funded flood insurance; flood insurance rate increases; siltation of port harbor, mouths, navigation; negative effect on tourism and fishing industries; continued beach renourishment expenses
<b>Flooding</b>	Flooding (severity/frequency)
<b>Impact to water resources</b>	Contamination of surface and ocean water; salt water intrusion; stormwater runoff & pollution; impact to drainage facilities further inland
<b>Loss of habitat &amp; natural storm protection</b>	Loss of habitat/species; threats to wildlife/habitat and general environmental degradation; erosion of beach/dune system; wetland losses; impact to vegetation; armoring estuarine shoreline
<b>Sociological</b>	Losing ability to use beach for recreational purposes; reduced quality of life; movement of baseline, setback line; residents/social & community; public health
<b>Other</b>	Accreted land and managing it for the future; increased density on beaches

Following a discussion of the challenges/barriers to addressing shoreline change in coastal communities, participants were asked to vote on the challenges/barriers they perceived to hinder their community the most. As with voting on the risks, participants were allowed three votes, and were able to cast all three votes for a single risk or distribute their votes as they saw fit. The challenges/barriers voted on were grouped into themes for ease of making comparisons (table 1b).

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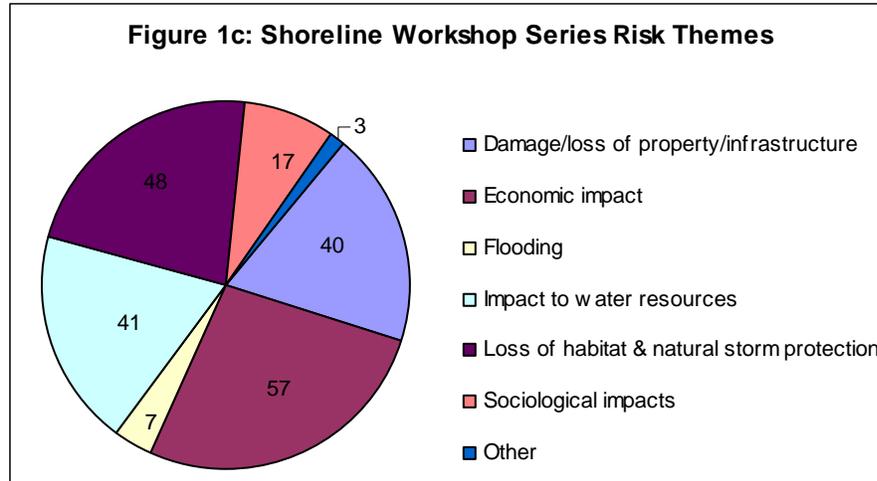
**Table 1b: Prioritized Challenge/Barriers Themes from Participant Voting Exercise.**

<b>Challenges/Barriers Themes</b>	<b>Challenges/Barriers</b>
<b>Lack of community collaboration</b>	Lack of well-defined goals; lack of cooperation/consensus; aggressive/increased development; greed; inadequate or poor community planning/support for shoreline/storm management; community collaboration and differences in regulations; short term economic benefits; need/demand for shoreline infrastructure/development
<b>Funding</b>	Financing mitigation strategies; lack of funding for plan implementation; budget limitations to mitigate potential effects; cost
<b>Lack of awareness and education</b>	Lack of public awareness/education; lack of qualified and credible experts to address the issue; lack of recognition of problem; equity/fairness (compensation for loss of property, who should pay, etc); unsure of how to adapt or what to do
<b>Lack of control</b>	Naturally occurring phenomenon; can't control weather and nature
<b>Mindset, resistance, denial</b>	Resistance to change; desire to live close to coast; public perception of reality of shoreline change; gradual nature of shoreline change issue makes it hard to address in current decision-making; scale of problem; too far in the future to affect today's decisions; community expectations; dependence on cars in community
<b>Politics/enforcement</b>	Lack of political will; regulations (right ones don't exist, existing regulations prevent us from addressing shoreline change); too much political involvement (shoreline decisions being made with too much political interest and not based on fact and need); regulatory issues; other priorities; lack of enforcement of regulations or ability to get around regulations (e.g. by paying fines)
<b>Property Rights</b>	Private property rights; development too close to the shoreline;
<b>Technology/solution design limitations</b>	Innovations in design; collateral damage as a result of some solutions

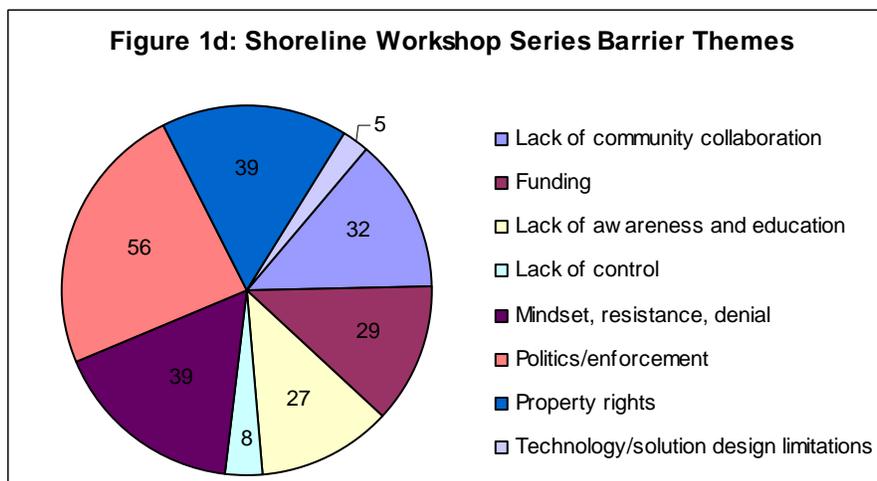
Economic impact (27% of votes), loss of habitat/natural storm protection (23% of votes), impact to water resources (19% of votes), and damage/loss of property/infrastructure (19% of votes) were identified as the biggest risks of shoreline change along the South Carolina coast (figure 1c).

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Politics/enforcement (24% of votes) was identified as the biggest barrier to addressing shoreline change along the South Carolina coast (figure 1d). In the north coast (Waccamaw) too much political involvement was a recurring barrier, in the south coast (Lowcountry) lack of political will was a recurring barrier, and in the central coast (B-C-D) politics/enforcement was not identified as a significant barrier to addressing shoreline risk. Although this barrier seemingly varies significantly across the coast, discussion notes indicate that lack of political will to address the issues may be a common thread. In Waccamaw, politician priorities other than shoreline change was identified as a barrier, and as previously mentioned it was discussed that decision-makers may not have the will to take science into account and apply it to shoreline policies. In the B-C-D region lack of community collaboration was perceived to be a significant barrier to addressing shoreline risks, and more specifically this focused on the lack of common, well-defined goals, and lack of cooperation/consensus. Lack of community collaboration in this sense may be related to the lack of will of community leaders to work together to develop a collaborative plan.

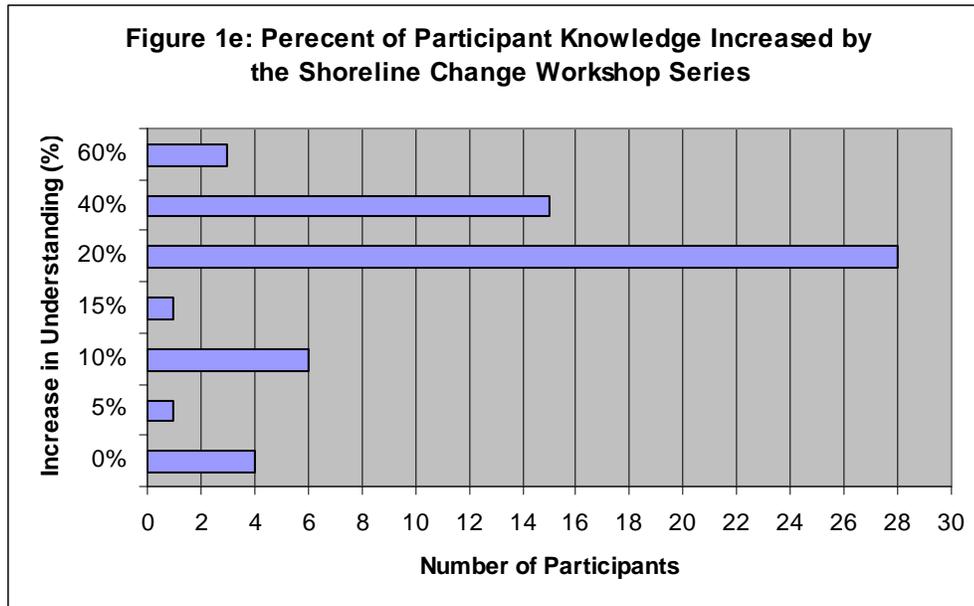


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## Workshop Series Evaluation

Fifty-eight of the ninety-three Shoreline Change Workshop Series participants completed a workshop evaluation. Forty-six of those responding indicated that the workshop increased their knowledge of shoreline change by at least 20% (figure 1e). All but two (97%) of the participants who completed an evaluation form said that they intended to apply knowledge gained from the workshop to their work.



## B. LOWCOUNTRY WORKSHOP RESULTS

Workshop Date: October 28, 2009

Workshop Location: University of South Carolina – Beaufort; Beaufort, SC

Workshop Contact: Rebekah Szivak, S.C. DNR ACE Basin NERR CTP, [SzivakR@dnr.sc.gov](mailto:SzivakR@dnr.sc.gov)

### Regional Characterization

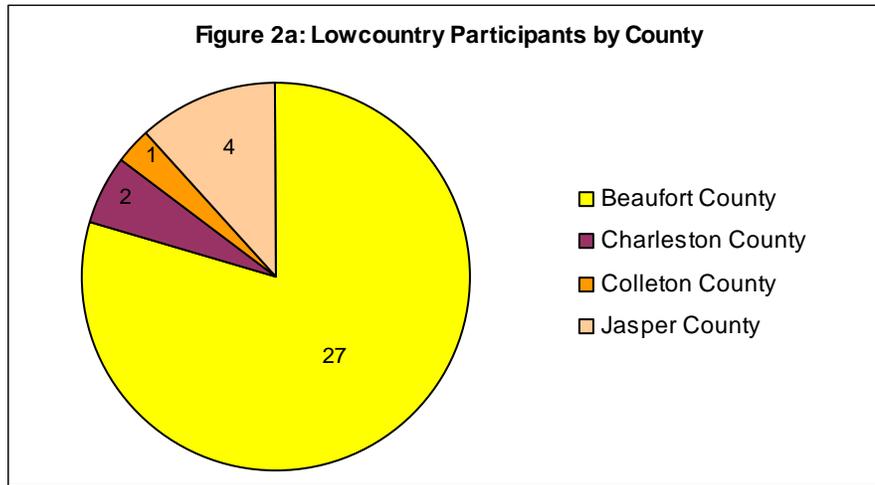
The Ashepoo, Combahee, and Edisto (ACE) Basin is the largest National Estuarine Research Reserve in the southeast and is 13 miles wide, 22 miles long, and contains approximately 350,000 acres of preserved land. The lowcountry workshop's target audiences were those from Jasper, Colleton and Beaufort Counties. Since the Beaufort-Jasper-Colleton region occupies the same watershed as the ACE Basin, it is important to focus on the education and training of those whose decisions affect this area. According to 2000 census data the population of these counties has been steadily increasing for the past decade and with more people comes more development. Beaufort County saw a 39.9% increase in population in 2000, Colleton County increased by 11.3%, and Jasper County increased by 33.5% (2000 Census). The development in this region and the human population are affected and put at risk as the shoreline changes due to erosion and accretion processes. Making environmentally conscious decisions when developing along the shoreline in the ACE Basin would also help to reduce the risks to people and development.

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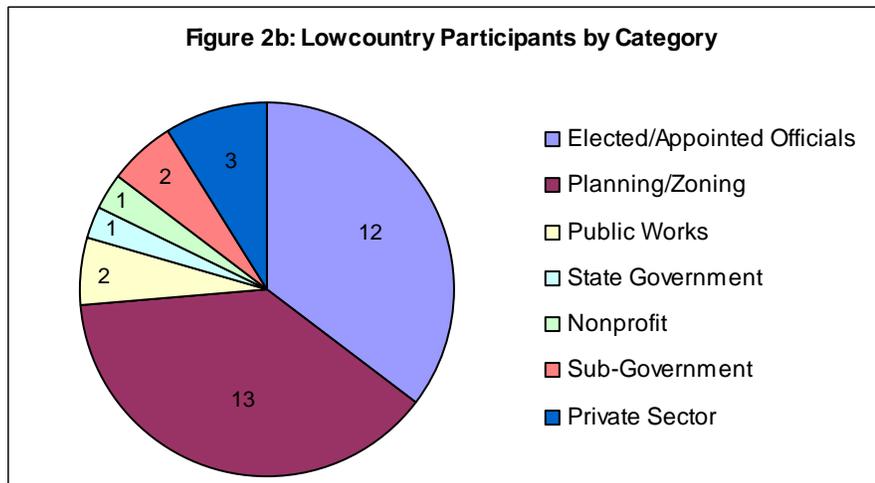
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## Workshop Attendance

The Lowcountry Shoreline Change Workshop participants were grouped by the county they represent (figure 2a). Although Beaufort, Colleton, and Jasper comprise the Lowcountry Region, two participants traveled from Charleston. Community members from Beaufort County were the overwhelming majority at the Lowcountry Workshop comprising almost 80% of the total workshop attendees.



The participants of the Lowcountry Shoreline Change Workshop were grouped by job affiliation (figure 2b). Of the thirty-four total participants that attended the workshop, 13 of them work in a planning or zoning department or related field (38% of total participants), and 12 are elected or appointed officials (35% of total participants).



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## Workshop Outcomes

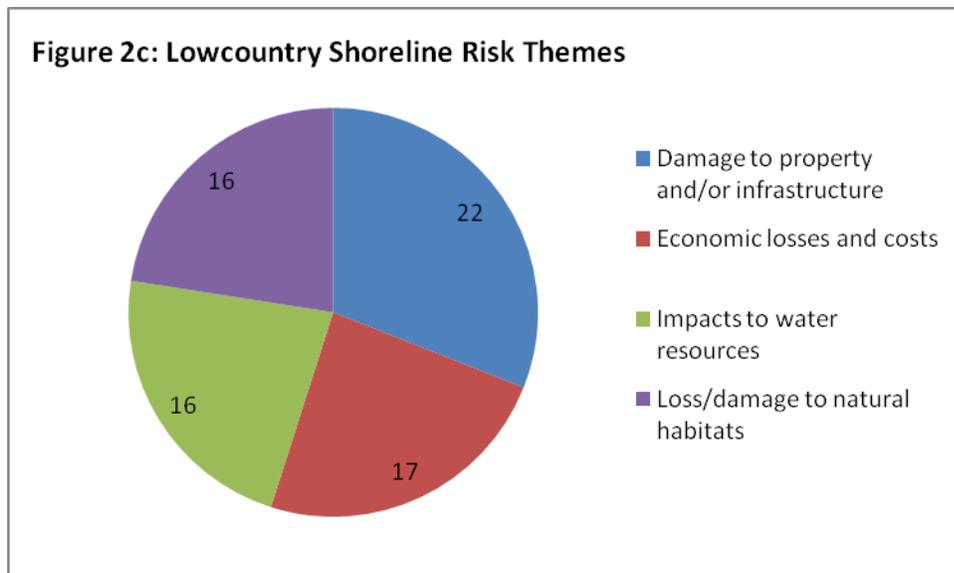
Participants identified risks of shoreline change and indicated which were most important to their communities. After discussion, participants were asked to vote on the risk or risks they felt were most important in their community. Those which were marked as most important were then grouped into categories. Examples of the responses and the categories they were grouped into are included in the table below (table 2a).

**Table2a: Individual and Grouped Risk Priorities from Discussion and Voting.**

**Risk Themes - Grouped**

Damage to property and/or infrastructure	Damage and loss of public and private property from erosion and flooding
	Loss of infrastructure (roads, power, water, sewage) from erosion and flooding
Economic losses and costs	Economic losses (loss of tax base, revenue, property values), insurance costs
	Increased economic costs (for flood control, repairing & maintaining infrastructure, etc)
Impacts to water resources	Impacts to water resources (salt water intrusion, stormwater runoff & pollution)
Loss/damage to natural habitats	Threats to wildlife & habitat/general environmental degradation
	Loss of habitat from erosion and flooding

The relative concern over each shoreline risk theme was determined by counting the number of times that category was marked as important by participants. The categories in this chart were voted on four or more times (figure 2c).



Participants then identified challenges/barriers of addressing shoreline change and indicated which were most prevalent in their communities. Following the discussion participants were asked to vote on the

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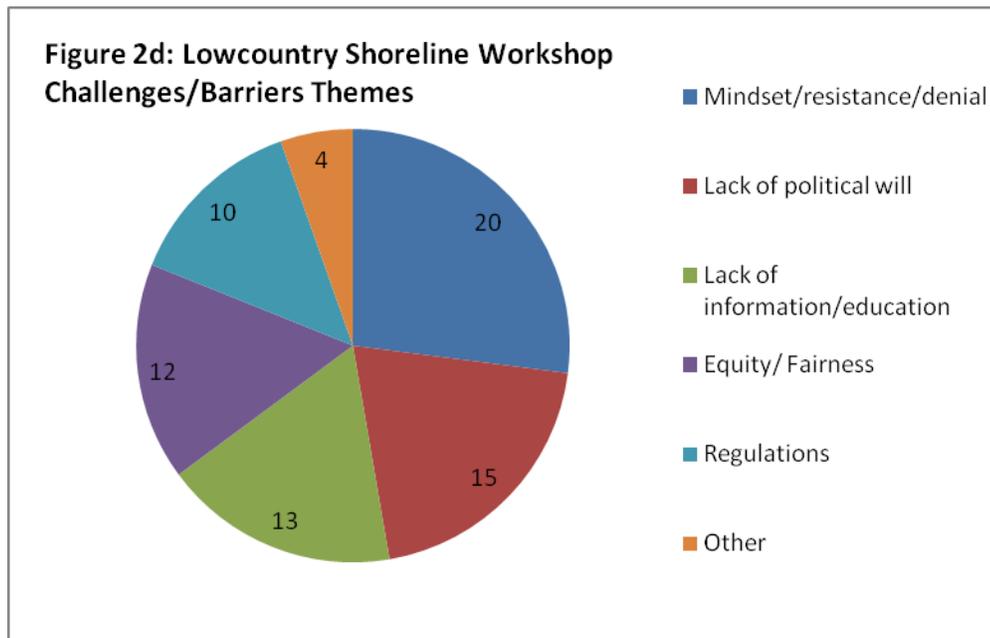
challenges/barriers they perceived to hinder their community the most. Those which were marked as most prevalent were grouped into categories. Examples of the responses and the categories they were grouped into are included in the table below (table 2b).

**Table 2b: Individual and Grouped Challenges/Barriers Priorities from Discussion and Voting.**

**Challenges/Barriers Themes - Grouped**

Mindset/resistance/denial	Mindset/community expectations
	Desire to live close to coast
	Resistance to change
	Denial of reality of shoreline change issues (don't think it will happen)
Equity/ Fairness	Equity/Fairness (compensation for loss of property, who should pay, etc)
Lack of political will	Lack of political will
Regulations	Regulations (right ones don't exist, existing regulations prevent us from addressing shore change)
Lack of information/education	Lack of information/ need for education
	Unsure of how to adapt or what to do
	Lack of recognition of problem (don't know info so not likely to make a priority)
Other	Innovations in design

The relative concern over each shoreline risk theme was determined by counting the number of times that category was marked as important by participants. The categories in this chart were voted on four or more times (figure 2d).



There were a number of repeating topics that were discussed in each breakout group, although the opinions on these topics often differed. Topics may refer to ideas that were listed on the flip

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charts or new ideas that were brought up during discussion. Topics were considered to be repeating if they were brought up in focus group conversation at least four times. There were also repeating topics which similar ideas occurred in more than one focus group. The table below lists the four repeating ideas that were discussed by two or more focus groups (table 2c).

**Table 2c: Repeating Ideas Occurring in Multiple Focus Groups**

<b>Repeating Idea</b>	<b># of Focus Groups Idea Occurred In</b>
Ordinances and legislation need to be consistent and regionally focused	4
Define public vs. private cost - flood insurance is encouraging development in risky areas at the cost of the state	4
Stormwater management - enforcement of setbacks and maintaining buffers	2
Increase awareness and education of risks and mitigation efforts to homeowners, professionals, and elected officials	4
Reducing population densities in areas of high risk by limiting development (retreat)	3

The main need discussed in each of the breakout groups was a need for more information and education in coastal communities. The target audience of this educational need was determined to be homeowners and elected officials. The attendees mentioned many times that the way to educate homeowners is to appeal to what they care about and directly relate shoreline change to them and their property. A few attendees suggested presenting information about the impacts shoreline change can have on stormwater runoff and water quality. These topics can more directly relate to a community and can act as a means to interest and influence community actions. Others suggested that an important educational need is for the public to understand how shoreline change is managed and, more importantly, why it must be managed.

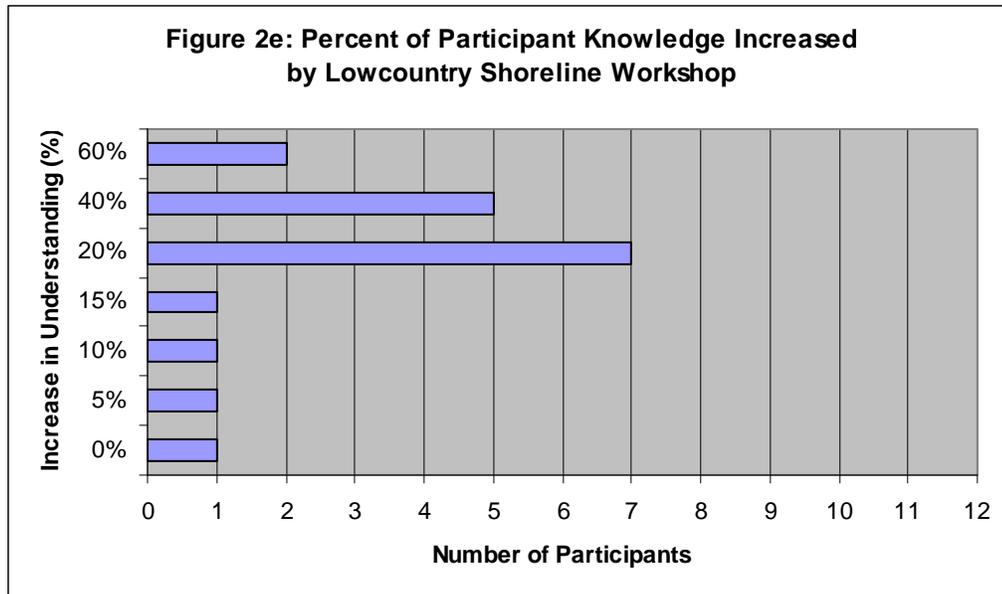
Another need that was mentioned by the breakout groups is stricter enforcement of shoreline setback lines, and better collaboration in creating regulations and ordinances for managing shoreline change. Through continued educational programs and opportunities for collaboration, Beaufort regional decision-makers can be better equipped to address shoreline change.

## ***Workshop Evaluation***

Eighteen of the thirty-four participants at the Lowcountry Shoreline Workshop completed a workshop evaluation form. Fourteen of those responding indicated that the workshop increased their knowledge of shoreline change by at least a 20% (figure 2e).

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Although knowledge gained is an important outcome from a workshop, intended use of that knowledge can be a way to measure workshop success. 94% of the shoreline change workshop participants who turned in an evaluation responded that they intend to use the knowledge learned at this workshop and apply it in the future. Overall the participants indicated the presentations to be very informative and the breakout sessions to be interesting and useful.

## C. BERKELEY-CHARLESTON-DORCHESTER WORKSHOP RESULTS

Workshop Date: November 4, 2009

Workshop Location: Lowcountry Graduate Center; North Charleston, SC

Workshop Contact: April Turner, S.C. Sea Grant Extension, [april.turner@scseagrant.org](mailto:april.turner@scseagrant.org)

### *Regional Characterization*

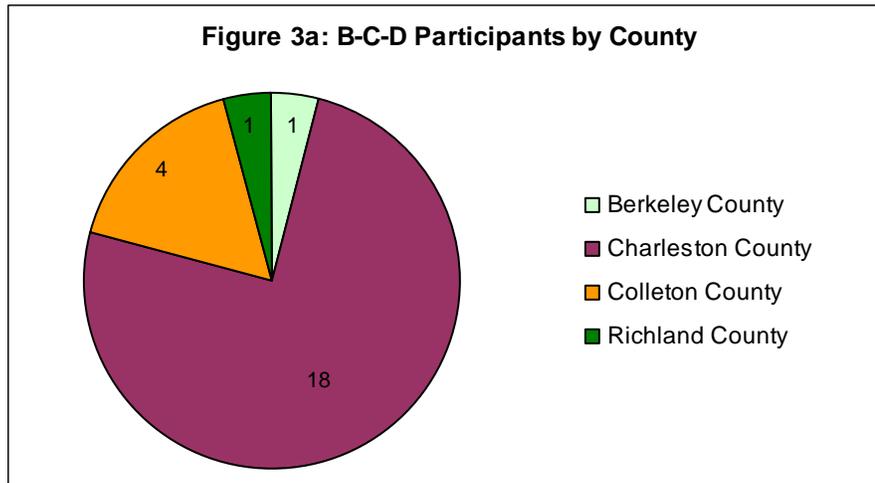
The Berkeley-Charleston-Dorchester (BCD) region is centrally located on South Carolina's coast between the Waccamaw to the north and the Lowcountry to the south, and encompasses 2,592 square miles. Both Berkeley and Charleston counties are comprised of approximately 1,000 square miles of property, whereas Dorchester County is about half their size. Although considered to be coastal counties, neither Berkeley nor Dorchester County has a boundary along the ocean. They have been designated as coastal counties because they contain coastal waters and tidelands. Charleston County, however, is adjacent to the Atlantic Ocean. The Charleston County shoreline stretches nearly 100 miles from the Cape Romain National Wildlife Refuge in the north to rural Edisto Beach (within the ACE Basin NERR) in the south. The Francis Marion National Forest is also located in the BCD region with boundaries in Berkeley and Charleston counties. In addition to being a population and economic center in the BCD region, the City of Charleston is a cultural and tourist destination on the East Coast, containing many historical buildings and landmarks. Geographically the City of Charleston is situated on a peninsula where the Ashley and Cooper Rivers meet to enter the Atlantic Ocean, and as such is a thriving container ship port.

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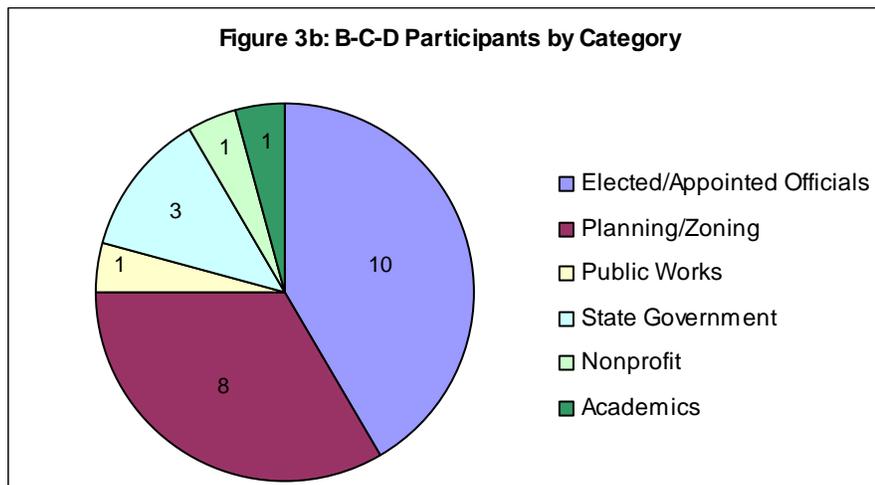
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## Workshop Attendance

The B-C-D Shoreline Change Workshop participants are grouped by the county they represent (figure 3a). Four participants traveled from Colleton County, specifically from the Town of Edisto Beach and one participant representing a nonprofit organization traveled from Richland County. In addition, a member of the State House of Representatives was present. Community members from Charleston County were the majority at the workshop representing 75% of the total attendees.



The participants of the B-C-D Shoreline Change Workshop are grouped by job affiliation (figure 3b). Of the twenty-four total participants that attended the workshop, 10 of them are elected or appointed officials (42% of total participants), and eight of them work in a planning or zoning department or related field (33% of total participants).

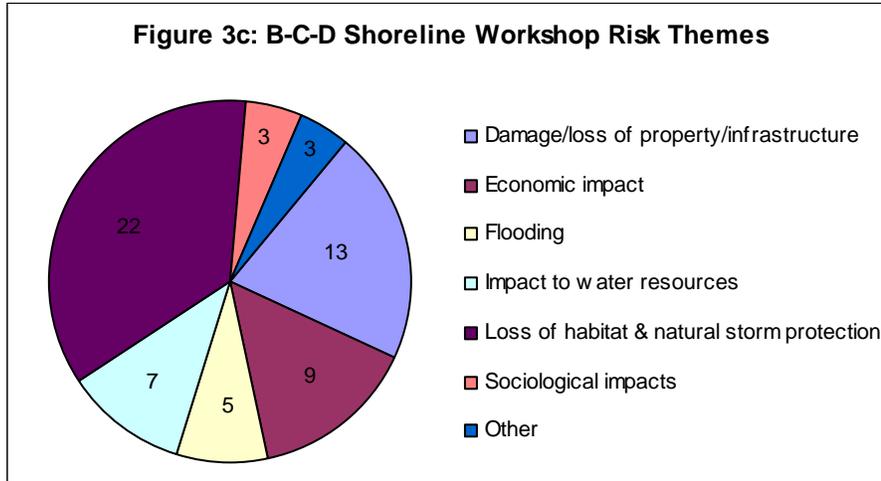


## Workshop Outcomes

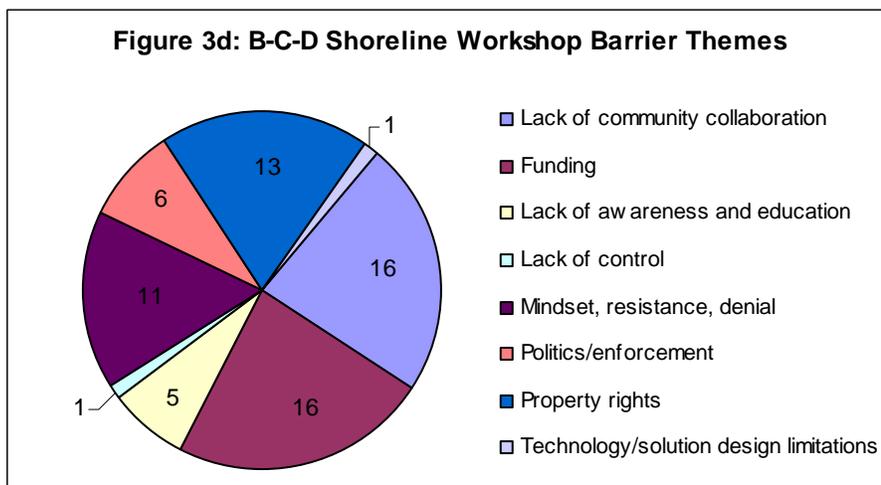
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Loss of habitat and natural storm protection was the most voted on risk theme during the B-C-D Shoreline Workshop, receiving approximately 36% of the votes casted (figure 3c). Damage/loss of property/infrastructure was also identified as a high risk, receiving 21% of the votes casted.



Lack of community collaboration and funding were the most voted on barrier themes during the B-C-D Workshop, each receiving approximately 23% of the votes casted (figure 3d). Within the community collaboration theme, lack of common, well-defined goals and lack of cooperation and consensus was identified as the biggest single barrier (after funding) to addressing shoreline change in B-C-D communities.



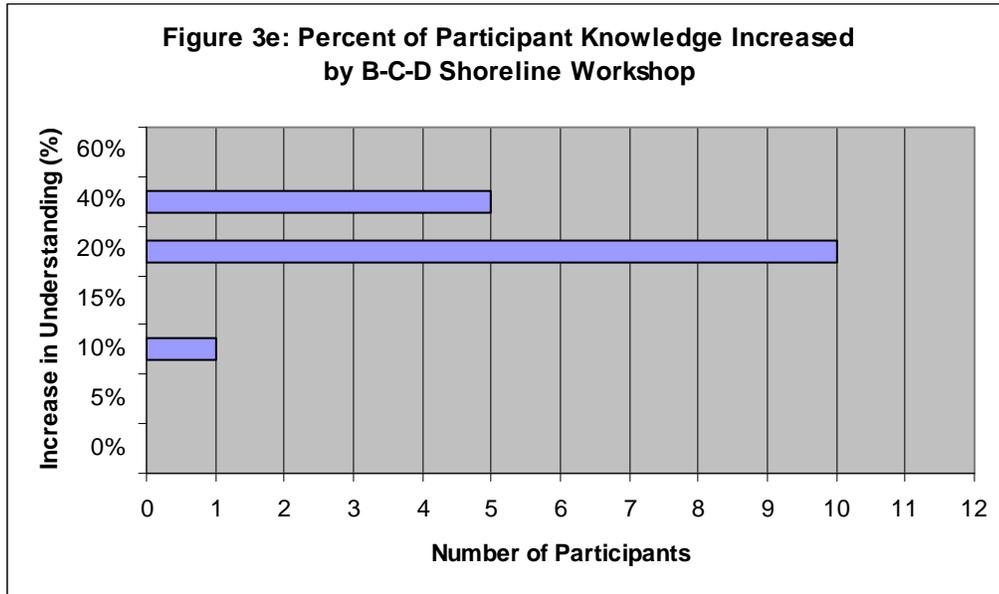
## ***Workshop Evaluation***

Sixteen of the twenty-four participants at the B-C-D Shoreline Workshop completed a workshop evaluation form. Fifteen of those responding indicated that the workshop increased their knowledge of

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shoreline change by at least a 20% (figure 3e). All of the B-C-D participants who completed an evaluation form said that they intended to apply knowledge gained from the workshop to their work.



## D. WACCAMAW WORKSHOP RESULTS

Workshop Date: November 18, 2009

Workshop Location: Coastal Carolina University – Conway, SC

Workshop Contact: Nicole Saladin, NIWB NERR CTP, [nicole@belle.baruch.sc.edu](mailto:nicole@belle.baruch.sc.edu)

### ***Regional Characterization***

The Waccamaw Regional Shoreline Change workshop was the third in the series, and occurred on November 18, 2009 at Coastal Carolina University’s Center for Marine and Wetland Studies in Conway, SC. This workshop mainly targeted Horry and Georgetown Counties, and the municipalities within these counties. Together, they make up what is known as the Grand Strand and South Strand regions. The Grand Strand is characterized predominantly by Myrtle Beach at its center and the booming tourist industry that exists there, and includes the stretch of coast from North Myrtle Beach (at the North Carolina-South Carolina state line) south to Surfside Beach. The South Strand refers to the stretch of coast from Surfside Beach to Georgetown, with Surfside sometimes included in the Grand Strand and sometimes in the South Strand. Along this stretch, coastal development and tourism shifts away from high rise hotels and condos in the north to detached beach homes and less large-scale commercial development (large shopping malls, big box stores, etc) in the south. Tourism is one of South Carolina’s fastest growing industries, and represents a significant portion of the state’s economy (both directly and through the generation of tax revenues), and it is the most important industry for the Grand Strand and the basis for the service, entertainment, hospitality, and retail industries that have emerged in the area. Development of new beachfront high-rise condominiums, hotels, and homes continues to add to the already high-density communities, making hazard mitigation, disaster response, risk assessment, and adaptation strategies (such as shoreline retreat) that much more difficult to plan for and address (as well as much more *important* to plan for and address). Given the extreme coastal development, and the critical role that this development plays in the region, it is vital that Grand Strand

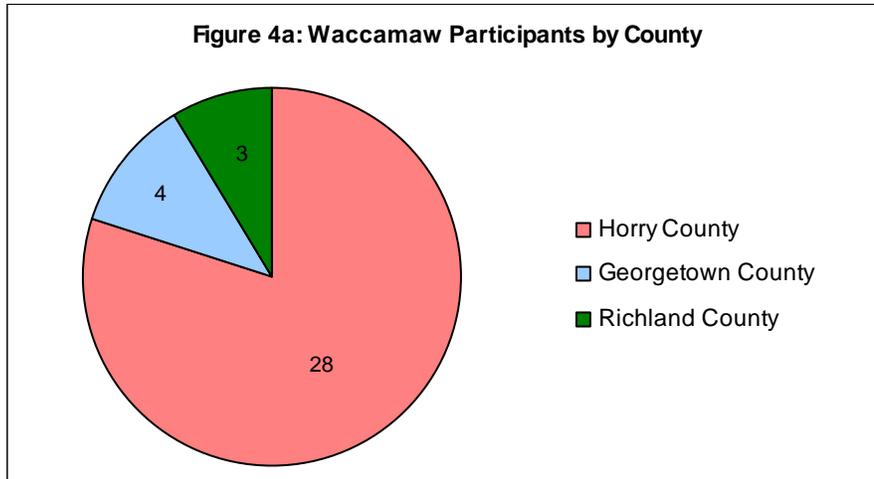
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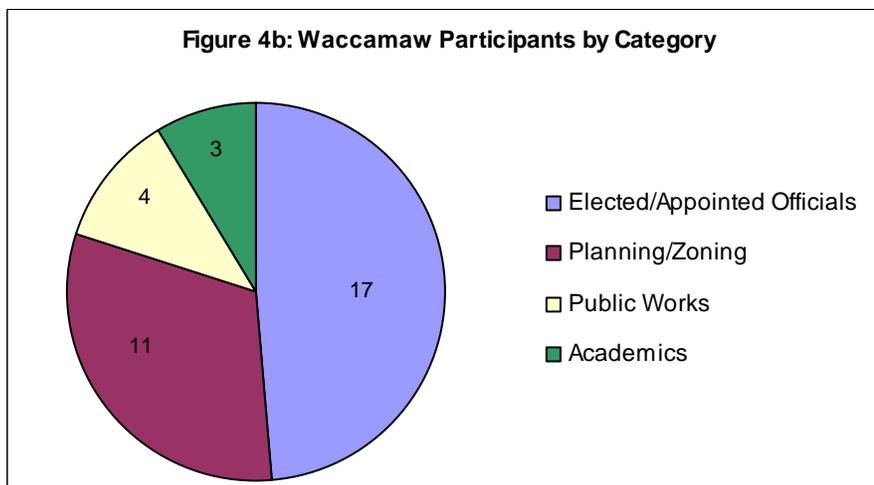
and South Strand decision makers understand, mitigate, and respond to the risks associated with shoreline change if the region is to continue to thrive socially, economically, and environmentally in the future.

## ***Workshop Attendance***

The Waccamaw Shoreline Change Workshop participants are grouped by the county they represent (figure 4a). Two University of South Carolina attendees from outside of the region traveled to Conway for the workshop. Community members from Horry County were the overwhelming majority at the Waccamaw Workshop, representing 80% of the total workshop attendees.



The participants of the Waccamaw Shoreline Change Workshop are grouped by job affiliation (figure 4b). Of the thirty-five total participants that attended the workshop, 17 were elected and appointed officials (49% of total participants), and 11 of them work in a planning or zoning department or related field (31% of total participants).



## ***Workshop Outcomes***

Table 4a shows a summary of the most important risks identified by workshop participants. Note that “Water Quality Contamination” was at the top of every breakout group’s list; others that are considered

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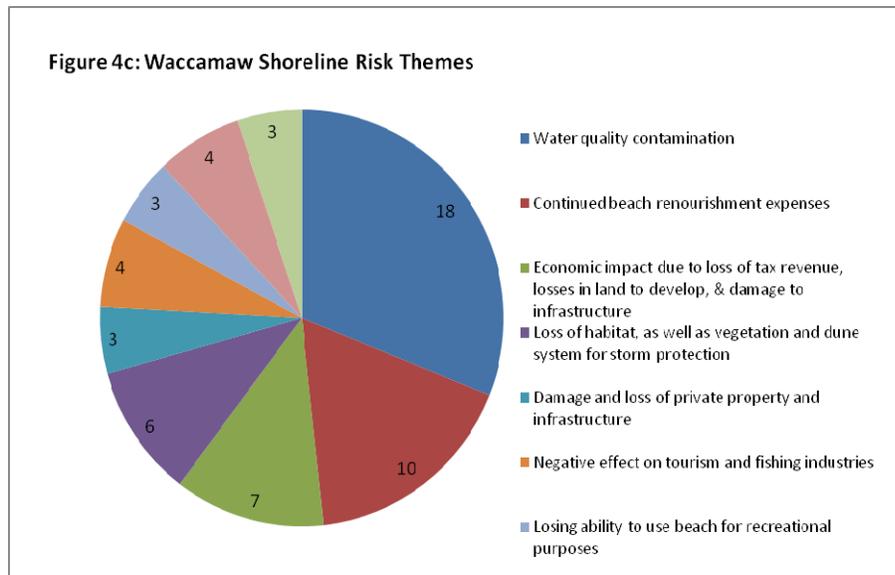
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“One of Most Important” risks were either in a group’s “top three” list, or they tied for second or third place with another risk.

**Table 4a: Summary of Risk Priorities Identified by Participants.**

Risk identified by pre-survey and through discussion during focus groups	Number of Groups Identifying Risk as One of Most Important	Number of Votes for Risk
Water quality contamination	4	18
Continued beach renourishment expenses	3	10
Economic impact due to loss of tax revenue, losses in land to develop, & damage to infrastructure	2	7
Loss of habitat, as well as vegetation and dune system for storm protection	2	6
Damage and loss of private property and infrastructure	1	3
Negative effect on tourism and fishing industries	1	4
Losing ability to use beach for recreational purposes	1	3
Residential, social & community [sense of place]	1	4
Accounting for loss, understanding costs/benefits	1	3

The relative concern over each shoreline risk theme was determined by counting the number of times that category was marked as important by participants (figure 4c). Data analysis began by considering a breakout group’s top three risks, and in many cases, several risks tied for second or third place, so were grouped with the top three. Hence, this list is larger than the prioritized risk lists for the other workshops because of the method of coding (top three versus four or more votes).



Discussions about ways to address the risk associated with water quality contamination largely centered around better stormwater management (including implementation of stormwater best management practices, better ordinances, watershed protection, and use of offshore ocean outfall pipes to move stormwater offshore), as well as updating septic and sewer systems, bacterial monitoring, and identifying contaminant sources.

The need for consistency in planning and regulations among neighboring communities and coast-wide was discussed, along with a need for more communication, collaboration, and coordination

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of planning documents. In this regard, the need for more education was also mentioned, and the Coastal Waccamaw Stormwater Education Consortium and the North Inlet-Winyah Bay NERR Coastal Training Program were specifically identified as avenues to deliver training and promote this sort of collaboration. The need for more models and case studies to help plan and help communicate the reality and importance of these risks was also identified.

Overall, there was a great deal of discussion of regulations at many different scales as a way to address a variety of risks. The South Carolina Department of Health and Environmental Control’s Office of Ocean and Coastal Resource Management – SC DHEC OCRM was specifically identified as an agency (along with local communities) that needed to provide more enforcement and tighter regulations regarding setback lines, building restrictions, and overall planning, issuance of fines, and hazard mitigation strategies.

Addressing beach renourishment expenses (the second most important risk identified) revolved around ideas for generating more money such as through more federal assistance, state taxes, and/or special tax districts. Yet, participants acknowledged that renourishment is not likely to be a permanent option because of the costs, the availability of sand (either transported in or available in local borrow sites), and the aesthetics and hazards of renourishment, and that there must be plans in place (such as retreat, buying back the beach and/or beachfront properties for more public access and preservation) for when renourishment is no longer an option. Participants strongly recognized that as costs of renourishment increase, along with other risks, that the issue will become more contentious because of political will and private property rights. Related to renourishment expenses, as well as other costs associated with shoreline change, the concept of more cost-benefit analyses was mentioned several times as a tool to help communicate the issues of shoreline change and promote alternatives to coastal development, retreat strategies, and other options that were identified as ways to reduce the risks to human communities.

The summary table of “challenges and barriers” prioritization results shows the most important challenges and barriers identified by workshop participants (table 4b). Note that challenges and barriers that are considered “One of Most Important” were either in a group’s “top three” list, or they tied for second or third place with another challenge/barrier.

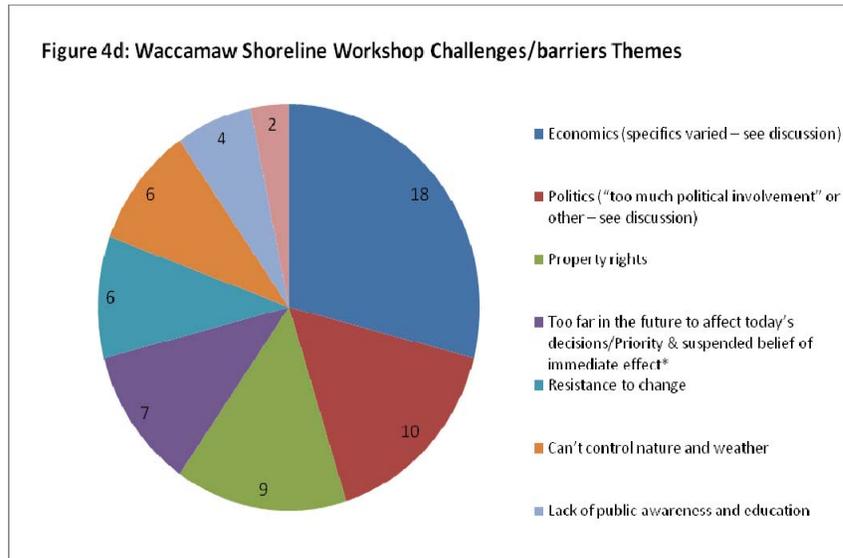
**Table 4b: Summary of Challenges/Barriers Priorities Identified by Participants.**

Challenges & barriers identified by pre-survey and through discussion during focus groups	Number of Groups Identifying Barrier/Challenge as One of Most Important	Number of Votes for Risk
Economics (specifics varied – see discussion)	4	18
Politics (“too much political involvement” or other – see discussion)	4	10
Property rights	2	9
Too far in the future to affect today’s decisions/Priority & suspended belief of immediate effect*	2	7
Resistance to change	2	6
Can’t control nature and weather	2	6
Lack of public awareness and education	1	4
Community collaboration/differences in regulations	1	2

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The relative significance of each challenge or barrier was determined by counting the number of times that category was marked as important by participants during the voting process (figure 4d). Data analysis began by considering a breakout group's top three challenges/barriers, and in many cases, several items tied for second or third place, so were grouped with the top three. Hence, this list is larger than the prioritized challenges/barriers lists for the other workshops because of the method of coding (top three versus four or more votes).



Participants were asked to identify training, informational, and technical assistance needs that would help them move forward with overcoming these challenges and barriers (or they could identify needs that would help to address specific risks identified earlier in the discussion).

Overwhelmingly, the need for training and education (especially for elected and appointed officials, but also for the public) was identified as the most important thing that could help address shoreline change more effectively. When it was pointed out that this particular event targeted that audience and efforts to engage elected and appointed officials were met with limited success, participants acknowledged the difficulty of recruiting them to training events. Several people mentioned having training requirements for those positions, similar to the continuing education requirements for planning professionals in SC.

The media (TV, radio, billboards, internet) were identified as ways to educate and engage not only elected and appointed officials, but also the general public and encourage them to volunteer in decision-making processes.

Regulatory needs were also identified, and included the need for more updated and science-based regulations, and more incentives and disincentives (such as more enforcement, more teeth, and more penalties to override potential profits and benefits from breaking regulations).

Full cost accounting to show the benefits of addressing shoreline change from an economic perspective was identified as another tool that could help educate the public and officials. Since economics was identified as one of the most significant challenges, it's important to overcome this with case studies and demonstration of the true cost to the public and other stakeholders of continuing with business as usual.

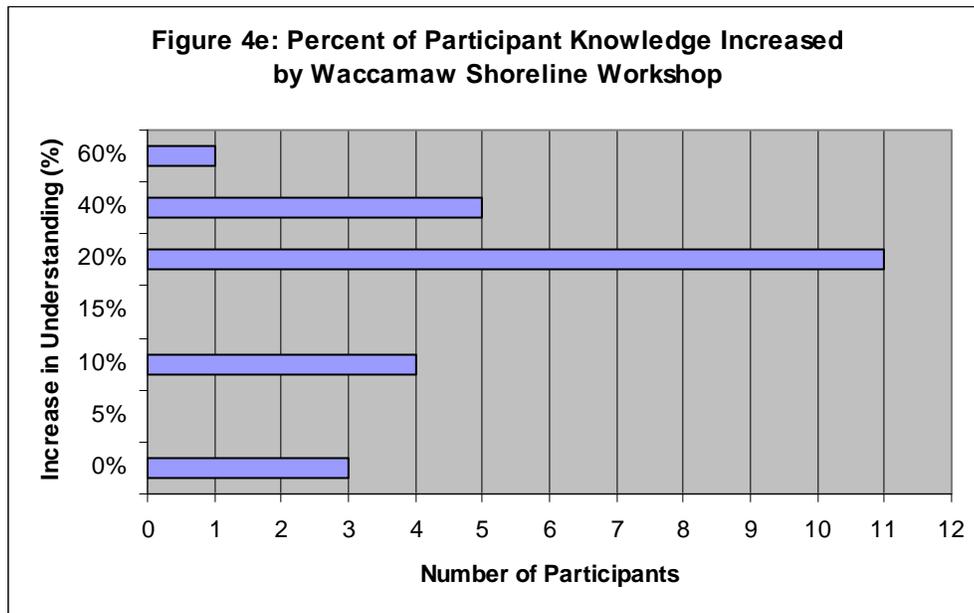
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## Workshop Evaluation

Of the thirty-seven participants at the Waccamaw region workshop, twenty-four (or 65%) completed and returned a workshop evaluation form. Twenty-two participants (92%) indicated that they increased their knowledge or understanding of shoreline change. When asked what the most useful aspects of the workshops were, responses were divided with about half the participants most valuing the presentations by experts and the knowledge they gained on specific issues related to shoreline change, and the other half indicating that the breakout sessions and opportunities to hear different perspectives was the most useful portion. There were also several comments that specifically identified a good balance between presentations and discussion as useful.

Workshop planners were also interested in the specific amount of knowledge or understanding gained from the workshop. To understand this, participants were asked to rate their level of knowledge or understanding before and after attending the workshop. Seventeen of workshop participants who completed an evaluation indicated that the workshop increased their knowledge of shoreline change by at least 20% (figure 4e).



In addition to knowledge gain, another important indicator of whether the workshop met its objectives is whether participants intend to use the knowledge gained from the workshop, an evaluation question to which 100% responded that yes, they did intend to apply this information to their work. However, some of the obstacles to applying this knowledge included: political barriers and regulations; a lack of or need for more education and information; a lack of long-term vision and planning, more concern with what is happening in the immediate future, or that this is not seen as a priority; and generally, there was a lot of mention of “other people” not having the proper information, political will, etc to address the issue so there is a perception that other decision makers who were not present at the workshop were the ones who needed the information or who served as barriers to the application of information presented at the workshop.

## **E. SHORELINE CHANGE WORKSHOP SERIES CONCLUSIONS**

Overall this workshop series confirmed that community elected/appointed officials and staff are concerned with addressing shoreline change risks and are willing to attend more educational and training workshops. There is a continued need to provide these kinds of training and educational events where community members can come together to discuss these types of issues and how to best address them. Providing such opportunities enables collaboration between regions in addition to an increased understanding of environmental issues and how the human environment is connected to and impacted by these issues.

## **F: NEXT STEPS**

### ***What to look for from your Outreach Organizations:***

The purpose of these workshop series was to determine what the targeted coastal communities need from outreach organizations to address shoreline change in a more proactive manner. This workshop series identified the community needs to be: education and training for the public, professionals and elected officials, more collaboration opportunities for elected officials leading to more consistent regulations, and education regarding economic effects.

These outcomes of this workshop series were based on the perceived risks associated with shoreline change and the challenges and barriers to addressing these risks, which was determined by a voting exercise. However once the risks were discussed and prioritized, participants were also asked to discuss ways they could address those risks. While the voting exercise forces participants to prioritize, open discussion is where a lot of rich information arises to learn how well people actually understand an issue and how to address it. During these periods of discussion, topics varied widely and covered some of the priority risks, as well as other topics that were then explored further in the second half of the focus group regarding challenges and barriers. The discussions offer much more detail into what is needed to address shoreline change. This detail will be addressed by the future efforts of outreach organizations.

Future outreach events will strive to continue to educate these target audiences on shoreline change, regulations, and economics. Additionally there will be training events for coastal municipalities concerning how to address shoreline change, as well increased opportunities for collaboration among municipalities and state representatives. Outreach organizations will also work to use the media and other marketing tools to increase awareness concerning shoreline change. These efforts will work to increase coastal communities' ability to plan for and respond to shoreline change and other environmental issues.