South Carolina's Changing Shoreline: Implications for the Future
Workshop Series Summary Report

South Carolina Coastal Information Network
June 2010

South Carolina Coastal Information Network
►►*A Coastal Partnership: providing educational and training opportunities for coastal community officials*
www.sccoastalinfo.org

Shoreline Change Workshop Series Overview

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), Berkeley-Charleston-Dorchester, and the Waccamaw (Georgetown and Horry Counties). These events complemented the SCDHEC-Office of Ocean and Coastal Resource Management (OCRM) Community Leaders' Discussion Forums held earlier in the year. The final report created by the Shoreline Change Advisory Committee after the OCRM discussion forums is available at: http://www.scdhec.gov/environment/ocrm/shoreline_change.htm.

The objective of the SCCIN workshops was to provide coastal community representatives updated information on the physical, ecological, and socio-economic impacts of shoreline change in 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/training needs for addressing shoreline change issues at the community level (in both the short and long term) and providing insight related to efforts already being taken within their communities. Workshop participants were asked the following four questions (questions 1 and 2 were asked in a pre-workshop survey and discussed in more detail during the workshop breakout sessions, and questions 3 and 4 were first asked during the workshop breakout sessions):

　　1) What risks does your community face as a result of shoreline change?

　　2) What are the most significant challenges and barriers to addressing shoreline change in
　　　 your community?

　　3) 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?

　　4) What kind of training, information or assistance do you need to address the challenges in
　　　 your community?

South Carolina's Changing Shoreline workshops featured scientists and resource managers working in the state 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 coastal communities. Obtaining insight from participants on this issue was considered to be important to determine what the concerns of community members are, 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

South Carolina Coastal Information Network
►►*A Coastal Partnership: providing educational and training opportunities for coastal community officials*
www.sccoastalinfo.org

more a community participates in risk assessment, the more likely they will have a higher level of commitment to the conclusions made. For this reason, gathering community input was considered to be equally important as providing information to participants during the Shoreline Change Workshop Series.

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. A section of the report was dedicated to presenting the results of the workshop series as a whole, and additional sections show the results of each of the individual workshops. A final discussion section is included to provide more specific information on what was discussed during each of the workshops, and compares the needs of communities in each of the regions. It is important to note that each of the workshops was analyzed by different people, using varying methods, and therefore it may be difficult to directly compare individual workshop results. For more information regarding the Shoreline Change Workshop Series, please refer to the point contact for each workshop in the appropriate sections of this report.

South Carolina Coastal Information Network
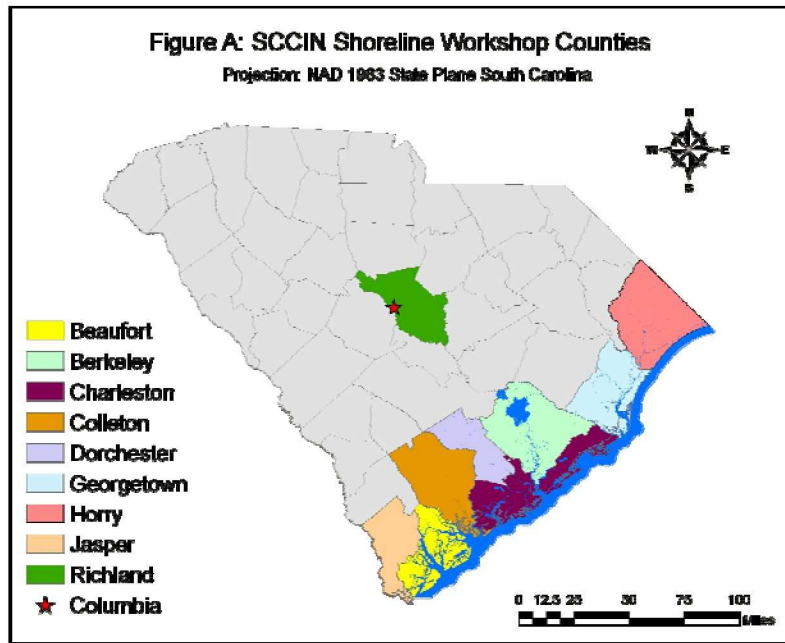►►*A Coastal Partnership: providing educational and training opportunities for coastal community officials*
www.sccoastalinfo.org

Table of Contents

- 4 -

Shoreline Change Workshop Series Target Audience

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

Figure A: SCCIN Shoreline Workshop Counties
Projection: NAD 1983 State Plane South Carolina

Beaufort
Berkeley
Charleston
Colleton
Dorchester
Georgetown
Horry
Jasper
Richland
★ Columbia

The Shoreline Change Workshop participant categories are listed below (Table A) 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 A: Shoreline Change Workshop Participants

Category	Affiliations Included	# of Attendees
Elected/Appointed Officials	Town/County Council, Commission 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
		Total: 93

Shoreline Change Workshop Series Results
(Lowcountry, Berkeley-Charleston-Dorchester, and Waccamaw Combined Workshop Results)
Workshop Series Contact: April Turner, S.C. Sea Grant Extension, April.Turner@scseagrant.org

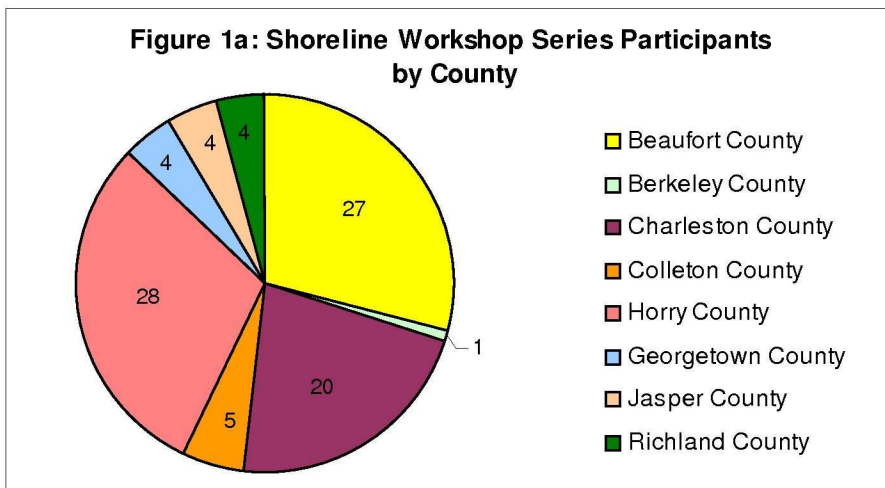## SOUTH CAROLINA COASTAL DESCRIPTION

The S.C. coastline is approximately 159 miles in length, and is characterized by 2,876 miles of tidal shoreline, and over 500,000 acres of coastal marshes (S.C. Coastal Council 1979). In addition to the extensive wetlands and maritime forests found throughout the coastal zone, there are 6 major estuaries along the S.C. coast, and 40 barrier islands running parallel to it (Hayes and Michel 2008). The S.C. coastal zone consists of the eight coastal counties, which have been designated by the S.C. Coastal Management Program as counties containing one or more critical areas, which are defined as coastal waters (from mean high water out to a 3-mile limit), tidelands (periodically inundated wetlands connected to the estuarine system), beaches, and oceanfront sand dunes (S.C. Coastal Council 1979).

The southeastern coast of the United States is a popular area to live, work, and play; and the coast of South Carolina is no exception. The 2009 US Census Bureau reports estimate that 4.56 million people are living in the state of South Carolina with approximately 26% of the total population living in the eight coastal counties. Population throughout the state increased by 30.8% between 1990 and 2009; however, in the eight coastal counties population increased by 44.1% (U.S. Census Bureau 2010). The most urbanized hubs along the South Carolina coast are the Myrtle Beach, Charleston, and Beaufort regions; all of which are amongst the top ten most densely populated areas within the state (S.C. Association of Counties 2008). Rural areas between the urban hubs are also under increasing pressure of development, particularly as many who move to South Carolina seek retirement and/or resort living.
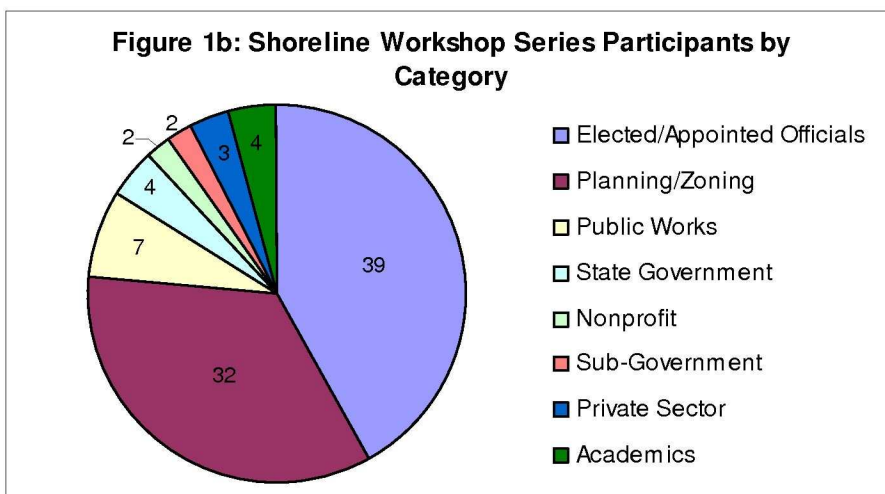
The economy of South Carolina relies heavily on tourism. In 2007 $17.2 billion was spent on travel and tourism in the state, supporting 12.6% of total state employment and accounting for 7.6% of the state economic revenue (SC Department of Parks, Recreation and Tourism 2007a). The majority of tourism-related revenue is acquired along the coast; three of the coastal counties (Horry, Charleston, and Beaufort) account for 59% of the state-wide domestic travel expenditures (SC Department of Parks, Recreation and Tourism 2007b). Coastal tourism alone accounted for $3.5 billion of the state gross domestic product in 2008, and supported 81,000 jobs (Moore School of Business, Division of Research 2009). Additionally, the Port of Charleston is one of the busiest container ports on the East and Gulf coasts and is recognized as one of the most efficient and productive ports in the country. The South Carolina State Ports Authority reported an operating revenue of $165 million in 2008 and served over 1800 vessels (PricewaterhouseCoopers 2008). Commercial fishing also plays a large role in the coastal economics of South Carolina with the major fisheries being shrimp, shellfish, crabs, and offshore finfish. State value added in 2008 from commercial fishing was $14 million, supporting 661 commercial fishing jobs (Moore School of Business, Division of Research 2009).

WORKSHOP SERIES ATTENDANCE

The Shoreline Change Workshop Series participants were 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.

Figure 1a: Shoreline Workshop Series Participants by County

- Beaufort County
- Berkeley County
- Charleston County
- Colleton County
- Horry County
- Georgetown County
- Jasper County
- Richland County

The participants of the Shoreline Change Workshop Series were 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 (34% of total participants). This workshop demographic was to be expected as elected/appointed officials, and municipal and regional staff were two of the primary target groups invited to the event.

Figure 1b: Shoreline Workshop Series Participants by Category

- Elected/Appointed Officials
- Planning/Zoning
- Public Works
- State Government
- Nonprofit
- Sub-Government
- Private Sector
- Academics

WORKSHOP SERIES OUTCOMES

After a discussion of community shoreline change risks, participants were asked to vote on the risk or risks they felt were most prevalent to 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: Shoreline Workshop Series Risks and Risk Themes**

Risk Themes	Risks
Damage/loss of property/infrastructure	Damage/loss of public/private property; loss of infrastructure; large scale destruction due to severe weather
Economic impact	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
Flooding	Flooding (severity/frequency)
Impact to water resources	Contamination of surface and ocean water; salt water intrusion; stormwater runoff & pollution; impact to drainage facilities further inland
Loss of habitat & natural storm protection	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
Sociological	Losing ability to use beach for recreational purposes; reduced quality of life; movement of baseline, setback line; residents/social & community; public health
Other	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).
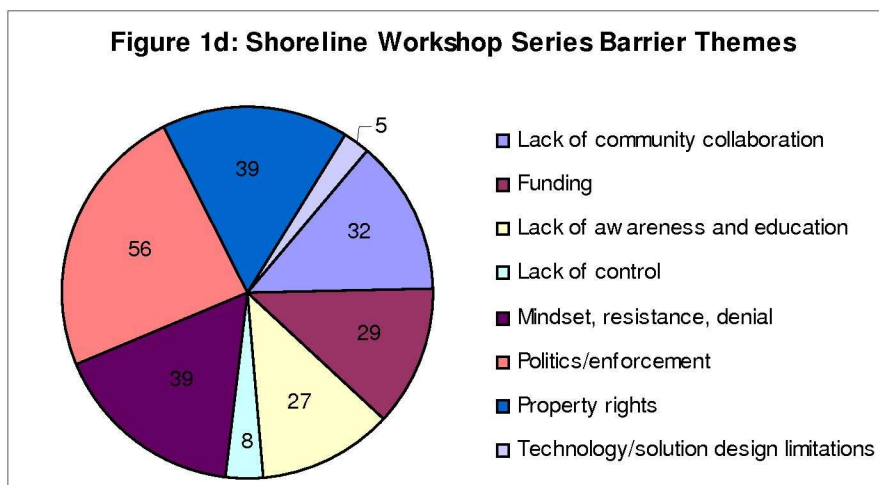
Table 1b: Shoreline Workshop Series Challenges/Barriers and Challenge/Barrier Themes

Challenges/Barriers Themes	Challenges/Barriers
Lack of community collaboration	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
Funding	Financing mitigation strategies; lack of funding for plan implementation; budget limitations to mitigate potential effects; cost
Lack of awareness and education	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
Lack of control	Naturally occurring phenomenon; can't control weather and nature
Mindset, resistance, denial	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
Politics/enforcement	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)
Property Rights	Private property rights; development too close to the shoreline;
Technology/solution design limitations	Innovations in design; collateral damage as a result of some solutions

The total number of votes for each shoreline change risk theme were tallied (Figure 1c) to determine the most important perceived shoreline risks in South Carolina coastal communities. 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 greatest risks of shoreline change along the South Carolina coast.

Figure 1c: Shoreline Workshop Series Risk Themes

□ Damage/loss of property/infrastructure
■ Economic impact
□ Flooding
□ Impact to water resources
■ Loss of habitat & natural storm protection
■ Sociological impacts
■ Other
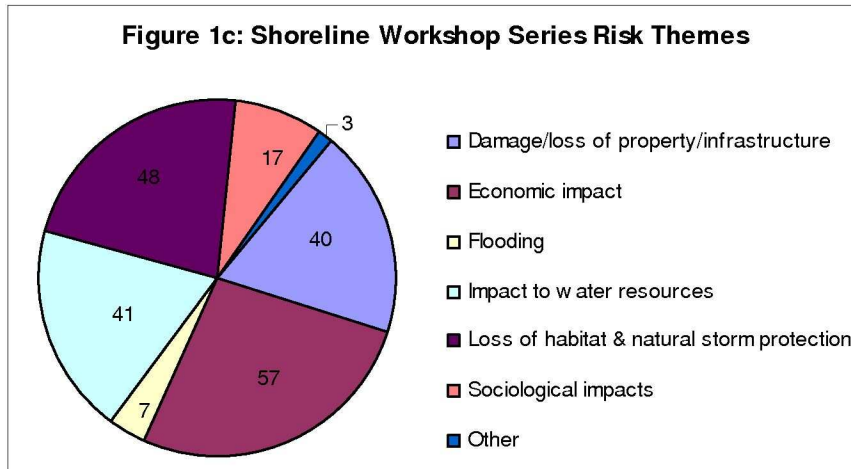
The total number of votes for each shoreline change barrier theme were tallied (Figure 1d) to determine the most important perceived shoreline barriers in South Carolina coastal communities. Politics/enforcement (24% of votes) was identified as the biggest barrier to addressing shoreline change along the South Carolina coast. 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 were identified as a barrier, and it was discussed that decision-makers may not have the will to take science into account in order to apply it to shoreline policies. In the B-C-D region lack of community collaboration was identified as 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.

Figure 1d: Shoreline Workshop Series Barrier Themes

□ Lack of community collaboration
■ Funding
□ Lack of awareness and education
□ Lack of control
■ Mindset, resistance, denial
■ Politics/enforcement
■ Property rights
□ Technology/solution design limitations

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%. 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.

Figure 1e: Perecent of Participant Knowledge Increased by the Shoreline Change Workshop Series
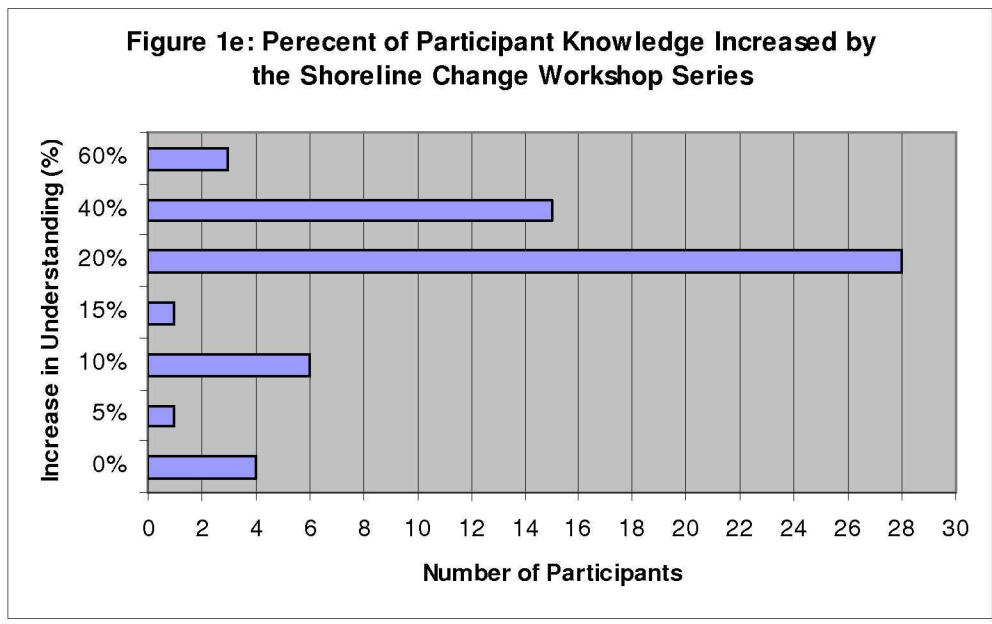
<u>**Lowcountry Workshop Results**</u>
October 28, 2009
University of South Carolina – Beaufort; Beaufort, SC
Workshop Contact: Rebekah Szivak, S.C. DNR ACE Basin NERR CTP, <u>SzivakR@dnr.sc.gov</u>

**REGIONAL CHARACTERIZATION**

The Lowcountry region is located in the southern portion of the state and contains the coastal counties of Beaufort, Jasper, and Colleton which together consist of approximately 2,299 square miles. Colleton County is spatially the largest within the Lowcountry containing 1,056 square miles, and Beaufort and Jasper counties are roughly half the size. Beaufort County is the population center of the Lowcountry region and saw a 79.6% increase in population between 1990 and 2009, and is now home to an estimated 155,215 people (US Census Bureau 2010). The population of Jasper County is a fraction of that of Beaufort (about 1/5); however, the population of Jasper County also saw a dramatic increase, 50%, during that period. The Ashepoo, Combahee, and Edisto (ACE) Basin, mostly located within the Lowcountry region, is the largest National Estuarine Research Reserve (NERR) in the southeast containing approximately 350,000 acres of preserved land.

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.

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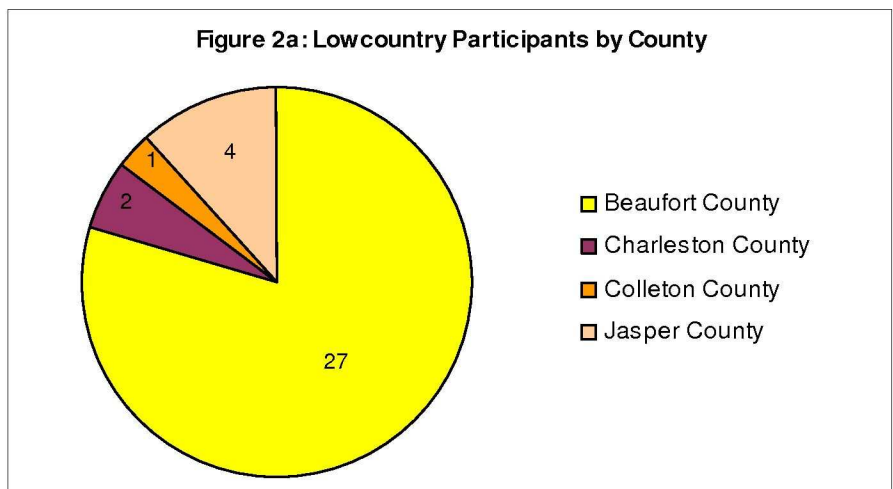
The participants of the Lowcountry Shoreline Change Workshop were grouped by job affiliation (Figure 2b). Of the thirty-four total participants that attended the workshop, 13 of them work in a planning or zoning department (38% of total participants), and 12 are elected or appointed officials (35% of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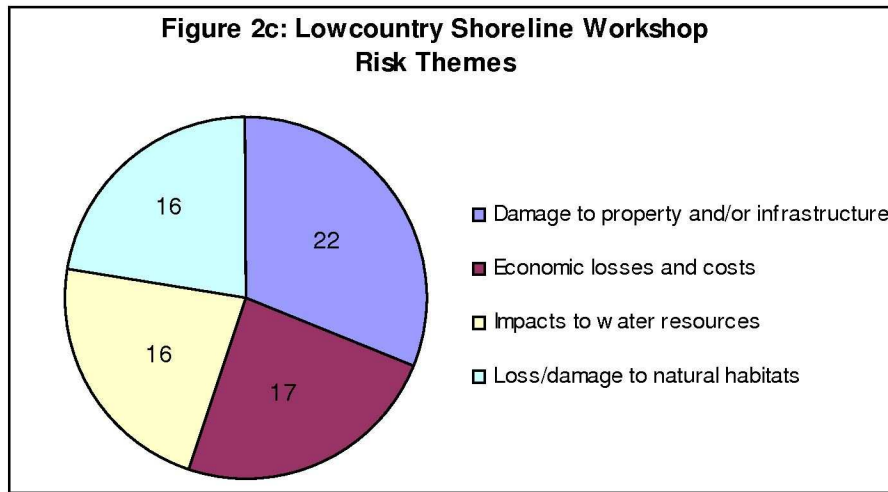

Figure 2b: Lowcountry Participants by Category
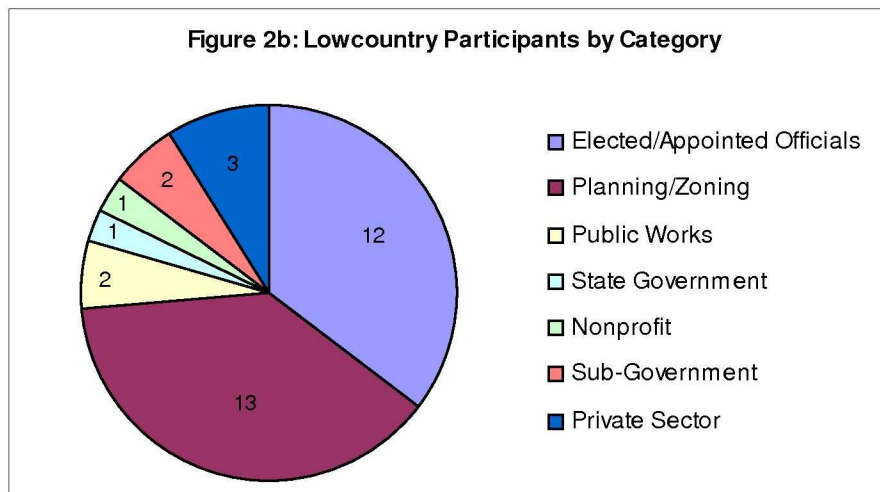
WORKSHOP OUTCOMES

Participants were asked to identify the risks of shoreline change in their communities. After discussion, participants were given the opportunity to vote on the risk or risks they felt were most prevalent to their community. The risks receiving the most votes were grouped into themes. The risks and the risk themes are included in Table 2a.

Table 2a: Lowcountry Shoreline Workshop Risks and Risk Themes

Risk Themes	Risks
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 instances a theme was voted on by participants. The themes included in Figure 2c were voted on in four or more instances. Damage to property and/or infrastructure was identified as the greatest risk of shoreline change in Lowcountry communities, receiving a total of 22 votes.

Figure 2c: Lowcountry Shoreline Workshop Risk Themes

- Damage to property and/or infrastructure
- Economic losses and costs
- Impacts to water resources
- Loss/damage to natural habitats

Additionally, participants identified the challenges and barriers of addressing shoreline change in their community. Following the discussion, participants were given the opportunity to vote on the challenges and barriers they perceived to hinder their community the most. The challenges and barriers receiving the most votes were grouped into themes. The challenges and barriers and the challenge and barrier themes are included in the Table 2b.

Table 2b: Lowcountry Shoreline Workshop Challenges/Barriers and Challenge/Barrier Themes

Challenge/Barrier Themes	Challenges/Barriers
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 ones 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 instances that a theme was voted on by participants. The themes included in Figure 2d were voted on in four or more instances. Mindset/resistance/denial was identified as the greatest barrier to addressing shoreline change in Lowcountry communities, receiving a total of 20 votes.

Figure 2d: Lowcountry Shoreline Workshop Barrier Themes
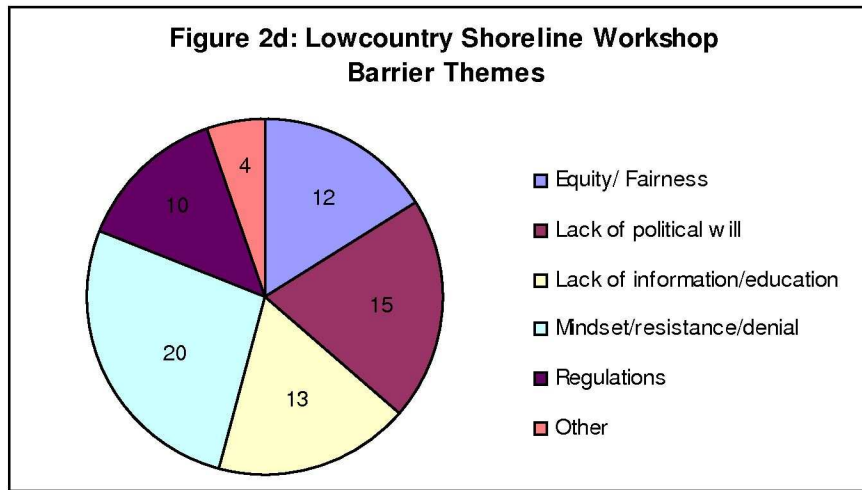
A number of repeating topics were discussed in several breakout groups, although the opinions on these topics often differed. Some of the topics related to risk and barrier ideas that were listed on the flip charts, and others were related to new ideas that were brought up during discussion. Topics were considered to be repeating if they were discussed in a single focus group conversation at least four times. Table 2c lists the five repeating ideas that were discussed by two or more breakout groups.

Table 2c: Repeating Ideas Discussed in Multiple Focus Groups

Repeating Idea	# of Groups that Discussed Idea
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
Reduce population densities in areas of high risk by limiting development (retreat)	3

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 20%. Seventeen (94%) of the Lowcountry participants who completed an evaluation form said that they intended to apply knowledge gained from the workshop to their work.

Figure 2e: Percent of Participant Knowledge Increased by Lowcountry Shoreline Workshop
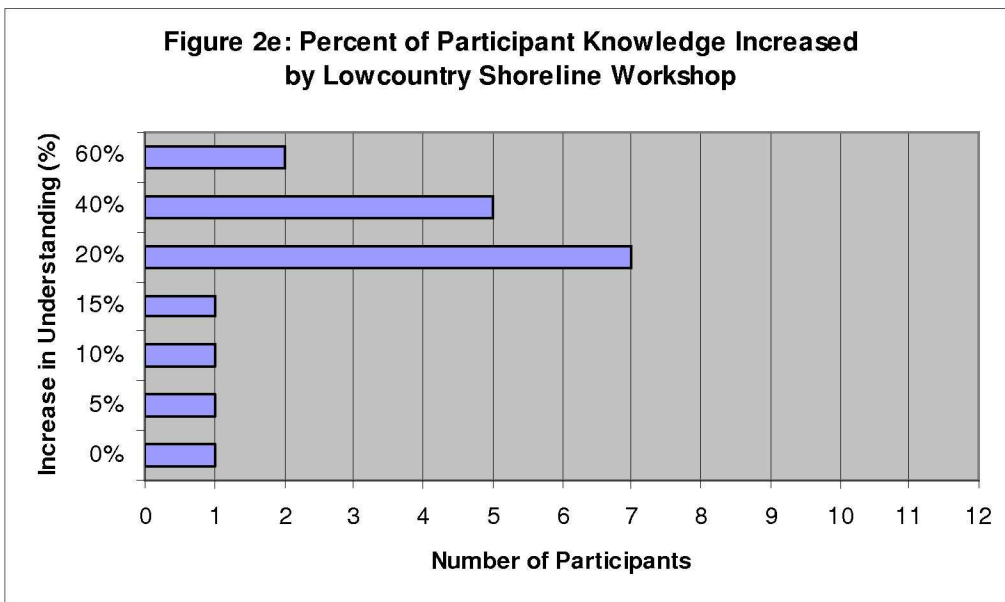
Berkeley-Charleston-Dorchester Workshop Results
November 4, 2009
Lowcountry Graduate Center; North Charleston, SC
Workshop Contact: April Turner, S.C. Sea Grant Extension, April.Turner@scseagrant.org
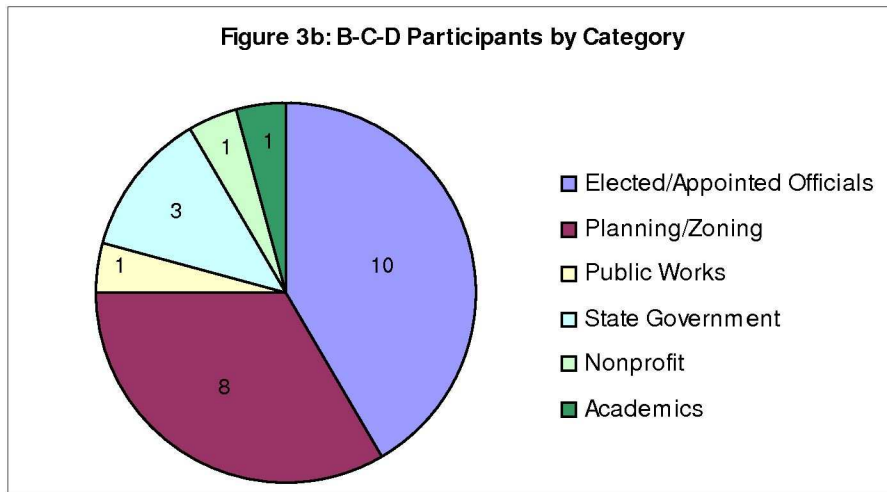
REGIONAL CHARACTERIZATION

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, where as 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. Population in the BCD region increased 30.1% from 1990-2009 with Dorchester County experiencing the greatest change (increase of 57%). Charleston County has the largest population of any S.C. coastal county at an estimated 355,276 people (US Census Bureau 2010). In addition to being a population and economic center in the coastal 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.

WORKSHOP ATTENDANCE

The B-C-D Shoreline Change Workshop participants were 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 comprising 75% of the total attendees.

Figure 3a: B-C-D Participants by County

- Berkeley County
- Charleston County
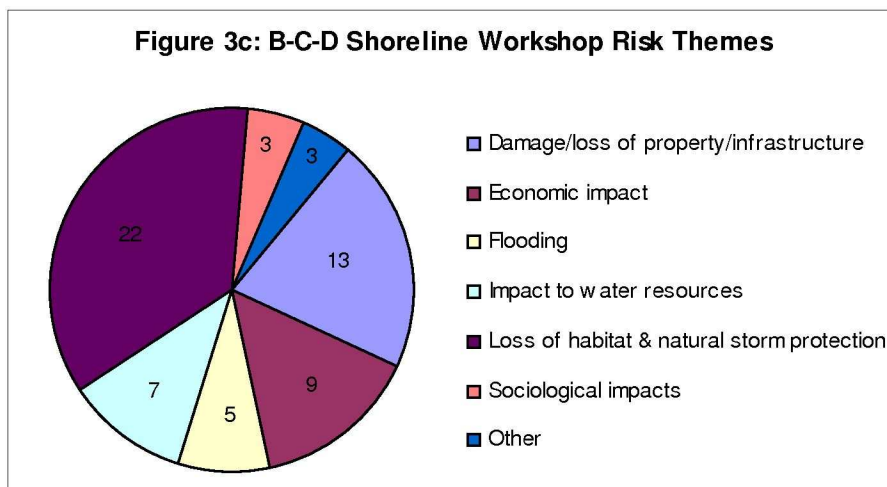- Colleton County
- Richland County
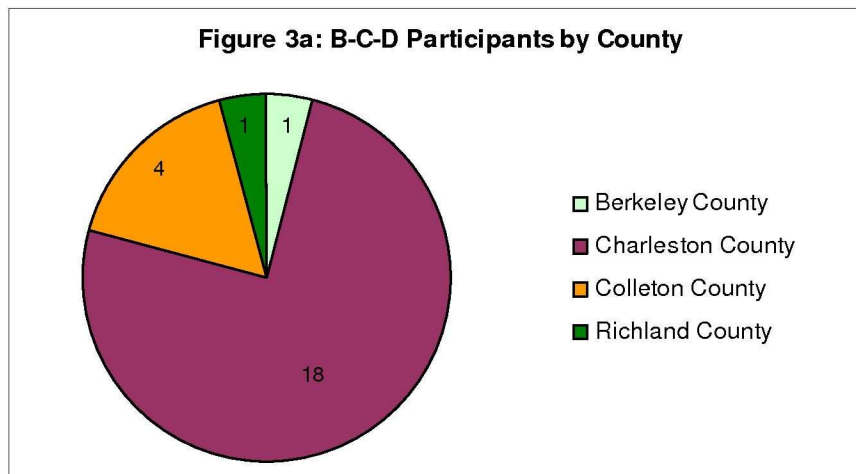
The participants of the B-C-D Shoreline Change Workshop were grouped by job affiliation (Figure 3b). Of the twenty-four total participants that attended the workshop, 10 of them are elected or appointed officials (42% of total participants), and 8 of them work in a planning or zoning department (33% of total participants).

Figure 3b: B-C-D Participants by Category

- Elected/Appointed Officials
- Planning/Zoning
- Public Works
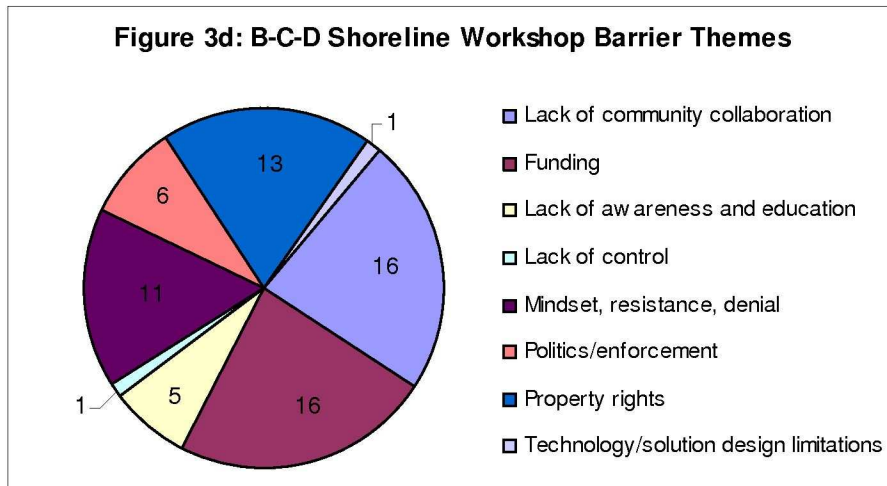- State Government
- Nonprofit
- Academics

WORKSHOP OUTCOMES

After a discussion of community shoreline change risks, participants were asked to vote on the risk or risks they felt were most prevalent to 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), and the total number of votes for each theme was tallied (Figure 3c). 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. Damage/loss of property/infrastructure was also identified as a high risk, receiving 21% of the votes casted.

Figure 3c: B-C-D Shoreline Workshop Risk Themes

- Damage/loss of property/infrastructure
- Economic impact
- Flooding
- Impact to water resources
- Loss of habitat & natural storm protection
- Sociological impacts
- Other

Following a discussion of the challenges/barriers to addressing shoreline change in B-C-D 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), and the total number of votes for each theme was tallied (Figure 3d). 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. 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.

Figure 3d: B-C-D Shoreline Workshop Barrier Themes

- Lack of community collaboration
- Funding
- Lack of awareness and education
- Lack of control
- Mindset, resistance, denial
- Politics/enforcement
- Property rights
- Technology/solution design limitations

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 shoreline change by at least 20%. 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.

Figure 3e: Percent of Participant Knowledge Increased by B-C-D Shoreline Workshop
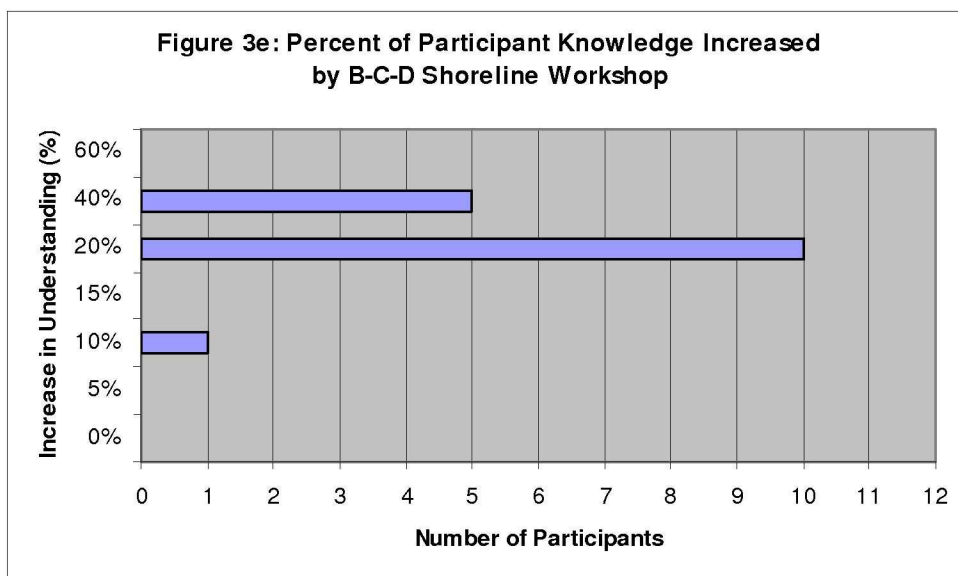
<u>**Waccamaw Workshop Results**</u>
November 18, 2009
Coastal Carolina University – Conway, SC
Workshop Contact: April Turner, S.C. Sea Grant Extension, April.Turner@scseagrant.org
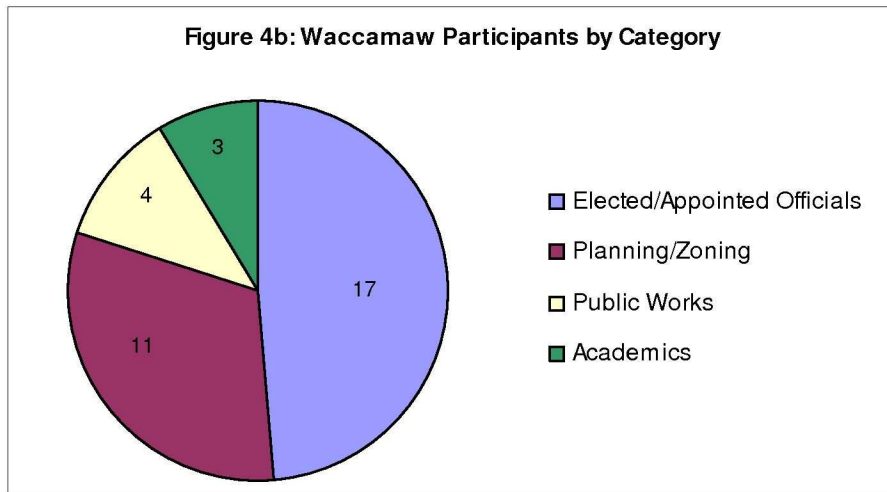
REGIONAL CHARACTERIZATION

The Waccamaw region is located in the northern portion of the state, and contains Horry, Georgetown and Williamsburg Counties. Horry and Georgetown are among the eight coastal counties (shoreline workshop target audience), and together these two counties make up what is known as the Grand Strand and South Strand regions comprising 1,949 square miles. Population in Horry and Georgetown Counties increased 70.5% between 1990 and 2009. Horry county had the greatest population change of all the coastal counties with an increase of 83.2% from 1990-2009 (US Census Bureau 2010). The Grand Strand is characterized predominantly by Myrtle Beach at its center (within Horry County) 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 in the south. The North Inlet-Winyah Bay NERR is located within the South Strand and is an area characterized by high quality coastal waterways. North Inlet is an ocean-dominated estuary and Winyah Bay is the location where four rivers meet the Atlantic Ocean.

WORKSHOP ATTENDANCE

The Waccamaw Shoreline Change Workshop participants were 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 comprising 80% of the total workshop attendees.

Figure 4a: Waccamaw Participants by County

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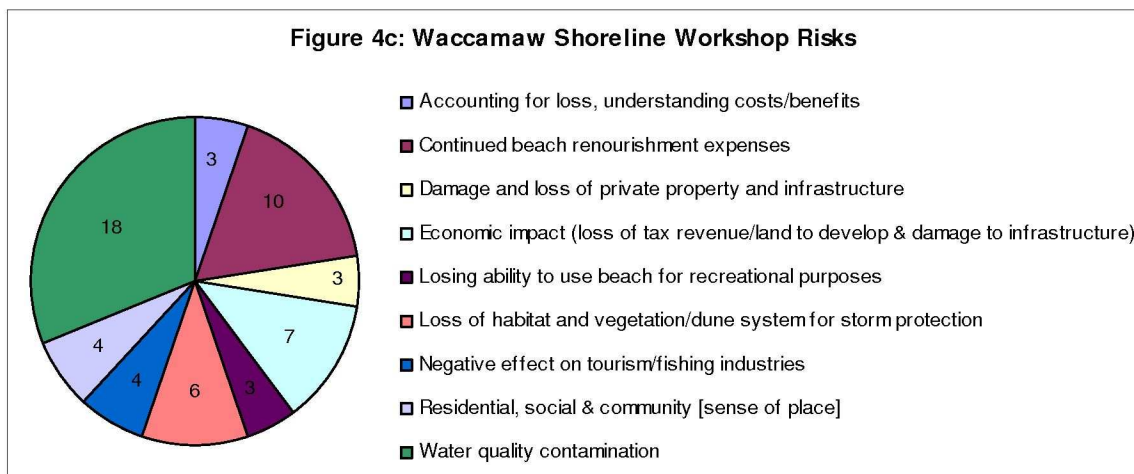- Georgetown County
- Richland County
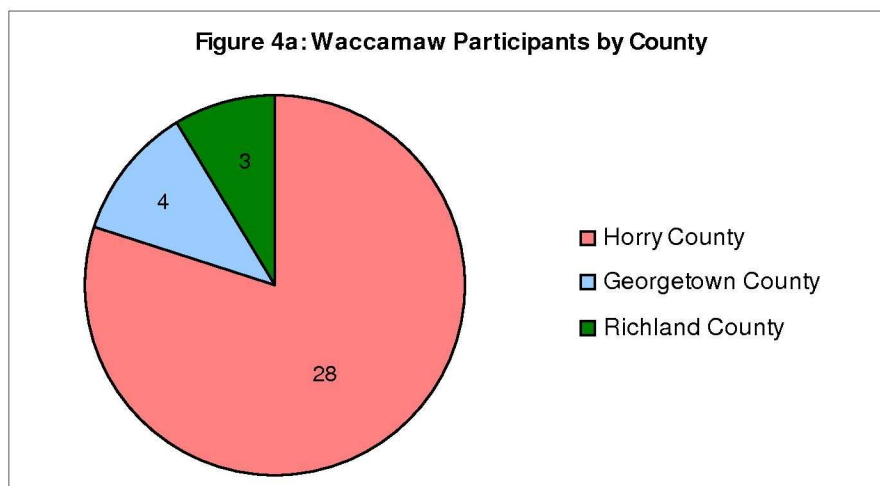
The participants of the Waccamaw Shoreline Change Workshop were grouped by job affiliation (Figure 4b). Of the thirty-five total participants that attended the workshop, 17 are elected and appointed officials (49% of total participants), and 11 of them work in a planning or zoning department (31% of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

Figure 4b: Waccamaw Participants by Category

Legend:
- Elected/Appointed Officials
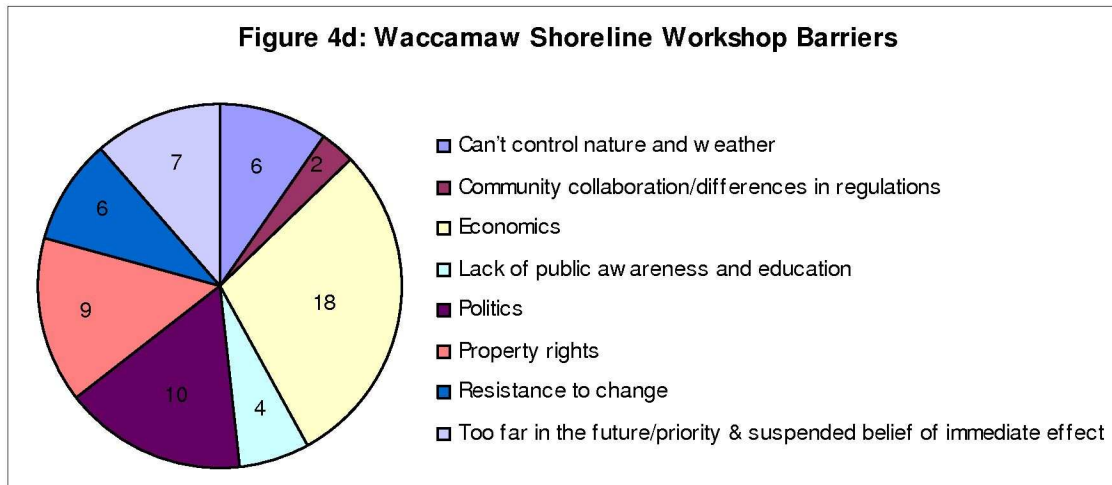- Planning/Zoning
- Public Works
- Academics

WORKSHOP OUTCOMES

After a discussion of community shoreline change risks, participants were asked to vote on the risk or risks they felt were most prevalent to 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. Data analysis began by calculating the number of votes for each risk to determine each breakout group's top three risks. In many cases, several risks tied for second or third place, and therefore were grouped with the top three. The top three risks from each group were compared (Figure 4c) to determine the most important perceived shoreline risks in the Waccamaw region. 'Water quality contamination' was at the top of every breakout group's list and received 18 votes overall.

Figure 4c: Waccamaw Shoreline Workshop Risks

Legend:
- Accounting for loss, understanding costs/benefits
- Continued beach renourishment expenses
- Damage and loss of private property and infrastructure
- Economic impact (loss of tax revenue/land to develop & damage to infrastructure)
- Losing ability to use beach for recreational purposes
- Loss of habitat and vegetation/dune system for storm protection
- Negative effect on tourism/fishing industries
- Residential, social & community [sense of place]
- Water quality contamination

Following a discussion of the challenges/barriers to addressing shoreline change in Waccamaw 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. Data analysis began by calculating the number of votes for each barrier to determine each breakout group's top three barriers. In many cases, several barriers tied for second or third place, and therefore were grouped with the top three. The top three barriers from each group were compared (Figure 4d) to determine the most important perceived barriers to addressing shoreline change in the Waccamaw region.

Figure 4d: Waccamaw Shoreline Workshop Barriers

- Can't control nature and weather
- Community collaboration/differences in regulations
- Economics
- Lack of public awareness and education
- Politics
- Property rights
- Resistance to change
- Too far in the future/priority & suspended belief of immediate effect

WORKSHOP EVALUATION

Twenty-four of the thirty-five participants at the Waccamaw Shoreline Change Workshop completed a workshop evaluation form. Seventeen of those responding indicated that the workshop increased their knowledge of shoreline change by at least 20%. Twenty-three (96%) of the Waccamaw participants who completed an evaluation form said that they intended to apply knowledge gained from the workshop to their work.

Figure 4e: Percent of Participant Knowledge Increased by Waccamaw Shoreline Workshop
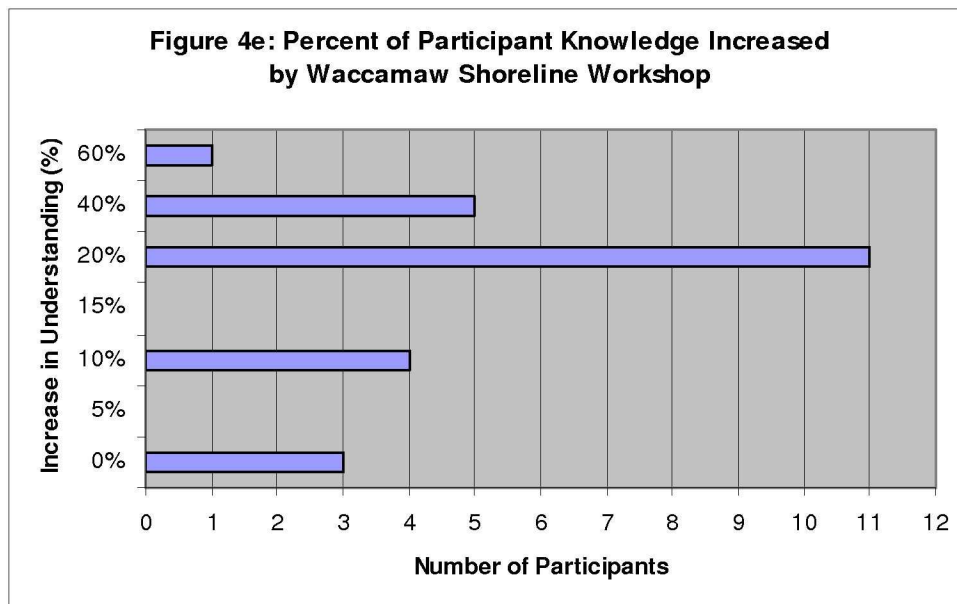
Shoreline Change Workshop Series Discussion

*Note: The discussion section of this report was created using the notes taken by SCCIN partners during the breakout sessions of each of the shoreline workshops. Quotations are used in some of the text in an attempt to convey the words of the workshop participants as accurately as possible. However, it should be noted the quotations are taken verbatim from the workshop discussion notes and may not be the exact words of the participant.

Education and Training

Decision-makers
Throughout the Shoreline Change Workshop Series the need for training and education was overwhelmingly identified as the most important thing that could help communities address shoreline change more effectively. Specifically, there is a call for more training and guidance from the state on how to assess and address shoreline change. Having training requirements for those in decision-making positions, similar to the continuing education requirements for planning professionals in South Carolina, was suggested several times. The need for case studies indicating what is and is not working to address shoreline change in coastal communities and the need for more shoreline change models (of all scales, including at the local scale and broader scales) and model ordinances was also discussed. Workshop participants emphasized the importance of obtaining science-based information that is easy to understand, since much of the science-based information on the topic that exists is difficult for non-scientists to interpret and disseminate. It was also suggested that the information be kept short and concise, inferring that people do not want to read long reports. In all of the workshops blending economics with education was discussed, because as one participant put it "people understand dollars and cents". In this regard, a cost-benefit analysis comparing the benefits/costs of addressing or not addressing shoreline change was identified as a tool that could help educate the public and officials. Much of the general public was perceived by participants as lacking recognition of any shoreline change problems.

Realtors and Homeowners
During the Lowcountry workshop new home buyers and realtors were identified as two groups in need of education on the implications of shoreline change. This was found to be important so that people moving into the Lowcountry understand the risks of owning a home close to the shore before they commit to a purchase (participants of the BCD and Waccamaw workshops also discussed this; one BCD participant called for better real-estate disclosure information and due-diligence for land buyers). It was mentioned by at least one participant that many of the beach-front homes in the Lowcountry area are vacation homes and are not inhabited most of the year. As such, it was suggested that people who have vacation homes in the Lowcountry area are not as involved with education and protection of their property and therefore new strategies may need to be developed to engage them. In addition, it was suggested that people in the Lowcountry who do not understand shoreline change and its implications may respond to information presented on how shoreline change may affect stormwater runoff and water quantity, two important and tangible issues to the public in that area. Lowcountry participants discussed the idea of repetitive education such as doing a series of newspaper articles on shoreline change as

opposed to a single long one, or including information in water and electric bills. One person suggested the media should have been present at the SCCIN shoreline workshop in order to write an article and inform the public that shoreline change discussions are taking place.

Public
Participants of the BCD workshop suggested maps and visual aids should be presented to decision-makers to illustrate the extent of the problems of shoreline change and better outline the high risk areas. In terms of educating the public, BCD participants suggested the best method of doing this is by word of mouth, and therefore it may be beneficial to target various civic organizations in communities to enlist their help (a Lowcountry participant suggested partnering with other groups such as League of Women Voters or Master Naturalists who might reach other audiences). Furthermore, it was emphasized that both decision-makers and the public in non-coastal areas also need to be educated about shoreline change and how it may affect them (Waccamaw and Lowcountry participants also mentioned this; in terms of who is going to pay for shoreline change one Lowcountry participant stated "the rest of the state has to buy into it" in order for anything to actually happen). This was considered to be particularly important by participants because people in non-coastal areas are currently perceived as not interested in shoreline change or the implications of it.

Waccamaw workshop discussions identified working with the media (T.V., radio, billboards, and internet) as a way to reach and educate the public (a Lowcountry participant suggested that all shoreline related reports and information should be posted on the Web and the internet should be used as a communicative vehicle). Participants also suggested that educational programs for schools could be beneficial (one Lowcountry participant also mentioned this), and that tourists should be targeted for education as well. Several Waccamaw participants elaborated on using a cost-benefit analysis of addressing shoreline change for educational purposes. One participant suggested performing an analysis on the present costs versus the future costs of shoreline change, and stated that that we "shouldn't need to spend money in the future to correct mistakes of the past" (a BCD participant said we need to anticipate the cost of rebuilding infrastructure that is damaged due to erosion and flooding). It was also recommended that analyses show the full cost, an individual's cost (e.g. house) and the public cost (e.g. federal flood insurance). Another participant said that we need a better way for the valuation of natural and environmental resources to account for those types of losses in economic terms. It was suggested tools that could demonstrate saving the blue heron is important or show the benefits of habitats to people would be useful for educating the public.

Policy and Regulation

Policy and regulation were recurring topics of discussion throughout the workshop series. This discussion included the need for:

- collaboration among communities and regions,
- statewide regulations,
- science-based regulations,

- a state estuarine management plan,
- more enforcement and stricter penalties to override potential benefits of breaking the law,

- tighter building restrictions and setback lines,
- market-based incentives for municipalities and the public to be proactive (federal flood insurance was frequently criticized through-out the workshops), and

- comprehensive plan updates (community resource inventories were recommended by several participants so that plans could be updated accordingly).

It was suggested that facilitators work with communities to go through the process of finding consensus of what needs to be done to address shoreline change. The SCDHEC OCRM was also identified as a state organization that should provide leadership on shoreline issues, and explain what needs to be done so local ordinances can be formed. Additionally, it was said that SCDHEC OCRM (not just local officials) should help enforce shoreline regulations. Several participants recognized that new laws and regulations could result in law suits because of private property rights. The issues surrounding private property rights, takings and shoreline change were continuously brought up in discussion. A few BCD participants mentioned that regardless of regulations some areas will be protected (e.g. downtown Charleston) at the sacrifice of the intertidal zone. The question was raised "how do you tailor your decisions to individual circumstances and communities versus the current approach which treats it all the same?". Instating a luxury tax on houses that are built too close to the shoreline for use in emergency situations was suggested at the Lowcountry workshop. It was also said that regulations governing purchasing land through real estate transfer fees need to change so that towns can purchase vulnerable properties; currently Hilton Head has a program, but it operates under the grandfather clause.

Erosion and Beach Renourishment

The topic of erosion and beach renourishment was discussed in all of the workshops. Most of the discussion was centered on the cost of renourishment; however the availability of sand and hazards of renourishment were also discussed. After stating that beach renourishment only works for five years, one Lowcountry participant said it "doesn't work long enough for the millions of money spent; waste of money". One BCD participant said it is "out of the question for a lot of municipalities for things like beach renourishment (because of cost), so it needs to be left up to the homeowners if they want it". When speaking of the implications sea level rise may have on septic tanks, another BCD participant supported beach renourishment with the stipulation that it depended on the placement of the septic tanks, whether they are in front or behind the houses. In a separate conversation at the BCD workshop it was suggested that there are alternatives to beach renourishment such as dune restoration, and information should be aggregated on these types of activities. During the Waccamaw workshop it was suggested local governments need relief from the costs of beach renourishment, and federal and state taxes should be adjusted to provide funding for local projects. Another participant said that the government should "take some of the money that would have been used for renourishment and begin to buy land (looking at pulling back) and give everyone the opportunity to have access to the shoreline". Building on land that has undergone beach renourishment was viewed as a real risk by one Waccamaw participant who was disturbed to hear that some communities are moving the baseline seaward. That person stated "moving the line back and forth is a problem". During another renourishment versus retreat discussion at the Waccamaw

workshop one participant added, "Hunting Island does it (renourishment) every two years. If a state park is defended, how in the world do we expect retreat to work?".

Water Resources

Impacts to water resources were another topic of discussion in each of the regions. Issues discussed included stormwater runoff and management, septic tanks and drainage, and saltwater intrusion and the availability of drinking water. One Waccamaw participant said, "Shoreline change does not typically directly result in water quality impacts. But, contamination from damaged structures, septic tanks, etc" does. Also, saltwater intrusion". Another Waccamaw participant said, "Salinity is really going to be a big issue for us", because our "drinking water is mostly from the Intracoastal Waterway and the Waccamaw River". A BCD participant commented, "Saltwater intrusion (in the BCD area) also comes from the fact the flow in the Cooper and Ashley are not what it should be. It's an up river and upland issue; reduced flows from up river." Continuing the conversation another participant added, "The lawsuit with North Carolina was too small in scope, only addressing low flow in drought years." They went on to state saltwater intrusion was an interstate issue and suggested some kind of partnership with North Carolina. Another BCD participant said, "Infrastructure could be more affected by stormwater runoff rather than future sea level rise." In order to address the infrastructure problem, one participant suggested the relocation of pipes and sewer drains. Comments regarding the need for improvements to drainage systems were also made during the Lowcountry and Waccamaw workshops. Replacing septic tanks with sewer systems was suggested a couple of times. It was also stated that shoreline change may threaten and damage wastewater infrastructure. The need for more flood control projects was also identified in the Lowcountry workshop, and one participant suggested creating impediments to flow and building roads higher.

There are a few other topics that were not discussed in each of the shoreline workshops, but may have been significant to a single workshop. The need to prioritize the steps to address shoreline change was discussed a great deal in the Lowcountry workshop. When speaking of state and local agencies one participant suggested that deadlines need to be set in order to see action. During the BCD workshop a question was raised in regards to who owns the accreted part of barrier islands and how would someone be able to develop it (Sullivan's Island is experiencing accretion in some areas). Another participant added, "Accreted land should never be built on". A participant of the BCD workshop also noted that as sea level rises, there will be a desire to armor the coast. During the Waccamaw workshop participants discussed the risk of losing the sense of place as the shoreline changes, and one participant declared, "Social and community needs are a subject that should be addressed". Finally, shoreline change discussions were brought up in both the Lowcountry and BCD workshops. A BCD participant said, "There is a need for places to address the issues of shoreline change in a public discussion". It was said that people are polarized, and get angry when solutions are not what they want them to be, and therefore a neutral place for discussions is needed. Similarly, a Lowcountry participant added communities should "embrace opportunities to have open dialogue". Another recommended "education among professionals to know how to talk to people".

What to Expect From the South Carolina Coastal Information Network

This workshop series provided participants with an introduction to the implications of shoreline change, in addition to serving as an informal assessment to determine what South Carolina coastal communities need to address these issues in a more proactive manner. The need for education and training specifically tailored for various groups (e.g., local government officials, realtors, home owners) was the dominant recurring theme. Collaboration among officials and consistency of regulations was also a highlighted need. Based on this information, the future outreach efforts of the SCCIN partners will strive to meet these needs with the common goal to increase the ability of coastal communities to plan for and respond to shoreline change and other environmental issues. Potential activities may include hazards mitigation training (e.g., NOAA Coastal Services Center's Roadmap for Adapting to Coastal Risk Training), public forums to foster information exchange, and workshops/seminars focusing on the economics of shoreline change.

References

Fischer, Frank. 1991. Risk Assessment and Environmental Crisis: Toward an Integration of Science and Participation. Industrial Crisis Quarterly 5(2): 113-132.

Hayes, Miles and Jacqueline Michel. 2008. A Coast for All Seasons: A Naturalist's Guide to South Carolina. Pandion Books, Research Planning, Inc., Columbia, S.C.

Moore School of Business, Division of Research. 2009. Underappreciated Assets: The Economic Impact of South Carolina's Natural Resources. University of South Carolina, Columbia, SC.

PricewaterhouseCoopers. 2008. South Carolina State Ports Authority: Financial Statements June 30, 2008 and 2007. PricewaterhouseCoopers LLP, Spartanburg, SC.

South Carolina Association of Counties. 2008. 2008 County Profiles. S.C. Association of Counties, Columbia, S.C.

South Carolina Coastal Council. 1979. The South Carolina Coastal Program. S.C. Coastal Council, Charleston, SC.

South Carolina Department of Health and Environmental Control—Office of Ocean and Coastal Resource Management. 2010. Adapting to Shoreline Change: A Foundation for Improved Management and Planning in South Carolina. South Carolina Department of Health and Environmental Control, CR-009823, Charleston, SC.

South Carolina Department of Parks, Recreation and Tourism. 2007a. The Economic Contribution of Tourism in South Carolina-2007 Tourism Satellite Account Results. S.C. Department of Parks, Recreation and Tourism, Columbia, S.C.

South Carolina Department of Parks, Recreation and Tourism. 2007b. The Economic Impact of Domestic Travel on South Carolina Counties, 2007. S.C. Department of Parks, Recreation and Tourism, Columbia, S.C.

United States Census Bureau. 2010. U.S. Census and Population Predictions. U.S. Census Bureau, Populations Division, Washington, D.C.

South Carolina Coastal Information Network
►►*A Coastal Partnership: providing educational and training opportunities for coastal community officials*
www.sccoastalinfo.org