

WHITE PAPER:

Identifying Decision-Focused Climate Adaptation Activities and Aligning Priorities Across Multiple Sectors and Scales in the Southeastern United States

SOUTHEAST WORKING GROUP CONVENED AT THE NATIONAL ADAPTATION FORUM MAY 11-14, 2015

Compiled by

Lisa Fouladbash, USDA Southeast Regional Climate Hub Cari Furiness, DOI Southeast Climate Science Center Shelby Krantz, Southeast Climate Consortium Aranzazu Lascurain, DOI Southeast Climate Science Center Hilary Morris, South Atlantic Landscape Conservation Cooperative Elda Varela, DOI Southeast Climate Science Center Adrienne Wootten, DOI Southeast Climate Science Center

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Introduction

The 2015 National Adaptation Forum, <u>http://nationaladaptationforum.org/sites/default/files/naf-2015-</u> <u>program-web.pdf</u>, was designed to provide opportunities for individuals in the adaptation community to share strategies, lessons, tools, and information. It was organized as a collection of symposia with facilitated practitioner presentations, formal training sessions, and thematic working groups, along with opportunities for networking and informal information exchange.

Proposals for working groups were solicited on topics such as agriculture and food security, architecture and design, city resilience planning, coalition building, community based adaptation, critical infrastructure, cultural heritage resources, disaster risk management, economic development, education and outreach, financing adaptation, international readiness, land use planning, marine and coastal impacts, monitoring and evaluation, natural resources, policy, public health, transportation, Tribal, and water resources.

NAF provided a framework developed by EcoAdapt that conveners used to identify where their proposed working group topics fit. The **Adaptation Ladder of Engagement** (http://www.ecoadapt.org/programs/state-of-adaptation/adaptation-ladder) is described with seven rungs:

- Awareness Climbing a ladder requires that you know the ladder exists and you take a first step up and on. In the case of adaptation, it is an awareness that climate change affects your ability to meet your goals, either by altering the effectiveness of the tools you use to achieve your goal or by undermining your goal itself. Either way you are making investments (time, money, political capital) to achieve your goal and those investments are vulnerable if you are not aware of (and taking into consideration) climate change.
- 2. Assessment The second rung is getting a better feel for the scope of the problem. This could take many forms, including a general review or a more formal vulnerability or risk assessment. Regardless of the approach, the key is to systematically assess how climate change might affect your work or other investments of time and money. How might climate change affect your ability to achieve your goals? Will climate change make your strategy less effective?
- 3. Planning Knowing your vulnerability should not result in paralysis. Rather it should inspire you to develop a strategy! Rung three moves from assessing the problem to identifying solutions. Based on the risks or opportunities identified in Rung 2, what you can do to reduce your vulnerability and increase your likelihood of better long-term outcomes? This might be a revision of some existing plan or process, or it might be a climate-focused Adaptation Action Plan that aims specifically to call out new activities or modifications.
- Adaptation Ladder of Engagement*

 7
 Sharing

 6
 Evaluation

 5
 Integration

 4
 Implementation

 3
 Planning

 2
 Assessment

 1
 Awareness

 brought
 EcoAdapt*
- 4. **Implementation** It is not enough to have a plan. The next rung is to put your plan into action. This may mean implementing new laws, regulations, or processes, or it may be adjusting existing activities by changing what you do and how or when you do it. Just like the emergency maps on the wall in public buildings, your adaptation plans are only effective if you jump to your feet and follow the path to get the fire extinguisher, pull the alarm, or get out of the burning building.
- 5. **Integration** Adapting to climate change is not a one-time action. It is a process of integrating climatesavvy thinking into the way you approach your work, allowing you to assess, anticipate, or respond to changes in climate, ecology, or management effectiveness as they happen. The fifth rung of the

adaptation ladder may be formal monitoring or adaptive management programs, or it may simply be consciously surfing the uncertainty wave.

- 6. Evaluation Fail early, fail often, learn quickly. It's a great mantra and perhaps even more so for climate adaptation. Good adaptation is going to require monitoring and evaluation in order to determine what is working and what is not working. We need lessons learned NOW in order to improve adaptation practice and achieve the best possible outcomes for the future. Project monitoring and evaluation should be integrated throughout your adaptation efforts to make sure that investments of time and effort are not wasted.
- 7. **Sharing** It is great to build internal capacity and resilience, but for most of us our chances of long-term success are increased if we share with and learn from others. The larger we make the adaptation community, the easier it becomes to make it part of our own work.

Description of Southeast Working Group Session

Identifying Decision-Focused Climate Adaptation Activities and Aligning Priorities Across Multiple Sectors and Scales in the Southeastern United States

The Southeastern United States (including the Caribbean) is a diverse landscape of natural and built systems, people, and organizations that faces a number of climate adaptation challenges *and* opportunities. A Working Group was proposed to convene organizations and partners in the Southeast to share existing and proposed adaptation projects that focus on decision-centered science to address climate impacts.

The Working Group was convened by the following organizations:

- The DOI Southeast Climate Science Center (SE CSC)
- Carolinas Integrated Sciences & Assessments (CISA)
- The USDA Southeast Regional Climate Hub (SERCH)
- The Southeast Climate Consortium (SECC)
- South Atlantic Landscape Conservation Cooperative (SA LCC)
- North Carolina Sea Grant
- Caribbean Landscape Conservation Cooperative
- Southeast and Caribbean Climate Outreach Community of Practice

This Working Group used use 5-minute "lightning" presentations to spur participation and quickly identify specific areas of interest for further exploration and discussion related to decision-centered science or "climate-smart" adaptation projects, either developed or planned. Attendees were identified and surveyed before the meeting to further focus the scope and scale of the discussions. Participants were encouraged to bring multiple perspectives from their own missions as well as from other sessions attended at the Forum to stimulate regional conversations and connections.

The Working Group discussions and outcomes centered on two rungs of the Adaptation Ladder of Engagement:

3. Planning. How can I meet my goals in the face of climate change? Decision science can play an important role in the planning stage for adaptation practices since it formalizes a structure by which to create a clear definition of a problem and of the specific objectives that are desired, then developing alternative actions that meet those objectives. Consequences of alternatives are quantified and tradeoffs are considered, taking into account elements of uncertainty and risk, and leading to an optimal decision. Working Group discussions were intended to focus on how elements of the decision framework have been, are being, or can be incorporated into plans for specific adaptation actions.

7. Sharing. Do my friends and peers know what I'm doing? This Working Group took advantage of the opportunity to share information about current and planned adaptation efforts and develop additional partnerships and synergies across the Southeastern landscape.

Planned outcomes for this session were:

- Southeastern United States adaptation-specific map of resources, projects, and people that can live on multiple sites, including regional partners and national databases such as the Climate Adaptation Knowledge Exchange (CAKE)
- Commitments for post-conference collaboration among and between regional groups
- A white paper featuring recommendations on Working Group findings as well as recommendations for mechanisms for the integration of science and decision making to advance climate adaptation
- Identification of strategies to support a community of adaptation practitioners to share efforts and lessons learned in the region.

Summary and Recommendations

In order to set the context and facilitate discussions, each organization prepared a 5-10- minute presentation using a common template, which provided an example of one adaptation project and summarized the following information:

- **Role in the Southeast Region**: Describe your activities and role in the Southeast, as distinct from other entities in the region
- **Other Adaptation Projects**: List other adaptation projects/resources/tools of significance to the region, or that are areas for potential collaboration
- **Barriers to Successful Regional Collaboration**: Describe what you perceive to be the most significant barriers to successful regional collaboration

Summaries of organizations' Activities and Roles and thoughts about Barriers to Regional Collaboration that were presented at the session are below.

Before the NAF, the conveners implemented a survey for climate adaptation professionals in the Southeast, to gather general information about their organizations and detail of their adaptation activities, especially those that incorporate elements of decision science, and interests/needs. The general categories for which the survey requested detail were: About You / Your Organization, Decision Science / Adaptation Projects, Tools and Resources, and Collaboration and Communication. The survey was sent to 84 collaborators identified by the conveners (**Appendix 4**), which elicited 24 responses. These provided additional regional information to supplement presentations at the Working Group session. Results of the pre-session survey were presented by Adrienne Wootten of the SE CSC (**Appendix 2**).

General discussion followed among the convening organizations and others attending NAF who joined the Working Group session, facilitated by Rachel Gregg of EcoAdapt (**Appendix 1**). Several potential action items for collaboration emerged; they are detailed below.

Lightning Talks

Activities and Role in the Southeast

- Caribbean LCC
 - Climate science and services for conservation, agriculture
 - Workshops with managers and scientists
 - Connect science providers with science users at the first step (e.g. coffee farmers)
 - Need to facilitate and build social collaboration
 - Communication and building a common language
- CISA
 - Health warning systems
 - Looking at heat stress
 - NC DETECT systems
 - Vulnerability assessment
 - Within existing metric

- \circ $\;$ Maybe warn people sooner about the danger of changes in heat
- Supporting adaptive capacity
- National Integrated Drought Information System
- Downscaling
- NC State Climate Office
 - DCERP
 - Accommodating the needs of the base, their mission areas, and sustainable resource management
 - History, data, and tools
 - PINEMAP
- South Atlantic LCC
 - Conservation Blueprint
 - Better combine existing resources
 - Conservation actions to protect shared areas of interest
 - Create a forum for collective action
 - State of the South Atlantic
- SERCH
 - Working lands, forest lands, range lands
 - SERCH LIGHTS: Drought alert system
 - Based on stakeholder needs
 - May expand into floods and storms
 - Toolshed: new website categorizing web and mobile tools
 - TACCIMO
- NC Sea Grant
 - Community Resilience planning
 - Pair vulnerability with consequences
 - Coastal science serving NC
- Southeast Conservation Adaptation Strategy
 - Provide context for your work
 - Ask: Is your work relevant to the FWS?
 - Goal: Network strategic plan
 - Interconnected landscapes and seascapes
 - What does collaboration look like?
- Southern Regional Extension Forestry
 - PINEMAP
 - Climate Science Learning Network (CS-LN)
 - Working with the climate hubs, extension, and land grant universities
- Southeast Climate Consortium
 - Tri-State Row Crop Climate Learning Network
- DOI Southeast Climate Science Center
 - Federal and university partnership focused on global change research
 - Understanding Conservation Management Decisions in the Face of Sea-Level Rise Along the U.S. Atlantic Coast

Barriers to Successful Regional Collaboration

• Regional and national products don't include US Caribbean

- Language
- Lack of investments in communication and innovative adaptation
- Better facilitation: Climate products aimed at users
- Continuing Engagement, Computing and Infrastructure, Communication (Jargon Gaps)
- Many organizations and partnerships finding their niches
- Acceptance of increasing climate variability and change as an issue that requires a coordinated response
- Incomplete knowledge of and communication among the wealth of diverse organizational efforts in Southeast
- Low capacity and funding
- Time
- Rewards for partnership
- Understanding different regions and groups dynamics and culture (e.g. working with a tribal liaison)
- Ensuring there is not overlap
- Communication

Recommended Actions for Collaboration

- Integrate information for organizations in the Southeast into CAKE
 - Start with a directory of climate adaptation practitioners each organization can register and update their information (directions in **Appendix 5**)
 - Potentially include costs of projects in descriptions
- Develop a mechanism for integrating blog posts across groups
- Develop a logic model use to define shared long-term goals for collaboration (draft in **Appendix 3**)
 - Effective coordination?
 - New grant opportunities?
 - Each group has different end game, but there are some common needs, e.g. land cover
- Meet and learn from other regional groups, such as regional adaptation forum groups and the Great Lakes/Midwest collaboration folks. Maybe meet at the next CISA meeting?
- Participate in NOAA Community of Practice practitioner-focused
 - Want to connect research/researchers with stakeholders
 - Know who/where is expertise/projects
- Connect with participants at other regional forums at NAF
- Consider developing a session at CISA Climate Resilience Conference

Appendix 1. Notes from NAF Southeast Working Group Session

May 12, 2015

Discussion

- Planning and Sharing as the main focus
- How do you use decision science in your organization?
 - (Word cloud) Conservation and resource management stood out
 - Organizations needs
 - Better information
 - What does this mean? More modeling, monitoring, etc. information?
- Main collaborators vs. who would you like to work with
 - Work with many feds and university, most interested in working with other, new partners
 - E.g. city and state

Rachel Gregg as moderator

- Interested in water and change in the SE
- Interest in better communication
 - o General comments
 - Louisiana

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- Interest in infrastructure
 - What are states doing and what unique funding opportunities may exist
 - \circ $\,$ E.g. working with the energy companies as one source
- USAID does work in this area
 - Having to show a need for more protection/safety
- Example from Sea Grant Jason Tybee Island in GA, partnership with the state to incorporate SLR into Hwy 80
- Terando
 - Does SC have more information in terms of development?
 - SC more stringent stormwater regulations in terms of what storm events they're managing for compared to NC? In NC, a lot of development. Cities could be doing more – Raleigh mainly mandates that development must manage for 2- and 10-year storm events, but the frequency of those is changing. Incorporating and trying to get out head of that by managing for the 25-year storm events (almost using climate projections)
- From West Nevada
 - Saw identical charts in Nevada about partnerships (e.g. Federal vs. local partners)
 - someone trying to aggregate common themes, best practices? In terms of who people want to work with, got identical results in Nevada needing to work more with local governments, etc. Any attempts to scale up to learning about collaboration on climate? Moving beyond regional focus.
 - Don't talk about climate, talk more about resilience, warm/wet, uncertainty
 - Concern about feds talking to feds vs. locals talking to locals
- City of Toronto
 - Asked about these organizations funding sources
 - Depends on the org
 - Kirstin NOAA supports RISAs, DOI supports LCCs and CSCs, USDA supports Hubs...Sea Grant has been around for 40+ years.
 - Shelby that's what we're trying to figure out-how our different regional projects will fit together in this funding atmosphere when some projects are long-term and permanent and others are lapsing.
 - Federal person from back of room federal agencies are regional and federal agencies regionally do work together, which can provide a strong continuous base for funding

that you can work with. Advantage of keeping those folks involved is that they can provide a level of continuity and administrative support.

- Sea Grant environmental justice lacking?
- Steve McNulty The evolution of climate change questions
 - Broader questions and analyses
 - Now people want to know how it relates locally
 - Aim to be specific but integrated
 - Questions started getting very specific and focused. Getting to the point now where there are lots of good projects, but that's evolving to the point where now we're trying to figure out how the projects relate. Hearing from Extension and Associate Deans that people want to know what's going across state lines, coordinating across states. It's a benefit of the federal government. The goal is to be specific but integrated—that's what we've evolved to. And this forum can help inform the direction this goes.
- Rachel
 - How much integration is there now?
 - Steve: very good
 - E.g. SERCH and SE CSC have a great collaboration and shared website
- Adrienne: on the other hand, could do better including the Caribbean
- Isabel CLCC established a network of different stakeholders, really improved integration with the Caribbean. Caribbean Hub is looking at what worked with the CLCC and what didn't to use it in their strategic activities.
- Kristin Dow: Different groups for conservation communities vs. public health communities
 - Liz Fly runs a South Atlantic and Gulf Community of Practice. That draws more on community planners, working waterfronts, livelihoods, public health. Some places where co-location has been an enormous benefit and quite a geographic distribution.
- Adam Terando
 - Coordination
 - FL and LA are particularly vulnerable
- Tim Breault of Florida says FL is doing alright
 - 26 million (?) population by 2060
 - Landscape planning important in face of this urbanization
 - Florida voters voted for 30 years' worth of land acquisition, 300 million per year over 30 years to buy land.
 - 27% of state forest in public ownership
 - FL as sand spit surrounded by ocean
 - Seeing effects in different areas of the coast, but averaging about a 9-inch sea level rise. Built the Everglades water control at 12 inches above high tide, so during protracted rainfall events like tropical storms and hurricanes, the storm surge exceeds that easily. Lots of flooding.
 - Dealing with flooding and man trying to re-plumb the everglades
 - The PFLCC doesn't make climate science, it uses it.
 - E.g. where might species move to?
 - Why are all these people saying they "do climate"—they do it in a different, complementary way. Defining niche so we look at synergism and how to augment one another. How to really put the data to work, make it useful.
 - Despite the state's leadership, FL is well positioned to prepare to and respond to climate changes
- Local government community development director in Florida, north side of Amelia Island.
 How do you see your organization's role in working with local governments? What do you

envision that relationship being? Relationship with Sea Grant due to UF connections, rely on Florida Sea Grant though GA is closest neighbor. More urbanized areas are ahead of the curve, but in a community of 12,000 people that doesn't have environmental staff, how do you see your groups being able to help?

- How else can these orgs help the local gov?
 - Interest in data, but don't know what is out there
 - E.g. Sea Grant, CAKE, UF
- Might not have contacts at other counties who specialize in these environmental roles
- Florida local gov
 - Small local govs do not have time to look around at all the content sent to them
 - Have links for so many databases and toolkits
 - Adrienne: outside of UF connection, how easy has it been to find other resources for your community? Would it help to have all that info in a single place like CAKE?
 - Hard to answer because she already knew where to look. Rely on Sea Grant but know about CAKE and the Southeast Community of Practice, at UF did Environmental Land Use Law so plugged into natural resources connection. But counterpart in another county, doesn't know how they'd know where to look because that county doesn't have a Sea Grant agent.
 - People saying click links for tools---to many links, too many things. Great ideas, but unmanageable.
 - Adrienne would it help to consolidate a database of contact info and tools?
 - \circ \quad Would prefer someone who comes to them and explains it all to them
 - Jessica Whitehead: this is what Sea Grant does!
 - \circ Go from county to county, mostly at those counties that request this service
 - But was encouraged from FL to go to the counties who don't know about this service and need someone to approach them about it and explain it all to them
 - Adaptation is a marathon, it's not a one-off or a spring. A continuous cycle of coming back and readjusting. Until they have someone who can be a consultant in every community. Concern for city planning
- E.g. talk to city engineers, DOT
- City operation department is building stuff every day, don't have to ask the commissioner to raise the seawall, just raise the seawall. Just have to tell the people who are designing it. Jason stormwater engineer in Tybee already had it figured out, Jason just helped him sell it. Basically what Sea Grant did is provide modelling and maps and cost-benefit. Price tag disincentives a giant seawall. Fernandina has big needs. Somewhere in Florida, have such diversity-communities that want to plan for sea level rise and others that are plugging their ears. Engineers, you get them behind closed doors...as soon as Jason showed GA DOT what their road will look like if they don't raise it flooded 30 times if they don't elevate it that's unacceptable, don't need a benefit-cost model!
- Libby Carnahan with FL Sea Grant several things going at one time. Working on regional momentum for SLR and climate change planning. At the same time, a small community came to one of her meetings, realized that SLR was an accepted fact and without Sea Grant even knowing, integrated the info into a stormwater management plan. Folks from county looking at integrated water plan are already planning for SLR even though they haven't started a climate action plan. They're engineers, they already understand it. FL Sea Grant has about 15 county agents for about 35 coastal counties, so spread a little thin, and they don't all work on climate

and coastal resiliency. Trying to change the models so that those with the expertise can train others and work in other areas.

- Climate community of practice
- Rachel CAKE map presentation
 - \circ $\,$ One place to go to find the product and services in your area
 - Full of case studies
 - A shared map to search for this content
 - ARS cultural resource
 - One state may not know what another state is doing
 - E.g. what is MO doing with corn?
 - Putting Agricultural Resource Service sites on CAKE?
 - *Farmers will listen to other farmers before they listen to the federal gov
 - o Georgetown listing of info also exists
 - How to we avoid re-inventing the wheel
 - Concerns about keeping the information product as well
 - Competing resources? Practitioners can even still be confused. National Sea Grant has its own portal as well. All need to agree on one system.
 - Kirstin how to build regional collaboration is an interesting conversation. Enormous amount of
 effort required to put together case study. Want to think about how to do that in the most
 efficient way, not rewrite information from website.
 - Rachel we just edit information from a website/report, upload it as a pdf to CAKE library. Take short descriptions from website and include link from website.
 - Lisa internal database of contacts that's becoming pretty robust. Should that eventually be public or shared. Wouldn't want to duplicate efforts of CAKE, how is that different? Look at land grants, Extension, agriculture, contact info, project info, needs/concerns, methods of communication.
 - Rachel don't do climate science or climate data, they partner with DataBasin. Started with tiered approach of users, first managers, then scientists, then educators and students. But every year they find other folks using the site, private sector folks.
- Hubs working on person database too
 - Scientists in the region and what they work on
 - Is what CAKE has similar?
 - CAKE has explored single click sign on as well for multiple sites
 - Have managers, researchers, educators, students, but have more private sector folks joining as well
- Aranzazu: suggested joining CAKE as an initial step before even adding case studies, making sure we all are signed on to a single location
 - Adam does CAKE provide cost of adaptation projects? Huge capacity issues. Overworked, small staff, Need ten Jesses. Needs to be a feedback when we're doing this adaptation work, costing out raising the sidewalks a foot. How much does that cost? So that can feed back into the other big decision, which is do we mitigate climate change, do we put a price on carbon. Already seeing hidden or internal costs anytime we're doing these adaptation projects. Don't lose sight of how we can feed back the investments we're making on the adaptation side into the mitigation side.
 - Steve: keeping partners in the loop

- There are tools out there that self-populate (like blogs in newsletter). If there's more or less a common format, and it populate across, a little can go a long way. Work smart not hard.
- o Shelby: repeating same info to different partners, redundancy
 - Do we need just one big newsletter?
- Jess what's the goal, purpose? Short, medium, and long-term goals? NOAA uses logic models for project planning. These would be good resources but none of us are going to commit to the effort for assembling and continuing to use them unless we know what the goal is. What is the goal? More effectively sharing expertise? At least 4 funded project in Beaufort, Hyde, Tyrell counties right now. Avoid stepping on toes through effective coordination? Pulling together on new grant opportunities? What's the end game---then decide on what tools we need.
- Steve: Each agencies end game is different
 - But each agency may have something they can use to get to their end game. May all need timely and precise climate info, or land cover info, to achieve goals of working land sustainability and biodiversity sustainability. CSC users don't care about pine or wheat, but they care about merganser biodiversity, we may need the same database. What things can we draw and distribute from the common pool.
- o Jessica Sea Grant
 - Salt water intrusion issues for county encompass both ag and biodiversity concerns
 - Wetland restoration as a mechanism to reduce saltwater intrusion to improve crop production. Systems perspective of shared resources. Improving how well we share and coordinate across the different regions.
 - CISA: user directory and expertise directory
 - NOAA focused due to funding
 - Expand what the definition of a community of practice is
 - ID stakeholders and users
 - Hubs want to know about best practices
- Shelby: could explore the LOGIC model
- Next steps:
 - White paper with recommendations
 - Copy of the survey
 - To be shared with those who signed in

Appendix 2. Southeast Working Group Partner Survey Results

Before the session in St. Louis, the conveners implemented a survey for climate adaptation professionals in the Southeast, to assess the information needs and available tools for climate adaptation and decision making in the Southeastern U.S. The planning committee developed a list of 84 collaborators from a range of organizations as the survey population. The following 23 organizations provided responses to the survey. These provided additional regional information to supplement the views represented at the Working Group session.



50 percent of respondents described the geographic extent of their organizations as the entire Southeastern US.

Mission and activity areas of responding partners in the Southeast.

	Activity Area	Count	Percent
	Conservation	16	66.7%
	Ag / Forestry Extension	9	37.5%
	Climate data / tool development	16	66.7%
	Climate modeling	6	25%
Choose all that	Climate Adaptation	19	79.2%
describe the activity	Decision Support	19	79.2%
areas of your	Stakeholder Engagement	21	87.5%
organization	Water Res. Management	10	41.7%
0	Public Env. Health	6	25%
"Other" includes:	Coastal / Marine Resources	14	58.3%
monitoring &	Building Adaptive Capacity	16	66.7%
science engagement,	Policy and planning	13	54.2%
large scale	Hazard Management	6	25%
conservation.	Other	4	16.7%



What is the main mission focus (foci) of your organization?

"Other" includes: climate adaptation, conservation planning, consultants, landscape scale conservation, forum forum for conservation planning & prioritization.

Mission Focus	Count	Percent	
Extension	11	45.8%	
Research	13	54.2%	
Outreach	9	37.5%	_
Env. Justice	1	4.2%	Er
Education	8	33.3%	
Other	11	45.8%	



How do you use decision science in your organization? This word cloud represents the words and ideas respondents expressed the most (larger words were used more often in responses). In the second representation, the words "climate" and "decision" were removed.



How do you use decision science within your organization?

"... to assist in scoping vulnerability assessments and prioritizing adaptation options."



"Help growers/managers decipher reasonable options for management and risk avoidance/mitigation within the forestry and natural resource sphere"

"... support science -based planning, policy and decision tools development ... used to develop vulnerability assessments, adaptation strategies, resilience tools, and coastal hazards amelioration projects."

Give an example of a climate adaptation project that your organization is working on. All responses received by surveyed partners.

USDA Forest Service

http://www.fs.usda.gov/ccrc/climate-projects/adaptation-examples/francis-marion-national-forest

State Climate Office of North Carolina

There are several project we are connected with, one that I am involved with directly is the Puerto Rico Project. Since there is such a need for high resolution climate projections in Puerto Rico, the SCO along with other partners at the SECSC, UNC, and FSU are producing projections which meet the needs of conservation managers and ecologists in Puerto Rico and the U.S. Virgin Islands. This project is also in conjunction with the Caribbean LCC, and began by gathering which variables and information the end users in Puerto Rico really needed before producing the projections.

Gullah/Geechee Sea Island Coalition

Gullah/Geechee SEA & ME is our major project that engages the community in educating others on traditional Gullah/Geechee methods of adaptation.

US Fish & Wildlife Service

Gulf of Mexico-wide Sea Level Rise; most SLR efforts have been in small portions of the gulf -- without consistent scenarios allowing large scale planning. We have funded mangrove migration and marsh migration due to SLR - all impacting coastal resources.

Southeast Regional Climate Hub

We are compiling and categorizing decision support tools from across the country that can assist working lands managers in adapting to climate change. These tools will be on a searchable, public-facing database, free and available to the public.

Southeast Climate Consortium

Agroclimate.org

NCSU-CES

PINEMAP, Climate Forest Woodlands Community of Practice, (advisory role) in Climate Science - Virtual Learning Network, SERCH support

NPS Old-Growth Bottomland Forest Research and Education

We are working to summarize several key examples of ecological changes related to climate change. By making these examples specific and relevant to Congaree we hope to build broader support for discussing adaptation projects in the future.

NC Sentinel Site Cooperative

Evaluation of shoreline stabilization techniques such as living shorelines (e.g. planting Spartina, creating and evaluating marsh sills, oyster reefs) versus bulkheaded sites.

South Atlantic Landscape Conservation Cooperative

Our Conservation Blueprint is a living spatial plan to achieve the Cooperative's shared vision of the future. The Blueprint measures the integrity of terrestrial, freshwater, and marine ecosystems using natural and cultural resource indicators, and explicitly models the threats of sea level rise and urbanization. Identifying the critical places and conservation actions to ensure a sustainable landscape in the face of these future changes creates a common adaptation strategy for the South Atlantic region that integrates with neighboring Southeastern LCCs' spatial priorities. Partners have already used expert-driven Blueprint 1.0 to guide conservation across the geography in coastal wetlands protection, public lands planning, climate adaptation for wildlife management, and hydrologic barrier removal. Efforts are also underway to integrate the Blueprint into local land acquisition criteria, ecosystem-based fishery management, and bobwhite quail habitat restoration. Data-driven Blueprint 2.0, scheduled for release in June 2015, improves on the first version by directly linking to the indicator models, increasing its spatial resolution, and adding an intuitive custom interface. Through a transparent process, a science-based plan, and a user-friendly product, the Cooperative intends the Blueprint to eventually become a "gold standard" for large landscape conservation tools.

Southern Region Extension Forestry

The Pine Integrated network: Education, Mitigation and Adaptation Project (PINEMAP) is a USDA funded, \$20 million project which is creating the research to help planted pine survive and thrive under a changing climate. We work on extension for this project.

SE Climate Science Center

Understanding Conservation Management Decisions in the Face of Sea-Level Rise Along the U.S. Atlantic Coast This project addresses a complex local scale conservation problem: managing the impacts associated with sea level rise and coastal flooding on migratory waterbirds and their habitat. Decisions made by a conservation manager are complicated by three elements that can be expected to occur in almost any of these management situations. Interactions among dynamic physical and biological processes affect both waterbirds and their habitat and food resources; these processes operate at local to flyway scales and are challenging to represent and analyze. These natural physical and biological systems are coupled with human systems; decisions made by nearby landowners or jurisdictions can have an impact on conservation resources. Finally, decision makers are still developing the experience and expertise to perceive, understand, and deal with the implications of the first two elements in making timely and effective decisions. The goal of this project is to develop a detailed description of the problems faced by conservation managers that will enable decision makers facing actual waterbird/habitat-related decisions to better understand their own decision making situation and improve their ability to propose investigations that address each of the three elements described above.

Cooperative Extension Service - Southern Region

PINEMAP (http://www.pinemap.org)

Gulf Coastal Plains & Ozarks LCC

Southeast Conservation Conservation Adaptation Strategy

EcoAdapt

State of Climate Change Adaptation in Southeast U.S. Water Resources - This project aims to survey, catalog, and assess (where possible) climate adaptation activities in the Southeast United States, focusing on water resources management, planning, and conservation. We are examining 10 states in the Southeast - Alabama, Louisiana, Georgia, Mississippi, Tennessee, Kentucky, South Carolina, North Carolina, Virginia, and Arkansas - through interviews, a needs assessment survey, case studies, and a synthesis report of trends, challenges, opportunities, and recommendations on how to integrate climate-informed thinking into water resources action.

USFWS

We dub up 500 keys tree cactus and moved them up slope (1 ft) to give them 20 -50 years before SLR will cause root zone issues.

Estudios Tecnicos

Community based climate change adaptation plan for the Municipality of Culebra, Puerto Rico

Georgetown Climate Center

The Climate Center has a number of projects ongoing, including a collaboration with the Western Adaptation Alliance to identify municipal strategies for managing water scarcity.

US FS International Institute of Tropical Forestry

We are developing communication tools (videos, factsheets) that convey successful climate adaptation practices to producers in PR and the USVI.

PRCZMP/PRCCC

Climate Vulnerability Assessments:

http://pr-ccc.org/publications/prccc-documents/

Sea Level Rise and Storm Surge Visualization tools: http://pr-ccc.org/prccc-coastal-vulnerability-viewer/

USDA Caribbean Climate Sub Hub

Adaptation Project: "Sustainable Land Management Practices for Climate Resilience in Tropical Forestry and Agriculture". The Caribbean Climate Sub Hub (CCSH) will identify and document local successes in sustainable land management practices that farmers, ranchers and landowners in Puerto Rico and the U.S. Virgin Islands could adopt to build climate change resilience. The aim of this outreach project is deliver climate services, to provide educational resources and a reference tool for practitioners in the form of written documents and short videos. The documents and videos will serve to demonstrate the potential of sustainable farming and forestry practices in reducing threats under climate change and will showcase the diversity of options available based on the experience of local farmers, ranchers and foresters that have implemented or are currently implementing sustainable land management practices. Specifically, we aim to document stories of practitioners in Puerto Rico and the U.S. Virgin Islands involved with conservation agriculture (i.e. no tillage, green manure, mulching, use of cover crops and crop rotation), soil and water conservation, agroforestry, integrated pest management, improved livestock management, aquaculture, among others.

North Carolina Sea Grant

We are using adaptation options identified in VCAPS to assist Hyde County, NC with developing a flood resiliency plan. The options identified are being explored through GIS-based cost-benefit analysis where appropriated. Other options will be mapped to the Community Rating System (CRS) program to get Hyde County points that may help them reach a Class 8 rating, saving residents and businesses in the Special Flood Hazard Area 10% on flood insurance policies.

List 2-3 tag words to describe your project



Does your organization of have education and outreach resources?



"Other" Includes: Alert system, live programs, teacher workshops and lesson plans, short videos, magazines

Which do you consider the most effective?



Of those who said they had a resource, how many said that resource is effective?

50%

	Count (Have)	Count (Effective)	Percent who thinks this is an effective resource
Social Media	17	2	0%
Newsletter	19	4	21%
Blog	12	1	8%
Website	23	8	30%
Factsheets	20	1	5%
List-servs	11	0	0%
YouTube	9	0	0%
Other	4	2	50%

Of those that said other - some form of "Direct Contact" was the most common response



Thinking of those you don't already work with, which organization(s) would you most like to work with in the future?



"Other" collaborators include: Gulf Coast CESU, International organizations & other countries, Extension Service and Producers.

Of those who said they already work with one group, which other groups do they want to work with most in the future?

"Others" who you would most like to work with: Urban planners, private land owners, EPA, National Climate Data Center, USGS Research Coops,

Of those who said they already work with one group, which other groups do they want to work with most in the future?



Percent of Respondents who want to work with a group given that they already work

Of those who said they already work with one group, which other groups do they want to work with most in the future?



What is your organization's biggest need in terms of climate communication and collaboration? This word cloud represents the words and ideas expressed by the most by survey respondents (larger words were used more often in responses). In the second representation, the word "climate" was removed.



"Downscaled precipitation and temperature and this information packaged for managers."

"integration with those who 'deliver' conservation and engage in land management."

"1. Coordinated, coherent efforts networked with nearby stakeholders and partners.

2. Staff time to develop and hone quality programs and products."

What is your organization's biggest need in terms of climate capabilities (e.g., staff expertise, computing infrastructure, access to tools or data, etc.)? This word cloud represents the words and ideas expressed most often (larger words were used more often in responses). In the second representation, the words "climate" and "funding" were removed.



"Resources, primarily people to work with the information users to train them." "...staff expertise in various disciplines including agronomists, environmental economists and planners, plus expertise in graphic communication and outreach."

Appendix 3. Draft Logic Model for Southeast Working Group

This logic model was drafted by Shelby Krantz of the Southeast Climate Consortium, as a mechanism to spur continued discussion about collaborative activities and shared goals for the climate adaptation community in the southeastern US, including the Caribbean.

Inputs	¢	Outputs		Outputs				Outcomes Impact	
		Activities	Participation		Short	Medium	Long		
Staff			Climate-adaptation related groups in the		Build community	Enhance integration among federal and	Regional prioritization of research areas and		
Time		regional meetings	Southeastern United States.		Enhance communication across sectors—regional	regional partners	stakeholders		
Money Support (web design		Provide Southeast-wide climate updates	Ex)		Linderstand each groups'	Avoid potential overlap in tool and resource			
graphic design)		Merge publically available resources for a 'one-stop-	SE CSC		strengths and weaknesses	Integrate databases			
Partners		shop'	SE RCC		Identify funding sources	(using CAKE with CRAVe capabilities for			
			SECC		for regional coordination and in-person meetings	cross-referencing)			
			CISA						
			SCIPP						
			Sea Grant						
			State Climate Offices						
			Regional Climate Hubs						
			LCCs						

Assumptions

Everyone wants to work together!

External Factors	
Funding Continuity of projects/groups	

Appendix 4. SE Collaborators for the Working Group at NAF

Aponte Felix		Special Assistant to the	Puerto Rico Department of Natural
		Secretary/Climate Specialist	and Environmental Resources
A 1990 10	Mialdi		Coorgetown Climate Conter
Arroyo		Executive Director	Georgetown Climate Center
Dallusii		Extension Associate	Southern Region Extension Foresters
Bobbie	Leslie		
Bolt	Michael	Water Resources Manager	E. Band of Cherokee
Breault	Tim	Coordinator	Peninsular FL LCC
Brennan	Jean	Science Coordinator	Appalachian LCC
Brown	Dave	Regional Climate Services Director, Southern Region	NOAA
Cimitile	Matt	Communications specialist	Appalachian LCC
Cohen	Susan		DoD, Marine Corps Base Camp Lejeune
Creamer	Nancy	Director: Center for Environmental Farming Systems	North Carolina State University : CEFS
Crespo	Wanda	Coordinator of Culebra Community- based climate adaptation project	Estudio Tecnicos
Cunningham	Patricia	PI	Defense Coastal Estuarine Research Program, RTI International
David	Shelley	Education Coordinator	NPS, Congaree National Park
Dennis	Stewart	Refuge Wildlife Biologist	Alligator River National Wildlife Refuge
Diaz	Ernesto	Director/Executive Secretariat	Puerto Rico Coastal Zone Management Program/Puerto Rico Climate Change Council
Doraiswarmy	Prakash		RTI International
Dorton	Jennifer	Coordinator	NC Sentinel Site Cooperative
	0	Communications Mgr.	Gulf Coastal Plains Ozarks LCC
Elliott	Gregg	,	
Elliott Emanuel	Ryan	Assistant Prof. NCSU Forestry & Envt Resources	NCSU
Elliott Emanuel Evans	Ryan Jason	Assistant Prof. NCSU Forestry & Envt Resources Assistant Professor of Environmental Science	NCSU Stetson University
Elliott Emanuel Evans Figg	Gregg Ryan Jason Dennis	Assistant Prof. NCSU Forestry & Envt Resources Assistant Professor of Environmental Science Coordinator	NCSU Stetson University Southeast Conservation Adaptation Strategy
Elliott Emanuel Evans Figg Fly	Gregg Ryan Jason Dennis Elizabeth	Assistant Prof. NCSU Forestry & Envt Resources Assistant Professor of Environmental Science Coordinator Lead, Southeast and Caribbean Climate Community of Practice and Coastal Climate Extension Specialist	NCSU Stetson University Southeast Conservation Adaptation Strategy SE CoP and South Carolina Sea Grant Consortium
Elliott Emanuel Evans Figg Fly Frank	Gregg Ryan Jason Dennis Elizabeth Knapp	Assistant Prof. NCSU Forestry & Envt Resources Assistant Professor of Environmental Science Coordinator Lead, Southeast and Caribbean Climate Community of Practice and Coastal Climate Extension Specialist President and CEO	NCSU Stetson University Southeast Conservation Adaptation Strategy SE CoP and South Carolina Sea Grant Consortium SC Small Business Chamber of Commerce
Elliott Emanuel Evans Figg Fly Frank Frasier	Gregg Ryan Jason Dennis Elizabeth Knapp Clyde	Assistant Prof. NCSU Forestry & Envt Resources Assistant Professor of Environmental Science Coordinator Lead, Southeast and Caribbean Climate Community of Practice and Coastal Climate Extension Specialist President and CEO Associate Professor & Extension Specialist	NCSU Stetson University Southeast Conservation Adaptation Strategy SE CoP and South Carolina Sea Grant Consortium SC Small Business Chamber of Commerce University of Florida/IFAS
Elliott Emanuel Evans Figg Fly Frank Frasier Furman	Gregg Ryan Jason Dennis Elizabeth Knapp Clyde Carrie	Assistant Prof. NCSU Forestry & Envt Resources Assistant Professor of Environmental Science Coordinator Lead, Southeast and Caribbean Climate Community of Practice and Coastal Climate Extension Specialist President and CEO Associate Professor & Extension Specialist Assistant Research Scientist	NCSU Stetson University Southeast Conservation Adaptation Strategy SE CoP and South Carolina Sea Grant Consortium SC Small Business Chamber of Commerce University of Florida/IFAS UGA/ SECC
Elliott Emanuel Evans Figg Fly Frank Frasier Furman Gardner	Gregg Ryan Jason Dennis Elizabeth Knapp Clyde Carrie Lindsay	Assistant Prof. NCSU Forestry & Envt Resources Assistant Professor of Environmental Science Coordinator Lead, Southeast and Caribbean Climate Community of Practice and Coastal Climate Extension Specialist President and CEO Associate Professor & Extension Specialist Assistant Research Scientist Communications specialist	NCSU Stetson University Southeast Conservation Adaptation Strategy SE CoP and South Carolina Sea Grant Consortium SC Small Business Chamber of Commerce University of Florida/IFAS UGA/ SECC SARP
Elliott Emanuel Evans Figg Fly Frank Frasier Furman Gardner Gassman	Gregg Ryan Jason Dennis Elizabeth Knapp Clyde Carrie Lindsay Nancy	Assistant Prof. NCSU Forestry & Envt Resources Assistant Professor of Environmental Science Coordinator Lead, Southeast and Caribbean Climate Community of Practice and Coastal Climate Extension Specialist President and CEO Associate Professor & Extension Specialist Assistant Research Scientist Communications specialist Assistant Public Works Director - Sustainability Division	NCSU Stetson University Southeast Conservation Adaptation Strategy SE CoP and South Carolina Sea Grant Consortium SC Small Business Chamber of Commerce University of Florida/IFAS UGA/ SECC SARP City of Fort Lauderdale
Elliott Emanuel Evans Figg Fly Frank Frasier Furman Gardner Gassman Gould	Gregg Ryan Jason Dennis Elizabeth Knapp Clyde Carrie Lindsay Nancy Bill	Assistant Prof. NCSU Forestry & Envt Resources Assistant Professor of Environmental Science Coordinator Lead, Southeast and Caribbean Climate Community of Practice and Coastal Climate Extension Specialist President and CEO Associate Professor & Extension Specialist Assistant Research Scientist Communications specialist Assistant Public Works Director - Sustainability Division Coordinator/Research Ecologist	NCSU Stetson University Southeast Conservation Adaptation Strategy SE CoP and South Carolina Sea Grant Consortium SC Small Business Chamber of Commerce University of Florida/IFAS UGA/ SECC SARP City of Fort Lauderdale Caribbean LCC and US Forest Service International Institute of Tropical Forestry
Elliott Emanuel Evans Figg Fly Frank Frasier Furman Gardner Gassman Gould Gregg	Gregg Ryan Jason Dennis Elizabeth Knapp Clyde Carrie Lindsay Nancy Bill Rachel	Assistant Prof. NCSU Forestry & Envt Resources Assistant Professor of Environmental Science Coordinator Lead, Southeast and Caribbean Climate Community of Practice and Coastal Climate Extension Specialist President and CEO Associate Professor & Extension Specialist Assistant Research Scientist Communications specialist Assistant Public Works Director - Sustainability Division Coordinator/Research Ecologist Lead Scientist, CAKE Content Editor	NCSU Stetson University Southeast Conservation Adaptation Strategy SE CoP and South Carolina Sea Grant Consortium SC Small Business Chamber of Commerce University of Florida/IFAS UGA/ SECC SARP City of Fort Lauderdale Caribbean LCC and US Forest Service International Institute of Tropical Forestry EcoAdapt
Elliott Emanuel Evans Figg Fly Frank Frasier Furman Gardner Gassman Gould Gregg Hanna	Gregg Ryan Jason Dennis Elizabeth Knapp Clyde Carrie Lindsay Nancy Bill Rachel Adel	Assistant Prof. NCSU Forestry & Envt Resources Assistant Professor of Environmental Science Coordinator Lead, Southeast and Caribbean Climate Community of Practice and Coastal Climate Extension Specialist President and CEO Associate Professor & Extension Specialist Assistant Research Scientist Communications specialist Assistant Public Works Director - Sustainability Division Coordinator/Research Ecologist Lead Scientist, CAKE Content Editor Director	NCSU Stetson University Southeast Conservation Adaptation Strategy SE CoP and South Carolina Sea Grant Consortium SC Small Business Chamber of Commerce University of Florida/IFAS UGA/ SECC SARP City of Fort Lauderdale Caribbean LCC and US Forest Service International Institute of Tropical Forestry EcoAdapt UNC Institute for the Environment

Hernandez	Debra		SE Ocean and Coastal Acidification Network
Hijuelos	Ann	Research Associate	The Water Institute of the Gulf
Hoagland	Serra	Southern Research Station- Tribal co-liaison	USDA Forest Service
Hubbard	Bill	Southern Region Extension Forester	Southern Region Extension Foresters
Idassi	Josh	Extension Specialist	North Carolina A&T Cooperative Extension
Jennifer	Mintz	Coordinator	So. Ocean Acidification Network
Jones	Shana	Public Service Faculty	UGA Carl Vinson Institute of Gov't
Jones-Farrand	Todd	Science Coordinator	GCPO LCC
Jurado	Jennifer	Director	Broward County, FL/Southeast Regional Florida Climate Compact
Konrad	Chip	Director	Southeast Regional Climate Center
Lauren	Thie	Epidemiologist	NC DHHS
Li	Wenhong	Professor	Duke University
Macdonald	Bridget	Communications specialist	North Atlantic LCC
Maldonado	Julie	Lead Writer; Tribal Chapter National Climate Assess.	Smithsonian/NCA
Maria	Whitehead	Winyah Bay and Pee Dee River Basin Project Director	The Nature Conservancy - South Carolina
		Planner	Puerto Rico Coastal Zone
Marrero	Vanessa		Management Program/Puerto Rico Climate Change Council
Matthews	Kim		RTI International
Mecray	Ellen	Regional Climate Services Director, Eastern Region	NOAA
Megalos	Mark	Outreach Associate	Southern Region Extension Foresters
Mendez	Pablo	Post Doc Research Assistant	University of Puerto Rico/Ecological Assessment of Generalized Littoral Environments Decision-Support System (EAGLE/OS).
Mordecai	Rua	Science Coordinator	South Atlantic LCC
O'Beirne	Bill	Southeast and Caribbean Region Lead	NOAA Office for Coastal Management
Olmi	Geno	Coordinator, Southeast and Caribbean Regional Team	NOAA
Pares	Isabel	Coordinator	USDA Caribbean Climate Sub Hub for Agriculture and Tropical Forestry
Patterson	Jacqueline	Director: Climate Justice Initiative	NAACP
Piazza	Sarai	Ecologist	USGS - Coastwide Reference Monitoring system
Pickens	Christine	Coastal Restoration & Adaptation Specialist	The Nature Conservancy - North Carolina
Plunket	Jennifer	Stewardship Coordinator	North Inlet-Winyah Bay NERR
Quet	Queen	Chieftess	Gullah/Geechee Nation
Ramos	Lillian	Research Associate	Puerto Rico Sea Grant
Ran	Limei	Research Associate	UNC Institute for the Environment
Raye	Nilius	Project Leader	US FWS, Low Country Refuges

Raynie	Rick	Chief Scientist	Planning & Research Division Coastal Protection and Restoration Authority of Louisiana
Riach	Jim	Senior Lecturer, Dept. of Earth & Environment	Florida International Univ.
Rimer	Linda	Liaison to NC & SC	EPA Region 4
Schiavinato	Lisa	Law, Policy, and Community Development Specialist (NCSG)/co- Director, NC Coastal Resources Law, Planning, and Policy Center	NC Sea Grant and UNC School of Law
Schill	Steve	Senior Scientist	The Nature Conservancy - Caribbean
Shafer	Mark	PI/Climatologist	Southern Climate Impacts Planning Program (SCIPP)
Shankar	Uma	Research Associate	UNC Institute for the Environment
Shelhas	John	Southern Research Station- Tribal co-liaison	USDA Forest Service
Stewart	Beth	Director	Cahaba River Society
Terry	Steve	Sr. Project Coord. /Natural Resources Committee	United Southern & Eastern Tribes
Thomas	Ruppert	Coastal Planning Specialist	Florida Sea Grant
Tirpak	John	Science Coordinator	Gulf Restoration Program
Todd	Kellison	Chief, Fisheries Ecosystem Branch	NOAA Fisheries - Beaufort Laboratory
Traxler	Steve	Science Coordinator	Peninsular Florida LCC
Treasure	Emrys	Biological Scientist	USDA Forest Service
Wathen	Greg	Coordinator	GCPO LCC
Weiner	Sarah	Program Coordinator	USDA Southeast Regional Climate Hub
Whitehead	Jessica	Coastal Communities Hazards Adaptation Specialist	North Carolina Sea Grant
Wotkyns	Susan	Climate Change Program Manager	Institute for Tribal Env. Professionals
Dow	Kirstin	Professor of Geography and Carolina Integrated Sciences and Assessments (CISA; cisa.sc.edu)	SC Sea Grant

Appendix 5. CAKE: Add Your Adaptation Case Study

One of the outcomes for this working group is to help populate EcoAdapt's <u>Climate Adaptation Knowledge</u> <u>Exchange</u> (CAKE) database with case studies of climate adaptation projects in the Southeast.

Contact Information: Rachel Gregg, Lead Scientist and CAKE Content Editor EcoAdapt rachel@ecoadapt.org 206-226-9186

Sample Case Study: Low Impact Development Manual for Coastal South Carolina North Inlet-Winyah Bay National Estuarine Research Reserve

Contact Info: Blaik Keppler Coastal Training Coordinator KepplerB@dnr.sc.gov

Greg Hoffman Engineer and Program Manager gph@cwp.org

Project Summary/Overview

The Low Impact Development (LID) Manual for Coastal South Carolina project is supported by years of outreach and research led by the South Carolina National Estuarine Research Reserves (NERRS) and South Carolina Sea Grant Consortium. The project includes key leaders in the area that serve on the LID Manual Advisory Committee, and incorporates public trainings/meetings throughout the process. The final product will be a guidance document defined and vetted by end users. Project Background

Low Impact Development (LID) is an approach to land development (or redevelopment) that works with nature to manage stormwater as close to its source as possible (US EPA 2014). Years of research and community engagement indicated the need for an LID manual for the South Carolina coast. A number of scoping workshops, focus groups, and a survey of engineers, planners, developers, and other design professionals resulted in a formal content assessment for the LID manual. Information on these past efforts is available at http://www.northinlet.sc.edu/LID/Past/.

The Ashepoo-Combahee-Edisto (ACE) Basin and North Inlet-Winyah Bay (NIWB) NERRs, South Carolina Sea Grant Consortium, and Center for Watershed Protection collaborated to secure \$329,943 in funding from the NERRS Science Collaborative to develop the manual. This two-year project (2012-2014) aims to provide local decision-makers with stormwater engineering specifications, land use planning resources, and site design practices that are tailored to the conditions of the South Carolina coast.

Appendix 6. Relevant Publications About Co-Production of Science

- Creating usable science: Opportunities and constraints for climate knowledge use and their implications for science policy, <u>Lisa Dilling^a</u>, and <u>Maria Carmen Lemos^b</u>, <u>doi:10.1016/j.gloenvcha.2010.11.006</u>
- Salience, Credibility, Legitimacy and Boundaries: Linking Research, Assessment and Decision Making. Available at: <u>http://ssrn.com/abstract_id=372280</u>
- What Stakeholder Needs Tell Us about Enabling Adaptive Capacity: The Intersection of Context and Information Provision across Regions in the United States, Dilling et al in American Meteorological Society's *Weather, Climate and Society*, January 2015.
- Moving toward the Deliberate Coproduction of Climate Science Knowledge, ALISON M. MEADOW, DANIEL B. FERGUSON et al in American Meteorological Society's Weather, Climate and Society, April 2015. DOI: 10.1175/WCAS-D-14-00050.1