



carolinas climate resilience conference

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CHARLOTTE, NC

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FINAL CONFERENCE REPORT

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We also owe our thanks to USC Conference and Event Planning. Pete Windham, Kate Shelton, and Lynn Betterley were key team members providing extensive logistical support and ensuring that the conference ran smoothly for all attendees and presenters.

The conference would not have been possible without the support of all of our generous sponsors. We greatly appreciate their contributions to the success of the event.

Gold Sponsors: AECOM, Clean Air Carolina and Medical Advocates for Healthy Air, EcoAdapt and the National Adaptation Forum, and the State Climate Office of North Carolina

Silver Sponsors: NC Sea Grant, the NC Water Resources Research Institute, and the National Environmental Modeling and Analysis Center (NEMAC)

Bronze Sponsors: Four Twenty Seven Climate Solutions, Hazen and Sawyer, the SC State Climatology Office, and the USC School of Earth, Ocean, and Environment

We are also very pleased that the 2016 event was certified Carbon Neutral by Shift Equity's Carbon Advantage Program. Sponsorships from the SC Sea Grant Consortium and the USDA Southeast Regional Climate Hub allowed CISA to "walk the talk" to reduce the environmental impact of the event.

The Carolinas Integrated Sciences & Assessments (CISA) is supported by NOAA's Regional Integrated Sciences & Assessments (RISA) program. Allocations from this grant were used to provide travel support for local government and community representatives, who play a crucial role in moving climate adaptation forward in the region.

Conference Motivation and Goals

WHY A CAROLINAS CLIMATE RESILIENCE CONFERENCE?

The idea for a [Carolinan Climate Resilience Conference](#) was borne from research to inform the Third US National Climate Assessment (NCA). In 2010 and 2011 researchers with the Carolinas Integrated Sciences & Assessments (CISA) conducted interviews with a variety of stakeholders and decision makers to inform a technical report for the NCA. This report, entitled [Engaging Climate-Sensitive Sectors in the Carolinas](#), revealed that interviewees rely primarily on in-person engagements such as meetings, workshops, and conferences to learn about sources of relevant and up-to-date climate information. Although many climate resources are readily available through online resources and tools, interviewees indicated that it is through one-on-one interactions that they are able to gain insight into how climate is best incorporated into their own work. Interviewees viewed in-person engagements as pivotal to fostering personal connections and networks as well as facilitating cross-sector collaborations. The research also indicated a lack of coordinated networks within the Carolinas providing climate-specific or climate-focused information and services.

CISA set out to address this gap and support these networking and information needs by convening climate information providers and users at the first Carolinas Climate Resilience Conference (CCRC) in 2014. This event drew nearly 200 people to the Charlotte, NC, area for two days of interactive sessions and engagement opportunities. Feedback from attendees and survey responses were overwhelmingly positive with the majority of respondents indicating that they would be interested in attending a second CCRC.

In order to maintain momentum and continue to foster a climate adaptation network in the region, CISA hosted a second conference in 2016. The conference was held September 12-14 in Charlotte, NC, attracting 272 attendees. This report provides an overview of the 2016 CCRC and post-conference survey results. This feedback will guide CISA's engagement with the network in the years ahead.

CONFERENCE GOAL: PROVIDE ACTIONABLE INFORMATION TO INCREASE CLIMATE RESILIENCE

The impacts of current climate variability and the evidence of climate change are continuing to grow and with them, our understanding of the challenges we face in adapting to those changes is developing. Building resilience – the ability to adjust to, or recover from, a stress or change – is an important step in preparing to successfully address current and future challenges. The goal of the CCRC was to provide a platform for scientists, decision makers, and practitioners to share their experiences and knowledge related to climate and climate adaptation. In addition to sharing findings from research and applied projects, the conference was also intended to foster cooperative efforts to develop real-world climate adaptation solutions in the Carolinas.

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The program for the Carolinas Climate Resilience Conference was developed to:

- Support on-the-ground resilience efforts by providing managers and regional experts with an opportunity to share lessons learned and discuss resources and tools for incorporating climate information into their work.
- Provide a venue for practitioners and researchers to share information about current activities, plans, and opportunities for collaboration.
- Contribute to the development of a climate information network for the Carolinas.

The conference format included interactive presentations, networking sessions, pre-conference workshops, and live tool demonstrations designed to encourage dialogue among attendees. A major goal was to create an atmosphere of collaboration and interaction among the wide variety of expertise and interests working throughout the region.



Jared Rennie
@jjrennie



Follow

So many good talks this morning, from insurance mitigation to outreach to analysis of 2015 SC Flood [#CCRC2016](#)



The Conference Program

WHO'S WHO AMONG CLIMATE ADAPTATION PRACTITIONERS IN THE CAROLINAS

To achieve the conference goals, the 2016 Carolinas Climate Resilience Conference convened university researchers, practitioners in the public and private sectors, and staff from local, state, and federal government to share knowledge about climate resilience-related experiences, resources, and tools. Fourteen states and the District of Columbia were represented as well as the country of Bolivia (Figure 1). There were 272 attendees at the conference, an almost 100 percent increase from the 2014 conference, which hosted 197 participants.

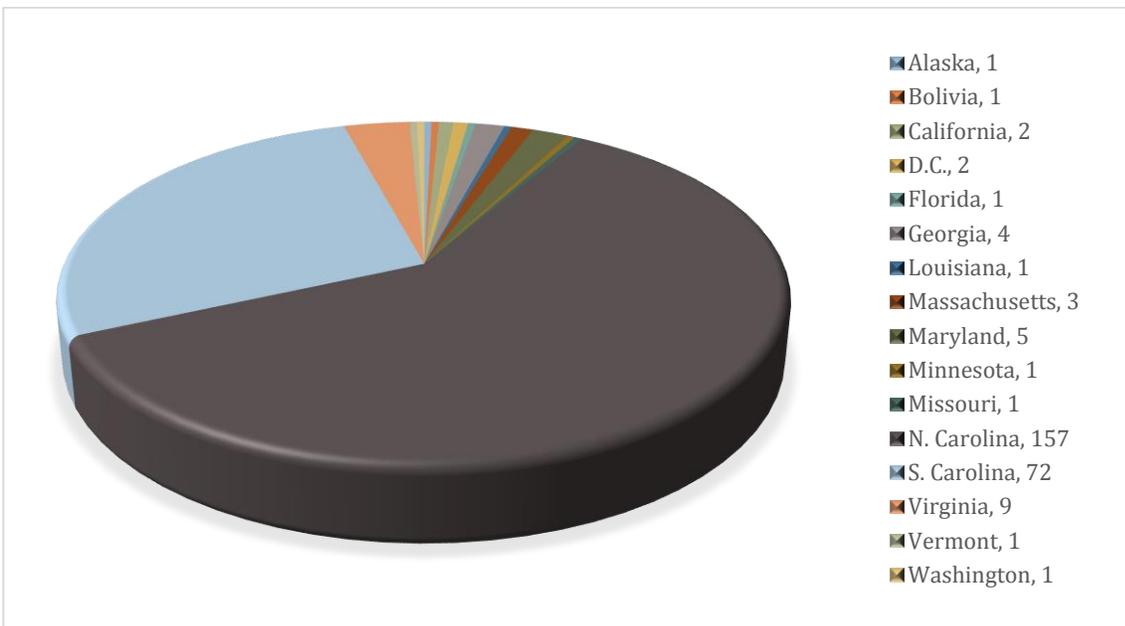


Figure 1: 2016 Home Locations of CCRC Attendees

The conference planning effort reached out to a diversity of sectors to encourage dialogue about opportunities for collaboration and thinking beyond traditional silos. Similar to 2014, university researchers represented the largest number of the attendees; however, a variety of other sectors were also represented. Figure 2 shows the breakdown by organization type. There was a slight increase in the number of federal and regional government representatives (22% of attendees in 2016 compared to 12% in 2014). There was a 3% decrease in the number of representatives from both NGOs and the private sector. In order to facilitate participation by local and state level representatives, CISA provided travel support to those who would not otherwise have been able to attend. This included 8 local government officials, 3 state government officials, 11 NGO representatives, 3 private sector representatives, and one tribal community representative.

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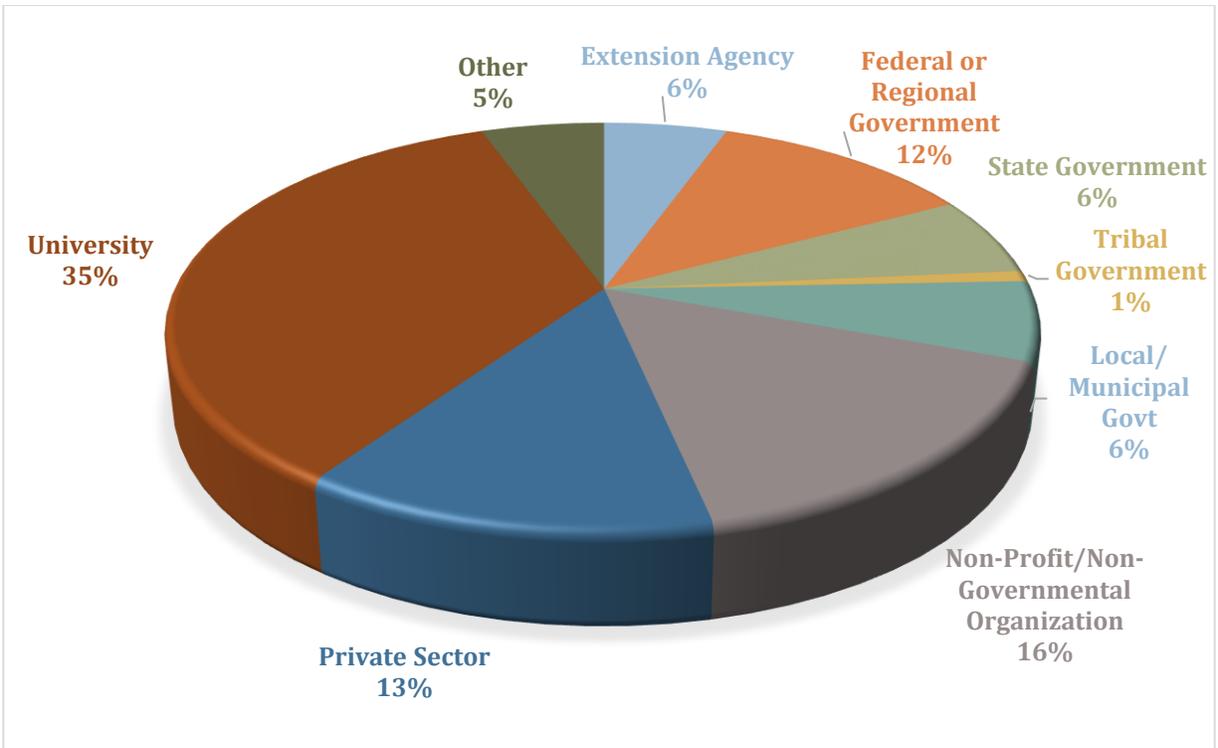


Figure 2: 2016 CCRC Attendee Organization Type

A FOCUS ON INTERACTION AND NETWORKING

The conference steering committee worked to enhance the networking opportunities provided at the 2016 CCRC. Breaks between sessions, interactive presentation formats, networking bingo, and audience polling questions during breaks were intended to foster discussion opportunities. A networking reception was also held on Monday evening after the first half day of sessions.

Conference survey respondents mentioned specifically the benefits of a discussion-focused format. Forty-eight percent of respondents noted that they would follow up with contacts they made at the conference for possible collaborations or future conversations when asked about their plans for specific actions they would take as a result of attending the CCRC.

"I found huge value in the networking opportunities as well as the interactions that occurred between speakers and attendees during the talks!"

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Session presenters were asked to choose one of five interactive conference formats. These formats included:

- “Climate Resources and Tool Demonstrations” sessions, which allowed groups to circulate among tool tables for hands-on demonstrations
- “Connecting the Dots” presentations, which were designed for presenters to be able to ask the audience questions to inform their projects or research
- “Illustrated Presentations”, which were a take on the traditional academic poster session; presenters were given 5 minutes to provide a short overview of their presentation to session participants before participants spent time visiting individual posters
- “Sharing Lessons Learned” presentations, which served as case study discussions
- The “What’s Going On?” format, which provided an opportunity to share ongoing research, efforts and partnerships in the Carolinas that address climate variability and change

Additional detail about the presentation formats can be found on the [Program page](#) of the conference website.

An attendee bingo game and text-in polling were incorporated to initiate conversations. The bingo cards asked attendees to find other conference participants who satisfied criteria such as “works for a local government” or “is involved in work to mitigate the impacts of sea level rise”. There was not as much participation in this activity in 2016 as in 2014, indicated by the minimal number of completed cards submitted by participants. There may be other activities that promote this same type of networking that could be incorporated into the 2018 conference.

[Poll Everywhere](#) software was used for live text-in polling during meals and breaks. Questions ranged from “What is the most interesting thing you learned during the morning plenary?” to “What would your climate superhero power be?” These were meant to be fun, light-hearted reflections of the day as well as conversation starters. Again, participation was somewhat limited. One idea to increase participation in 2018 may be to ask participants to respond to these questions during plenary sessions, rather than during breaks and lunches when conversations with colleagues may be more enticing than responding to poll questions.



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PRE-CONFERENCE WORKSHOPS

Two pre-conference workshops offered a more in-depth look at important climate topics for Carolinians: inclusive adaptation and resilience and effective climate communications. The workshops were formatted as roundtable discussions to allow attendees time for in-depth discussions on workshop topics.

Thirty individuals participated in the *Inclusive Climate Adaptation and Resilience Building Workshop*, which featured speakers who discussed climate impacts to marginalized communities. Speakers included:

- Ronny Bell, East Carolina University Brody School of Medicine's Department of Public Health
- Jacqui Patterson, NAACP Environmental and Climate Justice Program
- Reverend Leo Woodberry, Woodberry & Associates and Kingdom Living Temple in Florence, SC

Following speaker presentations, participants worked in small groups to discuss their own experiences in addressing similar challenges and identify specific action items and opportunities to foster this discussion during and beyond the CCRC. Survey respondents noted that learning about non-obvious ways that vulnerable populations are affected and the barriers to increased resilience in these communities was a very valuable component of this workshop.

Direct outcomes from this workshop are plans to continue and advance the dialogue initiated at the CCRC. Workshop organizers have submitted a similar session proposal for the 2017 National Adaptation Forum. Their hope is that a national-level discussion will allow them to connect with other groups conducting similar work, to identify opportunities for collaboration, and to adopt transferable ideas to support progress in this area in the Carolinas.

Twenty-seven participants attended the *Climate Communications in the Carolinas Workshop*, which was led by Susan Joy Hassol, Director of [Climate Communication](#). Participants discussed how to develop clear, concise, and compelling public messages around climate change. Survey respondents noted that Hassol's unique style and candid explanation of key communication challenges and best practices for clearly relaying climate information, particularly to skeptical audiences, were valuable components of this workshop. Communication was a key theme throughout the 2016 CCRC, allowing participants to share what they learned in the workshop and glean additional lessons learned from other speakers and participants.

PLENARY SESSIONS

The CCRC featured three plenary sessions. The opening plenary set the stage for a conference focused on climate resilience in the Carolinas. Three framing presentations were followed by a keynote address. Rob Phocas, City of Charlotte Energy and Sustainability Manager, welcomed attendees to the Charlotte area. Linda Rimer, EPA Region IV Liaison for Climate Resilience, shared a brief history of climate adaptation in the Carolinas. Deke Arndt, Chief of the Climate Monitoring Branch at NOAA's National Centers for Environmental Information in Asheville, NC, gave an overview of the current state of the climate, climate impacts, and projected future climate. His personal story about his grandmother's experiences during the Dust Bowl and the technological advances which prevented similar impacts during a more severe drought

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in the 1950s illustrated both human impacts on the environment that exacerbate climate impacts and ingenuity in the face of these challenges.

Bob Inglis, former US Representative for South Carolina's 4th district, gave the keynote address during the opening plenary. He discussed the importance of bipartisan support for climate change. Additionally, he highlighted the need to communicate through the language of one's audience. His new initiative, republicEn.org, encourages free-market solutions to energy and climate policy and specifically targets members of the Republican Party. After his presentation, he engaged with the audience about their perspectives on communication and climate change. Several survey respondents indicated that they would like to see him return to speak at future conferences.

The Tuesday morning plenary focused on water resources and climate resilience. The session was moderated by Susan White, Director of NC Sea Grant and the NC Water Resources Research Institute. Speakers included:

- Ed Bruce, Duke Energy
- Eric McClam, City Roots Farm
- Sydney Miller, City of Durham, NC Department of Water Management
- Maria Whitehead, SC Chapter of The Nature Conservancy

These speakers represented diverse perspectives from the government, business, and non-profit sectors. Their presentations covered common themes of water scarcity and the need for conservation in the face of the impacts of climate variability and projected climate change.

The closing plenary on Wednesday afternoon focused on climate communication strategies and examples in the Carolinas. Susan Joy Hassol of Climate Communication moderated the session. Panelists included:

- Greg Fishel, WRAL, Raleigh, NC
- Jim Gandy, WLTX, Columbia, SC
- David Salvesen, UNC Chapel Hill, Institute of the Environment

Instead of presentations or structured speeches, the panel took questions from the audience which then led to more in-depth conversation. Greg Fishel and Jim Gandy shared experiences about conveying complex science in ways that resonated with local news viewers. David Salvesen, producer of the [Climate Stories NC](#) documentary series, discussed his personalization of the topic through film. This approach has helped communicate the diversity of climate impacts in the Carolinas such as those to fisheries and public health.

Ninety plus survey respondents indicated that all of the plenaries were valuable to extremely valuable. Feedback also indicated that speakers were well chosen for the sessions.

"I really enjoyed the speakers at each of these [plenaries]. [There were a] wide variety of perspectives from both scientists and non-scientists. I think those perspectives help with climate communication."

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CONCURRENT SESSIONS

Created to appeal to an interdisciplinary audience, the conference program included a diverse range of topics. Major themes of concurrent sessions included:

- Climate communication and education
- Climate data and information needs
- Climate in the Carolinas
- Coastal communities and sea level rise
- Drought impacts
- Economics of climate change
- Resilient communities and infrastructure
- Water, land, and natural resources management

Sessions were organized around these core themes. Survey respondents noted that the sessions were well organized and highlighted their areas of interest. Over 60% of survey respondents indicated that they would be using the new data and tools that were demonstrated throughout the sessions.



Conference Survey

After the conference, an online survey was circulated to all participants in order to assess the value of various conference components. The survey also included questions about attendees' climate information and resource needs. CISA will use these responses to inform future work with stakeholders and decision makers. Forty-six percent of attendees (n=124) completed the survey.

BENEFITS OF ATTENDING THE CAROLINAS CLIMATE RESILIENCE CONFERENCE

Survey respondents were asked to indicate how well the CCRC succeeded in achieving the goals of the event. Respondents noted that networking and learning about new climate resources, tools, and expertise were two of the most effective components of the conference program. Gaining new knowledge and skills applicable in their work was also highly ranked. Results indicate that the conference was successful in achieving goals set out by the planning committees (Figure 3).

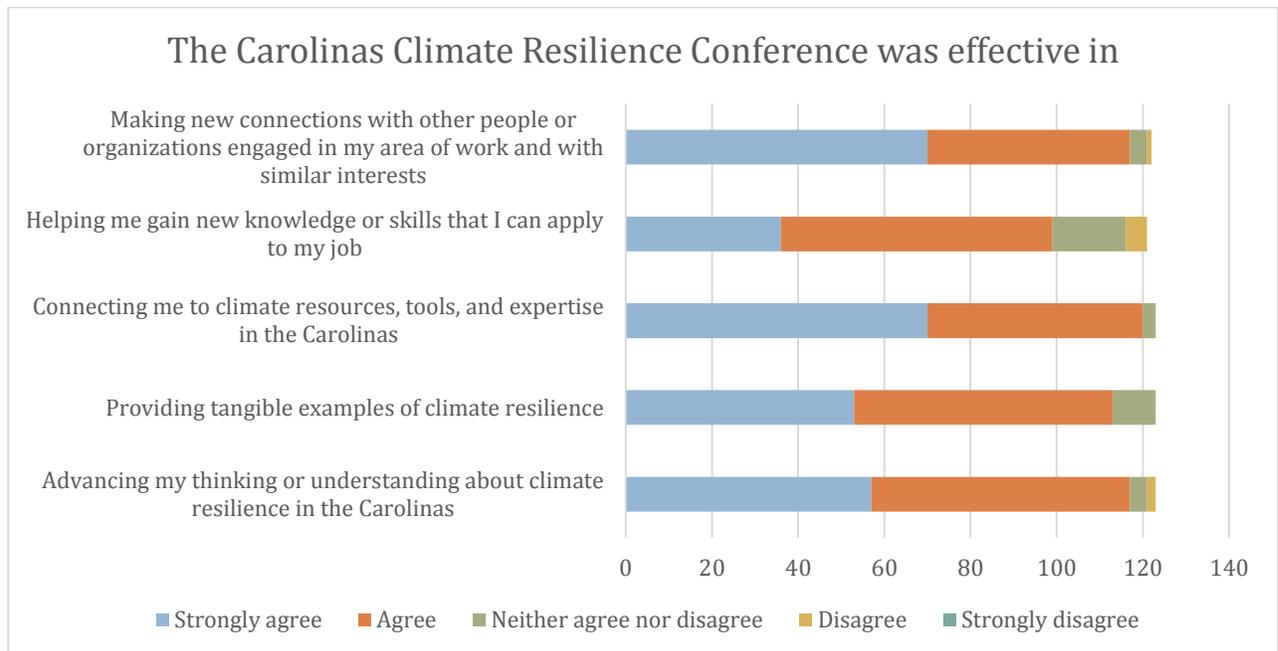


Figure 3: Effectiveness of the CCRC in Achieving its Goals

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KNOWLEDGE GAINED AND CONNECTIONS MADE

Attendees were also asked what information shared at the conference was most valuable to them. This was an open ended survey question and the responses fell into several general themes:

- Case studies from other communities and organizations
- Climate communications
- Climate science
- Learning about new tools and resources
- Networking, new connections

Of these categories, learning from case studies of climate adaptation activities was mentioned most often by survey respondents, followed by new connections made and climate communications science, respectively (Table 1).

“There is so much good work going on, and so many great people working on climate resilience, and so much progress since the last conference, it gave me great hope!”
“That many other persons are committed to awakening our fellow citizens to the realities and probable consequences of climate change. I also got a few good tips on how to speak to skeptics about climate change.”
“I would say it is not necessarily what I learned but I found huge value in the networking opportunities as well as the interactions that occurred between speakers and attendees during the talks.”

Table 1: Sample responses to survey question, “What was the most valuable thing you learned at the CCRC?”

To further assess what information was most useful to participants, a second, more specific question was asked about the type of information respondents planned to share with co-workers or colleagues. Once again, new connections and case studies rose to the top. Figure 4 shows the full breakdown of responses.

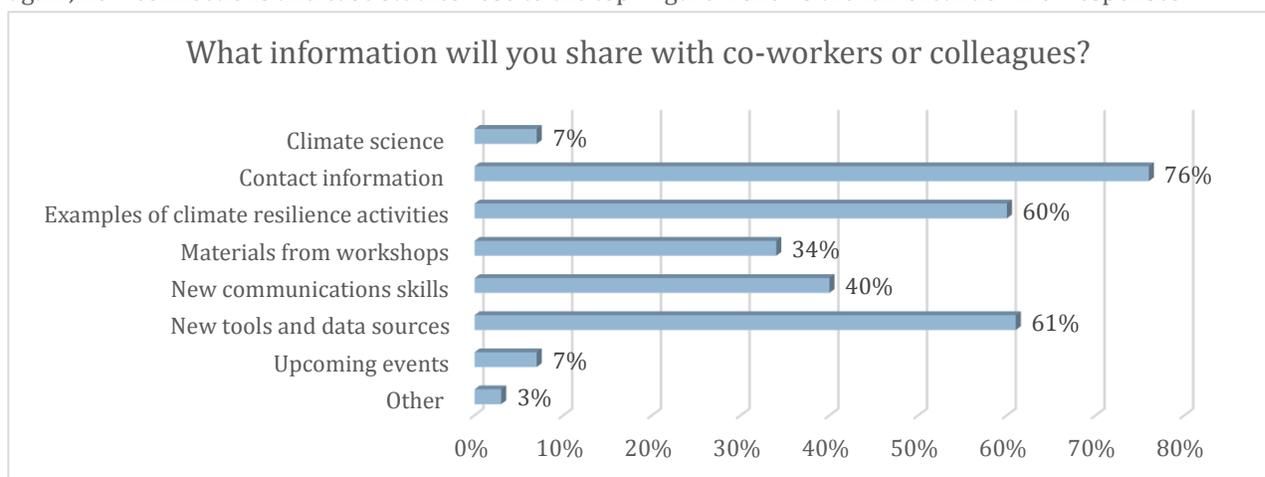


Figure 4: Information Conference Participants Plan to Share

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PLANS FOR CONFERENCE FOLLOW-UP

Conference attendees were also asked what specific plans they made or follow-up actions they would take as a result of attending the CCRC (Table 2). Sixty people responded to this survey question. Twenty-five percent of respondents noted that they would utilize tools or resources they learned about at the conference in their work. Following up with new connections to investigate the potential for collaboration was also a major theme (46% of responses). Several researchers noted that the feedback they received from conference participants would be incorporated into future work. The reach of the CCRC will also be extended beyond attendees through respondents who indicated that they will share information about new resources, tools, and case studies from other communities (13% of respondents).

“The conference challenged me to think about the various effects that climate change is likely to have on our operations. I will work to include those in our resiliency planning.”

“I want to incorporate climate change into more of our communications overall, but by focusing on individual stories. The videos shown during the conference will make great links.”

“I plan on contacting a number of individuals I met at the conference to collaborate and target for my research.”

Table 2: Sample responses to survey question, "What will you do, or change, as a result of attending the CCRC? Do you have specific plans or follow-up actions as a result of attending the conference?"

OVERARCHING CLIMATE ISSUES, NEEDS AND OPPORTUNITIES IN THE CAROLINAS

Challenges to Climate Resilience

When asked what challenges climate resilience efforts face in the Carolinas, major themes included: the political climate, a lack of funding for climate adaptation work, and needs for enhanced climate communications and public awareness of climate issues (Table 3).

“I think it would be very helpful to have a very frank discussion of the politics within the Carolinas and how to get around political resistance to planning and research efforts.”

“Examine whether resilience implementation is considered by the public and decision makers an ‘expense’ or ‘investment’. How are resilience efforts (i.e., infrastructure) funded? Cost/benefit calculation examples, return on investment, cost of doing nothing.”

“The usual: long timeline for climate change impacts v. short-term needs of decision makers; high cost of many adaptation options; distinguishing climate change impacts from natural variation; communicating all of the above.”

Table 3: Sample responses to survey question, "What challenges do climate resilience efforts in the Carolinas face?"

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Attendees offered very creative responses to the second part of this question, “What additional resources or opportunities might help to overcome these challenges?”

<p>“Obviously, legislative leadership would go a long way; climate data and adaptation strategy presentations at conference of city and county administrators.”</p>
<p>“I heard a lot about how to communicate and motivate communities, but there was nothing on how to reach state and federal elected officials, which is where a lot of the regulation and incentives get made.”</p>
<p>“Financial resources to support ongoing outreach/education campaigns to overcome apathy and denial among local-level decision makers and elected officials.”</p>
<p>“A lot of the problem becomes a communication issue. We all need to get better at that. Maybe an ‘ask the communicator’ session next time? And an opportunity to share what has and has not worked.”</p>
<p>“It seems that many communities are focused on engineering solutions to increasing climate resilience; for some communities, these may work, but we need to have a better understanding of the long-term costs and resources needed to sustain these solutions.”</p>
<p>“At this point it is about \$\$\$. Short of that, examples of creative ‘work arounds’ and existing efforts – the networking and best practices – are most useful resources.”</p>
<p>“For the scientists who are crunching the “big data” related to climate projections, it remains difficult to effectively summarize and communicate the gist of that information for other audiences. For those who are tackling or have tackled this issue, it might be helpful to put together some best practices about how this information can be presented, both visually and orally.”</p>

Table 4: Sample responses to survey question, “What additional resources or opportunities would help to overcome these challenges?”

The responses fell into 3 major categories. The majority of responses centered on the *need for legislation and political will* to move climate adaptation work forward in the Carolinas. Inviting more elected officials to participate in the 2018 conference and join the discussion may help make progress in this area by engaging these individuals on key issues and connecting them to the existing network of those working to address them. Additionally, speakers who are able to share examples of successful state legislation or municipal regulations and codes that support climate adaptation could provide important lessons learned.

Funding, as noted by survey respondents, is a challenge in addressing any issue but has not necessarily been a key focus of CCRC sessions in the past. To address this need and inform participants on this topic at future conferences, CISA could invite speakers who are able to discuss funding opportunities with community leaders as well as ask speakers to include information about their funding sources in presentations.

Finally, participants continue to emphasize the need for resources to support discussion around *climate communications and ways in which to best inform the public* about the impacts facing the Carolinas. Finding new and creative ways of sharing and teaching effective communications skills will provide value added to an engaged, interactive audience. CISA will use this survey feedback in planning future workshops and conference topics and speakers.

Additional Information and Resource Needs

In order to inform CISA's future work, questions were posed about the types of climate information that will be most useful to this network of practitioners and the best means of disseminating that information. Figure 5 displays responses to the question on climate information needs. These results will guide program development for upcoming workshops and conferences (see Looking Ahead section) for further discussion about CISA's planned future events). Additionally, this information will be employed to develop content in communications materials, to include CISA's quarterly newsletter, the [Carolinas Climate Connection](#), and the [Carolinas Climate Listserv](#).

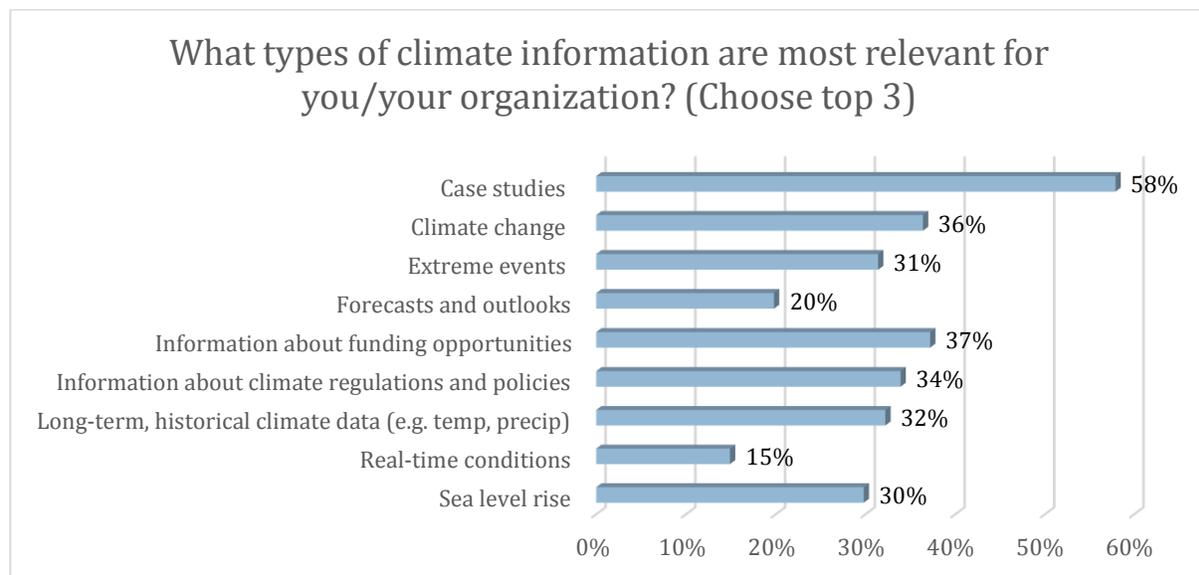


Figure 5: Climate Information Needs

Fifty-eight percent of respondents indicated that they need case studies and examples of actions by other communities and organizations to build climate resilience. The need for more basic climate science ranked relatively lower than case studies. These priorities may also be reflected in the need to cancel a third pre-conference workshop on climate fundamentals. Steering and program committee members initially identified a need for a climate science workshop to provide an opportunity for attendees new to the field to receive general information on basic climate science and resources in the Carolinas. The lack of demand for this workshop, limited participation in the “Ask the Climatologist” session, and the above survey responses suggests that this network has either already received the education and training needed to incorporate climate science into their work or, perhaps, there is a sense that this type of information is not needed to do the work. Additionally, when asked about the most valuable thing learned at the conference, case studies showing what other communities are doing to address climate impacts was one of the most often mentioned responses.

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When asked how they would like to receive information from CISA, most respondents indicated that they preferred websites (66%), followed by ½ to 1-day in-person meetings or workshops (45%) and colleagues (42%). CISA will consider these preferences when planning future engagements.

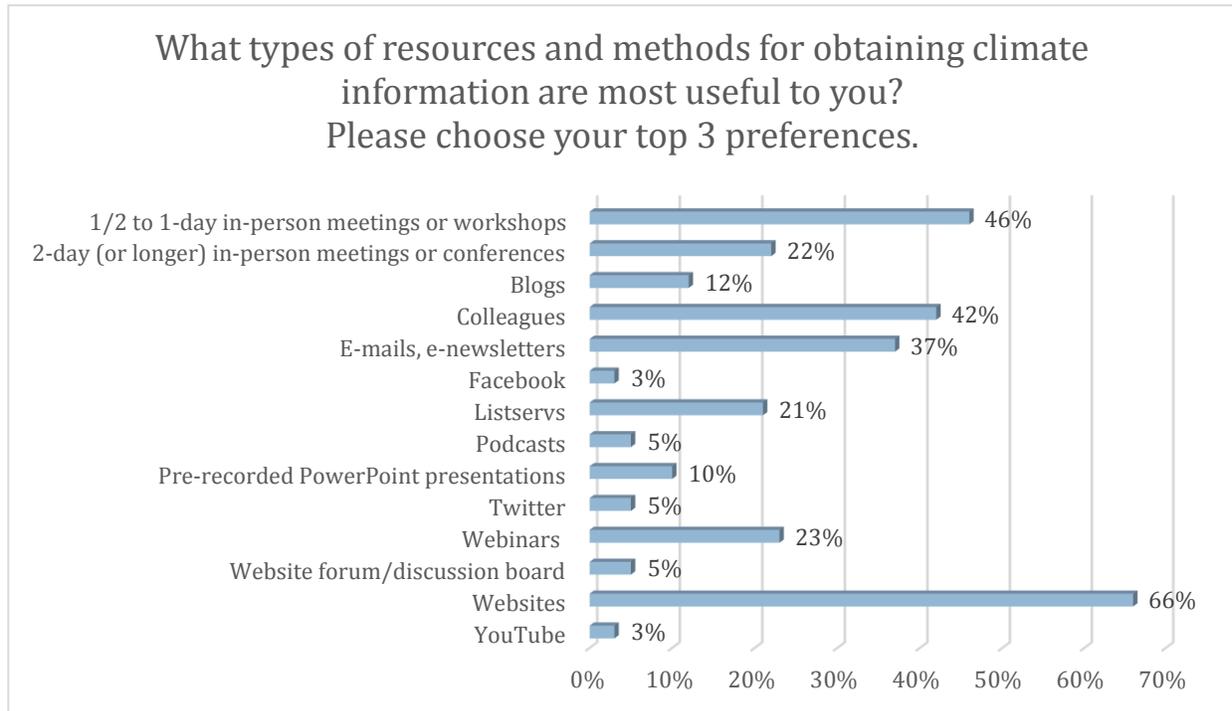


Figure 6: Preferred Methods for Receiving Climate Information

Looking Ahead

In offering continues support for the network of climate adaptation practitioners in the Carolinas, CISA is planning to host the third Carolinas Climate Resilience Conference in September 2018. As in 2016, lessons learned from the 2016 conference and assessment of regional climate information needs will be considered in the design of the 2018 conference program. Conference participant feedback will also inform CISA's other projects and activities.

During the alternate years, CISA is planning two other types of workshops. A series of smaller [Climate Connections workshops](#) are intended to, meet the need identified by survey respondents for more single day workshops. In collaboration with the SC State Climatology Office, CISA will host a series of three local workshops in South Carolina in 2017 with an emphasis on connections between climate and natural resources management. We also plan to host workshops for local elected officials, planners, and managers in order to foster awareness among community leaders about climate issues and increase adaptive capacity at the local level where climate impacts are experienced and best responded. CISA will partner with other trusted sources and information providers (e.g., Sea Grant, National Estuarine Research Reserve's Coastal Training Program, local Councils of Government) to reach target audiences and design workshops that integrate climate considerations into localized decision-making processes based on these organizations' prior work with the communities.

CISA is also committed to support the [Southeast and Caribbean Climate Community of Practice \(CCoP\)](#). The CCoP provides a forum for sharing lessons learned and best practices related to climate communication and adaptation. The CCoP also provides networking opportunities for its members. CISA will work in partnership with the Southeast regional Sea Grant programs, and NOAA's Southeast and Caribbean Regional Team (SECART), to host in-person meetings of this group in the off-years of the CCRC to expand the network throughout the region.

CISA team members at the University of North Carolina at Chapel Hill are developing a climate-health portal where climate-related public health impacts in the Carolinas will be presented and research to improve understanding of these impacts will be shared. Stakeholder engagements will help to publicize the website and refine content to make it useful and relevant for the intended audience.

Coordination of the [Coastal Carolinas Drought Early Warning System \(CC DEWS\)](#) program is also led by CISA. This portfolio of projects, supported by the [National Integrated Drought Information System \(NIDIS\)](#), is helping to build understanding of drought's effects on the Carolinas' coastal ecosystems and engage decision makers around these issues. In addition to regional coordination of CC DEWS activities, CISA contributes through assessment of historical drought events and precipitation patterns and trends in the Carolinas, assessment of drought indicators and impacts in Southeastern coastal ecosystems, and a program to expand drought impacts monitoring and reporting through citizen science.

CISA looks forward to all of these interactions with stakeholders and decision makers throughout the Carolinas and beyond to work towards our overarching goal of increasing adaptive capacity in the region.