

**Southeast and Caribbean  
Climate Outreach Workshop:  
Building a Community of Practice of Climate  
Extension and Outreach Professionals**

**Workshop Report**

**May 24 to 26, 2010  
Wyndham Jacksonville Riverwalk Hotel  
Jacksonville, Florida**

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NOAA Southeast and Caribbean Regional Team (SECART)  
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A view of downtown Jacksonville from across the St. Johns River.  
Photographs from the workshop may be found on the web site for the  
Southeast and Caribbean Climate Extension and Outreach Community of  
Practice website:  
<http://collaborate.csc.noaa.gov/climateadaptation/pages/scceocp.aspx>  
All photographs were taken by Michael Bailey, NOAA Fisheries.

## I. Executive Summary

To increase our capacity to coordinate and perform outreach, extension, and communication of climate information to stakeholders and decision makers, practitioners in the Southeast and U.S. Caribbean gathered at a workshop in Jacksonville, Florida, in May 2010. Workshop participants had education or outreach responsibilities related to climate and worked with a broad range of audiences, including private citizens, nonprofits, government agencies, business owners, resource managers, academia, elected officials, planners, regional planning councils, zoning commissions, media, and managers representing a variety of sectors (utilities, stormwater management, agricultural extension, transportation).

Information was shared among workshop participants through presentations and facilitated breakout discussions. Presentations included updates on the latest climate science for the region, the status of NOAA Climate Services activities, and the NOAA Climate Services portal (*climate.gov*). Information on tools and resources for climate outreach, including a variety of visualization techniques, was also provided.

A portion of the agenda was devoted to understanding and addressing stakeholder perceptions and perspectives. Presentations covered topics such as behavior change theories, risk perception variables, social marketing, and other tactics for fostering adaptation. Case studies were shared by participants who have made progress in the outreach and extension of climate information. Case studies focused on Satellite Beach, Florida; Savannah, Georgia; North Carolina; the Southeast Florida Regional Climate Change Compact; and the Carolinas Coastal Climate Extension Initiative.

Workshop participants indicated that they received a wide variety of questions from their customers about climate change and the anticipated impacts. Participants noted that there are still many individuals among our audiences that remain unconvinced that climate change is real. Other audience members seek answers to questions about specific impacts on a sector of interest such as the natural environment or input on what tools or resources are recommended to help address the impacts.

Participants identified the anticipated impacts from climate change of concern to the region. The highest ranked priorities based on group consensus voting were sea level rise, built environment and infrastructure, flooding, natural environment impacts, economics, planning, and social vulnerability and equity.

The top priority needs of participants to conduct outreach and communicate on climate change impacts were a consistent message from federal agencies and the science community on climate science and projections; tools for the public to “see” potential impacts of climate change at the local scale; steps for communities to take when using these tools; an expertise

directory vetted and with key search terms; high-resolution digital elevation models; and guidance on engagement specific to understanding climate change.

Participants noted the diversity of the audiences served and the importance of clearly identifying these audiences and tailoring climate education and outreach approaches specifically for those audiences. Participants identified education and communication approaches that have been or should be effective with these audiences. Among others, approaches identified included the use of visualization tools, working with established community groups and leaders, and focusing on the issues important to those groups.

The final session of the workshop was designed to move workshop attendees closer to becoming a community of practice for climate outreach and engagement. Participants identified next steps for the community as a whole to be the development of tools and resources that were identified as priority needs; inviting additional participants in the region to engage with the community of practice; developing fact sheets and consistent messaging on the science; providing access via a portal to resources identified during the workshop; establishing work groups in specific areas to develop and test products; and using SECART, the media, the new NOAA Regional Climate Service directors, and others as mechanisms to get the climate message out and coordinate activities.

It became clear that a follow-up meeting was a high priority for the group. Suggestions were made on the types of attendees that should be included in an expanded future workshop, the format for such a workshop including a virtual option, and specific topics that should be included in the agenda.

## II. Introduction

Coastal decision makers have expressed a need to incorporate the implications of climate change into their existing planning practices. However, these decision makers often lack sufficient climate literacy and context to incorporate climate information into their work. Within the Southeast and Caribbean region (North Carolina, South Carolina, Georgia, Florida, Puerto Rico, and the U.S. Virgin Islands), the needs are acute and urgent. Decision makers require more guidance on effectively communicating climate impacts to government officials, the public, and other stakeholders and in assisting these users with options for adaptation strategies. The information and guidance they receive must be accurate, useful, and timely.

With funding from NOAA's National Sea Grant College Program, the NOAA Southeast and Caribbean Regional Team (SECART) joined with the Sea Grant programs in the region to advance climate engagement strategies. The goal of this project was to enhance the capacity of this community to provide accurate and timely information, tools, and assistance related to climate change impacts and adaptation to stakeholders and to build a “community of practice”

of climate extension and outreach professionals in the Southeast and Caribbean region. The initial focus of the project was organization of a workshop to bring outreach professionals together to exchange information on climate change science, impacts, and best practices for outreach.

The workshop planning committee members included representatives from each Sea Grant program in the region, SECART, the NOAA Coastal Services Center, the Georgia Coastal Zone Management Program, and the North Carolina National Estuarine Research Reserve. The project was administered by the Georgia Sea Grant College Program.

The workshop was held at the Wyndham Hotel in Jacksonville, Florida, May 24-26, 2010. See Appendix A for the full workshop agenda and Appendix B for a list of participants and planning committee members.

### **III. Moving towards a Community of Practice**

The workshop brought together 52 outreach professionals from the four South Atlantic states and Puerto Rico, as well as state and regional climatologists. The training, presentations, and opportunities for interaction at the workshop, plus the framework established for future communication and collaboration, form the basis for the community of practice.

To help workshop participants understand the characteristics of their fellow attendees and identify other potential partners, David Bryant, Georgia Sea Grant Program, provided an overview of results from a survey participants completed during workshop registration (presentation available at <http://collaborate.csc.noaa.gov/climateadaptation/pages/scceocp.aspx>). The participants cut across areas of expertise, location, and organization. Sea Grant programs, national estuarine research reserves, university outreach organizations, and coastal zone management programs made up about half of the participants. The other half was even more diverse, with representatives from local and state governments, NOAA offices (National Marine Fisheries Service, National Marine Sanctuaries, Coastal Services Center, National Weather Service, Regional Integrated Science and Assessment), Environmental Protection Agency (EPA), U.S. Geological Survey (USGS), Southeast Regional Climate Center, state climatology offices, and nongovernmental organizations.

By design, workshop participants were largely outreach professionals. Ninety-six percent of the participants listed extension and outreach as a professional activity. Less than a third participated in biological or physical science research, but nearly two-thirds performed some social science research. Seventy-nine percent were also involved in management and administration. This group was well chosen to inform policy related to climate change; the top five priority stakeholder groups served by the attendees were identified as follows:

1. City and county government staff members
2. City and county government officials
3. Advisory committee or local council members
4. Extension, education, or communications staff members
5. State agency staff members

### **Important Background Resources for Linking Community Members**

The following Web-based resources exist to help maintain and build this community:

- **NOAA Coastal Services Center *Coastal Climate Adaptation* site:** The NOAA Coastal Services Center (CSC) website is designed to be a resource and a “gathering place” for climate adaptation communities of practice at varying scales. It has resources, a forum, a calendar, and areas for regional groups to exchange information. Presentations from the Southeast and Caribbean Climate Outreach Workshop are available here: <http://collaborate.csc.noaa.gov/climateadaptation/>.
- **NOAA Climate Services site:** This site has a breadth of resources, including its “ClimateWatch” magazine, K-12 curriculum, and informal education materials and climate data. Unlike the CSC site, it is not designed to host a community of practice but offers much that can be of use to that community: [www.climate.gov](http://www.climate.gov).
- **EPA Climate Change site:** Like NOAA, the EPA offers a Climate Change website with extensive resources. Climate change indicators, the latest science, and updates on regulation are available, along with assessments of economic, health, and environmental effects of climate change: [www.epa.gov/climatechange/index.html](http://www.epa.gov/climatechange/index.html).
- **Gulf of Mexico Climate Outreach Community of Practice:** The Gulf of Mexico region has a similar community of practice with a blog for continued collaboration: <http://stormsmart.org/>.

### **Value of a Community of Practice**

At the workshop, a plenary session was devoted to discussing how a Southeast and Caribbean Climate Outreach Community of Practice could be of value. Key points from that discussion included assertions that such a community

- Facilitates exchange and collaboration between science and policy communities
- Provides a forum through which successes of others can provide models to jump-start new projects
- Makes expertise in Southeast climate service groups (Southeast Regional Climate Center, state climatologists, university-based social scientists, etc.) accessible to managers of developing projects
- Allows members to ask for help from others
- Promotes development of regional toolkits
- Facilitates collaborative teams
- Facilitates finding partners for projects, grants, etc.
- Can supply a catalog of experts
- Can help avoid duplication of effort and promote transparency and consistency
- Promotes a stronger, more unified voice when seeking funding



- Allows sharing of resources at support level (e.g., graphic arts)
- Can offer basic information about important steps in originating projects (e.g., focus groups)
- Can offer point of entry to issue for public
- Can offer fact sheets and “ask the expert” function of website

At the end of the session, there was general agreement that the community formed at the workshop should continue to exchange ideas at subsequent workshops and through the NOAA Coastal Services Center’s Coastal Climate Adaptation website.

## IV. Climate Change in the Southeast and Caribbean Region

### Status of Climate Science in the Southeast and Caribbean Region

Many outreach professionals lack formal training in the science of climate change yet are expected to answer a range of questions about it. This is especially true for information about climate change on a regional scale, which is harder to locate for the Southeast than information about global or national climate change projections. The keynote address for the workshop addressed the current state of knowledge on climate change in the Southeast and Caribbean region.

**“Climate Change and the SECART Region.” Greg Carbone, Ph.D., University of South Carolina, Carolinas Integrated Sciences and Assessments (CISA) Center.** Dr. Carbone provided an update on the status of climate science in the southeastern U.S., with particular attention to the differences between climate change signals in this geographic region compared with those in the rest of the U.S. The full presentation is available at <http://collaborate.csc.noaa.gov/climateadaptation/pages/scceocp.aspx>.

Key points from the presentation include the following:

- Studies reviewed by the Intergovernmental Panel on Climate Change (IPCC) find little trend in annual temperatures in the southeastern U.S. from 1900 to the present, but annual temperatures increased modestly during the period from 1979 to present. This trend was most pronounced in winter months. Temperature trends for the region varied depending on the starting and ending periods, as well as the spatial extent considered. During the post-1975 warming period, both oceans and atmosphere had warmed.
- Climate models simulate global temperature quite well when the radiative forcings (e.g., solar, volcanic activity, greenhouse gas concentrations) are known. At a regional scale, the models simulate air temperature quite well when global ocean temperatures are known.
- Three ideas (citations in presentation) have been proposed to explain the modest temperature trends found in the Southeastern United States:
  - Interdecadal variability in ocean temperatures and resulting circulation patterns have led to cooler conditions in the region.

- Cooling in the Southeast could be an indirect response to global warming. There is no evidence to prove this, and recent work provides evidence to refute this notion.
- Increases in biogenic aerosols may have a cooling effect that offsets warming in the region. Reforestation of species releasing large amounts of isoprenes may explain this.
- Because they are infrequent, natural variability obscures detection of any historical trend in tropical cyclones. Some argue that data limitations in the early part of the record may contribute to the challenge. Recent work suggests that greenhouse warming will cause greater average cyclone intensity, increases in the frequency of the most intense cyclones, and decreases in the globally averaged frequency of all cyclones.
- Uncertainty regarding the magnitude, timing, and location of future climate change will persist into coming decades. Outreach professionals need to be aware of the parameters that scientists have used in calculating trends. When discussing trends with stakeholders, professionals need to be transparent about the data and methods used while conveying that societal mitigation and adaptation strategies will need to be made without complete knowledge of the future.

#### **Existing Activities: NOAA’s Climate Service, Regional Efforts**

There are many activities related to climate adaptation already underway in the region. During this session, presenters discussed opportunities for new partnerships and tools that will help partners collaborate as a community of practice.

**“Regional Climate Services: Communication and Education Assessments.” Ned Gardiner, Visualization Project Manager with NOAA’s Climate Program Office.** In this presentation, Gardiner provided information on NOAA’s climate services and what value it provides for climate service customers and the community of practice. He used historical tropical cyclone (hurricane) tracks and vulnerability indices as examples of how climate services could be applied to climate impacts in coastal areas. In particular, Gardiner showed examples of vulnerability, modeled water-level output, and real storm impacts from Hurricane Isabel, which impacted the Outer Banks of North Carolina in 2003. Gardiner then discussed potential impacts under different scenarios of sea level rise for this area.

Rising demand for climate services, however, is not limited to issues of coastal vulnerability. Many segments of society and the economy will be impacted by changing climate. Gardiner discussed the 2009 publication, *Global Climate Change Impacts in the United States*, which examined potential impacts from climate change to seven socioeconomic sectors in nine regions of the U.S. The report is the most authoritative assessment of the best available science on climate change and its impacts on the U.S.—impacts already being felt, and impacts yet to come. The report was produced under the auspices of the interagency U.S. Global Change Research Program (GCRP), comprising some 13 U.S. science-based departments and agencies. It was authored by a team of top scientists (31) from those government agencies, as well as from the private sector and major universities and research institutions, specializing in climate change and the impacts of climate change.

Gardiner then discussed the proposed formation of a Regional Climate Services Enterprise within NOAA. The mission of the NOAA Climate Service would be to

- Understand, predict, and explain changes in climate
- Develop and disseminate the best available science to inform mitigation and adaptation
- Support decision makers regionally to globally with timely and authoritative information

**“Southeast and Caribbean Climate Outreach Workshop: Building a Community of Practice of Climate Extension and Outreach Professionals.” Stephanie Fauver, NOAA Coastal Services Center.** Fauver gave a quick overview of how participants may set up an account on the Coastal Climate Adaptation site (<http://collaborate.csc.noaa.gov/climateadaptation>).

### **Breakout Groups: Our Audience’s Concerns about Climate Impacts in the Southeast and Caribbean Region**

Workshop participants were given numerous opportunities to interact and share experiences throughout the workshop. Much of that interaction focused on the impacts of most concern to their audience with the hopes of coming to consensus on where our community should devote resources and work together to leverage those resources.

#### *Climate Inquiries*

The first opportunity for interaction came during workshop introductions. Participants were asked to share a question they have received about climate change. Responses ranged from not accepting that our climate is changing to specific questions about how residents would be impacted or why a particular county is not already taking action. This exercise shows the broad range of understanding of the topic, acceptance of the issues, and level of desire or readiness to take action. The full list of responses can be found in Appendix C. Examples include the following:

- Is it real? Is it a hoax?
- How can we reach out to communities to demonstrate it is happening?
- What are local examples of climate change and the effects on shellfish?
- What tool should I use to look at sea level rise?
- What is the most compelling information that I don’t have to be a scientist to understand?
- Why doesn’t county X do more?

During an initial breakout session, workshop participants were asked to identify the various audiences with whom they work and to identify and prioritize the climate change impacts of most concern to these audiences. The following questions were used during this initial brainstorming session:

1. Of the audiences we work with, which ones are requesting climate change and adaptation information?

2. Those participants who were not yet fielding many (or any) requests for climate information were asked to instead respond to the question: What do you think are some reasons you are not yet getting requests for climate information?
3. Which climate change impacts are your audiences most concerned about? Or which climate change impacts do you anticipate will be generating the most concern among your audiences?

### *Climate Audiences*

Audiences that workshop participants engage in climate outreach included private citizens, nonprofits, government agencies, business owners, resource managers, academia, elected officials, government agencies, planners, regional planning councils, zoning commissions, media, and managers representing a variety of sectors (utilities, stormwater management, agricultural extension, transportation). The full list of responses can be found in Appendix D (Question 1).

### *Reasons for Lack of Requests*

A variety of responses were received for why some participants felt they were not receiving requests for climate information. This full list of responses can be found in Appendix D (Question 2). These responses reflected many of the common barriers to taking action on climate adaptation, including

- Time scale issue – too far into the future
- Not a priority or competing priorities
- Do not anticipate impacts or risks
- Political issue – want to steer clear, not their job, too many politicians
- Resources – cost
- Lack of information – who/why/what to ask, message at appropriate education level
- Too much information – lack of leadership/coordinated message/authoritative source
- Not enough certainty in climate change science

### *Impacts of Concern*

The anticipated impacts of climate change in the region are numerous. Responses were captured on flip charts. Workshop facilitators combined the lists from all four breakout groups. This full list of responses can be found in Appendix D (Question 3). Each participant was asked to select the responses that they felt reflected the top 3 impacts for the region. Results of the voting process (number of votes in parentheses) indicate the priority impacts for the region:

- Sea Level Rise (33)
- Built environment and infrastructure (19)
- Flooding (18)
- Natural environment impacts (13)
- Economics (11)
- Planning (11)
- Social vulnerability and equity (11)

- Stormwater management (8)
- Habitat changes (8)

## V. Working with Stakeholder Audiences on Adaptation

### Understanding and Addressing Stakeholder Perceptions and Perspectives

The goal of the first session on Day 2 was to give outreach professionals the skills they need to integrate their knowledge of climate science with stakeholder needs to develop strategies that encourage adaptation. One necessary skill is the ability to facilitate behavior change by presenting climate adaptation information that accommodates a stakeholder audience's perceptions, needs, and barriers to action. The three presentations explored how people decide to change their behavior, what communications and social marketing strategies may be effective for changing behavior, and methods that make climate information accessible to stakeholders for incorporating into their planning practices. Brief descriptions of each presentation are included below.

**“Understanding Audiences and Fostering Adaptation Behaviors (Social Science Can Help!).” Heidi Recksiek, NOAA Coastal Services Center.** Audience characterization is important because different audiences are in different stages of their acceptance and understanding of climate change science (see, for example, the George Mason University Center for Climate Change Communication study, *Global Warming's Six Americas*, 2009). Recksiek discussed three different theoretical frameworks that can help with understanding audiences' levels of acceptance and behavior. The stages-of-change model is a useful framework for understanding why people are at different phases of acceptance and which strategic frameworks may be appropriate for reaching varied audiences. Another framework is the diffusion of innovation model, in which outreach to early adopters who act encourages others to do so as well. Finally, the risk behavior and communication framework relies on understanding risk perception, which is what people know and feel about risks and their options for action.

**“Using the Most Powerful Tools and Concepts from Social Marketing and Community Based Social Marketing.” Paul Monaghan, Ph.D., University of Florida Institute of Food and Agricultural Sciences.** Community based social marketing (CBSM) is a tool that applies commercial marketing practices to outreach and educational programs. Such programs require outreach professionals to cater to what stakeholders want and explain why the desired behavioral change is better than the current behavior. Practitioners adjust programs by determining if their CBSM strategies are giving the public what they want.

**“Tactics for Facilitating Adaptation.” Jessica Whitehead, Ph.D., South Carolina Sea Grant Consortium and North Carolina Sea Grant.** Outreach on implementing adaptation strategies must make climate science relevant and make adaptation to climate change

accessible to stakeholders. Once outreach professionals understand their stakeholder audience, they may encourage stakeholders to either adopt stand-alone adaptation planning processes or mainstream adaptive measures into existing decision-making processes and plans. Often, it is more feasible for decision makers to adapt existing planning and management to reduce climate change vulnerability, and outreach professionals can work with stakeholders to determine strategies that have no regrets or minimal regrets—i.e., actions that stakeholders may have considered anyway or that will provide benefits even if climate change impacts are not as destructive. By identifying audience needs, professionals can select top-down or bottom-up approaches to planning that ultimately reduce barriers to climate change adaptation.

### **Breakout Groups: Identifying Barriers and Future Outreach and Engagement Needs**

During the second breakout session, participants were asked to identify information barriers and gaps. The following questions were used to guide discussion:

1. What are the barriers to transferring climate adaptation information to stakeholders?
2. What are stakeholders' barriers to acting on climate change information?
3. Given the impacts of concern and the barriers in the Southeast and Caribbean, what are the outreach and engagement needs in the region? What are the gaps we can help address via outreach and engagement efforts?

Participants' responses to each question are synthesized in the narratives below. A full list of responses can be found in Appendix E.

#### *Barriers to Sharing Information with Stakeholders*

Participants' perceptions of barriers to sharing climate information with stakeholders can be categorized into audience characteristics, the messengers' (climate outreach professionals') characteristics, characteristics of the information provided, and characteristics of the methods used to disseminate information. Choosing target audiences is difficult because of the large number of potential audiences, those audiences' readiness to receive the information, and the limited number of available adaptation actions. Climate outreach professionals can be confused over the roles of various experts and messengers in a broader climate outreach and engagement strategy. They may also lack sufficient knowledge about climate change and about making that information relevant to stakeholders. Both audiences and messengers experience information overload on climate issues, and the information that exists may not be easily understandable or at the correct temporal and spatial scale to be relevant to decision makers. Barriers to communication include institutional constraints, the ability to tailor the message to the audience's social norms, competing sources of information, lack of available resources, and lack of federal mandates for action.

#### *Stakeholders' Barriers to Acting on Climate Change Information*

Participants related that their stakeholders lack sufficient motivation because they are overwhelmed with the problem of climate adaptation, unsure of how to measure results, concerned that they may be "wrong" about acting, and have few incentives to act. Politics also

are a factor—two of the four breakout groups referred to addressing the climate change topic in certain regions as “political suicide.” Other reported challenges to stakeholders include lack of funding, perceptions of spatial and temporal scales for actions and results, competing sources of information, uncertainty in understanding available information, a lack of information tailored to stakeholder needs, and challenges in planning capacities.

*Addressing Gaps in Outreach and Engagement Needs in the Southeast and Caribbean Region*

Most of the needs and capacities that participants identified focused on building the capacity to implement climate outreach programs. Groups saw the primary role of outreach and extension professionals as being a trusted resource with knowledge of science and expertise in local and regional issues. A community of practice is a vital resource that must be easily accessible to all. Such a community of practice will help outreach professionals in the region to form partnerships and coordinate existing efforts in ways that will help professionals learn from each other. It will also allow enhanced lines of communication between researchers and outreach professionals. This improved communication will facilitate developing better local scale information about the issues concerning stakeholders, including tools that will help audiences visualize and discuss specific local climate impacts and adaptation strategies. As a result, outreach and engagement personnel in the region will be better able to engage stakeholders with setting criteria for adaptation actions and pursuing adaptation opportunities.

## VI. Climate Change Outreach: Case Studies and Best Practices

### Case Studies

During the Community of Practice Workshop, several case studies were presented to demonstrate some of the many ways that climate change is being addressed in the region. Case studies are an important tool for demonstrating real life applicability. The following are brief descriptions of the presentations given at the conference. To view the full presentations, visit <http://collaborate.csc.noaa.gov/climateadaptation/default.aspx>.

**“Toward the Formulation of an Adaptive Management Plan to Address Sea-level Rise, City of Satellite Beach, Florida.”** Randall W. Parkinson, Ph.D., P.G. Space Coast Climate Change Initiative. The City of Satellite Beach, through an EPA Climate Ready Estuaries Program grant, updated its comprehensive plan to consider the potential effects of climate change. The city also conducted a vulnerability assessment and included public education and outreach as part of the project.

**“Can Anybody Hear Me? Is Anybody Even Listening?”** Tancred Miller, North Carolina Division of Coastal Management (DCM). The North Carolina Department of Environment and Natural Resources performed a public survey to help gauge the perception of the reality and magnitude of sea-level rise, the perception of vulnerability, and the potential response

actions. The survey results are being used as a tool to help the DCM understand public perception and to design an effective education and outreach endeavor.

**“Case Study: Florida Keys.” Doug Gregory, University of Florida Institute of Food and Agricultural Services, and Alison Higgins, The Nature Conservancy.** The Florida Keys experience frequent tidal flooding and limited freshwater resources. They have limited adaptation options in their remote island location. The Nature Conservancy, staff members in Monroe, and other counties have developed a Regional Climate Change Compact to focus on new policies for addressing climate change, hosted a climate leadership summit, and are working on a regional climate change action plan.

**“Georgia Coastal Hazards and Local Initiatives.” Jackie Teal, Chatham County–Savannah Metropolitan Planning Commission, and Jennifer Kline, Georgia Coastal Management Program.** The Georgia Coastal Zone Management Program partnered with NOAA’s Coastal Services Center and the Chatham County–Savannah Metropolitan Planning Commission to hold the first “Roadmap to Coastal Hazards” workshop. The workshop was designed to assist local governments in incorporating transportation, emergency management, planning, public works, land conservation, etc. into one coastal hazards plan.

**“Piloting Climate Extension Methods: The Carolinas Coastal Climate Extension Initiative.” Jessica Whitehead, S.C. Sea Grant Consortium and N.C. Sea Grant.** The climate extension agent worked to increase the capacity that would allow her to inform and educate decision makers, organizations, governments, businesses, and stakeholders about the implications of climate change. Through this process, the extension program also worked to increase the capacity of the national and regional Sea Grant network, which would convey the research and deliver the outreach programs to their audiences.

### **Breakout Groups: Identifying Outreach/Extension/Communication Best Practices**

Following the case study presentations, workshop participants returned to their small groups to identify outreach, extension, and communication best practices—both climate outreach best practices and best practices that have worked for other topics or situations that could be applied to climate outreach. The following questions were answered by the groups:

1. Thinking about the approaches you use in your existing outreach, extension, and communication efforts on other topics, are there best practices or techniques that could be applied to climate outreach, extension, or communication?
2. What type of messaging or approaches do you think will resonate with what specific target audience?
3. How can we overcome some of the barriers that have been identified with specific audiences?

The full list of responses to these questions can be found in Appendix F.

General outreach, extension, and communication techniques that have worked for attendees that could be applied to climate adaptation include



- Tools for mapping and visualization of impacts directed at local citizens and county commissioners
- School programs for teachers and students to teach natural as well as social science, including the difference between weather and climate
- Use of a message tailored to the audience and locale using respected sources and trusted messengers
- Use of industry organizations and their common methods of dissemination
- Public forums, focus groups, and a variety of workshop techniques for discussion and engagement on the topic
- Identification and sharing of demonstration projects of communities taking action
- Building and fostering of a community of practice for outreach professionals in the region

For specific audiences, the groups felt that inserting a climate component into a message that already resonates with those audiences would be most effective. For example, city engineers already work to address flooding problems, emergency managers address public safety issues, and municipal administrators look to secure infrastructure funding. Incorporating a climate message and getting these public officials to think longer term and consider sea level rise and stronger storms would allow for improved planning in these communities. Opportunities to engage the public using possible loss of beach access and national security issues, or church groups on “stewardship of the Earth,” would provide a mechanism to target these groups with a climate message that would more likely resonate with them.

Participants felt the best way to overcome barriers was to utilize an appropriate message for the target audience. Messaging approaches include the use of a common language (e.g., in layman’s terms, the native language of the community), sustained dialogue to establish a trusted relationship, looking for the positive angles, moving past the science debate, giving the audience an “action step,” and finding an appropriate messenger.

## **VII. Climate Adaptation Tools and Resources**

Day 3 of the workshop began by sharing examples of tools and resources available to the community, followed by a discussion to identify specific tool and resource needs for climate outreach in the region.

### **Examples**

Four presentations displayed examples of climate outreach tools and resources available to the community. The four presentations are listed below. To view the full presentations visit <http://collaborate.csc.noaa.gov/climateadaptation/default.aspx>.

**“Resources for Climate Outreach and Extension.” Stephanie Fauver, NOAA Coastal Services Center.** Fauver provided an overview of the types of resources available through the Coastal Services Center, including fact sheets, guide books, visualizations, websites (particularly the Coastal Climate Adaptation website), trainings, and workshops.

**“Using Visualizations to Frame Discussions around Adaptation and Planning.” Ned Gardiner, NOAA Climate Program Office.** Gardiner presented the NOAA Climate Services portal ([www.climate.gov](http://www.climate.gov)) and discussed the types of resources that it contains.

**“Lessons Learned from Outreach and Extension.” Susan Weatherford, Renaissance Computing Institute at University of North Carolina–Asheville.** Weatherford presented outreach approaches and lessons learned, including key lessons and a four-step “from data to decisions” business process. The four steps are 1) integration of data, 2) creating visualizations, 3) telling the story, and 4) group decision-making.

**“Visualizing Sea Level Rise. Mary Culver, NOAA Coastal Services Center.** Culver presented several tools for visualizing the impacts of inundation from sea level rise. One such resource is the “Coastal Inundation Toolkit” ([www.csc.noaa.gov/digitalcoast/inundation/index.html](http://www.csc.noaa.gov/digitalcoast/inundation/index.html)), which contains a wealth of resources for understanding and communicating inundation risks.

### **Group Activity: Community Tool and Resource Needs**

Participants were asked to use a worksheet in their workshop packet to capture their thoughts to the following question: “Are there additional tools, data, guides, etc. we need to build capacity for climate outreach/engagement/communication?” Responses were shared and recorded and then participants voted on their priority needs.

The top needs as identified by participants were

1. Consistent message from federal agencies and the science community on climate science and projections for the Southeast and Caribbean region
2. Tools for the public to “see” potential impacts of climate change—at a localized scale so that it is meaningful
3. Action steps for communities to take when using or after using tools (you have the tool, now what?)
4. Expertise directory, vetted and with key terms
5. High-resolution elevation data, available as a digital elevation model (DEM)
6. Guidance on engagement specific to understanding climate change

The prioritized list of tools and resource needs identified during the session are presented in Appendix G. The complete list of tools and resources that were captured on participant worksheets is also presented in Appendix G.

## VIII. Next Steps: Capacity Building and Collaborating

The final session of the workshop was designed to move workshop attendees closer to becoming a community of practice for climate outreach and engagement. Participants were given a few minutes to respond to the two remaining questions on the worksheet:

- What will you do to advance climate outreach when you go home?
- What would you like the community to do to advance climate outreach?

Responses were then shared via group discussion. See Appendix H for the full list of individual actions and Appendix I for the full list of community actions.

Individual actions to advance climate outreach included helping to develop the workshop report, providing access to additional resources that participants learned about while at the workshop, and contacting people whose projects and activities could be of benefit to them or who were doing similar work to potentially partner and leverage resources. Some participants had ideas about immediate next steps to contact a group or organization (e.g., educators, planners, city officials) to help them make specific progress on climate adaptation based on what they learned at the workshop.

Actions that participants want to see from the community include the following:

- Development of top tool and resource needs
- Inviting additional participants in the region to join the community and participate in annual meetings and continued dialogue
- Developing fact sheets and consistent messaging on the science
- Providing access via a portal to the plethora of resources that were identified during the workshop
- Establishing work groups in specific areas to develop and test products
- Using SECART, the media, new NOAA regional Climate Service directors, and others as a vehicle to get the climate message out and coordinate activities.

Additional group discussion focused on identifying the top next steps the community should take to begin taking action. See Appendix J for the full list of next steps.

It became clear that a follow-up meeting was a high priority for the group. The group suggested that the list of attendees should be expanded to include additional cooperative extension agencies, climate scientists, additional federal agencies (e.g., Federal Emergency Management Agency, Department of Defense, U.S. Department of Agriculture, National Park Service), and national- and regional-level organizations (e.g., American Planning Association, Association of State Floodplain Managers, ports authorities). In addition, more diverse representation by stakeholders (e.g., insurance, banking, community health, ports authorities) at a follow-up meeting or at a separate climate outreach and engagement workshop should be considered. Because meeting topics would vary depending on the participant list, the feasibility of a

different type of meeting was discussed versus a follow-up meeting with expanded participation. Elements to consider for a future meeting included the following:

- Spend a couple days on the science so people can start building and adapting existing tools; outreach needs to be grounded in the science
- Provide participants with the opportunity to work with the data; experiential learning would be helpful
- “Science boot camp”
- Less structure to allow for “serendipitous discoveries”
- Continued exchange of what we’re all trying or doing

Additional next steps included identification of funding and support for expanded participation. Holding virtual workshops or meetings is also an option to cut back on costs. About one-third of participants would not have been able to make it to this meeting without financial support. Another option to keep lines of communication open includes adding an RSS feed or e-mail digest to the Coastal Climate Adaptation Community of Practice website. The full list of next steps as mentioned during group discussion at the end of the workshop can be found in Appendix J.

#### **Group Activity: Workshop Evaluation**

Participant reviews indicate that the workshop helped build capacity to address climate change issues for outreach and extension professionals in the region. This increased capacity would help in providing information and assistance to regional stakeholders. The workshop was effective in advancing a climate outreach community of practice for the region. Interest is strong for holding another workshop to continue what was started in Jacksonville, and workshop organizers are looking for opportunities and funding to facilitate such a workshop.

## **IX. Appendices**

Workshop materials including the agenda, participant list, and results from the breakout group discussions can be found in the appendices that follow.

## Appendix A: Final Participant Agenda

### **Southeast and Caribbean Climate Outreach Workshop** *Building a Community of Practice of Climate Extension and Outreach Professionals*

**May 24-26, 2010**

**Wyndham Jacksonville Riverwalk Hotel, Jacksonville, Florida**  
**Compass Amphitheater**

*Sponsored by the National Sea Grant Office and  
NOAA Southeast and Caribbean Regional Team (SECART)*

#### **~ WORKSHOP GOAL AND OBJECTIVES~**

Goal: Increase our capacity to coordinate and perform outreach/extension/communication of climate information to stakeholders and decision makers.

- Share information on the fundamentals behind climate science, including how science demonstrates there will be changes and how those changes are likely to manifest in the Southeast and Caribbean Region.
- Discuss how outreach and engagement efforts are currently addressing climate in the region, exploring both the state of people's knowledge in the region and the level of outreach.
- Identify ongoing climate adaptation efforts and activities in the region, considering adaptation from a built environment, natural environment, and social environment perspective
- Share existing climate adaptation information, tools, and training materials, and identify current and anticipated sources of tools and technical assistance
- Identify needs from an outreach/extension perspective to inform the development of new climate products and services.
- Share best practices for working with communities that might be applied to climate outreach.
- Begin building a community of practice focused on climate adaptation that is contextualized for the region.

#### **AGENDA**

**~ Monday May 24<sup>th</sup> ~**

12:30	Check-in, coffee Compass Room
1:00 pm	Welcome, Introductions, and Overview of Agenda

	Geno Olmi, NOAA SECART, and Heidi Recksiek, NOAA Coastal Services Center – Gulf Coast Services Center
1:20 pm	<i>Project Overview</i> , Chuck Hopkinson, Georgia Sea Grant
1:30 pm	<i>Coastal Climate Science and Likely Impacts in the Southeast and Caribbean Region</i> . Greg Carbone, Carolinas Integrated Sciences and Assessments Center at the University of South Carolina
2:30 pm	<i>Break</i>
2:45 pm	Breakout Groups: Concerns about Climate Impacts in the Southeast and Caribbean Region
3:45 pm	Report Out
4:15 pm	Existing Activities: NOAA’s Climate Service, Regional Efforts <ul style="list-style-type: none"><li>• <i>NOAA’s Climate Service: a Regional Focus</i>. Ned Gardiner, NOAA Climate Program Office</li><li>• <i>Summary of Workshop Registration Information – What are we Doing?</i> David Bryant, Georgia Sea Grant</li><li>• <i>Coastal Climate Adaptation Website</i>. Stephanie Fauver, NOAA Coastal Services Center</li></ul>
4:55 pm	Wrap up Day 1

(Evening gathering at The Landing)

~ Tuesday May 25<sup>th</sup> ~

8:00 am	<i>Breakfast – Compass Amphitheater</i>
8:30 am	Welcome, Overview of Day 2
8:45 am	Understanding and Addressing Stakeholder Perceptions and Perspectives <ul style="list-style-type: none"><li>• <i>Climate Change Attitudes/beliefs, Useful Behavior Change Theories, and Risk Perception Variables</i>. Heidi Recksiek, NOAA Coastal Services Center</li><li>• <i>Social Marketing: a Tool to Inform Climate Outreach and Communication</i>. Paul Monaghan, University of Florida</li><li>• <i>Tactics for Fostering Adaptation</i>. Jessica Whitehead, South Carolina Sea Grant and North Carolina Sea Grant</li></ul>
10:15 am	<i>Break</i>
10:30 am	Breakout Groups: Identifying Barriers and Future Outreach and Engagement Needs
11:30 am	Report Out
12:00 pm	<i>Lunch – Port Ballroom</i> Bridget O’Hara, National Environmental Modeling and Analysis Center at UNC-Asheville, will present the GeoDome.
1:00 pm	Climate Outreach/extension/communication Case Studies <ul style="list-style-type: none"><li>• <i>Towards the Formulation of an Adaptive Management Plan to Address Sea Level Rise, City of Satellite Beach, Florida</i>. Randall Parkinson, Space Coast Climate Change Initiative</li><li>• <i>Southeast Florida Regional Climate Change Compact</i>: Doug Gregory, Monroe County Extension, and Alison Higgins, The Nature Conservancy</li></ul>

- *Piloting Climate Extension Methods: the Carolinas Coastal Climate Extension Initiative*: Jessica Whitehead, South Carolina Sea Grant and North Carolina Sea Grant
  - *Georgia Coastal Hazards and Local Initiatives*: Jennifer Kline, Georgia Coastal Resources Division, and Jackie Teel, Chatham County Metropolitan Planning Commission
  - *Can Anyone Hear Me? Is Anyone Even Listening?* Tancred Miller, NC Department of Environment and Natural Resources, Division of Coastal Management
- 2:30 pm *Break*
- 2:45 pm Breakout Groups: Identifying Outreach/Extension/Communication Best Practices
- 3:45 pm Report out
- 4:15 pm Large Group Discussion: Brainstorming Potential Collaboration Opportunities
- 5:00 pm Wrap up Day 2

**~ Wednesday May 26<sup>th</sup> ~**

- 8:00 am *Breakfast – Dockside and Commerce rooms*
- 8:30 am Welcome, Overview of Day 3
- 8:35 am Examples of Climate Outreach Tools and Resources
- *Resources for Climate Outreach and Extension*. Stephanie Fauver, NOAA Coastal Services Center
  - *Using Visualizations to Frame Discussions around Adaptation and Planning*. Ned Gardiner, NOAA Climate Program Office
  - *Lessons Learned from Outreach and Extension*. Susan Weatherford, Renaissance Computing Institute at UNC-Asheville
  - *Visualizing Sea Level Rise*. Mary Culver, NOAA Coastal Services Center
- 9:45 am Large Group Discussion: Tools and Resource Needs
- 10:30 am *Break*
- 10:45 am Large Group Discussion: Next Steps for Capacity-Building and Collaborating
- 12:15 pm Closing Remarks
- 12:30 pm Adjourn

## Appendix B: Participant List

First Name	Last Name	Organization	E-mail address
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Climate Outreach Workshop Report

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\* Could not participate

\*\* Planning team member

## Appendix C: Icebreaker Introduction Questions

### Share a question you have been asked about climate change.

Which SLR estimate should I use for planning?  
What is the contribution of volcanoes to climate change?  
Who is already doing what in adaptation?  
What is the 50 year vision for the region and how does climate change fit into it?  
Cap and trade is destroying the economy.  
Why doesn't county X do more?  
How can we reach out to communities to demonstrate it is happening?  
What if you're wrong?  
How do SLR and climate change affect policies for beach and shoreline management?  
What science should we use?  
What can local government do?  
Who's going to pay at the local level for implementation?  
How can cities and counties begin to plan?  
What return interval in heavy rainfall and climate change is expected?  
What tool should we use to look at SLR?  
What are local examples of climate change and the effects on shellfish/shrimp?  
Isn't it a hoax?  
This is a communist plot to destroy the economy.  
What are counties going to do to incorporate climate change into comprehensive plans?  
Is this going to work?  
Don't see it, don't believe it.  
Is it real? Are humans the main cause?  
What impacts should we expect?  
It isn't real and is not human caused.  
When is it coming and how much?  
If SLR is real and we are to retreat, who will buy my house?  
It isn't real. Why should I care?  
What should we do from the regional perspective (county level)?  
Prove it to me.  
How will it affect wildlife populations and habitats?  
How can we come up with a vision for the region and have everyone work together?  
It is not real. Why not using X (tool/resource)?  
So what? Nothing I can do.  
Help me work on my hazard planning and long range planning.  
What is the most compelling information that I don't have to be a scientist to understand?  
Doesn't the cold winter the SE just had disprove global warming?  
Lots of skepticism  
Why did we just have such a cold winter with more snow if the planet is warming?  
Does 1 ft of SLR mean 1 ft or in 1ft?

How do you explain that the Internet said "..."?

We need education and outreach on the effects on the insurance industry.

Where can I find accurate information on a non-government website?

## **Appendix D: Climate Change Impacts and Audiences**

### **Question 1: Of the audiences we work with, which ones are requesting climate change and adaptation information?**

Federal agencies – national and field (e.g., DOT, HUD), GAO (Congress)

Media – statewide, rural and metro – TV, radio, print

Educators – all levels, formal and informal, education centers

Students – all levels through college

Elected officials – state, county, local

Seafood Alliances

State Agencies – fisheries, coastal management programs, Emergency Managers

County Governments – IT, especially GIS groups

Coastal resource managers – state parks, refuges, FWS, foresters, conservation land managers

Stormwater management – storm and waste water, building codes, etc

Water authority – waste, drink, sewer

Water resource managers

NGOs – land trusts, Audubon, TNC, Ducks Unlimited, Sierra Club – national, state, local

Private consultants – architects, engineers, site designers, attorneys

Planners – regional, local, county, neighborhood

Zoning commissions – county, city

Regional planning councils

Researchers, Scientists

Agricultural extension

Transportation – ports authority, DOT, rail, airports

Power companies (utilities)

Fishers/Shrimpers/Shellfish growers and harvesters – commercial and recreational

Private Citizens

- Land/Homeowners
- Builders/Developers/Consultants
- Community groups (church groups, grass roots organizations, concerned citizens)
- Churches (stewardship)
- Denialists
- Recreators – Surfers
- Real estate agents

Businesses

- Insurance – risk assessors

- Banking and investments
- Hotels (emergency managers)

**Question 2: What do you think are some of the reasons you aren't getting requests for climate information yet?**

Time scale – too far into the future  
 Not a priority – competing priorities  
 Do not anticipate impacts/risks  
 Political issue – want to steer clear, not their job, too many politicians  
 Resources – cost  
 Lack information – who/why/what to ask, message at appropriate education level  
 Too much info – lack of leadership/ coordinated message/authoritative source  
 Not enough certainty

**Question 3: Which climate change impacts are your audiences most concerned about? (Prioritized results from combining then multi-voting)**

Priority Impacts	Changing precipitation patterns (1)
Sea Level Rise (33)	
Built Environment/Infrastructure (19)	<u>Sea Level Rise (33)</u>
Flooding (18)	Flooding (18)
Natural Environment Impacts (13)	Coastal erosion (6)
Planning (11)	Tidal mean high water
Economics (11)	Storm surge (2)
Social vulnerability and equity (11)	Saltwater intrusion (2)
Stormwater management (8)	Wetlands loss/mitigation (4)
Habitat changes (8)	
Long term consequences (6)	<u>Natural Environment Impacts (13)</u>
Drinking water (6)	Freshwater inflow (2)
Coastal erosion (6)	Habitat changes (8)
Extreme Weather (6)	Species shifts (wild and agriculture)
	Invasives/pathogens (2)
	Coral bleaching
	Ocean acidification impacts (1)
Impacts – Full List, with voting results	
<u>Extreme Weather (6)</u>	
Flooding (including landslides)	<u>Built Environment/Infrastructure (19)</u>
Storms	Stormwater management (8)
Drought (2)	Drinking water (6)
Storm surge (storms) (3)	Septic/wastewater (2)
Wildfire	Revetment/armoring
	Roads/bridges (2)

Military bases  
Ports

Planning (11)

Long term consequences (6)  
Planning time frames  
Preservation/conservation (4)  
Shifting baselines

Global Insecurity (population expansion/resource wars) (1)  
(Increasing population in SE means more stressors and more people to be affected.)

Economics (11)

Tourism (2)  
Insurance (2)

Fisheries (recreational and commercial) (3)  
Agriculture  
Real estate (2)  
Taxes (1)  
Shipping  
Infrastructure investment (1)  
Aquaculture

Social vulnerability and equity (11)

Beach/waterfront access (3)  
Takings/property rights (4)  
Evacuation planning  
Safety (1)  
Insurance (1)  
Coastal demographics (1)  
Human health

## Appendix E: Identifying Barriers and Outreach and Engagement Needs

### Question 1: What are the barriers to transferring climate adaptation information to stakeholders?

#### *The audience*

How to pick a target audience

- Too many audiences
- Lack of information on audiences' responsibilities, priorities, and barriers to action
- Audiences at different stages of readiness to receive information
- No perception of urgency from stakeholders
- Recreational anglers and commercial anglers – question of time scale and urgency

Source of problem – NOT HUMAN-CAUSED

Lack of concern

Limited number of action steps for audiences to take to address the problem

#### *The messengers (climate outreach professionals)*

Ignorance of those responsible for providing outreach/education (need for common lexicon)

- Who are the experts?
- Who are the messengers?

- Effectively organizing a community of practice (whole preparation effort – manpower, time, tools, etc.)

Lack of knowledge of climate science, discomfort with topic

- New science
- Question of certainty
- Leadership and talking points
- Being confident in the information to present (uncertainty)

Lack of knowledge of how to make information relevant to stakeholders

- Credibility
- Language barrier
- Presenting effectively

Hesitation to cross advocacy barrier

Access to professional marketing and graphic design

### ***The information***

Information overload

- Too much untargeted information
- Information too sophisticated
- Many sources
- Unsure what's reliable/credible

Content of climate information provided

- Complexity of climate science
- Use of scientific terms, such as uncertainty, climate vs. weather
- Confusion between climate and weather (also climate change and climate variability)

Spatial and temporal scale of information

- Timing (not imminent)
- Lack of local data and validation of change
- Personal experience with climate change (making connection)

Clear detailed scenarios needed by decision makers in timely fashion

### ***The implementation***

Institutional constraints to addressing opportunities

- Time
- Staff members (especially staff members with local knowledge)
- Funding

Messaging sensitive to social norms

- Community members may be offended
- Political agenda
  - Lack of political will and champions
  - Lack of knowing how to overcome politics
- Natural communication vs. advocacy
- General disconnect between good science leading to good policy

- Lack of willingness to do trade-offs

Multiple sources of information

- Media
- Vocal non-believers
- Motivation for scientists to reach broader audiences

Lack of federal mandate for action

- Absence of leadership

Available resources

- Lack of central location for resources (clearinghouse)
- Tools must match information needs
- Adequate time to develop and use tools
- Acceptance of tool results

## **Question 2: What are stakeholders' barriers to acting on climate change information?**

### ***Motivation***

- Problem too big – overwhelming. People don't know where to start.
- Don't want to be perceived as 'wrong'
- Lack of incentives
- Mitigation vs adaptation
- Difficulty in measuring results

### ***Politics***

- 2 groups used term "political suicide" to address topic in some areas
- Political will
- Political timescale
- Manipulation of legislation (definance)

### ***Funding***

- Cost
- Economically difficult time
- Uncertainty in outcome of investments

### ***Spatial and time scale***

- Actions won't make a difference in my lifetime
  - Too far in future
- International scale of issues
  - Minor change won't affect global problem
  - Us vs. China

### ***Available information***

- Prediction/forecasting (how do we market uncertainty, ability to make decisions in the face of uncertainty)
- Credibility of sources
- Uncertainty in information
- Knowing what actions to take
- Information not tailored to stakeholder needs

***Information sources***

- Don't know who to go to for help
  - Coordination among government entities on message, actions, etc
- Don't know what are clear and reliable sources of information
  - Lack of clearinghouse for information

***Planning capacity and challenges***

- Planning horizons too short or nonexistent
- More pressing short-term priorities
- Limited ability to act on several priorities at one time
- Reactive vs. pro-active
- Need variety of options (individuals, as well as communities)
- Private property rights (dictating what folks can and cannot do on property)

**Question 3: Given the impacts of concern and the barriers in the southeast and Caribbean, what are the outreach/engagement needs in the region? What are the gaps we can help address via outreach and engagement efforts?**

***Outreach/extension role is to be a trusted resource, know the experts, and know the area and issues of importance.***

***Community of practice is needed – with easy access to all***

- Develop partnerships
  - Broaden partners to collaborate with – identify variety of partners
- Coordination among existing efforts (RISAs, Sea Grant, state climatologists, etc) will help with:
  - Identifying partners
  - Knowing who to go to for information
  - Assisting with decisions among opportunities (avoid duplication, leverage)
- Better definition and organization of our roles in climate adaptation
- Better development and implementation of 'terms' to work on these issues

***Get to know our audiences***

- Overall values
- Assessment of audience needs and current knowledge



- Attitudes and perceptions about climate change in different regions
- Recognize who the trusted messengers are in communities (e.g., non-govt, local, in profession)
  - Ambassadors (such as Master Gardeners) to reach public
- Understand the dynamics between politicals and the public (who answers to who)
- Identify appropriate stakeholders and communities to work with
  - Focus on low hanging fruit

***Improve the ways we communicate***

- Craft a factually-based, yet consistent, message
  - Concerted effort – advocating science not “belief,” public needs to know facts.
- Frame issues in appropriate ways for different audiences
- Help to develop strategies to communicate and make a difference – prioritize to maximize efforts
- Use other issues/topics (e.g., hazards) to introduce climate change
  - Take advantage of climate variability to build knowledge and credibility
  - Awareness of ocean issues/data (SECOORA, CARA)
- Explore how much emphasis we should place on younger audiences who will be around longer...

***Improve information available on local scales and about issues of concern to stakeholders***

- Need appropriate data to illustrate impacts/address community issues
  - Specific effects of climate change impacts
  - Better projections for more localized impacts
- Economic information
  - Dollar value estimates for costs associated with impacts, or tool to calculate it

***Enhance our “toolboxes”***

- Tools for answering naysayers.
- Materials beyond Internet/website tailored to audiences
  - Have basic information and education for a variety of audiences
  - Focused information presentation tailored to specific user groups
    - Use professionals to package information
- Clearinghouse of information (science, who’s doing what, agencies, points of contact, success stories and best practices)
- Visualization tools (Lidar, CanVIS, pictometry)
  - Suitable for use in public meetings
  - Training on how to use existing visualization tools
- Specific examples of local climate impacts, adaptation strategies, successes
  - Example ordinances that incorporate climate change considerations
  - Case studies disseminated
- More professional development
  - Train the trainer approaches

***Engage stakeholders to set criteria for adaptation actions and for pursuing opportunities***

- Approaches/incentives to incorporate climate change into long range planning
- Incentives for individuals and communities to act

**Appendix F: Best Practices for Outreach, Extension, and Engagement**

**Question 1: Keeping in mind the case study discussions, and thinking about the approaches you use in your existing outreach/extension/communication efforts on other topics, are there best practices or techniques that you think could be applied to climate outreach/extension/communication?**

***The audience***

- Conduct needs assessments to better define audience needs (all)

***Tools: Mapping and visualizations***

- Community visualizations and maps of SLR scenarios
  - For local citizens and county commissioners
  - Spurs questions about timeframe
  - Provides awareness of properties affected
  - Use local information
- Mapping of impacts
  - Map potential economic impacts
  - Clear visualizations of impacts alternatives
  - Flood maps to include future floodplain designations
- Innovative tools (e.g., Geodome)

***Education***

- For decision makers, focus on decisions with high risk and uncertain probabilities
- School programs for students and for teachers
- For K-12, focus on natural sciences and social science (vulnerability)
- K-12 environmental field trips
- Should be done without political bias
- Teach audiences difference between weather and climate (us, all audiences)

***Communication***

- Message
  - Use a consistent clear message re climate change and impacts among science and outreach communities
  - Stick to science (not beliefs/values discussion)

- Use a single message on a specific topic
  - Tailor information to specific audiences (all)
  - Develop message with local partners who are respected sources (e.g., SRL in South Carolina fact sheet)
- Define clear goal(s)
- Tie information to action – what is it that they can do (homeowners, schools, local govts, all)
- Information dissemination
  - Use trusted messengers
    - Faith community and trusted elders could be messengers for community audiences on environmental issues, green house gas emissions, clean energy, and adaptation actions
    - Extension agents and wildlife NGOs could be messengers for recreational fisheries audiences
    - Community members with influence
    - Sports or celebrity spokesperson can be messengers for specific actions (e.g., Jeff Gordon on biofuel)
  - Work through existing industry organizations and their common methods (commercial fishing, tourism, stormwater managers, planners)
  - Utilize outreach approaches such as PSAs, newsletters, (general audience – local, e.g., tourists, military)
  - Develop and use customizable materials for local situations/audiences
    - Simple fact sheets/graphics
    - Understandable
    - Address assumptions
    - Simple/consistent vocabulary e.g., “water words that work”, “the language of conservation”
  - Maintain Web blogs for selected communities (all audiences)
  - Keep webpages refreshed (not stale) and current (up to date information) (all audiences)
- Forums
  - Provide information distribution and discussion opportunities
  - Hold focus groups of elected officials to share points of view on issues (local governments)
  - Utilize public meetings
  - Mediated modeling
  - Focus on solutions
  - Experiential learning
  - Alternative scenario development
  - Bring in appropriate experts to meet needs of audience
- Repetition, persistence

**Training**

- Workshop trainings for target audiences that are most receptive
- Demonstration projects (fishers, engineers, us, all)

**Planning**

- For planners, focus on incorporating adaptation strategies into comprehensive, hazard mitigation, and other community plans
- ID and codify “no regret” (or minimal regret) strategies and determine what their impact would be
- Targeting planners that are identified as the “low hanging fruit group” for outreach efforts

**Incentives**

- Develop and promote incentives (homeowners, builders)
- Leveraging resources currently available – awareness from those who have

**Community of Practice**

- Build and utilize Community of Practice for climate outreach professionals in region
  - Better collaboration with others in the field (us)

**Question 2: What sort of messaging and approaches do you think will resonate with specific target audiences? How can we overcome some of the barriers that we identified with specific audiences?**

**Audience – interest message**

- Church groups – “Stewardship of the Earth”
- Planners (identify those on board with issue to work with-)
- City engineers – coastal flooding
- Professional organizations (APA and chapters, planning and zoning associations, etc.)
- Emergency managers – public safety
- Homeowners
- Insurance agents
- Land-use planners
- Municipal administrators – infrastructure funding
- Science teachers – up-to-date information for science educators
- Floodplain managers – community rating systems
- Small businesses – impacts
- Recreational anglers and commercial fishermen – loss of nursery habitat
- General public – national security angle (using military to garner “Average Joe” support of issue); to address social unrest
- Public – beach access losses

### **Messaging approaches**

- Look for positives related to climate adaptation
- Skeptical Science website (information tool)
- Target specific audience
- Generate a dialogue that is sustained
- Use a common language – in layman’s terms, in the native language for the community
- Focus on impacts
- Use a message that connects to issues they are already addressing
- Tell a story – not a horror story – build on previous experience
- Move on past ‘debate’
  - Use consensus info
  - Acknowledge uncertainty
- Customize info based on the audience’s interests (and their supervisors’) – answer the ‘so what?’
- Give audience an ‘action step’
- People respond to things that are personal (values)
  - e.g., for elected officials, may want to address issues that they will care about as people (i.e., what resonates with them?)
- Establishing trust – following through
- Visioning – photo documentation (by audience member)
- Tell people what you want them to do, not what you don’t want them to do
- Have the proper messenger deliver the message
  - Respected/influential
  - Early adopter/champion
- Communicate what works, what doesn’t, what’s happening – especially important for locals to communicate these topics to federals (help feds fund and assist with the most effective activities, strategies)

### **Appendix G: Climate Outreach Tool and Resource Needs**

#### ***Results from large group discussion and multivote***

(voting score shown in parentheses)

(20) Consistent message from feds and science community on science and projections for the SE

(15) Tools for public to “see” impacts – personalized

(11) Action steps for communities to take when using or after using tools (you have the tool, now what?)

(9) Expertise directory, vetted and with key search terms

- (8) High resolution elevation data available as a digital elevation model
- (7) Guidance on engagement specific to understanding climate change
- (4) Legal baselines – state regulations – wish list for climate change modifications
- (4) Survey questions and results for assessing perceptions
- (3) Recorded webinars – case studies
- (3) Tool to estimate cost of infrastructure damage (without action) vs. adaptation action
- (3) Resources explaining connections between climate and other issues of concern (e.g., stormwater management)
- (2) Resources describing positives of climate change
- (2) Funded mandate for states to act on adaptation
- (1) Prioritization guidance – what to do first
- (1) Resources for non-political outreach on adaptation and mitigation
- (1) Simple guidance on steps for adaptation
- (1) Explanations of assumptions to explain variation in climate change projections
- (0) Reuse/recycle agricultural tools for coast (seasonal to 6-mo. projections)

**Full list of responses provided by participants on worksheets to the question “Are there additional tools, data, guides, etc. that we need to build capacity for climate outreach/engagement/communication”?**

- Cross disciplinary resource compilation, including case studies, tools, etc.
- Easily accessible portal for data (e.g., tides)
- Adaptation guidebooks. Provide summaries of steps and case studies of how to adapt. The resources would be used by communities that want to plan ahead, but not sure on the next steps to proceed.
- Consensus data on impacts.
- Need more training/practice with some of the visualization tools and on how to incorporate existing layers of data.
- Systems- based facilitated exercises. Since there are examples, we should promote this adoption and document their efficiency
- Connections with energy, transportation, agriculture
- A user driven directory of organizations, their staff members, their expertise areas. And their contact info. This can provide the tool to query there resources.
- Yes
- Impacts of urban growth
- Basic understanding of climate variability- el nino and la nina (ENSO), – CPC’s seasonal outlook, -drought monitor/ drought
- Rewarded webinars
- Prioritization guidance
- Yes. Please share what these are and we will build them.
- Need visualization data for more of the coast. Including economic data isn’t critical but is a great advantage.

- Community/local/county – level visualization products showing portable impacts of climate change.
- A tool that anyone can use to identify potential impacts to their property.
- Can't think of any
- Yes – we have resources and expertise to build tools -> we just need to know what the audiences need.
- More than anything, high – yes
- State law/regulation – specific lists of existing laws/regulations useful to promote SLR adaptation
- State-specific policy recommendations for changes
- Guide on how to improve more elected officials in workshops on climate change
- Need the SLR viewer for the SE coasts.
- Functional tools developed with decision-making partners (like the Buncombe Co Risk Map Viewer)
- More interactive tools that allow decision makers to map out how systems work and what CC impacts might have consequences for them.
- Consistency in messages coming from science community
- Web tools for public life (using Google earth where people could locate their neighborhood to view potential impacts could be useful on coasts as well as inland/upland).
- Suggest specific and in-depth training in social marketing (the practice use of) in extensions/outreach settings.
- While there are a number of tools available, there needs to be ones that can have broad applicability but at the same time can be customized/ tailored to local needs.
- Visualization data
- Local data
- Visually are easily created (or that we can get training to be able to create. And that send a unified, simplified, and actionable message.
- Yes – would like some concise, standard vetted messages we can all use – talking points.
- I think just to develop a consistent message about climate change would be a huge step forward.
- Fisheries related to climate change impact information and visualizations.

## **Appendix H: Individual Actions to Advance Climate Outreach**

**When you go home, what will you do to promote/continue/advance climate outreach in your area? Responses captured during group discussion**

- Make everyone aware of EBM tools network: Related to coastal work – has a searchable tools database for coastal and natural resource tools to social and economics tools database plus webinars, listserv, and expertise directory

- Society for Conservation Biology Social Science working group – also has lots of resources
- Join Coastal Climate Adaptation Network:  
<http://collaborate.csc.noaa.gov/climateadaptation>
- Get involved in local community groups (Rotary, Lions Club, churches, etc) – good way to get to know decision makers (including elected officials) and becoming a trusted member increases your credibility as a trusted source of information
- Try to get Florida Sea Grant more up to speed – familiarize self with resources learned here and then do role-playing activities as part of Florida SG Extension annual meeting in fall – i.e., train the trainers!
- Incorporate more indirect outreach in festivals, events, etc. (augment existing work with climate change)
- Do something with all the flip charts
- Make sure everything is on CSC adaptation site and maintain it
- GA SLR project – try to contact people who presented viz work to present webinars and get more county and local level folks familiar with what’s available
- Make a connection with USFS and talk to researchers looking at climate and ecosystem processes
- Work with 2-3 local gov’ts and try to build relationships with local planners based on their concerns – then augment those concerns with SLR, etc.
- Add the DoD to message when discussing climate change (national security message)
- Work extensively with environmental educators – may try to incorporate some lesson plans on websites into this work
- Finish writing a grant for an interactive map!
- Keep working with City of Key West on adaptation plan and get people familiar with some of the resources learned about here
- Follow up with Randy to write an article for ClimateWatch (anyone can join weekly telecon on ClimateWatch story ideas)

***Additional responses captured from worksheets***

- Provide additional website links to group with resources for coastal work.
- Provide specific data/information from past work in SE to current projects.
- Try to get potential partners to collaborate in GA CZ.
- Work for more funding.
- Incorporate climate change/SLR lesson and data collection into our new adopt-an-estuary project.
- Establish contact with U.S. Forest Service researchers who are examining ecosystems processes
- Discuss with the director how climate change could be incorporated into our work.
- Improve collaboration with Sea Grant to develop a strategy for addressing adaptation.
- Continue to develop in-house expertise on the issue
- Would like to get involved with specific groups within the community; such as science clubs and science-related department at universities/colleges.



- Flesh out a Climate Change page on a Florida Keys Green Living and Energy Education website.
- Continue to support the Flood Damage Reduction Task Force.
- Further connect with participants of this group to listen to their needs.
- Continue to provide tools based on our customers' needs.
- Incorporate information that I learned into presentations that I routinely give to groups.
- Workshops and training.
- State planning.
- Work with contacts that I made, in particular UNCW-RENCI and EPA. This was a great networking opportunity.
- I would take the growth pattern image from the 50 year vision and compare it to SLR data – should influence all communities.
- Conduct a workshop in July and provide tools discovered at this workshop.
- Keep working at the RENCI and UNC Asheville Engagement Site and with NOAA's National Climatic Data Center in CLEAR (Climate Literacy Education and Research) Cooperative Agreement.
- Build relationships with local governments.
- Meetings with local government planners – their concerns/needs.
- Meetings with local government elected officials – their concerns/needs.
- Connect planners/officials with resources and expertise.
- Investigate where LiDAR data-mapping process is at in Florida and what needs to happen to make the data available and useful to coastal communities
- Follow-up on conversations from workshop (GA already).
- Continue working with audiences opportunistically on climate and watch for ways to collaborate.
- Continue to work with political leaders to implement a climate action plan for the county and the southeast Florida region.
- Use partners and other resources to provide workshops and training to stakeholders on climate change adaptation.
- Request to have climate change training, such as role playing activity and climate.gov resources included in state Sea Grant extension meeting.
- Become familiar with tools and resources already developed (e.g., CSC, climate.gov).
- Continue Sea Grant efforts in communities.
- Work on partnership opportunities follow-ups.
- I'm going to investigate existing tools to see how useful they would be in our public programs and in schools. Will use and promote the ones most pertinent to our area.
- Will develop and test a new climate change presentation for use in our public programs and outreach efforts in the community.
- Working with several communities on climate adaptation initiatives as part of several grants.
- Will promote tools/resources/programs highlighted at the outreach workshop with other coastal communities that have not addressed climate issues as yet. My goal is to

get some of the communities I work with to begin incorporating climate adaptation into their long-range planning process.

- Keeping engaged with the community of practice.
- Work with local governments to include/ address plans.
- Build it into our new “adopt an estuary” project; incorporate more into all of my education outreach.
- Participate in any amenable outreach efforts; add SLR content to existing outreach efforts; link the NOAA climate portal to our home page.
- Continue working with our local county governments on incorporating climate change adaptation and mitigation in their local comprehensive plans and land use codes, etc.
- Considering hosting the planning for climate change workshop.
- Work with climate specialist to develop programs and use some of the existing visualization tools to show inundation of fishery habitats to help describe fishery impacts.
- Use the NOAA Coastal Services Center climate adaptation website to learn and keep in touch with what others in the community of practice are doing with the climate outreach.

## **Appendix I: Community Actions to Advance Climate Outreach**

**What would you like the community to do next? What are priority community actions?**

**Responses captured from group discussion**

- Pursue top 4 tool/resource needs identified
- Continue conversation about science/politics dilemma and reaching people with different attitudes (it’s easier to highlight co-benefits and look at planning processes where climate information is needed – look for opportunities to explain multiple stressors)
- Research a stable funding mechanism to allow workshop to happen once a year
  - Look for creative sources – local/state funding, other agencies, etc.
  - NOAA Regional Teams need to be engaged heavily for logistical and funding support
  - Send strong message back to funders on what the needs are to continue what we started
- Try to make future meetings more inclusive so we don’t continue to have independent meetings
  - Broaden scope of invitees – more planners, coastal managers’ organizations
  - Fall: Sea Grant, 2 RISAs, RCC, state climatologists meet on climate outreach experience to show what climate community has already done
  - GOMEX and S. Atlantic need to meet together to take advantage of our similarities

- Bring ideas from meetings to new Reg'l CS directors
- Look for common message... or common understanding? Air some of the confusion, then need opportunities to discuss and understand what information we get from different sources and why
  - Webinars! Series, state-specific?
  - Wikipedia to lay out basics on the science – tie into developing coastalclimatewiki.org?
  - Confronting myths and misconceptions about climate science – tailor existing resources to our region and providing that information back to people who developed national/international resources
  - Be aware of developing too many resources – don't add to the workload for finding information!
- What will it take to get all of the regional groups together to drive one set of unified conclusions and one national focus on climate outreach? Be mindful about joining national dialogues
- Use the Coastal Climate Adaptation website as a portal for gathering information from broad range of sources
- Try to engage media to get message out (National Geographic, Discovery Channel, etc.)

***Additional responses captured from the worksheets.***

- Establish list serve
- Arrange follow-up meeting
- Promote collaboration among attendees (and others)
- I am concerned that many of the tools provided promote a top-down approach. We are assuming they will use the tools and the information presented will be relevant.
- We need to be careful using the term “no regrets”. I think we should use the term “minimal regrets”.
- Develop consensus voice on what is likely; give more holistic views, not just sea level rise.
- Better explain ongoing multiple stressors to ecosystems – land use, exploitation.
- Continue dialogue.
- Education in all levels.
- Get familiar with the NOAA Climate Portal (climate.gov)
- Stay in touch with what we're doing.
- Continue with the water shed wide planning that incorporates growth, water use, transportation, floodplain and steep slopes. Incorporate a long-term vision.
- Develop a list of bullets that everyone can use in their outreach efforts, websites, etc. so that no matter where the public or users search, they are getting some consistent messages.
- Plan to continue this meeting on an annual basis if funding could be identified.
- Help people to stay in touch.
- Coastal Services Center cleaning house for information will be good.

- Use SECART as a vehicle to coordinate climate outreach efforts and possibly generating resources.
- Identify local contacts for community health (Health Planning Council of NE Florida) and Department of Defense (Naval Air Station Jacksonville).
- Have a consistent message and all provide coordinated outreach.
- Start using the websites.
- Depending on results, apply for a NOAA grant to put the LiDAR data into a format useful for local governments and present it as a tool to local governments in a way that appeals to their current concerns.
- Build out coastal adaptation site, climate portals, and other clearinghouses and give guidance on what each has and doesn't have.
- Training opportunities.
- Need consistent and enforceable regulations specific to setback laws and better maintenance.
- Build an electronic community that fosters real partnerships (as opposed to current "partnerships" that often proceed in name only). Low hanging fruit would be to pursue the fact sheet idea (coordinate multiagency fact sheets on impacts and consequences).
- Establish work groups in specific areas where various products could be developed and tested – website, brochure, animations, etc.
- Continue collaboration established by the workshop – have quarterly or biannual Web meetings to showcase novel tools and approaches to climate outreach
- Need information compiled as resources to be relatively consistent with respect to the message. Inconsistencies (mixed messages) are counterproductive and lead to confusion and lack of credibility with target audiences.
- Invite professional associates, such as the Association of State Floodplain Managers and the American Planning Association.
- More living shorelines.
- Making sure community is taking steps to reduce carbon footprint NOW so as not to add or accelerate global climate change
- Collaborative website, case studies messages, develop the "tools needed" as discussed in workshop.
- Web portal that pulls all/most information for the different components of climate change.
- Create more tools and outreach materials!

## **Appendix J: Next Steps as a Community**

### **What are the top next steps? Where do we begin?**

- Having another regional meeting a high priority: who else to invite?
  - Cooperative extension agencies

- Insurance and banking
- More climate scientists
  - Climate Prediction Center
  - NCDC
- Other federal agencies
  - USFWS (more representation)
  - NPS
  - USGS (more representation)
  - USDA
  - DOD
  - FEMA (more representation)
  - DOT
  - Coordinate through US GCRP
- Someone in community health (CDC?)
- Ports Authorities
- Association of State Floodplain Managers
- APA
- Florida Inland Navigation Districts
- Invitation depends on goal for meeting – are they correct for what outcome should be?
- Meeting topic
  - Outreach needs to be grounded in science – spend a couple days on the science so people can start adapting tools
  - Doesn't need to be presentations – if you have the opportunity to work with the data, experiential learning would be helpful
  - An unfocused meeting allows us to pick up things we didn't know about – too strict a focus reduces “serendipitous discoveries.” So perhaps half day “science boot camp” as an option?
    - Virtual option?
  - Continuing exchange of what we're all trying/doing
  - Keep it specific to the Southeast
- Need to find funding and support for more people to attend – easier to get support with webinar option than it is to send a person to a meeting
  - Feedback on financial support for this meeting: was funding critical to getting people here? Was it enough?
    - About a third wouldn't have been able to make it w/o support of some sort
    - Sometimes it's also restrictions on travel
- Adding RSS feeds or e-mail digest options to CSC adaptation site